

Dr. 8 - Bk. 146

OFFICE OF COUNTY ENGINEER
RAMSEY CO. MINN.

Drainage Survey

MISCELLANEOUS DRAINAGE SURVEYS

From To

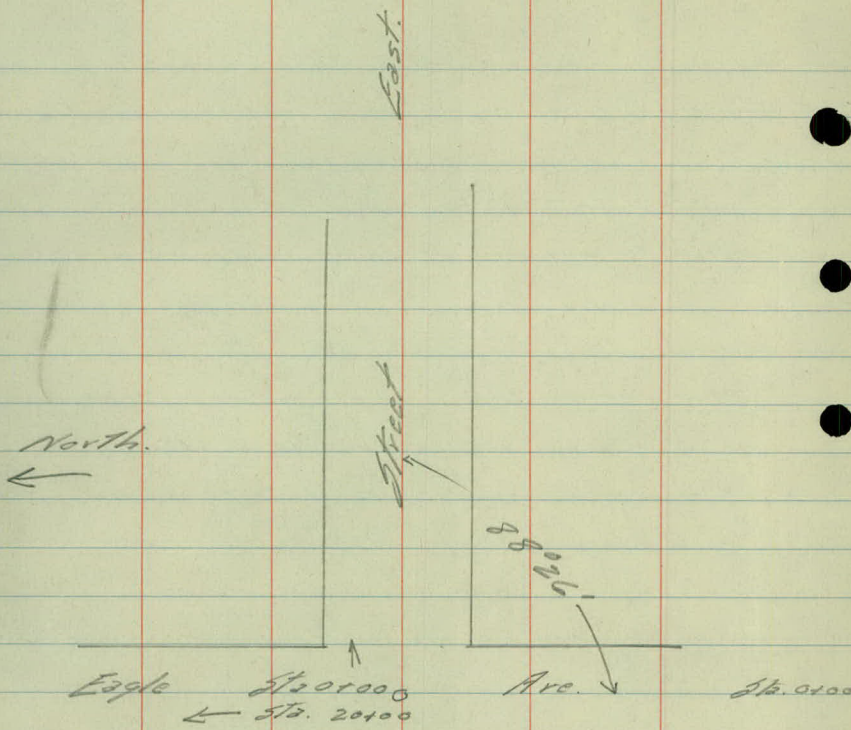
Road Acc't. No.

Date Filed 12-29-38 File

1
Drainage Situation at
Buffalo St. & Eagle Ave. White
Bear Township.

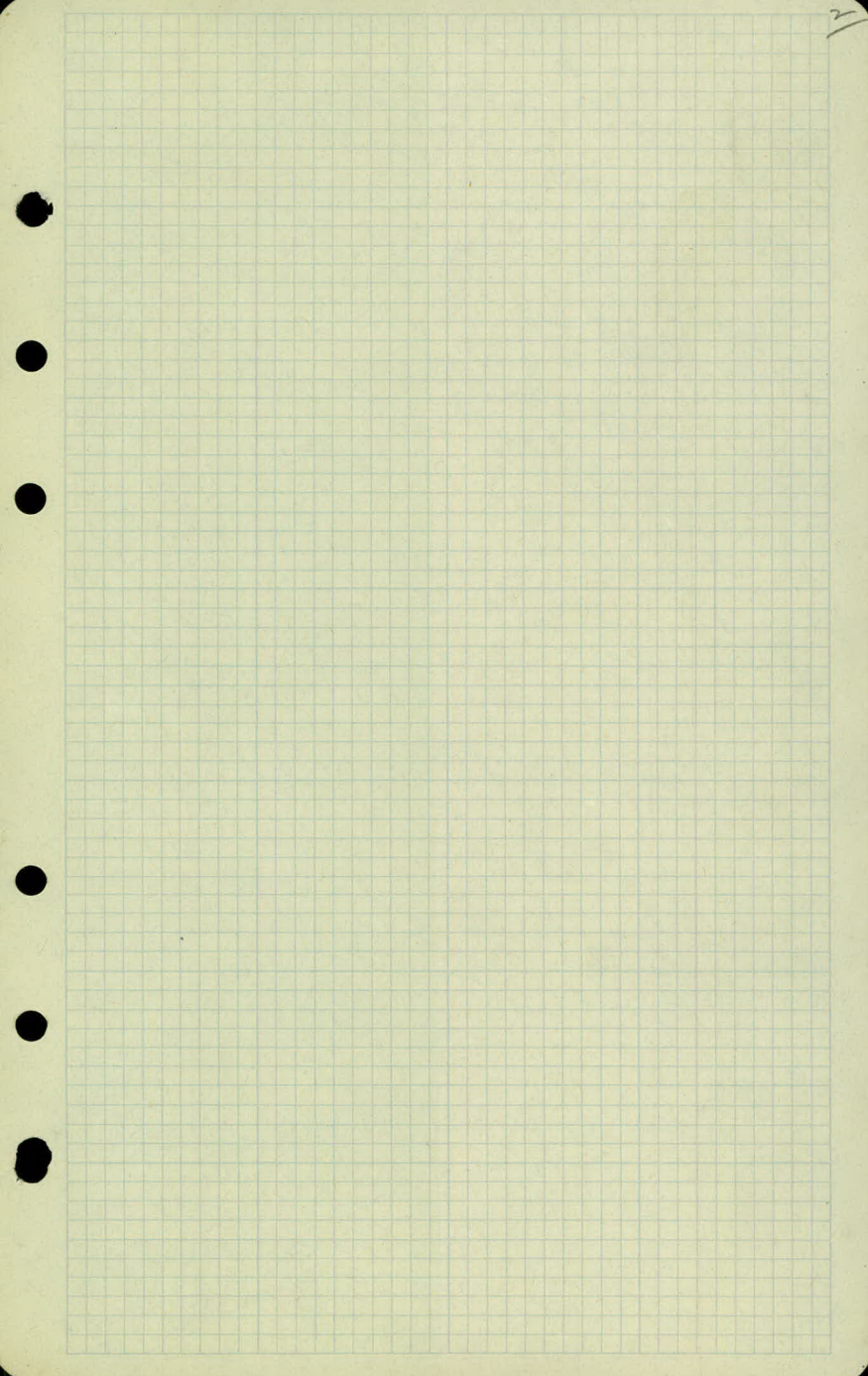
10/20/38

As per instructions A.W. Lindahl



Note: Base lines
are not relevant
to property lines
but follow $\frac{1}{2}$ of
Present Blacktop
Road.

Buffalo



Blacktop.
10 10

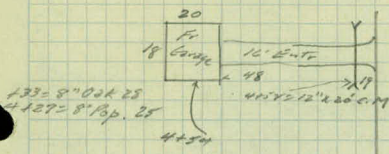
4 10 10

3 13 10

2 11 10

1 10 10

0400



East →

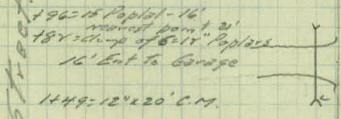
+84 = 12" Oak 19

+34 = 15" Oak 25
+24 = 7" 8" Birch 19
30 = 18' Oak 25

+67 = 12" Oak 25
+49 = 24" Oak 21

St.

2+33 = 3' Stone Walk



+47 = 12" Elm 24
+33 = 18" Oak 24'

Buffalo

+75 = 10" Elm 23

Buffalo

+27 = 4" 6" Oak 22'
+24 = 1" 14" Oak 18'
+22 = 1" 14" Oak 18'
+20 = 12" x 44' C.M.
+16 = 12" x 48' C.M.

19

20' Radius

Eagle

St.

14

13

12

11

10

9

8

7

North ↑

12" Dist. Ent. + 15
water. Ent. Block. Pitch
unable to locate current
here

9 8
↓
8

Low

+ 63-18" x 33' C.M. —————→ 15 ← Low

Note This current is buried
12" C.M. connects to Boat Current
on West End. This pipe is
buried and we were unable to
locate its course due to
being buried.

8 9

9 10
↓
8 9

83.7

↑ 44-15" x 44' C.M.

→ 16 ←

21

20

19

18

17

16

15

14

North ↑

+ 58 = 15" 0.25 20
 + 55 14.50 17
 + 31 = 12" 0.25 19'

7 8

17'  Both
 18+20 = 8" x 6' C.T.P.

Alonso

10 9

18'  17+47 = 12" x 16' C.M. 952.4

9 9

18'  8' Dist. E.T.
 16+48 = 10" x 20' C.M. 951.9

8 9

Loyle

18'  15+70 = 10" x 16' C.M. 950.4

8 8

18'  10' Dist. E.T.
 14+82 = 10" x 16' C.M. 950.3

17'  12" x 20' C.M.
 14+100

24

23

22

21

8 8

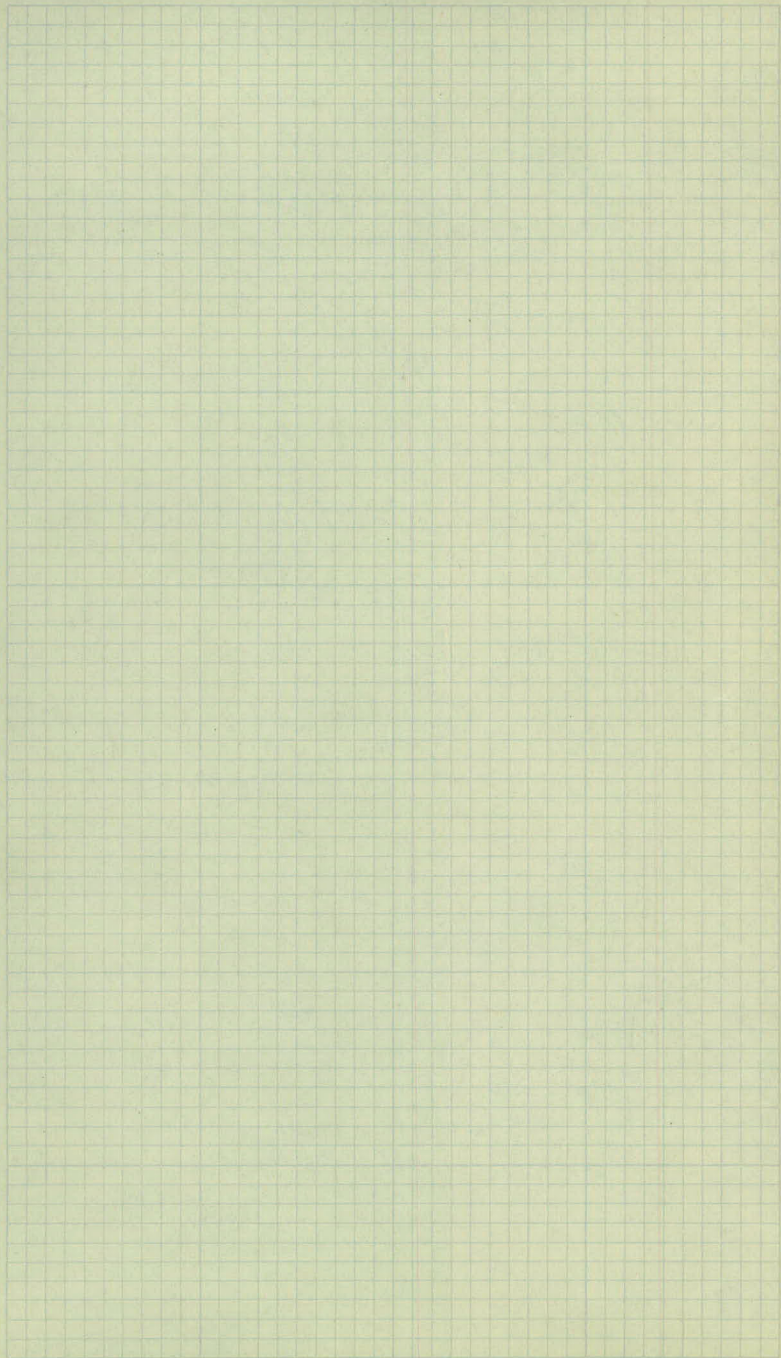


14

filled to ground

217180 12" x 62' C. M

8 8



Eagle Avenue

Sta.	+	π	-	Elev.
B.M.	3.75	926.25		922.50

7

+44 C.M. Culvert

11+40

11+63

T.P.	6.09	928.66	3.68	922.57
------	------	--------	------	--------

14+00

14+83

15+70

16+40

17+47

18

Lt

E

Rt

8

S.W. Cor. Mont. W. $\frac{1}{4}$ Cor. Sec. 12 = 1320.3'
 South of Buffalo. on E. Side of
 Eagle St.

$$\begin{array}{r} 22.5 \\ 3.8 \\ \hline \end{array} \quad \begin{array}{r} 4.2 \\ 9 \\ \hline \end{array} \quad \begin{array}{r} 4.5 \\ 11 \\ \hline \end{array} \quad \begin{array}{r} 20.8 \\ 5.5 \\ 14 \\ \hline \end{array} \quad \begin{array}{r} 5.2 \\ 22 \\ \hline \end{array} \quad \begin{array}{r} 5.4 \\ 25 \\ \hline \end{array} \quad \begin{array}{r} 5.0 \\ 20 \\ \hline \end{array}$$

$$\begin{array}{r} 17.05 \\ 1.2 \\ \hline 9.2 \end{array}$$

$$\begin{array}{r} 17.8 \\ 1.2 \\ \hline 8.4 \end{array}$$

$$\begin{array}{r} 32.0 \\ 4.3 \\ \hline \end{array} \quad \begin{array}{r} 5.5 \\ 12 \\ \hline \end{array} \quad \begin{array}{r} 7.0 \\ 15 \\ \hline \end{array} \quad \begin{array}{r} 7.4 \\ 30 \\ \hline \end{array} \quad \begin{array}{r} 18.7 \\ 7.5 \\ 75 \\ \hline \end{array} \quad \text{Low}$$

$$\begin{array}{r} 17.8 \\ 1.2 \\ \hline 8.4 \end{array}$$

$$\begin{array}{r} 20.4 \\ 1.2 \\ \hline 8.3 \end{array} \quad \begin{array}{r} 20.3 \\ 1.2 \\ \hline 8.4 \end{array}$$

$$\begin{array}{r} 30.3 \\ 1.2 \\ \hline 8.4 \end{array} \quad \begin{array}{r} 20.2 \\ 1.2 \\ \hline 8.5 \end{array}$$

$$\begin{array}{r} 21.1 \\ 1.2 \\ \hline 7.6 \end{array} \quad \begin{array}{r} 20.4 \\ 1.2 \\ \hline 8.3 \end{array}$$

$$\begin{array}{r} 21.9 \\ 1.2 \\ \hline 6.8 \end{array} \quad \begin{array}{r} 21.9 \\ 1.2 \\ \hline 6.8 \end{array}$$

$$\begin{array}{r} 22.5 \\ 1.2 \\ \hline 6.2 \end{array} \quad \begin{array}{r} 22.4 \\ 1.2 \\ \hline 6.2 \end{array}$$

$$\begin{array}{r} 24.8 \\ 3.9 \\ \hline \end{array} \quad \begin{array}{r} 4.7 \\ 11 \\ \hline \end{array} \quad \begin{array}{r} 5.7 \\ 13 \\ \hline \end{array} \quad \begin{array}{r} 22.7 \\ 6.0 \\ 17 \\ \hline \end{array} \quad \begin{array}{r} 5.4 \\ 19 \\ \hline \end{array} \quad \begin{array}{r} 5.3 \\ 25 \\ \hline \end{array} \quad \begin{array}{r} 6.0 \\ 27 \\ \hline \end{array}$$

Sta. + K - Elev.

928.66

19

+64

T.P. 5.65 932.30 2.01 926.65

B.M. 4.82 937.30 4.82 927.48

20

+17

+50

21

+18

22

Check Levels

B.M. 1.62 929.10 927.48

T.P. 4.18 926.88 6.40 922.70

B.M. 4.32 927.56 922.50

Ch.

E

St.

9

$$\begin{array}{r}
 26.1 \qquad \qquad \qquad 24.3 \\
 \underline{26} \quad \frac{30}{10} \quad \frac{42}{13} \quad \frac{44}{17} \quad \frac{38}{19} \quad \frac{37}{29} \\
 \\
 26.8 \qquad \qquad \qquad 25.4 \\
 \underline{19} \quad \frac{26}{14} \quad \frac{33}{17} \quad \frac{31}{20} \quad \frac{22}{50}
 \end{array}$$

R.R. Spike in Guy Pale. N.W. Cor. Buffalo & Eagle St.

$$\begin{array}{r}
 \frac{6.2}{50} \qquad \qquad \qquad 27.0 \\
 \underline{50} \quad \underline{53} \qquad \qquad \frac{47}{50} \\
 \\
 27.2 \qquad \qquad \qquad 25.4 \\
 \underline{51} \quad \frac{53}{7} \quad \frac{67}{15} \quad \frac{59}{19} \quad \frac{56}{50} \\
 \\
 27.4 \qquad \qquad \qquad 25.9 \\
 \underline{49} \quad \frac{57}{10} \quad \frac{64}{13} \quad \frac{64}{15} \quad \frac{55}{18} \quad \frac{51}{50} \\
 \\
 27.6 \qquad \qquad \qquad 26.0 \\
 \underline{47} \quad \frac{53}{9} \quad \frac{62}{12} \quad \frac{63}{14} \quad \frac{57}{17} \quad \frac{53}{50} \\
 \\
 \qquad \qquad \qquad \frac{25.4}{\text{inv. } 50} \qquad \qquad \frac{26.0}{\text{inv. } 110} \\
 \qquad \qquad \qquad \frac{6.9}{\qquad} \qquad \qquad \frac{6.3}{\qquad} \\
 \\
 28.1 \qquad \qquad \qquad 27.0 \\
 \underline{42} \quad \frac{48}{9} \quad \frac{53}{11} \quad \frac{53}{14} \quad \frac{38}{17} \quad \frac{19}{50}
 \end{array}$$

Sta.	+	π	-	Elev.
B.M.	4.84	934.30		927.48

0+00

+16

+16

+20

+50

1+00

+45

+48

✓

+50

T.P.	10.69	944.83	1.16	931.14
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3

Lt.

2

Rt.

11

$$\frac{5.0}{50}$$

27.0

$$\frac{5.3}{50}$$

$$\frac{5.8}{50}$$

$$\frac{6.5}{50}$$

$$\frac{6.8}{18}$$

$$\frac{6.0}{16}$$

$$\frac{5.2}{9}$$

27.2

$$\frac{5.1}{50}$$

$$\frac{5.2}{12}$$

$$\frac{6.2}{30}$$

$$\frac{2.0}{32}$$

$$\frac{7.1}{50}$$

25.3

1 hr.

$$\frac{7.0}{50}$$

25.5

1 hr.

$$\frac{6.8}{50}$$

$$\frac{5.0}{50}$$

$$\frac{5.6}{17}$$

$$\frac{6.3}{15}$$

$$\frac{6.3}{14}$$

$$\frac{5.1}{11}$$

27.6

$$\frac{4.7}{50}$$

25.1

1 hr.

$$\frac{7.2}{50}$$

25.2

1 hr.

$$\frac{7.1}{50}$$

$$\frac{5.3}{50}$$

$$\frac{5.5}{26}$$

$$\frac{5.7}{17}$$

$$\frac{6.0}{16}$$

$$\frac{6.0}{15}$$

$$\frac{4.8}{14}$$

28.0

$$\frac{4.3}{50}$$

$$\frac{5.2}{50}$$

$$\frac{5.2}{19}$$

$$\frac{5.8}{17}$$

$$\frac{5.8}{16}$$

$$\frac{4.4}{13}$$

28.5

$$\frac{3.8}{50}$$

26.2

1 hr. W

$$\frac{5.1}{50}$$

26.7

1 hr. E.

$$\frac{5.6}{50}$$

$$\frac{3.6}{50}$$

$$\frac{3.7}{27}$$

$$\frac{3.8}{17}$$

$$\frac{3.1}{14}$$

29.7

$$\frac{2.6}{50}$$

$$\frac{1.8}{50}$$

$$\frac{1.8}{19}$$

$$\frac{1.8}{15}$$

31.0

$$\frac{1.3}{50}$$

$$\frac{9.9}{50}$$

$$\frac{10.1}{18}$$

$$\frac{9.7}{13}$$

32.7

$$\frac{9.1}{50}$$

Sta. + K - Elev.

941.83

3+50

4

+50

+50

C.M. 44

5

B.M.

14.35 927.48

927.48

Lt.

E

Rt.

$$\begin{array}{r} 33.8 \quad 34.0 \quad 34.3 \\ 8.4 \quad 8.0 \quad 7.8 \\ \hline 30 \quad 18 \quad 14 \end{array}$$

(33.0)

$$\begin{array}{r} 33.0 \quad 33.4 \quad 33.8 \quad 35.0 \quad 35.4 \\ 8.4 \quad 8.8 \quad 8.5 \quad 8.4 \quad 8.0 \\ \hline 100 \quad 75 \quad 50 \quad 41 \quad 16 \end{array}$$

(35.2)

$$\begin{array}{r} 35.2 \quad 36.0 \quad 36.8 \\ 6.6 \quad 6.1 \quad 6.5 \\ \hline 100 \quad 75 \quad 50 \quad 21 \quad 19 \end{array}$$

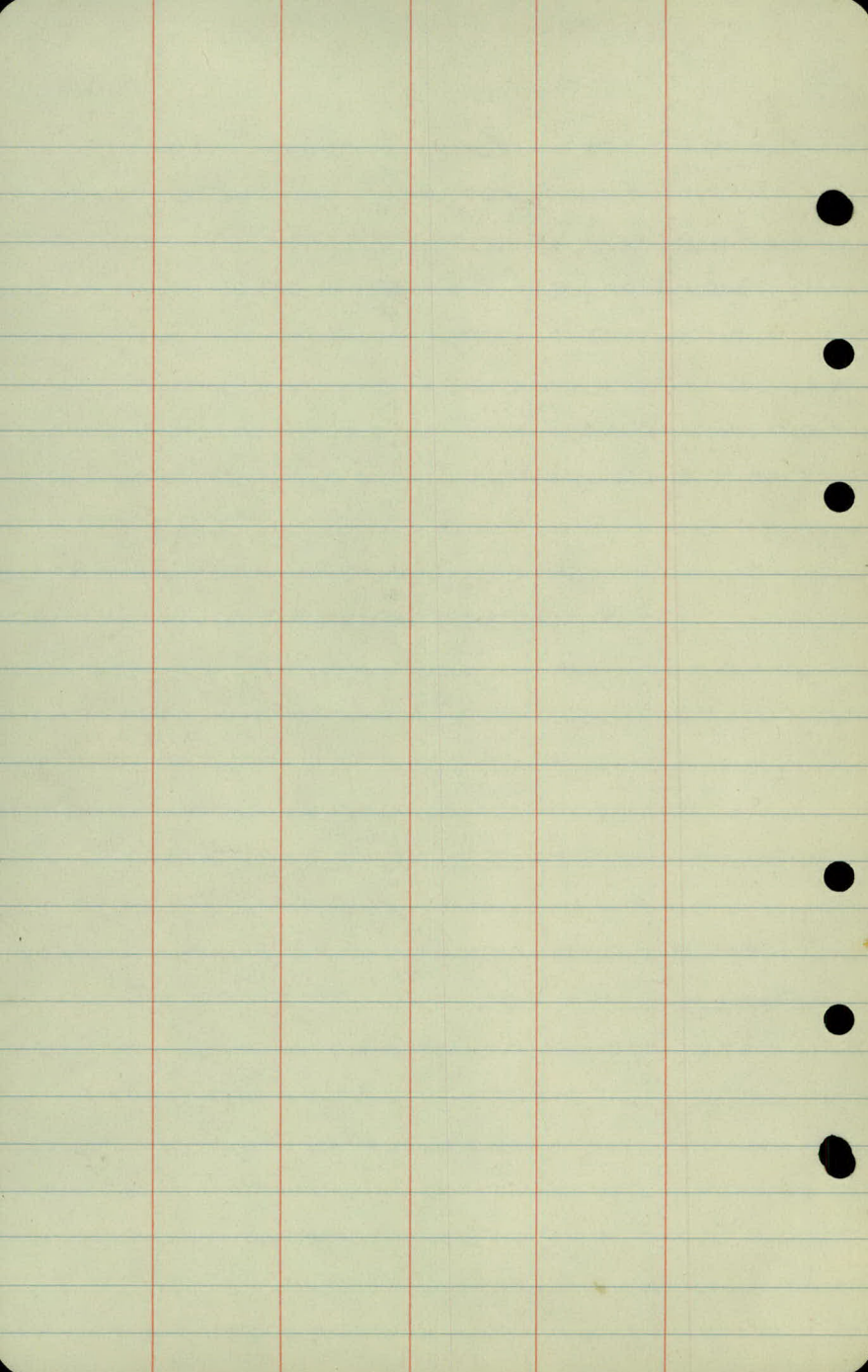
Inv W End

$$\begin{array}{r} 6.6 \end{array}$$

Inv E End

$$\begin{array}{r} 6.1 \end{array}$$

$$\begin{array}{r} +3.0 \quad +1.0 \quad 4.0 \quad 3.7 \quad 3.5 \\ \hline 30 \quad 26 \quad 17 \quad 14 \quad 10 \end{array}$$



Base Line to Main Ditch
off Eagle Ave.

Angle

Sta. Point Lt. Rt.

3+66 P.O.T.

0+00 P.I. 67°30'

Main Ditch

off Sta. 7+66

Sta.	+	π	-	Elev.
B.M.	4.12	926.62		922.50

0+00

+12

+18

+50

1

+50

✓

T.P.	5.53	926.51	5.64	920.98
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+50

3

+50

X 66 ~ Main Ditch

Base Line

Lt.

E

Rt.

15

51.9

4.7

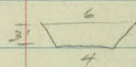
20.8

5.8

19.0

7.6

Main Ditch



19.3

$\frac{48}{100}$	$\frac{53}{80}$	$\frac{60}{64}$	$\frac{73}{38}$	$\frac{63}{16}$	6.7	$\frac{75}{25}$	$\frac{72}{50}$
------------------	-----------------	-----------------	-----------------	-----------------	-----	-----------------	-----------------

20.0

$\frac{46}{100}$	$\frac{55}{81}$	$\frac{56}{62}$	$\frac{66}{50}$	$\frac{66}{33}$	$\frac{58}{22}$	5.2	$\frac{58}{29}$	$\frac{68}{50}$
------------------	-----------------	-----------------	-----------------	-----------------	-----------------	-----	-----------------	-----------------

19.1

$\frac{65}{150}$	$\frac{59}{170}$	$\frac{51}{100}$	$\frac{44}{91}$	$\frac{55}{66}$	$\frac{64}{50}$	$\frac{75}{29}$	6.6	$\frac{57}{29}$	$\frac{56}{50}$
------------------	------------------	------------------	-----------------	-----------------	-----------------	-----------------	-----	-----------------	-----------------

Main Ditch $\frac{16.8}{78}$
 $\frac{65}{185}$

16.5

Main Ditch $\frac{101}{97}$ $\frac{67}{88}$ $\frac{57}{50}$ $\frac{69}{22}$ $\frac{78}{1}$ $\frac{61}{31}$ $\frac{55}{50}$

16.7

Main Ditch $\frac{78}{63}$ $\frac{78}{59}$ $\frac{75}{32}$ $\frac{81}{19}$ $\frac{75}{17}$ $\frac{66}{12}$ $\frac{64}{1}$ $\frac{57}{10}$ $\frac{62}{20}$ $\frac{70}{40}$ $\frac{70}{50}$

16.6

Main Ditch $\frac{79}{43}$ $\frac{77}{40}$ $\frac{68}{16}$ $\frac{58}{1}$ $\frac{56}{16}$ $\frac{51}{38}$

$\frac{75}{1}$ $\frac{68}{12}$ $\frac{62}{43}$

9.9

Sta	+	π	-	Elev
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		926.51		
--	--	--------	--	--

T.P.	4.50	926.78	4.23	924.98
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B.M.			4.28	924.50
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				<u>924.50</u>
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922.50

B.M. 4.10 926.60 922.50

3+00 Ditch on Rt. 6.8 19.8

4+00 6.5 20.1

~~488 Ditch to L. (8.3)~~

5+00 6.6 20.0

6+00 6.4 20.2

6+50 7.4 19.2

7+00 7.3 19.3

7+00 30' Rt. ^{18.2}
(8.4) 7.1 19.5

70' Rt. 8.2 18.4

100' Rt. 8.1 18.5

S.W. Cor. Mont. W. $\frac{1}{4}$ Cor. Sec. 12

4

4488 Ditch to Lt.

0430

8.3

18.3

50

8.5

18.1

100

8.5

18.1

200 P.I.

8.2

18.4

208

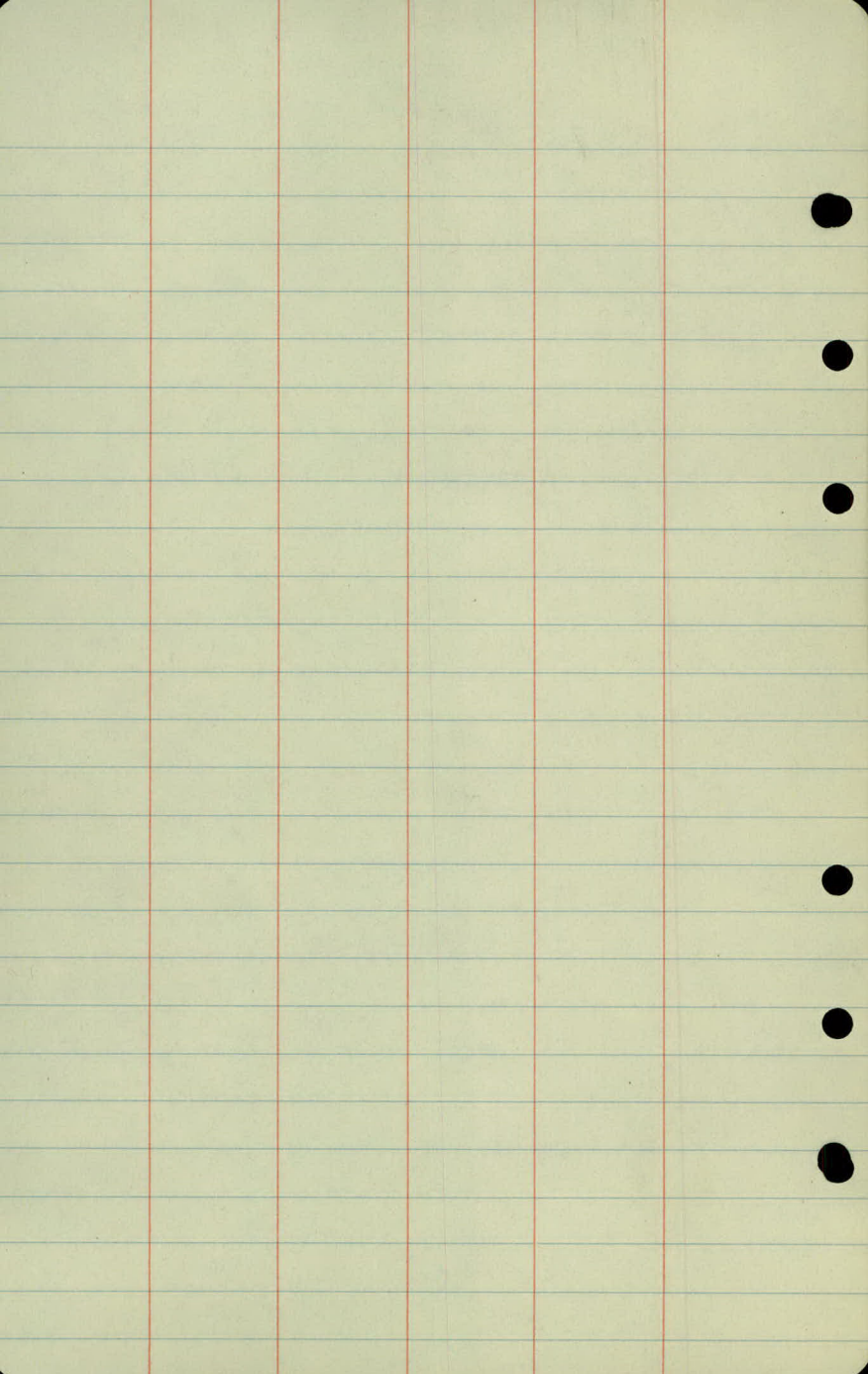
9.1

17.5

340' $\frac{1}{2}$ Main Ditch

10.2

16.4



Drainage Study
Alignment

Long Lake Rd

From $5\frac{1}{4}$ Sec 20 to $5\frac{1}{4}\frac{1}{4}$ Cor Sec 20

5+9. Pint

21+70.55 P.O.T.

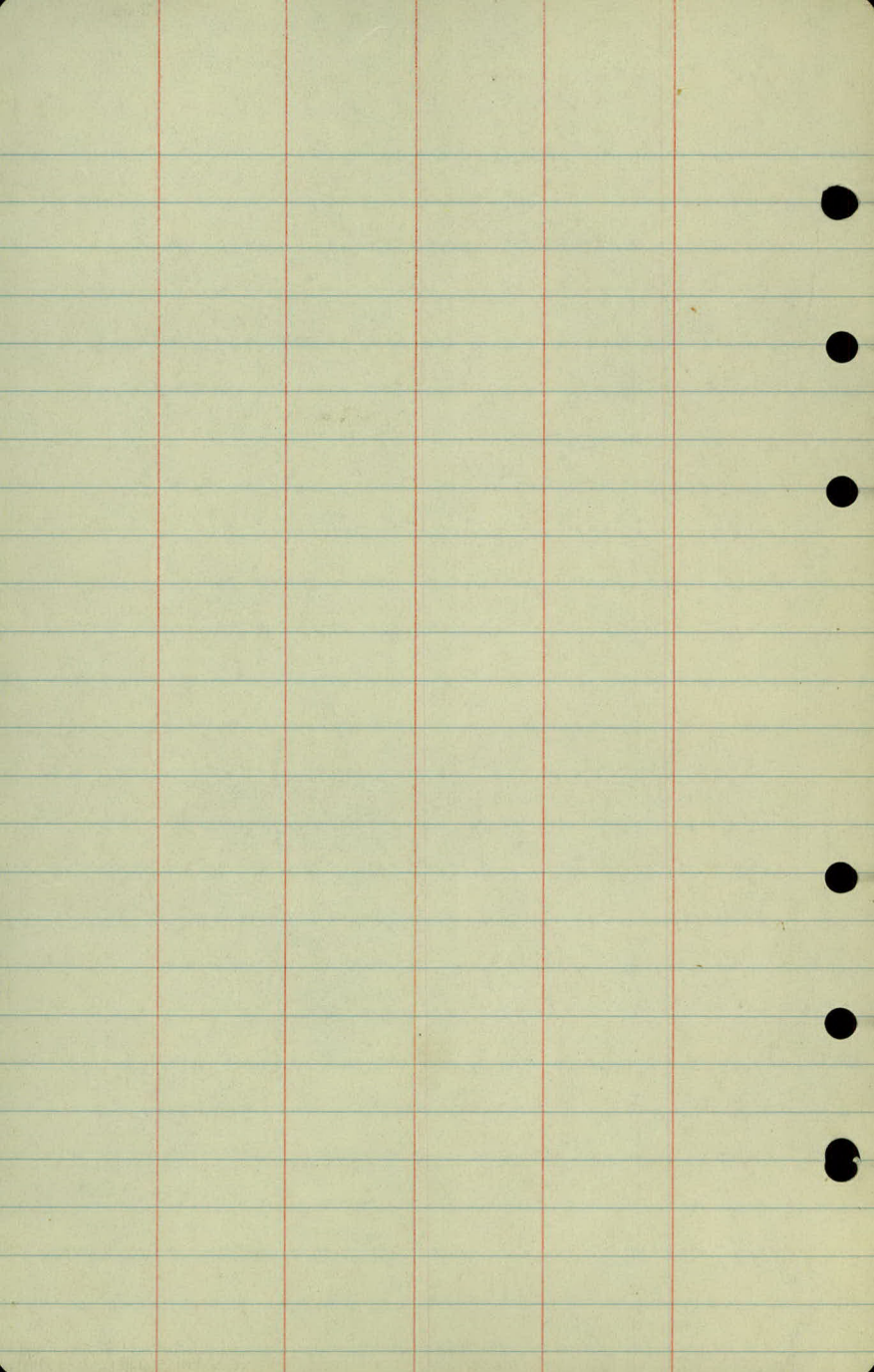
8+64.05

spt 5 1/4 1/4 Cor Sec 20

Mont

D

5 1/4 Cor Sec 20



Artificial Topography

Joe Lehr Prop.

at
Long Lake Mill & Co. Mill

16

Rd
10-10G Rail
12'+74 X Drain
24' x 54' Conc

15

4-10

G Rail
12'+70 Beg G Rail
12'+20 Beg G Rail
12'

14

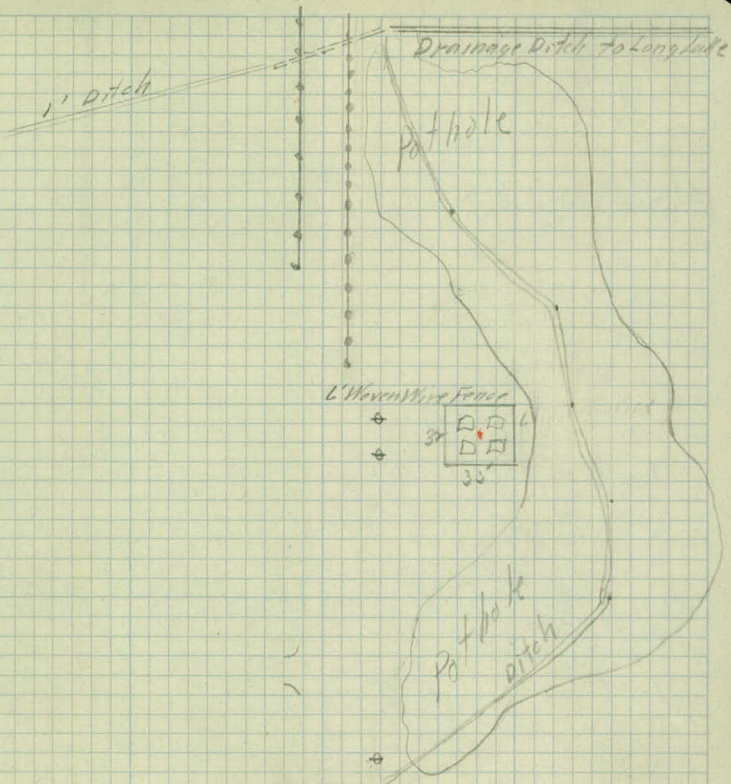
Rd
10-9+91 P.P.
28'+74 P.P.
28'+68 Trans Former
Base
22'

13

Rd
10-10

+45 Ent

12 +40 2' Ditch
30'+103 X Drain
24' x 42' Conc
21' x 21' Rd
11-10+18 P.P.
27'+50 2' Ditch
54'+88 T.P.
25'+63 Cork House
54'11 +40 2' Ditch
87'Rd
11-10+60 G.P.C.
25'+60 Ent Trees
30-45'+32 T.P.
35'+56 P.P.
28'+18 Beg Tree
43' x 100'Rd
11-1110 +81 Cork Ho.
35'



Low Garden Land

10x63 Ditch
300'

10x37 Ditch
200'

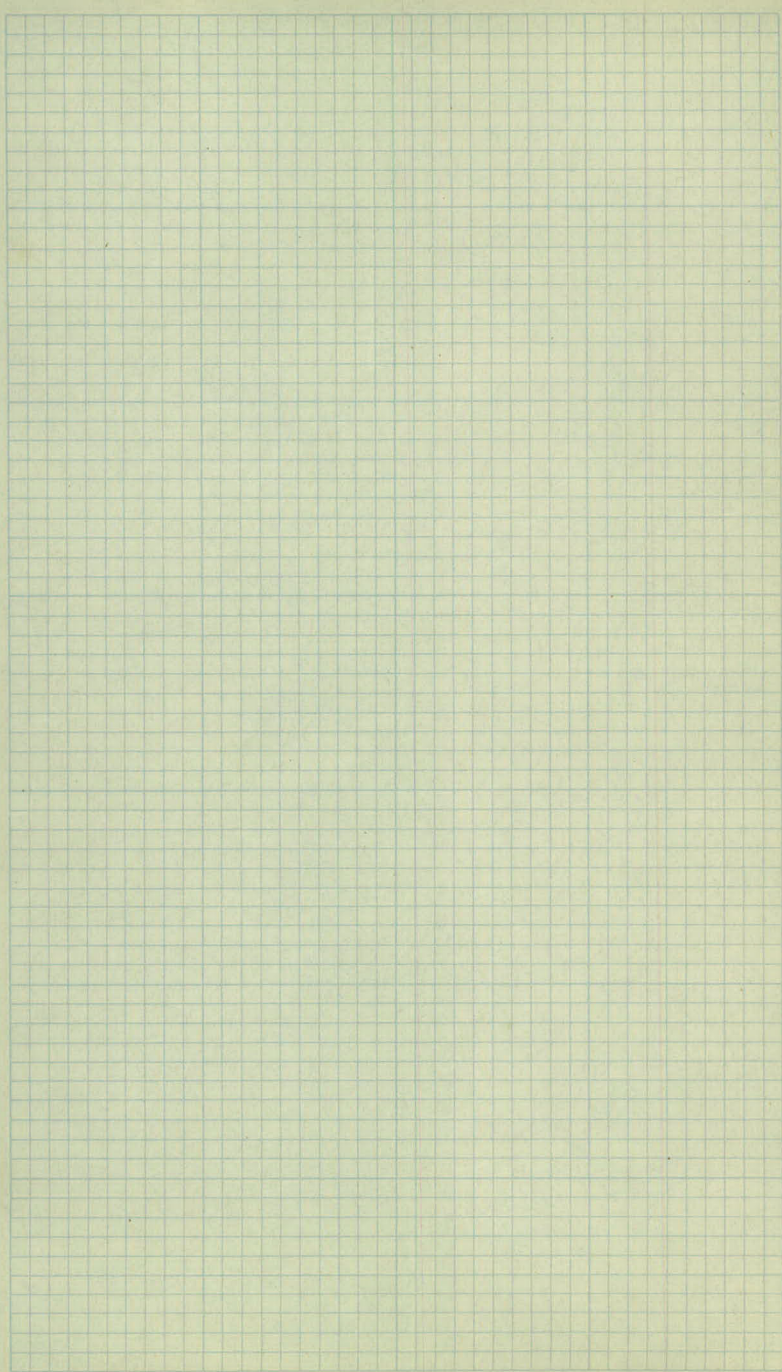
10x37 Ditch
200'

23

28

Start
Hans P.

28



X Sections
Joe Lehr Property

Sta	+	Δ	—	Elev
	2.42	890.01		887.59

10+12

86.4

+50

86.2

11

85.8

+50

85.1

12

84.4

+03

24" X 42' Conc X Drain

+25

84.3

+70

84.3

13

84.2

LT & RT

Tap Mont Co Rel E' x Long Lake Rel

10.2 10.4 5.7 4.3 5.3 5.2 4.2
 150 100 73 23 20 17 14 36
 9.8 9.3 9.1 9.2 9.0 8.0
 200 250 300 350 383 400

10.0 9.7 11.2 11.2 9.7 4.5 6.0 4.2
 150 100 99 97 92 23 20 14 3.8
 9.6 10.0 Ditch 9.2 9.1 8.7
 200 250 300 350 400

Ditch

9.6 11.4 11.4 9.7 8.2 5.4 6.0 5.7 4.3
 9.1 9.0 8.8 8.6 5.7 2.5 2.2 1.6 1.1 4.2
 10.7 10.4 9.7 9.3 7.9
 100 150 200 250 300

Ditch

9.8 9.7 9.2 11.5 11.5 9.4 6.9 5.2 5.1 4.6 4.1 4.1
 150 100 56 54 52 51 19 12 4.9 14 31 54 100
 9.5 6.2
 200 250

9.7 9.6 10.4 10.3 12.1 12.1 6.1 5.8 8.7 10.3 10.2 7.3
 150 100 52 29 27 21 14 5.6 12 20 42 72 89
 7.8
 200

11.3

Inv.

11.7

Inv.

8.0 9.1 8.2 6.3 6.0 10.3 11.3 11.8 11.8 10.7
 100 56 30 16 5.7 12 30 53 55 57 60
 7.0 9.3 10.1 11.0
 200 250 300 350

Ditch

2.5 7.7 7.7 6.0 5.8 9.0 11.1 12.4 12.4 11.5
 33 22 16 13 5.7 13 37 100 112 114 116
 6.6 11.3
 250 200

Ditch

6.0 7.3 6.8 10.0 11.2 12.4
 5.8 12 18 22 100 147 150
 9.9 11.5 11.3 12.4
 240 200 15.5 15.2

Sta + π - Elev

89001

13 + 50

84.0

14

83.9

+ 50

84.0

T.P

5.22

88935

5.88

88413

15

84.2

+ 50

84.8

+ 81

Main Ditch to Lake 84.8

B.M

176

88759

2

Rt

Ditch

6.0 $\frac{6.3}{13}$ $\frac{7.7}{17}$ $\frac{7.7}{21}$ $\frac{6.4}{27}$ $\frac{9.6}{100}$ $\frac{11.3}{146}$ $\frac{12.3}{147}$ $\frac{12.3}{149}$ $\frac{11.4}{151}$ $\frac{10.8}{200}$ $\frac{8.8}{25}$

Ditch

6.1 $\frac{6.1}{11}$ $\frac{8.0}{18}$ $\frac{8.1}{23}$ $\frac{7.4}{25}$ $\frac{9.7}{72}$ $\frac{10.3}{97}$ $\frac{11.2}{100}$ $\frac{11.4}{120}$ $\frac{12.6}{123}$ $\frac{12.4}{125}$ $\frac{11.7}{127}$ $\frac{11.3}{180}$

Ditch

6.0 $\frac{6.0}{13}$ $\frac{11.2}{27}$ $\frac{11.4}{95}$ $\frac{12.7}{98}$ $\frac{12.9}{100}$ $\frac{11.4}{102}$ $\frac{9.9}{140}$

Ditch

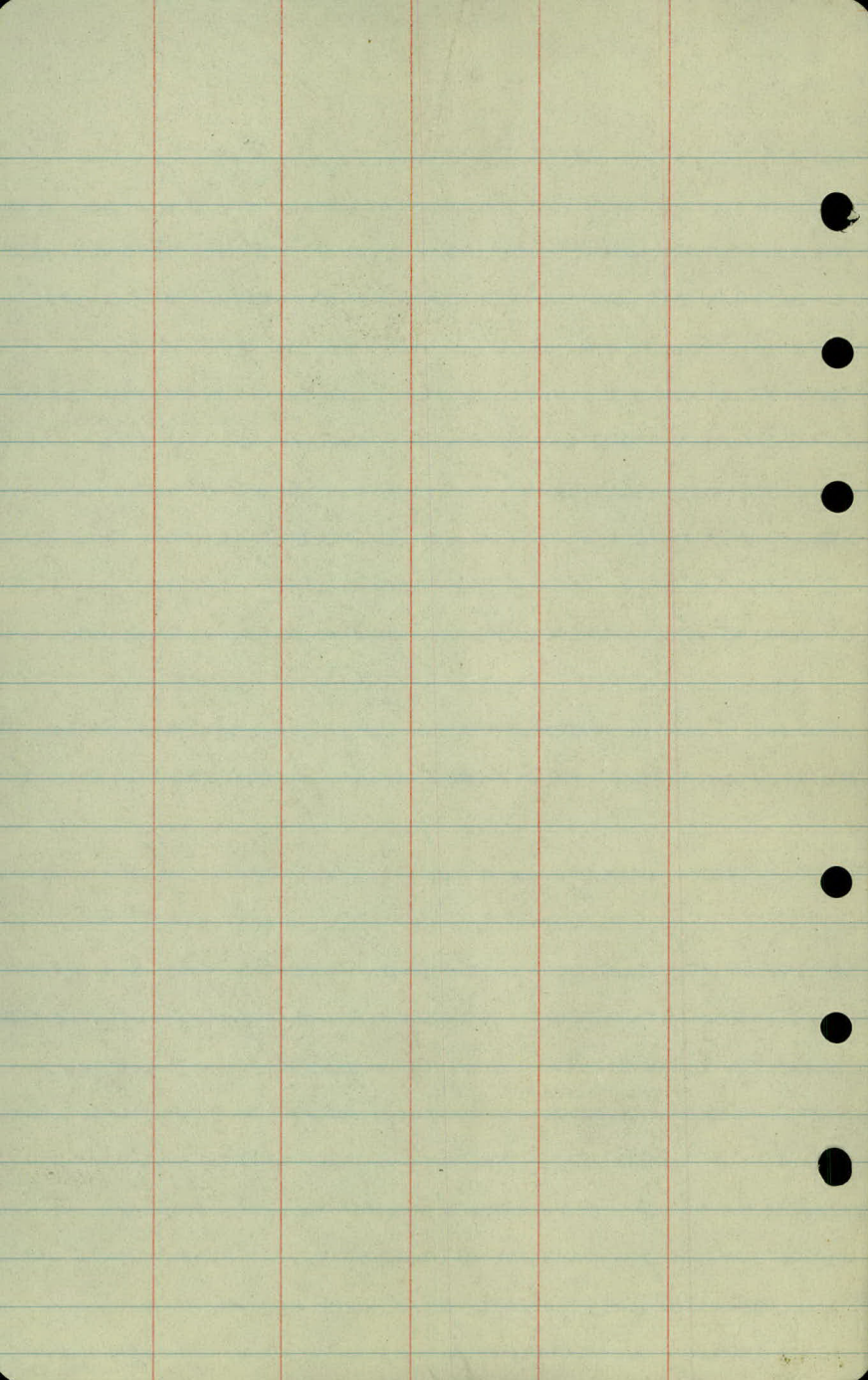
5.2 $\frac{5.3}{12}$ $\frac{11.1}{25}$ $\frac{12.4}{65}$ $\frac{14.0}{67}$ $\frac{13.2}{80}$ $\frac{12.5}{86}$ $\frac{11.8}{100}$ $\frac{10.2}{150}$

Ditch

4.6 $\frac{5.1}{12}$ $\frac{11.5}{26}$ $\frac{12.7}{30}$ $\frac{13.3}{32}$ $\frac{13.3}{34}$ $\frac{12.6}{35}$ $\frac{12.5}{100}$ $\frac{11.6}{150}$

4.6 $\frac{13.1}{36}$ $\frac{14.0}{100}$ $\frac{14.4}{200}$

Top of Mount Co Rd E x Long Lake Rd



4

10 + 12

$\frac{79.6}{100}$	$\frac{84.3}{73}$	$\frac{85.7}{23}$	$\frac{84.5}{20}$	$\frac{84.8}{17}$	$\frac{85.8}{14}$
$\frac{82.0}{400}$	$\frac{81.0}{383}$	$\frac{80.8}{350}$	$\frac{80.9}{300}$	$\frac{80.5}{250}$	$\frac{80.2}{200}$
					$\frac{79.8}{150}$

86.4
3.6

10 + 50

$\frac{80.3}{100}$	$\frac{78.8}{99}$	$\frac{78.8}{97}$	$\frac{80.3}{96}$	$\frac{85.5}{23}$	$\frac{84.0}{20}$	$\frac{85.8}{14}$
$\frac{81.3}{400}$	$\frac{80.9}{350}$	$\frac{80.8}{300}$	$\frac{80.0}{250}$	$\frac{80.4}{200}$	$\frac{80.0}{150}$	

86.2

11 + 00

$\frac{80.3}{86}$	$\frac{81.8}{57}$	$\frac{84.6}{25}$	$\frac{84.0}{22}$	$\frac{84.3}{16}$	$\frac{85.5}{11}$
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85.8

$\frac{80.3}{200}$	$\frac{79.6}{150}$	$\frac{79.3}{100}$	$\frac{80.4}{91}$	$\frac{78.6}{90}$	$\frac{78.6}{88}$
				$\frac{82.1}{300}$	$\frac{80.7}{250}$

11 + 50

$\frac{78.5}{52}$	$\frac{80.6}{51}$	$\frac{83.1}{19}$	$\frac{84.8}{12}$	$\frac{84.9}{14}$	$\frac{85.4}{31}$	$\frac{85.9}{54}$	$\frac{85.9}{100}$
$\frac{80.2}{150}$	$\frac{80.3}{100}$	$\frac{80.8}{56}$	$\frac{78.5}{54}$				
	$\frac{83.8}{250}$	$\frac{80.5}{200}$					

12 + 00

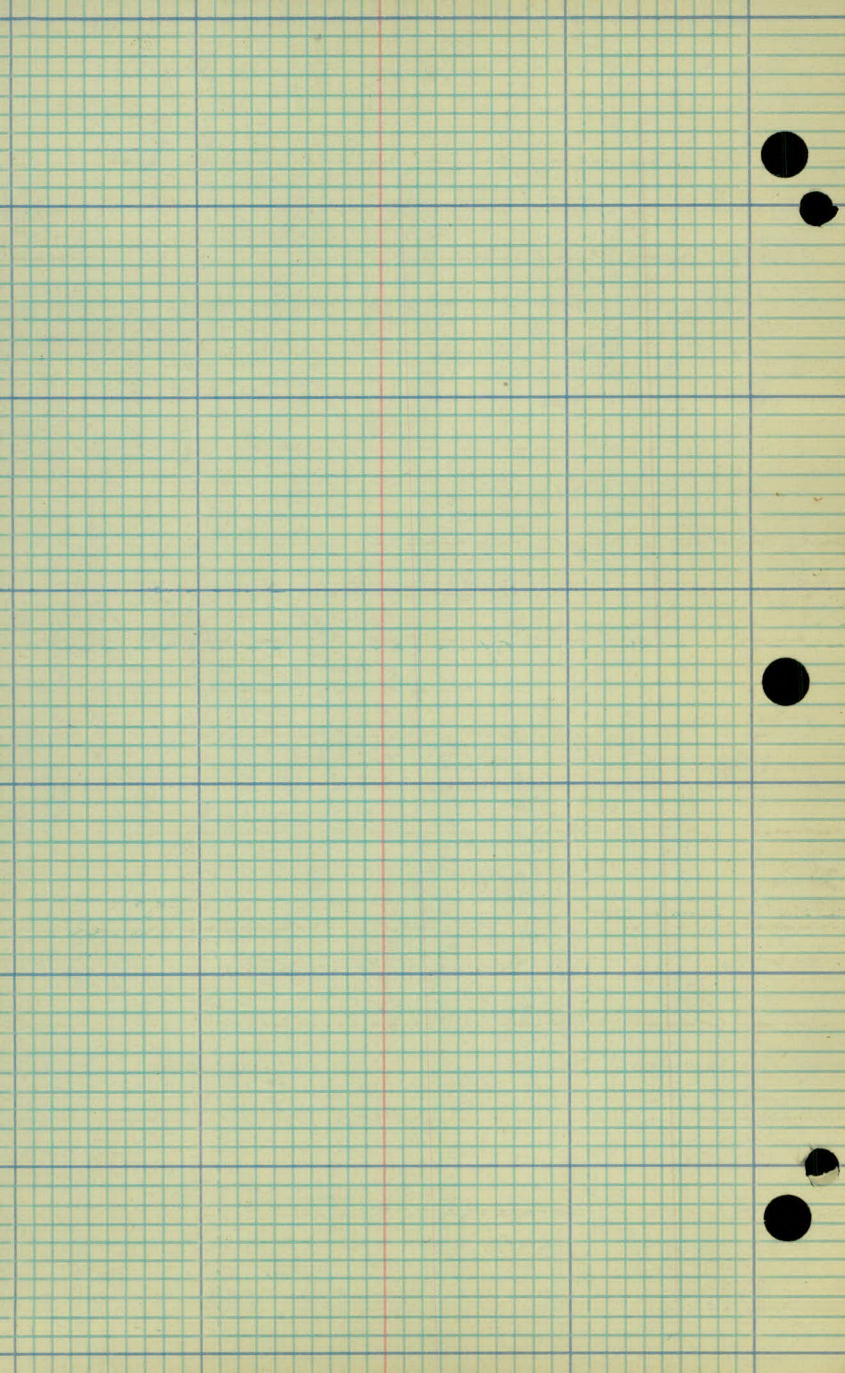
$\frac{79.7}{29}$	$\frac{77.9}{27}$	$\frac{77.9}{21}$	$\frac{83.9}{14}$	$\frac{84.2}{12}$	$\frac{81.3}{20}$	$\frac{79.7}{42}$	$\frac{79.8}{72}$	$\frac{82.7}{89}$
$\frac{82.2}{200}$	$\frac{80.3}{150}$	$\frac{80.4}{100}$	$\frac{79.6}{52}$					

12 + 03

$\frac{78.7}{21}$ X drain $\frac{78.3}{21}$

12 + 25

$\frac{81.8}{30}$	$\frac{83.7}{16}$	$\frac{84.0}{12}$	$\frac{79.7}{30}$	$\frac{78.7}{53}$	$\frac{78.2}{55}$	$\frac{78.2}{57}$
$\frac{82.0}{100}$	$\frac{80.9}{56}$	$\frac{79.3}{60}$	$\frac{79.0}{91}$	$\frac{79.9}{100}$	$\frac{80.7}{150}$	$\frac{83.0}{200}$



$$\begin{array}{r}
 12+70 \quad \begin{array}{r} 87.5 \\ 23 \end{array} \quad \begin{array}{r} 82.3 \\ 22 \end{array} \quad \begin{array}{r} 82.8 \\ 16 \end{array} \quad \begin{array}{r} 84.0 \\ 13 \end{array} \quad \begin{array}{r} 84.3 \\ 13 \end{array} \quad \begin{array}{r} 84.2 \\ 13 \end{array} \quad \begin{array}{r} 81.0 \\ 37 \end{array} \quad \begin{array}{r} 78.9 \\ 100 \end{array} \quad \begin{array}{r} 77.6 \\ 112 \end{array} \quad \begin{array}{r} 77.6 \\ 114 \end{array} \quad \begin{array}{r} 78.5 \\ 116 \end{array} \\
 \begin{array}{r} 78.7 \\ 200 \end{array} \quad \begin{array}{r} 83.4 \\ 250 \end{array}
 \end{array}$$

$$\begin{array}{r}
 13+00 \quad \begin{array}{r} 84.2 \\ 150 \end{array} \quad \begin{array}{r} 84.0 \\ 12 \end{array} \quad \begin{array}{r} 82.5 \\ 18 \end{array} \quad \begin{array}{r} 83.2 \\ 22 \end{array} \quad \begin{array}{r} 80.0 \\ 100 \end{array} \quad \begin{array}{r} 78.8 \\ 147 \end{array} \\
 \begin{array}{r} 77.6 \\ 150 \end{array} \quad \begin{array}{r} 77.6 \\ 152 \end{array} \quad \begin{array}{r} 78.7 \\ 155 \end{array} \quad \begin{array}{r} 78.5 \\ 200 \end{array} \quad \begin{array}{r} 80.1 \\ 240 \end{array}
 \end{array}$$

$$\begin{array}{r}
 13+50 \quad \begin{array}{r} 84.0 \\ 13 \end{array} \quad \begin{array}{r} 83.7 \\ 17 \end{array} \quad \begin{array}{r} 82.3 \\ 21 \end{array} \quad \begin{array}{r} 83.6 \\ 27 \end{array} \quad \begin{array}{r} 80.4 \\ 100 \end{array} \quad \begin{array}{r} 78.7 \\ 146 \end{array} \quad \begin{array}{r} 77.7 \\ 147 \end{array} \quad \begin{array}{r} 77.7 \\ 149 \end{array} \quad \begin{array}{r} 78.6 \\ 151 \end{array} \\
 \begin{array}{r} 79.2 \\ 200 \end{array} \quad \begin{array}{r} 81.2 \\ 250 \end{array}
 \end{array}$$

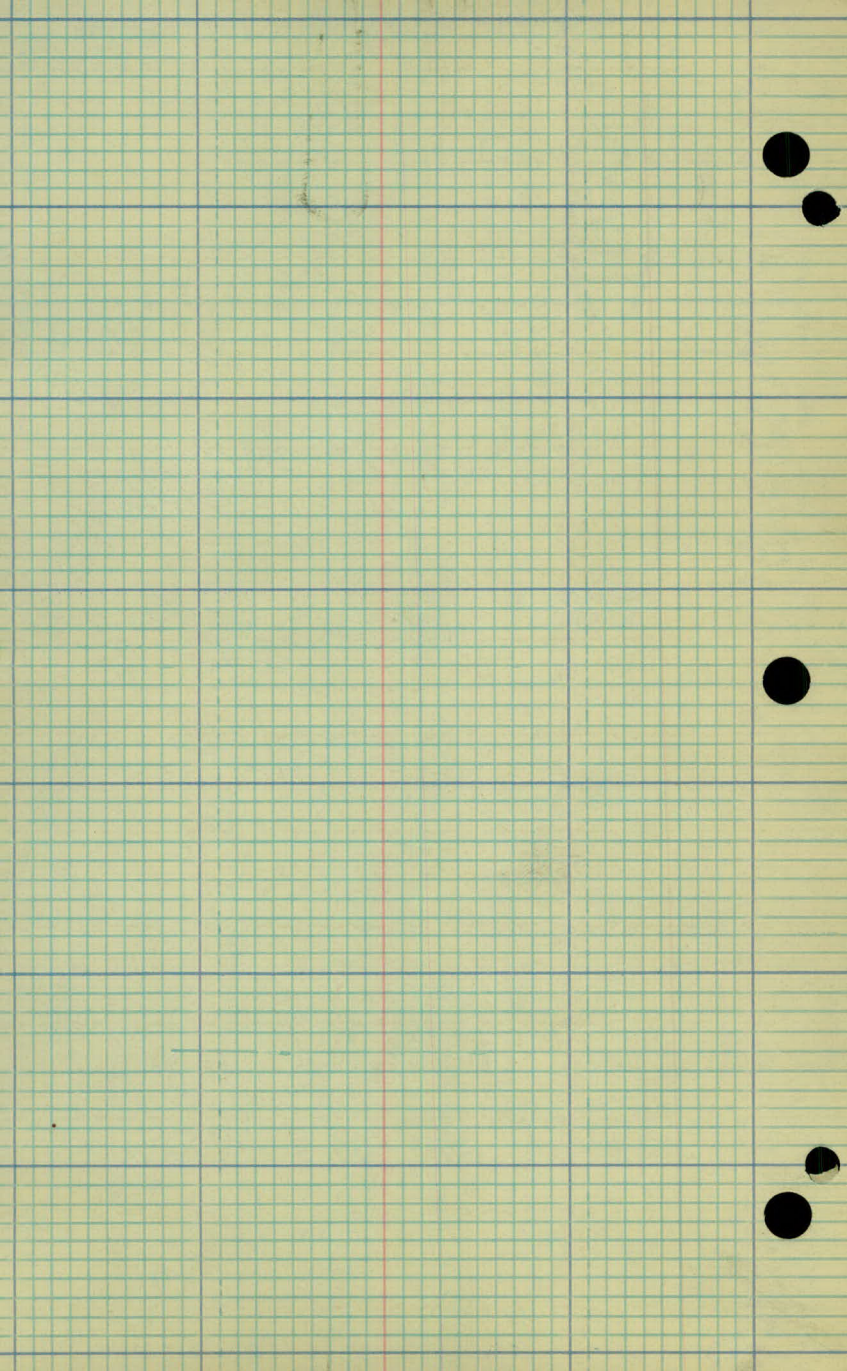
$$\begin{array}{r}
 14+00 \quad \begin{array}{r} 83.9 \\ 11 \end{array} \quad \begin{array}{r} 82.0 \\ 18 \end{array} \quad \begin{array}{r} 81.9 \\ 23 \end{array} \quad \begin{array}{r} 82.6 \\ 25 \end{array} \quad \begin{array}{r} 80.3 \\ 72 \end{array} \quad \begin{array}{r} 79.7 \\ 97 \end{array} \quad \begin{array}{r} 78.8 \\ 100 \end{array} \\
 \begin{array}{r} 78.6 \\ 120 \end{array} \quad \begin{array}{r} 79.4 \\ 123 \end{array} \quad \begin{array}{r} 77.4 \\ 125 \end{array} \quad \begin{array}{r} 78.3 \\ 127 \end{array} \quad \begin{array}{r} 78.7 \\ 180 \end{array} \quad \begin{array}{r} 79.8 \\ 200 \end{array}
 \end{array}$$

$$\begin{array}{r}
 14+50 \quad \begin{array}{r} 84.0 \\ 13 \end{array} \quad \begin{array}{r} 78.8 \\ 27 \end{array} \quad \begin{array}{r} 78.6 \\ 95 \end{array} \quad \begin{array}{r} 77.3 \\ 98 \end{array} \quad \begin{array}{r} 77.1 \\ 100 \end{array} \quad \begin{array}{r} 78.6 \\ 102 \end{array} \quad \begin{array}{r} 80.1 \\ 140 \end{array}
 \end{array}$$

$$\begin{array}{r}
 15+00 \quad \begin{array}{r} 84.2 \\ 12 \end{array} \quad \begin{array}{r} 84.1 \\ 25 \end{array} \quad \begin{array}{r} 78.3 \\ 65 \end{array} \quad \begin{array}{r} 77.0 \\ 67 \end{array} \quad \begin{array}{r} 75.4 \\ 80 \end{array} \quad \begin{array}{r} 76.2 \\ 86 \end{array} \quad \begin{array}{r} 76.9 \\ 100 \end{array} \quad \begin{array}{r} 77.6 \\ 150 \end{array}
 \end{array}$$

$$\begin{array}{r}
 15+50 \quad \begin{array}{r} 84.8 \\ 12 \end{array} \quad \begin{array}{r} 84.3 \\ 26 \end{array} \quad \begin{array}{r} 77.9 \\ 50 \end{array} \quad \begin{array}{r} 76.7 \\ 52 \end{array} \quad \begin{array}{r} 76.1 \\ 54 \end{array} \quad \begin{array}{r} 76.1 \\ 55 \end{array} \quad \begin{array}{r} 76.8 \\ 100 \end{array} \quad \begin{array}{r} 76.9 \\ 150 \end{array} \quad \begin{array}{r} 77.8 \\ 150 \end{array}
 \end{array}$$

$$\begin{array}{r}
 15+81 \quad \begin{array}{r} 84.8 \\ 36 \end{array} \quad \begin{array}{r} 76.3 \\ 100 \end{array} \quad \begin{array}{r} 75.4 \\ 200 \end{array}
 \end{array}$$



Levels thru ditch North
& South of "C". Drainage situation
at Culvert location
near Bock St.

9/23/38

Sta. + K - Elev.

Sta. 0+00 = 4" C"

Going South Ditch Spits in Willow

B.M. 6.05 909.48 903.43

0+00	5.00	04.5
+17	5.3	04.2
+31 Inv.	11.3	98.2 18" C.M.
+65	11.0	98.5
1+00	11.4	98.1
+50	11.5	98.0
2	11.9	97.6
+80	12.4	97.1
3	12.1	97.4
+20	12.0	97.5
4	12.5	97.0
+50	12.6	96.9
5	12.7	96.8
+50	12.9	96.6
7+50	97.5	96.5
Approx Bottom Pond	12.0	Ditch 13.0
Too Deep for Boots		
Water Surface	9.60	99.9

Sta + X - Elev.

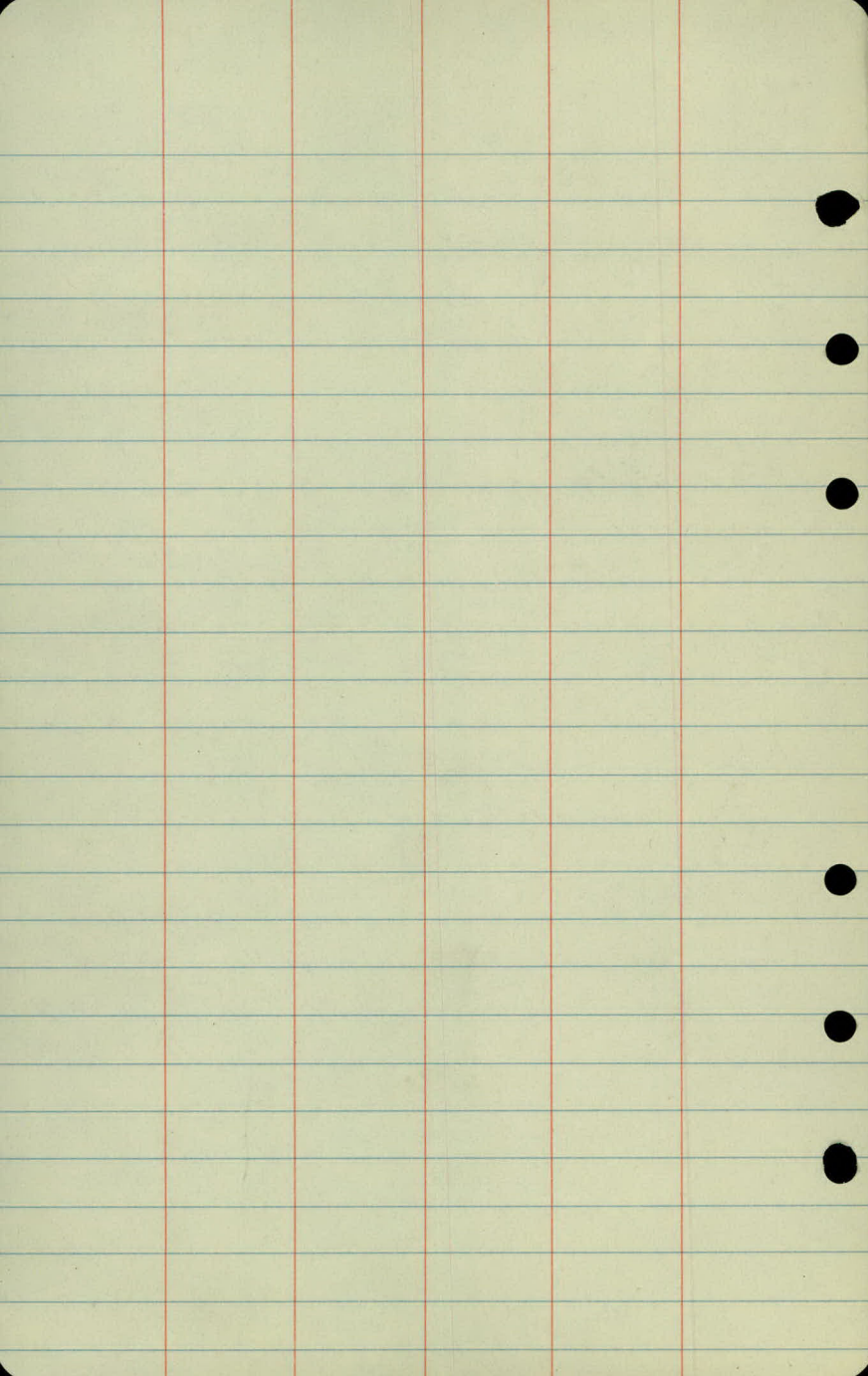
Going North Ditch

909.48

0+00	5.0	904.5
+15	6.0	03.5
+32 Inr. Culvert.	11.2	898.28
1+00	9.6	99.9
+66	9.4	00.1
✓	9.6	99.9
+45	9.8	99.7
3	9.7	99.8
+60	10.45	99.03
		9" Drain Tile

Down →

Unable to locate end. some
200' Further.



Sta.	+ K	- K	Elev.
B.M.	1.64	924.69	923.07
T.P.	0.14	924.76	922.14
T.P.	0.73	910.46	909.73
B.M.	7.03	910.46	903.43
T.P.	12.44	924.58	910.14
T.P.	3.70	925.11	921.41
B.M.	2.07	925.11	923.04
T.P.	0.19	916.61	916.42
T.P.	0.04	905.75	905.71
T.P.	0.13	892.71	892.58
T.P.	2.76	883.21	880.45
B.M.	5.94	883.21	877.27

48" C.M. the Back St.

T.P.	13.66	894.19	2.68	880.53
T.P.	13.78	907.43	0.54	893.65
T.P.	9.08	915.37	1.14	906.29
T.P.	10.50	925.14	0.73	914.64
B.M.			2.10	923.04

7/26/38

4

Spike in 18" Oak N.W. Cor. Co. Rd. "C"
+ Beck St.

Spike in willow @ culvert site 1000'
East of Beck St. on "C"

Spike in T.P. @ site of C.M. Culvert $\frac{1}{2}$
Mile North of "C" on Beck St.

1st West End.

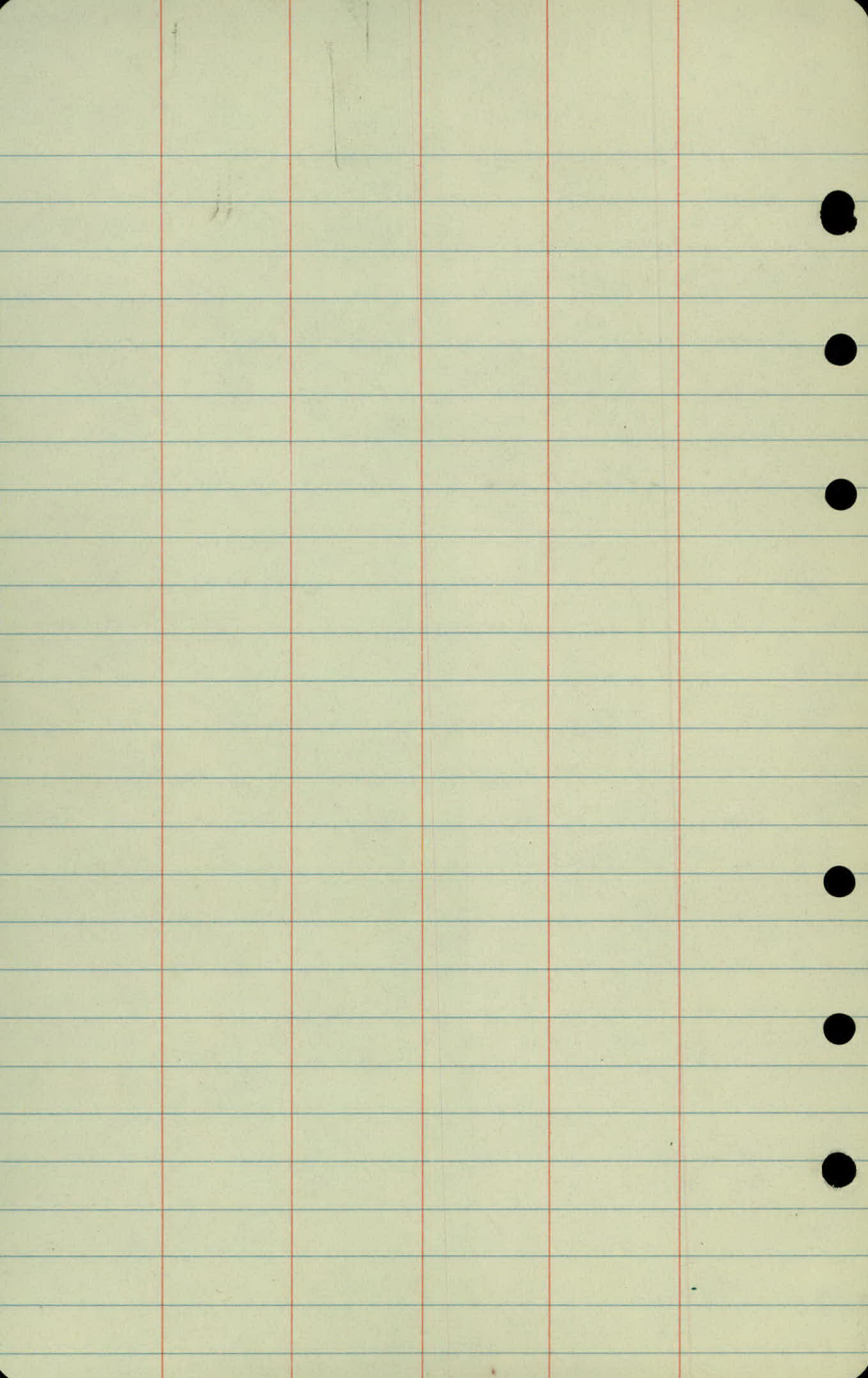
14.40

868.81

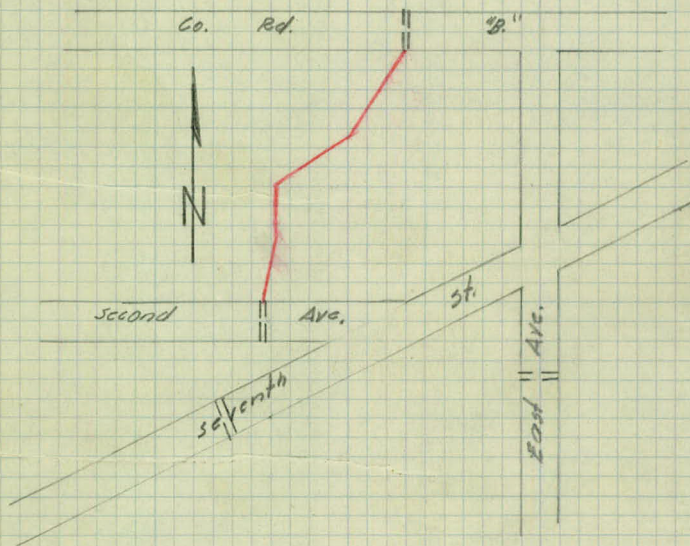
1st East End

13.43

869.78



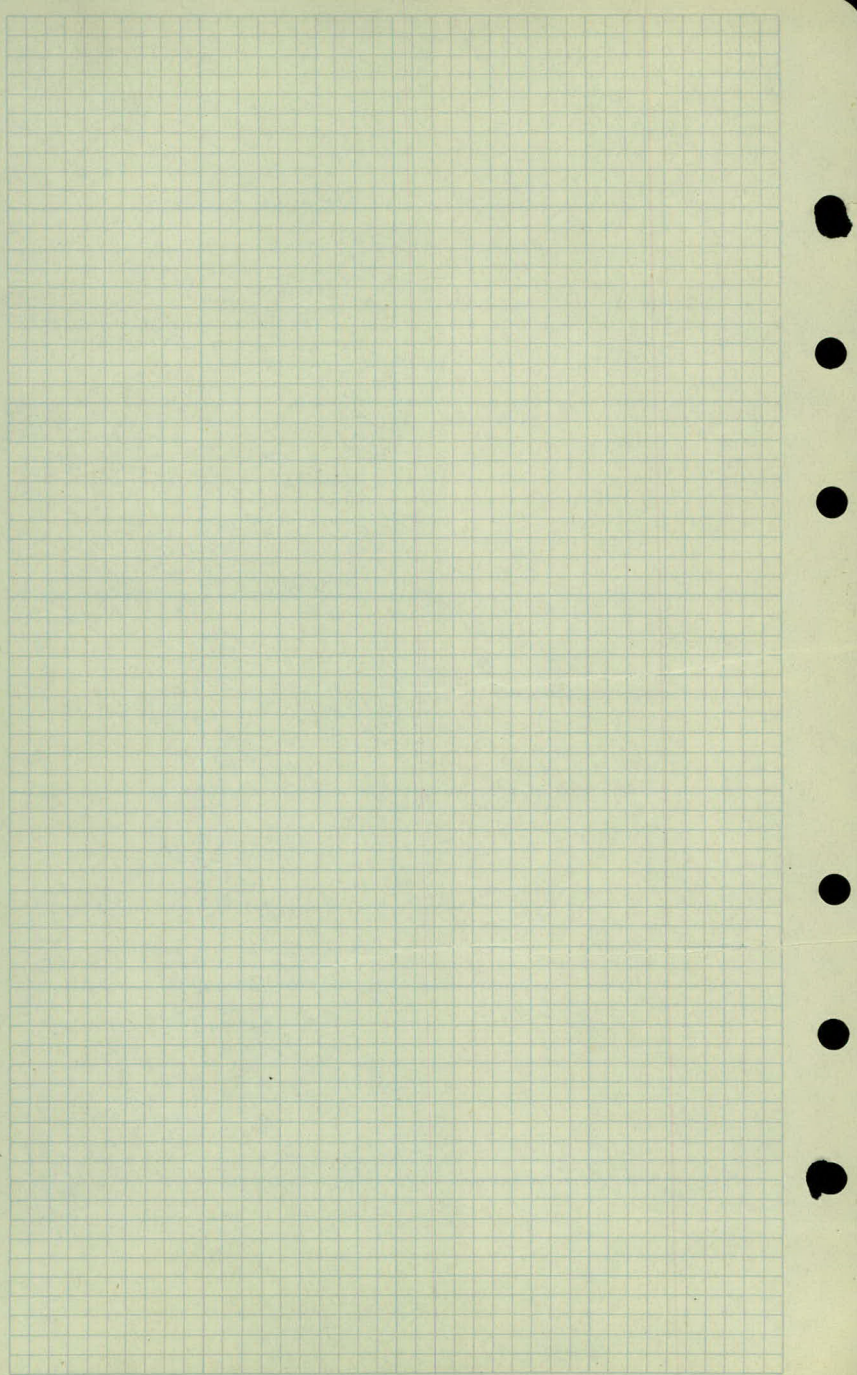
DITCH SURVEY
Second Ave to Co. Rd. "B"
No. St. Paul.



INDEX.

Align.	1-2
Topog.	3-5
X-sections -	6-9

Part ditch on new
align.
H.P.C.



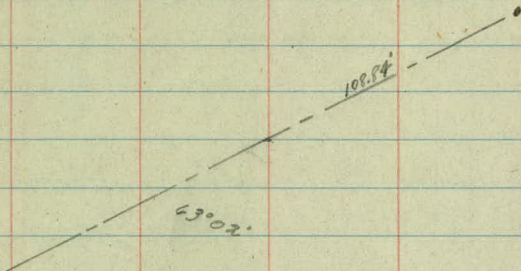
Alignment

Sta.	Point	ΔL	ΔR
7	+12.7 = to Co. Rd. "B"		
6	+80.8 = 3 End 29" C.M. Curve Under Co. Rd. "B"		
4	+661 P.I.	11° 11'	
3	+26.93 P.I.		36° 39'
1	+52.45 P.I.	7° 42'	
0	+00 = Approx. 2. Second Arc.		

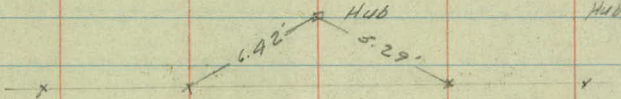
11/15/38
K.H.
L.B.H.
L.G.
M.J.G.

14-29-22

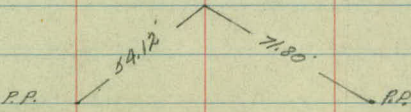
N.E. Cor. Sec.



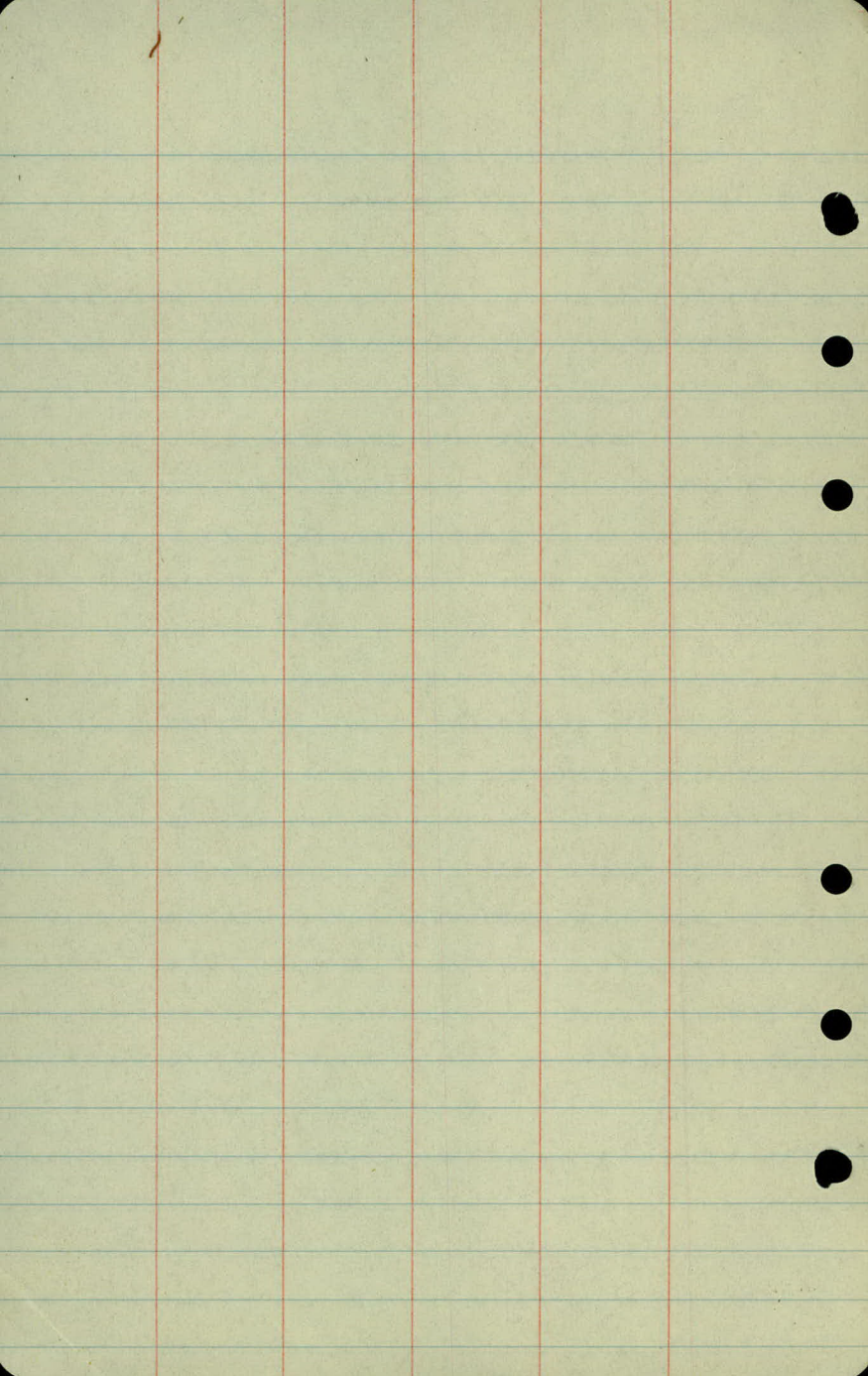
Hub



Hub



Roll Spikes



Topography

770-Ditch - 6'

107-4" Plum - 30'

130-4" Plum Tr - 29'

197-Ditch X 5 ft

184-6" Plum Tr - 80'

Ditch 00

100-Ditch - 3'

185-Ditch - 00

177 Plum pole

180-Ditch 00

140-Fe. Cork - 27'

120-Range Tie to Fe.

103-Ditch - 5'

193-Ditch - 15'

183-Fe. Cork - 69'

170-Ditch - 12'

120-Ditch - 00

125-Fe. X 5 ft

3 End Strawberries 10' 2)

Raspberries - 38'

2 Raspberries - 37'

180-Cor. Strawberries - 8'

152-Ditch - 00

1 Raspberries - 12' ^{Cor} Strawberries - 28'

Ditch - 12'

178-Ditch - 16' - Cult - 7'

134-Raspberries - 12'

115-Cor. Raspberries & Strawberries - 31'

115-Beg. Cult - 3'

108-M. Shoulder Line

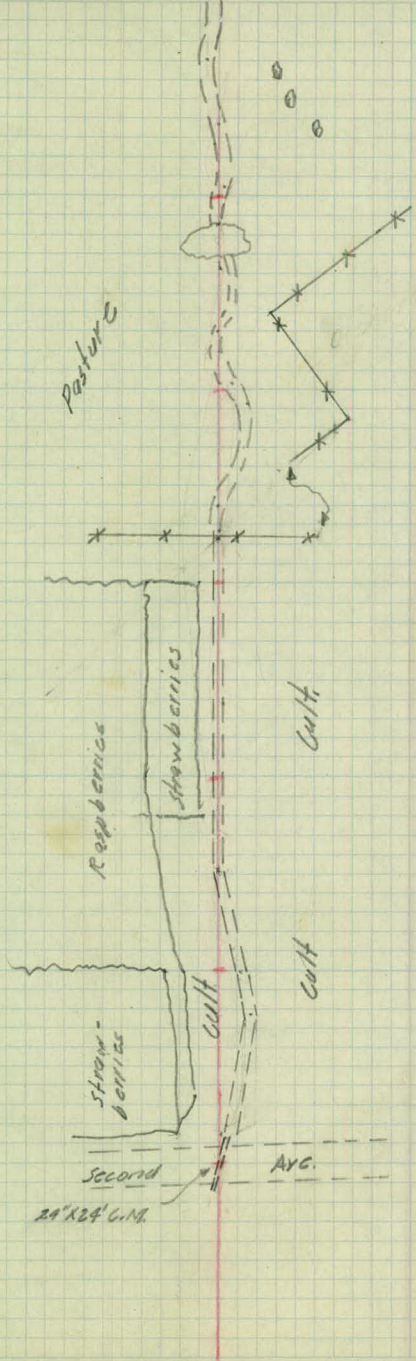
Cult 00

124-Cor. Cult - 16'

112-End. Cult - 3'

0100

- 00 = S. Shoulder Line



Pasture

Raspberries

strawberries

straw-
berries

Cult.

Cult.

Cult.

Secord

Ave.

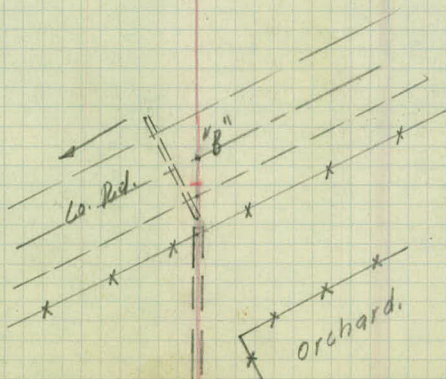
29° X 29' C.M.

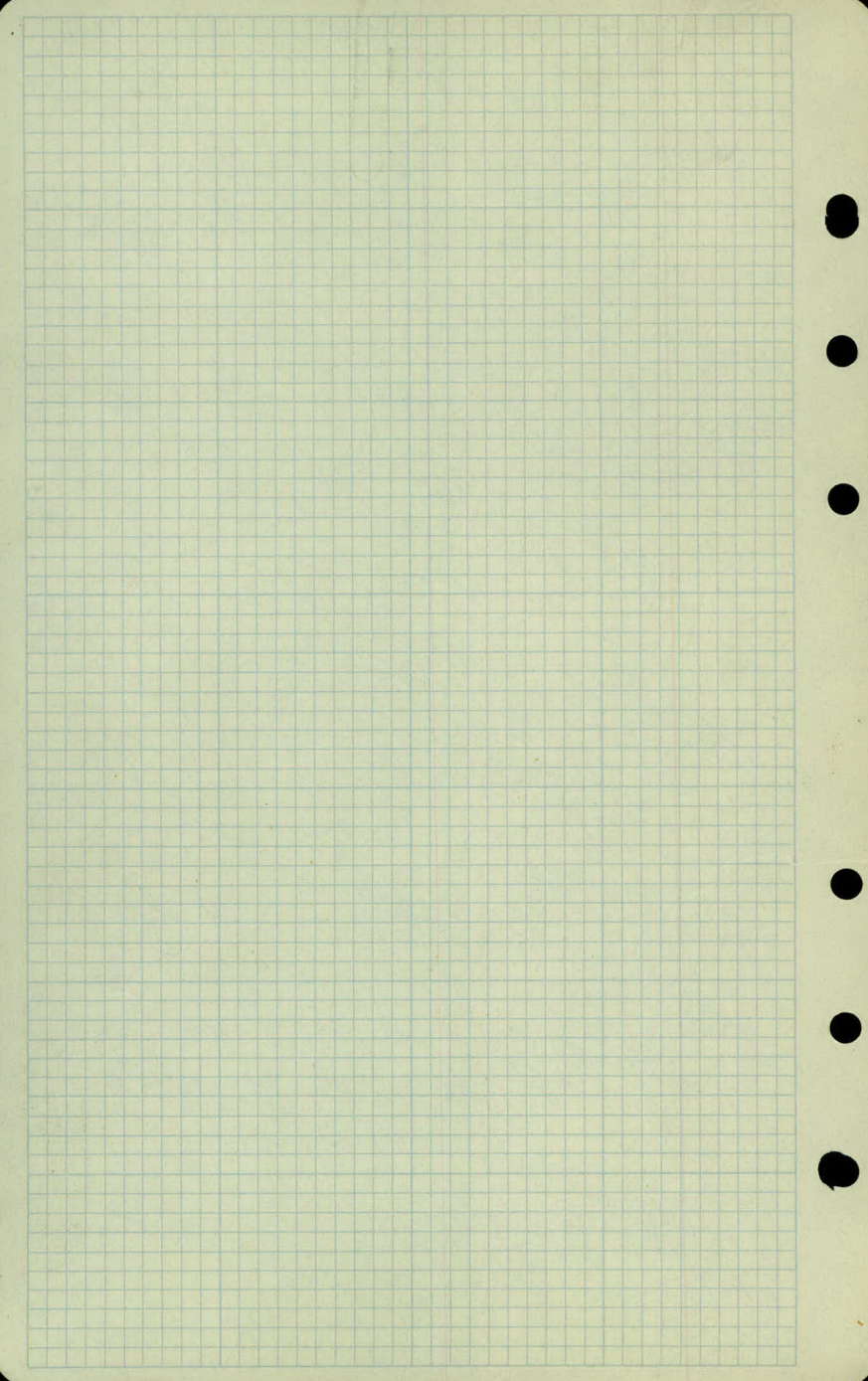
185-N. End 26' Culr - 27'

198-S. Shoulder Lino. Carded 8"
180.8 S. End Culr. 00
175-Pg. N° 2

125-0, Feb - 9'
182-Pg. Cor - 22'
110-Lang & Tie to Pg.
Pg - 33

6 Ditch - 1'





X sections

Sta	+	π	-	Elev	
B.M.	1.32	956.02			959.70
0	- 50			49.3	
0	- 12			49.3	
0	+ 10			51.0	
0	100			51.1	
	108			50.8	
	112			50.0	
	130			48.9	
	180			47.4	
1				47.1	
	145			46.8	
	152			45.3	

Lt

L

Rt

Top Hyd. N.W. Cor. 7th St + Kimbal St.

$$\frac{60}{50} \quad \frac{67}{25} \quad \frac{67}{25}$$

Culv 47.01

$$\frac{67}{20} \quad \frac{68}{7} \quad \frac{701}{3} \quad \frac{67}{20} \quad \frac{61}{20}$$

$$\frac{47}{20}$$

$$\frac{50}{20}$$

$$\frac{49}{20}$$

$$\frac{47}{20}$$

$$\frac{49}{20}$$

$$\frac{48}{20}$$

$$\frac{50}{20}$$

$$\frac{52}{20}$$

$$\frac{50}{20}$$

Culv 47.60

$$\frac{56}{20}$$

$$\frac{60}{20} \quad \frac{842}{3} \quad \frac{62}{5} \quad \frac{50}{20}$$

$$\frac{68}{20}$$

$$\frac{71}{12}$$

$$\frac{71}{3}$$

$$\frac{73}{8}$$

$$\frac{79}{10}$$

$$\frac{65}{20}$$

$$\frac{63}{20}$$

$$\frac{81}{20}$$

$$\frac{85}{15}$$

$$\frac{86}{11}$$

$$\frac{76}{14}$$

$$\frac{88}{18}$$

$$\frac{70}{21}$$

$$\frac{70}{21}$$

$$\frac{85}{20}$$

$$\frac{89}{8} \quad \frac{87}{10} \quad \frac{79}{14} \quad \frac{94}{16} \quad \frac{82}{20} \quad \frac{77}{20}$$

$$\frac{101}{22}$$

$$\frac{92}{10}$$

$$\frac{104}{4}$$

$$\frac{109}{6}$$

$$\frac{91}{20}$$

$$\frac{92}{20}$$

$$\frac{103}{23}$$

$$\frac{99}{3}$$

$$\frac{107}{1}$$

$$\frac{107}{1}$$

$$\frac{107}{4}$$

$$\frac{88}{4}$$

$$\frac{93}{20}$$

Sta.	+	π	-	Elev
		966.02		
2				45.3
+50				44.6
3				44.0
T.P.	6.23	950.34	11.91	441.11
+26				44.0
+60				44.3
1				44.0
+20				43.7
+24				42.7
+38				42.4
+44				43.8
+68				43.3

Lt.

K

Rt.

$$\frac{108}{20} \quad \frac{102}{3} \quad \frac{107}{1} \quad \frac{113}{1} \quad \frac{113}{2} \quad \frac{109}{3} \quad \frac{111}{5} \quad \frac{112}{13} \quad \frac{104}{20}$$

$$\frac{112}{20} \quad \frac{108}{2} \quad \frac{114}{1} \quad \frac{114}{1} \quad \frac{119}{2} \quad \frac{109}{2} \quad \frac{112}{20}$$

$$\frac{114}{20} \quad \frac{113}{1}$$

$$\frac{120}{1} \quad \frac{120}{2} \quad \frac{111}{2} \quad \frac{112}{20}$$

$$\frac{61}{20} \quad \frac{56}{2} \quad \frac{63}{1} \quad \frac{63}{1} \quad \frac{63}{2} \quad \frac{55}{2} \quad \frac{57}{20}$$

$$\frac{60}{20} \quad \frac{60}{7} \quad \frac{61}{8} \quad \frac{68}{10} \quad \frac{68}{11} \quad \frac{59}{20}$$

$$\frac{60}{20} \quad \frac{63}{8} \quad \frac{66}{9} \quad \frac{75}{11} \quad \frac{75}{12} \quad \frac{62}{20}$$

$$\frac{59}{20} \quad \frac{64}{7} \quad \frac{66}{6} \quad \frac{68}{7} \quad \frac{75}{8} \quad \frac{75}{9} \quad \frac{68}{20}$$

$$\frac{59}{20} \quad \frac{62}{9} \quad \frac{74}{6} \quad \frac{76}{4} \quad \frac{78}{6} \quad \frac{65}{20} \quad \frac{67}{20}$$

$$\frac{60}{20} \quad \frac{68}{6} \quad \frac{79}{7} \quad \frac{74}{7} \quad \frac{67}{20}$$

$$\frac{63}{20} \quad \frac{65}{9} \quad \frac{72}{9} \quad \frac{70}{20}$$

$$\frac{66}{20} \quad \frac{70}{10} \quad \frac{69}{15} \quad \frac{80}{20} \quad \frac{77}{20}$$

Sta.	+	-	Elev.
		750.34	
4	+78		41.4
	+84		42.0
5			41.8
	+50		42.8
6			42.0
	+50		40.5
	+75		40.9
	+77		40.3
	+80.8		
B.M.	8.16	950.34	8.15 942.19
I.P.	11.03	956.12	5.25 945.09
B.M.			1.42 954.70

954.70

lt. & rt.

$$\begin{array}{r} 71 \quad 72 \quad 82 \\ 20 \quad 10 \quad 8 \end{array} \quad \begin{array}{r} 89 \quad 85 \quad 70 \quad 68 \\ - \quad 11 \quad 14 \quad 20 \end{array}$$

$$\begin{array}{r} 70 \quad 71 \quad 75 \quad 83 \\ 20 \quad 9 \quad 2 \end{array} \quad \begin{array}{r} 77 \quad 72 \quad 71 \\ 4 \quad 10 \quad 20 \end{array}$$

$$\begin{array}{r} 74 \quad 75 \quad 76 \\ 20 \quad 13 \quad 1 \end{array} \quad \begin{array}{r} 85 \quad 80 \quad 73 \quad 69 \\ 1 \quad 6 \quad 20 \end{array}$$

$$\begin{array}{r} 76 \quad 74 \quad 89 \quad 84 \quad 75 \quad 75 \\ 20 \quad 4 \quad 3 \quad 2 \quad 1 \end{array} \quad \begin{array}{r} 68 \\ 20 \end{array}$$

$$\begin{array}{r} 70 \quad 79 \quad 80 \quad 84 \\ 20 \quad 11 \quad 7 \quad 2 \end{array} \quad \begin{array}{r} 96 \\ 1 \end{array} \quad \begin{array}{r} 76 \quad 83 \quad 74 \\ 0 \quad 20 \end{array}$$

$$\begin{array}{r} 88 \quad 92 \quad 98 \quad 96 \quad 88 \quad 81 \\ 20 \quad 7 \quad 3 \quad 8 \quad 20 \end{array}$$

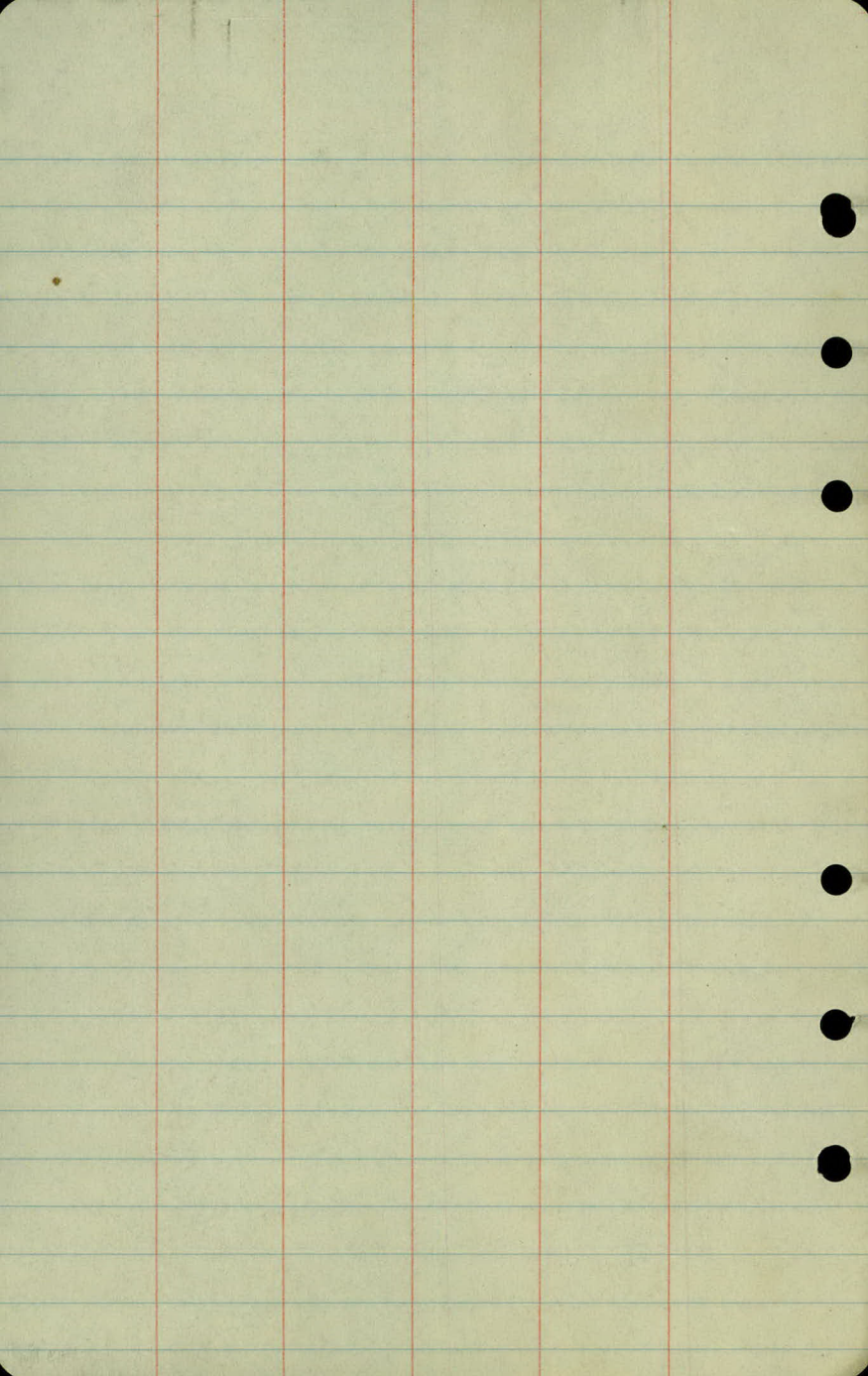
$$\begin{array}{r} 100 \quad 94 \quad 82 \\ 7 \quad 20 \end{array}$$

$$\underline{10.0}$$

$$\begin{array}{r} 1025 \\ \text{Calc.} \end{array} \quad 40.05$$

Top 3. End Culv 64.82

Top Hyd. New Ger. Kimbal 47.5 ft.



Xsections

Larperfour Ave.

Albee Ave to Hamling Ave.

on N. side

Sta.	+	π	-	Elev.
B.M.	2.57	947.27		947.30

125	+00			451.4
-----	-----	--	--	-------

+12	W. End 18" Long Culv.			451.1
-----	-----------------------	--	--	-------

+16				450.3
-----	--	--	--	-------

+46				450.4
-----	--	--	--	-------

+53	E. End 18" Long Culv.			450.1
-----	-----------------------	--	--	-------

+60				
-----	--	--	--	--

+80				
-----	--	--	--	--

126	+11			
-----	-----	--	--	--

+17				
-----	--	--	--	--

127				
-----	--	--	--	--

+06	W. End 15" Ext Culv.			
-----	----------------------	--	--	--

12/1/38
K.F.
L.C.
M.D.G.
L.B.H.

Lt.

Top Hyd. N.E. Cor. Lawrence Ave. & Albert Ave.

8.2 6.8 4.9 4.9 6.6 6.6 5.0 4.63
100 48 46 44 39 26 20 10

43.27

45.24

7.3 6.8 5.2 5.2 7.29 6.7 6.8 5.1 4.68
60 50 46 44 39 31 27 21 10

44.58
Calc.

45.19

43.87
6.0
60

5.1
30

45.13
4.74
10

43.67

6.2
60

5.2
30

45.04
4.83
10

44.42
Calc.

8.1 7.7 7.4 5.7 5.7 5.3 6.6 7.45 5.6 4.86
100 66 60 46 46 43 37 35 31 10

4.9

42.37

5.5 5.6 6.6 7.5 6.9 5.3 4.90
60 46 43 36 29 23 10

44.97

42.87

5.4 5.4 6.7 7.0 5.4 4.75
60 50 44 26 22 10

5.0

44.81

43.07

5.2 5.5 6.8 6.8 6.6 5.5 5.06
60 49 45 35 25 23 10

5.1

43.07

7.3 6.5 6.4 6.8 6.8 6.7 5.4 5.08
100 60 49 46 39 25 22 10

5.1

42.77

6.2 6.2 7.1 7.1 7.1 5.4 5.30
60 48 46 35 26 19 10

5.3

44.57

Calc 42.76

7.1
7.4

Sta. + T - Elev.

949.87

127 +62 E. End 15' Ent Culv

+70

128

+07 W. End 15' Ent Culv

+27 E. End 15' Ent Culv

+33

+65

+68 W. End 15' Ent Culv

+88 E. End 15' Ent Culv

129

T.P. 4.56 948.55 5.88 943.99

+10

14

K

42.48
Culv
7.99
34

42.47

44.41

$\frac{52}{60} \frac{55}{48} \frac{72}{44} \frac{74}{35} \frac{73}{26} \frac{53}{22} \frac{546}{10}$ 5.5

42.47

44.35

$\frac{51}{60} \frac{54}{48} \frac{70}{45} \frac{74}{35} \frac{73}{26} \frac{54}{21} \frac{5.52}{10}$ 5.5

42.37
7.5
35

42.52
7.35
35

42.37

44.29

$\frac{5.2}{60} \frac{55}{49} \frac{72}{48} \frac{75}{35} \frac{73}{26} \frac{58}{22} \frac{558}{10}$ 5.6

42.27

44.22

$\frac{52}{60} \frac{57}{47} \frac{75}{43} \frac{76}{35} \frac{75}{27} \frac{58}{22} \frac{565}{10}$ 5.7

42.30
7.57
35

42.33
7.54
35

42.17

44.12

$\frac{60}{60} \frac{60}{48} \frac{75}{44} \frac{77}{35} \frac{76}{26} \frac{61}{21} \frac{575}{10}$ 5.8

41.85

44.03

$\frac{53}{60} \frac{52}{49} \frac{66}{44} \frac{67}{35} \frac{65}{26} \frac{48}{21} \frac{952}{10}$ 4.5

Sta.

+

A

-

Elev.

948.55

129 480

486 W. End 15' Pot. Culv.

130 406 E. End 15' Pot. Culv.

411

455

131

450

456 W. End 24" C.M. Under Hamlin Ave.

B.M.

5.16

948.39

945.34

Lt

R

$$\begin{array}{r}
 48 \quad 52 \quad 66 \quad 67 \quad 65 \quad 45 \quad 467 \\
 60 \quad 79 \quad 74 \quad 36 \quad 36 \quad 20 \quad 10
 \end{array}$$

41.85

43.88

4.7

41.99

$$\begin{array}{r}
 656 \\
 35
 \end{array}$$

41.82

$$\begin{array}{r}
 673 \\
 35
 \end{array}$$

41.85

$$\begin{array}{r}
 56 \quad 55 \quad 67 \quad 67 \quad 69 \quad 47 \\
 60 \quad 48 \quad 45 \quad 36 \quad 26 \quad 20
 \end{array}$$

43.77

4.8

$$\begin{array}{r}
 58 \quad 58 \quad 67 \quad 69 \quad 68 \quad 54 \quad 486 \\
 60 \quad 49 \quad 49 \quad 35 \quad 27 \quad 23 \quad 10
 \end{array}$$

41.65

43.69

4.9

$$\begin{array}{r}
 58 \quad 58 \quad 67 \quad 69 \quad 68 \quad 55 \\
 60 \quad 48 \quad 45 \quad 37 \quad 36 \quad 22
 \end{array}$$

41.65

43.55

50.0

$$\begin{array}{r}
 52 \quad 55 \quad 68 \quad 71 \quad 71 \quad 55 \quad 519 \\
 60 \quad 49 \quad 46 \quad 36 \quad 27 \quad 22 \quad 10
 \end{array}$$

41.45

43.41

5.1

40.99

$$\begin{array}{r}
 756 \\
 35
 \end{array}$$

Top Mont Lacporteur + Hamline Ave

