29

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	13.53.0
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	14.02.6
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	14.35.6
8	1.32.0	28	4.62.0	48	7.92 0	68	11.22.0	88	14.52.0
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	15.18.0
13	2.14.6	33	5.44.6	53	8.74.6	73	12.04 6	93	15.34.6
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	15.67.6
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	16.00.6
18	2.97.0	38	6.27.0	58	9.57.0	78	12.87.0	98	16.17.0
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

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

Claridon Macadam
Road Improvement

Chardon Village &
Claridon Twp.

1922

Sperry Road or ~~Hilder~~ Road
Chester Twp. Page 29

Chester E&W Center Road 47
also known as Sherman Road Page 51
Sherman

Culverts near Geo Painter Page 25

SEE INDEX NEXT Pg.

29

COUNTY HOME RD. #5
SEC. E-F & CHARDON VILL.
Align't. 2-16
Profile elev. 18-27

#90 Sperry Rd. Sec. ~~C-E~~ J-K
Align't. 29-37
Sec. A-B 40-46

Sherman
~~CENTER~~ RD #97 SEC. D 51-57

Benches Sperry Rd Sec A-B 58-59
" Center " " D 61-62
~~" Sperry " " C-E~~

X SECTIONS Sperry Rd A-B 63-72
" " Center " " D 73-77
Culvert Elev. ± Middle Sec. "J". pg 38
Sperry Rd

Sherman
~~Center~~ Rd #97, part Munson Twp. Sec. E & F pg 47-49

Village Line S.E. along Macadam

Sta.	Angle	Bearing
9		
8		
7		— P.L. 7+24 Lt.
6		P.L. Rt. 5+70 —
+68.5 P.I	△ 14°-35' Rt.	(15-06 per F.R.Z.) at 4+50.4
5		
4		Note: See Fd. Bk. # 40 pgs 64-67 For 1952 references
3		
2		
+10.2	△ 1°-48' Rt.	(0-00 per F.R.Z.)
1		
0	△ 0-0	

4-6-'22 P.M.
Hanna Cgu
Thompson c

E
Unless noted offset stakes are set 25' Rt.

L.J. McNaughton

P.C. 7+24

96-12

Skiba

I.P. 30.18

83-48

spike

Nail in N. side Elec. L. Pole

24.76

26.73

P.L. Nail in S. side Line Post.

210.2

15-06

I.P. 30.01

120.1

Mattie Pease

Hambden Claridon

9-08-30

Nail in W. root 30" Elm

Keller

330.3

Twp. Line

spike

33.46

21.25'

Nail in W. side t pole

66.00

Moses

Claridon

Claridon Vill

I.P.

Sta	Angle
21	
20	
19	
18	
17	
16	P.I. Lt 16+16
15	
14	
13	
+38.7	Δ 2°-10' Rt.
12	
11	
10	

L. J. Johnson

P.I. 20+00

Skiba

P.I. 16+16

S & W S. side Tel. pole

S & W ~~Staple~~ S.W. root Maple

78 35

44 28 1

~~44 43~~

Spike

S & W set by F.C.P. 3-27-43

L. J. McNaughton

S. root Maple stump

28 52'

=114 20.6 per F.R.Z.

Skiba

Sta	Angle	
33		
		P.L. 32+55 Rt.
32		
31		
30		
		P.L. 29+93 Lt
29		
+48.7	0°-0'	
28		
27		
26		
25		
		P.L. 24+77 Rt
24		
23		
22		

G. Hoover

P.L. 32+55

P.L. 29+93

E. side
Nail
Elec. Lt. Pole

Spike

32.63'

51.02

Nail in N.W.
root Maple

J. A. Johnson

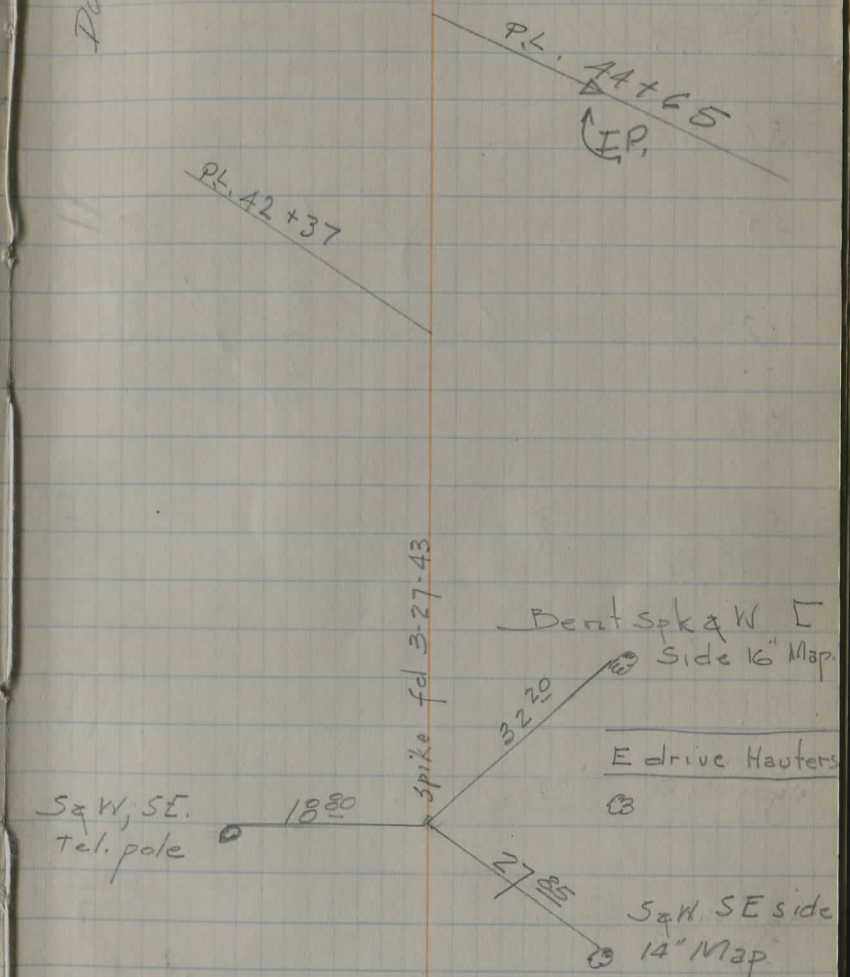
E. F. Zak

P.L. 24+77

Skiba

Sta	Angle	
45		P.L. 44 + 45
44		
43		
42		P.L. 42 + 37
41		
40		
39		
38		
+67±	△ 0°-26' Rt.	
37		3767
		3255
		512
36		
35		
34		

Doug 193



G. Haueter

Rain 5:30 pm.

Sta Angle

+19 P.T.

56

55

+62 Pl. Δ 42° - 58' Rt

54

53

+88.5 P.C.

52

51

50

49

48

47

46

m (52)

137-05

274-10

Δ = 42° - 58' Rt
D = 13° - 00'
P.I. = 54 + 62.0
T = 1 73.5
P.C. = 52 + 88.5
L = 3 30.5
P.T. = 56 + 19.0
E = 33'

See F.B. 40 Pg 66

4-8½-22 PM Fine

Hanna Grow Thompson

6

A. Krupansky

1532.4 to I.P.

30.0

Nail W. side Tel. pole

42°58'

27.45

30.0

12.72 I.P.

P.L.

Hub

48.95

Nail N. side E. Pole

P.L. 54+26

± sand

Spk NE side 8" Loc

Spk SE side 10" Map

34.49

80.60

62.65

IP on stk

137-06-30

Spk S side 20" Map

Bent '57

P.L.

IP

38.25

434.3

38.25

30.0

IP '57

Rocks but no find IP '57

Smith R.C. Pa

Sta Angle.

69

68

67

66

65

64

63

62

61

60

59

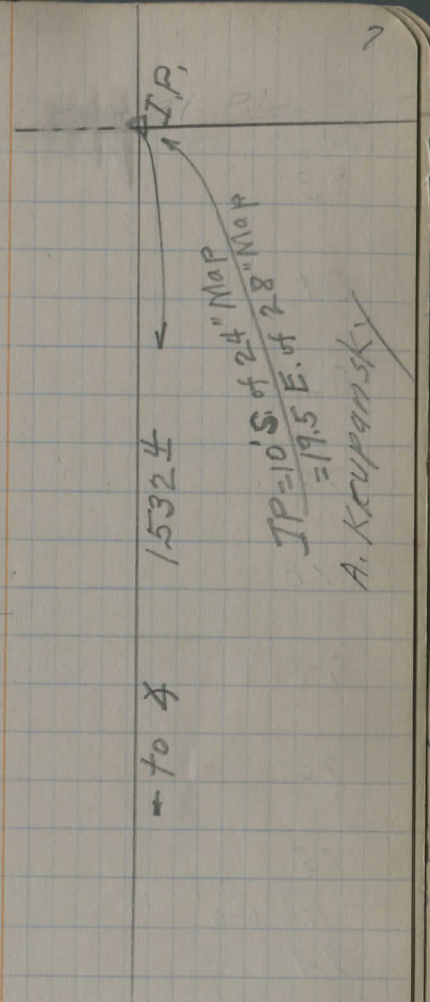
58

57

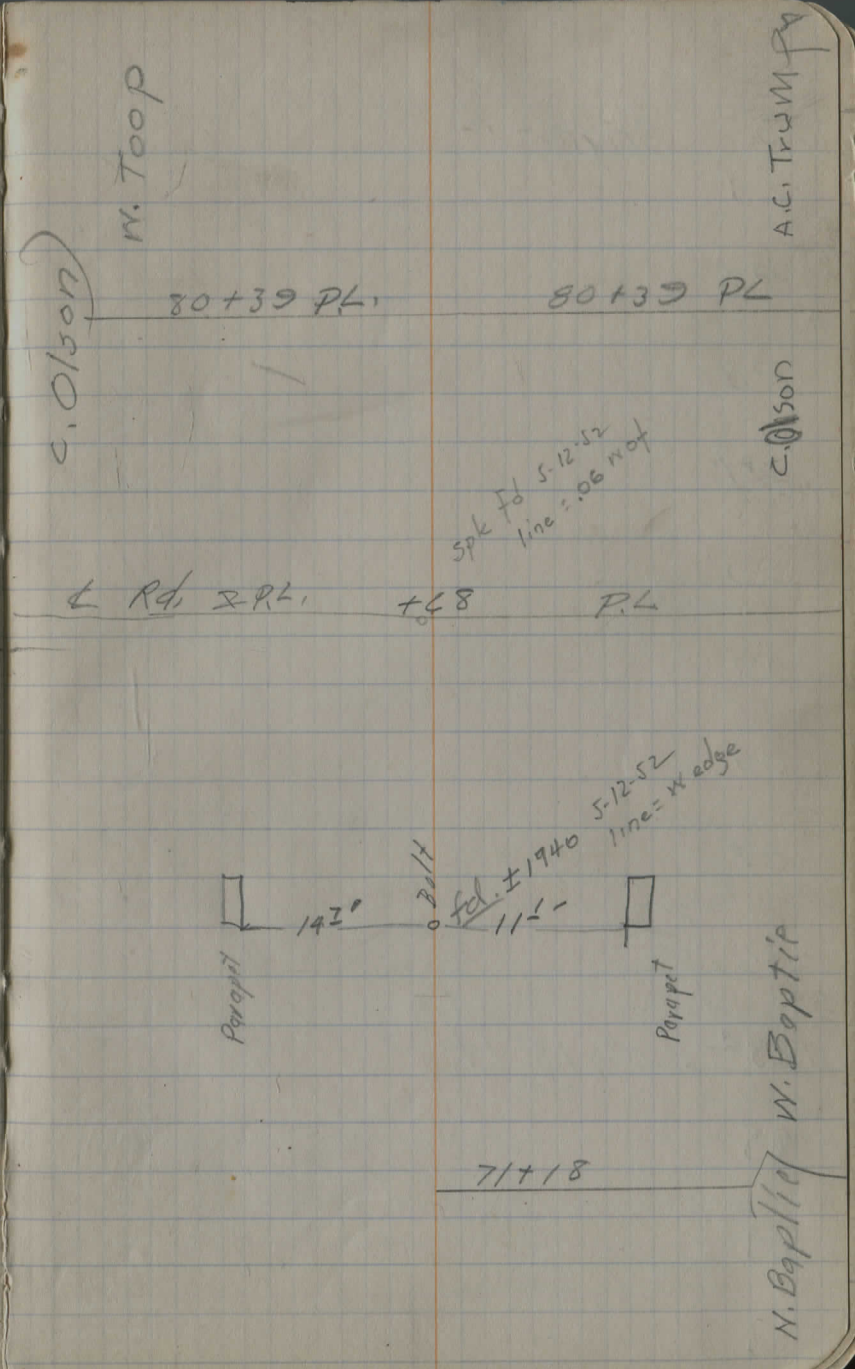
N. Baptist

PL CAT 53

R.A. Douglas



Sta	Angle
82	
81	
80	
79	
78	
77	
76	
75	
+17.8	0°-0'
74	
73	
72	
71	
70	



Sta. Angle

94

93

92

91

90

89

88

87

86 N 10-22 Hot

+23 8 Δ 0°-13' Lt.

85

84

83

P.L. 94+56 94+56 P.L.

Roberts

1249.8 → P.I.

P.L. 87+36

W.D. TOOP

Nail in N. side maple

P.R. spike

fd ±1940

43 44

30 00

Nail in N. side maple

179-25

A.W. Clemson

93+72 P.L.

Sta Angle

106

105

104

103

102

101

100

99

98

+73.6 Δ 0°-42' Rt Bolt set 5-12-52

97

96 I.P. Fd in W roots ✱ 18" map

95

106 + 11 P.L.

Boreham

P.I

1637.3

Stone

100 + 54 P.L.

I.P.

30.13 29.9

162.4

I.P.

30.25

150°

Spike

Edge stone milk stand

99'

I.P.

30°

97+41.85

Gordon Dr.

Tuxedo Land Co. Lake Apawila Allot.

1249.8

O. Loring

Sta Angle

117

+04 △ 1°-14' Lt

116

31.15

36.58

Spk NE side CE-T #4427

Spk NW side 16" map

115

114

113

+10 △ 0°-15' Lt.

38.08

32.75

112

111

±15'

Spencer

Boreham

110

109

108

107

W. Spencer

Spike

21.60

Elec. L.P.

20.85

T.P.

11604
11210.9
393.1

112+93 Pt.

Spike

Nail T.P. 6" above ground

19.68'

31.23'

Nail S. side w. cherry. 5' up.

11210.9
9773.6
1437.3

W. Spencer

Boreham

Sta Angle

℄ Spencer St

Spk SW. side Tel ± 197

(52)
178-23-30

356-47

68.40

+12° End.

Bolt set
5-12-52

123

122

57.89

Spk road face Tel ± 196

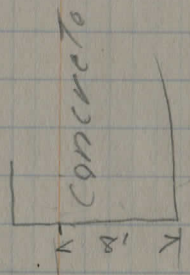
121

120

119

118

See Fd Bk #40 p95 64-67 for 1952 Def



17312
1160d

708

Village Portion

Sta	Angle
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	
0	

R. King

Sam Lehto

Pt. 9+08

F.O. Behlen

Pt. 4+10

Pt. 4+10

4+00

S.P. Warner

C.N. Smith

Pt. 2+90

S.G. Downing

2+25

2+09

S. Amick

S. Barker

C & E R R

Sta Angle

+87.5 Δ 0°-0'

+75

Appx ℄ R.R.

23

22

21

20

19

18

+63.9 Δ 0°-46' Lt

17

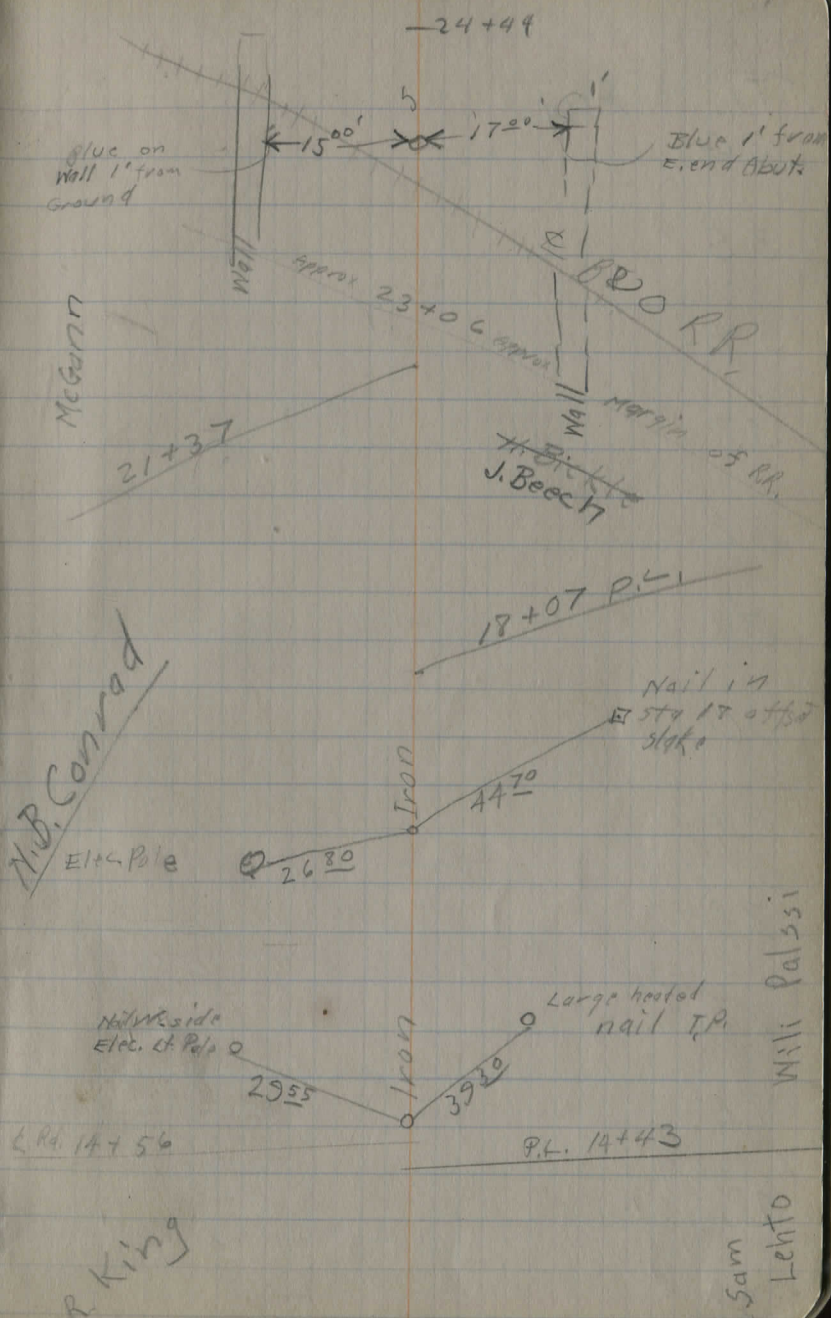
16

15 Δ 0°-0'

14+50 = end Macadam put in last fall.

14

13



Sta.	Angle
36	
35	
34	
33	
32	
31	
30	
29	
28	
27	
26	
25	
24	

Frank Moses

35+82

E. Ostrander

33+37 P.L.

C. Ostrander

293

Famara

28+42 P.L.

R. Thompson

Margin of R.R.

24 +44

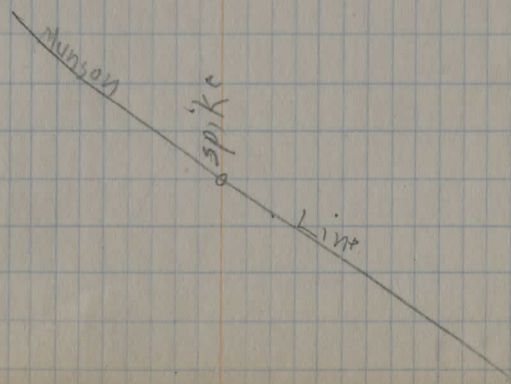
P.L.

24+44

+99½ ▲ 0° – 0'

38

37



— Level Notes —

Sta.	B.S.	H. I.	F.S.	Elev.
B.M.	9.20	1176.65		1167.45
123+12			6.8	69.9
123			6.4	70.3
122			5.0	71.7
121			3.1	73.6
120			0.8	75.9
T.P.	12.17	1188.57	0.25	1176.40
119			9.9	78.6
118			7.4	81.2
117			5.3	83.3
116			3.8	84.8
115			3.3	85.3
114			2.7	85.9
113			2.1	86.5
112			1.2	87.4
T.P.	9.72	1197.52	0.77	1187.80
111			7.7	89.8
110			4.9	92.6
109			1.9	95.6
T.P.	12.09	1209.27	0.34	1197.18
108			11.4	97.9
107			8.8	1200.5
106			6.3	03.0
B.M.			3.92	05.35

4-13-22
Fine - Spring Day
warm

Hanna
Grad

18

Readings taken on ℄ of road.

Nail in W. root maple school yard.

End of con. Pav.

S.W. Cor Con Pav. W. side of Rd.

		1209.27		
105			3.8	05.5
104			1.2	08.1
T.F.	12.29	122120	0.36	1208.91
103			10.3	10.9
102			6.9	14.3
101			3.5	17.7
100			0.6	20.6
T.F.	11.04	123213	0.11	1221.09
99			8.4	23.7
98			5.0	27.1
97			1.9	30.2
T.F.	11.58	124294	0.77	1231.36
96			9.5	33.4
95			7.1	35.8
94			4.7	38.2
93			3.7	39.2
92			2.7	40.2
91			1.4	41.5
90			0.4	42.5
T.F.	10.48	125308	0.34	1242.60
89			9.2	43.9
88			7.4	45.7
87			5.9	47.2

		125308			
86			4.6	48.5	
B.M.			2.44	1250.64	N.E. Cor. N. end of Toop's porch, Con. floor
85			3.7	49.1	
84			3.4	49.7	
83			3.8	49.3	
82			4.4	48.7	
81			4.7	48.4	
T.P.	3.56	125207	4.57	1248.51	
80			3.7	48.4	
79			3.7	48.4	
78			3.6	48.5	
77			4.2	47.9	
76			4.8	47.3	
75			5.2	46.9	
B.M.			4.80	47.27	S.W. cor. W. Par. 4.43 Mi. N. Gore Lon. Dr.
74			5.3	46.8	
73			5.1	47.0	
72			5.1	47.0	
71			4.8	47.3	
T.P.	5.46	125270	4.83	1247.24	
70			5.2	46.5	
69			4.4	47.3	
68			4.5	48.2	

		1252 70			
B.M.			4.29	1248.41	S.W. Cor W. Por.
67			4.7	48.0	
66			4.4	48.3	
65			3.9	48.8	
64			3.0	49.7	
63			2.7	50.0	
62			2.6	50.1	
T.P.	7.16	1257 38	2.48	1250.22	
61			6.8	50.6	
60			6.1	51.3	
59			5.6	51.8	
58			5.0	52.4	
57			4.4	53.0	
56			4.0	53.4	
+50			3.6	53.8	
55			2.9	54.5	
+50			2.8	54.6	
54			2.6	54.8	
+50			3.5	53.9	
T.P.	1.92	1256 03	3.27	1254.11	
53			3.5	52.5	
52			5.8	50.2	
51			8.4	47.6	

		1256 03		
50			10,4	45.6
49			13.0	43.0
T.P.	1.88	1245 05	12.86	1243.17
48			4.1	41.0
47			6.2	38.9
46			8.6	36.5
45			11.8	33.3
T.P.	0.96	1233 26	12.75	1232.30
44			2.7	30.6
B.M.			4.59	1228.67
43			4.9	28.4
42			6.7	26.6
41			8.4	24.9
40			9.3	24.0
39			10.6	22.7
38			11.7	21.6
T.P.	1.03	1222 73	11.56	1221.70
37			4.3	18.4
36			8.3	14.4
37+75			1.5	21.2
35			12.5	10.2
T.P.	0.82	1210 94	12.61	1210.12

N.W. Cor S. par.

		1210 94			
34				3.8	07.1	
33				5.8	05.1	
32				7.2	03.7	
B.M.				7.74	1203.20	N.E. Cor. H. Par.
31				7.5	03.4	
30				7.1	03.8	
29	Noon			7.7	03.2	
T.P.	1.92	1205	37	7.49	1203.45	
28				3.5	01.9	
+50				4.4	01.0	
27				6.1	99.3	
26				9.9	95.5	
T.P.	2.00	1194	34	13.03	1192.34	
25				3.0	91.3	
+25				3.8	90.5	
B.M.				7.21	1187.13	N.W. Cor. H. Par.
24				5.2	89.1	
23				6.0	88.3	
22				5.7	88.6	
21				4.2	90.1	
20				2.0	92.3	
+40				0.6	93.7	
19				0.3	94.0	

T. F.	8.91	1202 63	0.62	1193.72	
18			7.7	94.9	
17			6.7	95.9	
16			5.3	97.3	
15			4.0	98.6	
14			2.6	00.0	
13			1.2	01.4	
+50			0.7	01.9	
12			1.4	01.2	
11			5.7	96.9	
+50			8.0	94.6	
T. F.	0.87	1196 11	7.39	1195.24	
10			3.0	93.1	
9			6.1	90.0	
8			8.3	87.8	
7			10.3	85.8	
6			11.5	84.6	
T. F.	1.66	1185 94	11.83	1184.28	
5			2.6	83.3	
4			5.3	80.6	
3			7.3	78.6	
B. M.			8.53	1177.41	N. Par. NW. Cor.

		1185 74		
2			8.2	77.7
1			8.6	77.3
0 & 38+99 1			7.7	78.2
38			6.6	79.3
37 +75			6.0	79.4
36			8.4	77.5
T.P.	1.31	1178 83	8.42	1177.52
35			4.6	74.2
+25			7.4	71.4
34			8.8	70.0
T.P.	0.39	1166 61	12.61	1166.22
33			2.0	64.6
32			5.7	60.9
31			8.6	58.0
30			9.3	57.3
+50			9.6	57.0
29			10.4	56.2
28			12.5	54.1
T.P.	7.03	1161 44	12.20	1154.41
+50			7.6	53.8
B.M.			7.39	1153.05
27			7.3	54.1

S.W. Cor S. par.

$\frac{-2.2}{25}$ $\frac{-1.9}{17}$ $\frac{-2.3}{14-15}$ $\frac{-0.3}{10}$ $\frac{0.0}{00}$ $\frac{-0.3}{10}$ $\frac{-0.6}{12}$ $\frac{-2.8}{15-16}$ $\frac{-2.2}{18}$ $\frac{-1.4}{24-25}$

		1161 44		
26			5.9	55.5
25			3.9	57.5
24			2.0	59.4
Under brg. E side		1159 74	1.7	59.74
" " W "		1160 14	1.3	60.14
23			0.9	60.5
T.P.	6.96	1167 96	0.44	1161.00
22			5.9	62.1
21			5.3	62.7
20			4.6	63.4
19			3.7	64.3
18			1.9	66.1
T.P.	11.95	1178.78	1.13	1166.83

12-9 1.1 13-6

+1.0 25 | -1.4 12-14 | -2.2 13-12 | -0.4 9 | 0.0 00 | -0.6 12 | -2.2 13-14 | -0.7 15-19 | +0.1 21 | +0.8 25

+1.9 20 | -0.8 15-13 | -1.7 11-12 | -0.1 10 | 0.0 00 | +0.1 5 | -1.4 11-12 | +1.3 15 | +3.2 20

59.8 | 58.2 | 59.2 | 59.2 | 58.4 | 59.9 | 59.9

+0.4 15 | -1.2 12-11 | -0.2 9 | 0.0 00 | -0.2 10 | -1.0 12-13 | +0.5 15 | +0.4 20

1170.74 Bot Girder

11.0 to bottom R.R. bridge (clearance) =

11.0 " " " " " =1171.14

+1.8 20 | -1.5 16-15 | -0.1 13 | 00 | +0.4 9 | -1.0 10-11 | +0.4 13 | +1.5 20

-0.9 20 | -1.5 15 | -2.4 17-16 | -0.4 11 | -0.1 7 | 00 | -0.1 7 | -0.6 11 | -1.6 12-14 | -0.9 15 | -0.6 20

-0.5 20 | -2.4 17-15 | -0.6 12 | 0.0 9 | 00 | -0.1 7 | -0.5 11 | -1.5 13-14 | -0.3 16-19

-1.4 19 | -2.3 17-15 | -1.3 14 | -0.2 7 | 0.0 | -0.6 12 | +1.6 13-15 | -0.4 16 | -0.2 20

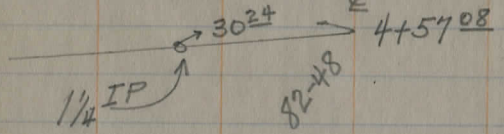
1922 improvement made grade line under bridge 1'-9" lower. Elev = 1157.99

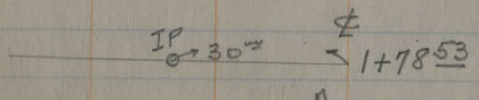
78 75

17	10.0	1168.8	
16	7.1	71.7	
15	3.8	75.0	
+55	1.1	77.7	
+50	0.6	78.2	end Macadam Rebuilt last fall
B.M.	1.71	1177.07	Top of stone on Lt.

Sec. ~~E~~ ~~G~~ J-K

TH #90 Sperry Road Location
also known as ~~Wilder~~ Road





Edge of Rd = Sta 1+07

Sta 0+00 ℄ Wilson Mills Rd

on Tangent

Note: Sta 0+00 = Sta 222+73.28 of Wilson Mills Rd Imp. on Tangent

11/21/33

Chester Twp

Wilson Mills Road North to Twp Line

Build new 18" Pipe

15" VSR in good condition

4+15 / 76 0

N

T.T. Spk Set ℄

5'4" Concrete Culvert in good condition Rather

N 12° 56 E 37.15

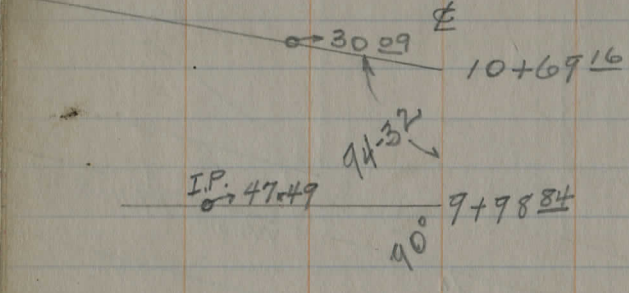
IP = 0.75 W. of W. end Culvert Headwall = 1.6 N of N. edge pvmt

Wilson Mills Road

Drill Hole

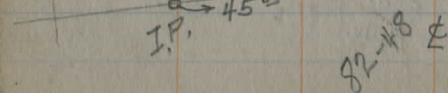
Sta 13+00 POT

Pipe Set



Sta. 8+27.62 PI Def Lt. 11°41'

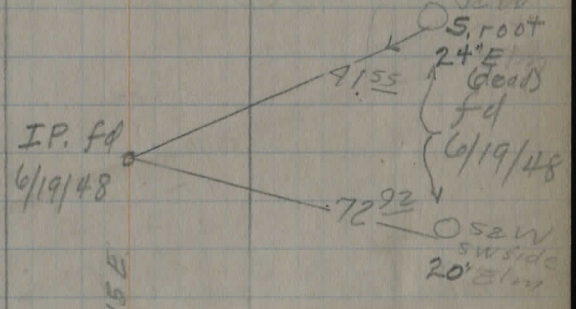
Pipe Set

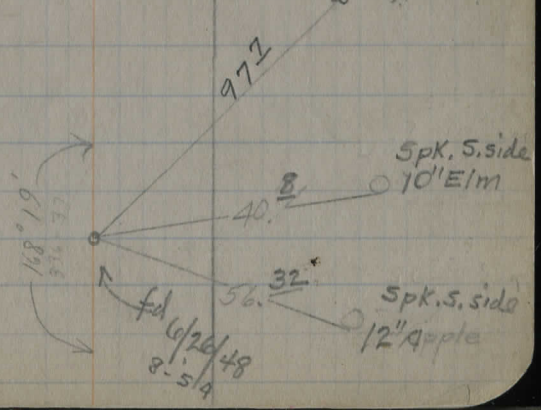


12" Culvert Required Sta 6+62

Guidrail 15" 10" SP in for addition

Set line





Nail SW. side 6" Elm
49.68

℄

Spk
24+05.68

Spk. S. side CEI. pole #399417
32.7

Sta 23 + 63.0

Sta 20+46.98 P.O.T.

Sta 17+12.68 PI D of RT 0°48'

Pg. 38 = levels

Nail S.W. side 6" Elm
49.68

8 x 3 or 10 x 3 Bridge required

23+50

24+62

stream

Culvert = 24 ± 46

Spk. S. side CEI 399417
32.7

Spk. 24+05.68

25'

Iron

= 61 ft S. of E&W hedge along S. bank of creek
= 135 ft. N. of 24" Apple

Wilder Farm

Prop Line

Pittsin

Iron P.

88-57

N 2° 03 E

Spk NW Root 12" Elm

6990

Pipe St 6.22-45

Spike 15" Node

23.00

Pipe

I. Pipe

23.00 ad.

Not a Prop Line

Gone

29.47

Spike 15" W Chevy

66.7

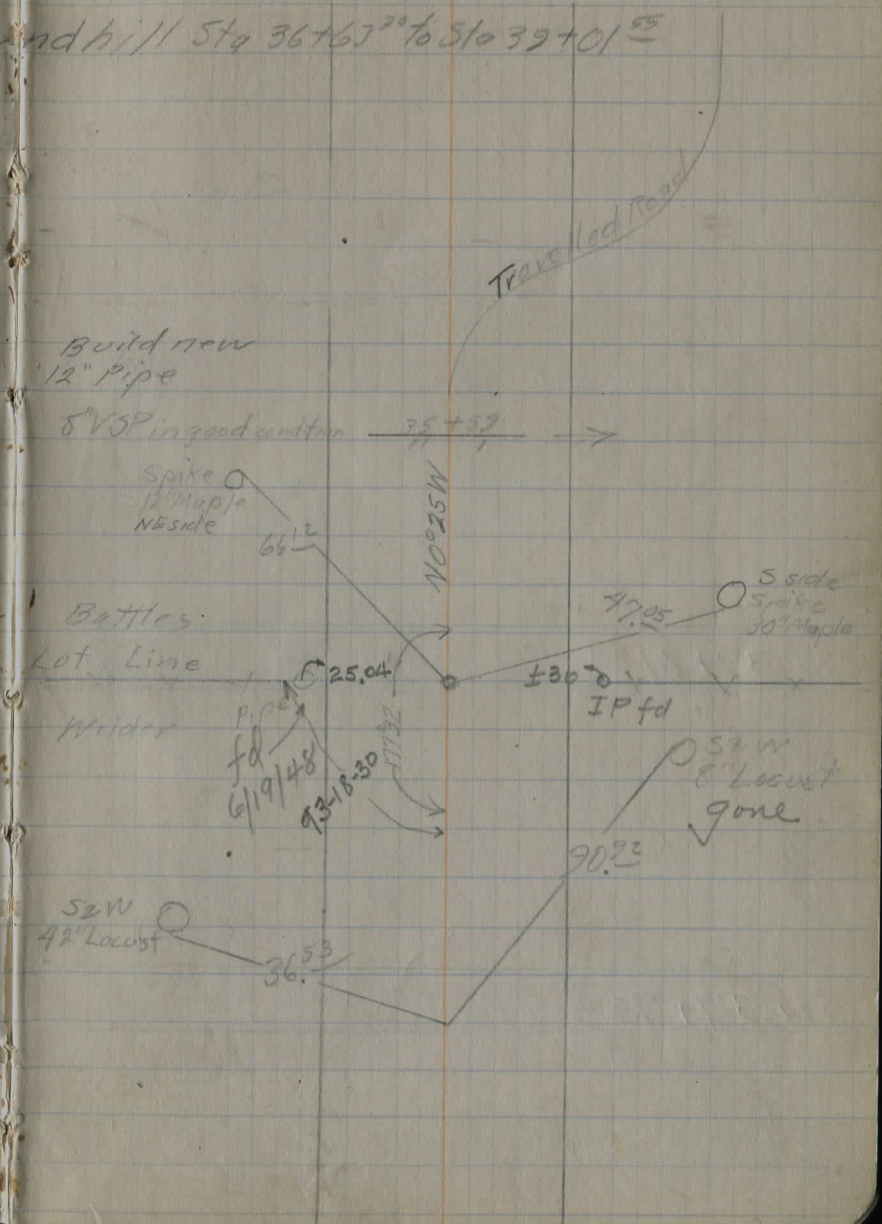
Spk SW 10" Elm

Note: See Line B for location around hill Sta 36+63.2 to Sta 39+01.5
See Page - 39

Sta 36+63.30 P.O.T. Hub Set

Sta 35+08.20 Def. Lt. 2°28' Pipe found

Sta 30+84.29 P.O.T. Hub Set



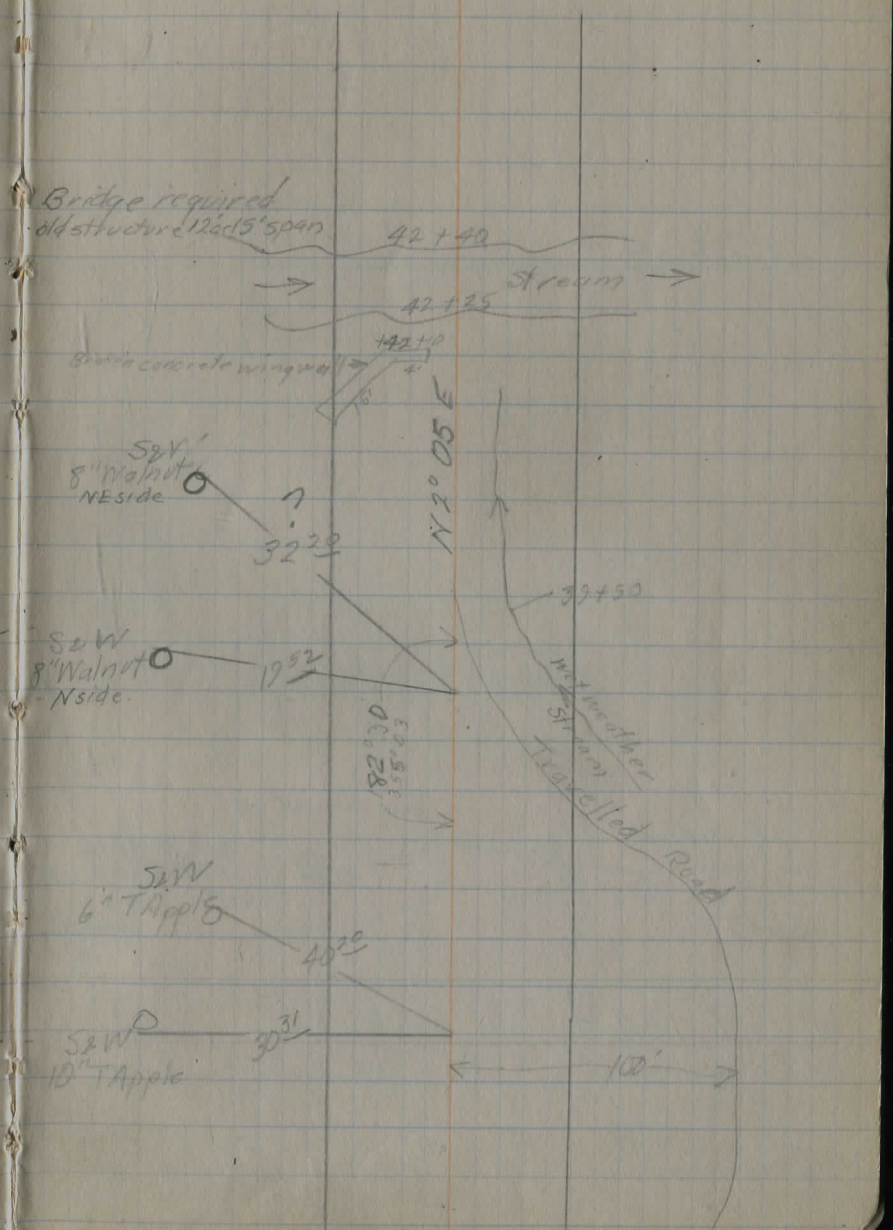
Sta 42 set RY.

Sta 39+01.55 PI Def. Rt. 2°30' Iron set

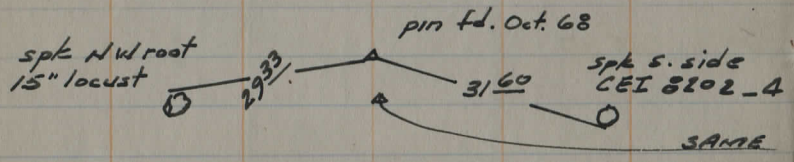
No find.

See Page 39 for Line B

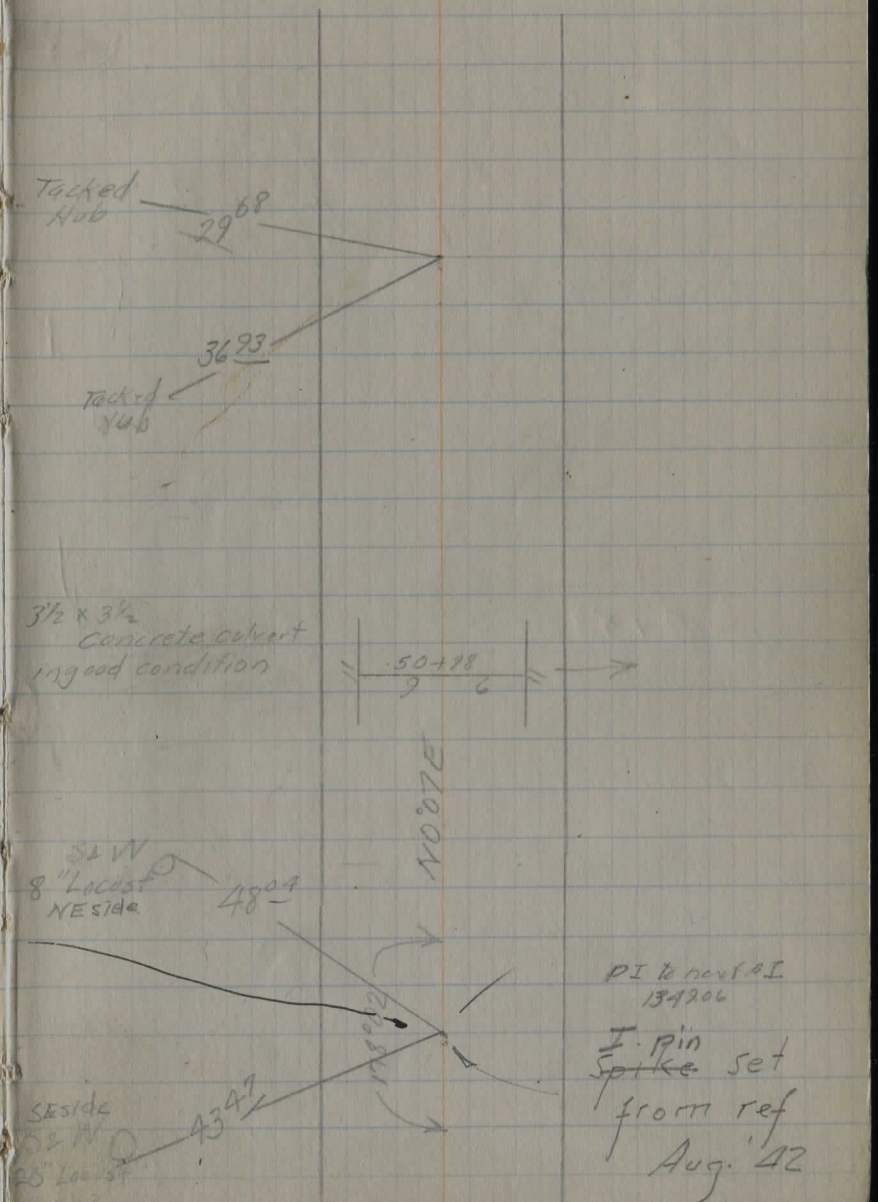
Sta 37+75.38 POT Iron set



Sta. 56 + 34.70 POT



Sta 47 + 34.84 PI Def Lt 1.58' Iron set



2.35
14.40
299.95 | 16.75
.05584 = tan. 3-11-48
+ 87-30
90-41-48
89-18-12

FCP
1925

0.03' in 299.95' = 0.26'

Sta 60+83.90 PI Def Rt 3°18' Pipe 36"

Note: Sta. 60+83.90 is 2.35 ft W of PI on Mulberry Con. Imp.

6083.90
4734.84
1349.06

See Bk # 127
Pg 49-50 for
Reloc. 1948

1½ x 3 stone box in fair condition

46+80
12 7

10" VSP in good condition

41+96
12 6

58 W 18" Hickory

93°00

Tacked Hub

32.27

N 13°25 E

S 3 W, N 17.38

2.35'

60+84 Mulberry Con. Road

87°30'

S 3 W side sign post

34.55

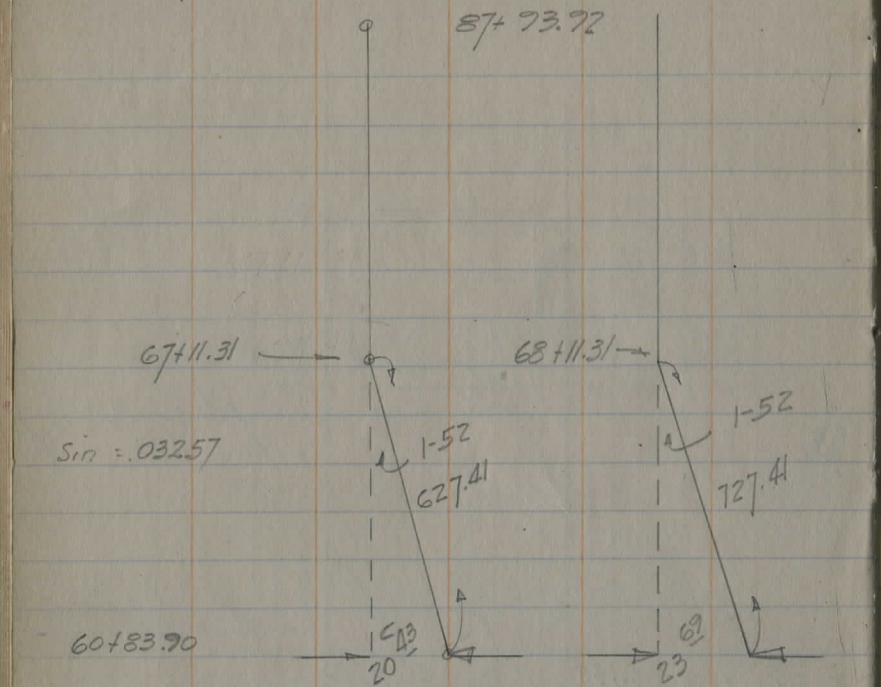
S & W Telpole

I.P. fd Aug. '42

90-41-48
90-45 meas.
(See Bk 127 Pg. 8)

F.C.P. 1945

5'+83 Mulberry Inc Road



68 + 11 31 ?

Sta 67 + 11 31 PI Dd. Rt. 1°52' Iron Set

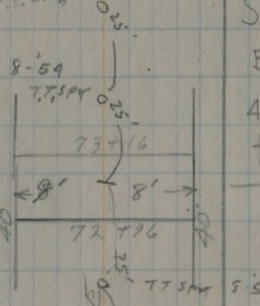
24" Corl Pin good condition

84+37
15 7

8-54 T.T.SPK

8-54 T.T.SPK

Span 26' Height 8'
Slab concrete Bridge
Pipe railing
in fair condition
S wall-concrete
N wall-Stone



Boring W side Sabut.
Blue clay to 4.5
4.5 to 4.75 or S fine gravel

V. SPK E. Root
42" Maple

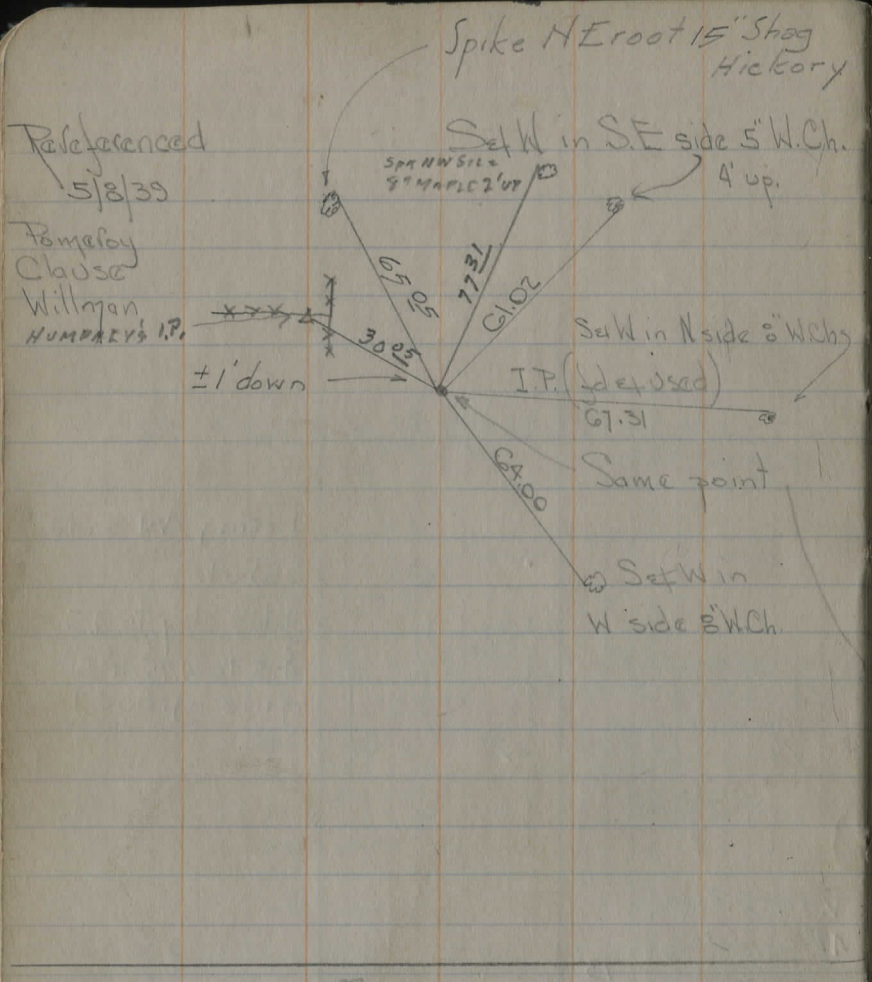
62 13'

S 25° 51' W 1598'

SPK N Side
CEI 899481

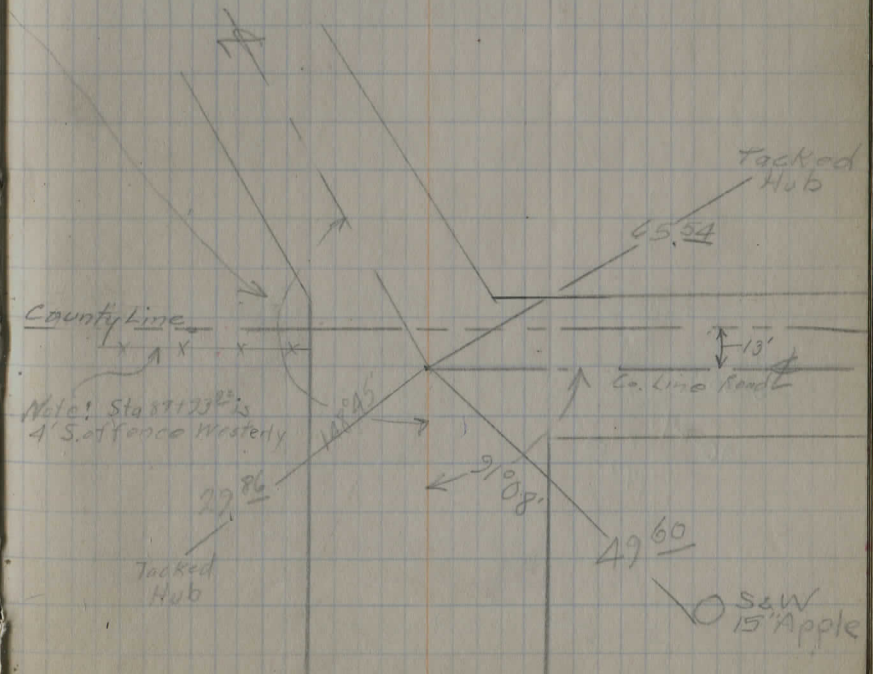
2598'

To find
10-29-43
Fd 14" down 8-54
BROUGHT UP WITH SQUARE HEAD BRIDGE BOLT



Sta 87 + 93.23 End of Imp. Top of Set

Note: County Line determined from fence corner 1500' West and an Iron Pipe 800' East of River Bridge. County Line is 1.3' N of Co. Line Road as traveled and 2' W of Fence line West



12/29/47

Rods

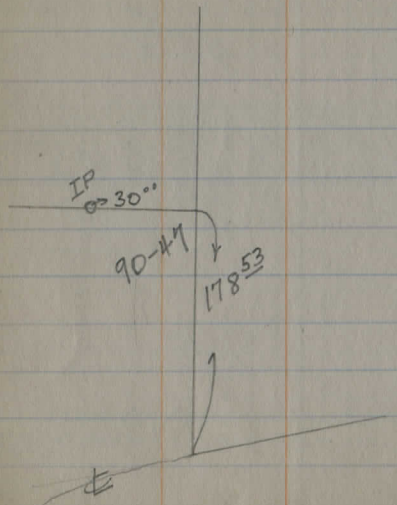
7.56 = F.L. East end middle 3@ 36" conc. Pipe

7.44 = F.L. West " " " " "

9.08 = " West " 12" conc. pipe = 335 ft

Nth " 3@36"

12" pipe = 1.6 ft lower ~~than~~ 3@36"



See back of book for computation.

Line B Sperry Road Hill Location

Note: Sta 40+33.11 Line B = 39+72.09 Line A

Sta 39+64.35 PI Def Rt. 46°48' = Sta 39+01.55 Line A.

Curve Data
- Δ - 46°48 Rt.
- D - 32° R = 179.05
- T - 77.49
- E - 16.0
- L - 146.25
- PC - 38+86.86
- PT - 40+33.11

Sta 38+27.77 PI Def Lt. 103°21 Inaccessible PI

Curve Data
- Δ - 103°21 Lt.
- D - 56° R - 102.31
- T = 122.39
- E - 62.6
- L - 184.55
- PC - 36+98.38
- PT - 38+82.93

Sta 36+63.39 PI Def Rt. 59°03 Hub Set

Curve Data
- Δ - 59°03' Rt.
- D - 80° R = 71.62
- T - 40.56
- E - 10.3
- L - 73.81
- PC - 36+22.74
- PT - 36+96.55

60°

1/17/73

#5 Aguilla Rd.

cont. on back this sheet

1

60784 Colvt.

FB # 128 Pg. 7

12793.4

9.5' 7'

PK

PK

Stakes set

30' Lt. ℄

PK

PK

PK

PK

PK

PK

PK

PK

PK

PK

PK

PK

0+0

Obs. 100-42'

FB 128 Pg. 6 = Rec'd 109-42'

Iron Pipe

New Bridge 1/73

Aguilla Rd.

FB 128 (77) Pg. 53

Iron Rod

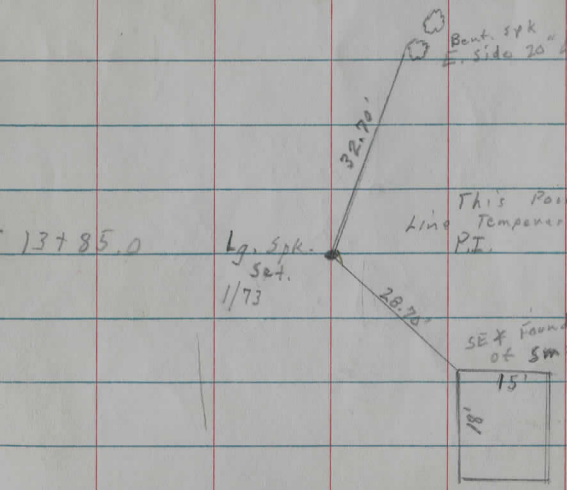
FB 128 1968 120-44'

Iron Pipe

This perfection seems to be 4° in error by

Iron Pipe

$ 4.42
$ 8.22
$ 2.87


Bent. Spk
E. side 20" below ust
32.70'
This Point set on Line Temporarily, is Not P.I.
13785.0
Lg. Spk. set. 1/73
28.70'
SE ✗ Foundation of small Bldg
15'
18'

#5 Aquilla Road

60°
1/18/73

Topo

	E	℄	W
3+0	Pavmt. edge	4' 8'	
+20		25'	6" Maple
+50	Pavmt edge	4' 8'	
+50			} wire fence
+35		26	
+14	1.5x4' Culvt	6' 15.5'	
2+0	Pavmt. edge	4' 8'	
+21		24'	4" Cherry
+05	CEI	28'	
+02			10" Conc. Dr. pipe
1+50	Pavmt. edge	4' 8'	
+42			℄ Grav. Dr.
+31		18'	8" V.I. Dr. pipe
1+0	Pavemt edge	5' 7'	
+50	Pavement edge	0 13'	
+50	3 Mail Box	8'	

0+0 = ℄ of Fisher & Aquilla Roads

	E.	℄	W.
5+10	Pavm't edge	5' 6'	
+11		29'	end fence & Brush 18" Hickory
+06		25'	14" Hickory
+50	Pavm't edge	5' 6'	
+20		29'	6" Maple
4+10		4' 7'	
+50	Pavm't. edge	4' 7'	
+49	CET	28'	
+39		26'	fence
3+10		25'	Beg Brush

R E HERSHBERGER
A. CYPZIK
D. LaMOREAUX

SNOW & SHERMAN RD. E OF FOWLER'S MILL RD. FOR MUNSON TWP.

F 2 FEB. '79
23° VAR. CLOUDINESS
W TO 14 MPH

W. 7 FEB 79
20° CLOUDY - SNOW
QUIET

RER
A.C.
D.L.

N

FOWLER'S MILL RD

400' 1"

0.17 MI.
0.14 MI.
0.125 MI.

.135
.14
.17

PK SET = MARKER STAKE R/W SET

PK SET = R/W MARKER STAKE SET

0.34 MI.

PK SET

PK SET

R/W MARKER STAKE SET.

CHEESEMAN DR.

SPK E FACE

33 SPK 0.317 X 011

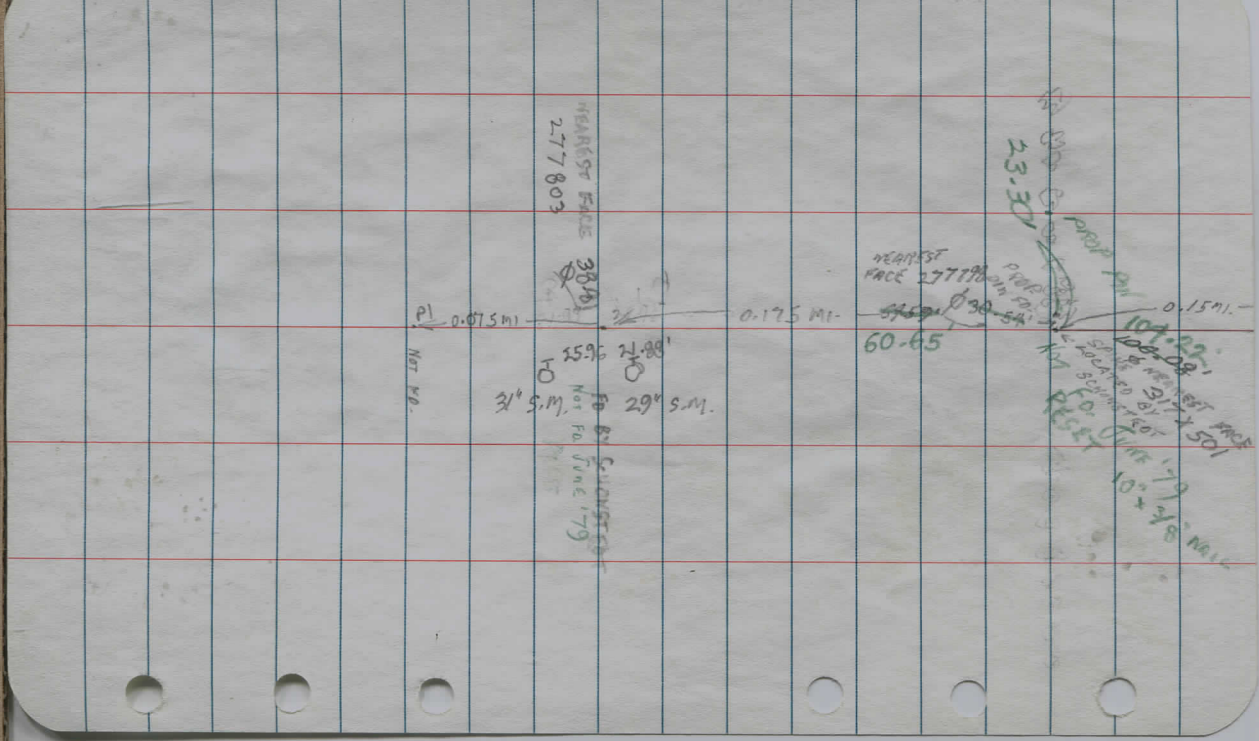
SPK N.E. SIDE

SPK W FACE

PK SET OVER SPIKE

SHERMAN RD.

HOPE 10"



NEAREST FACE
277803
~~Ø~~ 38.8'
PI
0.075 MI
NOT FD.
35.96
21.88'
31" S.M.
29" S.M.
FD BY SCHONSTEDT
NOT FD. JUNE '79
0.175 MI
NEAREST FACE 277798
PROP. PIN FD.
~~57.59'~~
Ø 30.54'
60.65
23.30'
PROP. PIN
0.15 MI.
107.22'
~~106.08'~~
SPIKE & NEAREST FACE 317 X 501
LOCATED BY SCHONSTEDT
NOT FD. JUNE '79
RESET 10" + 3/8" NAIL

Sec. "A" "1" "1"

11/27/33

Richey
Merriff
Dietz

40

Sperry Road or ~~Hill~~ Road
℄ Location

Sidestakes set 25' Rt. or East

Sta 10+49.22 POT

5/8" I.P. Set

Sta 4+94.22 POT.

Pipe Set

Sta 0+10 = Edge of Rt

Sta 0+00 ℄ Mayfield Road

X cut in Concrete

Mayfield Road North to Wilson Mills Road

25.0' Pipe

31.72 Set W 6" Pipe

44.81 Set W 10" Pipe

Old N 5°10' E

Set W 15" Maple

75.53

90°20'

180°38'

℄ Mayfield Rd

U.S. 322

65.26

Set W CEI Pole

67.50

3 nails CEI pole

100'

Sta 27+50 ± Fence E.

Sta 18+59 Fence W

15" Conc Pipe 38' long

32+97 →

12" Conc Pipe 32' long

27+18 →

25

12" Conc. Pipe 32' long

17+06 →

15" Conc. pipe 32' long

23+26 →

19+50 Drive

2'x3' stone & conc. Box culv. in good condition

16+12

7± 11±

85 → H

12+20

12+35

Sta 44+70.15 POT — Pipe Found

I.P. set in I. pipe 10/9/74-4" dia.

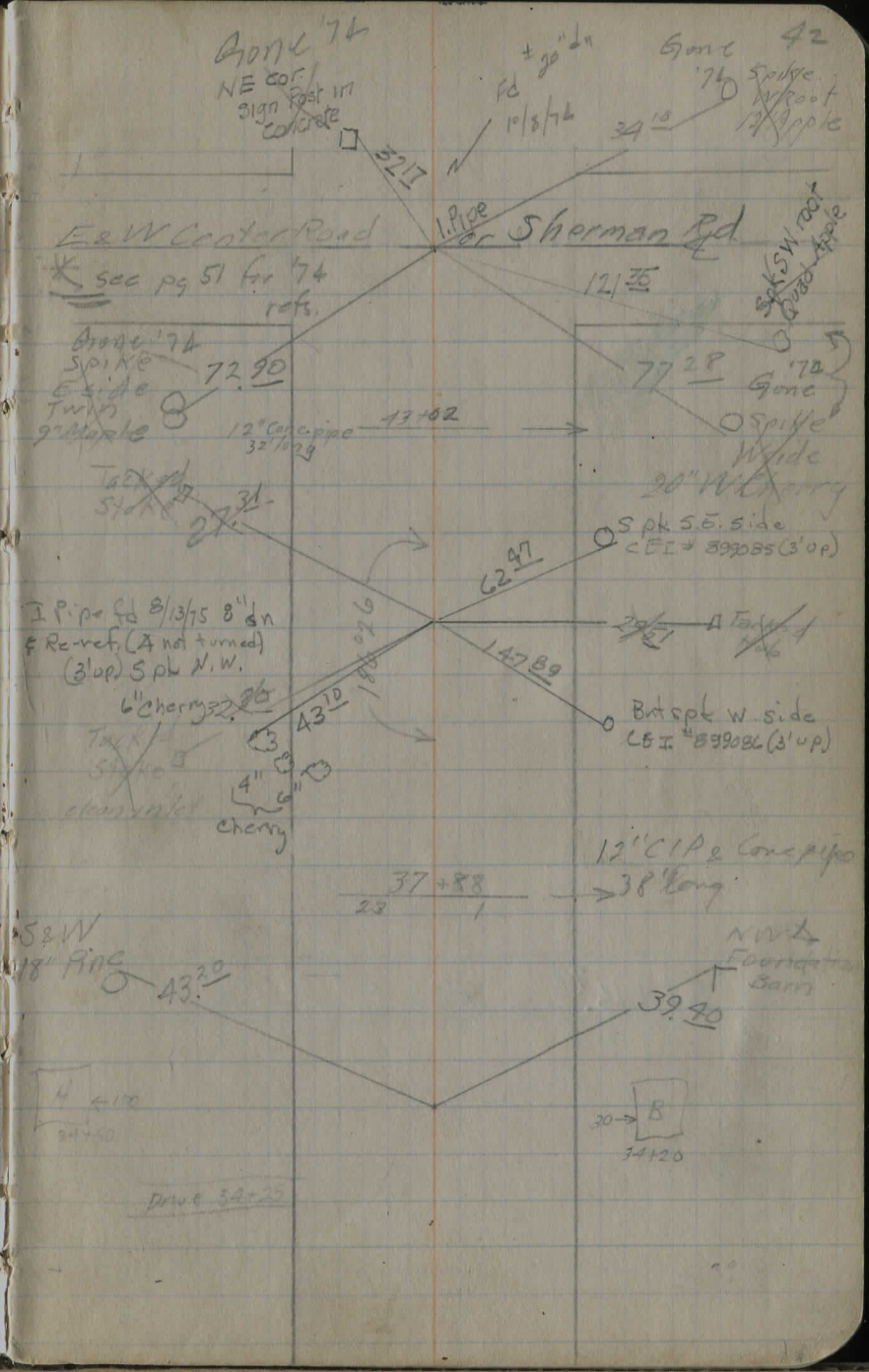
Sta 42+51.43 P.I. Det-Rt 6°26' — Iron Set

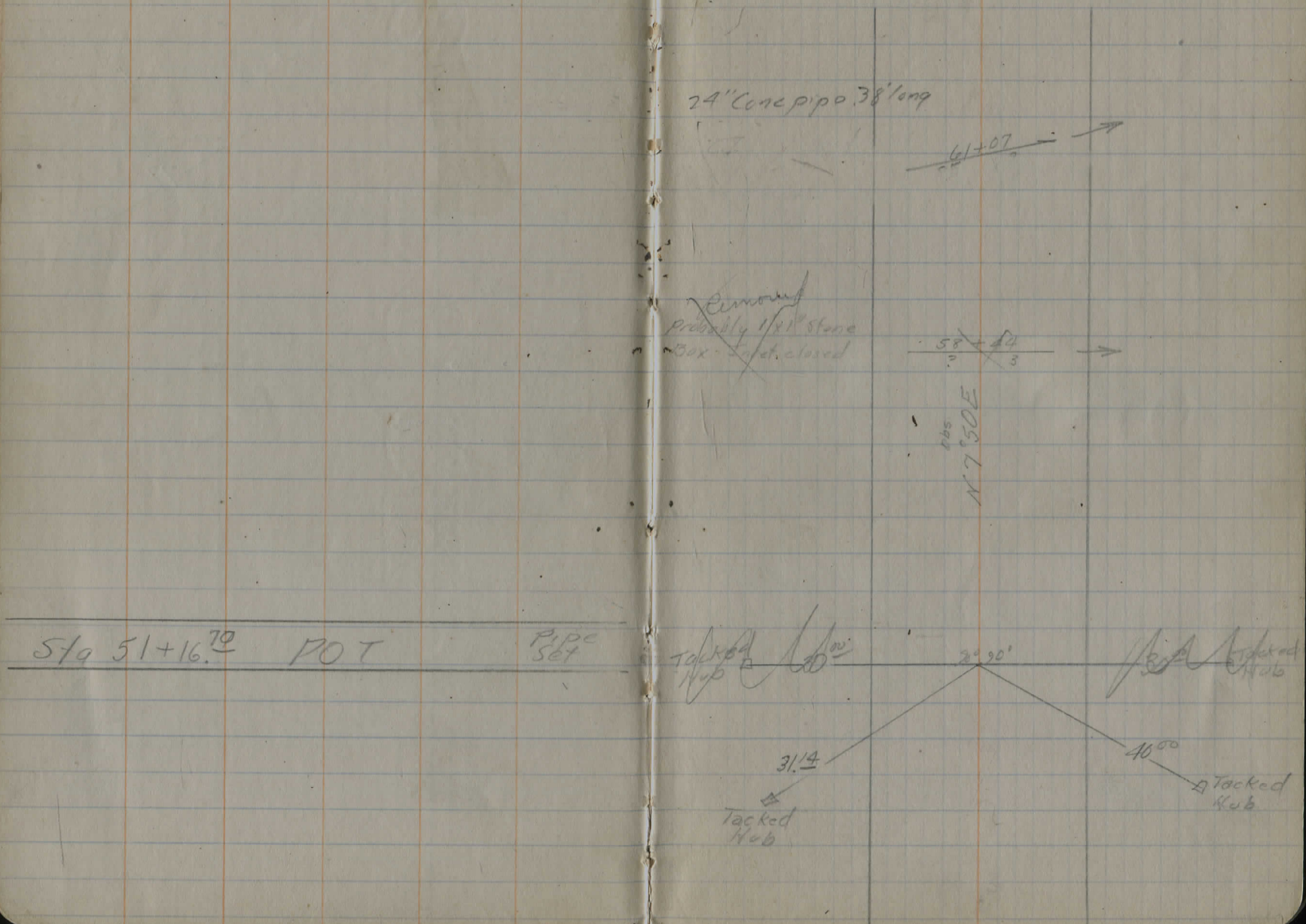
Curve Data:

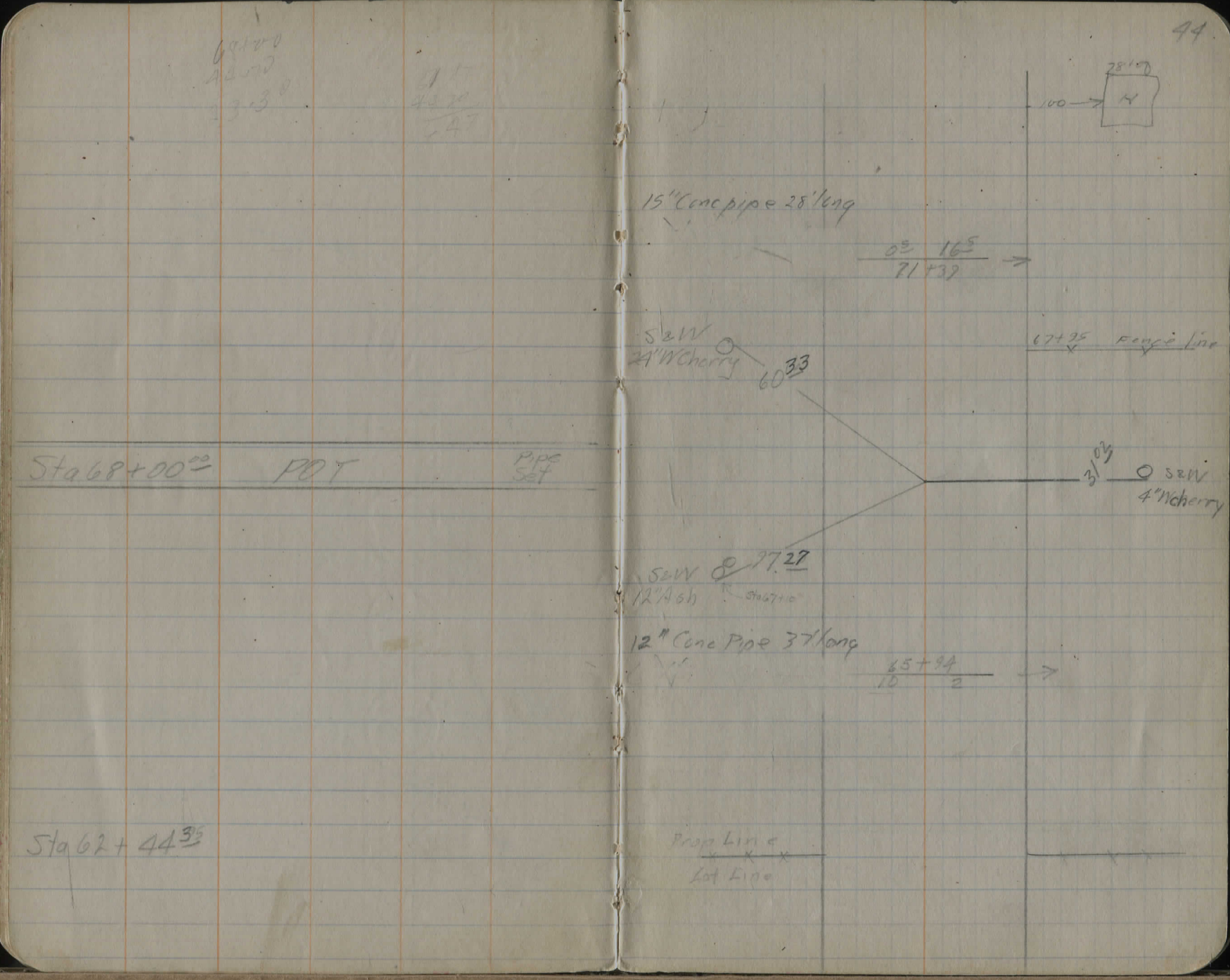
- Δ - 6°26' Rt.
- D - 1°30
- T - 214.67
- E - 6.0
- L - 428.52
- PC - 40+36.76
- PT - 44+65.65

40+36	0°00
41+00	0°38
42+00	1°13
43+00	1°58
44+00	2°43
44+65	3°13

Sta 34+52.31 POT — Nail & Shiner Set




24" Conc pipe 38' long
61+07
Removed
probably 1'x1' stone
Box - 2 ft. closed
58 + 03
3
N 7° 50E
Sta 51+16.70 POT
Pipe Sta
Tacked Hub
20° 90'
Tacked Hub
31.14
Tacked Hub
40.00
Tacked Hub


28'17"
N
100
15" Conc pipe 28' long
0° 16"
71+39
5 & W
24" W Cherry
60 33
67+25 Fence Line
Sta 68+00 POT
Pipe Set
3 03
5 & W
4" W Cherry
5 & W
12" Ash
27 27
Sta 67+10
12" Conc Pipe 37' long
65+94
10
2
Sta 62+44 35
Prop Line
Lot Line

Sta 85+43.65 PI Def Lt 10°37' Pipe Set

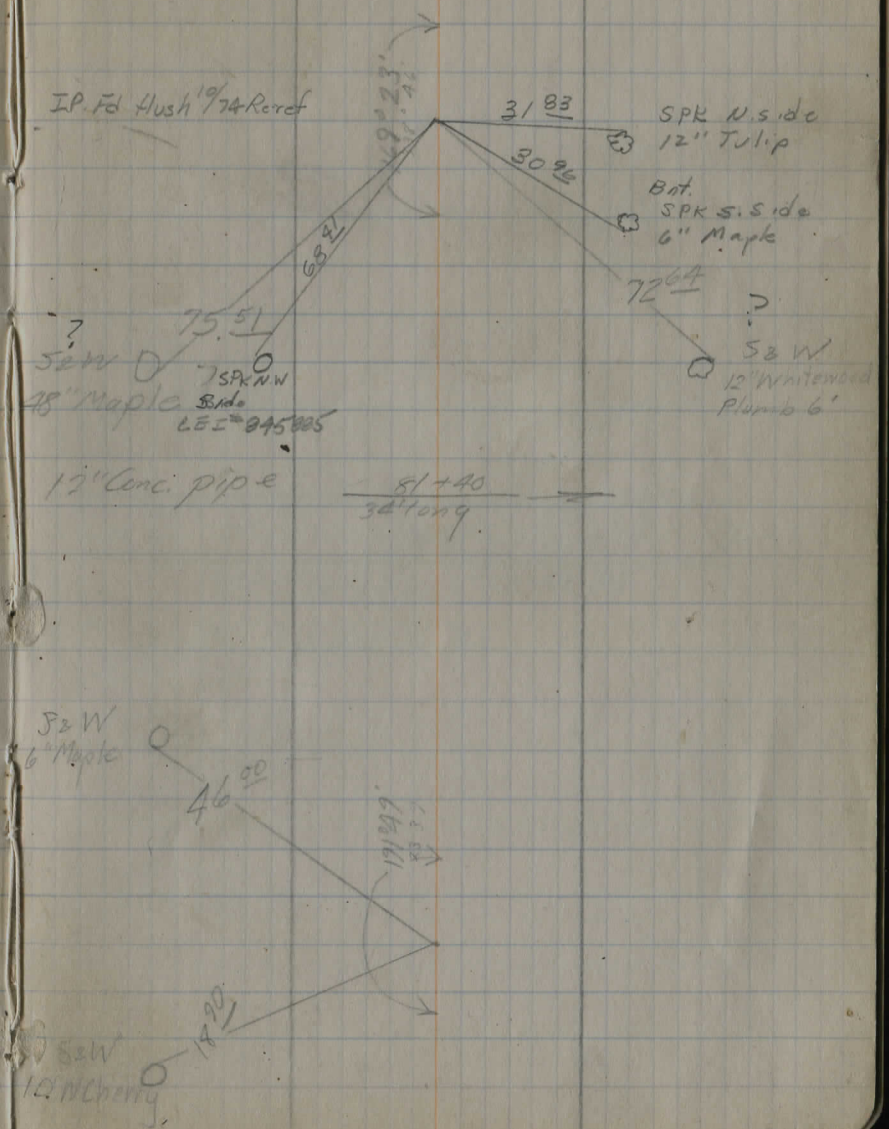
Curve Data
- Δ - 10°37' Lt
- D - 2°30'
- T - 212.96
- E - 9.9
- L - 424.66
- PC - 83+30.69
- PT - 87+55.35

84 - 1.1
85 - 6.4
86 - 5.3
87 - .67

Sta 79+62.52 PI Def Rt 11°49 Iron Set

Curve Data
- Δ - 11°49' Rt
- D - 2°30'
- T - 237.16
- E - 12.2
- L - 472.66
- PC - 77+25.36
- PT - 81+98.02

78 - 1.2
79 - 6.6
80 - 6.9
81 - 1.7



1.69 miles

5280 | 8932.60

3716

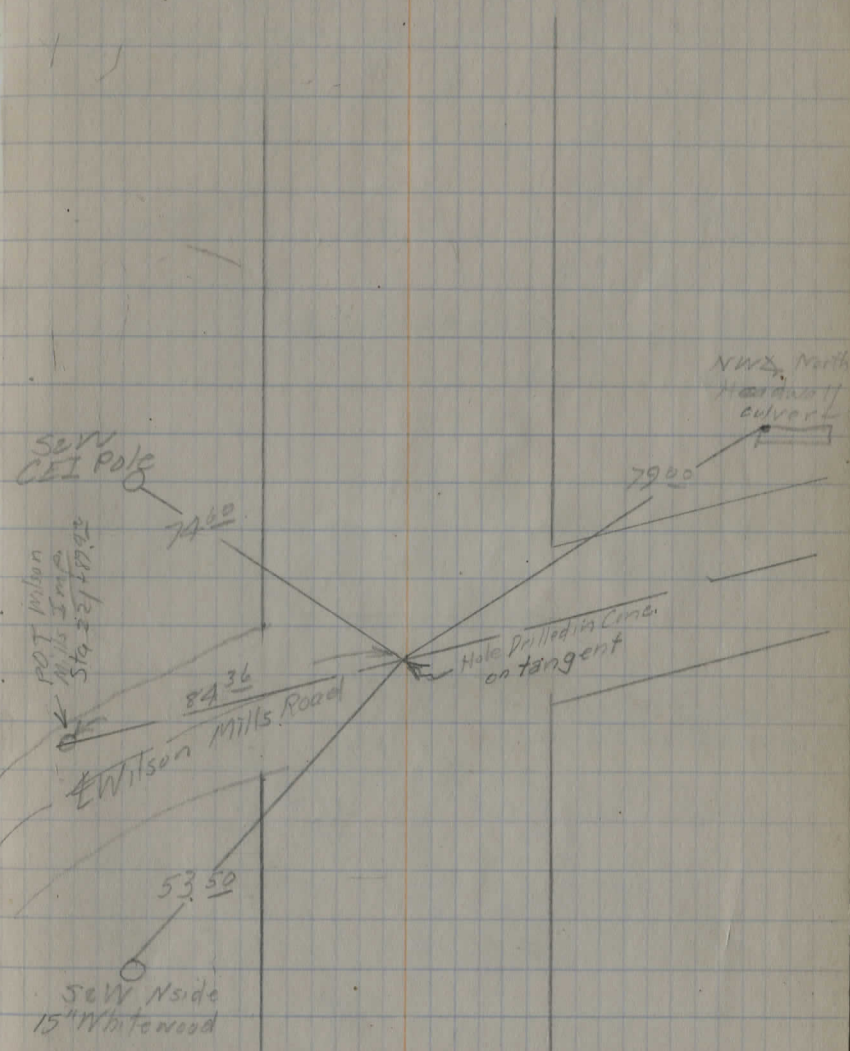
36526

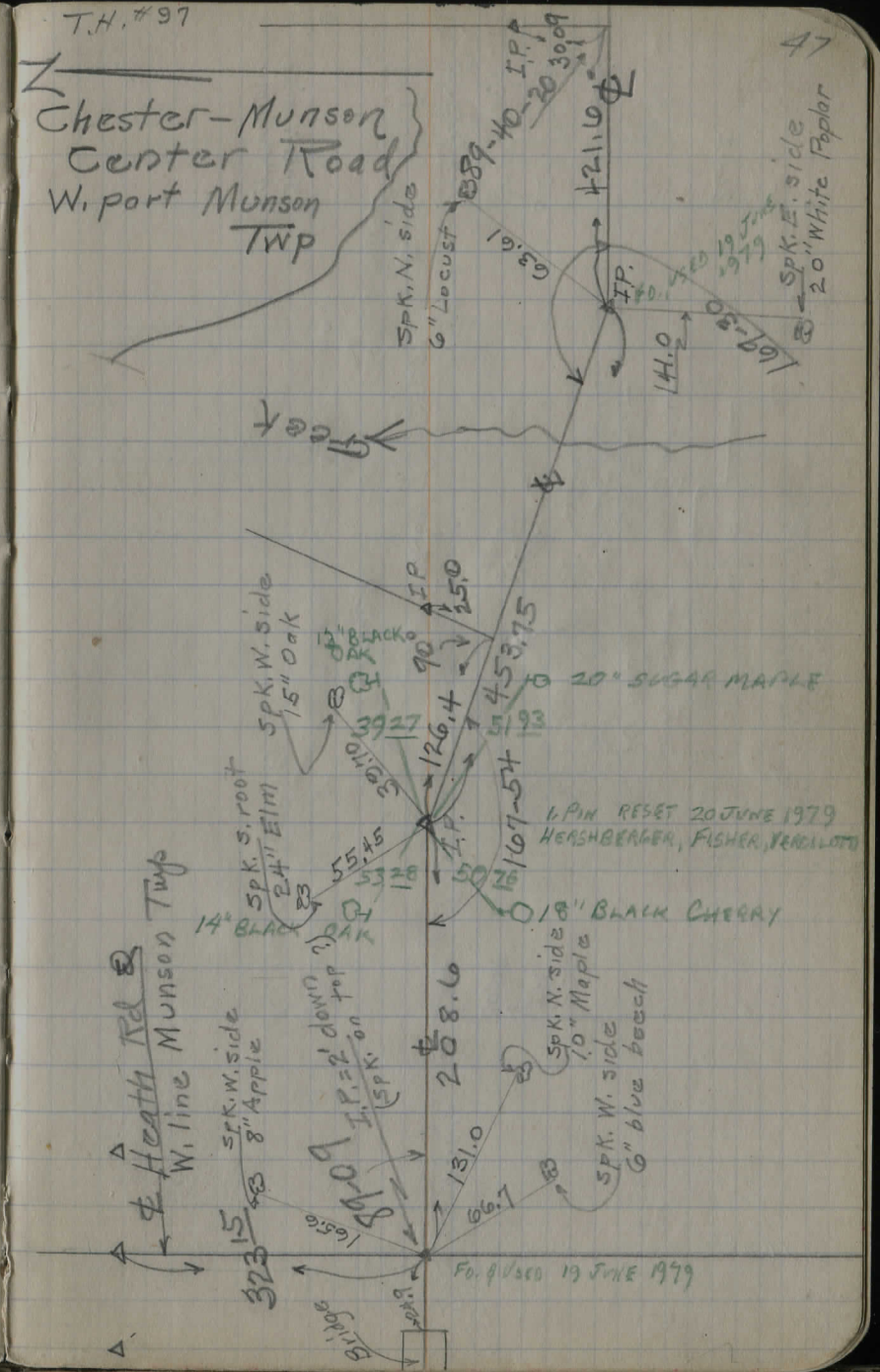
31681

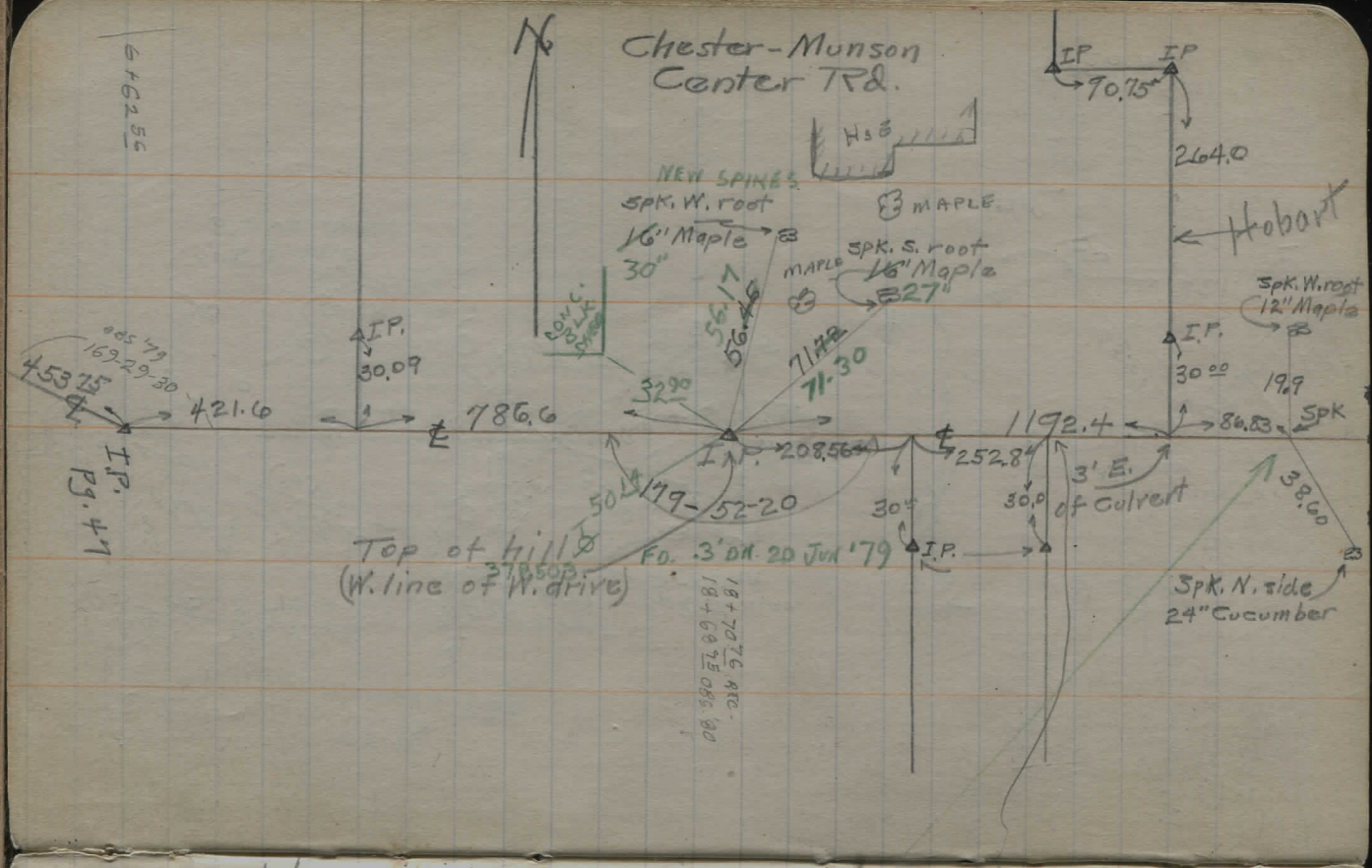
48460

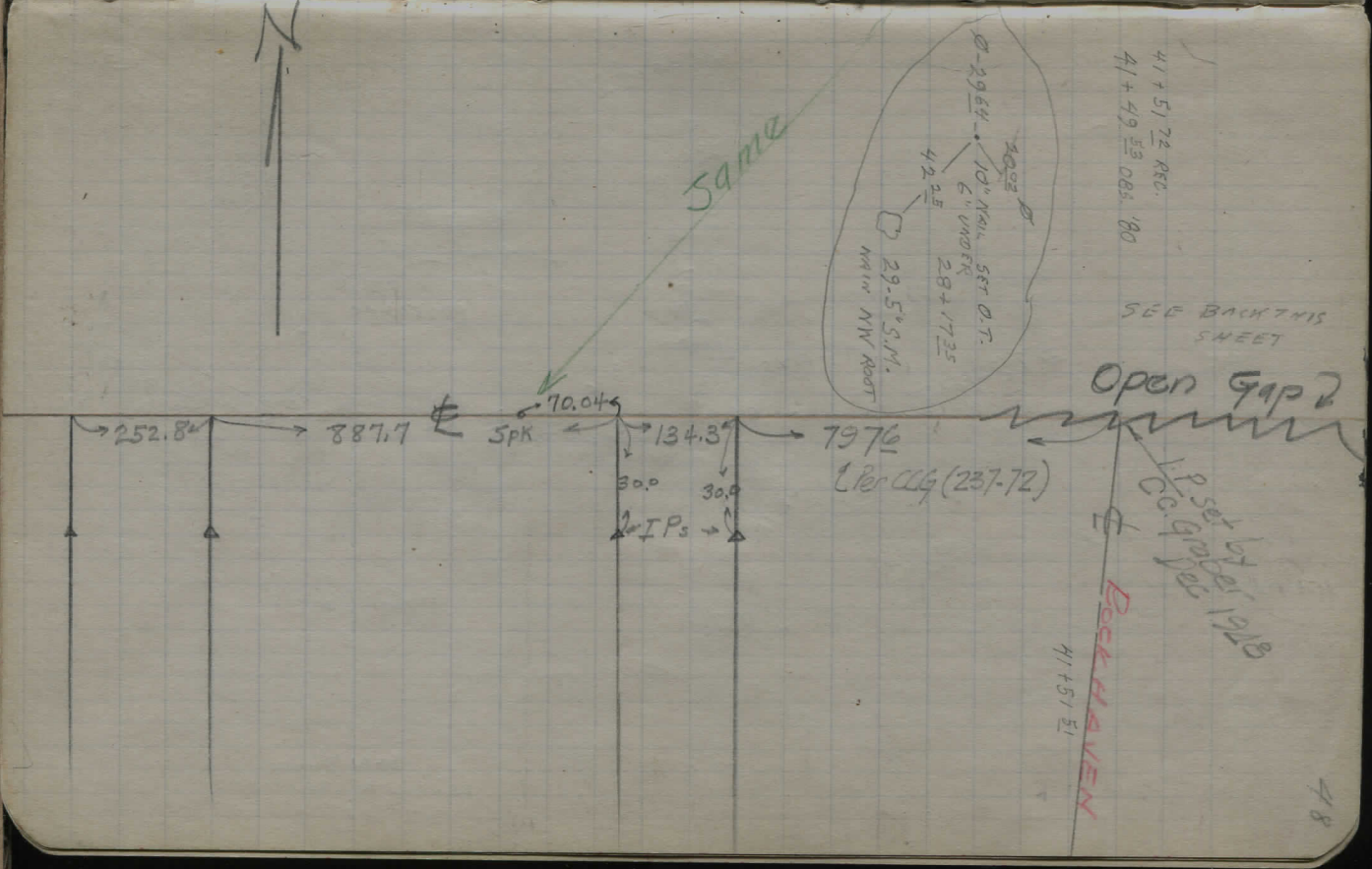
Sta 89+32.60 ℄ Wilson Mills Rd — Hole drilled in Pvt

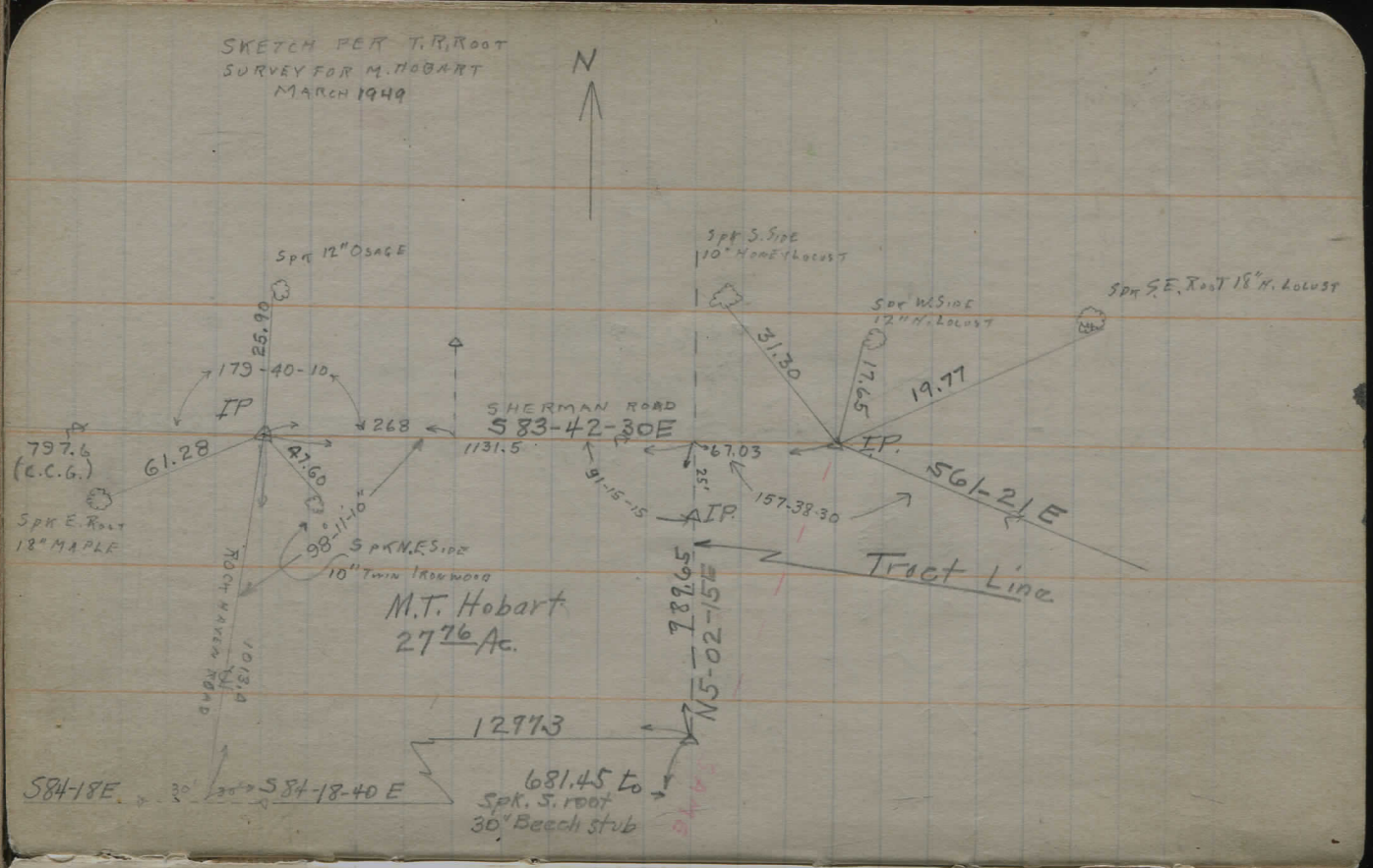
Sta 89+20 = Edge of Pvt

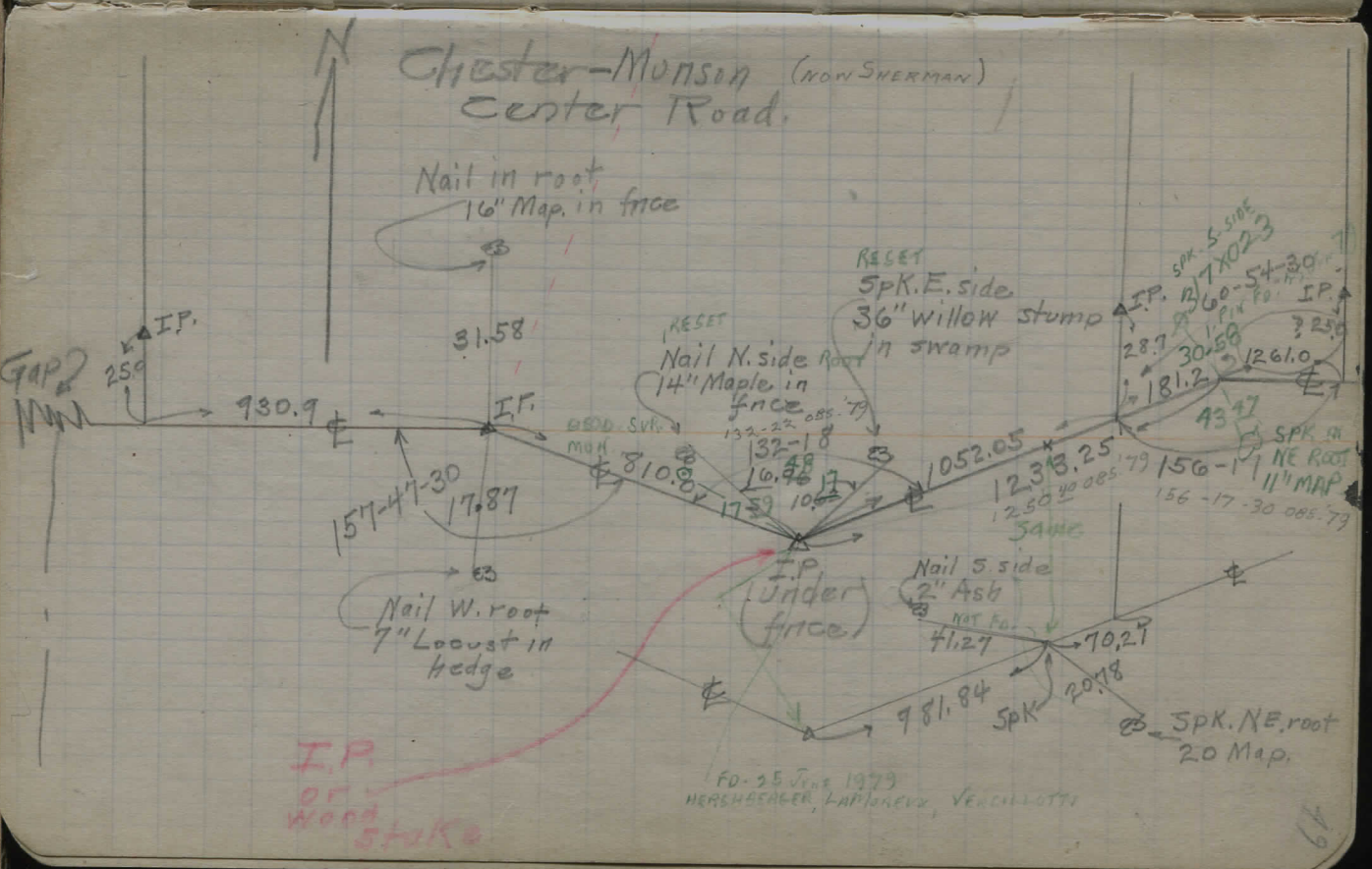


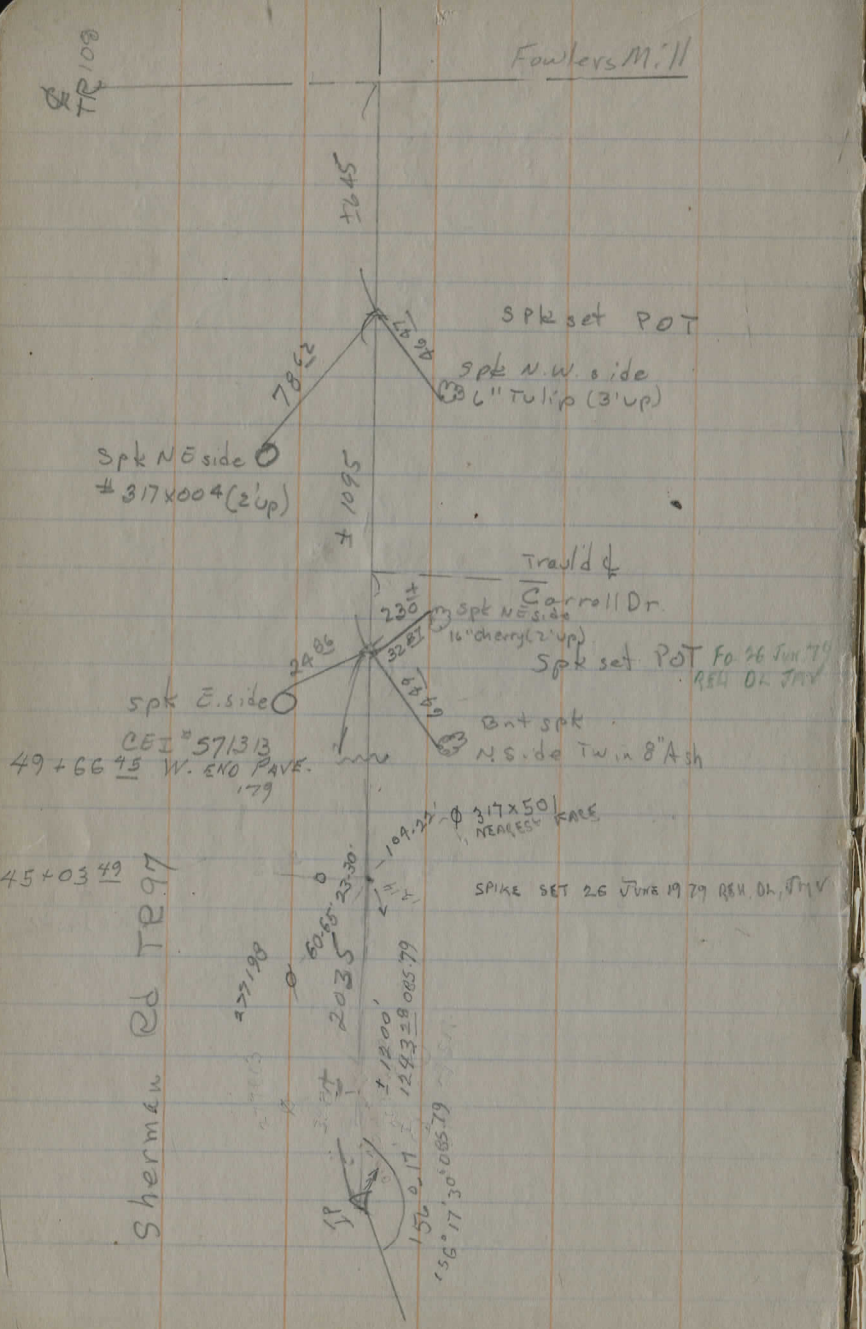

T.H. #97
Chester-Munson
Center Road
W. port Munson
Twp
SPK. N. side
6" Locust
I.P.
I.P.
SPK. E. side
20" White Poplar
I.P.
I.P.
I.P.
I.P.
17" BLACK OAK
SPK. W. side
15" oak
20" SUGAR MAPLE
SPK. S. root
24" Elm
14" BLACK OAK
I. PIN RESET 20 JUNE 1979
HERSHBERGER, FISHER, VERCILOTTO
18" BLACK CHERRY
Heath Rd
W. line Munson Twp
SPK. W. side
8" Apple
I.P. = 2' down
SPK. on top
SPK. N. side
10" Maple
SPK. W. side
6" blue beech
FD. PIPES 19 JUNE 1979
Bridge


Chester-Munson
Center Rd.
N
IP
IP
70.75
264.0
Hobart
H.S.
NEW SPIKE
Spk. W. root
16" Maple
30"
MAPLE
Spk. S. root
16" Maple
27"
Spk. W. root
12" Maple
IP.
30.09
I.P.
30.00
19.9
Spk
421.6
786.6
1192.4
86.53
208.56
252.8
3' E.
of Culvert
38.60
Spk. N. side
24" Cucumber
179-52-20
Top of Hill
(W. line of W. drive)
Fd. .3' DN. 20 Jun '79
IP.
Pg. 47
18+70.76 Rec.
18+60.45 Obs. '80


N
Same
Ø-29.64
10" Maple set O.T.
6" under
28+17.35
42.25
29.5' S.W.
Main NW Root
41+51.72 Rec.
41+49.53 Obs. '80
SEE BACK THIS SHEET
Open Gap
252.8
887.7
Spk
70.04
134.3
30.0
30.0
2 IPs
7976
1 Per CCG (237.72)
I.P. set by
CC. Graber Dec. 1918
ROCKHAVEN
41+51.51


SKETCH FOR T.R. ROOT
SURVEY FOR M. HOBART
MARCH 1949
N
Spk 12" Osage
Spk S. Side
10" Honey Locust
Spk W. Side
12" N. Locust
Spk S.E. Root 18" N. Locust
26.90
179-40-10
IP
268
SHERMAN ROAD
S 83-42-30 E
1131.5
61.28
47.60
797.6
(C.C.G.)
Spk E. Root
18" Maple
98-11-10
Spk N.E. Side
10" Twin Ironwood
67.03
25.
91-15-15
IP.
157-38-30
31.30
17.65
19.77
IP.
S 61-21 E
Tract Line
M.T. Hobart
27 76/100 Ac.
ROCK HAVEN ROAD
1013
N 5-02-15 E
789.65
12773
S 84-18 E
30'
S 84-18-40 E
681.45 to
Spk. S. root
30" Beech stub


N
Chester-Munson (NOW SHERMAN)
Center Road.
Nail in root
16" Map. in fence
IP.
25¢
GAP?
930.9
31.58
IP.
157-47-30
17.87
Nail W. root
7" Locust in
hedge
RESET
Nail N. side Root
14" Maple in
fence OBS. '79
132-22-18
RESET
Spk. E. side
36" willow stump
in swamp
810.08
1052.05
1233.25
1250 OBS. '79
SAME
IP
(under
fence)
Nail S. side
2" Ash
NOT FD.
41.27
70.27
981.84
Spk
20.18
Spk. NE. root
20 Map.
Spk. S. side
IP.
IP.
156-17-30
1261.0
181.2
28.7
30.58
43.47
Spk. in
NE Root
11" Map
156-17-30 OBS. '79
I.P
of
Wood
Stake
FD. 25 JUNE 1979
HERSHBERGER, LAPP & REVY, VERCELLOTTI


Fowlers Mill
CR 109
TR
±645
Spk set POT
Spk N.W. side
6" Tulip (3' up)
78.62
Spk NE side
#317x004 (2' up)
±1095
Trav'd ℄
Carroll Dr.
230±
Spk NE side
16" cherry (2' up)
Spk set POT Fo 26 Jun 79
RBH DL JMV
24.86
32.87
Spk E. side
CEI #571313
49+66.45 W. END PAVE.
'79
Bnt spk
N.S. de Tw in 8" Ash
109.33
317x501
NEAREST FACE
45+03.49
SPIKE SET 26 JUNE 1979 RBH DL JMV
Sherman Rd TR 97
±7198
2035.23.30
±12.00'
1243.39.0657.79
156°17'30"
156°17'30"0657.79
JP

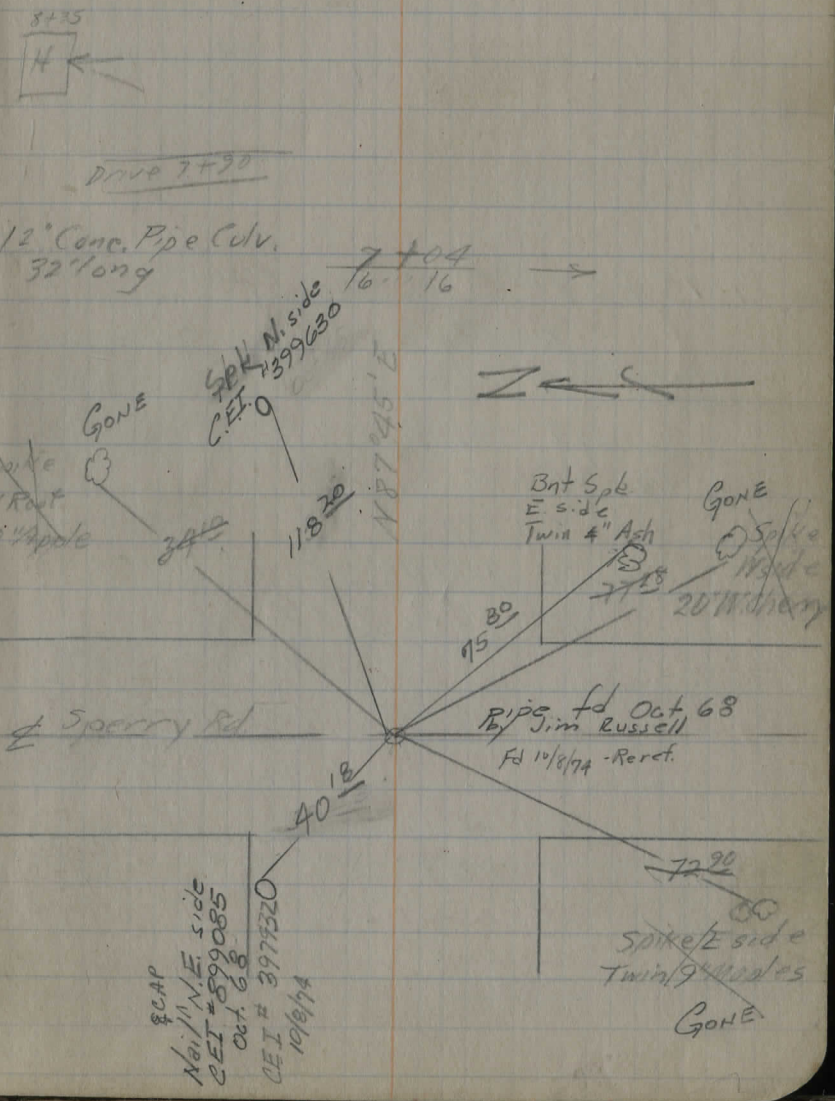
Sherman Rd

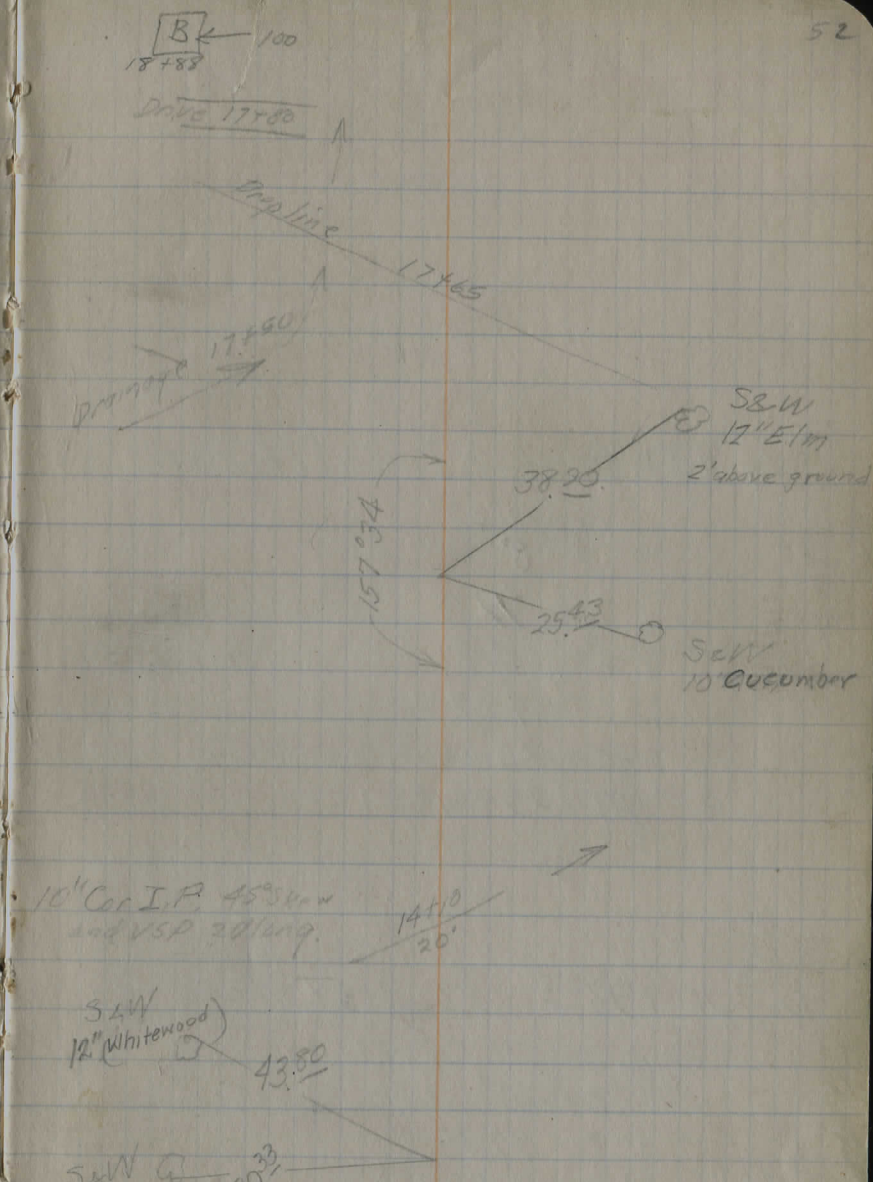
T.H. #97 Chester E&W Center Road
also known as Sherman Road
Side-stakes were set 25 Rt. of South

I.P. set in I pipe 10/9/74 4" dn. Pipe Found
Sta 0+00 ℄ Sperry Road

Note: Sta 0+00 - Sta 44+70.5 of Sperry Rd Imp

Sperry Rd East to Munson Line





Sta 15+29.40 PI Def Lt 22°26' Set

Curve Data
- Δ = 22°26' Lt.
- D = 14°
- T = 81.16
- E = 8.0
- L = 160.24
- PC = 14+48.24
- PT = 16+08.48

15-33
15+50 - 4.1
16 - 0.08

Sta 12+00 POT

H.P. Set

Sta 24+82.41 PI Def Lt 12°37'

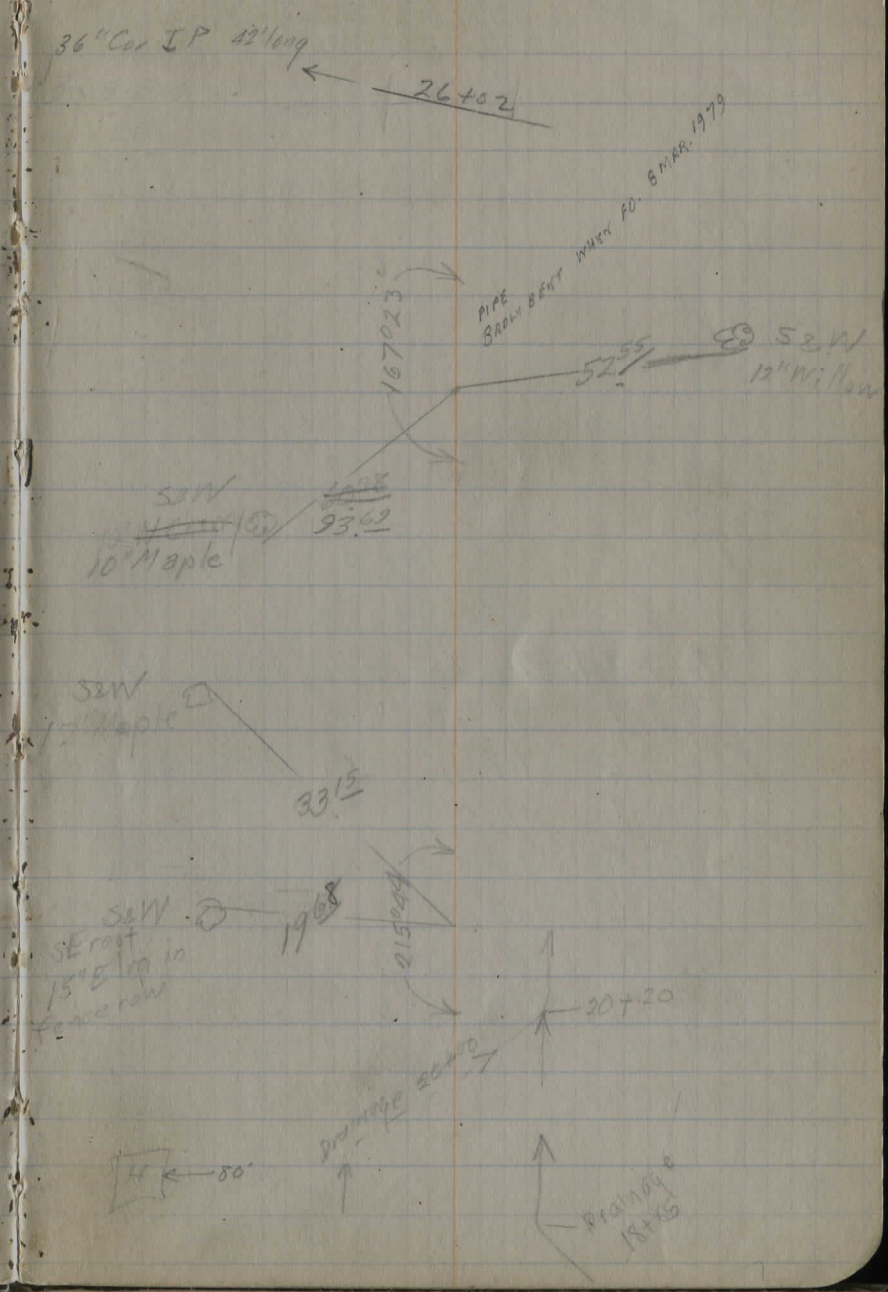
curve Data
- Δ = 12°37'
- D = 8°
- T = 79.18
- E = 4.4
- L = 157.71
- PC = 24+03.23
- PT = 25+60.94

24+50 – 1.5
25 – 2.6

Sta 20+93.42 PI Def Rt 35°44'

curve Data
- Δ = 35°44 Rt
- D = 20°
- T = 92.35
- E = 14.5
- L = 178.66
- PC = 20+01.07
- PT = 21+79.73

20+50 – 4.1
21+00 – 11.0
21+50 – 1.5



10"VSP in poor condition ← 35+29

N66-15E

S 2W
15" Maple

90.99

381597

48.77

S 2W

34.4

12" W Cherry in fence

PIN FD. 7 MARK. 179

30.88

12" TULIPTREE

60.03

26½" SCHOOL MARKED MAPLE, NAIL 7" ABOVE GROUND

30+73

29.74

P.L. ?

Sta 30+92.51 Left 22.25 Set

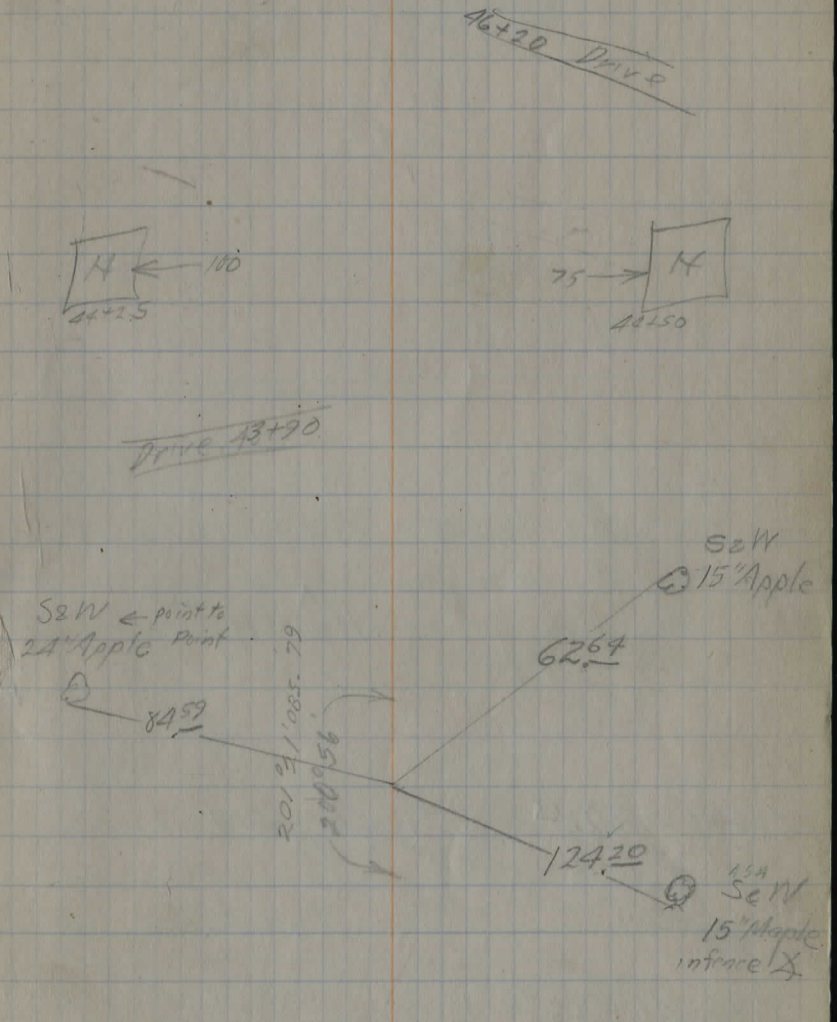
curve Data
- Δ = 22°25' Lt.
- D = 14°
- T = 81.10
- E = 7.9
- L = 160.12
- PC = 30+11.41
- PT = 31+71.53

30+50 - 1.8
31+00 - 6.0
31+50 - 6.53

Sta 41+20.50 PI Det Rt 20°56'

curve Data

- Δ = 20°56' Rt.
- D = 4°
- T = 264.62
- E = 24.4
- L = 523.33
- PC = 38+55.88
- PT = 43+79.21



.888 miles

5280 | 4687.87

4224

4638

4224

4147

63.15
2.49
88.05

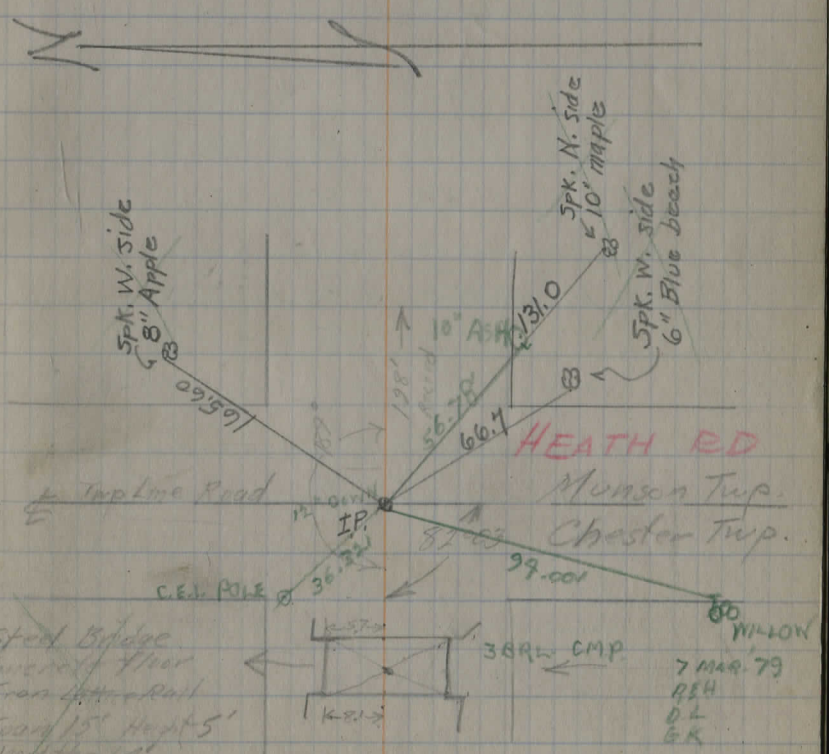
Sta 46+87 = Sta 55+69± of the Twp. Line Rd Improvement

Heath

Sta 46+87.87 ℄ Twp Line Road

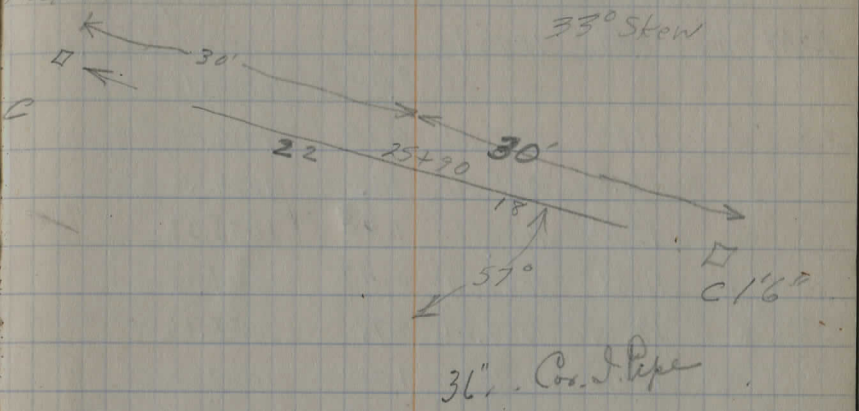
Sta 46+54.02 ℄ Bridge P.O.T. 2 spikes set on exact ℄

33.85
7.5
26.35



Culvert at Sta 25+90 Sherman Rd.

Flow N	10.6		
" S	7.6		
Finished Grade			
Flow S	8.0		
Stake S	7.30	5.80	C 1'6"
Flow N	10.8		
Stake N	11.50	8.50	C 3'0"



C. Graber
W. Rossback
May 22 1935

Clear. Cool.

	+	HI	-	Ele
Bench Mark Levels				Sperry Road
BM #1	1.48	1008.70		1007.22
			8.44	1000.26
	12.44	1012.66	0.26	1012.40
	12.86	1025.26	1.13	1024.13
	12.68	1036.81	1.48	1035.33
	11.88	1047.21	0.47	1046.74
	12.72	1059.46	0.78	1058.66
	12.17	1070.83	1.01	1069.82
BM #2	11.52	1081.34	4.36	1076.98
	4.36	1081.34	0.38	1080.96
	12.89	1093.85	1.34	1092.51
	11.55	1104.06	0.90	1103.16
BM #3	12.68	1115.84	0.69	1115.15
	0.69	1115.84	0.69	1115.15
	11.05	1126.20	10.05	1116.15
BM #4	8.24	1124.39	10.98	1113.41
	10.98	1124.39	0.53	1123.86
	10.79	1134.65	0.70	1133.95
	11.86	1145.81	0.02	1145.79
	10.72	1156.51	9.33	1147.18
	3.30	1150.48	7.89	1142.59
BM #5	5.70	1148.29	4.46	1143.83
	4.46	1148.29	1.54	1146.75
	11.41	1158.16	1.19	1156.97
	10.40	1167.37		

Spike in N. Root 18" Ash 275' W. of Sperry Rd. = B.M. = #29 Wilsons Mill Rd.
on spike
" stone
" spike
" stone
" "
" Spike.

B.M. Spike in Root 24" Map. 20' left at Sta 81+62
on spike
" "
" stump

BM Spike in Root 24" Map 30' left ℄ Sta 68+63
on spike (not B.M.)

B.M. Spike Root 18" Map 32' left ℄ Sta 60+40
on spike
" "
" "
" "

F/p conc pipe NW intersection Sta 44+85
BM Spike Root 15" Map (twin) 21' left ℄ 44+06.00

May 22 1931 — Graber Inst — Rossback Rod. — Clear Cool — 59

	+	HI	−	Ele	
		1167.37	0.08	1167.29	
	12.46	1179.75	0.38	1179.37	
BM #6	7.09	1186.46	3.28	1183.18	← B.M. 2 Spikes Root 15" Pine 30 L. of ℄ 34+73
	3.28	1186.46	12.00	1174.46	
	4.74	1179.20	11.85	1167.35	
	5.80	1173.15	9.15	1164.00	on temp stake 26+50 25' L. ℄
BM. #7	0.41	1164.41	4.89	1159.52	←
	4.89	1164.41	4.62	1159.79	B.M. Spike Root 15' Ash. 30' Left ℄ at Sta. 26+66
	1.40	1161.19	12.25	1148.94	Top stake Sta 19+00
	-0.02	1148.92	8.65	1140.27	on spike
BM #8	6.51	1146.78	11.14	1135.64	← B.M. Spike Root 18" W. Cherry 24' Rt of Sta. 16+09
	11.14	1146.78	1.70	1145.08	
	12.56	1157.64	0.17	1157.47	
	12.24	1169.71	0.12	1169.59	
	11.12	1180.71	0.53	1180.18	
	10.74	1190.92	7.11	1183.81	
	3.65	1187.46	7.39	1180.05	on ℄ Pipe Magf. 20' E of ℄
BM #10			6.21	1181.21	X on headwall (N.W. Cor.) + N.W. Cor X with Magfield

Check Lev. along Mayfield Rd. Sperry Rd to Chesterland. May 22, '35. 60

L	H I	−	Ele	
	1187.46		Ele	
		0.21	1187.25	
9.90	1197.15	0.30	1196.85	
8.53	1205.38	0.17	1205.21	
6.25	1211.46	11.97	1199.49	
0.95	1200.44	9.75	1190.69	
8.10	1198.79	0.18	1198.97	
10.07	1209.04	0.20	120884	
11.65	1220.49	0.00	1220.49	
9.85	1230.34	9.63	1220.71	
1.54	1222.25	7.18	1215.07	
7.10	1222.17	5.77	1216.40	
0.21	1216.61	7.26	1209.35	
5.90	1215.25	1.35	1213.90	
9.45	1223.35	5.66	1217.69	
2.47	1220.16	3.46	1216.70	1216.88
			1216.88 true El.	

On concrete platf. Cottrells Store
Govt. B.M. N.W. cor Wall. " " Chesterland.
" " " " " " " "

Bench Mark Levels E+W. Center Rd in Chester

	+	HI	−	Elc	
BM #1	4.63	1148.46		1143.83	
			11.29	1137.17	
	0.86	1138.03	8.40	1129.63	
	0.75	1130.38	11.61	1118.77	
BM #3	2.79	1121.56	0.63	1120.93	
BM [illegible]	0.63	1121.56	10.70	1110.86	
	1.10	1111.96	11.52	1100.44	
	1.84	1102.28	11.62	1090.66	
	1.73	1092.39	12.32	1080.07	
	0.29	1080.36	12.65	1067.71	
	0.61	1068.32	11.96	1056.36	
BM #4	1.70	1058.06	0.67	1057.39	
	0.67	1058.06	9.82	1048.24	
	2.38	1050.62	0.00	1050.62	
	11.42	1062.04	0.00	1062.04	
	12.04	1074.08	+0.01	1074.09	
BM #6	9.04	1083.13	9.36	1073.77	
	9.36	1083.13	0.00	1083.13	
	5.77	1088.90	10.73	1078.17	
	0.01	1078.18	11.34	1066.84	
	2.91	1069.75	11.95	1057.80	
BM #7	1.54	1059.34	6.87	~~1066.21~~	1052.47
	6.87	1059.34	11.78	1047.56	
	1.81	1049.37			

Cont on pg 62

(1st Rd. N of Mayfield East from Sperry Rd)

May 22 1935 — 61
C. Graber
W. Rossback
Clear. Cool

= BM #5 Sperry Rd Pg 58 this book.

{BM #2 = Spike in Root 24" Map 50' S. of ℄ Sta 2+70 El 1141.43
For Establishment see Pg 73 this book

BM Spike N. Root 10" Map 45' Rt ℄ Sta. 12+48

Spike S. Root 24" Map 35' Left (N) ℄ Sta 18+85

{BM #5 = Spike S. Root 48" Map 27' S of ℄ Sta 27+50 El = 1052.58
For establishment See Pg 75 this book

Spike Root 30" Map. 40' Rt ℄ Sta 29+27

top stake Sta 41+0
Hor. Spike Root 12" Apple 140' Lft Sta 41+0

	+	HI	−			
		1049.37				
			12.15	1037.22		
	1.17	1038.39	10.98	1027.41		
	1.28	1028.69	12.34	1016.35		
	0.90	1017.25	12.41	1004.84		
	0.45	1005.29	7.99	997.30		on d.H. & Iron Bridge floor
			7.85	997.44		T℄
BM#8	6.81	1004.25	4.50	999.75	999.98 ←	BM. 39.5' S. of Bridge ℄ on Twin 6sh 35' E ℄

X-Sec Sperry Rd. N. of Mayfield

	+	HI	−	Elev.	
BM#10	5.60	1186.81		1181.21	
0+00			6.5	80.3	
Culv.					
1+00			4.9	81.9	
2+00			4.2	82.6	
3+00			2.1	84.7	
	4.43	1190.17	1.07	1185.74	
4+00			4.1	86.1	
BM#9			1.90		1188.27
5+00			5.5	84.7	
6+00				76.8	
6+00	1.35	1179.80	11.72	1178.45	
7+00			8.5	71.3	
8+0			12.8	67.0	
	2.74	1169.56	12.98	1166.82	
9+0.			10.2	59.4	
	2.34	1159.18 ~~1159.50~~	12.72	1156.84	
10+0			8.6	50.6	
	0.96	1147.83 ~~1149.15~~	12.31	1146.87	
~~1+00~~					

63 5-23-35
Inst. CC Graber
Rod. W. Bossbeck
H. Hill. ch.
Clear, Cool, Windy

L & R

Xon
B.M. H.H. Culv. NW. cor. X with Mayf. Rd
100 / 5.0 — 6.5 — 100 / 7.3

18" V.P. Culv. 19 W. of 0+00 — 8 H FL N.1. 9.1 FL. S. End

2H 4.3 — 13 5.0 — 10 6.1 — 6 5.1 — 4.9 — 5 5.1 — 8 6.6 — 10 6.0 — Lev.

25 — 20 3.6 — 9.5 4.0 — 6 5.2 — 4 4.5 — 4.2 — 7.5 4.4 — 9.5 5.2 — 12 4.0 — 19 3.2

25 — 21 1.7 — 10 2.0 — 7 — 6 3.1 — 4 2.4 — 2.1 — 8 2.1 — 3.2 — 14 1.9 — 18 — 25 1.5

25 — 16 4.6 — 11 4.3 — 8 5.3 — 4 4.2 — 4.1 — 8.5 4.2 — 11 5.4 — 14 4.5 — 19.5 — 25 4.2

BM#9 3 Hor. Spikes Apple Tree 35 Rt — Sta 4+70

25 — 17 4.4 — 12 4.3 — 8 7.0 — 4 5.7 — 5.5 — 7 6.0 — 9 6.9 — 13 4.2 — 20 — 25 3.6

25 — 15 10.2 — 13 10.5 — 14 11.6 — 17 — 25 11

9 4.1 — 6 3.1 — 3.0 — 4 3.3 — 7 4.4

28 HA 5.9 — 21 6.5 — 14 9.4 — 8 6.5 — 8.5 — 5 8.6 — 8 9.0 — 9 9.7 — 11 8.3 — 17 — 25 8.4

25 — 21 7.7 — 15 9.5 — 9 15.2 — 5 12.9 — 12.8 — 5 13.0 — 9 15.0 — 11 12.8 — 18 13.5 — 25 14.5

19 — 25 2.8 — 85 — 75 11.3 — 5 10.4 — 10.2 — 6 10.3 — 8 11.7 — 14 6.7 — 25 9.2

25 — 21 3.5 — 18 4.6 — 9.5 — 10.5 9.8 — 6 8.7 — 8.6 — 5 8.8 — 7 — 8 9.4 — 11 8.7 — 16 7.1 — 23 — 25 9.9

T3.1

	+	HI	−	Elev	
		1147.83 +1149.15			
11+0.			1.7	46.1	
12+0			4.8	43.0	
13+0			5.9	41.9	
14+0			7.0	40.8	
		1141.77		1139.77	
	2.00	+1143.09	8.06	+1141.09	
15+0			3.7	38.0	
BM#8			6.13	+36.96	1135.64
16+0			6.5	35.2	
16+82 Conc Culv.		2.3 wide 2.5 High	7.5	34.2	
17+0			7.4	34.3	
18+0			4.3	37.4	
	11.43	1152.55	0.65	1141.12	
19+0			8.4	44.1	Reverse
	10.21	1162.53	0.23	1152.32	
20+0			11.0	51.5	
21+0			5.2	57.3	
+50			2.8	59.7	

L ℄ R

25 18 13 11 7 3 6 17 22 25
24 17 29 16 1.7 1.9 2.5 2.8 3.7 3.6

25 20 15 11 7 5 8 13 20-25
3.1 3.3 3.0 5.9 4.4 4.8 5.2 5.5 7.7 8.1

25 17 13 9 6 7 8 10 17 25
5.7 5.6 6.0 6.9 6.0 5.9 6.9 7.2 6.7 8.1 8.9

25 18 13 8.5-7.5 5 6 8.5 10 20 27
5.9 6.4 7.7 8.0 7.0 7.0 7.5 8.5 8.0 8.8 9.8

25 18 10 7 5 6 8 12 15-25
0.4 5.2 4.4 3.7 3.7 3.9 5.3 3.1 2.6

Check on BM #8 Pg 59 this book ✓

25 16 8 6 3.3 6 9 12 13 23 28
8.5 8.0 7.3 8.1 6.6 6.5 6.4 7.0 7.5 7.0 5.1 5.6

15 8 11 50
12.0 FL 13.0 7.9 H wall 7.5 8.3 HW 13.1

25-15 10 4 8 12 20 30
11.2 9.6 7.4 7.4 7.8 9.4 10.0 11.3

25 14 9 6 3 6 11 18 28
6.5 5.9 5.2 5.5 4.3 4.3 4.5 5.8 6.7 8.6 ✓

25 18 15 11 9 2 4 1 17-25
5.1 5.4 5.9 9.3 8.4 8.4 8.4 9.5 4.8 3.1 ✓

25-13 10 4 1 9 12 17 18-25
7.1 7.6 12.3 11.1 11.0 11.0 12.4 9.1 9.2

25 15 17 9 4 2 9 11 14 25
0.3 1.2 1.4 2.5 6.0 5.3 5.2 5.4 5.9 3.7 3.9

25-17 7 4 1 9 11 13 25
0.1 7.2 3.3 2.6 2.8 9.30 3.4 1.6 1.9

5/23/35

	+	HI	−	Elc	
		1162.53			
22+0			5.4	57.1	
	3.15	1158.82	6.86	1155.67	
23+0			5.0	53.8	
+26	15" Conc Pipe Culvert		5.2	53.6	
24+0			4.2	54.6	
24	9.80	1168.12	0.50	1158.32	
25+0			10.0	58.1	
26+0			7.4	60.7	
	4.49	1162.44	10.17	1157.95	
~~B.M.#7~~			3.01	1159.43	1159.52
~~26+44~~					
27+05			4.7	57.7	
27+0			4.4	58.0	
	6.36	1168.36	0.44	1162.00	
28+0			8.3	60.0	Reverse →
29+0			4.8	63.5	
	7.02	1174.83	0.55	1167.81	
30+0			10.4	64.4	
31+0			4.8	70.0	
32+0			6.1	68.7	

25/1.8 16/2.2 11/2.7 6/6.0 5/5.4 5.4 6/5.6 7/5.8 12/3.0 25/3.3

25 − 14 9/6.3 6.0 4/5.2 5.0 5/5.1 8/6.0 16/7.0 25/7.0

FL 12 3 5 16 Good
W End 7.5 5.3 5.2 5/5.4 8.8 FL End Fall

25/2.8 13/3.7 4.8 5.1 3/4.2 4.2 6/4.3 9/5.0 12/4.9 25/6.2

25/5.2 16/5.9 13/6.0 8/7.3 3/10.6 1/10.1 10.0 8/10.0 11/10.9 14/9.6 25/10.0

25/2.0 11/3.3 7/3.8 2/7.9 1/7.4 7.4 10/7.4 11/7.8 13/6.5 25/7.6

10.3

B.M. #7 Pg 59 this book El 1159.52

16/6.2 FL West 4/4.5 4.7 5/4.9 17/8.1 FLine East

17-25 14/5.4 13/6.2 9/5.2 4/4.3 4.4 5/4.9 8/5.9 16/6.7 25/7.6

25/3.5 20/8.1 14/7.6 8/6.8 5/9.0 3/8.5 8.3 6/8.1 9/8.4 15/6.2 21/2.9 25/2.5

25/2.9 16/3.3 4/4.3 7/4.6 4.8 3/5.0 5/6.0 7/5.7 11/6.9 16/9.5 25/10.3

25/8.1 18/8.5 13/9.0 7/10.5 5/10.4 10.4 5/10.6 6/11.0 9-18/10.0 20-25/10.2

25/1.5 16/2.3 13/2.2 6/6.1 3/4.9 4.8 7/5.0 9/5.9 12/5.2 15/6.1 20/6.6 25/7.5

25/2.9 19/3.1 16/4.0 10/5.6 8/6.7 5/6.2 6.1 5/6.2 8/6.9 10/7.5 11/7.0 17/5.9 25/9.0

	+	HI 1174.83	−	
culv = 32+97	3.49	1174.23	4.09	1170.74
33+0 + culv. 15" Conc pipe			4.6	69.6
	11.19	1185.12	0.30	1173.93
34+0			8.7	76.4
			2.05	1183.07
35+0			7.9	77.2
	2.49	1176.15	11.6	1173.66
36+0			9.5	66.7
	0.95	1166.06	11.04	1165.11
37+0			7.8	58.3
	1.41	1158.98	8.49	1157.57
37+88			3.7	55.2
~~38~~				
38+0			4.1	54.8
39+0			6.5	52.4
40			10.5	48.4
	0.86	1149.83	10.01	1148.97
41			3.9	45.9
42			5.9	43.9

5/23/35

25-21 / 7.1 — 16.0 / 7.8 — 10 / 4.5 — 4.6 — 8 / 5.0 Top slope — 103 / 20 End pipe EFL. Good fall — 21 / 13.0

25 / 5.1 — 17 / 5.6 — 16 / 7.1 — 15 / 7.9 — 7 / 8.6 — 8.7 — 17 / 8.5 — 18-25 / 8.1

25 / 3.7 — 19 / 5.0 — 14 / 6.8 — 13 / 7.3 — 7.9 — 7 / 8.0 — 11 / 7.5 — 26 / 6.3

25 / 6.7 — 19 / 6.5 — 13 / 10.9 — 9 / 9.7 — 9.5 — 18 / 8.6 — 25 / 8.4

25 / 4.7 — 21 / 4.8 — 15 / 7.3 — 13 / 8.0 — 7.8 — 15 / 7.5 — 18 / 7.0 — 25 / 7.0

FL. 20 / 5.6 — 13 / 3.6 — 3.7 — 12 / 4.5 — 18 / 8.7 FL. Good fall

25 / 4.7 — 18 / 4.5 — 15-16.5 / 5.1 — 14 / 4.7 — 11 / 3.9 — 4.1 — 12 / 4.5 — 21 / 10.0 — 27 / 10.9

25 / 4.7 — 22 / 5.9 — 19 / 6.0 — 15-17 / 7.6 — 13 / 6.5 — 6.5 — 14 / 6.9 — 20 / 7.7 — 25 / 8.1

25 / 8.9 — 20 / 9.2 — 18-16 / 11.6 — 13 / 10.1 — 10.5 — 14 / 10.8 — 16 / 10.5 — 22-25 / 11.3

25 / 3.7 — 18 / 4.2 — 17-15 / 5.7 — 13 / 4.5 — 3.9 — 12 / 4.5 — 15 / 5.3 — 26 / 6.3

25 / 4.7 — 19 / 5.0 — 15.5-17.5 / 7.3 — 13 / 6.0 — 5.9 — 12 / 6.0 — 15 / 6.8 — 25 / 6.7

	+	HI	—	ELEV	
		1149.83			
43+0.			6.3	43.5	
43+02	10" Conc Pipe Culv.		6.2	43.6	
	4.99	1148.53	6.51	1143.52	
BM #5			4.75	1143.78	1143.83
44+0			5.1	43.4	
℄ E+W Rd 44+73			4.8	43.7	
44+85	12 Conc P. Culv.		5.2	43.3	
44+85					
45+0			5.6	42.9	
45+06 to 45+22	12" V.S.P. 13' E of ℄ 11 to ℄				
	4.30	1146.86	5.97	1142.56	
46+0			3.7	43.1	
47+0			2.4	44.4	
BM #5 began 5/24/35			3.09	1143.77	
	6.52	1150.30		1143.78	1143.83
48+0			4.1	46.2	
49+0			3.4	46.9	
	8.61	1157.78	1.13	1149.17	
50+0			9.2	48.5	
51+0			4.4	53.3	
			4.2	53.5	
51+20					

25/7.5 19/7.5 18.5-15.5/8.7 14/7.3 10/6.7 6.3 7/6.9 10/7.6 15/7.5 19/7.9 25/7.6

FL=17/8.7 11/6.7 6.2 8/6.8 16/9.0 FL. E End

= BM #5 Pg 58 this book

25/5.2 18.5/5.7 18=15/6.7 14/5.8 5.1 5/5.4 14/5.6 17/5.1 25/4.7

W 100/5.0 4.8 100/4.4 E

FL.W. → 16/7.2 5.2 19/6.5 FL. E

25/6.2 15/5.9 13/6.3 10/5.6 5.6 11/5.5 14/6.7 25/4.6

25/5.3 13/4.8 7/3.6 3.7 1/3.7 5/4.7 12/5.0 14/4.8

25/1.8 14/2.1 12/2.5 10/2.1 6/2.3 2.4 10/2.0 12/2.6 13/2.3 17-25/20

on BM #5

BM #5 on this circuit

25/5.1 16/4.9 14/5.1 9/4.4 5/4.1 4.1 4/4.2 8/4.7 12/4.9 25/4.4 —

25/3.7 12/4.2 10/3.6 7/3.6 5/3.4 3.4 4/3.6 7/4.0 10/4.0 25/4.3 —

25/10.8 12/10.5 10/10.1 5/9.5 9.2 4/9.2 11/9.4 11.5/9.8 15/9.2 25/9.0 —

25/4.5 15/4.3 12/5.2 10/4.5 4.4 11/4.6 12.5/5.2 14/4.2 27/3.6

25/3.6 13/4.4 11/4.8 10/4.4 4.2 10/4.6 12.5/5.0 15/4.1 25/3.6

	+	HI	−	Elev.	
		1157.78			
52+0			8.0	49.7	
53+0			11.0	46.7	
	24	1148.26	11.96	1145.82	
54+0			7.1	41.1	
55+0			11.9	36.3	
			12.79	1135.47	
	19	1137.44	1135.47	~~12.79~~	
56+0			5.9	31.5	
57+0			10.7	26.7	
	21.5	1127.15	12.44	1125.00	
58+0			4.2	23.0	
59+0			6.5	20.7	
+50			9.3	17.9	
60+0			12.1	15.1	
	13.4	1117.39	11.10	1116.05	
BM #4			4.08	1113.31	1113.41
61+0			5.2	12.2	

61+07 ± 24" Conc P. Culv.
Westend 6140

Graber. Inst 5/24/35 68
Rossback Rod.
Hill ch.

25 15 12 10 4 11 13 16 25
73 73 80 75 8.0 82 75 79 68 60

25 14 12 10 5 3 9 10 12 14 25
124 122 125 118 114 110 113 110 114 120 111 104

25 15 12 10 10 12 15 25
59 60 70 65 7.1 67 76 60 56

25 14 12 10 11 10 12-13 15 25
122 122 126 121 11.9 11.7 12.0 13.1 12.0 12.0

25 17 13 11 6 9 11-13 16 25
52 45 72 60 59 56 57 69 38 30 wk dance

25 17 13 11 6 9 11 18 25
102 98 123 115 109 107 103 117 77 73 wk Sunday

25 15 11-12 9 10 9.0 12 15 25
37 45 54 41 42 45 51 68 57 54

25 17 15 13 10 6 13 20 25
52 57 65 83 67 65 66 78 84 95 done

25 21.5 14-15 13 10 16 20-25
66 59 102 93 93 88 56 51

25 19 12-13 10 7 2 11 20 25
89 83 130 119 117 121 120 126 78 75

BM #4 Pg 58 this book
25 18-17 12 8 14 23 25
65 69 82 56 57 53 70 85 86

19/8.0 F.L.W.

19/10.5 F.L.E. Good Fall.

	+	HI	−	ELEV
		1117.39		
62+0			4.2	13.2
	10.43	1126.48	13.4	1116.05
63+0			9.6	16.9
64+0			4.5	22.0
65			4.1	22.4
	5.24	1125.22	6.50	1119.98
66			6.3	18.9
65+94 Lt. 12" Conc. P. Culv				
67+0			7.0	18.2
68+0			6.0	19.2
68+50			10.1	15.1
~~69+0~~	1.43	1115.42	11.23	1113.99
~~BM #3~~			0.38	1115.04
69+0			8.5	06.9
	1.81	1104.83	12.40	1103.02
70+0			11.0	1093.8

5/24/35

Same up. 25 1.8 | 15 2.8 | 11-12 4.6 | 10 3.9 | 4.2 | 13 4.8 | 18 5.5 | 25 5.9 same gr.

Culv. same gr. 25 5.5 | 16 6.5 | 11 9.6 | 9.6 | 11 9.6 | 14 9.0 | 20 9.4 | 25 9.5 d.

up. 25 0.0 | 18 0.9 | 12 4.1 | 4.5 | 12 4.7 | 15 3.7 | 22-30 4.1
Same gr.

25 0.6 above 20 → 20 0.00 | 12 3.6 | 4.1 | 12 4.0 | 18 0.8 | 21-25 0.3

25 10.3 | 19 10.3 | 9 6.7 | 6.3 | 8 7.1 | 21 13.3 | 25 14.5

19 10.4 F.L.W at 66+0. (skew) 18 12.2 F.L.E good Tall. Culv. not completed

25 2.6 | 17 3.6 | 12 6.2 | 7.0 | 11 7.8 | 16 9.3 | 26 10.9 d.

25 1.3 | 15 2.5 | 11 4.6 | 6.0 | 9 5.9 | 16 3.1 | 25 3.2

25 5.1 | 23 4.9 | 14 5.7 | 9 8.8 | 10.1 | 10 10.5 | 12 11.1 | 17 6.0 | 25 5.8

BM #3 ... pg 58

up 25 4.8 | 15 5.7 | 12 8.1 | 9 8.0 | 8.5 | 13 8.7 | 12 9.5 | 15 7.2 | 25 8.6 d.

T.P. on Stump E.

up 25 8.3 | 9.5 1.3 | 10 10.8 | 11.0 | 10 11.0 | 13 11.4 | 17 10.2 | 25 10.6

	+	H.I.	−	Elev
		1104.83		
	1.85	1096.81	9.87	1094.96
71+0			8.6	88.2
71+39	Culvert	15" Conc Pipe	9.4	87.4
72+0.			8.8	88.0
73+0			4.8,	92.0
	10.90	1106.75	0.96	1095.85
74+0			9.2	1097.5
75+0			5.0	1101.7
76+0			7.6	1099.1
77+0			11.8	1094.9
		1095.97		1094.50
	1.47	1105.97	12.25	1104.50
78+0			5.5	90.4
79+0			11.7	84.2
		1085.59		1084.18
	1.41	~~1095.59~~	11.79	~~1094.18~~
80+0			6.2	79.3

25/9.4 12/9.9 8.6 7/7.6 17/9.5 25/10.7

*Light Pole 13/11.7 E.F.L. 9 ± Ground ± 15/11.1 W.F.L.

25/8.1 16/8.2 13/9.0 8.8 12/8.2 18/8.8 27/9.8

Top 25/1.7 17/2.5 15/4.0 4.8 25/7.0

up 25/5.4 16/6.0 15/6.6 9.2 17/11.8 21/9.3 25/9.4

25/3.5 16/4.5 15/5.3 5.0 11/5.2 14/6.0 17/5.5 25/5.2

25/6.1 16/5.9 14/6.8 7.6 14/7.4 15/6.7 19/7.3 22/6.9 25/7.0

25/10.8 19/11.0 15/11.4 14/11.3 11.8 15/11.7 16/11.0 25/10.3

25/2.5 14/3.0 13/4.0 5.5 14/5.4 16/4.3 25/4.2

25/8.7 16/9.4 15/10.6 11.7 12/11.3 16/9.5 25/9.7

25/4.2 15/4.7 12/6.8 6.2 16/4.4 17/4.0 25/3.6

	+	HI	−	Elev	
		1085.59			
81+0			9.4	76.1	
81+40 ℄	12" Conc. Culv.	Westend 81+34	9.9	75.6	
	3.76	1078.14	11.21	1074.38	
BM #2			1.35	1076.79	1076.98 =
82+0			4.6	73.6	
82+50			7.0	71.2	
83+0			9.9	68.3	
+50			12.8	65.4	
	1.44	1067.36	12.22	1065.92	
84			7.8	59.5	
	2.07	1057.26	12.17	1055.19	
84+50			1.7	55.5	
85+0			6.7	50.5	
	1.84	1048.37	10.73	1046.53	
86+0			10.4	38.0	
	0.09	1036.03	12.43	1035.94	
87+0			7.3	28.7	
	0.28	1024.23	12.08	1023.95	

87+40 = Spring 10' left ℄ center drain needed.

up 25 8.9 | 16 9.5 | 14 10.0 | 13 9.6 | 9.4 | 14 10.2 | 16 10.6 | 18 10.3 | 25 10.4

25 9.7 | 13 11.7 FL. West | 9.9 | 21 13.7 FL East | 25 14.1

BM. #2 pg 58 this book

25 1.7 | 11 2.5 | 8 3.9 | 4.6 | 17 4.6 | 23 5.5 | 25 5.9

25 7.9 | 12 7.8 | 11 6.6 | 7.0 | 14 5.4 | 17 3.3 | 25 3.4

25 14.4 | 16 10.8 | 9.9 | 14 8.3 | 18 5.7 | 25 4.9

45° slope 25 7' below 12 → 12 12.6 | 12.8 | 15 11.0 | 17 8.4 | 25 8.0

45° slope down 25 11.1 | 13 7.6 | 7.8 | 13 6.4 | 14 4.5 | 25 3.4

25 7.4 | 15 3.8 | 9 2.0 | 1.7 | 15 0.30 | 17 2.50 above 15 | 25 4.0 above 15 | up

25 7.2 | 19 6.1 | 12 7.2 | 6.7 | 8 6.8 | 10 3.7 | 25 2.1

25 8.8 | 19 8.4 | 14 10.6 | 10.4 | 8 8.5 | 11 6.6 | 25 6.3

5 7.33 | 14 3.8 | 10 6.7 | 7.3 | 14 6.0 | 17 4.0 | 25 4.1

	+	H.I.	−	ELEV	
		1024.23			
88+0			11.0	13.2	
	0.58	1013.05	11.76	1012.47	
8 +50			6.4	06.7	
	1.52	1004.62	9.95	1003.10	
89+0			5.0	999.6	
89+27 ± ℄ Wilsons Mills Rd			5.61	999.01	
	7.57	1010.59	1.60	1003.02	
BM #1			3.62	1006.97	1007.22

—	25/2.1	21/2.3	17/8.8	11.0	11/9.1	17/7.4	23/3.1	25/3.4	—
—	25/0.0	20/0.3	14/5.2	6.4	10/5.3	14/4.2	17/2.5	25/4.6	down
	25/4.8			5.0	15/4.5	17/2.8	25/3.2		
	100/3.59			5.61			100/8.58		

BM #1 pg 58 this book

X- Sec. E+W Rd in Chester → SHERMAN RD.

CENTER Pages 73 to 78.

	+	HI.	—		
BM #1	5.02	1148.85		1143.83	
1					
1+0			4.7	44.1	
2+0			5.3	43.5	
3+0			8.4	40.4	
BM #2	1.04	1142.47	7.42	1141.43	1141.43 =
4+0			4.7	37.8	
5+0			7.8	34.7	
6+0			10.6	31.9	
	3.45	1134.48	1143	1131.03	
7+0 = 12" Conc. P. Culv.			4.6	29.9	
7+92 = ℄ Drive					
8+0			5.0	29.5	
9+0			6.2	28.3	
10+0			8.0	26.5	
	3.20	1128.56	9.12	1125.36	
BM #3			7.63	1120.93	1120.93

1st Rd N of Mayfield E From Sperry Rd.

5-24-35 73

C. Graber Inst
W. Rossback Rod
H. Hill chain.

BM #1 See BM #5 Sperry Rd. Pg 58 this book

4.7

25 16 15 13 14 16 17 25
5.6 5.8 6.5 5.4 4.7 5.0 5.8 5.4 4.7

25 20 15 14 12 14 19 25
2.1 2.1 5.9 5.2 5.3 5.7 6.6 2.0 2.3

25 17 15 12 12 14 16 25
7.8 8.2 10.0 9.0 8.4 8.9 10.0 9.9 9.3

BM #2 2+70 Spk Root 24" Map. 50' So. of ℄

25 17 15 13 13 14.5 17 25
3.6 4.0 6.6 5.3 4.7 5.5 6.3 5.7 5.8

25 20 15 13 12 14.5 17 25
7.7 8.0 9.9 8.6 7.8 8.4 9.2 7.6 7.9

25 20 17 15.5 13 14.5 17 25
9.0 9.8 11.5 12.2 10.9 10.6 11.7 12.7 13.8

25 19 16 12 13 17 25
5.5 6.0 7.1 end FL 5.0 4.6 5.1 8.6 FL End 8.1

25 13 13 14.5 16 25
4.8 4.9 5.0 5.2 6.1 5.0 4.7

25 21 19 16 15 13 12 14 17 25
6.3 6.4 7.2 6.3 7.3 6.3 6.2 6.3 7.1 4.8 5.7

25 20 18 16 14 12 14 16 25
7.5 8.0 9.0 9.1 8.4 8.0 7.8 8.4 6.9 6.8

= BM #3 Pg 61 this book.

	+	HI	−		
	7.34	1128.27	1120	1120.93	
11+0			3.8	24.5	
12+0			6.0	22.3	
13+0			13.2	15.1	
	0.50	1116.45	12.32	1115.95	
14+0			12.1	04.3	
	1.54	1105.21	12.78	1103.67	
14+15	12" Cor. I.P. ~~Broken~~		14' S. of ℄		
15+0			14.7	90.5	
	0.14	1092.43	12.92	1092.29	
16+0					
	1.58	1081.26	12.75	1079.68	
16+0 cont.			6.7	74.6	
	0.24	1068.61	12.89	1068.37	
16+50			1.0	67.6	
17+0			5.8	62.8	
18+0			11.2	57.4	
17+83 Tr.	18+0 ℄ 20' Left ℄ drive Xing over 24" Cor. I.P.				
BM #4	0.43	1057.83	11.21	1057.40	1057.39
19+0			4.3	53.5	
20+0			6.3	51.5	

5/25/35 — 74

Fair warm — Graber Rossback Hill

BM #3

25/3.8	18/3.4	15/4.9	12/3.9	3.8	11/4.5	19/4.1	25/5.0	
25/5.2	16/5.2	14/6.5	12/6.2	6.0	14/6.6	17/4.5	25/4.3	
30/9.5		20/10.0	16/11.6	13.2	13/13.3	16/11.1	25/12.2	30/13.0
30/8.3		26/8.3	17/10.5	12.1	12.5/13.5	16/14.8	19/13.1	25/15.3	30/18.6
Fence 38/6.3		24/14.1	16/14.1	14.7	14/16.2	15/17.9	25/12.6	30/11.5
33 Tot. / 34								
15 Tot. 6.4				6.7	16/9.6	25/11.2	30/11.7	
15 Tot. 6.4				6.7	16/9.6	25/11.2	30/11.7	
27/10.8 higher than 16			16/0.2	1.0	11/1.5	17/3.8	25/6.0	30/6.6
		25/7.0	13/6.0	5.8	14/6.8	25/8.9		
		26/10.5	16/11.4	11.2	12.5/11.6	25/12.8		

BM #4							ditch	
25/4.0	22/3.6	18-20/5.3	17/4.0	4.3	30/2.9	31-34/4.8	35/0.7	
Left	18/4.1	14-16/5.4	18-20/7.7	17/5.6	6.3	37/5.7	ditch 38-41/7.6	42/6.2

	+	H.I.	−	ELEV
		1057.83		
21+0			7.0	50.8
	2.90	1051.21	9.48	1048.31
22+0			3.6	47.6
23+0			7.0	44.2
24+0			8.3	42.9
24+50			9.4	41.8
	2.54	1044.09	9.66	1041.55
25+0			4.2	39.9
26+0			6.0	38.1
25+97 ℄ = 36" Cor. I. Pipe		Send = 25+90 N " 26+15		
27+0			2.4	41.7
	888	1052.80	0.17	1043.92
	1057.85	1057.85	0.46	1057.39
	17.6	1047.85	11.76	1046.09
	8.84	1052.79	3.90	1043.95
BM#5			0.21	1052.58
27+50			8.8	44.0

5/25/35 75

25 15 11-13 6 14 21 27 43 44-47 56
7.4 7.5 10.1 7.2 7.0 7.6 10.1 10.6 9.4 10.8 8.4

28 23 18-20 17 25 44 45-48 50
3.7 2.6 5.1 2.8 3.6 4.1 4.0 6.4 6.4

30 25 18-17 16 9 13 25 40 43-46 56
2.6 3.6 8.0 6.2 6.7 7.0 7.1 5.2 6.4 9.9 7.4

30 25 21 20-18 16 25 29 33-37 41
8.1 9.2 9.1 10.0 9.0 8.3 8.4 9.4 11.7 7.4

30 25 22 21-19 18 25 31 32-35 38
5.0 6.3 7.8 10.6 8.0 9.4 10.6 11.3 12.7 10.0

45° w/o 27.5 T 16.5 15 25 30 32-36 38
13.0 higher than 16.5 4.2 2.3 4.2 3.8 3.7 7.5 3.7

30 26 25-23 22 13 15 21-25 26 30
5.2 5.7 8.3 5.7 7.3 6.0 6.5 9.0 7.0 6.4

27
11.6 FL. No
34 22 17
7.5 4.2 3.0 2.4

16
9.2 FL. South
25 30
5.2 5.6

BM #4 Pg 61 this book

BM #5
BM. Sta. 27+50 48" Map. (Spike in Root) 27' S of ℄
30 29 15 15 20 30
8.0 7.5 8.7 8.8 4.5 5.0 0.0

	+	HI	−	ELEV	
	5.85	1058.43		1052.58	BM. #5
28+0			7.2	51.2	
	12.16	1068.46	2.13	1056.30	
28+50			11.7	56.8	
	10.48	1078.73	0.21	1068.25	
29+0			14.2	64.5	
30+0			4.6	74.1	
	~~0.75~~		4.94	1073.79	1073.77
	11.16	1089.14	0.75	1077.98	
31+0			3.0	86.1	
32+0			8.8	80.3	
33+0			12.0	77.1	
	2.38	1079.69	11.83	1077.31	
34+0			8.6	71.1	
	1.17	1068.44	12.42	1067.27	
35+0			6.5	61.9	
35+50 Gully N.			7.6	60.8	
36+0			7.1	61.3	
	9.21	1072.96	4.69	1063.75	
37+0			7.4	65.6	
37+20 = VP1					

30/3.0 18/4.2 12/7.7 7.2 4/6.5 9/4.2 25/4.5 30/2.0

40/0.0 30/0.0 8/11.7 11.7 2/11.2 18/1.8 27/0.0 ← 30/1.5 about 27

30/9.2 24/8.6 12/9.8 6.0/13.0 14.2 9/11.8 20/7.4 25-30/7.1

30/6.0 24/4.5 8/4.6 4.6 5/4.4 21/2.2 30/2.0

BM #6

30 25/1.0 08 19/1.4 15/3.8 5/3.7 3.0 2.5/2.1

30/9.8 25/9.1 20/8.7 17/9.2 8.8 25/8.7 —

— 25/8.4 21/8.7 16/12.3 12.0 9/12.3 25/14.9

— 25/7.4 19/6.7 14/7.6 12/9.7 8.6 15/7.7 20/8.1

— 25/4.2 18/4.1 11/7.0 6.5 25/6.9 —

down 25/21.3 21/18.3 9/13.0 7.6 15/6.2 19/5.0 33/2.6

— 25/5.5 7/4.9 7.1 11/6.4 18/5.0 25/4.4 —

~ 25/5.7 13/5.0 9/4.5 7/6.3 7.4 5/6.5 6/5.6 9/4.9 25/3.7 —

	+	HI	−		
		1072.96			
38+0			7.6	65.4	
39+0			7.9	65.1	
+75 V.P.I.			8.4	64.6	
~~40+0~~					
40+0			10.3	62.7	
	0.57	1065.40	8.13	1064.83	
41			12.5	52.9	
	5.89	1059.02	12.27	1053.13	
BM#7			6.57	1052.45	1052.49
	2.07	1049.32	11.77	1047.25	
42+0			9.2	40.1	
	1.25	1038.13	12.45	1036.87	
	1.38	1027.55	11.95	1026.17	
43+00			11.6	26.5	
44+0			14.1	13.4	
	2.01	1017.06	12.50	1015.05	
	1.59	1006.67	11.98	1005.08	
45			4.3	02.4	
46+0			8.1	998.6	
T.P.	7.16	1004.46	9.37	997.30	
			4.70	999.76	999.75

d. 5% — 25/9.9 11/7.7 7.6 8/7.0 25/4.4 wf. 5.0%

— 25/9.4 18/9.3 9/8.0 7.9 17/6.9 25/5.7 5% wb —

25/9.3 12/8.6 8/7.4 7/8.3 8.4 4/8.3 8/6.9 19/5.7 25/4.6 wb

25/11.0 10/10.1 10.3 7/8.5 25/5.2 wp same gr.

— 25/8.9 19/8.8 15/7.4 5/9.5 3/12.2 12.5 9/12.0 18/7.0 22/5.3 28/4.8 32/4.6 —

BM#7

25/6.9 16/6.3 9/7.6 4/9.6 9.2 9/9.4 14/9.0 22/5.5 30/6.0

25/7.7 19/5.6 12/8.7 8/11.2 11.6 4/11.7 15/4.6 25/4.8

25/11.1 22/13.3 20/13.0 14.1 10/12.8 14/12.3 25/14.0

25/0.7 14/4.6 10/5.6 7/4.6 4.3 3/4.2 7/4.7 15/3.5 25/4.3

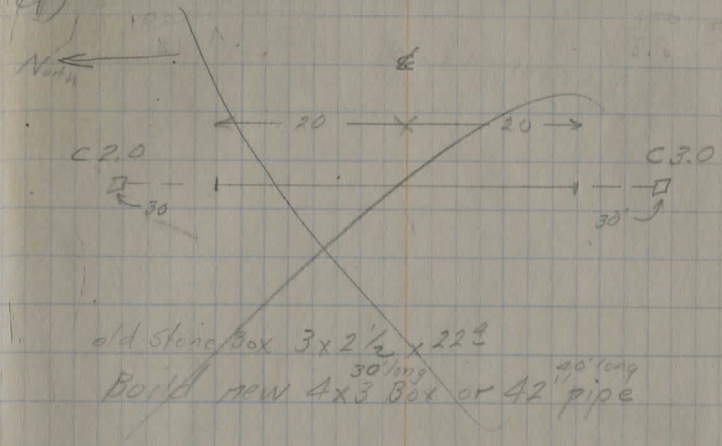
25/10.6 11/8.6 9/9.2 6/8.3 8.1 4/8.2 25/9.5

BM #8

Culverts on E&W Center Rd. (Sherman Rd)

1st Culv. East of Painter Drive.

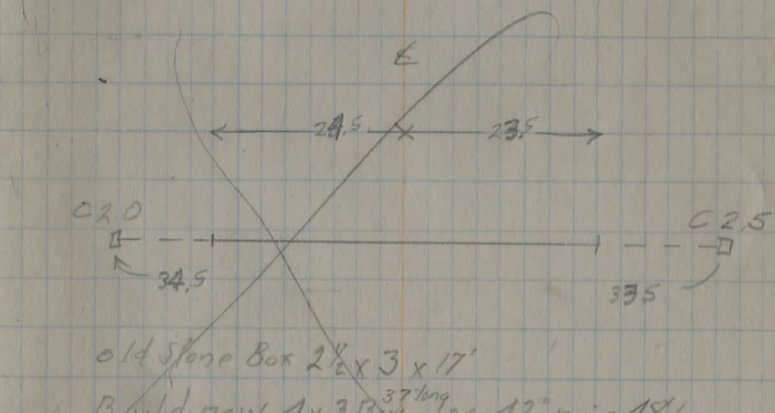
℄ Road	4.5		
50' North	9.8		
100' "	10.5		
Flow S	9.0		
Stake S	8.80	5.80	C 3.0
Flow N	9.3		
Stake N	9.50	7.50	C 2.0



old Stone Box 3 x 2½ x 22'
Build new 4 x 3 Box 30' long or 42" pipe 40' long

2nd Culvert East of Painter Drive

℄ Road	4.8		
100' North	11.8		
150' "	12.3		
Flow S	11.0		
Stake S	10.80	8.30	C 2.5
Flow N	11.5		
Stake N	11.70	9.70	C 2.0



old Stone Box 2½ x 3 x 17'
Build new 4 x 3 Box 37' long or 42" pipe 48' long

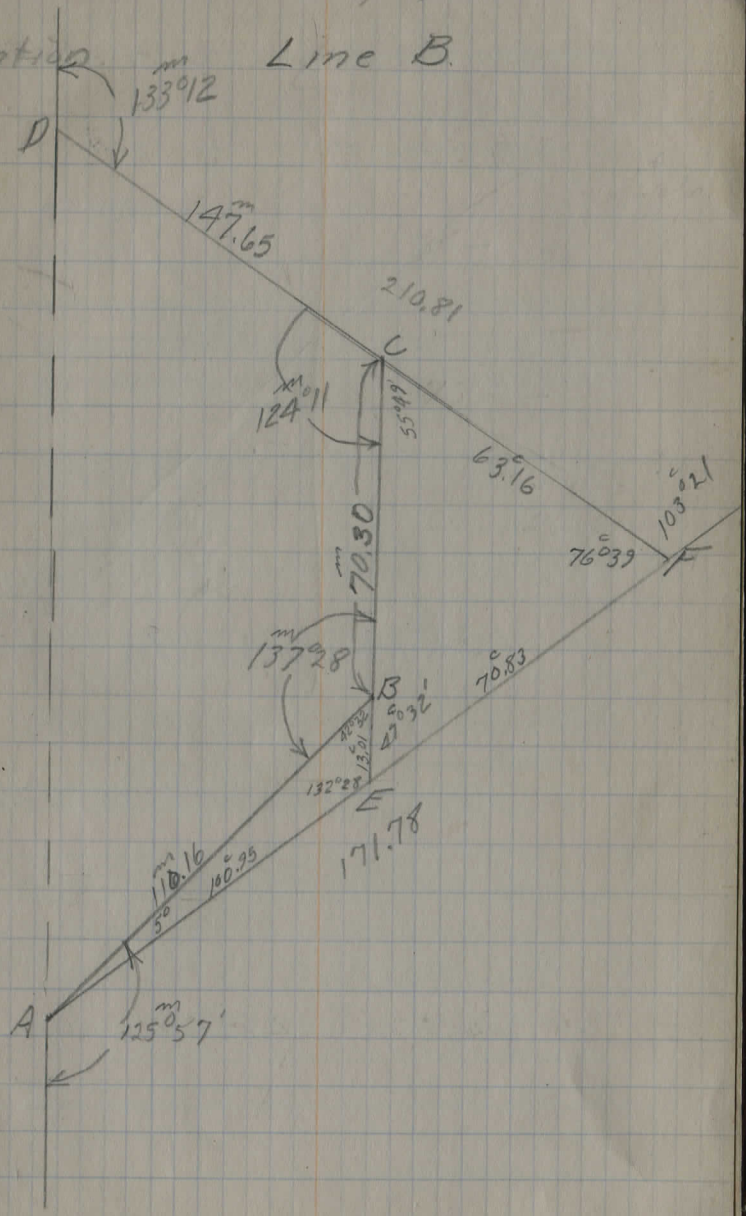
Computation on Sperry Road Hill Location

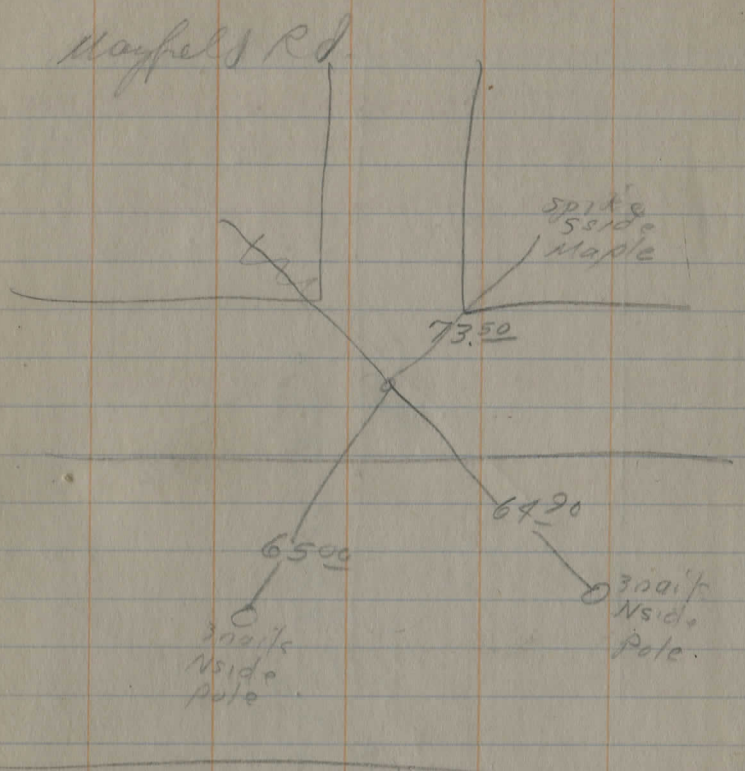
D = Sta 39+01.55 Line A

A = Sta 36+63.30 Line A

Notes transferred to page 39

Line B.



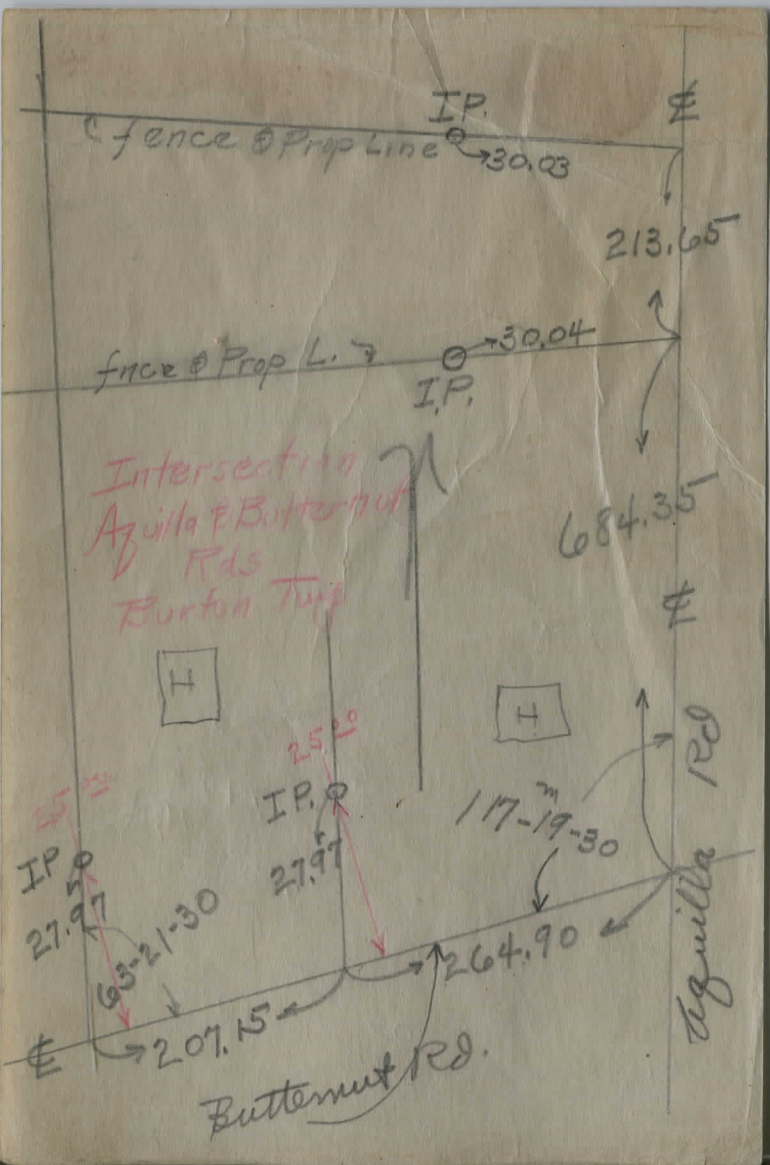


N line Jacobs, 1774.35 each of center P
Iron 25.20 West.

IMPROVED TABLES

AND

INFORMATION


IP.
℄
Fence ⊕ Prop Line
30.03
213.65
Fence ⊕ Prop L.
30.04
I.P.
Intersection
Aquilla ⊕ Buttermut
Rds
Burton Twp
684.35
℄
H
H
25.22
IP.
IP.
27.97
27.97
117-19-30
Aquilla Rd
63-21-30
264.90
207.15
℄
Buttermut Rd.

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.

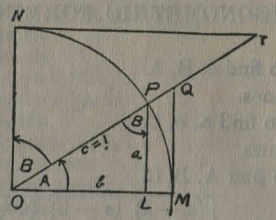


TABLE II

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

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

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

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

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

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

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

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

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

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.

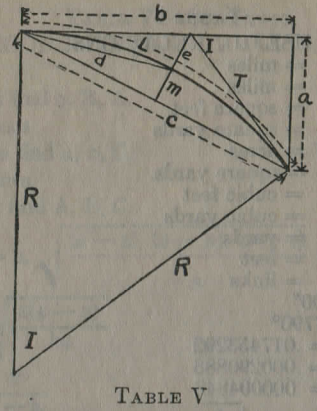


Table V

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) $a = 2\,R\,(\sin^2 \frac{1}{2} I)^2$ (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		50′	593.79	30.686		50′	1105.1	105.60	
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	20° C.	30′	830.76	59.914	20° C.	30′	1349.2	156.70	20° C.
40′	333.71	9.710	T	40′	839.27	61.141	T	40′	1358.0	158.72	T
50′	342.08	10.202	.13	50′	847.78	62.381	.26	50′	1366.8	160.76	.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	340.7	
32°	1643.0	230.9	.023	42°	2199.4	407.6	.037	52°	2794.9	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	20° C.	30′	2461.7	506.4	20° C.	30′	3078.7	774.7	20° C.
40′	1898.6	306.4	T	40′	2471.5	510.3	T	40′	3089.4	779.8	T
50′	1907.9	309.3	.53	50′	2481.4	514.3	.68	50′	3100.2	784.9	.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	+	10′	4099.5	1315.6	+	10′	4908.0	1814.7	+
20′	3397.5	931.6	5° C.	20′	4112.1	1322.9	5° C.	20′	4922.5	1824.1	5° C.
30′	3408.8	937.3	T	30′	4124.8	1330.3	T	30′	4937.0	1833.6	T
40′	3420.1	943.1	.25	40′	4137.4	1337.7	.30	40′	4951.5	1843.1	.36
50′	3431.4	948.9	E	50′	4150.1	1345.1	E	50′	4966.1	1852.6	E
62°	3442.7	954.8	.080	72°	4162.8	1352.6	.110	82°	4980.7	1862.2	.149
10′	3454.1	960.6		10′	4175.6	1360.1		10′	4995.4	1871.8	
20′	3465.4	966.5		20′	4188.5	1367.6		20′	5010.0	1881.5	
30′	3476.8	972.4		30′	4201.2	1375.2		30′	5024.8	1891.2	
40′	3488.3	978.3		40′	4214.0	1382.8		40′	5039.5	1900.9	
50′	3499.7	984.3		50′	4226.8	1390.4		50′	5054.3	1910.7	
63°	3511.1	990.2		73°	4239.7	1398.0		83°	5069.2	1920.5	
10′	3522.6	996.2	10° C.	10′	4252.6	1405.7	10° C.	10′	5084.0	1930.4	10° C.
20′	3534.1	1002.3	T	20′	4265.6	1413.5	T	20′	5099.0	1940.3	T
30′	3545.6	1008.3	.51	30′	4278.5	1421.2	.61	30′	5113.9	1950.3	.72
40′	3557.2	1014.4	E	40′	4291.5	1429.0	E	40′	5128.9	1960.2	E
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	.485	40′	4864.8	1786.7	.671	40′	5796.7	2420.9	.910
50′	4074.4	1300.9		50′	4879.2	1796.0		50′	5813.6	2432.9	

T = R tan 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	+	10′	6971.3	3294.1	+	10′	8362.7	4407.6	+
20′	5864.6	2469.3	5° C.	20′	6992.0	3310.1	5° C.	20′	8388.9	4429.2	5° C.
30′	5881.7	2481.5	T	30′	7012.7	3326.1	T	30′	8415.1	4450.9	T
40′	5898.8	2493.8	.43	40′	7033.6	3342.3	.51	40′	8441.5	4472.7	.62
50′	5916.0	2506.1	E	50′	7054.5	3358.5	E	50′	8468.0	4494.6	E
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
10′	5950.5	2531.0		10′	7096.6	3391.2		10′	8521.3	4538.8	
20′	5967.9	2543.5		20′	7117.8	3407.7		20′	8548.1	4561.1	
30′	5985.3	2556.0		30′	7139.0	3424.3		30′	8575.0	4583.4	
40′	6002.7	2568.6		40′	7160.3	3440.9		40′	8602.1	4606.0	
50′	6020.2	2581.3		50′	7181.7	3457.6		50′	8629.3	4628.6	
93°	6037.8	2594.0	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.
10′	6055.4	2606.8	T	10′	7224.7	3491.3	T	10′	8684.0	4674.2	T
20′	6073.1	2619.7	.86	20′	7246.3	3508.2	.103	20′	8711.5	4697.2	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	.401	40′	7289.8	3542.4	.536	40′	8767.0	4743.6	.721
50′	6126.4	2658.5		50′	7311.7	3559.6		50′	8794.9	4766.9	
94°	6144.3	2671.6		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		10′	7910.4	4037.8		10′	9567.2	5422.1	
20′	6630.1	3033.1	25° C.	20′	7934.6	4057.4	25° C.	20′	9598.9	5449.2	25° C.
30′	6649.6	3047.9	T	30′	7959.0	4077.2	T	30′	9630.7	5476.5	T
40′	6669.2	3062.8	2.18	40′	7983.5	4097.1	2.61	40′	9662.6	5504.0	3.16
50′	6688.8	3077.7	E	50′	8008.0	4117.0	E	50′	9694.7	5531.7	E
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	.1	40′	8285.0	4343.6	.1	40′	10059.0	5846.5	.1
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

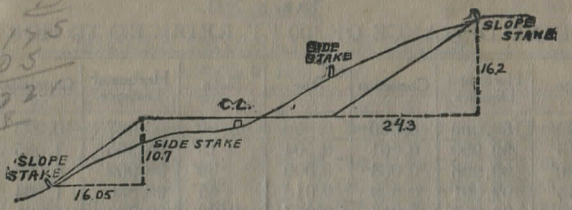
Slope	Horizontal Distance	Correction	Rise	Slope	Horizontal Distance	Correction	Rise
0°00′	100.000	0.000	0.000	8°00′	99.027	0.973	0.139
15′	99.999	0.001	0.004	15′	98.965	1.035	0.143
30′	99.996	0.004	0.009	30′	98.902	1.098	0.148
45′	99.991	0.009	0.013	45′	98.836	1.164	0.152
1 00	99.985	0.015	0.017	9 00	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



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.
	.0052	$1\frac{5}{16}$	.1094	$2\frac{9}{16}$	.2135	$3\frac{13}{16}$	.3177	$5\frac{1}{16}$	.4219	$6\frac{5}{16}$	.5260	$7\frac{9}{16}$	.6302	$8\frac{13}{16}$	.7344	$10\frac{1}{16}$	.8385	$11\frac{5}{16}$	.9427
	.0104	$\frac{3}{8}$	.1146	$\frac{5}{8}$	.2188	$\frac{7}{8}$	.3229	$\frac{1}{8}$	.4271	$\frac{3}{8}$	.5313	$\frac{5}{8}$	.6354	$\frac{7}{8}$	.7396	$\frac{1}{8}$	.8438	$\frac{3}{8}$	.9479
	.0156	$1\frac{7}{16}$	.1198	$1\frac{1}{16}$	.2240	$\frac{15}{16}$	.3281	$\frac{3}{16}$	.4323	$\frac{7}{16}$	.5365	$1\frac{1}{16}$	.6406	$\frac{15}{16}$	.7448	$\frac{3}{16}$	.8490	$\frac{7}{16}$	.9531
	.0208	$\frac{1}{2}$	.1250	$\frac{3}{4}$	.2292	4—	.3333	$\frac{1}{4}$	.4375	$\frac{1}{2}$	.5417	$\frac{3}{4}$	.6458	9—	.7500	$\frac{1}{4}$	.8542	$\frac{1}{2}$	.9583
	.0260	$1\frac{9}{16}$	.1302	$1\frac{13}{16}$	.2344	$\frac{1}{16}$	.3385	$\frac{5}{16}$	.4427	$\frac{9}{16}$	.5469	$1\frac{13}{16}$	.6510	$\frac{1}{16}$	.7552	$\frac{5}{16}$	.8594	$\frac{9}{16}$	.9635
	.0313	$\frac{5}{8}$	.1354	$\frac{7}{8}$	.2396	$\frac{1}{8}$	.3438	$\frac{3}{8}$	.4479	$\frac{5}{8}$	.5521	$\frac{7}{8}$	.6563	$\frac{1}{8}$	.7604	$\frac{3}{8}$	.8646	$\frac{5}{8}$	.9688
	.0365	$1\frac{11}{16}$	.1406	$1\frac{15}{16}$	.2448	$\frac{3}{16}$	.3490	$\frac{7}{16}$	.4531	$1\frac{1}{16}$	.5573	$1\frac{15}{16}$	.6615	$\frac{3}{16}$	.7656	$\frac{7}{16}$	.8698	$1\frac{1}{16}$	.9740
	.0417	$\frac{3}{4}$	.1458	3—	.2500	$\frac{1}{4}$	.3542	$\frac{1}{2}$	.4583	$\frac{3}{4}$	.5625	8—	.6667	$\frac{1}{4}$	.7708	$\frac{1}{2}$	.8750	$\frac{3}{4}$	.9792
	.0469	$1\frac{13}{16}$	.1510	$\frac{1}{16}$	.2552	$\frac{5}{16}$	.3594	$\frac{9}{16}$	.4635	$1\frac{3}{16}$	.5677	$\frac{1}{16}$	.6719	$\frac{5}{16}$	.7760	$\frac{9}{16}$	.8802	$1\frac{3}{16}$	9844
	.0521	$\frac{7}{8}$	.1563	$\frac{1}{8}$	.2604	$\frac{3}{8}$	.3646	$\frac{5}{8}$	.4688	$\frac{7}{8}$	.5729	$\frac{1}{8}$	.6771	$\frac{3}{8}$	.7813	$\frac{5}{8}$	.8854	$\frac{7}{8}$	.9896
	.0573	$1\frac{15}{16}$	.1615	$\frac{3}{16}$	.2656	$\frac{7}{16}$	.3698	$1\frac{1}{16}$	.4740	$1\frac{5}{16}$	.5781	$\frac{3}{16}$	.6823	$\frac{7}{16}$	.7865	$1\frac{1}{16}$	.8906	$1\frac{5}{16}$	9948
	.0625	$\frac{1}{4}$	.1667	$\frac{1}{4}$	.2708	$\frac{1}{2}$	.3750	$\frac{3}{4}$	.4792	7—	.5833	$\frac{1}{4}$	.6875	$\frac{1}{2}$	.7917	$\frac{3}{4}$	.8958		
	.0677	$2\frac{1}{16}$	.1719	$\frac{5}{16}$	.2760	$\frac{9}{16}$	.3803	$1\frac{3}{16}$	.4844	$\frac{1}{16}$	.5885	$\frac{5}{16}$	.6927	$\frac{9}{16}$	.7969	$1\frac{3}{16}$	.9010		
	.0729	$\frac{9}{16}$	.1771	$\frac{5}{8}$	.2813	$\frac{5}{8}$	.3854	$\frac{7}{8}$	.4896	$\frac{1}{8}$	.5938	$\frac{3}{8}$	.6979	$\frac{5}{8}$	.8021	$\frac{7}{8}$	.9063		
	.0781	$2\frac{1}{16}$	.1823	$\frac{7}{16}$	.2865	$1\frac{1}{16}$	.3906	$1\frac{5}{16}$	4948	$\frac{3}{16}$	.5990	$\frac{7}{16}$	.7031	$1\frac{1}{16}$	.8073	$1\frac{5}{16}$	.9115		
	.0833	$\frac{1}{4}$	.1875	$\frac{1}{2}$	.2917	$\frac{3}{4}$	.3958	6—	.5000	$\frac{1}{4}$	.6042	$\frac{1}{2}$	.7083	$\frac{3}{4}$	.8125	11—	.9167		
	.0885	$\frac{5}{16}$	.1927	$\frac{9}{16}$	.2969	$1\frac{3}{16}$	.4010	$\frac{1}{16}$	.5052	$\frac{5}{16}$	.6094	$\frac{9}{16}$	.7135	$1\frac{3}{16}$	.8177	$\frac{1}{16}$	.9219		
	.0938	$\frac{3}{8}$	.1979	$\frac{5}{8}$	.3021	$\frac{7}{8}$	.4063	$\frac{1}{8}$	.5104	$\frac{3}{8}$	.6146	$\frac{5}{8}$	.7188	$\frac{1}{8}$	.8229	$\frac{3}{8}$	.9271		
	.0990	$\frac{7}{16}$	.2031	$1\frac{1}{16}$	.3073	$1\frac{5}{16}$	.4115	$\frac{3}{16}$	.5156	$\frac{7}{16}$	.6198	$1\frac{1}{16}$	.7240	$1\frac{5}{16}$	.8281	$\frac{3}{16}$	.9323		
	.1042	$\frac{1}{2}$	.2083	$\frac{3}{4}$	.3125	5—	.4167	$\frac{1}{4}$	.5208	$\frac{1}{2}$	.6250	$\frac{3}{4}$	.7292	10—	.8333	$\frac{1}{4}$	.9375		

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