

KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND

SURVEYING INSTRUMENTS

NEW YORK.

CHICAGO. SAN FRANCISCO. ST. LOUIS.

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.

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

See Railroad Curves at the end of book.

Ditch 4

C. Murray
Charles Murray

St. Paul, Minnesota

Room #16

Court House

Net 27
8 08

34435

From Ramsey Co
 Survey Field Book

"Q"

1906

copied

2007

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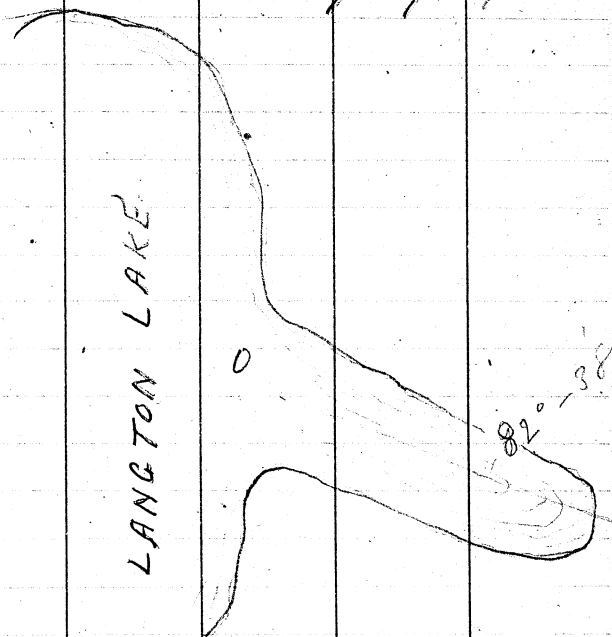
RC Ditch 4

RC Ditch 4

u7

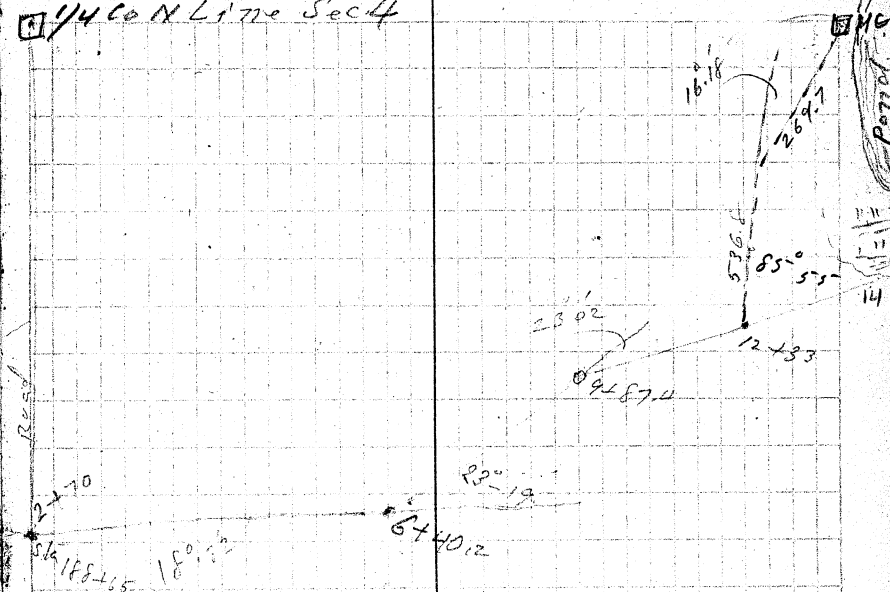
July 23/06

LANGTON LAKE



Line of Ditch in Sec 4 Rose

1/4 Co N Line Sec 4



48

Levels for Datab. in Snow

Sta.	BS	HI	FS	EL	Red
13M	166	230.39		228.73	
T.P.	3.00	226.59	7.80	222.59	
Water		Surface Length Lake		215.49	10.10
0				212.0	13.0
1				213.8	11.8
2				313.6	12.0
+44				215.6	10.2
+15				218.1	7.5
+70				220.2	5.4
3	450	216.5	Surface for	219.1	6.5
4				220.1	5.5
T.P.	6.66	227.42	4.83	220.76	
5				222.0	5.4
6				219.9	7.5
7				221.2	6.2
+40.2	Area	1		223.6	3.8
7				225.0	2.4
+60				223.1	0.3
8				219.9	7.5
9				220.9	6.5
T.P.	1.13	222.19	6.36	221.06	
+84.4	Angle			219.2	3.0
10				218.4	3.8
T.P.	0.66	211.17	11.68	212.51	

July. 25/06

Trans. Section

Top of Alaskan Glacier (Sta. 13) Lake Johnson

Toward

Edge of Water

Center Lake Johnson Road

44	Ditch in Sec 4				
S/E	B.S.	H.I.	F.S.	Elv	TR
11		211.17		205.8	5.0
12				198.9	12.5
T.P.	174	201.19	11.72	199.45	
+25				196.7	4.6
+33				198.0	3.2
+65				192.4	8.6
13				186.8	16.4
T.P.	2.96	192.03	12.10	189.09	
+10				184.2	7.6
+15				183.8	8.2
Water in Pond				184.86	7.17

Center of section

Center French at edge of Pond

50

Levels for Ditch in Secs 4 and 9 Town 30 Range 23.

Sta	BS	HI	FS	Elv.	Rod
BM	1.67	210.14		208.47	
T.P.			4.85	205.29	
	8.82	214.11			
T.P.			6.80	207.31	
	4.85	212.16			
T.P.	1.25	204.93	8.48	203.68	
		Water surface		202.8	2.10
0		In ditch		201.3	3.6
+20		Top of Road		203.7	1.2
+45				201.1	3.8
1				200.3	4.6
2				198.4	6.5
3				197.4	7.5
4				194.5	10.4
+30				193.4	11.5
5				193.9	11.0
6				193.7	11.2
7				192.6	12.3
T.P.	4.83	197.97	11.79	193.14	
8				191.3	6.7
+90				190.7	7.3
9				190.6	7.4
10				189.8	8.2
+70				190.5	7.5

July 31st /06

Top of West - Hendrix + Cross Roads
to West Side of Section

Top of 3" oak string 30' E of road
(30' E of road + 2' base to center)
Center of Road
Ditch Running Northwesterly

Enter Garrison Wet Swamp
from 50' to 100' wide

Angle left Swamp about 200' wide

Sta	Ditch	Level	Read	409	Rod
	B.S.	H.I.	F.S.	Flav	
12		197.97		191.2	6.8
+50				189.8	8.2
12				191.0	7.0
13				190.6	7.4
+92				190.4	7.6
14				190.5	7.5
T.P.	3.00	195.53	6.00	191.97	
15				189.9	5.6
16				189.5	6.0
17				189.1	6.4
+98				188.1	7.4
18				188.1	7.4
19				188.2	7.3
20				187.7	7.8
21				187.4	8.1
22				187.5	8.0
+80				186.8	8.7
+85				188.4	7.1
23				187.0	8.5
24				186.5	9.0
25				186.4	9.1
+41'				186.6	8.9
26				186.7	8.8
27				187.2	8.3
+60				187.0	8.5

T 30 - P 23

Angle Right

Angle left. Enter of ditch
follow ditch from here to creek

Angle Right

Entrance to old Box Culvert

Center of road: Angle right

Angle left

Leave Swamp, enter Dry meadow
Angle right

Sta	P.S.	H.I.	F.S.	Elev.	Rods	
28		195.53		187.3	8.2	
29				186.8	8.7	
30				186.3	9.2	
31	Enter Swamp			185.7	9.8	
Water Surface				185.78	9.75	Water Surf. Rice Creek.
Post 15					3.51	Top of Fence Post 6 th E from culvert marked "M"
32				184.8	10.75	Bottom of Swamp Near Edge of Rice
continued on page				#56		

Levels for ditch in sections 4 & 9 Town 30 Range 13

Sta	B.S.	I.I.	F.S.	Elev.	Rad	Running South
B.M.	5.00	208.58		203.68		Top of 3" Oak Stake So side of road
0				201.3	7.4	
1				201.2	7.5	
2				201.0	7.7	
3				201.3	7.4	
4				201.4	7.3	
5				201.1	7.6	
6				200.7	8.0	
7				200.4	8.3	
8				200.9	7.8	
9				200.4	8.3	
T.P.	6.11	200.82	5.9	202.71		
10				200.9	7.9	
11				200.2	8.6	
12				199.2	9.6	
13				199.2	9.6	
+50	Angle left			200.9	7.9	Bottom of 12" pipe under road
+55				203.1	5.7	Top of Road
+65				201.1	7.7	South end of pipe
14				201.1	7.7	
15				200.5	8.2	
16				201.4	7.4	
17				201.1	7.7	9.1 Oct in swamps 1997
18				201.6	7.2	
19	Angle right			200.5	8.3	

Sta.	K.C.	H.I.	F.C.	Elev.	Prod	
20		205.57		200.2	8.6	
21				200.4	8.4	
22				199.9	8.0	
23				200.0	8.8	
24				200.5	6.3	20271 water surf Sta 24 - Leave cond here
25				200.8	6.0	
T.P.	4.00	207.24	6.10	202.12		
26				201.5	4.8	
27				201.7	5.6	
28				201.9	5.4	
29				201.5	5.8	
+66				203.5	3.8	Top of Ridge
30				202.2	5.1	
31				201.0	6.3	
32				200.9	6.4	
33				199.9	7.2	
+26	Angle def			200.0	7.3	
34				199.7	8.6	
P.M. 6				201.69	5.63	12" Oak opposite Angle point 33+26
T.P.	3.26	202.10	8.50	198.82		
35				196.3	5.8	
36				196.2	5.9	
37				195.3	6.8	
38				194.2	7.9	
39				193.6	8.5	

58

Sta	B. S.	H. I.	F. C.	Elev.	Red.	
40		202.10		191.9	10.2	
+62	Angle left			191.3	10.8	
41				191.3	10.8	
42				192.4	9.7	
43				190.0	12.1	
T.P.	2.80	198.34	6.50	195.54		
+78				192.4	5.9	Top of ridge
44				191.1	7.2	
45	Angle R			188.7	9.6	
46				188.2	9.0	
47				189.3	10.0	
T.P.	5.81	195.60	8.50	199.50		
+70	Angle left			186.0	7.5	1/4 line
48				188.0	7.4	
49				188.2	7.4	
50				186.0	7.4	
51				188.0	7.4	
52				187.7	7.9	
53				189.0	7.4	
54				187.6	8.0	
+26	ditch Angle Right			195.2	10.4	
55				185.2	10.4	
56				184.5	11.1	
57				184.4	11.2	Exit of culvert under Kettle River Pond
+15	Center of road			190.3	5.2	24' side

59

Sea B.S. H.I. F.S. Elev. Rod

B. dia

195.60

1.48

194.12

5.25

105.25

Ground 10000 stakes

88

964

+50

6.2

99.0

5.85

99.3

96.4

+ 2.9

5

6.5

98.7

6.00

99.2

96.75

+ 2.5

4

6.1

99.1

5.73

99.5

97.10

+ 2.4

3

6.5

98.7

5.95

99.2

97.45

+ 1.8

2

6.3

99.9

5.83

99.4

97.80

+ 1.6

1

6.4

98.8

5.75

99.4

98.15

+ 1.4

0

= Mouth

5.9

99.3

5.3

100.0

98.5

+ 1.5

3r ft

to Mouth

5.8

99.4

5.0

100.0

99.2

+ 1.0 Mouth End

22

from side

6.0

99.2

5.2

100.0

98.8

+ 1.2

63

Grade Station & St. Paul Road

St.	BS	HI	FS	EL	TS
	0.82	279.35		278.53	
T.P.	1.90	269.15	12.10	267.25	
T.P.	6.90	266.85	9.20	259.95	
T.P.	8.95	272.44	5.36	263.49	
T.F.	12.15	282.38	2.21	270.25	
T.P.	11.48	295.66	1.00	281.38	
T.P.	8.07	299.53	1.40	291.45	
T.P.			3.37	296.16	
B.M.	1.10	302.95		301.85	
T.P.	1.00	294.05	9.90	293.05	
T.P.	0.55	284.08	10.52	283.53	
T.T.	1.35	272.11	11.32	272.76	
			8.20	265.91	

Aug 6, 1912

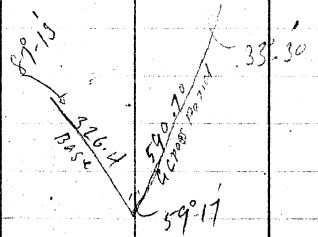
Grade of State St. 78' Left Side
 " " " " 81' Right

Grade in Union Park St. 115'

Grade of State St. 100' Right Side

Line of Dist. #4
 Commencing on the So. Line of Sec 9
 Sta. Angle Dist. Bearing

0	R. 83° 27'	464.35	N 6° 33' W
4-64.35	R. 28° 09'	445.00	N 21° 36' E
9+09.35	R. 15° 19'	572.55	N 36° 55' E
14+81.90	L. 5° 07'	801.70	N 31° 48' E
22+82.60	R. 63° 16'	513.40	S 82° 56' E
25+40	Center Line of Sec 9 - 1992.74 N. of 1/4		
27+97.	L. 63° 42'	378.35	N 31° 10' E
31+75.35	L. 39° 35'	537.00	N 8° 23' W
37+12.35	R. 57° 23'	402.30	N 79° 00' E
41+14.65	L. 69° 24'	458.00	N 9° 36' E
45+72.65	L. 29° 17'	306.85	N 17° 41' W
48+79.50	R. 22° 37'	795.00	N 4° 56' E
56+74.50	L. 74° 55'	346.80	N 74° 47' W
60+21.3	R. 56° 31'	957.30	N 18° 16' W
69+72.6	R. 36° 43'	1339.10	N 18° 27' E
83+11.70	R. 95° 11'	490.40	S 66° 22' E
88+02.10	L. 78° 19'	819.50	N 35° 19' E
96+21.60	L. 5° 15'	590.70	N 30° 04' E



From here to 102+12
 across Road

May 20, 1956

11.46 ft. West of 44 cor.

cor. on So. Line of Sec 9, angle of sights
 and Center line of Sec 9 = 84° - 46' R

Point for Triangulation

