NORTH WOODLAND ROAD
in RUSSELL TWP.
East of Chilicothe Road.

FIELD BOOK
364

105

KEUFFEL & ESSER CO.

DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.
NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.

FOR SINGLE TRACK EXCAVATIONS.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

For Keith's Railroad Curve Tabels see end of book.

Book 105

North Woodland Rd. - No. 16
Sections - D. E - F?

NORTHWOOD RD. 57-62
T.H. 156.

FAIRMOUNT RD #16 D&E
1947 64-71

FAIRMOUNT RD #16 D 1952
Grades
(1952) 41, 42, 43

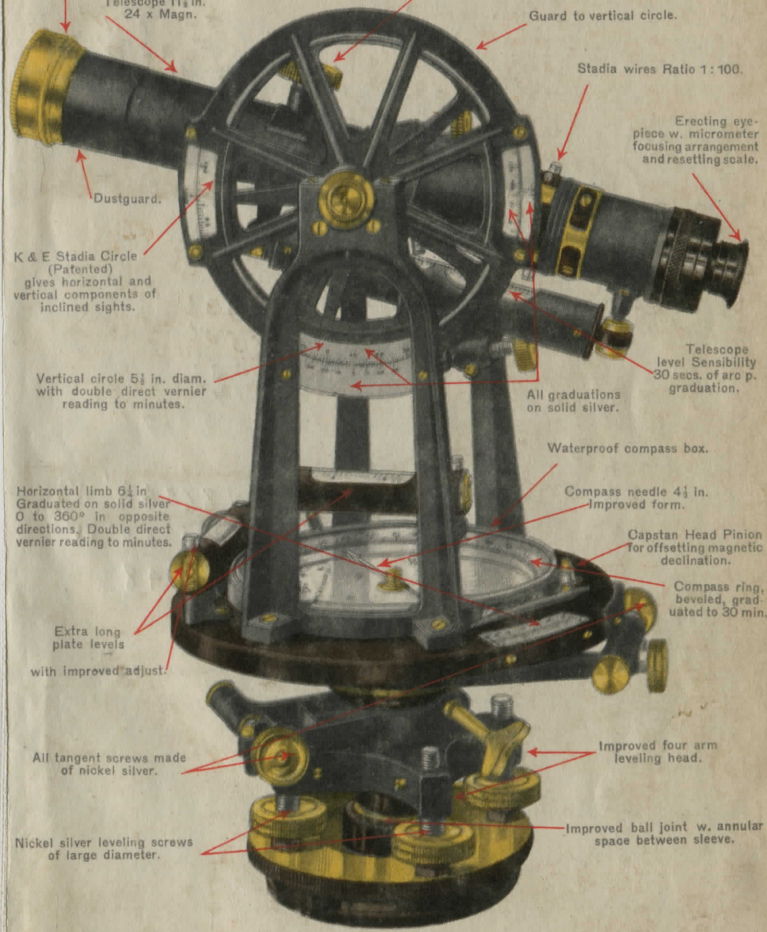
FAIRM'T RD #16 D Culvert '52
(1952) pgs 44 & 54

109

EXTRA FINE ENGINEERS' TRANSIT

No. 5060 S

KEUFFEL & ESSER CO., N.Y.



ALSO MADE WITH

INTERNAL FOCUSING TELESCOPE

PRACTICALLY DUST AND MOISTURE PROOF.—

66°38'
39°57'
26°41'

63°52'
39°57'
23°55'

81°38'
57°53'
23°45'

63°52'
87°09'
151°01'
28°59'
180°00'

87°09'
63°52'
23°17'

S87°09'W
N64°25'W
151°34'
28°26'

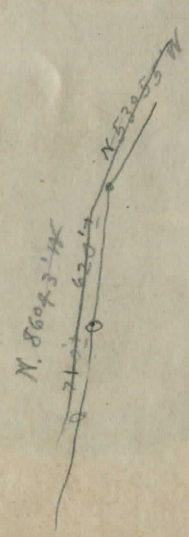
86°43'
53°55'
32°48'

755.85
50 80.
5835.85
726.6
5109.25

57°53'
85°50'
143°43'
36°17'
180°00'

66°40'
76°30'
143°10'
36°50'
180°00'

N86°43'W
N55°55'W
30°48'



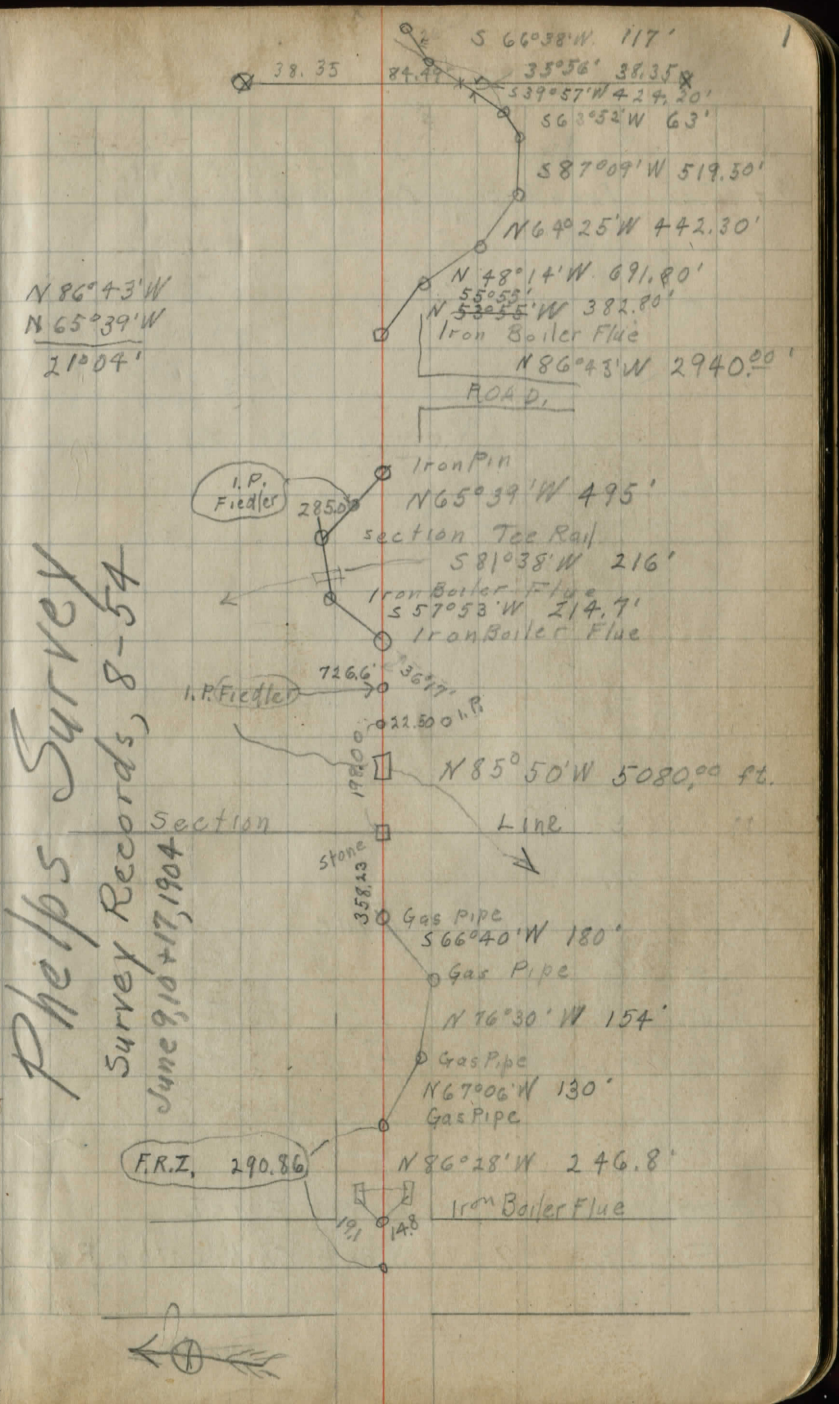
N65°39'W
S81°38'W
147°17'
32°43'

6762.2
2940.0
9702.2

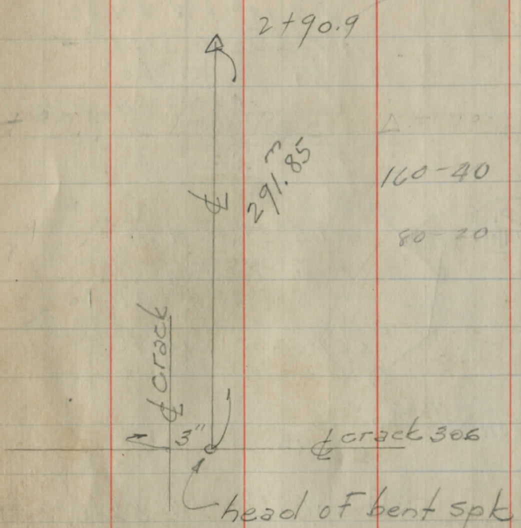
Phelps Survey

Survey Records, 8-54

June 9, 10 + 17, 1904



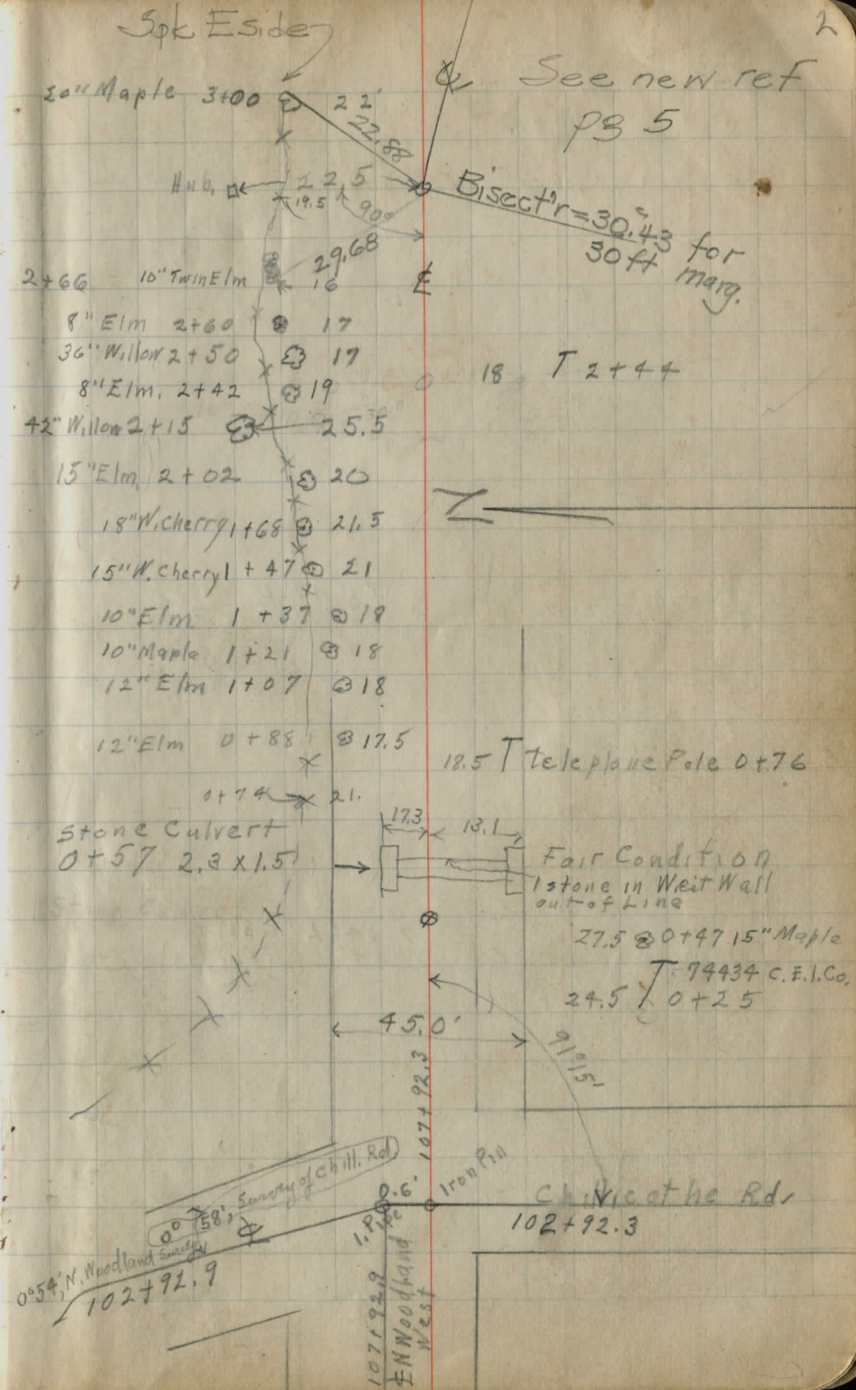
2+90.9 Iron Pipe, Δ = 19°20' Right.



0+44.2 Iron Boiler Flue

See Field Bk #176 for alignment & ref. as of June '54

0+00, N. Woodland Road East
= sta. 102+92.3 on ℄ Chillicothe Rd.


2
Spk E side
See new ref pg 5
20" Maple 3+00
22'
22.88
Hub
12.5
19.5
90°
Bisect'r = 30.43
30 ft for marg.
29.68
2+66 10" Twin Elm 16
8" Elm 2+60 17
36" Willow 2+50 17
18 T 2+44
8" Elm 2+42 19
42" Willow 2+15 25.5
15" Elm 2+02 20
18" W. cherry 1+68 21.5
15" W. cherry 1+47 21
10" Elm 1+37 18
10" Maple 1+21 18
12" Elm 1+07 18
12" Elm 0+88 17.5
18.5 T telephone Pole 0+76
0+74 21.
Stone Culvert
0+57 2.3 x 1.5
17.3
13.1
Fair Condition
1 stone in West Wall out of Line
27.5 0+47 15" Maple
T 74434 C.E.I. Co.
24.5 0+25
45.0'
91°15'
107+92.3
0.6'
Iron Pin
1 Pipe
Chillicothe Rd.
102+92.3
0°58' Survey of Chill. Rd
0°54' N. Woodland Survey
102+92.9
107+92.9
E N Woodland
West

Stopped Mar. 20, 1930
Fair, 400

Marks-Parks-Hassel

Δ = 27° 29' R. Corrected line
~~27° 25' R. Obs~~

7+55.~~85~~ .20 Iron Pipe Δ = 27° 30' (Phelps)

755.20
575.14
180.06

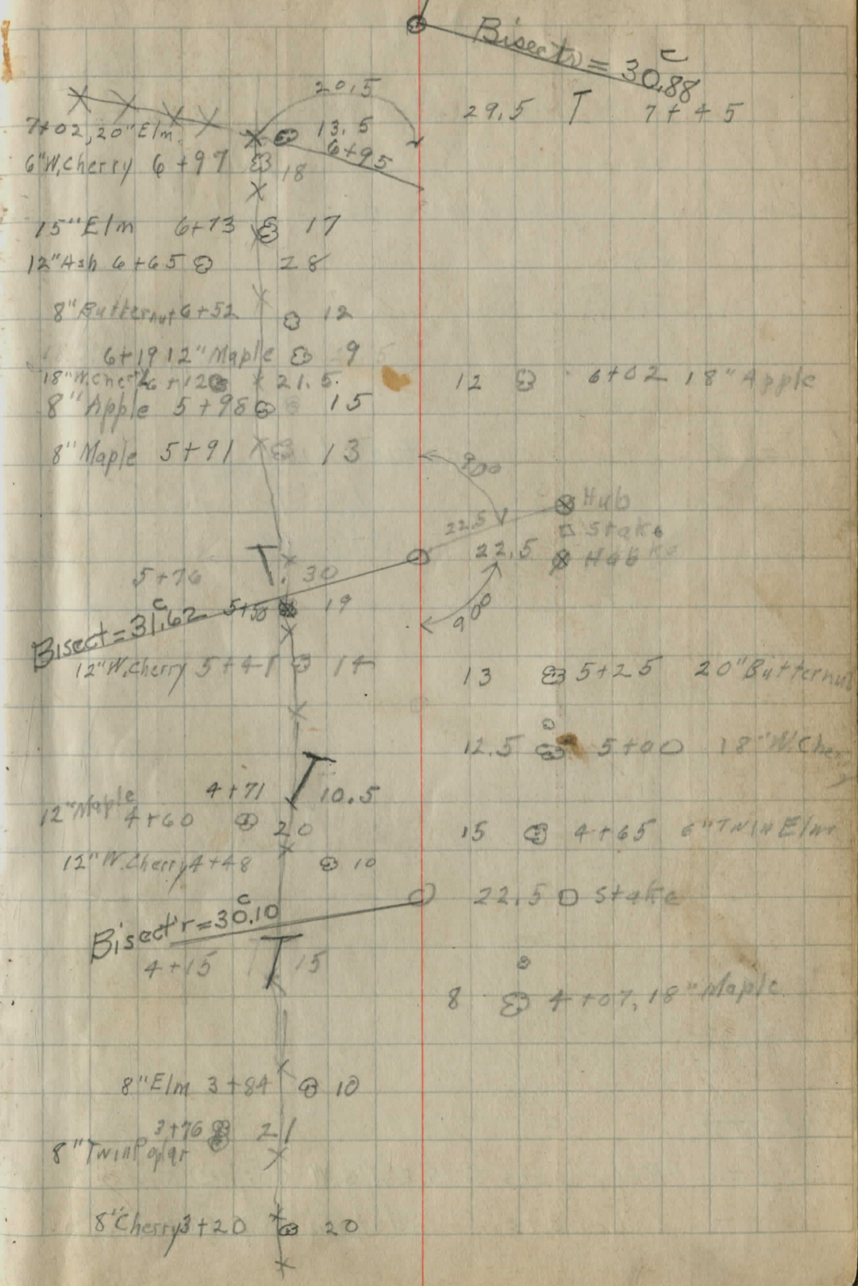
152.31
27.29
180.00

~~5+75.0~~ 5+75.14? Iron Pipe 36° 49' L Obs. Δ = 36° 50' L, Phelps

154.14
421.00
575.14

4+21.0 Iron Pipe Δ = 9° 24' L Obs. 9° 24' L. (Phelps)

421.00
290.90
130.10



Bisect'r = 30.88
29.5
7+45
20.15
7+02, 20" Elm.
13.5
6+95
6" W. Cherry 6+97 18
15" Elm 6+73 17
12" Ash 6+65 28
8" Butternut 6+52 12
6+19 12" Maple 9
18" W. Cherry 6+12 21.5
8" Apple 5+98 15
8" Maple 5+91 13
12 6+82 18" Apple
90°
Hub
Stake
Hub
22.5
22.5
5+76
30
Bisect = 31.62
5+50
19
90°
12" W. Cherry 5+41 14
13 5+25 20" Butternut
12.5 5+00 18" W. Che.
4+71
10.5
12" Maple 4+60 20
15 4+65 6" Twin Elm
12" W. Cherry 4+48 10
Bisect'r = 30.10
22.5 Stake
4+15
15
8 4+07, 18" Maple
8" Elm 3+84 10
3+76
8" Twin Poplar 21
8" Cherry 3+20 20

12+52.7

Steel Truss Bridge

12+00

S STAKE ± 11+50
7-49

S. STAKE
7-49

13.43
11+~~14.08~~ Stone on Section Line

10+84.20 m oct 54

m oct 54
178-59 on South

357-58

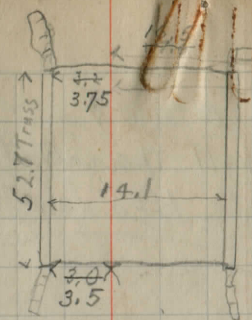
1113.43
755.20
358.23

8+62 8" v.t sewer pipe ℄ 1.5' N of end. old road all S.

20
7+55.~~85~~
358.23
11+14.08
198.00
13+12.08

References to S.E + S.W corners of concrete foundation of Porch

12+67 T ~~22.5~~ 23



Spk SW side

48" Maple 11+80 ~~37.5~~ 38.

~~17.5~~ 17 11+84 12" Sycamore

26.5 T 11+63

23. 11+14 12" Willow

29 11+08 3-4" Basswood

29 10+75 3-6" Elms

Fd 6/8/50
1' under

045

See pg. 72

25 5-6" Elms on root 10+74

29.5 T 10+45

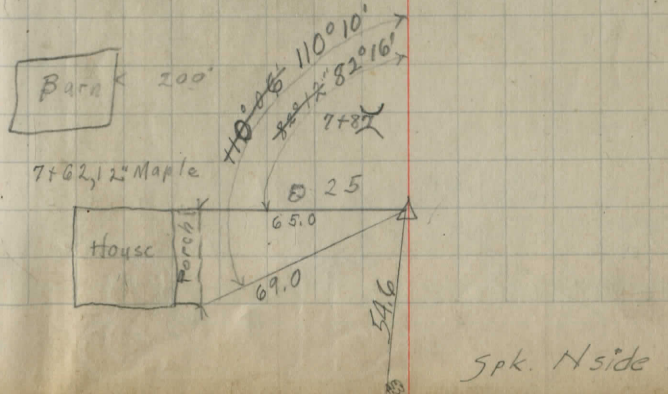
26 10+34 2-8" Elm

8+51
culvert

30.5 10+13 2-6" Basswood

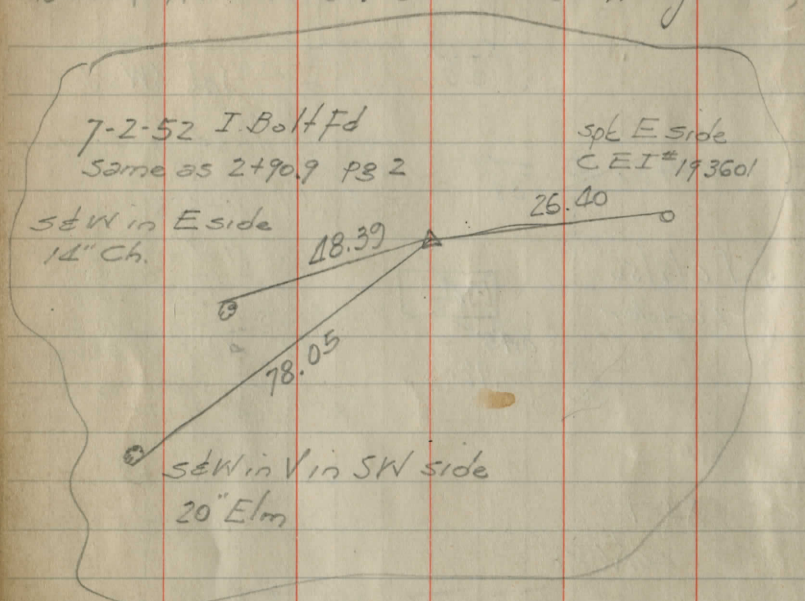
20' 100'
30.5 T 8+77

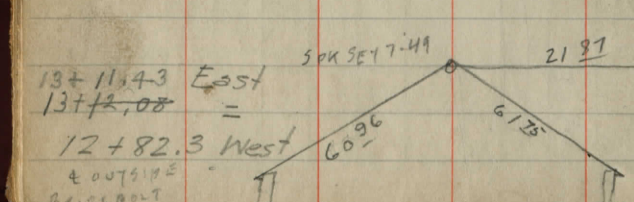
8+32 grapes 1'
8+26.5 1'

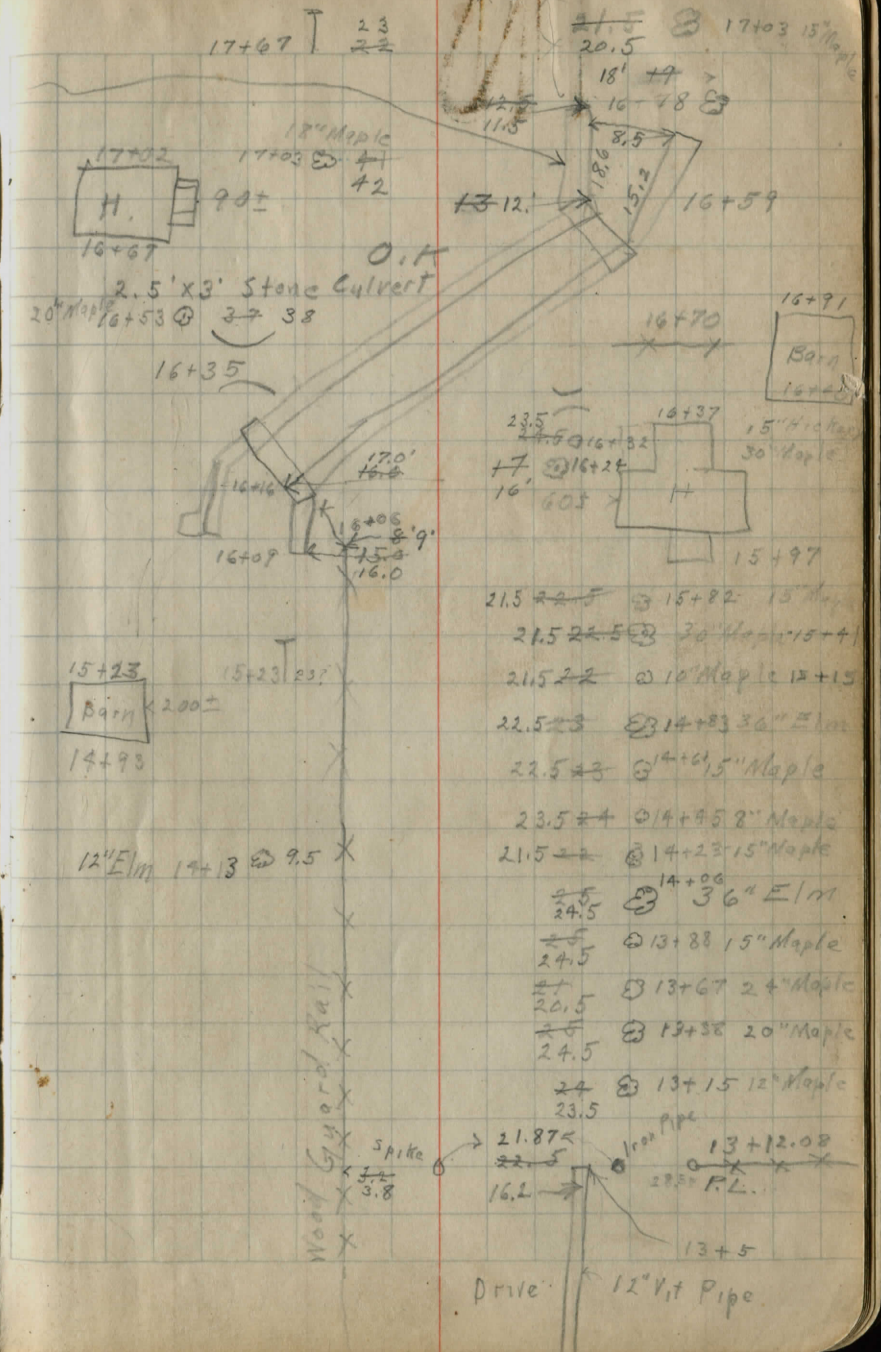


Spk. N side 14" Elm

Good Stone Masonry
Rebuild Wing Wall parallell to S. Wing Wall
Build Concrete Headwall + Wing Walls





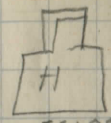


24+50 Spike 0°00'

Mar 21, 1929, 30° N. Wind.
Marks, Parks, Hassel, Asheraft.

Mar 22, 1930, 33° Fair.
Marks, Parks, Hassel
Locating Monuments in Hollow
St. Andrews Benev Soc.

0 22.5 0 stake



17 T 23+85

23 23+81 15" Maple
23+78
18

15" Maple
23+29
25.5

sq. stake set. 23+27 □ 18.2

24" Maple, 22+23 ⊙ 19

Square stake found 22+16 □ 17.3 15.6

22+11 T 12.5

C.E.I.Co. High Tension Line

creek

22+15

21+59

21.5

20+82
20+65
19+55
20" Maples
19+33
19+08
22

19+80 T 16.5

22.3

18+48

5.8

creek

17+90

38.00
58 + ~~38.62~~

54+00

5 STATE 7-49 ± 50' W William's Drive S. State 7-49

2450
755.85
1694.15
.00115
8470 75
16941 5
16941 5
1.94827 25

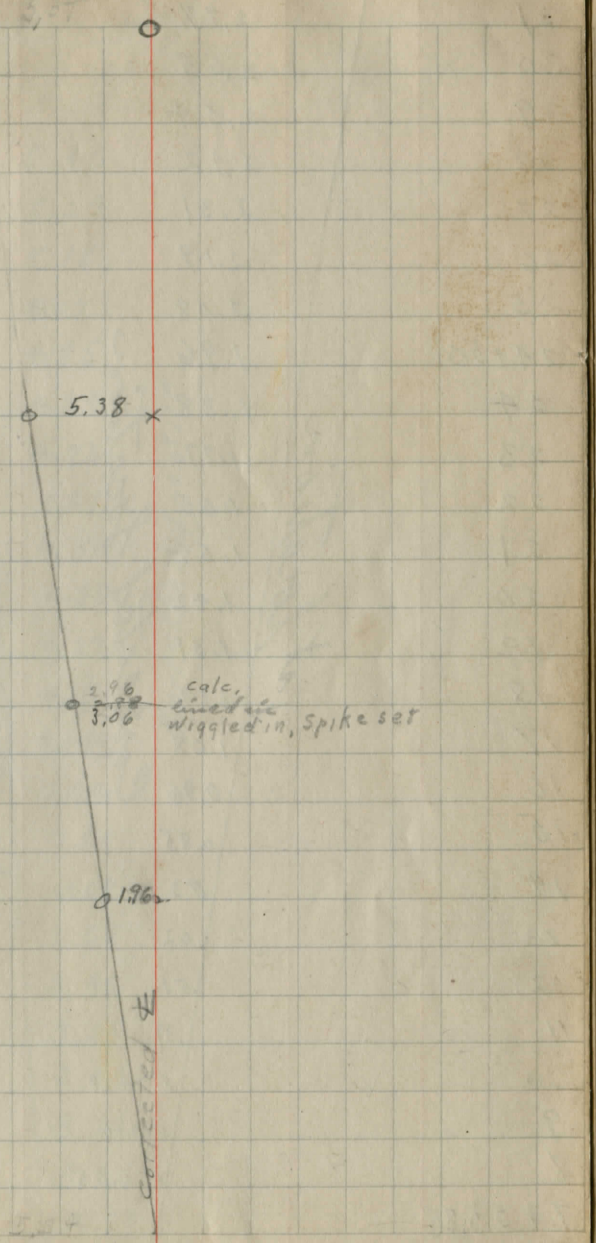
5400.00
755.85
~~4644.15~~

3300
2450
850
.00115
4250
850
850
.97750
1.95
2.93

5.3400 .00115
4644
6960
4644
23160

4644 5.3806 .00116
4644
7380
4644

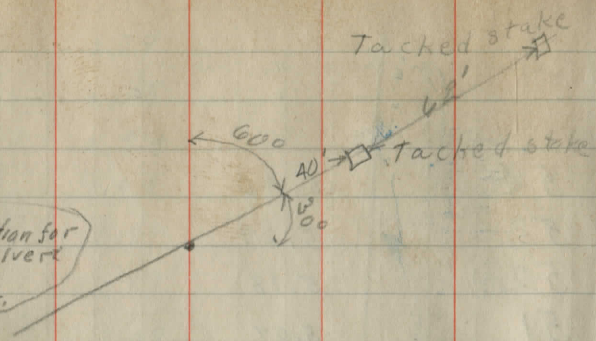
7+55.85



	1st Location	Corrected Location
31		2,77
30		2.65
29		2,54
28		2,42
27		2,31
26		2.19
25		2,08
24+50		1.96
24		1,88
23		1.77
22		1.65
21		1.54
20		1,42
19		1.31
18		1,19
17		1.08
16		0.96
15		0.85
14		.73
13		.62
12		.51
11		.39
10		← 0.28
9		← 0.16
8		← 0.05
7+55.85		

	1st Location	Corrected Location
54		5,40
53		5,29
52		5.18
51		5.07
50		4.95
49		4.84
48		4.73
47		4.61
46		4.50
45		4.38
44		4.27
43		4.15
42		4,04
41		3,92
40		3.81
39		3.69
38		3.58
37		3.46
36		3.35
35		3,23
34		3,12
33		3.01
32		2.89

26+72 Location for New Culvert
Mar. 4, 1931
Marks, Parks, Snyder.

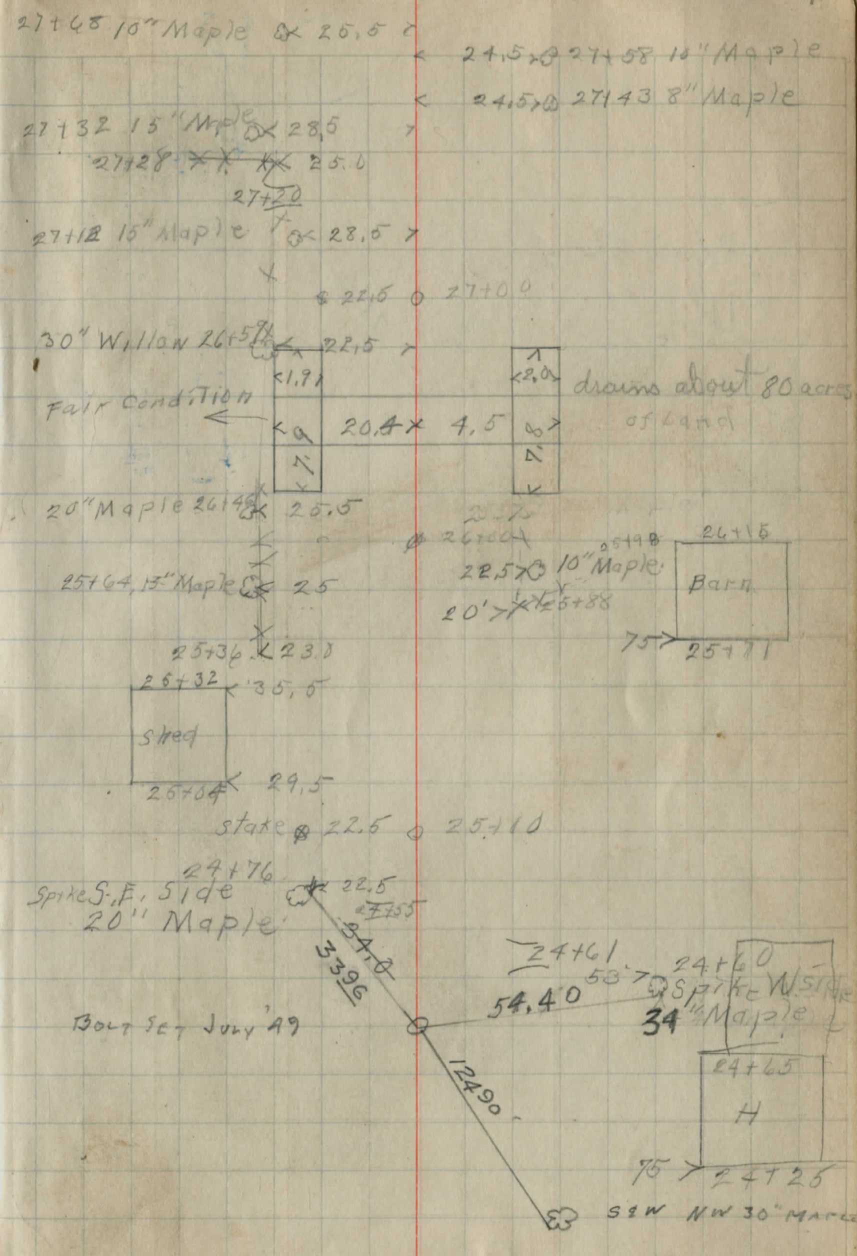


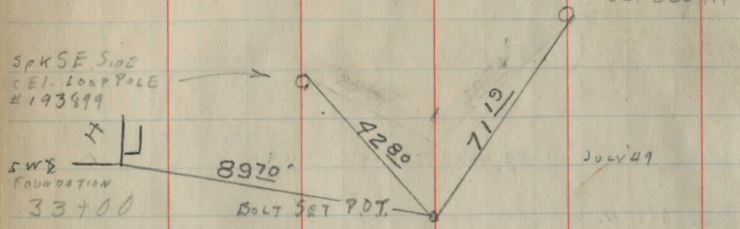
26+56,5   2'8" x 3'8" Stone slab top
Remove, Replace with 6' X 4' Concrete Culv.

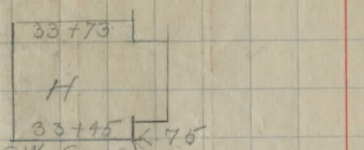
9 STAKE
7-49

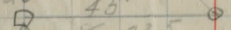
S Stake
7-49

24+50   Δ = 0°00'


27+48 10" Maple 25.5
24.5 27+58 10" Maple
24.5 27+43 8" Maple
27+32 15" Maple 28.5
27+28 25.0
27+20
27+12 15" Maple 28.5
22.5 27+00
30" Willow 26+59 22.5
1.9
Fair Condition
20.4 4.5
2.0
drains about 80 acres of Land
20" Maple 26+48 25.5
26+00
25+98 10" Maple
22.5
24+15
Barn
20' 25+88
25+64, 15" Maple 25
75
25+71
25+36 23.0
26+32 35.5
Shed
26+64 29.5
stake 22.5 25+10
24+76 22.5
Spike S.E. Side 20" Maple
27.55
34.0
3396
24+61
58
24+60
Spike W. Side 34" Maple
54.40
Bolt Set July '49
12490
24+65
H
75
24+26
S&W NW 30" Maple







90°

Small Creek

@ 22.5 × 32+00

31+70 @ 30'

@ 5' × 31+00

@ 5' 10' × 30+00

30+00

29+25 @ 15 ×

@ 10' @ 29+00

28+48

28+88 @ 25.5

28+72 @ 25.5

28+56 @ 25.5

10' Maple

28.0

23.5 × 28+39 18" W. Cherry

@ 22.5' @ 28+00

Stopped April 3, 1930
Sunny Warm D. Parks
F. Ashcraft

40+71.5 15" Corr pipe culvert
Req. 15" Pipe

5 STAKES 7-49 ± 50' WILLIAMS DRIVE.

37+20 Req. 15" Pipe

5: STAKES 7-49 ± 53+50

44+02 < 14 >
15 × 44+00

43+44 24" Apple < 30' >

15' × 43

42+15 < 18 >
Iron Boiler flue 42+02 < 23.0
22.5 × 42.00

41+94

41+70 < 14. >

22.5 × 41+00

14 ft Length of 15" Cast Iron Pipe on S. end | 4.9 | 19.4 > good shape. drains about 1/10 acres.

22.5 × 40+00

39+41 < 14.5

22.5 × 39+00

22.5 × 38+00

37+48 < 15.5

22.5 × 37+00

22.5 × 36+00

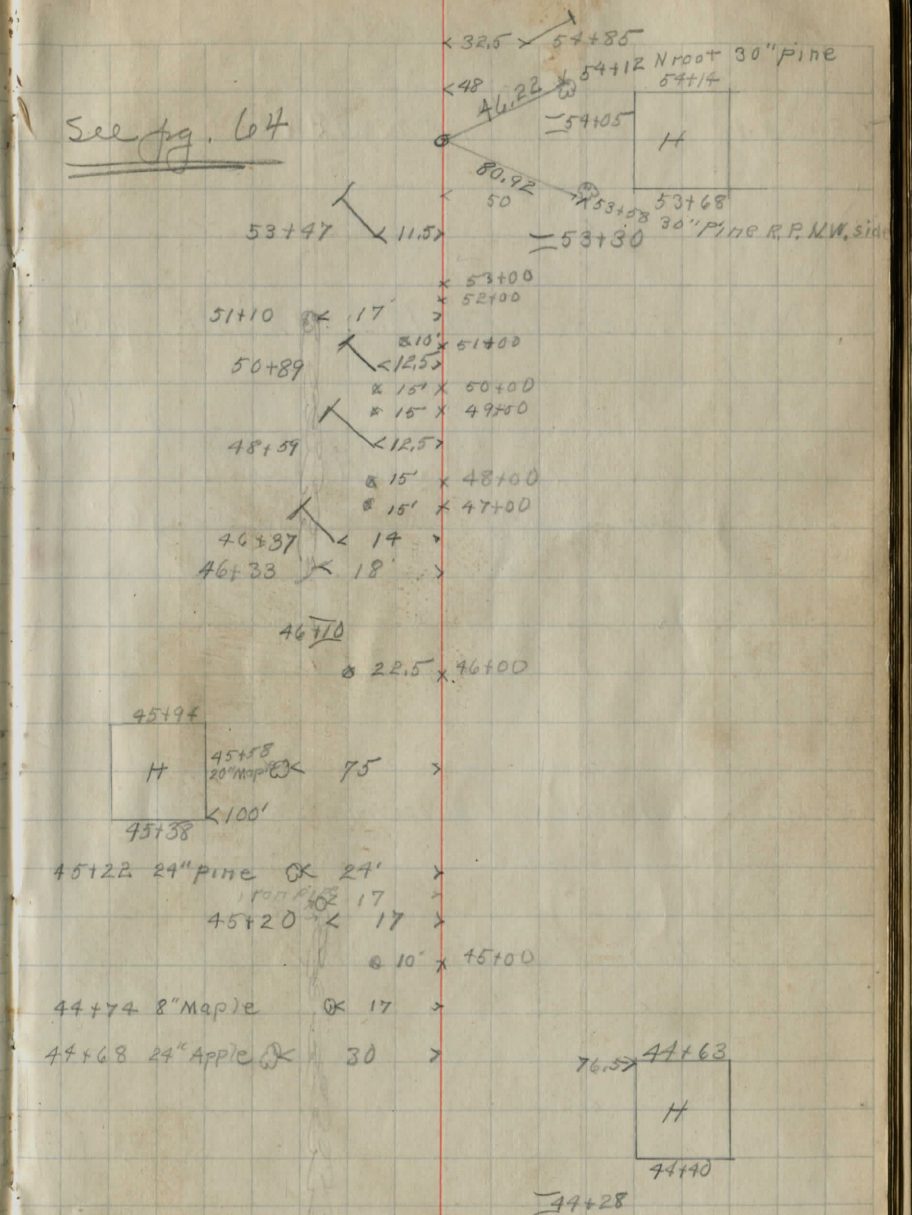
15" Elm
35+41 < 28.5 >
35+15
35+59
35+04 < 16.5 >
Barn
22.5 35+00
34+94 < 100'

22.5 34+00

54+00 Δ = 0°00'

See p3 64

53+93.5 = Northwood Rd



65+53.0 Δ = 0°00' to P.I.

493.8

147°-10' turned 8-22-50

62+68.4 Tee Rail Found Δ = 32°38'R See pg 65

215.9

Extend, Face stonewalls with concrete

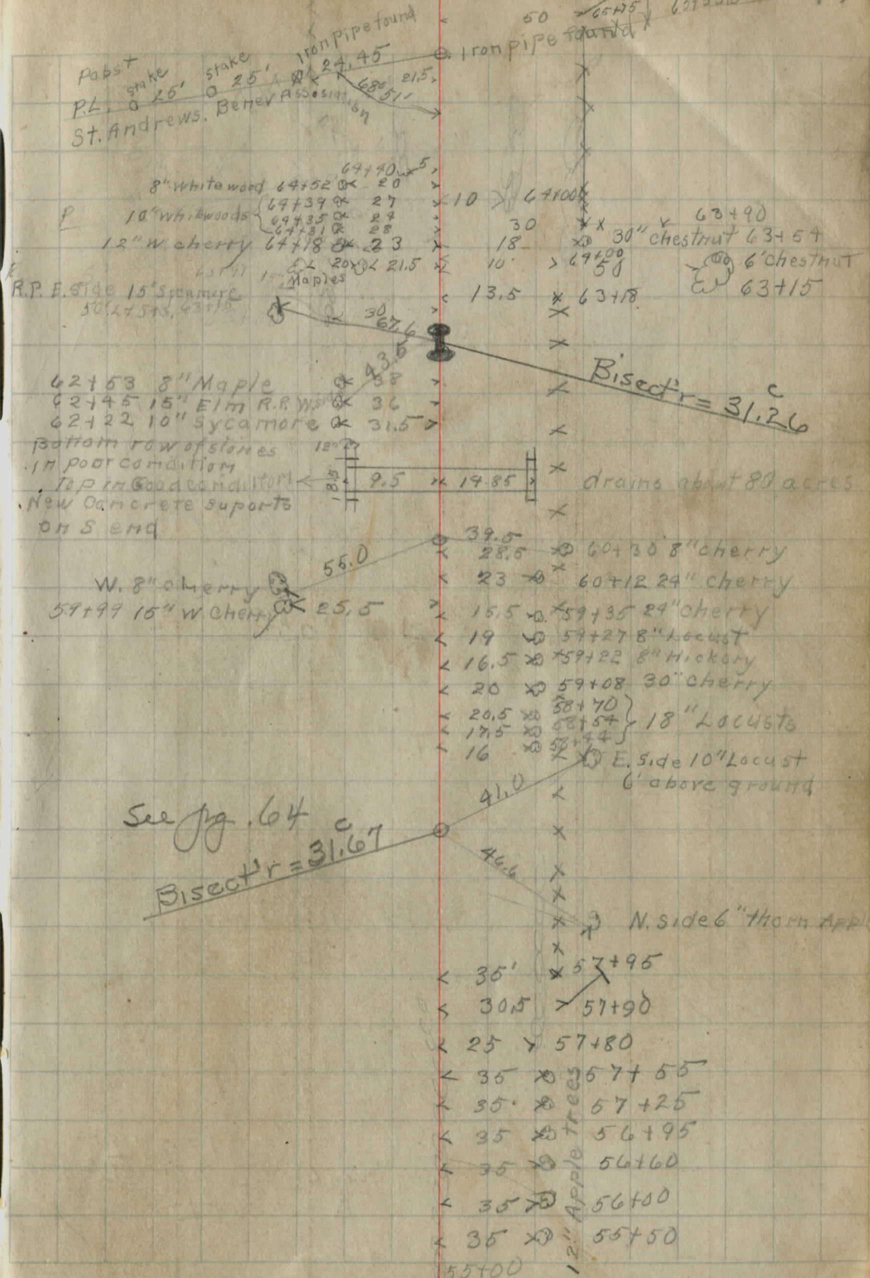
61+20.6 3.5x3.5 Stone Box

60+52.5 Iron Bar Found Δ 23°51'R See pg 65

214.5

58+38.0 Iron Boiler Flue Found Δ = 36°18'L
8-22-50

See pgs 64 on



65+53.0
Iron pipe found
Pabst
P.L. stake 25' stake 25'
24.45
St. Andrews. Benev Association
8" Whitewood 64+52 20
10" Whitewoods 64+39 27
12" W. cherry 64+18 23
64+00
30" chestnut 63+54
6' chestnut 63+15
R.P. E. Side 15" Sycamore
13.5 63+18
67.6
43.5
Bisect'r = 31.26
62+53 8" Maple
62+45 15" Elm R.R.W.
62+22 10" Sycamore 31.5
Bottom row of stones in poor condition
Top in good condition
New Concrete suports on S end
9.5 14.85
drains about 80 acres
60+30 8" cherry
60+12 24" cherry
W. 8" cherry
55.0
59+99 15" W. cherry 25.5
59+35 24" cherry
59+27 8" Locust
59+22 8" Hickory
59+08 30" cherry
18" Locusts
E. side 10" Locust 6' above ground
41.0
See pg. 64
Bisect'r = 31.67
46.6
N. side 6" thorn Apple
35' 57+95
30.5 57+90
25 57+80
35 57+55
35 57+25
35 56+95
35 56+60
35 56+00
35 55+50
12" Apple Trees
55+00

To P.I. at Heims

2355, 65

S. S. TANG 7-49 ± 200' ↑ E WATT ROAD

see ref Pg 66

73 + 48.35

67 + 62.2°

5 86.15

$\Delta = 0°00'$

Pin O.K. 8/16/34

69+96.5 12" Corr. culvert ends broken

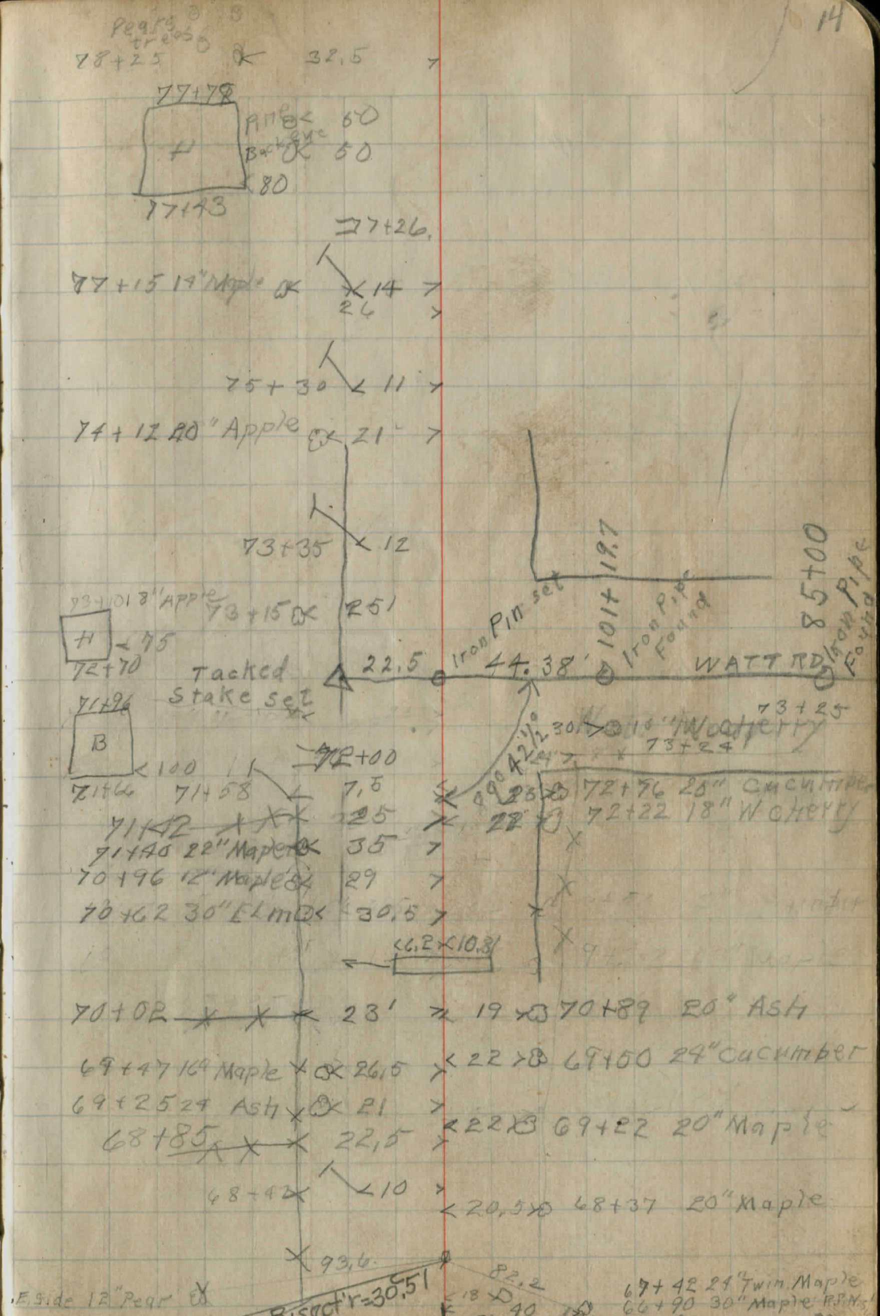
Req. 18" Pipe

21° 03' L

Corrected Line, $\Delta = 21°03'$ L

67+62.2 Iron Bar Found $\Delta =$ ~~21°04' L~~

SEE next pg for new ref



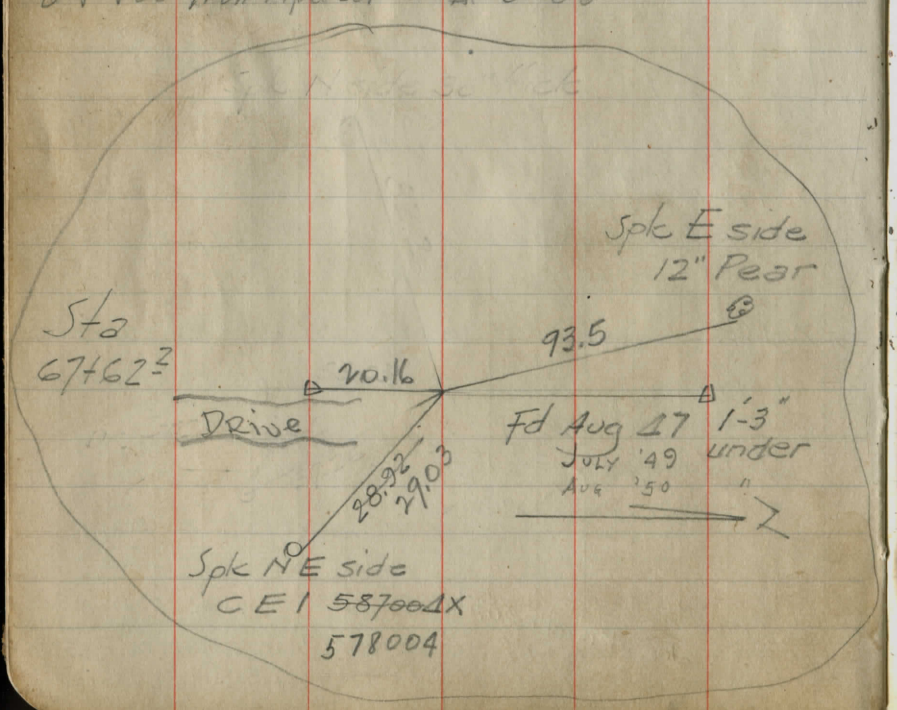
Pears trees
78+25 32.5
77+78
Apple 60
Buckeye 60
80
77+43
77+26
77+15 14" Maple 14 26
75+30 11
74+12 20" Apple 21
73+35 12
73+10 18" Apple
73+15 25'
75
72+70
Tacked Stake set
22.5
Iron Pin set
44.38'
101+19.7 Iron Pipe Found
85+00 Iron Pipe Found
WATT RD.
73+25
73+24
72+00
71+96
B
100
71+44 71+58
7.5
71+12 25
71+40 22" Maple 35
70+96 12" Maple 29
70+62 30" Elm 30.5
72+76 20" Cucumber
72+22 18" W. cherry
6.2 10.8
70+02 23'
19 70+89 20" Ash
69+47 16" Maple 26.5
22 69+50 24" Cucumber
69+25 24" Ash 21
22 69+22 20" Maple
68+85 22.5
68+42 10
20.5 68+37 20" Maple
93.6
82.2
Bisect'r = 30.51
E side 12" Pear
67+42 24" Twin Maple
66+90 30" Maple

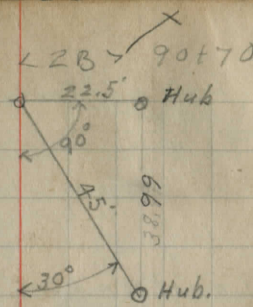
Apr. 10, Marks, Barton + Merrill, retracing Phelps Survey, from Fullertown West

Stopped, Apr. 10, 1930, Fair, 65° Parks, Gray, Belding, & Topo.

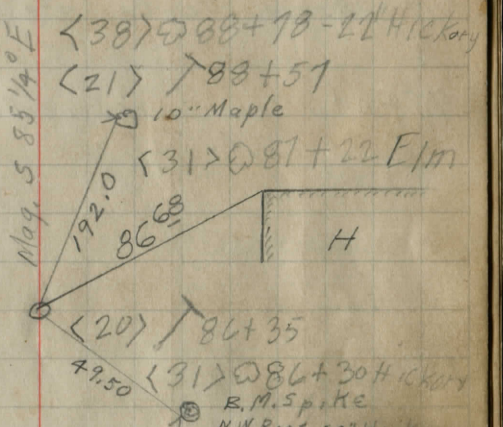
90+00 Iron Pipe Set Δ=0°00'

84+00 Iron Pipe set Δ=0°00'





Pin in I.P. fd
1" under Aug 47



100+86.85, Iron Bar Found Δ = 7°41 R See pg. 67

99+55, Location for 4'x3' Culvert on

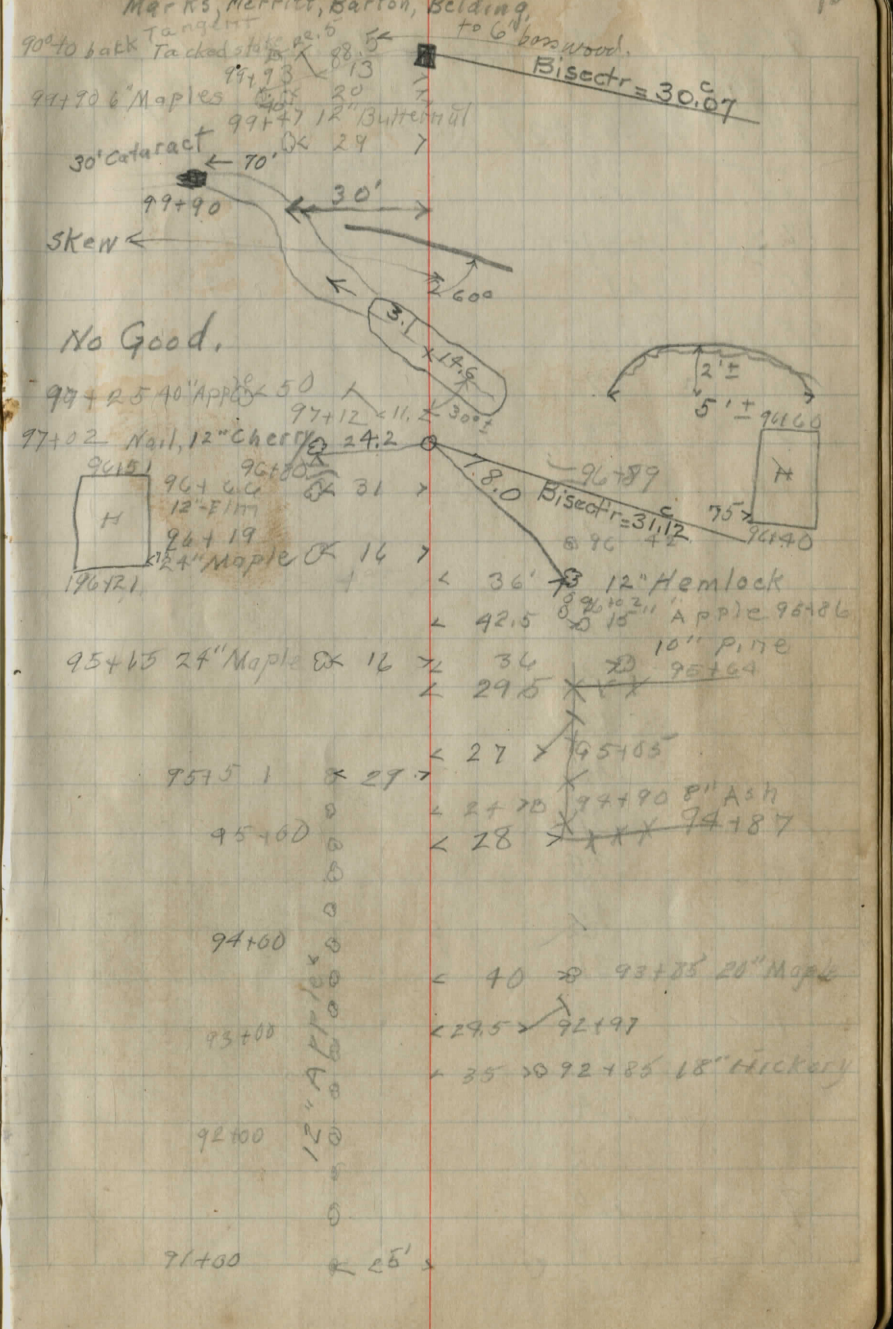
99+29 Rotten Concrete Arch, Absolutely

97+04.0 Iron Boiler Flye Found. Δ = 30°48' R. See pg 66

100 86.85
9704
382.85

S. STANS 7-29 W END "ELM ORCHARD"

Stopped Apr. 11, 1930 Fair. 70°
Marks, Merritt, Barton, Belding,



97+04.0 Trial Line Hit .63 N. of Iron Boiler Flue Found
67+62.2

29418 / .63000 (.0002

58

Sta	Correction South.
97	.63 ft.
96	.61
95	.59
94	.57
93	.55
92	.53
91	.51
90	.48
89	.46
88	.44
87	.42
86	.40
85	.37
84	.35
83	.33
82	.31
81	.29
80	.26
79	.24
78	.22
77	.20
76	.18
75	.15

Sta.	Correction South. .13
74	
73	.11
72	.09
71	.07
70	.04
69	.02
68	.00

11741.76
11221.67
520.29

114+32 Stone Box 1 length 15" Iron pipe N. End
Requires new 18" Pipe

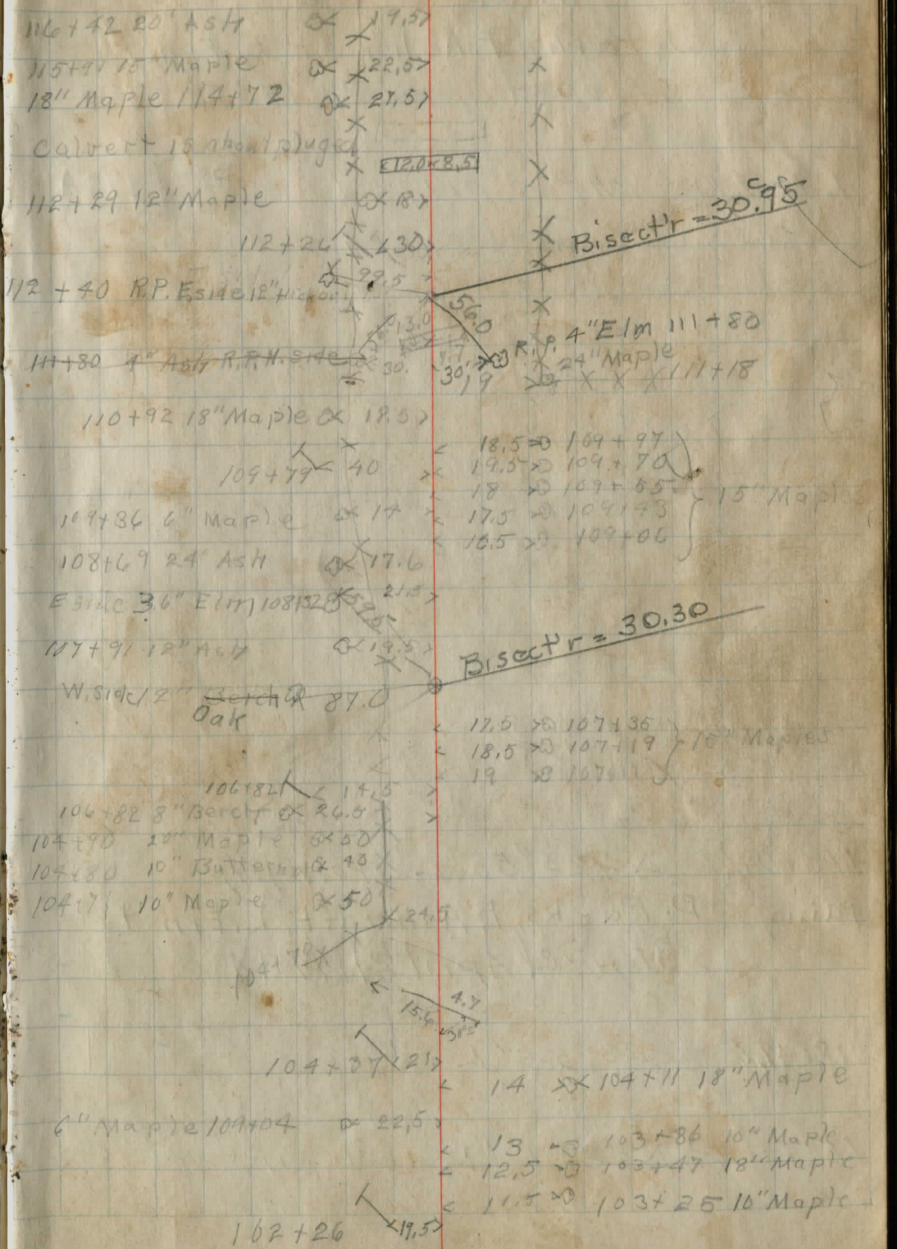
112+21.67 Δ - 28° 27' L Iron pipe? See pg 69
112+16.0 12" V.I.t pipe culvert set or found?
Requires new 15" pipe See pg 67

11221.67
10779.3
442.37

107+79.3 Δ = 16° 13' L Boiler flue found

10779.3
10086.85
692.45

107+54 12" corr Iron pipe good shape
Req. 15" pipe



Cold Wind.
D. Parks, F. Ashcraft L. Ernst
Stopped April 22 1930

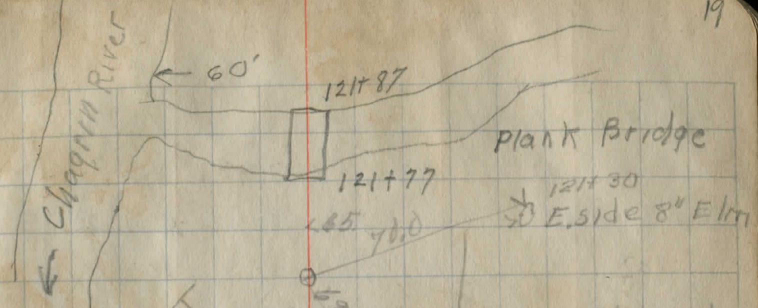
121+44.70 end of project See pg 70A
Twp line?

12144.70
11804.96
339.74

118+04.96 Δ = 23°55' L iron pipe (? found or set)
rainy P. Parks, F. Ashcraft, L. Ernst
Stopped April 21, 1930

63.00

117+41.96 Δ = 23°16' L iron pipe See pg 70
(? found or set)



121+42 ← 25.5 | < 12 >⊗ 121+42 15" Maple
< 17.5 >⊗ 121+03 15" Maple
< 17 >⊗ 120+94 18" Maple
< 19 >⊗ 120+76 20" Maple R.P. N.E. side
120+55 rock < 25.5 | < 16.5 >⊗ 120+30 ... Maple
< 17 >⊗ 120+15 18" Maple
< 16 >⊗ 119+98 12" Maple
< 16.5 >⊗ 119+83 24" Maple
119+25 8" Maple ⊗< 11 >
118+99 20" Maple ⊗< 9 >
118+53 18" Beech ⊗< 9.0 >
118+49 24" Beech ⊗< 9.5 > | 24 >⊗ 118+45 18" Butternut
14 >⊗ 118+48 12" Butternut
11.5 >⊗ 118+27 8" Maple
R.P. N.E. side
21 >⊗ 118+24 12" Butternut
27.0
118+15 6" Beech
R.P. W side ⊗< 25 >
27.7
Bisect'r 30°67

< 15' >⊗ 118+02 15" Maple
R.P. S. side 5" Beech ⊗< 24 >
118+00 10" Maple ⊗< 27 >
117+90 20" Maple ⊗< 30 >
117+85 20" Beech ⊗< 30 >
117+67 Maple ⊗< 25 >
117+57 18" Ash ⊗< 22.0 | 50
117+57 15" Apple R.P. N. side
58.0
Bisect'r = 30°63
117+30 12" Beech ⊗< 13.5 >
117+18 6" Boxwood ⊗< 16 >

B. M.	1.41	1052.41		1051.00
	0.76	1040.86	12.31	1040.10
B. M.			9.62	1031.24
	4.15	1035.35		1031.20 Record
0+00			6.2	1029.2
0-30			5.3	1030.1
0-50			4.5	1030.9
-100			0.7	1034.7
0+57				
~~0+44.2~~			6.3	1029.1
0+57				
~~0+44.2~~	For	Earth	Work	
1+00			6.9	1028.5
	5.04	1033.19	7.20	1028.15
2+00			5.1	1028.1
3+00			4.7	1028.5
4+00			2.0	1031.2
	12.89	1044.67	1.41	1031.78
4+00				
4+21			12.2	1032.5

S. E. root 30" Maple Lt., Sta. 112. Chillicothe

X - N.E. Cor. N. Head wall Culvert W. of Chillicothe

1033.5 1032.0 1030.6 1029.7 1029.4 1029.2 1029.2 1029.0 1029.0 1029.0 1029.5 1030.3

1.9/250 3.4/200 4.8/150 5.7/100 6.0/50 6.2/30 6.2/2 6.7/30 6.4/50 6.7/100 5.9/150 5.1/200

1024.1 11.3/200

1027.3 1026.5 1026.3 1027.9 1030.0 1029.0 1027.1 1029.0 1028.9 1030.0 1027.8 1026.1 1026.0 1025.9 1025.7 1025.0

8.1/50 8.9/29 9.1-7.5/Est. 17.3 5.4 6.4/12 6.3/9 6.7/9 5.5/10.5 5.4-7.6-8.8/13.1 9.4/23 9.6/27 9.7/50 10.5/100

N along ditch

8.0/23 9.0/20 8.0/21

7.4/30 7.8/21 8.2/13 9.0/13 7.3/9.5 6.9/9 7.4/10 8.9/13 7.8/16.5 8.0/30

5.7/30 5.7/27 5.6/19 5.6/14 6.2/10.5 5.4/8 5.1/9 5.4/11.5 6.2/14 5.7/16 5.9/21 6.1/30

+0.2/30 1.3/23 3.9/20 8.5/10 6.0/7.5 4.7/5 4.7/9 5.7/10 5.9/28.5 6.7/30

2.4/6 2.0/9 2.1/6 4.1/9 5.1/14.5 5.6/30

Large Stone Rt side Rd.

+4.5/40 0.2/30 3.1/24 8.2/15 8.8/13 13.5/9

+5.5/40 0.0/32 1.7/29 5.2/22 8.0/16.5 8.0/14.6 12.6/7 12.2/9

See 1950 Fol. Bk. levels No 104 pg 57

		1044.67		
5				
	4.37	1036.15		1031.78
4+21				
5			4.7	1031.5
5+75,14			5.5	1030.7
6			5.9	1030.3
	12.97	1049.12	0.00	1036.15
5+75,14				
6				
6+50				
	0.67	1036.82		1036.15
6+50			7.7	1029.1
7			8.5	1028.3
	4.91	1033.06	8.67	1028.15
7+25			5.0	1028.1
7+55,20			5.0	1027.6

+10.5 / 40 +4.0 / 30 0.8 / 24 8.1 / 10 13.6 / 2 13.2 / ℄

2.68 / ℄ 4.0 / 6 7.0 / 9.5 8.0 / 16 8.2 / 30

4.7 / 4 4.7 / 12 6.5 / 16 7.6 / 22.5 7.6 / 30

6.0 / 13 5.5 / 2 5.5 / 6 7.8 / 17.5 7.8 / 30

6.2 / 6 5.9 / 2 5.6 / 11 7.4 / 21 7.8 / 30

Spike in fence post

+3.8 / 50 0.2 / 46 3.6 / 41 11.3 / 29 13.0 / 22 18.5 / ℄

+5.9 / 50 +1.9 / 46 0.1 / 37 14.0 / 18 14.1 / 15 18.9 / ℄

+4.7 / 50 0.1 / 45 6.8 / 30 13.0 / 18 14.2 / 14 20.0 / ℄

8.0 / 4.5 7.7 / 2 7.9 / 16.5 9.3 / 30

+2.0 / 40 0.4 / 34 8.6 / 12 8.4 / 3 8.5 / ℄ 9.3 / 14.5 9.9 / 22 10.0 / 30

2.7 / 30 4.8 / 24 5.1 / 14 5.0 / 2 4.9 / 12.0 5.4 / 21 6.1 / 30

4.7 / 30 5.5 / ℄ 5.0 / 11 5.0 / 26 5.7 / 28 5.3 / 31

		1033.06 ✓		
8			5.4	1027.7
8+62	8"		5.9	1027.2
	4" V.t.	sewer pipe drain for field		
9			5.5	1027.6
10			4.9	1028.2
11			3.9	1029.2
B.M	6.54	1038.02 ✓	1.58	1031.48 ✓
11+80			6.5	1031.5
12			4.8	1033.2
12+26.35			4.5	1033.5
12+52.7			4.5	1033.5
12+55			4.6	1033.4
13			4.4	1033.6
14			3.7	1034.3

5.0/30 5.4/2 4.7/15.5 5.0/22.0 5.7/24.25 5.0/26.5 5.4/30

5.4/30 5.9/2 7.2/1.5 Inlet 4.7/6.5 5.0/21 5.6/22.5 5.6/32 4.0/95 8.3/100 Outlet

5.4/30 5.5/2 4.7/6.5 5.6/17 5.3/23 5.7/25 4.8/30

4.4/30 5.3/8.0 4.9/2 4.8/11 5.6/20 6.0/21.5 5.8/25 4.5/27.0 4.3/30

4.9/30 5.3/13.5 4.8/4 3.9/2 4.5/2.5 4.1/9.5 4.7/15 5.5/17.5 5.7/22 4.0/29.5 4.5/30

Spike S. Root 48" Maple 30' Left sta 11+80

7.8/30 8.7/14.5 5.9/2.5 6.5/2 6.3/11 9.7/17 10.9/24 9.7/30 9.7/40

12.3/10 11.3/25 12.7/5.5 Footer 5.4/4 Bridge Foot 4.6/3 4.8/12 Bridge Floor 4.6/11 5.5/12 Bridge Foot 13.4/17.5 Footer

1023.5 1023.4

14.5/3 4.6/3.7 4.5/2 Bridge Floor 4.5/11 14.65/11

11.9/30 11.9/21.6 14.1/13 11.6/7.5 11.2/7 5.3/4.5 4.7/2.5 4.5/2 Bridge Floor 4.5/10 5.3/12.5 9.6/12.5 10.9/19.0 12.2/27 10.3/36.5

11.2 5.3 / 7

4.6/2 4.5/10 5.6/11 4.5/23 5.7/39

7.4/30 10.8/23.5 11.9/20.5 11.9/15 4.2/4.6 4.4/2 4.7/17 4.0/30

5.7/30 5.7/27 9.8/23 9.5/15 3.6/5 3.7/2 3.7/5 4.1/12.5 4.8/13.6-15 2.7/18 2.4/30

		1038.02 ✓		
15			3.0	1035.0
	8.40	1043.78 ✓	2.64	1035.38 ✓
16			7.6	1036.2
16+41			6.8	1037.0
16+41	For earth work			
B.M.			8.36	1035.42 ✓

Stopped April 14, 1930

Parks - Gray, - Merritt

Cold North Wind 65°

N 5

4.7	4.7	8.1	8.0	3.1	3.0	2.8	3.1	3.5	2.7	2.2
30	24	20	14	7	2	6	12	13.5	17	30

8.8	8.7	12	11.5	7.8	7.6	7.8	2.7	1.6	0.7
36	34	30	16	12	4	14	23.5	30	35

1030.5	1031.2	1032.7	1034.5	1038.2	1036.5	1037.0	1037.9	1039.5	1035.2	1031.9	1032.16	1033.2	1034.0
13.3	12.2	12.1	9.3	5.6	7.3	6.8	5.9	4.3	8.6	11.9	11.2	10.6	9.8
100	75	54	50	28	4	20	2	22	42	52	34	50	100

ditch, parallel with Rd. W. E. Rail

7.2	6.6	6.9	6.9	5.7
36	72	9	6	31

E. root 24" Maple 25' Rt. Sta. 16+70

B.M	7.93	1043.35		1035.42
17			5.1	1038.3
18			4.0	1089.4
	12.02	1054.30	1.07	1042.28
19			12.7	1041.6
20			10.4	1043.9
21			7.1	1047.2
22			2.7	1051.6
	11.94	1065.98	0.26	1054.04
23			8.4	1057.6
	9.06	1073.64	1.38	1064.60
24			8.4	1065.3
24+50			6.2	1067.5
25			6.8	1066.9
25+35			9.2	1064.5
25+90				

E. root 24" Maple 25' Pt Sta. 16+70

5.4/30 5.1/E 5.0/4 9.6/8.5 9.6/19.5 6.3/21.5 6.3/30

3.3/30 4.1/20 4.0/E 4.0/4 4.0/7 4.4/16 4.2/22 4.3/30

12.1/30 12.9/14.5 13.5/13.5 12.8/12 12.7/E 13.1/7.5 14.2/10-13 13.3/15 10.3/21.5 9.7/26-30

9.0/30 9.3/16.5 10.9/12 10.4/11 10.4/E 11.2/10 12.1/12-16 5.6/25 5.5/30

5.4/30 6.5/13 8.3/12 7.2/10 7.1/E 7.1/8.5 8.6/16 9.3/20 4.2/25 4.2/30

0.2/30 0.4/22 2.0/11.5 3.3/7.5 2.8/8.5 2.7/E 2.7/8 6.3/14-16 1.0/24 1.0/30

4.7/30 7.2/12 9.1/10.5 8.6/9 8.4/E 8.7/7 8.9/11 4.4/13.5 6.5/20 10.6/30

7.3/30 7.5/18 8.9/12 8.3/9 8.4/7 8.2/4.5 8.9/6 6.3/15 5.4/14.5 5.5/30

6.1/30 6.3/13 5.2/6 6.2/4 4.0/7 2.2/22 2.0/30

4.1/30 6.0/26.5 4.8/20 3.3/15 7.8/9.5 8.1/11.5 6.8/E 2.5/7.5 0.7/19 0.3/30

9.9/30 10.3/23 11.2/21 10.5/19 10.0/4 10.9/3 9.2/E 5.3/7 2.1/11 0.3/30 0.0/40

14.2/E 0.7/18 0.4/30 0.4/40

		1073.66		
26				
	1.80	1062.61	12.85	1060.81
25+90			3.1	1059.5
26			4.1	1058.5
26+20			5.0	1057.6
	2.22	1060.59	4.24	1058.37
			2.6	1058.2
26+56.5	Stone Slab Top Culvert			
				1058.3
27 taken from H.I.		1064.82	6.5	~~1054.1~~
	6.45	1064.82		1058.37
B.M.			9.28	1055.54
	11.79	1076.40	0.21	1064.61
28			12.6	1063.8
	12.95	1089.14	0.21	1076.19
29			12.1	1077.0
	11.76	1099.85	1.05	1088.09
30			12.7	1087.2
31			6.3	1093.6
32			2.1	1097.8
	10.08	1107.59	0.34	1099.51
33			7.7	1101.9

1.5.2

11.3/3 5.6/12 2.4/30

5.4/30 4.2/21 3.6/20 3.4/1 3.1/2

6.2/30 4.5/21 4.0/19.5 3.4/10.5 3.7/3 4.1/2

6.8/30 5.2/21.5 5.5/20.5 5.0/20 4.1/16.5 5.0/2 6.4/11.5 2.9/22.5 0.4/30

S.E corner Headwall Culvert Sta 6+56.5

1053.1

14.7/100 11.1/40 9.9 6.4 2.2 3.4 2.5 2.6 2.9/2.5 2.3 6.2 9.9 8.9 8.4 6.1 7.3/4.5

1045.9 1049.5 1050.7 1054.0 1058.4 1057.2 1058.1 1058.0 1059.7 1058.3 1059.4 1059.7 1052.1 1052.8 1054.5

FL 13 21.30 30

8.2/30 7.5/27 7.8/22 8.6/20-18 7.3/16 6.3/7.5 6.5/2 6.9/2 7.6/3 10.3/17 10.9/40

East Side 12" Willow 60' Rt sta. 27+15

10.8/30 10.3/22 13.1/17 12.3/13 12.2/4 12.6/2 12.8/8 12.9/7 12.0/11 13.9/22 15.4/30

3.9/40 3.7/30 3.4/22 12.8/10 12.4 12.1/4.5 12.1/2 13.0/9.5 2.8/11 3.6/24 3.6/35 15/45

7.5/40 7.5/30 6.8/15 13.3/8 13.0/4 12.7/2 12.5/6 12.9/12 13.9/14 8.0/19.5 7.3/30 7.7/40

3.1/30 2.4/10 7.0/5 6.4/4 6.3/2 6.0/6 6.5/13 7.0/14 3.6/18 3.7/30

0.7/30 1.7/9 2.9/6.5 2.2/5 2.1/2 2.2/13 2.7/16.5 1.7/18.5 2.1/30

2.6/30 3.1/22 5.5/10 8.3/4 7.7/3 7.7/2 7.4/8 8.6/18.5 8.1/20 8.6/30

1109.59

33+50	6.4	1103.2
34	7.5	1102.1
35	10.2	1099.4
B.M	10.53	1099.06

Stopped April 15, 1930
D. Parks, E. Belding, F. Grau.

35 40
33 73
16 7

0.1/30	2.1/14.5	3.7/7	6.5/2	6.4/4	6.0/8	6.8/15	8.0/19	8.8/30
2.5/30	5.4/7	7.2/3	7.5/2	7.5/4	7.3/9	7.6/17	8.0/21	7.0/22.5	7.4/30
9.6/30	10.0/7.5	10.9/5	10.2/3	10.2/4	10.1/10	10.7/17	11.6/21	10.8/22.5	10.8/30

Start 15" E I m 28.0' Left Sta. 35+40

Gone

B.M	3.99	1103.05		1099.06
36			4.8	1098.3
37			5.1	1098.0
37+20			5.1	1098.0

Natural drain + 60° to back tangent

T. F. Williams reports that water on S. side runs to South.

38			4.6	1098.5
39			1.2	1101.9
	4.91	1106.92	1.04	1102.01
39+30			4.5	1102.4
40			4.7	1102.2
	7.36	1108.08	6.20	1100.72
40+71.5	15" cort. pipe Culvert		5.9	1102.2
41			6.0	1102.1
42			4.2	1103.9
43			2.1	1106.0
	11.58	1118.45	1.21	1106.87
44			9.7	1108.8

T. F. Williams says Water Runs to South.

		1118.45		
45			6.5	1112.0
B. M.			3.06	1115.39
			3.6	1111.9
46			3.6	1114.9
			0.2	1117.7
47			0.6	1117.9
	12.76	1131.21	0.00	1118.45
48			10.8	1120.4
49			7.4	1123.8
50			3.5	1127.7
	12.15	1142.78	0.58	1130.63
51			9.4	1133.2
52			5.0	1137.8
	12.43	1154.35	0.86	1141.92
53			11.7	1142.7
54			4.7	1149.7
B. M			2.09	1152.26
54+20			4.5	1149.9

6.6/30 6.1/15.5 6.2/7 7.5/7 6.8/4 6.5/2 6.2/6 7.1/15 8.1/17 5.9/20 5.9/30

Bent spike S. E root 20" Maple 75' Left sta, 45+58

2.8/30 3.8/7.5 4.3/4-4 3.7/2 3.6/2 3.1/6.5 3.6/15.5 4.5/16.5 3.2/19.5 3.1/30

1.2/30 0.8/7 1.7/5 1.2/4 0.6/2 0.2/6.5 0.7/14.5 1.4/17 0.3/19.5 0.0/30

12.4/30 12.4/20 11.9/16 11.4/6 11.7/4 11.1/2.5 10.8/2 10.0/8 10.6/15 11.0/16.5-18 10.4/20 10.2/30

7.9/30 7.8/22 6.9/16 7.6/5 8.6/4 7.4/2 7.0/7 7.5/16 8.2/18-19 7.3/20.5 7.3/30

2.0/30 2.4/20 2.0/15 2.7/6 4.7/3.5 3.6/2 2.8/8 3.4/15 4.2/18.5 2.5/21.5 2.4/30

7.5/30 7.5/16 7.8/8 10.6/3 9.6/2 9.4/8 10.2/15 11.0/17.5 8.1/21 7.8/30

3.5/30 4.2/7 6.0/4.5 5.0/2 4.4/7 5.9/17 3.9/20 3.6/30

10.7/30 10.6/17 11.3/6.5 12.9/4 11.7/2 11.4/5 12.0/13.5 12.8/16 11.1/18.5 10.5/22 10.8/30

5.9/30 1.7/7 5.3/3 4.7/2 4.2/7 4.7/15.5 3.3/30

R. P. spike N. root 30" pine 48' Right sta, 54+12

4.9/30 3.5/5 5.1/2 4.5/2 3.7/9 4.3/17.5 3.5/22 3.1/30

		1154.35 ✓		
55			6.6	1147.8
56		✓	8.6	1145.8
	2.47	1144.10	12.72	1141.63
57		✓	2.3	1141.8
	3.82	1135.31	12.61	1131.49
58			10.2	1125.1
T.P.			12.38	1122.73

Stopped April 17 1930

D. Parks, F. Ashcraft, F. Gray.

rain in forenoon Clear in Afternoon

5.1 / 30	5.2 / 25	6.6 / 8	6.6 / 2	8.9 / 7	7.5 / 14	8.1 / 21	8.8 / 23	8.1 / 24.5	8.1 / 30	11.4 / 35
7.6 / 30	7.9 / 23.5	8.6 / 8	9.0 / 5	12.9 / 7.5	12.3 / 12.5	11.6 / 18.5	12.3 / 24	13.1 / 27	11.1 / 30	
	1.5 / 30	2.3 / 2	2.7 / 2.5	9.1 / 10	8.2 / 13.5	7.8 / 18	8.5 / 24	9.3 / 27	5.5 / 30	5.5 / 35
2.3 / 30	3.7 / 7.5	8.5 / 3	10.2 / 2	10.2 / 1	9.5 / 2.5	8.7 / 11	9.0 / 14.5	9.6 / 19.5	6.5 / 24	6.1 / 30

T. P top of stake 5' Right Sta. 58+38.0

T. P. 1	9.0	1134.93		1122.65
58+38.0			10.1	1121.8
	5.03	1124.52	12.44	1119.49
59			8.8	1115.7
	2.05	1113.50	13.07	1111.45
60			7.8	1105.7
60+52.5			10.6	1102.9
	3.96	1107.26	10.20	1103.30
61			4.9	1102.4
61+20.6			4.7	1102.6
	12.23	1116.70	2.79	1104.47
62			12.0	1104.7
62+68.4			5.9	1110.8
63			2.0	1114.7
	12.31	1128.16	0.85	1115.85
B. M			8.65	1119.51
63+50			7.1	1121.1
	12.82	1140.38	0.60	1127.56
63+50		1120.1 19.3		

Tapot stake 6' Rt. Sta. 58+38.0

0.1 1.4 3.1 4.1 4.8 10.5 10.1 10.3 10.6 10.1 6.7 11.4
40 33 26.5 12 - 13 11 4 5.5 7 13.5 30

0.0 0.6 0.7 2.4 9.5 10.2 9.4 9.1 8.8 9.2 9.9 10.3 8.4 6.4 5.0 4.9 6.4 8.8
40 32 26 22.5 12.5 11 8.5 4.5 4 6.5 10 11 13 12.5 18.5 21 30 40

2.3 3.1 4.0 7.6 8.4 8.8 8.4 8.0 7.8 8.5 8.9 8.5 8.6 10.0 10.8 11.9
40 31 22 12.5 8.5 7 3.5 3 4 7 11 13 16 17.5 30 40

11.0 10.9 10.6 11.1 10.3 9.9 10.9 12.0 12.7
40 30 4 4.5 7 12 20.5 30 40

10.0 9.2 7.8 6.2 5.7 4.4 5.0 5.7 6.0 7.2 8.1 8.5
40 30 12.5 8 8.5 4 10 14 18 21 30 40

1092.3 1098.8 1099.9 1095.9 1096.3 1099.5 1102.2 1102.0 1102.6 1102.0 1102.3 1099.7 1096.3 1096.8 1096.8 1097.1
15.0 13.9 12.4 11.4 10.0 7.8-6.1 5.3 4.1 4.7 5.3 5.0-7.6-11.0 10.5 10.5 10.2
200 100 50 20 12 8.5 7.5 9 12.5 14.85 30 50 100

1100.1 1101.6 1103.1 1104.4 1104.2 1104.4 1104.8 1104.7 1104.3 1104.1 1104.1 1102.9 1101.6 1100.2
16.6 15.1 13.6 12.3 12.5 12.3 11.9 12.0 12.4 12.6 12.6 13.8 15.1 16.5
40 30 20 17 14 12 9 8 8 3.5 4.5 15 30 40

6.4 6.7 9.5 6.1 5.9 6.4 7.5 6.0 6.6 5.4 4.1
35 11 10-9 5.5 8 9.5 13 15 30 40 50

1.1 1.4 2.5 2.0 2.0 2.0 2.5 2.3 1.9 +1.5
30 17 14.5 11.5 8 4 6.5-7 10 25 40

R. P. spike E side 15" sycamore 50 Left Sta 63+15

2.6 4.7 4.6 4.3 7.5 6.6 6.2 7.1 8.0 7.2
40 35 30 21.5 17 13 8 8 3 5

T. P. Large Stone Rt. ditch sta. 63+90
19.3
8
9.5 4.9 1.4
14 25.5 37

		1140.38		
	10.17	1149.45	1.10	1139.28
63+50		29.4		
	12.54	1140.10		1127.56
64			12.2	1127.9
64+50			5.8	1134.3
T.P.	11.54	1150.77	0.87	1139.23
64				
64+50				
65			10.4	1140.4
T.P.			2.76	1148.01

Stopped April 18 1930
D. Parks, F. Ashcraft, E. Belding
Cloudy 60°

B.M. 1 00
Sta 1
" 2
" "
T.P. 00

28.4 Rt — 6.5/50 — 3.4/75

Large stone Rt ditch sta 63+90

0.8/50 — 3.8/90 — 7.7/30 — 11.0/20.5 — 11.3/14 — 13.5/11 — 12.7/7 — 12.2/2 — 12.3/3 — 13.0/6

0.2/30 — 3.2/16 — 3.6/7.5 — 7.0/4 — 6.1/1 — 5.8/2 — 5.9/7 — 6.8/10 — 5.0/13

Large stone Left Bank sta. 64+60

22.9 Rt — 8.0/30 — 6.3/40 — 9.7/50

16.5 Rt — 12.0/23 — 6.3/50

2.5/40 — 3.0/30 — 3.8/6.5 — 10.4/2 — 9.9/2 — 9.5/8 — 10.1/11 — 11.2/14.5 — 3.0/24 — 28/30 — 1.7/50

Large stone 10' left sta. 65+10

2.0 — 1.0 — 0.1
19 ditch — 20 wall — 26 top S/L

	10.84	1158.85		1148.01
65+50			11.1	1147.8
66			6.4	1152.5
	9.56	1167.53	0.88	1157.97
66+50			10.4	1157.1
67			6.6	1160.9
67+62.2			5.1	1162.4
68			3.8	1163.7
	4.17	1166.37	5.33	1162.20
69			4.3	1162.1
69+96.5	Poor Outlet		4.4	1162.0
70			4.4	1162.0
71			4.2	1162.8
	6.47	1169.25	3.56	1162.81
72			6.4	1162.9
73			5.5	1163.8

Large stone 10' left Sta 65+10

5.0 / 40	5.6 / 22.5	5.7 / 11.5	6.7 / 7.0	11.6 / 1	11.1 / 2	10.5 / 5	10.8 / 11	11.2 / 13.5	5.1 / 23	5.1 / 30
0.9 / 30	1.7 / 9	3.2 / 8.5	7.0 / 1.5	6.7 / 2	6.0 / 5	6.7 / 10	7.7 / 12.5	2.0 / 20	1.3 / 30	
6.5 / 30	6.3 / 22.5	6.5 / 8.5	11.2 / 3	10.4 / 2	10.2 / 5	10.8 / 9.5	11.6 / 12	6.4 / 19	6.3 / 25	6.6 / 30
4.0 / 30	4.0 / 11	7.9 / 7	7.0 / 3.5	6.6 / 2	6.7 / 5	8.0 / 10.5	4.8 / 15	4.6 / 23.5	4.6 / 30	
3.7 / 30	3.7 / 17.5	5.6 / 14.5	4.7 / 11.5	4.3 / 5.5	5.1 / 2		5.7 / 3	3.8 / 7.5	3.8 / 30	
3.5 / 40	2.8 / 22.5	3.5 / 18.5	5.0 / 12	4.1 / 7	3.7 / 1	3.8 / 2	4.2 / 3.5	5.3 / 8	3.9 / 12.5	3.3 / 19	3.3 / 30
3.9 / 30	4.4 / 17	4.2 / 10	5.5 / 7	4.8 / 4	4.3 / 2	4.1 / 1	4.6 / 5.5	5.7 / 11	4.5 / 13.5	3.6 / 23	3.6 / 30

1157.2	1157.4	1158.1	1159.0	1159.9	1160.4	1161.3	1161.4	1162.0	1161.5	1161.4	1160.5	1160.3	1160.0
9.2 / 280	9.0 / 200	8.3 / 160	7.4 / 100	6.3 / 60	6.4 / 30	6.0 / 10	5.1 / 6.2	5.0 / 5	4.4 / 2	4.1 / 2	5.0 5.4 / 10.8	6.1 / 30	6.4 / 50

over standing water about 1' deep

5.9 / 30	5.1 / 28.5	6.9 / 15.5	4.8 / 4	4.4 / 2	4.6 / 6	6.0 / 11.5	6.0 / 30	swamp	
4.9 / 30	4.5 / 25	5.2 / 6	4.4 / 2.5	4.2 / 2	3.8 / 3	4.7 / 8	5.2 / 11	4.7 / 12.5	4.9 / 17	4.7 / 30
5.6 / 35	6.2 / 15	7.4 / 4	6.7 / 1.5	6.7 / 0	6.1 / 4.5	6.7 / 9.5	7.3 / 12.5	6.0 / 14.5	6.0 / 30	
3.6 / 30	4.1 / 14	5.3 / 7.5	6.7 / 4.5	6.0 / 2	5.5 / 2	6.3 / 4	5.7 / 10	6.4 / 12.5	5.4 / 14.5	4.6 / 22.5	4.4 / 30		

		1169.25		
73+48.35			4.9	1164.4
B.M			3.50	1165.75
74			3.5	1165.8
75			2.0	1167.3
	6.55	1175.42	0.38	1168.87
76			6.4	1169.0
77			4.9	1170.5
	7.82	1179.34	3.90	1171.52
78			7.8	1171.5
79			6.0	1173.3
80			3.1	1176.2
80+25			2.4	1176.9
	4.88	1182.51	1.71	1177.63
81			6.2	1176.3
82			6.4	1176.1
83			5.7	1176.8

1164.4 1165.3 1164.51 1165.6 1165.8 1165.5 1166.1

2.0/40 1.8/30 2.7/23 4.0/15 4.6/8 5.4/6 4.8/4 4.9/2 4.0/30 4.2/50 3.7/100 3.3/150 3.8/200 3.2/250

Bent spike N.W. root 10" W, cherry 30' Rt, sta. 73+25

1.7/35 1.2/27 2.9/13.5 3.7/9 4.2/6.0 3.6/4.5 3.5/3 3.3/4 3.7/7.5 4.2/11.5 3.1/15.5 2.6/22.5 2.7/30

0.5/30 0.4/11 2.8/6 2.2/5 2.0/2 2.3/7 2.4/10.5 0.9/13.5 0.2/20.5 0.2/30

6.8/30 6.8/22.5 6.1/16.5 6.0/10.5 7.4/8 6.8/4.5 4.7/2 6.2/2 6.6/5 7.3/11 6.3/15 6.3/30

5.7/30 5.4/22.5 7.8/18.5 5.3/9.0 5.1/3.5 4.9/2 5.1/5 5.7/7 6.0/11.5 5.3/15 5.3/30

6.3/30 6.4/22.5 7.1/16 7.7/10.5 8.5/8.5 8.2/5.5 7.8/3 7.9/7.5 7.8/8 8.6/11 7.6/13.5 7.0/18.5 6.8/30

4.7/30 4.7/22.5 5.3/17 5.6/11.5 7.2/8.5 6.7/7.5 6.0/4 6.4/7 6.9/11 6.0/14.5 5.4/30

2.2/30 2.1/17 2.3/11.5 1.6/8 3.6/5 3.1/3 3.1/3 3.5/7.5 3.9/12.5 4.3/14 2.6/18.5 2.3/25 2.3/30

3.2/30 2.6/15 2.3/10.5 4.1/8 2.8/5 2.7/3 2.3/3.5 2.6/7.5 2.8/11 3.5/14 2.8/16 2.2/20 2.2/30

6.0/30 4.0/22.5 6.2/12.5 6.2/8.5 6.9/7 6.7/4.5 6.2/3 6.0/3.5 6.2/8.5 6.7/13 6.6/14.5 6.4/22 6.7/30

6.5/30 6.5/22.5 6.3/10 6.9/6 6.4/4 6.4/3 6.2/5 6.6/10 6.6/14 6.8/18 6.8/30

5.3/30 5.8/15 5.9/9.5 6.6/8 6.0/5.5 5.7/3 6.1/7 6.1/12.5 5.5/19.5 5.5/30

1182.51

84	4.5	1178.0
85	5.0	1177.5
B.M	3.61	1178.90

Stopped April 19, 1930
D. Parks, F. Ashcraft, L. Ernst
cold cloudy

4.8	4.8	4.9	5.7	4.8	4.5	4.7	5.4	4.7	4.0
30	15	10	8.5	5.5	2	8.5	12.6	10	30

4.3	4.6	4.9	6.1	5.3	5.0	5.2	5.8	4.8	4.7
30	15	8.5	7	5.	2	9	12	13.5	30

R.P. spike N.W. root 20" Hickory 30' Rt sta. 83+75

B.M.	2.26	1181.16		1178.90
86			5.7	1175.5
87			8.0	1173.2
88			9.7	1171.5
	0.13	1174.13	7.16	1174.00
89			4.1	1170.0
90			6.6	1167.5
91			10.1	1164.0
	0.28	1166.92	7.49	1166.64
92			5.4	1161.3
93			9.2	1157.7
	2.43	1157.99	11.36	1155.56
94			4.8	1153.2
95			9.4	1148.6
	3.38	1152.52	8.86	1149.14
96			6.5	1146.0
97			9.1	1143.4

R.P. spike N.W. root 20" Hickory 30' Rt. sta 83+75

3.7 / 30	3.9 / 15	4.3 / 8.5	6.7 / 4.5	5.7 / 2	5.5 / 3	5.6 / 10.5	6.7 / 12	4.6 / 15	3.9 / 21	3.4 / 30
5.6 / 30	6.0 / 15	6.7 / 8.5	8.7 / 4	8.0 / 2	7.7 / 4	8.1 / 11	8.8 / 13	6.9 / 16	6.3 / 20	5.9 / 30
7.9 / 30	8.1 / 15	8.7 / 7	10.5 / 4	9.7 / 2	9.4 / 5	9.7 / 12	10.5 / 15	9.2 / 17	8.4 / 23	8.4 / 30

Top of stake Rt. sta 88+00

3.4 / 30	3.9 / 15	4.2 / 5	4.8 / 3.5	4.1 / 2	3.9 / 5.5	4.3 / 12	5.0 / 14.5	3.7 / 18.5	3.8 / 30
6.0 / 30	5.8 / 15	6.1 / 8	6.1 / 5	7.4 / 2.5	6.6 / 2	6.2 / 6	6.5 / 13	7.5 / 15.5	5.0 / 20	5.0 / 30
7.0 / 30	7.0 / 22.5	7.5 / 10.5	8.1 / 6	8.5 / 2.5	10.1 / 2	9.3 / 2.5	8.8 / 8.5	9.2 / 15	10.0 / 17.5	7.0 / 22	6.3 / 30
3.4 / 30	3.1 / 22.5	3.2 / 11	3.7 / 2.5	5.6 / 2	4.0 / 1	4.9 / 3	4.8 / 9	4.9 / 16.5	6.0 / 19	3.3 / 23	2.1 / 30	2.5 / 40
7.2 / 30	6.8 / 20	7.1 / 9	7.4 / 3	9.2 / 2	9.5 / 1	8.9 / 3	8.6 / 9	8.4 / 16.5	9.9 / 20	6.7 / 25	5.5 / 30	6.6 / 40
1.5 / 30	1.5 / 22.5	1.9 / 13.5	2.4 / 2	4.8 / 2	4.9 / 1	4.2 / 3	4.0 / 9.5	4.0 / 16	4.8 / 19	1.0 / 27	0.1 / 30	0.1 / 40
		6.5 / 30	6.4 / 12.5	6.5 / 3	9.4 / 2	8.7 / 1.5	8.3 / 3.5	8.2 / 9.5	8.7 / 16.5	9.3 / 19	6.2 / 22.5	4.6 / 28	4.6 / 30
		5.6 / 30	5.6 / 22.5	5.7 / 7.5	6.5 / 2	7.2 / 1.5	6.7 / 4	6.3 / 11	6.2 / 19	7.7 / 22	3.7 / 30	2.9 / 40
				8.9 / 30	8.9 / 15	9.1 / 2	10.8 / 4	10.6 / 6	11.0 / 11	11.5 / 14.5	11.1 / 19	10.2 / 23.5	11.1 / 25	8.6 / 30	8.6 / 40

		1152.52		
B.M.			3.66	1148.86

Stopped April 21, 1930

D. Parks, F. Ashcraft, L. Ernst

B.M	0.05	1148.91		1148.86
	6.17	1142.18	12.90	1136.01
98			7.1	1135.1
99			10.5	1131.7
	3.59	1134.61	11.16	1131.02
99+25			4.4	1130.2
99+50			4.7	1129.9
99+75			4.9	1129.7
	4.94	1135.96		1131.02
100			6.3	1129.7
100+10			6.3	1129.7
	2.79	1134.79	3.96	1132.00
100+8685			3.6	1131.2
101			3.7	1131.1

R.R. spike N.W. side 12" Hemlock 30' Rt. sta. 96+20 Right.

R.R. spike N.W. side 12" Hemlock 36' Lt. sta. 96+20

2.2 2.1 8.1 7.6 7.3 7.1 7.9 1.2 1.1 0.4
3.2 2.2 14.5 13 6 4 2.5 10.5 21 30

8.9 9.4 9.3 10.4 10.3 10.5 10.4 11.1 10.6 10.9 11.3
30 22 13.5 10 5.5 7 9 11.5 13.5 14.5 30

Large stone 2.0 Rt sta 100+05

1128.7 1129.9 1127.9 1129.9 1126.9 1129.6

5.4 5.1 5.5 7.3 4.1 4.4 4.5 5.3 7.7 5.0
30 16 11.5 6 4 4 13 14 17 30

8.1 7.7 10.3 5.9 4.7 4.7 4.7 5.1 5.2 4.8 3.5 2.9
30 23.5 19.5 8 1.5 4 12 12.6 18.5 24.5 34 40

1123.9 1123.9 1121.9 1126.3

10.7 10.7 12.7 8.3 6.1 5.0 4.9 4.4 4.8 5.3 4.8 1.5 0.8
40 33 22.5 16.5 8.5 3 4 6 14.5 16 21.5 32 40

9.3 8.3 6.8 6.5 6.4 6.4 6.3 5.7 6.2 6.6 6.2 1.9 0.9
30 24.5 14 6 4.5 3 4 4 11.5 14 17.5 27 40

8.7 7.9 7.1 6.0 6.8 6.3 6.3 5.9 6.3 6.4 1.7 0.3
35 29 16 7 4 3 4 3.5 11 14 25.5 40

4.7 3.8 4.3 3.6 3.8 4.2 0.7 0.2
30 9 7 4 8 11 25 30

4.2 3.4 4.5 3.7 4.6 1.4 0.3 0.1
30 11 8.5 4 9 15.5 26 30

		1134.79		
102			7.9	1126.9
103			11.2	1123.6
	1.46	1124.29	11.96	1122.83
104			6.2	1118.1
104+54			7.8	1116.5
105			9.1	1115.2
	6.23	1120.33	10.19	1114.10
106			7.9	1112.4
107			12.1	1108.2
	2.05	1110.18	12.20	1108.13
107+71.3			6.0	1104.2
B.M.			2.72	1107.46
108			7.9	1102.3
109				
	0.13	1097.48	12.83	1097.35
109			2.1	1095.4
110			10.3	1087.2
111				

6.6 6.0 8.3 7.5 — 7.7 8.5 4.1 4.0
30 17.5 14 7 — 2 2.5 11.6 30

12.4 11.6 10.6 12.2 11.6 11.2 11.6 5.2 4.7
30 22.5 18 15 6 2 3.5 14 30

6.7 5.8 4.9 7.3 6.8 6.4 6.2 5.4 5.9 0.9 1.0
30 25 19 15.5 13.5 6.5 2 5.5 8.5 16.5 30

1106.9 1110.9 1113.1 1114.1 1115.4 1115.9 1116.5 1116.4 1115.7 1114.9 1117.8 1119.1 1120.2
17.4 13.4 11.2 10.2 8.9 8.4 7.8 7.7 8.6 9.9 6.5 5.2 4.1
40 30 16.6 10.6 19.6 8.6 2 3 4.7 4.7 9 16 30
F.L. F.L. ditch Parallel with C

11.4 9.9 8.8 9.6 9.0 9.1 9.1 6.8 8.9
30 22.5 16.5 15 7.5 2 3 6.5 30

10.2 9.1 7.0 8.3 7.9 7.6 2.1 1.1
30 22.5 11 8 2 7 17 30
Rock

12.8 11.3 10.1 12.8 12.3 12.1 12.0 11.3 11.7 6.4 5.7
30 22.5 9 7 6 9 8 11 14 23 30
Rock

7.3 5.3 4.6 7.6 6.0 6.2 2.0 0.1
30 22.5 17 14 8 4 11.5 30
Rock

R.P. spike E side 36" Elm El. 21.6 RT Sta 108+13

7.6 6.5 5.3 8.4 7.7 7.5 7.7 2.6 1.1
30 22.5 13.5 12 2 3.5 5.5 13 30
Rock

13.5 12.6 11.3 — 11.3 — 6.9 6.4
30 22.5 11 2 20 30

3.2 2.3 2.1 2.2 2.8
6.5 5 2 7 8.5

9.7 8.4 7.5 11.3 10.5 10.3 10.2 10.7 2.9 2.4
30 22.5 10.5 5.5 4 2 3 10.5 23 30

15.3 14.1 13.6 — 16.4 — 10.9 9.7
30 22.5 13.5 2 21.5 30

		1097.48		
	0,21	1084.89	12.80	1084.68
111			3.8	1081.1
112			6.7	1078.2
112+16			7.0	1077.89
		vit pipe culvert		
112+21.67			7.1	1077.8
	5,88	1082,76	8.01	1076,88
B.M			6.26	1076,50

Stopped April 22 1930

D. Parks. F. Ascraft. L Ernst

Cold wind

4.7 4.0 3.8 4.2 4.0
8 6.5 4 9 10

9.5 9.2 8.2 7.1 7.6 6.7 6.8 7.4 6.8 7.8 8.2 8.2
30 22.5 15 10 9 7 8 9.5 11 18 28 30

1069.1 1073.0 1073.6 1074.3 1074.4 1075.3 1077.7 1077.9 1077.9 1077.1 1075.8 1076.5 1075.1 1075.9
7.58 11.1 11.3 12.6 10.5 9.9 7.2 7.0 7.0 7.8 9.1 10.4 9.5 9.0
100 30 30 22.5 13.0 11 9 3 6.5 7.7 F.L. 30 30

9.0 8.7 7.7 7.2 7.1 7.6 9.1 9.3 7.3
30 22.5 15 12.5 4 9 12.6 21 30

P.I.
R.P. spike E. side 12" Hickory 75' Lt sta 112+40

B.M	7.02	1083.52		1076.50
113			7.4	1076.1
	5.65	1078.41	9.76	1073.76
113+50			7.1	1072.3
113+75			7.7	1071.7
	2.16	1075.92		1073.76
114			4.4	1071.5
114+32	Stone Box Culvert		4.6	1071.3
114+60			4.2	1071.7
115			3.5	1072.4
	12.09	1087.30	0.71	1075.21
115				
116			7.8	1079.5
117			4.4	1082.9
117+71.96			6.5	1080.8
118			11.6	1075.7

R.P. spike E side 12" Hickory 95' Lt sta 112+40

3.5/30 5.1/17 8.4/11.5 7.6/10 7.3/2.5 7.4/2 7.8/6.5 8.2/8 4.1/17.5 4.1/30

T.P. stone at Lt side of rd 113+26

2.6/30 2.6/17.5 7.8/11 7.0/9.5 7.0/2.5 7.1/2 7.0/6.5 7.6/8 1.7/11 1.7/30

11.7/30 10.7/22.5 8.5/11.5 7.8/9.5 7.7/2 7.0/6 8.1/7 5.4/12 4.8/22 4.2/30

8.0/30 7.9/25 7.4/17 4.6/8 4.7/2 4.5/5.5 5.1/10 5.6/12 5.4/13 5.9/25 5.2/30

1064.3 1069.7 1068.4 1068.7 1069.8 1070.7 1071.3 1071.2 1070.1 1069.3 1065.4 1069.0 1069.3 1070.1

11.6/110 8.2/51 7.3/30 7.2/12 6.1/12.0 5.2/7.5 4.6/2 4.7/7 5.8/8.5 6.6 7.6 6.7/30 6.6/50 5.8/100

6.2/30 5.9/22.5 4.9/15 5.3/13 4.7/11.5 4.2/2 4.5/6.5 5.5/10.5 6.2/19 6.7/30

4.7/11.5 3.5/10 3.3/2.5 3.5/2 3.5/5 4.1/6

9.9/30 9.8/20 14.9/2 10.8/12.5 12.1/22.5 13.7/30

4.1/30 4.1/12.5 8.4/12.5 7.8/11 7.4/4 7.8/2 7.8/3 8.1/4.5 3.7/9 3.5/12.5 3.9/30

10.7/30 2.7/17 2.5/13 5.0/10 4.4/2 4.8/6.5 5.1/9.5 2.2/13.5 2.2/30

17.3/30 6.2/16 7.0/13 6.4/6 6.5/4 6.5/3 6.7/9.5 0.7/13.5 1.3/17.5 1.3/30

20.3/30 10.3/20 10.6/14 12.0/12 11.4/6 11.6/4 11.8/2 12.0/3 10.2/5 5.4/12 5.3/20 5.7/30

		1087.30		
118+04.96	0.[illegible]	1[illegible]	12.3	1075.0
	0.18	1074.65	12.83	1074.47
118+45			2.8	1071.9
119			6.6	1068.1
120.			9.6	1065.1
121			10.8	1063.9
	4.81	1069.03	10.43	1064.22
B.M.			4.39	1064.64
121+44.7	Twp. Line		5.2	1063.83
75	Beyond.		3.8	1065.2
100	Beyond		2.4	1066.6
	11.32	1079.78	0.57	1068.46
2[illegible]	Beyond		6.1	1073.7
	7.79	1086.63	0.94	1078.84
	6.16	1089.59	3.20	1083.43
	4.85	1094.42	0.02	1089.57
B.M.			3.22	1091.20
				1092.16 record
				1[illegible]

$\frac{21.0}{30}$ $\frac{11.0}{15}$ $\frac{12.7}{12.5}$ $\frac{11.6}{6}$ $\frac{12.3}{4}$ $\frac{12.6}{2}$ $\frac{5.7}{10.5}$ $\frac{6.1}{18}$ $\frac{8.1}{30}$

$\frac{12.4}{30}$ $\frac{12.4}{27}$ $\frac{3.3}{6.5}$ $\frac{2.8}{4}$ $\frac{3.1}{9}$ $\frac{3.9}{14}$ $\frac{5.9}{22.5}$ $\frac{8.0}{30}$

$\frac{13.7}{30}$ $\frac{13.4}{22.5}$ $\frac{6.7}{5.5}$ $\frac{6.6}{4}$ $\frac{6.0}{3}$ $\frac{7.3}{11.5}$ $\frac{7.4}{18.5}$ $\frac{9.2}{30}$

$\frac{13.8}{30}$ $\frac{13.8}{22.5}$ $\frac{10.4}{18}$ $\frac{10.1}{10}$ $\frac{10.7}{8}$ $\frac{9.8}{7.5}$ $\frac{9.6}{4}$ $\frac{9.8}{6}$ $\frac{10.1}{8}$ $\frac{9.3}{10}$ $\frac{9.1}{22.5}$ $\frac{9.1}{30}$

$\frac{12.0}{30}$ $\frac{12.0}{22.5}$ $\frac{11.1}{12}$ $\frac{11.6}{10}$ $\frac{11.1}{7}$ $\frac{10.8}{4}$ $\frac{11.3}{5}$ $\frac{11.2}{8}$ $\frac{10.1}{16}$ $\frac{10.5}{22.5}$ $\frac{10.3}{30}$

R.R. spike N.E. root 20" Maple 19' Rt. sta. 120+76

$\frac{6.2}{30}$ $\frac{6.2}{15}$ $\frac{5.7}{13}$ $\frac{5.2}{4}$ $\frac{5.7}{6.5}$ $\frac{6.5}{9}$ $\frac{6.8}{11.5}$ $\frac{7.1}{20}$ $\frac{8.2}{21}$ $\frac{8.2}{30}$

Spike E. root 30" Evergreen W of Sta. 109+60 on Frosts Corners-Fullerton Rd.

	5.96	1070.60		1064.64
121+82			5.6	
121+82			11.4	
1118				1075.7
117+42				1080.8
117				1082.9

June 13, 193, Fair, 80° Marks, Hassel do

R.P. Spike, N.E Root 20" Maple, 19' R. 120+76

Bridge Floor

Stream Bed

1060.0
10.6
80 - 43.5
Marsh

+5.1
0

1060.0
10.6
100 - 46.0
Marsh

+10.2
0

1060.0
10.6
100 - 60
Marsh

+12.3

1952

FAIRMOUNT RD. CH #16

B.M.	4.60	1034.19		1029.59
℄ 306 ℄ 16			0.86	33,33
0+50				32.7
1+0				31.6
2+0	17.5' N	24" Elm		29.6
+40	13.5	14" "		
+60	11.0	12" "		
+64	12.0	30" " twin		
3+0				28.8
+12	14.0	20" map		
T.P.	5.29	1035.07	4.41	1029.78
TP	3.78	1033.04	5.31	1029.76
7+0	New stationing used 27.9			
	1x+82.3 new = 13+11.43 old			
8+0				27.9
8+50	prob. best loc for culvt			
9+0				27.8

7-2-52
F.C.P.
J.M.
A.T.
F.L.

SEC D

41

NE ℄ at E end Hdwl at NE quad ℄ 306

N Ground	N top stk	℄	℄ top stk	S ℄ #16 Ground
4.3	4.0	1.5	4.4	6.7
	30.2		29.8	
5.3	3.2	2.6	4.1	6.6
	31.0		30.1	
	30.0		29.9	
6.5	4.2	4.6	4.3	6.8
	37.5		29.8	
-0.9	-3.3	5.4	4.4	6.9
Top S Strm 3+0				
Top S Strm 7+0				
	31.1	27.9	29.8	
4.05	1.9	5.1 4.67 ℄ trav	3.2 32'	5.6 32'
	29.7	27.9	29.9	
5.6	3.3	5.1	3.1	5.0
	30.0	27.8	30.4	
5.6	3.0	5.2	2.6	4.8

		1033.04		
10+0				28.3
T.P.	5.31	1036.01 ✓	7.34	1030.70 ✓
11+0				
+69.5			7.9	33.1
			7.8	
BM			4.35	1031.66 (1031.72)
			6-3-57	
B.M.	6.34	1107.21		1100.87
T.P.	0.24	1095.57	11.88	1095.33
T.P.	0.35	1084.18	11.74	1083.83
29+50				82.25
29+0				77.6
T.P.	0.33	1073.72	10.79	1073.39
28+50				71.6
T.P.	4.00	1066.89	10.83	1062.89
28+0				66.6
27+58				
27+50				62.8
27+42				
27+0				60.4
27+05				
				59.7

North ℄ South

Ground	top Stk	28.3	top Stk	Ground
4.9	7.34	4.7	7.2	4.5
	30.70		30.7	
	30.7	30.4	30.1	
7.7	5.3	5.6	5.9	8.3

Wend. Bridge
E " "
Spk Sroot 48" map w/ crack

34+98

5.72

1.93
6.6
2.1

Stk N 27+50

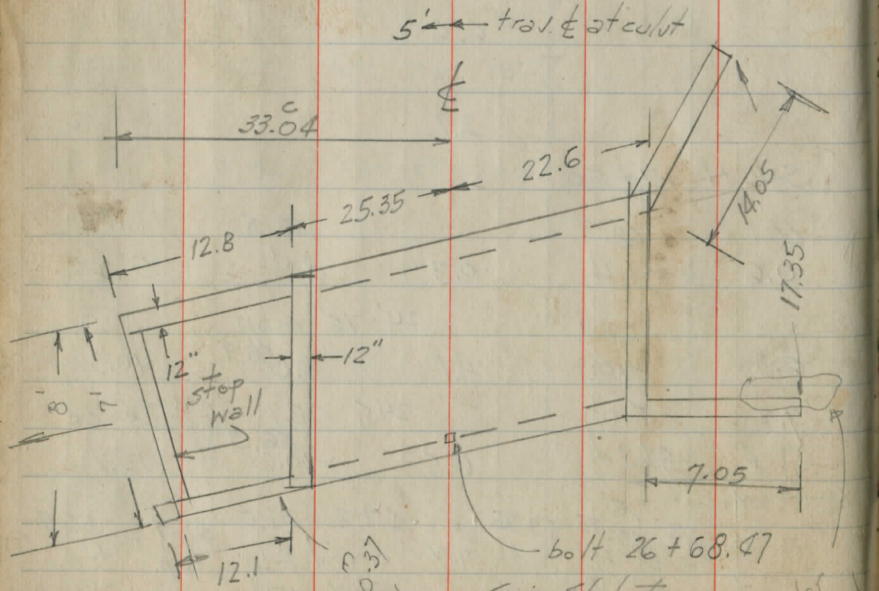
66.3	68.3		63.5	61.7
0.6	+1.4	0.3	3.4	5.2
	67.9	24'	16" map	
6.3	4.0	4.1	8.0 58.9	10.3
9.8	8.07	24.5	CEI	27' Fence
	58.9	6.5	56.3 10.6	12.7

25'

55.23 top 50.85 F/L 57.85 top/d 7.2 57.8 Ground 51.0 FL 58.9 top 56.9 top
11.66 16.04 9.04 6dwl 15.9 Hdwl 10.0
9.1 8.00

1066.89

T.P.			8.00	1058.89
B.M. SET			11.02	1055.87
T.P.	5.72	1064.61		1058.89
26+50				59.8
26+47				
26+25	Tel pole ± 23'			
26+0				61.0
25+50				63.3
T.P.	12.75	1075.17 ✓	7.19	1067.42 ✓
26+0				



43

Grd H Stk S Stk Grd

SW cor S to drwl

Spk N side most SE'ly willow ± 60' S of Culvt

54.0 ⇒ 51.5 58.3

10.6 13.1 4.8 6.3 8.55

20' map 25 ↕ 24' 28' ↕

75.1 13.6

F/L N of conc step at N end Culvt wings

59.61 61.0

7.7 5.0 3.6

Fence 67.47 63.3

24' 4.4 2.19 1.3

73.67

1.5 3.9

9-13-52

B.M.	11.34	1067.21		1055.87	
T.P.			8.34	1058.87	Most E'ly S side Slab Top Culvert
27+0				65.25	
26+50			10.10	F 7'-5½" 64.56	67.21 64.56 2.65
26			7.71	F 5'-6" 65.00	
25+50			5.21	F 4'-0" 66.0	
25				67.0	

67.21
65.00
2.21
7.71
221
5.5

67.21
66
1.21

re setting grade stakes

April 11, 1931 D. Parks
T. Snyder

Slope stakes set at sta. 1+

sta		
57	32.0	Lt. of ℄
58	44.0	Lt. of ℄
59	38.0	Lt. of ℄

8-4-31 New culvt Fairmount Rd

BM	3.40	1035.12		1031.72
Low Glass as front yd.			7.4	
			7.52	
			7.68	
			7.98	
			7.86	
			8.04	1027.08
			7.7	
			7.75	
			7.12	
			7.94	
			7.18	
			7.59	
			8.20	
			8.28	
			8.20	
			7.20	
			7.82	

Cont'd
Pg 54

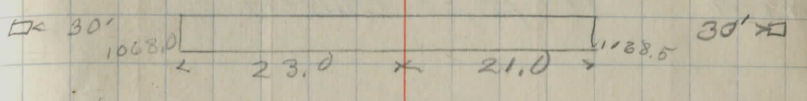
Sta 8+50

7+90
26' out

inlet F L 12" drive pipe Glass
out " " " " "
lawn 20' E of ℄ " at edge new fill
8+50 at edge of new fill " edge
8+80 " " " " " " "
9+0 " "
9+50 " "
10+50 " "
S edge trav rd 8+50
fence line " = +30' S of ℄
88' S of ℄
30' E of above
60' E " "
100 E and ± up on E
40' W
100' " = ± 5' E of Arm string P/C

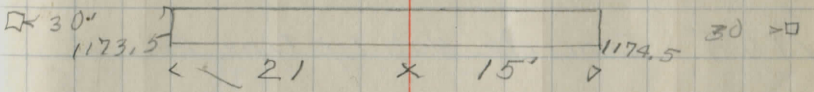
April, 30, 1937
D. Parks T. Smyde
Fair 65°

114+82	18" pipe culvert					
B.M.	5.72	1082.22		1076.50		
			12.12		1068.60	
			12.64		1068.08	
112+16	15" pipe culvert					
B.M.	5.72	1082.22		1076.50		
			4.80		1074.92	
			6.97		1073.25	



R.P. spike E side 12" Hickory 95' Lt. 112+40

13.62	C 1.5	Stake 30' Rt
14.14	C 1.5	Stake 30' Lt

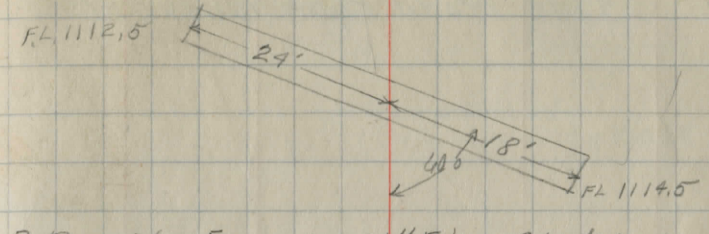


R.P. spike E. side 12" Hickory 95' Lt 112+40

7.30	C 2.5	Stake 30' Rt
8.97	C 2.0	Stake 30' Lt

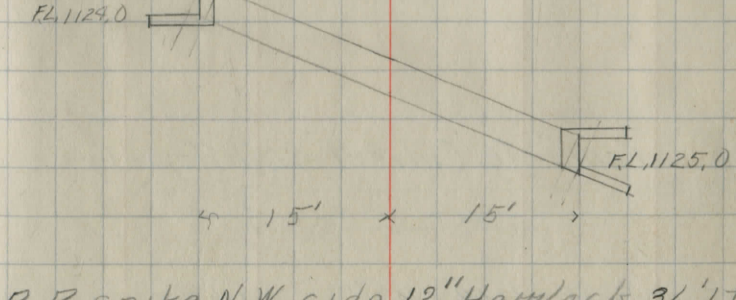
104+54	15" pipe culvert				
B. M.	8,55	1116.01		1107.46	
	9,02	1123.99	1.04	1114.97	
			1,42		1115,07
			12.78		1112,21
99+55	Concrete slab Top Type Culvert				
B. M.	0.02	1148.88		1148,86	
	0,93	1136,89	12,92	1135,96	
			5.39		1125,50
			11,39		1123,50

May 2, 1931
D. Parks, T. Snyder
Showers 66°



R.P. spike E. side 36" Elm 21.5 Lt. sta. 108+32

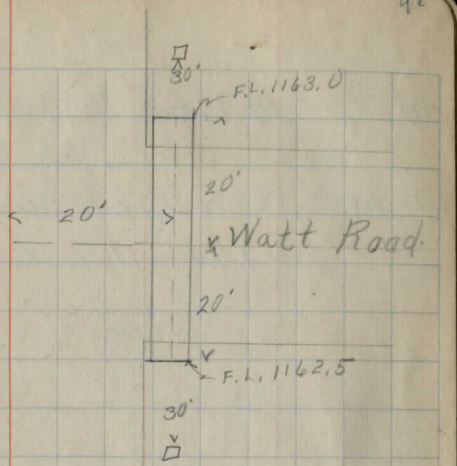
8.92	C 7.5	Stake 30' Rt
11.78	F 1.0	Stake 30' Lt



R.P. spike N.W. side 12" Hemlock 36' Lt. 96+20

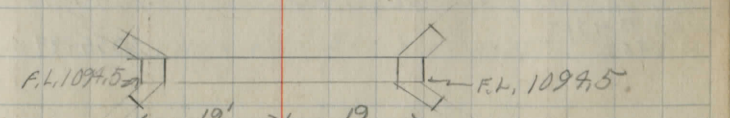
11,39	C 6,0	Stake 30 Rt.
13,39	C 2,0	Stake 30 Lt.

73+48 Side Road Pipe Culvert



B.M.	4.47	1170.22		1165.75	Bent spike N.W. root 10" W. cherry 30' Rt, sta. 73+25
			3.59	1163.13	7.09 C 3.5 stake 30' East
			3.85	1162.37	7.85 C 4.0 stake 30' West

61+18 Concrete Culvert, Slab Top - Type



B.M.	3.18	1122.69		1119.51	R.P. spike E. side 15" sycamore 50' Lt. sta. 63+15
	0.19	1110.28	12.60	1110.09	
			11.28	1094.5	15.78 C 4.5 stake 30' Rt
			11.78	1094.5	15.78 C 4.0 stake 30' Lt

Set to Bottom of footer

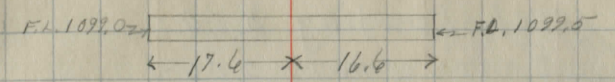
40+71.5 15" Pipe Culvert

B.M.	2,17	1117.56		1115,39	
	1,14	1107.52	11.18	1106,38	
			5,82		1099,70
			6,70		1098,82

26+72 Concrete Culvert, slab Top Type

EXT 1952 SEE Page 43 THIS BOOK

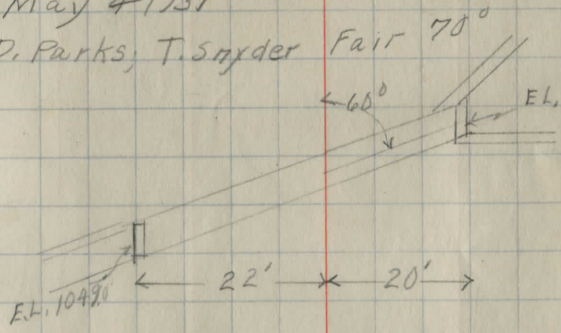
B. M. NEW B M SET 1952	7,86	1063.40		1055.54	GONE
				1055.87	
			9,92		1050.48
			12.33		1048.57



Bent Spike S.E. Root 20" Maple 75' Left 45+58

7,82	C 2,0	Stake 30' Rt.
8,70	C 2,0	Stake 30' Lt.

May 4 1931
P. Parks, T. Snyder Fair 70°



S. side 12" Willow 60' Rt. sta. 27+15

Spt N. side Most SE 4" Willow ± 60' Rt or S of CULVERT

12.92	C 3.0	Stake 40' Rt.
14,83	C 2,5	Stake 40' Lt.

Water level reading	5,50		
stake #0 at edge of water	5,00		
0+50	4,75	7,00	C 2,0
1+00	5,50	7,75	C 3,0
1+50	8,75	8,50	C 3,0
		9,25	C 0,5

	5.8	1037.0		1031.20
3+00				
3+40				
4				
5				
6				
7+10				
B.M.	14.20	1069.74		1055.54
23				
24				
25				
25+90				
26+00				
	15.87	1085.02	0.59	1069.15
29				
	15.11	1099.68	0.45	1084.57

May 28, 1931, Marks, Snyder, Barton
Fair, 80°

X, N.E. Cor., N.H.W., Culv. N. of Chillicothe Rd.
No Exear

0.0 Section

Orig. 22.5	2.3 17	5.1 12	5.3	5.2 9	8.9 17
Orig. 22.5	1.8 17	5.0 12	5.4	5.2 14	8.0 20
Orig. 22.5	3.4 18	6.3 14	6.5	6.0 12	7.8 16

0.0 Section
E. side 12" Willow, 60' R. Sta. 27+15
0.0 Section

3.6 18	4.9 13	4.4 10	4.2 0	4.3 11.5	Orig. 19
3.0 19.5	4.0 15	4.0	3.0 12	Orig. 21.5	
11.2 22	9.4 19	8.3	7.9 8	8.5 10	Orig 21

0.0 Section

0.0 Area.

		1099.68		
30				
31				
31+40				
31+45				
	11.65	1110.58	0.75	1098.93
32+50				
33				
33+50				
34				
34+50				
B.M.	0.51	1152.77		1152.26
53+70				
54				
55				
56				
57				

6.6/20 11.2/12 12.2/7.5 12.1 12.1/11.0 13.2/14-15

2.4/21 5.1/15.5 5.5 5.9/8.5 6.3/13 6.8/14 3.7/18

1/2 Area of Sta. 31

0.0 Area.

0.0 Area

4.3/22.5 4.9/18.5 7.9/12.0 8.9/8.4 9.2/0 9.0/15.5 9.6/19 9.4/22.5

2.7/22.5 2.8/19.7 5.8/14.0 8.0/8.5 8.3 8.4/14.5 9.3/22.5

3.2/30 4.0/22.0 7.5/16.0-15.5 8.5 8.0/8 8.3/14 9.0/20 8.2/22.5

0.0 Area

R.P. spike, N. Root, 30" Pine 48' R. Sta 54+12

Area 0.0

3.6/22.5-20 4.1/17-13 5.1/12 3.8/7.5 3.3 3.0/13.5 3.4/16 2.7/17.5 2.2/22.5

3.7/22.5 3.8/16 6.3/11.3 7.2/10 6.3/6.0 6.3 6.2/19.5 7.2/23.0 6.7/24

6.2/22.5 6.4/18.3 9.3/12.4 10.5/12.0 9.5/8.5 9.8/0 10.2/21.5 11.5/27 9.6/29.5

9.7/35 9.8/26.5 15.9/19

		1152.77		
	1.12	1137.68	16.21	1136.56
57				
58				
	0.95	1127.10	11.53	1126.15
59				
59+50				
B.M.	13.55	1133.06		1119.51
63+50				
64				
	16.53	1149.43	0.16	1132.90
64+50				
65				
	14.95	1163.86	0.52	1148.91
66				
67				
67+20				

2.2/17 1.5/13.5 2.0 1.6/22.0 3.0/24.7 +0.8/30

2.0/45 2.6/40.5 8.0/36 10.9/31 12.2/30 10.9/24 10.4 11.3/15.5 12.0/20 9.9/23 9.5/25 8.9/30

2.1/40 2.5/35 7.9/29 8.4/27.5 8.9/26.5 8.1/23 8.4/0 8.6/2 13.2/9 8.4/18

Area 0.0

R.R. spike, E. side 15" Sycamore, 50' L., 63+15

Area 0.0

3.3/22.5 4.0/16 6.6/15 5.0/11 4.7/0 4.5/9.5 5.7/14 1.5/16 Orig./22.5

11.1/22.5 11.1/19 13.6/15.9 15.5/14.5 14.8/11 14.6 15.1/10.5 16.0/4.5 10.6/22

2.3/30 2.4/21 6.1/16.5 8.7/15.5 8.0/12.5 7.8 8.2/11 9.4/13.5 6.3/17 1.9/22.5 1.5/24

5.9/30 6.0/24.5 5.9/21 10.0/16 12.1/14.7 11.2/11.5 10.8 11.2/10.5 12.7/15 9.3/16 7.2/19.3 6.5/22.5

0.1/17.5 1.8/13.5 4.5/13 2.9/9 2.5 3.0/11 4.3/14.5 1.0/16.5 0.8/22.5

Area, 0.0

	0.80	1149.66		1148.86
96+90				
97+00				
97+70				
101				
102				
103				
104				
105				
106				
107				
108				
108+80				
112+50				
113+00				
113+80				
	8.17	1084.67		1076.50
114+90				
115				
116				
	7.16	1088.35	3.48	1081.19

R.P. Spike, N.W. side 12" Hemlock, 36' Right, 96+35

Area, 0.0

6.9	5.7	6.5	7.7		7.5	7.2	7.6	7.8	7.6	5.7
22.5	5.5	3	2		0	3	5	21.5	26.5	30

Area 0.0

0.0

0.0

Area 0.1

Area 0.0

0.0

Area 0.0

East Section, Area, 0.0

Area 0.0

	Toe	Back Slope
	13	20
	8	14
	4	13
	13	19
	13.5	22

0.0

East Section

0.0

R.P. Spike E. side 12" Bitternut, 95'L, 112+40

0.0 Area

7.5	7.5	10.3	12.7	10.6	10.4	10.5	10.9	10.0	9.3	10.8
22.5	18.5	14.5	13	10		11	15	16.5	21	28

1.6	3.5	6.1	5.0	4.4	4.7	5.8	4.0	1.1	1.1
22.5-18.0	15.5	14.0	10		11	15.5	17	23	28

1088.35

117

117+42.

118

118+25

8-4-52 Farmount Rd culvt

1035.12

from pg. 44

	F.L. Grades	
	26.90	inlet FL
	26.60	outlet FL
	26.30	
	25.4	

inlet end = Sta 8+56.

N

± 5°; skew to west

midway between manholes on 9.7=Rod S

4.0 / 15.5	6.0 / 12	5.5				5.6 / 15.5	5.4 / 17.5	3.1 / 22	3.0 / 25
8.1 / 17		7.2					7.0 / 16	2.6 / 23	
13.4 / 26		11.9 / 0	12.0 / 10.5	11.3 / 14		6.4 / 20.5	6.6 / 22.5		

Area 0.0

Sta 8+50

35.12=H.I.

26.90 / 8.22 — 6.22 rod = 62'-0" Stk 30' N of ℄

35.12=H.I.

26.60 / 8.52 — 5.02 rod = 63'-6" " 30' S of ℄

35.12=H.I.

26.30 / 8.82 — 6.32 rod = 62'-6" 90' S of ℄

ground 100' S of ℄ ℄ down stuff to river

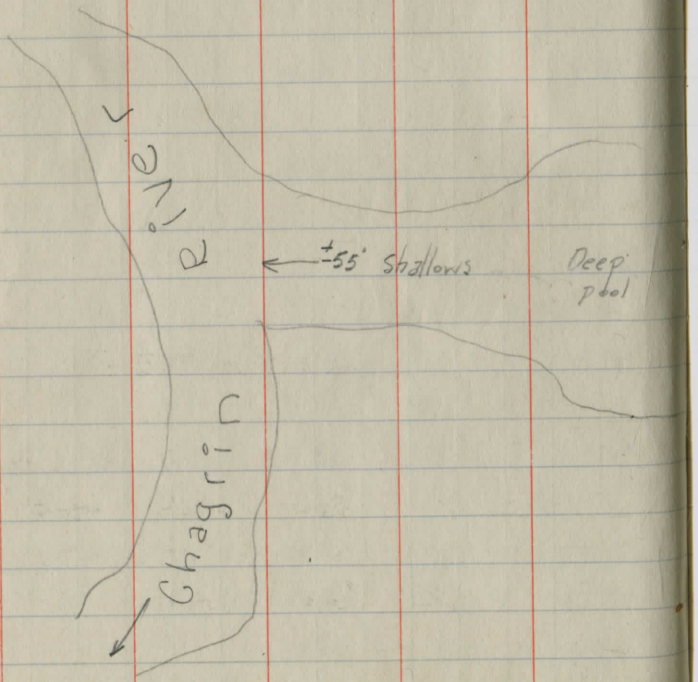
11/12/40 Pomeroy Richards

Culvert on N. Woodland (1st E of Fullertown)

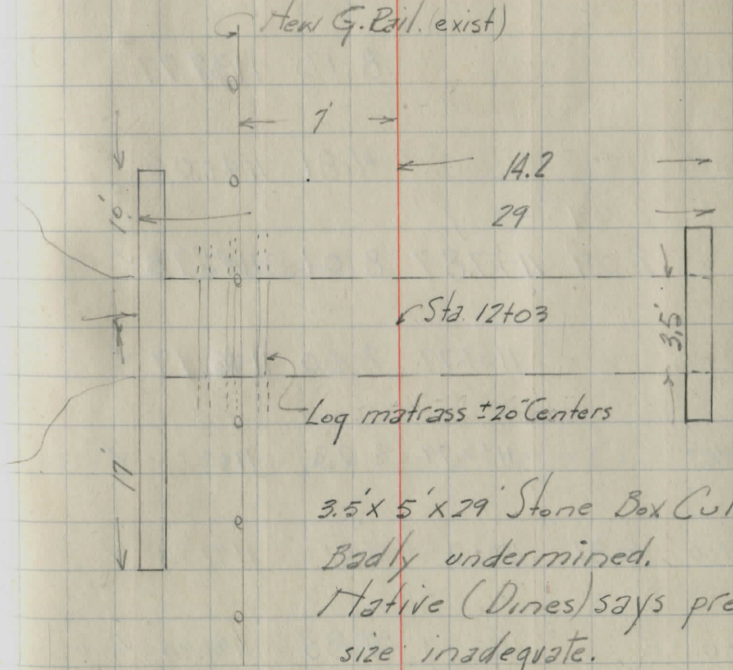
Profile	N. Woodland				
B.M.	1.77	1099.77		1098.00	
9 to			8.0		1091.8
T.P.	1.45	1088.90	12.32	1087.45	
10 to			5.5		1083.4
11 to			10.4		1078.5
T.P.	3.92	1080.72	12.10	1076.80	
12			4.6		1076.1
12+03			4.6		1076.1
13			4.6		1076.1
14			3.1		1079.6
15			0.8		1079.9
16			+3.2		1083.9
top op. S			7.16		73.56
F.L. S			12.4		68.32
30' S			11.5		69.2
100' S			10.9		69.8
200' S			9.0		71.7

X in S.E. cor. Conc. gas pump base (Fullers)

	1080.72			
F.L. 12" Boiler pipe		7.8		72.9
Top timber N.		13.1		67.6
" op. N		8.6		72.12
B.M.	1080.72	3.48	1077.24	
	10.38	1089.62	1.46	1079.27
	9.69	1098.78	0.53	1089.09
B.M.			0.79	1097.99 (1098.00)



Spike N. root 54" Elm 11 ± 80 ± 37' Rt



3.5' x 5' x 29' Stone Box Culv't.
Badly undermined.
Native (Dines) says present size inadequate.

Profile Northwood Drive

Levels run with transit

Approx. Sta.

7-28-47
Colebrook
Romero

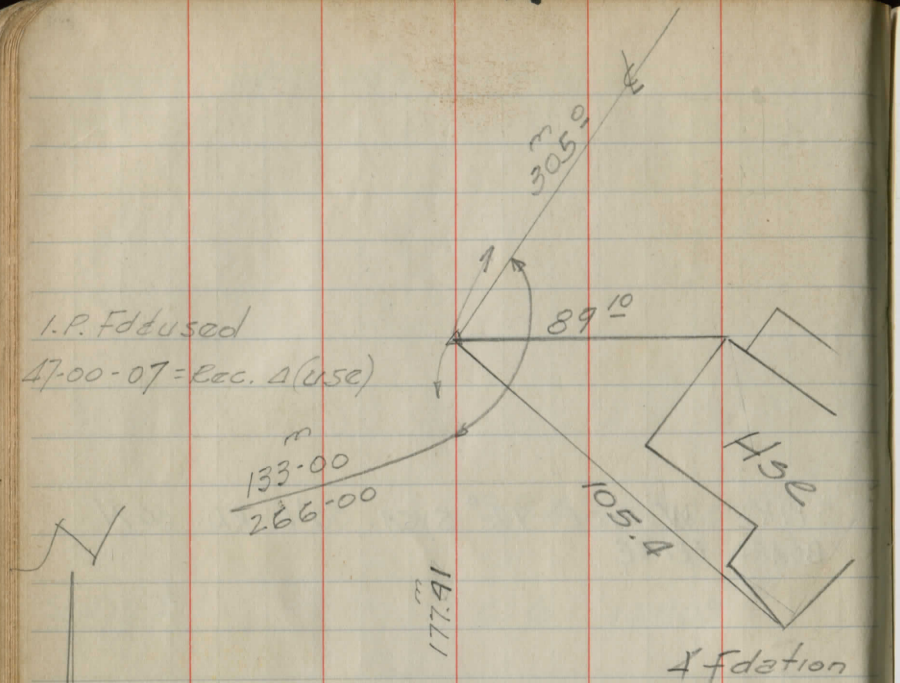
π_3	0.6.8	1136.78 ✓			
	0.68				
			11.77	1136.10 ✓	TP CURVE LEFT
			9.95	1137.92	~~TP CURVE LEFT~~
Sta 4+00			8.10	1139.77	
Sta 3+00			4.81	1143.06	
	2.09	1147.87 ✓	8.01	1145.78 ✓	TP CURVE RIGHT
Sta 2+00		1153.79	7.60	1146.19 ✓	
BM set		1153.79	3.73	1150.06 ✓	W. ROOT TWIN ELM 40' R. St 1+50. SPIKE N.W ROOT
Sta 1+00	~~5.81~~	1153.79	5.81	1147.98 ✓	
St 0+00		1153.79	4.85	1148.94 ✓	℄ NORTH WOODLAND
B.M. fd	1.53	1153.79 ✓		1152.26	Spk N root 30" Pine 18' rt (5) of ℄ N. Woodland ± in line with E edge house opposite Northwood Drive

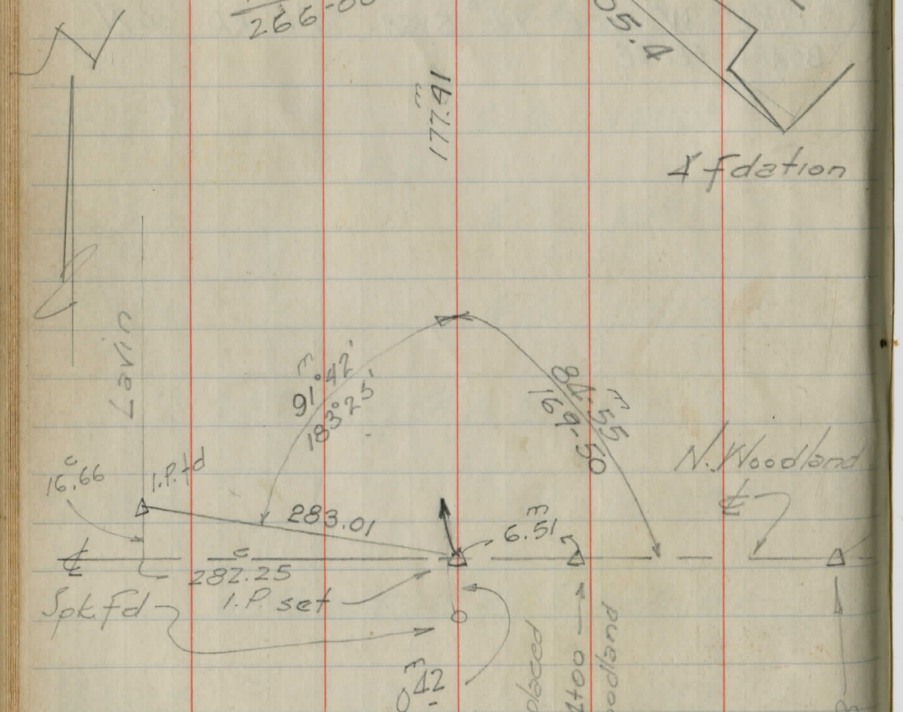
	+	HI	−	E		
	1.26	1108.01	11.69	1106.75	✓	TP
Sta 12+00			5.7	1112.7	✓	
Sta 11+75			4.8	1113.6	✓	
Sta 11+00			4.9	1113.5	✓	
Sta 10+00			4.8	1113.6	✓	
	3.48	1118.44	11.67	1114.96	✓	TP
Sta 9+00			11.0	1115.6	✓	
Sta 8+00			7.1	1119.5	✓	
Sta 7+00			2.2	1124.4	✓	
	0.79	1126.63	10.94	1125.84	✓	TP
Sta 6+00			7.35	1129.43	✓	
Sta 5+00		1136.78	3.36	1133.42	✓	

	+	H.I	−	E	
St 20+00			4.9	1073.2	✓
	0.53	1078.09	8.93	1077.56	✓
St a 20+0			8.8	1077.7	✓
St a 19+0			6.5	1080.0	✓
St a 18+0			6.2	1080.3	✓
St a 17+0			5.3	1081.2	✓
St a 16+0			2.0	1084.5	✓
	0.36	1086.49	11.17	1086.13	✓
St a 15+00			7.5	1089.8	✓
	1.14	1097.30	11.85	1096.16	✓
St a 14+00			10.2	1097.8	✓
St 13+00		1108.01	2.1	1105.9	

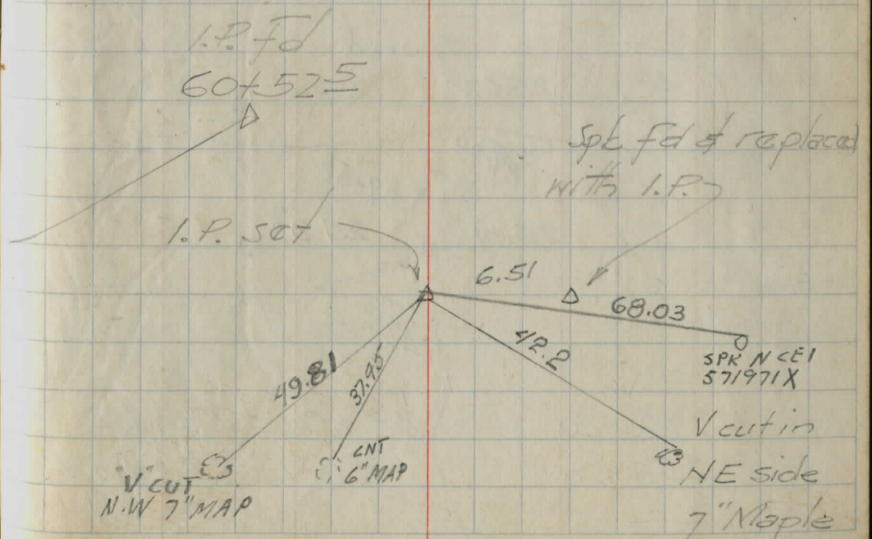
	+	H.I	−		
			3.94	1043.60	✓
Sta 26 ±			6.6	1040.9	✓
Sta 25 ±			6.1	1041.4	✓
St 24+00			6.2	1041.3	✓
	2.41	1047.54 ✓	10.85	1045.13	✓
Sta 23+00			3.8	1052.2	✓
	0.58	1055.98 ✓	11.55	1055.40	✓
St 22+00		1.3	1.3	1065.7	✓
	0.37	1066.95 ✓	11.51	1066.58	✓

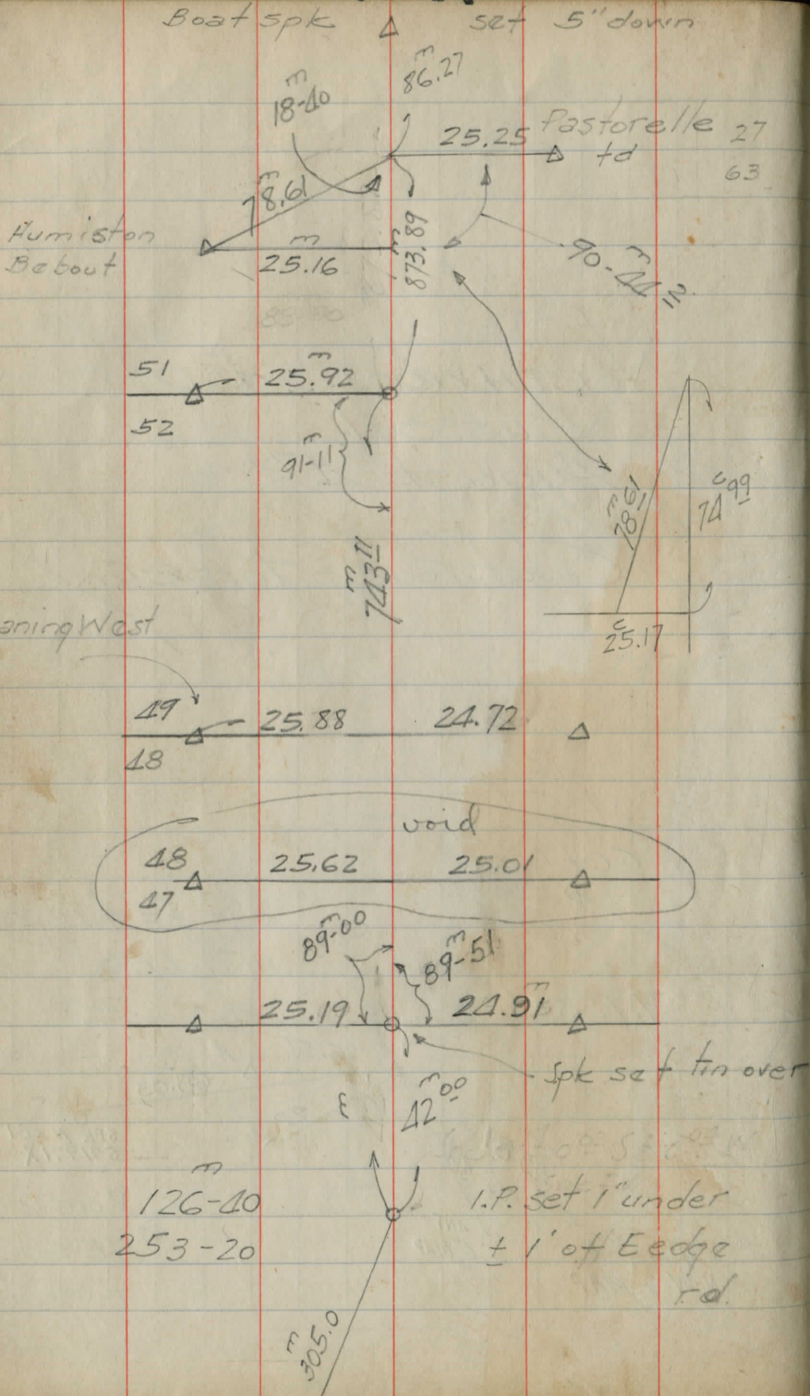
SPIKE W. SIDE 12" SYCA. 50'E. RD. 50'N
BOARD FENCE

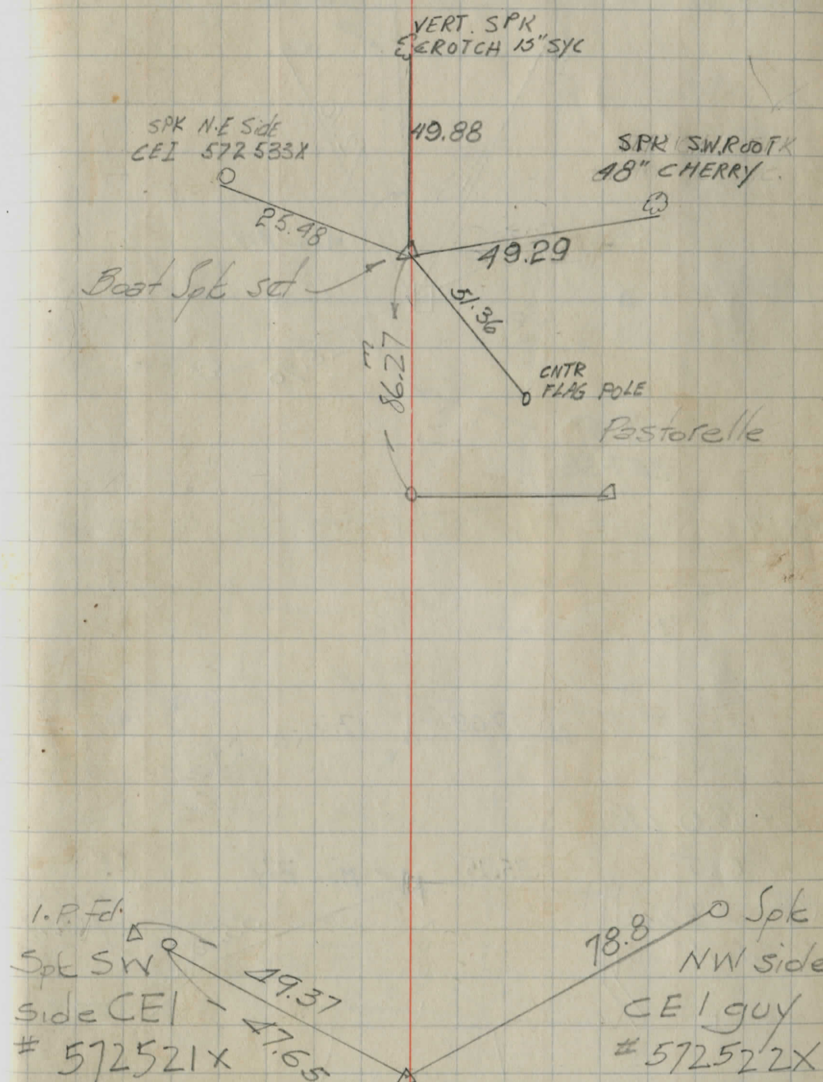




Northwood Rd
Russell, August '17
Colebrook - Pomeroy



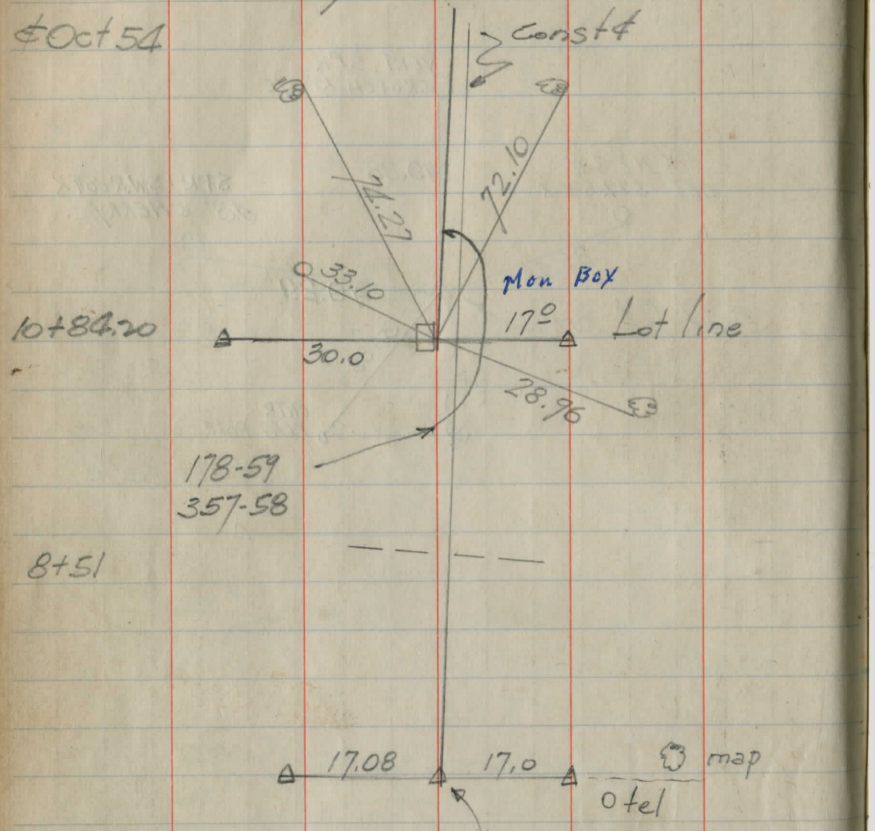

Boat spk set 5" down
86.27
18-40
Pastorelle fd
25.25
27
63
78.61
Humiston Bebout
25.16
873.89
90-44
51
25.92
52
91-11
78.61
74.99
743.11
25.17
leaning West
49
25.88
24.72
48
void
48
25.62
25.01
47
89-00
89-51
25.19
24.91
Spk set tin over
42.00
126-40
253-20
1.P. set 1" under
± 1' of E edge rd.
305.0

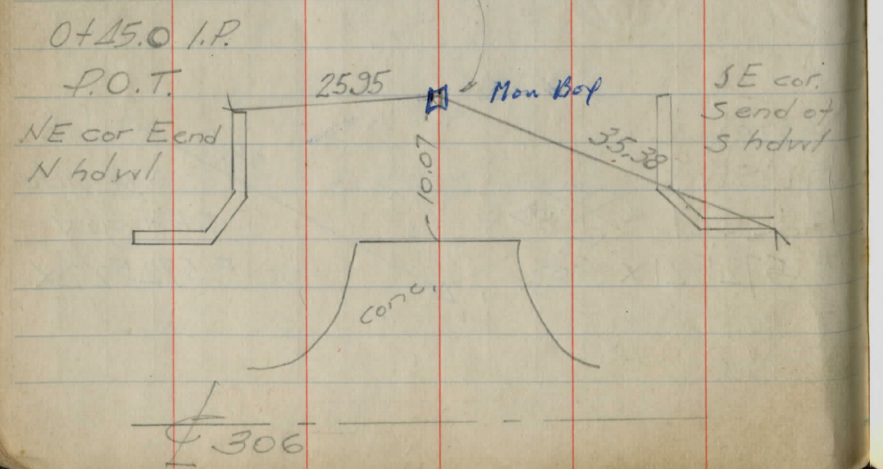

VERT. SPK CROTCH 15" SYC
49.88
SPK N.E Side CEI 572 533X
SPK S.W. ROOT 48" CHERRY
25.48
49.29
Boat Spk set
51.36
86.27
CNTR FLAG POLE
Pastorelle
1.P. fd
Spk SW side CEI # 572521X
49.37
47.65
78.8
Spk NW side CEI guy # 572522X

Fairmount Rd

℄ 25 of July 1952

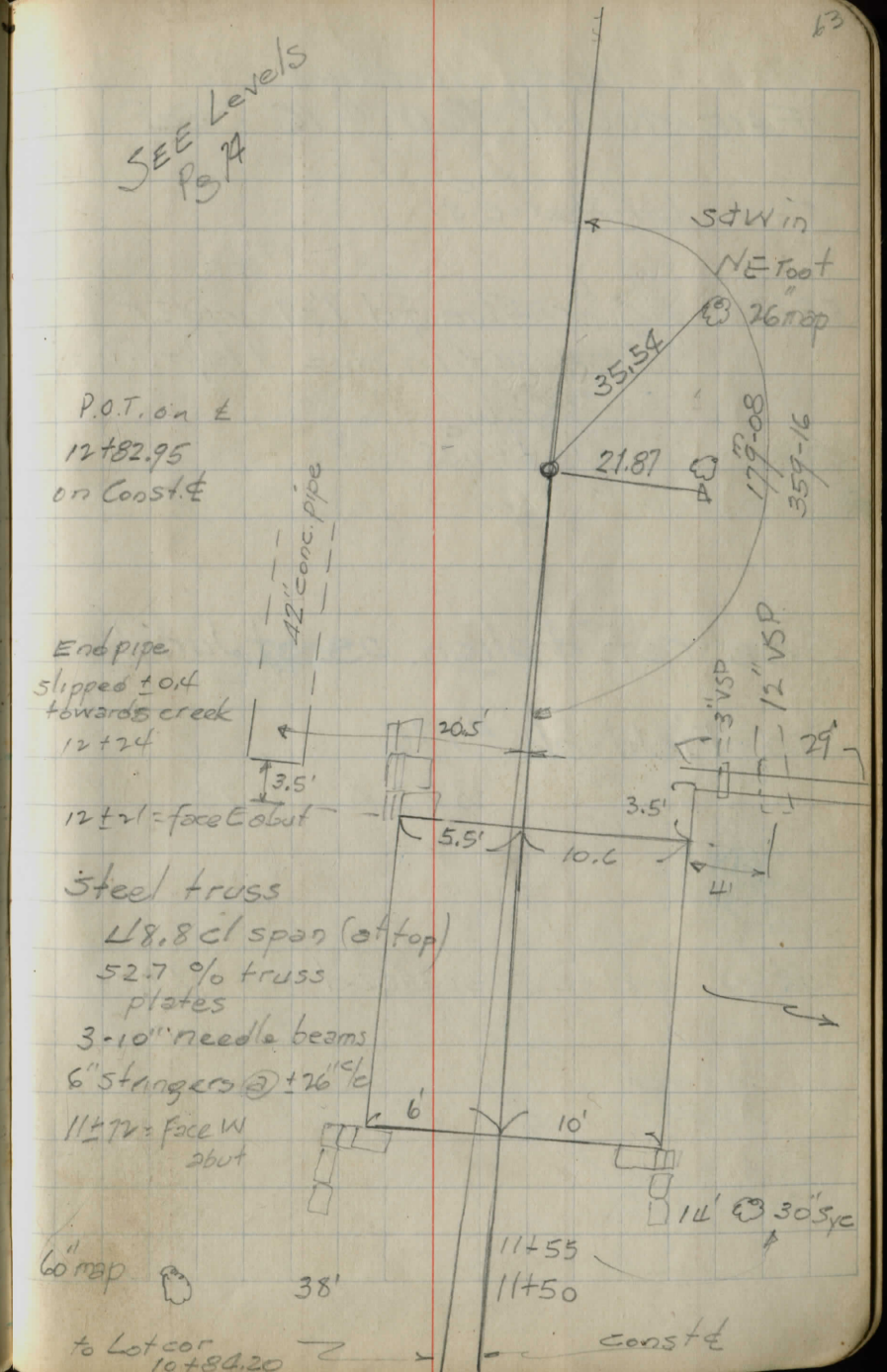
℄ Oct 54





63

SEE Levels Pg 74



North Woodland Rd

FAIRMOUNT RD # 16 Sec

59+0 tan offset = 0.5 C

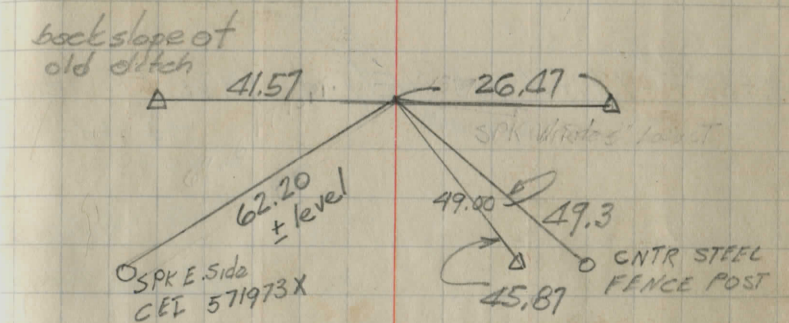
58+38 Boiler Flue Fd 1'-9" under
3/4" I.P. set in flue & left Flush

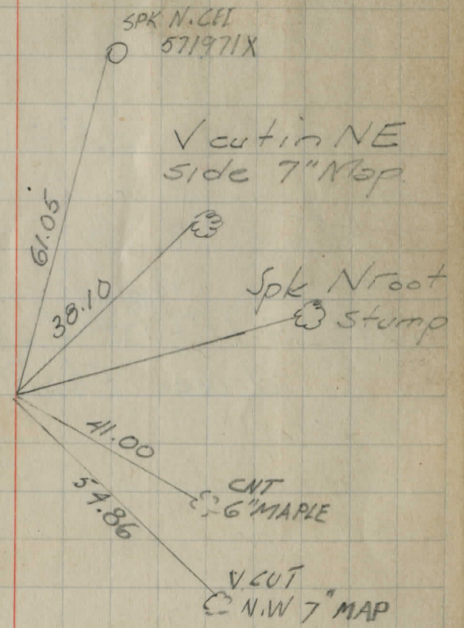
58+0 tan offset = 1.35 C

See ref. & align. as of June '54
in Field bk. # 176
" " 373 A 1973

51+00 Spk Fd & replaced with I.P.
2" under

D & E 1947





378

67+62 2

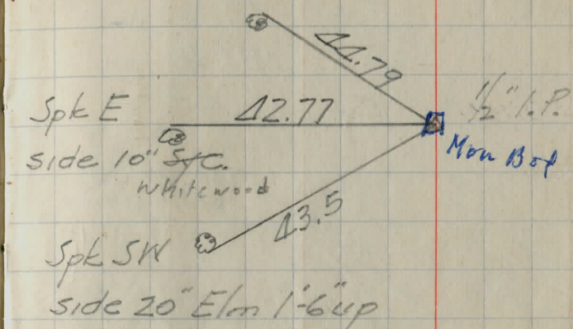
62+68 4 1/2" 1.P. Fd 0.75 NEly of old 3/4" 1.P. (bent) 8°-50' td

60+52.5 1.P. Fd ± 2" above gd. 4°-50'
driven Flush (1.P. looks recent)

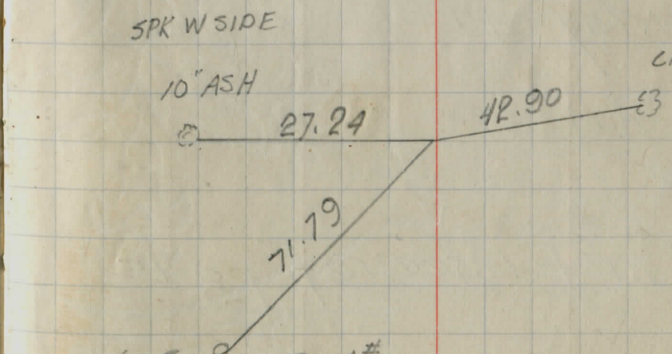
65

See new ref △ pg 15

Bent Spk SE side 10" Ch.



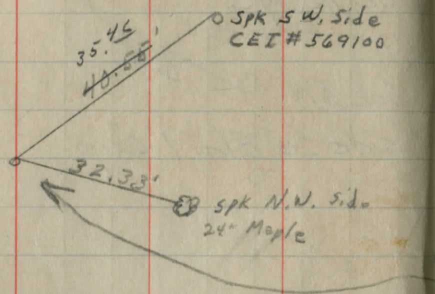
TURNED 147-10
8-22-50 294-20
m
32-50
32-38 old notes
ie 3/4" I.P. must be original



387.33' Rec
382.86' m
.82

Δ= 30-48 Rt
D= 17°
R= 337.03
T= 92.83
L= 181.18
E= 12.55

97+04.00



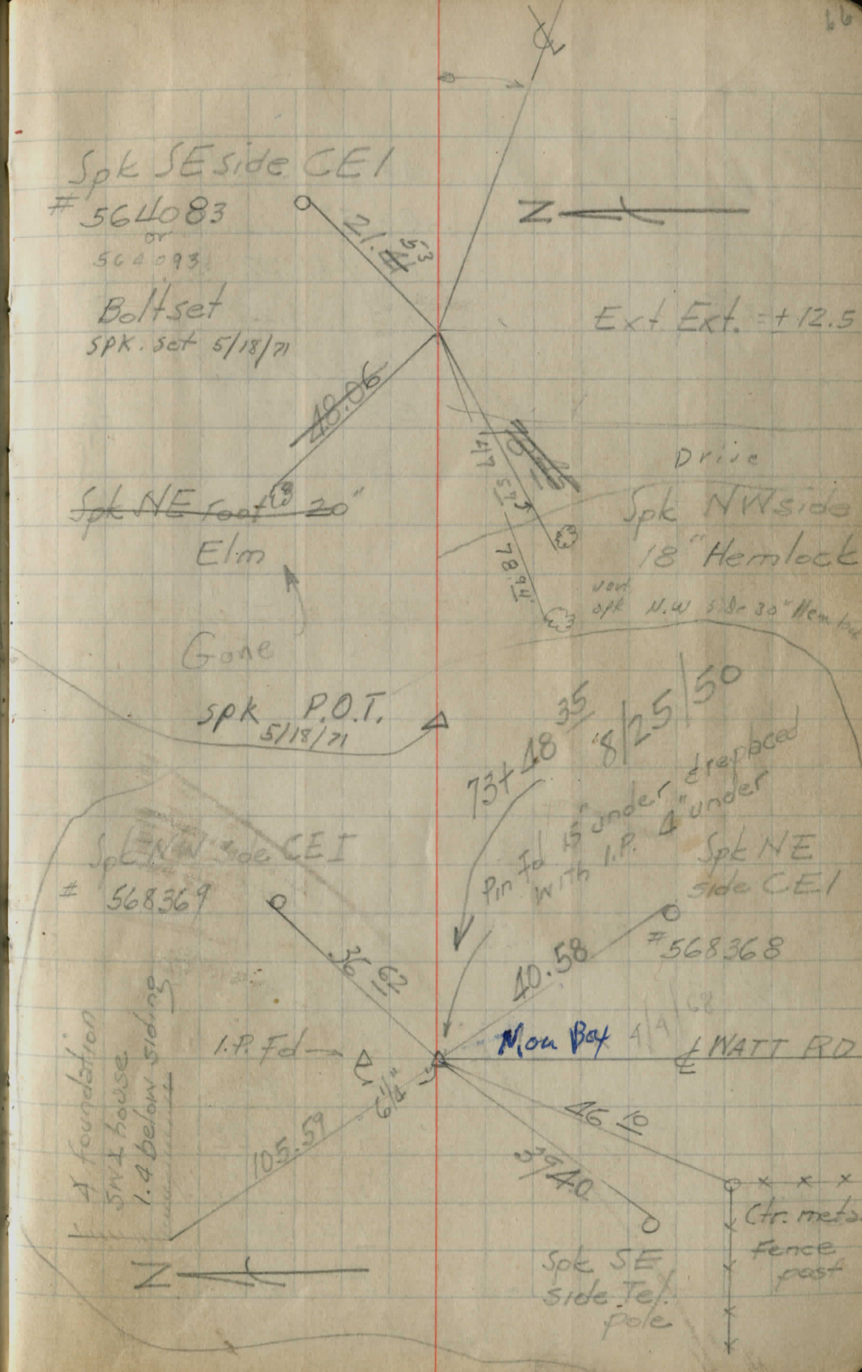
1304.0' Rec
1332.55' m
.42

Fairmount
~~North~~ Woodland
CH No 16 E(pt.)

1022.79 May 47

Aug 47

84+00 I.P Fd see ref pg 15


Spk SE side CEI
564083
or
564093
Boltset
Spk. set 5/18/71
21.48
48.06
~~Spk NE root 20"~~
Elm
Gone
Ext. Ext. = +12.5
Drive
Spk NW side
18" Hemlock
Spk N.W. Side 30" Hemlock
78.94
Spk P.O.T.
5/18/71
73+48.35
8/25/50
Pin Fd 15" under & replaced with I.P. 4" under
Spk NW side CEI
568369
Spk NE
side CEI
568368
36.62
40.58
I.P. Fd
Mon Box
℄ WATT RD
6½"
105.59
46.10
39.40
SW ⅃ house foundation
1.4 below siding
Ctr. metal
Fence post
Spk SE
side Tel.
pole

(444.69) Rec.
442.41' m
5
36

107+79.30

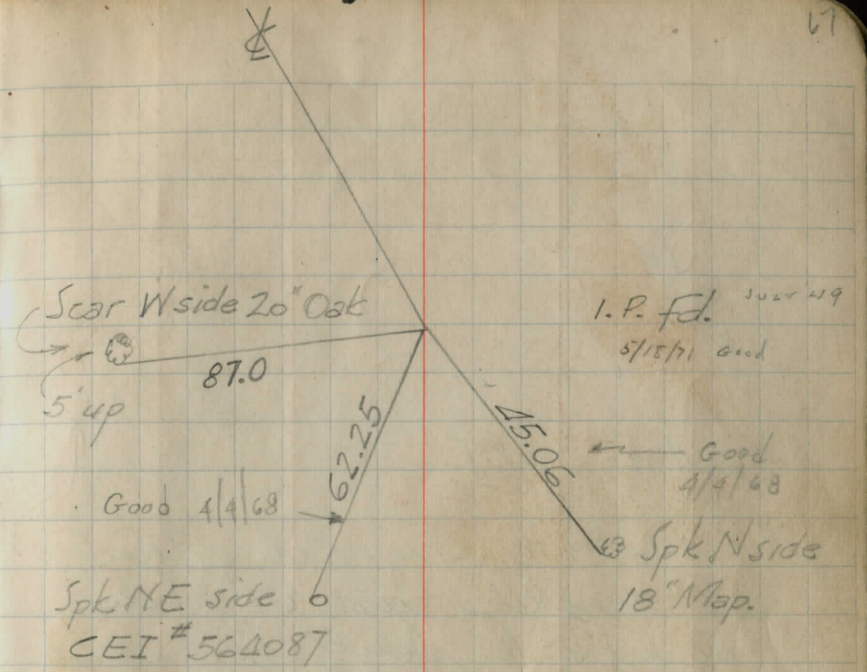
(692.75)
(692.87' m)
7
.50

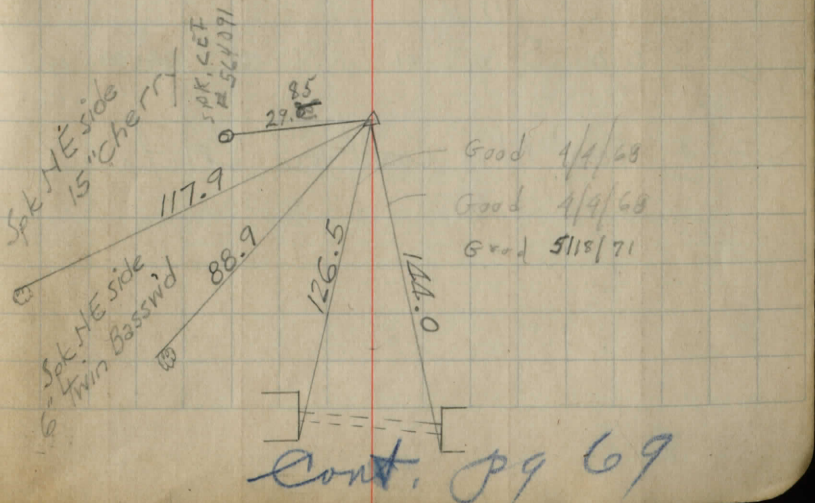
100+86.85

Δ = 16° 13' Lt.
D = 5°
R = 1145.92
T = 163.26
L = (324.32)
E = 11.57

I. P. Fd July '49
Δ = 7-11 R
D = 4°
R = 1432.40
T = 96.19
L = (192.08)
E = 3.23

Cont. pg 67





Cont. pg 69

See next pg

Judges gulch

± 700' E of bridge riding trail
x s creek just E of shale
rock bank south side creek
Easy slopes both banks

± 275' N of fence & to creek
± 300' S " " " = ± align of
= ± 900' N of road on Est line

15/32

END
S. STAKES 7-26-49
475.69 EAST OF 112+21.2

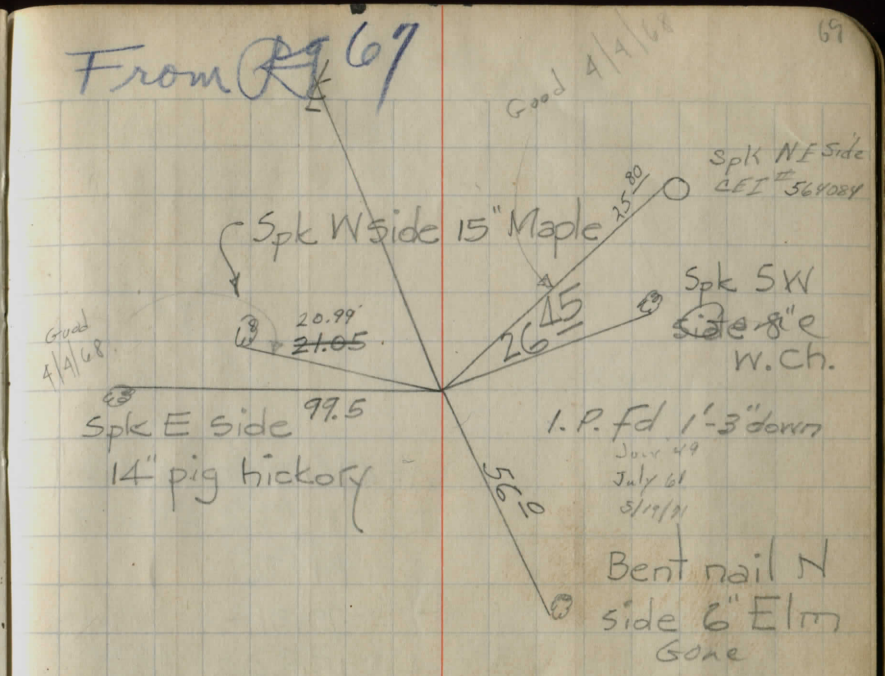
112+21.2

712

688

Δ = 28-27 Lt.
D = 18°
R = 318.31
T = 80.69
L = (158.055)
E = 10.07

From R9 67

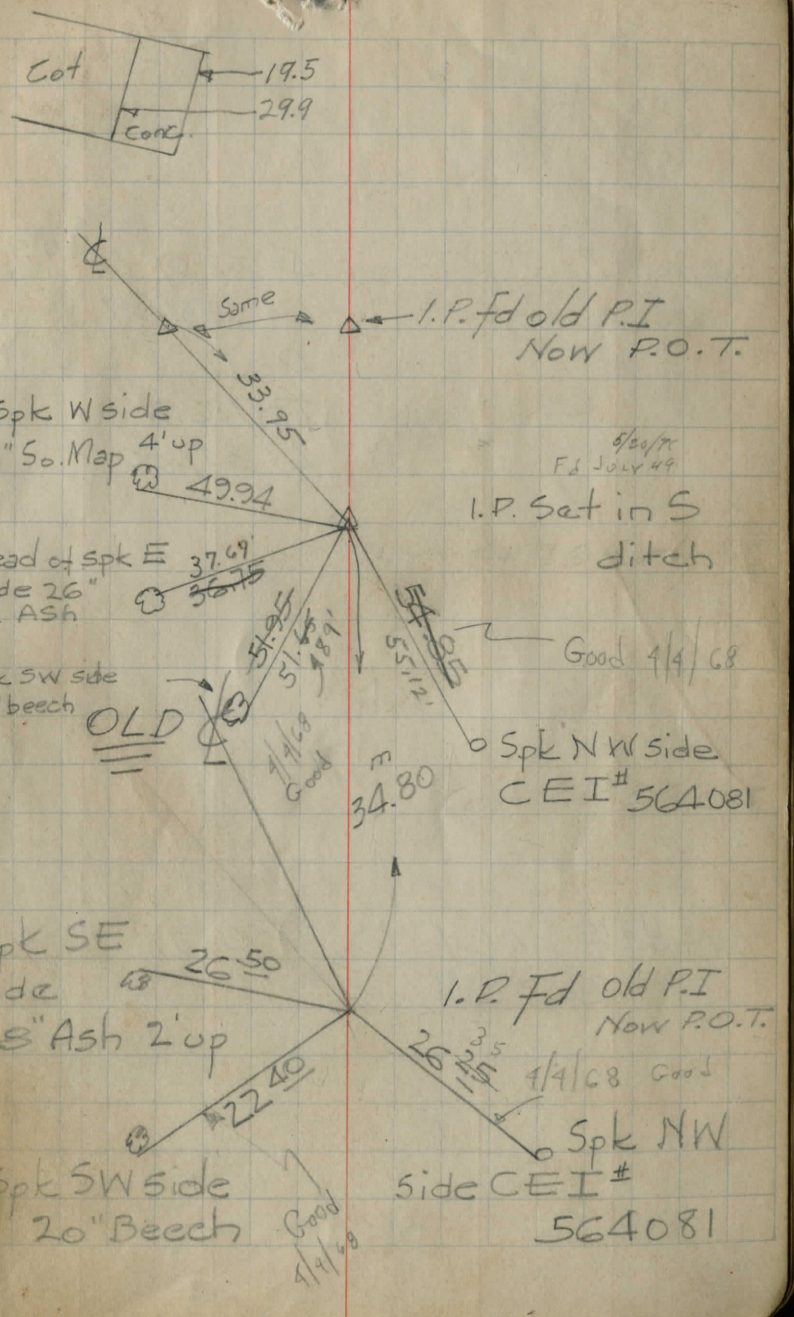


69

(117+76.80)

Δ = 47-12-30 Lt.
R = 182.86
D = 31-20
T = 79.91
L = 150.66
E = 16.70

117+42



165-08
(2) 330-16
135-24

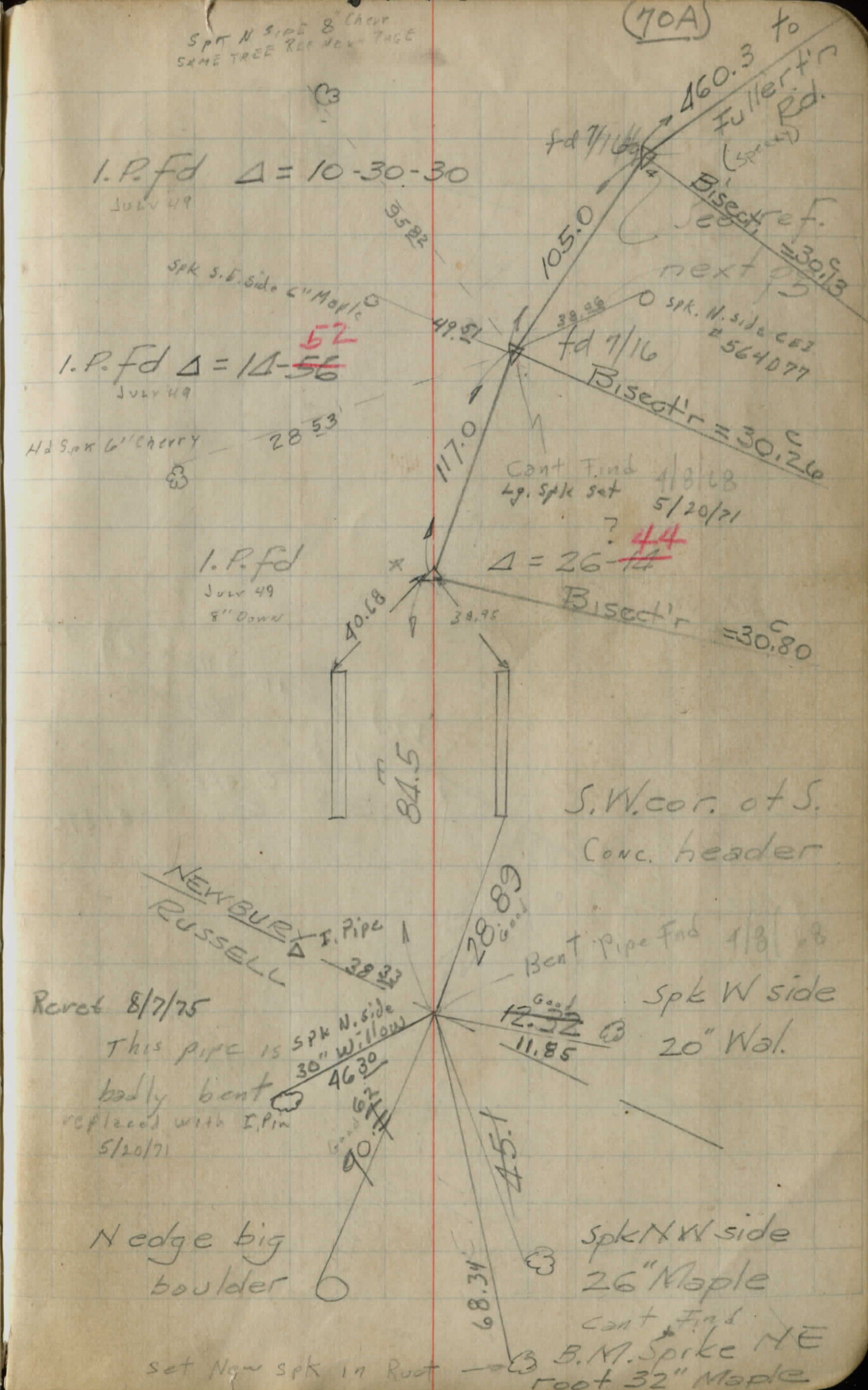
153-16
* 306-32
99-48

New P.I.
(inacessable)

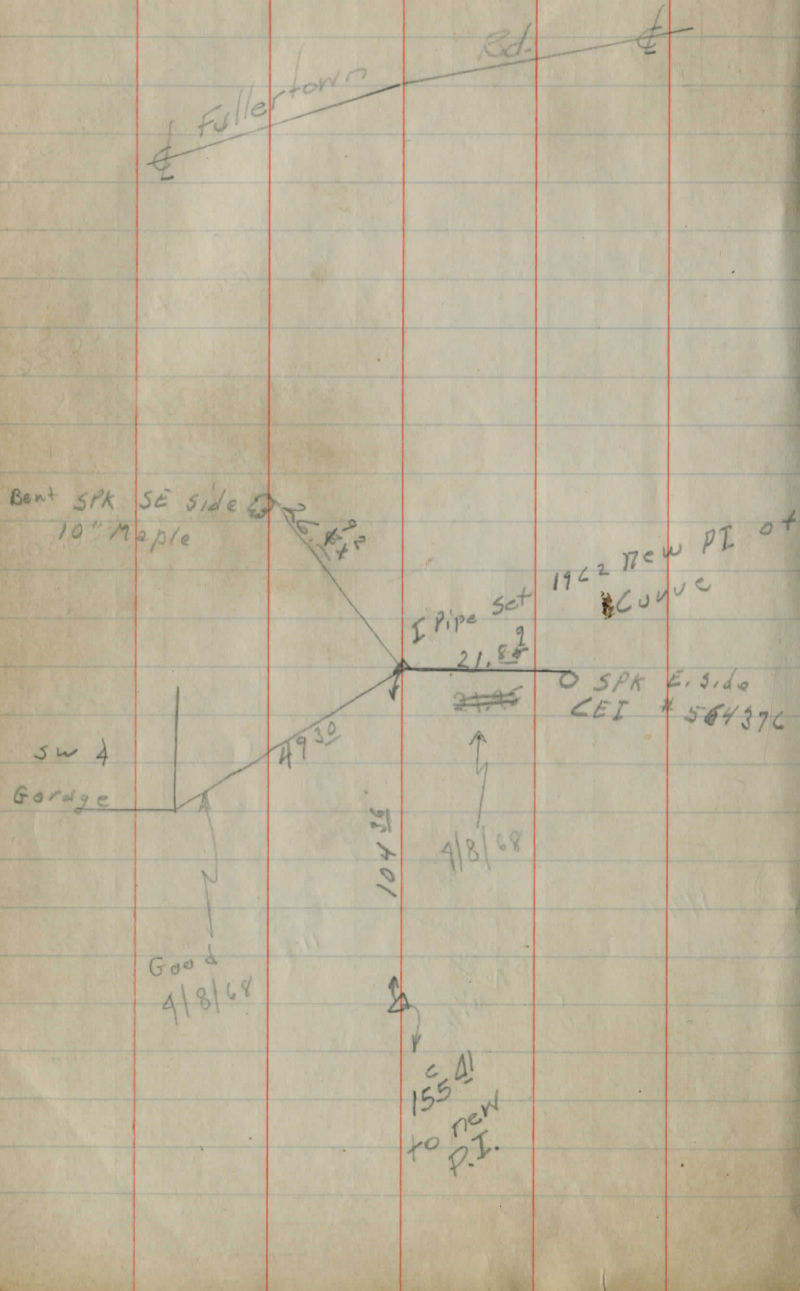
Δ = 52-07-30 ??
R = 381.97
D = 15°
T = 186.81
L = 347.50

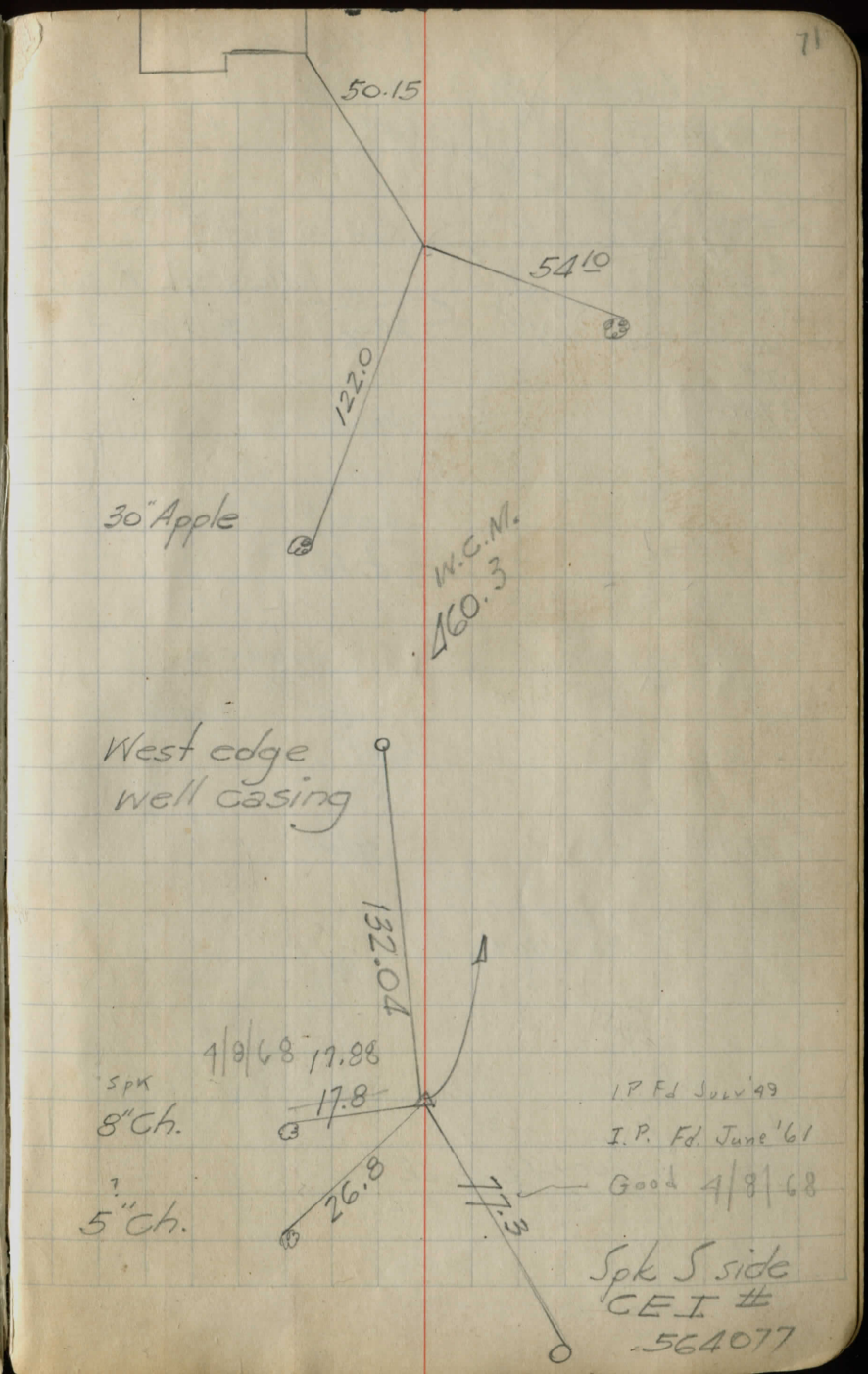
172.57

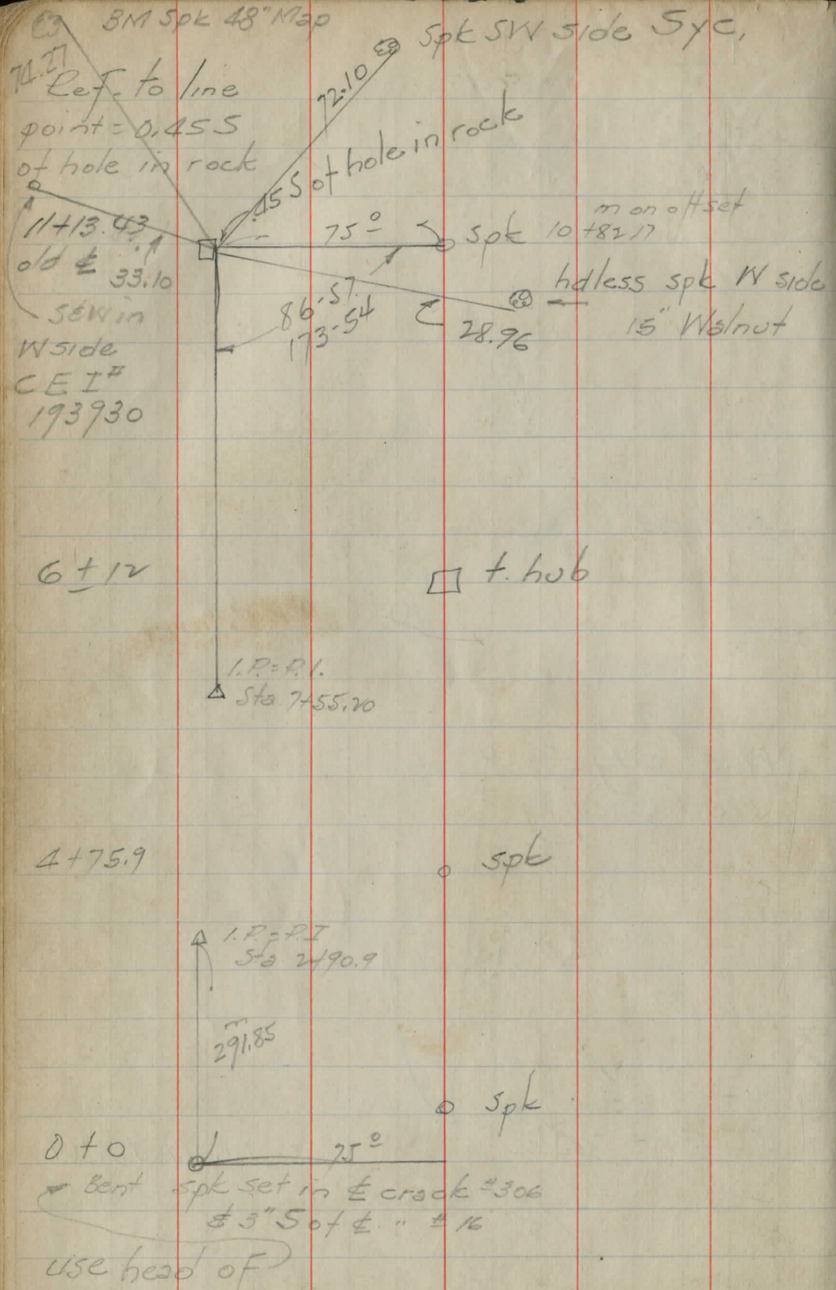
121+44[70] I.P. fd P.O.T.
JULY 49

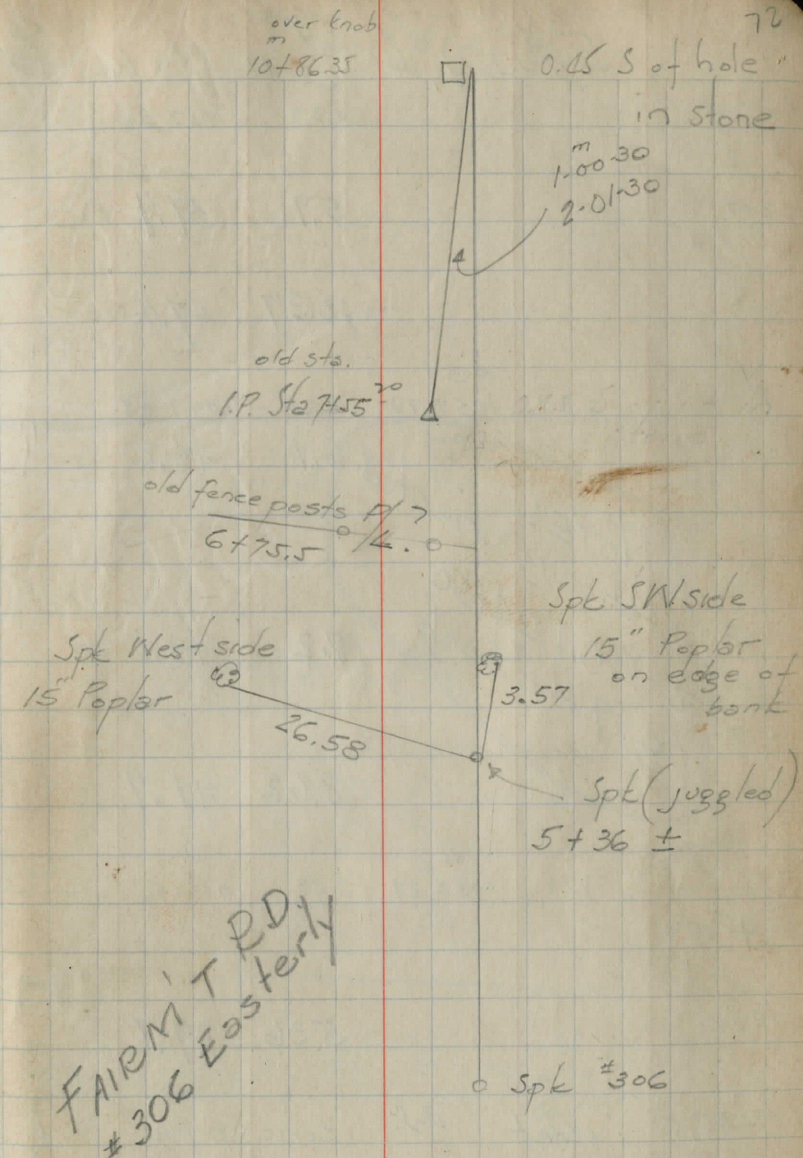


(70A)
Spk N side 8" Cherr
SAME TREE REF NEXT PAGE
460.3 to Fuller't'r Rd.
(Spencer)
fd 7/16
Bisect'r ref. = 30.13
See next pg.
I.P. fd Δ = 10-30-30
JULY 49
35.82
105.0
Spk S.E. side 6" Maple
49.51
38.96
Spk. N. side CE3 #564077
fd 7/16
I.P. fd Δ = 14-56 52
JULY 49
Bisect'r = 30.26
Hd Spk 6" Cherry
28.53
117.0
Cant Find Lg. Spk set
1/8/68
5/20/71
I.P. fd
JULY 49
8" Down
Δ = 26-14 44
Bisect'r = 30.80
40.68
38.95
84.5
S.W. cor. of S. Conc. header
NEWBURY
RUSSELL
I. Pipe
38.33
28.89 Good
Bent pipe Fnd 1/8/68
Reset 8/7/75
This pipe is badly bent replaced with I. Pin 5/20/71
Spk N. side 30" Willow
46.30
12.32 Good
11.85
Spk W side 20" Wal.
90.4 Good
45.1
N edge big boulder
68.34
Spk NW side 26" Maple
Cant Find
B.M. Spike NE root 32" Maple
set New spk in Root


Fullerton Rd.
℄
℄
Bent SPK SE side
10" Maple
I Pipe Set
19.62 new PI of Curve
21.8
SPK E. side
CEI # 564376
SW 4
Garage
49.30
104.35
4/8/68
Good
4/8/68
155.41
to new
P.I.


50.15
54.10
122.0
30" Apple
W.C.M.
460.3
West edge
well casing
132.04
4/8/68
17.88
17.8
SPK
8" Ch.
?
5" Ch.
26.8
77.3
I.P. Fd July '49
I.P. Fd. June '61
Good 4/8/68
Spk S side
CEI #
564077


BM Spk 48" Map
Spk SW side Syc.
74.27
Ref. to line
point = 0.45 S
of hole in rock
72.10
.45 S of hole in rock
m on offset
75°
Spk 10+82.17
11+13.43
old ℄
33.10
hdless spk W side
15" Walnut
86-57
173-54
28.96
SEW in
W side
CEI#
193930
6+12
t. hub
I.P. = P.I.
Sta 7+55.20
4+75.9
spk
I.P. = P.I.
Sta 2+90.9
291.85
Spk
0+0
75°
Bent spk set in ℄ crack #306
& 3" S of ℄ " #16
use head of


72
over knob
10+86.35
0.45 S of hole
in Stone
1.00-30
2.01-30
old sta.
I.P. Sta 7+55.20
old fence posts P/?
6+75.5
Spk SW side
15" Poplar
on edge of
bank
Spk West side
15" Poplar
3.57
26.58
Spk (juggled)
5+36 ±
FAIRM'T RD.
#306 Easterly
Spk #306

9-V-54 Pomeroy, Maynard, Temple

SOUTH DITCH No 16

C

	+	#1	−	EL'
BM, Fd			4.28	1053.51
+20				
22+0			5.9	51.9
+7				
21+8			10.37	47.4
		#3		
TP.	10.37	1057.79	2.85	1047.42
20+0			6.1	44.2
+95				
+56				
+50			7.2	43.1
+31				
+10				
19+0			8.62	41.7
		#2		
TP.	8.62	1050.27	3.43	1041.65
+99				
18+0			5.36	39.7
17+87.5	inlet	4½"	conc. pipe	
		#1		
BM	7.61	1045.08		1037.47

NOTE: Stationing oriented to P.O.T 24+50 pg. 9 this book

(E. of Rt 306) 5th Side of ℄

℄

SOUTH NW SIDE 5" CHANNEL ± 30' RT ± STA 22+40

10.05 · 30' CHANNEL

5.9 | 6.2 / 9.0 | 6.6 / 12' | 10.1 / 14+19' | 5.0 / 24' | 4.6 / 30-40 | FENCE AT 31' | CEI ℄ 562396 / 26'

10.37 | 10.8 / 8.5 | 11.3 / 12' | 13.2 / 14-20' | 6.9 / 30 | 4.9 / 50

HI #3

6.1 | 6.4 / 8.5 | 9.5 / 13 & 17.5 | 2.0 / 24' | 0.6 / 30 | −1.4 / 50

CEI ℄ 562395 / 26.5

32" MAPLE / 19.5

7.2 | 7.5 / 8.0 | 10.0 / 10+14 | 1.9 / 22.5 | 0.9 / 30' | 0.2 / 50

30" HYPLC / 20'

28" HYPLC / 20.5

8.62 | 9.0 / 8.0 | 11.3 / 13 | 5.8 / 23 | 5.9 / 30 | level OUT

HI #2

GUY 13' SOUTH

CEI ℄ 562394 / 24.5

HI #1

5.36 | 5.6 / 8.5 | 4.0 / 10 | 9.1 / 15.5 | 8.7 / 30 | FENCE / 31.5 | 9.9 / 33 | 4.8 / 42 | 5.5 / 50

Channel

10.75

FL = 1034.33

18'

℄

5

NE cor E end hdwl

Oct 25 54 Pom Maynard Temple

FAIRMOUNT RD AT CHAGRIN RIVER

			5.94	3r.41
			5.81	3r.54
			9.60	28.75
			5.98	3r.37
			5.89	32.46
			5.75	32.60
			5.76	3r.59
			13.8	24.55
12+24				
11+72	℄ West end exist'g bridge			
11+60				
11+0				
10+0				
8+51				
BM	663	1038.35		1031.72

See plan & dim pg 63

N S

S end conc ret. wall

N " " " "

bottom of opening 12" V.S.P.

SW Bridge seat (on stone

NW " " "

NE " " "

SE " " "

F/L outlet 42" conc pipe (end pipe dropped ± 4")

4.94 33.41

℄ bridge 5.02r 33.33

4.95 33.40

28.65 33.75 26.75

13.3/49 9.7/35 6.1/29 4.9/15 4.6/6 4.8/9' 11.6/22 13.1/33.5

34.05

LEVEL OUT 10.0/38 9.9/24 4.8/13.5 4.3 5.4/13.5 9.7/31.5 10.9/27 9.8/32

33.65

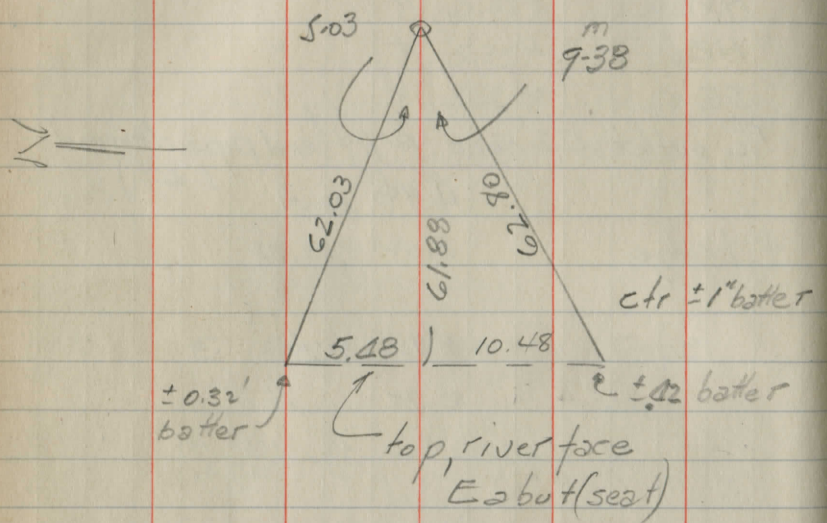
4.7

26.85 33.55 26.55 26.15 25.75 23.85

12" C.I. 30° CURVE O.L

11.5 4.8 11.8 12.2/20 12.6/15 14.5

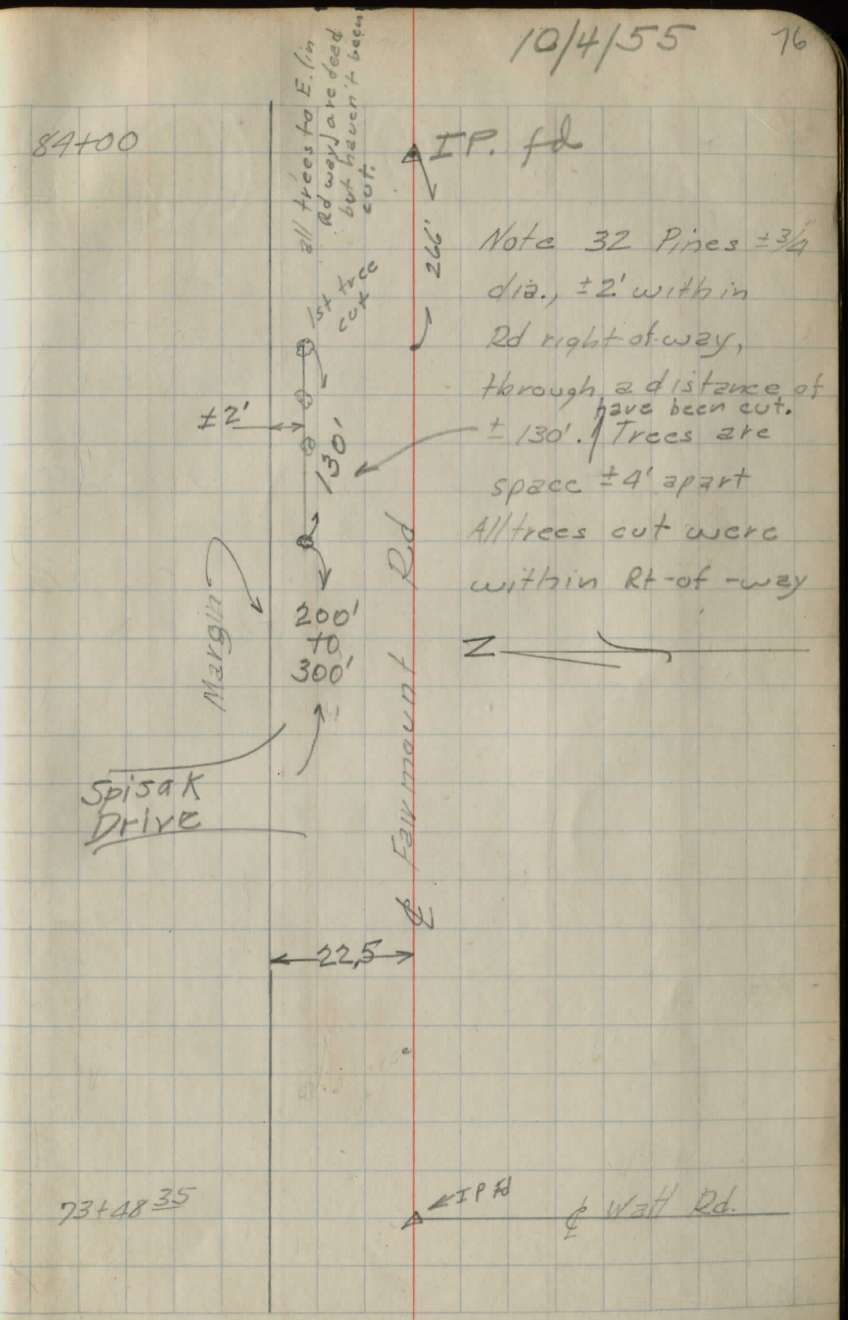
Spk. S root 60" maple N side #16 ℄ West of Chag. river



	15.0	23.35
	14.2	24.15
	13.5	24.85
	13.7	24.65
12+50		33.87
13+0		34.13
13+50		34.51

1038.35

F/L & chan N edge bridge
NW ground
SW
Ground NE & SE
4.48
4.27
3.84


84+00
All trees to E. (in Rd way) are dead but haven't been cut.
1st tree cut
I.P. fd
26'
Note 32 Pines ±3/4 dia., ±2' within Rd right-of-way, through a distance of ±130'. Trees are spacc ±4' apart All trees cut were within Rt-of-way have been cut.
N
±2'
130'
200' to 300'
Margin
Spisak Drive
℄ Fairmount Rd
22.5
73+48.35
I.P. fd
℄ Watt Rd.

Drainage Ditch to South near Sta 37

	HI	Ground	Grade	Stake	Cut on Stake
	50.00				
0		50	86	36	C 50
0+50			88	29	C 59
1			90	27	C 63
+50			92	30	C 62"
2		50	94	34	C 60"
+50			96	40	C 56"
3			99	58	C 41"
+50		1.02	102		C 80

99038

13839 3

3 2,92114

.41517

.10782

97.81 | 10.0700
9781
28900
19562
93380
78248
151320

8-05-15
171-54-45
85-57-22

38

98.33
√96,69.20
81
188 | 1569
1504
1963 | 6520
5889
19663 | 63100
58989

121+44.70
84.50
122 29.20

34.84
29.20
5.64

m
173-31

KEITH'S RAILROAD CURVE TABLES.

Published by KEUFFEL & ESSER CO., New York.

HOW TO USE KEITH'S TABLES.

EXAMPLE.

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P.=23° 20′ to the R. at Station 542+72.

Ext. in Tab. IV opposite 23° 20′=120.87
120.87÷12=10.07. Say a 10° Curve.

Tan. in Tab. IV opp. 23° 20′=1183.1
1183.1÷10=118.31.

Tab. V. correction for A. 23° 20′ for a 10° Cur.=0.16
118.31+0.16=118.47=corrected Tangent.

(If corrected Ext. is required find in same way)
Ang. 23° 20′=23.33°÷10=2.3333=L. C.

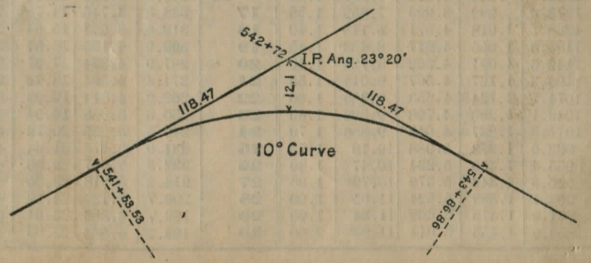
2° 19½′=def. for sta.	542	I. P.=sta.	542+72
4° 49½′= " " "	+50	Tan.=	1.18.47
7° 19½′= " " "	543	B. C.=sta.	541+53.53
9° 49½′= " " "	+50	L. C.=	2.33.33
11° 40′= " " "	543+	E. C.=sta.	543+86.86
	86.86		

100—53.53=46.47×3′(def. for 1 ft. of 10° Cur.)=139.41′=2° 19½″=def. for sta. 542.

Def. for 50 ft.=2° 30′ for a 10° Curve.

Def. for 36.86 ft.=1° 50½′ for a 10° Curve

(These tables are published in Field Books of KEUFFEL & ESSER Co., New York, N. Y.)



1948
MAY
3
MONDAY

MAY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JUNE

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Culvert @ $12.98 → M6.68

Sewer @ $11.13

60" conc. pipe @ $19.64 sq ft　　5/5/48

8 ga. Armco @ $12.54　　← 9' →　　3-5-2

23 sq ft

10 ga. @ $11.38

48" conc (culvert) = $9.19

16-10
12-50
360 linft
@ $11.13
$4006.80

37.0

31.7

Culvert front of Knuffs ±.9% →

± 1.5% →

33.5

Bdge.

CEI pole (40' W. of Knuffs Drive)
= ±32 N g &

CEI (E. end bdge)
= ±31 N g &

25.5

Footers
16 - 16
12 - 5 3
3 - 6 3

TABLE I. — Minutes in Decimals of a Degree.

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

TABLE II. — Inches in Decimals of a Foot.

1-16	3-32	1/8	3-16	1/4	5-16	3/8	1/2	5/8	3/4	7/8
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

TABLE III. — Radii, Ordinates and Deflections.

Deg.	Radius	Mid. Ord.	Tan. Def.	Chd. Def.	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan. Def.	Chd. Def.	Def. for 1 Foot
0° 10′	34377.	.036	.145	.291	0.05′	7°	819.0	1.528	6.105	12.21	2.10′
20	17189.	.073	.291	.582	0.10	20′	781.8	1.600	6.395	12.79	2.20
30	11459.	.109	.436	.873	0.15	30	764.5	1.637	6.540	13.08	2.25
40	8594.4	.145	.582	1.164	0.20	40	747.9	1.673	6.685	13.37	2.30
50	6875.5	.182	.727	1.454	0.25	8	716.8	1.746	6.976	13.95	2.40
1	5729.6	.218	.873	1.745	0.30	20	688.2	1.819	7.266	14.53	2.50
10	4911.2	.255	1.018	2.036	0.35	30	674.7	1.855	7.411	14.82	2.55
20	4297.3	.291	1.164	2.327	0.40	40	661.7	1.892	7.556	15.11	2.60
30	3819.8	.327	1.309	2.618	0.45	9	637.3	1.965	7.846	15.69	2.70
40	3437.9	.364	1.454	2.909	0.50	20	614.6	2.037	8.136	16.27	2.80
50	3125.4	.400	1.600	3.200	0.55	30	603.8	2.074	8.281	16.56	2.85
2	2864.9	.436	1.745	3.490	0.60	40	593.4	2.110	8.426	16.85	2.90
10	2644.6	.473	1.891	3.781	0.65	10	573.7	2.183	8.716	17.43	3.00
20	2455.7	.509	2.036	4.072	0.70	30	546.4	2.292	9.150	18.30	3.15
30	2292.0	.545	2.181	4.363	0.75	11	521.7	2.402	9.585	19.16	3.30
40	2148.8	.582	2.327	4.654	0.80	30	499.1	2.511	10.02	20.04	3.45
50	2022.4	.618	2.472	4.945	0.85	12	478.3	2.620	10.45	20.91	3.60
3	1910.1	.655	2.618	5.235	0.90	30	459.3	2.730	10.89	21.77	3.75
10	1809.6	.691	2.763	5.526	0.95	13	441.7	2.839	11.32	22.64	3.90
20	1719.1	.727	2.908	5.817	1.00	30	425.4	2.949	11.75	23.51	4.05
30	1637.3	.764	3.054	6.108	1.05	14	410.3	3.058	12.18	24.37	4.20
40	1562.9	.800	3.199	6.398	1.10	30	396.2	3.168	12.62	25.24	4.35
50	1495.0	.836	3.345	6.689	1.15	15	383.1	3.277	13.05	26.11	4.50
4	1432.7	.873	3.490	6.980	1.20	30	370.8	3.387	13.49	26.97	4.65
10	1375.4	.909	3.635	7.271	1.25	16	359.3	3.496	13.92	27.84	4.80
20	1322.5	.945	3.781	7.561	1.30	30	348.5	3.606	14.35	28.70	4.95
30	1273.6	.982	3.926	7.852	1.35	17	338.3	3.716	14.78	29.56	5.10
40	1228.1	1.018	4.071	8.143	1.40	18	319.6	3.935	15.64	31.29	5.40
50	1185.8	1.055	4.217	8.433	1.45	19	302.9	4.155	16.51	33.01	5.70
5	1146.3	1.091	4.362	8.724	1.50	20	287.9	4.374	17.37	34.73	6.00
10	1109.3	1.127	4.507	9.014	1.55	21	274.4	4.594	18.22	36.44	6.30
20	1074.7	1.164	4.653	9.305	1.60	22	262.0	4.814	19.08	38.16	6.60
30	1042.1	1.200	4.798	9.596	1.65	23	250.8	5.035	19.94	39.87	6.90
40	1011.5	1.237	4.943	9.886	1.70	24	240.5	5.255	20.79	41.58	7.20
50	982.6	1.273	5.088	10.18	1.75	25	231.0	5.476	21.64	43.28	7.50
6	955.4	1.309	5.234	10.47	1.80	26	222.3	5.697	22.50	44.99	7.80
10	929.6	1.346	5.379	10.76	1.85	27	214.2	5.918	23.35	46.69	8.10
20	905.1	1.382	5.524	11.05	1.90	28	206.7	6.136	24.19	48.38	8.40
30	881.9	1.418	5.669	11.34	1.95	29	199.7	6.360	25.04	50.07	8.70
40	859.9	1.455	5.814	11.63	2.00	30	193.2	6.583	25.88	51.76	9.00

TABLE IV. — Tangents and Externals to a 1° Curve.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10′	58.34	.30	10′	560.11	27.31	10′	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100.01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

TABLE IV. — Tangents and Externals to a 1° Curve.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
31°	1589.0	216.3	**41°**	2142.2	387 4	**51°**	2732.9	618.4
10′	1598.0	218.7	10′	2151.7	390.7	10′	2743.1	622.8
20	1606.9	221.1	20	2161.2	394.1	20	2753.4	627.2
30	1615.9	223.5	30	2170.8	397.4	30	2763.7	631.7
40	1624.9	226.0	40	2180.3	400.8	40	2773.9	636.2
50	1633.9	228.4	50	2189.9	404.2	50	2784.2	640.7
32	1643.0	230.9	**42**	2199.4	407.6	**52**	2794.5	645.2
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	**43**	2257.0	428.5	**53**	2856.7	672.7
10	1706.3	248.7	10	2266.6	432.0	10	2867.1	677.3
20	1715.3	251.3	20	2276 2	435.6	20	2877.5	682.0
30	1724.4	253.9	30	2285.9	439.2	30	2888.0	686.7
40	1733.5	256.5	40	2295.6	442.8	40	2898.4	691.4
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	50	2363.5	468.4	50	2972.1	725.0
35	1806.6	278.1	**45**	2373.3	472.1	**55**	2982.7	729.9
10	1815.7	280.8	10	2383.1	475.8	10	2993.3	734.8
20	1824.9	283.6	20	2392.8	479.6	20	3003.9	739.7
30	1834.1	286.4	30	2402.6	483.4	30	3014.5	744.6
40	1843.3	289.2	40	2412.4	487.2	40	3025.2	749.6
50	1852.5	292.0	50	2422.3	491.0	50	3035.8	754.6
36	1861.7	294.9	**46**	2432.1	494.8	**56**	3046.5	759.6
10	1870.9	297.7	10	2441.9	498.7	10	3057.2	764.6
20	1880.1	300.6	20	2451.8	502.5	20	3067.9	769.7
30	1889.4	303.5	30	2461.7	506.4	30	3078.7	774.7
40	1898.6	306.4	40	2471.5	510.3	40	3089.4	779.8
50	1907.9	309.3	50	2481.4	514.3	50	3100.2	784.9
37	1917.1	312.2	**47**	2491.3	518.2	**57**	3110.9	790.1
10	1926.4	315.2	10	2501.2	522.2	10	3121.7	795.2
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	10	2561.0	546.3	10	3186.9	826.7
20	1991.5	336.3	20	2571.0	550.4	20	3197.8	832.0
30	2000.9	339.3	30	2581.0	554.5	30	3208.8	837.3
40	2010.2	342.4	40	2591.0	558.6	40	3219.7	842.7
50	2019.6	345.5	50	2601.1	562.8	50	3230.7	848.1
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	**50**	2671.8	592.3	**60**	3308.0	886.4
10	2094.9	371.0	10	2681.9	596.6	10	3319.1	892.0
20	2104.3	374.2	20	2692.1	600.9	20	3330.3	897.5
30	2113.8	377.5	30	2702.3	605.3	30	3341.4	903.2
40	2123.3	380.8	40	2712.5	609.6	40	3352.6	908.8
50	2132.7	384.1	50	2722.7	614.0	50	3363.8	914.5

TABLE IV. — Tangents and Externals to a 1° Curve.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
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	20	4112.1	1322.9	20	4922.5	1824.1
30	3408.8	937.3	30	4124.8	1330.3	30	4937.0	1833.6
40	3420.1	943.1	40	4137.4	1337.7	40	4951.5	1843.1
50	3431.4	948.9	50	4150.1	1345.1	50	4966.1	1852.6
62	3442.7	954.8	**72**	4162.8	1352.6	**82**	4980.7	1862.2
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	4252.6	1405.7	10	5084.0	1930.4
20	3534.1	1002.3	20	4265.6	1413.5	20	5099.0	1940.3
30	3545.6	1008.3	30	4278.5	1421.2	30	5113.9	1950.3
40	3557.2	1014.4	40	4291.5	1429.0	40	5128.9	1960.2
50	3568.7	1020.5	50	4304.6	1436.8	50	5143.9	1970.3
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	50	4383.3	1484.4	50	5234.9	2031.4
65	3650.2	1063.9	**75**	4396.5	1492.4	**85**	5250.3	2041.7
10	3661.9	1070.2	10	4409.8	1500.5	10	5265.6	2052.1
20	3673.7	1076.6	20	4423.1	1508.6	20	5281.0	2062.5
30	3685.4	1082.9	30	4436.4	1516.7	30	5296 4	2073.0
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	40	4530.4	1574.7	40	5405.6	2147.5
50	3780.4	1134.8	50	4544.0	1583.1	50	5421.4	2158.4
67	3792.4	1141.4	**77**	4557.6	1591.6	**87**	5437.2	2169.2
10	3804.4	1148.0	10	4571.2	1600.1	10	5453.1	2180.2
20	3816.4	1154.7	20	4584.8	1608.6	20	5469.0	2191.1
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	20	4667.4	1660.5	20	5565.4	2258.0
30	3901.2	1202.0	30	4681.3	1669.2	30	5581.6	2269.3
40	3913.4	1208.9	40	4695.2	1678.1	40	5597.8	2280.6
50	3925.6	1215.8	50	4709.2	1686.9	50	5614.2	2292.0
69	3937.9	1222.7	**79**	4723.2	1695.8	**89**	5630.5	2303.5
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	**80**	4807.7	1749.9	**90**	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836.2	1768.2	20	5763.1	2397.0
30	4049.3	1286.5	30	4850.5	1777.4	30	5779.9	2408.9
40	4061.8	1293.6	40	4864.8	1786.7	40	5796.7	2420.9
50	4074.4	1300.9	50	4879.2	1796.0	50	5813.6	2432.9

TABLE IV. — Tangents and Externals to a 1° Curve.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
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	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	**102**	7075.5	3374.9	**112**	8494.6	4516.6
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	**103**	7203.2	3474.4	**113**	8656.6	4651.3
10	6055.4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
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	6162.6	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	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	**105**	7467.0	3682.3	**115**	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
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	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	**107**	7743.2	3902.9	**117**	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
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	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	**109**	8032.7	4137.1	**119**	9727.0	5559.4
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	**110**	8182.8	4259.7	**120**	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

Table V. Corrections for use with table IV,

For Tangents Add

△ ANGLE / CURVE	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
15°	.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.53	.58	.63	.68
20°	.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
25°	.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
30°	.10	.19	.29	.39	.49	.59	.69	.79	.89	.99	1.09	1.20	1.29	1.39
35°	.11	.22	.34	.47	.58	.69	.70	.81	.92	1.04	1.29	1.42	1.54	1.66
40°	.13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
45°	.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
50°	.17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
55°	.19	.38	.57	.76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
60°	.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
65°	.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
70°	.25	.51	.76	1.02	1.28	1.54	1.80	2.06	2.33	2.60	2.88	3.16	3.44	3.72
75°	.27	.56	.83	1.12	1.40	1.69	1.98	2.27	2.57	2.87	3.16	3.47	3.78	4.09
80°	.30	.61	.91	1.22	1.53	1.84	2.15	2.46	2.78	3.10	3.44	3.78	4.12	4.46
85°	.33	.66	1.00	1.33	1.68	2.02	2.36	2.70	3.05	3.40	3.77	4.14	4.55	4.89
90°	.36	.72	1.09	1.45	1.83	2.20	2.57	2.94	3.32	3.70	4.10	4.50	4.91	5.32
95°	.39	.79	1.19	1.55	2.00	2.40	2.80	3.20	3.61	4.02	4.49	4.98	5.38	5.83
100°	.43	.86	1.30	1.74	2.18	2.62	3.06	3.50	3.95	4.40	4.88	5.37	5.85	6 34

For Externals Add

ANGLE / CURVE	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°	.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°	.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	.046	.093	.142	.188	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°	.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.711	.845	922	1.01
70°	.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	.095	.182	.286	.383	.480	.578	.678	.777	.877	977	1.07	1.18	1.29	1.39
80°	.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1 62	1.76	1.91
90°	.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°	.174	.350	.522	.706	.985	1.06	1.25	1.43	1.62	1.80	1 99	2.18	2 38	2.58
100°	.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2 06	2.28	2.50	2.73	2.96

Table VI. Deflections for Sub Chords for Short Radius Curves.

Degree of Curve	Radius 50 / sin. def. ang.	$\frac{\frac{1}{2}\text{ sub chord}}{R}$ = sin of def. angle 12.5 Ft.	15 Ft.	20 Ft.	25 Ft.	Length of arc for 100 ft.
30°	193.18	1° 51′	2° 17′	2° 58′	3° 43′	101.15
32°	181.39	1° 59′	2° 25′	3° 10′	3° 58′	101.33
34°	171.01	2° 06′	2° 33′	3° 21′	4° 12′	101.48
36°	161.80	2° 13′	2° 41′	3° 33′	4° 26′	101.66
38°	153.58	2° 20′	2° 49′	3° 44′	4° 40′	101.85
40°	146.19	2° 27′	2° 57′	3° 55′	4° 54′	102.06
42°	139.52	2° 34′	3° 05′	4° 07′	5° 08′	102.29
44°	133.47	2° 41′	3° 13′	4° 18′	5° 22′	102.53
46°	127.97	2° 48′	3° 21′	4° 29′	5° 36′	102.76
48°	122.92	2° 55′	3° 29′	4° 40′	5° 50′	103.00
50°	118 31	3° 02′	3° 38′	4° 51′	6° 04′	103 24
52°	114.06	3° 09′	3° 46′	5° 02′	6° 17′	103 54
54°	110.11	3° 16′	3° 54′	5° 13′	6° 31′	103.84
56°	106.50	3° 22′	4° 02′	5° 23′	6° 44′	104.14
58°	103.14	3° 29′	4° 10′	5° 34′	6° 57′	104.43
60°	100.00	3° 35′	4° 18′	5° 44′	7° 11′	104.72

CURVE FORMULAS.

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan. \frac{1}{2} I}{\text{Sin. D}}$

$\text{Sin. D} = \frac{50}{R}$

$\text{Sin. D} = \frac{50 \tan. \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin. D}}$

$E = R \text{ ex. sec. } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{\frac{1}{2} I}{D}$

Tan. def. = ½ chord def.

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve, very nearly.

Table IV. contains Tangents and Externals to a 1° curve. Tan. and Ext. to any other radius may be found. nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Ext. opposite the given Central Angle by the given External.

To find. Nat. Tan. and Nat. Ex. Sec. for any angle by Table IV.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.), and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance: Multiply the angle by .01745, and the product by the distance.

Right Angle Triangles.— Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. 10. $10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. 25. $25^2 \div 200 = 3.125$. $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

Natural Sines

DEG.	0′	10′	20′	30′	40′	50′	DEG.	DEG.	0′	10′	20′	30′	40′	50′	DEG.
0	0000	0029	0058	0087	0116	0145	89	40	6428	6450	6472	6494	6517	6539	49
1	0175	0204	0233	0262	0291	0320	88	41	6561	6583	6604	6626	6648	6670	48
2	0349	0378	0407	0436	0465	0494	87	42	6691	6713	6734	6756	6777	6799	47
3	0523	0552	0581	0610	0640	0669	86	43	6820	6841	6862	6884	6905	6926	46
4	0698	0727	0756	0785	0814	0843	85	44	6947	6967	6988	7009	7030	7050	45
5	0872	0901	0929	0958	0987	1016	84	45	7071	7092	7112	7133	7153	7173	44
6	1045	1074	1103	1132	1161	1190	83	46	7193	7214	7234	7254	7274	7294	43
7	1219	1248	1276	1305	1334	1363	82	47	7314	7333	7353	7373	7392	7412	42
8	1392	1421	1449	1478	1507	1536	81	48	7431	7451	7470	7490	7509	7528	41
9	1564	1593	1622	1650	1679	1708	80	49	7547	7566	7585	7604	7623	7642	40
10	1736	1765	1794	1822	1851	1880	79	50	7660	7679	7698	7716	7735	7753	39
11	1908	1937	1965	1994	2022	2051	78	51	7771	7790	7808	7826	7844	7862	38
12	2079	2108	2136	2164	2193	2221	77	52	7880	7898	7916	7934	7951	7969	37
13	2250	2278	2306	2334	2363	2391	76	53	7986	8004	8021	8039	8056	8073	36
14	2419	2447	2476	2504	2532	2560	75	54	8090	8107	8124	8141	8158	8175	35
15	2588	2616	2644	2672	2700	2728	74	55	8192	8208	8225	8241	8258	8274	34
16	2756	2784	2812	2840	2868	2896	73	56	8290	8307	8323	8339	8355	8371	33
17	2924	2952	2979	3007	3035	3062	72	57	8387	8403	8418	8434	8450	8465	32
18	3090	3118	3145	3173	3201	3228	71	58	8480	8496	8511	8526	8542	8557	31
19	3256	3283	3311	3338	3365	3393	70	59	8572	8587	8601	8616	8631	8646	30
20	3420	3448	3475	3502	3529	3557	69	60	8660	8675	8689	8704	8718	8732	29
21	3584	3611	3638	3665	3692	3719	68	61	8746	8760	8774	8788	8802	8816	28
22	3746	3773	3800	3827	3854	3881	67	62	8829	8843	8857	8870	8884	8897	27
23	3907	3934	3961	3987	4014	4041	66	63	8910	8923	8936	8949	8962	8975	26
24	4067	4094	4120	4147	4173	4200	65	64	8988	9001	9013	9026	9038	9051	25
25	4226	4253	4279	4305	4331	4358	64	65	9063	9075	9088	9100	9112	9124	24
26	4384	4410	4436	4462	4488	4514	63	66	9135	9147	9159	9171	9182	9194	23
27	4540	4566	4592	4617	4643	4669	62	67	9205	9216	9228	9239	9250	9261	22
28	4695	4720	4746	4772	4797	4823	61	68	9272	9283	9293	9304	9315	9325	21
29	4848	4874	4899	4924	4950	4975	60	69	9336	9346	9356	9367	9377	9387	20
30	5000	5025	5050	5075	5100	5125	59	70	9397	9407	9417	9426	9436	9446	19
31	5150	5175	5200	5225	5250	5275	58	71	9455	9465	9474	9483	9492	9502	18
32	5299	5324	5348	5373	5398	5422	57	72	9511	9520	9528	9537	9546	9555	17
33	5446	5471	5495	5519	5544	5568	56	73	9563	9572	9580	9588	9596	9605	16
34	5592	5616	5640	5664	5688	5712	55	74	9613	9621	9628	9636	9644	9652	15
35	5736	5760	5783	5807	5831	5854	54	75	9659	9667	9674	9681	9689	9696	14
36	5878	5901	5925	5948	5972	5995	53	76	9703	9710	9717	9724	9730	9737	13
37	6018	6041	6065	6088	6111	6134	52	77	9744	9750	9757	9763	9769	9775	12
38	6157	6180	6202	6225	6248	6271	51	78	9781	9787	9793	9799	9805	9811	11
39	6293	6316	6338	6361	6383	6406	50	79	9816	9822	9827	9833	9838	9843	10
DEG.	60′	50′	40′	30′	20′	10′	DEG.	DEG.	60′	50′	40′	30′	20′	10′	DEG.

DEG.	0′	10′	20′	30′	40′	50′	DEG.
80	9848	9853	9858	9863	9868	9872	9
81	9877	9881	9886	9890	9894	9899	8
82	9903	9907	9911	9914	9918	9922	7
83	9925	9929	9932	9936	9939	9942	6
84	9945	9948	9951	9954	9957	9959	5
85	9962	9964	9967	9969	9971	9974	4
86	9976	9978	9980	9981	9983	9985	3
87	9986	9988	9989	9990	9992	9993	2
88	9994	9995	9996	9997	9997	9998	1
89	9998	9999	9999	9999	1.0000	1.0000	0
DEG.	60′	50′	40′	30′	20′	10′	DEG.

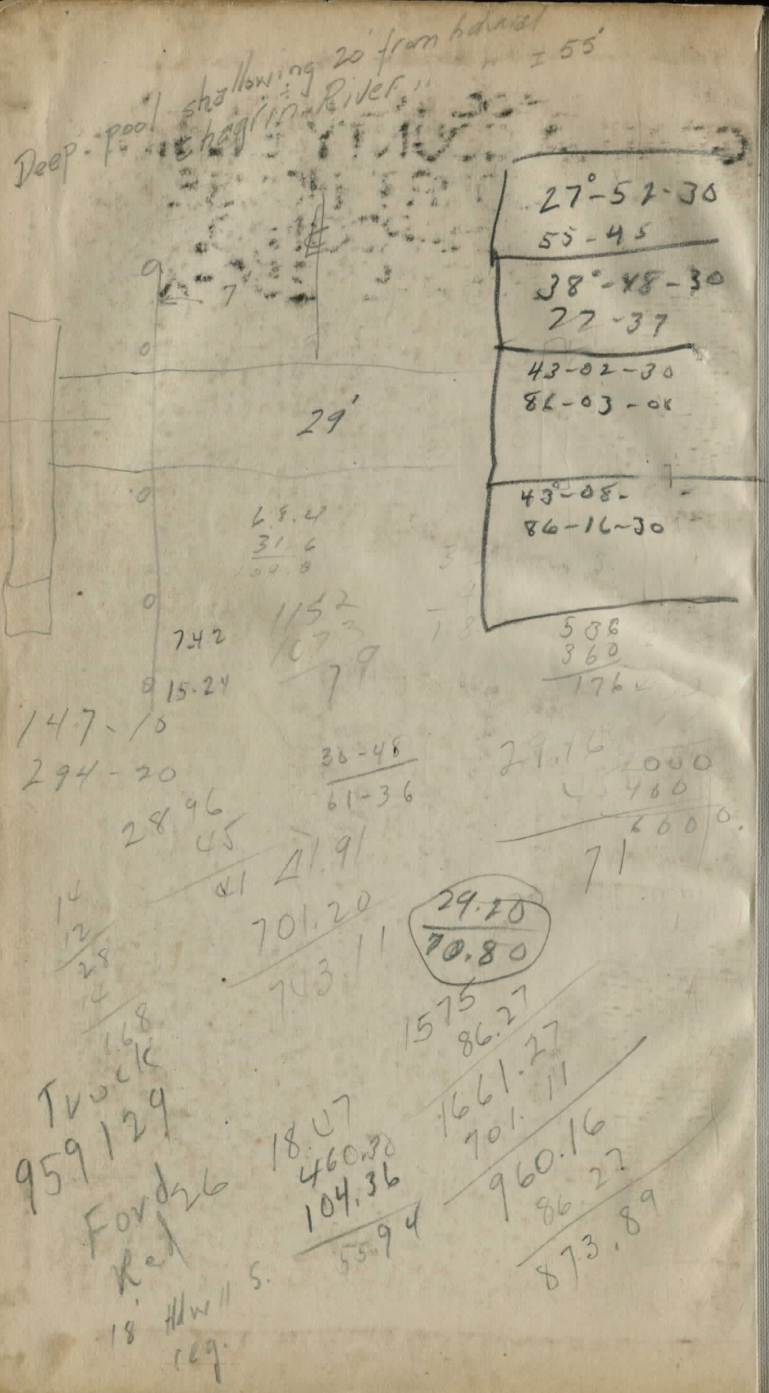
Natural Cosines

Natural Tangents

Deg.	0′	10′	20′	30′	40′	50′	Deg.	Deg.	0′	10′	20′	30′	40′	50′	Deg.
0	0000	0029	0058	0087	0116	0145	89	40	8391	8441	8491	8541	8591	8642	49
1	0175	0204	0233	0262	0291	0320	88	41	8693	8744	8796	8847	8899	8952	48
2	0349	0378	0407	0437	0466	0495	87	42	9004	9057	9110	9163	9217	9271	47
3	0524	0553	0582	0612	0641	0670	86	43	9325	9380	9435	9490	9545	9601	46
4	0699	0729	0758	0787	0816	0846	85	44	9657	9713	9770	9827	9884	9942	45
5	0875	0904	0934	0963	0992	1022	84	45	1.0000	1.0058	1.0117	1.0176	1.0235	1.0295	44
6	1051	1080	1110	1139	1169	1198	83	46	1.0355	1.0416	1.0477	1.0533	1.0599	1.0661	43
7	1228	1257	1287	1317	1346	1376	82	47	1.0724	1.0786	1.0850	1.0913	1.0977	1.1041	42
8	1405	1435	1465	1495	1524	1554	81	48	1.1106	1.1171	1.1237	1.1303	1.1369	1.1436	41
9	1584	1614	1644	1673	1703	1733	80	49	1.1504	1.1571	1.1640	1.1708	1.1778	1.1847	40
10	1763	1793	1823	1853	1883	1914	79	50	1.1918	1 1988	1.2059	1.2131	1.2203	1.2276	39
11	1944	1974	2004	2035	2065	2095	78	51	1.2349	1.2423	1.2497	1.2572	1.2647	1.2723	38
12	2126	2156	2186	2217	2247	2278	77	52	1.2799	1.2876	1.2954	1.3032	1.3111	1.3190	37
13	2309	2339	2370	2401	2432	2462	76	53	1.3270	1.3351	1.3432	1.3514	1.3597	1.3680	36
14	2493	2524	2555	2586	2617	2648	75	54	1.3764	1.3848	1,3934	1.4019	1.4106	1.4193	35
15	2679	2711	2742	2773	2805	2836	74	55	1.4281	1.4370	1.4460	1.4550	1.4641	1.4733	34
16	2867	2899	2931	2962	2994	3026	73	56	1.4826	1.4919	1.5013	1.5108	1.5204	1.5301	33
17	3057	3089	3121	3153	3185	3217	72	57	1.5399	1.5497	1.5597	1.5697	1.5798	1.5900	32
18	3249	3281	3314	3346	3378	3411	71	58	1,6003	1.6107	1.6212	1.6319	1.6426	1.6534	31
19	3443	3476	3508	3541	3574	3607	70	59	1.6643	1 6753	1.6864	1.6977	1.7090	1.7205	30
20	3640	3673	3706	3739	3772	3805	69	60	1.7321	1.7437	1.7556	1.7675	1.7797	1.7917	29
21	3839	3872	3906	3939	3973	4006	68	61	1.8040	1.8165	1.8291	1.8418	1.8546	1.8676	28
22	4040	4074	4108	4142	4176	4210	67	62	1.8807	1.8940	1.9074	1.9210	1.9347	1.9486	27
23	4245	4279	4314	4348	4383	4417	66	63	1.9626	1.9768	1.9912	2.0057	2.0204	2.0353	26
24	4452	4487	4522	4557	4592	4628	65	64	2.0503	2.0655	2.0809	2.0965	2.1123	2.1283	25
25	4663	4699	4734	4770	4806	4841	64	65	2.1445	2.1609	2.1775	2.1943	2.2113	2.2286	24
26	4877	4913	4950	4986	5022	5059	63	66	2.2460	2.2637	2.2817	2.2998	2.3183	2.3369	23
27	5095	5132	5169	5206	5243	5280	62	67	2.3559	2.3750	2.3945	2.4142	2.4342	2.4545	22
28	5317	5354	5392	5430	5467	5505	61	68	2.4751	2.4960	2.5172	2.5386	2.5605	2.5826	21
29	5543	5581	5619	5658	5696	5735	60	69	2.6051	2 6279	2.6511	2.6746	2.6985	2.7228	20
30	5774	5812	5851	5890	5930	5969	59	70	2.7475	2.7725	2.7980	2.8239	2.8502	2.8770	19
31	6009	6048	6088	6128	6168	6208	58	71	2.9042	2.9319	2.9600	2.9887	3.0178	3.0475	18
32	6249	6289	6330	6371	6412	6453	57	72	3,0777	3.1084	3.1397	3.1716	3.2041	3.2371	17
33	6494	6536	6577	6619	6661	6703	56	73	3.2709	3.3052	3.3402	3.3759	3.4124	3.4495	16
34	6745	6787	6830	6873	6916	6959	55	74	3.4874	3.5261	3.5656	3.6059	3.6470	3.6891	15
35	7002	7046	7089	7133	7177	7221	54	75	3.7321	3.7760	3.8208	3.8667	3.9136	3.9617	14
36	7265	7310	7355	7400	7445	7490	53	76	4.0108	4.0611	4.1126	4.1653	4.2193	4.2747	13
37	7536	7581	7627	7673	7720	7766	52	77	4.3315	4.3897	4.4494	4.5107	4.5736	4.6382	12
38	7813	7860	7907	7954	8002	8050	51	78	4.7046	4.7729	4.8430	4.9152	4.9894	5.0658	11
39	8098	8146	8195	8243	8292	8342	50	79	5.1446	5.2257	5,3093	5.3955	5.4845	5.5764	10
Deg.	60′	50′	40′	30	20′	10′	Deg.	Deg.	60′	50′	40′	30′	20′	10′	Deg.

Deg.	0′	10′	20′	30′	40′	50′	Deg.
80	5.6713	5.7694	5.8708	5.9758	6.0844	6.1970	9
81	6.3138	6.4348	6.5606	6.6912	6.8269	6.9682	8
82	7.1154	7.2687	7.4287	7.5958	7.7704	7.9530	7
83	8.1443	8.3450	8.5555	8.7769	9.0098	9.2553	6
84	9.5144	9.7882	10.078	10.385	10.711	11.059	5
85	11.430	11.826	12.250	12.706	13.197	13.727	4
86	14.300	14.924	15.605	16.350	17.169	18.075	3
87	19.081	20.206	21.470	22.903	24.542	26.432	2
88	28.636	31.242	34.368	38.189	42.964	49.104	1
89	57.290	68.750	85.940	114.588	171.885	343.77	0
Deg.	60′	50′	40′	30′	20′	10′	Deg.

Natural Cotangents



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

DISTANCES FROM CENTER OF ROADWAY FOR CROSS SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.
FOR SIDE HILL TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

MADE IN GERMANY.

R.