Job No. 7

No. Birch Lake Road

CO. PROJ. 23-56

FIELD BOOK

360

Office of Surveys St. Highways
ST. PAUL, MINN.

"2"

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
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	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 Tabels see end of book.

91+04.7
13+23.5
104.27

91+047
26+01.4
117+48.1

Proj. 23-56

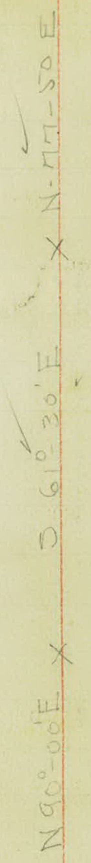
No. Birch Lake Road ~~Job. No. 9~~

Index to Notes

Kind	Sta	-	Sta.	Page	-	Page
Alignment	0+00	-	117+44.9	2	-	6
Art. Topog	0+00	-	117+44.9	9	-	28
Culv. Notes				29	-	

B.L. Line ℄ Transit Notes

Sta.		Ang. R.	Ang. L.
33 + 10.3	E.C.		
31 + 96.5	P.I.		40° 40'
30 + 71.1	B.C.		
26 + 17.4	E.C.		
23 + 38.5	P.I.	28° 30'	
20 + 47.4	B.C.		
17 + 00	P.O.T.		
2 + 32.2	P.O.T.		
0 + 00	Mon't	Int. Birch Lake + Cent. Rd.	



2-13-23

32-
49.2
47"

℄ R.F. Austin Transit
Skeeplin + Peiling - Chain
Johnson - Walsh. S. Artist + R. Flag

Z ←

Sta.	Def.
30+71±	0°00'
31+00	2°57'
32+00	10°57'
33+00	19°27'
33+10³	20°20'

17° Curve. L

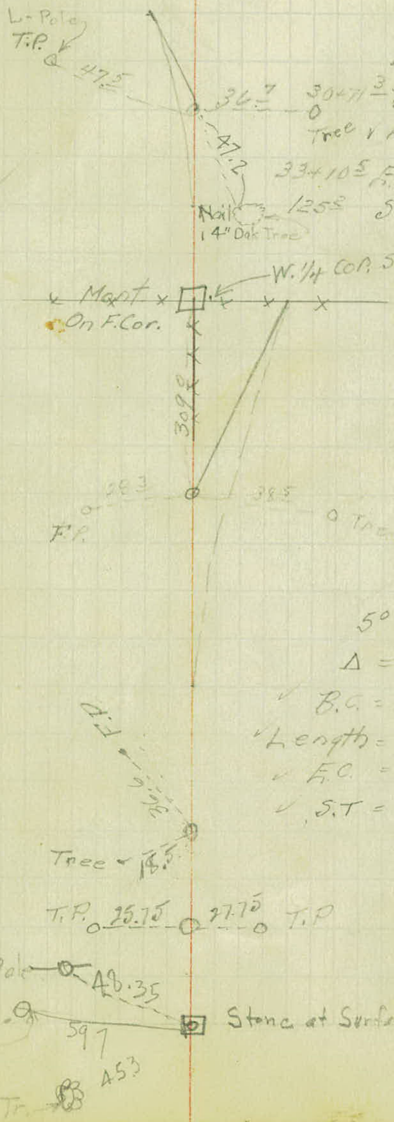
Δ = 40°40'

$30+71^3$ B.C = 30+71±

Tree, Length = 239.21

$33+10^5$ E.C. = $33+10^3$

125⁵ S.T = 125^4



Sta.	Def.
20+47⁴	0°0'
21+00	1°19'
22+00	3°49'
23+00	6°19'
24+00	8°49'
25+00	11°19'
26+00	13°49'
26+17⁴	14°15'

5° Curve. R.

Δ = 28°30'

B.C. = 20+47⁴

Length = 570.0

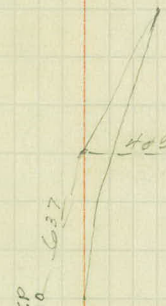
E.C. = 26+17.4

S.T = 291±

Sta		Ang. R.	Ang. L.	
				N-61°-00' E
43+28.7	B.C.			
42+36.6	P.I	18°36'		X
41+42.1	B.C.			
				N 42-24 E
38+34.2	E.C.			
36+91.7	P.I		35°26'	X
				N 77-50' E
35+38.9	B.C.			

Sign Here

Sta.	Def.
41+42.7	0°00'
42+00	2°57'
43+00	7°57'
43+287	9°18'



10° C. Right
Δ = 18° 36'
S.T. = 93.9
B.C. = 41+42.7
Length = 186.0
E.C = 43+28.7

Sta.	Def.
35+38.9	0°00' B.C
36+00	2°40'
37+00	9°40'
38+00	15°40'
+34.2	17°43' E.C

12° C. Left
Δ = 35° 26'
S.T. = 152.8
B.C = 35+38.9
Length = 295.3
E.C = 38+34.2

51+31.8
55+86
4.5

Sta.		Ang. R.	Ang. L	
55+86±	E.C. ✓			S 67° 39' E
54+72.8	P.I		11°24'	X
53+58±	B.C. ✓			S 56° 15' E
52+77.0	E.C. ✓			
51+85.3	P. I		38° 24'	X
50+85.0	B.C. ✓			S 17° 51' E
~~47+79.1~~	E.C. = 47+82.0 ✓			
46+76.0	P.I	101° 09'		X
~~44+30~~	B.C. 44+33.1 BC ✓			N 61° 00' E

{ (Long Sta. 47 to 48 = 97.1')
{ Equation Sta 47+82. = 47+76.2 }

298.7

4

Sta — Def.

53+58.4 = 0°00'

54+00 = 1°02'

55+00 = 3°32'

55+86.4 = 5°42' ✓

5° Curve left.

Δ = 11°24'

S.T. = 114.4 ✓

B.C. = 53+58.4 ✓

Length = 228.0 ✓

E.C. = 55+86.4 ✓

Sta. Def.

50+85 = 0+00

51+00 = 1°30'

52+00 = 11°30'

52+77.0 = 19°12' ✓

20° Curve left

Δ = 38°24'

S.T. = 100.27 ✓

B.C. = 50+85.0 ✓

Length = 192.0 ✓

E.C. = 52+77.0 ✓

Sta. Def

44+20.2 — 0°0'

45+00 — 19°07.5'

46+00 — 24°37.5'

47+00 — 39°07.5'

+79' — 50°35' ✓

Corrected in Field 3/9/23 PRB

29° C. Right

Δ = 101°09' ✓

S.T. = ~~241.79~~ 242.9 ✓

B.C. = ~~44+20.2~~ 44+32.1 ✓

Length 348.9

E.C. ~~47+79.1~~

EC = 47+82.0

Sta.		Ang. R.	Ang. L.	
63+46^{4}	E.C. ✓			
63+00^{1}	P.I	24°41'		
62+51^{5}	B.C. ✓			
62+08^{0}	E.C. ✓			
61+13^{7}	P.I	53°56'		
60+00^{6}	B.C. ✓			
56+96^{5}	E.C. ✓			
56+50^{4}	P.I		13°55'	
56+03^{7}	B.C. ✓			

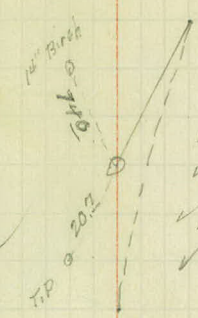
S 67° 39' E

S 81° 34' E

S 22° 38' E

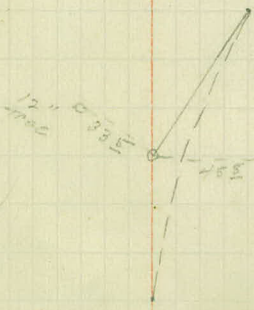
S 52° 57' E

Sta	Def
62+51.5	0°00'
63+00	6°18'
63+46.4	12°20½' ✓



26° Curve, R.
Δ = 24°41'
✓ S.T. = 48.63 ✓
✓ B.C = 62+51.5 ✓
✓ Length = 94.93 ✓
✓ E.C. = 63+46.4 ✓

Sta.	Def.
60+00.6	0°00'
61+00	12°53'
62+00	25°53'
62+08	26°58' ✓



26° Curve, R.
Δ = 53°56'
✓ S.T. = 113.1 ✓
✓ B.C = 60+00.6 ✓
✓ T.P. Len. = 207.4 ✓
✓ E.C. = 62+08.0 ✓

15° Curve-L
Δ = 13°55'
✓ S.T. = 46.7 ✓
✓ B.C. = 56+03.7 ✓
✓ Length = 92.5 ✓
✓ E.C = 56+96.2 ✓

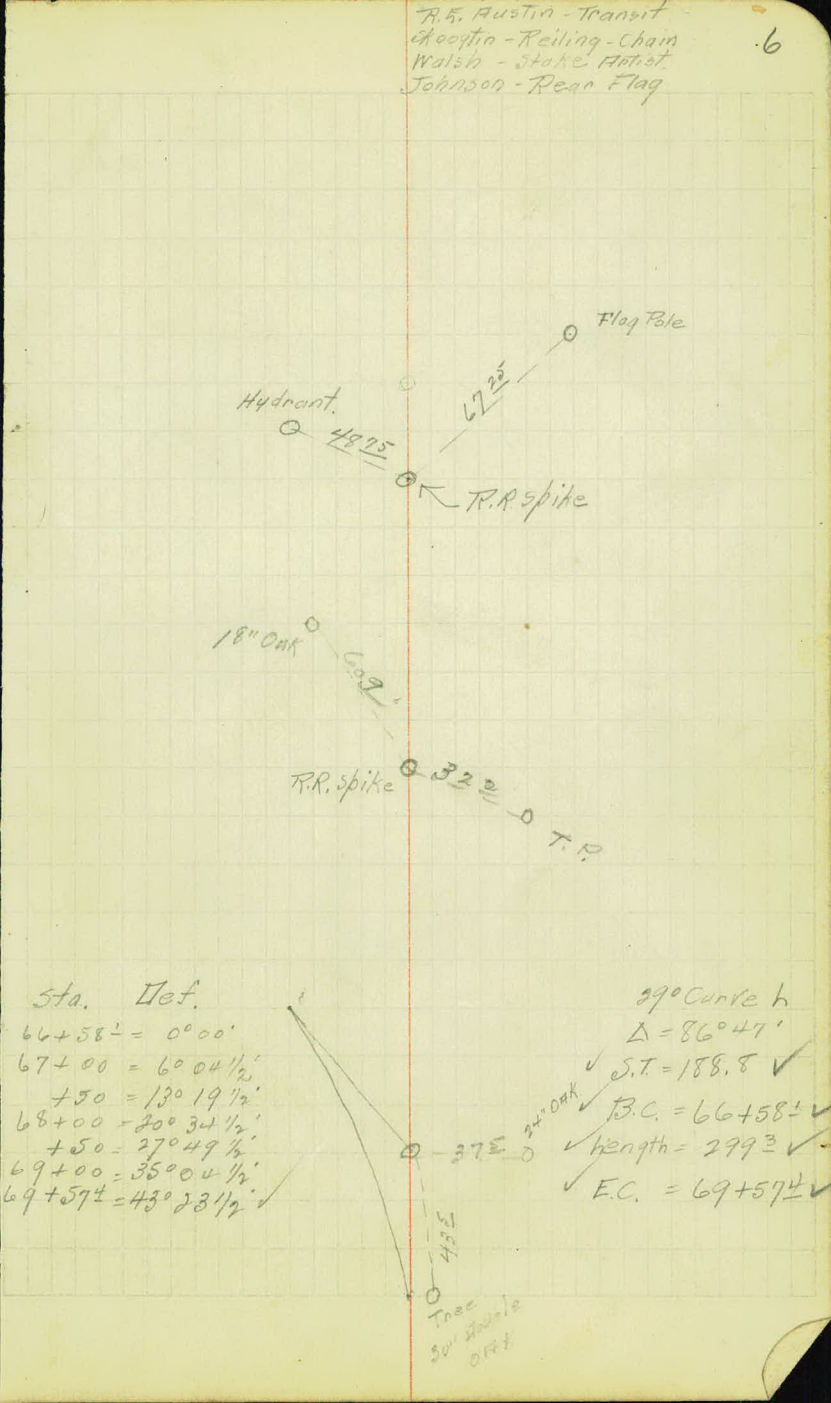
B.h. line

Sta.		Ang. R.	Ang. L.
117+44.2	P.O.T.	E. Bald Eagle Ave	
91+04.7	P.O.T		
69+57.4	E.C.		
68+46.2	P.I.		86°47'
66+58.1	B.C.		

S 89° 44' E

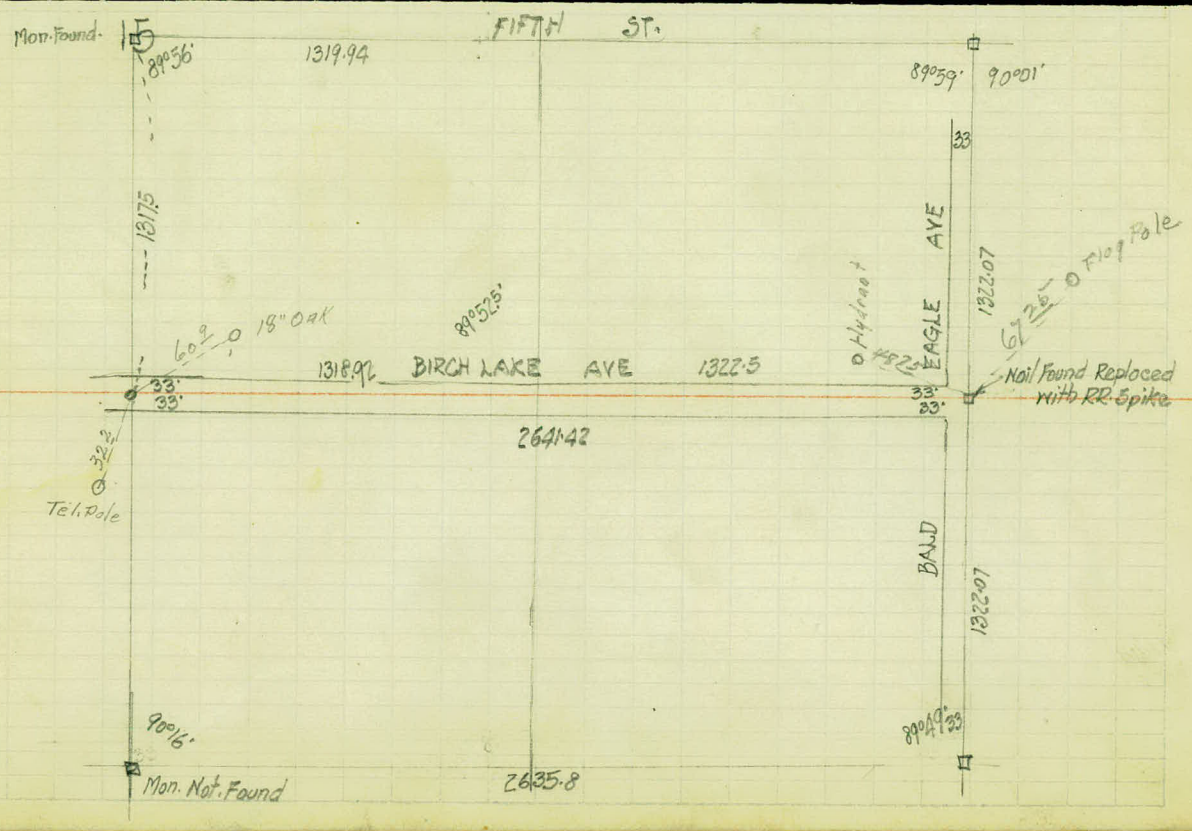
S 2° 57' E

R.E. Austin - Transit
Kooyton - Reiling - Chain
Walsh - Stake Artist
Johnson - Rear Flag



Sta.	Def.
66+58±	0°00'
67+00	6°04½'
+50	13°19½'
68+00	20°34½'
+50	27°49½'
69+00	35°04½'
69+57±	43°23½' ✓

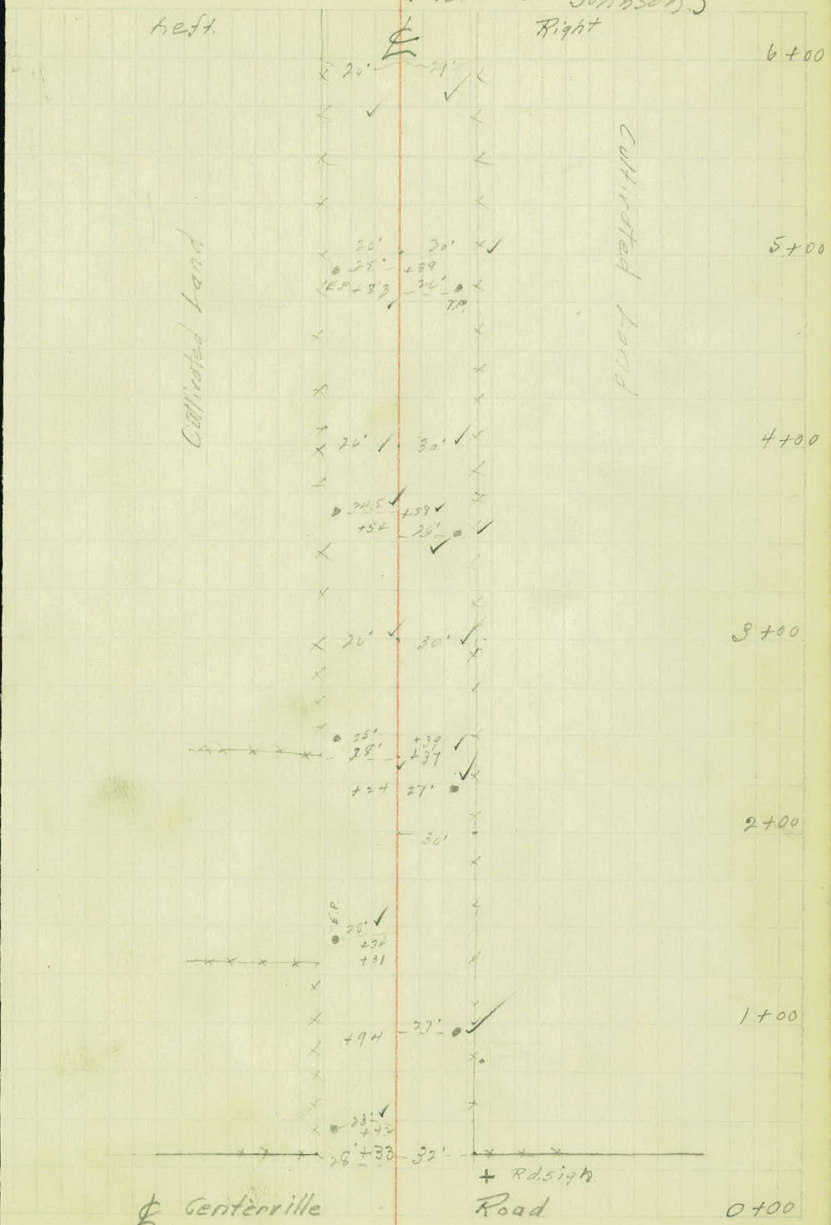
39° Curve h
Δ = 86°47'
✓ S.T. = 188.8 ✓
✓ B.C. = 66+58± ✓
✓ length = 299.3 ✓
✓ E.C. = 69+57± ✓

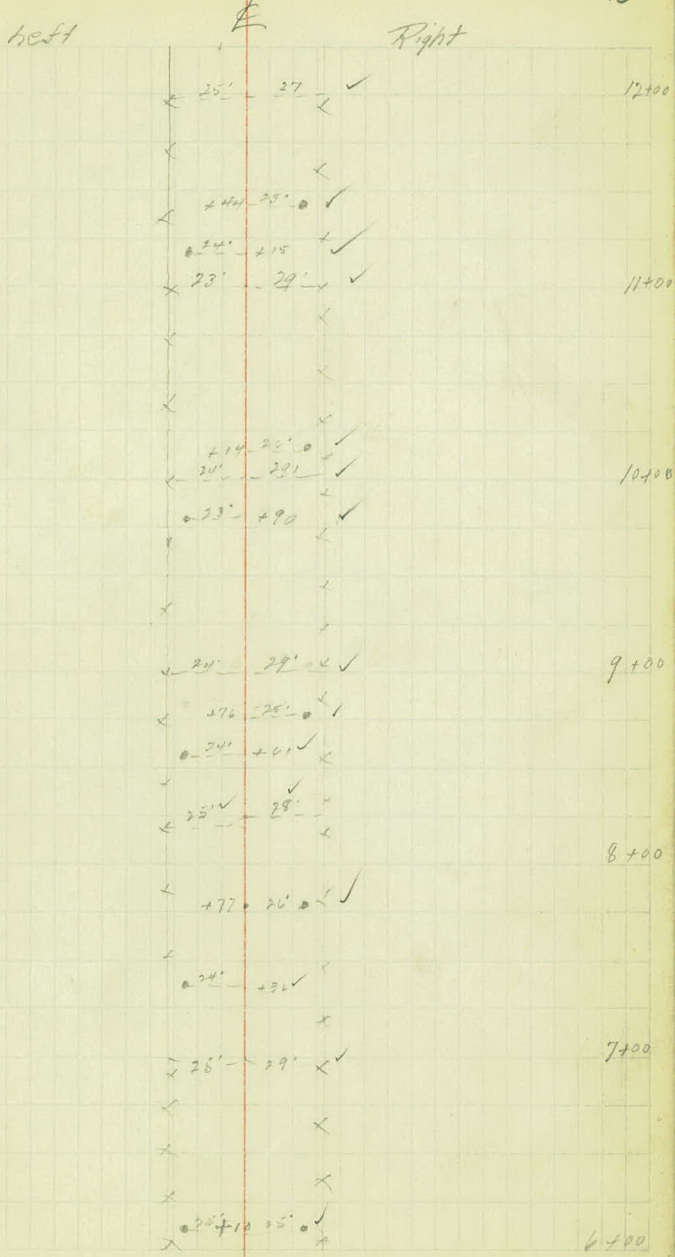

Mon. Found
FIFTH ST.
1319.94
89°56'
89°59'
90°01'
1317.5
33
EAGLE AVE
1322.07
Flag Pole
18" Oak
89°53.5'
Hydrant
BIRCH LAKE AVE
1322.5
1318.9'
Nail Found Replaced With RR Spike
33'
33'
2641.42
Tel. Pole
BAND
1322.07
90°16'
89°49'
Mon. Not Found
2635.8

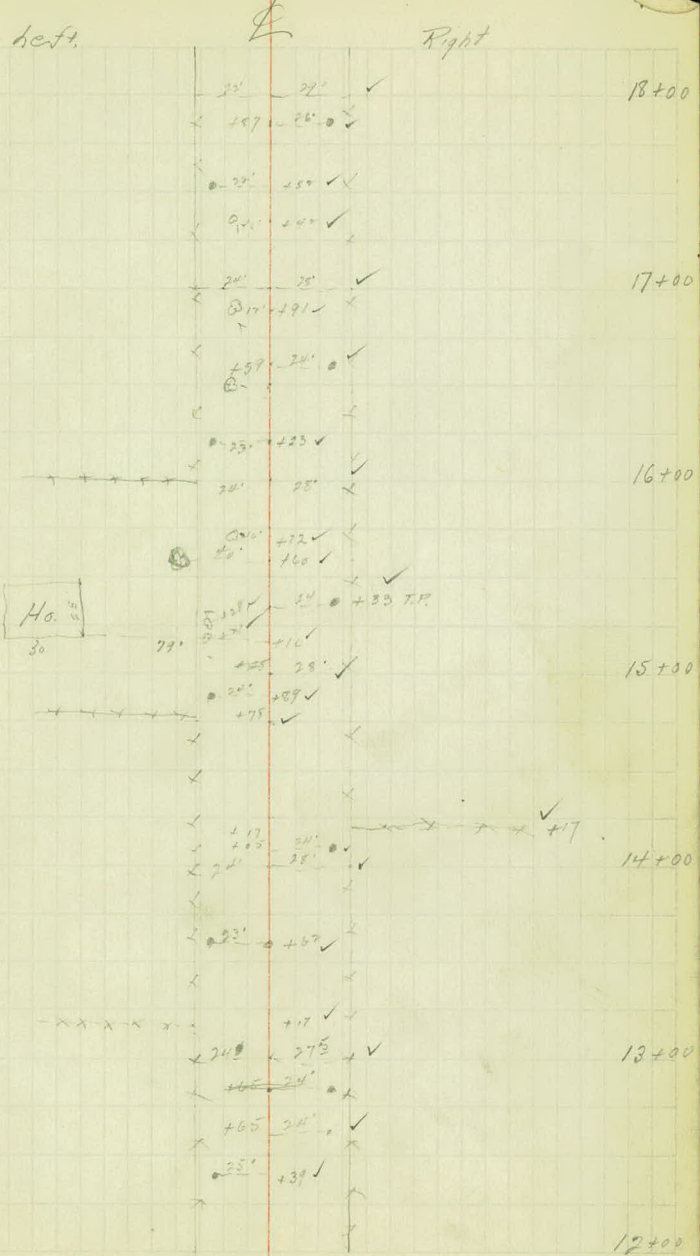
B. h. Line
Artificial Topography

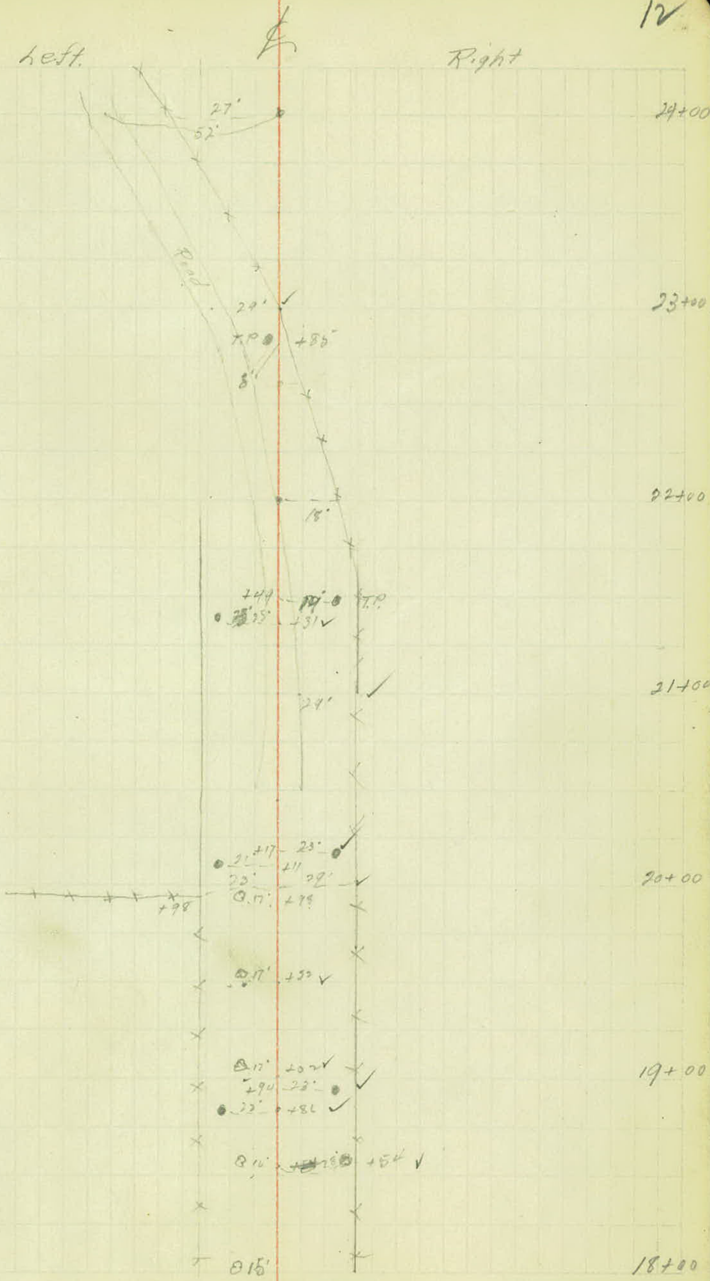
2-28-23

R.E. Austin.
Skaggio – Reiting } chain.
Walsh. – Johnson }



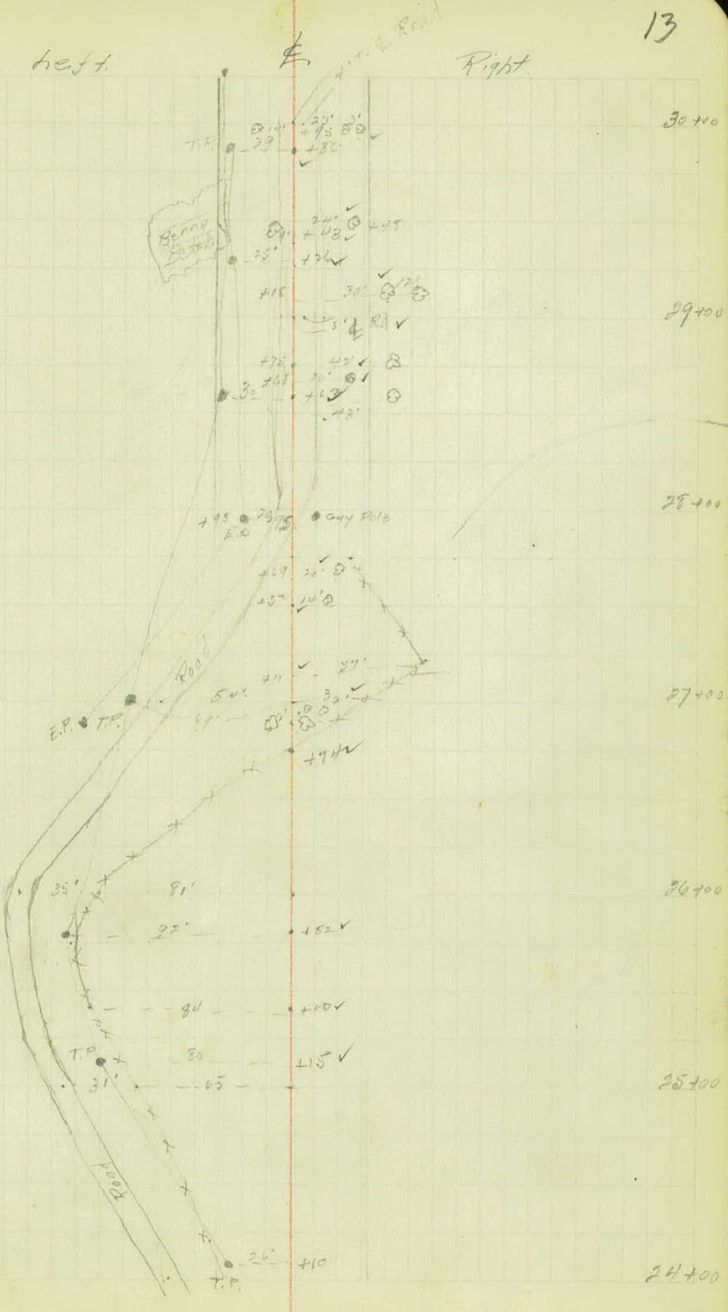

Left
℄
Right
12+00
11+00
10+00
9+00
8+00
7+00
25' 27'
+44 25'
24' +15
23' 29'
+14 26'
24' 29'
23' +90
24' 28'
+76 25'
24' +01
25' 28'
+77 26'
24' +32
26' 29'
+18 25'

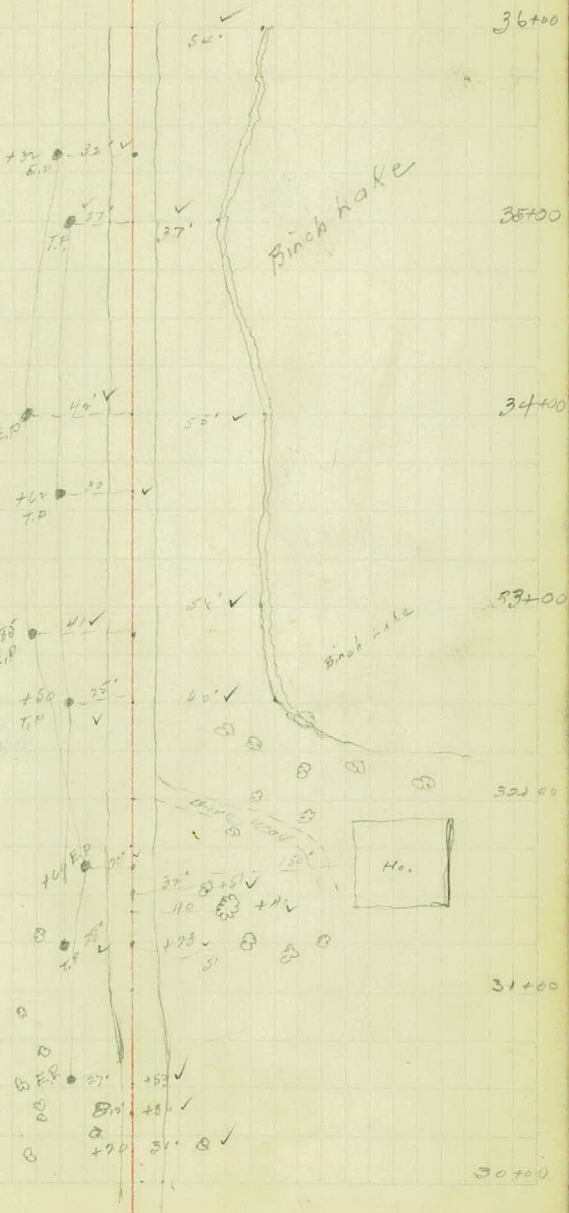

Left
℄
Right
18+00
17+00
16+00
15+00
14+00
13+00
12+00
Ho.
30
79'

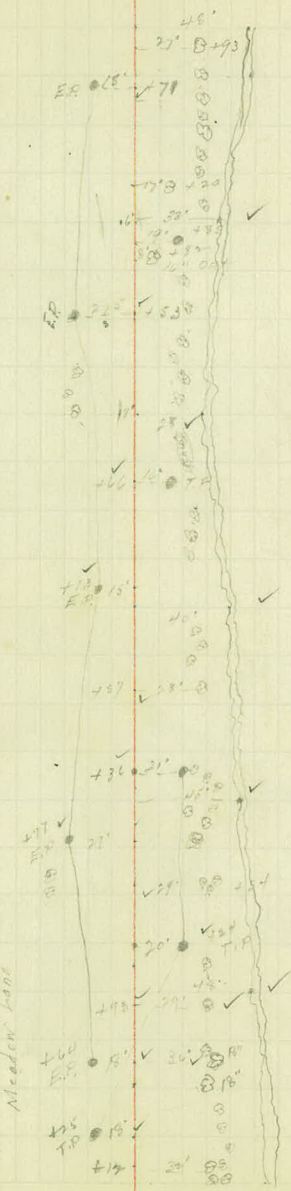


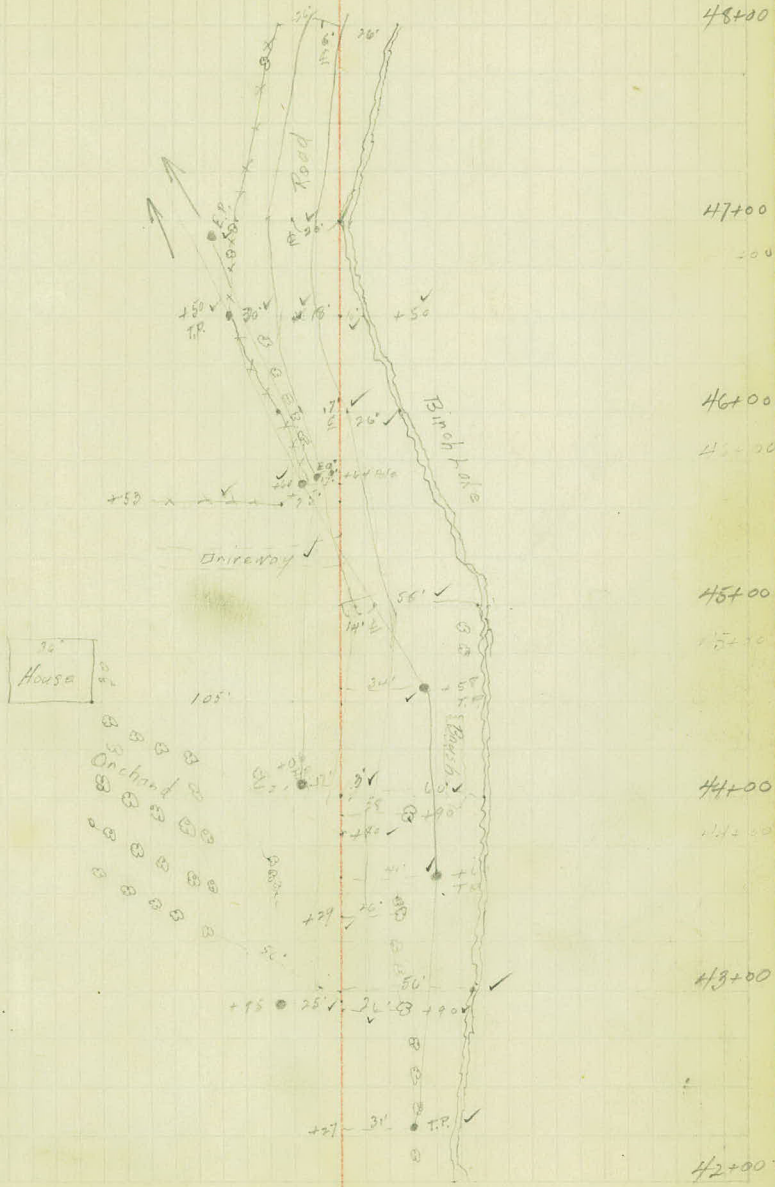
Left
Right
Road
24+00
23+00
22+00
21+00
20+00
19+00
18+00
27'
52'
24'
T.P.
+88'
8'
18'
+49
T.P.
+31
24'
+17
23'
21'
+11
22'
29'
+98
17'
+79
17'
+50
17'
+02
+94
22'
22'
+86
16'
+54
15'

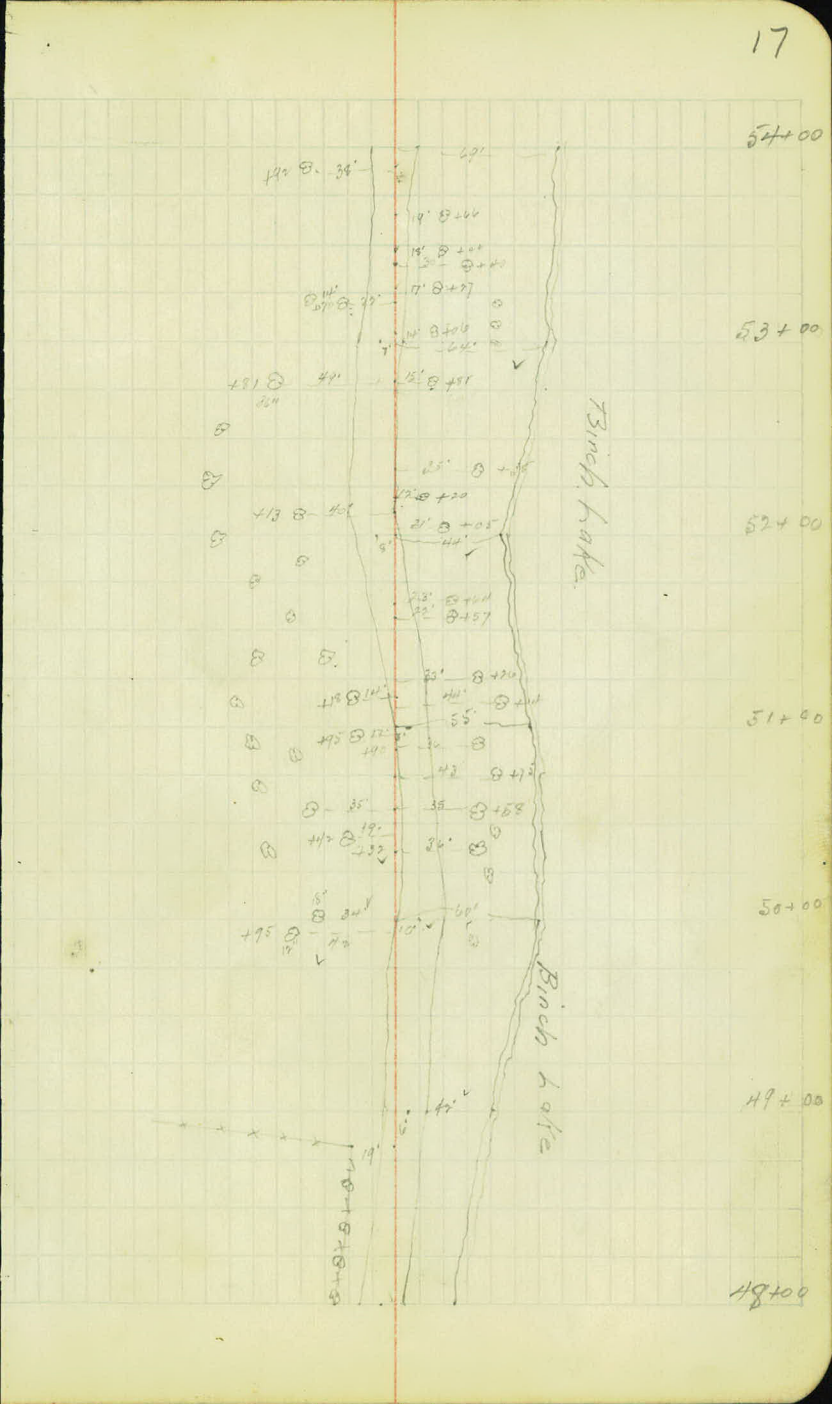
Left ℄ Right

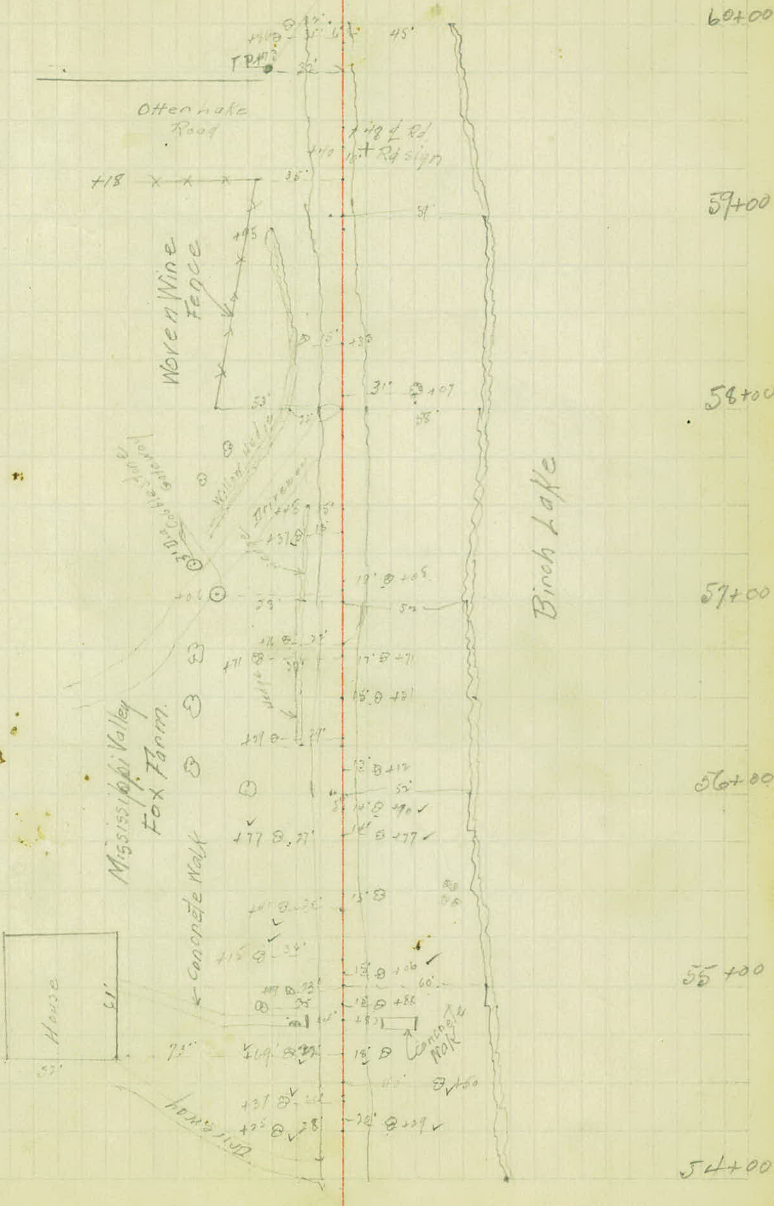

Road
Benny Bath
T.P.
E.P.
Guy Pole
Road
E.P. T.P.
Road
T.P.
T.P.
30+00
29+00
28+00
27+00
26+00
25+00
24+00

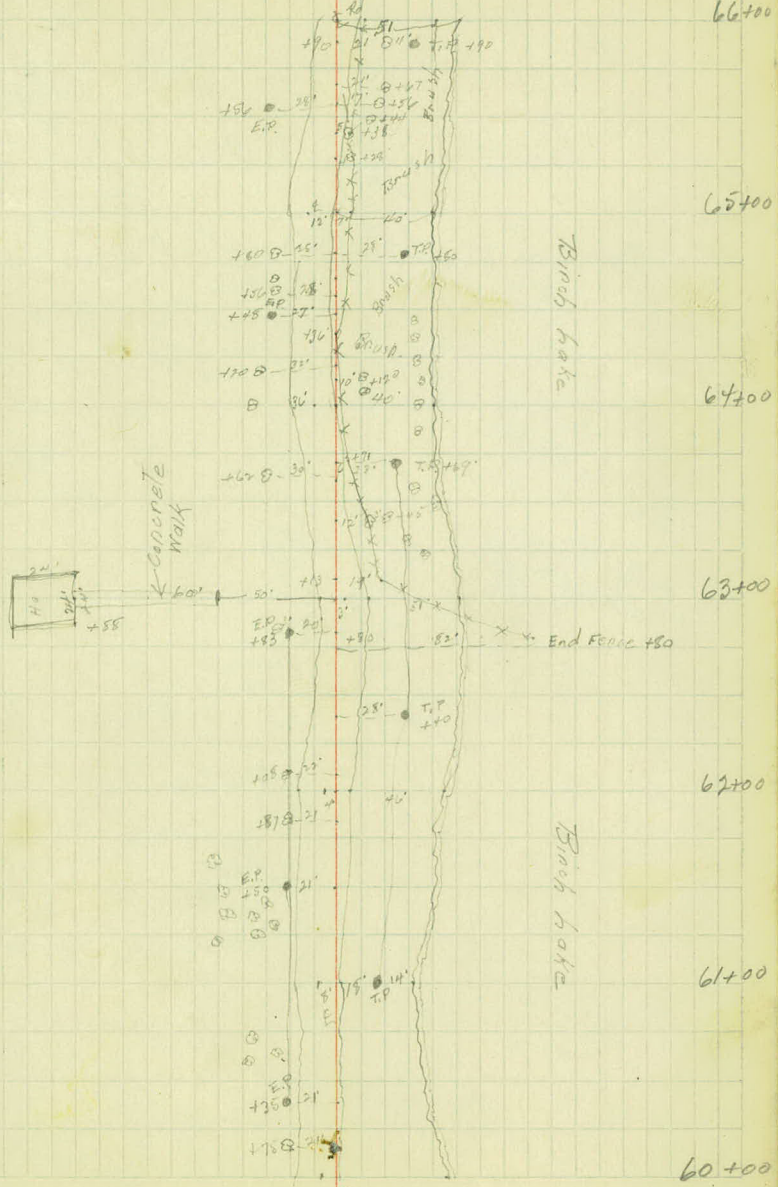

36+00
35+00
34+00
33+00
32+00
31+00
30+00
Birch Lake
Birch Lake
Ho.
E.P
T.P

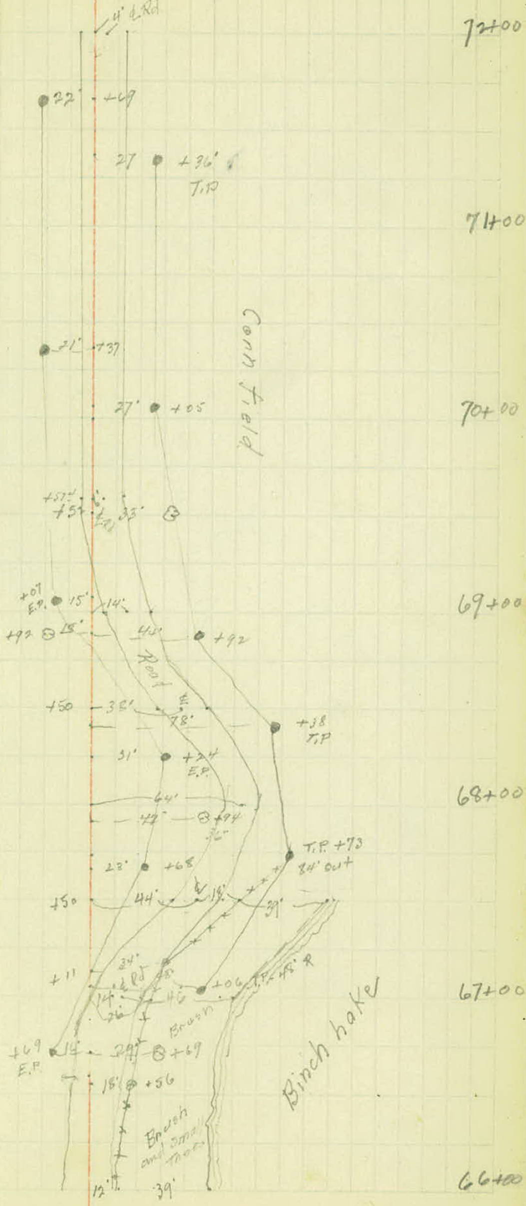

43+00
41+00
40+00
39+00
38+00
37+00
36+00
Meadow land

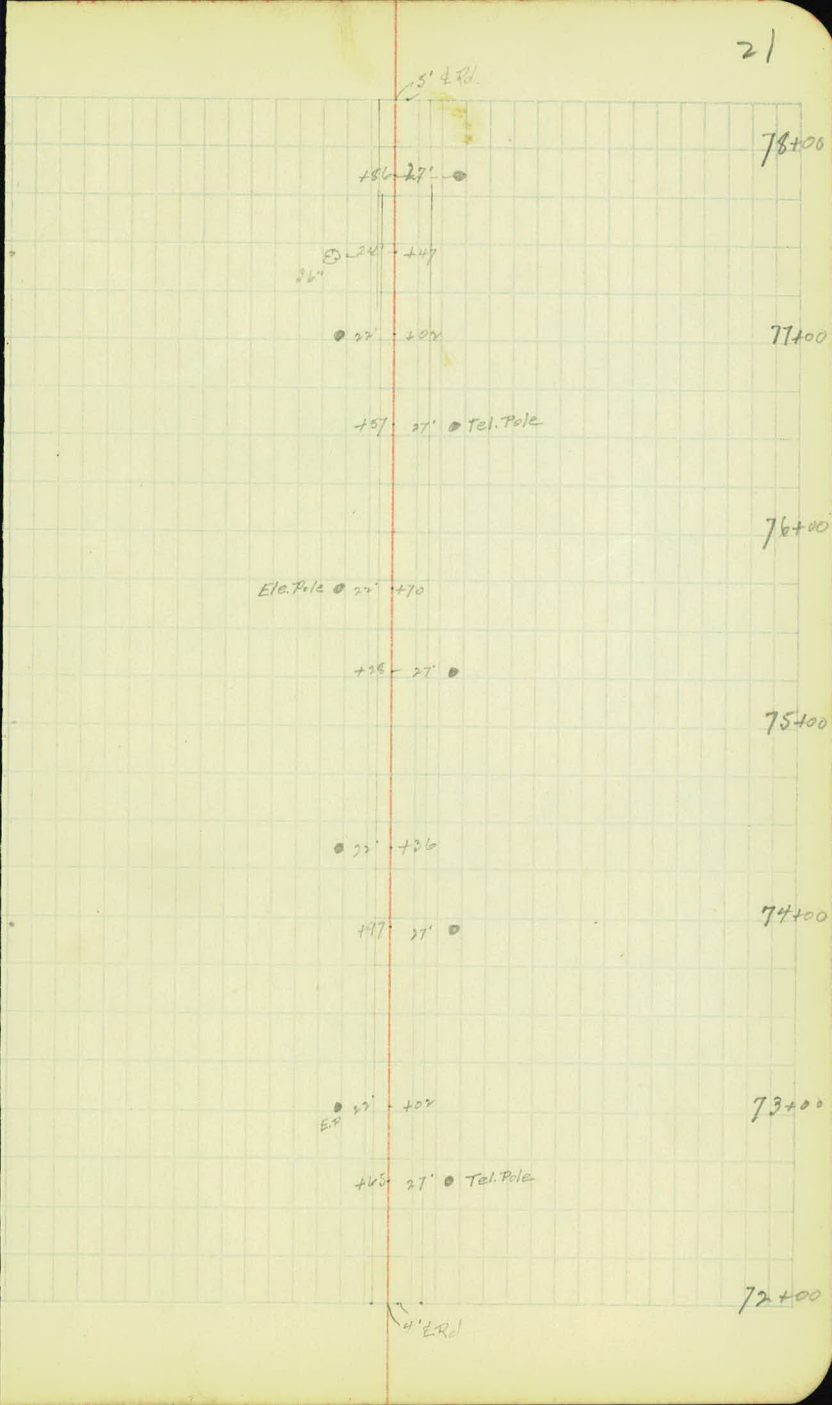

48+00
47+00
46+00
45+00
44+00
43+00
42+00
Road
Birch Lane
Driveway
House
105'
Orchard
T.P.
T.P.

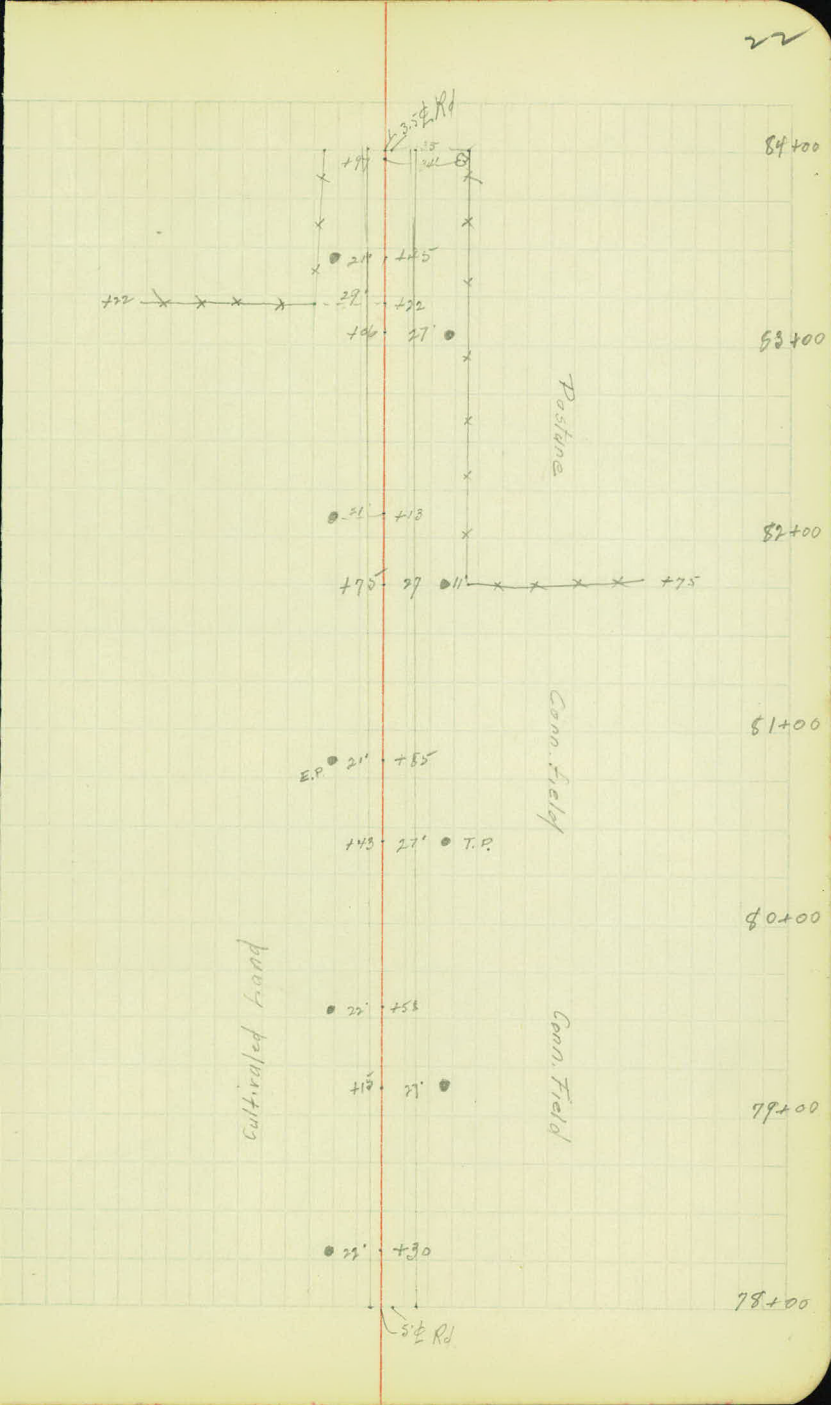

54+00
53+00
52+00
51+00
50+00
49+00
48+00
Birch Lake
Birch Lake

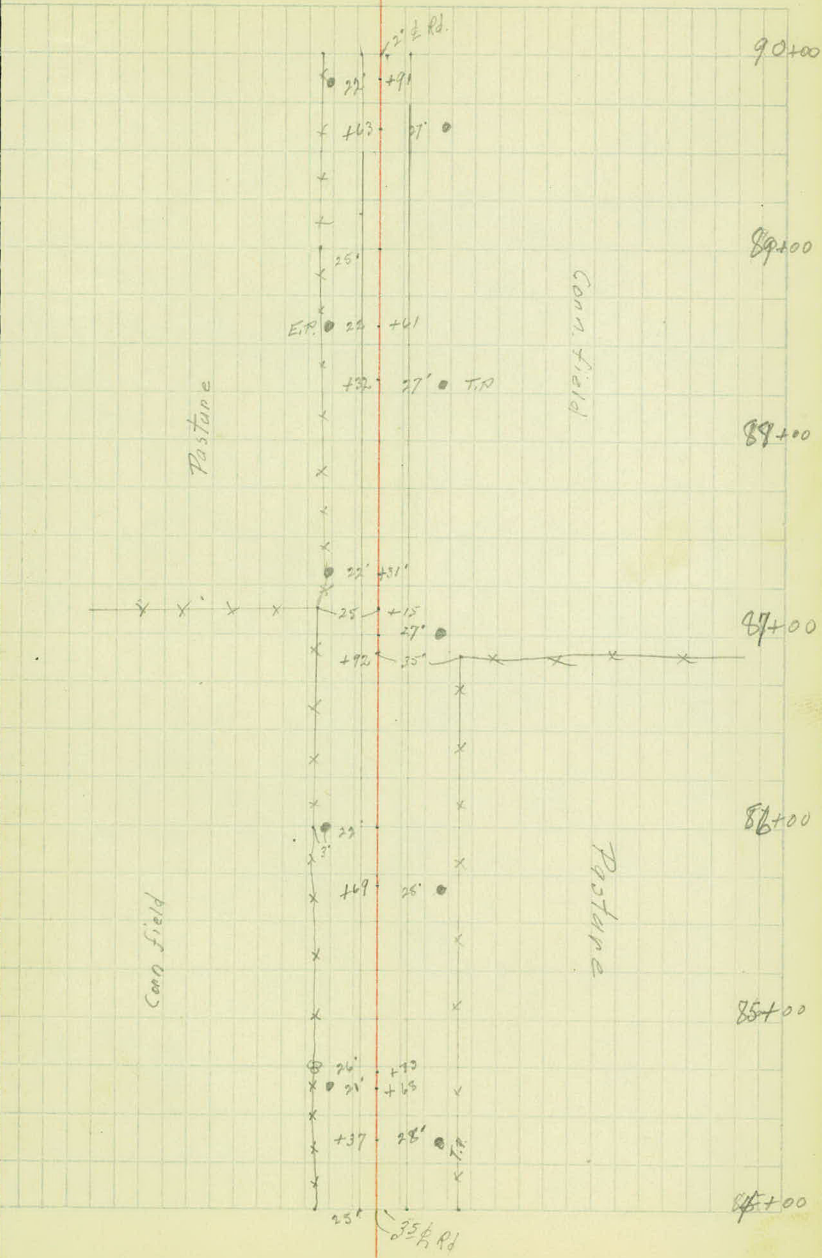

60+00
Otter Lake Road
59+00
Woven Wire Fence
58+00
Birch Lake
57+00
Mississippi Valley Fox Farm
56+00
Concrete Walk
55+00
House
54+00

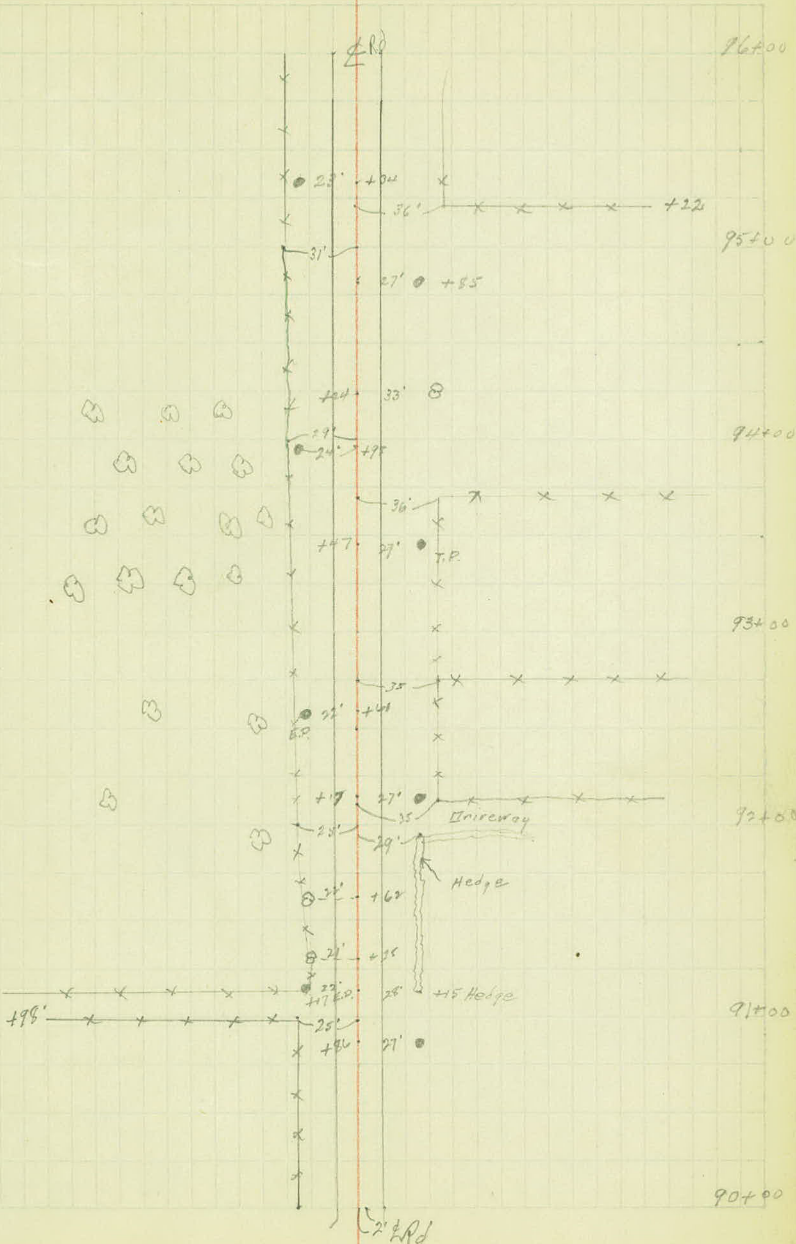

66+00
65+00
64+00
63+00
62+00
61+00
60+00
Birch Lake
Birch Lake
Concrete Walk
End Fence +50
T.P.
E.P.
Brush

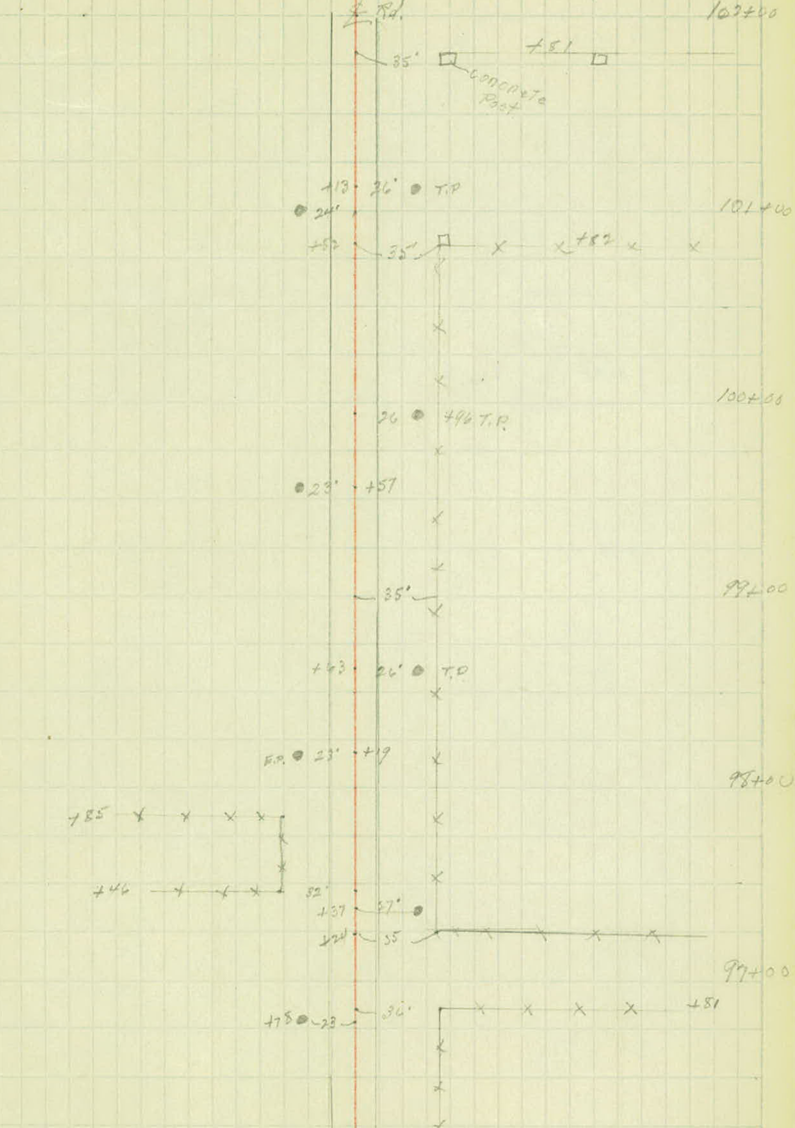

72+00
71+00
70+00
69+00
68+00
67+00
66+00
Corn Field
Corn Field
Road
Birch Lake
Brush
Brush and small Thorn
T.P.
E.P.
T.P. +73
84' out

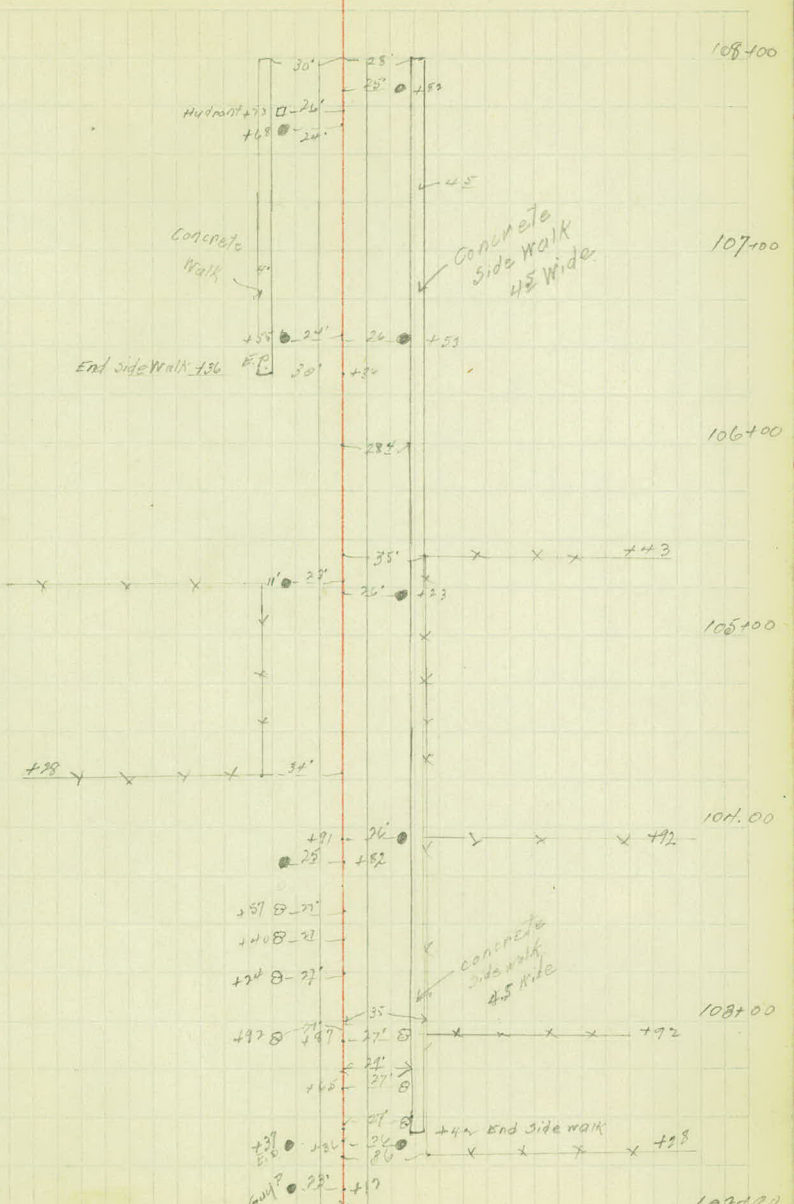

5' 4 Rd.
78+00
+86 - 27'
ED - 24' - +47
264
77+00
22' - +07
+57 - 27' Tel. Pole
76+00
Ele. Pole 22' +70
+26 - 27'
75+00
22' - +36
74+00
+97 - 27'
73+00
E.P. 22' - +07
+65 - 27' Tel. Pole
72+00
11' E.Rd.

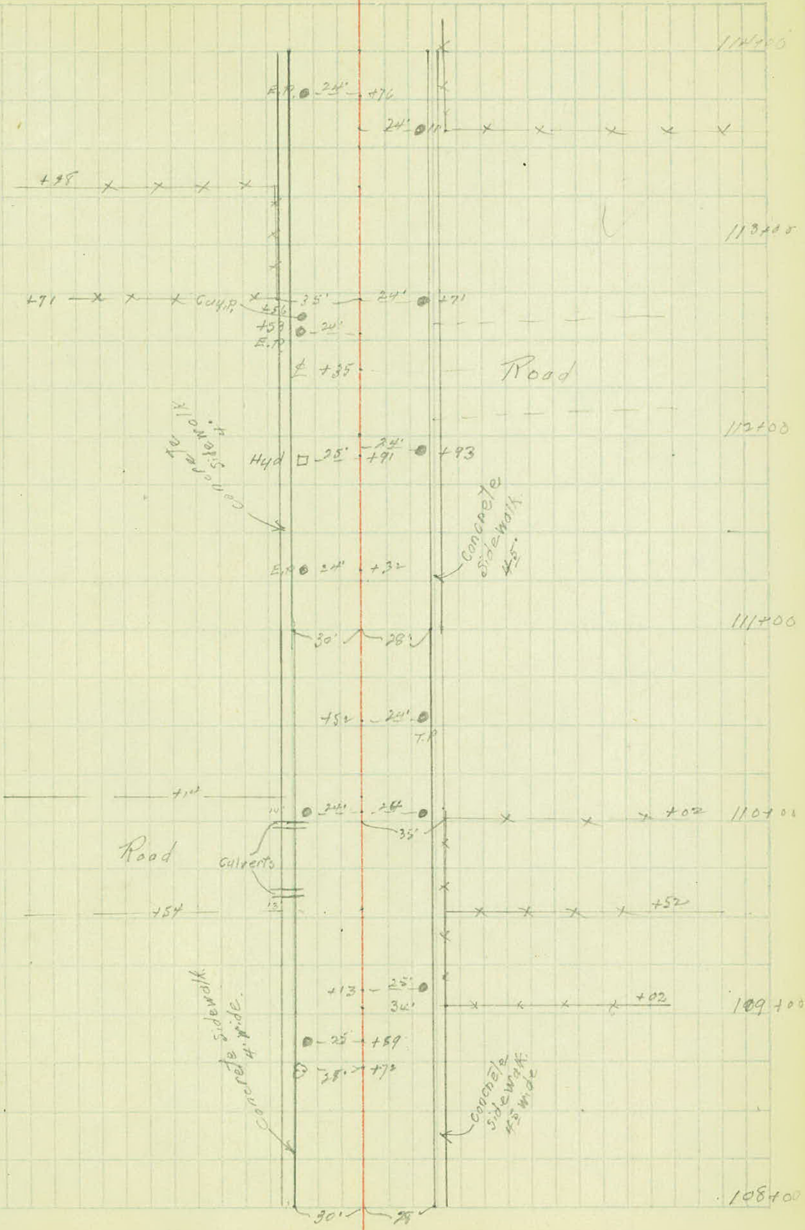

Rd
84+00
83+00
82+00
81+00
80+00
79+00
78+00
Pasture
Corn. Field
Corn. Field
Cultivated Land
E.P.
T.P.
Rd


2° ℄ Rd.
90+00
22'
+91
+63
27'
25'
89+00
Corn field
E.P.
22
+41
+32
27'
T.P.
Pasture
88+00
22'
+31'
25
+15
87+00
27'
+92
35'
22
3'
86+00
+69
28'
Pasture
Corn field
85+00
26'
+73
21'
+63
+37
28'
T.P.
84+00
25'
35' ℄ Rd


96+00
95+00
94+00
93+00
92+00
91+00
90+00
℄ Rd
+22
36'
31'
27'
+85
33'
29'
24'
+98
36'
+47
27'
T.P.
35
22'
+41
E.P.
+17
27'
35
Driveway
28'
29'
Hedge
+62
+36
22'
+17 E.P.
28'
+15 Hedge
+98'
25'
+86
27'
2' ℄ Rd


℄ Rd.
102+00
35'
+81
Concrete Post
+13
26'
T.P
24'
101+00
+52
35'
+82
100+00
26
+96 T.P.
23'
+57
99+00
35'
+43
26'
T.P
E.P.
23'
+19
98+00
+85
+46
32'
+37
57'
+24
35
97+00
+78
23
30'
+81
30
+09
27'
96+00


108+00
107+00
106+00
105+00
104.00
103+00
107+00
Concrete Walk
Concrete Side Walk 4.5 Wide
End Side Walk
Concrete Sidewalk 4.5 Wide
End Side walk
Hydrant
Gulf


114+00
E.P.
24'
+76
24'
+48
113+00
+71
Guy P.
35'
24'
+71
+56
+58
24'
E.P.
+35
Road
112+00
Hyd
25'
24'
+91
+93
Concrete sidewalk 4'
Concrete sidewalk 4.5'
E.P.
24'
+32
111+00
30'
28'
+52
24'
T.P.
+10
24'
24
110+00
+02
35'
Road
Culverts
+54
+52
+13
25'
30'
109+00
+02
25'
+89
35'
+72
Concrete sidewalk 4' wide
Concrete sidewalk 4.5' wide
108+00
30'
28'

B.h. Line – Artificial Topography

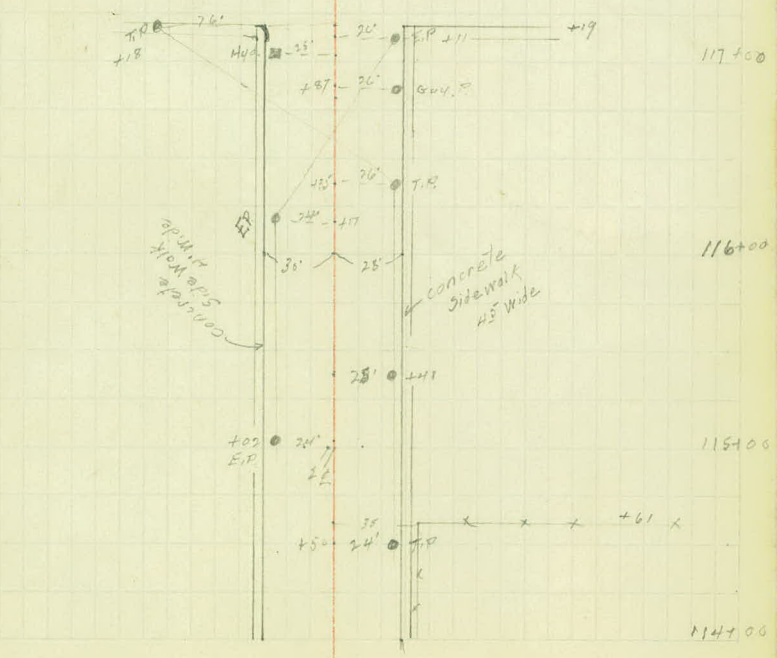
2-27-23

R.E. Austin - Recorder
S. Skooglin } chain
R. Walsh. }

28

117+44.9

℄ Bald Eagle Ave



Culverts B.h. line

Sta

12 + 50 12" Vit. Pipe
Ext 17' R.
1v 18± h.

34 + 00 12" Vit. Pipe
Extends 12' R - 18' h. ft

60 + 42± 10" Corrugated Pipe
Ext 14' R - 24' h. ft.

R.K. Austin
Skooglin
Walsh

Sta 12+00 = 100
4.5
104.5
4.

Inv. = 241.7 — 241.7 / 16.0 — 241.7 / 30.0 — 241.5 / 50.0

Drains Right

Inv. 226.0 — 225.0 / 32 — 224.9 / 50

Drains Left

Inv. 226.1 — 225.7 / 150 — 225.6 / 250

Drains Right

B.L. Line Traverse

Sta.	Left of Road.	Right of Road.	Ang. L	Ang. R
37+11.7 = 0+00				
1+00	9.7			
2+00	0.0			
3+00		2.0		
4+00		4.0		
5+00		19.0		
L +15		21.0		31°00'
+57	0.0			
6+00	7.0			
7+00	23.5			
8+00	18.0			
+78	0.0			
9+00		6.5		
L +27				84°30'
+44	0.0			
10+00	40.0			
11+00	36.0			
12+00	16.0			
13+00		2.0		
14+00		12.0		
+78	0.0	0.0		
15+00	7.0			
+70.5			40°30'	
16+00	21.0			
+98	0.0	0.0		
17+00		1.0		

Sta.	Left	Right	Ang. L.	Ang. R.	
18+00		12.0			
19+00		10.0			
20+00		1.0			
+10	0.0	0.0			
L +47 Z	6.0		20°00'		
21+00	4.0				
22+00	0.0	0.0			
23+00		3.0			
24+00		22.0			
L +25				58°0'	
25+00	2.0				
26+00	6.5				
27+00		9.0			
L +07 Z				29°0'	
28+00	0.0	6.0			
29+00	4.0				
30+00	3.0				
31+00	0.0	0.0			
32+00					
+10	Approx	L Birch	Arc		

Party #2

1 Austin
2 Loughin
3 Rob. Reeling
4 Johnson
5 Walsh
6 R. J. Long
7 Moloney

Tops. 1.2.5.
Xset 6.7.3.4

9°/C

42 + 36 6/4
1 + 0 4
41 + 322 = B.C.
2 + 06.6
434 389

.16376
637.3
49128
11632
49128
825.6
7364 248

9/18.6 (2.066 C
18
60
54
60

9°18'

57 + 31 8/4
56 + 50 4
81.4

33.2
9
28/9.8
3
8/6.94

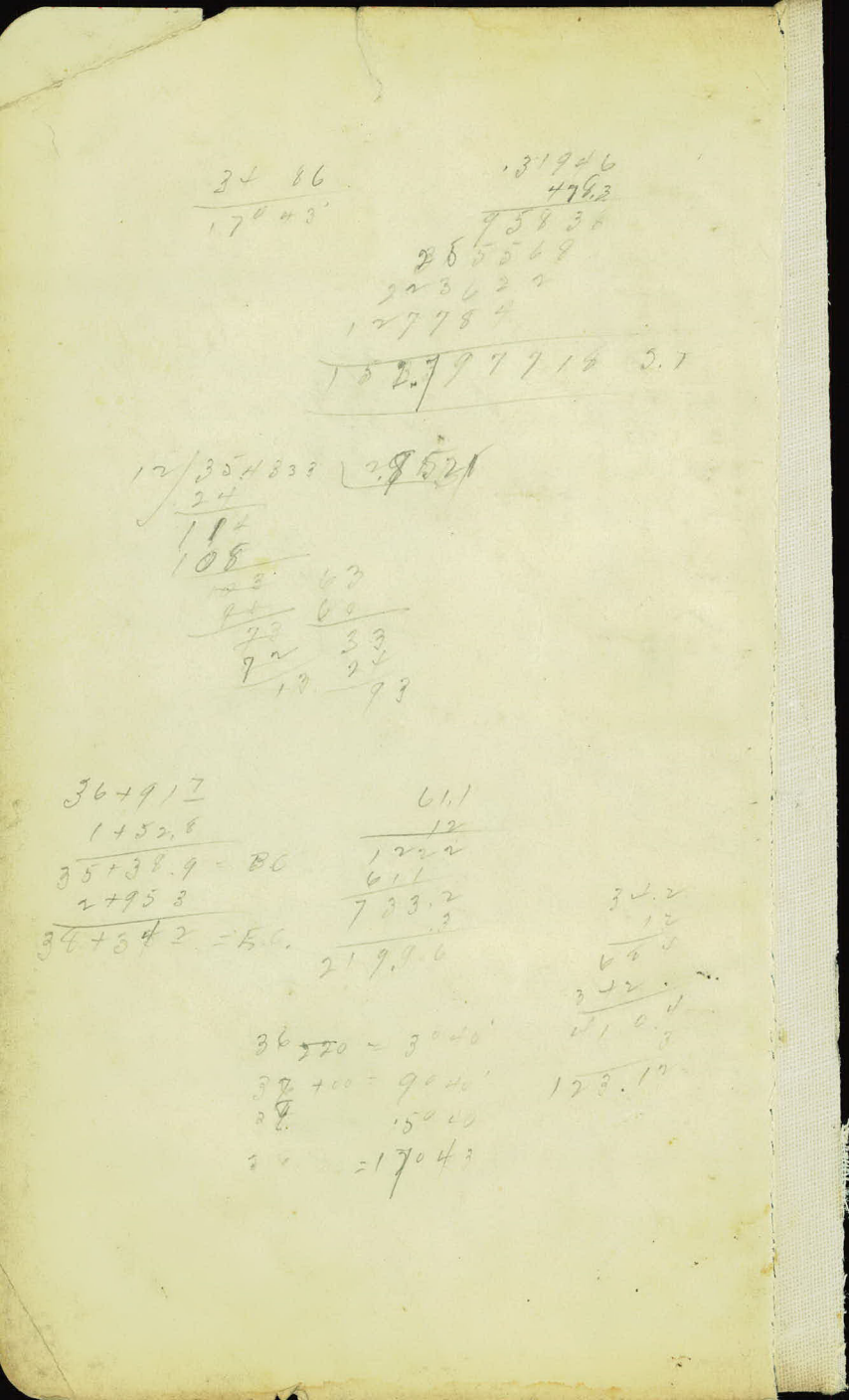
42 - 1°23'
43 - 5°53'
10° 23'

3/9
9
3501
3
1 0 5.13

1°45
53
8

42 - 3°03'
47 8/9 43 - 7°33'
610 2/2 + 389 - 9°18'
183.06

1°45
7°33
9°18



6-21-89

Steve Duff
City of White Bear
429-8526

VE CROSS
JUNE

RETROACTIVE Pay
1st HALF OF JUNE
JIM WAS TOLD

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES $1^1/_2$ 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.

62451