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FIELD BOOK

740

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B. K. ELLIOTT COMPANY

PLEASE RETURN TO  
GEAUGA COUNTY ENGINEER

TABLE FOR REDUCING PERCHES TO FEET AND INCHES.

PERCH.	FEET.	PERCH.	FEET.	PERCH.	FEET.	PERCH.	FEET.	PERCH.	FEET.	PERCH.	FEET.
1	16 6 in.	21	3 46 6 in.	41	6 76 6 in	61	10 06 6 in.	81	13 36 6 in		
2	33 0	22	3 63 0	42	6 93 0	62	10 23 0	82	13 54 0		
3	49 6	23	3 79 6	43	7 09 6	63	10 39 6	83	14 10 6		
4	66 0	24	3 96 0	44	7 26 0	64	10 56 0	84	14 27 0		
5	82 6	25	4 12 6	45	7 42 6	65	10 72 6	85	14 43 6		
6	99 0	26	4 29 0	46	7 59 0	66	10 89 0	86	15 0 0		
7	1 15 6	27	4 45 6	47	7 75 6	67	11 05 6	87	15 16 6		
8	1 32 0	28	4 62 0	48	7 92 0	68	11 22 0	88	15 33 0		
9	1 48 6	29	4 78 6	49	8 08 6	69	11 38 6	89	15 50 0		
10	1 65 0	30	4 95 0	50	8 25 0	70	11 55 0	90	16 6 0		
11	1 81 6	31	5 11 6	51	8 41 6	71	11 71 6	91	16 23 0		
12	1 98 0	32	5 28 0	52	8 58 0	72	11 88 0	92	16 40 0		
13	2 14 6	33	5 44 6	53	8 74 6	73	12 04 6	93	16 57 0		
14	2 31 0	34	5 61 0	54	8 91 0	74	12 21 0	94	17 14 0		
15	2 47 6	35	5 77 6	55	9 07 6	75	12 37 6	95	17 31 0		
16	2 64 0	36	5 94 0	56	9 24 0	76	12 54 0	96	17 48 0		
17	2 80 6	37	6 10 6	57	9 40 6	77	12 70 6	97	18 5 0		
18	2 97 0	38	6 27 0	58	9 57 0	78	12 87 0	98	18 22 0		
19	3 13 6	39	6 43 6	59	9 73 6	79	13 03 6	99	18 39 0		
20	3 30 0	40	6 60 0	60	9 90 0	80	13 20 0	100	18 56 0		

COURT HOUSE  
CHARDON, O.  
PHONE 250-X

B. K. ELLIOTT COMPANY, PITTSBURGH, PA.  
DRAWING MATERIALS AND SURVEYING INSTRUMENTS

Hambden Center Approach Pg. 1

" " " (1940) Pg. 12

<sup>C.H. #14</sup>  
Burton Sta Rd. (Alteration) Pg. 3

Hambden Center Park  
Survey Pg 9 Restake 1908 Pg 43, 44

Arch Street - Bainbridge Twp  
T.H. #175

Pg 20

Oak Street - Bridge Twp  
X Section 115 T.H. #174

Pg 35-42

PINE STREET T.H. #171

Pg 23

<sup>MAGUI (1873-1888)</sup>  
GEMMA STREET T.H. #177

Pg 45

TRAPPE RD T.H. #197

Pg 46

BARTOLOMEU RD T.H. #195

Pg 50

BM for sewer property in Cuyahoga Co.  
S of Chigrin Falls Village on Franklin Rd

Pg 60

Bainbridge Roller Rink Layout

Pg 58

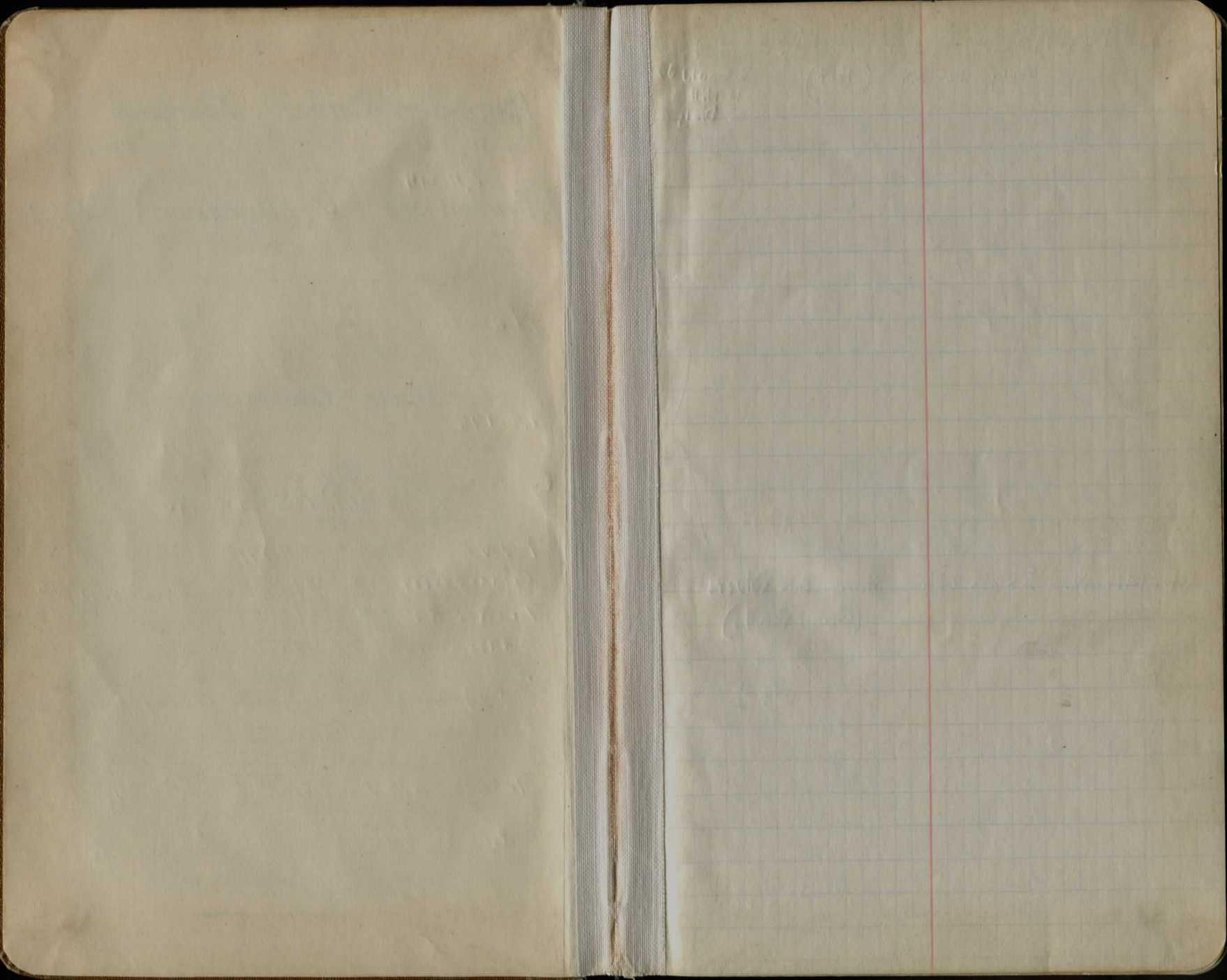
TAYLOR-MAY #186-F

Pg 49

Pine St. Ditch <sup>Stedia</sup>

145

Pg 65



# Hamben Tenter Approach

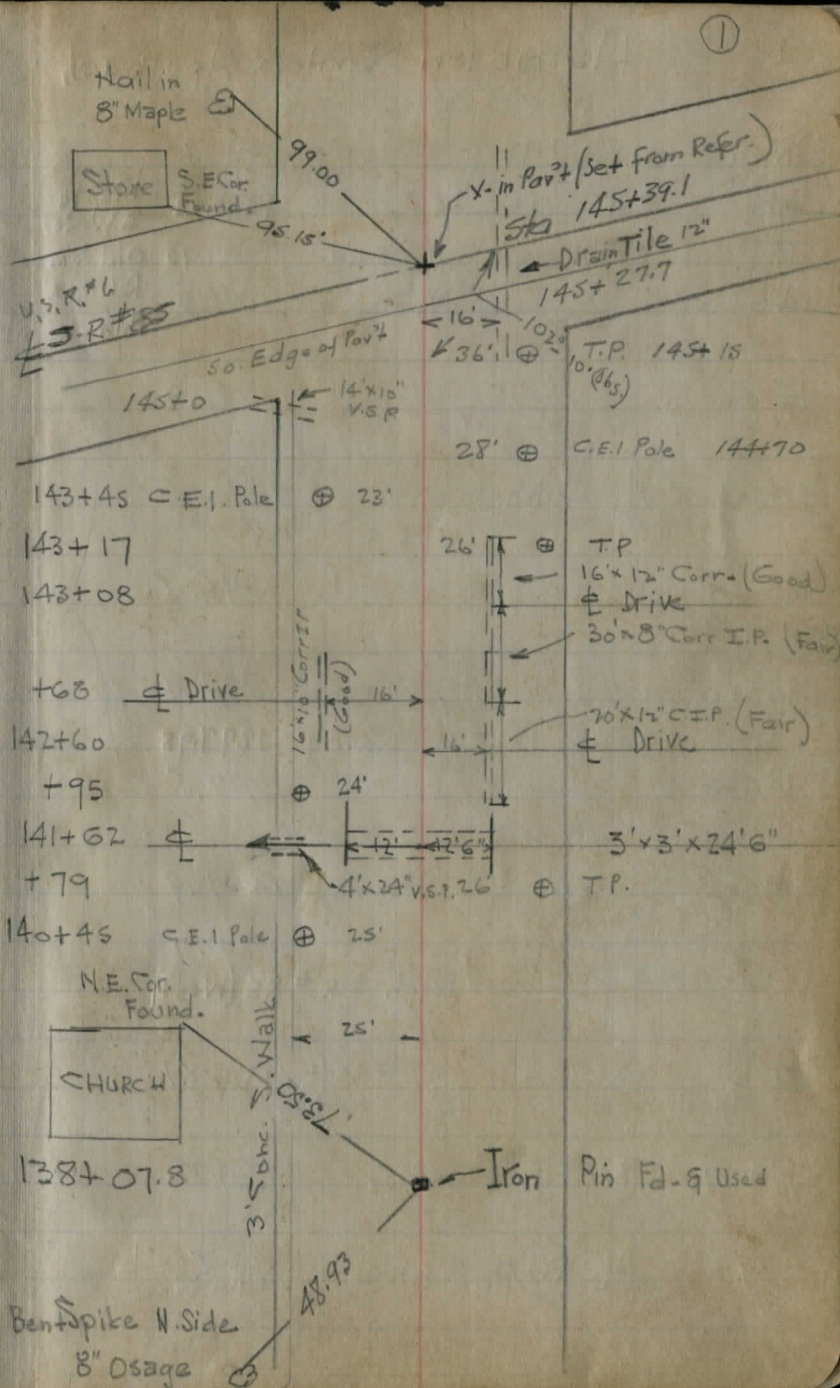
Aug. 12-35 (Hot)

S. Gould Jr  
H. Hill  
G. Dietz

Note: ~~changed~~  
see Vol. 87

Note:

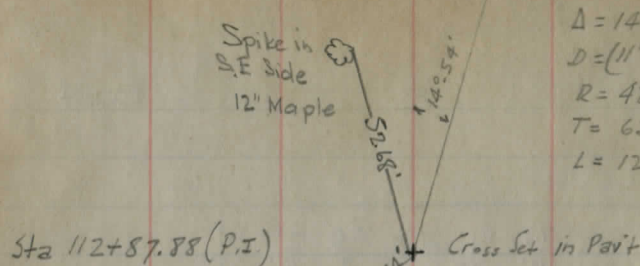
Sta 141+62 3'x3'x24'6" Stone Box Solvers  
(Good Sand.)



# Hambden Center Approach

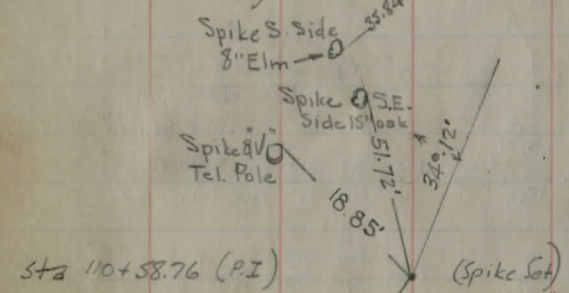
Sta	+	H. I.	-	Elev.	
BM.	3.11	1306.34		1308.23	Maple SW. Cor.
T.P.	3.37	1301.07	8.64	1297.70	Old State Rd. 9 N. - Hambden St.
140+0				1296.3	
141+0				1295.9	
+62	⊥	Culvert		1296.6	
142+0				1296.5	
143+0				1297.4	
T.P.	10.52	1308.50	3.09	1297.98	
144+0				1299.5	
+75		Change in Grade		1301.9	
				1303.7	
145+0		So. Ditch S.R. #85 (West)			
+15		So. Ditch S.R. #85 (East)		1305.1	
+27.7		So. Edge of Pav't		1305.72	
+39.1	⊥	S.R. #85		1305.28	
BM.			5.27	1303.23	

West	⊥	East
(S.W.) $\frac{6.0}{25'}$ $\frac{6.4}{22'}$ $\frac{7.3}{19'}$ $\frac{5.5}{12'}$	4.8	$\frac{5.0}{9'}$ $\frac{6.5}{15'}$ $\frac{5.3}{25'}$
(S.W.) $\frac{6.6}{25'}$ $\frac{6.9}{20'}$ $\frac{7.7}{17'}$ $\frac{6.0}{12'}$	5.2	$\frac{5.7}{10'}$ $\frac{6.8}{18'}$ $\frac{5.5}{25'}$
$\frac{11.3}{100'}$ $\frac{8.8}{FL.}$ $\frac{3.3}{12'}$ $\frac{3.3}{10.5'}$ $\frac{4.6}{10.5'}$	4.5	$\frac{4.2}{11'}$ $\frac{3.3}{11'}$ $\frac{3.3}{12.5'}$ $\frac{8.9}{FL.}$ $\frac{7.3}{50'}$
(S.W.) $\frac{7.0}{25'}$ $\frac{6.6}{18'}$ $\frac{7.1}{15'}$ $\frac{5.2}{10'}$	4.6	$\frac{5.0}{9'}$ $\frac{7.0}{15'}$ $\frac{6.1}{18'}$ $\frac{6.6}{25'}$
( $\frac{1.6}{H}$ ) (S.W.) $\frac{5.2}{25'}$ $\frac{5.9}{16'}$ $\frac{4.5}{11'}$	3.7	$\frac{4.2}{9'}$ $\frac{4.0}{25'}$ ( $\frac{1.2}{H}$ )
(S.W.) $\frac{8.9}{25'}$ $\frac{9.4}{21'}$ $\frac{11.6}{17'}$ $\frac{9.8}{11'}$	9.0	$\frac{9.6}{9'}$ $\frac{10.1}{15'}$ $\frac{11.2}{17'}$ $\frac{9.3}{25'}$ $\frac{7.8}{30'}$
(S.W.) $\frac{6.1}{25'}$ $\frac{6.3}{24'}$ $\frac{8.2}{18'}$ $\frac{7.1}{16'}$ $\frac{7.1}{12'}$	6.6	$\frac{6.8}{9'}$ $\frac{7.2}{13'}$ $\frac{9.1}{16'}$ $\frac{5.0}{25'}$ $\frac{5.2}{30'}$
$\frac{6.0}{50'}$ ( $\frac{7.0}{FL.}$ ) (S.W.) $\frac{5.3}{25'}$ $\frac{5.3}{24'}$ $\frac{5.5}{20'}$	4.8	$\frac{5.3}{8'}$ $\frac{7.9}{16'}$ $\frac{4.8}{23'}$ $\frac{4.8}{25'}$ $\frac{4.6}{30'}$
		( $\frac{7.8}{FL.}$ )
	$\frac{3.9}{50'}$ $\frac{4.5}{29'}$	3.4 $\frac{3.9}{10'}$ $\frac{4.7}{19'}$ $\frac{5.4}{25'}$ $\frac{4.1}{40'}$
	$\frac{4.21}{100'}$ $\frac{3.48}{50'}$	2.78 $\frac{1.88}{50'}$
	$\frac{4.80}{100'}$ $\frac{4.07}{50'}$	3.22 $\frac{2.24}{50'}$



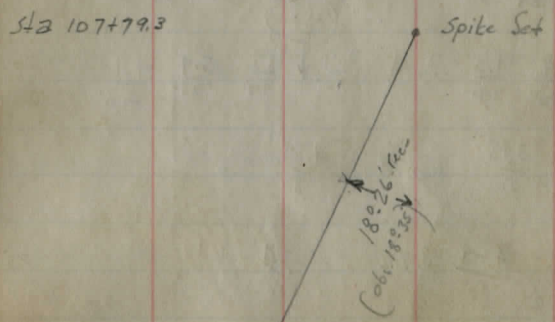
$\Delta = 140.54'$   
 $D = (11^\circ - 52')$   
 $R = 483.10$   
 $T = 63.17$   
 $L = 125.63$

P.C. = 112+24.71  
 P.T. = 113+0.34



$\Delta = 34.12'$   
 $D = 10^\circ$   
 $Tan = 176.49$   
 $R = 573.69$   
 $E = 26.50$   
 $L = 342.44$   
 P.C. = 108+82.27  
 P.T. = 112+24.71

X = NE Cor.  
 N. Hd Wall



Burton Sta Rd - 8-14-35  
 C.H. #14 (Fair)

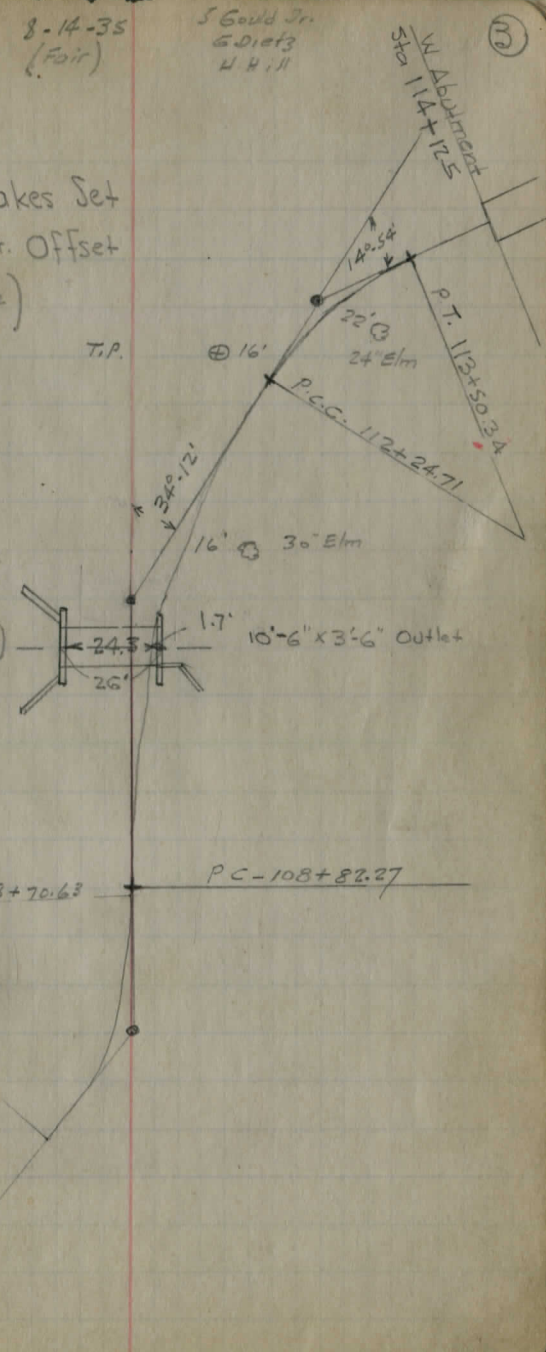
S. Gaud Dr.  
 G. Dietz  
 W.H.H.

NOTE: Stakes Set  
 on 25-ft. Offset  
 (Left Side)

+66  
 112+46

110+58

110+0 9'-6" x 4' (Inlet)  
 (Conc. Slab Top)  
 (Stone Walls)

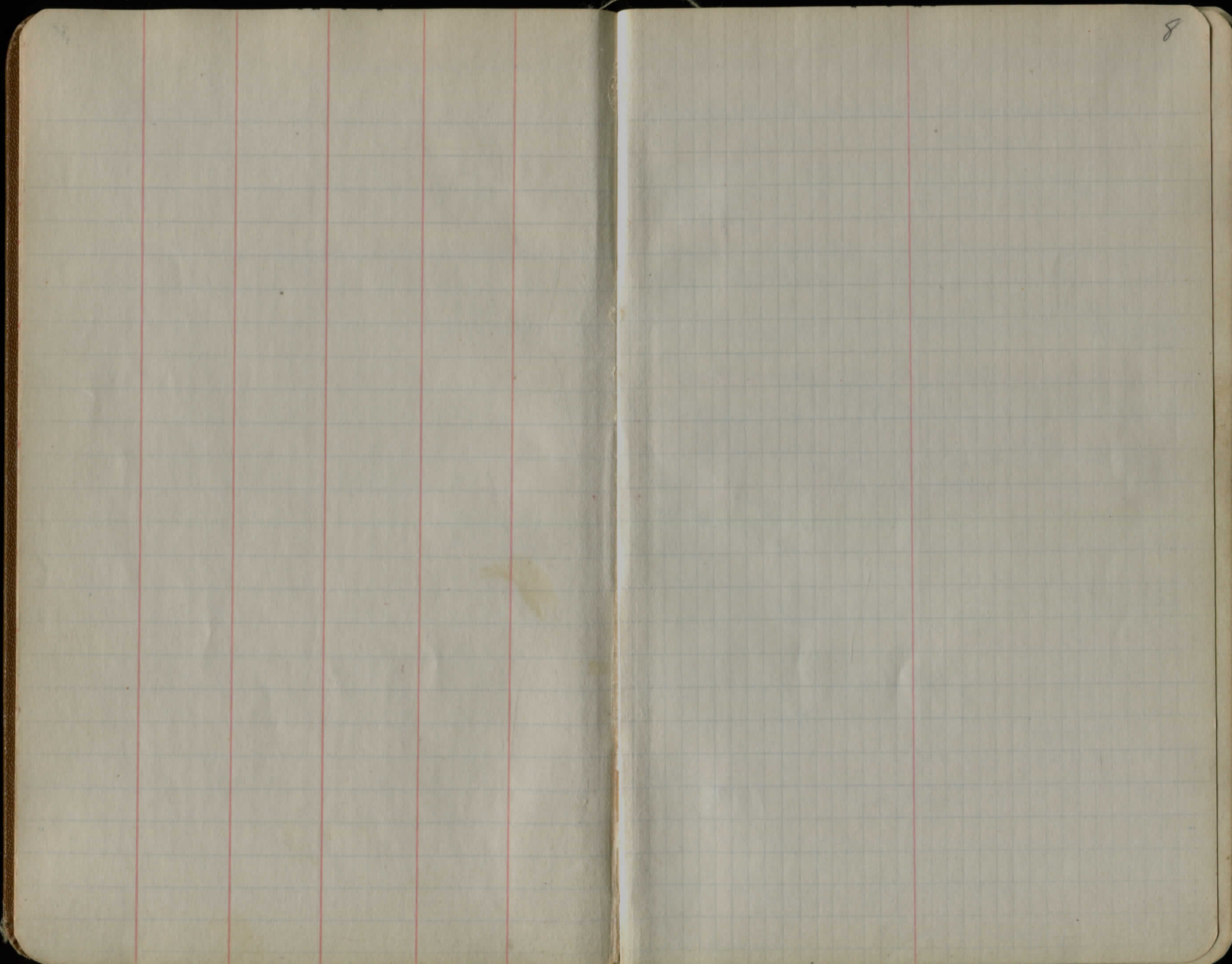














## Cross Sections at Nambden Center Park

BM 5.62 130885 1303.23

Spike root 15' Maple 100' SW X Old State Rd  
with Route 85

145+00

$\frac{99}{6.5}$	$\frac{60}{6.5}$	—	$\frac{40}{3.7}$	$\frac{99}{+0.5}$	—
------------------	------------------	---	------------------	-------------------	---

144+85 99 Lt. 5.8

144+00

$\frac{99}{9.5}$	$\frac{60}{9.2}$	—	$\frac{50}{5.5}$	$\frac{99}{2.0}$	—
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143+00

$\frac{99}{12.0}$	$\frac{50}{13.2}$	—	—	$\frac{99}{7.6}$	—
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142+73<sup>2</sup>

$\frac{99}{13.2}$	$\frac{50}{14.5}$	—	$\frac{50}{10.8}$	$\frac{99}{7.6}$	—
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145+07

$\frac{100}{5.0}$	$\frac{100}{10}$
-------------------	------------------

146 6.5

$\frac{99-75}{63}$	$\frac{30}{7.7}$	$\frac{15}{6.7}$	$\frac{5}{6.2}$	6.5	$\frac{8}{6.9}$	$\frac{12}{7.6}$	$\frac{25}{5.6}$	$\frac{99}{2.9}$
--------------------	------------------	------------------	-----------------	-----	-----------------	------------------	------------------	------------------

Base H<sub>2</sub>O pump 6.10

147 7.6

$\frac{99}{8.7}$	$\frac{30}{8.0}$	$\frac{24}{8.9}$	$\frac{18}{8.0}$	$\frac{8}{7.4}$	7.6	$\frac{8}{8.0}$	$\frac{15}{8.9}$	$\frac{30}{8.6}$	$\frac{99}{6.2}$
------------------	------------------	------------------	------------------	-----------------	-----	-----------------	------------------	------------------	------------------

148 8.0

—	—	—	—	8.0	$\frac{8}{8.3}$	$\frac{13}{9.9}$	$\frac{30}{9.3}$	$\frac{99}{7.0}$
---	---	---	---	-----	-----------------	------------------	------------------	------------------

145+30 Spt 3.1

145+45 N Pnt. 3.9

1305.0

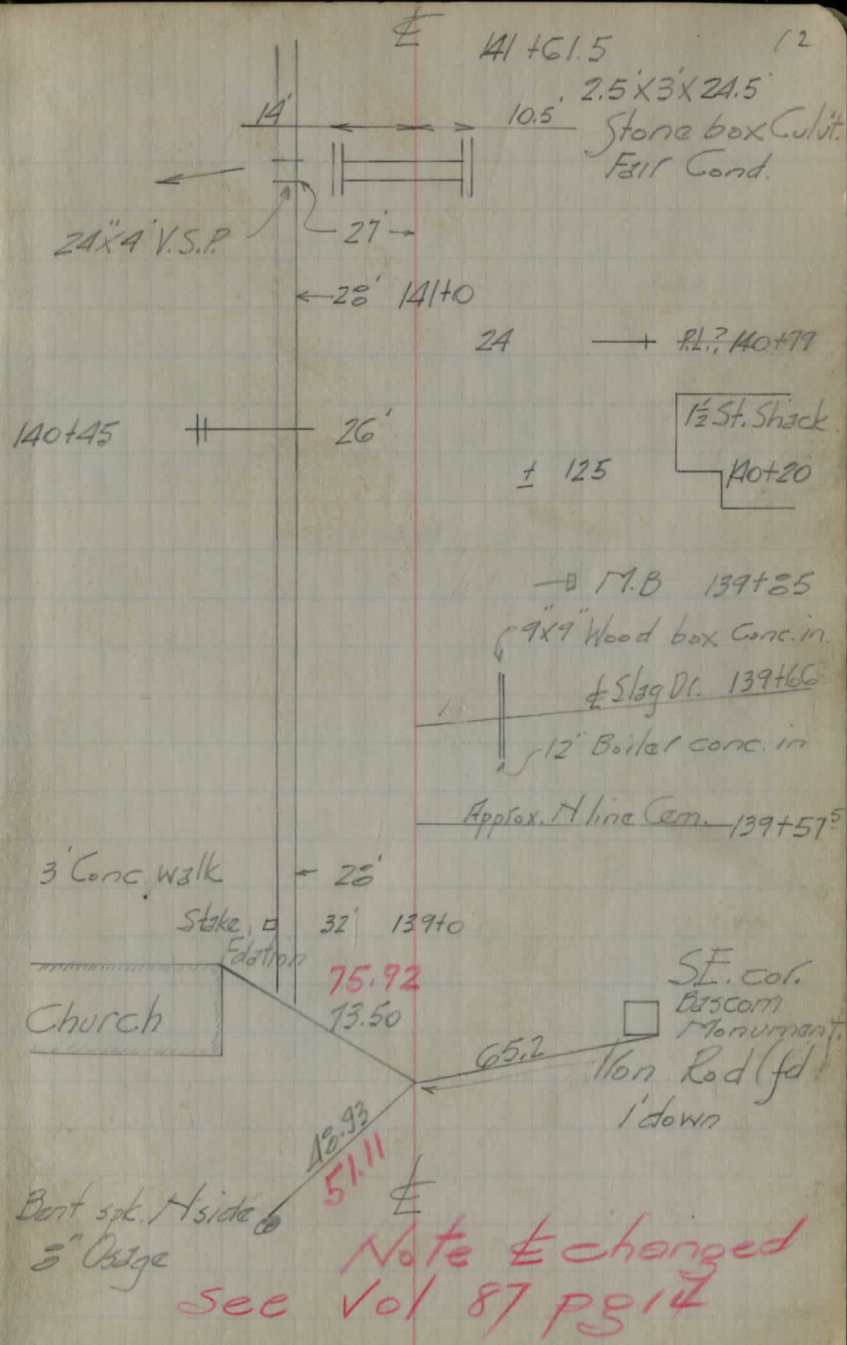
Flow 15' x 145+82 7.4



7/5/40 Pomeroy  
 Richards  
 Hosford

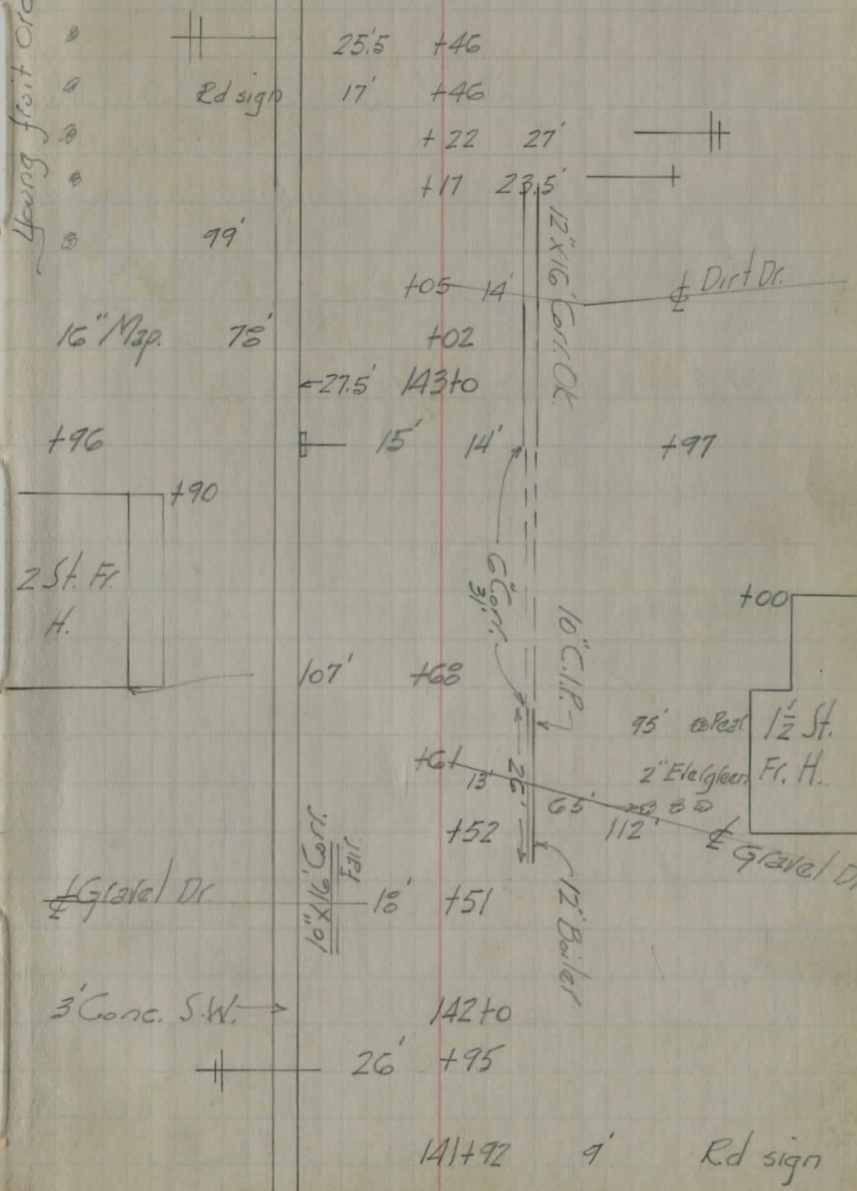
# HAMBDEN CENTER APPROACH

130+07.5

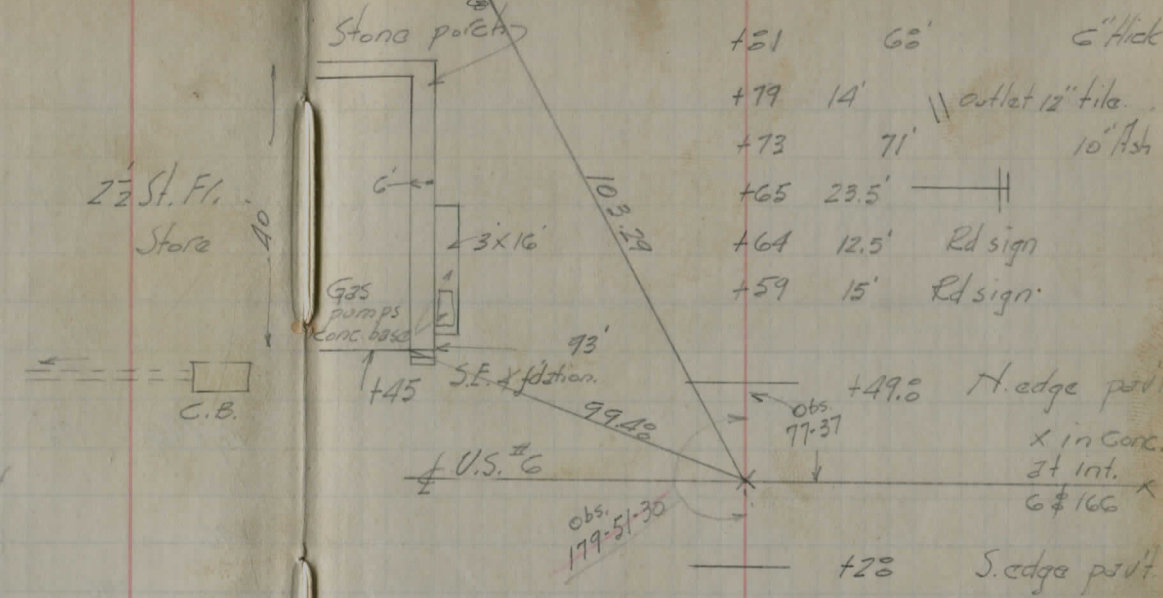


Note & changed  
 see Vol 87 pg 14

Young fruit Orchard

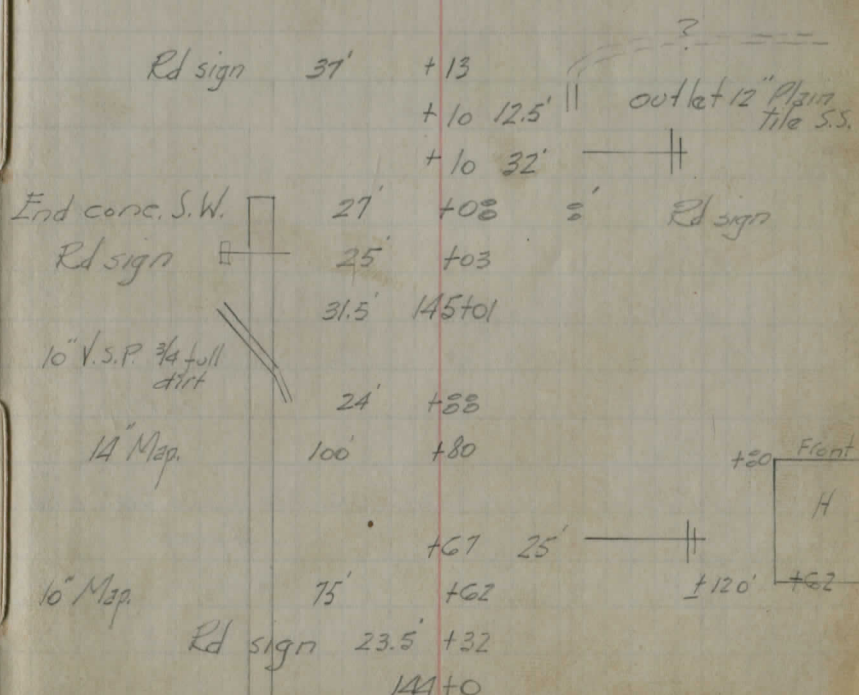


Trail in 5' T Map



- +51 60' 6" thick
- +79 14' || outlet 12" tile
- +73 71' 10' Ash
- +65 23.5'
- +64 12.5' Rd sign
- +59 15' Rd sign
- +49.0 H. edge part
- +28 S. edge part

145+37<sup>00</sup> X in conc. fd  $\neq$  used



- Rd sign 37' +13
- +10 12.5' || outlet 12" plain tile S.S.
- +10 32'
- End conc. S.W. 27' +08 2' Rd sign
- Rd sign 25' +03
- 31.5 145+01
- 10" V.S.P. 3/4 full dirt 24' +88
- 14" Map. 100' +80
- +67 25'
- 10" Map. 75' +62
- Rd sign 23.5' +32
- 144+0
- +80 Front
- +120' +62

Grapes x 29' +06  
 149+05 17 5'x6' Con  
 OK  
 Cindel Dr.

+98  
 148+35 22' ———|  
 shrub

+67

Rd sign 19' +59

+29 90'

147+03 22' ———|

76' +94

+78

+76 9' Rd sign +46

+67 72 15' Map

Rd sign 25' +58

+42

+20 86' 14' Ash

69' +17

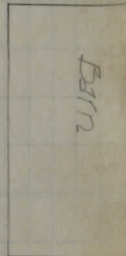
+12

115' 8' Map to

+11 10.5' Rd sign

78' 77' 146 to

Picket fence

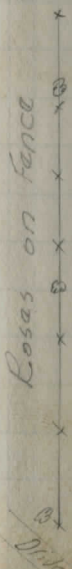


9" Map

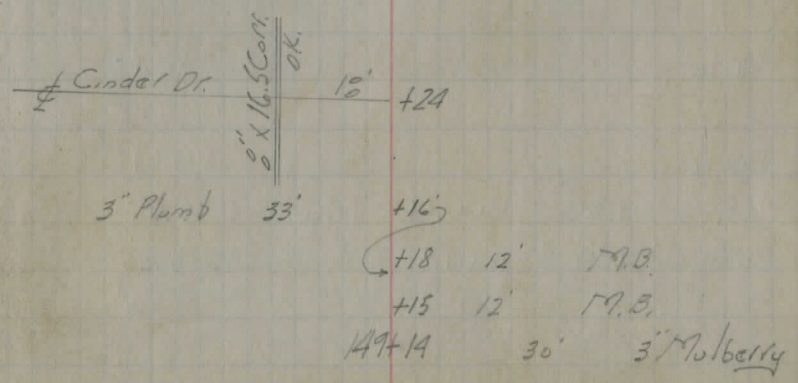
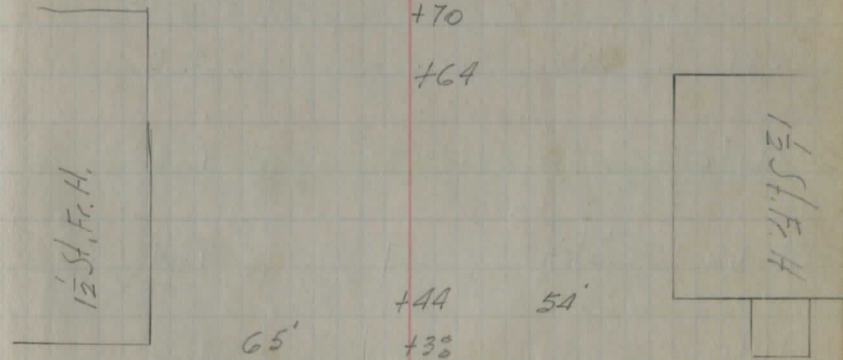
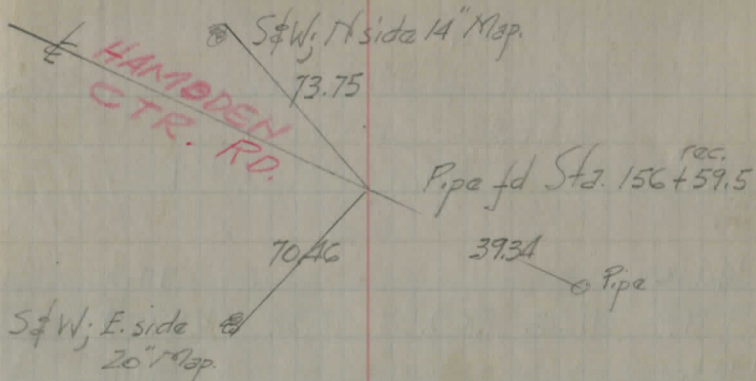
8" Map

3'x4' Conc well base  
 & pump.

8" Map



Ditch



2/9/40

Pomeby  
Richards  
Hosford

Clear Hof

W

E

E

17

## Profile &amp; Sections

Hambden Center Approach

STA. + H.I. - E

144 to 99.3

T.P. 11.00 1309.57 2.32 1297.69

143 to 97.1

+61 Drive 96.5

+51 Drive 96.5

142 to 96.3

+61.5 Culvert 96.4

141 to 95.6

140 to 96.1

139 to 97.1

T.P. 3.35 1300.01 7.66 1296.66

B.M. 1.09 1304.32 1303.23

↖ Rebase ↗

3.3	3.7	5.4	9.4	11.5	11.6	10.7	10.3	11.2	12.4	10.4	9.9	10.1	10.2
100	75	50	25	19	13	0		15	19	24	30	75	100
										21			

O.G.	3.0	4.1	4.2	4.7	3.5	2.9	3.3	4.0	2.7	0.9	+0.5	+1.0
Fl. patch	100	75	23	18	15		9	11	30	75	100	H
			30	20								

	96.1	96.6	98.0	
	3.5	3.9	3.4	2.0
	0	0	30	75

95.5 94.9 95.4

4.5	5.1	4.6	3.5
75	30	15	

8.1	6.0	5.6	5.0	4.6	3.7	4.2	6.3	5.1	5.5	5.8
75	30	20	17	14		0	11	15	30	75
			19							

92.3

92.3

9.3	7.9	7.7	5.0	3.7	3.6	3.7	4.8	7.7	6.6
100	FL.	FL.	top	11.5		0	top	FL.	30
	24' VSP		op.				op.		

5.6	5.7	6.5	5.2	4.4	4.8	5.7	5.0	3.9
32	22	18	15		9	12	15	30
		20				14		

5.1	5.2	6.2	6.0	4.5	3.9	4.5	5.7	4.2
32	23	21	18	14		9	12	30
							15	

29

Spk N.E. of H" Maple S.W. quad. of intersection

STA. + H.I. - E  
Dr.

149to 00.1  
148to 00.8  
T.P. 3.60 1304.69 2.56 13d.01  
147to 01.2  
146to 02.3

149.8 05.02

+37

+28 05.79

145to 03.6

1309.57

33 43 54  
H 50 16

5.7 5.2 5.3 6.4 5.3 4.5 4.6 5.0 6.4 4.0 3.0  
50 30 22 18 16 3 10 17 30 50 drive

6.6 5.5 5.6 6.0 4.4 3.8 3.9 4.4 5.5 5.6 5.2 4.9  
50 30 24 20 16 5 0 13 17 30 50

± 9.5 9.6 9.5 8.6 9.5 8.9 8.1 2.4 2.8 9.6 9.0 2.3 6.4  
100 75 50 30 24 19 6 6 11 27 75 100

02.8 0.5  
7.0 6.8 2.1 2.5 7.2 7.3 7.6 2.1 6.4 4.6 3.2  
100 75 65 35 10 7 4 30 75 100

4.6 5.7  
Gas base Ground  
store

2.05  
F.L.

4.55  
N. edge Post

5.72 5.75=N 5.11=4 3.27=N 3.14=4 2.20=S 1.60  
100 50 4.1 50 100

3.70  
S. edge post

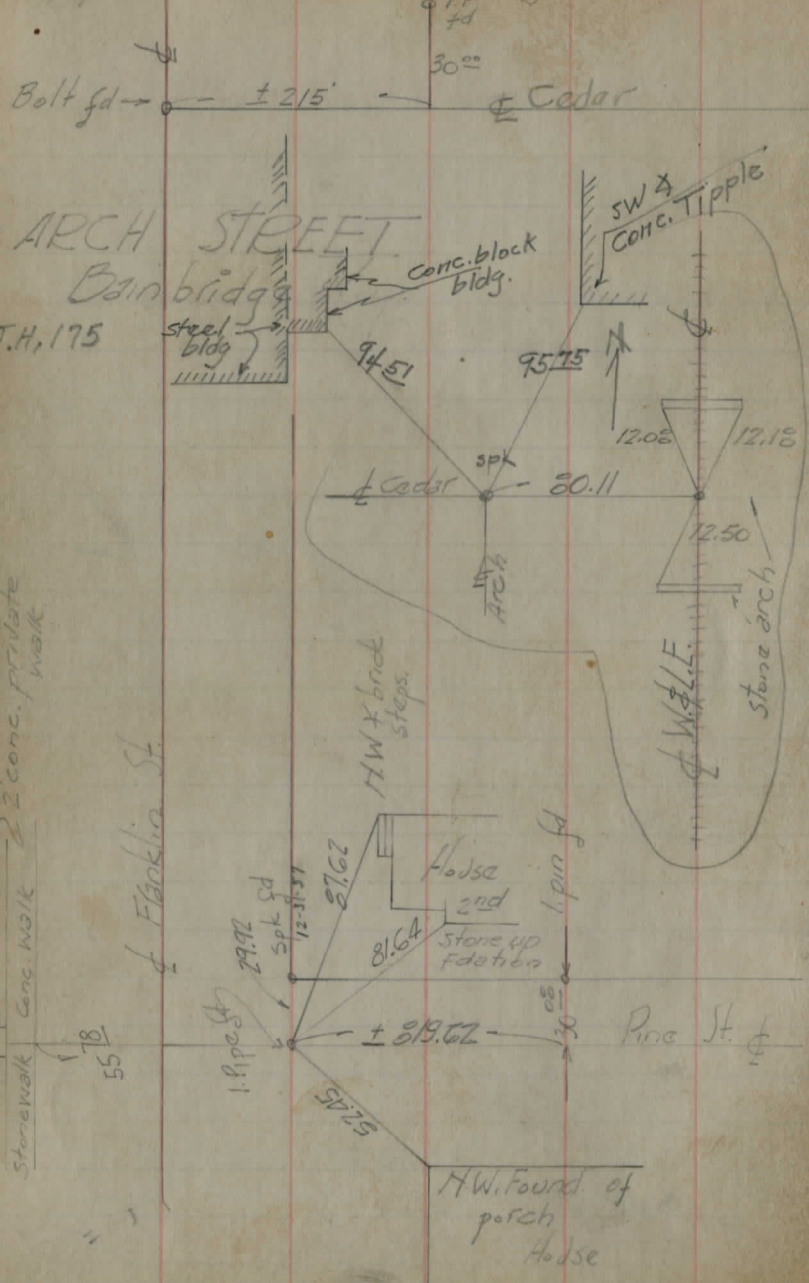
00.8

7.1 2.6 2.0  
F.L. F.L. F.L.  
in out out  
7.0 7.5 6.3 6.4 6.0 6.4 2.5 6.0 5.4 2.3 7.3  
100 75 30 21 12 15 19 30 75 100  
ditch

B.M.			5.17	1303.22	(1303.23)
T.P.	7.30	1308.39	3.60	1301.01	
150 to				99.0	
		1304.69			

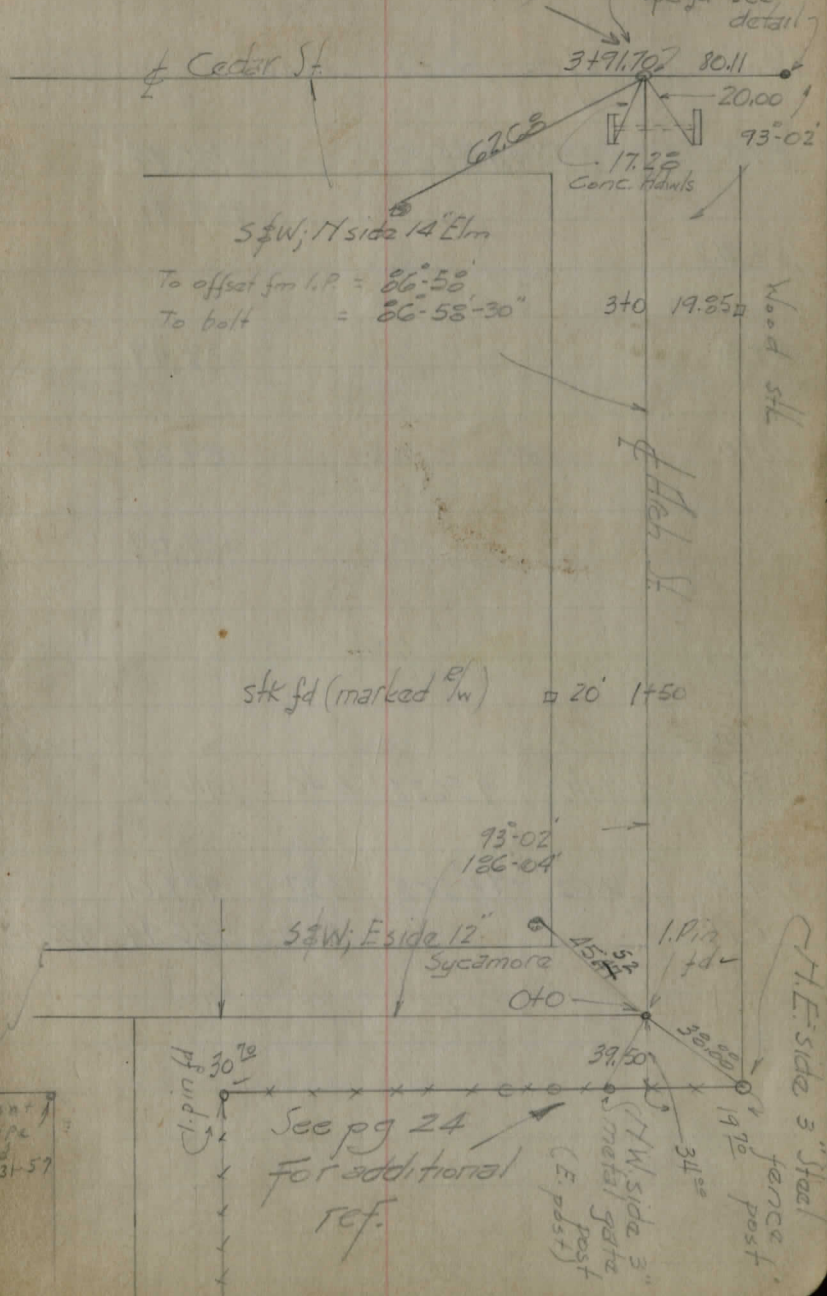
57

5/21/40 Tomalay Richards Rosford



Small screw set from refs. of F.C.Z.

I pin fd. I pipe set 12/28/57



8/22/40 Pomoroy

Profile Arch Street

B.M.	8.33	945.27		936.94
				937.11
3+91.7				
3+0				938.47
2+0				939.27
1+				942.07
1+0				
1+50				
T.P.	11.46	956.28	0.45	944.82
0+0				
T.P.	2.02	945.03	13.27	943.01
B.M.			8.09	936.94 (936.94)

X.W.  
 X in  $\Delta$  of W. Adwell Sta 3+81  
 W E

	8.16		
	6.8	$\frac{6.8}{5}$	
	6.0	$\frac{4.6}{7}$	
2.7 F.L.	3.2	$\frac{3.2}{3}$	6.8 F.L.
	2.2	$\frac{2.2}{1}$	
	10.1		
	4.6	5.2	5.3
100	$\frac{13}{E}$		

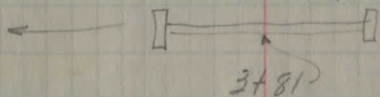
$\bigcirc$  =  $\frac{E}{E}$  travelled Ed.

8/22/40

Richards  
Pomeroytopo. Arch St.  
Bainbridge Twp.

22

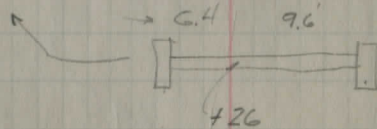
S. edge of Pit +89

~~12~~ x 28.8 Enc. V.S.P. Culit O.K.  
12" → 12.3 16.5 ←

Gr. Dr.		+5'
13" Elm	16'	+34
7" Map	6'	+23
7" Elm	18'	2+12
8" Elm	4'	+93
10" Elm	7'	+64
14" Elm	5'	+37

End brush

30" Conc. barrel Culit H.G.

2 x 1 1/2  
culit  
for R.R.

8" Elm 6' 1+12

//  
trees

12" Syc. 20' +40

0+0

Beg brush

Aug. 45.  
Hall-Port

Topo. Pine St  
T.M. 171

# 25' 7+05

20

10'x12' C.I.P.

1+97 12' Dr.  
1+94 Plugged

Cin. Dr.

Beg. tree row @ 19<sup>5</sup> 1+76  
slag Dr. 1+57

1+42 12' 8" x 16" V.S.P.  
slag Dr

Stk set at 30'  
PINE ST.  
20' Arch St.

0+08 inlet 8" tile 13'  
A Conc. Walk

0+0 I.P. Fd 24<sup>5</sup>

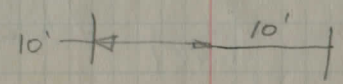
East edge Bit. Pav? 21'

FRANKLIN ST.

End tree row @ 22.8 6+85  
No dried good without stop wall at inlet

Looks OK inlet end  
12" Corr.

6+63



5+55

10'x14' Corr. unplugged  
4+17 13' Grav.

Dr. 3+65

Dr. 3+16

tree row @ 21.5 3+0 24<sup>5</sup>

Cin. Dr. 2+43

A Conc. Walk

inlet (?)  
Tocks  
op ditch

10+97 38'

10+85  $\frac{1}{2}$  trav. Rd (LIMAX)

10+70 24<sup>8</sup>  
30'  
29' Endwsk  
8"ch  
8"ch

10+27  
9+99 13' outlet  
6" tile

9+0 24<sup>8</sup>  
12'x20' corr  
plugged

8+62 11'

8+40

8+24

7+74

7+60 10' 8" tile

7+37

7+12 13' out 6" tile

Grav

Side stk 30'

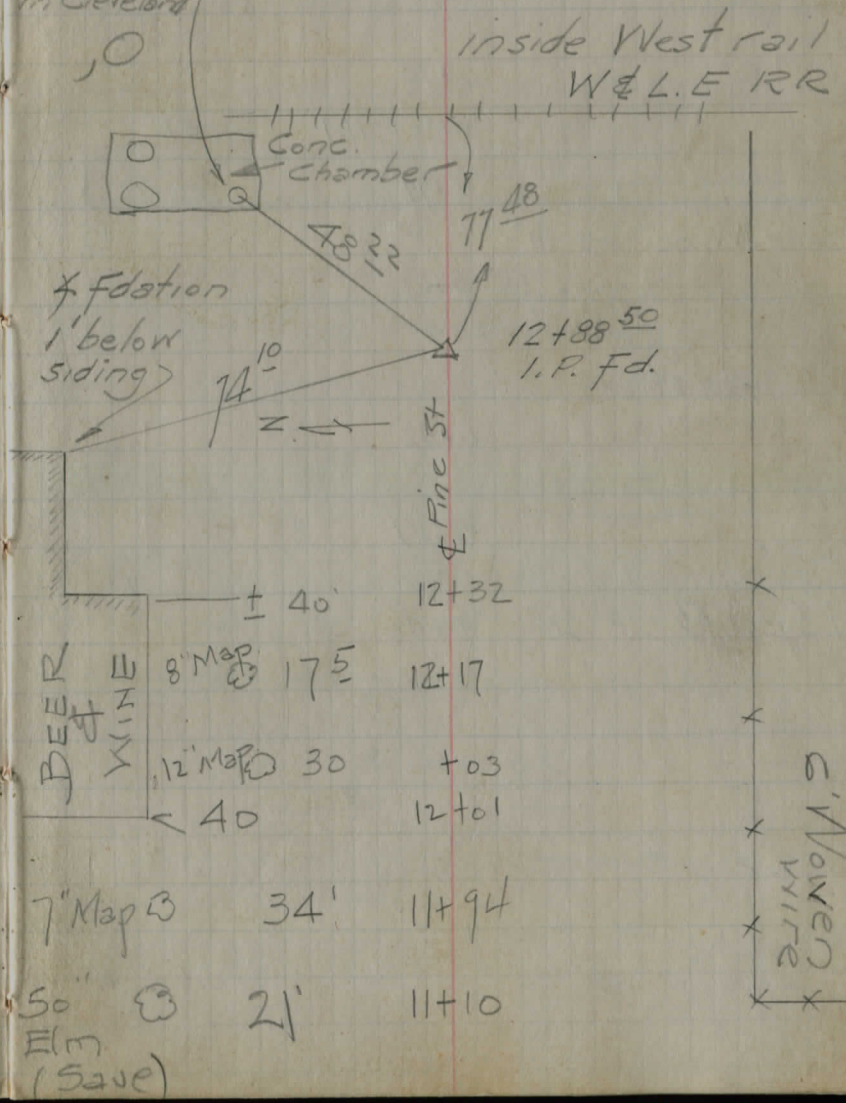
# 24'  
15 Map 20'

End on curb  
13.5

Slag

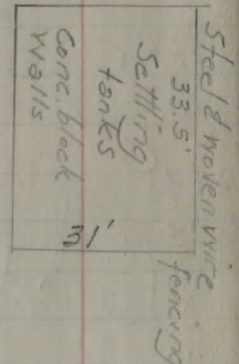


ctr O  
in Cleveland



3<sup>rd</sup> post  $\square$   
 $\square$  2'  
 $\square$  9'  $\rightarrow$   $\square$  2<sup>nd</sup> post

1+13 11.8



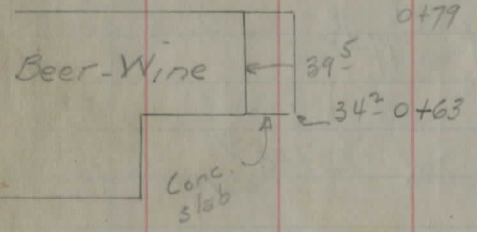
12" Elm  $\odot$

26

0+90

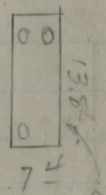
0+80 11.1

0+79



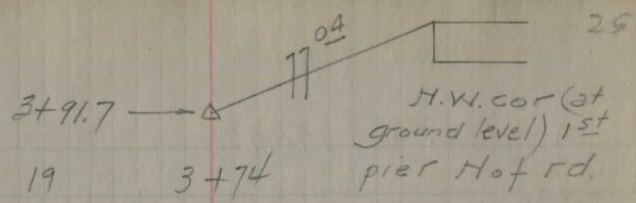
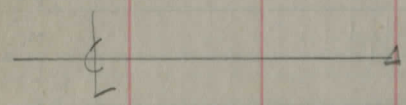
0+52 23'

0+41 23



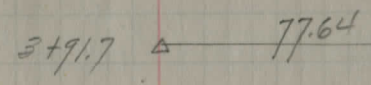
24" Syc.  $\odot$

20' 0+40



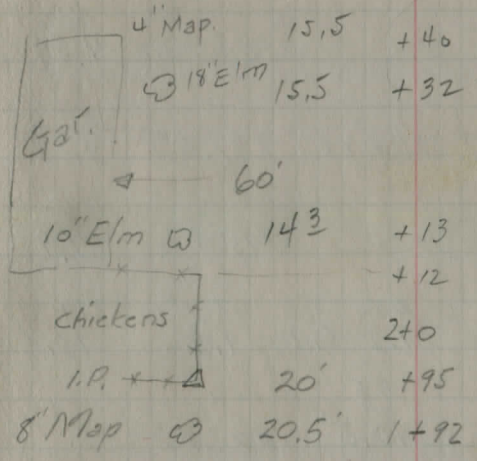
H.W. cor (at ground level) 1<sup>st</sup> pier Hof rd

19 3+74



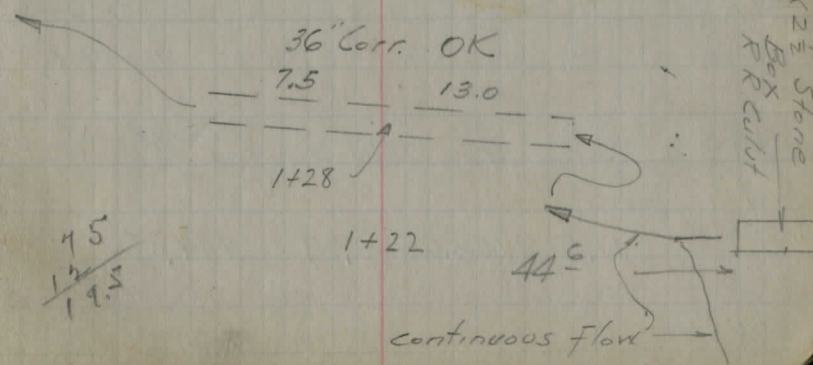
Inside W rail t ctr of ctr Arch

GRAU +49



6.5' of corr. pipe beyond limits of R/W West side Arch  
 5-29-46  
 can be ext. 7.4 on E

Brush T.O.B.T



7.5  
 1.2  
 1.3

+ HI -  
 B.M. 8.48 945.42 936.94

↓ J  
 8-15-45  
 Pom. Hall

3+0 Arch

3+91.7 ± 8.28 937.14

11.40 937.21 Outlet

3+0 938.32 7.84

♀ Drive 939.63 7.05

2+0 940.46 7.9

1+50 45 35 28.2 Creek 19  
 7.2 6.7 9.8 10.0

~~1+65~~ 1+28 Culvert 55 creek  
 10.5 942.52

1+0 top of fill on the west 943.67

TP 11.21 956.06 0.57 944.85

0+50 946.26

X in H.W. cor. of W hdwl  
 3+81 Arch St.

W E

Spike at intersection Inlet  
 Culvert 11.40 8.21 10.94  
 15 10.5 8.5 4.5  
 8.6 8.53 8.67 7.36 7.10 13.5 16.20  
 7.15 7.98 6.8

20 6.5 2.5 14 20  
 7.7 6.75 5.1 4.96 4.9 6.2

17 10.5 3.5 941.72 13 17+20  
 7.0 6.2 4.00 3.7 3.95 5.2

Outlet 8.4 flow line outlet 2.9 6.4 4.2  
 F.L. 4" Tile ±15" Inlet 7.4 6.8

↑ Outlet east of road  
 F.L. RR cul. outlet  
 Culvert of set. basin  
 4.8 11.5 7.5 11.5 12  
 1.5 2.0 1.75 1.8 1.4 ground 0.75 Wall 2.65  
 bottom setting basin ↑

41.5 27.5 15.5 5.5 5.5 10 20  
 5.55 9.3 10.6 9.9 9.8 9.5 10.2 9.75

H 1  
956.06

P.I. 950.86  
 12+50 PINE STREET 950.86  
 12+0 951.46  
 11+50 951.24

Base 50" Elm  
 11+0 950.76

BM 5.64 950 A2  
 Profile Climax St. 950.66

10+50 949.96

Drive way on north 949.06

10+00 947.36 40 31 21.5  
 11.8 10.6 9.3

TP 0.53 946.43 10.16 945.90 40  
 9+50 943.02 5.8

9+00 939.33 33.  
 level 2.3

N S

5.2  
 3.5 15 14 30 46  
 5.0 4.95 5.2 4.3 4.1 3.9  
 39.5 17.5 6.5 16 20 30+40  
 4.4 4.1 4.65 4.6 5.0 4.6 4.75  
 35 20 19 11.5 12.5 30 40  
 4.8 4.6 4.9 4.82 5.2 5.0 5.2 5.2

40 3.9 22 9.5 21 30+40  
 5.4 5.0 5.5 5.3 5.9 5.65

7.63 FL. - ?  
 Iron Pin N.W. + BioChem Co. fence<sub>50</sub> 100 150  
 5.4 5.5 5.6 5.4  
 (950.6) 5.8  
 35 10.5 7.0 10 12 15.5 24.5 30  
 6.5 9.4 6.0 6.1 6.3 6.6 5.6 5.9 5.5  
 +40

48 20  
 on down 10.1 7.8 7.0  
 13.5 11 9 6.0 5.5 9.5 13' 16 24.5 30  
 9.0 9.5 8.6 8.4 8.8 8.7 8.8 10.8 7.6 7.7 7.2  
 13' 16 24.5 30  
 13' 16 24.5 30

30. 16.5 11.5 7.5 6 5.5 8.5 10.5 11.5 17. 24.5  
 4.9 3.1 4.0 3.1 3.1 3.3 3.41 3.4 3.15 3.6 0.3 0.5  
 30 40  
 2.9 1.9  
 S ← → N  
 27.5 24.5 18 11.5 10 7.0 12.0 30 40  
 4.8 4.8 5.5 8.4 7.85 8.1 7.9 9.05 10.1 10.8

+ HI - Elev

9++ Drive way rt side 935.68

8+50 934.79

T.P. 0.05 934.76 11.72 934.71

8+00 931.56

Driveway north 929.81

Drive ? south 927.81

7+00 925.06

Culvert - 923.86

T.P. 0.54 924.42 10.88 923.88

6+00 922.17

Drive - south level 921.37

5+00 4.1 920.32

Drive - south 919.47

4+00 919.32

3+00 918.32

2+05 916.82

T.P. 4.44 921.13 8.23 916.19

N S

10.75 5.25 24.5+27.5 30 28.75 8.2

30 13 11.5 6.5 8.0 10.5 12.0 15.0  
13.5 12.3 12.75 11.6 11.70 11.5 11.7 11.9 10.5

30 17 11.5 8.5 10.0 11.0 15.5 24.5 27.5 30.  
2.6 3.1 3.7 3.3 3.2 3.3 4.1 2.0 1.2 1.2 0.1

50 3.8 4.95  
40

35 17 12 11.5 7.75 10.5 5.2 27.5  
10.8 11.5 10.8 9.85 9.70 9.9 12.5 15.5 24.5 40  
12.7 7.9 9.5 12.8

Inlet F.L. Col. 12.8 10.9 13.25 13.4 (Outlet F.L. 24.0)

37 18 12 8.5 9.5 13.0 27.5  
2.0 1.9 3.1 2.3 2.25 2.4 3.1 2.4 2.6 24.5 30

3.05 level

29.0 16.5 12.5 9.0 9.5 13.0 21 27.5  
4.2 4.3 4.8 4.1 4.1 4.3 4.75 3.8 3.85 24.5

30 16 15 13 11 4.45 level 27.5  
4.75 5.3 5.6 5.6 5.2 5.10 9.0 13.0 14.5 24.5  
5.2 5.85 5.4 4.9

32 14 11 9.0 12 13.5 27.5  
5.7 6.5 6.3 6.10 6.2 6.9 6.6 6.15 24.5

30 12 9.0 12.5 16 27.5  
7.5 7.8 7.6 7.7 8.4 7.7 7.4 24.5

926.13

1+00

916.58

0+08

8" tile flow line

0+00

916.33

-18

flow line catch basin  
& Franklin St. 916.27

T.P.

4.78 922.78 4.13 917.00

B.M.

2.43 919.15 (919.12)

29

25.0	N	15.0	12.0
4.15		5.1	4.95 4.55

8.0	S	15	27.5
4.7	5.95	4.6	24.5

7.0

4.8

 $\frac{25}{7.9}$ 

4.86

Spike S root 18" Map. 22' Lt Sta. 1476  
of Cedar St.

slopes  
Pine St.  
July

46  
POM  
CAN  
Bell

Grade

North      ‡      South

11+50      950.05

30 28.5 ↗  
see next pg

11+0      949.3

32 30 29 31 ↘

BM 2.27 952.69      950.42

Pin NW 4 Biochemical

10+50      947.65

5.04      32 30 27 24.2<sup>edge</sup> S.W.      5.04  
1.54 -      29.2      2.04 -  
C 3'-6"      C 3'-0"

10+0      945.10

7.59      32 30 23.5      7.59  
6.09 -      28.5      3.09 -  
C 1'-6"      C 4'-6"

9+50      942.2

10.49      26.5 23.5      10.49  
9.49 -      28.5 28.5      4.99  
C 1'-0"      C 5'-6"

T.P. 0.14 941.50      11.33 941.36

9+0      939.2

3.80 -      30 23.5 HI 952.69 13.49  
2.30 -      32 28.5      9.49  
F 1'-6"      C 4'-0"

8+50      936.3

7.7 -      32 30 23.5      5.2  
5.2 -      28.5      - 2.7  
F 2'-6"      C 2'-6"

941.50

T.P. 1.81 933.33 9.98 931.52

8+0 933.4

7+0  
T.P. 1.92 926.73 8.52 924.81

6+0 922.5

B.M. 5.61 956.03 950.42

11+0 949.3

11+50 950.5

B.M. 5.70 956.12 950.42

12 949.9

12+50 948.9

0+50 946.0

12+0  
L+ only

+0.10 32 23.5 28.5 <sup>H</sup> 941.50 8.1  
.40 995 6.6-  
F 0'6" C 1'-6"

8.4- 26.5 21 23 7.4-  
5.9 8.2) F 5.9  
F 2'-6" F 1'-6"

4.23 18-16 17-19 4.23  
3.73- 4.48 4.23  
C 0'6" C

6.73 32 30 29 31 6.73  
4.23- 4.73-  
C 2'-6" C 2'-0"

5.53 32 30 28.5 30.5 5.53  
3.53- 4.81 4.03-  
C 2'-0" C 1'-6"

6.22 32 32 6.13  
3.22 3.13  
C 3'-0" C 3'-0"

7.13 32 7.13  
3.63 31 2.63  
C 3' 6" C 4' 6"

10.03 22 18.5 10.03  
8.53 9.85 8.53  
C 1'-6" C 1'-6"

8-15-46 ck Levels Pine St  
 + H1 -  
 BM 5.83 956.25 950.42

10+50 947.65

10+0 945.10

11+0 949.3

11+50 950.5

12+0 949.9

B.M. 0.97 951.39 950.42

9+50 942.2

T.P. 0.37 941.43 10.33 941.06

9+0 939.2

8+50 936.3

8+00

T.P. 1.03 930.92 11.54 929.89

edge of berm L=grade

18.61 0.4H  
 8.22 8.23 14.5  
 11.5

111.15 0.4H  
 10.86 10.77 10.6  
 9 14

6.95 0.35H  
 6.6 6.5 6.3  
 8.5 15

5.75 0.25L  
 6.0 6.0 6.2  
 6.5 17

6.35 0.65H  
 5.8 5.7 6.2  
 9.5 18

9.19 0.19H  
 9.3 9.0 8.7  
 11 14

ditch 13 2.13 0.4L ditch 17  
 2.8 2.6 2.2  
 7.0 14

5.13 0.77L  
 6.2 5.9 5.7  
 10 14  
 d-12 d-16.5

8.03 9.2 1.17L 8.9  
 9.4 14  
 10.5 d-13.5 d 16.5

930.92

+

-

7+0

6+0

927.4

922.5

N

Φ

S

33

5  
11.5

ditch 15

$\frac{3.52}{4.7}$  1.18L

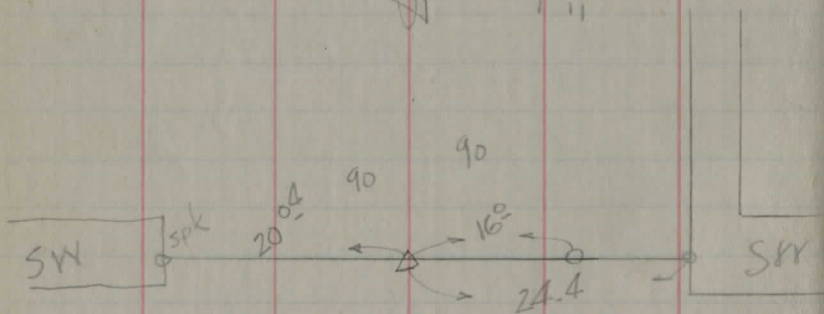
$\frac{8.42}{8.8}$  0.42L

4.7  
11 d 17

grade stake  
8.45

922.47

9-26-46



fine

5+k.s set 16' Rt  
= 7' off edge point

FRANKLIN

B. Ms for Oak St.

936.94 = + in N.W. Cor. West Adwall of Culvert thru Arch St. (near S. line Cedar St)

950.42 = I. pin at N.W. cor Bio Chem? fence

919.12 = Spike S. root 18" maple at N. side Cedar St @ 176 E. of & Franklin

Oak St Bench T.H.\*174

Maynard 36  
Temp/o  
Canfield

+ HI -

EL.

936.94 8.35 945.29 ✓ BM

+ in N.W. Cor W. Hdwall of Culvert  
thru Arch St.

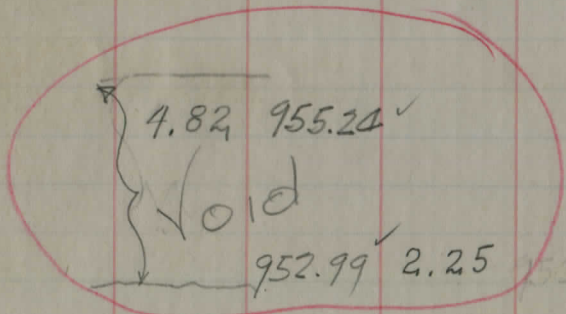
944.05 ✓ 1.24

10.51 954.56

950.42 ✓ 4.14

~~BM~~

I. pin at N.W. cor Bio Chem. fence



South  
Gate Post Bio Chem.

958.24 5.25 955.67

952.12 ✓ 3.55

BM.

+ in concrete footer 5th post south  
of S.W. Cor. Bio Chem. Office Bldg.

Elev. + HI -  
 952.12  
~~953.69~~ 0.66 12.67

0.74  
 13.35

5.87  
 930.03 ✓ 3.34

919.12 ✓ 3.15 BM

907.57 ✓ 14.70 T.P.

916.77 ✓ 6/18/10 PAINE RHODES & KER BM

I. Pipe N, E, Cor. Falls Laundry P.L.?  
 7.5' S. CEI # 303460 O.B.T.

Spike S root 18" maple at N. side Cedar St.  
 + 176' E. of Franklin

SPK. W. SIDE CEI # 55541 ± 15' S. OF  
 of FRANKLIN & CEDAR

Franklin + Oak  
+ HI - Elev  
North on Franklin

907.57 5.04 912.61 907.57 T.P.

1+00 907.68

South on Franklin

1+00 908.35

East on Oak

+50 909.85 T.P.  
8.70 921.31 0.00

1+00 914.36 OK

1+42 918.21 OK

1+77 High bank 12' drop to W.

2.00 9.98 930.15 923.55 T.P.  
1.14 T.P.  
0.17

929.99 (OK) → 929.99 B.M.

W. E. E.

S.W.	Drive		Berm		Berm	Ditch	S.W.
6.8	7.5	6.6	5.3	4.93	4.8	5.9	4.15
30	23	12	9		11	14	25

E. side drive	Toe slope	Guard rail	Edge Pmt.		Edge Pmt	Edge Berm
10	8.6	4.3	4.55	4.26	4.5	4.4
30	20	11	7.5		6	10
						5.8
						2.5

Ed. Pitch	Ditch	Ed. Ditch	Center Travel	Ed. road	Ditch
3.2	3.4	3.2	2.6	2.7	3.2
20	8	4	5	16	17.5
		6.5			20
			2.76		
			909.8		

Down	13.7	14.0	14.2	12.7	14.1	14.1	13.8	13.4	Down
	7.6	7.3	7.1	8.6	7.2	7.2	7.5	7.9	→
	20	15	10	7.5	5	11	18	20	

Flat to North	Ed. ditch	Ditch	Washout	Ditch	Ditch	Down sharp
1.3	1.0	2.5	5.4	5.15	3.2	2.4
20	16	10	8	2.5	9	20

UP	2.6	23.7	23.2	23.0	23.5	23.6	15.6	23.2	28.5	29.5
	3.7	6.5	6.95	7.2	6.7	6.6	6.6	7.0	1.7	0.7
	20	12	10	9.5	9.0	8.0	8.0	9.0	18.	20

I Pipe N.E. Cor. Falls Laundry Prop.

Ck from Franklin

+ - ELV

907.57 ✓  
10.90 .92

929.99 ✓ 12.61 942.60  
Tues. July 20

929.99 3.28 ✓ 933.27  
932.18 1.09 ✓ **BM**

This BM figure = 932.22 going SW from BM at E.G. Co.

2+50 926.57

3+50 930.67  
931.41 1.86  
8.65 940.06

TP  
TP

4+50 932.46

5+50 934.36

N. S.

Franklin and Oak,

I, Pipe N.E. Cor Falls laundry prop.

Spk N.W. root 20' maple W side drive  
41± E of Falls laundry line  
N.E. Cor pipe.

Flat N.	30.7	30.7	26.3	26.1	26.2	26.6	26.5	30.2	30.6	Flat S.
	2.55	2.6	7.0	7.2	7.1	6.7	6.75	7.15	3.05	2.7
	20	17.5	11	9.7	9	9	8	9	15	20

Flat to N.	31.5	31.5	30.6	30.7	30.7	30.3	31.7
	Hedge	1.8	Ed. Road	2.7	Ed.	Ditch	Top bank
	19	18.5	9.5	2.6	10	12	15

Flat N.	32.2	31.9	32.5	32.2
	7.9	Ditch	Ed. Road	7.9
	15	12.5	10	10

Flat	33.5	34.1	34.0	34.0	32.7	32.1
	6.6	6	Ed. Road	Ed. Road	7.4	8
	20	15	934.4	10.5	15	20

H I  
940.06

E I

+

-

6+50 938.46  
T.P. 1.70 938.36

T.P. 12.78 951.14

7+50 943.44

8+50 947.84

9+50 949.94  
T.P. 1.18 949.96

T.P. 6.95 956.91  
B.M. 4.90 952.01 (952.01)

10+50 950.46

P. 1. ± Sta 11+00 952.11

±

Flat 39.7 N<sub>1</sub> 38.6 38.1 38.8  
Wedge 0.4 Ed. Rd 38.5 Ed. Rd S  
16.5 1.45 2.0 1.3 38.6 38.4  
10 1.6 8.5 10 1.5 1.7  
15 20

44.3 43.9 43.2 43.7 43.1 43.4 43.2 42.7 42.6 43.1 43.5 43.1  
6.8 7.2 Ditch 7.9 7.4 8.0 7.7 7.85 8.4 8.5 8.0 7.6 8.0  
20 15 11 9 7 6 7 10.5 12 15 20

Flat 48.1 47.9 47.6 47.8 48.6 48.6  
3.0 3.2 Ed. Rd 947.8 Ed. Rd 2.5 2.5 Flat  
20 15 9 9 15 20

Flat 50.9 50.5 49.7 49.9 49.7 50.8  
0.2 0.6 Ed. rd. 1.4 1.4 0.3 Flat - S  
20 15 9 8 15

+ in Concrete footer 5th post S. of S.W. & Bio. Chem Off.

51.3 50.9 50.6 50.7 50.4 50.5 51.5  
5.6 6.0 6.4 6.2 6.5 6.4 5.4 5.4  
20 15 11 9 8 10 15 20

50.6 ← inside wheel track 51.7 ← E. edge rd  
6.3 N.W. of P.I. 952.1 4.8 5.2 N.E. P.I.  
22. 17

956.91

North on CLIMAX  
+ HI - ELV

1+00 951.41

2+00 950.81

3+00 950.61

3+58 949.81

BM 6.62? 950.29 (950.42)

W 51.6 51.2 Ed Rd 951.4 E 52.0  
Flat. -  $\frac{5.3}{15}$   $\frac{5.7}{10}$  5.5  $\frac{4.9}{19.5}$  Bldg-

50.7 50.7 50.4 Ed 950.8 50.6 49.8 Ditch 51.4 Fence 51.2  
 $\frac{6.2}{20}$   $\frac{6.2}{15}$   $\frac{6.5}{10}$  6.1  $\frac{6.3}{8}$   $\frac{7.1}{10}$   $\frac{5.5}{14}$   $\frac{5.7}{19}$

Flat 50.3 49.9 Edge Rd 950.6 50.0 48.9 Ditch 50.4 50.8  
 $\frac{6.6}{13.5}$   $\frac{7.0}{12}$  6.3  $\frac{6.9}{6}$   $\frac{8.0}{10}$   $\frac{6.5}{13}$   $\frac{6.1}{17}$   $\frac{6.5}{19.5}$  fence

Flat 50.5 49.4 Ditch 949.8 50.3  
 $\frac{6.4}{17.5}$   $\frac{7.5}{14}$   $\frac{7.2}{10.5}$  7.1  $\frac{7.1}{6}$   $\frac{6.62}{20}$  (B.M.)  
Black top Ed. turnout East turnout

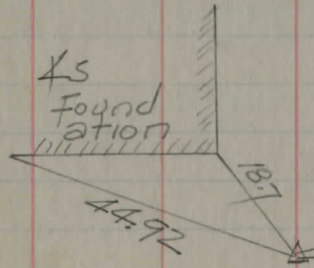
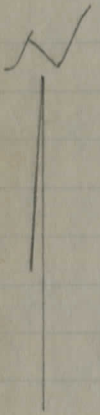
I pin N.W. cor Bio Chem fence.



12-2-48  
form  
skip

# RESTAKE OF HAMBDEN PARK

I.P. Fd 1" under



1/2" I.P. Fd 24" under  
1" set 1" under

55.28  
Spk S side  
12" Willow

See next page  
↑

cem  
328  
323

5 margin R+G  
per MBE

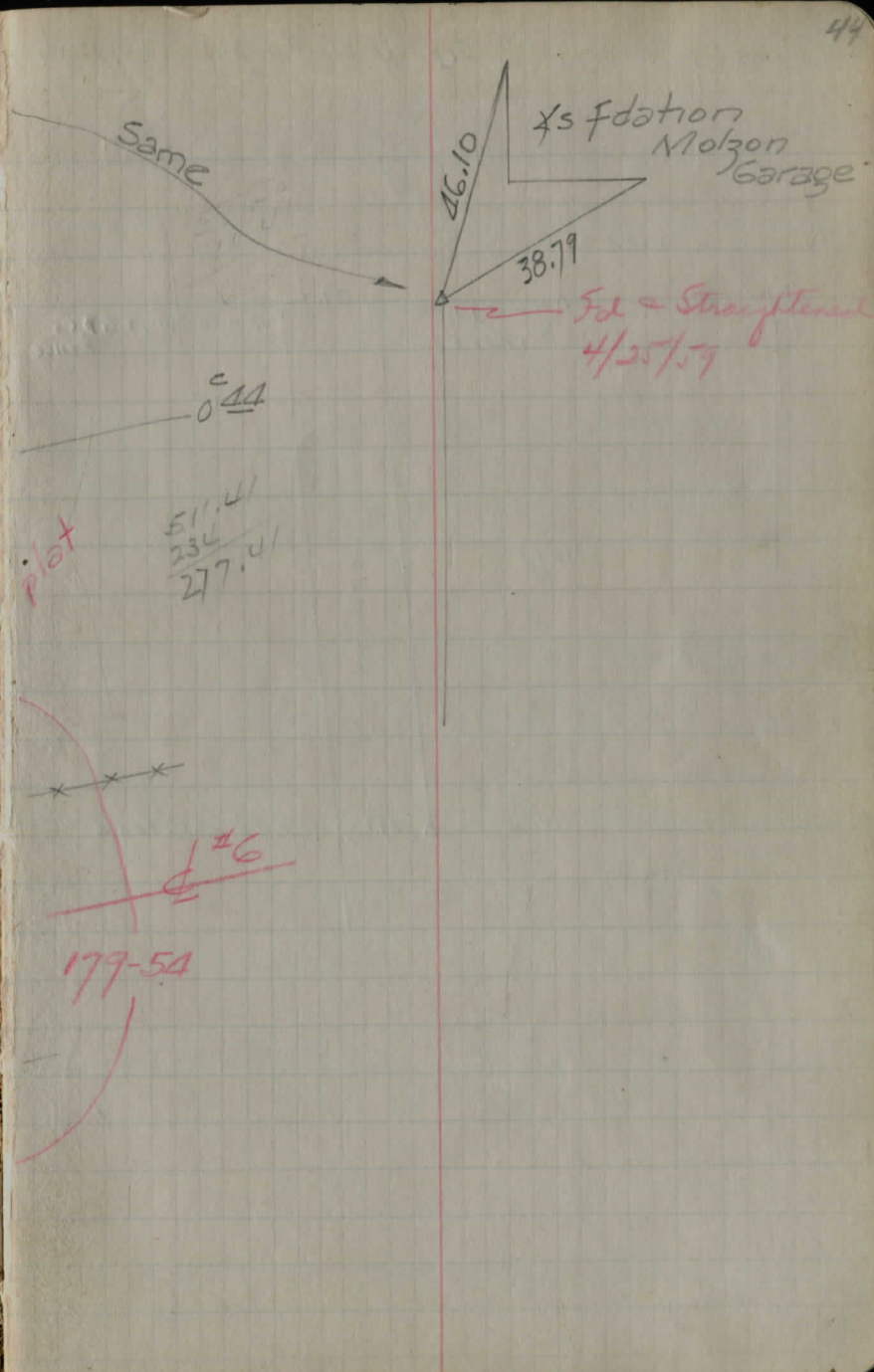
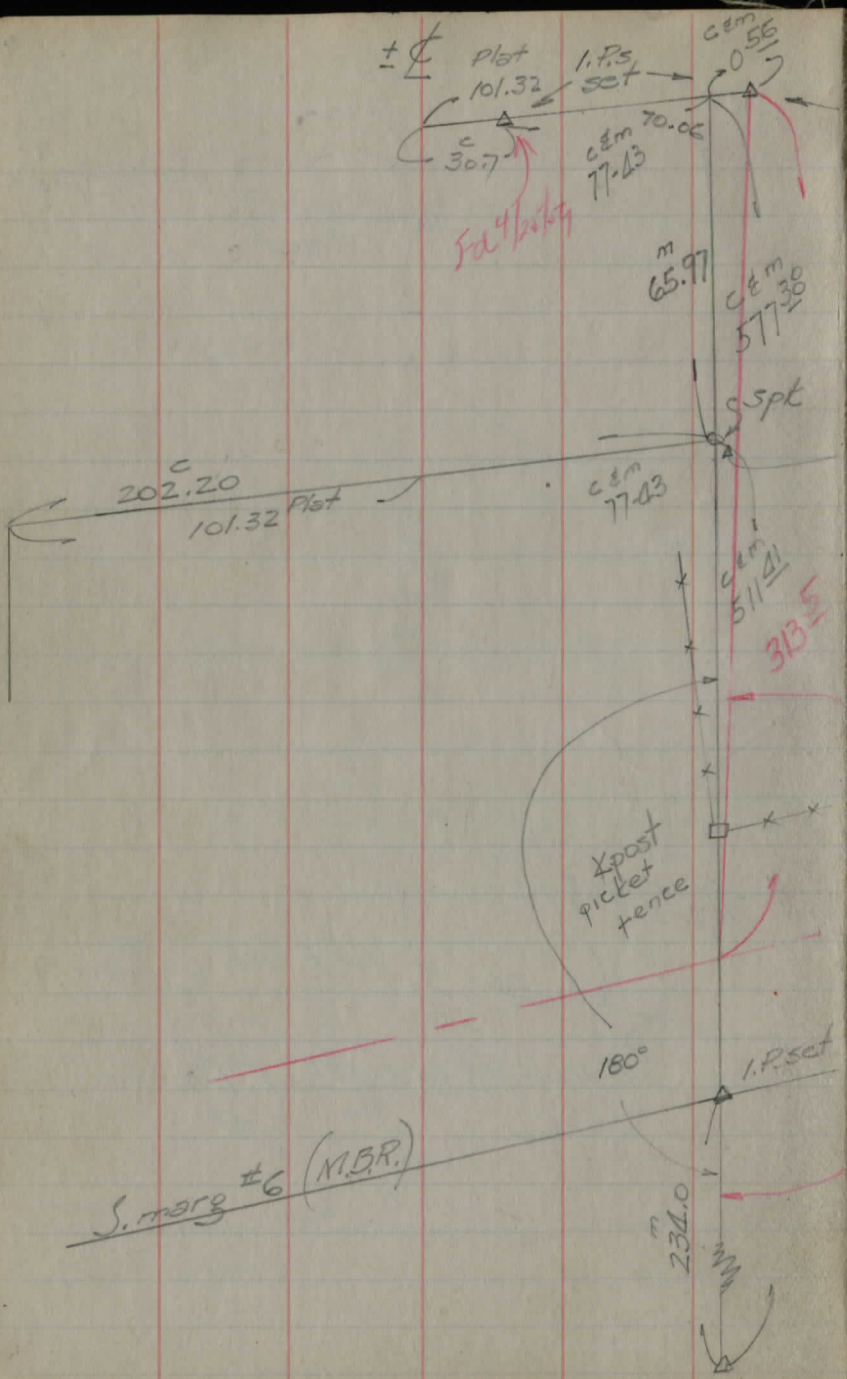
I.P. set

234.00

cem  
102-17  
56-15-30  
112-31

Fd Flush in Lawn

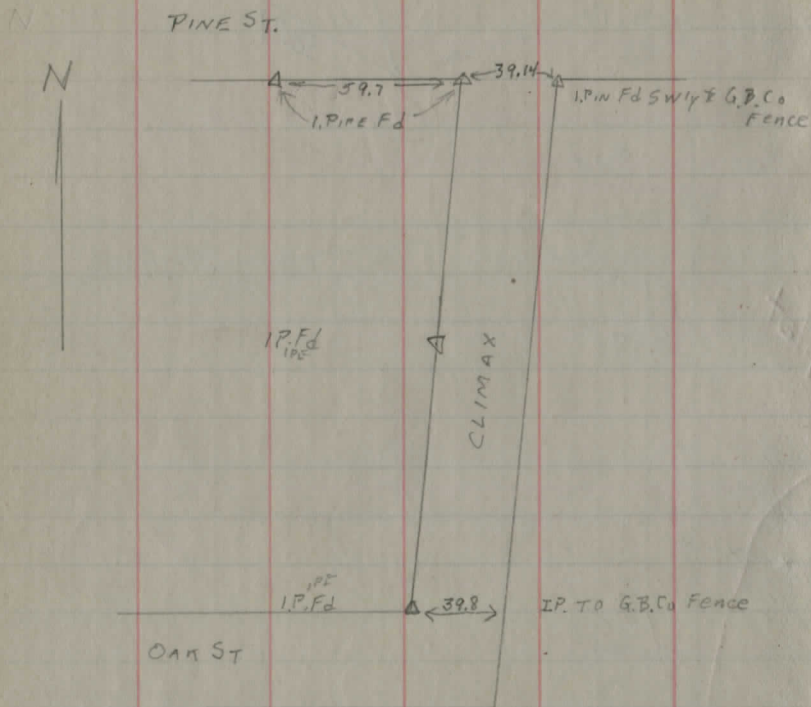
T. Rest I.P. Fd ± 4" E of 7" maple



Mogul 54 (1973 Clng)  
CLIMAX ST (Not DED)  
JUNE '51

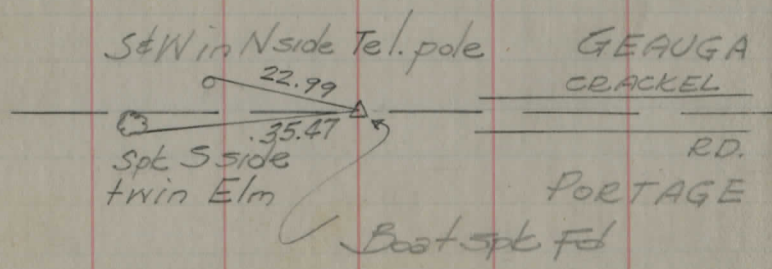
SEE FINE FOR PINE ST. (T.H. 197 1952)

CLIMAX ST



8-25-52  
J. Maynard  
A. Temple  
F.C. Fomeroy

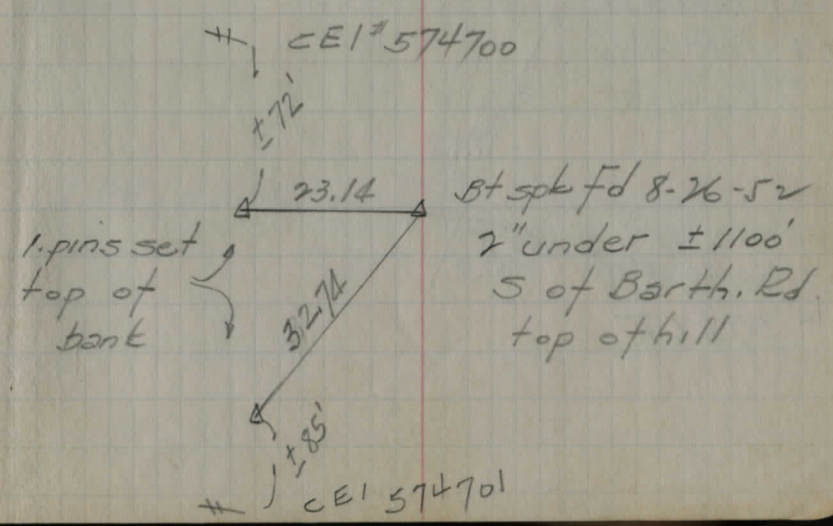
# THORPE ROAD

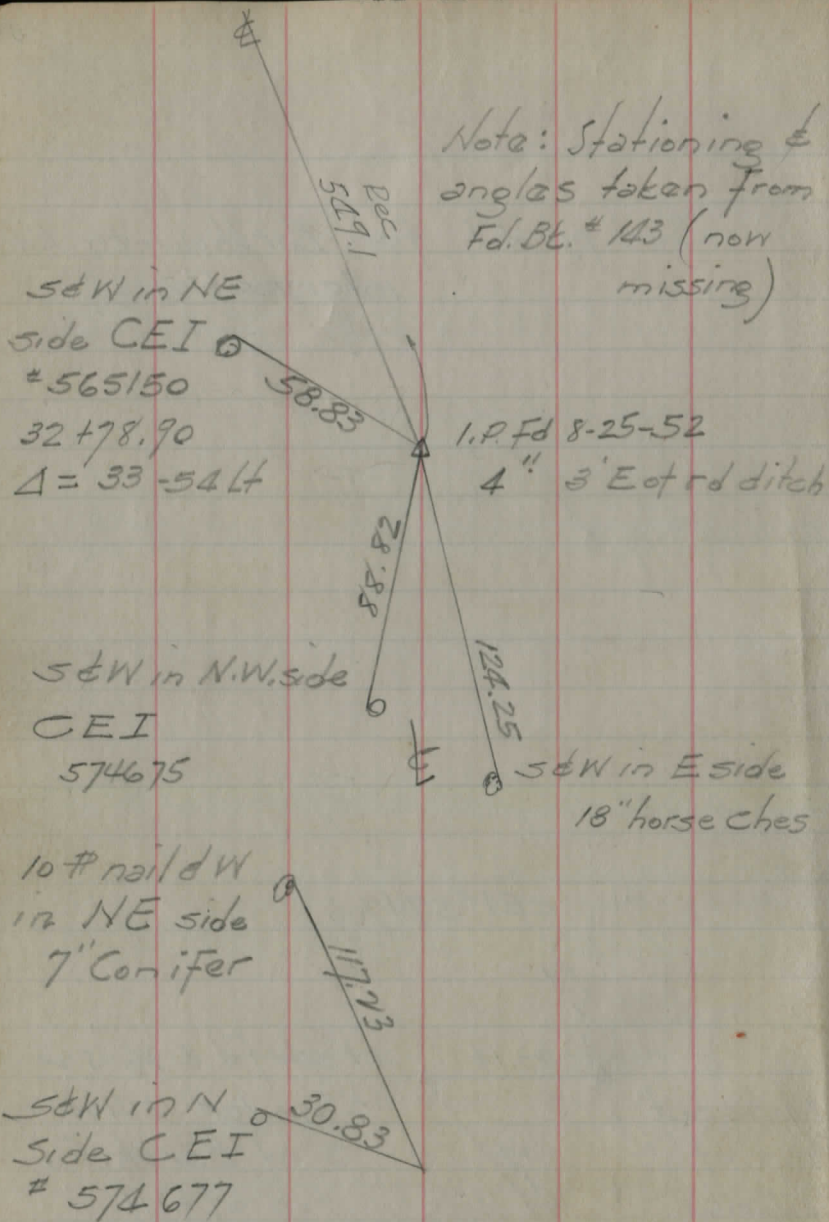


See pg 51 for Bartholomew Rd intersection of

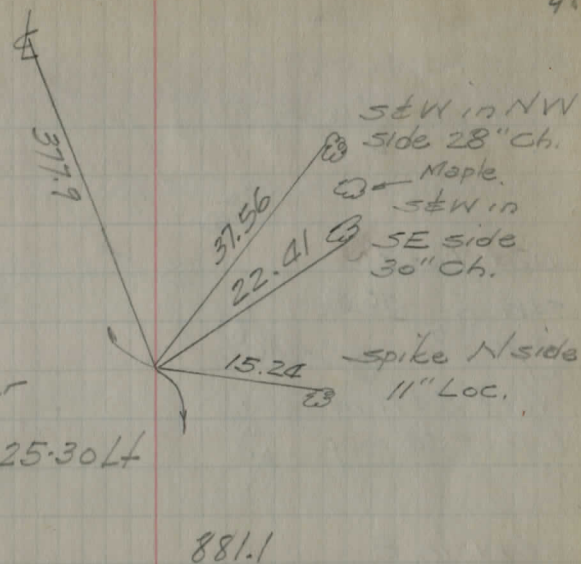
line = 1100' S of

pin set  
top of bank



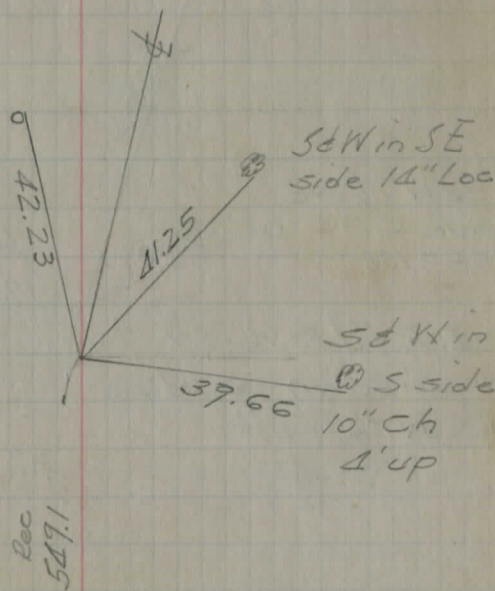


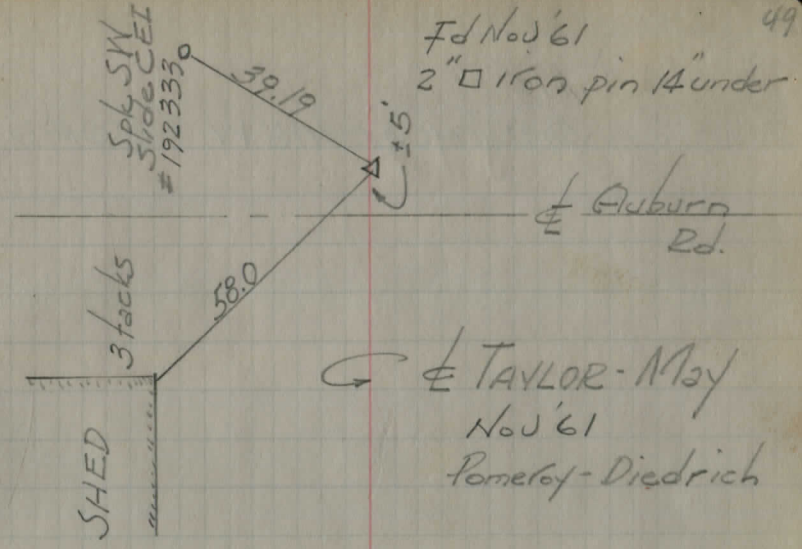
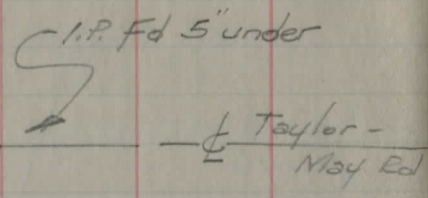
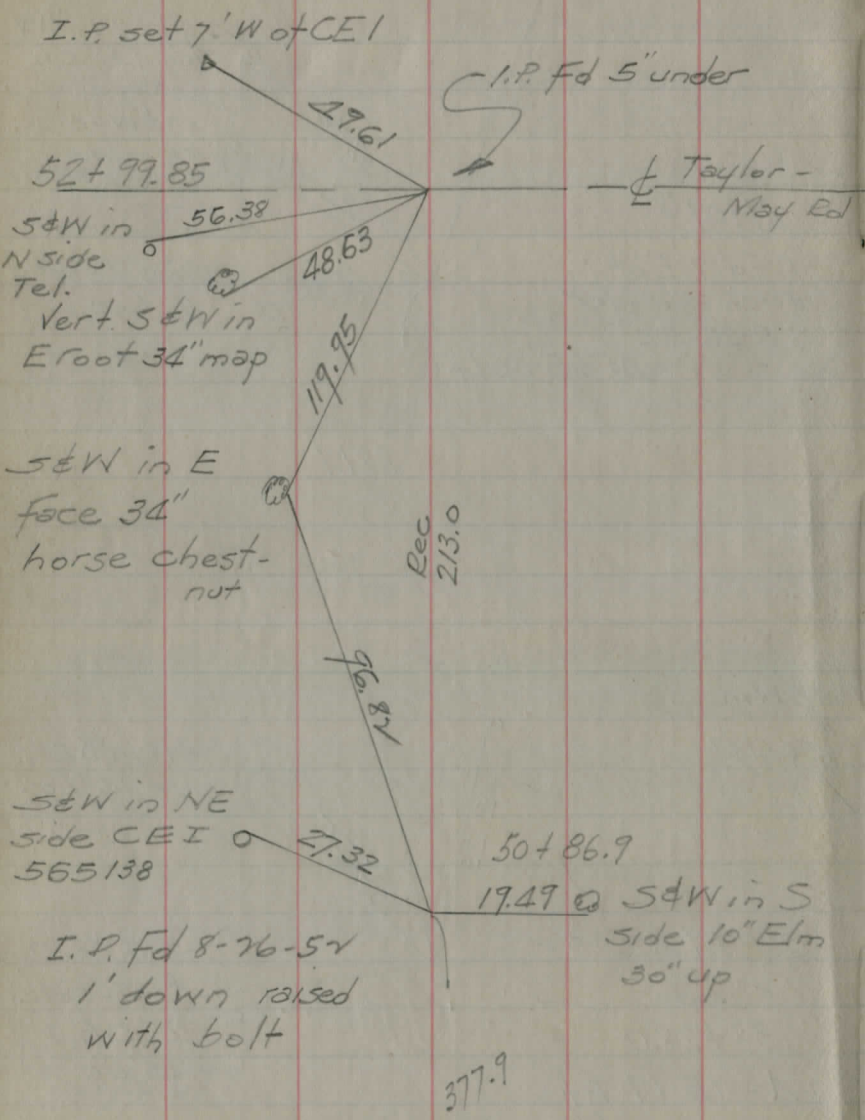
17+09<sup>10</sup>  
I.P. Fd 7' E of ditch 3" under  
8-26-52  
 $\Delta = 25.30 \text{ Lt}$



SEW in  
# 565147

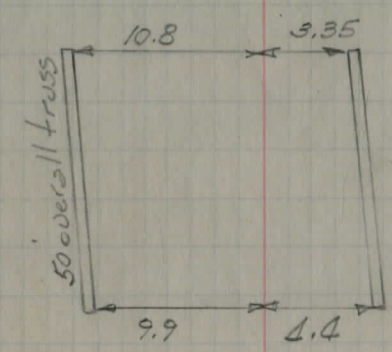
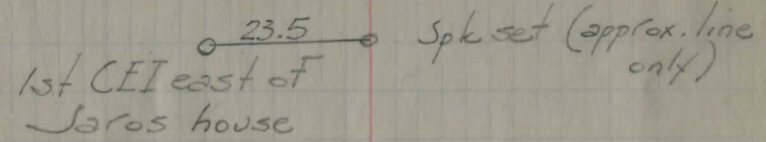
I.P. Fd 8-26-52  
5' under  
38+28.0  
 $\Delta = 15.19 \text{ Rt}$



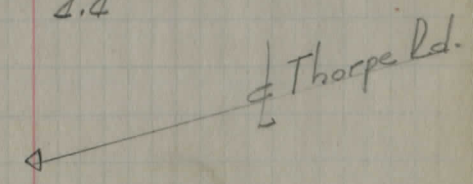


Fd Nov '61  
 2" □ iron pin 14" under

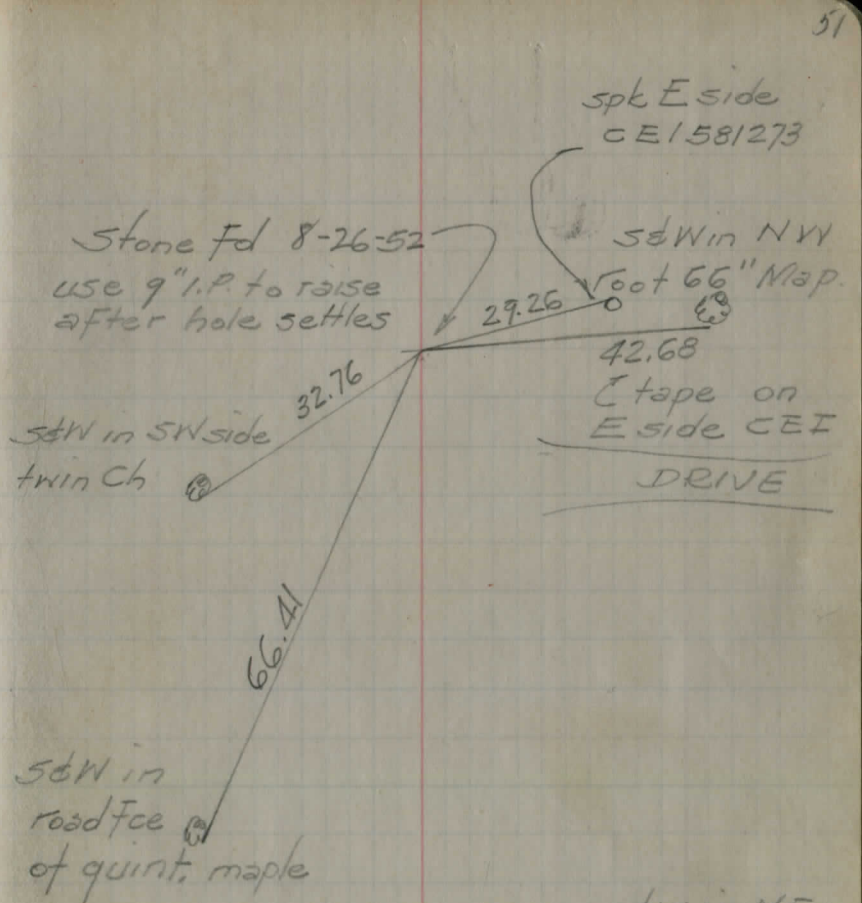
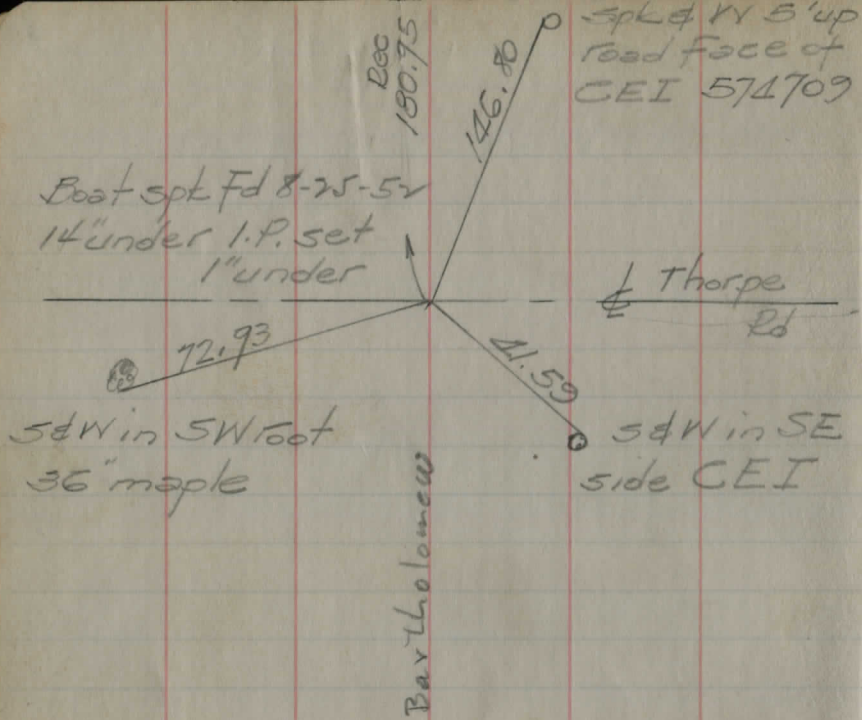
Pomeroy-Diedrich

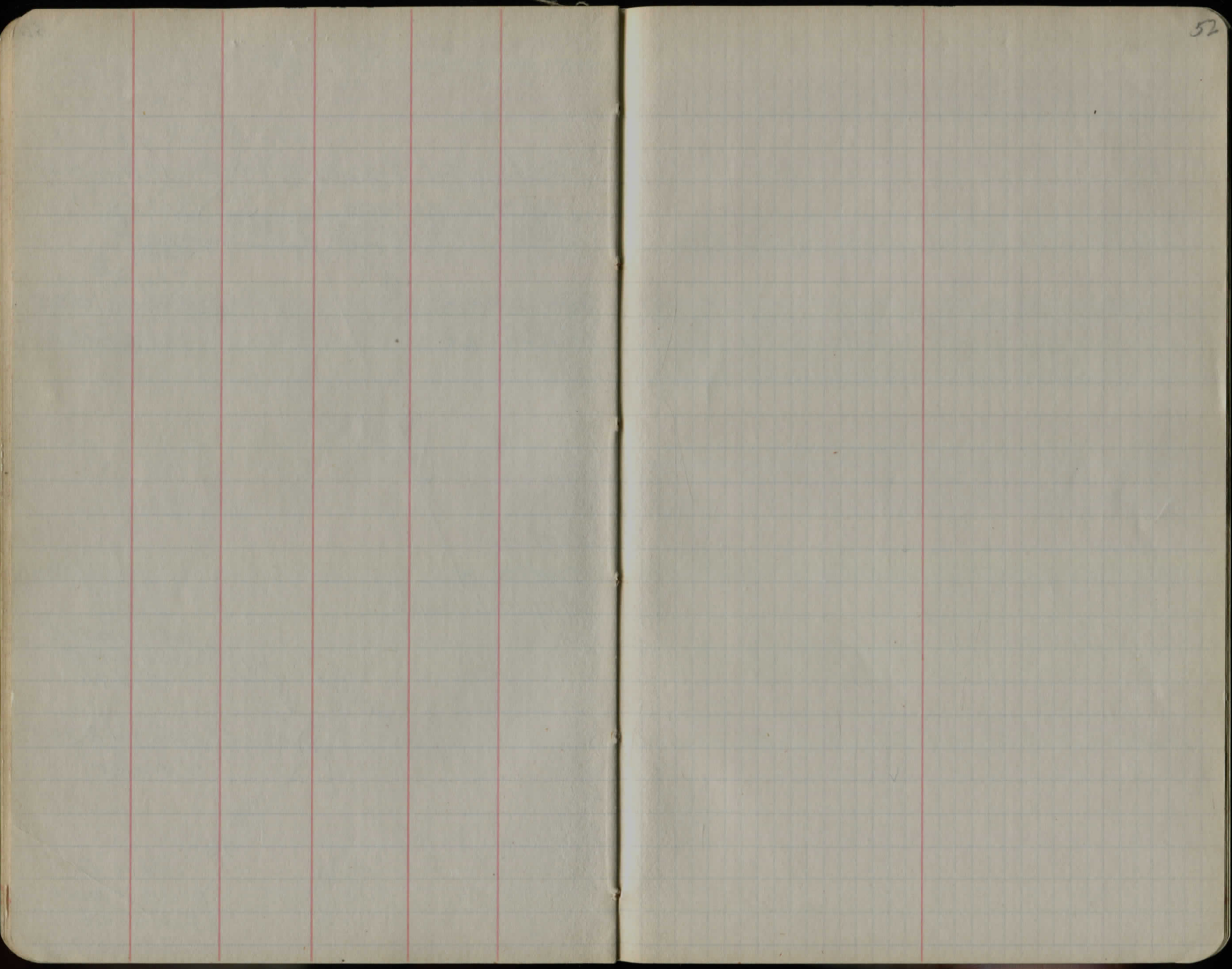


I.P. Fd 3" under Nov '61  
 See ref left side this sheet

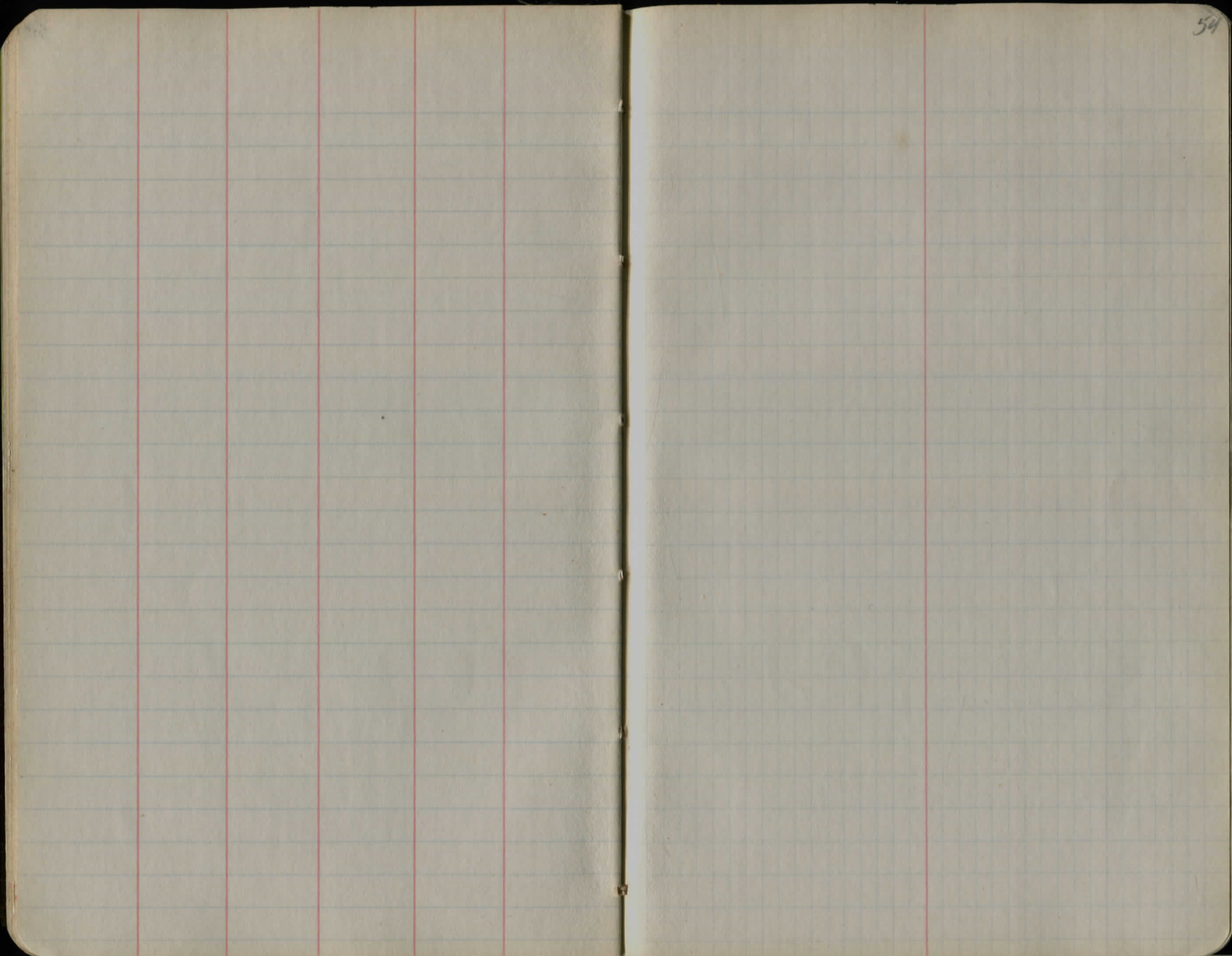


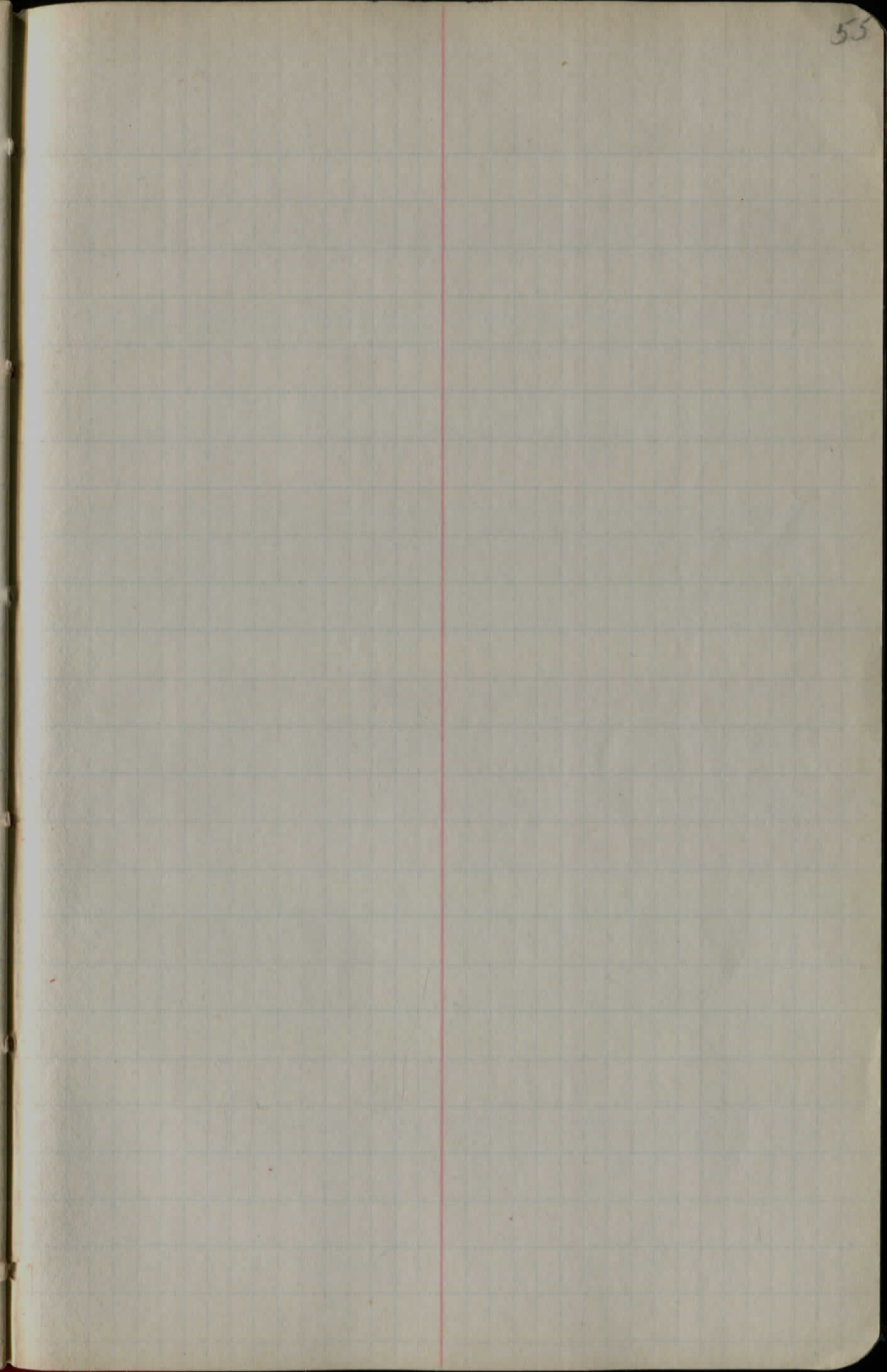
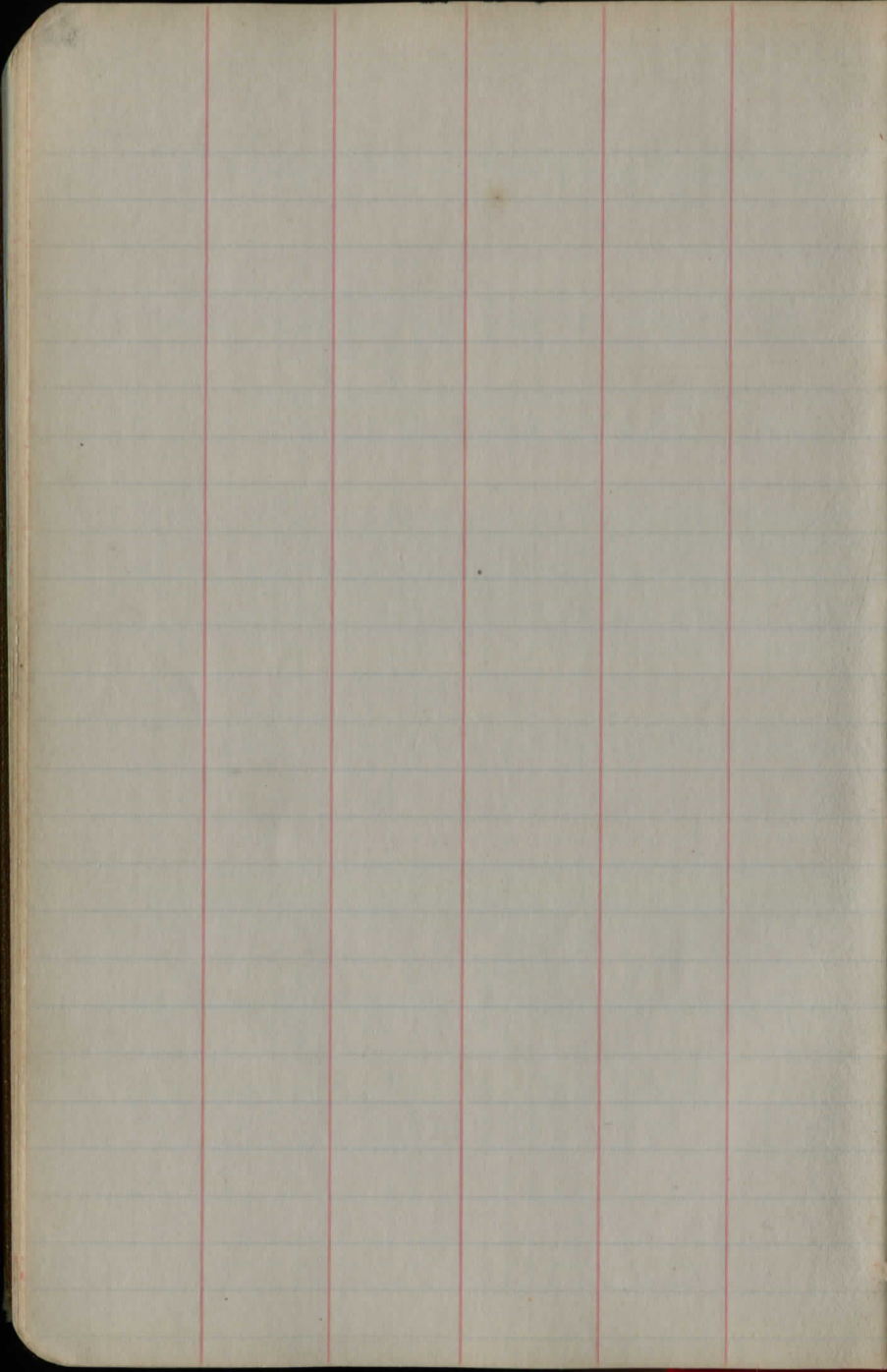
BARTHOLOMEW ROAD



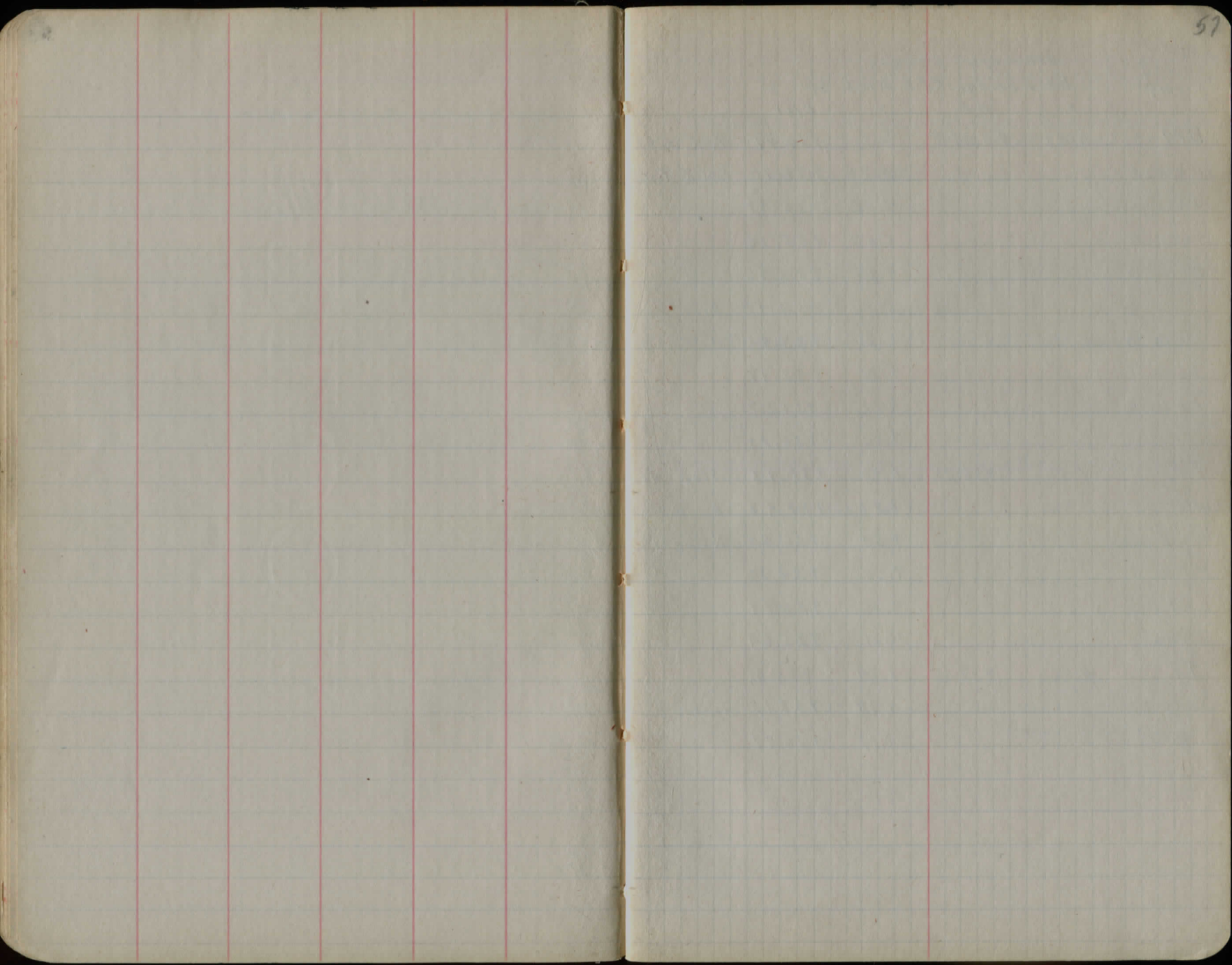












July 1929 Warm 84°

H. Patterson  
P. Young  
D. Ever

Drainage Levels  
Bainbridge Rd & Arch St

+ HI - Elev.

	+	HI	-	Elev.	
BM	3.49	940.93		936.94	X CUT NW & Hdwl. Culvert Sta 3+81 Arch St. Plans.
0+0 A			0.77	939.70	SW & Kehoe's Lumber Parking Lot.
1+0 A			4.06	936.37	
1+50 A			5.07	935.36	
0+0 B			4.97	935.46	
B			6.30	934.13	Door Step way at Roller Rink Front Bldg.
+50 B			6.54	933.93	at Conc. box for 8" Drainline 21" x 21" ID Square box
1+00 B			8.25	932.18	
1+30 B			8.76	931.67	
			9.50	930.93	
T.P.	2.32	936.25	6.50	933.93	Step at Center Roller Rink on S. side Bldg. <small>Blocked tight w/silt &amp; det.</small>
Outlet			8.76	927.49	8" Sewer tile running W along N side st.
" E Barrel			9.60	926.65	N & S Two Barrel Culvert
" W "			9.65	926.60	
+30			9.36	926.89	
+40			10.61	925.64	
T.P.	4.05	938.06	2.24	934.01	
			5.94	932.12	Inlet S. Tile restricted to 6" by opening in manhole - tile 8 max. Plugged w/dirt & stone <sup>side</sup>
B.M.			1.12	936.94	



H. Patterson  
T. Adams  
P. Young

12-24-57

Cold - Windy

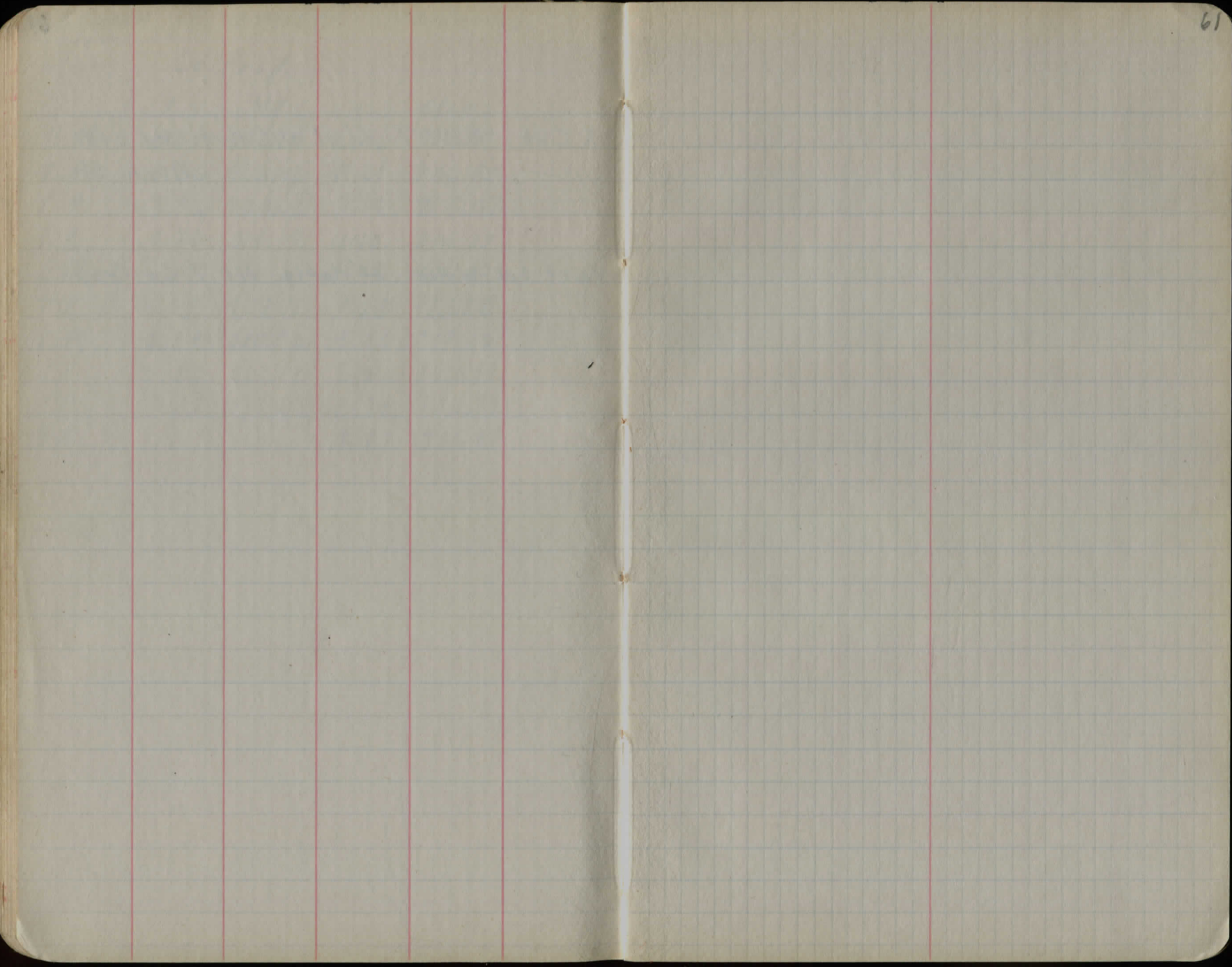
60

Co. Prop.

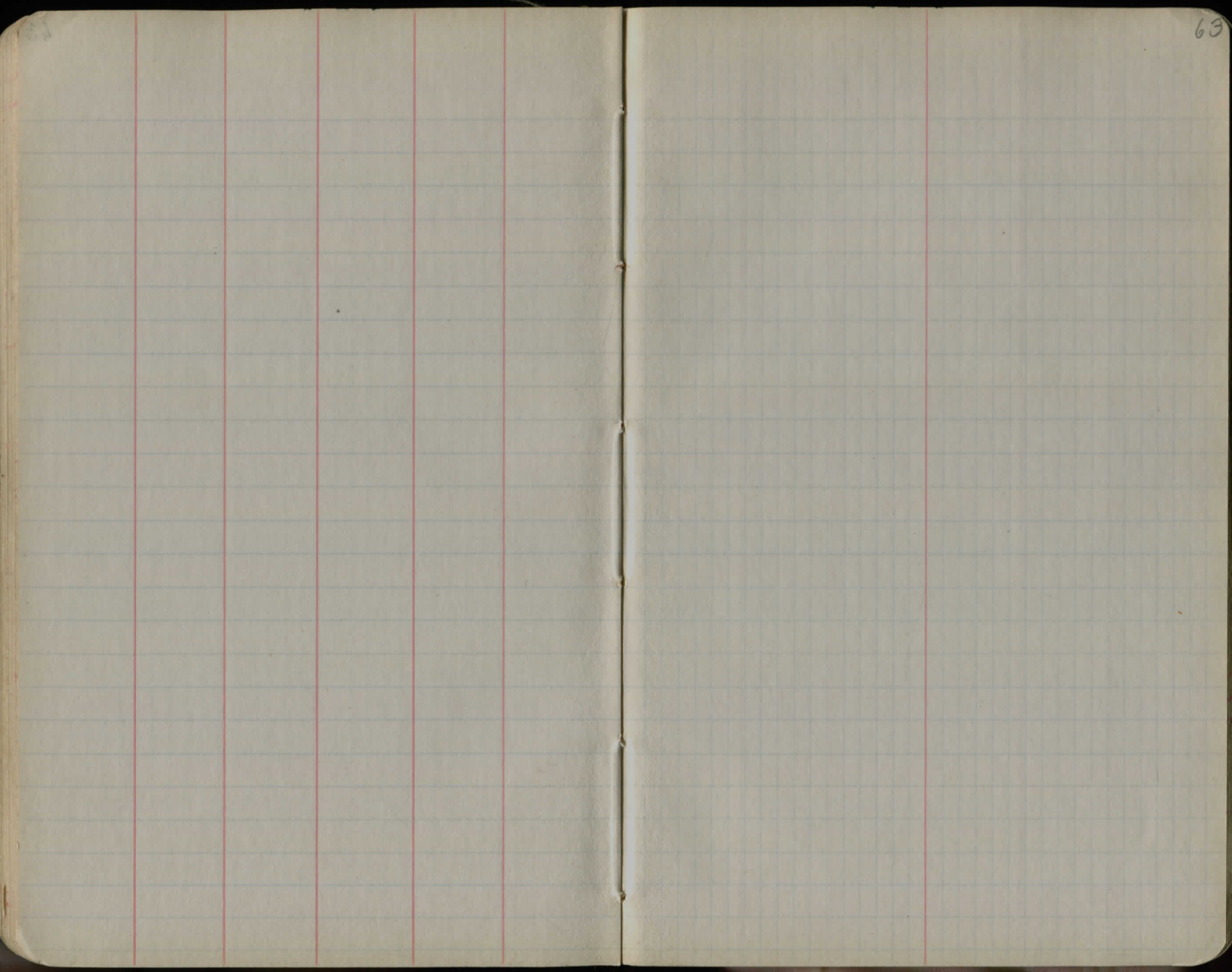
	t	HI	-	Elev
BM	0.85	937.79		936.94
T.P.	0.26	926.81	11.24	926.55
T.P.	1.96	920.03	8.74	918.07
T.P.	5.78	914.17	11.64	908.39
B.M.			8.14	906.03
TP	8.39	922.31	0.25	913.92
TP	6.34	924.50	4.15	918.16
TP	9.23	932.11	1.62	922.88
TP	7.57	939.34	0.34	931.77
BM			2.53	936.81

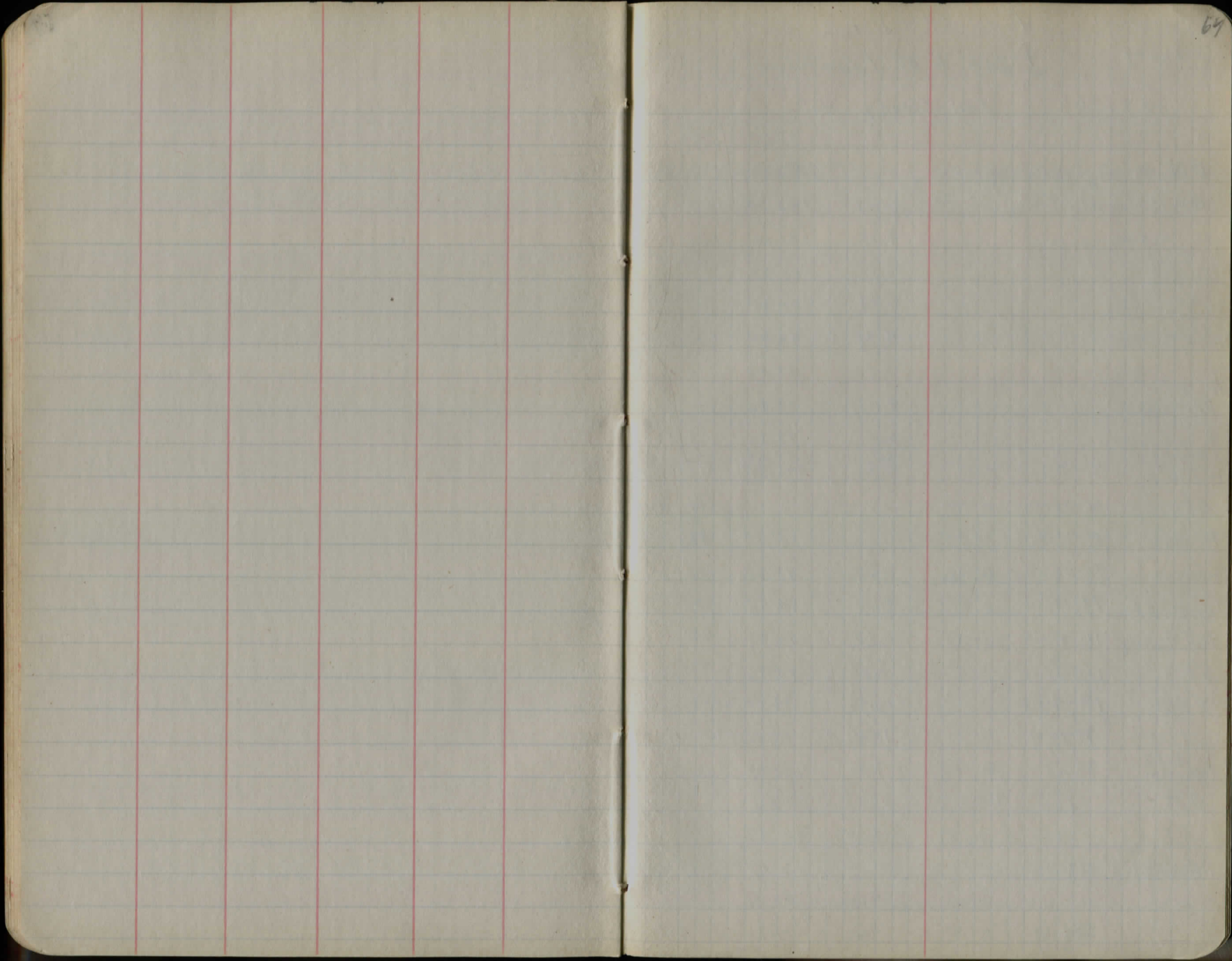
X Cut NW 7 Hdwl. W. Culvt. Sta. 3+81  
Arch St

Vert Spk W. Root. 20' Maple NE 7 Co. Prop.





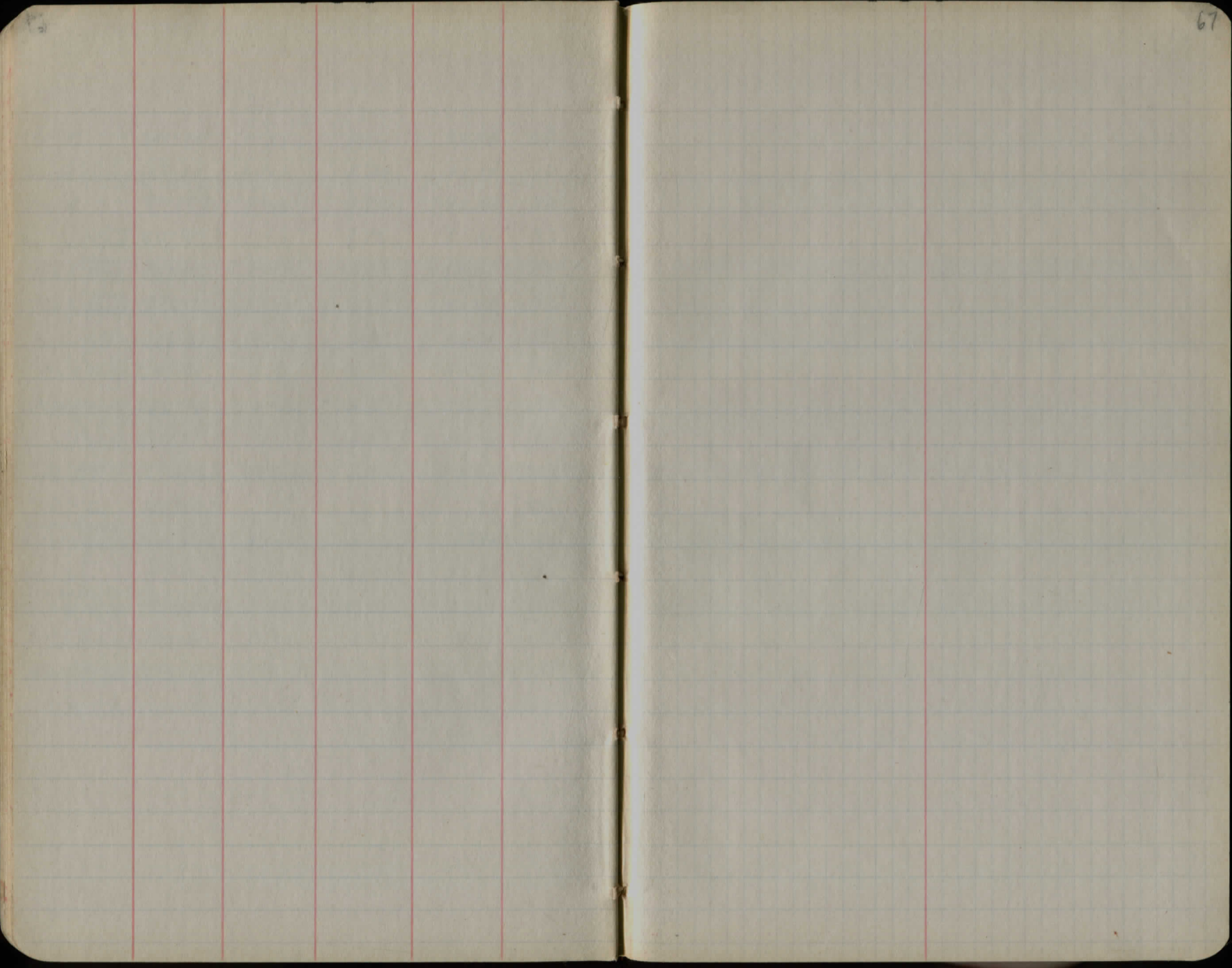


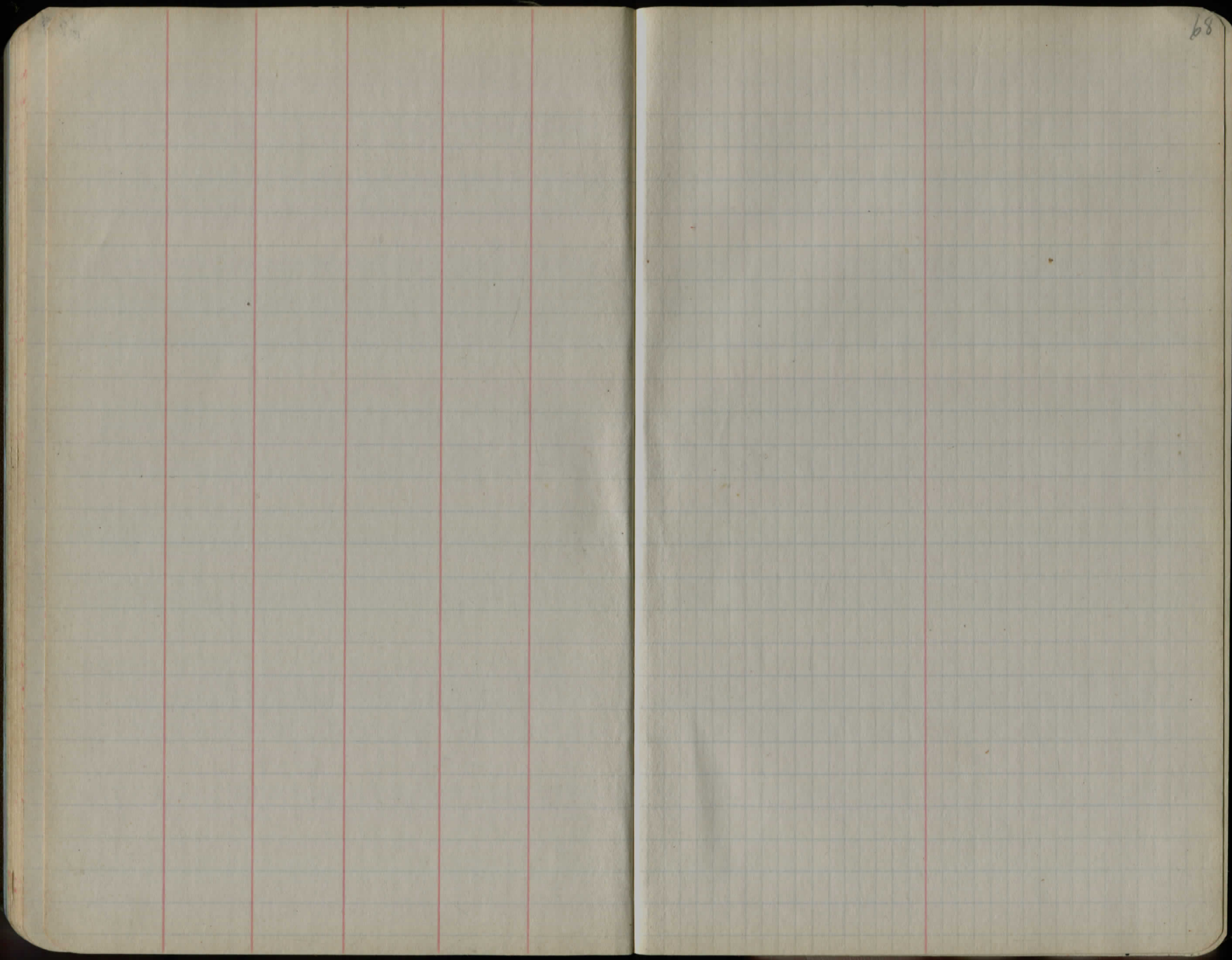


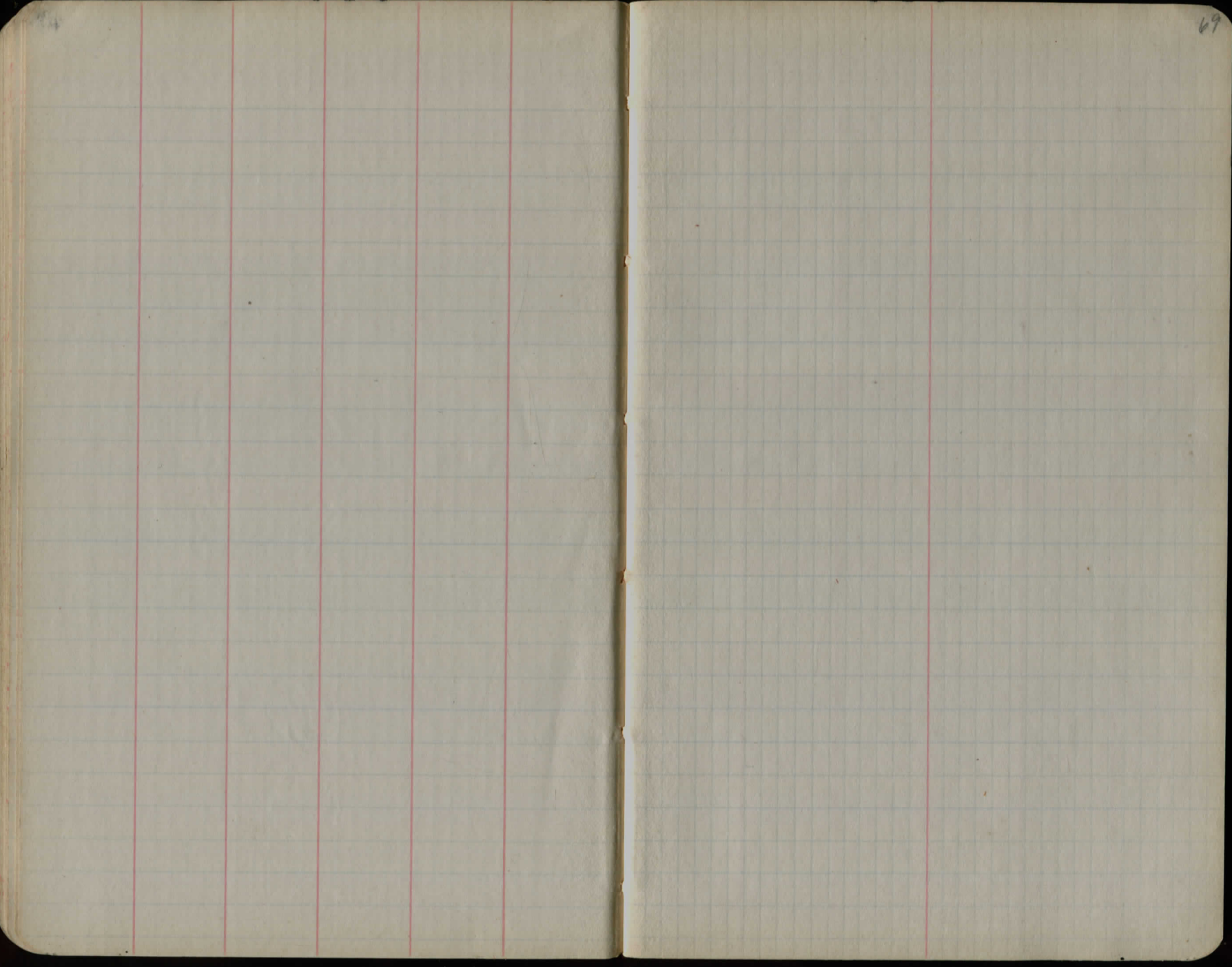


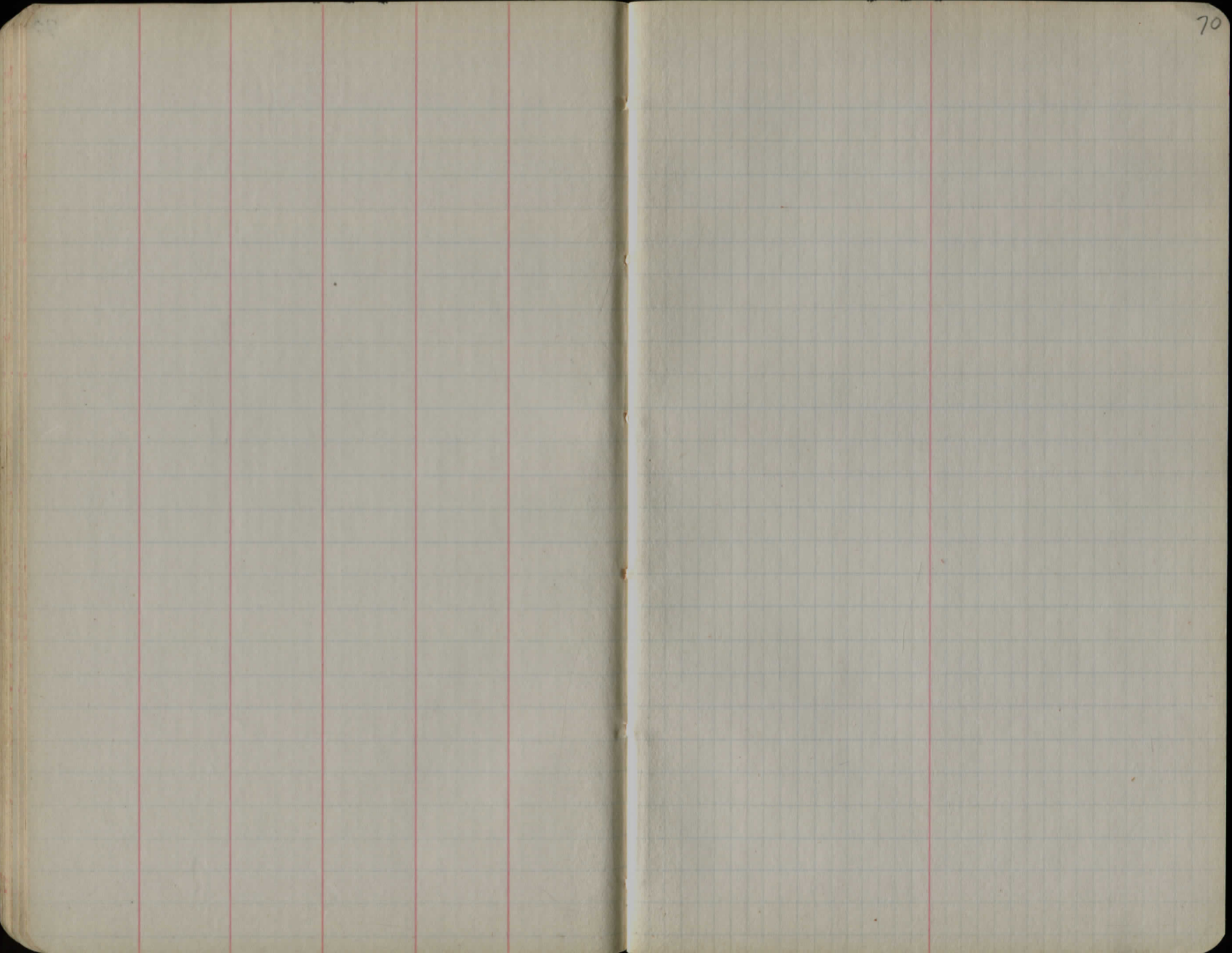
96.53

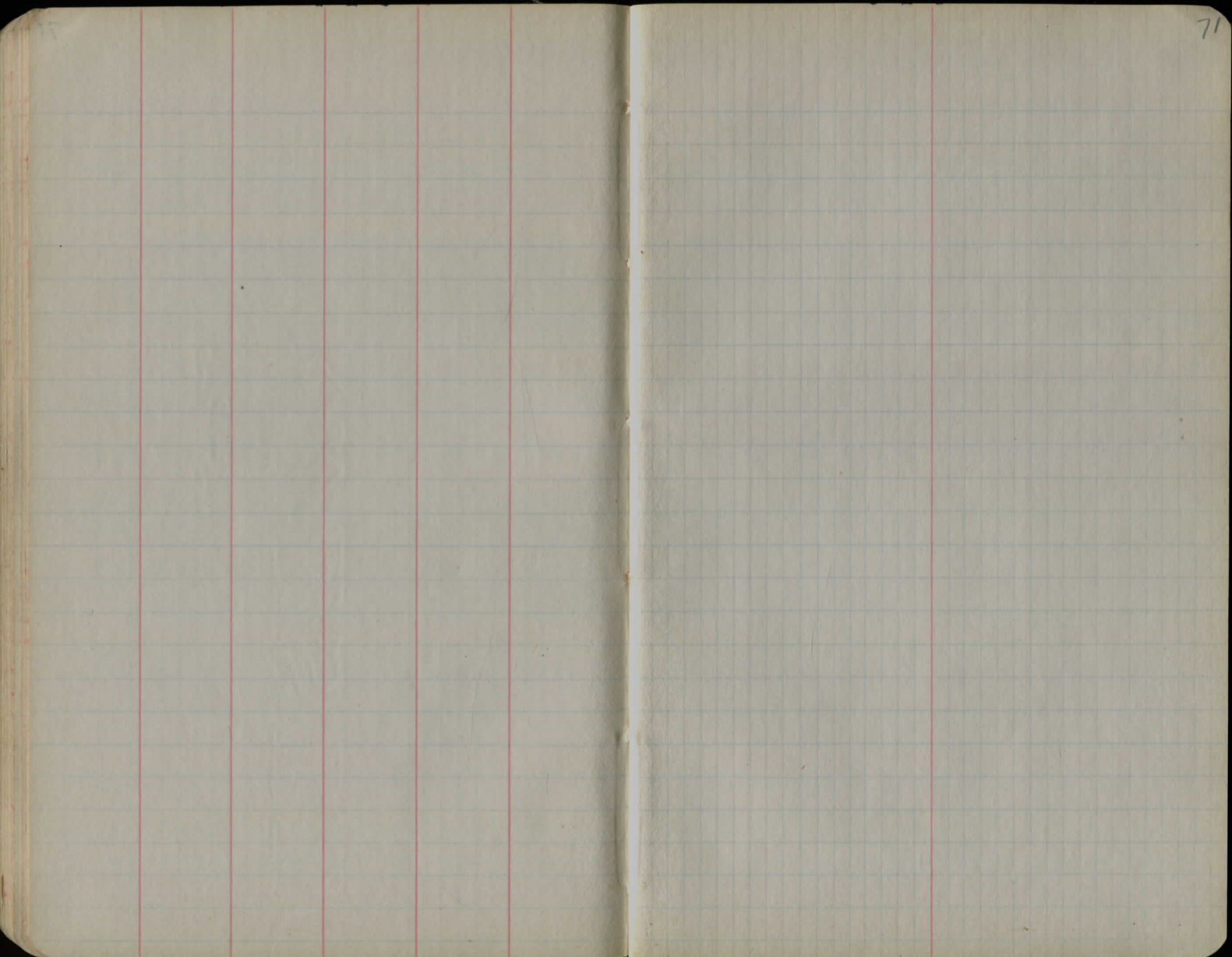
C-B	244-05	0-00	5.76	90.57	39'
Ground Level	158-58	0-00	5.25	91.28	10'
Prop 4	89-58-30	0-00	3.86	92.67	34'
Prop line <sup>10m</sup> to Ground	253-52	0-00	7.12	89.41	92'
SE 4 House <sup>Garage</sup>	257-53	0-00	6.65	89.85	91'
NE 4 House <sup>Garage</sup>	272-35	0-00	6.05	90.48	96'
Ground level	256-37	0-00	6.09	90.44	135'
NE 4 House	249-31	0-00	5.80	90.73	140'
NW 4 House	252-05	0-00	6.39	90.14	180'
Ground level	255-48	0-00	6.57	89.96	180'
Side Walk TP	3.76	93.37	6.92	89.61	202'
D-C	255-43-30				256'
Ed. Peter Franklin Outlet Pipe	354-16-00	0-00	5.63	87.74	36'
Inlet Drive	49-41	0-00	6.10	87.27	50'
Top Grate Manhole	81-55-00	0-00	6.16	87.21	168'
SW 4 House	350-00	0-00	2.86	90.51	77'
NW 4 House	334-11				87'













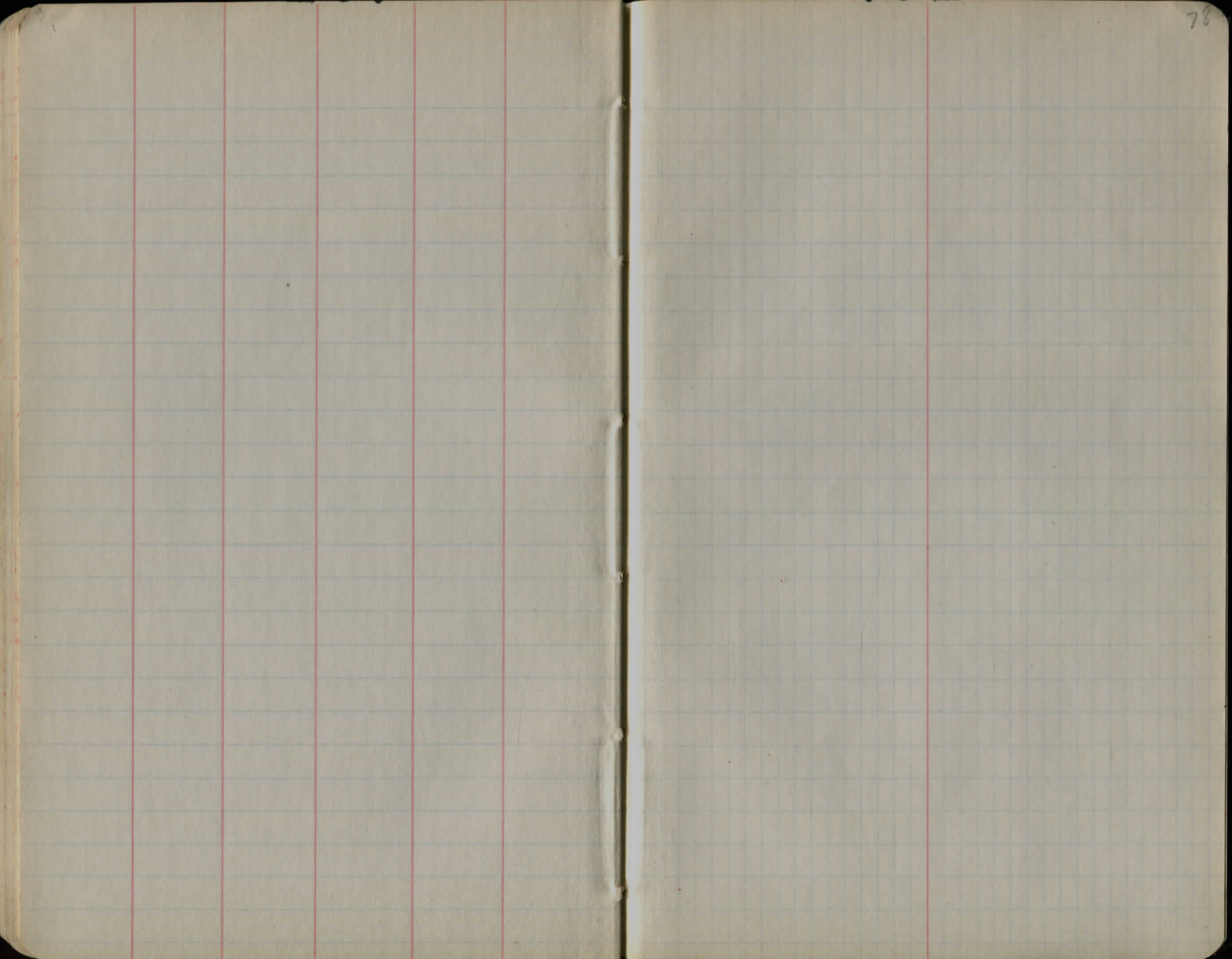












56.25  
47.65  

---

8.60

56.25  
45.10  

---

11.15

56.25  
49.30  

---

6.95

56.25  
50.50  

---

5.75

56.25  
49.9  

---

6.35

51.39  
42.2  

---

9.19

41.43  
34.2  

---

7.23

41.43  
36.3  

---

5.13

41.43  
33.4  

---

8.03

30.92  
27.4  

---

3.52

30.92  
22.5  

---

8.42

DIRECTIONS FOR USE OF TABLES

TABLE I.

Distance of base from side or shoulder  
table for any width roadway slope 1 1/2 to 1.  
If ground is nearly level, the cut or fill at side  
table is located by the double entry method in  
for column and top row. The number in both  
of table in same row and column gives distance

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IMPROVED TABLES

AND

INFORMATION

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## DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope  $1\frac{1}{2}$  to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in left column and top row. The number in body of table in same row and column gives distance from side stake to slope stake. If ground is not level estimate the difference in elevation between the side stake and slope stake, lower target by this amount if cut, elevate if fill. Add this amount to cut or fill and find distance in table. Set up rod at this point, and line of sight should cut target. If it does not make the slight adjustment necessary.

TABLE No. 9.

To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of corrections.

Degree of curve with a given I may be found by dividing tangent, (or external), opposite I by given tangent, (or external).

The distance from a point on the tangent to the curve is very nearly the square of the tangent length divided by twice the radius.

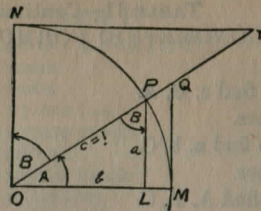


TABLE II  
TRIGONOMETRIC FORMULÆ.

$$\angle A = \angle MOP \quad \angle B = \angle PON = \angle OPL$$

$$R = OB = c = 1$$

$$\sin A = \frac{a}{c} = \frac{a}{1} = a = \cos B = LP$$

$$\cos A = \frac{b}{c} = \frac{b}{1} = b = \sin B = OL$$

$$\tan A = \frac{a}{b} = \frac{MQ}{OM} = \frac{MQ}{1} = MQ = \cot B = MQ$$

$$\cot A = \frac{NT}{ON} = \frac{NT}{1} = NT = \tan B = NT$$

$$\sec A = \frac{OQ}{OM} = \frac{OQ}{1} = OQ = \csc B = OQ$$

$$\csc A = \frac{OT}{ON} = \frac{OT}{1} = OT = \sec B = OT$$

$$\text{vers } A = \frac{LM}{OP} = LM = \text{covers } B \#$$

$$\text{covers } A = \frac{OP - LP}{OP} = OP - LP = \text{vers } B$$

$$\text{exsec } A = PQ = \text{coexsec } B$$

$$\text{coexsec } A = PT = \text{exsec } B$$

$$\sin \frac{1}{2} A = \sqrt{\frac{1 - \cos A}{2}} \quad \cos \frac{1}{2} A = \sqrt{\frac{1 + \cos A}{2}}$$

$$\sin 2A = 2 \sin A \cos A \quad \cos 2A = \cos^2 A - \sin^2 A$$

$$\text{Law of Lines} \quad \frac{\sin A}{a} = \frac{\sin B}{B} = \frac{\sin C}{C}$$

$$\text{Law of Cosines} \quad c^2 = a^2 + b^2 - 2ab \cos C$$

$$\text{Law of Tangents} \quad \frac{a+b}{a-b} = \frac{\tan \frac{1}{2}(A+B)}{\tan \frac{1}{2}(A-B)}$$

TABLE II—Continued  
TRIGONOMETRIC FORMULAE (continued)

In any triangle:

Given a, b, C; to find c, B, A.

Use Law of Lines.

Given A, B, c; to find a, b, C.

Use Law of Lines.

Given a, b, c; to find A, B, C.

$$\text{Let } \frac{a+b+c}{2} = s, \sqrt{\frac{(s-a)(s-b)(s-c)}{s}} = r$$

$$\cos \frac{1}{2} A = \sqrt{\frac{s(s-a)}{bc}}$$

$$\tan \frac{1}{2} A = \frac{r}{s-a}$$

$$\tan \frac{1}{2} B = \frac{r}{s-b}$$

$$\tan \frac{1}{2} C = \frac{r}{s-c}$$

Area of a triangle:

$$\text{Area} = \frac{1}{2} ab \sin C$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

PRISMOIDAL FORMULA.

$$\text{Vol.} = \frac{h}{6} (B+b+4M)$$

h = altitude; b, B = bases; M = midsection

TABLE III  
INCHES AND FRACTIONS OF AN INCH IN DECIMALS OF A FOOT

	0	1	2	3	4	5	6	7	8	9	10	11	
$\frac{1}{16}$	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219	$\frac{1}{16}$
$\frac{1}{8}$	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271	$\frac{1}{8}$
$\frac{3}{16}$	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323	$\frac{3}{16}$
$\frac{1}{4}$	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375	$\frac{1}{4}$
$\frac{5}{16}$	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427	$\frac{5}{16}$
$\frac{3}{8}$	.0313	.1146	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479	$\frac{3}{8}$
$\frac{7}{16}$	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531	$\frac{7}{16}$
$\frac{1}{2}$	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583	$\frac{1}{2}$
$\frac{9}{16}$	.0469	.1302	.2135	.2969	.3803	.4635	.5469	.6302	.7135	.7969	.8802	.9635	$\frac{9}{16}$
$\frac{5}{8}$	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688	$\frac{5}{8}$
$\frac{11}{16}$	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740	$\frac{11}{16}$
$\frac{3}{4}$	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792	$\frac{3}{4}$
$\frac{7}{8}$	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844	$\frac{7}{8}$
$\frac{15}{16}$	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896	$\frac{15}{16}$
1	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948	1
	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	1.000	
	0	1	2	3	4	5	6	7	8	9	10	11	

TABLE IV  
USEFUL RELATIONS.

Lineal feet	×.00019	= miles
Lineal yards	×.0006	= miles
Square inches	×.007	= square feet
Square feet	×.111	= square yards
Square yards	×.0002067	= acres
Acres	×4840	= square yards
Cubic inches	×.00058	= cubic feet
Cubic feet	×.03704	= cubic yards
Links	×.22	= yards
Links	×.66	= feet
Feet	×1.5	= links
360°	= 21600'	= 1296000"
Radius	= arc of 57.2957790°	
Arc of 1°	(radius = 1) =	.017453292
Arc of 1'	(radius = 1) =	.000290888
Arc of 1"	(radius = 1) =	.000004843

$$\pi = 3.141592654 \quad \sqrt{\frac{1}{\pi}} = 0.564190$$

$$\frac{\pi}{4} = 0.785398163 \quad \sqrt[3]{\frac{6}{\pi}} = 1.240700982$$

$$\frac{\pi}{6} = 0.523598776 \quad \pi^2 = 9.869604401$$

$$\sqrt{\frac{4}{\pi}} = 1.128379167 \quad \frac{1}{\pi^2} = 0.101321184$$

$$\frac{\pi}{6} = 0.523598776 \quad \sqrt{\pi} = 1.772453851$$

$$\frac{4\pi}{3} = 4.188790205 \quad \frac{1}{\pi} = 0.3183099$$

Curvature of Earth's surface = about 0.7 feet in 1 mile

Curvature in feet = 0.667 (Dist. in miles)<sup>2</sup>

Difference between arc and chord length, 0.05 feet in 11½ miles

$$\text{Probable error of a single observation} = 0.6754 \sqrt{\frac{\sum v^2}{n-1}}$$

Error in chaining of 0.01 feet in 100 feet:

Due to—

1. Length of tape error of 0.01 feet
2. Alignment. One end 1.4 feet out of line
3. Sag of tape at centre of 0.61 feet.
4. Temperature difference of 15°
5. Difference of pull of 15 lbs.

STADIA REDUCTION FORMULAE.

Horizontal Distance = R - R sin<sup>2</sup> a + C cos a

Vertical Distance = R ½ sin 2 a + C sin a

R = Reading ×  $\frac{\text{distance from Object glass to cross hairs}}{\text{distance between cross hairs}}$

C = distance from Object glass to cross hairs + distance from Object glass to center of instrument.

a = angle of elevation for mid Reading



TABLE VI (continued)  
SINES, COSINES, TANGENTS, COTANGENTS (continued)

deg	sin 0'	tan 0'	sin 10'	tan 10'	sin 20'	tan 20'	sin 30'	tan 30'	sin 40'	tan 40'	sin 50'	tan 50'	deg
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
									1.2203				
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	.2647	7753	1.2276	39
51	771	.2349	790	.2423	808	.2497	826	.2572	844	.3111	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3597	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.4106	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4641	175	.4193	35
55	192	.4281	208	.4370	225	.4460	241	.4550	258	.5204	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5798	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.6426	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.7090	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631		646	.7205	30
60	660	1.7321	8675	1.7437	8689	1.7556	8704	1.7675	8718	1.7797	8732	1.7917	29
61	746	.8040	760	.8165	774	.8291	788	.8418	802	.8546	816	.8676	28
62	829	.8807	843	.8940	857	.9074	870	.9210	884	.9347	897	.9486	27
63	910	.9626	923	.9768	936	.9912	949	2.0057	962	2.0204	975	2.0353	26
64	988	2.0503	9001	2.0655	9013	2.0809	9026	.0965	9038	.1123	9051	.1283	25
65	9063	.1445	075	.1609	088	.1775	100	.1943	112	.2113	124	.2286	24
66	135	.2460	147	.2637	159	.2817	171	.2998	182	.3183	194	.3369	23
67	205	.3559	216	.3750	228	.3945	239	.4142	250	.4342	261	.4545	22
68	272	.4751	283	.4960	293	.5172	304	.5386	315	.5605	325	.5826	21
69	336	.6051	346	.6279	356	.6511	367	.6746	377	.6985	387	.7228	20
70	397	2.7475	9407	2.7725	9417	2.7980	9426	2.8239	9436	2.8502	9446	2.8770	19
71	455	.9042	465	.9319	474	.9600	483	.9887	492	3.0178	502	3.0475	18
72	511	3.0777	520	3.1084	528	3.1397	537	3.1716	546	.2041	555	.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	.5764	10
80	9848	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	922	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.078	954	10.385	957	10.711	959	11.059	5
85	962	11.430	964	11.826	967	12.250	969	12.706	971	13.197	974	13.727	4
86	976	14.300	978	14.924	980	15.605	981	16.350	983	17.169	985	18.075	3
87	986	19.081	988	20.206	989	21.470	990	22.903	992	24.542	993	26.432	2
88	994	28.636	995	31.242	996	34.368	997	38.189	997	42.964	998	49.104	1
89	999	57.290	999	68.750	999	85.940	999	114.58	1.000	171.88	1.000	343.77	0
deg	60'	60'	50'	50'	40'	40'	30'	30'	20'	30'	10'	10'	deg
cos	cos	cot	cos	cot	cos	cot	cos	cot	cos	cot	cos	cot	

TABLE VII  
RODS IN FEET AND INCHES

Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches
1	16-6	21	346-6	41	676-6	61	1006-6	81	1336-6
2	33-0	22	363-0	42	693-0	62	1023-0	82	1353-0
3	49-6	23	379-6	43	709-6	63	1039-6	83	1369-6
4	66-0	24	396-0	44	726-0	64	1056-0	84	1386-0
5	82-6	25	412-6	45	742-6	65	1072-6	85	1402-6
6	99-0	26	429-0	46	759-0	66	1089-0	86	1419-0
7	115-6	27	445-6	47	775-6	67	1105-6	87	1435-6
8	132-0	28	462-0	48	792-0	68	1122-0	88	1452-0
9	148-6	29	478-6	49	808-6	69	1138-6	89	1468-6
10	165-0	30	495-0	50	825-0	70	1155-0	90	1485-0
11	181-6	31	511-6	51	841-6	71	1171-6	91	1501-6
12	198-0	32	528-0	52	858-0	72	1188-0	92	1518-0
13	214-6	33	544-6	53	874-6	73	1204-6	93	1534-6
14	231-0	34	561-0	54	891-0	74	1221-0	94	1551-0
15	247-6	35	577-6	55	907-6	75	1237-6	95	1567-6
16	264-0	36	594-0	56	924-0	76	1254-0	96	1584-0
17	280-6	37	610-6	57	940-6	77	1270-6	97	1600-6
18	297-0	38	627-0	58	957-0	78	1287-0	98	1617-0
19	313-6	39	643-6	59	973-6	79	1303-6	99	1633-6
20	330-0	40	660-0	60	990-0	80	1320-0	100	1650-0

TABLE VIII  
LINKS IN FEET AND INCHES

Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches
1	0-7.92	18	11-10.56	35	23-1.20	52	34-3.84	69	45-6.48	86	56-9.12
2	1-3.84	19	12-6.48	36	23-9.12	53	34-11.76	70	46-2.40	87	57-5.04
3	1-11.76	20	13-2.40	37	24-5.04	54	35-7.68	71	46-10.32	88	58-0.96
4	2-7.68	21	13-10.32	38	25-0.96	55	36-3.60	72	47-6.24	89	58-8.88
5	3-3.60	22	14-6.24	39	25-8.88	56	36-11.52	73	48-2.16	90	59-4.80
6	3-11.52	23	15-2.16	40	26-4.80	57	37-7.44	74	48-10.08	91	60-0.72
7	4-7.44	24	15-10.08	41	27-0.72	58	38-3.36	75	49-6.00	92	60-8.64
8	5-3.36	25	16-6.00	42	27-8.64	59	38-11.28	76	50-1.92	93	61-4.56
9	5-11.28	26	17-1.92	43	28-4.56	60	39-7.20	77	50-9.84	94	62-0.48
10	6-7.20	27	17-9.84	44	29-0.48	61	40-3.12	78	51-5.76	95	62-8.40
11	7-3.12	28	18-5.76	45	29-8.40	62	40-11.04	79	52-1.68	96	63-4.32
12	7-11.04	29	19-1.68	46	30-4.32	63	41-6.96	80	52-9.60	97	64-0.24
13	8-6.96	30	19-9.60	47	31-0.24	64	42-2.88	81	53-5.52	98	64-8.16
14	9-2.88	31	20-5.52	48	31-8.16	65	42-10.80	82	54-1.44	99	65-4.08
15	9-10.80	32	21-1.44	49	32-4.08	66	43-6.72	83	54-9.36	100	66-0.00
16	10-6.72	33	21-9.36	50	33-0.00	67	44-2.64	84	55-5.28	101	66-7.92
17	11-2.64	34	22-5.28	51	33-7.92	68	44-10.56	85	56-1.20	102	67-3.84

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218		11°	551.70	26.500		21°	1061.9	97.577	
10'	58.34	.297	+	10'	560.11	27.313	+	10'	1070.6	99.155	+
20'	66.67	.388	5° C.	20'	568.53	28.137		20'	1079.2	100.75	5° C.
30'	75.01	.491	T	30'	576.95	28.974	T	30'	1087.8	102.35	T
40'	83.34	.606	.03	40'	585.36	29.824	.06	40'	1096.4	103.97	.10
50'	91.68	.733	E	50'	593.79	30.686	.06	50'	1105.1	105.60	.13
2°	100.01	.873	.001	12°	602.21	31.561	.006	22°	1113.7	107.24	.013
10'	108.35	1.024		10'	610.64	32.447		10'	1122.4	108.90	
20'	116.68	1.188		20'	619.07	33.347		20'	1131.0	110.57	
30'	125.02	1.364		30'	627.50	34.259		30'	1139.7	112.25	
40'	133.36	1.552		40'	635.93	35.183		40'	1148.4	113.95	
50'	141.70	1.752		50'	644.37	36.120		50'	1157.0	115.66	
3°	150.04	1.964	10° C.	13°	652.81	37.070	10° C.	23°	1165.7	117.38	10° C.
10'	158.38	2.188	T	10'	661.25	38.031	T	10'	1174.4	119.12	T
20'	166.72	2.425	.06	20'	669.70	39.006	.13	20'	1183.1	120.87	.19
30'	175.06	2.674	E	30'	678.15	39.993	E	30'	1191.8	122.63	.26
40'	183.40	2.934	.003	40'	686.60	40.992	.011	40'	1200.5	124.41	.33
50'	191.74	3.207		50'	695.06	42.004		50'	1209.2	126.20	.40
4°	200.08	3.492	15° C.	14°	703.51	43.029	15° C.	24°	1217.9	128.00	15° C.
10'	208.43	3.790	T	10'	711.97	44.066	T	10'	1226.6	129.82	T
20'	216.77	4.099	.09	20'	720.44	45.116	.19	20'	1235.3	131.65	.26
30'	225.12	4.421	E	30'	728.90	46.178	E	30'	1244.0	133.50	.33
40'	233.47	4.755	.004	40'	737.37	47.253	.017	40'	1252.8	135.35	.40
50'	241.81	5.100		50'	745.85	48.341		50'	1261.5	137.23	.47
5°	250.16	5.459	20° C.	15°	754.32	49.441	20° C.	25°	1270.2	139.11	20° C.
10'	258.51	5.829	T	10'	762.80	50.554	T	10'	1279.0	141.01	T
20'	266.86	6.211	.09	20'	771.29	51.679	.19	20'	1287.7	142.93	.26
30'	275.21	6.606	E	30'	779.77	52.818	E	30'	1296.5	144.85	.33
40'	283.57	7.013	.004	40'	788.26	53.969	.017	40'	1305.3	146.79	.40
50'	291.92	7.432		50'	796.75	55.132		50'	1314.0	148.75	.47
6°	300.28	7.863	25° C.	16°	805.25	56.309	25° C.	26°	1322.8	150.71	25° C.
10'	308.64	8.307	T	10'	813.75	57.498	T	10'	1331.6	152.69	T
20'	316.99	8.762	.09	20'	822.25	58.699	.19	20'	1340.4	154.69	.26
30'	325.35	9.230	E	30'	830.76	59.914	E	30'	1349.2	156.70	.33
40'	333.71	9.710	.004	40'	839.27	61.141	.017	40'	1358.0	158.72	.40
50'	342.08	10.202		50'	847.78	62.381		50'	1366.8	160.76	.47
7°	350.44	10.707	30° C.	17°	856.30	63.634	30° C.	27°	1375.6	162.81	30° C.
10'	358.81	11.224	T	10'	864.82	64.900	T	10'	1384.4	164.86	T
20'	367.17	11.753	.09	20'	873.35	66.178	.19	20'	1393.2	166.95	.26
30'	375.54	12.294	E	30'	881.88	67.470	E	30'	1402.0	169.04	.33
40'	383.91	12.847	.004	40'	890.41	68.774	.017	40'	1410.9	171.15	.40
50'	392.28	13.413		50'	898.95	70.091		50'	1419.7	173.27	.47
8°	400.66	13.991	35° C.	18°	907.49	71.421	35° C.	28°	1428.6	175.41	35° C.
10'	409.03	14.582	T	10'	916.03	72.764	T	10'	1437.4	177.55	T
20'	417.41	15.184	.09	20'	924.58	74.119	.19	20'	1446.3	179.72	.26
30'	425.79	15.799	E	30'	933.13	75.488	E	30'	1455.1	181.89	.33
40'	434.17	16.426	.004	40'	941.69	76.869	.017	40'	1464.0	184.08	.40
50'	442.55	17.065		50'	950.25	78.264		50'	1472.9	186.29	.47
9°	450.93	17.717	40° C.	19°	958.81	79.671	40° C.	29°	1481.8	188.51	40° C.
10'	459.32	18.381	T	10'	967.38	81.092	T	10'	1490.7	190.74	T
20'	467.71	19.058	.09	20'	975.96	82.525	.19	20'	1499.6	192.99	.26
30'	476.10	19.746	E	30'	984.53	83.972	E	30'	1508.5	195.25	.33
40'	484.49	20.447	.004	40'	993.12	85.431	.017	40'	1517.4	197.53	.40
50'	492.88	21.161		50'	1001.7	86.904		50'	1526.3	199.82	.47
10°	501.28	21.887	45° C.	20°	1010.3	88.389	45° C.	30°	1535.3	202.12	45° C.
10'	509.68	22.624	T	10'	1018.9	89.888	T	10'	1544.2	204.44	T
20'	518.08	23.375	.09	20'	1027.5	91.399	.19	20'	1553.1	206.77	.26
30'	526.48	24.138	E	30'	1036.1	92.924	E	30'	1562.1	209.12	.33
40'	534.89	24.913	.004	40'	1044.7	94.462	.017	40'	1571.0	211.48	.40
50'	543.29	25.700		50'	1053.3	96.013		50'	1580.0	213.86	.47

T = R tan ½ I

E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10'	1598.0	218.7	5° C.	10'	2151.7	390.7	5° C.	10'	2743.1	622.8	5° C.
20'	1606.9	221.1		20'	2161.2	394.1		20'	2753.4	627.2	
30'	1615.9	223.5	T	30'	2170.8	397.4	T	30'	2763.7	631.7	T
40'	1624.9	226.0	.13	40'	2180.3	400.8	.17	40'	2773.9	636.2	.21
50'	1633.9	228.4	E	50'	2189.9	404.2	E	50'	2784.2	640.7	E
32°	1643.0	230.9	.023	42°	2199.4	407.6	.037	52°	2794.5	645.2	.056
10'	1652.0	233.4		10'	2209.0	411.1		10'	2804.9	649.7	
20'	1661.0	235.9		20'	2218.6	414.5		20'	2815.2	654.3	
30'	1670.0	238.4		30'	2228.1	418.0		30'	2825.6	658.8	
40'	1679.1	241.0		40'	2237.7	421.4		40'	2835.9	663.4	
50'	1688.1	243.5		50'	2247.3	425.0		50'	2846.3	668.0	
33°	1697.2	246.1	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10'	1706.3	248.7	T	10'	2266.6	432.0	T	10'	2867.1	677.3	T
20'	1715.3	251.3	.26	20'	2276.2	435.6	.34	20'	2877.5	682.0	.42
30'	1724.4	253.9	E	30'	2285.9	439.2	E	30'	2888.0	686.7	E
40'	1733.5	256.5	.046	40'	2295.6	442.8	.075	40'	2898.4	691.4	.112
50'	1742.6	259.1		50'	2305.2	446.4		50'	2908.9	696.1	
34°	1751.7	261.8	15° C.	44°	2314.9	450.0	15° C.	54°	2919.4	700.9	15° C.
10'	1760.8	264.5	T	10'	2324.6	453.6	T	10'	2929.9	705.7	T
20'	1770.0	267.2	.33	20'	2334.3	457.3	.41	20'	2940.4	710.5	.49
30'	1779.1	269.9	E	30'	2344.1	461.0	E	30'	2951.0	715.3	E
40'	1788.2	272.6	.070	40'	2353.8	464.6	.097	40'	2961.5	720.1	.168
50'	1797.4	275.3		50'	2363.5	468.4		50'	2972.1	725.0	
35°	1806.6	278.1	20° C.	45°	2373.3	472.1	20° C.	55°	2982.7	729.9	20° C.
10'	1815.7	280.8	T	10'	2383.1	475.8	T	10'	2993.3	734.8	T
20'	1824.9	283.6	.40	20'	2392.8	479.6	.51	20'	3003.9	739.7	.53
30'	1834.1	286.4	E	30'	2402.6	483.4	E	30'	3014.5	744.6	E
40'	1843.3	289.2	.070	40'	2412.4	487.2	.116	40'	3025.2	749.6	.168
50'	1852.5	292.0		50'	2422.3	491.0		50'	3035.8	754.6	
36°	1861.7	294.9	25° C.	46°	2432.1	494.8	25° C.	56°	3046.5	759.6	25° C.
10'	1870.9	297.7	T	10'	2441.9	498.7	T	10'	3057.2	764.6	T
20'	1880.1	300.6	.53	20'	2451.8	502.5	.68	20'	3067.9	769.7	.68
30'	1889.4	303.5	E	30'	2461.7	506.4	E	30'	3078.7	774.7	E
40'	1898.6	306.4	.070	40'	2471.5	510.3	.116	40'	3089.4	779.8	.168
50'	1907.9	309.3		50'	2481.4	514.3		50'	3100.2	784.9	
37°	1917.1	312.2	30° C.	47°	2491.3	518.2	30° C.	57°	3110.9	790.1	30° C.
10'	1926.4	315.2	T	10'	2501.2	522.2	T	10'	3121.7	795.2	T
20'	1935.7	318.1	.53	20'	2511.2	526.1	.68	20'	3132.6	800.4	.68
30'	1945.0	321.1	E	30'	2521.1	530.1	E	30'	3143.4	805.6	E
40'	1954.3	324.1	.070	40'	2531.1	534.2	.116	40'	3154.2	810.9	.168
50'	1963.6	327.1		50'	2541.0	538.2		50'	3165.1	816.1	
38°	1972.9	330.2	35° C.	48°	2551.0	542.2	35° C.	58°	3176.0	821.4	35° C.
10'	1982.2	333.2	T	10'	2561.0	546.3	T	10'	3186.9	826.7	T
20'	1991.5	336.3	.53	20'	2571.0	550.4	.68	20'	3197.8	832.0	.68
30'	2000.9	339.3	E	30'	2581.0	554.5	E	30'	3208.8	837.3	E
40'	2010.2	342.4	.070	40							

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°			
61°	3375.0	920.2	+	71°	4086.9	1308.2	+	81°	4893.6	1805.3	+			
10'	3386.3	925.9		10'	4099.5	1315.6		10'	4908.0	1814.7		10'	4908.0	1814.7
20'	3397.5	931.6		20'	4112.1	1322.9		20'	4922.5	1824.1		20'	4922.5	1824.1
30'	3408.8	937.3		30'	4124.8	1330.3		30'	4937.0	1833.6		30'	4937.0	1833.6
40'	3420.1	943.1		40'	4137.4	1337.7		40'	4951.5	1843.1		40'	4951.5	1843.1
50'	3431.4	948.9	.25	50'	4150.1	1345.1	.30	50'	4966.1	1852.6	.36			
			E				E				E			
62°	3442.7	954.8	.080	72°	4162.8	1352.6	.110	82°	4980.7	1862.2	.149			
10'	3454.1	960.6		10'	4175.6	1360.1		10'	4995.4	1871.8				
20'	3465.4	966.5		20'	4188.5	1367.6		20'	5010.0	1881.5				
30'	3476.8	972.4		30'	4201.2	1375.2		30'	5024.8	1891.2				
40'	3488.3	978.3		40'	4214.0	1382.8		40'	5039.5	1900.9				
50'	3499.7	984.3		50'	4226.8	1390.4		50'	5054.3	1910.7				
63°	3511.1	990.2	10° C.	73°	4239.7	1398.0	10° C.	83°	5069.2	1920.5	10° C.			
10'	3522.6	996.2	T	10'	4252.6	1405.7	T	10'	5084.0	1930.4	T			
20'	3534.1	1002.3	.51	20'	4265.6	1413.5	.61	20'	5099.0	1940.3	.72			
30'	3545.6	1008.3	E	30'	4278.5	1421.2	E	30'	5113.9	1950.3	E			
40'	3557.2	1014.4	.159	40'	4291.5	1429.0	.220	40'	5128.9	1960.2	.299			
50'	3568.7	1020.5		50'	4304.6	1436.8		50'	5143.9	1970.3				
64°	3580.3	1026.6	15° C.	74°	4317.6	1444.6	15° C.	84°	5159.0	1980.4	15° C.			
10'	3591.9	1032.8		10'	4330.7	1452.5		10'	5174.1	1990.5		10'	5174.1	1990.5
20'	3603.5	1039.0			20'	4343.8		1460.4		20'		5189.3	2000.6	
30'	3615.1	1045.2			30'	4356.9		1468.4		30'		5204.4	2010.8	
40'	3626.8	1051.4			40'	4370.1		1476.4		40'		5219.7	2021.1	
50'	3638.5	1057.7		50'	4383.3	1484.4		50'	5234.9	2031.4				
65°	3650.2	1063.9	T	75°	4396.5	1492.4	T	85°	5250.3	2041.7	T			
10'	3661.9	1070.2	.76	10'	4409.8	1500.5	.91	10'	5265.6	2052.1	1.09			
20'	3673.7	1076.6	E	20'	4423.1	1508.6	E	20'	5281.0	2062.5	E			
30'	3685.4	1082.9	.240	30'	4436.4	1516.7	.332	30'	5296.4	2073.0	.450			
40'	3697.2	1089.3		40'	4449.7	1524.9		40'	5311.9	2083.5				
50'	3709.0	1095.7		50'	4463.1	1533.1		50'	5327.4	2094.1				
66°	3720.9	1102.2	20° C.	76°	4476.5	1541.4	20° C.	86°	5343.0	2104.7	20° C.			
10'	3732.7	1108.6		10'	4489.9	1549.7		10'	5358.6	2115.3		10'	5358.6	2115.3
20'	3744.6	1115.1			20'	4503.4		1558.0		20'		5374.2	2126.0	
30'	3756.5	1121.7			30'	4516.9		1566.3		30'		5389.9	2136.7	
40'	3768.5	1128.2			40'	4530.4		1574.7		40'		5405.6	2147.5	
50'	3780.4	1134.8		50'	4544.0	1583.1		50'	5421.4	2158.4				
67°	3792.4	1141.4	1.02	77°	4557.6	1591.6	1.22	87°	5437.2	2169.2	1.45			
10'	3804.4	1148.0	E	10'	4571.2	1600.1	E	10'	5453.1	2180.2	E			
20'	3816.4	1154.7	.321	20'	4584.8	1608.6	.445	20'	5469.0	2191.1	.603			
30'	3828.4	1161.3		30'	4598.5	1617.1		30'	5484.9	2202.2				
40'	3840.5	1168.1		40'	4612.2	1625.7		40'	5500.9	2213.2				
50'	3852.6	1174.8		50'	4626.0	1634.4		50'	5517.0	2224.3				
68°	3864.7	1181.6	25° C.	78°	4639.8	1643.0	25° C.	88°	5533.1	2235.5	25° C.			
10'	3876.8	1188.4		10'	4653.6	1651.7		10'	5549.2	2246.7		10'	5549.2	2246.7
20'	3889.0	1195.2			20'	4667.4		1660.5		20'		5565.4	2258.0	
30'	3901.2	1202.0			30'	4681.3		1669.2		30'		5581.6	2269.3	
40'	3913.4	1208.9			40'	4695.2		1678.1		40'		5597.8	2280.6	
50'	3925.6	1215.8		50'	4709.2	1686.9		50'	5614.2	2292.0				
69°	3937.9	1222.7	.403	79°	4723.2	1695.8	.558	89°	5630.5	2303.5	.756			
10'	3950.2	1229.7		10'	4737.2	1704.7		10'	5646.9	2315.0				
20'	3962.5	1236.7		20'	4751.2	1713.7		20'	5663.4	2326.6				
30'	3974.8	1243.7		30'	4765.3	1722.7		30'	5679.9	2338.2				
40'	3987.2	1250.8		40'	4779.4	1731.7		40'	5696.4	2349.8				
50'	3999.5	1257.9		50'	4793.6	1740.8		50'	5713.0	2361.5				
70°	4011.9	1265.0	30° C.	80°	4807.7	1749.9	30° C.	90°	5729.7	2373.3	30° C.			
10'	4024.4	1272.1	T	10'	4822.0	1759.0	T	10'	5746.3	2385.1	T			
20'	4036.8	1279.3	1.54	20'	4836.2	1768.2	1.84	20'	5763.1	2397.0	2.20			
30'	4049.3	1286.5	E	30'	4850.5	1777.4	E	30'	5779.9	2408.9	E			
40'	4061.8	1293.6	.485	40'	4864.8	1786.7	.671	40'	5796.7	2420.9	.910			
50'	4074.4	1300.9		50'	4879.2	1796.0		50'	5813.6	2432.9				

T = R tan 1/2 I

E = R exsec 1/2 I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°			
91°	5830.5	2444.9	+	101°	6950.6	3278.1	+	111°	8336.7	4386.1	+			
10'	5847.5	2457.1		10'	6971.3	3294.1		10'	8362.7	4407.6		10'	8362.7	4407.6
20'	5864.6	2469.3		20'	6992.0	3310.1		20'	8388.9	4429.2		20'	8388.9	4429.2
30'	5881.7	2481.5		30'	7012.7	3326.1		30'	8415.1	4450.9		30'	8415.1	4450.9
40'	5898.8	2493.8		40'	7033.6	3342.3		40'	8441.5	4472.7		40'	8441.5	4472.7
50'	5916.0	2506.1	.43	50'	7054.5	3358.5	.51	50'	8468.0	4494.6	.62			
			E				E				E			
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360			
10'	5950.5	2531.0		10'	7096.6	3391.2		10'	8521.3	4538.8				
20'	5967.9	2543.5		20'	7117.8	3407.7		20'	8548.1	4561.1				
30'	5985.3	2556.0		30'	7139.0	3424.3		30'	8575.0	4583.4				
40'	6002.7	2568.6		40'	7160.3	3440.9		40'	8602.1	4606.0				
50'	6020.2	2581.3		50'	7181.7	3457.6		50'	8629.3	4628.6				
93°	6037.8	2594.0	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.			
10'	6055.4	2606.8	T	10'	7224.7	3491.3	T	10'	8684.0	4674.2	T			
20'	6073.1	2619.7	.86	20'	7246.3	3508.2	.103	20'	8711.5	4697.2	.125			
30'	6090.8	2632.6	E	30'	7268.0	3525.2	E	30'	8739.2	4720.3	E			
40'	6108.6	2645.5	.401	40'	7289.8	3542.4	.536	40'	8767.0	4743.6	.721			
50'	6126.4	2658.5		50'	7311.7	3559.6		50'	8794.9	4766.9				
94°	6144.3	2671.6	15° C.	104°	7333.6	3576.8	15° C.	114°	8822.9	4790.4	15° C.			
10'	6162.2	2684.7		10'	7355.6	3594.2		10'	8851.0	4814.1		10'	8851.0	4814.1
20'	6180.2	2697.9			20'	7377.8		3611.7		20'		8879.3	4837.8	
30'	6198.3	2711.2			30'	7399.9		3629.2		30'		8907.7	4861.7	
40'	6216.4	2724.5			40'	7422.2		3646.8		40'		8936.3	4885.7	
50'	6234.6	2737.9		50'	7444.6	3664.5		50'	8965.0	4909.9				
95°	6252.8	2751.3	T	105°	7467.0	3682.3	T	115°	8993.8	4934.1	T			
10'	6271.1	2764.8	1.30	10'	7489.6	3700.2	1.56	10'	9022.7	4958.6	1.93			
20'	6289.4	2778.3	E	20'	7512.2	3718.2	E	20'	9051.7	4983.1	E			
30'	6307.9	2792.0	.604	30'	7534.9	3736.2	.806	30'	9080.9	5007.8	.109			
40'	6326.3	2805.6		40'	7557.7	3754.4		40'	9110.3	5032.6				
50'	6344.8	2819.4		50'	7580.5	3772.6		50'	9139.8	5057.6				
96°	6363.4	2833.2	20° C.	106°	7603.5	3791.0	20° C.	116°	9169.4	5082.7	20° C.			
10'	6382.1	2847.0		10'	7626.6	3809.4		10'	9199.1	5107.9		10'	9199.1	5107.9
20'	6400.8	2861.0			20'	7649.7		3827.9		20'		9229.0	5133.3	
30'	6419.5	2875.0			30'	7672.9		3846.5		30'		9259.0	5158.8	
40'	6438.4	2889.0			40'	7696.3		3865.2		40'		9289.2	5184.5	
50'	6457.3	2903.1		50'	7719.7	3884.0		50'	9319.5	5210.3				
97°	6476.2	2917.3	1.74	107°	7743.2	3902.9	2.08	117°	9349.9	5236.2				

TABLE X.  
MIDDLE ORDINATES OF RAILS  
Length of Rail (feet)

C	R	30	28	26	24	22	20	C	R	30	28	26	24	22	20
o /	Feet	Inch	Inch	Inch	Inch	Inch	Inch	o	Feet	Inch	Inch	Inch	Inch	Inch	Inch
0-20	17189	.08	.07	.06	.05	.04	.03	8	716.8	1.88	1.64	1.42	1.20	1.01	.84
0-40	8594	.16	.14	.12	.10	.08	.07	9	637.3	2.12	1.84	1.60	1.35	1.14	.94
1-0	5730	.24	.20	.18	.15	.13	.10	10	573.7	2.36	2.05	1.78	1.50	1.27	1.04
1-20	4297	.31	.27	.23	.20	.17	.13	11	521.7	2.59	2.26	1.95	1.65	1.39	1.15
1-40	3438	.39	.34	.29	.25	.21	.17	12	478.3	3.83	2.47	2.15	1.81	1.54	1.26
2-0	2865	.47	.41	.35	.30	.25	.20	13	441.7	3.05	2.66	2.30	1.96	1.66	1.36
2-20	2456	.55	.48	.41	.35	.29	.23	14	410.3	3.30	2.87	2.48	2.10	1.78	1.46
2-40	2149	.63	.55	.47	.40	.33	.27	15	383.1	3.54	3.08	2.68	2.26	1.91	1.57
3-0	1910	.71	.62	.53	.45	.38	.31	16	359.3	3.76	3.28	2.83	2.40	2.04	1.67
3-20	1719	.78	.68	.59	.50	.42	.35	17	338.3	4.00	3.48	3.02	2.57	2.16	1.78
3-40	1563	.86	.75	.65	.55	.46	.38	18	319.6	4.21	3.67	3.18	2.70	2.28	1.87
4-0	1433	.94	.82	.71	.60	.50	.42	19	302.9	4.45	3.89	3.36	2.86	2.41	1.98
4-20	1323	1.02	.89	.77	.65	.55	.45	20	287.9	4.70	4.09	3.55	3.00	2.54	2.09
4-40	1228	1.10	.96	.83	.70	.59	.48	22	262.0	5.16	4.44	3.84	3.30	2.80	2.29
5	1146	1.18	1.03	.89	.75	.63	.52	24	240.5	5.64	4.92	4.20	3.59	3.04	2.50
6	955.3	1.41	1.23	1.06	.90	.76	.62	26	222.3	6.07	5.29	4.58	3.88	3.29	2.70
7	819.0	1.65	1.44	1.24	1.05	.89	.73								

TABLE XI.  
SHORT RADIUS CURVES

Radius Feet	Chord Feet	Central Angle	Deflection Angle	Deflection for 1 Foot
35	10	16-26	8-13	49.3
45	10	12-46	6-23	38.3
50	15	17-16	8-38	34.5
60	15	14-22	7-11	28.8
75	15	11-30	5-45	23.0
100	20	11-30	5-45	17.3
120	20	9-34	4-47	14.3
150	20	7-39	3-49	11.5
190	25	7-32	3-46	9.15
200	25	7-10	3-35	8.6
225	25	6-25	3-12	7.7
240	25	5-58	2-59	7.2
250	25	5-44	2-52	6.9
275	25	5-12	2-36	6.2
288	50	9-58	4-59	6.0
300	50	9-32	4-46	5.7
350	50	8-12	4-06	4.9
376	50	7-40	3-50	4.6
400	50	7-10	3-35	4.3
410	50	7-00	3-30	4.2

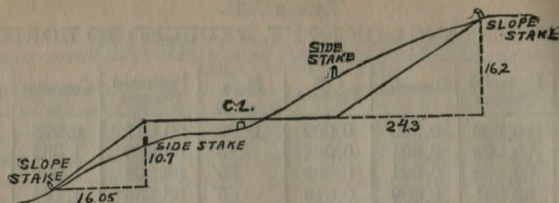
To find length of curve divide angle from P. C. to P. T. by central angle of chord, and multiply by length of chord.

TABLE XII.  
INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

Slope	Horizontal Distance	Correction	Rise Per Foot	Slope	Horizontal Distance	Correction	Rise Per Foot
0°00'	100.000	0.000	0.000	8°00'	99.027	0.973	0.139
15'	99.999	0.001	0.004	15'	98.965	1.035	0.143
30'	99.996	0.004	0.009	30'	98.902	1.098	0.148
45'	99.991	0.009	0.013	45'	98.836	1.164	0.152
1 00	99.985	0.015	0.017	9 00	98.769	1.231	0.156
15	99.976	0.024	0.023	15	98.700	1.300	0.161
30	99.966	0.034	0.026	30	98.629	1.371	0.165
45	99.953	0.047	0.031	45	98.556	1.444	0.169
2 00	99.939	0.061	0.035	10 00	98.481	1.519	0.174
15	99.923	0.077	0.039	15	98.404	1.596	0.178
30	99.905	0.095	0.044	30	98.325	1.675	0.182
45	99.885	0.115	0.048	45	98.245	1.755	0.187
3 00	99.863	0.137	0.052	11 00	98.163	1.837	0.191
15	99.839	0.161	0.057	15	98.079	1.921	0.195
30	99.813	0.187	0.061	30	97.992	2.008	0.199
45	99.786	0.214	0.065	45	97.905	2.095	0.204
4 00	99.756	0.244	0.070	12 00	97.815	2.185	0.208
15	99.725	0.275	0.074	15	97.723	2.277	0.212
30	99.692	0.308	0.078	30	97.630	2.370	0.216
45	99.657	0.343	0.083	45	97.534	2.466	0.221
5 00	99.619	0.381	0.087	13 00	97.437	2.563	0.225
15	99.580	0.420	0.092	15	97.338	2.662	0.229
30	99.540	0.460	0.096	30	97.237	2.763	0.233
45	99.497	0.503	0.100	45	97.134	2.866	0.238
6 00	99.452	0.548	0.105	14 00	97.030	2.970	0.242
15	99.406	0.594	0.109	15	96.923	3.077	0.246
30	99.357	0.643	0.113	30	96.815	3.185	0.250
45	99.307	0.693	0.118	45	96.705	3.295	0.255
7 00	99.255	0.745	0.122	15 00	96.593	3.407	0.259
15	99.200	0.800	0.126	15	96.479	3.521	0.263
30	99.144	0.856	0.131	30	96.363	3.637	0.267
45	99.087	0.913	0.135	45	96.246	3.754	0.271

TABLE XIII.  
MINUTES IN DECIMALS OF A DEGREE.

0 30"	.00833	10' 30"	.17500	20' 30"	.34167	30' 10"	.50833	40' 30"	.67500	50' 10"	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	18 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000

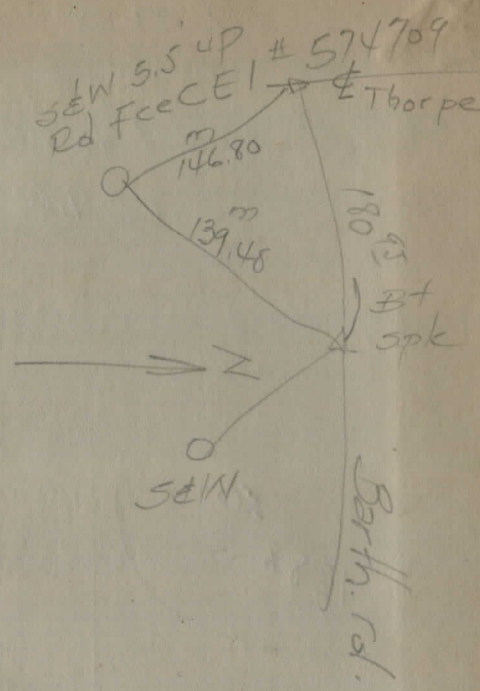


DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1 1/2 TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0 30	0 45	0 60	0 75	0 90	1 05	1 20	1 35	0
1	1 50	1 65	1 80	1 95	2 10	2 25	2 40	2 55	2 70	2 85	1
2	3 00	3 15	3 30	3 45	3 60	3 75	3 90	4 05	4 20	4 35	2
3	4 50	4 65	4 80	4 95	5 10	5 25	5 40	5 55	5 70	5 85	3
4	6 00	6 15	6 30	6 45	6 60	6 75	6 90	7 05	7 20	7 35	4
5	7 50	7 65	7 80	7 95	8 10	8 25	8 40	8 55	8 70	8 85	5
6	9 00	9 15	9 30	9 45	9 60	9 75	9 90	10 05	10 20	10 35	6
7	10 50	10 65	10 80	10 95	11 10	11 25	11 40	11 55	11 70	11 85	7
8	12 00	12 15	12 30	12 45	12 60	12 75	12 90	13 05	13 20	13 35	8
9	13 50	13 65	13 80	13 95	14 10	14 25	14 40	14 55	14 70	14 85	9
10	15 00	15 15	15 30	15 45	15 60	15 75	15 90	16 05	16 20	16 35	10
11	16 50	16 65	16 80	16 95	17 10	17 25	17 40	17 55	17 70	17 85	11
12	18 00	18 15	18 30	18 45	18 60	18 75	18 90	19 05	19 20	19 35	12
13	19 50	19 65	19 80	19 95	20 10	20 25	20 40	20 55	20 70	20 85	13
14	21 00	21 15	21 30	21 45	21 60	21 75	21 90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23 10	23 25	23 40	23 55	23 70	23 85	15
16	24 00	24 15	24 30	24 45	24 60	24 75	24 90	25 05	25 20	25 35	16
17	25 50	25 65	25 80	25 95	26 10	26 25	26 40	26 55	26 70	26 85	17
18	27 00	27 15	27 30	27 45	27 60	27 75	27 90	28 05	28 20	28 35	18
19	28 50	28 65	28 80	28 95	29 10	29 25	29 40	29 55	29 70	29 85	19
20	30 00	30 15	30 30	30 45	30 60	30 75	30 90	31 05	31 20	31 35	20
21	31 50	31 65	31 80	31 95	32 10	32 25	32 40	32 55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33 60	33 75	33 90	34 05	34 20	34 35	22
23	34 50	34 65	34 80	34 95	35 10	35 25	35 40	35 55	35 70	35 85	23
24	36 00	36 15	36 30	36 45	36 60	36 75	36 90	37 05	37 20	37 35	24
25	37 50	37 65	37 80	37 95	38 10	38 25	38 40	38 55	38 70	38 85	25
26	39 00	39 15	39 30	39 45	39 60	39 75	39 90	40 05	40 20	40 35	26
27	40 50	40 65	40 80	40 95	41 10	41 25	41 40	41 55	41 70	41 85	27
28	42 00	42 15	42 30	42 45	42 60	42 75	42 90	43 05	43 20	43 35	28
29	43 50	43 65	43 80	43 95	44 10	44 25	44 40	44 55	44 70	44 85	29
30	45 00	45 15	45 30	45 45	45 60	45 75	45 90	46 05	46 20	46 35	30
31	46 50	46 65	46 80	46 95	47 10	47 25	47 40	47 55	47 70	47 85	31
32	48 00	48 15	48 30	48 45	48 60	48 75	48 90	49 05	49 20	49 35	32
33	49 50	49 65	49 80	49 95	50 10	50 25	50 40	50 55	50 70	50 85	33
34	51 00	51 15	51 30	51 45	51 60	51 75	51 90	52 05	52 20	52 35	34
35	52 50	52 65	52 80	52 95	53 10	53 25	53 40	53 55	53 70	53 85	35
36	54 00	54 15	54 30	54 45	54 60	54 75	54 90	55 05	55 20	55 35	36
37	55 50	55 65	55 80	55 95	56 10	56 25	56 40	56 55	56 70	56 85	37
38	57 00	57 15	57 30	57 45	57 60	57 75	57 90	58 05	58 20	58 35	38
39	58 50	58 65	58 80	58 95	59 10	59 25	59 40	59 55	59 70	59 85	39
40	60 00	60 15	60 30	60 45	60 60	60 75	60 90	61 05	61 20	61 35	40
41	61 50	61 65	61 80	61 95	62 10	62 25	62 40	62 55	62 70	62 85	41
42	63 00	63 15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64 35	42
43	64 50	64 65	64 80	64 95	65 10	65 25	65 40	65 55	65 70	65 85	43
44	66 00	66 15	66 30	66 45	66 60	66 75	66 90	67 05	67 20	67 35	44
45	67 50	67 65	67 80	67 95	68 10	68 25	68 40	68 55	68 70	68 85	45
46	69 00	69 15	69 30	69 45	69 60	69 75	69 90	70 05	70 20	70 35	46
47	70 50	70 65	70 80	70 95	71 10	71 25	71 40	71 55	71 70	71 85	47
48	72 00	72 15	72 30	72 45	72 60	72 75	72 90	73 05	73 20	73 35	48
49	73 50	73 65	73 80	73 95	74 10	74 25	74 40	74 55	74 70	74 85	49
50	75 00	75 15	75 30	75 45	75 60	75 75	75 90	76 05	76 20	76 35	50

Computed by L. Leland Locke.





4-20-51

Frank

Attached is some  
road dope for Bartholomew  
and Thorpe Roads.

We checked our field books  
and this was all that we  
could find.

Keating (CEI Co)

Thorpe Road (South of Canfield Rd)

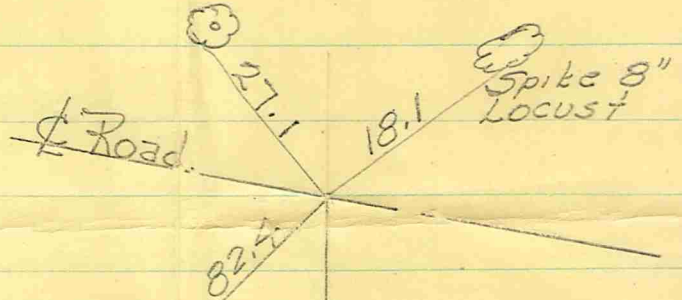
Sta 52+99.85  
Pipe Set  
Found 2-25-41

Sta 50+86.9  
Def 19°41'  
Pipe Set  
Found 2-25-41

Sta 47+09.1  
Def = 25°30'  
Pipe Set  
Found 2-25-41

Sta 38+28.0  
Def = 15°19'  
Pipe Set  
Found 2-25-1941

Spike 14" Cucumber



Cor  
"Mays"  
House

Cor  
"Mays"  
Barn

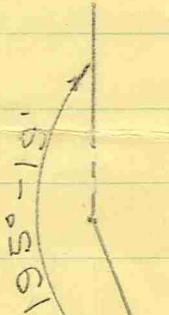
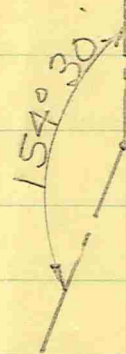
Spike 6" Locust

211.95

377.8

881.1

599.1



NOTE: This point  
is approx 50' north  
of CEI Co pole # 565147

Sta 32+78.9  
Def = 33°54'  
Pipe Set  
Found 2-25-41

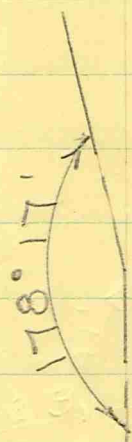
STA 28+34.1  
Def = 1°43'  
Pipe Set  
Found 2-25-41

STA 0+00  
Pipe Set  
Found 2-25-41

549.1

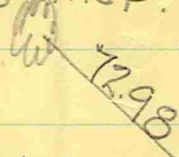
444.8

NOTE: This point is approx 45' South of CEI Co Pole # 565150

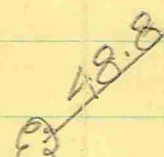


THORPE RD

5/8" W IN S.W.  
Side 30" map.



Bartholomew Rd.



2 NAILS IN N.E.  
Side 14" MAP.

STA 18+00

36.50' S&W. N.E. SIDE 24" MAPLE  
I.P.N. FD.  
P.O.T.  
24.16' S&W. N.W. SIDE 30" MAPLE.

374.77

S&W. N.E. SIDE 18" HICKORY.  
93.45'  
STONE MON FD. 1.5' DEEP.  
E. SUNSET DR.

31.09'

S&W. E. SIDE C.E.I. Co POLE  
#513778X

BARTHALMEW RD.

S&W. N.W. SIDE  
TWIN 6" ELM.

STA 0+00

96.72'

STONE MON FD.

QUINN RD

54.00'

25.00'

S&W WEST SIDE  
OF 12" WCHERRY.

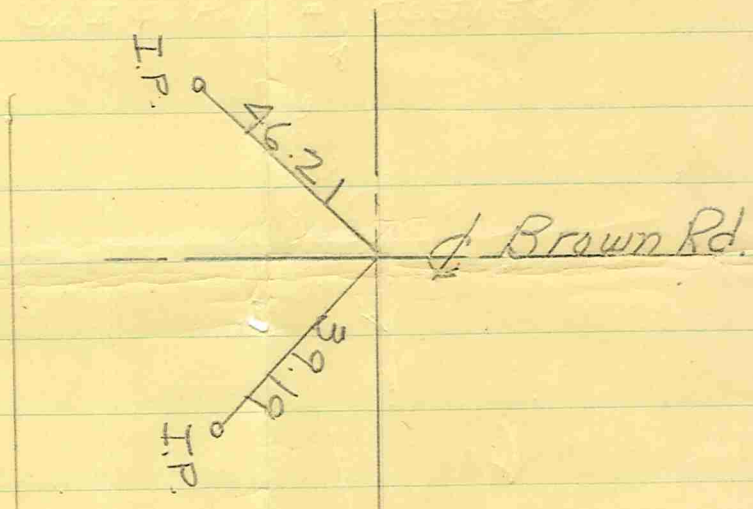
I.P. FD. N. LINE TABORVILLE.

DRIVE.

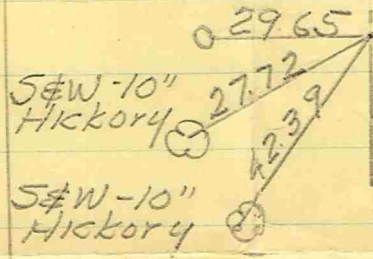
M. W. ALDERMAN

Bartholomew Rd.

STA 0+00

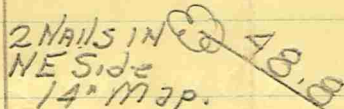


Sta 12+21.08  
 $\Delta = 0^{\circ}00$



S&W-SW  
 side 30" MAP

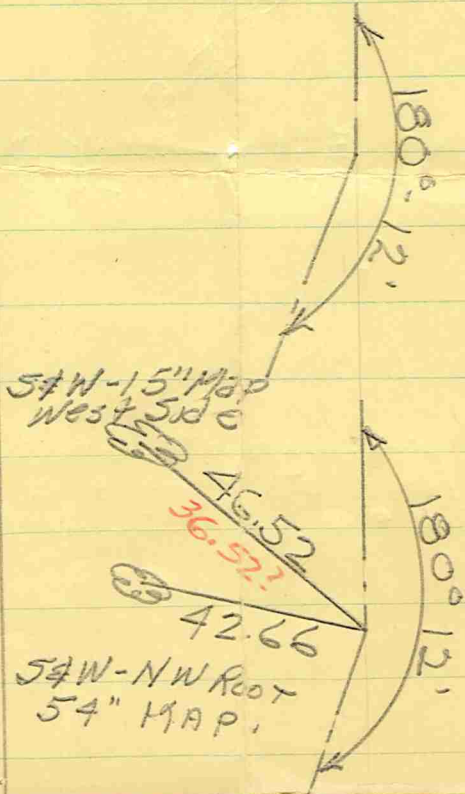
2 Nails in  
 NE Side  
 14" MAP.



Thorpe Rd

STA 46+63

STA 49+45.85  
 Spike Set  
 Def  $0^{\circ}12$  Rt.

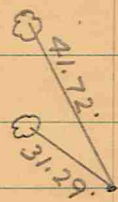


STA 80+77.3  
 Def =  $0^{\circ}12$  Rt.

S&W-NW Root  
 54" MAP.

S#W - root S. side  
24" maple

S#W - SE side  
24" maple

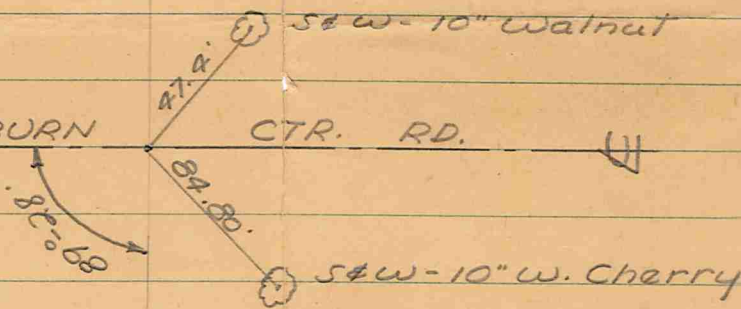


POT  
Sta 20+15.97  
Boat spike  
Found 8-24-46

Sta 0+00  
Sta 40+10.92 of Sec C  
 $\Delta = 0^\circ - 00' - 20''$  Rt.  
Boat Spike  
Found 8-24-46

CHARDON-AUBURN

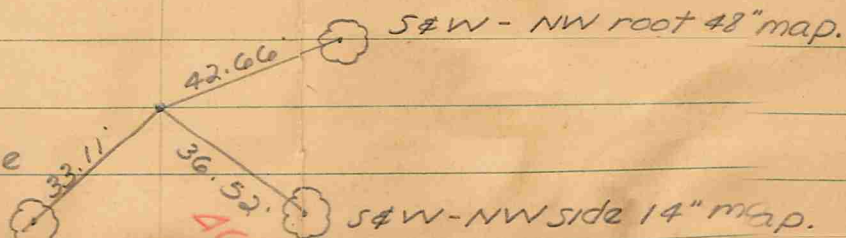
CTR. RD.



S#W - 10" Walnut

S#W - 10" W. Cherry

Sta 34+12.07  
Found 8-24-46  
 $\Delta = 0^\circ - 28' - 30''$  LT.  
drill hole in red sandstone  
(12" down)  
Sp. E. side twin  
W. Cherry



S#W - NW root 48" map.

S#W - NW side 14" map.

0.7 18.0

POT  
Sta. 18+45.55  
C.I.P. Culvert  
Found 8-24-46

iron pipe



S#W - north side of  
CEI pole # 574710X

Sta. 2+80.95  
Boat spike  
 $\Delta = 0^\circ - 11'$  rt.

nothing found  
8-24-46

J.P. WALKER

BARTHOLOMEW RD

AUBURN TWP.

Book C, pg. 65

1832 - 60' wide (statute law)

THORPE RD.

Sta 0+00  
Boat Spike

