

Transit Notes.
County Ditch No. 16
Bull-Moose Twp.

FINAL LOCATION.

FIELD BOOK

364 A

C. J. Bark,
- Engineer.

C. J. WHITE,
HIGHWAY ENGINEER,
WALKER, CASS CO.

97

KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND

SURVEYING INSTRUMENTS.

NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

Tables for Excavations and Embankments.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.

FOR SINGLE TRACK EXCAVATION.

"Copyright, 1895, by Keuffel & Esser Co."

	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
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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	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

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

FOR KEITH'S RAILROAD CURVE TABLES SEE END OF BOOK.

C. J. WHITE,
HIGHWAY ENGINEER,
WALKER, CASS CO.

File Under
Field Book #97

Stadia Traverse Line No. 1 B Variation ----- Instman. ----- Date -----

Inst. ----- Rodman ----- Weather -----
 Needle Bearing. Remarks.

Object.	Upper Wire	Middle Wire	Lower Wire	Rod Int.
□ B.S. □	6.42	4.51	2.60	3.82
" 51	4.00	3.00	2.00	2.00
" 52	7.00	5.00	3.00	4.00
" 53	5.00	3.20	1.40	3.60
" 54	6.00	4.00	2.00	4.00
" △	7.00	5.00	3.00	4.00
" F.S. □	6.00	4.00	2.00	4.00
□ B.S. □	10.00	6.00	2.00	8.00
" 51				
" 52				
" 53				
"				
" F.S. □				
□ B.S. □				

Sample
Traverse

Needle Bearing.	Remarks.
N. 16° 30' W.	□ = Sta 0+00 Main ditch.
N 10° 15 W	51 = North swamp edge.
N. 4° 45' E	52 = Point of high land. ^{Edge} swamp.
N. 30° 15 E	53 = Bay - Edge swamp.
N 6° 45 W.	54 = Edge swamp.
S 45° 15 E	△ = Triangulation Station #1.
N 40° 15 W	□ = Traverse Sta. #2 - Edge swamp
S 10° 15 E	□ = Traverse Sta. #3 - Edge swamp.

Notes

Connect the shots in this manner in the same order that they should be platted. Always take the shots in the field in the same order that they should be platted.

Triangulation Notes.

Ditch Bk 997 Base No. sta. Δ 4100 to Sta Δ 36+90 3690 ft.

T	Fore sight.	Object	ANGLE			Sum of 3 Pointings	Cor L.	Average	Remarks.
			1 st Pointing	2 nd Pointing	3 rd Pointing				
Δ	Δ	Δ	40°12'	40°11'	40°13'	120°36'	L.	40°12'	cloudy + cold.
Δ	Δ	Δ	60°05'	60°04'	60°06'	180°15'	R.	60°05'	" "

~~Sample of Notes.~~

~~of triangulation.~~

~~For Triang~~

Station Δ Bearing

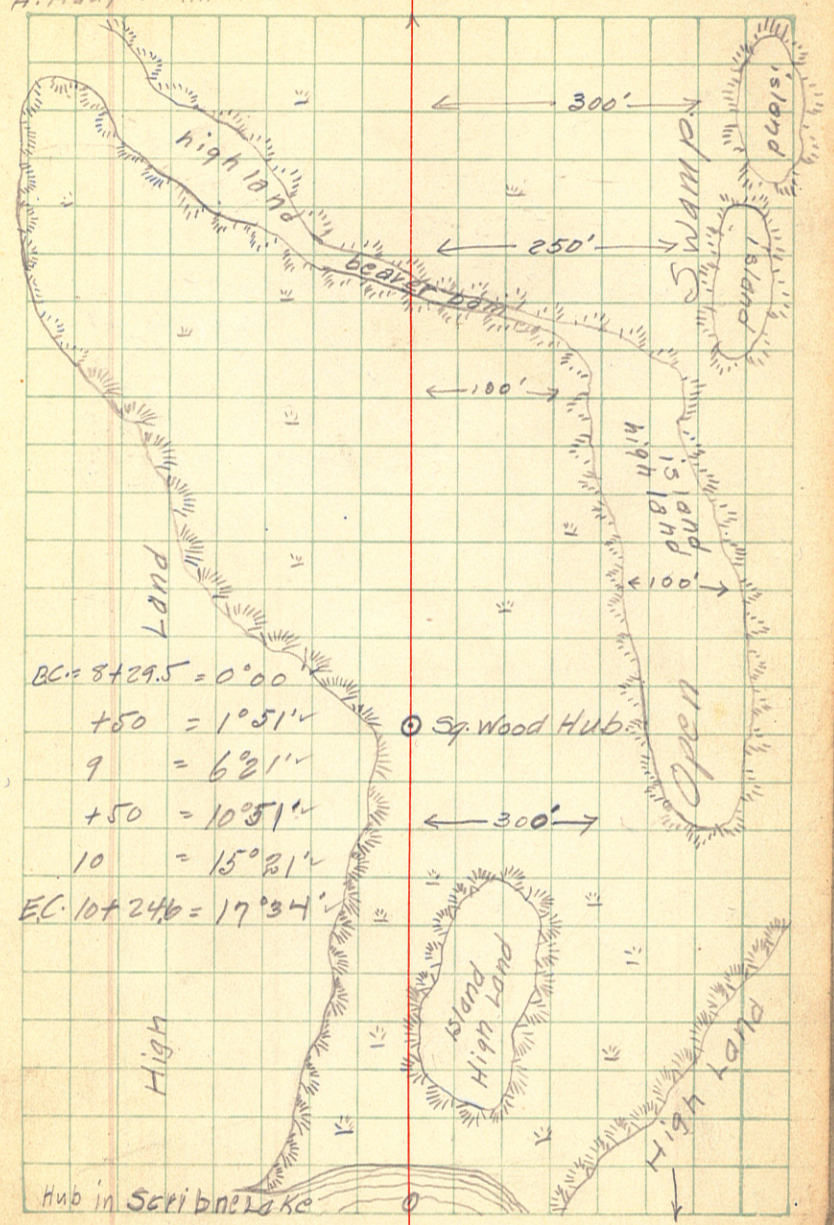
Variation = ~~North~~ Bk 097
Main Ditch

C.J. Bark = Eng.
O.A. Rusk = Rod Man.
J. Kater = Chairman
M. Wideman = Ax-Man
A. Haugen = Ax-Man

Jan. - 26 - 1922
Weather = Clear -
Warm South-East Wind

3		
2		
1		
20		
19		
18		
17		
16	558°30'W	
15		
14		
13		
12		
11		
10		
9+302	35°07' R.	
9		
8		
7		
6		
5	583°W.	
4		
3		
2		
1		
0+100	Δ	

$P.I. = 9 + 30.2$
 $A = 35^{\circ} 07' R.$
 $D_i = 18^{\circ}$
 $T = 100.7$
 $L_c = 195.1$
 $P.C. = 8 + 29.5$
 $E.C. = 10 + 24.6$
 $R = 318.3$



$B.C. = 8 + 29.5 = 0^{\circ} 00'$
 $+50 = 1^{\circ} 51''$
 $9 = 6^{\circ} 21''$
 $+50 = 10^{\circ} 51''$
 $10 = 15^{\circ} 21''$
 $E.C. = 10 + 24.6 = 17^{\circ} 34'$

Main Ditch Bk 097

2
Sta. Δ Bearing

7
6 S 81° 30' W
5
4
3

42+363 35° 49' L

2

1

40

9

8

7

6

5

4

3

2

1

30

9

8

7

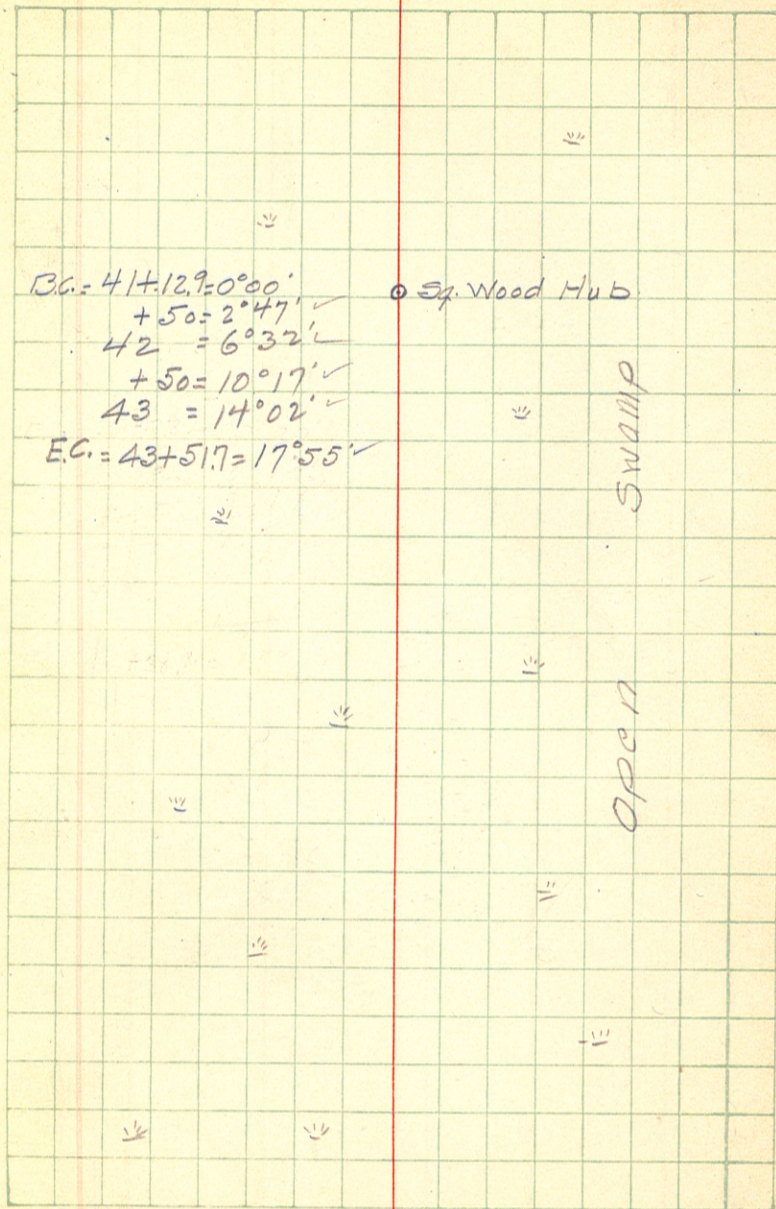
6

5

24

PI. = 42+363
Δ = 35° 49' L
DC = 15°
T = 123.4
LC = 238.8
R = 382.0
BC = 41+12.9
EC = 43+51.7

BC = 41+12.9 = 0° 00' ○ Sp. Wood Hub
+ 50 = 2° 47' ✓
42 = 6° 32' ✓
+ 50 = 10° 17' ✓
43 = 14° 02' ✓
EC = 43+51.7 = 17° 55' ✓



SWAMP

OPEN

3
Sta.

Δ

Bearing

1

70

9

8

7

6

5

4

3

2

61+342 Pat.

1

60

9

8

7

6

5

4

3

2

1

50

9

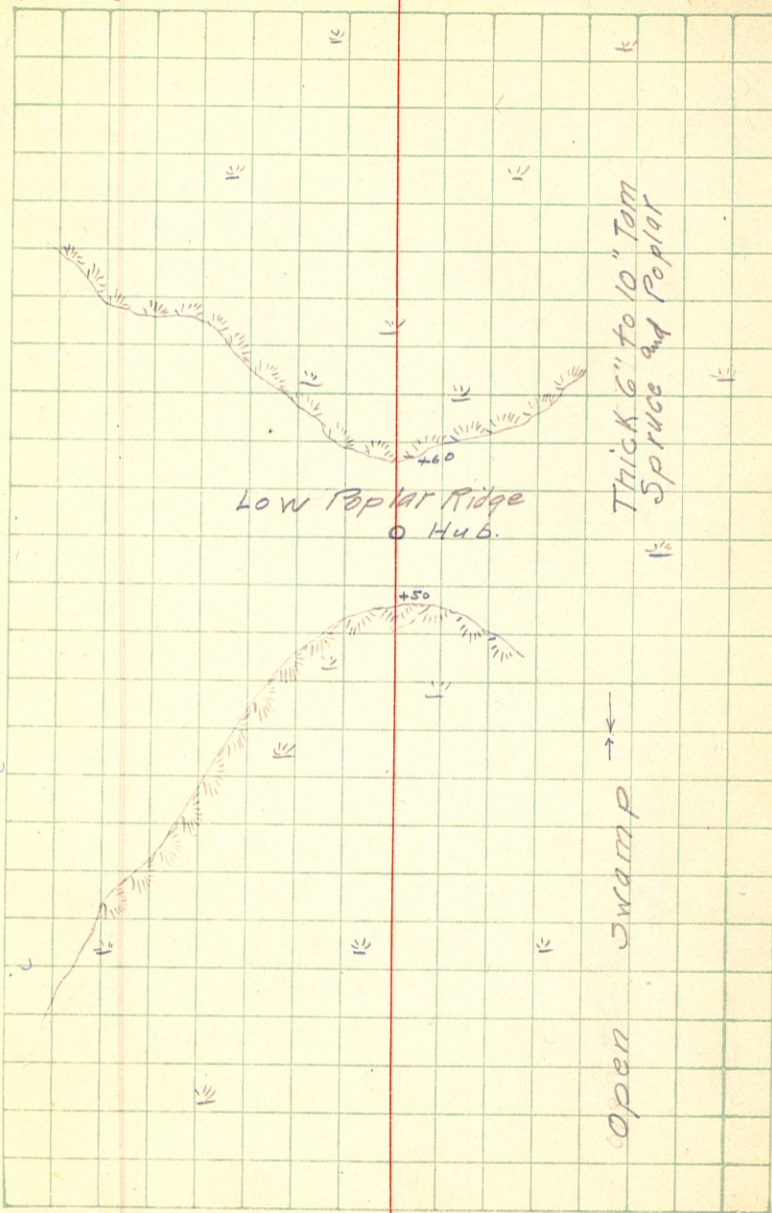
48

Main Ditch Bk 09

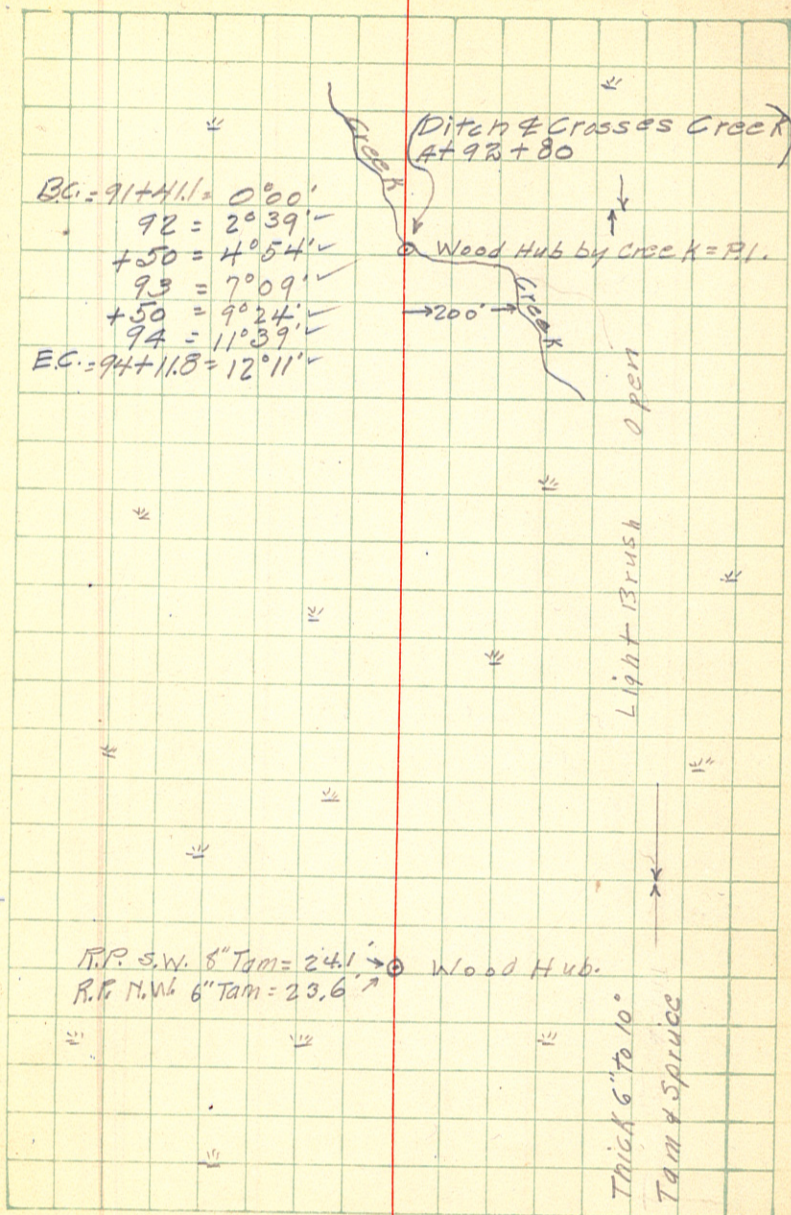
E. J. Bark = Eng.
O. A. Rush = Rod Man
J. Kater = Chain Man
M. Wideman = Ax Man
A. Haugen = Ax Man

Weather = Warm +
cloudy.
Jan. 27 - 1922

6



Sta.	A	Bearing		
5				
4				
3				
92+78.6	24°22'4" S	58° E	Ext. = 15'	P.I. = 92+78.6
2				D.C. = 9°
1				T = 137.5
90				L.C. = 270.7
9				R = 636.6
8				B.C. = 91+4.1
7				E.C. = 94+11.8
6				
5				
4				
3				
2				
1				
80				
9				
8				
77+00	P.O.T.			
6				
5				
4				
3				
72				



5
Sto.

Δ

Bearing

Main Ditch. Bk 097

120

9

8

7

6

5

4

3

112+00 Pat.

1

110

9

8

7

6

5

4

3

102+00 Pat.

1

100

9

8

7

6

← 75' →

8

Creek.

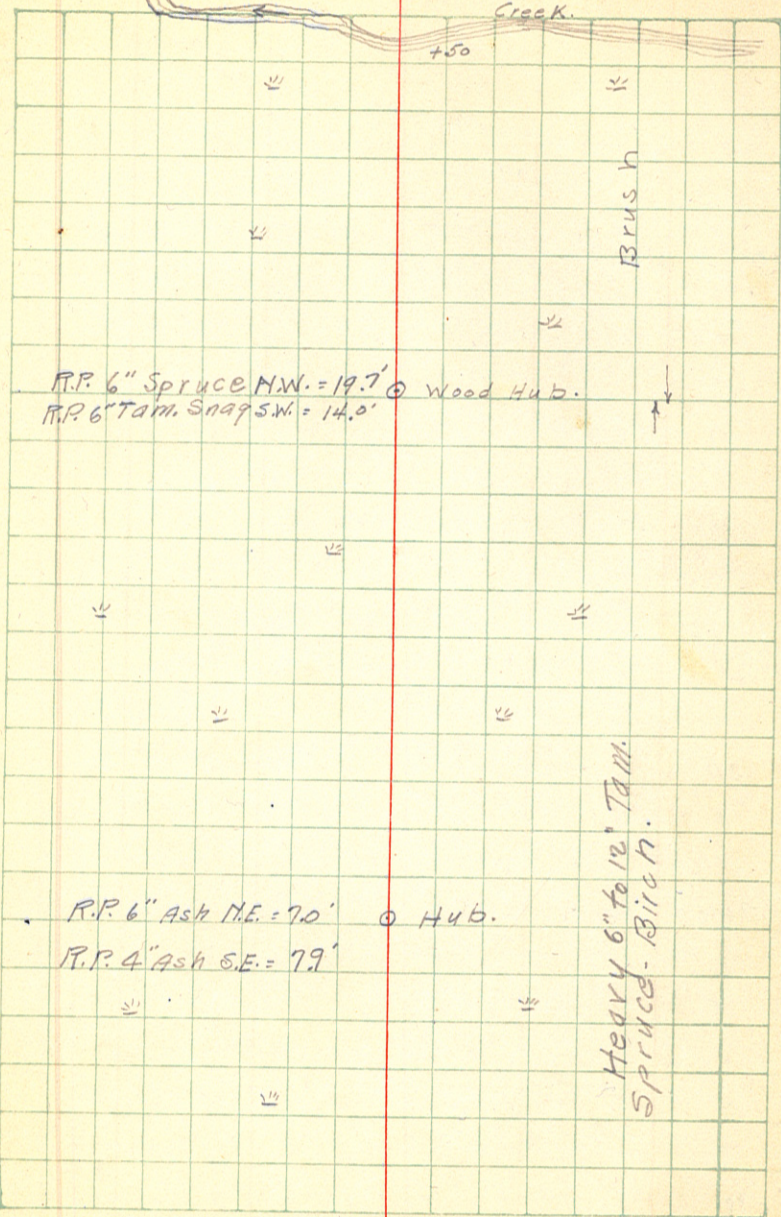
+50

Brush

R.P. 6" Spruce M.W. = 19.7' @ Wood Hub.
R.P. 6" Tam. Snag S.W. = 14.0'

R.P. 6" Ash N.E. = 7.0' @ Hub.
R.P. 4" Ash S.E. = 7.9'

Heavy 6" to 12" Tam.
Spruce. Birch.



6
Sta.

A

Bearing

5

4

3

2

141+00 P.O.T.

140

9

8

7

6

5

4

133+00 P.O.T.

2

1

130

9

8

127+00 P.O.T.

6

5

4

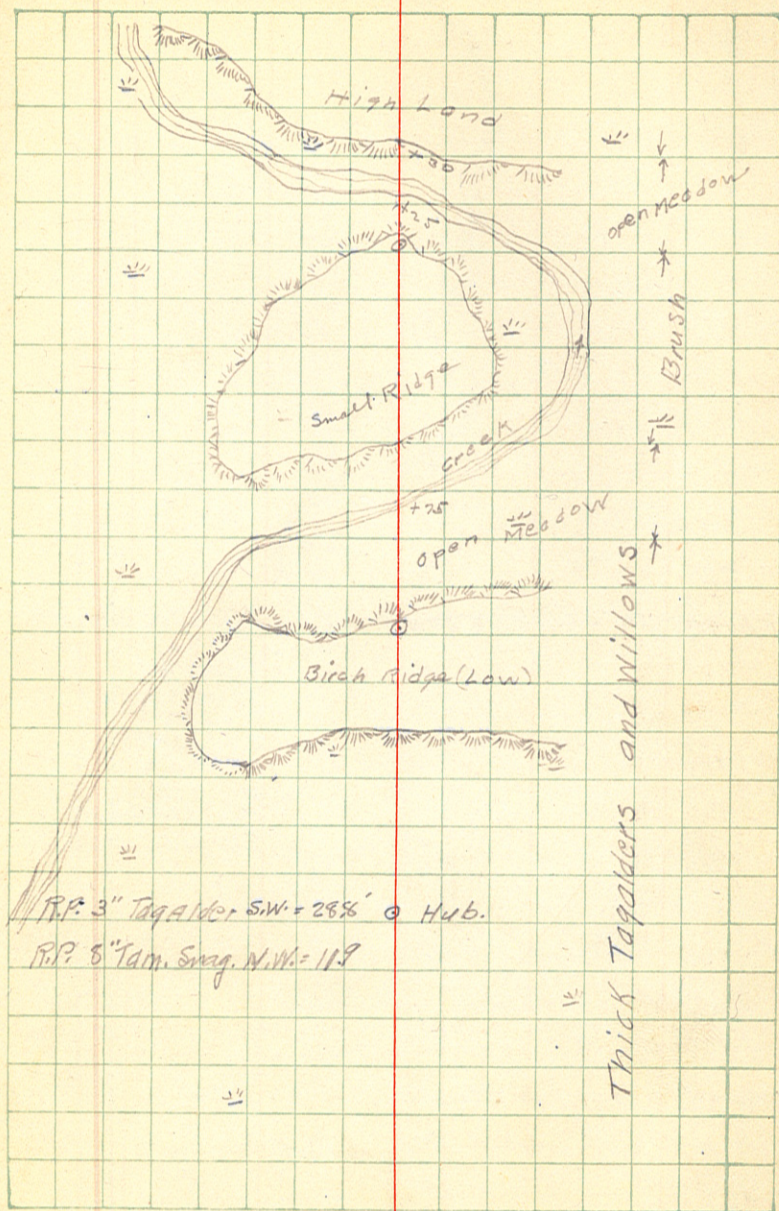
3

2

121

Main Ditch Bk 097

9



<u>7</u>		
Sta.	Δ	Bearing
8		
7		
6		
5		
4		
3		
2		
1		
160		
9		
8		
7		
156+279		54°35'LT 556°20'E
6		
5		
4		
3		
2		
1		
158		
9		
8		
147+096		ROT
7		
146		

Main Ditch

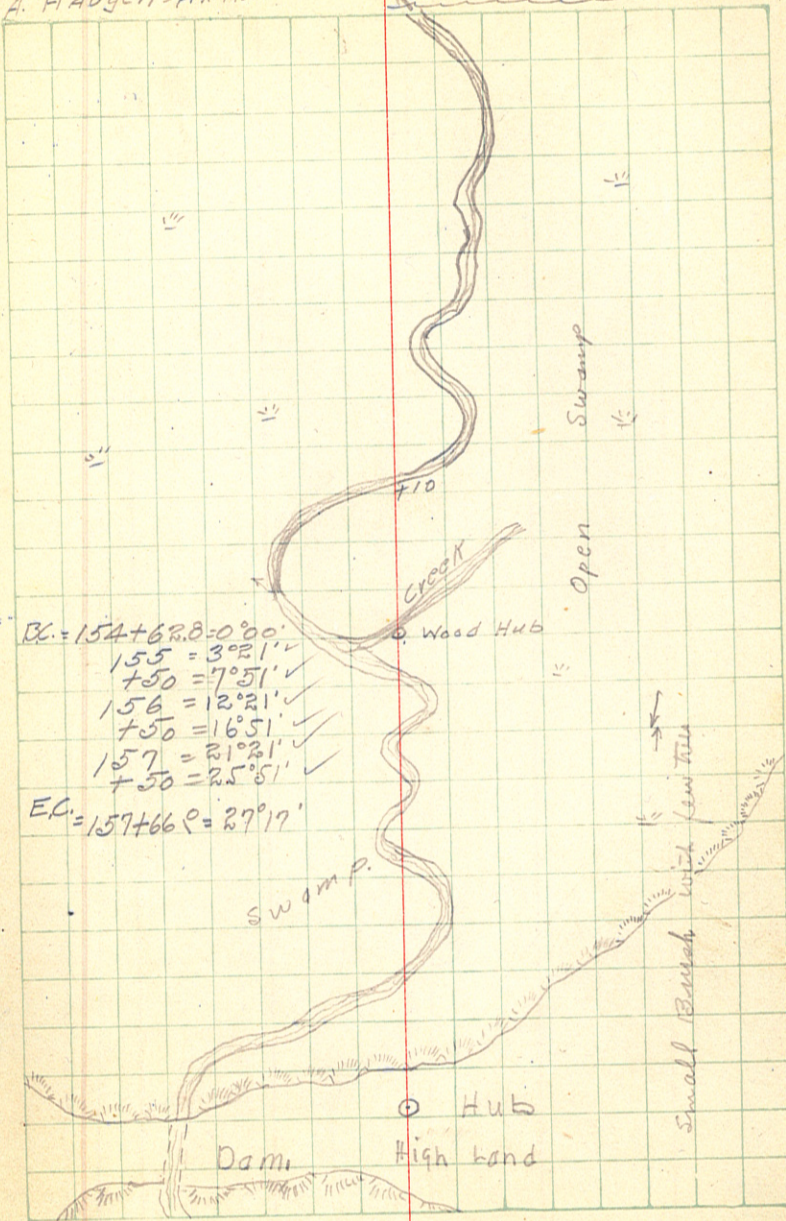
$RI = 156 + 279$
 $Ext = 40'$
 $\Delta = 54^\circ 35' LT$
 $PC = 18'$
 $T = 164.3'$
 $Lc = 303.3'$
 $R = 318.3'$
 $EC = 154 + 68.8$
 $EC = 157 + 66.0$

G.J. Bark = Eng.
 O.A. Rush = Rod Man
 J. Kater = Chainman
 M. Wideman = Ax Man
 A. Haugen = Ax Man

Weather = Warm
With S.E. Wind

10

Jan. 28 - 1922



8

Sta.

Beating

A

2

R1. 192+196 = 14° 32' R

1

T = 365.3

Lc = 726.7

190

R = 2765.0

D = 2°

9

BC = 188 + 52.3

EC = 195 + 79.0

BC = 188 + 52.3

8

7

6

5

4

3

2

1

190

9

8

7

6

5

4

3

2

1

190

169

BC = 188 + 52.3 = 0° 00'

189 = 0° 29' ✓

+50 = 0° 59' ✓

190 = 1° 29' ✓

+50 = 1° 59' ✓

191 = 2° 29' ✓

+50 = 2° 59' ✓

192 = 3° 29' ✓

+50 = 3° 59' ✓

193 = 4° 29' ✓

+50 = 4° 59' ✓

194 = 5° 29' ✓

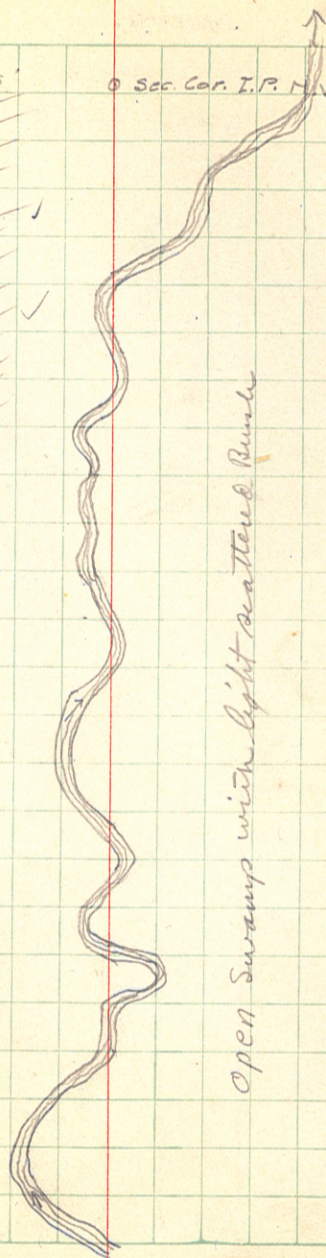
+50 = 5° 59' ✓

195 = 6° 29' ✓

+50 = 6° 59' ✓

EC = 195 + 79.0 = 7° 16'

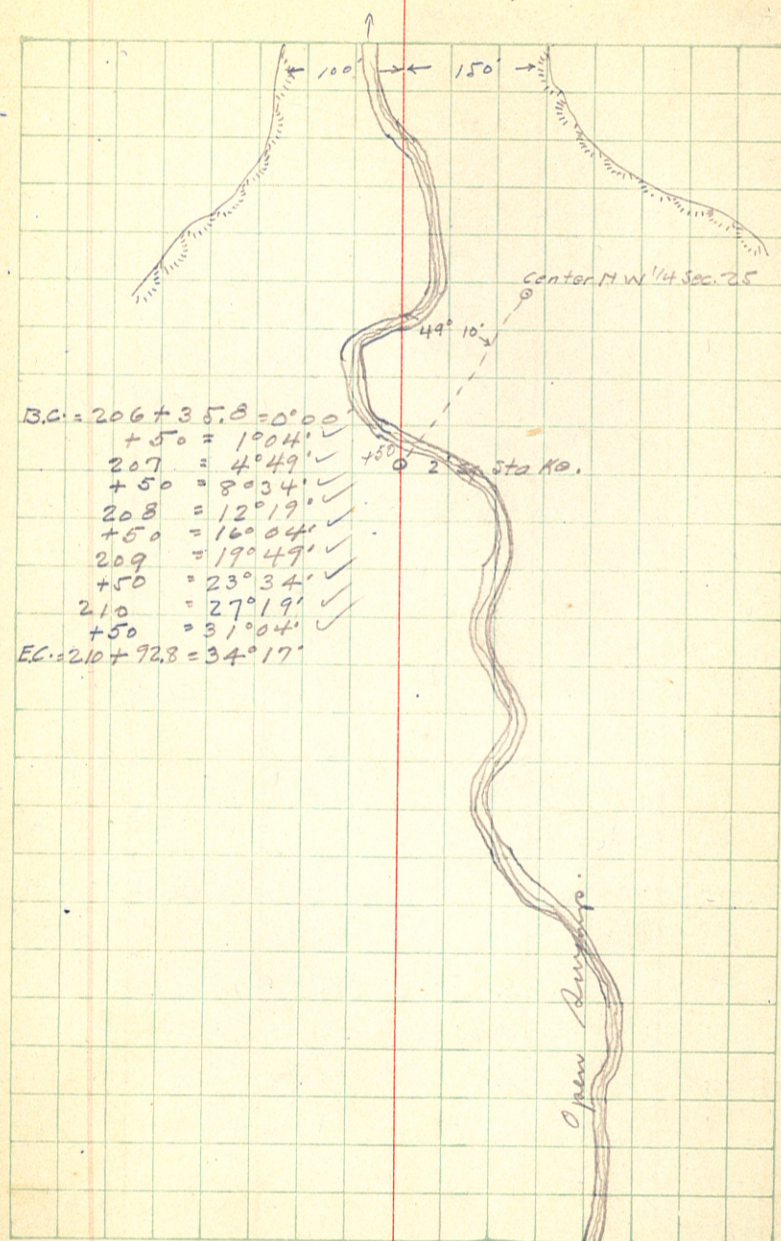
0 Sec. Cor. I.P.M.W. Sec. 25.



Open Swamp with light scattered Bunch

<u>9</u>			
Sta.	Δ	Bearing	A
4			
3		N53°E	
2			
1			
EC = 210 + 92.8			
10			
9			
8			
7			
BC = 206 + 35.8			
6			
5			
4			
3			
2			
1			
200			
9			
8			
7		S41°30'E	
6			
EC = 195 + 79.0			
5			
4			
193			

PI = 208 + 96.2 = 68°33' Lt
 Ext. = 80'
 Dc = 150
 A = 68°33' Lt
 T = 260.4
 Lc = 457.0
 R = 382.0
 BC = 206 + 35.8
 EC = 210 + 92.8

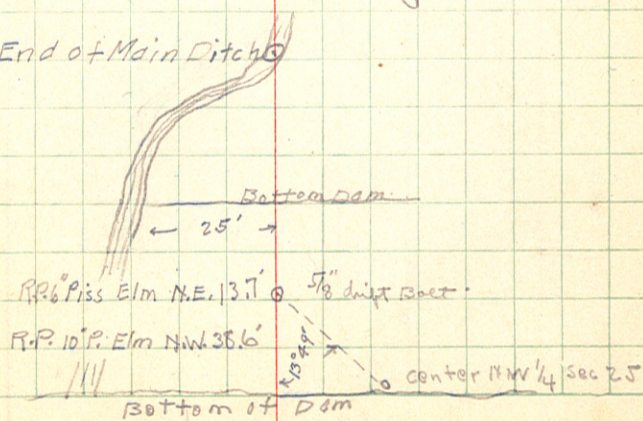


10.
sta. Δ Bearing

216+13.4	End of Main Ditch
6	
215	
+95	
214+85	
214+77.6	Rot.
+67	
214+50	

End of Main Ditch = 216+13.4

End of Main Ditch



13

Lateral Ditch Bk 097

Weather - Mild + Cloudy

15

sta.	Δ	Bearing
3		
2		
1		
20		
19		
18		
17		
16		
15+00	P.O.T.	
14		
13		
12		
11		
10		
9		
8		
7		N36°16'E
6		
5+13.9=EC.		
5		
4		
3		
2		
1		

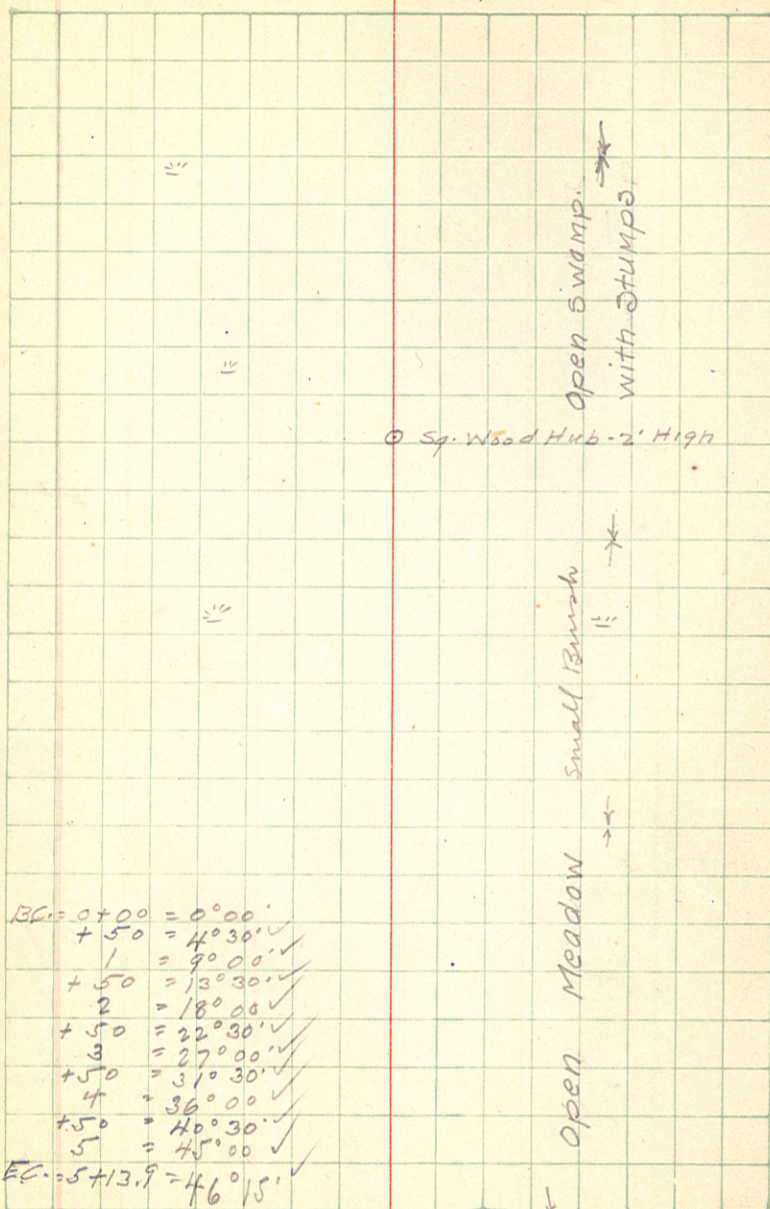
3
2
1
20
19
18
17
16
15+00
14
13
12
11
10
9
8
7
6
5+13.9=EC.
5
4
3
2
1

P.O.T.

N36°16'E

RC-0+00=188+32.5 Main Ditch

P.I. = 185+00 Main
 Δ = 92°30'
 T = 332.5
 L = 513.9
 R = 318.3
 D₀ = 18°
 RC = 0+00
 EC = 5+13.9



RC = 0+00 = 0°00'
 +50 = 4°30' ✓
 1 = 9°00' ✓
 +50 = 13°30' ✓
 2 = 18°00' ✓
 +50 = 22°30' ✓
 3 = 27°00' ✓
 +50 = 31°30' ✓
 4 = 36°00' ✓
 +50 = 40°30' ✓
 5 = 45°00' ✓
 EC = 5+13.9 = 46°15' ✓

Open Swamp with Stumps
 Small Brush
 Open Meadow

○ Sq. Wood Hub - 2' High

C.J. Dark
O.A. Rush
J. Kater
M. Wideman
A. Haugen

13

sta.

Δ

Bedding

8

7

6

5

4

3

2

1

40

9

8

7

6

5

4

3

2

31+00

Rot.

30

9

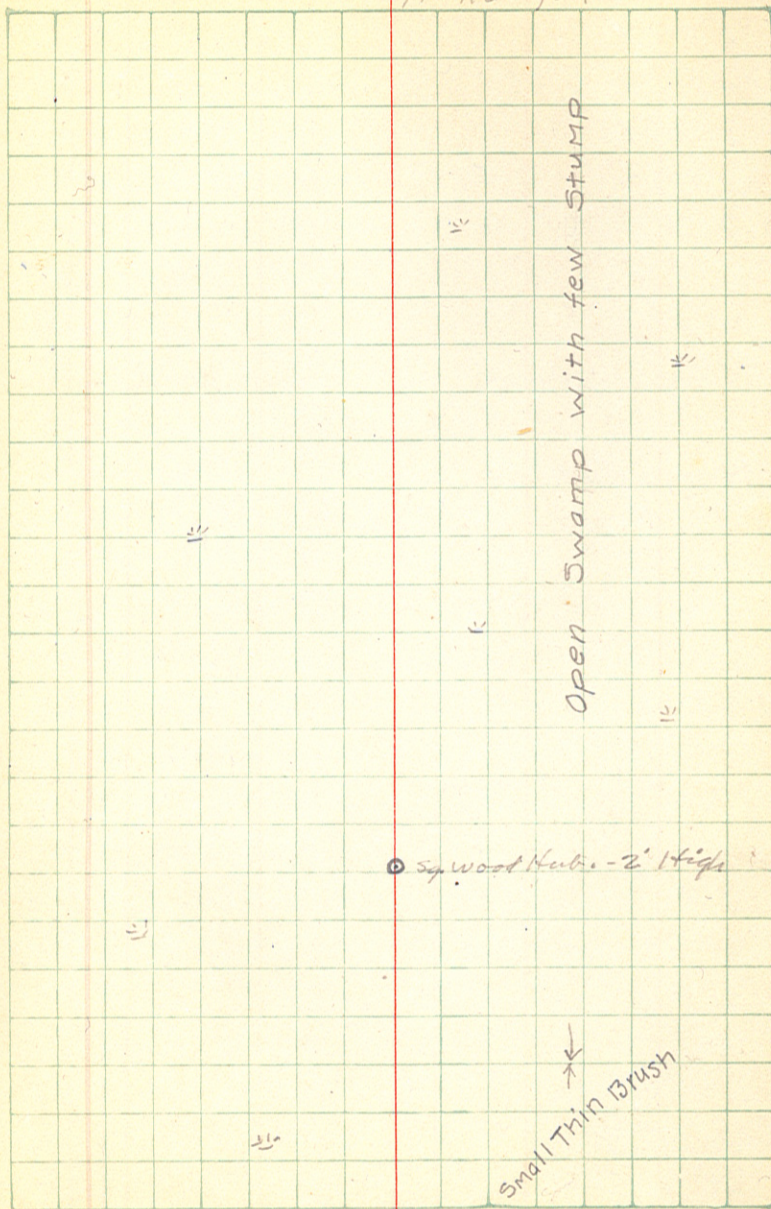
8

7

6

5

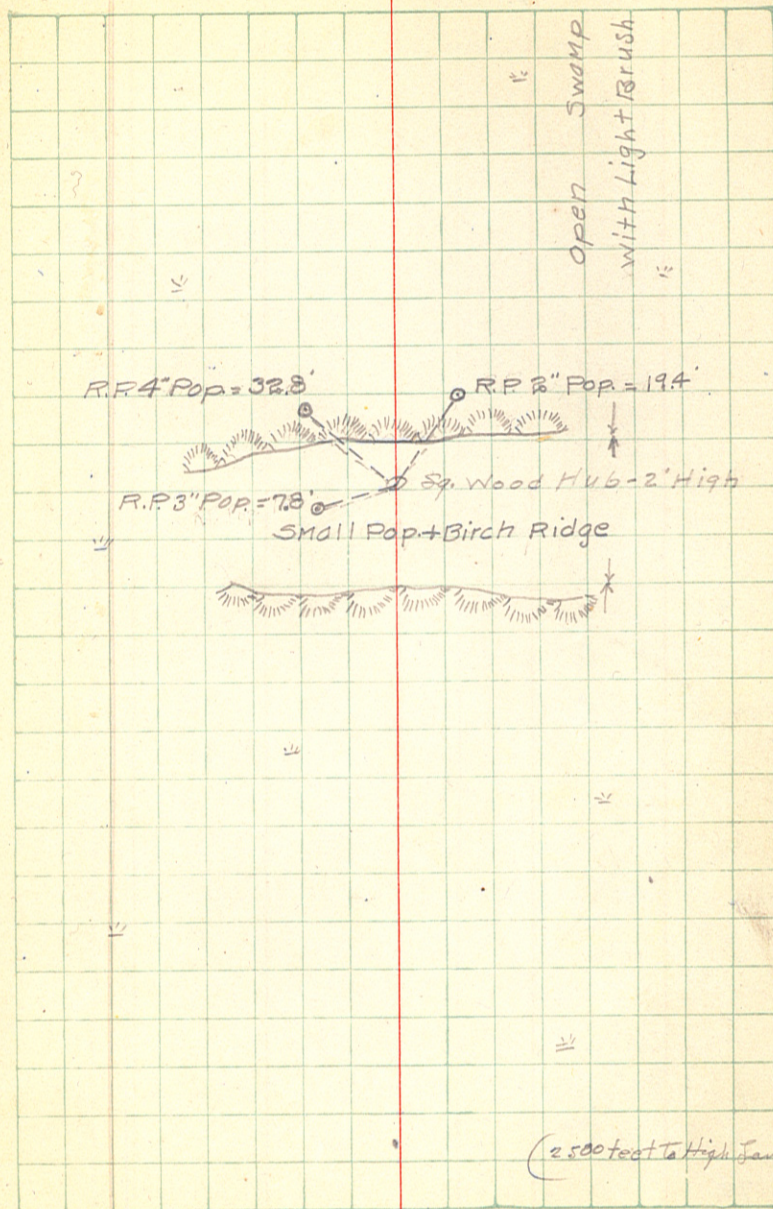
24



14
sta. Δ Bearing

3
2
1
70
9
8
7
6
5
64+00
3
2
1
60
9
8
7
6
5
4
3
2
1
50
49

P.O.T.



15
sta. Δ Bearing

8

7

6

5

4

3

2

1

90

9

8

7

6

5

84+00 R.O.T.

3

2

1

80

9

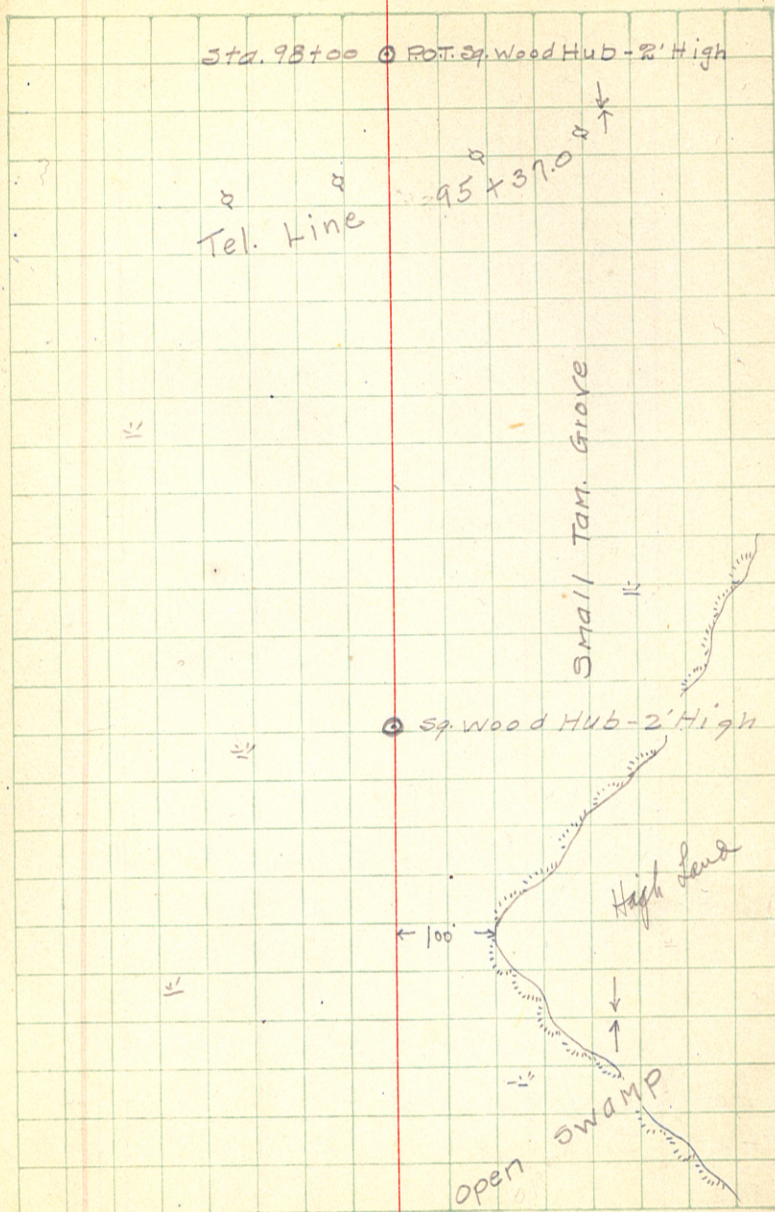
8

7

6

5

74



16
sta.

Δ

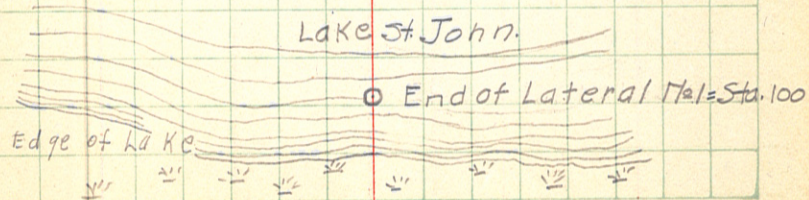
Bearing

100
99 + 66°
99

Lateral Mol

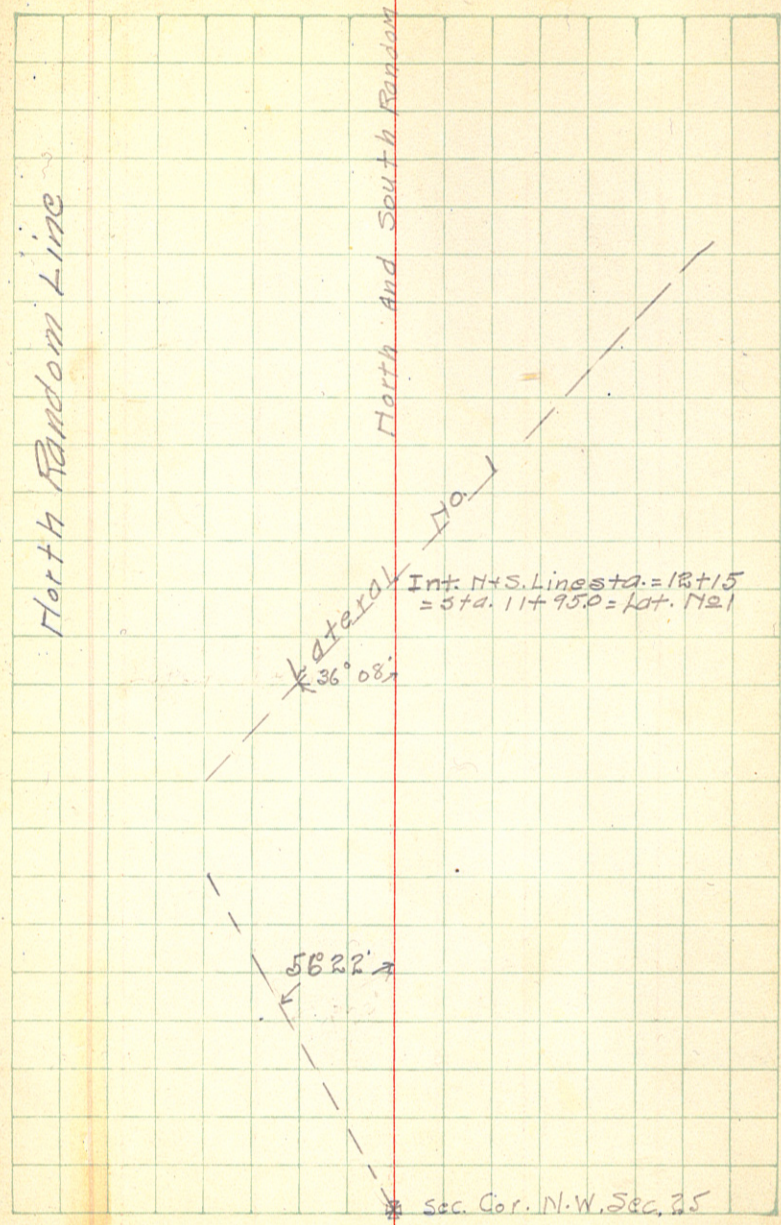
19

End of Lateral Mol.



<u>18</u> Sta.	A	Bearing
3		
2		
1		
20		
19		
18		
17		
16		
15+00	ROT.	
14		
13		
12+15		
12		
11		
10	ROT.	
9		
8		
7		
6		
5	ROT.	
4		
3		
2		
1		
0+00		

Random Line North
 Va. = $178^{\circ}30'E$



19
sta.

Δ

Bearing

6

5

4

3

2

1

40

9

8

7

6

5

4

3

2

1

30

2990+00 POT

9

8

27

2640+00 POT

6

5

24

Ditch Bk 097

North and South Line
Going North from Sec. Cor
N.W. Cor. Sec. 25

C.J. BARK-ENG.
O.A. Rush = Rodman
J. Kater = Chain Man
M. Wideman = Ax-Man
A. Haugen = Ax-Man

22

sta 28+00 = edge of

swamp on line ○ on 1-194 hand
gang water.

○ Hub

20

sta.

A

Bedring

8

7

6

5

64+280

4

3

2

1

60

9

8

7

6

5

4

3

58+800

2

1

50

9

8

7

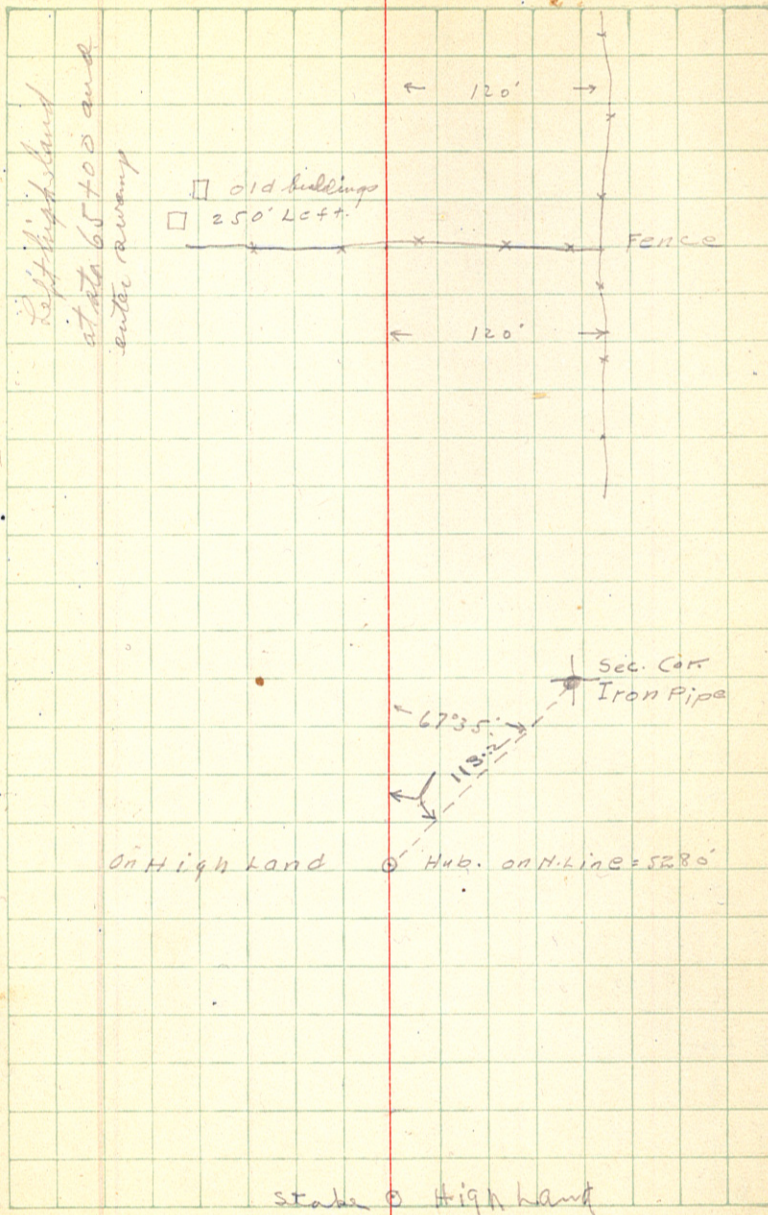
46+50

part

Ditch Bk 097

North Random Line

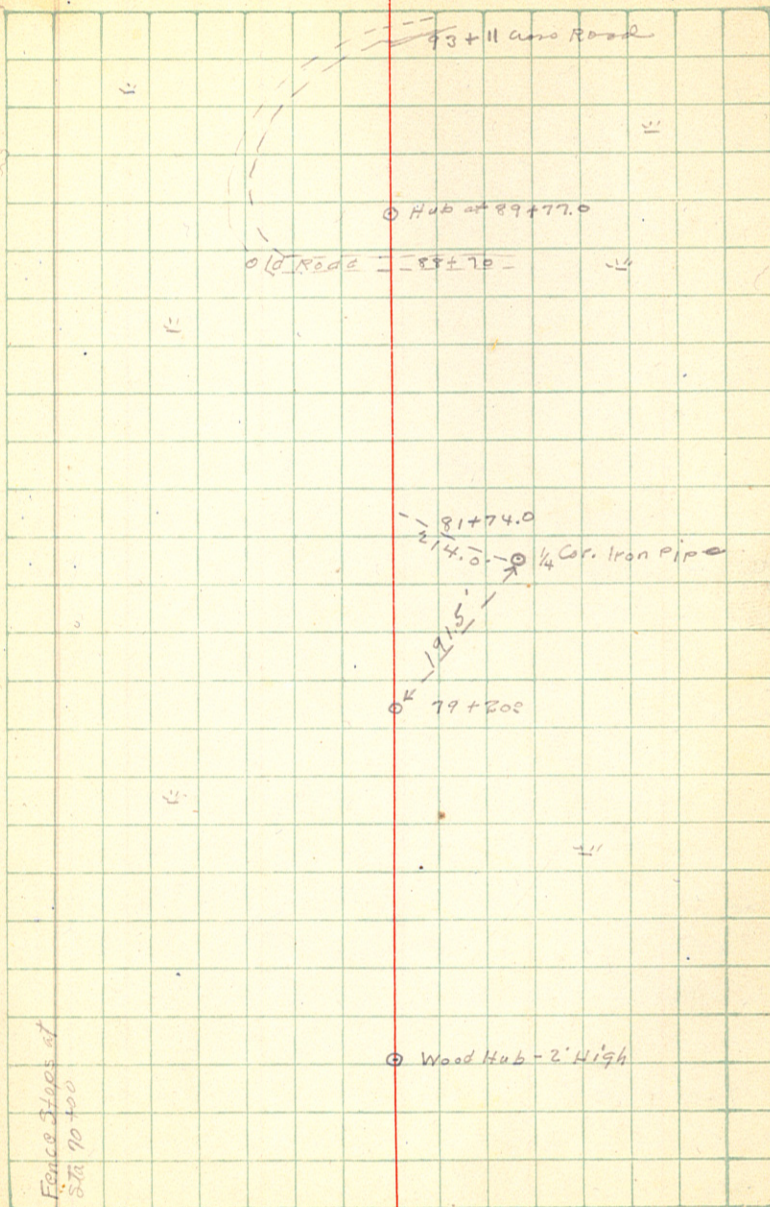
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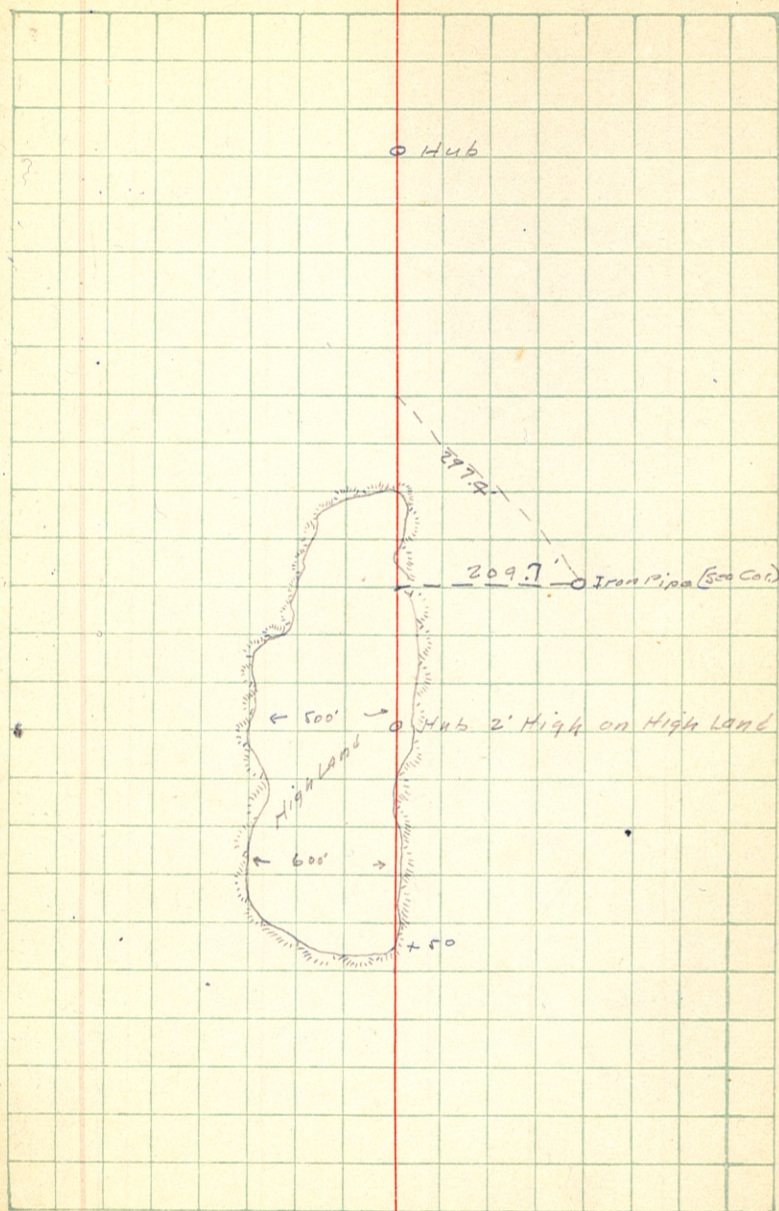
North Random Line

27

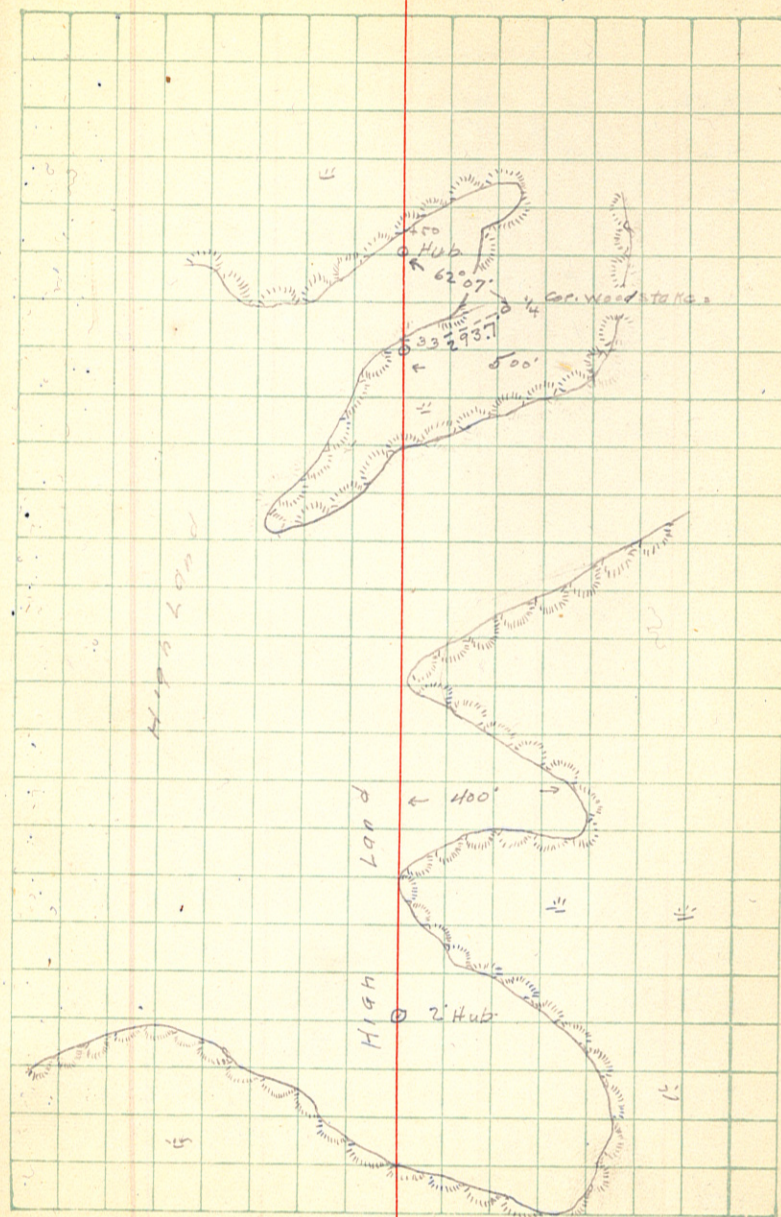
3
 2
 1
 90
 9
 8
 7
 6
 5
 4
 3
 2
 81
 80
 9
 8
 7
 6
 5
 4
 3
 72+00 P.O.T.
 1
 70
 69



14
 13
 112+31.4 P.O.T.
 12
 11
 10
 9
 108+83.9
 108
 107
 106+44.9 P.O.T.
 106+32
 106
 5
 104+00 P.O.T.
 3
 2
 1
 100
 9
 8
 7
 96+00 P.O.T.
 5
 94



- 38
- 37
- 36
- 35
- 134+00 Pct
- 33
- 132
- 1
- 130
- 127+00 Pct.
- 26
- 25
- 24
- 23
- 22
- 21
- 20
- 19
- 118+75° P.O.T.
- 18
- 17
- 16
- 115



159+58.3

59

58

57

56

55

54

53

52

51

50

49

148+63.9 ROT.

8

7

6

5

4

3

2

1

140

39

138+07.8

(End of North Random Line)

End of North Line

140.4'

Sec. 11 E. Cor. Sec. 11

Iron Pipe

91.00'

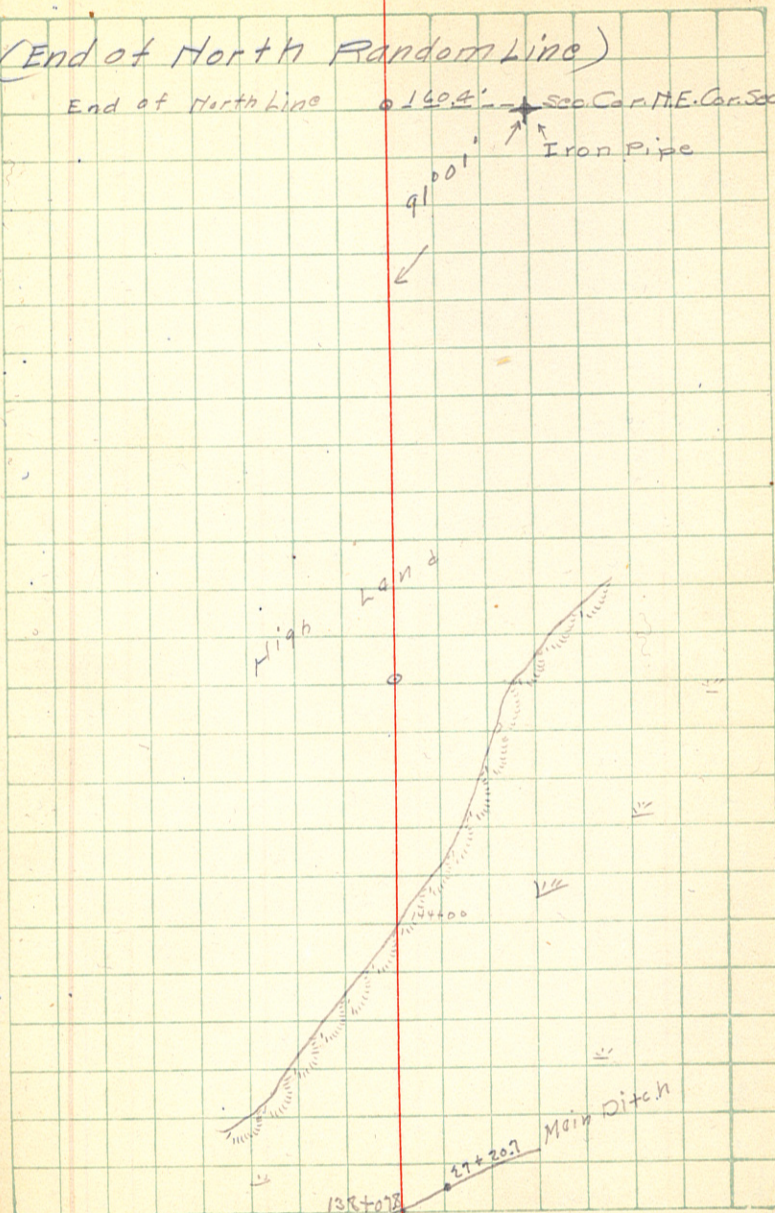
High Land

104+00

138+07.8

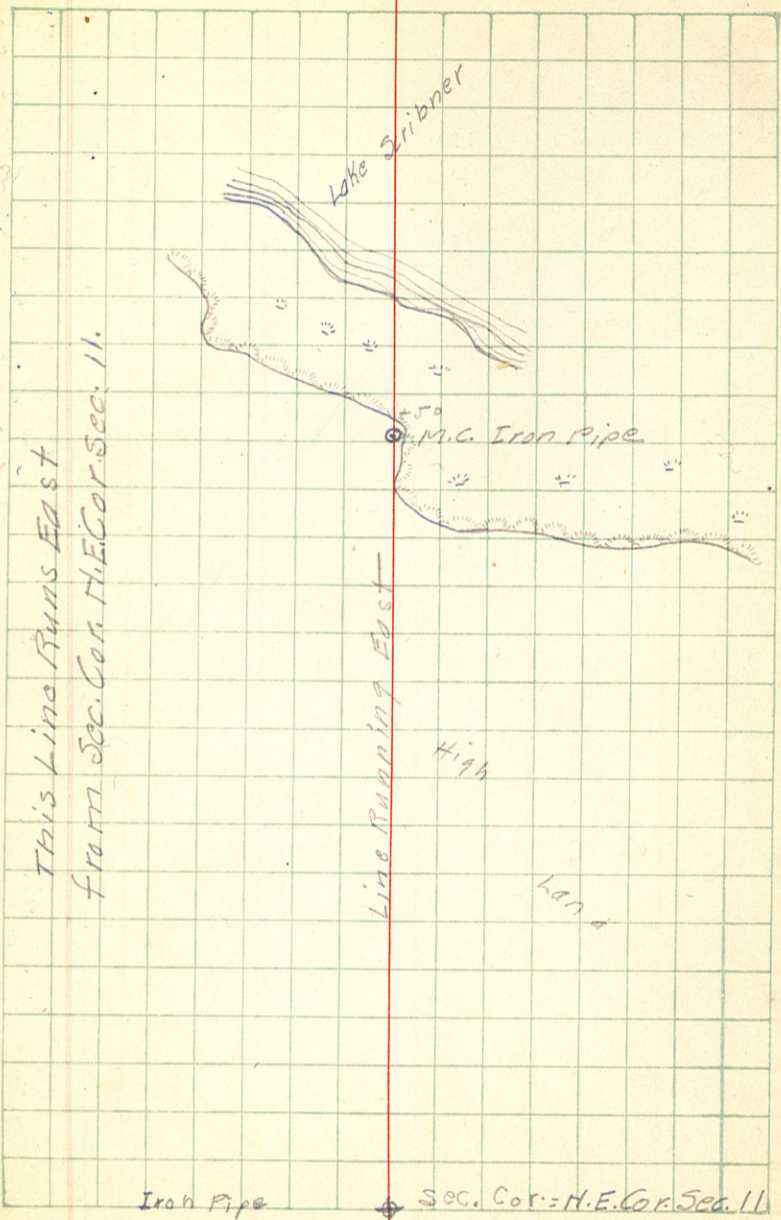
27+20.7

Main Ditch



- 4
- 3
- 2
- 1
- 20
- 19
- 18
- 17
- 16
- 15 + 58.1 P.O.T.
- 15
- 14
- 13
- 12
- 11
- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1

0+00 42°09' R₄



This Line Runs East from Sec. Cor. H.E. Cor. Sec. 11.

Line Running East

Iron Pipe

Sec. Cor. = H.E. Cor. Sec. 11

2

46

45+50 POT.

5

4

3

2

1

40

9

8

37+85.3 POT.

7

6

5

4

3

2

1

30

9

8

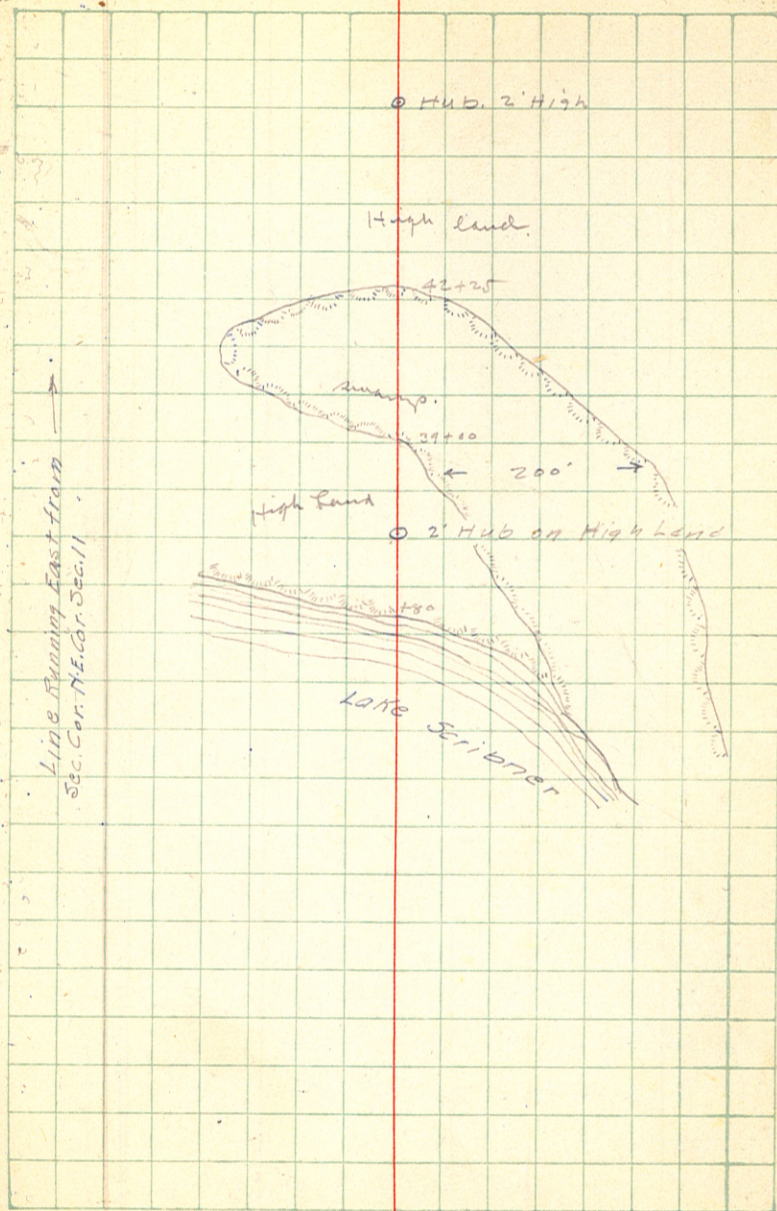
7

6

5

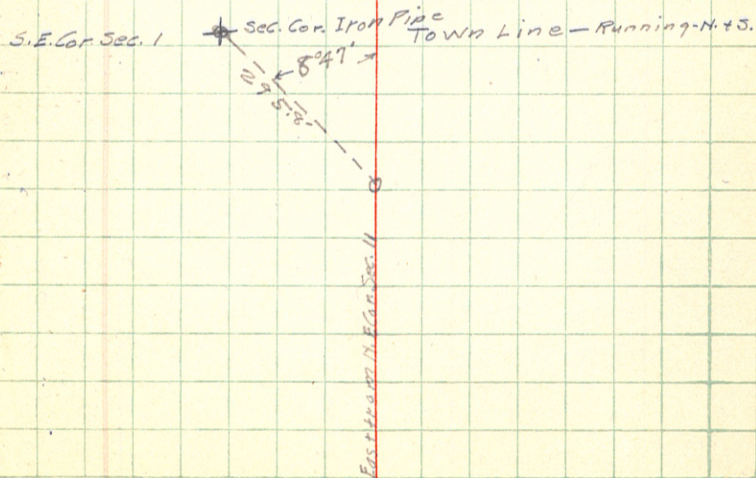
24

29



52+80 P.O.T.
 2
 1
 50
 9
 8
 47

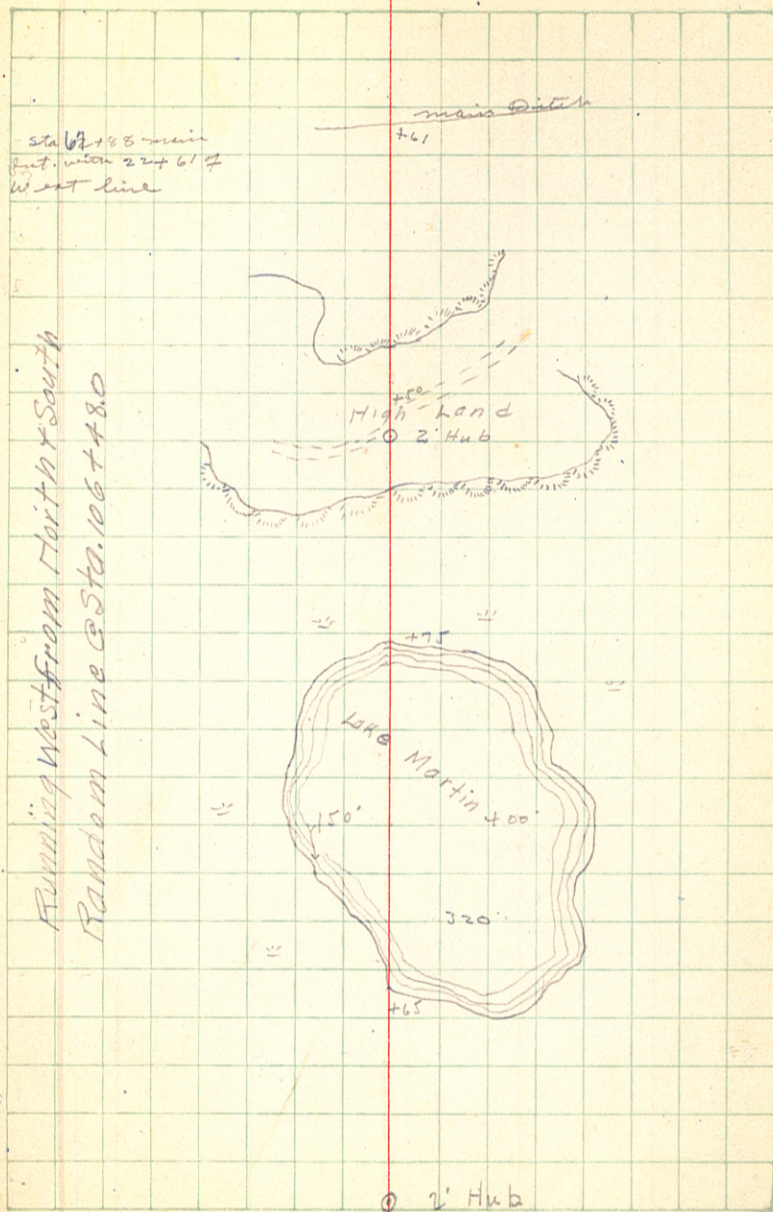
End of East Line
 from N.E. Cor. Sec. 11.



West Line from
 Sec. Cor. = S. W. Cor. Sec. 12.

24
 23
 22
 21
 20
 19
 18
 17
 16+00 P.O.T.
 15
 14
 13
 12
 11
 10
 9
 8
 7
 6
 5
 4
 3
 2
 1

0+00 = 106 + 48.0 on North Random Line

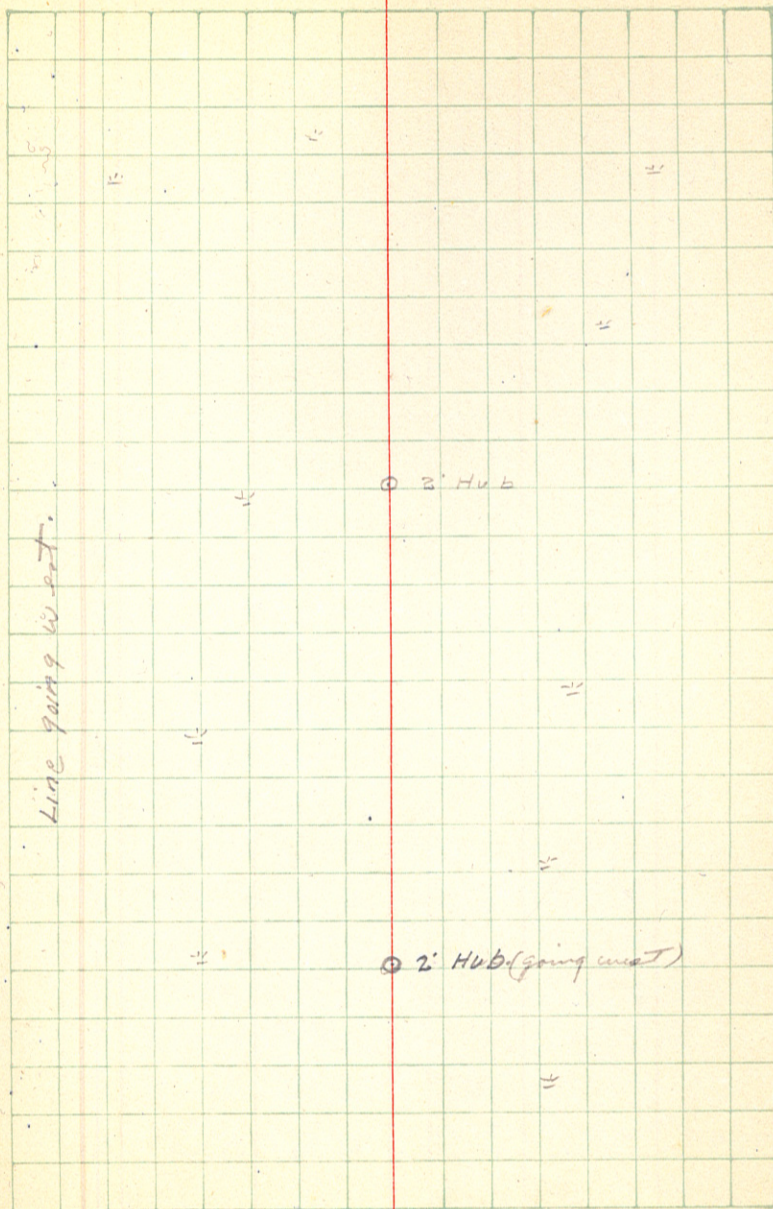


32

9	
8	
7	
6	
5	
4	
3	
2	
1	
4000	P.O.T.
9	
8	
7	
6	
5	
4	
3	
2	
1	
30	P.O.T.
29	
28	
27	
26	
25	

West Line from Sec. Cor.
S.W. Cor., Sec. 12

33

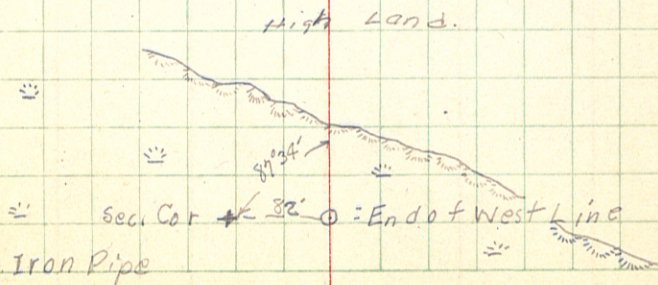


50+70

P.O.T.

50

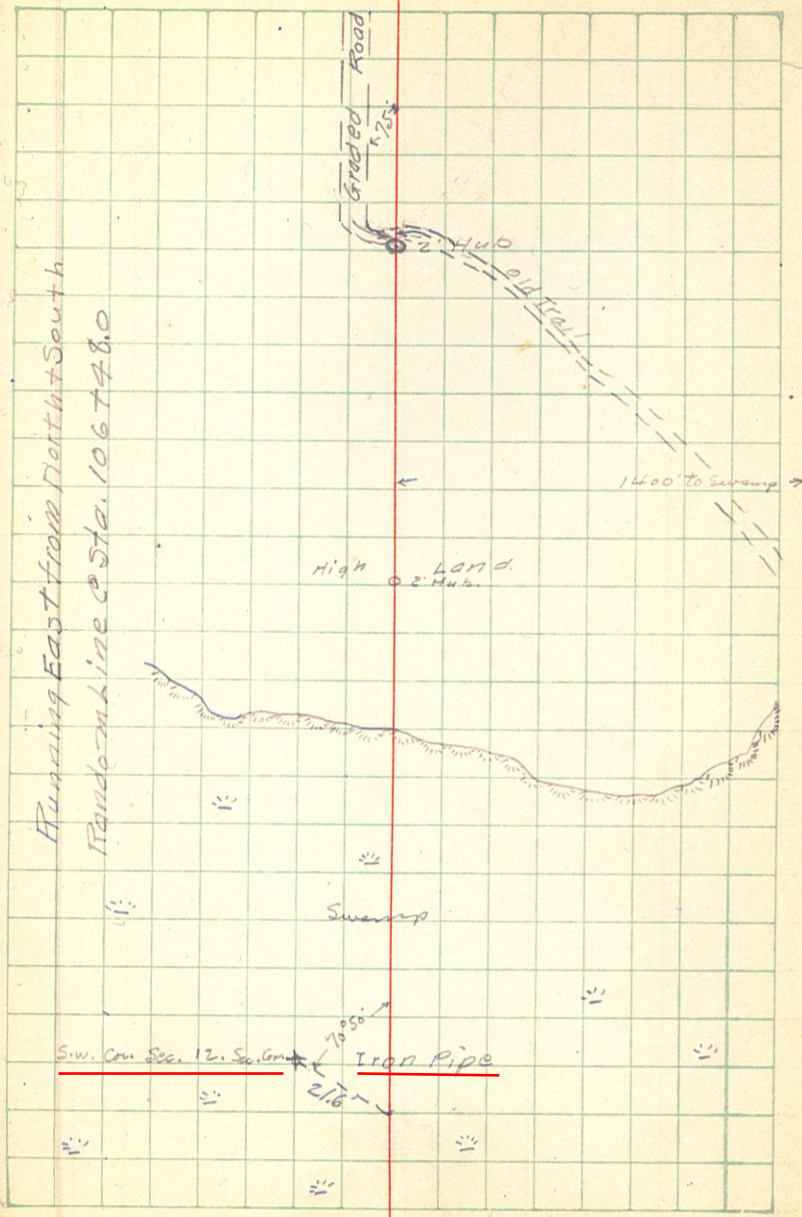
End of West Line
from S. W. Cor. Sec. 13.



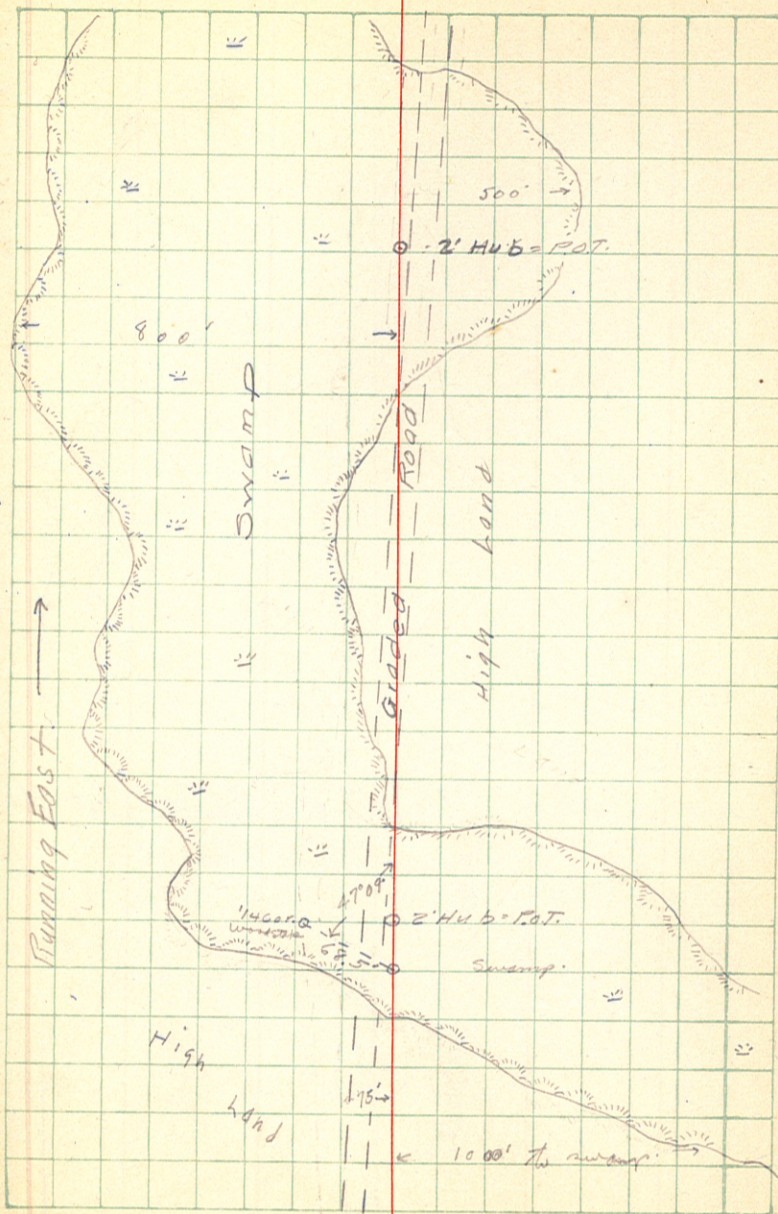
1

2	
1	
20	
19	
18 + 500 P.O.T.	
18	
17	
16	
15	
14	
13	
12 + 250 P.O.T.	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

0 + 00 = 106 + 48.0 on N. + S. Random Line



7	
6	
5	
4	
43400	P.O.T.
2	
1	
40	
9	
8	
7	
6	
5	
4	
3	
2	
1	
30	
29400	P.O.T.
28	
27	
26	
25	
24	
23	



3

55+800 P.O.T. = End of Line East from

S.W. Cor. Sec. 12

5

4

3

2

1

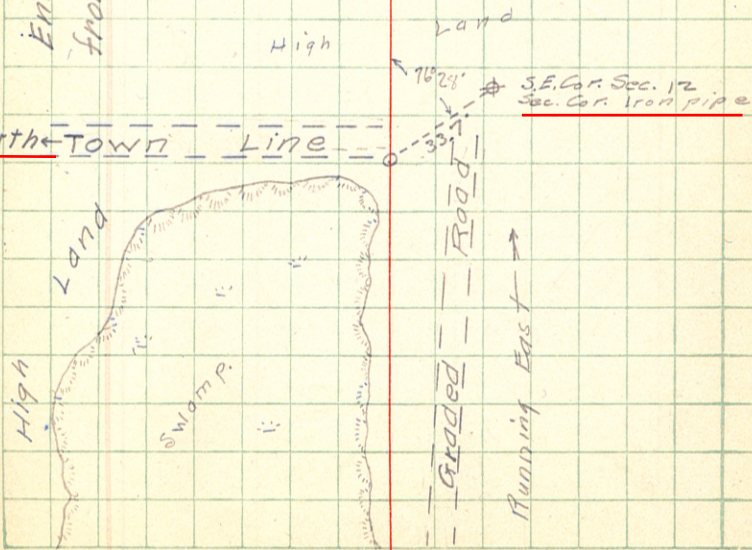
50

9

48

End of East Line
from S.W. Cor. Sec. 12

North-Town Line



1

4

3

2

1

20

19

18

17

16

15

14

13

12

11

10

9

8

7

6

5

4

3

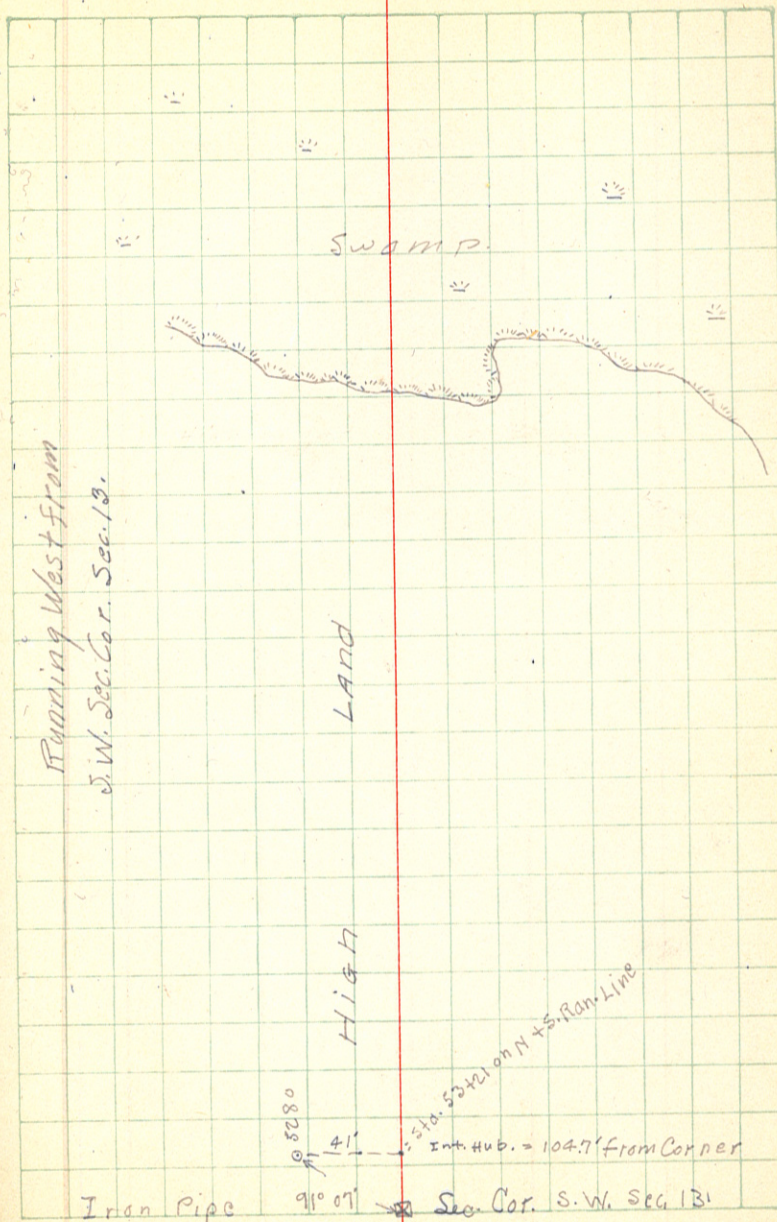
2

1

0+00

Ditch Bk 097 West Line from
the S.W. Cor. Sec. 13.

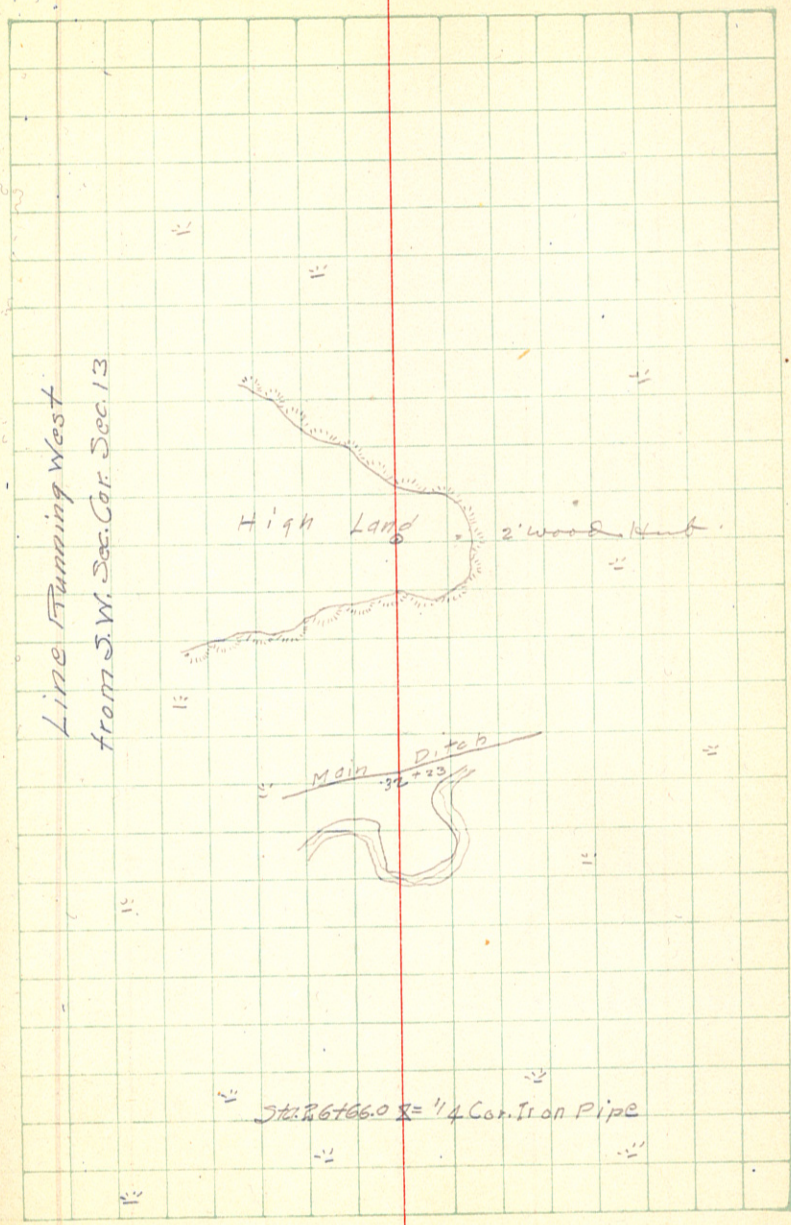
40



1100

8
7
6
5
4
3
2
1
40
9
36+00
7
6
5
4
3
2
1
30
9
8
7
26+66
6
25

P.O.T.



52+60 = End of Mile West.

2

1

50

49

West from S. W.
Cor. Sec. 13

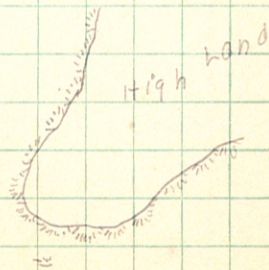
End of West Line
from S. W. Cor. Sec. 13.

Could Not find
Any Sign of Sec. Cor.

1/2

1/2

1/2



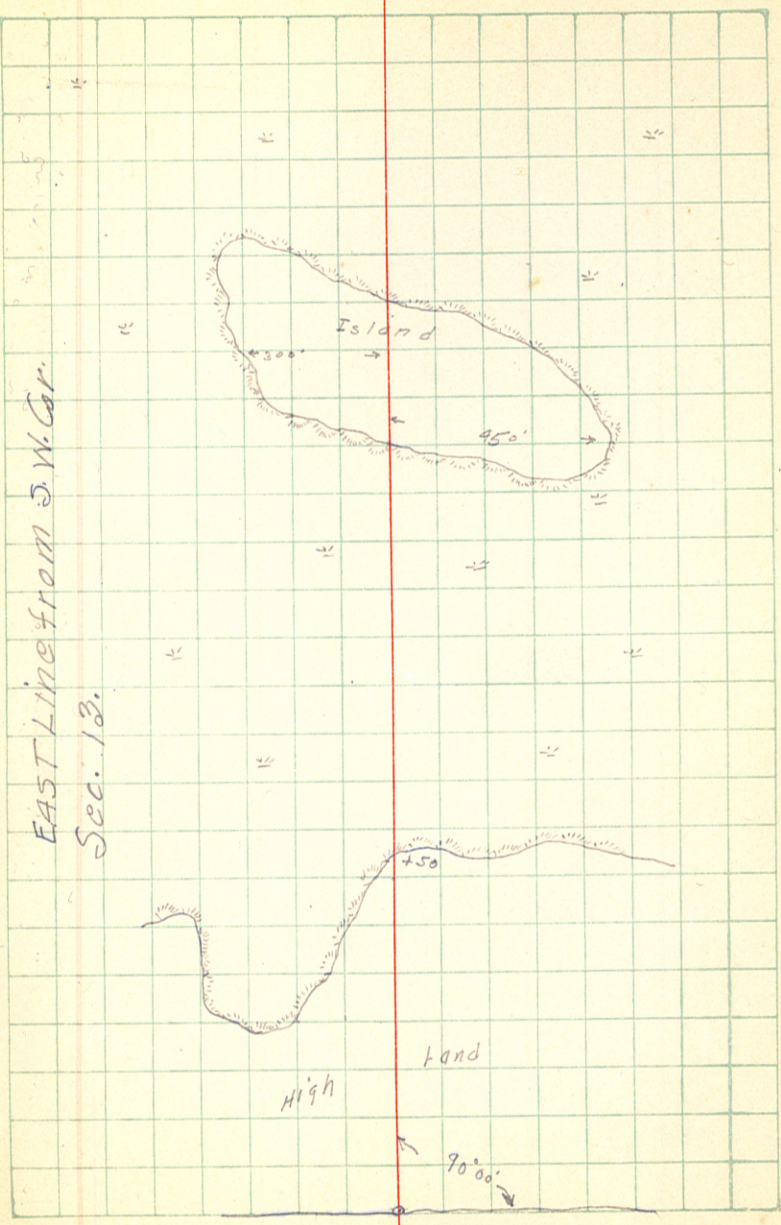
East Line from
S.W. Cor. Sec. 13

±

sta.

- 4
- 3
- 2
- 1
- 80
- 19
- 18
- 17
- 16
- 15
- 14
- 13
- 12
- 11
- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1

0+00 = 52+80 = North Random Line

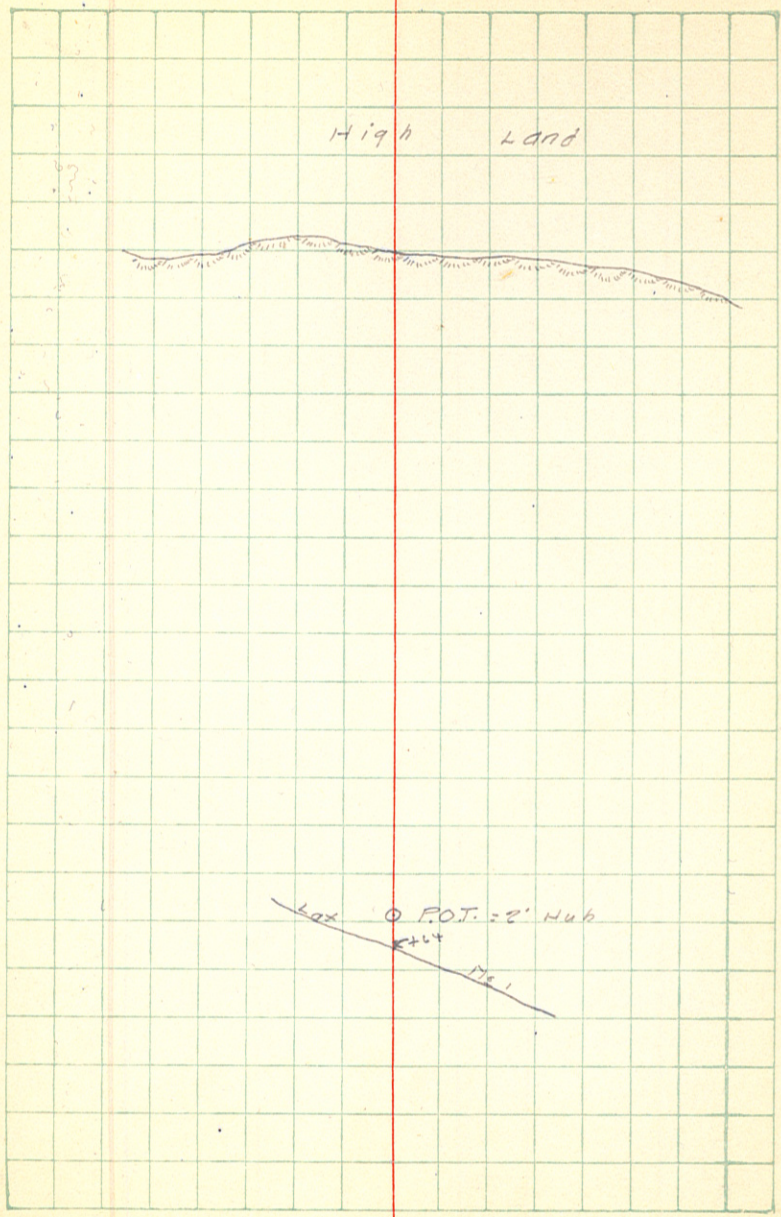


24

- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1
- 40
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 3100 P.O.T.
- 30
- 9
- 8
- 7
- 6
- 25

Ditch Bk 097 East Line from S.W. Cor. Sec. 12

45



31

East line from
S. W. Cor. Sec. 13.

46

54+00

End of East Line

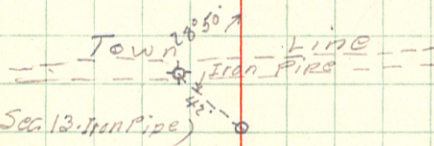
3

2

1

50

End of East Line from
S. W. Cor. Sec. 13



(S.E. Cor. Sec. 12. Iron Pipe)

13+20 = 1/16 Cor. = Iron Pipe

13

12

11

10

9

8

7

6

5

4

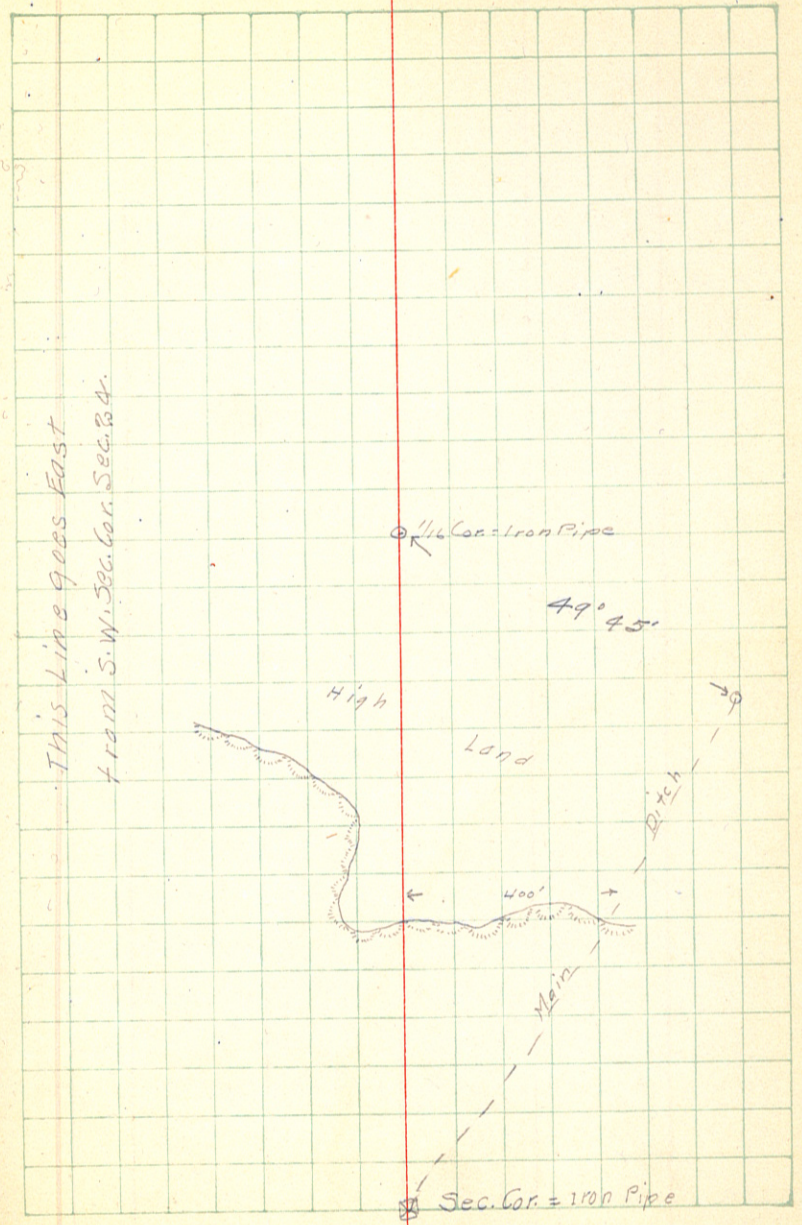
3

2

1

0+00

This Line goes East
from S.W. Cor. Sec. 24.

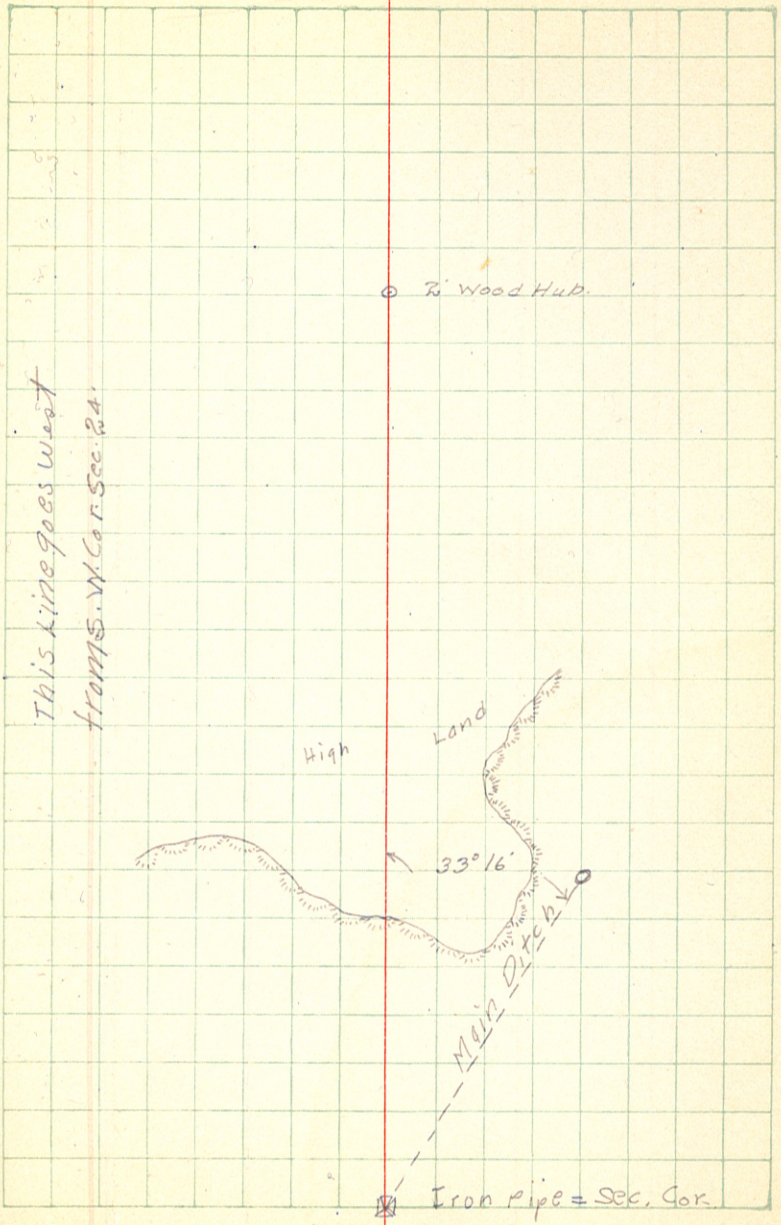


- 4
- 3
- 2
- 1
- 20
- 19
- 18
- 17
- 16
- 15
- 14
- 13
- 12
- 11
- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1

19+00 P.O.T.

0+00

This line goes west
from S.W. Cor. Sec. 24.



31

- 7
- 6
- 5
- 4
- 3
- 2
- 1

40

39+64⁰

- 9
- 8

7

6

5

34+00 P.O.T.

3

2

1

30

9

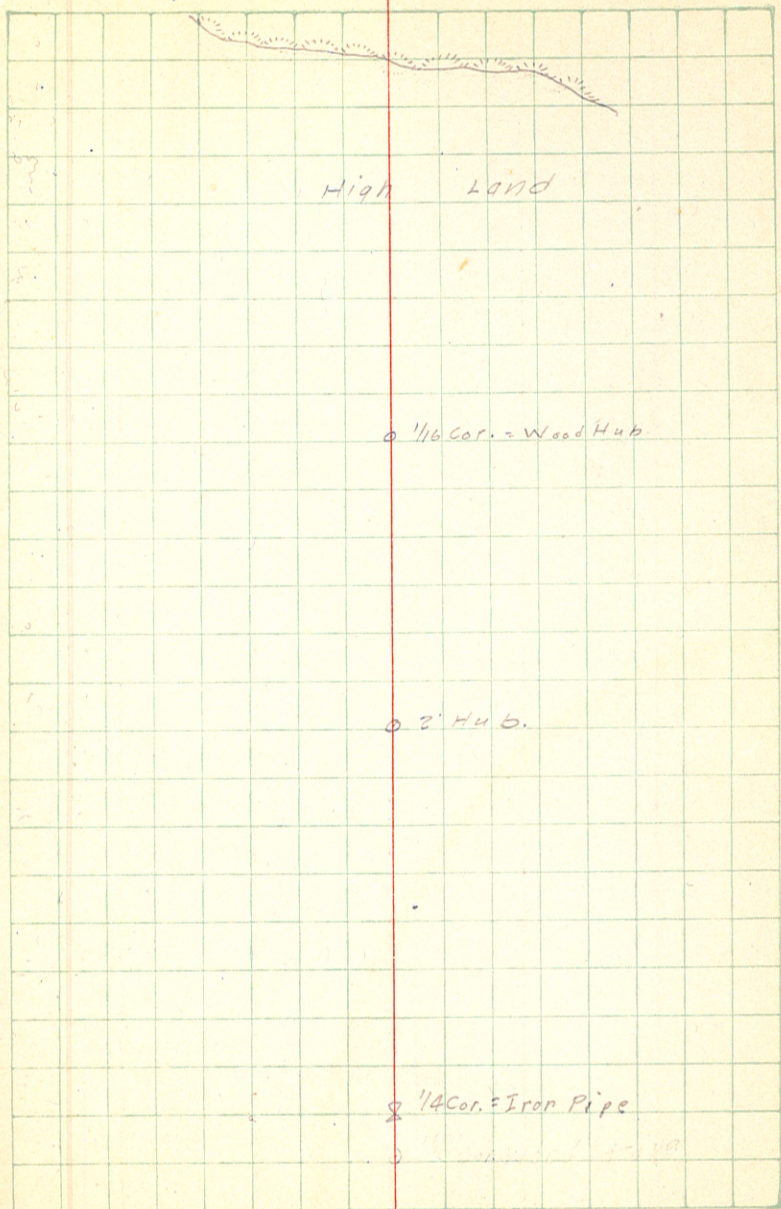
8

7

26+43⁰

6

25



High Land

○ 1/16 Cor. = Wood Hub

○ 2' Hub

□ 1/4 Cor. = Iron Pipe

52 + 75°

2

1

58

9


48

End of West Line from
S.W. Cor. Sec. 24.

Sec. Cor. = Iron Pipe



Swamp

St 9.  Besting

4 S 41° 10' W

3

132+51.8 61° 34' Rt.

132

1

30

29

28

27

26

125

EG. 124+17.8

124

+50

123

+50

122

+50

121

+50

S 20° 30' E

120

+50

119

50

BC. = 117+98.4

P.I. = 132+51.8

Δ = 61° 34' Rt

T = 213.3

L = 384.8

R = 358.1

Ext = 60'

Dc = 16°

BC. = 130+38.5

EC. = 134+23.3

P.I. = 121+10.9 = Main

Δ = 78° 35' Lt

T = 312.5

L = 619.4

R = 1910.0

Ext = 30'

BC. = 117+98.4

EC. = 124+17.8

Dc = 3°

2' Hub

BC. = 130+38.5 = 0° 00'

+50 = 0° 55' ✓

131 = 4° 55' ✓

+50 = 8° 55' ✓

132 = 12° 55' ✓

+50 = 16° 55' ✓

133 = 20° 55' ✓

+50 = 24° 55' ✓

134 = 28° 55' ✓

EC. = 134+23.3 = 30° 47'

BC. = 117+98.4 = 0° 00'

118 =

+50 = 0° 46' ✓

119 = 1° 31' ✓

+50 = 2° 16' ✓

120 = 3° 01' ✓

+50 = 3° 46' ✓

121 = 4° 31' ✓

+50 = 5° 16' ✓

122 = 6° 01' ✓

+50 = 6° 46' ✓

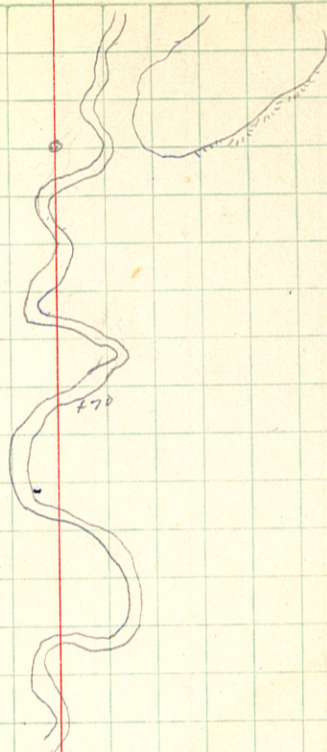
123 = 7° 31' ✓

+50 = 8° 16' ✓

124 = 9° 01' ✓

EC. = 124+17.8 = 9° 17'

○ P.I. = 121+10.9 = Main Ditch



155+21.2 40°03'LT

J

4

S38°20'W

3

2

1

150+73.0 74°56'RT

150

9

8

7

6

S36°40'E

5

4

3

2

141+26.9 77°48'LT

1

40

9

8

7

6

135

P.I. = 155 + 21.2

$\Delta = 40^{\circ}03'LT$

Dc = 9'

T = 231.5

Lc = 495.0

Ext = 40'

R = 636.6

BC = 152 + 89.7

EC = 157 + 34.7

= 153 + 31.5 = Main Ditch

P.I. = 150 + 73.0

$\Delta = 74^{\circ}56'RT$

Dc = 21'

T = 209.1

Lc = 356.8

R = 272.9

Ext = 70'

BC = 148 + 63.9

EC = 152 + 20.7

P.I. = 141 + 26.9

Ext = 90'

$\Delta = 77^{\circ}48'LT$

T = 256.8

Lc = 432.2

Dc = 18'

R = 318.3

BC = 138 + 70.1

EC = 143 + 02.3

BC = 152 + 89.7

153 = 0°28'

+50 = 2°43'

154 = 4°58'

+50 = 7°13'

155 = 9°28'

+50 = 11°43'

156 = 13°58'

+50 = 16°13'

157 = 18°28'

EC = 157 + 34.7 = 20°02'

= 153 + 31.5 = Main Ditch

BC = 148 + 63.9 = 0°00'

-149 = 3°47' ✓

+50 = 9°02' ✓

150 = 14°17' ✓

+50 = 19°32' ✓

151 = 24°47'

+50 = 30°02'

152 = 35°17'

EC = 152 + 20.7 = 37°28'

BC = 138 + 70.1 = 0°00'

139 = 2°41' ✓

+50 = 7°11' ✓

140 = 11°41' ✓

+50 = 16°11' ✓

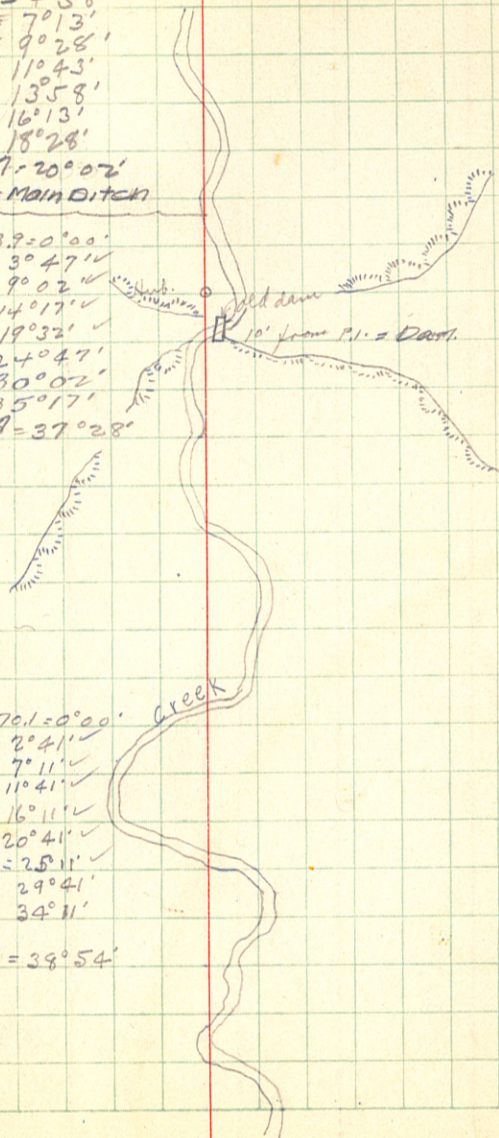
141 = 20°41' ✓

+50 = 25°11' ✓

142 = 29°41'

+50 = 34°11'

EC = 143 + 02.3 = 38°54'



C. J. Bark = Eng.
 O. A. Rush = Rod.
 M. Wideman = Chain.
 A. Haugen = Ax.
 A. Johnson = Ax.

Sta. Δ Bearing

4

3

2

1

20

19+00 P.O.T.

18

17

16

15

14

13

12

11

10

9

8

7

6

5

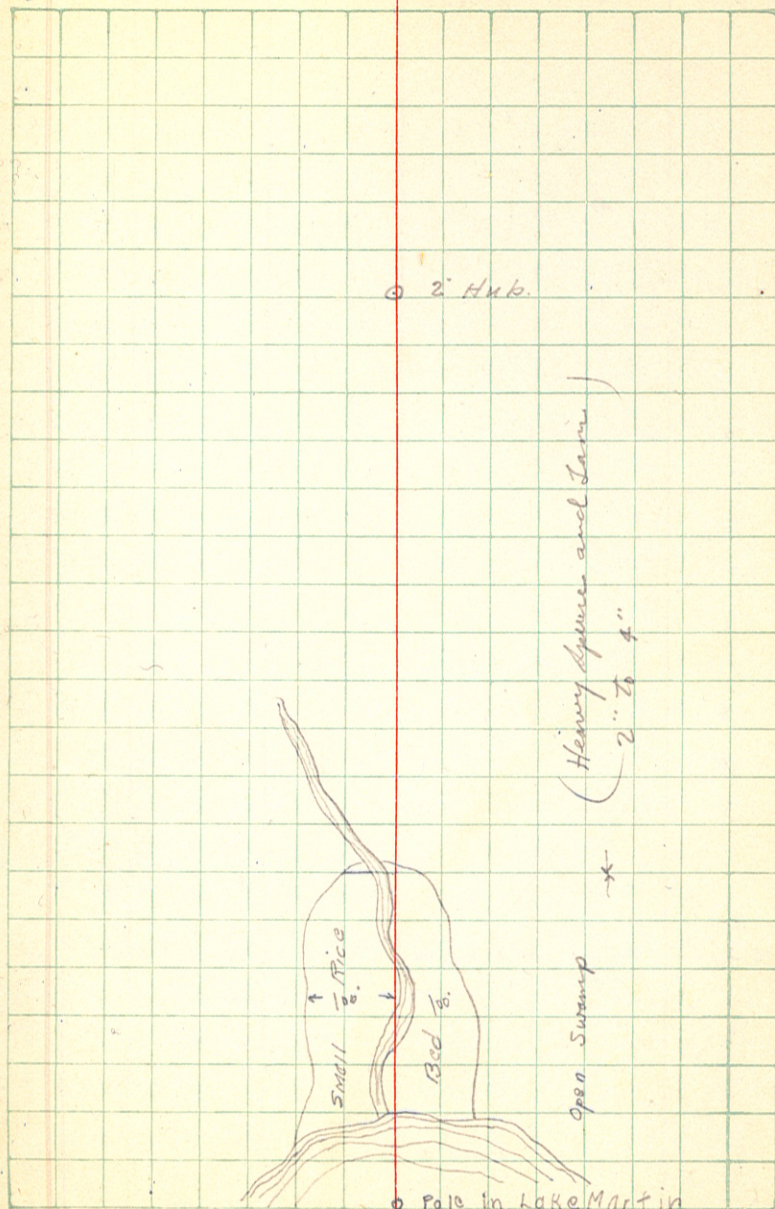
4

3

2

1

0+00



55

Sta. Δ Bearing

39+05.9 = 104+56.7 - Main Ditch = End of Lot. 792.

39

38

37

36

35+42.7 = 100+05.9 = Main Ditch

5

4

3

2

1

30+00 P.O.T. S36°W

9

8

7

6

25

PI. = 35+42.7
 $\Delta = 37^{\circ}45'44''$
 $R = 5'$
 $T = 391.8$
 $L_c = 755.0$
 $Ext = 60'$
 $R = 1146.0$
 $BC = 31+50.9$
 $EC = 39+05.9$
 $= 104+56.7 = \text{Main Ditch}$

Ditch Bk 997

LATERAL-NO. B

C.J. BARK = Eng.
 O.A. RUSH = Rod
 M. WIDEMAN = Chain
 A. HAUGEN = Ax
 A. JOHNSON = Ax

56

End of Lateral No. B
 From Lake Martin to
 Sta. 104+56.7 of Main Ditch

BC = 31+50.9 = 0°00'	
32 = 1°14'	↑
+50 = 2°29'	
33 = 3°44'	
+50 = 4°59'	
34 = 6°14'	
+50 = 7°29'	
35 = 8°44'	
+50 = 9°59'	
36 = 11°14'	
+50 = 12°29'	
37 = 13°44'	
+50 = 14°59'	
38 = 16°14'	
+50 = 17°29'	
EC 39+05.9 = 18°53'	O 2' Hub

LATERAL - No. B.

	Water	Muck
Middle of Lake Martin =	8.7'	20'
0+00	4.7'	15'
5	3.4'	10'
10	0	0
15	0	0
20	0	0
25	0	0
30	0	0
33	1'	0
35	0	1'

= Main Ditch =

Middle of Lake Scribner:	2'	20'
0+00	2'	15'
5	0	0
10	0	0
15	0	0
20	0	0
25	0	0
30	0	0
35	0	0
40	0	0
45	0	0
50	0	0

No Bottom
No Bottom
No Bottom
10' Peat - No Bottom
4' Peat - To Sand & Clay mixture
2' Peat - To Sand & Clay mixture
4' Peat - To Sand Bottom
3' Peat - To Sandy Bottom
Sandy Bottom
Sandy Bottom
No Bottom
No Bottom
3' Peat To sand bottom.
4' " " " "
4' " " " "
1' " " " "
6' " " " "
8' Peat No bottom
8' " " "
8' " " "
8' " " "
8' " " "

			Water	Muck
55			0	0
60			0	0
65			0	0
70			0	0
75			0	0
80			0	0
85			0	0
90			0	0
92+84	creek		1'	3'
95			0	0
100			0	0
105			0	0
110			0	0
115			0	0
120+50	River 22' Wide		1.5'	0
125			0	0
130			0	0
135			0	0
135+75	River 20' Wide		2'	0
140			0	0
142+25	River 19' Wide		2.5'	1'
150			0	0
150+90	River 15' wide		4'	0
151+50	" 17' "		4'	0
152+10	" 21' "		4	0

4'	peat	To sand bottom
4'	"	To sand & clay mixture
8'	"	To sand bottom.
3'	"	" " " "
6'	"	" " " "
8'	peat	No bottom.
3'	"	To sand bottom
3'	"	" " " "
		To sand bottom
4'	peat	to sand bottom.
3'	"	" " " "
8'	peat	No bottom
8'	"	" " "
8'	"	" " "
		Sand bottom
6'	peat	To sand bottom
4'	"	" " " "
3'	"	" " " "
		Sand bottom
3'	peat	To sand bottom
		To sand bottom
2'	peat	To sand bottom
1'	sand	To gravel bottom
1'	"	" " " "
1'	"	" " " "

			water	Muck
153+50	River	15' wide	4'	0
154+05	"	15' "	4'	0
154+80	"	20' "	4'	0
155			0	0
160			1'	0
165			0	0
167	River	20' wide	3'	0
170			0	0
174	River	20' wide	3'	0
180			0	0
185			0	0
190			0	0
195			0	0
200			0	0
205			0	0
207+50	River	15' wide	3'	0
210			0	0
216+134	River	25' wide	2.5'	0

LATERAL No 1

0+00	0	0
5	0	0
10		
15		
20		
25		

	gravel bottom
	" "
	" "
4'	Peat To gravel bottom
4'	" To sand "
2'	" " " "
	To sand bottom
2'	Peat To sand bottom
	Sand + Rock "
1'	Peat To sand "
3'	" " " "
1'	" " " "
3'	" " " "
3.5'	" " " "
3'	" " " "
	Gravel bottom
2'	Peat To sand bottom.
	gravel and Rock bottom
4'	Peat To sand bottom
4'	" " " "
4'	" " " "
4.5'	" " " "
6	" " " "
8	" No bottom

Note
Very stiff peat

	Water	Muck
30	0	0
35	0	0
40	0	0
45	0	0
50	0	0
55	0	0
60	0	0
65	0	0
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0
95	0	0
100+00 end of lateral No 1	3'	20'
Middle of Lake St. John	13'	10'

"A" Line

117+984	0	0
120+75 River 22' wide	1.5'	0
125	0	0
130 on Rt edge of river	3'	1'
135	0	0
140	0	0
145	0	0

8' stiff peat No bottom
8' " " " "
8' " " " "
8' " " " "
6' peat To clay bottom
3' " " " "
2' " " " "
2' " " " "
6' " " " "
4' " " " "
2' " To sand bottom
3' " " " "
8' peat No bottom
8' " " " "
No bottom
" "
8' peat No bottom
sand bottom
4' peat to sand bottom.
To sand bottom
4.5' peat To sand bottom
4' " " " "
3.5' " " " "

3

	water	Muck
150	0	0
155		

62

2'	Peat To sand bottom.
4'	" " gravel "

Triangulation Notes

Ditch Bk 097

G. J. Bark - Engineer

Scribner Lake.

Sta. A = 22 to 0 E. Line from Sec. Cor.
to Sta. B = 36 to 0 E. " " " " = 1400 feet

73

T	Fore Sight	Object	Angles		
			1st. Pointing	2nd. Pointing	3rd. Pointing
△	△	△	97°59'	97°59'	97°59'
△	△	△	91°05'	91°04'	91°04'
△	△	△	61°29'	61°29'	61°28'
△	△	△	22°28'	22°28'	22°28'
△	△	△	91°03'	91°03'	91°03'
△	△	△	69°07'	69°07'	69°07'
△	△	△	55°06'	55°05'	55°05'
△	△	△	34°12'	34°12'	34°12'
△	△	△	19°07'	19°07'	19°07'
△	△	△	19°39'	19°39'	19°39'
△	△	△	36°23'	36°23'	36°23'
△	△	△	43°12'	43°12'	43°12'
△	△	△	56°56'	56°56'	56°56'
△	△	△	29°32'	29°32'	29°32'
△	△	△	46°14'	46°14'	46°14'
△	△	△	68°43'	68°43'	68°43'
△	△	△	79°58'	79°58'	79°58'
△	△	△	100°49'	100°49'	100°49'

Sum of 3 Pointings	Revl.	Average	Remarks
293°17'	R	97°59' ✓	
273°13'	R	91°04' ✓	
184°27'	R	61°39' ✓	
67°24'	R	22°28' ✓	
273°09'	L	91°03' ✓	
207°21'	L	69°07' ✓	
165°16'	L	55°05' ✓	
102°36'	L	34°12' ✓	
57°21'	L	19°07' ✓	
56°17'	L	19°37' ✓	
109°09'	L	36°23' ✓	
129°36'	L	43°12' ✓	
170°08'	L	56°56' ✓	
88°36'	R	29°32' ✓	
138°42'	R	46°14' ✓	
205°29'	R	68°43'	
239°14'	R	79°58'	
301°47'	R	100°49'	

Triangulation Notes Ditch Bk 097

Sta. A = 101 + 00 Lot. H 21 to
Sta. B = 112 + 00 = 110 feet

LAKE ST. JOHN.

K	Fore Sight	Object	Angles		
			1st Pointing	2nd Pointing	3rd Pointing
△	△	△	69°19'	69°19'	69°19'
△	△	△	39°45'	39°45'	39°45'
△	△	△	25°56'	25°56'	25°56'
△	△	△	13°41'	13°41'	13°41'
△	△	△	94°20'	94°20'	94°20'
△	△	△	31°01'	31°01'	31°01'
<hr/>					
△	△	△	25°41'	25°41'	25°41'
△	△	△	80°18'	80°18'	80°18'
△	△	△	130°25'	130°25'	130°25'
△	△	△	140°27'	140°26'	140°27'
△	△	△	18°43'	18°43'	18°43'
△	△	△	44°48'	44°48'	44°48'

Sum of 3 Pointings	Perk.	Average	REMARKS
207°57'	R	69°19'	Clear and safe
119°15'	R	39°45'	
77°48'	R	25°56'	
41°03'	R	13°41'	
283°00'	L	94°20'	
93°03'	L	31°01'	
<hr/>			
77°03'	L	25°41'	
240°54'	L	80°18'	
391°15'	L	130°25'	
421°21'	L	140°27'	
56°09'	R	18°43'	
134°24'	R	44°48'	

Next Pt. = 156 + 78.6
 Turn Angle Here to
 Hit J. Curo's Corner.

$$\begin{array}{r} 545^{\circ} 10' E \\ 830 \\ \hline 3640 \end{array}$$

$$\begin{array}{r} 32^{\circ} 40' \\ 830 \\ \hline 4070 \\ = 41^{\circ} 10' \end{array}$$

$$\begin{array}{r} 155 + 212 \\ 218.0 \\ \hline 153 + 03.2 \\ 445.0 \\ \hline 157 + 48.2 \end{array}$$

$$\begin{array}{r} 500 \\ 32 \\ \hline 468 \\ 27 \\ \hline 3276 \\ 936 \\ \hline 6 \overline{) 26.36} \\ \underline{120} \end{array}$$

$$\begin{array}{r} 50 \\ 36 \\ \hline 100 \\ 60 \overline{) 120} \\ \underline{120} \\ 15 \end{array}$$

$$\begin{array}{r} 445 \\ 9 \overline{) 400500} \\ \underline{36} \\ 40 \\ \underline{36} \\ 36 \\ \underline{36} \\ 45 \end{array}$$

$$\begin{array}{r} 206 \\ 215 \\ \hline 421 \\ 215 \\ \hline 636 \\ 215 \\ \hline 851 \\ 215 \\ \hline 1066 \\ 215 \\ \hline 11006 \\ 215 \\ \hline 1321 \\ 215 \\ \hline 1536 \\ 215 \\ \hline 1751 \\ 210 \\ \hline 1561 \\ 2001 \end{array}$$

$$\begin{array}{r} 482 \\ 27 \\ \hline 3574 \\ 964 \\ \hline 13011 \\ \underline{120} \\ 10 \\ 42 \end{array}$$

121+10.9 $\frac{40.}{133}$

$\Delta = 35^{\circ}49'Lt$
 Ext. = 20 feet.
 P.I. = 42+36.3

$\frac{2740}{930} \frac{6130}{830}$
 N $19^{\circ}1' E$
 $\frac{3570}{5300}$

$\frac{188+523}{185}$
 352.3

$\frac{21}{52} \frac{5022}{10500}$
 14.

$\frac{2806}{130}$
 2030

$\frac{1330}{830} \frac{526}{1050}$
 $\frac{2180}{-22}$

$\frac{27277}{27277} \frac{190}{830}$
 $\frac{1056}{2640} \frac{2730}{830}$

$\frac{6134}{2030} \frac{6450}{830}$
 $\frac{4104}{5620}$

$\frac{6360}{830} \frac{185}{15}$
 $\frac{5590}{315} \frac{2950}{830}$

$\frac{4960}{830} = 38^{\circ}26'$
 4130

$\frac{192+196}{750}$
 $\frac{184+67.6}{P.I. = Lt.}$

$20^{\circ}35'$

$\frac{1630}{830}$
 $\frac{3460}{5350 W}$

$\frac{5622}{3716}$
 6938

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.