

21

7-17-00 / 10-14-03 / 2-14-04

21

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

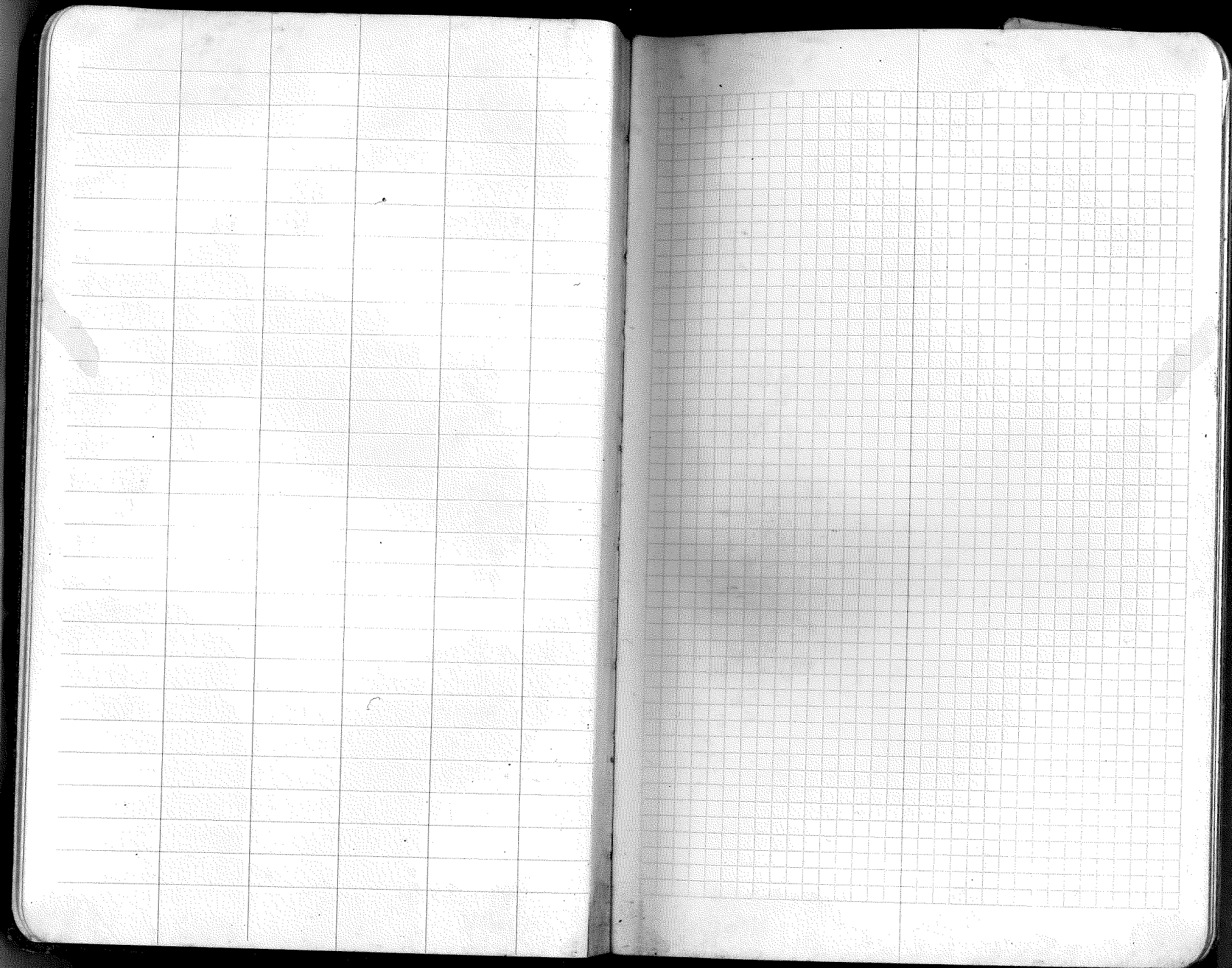
Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 30.6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be $30.6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

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The paper stock of this book is made of a high grade 50% rag paper having a water resisting surface. This book is sewed with Bing Special Enamel Waterproof Thread.

Made in U. S. A.

3+30 1T
9+70 3T
13+90 $\frac{1}{2}$ cor.
16+50 5T.
33+10 7T.
36+40 $\frac{1}{2}$ cor.
39+70 9T.
36+30 11T
39+60 $\frac{1}{2}$ cor.
43+90 13T
49+50 15T.
53+30 5 EC. con



138-25

T 138 N R. 2

6	5	4	3	2	1
32 31	30 29	28 27	26 25	24 23	22 21
7	8	9	10	11	12
18	17	16	15	14	13
12 11	10 9	8 7	6 5	4 3	2 1
19	20	21	22	23	24
30	29	28	27	26	25
		13 14	15 16	17 18	19 20
31	32	33	34	35	36
44 43	42 41	39 38	37 36	35 34	33 32

138-25

W. D. EAST $\frac{14}{23}$ $\frac{23}{14}$ 138-25

21+20 ENTERED NORTH SIDE OF SPRUCE

17+78 CREEK RUN NW-SE

13+67 BARBED FENCE RUNS NS

7+80 CREEK RUNS N.S.

OFFSET 52 FT. N. THEN START EAST FROM CORNER
 0+63 BARBED FENCE RUNS N.S.
 0+00 Started East from $\frac{15}{23}$ 138-25

WEATHER: VERY WINDY E.
 ABOUT 15° BELOW ZERO

DATE: JAN. 18, 1940

Party:

DEER AN - COMP. FISH
 MINK AN - COMP. FISH
 AMPEL - NOSE
 LAKE - NOSE
 YAGER - ANE
 FOUND

Look for:

No B.T. recorded

Only set $\frac{1}{4}$ stake

Correct dist.

Dist. 26+40'

SEVERAL OLD BLAZES
 BUT SWAMPY OF THEM ARE
 AT 20' POSSIBLE
 SWAMP

A 6" balsam with
 blazes on four
 sides.

OPEN FIELD

Magnetic Bearing N 82° 36' E
 Bardon Line

of road & intersection of fence.

Var. 7° 24' and \odot The I.P. is in center
 of road.

52480 NO EVIDENCE

14/13
23/24 138-25

47450 HIGH LINES

YUN. NE-SW

40452

ENTRANCE WEST OF SPRUCE SWAMP

30430

LEFT EAST SIDE OF SPRUCE SWAMP

26440

Continued East

from $\frac{14}{23}$ 138-25
Temp $\frac{4}{11}$

Weather: VERY WINDY
ABOUT 15° BELOW
ZERO

E. Date: JAN. 18, 1940. 2.

Party:

DELMAN - COMP. RICH
MINIERTI - AKE
APREL - NIES
LAW - AKE
YAGER - AKE

Found:

NO EVIDENCE

Look for:

Distance = 5280'
Tom 3" N. 58 E 10 Iks.
" 4" S 68 W 24 Iks.
" 2" N 41 W 25 Iks.
" 2" S 61 E 33 Iks.

~~SPRUCE SWAMP~~

N 62° 36' W

A LINE TO BLANKET
RANDOM LINE

SPRUCE SWAMP

VAR. TREN

2640

2660

NO EVIDENCE

$\frac{13}{24}$

138-25

~~128-25~~

E.M.

2140

ROUTE FOR ON

1140

HIT EAST SIDE OF SPRUCE SWAMP

7766

LEFT SWAMP EASTSIDE

2415

CREEK

YONS N.S.

0400

STARTED

CONTINUED EAST FROM

$\frac{14}{23}$

128-25

Temp. cor. 23/24

E

LOOK FOR:

DATE JAN. 19, 1940

PARTY

DEIMAN - COMP. PACK

MINNERATH - AXE

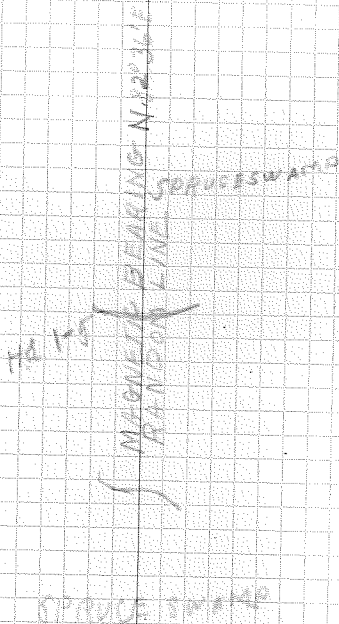
ARDEL - NOTES

LAW - AXE

YAGER - AXE

FOUND:

NO EVIDENCE



VAT. 7°24'

25740 NO EVIDENCE 13/28-25
12:00 HIT WEST SIDE OF SPRUCE SWAMP
OFF BACK 53 FT AND SET 3' CAP POST

28712 LEFT EAST SIDE OF SPRUCE SWAMP

26740 CONTINUED EAST FROM TEMP. 13/24 138-25

138-25

~~128-25~~ E.M.

DATE: JAN. 22, 1945
PARTY:

E.
SPRUCE SWAMP
DEIMAN - COMD CH.
MINVERN - RIF.
APPEL CHAS
YAGER - AVE
BECKER - AVE

LOOK FOR
DISTANCE = 52780

FOUND:
~~NO EVIDENCE~~

MARSH BEARING
MADISON LINE

MIXED WOODS

SPRUCE SWAMP

YAG 724

2410 SET TEMP. COR. IN SWAMP ¹⁵ 138-25

24100 CENTER OF SAME CREEK

21800 CROSSED CENTER OF 30' CREEK

1940 ENTERED WILLOW SWAMP

1384 LEFT MEAD OY - ENTERED ASPEN
12150 HIT MEADOW

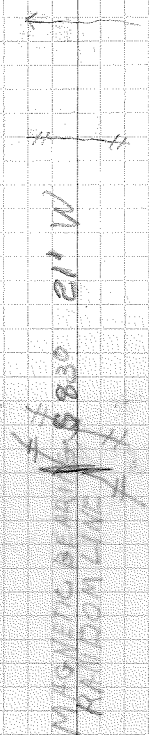
Aspen Timber + Birch

2400 STARTED WEST FROM ¹⁵ 138-25

LOOK FOR:
NO TREES.
POST IN MEADOW
WITH PILE OF STONE

PARTY 23
DATE: JAN 24
PARTIAL
DARKEN - ONE
MINUTE - PICK
APPEL MATHO
LAW - ARE

FOUND: NO EVIDENCE



VARY 6'39"

center of road + inter
of fence. Found
showed in location

5

~~14/15~~ ~~15/16~~ 138-25
~~21/22~~ ~~22/23~~

Sec. cor. is 15.6' South.
← former road Sec. cor. in road at fence cor.
49+44 LEFT ASPEN - CROSSED ROAD.
49+15 set temp. stake.

44+00 LEFT JACK PINE ENTERED ASPEN (REPRG)

33+77 Logging road
33+60 Set approx. W 1/4 stake.

36+60 left swamp - hit Jack Pine pole timber.

27+90 center of same creek - 25'-30' wide

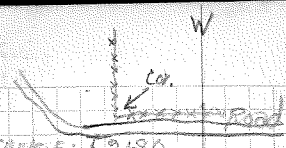
38+40 CONTINUED WEST FROM ~~15/22~~ 138-25

6.

DATE: JAN 25
PARTY:
DELMAN - COMP
HOPPEL - NOTE
LAV - ABE
MINNERATH - ABE

LOOK FOR:
DISTANCE: 32+80
Y PINE 7" N. 95° E 16 INCH.
Y PINE 7" N. 97° W 21 INCH.
Y PINE 5" S. 65° E 12 INCH.
Y PINE 8" S. 44° W 18 INCH.

FOUND:
NO EVIDENCE
except what
farmer told us
about the corner
of the fence and
by the road.



PJ-5-9

VAR. 6039'

23 Set Temp. & cor. stake. ~~21~~ 31-15

25+20 ENTERED BLACK SPRUCE

22+68 LEFT ASPEN REPROD. ENTERED SWAMP

21+63 CROSSED N. + S. DITCH

20+62 CROSSED FENCE

17+26 LEFT SWAMP, ENTERED ASPEN REPR.

14+40 Mre

8+00 ENTERED HAWWOOD SWAMP

8+00 Line is 156' No. of the cor. s.m.
STARTED WEST FROM $\frac{16}{21} \frac{15}{22} \frac{12}{11} \frac{6}{2}$ 35-25

DATE: JAN 25 7.

PARTY:
DELMAN - COND
APPEL - NOTS
LAV - CHAIR
MINNERATH - PICKETS
GARDNER - AVE

LOOK FOR:
ASPEN 10" N.W. E 1/4 KRS.
W. BIRCH 6' S.W. 1/4 KRS.

FOUND:
NO EVIDENCE
IRON PIPE 298'
Sd. + 342' West.
This I.P. near
fence - See
following page.



VAR. 726

Continued same line West
as on pages 5+6.

46+22 Set sec. cor. - Temp. stop. 17 16 138-25
53+20 Crossed small trail. 20/23
23+28 OFFSET 293' S. 20/21

27+00 LEFT ASPEN BEARBOD. ENTERED HARDWOOD

29+32 Found Iron Pipe 1/2 cor. 212 ft. south.
29+00 ENTERED ASPEN BEARBOD.

28+00 LEFT BLACK SPRUCE

26+40 CONTINUED WEST FROM 16 135-25

DATE JAN. 25 8.

PARTY:
DEIMEN - CAMP
APPEL - NOTES
LAU - CHAIN
MINNERATH - PICKET
GARDEMER - AXE
FOUND:
NO EVIDENCE

LOOK FOR
DISTANCE: 50 FT
ASPEN 9" E 18 IKS
PICKET N 1/4 E 18 IKS
ASPEN 8 1/4 W 14 IKS
PICKET 5" N 1/4 W 13 IKS

MAGNETIC BEARING S 33° 21' W
HARDWOOD LINE

I.P. is along a fence line. The I.P. is 293' So. of line.

VAR. 7° 36'

26+40 set Temp by car stake.

~~26+40~~ LEA Var 40

E.M. 138-25
17 X ~~178~~ 20 X E.M.

7+45 CROSSED SMALL STREAM

6+80 LEFT ASPEN REPROD. ENTERED HARDWOOD SWAMP

~~6+22 SET BOX FOR LONG MILE~~

~~53+80 CROSSED SMALL TRAIL~~

0+00
~~53+80~~

STARTED WEST FROM TEMP ^{car.} 17/42 130-35
30127

DATE: JAN, 27 9

PARTY:
DELMAN - CAMP
FROEL - NOTES
LAD - CAPTAIN
MUNNETH - PICKETS
GARDNER - FIRE

LOOK FOR:
NO BT. RECORDED

FOUND:
NO EVIDENCE

MAPS SET BEARING 53° 21' N
HARDWOOD SWAMP

VAR. 7° 3'

~~36+0~~

52+80

VAR. 103

Set. temp. cor. stake

18/17
19/20



E.M. 2-19-40

138-25

50+55 ENTERED CEDAR SWAMP

41+45 CROSSED NARROW TRAIL

~~41+45 CROSSED NARROW TRAIL~~

~~41+45 LEFT CEDAR SWAMP ENTERED PINE WOOD
W/ HAVEN DENSE GRASS~~

33+30 ENTERED P.

26+45 ^{VAR. 103} CONTINUED WEST FROM ^{TOP} 17/20 135-25

DATE: 9 MAY 29, 1940

PARTY: 10

DEIMER - COMP.

APPLE - NOTES

LEU - CHAIN

MINNERTH - PICKETS

GARDNER - AXE

LOOK FOR

DISTANCE: 1380

SPRUCE 7 INS. S 36° E 33 INS.

TAM. 13 INS. S 35° W 12 INS.

TAM. 3 INS. N 61° E 32 INS.

W. SPRUCE 10 INS. N 13° W 15 INS.

FOUND:

NO EVIDENCE

+

MAGNETIC BEARING S 83° 21' N
RANDOM LINE

+

VAR. 103'

26+40 set approx. 1/4 stake

138-25

~~138-25~~

~~26+40 set approx. 1/4 stake~~

18+70 LEFT LOWLAND AND HARDWOOD ENTERED
SMALL EVERGREEN AND SPRUCE

~~18+70 LEFT LOWLAND AND HARDWOOD ENTERED
SMALL EVERGREEN AND SPRUCE~~

10+00 LEFT ASPEN REPROD. ENTERED HARDWOOD

5+00 CROSSED OLD TRAIL
3+00 LEFT HARDWOOD ENTERED ASPEN REPROD.

~~3+00 LEFT HARDWOOD ENTERED ASPEN REPROD.~~

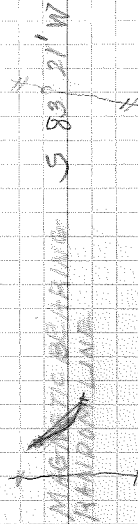
0+00 STARTED WEST FROM RE^{MARK} 138-25 138-25

DATE: JAN, 30, 1949

PARTY
DEYMAN - COMP
APPEL - NOTES
LAW - CHAIN
MINWORTH - TICKETS
GARDNER - ME

LOOK FOR
NO ST. RECORDED

FOUND
No evidence



VAN, 703

26+40 Set Approx. $\frac{1}{4}$ stake $\frac{28}{33}$ 138-25

23+10 ENTERED TAMARACK SWAMP

20+00 ENTERED ASPEN REPROD. WENT DOWN SMALL
HILL INTO SWAMP

17+55 LEFT ASPEN ENTERED CLEAR SPOT

13+00 LEFT SWAMP ENTERED ASPENS

5+50 ENTERED WILLOW SWAMP AND PASSED
FENCE

0+00 STARTED EAST FROM W.P. IN
CENTER OF ROAD B.T. S.E. OF I.P. $\frac{24}{32}$
I.P. IS IN ROAD.

DATE: Feb 1.

PARTY:

13.

MINNEAPOLIS - COMP - PICK.
APPEL - NOTES
LAW - CHAIN
GARDENER - AXE

LOOK FOR:
TAM 12" S. 25 W. 21 LKS.
TAM 10" N. 25 W. 13 LKS.

E

FOUND TREE
BLAZED ON FOUR
SIDES 41' SE-SW
O.C. 1/4 30'

W

N

S

MARKING BEARING
ROAD LINE

N 85° E

W

W.P.
D.B.
D.B.

Hay Stack

Road

B.T.

North

V.A.R. 7'

52+80 Set, Temp. sec. cor. $\frac{28}{33} \mid \frac{27}{34}$ 138-25

49+47 RECROSSED DITCH 3rd TIME

44+43 RECROSSED DITCH 2nd TIME

42+80 CROSSED DITCH WITH OCCASIONAL WILLOWS
GROWING ON BANKS

38+30 ENTERED
LEFT ASPEN/OLD LAKE BOTTOM

36+15 LEFT CEDAR ENTERED ASPEN

32+40 LEFT ASPEN ENTERED CEDAR GROVE

30+45 LEFT TAMARACK ENTERED ASPEN

26+40 CONTINUED EAST FROM $\frac{28}{33}$ TAMP. 138-25

LOOK FOR:

TAM 8" N. 15 E 42 LKS.
TAM 7" N. 46 W 48 LKS.
TAM 7" S. 45 E 38 LKS.
TAM 9" S. 10 W 23 LKS.

E

DATE: 7/4/1,
PARTY: 14
MINNERETH - COMP. PICK.
APPEL - NOTES
LAW - CHAIN
GARDNER - AXE

FOUND:

NO EVIDENCE

Trees once here
but now SA and
other swamp brush
& herbs.



26+40 Set trap $\frac{1}{4}$ cor. $\frac{27}{34}$ 138-25

Entered spr. swamp

21+64 LEFT ASH + ASPEN ENT. BALSOM

17+26 ~~LEFT~~ WILLOWS ENT. ASH + ASPEN

15+~~20~~¹⁰ SMALL ROAD

12+42 ~~LEFT~~ ASPEN + BALSOM ENT. WILLOWS
Willows & Alders present.

5+19 LEFT WILLOWS ENT. ASPEN + BALSOM

1+00 LEFT OLD LAKE BOTTOM ENT. WILLOWS

0+00 STARTED EAST FROM TOP $\frac{28}{32} | \frac{27}{34}$ 138-25

DATE:

PARTY: 13

MINNERETH - COMP. POK
LAW - NOTES
JOHNSTON - CHAIN
HESSE - AXE
DROKER - AXE

FOUND:

No
EVIDENCE of
original cor.
Found an old sec.
line cut and
trees blazed.
This line was 67'
No. of our random
line.

LOOK FOR:
SPRUCE 1" NIS E DILKS.
TAN 4" S 12 W 18 LKS.

+

ROAD

+

+

+

VAR. 6+43

29 | 26
32 | 35 138-25

29+80 set temp sec. cor.

50+23⁰⁰ LEFT DALSON ENT. ASPEN

~~43+27 LEFT WILLOW ENT. DALSON~~
43+59 LEFT WILLOW ENT. DALSON
& SPRUCE.

~~38+15 CROSSED CREEK~~
38+00 CROSSED CREEK

36+30 Left spr., Bal., Ten. SWAMP
~~35+00 LEFT DALSON ENT. WILLOW~~

26+40 CONTINUED EAST FROM $\frac{29}{34}$

old blazed trees
on TEMP. cor

DATE: 16
PARTY:

LOOK FOR:

W. BIRCH 10" N. 88° E. 17 LKS. #
BLK. HSH 3" N. 49° W. 33 LKS.
W. MAPLE 3" S. 60° W. 52 LKS.
W. MAPLE 5" S. 22° E. 70 LKS.

MINNERETH-COMP-PICK
LAW - MOTES
JOHNSTON - CHAIN
HESSLE - AXE
DARKEY - AXE

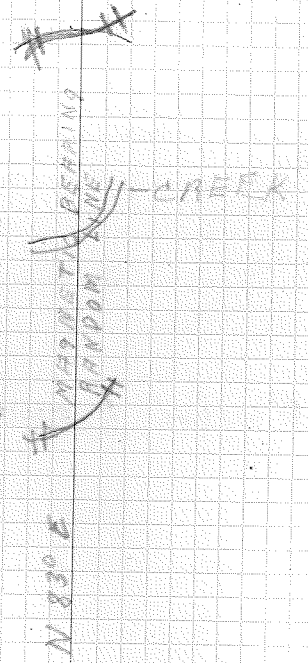
FOUND:
NO EVIDENCE

100 FT. E. FOUND a
BLAZED TREE
SOME ONE APPROX. SEC. COR.

Balsam
Spr.
MIT

Open

M9r
M9c



26+40 Set temp $\frac{1}{4}$ cor. $\frac{26}{35}$ 138-25
This take is just No. of old barn
by old Mill.
22+97, SMALL ROAD
23+85 LEFT BALSOM ENT. ASPEN

1
17+90 LEFT ASPEN ENT. BALSOM

9+00 CROSSED HIGHLINE

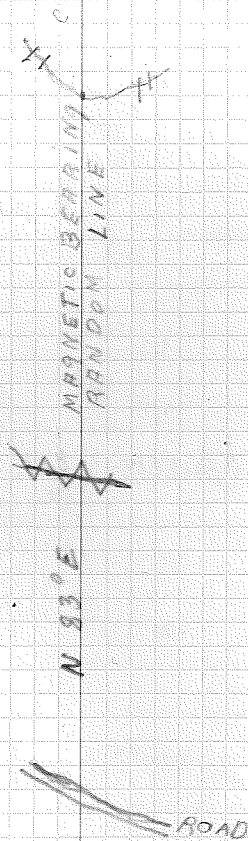
CROSSED
2+08 \nearrow SMALL LOGGING ROAD

0+00 Started East from temp $\frac{27}{34} \frac{26}{35}$ 138-25

LOOK FOR:
W. BIRCH 6" IN 7' E 21 KRS.
W. BIRCH 7" IN 11' E 33 KRS.

DATE: 17
PARTY:
MINNERETH - COMP. PICK
LAU - NOTES
MEELDERG - CHAIN
HESSE - AXE
BECKER - AXE

FOUND:
No
EVIDENCE



52+80 307 Temp. Sec. cor.

$\frac{26}{33} \frac{25}{36}$

138-25

35+86 LEFT ASPEN ENT. BALSON.
3

26+40 cont'd East from top

$\frac{26}{35}$

138-25

DATE:
PARTY:

18,

E
MINNEBETH-COMP-PICK
LAW - NOTES
NEFLBERG-CHAIN
HEESE-AXE
BECKER-AXE

FOUND:

No

EVIDENCE

MAGNETIC BEARING
RANDOM LINE
N 53° E

26+40 SET ~~Temp.~~ $\frac{1}{7}$ COV $\frac{25}{36}$ 138-25

5+65 LEFT WILLOWS ENT, ASPEN

3+95 LEFT BALSAM ENT, ASPEN WILLOW

0+10 started Ent from temp. $\frac{26}{31} | \frac{25}{36}$ 138-25

LOOK FOR:

~~TAM 4 INS. N 50 E 19 IKS.~~

~~TAM 3 INS. S 74 E 22 IKS.~~

~~TAM 5 INS. S 32 W 51 IKS.~~

~~TAM 3 INS. N 61 W 41 IKS.~~

ASPEN 13' N 25 E 10 IKS

ASPEN 10' S 80 W 20 IKS

DATE
PARTY

BECKER - COMP PICK
LAU - NOTES
PROCKNOW - CHAIN
DERMAN - AXE
GARDNER - AXE

FOUND

No
EVIDENCE

Magnetic Bearing N 53°
Random line

52180 IN THE LAKE

$\frac{25}{36}$ 138-25

Temp. M.C.
SET ~~S.E.~~ COR.

48776² ENT. LAKE - Set Temp M.C.

45465 LEFT BALSONENT.

42463 LEFT ASPEN ENT. BALSON

26740

Continued East from $\frac{25}{36}$ 138-25

DATE 20
PARTY E

LOOK FOR

W PINE 13" N33 W 20 LBS
W PINE 10" 9.94 W 17 LBS

BECKER - COMP - PICK
LAD - NOTES
PROCKNOW - CHAIN
DEIMAN - AXE
GARDNER - AXE

LAKE

FOUND

NO
EVIDENCE

Cor. is in the
lake.

H H

H H

N 83° E

Magnetic Bearing
Random line

26+40 Set Temp. stake $\frac{1}{12}$ 138-25

18+00 LEFT CEDAR SWAMP ENTERED ASPEN REFUGE

8+85 ENTERED CEDAR SWAMP

0+00 Started West from intersection of game
refuge line (see line map) & road. $\frac{1}{12}$ 138-25

DATE: FEB. 5 21
PART:
MINNERTH-COMP+PICK
APPEL NOTES
LAW-CHAIN
GARDNER-ARE

Look for:

Found: NO EVIDENCE

Chain along the road which is 500' line.

Magnetic Bearing S. 83° W.

YAT. 7°

Brushed line

52+80 At junction of a
country road where it turns so.
+ a trail leading no.

$\frac{2}{11}$ 138-25

36+00 CROSSED SMALL WINDY ROAD

31+50 CROSSED HIGHLINE

26+40 CONTINUED WEST
from Temp.

$\frac{1}{14}$ 138-25

Look For:

DATE: FEB 5, 22

PARTY:
MILNEARTH-CAMP-PICK
HAPPEL-NOTES
LOU-CROWN
GARDNER-ARE

FOUND: NO EVIDENCE
Except a camp
in the road.

Chamberlain's Along The Road vehicle's see line
MAGNETIC DENARY S. 830 W.

VAR 7°

26+40 Set temp stake. $\frac{2}{11}$ 138-25
in lake.

24+00 STARTED ACROSS LAKE
Little Pine

20+00 LEFT HARRWOODS STARTED DOWN SLOPE
TOWARD LAKE

0+00 STARTED WEST FROM INTERSECTION OF $\frac{2}{11}$
ROAD AND TRUCK TRAIL $\frac{1}{12}$

DATE: FEB 6 23

PARTY:
MINNERETH - COMP - PICK
HAPPEL - NOTES
LAW - CHAIN
GARDNER - AXE

FOUND:
NO EVIDENCE

LOOK FOR:



Magnetic bearing 82° 45' W
using old game line - checked variation.

138-25

52+80

SET SEC. COX. ON LAKE

$\frac{3}{2}$
10/11 138-25

LOOK FOR
NO BT. RECORDED

DATE: FEB 5 24
PARTY:
MINNERETH - COMP - PICK.
APPEL - NOTES
LAW - CHAIN
GARDNER - TAKE

FOUND NO EVIDENCE

Cox. in Lake.

Magnetic Bearing S 82° 45' W
Barlow Link

26+40

CONTINUED WEST ACROSS LAKE

$\frac{2}{11}$ 138-25

52+80 set temp. sec. cor.

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

138-25

49+30 LEFT TAM. ENTERED ASPEN RAPID.

31+00 LEFT ASPEN ENTERED TAM. SWAMP

26+40 CONTINUED WEST FROM

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

138-25

DATE: FEB. 9, 26.

PARTY:

MINDRETH - COMP. PICK

KOPPEL - NOTES

LAU - CHAIN

GARDNER - AXE

HEESE - AXE

LOOK FOR:

W. PINE 8" N 45° E 28 LKS

J. PINE 8" N 45° W 22 LKS

TAM. 8" S 20° E 22 LKS

TAM. 7" S 18° W 49 LKS

FOUND: NO EVIDENCE

MAGNETIC BEARING 8 210 45 W
RANDOM LOC.

Y.R.R. 70451

26+40 Sat temp. $\frac{1}{4}$ cor. stake $\frac{4}{9}$ 135-25

19+26 LEFT WILLOWS ENT. ASPEN + SPRUCE

14+60 CROSSED DITCH

~~8+30~~ ENT. WILLOWS

~~8+30~~ ENT. WILLOWS

8+30 ENT. WILLOWS LEFT CLEARING

2+50 LEFT ASPEN ENT. LOW CLEAR SPOT

0+00 STARTED WEST FROM $\frac{4}{10}$

DATE: Feb. 7, 27.

PARTY:
MINNERTH - CAMP - PICK.
HALL - NOTES
LAD - CHAIN
GARDNER - AXE
HESSE - ALE

LOOK FOR:

ASPEN 7" S 70 W 20 LKS
ASPEN 6" N 10 E 40 LKS

FOUND
NO EVIDENCE

H—H

MAGNETIC BEARING S 82 W

S 82 W
Random 1/4

VAR. 70

32+80 Set temp. sec. cor.

$\frac{5}{8} \frac{14}{9}$

138-25

48+80 LEFT, SPRUCE ENT. ASPEN

41+26 CROSSED DITCH

35+65 LEFT ASPEN ENT. SPRUCE

31+00 LEFT SPRUCE ENT. ASPEN

~~30+00 LEFT SPRUCE ENT. ASPEN~~

28+20 LEFT ASPEN ENT. SPRUCE

26+40 CONTINUED WEST FROM ~~27+1~~ $\frac{4}{9}$ 136-25

DATE: Feb. 9, 28.

PARTY:

MINNACOTTI - CAMP
APPLE - KETAS
LAD - CHAIN
CARPENTER - GLE
LESSE - GLE

LOOK FOR
W. DITCH 10" N52 E 7 LKS
W. DITCH 8" N30 W 29 LKS
W. DITCH 8" S32 E 46 LKS
W. DITCH 6" S46 W 22 LKS

FOUND: NO EVIDENCE

MAGNETIC BEARING S 82° 45' N
Random 148°

VAR 7°

26+40 Set temp. $\frac{1}{4}$ cor.

$\frac{5}{8}$ 136-25

25+50 LEFT WILLOW + BIRCH ENT. ASPEN

~~19+50 LEFT ASPEN + SPRUCE ENT. WILLOW + BIRCH~~

19+50 LEFT ASPEN + SPRUCE ENT. WILLOW + BIRCH

8+56 ENT. ASPEN + SPRUCE

8+00 STARTED WEST FROM $\frac{5}{8}$

136-25

DATE: FEB 13 1940

PARTY:

MINNERETH - COMP. PICK

LAU - NOTES

JOHNSTON - CHAIN

HASSE - AXE

BECKER - AXE

FOUND:

NO EVIDENCE

LOOK FOR:

Y. PINE 4" N20 W20 LKS
ASPEN 2" S22 E21 LKS

W



582° 15' W ← MAGNETIC BEARING 582° 15'
MONTAN # 1120

VHR. 7°

52+80 set approx. sec. cor. $\frac{6}{5}$ 138-25
Stake. $\frac{7}{8}$

48+00 ENT. ASPEN + WILLOWS + BIRCH

38+55 LEFT LOW CLEAR SPOT ENT. ASPEN

33+27 ENT. LOW CLEAR SPOT LEFT ASPEN

26+40 CONTINUED WEST FROM $\frac{5}{8}$

DATE FEB 13 1940
PARTY 30.

MINNERETH-CAMP-PICK
LAW - NOTES
JOHNSTON - CHAIN
HASSE - AXE
BECKER - AXE

LOOK FOR:

ASPEN 7" N8 E 11 LKS
W. BIRCH 8" S77 E 22 LKS
W. BIRCH 5" S18 W 8 LKS
MAPLE 7" N29 W 10 LKS

FOUND:
No EVIDENCE
No ORIGINAL CRY.

MAGNETIC RANGE S 80° W
RANGE
#

VAR. 70°

22480 SET. TEMP. APPROX SEC. COR. STAKE $\frac{6}{7}$ 138-25

30700 ENT. ASPEN + BIRCH + WILLOWS

26440 CONTINUED WEST FROM $\frac{6}{7}$ 138-25

DATE: Feb 14 - 1940
PARTY: 32

MINNERETH - COMP - PICK
LAU - NOTES
JOHNSTON - CHAIN
HASSE - AXE
BECKER - AXE
NORTON - AXE

FOUND
No ORIGINAL
EVIDENCE

LOOK FOR
W. BIRCH 9" 118 E35 LKS
W. BIRCH 6" 547 E34 LKS
W. BIRCH 8" 546 W30 LKS
BLK. OAK 6" 1122 W12 LKS

MAGNETIC BARRELING SYSTEM
Rounds Line

5 20° 45' W
#

VAR. 7°

26+40 SET ~~OR.~~ ^{Approx.} $\frac{1}{4}$ COR.

$\frac{33}{4}$ 138-25

9+10 LEFT LOW CLEAR SPOT ENT. ASPEN

5+99 LEFT SPRUCE ENT CLEAR LOW SPOT

ENT. SPRUCE

0 + 00 STARTED EAST FROM $\frac{32}{5}$ $\frac{33}{4}$ - 138 25

DATE 27-1940

33

PARTY:
DEIMIN - COMP - PICK
LAW - NOTES
E ROIGER - CHAIN
DECKER - AXE
FRACKNOW - AXE
GARDNER - AXE

LOOK FOR:

HORWOOD 5' N30E 271Ks
LYNN 10' S53W 561Ks.

FOUND
NO ORIGINAL
EVIDENCE

Magnetic Bearing Line
Random
N. 53° E

The ori. B.T. is N 50° E - Tam.
Tree with TAG on it is N 41° E - Tam.

Started East from ^{old}
old wood corner post ^{BT}
square + scribed.

50° OLD BT. N.
40° YELLOW TAG

52+80 SET APPROX COA

$\frac{33}{4} \frac{34}{3}$

138-25

29+00 LEFT ASPEN ENT. LAKE + Marsh

26+40 Contd. east on same line from $\frac{33}{3}$ 138-25
137-25

DATE. 27/9/40

34

PARTY:

DEIMAN - COMP-PICK
E LAGU - NOTES
ROIGER - CHAIN
BECKER - AXE
PROCKNOW - AXE
SARDNER - AXE

Look for:

Tan. 5, N52W, 25 IKS.

Tan 5, N 22 $\frac{1}{2}$ E, 24 IKS.

Tan. 5, S 24 E, 92 IKS.

Tan. 5, S 65 W, 75 IKS.

FOUND:

NO ORIGINAL
EVIDENCE

Appeared as Tan

once were here

but now is a

marsh and no trees.

Magnetic Bearing N 83° E

Random Line

X

24+40 SET ^{APPROX. 1/2} COR.

$\frac{34}{3}$ 138-25

24+96 LEFT TAM ENT ASPEN

18+96 LEFT ASPEN + BALDOM ENT. TAM.

12+50 ENT ASPEN + BALDOM

0+10 LEFT LAKE ENT. ASPEN
Marsh

0+00 Continued east on same line ^{from} 33+30 138-25

DATE: 27-1940

35

PARTY:

E DEIMAN - COMP - PICK

LAU - NOTES

ROIGER - CHAIN

~~H~~ BECKER - AXE

PROCKNOW - AXE

SADNER - AXE

Look for:

Lynx 8" S50W, 26 IKS.

W. Birch 8" 22 $\frac{1}{2}$ E, 34 IKS.

FOUND

NO ORIGINAL

EVIDENCE.

There is an old
cut line 25' S.

~~H~~ ~~H~~ of our line.

Magnetic Bearing N 83° E
Random Line

52+20 SET APPROX SEC. COR $\frac{34}{35}$ 138-25

47+27 SMALL LAKE ENTASPEN

39+74 SMALL LAKE LEFT ASPEN

31+01 HIGH LINE

27+75 SMALL ROAD

26+40 continued east from $\frac{34}{3}$ 138-25
same line.

DATE FEB 29-1940 36

PARTY

BECKER - COMP - PICK
LAU - NOTES
ROISER - CHAIN
DELMAN - AXE
BARDNER - AXE
YAGER - AXE

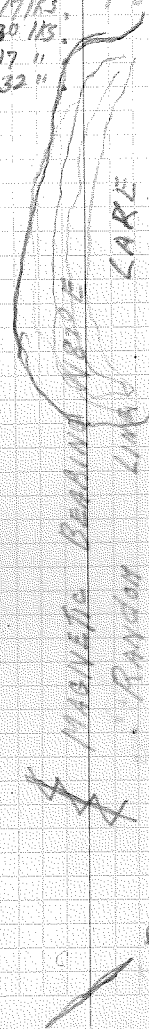
LOOK FOR:

XAN 6" N 32 E 13 IK3
4" N 52 W 16
2" S 32 E 16
2" S 34 W 52

Soft Moxie 8" N 62 E 17 IK3
" 8" N 10 W 30 IK3
" 8" S 62 W 17 "
W. Birch 12" S 98 E 32 "

FOUND

NO ORIGINAL
EVIDENCE



26740 SET APPROX $\frac{1}{4}$ COR

$\frac{35}{2}$ 137-225

LOOK FOR

TAMMWOOD N 30 E 32 1K3
LYNN N 10 E 55 W 36 W

W BIRCH N 23 E 31 1K3
W BIRCH 34 N E 32 1K3

DATE FEB 29 - 1940

37

PARTY:
BECKER - COMP - PICK
LAU - NOTES
ROIBER - CHAIN
DEIMAN - AXE
GARDNER - AXE
YAGER - AXE

FOUND

NO ORIGINAL
EVIDENCE

Magnetic Profile N 83 E

BANDS LINE

1 + 38 CROSSED OLD LINE N+S

0 + 00

CONTINUED EAST FROM TEMP.

3405 138-25
312 137-25

52+80 SEC. CUT IN LAKE

51+33 SET APPROX M.C. + ENT. LAKE

LEFT
ASPEN

33/36
2/1

138-25

DATE: FEB 29 - 1940

38

PARTY:

BECKER - COMP - PICK
LAU - NOTES
ROIGER - CHAIN
DEIMAN - AXE
GARDNER - AXE
YAGER - AXE

LOOK FOR

LAKE

M.C. COR.

ASPEN 10' N 57° W 84'

ASPEN 6' N 84 3/4° W 84'

FOUND

NO ORIGINAL

EVIDENCE

Marsilio Peakline 1880'

Random LINE

26+40

CONTINUED EAST FROM

TRAMP

25/36
2

138-25

25+40 SET APPROX 1/4 COR

35
1

23+10 LEFT ASPEN ENT TAM

9+44 LEFT LAKE ENT ASPEN

0100

CONTINUED EAST FROM

707 35/36
37

135-25

DATE FEB-27-1940

31

PARTY:
BECKER - COMP-PICK
LAU - NOTES
ROIGER - CHAIN
DEIMAN - AXE
GARDNER - AXE
YASER - AXE

LOOK FOR
ASPEN 8" N 41 E 12 IKS
W PIRCH 6" S 36 W 34 IKS

~~FOUND~~
NO ORIGINAL
EVIDENCE

~~MANAGED DEADLINE TRIP OF~~
RANDOM LINE
LAKE

52+80 set Aprox Temp sec. cor. ^{39.31}/₁₆

49+00 Left spruce swamp - enter
Hardwood and birch

41+53 offset 43 feet to the ^{North}~~old~~ line
to get on old line

37+23 Enter spruce swamp

31+30 Left spruce swamp
Aspen

29+70 Enter spruce swamp
Also set

26+40 CONTINUED EAST from ^{Approx} ~~1/2~~ cor. ³⁶/₁

DATE: March 6 1940
E PARTY:
Becker chainman
Diemen AXE
Raiger chainman

a N45 cut line →
a cut line →
E & W.

FOUND
No evidence
except cut lines
The intersection of
the two cut lines
is 10' No. & 100' E.

43 feet
41+53

Maple Beech N 85° E
Hardwood line

26+60 set a stake west of road.
26+40 SET APPROX $\frac{1}{4}$ COR. $\frac{32}{138-25}$
25+92 Center of road is at 2640'
~~SET APPROX $\frac{1}{4}$ COR.~~

15+02 LEFT SPRUCE ENT. ASPEN + WILLOWS

10+26 SMALL ROAD

1+54 STARTED IN SPRUCE SMALL ROAD
0+00 started west from sec. $\frac{32}{33}$ 138-25
Good cor. post.

Date: MARCH 7 - 1940 41
Party:

Look for:
W. PINE 12" N40E 18 IKS
" 12" S 30E 30 IKS
Dist. 2640'

BECKER - COMP - PICK
LAU - NOTES
ROIGER - CHAIN
DEIMAN - AXE
ANDERSON - AXE

Found
No good evidence.

S 83° W Magnetic Bearing # 4
Barbara L. H. H.

Cr. notes called for

Tan 6 N 58° E 13 IKS
" 4 N 59° W 12 "
" 7 S 22° E 42 "
" 6 S 34° W 52 "

145° ROADS

0+71
see page 33.

52+90
52+50

SET APPROX
Found ~~at~~ cut
intersection

Sec. cor.

31 | 32

138-25

lines 30' 10' So. and W. 4 E

Found the stake 182' So. of our
random line.

32+32

SMALL ROAD

20+40

Cont'd ↓ west
same line from Temp.

32

138-25

Aspen stake

cut
line

Date: MARCH-4-1940 42

Party:

cut line

→ 182 ←

DECKER-COMP-PICK

LAW - NOTES

BOIGER-CHAIN

DEIMAN-AXE

ANDERSON-AXE

Look for:

W. Pine-10" N56 E 97 1/2

No stand, 1000 ft 5.31

W. Pine 10" S33 1/2 E 91 1/2

" 6" S67 W 48 1/2

Dist. 5280'

Found:

No evidence of ori. sur.

Found an approx. cor.

stake - aspen 2"

~~square~~ on all sides.

blazed

The stake was 182'

So. of our post

set in at 5280'

We set an approx.

stake at 5280'

MURPHY SPRING SEEN
Random line

26+40 SET APPROX 1/4 COR.

31

138-25

20+40 LEFT TAM ENT ASPEN

9+40 LEFT ASPEN ENT. TAM

0+00 cont'd. west from our approx. cor. stand

31

138-25

DATE MARCH 5-1940

PARTY

BECKER - COMP-PRK

LAW - NOTES

BOISER - CHAIN

DEWALL - AXE

ANDERSON - AXE

Look for:

W. Pine 6" N 22 E 19 1/2 Ks

W. Birch 6" S 30 W 42 1/2 Ks

Found:

No. corner post or
B.T.

~~||||~~
MAGNETIC BEARING S 83° W
RANGE LINE

138-25 36/31 = 138-25
52+80 SET APPROX COR 138-25 1/6 = 137-25

50+51 LEFT WILLOWS ENT. JACK PINE

~~49+50 Found a line 10' No. which tests
from swamp to a line going to N.S.~~

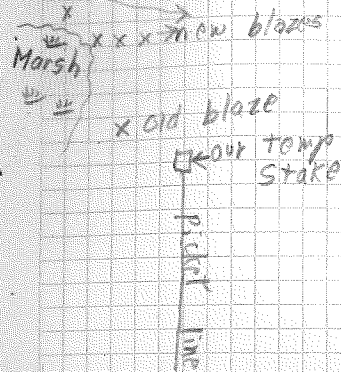
43+71 LEFT JACK PINE ENT. WILLOWS

~~42+72 A line 43' No. is a 1/2 line offset~~

38+75 LEFT ASPEN ENT. JACK PINE

36+70 Continued west on same line
from temp. 31/30 138-25

DATE: MARCH 5, 1940 44
PARTY:
DECKER - COMP - PICK
LAU - NOTES
GOICER - CHAIN
BEJMAN - AXE
ANDERSON - AXE



Found:
No corner post of B.
Found scattering of
new blazes and
one old blaze.

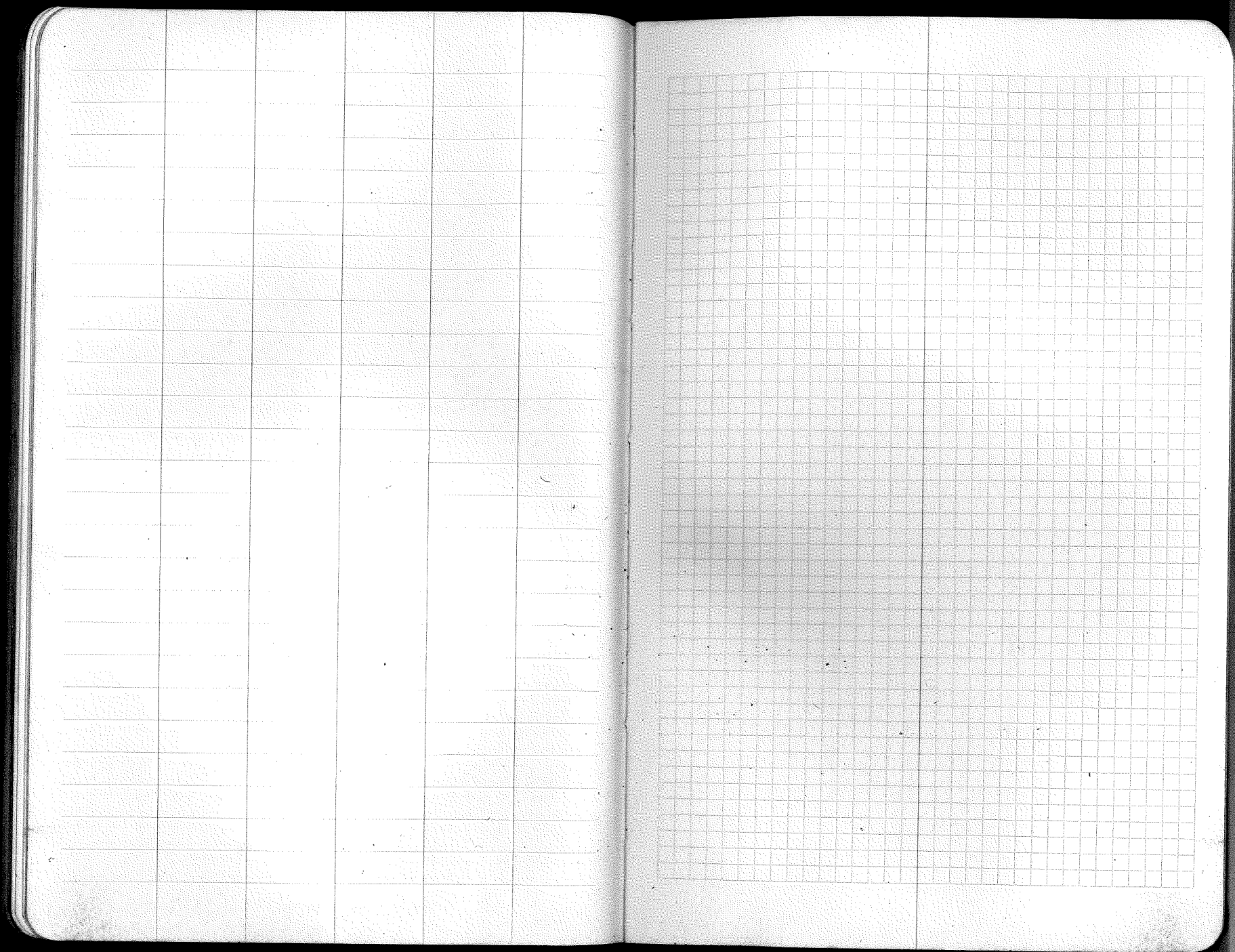
The old blaze - N45
faces - was about 100'
SW of our temp.

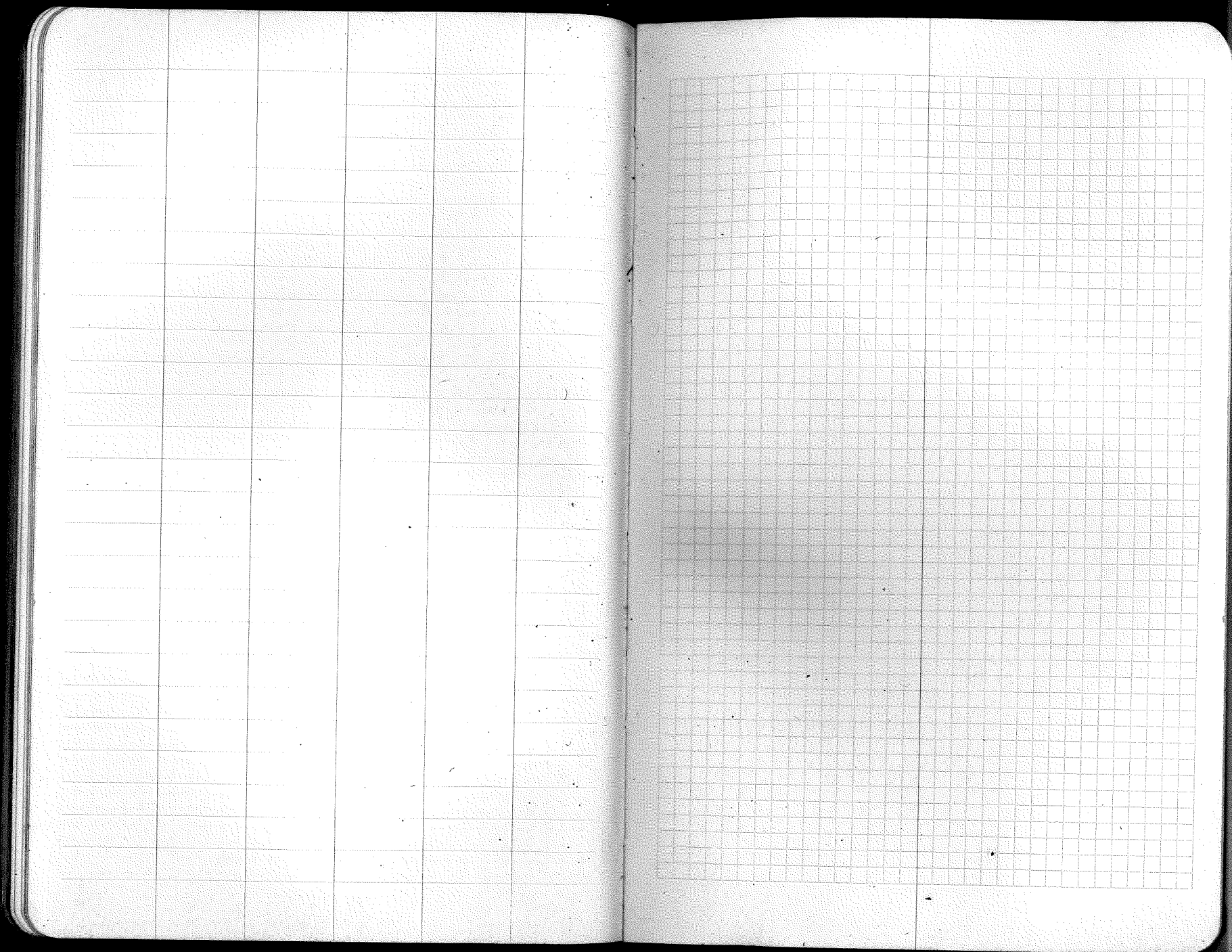
Cor. stake.
The new blazes
are fairly west.

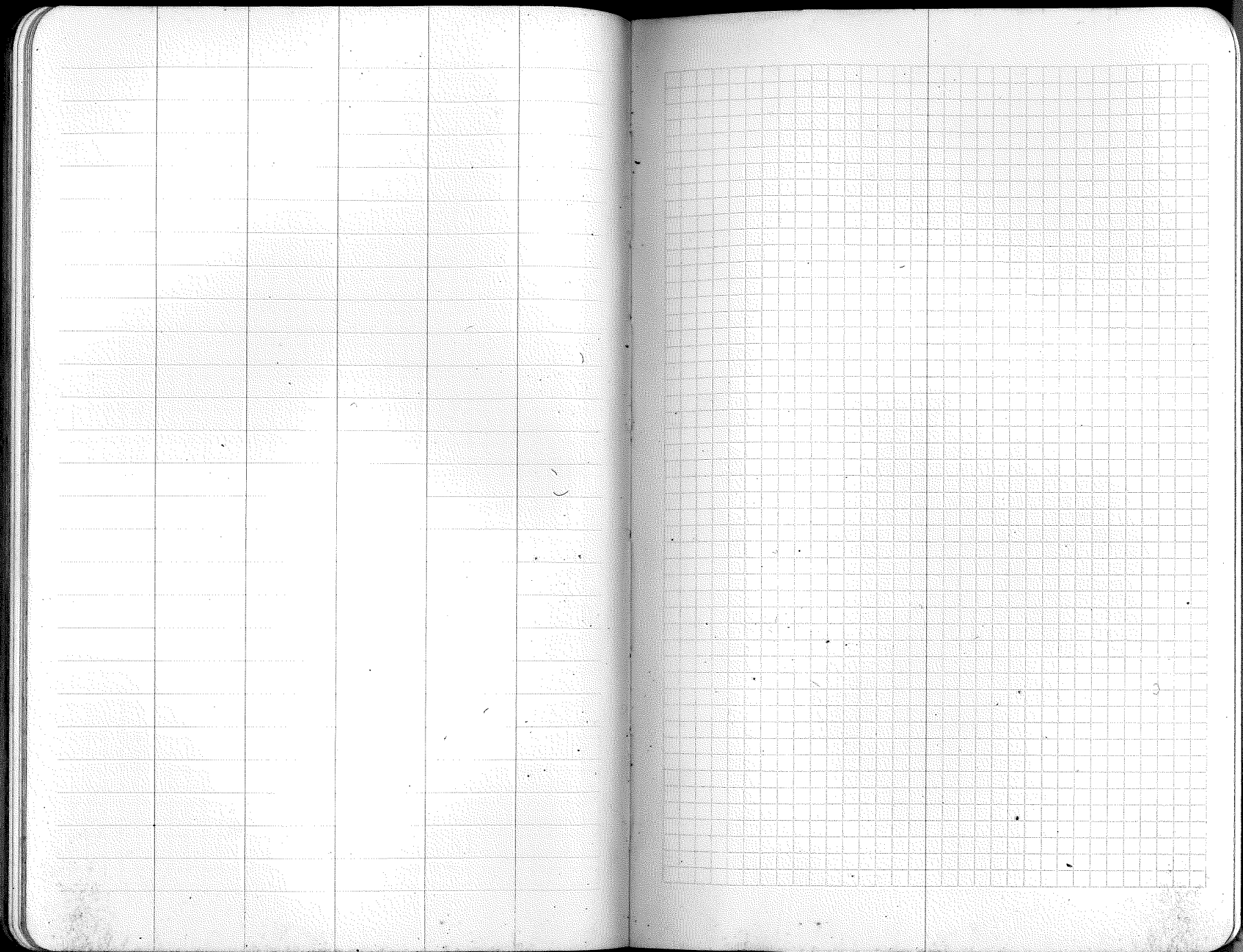
There are 3 on a
N45 line and 2
on an E-W line.

MAGNETIC DEARINGS
RANDOM LINE









DC
WPA 28

138-28

6	5	4	3	2	1
					8 7
7	8	9	10	11	12
18	17	16	15	14	13
12 11 10 9 8 7 6 5 4 3 2 1					
19	20	21	22	23	24
30	29	28	27	26	25
18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1					
31	32	33	34	35	36
				25 24	

26+40 set approx $\frac{13}{29}$ W. 138-28

16-50 set approx $\frac{1}{10}$ W.
16-20 left swamp center high bank
over land - approx. 2 yr ago
13+20 set approx $\frac{1}{16}$ cor. W.

3+0? leave road enter swamp
7+0? cross road center of 20' road

0+00 STARTED WEST FROM $\frac{13}{29}$ W. 138-28
138-27 Var. $6\frac{1}{2}^{\circ}$

DATE: 12-12-40

PARTY: Shintz Leader

Look For:

ASPEN 10° N 241KS
W.PINE 20° S 13° E 491KS

Fisher Picket
shells eye
T. Ferry tin
L. Yager can

FOUND: No evidence

MEMPHIS PARKING S 83° 30' W
RANDOM LINE

14/13
23/34 138-28

50+00 Found sec. cor. I.p.
did not chn. further

40+00 Leave Swamp & enter Ha - 0 - 14 Hm.
39+60 set approx. to cor. W.
38+00 cross creek & enter S.H.

26+40 ~~23+40~~ cont'd. West on same line 13 84 138-28

DATE: 12-12-40
PARTY: Shints L. 2

LOOK FOR:
W. BIRCH 5" N 82° E 12 1/2 K'S
W. BIRCH 7" N 88° W 20 1/2 K'S
SPRUCE 4" S 35° E 28 1/2 K'S
W. BIRCH 7" S 20° W 39 1/2 K'S



Fisher - picket
Shules - AXE
T. Terry chn.
L. Yagor chn.

FOUND: Five iron pipes,
Four witness corners
& the section "in
the middle"

W.C. O O.W.C.
O.S.S.
W.C. O O.W.C.

I.p. 79' N 6 1/2° W From our line
witness cor. N.W. 40'
" " S.E. 40'
" " N.E. 40'
" " S.W. 40'

MAGNETIC DECLINATION S 83° 30' W
NARROW LINE

Var 6 1/2°

26+40 set approx $\frac{1}{2}$ cor. W $\frac{14}{23}$ 138-28

H 8

13+20 set approx to cor. W.

9+00 enter H6
8+50 cross creek & small swamp

00+00 started West from top pp $\frac{14}{23} | \frac{13}{24}$

DATE: 12-16-40
PARTY: Fisher
W. Yager
Terry
Hanson
Kertekas

3

LOOK FOR:
LINN. 12" N3°E 30 IKS
ASPEN 14" S54°W 28 IKS

FOUND: No Evidence

MAGNETIC BEARING 83°30' W
RANDOM LINE



52+97 Iron pipe sec. cor. 19' No. $\frac{15}{20}$ 138-28
52+86 hit sec. cor. N. 19' $\frac{20}{23}$
W. 17'

H₂

39+60 set approx. $\frac{1}{4}$ cor. W

H₂

26+00 contd. West from $\frac{14}{23}$ 138-28
on same line

DATE: 12-16-40

PARTY: Fisher
Yager
Terry
Hanson
Kortchak

LOOK FOR:
BIRCH 6" N 10° E 7 IK
" 7" N 37° W 10 IK
" 5" S 30° E 14 IK
" 3" S 57° W 18 IK

FOUND: Five I. ps. ^{NW} ^{OSC} ^{OW}
^{NW} ^{OW}

We were 19' short on
mile Sd. cor. 17' N. of
our line

MAGNETIC BEARING S 83° 30' W
RANDOM LINE

VAR $\frac{10}{2}$

26+40 set approx $\frac{1}{4}$ cor. W. $\frac{15}{138-28}$
3" aspen stake

thick Ha

13+20 set approx $\frac{1}{16}$ cor. W. - 2" Ha stake

10+50 enter thick Ha

00+00 start West from Ip $\frac{115}{137-25}$ $\frac{138-28}{75}$

DATE: 12-17-40

PARTY: Fisher

W.

LOOK FOR:
B. HSN 5" N48°W 28 IKS
ASPEN 10" S50°E 19 IKS

Yager
Terry
Kortchak

FOUND: No Evidence

MPL. NET 10 DEPT. 16 S 84°30' W
RANDOM LINE



52+80 set approx $\frac{14}{21} \frac{15}{33}$ 138-38
sec. cor. West
5" aspen stake

H₂

39+60 set approx. $\frac{1}{4}$ cor. W.
3" aspen stake

35+60 cross logging road
A

26+40 contd. West from $\frac{15}{30}$ 138-38

DATE: 12-18-40

PARTY: Fisher

W.

Yagor

T. Terry

Hanson

Kortekas

LOOK FOR:

SPRUCE 14" N 45° E 17 IKS

ASPEN 10" N 60° W 37 IKS

" 14" S 85° E 39 IKS

R. MAPLE 14" S 5° W 73 IKS

FOUND: No Evidence

MAGNETIC BEARING S 74° 30' W
APPROX. 100 M LINE

V. OR 5 $\frac{1}{8}$

26+40 Set Approx. $\frac{1}{4}$ cor.

$\frac{16}{27}$ 138-38

3" ash stake

22+18 cross Stuart Lake road

13+20 set approx. $\frac{1}{10}$ cor. W
3" aspen stake

11+50 cross creek

0+00

started WEST FROM $\frac{16}{22}$ $\frac{15}{22}$ 138-38

DATE: 12-19-40

PRATY: Fisher

Yager

T. Terry

Hanson

Kartakows

LOOK FOR:
BIRCH 7" N34°W 351KS
" 7" S50°W 391KS

FOUND: No evidence

MAGNETIC READING S.F. 80 W
RANDOM LINE

52+90 set approx. sec. cor. $\frac{17}{16}$ 138-38
set 4" aspen stake

39+60 Set Approx. to corner W-5
38+40 left swamp 3" Birch stake

35+61 Hit small creek

33+5 Entered Alder Swamp

26+40 (cont) west on same line $\frac{16}{21}$ 138-38

DATE: 12-27-40

PARTY: Fisher

Yager

Hanson

Kortekogs

Berglund

LOOK FOR:
H. PINE 10" S 45° W 120' KS
H. " 10" S 10° E 140' KS
OPEN MARSH ON N.

FOUND:

No Evidence

MAGNETIC BEARINGS 30' W
RANDOM LINE

VAR 5 1/2°

26+40 set approx $\frac{1}{4}$ cov. W.
set 4" aspen stake

$\frac{17}{30}$ 138-28

21+00 cross small willow swamp.
200F. across

13+20 set approx $\frac{1}{6}$ cov. W.

4+00 leave marsh & enter Kat 5m.

1+20 cross open marsh

00+00 started W. from

$\frac{17}{30}$ 138-28

Date: 12-30-40

Party: Fisher

Yager

Hanson

Kortekas

Berglund

19

Look for:

Blk. oak " S 12 W 12 1/2

Aspen " N 30 E 31 1/2

Found:

No evidence

Distance: 26+35

Mag. Bearing S 84° 30' W
Banded Line

52+80 set approx. sec. cor. N.

51+60 cross logging trail

18 | 17
19 | 20
3" aspen
stake

42+60 leave marsh & enter highland

41+30 cross small marsh

39+60 set approx. $\frac{1}{2}$ cor. W.
4" aspen stake

²⁷
37+00 enter open country - with
small amount of willow brush

26+40 contd. West from $\frac{1}{4}$ cor. $\frac{17}{20}$ 18-21

Date: 12-30-40

Party: Fisher
W. Jager
Berghand
Hutchings
Hanson

Look for:

W. pine 12" S20° E 12 lbs
Twp. 4" S 42° W 29 lbs
Twp. 7" N 82° W 28 lbs
No other trees
near

Found: No Evidence

distance: 52+80

Mag. Bearing S 8° 30' W
Barlow Line

25+74 set approx. $\frac{1}{4}$ cor. W.
set 2" birch stake

18
17 138-26

17+30 leave hay meadow & enter Ho

14+10 enter wild hay meadow

13+20 set approx. $\frac{1}{16}$ cor. W. 2 1/2" aspen
stake

5+50 cross old truck trail

92' to center of road
00+00 started West from $\frac{18}{17}$ / $\frac{19}{20}$ 138-26

date: 12-30-40

Party: Fisher

Yager
Berglund
Kartekas
Hanson

Look for:

W. Birch 8" N13°E 131ks
Aspen 14" S35°W 191ks

Found: No Evidence

Distances: 25+74

Magnetic Bearing S 89° 30' W
Boulder Line

53+76 hit cor. 76' s. of our ^{line} 13 | 18
set our cor at end of line 24 | 19
set 4" ash stake

44+56 enter willow & alder swamp

39+60 set approx. to cor. W.
4" aspen stake

25+74 contd. West $\frac{13}{19}$ 138-28

Date: 12-31-40
W. Party: Fisher
Yager
Hanson
Terry
Kortekads

(12)

Look for:

Iron pipe
on Range Line

Distance: 52+14

Found: Iron pipe &
4 witness pipes
corner is in the swamp

Magnet - Bearing S 84° 30' W
Range Line

26+00 set approx $\frac{1}{4}$ cor. W
26+60 left road

$\frac{28}{33} | 133-28$

13+20 set approx $\frac{1}{16}$ cor. W.
2" aspen stake

0+00 started w. from cor. in center of road

$\frac{28}{33} | 27-133-28$

Date: 1-2-41

Party: Fisher
Lagor
Harrison
Kortekas
T. Terry

(13)

Look for:
ASPEN 12" N 35° E 28 lbs
J. pine 7" S 50° W 33 lbs

Distance: 26+20

Found: No Evidence

Neo. Bur. S. 83° W.

Chaining along Pine Run - Embury Road

52+80 set approx. s.e. cor.
set 5" ash stake T. 131-28

29	28
32	33

39+60 set approx. to cor. W
3" aspen stake

33+50 enter high land brush

corn field

26+70 hit corn field
contd W. firm

28
33

131-28

Date: 1-2-41

Party: Fisher
Vogel
Hanson
Kertch
T. Terry

Look for:
Ash 5" N 70 E 15 1ks
" " N 20 W 22 1ks
" " S 85 E 20 1ks
" " S 20 W 20 1ks

Found: No Evidence
of original cor.

Distances: 52+41

Mag. Bearing S 83° W
Bearing Line

26+40 Set Approx. $\frac{1}{4}$ corner $\frac{29}{32}$
25+50 Entered 4" Ash
Alder + Willow Swamp

B+20 Set Approx. $\frac{1}{6}$ corner, 3" Pop.

2+60 left swamp enter Ha

79+00 enter willow swamp $\frac{29}{28}$
00+00 started West from $\frac{32}{33}$

138-28

Date: 1-3-41
W Party: Fisher
Yager
Hanson
Kerlekoos
T. Terry

Look for:

Birch 6" S 60° E 20 ft
Maple 20" N 10° W

Found:

No evidence

Distance: $26 + \frac{41}{2}$

Mag. Bearing S 89° W
Horizontal Line

138 11

52+83 Set Approximate Section $\frac{30}{31} \frac{29}{32}$
5" Pop. Corner

34+50 See Approx. to corner 3" Pb

30+00 left swamp

20+40 (con't) W. 11 SW 1/4 $\frac{29}{32}$ 158-28

158-28

Date: 1-3-41
Party: Fisher
Yager
Hanson
Kortekaas
Terry, T.

16

Look for:
Terry 7" N 82° E 80kts
W. Pine 16" N 45° W 97kts
Terry 8" S 55° E 20kts
W. Pine 12" S 65° W 16kts

Found:
No Evidence

Distance: 52+83

Magnetic bearing S 83° W
Fisher line

26+46 Set Approx. $\frac{1}{4}$ corner $\frac{30}{31}$
3" Pb.

13+20 Set Approx. $\frac{1}{16}$ Cor. 3" Pop.

1+63 Hit Road
0+00 started west from approx. sec. 18
 $\frac{30}{31}$ 27 30 138-28

138-28
Date: Jan 3, 1941 (17)
Party: Fisher
Yager
Hanson
Kontkous
Terry, T.

Look for:

Burr Oak 12" N6°E40' ^{1/2} Found:
W. P. 10" S 67° W 32 lbs. No evidence

Distance: 26+46

Magnetic bearing 5.83° W
Random Line

On sand var.

53+16 Found iron pipe 118' North. 25/30

52+86 Set Approx. Section Cor. 36/31

50 6" Maple

50+00 Hit Road

39+60 Set Approx. $\frac{1}{10}$ cor. 9" Pop.

26+40 cont. west on same line $\frac{30}{31}$ 138-28

138-28 W Date: 1/6/41 Party: Fisher Terry R. Schultz Kortekaas Hanson (18)

Look for:

Iron pipe

Found: 53+16

~~53+16~~ 118' Iron pipe 118' North of our random line

Distance: 52+86

Magnetic Bearing 5.83° W Random Line

26+68 Set Approx. $\frac{1}{4}$ corner

4" Ass.

$\frac{27}{34}$ 138-28

13+20 Set Appr. $\frac{1}{16}$ corner

3" Ass.

0+00

started E. from
intersection of roads

$\frac{28}{33}$ $\frac{27}{34}$ 138-28

Date: 1/7/41

E. Barty

Fisher
Terry
R. Schultz
Martha Koss
Hansin

19

Look for:

Had pins 8" N 20° E 15 lbs
" " 8" S 13° E 43 lbs

Found: 53+86

Distance: 26+68

~~From pipe 1/4 South
of our random line
4 wire corners~~

Chaining along road
Magnetic bearing N 23° 30' E

100 5'

53+86 Hit corner at 53+86 - south 27 | 26
 Found iron pipe $1\frac{1}{2}$ ' north of line. 34 | 35

51+40 Left swamp Entered J. Pine - Birch

50+10 Entered Willow swamp

39+61 Set Approx. $\frac{1}{16}$ corner 3" birch
 38+25 Left Road Entered Jack Pine
 and Birch

26+40 cont. East from 27 | 34 138-28

Date: 1-7-41

Party: Fisher

Terry T. - Notes
 Schultz
 Kortegaas
 Hanson

Look for:

J. pine 5" NSE 80 lks
 " 5" N 45 W 45 lks
 " 6" S 55 E 22 lks
 Y. pine 11" S 50 W 130 lks

Distance: 53+36

Found:

At 53+86 found
 iron pipe $1\frac{1}{2}$ ' North
 of our line.



Magnetic Bearing N 85° 20' E
 Section Line

26+40 set approx. $\frac{1}{4}$ stake

$\frac{26}{35}$ 138-28

13+20 set approx. w $\frac{1}{16}$ - 4" maple
12+50 creek - small

0+00 started east from iron pipe sec. cov.
at $\frac{21+20}{34+33}$ 138-28

E. Date: Jan. 8, 1941 21

Party: Fisher - chief

Terry T - notes

Kartelack

Hanson

Schultz

Found:

Found witness cov.

Banner line
Magnetic Bearing N 83° 30' E

$\frac{26}{35} | \frac{25}{36}$

138-28

51+62 Hit road - corner in middle of road

39+60 set approx. E $\frac{1}{16}$ - 3" Birch

28+78 offset south 8'

26+40 cont'd, east on same line from
 $\frac{1}{4}$ cor. $\frac{26}{35}$ 138-28

Date: Jan. 8, 1941

Party: Fisher - Chief

Terry T. Hobbs

Karl Laas

Hanson

Schultz, R.

Found: Iron Pipe

Magnetic Bearing N 83° 30' E
Hudson Line

26+40 Set Approx. $\frac{1}{2}$ corner - 4" Bal. $\frac{25}{36}$ 138-23

- Also Hit meadow

19+80 Left meadow entered birch
and J. Pine

13739 Hit meadow

13+20 Set Approximate $\frac{1}{4}$ cor. 4" Bal.

0+00 started east from

$\frac{25}{35}$ $\frac{25}{36}$

138-21

Date: 1/10/41 23

Party: Fisher
Hanson
B. Schultz
Kovalekas
Terry

Found:

Magnet's Bearing N 83° 30' E
Pardon

33100 H.I.C. Road and Corner $\frac{25}{36}$ 138-28
Set APPROX. Section Corner S.I.P. line

44710 H.I.C. Road
43100 Entered aspen and Jack Pine

34760 set Approx. $\frac{1}{16}$ corner - Hill fence
- 3" asp.

33400 left meadow - entered small asp.

26740 Cont. East on same line $\frac{25}{36}$ 131-28
from $\frac{1}{4}$ corner 36

Date: 1/10/41

Party: Fisher
P. Schultz
Hansen
Kovlekas
Murray

Found: Iron Pipe
31' South of
our random line
Also 4 witness corners

Magnetic Bearing N 83° 30' E
Barbed Wire

26+40 SET cor on curve of $\frac{1}{4}$ cor. $\frac{35}{\text{Road}}$ 138-28

13+20 SET APPROX $\frac{1}{16}$ cor.

0+00 started east from iron pipe north-
west of curve in path $\frac{34}{35}$ 138-28

Date: Jan 17, 1941. (25)

Party: DEJ man - chief
Schultz
Moore
Koylerkas
Worlic - Notes

Random Line
Mag. bar. N. 83 (30) E

35/36

138-28

39460 SET APPROX $\frac{1}{16}$ COY

39440 ENTOR 2 SPECY Birch + pine

39440 CONTINUED. on same line ³⁵ 135-28

Date: Jan 14, 1948

Party: DEIMAN - chief
MOORE
HARTMAN
SCHWITZ
WARTHEISS.

Abandon line
Map. Dist. N 95° 31' E.

3 138-28

35 / 36 138-28

27

Date:
Party:

T.138-28 36/30 T.138-27
T.137-28 1/6 T.137-27

Date:
Party:

28

36 138-28

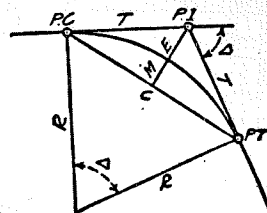
2640 SET APP $\frac{1}{16}$ Cor.

13120 SET APP $\frac{1}{16}$ Cor.

00+00 STARTED South!

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

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CURVE FORMULAS

Radius= $R = \frac{50}{\sin \frac{D}{2}}$ (1) Degree of Curve= D and $\sin \frac{D}{2} = \frac{50}{R}$ (2)

Tangent= $T = R \tan \frac{\Delta}{2}$ (3) Length of Curve= $L = 100 \frac{\Delta}{D}$ (4)

Middle ordinate= $M = R(1 - \cos \frac{\Delta}{2})$ (5) $= R \text{vers} \frac{\Delta}{2}$ (6)

External= $E = T \tan \frac{\Delta}{4} = R \div \cos \frac{\Delta}{2} - R$ (8) $= R \text{exsec} \frac{\Delta}{2}$ (9)

Long Chord= $C = 2 R \sin \frac{\Delta}{2}$ (10) $\Delta =$ Central Angle

EXPLANATION AND USE OF TABLES

Stations.—Given P. I.=Sta. 161+60.35 to find Sta. of P. C. and P. T. $\Delta=62^\circ 10'$ $D=8^\circ 20'$. From Table IV for 1° curve $T=3454.1$ and $\div 8\frac{1}{2}=414.49$ ft. From Table V correction=.36 or $T=414.85$ ft. P. C.=Sta. P.I.— $T=157+45.50$. Also from (4) $L=746.00$ and P. T.=Sta. P. C. + $L=164+91.50$.

Offsets.—Tangent offsets vary (approximately) directly with D and with square of the distance. Thus tangent offset for Sta. 158 on above curve is 2.16 ft. found as follows. From Table III tangent offset for 100 ft.=7.27 ft. Distance= $158 - \text{Sta. P. C.} = 54.50$, hence offset= $7.27 (54.50 \div 100)^2 = 2.16$ ft. Also square of any distance divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(54.50)^2 \div (2 \times 688.26) = 2.16$ ft.

Deflections.—Deflection angle= $\frac{1}{2} D$ for 100 ft., $\frac{1}{4} D$ for 50 ft., etc. For c ft.=(in minutes) $.3 \times C \times D^\circ$ or=defl. for 1 ft. from Table III $\times C$. For Sta. 158 of above curve= $.3 \times 54.5 \times 8\frac{1}{2} = 136.2'$ or $2^\circ 16.2'$, or= $2.50 \times 54.5 = 136.2'$ from Table III. For Sta. 159 deflection angle= $2^\circ 16.2' + 8^\circ 20' \div 2 = 6^\circ 26.2'$, etc.

Externals.—May be found in similar manner to tangents. Thus E for curve above is 91.37. For from Table IV for 1° curve $E=960.6$ for $8^\circ 20' = 960.6 \div 8\frac{1}{2} = 91.27$ and from Table V correction=.10 or $E=91.37$ ft. Or suppose $\Delta=32^\circ$ and E is measured and found to be 42 ft. What is D ? From Table IV $E=230.9$ and $\div 42 = 5.5$ or $D=5^\circ 30'$.

26748 CONT ON SAME LINE

TABLE I.—MINUTES IN DECIMALS OF A DEGREE.

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

TABLE II.—INCHES IN DECIMALS OF A FOOT.

1-16	3-32	1/4	3-16	5-16	3/8	1/2	5/8	3/4	7/8	
.0052	.0078	.0104	.0156	.0208	.0313	.0417	.0521	.0625	.0729	
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

TABLE III.—RADI, ORDINATES AND DEFLECTIONS.

Deg.	Radius	Mid. Ord.	Tan. Offset	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan. Offset	Def. for 1 Foot
0° 10'	34377.5	.036	.145	0.05	7° 20'	819.02	1.528	6.105	2.10
0° 20'	17188.8	.073	.291	0.10	7° 30'	781.84	1.600	6.395	2.20
0° 30'	11459.2	.109	.436	0.15	7° 40'	764.49	1.637	6.540	2.25
0° 40'	8594.42	.145	.582	0.20	7° 50'	747.89	1.673	6.685	2.30
0° 50'	6875.55	.182	.727	0.25	8° 20'	716.78	1.746	6.976	2.40
1° 10'	5729.65	.218	.873	0.30	8° 30'	688.16	1.819	7.266	2.50
1° 20'	4911.15	.255	1.018	0.35	8° 40'	674.69	1.855	7.411	2.55
1° 30'	4297.28	.291	1.164	0.40	8° 50'	661.74	1.892	7.556	2.60
1° 40'	3819.83	.327	1.309	0.45	9° 20'	637.28	1.965	7.846	2.70
1° 50'	3437.87	.364	1.454	0.50	9° 30'	614.56	2.037	8.136	2.80
2° 10'	3125.36	.400	1.600	0.55	9° 40'	603.80	2.074	8.281	2.85
2° 20'	2864.93	.436	1.745	0.60	9° 50'	593.42	2.110	8.426	2.90
2° 30'	2644.58	.473	1.891	0.65	10° 20'	573.69	2.183	8.716	3.00
2° 40'	2455.70	.509	2.036	0.70	10° 30'	546.44	2.292	9.150	3.15
2° 50'	2292.01	.545	2.181	0.75	10° 40'	521.67	2.402	9.585	3.30
3° 10'	2148.79	.582	2.327	0.80	10° 50'	499.06	2.511	10.02	3.45
3° 20'	2022.41	.618	2.472	0.85	11° 20'	478.34	2.620	10.45	3.60
3° 30'	1910.08	.655	2.618	0.90	11° 30'	459.28	2.730	10.89	3.75
3° 40'	1809.57	.691	2.763	0.95	11° 40'	441.68	2.839	11.32	3.90
3° 50'	1719.12	.727	2.908	1.00	11° 50'	425.40	2.949	11.75	4.05
4° 10'	1637.28	.764	3.054	1.05	12° 20'	410.28	3.058	12.18	4.20
4° 20'	1562.88	.800	3.199	1.10	12° 30'	396.20	3.168	12.62	4.35
4° 30'	1494.95	.836	3.345	1.15	12° 40'	383.07	3.277	13.05	4.50
4° 40'	1432.69	.873	3.490	1.20	12° 50'	370.78	3.387	13.49	4.65
4° 50'	1375.40	.909	3.635	1.25	13° 20'	359.27	3.496	13.92	4.80
5° 10'	1322.53	.945	3.718	1.30	13° 30'	348.45	3.606	14.35	4.95
5° 20'	1273.57	.982	3.926	1.35	13° 40'	338.27	3.716	14.78	5.10
5° 30'	1228.11	1.018	4.071	1.40	13° 50'	319.62	3.935	15.64	5.40
5° 40'	1185.78	1.055	4.217	1.45	14° 20'	302.94	4.155	16.51	5.70
5° 50'	1146.28	1.091	4.362	1.50	14° 30'	287.94	4.374	17.37	6.00
6° 10'	1109.33	1.127	4.507	1.55	14° 40'	274.37	4.594	18.22	6.30
6° 20'	1074.88	1.164	4.653	1.60	14° 50'	262.04	4.814	19.08	6.60
6° 30'	1042.14	1.200	4.798	1.65	15° 20'	250.79	5.035	19.94	6.90
6° 40'	1011.51	1.237	4.943	1.70	15° 30'	240.49	5.255	20.79	7.20
6° 50'	982.64	1.273	5.088	1.75	15° 40'	231.01	5.476	21.64	7.50
7° 10'	955.37	1.309	5.234	1.80	15° 50'	222.27	5.697	22.50	7.80
7° 20'	929.57	1.346	5.379	1.85	16° 20'	214.18	5.918	23.35	8.10
7° 30'	905.13	1.382	5.524	1.90	16° 30'	206.68	6.139	24.19	8.40
7° 40'	881.95	1.418	5.669	1.95	16° 40'	199.70	6.360	25.04	8.70
7° 50'	859.92	1.455	5.814	2.00	16° 50'	193.18	6.583	25.88	9.00

Note. Chord Deflection=2 times tangent deflection.

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

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
1° 10'	50.00	.22	11° 10'	551.70	26.50	21° 10'	1061.9	97.57
1° 20'	58.34	.30	11° 20'	560.11	27.31	21° 20'	1070.6	99.16
1° 30'	66.67	.39	11° 30'	568.53	28.14	21° 30'	1079.2	100.75
1° 40'	75.01	.49	11° 40'	576.95	28.97	21° 40'	1087.8	102.35
1° 50'	83.34	.61	11° 50'	585.36	29.82	21° 50'	1096.4	103.97
2° 10'	91.68	.73	12° 10'	593.79	30.68	22° 10'	1105.1	105.60
2° 20'	100.01	.87	12° 20'	602.21	31.56	22° 20'	1113.7	107.24
2° 30'	108.35	1.02	12° 30'	610.64	32.45	22° 30'	1122.4	108.90
2° 40'	116.68	1.19	12° 40'	619.07	33.35	22° 40'	1131.0	110.57
2° 50'	125.02	1.36	12° 50'	627.50	34.26	22° 50'	1139.7	112.25
3° 10'	133.36	1.55	13° 10'	635.93	35.18	23° 10'	1148.4	113.95
3° 20'	141.70	1.75	13° 20'	644.37	36.12	23° 20'	1157.0	115.66
3° 30'	150.04	1.96	13° 30'	652.81	37.07	23° 30'	1165.7	117.38
3° 40'	158.38	2.19	13° 40'	661.25	38.03	23° 40'	1174.4	119.12
3° 50'	166.72	2.43	13° 50'	669.70	39.01	23° 50'	1183.1	120.87
4° 10'	175.06	2.67	14° 10'	678.15	39.99	24° 10'	1191.8	122.63
4° 20'	183.40	2.93	14° 20'	686.60	40.99	24° 20'	1200.5	124.41
4° 30'	191.74	3.21	14° 30'	695.06	42.00	24° 30'	1209.2	126.20
4° 40'	200.08	3.49	14° 40'	703.51	43.03	24° 40'	1217.9	128.00
4° 50'	208.43	3.79	14° 50'	711.97	44.07	24° 50'	1226.6	129.82
5° 10'	216.77	4.10	15° 10'	720.44	45.12	25° 10'	1235.3	131.65
5° 20'	225.12	4.42	15° 20'	728.90	46.18	25° 20'	1244.0	133.50
5° 30'	233.47	4.76	15° 30'	737.37	47.25	25° 30'	1252.8	135.35
5° 40'	241.81	5.10	15° 40'	745.85	48.34	25° 40'	1261.5	137.23
5° 50'	250.16	5.46	15° 50'	754.32	49.44	25° 50'	1270.2	139.11
6° 10'	258.51	5.83	16° 10'	762.80	50.55	26° 10'	1279.0	141.01
6° 20'	266.86	6.21	16° 20'	771.29	51.68	26° 20'	1287.7	142.93
6° 30'	275.21	6.61	16° 30'	779.77	52.89	26° 30'	1296.5	144.85
6° 40'	283.57	7.01	16° 40'	788.26	53.97	26° 40'	1305.3	146.79
6° 50'	291.92	7.43	16° 50'	796.75	55.13	26° 50'	1314.0	148.75
7° 10'	300.28	7.86	17° 10'	805.25	56.31	27° 10'	1322.8	150.71
7° 20'	308.64	8.31	17° 20'	813.75	57.50	27° 20'	1331.6	152.69
7° 30'	316.99	8.76	17° 30'	822.25	58.70	27° 30'	1340.4	154.69
7° 40'	325.35	9.23	17° 40'	830.76	59.91	27° 40'	1349.2	156.70
7° 50'	333.71	9.71	17° 50'	839.27	61.14	27° 50'	1358.0	158.72
8° 10'	342.08	10.20	18° 10'	847.78	62.38	28° 10'	1366.8	160.76
8° 20'	350.44	10.71	18° 20'	856.30	63.63	28° 20'	1375.6	162.81
8° 30'	358.81	11.22	18° 30'	864.82	64.90	28° 30'	1384.4	164.86
8° 40'	367.17	11.75	18° 40'	873.35	66.18	28° 40'	1393.2	166.95
8° 50'	375.54	12.29	18° 50'	881.88	67.47	28° 50'	1402.0	169.04
9° 10'	383.91	12.85	19° 10'	890.41	68.77	29° 10'	1410.9	171.15
9° 20'	392.28	13.41	19° 20'	898.95	70.09	29° 20'	1419.7	173.27
9° 30'	400.66	13.99	19° 30'	907.49	71.42	29° 30'	1428.6	175.41
9° 40'	409.03	14.58	19° 40'	916.03	72.76	29° 40'	1437.4	177.55
9° 50'	417.41	15.18	19° 50'	924.58	74.12	29° 50'	1446.3	179.72
10° 10'	425.79	15.80	20° 10'	933.13	75.49	30° 10'	1455.1	181.89
10° 20'	434.17	16.43	20° 20'	941.69	76.86	30° 20'	1464.0	184.08
10° 30'	442.55	17.07	20° 30'	950.25	78.26	30° 30'	1472.9	186.29
10° 40'	450.93	17.72	20° 40'	958.81	79.67	30° 40'	1481.8	188.51
10° 50'	459.32	18.38	20° 50'	967.38	81.09	30° 50'	1490.7	190.74
11° 10'	467.71	19.06	21° 10'	975.96	82.53	31° 10'	1499.6	192.99
11° 20'	476.10	19.75	21° 20'	984.53	83.97	31° 20'	1508.5	195.25
11° 30'	484.49	20.45	21° 30'	993.12	85.43	31° 30'	1517.4	197.52
11° 40'	492.88	21.16	21° 40'	1001.7	86.90	31° 40'	1526.3	199.82
11° 50'	501.28	21.89	21° 50'	1010.3	88.39	31° 50'	1535.3	202.12
12° 10'	509.68	22.62	22° 10'	1018.9	89.89	32° 10'	1544.2	204.44
12° 20'	518.08	23.38	22° 20'	1027.5	91.40	32° 20'	1553.1	206.77
12° 30'	526.48	24.14	22° 30'	1036.1	92.92	32° 30'	1562.1	209.12
12° 40'	534.89	24.91	22° 40'	1044.7	94.46	32° 40'	1571.0	211.48
12° 50'	543.29	25.70	22° 50'	1053.3	96.01	32° 50'	1580.0	213.86

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

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
31°	1589.0	216.3	41°	2142.2	387.4	51°	2732.9	618.4
10'	1598.0	218.7	10'	2151.7	390.7	10'	2743.1	622.8
20	1606.9	221.1	20	2161.2	394.1	20	2753.4	627.2
30	1615.9	223.5	30	2170.8	397.4	30	2763.7	631.7
40	1624.9	226.0	40	2180.3	400.8	40	2773.9	636.2
50	1633.9	228.4	50	2189.9	404.2	50	2784.2	640.7
32	1643.0	230.9	42	2199.4	407.6	52	2794.5	645.2
10	1652.0	233.4	10	2209.0	411.1	10	2804.9	649.7
20	1661.0	235.9	20	2218.6	414.5	20	2815.2	654.3
30	1670.0	238.4	30	2228.1	418.0	30	2825.6	658.8
40	1679.1	241.0	40	2237.7	421.4	40	2835.9	663.4
50	1688.1	243.5	50	2247.3	425.0	50	2846.3	668.0
33	1697.2	246.1	43	2257.0	428.5	53	2856.7	672.7
10	1706.3	248.7	10	2266.6	432.0	10	2867.1	677.3
20	1715.3	251.3	20	2276.2	435.6	20	2877.5	682.0
30	1724.4	253.9	30	2285.9	439.2	30	2888.0	686.7
40	1733.5	256.5	40	2295.6	442.8	40	2898.4	691.4
50	1742.6	259.1	50	2305.2	446.4	50	2908.9	696.1
34	1751.7	261.8	44	2314.9	450.0	54	2919.4	700.9
10	1760.8	264.5	10	2324.6	453.6	10	2929.9	705.7
20	1770.0	267.2	20	2334.3	457.3	20	2940.4	710.5
30	1779.1	269.9	30	2344.1	461.0	30	2951.0	715.3
40	1788.2	272.6	40	2353.8	464.6	40	2961.5	720.1
50	1797.4	275.3	50	2363.5	468.4	50	2972.1	725.0
35	1806.6	278.1	45	2373.3	472.1	55	2982.7	729.9
10	1815.7	280.8	10	2383.1	475.8	10	2993.3	734.8
20	1824.9	283.6	20	2392.8	479.6	20	3003.9	739.7
30	1834.1	286.4	30	2402.6	483.3	30	3014.5	744.6
40	1843.3	289.2	40	2412.4	487.2	40	3025.2	749.6
50	1852.5	292.0	50	2422.3	491.0	50	3035.8	754.6
36	1861.7	294.9	46	2432.1	494.8	56	3046.5	759.6
10	1870.9	297.7	10	2441.9	498.7	10	3057.2	764.6
20	1880.1	300.6	20	2451.8	502.5	20	3067.9	769.7
30	1889.4	303.5	30	2461.7	506.4	30	3078.7	774.7
40	1898.6	306.4	40	2471.5	510.3	40	3089.4	779.8
50	1907.9	309.3	50	2481.4	514.3	50	3100.2	784.9
37	1917.1	312.2	47	2491.3	518.2	57	3110.9	790.1
10	1926.4	315.2	10	2501.2	522.2	10	3121.7	795.2
20	1935.7	318.1	20	2511.2	526.1	20	3132.6	800.4
30	1945.0	321.1	30	2521.1	530.1	30	3143.4	805.6
40	1954.3	324.1	40	2531.1	534.2	40	3154.2	810.9
50	1963.6	327.1	50	2541.0	538.2	50	3165.1	816.1
38	1972.9	330.2	48	2551.0	542.2	58	3176.0	821.4
10	1982.2	333.2	10	2561.0	546.3	10	3186.9	826.7
20	1991.5	336.3	20	2571.0	550.4	20	3197.8	832.0
30	2000.9	339.3	30	2581.0	554.5	30	3208.8	837.3
40	2010.2	342.4	40	2591.0	558.6	40	3219.7	842.7
50	2019.6	345.5	50	2601.1	562.8	50	3230.7	848.1
39	2029.0	348.6	49	2611.2	566.9	59	3241.7	853.5
10	2038.4	351.8	10	2621.2	571.1	10	3252.7	858.9
20	2047.8	354.9	20	2631.3	575.3	20	3263.7	864.3
30	2057.2	358.1	30	2641.4	579.5	30	3274.8	869.8
40	2066.6	361.3	40	2651.5	583.8	40	3285.8	875.3
50	2076.0	364.5	50	2661.6	588.0	50	3296.9	880.8
40	2085.4	367.7	50	2671.8	592.3	60	3308.0	886.4
10	2094.9	371.0	10	2681.9	596.6	10	3319.1	892.0
20	2104.3	374.2	20	2692.1	600.9	20	3330.3	897.5
30	2113.8	377.5	30	2702.3	605.3	30	3341.4	903.2
40	2123.3	380.8	40	2712.5	609.6	40	3352.6	908.8
50	2132.7	384.1	50	2722.7	614.0	50	3363.8	914.5

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

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
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	20	4112.1	1322.9	20	4922.5	1824.1
30	3408.8	937.3	30	4124.8	1330.3	30	4937.0	1833.6
40	3420.1	943.1	40	4137.4	1337.7	40	4951.5	1843.1
50	3431.4	948.9	50	4150.1	1345.1	50	4966.1	1852.6
62	3442.7	954.8	72	4162.8	1352.6	82	4980.7	1862.2
10	3454.1	960.6	10	4175.6	1360.1	10	4995.4	1871.8
20	3465.4	966.5	20	4188.5	1367.6	20	5010.0	1881.5
30	3476.8	972.4	30	4201.2	1375.2	30	5024.8	1891.2
40	3488.3	978.3	40	4214.0	1382.8	40	5039.5	1900.9
50	3499.7	984.3	50	4226.8	1390.4	50	5054.3	1910.7
63	3511.1	990.2	73	4239.7	1398.0	83	5069.2	1920.5
10	3522.6	996.2	10	4252.6	1405.7	10	5084.0	1930.4
20	3534.1	1002.3	20	4265.6	1413.5	20	5099.0	1940.3
30	3545.6	1008.3	30	4278.5	1421.2	30	5113.9	1950.3
40	3557.2	1014.4	40	4291.5	1429.0	40	5128.9	1960.2
50	3568.7	1020.5	50	4304.6	1436.8	50	5143.9	1970.3
64	3580.3	1026.6	74	4317.6	1444.6	84	5159.0	1980.4
10	3591.9	1032.8	10	4330.7	1452.5	10	5174.1	1990.5
20	3603.5	1039.0	20	4343.8	1460.4	20	5189.3	2000.6
30	3615.1	1045.2	30	4356.9	1468.4	30	5204.4	2010.8
40	3626.8	1051.4	40	4370.1	1476.4	40	5219.7	2021.1
50	3638.5	1057.7	50	4383.3	1484.4	50	5234.9	2031.4
65	3650.2	1063.9	75	4396.5	1492.4	85	5250.3	2041.7
10	3661.9	1070.2	10	4409.8	1500.5	10	5265.6	2052.1
20	3673.7	1076.6	20	4423.1	1508.6	20	5281.0	2062.5
30	3685.4	1082.9	30	4436.4	1516.7	30	5296.4	2073.0
40	3697.2	1089.3	40	4449.7	1524.9	40	5311.9	2083.5
50	3709.0	1095.7	50	4463.1	1533.1	50	5327.4	2094.1
66	3720.9	1102.2	76	4476.5	1541.4	86	5343.0	2104.7
10	3732.7	1108.6	10	4489.9	1549.7	10	5358.6	2115.3
20	3744.6	1115.1	20	4503.4	1558.0	20	5374.2	2126.0
30	3756.5	1121.7	30	4516.9	1566.3	30	5389.9	2136.7
40	3768.5	1128.2	40	4530.4	1574.7	40	5405.6	2147.5
50	3780.4	1134.8	50	4544.0	1583.1	50	5421.4	2158.4
67	3792.4	1141.4	77	4557.6	1591.6	87	5437.2	2169.2
10	3804.4	1148.0	10	4571.2	1600.1	10	5453.1	2180.2
20	3816.4	1154.7	20	4584.8	1608.6	20	5469.0	2191.1
30	3828.4	1161.3	30	4598.5	1617.1	30	5484.9	2202.2
40	3840.5	1168.1	40	4612.2	1625.7	40	5500.9	2213.2
50	3852.6	1174.8	50	4626.0	1634.4	50	5517.0	2224.3
68	3864.7	1181.6	78	4639.8	1643.0	88	5533.1	2235.5
10	3876.8	1188.4	10	4653.0	1651.7	10	5549.2	2246.7
20	3889.0	1195.2	20	4667.4	1660.5	20	5565.4	2258.0
30	3901.2	1202.0	30	4681.3	1669.2	30	5581.6	2269.3
40	3913.4	1208.9	40	4695.2	1678.1	40	5597.8	2280.6
50	3925.6	1215.8	50	4709.2	1686.9	50	5614.2	2292.0
69	3937.9	1222.7	79	4723.2	1695.8	89	5630.5	2303.5
10	3950.2	1229.7	10	4737.2	1704.7	10	5646.9	2315.0
20	3962.5	1236.7	20	4751.2	1713.7	20	5663.4	2326.6
30	3974.8	1243.7	30	4765.3	1722.7	30	5679.9	2338.2
40	3987.2	1250.8	40	4779.4	1731.7	40	5696.4	2349.8
50	3999.5	1257.9	50	4793.6	1740.8	50	5713.0	2361.5
70	4011.9	1265.0	80	4807.7	1749.9	90	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836.2	1768.2	20	5763.1	2397.0
30	4049.3	1286.5	30	4850.5	1777.4	30	5779.9	

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

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
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	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	102	7075.5	3374.9	112	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002.7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93	6037.8	2594.0	103	7203.2	3474.4	113	8656.6	4651.3
10	6055.4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94	6144.3	2671.6	104	7333.6	3576.8	114	8822.9	4790.4
10	6162.6	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234.6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	105	7467.0	3682.3	115	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344.8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96	6363.4	2833.2	106	7603.5	3791.0	116	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259.0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	107	7743.2	3902.9	117	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98	6591.2	3003.8	108	7886.2	4018.2	118	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	109	8032.7	4137.1	119	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	6808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100	6828.3	3184.1	110	8182.8	4259.7	120	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

TABLE V.—CORRECTIONS FOR TANGENTS AND EXTERNALS.

These corrections are to be added to the approximate values, found by dividing the tangent, or external, for a 1° curve (Table IV) by the degree of curve, in order to obtain the true tangents, or externals. Intermediate values may be obtained by interpolation.

FOR TANGENTS ADD

Central Angle	DEGREE OF CURVE													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
15°	.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.58	.65	.72	.79
20°	.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
25°	.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
30°	.10	.19	.29	.39	.49	.59	.69	.79	.89	.99	1.09	1.20	1.29	1.39
35°	.11	.22	.34	.47	.58	.69	.79	.81	.92	1.04	1.29	1.42	1.54	1.66
40°	.13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
45°	.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
50°	.17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
55°	.19	.38	.57	.76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
60°	.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
65°	.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
70°	.25	.51	.76	1.02	1.28	1.54	1.80	2.06	2.33	2.60	2.88	3.16	3.44	3.72
75°	.27	.56	.83	1.12	1.40	1.69	1.98	2.27	2.57	2.87	3.16	3.47	3.78	4.09
80°	.30	.61	.91	1.22	1.53	1.84	2.15	2.46	2.78	3.10	3.44	3.78	4.12	4.46
85°	.33	.66	1.00	1.33	1.68	2.02	2.36	2.70	3.05	3.40	3.77	4.14	4.55	4.89
90°	.36	.72	1.09	1.45	1.83	2.20	2.57	2.94	3.32	3.70	4.10	4.50	4.91	5.32
95°	.39	.79	1.19	1.55	2.00	2.40	2.80	3.20	3.61	4.02	4.40	4.98	5.38	5.83
100°	.43	.86	1.30	1.74	2.18	2.62	3.06	3.50	3.95	4.40	4.88	5.37	5.85	6.34
110°	.51	1.03	1.56	2.08	2.61	3.14	3.67	4.21	4.76	5.31	5.86	6.43	7.01	7.60
120°	.62	1.25	1.93	2.52	3.16	3.81	4.45	5.11	5.77	6.44	7.12	7.80	8.50	9.22

FOR EXTERNALS ADD

Central Angle	DEGREE OF CURVE													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	.003	.007	.010	.014	.018	.023	.027	.030	.032	.035	.039	.043	.047	.051
20°	.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°	.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.218	.230	.247	.264
40°	.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	.046	.093	.142	.188	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°	.053	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.771	.845	.922	1.01
70°	.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	.095	.182	.286	.383	.480	.578	.678	.777	.877	.977	1.07	1.18	1.29	1.39
80°	.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	.128	.259	.391	.524	.657	.790	.926							

TABLE VI.--CORRECTIONS FOR SUB-CHORDS AND LONG CHORDS.

FOR SUB-CHORDS ADD										Excess of arc per 100 ft.	LONG CHORDS				
D	10	20	30	40	50	60	70	80	90		D	200	300	400	500
4°	.00	.00	.01	.01	.01	.01	.01	.01	.00	.02	1	199.99	299.97	399.92	499.85
6	.00	.01	.01	.02	.02	.02	.02	.01	.01	.05	2	199.97	299.88	399.70	499.39
8	.01	.02	.02	.03	.03	.03	.03	.02	.01	.08	3	199.93	299.73	399.32	498.63
10	.01	.02	.03	.04	.05	.05	.05	.04	.02	.13	4	199.88	299.51	398.78	497.57
12	.02	.04	.05	.06	.07	.07	.07	.05	.03	.18	5	199.81	299.24	398.10	496.20
14	.02	.05	.07	.08	.09	.10	.09	.07	.04	.25	6	199.73	298.90	397.26	494.53
16	.03	.06	.09	.11	.12	.12	.12	.09	.05	.33	7	199.63	298.51	396.28	492.57
18	.04	.08	.11	.14	.15	.15	.15	.12	.07	.41	8	199.51	298.05	395.14	490.31
20	.05	.10	.14	.17	.19	.20	.18	.15	.09	.51	9	199.38	297.54	393.86	487.75
22	.06	.12	.17	.21	.23	.24	.22	.18	.10	.62	10	199.24	296.96	392.42	484.90
24	.07	.14	.20	.25	.28	.28	.26	.21	.12	.74	12	198.90	295.63	389.12	478.34
26	.09	.17	.24	.29	.32	.33	.31	.25	.15	.86	14	198.51	294.06	385.22	470.65
28	.10	.19	.27	.34	.37	.38	.36	.29	.17	1.00	16	198.05	292.25	380.76	461.86
30	.11	.22	.31	.39	.43	.44	.41	.33	.19	1.15	18	197.54	290.21	375.74	452.02
32	.13	.25	.36	.44	.49	.50	.47	.38	.22	1.31	20	196.90	287.94	370.17	441.15
34	.15	.28	.40	.50	.55	.57	.53	.43	.25	1.48	22	196.32	285.44	364.06	429.30
35	.17	.32	.45	.56	.62	.64	.59	.48	.28	1.66	24	195.63	282.71	357.43	416.53
36	.18	.36	.51	.62	.70	.71	.66	.53	.31	1.88	26	194.87	279.76	350.30	402.89
40	.21	.40	.56	.69	.77	.79	.73	.59	.35	2.06	28	194.06	276.59	342.69	388.42
42	.23	.44	.62	.76	.85	.87	.81	.65	.38	2.28	30	193.18	273.20	334.61	373.20
44	.25	.48	.68	.84	.94	.96	.89	.72	.42	2.50	32	192.25	269.61	326.08	357.28
45	.27	.52	.75	.92	1.02	1.05	.98	.78	.46	2.74	34	191.26	265.81	317.12	340.73
48	.30	.57	.81	1.00	1.12	1.14	1.06	.85	.50	2.99	36	190.21	261.80	307.77	323.61
50	.32	.62	.89	1.09	1.21	1.24	1.15	.93	.55	3.24	38	189.10	257.60	298.03	305.99
52	.35	.67	.96	1.18	1.31	1.35	1.25	1.01	.59	3.52	40	187.94	253.21	287.94	287.94
54	.38	.73	1.04	1.28	1.42	1.46	1.33	1.09	.64	3.80	42	186.72	248.63	277.51	269.54
56	.41	.78	1.12	1.38	1.53	1.57	1.46	1.17	.69	4.09	44	185.44	243.87	266.78	250.85
58	.44	.84	1.20	1.48	1.65	1.69	1.57	1.20	.74	4.40	46	184.10	239.93	255.78	231.95
60	.47	.91	1.29	1.59	1.76	1.81	1.68	1.35	.80	4.72	48	182.71	233.83	244.51	212.92

Note.—When a chord of less than 100 ft. is used the corrections given in the above table should be added to the nominal length of chord to get the length which should be used in order that the 100 ft. points will check with those obtained by using the standard 100 ft. chord. Thus in locating a 14° curve by 25 ft. chords measure 25.06 for each chord. Long chords are useful in passing obstacles.

TABLE VII.—MIDDLE ORDINATES FOR RAILS IN FEET.

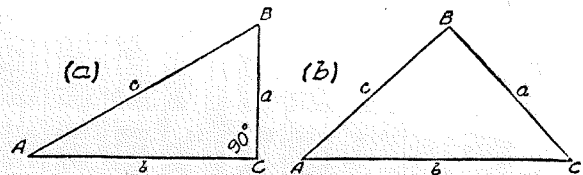
Deg. of Curve	LENGTH OF RAILS						Deg. of Curve	LENGTH OF RAILS							
	32	30	28	26	24	22		20	32	30	28	26	24	22	20
1°	.022	.020	.016	.013	.011	.009	.008	16°	.356	.313	.273	.236	.200	.170	.139
2	.045	.038	.034	.029	.025	.021	.017	17	.378	.333	.290	.252	.213	.180	.148
3	.067	.058	.051	.044	.037	.031	.026	18	.400	.351	.306	.265	.225	.190	.156
4	.089	.079	.069	.060	.050	.042	.035	19	.423	.371	.324	.280	.238	.201	.165
5	.112	.099	.086	.074	.063	.053	.044	20	.445	.392	.341	.296	.250	.212	.174
6	.134	.117	.102	.088	.076	.064	.052	21	.466	.410	.357	.309	.259	.222	.182
7	.156	.137	.120	.104	.088	.074	.061	22	.487	.430	.375	.325	.275	.233	.191
8	.179	.158	.137	.119	.100	.085	.070	23	.509	.450	.390	.338	.287	.243	.199
9	.201	.175	.153	.133	.112	.095	.078	24	.531	.469	.408	.354	.299	.253	.208
10	.223	.196	.171	.148	.125	.106	.087	25	.552	.486	.424	.367	.311	.263	.216
11	.245	.216	.188	.163	.139	.117	.096	26	.573	.506	.441	.382	.323	.274	.225
12	.268	.236	.206	.179	.151	.128	.105	27	.594	.524	.457	.395	.335	.284	.232
13	.290	.254	.222	.192	.163	.138	.113	28	.618	.545	.475	.411	.348	.294	.242
14	.312	.275	.239	.207	.175	.148	.122	29	.638	.564	.491	.424	.359	.303	.250
15	.334	.295	.257	.223	.188	.159	.131	30	.660	.583	.508	.438	.374	.313	.259

SLOPE REDUCTIONS.

When distances are measured on a slope they may be reduced to the equivalent horizontal distance by the following approximate rule:—subtract from the slope distance the square of the rise divided by twice the slope distance. Thus for a slope distance of 250.3 ft. and a rise of 15 ft. correction=15²÷2×250.3=.45 (by slide rule) or horizontal distance=250.3-.45=249.85. When vertical angle=V. A. is measured horizontal distance=slope distance—slope distance (1—Cos. V. A.). Thus for slope distance of 248.7 ft. and V. A. of 4° 20' from Table VIII Cos=.99714 and correction=1—.99714=.00286 per foot or total of .286×2½ (near enough)=.57 and horizontal distance=248.7—.57=248.13 ft.

See fig. (a). TRIGONOMETRICAL FORMULAS.

- sin. $A = \frac{a}{c}$
- cos. $A = \frac{b}{c}$
- tan. $A = \frac{a}{b}$
- cot. $A = \frac{b}{a}$
- sec. $A = \frac{c}{b}$
- cosec. $A = \frac{c}{a}$



FORMULA FOR SOLVING TRIANGLES.

Given	Sought.	Right triangles. See fig. (a).
a, c	A, B, b	sin. A = $\frac{a}{c}$, cos. B = $\frac{a}{c}$, b = $\sqrt{(c+a)(c-a)}$
a, b	A, B, c	tan. A = $\frac{a}{b}$, cot. B = $\frac{a}{b}$, c = $\sqrt{a^2+b^2}$
A, a	B, b, c	B = 90° - A, b = a cot. A, c = $\frac{a}{\sin. A}$
A, b	B, a, c	B = 90° - A, a = b tan. A, c = $\frac{b}{\cos. A}$
A, c	B, a, b	B = 90° - A, a = c sin. A, b = c cos. A
Given	Sought.	Oblique triangles. See fig. (b).
A, B, a	b	b = $\frac{a \sin. B}{\sin. A}$
A, a, b	B	sin. B = $\frac{b \sin. A}{a}$
a, b, C	A - B	tan. $\frac{1}{2}(A-B) = \frac{(a-b) \tan. \frac{1}{2}(A+B)}{a+b}$
a, b, c	A	$\left\{ \begin{array}{l} \text{If } s = \frac{1}{2}(a+b+c), \sin. \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{bc}} \\ \cos. \frac{1}{2}A = \sqrt{\frac{s(s-a)}{bc}}, \tan. \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}} \\ \sin. A = \frac{2\sqrt{s(s-a)(s-b)(s-c)}}{bc} \end{array} \right.$
A, B, C, a	area	area = $\frac{a^2 \sin. B \sin. C}{2 \sin. A}$
A, b, c	area	area = $\frac{1}{2}bc \sin. A$
a, b, c	area	s = $\frac{1}{2}(a+b+c)$, area = $\sqrt{s(s-a)(s-b)(s-c)}$

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.		
0	0	0	∞	1	90	1	∞	0	0		
10	.0029	.0029	343.8	.99998	50	.7660	1.1918	.8391	.6428		
20	.0058	.0058	171.9	.99996	40	.6428	.7660	1.1918	.6428		
30	.0087	.0087	114.6	.99993	30	.5196	.5196	1.1918	.5196		
40	.0116	.0116	85.94	.99989	20	.3964	.3964	1.1918	.3964		
50	.0145	.0145	68.75	.99989	10	.2732	.2732	1.1918	.2732		
1	.0175	.0175	57.29	.99985	89	.9823	1.1918	.0175	.0175		
10	.0204	.0204	49.10	.99979	50	.7660	1.1918	.0204	.0204		
20	.0233	.0233	42.96	.99973	40	.6428	.7660	.0233	.0233		
30	.0262	.0262	38.19	.99966	30	.5196	.5196	.0262	.0262		
40	.0291	.0291	34.37	.99958	20	.3964	.3964	.0291	.0291		
50	.0320	.0320	31.24	.99949	10	.2732	.2732	.0320	.0320		
2	.0349	.0349	28.64	.99939	88	.9823	1.1918	.0349	.0349		
10	.0378	.0378	26.43	.99929	50	.7660	1.1918	.0378	.0378		
20	.0407	.0407	24.54	.99917	40	.6428	.7660	.0407	.0407		
30	.0436	.0437	22.90	.99905	30	.5196	.5196	.0436	.0436		
40	.0465	.0466	21.47	.99892	20	.3964	.3964	.0465	.0465		
50	.0494	.0495	20.21	.99878	10	.2732	.2732	.0494	.0494		
3	.0523	.0524	19.08	.99863	87	.9823	1.1918	.0523	.0523		
10	.0552	.0553	18.07	.99847	50	.7660	1.1918	.0552	.0552		
20	.0581	.0582	17.17	.99831	40	.6428	.7660	.0581	.0581		
30	.0610	.0612	16.35	.99813	30	.5196	.5196	.0610	.0610		
40	.0640	.0641	15.60	.99795	20	.3964	.3964	.0640	.0640		
50	.0669	.0670	14.92	.99776	10	.2732	.2732	.0669	.0669		
4	.0698	.0699	14.30	.99756	86	.9823	1.1918	.0698	.0698		
10	.0727	.0729	13.73	.99736	50	.7660	1.1918	.0727	.0727		
20	.0756	.0758	13.20	.99714	40	.6428	.7660	.0756	.0756		
30	.0785	.0787	12.71	.99692	30	.5196	.5196	.0785	.0785		
40	.0814	.0816	12.25	.99668	20	.3964	.3964	.0814	.0814		
50	.0843	.0846	11.83	.99644	10	.2732	.2732	.0843	.0843		
5	.0872	.0875	11.43	.99619	85	.9823	1.1918	.0872	.0872		
10	.0901	.0904	11.06	.99594	50	.7660	1.1918	.0901	.0901		
20	.0929	.0934	10.71	.99567	40	.6428	.7660	.0929	.0929		
30	.0958	.0963	10.39	.99540	30	.5196	.5196	.0958	.0958		
40	.0987	.0992	10.08	.99511	20	.3964	.3964	.0987	.0987		
50	.1016	.1022	9.788	.99482	10	.2732	.2732	.1016	.1016		
6	.1045	.1051	9.514	.99452	84	.9823	1.1918	.1045	.1045		
10	.1074	.1080	9.255	.99421	50	.7660	1.1918	.1074	.1074		
20	.1103	.1110	9.010	.99390	40	.6428	.7660	.1103	.1103		
30	.1132	.1139	8.777	.99357	30	.5196	.5196	.1132	.1132		
40	.1161	.1169	8.556	.99324	20	.3964	.3964	.1161	.1161		
50	.1190	.1198	8.345	.99290	10	.2732	.2732	.1190	.1190		
7	.1219	.1228	8.144	.99255	83	.9823	1.1918	.1219	.1219		
10	.1248	.1257	7.953	.99219	50	.7660	1.1918	.1248	.1248		
20	.1276	.1287	7.770	.99182	40	.6428	.7660	.1276	.1276		
30	.1305	.1317	7.596	.99144	30	.5196	.5196	.1305	.1305		
40	.1334	.1346	7.429	.99106	20	.3964	.3964	.1334	.1334		
50	.1363	.1376	7.269	.99067	10	.2732	.2732	.1363	.1363		
	Cosin.	Cotg.	Tan.	Sine.	Angle.		Cosin.	Cotg.	Tan.	Sine.	Angle.

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

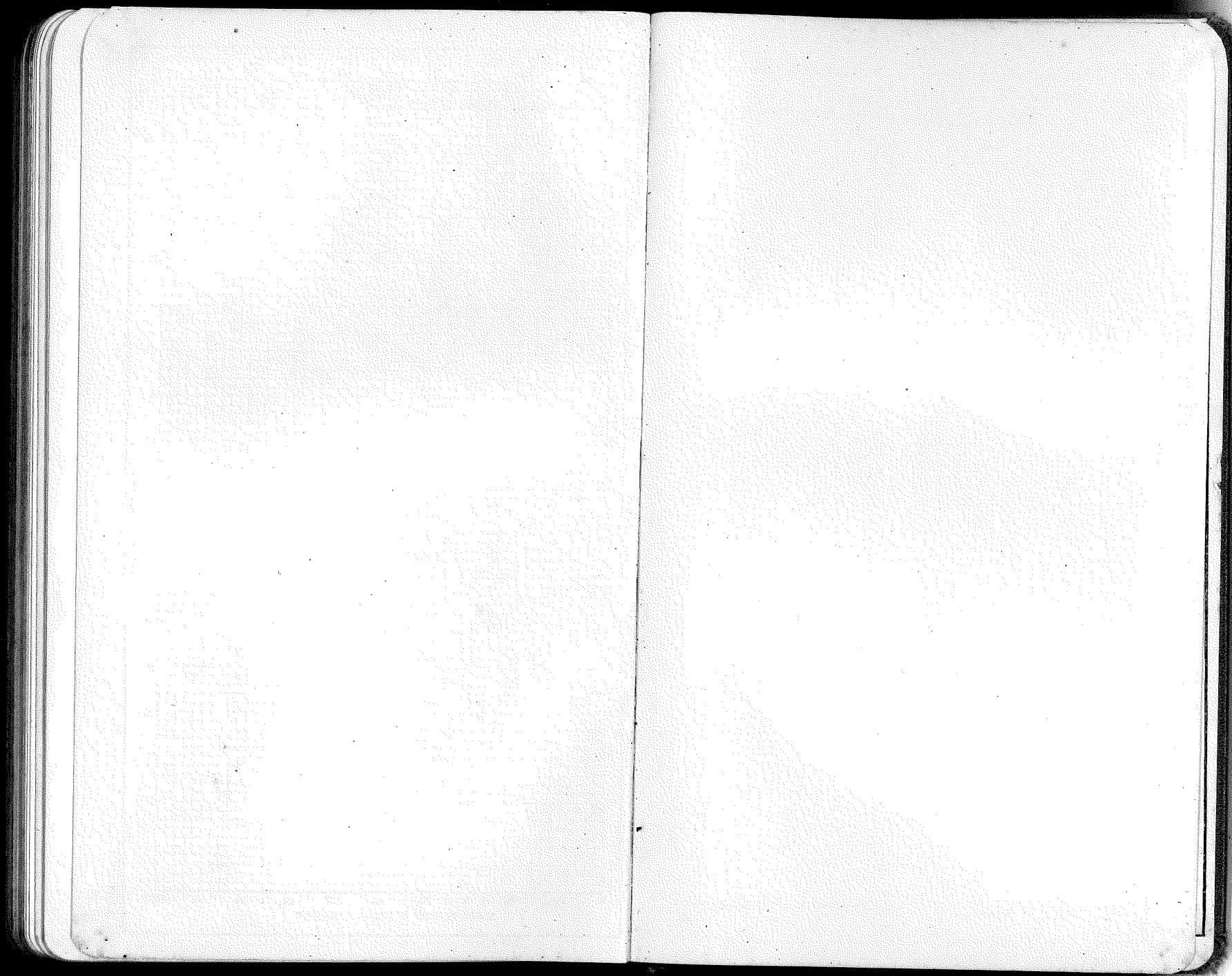
Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.		
16	.2756	.2867	3.487	.96126	74	.4067	.4452	2.246	.91355		
10	.2784	.2899	3.450	.96046	50	.4094	.4487	2.229	.91236		
20	.2812	.2931	3.412	.95964	40	.4120	.4522	2.211	.91116		
30	.2840	.2962	3.376	.95882	30	.4147	.4557	2.194	.90996		
40	.2868	.2994	3.340	.95799	20	.4173	.4592	2.177	.90875		
50	.2896	.3026	3.305	.95715	10	.4200	.4628	2.161	.90753		
17	.2924	.3057	3.271	.95615	73	.4226	.4663	2.145	.90631		
10	.2952	.3089	3.237	.95545	50	.4253	.4699	2.128	.90507		
20	.2979	.3121	3.204	.95459	40	.4279	.4734	2.112	.90383		
30	.3007	.3153	3.172	.95372	30	.4305	.4770	2.097	.90259		
40	.3035	.3185	3.140	.95284	20	.4331	.4806	2.081	.90133		
50	.3062	.3217	3.108	.95195	10	.4358	.4841	2.066	.90007		
18	.3090	.3249	3.078	.95106	72	.4384	.4877	2.050	.89879		
10	.3118	.3281	3.048	.95015	50	.4410	.4913	2.035	.89752		
20	.3145	.3314	3.018	.94924	40	.4436	.4950	2.020	.89623		
30	.3173	.3346	2.989	.94832	30	.4462	.4986	2.006	.89493		
40	.3201	.3378	2.960	.94740	20	.4488	.5022	1.991	.89363		
50	.3228	.3411	2.932	.94646	10	.4514	.5059	1.977	.89232		
19	.3256	.3443	2.904	.94552	71	.4540	.5095	1.963	.89101		
10	.3283	.3476	2.877	.94457	50	.4566	.5132	1.949	.88968		
20	.3311	.3508	2.850	.94361	40	.4592	.5169	1.935	.88835		
30	.3338	.3541	2.824	.94264	30	.4617	.5206	1.921	.88701		
40	.3365	.3574	2.798	.94167	20	.4643	.5243	1.907	.88566		
50	.3393	.3607	2.773	.94068	10	.4669	.5280	1.894	.88431		
20	.3420	.3640	2.747	.93969	70	.4695	.5317	1.881	.88295		
10	.3448	.3673	2.723	.93869	50	.4720	.5354	1.868	.88158		
20	.3475	.3706	2.699	.93769	40	.4746	.5392	1.855	.88020		
30	.3502	.3739	2.675	.93667	30	.4772	.5430	1.842	.87882		
40	.3529	.3772	2.651	.93565	20	.4797	.5467	1.829	.87743		
50	.3557	.3805	2.628	.93462	10	.4823	.5505	1.816	.87603		
21	.3584	.3839	2.605	.93358	69	.4848	.5543	1.804	.87462		
10	.3611	.3872	2.583	.93253	50	.4874	.5581	1.792	.87321		
20	.3638	.3906	2.560	.93148	40	.4899	.5619	1.780	.87178		
30	.3665	.3939	2.539	.93042	30	.4924	.5658	1.767	.87036		
40	.3692	.3973	2.517	.92935	20	.4950	.5696	1.756	.86892		
50	.3719	.4006	2.496	.92827	10	.4975	.5735	1.744	.86748		
22	.3746	.4040	2.475	.92718	68	.4900	.5774	1.732	.86603		
10	.3773	.4074	2.455	.92609	50	.4925	.5812	1.720	.86457		
20	.3800	.4108	2.434	.92499	40	.4950	.5851	1.709	.86310		
30	.3827	.4142	2.414	.92388	30	.4975	.5890	1.698	.86163		
40	.3854	.4176	2.394	.92276	20	.4950	.5930	1.686	.86015		
50	.3881	.4210	2.375	.92164	10	.4925	.5969	1.675	.85866		
23	.3907	.4245	2.356	.92050	67	.4900	.6009	1.664	.85717		
10	.3934	.4279	2.337	.91936	50	.4925	.6048	1.653	.85567		
20	.3961	.4314	2.318	.91822	40	.4950	.6088	1.643	.85416		
30	.3987	.4348	2.300	.91706	30	.4975	.6128	1.632	.85264		
40	.4014	.4383	2.282	.91590	20	.4950	.6168	1.621	.85112		
50	.4041	.4417	2.264	.91472	10	.4925	.6208	1.611	.84959		
	Cosin.	Cotg.	Tan.	Sine.	Angle.		Cosin.	Cotg.	Tan.	Sine.	Angle.

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.	
°					°					
32	.5299	.6249	1.600	.84805	58	.84805	1.600	.6249	.5299	
10	.5324	.6289	1.590	.84650	50	.84650	1.590	.6289	.5324	
20	.5348	.6330	1.580	.84495	40	.84495	1.580	.6330	.5348	
30	.5373	.6371	1.570	.84339	30	.84339	1.570	.6371	.5373	
40	.5398	.6412	1.560	.84182	20	.84182	1.560	.6412	.5398	
50	.5422	.6453	1.550	.84025	10	.84025	1.550	.6453	.5422	
33	.5446	.6494	1.540	.83867	57	.83867	1.540	.6494	.5446	
10	.5471	.6536	1.530	.83708	50	.83708	1.530	.6536	.5471	
20	.5495	.6577	1.520	.83549	40	.83549	1.520	.6577	.5495	
30	.5519	.6619	1.511	.83389	30	.83389	1.511	.6619	.5519	
40	.5544	.6661	1.501	.83228	20	.83228	1.501	.6661	.5544	
50	.5568	.6703	1.492	.83066	10	.83066	1.492	.6703	.5568	
34	.5592	.6745	1.483	.82904	56	.82904	1.483	.6745	.5592	
10	.5616	.6787	1.473	.82741	50	.82741	1.473	.6787	.5616	
20	.5640	.6830	1.464	.82577	40	.82577	1.464	.6830	.5640	
30	.5664	.6873	1.455	.82413	30	.82413	1.455	.6873	.5664	
40	.5688	.6916	1.446	.82248	20	.82248	1.446	.6916	.5688	
50	.5712	.6959	1.437	.82082	10	.82082	1.437	.6959	.5712	
35	.5736	.7002	1.428	.81915	55	.81915	1.428	.7002	.5736	
10	.5760	.7046	1.419	.81748	50	.81748	1.419	.7046	.5760	
20	.5783	.7089	1.411	.81580	40	.81580	1.411	.7089	.5783	
30	.5807	.7133	1.402	.81412	30	.81412	1.402	.7133	.5807	
40	.5831	.7177	1.393	.81242	20	.81242	1.393	.7177	.5831	
50	.5854	.7221	1.385	.81072	10	.81072	1.385	.7221	.5854	
36	.5878	.7265	1.376	.80902	54	.80902	1.376	.7265	.5878	
10	.5901	.7310	1.368	.80730	50	.80730	1.368	.7310	.5901	
20	.5925	.7355	1.360	.80558	40	.80558	1.360	.7355	.5925	
30	.5948	.7400	1.351	.80386	30	.80386	1.351	.7400	.5948	
40	.5972	.7445	1.343	.80212	20	.80212	1.343	.7445	.5972	
50	.5995	.7490	1.335	.80038	10	.80038	1.335	.7490	.5995	
37	.6018	.7536	1.327	.79864	53	.79864	1.327	.7536	.6018	
10	.6041	.7581	1.319	.79688	50	.79688	1.319	.7581	.6041	
20	.6065	.7627	1.311	.79512	40	.79512	1.311	.7627	.6065	
30	.6088	.7673	1.303	.79335	30	.79335	1.303	.7673	.6088	
40	.6111	.7720	1.295	.79158	20	.79158	1.295	.7720	.6111	
50	.6134	.7766	1.288	.78980	10	.78980	1.288	.7766	.6134	
38	.6157	.7813	1.280	.78801	52	.78801	1.280	.7813	.6157	
10	.6180	.7860	1.272	.78622	50	.78622	1.272	.7860	.6180	
20	.6202	.7907	1.265	.78442	40	.78442	1.265	.7907	.6202	
39	.6225	.7954	1.257	.78261	51	.78261	1.257	.7954	.6225	
10	.6248	.8002	1.250	.78079	50	.78079	1.250	.8002	.6248	
20	.6271	.8050	1.242	.77897	40	.77897	1.242	.8050	.6271	
39	.6293	.8098	1.235	.77715	51	.77715	1.235	.8098	.6293	
10	.6316	.8146	1.228	.77531	50	.77531	1.228	.8146	.6316	
20	.6338	.8195	1.220	.77347	40	.77347	1.220	.8195	.6338	
30	.6361	.8243	1.213	.77162	30	.77162	1.213	.8243	.6361	
40	.6383	.8292	1.206	.76977	20	.76977	1.206	.8292	.6383	
50	.6406	.8342	1.199	.76791	10	.76791	1.199	.8342	.6406	
40	.6428	.8391	1.192	.76604	50	.76604	1.192	.8391	.6428	
10	.6450	.8441	1.185	.76417	50	.76417	1.185	.8441	.6450	
20	.6472	.8491	1.178	.76229	40	.76229	1.178	.8491	.6472	
30	.6494	.8541	1.171	.76041	30	.76041	1.171	.8541	.6494	
40	.6517	.8591	1.164	.75851	20	.75851	1.164	.8591	.6517	
50	.6539	.8642	1.157	.75661	10	.75661	1.157	.8642	.6539	
41	.6561	.8693	1.150	.75471	49	.75471	1.150	.8693	.6561	
10	.6583	.8744	1.144	.75280	50	.75280	1.144	.8744	.6583	
20	.6604	.8796	1.137	.75088	40	.75088	1.137	.8796	.6604	
30	.6626	.8847	1.130	.74896	30	.74896	1.130	.8847	.6626	
40	.6648	.8899	1.124	.74703	20	.74703	1.124	.8899	.6648	
50	.6670	.8952	1.117	.74509	10	.74509	1.117	.8952	.6670	
42	.6691	.9004	1.111	.74314	48	.74314	1.111	.9004	.6691	
10	.6713	.9057	1.104	.74120	50	.74120	1.104	.9057	.6713	
20	.6734	.9110	1.098	.73924	40	.73924	1.098	.9110	.6734	
30	.6756	.9163	1.091	.73728	30	.73728	1.091	.9163	.6756	
40	.6777	.9217	1.085	.73531	20	.73531	1.085	.9217	.6777	
50	.6799	.9271	1.079	.73333	10	.73333	1.079	.9271	.6799	
43	.6820	.9325	1.072	.73135	47	.73135	1.072	.9325	.6820	
10	.6841	.9380	1.066	.72937	50	.72937	1.066	.9380	.6841	
20	.6862	.9435	1.060	.72737	40	.72737	1.060	.9435	.6862	
30	.6884	.9490	1.054	.72537	30	.72537	1.054	.9490	.6884	
40	.6905	.9545	1.048	.72337	20	.72337	1.048	.9545	.6905	
50	.6926	.9601	1.042	.72136	10	.72136	1.042	.9601	.6926	
44	.6947	.9657	1.036	.71934	46	.71934	1.036	.9657	.6947	
10	.6968	.9713	1.030	.71732	50	.71732	1.030	.9713	.6968	
20	.6988	.9770	1.024	.71529	40	.71529	1.024	.9770	.6988	
30	.7009	.9827	1.018	.71325	30	.71325	1.018	.9827	.7009	
40	.7030	.9884	1.012	.71121	20	.71121	1.012	.9884	.7030	
50	.7050	.9942	1.006	.70916	10	.70916	1.006	.9942	.7050	
						.7071	1.	1.	.7071	
									°	
	Cosin.	Cotg.	Tan.	Sine.	Angle.	Cosin.	Cotg.	Tan.	Sine.	Angle.

TABLE IX.—CALCULATION OF EARTHWORK.

Width	HEIGHT														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.02	.04	.06	.07	.09	.11	.13	.15	.17	.18	.20	.22	.24	.26	.28
2	.04	.07	.11	.15	.18	.22	.26	.30	.33	.37	.41	.44	.48	.52	.56
3	.06	.11	.17	.22	.28	.33	.39	.44	.50	.56	.61	.67	.72	.78	.83
4	.07	.15	.22	.30	.37	.44	.52	.59	.67	.74	.81	.89	.96	1.04	1.11
5	.09	.19	.28	.37	.46	.56	.65	.74	.83	.93	1.02	1.11	1.20	1.30	1.39
6	.11	.22	.33	.44	.56	.67	.78	.89	1.00	1.11	1.22	1.33	1.44	1.55	1.67
7	.13	.26	.39	.52	.65	.78	.91	1.04	1.16	1.30	1.42	1.55	1.68	1.81	1.94
8	.15	.30	.44	.59	.74	.89	1.04	1.19	1.33	1.48	1.63	1.78	1.92	2.08	2.22
9	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50
10	.18	.37	.56	.74	.93	1.11	1.30	1.48	1.67	1.85	2.04	2.22	2.41	2.59	2.78
11	.20	.41	.61	.82	1.02	1.22	1.43	1.63	1.83	2.04	2.24	2.44	2.65	2.85	3.06
12	.22	.44	.67	.89	1.11	1.33	1.56	1.78	2.00	2.22	2.44	2.67	2.89	3.11	3.33
13	.24	.48	.72	.96	1.20	1.44	1.68	1.92	2.16	2.41	2.65	2.89	3.13	3.37	3.61
14	.26	.52	.78	1.04	1.30	1.55	1.81	2.08	2.33	2.59	2.85	3.11	3.37	3.63	3.89
15	.28	.56	.83	1.11	1.39	1.67	1.94	2.22	2.50	2.78	3.06	3.33	3.61	3.89	4.17
16	.30	.59	.89	1.18	1.48	1.78	2.07	2.37	2.67	2.96	3.26	3.56	3.85	4.15	4.44
17	.31	.63	.94	1.26	1.57	1.89	2.20	2.52	2.83	3.15	3.46	3.78	4.09	4.41	4.72
18	.33	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00
19	.35	.70	1.06	1.41	1.76	2.11	2.46	2.82	3.17	3.52	3.87	4.22	4.57	4.92	5.28
20	.37	.74	1.11	1.48	1.85	2.22	2.59	2.96	3.33	3.70	4.07	4.44	4.81	5.18	5.56
21	.39	.78	1.17	1.55	1.94	2.33	2.72	3.11	3.50	3.89	4.28	4.67	5.06	5.44	5.83
22	.41	.81	1.22	1.63	2.04	2.44									



**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	26.2	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.

21

7-1900 / 1000 / 2000 / 3000

2000

2000

32-4-5-1-1900

21