MUNSON CENTER - CHARDON RD.

3

FIELD BOOK

740

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.	1	13.36.6 in.
2	33.0	22	3 63.0	42	6.93.0	62	23.0		13.53 0
3	49.6	23	3.79.6	43	7.09 6	63		83	13.69.6
4	66.0	24	3.96.0	44	7.26.0	64			13.86.0
5	82.6	25	4 12.6	45	7.42.6	65			14.02.6
6	99.0	26	4.29.0	46	7.59.0	66			14.19.0
7	1.15.6	27	4.45.6	47	7.75.6	67			14.35.6
8	1.32.0	28	4.62.0	48	7.92.0	68			14.52.0
9	1.48.6	29	4.78.6	49	8.08.6	69			14.68.6
10	1.65.0	30	4.95.0	50	8.25.0	70	11.5 .0		14.85.0
11	1.81.6	31	5 11.6	51	8.41.6	71	11.7		15.01.6
12	1.98 0	32	5.28 0	52	8.58.0	72	11.8		15.18.0
13	2.14.6	33	5.44.6	53	8.74.6	73			15.34.6
14	2.31.0	34	5.61.0	54	8.91.0	74			15.51.0
15	2.47.6	35	5.77.6	55	9.07 6	75	12.37.6		15.67.6
16	2.64.0	36	5.94.0	56	9.24.0	76	12.54.0		15.84.0
17	2.80.6	37	6.10.6	57	9.40.6	77	12.7		16.00.6
18	2.97.0	38	6.27.0	58	9.57.0	78	12.8		16.17.0
19	3.13.6	39	6.43.6	59	9.73.6	79	03.6		16.33.6
20	3.30.0	40	6.60.0	60	9.90.0	80	13.20.0		16.50.0

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

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

7

CHARDON-AUBURN RD. #4
SEC N-D PROFILE 79
STK for 1964 IMPROV. 78

1951 61-64

CHARDON-AUBURN RD. #4
Sec. N-O Align't. 2-10
Bks 61-64

WILSON MILLS RD. #8
Sec. I-J-K-L-M & Village
Align't. 101 22

Topo. both above 24-51

Profile CHARDON-AUBURN RD
Sec P #4 56-60
Bean Rd #103 pg 65-72
Wearsch Rd #99 Back of
Woodbrook " #100 } Book

Wilson Mills Rd at Wearsch Rd Pg. 73
Studio for Prelim. Curve Relocation
Est. & Point at Wearsch Rd Pg. 75
Bean Rd #103
X Sec. Stark ditch Pg 76

1918 INDEX 1919

Page

9-12-49
Fair
Windy

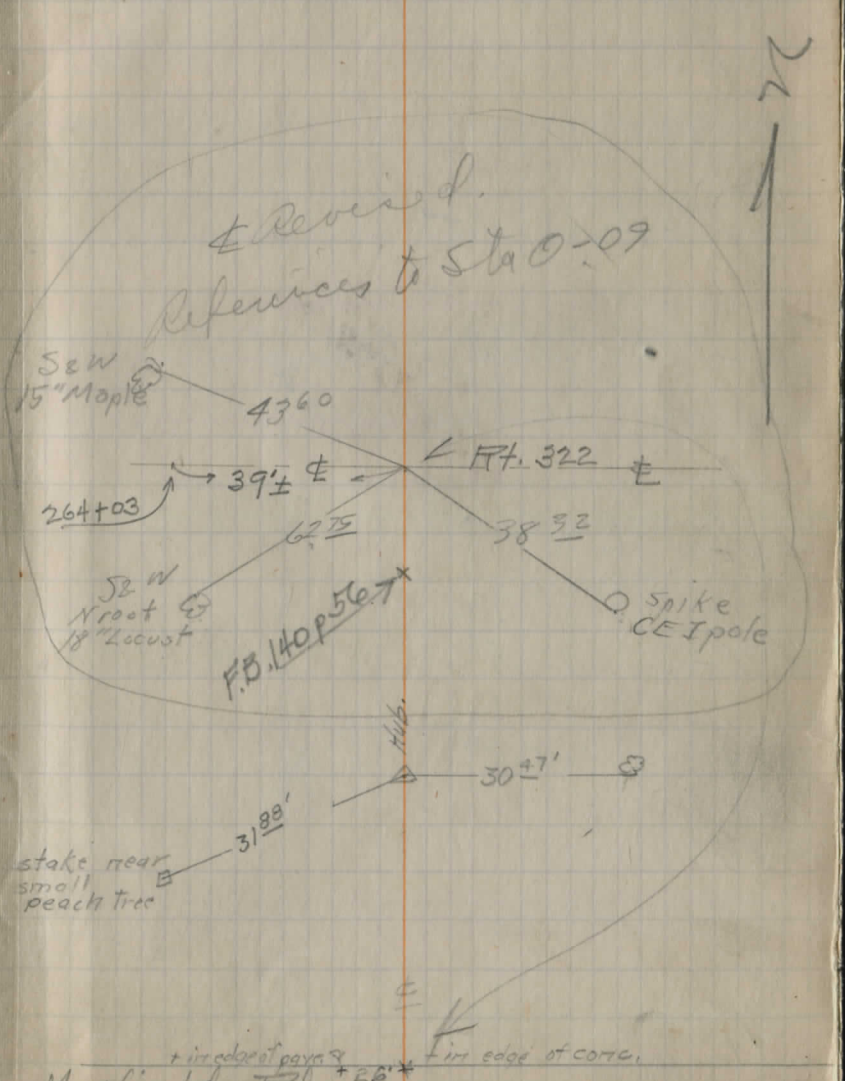
Lt. Rt. Hamm
Drake
Thompson

Sta.	Angle	Bearing
10	Auburn Rd.	
	CH #4 See N20	
9		
	Wilson Mills Rd	
8	CH # 8 See I to L	
7		
6		
5		
4		
3		
+13.3	△ 0°—0'	
2		
1		
0		

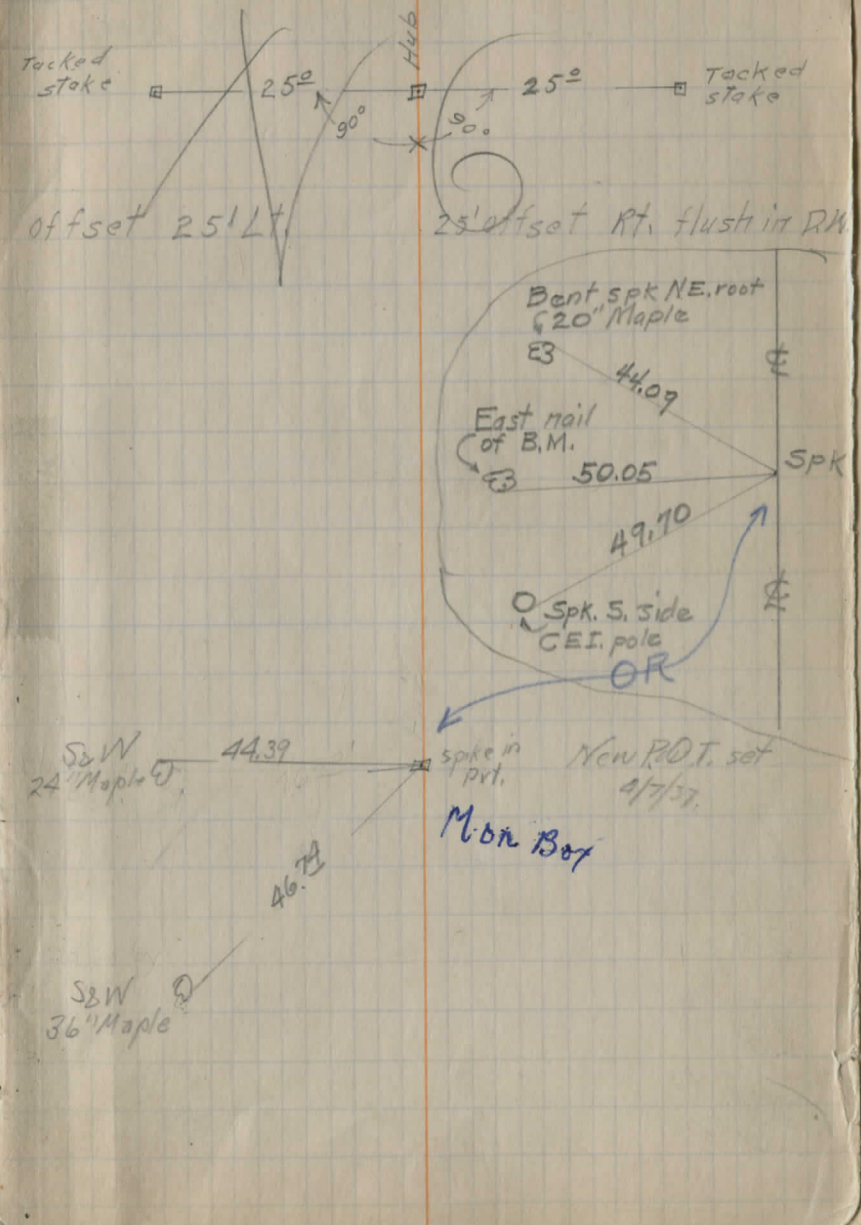
1951 & points
See pgs 61-64

Lt. ℄ Rt. 2

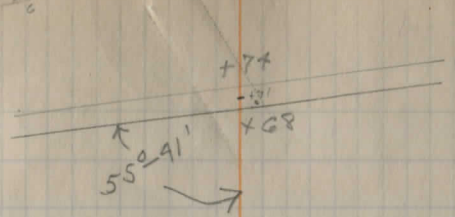
Stakes set 25' Rt. of ℄ unless noted.



Sta.	Angle	Bearing	offset 25' Lt.
21	△ 0°—00'		21
20			20
19			
18			
17			
16			
15			
+72.5	△ 0°—00'		
14			
13			
12			
11			

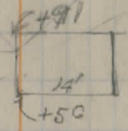


Sta.	Angle	Bearing	Offset 25' Lt. ℄
33			—
32			—
31			—
30			—
Sta 29+84.9±		P.O.T. Revised ℄	
29		is 2.55 east of pipe found on Lot Line	27
28			—
27			27
26			26
25			25
24			24
23			23
22			22



Not of Sherman

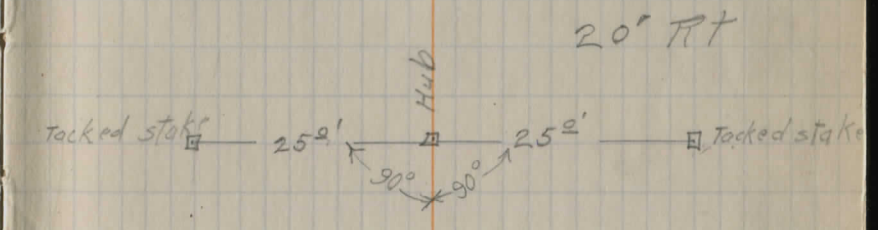
℄ ~~Abandoned~~ — Mon Box



Bridge

℄ of 29+95±

Sta.	Angle	Bearing
44		
43		9-13-'19
42		
41		
40		
39		
38		
+36 1	0°-0'	N 4° E
37		
36		
35		
34		



30' Rt.

Sta	Angle	Bearing
56		
55		
54		
53		
52		
51		
50		
49		
48		
47		
46		
45		

Sta.	Angle	Bearing
67		
66		
65		
64		
63		
62		
61		
60		
59		
58		
+79	0°-0'	
57		

℄

30' Rt.

30' Rt.

30'

30'

25'

30

LT 25

Tack in S.W. side Locust

24 15'

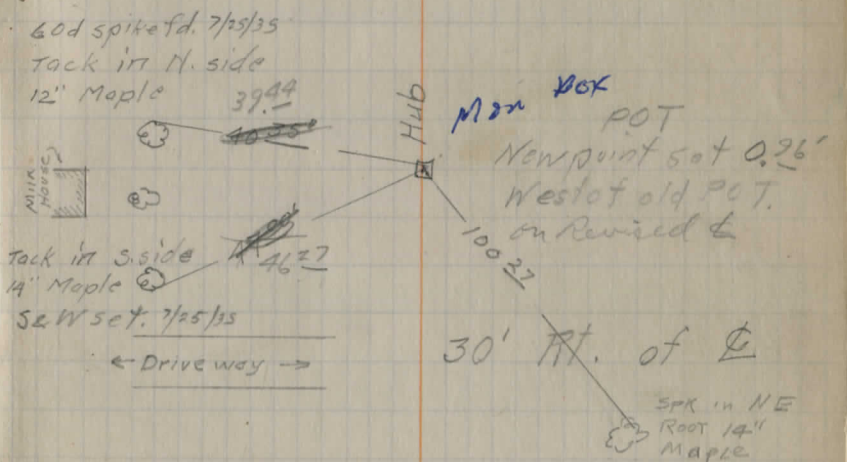
Hub

Mon Boy

Tack in S. side locust

31 30'

Sta.	Angle	Bearing
78		
77		
76		
75		
+98.7 △	Revised ℄	Def Lt. 0°06'
74		
73		
72		
71		
70		
69		
68		



Sta.	Angle	Bearing
90		
89		
88		
87		
86		
85		
84		
83		
82		
81		
80		
79		

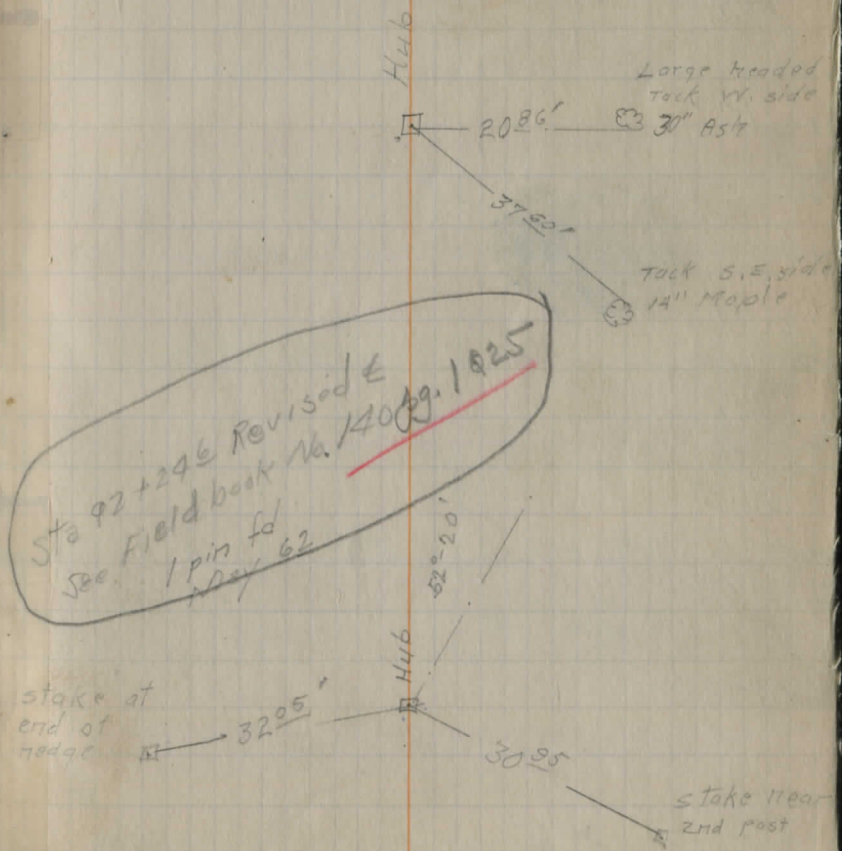
Sta.	Angle	Bearing
100		
99		
98		
+35 1	Δ 0°-0'	
97		
96		
95		
94		
93		
9-15-19		
+24 C	Δ 52°-20' Rt.	
92		
91		

(Intersection with Curve or its sides (Δ 55° - 30' Et)

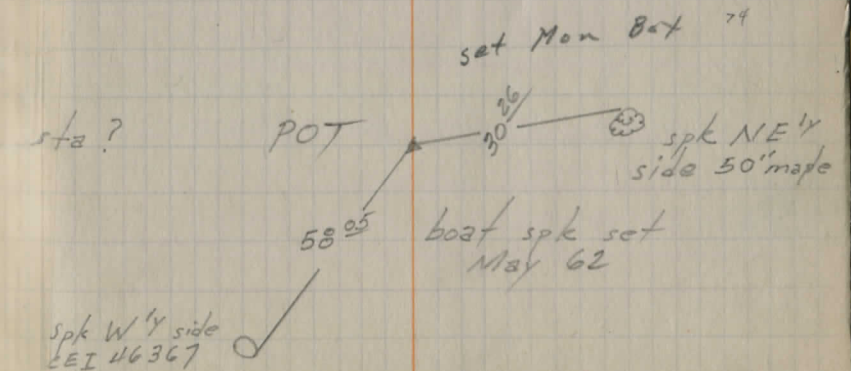
± 8973 Chardon Corp line ℄

bolt at #1 6-26-47

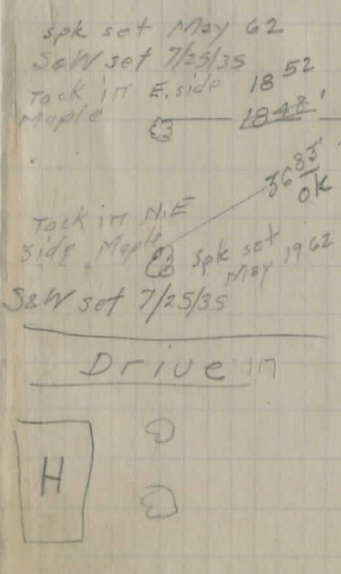
Approx meas



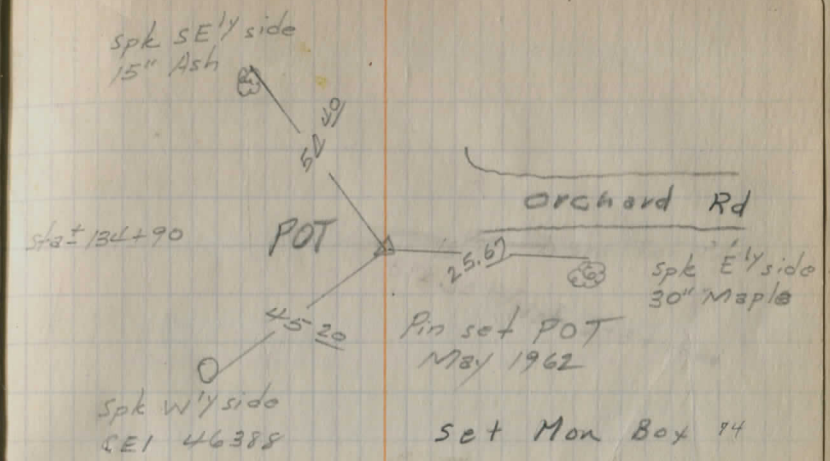
Sta.	Angle	Bearing
112		
111		
110		
109		
108		
107		
106		
105		
104		
103		
102		
101		



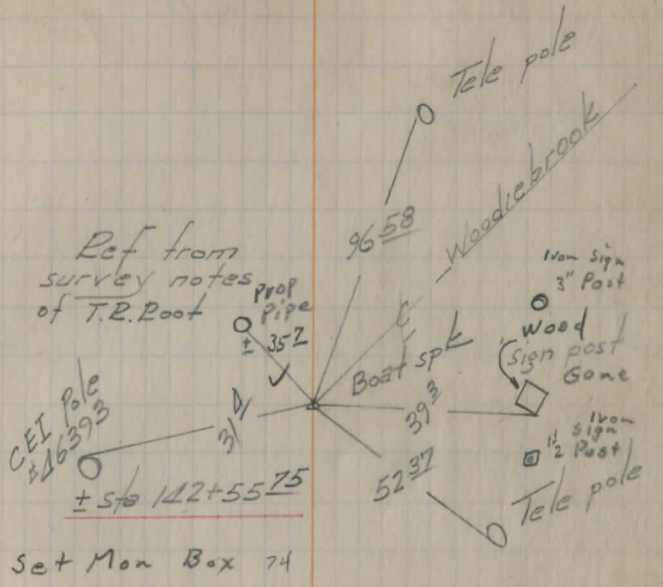
Sta.	Angle	Bearing
123		
122		
121		
120		
119		
118		
+45	Rt. 0°-0'	
117		
116		
115		
114		
113		

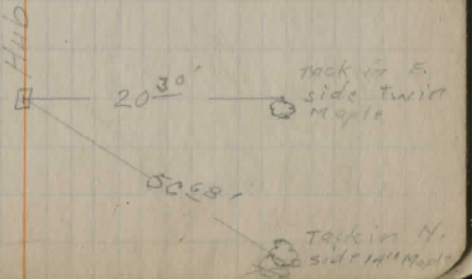


St	Sta.	Angle	Bearing
1	135		
1	134		
1	133		
1	132		
1	131		
1	130		
+-	129		
1	128		
	127		
	126		
	125		
	12A		

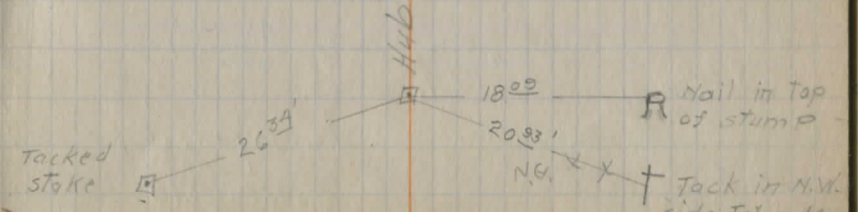


Sta.	Angle	Bearing
146		
145		
144		
143		
142		
141		
140		
139		
138		
137		
+57 2	0°-0'	
136		





Sta.	Angle	Bearing
157		
156		
155		
154		
153		
152		
151		
150		
149		
148		
+ 72	0°-0'	
147		



Sta. Angle Bearing

168

167

166

165

164

163

162

161

160

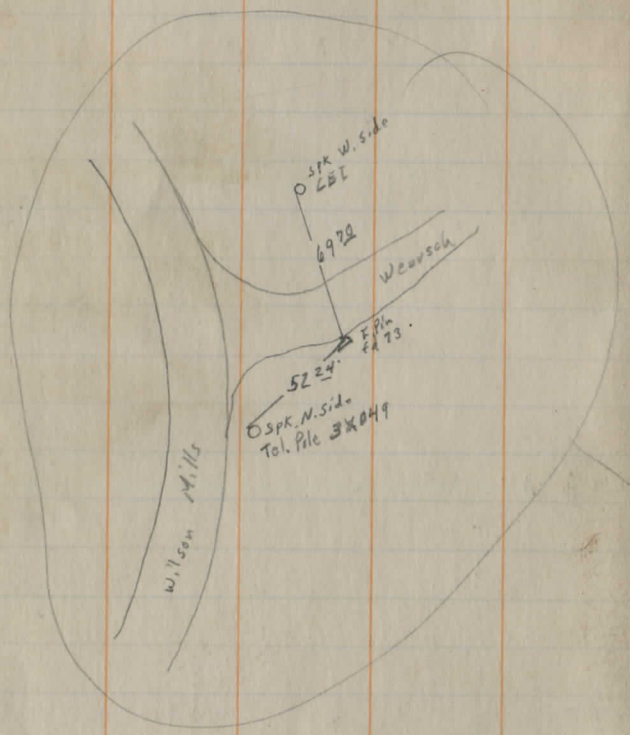
+35 78 P.T.

159

+70 3 P.I. 45°-00' Lt.

158

+95 16 P.C.



Δ =	45°-00'
D =	22°-00'
P.I. =	158+70 3
T =	7 5 14
P.C. =	157+95 16
L =	1 40 82
P.T. =	159+35 78
E. =	148.7 ft.
Deflection =	11.0°

R = 181.40

by these notes.

1806.46

Ref. from survey notes of T.R.R.

Gone

Spk S side 10" Cherry

65 85

62

May

Pk Ld.

51 90

55 13

41 55

Wilson Mills

moved Spk W. side CEI Pole

52 more

Tacked Stake

33 25'

Large nail in B.M. on stump

45 25'

see pg 75 for ref. May 1962 bolt set

29 43'

Tacked Stake

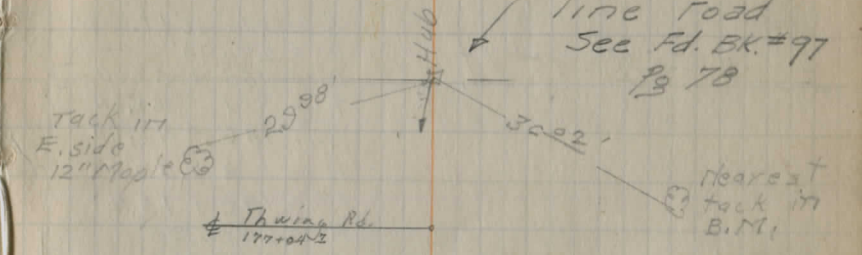
℄ Wearsch Rd

see attached sheet in back of this book

Sta.	Angle	Bearing
179		
+05.94 P.T.		
178.		
+67.10 P.I.	Δ 36°-24' Rt.	
+23.22 P.C.		
177		
176		
175		
174		
173		
172		
171		
170		
169		

Δ = 36°-24' Rt.
D = 440-00'
P.I. = 177 + 67.10
T = 43.88
P.C. = 177 + 23.22
L = 82.72
P.T. = 178 + 05.94
E = 7'-03
Def. per. Ft. = 0.22°

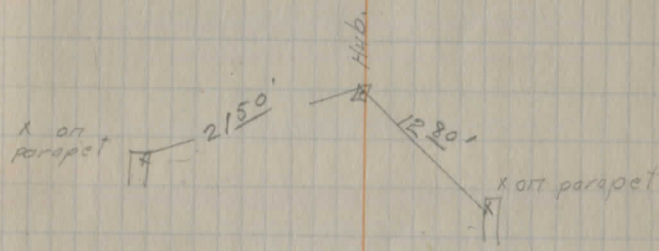
P.I. near Town line road
See Fd. Bk. #97 Pg 78



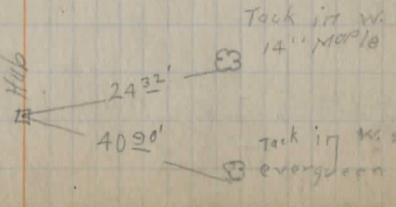
Sta.	Angle	Bearing
+15.21 P.T.		
190		
189		
+57.0 P.T.	8°-40' Lt.	
188		
187		
+98.14 P.C.		
186		
185		
184		
183		
182		
181		
180		

Δ = 8°-40' Lt.
D = 2°-44'
PI = 188 + 57.00
T = 1 58.86
P.C. = 186 + 98.14
L = 3 + 17.07
P.T. = 190 + 15.21
R = 2096.39
E = 6.02 ft.

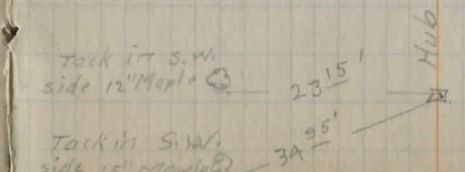
Def. per ft. = 0.82'



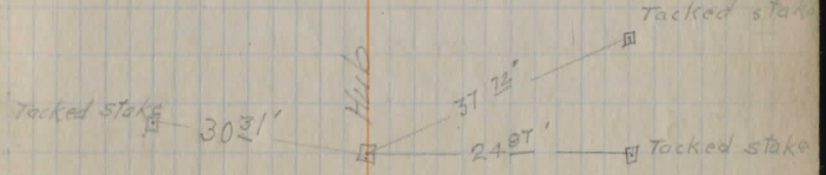
Sta.	Angle	Bearing
201		
200		
199		
198		
197		
196		
195		
194		
193		
192		
191		
+77.7	0° 0'	N. 40° E.



Sta.	Angle	Bearing
212		
211		
210		
209		
208		
207		
206		
205		
204		
203		
202		
+98	0° 0'	



Sta.	Angle	Bearing	Offset 20' Rt
223			20
222			20
221			20
220			20
219			
218			
217			
216			
215			
214			
+88	0°-0'		
213			

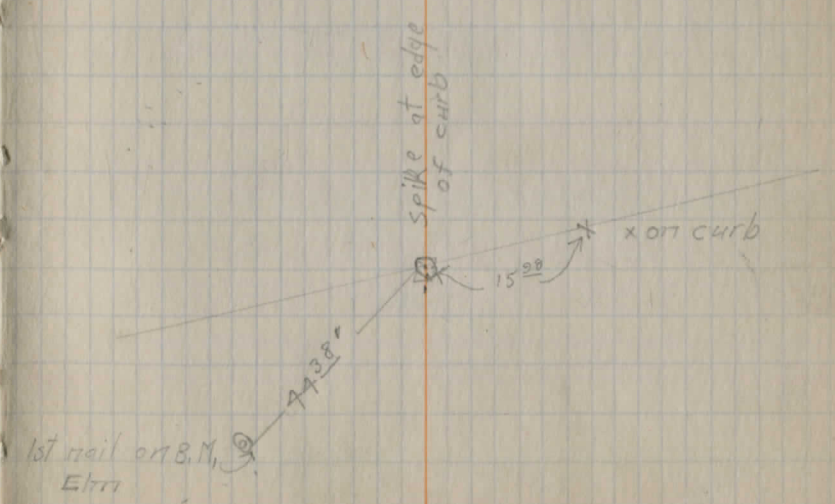


Sta. Angle Bearing

+97.0 End pavement = 4.28 mi

225

22A



9-23-19
Hanna Thompson

TOPO

5

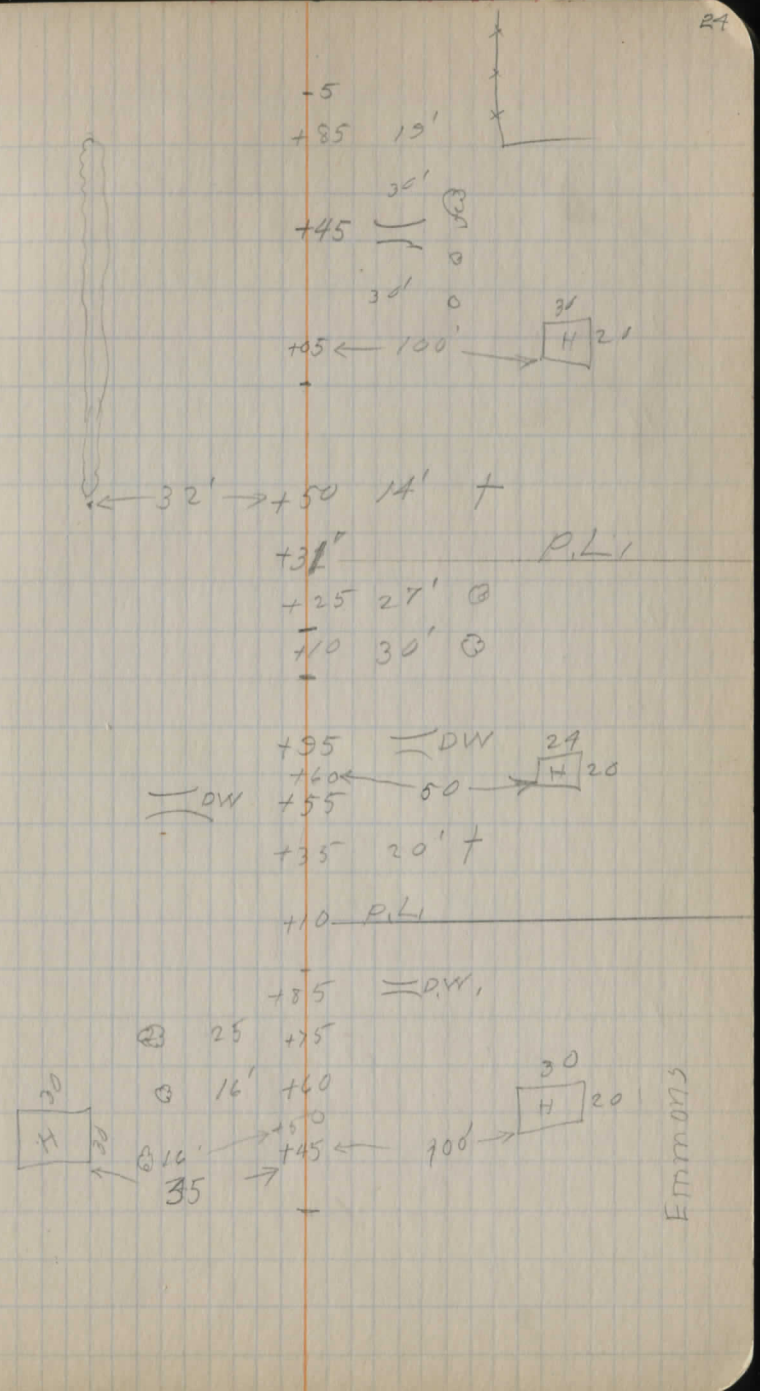
4

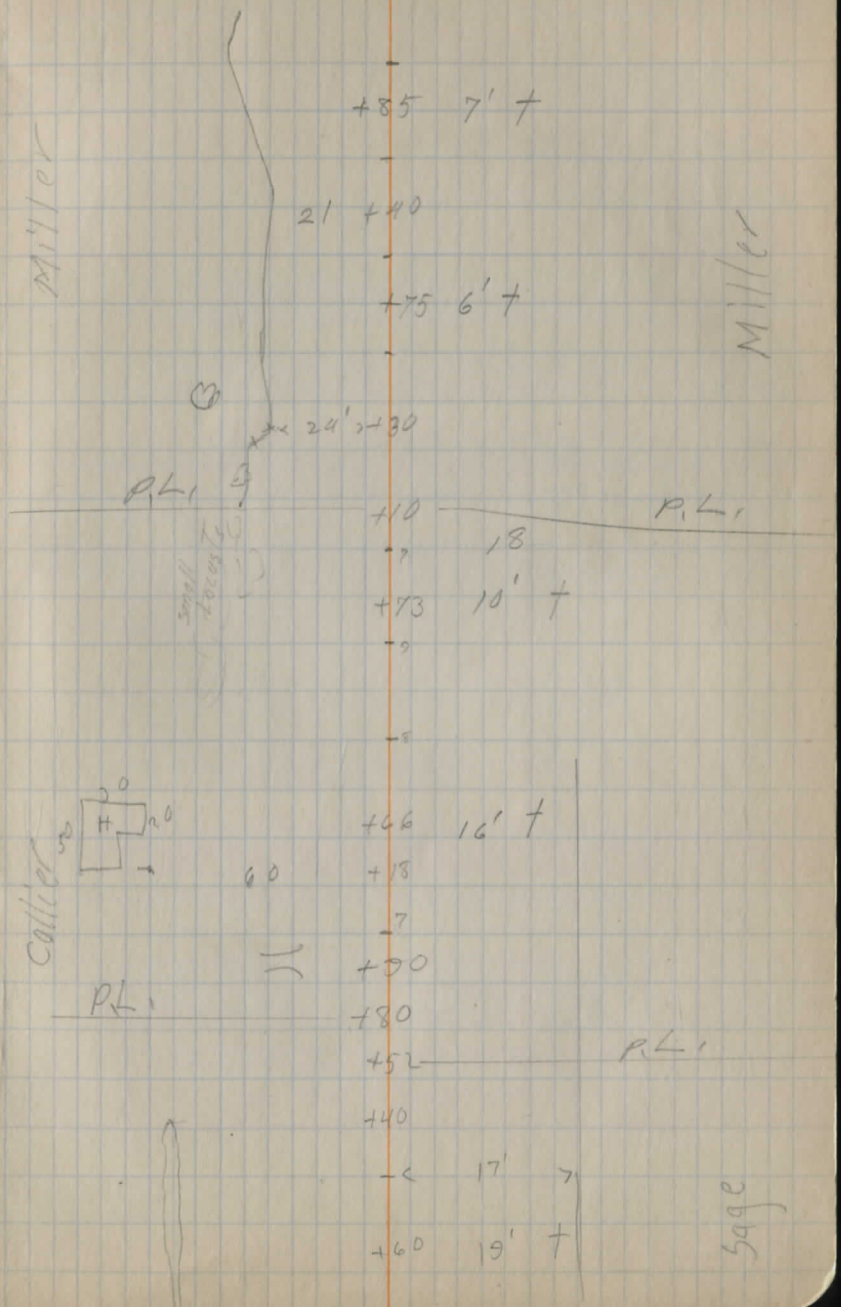
3

2

1

0




Miller
Miller
+85 7' +
21 +40
+75 6' +
24' +30
P.L.
+10
P.L.
18
+73 10' +
Collier
20
20
50
60
+66 16' +
+18
+00
+80
P.L.
+52
P.L.
+40
17'
+60 19' +
Sage

20

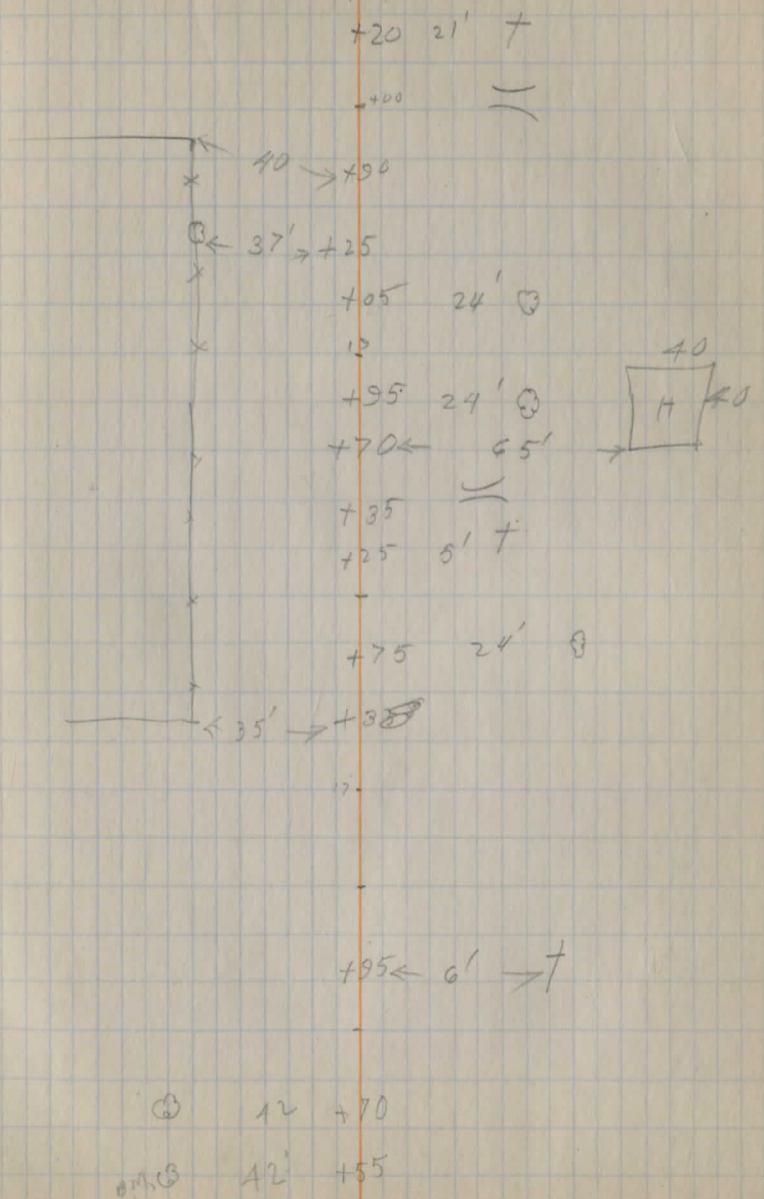
19

18

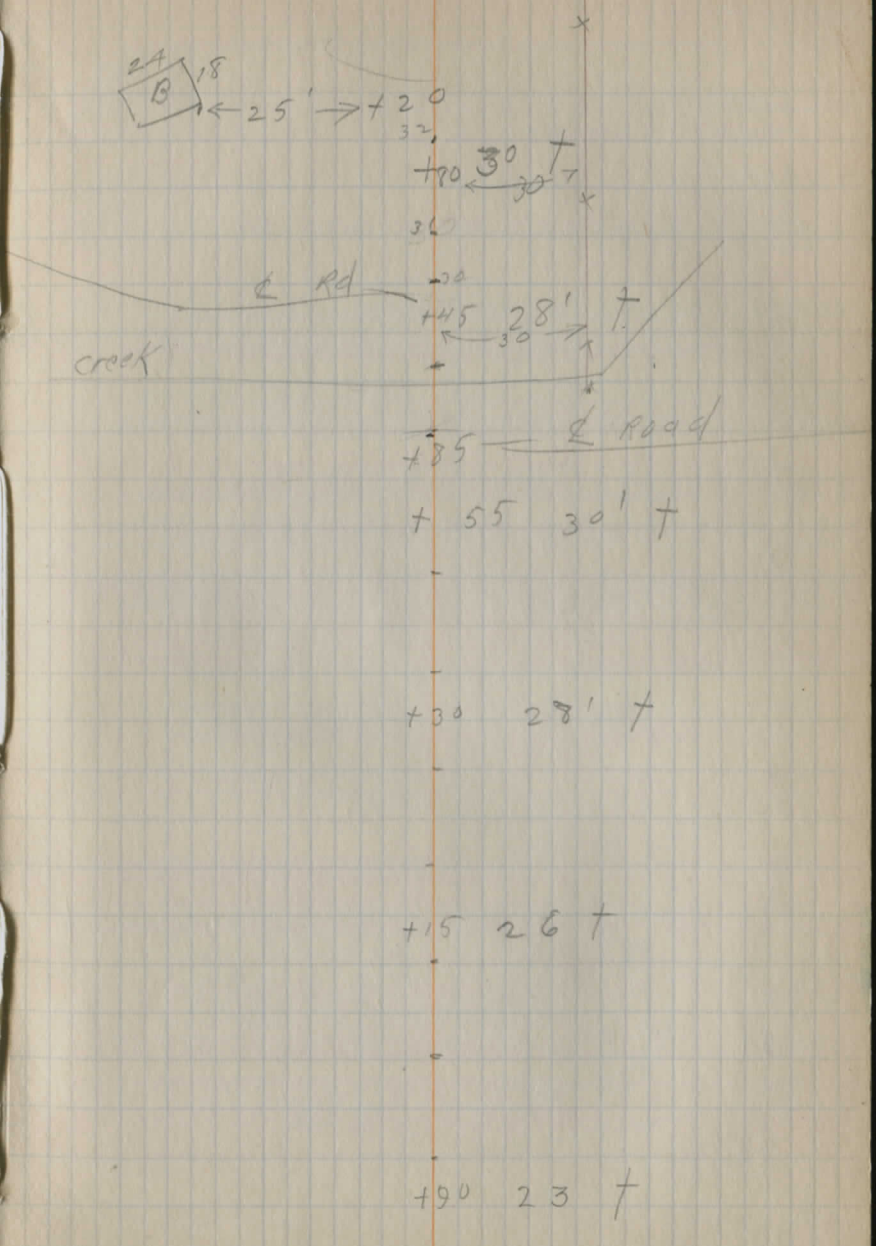
17

16

15



32
31
30
29
28
27
26
25
24
23
22
21



42

41

40

39

38

37

36

35

34

33

+41
+40 23' +

+17
40

30
+80 25' +
17' +60

+65 —DM.
+62 100'

40
M
40

J. K. Davis

+92 27' +

+25 35' +

10 M.S. +
20

W/R 18'
+20

+55 → 32'

30
S
35' → 32'

J. K. Davis

51

50

49

48

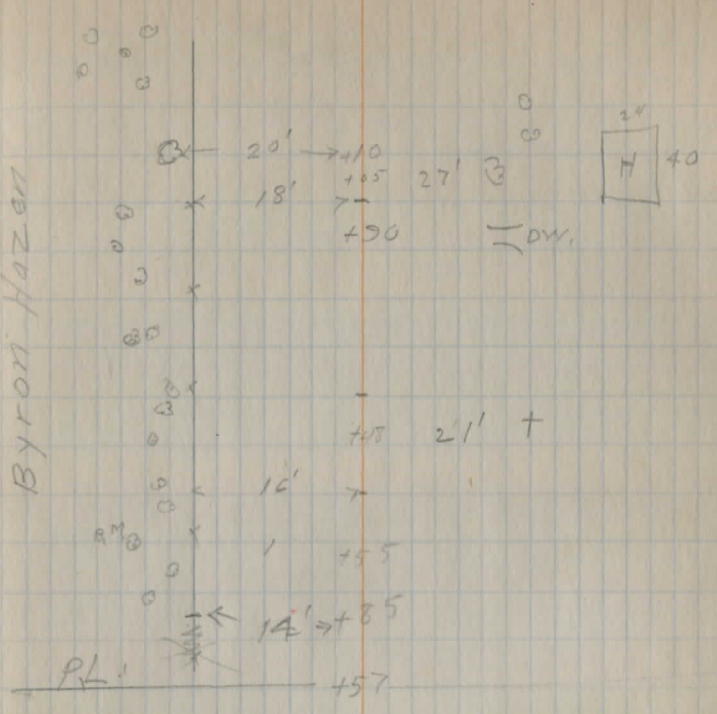
47

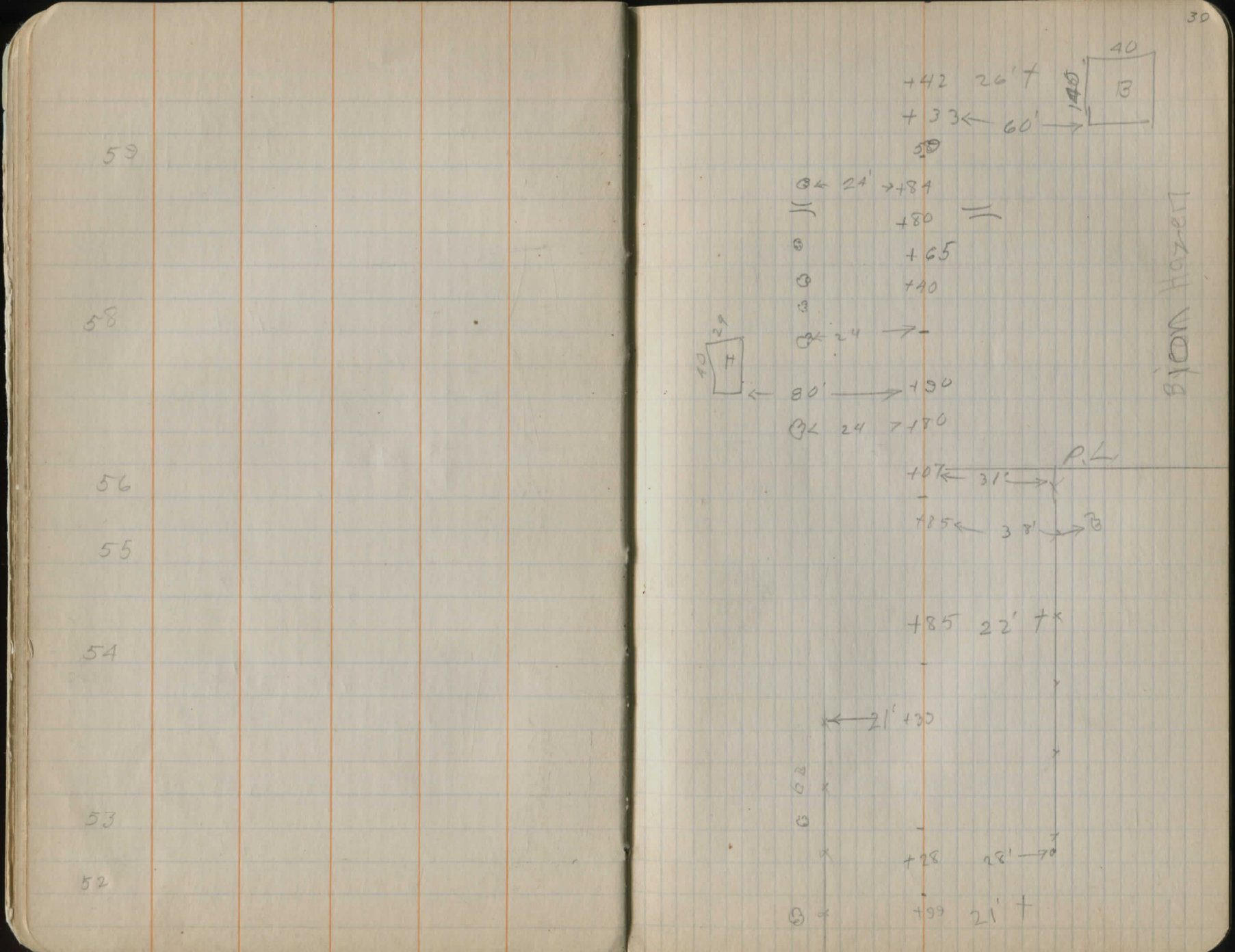
46

45

44

43




40
B
+42 26' +
+33 ← 60' →
24' →
+84
+80
+65
+40
24 →
H
80' →
+90
24 +80
P.L.
+07 ← 31' →
+85 ← 38' →
+85 22' +
21' +30
+28 28' → 70'
+99 21' +
BION Hazen

71

70

69

68

67

66

65

64

63

62

61

60

Hazen

@ 25' +46

+36

+92 19' +

PL +43

+67 21' +

+44

+45 30' +

66

65

+07 30' +

BIOT Hazen

+60 30' +

Biot Hazen

30

36 H

36

77

76

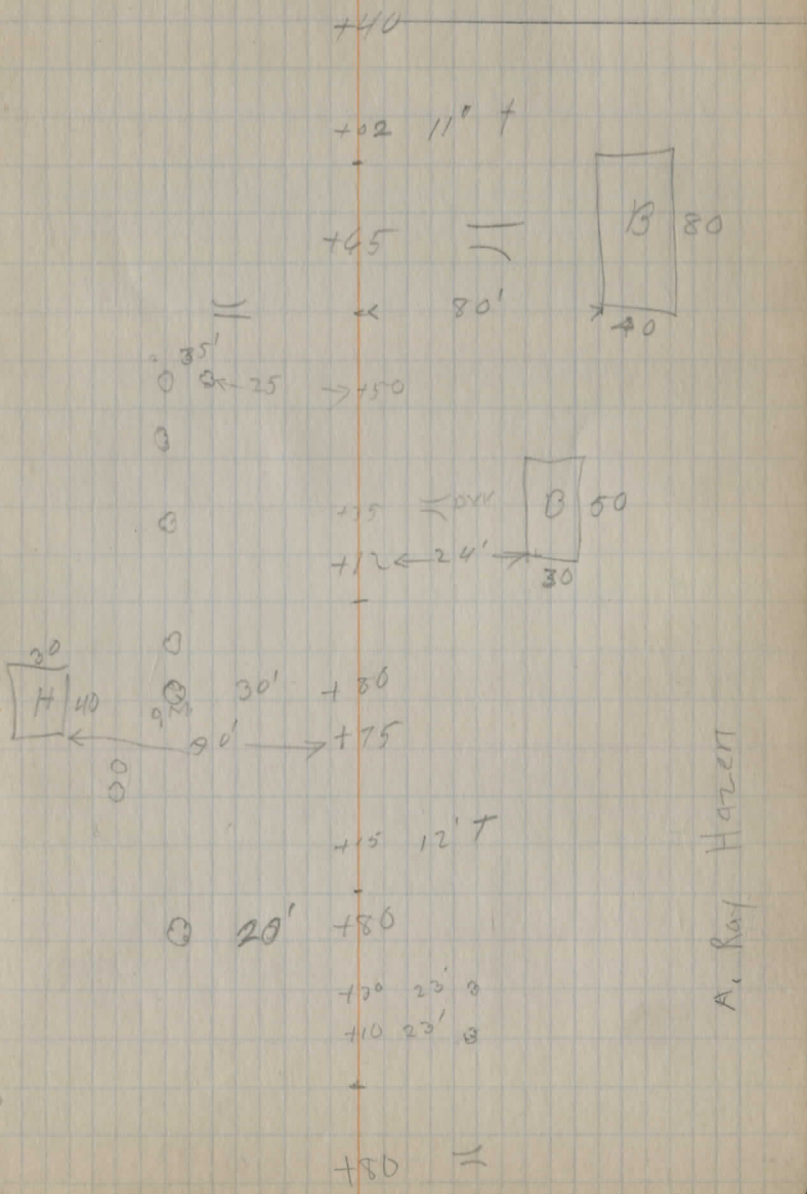
75

74

73

72

E. Hazen



A. Ray Hazen

Forest Hazen

90
89
88
87
86
85
84
83
82
81
79
78

J. Glacy.

E. Downing

Pl. +21' 12' t +13 Pl.
22'

+27 13' t

+12 11' t

+75 11' t

+145 13' t

+138' 17' 3

+20 11' t

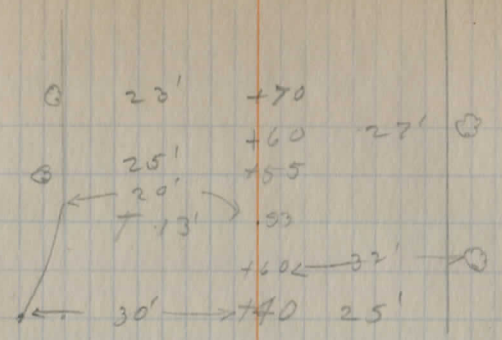
93

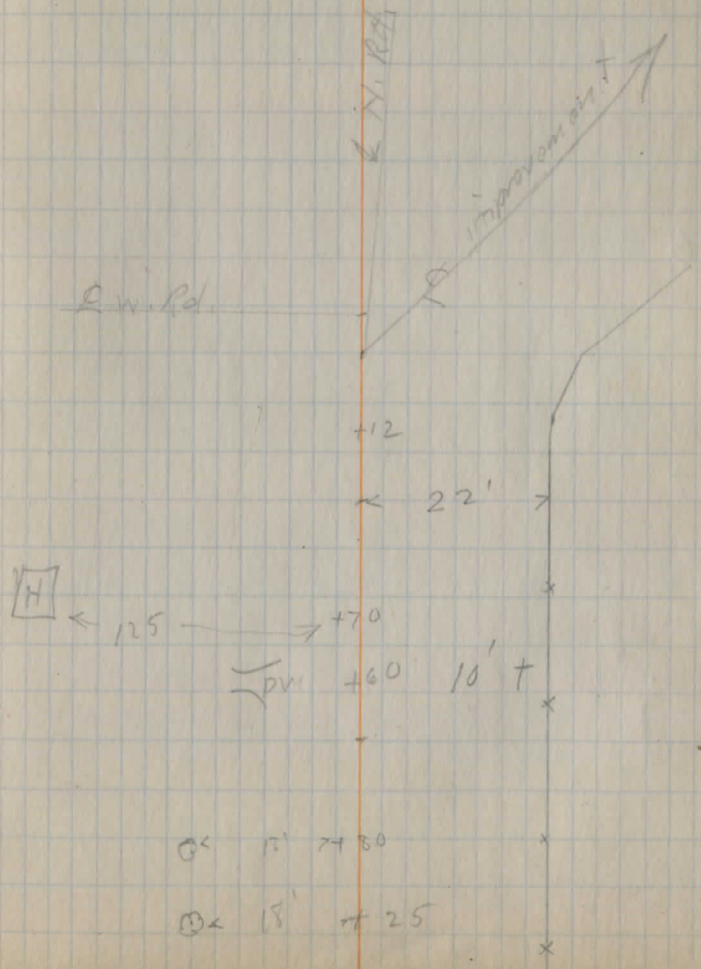
92

91

E. Downing

E. Downing





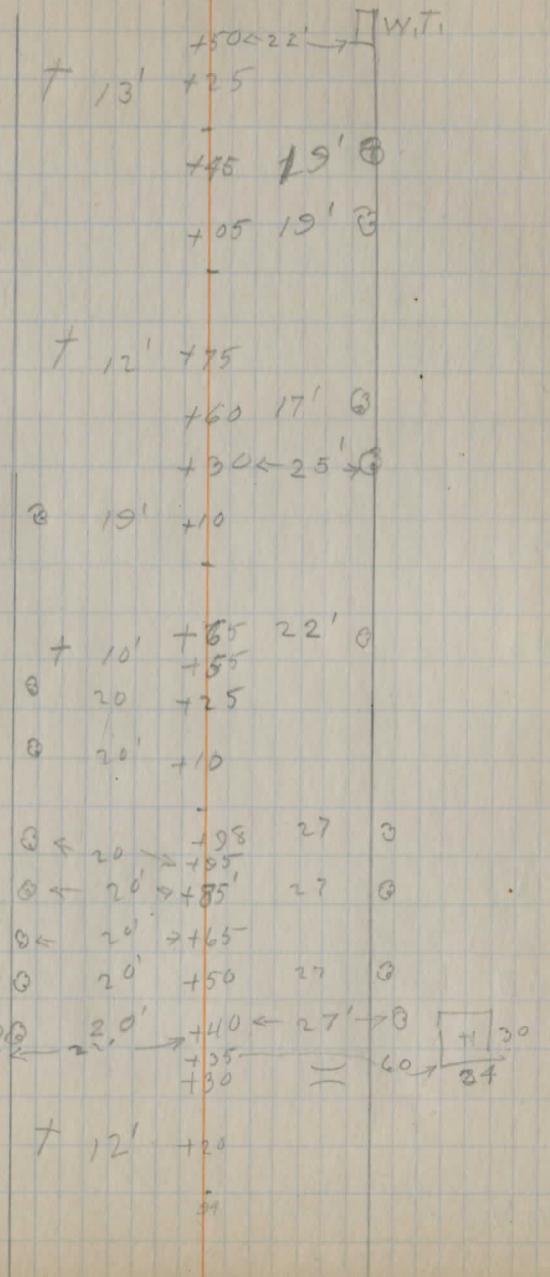
97

97

96

95

94


+50 <22'→ W.T.
T 13' +25
+45 19' ⊕
+05 19' ⊕
T 12' +75
+60 17' ⊕
+30 ←25'→ ⊕
⊕ 19' +10
T 10' +65 22' ⊕
+55
⊕ 20 +25
⊕ 20' +10
⊕ ←20→ +98 27 ⊕
+95
⊕ ← 20' → +85' 27 ⊕
⊕ ← 20' → +65
⊕ 20' +50 27 ⊕
⊕ 20' +40 ← 27' → ⊕
⊕ ← 20' → +35
+30
60
T 30
34
T 12' +20

106

105

104

103

102
101

100

99

+90 15' +
0 25 +85 25' 0
0 25 +42
+10 26 0
+99 26' 0
+80 27 0
0 26' +36 27' 0
+30 26' 0
0 25' +45 19' +0
0 25 +36 27 0
27' 0
+33 P.L.
BASS LAKE Co.
+39 P.L. +39 18' + P.L.
25
+03 22' 0
+95
+ 15' 24'
+95 21' 0
+80 20' 0
+75
+ 12'

Bass Lake Co.

F. Carver

111

110

109

108

1

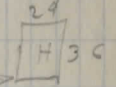
107

3 28' +90
+40 28' 3
3 28' +40
3 29' +05
+01 28' 3

3 25' +30 30' 3
+80 60
+75 35' 3
3 25' +60
3 29' +45 16' 28 3
+20 25 3
+10 29 3

+95 28 3
+80 28 3
+60 28 3
3 25 +45
+20 25' 3
3 25 +10

3 25' +85 25 3
+50 25 3
3 25 +35
3 25' +10 25' 3



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115

114

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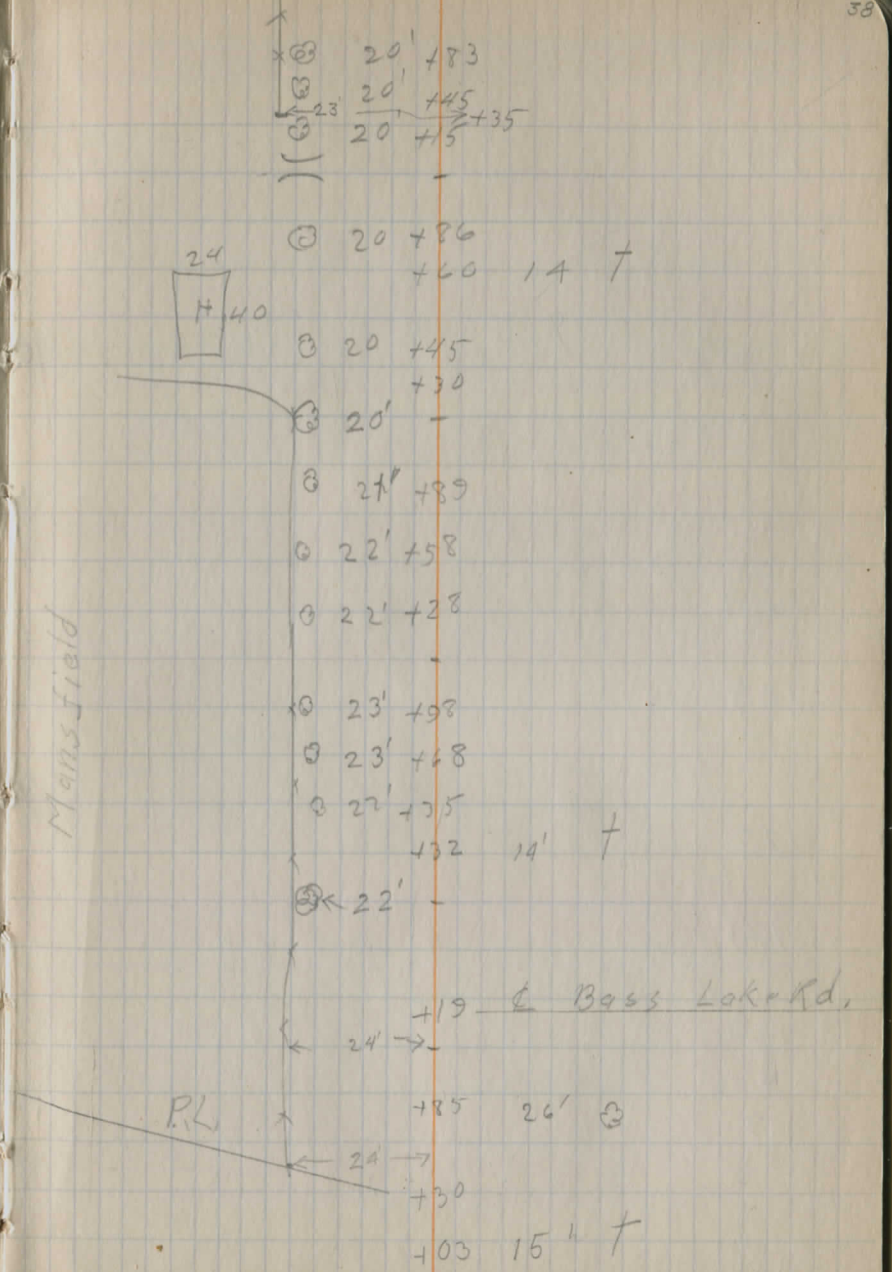
112



127

126

125

124

123

122

121

120

119

118

+70 28' B
+60 28' B
+45 12' T

+60 26 C
+53 26 B
+20 26' B

+45 10' T

+40 13' T

22' → +75
+66

+80 13' T

+54 30' B

70' 13' T

B 20' +40

134

133

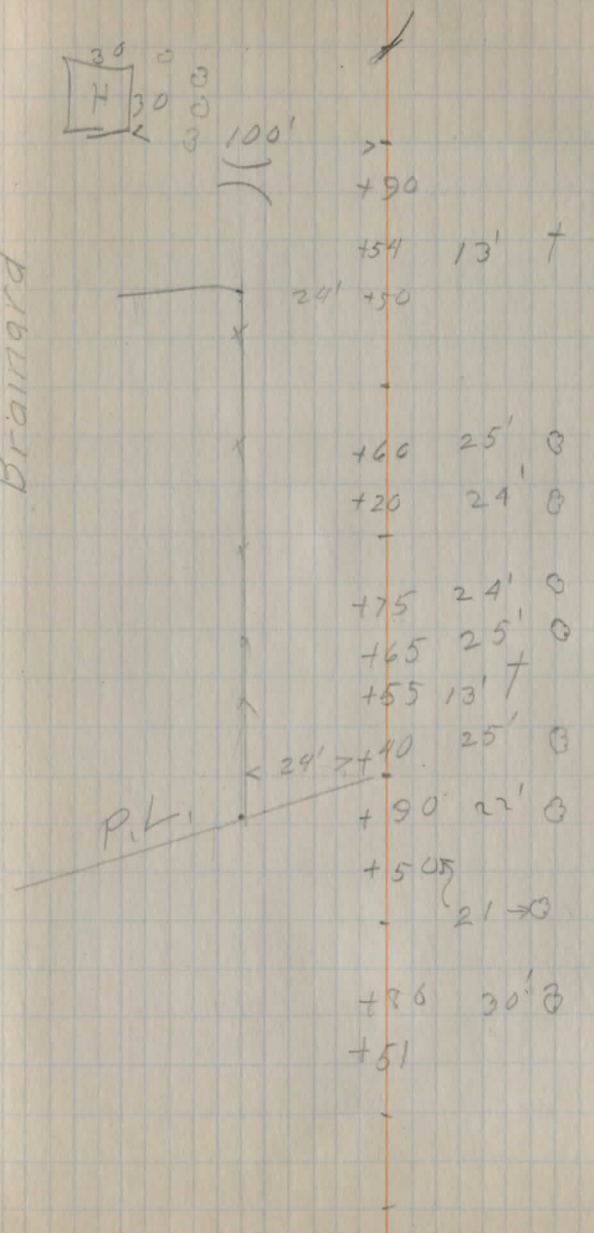
132

131

130

129

128



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142
141

140

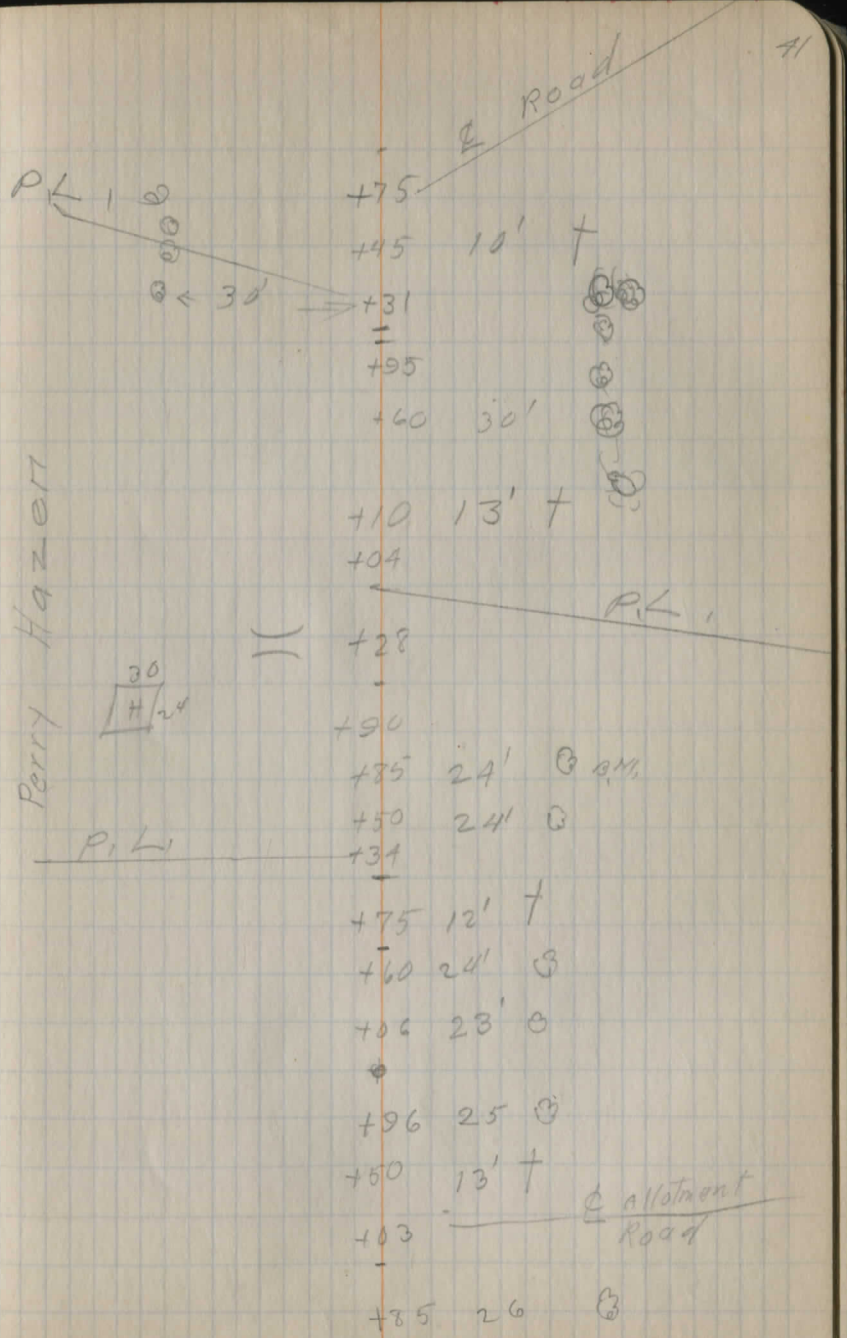
139

138

137

136

135



154

153

152

151

150

149

148

147

146

145

144

EDWARDS

+90 16' T

+45 15' T

+18 15' T

+88 15' T

+55 15' T

+17 15' T

EDWARDS

165

164

163

162

161

160

159

158

157

156

155

Burdick

29 H 30

600

+60 26

+40

14' +40

+32 P. L.

14' +05

14' +70

20' +75

+60 DW

+16 23' †

20' +75 17' †

+04 17' †

173

172

171

170

169

168

167

166

+90
+55
+30
+80
+45
+18
+90
+55
+35
+65
+35
+80
+50
+35
+12
+90
+60
+25
+35

15'
15'
15'
14'

30
30

BUILDING

P.L.

<—35—>

182

181

180

179

178

177

176

175

174

Corp. T 19 +56
(Not P.L.)
+64
23' +52
Line
(Not P.L.)
T 19'
T 19' +75
T 19' +60
T 27' +60
+45 18' 10 M.
Twp Line
℄ Road #27
T 15' +70
T 15' +18
+35
+10
T 15' +70
+35
+10

191

190

189

188

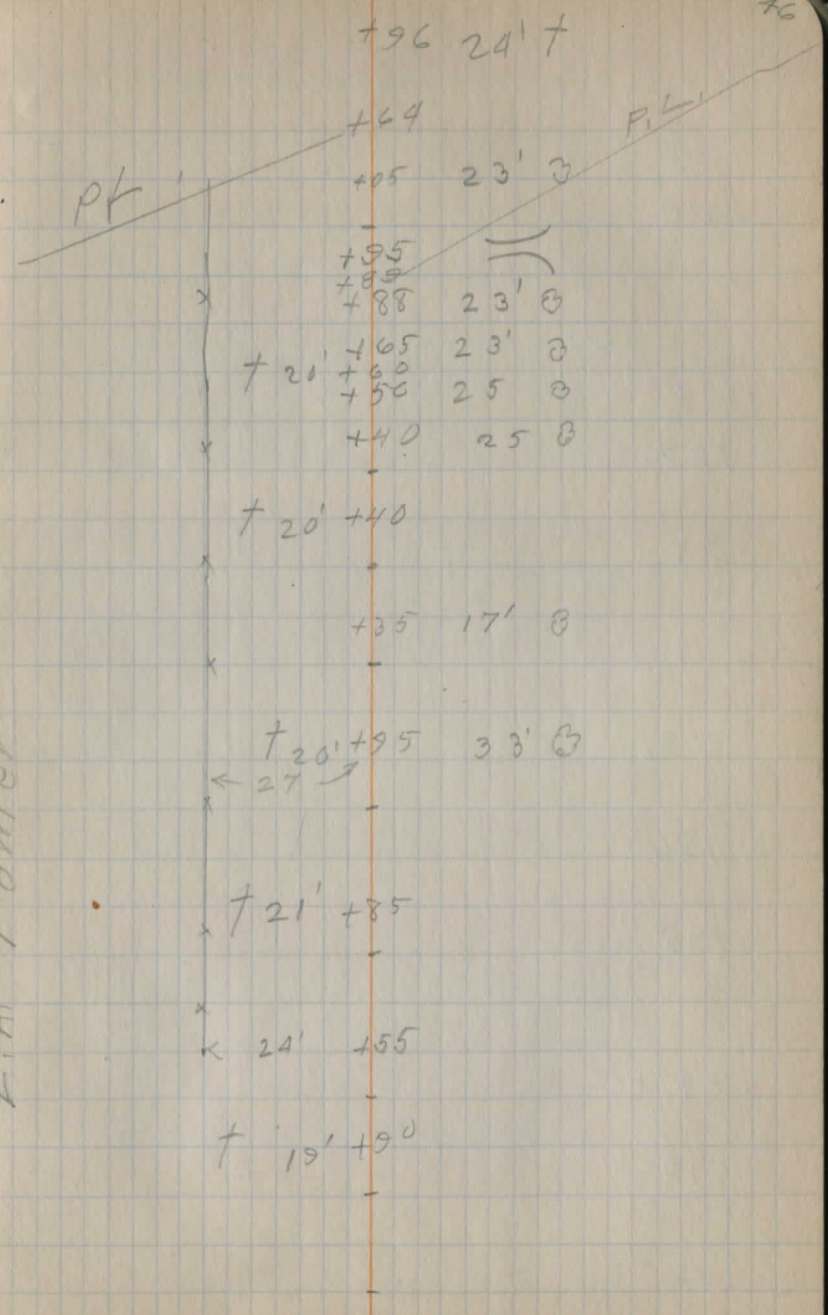
187

186

185

184

183



E. A. Fowler

200

199

198

197

196

195

194

193

192

24 +90

+65

+30 23' t

+10

+85

+55

25' +20

+02 23' t

25' +75 24' t

+10 30' B

+85 23' t

+75 28' B

+60 23' t

106

205

204

263

202

201

+40 22' †

+75 ← 26' →

+55

25 +27 23' †

P. L.

(?)

22' +75

+60

+35

+06 23' †

+00

+80

+60 ← 55

+50

+30

+06

23'

23' +80

+70 22' †

+50

21 +15

H 36 30

D. Meade

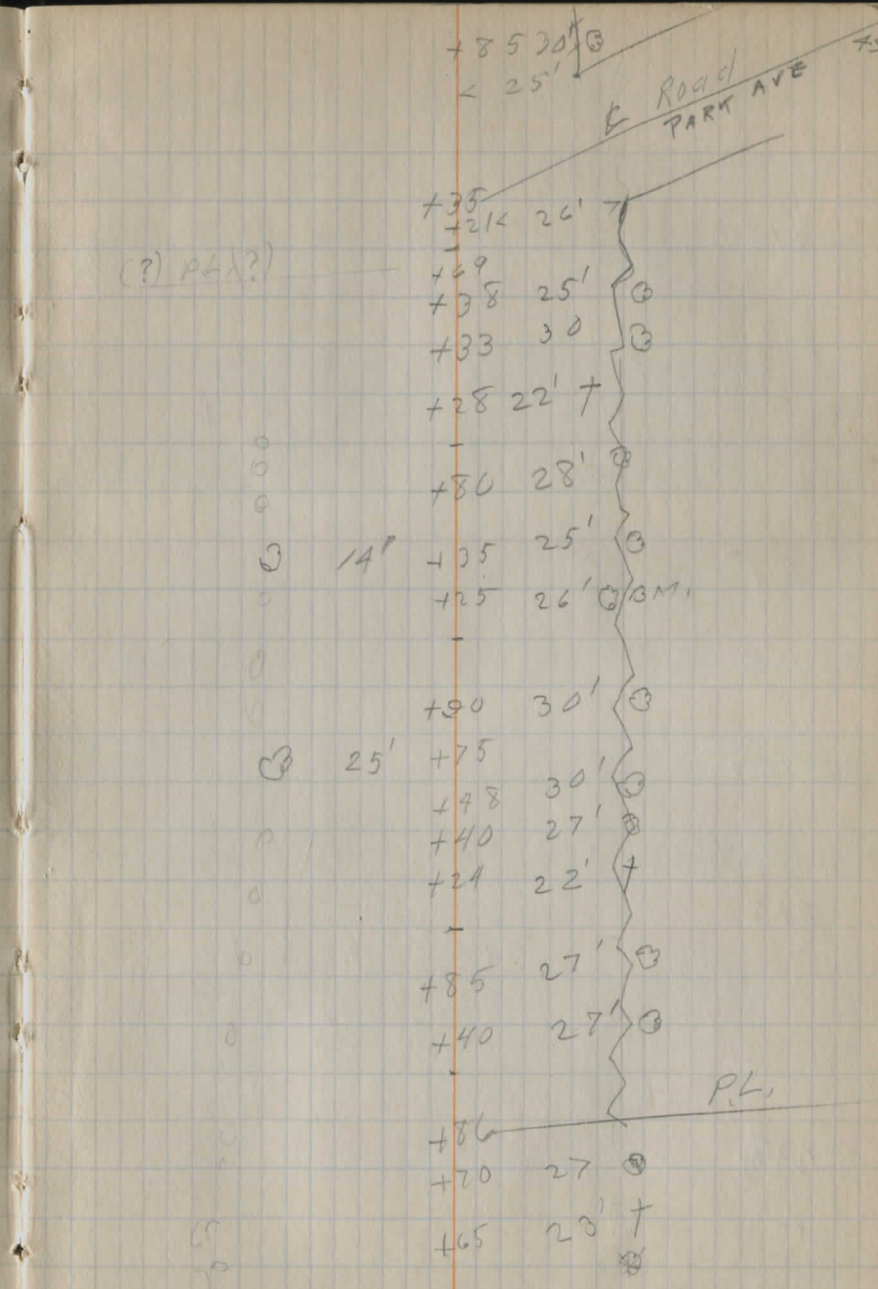
211

210

209

208

207



219

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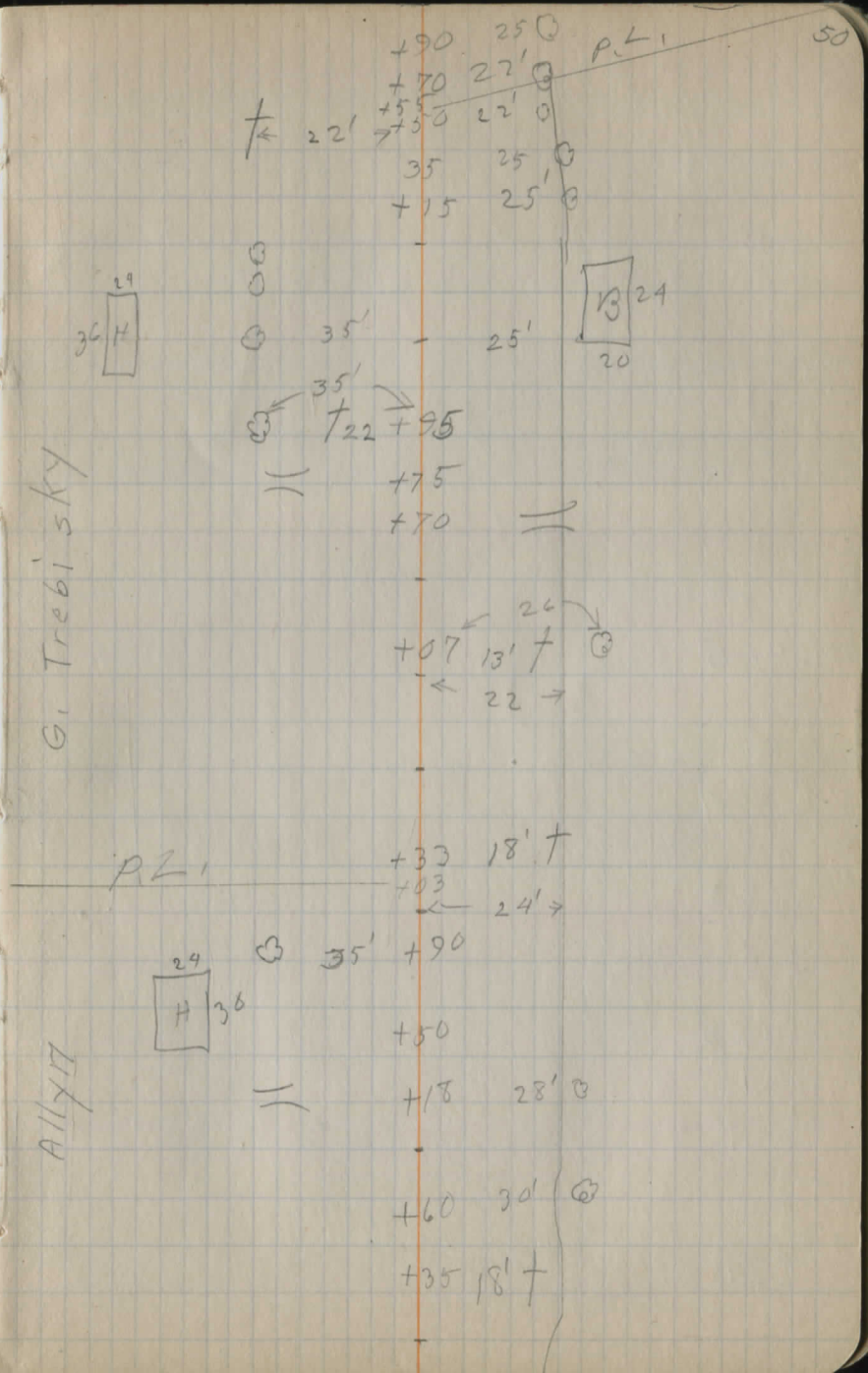


"Finie"

225

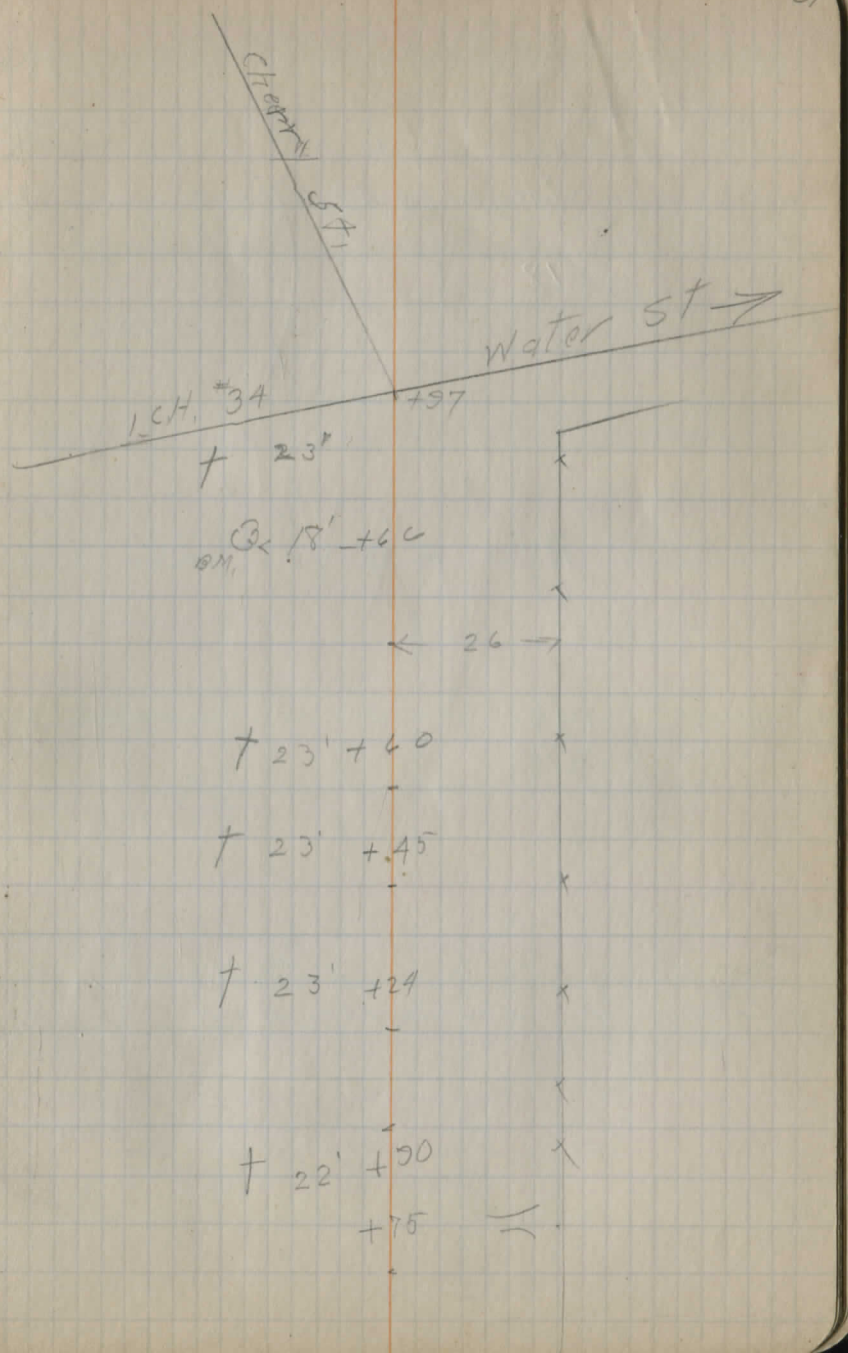
224

223

222

221

220



℄ Location County Highway No 4
Jennings Cor North to Thwing School
s/d stakes 25' Rt. of ℄

Sta 12+62.18	PI Dr ℄ 0°08'	Iron set

Rewired
See Vol 140

Pipe ○ 30.86 — 179.52 — 1800 — 30.50 — ○ Pipe

Buildrow 12" 30' long
8" Cor IP in good condition Ft. Rt. 10' long

8+62 →

N 8°30 E

S & W Wroot 15" Maple

47.88

S & W 12" Maple

79.53

92°53'10"

270 spike

911.45

Munson Center Road

℄ Wilson Mills Road

90°05'30"

℄ Chorden

127°47'30"

Sta 0+00	℄ Wilson Mills Road	Iron set in spike hole found

Sta 30+25.00 POT Rod Set

Extend 24' & relay
18" VSP culvert
in good condition
Fl Lt. 16' long.

34+00

50 W
24" Maple

91.68

50 W
24" Maple

74.42

Approx Sline Boarder

Extend 20' & relay
12" CIP culvert
in good condition
Fl Lt. 13' long

28+76

Sta 23+40 ± 12" Culvert required Fl Lt.

Sta 20+10 Culvert required Fl Lt.

Reversed

Sta 43+58.66 POT Iron Set

Remove ← 53+25
8" Cor. P culvert
in poor condition
Fl Lt.

Extend or build new
5'x3.5' Tano Box ← 49+42
culvert in good 9 92
condition Fl Lt.
18' long

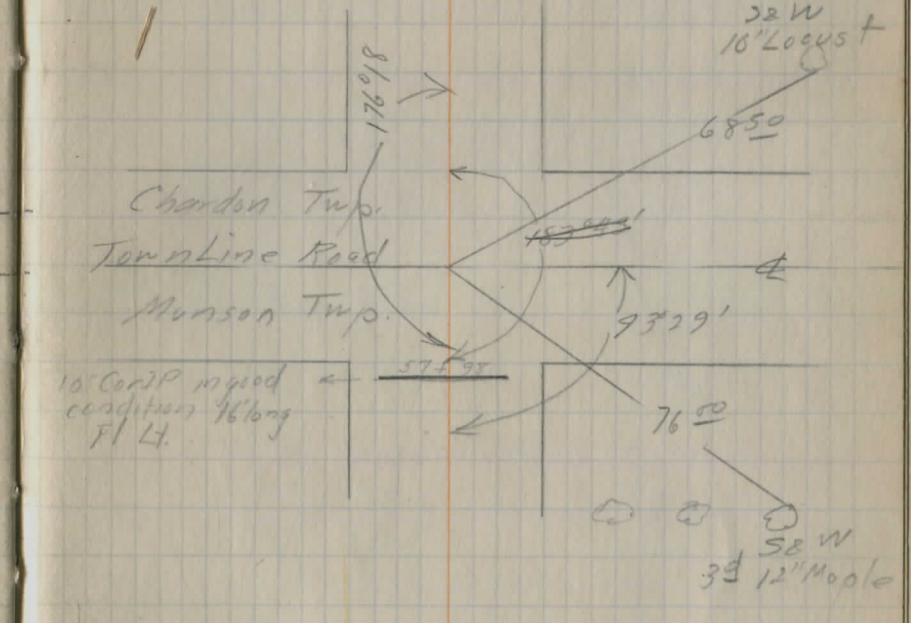
32.00 ⓔ S & W
15" Maple
5 W root

52.27
ⓔ S & W
W root 30"
Maple

Build new 18" 40' long
salvage old to 54+57
12' C.I.P culvert ← 49+25
in good condition
Fl Lt. 16' long.

1.10 miles.
5280 | 5813.00
-280
-330
-250

Sta 58+13.05 End of Imp. Iron Found
℄ Town Line Road



12" C I P culvert ← 54+57
in good condition
Flt 14 long.

Profile Levels			CH No 4		Downing
B.M.#1	5.78	1319.02			1313.24
0+00			4.5	14.5	
South					
1			6.5	12.5	
2			9.2	09.8	
3	0.57	1306.81	12.78	1306.24	
3			1.8	05.0	
4			7.3	99.5	
5			10.8	96.0	
	-0.03	1293.96	12.88	1293.93	
6			2.5	91.5	
7			6.7	87.3	
8			8.2	85.8	
8+82					
9			9.1	84.7	
	2.34	1287.31	8.99	1284.97	
10			2.9	84.4	
11			4.8	82.5	
B.M.#2			1.80		1285.51
12			5.9	81.4	
13			7.0	80.3	
	2.41	1282.30	7.42	1279.89	
14			3.5	78.8	
15			5.3	77.0	
16			8.2	74.1	

31.5/34 Pitney Corner Pennsey

Spike W root 30" Maple 100' Rt Sta 0+30

Road W 100/7.7 100/8.5 Road NE

10/28 100/2.2

#1/10.1 #1/10.5

Spike E root 15" Maple 25' Lt & Sta 9+90

		128230				
17			11.3	71.0		
	3.04	73.8 1273.75	1.55	1270.75		
18			3.6	70.2		
19			4.5	69.3		
20			4.2	69.6		
B.M.3			5.89		1267.90	Spike Brad 15" Maple 25'L ± Sta 20+45
21			2.4	71.4		
22			1.5	72.3		
	3.75	1275.75	1.79	1272.00		
23			4.7	71.0		
24			3.9	71.8		
25			5.6	70.1		
26			7.6	68.1		
27			7.4	66.3		
	3.93	1269.50	10.18	1265.57		
28			3.5	66.0		
28+76			4.9	64.6		
29			4.6	64.9		
B.M.4			5.91		1268.53	Spike 12" Root 24" Maple 25' Rt ± Sta 30+10
30			4.4	65.1		
31			3.3	66.2		
32			5.8	63.7		
33			8.9	60.6		
	4.08	1264.51	9.07	1260.43		

Rt 7.0	Lt 6.7

		1264.51					
34			6.6	57.9		Fl 13.2	Fl 9.9
35			4.7	59.8			
36			4.6	59.9			
37			3.1	61.4			
	5.39	1269.50	0.40	1264.11			
38			2.9	66.6			
39			2.6	66.9			
40			5.4	61.1			
40+25			8.8	60.7		Fl. 13.3	Fl 12.3
41			8.0	61.5			
42			5.9	63.6			
	0.01	1267.01	2.50	1267.00			
B4 to 5			4.46		1262.55	Spike W root 30" Maple 30' Rt & Sta 39+90	
	6.72	1273.72	0.01	1267.00			
43			4.4	69.3			
44			3.5	70.2			
45			3.4	70.3			
46			6.7	67.0			
	1.27	1265.89 (5.7)	9.10	1264.62			
47			5.7	60.2			
48			11.8	54.1			
49			13.4	52.5			
	5.70	1258.48 (5.7)	12.91	1252.78			
49+49			6.5	52.2		Fl 13.3 TO 9.2	TO 9.1 Fl 12.4
50			5.1	53.6			

		125868				
BM #6			0.95		1257.73	Spike Wroot 24" W Cherry 30' Rt & Sta 50+20
	064	58.9 125837				
51			4.3	54.1		
52			5.8	52.6		
53			6.3	52.1		
53+25	culvert		6.2	52.2		
54			7.7	50.7		
54+57	culvert		8.0	50.4		
	6.75	57.1 125706	8.06	1250.31		
55			6.0	51.1		
56			4.8	52.3		
57			3.7	53.4		
58			3.2	53.9		
58+13			3.2	53.9		
Road North 100			2.0	55.1		
BM #7			1.19		1255.87	Spike E Root 10" Maple 30' Rt & Sta 57+25
57+98	culvert					

FD 6.9 FI 7.0

FI 11.0 FI 10.8

120 7.7 100 -1.0

FI 5.9 FI 4.2

Check Level Dunnings Cor Road N to Thuring School

B4#7	1.19	1257.06			1255.87
	8.55	1258.86	6.75	1250.31	
B4#6	1.33	1259.05	1.14	1257.72	1257.73
	11.36	1270.19	0.22	1258.83	
	2.25	1271.63	0.81	1262.38	
B4#5	8.45	1271.00	9.09	1262.54	1262.55
	3.83	1263.02	1.11	1259.19	
	7.66	1270.64	0.04	1262.98	
B4#4			2.07	1268.57	1268.57
	8.21	1273.36	5.49	1265.15	
	4.10	1275.37	2.10	1271.26	
B4#3			7.49	1267.88	1267.90
	7.85	1277.92	5.30	1270.07	
	7.07	1284.45	0.54	1277.38	
	6.54	1289.38	1.62	1282.83	
B4#2			3.89	1285.48	1285.51
	10.98	1298.73	1.62	1287.75	
	12.70	1310.84	0.59	1298.14	
	9.02	1318.78	1.08	1307.76	
B4#1			5.52	1313.26	1313.24

Auburn Rd CH #4
Sec N & O

Pomeroy 6-18-51
Temple

Former notes
Pg 2 (herein)

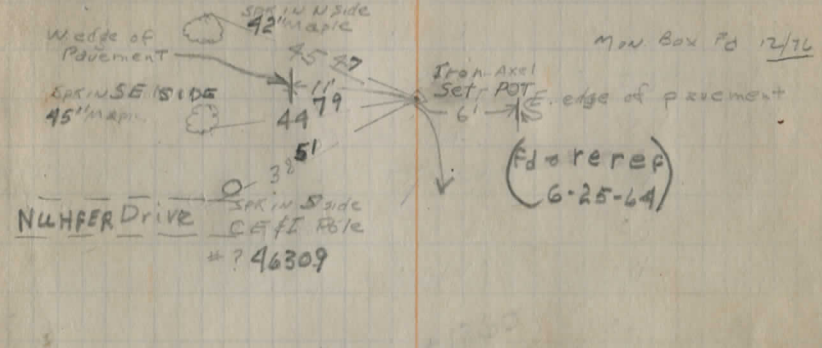
11+67.13

V+33.12 I.P. set P.O.T.

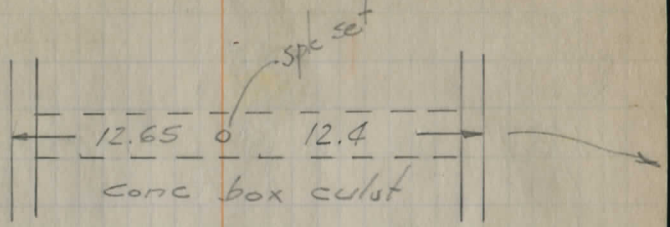
Stks at 15' offset

0-16.40 R.R. spk Fd & used

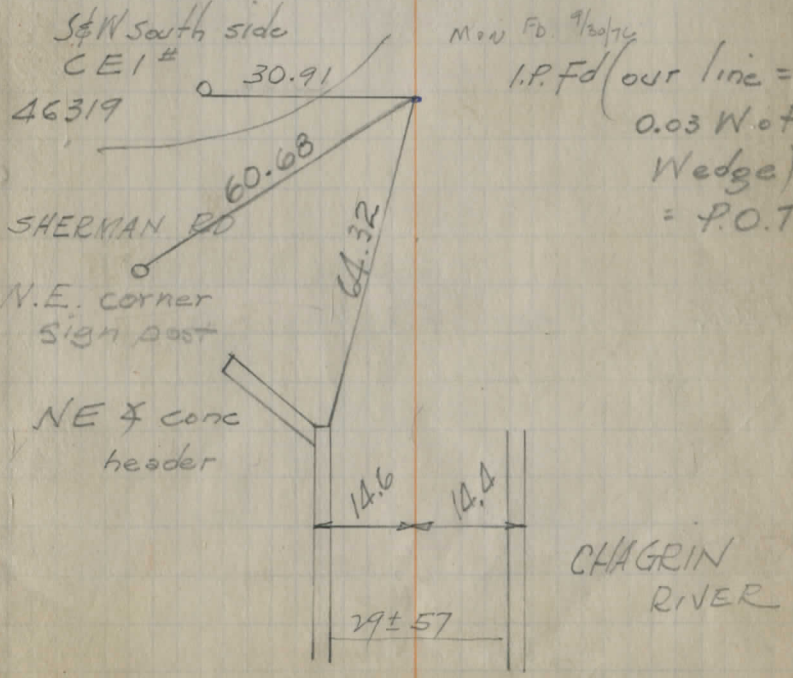
7-12-51
Stks at 15' unless otherwise marked



30+56.72



(Found + Refer.
6-25-64



74+98.7 Spk Fd ℄ replaced with I.P.

179.55
351.50

SPK.

39.44

16.27

100.27

Drive to brick house

Spk in NE root 14" map

Mon Box Fd 12/76

57+20.6 I.P. set P.O.T.

Sanborn

Spk S side 24" maple

23.82

65.23

116.74

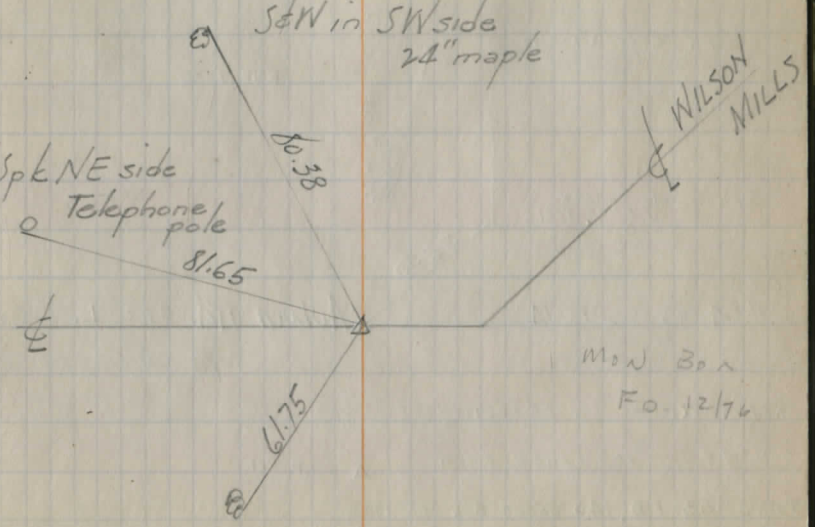
Spk SE side C.E.I #

79.27

Sanborn PL

Repp

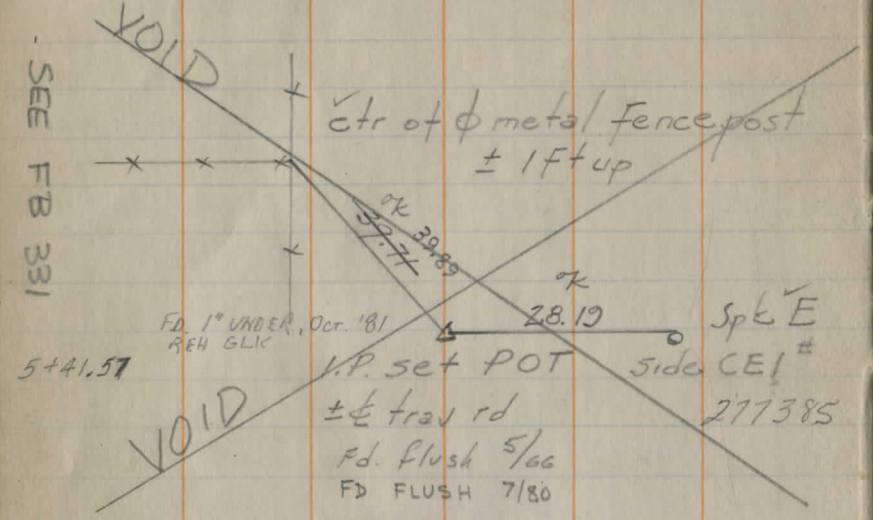
92 +68.05 Bolt fd

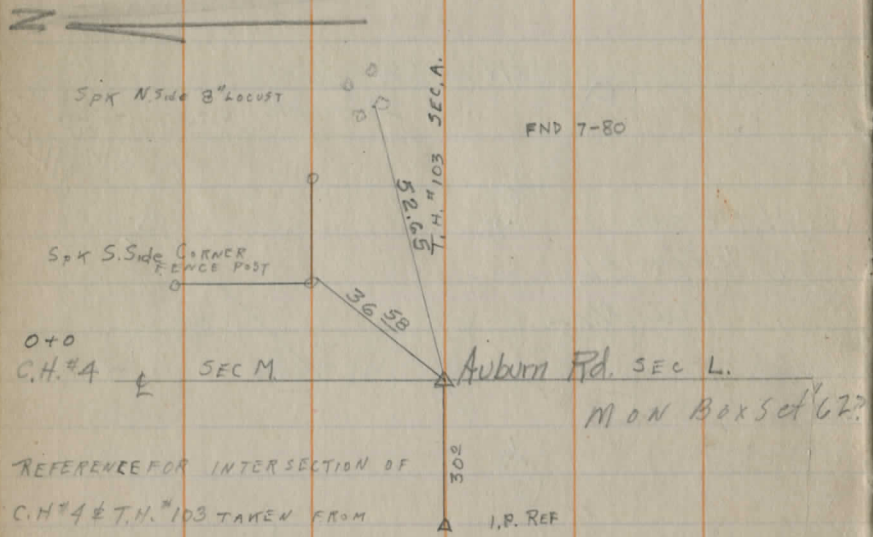


June 19-1951

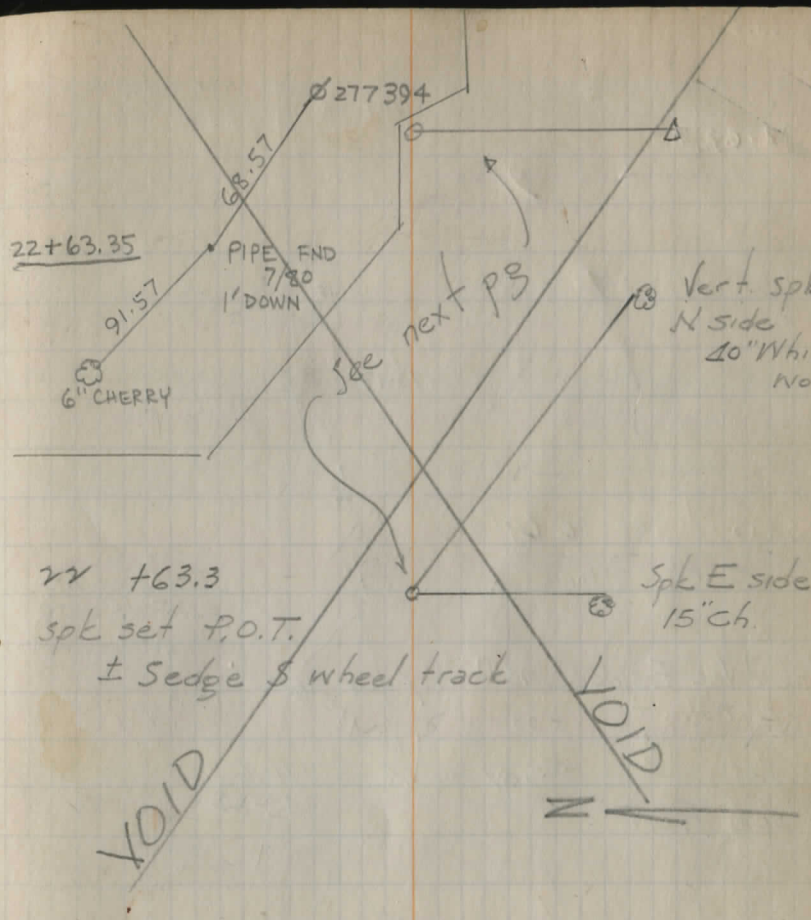
Sec. A

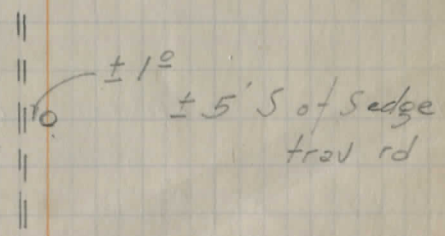
BEAN Ed C.H.# 103

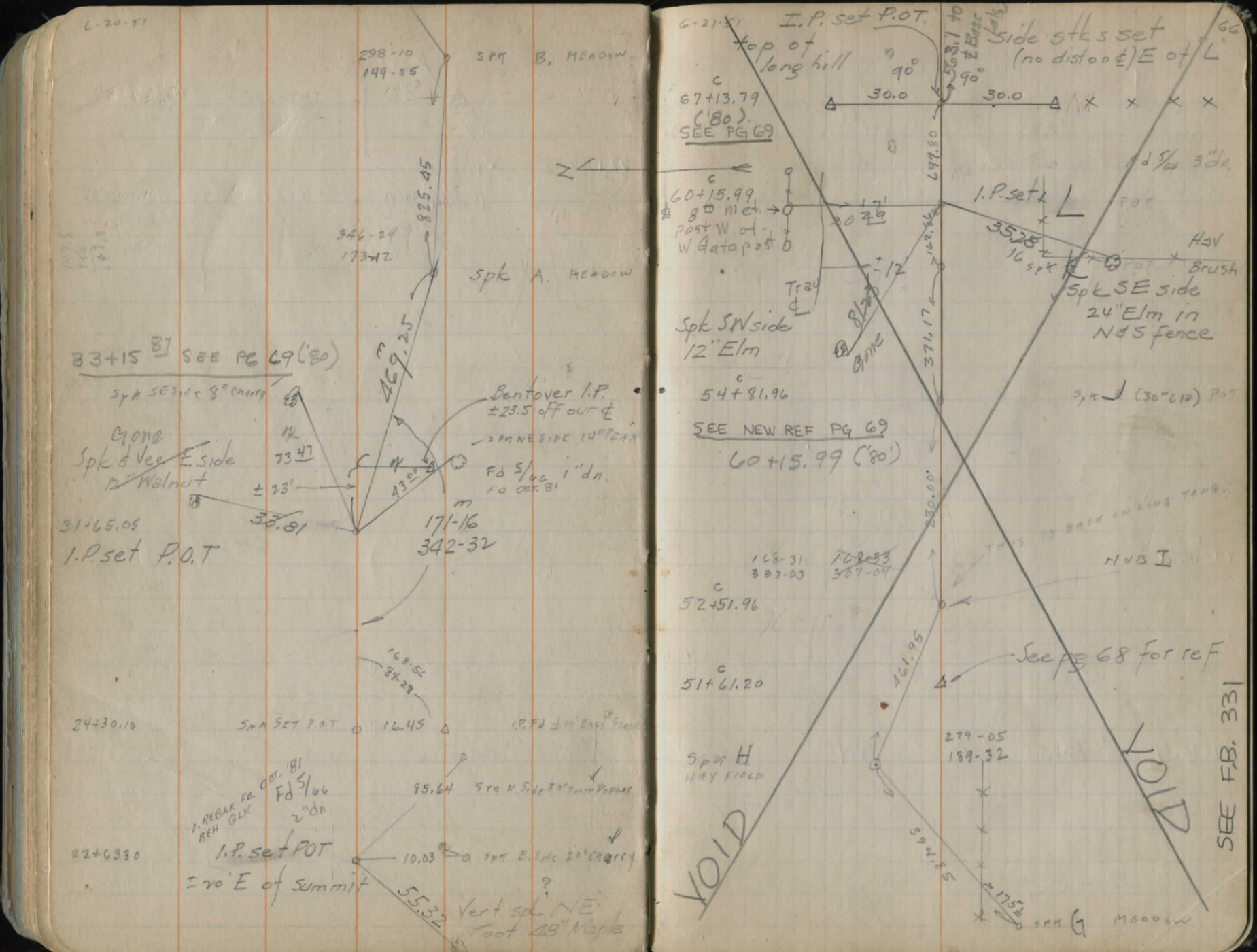




REFERENCE FOR INTERSECTION OF C.H.# 4 & T.H.# 103 TAKEN FROM PAGE 53 F.B. 140 DATED AUG 26TH 1946






6-20-81
298-10
149-05
SPK B. MEADOW
825.45
346-24
173+12
Spk A. MEADOW
33+15 [B] SEE PG 69 ('80)
Spk SE Side 8" Cherry
Gone
Spk & Vee E Side
12" Walnut
73 47
± 23'
33.81
469.25
Bent over I.P.
±23.5 off our ℄
Fd S/66 1"dn.
Fd Oct. 81
43°
31+65.05
I.P. set P.O.T
171-16
342-32
168-61
84-28
24+30.10
Spk SET P.O.T
16.45
I.P. Fd ±10' East
Fd S/66
2"dn
Oct. 81
1. REBAR Fd. REH GLK
I.P. set POT
22+63.30
1 ro'E of summit
10.03
Spk E. Side 20" Cherry
55.32
Vert spk NE
Foot 18" Maple
6-21-81
I.P. set P.O.T.
Top of long hill
Side stks set
(no distance) E of ℄
90°
30.0
30.0
67+13.79
('80)
SEE PG 69
60+15.99
8" Met. post W of W Gate post
± 12'
Tree ℄
Spk SW side
12" Elm
54+81.96
SEE NEW REF PG 69
60+15.99 ('80)
I.P. set ℄
35.28
16 Spk
Spk SE side
24" Elm in N&S fence
Brush
Spk (30" Elm) POT
697.60
371.17
230.00
168-31
387-03
168-33
387-04
HUB I
52+51.96
51+61.20
161.95
See PG 68 for ref
279-05
139-32
Spk H
HAY FIELD
VOID
VOID
SEE F.B. 331
Spk G MEADOW
66

6-21-51

Vert spt Stroot 30" Ash

73.60

Contd PB 70

5 PK (#2) P.O.T.

82.70

SE & brick chim.

m 615-

Conc 5/66

C 84+29.29

176-29

R T&W

CEI 179-00

176-45

179-80

SET B+T&S

I.P. Id 75.6 N.E.

Last

5 PK (#1) P.O.T. N. Wheel TRACK

C 78+14.29

PEG 12'

N

Stw N Side CEI

Stw E Side OBT

Stw NE Side CEI

SEC B.

537.40

B.M. 716.00

B.M. 648.6

B.M. 676.21

B.M. 676.25

C 72+76.89 P.O.T. Bass Lake

CH. 23

Mon Box SET '63?

179.04

89.92

85.06

563.10

SEWER?

Stw NE Side CEI

STA 7+34 on #23

P.I.

P.O.T.

DRAINAGE STRUCTURES

67

BEAN RD

H

29 ± 14

12" VSP

12" corr?

DRIVE

24.5

8'

OK

18'

1°

21 ± 50

12" corr I.P. culvt

OK

Round grate over C.B.

23.5±

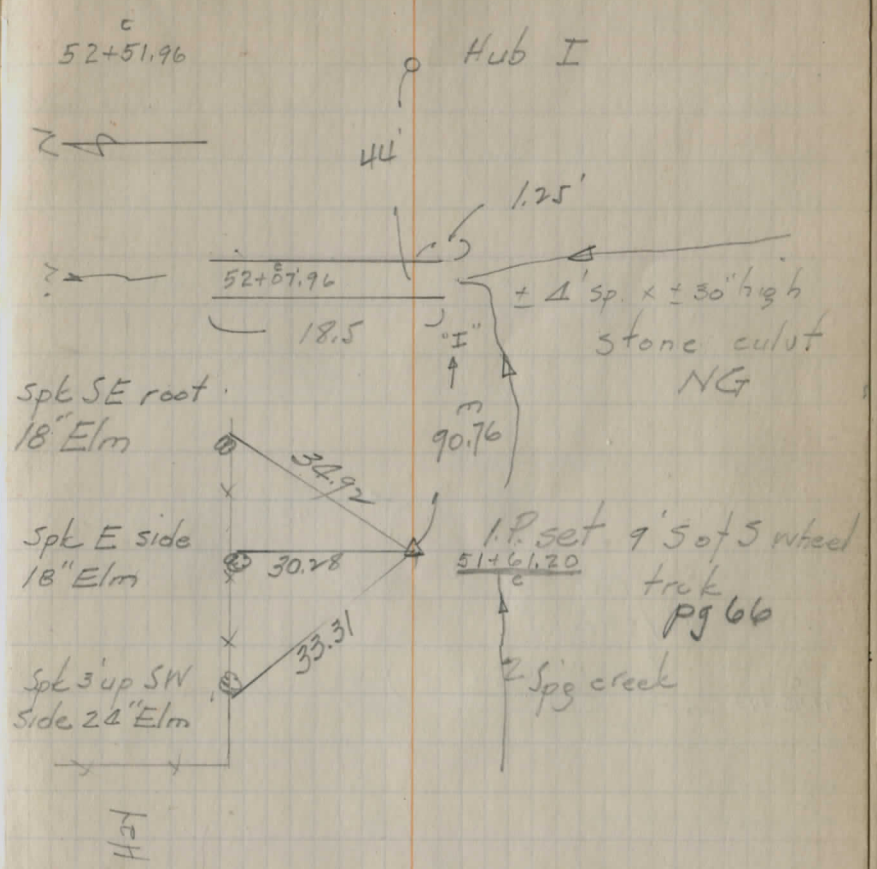
20.5

2'

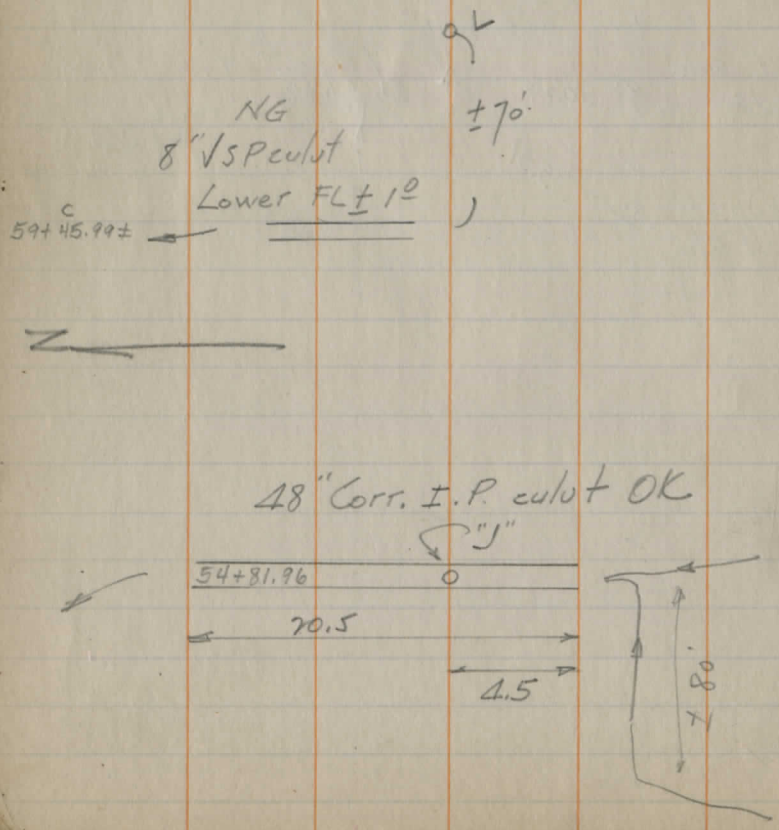
12 ± 14

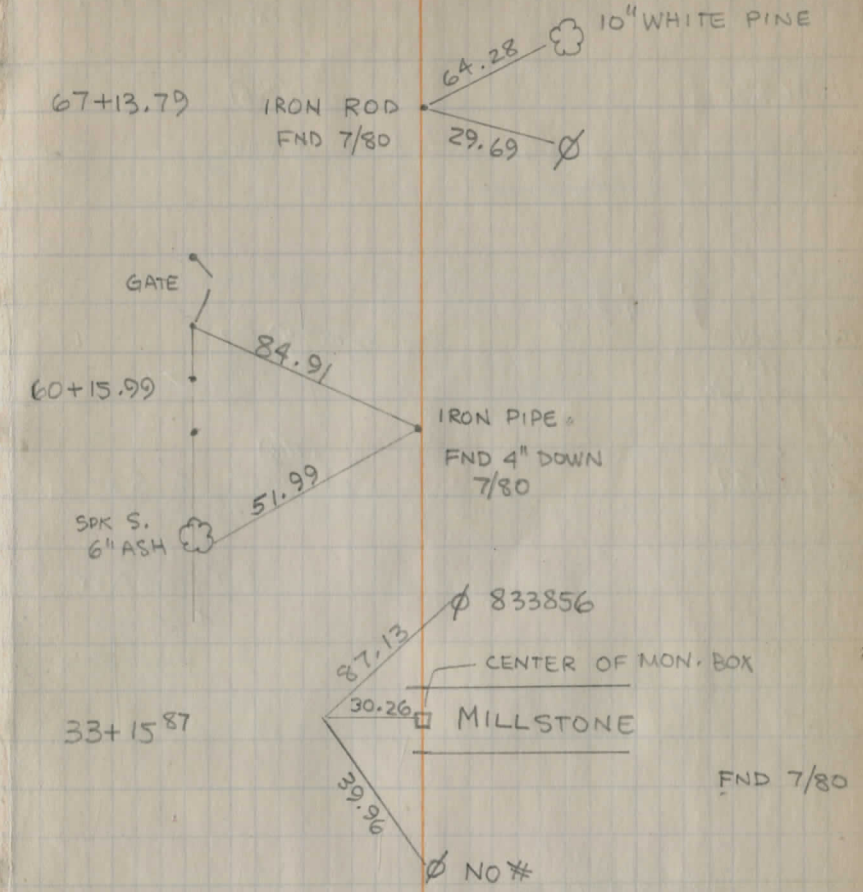
10" V S P culvt

2 end pces should be relaid



35 ± 8 v Old culvt washed out
Was 18" — better make new
24"


℄
±70'
NG
8" √S Pcvlvt
Lower FL ± 1°
C
59+45.99±
48" Corr. I.P. cvlvt OK
"J"
54+81.96
70.5
4.5
8.0'


10" WHITE PINE
64.28
67+13.79
IRON ROD
FND 7/80
29.69
GATE
84.91
60+15.99
IRON PIPE
FND 4" DOWN
7/80
SPK S.
6" ASH
51.99
⌀ 833856
67.13
CENTER OF MON. BOX
30.26
33+15.87
MILLSTONE
FND 7/80
39.96
⌀ NO #

Bean Road CH. 103-Sec B
1951

N

C
110+69.36

Spk Set on Post #5

CHERRY

CURVE

N

CHERRY

1 Elm 4 Chestnuts Clean

906.12

C
101+63.24
CAN SEE
Spk #4 to #2 Spk

Spk #4 POT

CHERRY

235.67

C
99+27.57

#3
Spk set ±6' S of
E elm
±7' from NW
± bridge
head stone

Spk NW.
CEI 5C4878

24.92

IP. set 5/10/66 (3" dn.)

84+99.96 (POT)

Spk. SW.
16" Pine

45.59

C
84+29.29

Spk. POT #2

1498.28'

615°

Brought Forward from Top
LEFT HAND Pg 67

JUNE 1951

70

24" VSP x 43' W

28' RISE

W. Edge Pave Rt 44

CONC. Hdwl.

19°53
12°53
14°15
66.35
60.2
52.4

BEAN RD Spk #8

KORELL N LINE

KORELL N LINE
I.P. Fd

SEE NEXT PAGE

I.P.Fd - BUENNER S. LINE

RTY 735
35°
23'

325-22E
162.44

261.18

L'

1672.91

Spk POT

62.85

1593.71

C
134+34.72

Spk POT #8

I.P.Fd
BAUER
N. LINE

1113.50
227.11

105.64
ON-181

1144.78

BOULDERS

C
122+89.94

Spk #7 POT

739.92

C
115+50.02

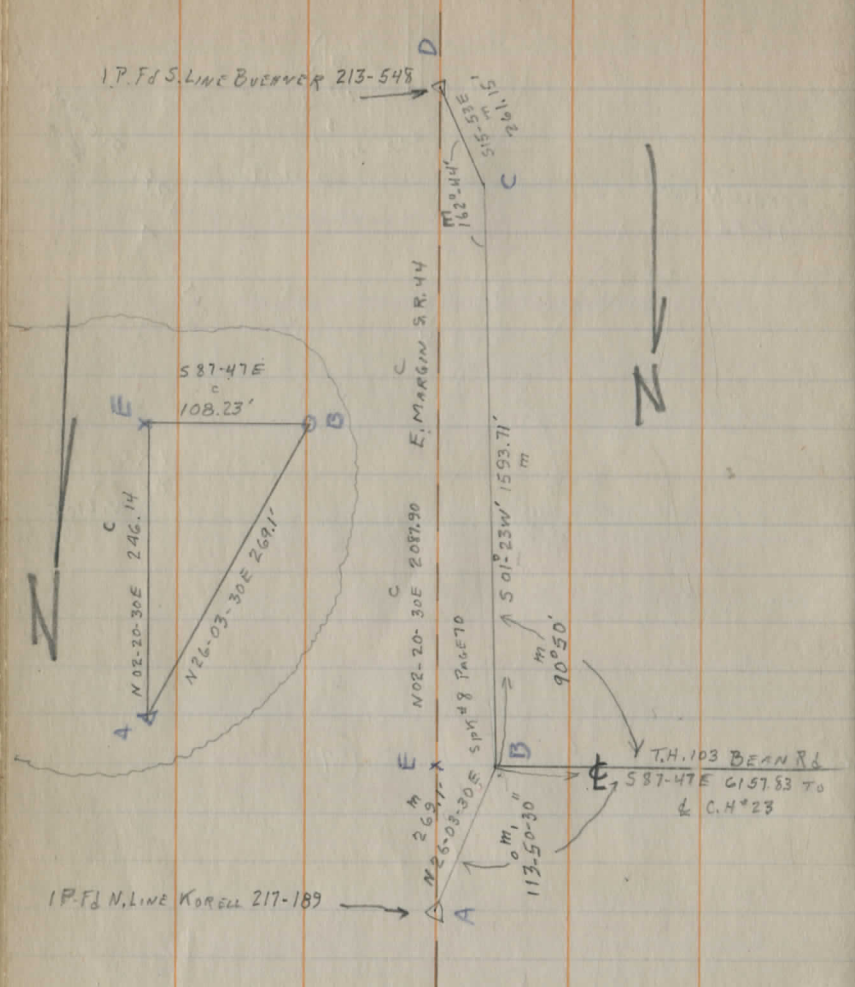
Spk #6 POT

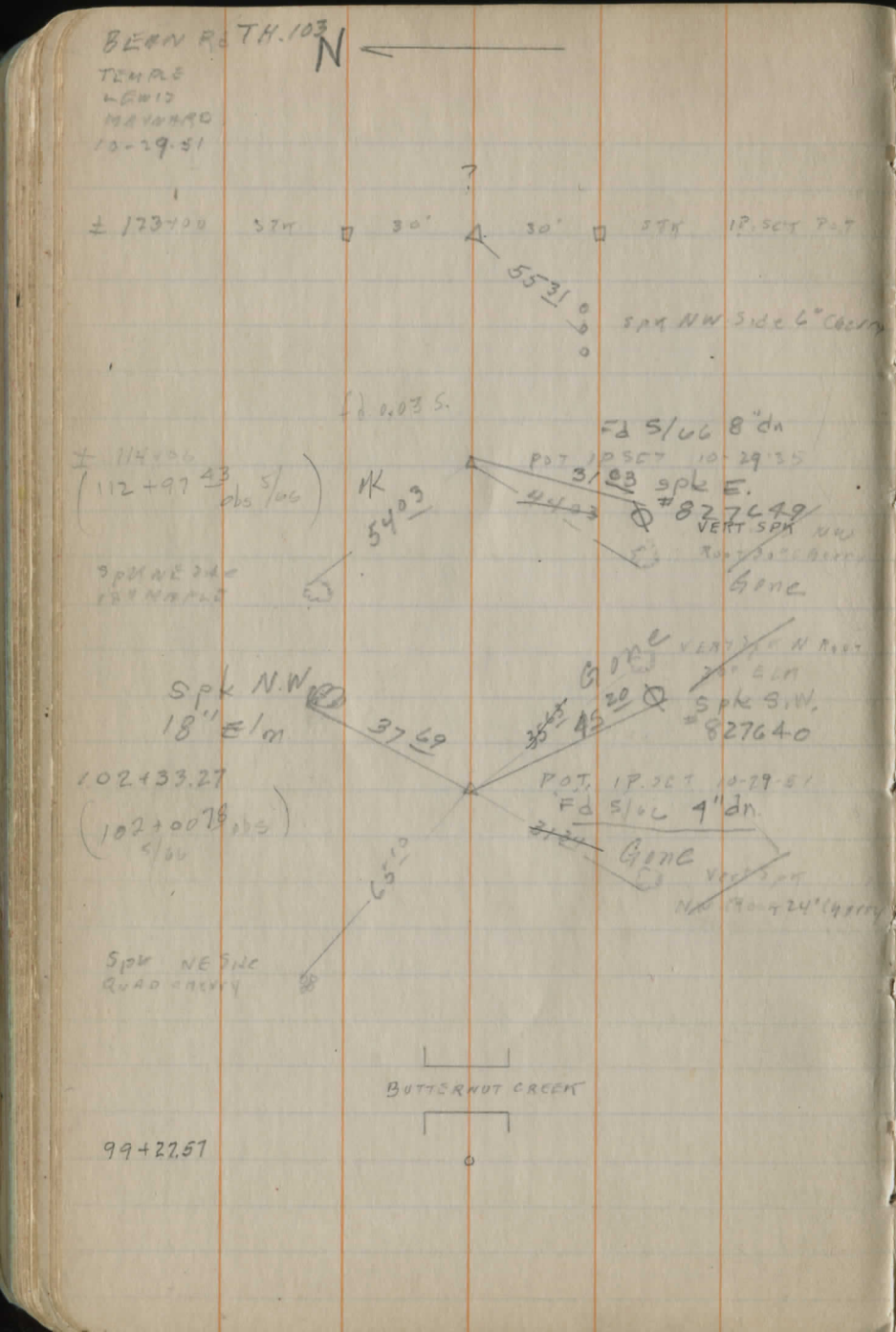
CAN SEE Spk #6 to Spk #4

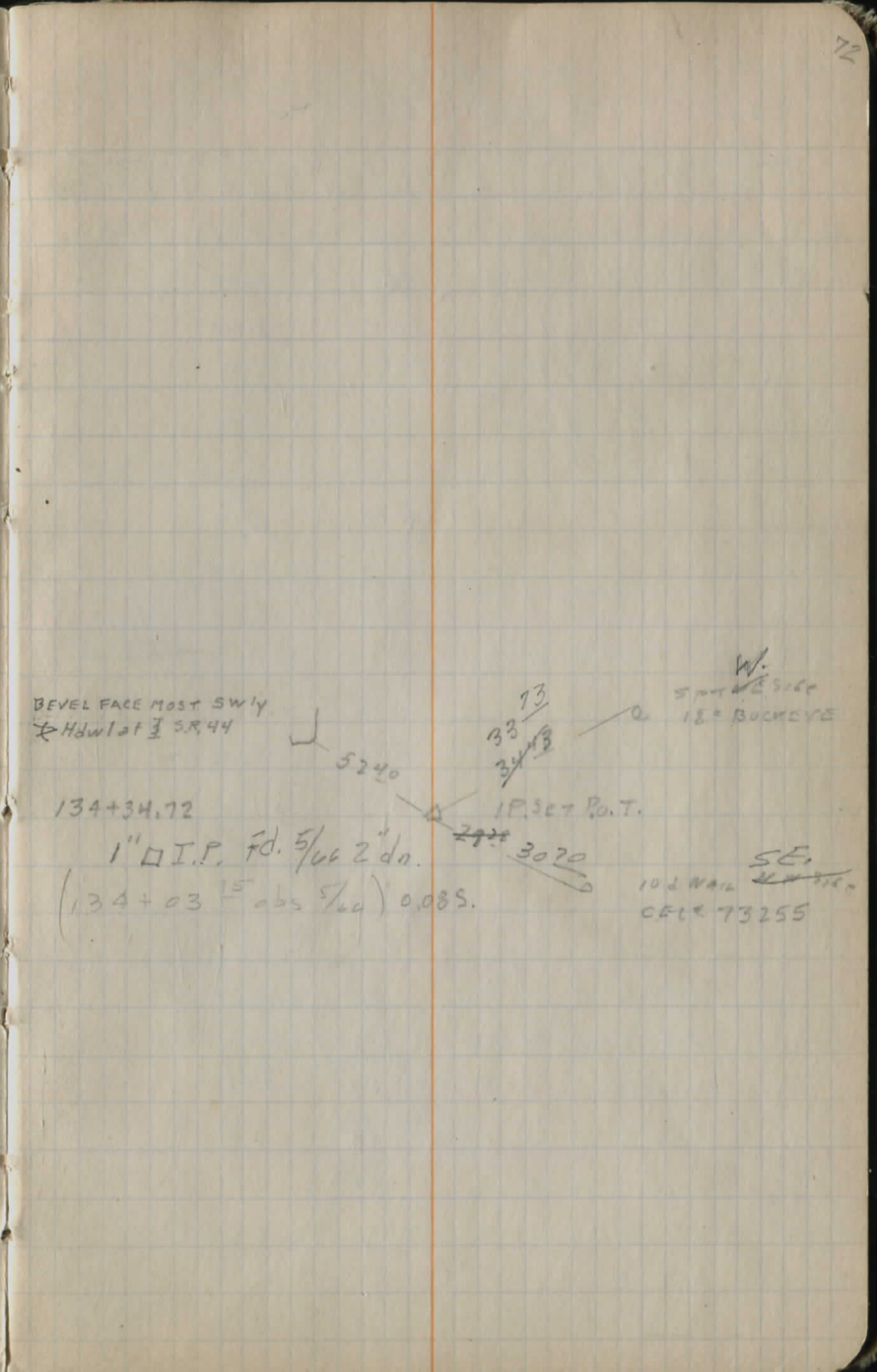
189.66

C
110+69.36

Spk POT #5


I.P. Fd S. Line Buehner 213-548
D
C
S15-53E
261.15'
M
162°44'
E. Margin S.R. 44
C
N02-20-30E 2087.90
S 01°23W 1593.71'
M
90°50'
T.H. 103 Bean Rd
℄
S87-47E 6157.83 To
℄ C.H. #23
B
E
N26-03-30E 269.1'
M
113-50-30
A
I.P. Fd N. Line Korell 217-189
S87-47E
C
108.23'
E
B
C
246.14
N02-20-30E
A
N


BEARN RD TH. 103
N
TEMPLE
LEWIS
MAYNARD
10-29-51
± 123+00
STA
30'
30'
STA
I.P. SET P.O.T.
55 31
SPK NW Side 6" Cherry
Fd 0.03 S.
Fd S/66 8" dn
± 114+06
(112+97 43 obs S/66)
MK
54 03
P.O.T. I.P. SET 10-29-51
31 03 spk E.
#827649
VERT SPK NW
Root Side Cherry
Gone
SPK NE Side
RAY MAPLE
Spk N.W.
18" Elm
37 69
35 45
20
Gone
VERT SPK N Root
6" ELM
Spk S.W.
#827640
102+33.27
(102+00 78 obs S/66)
P.O.T. I.P. SET 10-29-51
Fd S/66 4" dn.
Gone
VERT SPK
N Root 24" Cherry
SPK NE Side
QUAD CHERRY
BUTTERNUT CREEK
99+22.57


BEVEL FACE MOST SW'LY
HUB 1 of 3 SR 44
5240
134+34.72
1" □ I.P. Fd. S/66 2" dn.
(134+03 15 obs S/66) 0.08 S.
I.P. SET P.O.T.
30 20
33 73
34 13
W.
SPOT IN E Side
18" BUCKEYE
10" WALNUT
CEL 73255
SE.

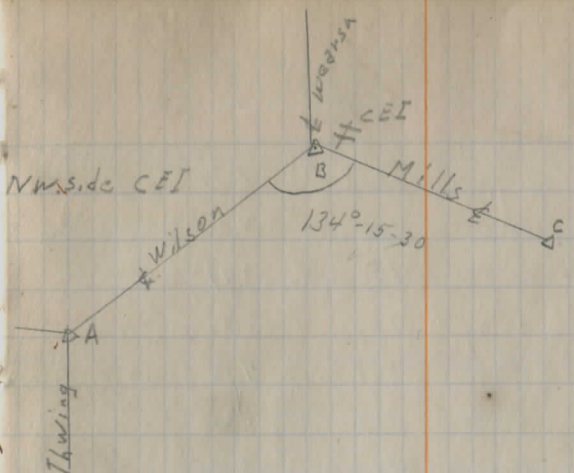
H Patterson
G. Diedrich

Wilson Mills & Wearsh Rd.

2-2-61

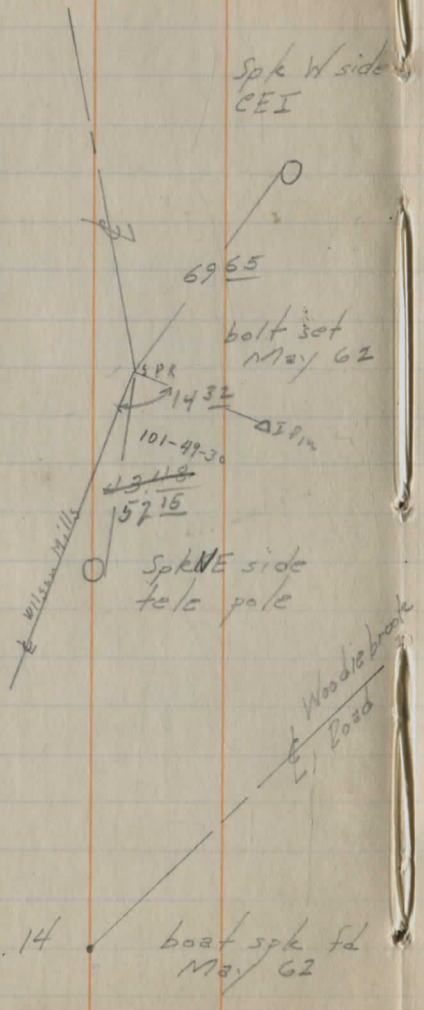
Cold ± 5° above

Set Back Sta. Sight	B - C	Hor. ∠	Vert. ∠	Sted. Dist.	Rod Read	B.M. Spk Elev.	
	B.M.				3.37	100.0	
	℄ Rd	R 0-47	+ 0-51	560	1.00		
	CEI	R 3-26-30	+ 1-15	564	2.00		
	SW ∠ House	R 15-15-30	+ 1-51	640	3.00		
	SE SW ∠ House Porch	R 17-17	+ 2-00	580	3.00		
	~~SW ∠ House~~	R 1-13	0-30				
	℄ Rd.			420	2.00		
	B.M.				3.40		
	B.M.			~~410~~	3.46	100.0	
	CEI	R. 4°-53-00	+ 0°-38	412	1.00		
	N Edge Rd	R. 2°-27-00	+ 0°-10	420	0.00		
	S " "	R+0°-02-00	+ 0°-10	416	0.00		
	S " "	R+0°-04-00	0°-00	2 852	1.90		
	N " "	R 4°-10-00	0-00	252	1.60		
	CEI	R. 8°-15-00		254			
	CEI	R 19°-54-00		109			
	N Edge Rd.	R. 12°-05-00	0°-00	103	3.37		
	S. Edge Rd	R. 2°-36-00	0°-00	100	3.12		
	N. f/∠ Culvt.	R 44°-24-00	0°-00	54	6.91 ~~6.97~~		
	N. Edge Rd.	R. 39°-13-00	0-00	50	3.71		
	S. " "	R. 22°-50-00	0-00	37	2.90		
	S. f/∠ Culvt	R. 10-31-00	0-00	32	6.66		
	N Edge Rd	R 113-24-00	0-00	64	4.26		
	S " "	R. 128-44-00	0-00	57	3.66		



S Edge Rd.	Rt. 135°-25	0-00	125	4.23
N " "	Rt. 127-11	0-00	127	4.30
~~C~~ O.B.T.	Rt. 121-55	0-00	130	3.19
~~C~~ O.B.T.	Rt. 129-39	0-00	324	3.80
N. Edge Rd	Rt. 131-45	0-00	322	4.50
S. " "	Rt. 134-48	0-00	321	5.00
S " "	Rt. 134-38	0-00	462	3.30
N " "	Rt. 132-33	0-00	463	3.03
O.B.T.	Rt. 131-06	0-00	464	2.90
Willow	Rt. 124-26	0-00	308	3.30
"	Rt. 118-21	0-00	206	2.66
"	Rt. 105-04	+ 0°-02	200	1.00
SE X	Rt. 101-12	+ 1°-20	255	5.20
SW X	Rt. 97-04	+ 1°-20	242	5.46
B.M.				3.43

2-16-61 Est. ℄ Point at Woodruff Rd.

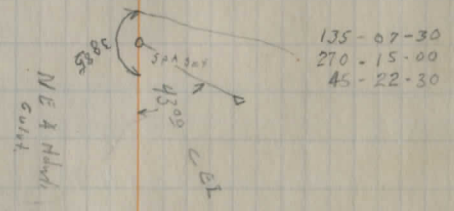


Ref. see pg. 14

boat spk fd May 62

Δ Pin Fd Thwing Rd.

{ 161-49-30
{ 203-39-0



. 0 CIK Fd

H. Patterson
B. Moss
T. Adams

9-8-61

Bean Rd.

X Sec. of Drainage Ditch
Stark Prop.

B.M.	10.65	110.65		100.00	Top 36" Conc	pipe outlet end
0+0				105.37		
T. P.	4.00	108.59	6.06	104.59		
1+0				103.63		
T.P.	4.42	107.44	5.57	103.02		
+50				103.06		
1+73	Inlet	15"	Culvt			
BM	7.04	107.04	7.44	100.00		
2+00				102.19		
0+50	Creek		10.28	96.26		
1+00	"		11.70	95.34		
1+50	"	end of cut channel	11.25	95.79		
2+00	"	Nat t.l.	11.18	95.86		
2+16	Elm Tree	30' Lt of ℄		101.86		
2+20 Rd						
2+32	=	Drive south				
2+30 Rd				101.13		
2+77	Twin 15" cherry		26' Rt of ℄			
3+0				100.14		
+50				98.47		
4+00				96.08		

S ℄ Rd. N

✓	7.70 / 60	7.45 / 40	7.28 / 30	6.60 (Ditch) / 15	5.28	7.15 / 15	8.00 / 30	8.10 / 40
✓		6.90 (water) / 40	6.79 (water) / 30	6.66 (water, Ditch) / 15	5.36 / 12	4.96	7.70 / 14.5	8.20 / 30	8.24 / 40
✓	3.01 / 60	6.51 (Swamp) / 40	6.76 / 30	6.20 (Ditch Channel) / 17	5.03 (Berm) / 13.5	4.38	6.92 / 17.5	7.65 / 30	7.88 / 40
				7.53 / 16					
✓				9.90 Inlet 36" Pipe 15'		4.85	10.23 outlet 36" Pipe 15'	7.65 (14.5) outlet 15" Pipe	
✓	3.18 / 40	3.14 / 30	5.72 / 13			5.18	5.59 / 16	5.64 / 30	6.12 / 40
✓	3.22 / 40	3.73 / 30	6.57 (Ditch) / 10.5			4.81	6.36 / 13	4.53 / 30	4.73 / 40
✓	3.81 / 40	5.31 / 30	9.00 / 10			4.90	7.76 / 14.5	2.10 / 30	2.45 / 40
✓	6.45 / 40	7.40 / 30	7.71 / 7.5			8.57	10.05 / 15	2.51 / 30	1.70 / 40
	10.81 / 40	11.07 / 30	11.71 / 10			10.96	12.30 / 14	13.35 / 30	14.83 / 40

10?.04

4+50		℄ 12.40	94.64
5+00		℄ 13.35	93.69

4/12/63

observations by Temple

roll-a-tape dist. from ℄ Bass Lake Rd along Been Rd to SW cor Stark property = 2354'

Tape measurement along Been from SW cor Stark easterly to culvert = 518'

Dist along Been from SR 44 ℄ to SW cor. Stark = 3755.67 by survey of Temple.

3755 - 518 = 3237' from SR 44 to culv't in question.

According to notes in this field book, the dist. from the ℄ of Bass Lake Rd to ℄ of SR 44 is 6236.06 feet

By deed, the dist. from the ℄ of Bass Lake Rd to the SW cor. of Stark is 2481.6 feet. This dist plus my dist. of 3755.67, give a total dist from Bass Lake Rd to SR 44 of 6237.27 which is 1.21 feet longer than the dist. as shown by the field notes in this book.

2447 dist George & I measured from SW cor Stark to ℄ Bass Lake Rd

2447 + 3755 = 6202

14 7/8" dist on photo from #23 to SR 44

14.875"

Davidson
Winchell
Raney
Young

Auburn Rd. ℄
Sherman Rd.

Sonny - Warm 7/28/64

1964 Improvement. — Cuts to F.G ℄

Sta	+	π	−	Elev	Grid	Cut	Fill
B.M #2	0.37	109.34		108.97			
12+50			3.68	105.66	105.0	0.66	
12+0			0.88	108.46	104.1	4.36	
+50			0.74	108.60	103.2	5.40	
11+0			1.86	107.48	102.3	5.18	
+50			2.98	106.36	101.4	4.96	
10+0			4.22	105.12	100.5	4.62	
T.P.	4.18	105.76	7.76	101.58			
9+54			0.33	105.43	99.64	5.79	
9+0			3.70	102.06	98.7	3.36	
+50			5.33	100.43	97.8	2.63	
8+0			8.32	97.44	97.01	0.43	
T.P. 2	4.40	99.14	11.02	94.74			
7+50			3.05	96.09	96.0	0.09	
7+0			4.75	94.39	96.0	—	1.61
5+0			3.26	95.88	96.0	—	0.12
+50			3.05	96.09	96.0	0.09	
4+0			2.58	96.56	96.0	0.56	
T.P. 3	7.00	103.26	2.88	96.26			
3+50			5.48	97.78	96.3	1.48	
B.M #1			3.22	100.04	± 0.04 ft		

Spk. S.E Side C.L. E Side Auburn Rd. 600± N. Sherman Rd.

Stks 12+50 to 7+0 set ℄ W. R/W.

Stks 5+0 to 3+50 set ℄ E. R/W

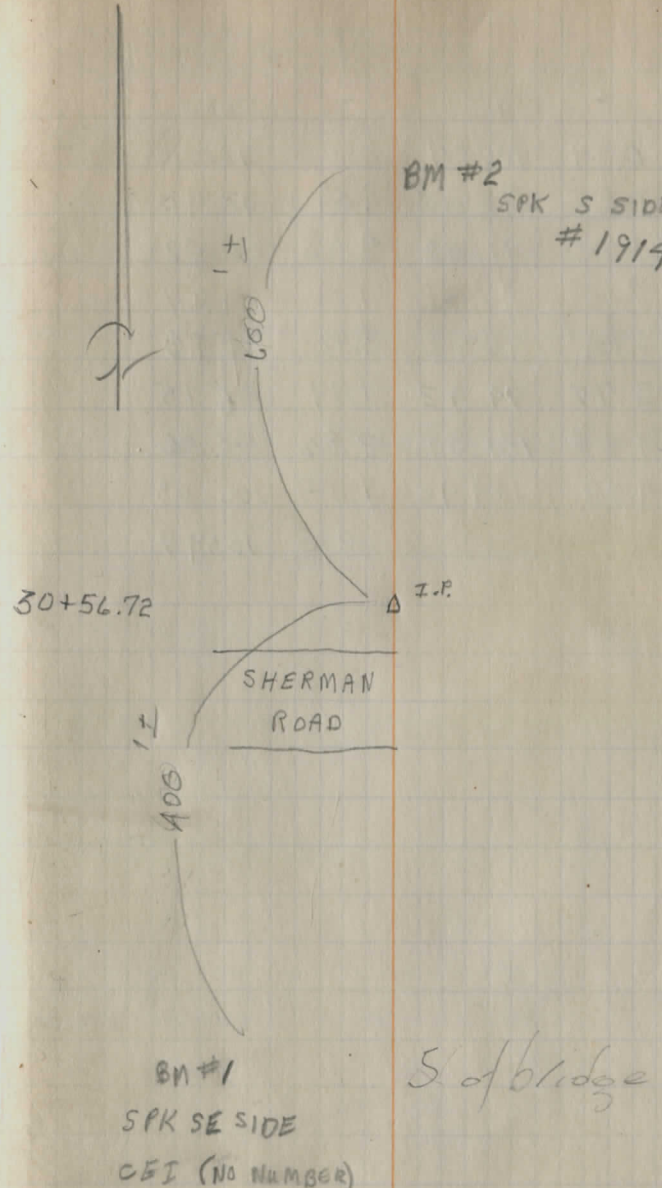
Spk S. Side C.L. W. Auburn Rd ± 400' S. Sherman Rd.

A. WINCHELL
P. RANNEY

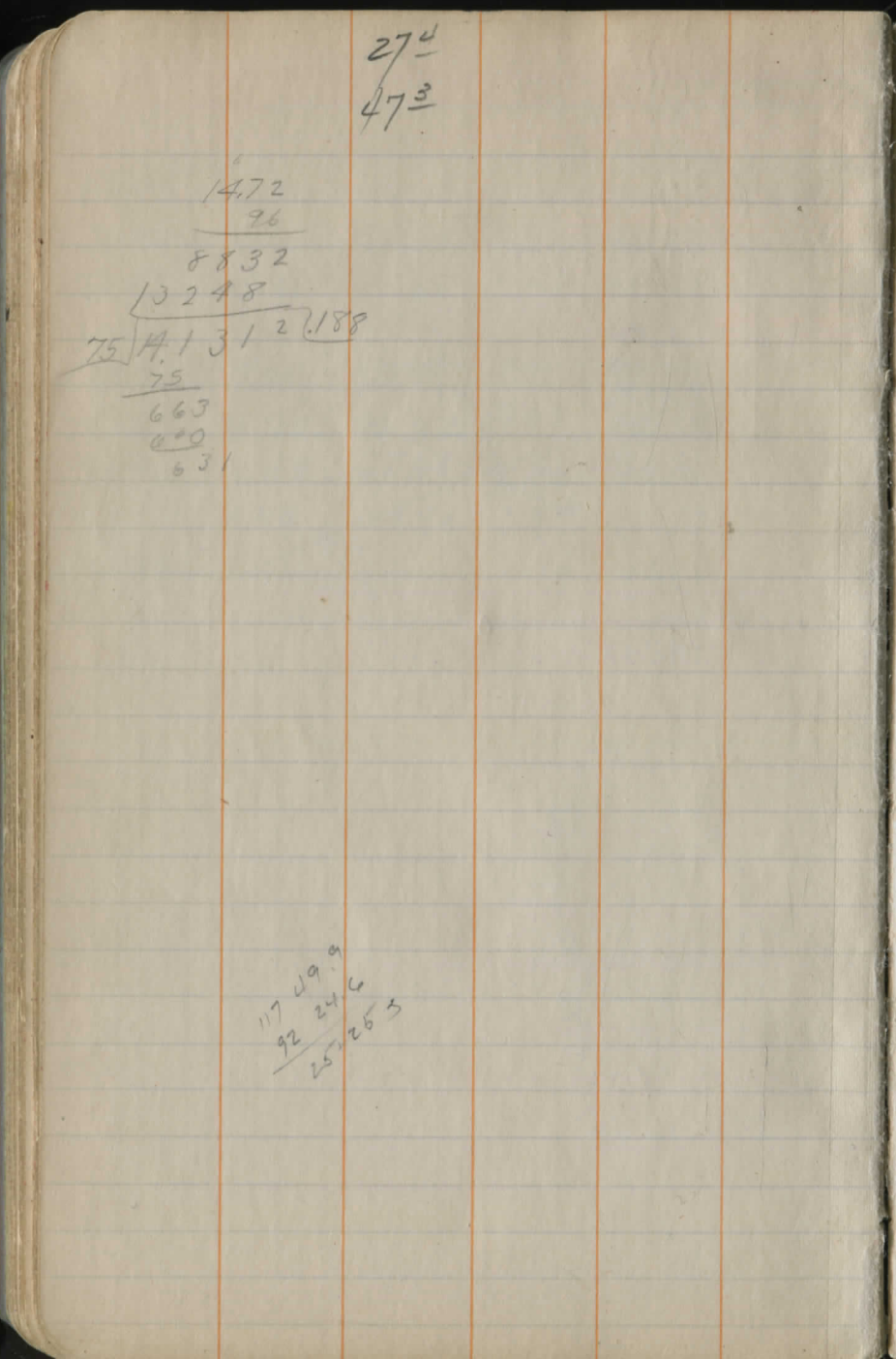
6-26-64

AUBURN RD.
PROFILE BOTH SIDES OF SHERMAN RD. INTERSECTION
SEC N&O

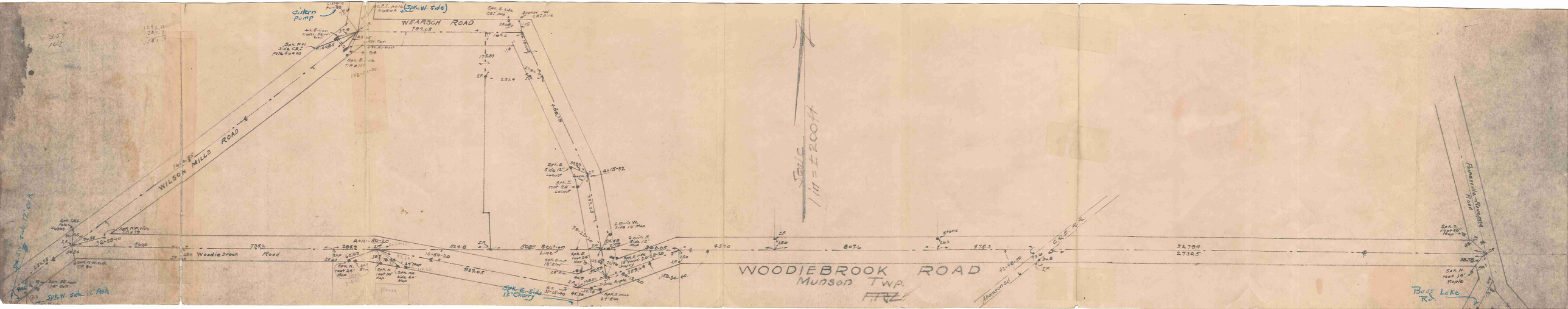
	+	HI	−	ELEV	
BM#1	7.37	107.37		100.0	
6+00 S			.19	107.18	✓
5+00 S			6.19	101.18	✓
4+00 S			10.01	97.36	✓
3+00 S			11.88	95.49	✓
TP#1	3.58	99.13	11.82	95.55	✓
2+00 S			4.28	94.85	✓
1+00 S			3.26	95.87	✓
0+62 S			3.47	95.66	✓
0+00			4.71	94.42	✓
1+00 N			3.69	95.44	✓
2+00 N			0.33	98.80	✓
TP#2	10.80	109.37	0.56	98.57	✓
3+00 N			6.41	102.96	✓
3+29 N			5.73	103.64	✓
4+00 N			5.65	103.72	✓
5+00 N			4.83	104.54	✓
6+00 N			3.41	105.96	✓
7+00 N			1.19	108.23	✓
BM#2			0.40	108.97	✓



	+	HI	−	ELEV
BM#2	0.24	100.24		100.0
TP#1	0.25	90.65	9.84	90.40
TP#2	5.80	91.82	4.63	86.02
TP#3	7.05	97.02	1.85	89.97
BM#1	5.04	96.14	5.92	91.10
TP#4	8.77	94.92	9.99	86.15
TP#5	9.83	101.89	2.86	92.06
TP#6	4.58	104.93	1.54	100.35
BM#2			0.96	103.97



IMPROVED TABLES
AND
INFORMATION


WOODIEBROOK ROAD
Munson Twp.
WILSON MILLS ROAD
WEARSCH ROAD
Painesville-Ravenna Road
Woodiebrook Road
Section Line
Scale 1 in = ±200 ft
Cistern Pump
Spk. W. side
C.E.I. pole 46404
Spk. S. side CEI pole
Anchor rod CEI pole
N.E. Cor. Conc. Head-Wall
N.W. Cor. Conc. Hd-Wall
Spk. N.W. Side C.E.I. Pole 46403
Spk. E. Side T.P. #119
Spk. CEI Pole 46393
Spk. N.W. side T.P. #79
Spk. N.W. side T.P. 80
Spk. SE root 14" Oak
Spk. W. side 12" Ash
Spk. SW side 12" Oak
Spk. N. root 24" Map Gone 5-4-61
24" Elm
Spk. N. root 30" Map
Spk. NE. side 24" Map
House
A=10-50-20
10-50-20
Spk. E. side 12" Cherry
A= 31-15-40
Spk. E. Side 12" Locust
Spk. E. root 20 Locust
A=15-32
2 nails W. Side 10" Map.
2 nails S. Side 12" Map
Spk. E. root 24" Map
Spk. E. root 18" Elm
24" Elm
Spk. E side 15" twin Cherry
Triple Apple
Spk. S. root 27" Elm
I.P.
stone
C.&E. R.R.
Abandoned
Spk. S. root 30" Map
Spk. N. root 14" Maple
Bass Lake Rd.
794.05
1614.55
735.2
285.9
524.8
508.7
937.05
458.35
353.25
366.05
459.0
807.6
475.3
3279.4
2730.5
FRZ

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.

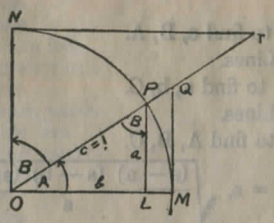


TABLE II

TRIGONOMETRIC FORMULÆ.

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

$R = OB = c = 1$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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.

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

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

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

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

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

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

$\pi = 3.141592654$ $\qquad \sqrt{\frac{1}{4}} = 0.564190$

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

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

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

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

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

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

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

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 = $R\ \tfrac{1}{2} \sin 2a + C \sin a$

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

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

a = angle of elevation for mid Reading

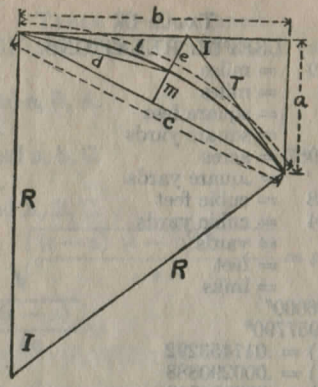


Table V

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

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10′	58.34	.297	5° C.	10′	560.11	27.313	5° C	10′	1070.6	99.155	5° C
20′	66.67	.388	T	20′	568.53	28.137	T	20′	1079.2	100.75	T
30′	75.01	.491	.03	30′	576.95	28.974	.06	30′	1087.8	102.35	.10
40′	83.34	.606	E	40′	585.36	29.824	E	40′	1096.4	103.97	E
50′	91.68	.733	.001	50′	593.79	30.686	.006	50′	1105.1	105.60	.013
2°	100.01	.873		12°	602.21	31.561		22°	1113.7	107.24	
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
			.13				.26				.39
7°	350.44	10.707	E	17°	856.30	63.634	E	27°	1375.6	162.81	E
10′	358.81	11.224	.006	10′	864.82	64.900	.022	10′	1384.4	164.86	.051
20′	367.17	11.753		20′	873.35	66.178		20′	1393.2	166.95	
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

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10′	1598.0	218.7	5° C.	10′	2151.7	390.7	5° C.	10′	2743.1	622.8	5° C.
20′	1606.9	221.1	T	20′	2161.2	394.1	T	20′	2753.4	627.2	T
30′	1615.9	223.5	.13	30′	2170.8	397.4	.17	30′	2763.7	631.7	.21
40′	1624.9	226.0	E	40′	2180.3	400.8	E	40′	2773.9	636.2	E
50′	1633.9	228.4		50′	2189.9	404.2		50′	2784.2	640.7	
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
			.53				.68				.84
37°	1917.1	312.2	E	47°	2491.3	518.2	E	57°	3110.9	790.1	E
10′	1926.4	315.2	.093	10′	2501.2	522.2	.151	10′	3121.7	795.2	.225
20′	1935.7	318.1		20′	2511.2	526.1		20′	3132.6	800.4	
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	25° C.	10′	2561.0	546.3	25° C.	10′	3186.9	826.7	25° C.
20′	1991.5	336.3	T	20′	2571.0	550.4	T	20′	3197.8	832.0	T
30′	2000.9	339.3	.67	30′	2581.0	554.5	.85	30′	3208.8	837.3	1.05
40′	2010.2	342.4	E	40′	2591.0	558.6	E	40′	3219.7	842.7	E
50′	2019.6	345.5	.117	50′	2601.1	562.8	.189	50′	3230.7	848.1	.283
39°	2029.0	348.6		49°	2611.2	566.9		59°	3241.7	853.5	
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	.340
50′	2132.7	384.1		50′	2722.7	614.0		50′	3363.8	914.5	

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2	+	71°	4086.9	1308.2	+	81°	4893.6	1805.3	+
10′	3386.3	925.9	5° C.	10′	4099.5	1315.6	5° C.	10′	4908.0	1814.7	5° C.
20′	3397.5	931.6	T	20′	4112.1	1322.9	T	20′	4922.5	1824.1	T
30′	3408.8	937.3	.25	30′	4124.8	1330.3	.30	30′	4937.0	1833.6	.36
40′	3420.1	943.1	E	40′	4137.4	1337.7	E	40′	4951.5	1843.1	E
50′	3431.4	948.9		50′	4150.1	1345.1		50′	4966.1	1852.6	
62°	3442.7	954.8	.080	72°	4162.8	1352.6	.110	82°	4980.7	1862.2	.149
10′	3454.1	960.6		10′	4175.6	1360.1		10′	4995.4	1871.8	
20′	3465.4	966.5		20′	4188.5	1367.6		20′	5010.0	1881.5	
30′	3476.8	972.4		30′	4201.2	1375.2		30′	5024.8	1891.2	
40′	3488.3	978.3		40′	4214.0	1382.8		40′	5039.5	1900.9	
50′	3499.7	984.3		50′	4226.8	1390.4		50′	5054.3	1910.7	
63°	3511.1	990.2	10° C.	73°	4239.7	1398.0	10° C.	83°	5069.2	1920.5	10° C.
10′	3522.6	996.2	T	10′	4252.6	1405.7	T	10′	5084.0	1930.4	T
20′	3534.1	1002.3	.51	20′	4265.6	1413.5	.61	20′	5099.0	1940.3	.72
30′	3545.6	1008.3	E	30′	4278.5	1421.2	E	30′	5113.9	1950.3	E
40′	3557.2	1014.4		40′	4291.5	1429.0		40′	5128.9	1960.2	
50′	3568.7	1020.5	.159	50′	4304.6	1436.8	.220	50′	5143.9	1970.3	.299
64°	3580.3	1026.6		74°	4317.6	1444.6		84°	5159.0	1980.4	
10′	3591.9	1032.8		10′	4330.7	1452.5		10′	5174.1	1990.5	
20	3603.5	1039.0		20′	4343.8	1460.4		20′	5189.3	2000.6	
30′	3615.1	1045.2		30′	4356.9	1468.4		30′	5204.4	2010.8	
40′	3626.8	1051.4		40′	4370.1	1476.4		40′	5219.7	2021.1	
50′	3638.5	1057.7	15° C.	50′	4383.3	1484.4	15° C.	50′	5234.9	2031.4	15° C.
65°	3650.2	1063.9	T	75°	4396.5	1492.4	T	85°	5250.3	2041.7	T
10′	3661.9	1070.2	.76	10′	4409.8	1500.5	.91	10′	5265.6	2052.1	1.09
20′	3673.7	1076.6	E	20′	4423.1	1508.6	E	20′	5281.0	2062.5	E
30′	3685.4	1082.9	.240	30′	4436.4	1516.7	.332	30′	5296.4	2073.0	.450
40′	3697.2	1089.3		40′	4449.7	1524.9		40′	5311.9	2083.5	
50′	3709.0	1095.7		50′	4463.1	1533.1		50′	5327.4	2094.1	
66°	3720.9	1102.2		76°	4476.5	1541.4		86°	5343.0	2104.7	
10′	3732.7	1108.6		10′	4489.9	1549.7		10′	5358.6	2115.3	
20′	3744.6	1115.1		20′	4503.4	1558.0		20′	5374.2	2126.0	
30′	3756.5	1121.7		30′	4516.9	1566.3		30′	5389.9	2136.7	
40′	3768.5	1128.2	20° C.	40′	4530.4	1574.7	20° C.	40′	5405.6	2147.5	20° C.
50′	3780.4	1134.8	T	50′	4544.0	1583.1	T	50′	5421.4	2158.4	T
67°	3792.4	1141.4	1.02	77°	4557.6	1591.6	1.22	87°	5437.2	2169.2	1.45
10′	3804.4	1148.0	E	10′	4571.2	1600.1	E	10′	5453.1	2180.2	E
20′	3816.4	1154.7	.321	20′	4584.8	1608.6	.445	20′	5469.0	2191.1	.603
30′	3828.4	1161.3		30′	4598.5	1617.1		30′	5484.9	2202.2	
40′	3840.5	1168.1		40′	4612.2	1625.7		40′	5500.9	2213.2	
50′	3852.6	1174.8		50′	4626.0	1634.4		50′	5517.0	2224.3	
68°	3864.7	1181.6		78°	4639.8	1643.0		88°	5533.1	2235.5	
10′	3876.8	1188.4		10′	4653.6	1651.7		10′	5549.2	2246.7	
20′	3889.0	1195.2	25° C.	20′	4667.4	1660.5	25° C.	20′	5565.4	2258.0	25° C.
30′	3901.2	1202.0	T	30′	4681.3	1669.2	T	30′	5581.6	2269.3	T
40′	3913.4	1208.9	1.28	40′	4695.2	1678.1	1.53	40′	5597.8	2280.6	1.83
50′	3925.6	1215.8	E	50′	4709.2	1686.9	E	50′	5614.2	2292.0	E
69°	3937.9	1222.7	.403	79°	4723.2	1695.8	.558	89°	5630.5	2303.5	.756
10′	3950.2	1229.7		10′	4737.2	1704.7		10′	5646.9	2315.0	
20′	3962.5	1236.7		20′	4751.2	1713.7		20′	5663.4	2326.6	
30′	3974.8	1243.7		30′	4765.3	1722.7		30′	5679.9	2338.2	
40′	3987.2	1250.8		40′	4779.4	1731.7		40′	5696.4	2349.8	
50′	3999.5	1257.9		50′	4793.6	1740.8		50′	5713.0	2361.5	
70°	4011.9	1265.0	30° C.	80°	4807.7	1749.9	30° C.	90°	5729.7	2373.3	30° C.
10′	4024.4	1272.1	T	10′	4822.0	1759.0	T	10′	5746.3	2385.1	T
20′	4036.8	1279.3	1.54	20′	4836.2	1768.2	1.84	20′	5763.1	2397.0	2.20
30′	4049.3	1286.5	E	30′	4850.5	1777.4	E	30′	5779.9	2408.9	E
40′	4061.8	1293.6		40′	4864.8	1786.7		40′	5796.7	2420.9	
50′	4074.4	1300.9	.485	50′	4879.2	1796.0	.671	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°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9	+	101°	6950.6	3278.1	+	111°	8336.7	4386.1	+
10′	5847.5	2457.1	5° C.	10′	6971.3	3294.1	5° C.	10′	8362.7	4407.6	5° C.
20′	5864.6	2469.3	T	20′	6992.0	3310.1	T	20′	8388.9	4429.2	T
30′	5881.7	2481.5	.43	30′	7012.7	3326.1	.51	30′	8415.1	4450.9	.62
40′	5898.8	2493.8	E	40′	7033.6	3342.3	E	40′	8441.5	4472.7	E
50′	5916.0	2506.1		50′	7054.5	3358.5		50′	8468.0	4494.6	
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
10′	5950.5	2531.0		10′	7096.6	3391.2		10′	8521.3	4538.8	
20′	5967.9	2543.5		20′	7117.8	3407.7		20′	8548.1	4561.1	
30′	5985.3	2556.0		30′	7139.0	3424.3		30′	8575.0	4583.4	
40′	6002.7	2568.6		40′	7160.3	3440.9		40′	8602.1	4606.0	
50′	6020.2	2581.3		50′	7181.7	3457.6		50′	8629.3	4628.6	
93°	6037.8	2594.0	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.
10′	6055.4	2606.8	T	10′	7224.7	3491.3	T	10′	8684.0	4674.2	T
20′	6073.1	2619.7	.86	20′	7246.3	3508.2	.103	20′	8711.5	4697.2	1.25
30′	6090.8	2632.6	E	30′	7268.0	3525.2	F	30′	8739.2	4720.3	E
40′	6108.6	2645.5		40′	7289.8	3542.4		40′	8767.0	4743.6	
50′	6126.4	2658.5	.401	50′	7311.7	3559.6	.536	50′	8794.9	4766.9	.721
94°	6144.3	2671.6		104°	7333.6	3576.8		114°	8822.9	4790.4	
10′	6162.2	2684.7		10′	7355.6	3594.2		10′	8851.0	4814.1	
20′	6180.2	2697.9		20′	7377.8	3611.7		20′	8879.3	4837.8	
30′	6198.3	2711.2		30′	7399.9	3629.2		30′	8907.7	4861.7	
40′	6216.4	2724.5		40′	7422.2	3646.8		40′	8936.3	4885.7	
50′	6234.6	2737.9	15° C.	50′	7444.6	3664.5	15° C.	50′	8965.0	4909.9	15° C.
95°	6252.8	2751.3	T	105°	7467.0	3682.3	T	115°	8993.8	4934.1	T
10′	6271.1	2764.8	1.30	10′	7489.6	3700.2	1.56	10′	9022.7	4958.6	1.93
20′	6289.4	2778.3	E	20′	7512.2	3718.2	E	20′	9051.7	4983.1	E
30′	6307.9	2792.0	.604	30′	7534.9	3736.2	.806	30′	9080.9	5007.8	1.09
40′	6326.3	2805.6		40′	7557.7	3754.4		40′	9110.3	5032.6	
50′	6344.8	2819.4		50′	7580.5	3772.6		50′	9139.8	5057.6	
96°	6363.4	2833.2		106°	7603.5	3791.0		116°	9169.4	5082.7	
10′	6382.1	2847.0		10′	7626.6	3809.4		10′	9199.1	5107.9	
20′	6400.8	2861.0		20′	7649.7	3827.9		20′	9229.0	5133.3	
30′	6419.5	2875.0		30′	7672.9	3846.5		30′	9259.0	5158.8	
40′	6438.4	2889.0	20° C.	40′	7696.3	3865.2	20° C.	40′	9289.2	5184.5	20° C.
50′	6457.3	2903.1	T	50′	7719.7	3884.0	T	50′	9319.5	5210.3	T
97°	6476.2	2917.3	1.74	107°	7743.2	3902.9	2.08	117°	9349.9	5236.2	2.52
10′	6495.2	2931.6	E	10′	7766.8	3921.9	E	10′	9380.5	5262.3	E
20′	6514.3	2945.9	.809	20′	7790.5	3940.9	1.08	20′	9411.3	5288.6	1.46
30′	6533.4	2960.3		30′	7814.3	3960.1		30′	9442.2	5315.0	
40′	6552.6	2974.7		40′	7838.1	3979.4		40′	9473.2	5341.5	
50′	6571.9	2989.2		50′	7862.1	3998.7		50′	9504.4	5368.2	
98°	6591.2	3003.8		108°	7886.2	4018.2		118°	9535.7	5395.1	
10′	6610.6	3018.4	25° C.	10′	7910.4	4037.8	25° C.	10′	9567.2	5422.1	25° C.
20′	6630.1	3033.1	T	20′	7934.6	4057.4	T	20′	9598.9	5449.2	T
30′	6649.6	3047.9	2.18	30′	7959.0	4077.2	2.61	30′	9630.7	5476.5	3.16
40′	6669.2	3062.8	E	40′	7983.5	4097.1	E	40′	9662.6	5504.0	E
50′	6688.8	3077.7		50′	8008.0	4117.0		50′	9694.7	5531.7	
99°	6708.6	3092.7	1.02	109°	8032.7	4137.1	1.36	119°	9727.0	5559.4	1.83
10′	6728.4	3107.7		10′	8057.4	4157.3		10′	9759.4	5587.4	
20′	6748.2	3122.9		20′	8082.3	4177.5		20′	9792.0	5615.5	
30′	6768.1	3138.1		30′	8107.3	4197.9		30′	9824.8	5643.8	
40′	6788.1	3153.3		40′	8132.3	4218.4		40′	9857.7	5672.3	
50′	6808.2	3168.7		50′	8157.5	4239.0		50′	9890.8	5700.9	
100°	6828.3	3184.1	30° C.	110°	8182.8	4259.7	30° C.	120°	9924.0	5729.7	30° C.
10′	6848.5	3199.6	T	10′	8208.2	4280.5	T	10′	9957.5	5758.6	T
20′	6868.8	3215.1	2.62	20′	8233.7	4301.4	3.14	20′	9991.0	5787.7	3.81
30′	6889.2	3230.8	E	30′	8259.3	4322.4	E	30′	10025.0	5817.0	E
40′	6909.6	3246.5		40′	8285.0	4343.6		40′	10059.0	5846.5	
50′	6930.1	3262.3	1.22	50′	8310.8	4364.8	1.63	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.

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

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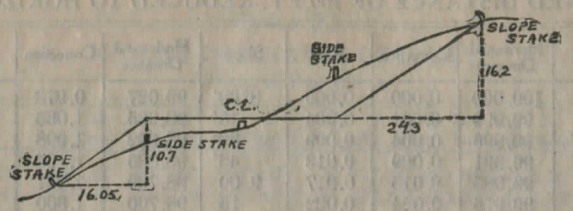

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

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	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	8
9	13 50	13.65	13 80	13 95	14.10	14.25	14.40	14 55	14.70	14.85	9
10	15.00	15 15	15 30	15 45	15.60	15.75	15.90	16.05	16.20	16 35	10
11	16 50	16 65	16 80	16.95	17 10	17.25	17.40	17.55	17.70	17.85	11
12	18 00	18.15	18.30	18 45	18.60	18 75	18.90	19.05	19.20	19 35	12
13	19 50	19 65	19.80	19.95	20.10	20.25	20 40	20.55	20.70	20.85	13
14	21.00	21 15	21.30	21.45	21 60	21.75	21.90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24 15	24 30	24 45	24.60	24.75	24 90	25 05	25.20	25.35	16
17	25.50	25 65	25.80	25 95	26.10	26 25	26 40	26.55	26.70	26.85	17
18	27.00	27 15	27.30	27 45	27.60	27.75	27.90	28.05	28 20	28.35	18
19	28 50	28 65	28 80	28.95	29.10	29.25	29.40	29.55	29.70	29.85	19
20	30 00	30 15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31 50	31 65	31.80	31.95	32 10	32 25	32.40	32.55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33.60	33 75	33.90	34.05	34.20	34.35	22
23	34 50	34 65	34.80	34.95	35.10	35 25	35 40	35.55	35.70	35 85	23
24	36.00	36 15	36.30	36 45	36.60	36.75	36.90	37.05	37.20	37.35	24
25	37.50	37.65	37 80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39 00	39 15	39.30	39 45	39 60	39.75	39.90	40.05	40.20	40.35	26
27	40 50	40 65	40 80	40.95	41.10	41.25	41 40	41.55	41.70	41.85	27
28	42 00	42 15	42.30	42.45	42.60	42 75	42.90	43.05	43.20	43.35	28
29	43 50	43 65	43.80	43 95	44.10	44 25	44 40	44.55	44.70	44 85	29
30	45 00	45 15	45.30	45 45	45.60	45.75	45.90	46.05	46 20	46.35	30
31	46.50	46.65	46.80	46 95	47.10	47.25	47.40	47.55	47.70	47.85	31
32	48 00	48.15	48.30	48 45	48.60	48 75	48.90	49.05	49 20	49.35	32
33	49.50	49 65	49.80	49.95	50.10	50.25	50.40	50.55	50.70	50.85	33
34	51 00	51.15	51.30	51.45	51.60	51.75	51.90	52.05	52.20	52.35	34
35	52 50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54 00	54.15	54.30	54 45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55 50	55 65	55.80	55.95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57.00	57.15	57.30	57 45	57.60	57 75	57.90	58.05	58.20	58 35	38
39	58 50	58.65	58 80	58.95	59.10	59 25	59.40	59 55	59.70	59.85	39
40	60 00	60 15	60 30	60 45	60 60	60.75	60 90	61.05	61 20	61.35	40
41	61.50	61 65	61.80	61 95	62 10	62 25	62.40	62 55	62 70	62.85	41
42	63 00	63.15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64.35	42
43	64.50	64 65	64 80	64.95	65.10	65 25	65 40	65.55	65.70	65.85	43
44	66 00	66 15	66.30	66.45	66.60	66.75	66.90	67.05	67.20	67.35	44
45	67 50	67 65	67 80	67.95	68.10	68.25	68.40	68.55	68.70	68.85	45
46	69 00	69 15	69 30	69.45	69.60	69.75	69.90	70.05	70.20	70.35	46
47	70 50	70 65	70 80	70 95	71.10	71.25	71 40	71.55	71.70	71.85	47
48	72.00	72 15	72.30	72.45	72.60	72.75	72.90	73 05	73.20	73 35	48
49	73 50	73 65	73.80	73.95	74.10	74.25	74.40	74.55	74.70	74.85	49
50	75.00	75.15	75.30	75.45	75.60	75.75	75.90	76.05	76.20	76.35	50

Computed by L. Leland Locke.

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.	Ins.	Dec.
1/16	.0052			2 9/16	.2135	3 11/16	.3177	5 1/16	.4219	6 5/16	.5260	7 9/16	.6302	8 13/16	.7344	10 1/16	.8385	11 5/16	.9427
1/8	.0104					1/8	.3229	1/8	.4271	3/8	.5313	5/8	.6354	7/8	.7396	1/8	.8438	3/8	.9479
3/16	.0156					5/16	.3281	3/16	.4323	7/16	.5365	11/16	.6406	15/16	.7448	3/16	.8490	7/16	.9531
1/4	.0208					4—	.3333	1/4	.4375	1/2	.5417	3/4	.6458	9—	.7500	1/4	.8542	1/2	.9583
5/16	.0260					1/16	.3385	5/16	.4427	9/16	.5469	13/16	.6510	1/16	.7552	5/16	.8594	9/16	.9635
3/8	.0313					1/8	.3438	3/8	.4479	5/8	.5521	7/8	.6563	1/8	.7604	3/8	.8646	5/8	.9688
7/16	.0365					3/16	.3490	7/16	.4531	11/16	.5573	15/16	.6615	3/16	.7656	7/16	.8698	11/16	.9740
1/2	.0417					1/4	.3542	1/2	.4583	3/4	.5625	8—	.6667	1/4	.7708	1/2	.8750	3/4	.9792
9/16	.0469					5/16	.3594	9/16	.4635	13/16	.5677	1/16	.6719	5/16	.7760	9/16	.8802	13/16	.9844
5/8	.0521					3/8	.3646	5/8	.4688	7/8	.5729	1/8	.6771	3/8	.7813	5/8	.8854	7/8	.9896
11/16	.0573					7/16	.3698	11/16	.4740	15/16	.5781	3/16	.6823	7/16	.7865	11/16	.8906	15/16	.9948
3/4	.0625					1/2	.3750	3/4	.4792	7—	.5833	1/4	.6875	1/2	.7917	3/4	.8958		
13/16	.0677					9/16	.3803	13/16	.4844	1/16	.5885	5/16	.6927	9/16	.7969	13/16	.9010		
7/8	.0729					5/8	.3854	7/8	.4896	1/8	.5938	3/8	.6979	5/8	.8021	7/8	.9063		
15/16	.0781					11/16	.3906	15/16	.4948	3/16	.5990	7/16	.7031	11/16	.8073	15/16	.9115		
1—	.0833					3/4	.3958	6—	.5000	1/4	.6042	1/2	.7083	3/4	.8125	11—	.9167		
1/16	.0885					13/16	.4010	1/16	.5052	5/16	.6094	9/16	.7135	13/16	.8177	1/16	.9219		
1/8	.0938					7/8	.4063	1/8	.5104	3/8	.6146	5/8	.7188	7/8	.8229	1/8	.9271		
3/16	.0990					15/16	.4115	3/16	.5156	7/16	.6198	11/16	.7240	15/16	.8281	3/16	.9323		
1/4	.1042					5—	.4167	1/4	.5208	1/2	.6250	3/4	.7292	10—	.8333	1/4	.9375		

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