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## EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and SURVEYING INSTRUMENTS  
Chicago New York San Francisco New Orleans Pittsburg Toronto

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.  
Roadway 16 feet wide. Side Slopes 1 on 1.  
For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	0
1	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	1
2	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	2
3	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	3
4	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	4
5	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	5
6	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	6
7	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	7
8	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	8
9	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	9
10	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	10
11	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	11
12	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	12
13	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	13
14	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	14
15	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	15
16	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	16
17	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	17
18	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	18
19	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	19
20	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	20
21	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	21
22	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	22
23	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	23
24	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	24
25	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	25
26	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	26
27	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	27
28	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	28
29	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	29
30	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	30
31	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	31
32	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	32
33	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	33
34	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	34
35	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	35
36	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	36
37	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	37
38	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	38
39	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	39
40	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	40

**Example**—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 30.6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be  $30.6 - (20 - 16) \div 2$  or 2 ft. added to  $30.6 = 32.6$ . For slopes of 1 on 1½ see inside of back cover.

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*Index in center*

This Field Book is manufactured  
of a high grade 50% Rag Paper  
having a WATER RESISTING surface.

INDEX IN CENTRE

Sta.	B.S.	H.I.	F.S.T.P.	F.S.	Elev.
B.M.	3.9	103.9			100.00
0+20 P.C.				5.65	98.25
M.D. int.	2.0	96.8	9.1		94.8
Ext.	6.55	99.55	8.8		88.0
2+80 I.T.	8.45	99.9	3.6		90.95
3+50	7.1	105.4	1.1		98.3
4+50				6.25	99.15
5+05	6.8	105.2	7.0		98.9
5+50				5.0	100.2
T.P.	6.15	108.25	3.1		102.1
6+50	6.55	111.55	3.25		105.00
7+00				4.65	106.90
8+00	4.5	108.05	8.00		103.55
8+50				5.75	102.3
9+00				7.15	100.90
9+30	9.5	111.35	6.2		101.85
10+00	8.00	116.90	2.95		108.90
11+00	2.8	114.05	5.15		111.25
12+00	11.55	120.55	5.05		109.00
T.P.	10.8	130.65	.7		119.85
13+00	11.2	139.15	2.7		127.95
T.P.	9.85	147.00	2.0		137.15
14+00				7.7	139.30
	115.70		68.70		

OK

Weather:

Cloudy - Cool  
 B.M. on 4" white oak  
 40 ft. No. of town road

Sept. 18 1936

Party  
 H. Nilson - Abney  
 G. Engbretsen - Rod

②

Sta.	B.S.	H.I.	F.S.	F.S.	Elev.
		197.00			
15+00	8.75	154.70	1.05		145.95
16+00				5.85	148.85
17+00	8.55	159.15	4.1		150.6
17+50				4.15	155.00
18+00	10.05	165.75	3.45		155.70
T.P.	7.9	172.35	1.3		164.45
18+67				3.35	169.00
19+00	1.2	170.75	2.8		169.55
19+50				8.95	161.80
PC 19+85	4.8	165.85	9.7		161.05
55 M.O. C.L.				5.0	160.85
55 C.L.	8.25	168.20	5.9		159.95
55 M.O. C.L.	6.55	171.15	3.6		164.60
PT 22+15	9.35	177.75	2.75		168.40
23+00	8.5	182.10	4.15		173.60
24+00	5.8	189.05	3.85		178.25
24+35				6.85	177.20
25+00	8.5	190.30	2.25		181.80
25+38				8.65	181.65
25+50				7.15	183.15
T.P.	11.5	201.30	.50	<del>5.0</del>	189.80
26+00				4.85	196.45
T.P.	9.6	210.65	.25		201.05
PT 26+50				3.15	207.50
53	109.30		45.65		

O.K.

③

Sta.	B.S.	H.I.	F.S.	F.S.	Elev.
		210.65			
26+75 <sup>78</sup>				6.9	203.75
EXT. IC. <sup>c.l.</sup>				2.45	208.20
P.T. NORTH. <sup>c.l.</sup>				5.1	205.55
Eva. No. c.l.				6.2	204.45
#2 Kidney	8.95			<del>8.95</del> 12.16	219.60
	233.95		→ 114.35		100.00
	114.35				
	119.60		←	→ 119.60	

Center Line Traverse.					
Sta.	Bearing Mag.	Bearing True	Notes	Proj.	Job
0+00	N85°E	S88°E	162'		
PI. 1+62	N5°W	N2°E	1938'		
PI. 2+100	N53°W	N46°W	511.75'		
PI. N. 26+11.75	N7°W	North	77'		
26+11.75	N53°W	N46°W	2485'		
PI. 50. 26+36.6	S83°W	West	42'		
Tie S.C. <sup>23/24</sup> 26/25	S5°E	S2°W	- 12 feet from Sta 1+62		
# 1	PI. 1+62	# 3	PI. 26+11.75		
	Cent. Δ - 90°		Cent. Δ - 48°		
	Ext. - 62'		Ext. - 5'	P.C. - 25+56.15	
	Tang. - 150'		Tang. - 25'	P.T. - 26+36.75	
	Rad. - 150'		Rad. - 60'		
	Chord. - 115'		Chord. - 24'		
	M.O. - 115'		M.O. - 15'		
# 2	PI. 2+100	# 4	PI. 26+36.6		
	Cent. Δ - 48°		Cent. Δ - 44°	P.C. - 26+19.6	
	Ext. - 23'		Ext. - 3'	P.T. - 26+53.6	
	Tang. - 115'		Tang. - 17'		
	Rad. - 250'		Rad. - 40'		
	Chord. - 107.5'				
	M.O. - 6'				

5/

Curves.

45

P.I.

Cont.  $\Delta - 90^\circ$

Ext. - 15'

Tang. - 35'

Rad. - 40'

M.O. - 2.5'



Cross Sections - Project 9 Jobb

Sta.	B.S.	H.I.	F.S.	Elev.	Grade Elev.	Ground Elev.
26+92.6	5.5	209.25			202.50	203.75
26+93.6		212.50			202.50	207.50
C.L.A.			4.6	207.9	202.50	207.9
C.L.B.			4.5	208.0	202.50	208.0
C.L.C.	3.6	211.6	4.65	206.95	202.50	206.95
C.L.D.			6.05	205.55	202.50	205.55
C.L.END.			7.15	204.45	202.50	204.45

Grade Rod.		L.	C.	R.
6.75	Soi →	$\frac{-2.5}{9.0}$	$\frac{+1.25}{0.0}$	$\frac{+3.6}{1.7}$
10.0	Soi →	$\frac{+3.4}{9.0}$	$\frac{+5.0}{0.0}$	$\frac{+2.85}{1.85}$
10.0	inside cut curve →	$\frac{+8.15}{15.15}$	$\frac{+5.4}{0.0}$	
10.0	"	$\frac{+8.25}{15.2}$	$\frac{+5.5}{0.0}$	
9.1	"	$\frac{+3.25}{14.9}$	$\frac{+4.95}{0.0}$	
9.1	"	$\frac{+6.5}{13.9}$	$\frac{+3.05}{0.0}$	$\frac{-1.5}{9.0}$
9.1	"	$\frac{+5.2}{12.9}$	$\frac{+1.95}{0.0}$	$\frac{-1.5}{9.0}$

9/28/36  
 H. N. Notes  
 G. E. Res  
 C. E. Abney  
 Weather:  
 Clear.

End 9/28/36

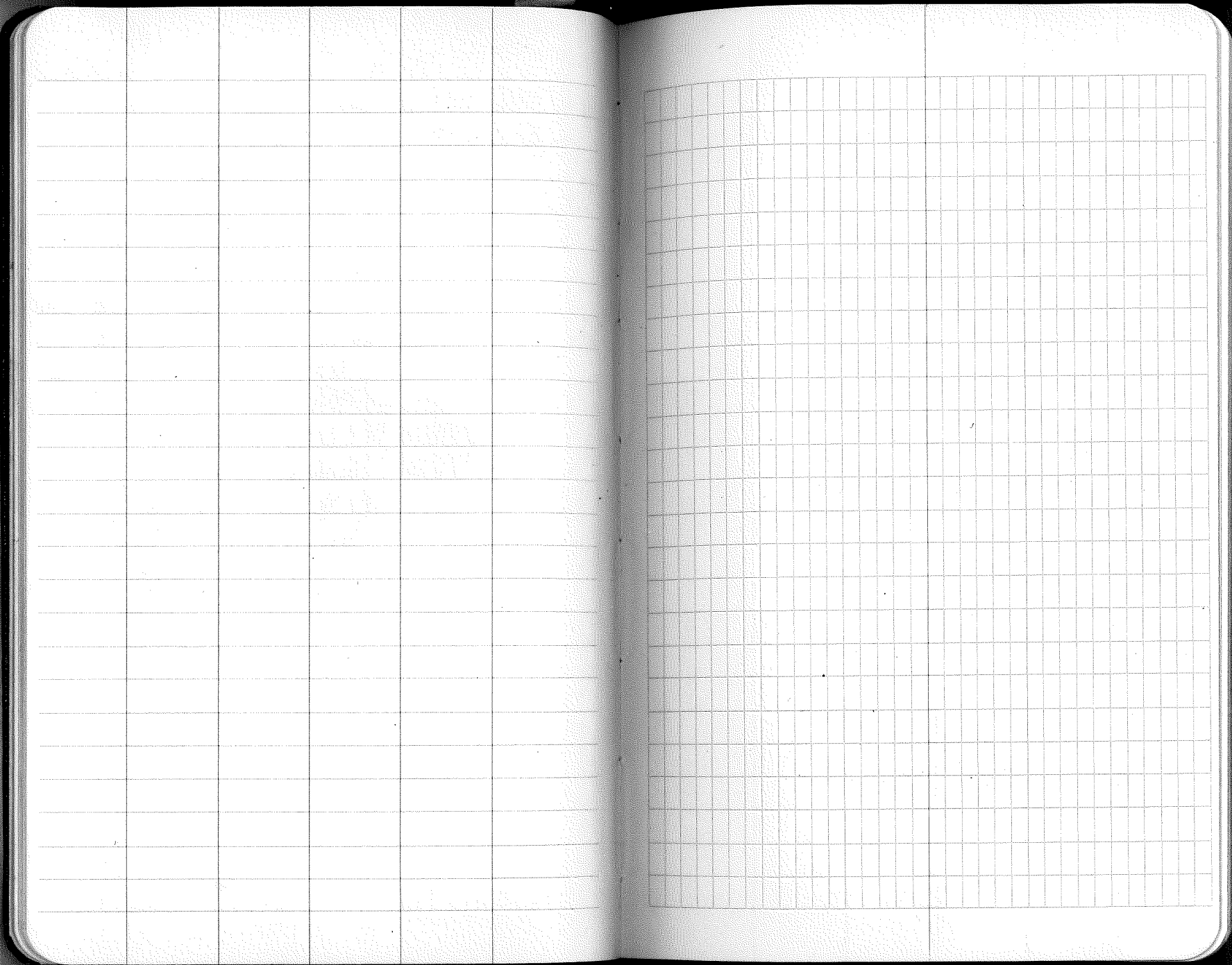
I.P.	Sec. Cor to	$\frac{33}{4} \frac{34}{3}$
1+00	Tamarack & Spruce Swamp	
5+50	Leave Tam. & Spruce Swp.	
9+00	Tam. Swamp (small swamp)	
13+20	Leave Tam. Swamp.	
18+43	Int Road E & W	
29+50	Enter Spruce Swamp	
52+50	Set 4" sq. Oak App. Cor. Post to	
	secs. $\frac{4}{9} \frac{3}{10}$	

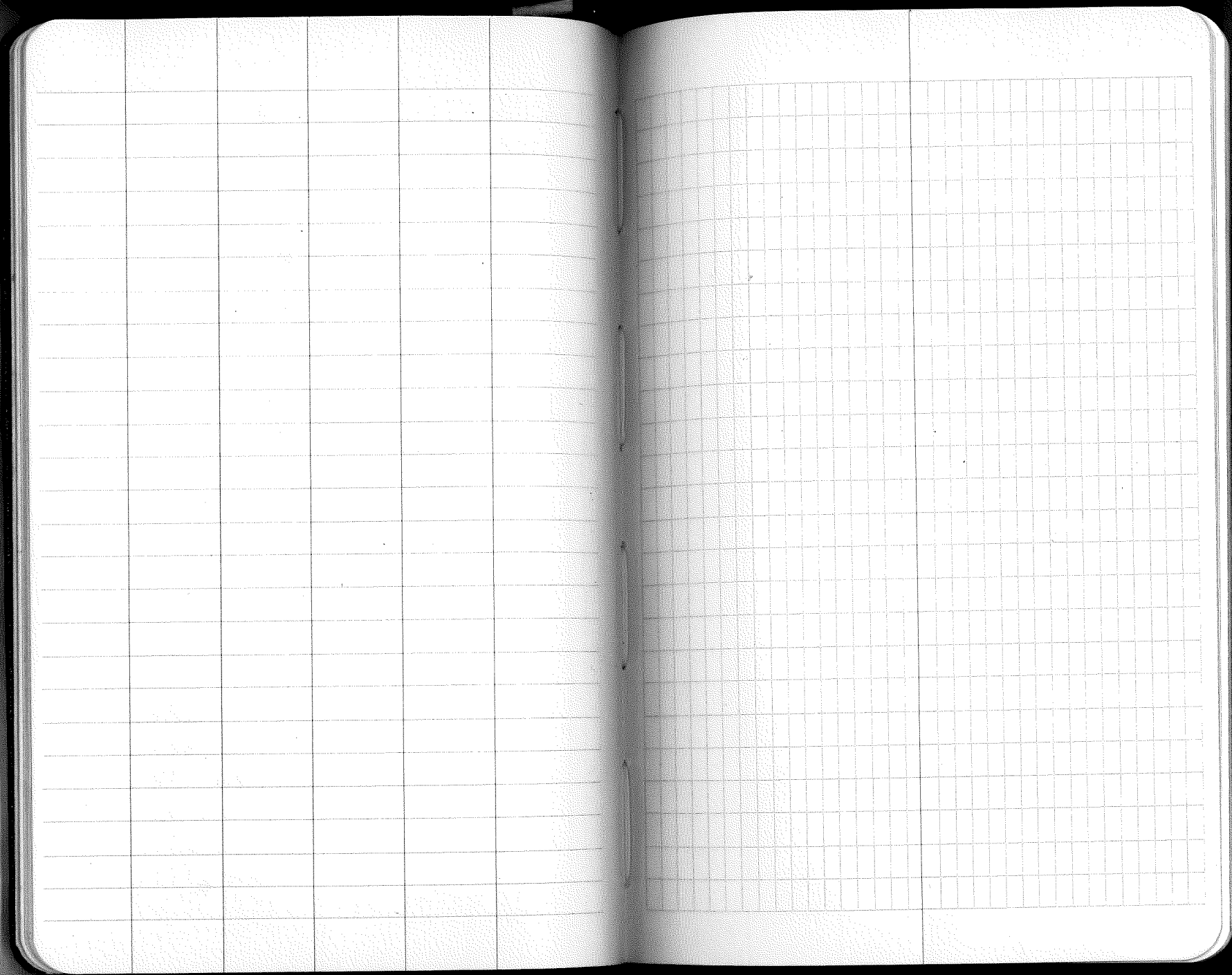
Found birch stake keeled  
 " 40 Gr. W.  $\frac{1}{4}$   $\frac{3}{10}$  " 35 ft.  
 so. & 5 ft. W. of our  
 App. corner.

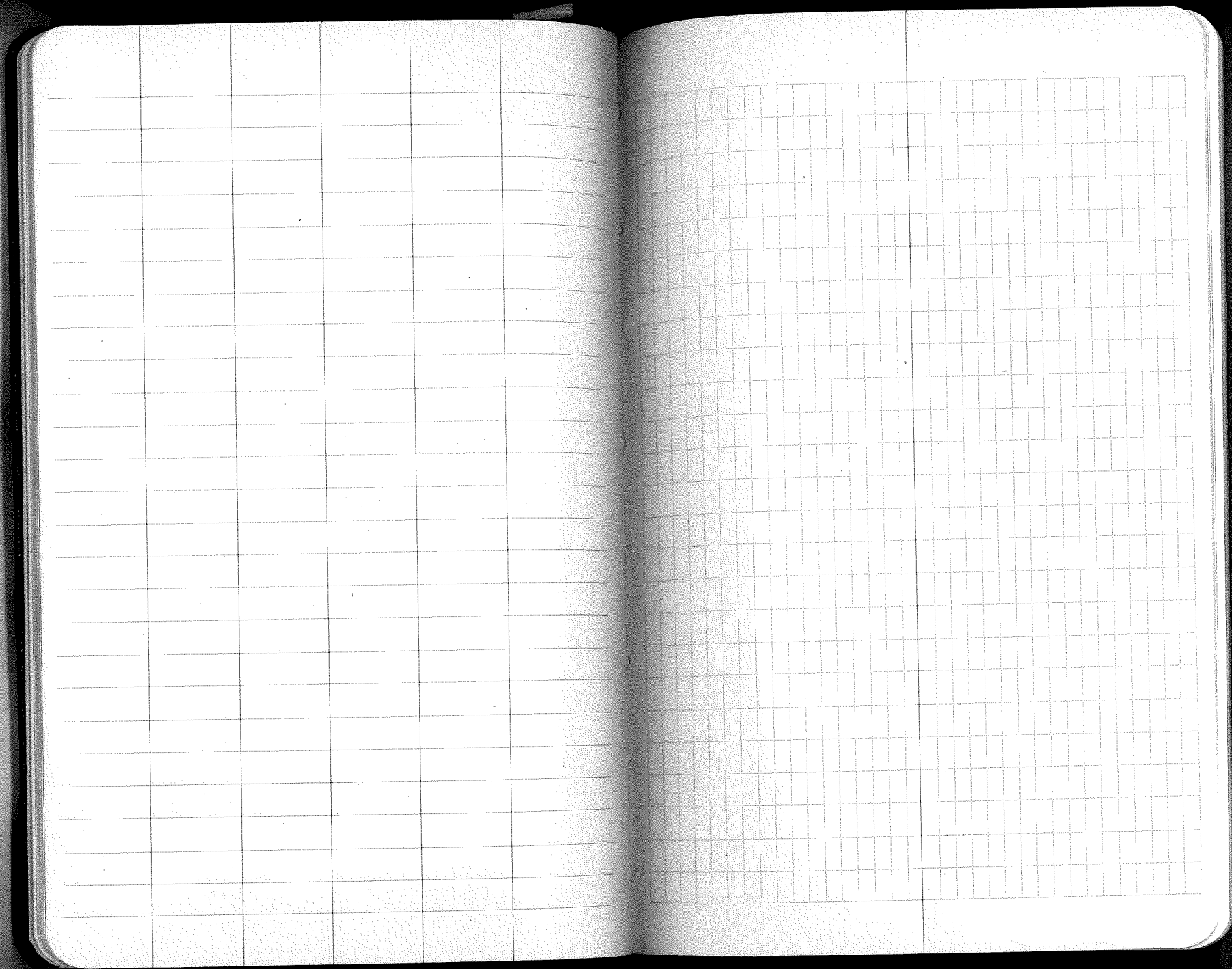
Date - Sept. 18, 1937  
 weather - Fair - cool

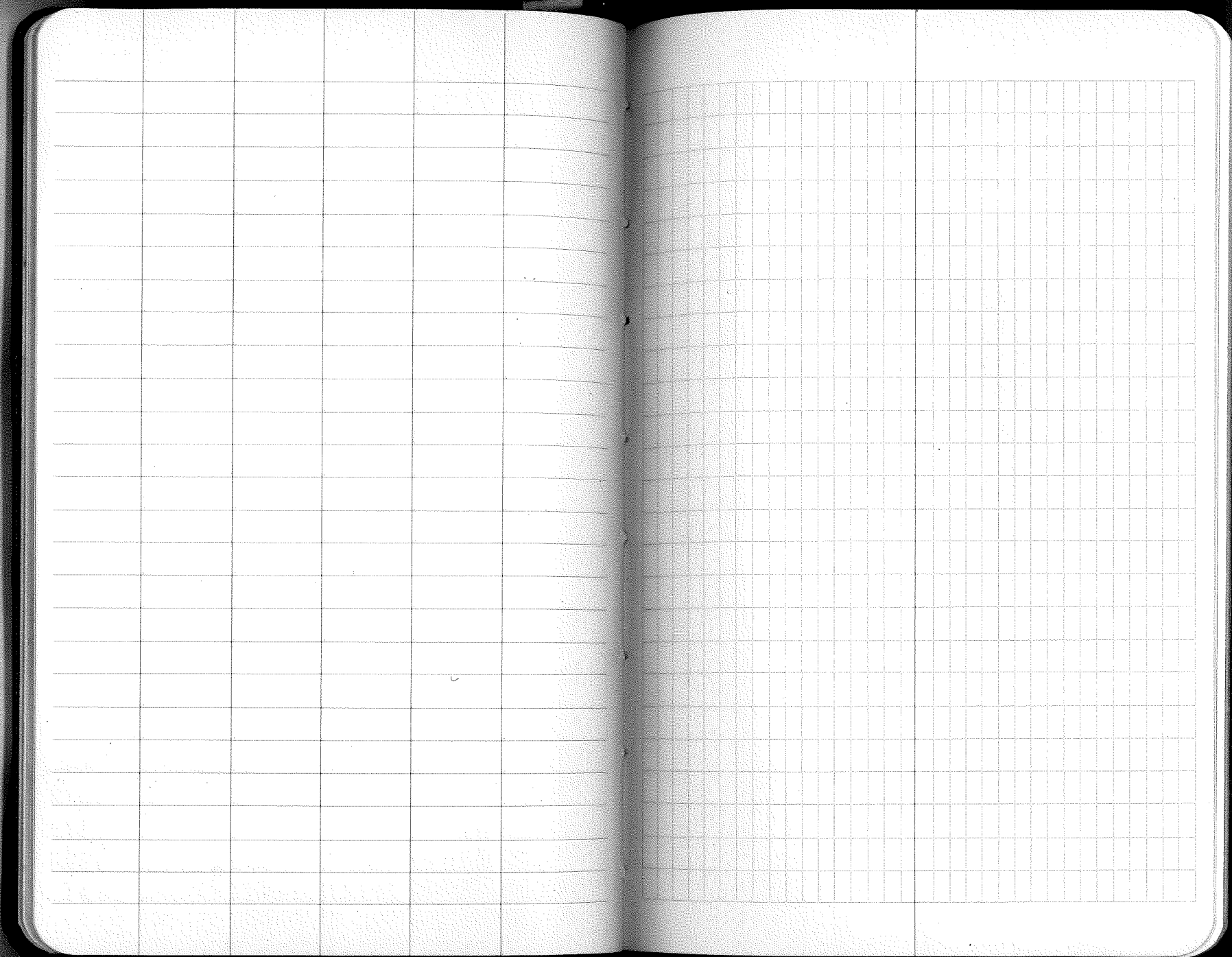
Line Running So. East  
 Sec. 3 & 4 T139 N  
 R26 W  
 H. Bearing  $56^{\circ}30'E$

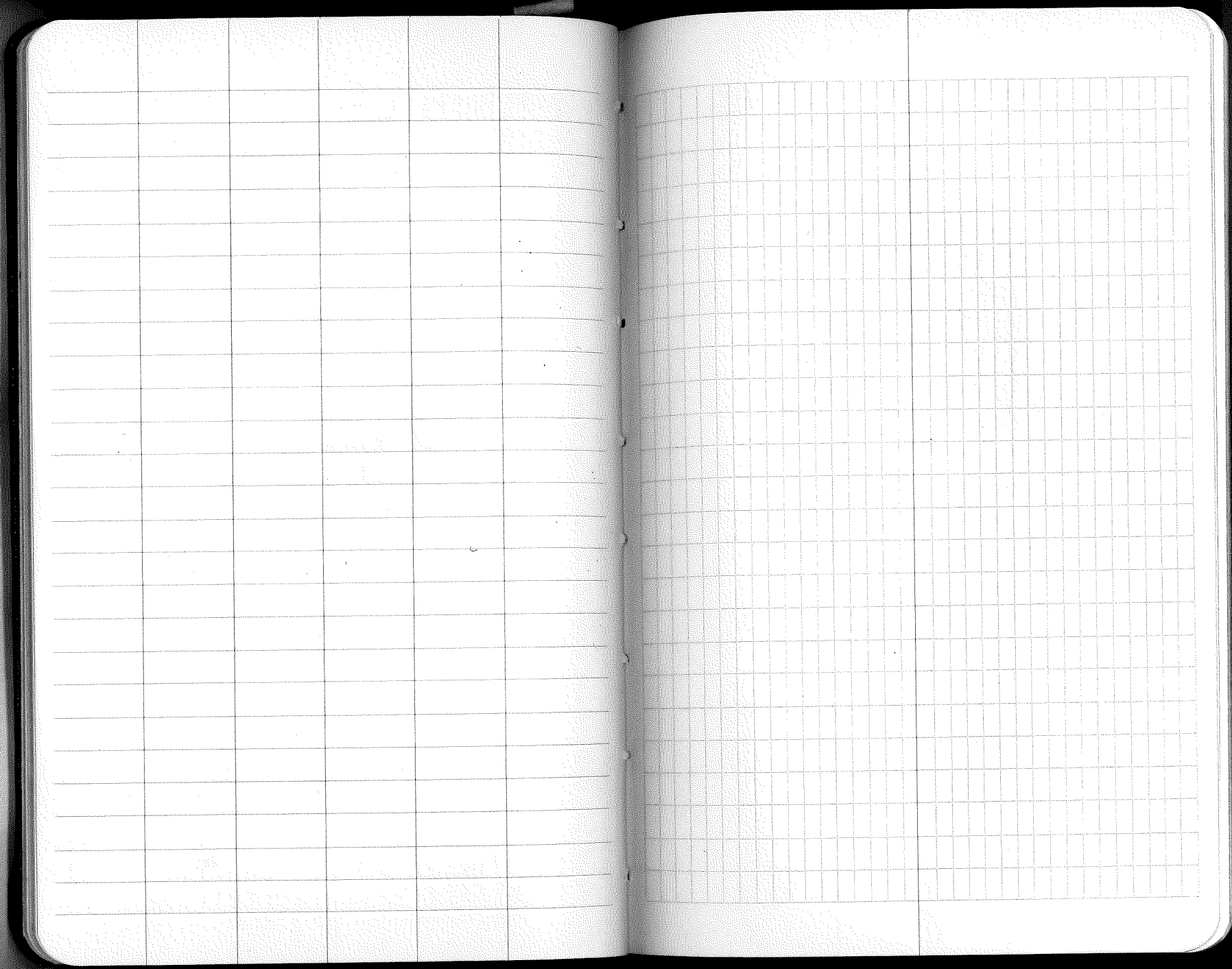
Party: Ferguson, T.  
 Betzer  
 Tadd  
 Johnson  
 Mysteram  
 Ardrasen

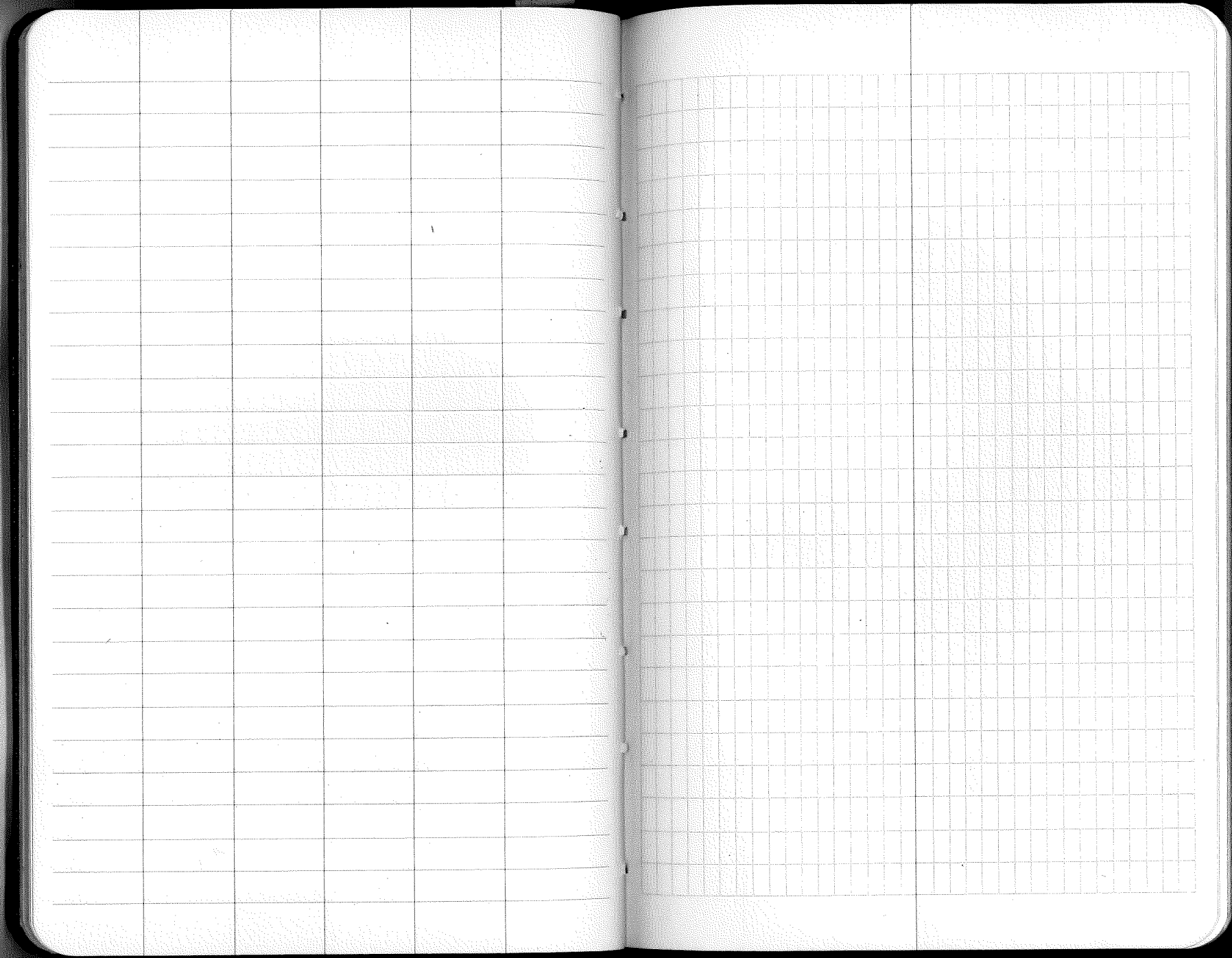






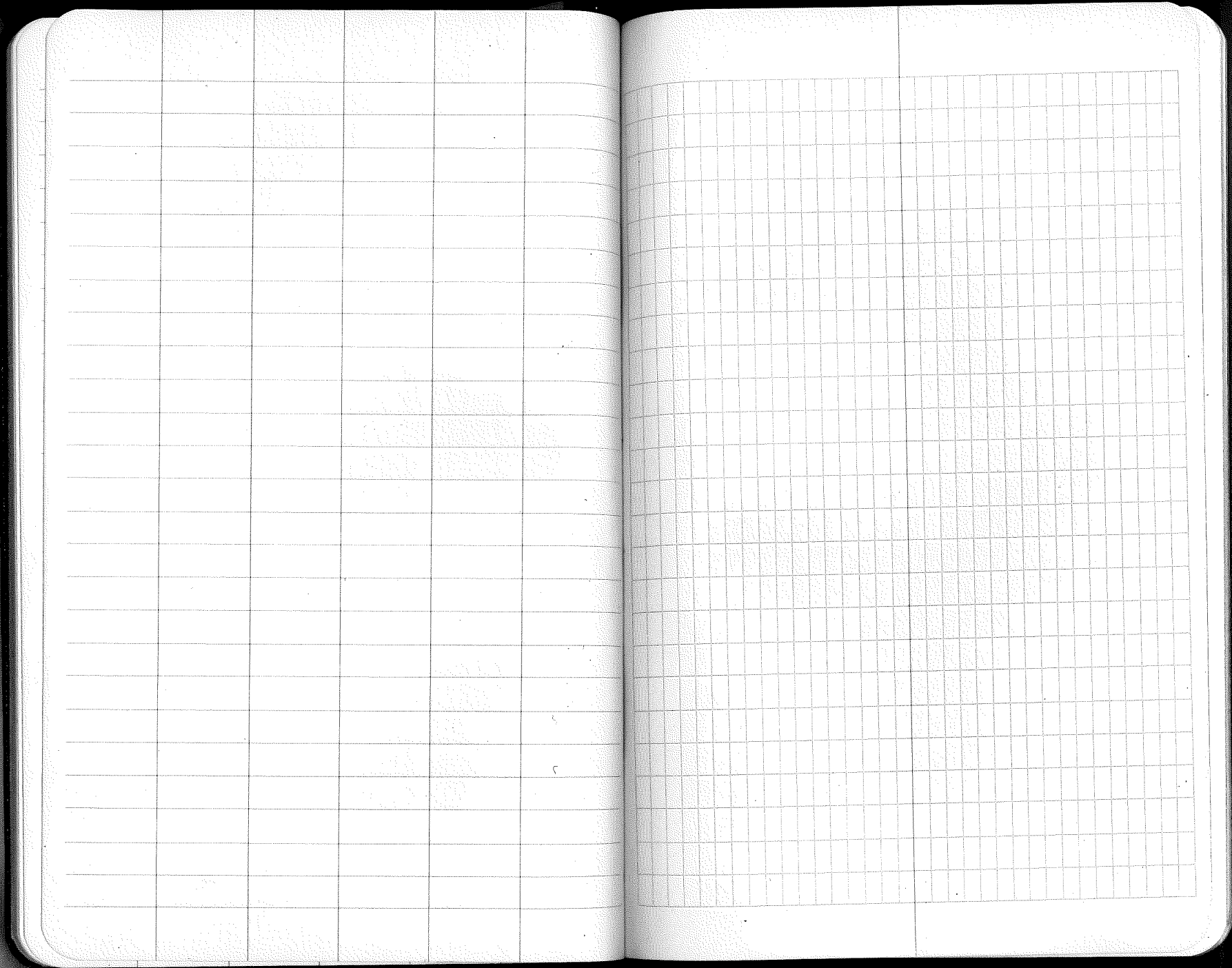












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13927

This page is a blank ledger with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The grid is composed of thin, light-colored lines.

This page is a blank ledger with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The grid is composed of thin, light-colored lines.



Index  
19927

This is a blank ledger page with a grid of 6 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last being the narrowest. The grid is composed of thin, light-colored lines on a white background.

This is a blank ledger page with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last being the narrowest. The grid is composed of thin, light-colored lines on a white background.

I dex  
1982

The image shows an open notebook with two blank, grid-lined pages. The pages are white with a light gray grid pattern. The notebook has a dark cover visible around the edges. At the top of the right page, there is a small, dark rectangular label with the text "I dex" and "1982" written on it. The pages are otherwise empty of any writing or markings.

Idea  
19927

A blank ledger page with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The rows are of uniform height.

A blank ledger page with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The rows are of uniform height.

I dex  
112227

This is a blank ledger page with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The grid is composed of thin, light-colored lines.

This is a blank ledger page with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The grid is composed of thin, light-colored lines.



I dex  
1992Y

A blank ledger page with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The grid is composed of thin, light-colored lines.

A blank ledger page with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The grid is composed of thin, light-colored lines.

*Index*  
12927

This page is a blank ledger with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The grid is formed by thin, light-colored lines.

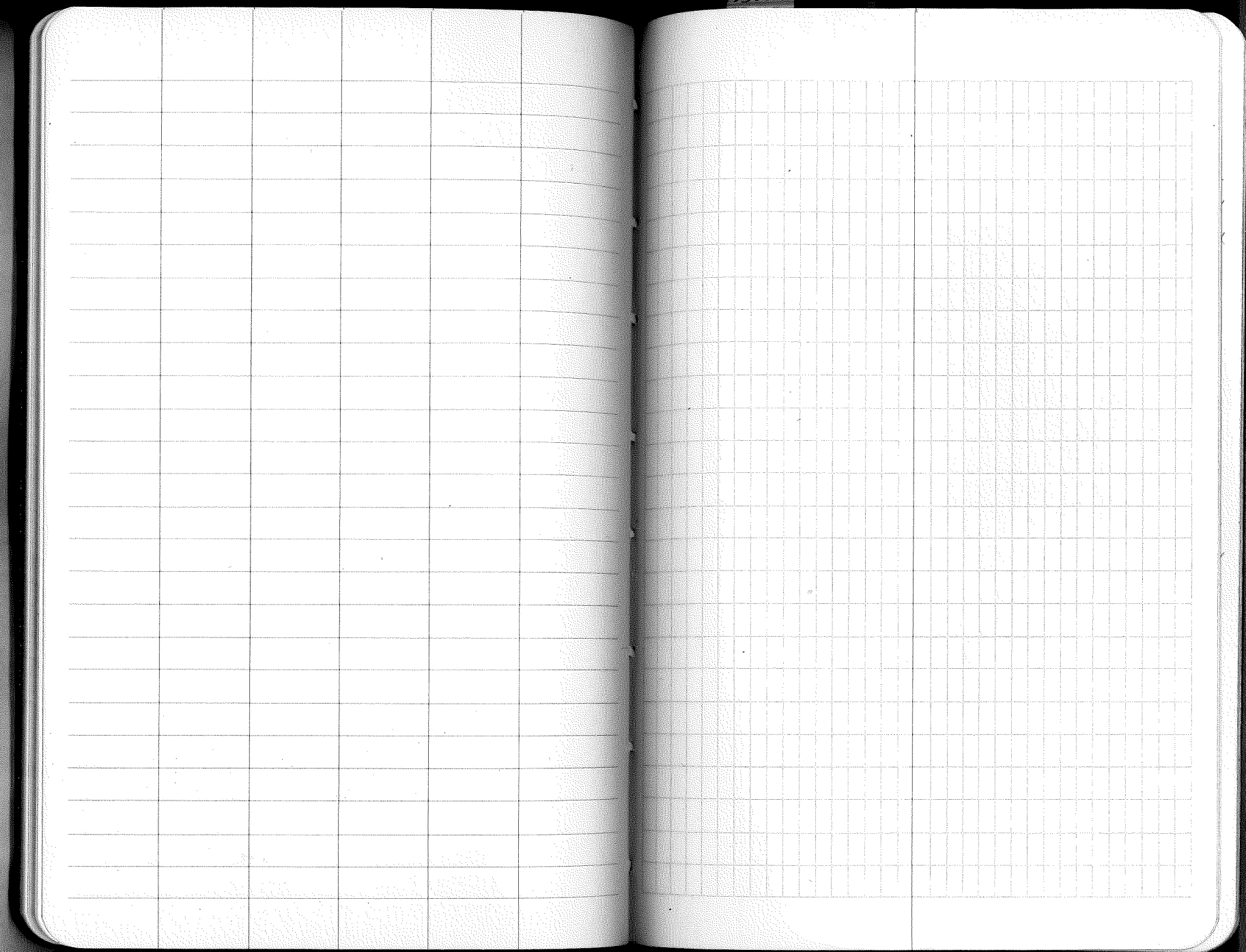
This page is a blank ledger with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The grid is formed by thin, light-colored lines.

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199-27

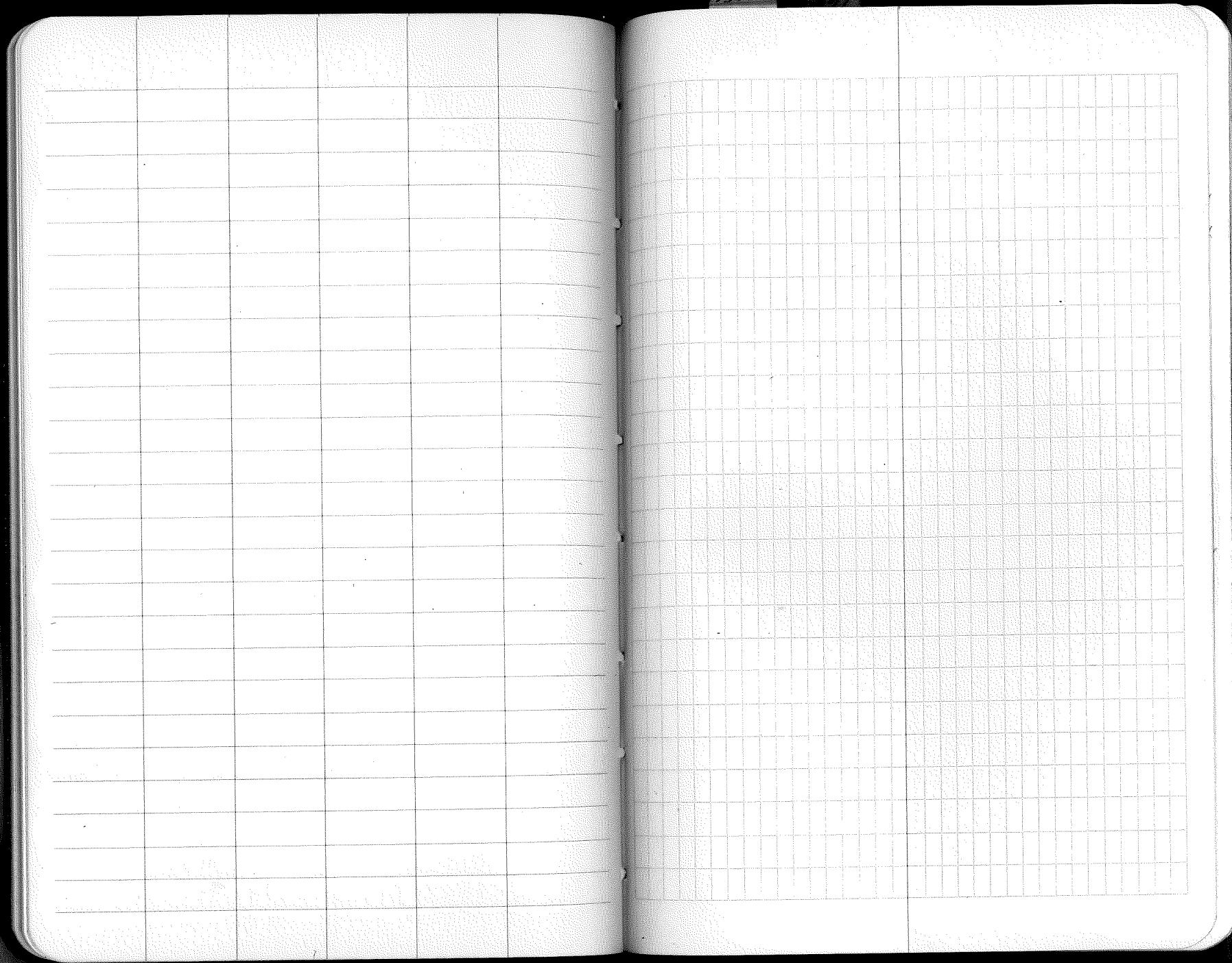
This page is a blank ledger with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The rows are of uniform height. The page is otherwise empty.

This page is a blank ledger with a grid of 10 columns and 25 rows. The columns are of varying widths, with the first column being the widest and the last column being the narrowest. The rows are of uniform height. The page is otherwise empty.

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199-27

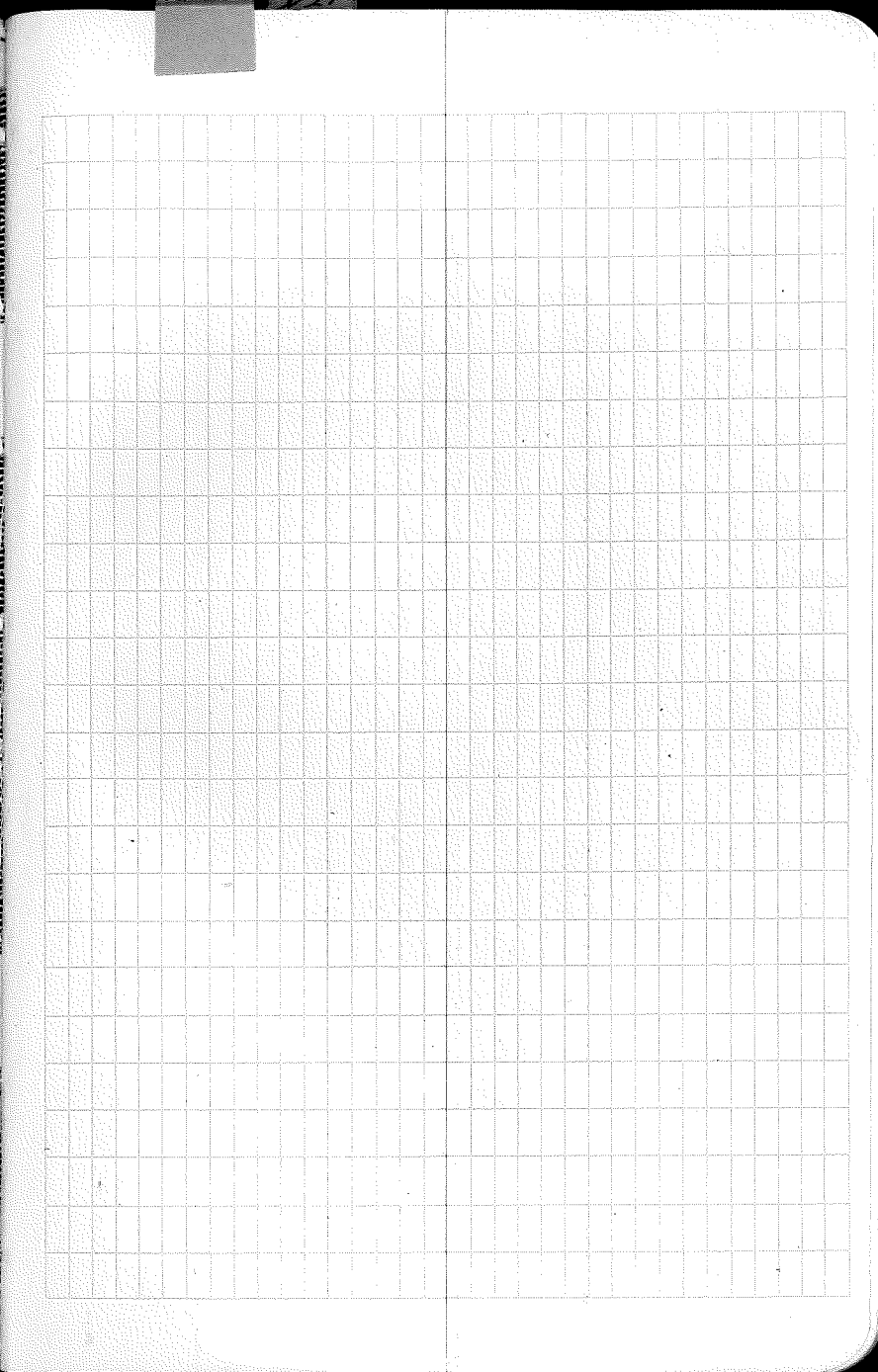
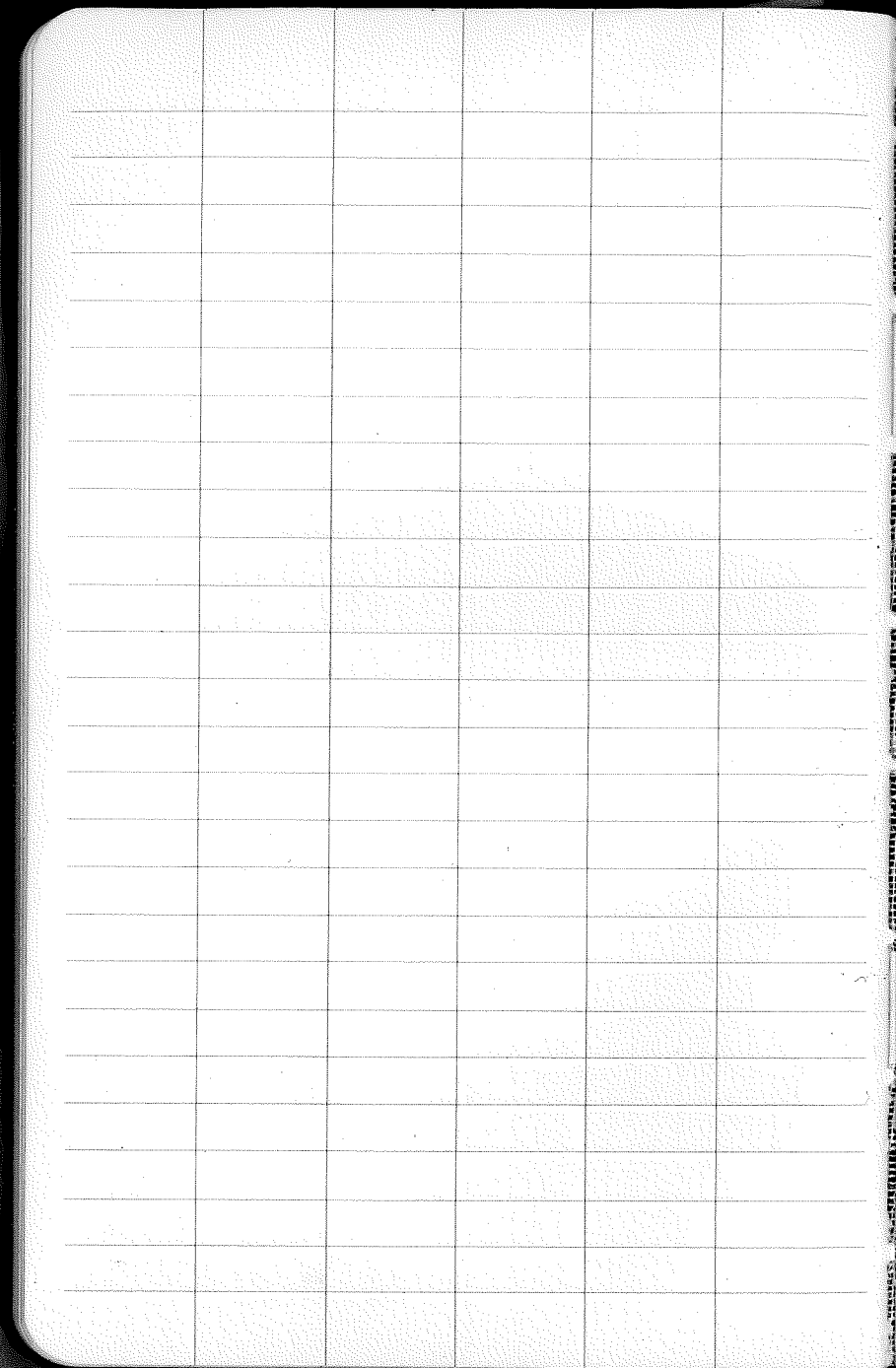


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Direction		Location	Page
North	between	35 + 36	1
North	"	26 + 25	2
North	"	23 + 24	3
North	"	14 + 13	4
North	"	11 + 12	5
North	"	2 + 1	6
East	"	1 + 12	7
West	"	2 + 11	8
West	"	3 + 10	9
West	"	4 + 9	10
West	"	5 + 8	11 x
East	"	6 + 7	12 x
East	"	13 + 24	13 x
West	"	12 + 23	14 x
West	"	15 + 22	15 x
West	"	16 + 21	16
East	"	12 + 13	17 x
West	"	14 + 11	18 x
West	"	2(139) 35(140)	19 x
West	"	3(139) 34(140)	20 x
West	"	4(139) 33(140)	21 x

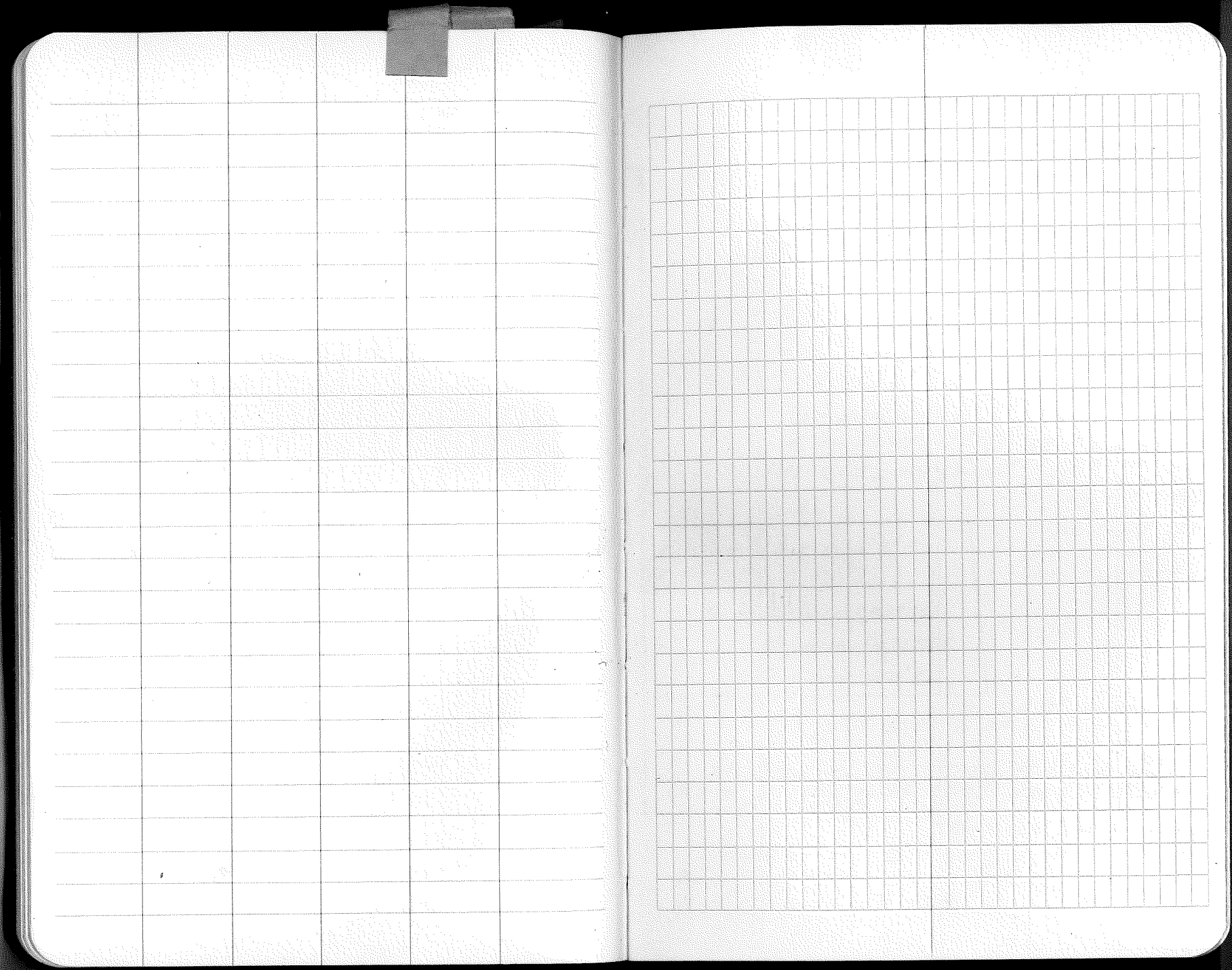
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Direction		Location	Page
west	between	5(139) 32(140)	22 x
West	"	6(139) 31(140)	23 x
South	"	18(27) 13(28)	24 x
South	"	6(27) 1(28)	25 x
West	"	10 + 15	26 x
West	"	16 + 9	27 x
West	"	8 + 17	28 x
West	"	36 + 25	29 x
West	"	22 + 27	30 x
West	"	23 + 26	31 x
West	"	24 + 25	32 x
West	"	26 + 25	33 x
West	"	27 + 34	34 x
East	"	36(139) 41(138)	35
East	"	35(139) 42(138)	36
South	"	12(27) + 7(26)	- 37
South	"	13(27) + 18(26)	- 38
South	"	1(27) + 6(26)	- 39
South	Illegible	7 27 + 12(28)	- 40



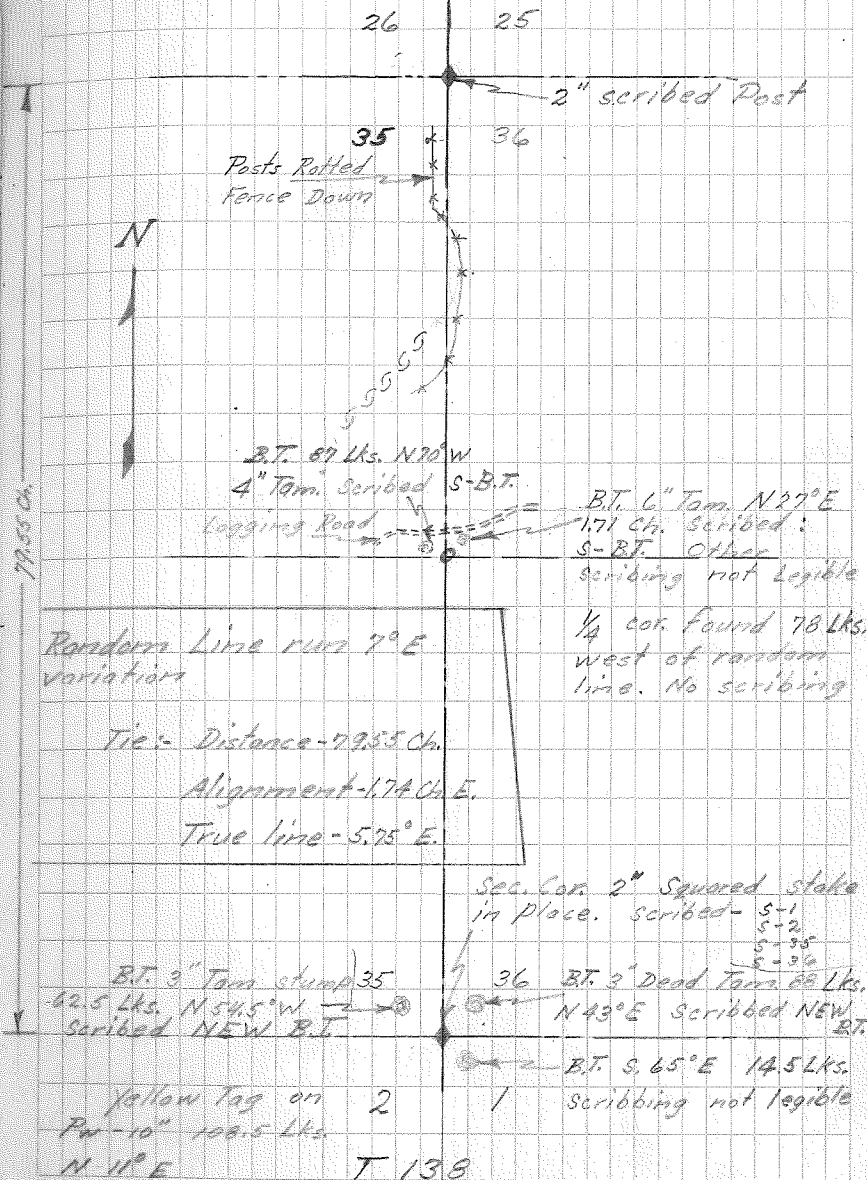




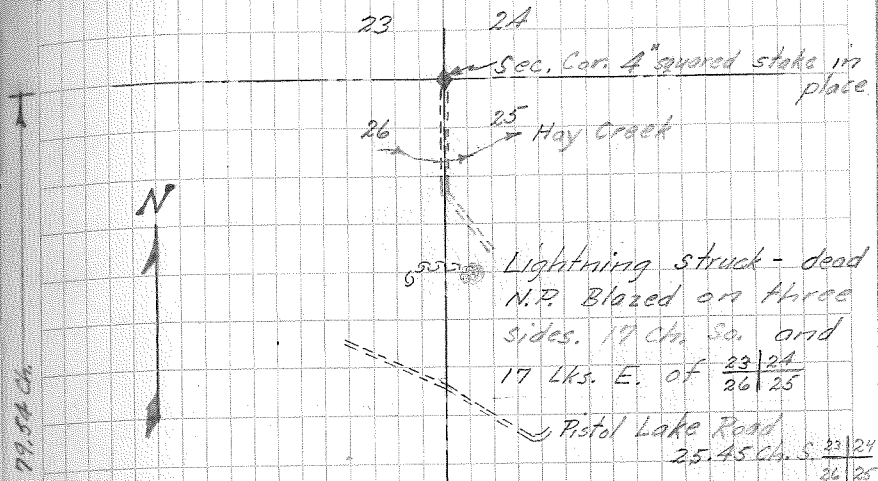
T 139 R 27

1.

Line Running North Between Secs. 35 & 36



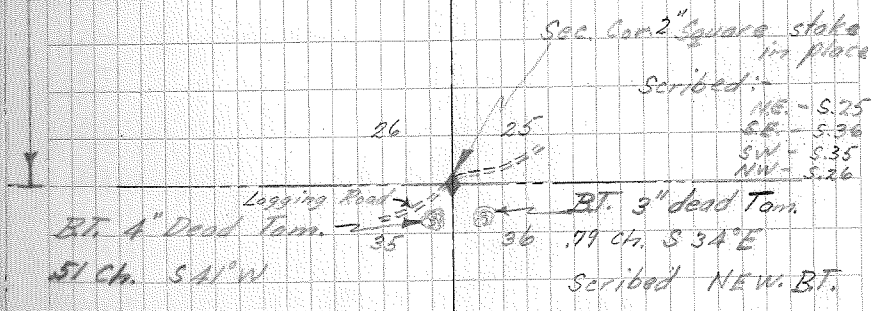
Line Running North Between Secs. 26 & 25



Logging Road 38.62 Ch.  
So. of  $\frac{23}{26} \frac{24}{25}$

BT. N 73° E 86 Lks Blazed  
12" pine stub.

Random line runs 6° E. Var  
Tie: Distance - 79.54 Ch.  
Alignment - 1.54 Ch.  
True Line - 4.9° E



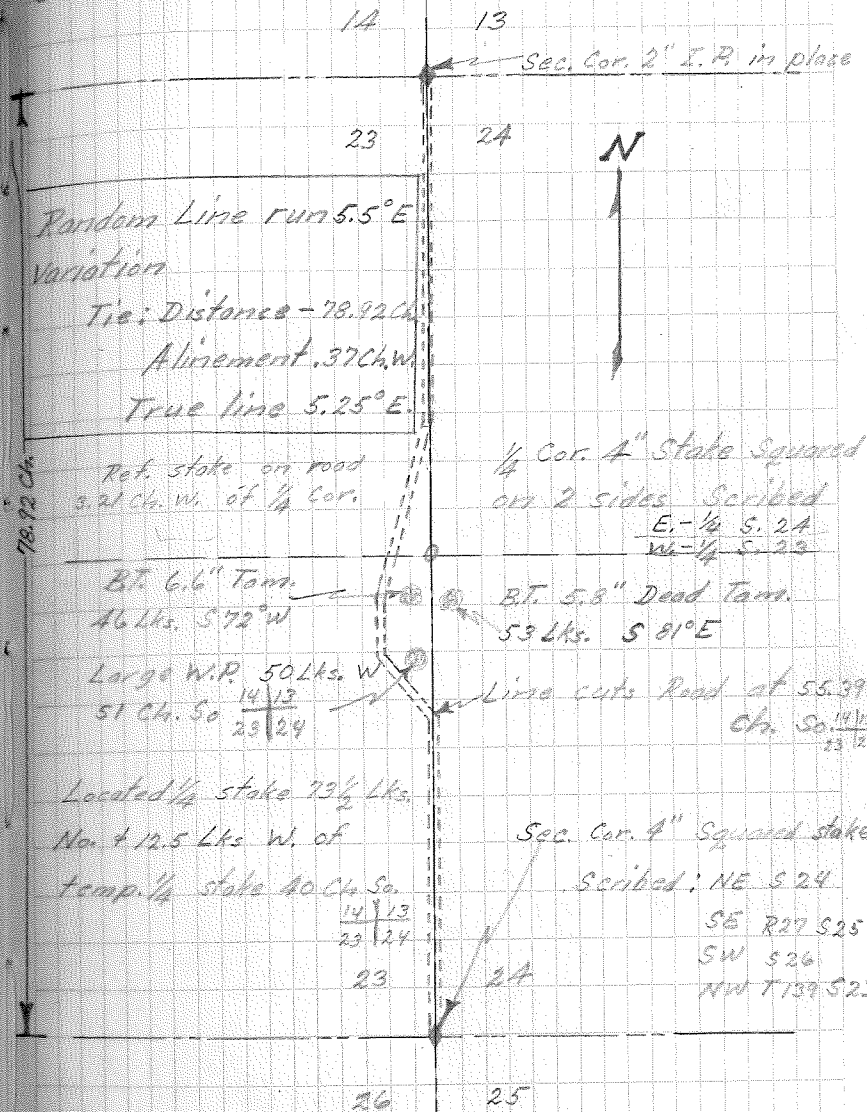
Logging Road  
BT. 4" Dead Tom. 51 Ch. S 41° W

Sec. Cor. 2" square stake in place  
Scribed:  
NE - 5.25  
SE - 5.36  
SW - 5.35  
NW - 5.26  
BT. 3" dead Tom. 79 Ch. S 34° E  
Scribed NEW. BT.

T 139 R 27

3

Line Running North Between Secs. 23 & 24



Random Line run 5.5° E  
Variation

Tie: Distance - 78.92 Ch.

Alignment .37 Ch. W.

True line 5.25° E

78.92 Ch.

Ref. stake on road  
3.21 Ch. W. of 1/4 Cor.

1/4 Cor. 4" Stake Squared  
on 2 sides Scribed  
E. - 1/4 S. 24  
W. - 1/4 S. 23

BT. 6.6" Tam.

46 Lks. S 72° W

BT. 5.8" Dead Tam.

53 Lks. S 81° E

Large W.P. 50 Lks. W

51 Ch. So.  $\frac{14}{13}$   
 $\frac{23}{24}$

Line cuts Road at 55.39

Ch. So.  $\frac{14}{13}$   
 $\frac{23}{24}$

Located 1/2 stake 73 1/2 Lks.

Nor. + 12.5 Lks. W. of

temp. 1/4 stake 40 Ch. So.

$\frac{14}{13}$   
 $\frac{23}{24}$

23

Sec. Cor. 4" Squared stake

Scribed: NE S 24

SE R27 S25

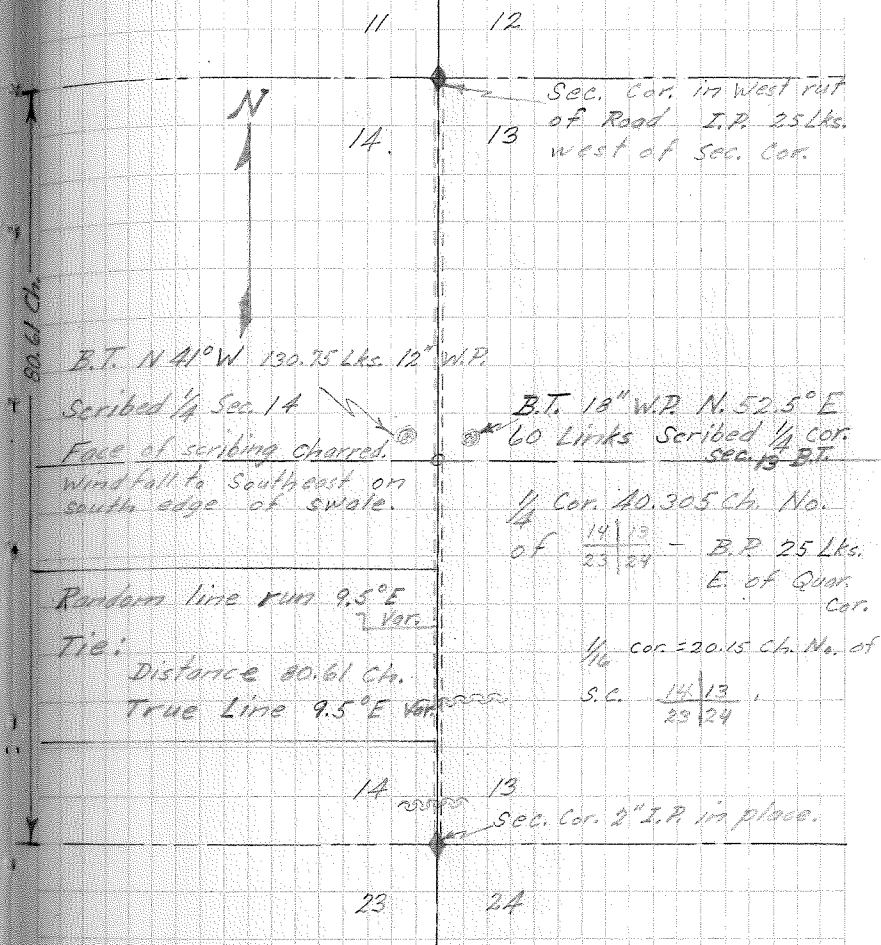
SW S26

NW T139 S23

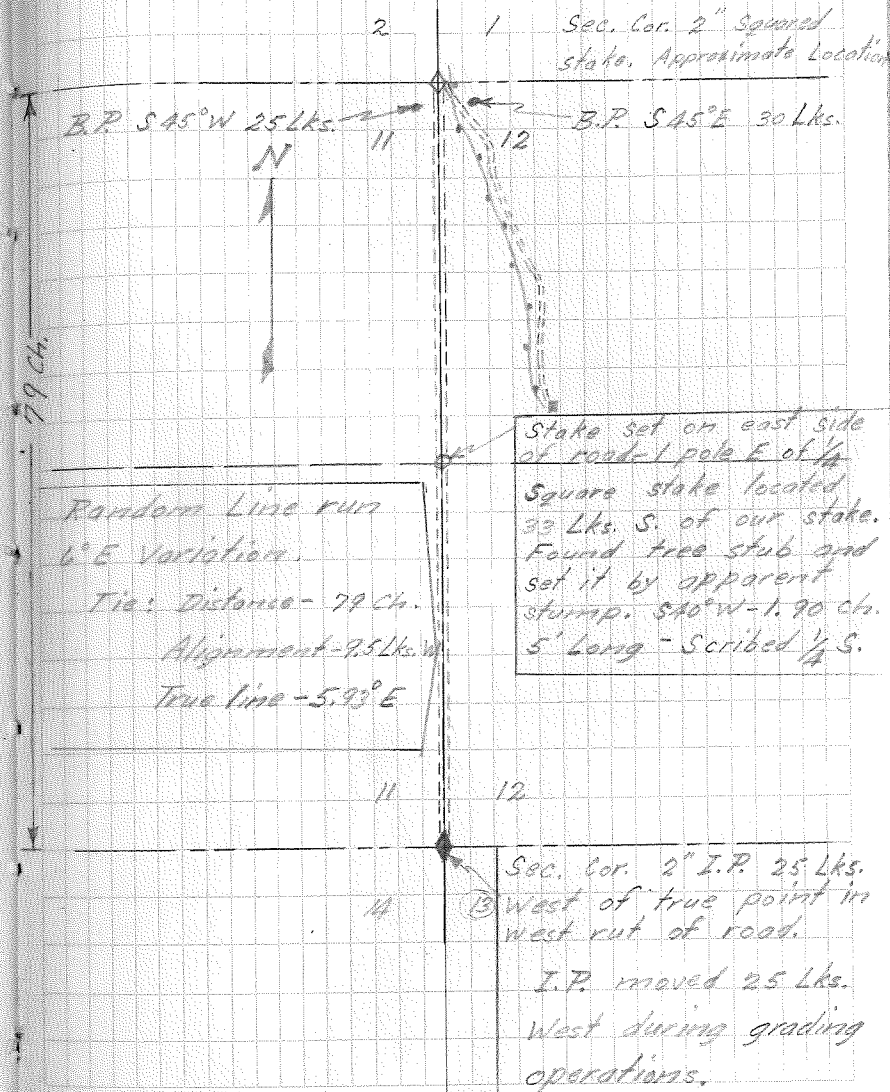
26

25

Line Running North Between Secs. 14 &amp; 13



## Line Running North Between Secs. 11 &amp; 12



T139 R27

6

Line running North between Secs. 24 & 1

N

35

B.T.'s From Sec. Cor. in Road

J.P. 7" S 83° E 98 Lks. Blazed

J.P. 7" S 57° W 57.5 Lks. Blazed

J.P. 9" N 57° W 88 Lks. Blazed

I.P. 50 Lks. W. of Sec. Cor.

Old stake on ground

2" square

Scribed:

T140N-R27W S-36

T139N-R27W

T139N-R27W S-2

Scribing almost  
obliterated

I.P. 50 Lks. E. of Sec. Cor.

Sec. Cor. evidently buried

in road - East rat.

Quarter Corner 42.45 Ch.

N of  $\frac{21}{11}$

Random Line Run

6.5° E. Variation

Tie:

Alignment - 1.73 Ch.

Distance - 85.69 Ch.

True Line - 5.4° E

B.T. S 55° W - 68 Lks

0.5" Tom Stub

Scribed: B.T.  $\frac{1}{4}$  S B.T.

Road 55.17 Ch. S. of  $\frac{25}{21}$

2

1 Sec. Cor. 2" sq. stake

APP. Location

B.P. S 45° W 25 Lks.

11

B.P. S 45° E 30 Lks.

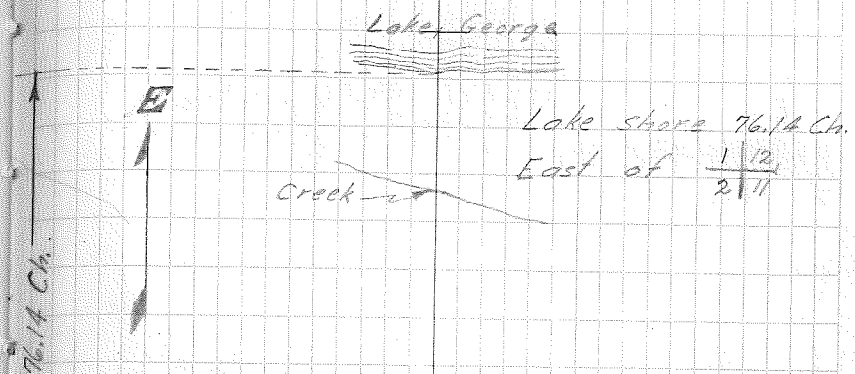
12

T 199 R 29

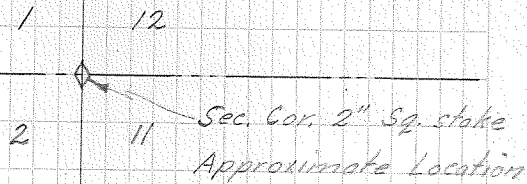
Oct. 23, 1936

7

Line Running East between Secs. 14 & 12



Random Line Run  
7° E Variation.



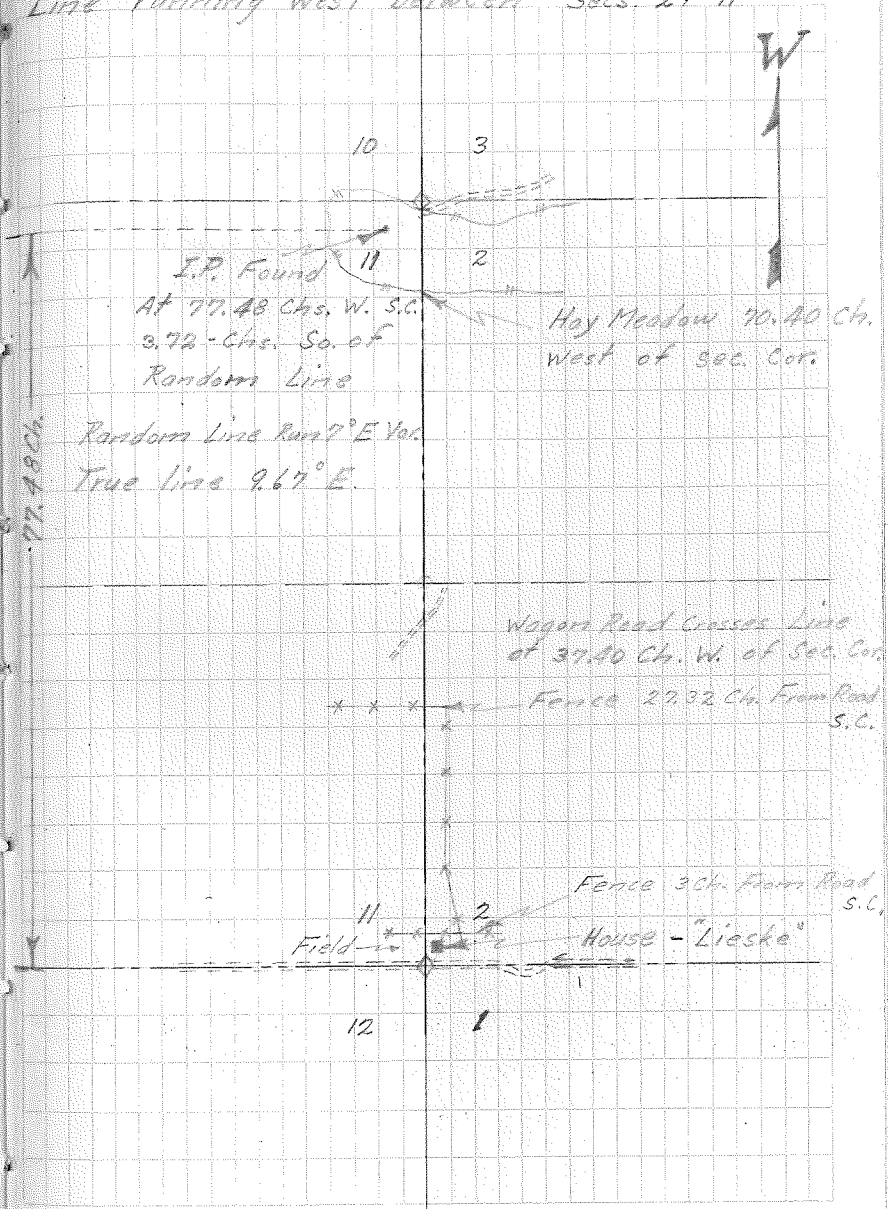


T139 R27

Nov. 3, 1936

8

Line running West between Secs. 2 & 11



77.48 Ch.

I.P. Found  
At 77.48 Chs. W. S.C.  
3.72 - Chs. So. of  
Random Line

Hay Meadow 70.40 Chs.  
West of Sec. Cor.

Random Line Run 7° E Var.  
True Line 9.67° E.

Wagon Road Crosses Line  
at 37.40 Ch. W. of Sec. Cor.

Fence 27.32 Ch. From Road  
S.C.

Fence 3 Ch. From Road  
S.C.  
House - "Lieske"

12

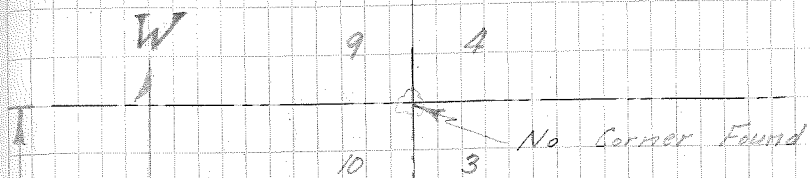
1

T 139 R 27

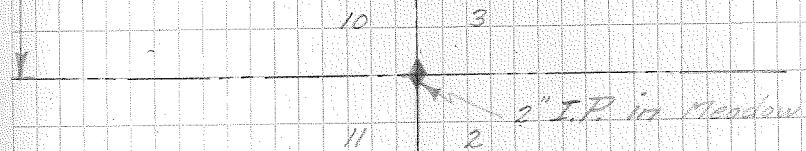
Nov. 12, 1936

9

Line Running West Between Secs. 3 & 10



Random line runs  
8° E Variation



T 139 R 27

Nov. 13, 1936 10

Line running west between Secs 4 & 9

W

8

5

9

4

Oak stake put in

3' Aspen Blazed  
on 3 sides. By  
Large Fir stump  
74.75 Chs. west

Pondus Line 8° E  
Var.

6.23 Ch. No.  $\frac{9}{10} \frac{4}{3}$

Alignment 6.23 Ch. Sec.



Creek 23.48 Ch.

from  $\frac{9}{10} \frac{4}{3}$

9

4

10

3

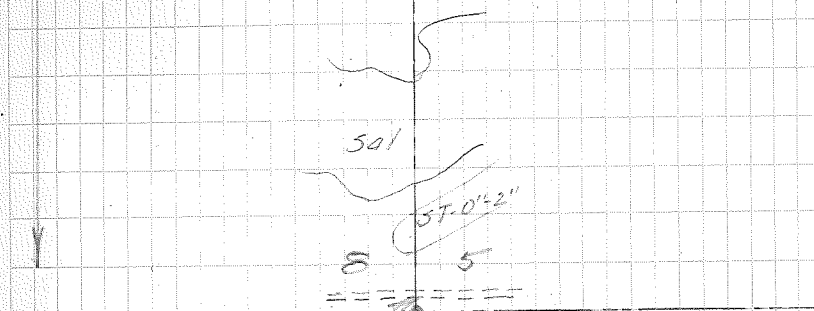
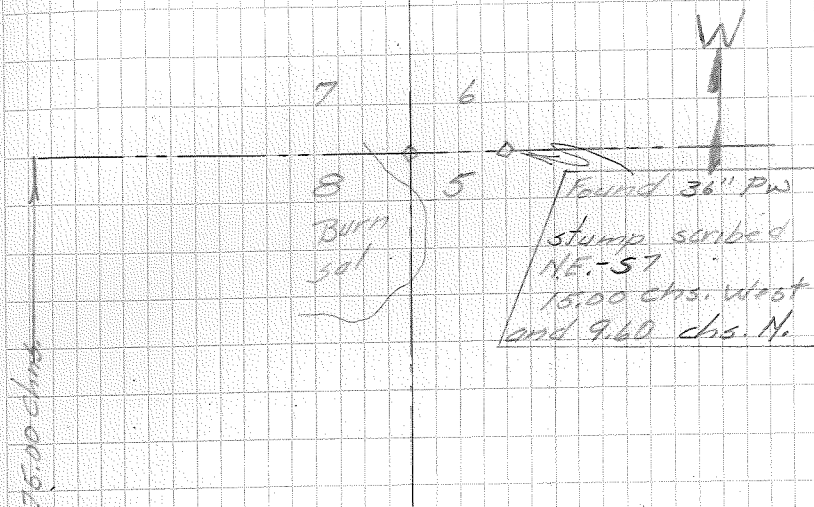
T139 R27

Dec. 2, 1936

11.

Eng. Bretson

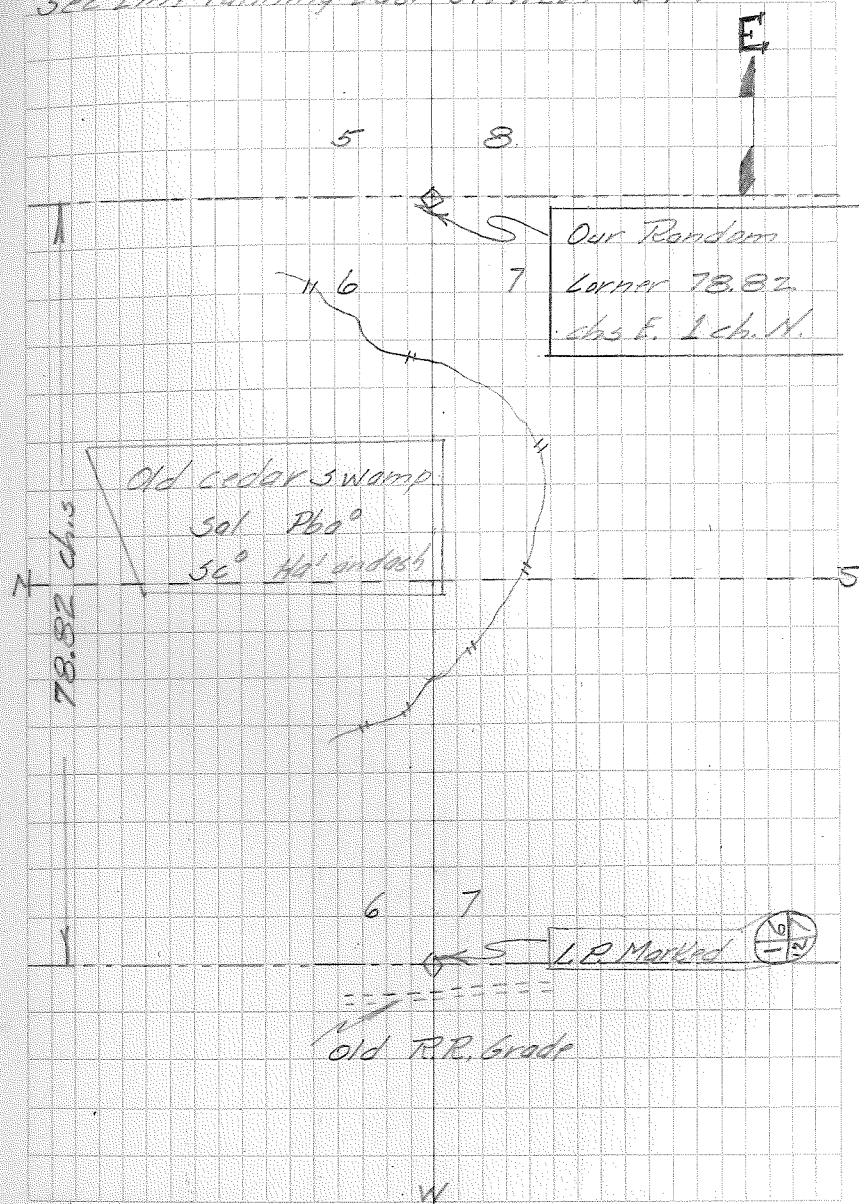
Line running west between Secs. 5 & 8



Old R.R. Grade  
1.30 Chs. west of Cor

4 Random line  
3° E Variation  
Alignment 9.60 chs. So

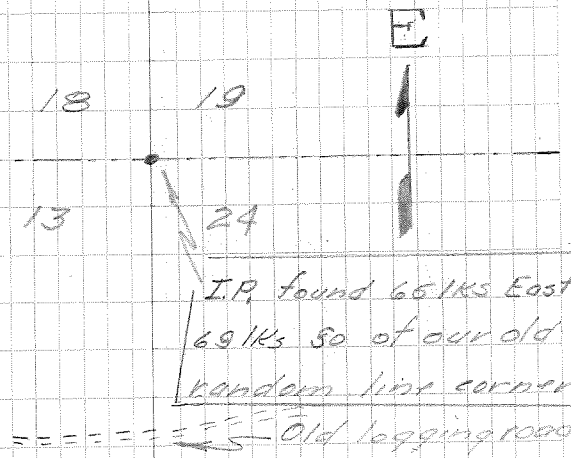
See line running East between 6+7



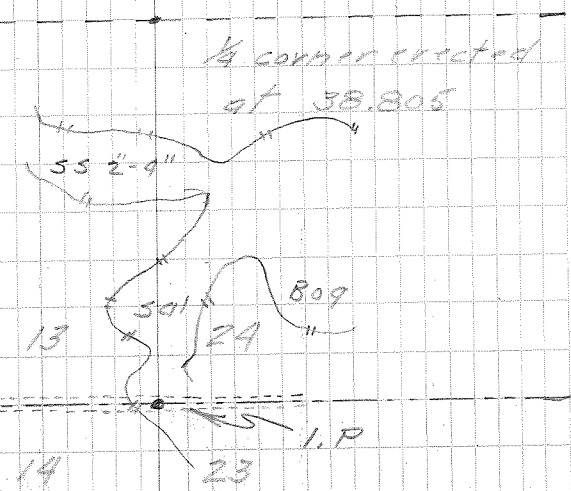
T. 139 R. 27

Dec 15 - 1936 13  
Engbretson

Line running West between 13+24



N  
7781 Chains



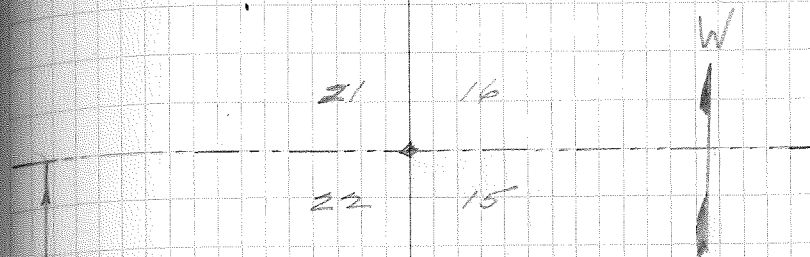
Random Line Run 8° E Variation  
True Line 8° E Variation  
Alignment 7 1/2 N's N's



T 139 R 27

Oct. 1 1936  
Eng-bretson 15

Line running West Between 15+22



Random Line 70° Var.

301

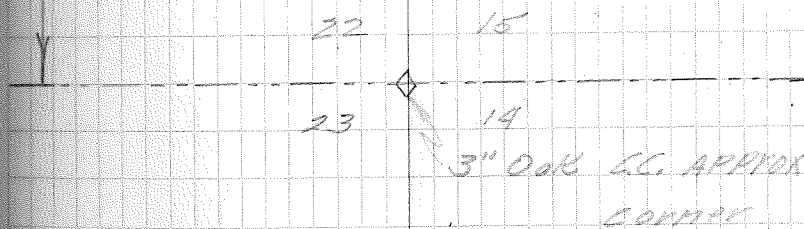
Dam is 3 chains long  
2.85 chains So. of Random

offset at 31.90

4.50 chs So  
6.60 chs West

Beaver House  
Pond

31.60 chains to  
Beaver Pond



3" Oak CC. APPROX  
CORNER



T 139 R 27W

No Date  
Robinson 16

Line running West between 16 & 21

W

3" squared  
stake

SW → ST 55 2'-6"

50' → ST 40 40'-0" 6"

ST 40 40'-0" 6"

Random Map Boundary S80W

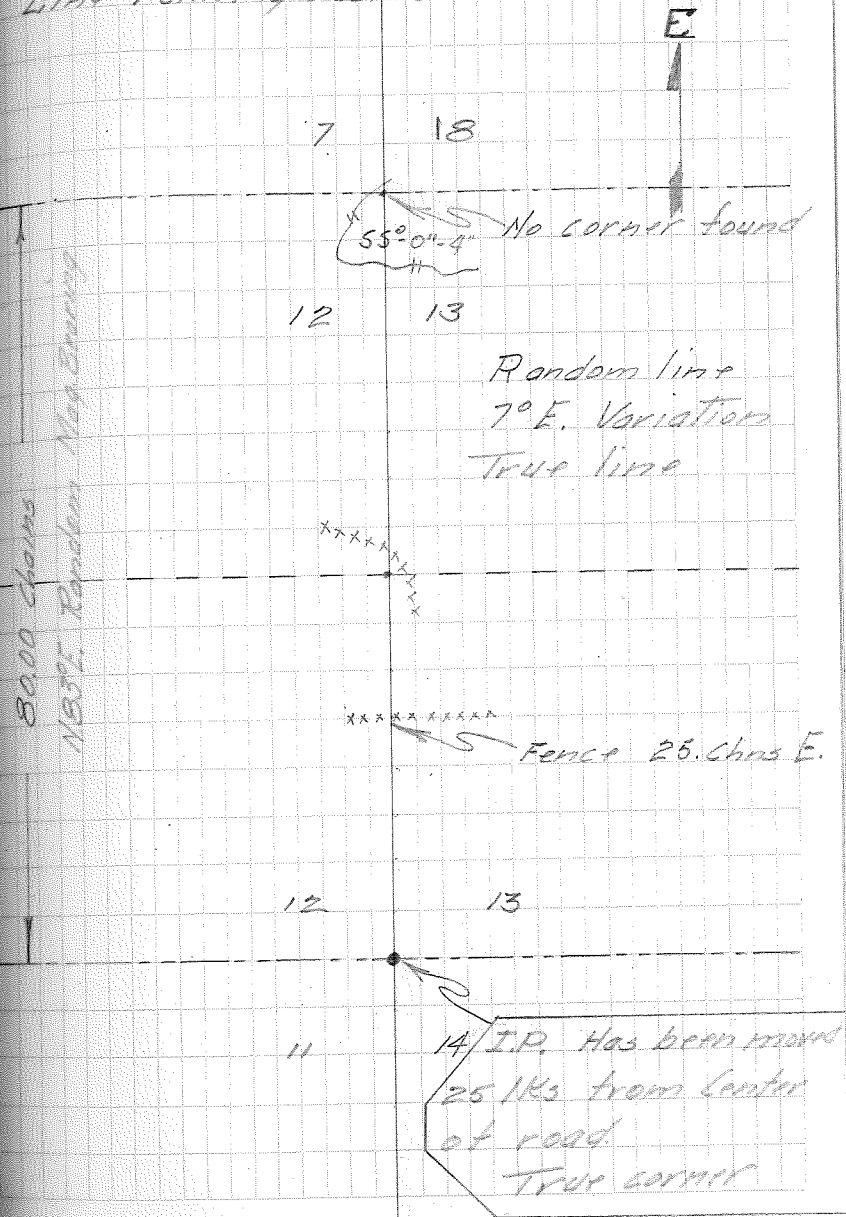
T 139 R. 27

Oct 22 1986

17

Engelbrechtsen

Line running East between 12+13.



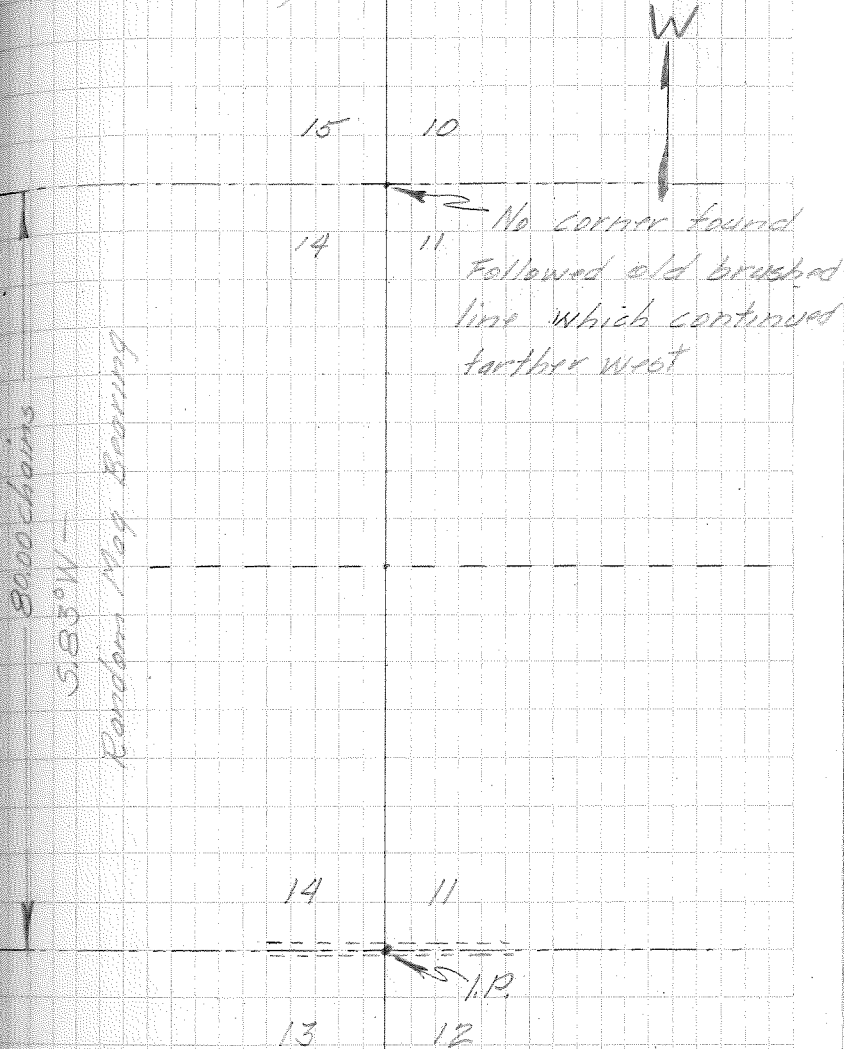
T 139 R 27

Oct 29 1936

18

Engbratson

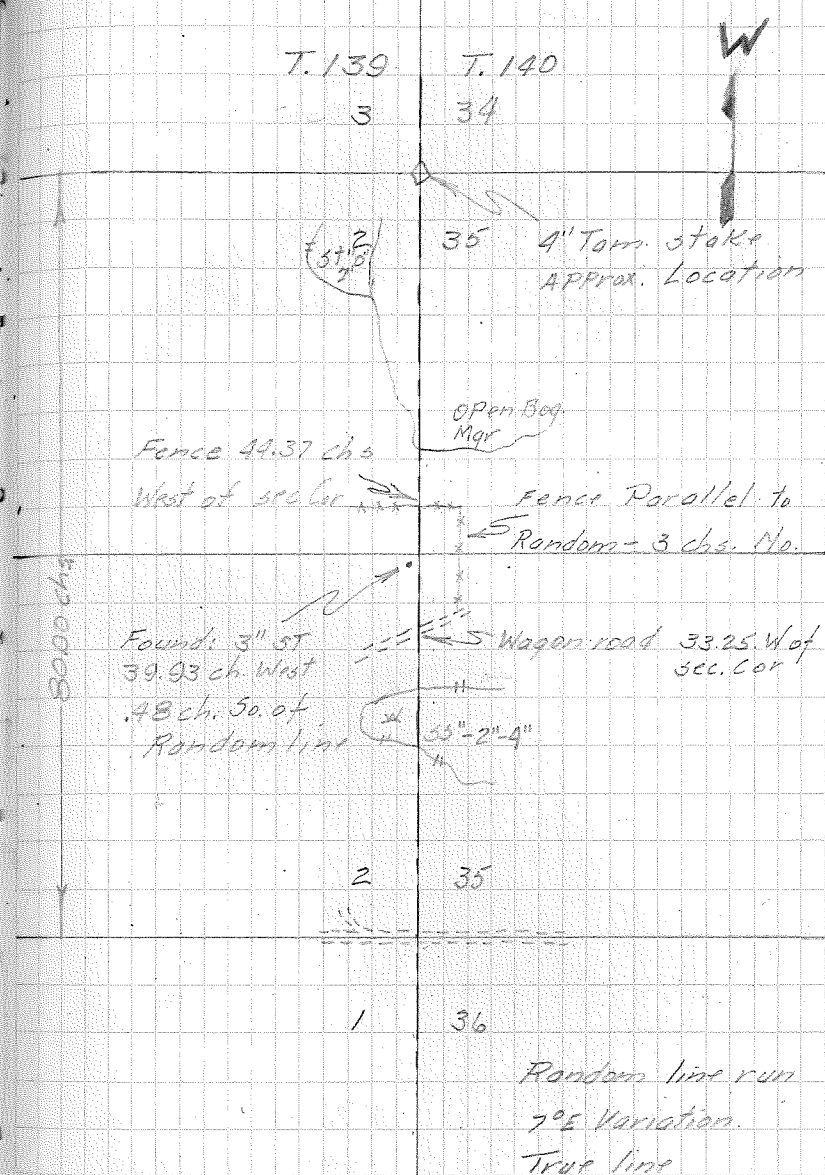
Line Running West between 14+11



T. 139-140 R. 27W

Nov. 4- 1936  
Compass Engestrain 19

Line running West between Secs. 2 & 35



T. 139

T. 140

3

34

35

4" Torn stake  
APPROX. Location

Fence 44.37 chs

West of sec. cor

Open Bog  
Mar

Fence Parallel to

Random - 3 chs. No.

Found 3" ST

39.93 ch. West

.48 ch. So. of

Random line

Wagon road 33.25 W of  
sec. cor

55'-2"

2

35

1

36

Random line run  
7°E Variation.  
True line

T. 139-140 R. 27

Nov. 4-5 1936  
Compass Engbatson 20

Line running West between Sec. 3+34

T. 139

T. 140

W

4

33

3

34

Found squared  
stake at 82.70 chs.  
1.78 chains so. of  
Random line

Wagon Road  
62.12 chs. West  
from Sec. Cor.

Mqr.

82.70 chs.

Sal

Mqr.

3  
57.0°-2'

34  
Mqr.

Open bag

2

35

Random line run  
7° E Variation  
True line 7.5° E. Var  
Alignment - 1.78 chs. No

T. 139-140 R. 27.

21

Line running West Nov. 5-6 1936  
between 4 & 33 Compass Engstrom  
T. 139 T. 140

Old squared stake 51 32  
found in small 4 33  
box at 79.90 chs. 501  
11 lbs. 50 of Random  
line

W

5T. "4-6"

79.90 chs

53 2-29

Creek 22.00 chs  
from Sec Cor

4 33

3 34

Old squared st. found  
New set beside it.

Random line 7.5° Var.  
True line 7.5°  
Aligned at 11 lbs. No

T. 139-140 R27

Nov 6-1936

Compass Engbride 22

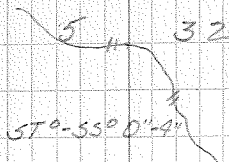
Line running west between 5+32

6

31

No corner found

4" Pn. stake put in



W

80.00 chs.

MQR

309



MQR

Wagon road.  
25.00 chains



Wagon road.  
6.89 chains

5

32

4

33

Random line run at  
7.5° E. Variation.

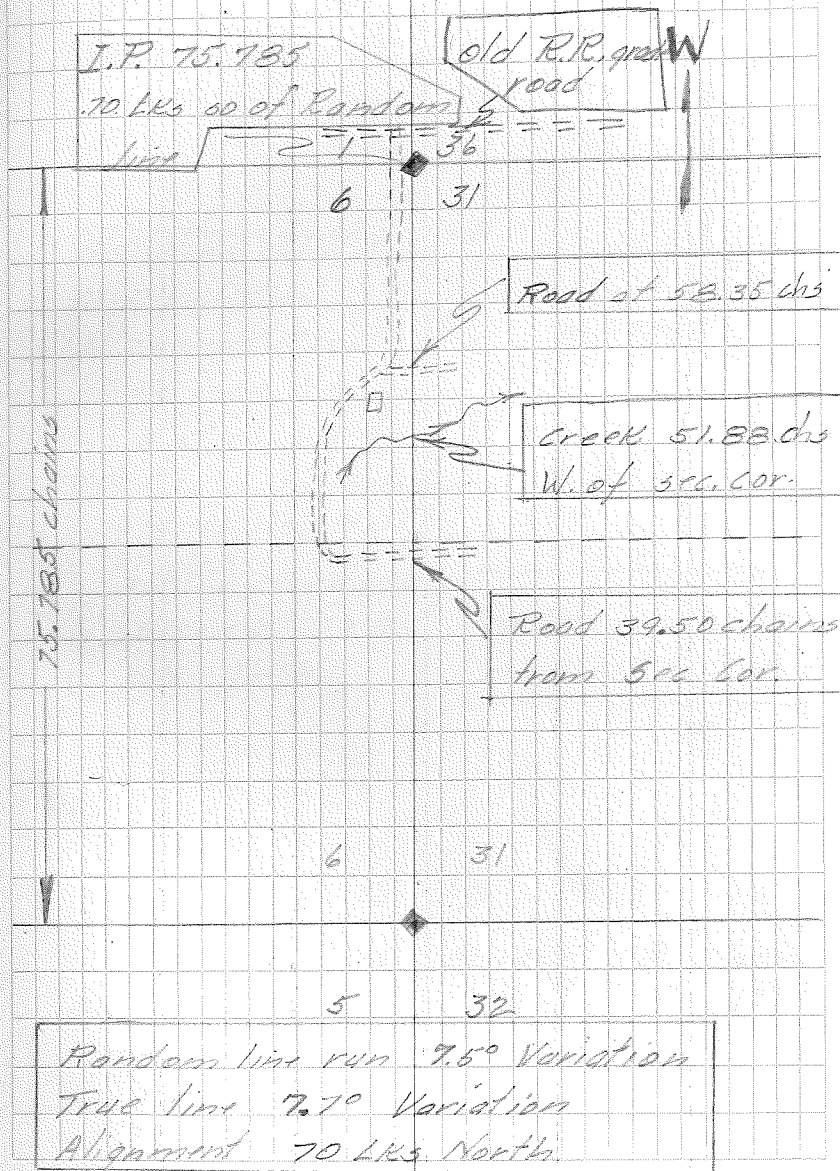
East

T. 139-190 R27

Nov 9, 1936

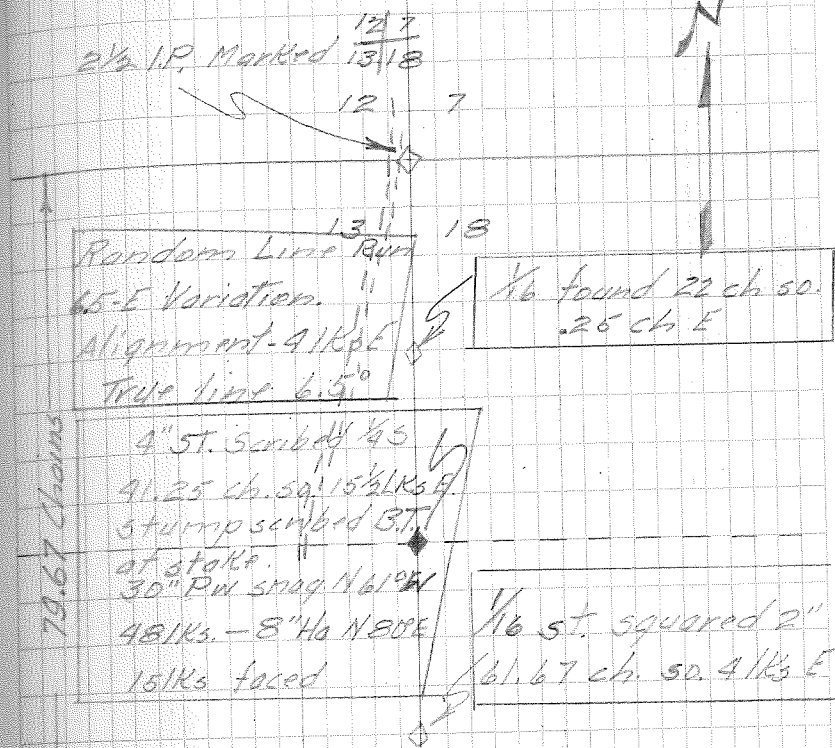
Compass Englebrat cor 23

Line running West between 6 & 31





T. 139-R 27-28 Aug 25, 1936  
 Sept 15, 1936. Engstrom 24  
 Line running South between 13+18



79.67 Chains  
 4" St. Scribed  $\frac{1}{4}$  S  
 41.25 ch. sq.  $15\frac{1}{2}$  links E  
 stump scribed BT  
 at stake.  
 30" Pin snag N 61° W  
 48 links - 8" Ho N 80° E  
 15 links faced

$\frac{1}{6}$  found 22 ch. so.  
 .25 ch E

$\frac{1}{6}$  st. squared 2"  
 61.67 ch. so. 4 links E

13 18  
 24 19  $2\frac{1}{2}$ " IP Marked  
 Old square post  $\frac{13}{18}$   
 5.14° E - 17 1/2 links 24/19  
 Scribing gone 79.67 ch. so.  
 4 links E

T 139 R 27-28

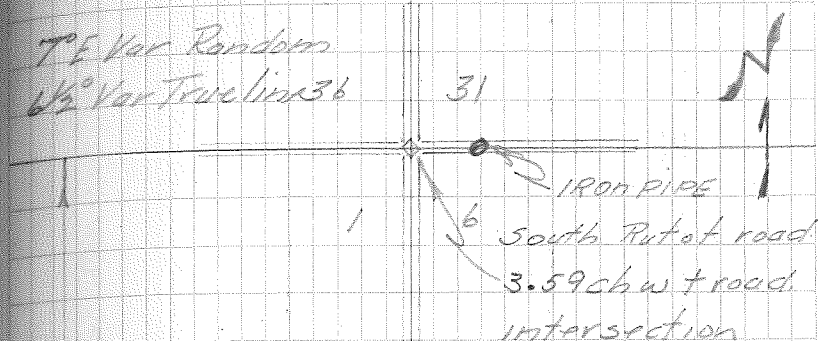
25

Line Running South between 1 & 6

7° E Var Random

6 1/2° Var True line 36

31



79.24 Chains

2" Iron Pipe 1/4 Cor

1

6

12

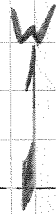
7

7° going South on Grade  
39.74 Chains. 3.22. 1/4's west of 1/4 corner  
6 1/2° True variation

T. 139N R27W

Dec. 8, 1936  
Engbretson 26

line west between 10+15



16 9

Ash-Pba.  
swamp

Found 3" Ash.

Squared- 77.81 chs.

15 10

77.81 chs.

5.83°W Random Mag Bearing

5.83°W True line



15 10

14

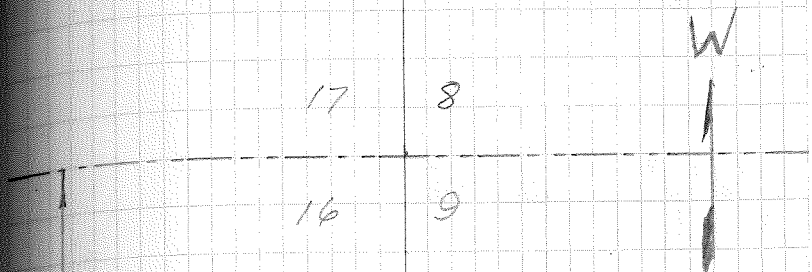
11

set approx  
oak stake  
sec. cor

T. 139N R 21W.

Dec 18-1936  
Engelbreton 27

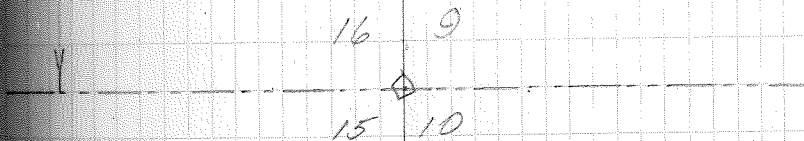
Line running West between 16+9



50.00 chains

offset 106 lks  
also chains and  
cut on 7° E Var

Old summit  
site at  
20.00 chains



3" Ash stake by Random line run  
16" PW. Wind fall at 5° E Variation

Run 7° True

T 139 R. 27

Dec 21 1936 28  
Engelbratson.

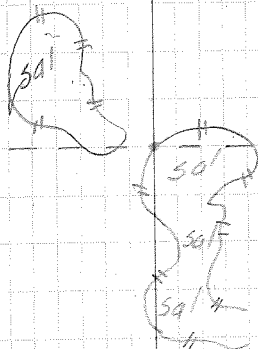
Line running West between 17-8

W

18 7

17 8 No corner found

8000 Chans  
Random Mag Bearing 3.83° W



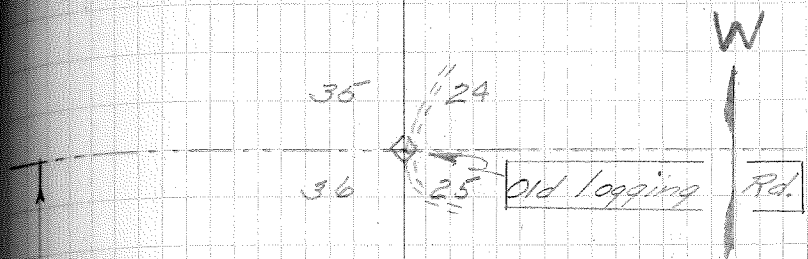
17 8

16 9

No corner found

T. 139 R. 27W Jan 14 1937 29  
Engelbratsen

Line running West between 36+25

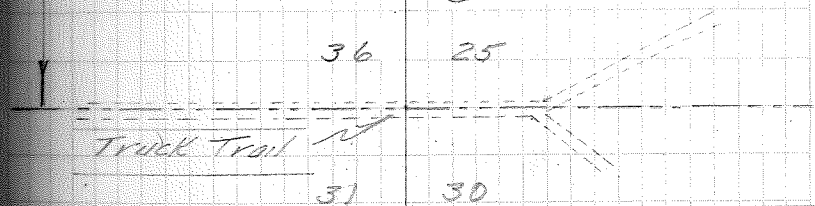


77.58 chns.  
Pop. Bearing S 82° 5' W

Established  $\frac{1}{4}$  corner  
at 38.79 chains

Small creek in  
Deep Ravine at  
29.00 chains

creek at 12 chns



Random line 75° E Var  
Trac line 75° E Var

T139 R27

Jan 28 1937  
Modahl

30

Line running West

Sec. 22 and Sec. 27

W

28	21
27	22

HO 15-30  
BM  
HB

501

HO 15-BM

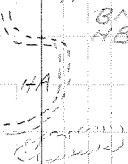
57

27	22
----	----

26	23
----	----

30.00 Chains

Mag Bearings 79° Variations



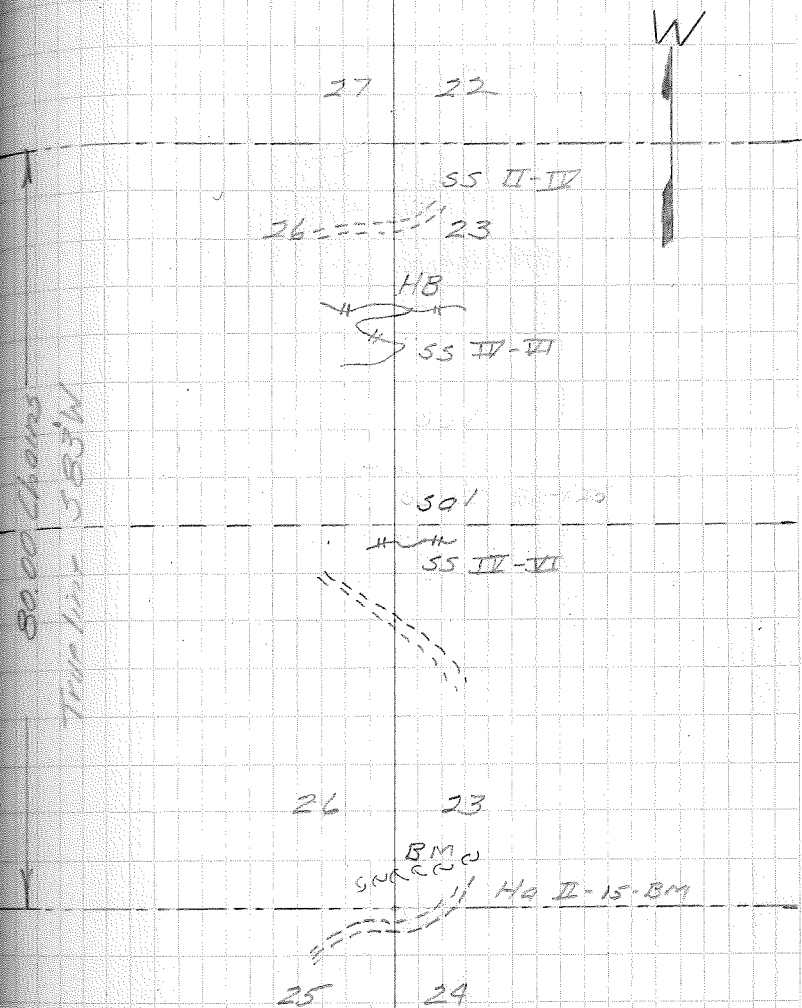
T 139 R 27

Jan 26 1937

31

Modohi

Line running West between 23+26



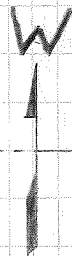


T 139 R27

Jan 20, 1937 32  
Modahl

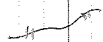
Line running West between 24+25

Random 6.45' E Var  
 Alignment .47 ch. 26 23  
 Dist. 79.61  
 True line ? 25 24

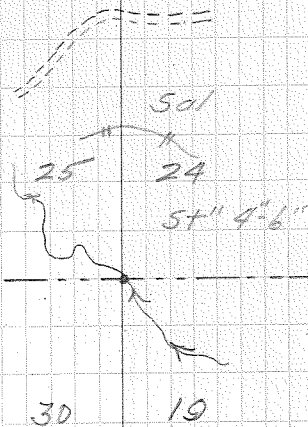


Hg. II 15 Bm  
H

55 VI



79.61 chains  
 Random line 583.16 W



30

19

T139 R27

Feb 3, 1937

33

Modahl

Line Running West between 26+35

34 27

35 26

W

Ha II-III 15-50

X

55 II-III

BM

Ha IV-15

35 26

5T II-III 150

36 25

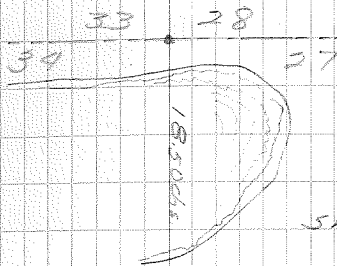
5000 Chalo

T139 R27W

Feb 9, 1937 34

Mo doh!

Line running West Between 27+34



short 57075chs

HO II-IV-15-25 HB

501-05h

34 27

HO II-IV 15-20

35 36

5000chains  
Random Map Starting 583W.

T 138-139 R 27

35

Line running East between 36 & 1

B.T. 14" JP blazed

No scribing.

N. 66° W 89.1 Ks

2" squared

5 stake

Turtle blaze on 13"  
JP. 330 chains west of

34/81  
116

Random 7° E Var.

Alignment 260 chains

Stream

E

79.20 chains

10/10

Ho 2-4"  
Pn 0

30

30

10

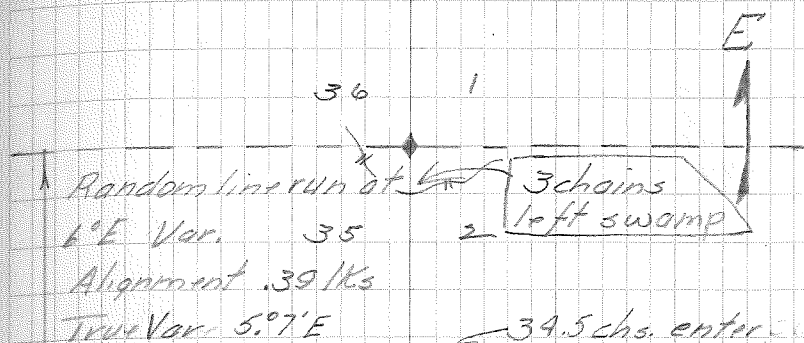
500 Cor.

2" squared stake

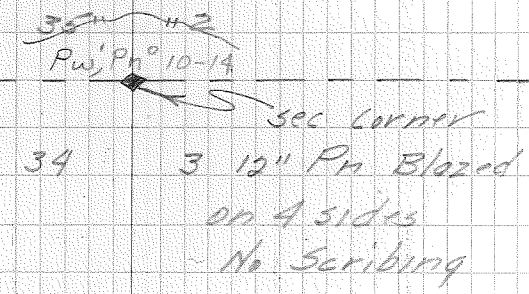
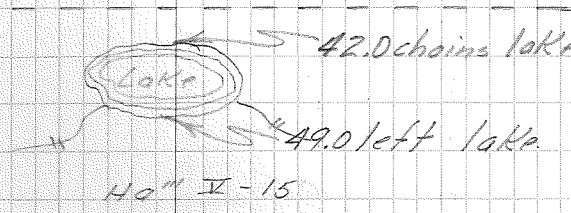
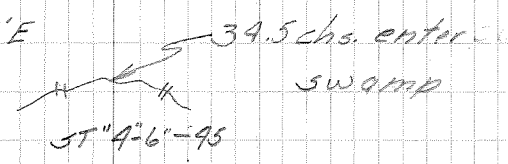
T 138-139 R 27

Feb. 3, 1937 36

Line running West between 35 & 2



79.05 chains



T 139 R 26-27

Jan 6 1937 37  
Engelbratsen

Line running So Between 12+7

S

2.83 chs West To

13 18 SAPP CC. Corner

12 7 12.7  
131.8

81.23 chains

Random line Var of 6.30'

Stake put in at  
19.52 chains  
APP M.C.

Lake George

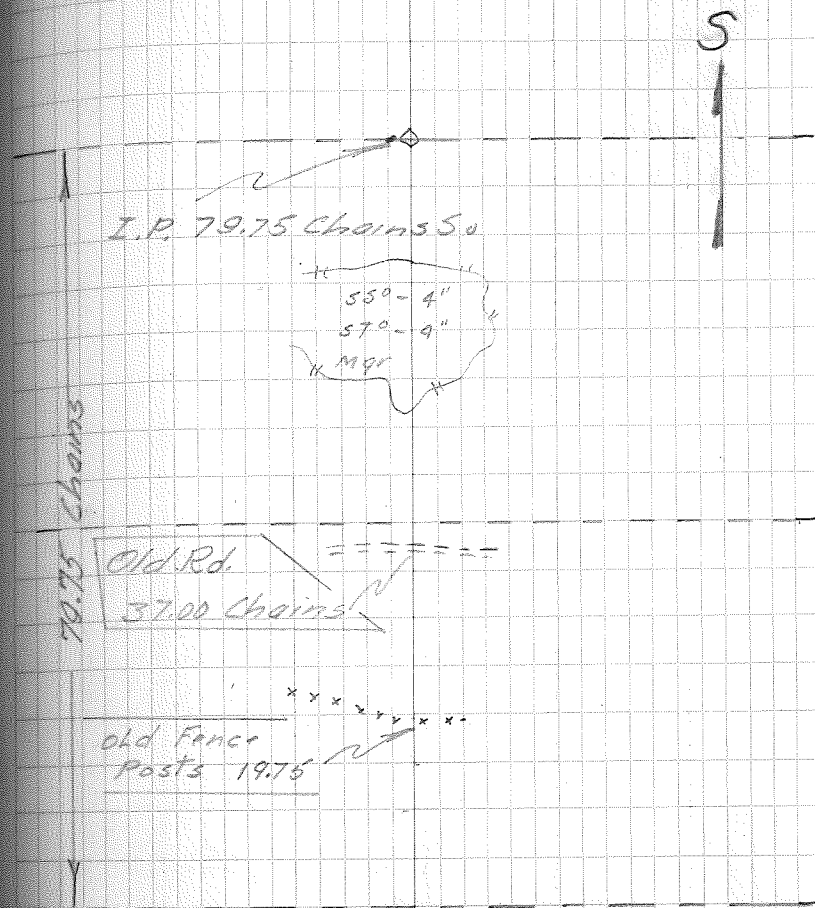
12 7

1 6 Sec Corner  
in Lake George

T 139-R 26-27W Jan 8 1937 <sup>38</sup>

Engelbrotson

Line running So between 13 + 18



Random line run at  
63° E Variation  
Alignment 68 Lks East  
True Var 7° E Var

T 139 R 27-26

Jan 6 1937

39

Engelbrotson

Line running S between Sec. 146

S

APPROX. Ck. Corner

81.58 chains

also in lake

Lake George.

53.00 chains

reach lake.

81.58 chains

Point

42.25 chains

to Point

13.50 chains

left isle

Lake George

6.71 chains

to Island

Island

True Var  $6\frac{1}{2}^{\circ}E$

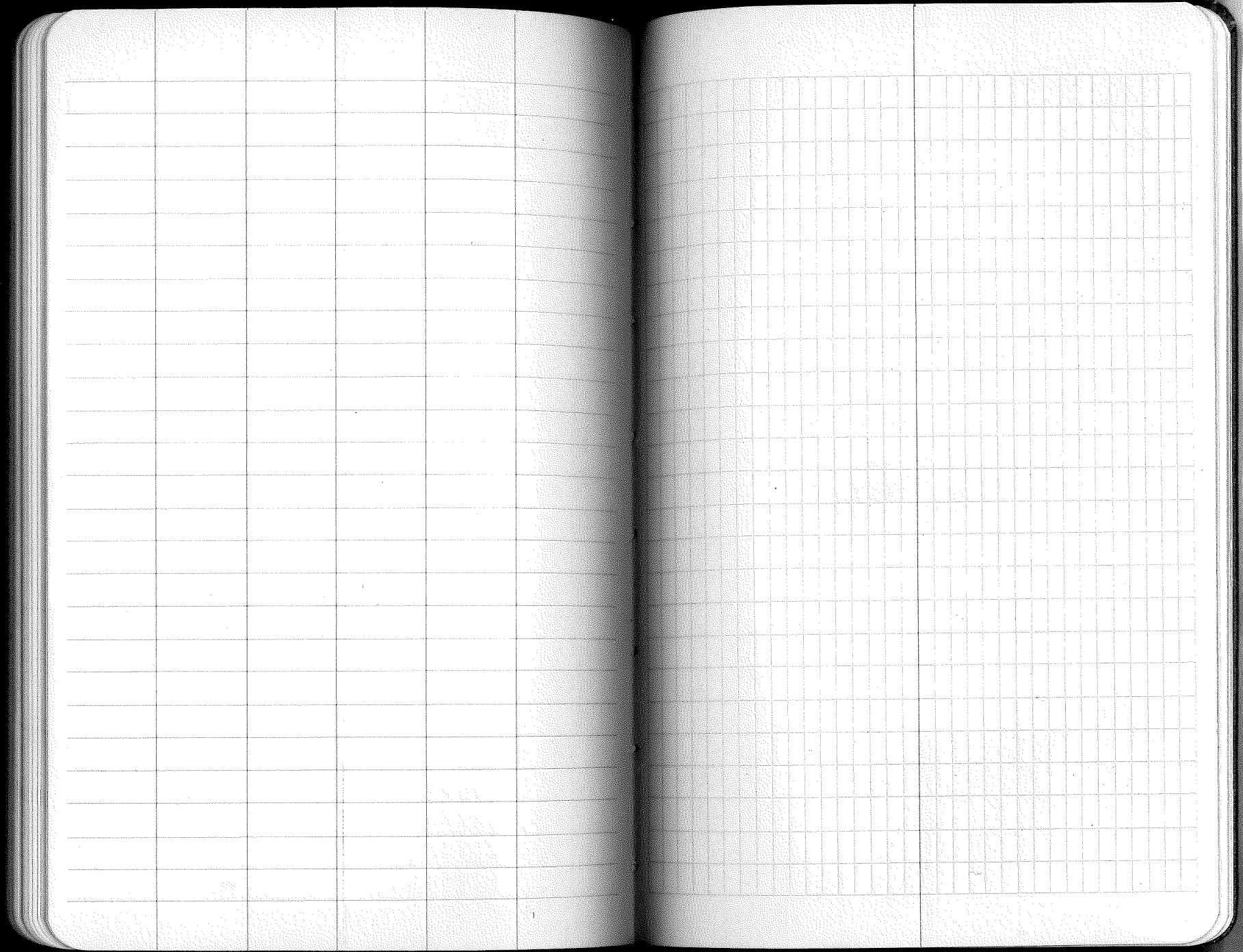
Random  $6\frac{1}{2}^{\circ}E$

Sec. Cor. in lake

George.



79.84 chains

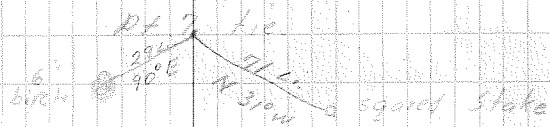


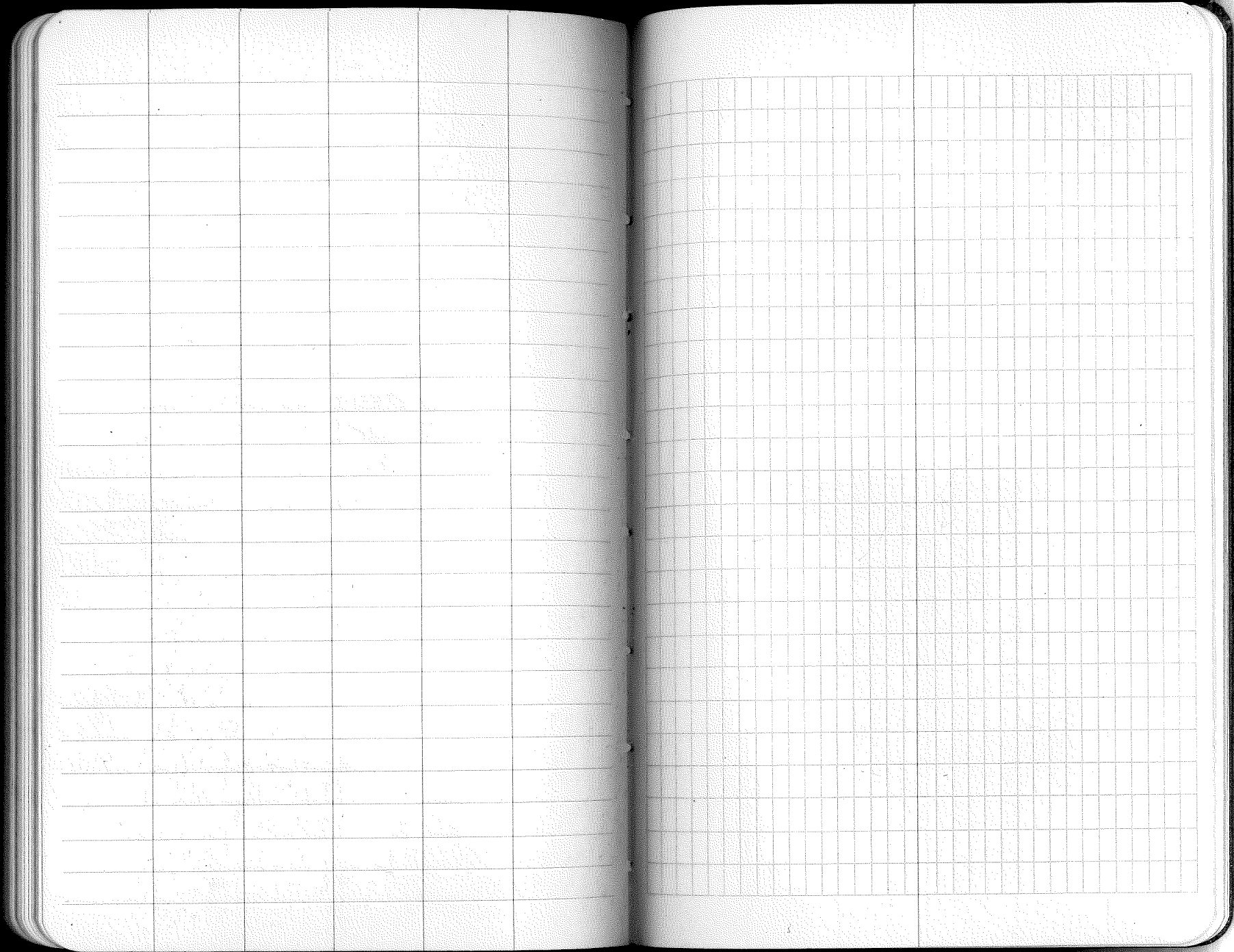
Points	Dist in Chains	Mag B	True B.
Point 1		<del>S 91° E</del>	<del>S 22° E</del>
1-2	5.73 Ch.	S 31° E	S 24° E
2-3	13.78	S 11° W	S 18° W
3-4	5.27	S 24° W	S 31° W
4-5	12.82	S 32° W	S 39° W
5-6	9.63	S 27° W	S 34° W
6-7	14.29	S 35° W	S 42° W
	41.52		

7° E Declination

Dist. Along No. 6 to Swolens Road

Road at 10.5 Ch. from Pt. 3 Left side





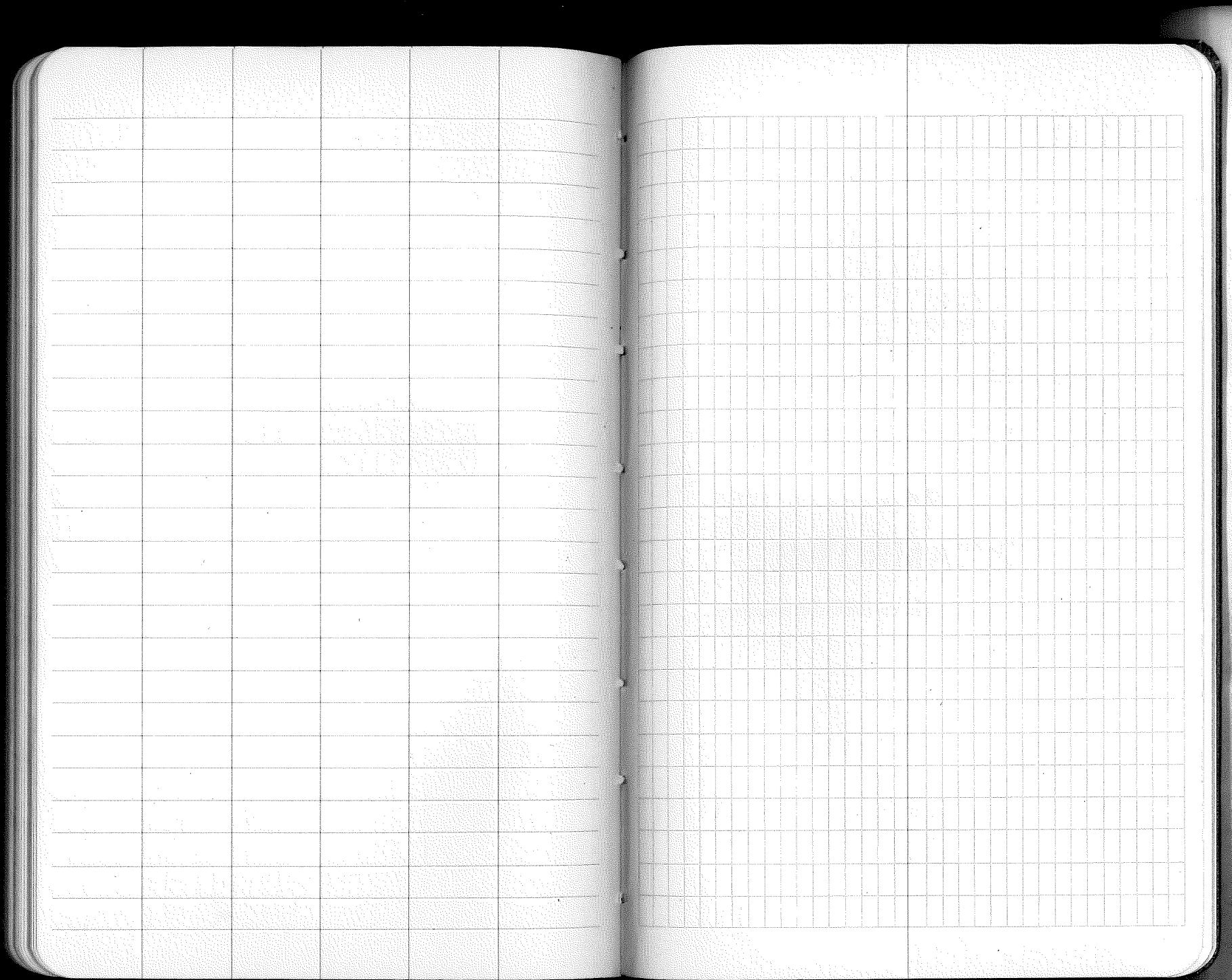






TABLE II—Continued  
TRIGONOMETRIC FORMULAE (continued)

In any triangle:

Given a, b, C; to find c, B, A.

Use Law of Lines.

Given A, B, c; to find a, b, C.

Use Law of Lines.

Given a, b, c; to find A, B, C.

$$\text{Let } \frac{a+b+c}{2} = s, \sqrt{\frac{(s-a)(s-b)(s-c)}{s}} = r$$

$$\cos \frac{1}{2} A = \sqrt{\frac{s(s-a)}{bc}}$$

$$\tan \frac{1}{2} A = \frac{r}{s-a}$$

$$\tan \frac{1}{2} B = \frac{r}{s-b}$$

$$\tan \frac{1}{2} C = \frac{r}{s-c}$$

Area of a triangle:

$$\text{Area} = \frac{1}{2} ab \sin C$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

PRISMOIDAL FORMULA.

$$\text{Vol.} = \frac{h}{6} (B+b+4M)$$

h = altitude; b, B = bases; M = midsection

TABLE III  
INCHES AND FRACTIONS OF AN INCH IN DECIMALS OF A FOOT

	0	1	2	3	4	5	6	7	8	9	10	11
$\frac{1}{16}$	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219
$\frac{1}{8}$	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271
$\frac{3}{16}$	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323
$\frac{1}{4}$	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375
$\frac{5}{16}$	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427
$\frac{3}{8}$	.0313	.1146	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479
$\frac{7}{16}$	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531
$\frac{1}{2}$	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583
$\frac{9}{16}$	.0469	.1302	.2135	.2969	.3803	.4635	.5469	.6302	.7135	.7969	.8802	.9635
$\frac{5}{8}$	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688
$\frac{11}{16}$	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740
$\frac{3}{4}$	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792
$\frac{13}{16}$	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844
$\frac{7}{8}$	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896
$\frac{15}{16}$	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948
1	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	1.000
	0	1	2	3	4	5	6	7	8	9	10	11

TABLE IV  
USEFUL RELATIONS.

Lineal feet	×.00019	= miles
Lineal yards	×.0006	= miles
Square inches	×.007	= square feet
Square feet	×.111	= square yards
Square yards	×.0002067	= acres
Acres	×4840	= square yards
Cubic inches	×.00058	= cubic feet
Cubic feet	×.03704	= cubic yards
Links	×.22	= yards
Links	×.66	= feet
Feet	×1.5	= links

$$360^\circ = 21600' = 1296000''$$

$$\text{Radius} = \text{arc of } 57.2957790^\circ$$

$$\text{Arc of } 1^\circ (\text{radius} = 1) = .017453292$$

$$\text{Arc of } 1' (\text{radius} = 1) = .000290888$$

$$\text{Arc of } 1'' (\text{radius} = 1) = .000004848$$

$$\pi = 3.141592654$$

$$\sqrt{\frac{1}{\pi}} = 0.564190$$

$$\frac{\pi}{4} = 0.785398163$$

$$\sqrt[3]{\frac{6}{\pi}} = 1.240700982$$

$$\frac{\pi}{6} = 0.523598776$$

$$\pi^2 = 9.869604401$$

$$\sqrt{\frac{4}{\pi}} = 1.128379167$$

$$\frac{1}{\pi^2} = 0.101321184$$

$$\frac{\pi}{6} = 0.523598776$$

$$\sqrt{\pi} = 1.772453851$$

$$\frac{4\pi}{3} = 4.188790205$$

$$\frac{1}{\pi} = 0.3183099$$

Curvature of Earth's surface = about 0.7 feet in 1 mile

Curvature in feet = 0.667 (Dist. in miles)<sup>2</sup>

Difference between arc and chord length, 0.05 feet in 11½ miles

$$\text{Probable error of a single observation} = 0.6754 \sqrt{\frac{\sum v^2}{n-1}}$$

Error in chaining of 0.01 feet in 100 feet:

Due to—

1. Length of tape error of 0.01 feet
2. Alignment. One end 1.4 feet out of line
3. Sag of tape at centre of 0.61 feet.
4. Temperature difference of 15°
5. Difference of pull of 15 lbs.

STADIA REDUCTION FORMULAE.

$$\text{Horizontal Distance} = R - R \sin^2 a + C \cos a$$

$$\text{Vertical Distance} = R \frac{1}{2} \sin 2a + C \sin a$$

distance from Object glass to cross hairs

$$R = \text{Reading} \times \frac{\text{distance from Object glass to cross hairs}}{\text{distance between cross hairs}}$$

C = distance from Object glass to cross hairs + distance from Object glass to center of instrument.

a = angle of elevation for mid Reading



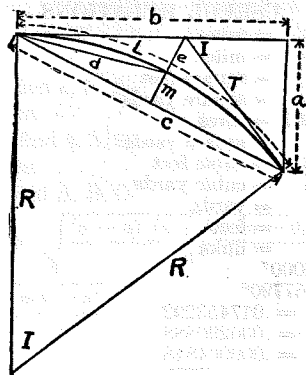


TABLE V  
CURVE FORMULAE FOR SIMPLE CURVES  
COMPILED BY J. CALVIN LOCKE, C.E.

- (1)  $c = \sqrt{2Ra}$  (2)  $c = \sqrt{a^2 + b^2}$   
 (3)  $c = \sqrt{2R(R - \sqrt{(R+b)(R-b)})} = \sqrt{2R(R - \sqrt{R^2 - b^2})}$   
 (4)  $c = 2\sqrt{m(2R - m)}$   
 (5)  $c = 2R \sin \frac{1}{2} I$  (6)  $c = 2T \cos \frac{1}{2} I$   
 (7)  $e = R \operatorname{exsec} \frac{1}{2} I$   
 (8)  $e = R \tan \frac{1}{2} I \tan \frac{1}{4} I$  (9)  $e = T \tan \frac{1}{4} I$   
 (10)  $b = \sqrt{a(2R - a)}$   
 (11)  $b = \sqrt{\left(c + \frac{c^2}{2R}\right)\left(c - \frac{c^2}{2R}\right)} = \sqrt{c^2 - \frac{c^4}{4R^2}}$   
 (12)  $b = R \sin I$  (13)  $b = a \cot \frac{1}{2} I$   
 (14)  $R = \frac{a^2 + b^2}{2a} = \frac{c^2}{2a}$  (15)  $R = \frac{d^2}{2m} = \frac{c^2 + 4m^2}{8m}$   
 (16)  $d = \sqrt{R(2R - \sqrt{(2R+c)(2R-c)})} = \sqrt{R(2R - \sqrt{4R^2 - c^2})}$   
 (17)  $d = \sqrt{2Rm}$  (18)  $d = 2R \sin \frac{1}{4} I$  (19)  $m = \frac{d^2}{2R}$   
 (20)  $m = R \mp \sqrt{\left(R + \frac{c}{2}\right)\left(R - \frac{c}{2}\right)} = R \mp \sqrt{R^2 - \frac{c^2}{4}}$   
 (21)  $m = R \operatorname{vers} \frac{1}{2} I$  (22)  $m = R \sin \frac{1}{2} I \tan \frac{1}{4} I$  (23)  $m = \frac{1}{2} c \tan \frac{1}{4} I$   
 (24)  $a = \frac{c^2}{2R}$  (25)  $a = R - \sqrt{(R+b)(R-b)} = R - \sqrt{R^2 - b^2}$   
 (26)  $a = 2R(\sin^2 \frac{1}{2} I)^2$  (27)  $a = R \operatorname{vers} I$  (28)  $a = R \sin I \tan \frac{1}{2} I$   
 (29)  $a = b \tan \frac{1}{2} I$  (30)  $a = T \sin I$  (31)  $T = R \tan \frac{1}{2} I$   
 (32)  $I = \frac{L}{R} \times 57.295780$  (33)  $R = \frac{L}{I} \times 57.295780$   
 (34)  $L = IR \times 0.01745329$  (35)  $L = \frac{8d - c}{3}$   
 (36)  $\text{Area Seg.} = \frac{LR - R^2 \sin I}{2} = \frac{LR - Rb}{2}$

TABLE VI  
SINES, COSINES, TANGENTS, COTANGENTS

deg	sin 0'	tan 0'	sin 10'	tan 10'	sin 20'	tan 20'	sin 30'	tan 30'	sin 40'	tan 40'	sin 50'	tan 50'	sin 60'	tan 60'	sin 70'	tan 70'	sin 80'	tan 80'	sin 90'	tan 90'
0	0000	0000	0029	0029	0058	0058	0087	0087	0116	0116	0145	0145	0175	0175	0204	0204	0233	0233	0262	0262
1	175	0175	0204	0204	0233	0233	0262	0262	0291	0291	0320	0320	0349	0349	0378	0378	0407	0407	0436	0436
2	349	349	378	378	407	407	436	436	465	465	494	494	523	523	552	552	581	581	610	610
3	523	523	552	552	581	581	610	610	640	640	669	669	698	698	727	727	756	756	785	785
4	698	698	727	727	756	756	785	785	814	814	843	843	872	872	901	901	929	929	958	958
5	872	872	901	901	929	929	958	958	987	987	1016	1016	1045	1045	1074	1074	1103	1103	1132	1132
6	1045	1045	1074	1074	1103	1103	1132	1132	1161	1161	1190	1190	1219	1219	1248	1248	1277	1277	1305	1305
7	1219	1219	1248	1248	1277	1277	1305	1305	1334	1334	1363	1363	1392	1392	1421	1421	1449	1449	1478	1478
8	1392	1392	1421	1421	1449	1449	1478	1478	1507	1507	1536	1536	1564	1564	1593	1593	1622	1622	1650	1650
9	1564	1564	1593	1593	1622	1622	1650	1650	1679	1679	1708	1708	1737	1737	1766	1766	1795	1795	1824	1824
10	1737	1737	1766	1766	1795	1795	1824	1824	1853	1853	1883	1883	1912	1912	1941	1941	1970	1970	2000	2000
11	1883	1883	1912	1912	1941	1941	1970	1970	2000	2000	2030	2030	2060	2060	2090	2090	2120	2120	2150	2150
12	2030	2030	2060	2060	2090	2090	2120	2120	2150	2150	2180	2180	2210	2210	2240	2240	2270	2270	2300	2300
13	2150	2150	2180	2180	2210	2210	2240	2240	2270	2270	2300	2300	2330	2330	2360	2360	2390	2390	2420	2420
14	2270	2270	2300	2300	2330	2330	2360	2360	2390	2390	2420	2420	2450	2450	2480	2480	2510	2510	2540	2540
15	2390	2390	2420	2420	2450	2450	2480	2480	2510	2510	2540	2540	2570	2570	2600	2600	2630	2630	2660	2660
16	2450	2450	2480	2480	2510	2510	2540	2540	2570	2570	2600	2600	2630	2630	2660	2660	2690	2690	2720	2720
17	2570	2570	2600	2600	2630	2630	2660	2660	2690	2690	2720	2720	2750	2750	2780	2780	2810	2810	2840	2840
18	2660	2660	2690	2690	2720	2720	2750	2750	2780	2780	2810	2810	2840	2840	2870	2870	2900	2900	2930	2930
19	2720	2720	2750	2750	2780	2780	2810	2810	2840	2840	2870	2870	2900	2900	2930	2930	2960	2960	2990	2990
20	2780	2780	2810	2810	2840	2840	2870	2870	2900	2900	2930	2930	2960	2960	2990	2990	3020	3020	3050	3050
21	2840	2840	2870	2870	2900	2900	2930	2930	2960	2960	2990	2990	3020	3020	3050	3050	3080	3080	3110	3110
22	2870	2870	2900	2900	2930	2930	2960	2960	2990	2990	3020	3020	3050	3050	3080	3080	3110	3110	3140	3140
23	2900	2900	2930	2930	2960	2960	2990	2990	3020	3020	3050	3050	3080	3080	3110	3110	3140	3140	3170	3170
24	2930	2930	2960	2960	2990	2990	3020	3020	3050	3050	3080	3080	3110	3110	3140	3140	3170	3170	3200	3200
25	2960	2960	2990	2990	3020	3020	3050	3050	3080	3080	3110	3110	3140	3140	3170	3170	3200	3200	3230	3230
26	2990	2990	3020	3020	3050	3050	3080	3080	3110	3110	3140	3140	3170	3170	3200	3200	3230	3230	3260	3260
27	3020	3020	3050	3050	3080	3080	3110	3110	3140	3140	3170	3170	3200	3200	3230	3230	3260	3260	3290	3290
28	3050	3050	3080	3080	3110	3110	3140	3140	3170	3170	3200	3200	3230	3230	3260	3260	3290	3290	3320	3320
29	3080	3080	3110	3110	3140	3140	3170	3170	3200	3200	3230	3230	3260	3260	3290	3290	3320	3320	3350	3350
30	3110	3110	3140	3140	3170	3170	3200	3200	3230	3230	3260	3260	3290	3290	3320	3320	3350	3350	3380	3380
31	3140	3140	3170	3170	3200	3200	3230	3230	3260	3260	3290	3290	3320	3320	3350	3350	3380	3380	3410	3410
32	3170	3170	3200	3200	3230	3230	3260	3260	3290	3290	3320	3320	3350	3350	3380	3380	3410	3410	3440	3440
33	3200	3200	3230	3230	3260	3260	3290	3290	3320	3320	3350	3350	3380	3380	3410	3410	3440	3440	3470	3470
34	3230	3230	3260	3260	3290	3290	3320	3320	3350	3350	3380	3380	3410	3410	3440	3440	3470	3470	3500	3500
35	3260	3260	3290	3290	3320	3320	3350	3350	3380	3380	3410	3410	3440	3440	3470	3470	3500	3500	3530	3530
36	3290	3290	3320	3320	3350	3350	3380	3380	3410	3410	3440	3440	3470	3470	3500	3500	3530	3530	3560	3560
37	3320	3320	3350	3350	3380	3380	3410	3410	3440	3440	3470	3470	3500	3500	3530	3530	3560	3560	3590	3590
38	3350	3350	3380	3380	3410	3410	3440	3440	3470	3470	3500	3500	3530	3530	3560	3560	3590	3590	3620	3620
39	3380	3380	3410	3410	3440	3440	3470	3470	3500	3500	3530	3530	3560	3560	3590	3590	3620	3620	3650	3650
40	3410	3410	3440	3440	3470	3470	3500	3500	3530	3530	3560	3560	3590	3590	3620	3620	3650	3650	3680	3680
41	3440	3440	3470	3470	3500	3500	3530	3530	3560	3560	3590	3590	3620	3620	3650	3650	3680	3680	3710	3710
42	3470	3470	3500	3500	3530	3530	3560	3560	3590	3590	3620	3620	3650	3650	3680	3680	3710	3710	3740	3740
43	3500	3500	3530	3530	3560	3560	3590	3590	3620	3620	3650	3650	3680	3680	3710	3710	3740	3740	3770	3770
44	3530	3530	3560	3560	3590	3590	3620	3620	3650	3650	3680	3680	3710	3710	3740	3740	3770	3770	3800	3800
45	3560	3560	3590	3590	3620	3620	3650	3650	3680	3680	3710	3710	3740	3740	3770	3770	3800	3800	3830	3830
46	3590	3590	3620	3620	3650	3650	3680	3680	3710	3710	3740	3740	3770	3770	3800	3800	3830	3830	3860	3860
47	3620	3620	3650	3650	3680	3680	3710	3710	3740	3740	3770	3770	3800	3800	3830	3830	3860	3860	3890	3890
48	3650	3650	3680	3680	3710	3710	3740	3740	3770	3770	3800	3800	3830	3830	3860	3860	3890	3890	3920	3920
49	3680	3680	3710	3710	3740	3740	3770	3770	3800	3800	3830	3830	3860	3860	3890	3890	3920	3920	3950	3950
50	3710	3710	3740	3740	3770	3770	3800	3800	3830	3830	3860	3860	3890	3890	3920	3920	3950	3950	3980	3980
51	3740	3740	3770	3770	3800	3800	3830	3830	3860	3860	3890	3890	3920	3920	3950	3950	3980	3980	4010	4010
52	3770	3770	3800	3800	3830	3830	3860	3860	3890	3890	3920	3920	3950	3950	3980	3980	4010	4010	4040	4040
53	3800	3800	3830	3830	3860	3860	3890	3890	3920	3920	3950	3950	3980	3980	4010	4010	4040	4040	4070	4070
54	3830	3830	3860	3860	3890	3890	3920	3920	3950	3950	3980	3980	4010	4010	4040	4040	4070	4070	4100	4100
55	3860	3860	3890	3890	3920	3920	3950	3950	3980	3980	4010	4010	4040	4040	4070	4070	4100	4100	4130	4130
56	3890																			

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

deg	sin 0'	tan 0'	sin 10'	tan 10'	sin 20'	tan 20'	sin 30'	tan 30'	sin 40'	tan 40'	sin 50'	tan 50'	deg
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
										1.2203			
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	.2647	7753	1.2276	39
51	771	.2349	790	.2423	808	.2497	826	.2572	844	.3111	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3597	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.4106	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4641	175	.4193	35
55	192	.4281	208	.4370	225	.4460	241	.4550	258	.5204	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5798	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.6426	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.7090	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631		646	.7205	30
60	660	1.7321	8675	1.7437	8689	1.7556	8704	1.7675	8718	1.7797	8732	1.7917	29
61	746	.8040	760	.8165	774	.8291	788	.8418	802	.8546	816	.8676	28
62	829	.8807	843	.8940	857	.9074	870	.9210	884	.9347	897	.9486	27
63	910	.9626	923	.9768	936	.9912	949	2.0057	962	2.0204	975	2.0353	26
64	988	2.0503	9001	2.0655	9013	2.0809	9026	.0965	9038	.1123	9051	.1283	25
65	9063	1.445	075	.1609	088	.1775	100	.1943	112	.2113	124	.2286	24
66	135	.2460	147	.2637	159	.2817	171	.2998	182	.3183	194	.3369	23
67	205	.3559	216	.3750	228	.3945	239	.4142	250	.4342	261	.4545	22
68	272	.4751	283	.4960	293	.5172	304	.5386	315	.5605	325	.5826	21
69	336	.6051	346	.6279	356	.6511	367	.6746	377	.6985	387	.7228	20
70	397	2.7475	9407	2.7725	9417	2.7980	9426	2.8239	9436	2.8502	9446	2.8770	19
71	455	.9042	465	.9319	474	.9600	483	.9887	492	3.0178	502	3.0475	18
72	511	3.0777	520	3.1084	528	3.1397	537	3.1716	546	.2041	555	.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	5.764	10
80	9848	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	922	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.078	954	10.385	957	10.711	959	11.059	5
85	962	11.430	964	11.826	967	12.250	969	12.706	971	13.197	974	13.727	4
86	976	14.300	978	14.924	980	15.605	981	16.350	983	17.169	985	18.075	3
87	986	19.081	988	20.206	989	21.470	990	22.903	992	24.542	993	26.432	2
88	994	28.636	995	31.242	996	34.368	997	38.189	997	42.964	998	49.104	1
89	9998	57.290	9999	68.750	9999	85.940	9999	114.58	1.000	171.88	1.000	343.77	0
deg	cos	60'	cot	50'	cos	40'	cos	30'	cos	20'	cos	10'	deg

TABLE VII  
RODS IN FEET AND INCHES

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

TABLE VIII  
LINKS IN FEET AND INCHES

Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches
1	0-7.92	18	11-10.56	35	23-1.20	52	34-3.84	69	45-6.48
2	1-3.84	19	12-6.48	36	23-9.12	53	34-11.76	70	46-2.40
3	1-11.76	20	13-2.40	37	24-5.04	54	35-7.68	71	46-10.32
4	2-7.68	21	13-10.82	38	25-0.96	55	36-3.60	72	47-6.24
5	3-3.60	22	14-6.24	39	25-8.88	56	36-11.52	73	48-2.16
6	3-11.52	23	15-2.16	40	26-4.80	57	37-7.44	74	48-10.08
7	4-7.44	24	15-10.08	41	27-0.72	58	38-3.36	75	49-6.00
8	5-3.36	25	16-6.00	42	27-8.64	59	38-11.28	76	50-1.92
9	5-11.28	26	17-1.92	43	28-4.56	60	39-7.20	77	50-9.84
10	6-7.20	27	17-9.84	44	29-0.48	61	40-3.12	78	51-5.76
11	7-3.12	28	18-5.76	45	29-8.40	62	40-11.04	79	52-1.68
12	7-11.04	29	19-1.68	46	30-4.32	63	41-6.96	80	52-9.60
13	8-6.96	30	19-9.60	47	31-0.24	64	42-2.88	81	53-5.52
14	9-2.88	31	20-5.52	48	31-8.16	65	42-10.80	82	54-1.44
15	9-10.80	32	21-1.44	49	32-4.08	66	43-6.72	83	54-9.36
16	10-6.72	33	21-9.36	50	33-0.00	67	44-2.64	84	55-5.28
17	11-2.64	34	22-5.28	51	33-7.92	68	44-10.56	85	56-1.20

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10'	58.34	.297	5° C.	10'	560.11	27.313	5° C	10'	1070.6	99.155	5° C
20'	66.67	.388	T	20'	568.53	28.137	T	20'	1079.2	100.75	T
30'	75.01	.491	.03	30'	576.95	28.974	.06	30'	1087.8	102.35	.10
40'	83.34	.606	E	40'	585.36	29.824	E	40'	1096.4	103.97	E
50'	91.68	.733	.001	50'	593.79	30.686	.006	50'	1105.1	105.60	.013
2°	100.01	.873	10° C.	12°	602.21	31.561	.006	22°	1113.7	107.24	.013
10'	108.35	1.024	T	10'	610.64	32.447	T	10'	1122.4	108.90	T
20'	116.68	1.188	.06	20'	619.07	33.347	.13	20'	1131.0	110.57	.19
30'	125.02	1.364	E	30'	627.50	34.259	E	30'	1139.7	112.25	E
40'	133.36	1.552	.003	40'	635.93	35.183	.011	40'	1148.4	113.95	.025
50'	141.70	1.752	15° C.	50'	644.37	36.120	.017	50'	1157.0	115.66	.046
3°	150.04	1.964	T	13°	652.81	37.070	.017	23°	1165.7	117.38	.065
10'	158.38	2.188	.09	10'	661.25	38.031	.19	10'	1174.4	119.12	.29
20'	166.72	2.425	.004	20'	669.70	39.006	.017	20'	1183.1	120.87	.038
30'	175.06	2.674	T	30'	678.15	39.993	.017	30'	1191.8	122.63	.070
40'	183.40	2.934	E	40'	686.60	40.992	.026	40'	1200.5	124.41	.117
50'	191.74	3.207	15° C.	50'	695.06	42.004	.026	50'	1209.2	126.20	.171
4°	200.08	3.492	T	14°	703.51	43.029	.026	24°	1217.9	128.00	.229
10'	208.43	3.790	.09	10'	711.97	44.066	.026	10'	1226.6	129.82	.299
20'	216.77	4.099	.004	20'	720.44	45.116	.026	20'	1235.3	131.65	.380
30'	225.12	4.421	T	30'	728.90	46.178	.026	30'	1244.0	133.50	.471
40'	233.47	4.755	E	40'	737.37	47.253	.026	40'	1252.8	135.35	.571
50'	241.81	5.100	15° C.	50'	745.85	48.341	.026	50'	1261.5	137.23	.680
5°	250.16	5.459	T	15°	754.32	49.441	.026	25°	1270.2	139.11	.799
10'	258.51	5.829	.09	10'	762.80	50.554	.026	10'	1279.0	141.01	.928
20'	266.86	6.211	.004	20'	771.29	51.679	.026	20'	1287.7	142.93	.106
30'	275.21	6.606	T	30'	779.77	52.818	.026	30'	1296.5	144.85	.197
40'	283.57	7.013	E	40'	788.26	53.969	.026	40'	1305.3	146.79	.299
50'	291.92	7.432	15° C.	50'	796.75	55.132	.026	50'	1314.0	148.75	.412
6°	300.28	7.863	T	16°	805.25	56.309	.026	26°	1322.8	150.71	.536
10'	308.64	8.307	.09	10'	813.75	57.498	.026	10'	1331.6	152.69	.671
20'	316.99	8.762	.004	20'	822.25	58.699	.026	20'	1340.4	154.69	.816
30'	325.35	9.230	T	30'	830.76	59.914	.026	30'	1349.2	156.70	.971
40'	333.71	9.710	E	40'	839.27	61.141	.026	40'	1358.0	158.72	1.136
50'	342.08	10.202	15° C.	50'	847.78	62.381	.026	50'	1366.8	160.76	1.311
7°	350.44	10.707	T	17°	856.30	63.634	.026	27°	1375.6	162.81	.150
10'	358.81	11.224	.09	10'	864.82	64.900	.026	10'	1384.4	164.86	.299
20'	367.17	11.753	.004	20'	873.35	66.178	.026	20'	1393.2	166.95	.458
30'	375.54	12.294	T	30'	881.88	67.470	.026	30'	1402.0	169.04	.627
40'	383.91	12.847	E	40'	890.41	68.774	.026	40'	1410.9	171.15	.806
50'	392.28	13.413	15° C.	50'	898.95	70.091	.026	50'	1419.7	173.27	.995
8°	400.66	13.991	T	18°	907.49	71.421	.026	28°	1428.6	175.41	.189
10'	409.03	14.582	.09	10'	916.03	72.764	.026	10'	1437.4	177.55	.348
20'	417.41	15.184	.004	20'	924.58	74.119	.026	20'	1446.3	179.72	.517
30'	425.79	15.799	T	30'	933.13	75.488	.026	30'	1455.1	181.89	.696
40'	434.17	16.426	E	40'	941.69	76.869	.026	40'	1464.0	184.08	.885
50'	442.55	17.065	15° C.	50'	950.25	78.264	.026	50'	1472.9	186.29	1.084
9°	450.93	17.717	T	19°	958.81	79.671	.026	29°	1481.8	188.51	.288
10'	459.32	18.381	.09	10'	967.38	81.092	.026	10'	1490.7	190.74	.457
20'	467.71	19.058	.004	20'	975.96	82.525	.026	20'	1499.6	192.99	.636
30'	476.10	19.746	T	30'	984.53	83.972	.026	30'	1508.5	195.25	.825
40'	484.49	20.447	E	40'	993.12	85.431	.026	40'	1517.4	197.53	1.024
50'	492.88	21.161	15° C.	50'	1001.7	86.904	.026	50'	1526.3	199.82	1.233
10°	501.28	21.887	T	20°	1010.3	88.389	.026	30°	1535.3	202.12	.447
10'	509.68	22.624	.09	10'	1018.9	89.888	.026	10'	1544.2	204.44	.616
20'	518.08	23.375	.004	20'	1027.5	91.399	.026	20'	1553.1	206.77	.795
30'	526.48	24.138	T	30'	1036.1	92.924	.026	30'	1562.1	209.12	.984
40'	534.89	24.913	E	40'	1044.7	94.462	.026	40'	1571.0	211.48	1.183
50'	543.29	25.700	15° C.	50'	1053.3	96.013	.026	50'	1580.0	213.86	1.392

T = R tan 1/2 I

E = R exsec 1/2 I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10'	1598.0	218.7	5° C.	10'	2151.7	390.7	5° C.	10'	2743.1	622.8	5° C.
20'	1606.9	221.1	T	20'	2161.2	394.1	T	20'	2753.4	627.3	T
30'	1615.9	223.5	.13	30'	2170.8	397.4	.17	30'	2763.7	631.7	.21
40'	1624.9	226.0	E	40'	2180.3	400.8	E	40'	2773.9	636.2	E
50'	1633.9	228.4	.023	50'	2189.9	404.2	.037	50'	2784.2	640.7	.056
32°	1643.0	230.9	10° C.	42°	2199.4	407.6	10° C.	52°	2794.5	645.2	10° C.
10'	1652.0	233.4	.13	10'	2209.0	411.1	.17	10'	2804.9	649.7	.19
20'	1661.0	235.9	T	20'	2218.6	414.5	.26	20'	2815.2	654.3	.28
30'	1670.0	238.4	.26	30'	2228.1	418.0	.34	30'	2825.6	658.8	.37
40'	1679.1	241.0	E	40'	2237.7	421.4	E	40'	2835.9	663.4	E
50'	1688.1	243.5	.046	50'	2247.3	425.0	.075	50'	2846.3	668.0	.112
33°	1697.2	246.1	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10'	1706.3	248.7	.19	10'	2266.6	432.0	.26	10'	2867.1	677.3	.28
20'	1715.3	251.3	T	20'	2276.2	435.6	.34	20'	2877.5	682.0	.37
30'	1724.4	253.9	.26	30'	2285.9	439.2	.43	30'	2888.0	686.7	E
40'	1733.5	256.5	E	40'	2295.6	442.8	E	40'	2898.4	691.4	E
50'	1742.6	259.1	.046	50'	2305.2	446.4	.075	50'	2908.9	696.1	.112
34°	1751.7	261.8	15° C.	44°	2314.9	450.0	15° C.	54°	2919.4	700.9	15° C.
10'	1760.8	264.5	.19	10'	2324.6	453.6	.26	10'	2929.9	705.7	.28
20'	1770.0	267.2	T	20'	2334.3	457.3	.34	20'	2940.4	710.5	.37
30'	1779.1	269.9	.26	30'	2344.1	461.0	.43	30'	2951.0	715.3	E
40'	1788.2	272.6	E	40'	2353.8	464.6	E	40'	2961.5	720.1	E
50'	1797.4	275.3	.046	50'	2363.5	468.4	.075	50'	2972.1	725.0	.112
35°	1806.6	278.1	10° C.	45°	2373.3	472.1	10° C.	55°	2982.7	729.9	10° C.
10'	1815.7	280.8	.29	10'	2383.1	475.8	.37	10'	2993.3	734.8	.28
20'	1824.9	283.6	T	20'	2392.8	479.6	.46	20'	3003.9	739.7	.37
30'	1834.1	286.4	.26	30'	2402.6	483.4	.55	30'	3014.5	744.6	E
40'	1843.3	289.2	E	40'	2412.4	487.2	.64	40'	3025.2	749.6	E
50'	1852.5	292.0	.070	50'	2422.3	491.0	.73	50'	3035.8	754.6	.112
36°	1861.7	294.9	15° C.	46°	2432.1	494.8	15° C.	56°	3046.5	759.6	15° C.
10'	1870.9	297.7	.37	10'	2441.9	498.7	.46	10'	3057.2	764.6	.28
20'	1880.1	300.6	T	20'	2451.8	502.5	.55	20'	3067.9	769.7	.37
30'	1889.4	303.5	.26	30'	2461.7	506.4	.64	30'	3078.7	774.7	E
40'	1898.6	306.4	E	40'	2471.5	510.3	.73	40'	3089.4	779.8	E
50'	1907.9	309.3	.070	50'	2481.4	514.3	.82	50'	3100.2	784.9	.112
37°	1917.1	312.2	10° C.	47°	2491.3	518.2	10° C.	57°	3110.9	790.1	10° C.
10'	1926.4	315.2	.46	10'	2501.2	522.2	.55	10'	3121.7	795.2	.28
20'	1935.7	318.1	T	20'	2511.2	526.1	.64	20'	3132.6	800.4	.37
30'	1945.0	321.1	.26	30'	2521.1	530.1	.73	30'	3143.4	805.6	E
40'	1954.3	324.1	E	40'	2531.1	534.2	.82	40'	3154.2	810.9	E
50'	1963.6	327.1	.070	50'	2541.0	538.2	.91	50'	3165.1	816.1	.112
38°	1972.9	330.2	15° C.	48°	2551.0	542.2	15° C.	58°	3176.0	821.4	15° C.
10'	1982.2	333.2	.55	10'	256						

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2	+	71°	4086.9	1308.2	+	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	5° C.	20'	4112.1	1322.9	5° C.	20'	4922.5	1824.1	5° C.
30'	3408.8	937.3	T	30'	4124.8	1330.3	T	30'	4937.0	1833.6	T
40'	3420.1	943.1	.25	40'	4137.4	1337.7	.30	40'	4951.5	1843.1	.36
50'	3431.4	948.9	E	50'	4150.1	1345.1	E	50'	4966.1	1852.6	E
62°	3442.7	954.8	.080	72°	4162.8	1352.6	.110	82°	4980.7	1862.2	.149
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	10° C.	73°	4239.7	1398.0	10° C.	83°	5069.2	1920.5	10° C.
10'	3522.6	996.2	T	10'	4252.6	1405.7	T	10'	5084.0	1930.4	T
20'	3534.1	1002.3		20'	4265.6	1413.5		20'	5099.0	1940.3	
30'	3545.6	1008.3	.51	30'	4278.5	1421.2	.61	30'	5113.9	1950.3	.72
40'	3557.2	1014.4	E	40'	4291.5	1429.0	E	40'	5128.9	1960.2	E
50'	3568.7	1020.5	.159	50'	4304.6	1436.8	.220	50'	5143.9	1970.3	.299
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	15° C.	50'	4383.3	1484.4	15° C.	50'	5234.9	2031.4	15° C.
65°	3650.2	1063.9	T	75°	4396.5	1492.4	T	85°	5250.3	2041.7	T
10'	3661.9	1070.2	.76	10'	4409.8	1500.5	.91	10'	5265.6	2052.1	1.09
20'	3673.7	1076.6	E	20'	4423.1	1508.6	E	20'	5281.0	2062.5	E
30'	3685.4	1082.9		30'	4436.4	1516.7		30'	5296.4	2073.0	
40'	3697.2	1089.3	.240	40'	4449.7	1524.9	.332	40'	5311.9	2083.5	.450
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	20° C.	40'	4530.4	1574.7	20° C.	40'	5405.6	2147.5	20° C.
50'	3780.4	1134.8	T	50'	4544.0	1583.1	T	50'	5421.4	2158.4	T
67°	3792.4	1141.4	1.02	77°	4557.6	1591.6	1.22	87°	5437.2	2169.2	1.45
10'	3804.4	1148.0	E	10'	4571.2	1600.1	E	10'	5453.1	2180.2	E
20'	3816.4	1154.7	.321	20'	4584.8	1608.6	.445	20'	5469.0	2191.1	.603
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	25° C.	20'	4667.4	1660.5	25° C.	20'	5565.4	2258.0	25° C.
30'	3901.2	1202.0	T	30'	4681.3	1669.2	T	30'	5581.6	2269.3	T
40'	3913.4	1208.9	1.28	40'	4695.2	1678.1	1.53	40'	5597.8	2280.6	1.83
50'	3925.6	1215.8	E	50'	4709.2	1686.9	E	50'	5614.2	2292.0	E
69°	3937.9	1222.7	.403	79°	4723.2	1695.8	.558	89°	5630.5	2303.5	.758
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	30° C.	80°	4807.7	1749.9	30° C.	90°	5729.7	2373.3	30° C.
10'	4024.4	1272.1	T	10'	4822.0	1759.0	T	10'	5746.3	2385.1	T
20'	4036.8	1279.3	1.54	20'	4836.2	1768.2	1.84	20'	5763.0	2397.0	2.20
30'	4049.3	1286.5	E	30'	4850.5	1777.4	E	30'	5779.9	2408.9	E
40'	4061.8	1293.6		40'	4864.8	1786.7		40'	5796.7	2420.9	
50'	4074.4	1300.9	.485	50'	4879.2	1796.0	.671	50'	5813.6	2432.9	.910

T = R tan 1/2 I      E = R exsec 1/2 I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	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	5° C.	20'	6992.0	3310.1	5° C.	20'	8388.9	4429.2	5° C.
30'	5881.7	2481.5	T	30'	7012.7	3326.1	T	30'	8415.1	4450.9	T
40'	5898.8	2493.8	.43	40'	7033.6	3342.3	.51	40'	8441.5	4472.7	.62
50'	5916.0	2506.1	E	50'	7054.5	3358.5	E	50'	8468.0	4494.6	E
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
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	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.
10'	6055.4	2606.8	T	10'	7224.7	3491.3	T	10'	8684.0	4674.2	T
20'	6073.1	2619.7		20'	7246.3	3508.2		20'	8711.5	4697.2	
30'	6090.8	2632.6	.86	30'	7268.0	3525.2	.103	30'	8739.2	4720.3	1.25
40'	6108.6	2645.5	E	40'	7289.8	3542.4	E	40'	8767.0	4743.6	E
50'	6126.4	2658.5	.401	50'	7311.7	3559.6	.536	50'	8794.9	4766.9	.721
94°	6144.3	2671.6		104°	7333.6	3576.8		114°	8822.9	4790.4	
10'	6162.2	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	15° C.	50'	7444.6	3664.5	15° C.	50'	8965.0	4909.9	15° C.
95°	6252.8	2751.3	T	105°	7467.0	3682.3	T	115°	8993.8	4934.1	T
10'	6271.1	2764.8	1.30	10'	7489.6	3700.2	1.56	10'	9022.7	4958.6	1.93
20'	6289.4	2778.3	E	20'	7512.2	3718.2	E	20'	9051.7	4983.1	E
30'	6307.9	2792.0		30'	7534.9	3736.2		30'	9080.9	5007.8	
40'	6326.3	2805.6	.604	40'	7557.7	3754.4	.806	40'	9110.3	5032.6	1.09
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	20° C.	30'	7672.9	3846.5	20° C.	30'	9259.0	5158.8	20° C.
40'	6438.4	2889.0	T	40'	7696.3	3865.2	T	40'	9289.2	5184.5	T
50'	6457.3	2903.1	1.45	50'	7719.7	3884.0	1.08	50'	9319.5	5210.3	2.52
97°	6476.2	2917.3	E	107°	7743.2	3902.9	E	117°	9349.9	5236.2	E
10'	6495.2	2931.6	.809	10'	7766.8	3921.9	1.08	10'	9380.5	5262.3	1.46
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	25° C.	20'	7934.6	4057.4	25° C.	20'	9598.9	5449.2	25° C.
30'	6649.6	3047.9	T	30'	7959.0	4077.2	T	30'	9630.7	5476.5	T
40'	6669.2	3062.8	2.18	40'	7983.5	4097.1	2.61	40'	9662.6	5504.0	3.16
50'	6688.8	3077.7	E	50'	8008.0	4117.0	E	50'	9694.7	5531.7	E
99°	6708.6	3092.7	1.02	109°	8032.7	4137.1					

TABLE X.  
MIDDLE ORDINATES OF RAILS  
Length of Rail (feet)

C o /	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch	C o	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch
0-20	17189	.08	.07	.06	.05	.04	.03	8	716.8	1.88	1.64	1.42	1.20	1.01	.84
0-40	8594	.16	.14	.12	.10	.08	.07	9	637.3	2.12	1.84	1.60	1.35	1.14	.94
1-0	5730	.24	.20	.18	.15	.13	.10	10	573.7	2.36	2.05	1.78	1.50	1.27	1.04
1-20	4297	.31	.27	.23	.20	.17	.13	11	521.7	2.59	2.26	1.95	1.65	1.39	1.15
1-40	3438	.39	.34	.29	.25	.21	.17	12	478.3	3.83	2.47	2.15	1.81	1.54	1.26
2-0	2865	.47	.41	.35	.30	.25	.20	13	441.7	3.05	2.66	2.30	1.96	1.66	1.36
2-20	2456	.55	.48	.41	.35	.29	.23	14	410.3	3.30	2.87	2.48	2.10	1.78	1.46
2-40	2149	.63	.55	.47	.40	.33	.27	15	383.1	3.54	3.08	2.68	2.26	1.91	1.57
3-0	1910	.71	.62	.53	.45	.38	.31	16	359.3	3.76	3.28	2.83	2.40	2.04	1.67
3-20	1719	.78	.68	.59	.50	.42	.35	17	338.3	4.00	3.48	3.02	2.57	2.16	1.78
3-40	1563	.86	.75	.65	.55	.46	.38	18	319.6	4.21	3.67	3.18	2.70	2.28	1.87
4-0	1433	.94	.82	.71	.60	.50	.42	19	302.9	4.45	3.89	3.36	2.86	2.41	1.98
4-20	1323	1.02	.89	.77	.65	.55	.45	20	287.9	4.70	4.09	3.55	3.00	2.54	2.09
4-40	1228	1.10	.96	.83	.70	.59	.48	22	262.0	5.16	4.44	3.84	3.30	2.80	2.29
5	1146	1.18	1.03	.89	.75	.63	.52	24	240.5	5.64	4.92	4.20	3.59	3.04	2.50
6	955.3	1.41	1.23	1.06	.90	.76	.62	26	222.3	6.07	5.29	4.58	3.88	3.29	2.70
7	819.0	1.65	1.44	1.24	1.05	.89	.73								

TABLE XI.  
SHORT RADIUS CURVES

Radius Feet	Chord Feet	Central Angle	Deflection Angle	Deflection for 1 Foot
35	10	16-26	8-13	49.3
45	10	12-46	6-23	38.3
50	15	17-16	8-38	34.5
60	15	14-22	7-11	28.8
75	15	11-30	5-45	23.0
100	20	11-30	5-45	17.3
120	20	9-34	4-47	14.3
150	20	7-39	3-49	11.5
190	25	7-32	3-46	9.15
200	25	7-10	3-35	8.6
225	25	6-25	3-12	7.7
240	25	5-58	2-59	7.2
250	25	5-44	2-52	6.9
275	25	5-12	2-36	6.2
288	50	9-58	4-59	6.0
300	50	9-32	4-46	5.7
350	50	8-12	4-06	4.9
376	50	7-40	3-50	4.6
400	50	7-10	3-35	4.3
410	50	7-00	3-30	4.2

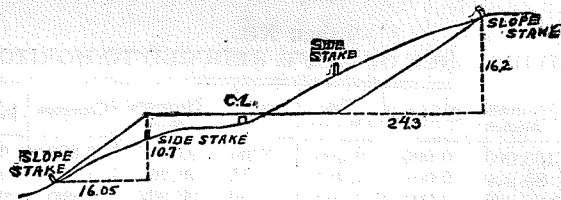
To find length of curve divide angle from P. C. to P. T. by central angle of chord, and multiply by length of chord.

TABLE XII.  
INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

Slope	Horizontal Distance	Correction	Rise Per Foot	Slope	Horizontal Distance	Correction	Rise Per Foot
0°00'	100.000	0.000	0.000	8°00'	99.027	0.973	0.139
15'	99.999	0.001	0.004	15'	98.965	1.035	0.143
30'	99.996	0.004	0.009	30'	98.902	1.098	0.148
45'	99.991	0.009	0.013	45'	98.836	1.164	0.152
1 00	99.985	0.015	0.017	9 00	98.769	1.231	0.156
15	99.976	0.024	0.022	15	98.700	1.300	0.161
30	99.966	0.034	0.026	30	98.629	1.371	0.165
45	99.953	0.047	0.031	45	98.556	1.444	0.169
2 00	99.939	0.061	0.035	10 00	98.481	1.519	0.174
15	99.923	0.077	0.039	15	98.404	1.596	0.178
30	99.905	0.095	0.044	30	98.325	1.675	0.182
45	99.885	0.115	0.048	45	98.245	1.755	0.187
3 00	99.863	0.137	0.052	11 00	98.163	1.837	0.191
15	99.839	0.161	0.057	15	98.079	1.921	0.195
30	99.813	0.187	0.061	30	97.992	2.008	0.199
45	99.786	0.214	0.065	45	97.905	2.095	0.204
4 00	99.756	0.244	0.070	12 00	97.815	2.185	0.208
15	99.725	0.275	0.074	15	97.723	2.277	0.212
30	99.692	0.308	0.078	30	97.630	2.370	0.216
45	99.657	0.343	0.083	45	97.534	2.466	0.221
5 00	99.619	0.381	0.087	13 00	97.437	2.563	0.225
15	99.580	0.420	0.092	15	97.338	2.662	0.229
30	99.540	0.460	0.096	30	97.237	2.763	0.233
45	99.497	0.503	0.100	45	97.134	2.866	0.238
6 00	99.452	0.548	0.105	14 00	97.030	2.970	0.242
15	99.406	0.594	0.109	15	96.923	3.077	0.246
30	99.357	0.643	0.113	30	96.815	3.185	0.250
45	99.307	0.693	0.118	45	96.705	3.295	0.255
7 00	99.255	0.745	0.122	15 00	96.593	3.407	0.259
15	99.200	0.800	0.126	15	96.479	3.521	0.263
30	99.144	0.856	0.131	30	96.363	3.637	0.267
45	99.087	0.913	0.135	45	96.246	3.754	0.271

TABLE XIII.  
MINUTES IN DECIMALS OF A DEGREE.

0 30"	.00833	10' 30"	.17500	20' 30"	.34167	30' 10"	.50833	40' 30"	.67500	50' 10"	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	13 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

SLOPE  $1\frac{1}{2}$  TO 1. ROADWAY OF ANY WIDTH.

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

Computed by L. Leland Locke.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1½

For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	0
1	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7	10.9	1
2	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	2
3	12.5	12.7	12.8	13.0	13.1	13.3	13.4	13.6	13.7	13.9	3
4	14.0	14.2	14.3	14.5	14.6	14.8	14.9	15.1	15.2	15.4	4
5	15.5	15.7	15.8	16.0	16.1	16.3	16.4	16.6	16.7	16.9	5
6	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4	6
7	18.5	18.7	18.8	19.0	19.1	19.3	19.4	19.6	19.7	19.9	7
8	20.0	20.2	20.3	20.5	20.6	20.8	20.9	21.1	21.2	21.4	8
9	21.5	21.7	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	9
10	23.0	23.2	23.3	23.5	23.6	23.8	23.9	24.1	24.2	24.4	10
11	24.5	24.7	24.8	25.0	25.1	25.3	25.4	25.6	25.7	25.9	11
12	26.0	25.2	26.3	26.5	26.6	26.8	26.9	27.1	27.2	27.4	12
13	27.5	27.7	27.8	28.0	28.1	28.3	28.4	28.6	28.7	28.9	13
14	29.0	29.2	29.3	29.5	29.6	29.8	29.9	30.1	30.2	30.4	14
15	30.5	30.7	30.8	31.0	31.1	31.3	31.4	31.6	31.7	31.9	15
16	32.0	32.2	32.3	32.5	32.6	32.8	32.9	33.1	33.2	33.4	16
17	33.5	33.7	33.8	34.0	34.1	34.3	34.4	34.6	34.7	34.9	17
18	35.0	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	18
19	36.5	36.7	36.8	37.0	37.1	37.3	37.4	37.6	37.7	37.9	19
20	38.0	38.2	38.3	38.5	38.6	38.8	38.9	39.1	39.2	39.4	20
21	39.5	39.7	39.8	40.0	40.1	40.3	40.4	40.6	40.7	40.9	21
22	41.0	41.2	41.3	41.5	41.6	41.8	41.9	42.1	42.2	42.4	22
23	42.5	42.7	42.8	43.0	43.1	43.3	43.4	43.6	43.7	43.9	23
24	44.0	44.2	44.3	44.5	44.6	44.8	44.9	45.1	45.2	45.4	24
25	45.5	45.7	45.8	46.0	46.1	46.3	46.4	46.6	46.7	46.9	25
26	47.0	47.2	47.3	47.5	47.6	47.8	47.9	48.1	48.2	48.4	26
27	48.5	48.7	48.8	49.0	49.1	49.3	49.4	49.6	49.7	49.9	27
28	50.0	50.2	50.3	50.5	50.6	50.8	50.9	51.1	51.2	51.4	28
29	51.5	51.7	51.8	52.0	52.1	52.3	52.4	52.6	52.7	52.9	29
30	53.0	53.2	53.3	53.5	53.6	53.8	53.9	54.1	54.2	54.4	30
31	54.5	54.7	54.8	55.0	55.1	55.3	55.4	55.6	55.7	55.9	31
32	56.0	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.2	57.4	32
33	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6	58.7	58.9	33
34	59.0	59.2	59.3	59.5	59.6	59.8	59.9	60.1	60.2	60.4	34
35	60.5	60.7	60.8	61.0	61.1	61.3	61.4	61.6	61.7	61.9	35
36	62.0	62.2	62.3	62.5	62.6	62.8	62.9	63.1	63.2	63.4	36
37	63.5	63.7	63.8	64.0	64.1	64.3	64.4	64.6	64.7	64.9	37
38	65.0	65.2	65.3	65.5	65.6	65.8	65.9	66.1	66.2	66.4	38
39	66.5	66.7	66.8	67.0	67.1	67.3	67.4	67.6	67.7	67.9	39
40	68.0	68.2	68.3	68.5	68.6	68.8	68.9	69.1	69.2	69.4	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For same slopes but other widths of roadbed correct above figures by one-half difference in width of roadbed; thus in example above for 20 ft. roadbed distance will be  $41.9 + (20 - 16) \div 2$  or 2 ft. added to 41.9 = 43.9. For slopes of 1 on 1 see inside of front cover.

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