168

K & E

FIELD BOOK

T 360

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.

Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

KEUFFEL & ESSER CO., N. Y.

For Curve Tables see end of book.

FINDER PLEASE NOTIFY
COUNTY ENGINEER.
COURT HOUSE
CHARDON

No 168

BOOK 168

INDEX

100.00
Ass

F.L -.10	6.50	106.50		
0+50				
1				
+50				
2				
+50			7.25	99.25
3				97.40
4	0.97	101.52	5.95	100.55
5				
6				
7				
8				
9				

Ditch on
clay St. Montville
front farms

N Cut

Ditch	Stk
6.05	1.12
5.60	1.30
6.15	1.73
6.40	2.08
7.15	3.15 ✓
8.1	4.28
10.05	5.95
6.05	1.73
6.9	3.46
7.3	3.98
8.3	5.11
9.55	5.80

Grade

6.50		Cuts
	6.65	5.53
	6.80	5.50
.3%	6.95	5.22
	7.10	5.02
7.25	7.25	4.10
	97.40 9.1	4.82
	(96.45 11.05	5.10
	94.5 7.0	5.27
	94.02 7.5	4.04
	93.82 7.7	3.72
	93.12 8.4	3.29
	91.80 9.72	3.92

to reg. grade

101.52

10

+45 11.05 90.47

101.52
11.05
90.47

99.25
90.47
8 | 8.78
1.09

10.45
2.50
7.95
8.00

Gd
10.05

Gd
91.00
10.12

	Slope	Stakes		Grade
			PARKMAN - FARMINGTON	
52				972.95 ✓ 9.93
51				969.0 13.88
T.P.	9.95	982.88 ✓	0.34	972.93 ✓
50				963.0
T.P.	12.49	973.27 ✓		960.78
T.P.	11.01	971.79 ✓	0.09	960.78 ✓
49				957.0 3.87
T.P.	11.23	960.87 ✓	1.50	949.64 ✓
48				951.0 .14
T.P.	8.21	951.14 ✓	10.45	942.93 ✓
47				946.95 6.43 ✓
46	Note: Stakes set 2' back of slope			
B.M.	5.87	953.38		947.51

OWEN ROAD

				27		9.93 4.68 C 5.25 ✓
13.88 1.88 ✓ C 12.0		37.5	30		13.88 ✓ 3.88 C 10.0	
10.27 0.52 ✓ C 9.75	973.27 63 10.27	30	30	971.79 963 8.79	8.79 7.29 C 1.5 ✓	
4.37 3.87 ✓ F 0.50		19	22		4.87 3.87 ✓ F 1.0	
9.89 .14 F 9.75 ✓		30.0	30		9.89 .14 ✓ F 9.75	
		21.5	25.5		10.43 6.43 F 4.0 ✓	

Spk WW root 22" Mag. 34' Rt. 44+32

	0.24	977.44	11.28	977.20	
3+55				976.2	12.28
3+0				979.5	8.98
2+50				981.0	7.48
2+0				980.6	7.88
1+50				978.6	9.88
T.P.	6.16	988.48	0.56	982.32	
1+0				976.5	6.38
0+50				974.3	8.58
0+27				973.0	
		982.88			

12.28
9.28
C 3.00

9.23
8.98
F 0.25

7.48
5.48
C 2.0

7.88
4.63
C 3.75

9.88
5.38
C 4.50

6.38
0.88
C 5.50

20	21	12.28 4.78 C 7.50
17	23.5	8.98 3.23 C 5.75
16	20	7.48 2.98 C 4.50
19	20.5	7.88 2.88 C 5.0
21.5	24.5	9.88 3.38 C 6.50
22	25	6.38 0.13 C 6.25
25	23.5	8.58 2.08 C 6.5

8+55				961.1	
7+55				960.1	1.68
6+55				961.1	0.68
BM. 5+55	7.74	961.78	10.46	953.99 964.3	954.04 0.15 ✓
T.P. 4+55	0.13	964.45 ✓ 977.44 ✓	13.12	964.32 ✓ 969.7	7.74 ✓

20.5
26
46.5

19.5
18
37.5

4.18
1.68
F 2.50

17.5 16

1.68
1.18
C 0.5

6.68
0.68
F 6.0

24 18.5

3.18
0.68
2.50

5.40
.15 ✓
F 5.25

23 25

6.65
.15 ✓
F 6.5

7.74
3.74
C 4.0 ✓

21.5 19

7.74
5.99
C 1.75 ✓

H.I.
951.14

7.74 961.78 954.04

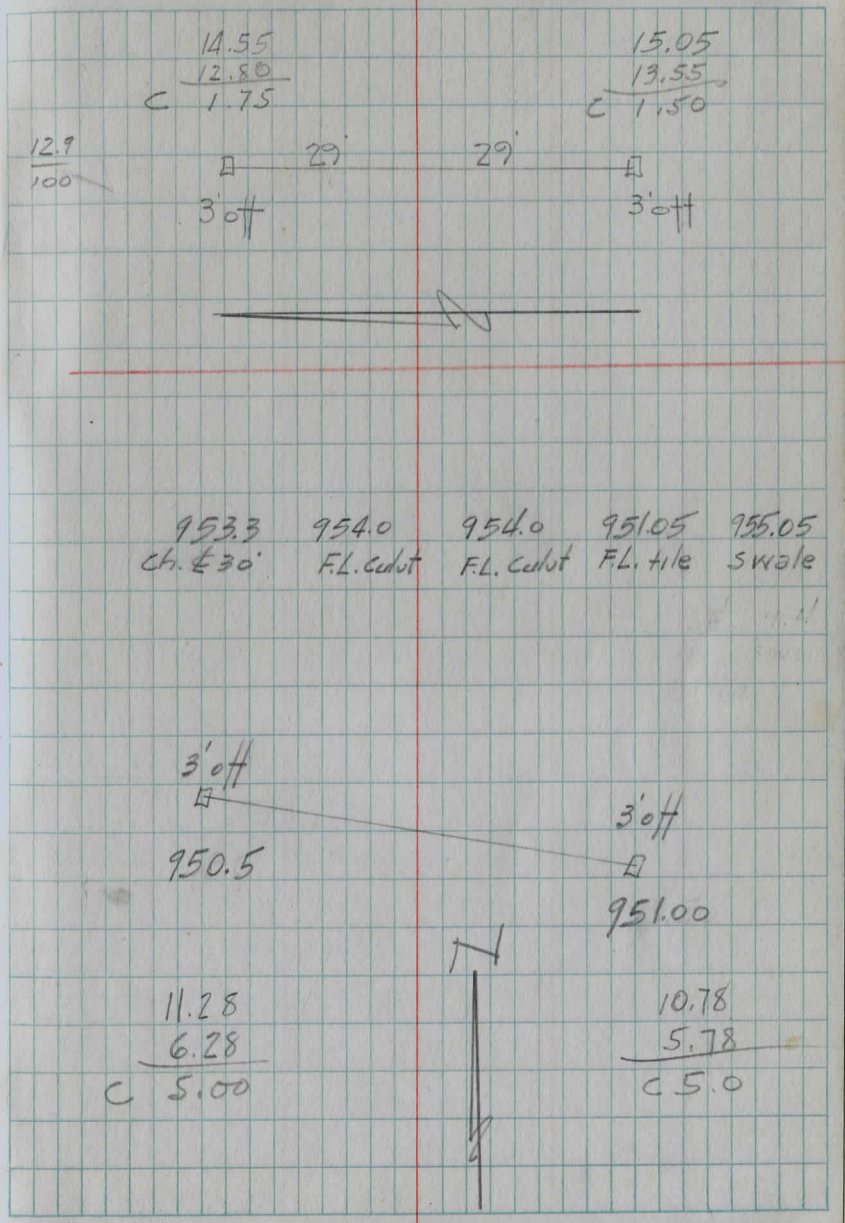
950.00

50'

100' 9.8 Gd

12.05 Gd
10.58
C 1.50

11.72
8.72
C 3.0



T.H.109 HALL ROAD

10-7-13 Hall Thompson

Pon.

spk rd. face 15" Walnut

58.55

27.23

24.30

spk NW side 10" Ash

7+29.18

spk E side 5" maple

Bad spk set (hit solid rock)

H

Sq W, NW root

Bent spk SE root cor maple

I.P. Fd

45.39

99.51

20" Soft wood

0+0

See FB 17 pg 14

60.2

Sq W; N side

18" Elm

3' up

TAYLOR to CTR. ROADS

Δ = 9-34

D = 6°

R = 954.93

P.I = 7+29.18

T = 79.91

P.C = 1+49.27

L = 159.45

P.T. 3+08.72

tan offset 240 = 1.36

240 1.83

170-26 m

340-51-30

10-9-53

Dom-Maynard

Doran-Summers

Note:

see pg 14

for 1973 Refs

79.15 m

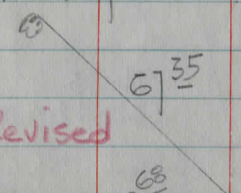
158-39-30

℄ Taylor Wells Rd

90.08

x

Spk SE root 12" Maple

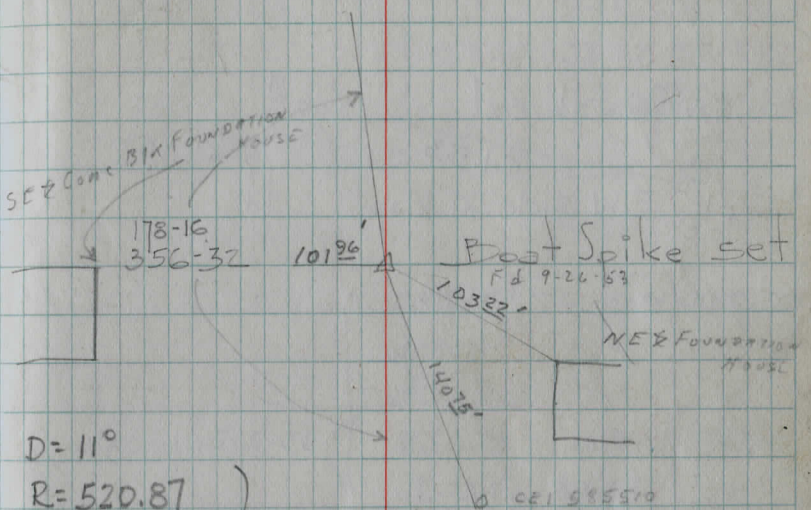


11+09.52 Revised
11+14 03
Spk W; SW
root 24" Beech
Gone

PC 3+24.11		15-21
+50	1-25-30	13-55-30
4+0	4-10-30	11-10-30
+50	6-55-30	8-25-30
5+0	9-40-30	5-40-30
+50	12-25-30	2-55-30
6+03.2	15-21	

4+67.09 Iron set

6.5' Ext.



D = 11°
R = 520.87
PI 4+67.09
T 1 42.98
PC 3+24.11
L 2 79.09
PT 6+03.20
E = 19.27

} Office Revision — sted 5-5-54

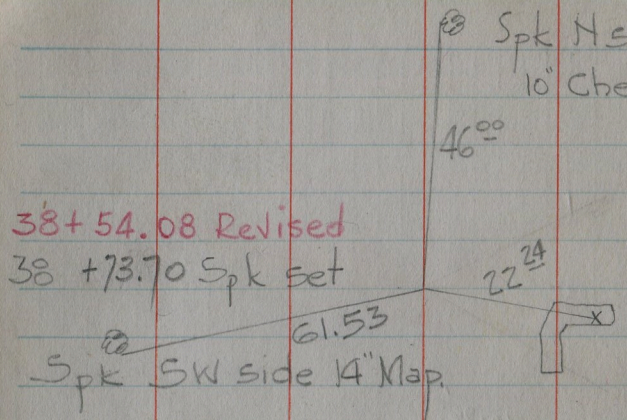
Δ = 30° 42'
D = 32°
R = 179 05
T = 49 15
L = 95 94
E = 6 67

} Field

tang. offset
5+0 = 0.48'

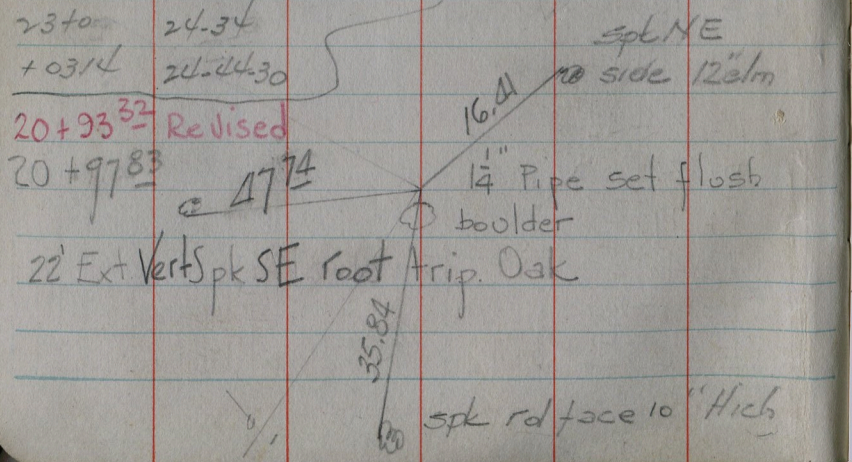
PI 4+67.09
49.15
PC 4+17.94
95.94
PT 5+13.88

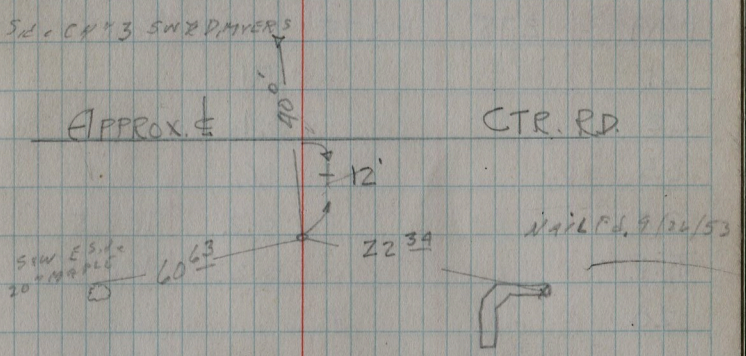
m
149-18
298-36



PC 18+53.29		24-44-30
19+0	2-34	22-10-30
+50	5-19	19-25-30
20+0	8-04	16-40-30
+50	10-49	13-55-30
21+0	13-34	11-10-30
+50	16-19	8-25-30
22+0	19-04	5-40-30
+50	21-49	2-55-30
23+0	24-34	
+03.14	24-44-30	

20+0 4.5 N of tang
22+0 1' N of





OFFICE REVISION

D = 11°
R = 520.87
PI = 20+93.32 E = 52.65
T = 2 40.03
PC = 18+53.29
L = 4 49.85
P.T. = 23+03.14

staked 5-5-54

130-31
261-02

As Field

Δ = 49-29
D = 22°
R = 260.43
T = 120.01
L = 224.92
E = 26.32
P.I = 20+97.83
/ 20.01
PC 19+77.82
224.92
P.T. 22+02.74

BM	2.75	102.75		100.00
21			5.1	
22			3.4	
23			1.6	
24			0.2	102.5
T.P.			0.23	102.52
20				
19				
18				
T.P.	4.42	98.88	8.29	94.46
17				
16				
15				

16+82

R.P. on Beech

7.0
Lt ditch

6.5

7.2
Rt ditch

8.3
ditch

7.7

8.4
ditch

94.35

~~9.0~~ 8.4

9.0
ditch

93.88

5.7

5.0

5.9

6.1

5.1

6.1

4.9

4.3

5.0

up NW'ly

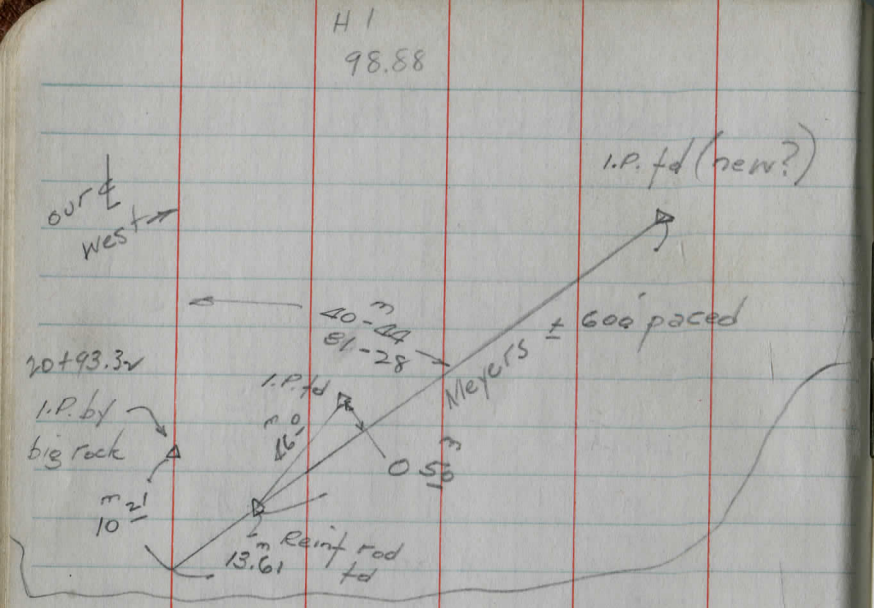
NC

±75°

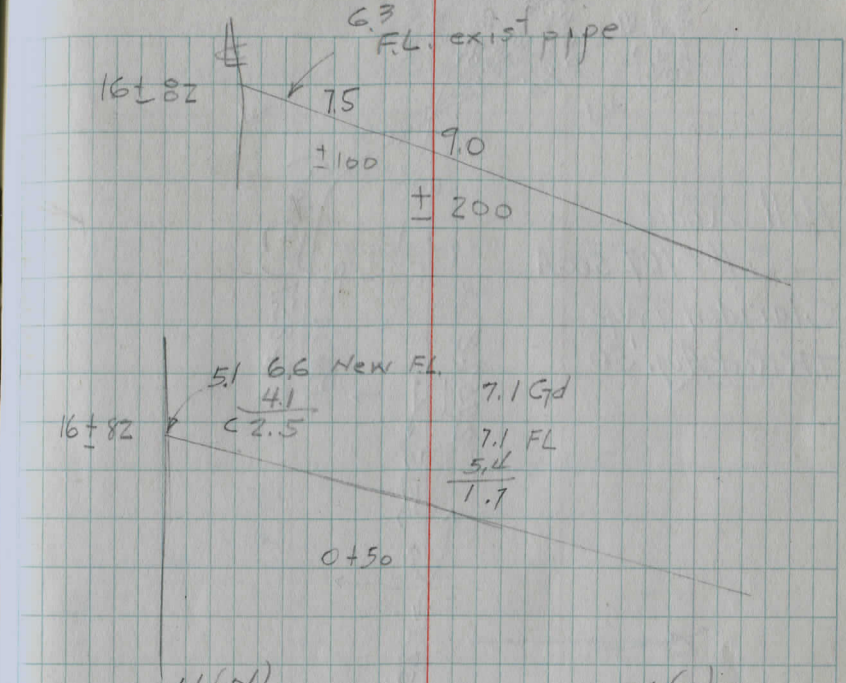
3.8
±140

5.5
45

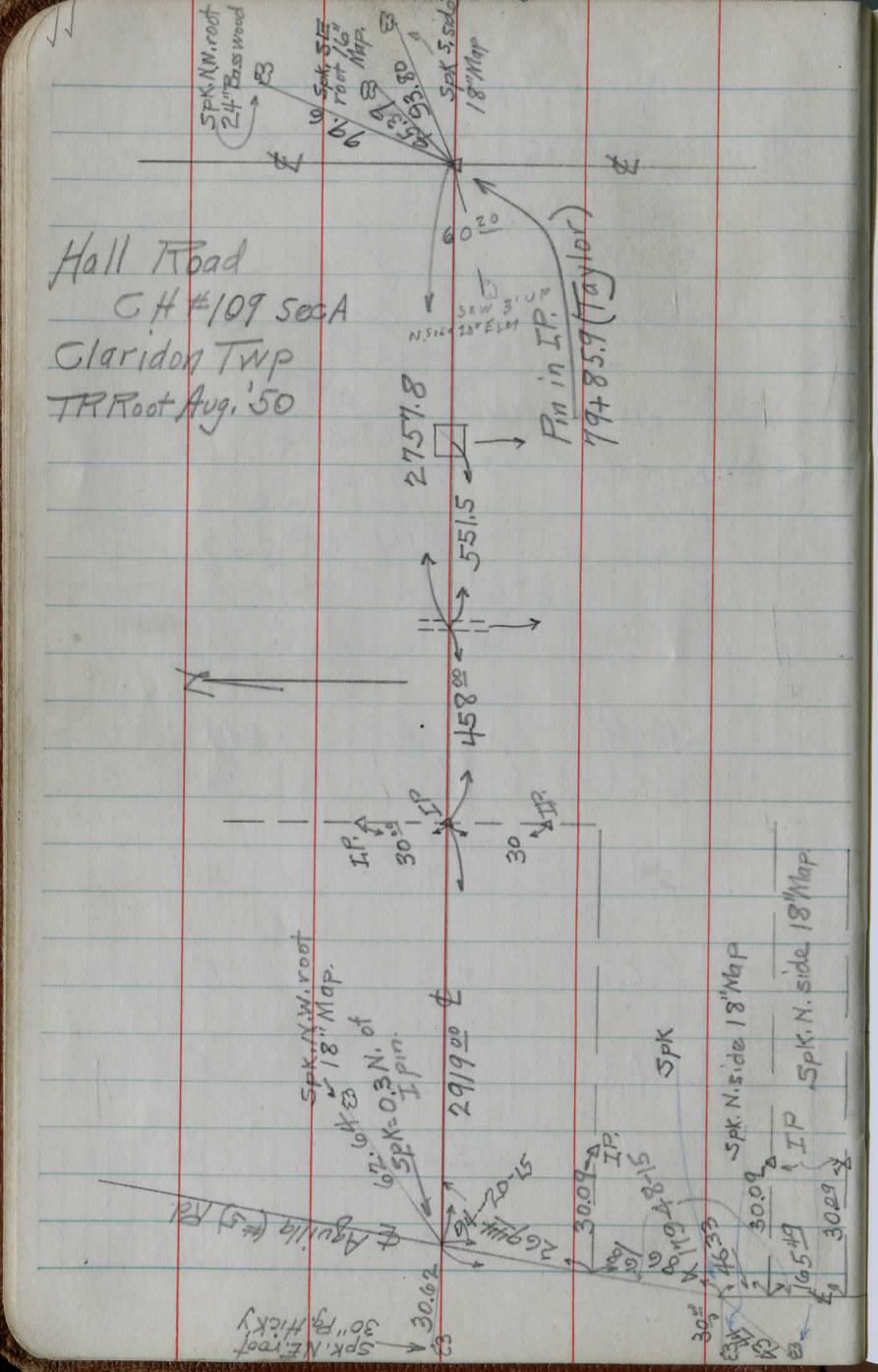
16+50

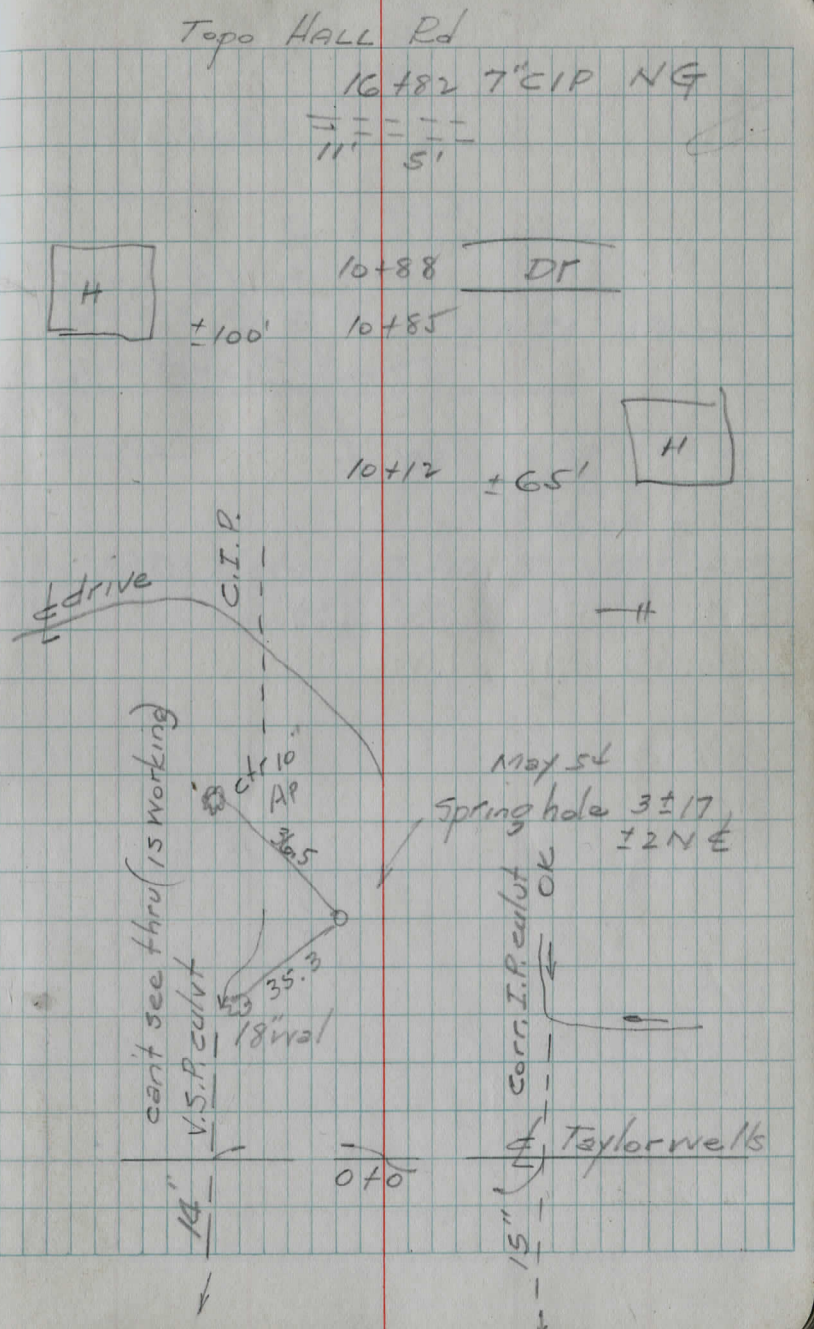


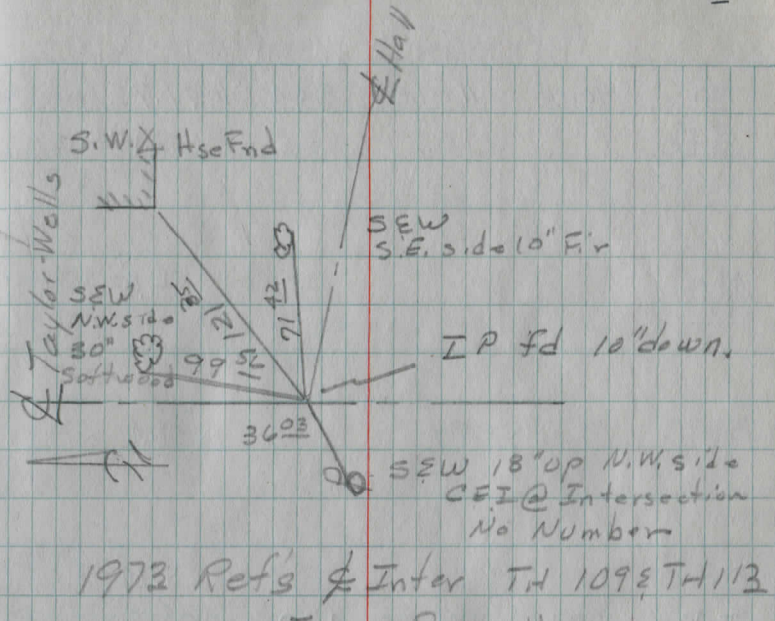
23+0	N ditch	74	
T.P. 24	4.88	107.30	102.52
25			
26			
27			
28			
29			



℄ (N)		℄ (S)
6.2	102.5	5.7
5.4	102.6 4.7	5.4
5.2	4.3	5.1
5.1	4.1	5.0
4.4	3.5	4.2
3.7	2.7	3.5


Hall Road
CH #109 SecA
Claridon Twp
TR Root Aug. '50
Spk. N.W. root 24" Basswood
Spk. S.E. root 16" Map.
Spk. S. side 18" Map
99.0
93.80
60° 20'
S&W 3' UP N.S. 24" ELM
Pin in I.P. 79+85.9 (Taylor)
2757.8
551.5
458.00
I.P.
30.0
29/9.00
Spk. N.W. root 18" Map.
67.1 of Spk = 0.3 N. of I.P.m.
Spk. N. side 18" Map
Spk
Spk. N. side 18" Map
I.P.
30.09
30.09
30.29
30.62
Spk. N.E. root 30" Pk. Hickory


Topo HALL Rd
16+82 7" CIP NG
11'
5'
10+88 DF
10+85
±100'
10+12
±65'
H
H
C.I.P.
℄ drive
can't see thru (15 working)
V.S.P. culvt
18" rcp
CP 10" AP
36.5
35.3
May St
Spring hole 3±17
±2 N ℄
Corr. I.P. culvt OK
℄ Taylorwells
14"
15"
0+0



1973 Refs & Inter TH 109 & TH 113
per James Russell

PARKMAN - THOMPSON ROAD

T.P.	10.13	1107.85	8.64	1097.72	Sob Gd
5+0			2.15		1104.21
4+0			4.63		1101.73
3+78	Culvert		Lt 1098.4		8.0
3+0			5.20		1101.16
T.P.	0.77	1106.36	1.39	1105.59	
Sta. Stk	2+0	Lt (W)			
2+0			4.51	4.41	1102.57
1+0			2.26		1104.72
0+33			.76		1106.22
B.M.	1.42	1106.98		1105.56	

Note: Stakes set 2' back of slope

SECTION D

+ 8.64 3.64 F 1.0 ✓	24 - .21 23.79	28.5 .21 28.71	8.65 2.15 F 6.50 ✓
4.63 2.13 C 2.50 ✓	25 - 2.16 22.84 24.50		
8.0 4.25 C 3.75 ✓			
5.20 4.45 C .75 ✓	23 - 4.12 18.88	16.5 + 4.12 20.62 23.2	5.95 5.20 F .75 ✓
4.41 1.41 C 3.00	29.5 6.08 23.42	15 6.08 21.08	6.41 4.41 F 2.0
2.26 ✓ 2.26 G	27 8.00 18.96	10 8.04 18.04	3.26 2.26 F 1.0 ✓
0.76 .01 ✓ C 0.75	30 - 9.35 20.65	13.5 + 9.35 22.85	3.76 .76 F 3.00
5.47 F.L. Exist 15" C on C	5.22 Gd. 24	6.00 F.L.	6.00 4.50 C 1.50 27' = 3' OFF

BM			4.95	1126.51	(1126.48)
11+0					
10+0					
T.P.	3.85	1131.46	0.42	1127.61	
9+0					
8+0				8.86	1118.17
7+0					1113.87
T.P.	8.88	1128.03 ④		1119.15	
6+30					1110.16
T.P.	7.66	1114.42 ✓ ③		1106.76	
T.P.			0.34	1119.15 ✓	
6+0					1108.57
T.P.	12.73 ②	1119.49 ✓	1.09	1106.76 ✓	
5+50				1.70	1106.15
		① 1107.85 ✓			

5+10 to 5+50 002 255 16

4.5

6.46
4.21
C 2.25 ✓

31.46
1125.00
6.46

16.5
+ 3.5
20.0

25.5
-3.5
22.0

31.46
1126.21
5.25

5.25
4.50
C 0.75 ✓

6.76
3.26
C 3.50 ✓

31.46
1124.70
6.76

20.
+ 3.0
23.0

28
- 3.0
25.0

31.46
1126.32
5.14

5.14
3.64
C 1.50 ✓

4.91
0.41
C 4.50 ✓

1123.12
4.91

19
+ 7.5
26.5

32
- 7.5
24.5

28.03
1123.88
4.15

4.15
1.15
C 3.0 ✓

8.87
2.12
C 6.75 ✓

23.5
5.67
29.17

29.5
5.67
23.83

cut

8.86
6.11
F 2.75

14.16
6.41
C 7.75 ④ ✓

27
3.71
30.71

23
3.71
19.29

1.55
0.55
HI ③ F 1.0 ✓

9.33
0.58 HI ②
C 8.75 ✓

29.5
2.34
33 to 31.84

31.5
2.34
29.16

11.26
14.26
HI ③ F 7.00 ✓

10.92 HI ③
4.67
C 6.25 ✓

25.5
+ 1.75
27.25

31.5
- 1.75
29.75

HI ① + 0.72
5.78
F 6.50 ✓

2.70
1.70
F 1.0 ✓

23.5
+ .77
24.27

22.5
.77
21.73

25.70

RESETING SLOPES

6+0	15.95 / 8.57 / 7.38	7.50 / 7.35 / +.26 = ℄		1108.57	
T.P.	10.51	1115.95	1.06	1105.44	6.50 / 6.15 / .35
5+50	+2.1			1106.15	
BM.			3.72		
5+0 ℄	F 3.2				
5+0				1104.21	6.50 / 4.21 / 2.29
T.P.	2.26	1106.50	1.92	1104.24	
4+0			6.16 / 1.73 / 4.43	1101.73	
3+0			6.16 / 1.16 / 5.00	1101.16	
T.P. for Sta 2 only	5.64	1108.29	3.51	1102.65	8.29 / 2.65 / 5.64
2+0				1102.47	
T.P.	2.21	1106.16	7.16	1103.95	
1+0			11.11 / 04.72 / 6.39	1104.72	
BM.	3.81	1111.11		1107.30	

JUNE 1944

W E

1.38 / 0.88 / C 6.50 — 29.2 ℄ — 31.8 ℄

2.10 / .35 / F 1.75 — 26.2 ℄ — 24.3 ℄ — 7.85 / .35 / F 7.50

Spk SE root trip Elm 5+20 Lt

3.29 / 2.29 / F 1.0 — 25.8 ℄ — 30.7 ℄ — 8.79 / 2.29 / F 6.5

4.43 / 1.93 / C 2.50 — 25 ℄ — 27.25 ℄

5.00 / 4.00 / C 1.0 — 21 ℄ — 22.5 ℄ — 5.50 / 5.00 / F 0.5

5.64 / 2.64 / C 3.0 — 25.5 ℄ — 23 ℄

6.89 / 6.39 / F .50 — 20.75 ℄ — 20 ℄ — 7.14 / 6.39 / F 0.75

X SE & SW wing wall

			4.55		
11+0					
10+0					
9+0					
BM.	5.04	1131.74	5.60	1126.70	
T.P.	5.24	1132.30	1.04	1127.06	
8+0				1119.17	28.10 19.17 8.93
7+0				1113.87	
T.P.	12.20 5.79 5.25 C .54	1128.10	0.05	1115.90	
6+30				1110.16	
		1115.95			

W E

6.74 / 4.74 / C 2.0 — 31.74 — 1125.00 — 21.6 — 6.74 E — 24.2 E — 31.74 — 1126.21 — 5.53 — 5.53 / 4.53 / C 1.0

7.04 / 3.54 / C 3.50 — 31.74 — 1124.70 — 25.2 — 7.04 E — 26.3 E — 31.74 — 1126.32 — 5.42 — 5.42 / 4.17 / C 1.25

8.62 / 3.62 / C 5.00 — 31.74 — 1123.12 — 28.4 — 8.62 E — 26.4 E — 31.74 — 1123.88 — 7.86 — 7.86 / 4.61 / C 3.25

Ref Spk W side Elm 9+25

8.93 / 2.18 / C 6.75 — 31 E — 20.8 E — 8.93 / 5.18 / C 3.75

14.23 / 5.98 / C 8.25 — 28.10 / 13.87 / 14.23 — 32.7 E — 21.3 E — 15.95 / 13.87 / 2.08 — 3.33 / 2.08 / F 1.25

17.94 / 9.44 / C 8.50 — 28.10 / 10.16 / 17.94 — 31.8 E — 29.2 E — 15.95 / 10.16 / 5.79 — 12.29 / 5.79 / F 6.50

Levels along S side

T.P	4.15	1131.36		1127.21

Note 0+0 : Emerg Park Thomp Rd

0 − = W

0 + = E

0+0

0-30 X rd culvt

0-100

0-200

0-300

0-400 Summit (by eye)

1+0

2+0

T.P.	2.27	1126.43	7.20	1124.16

3+0

4+0

Swine Ck Rd

1125.7

7.1 E — 5.7 ditch

6.0 FL in — 6.3 FL out

E 4.2 — ditch 5.3

3.4 — 2.4

0.4 — ± 1.5

+0.5 — ?

6.8 — 8.0

1122.6

7.5 — 8.8

21.9

3.1 — 4.5

21.2

4.0 — 5.2

31.36

6.3

25.06

24.4

.66

stk

6.50

7.20

2.70

3.70

1126.43

4+50	Kals drive	
5+00		
6+00		
T.P	0.21	10.56
7+00		
BM.		± 9.25
± 115'	12" tile	

1120.4

6.15	6.02
F.L. out	F.L. in
E	ditch
5.1	6.6
6.7	8.1
0.2	1.9

25.7
20.4
4.4 | 5.3 | 1.2
40
90

	31.01		31.01	
11+83	1124.4		1124.10	
	6.61		6.91	
11+0	ditch			1123.5
11+0			3.44	
10+0	ditch			1123.0
10+0				
T.P.	3.80	1131.01		1127.21

6.61
4.61
C 2.0 ✓

6.91
5.41
C 1.50 ✓

31.01
23.5
7.51

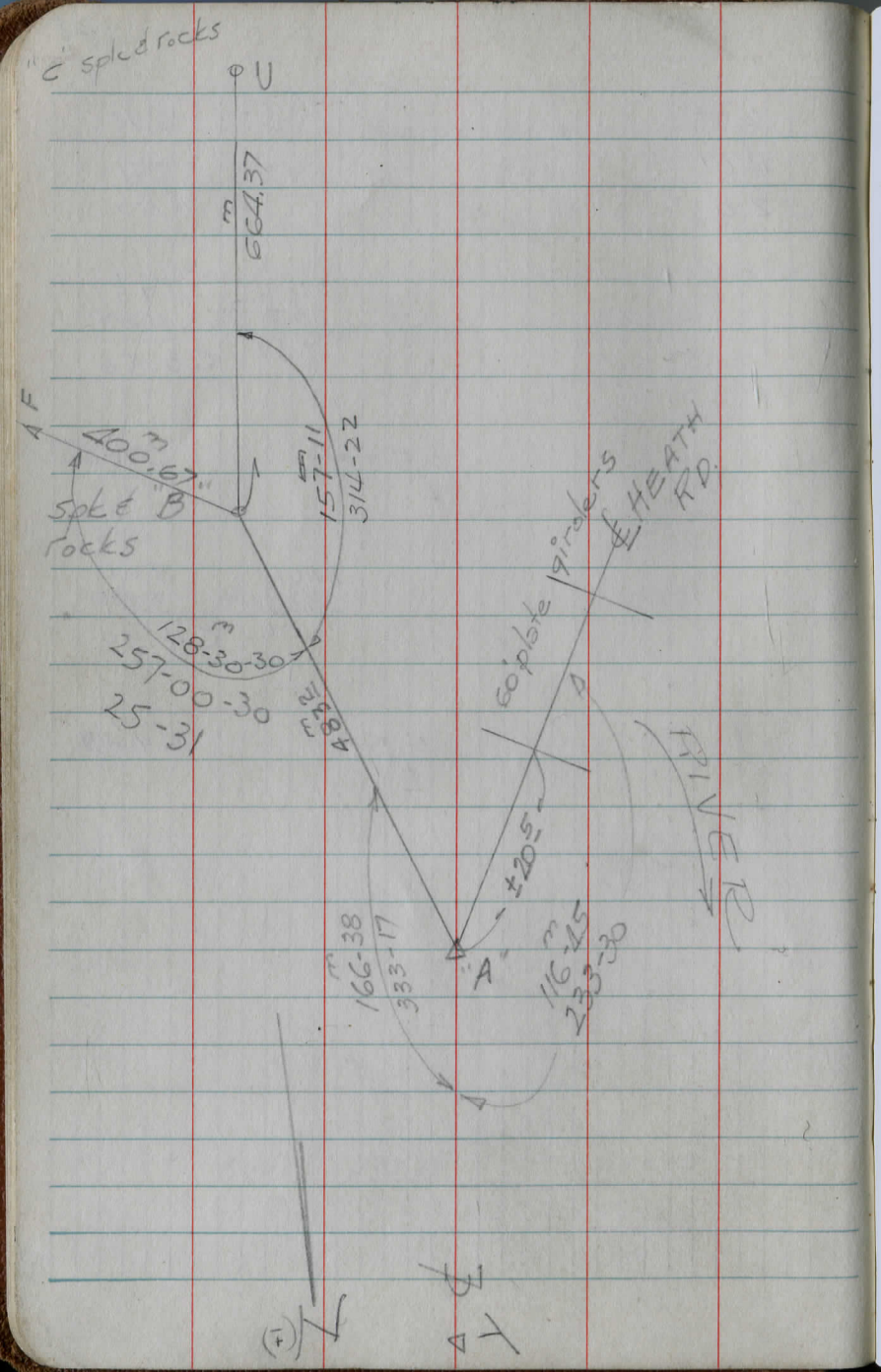
7.51
4.01
C 3.50

3.5 → ℄ C 1'-0"

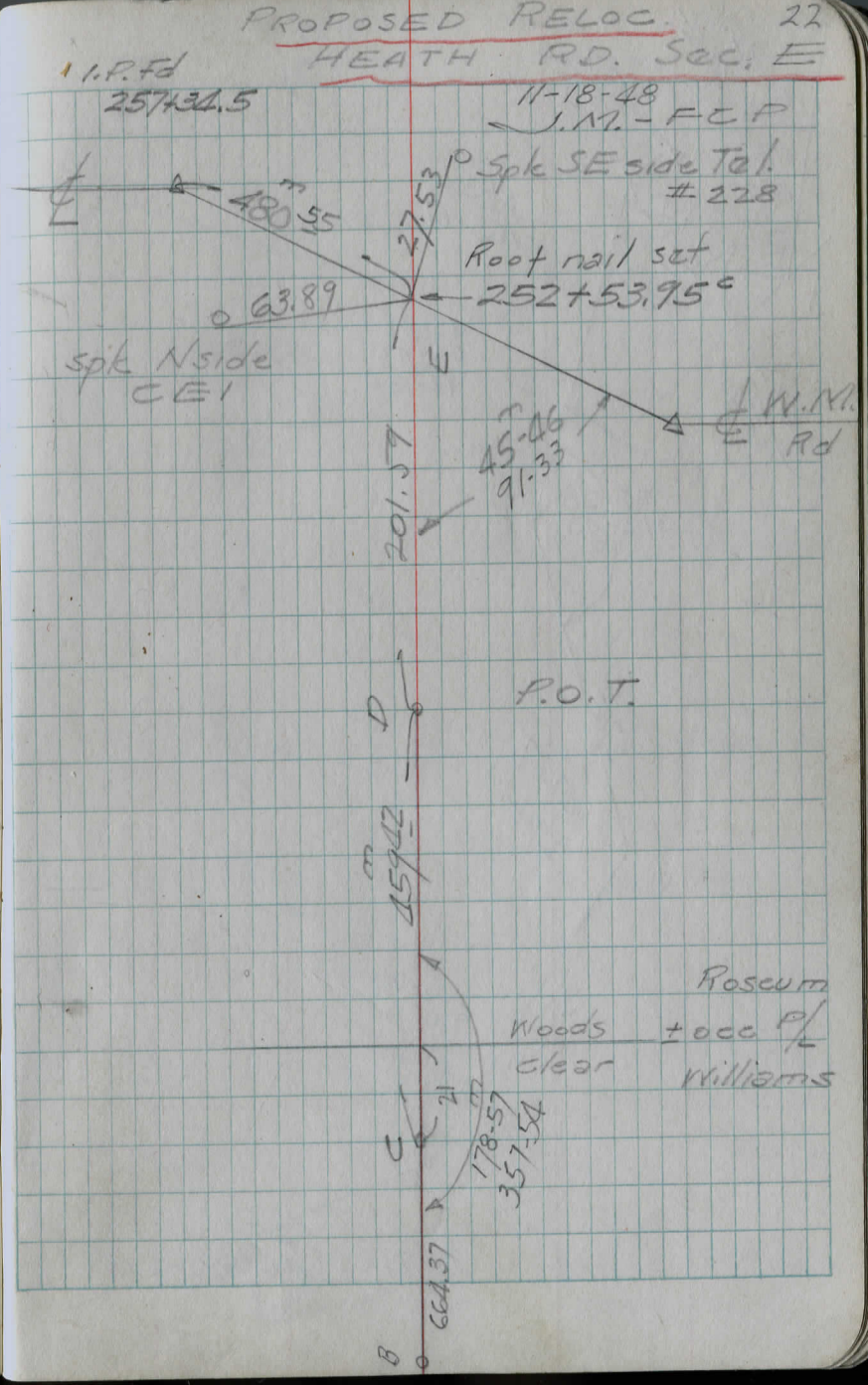
31.01
23.0
8.01

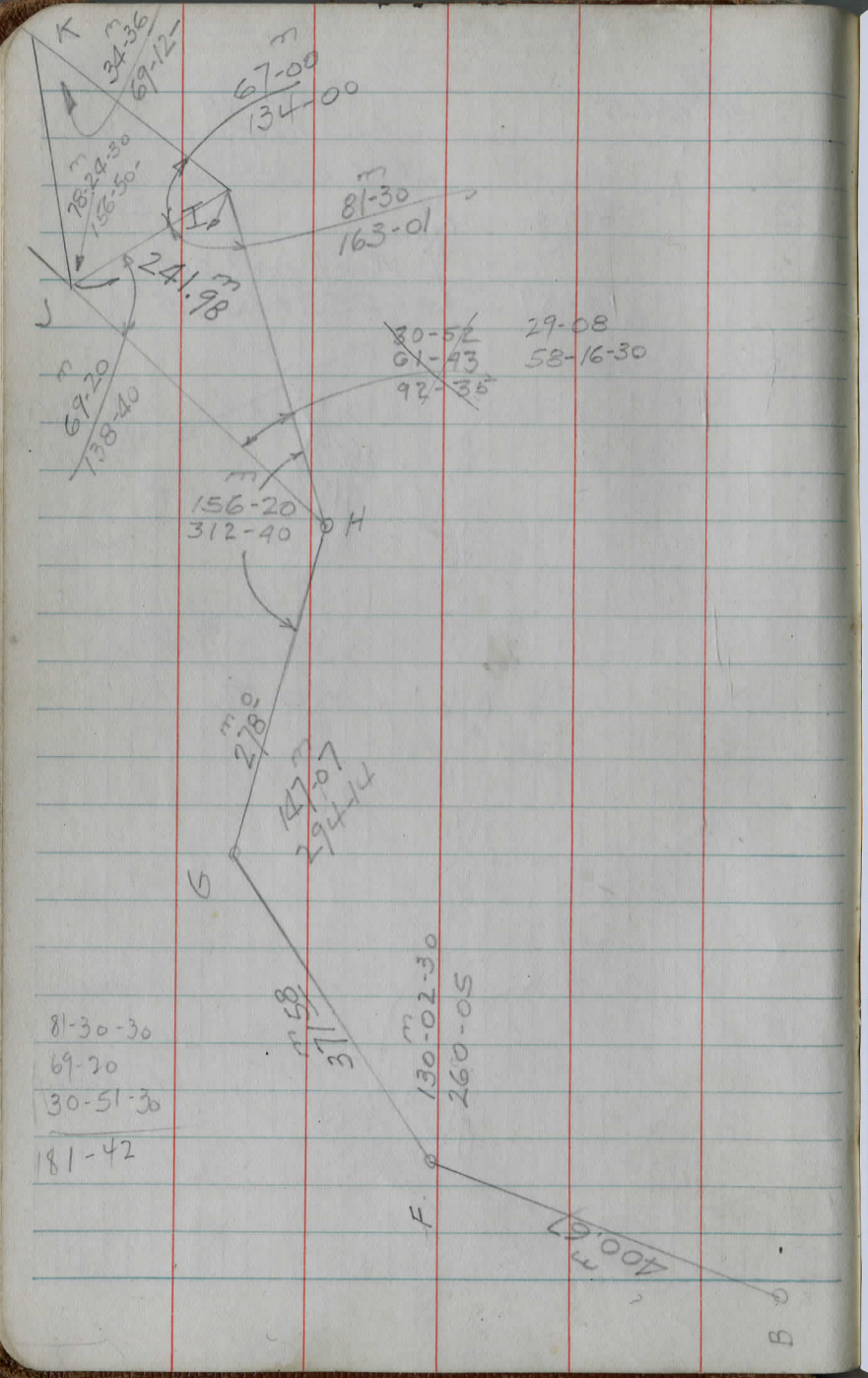
8.01
3.51
C 4.50

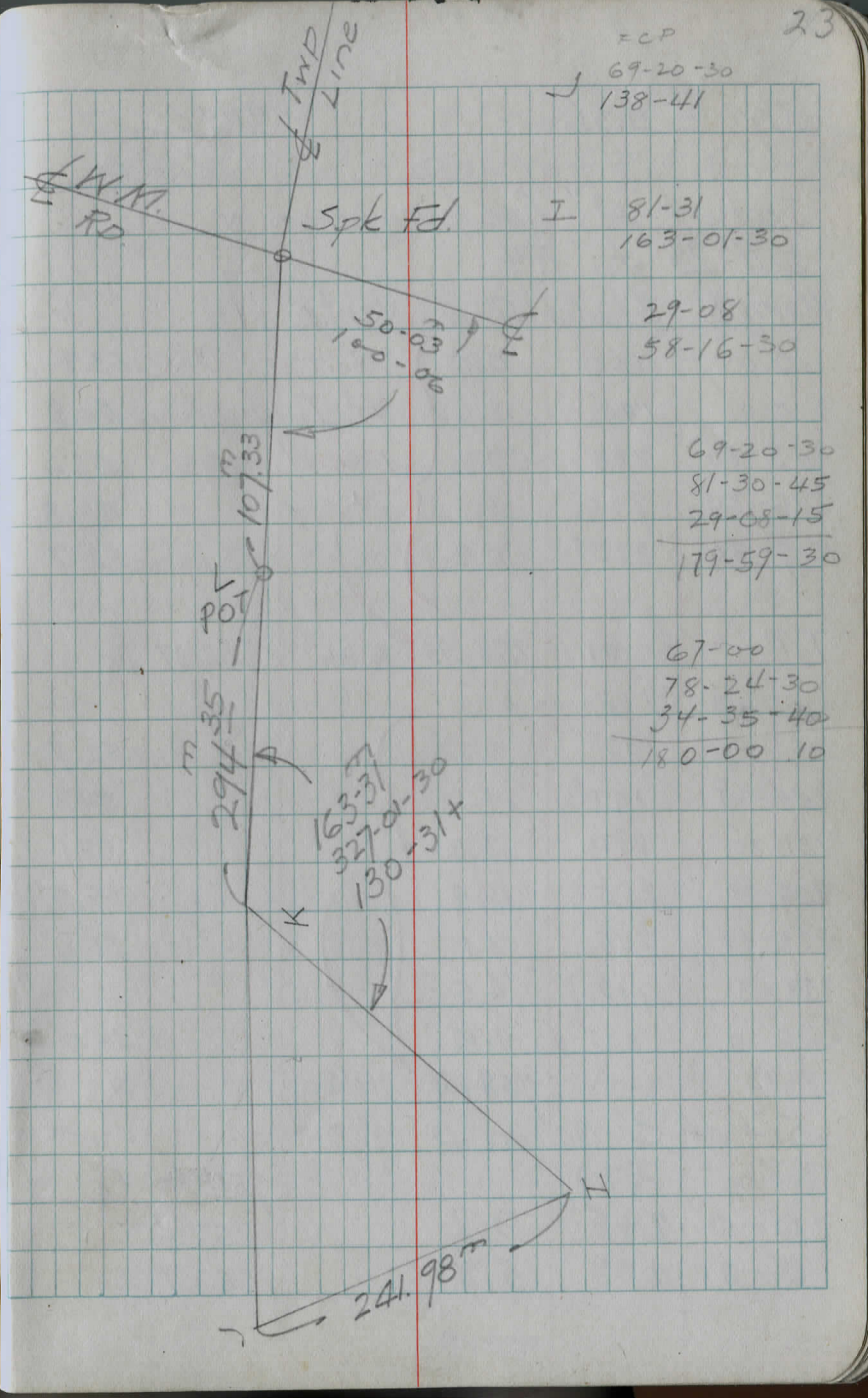
5.5 → ℄ C 1'-3"



PROPOSED RELOC.
HEATH RD. Sec. E




K
34-36
69-12-
67-00
134-00
78-24-30
156-50-
I
81-30
163-01
241.98
J
69-20
138-40
30-51
61-43
92-35
29-08
58-16-30
156-20
312-40
H
278.0
147.07
294-44
G
81-30-30
69-20
30-51-30
181-42
37.58
37.58
130-02-30
260-05
F
400.67
B


E.C.P
69-20-30
138-41
Twp Line
16 W M
R 2
Spk Fd.
I
81-31
163-01-30
150-03
29-08
58-16-30
69-20-30
81-30-45
29-08-15
179-59-30
107.33
P.O.T.
67-00
78-24-30
34-35-40
180-00-10
294.35
163-31
327-01-30
130-31
K
H
J
241.98

	+	H.I.	−		
B.M.	9.31			949.62	
Set at "A" back sight on "y" all Ls to Rt					
Horiz L	Stadia	Rod	Vert. L		
0.0	0.0	5.0	NOTE: USE		53.9
0.0	190'	8.6	HI below		50.3
A3-30	235'	7.7	readings		51.2
96-20	260'	5.1			53.8
175-30	223'	6.2			52.7
TP	6.81	958.93	6.86	952.07	
Set on "B" bs. on "A"					
43-40	193'	6.2			52.7
144-05	107'	4.1			54.8
181-30	250	3.8			55.1
203-00	255	3.4			55.5
235-45	255	3.1			55.8
279-15	119	6.5			52.4
0-0	0.0	4.95			54.0
T.P.		958.88	4.48		
Set at "C" B.S. on "B"					
TP.	8.79			954.40	
0-0	295'	9.8		53.4	
0-0	208	5.3		57.9	
		963.19			

same

Semi Vert spk W side 18" Elm Edge W side Rd ± 6.5' Not R.R. Girder.

"A"

Gradual down to North

± level 100' E then up 15' steep

± " 150' NE; 300' E, brush & trees to East

E creek bank ± 60' SW

± level - brush - trees to E.

" " " " "

" " " " "

Flat ±

E. bank creek ± 35' W

" " " " 75' "

"B"

Hub W side mown strip

Note! All elev. 1=high in relation to Wilson Mills B.M.

+	H I	−	E
Horiz L	Stadia	Rod	Vert L	
0-0	00	5.2		58.0
20-0	232	4.9		58.3
109-00	58'	2.8		60.4
		12.5		50.7
87-40	109 C 110'	5.0	+7-15	72.1 C
161-10	62'	1.7		61.5
161-10	73'	9.4		53.8
161-10	104	9.55		53.7
139-50	260	7.3		55.9
127-00	330 N	5.0	+3-35	78.8 C
204-40	210	10.0	−0-50	50.1 C
213-30	170	9.1		54.1
276-50	50	5.5		57.7
276-50	65	10.1		53.1
276-50	118	10.2		53.0
273-25	190	5.0	−2-45	49.1 C
307-30	165	10.7		52.5
T.P.	10.71	963.19	7.96	955.23
SET ON II, BS. ON C				
0-0	192	9.6		56.3
10-50	68'	8.8		57.1
0-0	80'	14.2		51.7
75-40	70'	7.8		58.1
114-30	193	6.6		59.3
156-20	126	12.4		~~63.5~~ 53.5
		965.94		

459.44 25

COLD HANDS

BRUSH EAST 15

TOP BANK OLD CREEK CHANNEL ℄ 20' SE 16

" " ℄ 17

MOST WLY PT PLATEAU IN WOODS ON N BANK O.C. CHANNEL 40' N OF ℄ 18

N BANK OLD CREEK " NE & SE ℄ 40' S 19

20

S BANK OL CHAN ± LEVEL NE-E-S-SW 21

SW " " " ℄ 20 E & 2' lower 22

MOST SLY END PLATEAU 23

N EDGE OLD CH & MINNEIL CREEK CONFLUENCE 24

℄ M.W. CR IS 20' SW ± level NE 25

26

27

NE BANK CREEK, CREEK BENDS W 28

CONFLUENCE CREEK & RIVER ± 25' SW ± 2' lower 29

E BANK RIVER ℄ 45 W 30

31

N BANK CREEK ℄ 30' W 32

" " " ℄ 12 S 33

" EDGE " ℄ 6' SW 34

N BANK " ANGLE 20' SW 35

" " " ℄ 40' S.E. 36

℄ CREEK MOST SLY PT 37

Horiz'L	+ Stadia	HI Rod	− Vert'L	
0-0		6.0		59.9
339-20	91'	6.7		59.2
298-40	150	8.2		57.7
114-30	17'	4.6		61.3
TP	6.45	965.94	2.40	963.54
Set at E bson "E"				
31-50	79'	5.3		64.7
71-0	175'	8.0		62.0
132-15	252	2.1		67.9
0-0	0.0	5.4		964.6
0-0	40'	4.3		65.7
		5.95		974.04
T.P	11 59	969.99	2.60	967.39
"	11 51	978.97	0.0	978.97
"	10 96	990.48	0.0	990.48
"	8 75	1001.44	0.0	1001.44
	"	1010.19	3 18	1007.01
"	8 90	1017.39	1 70	1008.49
BM set			4.96	1012.43
T.P.	4.50	958.90		954.40
T.P.	6 04	962.19	2.15	956.45

Note: Use HI above readings from here on →

S Brnch Creek

" " "

15' W to Swamp Hole ± 4' lower

S Brnch Creek Angles S

Mast S Creek Brnch

S Creek Brnch & 18' NW

Museum Drive N edge pavement

963.6 (Plan)

Top Backslope Ditch

BM. BTC. Pole 22.8 Spk SE. side

E End Museum Drive Pipe

1' Error See pg 31

BM. Spk W side 10" Apple = SM #35

W. Mill Surv. 28' Lt Sta 261+40

Bent spk SW side 10" Locust 25' N of

E. Wilson Mills Sta 265+10

Hub W side open space

2" dead stub ±40 into brush

Note: All elev. 1.0 high

	+	962.49	−	
Set "F"	6.5 on B			
Horiz L	Stadia	Rod	Vert L	
0-0	227	8.6		53.9
30-20	154	8.0		54.5
87-0	73'	6.4		56.1
0-0	0	4.8		57.7
160-0	56	3.2		59.3
160-0	84'	3.6		58.9
231-0	18	3.0		59.5
" "	123	1.7		60.8
277-50	43'	2.3		60.2
284-0	42'	4.3		58.2
336-30	93'	6.6		55.9
323-10	92'	3.9		58.6
292-40	84	1.9		60.6
" "	181'	5.0	0-45	59.9
BM	11 02	973.23	0.35	962.11 BM.
TP.	11 40	984.63	0-0	973.23
T.P.	8 31	992.23	0-71	983.92
Set at G 6.5 on F				
0-0	92'	11.42		80.8
62-0	97	0.6		91.6
111-13	153 151	5.0	9°-0'	1011.2
0-0	0-0	4.9		87.3
210-10	88'	1.0		91.2
250°-00	272	5.7		86.5
290-10	220	12.5		79.7

W. EDGE SWAMP

SWAMP ALL AROUND

" " "

N. END RIDGE INTO SWAMP

DRY EXTENDS 60' N; SWAMP E & W

SWAMP EXT ± 200' EAST

RIDGE SLY

S. EDGE SWAMP UPGRAD TO S.

EDGE RIDGE

SWAMP

S. EDGE SWAMP, E. & SE & W

± level on out to open field on this line

± " S ± 70'

30' SE 1' HIGHER THEN UP STEEP ± level S.W. - W. - NW

N.E. Root 12" MAPLE ± on line F-G EDGE SWAMP

BREAK IN GRADE

Slight Ridge Lower E & W

Ridge

Up Steeper S

DOWN GRAD FOR 170' TO S.W. Then down STEEP

DOWN STEEP TO NW.

Horiz	+ Stad	992.23 Rod	− Vert	
T P	11 08	1002.75	0.56	991.67
	6 61	1009.36	0.0	1002.75
Set at H 65 6				
40-15	162	5.0	+2-40	1011.9
74-30	214	5.0	+3-40	1018.0
116-50	96	6.2		03.2
0-0	0-0	4.9		04.5
319-0	40	5.2		04.2
245-25	88	5.0	-7-30	992.9
245-25	153	5.0	-5-20	990.1
236-57	97	5.0	-8-10	990.6
T.P.	0.07	998.60	10 83	998.53
"	0.97	988.67	10 90	987.70
"	0.89	977.96	11 60	977.07
"	5.63	974.11	948	968.48
"	3 39	971.25	6 25	967.86
Set on I 85 on J				
92-15	70	6.0		65.2
" "	96	11.3		60.0
" "	122	7.4		63.8
" "	189	8.1		63.1
			0.76	970.49 BM
128-30	232	7.6		63.6
128-0	180	7.5		63.7
"	96	9.3		62.0

Spk NW root 30" Map ± 40 NE of H

Top N. side ridge

25' NW of S. side ridge same Elev. 300' N.E. = 7' higher

Steep S. to Creek Valley

Slope to N & W from ridge top

Toe steep slope

20' S.E. & Down steep; 70' S.W. Down steep

I.P. Williams' S.E. X?

Hub on line I-J 60' E of I

N Bank Creek

℄ Creek Bends S.

S Bank

Up Steep S

Spk N 8.4c 12" W. Cherry S. Side Creek

Gorge from S.E., S Bank Creek & 10' N, Up Steep S, Creek Bends W

N. Bank

Hi Water Mk S mdt

	+ ST	971.25 ROD	− VERT	
198-00	80'	9.4		61.8
"	205	8.8		62.4
236-20	250	10.6		60.6
264-0	310	2.2		69.0
"	150	4.6		66.6
0-0	00	5.2		66.0
Set at J 6.5 on I				
T.P.	7.22	975.08		967.86
0-0	0.0	5.0		70.1
85-30	217	6.1	+1-05	69.0
123-00	200	5.0	+1-05	73.9
183-20	145	2.5		72.6
238-00	264	8.9		66.2
238	300'	12.0	−0-20	61.3
276-10	150	9.6		65.5
" "	193	9.5		65.6
" "	259	7.9		67.2
261-40	230	6.4		68.7
303-00	285	10.2		64.9
303	187			
BM	10.87	981.36		970.49
T.P.	10.14	990.66	0.81	980.52
T.P.	7.06	997.72	0.0	990.66
T.P	9.90	1007.62	0.0	997.72
T.P.	9.07	1015.60	1.09	1006.53

1st Flood Channel — Flood Area

± level NW - Woods & Brook to W.

70' NW = S. End Ridge

Toe S. Side Ridge

30' W = 5' lower ± level NE-E-SE.

Quit 11-27-48

Hub on line I-J ±60' E of I

Up Steep N. & Woods

Edge Woods, level 100' N then up STEEP

level N & E

N. Bank Creek

" Up Steep & High S Edge Creek

N. Bank S/S Head S. in Creek & 10' S

S. "

Up Steep S.

" " S.E. promontory & Cr 20' N

" " S.

Ck bends S/slightly W.

Spk N side Wch

Hub W side garden

	+	1015.60	−		
Horiz L	Stad	Rod	Vert L		
Set at K 6 s on I					
0-0	0.0	4.8		10.8	
124-00	41'	1.6		14.0	
" "	196	5.0	+4-10	20.8	
168-00	223	5.0	+1-00	14.5	
" "	106	0.8		14.8	
205-00	167	8.4		07.2	
235-30	122	10.8		04.8	
270-00	92	11.5		04.1	
282-00	170	5.0	-3-30	1000.2	
320-35	205	5.0	-3-15	999.0	
318-00	102	5.0	-5-00	01.7	
275-15	58	10.9		04.7	
T.P.	8.26	1014.79		1006.53	
T.P.	0.75	1013.47	2.07	1012.72	
Set at L 6 s on K					
0-0	0.0	4.2		09.3	
146-40	67'	1.9		11.6	
255-00	38'	3.3		10.2	
302-10	78'	5.1		08.4	
316-00	160	7.7		05.8	
328-30	164	10.	-3-50	992.5	
17-00	56	10.	-5-30	998.1	
117-00	75	10.6		1002.9	
T.P.	5.73	1018.45		1012.72	
BM			5-05	1013.40	1012.43
0-0	0.0	5.3		13.1	

all south ℄ creek is wooded to top ℄ hill Gulley is wooded to road

Down steep N

" " N, ± level S E.

25' N = Steep drop to Ck, Down E-S-W

N. Bank Gulley, 20' S E = Most W'ly Shed, N Bank bears S 60°

Garden slopes W.

N. Bank Gulley

" " "

" " "

" " "

12' N = Steep drop to Ck Valley, 50' W = 6' Corner & Point Gulley & Ck Valley

Down Steep N. Flat S.

W. Edge Garden

Lot Stub

S Bank Gulley

" " "

" " "

" " "

" " " Down Projects into Gulley

℄ Gulley - Bottom 25' wide

℄ " " 60' "

℄ " " 30' "

12-2-48

CHECK LEVELS

	+		−		
B.M.	0.65	1007.66		1007.01	
	1.07	997.95	10.78	996.88	
	1.52	988.41	11.06	986.89	
	0.86	978.15	11.12	977.29	
			11.85	966.30	

MAY 4TH '34 Hambden Cem SEE FILE

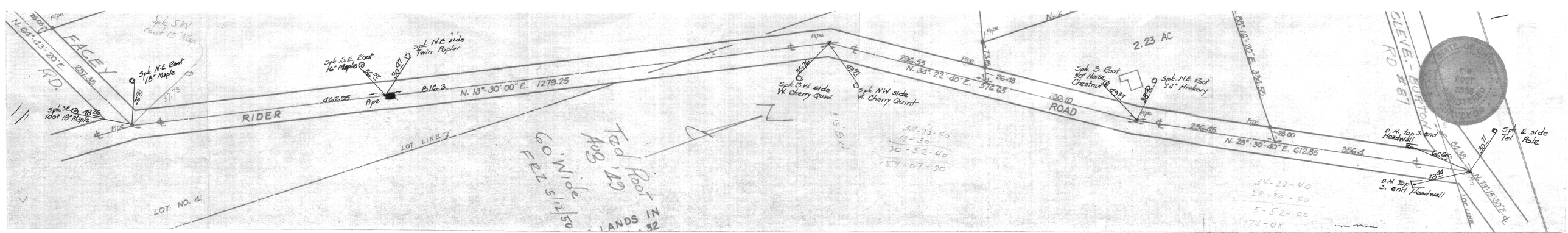
Set on spk 8' front of vault				Lot No
123-45 Lt		94.23'		137
136-55 "		91.7'		136
174-28 "		115.6'	SW	133
137-01 "		144.6'		~~106~~ 109
162-58 "		160.13'		~~109~~ 106
136-54 " (273.47		228.35'		61
20-11 Lt		48.33'	NW	J. Ransom
1-13 Rt		64.44'	" "	Brown
75-37 "		142.8'	" "	Murry 211
135-50 "		84.59	SW "	138
Set on #61	BS on Spk	8' W of	vault	
89-23 Rt		70.45		58
133-45 Rt		43.5		56
194-22 "		31.35		57

Spk W side Apple

E end Roseum drive pipe

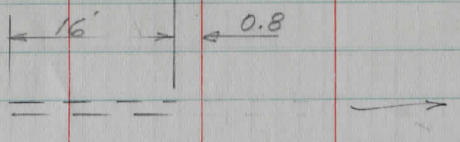
BS on spk NEly in hedge 93.48'

to ctr of clay should be 0.45 S


FACEY RD.
RIDER
ROAD
CLEVE.-EDGERTON RD.
LOT LINE
LOT NO. 41
Spk. SW root 15" Map
Spk. N.E. Root 18" Maple
Spk. S.E. Root 16" Maple
Spk. N.E. side Twin Poplar
Spk. SE root 18" Maple
Pipe
N. 64°-43'-20" E. 237.35
162.95
816.3
N. 13°-30'-00" E. 1279.25
Spk. S.W. side W. Cherry Quad
Spk. N.W. side W. Cherry Quint
296.55
N. 34°-22'-40" E. 316.25
2.23 AC
Spk. S. Root 30" Horse Chestnut
Spk. N.E. Root 24" Hickory
280.10
256.25
N. 28°-30'-40" E. 612.85
D.H. top S. end Headwall
Spk. E side Tel. Pole
N. 73°-15'-30" E.
STATE OF OHIO F.R. ROOT 2556 REGISTERED SURVEYOR
Ted Root Aug. '49
60' Wide FRL 5/12/50
LANDS IN
34-22-40
28-30
30-52-40
159-07-20
34-22-40
28-30-40
5-52-00
174-08

RIDER ROAD SEC

1+62.75 △ P.O.T.



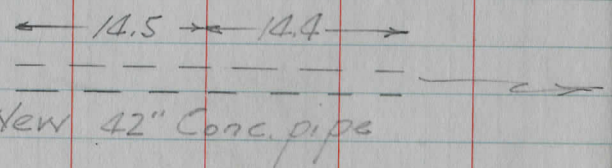
1+67.8

8"x16 Corr. I.P. Rusted some

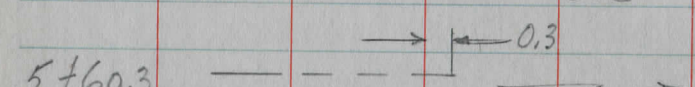
P.T. 12+50.82

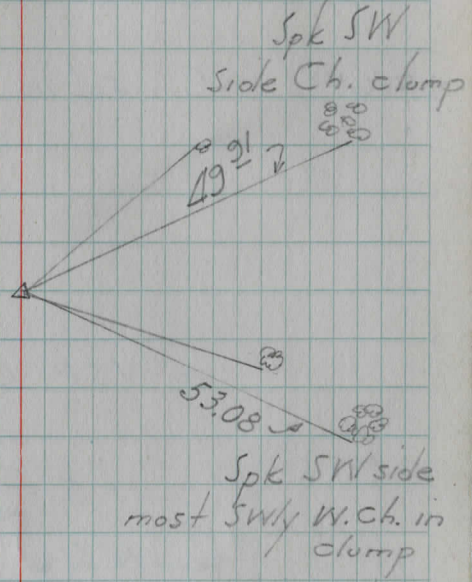
12+78.8 I.P. Fd 8" under

P.C 11+02.86



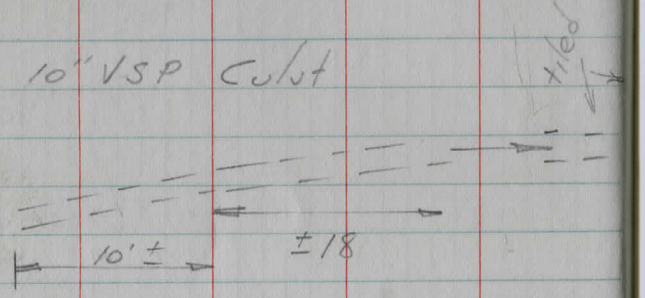
12" x 12' Corr I.P OK





24+64.34 Pin fd in 87 pav't

10" VSP Culvt



18 +51.68

HALL RD Contd from pg 49

	+	1239.25	−	
20+0				
T.P.	6.52	1242.96	2.81	1236.44
B.M.	spike triple oak		4.82	1238.14 (1238.15)
21+0				
P.T.	VV+0V.74			
T.P.	5.91	1247.26	1.61	1241.35
23+0				
24+0				
25+0				
06 T.P.	5.56	1248.40	4.42	1242.84
26+0				
27+0				
28+0				

North South 36

35.7

3.3 2.9 3.2 4.2 3.1 3.5 3.7
30 27 15 12 10 20 30

37.3

5.2 5.4 6.7 5.7 5.7 5.9 5.2
30 15 17 3 13 30

39.4

3.0 2.6 5.3 3.9 3.6 4.4 3.0 2.8
30 21 15 9 5 9 30

41.3

5.4 5.6 8.1 5.8 6.0 6.6 5.4 5.6
30 25 20 14 4 9 30

42.5

4.6 4.6 6.3 4.6 4.8 5.9 5.1 5.3
30 22 17 11 6 9 30

42.6

4.7 5.4 6.1 4.6 4.7 5.1 5.9 5.3 5.4
30 16 15 9 5 8+9 10 30

42.6

5.7 6.1 7.4 5.6 5.8 5.8 6.8 6.5 7.1
30 19 17 10 3 9 14 27

Outlet channel

42.8

5.8 5.6 6.7 5.3 5.6 6.5 6.3
30 20 15 9 5 9 30

43.5

5.5 5.8 4.7 4.9 5.4 6.1 5.0 4.4
30 18&16 9 6 8 16 30

		1248.40 ✓			
	+	✓	—		
T.P.	5.65	1249.72	4.33	1244.07	
29+0					
30+0					
31+0					
T.P.	9.94	1257.02	2.64	1247.08	
32+0					
33+0					
34+0					
35+0					
36+0					
37+0					
38+0					
intersection ℄		−0.1			
T.P.	5.45	1261.94	0.53	1256.49	
B.M.			4.71	1257.23	(1257.24)

North

South

44.2

6.0 6.2 5.4 5.5 — 6.0 6.5 5.6 5.2
30 22 11 7 8 11 30

44.8

5.4 5.5 4.5 4.9 — 5.3 5.9 5.3 4.9
30 23 11 7 8 10 30

45.8

4.6 3.8 3.9 4.8 — 4.4 4.8 — 4.2
30+22 14 1 2 5 8 30

47.0

10.5 10.0 10.0 — 10.3 10.7 10.1 10.4
30+23 11 1 6 9 11 23

48.3

8.4 8.8 9.2 8.9 8.7 — 9.1 8.4 7.9
27 17 14 12 9 11 30

49.6

6.3 6.8 7.8 7.6 7.4 — 7.2 7.5 6.3 5.6
30 17 12 11 6 8 12 30

51.5

4.8 5.4 6.2 5.9 5.5 — 5.3 6.3 5.2 4.8
30 14 11 9 5 9 12 30

52.9

4.0 4.3 4.8 4.2 4.1 — 3.7 5.0 4.2 3.4
30 12 10+8 7 5 9 11 30

54.3

1.9 2.5 3.1 2.7 — 2.1 1.9 1.5
30 12 8 7 19 30

56.4

0.2 0.4 1.1 0.6 0.60 — 0.4
30 10 7 5 10+30

1X in Send Shd wall

77.67

	77.67	77.67	
A4	5.75 S	71.56 G	
	71.92 S	6.11	
A3	77.67	77.67	
	5.60 S	71.74 G	
	72.07	5.93	
AF	77.67	77.67	
	5.15	71.91 G	
	72.52	5.76	
AE	77.67	77.67	
	5.05	72.08 G	
	72.67	5.59	
BM.	4.51	73.16	(1273.13)

check grades
Race track
cont'd from pg 79

Levels for setting fence

BM.	5.85	78.98	1273.13
E west			
F "			
G "			
H "			

out

40' out 38

77.67
4.35
1.5 low
73.37 S

77.67
74.89 G
2.78

77.67
4.15
1.6 low
73.57 S

77.67
75.20 G 43'
2.47

77.67
75.07 G
2.60 4.25
1.6 low

77.67
3.35
1.1 low
74.37

77.67
75.52 G 47'
2.15

77.67
75.24 G
2.43 3.75
1.3 low

77.67
2.95
1.1 low
74.77

77.67
75.91 G 52.5
1.76

77.67
75.41 G
2.26 3.65
1.3 low

78.98
73.63 G
1.42
75.05

78.98
75.05
3.93
.20
4.13 Final
5.80 (S)

78.98
5.8
73.18 S

78.98
73.80 G
1.42
75.22

78.98
75.22
3.76
.20
3.96 Final
5.80 (S)

73.18 S

78.98
73.97 G
1.42
75.39

78.98
75.39
3.59
3.90 Final
5.60 (S)

78.98
5.60
73.38 S

78.98
72.14 C
1.42

78.98
75.56
3.42
3.72 Final
5.24 (S)

78.98
5.24
73.74

78.98

I west

Ia west

T.P.	4.94	81.00	2.88	76.10	(76.06)
			Outside		
I b			3.10	77.90	
I c			2.44	78.56	
I d			2.44	78.56	
T P.	5.26	81.32		76.06	
I e			2.70	78.62	
I f			2.35	78.97	
I g			2.68	78.64	

74.38 G
1.42
75.80

78.98
75.80
3.18

4.90 (S)

3.31 Final

78.98
4.90
74.08 S

74.55
1.44
75.99

78.98
75.99
2.99

4.95 (S)

3.21 Final

78.98
4.95
74.03 S

74.73 G
1.42
76.15

81.00
76.15
4.85

6.47 (S)

5.04 Final

81.00 .2 low
6.47
74.53 S

74.90 G
1.42
76.32

81.00
76.32
4.68

6.26 (S)

4.75 Final

81.00 .16 low
6.26
74.74 S

75.07 G
1.42
76.49

81.00
76.49
4.51

6.05 (S)

4.55 Final

81.00
6.05
74.95 S

75.23 G
1.42
76.65

81.32
76.65
4.67

6.25 (S)

4.74 Final

81.32
6.25
75.07 S

75.39 G
1.42
76.81

81.32
76.81
4.51

6.50 (S)

4.80 Final

81.32
6.50
74.82 S

75.49 G
1.42
76.91

81.37
76.91
4.41

5.97 (S)

4.45 Final

81.32
5.97
75.35 S

		81.32			
I h			2.80	78.52	
T.P.	5.26	81.32		76.06	
I i					OK
I j					~~OK~~
I K					OK
I l					OK
I m					~~OK~~
I n					OK
I o					OK

75.54 G
1.42
76.96

81.32
76.96
4.36

5.77 (S)
4.35 Final

~~81.32~~
5.77
75.55 S

Centerline of P.S.C. at N.E. 288 N. Ave

75.54 G
1.42
~~76.96~~

81.32
76.96
4.36

5.73 S
4.34 Final

81.32
5.73
75.59 S

75.54 G
1.42
76.96

81.32
76.96
4.36

5.59 S
4.18 Final

81.32
5.59
75.73 S

75.49 G
1.42
76.91

81.32
76.91
4.41

5.80 (S)
4.41 Final

81.32
5.80
75.52

75.39 G
1.42
76.81

81.32
76.81
4.51

6.00 (S)
4.51 Final

81.32
6.00
75.32

75.24 G
1.42
76.66

81.32
76.66
4.66

5.82 (S)
4.52 Final

81.32
5.82
75.50

75.04 G
1.42
76.46

81.32
76.46
4.86

6.38 (S)
4.84 Final

81.32
6.38
74.94

74.79 G
1.42
76.21

81.32
76.21
5.11

6.53 (S)
5.10 Final

81.32
6.53
74.79

81.32

Ip

Ia

T.P. 2.70 78.76 76.06

I east

H "

G "

F "

E "

D "

C

C "

74.556
1.42
75.97

74.306
1.42
75.72

74.056
1.42
75.47

73.706
1.42
75.12

73.456
1.42
74.87

73.206
1.42
74.62

72.956
1.43
74.37

72.70
1.42
74.12

72.45
1.42
73.87

81.32
75.97
5.35

81.32
75.72
5.60

78.76
75.47
3.29

78.76
75.12
3.64

78.76
74.87
3.89

78.76
74.62
4.14

78.76
74.37
4.39

78.76
74.12
4.64

78.76
73.87
4.89

6.40 (S)
5.15 Final

6.40 (S)
5.30 Final

3.00 Final

(S)
3.34 Final

3.70 S
Final

S
4.08 Final

S
4.50 Final

S
4.6 Final

S
5.00 Final

81.32
6.40
74.92

81.32
6.40
74.92

74.605

74.31 S

73.81 S

73.52 S

73.09 S

72.76 S

72.19 S

B East ✓

A " ✓

8/7/50 Grades for top of fence rail

B11	4.22	77.66	73.44	
A2	east			✓
Ap				✓
Ao				✓
Am				✓
Am				✓
A1				✓

72.20 + 1.42 = 73.62 — 78.76 − 73.62 = 5.14 — 5.3 Fma — 71.81 S

71.95 + 1.42 = 73.37 — 78.76 − 73.37 = 5.39 — 5.5 — 71.76 S

Most Sly "R"

71.70 G S=G — 1.42 — 73.12 — 77.67 − 73.12 = 4.55 = R

71.45 G S=G — 1.42 — 72.87 — 77.67 − 72.87 = 4.80 = R

71.20 S=G — 1.42 — 72.62 — 77.67 − 72.62 = 5.05 = R

70.95 S=.12 H — 1.42 — 72.37 — 77.67 − 72.37 = 5.30 − .06 = 5.24 R

70.85 S=.12 H — 1.42 — 72.27 — 77.67 − 72.27 = 5.40 − .06 = 5.34 R

70.90 S=.30 L — 1.42 — 72.32 — 77.67 − 72.32 = 5.35 + .15 = 5.50 R

77.66 outside

AK ✓

Aj ✓

Ai ✓

Ah ✓

Ag ✓

AF ✓

Ae ✓

	75.36	74.21	
Ad	2.30 S	3.45 S	✓
	59.5	40	
	75.26	74.01	
Ac	2.40 S	3.6 S	✓
	67	40	

71.076 S = 0.35 L
1.42
72.49

77.66
72.49
5.17 + .17 = 5.34 R

71.246 S = 0.12 L
1.42
72.66

77.66
72.66
5.00 + .06 = 5.06 R

71.406 S = G
1.42
72.82

77.66
72.82
4.84 = R

71.56 G S = 0.36 H
1.42
72.98

77.66
72.98
4.68 - .18 = 4.50 R

71.74 G S = 0.33 H
1.42
73.16

77.66
73.16
4.50 - .16 = 4.34 R

71.91 S = 0.7 H
1.42
73.33

77.66
73.33
4.33 - .33 = 4.0 R

72.08 S = 0.6 H
1.42
73.50

77.66
73.50
4.16 - .30 = 3.86 R

72.25 G
1.42
73.67

77.66
5.35 S
72.31 = .06 H

77.66
3.67
4.00 = R

72.42 G
1.42
73.84

77.66
5.60 S
72.06 = 0.36 L

77.66
73.84
3.82 + .18 = 4.00 R

77.66

	out side S			
A6	74.96	73.76		
	2.70	3.90		
	75'	40'		✓
	74.61	73.54		
A2 west	3.05	4.12		✓
	80'	40'		
A "		2.75	74.91	✓
		80		
B "		2.70	74.96	✓
		80		
C "		2.67	74.99	✓
		80		
D "		2.78	74.88	✓
		80		

72.59 G
1.42
74.01

77.66
5.30 S
72.36 = .23L

77.66
74.01
3.65 + .11 = 3.76 R

72.77 G
1.42
74.19

77.66
5.20 S
72.46 = .31L

77.66
74.19
3.47 + 15 = 3.62 R

72.94 G
1.42
74.36

77.66
5.00 S
72.66 = .28L

77.66
74.36
3.30 + 14 = 3.44 R

73.11 G
1.42
74.53

77.66
5.20 S
72.46 = .65L

77.66
74.53
3.13 + 32 = 3.45 R

73.28 G
1.42
74.70

77.66
5.05 S
72.61 = .67L

77.66
74.70
2.96 + 33 = 3.29 R

73.45 G
1.42
74.87

77.66
4.92 S
72.74 = .71L

77.66
74.87
2.79 + 35 = 3.14 R

Levels on Infield Burton Fairgrounds Race Track

	+	HI	−	Elev
		77.66		
Southerly Radius pt			(73.63) ✓ 4.03	
A 100' S			(72.12) ✓ 5.54	
A 100' S			(71.53) ✓ 6.13	
A 100' S			(73.04) ✓ 4.62	
A ℄			(74.00) ✓ 3.66	
A 100' W			(73.62) ✓ 4.04	
A 100' E			(73.17) ✓ 4.49	
B ℄			(73.72) ✓ 3.94	
B 100' E			(73.73) ✓ 3.93	
B 100' W			(73.33) 4.33	
C ℄			(73.97) ✓ 3.69	
C 100' E			(73.31) ✓ 4.35	
C 100' W			(73.89) ✓ 4.77	
D ℄			(74.11) ✓ 3.55	
D 100' E.			(73.55) ✓ 4.11	
D 100' W.			(72.97) ✓ 4.69	

	+	HI	−	Elev
T.P.	4.54	80.60		76.06
E				
F				
G				
H				
I				
Northerly radius pt.				
Ii 100' North				
Im				
Ie				

E

outside E. 100'

IN

E

100'

outside

46

(74.48) 6.11	(74.21) 6.39	(73.23) ✓ 7.38	74.85 5.75
(74.76) 5.84	(74.47) 6.13	(73.55) ✓ 6.65	(75.41) 5.19
(75.05) 5.55	(74.77) 5.83	(74.70) ✓ 5.90	(75.91) 4.69
(75.06) 5.54	(75.13) 5.47	(74.95) ✓ 5.65	(76.00) 4.60
(75.30) 5.30	(75.52) 5.08	(75.60) ✓ 5.00	(76.50) 4.10
	(76.20) 4.36		
	(76.18) 4.42		
(75.63) 5.57			
		(76.01) 4.59	

Levels 10-10-53		Hall HI	Rd	E	
B.M.	1.49	1258.73		1257.24	←
T.P.	1.52	1249.59 ✓	10.66	1248.07 ✓	
T.P.	2.93	1245.78 ✓	6.74	1242.85 ✓	
T.P	1.59	1240.35 ✓	7.02	1238.76 ✓ N. Side Rd	
B.M. Spk SE. root triple oak Sta 20+80				2.20	
T.P.	6.05	1239.58	6.82	1233.53 ✓	
T.P.	0.92	1236.65	3.85	1235.73 ✓	
B.M.	0.98	1228.33	9.30	1227.35 ✓	
T.P	0.73	1218.87	10.19	1218.14 ✓	
T.P	0.43	1207.88	11.42	1207.45 ✓	
	0.78	1197.73	10.93	1196.95 ✓	
B.M	11.61	1197.73	11.61	1186.12 ✓	
1+0					
T.P.	5.92	1201.86	0.79	1196.94	
2+0					
T.P.	9.92	1209.76	3.02	1199.84	
3+0					
↳ +50?					

See Fd. Bk # 175 Pg. 7

X in Send Shdwl SW quad Hall & Claridon-Troy

elev = 1238.15 ✓

℄ Bolt Sta 11+14.03

BM S root 12" Elm 20' N of Sta 7+60

NORTH SOUTH

Ref Spk in Elm SW quad intersection

11.33 inlet FL

8.94 (88.8)

0+0 ℄ ℄

11.44 in FL

13.06 outlet FL

(93.3)

3.5	3.7	4.7	4.4		4.8	5.9	3.7	4.8	
30	17	12	(98.3)		10	12	16	30	
3.0	2.3	5.4	5.0	4.6	5.0	5.3	1.0	1.3	
30	14	9	6		7	8	14	30	

↳ solid rock (91.6)

6.0	5.6	9.0	8.3	8.2	8.3	9.1	5.4	5.4
30	15	8	4	5.3	7	8	15	30

		1209.76	–	
P.I.	3+07.7			
T.P.	10.07	1217.51	2.32	1207.44
4+0				
4+50				
T.P.	9.80	1225.09	2.22	1215.29
P.T.	5+14			
6+0				
T.P.	9.62	1232.67	2.04	1223.05
7+0				
BM			5.32	1227.35 (1227.35)
8+0				
9+0				
T.P.	8.82	1240.79	0.70	1231.97
10+0				
11+0				

North — South

05.2

1.6 1.5 5.3 4.8 4.6 — 4.8 5.6 1.8 2.2
30 15 7 5 5 8 14 30

11.2

3.3 3.2 7.2 6.5 6.3 — 6.4 7.0 4.0 4.5
30 17 10 8 3 7 11 30

13.6

1.5 1.7 5.2 4.1 3.9 — 4.0 4.7 2.6 3.0
30 15 8 4 6 10 13 30

16.8

7.0 7.4 9.5 8.3 — 8.7 9.6 7.8 8.0
30 16 12 6.1 3 6 9 30

20.0

4.1 4.0 6.3 5.4 5.1 — 5.5 6.2 4.2 3.4
30 16 11 8 1.5 3 5 8 30

23.2

7.3 6.7 8.5 10.3 9.6 9.5 — 9.5 10.3 8.8 8.2
30 20 11 6-8 4 5 9 12 30

Spk SE root 12" elm

26.6

4.5/30 5.2/10 4.7/4 4.1 — 5.8/4 4.0/8 4.7/12 5.4/14 5.2/30

29.6

2.6 2.6/9 3.9/5 3.1 — 2.8/3 3.1/6 4.2/12 2.5/15 2.0/30
30

37.7

7.1 7.1 8.8 8.2 8.1 — 8.3 9.7 8.3 7.8
30 14 5 4 9 10 12 30

35.6

4.3 4.4 6.0 5.4 5.2 — 5.5 6.5 5.0 5.4
30 14 6 4 8 12 16 30

		+	H.I.	−	
12			1240.79 ✓		
T.P.	5.15		1240.61 ✓	5.33	1235.46 ✓
13+0					
14+0					
15+0					
16+0			✓		✓
T.P.	5.73		1238.48	7.36	1233.25
16+82	cr/bt				
T. P.	6.00		1239.25		1233.25
17					
18+0					
19+0					

same

continued page 36

North

35.4

4.6 4.3 5.9 5.4
30 13 3-5

5.2 5.8 5.0
4 10 30

35.4

5.1 5.1 6.4 5.5
30 21 8 5

5.2 6.3 6.1 6.3
1 14 13 16 30

35.1

5.3 5.6 6.2 5.3 5.5
30 22 13 8

6.5 5.7 6.1
7 15+19 30

34.5

5.5 5.6 6.7 5.9 6.1
30 21 14 7

6.9 6.1 6.7
6 12 30

33.3

6.7 6.4 8.1 7.4 7.2 7.3
30 22 12 10 4

7.8 8.0
11 30

32.4 33.2 30.8 29.7

6.1 5.3 7.7 8.8 10.2
FL Ch 100 200
50'

33.2

swampy
6.7 6.4 5.6 6.0
30 9 6

6.6 7.5
10 30

34.2

4.9 5.5 5.5 5.8 5.0
30 22 8 6 2

5.4 5.7 6.4
9 12 30

35.0

3.4 3.6 5.0 4.2
30+20 14 5+6 2

4.6 4.9 4.5
8 11+20 30

1/25/50 #4 From Rt 6 north

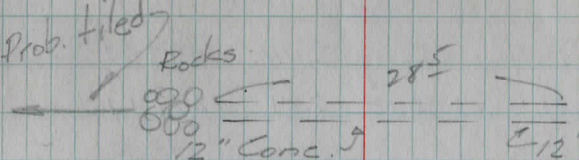
BM	1.73	1275.55		1273.82
Rt #6	W			
B.M	12.19	86.01		1273.82
Rt 6	East			
SM.	9.59	1283.41 ✓		1273.82
98+0			7.3	76.1
100				
102			5.4	80.0
103+19		culvt		
T.P.	7.66	1285.59 ✓	5.48	1277.93
104			5.1	80.5
106			4.1	81.5
107+12		Pond outlet into Erd ditch		
108			4.6	81.0
110			8.2	77.4
T.P.	2.70	1281.07 ✓	7.22	1278.37
112+0				
112+89				CULVERT

W E

63.8 X SE X S bdw / #4 & #6 63.7 70.6 72.4 74.4
11.7 10.9 9.1 6.8 4.9 3.1 1.1
560 500 400 300 200 100 0
culvt
up to west 76.1 78.6 81.5 84.7 86.8
9.9 7.4 4.5 1.3 +0.8±
100 200 300 400 500

W E

79.6
2.1 2.2 5.1 4.6 3.8 4.3 5.1 3.6 2.8
30 17 12 10 8 11 14 30
80.1
6.3 3.3 5.8
FL FL



Cannot see thru rusted H_2O running under
Replace

Top Stk 112

5.4 75.7
9.5 8.9 8.7 4.7 8.6
200 100 WFL E.FL.
76.4

JAN 25-50
HOT-WINDY-SUNNY
70°F

1281.07 ✓

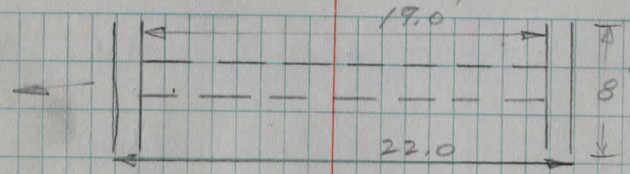
112+89		36"x36" Conc box Culvt both walls cracked & shoved in (out)			
114+0				75.6	
115+0				75.9	
116+0				78.0	
+20	SPRING CREEK FROM EAST				
117+0				80.5	
T.P.	11.12	1291.62 ✓	0.57	1280.50	
118+0				85.7	
B.M.	MOST WLY LEG FOUND. N. TOWER		8.44	1283.18	(8422)
T.P.	13.01	1304.12 ✓	0.51	1291.11	
119+0				93.8	
120+0				100.8	
120+67.82	SPK SET	IP 30' WEST	STK 30' EAST		
121+0				03.1	
122+0				01.0	
T.P.	8.16	1306.76 ✓	5.52	1298.60	
123+35			26" FAIR	12" C.I.P. CULV	

C = CORRUGATED
NOT CAST IRON

97.85

W E

51



5.5
5.2
3.1
0.6
5.9
10.3

0.7 0.8 4.5 4.0 3 3 3.8 4.1 0.0 .8 ebove 0.0
30 24 13 10 9 11 21 30

1.0
3.1

98.5 96.1
11.3 8.3 10.7
W.F. E.F.

		1306.76 ✓		
124+0				98.4
125+0				1300.0
126+0				1301.9
+97.85	Spk on ℄ between		I.P.'s	↓
B.M. set			5.30	1301.46
128+0				01.5
T.P.	7.83	1310.77 ↓	3.82	1302.94
130+0				04.5
132+0				05.8
134+0				05.1
136+0				1302.07
T.P.	1.86	1303.58 ↓	9.05	1301.72
137+56	12"×10" Corrugated Iron Pipe Culvert 27' long; Beveled			
138+0				00.6
139+46.67	Spk Fd			
139+40				01.9
140+0				1299.9

≠ 1267

W E

8.4
6.8
4.9

Spk S. E. Root 20" E & W 33' West of ℄ at 126+97.85

5.3
6.3
6.0
5.7
8.7

1300.5

5.7 / W.F.4 — 3.1 — 5.3 / E.F.L.

with 12" Cone

3.0
1.7

2.3/30 — 2.6/17 — 4.4/12.5 — 3.7 — 4.1/9 — 4.3/12 — 3.7/13 — 1.8/30

		1303.58 ✓		
141+0				95.3
142+0				91.5
T.P.	0.35	1291.51 ✓	12.42	1291.16
143+0				88.4
144+0				86.0
145+0				83.2
146+0				78.5
T.P.	0.39	1278.98 ✓	12.92	1278.59
147+0				71.9
T.P.	0.98	1267.06 ✓	12.90	1266.08
148+0				63.8
B.M.			12.28	1254.78
149+0				55.9
B.M.	0.01	1254.79 ✓		1254.78
150			4.2	50.6
+49				

40'

Rdwy 17

24" Conc. pipe culvt Ok

151			4.1	50.7
T.P.	12.25	1267.04 ✓	0.00	1254.79
152			10.6	54.4
B.M.			9.50	1259.54 (57.70)
old NG				

8.3

12.1

3.1

150+49
9660
5389

5.5

8.3

13.0

7.1

3.3

West Post 23° Right 149+18 — 30' E of ℄ 100+50 ℄ Culvert

11.2

49.8

5.0

Good Fill

12.7 FL

11.7 FL

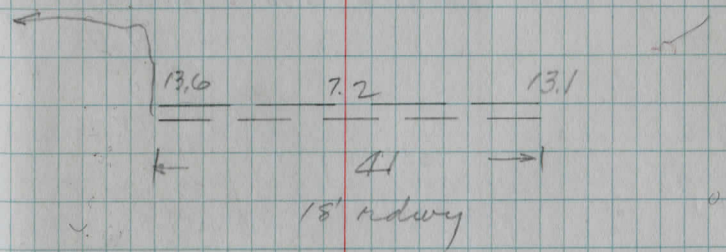
Culv 5395' CLB
BM 1257.81
1258.70

Rest over spk C.L.B. '29

		1267.04 ✓		
153			4.6	62.4
T.P.	11.23	1277.95	0.32	1266.72
154			10.1	67.9
155			5.9	72.1
156			3.9	74.1
157			3.4	74.6
158			6.5	71.5
159			11.3	66.7
T.P.	-0.02	1266.37	11.56	1266.39
160			4.6	61.8
161			10.0	56.4
T.P.	0.99	1254.80	12.56	1253.81
162			4.2	50.6
163			7.2	47.6
+02		24" Conc pipe culvt.		
		OK		
164			4.4	50.4
T.P.	12.58	1265.93	1.45	1253.35
165			8.8	57.1
166			1.4	64.5
T.P.	8.70	1274.09	0.54	1265.39
BM			5.61	68.48

Spk sink

7.7	2.6	5.3	4.8	4.6	4.8	5.6	2.5	2.4
30	18	12	8		9	13	20	30



Spk E root 30" Oak 78' Lt 165+95

		1274.09 ✓		
		68.4		
166+98	14.7 FL Conc	5.7		10.2 FL Conc
168			0.8	73.3
T.P.	12.15	1286.24 ✓	0.0	1274.09
169+0				79.3
170+0				83.5
171+0				84.1
172+0				82.8
T.P.	1.89	1284.13 ✓	3.95	1282.29
174+0				79.7
176+0				79.2
+05	12" Conc	25' long; road to replace 35' Washover North		12 Conc P
178+0				81.2
T.P.	8.93	1290.56 ✓	2.50	1281.63
179+0				81.9
180+0				82.0
	4.5	4.4		84.4

W E

No find this end 12" V it 7

15" Conc ℄ 166+98

45' W. 7.7 FL Conc

167+37 to

2 Trading — 1

S+C left of 168

6.9

2.7

2.1

3.4

4" Tile W. from 172+08 to 173+62

4.4

4.9

Rusinak Pond 7.5 WFL 7.2 EFL

2.9

8.7

9.3 9.7 8.6 9.2 9.9 8.1 7.8

30 15 9 11 17 30

6.2

1290.56 ✓

#5 Fly from #4 AUBURN Rd

2+00

4+00

5+00

#4 N'ly 1290.56 from #5 MENTOR Rd

2+00

BM

#5 N'ly 1290.56 from #4

2+00

BM. SET "E"			1.58	1288.98 ✓
BM. SET	3.14	1287.05 ✓	6.65	1283.91 ✓
± 4 north				
BM	0.88	1284.78 ✓		1283.91
± 5 WEST				
TP.	5.56	1278.99 ✓	11.35	1273.43
TP.	1.58	1275.22 ✓	5.35	1273.64
B.M.			6.35	1269.87 (1270.13)

2.6	88.0	
1.7	88.9	
0.7	89.7	
9.7	80.9	
10.9	79.7	

SW Root 20" CATALPA N'ly SIDE #5 ± 150' E of #4

S Root 24" ELM NW QUADRANT ℄ #4 & #5

77.1 — 9.9 (400) — 10.7 (500) — 76.3

73.9 — 10.9 (400) — 13.1 (500) — 71.7

Well S not chestnut stump ± 150'

NW on #5

Section on #5 = 18' pavt

	W	℄	E
180	0" 7'	7"	0" 6'

Hill at 170 ± 220' N.P.S.

160	½" 8'	1" 6'	2"	1" 6'	½ 8'

Hill N of 156 - ±220' NPS
Hill S of 156 ±280 NPS.
Hill N of 144 ±286 NPS
" N of 140 ±174 NPS

140	0	1" Sand 6	2" ℄	1" Sand 6	0

Hill S of 120 ±165 NPS.

RTL 100' W of #5 = 19½' Pave, Pav Edge to N Ditch 12½ 3' Berm & South Flat

120+0		Water 7	2" ℄	Water 7	
100+0	1" 8	3" 6W	4" ℄	3" 6E	1" 8

Jump to Pg 60

3' berms 32' ditch to d

Gravel & clay Mesta Rd to #6

100 E Pave 19½ Edge Pav to N Ditch 13½ - 4' BERM Pav Edge to South Thru Flat

W.L M.L 100' WEST ℄ "A"

#4-100'S ℄ W.L M.L

W.L M.L 100 E ℄ #4

℄

℄-W DITCH 16' N DEPTH 2' 19.5 PAVE, S DEPTH 3', E-S DITCH 16

℄-E DITCH 30' E DEPTH N' 25' W DEPTH S ℄ DITCH 17

℄-N DITCH 31' N DEPTH 11' 39.5 S DEPTH 9 ℄ S DITCH 32

W E

8+82

#1

12" CORIP 36" 22' Rdwy

20+17

S edge Road

12" Con IP

24' rdwy

36"

#2

CAST IRON 28+76 17°

CORIP

#3

36" 24" rdwy

ENLARGED DITCH TO NORTH SIDE WAS 24 LF 90° ANGLE

N of Track

N S

Tieing W of "L"

℄ Ditch (15') BERM 7' PAVED 12' (5' BERM (11' ℄ - Ditch

℄ - Ditch (13') BERM 9' PAVE 14' (6' BERM (14½ + Ditch

15" Conc IP

33+99 Al' 24' R/W

18" Conc P

40+24 Al' 40' 24' R/W

Sugar House

49+48 23' R/W

46'

2 Course of Stone with 1ft Conc wall & Conc Cap 3' wide 4' High Good

54+68 18" Conc IP 25' R/W

Turner Subdivision

38'

64+16 14" Conc Pipe 22' R/W

36½'

70+34 15" Conc 24' R/W

25'

W E

2-24" Conc

Clean up outlet

75+19 #10

33' 22½ deg

12° Conc 82+82 #11

28' 25° deg

15° Conc 87+13 #12

25½' WASH OUT 24° deg

20' long

89+24 14½ deg

36" RCP RCP REMOVE OLD STORM. Conc Slab
Some Pushin - Should Replace & WIDEN EARTH

NEED ANOTHER ± 200' South by Field Drain
WASH OVER

79+40 1" 2" 3" 3" 1"
4' 6' ℄ 6' 8'

60+00 1" 4" 5" 1" WATER BOARD
8 6' ℄ L 8

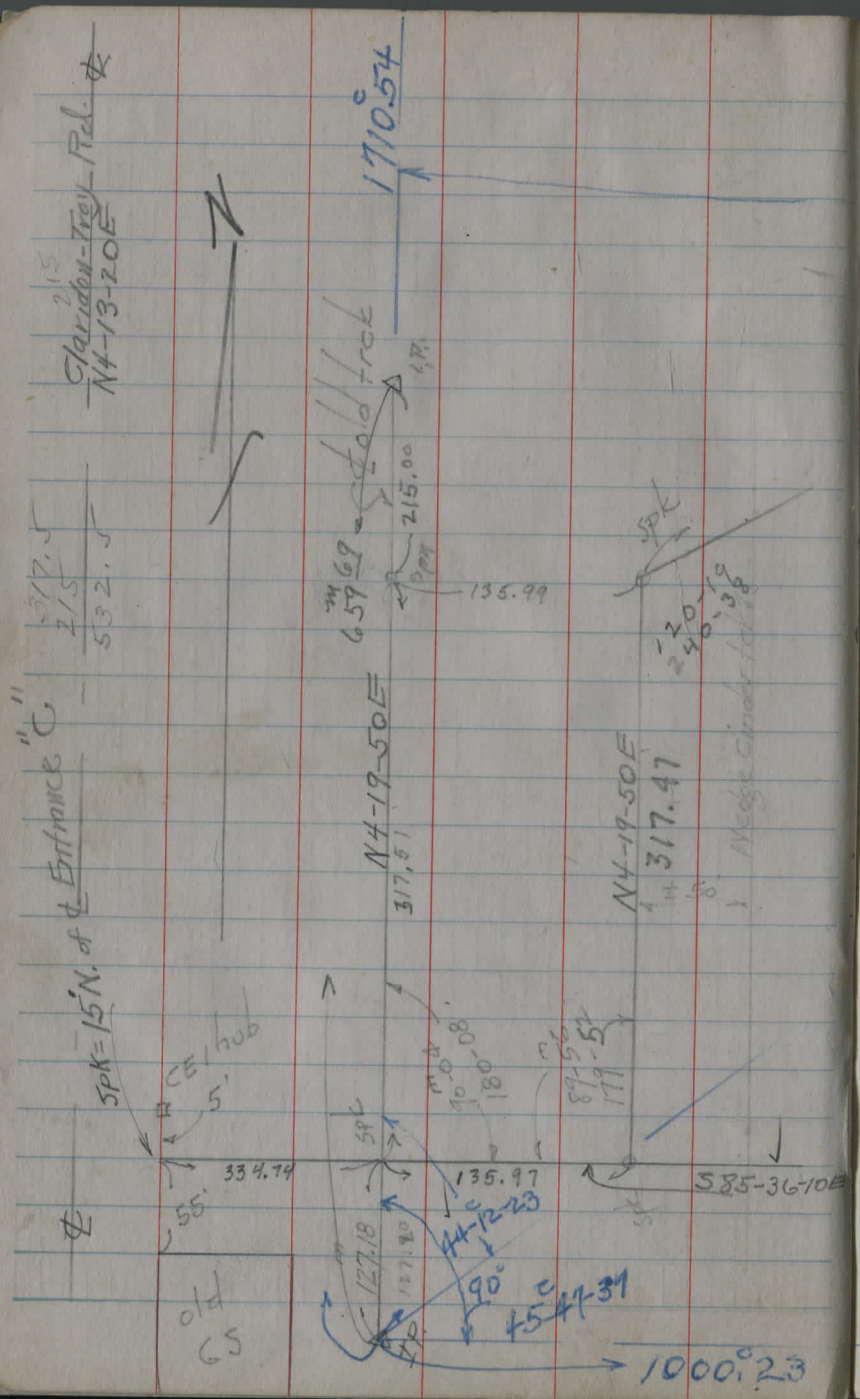
HUMP ± 44+40 240' NPS. N ± S

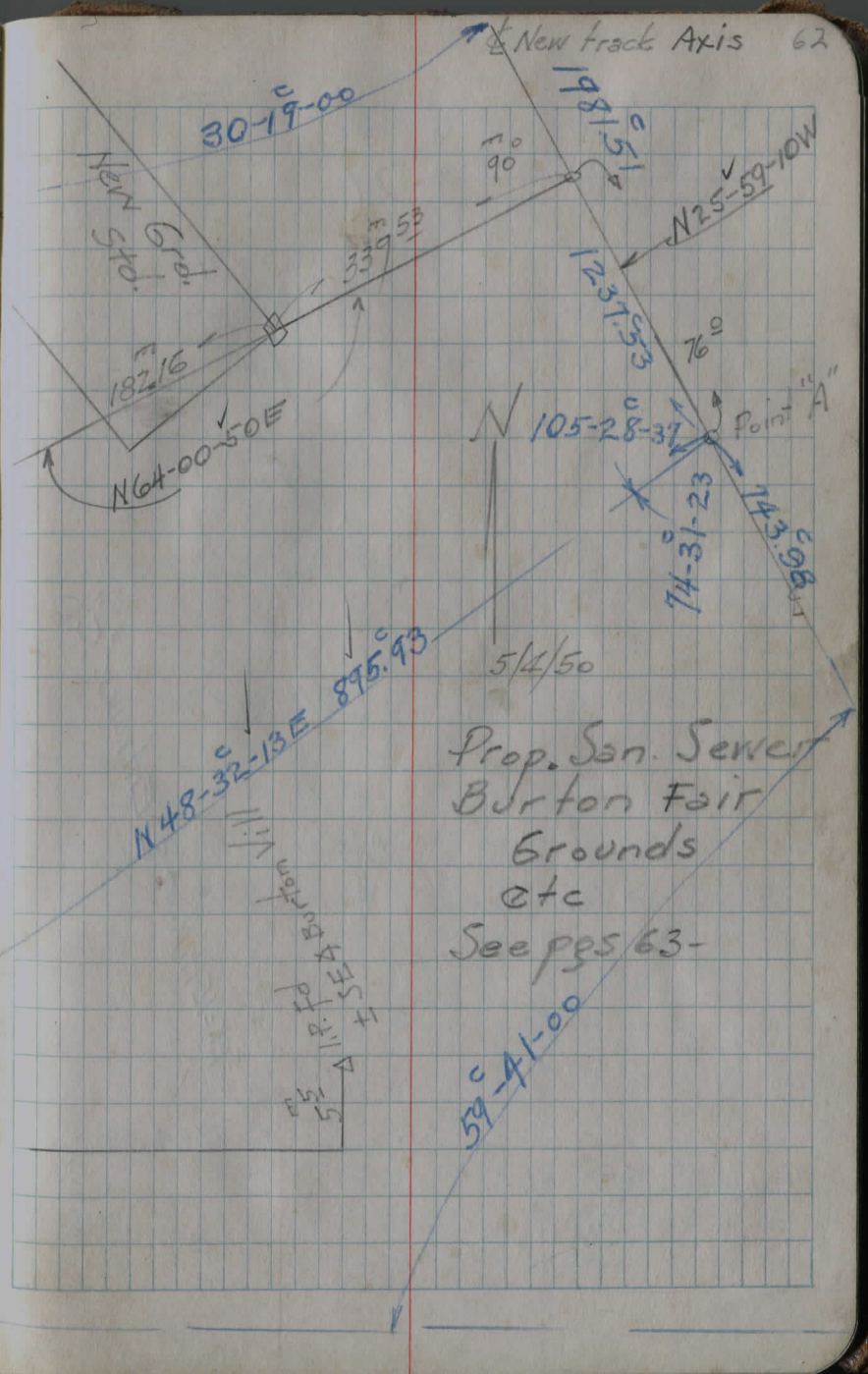
40+80 6" 3" 1" Stay
6 ± 8' ℄ 6 ± 5

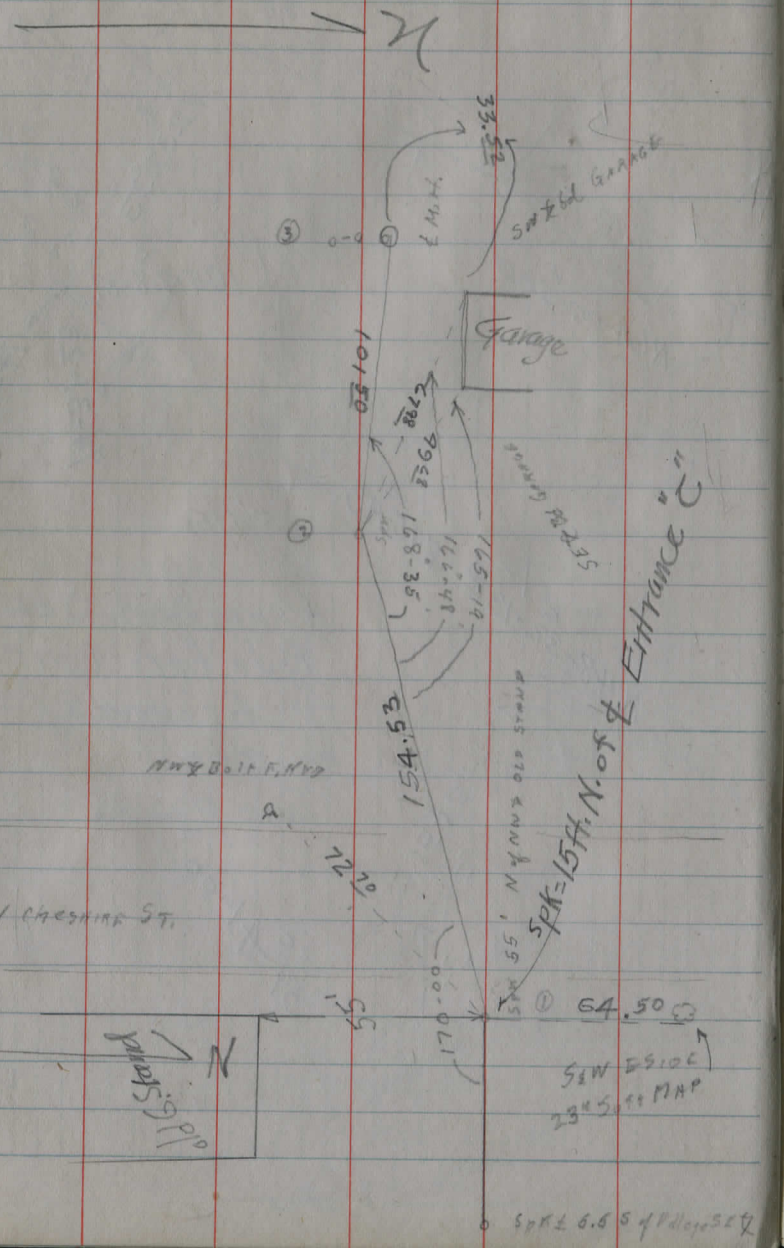
Hole ±3920

?

7040	1" Sand	4" Bent Grout	Cap	6" Slow Sand Fill	
	75'	6'	5'	7'	Mud 13'


Gladdon-Trey Rd. ℄
N4-13-20E
1710.54
℄ Entrance "C"
5PK=15'N. of ℄
CE hub
5'
55'
334.74
N4-19-50E
317.61
215.00
135.99
135.97
317.47
585-36-10E
N4-19-50E
179-51
180-08
90°
44-12-23
90°
545-31
1000.23
127.18
o/d
GS


New track Axis
1981.54
30-19-00
New Grd. Sta.
339.53
182.16
N64-00-50E
N25-59-10W
1231.53
76°
90°
N 105-28-37
Point "A"
74-31-23
143.98
5/4/50
N48-32-13E 895.93
Prop. San. Sewer
Burton Fair
Grounds
etc
See pg 5/63-
59-41-00


N
33.55
Stone Garage
E.M.H.
Garage
101.50
154.53
Spk=15ft. N. of ℄ Entrance "C"
N 55° 55' W
64.50
N Cheshire St.
170.00
55'
Old Stone Wall
Spk ± 6.6 S of Pillar Set

LEVELS ON PROPOSED SEWER LINE FROM SET

B.M.				1273.13
	+	H.I.	−	Elv
T.P.	4.97	104.97	2.77	102.20
	4.12	106.32	5.68	100.64
			4.19	102.13
			5.28	101.04
			8.65	97.67
				92.49

B.M.	4.97	1278.10		1273.13
T.P.	4.12	1279.45	2.77	1275.33
			5.68	
			4.19	1275.26
			5.28	
			8.65	1270.80
			13.83	1265.62

Groundsroad 1.5 mi W of NORFOLK HIGH

64

Spk in Elm SE of Well 5-6-50

CEI Pole Hub WEDGE OLD Tract
Spk Nail Corner ①
NW Nut F. Hyd.
Spk ②
M.H. Cover ③
F.L. MH. ADD 5.18

Spk NE root 18" Elm
CEI hub
Spk N of old GS
NW Nut F Hyd
Spk ②
M.H. cover
F.L. M.H.

	+	HI	−	EL
B.M.	4.65	1277.78		1273.13
			6.33	1271.46
			6.50	1271.28
			6.46	1271.32
			5.85	1271.93
			5.62	1272.16
			4.50	1273.28
			2.90	1274.88
			2.77	1275.01
			3.80	1274.98
TP.	4.08	1279.16	2.70	1275.08
			4.74	1274.52
			4.11	1275.05
			5.42	1273.74
			3.93	1275.23
			5.60	1273.56
			5.03	1274.13
			6.17	1273
			8.40	1270.76
			8.16	1271.
			6.35	
			9.10	1270.06

SPK ELM TREE near NE Well house

Hub SE ± G.S.

100' on line Ground

Bottle 4

100' S of Bottle

200' " " 4

312.47 S of 4 or Cinder Spk

100' W Cinder Spk

± Old fence & proposed street

200' W C Spk

300' W C Spk

400 " " "

Spk N old Ground

NW ± Bolt F. Hydrant (W. side Cheshire St. ± N. corp Line)

100 W/y G.S. Spk

Spk (2) " "

200' W/y G.S. Spk

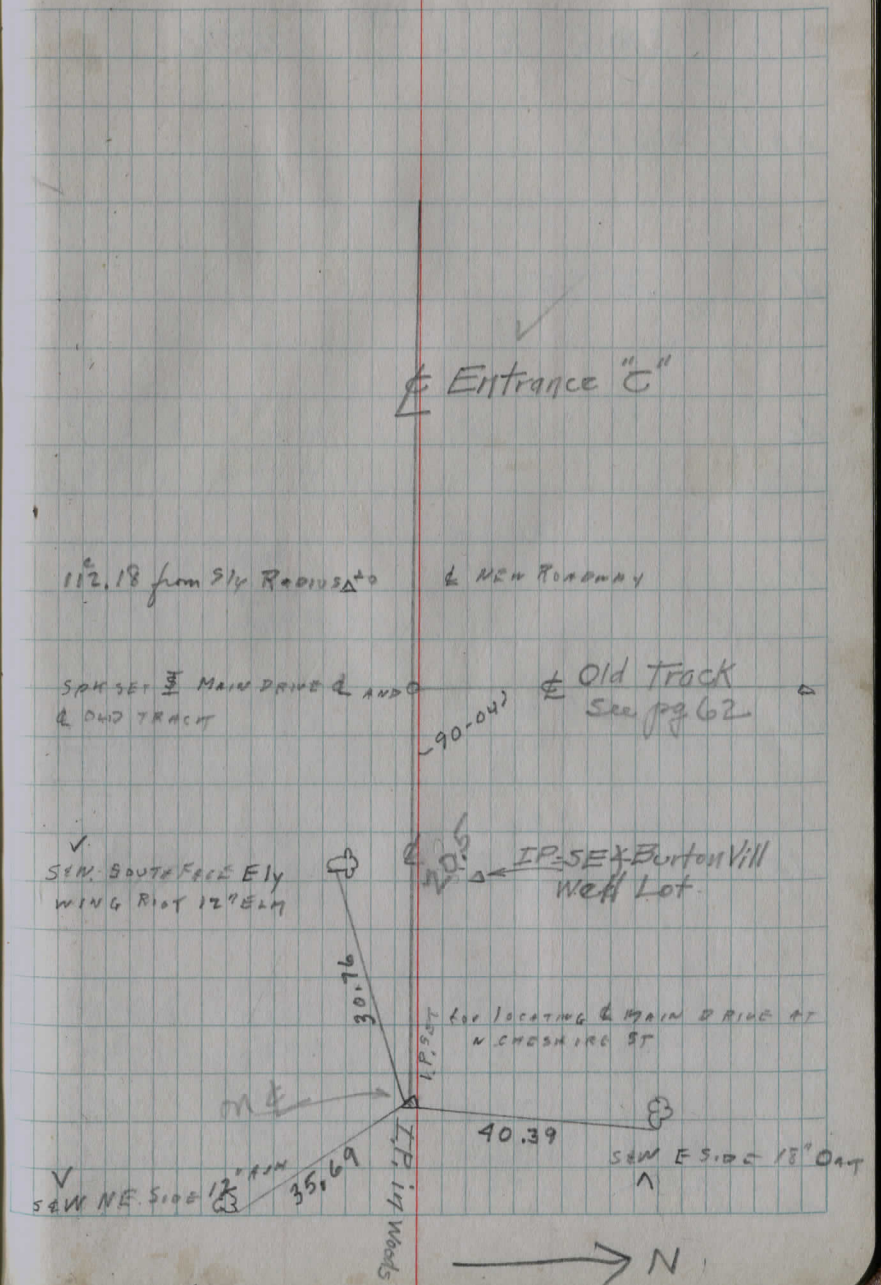
M.H. Center

Ground by M.H.

W. CB on N Cheshire (ADD 2.75 for F.L.)

F.L. C.B. outlet (NW/y)

MAIN ROADWAY FRINGFORDS 5-6-50
AS PER PLAN



New TRACK GRADES 1950

BM.	3.12	76.25	1273.13	
A2 W				
A6				
Ac				1.04
Ad				
Ae				
Af				
Ag				
Ah				

in

out

3.15

74.15 G

75.75 G

Sept 10

76.25
72.42 G
3.83

3.83
1.33 R
2.50 C

76.82 G

76.25
72.25 G
4.00

4.00
2.00 R
2.00 C

76.25
76.38 G

76.25
72.08 G
4.17

4.17
0.67 R
3.50 C

76.25
75.71 G
.54

0.54
0.04 R
.50 F

76.25
71.91 G
4.34

4.34
0.84 R
3.50 C

76.25
75.52 G
.73

0.73
0.23 R
.50 C

76.25
71.74 G
4.51

4.51
2.01 R
2.50 C

76.25
75.20 G
1.05

1.05
2.55 R
1.50 F

76.25
71.56 G
4.69

4.69
1.69 R
3.00 C

76.25
74.89 G
1.36

1.36
2.36 R
1.00 F

#1
76.25

Ai

Aj

Ak

Al

Am

An

Ao

↑ 89

76.25
71.40 G
4.85

4.85
1.85 R
3.00 C

76.25
74.73 G
1.52

1.52
2.02 R
.50 F

76.25
71.24 G
5.01

5.01
3.01 R
2.00 C

76.25
74.57 G
1.68

1.68 R = spk
in elm +
6' up

76.25
71.07 G
5.18

5.18
5.18 R
xx G

76.25
74.40 G
1.85

1.85
7.85 R
6.00 F

76.25
70.90 G
5.35

5.35
9.35 R
4.00 F

76.25
74.23
2.02

2.02
11.52 R
9.50 F

76.25
70.85
5.40

5.40
9.40 R
4.00 F

76.25
74.18
2.07

2.07
11.57 R
9.50 F

76.25
70.95
5.30

5.30
9.30 R
4.00 F

76.25
74.28
1.97

1.97
10.97 R
9.00 F

76.25
71.70
5.05

5.05
9.55 R
4.50 F

76.25
74.53
1.72

1.72
9.72 R
8.00 F

5/20/50

	T	H.	-	Elv
BM	3.60	1276.73		1273.13
B west				
C "				
Top C.B			3.28	73.45
D "				
E "				
F "				
G "				
H				

2nd toe inside

69

1276.73
73.11 G
3.62

3.62
2.12 R
1.50 C

76.73
74.38 G
2.35

2.35
2.35 R
.00 G

76.73
73.45 G
3.28
1.78 R
1.50 C

76.73
74.56 G
2.17

2.17
1.67 R
.50 C

76.73
73.63 G
3.10

3.10
1.60 R
1.50 C

76.73
74.74 G
1.99

1.99
0.99 R
1.00 C

76.73
73.80 G
2.93

2.93
2.43 R
.50 C

76.73
74.91 G
1.82

1.82
2.32 R
.50 F

76.73
73.97 G
2.76

2.76
1.76 R
1.00 C

76.73
74.14 G
2.59

2.59
0.09 R
2.50 C

76.73
75.25 G
1.48

1.48
2.98 R
1.50 F

BM	3.86	1276.99		1273.13
A2 west				
A6				
Ac				
Ad				
AJ				

76.99
74.15 G
2.84

2.84
3.34 R
.50 F

76.99
75.75 G
1.24

1.24
3.24 R
2.00 F

76.99
76.82 G
.17

0.17
1.67 R
1.50 F

76.99
76.38 G
.61

0.61
1.61 R
1.00 F

76.99
74.57 G
2.42

2.42

6-21-56 FAIRGROUND LEVELS & SIDE IN

	+	H.I.	−	ELEV.
B.M.	5.73	1278.86 ✓		1273.13
A EAST				
B				
C				
D				
E				
F				
G				
H				
I				

IN

WELLHOUSE

6.91	78.86	✓
4.96	71.95 G	
2.00 C	6.91	
6.66	78.86	✓
4.16	72.20 G	
2.50 C	6.66	
6.41	78.86	✓
3.91	72.45 G	
2.50 C	6.41	
6.16	78.86	✓
3.16	72.70 G	
3.00 C	6.16	
5.91	78.86	✓
3.41	72.95 G	
2.50 C	5.91	
5.66	78.86	✓
3.16	73.20 G	
2.50 C	5.66	
5.41	78.86	✓
1.91	73.45 G	
3.50	5.41	
5.16	78.86	✓
1.66	73.70 G	
3.50 C	5.16	
4.81	78.86	✓
1.31	74.05 G	
3.50 C	4.81	

78.86

	+	H	-	E
T.P	5.38	1281.44 ✓	7.80	1276.06 ✓
Id				
IE				
IF				
IG				
IH				
II				
IJ				
IK				

IN

CENTER Pipe of PSC at North ℄ 2.88 North Hub (PSE 6-21-50)

6.37	8144		
3.37	7507		✓
3.00 C	6.37		
6.21	8144		
2.71	7523		✓
3.50 C	6.21		
4.06	8144		
2.05	7539		✓
4.00 C	6.05		
5.95	8144		
2.95	7549		✓
3.00 C	5.95		
5.90	8144		
2.40	7554		✓
3.50 C	5.90		
5.90	8144		
1.40	7554		✓
4.50 C	5.90		
5.90	8144		
0.40	7554		✓
5.50 C	5.90		
5.95	8144		
0.95	7549		✓
5.00 C	5.95		

G-29-50 FAIRGROUNDS

BM	5.24	1291.30	1276.06
IF			
IG			
IH			
I2			
I2			
IM			
IL			
IM			
IW			
IO			

OUT

PIPE of PSC 1N north

5.91	81.30	81.30	2.58
1.90	75.39	78.72	2.58
4.00	5.91	2.58	0.00
5.81	81.30	81.30	2.34
5.81	75.49	78.96	.84
0.00	5.71	2.34	1.50
5.76	81.30	81.30	2.43
2.26	75.54	78.87	.93
3.50	5.76	2.43	1.50
5.76	81.30	81.30	2.43
2.76	75.54	78.87	.43
3.00	5.76	2.43	2.00
5.76	81.30	81.30	2.43
.26	75.54	78.87	2.43
5.50	5.76	2.43	0.00
5.81	81.30	81.30	2.48
.81	75.49	78.82	2.48
5.00	5.81	2.48	0.00
	81.30	81.30	2.58
5.91	75.39	78.72	2.58
5.91	5.91	2.58	0.00
0.00	81.30	81.30	2.73
6.06	75.24	78.57	1.23
2.56	6.06	2.73	1.50
3.50	81.30	81.30	2.93
6.76	75.04	78.37	.43
1.76	6.26	2.93	2.50
5.00	81.30	81.30	3.18
6.51	74.79	78.12	2.18
6.51	6.51	3.18	1.00
0.00			

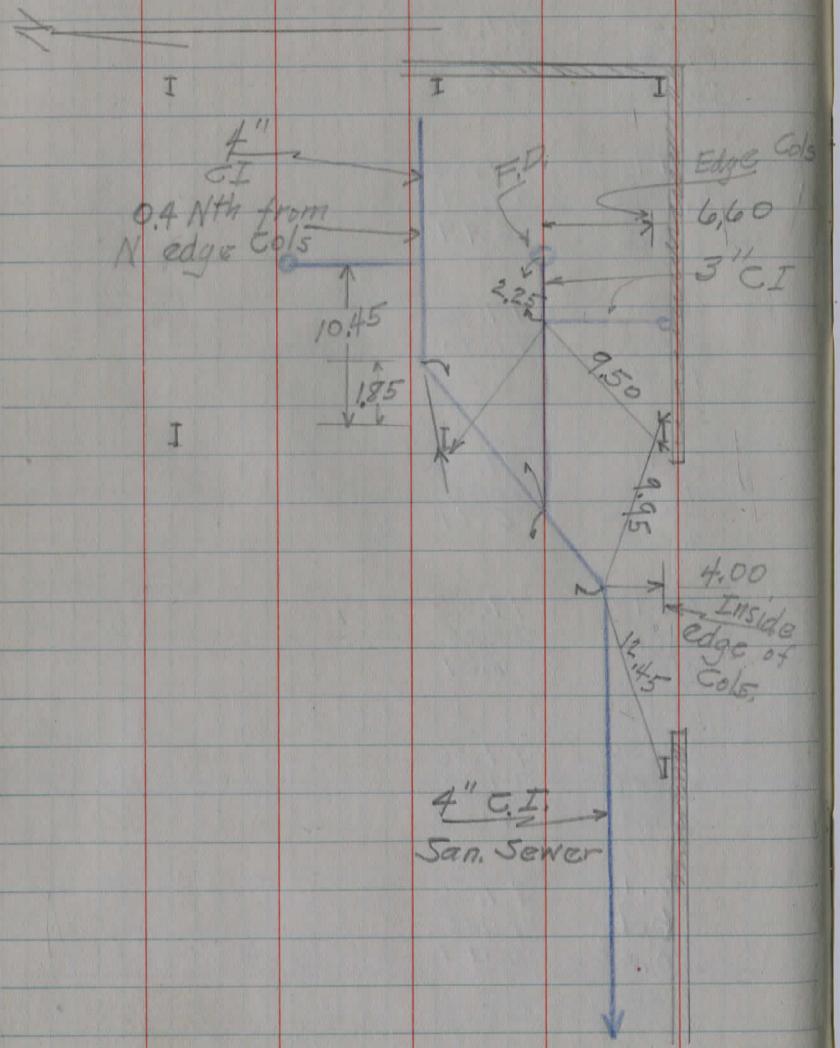
	+	HI	−	ELV
BM				1273.13
	9.43	1277.56		
A J				
A K				
A L				
A M				
A N				
A O				
A P				
BM			4.43	1273.13
A I				

WELL HOUSE 1N

6.32	77.56
6.32	71.24
0.00	6.32
6.49	77.56
5.99	71.07
.50	6.49
6.66	77.56
5.66	70.90
1.00	6.66
6.71	77.56
4.71	70.85
2.00	6.71
6.61	77.56
4.61	70.95
2.00	6.61
6.36	77.56
4.36	71.20
2.00	6.36
6.11	77.56
6.11	71.45
0.00	6.11
6.16	77.56
3.14	71.40
3.02	6.16

Toilet Waste lines 7/15/50

Sth. East Corner Grand stand



check grades Race track
7/29/50

T.P.	5.35	1281.41		1276.06
			inside	
I1			5.80 S	75.6 S
				75.5 = G
Ij			5.5 S	75.9 S
				75.54 = G
IK		81.41	5.3 S	76.1
		75.49		75.49 = G
		5.92		
I/			6.12 S	75.29
				75.39 G
Im			5.84 S	75.57
				75.24 G
In			6.35 S/	75.06
				75.04 G

stks to grade

outside

3.1 S
78.3 S
78.87 = G

2.54
78.87

2.65 S
78.76
78.87 = G

1.9 S
79.5
78.8 G
7.

81.41
78.82
2.59

2.66 S
78.75 78.72 G

2.94 S
78.47 78.57 = G

2.80 S
78.61 78.37 G

		1281.41	in		
Io			6.70 S	74.71	
				74.79	G
Ip		81.41 74.55 6.86	6.40 S	75.01	
				74.55	G
Ia East		81.41 74.30 7.11	6.30 S 75.11	74.30	G
I "		81.41 74.05 7.36	6.85 74.65		
H "			7.10 S 74.31	81.41 73.70 7.71	G
T.P	2.47	77.96	5.92	75.49	
G "			4.15 S	77.96 73.45 4.51	G

out

3.9 S		81.41 78.12 3.29
77.51	78.12 = G	
5.45 S		
75.96	76.63 G	
6.30 S		
75.11	75.13 G	
6.8 S		
74.6	74.60 G	
7.05 S	74.25 G	
74.36		
3.92 S		
74.04	74.00 G	

1277.96

F east			4.64 S	77.96
			(73.32)	73.20 G
				4.76
E "	old grade stk 2.50 cut 2'-6"		4.92 S	77.96
			(73.04)	72.95 G
				5.01
D "			5.70 S	77.96
			72.26	72.70 G
				5.26
C "			5.77 S	77.96
			72.19 S	72.45 G
				5.51
B "			6.15 S	77.96
			71.81 S	72.20 G
				5.76
A "			6.20	77.96
			71.76	71.95 G
				6.01
T.P.	4.21	77.67	4.50	73.46
A2			5.90 S	77.67
			71.77	71.70 G
				5.97

out

78

77.96		77.96
3.88 S		73.75 G
74.08		4.21
77.96		
3.78 S		77.96
74.18		73.506
		4.46
77.96		
4.64 S		77.96
73.32		73.25 G
		4.71
77.96		
4.88 S		77.96
73.08		73.50 G
		4.96
77.96		77.96
5.05		72.75 G
72.91		5.21
		72.50 G

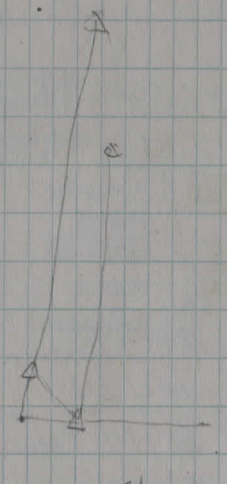
I.P. most S/y R = R of inside fence)

77.67		
4.95 S		77.67
72.72		72.53
		5.14

1277.67

Ap	77.67 6.2 S 71.47	71.45 G 6.22	
Ao	77.67 6.5 S 71.17	71.20 G 6.47	
An	77.67 6.6 S 71.07	70.95 G 6.72	
Am	77.67 6.7 S 70.97	70.85 G 6.82	
Al	77.67 7.1 S 70.57	70.90 G 6.77	
AK	77.67 6.95 S 70.72	71.07 G 6.60	
Aj	77.67 6.55 S 71.12	71.24 G 6.43	
top C.B.	7.43	70.24	
Ai	77.67 6.2 S 71.47	77.67 71.40 G 6.27	

	77.67 4.8 S 72.88	73.52 G 4.15
	77.67 5.0 S 72.67	74.53 G 3.14
	77.67 4.9 S 72.77	74.28 G 3.39
	77.67 4.9 S 72.77	74.18 G 3.49
	77.67 5.0 S 72.67	74.23 G 3.44
	77.67 4.9 S 72.77	74.40 G 3.27
	77.67 4.5 S 73.17	74.57 G 3.10
	77.67 4.3 S 73.37	77.67 74.73 G 2.94



Δ = 20-52-40 Δ/2 = 10-26-20

D = 6-00

E = 954.93 75.95 81.41 78.87 2.54

T = 175.94

L = 347.96 81 37 76.10 5.15

1102.86 10-26

12+0-97.14 = 2-55 7-31

13+0 5-55 4-31

14+0 8-55 1-31

P.T. +50.82 = 1-31 10-26

1851.68 14.5 12.75 1.75

612.85 12.75 1.75

64.53

1102.86 347.96 1450.82

97.14

954.93 3

18426

347.96

38|19|72 3 6 | 2087.78

19|09|86

13|81|972 8667 011 8778 7-31 2-55 10-26

76|39|44

95|49|3

15|936|032 -3

× ××× ×

CURVE TABLES.

Published by KEUFFEL & ESSER CO.

HOW TO USE CURVE TABLES.

Table I. 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 I.: 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.

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. I opposite 23° 20′ = 120.87
120.87 ÷ 12 = 10.07. Say a 10° Curve.

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

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.

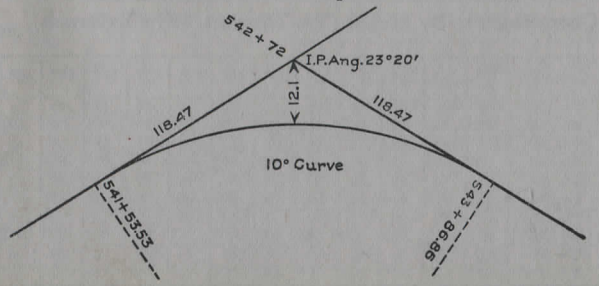


Table I. — Tangents and Externals to a 1° Curve.

Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
1°	50.00	.22	8°	400.66	13.99	15°	754.32	49.44
10′	58.34	.30	10′	409.03	14.58	10′	762.80	50.55
20	66.67	.39	20	417.41	15.18	20	771.29	51.68
30	75.01	.49	30	425.79	15.80	30	779.77	52.82
40	83.34	.61	40	434.17	16.43	40	788.26	53.97
50	91.68	.73	50	442.55	17.07	50	796.75	55.13
2	100.01	.87	9	450.93	17.72	16	805.25	56.31
10	108.35	1.02	10	459.32	18.38	10	813.75	57.50
20	116.68	1.19	20	467.71	19.06	20	822.25	58.70
30	125.02	1.36	30	476.10	19.75	30	830.76	59.91
40	133.36	1.55	40	484.49	20.45	40	839.27	61.14
50	141.70	1.75	50	492.88	21.16	50	847.78	62.38
3	150.04	1.96	10	501.28	21.89	17	856.30	63.63
10	158.38	2.19	10	509.68	22.62	10	864.82	64.90
20	166.72	2.43	20	518.08	23.38	20	873.35	66.18
30	175.06	2.67	30	526.48	24.14	30	881.88	67.47
40	183.40	2.93	40	534.89	24.91	40	890.41	68.77
50	191.74	3.21	50	543.29	25.70	50	898.95	70.09
4	200.08	3.49	11	551.70	26.50	18	907.49	71.42
10	208.43	3.79	10	560.11	27.31	10	916.03	72.76
20	216.77	4.10	20	568.53	28.14	20	924.58	74.12
30	225.12	4.42	30	576.95	28.97	30	933.13	75.49
40	233.47	4.76	40	585.36	29.82	40	941.69	76.86
50	241.81	5.10	50	593.79	30.68	50	950.25	78.26
5	250.16	5.46	12	602.21	31.56	19	958.81	79.67
10	258.51	5.83	10	610.64	32.45	10	967.38	81.09
20	266.86	6.21	20	619.07	33.35	20	975.96	82.53
30	275.21	6.61	30	627.50	34.26	30	984.53	83.97
40	283.57	7.01	40	635.93	35.18	40	993.12	85.43
50	291.92	7.43	50	644.37	36.12	50	1001.7	86.90
6	300.28	7.86	13	652.81	37.07	20	1010.3	88.39
10	308.64	8.31	10	661.25	38.03	10	1018.9	89.89
20	316.99	8.76	20	669.70	39.01	20	1027.5	91.40
30	325.35	9.23	30	678.15	39.99	30	1036.1	92.92
40	333.71	9.71	40	686.60	40.99	40	1044.7	94.46
50	342.08	10.20	50	695.06	42.00	50	1053.3	96.01
7	350.44	10.71	14	703.51	43.03	21	1061.9	97.57
10	358.81	11.22	10	711.97	44.07	10	1070.6	99.16
20	367.17	11.75	20	720.44	45.12	20	1079.2	100.75
30	375.54	12.29	30	728.90	46.18	30	1087.8	102.35
40	383.91	12.85	40	737.37	47.25	40	1096.4	103.97
50	392.28	13.41	50	745.85	48.34	50	1105.1	105.60

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
5°	T=.02	.03	.05	.06	.08	.10	.11	.13	.15	.16	.18	.20	.21	.23
	E=.000	.000	.001	.001	.002	.002	.002	.003	.003	.004	.004	.004	.005	.005
10°	T=.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
	E=.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	T=.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.53	.58	.63	.68
	E=.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	T=.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
	E=.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	T=.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
	E=.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135

Table I. — Tangents and Externals to a 1° Curve.

Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
22°	1113.7	107.24	29°	1481.8	188.51	36°	1861.7	294.9
10′	1122.4	108.90	10′	1490.7	190.74	10′	1870.9	297.7
20	1131.0	110.57	20	1499.6	192.99	20	1880.1	300.6
30	1139.7	112.25	30	1508.5	195.25	30	1889.4	303.5
40	1148.4	113.95	40	1517.4	197.53	40	1898.6	306.4
50	1157.0	115.66	50	1526.3	199.82	50	1907.9	309.3
23	1165.7	117.38	30	1535.3	202.12	37	1917.1	312.2
10	1174.4	119.12	10	1544.2	204.44	10	1926.4	315.2
20	1183.1	120.87	20	1553.1	206.77	20	1935.7	318.1
30	1191.8	122.63	30	1562.1	209.12	30	1945.0	321.1
40	1200.5	124.41	40	1571.0	211.48	40	1954.3	324.1
50	1209.2	126.20	50	1580.0	213.86	50	1963.6	327.1
24	1217.9	128.00	31	1589.0	216.3	38	1972.9	330.2
10	1226.6	129.82	10	1598.0	218.7	10	1982.2	333.2
20	1235.3	131.65	20	1606.9	221.1	20	1991.5	336.3
30	1244.0	133.50	30	1615.9	223.5	30	2000.9	339.3
40	1252.8	135.35	40	1624.9	226.0	40	2010.2	342.4
50	1261.5	137.23	50	1633.9	228.4	50	2019.6	345.5
25	1270.2	139.11	32	1643.0	230.9	39	2029.0	348.6
10	1279.0	141.01	10	1652.0	233.4	10	2038.4	351.8
20	1287.7	142.93	20	1661.0	235.9	20	2047.8	354.9
30	1296.5	144.85	30	1670.0	238.4	30	2057.2	358.1
40	1305.3	146.79	40	1679.1	241.0	40	2066.6	361.3
50	1314.0	148.75	50	1688.1	243.5	50	2076.0	364.5
26	1322.8	150.71	33	1697.2	246.1	40	2085.4	367.7
10	1331.6	152.69	10	1706.3	248.7	10	2094.9	371.0
20	1340.4	154.69	20	1715.3	251.3	20	2104.3	374.2
30	1349.2	156.70	30	1724.4	253.9	30	2113.8	377.5
40	1358.0	158.72	40	1733.5	256.5	40	2123.3	380.8
50	1366.8	160.76	50	1742.6	259.1	50	2132.7	384.1
27	1375.6	162.81	34	1751.7	261.8	41	2142.2	387.4
10	1384.4	164.86	10	1760.8	264.5	10	2151.7	390.7
20	1393.2	166.95	20	1770.0	267.2	20	2161.2	394.1
30	1402.0	169.04	30	1779.1	269.9	30	2170.8	397.4
40	1410.9	171.15	40	1788.2	272.6	40	2180.3	400.8
50	1419.7	173.27	50	1797.4	275.3	50	2189.9	404.2
28	1428.6	175.41	35	1806.6	278.1	42	2199.4	407.6
10	1437.4	177.55	10	1815.7	280.8	10	2209.0	411.1
20	1446.3	179.72	20	1824.9	283.6	20	2218.6	414.5
30	1455.1	181.89	30	1834.1	286.4	30	2228.1	418.0
40	1464.0	184.08	40	1843.3	289.2	40	2237.7	421.4
50	1472.9	186.29	50	1852.5	292.0	50	2247.3	425.0

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
20°	T=.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
	E=.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	T=.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
	E=.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°	T=.10	.19	.29	.39	.49	.59	.69	.79	.89	.99	1.09	1.20	1.29	1.39
	E=.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	T=.11	.22	.34	.47	.58	.69	.80	.93	1.05	1.17	1.29	1.42	1.54	1.66
	E=.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°	T=.13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
	E=.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	T=.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
	E=.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445

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

Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
43°	2257.0	428.5	**50°**	2671.8	592.3	**57°**	3110.9	790.1
10′	2266.6	432.0	10′	2681.9	596.6	10′	3121.7	795.2
20	2276.2	435.6	20	2692.1	600.9	20	3132.6	800.4
30	2285.9	439.2	30	2702.3	605.3	30	3143.4	805.6
40	2295.6	442.8	40	2712.5	609.6	40	3154.2	810.9
50	2305.2	446.4	50	2722.7	614.0	50	3165.1	816.1
44	2314.9	450.0	**51**	2732.9	618.4	**58**	3176.0	821.4
10	2324.6	453.6	10	2743.1	622.8	10	3186.9	826.7
20	2334.3	457.3	20	2753.4	627.2	20	3197.8	832.0
30	2344.1	461.0	30	2763.7	631.7	30	3208.8	837.3
40	2353.8	464.6	40	2773.9	636.2	40	3219.7	842.7
50	2363.5	468.4	50	2784.2	640.7	50	3230.7	848.1
45	2373.3	472.1	**52**	2794.5	645.2	**59**	3241.7	853.5
10	2383.1	475.8	10	2804.9	649.7	10	3252.7	858.9
20	2392.8	479.6	20	2815.2	654.3	20	3263.7	864.3
30	2402.6	483.4	30	2825.6	658.8	30	3274.8	869.8
40	2412.4	487.2	40	2835.9	663.4	40	3285.8	875.3
50	2422.3	491.0	50	2846.3	668.0	50	3296.9	880.8
46	2432.1	494.8	**53**	2856.7	672.7	**60**	3308.0	886.4
10	2441.9	498.7	10	2867.1	677.3	10	3319.1	892.0
20	2451.8	502.5	20	2877.5	682.0	20	3330.3	897.5
30	2461.7	506.4	30	2888.0	686.7	30	3341.4	903.2
40	2471.5	510.3	40	2898.4	691.4	40	3352.6	908.8
50	2481.4	514.3	50	2908.9	696.1	50	3363.8	914.5
47	2491.3	518.2	**54**	2919.4	700.9	**61**	3375.0	920.2
10	2501.2	522.2	10	2929.9	705.7	10	3386.3	925.9
20	2511.2	526.1	20	2940.4	710.5	20	3397.5	931.6
30	2521.1	530.1	30	2951.0	715.3	30	3408.8	937.3
40	2531.1	534.2	40	2961.5	720.1	40	3420.1	943.1
50	2541.0	538.2	50	2972.1	725.0	50	3431.4	948.9
48	2551.0	542.2	**55**	2982.7	729.9	**62**	3442.7	954.8
10	2561.0	546.3	10	2993.3	734.8	10	3454.1	960.6
20	2571.0	550.4	20	3003.9	739.7	20	3465.4	966.5
30	2581.0	554.5	30	3014.5	744.6	30	3476.8	972.4
40	2591.0	558.6	40	3025.2	749.6	40	3488.3	978.3
50	2601.1	562.8	50	3035.8	754.6	50	3499.7	984.3
49	2611.2	566.9	**56**	3046.5	759.6	**63**	3511.1	990.2
10	2621.2	571.1	10	3057.2	764.6	10	3522.6	996.2
20	2631.3	575.3	20	3067.9	769.7	20	3534.1	1002.3
30	2641.4	579.5	30	3078.7	774.7	30	3545.6	1008.3
40	2651.5	583.8	40	3089.4	779.8	40	3557.2	1014.4
50	2661.6	588.0	50	3100.2	784.9	50	3568.7	1020.5

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
40°	T=.13	.26	.40	.53	.67	.80	.93	.106	1.20	1.34	1.49	1.64	1.79	1.94
	E=.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	T=.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
	E=.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	T=.17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
	E=.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	T=.19	.38	.57	.76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
	E=.046	.093	.142	.188	.236	.283	.332	3.81	.420	.479	.530	.582	.641	.700
60°	T=.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
	E=.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	T=.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
	E=.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.711	.845	.922	1.01

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

Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
64°	3380.3	1026.6	**71°**	4086.9	1308.2	**78°**	4639.8	1643.0
10′	3591.9	1032.8	10′	4099.5	1315.6	10′	4653.6	1651.7
20	3603.5	1039.0	20	4112.1	1322.9	20	4667.4	1660.5
30	3615.1	1045.2	30	4124.8	1330.3	30	4681.3	1669.2
40	3626.8	1051.4	40	4137.4	1337.7	40	4695.2	1678.1
50	3638.5	1057.7	50	4150.1	1345.1	50	4709.2	1686.9
65	3650.2	1063.9	**72**	4162.8	1352.6	**79**	4723.2	1695.8
10	3661.9	1070.2	10	4175.6	1360.1	10	4737.2	1704.7
20	3673.7	1076.6	20	4188.5	1367.6	20	4751.2	1713.7
30	3685.4	1082.9	30	4201.2	1375.2	30	4765.3	1722.7
40	3697.2	1089.3	40	4214.0	1382.8	40	4779.4	1731.7
50	3709.0	1095.7	50	4226.8	1390.4	50	4793.6	1740.8
66	3720.9	1102.2	**73**	4239.7	1398.0	**80**	4807.7	1749.9
10	3732.7	1108.6	10	4252.6	1405.7	10	4822.0	1759.0
20	3744.6	1115.1	20	4265.6	1413.5	20	4836.2	1768.2
30	3756.5	1121.7	30	4278.5	1421.2	30	4850.5	1777.4
40	3768.5	1128.2	40	4291.5	1429.0	40	4864.8	1786.7
50	3780.4	1134.8	50	4304.6	1436.8	50	4879.2	1796.0
67	3792.4	1141.4	**74**	4317.6	1444.6	**81**	4893.6	1805.3
10	3804.4	1148.0	10	4330.7	1452.5	10	4908.0	1814.7
20	3816.4	1154.7	20	4343.8	1460.4	20	4922.5	1824.1
30	3828.4	1161.3	30	4356.9	1468.4	30	4937.0	1833.6
40	3840.5	1168.1	40	4370.1	1476.4	40	4951.5	1843.1
50	3852.6	1174.8	50	4383.3	1484.4	50	4966.1	1852.6
68	3864.7	1181.6	**75**	4396.5	1492.4	**82**	4980.7	1862.2
10	3876.8	1188.4	10	4409.8	1500.5	10	4995.4	1871.8
20	3889.0	1195.2	20	4423.1	1508.6	20	5010.0	1881.5
30	3901.2	1202.0	30	4436.4	1516.7	30	5024.8	1891.2
40	3913.4	1208.9	40	4449.7	1524.9	40	5039.5	1900.9
50	3925.6	1215.8	50	4463.1	1533.1	50	5054.3	1910.7
69	3937.9	1222.7	**76**	4476.5	1541.4	**83**	5069.2	1920.5
10	3950.2	1229.7	10	4489.9	1549.7	10	5084.0	1930.4
20	3962.5	1236.7	20	4503.4	1558.0	20	5099.0	1940.3
30	3974.8	1243.7	30	4516.9	1566.3	30	5113.9	1950.3
40	3987.2	1250.8	40	4530.4	1574.7	40	5128.9	1960.2
50	3999.5	1257.9	50	4544.0	1583.1	50	5143.9	1970.3
70	4011.9	1265.0	**77**	4557.6	1591.6	**84**	5159.0	1980.4
10	4024.4	1272.1	10	4571.2	1600.1	10	5174.1	1990.5
20	4036.8	1279.3	20	4584.8	1608.6	20	5189.3	2000.6
30	4049.3	1286.5	30	4598.5	1617.1	30	5204.4	2010.8
40	4061.8	1293.6	40	4612.2	1625.7	40	5219.7	2021.1
50	4074.4	1300.9	50	4626.0	1634.4	50	5234.9	2031.4

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
60°	T=.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3 07
	E=.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	T=.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
	E=.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.711	.845	.922	1.01
70°	T=.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
	E=.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	T=.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
	E=.095	.182	.286	.383	.480	.578	.678	.777	.877	.977	1.07	1.18	1.29	1.39
80°	T=.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
	E=.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	T=.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
	E=.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91

Table I. — Tangents and Externals to a 1° Curve.

Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
85°	5250.3	2041.7	**92°**	5933.2	2518.5	**99°**	6708.6	3092.7
10′	5265.6	2052.1	10′	5950.5	2531.0	10′	6728.4	3107.7
20	5281.0	2062.5	20	5967.9	2543.5	20	6748.2	3122.9
30	5296.4	2073.0	30	5985.3	2556.0	30	6768.1	3138.1
40	5311.9	2083.5	40	6002.7	2568.6	40	6788.1	3153.3
50	5327.4	2094.1	50	6020.2	2581.3	50	6808.2	3168.7
86	5343.0	2104.7	**93**	6037.8	2594.0	**100**	6828.3	3184.1
10	5358.6	2115.3	10	6055.4	2606.8	10	6848.5	3199.6
20	5374.2	2126.0	20	6073.1	2619.7	20	6868.8	3215.1
30	5389.9	2136.7	30	6090.8	2632.6	30	6889.2	3230.8
40	5405.6	2147.5	40	6108.6	2645.5	40	6909.6	3246.5
50	5421.4	2158.4	50	6126.4	2658.5	50	6930.1	3262.3
87	5437.2	2169.2	**94**	6144.3	2671.6	**101**	6950.6	3278.1
10	5453.1	2180.2	10	6162.6	2684.7	10	6971.3	3294.1
20	5469.0	2191.1	20	6180.2	2697.9	20	6992.0	3310.1
30	5484.9	2202.2	30	6198.3	2711.2	30	7012.7	3326.1
40	5500.9	2213.2	40	6216.4	2724.5	40	7033.6	3342.3
50	5517.0	2224.3	50	6234.6	2737.9	50	7054.5	3358.5
88	5533.1	2235.5	**95**	6252.8	2751.3	**102**	7075.5	3374.9
10	5549.2	2246.7	10	6271.1	2764.8	10	7096.6	3391.2
20	5565.4	2258.0	20	6289.4	2778.3	20	7117.8	3407.7
30	5581.6	2269.3	30	6307.9	2792.0	30	7139.0	3424.3
40	5597.8	2280.6	40	6326.3	2805.6	40	7160.3	3440.9
50	5614.2	2292.0	50	6344.8	2819.4	50	7181.7	3457.6
89	5630.5	2303.5	**96**	6363.4	2833.2	**103**	7203.2	3474.4
10	5646.9	2315.0	10	6382.1	2847.0	10	7224.7	3491.3
20	5663.4	2326.6	20	6400.8	2861.0	20	7246.3	3508.2
30	5679.9	2338.2	30	6419.5	2875.0	30	7268.0	3525.2
40	5696.4	2349.8	40	6438.4	2889.0	40	7289.8	3542.4
50	5713.0	2361.5	50	6457.3	2903.1	50	7311.7	3559.6
90	5729.7	2373.3	**97**	6476.2	2917.3	**104**	7333.6	3576.8
10	5746.3	2385.1	10	6495.2	2931.6	10	7355.6	3594.2
20	5763.1	2397.0	20	6514.3	2945.9	20	7377.8	3611.7
30	5779.9	2408.9	30	6533.4	2960.3	30	7399.9	3629.2
40	5796.7	2420.9	40	6552.6	2974.7	40	7422.2	3646.8
50	5813.6	2432.9	50	6571.9	2989.2	50	7444.6	3664.5
91	5830.5	2444.9	**98**	6591.2	3003.8	**105**	7467.0	3682.3
10	5847.5	2457.1	10	6610.6	3018.4	10	7489.6	3700.2
20	5864.6	2469.3	20	6630.1	3033.1	20	7512.2	3718.2
30	5881.7	2481.5	30	6649.6	3047.9	30	7534.9	3736.2
40	5898.8	2493.8	40	6669.2	3062.8	40	7557.7	3754.4
50	5916.0	2506.1	50	6688.8	3077.7	50	7580.5	3772.6

Corrections to be Added (T = Tangent. E. = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
85°	T=.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
	E=.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91
90°	T=.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
	E=.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°	T=.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
	E=.174	.350	.522	.706	.985	1.06	1.25	1.43	1.62	1.80	1.99	2.18	2.38	2.58
100°	T=.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
	E=.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96
105°	T=.46	.94	1.42	1.90	2.38	2.87	3.34	3.84	4.35	4.84	5.35	5.87	6.40	6.93
	E=.230	.470	.700	.938	1.17	1.42	1.65	1.90	2.14	2.39	2.64	2.90	3.16	3.41

Table I. — Tangents and Externals to a 1° Curve.

Chord = 100 ft.

Int. Angle	Tangent	External	Int. Angle	Tangent	External	Int. Angle	Tangent	External
106°	7603.5	3791.0	**111°**	8336.7	4386.1	**116°**	9169.4	5082.7
10′	7626.6	3809.4	10′	8362.7	4407.6	10′	9199.1	5107.9
20	7649.7	3827.9	20	8388.9	4429.2	20	9229.0	5133.3
30	7672.9	3846.5	20	8415.1	4450.9	30	9259.0	5158.8
40	7696.3	3865.2	40	8441.5	4472.7	40	9289.2	5184.5
50	7719.7	3884.0	50	8468.0	4494.6	50	9319.5	5210.3
107	7743.2	3902.9	**112**	8494.6	4516.6	**117**	9349.9	5236.2
10	7766.8	3921.9	10	8521.3	4538.8	10	9380.5	5262.3
20	7790.5	3940.9	20	8548.1	4561.1	20	9411.3	5288.6
30	7814.3	3960.1	30	8575.0	4583.4	30	9442.2	5315.0
40	7838.1	3979.4	40	8602.1	4606.0	40	9473.2	5341.5
50	7862.1	3998.7	50	8629.3	4628.6	50	9504.4	5368.2
108	7886.2	4018.2	**113**	8656.6	4651.3	**118**	9535.7	5395.1
10	7910.4	4037.8	10	8684.0	4674.2	10	9567.2	5422.1
20	7934.6	4057.4	20	8711.5	4697.2	20	9598.9	5449.2
30	7959.0	4077.2	30	8739.2	4720.3	30	9630.7	5476.5
40	7983.5	4097.1	40	8767.0	4743.6	40	9662.6	5504.0
50	8008.0	4117.0	50	8794.9	4766.9	50	9694.7	5531.7
109	8032.7	4137.1	**114**	8822.9	4790.4	**119**	9727.0	5559.4
10	8057.4	4157.3	10	8851.0	4814.1	10	9759.4	5587.4
20	8082.3	4177.5	20	8879.3	4837.8	20	9792.0	5615.5
30	8107.3	4197.9	30	8907.7	4861.7	30	9824.8	5643.8
40	8132.3	4218.4	40	8936.3	4885.7	40	9857.7	5672.3
50	8157.5	4239.0	50	8965.0	4909.9	50	9890.8	5700.9
110	8182.8	4259.7	**115**	8993.8	4934.1	**120**	9924.0	5729.7
10	8208.2	4280.5	10	9022.7	4958.6	10	9957.5	5758.6
20	8233.7	4301.4	20	9051.7	4983.1	20	9991.0	5787.7
30	8259.3	4322.4	30	9080.9	5007.8	30	10025.0	5817.0
40	8285.0	4343.6	40	9110.3	5032.6	40	10059.0	5846.5
50	8310.8	4364.8	50	9139.8	5057.6	50	10093.0	5876.1

Corrections to be Added (T = Tangent. E = External.)

Int. Angle	Curve 5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
100°	T=.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
	E=.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96
105°	T=.46	.94	1.42	1.90	2.38	2.87	3.34	3.84	4.35	4.84	5.35	5.87	6.40	6.93
	E=.230	.470	.700	.938	1.17	1.42	1.65	1.90	2.14	2.39	2.64	2.90	3.16	3.41
110°	T=.50	1.03	1.55	2.08	2.60	3.14	3.66	4.21	4.76	5.31	5.86	6.43	7.01	7.59
	E=.260	.535	.808	1.08	1.36	1.63	1.91	2.19	2.49	2.61	3.05	3.35	3.65	3.95
115°	T=.54	1.13	1.70	2.29	2.86	3.45	4.03	4.63	5.23	5.83	6.44	7.07	7.70	8.35
	E=.307	624	.939	1.26	1.57	1.89	2.21	2.54	2.87	3.20	3.53	3.88	4.23	4.58
120°	T=.61	1.25	1.89	2.52	3.16	3.81	4.44	5.11	5.78	6.44	7.11	7.80	8.51	9.21
	E=.339	.720	1.08	1.45	1.82	2.20	2.56	2.95	3.33	3.73	4.10	4.50	4.91	5.32

Table II. — Radii, Ordinates and Deflections. Chord = 100 ft.

Deg.	Radius	Mid. Ord.	Tan. Dist.	Def. Dist.	Def. for 1 Ft.	Deg.	Radius	Mid. Ord.	Tan. Dist.	Def. Dist.	Def. for 1 Ft.
	ft.	ft.	ft.	ft.	′		ft.	ft.	ft.	ft.	′
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	3.718	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	6.139	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

The middle ordinate in inches for any cord of length (C) is equal to .0012 C^2 multiplied by the middle ordinate taken from the above table. Thus, if it desired to bend a 30 ft. rail to fit a 10 degree curve, its middle ordinate should be .0012×900×2.183 or 2.36 inches.

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

Degree of Curve	Radius 50 / sin. ½ def. ang.	½ sub chord / R = sin of ½ def. angle				Length of arc for 100 ft.
		12.5 Ft.	15 Ft.	20 Ft.	25 Ft.	
30°	193.18	1° 51′	2° 17′	2° 58′	3° 43′	101.15
32°	181.39	1° 59′	2° 25′	3° 19′	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

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

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

$\text{Sin. } \frac{1}{2} D = \frac{50}{R}$

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

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

$R = \frac{50}{\text{Sin. } \frac{1}{2} D}$

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

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

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

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

$\text{Tan. def.} = \frac{1}{2} \text{ chord def.}$

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

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft. see Table II.), 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.

GENERAL DATA

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.

Leveling. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.5774 d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3} d^2$. Both corrections are negative.

Probable Error. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 = the sum of the squares of these differences and n = the number of observations, then the probable error of the mean $= \pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$

Solar Ephemeris. Attention is called to the Solar Ephemeris for the current year, published by Keuffel & Esser Co., and furnished free of charge upon request, which is $3\frac{1}{4} \times 5\frac{7}{8}$ in., with about 90 pages of data very useful to the Surveyor; such as the adjustments of transits, levels and solar attachments; directions and tables for determining the meridian and the latitude from observations on the sun and Polaris; stadia measurements; magnetic declination; arithmetic constants; English and Metric conversions; trigonometric formulas; Natural and Logarithmic Functions; and Logarithms of Numbers.

Table IV. — 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 V. — Inches in Decimals of a Foot.

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.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

Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
° ′							
0	0	0	1.	∞	∞	1.	90
10	0029	.0029		343.8	343.8	1.	50
20	.0058	.0058		171.9	171.9	.99998	40
30	.0087	.0087		114.6	114.6	.99996	30
40	.0116	.0116	1.0001	85.94	85.94	.99993	20
50	.0145	.0145	1.0001	68.76	68.75	.99989	10
1	.0175	.0175	1.0002	57.30	57.29	.99985	89
10	.0204	.0204	1.0002	49.11	49.10	.99979	50
20	.0233	.0233	1.0003	42.98	42.96	.99973	40
30	.0262	.0262	1.0003	38.20	38.19	.99966	30
40	.0291	.0291	1.0004	34.38	34.37	.99958	20
50	.0320	.0320	1.0005	31.26	31.24	.99949	10
2	.0349	.0349	1.0006	28.65	28.64	.99939	88
10	.0378	.0378	1.0007	26.45	26.43	.99929	50
20	.0407	.0407	1.0008	24.56	24.54	.99917	40
30	.0436	.0437	1.0010	22.93	22.90	.99905	30
40	.0465	.0466	1.0011	21.49	21.47	.99892	20
50	.0494	.0495	1.0012	20.23	20.21	.99878	10
3	.0523	.0524	1.0014	19.11	19.08	.99863	87
10	.0552	.0553	1.0015	18.10	18.07	.99847	50
20	.0581	.0582	1.0017	17.20	17.17	.99831	40
30	.0610	.0612	1.0019	16.38	16.35	.99813	30
40	.0640	.0641	1.0020	15.64	15.60	.99795	20
50	.0669	.0670	1.0022	14.96	14.92	.99776	10
4	.0698	.0699	1.0024	14.34	14.30	.99756	86
10	.0727	.0729	1.0027	13.76	13.73	.99736	50
20	.0756	.0758	1.0029	13.23	13.20	.99714	40
30	.0785	.0787	1.0031	12.75	12.71	.99692	30
40	.0814	.0816	1.0033	12.29	12.25	.99668	20
50	.0843	.0846	1.0036	11.87	11.83	.99644	10
5	.0872	.0875	1.0038	11.47	11.43	.99619	85
10	.0901	.0904	1.0041	11.10	11.06	.99594	50
20	.0929	.0934	1.0043	10.76	10.71	.99567	40
30	.0958	.0963	1.0046	10.43	10.39	.99540	30
40	.0987	.0992	1.0049	10.13	10.08	.99511	20
50	.1016	.1022	1.0052	9.839	9.788	.99482	10
6	.1045	.1051	1.0055	9.567	9.514	.99452	84
10	.1074	.1080	1.0058	9.309	9.255	.99421	50
20	.1103	.1110	1.0061	9.065	9.010	.99390	40
30	.1132	.1139	1.0065	8.834	8.777	.99357	30
40	.1161	.1169	1.0068	8.614	8.556	.99324	20
50	.1190	.1198	1.0072	8.405	8.345	.99290	10
7	.1219	.1228	1.0075	8.206	8.144	.99255	83
10	.1248	.1257	1.0079	8.016	7.953	.99219	50
20	.1276	.1287	1.0082	7.834	7.770	.99182	40
30	.1305	.1317	1.0086	7.661	7.596	.99144	30
40	.1334	.1346	1.0090	7.496	7.429	.99106	20
50	.1363	.1376	1.0094	7.337	7.269	.99067	10
							82
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
° ′							
8	.1392	.1405	1.0098	7 185	7.115	.99027	82
10	.1421	.1435	1.0102	7.040	6.968	.98986	50
20	.1449	.1465	1.0107	6.900	6.827	.98944	40
30	.1478	.1495	1.0111	6.766	6.691	.98902	30
40	.1507	.1524	1.0115	6.636	6.561	.98858	20
50	.1536	.1554	1.0120	6.512	6.435	.98814	10
9	.1564	.1584	1.0125	6.394	6.314	.98769	81
10	.1593	.1614	1.0129	6.277	6.197	.98723	50
20	.1622	.1644	1.0134	6.166	6.084	.98676	40
30	.1650	.1673	1.0139	6.059	5.976	.98629	30
40	.1679	.1703	1.0144	5.955	5.871	.98580	20
50	.1708	.1733	1.0149	5.855	5.769	.98531	10
10	.1736	.1763	1.0154	5.759	5.671	.98481	80
10	.1765	.1793	1.0160	5.665	5.576	.98430	50
20	.1794	.1823	1.0165	5.575	5.485	.98378	40
30	.1822	.1853	1.0170	5.488	5.396	.98325	30
40	.1851	.1883	1.0176	5.403	5.309	.98272	20
50	.1880	.1914	1.0181	5.320	5.226	.98218	10
11	.1908	.1944	1.0187	5.241	5.145	.98163	79
10	.1937	.1974	1.0193	5.164	5.066	.98107	50
20	.1965	.2004	1.0199	5.089	4.989	.98050	40
30	.1994	.2035	1.0205	5.016	4.915	.97992	30
40	.2022	.2065	1.0211	4.945	4.843	.97934	20
50	.2051	.2095	1.0217	4.877	4.773	.97875	10
12	.2079	.2126	1.0223	4.810	4.705	.97815	78
10	.2108	.2156	1.0230	4.745	4.638	.97754	50
20	.2136	.2186	1.0236	4.682	4.574	.97692	40
30	.2164	.2217	1.0243	4.620	4.511	.97630	30
40	.2193	.2247	1.0249	4.560	4.449	.97566	20
50	.2221	.2278	1.0256	4.502	4.390	.97502	10
13	.2250	.2309	1.0263	4.445	4.331	.97437	77
10	.2278	.2339	1.0270	4.390	4.275	.97371	50
20	.2306	.2370	1.0277	4.336	4.219	.97304	40
30	.2334	.2401	1.0284	4.284	4.165	.97237	30
40	.2363	.2432	1.0291	4.232	4.113	.97169	20
50	.2391	.2462	1.0299	4.182	4.061	.97100	10
14	.2419	.2493	1.0306	4.133	4.011	.97030	76
10	.2447	.2524	1.0314	4.086	3.962	.96959	50
20	.2476	.2555	1.0321	4.039	3.914	.96887	40
30	.2504	.2586	1.0329	3.994	3.867	.96815	30
40	.2532	.2617	1.0337	3.949	3.821	.96742	20
50	.2560	.2648	1.0345	3.906	3.776	.96667	10
15	.2588	.2679	1.0353	3.864	3.732	.96593	75
10	.2616	.2711	1.0361	3.822	3.689	.96517	50
20	.2644	.2742	1.0369	3.782	3.647	.96440	40
30	.2672	.2773	1.0377	3.742	3.606	.96363	30
40	.2700	.2805	1.0386	3.703	3.566	.96285	20
50	.2728	.2836	1.0394	3.665	3.526	.96206	10
							74
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

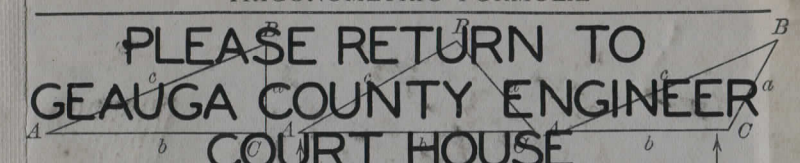
Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
° ′							
16	.2756	.2867	1.0403	3.628	3.487	.96126	74
10	.2784	.2899	1.0412	3.592	3.450	.96046	50
20	.2812	.2931	1.0423	3.556	3.412	.95964	40
30	.2840	.2962	1.0429	3.521	3.376	.95882	30
40	.2868	.2994	1.0438	3.487	3.340	.95799	20
50	.2896	.3026	1.0448	3.453	3.305	.95715	10
17	.2924	.3057	1.0457	3.420	3.271	.95630	73
10	.2952	.3089	1.0466	3.388	3.237	.95545	50
20	.2979	.3121	1.0476	3.357	3.204	.95459	40
30	.3007	.3153	1.0485	3.326	3.172	.95372	30
40	.3035	.3185	1.0495	3.295	3.140	.95284	20
50	.3062	.3217	1.0505	3.265	3.108	.95195	10
18	.3090	.3249	1.0515	3.236	3.078	.95106	72
10	.3118	.3281	1.0525	3.207	3.048	.95015	50
20	.3145	.3314	1.0535	3.179	3.018	.94924	40
30	.3173	.3346	1.0545	3.152	2.989	.94832	30
40	.3201	.3378	1.0555	3.124	2.960	.94740	20
50	.3228	.3411	1.0566	3.098	2.932	.94646	10
19	.3256	.3443	1.0576	3.072	2.904	.94552	71
10	.3283	.3476	1.0587	3.046	2.877	.94457	50
20	.3311	.3508	1.0598	3.020	2.850	.94361	40
30	.3338	.3541	1.0608	2.996	2.824	.94264	30
40	.3365	.3574	1.0619	2.971	2.798	.94167	20
50	.3393	.3607	1.0631	2.947	2.773	.94068	10
20	.3420	.3640	1.0642	2.924	2.747	.93969	70
10	.3448	.3673	1.0653	2.900	2.723	.93869	50
20	.3475	.3706	1.0665	2.878	2.699	.93769	40
30	.3502	.3739	1.0676	2.856	2.675	.93667	30
40	.3529	.3772	1.0688	2.833	2.651	.93565	20
50	.3557	.3805	1.0700	2.811	2.628	.93462	10
21	.3584	.3839	1.0711	2.790	2.605	.93358	69
10	.3611	.3872	1.0723	2.769	2.583	.93253	50
20	.3638	.3906	1.0736	2.749	2.560	.93148	40
30	.3665	.3939	1.0748	2.729	2.539	.93042	30
40	.3692	.3973	1.0760	2.709	2.517	.92935	20
50	.3719	.4006	1.0773	2.689	2.496	.92827	10
22	.3746	.4040	1.0785	2.670	2.475	.92718	68
10	.3773	.4074	1.0798	2.650	2.455	.92609	50
20	.3800	.4108	1.0811	2.632	2.434	.92499	40
30	.3827	.4142	1.0824	2.613	2.414	.92388	30
40	.3854	.4176	1.0837	2.595	2.394	.92276	20
50	.3881	.4210	1.0850	2.577	2.375	.92164	10
23	.3907	.4245	1.0864	2.559	2.356	.92050	67
10	.3934	.4279	1.0877	2.542	2.337	.91936	50
20	.3961	.4314	1.0891	2.525	2.318	.91822	40
30	.3987	.4348	1.0904	2.508	2.300	.91706	30
40	.4014	.4383	1.0918	2.491	2.282	.91590	20
50	.4041	.4417	1.0932	2.475	2.264	.91472	10
							66
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
° ′							
24	.4067	.4452	1.0946	2.459	2.246	.91355	66
10	.4094	.4487	1.0961	2.443	2.229	.91236	50
20	.4120	.4522	1.0975	2.427	2.211	.91116	40
30	.4147	.4557	1.0989	2.411	2.194	.90996	30
40	.4173	.4592	1.1004	2.396	2.177	.90875	20
50	.4200	.4628	1.1019	2.381	2.161	.90753	10
25	.4226	.4663	1.1034	2.366	2.145	.90631	65
10	.4253	.4699	1.1049	2.351	2.128	.90507	50
20	.4279	.4734	1.1064	2.337	2.112	.09383	40
30	.4305	.4770	1.1079	2.323	2.097	.90259	30
40	.4331	.4806	1.1095	2.309	2.081	.90133	20
50	.4358	.4841	1.1110	2.295	2.066	.90007	10
26	.4384	.4877	1.1126	2.281	2.050	.89879	64
10	.4410	.4913	1.1142	2.268	2.035	.89752	50
20	.4436	.4950	1.1158	2.254	2.020	.89623	40
30	.4462	.4986	1.1174	2.241	2.006	.89493	30
40	.4488	.5022	1.1190	2.228	1.991	.89363	20
50	.4514	.5059	1.1207	2.215	1.977	.89232	10
27	.4540	.5095	1.1223	2.203	1.963	.89101	63
10	.4566	.5132	1.1240	2.190	1.949	.88968	50
20	.4592	.5169	1.1257	2.178	1.935	.88835	40
30	.4617	.5206	1.1274	2.166	1.921	.88701	30
40	.4643	.5243	1.1291	2.154	1.907	.88566	20
50	.4669	.5280	1.1308	2.142	1.894	.88431	10
28	.4695	.5317	1.1326	2.130	1.881	.88295	62
10	.4720	.5354	1.1343	2.119	1.868	.88158	50
20	.4746	.5392	1.1361	2.107	1.855	.88020	40
30	.4772	.5430	1.1379	2.096	1.842	.87882	30
40	.4797	.5467	1.1397	2.085	1.829	.87743	20
50	.4823	.5505	1.1415	2.073	1.816	.87603	10
29	.4848	.5543	1.1434	2.063	1.804	.87462	61
10	.4874	.5581	1.1452	2.052	1.792	.87321	50
20	.4899	.5619	1.1471	2.041	1.780	.87178	40
30	.4924	.5658	1.1490	2.031	1.767	.87036	30
40	.4950	.5696	1.1509	2.020	1.756	.86892	20
50	.4975	.5735	1.1528	2.010	1.744	.86748	10
30	.5000	.5774	1.1547	2.000	1.732	.86603	60
10	.5025	.5812	1.1566	1.990	1.720	.86457	50
20	.5050	.5851	1.1586	1.980	1.709	.86310	40
30	.5075	.5890	1.1606	1.970	1.698	.86163	30
40	.5100	.5930	1.1626	1.961	1.686	.86015	20
50	.5125	.5969	1.1646	1.951	1.675	.85866	10
31	.5150	.6009	1.1666	1.942	1.664	.85717	59
10	.5175	.6048	1.1687	1.932	1.653	.85567	50
20	.5200	.6088	1.1707	1.923	1.643	.85416	40
30	.5225	.6128	1.1728	1.914	1.632	.85264	30
40	.5250	.6168	1.1749	1.905	1.621	.85112	20
50	.5275	.6208	1.1770	1.896	1.611	.84959	10
							58
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle

Natural Trigonometrical Functions

Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
° ′							° ′
32	.5299	.6249	1.1792	1.887	1.600	.84805	58
10	.5324	.6289	1.1813	1.878	1.590	.84650	50
20	.5348	.6330	1.1835	1.870	1.580	.84495	40
30	.5373	.6371	1.1857	1.861	1.570	.84339	30
40	.5398	.6412	1.1879	1.853	1.560	.84182	20
50	.5422	.6453	1.1901	1.844	1.550	.84025	10
33	.5446	.6494	1.1924	1.836	1.540	.83867	57
10	.5471	.6536	1.1946	1.828	1.530	.83708	50
20	.5495	.6577	1.1969	1.820	1.520	.83549	40
30	.5519	.6619	1.1992	1.812	1.511	.83389	30
40	.5544	.6661	1.2015	1.804	1.501	.83228	20
50	.5568	.6703	1.2039	1.796	1.492	.83066	10
34	.5592	.6745	1.2062	1.788	1.483	.82904	56
10	.5616	.6787	1.2086	1.781	1.473	.82741	50
20	.5640	.6830	1.2110	1.773	1.464	.82577	40
30	.5664	.6873	1.2134	1.766	1.455	.82413	30
40	.5688	.6916	1.2158	1.758	1.446	.82248	20
50	.5712	.6959	1.2183	1.751	1.437	.82082	10
35	.5736	.7002	1.2208	1.743	1.428	.81915	55
10	.5760	.7046	1.2233	1.736	1.419	.81748	50
20	.5783	.7089	1.2258	1.729	1.411	.81580	40
30	.5807	.7133	1.2283	1.722	1.402	.81412	30
40	.5831	.7177	1.2309	1.715	1.393	.81242	20
50	.5854	.7221	1.2335	1.708	1.385	.81072	10
36	.5878	.7265	1.2361	1.701	1.376	.80902	54
10	.5901	.7310	1.2387	1.695	1.368	.80730	50
20	.5925	.7355	1.2413	1.688	1.360	.80558	40
30	.5948	.7400	1.2440	1.681	1.351	.80386	30
40	.5972	.7445	1.2466	1.675	1.343	.80212	20
50	.5995	.7490	1.2494	1.668	1.335	.80038	10
37	.6018	.7536	1.2521	1.662	1.327	.79864	53
10	.6041	.7581	1.2549	1.655	1.319	.79688	50
20	.6065	.7627	1.2577	1.649	1.311	.79512	40
30	.6088	.7673	1.2605	1.643	1.303	.79335	30
40	.6111	.7720	1.2633	1.636	1.295	.79158	20
50	.6134	.7766	1.2661	1.630	1.288	.78980	10
38	.6157	.7813	1.2690	1.624	1.280	.78801	52
10	.6180	.7860	1.2719	1.618	1.272	.78622	50
20	.6202	.7907	1.2748	1.612	1.265	.78442	40
30	.6225	.7954	1.2778	1.606	1.257	.78261	30
40	.6248	.8002	1.2808	1.601	1.250	.78079	20
50	.6271	.8050	1.2838	1.595	1.242	.77897	10
Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle	

Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
° ′							° ′
39	.6293	.8098	1.2868	1.589	1.235	.77715	51
10	.6316	.8146	1.2898	1.583	1.228	.77531	50
20	.6338	.8195	1.2929	1.578	1.220	.77347	40
30	.6361	.8243	1.2959	1.572	1.213	.77162	30
40	.6383	.8292	1.2991	1.567	1.206	.76977	20
50	.6406	.8342	1.3022	1.561	1.199	.76791	10
40	.6428	.8391	1.3054	1.556	1.192	.76604	50
10	.6450	.8441	1.3086	1.550	1.185	.76417	50
20	.6472	.8491	1.3118	1.545	1.178	.76229	40
30	.6494	.8541	1.3151	1.540	1.171	.76041	30
40	.6517	.8591	1.3184	1.535	1.164	.75851	20
50	.6539	.8642	1.3217	1.529	1.157	.75661	10
41	.6561	.8693	1.3251	1.524	1.150	.75471	49
10	.6583	.8744	1.3284	1.519	1.144	.75280	50
20	.6604	.8796	1.3318	1.514	1.137	.75088	40
30	.6626	.8847	1.3352	1.509	1.130	.74896	30
40	.6648	.8899	1.3386	1.504	1.124	.74703	20
50	.6670	.8952	1.3421	1.499	1.117	.74509	10
42	.6691	.9004	1.3456	1.494	1.111	.74314	48
10	.6713	.9057	1.3492	1.490	1.104	.74120	50
20	.6734	.9110	1.3527	1.485	1.098	.73924	40
30	.6756	.9163	1.3563	1.480	1.091	.73728	30
40	.6777	.9217	1.3600	1.476	1.085	.73531	20
50	.6799	.9271	1.3636	1.471	1.079	.73333	10
43	.6820	.9325	1.3673	1.466	1.072	.73135	47
10	.6841	.9380	1.3711	1.462	1.066	.72937	50
20	.6862	.9435	1.3748	1.457	1.060	.72737	40
30	.6884	.9490	1.3786	1.453	1.054	.72537	30
40	.6905	.9545	1.3824	1.448	1.048	.72337	20
50	.6926	.9601	1.3863	1.444	1.042	.72136	10
44	.6947	.9657	1.3902	1.440	1.036	.71934	46
10	.6967	.9713	1.3941	1.435	1.030	.71732	50
20	.6988	.9770	1.3980	1.431	1.024	.71529	40
30	.7009	.9827	1.4020	1.427	1.018	.71325	30
40	.7030	.9884	1.4061	1.422	1.012	.71121	20
50	.7050	.9942	1.4101	1.418	1.006	.70916	10
	.7071	1.	1.414	1.414	1.	.70711	45
Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sin.	Angle	



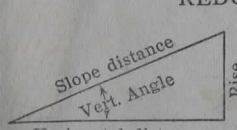
For Angle A. $\sin = \frac{a}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B, c = \sqrt{a^2 + b^2} = a\sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B, b = \sqrt{(c+a)(c-a)} = c\sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90° - A, b = a \cot A, c = \frac{a}{\sin A}$.
A, b	B, a, c	$B = 90° - A, a = b \tan A, c = \frac{b}{\cos A}$.
A, c	B, a, b	$B = 90° - A, a = c \sin A, b = c \cos A$,

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}, C = 180° - (A + B), c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}, C = 180° - (A + B), c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180° - C, \tan \frac{1}{2}(A - B) = \frac{(a-b)\tan \frac{1}{2}(A+B)}{a+b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2}, \sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{b\,c}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{a\,c}}, C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{b\,c \sin A}{2}$
A, B, C, a	Area	area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = 5° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .9959 = 318.09 ft. Horizontal distance also = Slope distance minus slope distance times (1 — cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. Cosine 5° 10′ = .9959. 1 — .9959 = .0041. 319.4 × .0041 = 1.31. 319.4 — 1.31 = 318.09 ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance $= 302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.

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