Chardon-Mentor Road

84

FIELD BOOK

740

PLEASE RETURN TO
GEAUGA COUNTY ENGINEER
COURT HOUSE
CHARDON, O.
PHONE 250-X

TABLE FOR REDUCING PERCHES TO FEET AND INCHES.

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	[illegible]
3	49.6	23	3.79.6	43	7.09.6	63	10.39.6	83	13.69.6
4	66.0	24	3.96.0	44	7.26.0	64	10.56.0	84	13.86.0
5	82.6	25	4 12.6	45	7 42.6	65	10.72.6	85	[illegible]
6	99.0	26	4.29.0	46	7.59.0	66	10.89.0	86	14.19.0
7	1.15.6	27	4.45 6	47	7.75.6	67	11.05.6	87	[illegible]
8	1.32.0	28	4.62.0	48	7.92 0	68	11.22.0	88	[illegible]
9	1.48.6	29	4.78.6	49	8.08.6	69	11.38.6	89	14.68.6
10	1.65.0	30	4.95.0	50	8.25.0	70	11.55.0	90	14.85.0
11	1.81.6	31	5 11.6	51	8.41.6	71	11.71.6	91	15 01.6
12	1.98 0	32	5.28 0	52	8.58.0	72	11.88.0	92	[illegible]
13	2.14.6	33	5.44.6	53	8.74.6	73	12.04 6	93	[illegible]
14	2.31.0	34	5.61 0	54	8.91.0	74	12.21.0	94	15.51.0
15	2.47.6	35	5.77 6	55	9.07.6	75	12.37.6	95	[illegible]
16	2.64.0	36	5.94.0	56	9.24.0	76	12.54.0	96	15.84.0
17	2.80.6	37	6.10.6	57	9.40.6	77	12.70.6	97	[illegible]
18	2.97.0	38	6.27 0	58	9.57.0	78	12.87.0	98	[illegible]
19	3.13.6	39	6.43.6	59	9.73.6	79	13.03.6	99	16.33.6
20	3.30.0	40	6.60.0	60	9.90.0	80	13.20.0	100	16.50.0

Property of
Geauga County Surveyor's Office
Chardon, Ohio.

CHARDON-MENTOR RD.
C.H. #5
CHARDON TWP.
GEAUGA COUNTY.
OHIO
1922

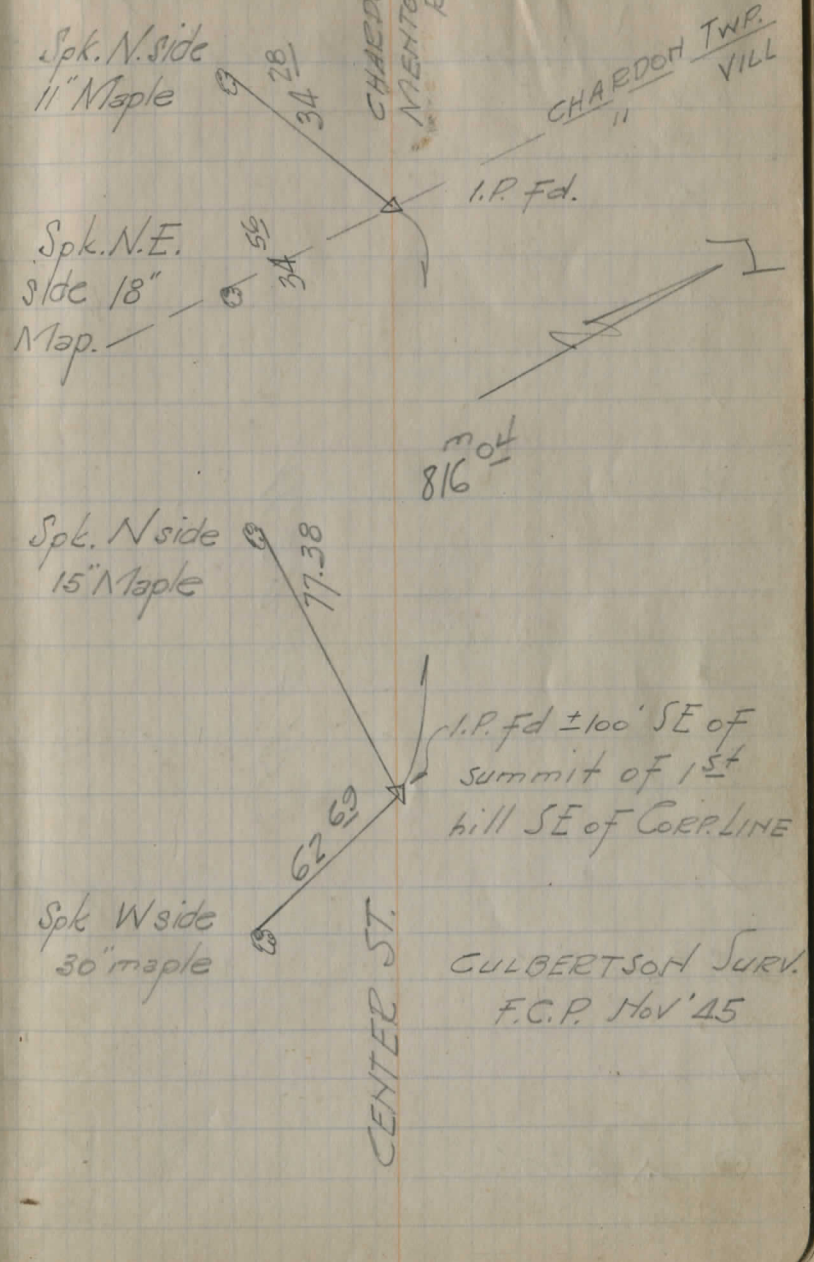
B.R. KENNEY
County Surveyor

G. R. Hanna
Asst.

(84)

- Index -

Transit notes.


Spk. N. side
11" Maple
34.28
CHARDON MENTOR RD.
CHARDON TWP. VILL
11
I.P. Fd.
Spk. N.E.
side 18"
Map.
34.56
816.04
Spk. N side
15" Maple
77.38
I.P. Fd ±100' SE of
summit of 1st
hill SE of Corp. Line
62.69
Spk W side
30" maple
CENTER ST.
CULBERTSON SURV.
F.C.P. Nov '45

2A TRANSIT #84 NOTES

Sta. Angle Bearing

10

9

8

7

6

5

4

3

2

13.8 ahead

+86.2 △ 0°-0'

1

0 △ 0°-0'

N 49°03' W

9-23-22 Fine

#84 3

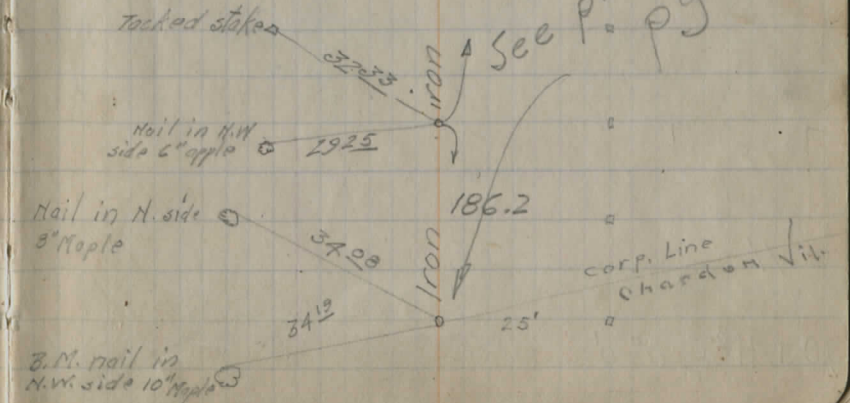
Hanna-T
Grau-C
Spoon-C

Lt. ℄ Rt.

Offset stakes 25' to Rt. unless otherwise noted

25'

855.6



3/A

Sta	Angle	Bearing
20		
19		
18		
17		
16		N. 48°20' W
55.7		
44.3	Δ 0°-43' Rt.	
15		
14		
13		
12		
11		N 49°03' W
55.2 ahead		
10+41.8	∠ 0°-0'	

℄

25'

733.1

11/30-27 P.R. Parks

Spk in N W Side 10" Apple 0.3

64.51

Iron

36.3

Spk W side CE I #551609

I.P. Fd 6-23-47

64.48

Spk SE side Tel. pole # 1887

502.5

Tacked Stake

25'

25.24'

Iron

31.27'

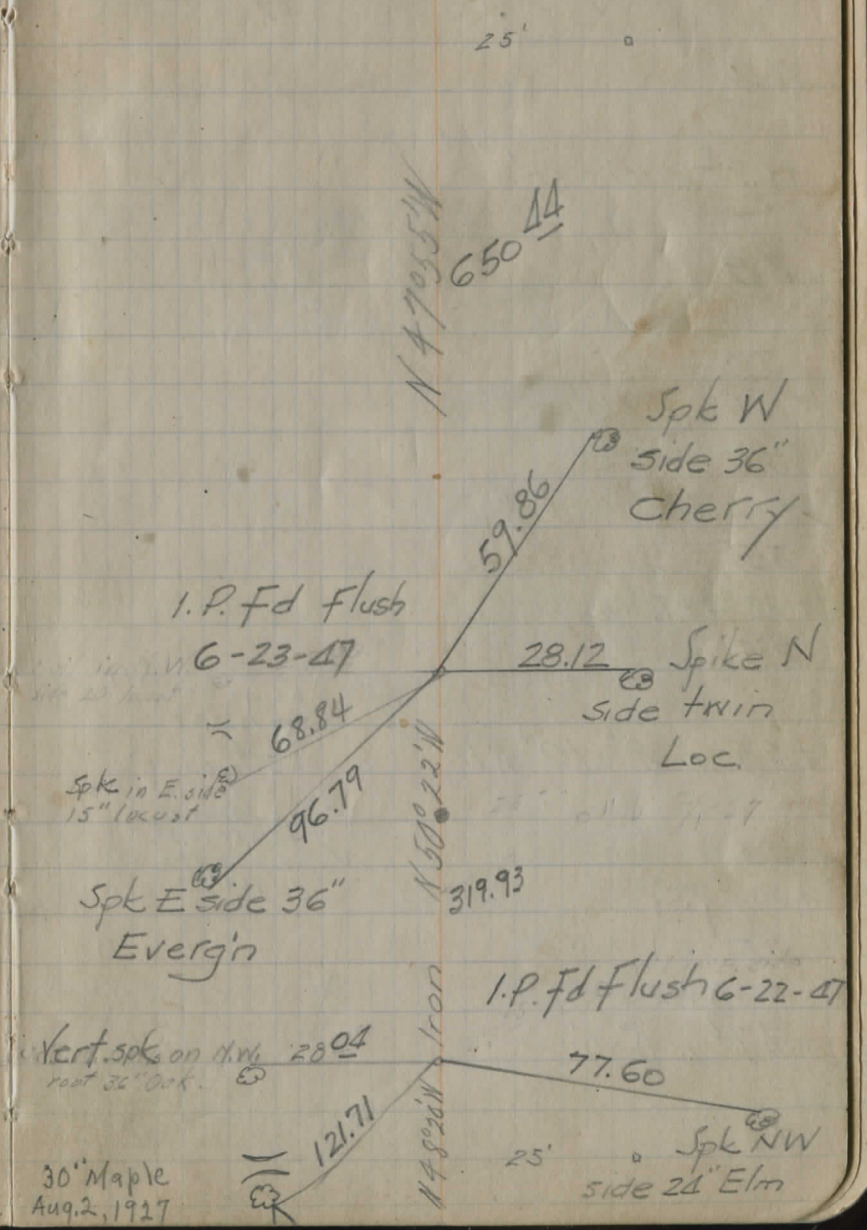
Tacked Stake

855.6

Sta.	Angle	Bearing
31		
30		
29		
28		
+19 78 P.T.	1°13½'	
27	1°07½'	
	Noon	
26	0°37½'	
+97 3	Δ 2°-27' Rt.	
25	0°07½'	
+74 78 P.C.		
24		
+79 05 P.T.	1°01'	
23	0°37'	
+77 4	Δ 2°-02' Lt.	
22	0°07'	
+75 72 P.C.		
21		

Δ = 2°-27' Rt.
D = 1°-00'
P.I. = 25+97.3
T = 1 22.52
P.C. = 24+74.78
L = 2 45.00
P.T. = 27+19.78
E = 1.31
Def. per ft. = 0.30'

Δ = 2°-02' Lt
D = 1°-00'
P.I. = 22+77.4
T = 1 01.62
P.C. = 21+75.72
L = 2 03.33
P.T. = 23+79.05
E = 0.90
Def. per ft. = 0.3'



5A

84

Sta.	Angle	Bearing
40		
+09	0°-0'	
39		
38		
37		
36		
+92.38 P.T.		
35	2°14'	
+90.5	8°-10' Rt.	
34	0°14'	
+88.22 P.C.		
33		
52.3		
+47.1	0°-0'	
32		

N. 39°45' W

N 47° 55' W

7.62
102.28
109.90

Δ = 8° 10' Rt.
D = 4° 00'
R = 1432.69
P.I. = 34+90.50
T = 1 02.28
P.C. = 33+88.22
L. = 2 01.16
P.T. = 35+92.38
✓ Def. per ft. = 0.02°
E = 3.64'

84

c

Spk N-side
Tel pole 1902

79.59

53.71

Iron

Spk W
side CEI
551629

I.P. Fd C-23-17

Mon. Box
Set
1.65'

104.60

Spk W
side CEI
551628

Spk N side 14" Hick.

15.72

Iron

Mon. Box
Set
1.65'

I.P. Fd C-23-17
1/4" under

P.I.

28.22

Spk E root
S. root 24" Maple

39.85

Nail in S. side
18" ash

202.8

Mon. Box
Set
1.65'

Iron

I.P. Fd C-23-17
1/2" under
Spk thru tin
set

26°22'

46.20'

Nail in N. side
20" Maple

Nail in SW
side 30" Maple

25'

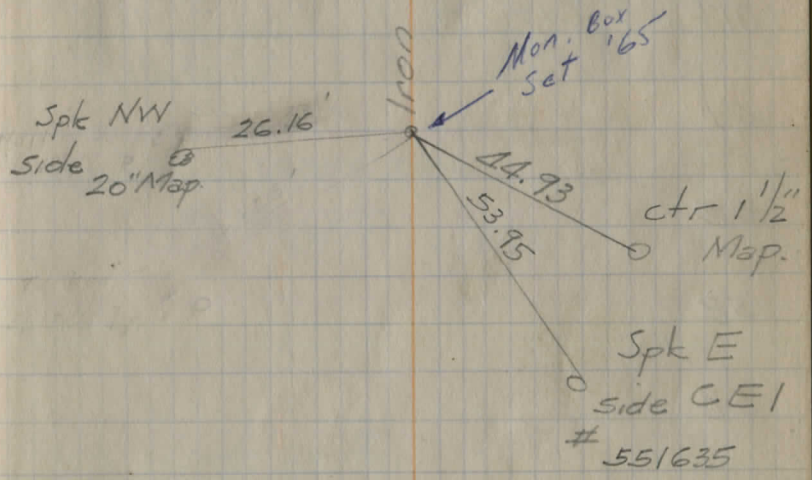
Cooley — H

64 #84

Sta.	Angle	Bearing
52		
51		
50		
49+00	0°-0'	
48		
47		
46		
45		
44		
43		
42		
41		

N. 39°-15' W.

25



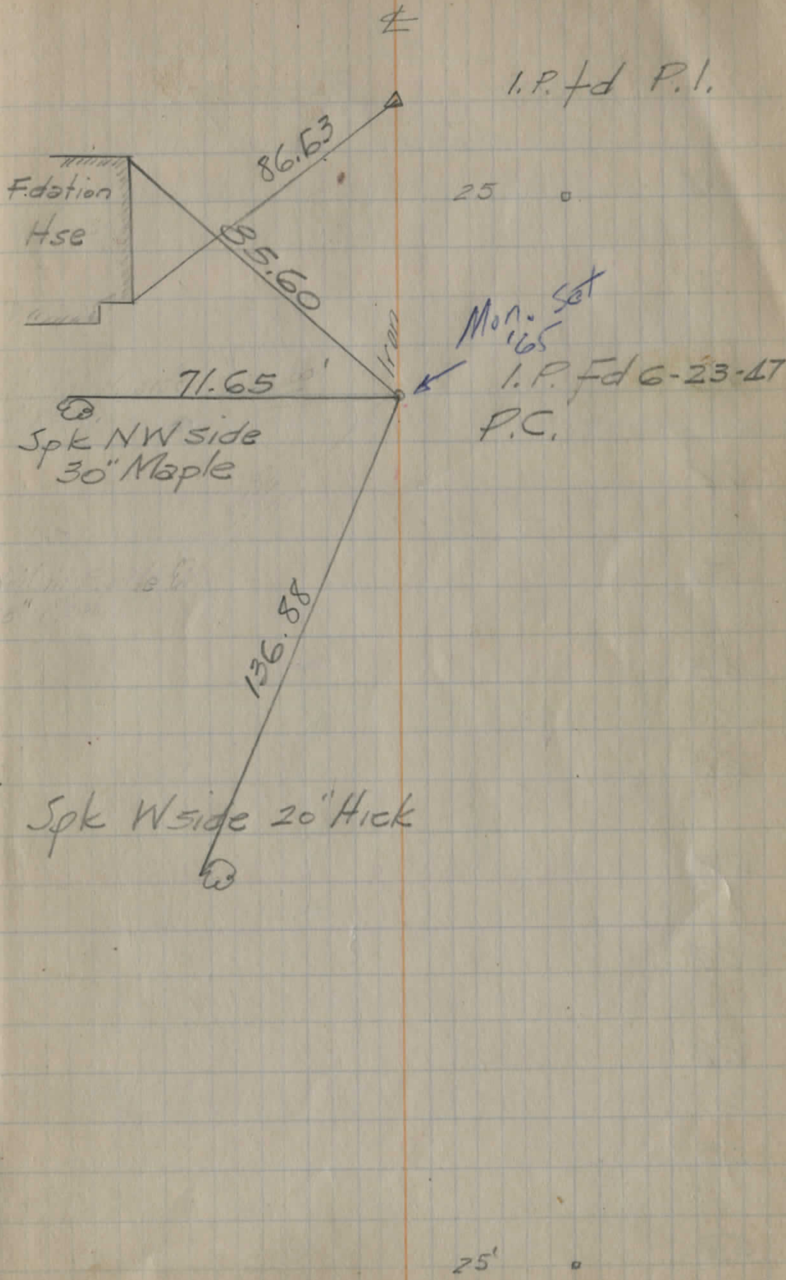
25'

7A 9-26-'22 Fine Hanna Gray Spahn # 84

Sta.	Angle	Bearing
63		N 41°37'W
62		
+01^4	AM. 1°49' Lt.	
61		
+0^55 P.C.		
60		
59		
58		
57		N 39°45'W
56		
55		
54		
53		

Δ = 1°49' Lt.
D = 1°00'
P.I. = 61 + 01 4
T = 90 85
P.C. = 60 + 10 55
L = 1 81 67
P.T. = 61 + 92 22
E. = .72'
Def. per ft. = 0.3'

Tang. meas = .03 longer than curve



8A #84

Sta	Angle	Bearing.
75		
74		
73		
72		
71		
70		
69		
68		N 41° 34' W
67		
66		
65		
64		

℄ #84

25 ▫

▫ Roofing Nail 12' □
Quit 6-23-47

25' ▫

9A #84

Sta	Angle	Bearing
87		
86		
85		
84		
83		
82		
81		
80		
79		
78		Auburn Rd.
+62	approx. ℄ Ctr Rd. (1.47 mi. from Corp. line)	
77	△ 0°-0'	
76		

N 41°34'W

7762 ft. = 1.47 mi.

℄ #84

25

See bk #45 pg 11. For REF. to Sta. 77+63.45

1 foot 25' Lt.

Nail in N. side ℄ "locust

2523

Iron

Mon. Box set '65

52.2'

8" Catalpa

25'

31 39

Track on Sta 0 near Cor. Post

#84

Sta	Angle	Bearing
97		
96		
95		
94		
93		
92		
91		
90		
89		
88		

I.P. Fd May '46 FCP

N 40° 52' W

41.98

Spk. W. side 12" pig hick.

+52.3 Δ 0° 42' Rt

20.15

S. side Chest. Stump.

68.70

84.25

Spk. W. side Tel. pole #1932

Spk. S.W. side CEI #551671

N 41° 34' W

Porch

76.50

I.P. Fd. May '46 F.C.P.

+10° Δ 0°-0'

Tel. pole #1928

34.48

106.95

26.37

Spk NE side 12" Mop.

to I.P. N.W. of Sch.

℄

Nail in E. side 6" chestnut

Spike

39.42

20.15

B.M. Nail S.E. root big chestnut

Mon. Box Set June '64

Tacked stake

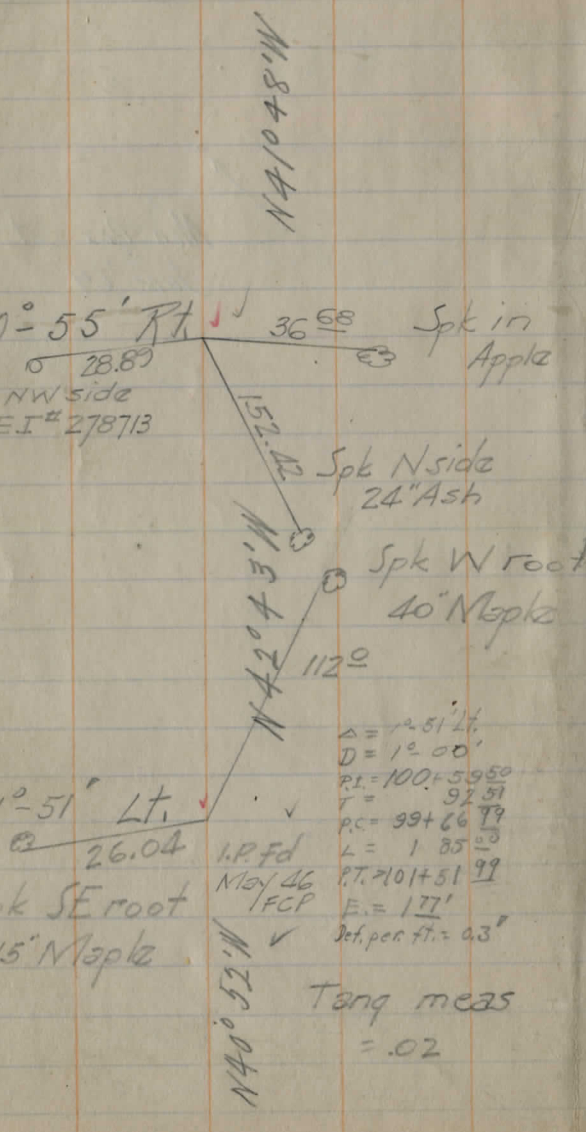
34.70

Iron

Tacked stake

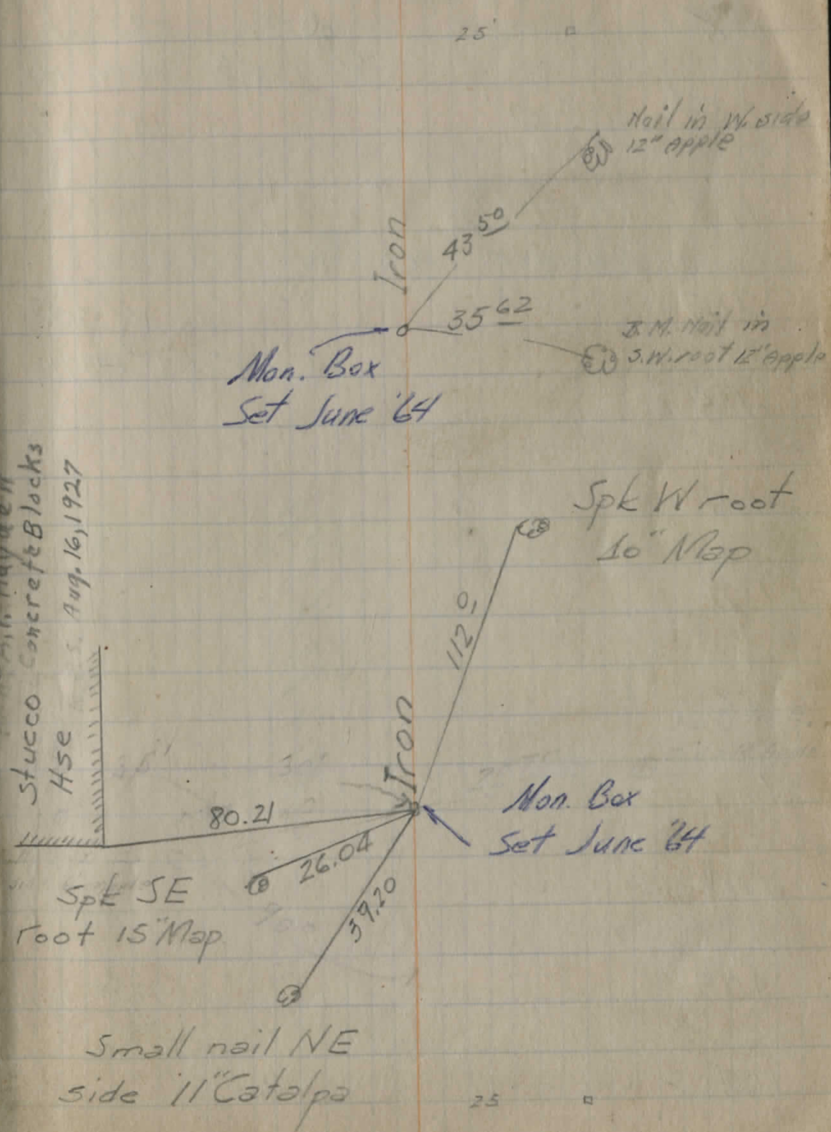
24.05

Sta.	Angle	Bearing
107		N41°04'8"W
106		
105		
+03 5	△ 0°-55' Rt.	
104		
103		N42°43'W
102		
101		
+59 5	△ 1°-51' Lt.	
100		
99		N40°52'W
98		



△ = 1°51' Lt.
D = 1° 00'
P.I. = 100+59 50
T = 92 51
P.C. = 99+66 99
L = 1 85 00
P.T. = 101+51 99
E. = 1.77'
Def. per. ft. = 0.3"

Tang meas = .02



Sta Angle Bearing

118 Spk E side CEI # 193719

52.80

97 3/4 ℄ Spk N.W. side 15" Appl

+97.4 ▵ 0°-0'

117 I.P. Fd May 46 1/4" under FCP

109.43

116 Spk W side CEI # 193718

115

114

113

112

111

110

109

108

N 41° 48' W

℄

Iron

21 65/100

Nail in N.W. side 14" Maple

58 97/100

Nail in N.E. side 15" Hickory

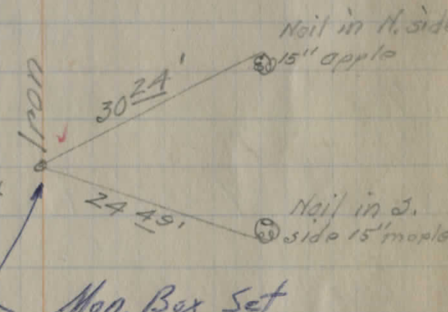
Sta	Angle	Bearing
130		
129	quit P.M.	spike in ℄
128		
127		
126		
125		
+76.5	△ 0°-0'	N 41°48' W
124		
123		
122		
121		
120		
119		

9-27-22 A.M.
Perfect

Hanna
Gray
Spohn

℄

See pg 17
yellow sheet



Mon. Box Set
June '64

A 4

Sta.	Angle	Bearing
141		
140		
139		N 69° 44' W
138		
137		
136		+15 P.O.B. rd. 2.64 to Co. line.
+51.95	27°-56' Lt.	(Widen pavement with curve on Lt. of tangents
135		
134		
133		
132		N 7° 48' W
131		

℄

Stake, Panton Tangent Produced
May 18, 1928. W.C.M

27°56'

200.0' (Iron)

offset 40' Rt.

57.42

Mon. Box
Set June '64

78.41

2 spks SW
side 16" Map

F.N. nail in W. root 20" Maple

5pk SW
side 26' So.
Map

Sta. Angle Bearing

+64 28 Δ 6°0'

153

152

151

150

149

148

147

146

145

144

143

142

N 69° 47' W

℄

Mon. Box
Set June '44

Nail in N.W.
side 24" Maple

28 46'

See yellow sheet
next pg.
for CE 1
ref to trees

41 05'

Iron

Nail in E.
side 24" Maple

same

68.35

I.P. Fd ½" above
pavt. 6-25-47

Blythe
Hse

80.26

SPK Fd. 2-7-59
± ½ Down

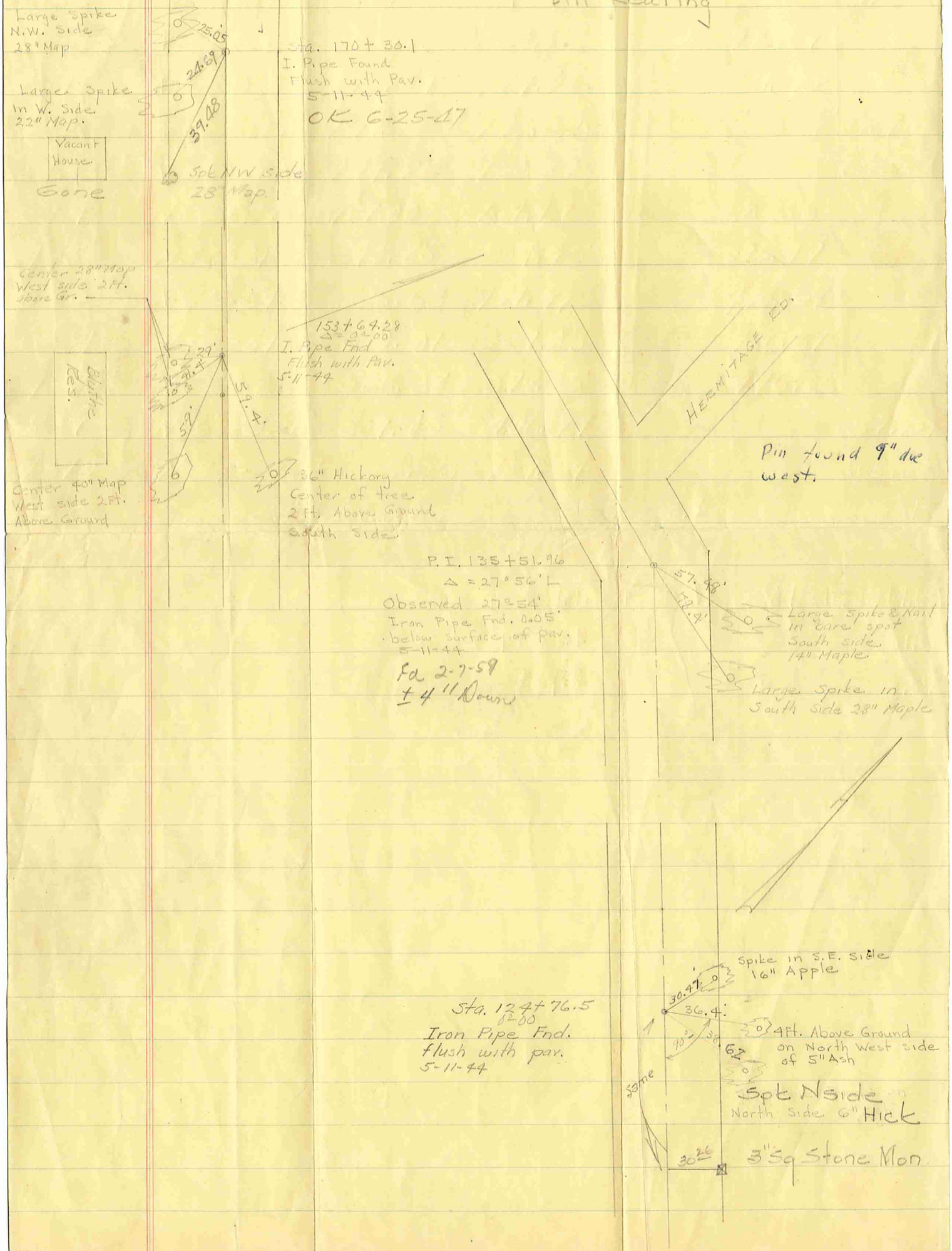
Lt A

Sta.	Angle	Bearing
165		
164		
163		
162		
161		
160		
159		
158		
157		
156		
155		
154		

N. 69° 44' W.

Clyde here are the ties which I took for those points on the Chardon - Mentor Rd. Chardon Twp.
If I have forgotten anything, you can ask me about it the next time that I come over.

→ Bill Keating ↘



17 A

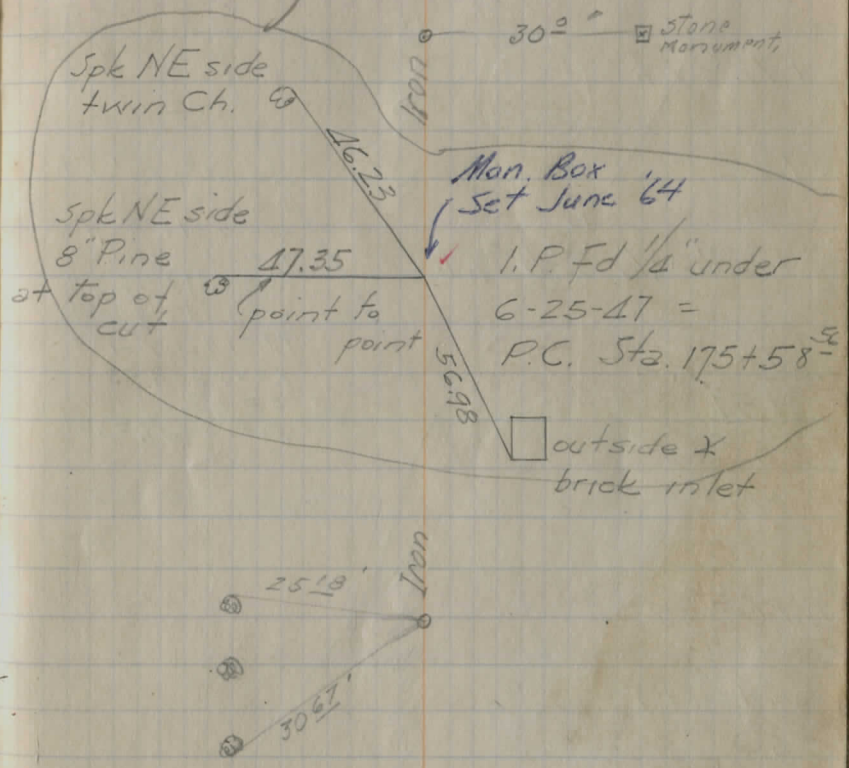
Sta.	Angle	Bearing
~~176~~		
~~+36 4~~	~~Δ 0° 0'~~	
175		
174		N 68° 50' W
173		
172		
171		
+30 1-	Δ 0° - 54' Rt.	See yellow slip
170		
169		
168	Noon	N 69° 44' W
167		
166		

10-13-22 P.M.
Fair - Cool

Hanna Grau Spahn

18

Revised Location on Page 73



Sta.	Angle	Bearing
184		
183		
+72 38 P.T.		
182		
+92 4	Δ P.T. 3°-12' Rt.	
+50		
+12 38 P.C.		
181		
+50		
180		
+50		
179		
35.67		
+64 33 P.T.		
+50		
178		
+60 7	Δ 29°-46' Rt.	
+50		
177		
+51 66 P.C.		

N: 35°-52'-W

N 39°-07'-W

N 68°-50'-W

Δ = 3°-12' Rt.
D = 2°-00'
P.I. = 181+92.40
T = 80.02
P.C. = 181+12.38
L = 1 60.00
P.T. = 182+72.38
R = 2864.93
E = 1 12
Def. per Ft. = .01°

Δ = 29°-46' R.
D = 14°-00'
P.I. = 177+60.70
T = 1 09.04
P.C. = 176+51.66
L = 2 12.62
P.T. = 178-64.28
R = 410.27
E = 14 24
Def. per. Ft. = .07°

10-16-22 P.M.
cloudy
-Spk S side 10" Evergn

Ex Sch

61.5

94.29

52.8

Roof. nail in ctr 5 x bd

Spk SE side 12" Nbp.

1 Pfd. Flush 6-'47
Sta. 183+29.95
orig. surv. =
183+22.15 of
reloc.
See pg 73
Mon. Box Set
June '64

Nail in S. side Twin W. Cherry

Void

76.12

Iron

Nail in N.W. side 10" W. Cherry 3' above ground

68.11

248.05 V
80.02 V
109.04 V
437.11 V

25

Offset 18' Rt.
" 8 "
" 3' "
" 8' "

Offset 8' Rt.

14°-53'
13°-53'
10°-23'

Offset 30' Rt.

Nail in N. side 10" Poplar

27.83'

P.T.

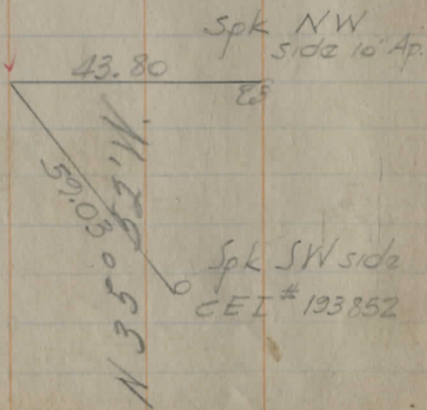
65.15

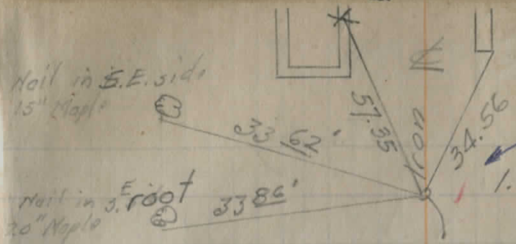
Nail in end apple limb 5' from ground

6°-53'
3°-23'
0°

Hub

Sta.	Angle	Bearing
+194	△ 0°0'	
195		
194		
193		
192		
	(+50 road to L. ?)	1.58 mi.
191		
190		
189		
+11Z	△ 0°-0'	
	I.P. Fd Flush Apr. '46	
188		
187		
186		
185		





SE ✕ Conc. hdwall

Mon Box Set June '64

I.P. Fd 1/2" under Mar. '46

Spk set Flush June '47

Offset 25' Lt.

25 Lt

25

335.09

℄ WISNER RD

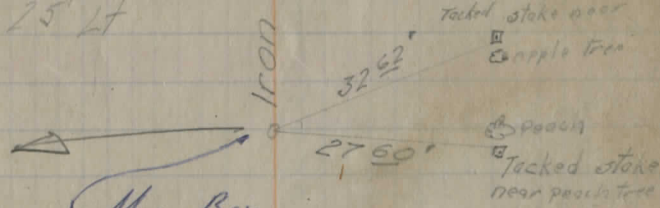
191+84.31

30' Lt

Off. 25' Lt.

Offset 25' Lt.

" 25' Lt



Mon. Box Set June '64

20 A

Sta.	Angle	Bearing
+88.2	0°-0'	
207		
206		
205		
204		
203	10°-17'-22"	
202		
201		
200		
199		
198		
197		
196		

N 35°-32' W.

Spk E root → 63
30" Pine

21

67.17

Iron

Nail in N.W. side 14" post

36.45

I.P. fd ½" under 6-24-47

41.21

Nail in S.W. side 14" post

Quit 6-24-47

Mon. Box Set June '64

25' Rt.

Off 25' Lt.

" 25 "

" 25 "

" 25 "

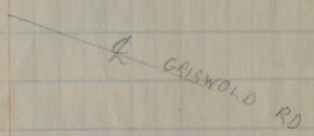
" 25 "

" 25 "

" 25 "

24 A

Sta.	Angle	Bearing
220		
219		
218		
	+56	
217		
216		
215		
214		
213		N 35° 52' W
212		
211		
210		
209		
208		



12A

232 △ 0°0'

231

230

229

228

227

226

225

224

223

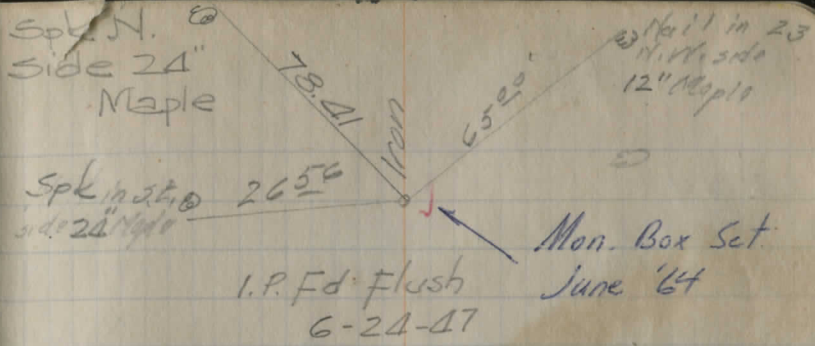
222

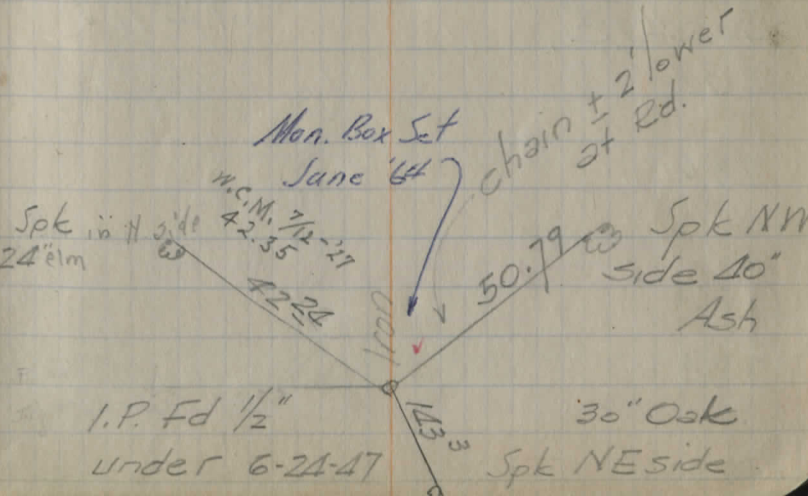
+16.3 △ 0°-0'

221

N 35°55' W

P.H.





23 A

244

243

242

241

+06 9°26' P.T. 3°43'

240 3°38'

+58.3 △ P.I. 7°-26' Lt.

238 2°23'

+09.41 P.C. 1°08'

237

236

235

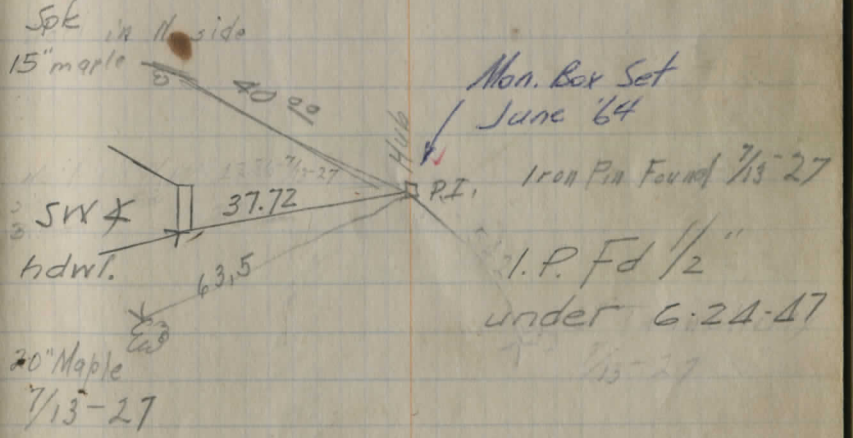
234

233

N 30°18' W

N 35°52' W

△ = 7°-26' Lt.
D = 2°-30'
P.I. = 238+58.30
T = 1 48.89
P.C. = 237 09.41
L = 2 97.33
P.T. = 240+06.74
R = 2292.01
E = 4.83
Def. per ft. = .0125



24 A

256

+76 I △ 0°-0'

255

254

253

252

+30 5 △ 0°-0'

251

250

249

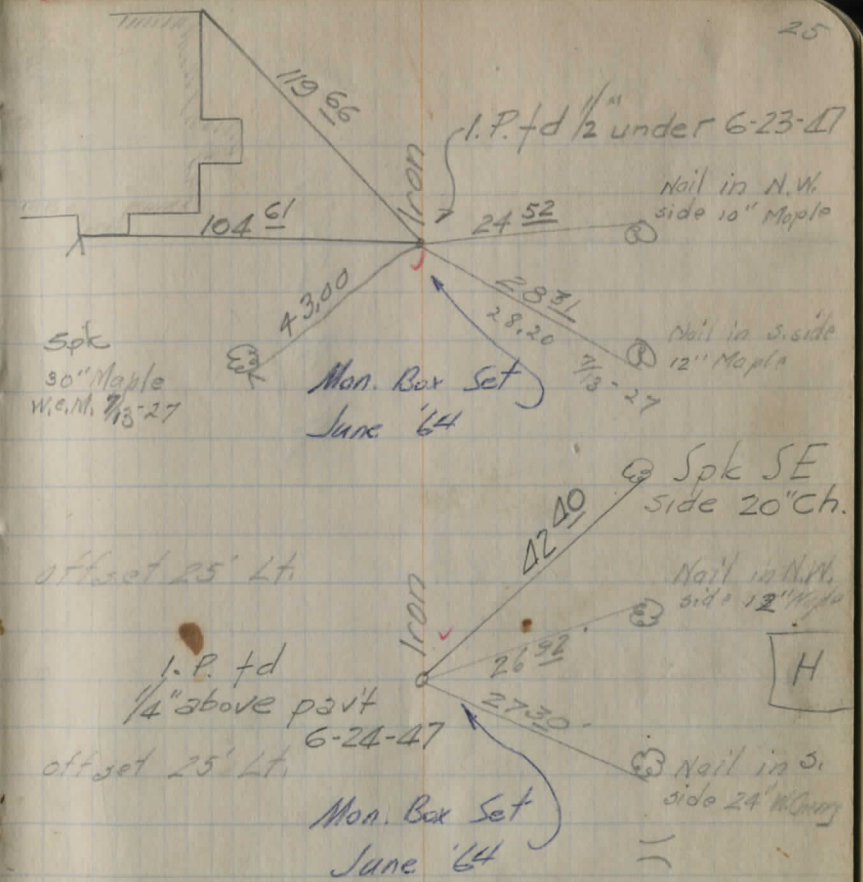
248

247

246

245

N 43°18' W



25A

268

267

266

265

264

263

262

261

260

259

258

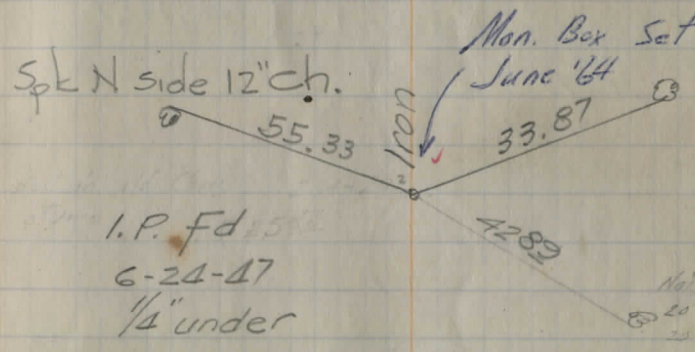
257

70.8

N 14°23' W

N 43°18' W

+29.2 Δ 1°-05' Lt.



5280) 27559.3 (5.22 Miles
26400
1159 3
10560
10330

+58.26, to Lake Co. Monument | July 13, 1927

+59 3/0 from 0°0' Ebd impriment

275

274

273

272

+33 39 P.T.

271 5°30'

270+70 15°00' July 13, 1927

+71 5 P.I. 14°-58' Rt.

+50

+18 +08.5 P.C. 2°30'

270

269

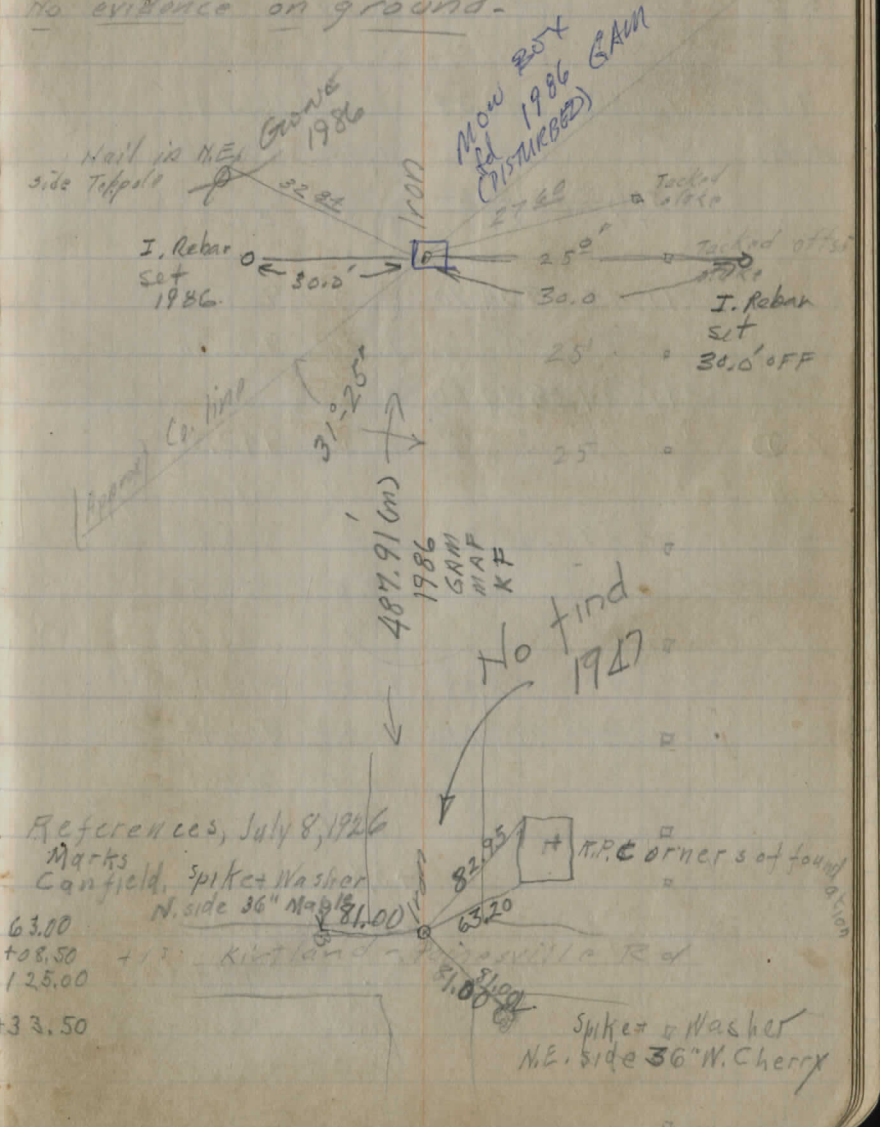
N29°25'W

N44°23'W

Mon. Box Set June '64

Δ = 14°-58' Rt.
D = 12°-00'
P.I. = 270+71.5
T = 62.73 (63.00)
P.C. = 270+08.77
L = 124.72 (125.00)
P.T. = 271+33.5 (33.50)
R = 478.337
E = 4.0 Ft.

Note:- used description of farm on Lt. to locate where Co. line intersects road. No evidence on ground.



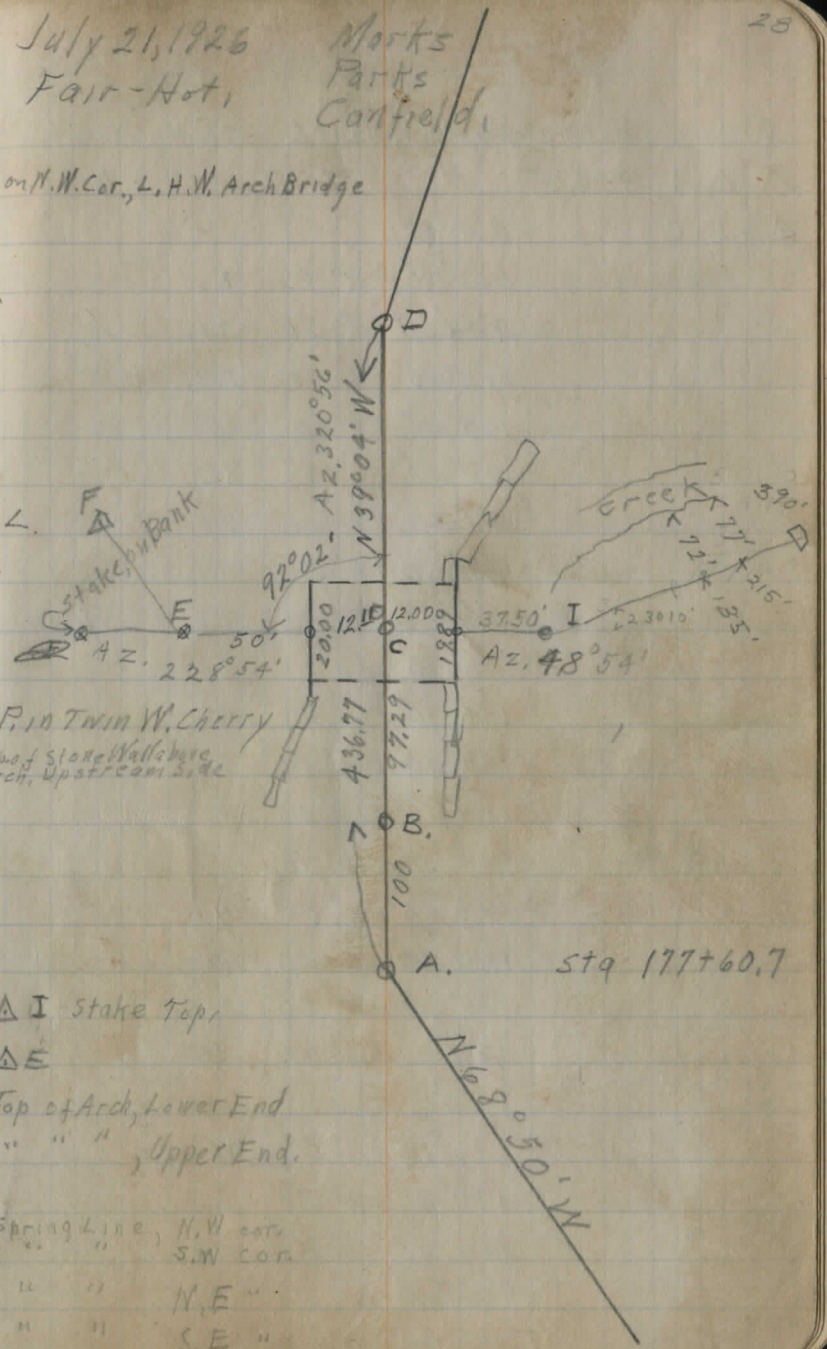
	11.00	934.25		923.25
△B			4.77	929.48
△C			8.75	925.50
T.P.	12.60	946.34	0.51	933.74
△A.			4.80	941.54
	July 22 1926 H.I.		—	El.
	11.45	934.70		923.25
			1.34	933.36
	11.14	944.50		
△D	7.79	950.17	2.12	942.38
B.M. set.			2.27	947.90
B.M.	7.27	930.52		923.25
			7.0	923.5
B.M	1.15	924.40		923.25
	0.75	912.88	12.27	912.13
	6.07	910.51	8.44	904.44
			1.20	909.31
			5.36	905.15
			+5.82	916.33
			+5.85	916.36
	2.51		60 T	
		906.95		904.44
			0.40	906.55
			0.60	906.35
			0.40	906.55
			0.60	906.35

Spike at ↗

July 21, 1926
Fair - Hot,

Marks
Parks
Canfield.

X on N.W. Cor., L. H.W. Arch Bridge



△I Stake Top.

△E

Top of Arch, Lower End

" " " , Upper End.

Spring Line, N.W cor.

" " S.W cor.

" " N.E "

" " S.E "

Sta.	H.I.	Azimuth	Vert ∠	Stadia	Rod	Angular Diff. in El.	El.	Dist	Description
⛫ △A	946.34				4.80		941.54	0.0	
△A.B+C		320°56'							
		262°30'	-2°40'	8.	4.8	-0.4	941.1	8.	corner fence post
		226°20'	+3°30'	34.		+2.1	943.6	34	fence
		195°40'	+8°00'	28.		+3.9	945.4	28	
		199°00'	+8°30'	62.		+9.1	950.6	61.	
		198°23'	+8°40'	85.		+12.7	954.2	84	house corner
		191°37'	+9°00'	77.		+11.9	953.4	75	Porch corner
		181°50'	+8°40'	81.		+12.1	953.6	79	Porch corner
		179°00	+10°45'	93.	9.00	+17.1	954.4	90	house corner
		185°10'	+10°20'	51.	4.8	+9.0	950.5	50	
		186°40'	+11°05'	47.		+8.9	950.4	46	
		185°10'	+13°00'	26.		+5.7	946.8	25	
		154°10'	+15°45'	45.		+11.8	953.3	42	
		140°45'	+10°30'	47.		+8.4	949.9	46	center drive
		175°25'	+8°00'	96.		+13.2	954.7	94	center drive
		169°20'	+8°20'	100.		14.3	955.8	98	
		134°30'	+10°50'	55.		10.4	951.9	53	
		127°30'	+11°07'	53.		10.0	951.5	51	
		123°56'	+11°28'	110.		21.5	963.0	106	
		120°10'	+11°55'	168.		33.5	975.0	162	
		119°25'	+11°25'	216.		41.8	983.3	208	
		117°35'	+10°55'	247.		46.0	987.5	238	
		125°40'	+11°35'	220.		43.3	984.8	212	
		138°30'	+10°35'	107.		19.4	960.9	104	

Stq	H. I.	Az.	Vert L	Stadia	Rod	Angular Diff. in Elv	El.	Dist.	
⊼ △ A	946.34				4.8		941.54		
		109°55'	+8°55'	53.	4.8	+8.1	949.6	53	℄ road
		109° 00'	+7°05'	272.		+33.3	974.8	268	ditch
		111°25'	+7°25'	270.		+34.5	976.0	265	
		113°20'	+7°20'	272.		+34.5	976.0	268	
		102°15'	+7°12'	109.		+13.5	955.0	108	
		98°25	+10°05'	111.		+19.2	960.7	108	
		88°45'	+6° 00'	50.		+ 5.2	946.7	50	
		83°40'	+10°10'	54.		+ 9.4	950.9	52	
		81°10'	+9° 40'	75.		+12.4	953.9	73	
		86° 10'	+10° 30'	140.		+25.1	966.6	136	
		219°10'	+6° 40'	27.		+ 3.1	944.6	27	15" Poplar
		320°56'	-7° 03	100.		12.2	929.3		△ B
⊼ △ B	934.48				5.00		929.48		△ C
		920°56'							
		210° 20'	+2°50'	135.	12.7	+6.7	923.5	135	foot of bank
		188°45'	+5°40'	132.	5.0	+13.0	942.5	132	
		193°45'	-0°35'	102.		-1.0	928.5	102	
		181°30'	-1°35'	55.		-1.5	928.0	55	
		172°15'	+0°45'	80.		+1.0	930.5	80	
		172°15'	+4°20'	109.		+8.3	937.8	109	
		170°45'	+6°50'	128.		+15.2	944.7	127	
		153°25'	+2°55'	54.		+2.8	932.3	54	
		149°10'	+4°40'	53.		+4.3	933.8	53	
		146°40	+3°55'	53.		+3.6	933.1	53	

Sta.	H. I.	Az.	Vert. ∠	Stadia	Rod	Angular Diff. in El.	El.	Dist	
℄ ΔB.	934.48				5.0		929.48		
		135°00'	+5°15'	53.		+4.8	934.3	53	
		118°15'	+3°40'	57.		+3.6	933.1	57	
		106°45'	+5°15'	57.		+5.2	934.7	57	
		134°15	0°	25.	2.7	—	931.8	25	℄ road
		103°40'	0°	30.	6.3		928.2	30	ditch intersection
		99°20'	0°	27.	3.5		931.0	27	
		8°10'	0°	17.	6.3		928.2	17	S. end guard-rail
		27°00'	0°	54.	10.6		923.9	54	
		46°40'	0°	55.	6.3		928.2	55	
		76°30'	0°	63.	3.9		930.6	63	
		73°00'	0°	66.	3.6		930.9	66	
		67°45'	0°	66.	3.0		931.5	66	℄ drive
		67°45'	—	20.	—	—	—	20	℄ drive
		56°45'	0°	88.	3.8		930.7	88	
		48°00'	0°	90.	2.5		932.0	90	
		58°15'	0°	131.	1.4		933.1	131	corner house
		66°40	0°	140.	0.		934.5	140	South edge drive
		71°00'	+1°40'	125.		+3.6	933.1	125	ditch
		73°30'	+2°20'	127.		5.2	934.7	127	
		58°47'	0°	122.	1.8		932.7	122	corner porch
		48°22'	0°	114.	3.1		931.4	114	corner porch
		46°50'	0°	122.	2.1		932.4	122	corner house
		26°25'	0°	130.	7.5		927.0	130	
		(18°30' 22°15')	0°	130.	14.6		919.9	130	two points

Sta	H.I.	Az.	Vert ∠	Stadia	Rod	Angular diff. in El.	El.	Dist	
⊼ △ B.	934.48				5.0		929.48		
		43° 15'	-4° 18'	71.	0	-5.3	929.2	71	
		32° 35'	-5° 03'	68.		-6.0	923.5	68	
		25° 50'	-5° 30'	67.		-6.4	923.1	67	
		307° 05'	-4° 55'	36.		-3.1	926.4	36	
		302° 45'	-8° 00'	37.		-5.1	924.4	37	end guard-rail
		299° 35'	-9° 45'	40.		-6.8	922.7	40	27" elm
		285° 30'	-10° 45'	56.		-10.3	919.2	54	
		283° 45'	-10° 40'	73.		-13.3	916.2	71	24" elm
		278° 25'	-0° 55'	94.	17.8	-1.5	915.0	94	twin ash 15"&18"
		270° 30'	-7° 05'	104.		-13.0	916.5	103	twin elm 12"&18"
		273° 10'	-5° 05'	143.		-12.7	916.8	143	edge bank
		268° 25'	-5° 05	147.		-13.0	916.5	147	fence line
		265° 00'	-6° 45'	87.		-10.2	919.3	86	∠ in fence
		280° 00'	-9° 20'	29.		-4.6	924.9	29	fence corner
		239° 30'	-5° 00'	115.		-10.0	919.5	115	
		240° 30'	-2° 39'	222.		-10.2	919.3	222	
		237° 45'	-0° 40'	256.		-3.0	926.5	256	
		224° 45'	-0° 38'	180.		-2.0	927.5	180	
		225° 25'	-2° 35'	144.		-6.5	923.0	144	
		220° 40'	-3° 30'	103.		-6.3	923.2	103	
		222° 00'	-3° 00'	87.		-4.6	924.9	87	
		221° 40'	-4° 25'	73.		-5.6	923.9	73	
		217° 30'	-3° 10'	33.		-1.8	927.7	33	

July 22, 1926.
Fair. Warm.

Marks, Parks. Canfield 33

Sta.	H.I.	Az.	Vert. L	Stadia	Rod	Angular Diff in El.	El	Dist.	
⊼ △ C.	930.80				5.30		925.50		
~~⊼ P~~		320°56'							△ D.
		161°43'	0°		7.4		923.6	49.8	S.W. corner bridge-wall.
		175°14'	0°		6.9		923.9	21.7	
		281°04'	0°		7.5		923.3	19.8	
		149°00'	0°	61.	4.4		926.4	61	
		142°00'	0°	59.	3.9		926.9	59	
		132°58'	0°	71.	3.8		927.0	71	∠ in guard rail
		228°00'	0°	9.	5.9		924.9	9	
		48°00'	0°	8.	5.5		925.3	8	
		314°22'	0°	99.	2.9		927.9	99	
		321°16'	0°	97.	2.9		927.9	97	
		926°05'	0°	99.	1.4		929.4	99	
⊼ △ D.	947.63				5.25.		942.38		
		140°56'	-4°02'	242.		-17.0	925.4		△ C.
		131°20	-3°35'	95.	8.0	-5.9	933.7	95	end guard-rail
		147°45'	-5°05'	103.		-9.1	933.3	103	
		142°30'	-6°00'	97.		-10.1	931.3	97	
		156°30'	-4°35'	82.		-6.5	935.9	82	
		183°10'	-2°15'	69.		-2.7	939.7	69	
		212°35'	-2°00'	68.		-2.4	940.0	68	
		234°00'	-1°20'	92.		-2.1	940.3	92	
		257°20'	-0°10'	105.		-0.3	942.1	105	
		268°25'	+1°00'	120.		+2.1	944.5	120	
		268°15'	+0°35'	171.		+1.7	944.1	171	15' North of bank 6' " " 4' Chestnut

Sta.	H.I.	Az	Vert. ∠	Stadia	Rod	Angular Diff. in El	El.	Dist	
⊼ △ D	947.63				5.25		942.38		
		268°30'	0°00'	237.	9.5		938.1	237	
		273°45'	0°00'	236.	2.0		945.6	236	18" walnut
		280°10'							corner schoolhouse
		288°57'	+3°05'	164.		+8.9	951.3	164	" " "
		293°15'	+3°15'	185.		+10.5	952.9	185	" " "
		294°15'	+3°50'	211.		+14.1	956.5	211	edge schoolyard
		316°00'	+5°35'	184.		+17.8	960.2	183	" " "
		313°20'	+5°15'	177.		+16.1	958.5	176	8" wild cherry
		308°30'	+4°45'	180.		+14.9	957.3	179	6" evergreen
		300°10'	+3°05'	147.		+8.0	950.4	147	
		316°10'	+5°05'	158.		+14.0	956.4	158	10" wild cherry
		313°55'	+5°30'	140.		+13.3	955.7	140	4" maple
		311°30'	+5°40'	117.		+11.5	953.9	117	8" maple
		308°20'	+6°00'	95.		+9.9	952.3	95	6" maple
		302°10'	+6°45'	71.		+8.3	950.7	71	6" maple
		270°20'	+3°25'	76.		+4.5	946.9	76	10" twin wild cherry
		265°50'		78.				78	10" wild cherry
		265°50'		98.				98	8" wild cherry
		264°45'		97.				97	12" Chestnut
		263°45'		110.				110	20" W. Cherry
		116°10'	-4°10'	72.		-5.2	937.2	72	
		89°10'	+3°10'	57.		+3.2	945.6	57	
		116°00'	+0°30'	37.		+0.3	942.7	37	
		125°10'	-6°20'	35.		-3.9	938.5	35	

Sta	H.I.	Az	Vert. ∠	Stadia	Rod	Diff. in El	El.	Dist	
⊼△D	947.63				5.25		942.38		
		141°00′	-5°15′	35.		-3.1	939.3	35	
		164°45′	-6°50′	40.		-4.7	937.7	40	
		169°00′	-4°40′	41.		-3.3	939.1	41	
		9°40′	+9°45′	54.		+9.2	951.6	54	5" Apple Alternate Apple + Peach trees spaced 15′
							3 apple, 4 peach trees between		
		336°30′	+6°25′	172.		+19.3	961.7	171	5" Apple
		331°00′	+6°10′	168.		+18.0	960.4	166	
		328°10′	+3°50′	165.		+11.0	953.4	165	
		324°00′	+4°15′	165.		+12.2	954.6	165	
		320°10′	+4°00′	168.		+11.7	954.1	168	
		318°40′	+4°55′	164.		+14.0	956.4	164	
		291°40′	0°	35	0.3		947.3	35	
		298°50′	0°	33	4.9		942.7	33	
		321°00′	0°	29	3.3		944.3	29	
		345°10′	0°	31.	3.7		943.9	31	
		359°10′	+11°10′	37.		+7.0	949.4	37	
⊼△E	908.67	4′			3.52		905.15		
		48°54′						111.60	△I
		37°50′	+5°15′	51.		+4.5	909.7	51	
		49°00′	0°	60.	6.0		902.7	60	Stream Bed 2′ Lower on S. Side 1′ Higher " N. "
		67°10′	0°	51.	5.5		903.2	51	
		95°35′	+7°45′	64.		+8.6	913.8	63	
		120°	0°	30.	5.1		903.6	30	
		120°	0°	19.	6.1		902.6	19	

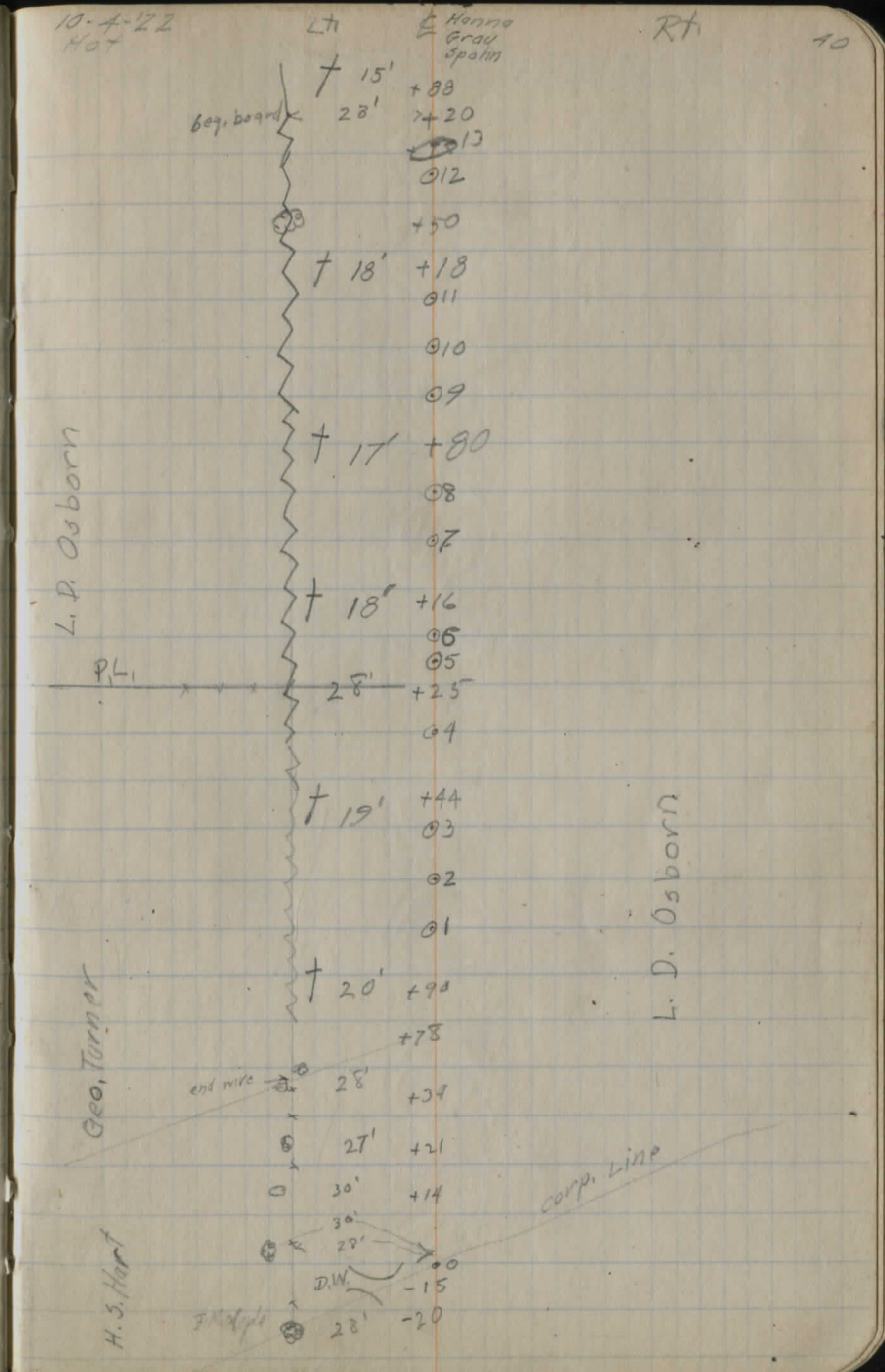
Sta.	H.I.	AZ	Vert.∠	Stadia	Rod	Angular diff. in El.	El.	Dist.	
⊼ △ E	908.67				3.52		905.15		
		120°	0°	10.	5.5		903.2	10	
		183°00′	0°	15.	6.9		901.8	15	
		185°00′	0°	27.	4.2		904.5	27	
		31°20′	+4°30′	33.		+ 2.6	907.8	33	
		12°40′	+9°05′	40.		+ 5.2	910.4	40	
		345°25′	+6°20′	70.		+ 7.7	912.9	70	
		338°20′	+6°20′	106.		+11.9	917.1	106	
		336°00′	+5°30′	65.		+ 6	911.4	65	
		337°00′	+5°25′	62.		+ 5.8	911.0	62	
		339°00′	0°	26.	3.6		905.1	26	
		340°00′	+6°13′	60.	3.52	+ 6.6	911.8	60	△ G
		270°00′	0°	56.	6.9		901.8 – on Rock 0.3′ above stream Bed	56.	△ F
⊼ △ G	917.0				5.2		911.8		
		203°40′	0°	33.	9.5		907.5	33	
		219°15′	0°	20.	8.0		909.0	20	
		274°00′	0°	8.	6.0		911.0	8	
		329°00′	0°	22.	3.0		914.0	22	
		323°15′	+6°30′	40.		+4.5	916.3	40	
		300°00′	-2°00′	38.		-1.3	910.5	38	
		311°00′	+3°20′	85.		+5.0	916.8	85	
		324°00′	+9°05′	88.		+13.4	925.2	88	
⊼ △ F	906.7	~~270°00′~~			4.9		901.8		
		90°00′		56.				56	△ E
		134°00′	0°	24	3.6		903.1	24	

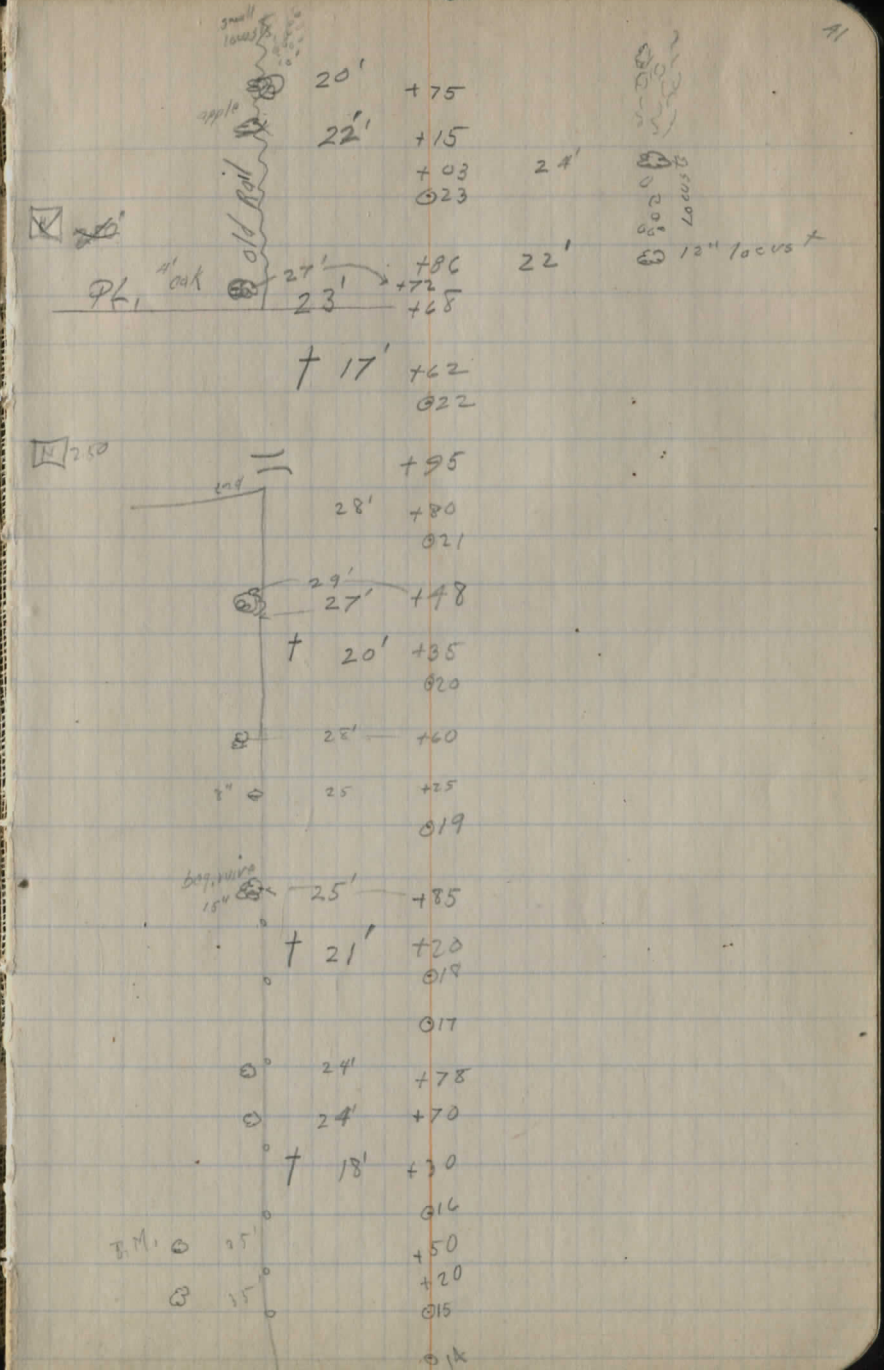
Sta	H.I.	AZ.	Vert.∠	Stadia	Rod	Angular diff. in El.	El.	Dist	
⊼ △ F	906.7				4.9		901.8		
		59°30′	0°	27.	5.0		901.7	27	
		15°15′	0°	17.	5.3		901.4	17	edge of waterfall
		236°45′	0°	17.	5.0		901.7	17	" " " "
		139°20′	+24°00′	41.		+15.2	917.0	35	
		173°15′	+27°20′	34.		+14.0	915.8	27	
		248°30′	+16°10′	42.		+11.2	913.0	39	
		291°15′	+2°15′	90.		+3.5	905.3	90	
		320°00′	-16°00′	76.	4.9	-20.2	881.6	71	△ H
⊼ △ H	886.8				5.2		881.6		
		140°							△ F
		185°00′	+8°50′	42.		+6.4	888.0	42	
		155°00′	+7°00′	61.		+7.4	889.0	61	
		142°00′	+7°45′	48.		+6.4	888.0	48	
		114°20′	+8°15′	48.		+6.8	888.4	48	
		106°30′	+7°30′	32.		+4.1	885.7	32	
		112°30′	0°	28.	3.9		882.9	28	
		138°45′	0°	41.	2.5		884.8	41	
		158°40′	0°	39.	2.8		884.0	39	
		186°10′	0°	33.	4.1		882.7	33	
		251°00′	0°	34.	5.2		881.6	34	
		295°00′	0°	30.	7.5		879.3	30	
		268°30′	0°	57.	2.4		884.4	57	
		277°00′	0°	74.	2.2		884.6	74	
		279°00	0°	96.	6.7		880.1	96	

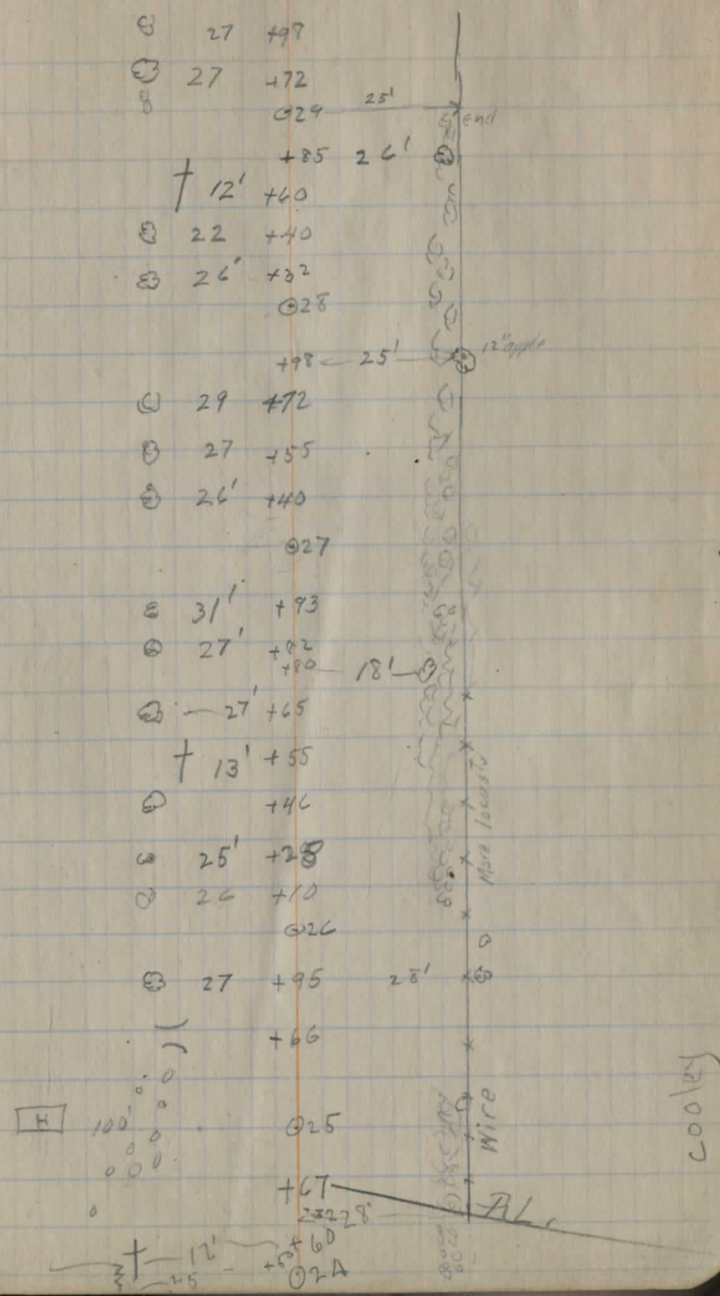
Sta.	H.I.	Az.	Vert. ∠	Stadia	Rod	Angular Diff. in El	El	Dist.	
⊼ △ H	886.8				5.2		881.6		
		285° 45′	0°	145.	5.7		881.1	145	
		298° 00′	0°	118.	5.3		881.5	118	
		315° 15′	0°	80.	4.5		882.3	80	
		330° 00′	0°	53.	4.4		882.4	53	
		327° 00′	0°	38.	4.8		882.0	38	
		345° 20′	+10° 05′	47.	5.2	+8.1	889.7	47	
		3° 00′	0°	21.	3.5		883.3	21	
		69° 20′	+14° 25′	34.		+7.9	889.5	34	
		91° 00′	+16° 10′	54.		+14.5	896.1	50	
		108° 45′	+10° 55′	39.		+7.3	888.9	39	
		104° 00′	0°	30.	1.0		885.8	30	
		331° 00′	0°	7.	5.2		881.6	7	
⊼ △ I	913.6				4.3		909.31		
		228° 54′						111.60	△ E
		282° 30′						40.8	edge of wing wall
		248° 10′						37.4	wingwall
		248° 10′						39.2	bridge wall
		206° 15′	0°		6.3		907.3	40.6	" "
		178° 36′						60.3	end of wing wall
⊼ △ I	913.2				3.9		909.31		Aug. 16, 1926 Marks-Canfield
		228° 54′							△ E
		194°		25	3.4		909.8	25	
		194°		41	2.1		911.1	41	
		184	+2° 00′	49		+1.7	911.0	49	

Sta.	H.I.	Az.	Vert. ∠	Stadia	Rod	Angular diff. in El.	El.		
	913.2				3.9		909.3		Pitch
		184°	0	46	1.2		912.0	46	
		162°	+ 7°	76		+9.2	918.5	76	
		138°	+ 5°40′	63		+6.2	915.5	63	
		95°	+ 4°	50		+3.5	912.8	50	
		66°15′	—	47	1.9		911.3	47	
		65°	+6°30′	60		+6.75	916.1	60	
		64°	+2°	60	2.0	+2.1	913.3	60	Small stream ~~Ditch~~ 3' Wide, Stone Walls
		18°	0	84	0.6		912.6	84	
		12°	0	84	3.1		910.1	84	
		17°	0	55	4.0		909.2	55	
		258°	0	18	8.0		905.2	18	South of Small Stream
		305°	0	25	8.3		904.9	25	
		302°	0	26	9.5		903.7	26	
		301°30′	0	43	9.1		904.1	43	
		350°	0	112	4.3		908.9	112	Hard Shale above + Below Falls
		338°	0	115	4.3		908.9	115	Top of 4' Water Fall
		306°10′	0	63	3.4		909.8	63	Top of 4' Water Fall
⊼△ J.	914.3				4.5		909.8		△ J.
		344°	0	28	0.5		913.8	28	
		313°	+10°	35	4.5	+6.0	915.8	35	
		320°30′	+9°30′	43	4.5	+10.0	919.8	63	
		353°30′	+3°50′	62	4.5	+4.1	913.9	62	

TOPOGRAPHY


10-4-22
Hot
Lft
E. Hanna
Gray
Spahn
Rt
40
Beg. board
15'
28'
+88
+20
13
12
+50
18'
+18
11
10
9
17'
+80
8
7
18'
+16
6
5
P.L.
28'
+25
4
19'
+44
3
2
1
20'
+98
+78
end wire
28'
+34
27'
+21
30'
+14
30'
28'
D.W.
-15
-20
28'
L. D. Osborn
Geo, Turner
H. S. Hart
corp. Line
L. D. Osborn


small locust
apple
old trail
20'
+75
22'
+15
+03
⊙23
24'
locust
22'
12" locust
Pl.
11" oak
27'
+86
+72
23'
+68
† 17'
+62
⊙22
+95
28'
+80
⊙21
29'
27'
+48
† 20'
+35
⊙20
25'
+60
8"
25
+25
⊙19
beg. survey
25'
+85
† 21'
+20
⊙19
⊙17
24'
+78
24'
+70
† 18'
+30
⊙16
B.M.
25'
+50
15'
+20
⊙15


27 +98
27 +72
O29
25'
end
+85
26'
12' +40
22 +40
26' +32
O28
12" apple
+98
25'
29 +72
27 +55
26' +40
O27
31' +93
27' +82
+80
18'
27' +65
13' +55
+46
25' +28
26 +10
O26
27 +95
28'
+66
H
100'
O25
Wire
+67
28'
12'
+60
O24
cooley

⊙38

† 20' +20

⊙37

29' +45

⊙36

28 +56

8" 26 +32

† 19' +15

⊙35

+

24' +95 25' Bm. maple

+60 25'

⊙34

† 13' ⊙33

+14 26'

+30 26

+08 26' Str. of 2" maple

⊙32

+85 — 75'

Bridge

70'

+40 30

+18 30

+06

⊙31

† 12' +82 — 150' B

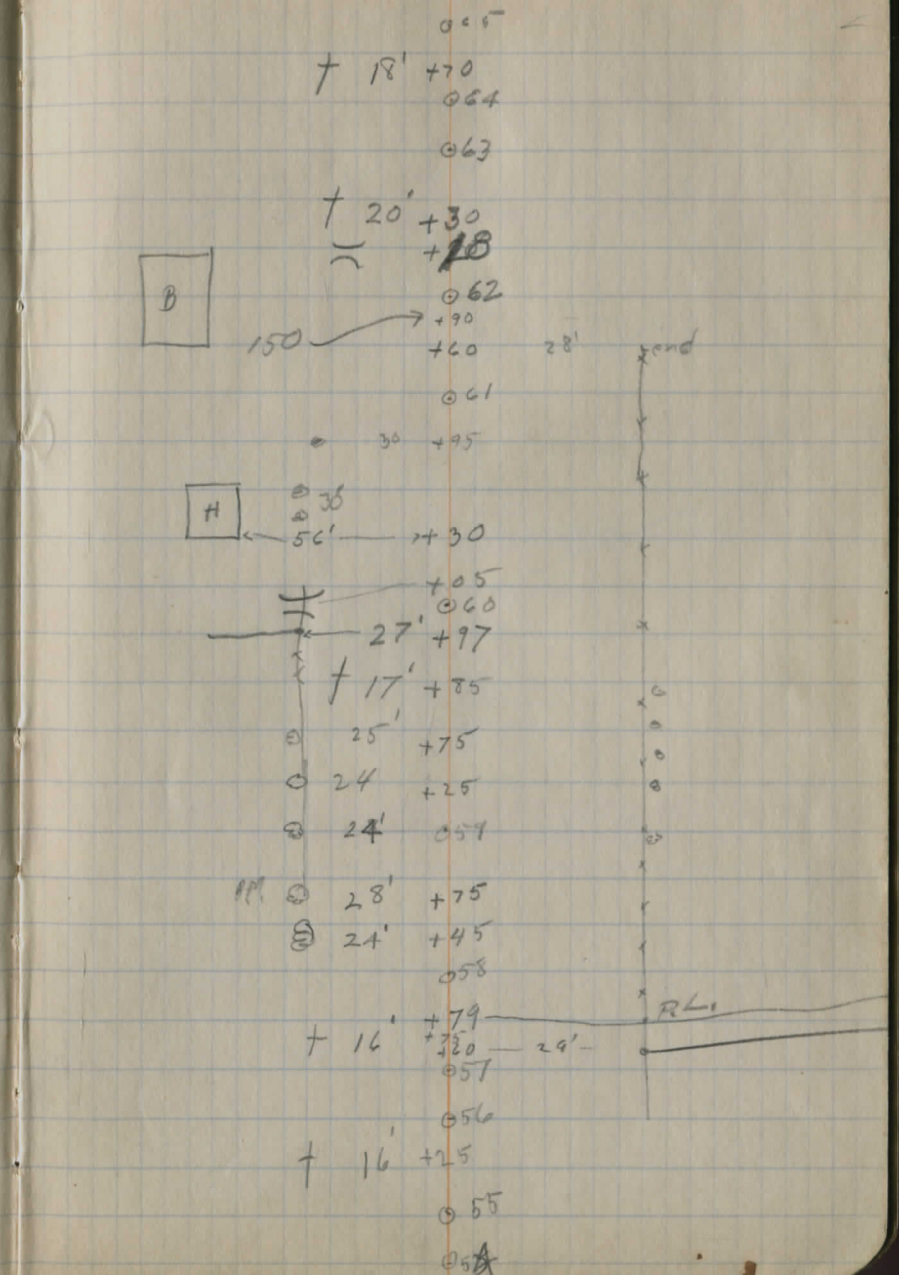
+77 27'

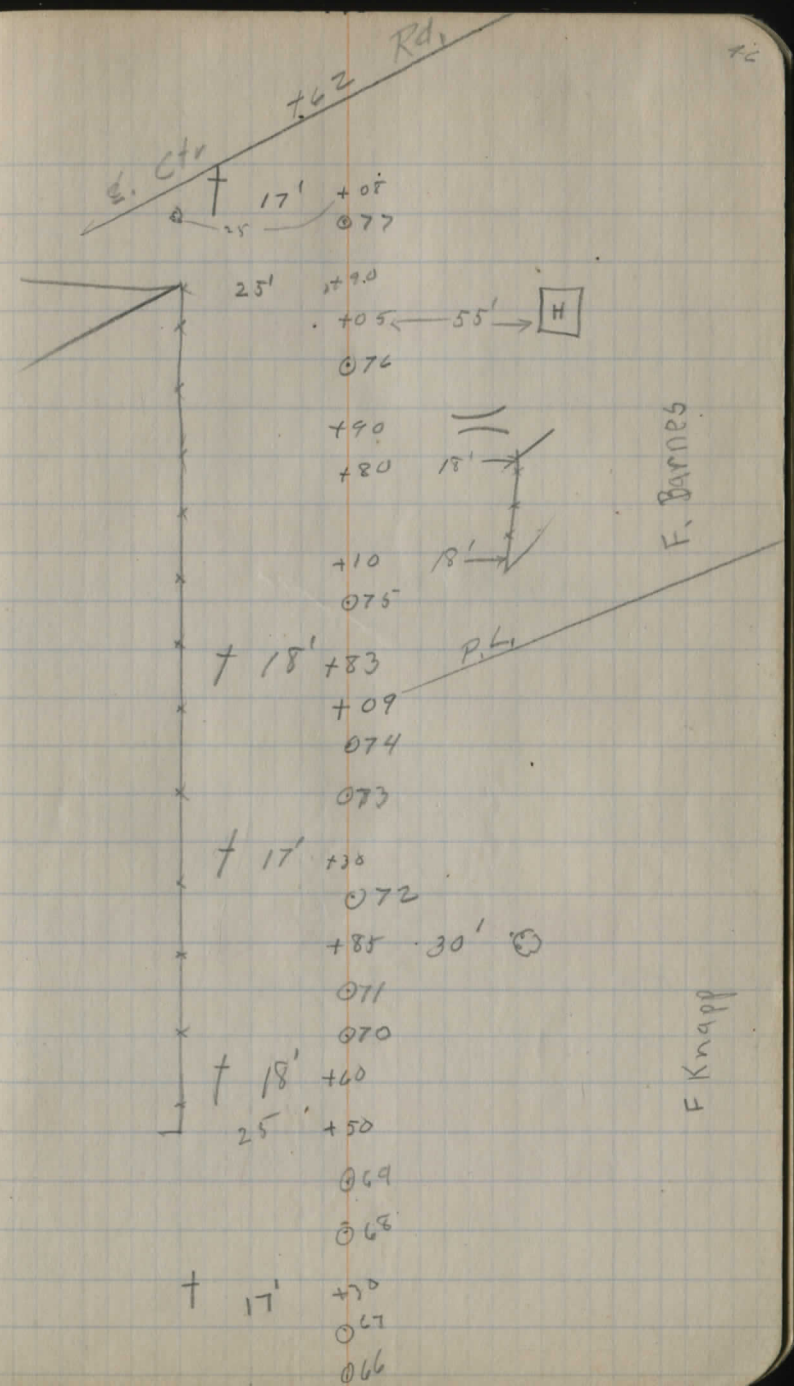
+30 — 23'

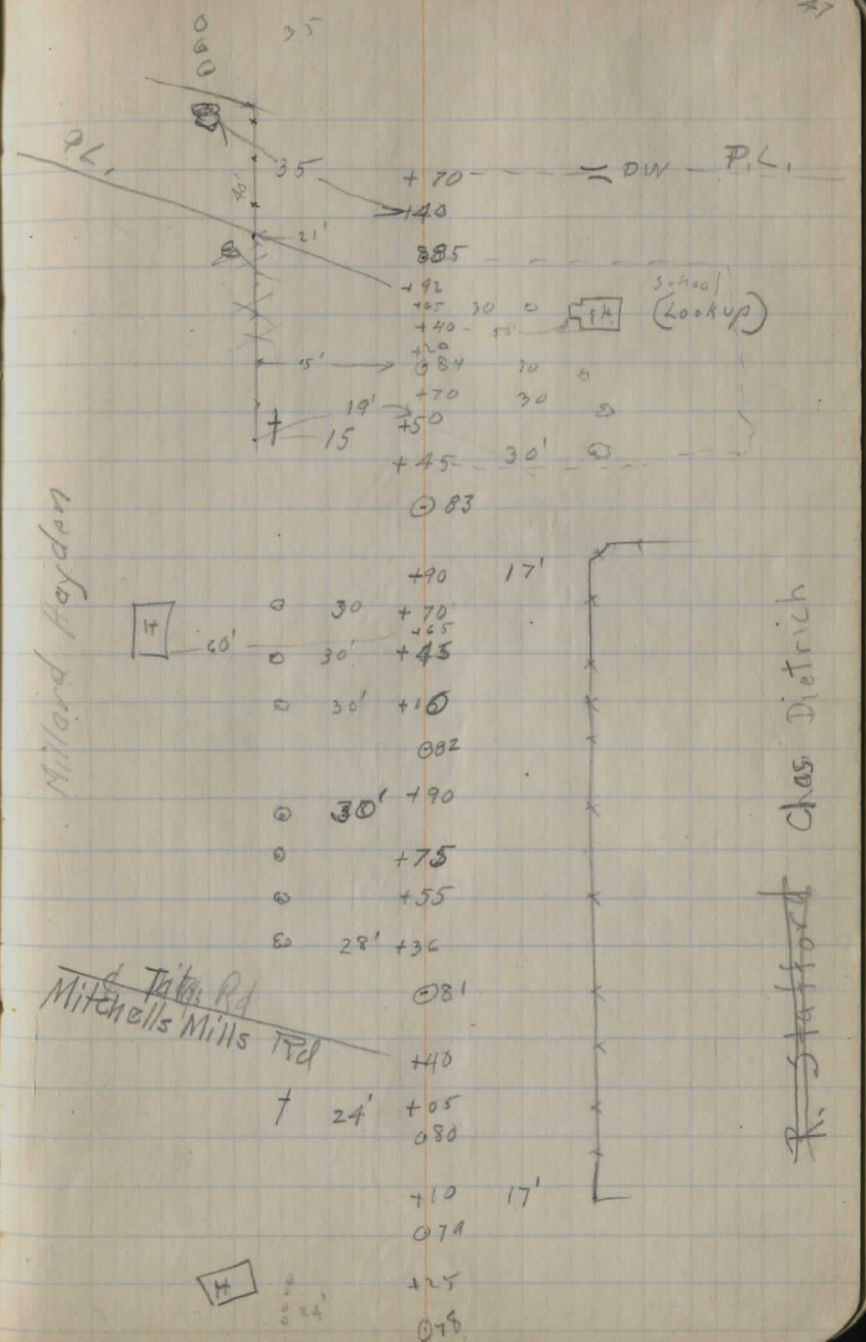
⊙30

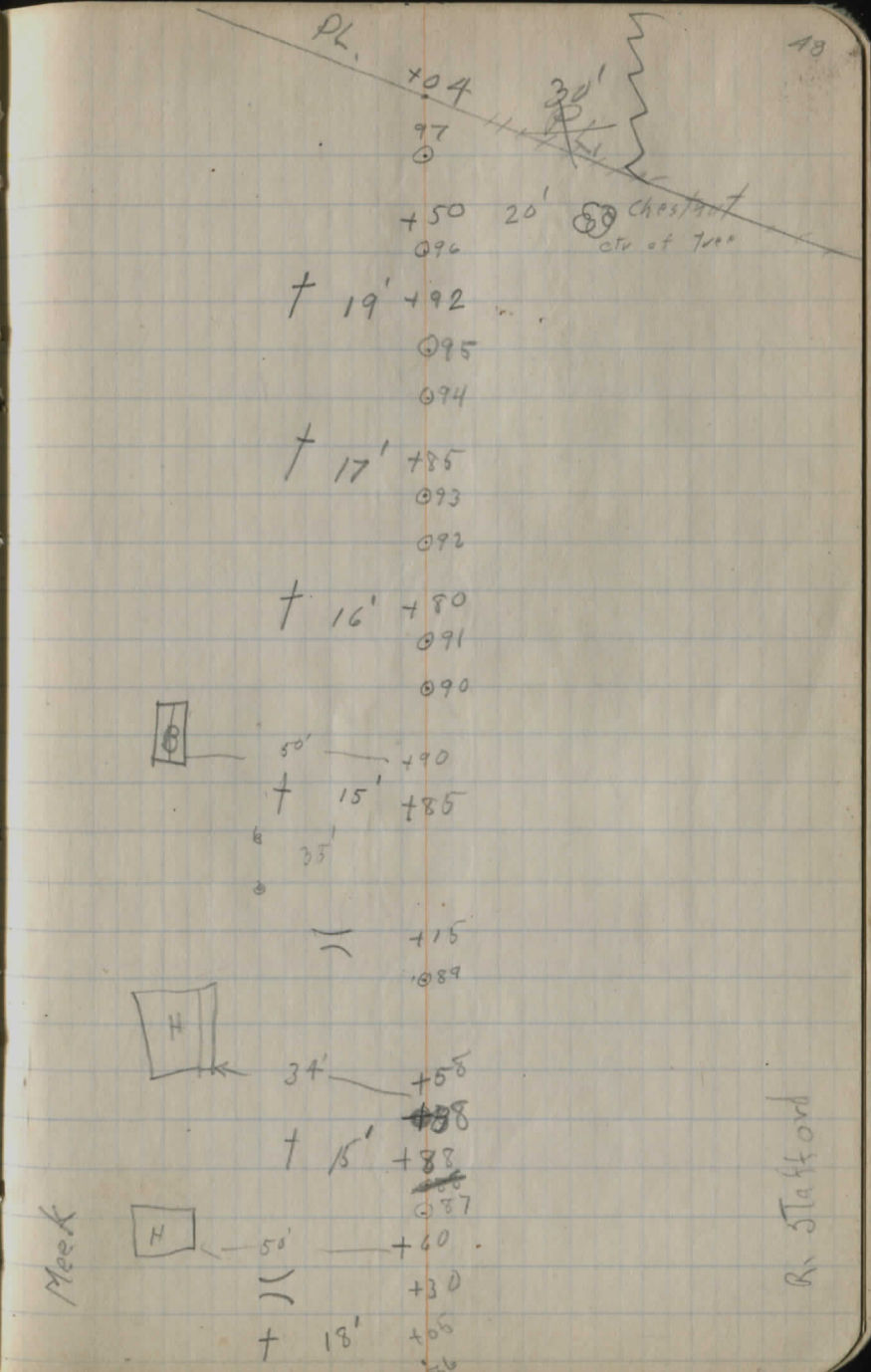
MR Hayden

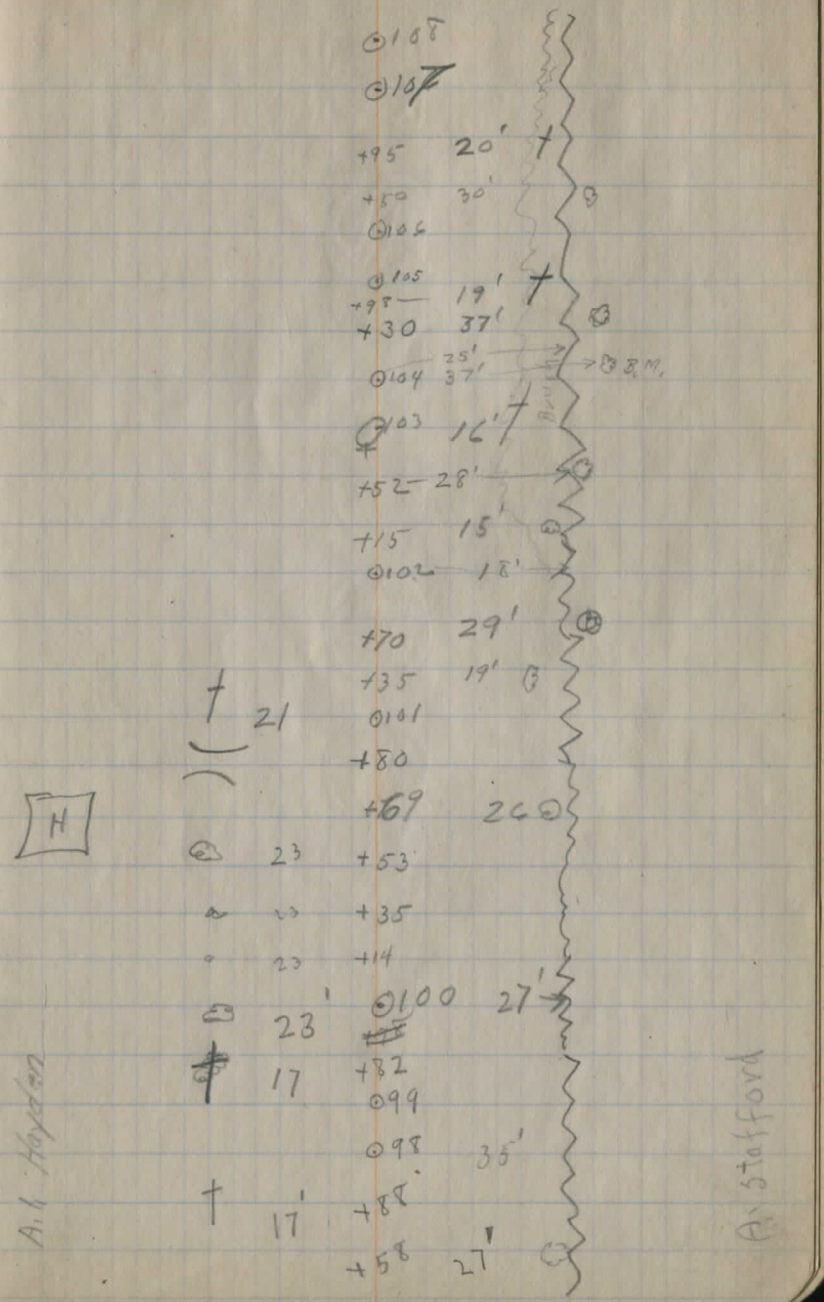
⊙53
+ +95
⊙52
⊙51
+ 8' +85
⊙50
⊙49
⊙ 26' +70
+ 19' +55
⊙48
⊙ 27' +45
+19
⊙47
F. Knapp
Pl. Dietrich Cooley
⊙ 28' +55
+ 20 +25
⊙46
Pl.
⊙ 25' +65
⊙ 34' ⊙46
+23
⊙44
+ 20 +85
⊙43
⊙42
+ 22' +55
⊙41
⊙40
+ 22' +10
⊙39

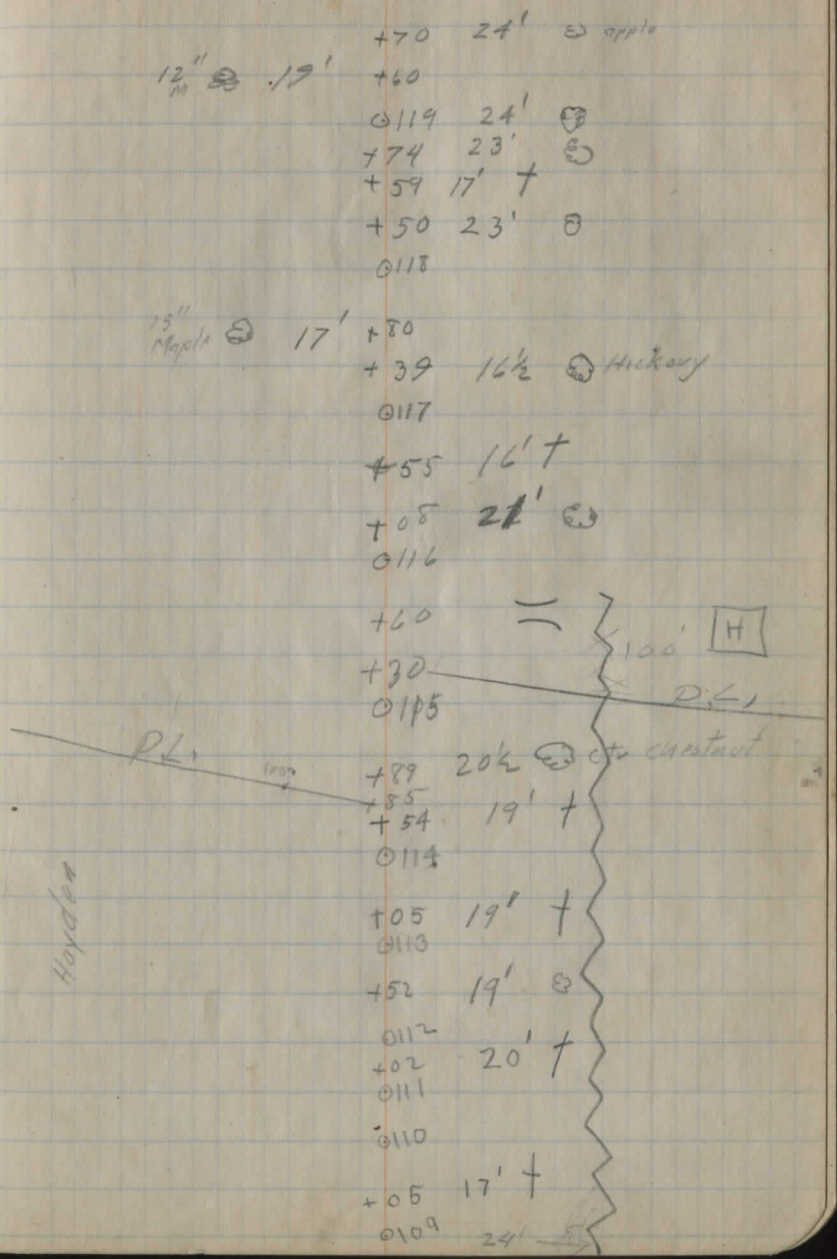

+ 18' +70
64
63
+ 20' +30
+18
62
B
150
+90
+60
28'
end
61
30 +45
H
35
50'
+30
+05
60
27' +97
+ 17' +85
25' +75
24 +25
24' 54
28' +75
24' +45
58
+79
+ 16' +20
29'
57
56
+ 16' +25
55
RL

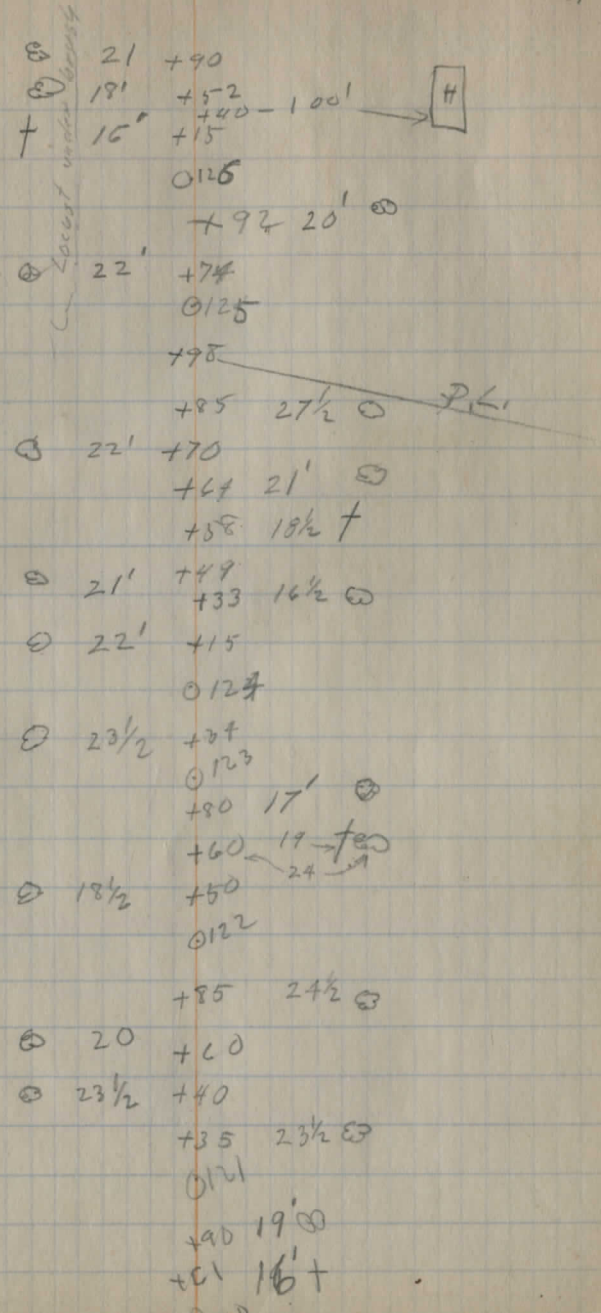

Rd.
+62
℄ Ctr
17'
+08
77
25'
+90
+05
55'
H
76
+90
+80
18'
+10
75
18'
+83
+09
74
73
17'
+30
72
+85
30'
71
70
18'
+60
25'
+50
69
68
17'
+70
67
66
F. Barnes
P.L.
F Knapp

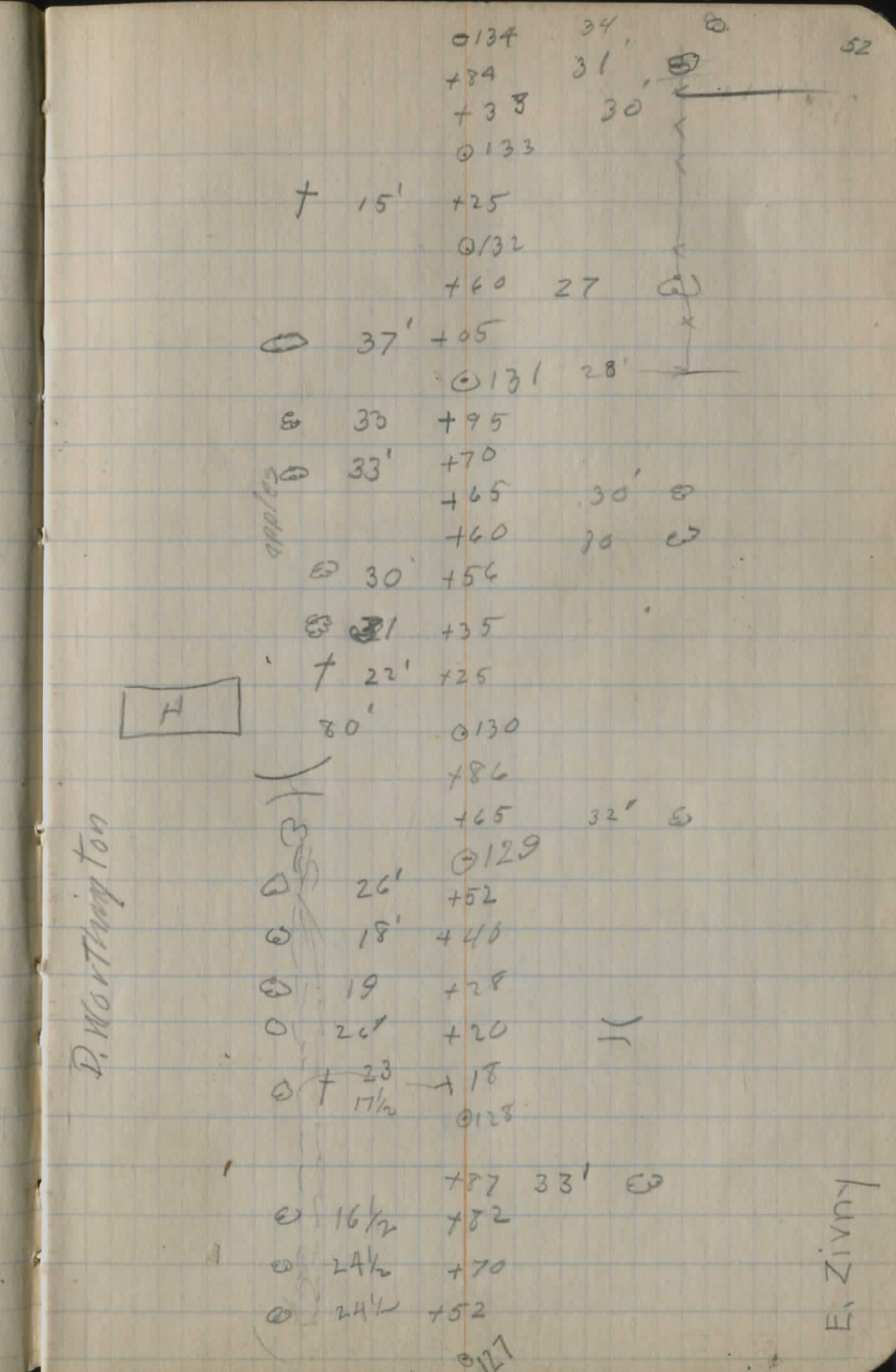

PL
35
21'
15'
19'
15
+70
140
385
+92
+85
+40
+20
384
+70
+50
+45
30'
383
+90
17'
30
+70
+65
60'
30'
+45
30'
+10
382
30'
+90
+75
+55
28'
+30
381
+40
24'
+05
380
+10
17'
379
+25
378
DW
P.L.
School
(Lookup)
Millard Hayden
Chas Dietrich
R. Stafford
Tait Rd
Mitchells Mills Rd

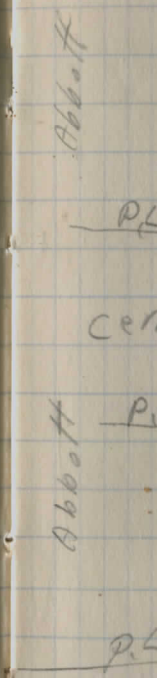

PL.
+04
97
30'
+50
20'
Chestnut
ctr. of Tree
+96
+19'
+92
95
94
+17'
+85
93
92
+16'
+80
91
90
50'
+90
+15'
+85
35'
+15
89
H
34'
+58
+88
+15'
+88
87
H
50'
+60
+30
+18'
+05
Meek
R. Stafford


108
107
+95 20'
+50 30'
106
105
+98 19'
+30 37'
104 25' 37'
103 16'
+52 28'
+15 15'
102 18'
+70 29'
+35 19'
101
+80
+69 200
21
H
23 +53
+35
+14
100 27'
23'
17 +82
99
98 35'
17' +88
+58 27'
A. H. Hayden
A. Stafford


+70 24' apple
12" M 19'
+60
119 24'
+74 23'
+59 17'
+50 23'
118
15" Maple 17'
+80
+39 16½ Hickory
117
+55 16'
+08 21'
116
+60
+30
105
100'
H
P.L.
P.L.
Iron
+89 20½ Chestnut
+85
+54 19'
114
Hayden
+05 19'
113
+52 19'
112
+02 20'
111
110
+06 17'
109
24'


21 +90
18' +52 +40 - 100'
H
16' +15
0126
+92 20'
22' +74
0125
+98
+85 27½
P.L.
22' +70
+64 21'
+58 18½
21' +49
+33 16½
22' +15
0124
23½ +84
0123
+80 17'
+60 19
24
18½ +50
0122
+85 24½
20 +60
23½ +40
+35 23½
0121
+90 19'
+61 16'
0120

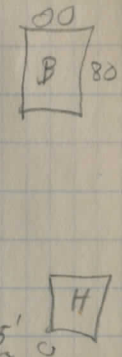

0134 34'
+84 31'
+38 30'
0133
15' +25
0132
+60 27'
37' +05
0131 28'
33 +95
33' +70
+65 30'
+60 20
30 +56
31 +35
22' +25
H
80'
0130
+86
+65 32'
0129
26' +52
18' +40
19 +28
20' +20
23 +18
17½ 0128
+87 33'
16½ +82
24½ +70
24½ +52
0127
D. Worthington
E. Zivny



+92 19' ⊖
+30 19' ⊖
+25 14½ †
⊙145
+75 19' ⊖
+20 19' ⊖
+06
⊙144
+32 14½ †
+03 19½ ⊖
⊙143
+85
+46 20' ⊖
⊙142
+88 20' ⊖
+30 15' † ⊖
+29 21½
⊙141
⊙140
⊙139
+74 15' †
+66
⊙138
⊙137
+70 29' † ⊖ Pipe Rd
+15
⊙136
+05 36' ⊖
⊙135
+80 30 ⊖BM
† 16½ +40

E.L. Worthington

⊙153
+40 14' ⊥
⊙152
+70 25 = 10'
+60 25 =
+22 13½ ⊥ 25 → B
⊙151
+88 24½ ⊘ 30"
+48 24 ⊗ 75'
+44 23½ ⊗
⊙150
+76 17½ ⊗
+47 14' ⊥
+33 27' ⊘
+16 18' ⊘
⊙149
+97 25' ⊗
+81 26' ⊗
+53 18' ⊗
+15 22½ ⊗
⊙148
+90 18' ⊗
+65 25' ⊗
40 15½ ⊥
+23 19' ⊗
+2 24' ⊗
⊙147
+56 24½ ⊗
+51 18½ ⊗
⊙146



10-18-22

154

Mather

85

⊙163

6" Hickory ⊙ 19' +25

+09

⊙162

+95 19' †

⊙161

+25 19' †

⊙160

⊙159

+24 19' †

⊙158

⊙157

Boundary

+23 18½ †

⊙156

+63 28' ⊙

+20 30' ⊙

+05 27' ⊙

⊙155

+77 25' ⊙

+45 26' ⊙

+37 27' ⊙

+05 †

⊙154

small boundary oak

Large Chestnut

Worthington

Abbott

⊙ 28' +40

⊙ 27½ +33

+22

⊙ 27½ +12 27½ ⊙

H

50°

29

Pl. +22

Pl. +36.4

5c

+22 25' 03
@175
+90 20' +
@174
@173
+80 19' 7
@172
@171
26' +95
+
+71 19' 7
@170
+66
+15
+11
@169
+60 17' +
@168
+75
@167
+60 180
+52 20' +
@166
@165
+43 21' 7
@164

small +

B

60'

DW

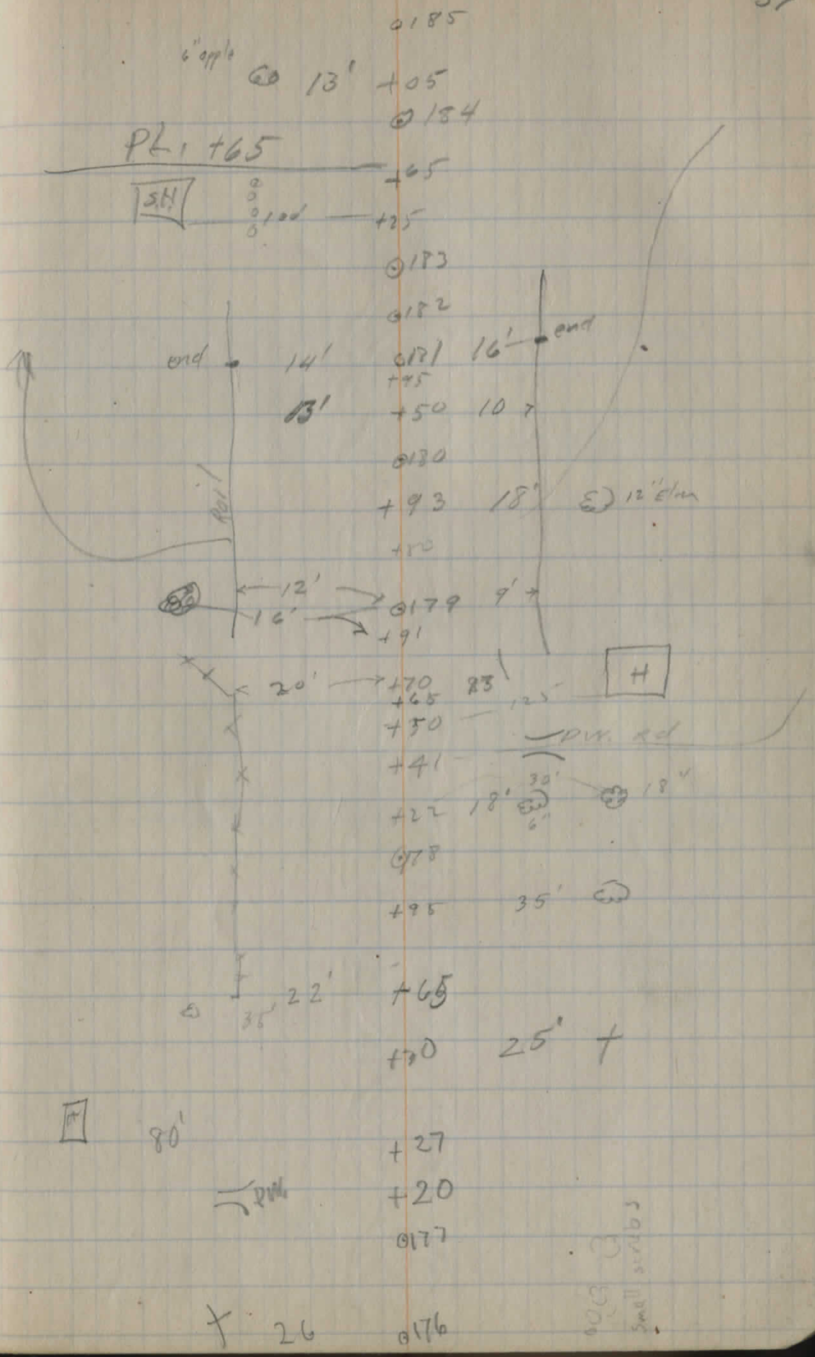
H

49'

20'

H

MAP


⊙185
6" apple
13'
+05
⊙184
PL, +65
+65
SH
10d
+25
⊙183
⊙182
end
14'
⊙181
16'
end
+95
13'
+50
10
⊙180
+93
18'
12" Elm
+70
12'
⊙179
9'
16'
+91
20'
+70
83
+65
H
+50
pvt. rd
+41
30'
+22
18'
6"
18"
⊙178
+95
35'
22'
+65
35'
+30
25'
80'
+27
pvt.
+20
⊙177
26
⊙176
small shrubs

⊙ 30' +34

⊙ 35' +14

⊙195

⊙ 31' +90

⊙ 30' +58

⊙ 28' +45

⊙ 35' +35

⊙194

+90

+52

⊙193

+63

⊙192

+90

℄ Rd. +80

⊙191

+75

⊙190

+86

⊙189

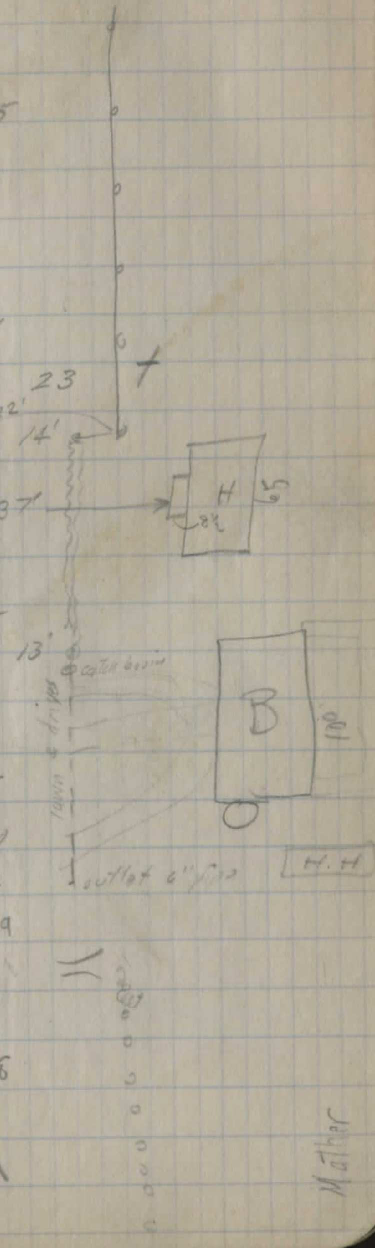
+58

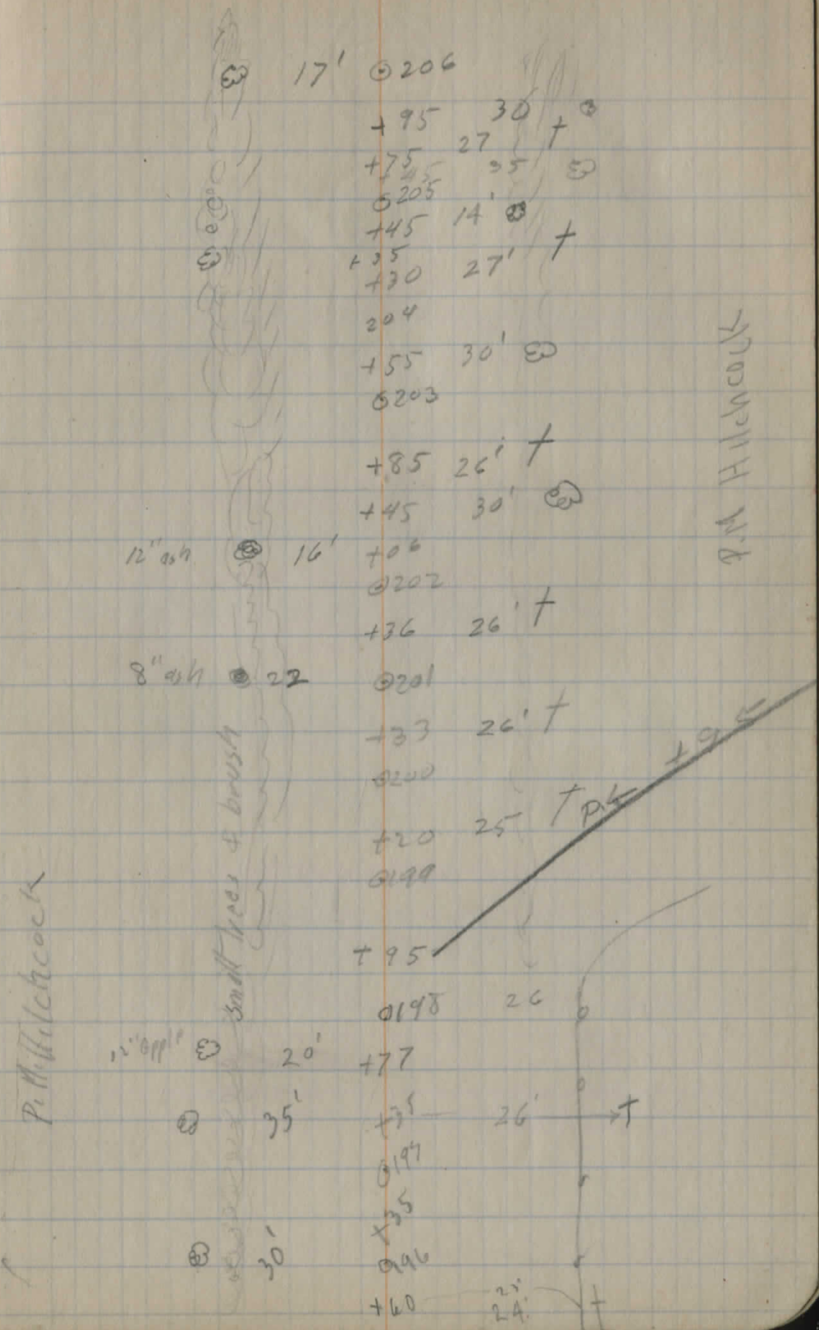
⊙188

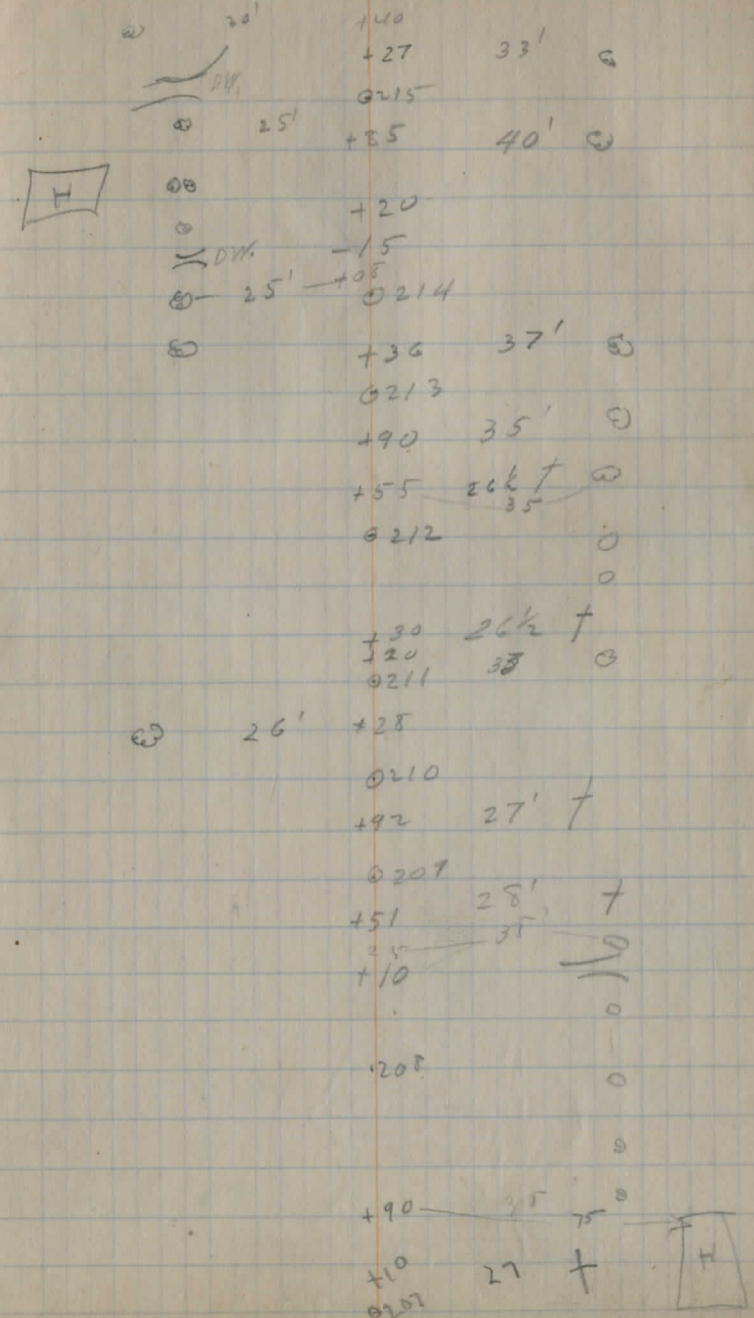
⊙187

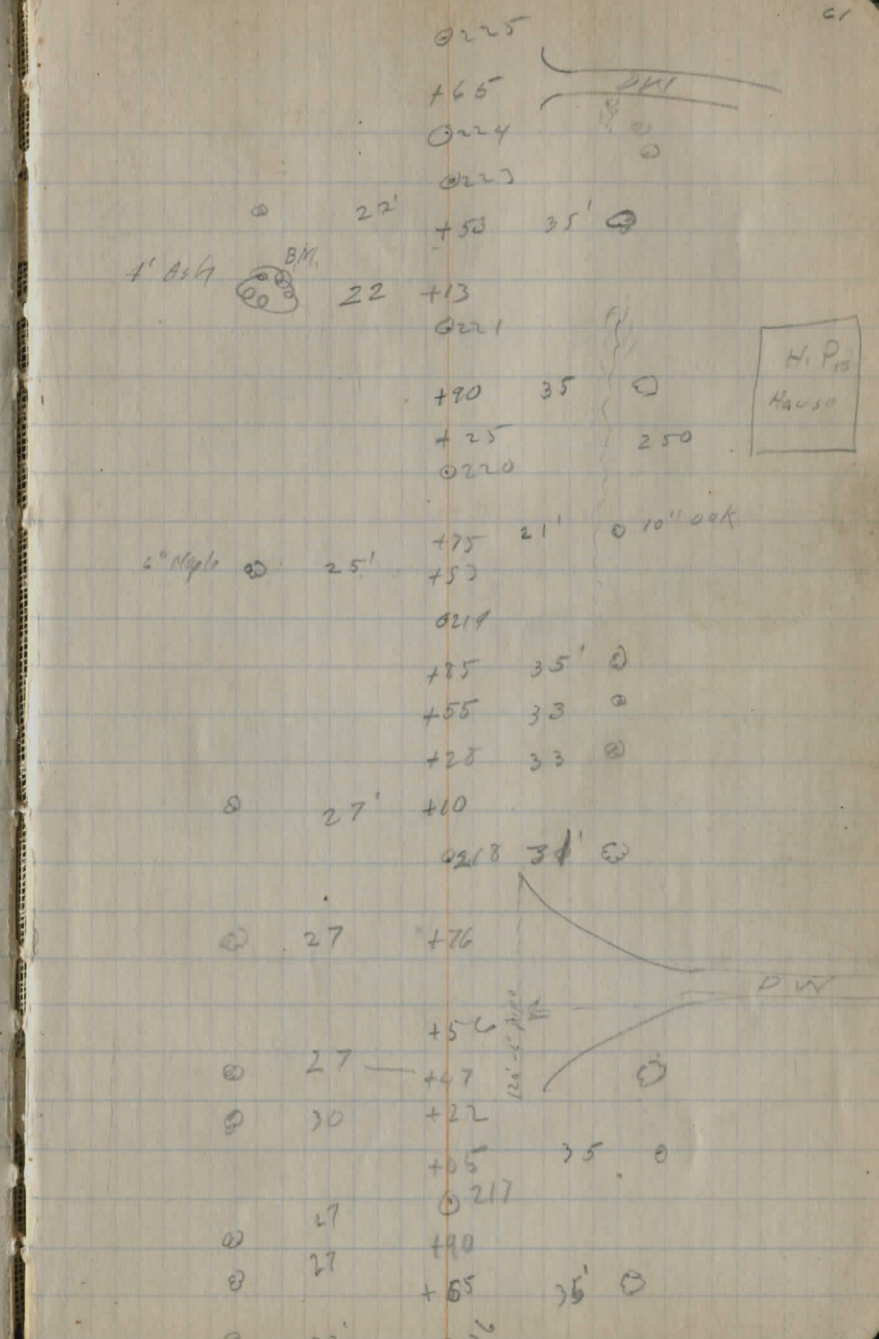
⊙186

Mather




17'
⊙206
+95
30
27
+75
35
⊙205
+45
14'
+35
+30
27'
204
+55
30'
⊙203
+85
26'
+45
30'
12" ash
16'
+06
⊙202
+36
26'
8" ash
22
⊙201
+33
26'
⊙200
+20
25'
T.P.4
⊙199
+95
⊙198
26
12" apple
20'
+77
35'
+75
26'
⊙197
+35
30'
⊙196
+40
24'
small trees & brush
P. Hitchcock
P. M. Hitchcock


20'
DW.
25'
H
DW.
25'
140
+27
33'
0215
+85
40'
+20
-15
+05
0214
+36
37'
0213
+90
35'
+55
26 1/2 t
35
0212
+30
26 1/2 t
+20
0211
26'
+28
0210
+92
27' t
0209
+51
28' t
35'
+10
0208
+90
+10
27 t
0207
H


225
+65
224
223
27'
+50
35'
1' ash
B.M.
22
+13
221
+90
35
+25
250
220
H. P.
House
+75
21'
10" oak
6" Maple
25'
+53
214
+85
35'
+55
33
+28
33
27'
+10
218
34'
27
+76
D.W.
+56
27
+47
30
+22
+05
35
217
27
+90
27
+65
35
22'
216

@ —28' +65
+55 30' ⑤
② — 28' +35
+06 — 30 — ④
⊙230

③ 27' +75
+60 30' ③
+55 31'
+10
⊙232 30' ②

① 26' +95
+24 28' ① 2" poor
31 ③
+05
⊙231

+62 32' ③
10" Apple ⑩ 20' +21
+14 32 ①
⊙230

⑤ 25' +40
+15 32' ⑤
⊙229

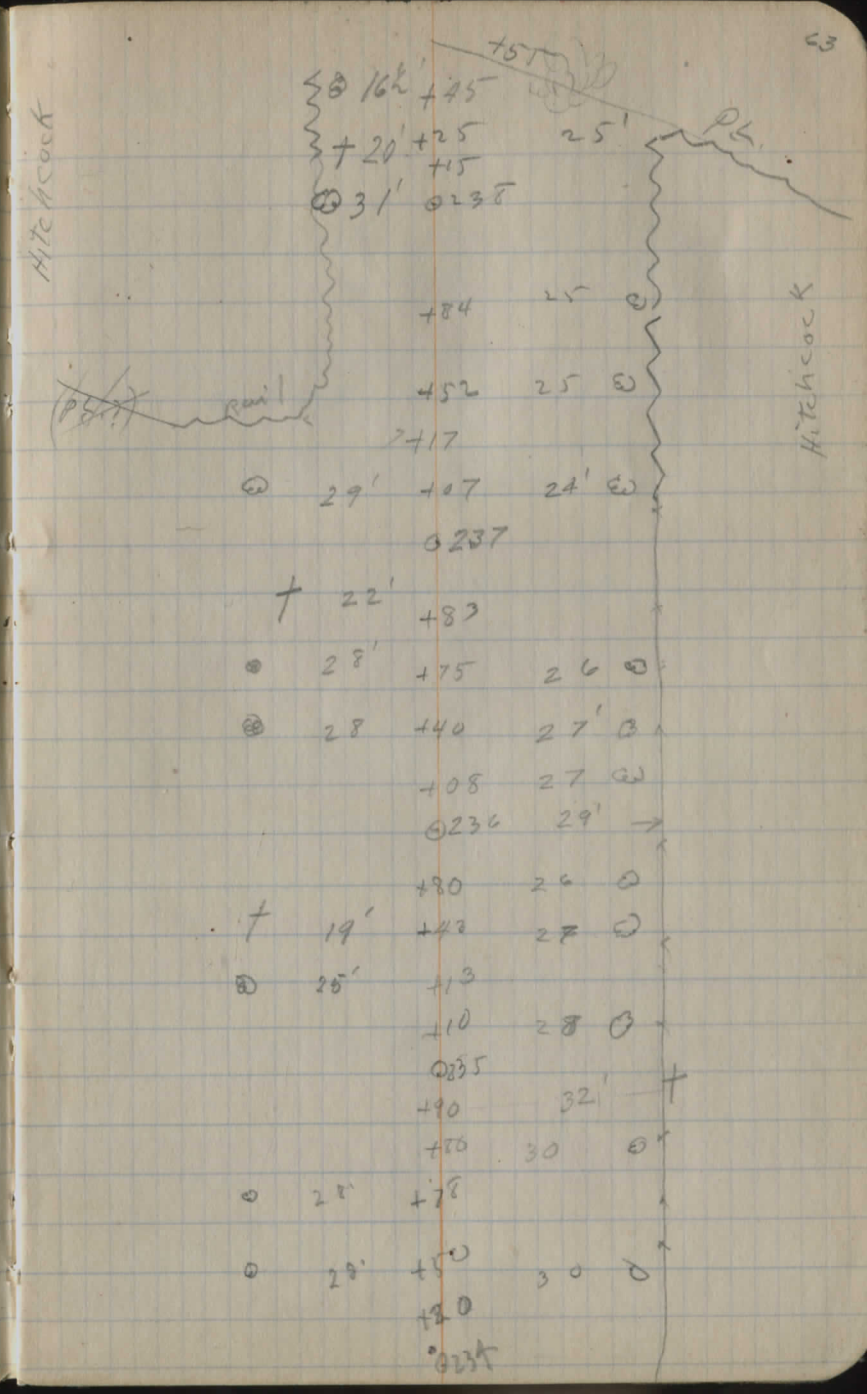
⑥ 24 +67
⊙228

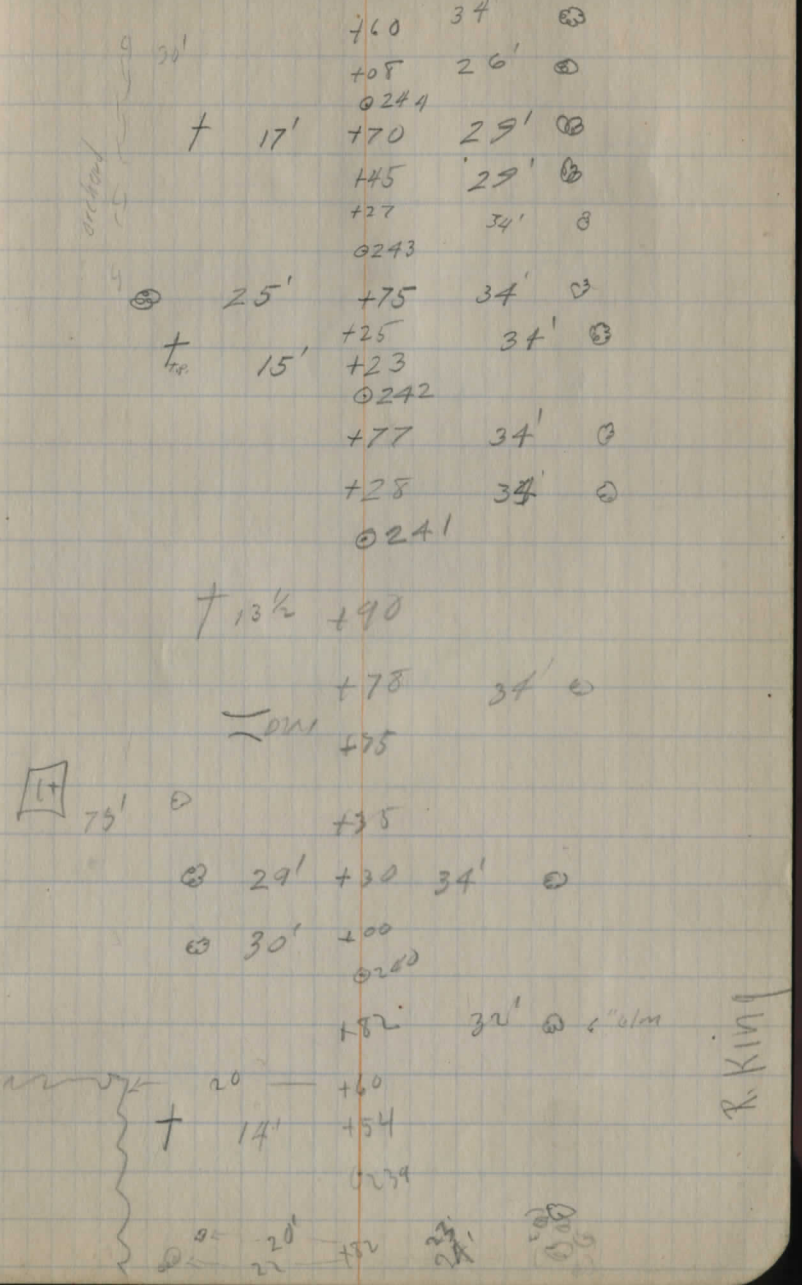
④ 24 +93

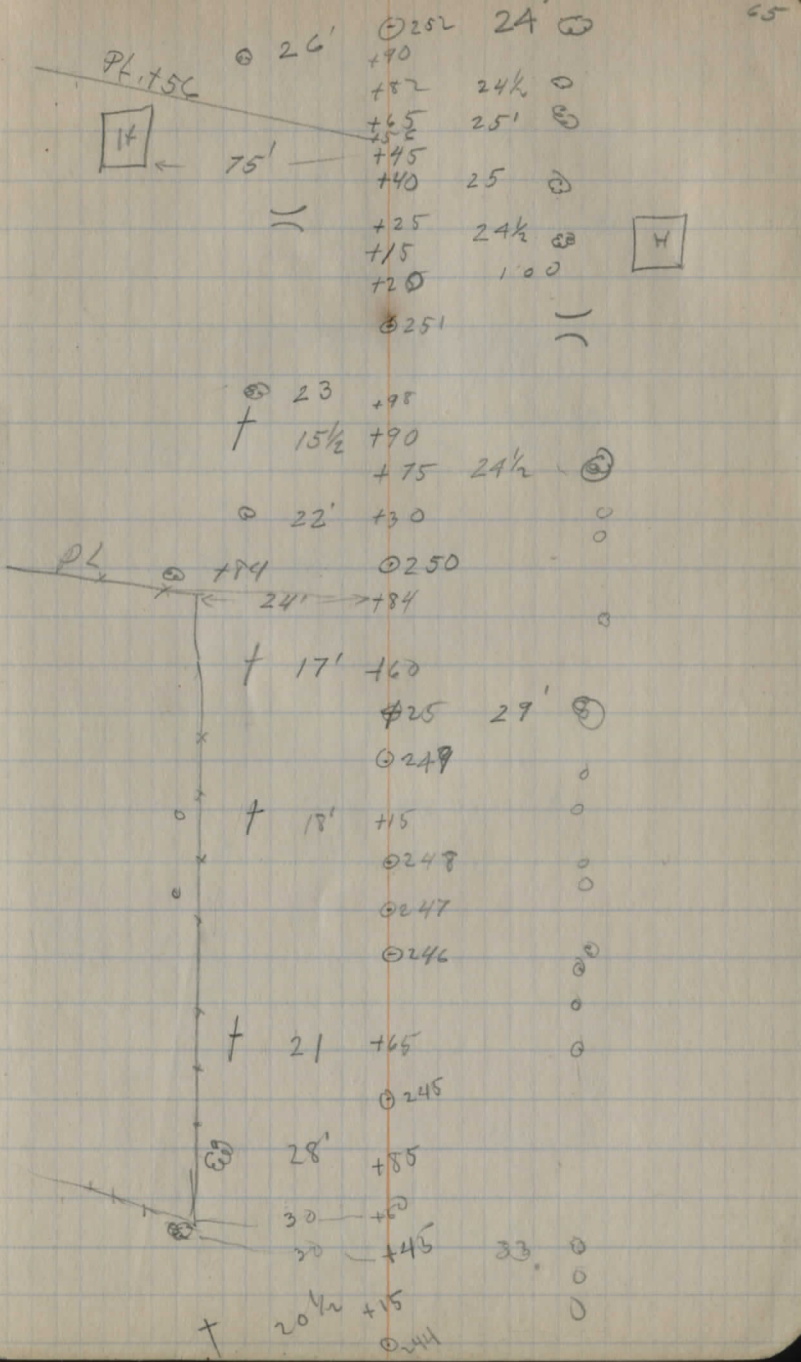
⑤ 24 +12
⊙227

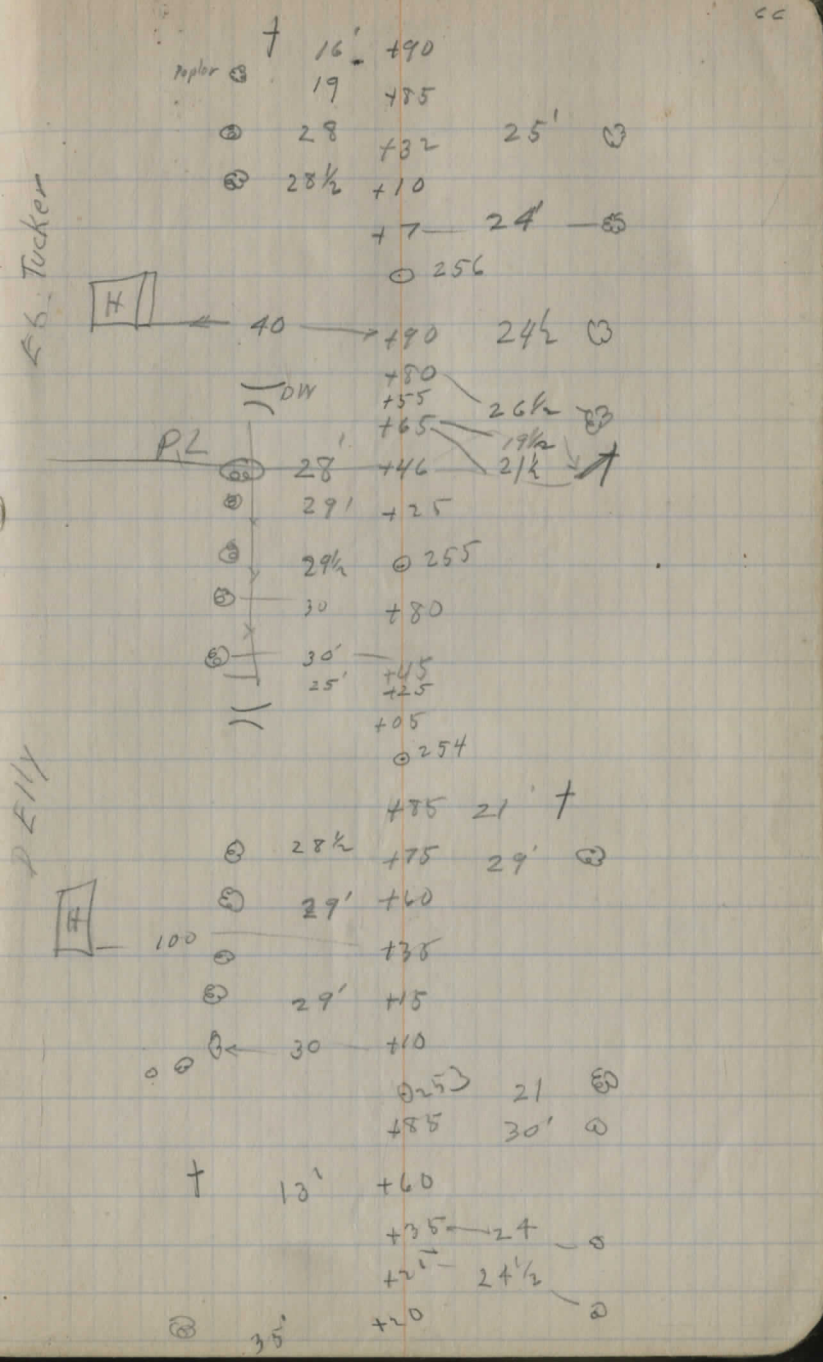
⑤ 25 +43
⊙226

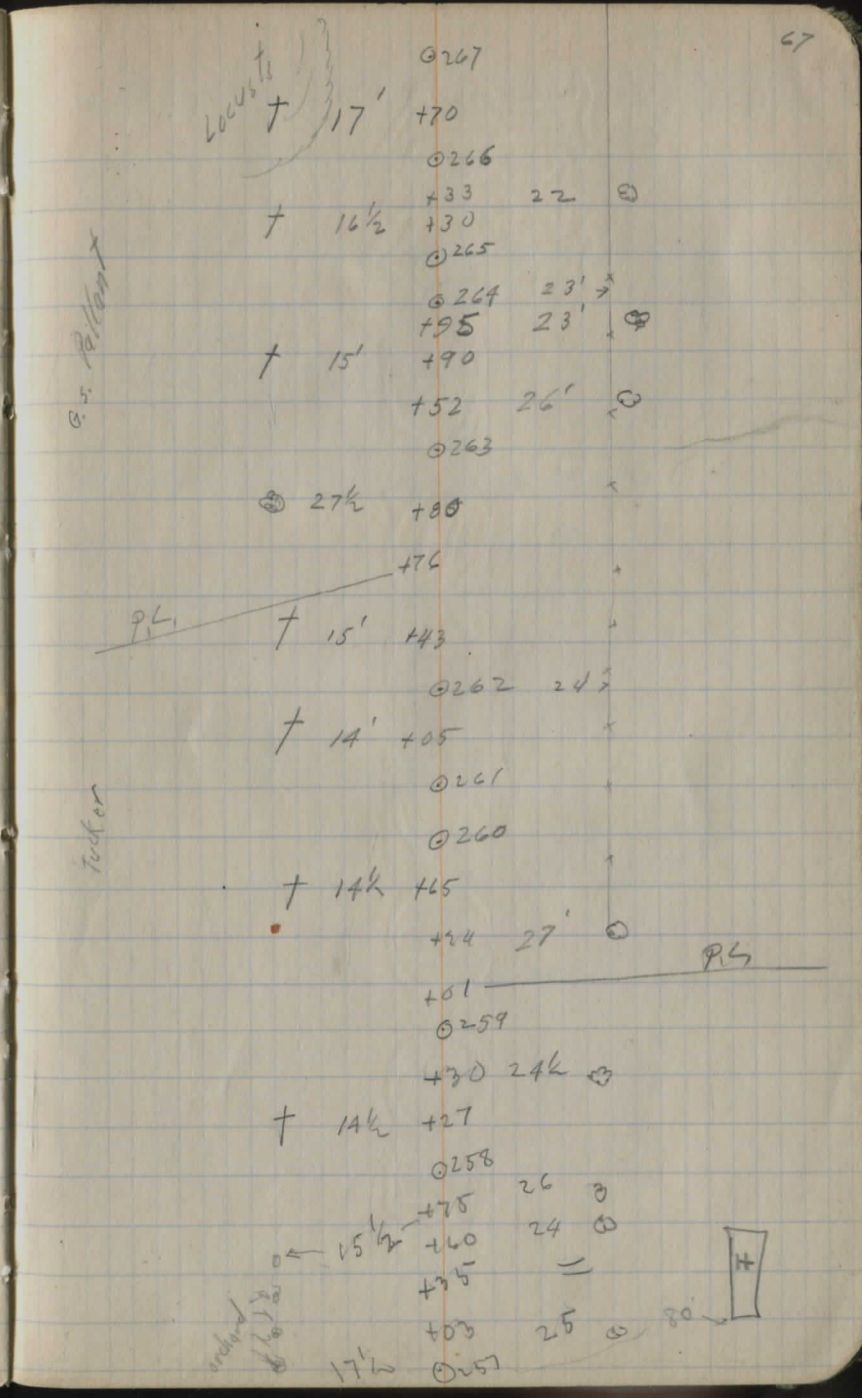
⑤ 26 +53

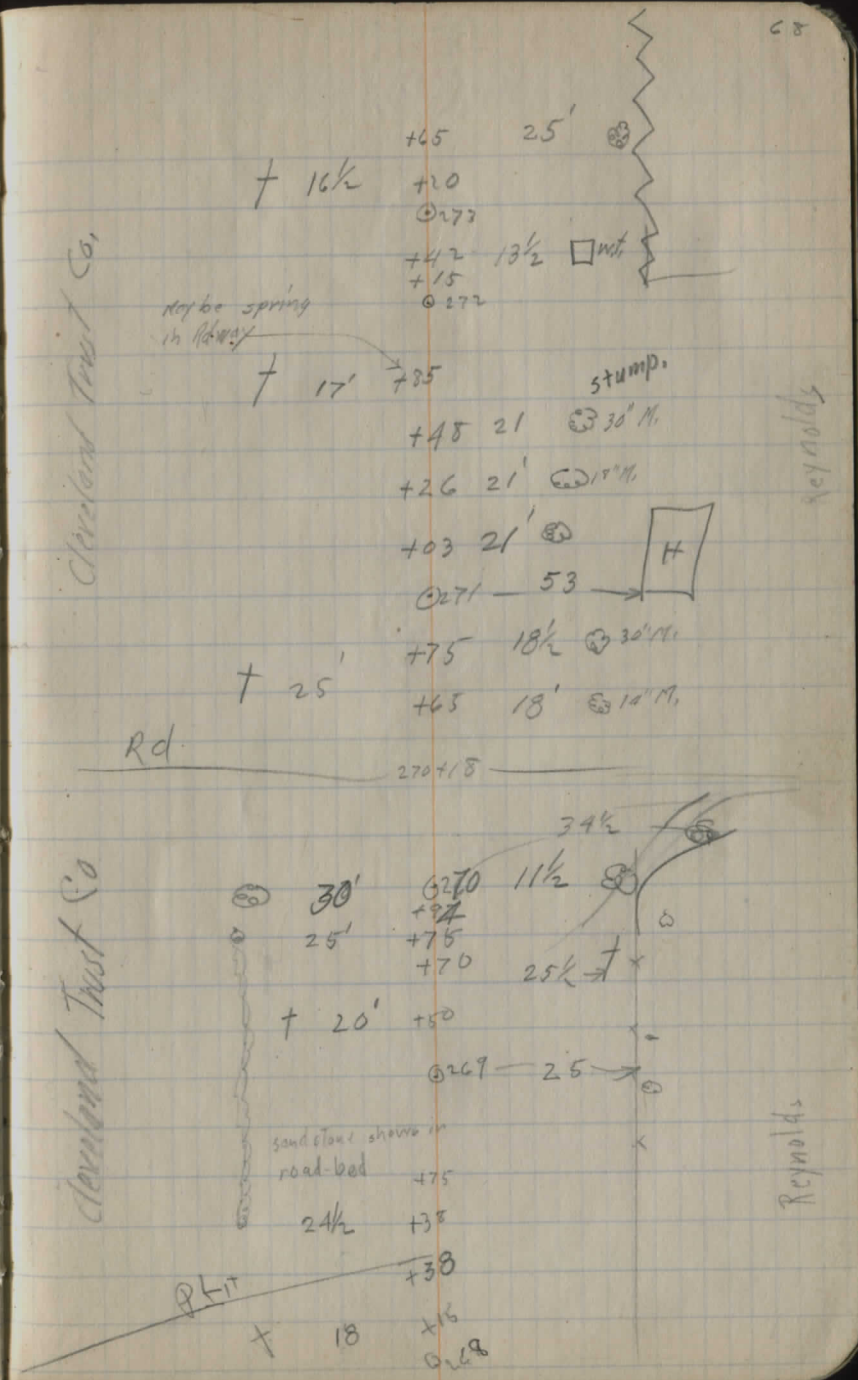

Hitchcock
Hitchcock
+45
16'
+45
+25
+20'
25'
+15
31'
0238
+84
25
452
25
717
29'
407
24'
0237
22'
+83
28'
+75
26
28
+40
27'
+08
27
0236
29'
+80
26
19'
+42
27
25'
+13
+10
28
0235
+90
32'
+80
30
28'
+78
29'
+50
30
+20
0234

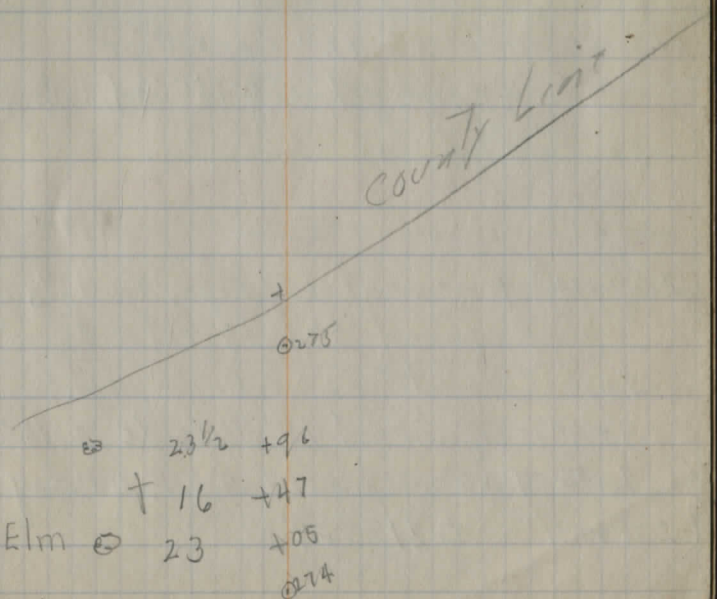

+60 34'
+08 26'
0244
17' +70 29'
+45 29'
+27 34'
0243
25' +75 34'
+25 34'
15' +23
0242
+77 34'
+28 34'
0241
13½ +90
+78 34'
+75
75'
+35
29' +30 34'
30' +00
0280
+82 32'
20' +60
14' +54
0239
20'
+82


Pl. +56
17
75'
26'
+90
+82
24½
+65
25'
+45
+40
25
+25
24½
+15
+20
100
H
23
+98
15½
+90
+75
24½
22'
+30
Pl.
+84
24'
+84
17'
+60
25
29'
+48
18'
+15
+47
+46
21
+65
+45
28'
+85
30
+60
30
+45
33
20½
+15
+44


Poplar
16'
+90
19
+85
28
+32
25'
28½
+10
+7
24'
256
H
40
+90
24½
DW
+80
+55
+65
26½
19½
PL
28'
+46
21½
29'
+25
29½
255
30
+80
30'
+45
25'
+25
+05
254
+85
21'
28½
+75
29'
29'
+60
H
100
+38
29'
+15
30
+10
25
21
+85
30'
13'
+60
+35
24
+2
24½
35'
+20
Ed. Tucker
Dell


Locust
17'
+70
⊙267
⊙266
+33
22
16½
+30
⊙265
⊙264
23'
+95
23'
15'
+90
+52
26'
⊙263
27½
+80
+76
PL
15'
+43
⊙262
24'
14'
+05
⊙261
⊙260
14½
+45
+24
27'
+01
PL
⊙259
+30
24½
14½
+27
⊙258
+75
26
+60
24
15½
+35
+03
25
80
17½
⊙257


+65 25'
† 16½
+20
⊙273
+42 13½ □ wt.
+15
⊙272
Cleveland Trust Co.
Maybe spring in Roadway
† 17'
+35
stump.
+48 21 30" M.
+26 21' 15" M.
+03 21' 30" M.
⊙271 — 53
H
Reynolds
† 25'
+75 18½ 30" M.
+65 18' 14" M.
Rd.
270+18
34½
⊙270 11½
30'
25'
+94
+75
+70
25½
† 20'
+50
⊙269 — 25
Cleveland Trust Co
sand stone shows in road-bed
+75
24½
+38
+38
† 18
+16
Reynolds


County Line
+
⊙275
23½ +96
+16 +47
B.M. Elm ⊙ 23 +05
⊙274

Aug. 16, 1926 - Cloudy, Marks - Canfield

Culvert Investigation

14+35 Present 6" V. Pipe, No Outlet ditch, 12" Std required.

5.1 1093.3 1088.2

1088.9	1088.2	1087.9	1086.5	1084.7	1082.5	1080.6
4.4	5.1	5.4	6.8	8.6	10.6	12.7
50	℄	50	100	150	200	250

No Ditch

152+25 None present, 12" Std. V.P. + 50 outlet ditch to right required.

162+80 Present 22 Lin. ft. 12" V.P., No H.W.s

162+75, Required Std. 12" Hillside Culvert or Carry through to 168+40

30' Outlet Ditch Required, Good Slope.

3 Acre Drainage Area.

168+40 No Existing Structure, Required 12" Std. Hillside Culvert, and 50' Outlet ditch to left.

195+60 Present 12" Corr. Pipe

Required 12 or 15" Std. Hillside Culvert

Good Slope in Ravine

209+94 Present 15" Pipe, No. H.W.s.

Required Std. 15" Culvert + Outlet Ditch for 100' Left.

215+34 Present 12" V.P., No. H.W.s.

215+40 Required 12" Hillside + 150' Outlet Ditch.

{217+56 Take up present 8" V.P. + Relay to Ditch Grade in New Ditch Line, Build Side Road Headwalls

{216+91 to 218+09

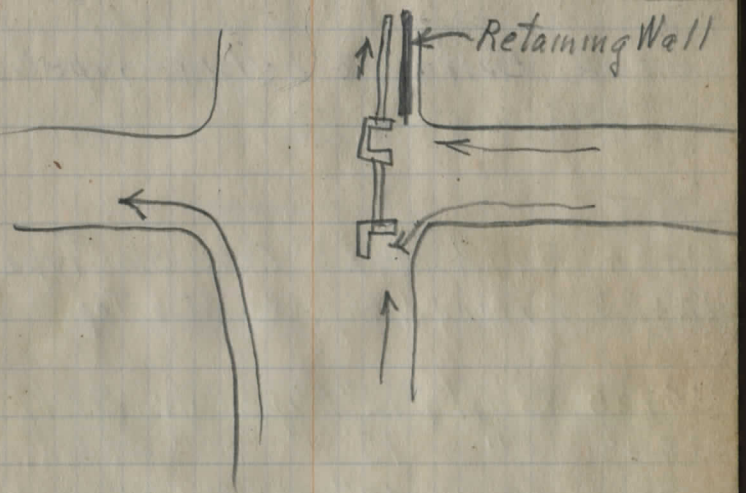
238+35 2½' X 4' Stone Culvert, Extend with Concrete, No Floor.

247+20 3½' X 3' " " " " " " See X See. Notes

252+76 2½' X ? See X See Notes

260+59 Present 6" V. P. Required 12" Std. Culvert, 100' Outlet

270+18 Required 12" Side Road Culvert on Right + 12" Pipe + a retaining wall Spart 4 Maple trees.



2.05 908.40 906.35
+ 3.6 912.0

14+06. Build 12" Hillside Pipe Culv.

21+44 Build 4'X 3' Conc. Slab Type
22+25 Extend With 3'X3' Slab. Top.

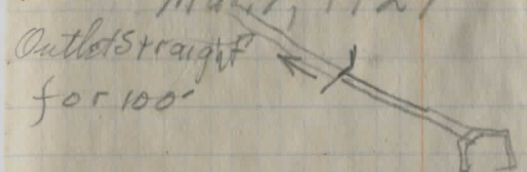
30+25 Build 12" Pipe Culv. Std.
34+36 " 15" " Std.
53+00 Build 12" Std. Pipe, Dig outlet
~~57+90 Build 15" Std. Pipe Dig outlet~~
73+82 " 15" Std. pipe
84+09 " 15" " " on Skew
~~91+82 " 12" " "~~
91
91+82 Build 12" Std. Pipe
103+90 " 15" Hillside
116+40 " 15" "
120+60 " 18" "
132+42 Extend 3'X2'

Sept. 10, 1926 W. C. Marks O. Reed. 72

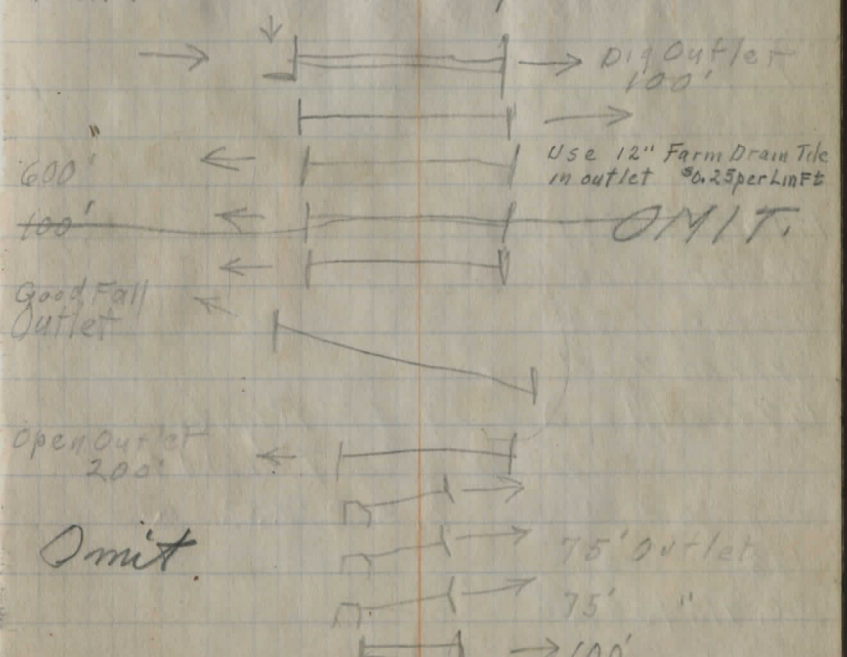
Spring Line, S.W. Cor. Arch Bridge
Top of Shale, S. Bank, 50' W. of Stone Arch.

Mar. 7, 1927

Outlet Straight for 100'



Build New Concrete Top.



June 6, 1927 Marks, D. Parks, R. Hassel

$\Delta = 5°15'$ Right

183+22.15 New Location = 183+29.95 Old Location

183

182+50

182

+50

181

180+50

180

179+50 179+45.70, ℄ 20' Stone Arch

179+30

179

178+50

P.T. 178+35.89 | 13°52'

178+00 12°04'

177+50 9°34'

177+00 7°04'

177+00 P.I. - $\Delta = 27°44'$ Right.

$D = 10°00'$ $T = 141.44$

176+50 4°34' $L = 277.33$

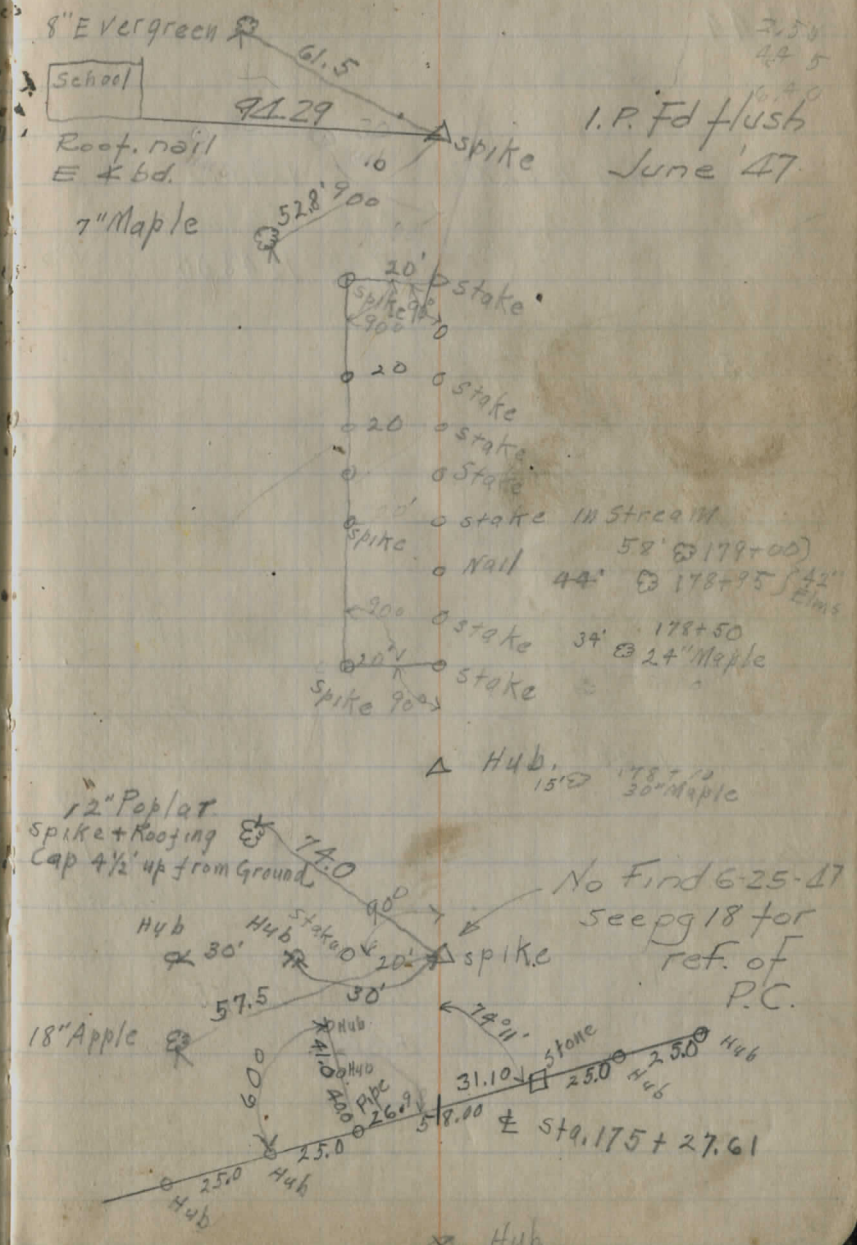
17538.58

17835.89

176 2°04'

P.C. 175+58.56

170+30.1 $\Delta = 0°54'$ R.



CULVERTS

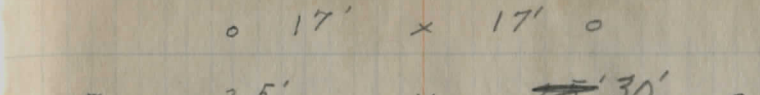
21+44

	2.50	1052.02		1249.52
			9.02	1243.00
			9.02	1243.00

178+65

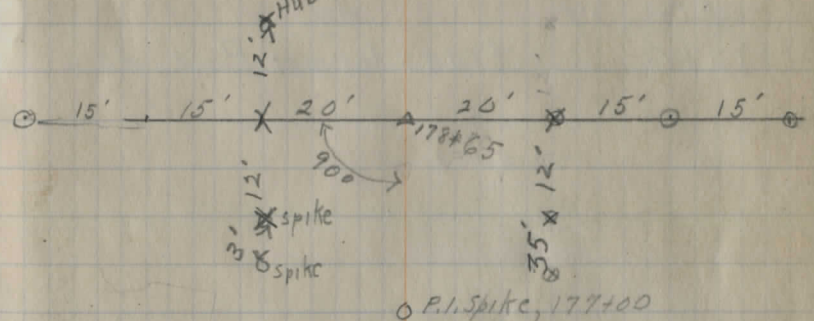
B.M.	10.20	933.45		923.25
				936.57
				− 14.17 ½
				922.40
			7.10	926.35
			5.50	

Aug. 2, 1927 Marks, D. Parks, R. Hassel



B. M. 3 nails, N.W. Roof, 36" Oak Left,
Stake 30' Right Cut 5.0 to Bottom of Footer
" 25' Left, " 5.0 " " " "

Aug. 25, 1927, Marks, Parks, Hassel



Profile Grade, 178+65 .87 pavement
Overall Height of Barrell + Pavement 2.22
El., Bottom of Footer 8.08
11.05, Gr. Rod 3.00
C 4.0 Stake 50' Left 14.17
C 5.5 " 50' Right

Sta. 270 to 275+60

same

~~268+15 Tel. Pole, Left,~~
~~267+20 C.E.I. Co. Right,~~
~~266+15 do. "~~
~~265+10 " "~~
270 to 260 C.E.I. Poles on R. in Slope
243 to 239 do
212+6 Transformer Pole do

Aug. 10, 1927 - Market + Hazel 75

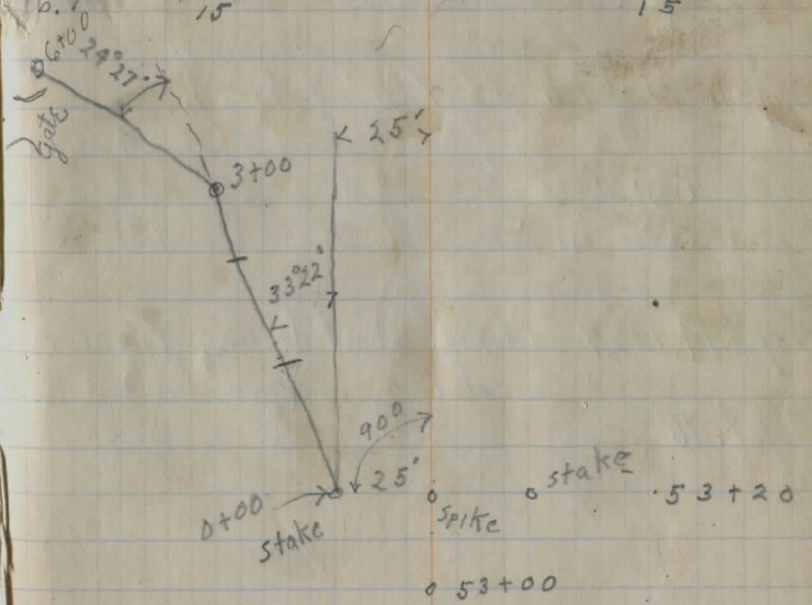
C.E.I. Poles on left, all inside Slope Lines
Tel. " " " " " " "

					Flow Line Grade
B.M.	1.00	1305.4		1304.37	
0+00					1299.0
1+00					1298.0
2+00					1297.0
3+00					1296.0
4+00					1293.5
5+00					1291.0
6+00			15.5	1289.9	1288.5

Aug 20, 1927 Marks + Grau

Cuts from Top of stakes

Gr. Rod.	South Side ℄	North Side
6.4	C 5.0 / 15	3.4 Cut 3.0
7.4	C 5.0 / 15	3.7 Cut 3.7
8.4	C 5.0 / 15	4.8 Cut 3.6
9.4	C 5.0 / 15	6.4 Cut 3.0
11.9	C 5.0 / 15	8.4 Cut 3.5
14.4	C 4.0 / 15	12.4 Cut 2.0
16.9	Cut 2.5 / 15	C 4.0 / 15 C 5.0 / 15 C 5.0 / 15 C 6.0 / 15 Cut 4.5 / 15 Cut 3.5 / 15



Aug. 25, 1927.

Culvert at 179+45.7

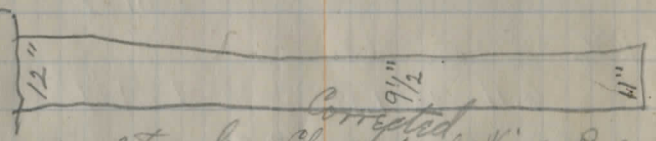
Cement Delivered 20+40+40 = 100 sacks 10 men 1 Truck

" Left Over 23 "

" Used 77 " in Side Walls of arch + Ret. Wings.

	cement on Job		Left Over	Used	
Aug. 26	(23)+39+4+1+40+40	= 183	29	154	10 men, 1 Truck " " " " " "
" 27	(29)+40	= 69	14	55	10 men 1 Truck " " " " " "
" 29	(14)+36+36+26	= 112	14	98	10 men 1 Truck Arch + Wings.
" 30	(14)+36+30	= 80	6	74	10 " 2 " Closed 28' of Arch, L. end

Aug. 31. Depth at top of Arch. 4 sacks



	(2)+36+36	=	74	22	52
Sept. 1	(22)+37+1	=	60	0	60

10 men 2 trucks. Closed Arch + Wings, R. end.

7 " 2 " . Middle section of arch

Sept. 14, 1927 School shut down, tractor + scrapers had left job and were working on Rock-haven Road in Munson Twp.

Sept. 15

CULVERTS

H.W. Stakes set for face of H.W.

				Grade
73+82				
	5.18	1293.53	1288.35	
	3.4	1290.13		1286.63
	5.15	1288.38		1285.88
~~34+36~~	~~6.48~~	~~1308.96~~	~~1302.48~~	
	~~7.86~~			1299.1
	8.04			~~1298.4~~
			1301.07	
34+36				
	6.11	1307.18	1301.07	
	7.80			1298.40
	7.55			1299.10
29+85	4.57	1300.07		1295.50
T.P. Hub, Right, 30+00				
	4.07			1292.00
	3.07			1293.00

Sept. 5, 1927 Marks, D. Parks

Gr. Rod.

15" Vit. Pipe Culvert, 34' Long.

Right Slope Hub, 74+00

6.90 C 3'6" Stake, 25' Right

7.65 C 2'6" " , 25' Left

Sept 12 1927 D. Parks C. Rand

15" Vit Pipe Culvert

~~9.86~~ ~~C 2'6"~~ ~~Stake 25' Right~~

~~10.56~~ ~~C 2'6"~~ ~~Stake 25' Left~~

Sept. 13, 1927 Marks, D. Parks, C. Rand

15" Vit. Pipe Culvert 36' Long

B. M. Right, 34+95

8.78 Cut 1.0, Stake 25' Right

8.08 Cut 0.5 " " Left

12" Vit. Pipe Culv. 32'

8.07 Cut 4.0 Stake 25' Right.

7.07 Cut 4.0 " " Left.

Excavation

Culvert, 179+45.7

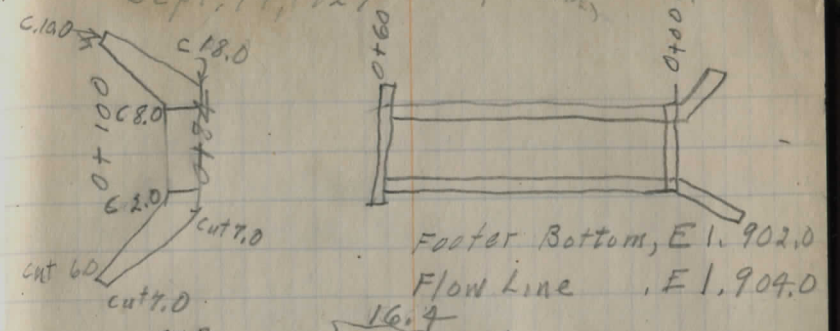
	Length	Depth Av.	Width	Cu. Yds.
Left Wing	22'	11.5	7'	72.
	22'	5.5	5.5	25.

Channel Excav., Outlet — 25.

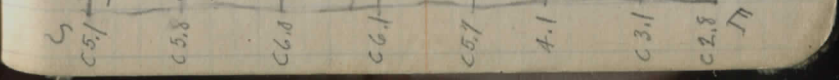
B. M.	6.5	916.5			910.00	
	Av. Cut. x Width		Product Sq. ft.	Deduct sq. ft.	Area	
0-10	8.0	10.0	80.		80.	
0	-	-				33
0+00	7.05	16.4	116.	18.	98.	
						37
0+10	7.1	16.4	117.	18.	99.	
						35.
0+20	6.4	16.4	105.	18.	87.	
						31.
0+30	6.15	16.4	101.	18.	83.	
						28.
0+40	5.35	16.4	88.	18.	70	
						20.
0+50	3.25	16.4	53.	18.	35	
						19.
0+60	3.50	24.0	84.	18.	66	325. Cu. Yds.

Culvert, 178+65 — 147. Cu. Yds.

Sept. 14, 1927 Marks, D. Parker, Rand. 79



911.0		909.0
5.5		7.5
15-10		10-15
910.2		907.9
6.3		8.6
8.2		8.2
910.1		908.1
6.4		8.4
8.2		8.2
910.1		906.7
6.4		8.8
8.2		8.2
909.9		906.4
6.6		10.7
8.2		8.2
909.2		905.5
7.3		11.8
8.2		8.2
906.4		904.1
10.1		12.4
8.22		8.2
906.9		904.1
7.6		12.4
12		12



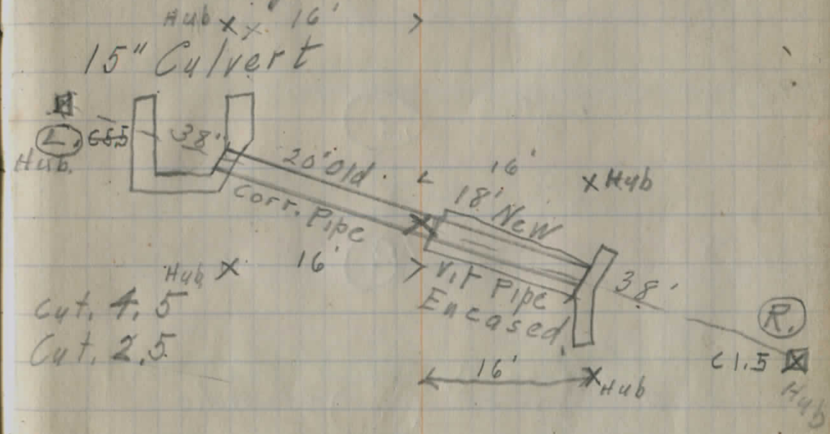
25+56.5 3.20 .15 1270.95
slope-hub Right, 26+00
3.20 1277.00 1273.80

Hub (L)	2.55	1274.45	~~1268.95~~ 8.05
Hub (R)	7.55	1269.45	~~1267.95~~ 9.05

1269.9
1267.1

1.47 Curb to Cent.
3.75 Co. line " "
1.58 " " to "Tates" rd
2.64 " " " Worthington Cur.
5.22 total length.

27559.3 co. line
7762 Grand Cent. Chd
19797.3 | 3.75 miles
15840
39573
36960
26130
26400
+2.70



Man-Holes, Center St. Chardon Vill,
May. 1., 1928 Marks, D. Parks, C. Rand, H. Clause

32+15.5 R.P. Stake ⊙ "M.H. 25'" ⊗ stake

29+51 stake ○ 25' 25' ○ stake

27+00 Iron Pipe ○ 26'

23+98

20+83.5 stake ○ 25' 25' ○ stake

18+52 stake ○ 25' stake ○ 25'

IMPROVED TABLES

AND

INFORMATION

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope 1½ 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.

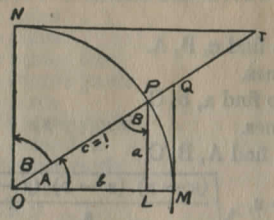


TABLE II

TRIGONOMETRIC FORMULÆ.

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

$R = OB = c = 1$

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

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

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

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

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

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

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

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

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

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

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

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

Law of Lines $\dfrac{\sin A}{a} = \dfrac{\sin B}{B} = \dfrac{\sin C}{C}$

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

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

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.

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

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

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

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

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

Area of a triangle:

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

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

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	
1/16	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219	1/16
1/8	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271	1/8
3/16	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323	3/16
1/4	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375	1/4
5/16	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	6927	.7760	.8594	.9427	5/16
3/8	.0313	.1146	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479	3/8
7/16	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531	7/16
1/2	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583	1/2
9/16	.0469	.1302	.2135	.2969	.3803	.4635	.5469	.6302	.7135	.7969	.8802	.9635	9/16
5/8	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688	5/8
11/16	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740	11/16
3/4	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792	3/4
13/16	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844	13/16
7/8	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896	7/8
15/16	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948	15/16
1	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	1.000	1
	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) = .000004848

$\pi = 3.141592654$

$\sqrt{\frac{1}{4}} = 0.564190$

$\frac{\pi}{4} = 0.785398163$

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

$\frac{\pi}{6} = 0.523598776$

$\pi^2 = 9.869604401$

$\sqrt{\frac{4}{\pi}} = 1.128379167$

$\frac{1}{\pi^2} = 0.101321184$

$\frac{\pi}{6} = 0.523598776$

$\sqrt{\pi} = 1.772453851$

$\frac{4.\pi}{3} = 4.188790205$

$\frac{1}{\pi} = 0.3183099$

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

Curvature in feet = 0.667 (Dist. in miles)²

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

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

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 FORMULÆ.

Horizontal Distance = R — R $\sin^2$ a + C cos a

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

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

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

a = angle of elevation for mid Reading

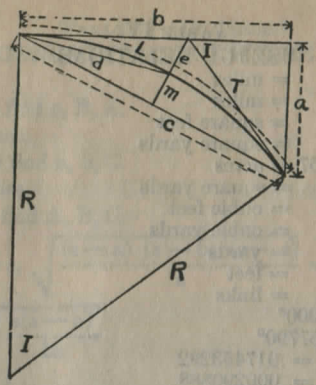


Table V

CURVE FORMULAE FOR SIMPLE CURVES

Compiled by J. Calvin Locke, C.E.

(1) $c = \sqrt{2Ra}$ (2) $c = \sqrt{a^2+b^2}$

(3) $c = \sqrt{2R\,(R-\sqrt{(R+b)\,(R-b)}} = \sqrt{2R(R-\sqrt{R^2-b^2})}$

(4) $c = 2\sqrt{m\,(2R-m)}$

(5) $c = 2R \sin \frac{1}{2} I$ (6) $c = 2T \cos \frac{1}{2} I$

(7) $e = R \operatorname{exsec} \frac{1}{2} I$

(8) $e = R \tan \frac{1}{2} I \tan \frac{1}{4} I$ (9) $e = T \tan \frac{1}{4} I$

(10) $b = \sqrt{a\,(2R-a)}$

(11) $b = \sqrt{\left(c+\frac{c^2}{2R}\right)\left(c-\frac{c^2}{2R}\right)} = \sqrt{c^2-\frac{c^4}{4R^2}}$

(12) $b = R \sin I$ (13) $b = a \cot \frac{1}{2} I$

(14) $R = \frac{a^2+b^2}{2a} = \frac{c^2}{2a}$ (15) $R = \frac{d^2}{2m} = \frac{c^2+4m^2}{8m}$

(16) $d = \sqrt{R\,(2R-\sqrt{(2R+c)\,(2R-c)}} = \sqrt{R(2R-\sqrt{4R^2-c^2})}$

(17) $d = \sqrt{2Rm}$ (18) $d = 2R \sin \frac{1}{4} I$ (19) $m = \frac{d^2}{2R}$

(20) $m = R \mp \sqrt{\left(R+\frac{c}{2}\right)\left(R-\frac{c}{2}\right)} = R \mp \sqrt{R^2-\frac{c^2}{4}}$

(21) $m = R \operatorname{vers} \frac{1}{2} I$ (22) $m = R \sin \frac{1}{2} I \tan \frac{1}{4} I$ (23) $m = \frac{1}{2} c \tan \frac{1}{4} I$

(24) $a = \frac{c^2}{2R}$ (25) $a = R - \sqrt{(R+b)\,(R-b)} = R - \sqrt{R^2-b^2}$

(26) $a = 2R\,(\sin^2 \frac{1}{2} I)^2$ (27) $a = R \operatorname{vers} I$ (28) $a = R \sin I \tan \frac{1}{2}$

(29) $a = b \tan \frac{1}{2} I$ (30) $a = T \sin I$ (31) $T = R \tan \frac{1}{2} I$

(32) $I = \frac{L}{R} \times 57.295780$ (33) $R = \frac{L}{I} \times 57.295780$

(34) $L = IR \times 0.01745329$ (35) $L = \frac{8d-c}{3}$

(36) Area Seg. $= \frac{LR - R^2 \operatorname{Sin} I}{2} = \frac{LR - Rb}{2}$

Table VI

SINES, COSINES, TANGENTS, COTANGENTS

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.
0	0000	0000	0029	0029	0058	0058	0087	0087	0116	0116	0145	0145	89
1	175	0175	0204	0204	0233	0233	0262	262	291	291	320	320	88
2	349	349	378	378	407	407	436	437	465	466	494	495	87
3	523	524	552	553	581	582	610	612	640	641	669	670	86
4	698	699	727	729	756	758	785	787	814	816	843	846	85
5	872	875	901	904	929	934	958	963	987	992	1016	1022	84
6	1045	1051	1074	1080	1103	1110	1132	1139	1161	1169	190	198	83
7	219	228	248	257	279	287	305	317	334	346	363	376	82
8	392	405	421	435	449	465	478	495	507	524	536	554	81
9	564	584	593	614	622	644	650	673	679	703	708	733	80
10	736	763	765	793	794	823	822	853	851	883	880	914	79
11	908	944	937	974	965	2004	994	2035	2022	2065	2051	2095	78
12	2079	2126	2108	2156	2136	186	2164	217	193	247	221	278	77
13	250	309	278	339	306	370	334	401	363	432	391	462	76
14	419	493	447	524	476	555	504	586	532	617	560	648	75
15	588	679	616	711	644	742	672	773	700	805	728	836	74
16	756	867	784	899	812	931	840	962	868	994	896	3026	73
17	924	3057	952	3089	939	3121	3007	3153	3035	3185	3062	217	72
18	3090	249	3118	281	3145	314	173	346	201	378	228	411	71
19	256	443	283	476	311	508	338	541	365	574	393	607	70
20	420	640	448	673	475	706	502	739	529	772	557	805	69
21	584	839	611	872	638	906	665	939	692	973	719	4006	68
22	746	4040	773	4074	800	4108	827	4142	854	4176	881	210	67
23	907	245	934	279	961	314	987	348	4014	383	4041	417	66
24	4067	452	4094	487	4120	522	4147	557	173	592	200	628	65
25	226	663	253	699	279	734	305	770	331	806	358	841	64
26	384	877	410	913	436	950	4462	986	488	5022	514	5059	63
27	540	5095	566	5132	592	5169	617	5206	643	243	669	280	62
28	695	317	720	354	746	392	772	430	797	467	823	505	61
29	848	543	874	581	899	619	924	658	950	696	975	735	60
30	5000	774	5025	5812	5050	851	5075	890	5100	930	5125	969	59
31	150	6009	175	6048	200	6088	225	6128	250	6168	275	6208	58
32	299	249	324	289	348	330	5373	371	398	412	422	453	57
33	446	494	471	536	495	577	519	619	544	661	568	703	56
34	592	745	616	787	640	830	664	873	688	916	712	959	55
35	736	7002	760	7046	783	7089	807	7133	831	7177	854	7221	54
36	878	265	901	310	925	355	948	400	972	445	995	490	53
37	6018	536	6041	581	6065	627	6088	673	6111	720	6134	766	52
38	157	813	180	860	202	907	225	954	248	8002	271	8050	51
39	293	8098	316	8146	338	8195	361	8243	383	292	406	342	50
40	428	391	450	441	472	491	494	541	517	591	539	642	49
41	561	693	583	744	604	796	626	847	648	899	670	952	48
42	691	9004	713	9057	734	9110	756	9163	777	9217	799	9271	47
43	820	325	841	380	862	435	884	490	905	545	926	601	46
44	947	657	967	713	988	770	7009	827	7030	884	7050	942	45
45	7071	1.0000	7092	1.0058	7112	1.0117	133	1.0176	153	1.0235	173	1.0295	44
deg.	60′ cos	60′ cot	50′ cos	50′ cot	40′ cos	40′ cot	30′ cos	30′ cot	20′ cos	20 cot	10′ cos	10′ cot	deg.

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
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	1.2203	7753	1.2276	39
51	771	2349	790	.2423	808	.2497	826	.2572	844	.2647	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3111	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.3597	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4106	175	.4193	35
55	192	4281	208	.4370	225	.4460	241	.4550	258	.4641	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5204	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.5798	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.6426	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631	.7090	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	9995	31.242	9996	34.368	997	38.189	997	42.964	9998	49.104	1
89	9998	57.290	9999	68.750	9999	85.940	9999	114.58	1.000	171.88	1.000	343.77	0
deg.	60′ cos	60′ cot	50′ cos	50′ cot	40′ cos	40′ cot	30′ cos	30′ cot	20′ cos	30′ cot	10′ cos	10′ cot	deg.

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- .000
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

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	5° C	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	E	50′	1105.1	105.60	E
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	E
40′	183.40	2.934	.003	40′	686.60	40.992	.011	40′	1200.5	124.41	.025
50′	191.74	3.207		50′	695.06	42.004		50′	1209.2	126.20	
4°	200.08	3.492		14°	703.51	43.029		24°	1217.9	128.00	
10′	208.43	3.790		10′	711.97	44.066		10′	1226.6	129.82	
20′	216.77	4.099		20′	720.44	45.116		20′	1235.3	131.65	
30′	225.12	4.421		30′	728.90	46.178		30′	1244.0	133.50	
40′	233.47	4.755		40′	737.37	47.253		40′	1252.8	135.35	
50′	241.81	5.100	15° C.	50′	745.85	48.341	15° C.	50′	1261.5	137.23	15° C.
5°	250.16	5.459	T	15°	754.32	49.441	T	25°	1270.2	139.11	T
10′	258.51	5.829	.09	10′	762.80	50.554	.19	10′	1279.0	141.01	.29
20′	266.86	6.211	E	20′	771.29	51.679	E	20′	1287.7	142.93	E
30′	275.21	6.606	.004	30′	779.77	52.818	.017	30′	1296.5	144.85	.038
40′	283.57	7.013		40′	788.26	53.969		40′	1305.3	146.79	
50′	291.92	7.432		50′	796.75	55.132		50′	1314.0	148.75	
6°	300.28	7.863		16°	805.25	56.309		26°	1322.8	150.71	
10′	308.64	8.307		10′	813.75	57.498		10′	1331.6	152.69	
20′	316.99	8.762		20′	822.25	58.699		20′	1340.4	154.69	
30′	325.35	9.230		30′	830.76	59.914		30′	1349.2	156.70	
40′	333.71	9.710	20° C.	40′	839.27	61.141	20° C.	40′	1358.0	158.72	20° C.
50′	342.08	10.202	T	50′	847.78	62.381	T	50′	1366.8	160.76	T
7°	350.44	10.707	.13	17°	856.30	63.634	.26	27°	1375.6	162.81	.39
10′	358.81	11.224	E	10′	864.82	64.900	E	10′	1384.4	164.86	E
20′	367.17	11.753	.006	20′	873.35	66.178	.022	20′	1393.2	166.95	.051
30′	375.54	12.294		30′	881.88	67.470		30′	1402.0	169.04	
40′	383.91	12.847		40′	890.41	68.774		40′	1410.9	171.15	
50′	392.28	13.413		50′	898.95	70.091		50′	1419.7	173.27	
8°	400.66	13.991		18°	907.49	71.421		28°	1428.6	175.41	
10′	409.03	14.582		10′	916.03	72.764		10′	1437.4	177.55	
20′	417.41	15.184	25° C.	20′	924.58	74.119	25° C.	20′	1446.3	179.72	25° C.
30′	425.79	15.799	T	30′	933.13	75.488	T	30′	1455.1	181.89	T
40′	434.17	16.426	.16	40′	941.69	76.869	.32	40′	1464.0	184.08	.49
50′	442.55	17.065	E	50′	950.25	78.264	E	50′	1472.9	186.29	E
9°	450.93	17.717	.007	19°	958.81	79.671	.028	29°	1481.8	188.51	.065
10′	459.32	18.381		10′	967.38	81.092		10′	1490.7	190.74	
20′	467.71	19.058		20′	975.96	82.525		20′	1499.6	192.99	
30′	476.10	19.746		30′	984.53	83.972		30′	1508.5	195.25	
40′	484.49	20.447		40′	993.12	85.431		40′	1517.4	197.53	
50′	492.88	21.161		50′	1001.7	86.904		50′	1526.3	199.82	
10°	501.28	21.887	30° C.	20°	1010.3	88.389	30° C.	30°	1535.3	202.12	30° C.
10′	509.68	22.624	T	10′	1018.9	89.888	T	10′	1544.2	204.44	T
20′	518.08	23.375	.19	20′	1027.5	91.399	.39	20′	1553.1	206.77	.59
30′	526.48	24.138	E	30′	1036.1	92.924	E	30′	1562.1	209.12	E
40′	534.89	24.913	.008	40′	1044.7	94.462	.034	40′	1571.0	211.48	.078
50′	543.29	25.700		50′	1053.3	96.013		50′	1580.0	213.86	

T = R tan ½ I E = R exsec ½ I

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		10′	2151.7	390.7		10′	2743.1	622.8	
20′	1606.9	221.1	5° C.	20′	2161.2	394.1	5° C.	20′	2753.4	627.2	5° C.
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		44°	2314.9	450.0		54°	2919.4	700.9	
10′	1760.8	264.5		10′	2324.6	453.6		10′	2929.9	705.7	
20′	1770.0	267.2		20′	2334.3	457.3		20′	2940.4	710.5	
30′	1779.1	269.9		30′	2344.1	461.0		30′	2951.0	715.3	
40′	1788.2	272.6		40′	2353.8	464.6		40′	2961.5	720.1	
50′	1797.4	275.3	15° C.	50′	2363.5	468.4	15° C.	50′	2972.1	725.0	15° C.
35°	1806.6	278.1	T	45°	2373.3	472.1	T	55°	2982.7	729.9	T
10′	1815.7	280.8	.40	10′	2383.1	475.8	.51	10′	2993.3	734.8	.63
20′	1824.9	283.6	E	20′	2392.8	479.6	E	20′	3003.9	739.7	E
30′	1834.1	286.4	.070	30′	2402.6	483.4	.116	30′	3014.5	744.6	.168
40′	1843.3	289.2		40′	2412.4	487.2		40′	3025.2	749.6	
50′	1852.5	292.0		50′	2422.3	491.0		50′	3035.8	754.6	
36°	1861.7	294.9		46°	2432.1	494.8		56°	3046.5	759.6	
10′	1870.9	297.7		10′	2441.9	498.7		10′	3057.2	764.6	
20′	1880.1	300.6		20′	2451.8	502.5		20′	3067.9	769.7	
30′	1889.4	303.5		30′	2461.7	506.4		30′	3078.7	774.7	
40′	1898.6	306.4	20° C.	40′	2471.5	510.3	20° C.	40′	3089.4	779.8	20° C.
50′	1907.9	309.3	T	50′	2481.4	514.3	T	50′	3100.2	784.9	T
37°	1917.1	312.2	.53	47°	2491.3	518.2	.68	57°	3110.9	790.1	.84
10′	1926.4	315.2	E	10′	2501.2	522.2	E	10′	3121.7	795.2	E
20′	1935.7	318.1	.093	20′	2511.2	526.1	.151	20′	3132.6	800.4	.225
30′	1945.0	321.1		30′	2521.1	530.1		30′	3143.4	805.6	
40′	1954.3	324.1		40′	2531.1	534.2		40′	3154.2	810.9	
50′	1963.6	327.1		50′	2541.0	538.2		50′	3165.1	816.1	
38°	1972.9	330.2		48°	2551.0	542.2		58°	3176.0	821.4	
10′	1982.2	333.2		10′	2561.0	546.3		10′	3186.9	826.7	
20′	1991.5	336.3	25° C.	20′	2571.0	550.4	25° C.	20′	3197.8	832.0	25° C.
30′	2000.9	339.3	T	30′	2581.0	554.5	T	30′	3208.8	837.3	T
40′	2010.2	342.4	.67	40′	2591.0	558.6	.85	40′	3219.7	842.7	1.05
50′	2019.6	345.5	E	50′	2601.1	562.8	E	50′	3230.7	848.1	E
39°	2029.0	348.6	.117	49°	2611.2	566.9	.189	59°	3241.7	853.5	.283
10′	2038.4	351.8		10′	2621.2	571.1		10′	3252.7	858.9	
20′	2047.8	354.9		20′	2631.3	575.3		20′	3263.7	864.3	
30′	2057.2	358.1		30′	2641.4	579.5		30′	3274.8	869.8	
40′	2066.6	361.3		40′	2651.5	583.8		40′	3285.8	875.3	
50′	2076.0	364.5		50′	2661.6	588.0		50′	3296.9	880.8	
40°	2085.4	367.7	30° C.	50°	2671.8	592.3	30° C.	60°	3308.0	886.4	30° C.
10′	2094.9	371.0	T	10′	2681.9	596.6	T	10′	3319.1	892.0	T
20′	2104.3	374.2	.80	20′	2692.1	600.9	1.02	20′	3330.3	897.5	1.27
30′	2113.8	377.5	E	30′	2702.3	605.3	E	30′	3341.4	903.2	E
40′	2123.3	380.8	.141	40′	2712.5	609.6	.227	40′	3352.6	908.8	
50′	2132.7	384.1		50′	2722.7	614.0		50′	3363.8	914.5	.340

T = R tan ½ I E = R exsec ½ I

Table IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°
61°	3375.0	920.2	+
10′	3386.3	925.9	5° C.
20′	3397.5	931.6	T
30′	3408.8	937.3	.25
40′	3420.1	943.1	E
50′	3431.4	948.9	
62°	3442.7	954.8	.080
10′	3454.1	960.6	
20′	3465.4	966.5	
30′	3476.8	972.4	
40′	3488.3	978.3	
50′	3499.7	984.3	
63°	3511.1	990.2	10° C.
10′	3522.6	996.2	T
20′	3534.1	1002.3	.51
30′	3545.6	1008.3	E
40′	3557.2	1014.4	.159
50′	3568.7	1020.5	
64°	3580.3	1026.6	
10	3591.9	1032.8	
20′	3603.5	1039.0	
30′	3615.1	1045.2	
40′	3626.8	1051.4	
50′	3638.5	1057.7	15° C.
65°	3650.2	1063.9	T
10′	3661.9	1070.2	.76
20′	3673.7	1076.6	E
30′	3685.4	1082.9	.240
40′	3697.2	1089.3	
50′	3709.0	1095.7	
66°	3720.9	1102.2	
10′	3732.7	1108.6	
20′	3744.6	1115.1	
30′	3756.5	1121.7	
40′	3768.5	1128.2	20° C.
50′	3780.4	1134.8	T
67°	3792.4	1141.4	1.02
10′	3804.4	1148.0	E
20′	3816.4	1154.7	.321
30′	3828.4	1161.3	
40′	3840.5	1168.1	
50′	3852.6	1174.8	
68°	3864.7	1181.6	
10′	3876.8	1188.4	
20′	3889.0	1195.2	25° C.
30	3901.2	1202.0	T
40′	3913.4	1208.9	1.28
50′	3925.6	1215.8	E
69°	3937.9	1222.7	.403
10′	3950.2	1229.7	
20′	3962.5	1236.7	
30′	3974.8	1243.7	
40′	3987.2	1250.8	
50′	3999.5	1257.9	
70°	4011.9	1265.0	30° C.
10′	4024.4	1272.1	T
20′	4036.8	1279.3	1.54
30′	4049.3	1286.5	E
40′	4061.8	1293.6	
50′	4074.4	1300.9	.485

I	T	E	I=80°
71°	4086.9	1308.2	+
10′	4099.5	1315.6	5° C.
20′	4112.1	1322.9	T
30′	4124.8	1330.3	.30
40′	4137.4	1337.7	E
50′	4150.1	1345.1	
72°	4162.8	1352.6	.110
10′	4175.6	1360.1	
20′	4188.5	1367.6	
30′	4201.2	1375.2	
40′	4214.0	1382.8	
50′	4226.8	1390.4	
73°	4239.7	1398.0	10° C.
10′	4252.6	1405.7	T
20′	4265.6	1413.5	.61
30′	4278.5	1421.2	E
40′	4291.5	1429.0	.220
50′	4304.6	1436.8	
74°	4317.6	1444.6	
10′	4330.7	1452.5	
20′	4343.8	1460.4	
30′	4356.9	1468.4	
40′	4370.1	1476.4	
50′	4383.3	1484.4	15° C.
75°	4396.5	1492.4	T
10′	4409.8	1500.5	.91
20′	4423.1	1508.6	E
30′	4436.4	1516.7	.332
40′	4449.7	1524.9	
50′	4463.1	1533.1	
76°	4476.5	1541.4	
10′	4489.9	1549.7	
20′	4503.4	1558.0	
30′	4516.9	1566.3	
40′	4530.4	1574.7	20° C.
50′	4544.0	1583.1	T
77°	4557.6	1591.6	1.22
10′	4571.2	1600.1	E
20′	4584.8	1608.6	.445
30′	4598.5	1617.1	
40′	4612.2	1625.7	
50′	4626.0	1634.4	
78°	4639.8	1643.0	
10	4653.6	1651.7	
20′	4667.4	1660.5	25° C.
30′	4681.3	1669.2	T
40′	4695.2	1678.1	1.53
50′	4709.2	1686.9	E
79°	4723.2	1695.8	.558
10′	4737.2	1704.7	
20′	4751.2	1713.7	
30′	4765.3	1722.7	
40′	4779.4	1731.7	
50′	4793.6	1740.8	
80°	4807.7	1749.9	30° C.
10′	4822.0	1759.0	T
20′	4836.2	1768.2	1.84
30′	4850.5	1777.4	E
40′	4864.8	1786.7	
50′	4879.2	1796.0	.671

I	T	E	I=90°
81°	4893.6	1805.3	+
10′	4908.0	1814.7	5° C.
20′	4922.5	1824.1	T
30′	4937.0	1833.6	.36
40′	4951.5	1843.1	E
50′	4966.1	1852.6	
82°	4980.7	1862.2	.149
10′	4995.4	1871.8	
20′	5010.0	1881.5	
30′	5024.8	1891.2	
40′	5039.5	1900.9	
50′	5054.3	1910.7	
83°	5069.2	1920.5	10° C.
10′	5084.0	1930.4	T
20′	5099.0	1940.3	.72
30′	5113.9	1950.3	E
40′	5128.9	1960.2	.299
50′	5143.9	1970.3	
84°	5159.0	1980.4	
10′	5174.1	1990.5	
20′	5189.3	2000.6	
30′	5204.4	2010.8	
40′	5219.7	2021.1	
50′	5234.9	2031.4	15° C.
85°	5250.3	2041.7	T
10′	5265.6	2052.1	1.09
20′	5281.0	2062.5	E
30′	5296.4	2073.0	.450
40′	5311.9	2083.5	
50′	5327.4	2094.1	
86°	5343.0	2104.7	
10′	5358.6	2115.3	
20′	5374.2	2126.0	
30′	5389.9	2136.7	
40′	5405.6	2147.5	20° C.
50′	5421.4	2158.4	T
87°	5437.2	2169.2	1.45
10′	5453.1	2180.2	E
20′	5469.0	2191.1	.603
30′	5484.9	2202.2	
40′	5500.9	2213.2	
50′	5517.0	2224.3	
88°	5533.1	2235.5	
10′	5549.2	2246.7	
20′	5565.4	2258.0	25° C.
30′	5581.6	2269.3	T
40′	5597.8	2280.6	1.83
50′	5614.2	2292.0	E
89°	5630.5	2303.5	.756
10′	5646.9	2315.0	
20′	5663.4	2326.6	
30′	5679.9	2338.2	
40′	5696.4	2349.8	
50′	5713.0	2361.5	
90°	5729.7	2373.3	30° C.
10′	5746.3	2385.1	T
20′	5763.1	2397.0	2.20
30′	5779.9	2408.9	E
40′	5796.7	2420.9	
50′	5813.6	2432.9	.910

T = R tan ½ I E = R exsec ½ I

Table IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°
91°	5830.5	2444.9	+
10′	5847.5	2457.1	5° C.
20′	5864.6	2469.3	T
30′	5881.7	2481.5	.43
40′	5898.8	2493.8	E
50′	5916.0	2506.1	
92°	5933.2	2518.5	.200
10′	5950.5	2531.0	
20′	5967.9	2543.5	
30′	5985.3	2556.0	
40′	6002.7	2568.6	
50′	6020.2	2581.3	
93°	6037.8	2594.0	10° C.
10′	6055.4	2606.8	T
20′	6073.1	2619.7	.86
30′	6090.8	2632.6	E
40′	6108.6	2645.5	.401
50′	6126.4	2658.5	
94°	6144.3	2671.6	
10′	6162.2	2684.7	
20′	6180.2	2697.9	
30′	6198.3	2711.2	
40′	6216.4	2724.5	
50′	6234.6	2737.9	15° C.
95°	6252.8	2751.3	T
10′	6271.1	2764.8	1.30
20′	6289.4	2778.3	E
30′	6307.9	2792.0	.604
40′	6326.3	2805.6	
50′	6344.8	2819.4	
96°	6363.4	2833.2	
10′	6382.1	2847.0	
20′	6400.8	2861.0	
30′	6419.5	2875.0	
40′	6438.4	2889.0	20° C.
50′	6457.3	2903.1	T
97°	6476.2	2917.3	1.74
10′	6495.2	2931.6	E
20′	6514.3	2945.9	.809
30′	6533.4	2960.3	
40′	6552.6	2974.7	
50′	6571.9	2989.2	
98°	6591.2	3003.8	
10′	6610.6	3018.4	
20′	6630.1	3033.1	25° C.
30′	6649.6	3047.9	T
40′	6669.2	3062.8	2.18
50′	6688.8	3077.7	E
99°	6708.6	3092.7	1.02
10′	6728.4	3107.7	
20′	6748.2	3122.9	
30′	6768.1	3138.1	
40′	6788.1	3153.3	
50′	6808.2	3168.7	
100°	6828.3	3184.1	30° C.
10′	6848.5	3199.6	T
20′	6868.8	3215.1	2.62
30′	6889.2	3230.8	E
40′	6909.6	3246.5	
50′	6930.1	3262.3	1.22

I	T	E	I=110°
101°	6950.6	3278.1	+
10′	6971.3	3294.1	5° C.
20′	6992.0	3310.1	T
30′	7012.7	3326.1	.51
40′	7033.6	3342.3	E
50′	7054.5	3358.5	
102°	7075.5	3374.9	.268
10′	7096.6	3391.2	
20′	7117.8	3407.7	
30′	7139.0	3424.3	
40′	7160.3	3440.9	
50′	7181.7	3457.6	
103°	7203.2	3474.4	10° C.
10′	7224.7	3491.3	T
20′	7246.3	3508.2	.103
30′	7268.0	3525.2	E
40′	7289.8	3542.4	.536
50′	7311.7	3559.6	
104°	7333.6	3576.8	
10′	7355.6	3594.2	
20′	7377.8	3611.7	
30′	7399.9	3629.2	
40′	7422.2	3646.8	
50′	7444.6	3664.5	15° C.
105°	7467.0	3682.3	T
10′	7489.6	3700.2	1.56
20′	7512.2	3718.2	E
30′	7534.9	3736.2	.806
40′	7557.7	3754.4	
50′	7580.5	3772.6	
106°	7603.5	3791.0	
10′	7626.6	3809.4	
20′	7649.7	3827.9	
30′	7672.9	3846.5	
40′	7696.3	3865.2	20° C.
50′	7719.7	3884.0	T
107°	7743.2	3902.9	2.08
10′	7766.8	3921.9	E
20′	7790.5	3940.9	1.08
30′	7814.3	3960.1	
40′	7838.1	3979.4	
50′	7862.1	3998.7	
108°	7886.2	4018.2	
10′	7910.4	4037.8	
20′	7934.6	4057.4	25° C.
30′	7959.0	4077.2	T
40′	7983.5	4097.1	2.61
50′	8008.0	4117.0	E
109°	8032.7	4137.1	1.36
10′	8057.4	4157.3	
20′	8082.3	4177.5	
30′	8107.3	4197.9	
40′	8132.3	4218.4	
50′	8157.5	4239.0	
110°	8182.8	4259.7	30° C.
10′	8208.2	4280.5	T
20′	8233.7	4301.4	3.14
30′	8259.3	4322.4	E
40′	8285.0	4343.6	
50′	8310.8	4364.8	1.63

I	T	E	I=120°
111°	8336.7	4386.1	+
10′	8362.7	4407.6	5° C.
20′	8388.9	4429.2	T
30′	8415.1	4450.9	.62
40′	8441.5	4472.7	E
50′	8468.0	4494.6	
112°	8494.6	4516.6	.360
10′	8521.3	4538.8	
20′	8548.1	4561.1	
30′	8575.0	4583.4	
40′	8602.1	4606.0	
50′	8629.3	4628.6	
113°	8656.6	4651.3	10° C.
10′	8684.0	4674.2	T
20′	8711.5	4697.2	1.25
30′	8739.2	4720.3	E
40′	8767.0	4743.6	.721
50′	8794.9	4766.9	
114°	8822.9	4790.4	
10′	8851.0	4814.1	
20′	8879.3	4837.8	
30′	8907.7	4861.7	
40′	8936.3	4885.7	
50′	8965.0	4909.9	15° C.
115°	8993.8	4934.1	T
10′	9022.7	4958.6	1.93
20′	9051.7	4983.1	E
30′	9080.9	5007.8	1.09
40′	9110.3	5032.6	
50′	9139.8	5057.6	
116°	9169.4	5082.7	
10′	9199.1	5107.9	
20′	9229.0	5133.3	
30′	9259.0	5158.8	
40′	9289.2	5184.5	20° C.
50′	9319.5	5210.3	T
117°	9349.9	5236.2	2.52
10′	9380.5	5262.3	E
20′	9411.3	5288.6	1.46
30′	9442.2	5315.0	
40′	9473.2	5341.5	
50′	9504.4	5368.2	
118°	9535.7	5395.1	
10′	9567.2	5422.1	
20′	9598.9	5449.2	25° C.
30′	9630.7	5476.5	T
40′	9662.6	5504.0	3.16
50′	9694.7	5531.7	E
119°	9727.0	5559.4	1.83
10′	9759.4	5587.4	
20′	9792.0	5615.5	
30′	9824.8	5643.8	
40′	9857.7	5672.3	
50′	9890.8	5700.9	
120°	9924.0	5729.7	30° C.
10′	9957.5	5758.6	T
20′	9991.0	5787.7	3.81
30′	10025.0	5817.0	E
40′	10059.0	5846.5	
50′	10093.0	5876.1	2.20

T = R tan ½ I E = R exsec ½ I

Table X.

MIDDLE ORDINATES OF RAILS

Length of Rail (feet)

C ° ′	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch	C °	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 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.

5729.65' = R 1° Curve

573.69' = R 10° "

Table XII.

INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

Slope	Horizontal Distance	Correction	Rise	Slope	Horizontal Distance	Correction	Rise
.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	0.022	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

For each foot take one one-hundredth of each reading.

Table XIII.

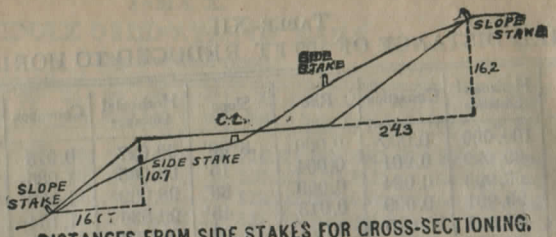
MINUTES IN DECIMALS OF A DEGREE.

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	13 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

C ° ′	R Fee
0–20	171
0–40	85
1–0	57
1–20	42
1–40	34
2–0	286
2–20	245
2–40	214
3–0	191
3–20	171
3–40	156
4–0	143
4–20	132
4–40	122
5	1146
6	955.
7	819.

To find length o

572
573.



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1½ 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	12.90	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.

TABLE OF INCHES REDUCED TO DECIMALS OF A FOOT.

Ins.	Dec.	Ins.	Dec.	Ins.	Dec.	Ins.	Dec.	Ins.	Dec.	Ins.	Dec.	Ins.	Dec.	Ins.	Dec.	Ins.	Dec.
1/16	.0052	5/16	.1094	9/16	.2135	13/16	.3177	1/16	.4219	5/16	.5260	9/16	.6302	13/16	.7344	1/16	.8385	5/16	.9427
1/8	.0104	3/8	.1146	5/8	.2188	7/8	.3229	1/8	.4271	3/8	.5313	5/8	.6354	7/8	.7396	1/8	.8438	3/8	.9479
3/16	.0156	7/16	.1198	11/16	.2240	15/16	.3281	3/16	.4323	7/16	.5365	11/16	.6406	15/16	.7448	3/16	.8490	7/16	.9531
1/4	.0208	1/2	.1250	3/4	.2292	1	.3333	1/4	.4375	1/2	.5417	3/4	.6458	1	.7500	1/4	.8542	1/2	.9583
5/16	.0260	9/16	.1302	13/16	.2344	1 1/16	.3385	5/16	.4427	9/16	.5469	13/16	.6510	1 1/16	.7552	5/16	.8594	9/16	.9635
3/8	.0313	5/8	.1354	7/8	.2396	1 1/8	.3438	3/8	.4479	5/8	.5521	7/8	.6563	1 1/8	.7604	3/8	.8646	5/8	.9688
7/16	.0365	11/16	.1406	15/16	.2448	1 3/16	.3490	7/16	.4531	11/16	.5573	15/16	.6615	1 3/16	.7656	7/16	.8698	11/16	.9740
1/2	.0417	3/4	.1458	1	.2500	1 1/4	.3542	1/2	.4583	3/4	.5625	1	.6667	1 1/4	.7708	1/2	.8750	3/4	.9792
9/16	.0469	13/16	.1510	1 1/16	.2552	1 5/16	.3594	9/16	.4635	13/16	.5677	1 1/16	.6719	1 5/16	.7760	9/16	.8802	13/16	.9844
5/8	.0521	7/8	.1563	1 1/8	.2604	1 3/8	.3646	5/8	.4688	7/8	.5729	1 1/8	.6771	1 3/8	.7813	5/8	.8854	7/8	.9896
11/16	.0573	15/16	.1615	1 3/16	.2656	1 7/16	.3698	11/16	.4740	15/16	.5781	1 3/16	.6823	1 7/16	.7865	11/16	.8906	15/16	.9948
3/4	.0625	1	.1667	1 1/4	.2708	1 1/2	.3750	3/4	.4792	1	.5833	1 1/4	.6875	1 1/2	.7917	3/4	.8958		
13/16	.0677	1 1/16	.1719	1 5/16	.2760	1 9/16	.3803	13/16	.4844	1 1/16	.5885	1 5/16	.6927	1 9/16	.7969	13/16	.9010		
7/8	.0729	1 1/8	.1771	1 3/8	.2813	1 5/8	.3854	7/8	.4896	1 1/8	.5938	1 3/8	.6979	1 5/8	.8021	7/8	.9063		
15/16	.0781	1 3/16	.1823	1 7/16	.2865	1 11/16	.3906	15/16	.4948	1 3/16	.5990	1 7/16	.7031	1 11/16	.8073	15/16	.9115		
1	.0833	1 1/4	.1875	1 1/2	.2917	1 3/4	.3958	1	.5000	1 1/4	.6042	1 1/2	.7083	1 3/4	.8125	1	.9167		
1/16	.0885	1 5/16	.1927	1 9/16	.2969	1 13/16	.4010	1/16	.5052	1 5/16	.6094	1 9/16	.7135	1 13/16	.8177	1/16	.9219		
1/8	.0938	1 3/8	.1979	1 5/8	.3021	1 7/8	.4063	1/8	.5104	1 3/8	.6146	1 5/8	.7188	1 7/8	.8229	1/8	.9271		
3/16	.0990	1 7/16	.2031	1 11/16	.3073	1 15/16	.4115	3/16	.5156	1 7/16	.6198	1 11/16	.7240	1 15/16	.8281	3/16	.9323		
1/4	.1042	1 1/2	.2083	1 3/4	.3125	2	.4167	1/4	.5208	1 1/2	.6250	1 3/4	.7292	2	.8333	1/4	.9375		

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