

Moul's Ev.

No 3.

50

FIELD BOOK

360

KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND

SURVEYING INSTRUMENTS.

NEW YORK.

CHICAGO.

SAN FRANCISCO.

ST. LOU

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTION IN

ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.

FOR SINGLE TRACK EXCAVATION.

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

Calculated by Julien A. Hall, M. Am. Soc. C. E.

For Keith's Railroad Curve-Tables see end of book.

Dec. 11-142-31 - Kunkle + We Surg.
7 1/2 bot No 2 - Page 6 to 19.

Dec. 31-141-27 - School District
140-27-sub. Page 20 to 22

Dec 20-138-29 - State Sand-
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Setting of mon. - 138-29 Dec 20 -
52

Dec. 9 - 134-30 -	53 -
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L. E. Cor. Dec 10 " "	56

Dec 1-2 - 137-30 -	80-83-95
Dec - 14-5 - 137-30 -	84-94
Dec. 1+2 - 136-31	
" 11+12 - " "	96-

Morse Lake Surg

Setting mon. - 138-29-138-30-104+105-

7 Since Surg 136-31	} 107-
S " " 137-31	

Walker-Minn. July 11-1910.

Came up on afternoon train to survey for Kinkadee and McSury.

July 12-1910.

Surveying for Kinkadee & McSury.

Sec. 11-14-23-31.

Charlie Chatfield, Tom Kennedy and I.

We went to MC No 12, found Norway washed down but could see where it stood by a hole in the bank. Setting Transit on true line down east on 91° Var. Norway (blazed) on line so I set transit 1 foot south of line and run east - 90° Var.

570 we couldn't find cor - 2-3-10-11. We hunted within a radius of 100 feet or more.

We then went to Walker.

Wed. July 13-1910.

Curtis, Chatfield, Kennedy and I.

We went to the New Agency and Posa took us to cor of 13-14-23-24 where we found an iron stake which was set by James W. Middleton or John Bartlett.

Good notes call for -

YP 16 \backslash 83° E 37 lbs = 24.42 ft.

YP 14 \backslash 59° W 25 " = 16.50 "

YP 18 S 65° W 31 " = 20.40 "

YP 10 S 55° E 51 " = 33.66 "

Set connection now - B.T.'s stand as follows - 9° Var.

Y.P. 18 N 83° 14' E 24.60 feet.

Y.P. 14 N 61° - W 16.42 "

Y.P. 18 S 64° - W 20.45 "

Y.P. 10 S 54° 52' E 38.10 "

We concluded that the surveyor had ignored the SE B.T. and set the iron from the other 3 B.T.'s.

All the stumps were plainly marked.

We then ran a compass line north. 1° Var. Rough chain. Found an old cut out hole.

2640 stake in small round meadow.

5300 we found cor - 11 - 12 - 13 - 14.

Found an old stake marked -

11 - 12 - 13 - 14.

Now notes call for -

Birch 37 19 E 41 chs = 27.06 ft.

Pop 7 15 1 W 41 " = 32.34 "

R. ash 8 8 3 7 W 66 " = 43.56 "

W.P. 18 55 1/2 E 75 " = 49.50 "

We cut pin from the Popi and R. ash & find setting in stake hole. W.P. blown down - we found no marks so did not use it. No trace of Birch.

Old B.T.'s then stood -

R. ash

Poplar

8

142-31

Set new BT's as follows

Setting transit on gas 3 men
west - 40' ea.

250 - cross wagon road - N+S

510 Hub on small ridge

1010.40 Hub

1395.20 Hub

Thurs. July 14 - 1910

Bob Ross, Charlie Chatfield + 5
continuing yesterday's line

1721.40 Hub

2086.30 Hub

On account of a yellow Norway
being in line to set a new hub
at 2086.30, $1\frac{1}{2}$ feet north, and
at 1721.40, $1\frac{1}{2}$ feet north, then
continued west - line being $1\frac{1}{2}$
feet north.

At 2640 no trace of $\frac{1}{4}$ cor.

Wood. holes call for - It's X at 2

WP 30877 E 11 lbs =

YP 24779 E 62 " =

2705.50 Hub

3159.20 Hub

3200 ft in log pile

Sec. 11-142-31

9

At about 3240 - water's edge - on
enter Buck Lake.

MC. No 10 - 1500. Notes call for -

WP 18 N $1\frac{1}{2}$ W 43 lbs

Bk 3 S 78 E 53 "

could find no trace of W. line.

Friday, July 15-1910

Bob. Ross, Charlie Chatfield & I.

Setting Transit on cor. 11-12-13-14

Turn north 90° Var.

445.50 Hub.

911.15 Hub

1208.10 "

1645.90 "

Saturday July 16-10.

Ross, Chatfield and I.

Continuing yesterday's line.

2181.30 Hub

On account of 20" WP being in line
I got 1 foot east - Hub 1645.90 and
Hub 2181.30. Then continued
north on line which is 1 foot
east.

2623.40 old stake sets 1.30 feet west.

I found 2 old stakes, both

plainly marked $\frac{1}{4}$ sec. on 2 sides.

1500. Notes call for - O to F at 5

R. Sub 4 N 51 E 27

MP 30 S 15 W 50

10 Su. 11 - 142 - 31

One was on the ground and the other standing. There is no doubt but what it was set from the SW B.T., which is still there but blown over - could find no marks as it was badly burned. Checked about right for course and measurement. Could not find NE B.T. Evidently rotted.

Sunday July 17 - 1910

Went to Pine River on night train.

Monday July 18 - 1910.

Back to Walker in P.M.

Tuesday July 19 - 1910.

Ross, Chatfield, Ben King + J.
Continuing line north from
 $\frac{1}{4}$ post, east side of Su 11. - being
1.3 feet east of line at $\frac{1}{4}$ post.

500.30 Sack in 20" x 54" bag.

1085.10 Hub

1635 Hub

2049.30 Hub

2405.70 Hub

2640 Pin

Sec. 11 - 142 - 31.

East Boundary.

11

NE Cor Sec 11 - 1500. Notes call for -
1-2 - 11 - 12

WP 30 N 72 E 194 = 128.04 feet

4P 30 N 22 1/2 W 242 = 159.72 "

4P 30 S 66 1/2 E 70 = 46.20 "

We hunted a short time but
didn't find BT's - but I think
they are there. The post
evidently sits in a small meadow
which is east of my line - as
the BT's set so far away - probably
at the edge of the meadow.
Two blazed line trees also
indicated that it sits in meadow.

Wed. July 20 - 1910.

Ross, Chatfield, King + S.

Setting Transit on 1/4 post, east
side of Sec. 11, Run west, 90° R.

548.70 1st sub

1179.20 1st sub

1588.10 1st sub

1949 1st sub

2146 1st sub

12

Dec. 11 - 142 - 31.

Partly
clear

E. + W Center Line.

2514.50 Hub

Thursday July 21 - 1910.

Ross, Chatfield, King + S.

Continuing yesterday's line.

2640 Hub at foot of hill west side.

2777 Hub

3247 Hub

3481.80 Hub

3960 Hub

3969.10 Hub

4383.75 Hub

4691.60 Hub - about 10 feet east of
the water edge.

4700 enter Suck Lake.

Friday July 22 - 1910.

Ross, Chatfield, King + S.

In A.M. we hunted for 1/4 cor
south side of Dec. 11.A 4x20 blazed on two sides
stands about 115 feet south of the
line to run to the lake. I went
back and hunted on south side
line but could not find any

Dec. 11 - 142 - 31

partly
Record

13

North Boundary.

sign of B.T.s for $\frac{1}{4}$ cor. I also
looked at lake edge and
found no sign of MC B.T.s.
We then moved up to MC
No 12.

Setting transition on hub which
is 15 feet east of MC. - set from
the NP B.T. I find the line
hits a LP 30 which is blazed
on two sides - old line blaze.

At MC No 12 - 1500. Notes call for -

LP 18 N 64 E 43 - 28.38

Bush 85 1 1/2 W 23

Set a small hub 1 foot south
and run east - 90° or

15 small hub

35 C. Blazed NP 30°

480.90 Hub on hill

687.40 Hub on hill

900 deep valley

1208.15 Sink in old bog.

1410 enter small bog

1700 leave bog

1886.90 Hub on hill

2000 Run on W. side of hill

570 - see notes July 12

Sec. 11-142-31 - north boundary.
14 Saturday - July 23 - 1910.

Ross-Chatfield, King & J.

Continuing line east.

partly
Recorded

We cut about 400 feet of line and
it rained. 1/2 day fall.

Sunday July 24 - 1910.
At Pine River.

Monday July 25 - 1910.
To Walker in P. M.

Tuesday July 26 - 1910.
King, Chatfield & J. (Ross & J. King).
Continuing line east.

1/4 post - north side of Sec 11-142-31

Gov. notes call for H & O at 2

1 P 20 N 20 E 77 lbs = 57.42 feet

1 P 27 S 52 W 58 " = 38.28 "

146.40 Hilt

796.80 Hub on Pine Ridge

3181.00 1/4 post sets south 38.70 feet.

Found both B.T. (strings) plainly
marked. SW BT nearly all buried,
only a shell left with BT plain.

N+S. Center Line
No 17-142-31.

Partly 15
Recorded

NW BT cut high. Set a 3" x 3" x 24"
oak stake marked 1/4-1/4-X-X
by flat measurement.

BTs stood as follows - 90° far.

LP St 20 N 10° W 57.42 ft

LP " 27 S 63° 35' W 38.28 ft

Setting transition stake 9
run ~~south~~ 90° far.

332.80 Hub

Wed. July 27-1910.
Chatfield, King, Windyworth + S.
Continuing yesterday's line south

MC N^o 12 - found.

Sec. Cor - 2-3-10-11 - found.

$\frac{1}{4}$ Cor - between 2 & 11 found

Cor - 1-2-11-12 - lost.

$\frac{1}{4}$ Cor - between 11 & 12 - found.

Cor. - 11-12-13-14 - found.

$\frac{1}{4}$ Cor - between 11 & 14 lost.

MC N^o 10 found.

17



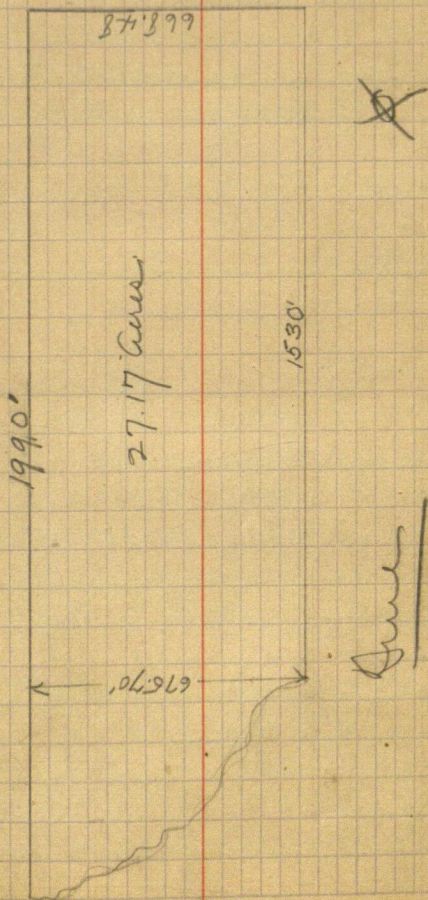
18

Partly Recorded

Partly Recorded

19

N $\frac{1}{2}$ of Lot. No 2 - Sec. 11 - 142-31



20

Sec. 31-141-27.

212

Tuesday - Sept. 27-1910.

School District No 1.

Left Pine River with stage-bound
for Songville. Fare \$1.50Arrived at Songville at 3:30 P.M.

Wed. Sept. 28-1910.

Jim Ford

George Ford

John Smith

A. W. Moultrie

In A.M., Wm Burrell drove me
from Songville to John Smith
place. John then took me to
the SW cor of Sec. 31-141-27.I found Ben Clark's stake
but found no bearing tree.We then walked to the NW cor
Sec 6-140-27 where we found
a stake - Hov. notes call for sec 21.I found that the stake was
set 30° south of east of the W.P.
(the spruce gone). The W.P. was
down but plainly marked.

Setting transit where B.T.

Record No 212

SW Cor - Sec. 31 - 141-27 212

How. note call for - T-

Ang. 14 N 10 W 14 lbs = 9.24 fut.

maybe 7 N 40 E 26 " = 17.16 "

NW Cor - Sec. 6 - 140-27

A - WP 14 S 30 E 20 = 13.20

Apr 4 S 76 W 140 = 92.40

had formerly been set a
stake by course and measurement.
80 Variation.

Then run west on 80 Var.

At 376.20 - Hub.

Found a large rotten poplar
stump, also a rotten maple
stump. Set a pin by measure-
ment, then set machine on pin,
the course checked within 2°.

It was the only large poplar
near - and only maple I have
found - called it the corner.

At _____ put SW Cor 31 - 141-27
sets south _____ feet

Then Bearings at SW Cor 31 - 141-27

WP stump 18 - S 52° 24' W 2.26 fut.

Record No 212 212 *

22

141-27

Setting Transit on SW cor Sec
 21-141-27 - Run north $8^{\circ}30'$ Pac.

300 Pin

600 Hub

900 Pin

1200 Pin

1320 Hub

Quit for day.

Warden.

212

Record No 212

212

Dec. 20 - 138-29.

214

23

Wed. June 14 - 1911.

Ed. B. Boman - J. - ~~roval~~

Saturday last we moved to head
of Norway Lake - walked to
SE Cor. 20.

Pro. notes call for - 19-20-29-30
Sum 10 N 24 E 20 = (wrong)
" 18 N 26 W 18 = 7.92
" 6 S 63 W - - - -
" 6 S 10 E 15

Found N E - N W bearing
plainly marked. Also ~~also~~
a corner which was previously
set by Curo. he put in a new
bearing, viz:

Sum app 8 S 67 1/2 W 8.50

Relate from NW + NW SW.

Revised.

SE Cor - 20

We then walked 1 mile east -
found SE Cor. Dec. 20 - New Bearing
Curo put in -

NP app N 23 W 40.10 ft to
trip in slip

NP app. S 54° 44' E 2870 feet
to trip in string.

Record No 214

214

²⁴ S Bound Dec 20-138-29
214 Thurs. June 15-1911.

A Rounds } at night
Ed Bowman } X foot

Clyde Hall - chairman
Pettung on SW cor 70,
near east 8° 30' var.

200 In - 400 - 600 - 800

(all in tomorrow morning)

925 leave swamp

1000 Pin

1054 Hub on knoll

1160 entire dry land

1200 Pin in " "

1400 " " " "

1508 leave " "

1600 Pin

1800 Hub

2000

2200

2400

14 Cor - S side 20 - 180 v. notes &
call for - 180 v. at 8

B Pin 7 N 70 W 178 (or 118) = 117.48

" " 9 S 89 W 168 = 110.88

Record N° 214 **214**

do

138-~~29~~214²⁵

2427.70 Hub

2560 entire dry shew

2600 Pin in " "

2640 Hub - Dmg 1/4 cor.

No trace of 1/4 corner. ←

2800

3000

3200

3375 - leaves shew - entire ^{pin} from very

3400

3600

3800

4000

4200

4375 leave among

4400 On

→ At 2609.30, just east, 1/4
cor. sets south 37.30' just
180° 30'

Found this 1/4 cor. later - taken
from Curcio's notes. He set
this several years ago from
the point B. to.

Record No 214 ²¹⁴

²⁶
21⁴ 138-29 do
Friday June 16 - 1911

A Round
Ed. Bowman, Olat.

Clyde Hall

O.W.M.

Cont. up line east.

4453.60 Hub

4550 enter sup - $\pi + S$

4600

4800

4900 leave sup - $\pi W + S$

5000

5200

8°20'

SE Cor. Rec. 20 - Curve put
in new bearings - see Page 73

at 5293.10 feet east, SE Cor
20 sets north 40.90 feet.

Found string marked
by curve.

5293.20 Hub - 1 foot east of
east wheel track of main
wagon road $\pi + S$.

21⁴

Record No 214

East Bound, Run 20-138-29 21

214

Setting on SE Cor 20, run
north $8^{\circ}15'$ Var

200

400

600

800

960.30 Hub

1000

1200

1400

1600

1800

1839.55 Hub in road.

$\frac{1}{4}$ cor - west side of sec 20 -
gro. note call for -
R to Cat 3 -

$NP15 \ N48E \ 15 = 9.90$

$NP12 \ N13W \ 76 = 50.16$

2000

2200

2400

2600

No 40 - Hub - Temp $\frac{1}{4}$ Cor -
no trace of $\frac{1}{4}$ cor.

214

Record No 214

214

do

138-29

2800 Hub

3000

3200

3400

3600

3800

4000

4129.60 Hub on hill

4200

4400

4600

4800

5000

5200

At NE Cor. sec. 20 - 7/11. Hub
found 7 red B's. 14
in new bearings -
16-17-20-21

NP 14 N 3 W 16

XP 8 S 63 W 95

Shore notes
are evidently for
the cor. 1 mile
north of this corner
Not necessary
way
A.W.M.

16-17-20-21 -

Gov. notes call for -

NP 9 N 83 E 47 = 31.02

NP 10 N 65 W 91 = 60.06

Recad No 214

13829 214

29

NP 8 313 1/2 W 127 = 83.82

NP 9 564 E 51 = 33.66

5277.4 Hub - Page 37.

West Bound. Dec. 20

Date June 17 - 1911.

R-boat.

Bowman, Hall, Rounds & J.

Setting on SW cor 20 -
run north 805 ft.

(In swamp.)

210

400

600

687.45 Hub

800

1000

1200

1400

1406.6 Hub

1600

1800

2000

Recad No 214 214

30

138-29

West Bound - 20

214

1/4 post - West side of 20 -

Gov. note call for - 8 to Bat 3 -

Jan 7 870 W 6 = 3.96

Jan 6 772 E 4 = 2.66

2024.4 Hub

7700 Ten

7400

7600

7661.60 Hub

At 7654 feet north - 1/4 cor
on west side of sec 20 sets
west 10.35 feet.

Found both bearing trees,
dead and broken off about
5 feet high. Marked plain
ditch by measuring 1-
courses checking. Shows
a 3 foot 3 1/3 post with top
in top.

The measurements over an
4 ft. ^{width} 13 proportioned.

Record No 214

214

N¹³⁸/₂ of W Bound - Dec. 20²⁹ 1914³¹

Putting on 1/2 cor - west side
of W - over north 8° X an.
1200 -

Sunday June 18th 1911
at home.

Monday June 19th 1911

Bowman Hall to O-trat
Cont. Put. line north.

400

600

646.90 Hub

800

1000

1200

1370 - Hub - Dings 1/16 cor

1400

1600

1800

2000 Hub

2200 - 2400 - 2500 home sup

2600

2640 Hub - Dings 1/16 cor
Record N^o 214

1914

214 Bound - Sec 20

138-29

At NW cor - 20 - No. notes
call for - 17-18-19-20

NP 20 755 E 117 = 77.22

NP 16 749 W 67 = 44.22

NP 12 578 W 75 = 49.50

BP 12 547 E 154 = 101.64

Tuesday June 20 - 1911.

Hall, Bowman + S. O. boat

I found the N E string -
the old logs plain but marks
very faint - ^{at all marks string} the string badly
burned. At the NW + SW I found
strings - badly burned but
measurement checking out to
.5 ft - courses clearly within
a 1-5-3 - At SE found
old y P slip - badly burned -
measurement nearly checking
also course.

As I found the above strings
on a narrow neck of land
between the swamp and
S. 214 all mentioned the
Record No 214

NW Cor. Sec. 20. 138-29. 33
214

corner could not be any
other place near - and at
the stumps check for size,
kind, distance and course
to call it O.K.

The NE bearing tree shows
the old blaze very plain -
showing the old air marks -
but the B.T. is not visible.

At 2662 feet north -
NW corner of Sec. 20 sets west
3.40 feet.

to put in new bearing - 8°

JP 4 N $5^{\circ}30'E$ 9.12 feet

JP 5 N $6^{\circ}18'45''W$ 3.70 "

Record No 214 # 214

34 North Bound. Dec. 20 - 138.29

214

Putting on NW Cor Dec 20
3 run east 8° 30' Var.

68 enter small round mine
200

755 leave " " "

400

546.10 Hub.

600

650 ^{enter} small round bog

700 leave same

800

958.40 Hub

1000

1200

1320 Hub - Sump 1/16 Cor.

~~1400~~

Wed. June 21st 1911.

Bowman, Hill, John
Crossman + S. O + boat
Cont. N Bound west.

214

1600

1800

1802.40 Hub

Record N = 214

Lo - 138-29

35

1/214

$\frac{1}{4}$ post - 9/1 side Sec. 20 - low.

notes call for - K to W at 5

BbP 8 S 50 E 07 = 11.22

BbP 9 N 47 W 30 = 19.80

2555.40 Hilt

2600

Found the SE bearing line -
standing, and $\frac{1}{4}$ R very plain,
also old blaze at brown but
burned so B $\frac{1}{4}$ was not visible.

Put on by me & course -
8:30' low.

At 2651.55 feet east, $\frac{1}{4}$
post on side of 20 sets south
3.70 feet.

Then continued random
line east.

2800

3000

Record N = 214 - 214

26
214

do - 138-29

3075 Hub

3710 enter sup - dead line - 71+5

3400

3600

3656 leave sup

3729 Hub

3800

4000

4200

4217.20 Hub

4400

4600

Shun. June 28 - 91
O - lost

Bowman, cushion, Hall & S

cont. east.

4695.25 Hub

4800

5000

5200

at 71 E Co. 70 - 1500. notes call

for 214 - page 28

Record No 214

NE Cor 20.

138-29

37

214

Found NE plumb - part of
BT showing - SW step north
BT plumb - SE turned step.
NW turned step.

at cor from NE - SW T2 s.

at 5302.90 east - NE Cor
20 sets south 22.22 feet.

East Bound - 20.

at 5289.40 N - NE Cor
20 sets east 9.38 feet

$\frac{1}{4}$ cor - east side 20.

at 2640 - $\frac{1}{4}$ cor. sets
North 4.70 feet, and east
4.69 feet.

Record N=214 **214**

138-29

E + W Center Survey.

214

Putting on $\frac{1}{2}$ cor. east
side 20 - run west - $8^{\circ}30'$ N.

200

223.50 Hub

400

600

630.6 Hub

800 enter meadow + clear land N 1/2
and SE - extending 1000 feet N.
and 600 S.

1000

1200

1400

1600

1800 leave meadow - clear, N 1/2
and S

1947.10 Hub

2000

Friday June 23 -
all out. met.

Bourman \$100

214

Record No 214

20-188-29
214 39

Saturday June 24-

Sunday June 25-

Monday June 26-

Discharge boat.

Bowman, Hall, Crossman - 9

Cont. Friday: line west.

2900

2369.60 Hub

2400

2600

2640 - Hub, Aug Aug. 7 Dec

2800

2850 into low land

3000

3200 " low swamp

3400

3600

3800

Record No 214 214

40 E + W Center line ¹³⁸⁻²⁹

214 running west

3960 Hub - Sing $\frac{1}{16}$

4000

4075 leave sing NE + SW

4095.60 Hub

4200

4370.45 Hub

4400

4500 enter sing N + S

4600

4800

5000

5700

At 5295.85 quit west, $\frac{1}{4}$
cor. on west side of 20, sets
rough 24.10 feet

214

Record No 214

138-29
N + S Center Line Sec. 20. 41
Running south 214

Tuesday - June 27-1911
Hall, Buchanan, Crossman & J.
Sizminis boat.

Putting on $\frac{1}{4}$ post - N side
Sec. 20 - run South $8^{\circ}10'$ Var.

150 enter meadow E side
300
400
600
800
1000
1100 - point gland - 1/4 from E side
1400
1320 Hub - Swamp $\frac{1}{4}$ C
1400
1450 leave meadow - NW - SE
1571.10 Hub
1600
1800
2000
2150.70 Hub
2200

Record No 214 + 214

~~114~~ 214

20 138-29

2400

2600

2640 Hub

Hub

Random

At 2648.90 South, N + S Center
line intersects E + W Random
Center line at 2649.70 west
Hub —

2775 - enter meadow below

2800 ¹⁰ have same

3000

3100 enter creek bottom small

3200

3250 local same

3350 - meadow E + W

3400

3600

3800 leave meadow N + S E.

4000

4200

4400

4500 - 1 Hub

214 or 1 No 214

Record
No 214

do —

188-29 214 ⁴³

4600

4800

5000 Sub $80^{\circ}15'$

5200

5225 entire meadow E + W.

At 5364.30 south, $\frac{1}{4}$ cor -
south side of 20, sets west
35.45 feet.

($\frac{1}{4}$ cor. set by Cur about 5 years
ago - he had a B T then - no
flow of it now. I was with
him then.) $180^{\circ}15'$

Center of Rec. 20

2648.90 S sets west 17.53 feet.

= 2649.70 + 17.50 = 2667.20
West.

2667.20 W sets south 12.14 feet.

\therefore W 2648.90 sets west 17.53 feet
and south 12.14 feet = 214
center of section 20.

[illegible]

$\frac{1}{16}$ cor. bet. $\frac{1}{4}$ cor on north
side of section - sets at
1330.52 South and west
8.8 feet.

1/16 cor - S 7 NW cor section 26
Pits at 1331 feet north, and
west 1.70 feet

Record No 214
214

E + W Center June 27 NW $\frac{1}{4}$ 214
Running west.

Wed. June 28 - 1911. 50¢
Hall - ~~B. Duran~~ ~~cross~~
~~and D.~~

~~Edmund's boat.~~

Setting on $\frac{1}{16}$ cor - bet. $\frac{1}{4}$
cor. on north side of road center
of section - true west, $80^{\circ}30'$

40 leave meadow

200

400

521.50 Hub on hill

600

800

1000

1200

1320 - Hub - Sump $\frac{1}{16}$

1368.60 Hub

1400

1600

1800

1908.10 Hub

2000 - enter Tam. swamp

Record No 214

214

214

du — 138-29

2200

2400

2600

At 2640.80 feet west, $\frac{1}{16}$ cor.
south, NW cor 20 - sets
south 820 feet.

$\frac{1}{16}$ cor - bet. $\frac{1}{4}$ cor on west
side 720 and center of section.
Sets at 3981.57 west, and
south 18.12 feet.

$\frac{1}{16}$ cor - bet. NW cor 20 and
 $\frac{1}{4}$ cor on north side —
Sets at 1325.75 east, and
south 1.85 feet.

214

Record No 214

138-29

N + S Center Line \nearrow NW $\frac{1}{4}$ - 20
 Running north

Thursday June 27 214

Hall-Brown-Crossroads
 x boat. Dated 10: A.M.

Putting on $\frac{1}{16}$ ft center
 section and $\frac{1}{4}$ on west side
 run north 8° Yae

100 leave sup - \nearrow E + SW

175.6 Hub

200

400

600

700

835.40 Hub in park \nearrow ESW

1000

Hub center ~~section~~

1175 leave

1200.

At 1340.85 feet north, interest
 E + W Center Line at $\frac{1}{3}$ 6.50
 feet west.

1400

Record N = 214

214

48 **214**

do - 138-29

Friday June 30 - 1911

504

Hall - Bowmar, Crossman & 2.
x boat,

6 hours

1417

Hub

1600

1800

2000

2200

2400

2600

2663.70 Hub

At 2661.90 feet north - $\frac{1}{16}$
cor east of Hub cor to sets
west 7.80 feet.

214

Record No 214

138-29

214

49

Center of NW $\frac{1}{4}$ - Sec 20

W 1316.50 sets south
10 feet and west
3.90 feet.

W 1316.50 sets west 3.90
feet and south 10 feet.

Sunday - Aug 1 - 1911.

W. M. + 2 - Sec. 20 - 13.8-29
State Rec. Board

Wed. Aug 2 - 1911
John Kline (low m. plan)
Wm. Waynes
J. W. M.

Sub. dividing NE $\frac{1}{4}$ NW
Sec. 20 - 138-29

Record No 214

214

59 **214**

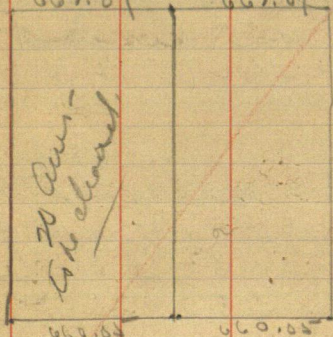
138-29

NE 1/4 NW 1/4

Sec. 20 - 138-29

662.87

662.87

**214**

Record No 214

N Line Swp. 137-30 ~~218~~ 5/
218

Shurs. Aug 3 - 1911.

Foster and I worked on
north line Swp. 137-30.

Isac Norman in A.M.

At $\frac{1}{4}$ cor. - N side sec. 3 -

Gov. notes call for - d -

BP 10 S $19\frac{1}{2}^{\circ}$ E 13 = 8.58 feet.

" 8 N $19\frac{1}{2}^{\circ}$ E 33 = 21.78 "

We found both bearings -
plainly marked - have been cut
off just above upper blaze.

Set cor. by measurement,
courses throw mess. way off.

Old BTs then stand to

BP Stub 6' high N $27^{\circ}4'$ E - 21.78

" " 6' " S $24^{\circ}52'$ E 8.58

We set iron monument in
cement. (2" x 48")

218

218

52/214 138-29-

Setting monuments.

Geo. Moulson - 2.

July 6th

Set corners in Sec 20-138-29

Fig:

SW cor - 2" x 48"

1/4 cor on West - 1 1/4" x 6'

NW cor 2" x 48"

1/4 cor on South 1 1/4" x 8'

1/4 " " North 2" x 48" - incement

July 7th

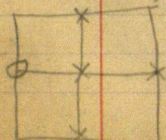
Set -

N E - S E and 1/4 cor on west
all 2" x 48" - set in cement

July 8th

Set - center Sec - 2" x 48"

1/4 cor also following corners -



X = 1 1/4" x 48"

O = 1 1/4" x 6'

Record No 214

NW 1/4 Sec 20 214

134-30 - cont. from
Book No 4

53

Spack Bound. Dec. 10

Tuesday Aug. 15 - 1911.

Steve Collins x (means chairman
+ playman)

George "

Thomas "

Setting on Survey, S. E. Cor
Sec. 9 - Run east by backsighting
on random line returning west
of said corner.

35 enter dredging sluic

700

192

375 leave " " "

400

577.75 Hub on hill

600

800 hub on hill

1000

1200

1264.30 Hub on hill

1300

1400 - depression

1500

1600

192 Recorded

54 South Boundary Rec. 10-134-30
1681 - Center big rock in road on line
1688.70 Hub
1800

1875 enter dried up stream N + S
2000 leave " " NE + S
2200
2400

2483 Hub

2600

2640

2775 - cross road NE + SW

At about 2798 - an old stake
sets north about 15 feet.

At $\frac{1}{4}$ cor. south side 10 - 1500.

Notes call for - Book 4 - Page 149
I to X at 3 -

True 38 NS 7 E 38 = 25.08

Bir 8 S 11 E 35 = 23.10

No trace of $\frac{1}{4}$ cor.

Cont. east.

2800

2925 enter ^{small} meadow

3000

3200 leave

3400 Pin west side high hill

3600 " " " "

Recorded

1921

do. 134-30

55

192

3800

3808.20 Hub on top of hill.

4000

4200

4400

4600

4788.40 Hub on hill

4800

5000

At SE Cor. Dec. 10 - Geo. notes

call for - 10-11-14-15

Time 36 N 18 W 13 = 8.58

" 36 S 48 W 33 = 21.78

" 24 S 48 E 49 = 37.34

" 30 N 72 E 77 = 50.82 ✓

Recorded
192

56 SE Cor Sec. 10-134-30

1922 Wednesday Aug. 16-1911
191 Same area -

At the SE Cor Sec. 10- I found the State has set the corner, and I drove on 3 short pieces of pipe, 1 piece being driven straight for the corner and the other 2 starting towards the SE & SE. thus indicating that that is Forest Reserve.

They evidently set the cor. from the old B.T. - as shown below. I found the N North bearing ~~4~~ blazed and marked B.T.

Putting transit over from the old string the station is
9° Var.

Pine string burned	N 7° 30' W	7.75 ft.
" " "	N 20' E	50.60 "
" " "	S 47° W	21.30 "
" " "	S 48° 30' E	37.30 "

(Both North on marked B.T.)

An account of the NW B.T. being badly burned they marked the large stump on the east edge.

1922 Recorded

20-134-30 192 57

The SE - SW are so badly
burned that the measuring
was done by holding the ~~chain~~
~~tape~~ tape at the approximate
P.O.T.

at 5290.10 feet east, SE
Cor. Sec. 10 sets south
60.50 feet.

Little pot hole near S 75W 80 feet

We piled rocks around pipes

5 find that the state surveyor
used that "Scrub" $\frac{1}{4}$ post on
the south side of 10 - as we
found his iron $\frac{1}{16}$ cor. - the
key way between the $\frac{1}{4}$ cor. and
SE cor. - 10. Two pipes ($1\frac{1}{4}$)
1 stone straight and the other
slanting. N 45° E.

192

Recorded

58

192

East Bound Rec. 16 - 134 - 30

Going back to the Supp. S.E. Cor.

Sec. 9 - continued random
line south.

2800 Pin on south side of big hill

3000 " " top " " "

3084.30 Hub " " " "

3700 Pin " south side " " "

3400 do

3500 with small dry pot hole.

3600

3675 leave " " " "

3800 Pin south side hill

1/4 cor. bet. 15 + 16 - Gov. note
call for - Q to 1 at 4 -

Pine 11 S 6 W 11 = 7.76 feet.

T. plan 13 S 55 E 4 = 2.64 "

4000

do

4200

"

4400

"

4570.50 Hub on high hill around

4600

4800

Pin south side hill

4900

with small stream

5000

do

192

Recorded

5780 - no trace $\frac{1}{4}$ - east side 16.
Everything buried.

5785 - entire small round meadow

5400

5475 - same same

5600

5800

5928.70 Hub - there abrupt decline south.

Thursday, Aug. 17-1911.

Drive over. Cont. go line south.

6000 Pin south side hill

6200 in low land

6400 - foot of hill

6600 - top of hill

6635 Hub on top of hill

6800 - south foot of hill - entire
small round meadow

7000

7100 live meadow

7200

Recorded 192

60 192 to 134-30
7400 in small meadow

7560 here "

7600 on T. ring line

7761.80 Hub on hill 9°20' Var

7800

2014
2012
15

SE Cor. Dec. 16 - Hov. notes
coll for - 15-16-21-22

NP 14 S 24° E 61 = 40.26

Pine 26 N 5° E 75 = 49.50

" 30 S 63° E 95 = 68.70

Round the NP SE B.T., being
a string and the B.T. showed.
The marks are dim but show,
the B being plain and the T not
showing well.

Putting Transit over string
out T. ring, cor. 9°20' Var.

Putting on string, cor. we cut
out and find the NE string ^{20"}
badly buried, but chipping
for course & meas.

Putting out S 63° E, & find
WT uprooted and badly buried
20" or longer.

192

Recorded

SE Cor. Sec. 16 134-30 61

checking for me. but being
about 20' too far east.

Then for my Survey. SE Cor
Sec 16 is correct.

At 7918 South $\frac{1}{4}$ cor - on
east side of sec 9 - SE cor.
Sec. 16 sets east 31.50 feet.

At SE-Cor 16 - to put in new.

Planning -

Payton 8 N 81° E 61.50 feet
Hobbs 6 S 15° 37' W 166.76 "

As I did not have my marking
iron, I made the BT's with
stakes.

Used a 3" x 3" x 24" poplar
stake - piled rocks around,
well up on stake. Also in the
NE Cor. of little meadow, about
140 feet ^{or more} north of water's edge -
Soggy Lake.

Chris witnessed setting &
corner - etc.

I fastened old BT with
jacks - mize, and filled with tar

62

2 E + W Center Line Dec. 9-134-20

3

Putting on 1/4 corner, east side
Dec. 9 - turn west 90° R.

700

- clearing

400

588

Cur^{main} road - NE + SW

600

700

enter timber

800

1000

1200

1291.40 Hub

1320

Hub - Turn 1/6 cor

1400

1420

- road NW - SE - to Cedar

1600

- in small meadow

1800

1977.20 Hub

2000

2200

2400

2536.30 Hub - edge corn field

2600

in

2800

" field

192

Recorded

134-30

do

192

63

2817. Hub

Friday - Aug 18 - 1911

some new - etc

Con. up line west

3000

3200

3350 - Hub - then part

north 344

part of the line

continued west. (offset around

Hoy Lake.)

3400 (3350 + 50)

3600

3800

4000

4200

4400

4589.36. Hub in field

4600

4800 - 4900 enter meadow

5000

5200 - Hub on meadow - 9:15 P.M.

Recorded 192

66

192

West Bound Rec. 9-134-30.

Setting Transit over NW Cor.

Rec 9- (in sup.) which is at least
 spring from old to T's - river
 South $8^{\circ} 15'$ Var.

200

400

600

800

1000

1200

1400

1600

1800

2000

2200

2400

2600

2800

3000 - No trace NW Cor.

3156 - Hub on brook

3200

3400

3459.60 $\rightarrow 8^{\circ} 45'$ Hub - 7 feet north of E+W
 wagon road

192

Recorded

MC No 18 134-30 65

192

1/4 cor. west side Sec. 9 -
Sod. water call for R to C at 5
W. X. Cor. Round 536 = 353.76
Pine 7 S. 45 E 84 = 55.44 feet

MC - No 18, Sod water call for -
Pine 18 North 27 = 17.82
" 15 N 55 W 54 = 35.64

At MC No 18 - found 2 old
stumps. Emmett Cole says the
NP was plainly marked some
time ago. The old blaze shows
plain now. The WP is badly
blamed - no blaze showing.
As they are the only two stumps
that will check at all, they are
no doubt the old BT's.

2 set corner by meas. from
both stumps. They then
stand - 2° 30' Var
WP stump N 10° W 17.87
NP " N 53° 43' W 35.64

Recorded 1921

66

192

do

134-30

Drive a 3" x 3" x 70" stake for
corner and put in two
Bearings - viz: $8^{\circ} 30' \text{ Var}$
 $NP 10 \text{ N } 79^{\circ} 48' \text{ E } 48.55 \text{ feet}$
 $NP 11 \text{ N } 65^{\circ} 30' \text{ W } 78.80 \text{ ''}$
 to top heads.

OK 3494.60 feet south,
 MC No 18 sets west 53.34 feet.

Position $7/4$ corner,
 west side Sec. 9 134-30.

Hor. chain from NW cor. Sec 9
 to MC No 18 = 3465 feet.
 Thy chain = 3494.60 "

$$3465 : 3494.60 : 7640 : x$$

$$x = 2667.4$$

$$3465 : 3494.60 : 875 : x$$

$$x = 837.4$$

$$2667 + 837 = 3494 - \text{check}$$

192

Recorded

Correction ¹³⁴⁻³⁰ for $\frac{1}{4}$ Cor **192** ⁴⁷
west side Sec 9-134-30

$\frac{1}{4}$ corner, west side
Sec 9 - sets at 2667 South
and west 40.6 feet.

$\frac{1}{4}$ Cor - West side Sec 9-134-30

Set Aug. 19-1911
Same and etc.

Set the $\frac{1}{4}$ corner on west
side of Sec 9. Put down a
tamarack pole 18 feet long,
squared at big end, $3\frac{1}{2}'' \times 3\frac{1}{2}''$.
Pushed it down in bog until
7 feet sq. end stuck out.

2 feet in bearing -
courses might vary on account
of setting transit on Capt bog.
90° Var. -

Run 4 S $52^{\circ} 30'$ W 167.65 feet.

" 7 N 54° W 183.10 "

So back heads drove in blaze

192

At 5108.70 feet west, on east
west center line Sec 9, $\frac{1}{4}$ cor.
sets south - 327.30 feet.

344 - 327.30 - 16.70. " at 5108.20 W. or E +
10 feet North | W. Cap. Random line from sets North 16.70 feet.

Record
checked every nighting there on first top of line and
measuring.

48

N+S Center Line Sec. 9-134-20.

192

Setting transit on $\frac{1}{4}$ Corner, north
side Sec. 9 - (which is at last spring)
run south $8^{\circ}30'$ Var. (Swampy.)

200

400

600 - 700 leave swampy.

800

834.70 Hub

1000

1200

1320 Hub - Spring $\frac{1}{16}$ Cor

1400

1600

1750 cross wagon road - NW+SE - Colin

1800

1858.45 Hub

2000

2200

2400

2600

At 2658 South, N+S Center
Random line crosses E+W
Center Random line at
2493.30 feet West.

Jul 192

Recorded

no

192

do - 134-30

2800

3110

3200

3250 enter small meadow

3400

3475 leave meadow

3600

3800

4000 Hub

4200

4235 Road N E + S

4400

4600 Hub 8040'

4800

4900 enter small meadow

150 ft. wide E + W

5000

5200

5290 Hub

Sunday Aug 20 - '11

4 Am Notes -

1 day Cass Co.

192

Recorded

184-30
Correction -

192

71

Monday Aug. 21 - 1911.

SE Corner Rec. 9 - 134-30 -
Established as follows -

Sod. chain from $\frac{1}{4}$ Cor. on east
side Rec. 9 to SE Cor. Rec. 16 =
 $7640 + 5280 = 7920$ feet.

My chain = 7918 feet.

\therefore position on SE Cor. Rec. 9
for N + S =

$7920 : 7640 : 7918 : x$

$x = 2639.34$ = distance Rec. Cor.
S to point on $\frac{1}{4}$ Cor. on west side Rec. 9

Sod. chain from RE Cor. Rec. 10
to MC to 21 =

5286.6 and 3861 negatively
 $5286.6 + 3861 = 9147.6$ feet

My chain = $5290.10 + 3751.30 =$
9041.40 feet.

192

Recorded

17

192

20

134-30

Position of E Cor. Sec. 9 for
East and West -

$$9147.6 : 5286.6 :: 9041.40 : x$$

$x = 5224.70 = \text{distance S E}$
Cor. Sec. 9 sets west of E Cor. Sec. 10.

$$9147.6 : 3861 :: 9041.40 : x$$

$$x = 3816.20$$

$3816.20 + 5224.70 = 9041.40$
which checks

\therefore Survey E E Cor. Sec. 9 -
sets east 65.40 feet and north
.66 feet.

1/4 Cor. - South side Sec. 9 -
rod chain from S E Cor. Sec. 9 to
MC No 21 -

$$\begin{array}{rcl} 40 \text{ chain} & = & 7640 \text{ feet} \\ 18.50 \text{ "} & = & 1221 \text{ "} \end{array} \quad \left. \vphantom{\begin{array}{rcl} 40 \text{ chain} & = & 7640 \text{ feet} \\ 18.50 \text{ "} & = & 1221 \text{ "} \end{array}} \right\} = 3861 \text{ feet}$$

My chain = 3816.20 feet.

$$3861 : 7640 :: 3816.20 : x$$

$x = 7609.4 = \text{distance 1/4 Cor.}$
192
Recorded

192

South side Sec 9 - sets west
SE Cor Sec 9.

3861: 1221: 3816.70 X

X = 1206.80 = distance from
1/4 Cor on S of 9 to MC No 71
1206.8 + 2609.4 = 3816.20
which checks O.K.

2640 - Jump 1/4 Cor on S side
9 - sets east 96 feet and
south 14 feet.

1/4 Cor. south side 9 - sets on
random line at 2544 feet.

1/16 Cor - bet. NE Cor Sec 9
and 1/4 Cor on east side

1370 set north .75 feet and
east 10.39 feet.

Recorded

192

24

Dec. 9 - 134-30

192 Tuesday Aug. 27-1911.

Same crew etc.

Went to the S E cor. Dec 9 being
on west side of dry slum.

Put in 10 soundings — viz.

NP 8. N $47^{\circ}24'$ W. 104.40

XP 11 S $54^{\circ}49'$ W. 138.30

Big Rock on east side of meadow
stands N $78^{\circ}51'$ E to highest point.

90 Yds.

For corner we drove a 3 x 5 x 20
with out stakes

Put 1/4 corner on south
side Dec. 9 - being about 15 feet
south of small meadow.

Used a 2 x 2 x 14 with brick
stakes

Bearing — 90 Yds.

Point XP 5 S $48^{\circ}10'$ W 24.45

XP 6 S $30^{\circ}44'$ E 43.03

Recorded

192

192

At 5303.90 feet south, on
North and South Center Sine
of Section 9, $\frac{1}{4}$ corner on south
side sets west 31.73 feet.

Set the $\frac{1}{16}$ cor. south of
NE Cor. Sec. 9.
Bearing - 70° 10'.

Point 6 N 4° 53' W 37.38
N 10° 10' E 40.50

E & W Center Sine of NE $\frac{1}{4}$ Sec 9.

Setting on above $\frac{1}{16}$ cor -
run west - 8° 50' 10'.

200

400

450 center survey

600

760 alone

810

1000. Sub

1200

1400

1600

192

Recorded

72

1800

192

to

134-30

2000

Hub

2150

entr small meadow

2200

Pm

2300

home " " "

at 2535 feet west, $\frac{1}{16}$ corner
 north center of sec. into north
10.44 feet

192

Recorded

Corrections - Dec 9 - 134-30⁷⁷

192

Center of Section.

Hub No. S 2658 sets west 15.6
feet and north 8.15 feet * (820)

$\frac{1}{16}$ corner South of Center of Section
Sets at 3976.9 South, and
west 23.40 feet.

$\frac{1}{16}$ corner North of Center of Section
Sets at 1325 feet South and
west 7.83 feet.

N + S Center Line
1858.45 sets west 10.90 feet
4600 " " 27 "

$\frac{1}{16}$ cor. south of $\frac{1}{4}$ cor. on east
side Sec.

sets at 1319.67 south and east
37.70 feet.

Recorded

192

75

Dec. 9 - 134 30 1921

Set 1/16 North of Center of sec.
Bearing - 9° Var.

TP 12 S 67° 30' W 20.70
Poplar 5 S 37° 14' E 58.73
Horse 3 x 3 x 16" Poplar stake.

Set Center of sec. 3 x 3 x 18" Poplar
Bearing 9° Var.

Poplar Stake 4 N 88° 8' E 60.55
Bundled string Pine S 21° 39' E 41.90

Set 1/16 Cor. South of Center of sec.
Bearing 90°

TP 9 N 35° 44' W 37.03
TP 6 S 54° 10' W 28.95
3 x 3 x 18 inch of 5 stakes

Set 1/16 Cor. South of 1/4 corner
East side of sec. 9.
3 x 3 x 16 inch stake.
Piled stones around

192

Recorded

184-30

192

Correction - E + W angle
 Sine of π E $\frac{1}{4}$ Sec 9.

1000	sine north	4.1	feet
2000	" "	8.2	"

Set $\frac{1}{16}$ corner east of SW Cor
 Sec. 3 ... - above $\frac{1}{2}$ " x 1" iron.

Wednesday Aug 13 -

To Pulley - the Pine River
~~\$2.00~~ ~~\$1.32~~

Recorded

192

20

Aug. 137. R-30.

Walden

Monday Aug. 28-1911

296

Trump Horn - fly + chman
 John Crossman - alman
 (Dane Norman along)
 A.M.

Det. Section 1+7-

At SW cor. Sec. 1 - 1200. 2000

call for - 1-2-11-12

P 10 S 37 E 23 = 15.18

P 14 N 24 W 29 = 19.14

" 5 S 67 W 25 = 16.50

NP 10 N 38 E. 30 = 19.80

Ref cor. from NW + NE B.T's

By measurement =

det B.T's then stand -

NP 14 N 41° 30' E 19.80

P 25 15 N 38° 30' W 19.14

P 10 10° 10'

SW + SE bearings

Putting on corner - run north

10° 10'

Trail close charming

West Bound Dec. 1, 1937-38

100 leave highland

200

300 enter meadow 296

400

600

800

950 leave meadow

1000

1200 Hub

1320 " Sings $\frac{1}{16}$ cor.

1400

1430.55 Hub on Stoney river, (E+W)

General direction NW - SE

1450 enter river

1515 leave river, enter bogalike

1600

1800

1900 enter meadow

2000

2200

2400

2500 leave meadow

2578 Hub

2600

2640 - To trace - $\frac{1}{4}$ cor. This is line

all cut close to ground

cont. north

Tr 296

do - 137-30

1/4 corner bet. Sec. 1 + 7.

Sec. 7, T. 10 N. - Q to F at 6

SP 87124 E 21 = 13.86

W. 7 S 58 W 7 = 4.62

2800

2945.60 Hub

3000

3200

3400

3600

3800

4000

4096.40 Hub

4200

4400

4600

4800

5000

5200

9°30'

TV SE Cor. Rec. 5-137-20
Tuesday Aug 29-1911

296

SE Cor. Rec. 5-137-20
4-5-8-9
WP 16 N 63 E 17 = 11.22
" 8 N 57 W 11 = 7.26
" 10 S 15 E 36 = 23.76
Head Pile 18 S 60 W 37 = 24.42

Same Crew -

Swing beam. 83.50

Went to Seaford -

Went to SE Cor. Rec. 5 -

Set Cor. ^{ing. mcs.} pole old BT (S - except
SW one - gone. All BTs down and
badly burned - could not see marks,
but lines all right size, kind, and
stand about right. Balizes plain
3 1/2 x 3 1/2 x 2 inch slabs, 6' above
ground.

New Bearings -

Oct 7 S 27° 7' E 33.80
Bin 7 N 33° 34' E 35.60

90° Var. To look head

(found an old stone - 10' south of mine
and under it)

East Bound. Run 5 - 137-30 25-

Setting on S.E. Cor - Run 5 - 296
near north, 91° E.

10 enter bogalder

200

250 leave

400

600 Hub -

800

1000

1200

1261.70 Hub

1279.50 - Wire fence to W

1400

1600

1700 enter dry meadow

1800

2000

2200

2400 leave meadow

2600

76

137-30

$\frac{1}{4}$ corner - east side Dec 5-
137-30 - 1500 rods - R-C-L
S 87° 50' W 23 = 15.18 feet
S 65° 80' E 35 = 23.10 "

296

Wednesday, Aug. 30 - 1911.

Same crew etc.

Found the $\frac{1}{4}$ corner between
4+5. NW a stub 5' high, all marks
very plain - SE a tree all marks
plain. Set a stake by meas.

Old BTs then stand -

Stub	N 50	W 15.18
Tree	S 78° 30' E	28.80

90° Var.

At 2644.50 feet north, $\frac{1}{4}$ cor.
between 4+5, sets west 13.55 feet.

I set above $\frac{1}{4}$ cor. by meas + course
from NW BT - the course from
SE BT then checked. 90° Var.

She shows the Gov. surveyor
made a mistake measuring from
the SE B.T.

NW East Bound. Dec 5 - 137-20²⁷

Sitting on 1/2 sec. bet. 4 + 5
run north 90° var.

296

200

400

600 Hub

800

1000

1200

1350 Hub

1400

1600

1800

2000

2200

2236 Hub

2271 On main road. NW + SE

2380 into NW land NW + SE

2400

Jack Pine

8°40'

11

do

N.E. Cor

N.E. Cor. Sec. 5 - 137.30 - 100.

Notes - C

Elm 20 S 8 E 435 = 287.10 ft.

WP 35 S 23 W 360 = 237.60 "

Same 10 N 1 E 542 = 357.72 "

296

Kind large burned WP stump on high ground. Norman says it is the old B.T. John says he saw the marks plain, before tree was cut + burned. The inside of stump is burned out, leaving a shell on both sides showing the two old blow holes plain.

No other large WP along main, near.

Not N.E. Cor. Sec. 5, from WP B.T. stump, by course near. 90° var.

Kind old stump, which might have been B.T., don't know, var.

Return Elm 70 S 10 30' E 767.50

Same 10 N 7 E 367.00

East Bound. Rec 5 - NE Cor. 79
¹³⁷⁻³⁰
Thursday Aug 31 - 1911

Same creek etc.

296

At 7685.20 feet North, on
the $\frac{1}{2}$ of East Bound. Rec 5,
NE Cor Rec 5 sets west 78.93 feet.

Cor. 75 feet North of New River

About 14 or 15 years ago. (2200
Norman swears to this) a certain
Mr. Trey, a logger, cleared up
the meadow where the NE Cor
Rec 5 stands, for logging purposes.

He put in a dam below stream,
and changed the channel of the
river to its present channel.

Old channel shows plain.
The NE Cor. Rec 5 now sets
north of the New river, and
south of the old river.

90 East Bound Rec. 8. - 137-30.

296 Putting on cor. 4-5-8-9 -
run north, 90° Var.

200

400 Hub

500 enter lowland

555 deep - $71^{\circ}E + W$ ($71^{\circ}E$)

600

800

1000

1200

1320 Hub - Sump $1/16$ on dry point

1400

1440.75 Hub

5000 in

1600 enter grassy meadow

$1/4$ post - bet 8+9 - low, var. -

R to Cat 5 -

WP 35 S 35 E 33 = 21.78

Bul 6 S 84 W 37 = 21.12

1800

2000

2200

2400

2600

2797.80 Hub by fence

137-30

296²¹

Curr's corner stands from
WT string -

S35E 19.71 feet - 90° Var

At 2797.30 feet South, $\frac{1}{4}$ cor
between 8 & 9 sets west
16 feet.

Above $\frac{1}{4}$ cor. set by Curr.

Mike Thompson saw Curr
put it where it is. 2x4 post.
marked $\frac{1}{4}$.

String marked Old B.T.

C. V.
This corner sets correct from
the heart of the string of the old
SE BT Curr

97

137-30

Friday, Sept. 1, - 1911.

Same Chis. etc.

296 Corrections.

North $\frac{1}{2}$ of East Bound. Sec. 5-13720

$\frac{1}{16}$ cor. sets at 1354.30 North,
and west 39.80 feet.

(Prog. the meas.)

600 sets west. 17.6 feet.

2736 " " 65.8 "



South $\frac{1}{2}$ of East Bound. Sec 5.

600 sets west 3.06 feet.

$\frac{1}{16}$ cor. sets at 1327.25 North,
and west 6.77 feet.

$\frac{1}{16}$ contains
 100 ch. from $\frac{1}{16}$ cor. to N E cor. Sec 5 =
 19.65 ch = 1296.90
 100 ch. from $\frac{1}{4}$ post to N E cor. = 2616.90
 my chain = 2685.20

Position $\frac{1}{16}$ -
 $2616.9 : 2685.20 : 1320 : x$
 $x = 1354.30$

N 1/4 Sec 8 - 137.20

400 sets west $\frac{1}{16}$ post

$\frac{1}{16}$ cor. sets South at 1398.65
 and west 8 feet.

94 296

137-30

Setting on N.E. Cor. Sec 5,
run south, $10^{\circ}15'$ Var.

(To get point of crossing road
which angles around mill.)

90 cu. Rio River-

200

250 highland

291.60 ft

We then worked at cutting out line
around river, to straighten road.

Set. Sept. 7-911.

River crew all - except Norman
absent.

Crew worked A.M.

Corrections for West Bound.

Dec. 1-137-30.

Position of $\frac{1}{4}$ corner.

Sub. ch. from SW cor. to NW cor. = $79.12 = 5221.92$ feet.

My ch. = 5311

Sub. ch. from $\frac{1}{4}$ cor. on W side
Dec. 1 to NW cor. = $39.12 = 2581.92$

$5221.92 : 2640 : 5311 : X$

$X = 2684.90$

~~X checked.
to set~~

$\therefore \frac{1}{4}$ cor. sets at 2685 North and
west ——— feet.

$\frac{1}{16}$ cor. bet SW cor. & $\frac{1}{4}$ cor. on West.

$2685 \div 2 = 1342.50$

sets at 1342.50 North and
west 3.90 feet.

4096.40 sets west 12.48

2945.60 " " 8.70

1700 " " 3.50

96

136-31

Moose Lake

191 Monday Sept 18-1911

✓ Sept Pine River at 11:30 P.M.
 ✓ rode with stage to countrymans.
 Home —

Tuesday Sept. 19-1911.

136-31

Recorded

Cor. 1-2-11-17 - Mod. notes
 call for —

W 31 5 57 4 E 4 = 2.64 feet

" 6 7 50 W 10 = 6.6

" 6 3 20 1/2 W 20 = 13.20

Cor. 5 7 29 1/2 E 21 = 13.86

1/4 cor. bet. 1 + 2 - Mod. notes —

✓ O to 7 at 6.

✓ Same 8 7 76 W 9 = 5.94

" 12 S 55 1/2 E 24 = 15.84

7 W Cor. Dec. 1 - Mod. notes call for F.

✓ Head P 12 S 17 W 128 = 84.48

Asy 8 S 19 E 207 = 136.67

West Bound. Dec. 1-136-34) 97

Mr. Powell - ch - fly man
Herbert Wenholz as man
Frank Countryman " 191

cor- 1-2-11-12-
Countryman showed me the old
stumps - and stumps - he
saw Marks plane - years ago
and says the Marks were
burned this spring. Stumps
and chips - John, Dick, +
Holt used this corner -

Sitting on cor- 1-2-11-12
run north 80° 15' Var.

200

300 enter lowland

400

500 leave " "

600

800

1000

1138.70 Hub on rise

1200

1400 ^{down} interrupted for sup. 71E - SW

Record 191

191

191

98

1600

1800

2000

2100

2200

2250

2400

2600

2640

do -

136-31

191

leave ring

216330

Hub

Hub

Hub

Hub

Hub

Hub

Hub

Hub

Hub

Hub

Hub

Hub

Hub

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note

heavy brush

86/09

enter ring

1/4 post between 1 + 7 - 1500. notes
call for - page 96

Hub both PTs - plainly marked
and all marks present.

SE, a stub, 13" dry, burned, about 25
feet high - standing.

Hub 8" pole down in bog, full
length. Round old stub.

in mud, 15 feet long - marked 1/2
on 9 sides - 10 cut on top 2 1/2 feet and

set for cor. PTs check. (only 2 - 8 feet long, and 1
too far south. (only 2 - 8 feet long, and 1
standing in old notes.)

At No 59.80 North, 1/4 post bet
1 + 7 sets west 14.05 feet.

191

N¹/₄ W of West Bound. Sec. 1 - 24
136-31 136-31

Setting on $\frac{1}{4}$ cor. bet 1+2 -
run north 8°15' E.

200

400

Wednesday, Sept 20-1911.

Same as its -
Cont. up. line North.

600

636.60 Hub

700

1000

1200

1260 leave swg - with joint high
land.

1320 Hub

1400

1529 Hub

1600

1700 enter creek edge of meadow

1800

2000

2100 leave " "

2200

Record

191

100

191

do

136-31

2299.10 Hub

2400

2600

2770 - Hub in ditch on west
side of E. W. graded road.At Hub Cor. Rec 1 - 1500, note
call for - on page 96.

Find no truly bearing.

Sm. Hk. Sections 11+12

Thursday Sept 21-1911

Same crew as

Setting on cor. 1-2-11-12-

run south 8° 40' W

200

300

400

600

800

1000

1200

Hub

1400

1600

Record

191

Smith, Dickson 11 + 12 - cont 101
136-31

191

1600

2000 Hub

2130 cross creek bottom

2200

2250 cross creek - NE + SW

$\frac{1}{4}$ cor. bet. 11 + 12 - 1500. notes

call for - 0 to 7 at 5

Asp 18 N 50 W 15 = 9.90 feet.

W 6 S 55 $\frac{1}{2}$ E 20 = 13.20 "

2350 cross creek bottom

2400

2600

2640 - Hub - 2000 $\frac{1}{4}$ cor -

No trace $\frac{1}{4}$ cor - find stake
set by 1 tablets - no tree check.

Continue south

2800

3000 Hub

3200

3400

3600

3800

3998.35 Hub

191

Recorded

107

4000 91

do -

136-21

4200

4400

4575

enter pen area - NE + SW

4600

4800

SE Cor. Dec. 11 - 1200. notes

call for - 11-17-13-14

Jan 14 S 45 E 9 = 5.94 feet

" 16 S 36 W 21 = 13.86 "

" 11 N 31 E 47 = 31.07 "

" 10 N 10 1/2 W 68 = 44.88

Friday Sept. 27 - 1911

Same crew etc.

(Wentholz finds 1st B.T.)

SE Cor. Dec. 11

Kind SE BT - a dead stub
hook of at stump - marked plain
R 31 W S 13. all other marks
burned.Kind NE BT - down + burned -
marked plain S 12 - all other
marks burned

1191

136-31 SE Cor. Sec 11 191

163

Do not find SWBT.

Kind filling 7NW - chub -
no marks

Set corner from SE stop - 8°30'
for - 7W stop then chub - can
not tell what exact place where
SE stood - approximate position
chub -

At 5303 feet South, SE
Cor. Sec. 11 sets east 60.80 feet.
There a 3" x 3" x 3" Kam. post.

Correction - lat. 11 + 14

At 2440 - 1/4 cor. lat. 11 + 14 set
south 11.50 feet and east
30.40 feet.

new set east	24.90
1200 "	13.75
300 "	3.44

Recd

191

104

36-31. MORIS -

In P.M. we put 2" gal. iron
mons. well filled around ditch
cement and rocks at the following
corners -

✓ 1-2-11-12
1/4 cor. bet 11+12

Saturday, Sept 23-1911

A.M. To Pine River on stage	75¢
P.M. " Walker " train	91¢

Sunday - Sept 24

A.M. To Pine River	more time	91¢
--------------------	-----------	-----

Monday Sept 25

Morse Lake Subg.

Tuesday Sept 26

Chas Co - mon. bet 1/4 cor -
inside cor. 31-138-29
2" mon.

Chas Co.

Thursday Sept 28 - 1911

Morse Lake -

✓ To Walker to get special
notes from Chas

1911

136-31

191

105

Friday Sept 29 -

Moose Lake -

Return from Walden - on
midnight train - arriving 2:00 A.M.

Friday Sept 29 - Sept 27 -

Cass Co - sitting north -
at corner - 138-30But section 23 + 24 - NE 1/4 - stub
plain" " 23 + 26 SE 1/4 - stub
plain

2" gal. pipe - in cement.

Sat - Sept 30 -

Took + son to town Lakeview.

Monday Oct. 1 - 1910 1911

Rode to Countryman's place
with Andrews on stage.

Took 11:15. 1 day Moose Lake.

191

106

136-31 - moose Lake Sup.

1.9 Tuesday Oct. 3 - 1911

SW Cor. Sup. 137-30. - Curved table
 hatched and put in new bearing as
 follows, $80^{\circ}41'$ Yaw.

✓ Elm $85^{\circ}41'42''$ E 27.18 feet
 Ash $87^{\circ}45'51''$ W 49.34 "

NE Cor. Sup. 136-31 - Curved table
 call for Post

✓ SW Cor. 30 - 137-31 - Bumpo Sup.
 Prod. notes call for - 0

Pine $107^{\circ}85'12''$ E 19 = 12.54 feet.

W Pine $77^{\circ}12\frac{3}{4}'$ W 51 = 33.66 "

A.M.

John Jewell

Frank Countryman

A.W.M.

✓ Alike $\frac{1}{4}$ post but sections 1 & 2 136-31,
 we set an iron non, $1\frac{1}{4} \times 6$ gal iron
 pipe in cement & rocks.
 Iron anchor rod thru pipe 4 feet
 from top end. Shredder on
 bottom end. No eye or chisel on
 top end.

136-31

191

107

P.M. (Hubert Wenholz)

We set corner 11-12-13-14-
 1 1/4" x 6' gal. iron pipe, set in rock
 and cement. No logs. 16" above
 ground. (2m away)

Est. NW Cor. Sec 1 - 736-31

Wednesday Oct. 4 - 1911.

John Jewell x (country man)
 Hubert Wenholz (brought hammer)
 Frank Countryside (out with me)
 P.M.

At S E Cor 137-31 - 2 found
 stakes set by Curo - both RT's ✓
 present. (Page 104)

Setting on corner 3m
 west 80.40' Var - down road.

m - 400 - 600 - 800

999.70 Hub

1000 - 1200 - 1400 - 1600 -

1782 Hub - Sump NW Cor Sec 1 - 736-31

1800 enter low land - marsh

2000

2200

2400 leave low land - E + S

2600

2800

191

108 Estab. NW Cor. Sec. 1-136-31 Cont.
#101

3000 - 3200 - 3400 -

3600 Hub - center of road

3800 - 4000 - 4200 - 4400 - 4600 - 4800 - 5000

5700 Hub in road. 90' 10' Var

also NW Cor. 36-137-31 - 4500 - 5000

Coat for - Pay 100

Just the Pine - cut about 10 feet
long - ^{plainly marked} grubbed out and laying south
ward. Mr. Hinch - The Countryman
Piquette to where the post set - before
the grubber took it out. Set a square
hub for Cor - SW 36-137-31.

At 527860 W, SW Cor. Sec. 36-137-31
sets south 5.25 feet.

Then continue west on same line

5400 - 5600 -

5800 Hub - N of NW Hub back - W Road

6000 - 6200 - 6400 - 6600 - 6800 - 7000

7093.6 - Hub in front of Hinch's

house - Dump NW Cor. Sec. 2-136-31
(Hub 15 feet to the east)

7200 - 7400 - 7600 - 7800 - 8000 - 8200

CT

T₁ Sun Aug 136-31 } Running 109
3 " " 137-31 } West

7400 - 8600 - 8800 - 9000 - 9200 - 9400

9600 - 9800 - 10000

10100 Sub -

161
161
161

Out for day - all full day

Thursday Oct. 5 - 1911

Same crew etc. (P.E.C. - bridge down) ^{with me}

In Ann's notes I found that he ran this same line, beginning at SW cor. 36 and running west. He did not find any low corner until he got to the 1/4 cor. on the south side of section 33. He found both BTs - strong & plainly marked.

The meas. from SW of 36 to 1/4 cor. on south side Sec. 33 being 0.80 of a foot long.

He then established the SW corner of Sec 34 - and put in new bearings: 80° 46' Var.

Bench 3 S 87° 54' E 31.60 feet

" 3 S 2° 8' W 44.49 "

To rock heads.

161

110

do - 136 - 31
137 - 31

T6T

10200 - east edge meadow

10400 " "

at 10560.69 feet west, 1 hall
shale to south 3.40 feet.
(SW cor. 35)

10600 - south side of seawall

10800 - new road

11000

11100 Hub in road -

11200 - West side slope, to slough

11250 - lowland

11400

11500 - 50 feet east of water edge

11700 " in lowland with " "

11750 - highland

11800 - 12000 - 12200 - 12400 - 12600

12800 in small meadow

13000 ~~Hub~~ on old road NE + SW

13200 - 13400 - 13600

13800 Hub on hill

14000 - 14200 - 14400 - 14600 - 14800

14883.71 Hub

15000 / 15200 -

15400 - 15600

15600 - 15800

T6T

SW Cor. Sec 34-137-31¹¹¹

At SW Cor. Sec. 34^{36²³ 33}-137-31 - 3
found the SW Bearing one which
was put in by Curis; (see page 109)
The SE BT and the corner
stake have been graded out.
Set the corner by course
and measurement from SW BT.
Ran a 3x3x16 inch brick stake.

Put in New Bearing, viz:
WB. 4 S 51° 51' E 58.35 feet.
(Same Val. as Curis - 8° 46'.)

At 15838.30 feet West, the
SE Cor. Sec. 33 at 6 North 0.15 feet
Thy chain from SW cor 36-137-31
to SW Cor 34-137-31 =
 $15838.30 - 5278.60 = 10559.70$
Curis chain = 10560.64, or less
than 1 foot difference. This proves
that I have set both corners
correctly.

161

117

NW Cor. Sec. 1-136-31

Gov. ch. from SE Cor. 36-137-31 to
SW 36-137-31 = 5280 feet.

My ch. = 5278.60

Gov. ch. from SE 36-137-31 to
NW Sec. 1-136-31 = 27.00 chains =
1787 feet. 191

5280 : 5278.60 : 1787 : X

X = 1781.52

∴ NW Cor. Sec. 1-136-31 sets

1781.52 feet west of SE Cor. 36-137-31

136-31-1-136-31 NW

[At 1787 = NW Cor. Sec. 1 - sets
east 48 feet and south 1.77 feet.

NW Cor. Sec. 7-136-31

Gov. ch. of South Side Sec. 35-137-31 = 5280 feet.

My ch. = $10559.70 \div 7 = 5279.85$

Gov. ch. from SE Cor. Sec. 35-137-31 to NW Cor. Sec. 7-136-31 = 27.50 chains = 1815 feet.

5280 : 5279.85 : 1815 : X

X = 1815 - nearly 1814.95

136-31

112

$$5278.60 + 1815 = 7093.6$$

NW Cor. Sec. 7-136-31 - 1 inch
 7093.6 sets east ^(0.05) 0.70 feet -
 [This is no 0.15 too far east - leave
 only .05 more - gauge 108] = .05
 and south 4.27 feet.

NW Cor. Sec. 3-136-31.

Sec. ch. of South line Sec 34-

137-31 = 5280 feet.

My ch. = 5279.85

Sec. ch. from SE Cor. Sec. 34-

137-31. To NW Cor. Sec. 3-136-31

= 27.54 chains = 1817.64 feet.

5280: 5279.85: 1817.64: x

x = 1817.60

NW Cor. Sec. 3 sets at 12376.76⁰⁵
 feet West, and south 1.70 feet.

114

137-31
136-31

Friday Oct. 6-1911.

Frank Countryman x G.W.M.
Hubert Winkley J.F.C. brings dinner with
mySW Cor. Sec. 35-137-31 sets at
10558.45 and north 2.675

We set square line

T6T

N $\frac{1}{2}$ - Sec. 14-2-136-31at 2748.10 feet north, June NW
Cor. Sec. 1 sets west 26.94 feet.

636.60 sets west 6.25 feet

1320 " " 17.90 "

1529 " " 15.00 "

2299.10 " " 27.60 "

Setting on SE Cor. Aug 137-31

run east 8010'

200-4-6-8-10-12-14

1700 Hub in cen. road.

14-16-18-20-22-24-26-28-30-32-34

at 3556.50 East p NE Cor
Aug 136-31 sets south
2.000 feet. (skin corner
previously established by Cus.)

136-31

115

We then went home - arriving at
Countryman at 4:45. Frank
and Herbert then put in the rest
of the day making a motorbox.
Drove out - and went out to
the mail box.

Saturday Oct. 7 - 1911.

Frank Countryman
Herbert Workhug
A.W.M.

161

Countryman's team.

We set the following traps -
2" galvanized pipe - caps - well set
in concrete and rock - with -
anchor rod through bottom of pipe.

Aug 136 - Range 31 - Moose Lake

TW Col. Dec. 3

TW " " 2

TW " " 1

Aug 137 - Range 31 - Bungo

STW Col. Dec. 36

SE " " 36

\$6.50

(Bungo Aug. to pay for sitting " deer comes)
as signed by Mrs. Hunt

116

136-31

Sunday - Oct. 8 - 1911.

Wrote notes - went hunting

161

Monday Oct. 9-1911.

French Countryman x

Herbert W. W. W.

G. W. M.

Setting on Cor-1-7-11-15-

over west. $8^{\circ}35'$

200 - 450 -

600 ft. in round.

800-10-12-14-16-18-20-22-24-26

2640 sub in road - Sings. Nov. 6/2 + 11

28-30-32-34-36-38-40-42-44-46

48-56-5700

5280 - *sub.*

At the corner 7-3-10-11,

T. W. Hubs, C. E. - his notes read -

"June 17 - '05 - Moose Lake Road

Hursey. Sports - L. Brownell,

Ed. Brockenell + Buzard

② Dec. Cor. 2-3-10-IP. This cover was lost. and John Baker reset it

Cor. 2-3-10-11- 136-31. 117

by running N+S, E+W from
known corners, and intersected,
placing stone with x for corner. //

We hunted and dug for
some time, looking for the above
stone. D. E. Courtney ~~not~~ found it
on the south side of road 1 foot
south of grader ditch. It was
well buried and roots grown all
around it - so it has not been
moved for years. No one knew
anything about it until I told
them that there was a stone
marked x for corner. As John Lake
was Dep. Co. Surveyor, Cass Co.,
and evidently established the
corner correctly - I use it.
The stone is about the size of a negro's head.

At 5278.90 west, Cor. 2-3-10-11
sets south 10.76 feet.

At 2640 - $\frac{1}{4}$ cor. then sets east
0.55 feet and south 538 feet = true
 $\frac{1}{4}$ cor. lat 2+110

Telephone poles on south side
of road - at cor. 2-3-10-11 - set about $7\frac{1}{2}$
feet south of corner. ~~and~~ corner line
with road running north.

118 - Dec. Line - bet. 7+11 - 136 - 31

We then set the following monuments - 3" galvanized pipe - 4' long - caps + anchor rods - well buried in concrete and stone - flat stone placed under bottom end of pipe.

Cor. 7-3-10-11

1/4 cor. bet. 7+11

Witnesses - other than crew -

P. E. Countryman - resident -
lives in Sec. 17 - NW 1/4.

Record

2-3-10-11

2639.45

Sec. 7

5278.90

Sec. 11

School House

2639.45

2-3-10-11

At cor. 7-3-10-11 - I placed the mark which I found marked X, in concrete at top of filling around pipe - the X showing peaked on south side of pipe.

At 1/4 cor. bet. 7+11 - there is a 2' mark lying NW - at north side of grass ditch - marked B.T. - evidently done by Hallett.

1611

South Bound. Dec. 23-136-31 119

Tuesday Oct. 10-1911.

In A.M. - P. E. Countryman
drove us to Winkler's place - Dec. 25,
arriving at cor. 23-24-25-26 at
9:30.

Hunted Winkler's

Tracks Countryman x
A.M.

1611

Sitting on corner 23-24-25-26

This corner set last year from
the NE Poplar - Hunga stub and
plainly marked - find stub down
and back into road - which is
the corner. Run west 9°55' -

200 - Pin

400 Stub in road.

6-8-10-12-

1320 - Stub - Set $\frac{1}{4}$ cor.

^{1400 ft}
1600 - Stub in front of school house

18-20-22-24-26

2640 - Stub - Set $\frac{1}{4}$ cor. bet 23+26

$\frac{1}{4}$ cor. bet 23+26 - 1200. notes call for

L to V at 2 -

Elm 7 N 50 W 34 = 22.44 feet

" S 51 E 21 = 13.86 "

Run

120 Halletts Cove. Oct. 23 + 24

136-31

Found a 8' or 9" Elm - standing
south of the road - 30' more or less,
marked BT-S 26 - but marked
thru, all the marks being on the
upper and only blaze -
this is the way Hallett always
marked his corners, i.e. up-
side down. Measuring

the growth - it measures 2",
this leaves the tree a diameter of
5" when marked. No blaze or BT at
bottom. As this tree does not
correspond with the Sov. size, and is
not marked as the Sov. marked
their trees, I do not use it.

The marks and growth looks to
be about 8 to 10 yrs old. Hallett
surveyed them here about then.
Being marked upside down,
indicates it is Halletts.

A 5" tree marked 35 yrs ago - and
now standing green - would be
larger than 8 1/2". The marks
were not grown over - only about
1/4 inch on each side.

(Not using old BTs.)

161

South Bound. Dec. 23-136-21/21

We continue west -

28-30 -

3100 Hub

32-34-36 -

3700 Hub - 30 feet east of swamp

NW + SE. Road runs NW - there
around swamp.

3730 enter swamp.

3800-40-42-44-46-48-50-5700

161

Cor. 22-23-26-27-1500. notes
call for -

A 3.5148 E 60 = 39.60

" 2.7168 W 61 = 40.26

" 3.539 W 15 = 9.90

Record

Find 2 stakes - one new one,
and the other is without question
the old 1500. stake as the marks
show plain - stake is partly
rotted away - R. 31 W. showing
plain - the marks also show
but cannot tell what they are as parts
of stake rotted away. Also find
2 Tomarocks trees showing
plainly marked - and so old
that they are surely the 1500. trees

127 Cor. 22-23-26-27-136-31.

One stands NW and one NE,
an old stump SW.

2 at the corner by flat near.
from the NW + NE Pts - they
then stand -

Head down towards ^{3 1/2"} - being burned
at bottom - $751^{\circ}44'E$ 29.60
Old Sam. standing 3" -

$730^{\circ}15'W$ -

Sam. Stg 3 S

161

W 9.75

40.26 ^{80°}

I find the new and old
stake standing - east of mine -
meas. or courses as not check -
which proves they make a mistake
in taking courses.

The old stake had been lying
in the moss for years - and
piled up + reset - no sign of
bottom end. I find where it
had been lying - one end being
where my stake sets.

at 5339.90 West - cor. 22-23 -

26-27 - sets south 13.91 feet

72 Sam. marked - T136K-S23

S22

NW

Tam's died next year after marking.

W. Sound Dec. 25 - 136-31

123

Wed. Oct. 11 - 1911.

Same crew as yesterday.

Setting on cor. 23-24-25 - No.
run east - down main road - 8048'

2-4-6

700 1st on hill.

8-10-12-14-16-18-20-22-24

700 1st on hill

7640 " 2nd $\frac{1}{4}$

$\frac{1}{4}$ cor. bet. 24 & 25 - No. note - 2 to 1st

W on 9 S 10 E 17 = 11.22

Asy 12 N 20 E 14 = 9.74

No trace of $\frac{1}{4}$ cor. - cont. east

28-30-32-34-36-38-40-42

4260 cross Stony Brook - N - S

4400 - 46-48-50-52

5280 - 1st - North of wagon road - 2nd

N E Cor. Dec. 25

N E Cor. Dec. 25 - No. note - 4

Jan 6 S 34 W 4 M = 2.64

" 4 N 74 W 5 " = 3.30

Apr 8 N 22 E 9 " = 5.94

For 10 S 36 E 8 " = 5.28

124 NE Cor. Sec. 25 - 136-31

at 5248.50 feet East, stone in
on road for NE Cor. 25 - sets south
19.85 feet.

161

NE Cor. Sec. 25 - 136-31

John Nelson - lives in SE $\frac{1}{4}$ of Sec
24 - Testifies as follows -

"That Ole Munson's brother
moved here 17 years ago - found
the lost stake - being partly
rotten then, and piled rocks
around the stake. That the trees
were dead & down when Munson
came - just as they are now.

That he (John Nelson) moved here
14 years ago. Hallet surveyed
the road between Sec. 24 & 25 -
(Roadbook shows Hallet surveyed said
road in 1903) and Nelson helped
him. Hallet put his stake in the
center of said pile of rocks.

When road was worked Nelson
was road boss - took up stake
and places rocks in place."

We find the rocks - also Hallett's stake setting against stumps.

Old Munson & Nelson live in same house. Munson's brother died some years ago.

Found a 9" W.S., green and standing, $\pi - (15/7)$ about 6 rods, now blazed on both sides. One north blaze is marked: TOWN LINE. X. Evidently done by Hallett - as the mark X is his private mark. Some of the blazes appear to be older than Hallett's.

Said Nelson testifies - "That Hallett established the $1/4$ cor - bet 24 + 25 - and that he found no B.T.s. That he nor Munson ever saw any B.T.s. for mile $1/4$ E. cor. 25"

#191

Recorded

170

136-31

Condition for 1/4 cor. lot 24-25

1/4 cor. lot 24-25-136-31

At N 40- 1/4 cor. nets 15.75 west,
and south 9.92 1/2 feet.

At 1/4 cor. lot 24-25- 3 find the
stone set by Nelson - which he put
where Hallet's Station was. 2 find
red rotten stumps.

W B is 10 1/2 S 3 E 10 feet

B is (3) N 34 W 9.75 "

This does not correspond with the
Gov. field notes.

As Nelson was chaining
when Hallet surveyed and this
is his SW cor - and he says he does
not remember ever seeing any
B stake - Hallet evidently did
not have any B's.

2 ignore Hallet's 1/4 cor.

1191

Recorded

Mons. - 136-31

127

Thursday Oct. 12 - 1911.

Same ans-Wentok's team all day.

We set the following mons-
in concrete and rock - 2" gal
pipe - caps + anchor rod - flat bar
under bottom end of pipe.
Corners - 5 to 1. - clean dry sand.

Dec. 25 - 1

NW cor - (23-24-25-n)

SW " (25-n-35-36)

1/4 " on west side. (bet. 25-n)

Dec. 26 -

SW cor

1/4 cor on west side.

All the above corners set
last year.

Caps are marked.

191

Revised

136-31

Friday - Oct-13-1911.

Rained -

Sat. Oct. 14-1911

To Pine River on trip - Rained -

Sunday Oct 15 -

at Pine River.

Monday - Oct 16 -

To trip on day - leave P.R. at 1:00 P.M.,
arrived at trip 7:00 P.M. - Rained.

Tuesday Oct 17-1911

Threat Country men x

Hubert Wentok

A.W.M.

Wentok's team

We set monuments all day - all mon's regular size and set in the usual way except one, i. e., cor. 22-23-Cor-27 - where we set a $1\frac{1}{4}$ " x 6' galvanized pipe - no cap - anchor pin split from bottom.

We set the following -

Cor. 22-23-26-27

21-22-27-28

T61

27-28-33-34

 $\frac{1}{4}$ post - North side Sec. 28. $\frac{1}{4}$ " South " " 28.

All the corners on Section 28
 I set last year - and now found
 all of my stakes - except on
 the south side where the top
 was broke off, but found points

all full range
 161

Wednesday Oct. 18-1911

Amusew - notes.

Corrections for South Bound. Sec. 23 -

At 5339.90 West, SW cor. Sec. 23
 sets south 13.91 feet.

$\frac{1}{4}$ cor. - South side 23 -

At 7640 - $\frac{1}{4}$ cor. sets west 29.95
 feet, and south 6.95 feet (269.95)

$\frac{1}{16}$ cor. - bet $\frac{1}{4}$ cor. on south
 and SE cor. Sec. 23 -

At 1320. $\frac{1}{16}$ cor. sets west
 14.97 feet, and south 3.48 feet.
 (1334.97)

1600 sets south $\frac{4}{16}$ feet.

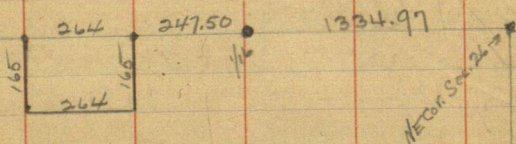
130

136-31

School House Site - Sec 26-136-31

Recorded

161



In A.M. we worked for School
District - surveying school house

Site -

A.M. 4 hrs

7.00

P.C. 4 "

80

H.W. 4 "

80

 \$3.60

We then covered 1/4 cor. on south
side Sec. 23 - drove square hub
in 1/2' below level of ground and
covered with dirt.
Sp 7 is about 7 feet.

East Bound. Dec. 25-1963/31

T.M.

Setting on NE Cor. Dec. 25 -
run south $8^{\circ}30'$. (This work being
done to check on NE Cor 75 - page 124)

0.0 - Aug.

200 - 400

455.20 12th

600 - 800 -

859.25 14th

900 enter trey alder + meadow land. NE + SW

1000 - 1200 - 1400 - 1600

1800 14th.

1830 - 80% run - east + west (run)

1850 enter open meadow

1/4 cor. - east side Dec. 25 - Koo. notes

call for - L.

Pin 10 N 15W 7 = 4.67 feet.

Aug 7 S 5E 12 = 7.97 "

Recorded

132

136-31-30

Thursday, Oct. 19 - 1911.

Same crew ^{as} Cont. yesterday's line south
 1900 Fin
 2000 Cont. Stony Brook - E + W.
 2100 Fin
 2250 Same section - into Brook
 2300 Dub - 2 ft. south of rail fence
 2500
 2600

At N. 36.50 South, ... 1/2 cor. runs
 west 7.40 feet

1611

10:45 - A.M.

Maynes Olson - who lives on
 Dec. 30 - 136-30, testifies
 as follows -

"At the T E Cor Dec 25 - 136-31 -
 he saw a Spruce Bearing Tree about
 15 years ago also the old Gov. stake -
 being partly rotted then.
 About 13 years ago James Corfield,
 County Surveyor of Cass Co,

surveyed from the east in to
 NE cor 75 - But he also found the
 Spr. 25 and also one stake
 Olson says the present rock
 is at the place where the stake
 formerly stood."

(See page 124 - de Munson citation)

"Also that about 5 years ago
 a competent surveyor surveyed
 the east bound. Sec. 25 for a
 logging company. Starting at
 the rock at the NE cor 75 he
 ran south: finding no Spr.
 corner at the $\frac{1}{4}$ he continued
 south to the SE 75. He then
 correctly established the $\frac{1}{4}$."

I find the above $\frac{1}{4}$ cor - and
 it seems O.K. The surveyor put
 in a post - marked $\frac{1}{4}$ S - post
 around the bottom - Bearings

Page 55 E

W P Brown / Westely.

161

Taking all evidence into
 consideration - the rock at the
 NE cor 75 - 136-31 - is correct. ✓

134

136-31-30

Oct-19- P.M.

Board met - 2 - put in 7 bills
as follows -

Downy House Lake -

So A.W. Moulton, M.

20 days - a day - 80.00

Downy House Lake

So A.W. Moulton, M.

Expenses

6.32

Both bills allowed.

Friday Oct. 20 - 1911.

Herbert Wankelz

Tronto Countryman

G.W.M.

Wankelz - team -

161

Setting monuments

A.M. to be charged to the School District
as in all school site corners and
vic. (School District No. 7)

✓

136-31-30

135

We set the following corners -

136-31

$\frac{1}{4}$ post - S side Sec. 23

$\frac{1}{16}$ cor. - east of $\frac{1}{4}$ post on S
side Sec. 230 ($1\frac{1}{4}" \times 4"$ - no cap)

NE Cor. Sec. 25

NE " " 1

Set 4 corners for school
house site as per page
130. - $1\frac{1}{4}" \times 3"$ - no cap.

Saturday Oct. 21 - 1911.

So Pine Run on way
arriving 12:00 - Ran 11 ~~mi~~ ^{mi}

191

1370

137-30

Thursday Nov. 7-1911.

1 day for the Pine River
Telephone Co.

Rd. M - E. S. Thorne & S
measured and run lines
for telephone line.

By. at Cor. on 7 & 3rd - 136-29
around a line west to reach
Saber road.

Friday Nov. 3-1911.

137-30 - Walden.

Wm. Volz (Horse & buggy)

Ernest Thomas

A. W. M.

We laid out a road around
the river, from P. R. bridge, thence
west, on north end of sections
4 & 5. All full day.

(Angles, distances etc, to be taken
after road is built.)

Sat. Nov. 4 - 1911.

In P.M., Chas. W. Saller and I drove to Lake Ada - return

Sunday Nov. 5 - '11

Monday Nov 6 -

Tuesday Nov 7 - 1911.

A.M. - worked on notes - 13829.

P.M.

B. E. Widemann and I - working on Courtywood - Sec. 31 - 138129.

Beg. at the $\frac{1}{16}$ cor - south of center of section - run west by tape - setting on my old cut outline.

200 Pin

340 enter Rowley Brook

352 Pin in log ($200 + 152$)

552 Pin ($352 + 200$)

600 leave N. Brook

600 Pin ($552 + 48$)

800 - 1000 - 1200 -

1320 Hub - Run $\frac{1}{16}$ cor

138 County Road - sec 31-138-24

E + W Cor. line SW $\frac{1}{4}$

1400-1600-1800-2000-

2200 Hues.

2400-2600

at 2777.80 West, $\frac{1}{16}$ cor. south
of $\frac{1}{4}$ cor. on west side of the sec. -
sets north 1.17 feet.

West Bound. Sec 31

Wednesday Nov. 8-1911.

B.E.W. - 2.

At the $\frac{1}{2}$ post - west side

sec. 31 - Cuto put in new bearings ^{on}

By 10 S 51° 45' E 64.53^{ft} to bolt head

" 5 S 15° 41' W 60.68^{ft} to nail head.

(Nail post gone) Var. 8° 46'

2 find ring peg which set from
the above studies last year.

Run north by backsighting on
 $\frac{1}{16}$ cor. Var. 8° 35'

10 men corn field

200-400-600-800

1000 Hues

1200

1320 Hub - Sings' 1/16

1400

1545 cross wire fence E + W

1600 Hub 8° 25'

1

MC No 18 - Nov. main core for -
 Jan 4 S 15° E No = 17.16
 " 5 S 46° W 2.8 = 18.48

Distance on plat from 1/4 cor-
 west side 3' to MC No 18 =
 $20 + 8.75 = 28.75$ chs = 1897.50

Set stake from rock string ^{by miles} - ^{plunging}
 being plainly marked.
 Old BTs then staked - 8° 45'

Jan 4 S 18° 17.16

" 5 S 73° 45' W 18.48

(Courses approximate)

At 1963.40 feet north
 MC No 18 sets west 15.05 feet

Thursday Nov. 9 - 1911.

Dec. 31 - 138-29.

Dist. by Nov. plat from $\frac{1}{4}$ cor. on
west side to M.C. No 18 = 28.75 chains
= 1897.50

My chain = 1963.40

Diff. = 1963.40 - 1897.50 = 65.90 feet.

$\frac{1}{16}$ cor. bet. $\frac{1}{4}$ cor. on west and M.C. No 18

1897.50 : 1963.40 :: 1370 : X

X = 1365.8

$\therefore \frac{1}{16}$ cor. sets at 1365.8 north and
west 10.43 feet.

1000 and west 12.70 feet

A.M. - Worked on notes

P.M. Wideman - 5.

Reg. at center of section 31 -
no much work. by back-sighting on
true line east. We worked all
P.M., getting the ice cut and then
that side in line.

Friday Nov. 10 - 1911

A.M. -

Wideman + S - we counted
 $\frac{1}{16}$ corner north of $\frac{1}{4}$ cor on
 west side section 31-138-29
 and drove down a 2' grain
 (Road - 1775.75 North)

1' $\frac{1}{4}$ " gal. iron pipe.

We then found the starting
 point of the road where it
 intersects the above line, being at
 1775.75 feet north of $\frac{1}{4}$ cor.

P.M. - John Crossman + S -

A.M.C. The 18' we drove ~ 10 feet
 from 7' $\frac{1}{4}$ " gal. iron pipe.

We then started following the
 road line running N of the
 above starting point.

Saturday Nov. 11 - 1911

A.M. - Snowed.

P.M.

Sunday Nov 12 -

Snowed nearly all day cold.

147 Country Road ^{around} Norway Lake 13829

Monday Nov. 13 - 1911.

John Crossman & S.

We worked all day laying and cutting out road on west side of Norway Lake.

Tuesday Nov. 14 - 1911.

A.M. - John Crossman & S.

On road west side of Lake -
three Swans & 4 Petrels.

P.M. - I worked on notes for school dist. No. 1 - for survey of schoolhouse site in Rev. 6 - Wash.
Cros worked on notes half of the night - his bill being \$5.00
This morning I am to report to the School District.

Wed. Nov. 15 -

A.M. -

P.M. John Crossman & S left
Pine Bluff at 1:00 P.M. Sunday
Train. Arrived at Washburn
T.O. at 5:15

School District -

138-29

140-26

143

Sun. Nov. 16 - 1911

We left Walrus at 7:45. (Rain to June 11.75)

Arrived at Snowball at 11

P.M. - John C. and I found the old
line on Skier Run. 140-26.
Also SW cor. Dec. 6

Tuesday Nov 17 - 1911.

Dec. 6 - 140-26 - ..

Civic's distance from SW cor. Dec
6 to MC on north side Sulphur =
4138.88

Good. ch. - 4148.10

Avg. = 15.7

4148.10 : 2640 : 15.7 : ✓

X = 9.6

∴ 1/4 cor. on west end 6 - sec at
2640 - 9.6 - 2630.40

2149.75 - hub on creek wall

(ch. sec. - 1502.48 from MC on north
side Sulphur)

144 Dec. 6 - 140 - 26.

School District No 1

John C., Chas. Blum + S.

They at Hub No 2 147.25 on S side

Dec. 6 - run over north 8° Var.

At 2630 - run west 8° Var - =
approximate E + W center line

Dec. 6.

Full day.

Sat. Nov. 18 - 1911.

Said Blum for board gas

John C + S. and team

84.00
2.00
86.00

Set Hub on E + W line.

Left Snowball at 8:30 A.M.

Arrived Wabado at 11:45 A.M.

Miner 60¢

Left Wabado 1:25

Arrived Pine River 5:20

Sunday Nov. 19 - 1911.

Sec. 31- 138-29. County road.

Monday Nov. 20- 1911.

John C. & S. Sitting on center section
then west by backsighting (as near as
could) on hub in line.
58° 40' / ac.

31.50 enter Norway Brook N + S
500 on in
400 " "

515 leave Brook N E + S W
600 in Killesno's field
768.82 Hub.. " " (mantle)
800-1000 1200-1500 + leave field
1370 Hub in pine thicket 1/16 cor.
1400-1600-1800- ~~2000~~ "


2000 Hub
2127 - cross wire fence N + S
2200-2400
2519 cross W fence N + S
2600-2800

At 2852.50 - 1/4 cor. on west side Sec. 31
at south .72 feet.

146

Dec. 31 - 138-29 - County road:

Tuesday Feb. 21 - 1911.

Crossman Beg. at cement mon. at $\frac{1}{16}$ cor. north
of center of section & run west $8^{\circ}15'$ N.

197 into river NW + S
 200 Pin on ice
 400 "
 600 "
 664 leave river - N + S
 800 Hub
 1000 - 1200
 1400 Hub
 1560.85 " - $8^{\circ}10'$
 1554 - in line with N + S fence
 1600 Pin in field
 1800 - 2000
 2010 - Holmgren's road - N + S
 2200 - 2400 - 2600 - 2800

At 2937.00 feet west $\frac{1}{16}$ cor. north
 of $\frac{1}{4}$ cor. on west side of section set
 north 31.20 feet.

Dec. 138-29

147

Wed. Nov 22 - 1911.

Crossman + S.

A.M. We worked on right line

Sec. 31 - finding old holes etc.

Then on road on west side of
Lake - ended ~~at~~ about the E + W
center line of Sec 25 - 138-30, near
the river.

P.M. - McGuire here - so 2 didn't
work - Crossman putting in about 4 days
going up and getting up the lake etc.

Thursday Nov. 23 - 1911.

Crossman + S -

Morning - taking angles on
county road around west side of
Lake.

148

138-29

Titus County road on west side
 of Highway Sub - in section 25-30-
 138-20.

Stations	Bearings	Distances	Approx. Mag. Decl. Hot. Check
No. 1 x	N 61° 30' W	878.80	N 70° 40' W
" 2	N 22° 16' W	702.30	N 31° 10' W
" 3	N 10° E	134.40	N 1° 20' E
" 4	N 40° 36' E	117.15	N 31° 45' E
" 5	N 51° 44' E	270.75	N 42° 20' E
" 6	N 72° 52' E	314.20	N 64° 35' E
" 7	N 15° 38' E	240.35	N 16° 40' E
" 8	N 21° 27' E	640.90	N 12° 20' E
" 9	N 30° E	405.10	N 18° 20' W
" 10	N 10° 57' E	891	N 12° E
" 11	S 86° 10' E	179.8	N 85° 30' E
Sec. 30 - 138-29			Station not west side Range line with Sec. 29 North and Highway Sub.
" 12	N 30° 19' E	251.90	N 21° 30' E
" 13	N 33° 28' E	101	N 24° 45' E
" 14	N 47° 5' E	274.85	N 38° 10' E
" 15	N 60° 50' E	202.50	N 52° 10' E
" 16	N 77° 51' E	137.10	N 69° E
" 17	S 78° 9' E	283.90	S 87° E

* Station not being at a point on the west
 boundary of Sec. 30-138-29, 1775.75 feet north
 of the 1/4 Post.
 The line to Sec. 30-138-29 used as a true line
 to the bearing of 8° 50' 10"

13829

1449

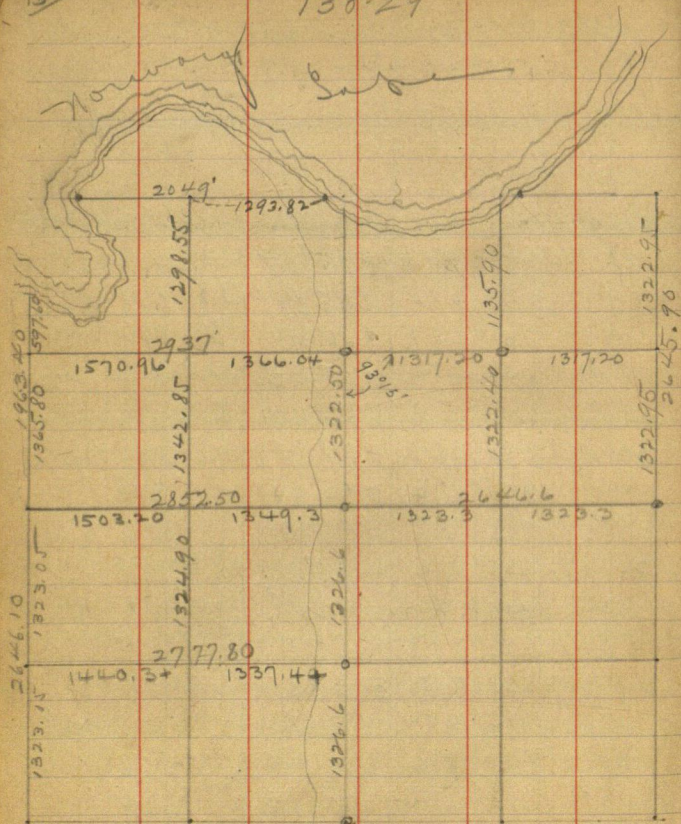
County Road around Norway Lake

Stations	Bearings	Distances	Cumulative Mag. Error
No 18	N 87° 80' E	1285.25	N 78° 15' E
" 19	N 57° 6' E	365.80	N 48° 30' E
" 20	N 30° 58' E	862.20	N 22° 30' E
" 21	N 50° 45' E	505.00	N 42° 15' E
" 22	N 58° 21' E	572.60	N 49° 45' E
" 23	N 73° 35' E	457.15	N 64° 05' E
" 24	S 79° 11' E	345.55	S 88° 5' E
" 25	S 68° 52' E	414.38	S 77° 40' E
" 26	S 54° 3' E	417.90	S 62° 50' E
" 27	S 41° 28' E	471.30	S 50° 15' E
" 28	S 26° 39' E	60.38	S 35° 40' E
" 29	S 20° 2' E	305.83	S 29° E
" 30	S 16° 50' E	396.60	S 25° 40' E
" 31	S 9° 18' E	661.40	S 18° 20' E
" 32	S 13° 27' W	320.70	S 4° 30' W
" 33	S 4° 32' W	995	S 4° 25' E
" 34	S 88° 06' W	250.44	S 79° 30' W
" 35	S 57° 9' W	201.43	S 47° 45' W
" 36	S 2° 37' W	540.24	S 1° 40' E

Spring on the section line - east boundary
 of Chickamauga Beach, 110.24 feet north
 of the SE corner of lot No 9.

55

138-29



Aug. 31-138-29.
 True measurements.

County road around Norway Lake 15/

Friday Nov. 24 - 1911.

Crossman + S - worked from Sta.
12 to 18.

- Notes of line across run
Dist. from Sta 11 to 15 = 179.80
- " " bank to bank - 120
- " " water edge to WE - 108

Saturday Nov. 25 - 1911.

Crossman + S.

Worked from Sta. 18 to 21

Sunday Nov. 26 - 1911

At home.

Monday Nov. 27 - 1911.

Crossman + S.

Worked from Sta 21 to 23

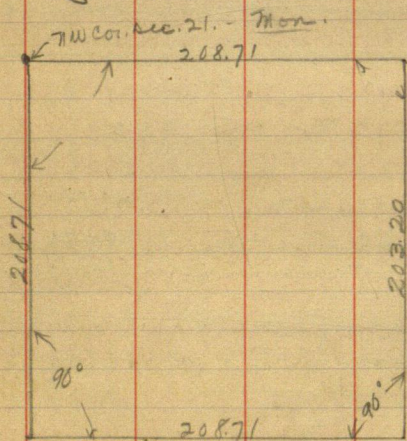
152

Dec. 21 - 138-29.

Tuesday, Nov. 28 - 1911.

School District No 1.

Crossman + J - worked
 surveying school house site
 in T.W. Cor. Sec. 21 - 138-29.
 Siding S. 40°



County road - Norway Lake 153
138-29

Wednesday - Nov. 29 - 1911.

MC No 6 - 138-30 - Good notes call for -
Sum 4 S 42 W 15 = 9.90 feet.
" 6 N 70 W 30 = 19.80 "

MC No 7. 138-30
Elem 18 S 23 W 116 = 76.56
Cabo 14 N 86 W 157 = 103.67

NE Cor. Sec. 25 - 138-30 - L
Sum 12 N 2 E 10 = 6.60
" 5 N 40 W 22 = 14.52
" 9 S 70 W 6 = 3.96
" 6 S 61 E 25 = 16.50

NE cor., east side Sec 25 - 138-30 - (21)
WC - 160 W or west = 105.60
Elem 18 S 23 W 116 = 76.56
Cabo 14 N 86 W 157 = 103.67
Notes for 138-29 say - Elem 18 S 23 E 116)

Crossman + 2.

Begin at MC No 6 - run west - 8030'
At 737.40 feet west - intersected the
road line between Sta 2 and Sta.
3 at 499.35 north

154 East Bound. Dec. 25 - 138-30

We then walked up chimney and
went in the swamp to the NE Cor. Sec. 25 -
(Crossman drive where corner is.)

NE Cor. Dec. 25 - 138-30

Set hub for corner from the NE
and SE ~~to~~ ^{to} - being very plain -
^{both places showing} ~~both~~ ^{all markers present.}
both stakes about 8 feet high.

NW gone.

SW - find and old rotten stump
which checks for distance

old BT's stand - $7^{\circ}30'$ var.

June 14 N 12° E

" 10 S $55^{\circ}45'$ E

old ~~stop~~ 10 S 11 W

Run south - $7^{\circ}50'$ var.

200

375 leave swamp - NW - SE

400 - enter pine

600

600.40 Hub

do 138 29
" 30

155

Thursday Nov. 30 - 1911.

Thanksgiving - didn't work.

Friday Dec. 1 - 1911

Crossman - 3, - continuing
Wed. line south.

800 - 1000 - 1200 - 1400

1455 1st

1600 -

1800 enter aug - $\pi E + SW$.

2000 - 2200

2287.80 sub on small ridge

2300 enter river $\pi E + SW$

2400 pin in ice on river

2410 same " $\pi E + SW$

2640 - 1st - Dump $\frac{1}{4}$ corner - this
sets at edge of lake (MC)

Trace of WC on bearing trees

She continued line south on lake

200 - 400 - 600 - 800 - 1000 - 1200 - 1400 -

1600 - 1800 - 2000 - 2200 - 2400 - 2600 -

2800 - 3000 - 3200 - 3400

At 3384.90 south, MC 20 - 5 sets

west 107.30 feet.

138-30

Saturday - Dec. 7 - 1911

Crossman + S - 3/4 day

At 2558.44 feet south, the Range line intersects the road line bet. Stations 11 & 12, on line, at 141.67 feet east of Sta. 11.

138-30

We continued east boundary of Sec. 25 - across the lake to MC on east boundary sec. 36.

Then tried to locate Indian Trail Ave - Woodward, but cannot find the stakes - nor any signs of lines cut - I guess Curb surveyed Woodward "on paper". I find the stakes on the front.

Sunday Dec. 3 - 1911

At home

Monday Dec. 4-1911

In P. M. I went to Walker
to get plot of "Rowood" from
the records. Arrived at
Walker about 5 o'clock. - worked
up my plot that evening.
Hatched 9/10

Tuesday - Dec. 5-1911

Worked at plot until nearly
train time - then took
train for Pine River

Boarded overnight 1.15
fare Walker to P. R. 91

160

School House Pile - 140-76

1 Core ²

SW cor. Set 3

Dec. 6 - 140-76.

School House Pile - 138-79

1 Core

SW cor. Dec. 71

KEITH'S RAILROAD CURVE TABLES.

Published by KEUFFEL & ESSER CO., New York.

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HOW TO USE KEITH'S TABLES.

EXAMPLE.

Wanted a Curve with an Ext. of about 12 ft. Angle
of Intersection or I. P.= $23^{\circ} 20'$ to the R. at Station
542+72.

Ext. in Tab. IV opposite $23^{\circ} 20' = 120.87$
 $120.87 + 12 = 10.07$. Say a 10° Curve.

Tan. in Tab. IV opp. $23^{\circ} 20' = 1183.1$
 $1183.1 + 10 = 118.31$.

Tab. V. correction for A. $23^{\circ} 20'$ for a 10° Cur.=0.16
 $118.31 + 0.16 = 118.47 = \text{corrected Tangent}$.

(If corrected Ext. is required find in same way)
Ang. $23^{\circ} 20' = 23.33^{\circ} + 10 = 2.3333 = \text{L. C.}$

$2^{\circ} 19\frac{1}{2}' = \text{def. for sta. } 542$	I. P.=sta. 542+72
$4^{\circ} 49\frac{1}{2}' = \text{ " " " } +50$	Tan.= 1.18.47
$7^{\circ} 19\frac{1}{2}' = \text{ " " " } 543$	B. C.=sta. 541+53.53
$9^{\circ} 49\frac{1}{2}' = \text{ " " " } +50$	L. C.= 2.33.33
$11^{\circ} 40' = \text{ " " " } 543+$	E. C.=sta. 543+86.86
86.86	

$100 - 53.53 = 46.47 \times 3' (\text{def. for 1 ft. of } 10^{\circ} \text{ Cur.}) = 139.41' =$
 $2^{\circ} 19\frac{1}{2}' = \text{def. for sta. } 542$.

Def. for 50 ft.= $2^{\circ} 30'$ for a 10° Curve.

Def. for 36.86 ft.= $1^{\circ} 50\frac{1}{2}'$ for a 10° Curve

(These tables are published in Field Books of
KEUFFEL & ESSER Co., New York, N. Y.)

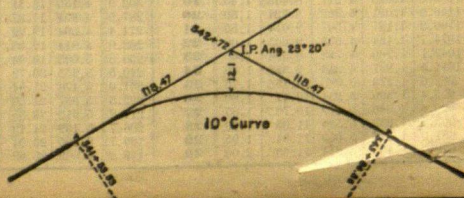


TABLE I. — Minutes in Decimals of a Degree.

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	$\frac{1}{8}$	3-16	$\frac{1}{4}$	5-16	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
.0052	.0078	.0104	.0156	.0208	.0260	.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. — Radii, Ordinates and Deflections.

Deg.	Radius	Mid. Ord.	Tan. Def.	Chd. Def.	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan. Def.	Chd. Def.	Def. for 1 Foot
0° 10'	34377.	.096	.145	.291	0.05'	7°	819.0	1.528	6.105	12.21	2.10'
20	17189.	.073	.291	.582	0.10	20'	781.8	1.600	6.395	12.79	2.30
30	11459.	.109	.436	.873	0.15	30	764.5	1.637	6.540	13.08	2.35
40	8594.4	.145	.582	1.164	0.20	40	747.9	1.673	6.685	13.37	2.40
50	6875.5	.182	.727	1.454	0.25	50	716.8	1.746	6.916	13.95	2.40
1	5729.6	.218	.873	1.745	0.30	20	688.2	1.819	7.266	14.53	2.50
10	4911.2	.255	1.018	2.036	0.35	30	674.7	1.855	7.411	14.82	2.55
20	4297.3	.291	1.164	2.327	0.40	40	661.7	1.892	7.556	15.11	2.60
30	3819.8	.327	1.309	2.618	0.45	50	637.3	1.965	7.846	15.69	2.70
40	3437.9	.364	1.454	2.909	0.50	20	614.6	2.037	8.136	16.27	2.80
50	3125.4	.400	1.600	3.200	0.55	30	603.8	2.074	8.281	16.56	2.85
2	2864.9	.436	1.745	3.490	0.60	40	593.4	2.110	8.426	16.85	2.90
10	2644.6	.473	1.891	3.781	0.65	50	573.7	2.183	8.716	17.43	3.00
20	2455.7	.509	2.036	4.072	0.70	20	546.4	2.292	9.150	18.30	3.15
30	2292.0	.545	2.181	4.363	0.75	30	521.7	2.402	9.585	19.16	3.30
40	2148.8	.582	2.327	4.654	0.80	40	499.1	2.511	10.02	20.04	3.45
50	2022.4	.618	2.472	4.945	0.85	50	478.3	2.620	10.45	20.91	3.60
3	1910.1	.655	2.618	5.235	0.90	20	459.3	2.730	10.89	21.77	3.75
10	1809.6	.691	2.763	5.526	0.95	30	441.7	2.839	11.32	22.64	3.90
20	1719.1	.727	2.908	5.817	1.00	40	425.4	2.949	11.75	23.51	4.05
30	1637.3	.764	3.054	6.108	1.05	50	410.3	3.058	12.18	24.37	4.20
40	1562.9	.800	3.199	6.398	1.10	20	396.2	3.168	12.62	25.24	4.35
50	1495.0	.836	3.345	6.689	1.15	30	383.1	3.277	13.05	26.11	4.50
4	1432.7	.873	3.490	6.980	1.20	40	370.8	3.387	13.49	26.97	4.65
10	1375.4	.909	3.635	7.271	1.25	50	359.3	3.496	13.92	27.84	4.80
20	1322.5	.945	3.718	7.561	1.30	20	348.5	3.606	14.35	28.70	4.95
30	1273.6	.982	3.926	7.852	1.35	30	338.3	3.716	14.78	29.56	5.10
40	1228.1	1.018	4.071	8.143	1.40	40	319.6	3.935	15.64	31.29	5.40
50	1185.8	1.055	4.217	8.433	1.45	50	302.9	4.155	16.51	33.01	5.70
5	1146.3	1.091	4.362	8.724	1.50	20	287.9	4.374	17.37	34.73	6.00
10	1109.3	1.127	4.507	9.014	1.55	30	274.4	4.594	18.22	36.44	6.30
20	1074.7	1.164	4.653	9.305	1.60	40	262.0	4.814	19.08	38.16	6.60
30	1042.1	1.200	4.798	9.596	1.65	50	250.8	5.035	19.94	39.87	6.90
40	1011.5	1.237	4.943	9.886	1.70	20	240.5	5.255	20.79	41.58	7.20
50	982.6	1.273	5.088	10.18	1.75	30	231.0	5.476	21.64	43.28	7.50
6	955.4	1.309	5.234	10.47	1.80	40	222.3	5.697	22.50	44.99	7.80
10	929.6	1.346	5.379	10.76	1.85	50	214.2	5.918	23.35	46.69	8.10
20	905.1	1.382	5.524	11.05	1.90	20	206.7	6.139	24.19	48.38	8.40
30	881.9	1.418	5.669	11.34	1.95	30	199.7	6.360	25.04	50.07	8.70
40	859.9	1.455	5.814	11.63	2.00	40	193.2	6.583	25.88	51.76	9.00

TABLE IV. — Tangents and Externals to a 1° Curve.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10'	58.34	.30	10'	560.11	27.31	10'	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	29.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100.01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

IV

TABLE IV. — Tangents and Externals to a 1° Curve.

Angle	Tangent	External	Angle	Tangent	External	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.

Angle	Tangent	External	Angle	Tangent	External	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	4653.6	1651.7	10	5549.2	2246.7
20	3889.0	1195.2	20	4667.4	1660.5	20	5565.4	2258.0
30	3901.2	1202.0	30	4681.3	1669.2	30	5581.6	2269.3
40	3913.4	1208.9	40	4695.2	1678.1	40	5597.8	2280.6
50	3925.6	1215.8	50	4709.2	1686.9	50	5614.2	2292.0
69	3937.9	1222.7	79	4723.2	1695.8	89	5630.5	2303.5
10	3950.2	1229.7	10	4737.2	1704.7	10	5646.9	2315.0
20	3962.5	1236.7	20	4751.2	1713.7	20	5663.4	2326.6
30	3974.8	1243.7	30	4765.3	1722.7	30	5679.9	2338.2
40	3987.2	1250.8	40	4779.4	1731.7	40	5696.4	2349.8
50	3999.5	1257.9	50	4793.6	1740.8	50	5713.0	2361.5
70	4011.9	1265.0	80	4807.7	1749.9	90	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836.2	1768.2	20	5763.1	2397.0
30	4049.3	1286.5	30	4850.5	1777.4	30	5779.9	2408.9
40	4061.8	1293.6	40	4864.8	1786.7	40	5796.7	2420.9
50	4074.4	1300.9	50	4879.2	1796.0	50	5813.6	2432.9

Table VI. Deflections for Sub Chords for Short Radius Curves.

Degree of Curve	Radius 50 sin. def. ang.	$\frac{1}{2}$ sub chord = sin of def. angle R				Length of arc for 100 ft.
		12.5 Ft.	15 Ft.	20 Ft.	25 Ft.	
30°	193.18	1° 51'	2° 17'	2° 58'	3° 43'	101.15
32°	181.39	1° 59'	2° 25'	3° 10'	3° 58'	101.33
34°	171.01	2° 06'	2° 33'	3° 21'	4° 12'	101.48
36°	161.80	2° 13'	2° 41'	3° 33'	4° 26'	101.66
38°	153.58	2° 20'	2° 49'	3° 44'	4° 40'	101.85
40°	146.19	2° 27'	2° 57'	3° 55'	4° 54'	102.06
42°	139.52	2° 34'	3° 05'	4° 07'	5° 08'	102.29
44°	133.47	2° 41'	3° 13'	4° 18'	5° 22'	102.53
46°	127.97	2° 48'	3° 21'	4° 29'	5° 36'	102.76
48°	122.92	2° 55'	3° 29'	4° 40'	5° 50'	103.00
50°	118.31	3° 02'	3° 38'	4° 51'	6° 04'	103.24
52°	114.06	3° 09'	3° 46'	5° 02'	6° 17'	103.54
54°	110.11	3° 16'	3° 54'	5° 13'	6° 31'	103.84
56°	106.50	3° 22'	4° 02'	5° 23'	6° 44'	104.14
58°	103.14	3° 29'	4° 10'	5° 34'	6° 57'	104.43
60°	100.00	3° 35'	4° 18'	5° 44'	7° 11'	104.72

CURVE FORMULAS.

$T = R \tan \frac{1}{2} I$	$R = T \cot. \frac{1}{2} I$	Chord def. = $\frac{\text{chord}^2}{R}$
$T = 50 \tan. \frac{1}{2} I$	$R = 50$	
$\frac{\text{Sin. D}}{\text{Sin. D} = 50}$	$\frac{\text{Sin. D}}{\text{Sin. D}}$	No. chords = $\frac{\frac{1}{2} I}{D}$
$\frac{R}{\text{Sin. D} = \frac{50 \tan. \frac{1}{2} I}{T}}$	$E = R \text{ ex. sec. } \frac{1}{2} I$	Tan. def. = $\frac{1}{2}$ chord def.
	$E = T \tan \frac{1}{2} I$	

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

Table IV. contains Tangents and External to a 1° curve. Tan. and Ext. to any other radius may be found, nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

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

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

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

To find angle for a given distance and deflection.

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

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

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

RIGHT ANGLE TRIANGLES.— Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

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

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

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

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

Natural Sines

deg.	0'	10'	20'	30'	40'	50'	deg.	0'	10'	20'	30'	40'	50'	deg.	
0	0000	0029	0058	0087	0116	0145	89	40	6428	6450	6472	6494	6517	6539	49
1	0175	0204	0233	0262	0291	0320	88	41	6561	6583	6604	6626	6648	6670	48
2	0349	0378	0407	0436	0465	0494	87	42	6691	6713	6734	6756	6777	6799	47
3	0523	0552	0581	0610	0640	0669	86	43	6820	6841	6862	6884	6905	6926	46
4	0698	0727	0756	0785	0814	0843	85	44	6947	6967	6988	7009	7030	7050	45
5	0872	0901	0929	0958	0987	1016	84	45	7071	7092	7112	7133	7153	7173	44
6	1045	1074	1103	1132	1161	1190	83	46	7193	7214	7234	7254	7274	7294	43
7	1219	1248	1279	1305	1334	1363	82	47	7314	7333	7353	7373	7392	7412	42
8	1392	1421	1449	1478	1507	1536	81	48	7431	7451	7470	7490	7509	7528	41
9	1564	1593	1622	1650	1679	1708	80	49	7547	7566	7585	7604	7623	7642	40
10	1736	1765	1794	1822	1851	1880	79	50	7660	7679	7698	7716	7735	7753	39
11	1908	1937	1965	1994	2022	2051	78	51	7771	7790	7808	7826	7844	7862	38
12	2079	2108	2136	2164	2193	2221	77	52	7880	7898	7916	7934	7951	7969	37
13	2250	2278	2306	2334	2363	2391	76	53	7986	8004	8021	8039	8056	8073	36
14	2419	2447	2476	2504	2532	2560	75	54	8090	8107	8124	8141	8158	8175	35
15	2588	2616	2644	2672	2700	2728	74	55	8192	8208	8225	8241	8258	8274	34
16	2756	2784	2812	2840	2868	2896	73	56	8290	8307	8323	8339	8355	8371	33
17	2924	2952	2979	3007	3035	3062	72	57	8387	8403	8418	8434	8450	8465	32
18	3090	3118	3145	3173	3201	3228	71	58	8480	8496	8511	8526	8542	8557	31
19	3256	3283	3311	3338	3365	3393	70	59	8572	8587	8601	8616	8631	8646	30
20	3420	3448	3475	3502	3529	3557	69	60	8660	8675	8689	8704	8718	8732	29
21	3584	3611	3638	3665	3692	3719	68	61	8746	8760	8774	8788	8802	8816	28
22	3746	3773	3800	3827	3854	3881	67	62	8829	8843	8857	8870	8884	8897	27
23	3907	3934	3961	3987	4014	4041	66	63	8910	8923	8936	8949	8962	8975	26
24	4067	4094	4120	4147	4173	4200	65	64	8988	9001	9013	9026	9038	9051	25
25	4226	4253	4279	4305	4331	4358	64	65	9063	9075	9088	9100	9112	9124	24
26	4384	4410	4436	4462	4488	4514	63	66	9135	9147	9159	9171	9182	9194	23
27	4540	4566	4592	4617	4643	4669	62	67	9205	9216	9228	9239	9250	9261	22
28	4695	4720	4746	4772	4797	4823	61	68	9272	9283	9293	9304	9315	9325	21
29	4848	4874	4899	4924	4950	4975	60	69	9336	9346	9356	9367	9377	9387	20
30	5000	5025	5050	5075	5100	5125	59	70	9397	9407	9417	9426	9436	9446	19
31	5150	5175	5200	5225	5250	5275	58	71	9455	9465	9474	9483	9492	9502	18
32	5299	5324	5348	5373	5398	5422	57	72	9511	9520	9528	9537	9546	9555	17
33	5446	5471	5495	5519	5544	5568	56	73	9563	9572	9580	9588	9596	9605	16
34	5592	5616	5640	5664	5688	5712	55	74	9613	9621	9628	9636	9644	9652	15
35	5736	5760	5783	5807	5831	5854	54	75	9659	9667	9674	9681	9689	9696	14
36	5878	5901	5925	5948	5972	5995	53	76	9703	9710	9717	9724	9730	9737	13
37	6018	6041	6065	6088	6111	6134	52	77	9744	9750	9757	9763	9769	9775	12
38	6157	6180	6202	6225	6248	6271	51	78	9781	9787	9793	9799	9805	9811	11
39	6293	6316	6338	6361	6383	6406	50	79	9816	9822	9827	9833	9838	9843	10
deg.	60'	50'	40'	30'	20'	10'	deg.	deg.	60'	50'	40'	30'	20'	10'	deg.

deg.	60'	50'	40'	30'	20'	10'	deg.
80	9818	9853	9858	9863	9868	9872	9
81	9877	9881	9886	9890	9894	9899	8
82	9903	9907	9911	9914	9918	9922	7
83	9925	9929	9932	9936	9939	9942	6
84	9945	9948	9951	9954	9957	9959	5
85	9962	9964	9967	9969	9971	9974	4
86	9976	9978	9980	9981	9983	9985	3
87	9986	9988	9989	9990	9992	9993	2
88	9994	9995	9996	9997	9997	9998	1
89	9998	9999	9999	9999	1.0000	1.0000	0

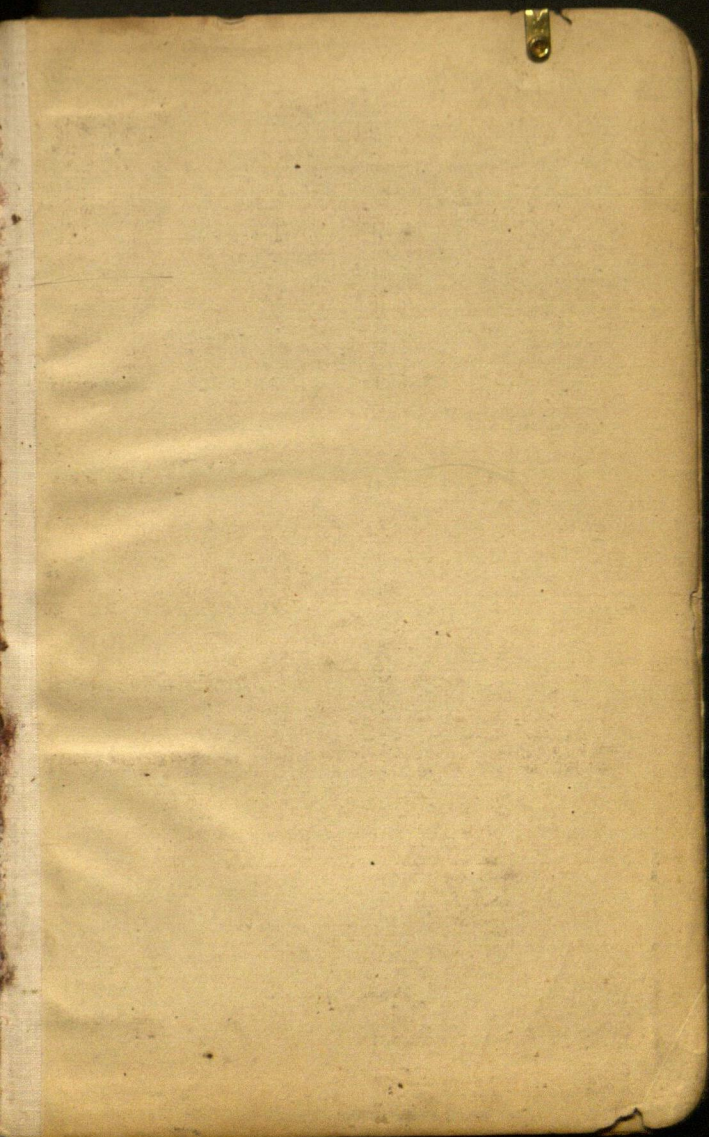
Natural Cosines

Natural Tangents

deg.	0'	10'	20'	30'	40'	50'	deg.	0'	10'	20'	30'	40'	50'	deg.	
0	0000	0029	0058	0087	0116	0145	89	40	8391	8441	8491	8541	8591	8642	49
1	0175	0204	0233	0262	0291	0320	88	41	8693	8744	8796	8847	8899	8952	48
2	0349	0378	0407	0437	0466	0495	87	42	9004	9057	9110	9163	9217	9271	47
3	0524	0553	0582	0612	0641	0670	86	43	9325	9380	9435	9490	9545	9601	46
4	0699	0729	0758	0787	0816	0846	85	44	9657	9713	9770	9827	9884	9942	45
5	0875	0904	0934	0963	0992	1022	84	45	1.0000	1.0058	1.0117	1.0176	1.0235	1.0295	44
6	1051	1080	1110	1139	1169	1198	83	46	1.0355	1.0416	1.0477	1.0533	1.0599	1.0661	43
7	1228	1257	1287	1317	1346	1376	82	47	1.0724	1.0786	1.0850	1.0913	1.0977	1.1041	42
8	1405	1435	1465	1495	1524	1554	81	48	1.1106	1.1171	1.1237	1.1303	1.1369	1.1436	41
9	1584	1614	1644	1673	1703	1733	80	49	1.1504	1.1571	1.1640	1.1708	1.1778	1.1847	40
10	1763	1793	1823	1853	1883	1914	79	50	1.1918	1.1988	1.2059	1.2131	1.2203	1.2276	39
11	1944	1974	2004	2035	2065	2095	78	51	1.2349	1.2423	1.2497	1.2572	1.2647	1.2723	38
12	2126	2156	2186	2217	2247	2278	77	52	1.2799	1.2876	1.2954	1.3032	1.3111	1.3190	37
13	2309	2339	2370	2401	2432	2462	76	53	1.3270	1.3351	1.3432	1.3514	1.3597	1.3680	36
14	2493	2524	2555	2586	2617	2648	75	54	1.3704	1.3848	1.3934	1.4019	1.4106	1.4193	35
15	2679	2711	2742	2773	2805	2836	74	55	1.4281	1.4370	1.4460	1.4550	1.4641	1.4733	34
16	2867	2899	2931	2962	2994	3026	73	56	1.4826	1.4919	1.5013	1.5108	1.5204	1.5301	33
17	3057	3089	3121	3153	3185	3217	72	57	1.5399	1.5497	1.5597	1.5697	1.5798	1.5900	32
18	3249	3281	3314	3346	3378	3411	71	58	1.6003	1.6107	1.6212	1.6319	1.6426	1.6534	31
19	3443	3476	3508	3541	3574	3607	70	59	1.6643	1.6753	1.6864	1.6977	1.7090	1.7205	30
20	3640	3673	3706	3739	3772	3805	69	60	1.7321	1.7437	1.7556	1.7675	1.7797	1.7917	29
21	3839	3872	3906	3939	3973	4006	68	61	1.8040	1.8165	1.8291	1.8418	1.8546	1.8676	28
22	4040	4074	4108	4142	4176	4210	67	62	1.8807	1.8940	1.9074	1.9210	1.9347	1.9486	27
23	4245	4279	4314	4348	4383	4417	66	63	1.9626	1.9768	1.9912	2.0057	2.0204	2.0353	26
24	4452	4487	4522	4557	4592	4628	65	64	2.0503	2.0655	2.0809	2.0965	2.1123	2.1283	25
25	4663	4699	4734	4770	4806	4841	64	65	2.1445	2.1609	2.1775	2.1943	2.2113	2.2286	24
26	4877	4913	4950	4986	5022	5059	63	66	2.2460	2.2637	2.2817	2.2998	2.3183	2.3369	23
27	5095	5132	5169	5206	5243	5280	62	67	2.3559	2.3750	2.3945	2.4142	2.4342	2.4545	22
28	5317	5354	5392	5430	5467	5505	61	68	2.4751	2.4960	2.5172	2.5386	2.5605	2.5826	21
29	5543	5581	5619	5658	5696	5735	60	69	2.6051	2.6279	2.6511	2.6746	2.6985	2.7228	20
30	5774	5812	5851	5890	5930	5969	59	70	2.7475	2.7725	2.7980	2.8239	2.8502	2.8770	19
31	6009	6048	6088	6128	6168	6208	58	71	2.9042	2.9310	2.9600	2.9887	3.0178	3.0475	18
32	6249	6289	6330	6371	6412	6453	57	72	3.0777	3.1084	3.1397	3.1716	3.2041	3.2371	17
33	6494	6536	6577	6619	6661	6703	56	73	3.2709	3.3052	3.3402	3.3759	3.4124	3.4495	16
34	6745	6787	6830	6873	6916	6959	55	74	3.4874	3.5261	3.5656	3.6059	3.6470	3.6891	15
35	7002	7046	7089	7133	7177	7221	54	75	3.7321	3.7760	3.8208	3.8657	3.9136	3.9617	14
36	7265	7310	7355	7400	7445	7490	53	76	4.0108	4.0611	4.1126	4.1653	4.2193	4.2747	13
37	7536	7581	7627	7673	7720	7766	52	77	4.3315	4.3897	4.4494	4.5107	4.5736	4.6382	12
38	7813	7860	7907	7954	8002	8050	51	78	4.7046	4.7729	4.8430	4.9152	4.9894	5.0658	11
39	8098	8146	8195	8243	8292	8342	50	79	5.1446	5.2257	5.3093	5.3955	5.4845	5.5764	10
deg.	60'	50'	40'	30'	20'	10'	deg.	60'	50'	40'	30'	20'	10'	deg.	

deg.	0'	10'	20'	30'	40'	50'	deg.
80	5.6713	5.7694	5.8708	5.9758	6.0844	6.1970	9
81	6.3138	6.4348	6.5606	6.6912	6.8269	6.9682	8
82	7.1154	7.2687	7.4287	7.5958	7.7704	7.9530	7
83	8.1443	8.3450	8.5555	8.7769	9.0098	9.2553	6
84	9.5144	9.7882	10.078	10.385	10.711	11.059	5
85	11.430	11.826	12.250	12.706	13.197	13.727	4
86	14.300	14.924	15.605	16.350	17.169	18.075	3
87	19.081	20.206	21.470	22.903	24.522	26.432	2
88	28.636	31.242	34.368	38.189	42.904	49.104	1
89	57.290	68.750	85.940	114.588	171.885	343.770	0
deg.	60'	50'	40'	30'	20'	10'	deg.

Natural Cotangents



Moulton, old notes:

at 5289.40 N. - NE Cor Sec 20 sub

East 9.38 feet

4129.60 sub East 7.32 feet

Run East $7\frac{1}{2}$ or

E 203.20

Midland Supply Co. St Paul

*A Square Area at 2087 ft
on the side*

16.5 x 16.5 = 272.25

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES $1\frac{1}{2}$ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

MADE IN GERMANY.