

CLARIDON~BURTON
COUNTY ROAD
SEC. "B"

73

LEVEL BOOK

1307

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

114
36
78
52
26

Burton to Claridon

BURTON-CLARIDON
SECTION "B"

COUNTY ROAD

CLARIDON TOWNSHIP

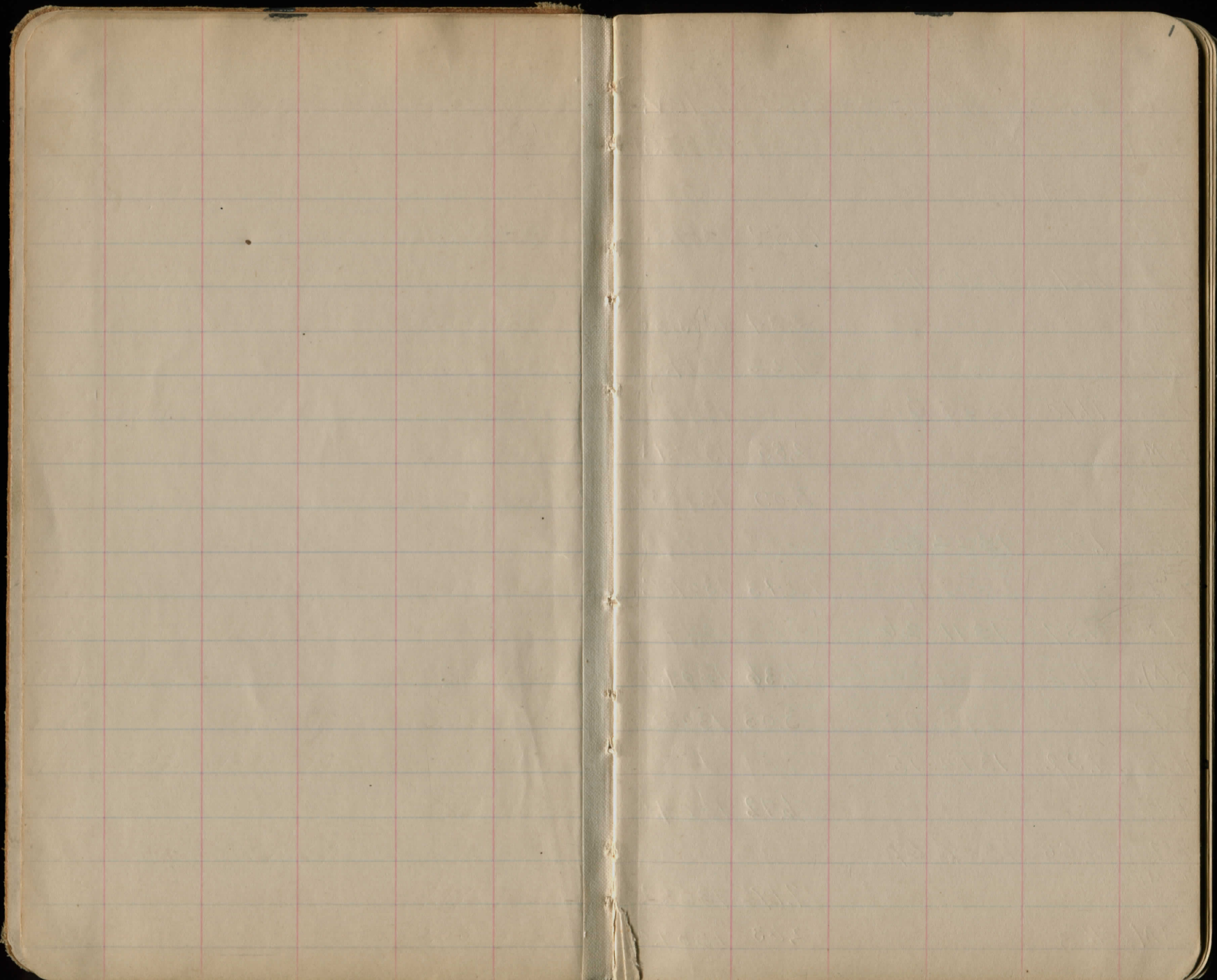
GEAUGA COUNTY, O..

L. J. McNAUGHTON
COUNTY HIGHWAY SUPERINTENDENT
1916

Benchmarks - pg. 2-5

X-Sections - pg. 8-24

73



Sta.	B.S.	H.I.	F.S.	Elev.	MARKS
BM				1323.91	on Elm tree in S.W. cor. of Park ^{Park} Christen
H.I.	2.34	1326 25			
T.P.			11.70	1314.55	
H.I.	1.17	1315 72			
TEMP B.M.			2.34	1313.58	X ON N.E. COR. OF EAST PARAPET
T.P.			1.22	1314.50	
H.I.	11.10	13 25 60		10	
BM #1			2.85	1322.75	LARGE TACK ON 30" ASH TREE IN FRONT OF J. DE RITT. #103450
T.P.			5.09	1320.51	
H.I.	1.81	13 22 32			
T.P.			12.43	1309.89	
H.I.	1.37	13 11 26			
BM #2			6.36	1309.90	LARGE TACK ON 8" MAPLE 30 W. STA. 95+05
T.P.			3.03	1308.23	
H.I.	1.92	13 10 15			
T.P.			6.12	1304.03	
H.I.	5.66	13 09 69			
TEMP B.M.			7.19	1302.50	X ON N.E. COR. OF EAST PARAPET
BM #3			2.63	1307.06	BIG TACK ON 10" MAPLE 30' W. OF STR. 79

STA.	B. S.	H. I.	F. S.	ELEV.	
T.P.			5.34	1304.35	
H.I.	2.19	1306.54			
T.P.			7.49	1299.05	
H.I.	3.51	1302.56			
B.M.	#4		1.03	1301.53	TACK ON N.W. Root 2" APPLE STA. 65+10
T.P.			12.08	1290.98	
H.I.	6.53	1297.01		1297.01	
TEMP					
B.M.	#5		11.56	1285.45	X ON N.E. COR. OF E. PARAPET STA.
B.M.	#5		4.20	1292.81	ON 2" THORN APPLE 30' R. OF STA
T.P.			12.68	1284.53	
H.I.	0.84	1283.17			
B.M.	#6		5.63	1279.54	TACK ON N. Root 12" MAPLE 30' L. STA. 99+5
T.P.			11.09	1274.13	
H.I.	0.91	1273.04			
B.M.	#7		6.09	1268.95	LARGE TACK ON 20" MAPLE 30' L. STA.
T.P.			10.86	1264.18	
H.I.	1.32	1265.50			
T.P.		DINNER	12.26	1253.24	

✓

STA.	B.S.	H.I.	F.S.	ELEV.	
	1.78	1255 02			
TEMP			3.98	1251.04	X ON N.E. COR. OF EAST FRAMPET
B.M. # 8			3.18	1251.84	LARGE TACK ON ROOT OF 10' MAPLE 30' R. STA.
T.P.			6.91	1248.11	
H.I.	2.32	1250 43			
B.M. # 9			3.40	1247.83	ON BASE OF N.E. COR. BOARD F.M. NISH'S - MAIN PART
T.P.			5.90	1244.53	
H.I.	0.96	1245 49			
T.P.			11.66	1253.83	
H.I.	0.35	1234 18			
B.M. # 10			6.11	1228.07	LARGE TACK, N.E. ROOT 18" MAPLE 30 L. STA. 22
T.P.			11.98	1222.20	
H.I.	0.60	1222 80			
B.M. # 11			4.31	1218.49	TACK S.E. ROOT PEAR TREE 50 L. STA.
T.P.			11.38	1211.42	
H.I.	0.26	1211 68		1211.68	
B.M. # 12			5.48	1206.20	TACK ON E. ROOT 3' MAPLE 50 L. OF STA 6
H.I.	3.83	1240 03			

27+60

✓

STA	B.S.	H I	F S	ELEV.	
TP			12.48	1199.55	
H.I.	764	1205	19		
TEMP.					
B.M.			9.20	1195.99	X ON STONE S.E. COR. BRIDGE
B.M. #13			0.87	1204.32	TACK ON ROOT 10" WILD CHERRY @ STA. 0-80

FINIS

✓

STA.	+BS	CHECK		F S	ELEV.	LEVELS
		H	I.			
B.M.	#13				1209.32	TACK ON ROOT 10" WILD CHERRY 30' R. STA. 0-80
H.I.	0.87	1205	19			
T.P.				6.11	1199.08	
H.I.	10.55	1209	63			
B.M.	#12			3.44	1206.19	TACK - E. ROOT 3' MAPLE 50' L OF STA. 6
T.P.				3.32	1206.31	
H.I.	12.98	1219	29		1219.29	
B.M.	#11			0.80	1218.49	TACK ON S.E. ROOT PEAR TREE 50' L. STA. 16+90
T.P.				0.25	1219.04	
H.I.	11.10	1230	14			
B.M.	#10			2.10	1228.04	TACK ON N.E. ROOT 18" MAPLE 30' L. STA. 22
T.P.				0.73	1229.41	
H.I.	13.09	1242	50			
T.P.				1.38	1241.12	
H.I.	8.10	1249	22			
T.P.						
B.M.	#9			2.17	1247.05	P. M ^E NISH'S BASE OF COR. BOARD. N.E. COR. MAIN PART-27+60

GROSS

STA B.S. H I F.S. ELEV

B.M. #13 1209.32

H I 0.32 1209.64

0-100 1.0 1203.⁶

0 8.3 1196.3

1 8.5 1196.1

1+25 7.4 1197.2

2 8.8 1195.8

T.P. 2.12 1202.52

H I 8.27 1210.79

3 11.9 1198.9

4 7.5 1203.3

5 5.5 1205.3

W. Henry
G. Welsh

SECTION NOTES

TACK IN ROOT. 10 WILD CHERRY 30 R. STA 0-80

1.0
00
-0.4 -0.4 +0.7 -0.2 +0.2 -2.9 -2.9
1.9 7.9 9.0 8.3 8.1 8.5 5.9 5.4
25 20 7 00 13 16 20 25

+2.5 +2.9 -0.2 -0.1 +1.5 +1.8
11.0 10.9 8.3 8.5 8.9 10.0 10.3
25 13 9 00 9 8 25

BRIDGE 7.4
00
+1.5 +2.0 +2.9 +1.3 +0.1 0.0 +0.7 +0.2 +0.5
10.3 10.8 11.2 10.1 8.9 8.8 8.8 9.5 9.0 9.3
25 20 16 13 9 00 9 13 15 25

-1.9 +3.0 -0.1 +0.1 +0.7 +0.4 -3.3
10.0 14.9 11.8 11.9 12.0 12.6 12.3 8.6
25 17 11 00 6 8 13 25

-1.7 +3.3 +0.1 +0.7 -2.4 -2.2
5.8 10.8 7.6 7.5 7.9 5.1 5.3
25 17 12 00 9 19 25

-0.3 +4.4 +0.1 -0.5
5.2 9.9 5.6 5.5 5.0
25 17 9 00 25

STA. B.S. H I F.S. ELEV
 6 12 10 79 5.6 1205.2

LT 2 RT
 -0.6 -0.2 +3.7 +0.6 +0.8 -1.8 -1.8
 5.0 5.4 9.3 6.2 5.6 6.4 3.8 3.8
 25 22 17 9 0 0 15 20 25

? B.M. #12 4.58 1206.21
 7 6.6 1204.2

TRACK BOX E. ROOT 3' MAPLE - 50 L. OF STA. 6
 -0.1 +0.5 +2.4 +0.8 +6.5 +0.9
 6.5 7.1 7.5 7.4 6.6 8.1 7.5
 25 20 16 12 0 0 18 25

8 5.6 1205.2

+0.7 +1.0 +2.1 +1.9 +0.6 +0.4 +2.2 +1.4 +0.9
 6.3 6.6 7.7 7.5 6.2 5.6 6.0 7.8 7.0 6.5
 25 18 12 8 9 0 0 13 17 19 25

T.P. 4.91 1205.88

H.I. 9.13 1215.01

-0.3 0.0 +1.0 +0.1 +0.8 -0.1 -0.1
 9.6 9.9 10.9 9.9 10.0 10.7 9.8 9.8
 25 12 9 0 0 18 19 20 25

9 9.9 1205.1

10 9.0 1206.0

-0.2 +0.2 +1.1 +0.3 0.0 +0.7 +0.3 -1.0
 8.8 9.2 10.1 9.3 9.0 9.0 9.7 9.3 8.0
 25 15 12 10 0 0 15 16 17 25

11 7.7 1207.3

+0.1 +0.6 +1.2 +0.3 +0.4 +1.1 +0.3 -0.7
 7.8 8.3 8.9 8.0 7.7 8.1 8.8 8.0 7.0
 25 14 12 9 0 0 14 15 17 25

12 6.1 1208.9

+0.3 +0.9 +1.5 +1.0 +0.3 +0.9 +0.4 -0.2
 6.4 7.0 7.6 7.1 6.1 6.4 7.0 6.5 5.9
 25 19 13 11 0 0 12 15 18 25

STA. B.S. H T F.S. ELEV.

1215 01

13

AA 1210.6

14

2.5 1212.5

T.P.

0.69 1219.37

H.I. 9.20 1223 57

BM #11

5.09 1218.57

15

92 1219.1

1219.9

16

7.9 1215.7

17

6.0 1217.6

18

4.3 1219.3



LT

±

RT

0.0 +0.8 +1.6 +0.7 +0.5 +1.1 +0.6 -1.0
 $\frac{4.9}{25} \frac{5.2}{18} \frac{6.0}{11} \frac{5.1}{9} \frac{4.4}{00} \frac{1.9}{12} \frac{5.5}{14} \frac{5.0}{17} \frac{3.9}{25}$

-0.2 +0.7 +1.3 +0.6 +0.3 +1.6 +0.8 -0.5 -1.0
 $\frac{2.3}{25} \frac{3.2}{14} \frac{3.8}{13} \frac{3.1}{11} \frac{2.5}{00} \frac{2.8}{10} \frac{4.1}{12} \frac{3.3}{14} \frac{2.0}{19} \frac{1.5}{25}$

TACK SE FOOT BOARD TREE 50.1 STA 16+90
+0.1 +0.3 +1.1 +0.7 +0.2 +0.3 +0.5 -1.4 -1.4
 $\frac{4.3}{25} \frac{1.0}{14} \frac{10.3}{12} \frac{9.7}{11} \frac{9.2}{00} \frac{9.4}{7} \frac{9.5}{9} \frac{9.1}{11} \frac{8.8}{18} \frac{8}{25}$

+0.2 +0.6 +1.1 +0.6 +0.3 +1.1 +1.0 -0.2 -1.2
 $\frac{8.1}{25} \frac{8.5}{18} \frac{9.0}{17} \frac{8.5}{14} \frac{7.9}{00} \frac{8.2}{7} \frac{9.0}{8} \frac{8.9}{10} \frac{7.7}{15} \frac{6.7}{25}$

-1.2 -0.2 +0.2 +0.3 +1.3 +1.5 +0.5 -1.4
 $\frac{4.8}{25} \frac{5.8}{21} \frac{6.2}{19} \frac{6.4}{00} \frac{6.3}{5} \frac{9.3}{7} \frac{9.5}{10} \frac{6.5}{13} \frac{4.6}{18} \frac{2.8}{25}$

+1.0 +0.6 +0.2 -0.1 +1.2 +1.4 -1.8 -2.4
 $\frac{5.2}{25} \frac{4.8}{15} \frac{4.5}{13} \frac{4.3}{00} \frac{7.2}{3} \frac{5.5}{8} \frac{5.7}{10} \frac{2.5}{16} \frac{1.9}{25}$

STA B.S. H.I. F.S. EX. 11

19	1223.57	3.1	1220.5
T.P.		1.65	1221.85

H.I. 8.00 1229.92

B.M. #10 with chisel

20		1.76	1228.16
		8.2	1220.1

21

		6.1	1223.8
--	--	-----	--------

22

		2.9	1227.0
T.P.		0.36	1228.56

H.I. 12.42 1241.98

23

		9.7	1232.3
T.P.		0.44	1241.59

H.I. 7.91 1249.95

24

		9.5	1240.5
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✓

LT. E RT.

-1.4	+1.1	+0.7	+0.1	0.0	+1.1	-0.3
1.5	4.2	3.5	3.2	3.1	3.1	2.8
2.5	1.9	1.5	8	0.0	2.6	2.5

TRUCK NE FOOT 18" MAPLE 30 L. STA. 22

9.0	9.0	8.6	8.2	9.0	8.4	5.9
2.5	1.7	1.6	8.0	1	6	2.5
+0.8	+0.8	+0.4		+0.8	+0.2	-2.3

-0.1	+0.5	+0.6	+0.2	+0.1	+0.9	-0.1	-0.1	-2.4
6.0	6.6	6.7	6.3	6.1	6.2	7.0	6.0	6.0
2.5	7.8	7.3	7.4	8.0	2	5	8	1.5

-0.6	-0.1	+0.9	-0.1	+0.1	+1.1	-0.6	-1.6
2.3	2.5	3.3	2.8	2.9	3.0	2.0	2.3
2.5	7.9	1.7	7	8.0	7	6	1.2

-1.9	-1.5	+0.7	-0.2	+0.3	+0.6	-2.7	-3.4	-3.4
7.8	7.2	10.7	9.5	9.7	10.0	10.5	7.0	6.5
2.5	2.0	1.5	6	8.0	6	8	1.4	2.5

-1.4	-1.0	+0.6	+0.1	+0.3	+1.9	-5.5	-5.5
5.1	8.5	10.1	9.6	9.5	9.8	11.7	1.1
2.5	2.8	1.5	1.3	8.0	1.0	1.2	2.0

STA. B.S. 1249.45 F.S. ELE.

25 5.3 1249.45

26 4.5 1245.8

27 4.0 1245.5

B.M. #9 3.26 1247.19

B.M. #9 1247.05

H.I. 5.15 1252.20

28 6.6 1245.6

29 6.2 1246.0

30 4.2 1248.0

29+90

	LT.			RT
-0.3	+0.2+1.0	+0.5	+0.9	+1.8-2.9-3.5
5.0	5.5 6.3	5.8 5.3	6.2 7.1 8.1	1.8
2.5	1.6 1.3	1.2 1.0	1.1 1.3 2.0	2.5

+2.3	+2.0	+0.6	+0.5	+1.4	+0.2	-0.6
6.8	6.5 5.1	4.5 5.0	5.9	4.7	5.9	5.9
2.5	2.0 1.0	0.0 1.2	1.8	1.8	2.5	2.5

+0.3	+0.7	+1.0	+0.7	+0.7	+1.3	+0.5	+2.2
1.3	1.7 5.0	4.0 4.7	4.1 5.3	4.5	4.5	4.5	4.5
2.5	1.9 1.2	0.0 0.0	9 12 19	17	2.5	2.5	2.5

PAUL MSHNISHS
 BASE OF COR. BOARD N.E. COR. MAIN PART
 " " " " " " " "

+0.7	+0.5	+0.3	+0.4	+0.9	0.0-1.0
7.5	7.1	6.6	6.9	7.0 7.5	6.6 5.6
2.5	1.9	0.0 1.1	1.9 1.6	1.9 2.5	2.5

+0.8	+0.3	-0.0	+0.4	-0.7-2.8
7.0	6.2	6.5	6.2 4.6	5.5 3.4
2.5	0.0 9	13 15	1.9 2.5	2.5

-1.3	-0.6	+0.7	-0.5	-1.8
2.9	4.3	3.6	4.6	3.7 2.4
2.5	0.0 12	1.9 1.7	2.5	2.5

2.1
 38 LEFT BARN ENTRANCE

STA. B.S. 1252.20

F.S. ELEV.

LT.							
	+2.0			+0.8	+1.2	-0.9	-2.2
	<u>6.1</u>			<u>4.1</u>	<u>4.9</u>	<u>5.3</u>	<u>3.2</u>
	25			00	11	12	16
							25

31 4.1 1248.1

	+1.5	+0.7		+0.7	+1.3	-0.7	-1.5
	<u>5.4</u>	<u>4.6</u>		<u>3.9</u>	<u>4.6</u>	<u>5.2</u>	<u>3.2</u>
	25	17		00	10	12	18
							25

32 3.9 1248.3

	-0.6	+0.3		+0.6	+2.6	-2.6	-3.1
	<u>2.0</u>	<u>2.9</u>		<u>2.6</u>	<u>3.2</u>	<u>5.2</u>	<u>0.0</u>
	25	16		00	6	11	20
							25

33 2.6 1249.6

	+2.1	+1.7	+0.6		+0.6	+2.8	0.0	-0.5
	<u>4.9</u>	<u>4.5</u>	<u>3.9</u>		<u>2.8</u>	<u>3.9</u>	<u>5.6</u>	<u>2.8</u>
	25	21	16		00	8	12	18
								25

34 2.8 1249.4

T.P. 1.12 1251.08

H.I. 5.92 1257.00

B.M. #8 34+22 5.14 1251.86

LARGE TACK ON FOOT 12" MAPLE 307.3 STA. 34+

35 6.2 1251.8

	+6.2	+1.2	+1.8	+0.8	6.2	+0.2	+2.9	+1.0	-2.4	-2.9
	<u>7.1</u>	<u>7.4</u>	<u>8.0</u>	<u>1.6</u>	<u>6.2</u>	<u>6.7</u>	<u>8.6</u>	<u>7.2</u>	<u>3.8</u>	<u>3.8</u>
	25	22	21	18	00	6	10	15	20	25

36 6.0 1251.0

	+0.6	+1.5	+1.7		+0.4	+1.5	-2.6
	<u>6.6</u>	<u>7.1</u>	<u>7.7</u>		<u>6.0</u>	<u>6.7</u>	<u>7.5</u>
	25	21	20		00	5	10
							25

37 5.7 1251.3

	+0.5	+0.5	+1.0	+0.3	-0.5		+0.8	-0.4	-1.7
	<u>6.2</u>	<u>6.2</u>	<u>6.7</u>	<u>6.0</u>	<u>5.2</u>	<u>5.7</u>	<u>6.5</u>	<u>5.3</u>	<u>4.9</u>
	25	21	20	19	10	00	9	20	25

38 3.6 1253.4

	-2.2	+0.4	+1.2	+0.2	-0.4		+1.2	+0.3
	<u>1.4</u>	<u>4.0</u>	<u>4.8</u>	<u>3.8</u>	<u>3.2</u>	<u>3.6</u>	<u>4.8</u>	<u>3.9</u>
	25	20	19	18	10	00	6	25

STA.	B.S.	H. T.	F.S.	ELEV.
T.P.			0.12	1256.58
H.I.	1269	1269	52	
39			11.0	1258.5
40			4.6	1264.9
B.M. #7	40+15		0.52	1269.00
41			2.7	1266.8
T.P.			1.20	1268.82
H.I.	7.33	1275.65		
42			7.4	1268.3
43			6.8	1268.9
44			6.0	1269.7
45			3.6	1272.1
T.P.			1.32	1274.33

LT. R+

am^s Nush lawn. ♀

-63 -59 -01 +1.4 to 5 00 30 -0.9 +1.6

47	60	10.9	12.4	11.5	11.0	11.0	10.0	12.6
30	25	17	16	19	5	00	9	25

-0.7 -0.2 +0.6 00 +0.9 +0.9 +3.4

39	49	5.2	4.6	4.6	5.5	5.0	8.0
25	20	16	5	00	6	8	25

LARGE TACK 2016. 30 L. OF ♀

1.6	3.3	2.7	2.7	3.2	2.7	1.0	0.8	1.3
25	15	6	00	4	7	10	18	25

-1.1 +0.6 -0.3 +0.5 00 -1.7 -1.9

+1.1 +0.8 +0.8 -0.2 +0.1 +1.0 +0.9 -0.9

8.5	8.2	8.2	7.2	7.9	7.5	8.1	7.8	6.5
25	19	17	7	00	3	5	6	25

+0.5 +0.3 +0.7 -0.3 +0.7 -0.7 -1.0

7.3	7.1	7.5	6.5	6.8	7.5	6.1	5.8
25	16	14	6	00	4	10	25

+0.3 +0.1 +0.6 -0.2 +0.2 +0.6 -0.1 -1.1

6.3	6.1	6.6	5.8	6.0	6.2	6.6	5.9	4.9
35	16	14	6	00	4	5	7	25

-2.0 -2.0 +0.2 +0.4 +1.2 00 +1.0 +0.9 -1.5

1.6	1.6	3.8	4.0	4.8	3.6	3.6	4.6	4.0	2.1
25	23	18	16	14	3	00	7	8	25

TEMP STAKE 15' L. OF STA. 45+90

8-15-16 am

15

STA. B S H I F S ELEV.

T.P. 1274.33

H.I. 967 1284 90

96 7.7 1276.3

97 5.3 1278.7

95

4.1 1279.9

98 4.7 1279.3

99 4.6 1279.4

B.M. #6 9.99 1279.56

50 3.5 1280.5

T.F. 3.36 1280.64

H.I. 9.02 1289.66

51 8.4 1281.3

8.9

TEMP STAKE 15' L. OF STA. 45+40.

-1.8	-0.6	+1.0	-0.2	+0.9	+1.0	00	-1.4
<u>5.9</u>	<u>7.1</u>	<u>8.9</u>	<u>7.5</u>	<u>7.7</u>	<u>8.1</u>	<u>8.7</u>	<u>7.7</u>
25	19	16	6	00	9	6	8
							25

00	+0.9	-0.1	+0.9	-2.6
<u>5.3</u>	<u>5.1</u>	<u>5.2</u>	<u>5.3</u>	<u>5.7</u>
25	17	7	00	6
				25

DRIVE

40 FT R.

BANK Floor

+0.9	+1.1	+0.6	-0.2	-1.2	-2.1
<u>5.6</u>	<u>5.8</u>	<u>5.3</u>	<u>4.7</u>	<u>4.5</u>	<u>3.5</u>
25	17	13	00	18	20
					25

+0.9	+0.9	00	+0.6	-2.2
<u>5.0</u>	<u>5.5</u>	<u>4.6</u>	<u>4.6</u>	<u>5.2</u>
25	17	6	00	8
				25

ON ROOT - 12" MAPLE 30' L. OF STA. 49+15

4.5	4.5	5.0	4.2	3.5	3.5	4.5	3.7	2.1
<u>3.3</u>	<u>1.9</u>	<u>1.7</u>	<u>1.5</u>	<u>6</u>	<u>00</u>	<u>9</u>	<u>11</u>	<u>2.5</u>
19	19	15	00					

+0.6	+0.9	+1.3	+0.6	-0.2	+0.1	+0.7	-1.2
<u>9.0</u>	<u>9.3</u>	<u>9.7</u>	<u>9.0</u>	<u>8.2</u>	<u>8.4</u>	<u>8.5</u>	<u>9.1</u>
25	17	16	14	5	00	9	9
							25

DRIVE

STA. B.S. H. I. F. S. ELEV.
 52 1289 66 6.6 1283.1

+05 +05 +12 +0.6 -02 2 +03 +1.1 -1.0 -2.2
 $\frac{7.1}{25} \frac{7.1}{19} \frac{7.8}{16} \frac{7.2}{15} \frac{6.4}{5} \frac{6.6}{20} \frac{6.9}{4} \frac{7.7}{8} \frac{5.6}{12} \frac{4.4}{25}$

53 4.1 1285.6

+11 +11 +15 +0.8 -01 +02 +1.1 -0.1 -1.1
 $\frac{5.2}{25} \frac{5.2}{16} \frac{5.6}{15} \frac{4.9}{14} \frac{4.0}{9} \frac{4.1}{00} \frac{2.3}{5} \frac{5.2}{9} \frac{4.0}{13} \frac{3.0}{25}$

54 3.3 1286.4

+06 +06 +1.1 00 +03 +0.8 +0.3 -2.0
 $\frac{3.9}{25} \frac{3.9}{17} \frac{4.4}{15} \frac{3.3}{5} \frac{3.3}{00} \frac{3.6}{5} \frac{4.1}{7} \frac{3.6}{8} \frac{1.3}{25}$

55 2.2 1287.5

-0.3 -0.3 +0.9 0.0 +0.5 +1.0 0.0 -3.2
 $\frac{1.9}{25} \frac{1.9}{18} \frac{3.1}{16} \frac{2.2}{6} \frac{2.2}{00} \frac{2.7}{5} \frac{3.2}{7} \frac{2.2}{9} \frac{-1.0}{25}$

T.P. 0.60 1289.06

H.I. 6.23 1295 29

+0.3 +0.3 +0.9 -0.2 +0.3 +1.0 -2.5
 $\frac{6.0}{23} \frac{6.0}{18} \frac{6.6}{15} \frac{5.5}{7} \frac{5.7}{00} \frac{6.0}{9} \frac{6.7}{6} \frac{3.2}{25}$

56 5.7 1289.6

BM #5 2.37 1292.92

ON THORNAPPLE TREE 30' R. 55+50

57 3.5 1291.8

+0.9 +0.9 +1.1 00 +0.1 +0.5 -2.2
 $\frac{4.4}{25} \frac{4.4}{16} \frac{4.6}{15} \frac{3.5}{7} \frac{3.5}{00} \frac{3.6}{9} \frac{4.0}{5} \frac{1.3}{25}$

58 3.4 1291.9

+0.8 +0.8 +1.2 0.0 +0.1 +0.6 -1.2
 $\frac{7.2}{25} \frac{4.2}{17} \frac{4.6}{15} \frac{3.4}{6} \frac{3.4}{00} \frac{3.0}{9} \frac{4.0}{6} \frac{2.2}{25}$

59 5.6 1289.7

+2.2 +0.9 +0.1 00 +0.6 +0.3 -2.1
 $\frac{7.8}{23} \frac{6.5}{16} \frac{5.7}{7} \frac{5.6}{00} \frac{5.6}{9} \frac{6.2}{6} \frac{5.9}{7} \frac{3.5}{25}$



STA BS H I F.S. ELEV
 60 1295 29 8.1 1287.2

$$\begin{array}{r} -1.3 \\ 6.8 \\ \hline 25 \end{array}$$

$$\begin{array}{r} +11 \\ 92 \\ \hline 15 \end{array}$$

$$\begin{array}{r} -0.9 \\ 7.7 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 8.1 \\ 00 \\ \hline 00 \end{array}$$

$$\begin{array}{r} +11 \\ 9.2 \\ \hline 6 \end{array}$$

$$\begin{array}{r} -37 \\ 1.7 \\ \hline 18 \end{array}$$

$$\begin{array}{r} -4.8 \\ 5.3 \\ \hline 25 \end{array}$$

6.0+75.

TEMP. B.M. 9.73 1285.56
 T.P. 9.73 1285.56

CROSS-SECTION SAME AS STA 60
 X N.E. COR. EAST PARAPET

H.I. 6.88 1292 44
 61 8.4 1284.0
 61+50 8.6 1283.8

$$\begin{array}{r} +3.9 \\ 12.3 \\ \hline 25 \end{array}$$

$$\begin{array}{r} +3.3 \\ 11.7 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 0.0 \\ 8.1 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 8.1 \\ 00 \\ \hline 00 \end{array}$$

$$\begin{array}{r} 8.3 \\ 7 \\ \hline 00 \end{array}$$

$$\begin{array}{r} -0.1 \\ 120 \\ \hline 10 \end{array}$$

$$\begin{array}{r} +36 \\ 12.8 \\ \hline 15 \end{array}$$

$$\begin{array}{r} +2.9 \\ 11.0 \\ \hline 25 \end{array}$$

$$\begin{array}{r} +2.6 \\ 8.6 \\ \hline 00 \end{array}$$

62 7.1 1285.3
 T.P. 0.04 1292.10

$$\begin{array}{r} -1.0 \\ 6.1 \\ \hline 25 \end{array}$$

$$\begin{array}{r} -1.0 \\ 6.1 \\ \hline 21 \end{array}$$

$$\begin{array}{r} +0.7 \\ 7.8 \\ \hline 16 \end{array}$$

$$\begin{array}{r} -0.2 \\ 7.3 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 7.1 \\ 00 \\ \hline 00 \end{array}$$

$$\begin{array}{r} 7.3 \\ 9 \\ \hline 00 \end{array}$$

$$\begin{array}{r} +0.2 \\ 7.7 \\ \hline 6 \end{array}$$

$$\begin{array}{r} +0.6 \\ 7.7 \\ \hline 8 \end{array}$$

$$\begin{array}{r} +0.6 \\ 5.3 \\ \hline 16 \end{array}$$

$$\begin{array}{r} -1.8 \\ 5.3 \\ \hline 25 \end{array}$$

H.I. 1091 1303 31
 63 11.3 1292.0

$$\begin{array}{r} -2.7 \\ 8.6 \\ \hline 25 \end{array}$$

$$\begin{array}{r} -2.4 \\ 8.9 \\ \hline 19 \end{array}$$

$$\begin{array}{r} +0.3 \\ 11.6 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 11.3 \\ 00 \\ \hline 00 \end{array}$$

$$\begin{array}{r} +1.0 \\ 12.3 \\ \hline 5 \end{array}$$

$$\begin{array}{r} -3.9 \\ 7.4 \\ \hline 14 \end{array}$$

$$\begin{array}{r} -5.1 \\ 6.2 \\ \hline 20 \end{array}$$

$$\begin{array}{r} -5.1 \\ 6.2 \\ \hline 25 \end{array}$$

7.2
 3.8

BANK ENTRANCE
 30' L - STA 63+50

64 6.1 1297.2

$$\begin{array}{r} -0.4 \\ 6.7 \\ \hline 25 \end{array}$$

$$\begin{array}{r} -4.1 \\ 6.1 \\ \hline 00 \end{array}$$

$$\begin{array}{r} 5.7 \\ 6 \\ \hline 00 \end{array}$$

$$\begin{array}{r} -4.1 \\ 2.0 \\ \hline 25 \end{array}$$

B.M. 1.68 1301.63

THAT N.Y. ROUT 2 APPLE STA 65+10

STD BS H I F S ELEV
 65 1303.31 5.6 1297.7

66 4.8 1298.5

67 4.0 1299.3

68 2.9 1300.4

69 3.0 1300.3

70 2.4 1300.9

T.P. 082 1302.49

HI 4.48 1306.97

71 4.0 1302.2

72 5.3 $\frac{1301.7}{1300.9}$

73 5.0 1302.0

LT \$ RT
 $\frac{+0.7}{6.3} + \frac{+0.2}{5.8} \frac{00}{5.6} + \frac{+0.6}{5.6} - \frac{-0.2}{6.2} - \frac{-2.2}{5.1} - \frac{-2.2}{3.4}$
 $\frac{2.5}{16} \frac{00}{00} \frac{7}{6} \frac{19}{19} \frac{2.5}{25}$

$\frac{+0.7}{5.2} + \frac{+0.4}{5.2} + \frac{+0.9}{3.7} - \frac{-0.2}{4.6} + \frac{+0.5}{4.8} - \frac{-2.3}{5.3} - \frac{-2.3}{2.5}$
 $\frac{2.5}{21} \frac{19}{19} \frac{6}{6} \frac{00}{00} \frac{9}{9} \frac{2.5}{25}$

$\frac{+1.5}{5.5} + \frac{+1.0}{5.0} + \frac{+1.2}{5.2} - \frac{-0.1}{3.9} + \frac{+0.4}{4.0} - \frac{-0.2}{4.4} - \frac{-2.0}{3.8} - \frac{-2.0}{2.0}$
 $\frac{2.5}{20} \frac{19}{19} \frac{9}{9} \frac{00}{00} \frac{9}{9} \frac{6}{6} \frac{2.5}{25}$

$\frac{+1.6}{4.5} + \frac{+0.3}{3.2} - \frac{-2.2}{2.9} - \frac{-2.2}{0.7} - \frac{-2.2}{2.5}$

$\frac{+1.7}{4.4} + \frac{+0.1}{3.1} - \frac{-1.6}{3.0} - \frac{-1.6}{1.4} - \frac{-1.6}{2.5}$

$\frac{+2.0}{4.4} + \frac{+0.9}{3.3} - \frac{-0.4}{2.4} + \frac{+0.1}{2.0} - \frac{-1.2}{2.5} - \frac{-1.2}{1.8} - \frac{-1.2}{2.5}$

100

100' FACTOR CROSS-SECTION
 $\frac{+1.2}{6.0} + \frac{+1.2}{6.0} + \frac{+1.6}{6.4} + \frac{+0.7}{3.5} - \frac{-0.6}{4.8} + \frac{+0.3}{4.2} - \frac{-1.2}{3.7} - \frac{-1.2}{3.6}$
 $\frac{2.5}{19} \frac{19}{19} \frac{7.8}{7.8} \frac{7.4}{7.4} \frac{00}{00} \frac{1.9}{1.9} \frac{2.0}{2.0} \frac{2.5}{2.5}$

$\frac{+0.5}{5.8} + \frac{+0.9}{3.7} + \frac{+0.4}{5.3} - \frac{-1.0}{5.7} - \frac{-2.1}{4.3} - \frac{-2.1}{3.2}$
 $\frac{2.5}{18} \frac{00}{00} \frac{5}{5} \frac{10}{10} \frac{2.5}{2.5}$

$\frac{+1.6}{6.6} + \frac{+0.9}{5.9} + \frac{+1.2}{6.2} + \frac{+0.6}{5.6} + \frac{+0.8}{5.0} - \frac{-0.5}{5.8} - \frac{-1.7}{4.5} - \frac{-1.7}{3.3}$
 $\frac{2.5}{15} \frac{1.4}{1.4} \frac{1.3}{1.3} \frac{00}{00} \frac{1.3}{1.3} \frac{1.6}{1.6} \frac{2.5}{2.5}$

STA. B.S. H.I. 1306.97

F.S. ELEV

74 4.6 1302.4

75 5.8 1301.2

76 3.0 1309.0

T.P. 2.23 1309.74

H.I. 4.51 1309.25

77 6.4 1302.9

78 7.9 1301.3

TEMP. B.M. 6.63 1302.62

79 7.5 1301.5

B.M. #3 2.06 1307.19

80 5.2 1304.1

81 3.9 1305.4

✓

Lt. ♀ RT. +1.2 +1.2 +1.7 +0.8 +0.6 +1.6 -0.8 -1.8

5.8 5.8 6.3 5.4 4.6 5.2 6.2 3.8 2.8
25 75 74 11 00 9 12 18 25

+2.6 +1.0 +0.2 +1.2 -1.4

8.4 6.8 5.8 6.0 7.0 4.7
25 16 00 9 13 25

-1.2 -0.8 +0.6 00 +0.1 -2.7 -2.7

1.8 2.2 3.6 3.0 3.0 3.1 0.6 0.6
25 15 12 00 8 11 17 25

-2.7 -1.8 +0.7 +0.8 -0.7 -3.9

4.0 4.6 7.1 6.4 6.8 5.7 2.5
25 18 12 00 7 13 25

+5.3 +4.6 +0.2 -0.2 +3.7 +0.6

13.2 12.3 8.1 7.9 7.7 11.3 8.5
25 13 10 00 10 17 25

+0.3 -0.2 +0.8 +0.9 -0.5 -4.3

7.8 7.3 8.3 7.5 8.9 7.0 3.2
25 20 11 00 12 16 25

BIGTACK ON 10" MAPLE 30'R. STA. 79

+1.4 +1.0 +0.5 +1.1 -1.7

6.6 6.2 5.2 5.7 6.3 3.5
25 9 00 10 13 25

+0.6 +1.0 +0.7 +1.3 -1.0 -1.5

4.5 4.9 3.9 4.6 5.2 2.9 2.4
25 10 00 12 14 19 25

STA. B.S. H.T. F.S. ELEV
 82 1309 25 3.1 1306.2

83 3.8 1305.3
 7.1

84 4.5 1304.8

85 4.0 1305.3

86 10.8 1298.5

T.P. 10.19 1299.06

H.T. 11.29 1310 35

87 14.2 1296.2

88 10.1 1300.3

89 4.2 1306.2

90 -1.6 1308.8

LT. 2 RT.
 +1.1 +1.4 +0.9 +1.5 -0.8
 4.2 4.5 3.1 4.0 4.6 2.3
 2.5 1.3 0.0 1.3 1.4 2.5

+0.1 +1.1 +1.8 +0.6
 4.4 4.9 5.6 4.4 3.8 +0.4 +1.0 -0.8
 2.5 1.9 1.2 8 0.0 1.0 1.2 2.5

+0.9 +0.9 +1.5 +0.5
 5.4 5.4 6.0 5.0 4.5 DRIVE
 2.8 1.9 1.3 1.0 0.0 -0.6
 3.9
 2.5

+1.3 +1.3 +2.4 +1.4
 5.3 5.3 6.4 5.4 9.0 +0.6 +1.9 -0.2 -1.0
 2.5 1.6 1.4 1.0 0.0 1.3 1.5 1.8 2.5

-1.5 +0.6 +0.4 -2.0
 9.3 11.4 10.8 11.2 8.8
 2.5 1.0 0.0 1.2 2.5

+4.0 +1.5 0.0 0.0 +3.5
 18.2 15.7 14.2 14.2 14.3 17.7
 2.5 1.2 7 0.0 1.1 2.5

-0.6 BANKS START 57 87 +50 -38
 9.5 10.0 10.9 10.9 10.1 14.2 10.8 6.3
 2.5 1.1 1.0 9 0.0 9 1.1 2.5

-0.8 +1.1 +0.4 +0.8 -1.5 -1.5
 3.4 5.3 4.2 4.0 5.0 1.7 1.7
 2.5 6 0.0 1.0 1.2 2.0 2.5

+1.4 +1.4 +1.2 -1.0 -1.4
 3.0 3.0 1.6 2.8 0.6 0.2
 2.5 8 0.0 1.9 1.5 2.5

✓

STA.	B.S.	H	I	F.S.	ELEV
91		1310	35	3.0	1307.4
92				4.5	1305.9
93				5.9	1304.5
94				6.7	1303.7
95				6.2	1304.2
T.P.				15.3	1308.82
H.I.	0.09	1308	91		
BM #2				3.79	1305.14
T.P.				0.09	1308.82
H.I.	12.08	1320	90		
96				13.5	1307.4
97				7.7	1313.2
				6.9	
98				3.2	1317.5

LT				RT	
00	+0.7		+0.7	-2.2	-2.2
<u>3.0</u>	<u>3.7</u>	<u>3.0</u>	<u>3.7</u>	<u>0.8</u>	<u>0.8</u>
2.5	10	00	14	22	25
+0.5	+0.8		+0.4	+0.8	-1.7
<u>5.0</u>	<u>5.3</u>	<u>4.5</u>	<u>4.9</u>	<u>5.3</u>	<u>2.8</u>
2.5	12	00	12	14	25
+1.3	+1.3	+1.0		+0.7	+1.3
<u>7.2</u>	<u>7.2</u>	<u>6.9</u>	<u>5.9</u>	<u>6.6</u>	<u>7.2</u>
2.5	12	9	00	11	15
+2.6	+1.3	+0.4		+0.8	+1.2
<u>9.3</u>	<u>8.0</u>	<u>7.1</u>	<u>6.7</u>	<u>7.5</u>	<u>7.9</u>
2.5	10	8	00	12	25
+0.4	+0.6	+1.0		+0.1	+0.8
<u>6.6</u>	<u>6.8</u>	<u>7.2</u>	<u>6.2</u>	<u>6.3</u>	<u>7.0</u>
2.5	15	14	00	13	17
-2.3	+1.0	+0.4		+0.4	+1.0
<u>11.2</u>	<u>14.5</u>	<u>13.9</u>	<u>13.5</u>	<u>13.9</u>	<u>14.5</u>
2.5	13	10	00	8	10
-2.5	+0.5		+0.6	+1.0	-0.2
<u>5.2</u>	<u>8.2</u>	<u>7.7</u>	<u>8.3</u>	<u>8.7</u>	<u>7.5</u>
2.5	11	00	8	10	12
+0.7	+0.6	+0.6		+0.8	-0.4
<u>3.3</u>	<u>3.8</u>	<u>3.8</u>	<u>3.2</u>	<u>4.0</u>	<u>2.8</u>
2.0	15	12	00	9	25

LARGE TACK ON 8" MAPLE 30 L STA 95⁰⁵ T 80

✓

STA	B.S.	H.	I.	F.S.	ELEV.
99		1320.90		2.9	1318.0
100				3.1	1317.8
T.P				0.13	1320.77
H.I.	5.40	1326.17			
101				6.7	1319.5
102				3.3	1322.9
				3.8	
				1.7	
102+50				2.4	1323.8
103				3.4	1322.8
BM #1				3.17	1323.00
104				6.0	1320.2

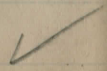
LT	+	FT	+	FT			
-0.9	+15		+11.0	-0.3			
<u>2.5</u>	<u>4.4</u>	<u>2.9</u>	<u>3.9</u>	<u>2.6</u>			
25	18	00	12	25			
+1.6	+03		+05	+0.9			
<u>4.7</u>	<u>3.4</u>	<u>3.1</u>	<u>3.6</u>	<u>3.3</u>			
25	12	00	9	25			
+0.1	+06		+05	-1.0			
<u>6.8</u>	<u>7.3</u>	<u>6.7</u>	<u>7.2</u>	<u>5.7</u>			
25	15	00	8	25			
-1.0	-1.0	+07	+03	+08	00	-1.1	
<u>2.3</u>	<u>2.3</u>	<u>4.0</u>	<u>3.3</u>	<u>3.6</u>	<u>4.1</u>	<u>3.3</u>	<u>2.2</u>
25	19	13	00	12	13	14	25

DRIVE

DRIVE	+	+	+	+	+	+	+	+
-0.4	-0.4	+0.9	+0.2					
<u>2.0</u>	<u>2.0</u>	<u>3.3</u>	<u>2.6</u>	<u>2.4</u>	<u>2.7</u>	<u>0.7</u>		
25	19	14	11	00	15	25		
0.0	0.0	+1.0	+0.3					
<u>3.4</u>	<u>3.4</u>	<u>4.4</u>	<u>3.7</u>	<u>3.4</u>	<u>3.7</u>	<u>3.2</u>	<u>2.3</u>	<u>1.8</u>
25	19	16	13	00	7	11	13	25

DRIVE TRACK ON FOOT 30" FSH 30L. STA 102+50

+	+	+	+	+	
+0.3	+0.7		+0.4	+1.1	-1.7
<u>6.3</u>	<u>6.7</u>	<u>6.0</u>	<u>6.4</u>	<u>7.1</u>	<u>4.3</u>
25	16	00	7	10	25



STA.	B.S.	13	14	15	F.S.	ELEV.
105	1326.77				9.1	1317.1
106					10.9	1315.3
					11.7	
					11.7	
T.P.					12.23	1313.94
H.I.	2.16	1316.10				
107					3.0	1313.1
					4.2	
TEMP					2.97	1313.63
B.M.					4.1	1312.0
108					4.7	
109					4.9	1311.2
110					4.7	1311.4
					3.9	
111					3.0	1313.1

LT				RT			
+0.5	+0.5	+0.9	+0.9	+0.9	+0.9	0.0	-1.2
<u>2.6</u>	<u>2.6</u>	<u>10.0</u>	<u>9.5</u>	<u>9.1</u>	<u>2.5</u>	<u>10.0</u>	<u>9.5</u>
25	16	15	12	00	8	10	11
						20	25
+0.8	+0.7	-0.1		+0.3	+1.0	-1.5	
<u>11.7</u>	<u>11.6</u>	<u>10.8</u>	<u>10.9</u>	<u>11.2</u>	<u>11.9</u>	<u>9.4</u>	
25	19	9	00	6	10	25	
DRIVE				DRIVE			
+0.9	+1.1	-0.2		+0.8	+1.2	+0.7	+0.3
<u>3.9</u>	<u>4.1</u>	<u>2.8</u>	<u>3.0</u>	<u>3.8</u>	<u>4.2</u>	<u>3.7</u>	<u>3.3</u>
25	19	3	00	9	10	11	21
							25
DRIVE				DRIVE			
+2.2	+2.2	+0.6		+0.6	+2.5	+1.2	+0.8
<u>2.5</u>	<u>6.3</u>	<u>4.7</u>	<u>4.1</u>	<u>4.7</u>	<u>6.6</u>	<u>5.3</u>	<u>4.7</u>
25	16	9	00	10	12	15	25
+2.0	+2.1	+0.8		+1.0	+0.5	-0.2	
<u>6.9</u>	<u>7.0</u>	<u>5.7</u>	<u>4.9</u>	<u>5.9</u>	<u>5.7</u>	<u>4.7</u>	
25	19	9	00	13	23	25	
+1.8	+0.9			+0.3	+0.7	+1.4	+0.8
<u>6.5</u>	<u>5.1</u>	<u>4.7</u>	<u>5.0</u>	<u>5.7</u>	<u>6.1</u>	<u>5.5</u>	<u>6.2</u>
25	8	00	7	10	11	12	20
							25
+0.5	+0.5	+1.0		+0.1	+1.2	+0.1	+0.1
<u>3.5</u>	<u>3.5</u>	<u>4.3</u>	<u>3.0</u>	<u>3.1</u>	<u>4.2</u>	<u>3.1</u>	<u>3.1</u>
25	17	15	00	5	8	13	19
							25

✓

STA BS H T FS ELEV

TP 1316 70 1.21 1319.89

H.I. 1085 1325 74

112 9.4 1316.3

113 6.9 1318.8

114 4.2 1321.5

114+28) 4.0 1321.7

B.M. 163 1321.1

7.0 1321.7



+03	+07	+16		+06	+15	00	-15
<u>9.7</u>	<u>10.1</u>	<u>11.0</u>	<u>9.4</u>	<u>10.0</u>	<u>10.9</u>	<u>9.4</u>	<u>7.9</u>
25	27	15	00	5	11	19	25

-0.9	+0.1	+1.3		+03	+18	+0.9	-2.1
<u>6.0</u>	<u>7.0</u>	<u>8.2</u>	<u>6.9</u>	<u>7.2</u>	<u>8.7</u>	<u>7.3</u>	<u>4.8</u>
25	18	15	00	8	12	19	25

+07	+13		00	-0.5
<u>4.9</u>	<u>5.5</u>	<u>4.2</u>	<u>4.2</u>	<u>3.7</u>
25	17	00	14	25

+32	+11		-08	-2.2
<u>7.2</u>	<u>5.1</u>	<u>4.0</u>	<u>3.2</u>	<u>1.8</u>
100	25	00	25	100

ON ELM TREE IN S.W. COR. CLARISON PARK
100 N ON

Culverts

Sta.	B.S.	H.I.	F.S.	Elev.
	BM #13	0.70	1204.72	1204.02
	T.P.	1.08	1199.22	6.58 1193.14
				9.3 1189.9
				9.5 1189.7

H20

Stone abutments in
good condition

3.30	1195.9
3.02	1190.20

7735

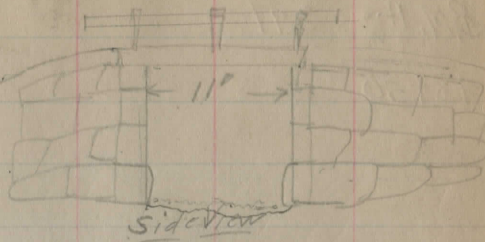
7785

34436 136 1253 22

	125186 BM
7.27	459.5
7.62	45.60
2.65	50.57

Sta. 1+20 E. edge

Bottom of creek Rt.
" " Lt.



Width of abutment 17'

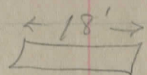
Wooden Bridge

E. edge 5' Rt. of ϕ

W. Edge 12' Lt. of ϕ

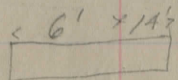
S. Bridge Seat.

N. " "



12" C.I.P.

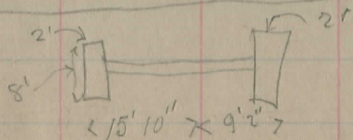
Top of pipe about 1ft under traveled Road



2'x1' Stone Box.

No floor.

ϕ same elev. as Sta. 8+00



2' C.I.P.

Fine condition

Ft. Rt.

" Lt.

ϕ Rd.

Sta. B.S. H. I. F.S. Elev.
 B.M. #6 391 1283.47 1279.56
 48+50

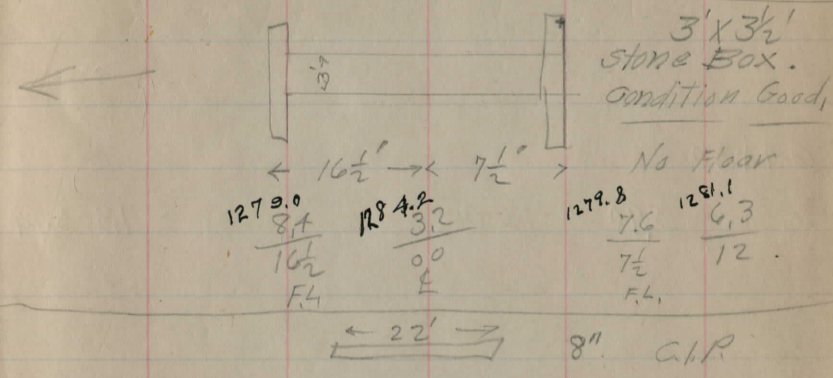
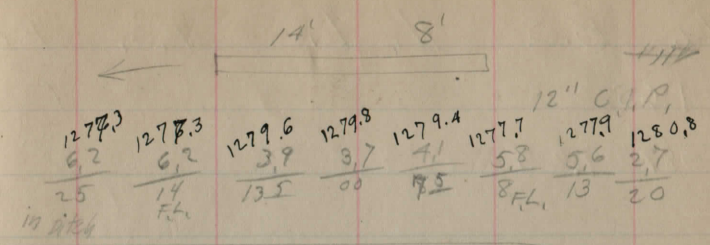
61 1.84 1287.40 1285.56
 1284.2

77+25

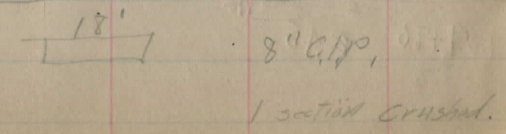
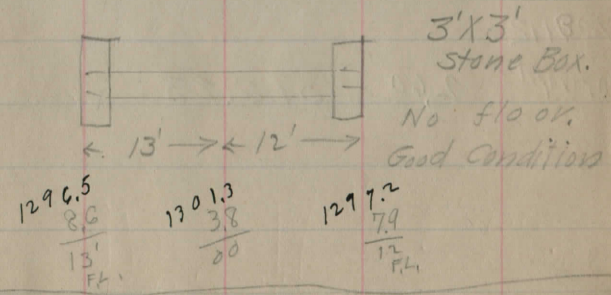
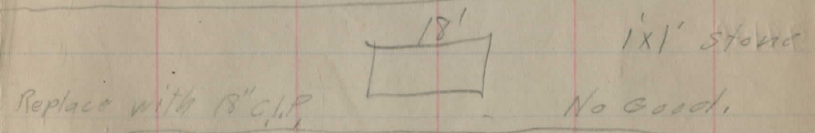
75+36

78 2.49 1305.11 1302.62
 1301.3

73+70



about 8" dirt over pipe



Sta. B.S. H. I. F.S. Elev

86+65

B.S. 487 1.25 1297.5

1296.2

94+30

B.M. 2 3.90 1309.8

1304.90

99+80

108+12

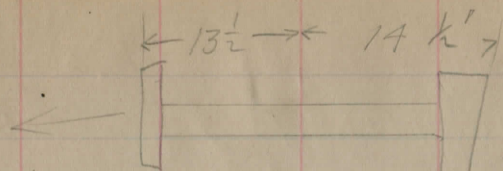
+ on Parapet 2.60 1316.23

1313.63

1312.3

109+80 2.45

1313.68



Condition fair

3'x3 stone Box No Bottom

Wend needs relaying.

1297.6
9.9
25

1287.8
9.7
13 1/2

1292.9
4.6
13

1295.9
1.6
9

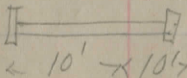
1296.2
1.3
00

1295.9
1.6
8

1293.3
4.2
14

1288.6
8.1
14 1/2
FL.

Parapets poor



3'x2' stone Box Culvert No floor

Poor Condition

1300.2
8.6
15

1300.2
8.6
10
FL.

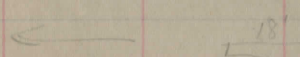
1302.7
6.1
9

1293.9
7.9
00

1308.2
5.6
9

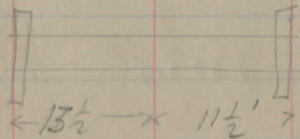
1300.3
8.5
10
FL.

1300.2
8.6
15



6" C.I.P.

suggestion - Unit pipe lay grade to drain to S.

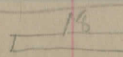


3'x3 stone PLANK floor Good Condition

1308.0
8.2
13 1/2
FL.

1312.3
3.9
00

1308.1
8.1
11 1/2
FL.



8" C.I.P.

3.8
15

2.4
9

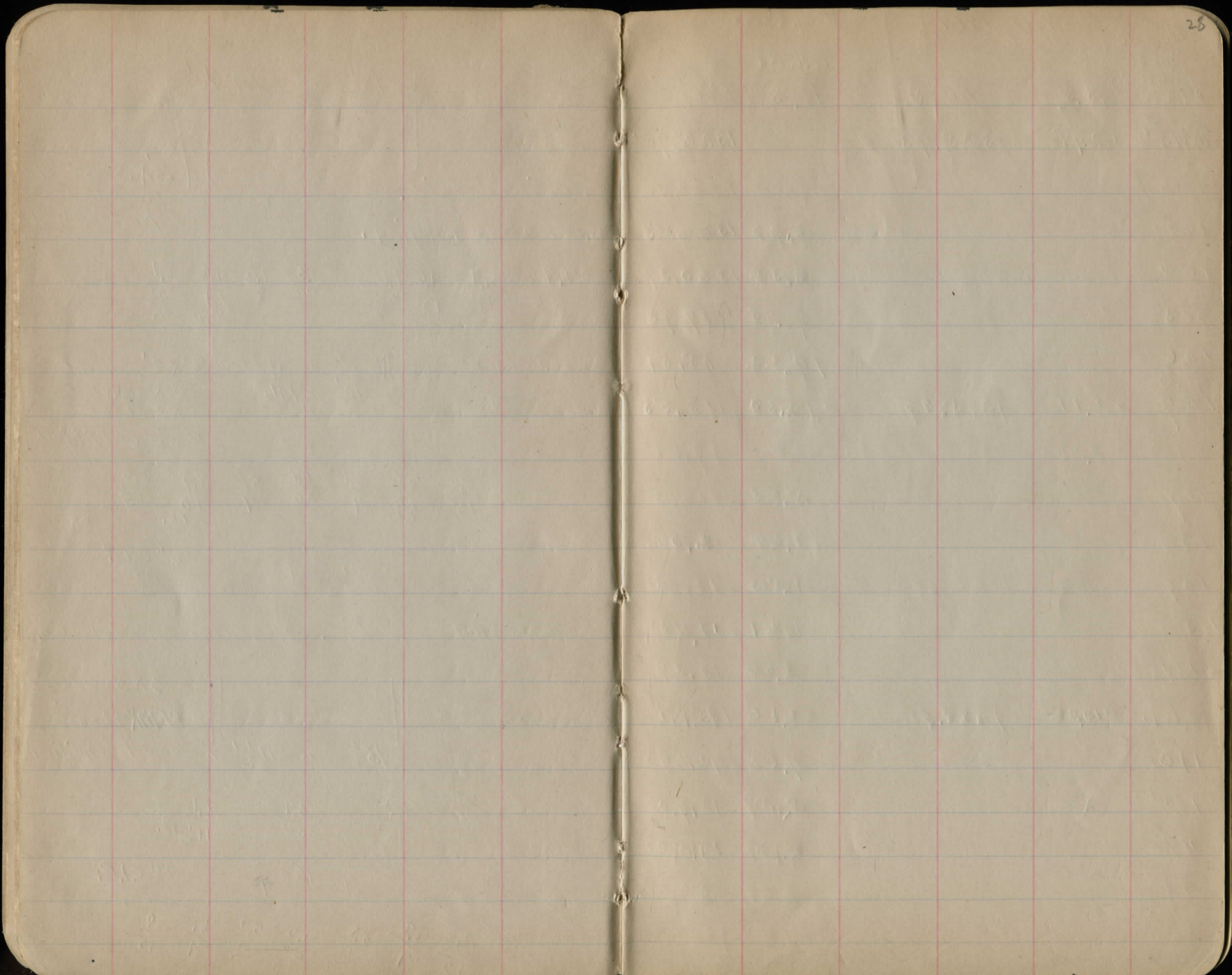
5.7
8.2

7.5
00

5.3
4.2

8.8
9

8.9
15



9/11-1917

temp -29

Hanna
Grav
Fidler

B.S.

A 9

Ced. Rd

F.S. Elev

BM. #1 +2.98 1325.73

1322.75

103 3.20 1322.58

104 5.34 1320.39

105 7.78 17.95

106 19.22 15.57

TP
107 +2.11 1315.66

2.11

109 2.23 13.43

108 3.64 12.02

109 4.53 11.13

110 7.21 11.45

111 2.27 13.39

111 +10.82 1323.92

112 7.82 16.10

113 5.02 15.90

114 2.78 21.52

L. # R.
Rd st/stake grid Rod Rod God st/stk st/stk Rd

3.2 $\frac{0.0}{12.0}$ 0.0 3.2 1.7 G. 1.5 $\frac{0.15}{21.2}$ 1.7

4.2 $\frac{0.9}{17.6}$ F0.7 6.04 4.34 C 1.0 $\frac{0.7}{20.1}$ 4.6

9.4 $\frac{1.6}{16.6}$ F1.4 9.18 8.78 F 1.0 $\frac{1.3}{17.1}$ 9.1

11.4 $\frac{1.2}{17.2}$ F1.1 11.32 10.62 F0.4 $\frac{1.0}{17.5}$ 11.2

-12.18 1113.55

3.7 $\frac{1.5}{16.8}$ F1.3 3.53 3.03 F0.8 $\frac{1.0}{17.5}$ 3.2

6.1 $\frac{2.3}{17.6}$ F2.3 5.94 4.74 F1.1 $\frac{1.3}{16.8}$ 5.1

7.0 $\frac{2.5}{17.6}$ F2.2 6.73 F0.7 $\frac{1.0}{17.5}$ 5.5

16.3 $\frac{1.8}{16.3}$ F1.7 5.91 5.91 F1.7 $\frac{1.9}{16.5}$

3.3 $\frac{1.0}{17.5}$ 2.67 F0.4 $\frac{0.6}{18.1}$ 2.9

6 $\frac{0.9}{20.3}$ 6.9

8.4 $\frac{0.6}{18.1}$ F0.4 8.22 6.72 C 1.1 $\frac{0.9}{20.3}$ 6.9

19.6 $\frac{0.4}{19.6}$ F0.6 4.42 4.52 C 0.5 $\frac{0.2}{19.5}$ 5.0

3.8 $\frac{1.4}{16.9}$ F1.3 3.7 1.90 G 0.5 $\frac{0.7}{19.6}$ 2.0

9/11-17

Sta	B.S.	H.O.	F.S.	Elev
BNT ¹⁰²	+1.74	1327.49		1322.75
750			4.63	1322.86
102			4.91	22.58
101			6.95	20.54
100			9.01	18.48
99			9.34	18.10
98			10.71	16.78
T.P.	+1.07	1318.73	-9.83	17.66
97			5.73	1313.00
96			10.55	08.18
T.P.	+1.67	1309.75	-11.65	1307.08
95			3.96	1304.29
BNT ¹⁰¹			-3.84	
B.M.	+5.15	1310.29		1305.14
94			6.24	1304.03
93			5.59	04.70
92			4.19	06.10
91			2.69	07.60
T.P.			-1.76	1308.53

grid Ref

Red	$\frac{R}{S}$	Red	Red	Red	Red	Red
				2.53	2.1	2.19
3.53	$\frac{1.0}{2.05}$	6.61	3.53			
3.8	$\frac{C 1.1}{20.7}$	0.1	3.81	3.91	0.0	$\frac{C 0.8}{20.2}$
9.5	$\frac{F 1.5}{16.9}$	F 1.4	8.35	7.65	F 0.7	$\frac{F 1.0}{17.5}$
11.0	$\frac{F 2.0}{15.0}$	F 2.0	11.06	10.4	F 1.4	$\frac{F 1.5}{16.9}$
11.3	$\frac{F 2.0}{15.7}$	F 1.8	11.14	9.64	F 0.3	$\frac{F 0.7}{17.9}$
9.8	$\frac{+0.9}{20.4}$	0.9	9.81	9.91	C 1.0	$\frac{C 0.8}{20.2}$
4.0	$\frac{C 0.8}{20.2}$	C 1.1	4.64	4.53	C 1.2	$\frac{C 0.7}{20.0}$
9.1	$\frac{C 1.5}{21.3}$	C 1.5	9.05	10.35	C 0.2	$\frac{0.0}{19.0}$
5.9	$\frac{F 1.4}{16.9}$	F 1.4	5.36	5.26	F 1.3	$\frac{C 1.3}{17.0}$
8.9	$\frac{F 2.5}{16.0}$	F 2.6	8.84	7.54	F 1.3	$\frac{F 1.3}{17.0}$
7.2	$\frac{F 1.6}{16.5}$	F 1.5	7.09	4.59	C 1.0	$\frac{C 0.8}{20.2}$
4.8	$\frac{F 0.6}{18.1}$	F 0.7	4.89	2.59	C 1.6	$\frac{C 1.5}{21.3}$
2.7	$\frac{F 0.3}{18.5}$	F 1	2.79	0.79	C 1.9	$\frac{C 1.9}{21.9}$

Elev used in reactions

Sept. 18th 1917 - K.M. & E.A.F.

R

30

+7-
Rods HD

grade
Elev

79	1308.93	6.11	1302.82
78		6.88	1302.05
77		6.47	1302.46

+1.93 1309.12 Elev. used in sec. 1307.19
ground at Summit
4.00 1305.12

76 x 50 = grade = 1302.88

76		5.99	1303.13
75		5.98	1303.14
74		6.30	1302.82
73		6.62	1302.50
T.P.	-9.06		<u>1302.06</u>

+8.13 1305.19 H.D. too low

72 5.00 1303.01 1302.18

70 +4.71 1306.77 too low too

72	+4.51	1306.59	4.89	1302.18
71			4.71	1301.86
70			5.00	1301.54
69	5' offset for slope stakes		5.35	1301.22
68			5.72	1300.85

T.P. -5.83
+30.23 1304.02

Elev. stakes in wheel tracks OK

Lot 2 Pt

round rod	slope stk	grade stake	stake Rod	stake Rod	gd. stk	slope stk
7.1	F1.0 17.5	F0.9	7.01	3.11	C.8.0	2.7 20.1
12.2	F5.3 21.5	F5.3	12.18	8.98	F2.1	F 3.2 17.4
8.7	C2.8 23.2	C.28	3.67	1.97	C.4.8	C 4.3 25.5

Piedmont & Co.

July 9th 1915

4.4	C1.6 21.5	C.17	4.29	1.99	C.4.0	C.4.0 25.0
9.5	F3.0 18.	F3.7	for v.c.	7.78	F1.8	F 2.1 15.3
8.1	F1.8 16.2	F1.9	8.20	5.10	C.1.2	C.0.8 20.2
8.2	F1.6 16.6	F1.4	8.02	5.62	C1.0	C.0.9 20.4

5.2	F0.8 17.8	F0.8	5.19		C1.4	C.1.2 20.8
5.3	F0.6 18.1	F0.5	5.21	5.71	C1.3	C.1.1 20.6
6.7	F1.2 17.2	F1.1	6.13	4.73	C.0.3	0.0 19.0
7.3	F1.9 16.1	F2.0	7.35	4.75	C.0.6	C.0.3 19.5
7.0	F1.3 17.0	F1.3	7.02	3.32	C2.4	C.2.5 22.8

Ranch # 4, used as 301.65 on x sec.

July 11-1918 - Redford Farm

P.M.	+172	1308.91		1307.19
76+50	= Summit + 100' V.C.		4.66	1304.25
			57.43	1303.58
77			6.27	1302.74
78	mark on Parafet	6.68	6.58	1302.33
78+50		6.65	6.55	1302.36
76		4.87	4.77	1304.14
75	V.C. 240' raise	0.17		1303.31
	+0.77	1302.42		1301.65
67			2.27	1300.15
66			3.02	1299.40
65	Between House & Barn		3.77	98.65
64	= Between House & Barn		5.43	96.99
63			10.12	92.30
T.P.	-12.76			1289.66
	o boy!			
	+0.00	1289.66		
62	100' N. of Culvert)		2.45	1289.21
61	N side - "		3.95	85.91
T.P.	-4.11			1285.55

	L.T.	±	Rt	Grade	Stake	Grade	Stake	Grade	Stake
				stake	Rd	Stake	Rd	Grade	Stake
	3.1	$\frac{C1.5}{21.5}$	C1.7	2.96	0.46	C1.42	$\frac{C4.1}{21.2}$	0.5	
	3.5	$\frac{C1.8}{21.7}$	C1.7	3.23	2.63	C2.7	$\frac{C2.3}{22.5}$	3.0	
	4.0	$\frac{C0.8}{20.2}$	C0.8	3.97	1.77	C3.0	$\frac{C2.9}{23.5}$	1.9	
	3.7	$\frac{F1.4}{16.9}$	F1.2	3.47	0.57	C1.7	$\frac{C1.6}{21.5}$	0.7	
	4.4	$\frac{F1.4}{16.9}$	F1.3	4.32	1.52	C1.5	$\frac{C1.3}{21.}$	1.7	
	5.0	$\frac{F1.2}{17.2}$	F1.1	4.89	2.67	C1.1	$\frac{C1.09}{20.4}$	2.9	
	5.7	$\frac{F0.3}{18.6}$	G0.2	5.23	0.83	C4.6	$\frac{C4.3}{25.5}$	1.1	
	7.7	$\frac{C2.4}{22.6}$	C2.5	7.62	5.02	C5.1	$\frac{G5.0}{26.5}$	5.1	
					5.05		$\frac{G5.0}{27.5}$	2.4	
	4.7	$\frac{F2.2}{15.5}$	F1.6	4.15	2.05	G0.4	$\frac{0.0}{19.0}$	2.9	
	10.0	$\frac{F6.0}{25.0}$	F5.7	9.65	8.85	F4.9	$\frac{F5.0}{21.0}$	9.0	
S. E. corner of W. Parafet Sta. 61									

7/1/19 Finished Grades

Sta Rods HI Stake Grade Elev

1223.29

15700 9.17 9.07 1214.22

-8.93

T.P. +0.37 1214.73

1214.36

14+50 1.45 1.35 13.38

14 2.27 2.17 12.56

13+50 3.09 2.99 11.74

13 3.91 3.81 10.92

12+50 4.73 4.63 10.10

12 5.55 5.45 09.28

11+50 6.37 6.27 08.46

11 7.19 7.09 07.64

10+50 7.92 7.82 06.91

10+18.26 P.I. 8.30 8.20 06.53

-8.06

T.P. +3.01 1209.68

1206.67

10+00 3.43 3.33 06.35

9+63.76 P.I. 3.73 3.63 06.05

9+50 3.81 3.71 05.97

9+08.76 P.C. 3.98 3.88 05.80

8+50 4.14 4.04 05.64

Grade

"(0.01 low)

"

"

"

"(0.01 low)

"

"

"

"

"

"

"(0.01 low)

"

"(0.01 low)

"

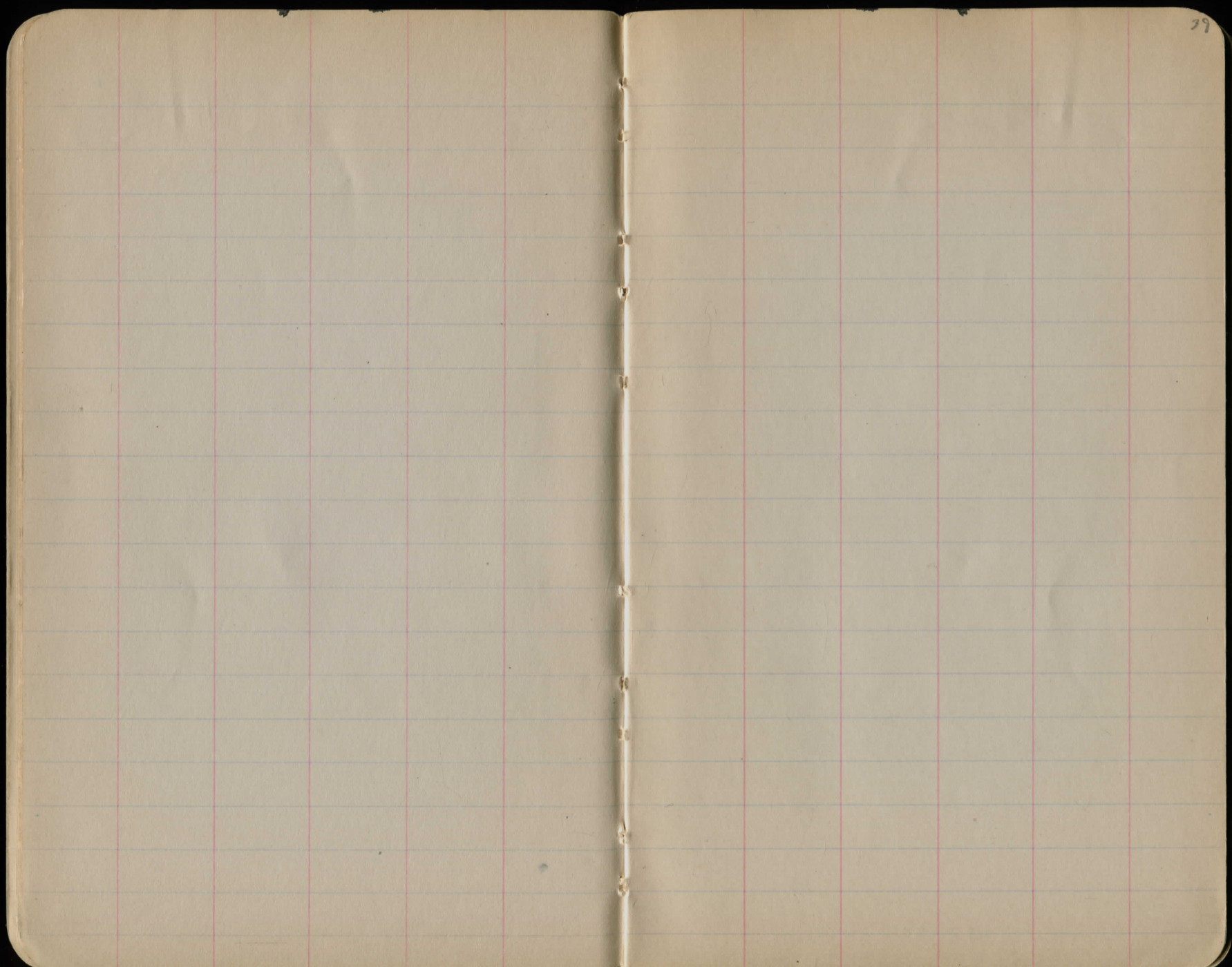
8	1209.68	4.26	4.16	05.52
7+50		4.38	4.28	05.40
7		4.50	4.40	05.28
6+50		4.62	4.52	05.16
6		4.74	4.64	05.04
T.P.	-4.75			
	+480	1209.73		120493
B.M. #12-355				1206.19
				1206.18

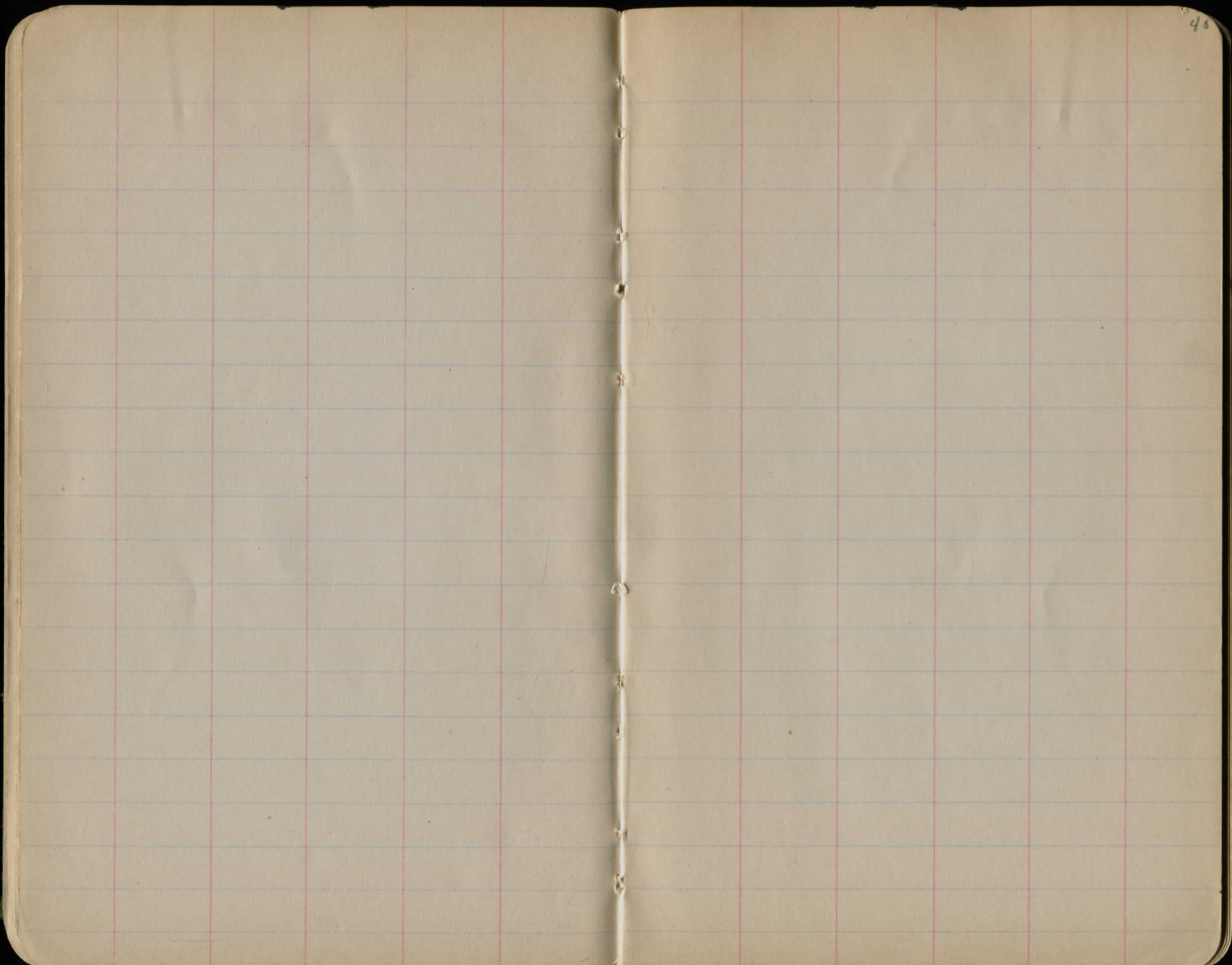
Finish Graded to Sta 6+00
 " tacked to " 10+18.26
 7/1/49 Z.

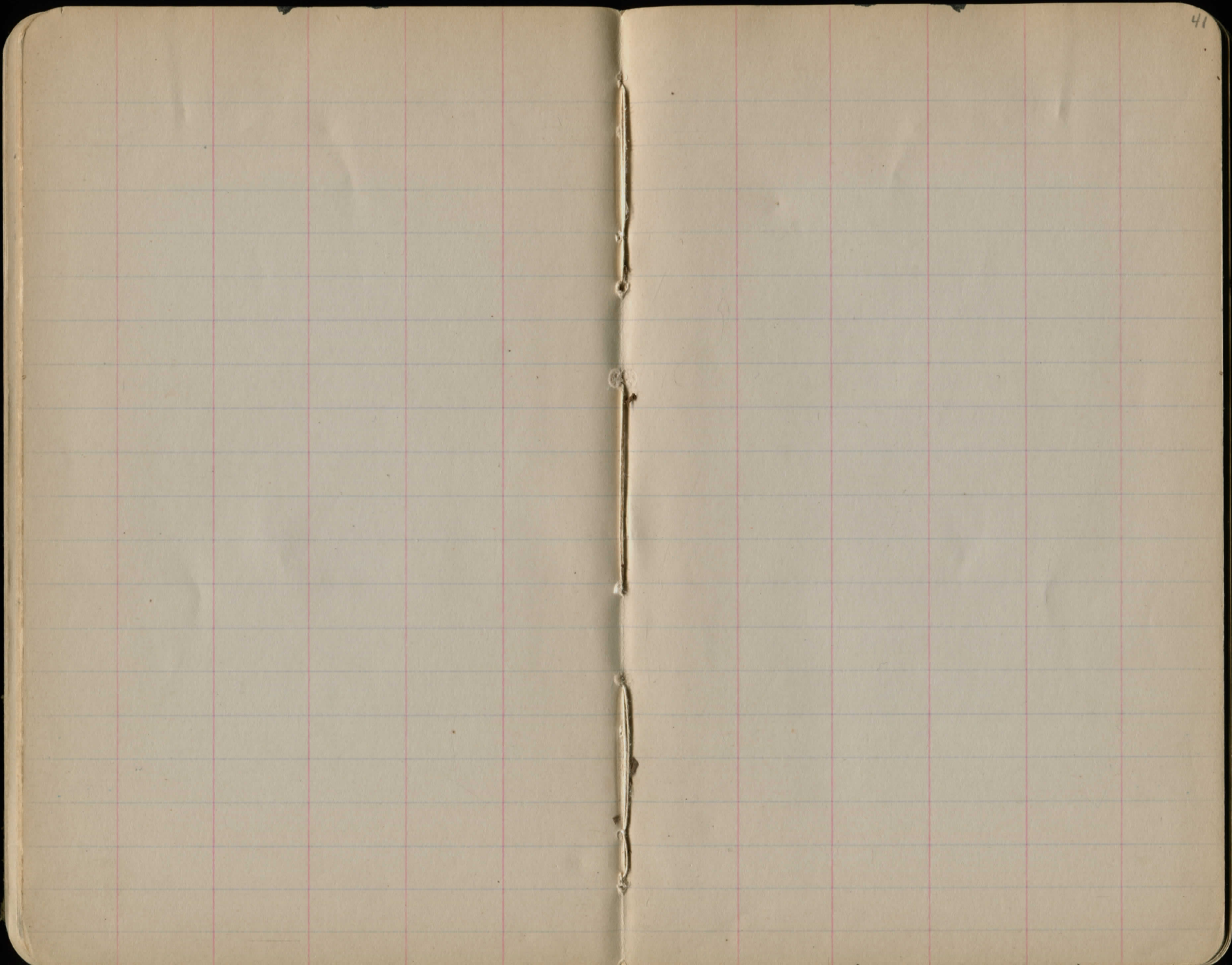
Grade
 ,
 "
 "
 "

Sta.	B.S.	H	I	F.S.	Grade Elev.
B.M. #12	2.78	1208	98		1206.20
10+82 ⁶ RT				2.95	06.53
10+00				2.63	06.35
9+63 ³				2.93	06.05
9+50				3.01	05.97
9+25				3.22	05.84
9+08 ² PC,				3.22	05.76
9+00				3.22	05.76
8+50				3.34	05.64
8				3.42	05.52
7+50				3.58	05.40
7				3.70	05.28
6+50				3.82	05.16
6				3.94	05.04
5+50				4.06	04.92
5				4.47	04.51
4+50				5.48	03.50
4				6.78	02.20
3+50				8.08	00.90

		1208	98		
T.P	1.01	1201	85	8.14	1200.84
3				2.25	1199.60
2+50				3.55	1198.30
2				4.53	1197.32
+ stake near bridge N. end				4.93	97.00
1+00				4.85	97.00
T.P				4.62	1197.23







1918
June 14th Fuller & Gray

Sta.	Rods	H.D	Grade Stake	Grade Rod	Grade Elevations
114+28					1321.70
+0					
B.M.	+0.80	1324.71			1323.91
			To be adjusted to int. E. or W. grade		
114+28	set at 2 grade		3.01	3.01	1321.70
114			3.29	3.19	1321.52
113+50			4.57	4.47	1320.30
113			5.91	5.81	1318.90
112+50			7.31	7.21	1317.50
112			8.71	8.61	1316.10
111+50			10.11	10.01	1314.70
111			11.42	11.32	1313.39
T.P.	-11.43				<u>1313.28</u>
	+3.50	1316.78			12
110+50			4.62	4.52	1312.26
110			5.43	5.33	1311.45
109+50			5.78	5.68	1311.10
109			5.75	5.65	1311.13
108+50			5.38	5.28	1311.50
108			4.86	4.76	1312.02
107+50			4.25	4.15	1312.63

6581

Sta.	Rods	H I	Red on stake	gd rd	Elevs
107	10	1816.78	3.45	3.35	1813.43
106+50			2.50	2.40	1814.38
106			1.27	1.27	1815.1
105+50			0.15	0.05	1816.73
105					17.95
104+50					19.17
T.P.	-0.81				<u>1815.94</u>
	+9.52	1825.46			
105+50			8.83	8.73	1816.73
105			7.61	7.51	17.95
104+50	stake slants to N.		6.39	6.29	19.17
104		0.01 hr	5.17	5.07	20.39
103+50			3.95	3.85	21.61
103			3.03	2.93	22.53
B.M. #1	+2.69	1825.44	3.01	2.91	1822.75
102+50			2.68	2.58	22.86
102			2.96	2.86	22.58
101+50			3.83	3.73	21.71
101					20.54

100 High

3.03

3.01

June 20 - 1918
Fiedler & Fran

Reds H.O. Elev

+3.46 1326.21 1322.75

101+50 4.61 4.51 1321.96

101. 5.77 5.67 1320.54

100+50 6.94 6.84 1319.37

100 7.73 7.73 1318.48

99+50 8.16 8.06 1318.15

99 8.21 8.11 1318.10

98+50 8.56 8.46 1317.75

98 9.53 9.43 1316.78

BNT⁴⁰ +12.00 1316.90 1304.90

97+50 1.80 1.70 1305.20

97 4.00 3.90 1303.00

96+50 6.50 6.40 1301.50

96 8.82 8.72 1300.18

95+50 10.80 10.70 1299.20

95 12.21 12.11 1297.79

+4.83 1309.97 1305.14

94+50 5.92 5.82 1304.15

& Albert R F.L. (cut) 8.07

B.M. Elev. as used in 1918

865
210
655
175
480

313
450
389
150

114
84

TP-400

stake rod grid rod Elev

94	130	1309.99	6.02	5.92	1304.05
93+50			5.82	5.72	4.25
93		low 0.02	5.39	5.27	4.70
92+50			4.72	4.62	1305.35
92			3.97	3.87	06.10
91+50			3.22	3.12	06.85
91			2.79	2.39	1307.60
90+50			2.07	1.97	1308.00
90			2.39	2.29	07.68
89+50			3.42	3.32	06.65
89			5.19	5.07	1304.90
T.P.	-4.00				1305.97
	+0.08	1306.05			13
88+50			3.35	3.25	1302.80
88			5.45	5.35	1300.70
87+50		low 0.01	7.55	7.45	1298.60
	+9.90	1308.39			1298.49
87			10.97	10.87	1297.52
86+50			9.99	9.89	1298.50

22 1.7

HJ

stake Rod grade Rod. 4.29 48
4.39 9

86		1308.39	7.99	7.89	1300.50
85+50	slope		5.99	5.89	1302.50
85			4.39	4.29	1304.10
84+50			3.39	3.29	1304.70
					F.O. 10m R.F. 5.4
84			3.19	3.09	1305.30
83+50		high 0.017	2.86	2.76	1305.63
T.P.	-2.82				1305.57
Fiedler & Grant - July 9 th 1918					
B.M.	+1.75				1307.06
		1308.94	used in x sec. as		1307.19
83+50			3.41	3.31	1305.63
83		low 0.01	3.25	3.11	1305.83
82+50			3.15	3.05	1305.89
82			3.23	3.13	1305.81
81+50			3.43	3.33	1305.61
81			3.77	3.67	1305.27
80+50			4.25	4.15	07.79
80			4.36	4.26	07.18
79+50		low 0.02	5.54	5.44	03.50
79			6.22	6.12	1302.82

Fiedler July 20th 1918

Stake Rod	grade	Apple Tree	11'R. E
R. 17. +0.88	1302.51	1301.63	96.99
64 at roadside	(4.57) cut 3.0		
63+50	7.57	7.77	1295.04
	(4.81) cut 3.6		
63	10.31	10.21	1292.30
	(8.61) cut 4.50		
62+50	13.11	13.01	1289.50
T. R. -12.89			1289.62
	set at grade		
62 +1.05	1290.67	3.56	3.46 1287.21
	set at grade		
61+50	4.82	4.72	85.95
	(9.26) Full 4.2		
61	5.06	4.96	85.71
	set at grade		
60+50	4.87	4.17	86.60
	(2.07) cut 0.9		
60	2.97	2.87	87.50
	set at grade		
59+50	1.67	1.57	89.10
59	0.37	0.27	90.40
T. Stake and P. -0.37			1290.30
58+50	73.63	1293.93	2.59
			2.49 1291.44
58	2.05	1.95	91.98
	(7.04) cut 1.0		
57+50	2.04	1.94	91.99
	(1.03) cut 1.5		
57	2.53	2.43	91.50
	set at grade		
56+50	3.28	3.18	90.75
	set at grade		
56	4.03	3.93	1290.00
	set at grade		
55+50	4.78	4.68	89.25

Stake	2 grade	50
11'R. E		
set at grade		
5.53	5.43	1285.50
set at grade		
6.28	6.18	87.75
set at grade		
7.03	6.93	1287.00
set at grade		
7.78	7.68	86.25
set at grade		
8.51	8.45	86.48
set at grade		
9.33	9.23	87.70
set at grade		
10.13	10.03	83.90
		1283.80
55		
53+50		
53		
52+50		
52		
on stake		
T. P.	-10.13	
	+0.47	1284.27
set at grade		
1.27	1.17	1283.10
set at grade		
2.07	1.97	82.30
set at grade		
2.80	2.70	81.57
50		
3.39	3.29	80.95
49+50		
3.85	3.75	80.62
49		
4.17	4.07	80.20
+50		
4.42	4.32	79.90
48 near driveway		
4.67	4.57	79.70

80 459

353

760 309

258

273

306

273

273

576

865

324

146

350

216

33

7

471

61

343

222

74

306

3.43

565

1302.52

July 13th 1915 - Fullers Farm

RM 41.70 1308.89 as used in x rec. 1307.19 73+50 6.39 6.29 1307.66

82 0.18 3.08 087.72 73 6.57 6.45 1302.50

81+50 0.38 3.28 5.61 74+50 6.91 6.61 1302.34

as cut 3.60

81 3.72 3.62 5.27 72 6.87 6.77 0218

78+50 6.70 6.60 1302.29 71+50 7.03 6.93 0202

4.59

80 4.81 4.71 04.18 71 7.19 7.09 1301.86

79 6.17 6.07 1302.82 70+50 7.35 7.25 1301.70

80+50 4.20 4.10 04.79 70 7.51 1301.54

+2.12 1309.31

5.76

1307.19

69+50

7.67

79+50 5.91 5.81 03.50 69 7.83

77+50 6.67 6.57 1302.74 68+50 7.99

77 5.83 5.73 1303.68 68 8.20 8.10 1300.85

stake buried 5.12

76+50 0.04 high 5.16 5.06 1304.25

76 5.27 5.17 1304.14

75+50 OKR 5.77 5.67 1303.64

75 6.10 6.00 1303.31

74+50 8.43 6.33 1302.98

TP stake -6.43 1302.58

+6.07 1308.95

Aug. 21st Fieldbook & Journal 12899.0
 (Reset - all out) 1289.40

908
 750
 150
 339
 3.10
 229
 1284.80
 2.70
 2.69
 5.01
 89.90
 6.89
 4.2
 11.09
 52

2' apple			X sec 8'er
BM	+0.39	1302.02	1301.63
64+50		3.90	3.80 1298.22
near BM			
65	old stake OK	3.77 ✓	3.37 .98.65
		→ 4.63 cut 0.5 ←	
64		5.18	5.03 96.99
63+50		7.08	6.98 1295.04
63		9.82	9.72 1292.30
		→ 12.13 cut 0.5 ←	
62+50		12.62	12.52 1289.50
T.P.	-12.12		1289.90
	+2.60	1292.50	
62		5.39	5.29 1287.21
61+50		6.65	6.55 1285.95
61		6.89	6.79 1285.71
60+50		6.10	6.00 86.50
60	0.01 from	4.80	4.70 87.50
59+50		3.50	3.40 89.10
59		2.20	2.10 90.40
BM	+5.24	1284.80	1279.56
50+60		3.33 ✓	3.23 81.57
50		3.92 ✓	3.82 80.95

47+50 (in driveway)	5.70	5.35	1279.45
47	6.01	5.91	78.89
46+50	7.20	7.10	77.70
46	8.90	8.60	76.20
T.P.	-8.70		1276.10
	+0.48	1276.58	44
45+50	1.95	1.58	74.70
45	3.48	3.38	73.20
44+50	4.88	4.78	71.80
44	6.05	5.95	70.63
43+50	7.03	6.98	69.65
	→ 6.78 cut 1.0 ←		
43	7.78	7.68	68.90
	→ 7.43 cut 1.0 ←		
42+50	8.43	8.33	68.25
	→ 7.58 cut 1.5 ←		
42	9.08	8.98	67.60
as in x sec			
BM	+1.73	1270.73	1269.00
	→ 1.58 cut 2.3 ←		
41+50	3.88	3.78	1266.95
	→ 1.53 cut 3.0 ←		
41	4.53	4.43	66.30
	→ 2.94 cut 2.5 ←		
40+50	5.44	5.34	65.39

Aug, 27

205

sla	1247.62		665	
24		272	8.62	1239.00
23+50		0.02 hour 11.47	11.37	1236.25
T.P. 1/10 hour	-12.80			1235.32
	+0.23			1235.55
		→ 3.15 fill 1.0 ←		
23		2.15	2.05	1233.50
2 2+50		0.01 hour 4.74	4.64	1230.91
22		7.01	6.91	2564
21+50		8.97	8.87	2665
21		10.61	10.51	2504
20+50		11.94	11.84	23.91
20		12.95	12.85	2270
T.P.	-12.95			1222.60
	+2.47			1225.07
19+50	short stake	0.02 hour 3.32	3.22	2185
19		4.17	4.07	2100
18+50		5.02	4.92	2015
18		5.87	5.77	1930
17+50		6.72	6.52	1845
	-6.72			1218.35
	+5.80			1218.49
		ok of 0.02		
		5.66		

47.05 5.9	Rod on grade 1 stake	Grade Rod 2	Slope Stakes set 1' back of 10%	Trolley + Grade Average L. R.	54
34					F 2.3
34	5.83	3.73			15.5
33+50	5.13	4.03			F 1.0
33	5.43	4.33			17.5
32+50	5.55	4.75	STA		0.0
32	5.23	5.13			1.9
31+50	5.65	5.55			0.7
31	6.1	6.0	f.4		18.
30+50	2.9	2.8			0.0
30	2.30	3.2			1.9
29+50	3.7	3.6			0.0
29	4.1	4.0			19.0
28+50	4.4	4.3			F 1.0
28	4.7	4.6			17.5
27+50	5.30	4.9	5-5		F 0.6
27	5.2	5.1			18.1
26+50	3.9	3.8			0.0
26	4.0	3.9	a.3		19.0
25+50	4.4	4.3			0.1
25	5.7	5.6			19.1
					F 1.0
					17.5
					F 0.6
					18.1
					0.0
					19.0
					0.1
					19.1
					F 1.0
					18.4
					0.8
					20.2
					0.7
					20.1
					0.2
					25.2

2.9
~~Plate~~ Red
~~Red~~ L R
 2 grade

24+SD	6.10	6.40	0.60	0.28	45.8
				23.2	27.5
21	9.20	9.10	R 3.0	C 2.1	05.6
			4.90	22.2	27.4
					4.4
23+SD	12.0	11.9	R 2.5		25.6
				C 1.7	
23+SD	4.7	4.6	4.29	21.7	21.7
				C 0.9	C 2.00
23	8.5	7.4		19.6	22.0
			R 9.2		C 0.8
22+SD	10.1	10.0			20.2
			R 3.3		C 0.2
2.2	3.6				19.3

Pear Tree

BM	+1.38	1219.89	1.52		1218.49
			35		18.40
17			2.37	2.29	1217.60
			35		
16+SD			3.22	3.12	16.76
16			4.09	3.97	15.90
15+SD			4.92	4.82	15.05
15			5.75	5.65	14.22
14+SD			6.59	6.49	13.38
14			7.41	7.31	12.56
13+SD			8.23	8.13	11.74
13			9.05	8.95	10.92
					1210.82

-9.05

+0.05 10.87

9:00. Tick = 3:15 PM

1210.87

12+SD	0.87	0.77	1210.10
12	1.69	1.59	09.28
11+SD	2.51	2.41	08.46
11	3.33	3.23	7.64
10+SD	4.06	3.96	1206.91

6/11/19 Thompson Douglas Nathman

Sta Todd H.I. Stake Grad Elev

B.M.#7	+2.73	1271.68		1268.95
42+00		2.56	4.08	1267.60
41+50		3.23	4.73	66.95
41		3.86	5.38	66.36
40+50		4.74	6.29	65.39
40		6.69	7.73	63.95
39+50		9.16	9.69	61.94
39		12.60	12.18	59.50
T.P.	-12.60 +0.98	1260.06		1259.08
38+50		4.31	3.31	56.75
38		5.50	5.53	54.53
37+50		6.64	6.68	53.38
37		8.78	7.31	52.75
36+50		8.88	7.93	52.13
T.P.	-9.46 +3.84	1254.44		1250.60
36		3.34	2.85	51.59
35+50		3.66	3.20	51.24
35		3.44	3.46	50.98
34+50		7.24	3.72	50.72
B.M.#8	-2.67			1251.77

left of 41+30
large oak root of maple

- C 1.5 ✓
- C 1.5 ✓
- C 1.5 ✓
- C 1.5 ✓
- C 1.0 ✓
- C 0.5 ✓
- F 0.5 ✓

- F 1.0 ✓
- Grade ✓
- Grade ✓
- F 1.5 ✓
- F 1.0 ✓

- F 0.5 ✓
- F 0.5 ✓
- Grade ✓

F 3.5 large oak on root - 12" maple
(251.86) 30 ft. 12 ft. Sta 34+20

6/19/19

Gru
Zethmayr

57

Sta Rods H.I. Stake Grady Elev

BM #8 +1.24 1253.10

1251.86

34+50	5.89	+2.38	50.72	F3.5 ✓
34	4.08	2.64	50.46	F1.5 ✓
33+50	3.88	2.92	50.18	F1.0 ✓
33	4.72	3.25	49.85	F1.5 ✓
32+50	5.07	3.61	49.49	F1.5 ✓
32	4.49	4.02	49.08	F0.5 ✓
31+50	5.41	4.45	48.65	F1.0 ✓
31	5.34	4.88	48.22	F0.5 ✓
30+50	4.77	5.31	47.79	C0.5 ✓
30	4.68	5.74	47.36	C1.0 ✓
T.P.	-5.09			
	+2.08	1250.09	1248.01	
29+50	3.12	3.14	46.95	Grade ✓
29	3.98	3.50	46.59	F0.5 ✓
28+50	4.28	3.82	46.27	F0.5 ✓
28	4.54	4.09	46.06	F0.5 ✓
27+50	4.81	4.34	45.75	F0.5 ✓
27	5.06	4.59	45.50	F0.5 ✓
26+50	5.32	4.84	45.25	F0.5 ✓

Sta	Pods	H.I.	Stake	Grade	Elev.
26		1250.09	5.60	5.09	1245.00
25+50			5.82	5.34	44.75
B.M.#9	-3.05				1247.05 1247.04
B.M.#9	+3.05	1250.10			
T.P.	-5.75				1244.35
25	+1.18	1245.53	2.14	1.65	43.88
24+50		33.50	4.24	3.78	41.75
24			6.54	6.53	39.00
23+50	-11.69		9.75	9.28	36.25
T.P.	+0.10	1233.94			1233.84
23			1.90	0.44	33.50
22+50			4.02	3.03	30.91
22			5.78	5.30	28.64
B.M.#10	-5.85				1228.09
21+50			7.76	7.26	26.68
21			9.38	8.90	25.04
T.P.	-9.38				1224.56
	+0.12	1224.68			

F 0.5 ✓
 F 0.5 ✓
 on side hub of 25+58.9
 F 0.5 ✓
 F 0.5 ✓
 Grade ✓
 F 0.5 ✓
 F 1.5 ✓
 F 1.0 ✓
 F 0.5 ✓
 (1228.09)
 F 0.5 ✓
 F 0.5 ✓

Sta Rods A.I. Stake Grade Elev.

20+50 1224.68 1.44 0.97 1223.71

20 2.47 1.98 22.70

19+50 3.30 2.83 21.85

19 4.17 3.68 21.00

18+50 5.00 4.53 20.15

18 5.85 5.38 19.30

17+50 6.69 6.23 18.45

17 7.57 7.08 17.60

T.P. -7.57 1217.11

+4.35 1221.46

B.M. #11 -2.94

hot sultry

6/18/19

Groo Thompson Zethmayr

1218.57
1218.52

B.M. #B 7.18 1205.50

1204.32

0+29.7 9.14 7.64 1197.86

+62.7(ft) 8.74 8.26 97.24

1+00 10.00 8.50 97.00

T.P. -8.32 1197.18

+7.84 1205.02

F 0.5

F 0.5

F 0.5

F 0.5

F 0.5

F 0.5

F 0.5

F 0.5

F 0.5

F 0.5

F 0.5

F 1.50

F 0.5

F 1.5

:2+00 1205.02 ✓ 8.67 7.70 ✓ 197.32 ✓
 +50 7.72 6.72 ✓ 98.30 ✓
 3 5.42 5.42 ✓ 99.60 ✓
 +50 4.08 4.12 ✓ 1200.90 ✓
 4 1.80 2.82 ✓ 02.20 ✓
 T.P. -0.36 ✓
 +4.97 1209.63 ✓ 1204.66 ✓
 4+50 3.59 6.13 ✓ 03.50 ✓
 5 3.59 5.92 ✓ 04.51 ✓
 +50 3.69 4.71 ✓ 04.92 ✓
 6 4.09 4.59 ✓ 05.04 ✓
 B.M.#12 -3.50 ✓
 1206.21 ✓
 1206.13 ✓

F1.0 ✓
 F1.0 ✓
 Grade ✓
 Grade ✓
 C1.0 ✓
 C1.0 ✓
 C1.5 ✓
 C1.5 ✓
 C1.0 ✓
 C0.5 ✓
 1206.13 ✓

49	1283.90	3.80	3.70	1280.20	Grade
+8+50		4.05	3.95	79.95	"
48		4.30	4.20	79.70	"
+7+50		4.56	4.45	79.45	" (C.O. low) stake
47		5.11	5.01	78.89	"
+6+50		6.30	6.20	77.70	"
T.P.	-5.79 +1.11			1279.22	1278.11

46		3.12	3.02	76.20	Grade
+5+50		4.62	4.52	74.70	"
+5		6.12	6.02	73.20	"
T.P.	-7.45 +0.58			1272.35	1271.77

44+50		0.65	0.55	71.80	Grade
44		1.82	1.72	70.63	"
+3+50		2.80	2.70	69.65	" (C.O. low)
43		2.55	3.45	68.90	Cut 1'-0" ←
+2+50		4.20	4.10	68.25	Grade
+2		4.85	4.75	67.60	"

41+50	127235	5.50	54066.95	Grade
41		6.14	6.0566.30	
40+50		7.06	6.9665.39	
40		8.50	8.4063.95	

Graded + Tacked to 40+00

BM #7 -3.42			1268.93	+244.00
6/23 Grav				
7.474				

BM #7 +0.96	1269.96		1269.00	
-------------	---------	--	---------	--

39+50		8.07	7.971261.99	Grade
-------	--	------	-------------	-------

39		10.56	10.46	59.50	Grade
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T.P. -11.83				
+0.41	1258.54		1258.13	

38+50		1.89	1.79	56.75	Grade
-------	--	------	------	-------	-------

38		4.11	4.01	54.53	
----	--	------	------	-------	--

37+50		5.26	5.16	53.38	
-------	--	------	------	-------	--

37		5.89	5.79	52.75	
----	--	------	------	-------	--

36+50		6.51	6.41	52.13	
-------	--	------	------	-------	--

36		7.05	6.95	51.59	
----	--	------	------	-------	--

T.P. -7.05				
+2.70	1254.19		1251.49	

35+50 1254.19 3.05 2.95 1251.24 Grade

35 3.37 3.2 50.98 (0.01 low)

34+50 3.57 3.47 50.72

B.M.#6 -2.32
+2.32 1254.18 1251.87 1251.86

34 3.82 3.72 50.46 Grade

33+50 4.10 4.00 50.18

33 4.33 4.33 49.85

32+50 4.79 4.69 49.49

32 5.20 5.10 49.08

T.P. -6.90
+3.57 1250.85 1247.28

31+50 2.30 2.20 48.65 Grade

31 2.73 2.63 48.22 (0.01 low)

30+50 3.16 3.06 47.79

30 3.59 3.49 47.36

29+50 4.00 3.90 46.95

29 4.36 4.26 46.59

28+50 4.68 4.58 46.27

28 4.95 4.85 46.00

B.M.#9 -3.80
1247.05

B.M.#9 +2.07 1249.12

1247.05

27+50 3.47 3.37 1245.75

Grade 43.0

27 3.72 3.62 45.50

(0.02 low)

26+50 3.97 3.87 45.25

Grade 43.0

26 4.22 ~~4.12~~ 4.12 45.00

0.01 low

25+50 4.47 4.37 44.75

Grade 43.0

25 5.34 5.24 43.88

Grade 43.0

24+50 7.47 7.37 41.75

Grade 43.0

24 10.22 10.12 39.00

Grade 43.0

-10.06

T.P. +0.08 1239.14

1239.06

23+50 2.99 2.89 36.25

0.01 low

23 5.74 5.64 33.50

Grade 43.0

22+50 8.33 8.23 30.91

Grade 43.0

22 10.60 10.50 28.64

Grade 43.0

T.P. -10.12 1229.02

+0.25 1229.27

Kiedler & Grau July 27th 1915.

Scotland Sta. West side Road

Assumed.
Elev.

Remarks

E. end. of Concrete

14' wide assumed ground

4' L. on ground

Elev. of S. side of old pavement

L. or Northy

R. or Southy

67

8.25
99.5
110.28
99.5
110.78
2.7

Sta	Red	Assumed Elev.	Remarks	Elev. of S. side of old pavement	L. or Northy	R. or Southy
0.	+8.75	108.76	100.00 99.50	99.82	8.88	8.75
1			102.05	102.53	6.8	6.7
2			104.85	105.21	4.1	3.9
3			107.55	107.97	1.4	1.2
TP	-0.34	108.41				
	+10.07	118.48				
4			110.28	110.68	8.4	8.2
5			112.60	113.13	6.0	5.8
6			114.78	115.28	3.8	3.70
7			116.08	116.58	2.6	2.40
8			116.98	117.30	1.7	1.5
TP	-1.02	117.46				
	+4.88	122.34				
9			117.34	117.74	5.1	5.0
9+0.5			117.85	117.76	4.46	4.49
9+12.2			118.15	118.08	4.09	4.19
9+15.4			118.21	118.04	4.09	4.13

use 4 9

567
653

894
21
84
704
587
117

45
27
315
90
1215

894
270
624
2270
135

462

270
35
1350

895 68
725
150
113
107

0	+8.94	108.94	8.94	100.00
0	+50		7.59	
0	+5-500 stake		7.46	
1			6.20	
1	+50		4.89	
2			3.57	
2	+50		2.19	
3	-84		.84	108.10
	+9.74	117.84	9.74	
	+50		7.39	
4			7.04	
4	+50		5.87	
5			4.67	
	+50		3.56	
6			2.49	
6		set at	2.45	
	+50		1.70	
	-1.37			106.50
7	+5.14	121.64	5.05	

Elev. old fence

	4.21	5.05
7+50	3.71	4.55
8	3.39	4.25
8+50	3.15	4.06

Embark at 94+30

Tackled Stake

Paired Stake

□ 15' X 15' □

□ Outlets

Side Stakes set 1' outside of Headwalls

□ 15' X 15' □

Culvert Sta 86+65

□ 23.5' X 22.5' □ Stake

side stakes set 1' outside parapets

no stakes set

□ 23.5' X 22.5' □ Stake

71+25

□ 15' X 15' □

(side stakes set 1' outside of head walls)

□ 15' X 15' □

Stakes set for 2' of pipe in line with ditch to West, near fence line

May 20th 1918

Trudler & Grown Stake

grade Red 2269

B.M. #2 +392 1309.06 Road 1308.14

Stake marked FL 2'-6" ↓ 7.46 9.46 1299.60

" " " 2'-6" ↓ 7.16 9.16 1299.90

1300.4
2.6
1303
1309.1

86+65

B.M. #3 +330 1310.36 1307.06

T.P. -10.80 1299.56

+1.61 1201.17

Stake marked FL 2'-6" ↓ 10.27 12.77 1288.40

" " FL 1'-6" ↓ 12.67 13.67 1287.50

75+36

+2.49 1309.55

1307.06

(2B) F.L. stake marked 1' ↑ 10.40 9.40 1300.15

" " " 0'-6" ↓ 8.40 8.90 1300.65

Stake set for 2' of pipe = 20' from ^{road} R.F.L.

Stakes set 71+25

F.L. marked 4'-0" ↓ 5.95 9.95 1299.60

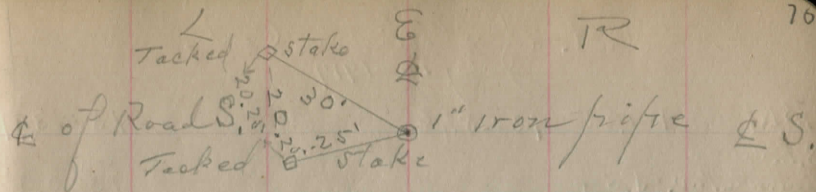
F.L. marked 2'-6" ↓ 7.75 10.25 1299.30

Culvert at Sta. 50+20

R.M.	+5.38	1284.92	Stake Rod	grade Rod	1279.54
------	-------	---------	-----------	-----------	---------

Stake Marked cut	2'-6"	5.02	7.52	1277.4
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Stake on Ro. marked cut	4.0	3.22	7.22	1277.7
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Int. at Claridon Cent.
July 10-1917

BM. +1.85 1325.76 1323.91
S.E. corner
Concrete Pav. -5.34 1320.47
Sta.
114+28 -4.06 Tacked stake on 2' offset line 1321.70

1321.70
20.42
28 1.28 14.59%
112
160
140
200
196

measured 39' offset from end of
Concrete Pavement to offset stake at
Sta 114+28 B+C road

BM +2.71 1326.62 1323.91
7.92 1321.70
5.20 5-10 1321.52

+ 3.5% old pavement to West
+ 2.6% Proposed to East

114+28 Burton & Claridon road 1321.70

2.6%

.09
234 raise across N. end of B+C road

IMPROVED TABLES AND INFORMATION

TABLE No. 2

To find Tangent and External for curve of any other degree divide by degree of curve and add correction found in column of corrections. Degree of curve with a given L may be found by dividing tangent (or external), opposite L by given tangent (or external).

The distance from a point on the tangent to the curve is very nearly the square of the tangent length divided by twice the radius.

TABLE II—Continued
TRIGONOMETRIC FORMULAE (continued)

In any triangle:

Given a, b, C; to find c, B, A.

Use Law of Lines.

Given A, B, c; to find a, b, C.

Use Law of Lines.

Given a, b, c; to find A, B, C.

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

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

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

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

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

Area of a triangle:

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

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

PRISMOIDAL FORMULA.

$$\text{Vol.} = \frac{h}{6} (B+b+4M)$$

h = altitude; b, B = bases; M = midsection

TABLE III
INCHES AND FRACTIONS OF AN INCH IN DECIMALS OF A FOOT

	0	1	2	3	4	5	6	7	8	9	10	11
$\frac{1}{16}$	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219
$\frac{1}{8}$	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271
$\frac{3}{16}$	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323
$\frac{1}{4}$	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375
$\frac{5}{16}$	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427
$\frac{3}{8}$	.0313	.1146	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479
$\frac{7}{16}$	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531
$\frac{1}{2}$	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583
$\frac{9}{16}$	.0469	.1302	.2135	.2969	.3803	.4635	.5469	.6302	.7135	.7969	.8802	.9635
$\frac{5}{8}$	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688
$\frac{11}{16}$	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740
$\frac{3}{4}$	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792
$\frac{13}{16}$	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844
$\frac{7}{8}$	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896
$\frac{15}{16}$	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948
1	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	1.0000
	0	1	2	3	4	5	6	7	8	9	10	11

TABLE IV
USEFUL RELATIONS.

Lineal feet	×.00019	= miles
Lineal yards	×.0006	= miles
Square inches	×.007	= square feet
Square feet	×.111	= square yards
Square yards	×.0002067	= acres
Acres	×4840	= square yards
Cubic inches	×.00058	= cubic feet
Cubic feet	×.03704	= cubic yards
Links	×.22	= yards
Links	×.66	= feet
Feet	×1.5	= links

$$360^\circ = 21600' = 1296000''$$

$$\text{Radius} = \text{arc of } 57.2957790^\circ$$

$$\text{Arc of } 1^\circ (\text{radius} = 1) = .017453292$$

$$\text{Arc of } 1' (\text{radius} = 1) = .000290888$$

$$\text{Arc of } 1'' (\text{radius} = 1) = .000004848$$

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

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

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

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

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

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

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

Curvature in feet = $0.667 (\text{Dist. in miles})^2$

Difference between arc and chord length, 0.05 feet in $11\frac{1}{2}$ miles

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

Error in chaining of 0.01 feet in 100 feet:

Due to—

1. Length of tape error of 0.01 feet
2. Alignment. One end 1.4 feet out of line
3. Sag of tape at centre of 0.61 feet.
4. Temperature difference of 15°
5. Difference of pull of 15 lbs.

STADIA REDUCTION FORMULÆ.

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

Vertical Distance = $R \frac{1}{2} \sin 2a + C \sin a$

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

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

a = angle of elevation for mid Reading

TABLE VI (continued)
SINES, COSINES, TANGENTS, COTANGENTS (continued)

degs.	sin 0'	tan 0'	sin 10'	tan 10'	sin 20'	tan 20'	sin 30'	tan 30'	sin 40'	tan 40'	sin 50'	tan 50'	degs.
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
										1.2203			
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	.2647	7753	1.2276	39
51	771	.2349	790	.2423	808	.2497	826	.2572	844	.3111	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3597	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.4106	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4641	175	.4193	35
55	192	.4281	208	.4370	225	.4460	241	.4550	258	.5204	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5798	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.6426	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.7090	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631		646	.7205	30
60	660	1.7321	8675	1.7437	8689	1.7556	8704	1.7675	8718	1.7797	8732	1.7917	29
61	746	.8040	760	.8165	774	.8291	788	.8418	802	.8546	816	.8676	28
62	829	.8807	843	.8940	857	.9074	870	.9210	884	.9347	897	.9486	27
63	910	.9626	923	.9768	936	.9912	949	2.0057	962	2.0204	975	2.0353	26
64	988	2.0503	9001	2.0655	9013	2.0809	9026	.0965	9038	.1123	9051	.1283	25
65	9063	.1445	075	.1609	088	.1775	100	.1943	112	.2113	124	.2286	24
66	135	.2460	147	.2637	159	.2817	171	.2998	182	.3183	194	.3369	23
67	205	.3559	216	.3750	228	.3945	239	.4142	250	.4342	261	.4545	22
68	272	.4751	283	.4960	293	.5172	304	.5386	315	.5605	325	.5826	21
69	336	.6051	346	.6279	356	.6511	367	.6746	377	.6985	387	.7228	20
70	397	2.7475	9407	2.7725	9417	2.7980	9426	2.8239	9436	2.8502	9446	2.8770	19
71	455	.9042	465	.9319	474	.9600	483	.9887	492	3.0178	502	3.0475	18
72	511	3.0777	520	3.1084	528	3.1397	537	3.1716	546	.2041	555	.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	.5764	10
80	9348	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	922	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.078	954	10.385	957	10.711	959	11.059	5
85	962	11.430	964	11.826	967	12.250	969	12.706	971	13.197	974	13.727	4
86	976	14.300	978	14.924	980	15.605	981	16.350	983	17.169	985	18.075	3
87	986	19.081	988	20.206	989	21.470	990	22.903	992	24.542	993	26.432	2
88	994	28.636	995	31.242	996	34.368	997	38.189	997	42.964	998	49.104	1
89	9998	57.290	9999	68.750	9999	85.940	9999	114.58	1.000	171.88	1.000	343.77	0
90	60'	60'	50'	50'	40'	40'	30'	30'	20'	20'	10'	10'	degs.
	cos	cot	cos	cot	cos	cot	cos	cot	cos	cot	cos	cot	

TABLE VII
RODS IN FEET AND INCHES

Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches
1	16-6	21	346-6	41	676-6	61	1006-6	81	1336-6
2	33-0	22	363-0	42	693-0	62	1023-0	82	1353-0
3	49-6	23	379-6	43	709-6	63	1039-6	83	1369-6
4	66-0	24	396-0	44	726-0	64	1056-0	84	1386-0
5	82-6	25	412-6	45	742-6	65	1072-6	85	1402-6
6	99-0	26	429-0	46	759-0	66	1089-0	86	1419-0
7	115-6	27	445-6	47	775-6	67	1105-6	87	1435-6
8	132-0	28	462-0	48	792-0	68	1122-0	88	1452-0
9	148-6	29	478-6	49	808-6	69	1138-6	89	1468-6
10	165-0	30	495-0	50	825-0	70	1155-0	90	1485-0
11	181-6	31	511-6	51	841-6	71	1171-6	91	1501-6
12	198-0	32	528-0	52	858-0	72	1188-0	92	1518-0
13	214-6	33	544-6	53	874-6	73	1204-6	93	1534-6
14	231-0	34	561-0	54	891-0	74	1221-0	94	1551-0
15	247-6	35	577-6	55	907-6	75	1237-6	95	1567-6
16	264-0	36	594-0	56	924-0	76	1254-0	96	1584-0
17	280-6	37	610-6	57	940-6	77	1270-6	97	1600-6
18	297-0	38	627-0	58	957-0	78	1287-0	98	1617-0
19	313-6	39	643-6	59	973-6	79	1303-6	99	1633-6
20	330-0	40	660-0	60	990-0	80	1320-0	100	1650-0

TABLE VIII
LINKS IN FEET AND INCHES

Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches
1	0- 7.92	18	11-10.56	35	23- 1.20	52	34- 3.84	69	45- 6.48
2	1- 3.84	19	12- 6.48	36	23- 9.12	53	34-11.76	70	46- 2.40
3	1-11.76	20	13- 2.40	37	24- 5.04	54	35- 7.68	71	46-10.32
4	2- 7.68	21	13-10.32	38	25- 0.96	55	36- 3.60	72	47- 6.24
5	3- 3.60	22	14- 6.24	39	25- 8.88	56	36-11.52	73	48- 2.16
6	3-11.52	23	15- 2.16	40	26- 4.80	57	37- 7.44	74	48-10.08
7	4- 7.44	24	15-10.08	41	27- 0.72	58	38- 3.36	75	49- 6.00
8	5- 3.36	25	16- 6.00	42	27- 8.64	59	38-11.28	76	50- 1.92
9	5-11.28	26	17- 1.92	43	28- 4.56	60	39- 7.20	77	50- 9.84
10	6- 7.20	27	17- 9.84	44	29- 0.48	61	40- 3.12	78	51- 5.76
11	7- 3.12	28	18- 5.76	45	29- 8.40	62	40-11.04	79	52- 1.68
12	7-11.04	29	19- 1.68	46	30- 4.32	63	41- 6.96	80	52- 9.60
13	8- 6.96	30	19- 9.60	47	31- 0.24	64	42- 2.88	81	53- 5.52
14	9- 2.88	31	20- 5.52	48	31- 8.16	65	42-10.80	82	54- 1.44
15	9-10.80	32	21- 1.44	49	32- 4.08	66	43- 6.72	83	54- 9.36
16	10- 6.72	33	21- 9.36	50	33- 0.00	67	44- 2.64	84	55- 5.28
17	11- 2.64	34	22- 5.28	51	33- 7.92	68	44-10.56	85	56- 1.20
								102	67- 3.84

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218		11°	551.70	26.500		21°	1061.9	97.577	
10'	58.34	.297	+	10'	560.11	27.313	+	10'	1070.6	99.155	+
20'	66.67	.388	5° C.	20'	568.53	28.137	5° C.	20'	1079.2	100.75	5° C.
30'	75.01	.491	T	30'	576.95	28.974	T	30'	1087.8	102.35	T
40'	83.34	.606	.03	40'	585.36	29.824	.06	40'	1096.4	103.97	.10
50'	91.68	.733	E	50'	593.79	30.686	.06	50'	1105.1	105.60	E
2°	100.01	.873	.001	12°	602.21	31.561	.006	22°	1113.7	107.24	.013
10'	108.35	1.024		10'	610.64	32.447		10'	1122.4	108.90	
20'	116.68	1.188		20'	619.07	33.347		20'	1131.0	110.57	
30'	125.02	1.364		30'	627.50	34.259		30'	1139.7	112.25	
40'	133.36	1.552		40'	635.93	35.183		40'	1148.4	113.95	
50'	141.70	1.752		50'	644.37	36.120		50'	1157.0	115.66	
3°	150.04	1.964	10° C.	13°	652.81	37.070	10° C.	23°	1165.7	117.38	10° C.
10'	158.38	2.188	T	10'	661.25	38.031	T	10'	1174.4	119.12	T
20'	166.72	2.425	.06	20'	669.70	39.006	.13	20'	1183.1	120.87	.19
30'	175.06	2.674	E	30'	678.15	39.993	E	30'	1191.8	122.63	E
40'	183.40	2.934	.003	40'	686.60	40.992	.011	40'	1200.5	124.41	.025
50'	191.74	3.207	T	50'	695.06	42.004	T	50'	1209.2	126.20	T
4°	200.08	3.492	15° C.	14°	703.51	43.029	15° C.	24°	1217.9	128.00	15° C.
10'	208.43	3.790	T	10'	711.97	44.066	T	10'	1226.6	129.82	T
20'	216.77	4.099	.06	20'	720.44	45.116	.13	20'	1235.3	131.65	.19
30'	225.12	4.421	E	30'	728.90	46.178	E	30'	1244.0	133.50	E
40'	233.47	4.755	.003	40'	737.37	47.253	.011	40'	1252.8	135.35	.025
50'	241.81	5.100	T	50'	745.85	48.341	T	50'	1261.5	137.23	T
5°	250.16	5.459	20° C.	15°	754.32	49.441	20° C.	25°	1270.2	139.11	20° C.
10'	258.51	5.829	E	10'	762.80	50.554	E	10'	1279.0	141.01	E
20'	266.86	6.211	.004	20'	771.29	51.679	.017	20'	1287.7	142.93	.038
30'	275.21	6.606	T	30'	779.77	52.818	T	30'	1296.5	144.85	T
40'	283.57	7.013	.06	40'	788.26	53.969	.038	40'	1305.3	146.79	.070
50'	291.92	7.432	E	50'	796.75	55.132	E	50'	1314.0	148.75	E
6°	300.28	7.863	25° C.	16°	805.25	56.309	25° C.	26°	1322.8	150.71	25° C.
10'	308.64	8.307	T	10'	813.75	57.498	T	10'	1331.6	152.69	T
20'	316.99	8.762	.06	20'	822.25	58.699	.13	20'	1340.4	154.69	.19
30'	325.35	9.230	E	30'	830.76	59.914	E	30'	1349.2	156.70	E
40'	333.71	9.710	.003	40'	839.27	61.141	.017	40'	1358.0	158.72	.038
50'	342.08	10.202	T	50'	847.78	62.381	T	50'	1366.8	160.76	T
7°	350.44	10.707	30° C.	17°	856.30	63.634	30° C.	27°	1375.6	162.81	30° C.
10'	358.81	11.224	E	10'	864.82	64.900	E	10'	1384.4	164.86	E
20'	367.17	11.753	.006	20'	873.35	66.178	.022	20'	1393.2	166.95	.051
30'	375.54	12.294	T	30'	881.88	67.470	T	30'	1402.0	169.04	T
40'	383.91	12.847	.06	40'	890.41	68.774	.038	40'	1410.9	171.15	.070
50'	392.28	13.413	E	50'	898.95	70.091	E	50'	1419.7	173.27	E
8°	400.66	13.991	35° C.	18°	907.49	71.421	35° C.	28°	1428.6	175.41	35° C.
10'	409.03	14.582	T	10'	916.03	72.764	T	10'	1437.4	177.55	T
20'	417.41	15.184	.06	20'	924.58	74.119	.13	20'	1446.3	179.72	.19
30'	425.79	15.799	E	30'	933.13	75.488	E	30'	1455.1	181.89	E
40'	434.17	16.426	.003	40'	941.69	76.869	.017	40'	1464.0	184.08	.038
50'	442.55	17.065	T	50'	950.25	78.264	T	50'	1472.9	186.29	T
9°	450.93	17.717	40° C.	19°	958.81	79.671	40° C.	29°	1481.8	188.51	40° C.
10'	459.32	18.381	E	10'	967.38	81.092	E	10'	1490.7	190.74	E
20'	467.71	19.058	.006	20'	975.96	82.525	.022	20'	1499.6	192.99	.051
30'	476.10	19.746	T	30'	984.53	83.972	T	30'	1508.5	195.25	T
40'	484.49	20.447	.06	40'	993.12	85.431	.038	40'	1517.4	197.53	.070
50'	492.88	21.161	E	50'	1001.7	86.904	E	50'	1526.3	199.82	E
10°	501.28	21.887	45° C.	20°	1010.3	88.389	45° C.	30°	1535.3	202.12	45° C.
10'	509.68	22.624	T	10'	1018.9	89.888	T	10'	1544.2	204.44	T
20'	518.08	23.375	.06	20'	1027.5	91.399	.13	20'	1553.1	206.77	.19
30'	526.48	24.138	E	30'	1036.1	92.924	E	30'	1562.1	209.12	E
40'	534.89	24.913	.003	40'	1044.7	94.462	.017	40'	1571.0	211.48	.038
50'	543.29	25.700	T	50'	1053.3	96.013	T	50'	1580.0	213.86	T

T = R tan 1/2 I

E = R exsec 1/2 I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10'	1598.0	218.7	5° C.	10'	2151.7	390.7	5° C.	10'	2743.1	622.8	5° C.
20'	1606.9	221.1	T	20'	2161.2	394.1	T	20'	2753.4	627.2	T
30'	1615.9	223.5	.03	30'	2170.8	397.4	.06	30'	2763.7	631.7	.09
40'	1624.9	226.0	.06	40'	2180.3	400.8	.10	40'	2773.9	636.2	.12
50'	1633.9	228.4	E	50'	2189.9	404.2	E	50'	2784.2	640.7	E
32°	1643.0	230.9	.023	42°	2199.4	407.6	.037	52°	2794.6	645.2	.056
10'	1652.0	233.4		10'	2209.0	411.1		10'	2804.9	649.7	
20'	1661.0	235.9		20'	2218.6	414.5		20'	2815.2	654.3	
30'	1670.0	238.4		30'	2228.1	418.0		30'	2825.6	658.8	
40'	1679.1	241.0		40'	2237.7	421.4		40'	2835.9	663.4	
50'	1688.1	243.5		50'	2247.3	425.0		50'	2846.3	668.0	
33°	1697.2	246.1	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10'	1706.3	248.7	T	10'	2266.6	432.0	T	10'	2867.1	677.3	T
20'	1715.3	251.3	.26	20'	2276.2	435.6	.34	20'	2877.5	682.0	.42
30'	1724.4	253.9	E	30'	2285.9	439.2	E	30'	2888.0	686.7	E
40'	1733.5	256.5	.046	40'	2295.6	442.8	.075	40'	2898.4	691.4	.112
50'	1742.6	259.1	T	50'	2305.2	446.4	T	50'	2908.9	696.1	T
34°	1751.7	261.8	15° C.	44°	2314.9	450.0	15° C.	54°	2919.4	700.9	15° C.
10'	1760.8	264.5	T	10'	2324.6	453.6	T	10'	2929.9	705.7	T
20'	1770.0	267.2	.06	20'	2334.3	457.3	.06	20'	2940.4	710.5	.06
30'	1779.1	269.9	E	30'	2344.1	461.0	E	30'	2951.0	715.3	E
40'	1788.2	272.6	.013	40'	2353.8	464.6	.013	40'	2961.5	720.1	.013
50'	1797.4	275.3	T	50'	2363.5	468.4	T	50'	2972.1	725.0	T
35°	1806.6	278.1	20° C.	45°	2373.3	472.1	20° C.	55°	2982.7	729.9	20° C.
10'	1815.7	280.8	E	10'	2383.1	475.8	E	10'	2993.3	734.8	E
20'	1824.9	283.6	.026	20'	2392.8	479.6	.026	20'	3003.9	739.7	.026
30'	1834.1	286.4	E	30'	2402.6	483.4	E	30'	3014.5	744.6	E
40'	1843.3	289.2	.051	40'	2412.4	487.2	.051	40'	3025.2	749.6	.051
50'	1852.5	292.0	T	50'	2422.3	491.0	T	50'	3035.8	754.6	T
36°	1861.7	294.9	25° C.	46°	2432.1	494.8	25° C.	56°	3046.5	759.6	25° C.
10'	1870.9	297.7	T	10'	2441.9	498.7	T	10'	3057.2	764.6	T
20'	1880.1	300.6	.076	20'	2451.8	502.5	.076	20'	3067.9	769.7	.076
30'	1889.4	303.5	E	30'	2461.7	506.4	E	30'	3078.7	774.7	E
40'	1898.6	306.4	.026	40'	2471.5	510.3	.026	40'	3089.4	779.8	.026
50'	1907.9	309.3	T	50'	2481.4	514.3	T	50'	3100.2	784.9	T
37°	1917.1	312.2	30° C.	47°	2491.3	518.2	30° C.	57°	3110.9	790.1	30° C.
10'	1926.4	315.2	E	10'	2501.2	522.2	E	10'	3121.7	795.2	E
20'	1935.7	318.2	.051	20'	2511.2	526.1	.051	20'	3132.6	800.4	.051
30'	1945.0	321.1	E	30'	2521.1	530.1	E	30'	3143.4	805.6	E
40'	1954.3	324.1	.076	40'	2531.1	534.2	.076	40'	3154.2	810.9	.076
50'	1963.6	327.1	T	50'	2541.0	538.2	T	50'	3165.1	816.1	T
38°	1972.9	330.2	35° C.	48°	2551.0	542.2	35° C.	58°	3176.0	821.4	35° C.
10'	1982.2	333.2	E	10'	2561.0	546.3	E	10'	3186.9	826.7	E
20'	1991.5	336.3	.076	20'	2571.0	550.4	.076	20'	3197.8	832.0	.076
30'	2000.8	339.3	T	30'	2581.0	554.5	T	30'	3208.8	837.3	T

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2	+	71°	4086.9	1308.2	+	81°	4893.6	1805.3	+
10'	3386.3	925.9		10'	4099.5	1315.6		10'	4908.0	1814.7	
20'	3397.5	931.6	5° C.	20'	4112.1	1322.9	5° C.	20'	4922.5	1824.1	5° C.
30'	3408.8	937.3	T	30'	4124.8	1330.3	T	30'	4937.0	1833.6	T
40'	3420.1	943.1	.25	40'	4137.4	1337.7	.30	40'	4951.5	1843.1	.36
50'	3431.4	948.9	E	50'	4150.1	1345.1	E	50'	4966.1	1852.6	E
62°	3442.7	954.8	.080	72°	4162.8	1352.6	.110	82°	4980.7	1862.2	.149
10'	3454.1	960.6		10'	4175.6	1360.1		10'	4995.4	1871.8	
20'	3465.4	966.5		20'	4188.5	1367.6		20'	5010.0	1881.5	
30'	3476.8	972.4		30'	4201.2	1375.2		30'	5024.8	1891.2	
40'	3488.3	978.3		40'	4214.0	1382.8		40'	5039.5	1900.9	
50'	3499.7	984.3		50'	4226.8	1390.4		50'	5054.3	1910.7	
63°	3511.1	990.2	10° C.	73°	4239.7	1398.0	10° C.	83°	5069.2	1920.5	10° C.
10'	3522.6	996.2	T	10'	4252.6	1405.7	T	10'	5084.0	1930.4	T
20'	3534.1	1002.3	.51	20'	4265.6	1413.5	.61	20'	5099.0	1940.3	.72
30'	3545.6	1008.3	E	30'	4278.5	1421.2	E	30'	5113.9	1950.3	E
40'	3557.2	1014.4	.159	40'	4291.5	1429.0	.220	40'	5128.9	1960.2	.299
50'	3568.7	1020.5		50'	4304.6	1436.8		50'	5143.9	1970.3	
64°	3580.3	1026.6		74°	4317.6	1444.6		84°	5159.0	1980.4	
10'	3591.9	1032.8		10'	4330.7	1452.5		10'	5174.1	1990.5	
20'	3603.5	1039.0		20'	4343.8	1460.4		20'	5189.3	2000.6	
30'	3615.1	1045.2		30'	4356.9	1468.4		30'	5204.4	2010.8	
40'	3626.8	1051.4		40'	4370.1	1476.4		40'	5219.7	2021.1	
50'	3638.5	1057.7	15° C.	50'	4383.3	1484.4	15° C.	50'	5234.9	2031.4	15° C.
65°	3650.2	1063.9	T	75°	4396.5	1492.4	T	85°	5250.3	2041.7	T
10'	3661.9	1070.2	.76	10'	4409.8	1500.5	.91	10'	5265.6	2052.1	1.09
20'	3673.7	1076.6	E	20'	4423.1	1508.6	E	20'	5281.0	2062.5	E
30'	3685.4	1082.9	.240	30'	4436.4	1516.7	.332	30'	5296.4	2073.0	.450
40'	3697.2	1089.3		40'	4449.7	1524.9		40'	5311.9	2083.5	
50'	3709.0	1095.7		50'	4463.1	1533.1		50'	5327.4	2094.1	
66°	3720.9	1102.2		76°	4476.5	1541.4		86°	5343.0	2104.7	
10'	3732.7	1108.6		10'	4489.9	1549.7		10'	5358.6	2115.3	
20'	3744.6	1115.1		20'	4503.4	1558.0		20'	5374.2	2126.0	
30'	3756.5	1121.7	20° C.	30'	4516.9	1566.3	20° C.	30'	5389.9	2136.7	20° C.
40'	3768.5	1128.2	T	40'	4530.4	1574.7	T	40'	5405.6	2147.5	T
50'	3780.4	1134.8	.102	50'	4544.0	1583.1	.122	50'	5421.4	2158.4	.145
67°	3792.4	1141.4	E	77°	4557.6	1591.6	E	87°	5437.2	2169.2	E
10'	3804.4	1148.0	.321	10'	4571.2	1600.1	.445	10'	5453.1	2180.2	.603
20'	3816.4	1154.7		20'	4584.8	1608.6		20'	5469.0	2191.1	
30'	3828.4	1161.3		30'	4598.5	1617.1		30'	5484.9	2202.2	
40'	3840.5	1168.1		40'	4612.2	1625.7		40'	5500.9	2213.2	
50'	3852.6	1174.8		50'	4626.0	1634.4		50'	5517.0	2224.3	
68°	3864.7	1181.6		78°	4639.8	1643.0		88°	5533.1	2235.5	
10'	3876.8	1188.4	25° C.	10'	4653.6	1651.7	25° C.	10'	5549.2	2246.7	25° C.
20'	3889.0	1195.2	T	20'	4667.4	1660.5	T	20'	5565.4	2258.0	T
30'	3901.2	1202.0	.128	30'	4681.3	1669.2	.153	30'	5581.6	2269.3	.183
40'	3913.4	1208.9	E	40'	4695.2	1678.1	E	40'	5597.8	2280.6	E
50'	3925.6	1215.8	.403	50'	4709.2	1686.9	.558	50'	5614.2	2292.0	.756
69°	3937.9	1222.7		79°	4723.2	1695.8		89°	5630.5	2303.5	
10'	3950.2	1229.7		10'	4737.2	1704.7		10'	5646.9	2315.0	
20'	3962.5	1236.7		20'	4751.2	1713.7		20'	5663.4	2326.6	
30'	3974.8	1243.7		30'	4765.3	1722.7		30'	5679.9	2338.2	
40'	3987.2	1250.8		40'	4779.4	1731.7		40'	5696.4	2349.8	
50'	3999.5	1257.9	30° C.	50'	4793.6	1740.8	30° C.	50'	5713.0	2361.5	30° C.
70°	4011.9	1265.0	T	80°	4807.7	1749.9	T	90°	5729.7	2373.3	T
10'	4024.4	1272.1	1.54	10'	4822.0	1759.0	1.84	10'	5746.3	2385.1	2.20
20'	4036.8	1279.3	E	20'	4836.2	1768.2	E	20'	5763.1	2397.0	E
30'	4049.3	1286.5	.485	30'	4850.5	1777.4	.671	30'	5779.9	2408.9	.910
40'	4061.8	1293.6		40'	4864.8	1786.7		40'	5796.7	2420.9	
50'	4074.4	1300.9		50'	4879.2	1796.0		50'	5813.6	2432.9	

T = R tan ½ I

E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9	+	101°	6950.6	3278.1	+	111°	8336.7	4386.1	+
10'	5847.5	2457.1		10'	6971.3	3294.1		10'	8362.7	4407.6	
20'	5864.6	2469.3	5° C.	20'	6992.0	3310.1	5° C.	20'	8388.9	4429.2	5° C.
30'	5881.7	2481.5	T	30'	7012.7	3326.1	T	30'	8415.1	4450.9	T
40'	5898.8	2493.8	.43	40'	7033.6	3342.3	.51	40'	8441.5	4472.7	.62
50'	5916.0	2506.1	E	50'	7054.5	3358.5	E	50'	8468.0	4494.6	E
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
10'	5950.5	2531.0		10'	7096.6	3391.2		10'	8521.3	4538.8	
20'	5967.9	2543.5		20'	7117.8	3407.7		20'	8548.1	4561.1	
30'	5985.3	2556.0		30'	7139.0	3424.3		30'	8575.0	4583.4	
40'	6002.7	2568.6		40'	7160.3	3440.9		40'	8602.1	4606.0	
50'	6020.2	2581.3		50'	7181.7	3457.6		50'	8629.3	4628.6	
93°	6037.8	2594.0	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.
10'	6055.4	2606.8	T	10'	7224.7	3491.3	T	10'	8684.0	4674.2	T
20'	6073.1	2619.7	.86	20'	7246.3	3508.2	.103	20'	8711.5	4697.2	.125
30'	6090.8	2632.6	E	30'	7268.0	3525.2	E	30'	8739.2	4720.3	E
40'	6108.6	2645.5	.401	40'	7289.8	3542.4	.536	40'	8767.0	4743.6	.621
50'	6126.4	2658.5		50'	7311.7	3559.6		50'	8794.9	4766.9	.721
94°	6144.3	2671.6		104°	7333.6	3576.8		114°	8822.9	4790.4	
10'	6162.2	2684.7		10'	7355.6	3594.2		10'	8851.0	4814.1	
20'	6180.2	2697.9		20'	7377.8	3611.7		20'	8879.3	4837.8	
30'	6198.3	2711.2		30'	7399.9	3629.2		30'	8907.7	4861.7	
40'	6216.4	2724.5		40'	7422.2	3646.8		40'	8936.3	4885.7	
50'	6234.6	2737.9	15° C.	50'	7444.6	3664.5	15° C.	50'	8965.0	4909.9	15° C.
95°	6252.8	2751.3	T	105°	7467.0	3682.3	T	115°	8993.8	4934.1	T
10'	6271.1	2764.8	1.30	10'	7489.6	3700.2	1.56	10'	9022.7	4958.6	1.93
20'	6289.4	2778.3	E	20'	7512.2	3718.2	E	20'	9051.7	4983.1	E
30'	6307.9	2792.0	.604	30'	7534.9	3736.2	.806	30'	9080.9	5007.8	.809
40'	6326.3	2805.6		40'	7557.7	3754.4		40'	9110.3	5032.6	
50'	6344.8	2819.4		50'	7580.5	3772.6		50'	9139.8	5057.6	
96°	6363.4	2833.2		106°	7603.5	3791.0		116°	9169.4	5082.7	
10'	6382.1	2847.0		10'	7626.8	3809.4		10'	9199.1	5107.9	
20'	6400.8	2861.0		20'	7649.7	3827.9		20'	9229.0	5133.3	
30'	6419.5	2875.0	20° C.	30'	7672.9	3846.5	20° C.	30'	9259.0	5158.8	20° C.
40'	6438.4	2889.0	T	40'	7696.3	3865.2	T	40'	9289.2	5184.5	T
50'	6457.3	2903.1	.174	50'	7719.7	3884.0	.208	50'	9319.5	5210.3	.252
97°	6476.2	2917.3	E	107°	7743.2	3902.9	E	117°	9349.9	5236.2	E
10'	6495.2	2931.6	.809	10'	7766.8	3921.9	1.08	10'	9380.5	5262.3	1.46
20'	6514.3	2945.9		20'	7790.5	3940.9		20'	9411.3	5288.6	
30'	6533.4	2960.3		30'	7814.3	3960.1		30'	9442.2	5315.0	
40'	6552.6	2974.7		40'	7838.1	3979.4		40'	9473.2	5341.5	
50'	6571.9	2989.2		50'	7862.1	3998.7		50'	9504.4	5368.2	
98°	6591.2	3003.8		108°	7886.2	4018.2		118°	9535.7	5395.1	
10'	6610.6	3018.4	25° C.	10'	7910.4	4037.8	25° C.	10'	9567.2	5422.1	25° C.
20'	6630.1	3033.1	T	20'	7934.6	4057.4	T	20'	9598.9	5449.2	T
30'	6649.6	3047.9	.218	30'	7959.0	4077.2	.261	30'	9630.7	5476.5	.316
40'	6669.2	3062.8	E	40'	7						

TABLE X.
MIDDLE ORDINATES OF RAILS
Length of Rail (feet)

C	R	30	28	26	24	22	20	C	R	30	28	26	24	22	20
o /	Feet	Inch	Inch	Inch	Inch	Inch	Inch	o	Feet	Inch	Inch	Inch	Inch	Inch	Inch
0-20	17189	.08	.07	.06	.05	.04	.03	8	716.8	1.88	1.64	1.42	1.20	1.01	.84
0-40	8594	.16	.14	.12	.10	.08	.07	9	637.3	2.12	1.84	1.60	1.35	1.14	.94
1-0	5730	.24	.20	.18	.15	.13	.10	10	573.7	2.36	2.05	1.78	1.50	1.27	1.04
1-20	4297	.31	.27	.23	.20	.17	.13	11	521.7	2.59	2.26	1.95	1.65	1.39	1.15
1-40	3438	.39	.34	.29	.25	.21	.17	12	478.3	3.83	2.47	2.15	1.81	1.54	1.26
2-0	2865	.47	.41	.35	.30	.25	.20	13	441.7	3.05	2.66	2.30	1.96	1.66	1.36
2-20	2456	.55	.48	.41	.35	.29	.23	14	410.3	3.30	2.87	2.48	2.10	1.78	1.46
2-40	2149	.63	.55	.47	.40	.33	.27	15	383.1	3.54	3.08	2.68	2.26	1.91	1.57
3-0	1910	.71	.62	.53	.45	.38	.31	16	359.3	3.76	3.28	2.83	2.40	2.04	1.67
3-20	1719	.78	.68	.59	.50	.42	.35	17	338.3	4.00	3.48	3.02	2.57	2.16	1.78
3-40	1563	.86	.75	.65	.55	.46	.38	18	319.6	4.21	3.67	3.18	2.70	2.28	1.87
4-0	1433	.94	.82	.71	.60	.50	.42	19	302.9	4.45	3.89	3.36	2.86	2.41	1.98
4-20	1323	1.02	.89	.77	.65	.55	.45	20	287.9	4.70	4.09	3.55	3.00	2.54	2.09
4-40	1228	1.10	.96	.83	.70	.59	.48	22	262.0	5.16	4.44	3.84	3.30	2.80	2.29
5	1146	1.18	1.03	.89	.75	.63	.52	24	240.5	5.64	4.92	4.20	3.59	3.04	2.50
6	955.3	1.41	1.23	1.06	.90	.76	.62	26	222.3	6.07	5.29	4.58	3.88	3.29	2.70
7	819.0	1.65	1.44	1.24	1.05	.89	.73								

TABLE XI.
SHORT RADIUS CURVES

Radius Feet	Chord Feet	Central Angle	Deflection Angle	Deflection for 1 Foot
35	10	16-26	8-13	49.3
45	10	12-46	6-23	38.3
50	15	17-16	8-38	34.5
60	15	14-22	7-11	28.8
75	15	11-30	5-45	23.0
100	20	11-30	5-45	17.3
120	20	9-34	4-47	14.3
150	20	7-39	3-49	11.5
190	25	7-32	3-46	9.15
200	25	7-10	3-35	8.6
225	25	6-25	3-12	7.7
240	25	5-58	2-59	7.2
250	25	5-44	2-52	6.9
275	25	5-12	2-36	6.2
288	50	9-58	4-59	6.0
300	50	9-32	4-46	5.7
350	50	8-12	4-06	4.9
376	50	7-40	3-50	4.6
400	50	7-10	3-35	4.3
410	50	7-00	3-30	4.2

To find length of curve divide angle from P. C. to P. T. by central angle of chord and multiply by length of chord.

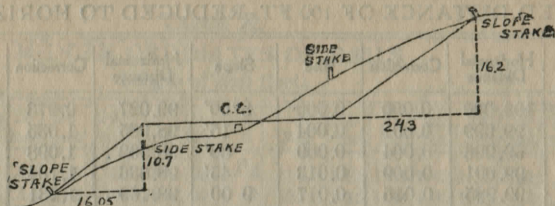
TABLE XII.
INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

Slope	Horizontal Distance	Correction	Rise	Slope	Horizontal Distance	Correction	Rise
0°00'	100.000	0.000	0.000	8°00'	99.027	0.973	0.139
15'	99.999	0.001	0.004	15'	98.965	1.035	0.143
30'	99.996	0.004	0.009	30'	98.902	1.098	0.148
45'	99.991	0.009	0.013	45'	98.836	1.164	0.152
1 00'	99.985	0.015	0.017	9 00'	98.769	1.231	0.156
15	99.976	0.024	0.022	15	98.700	1.300	0.161
30	99.966	0.034	0.028	30	98.629	1.371	0.165
45	99.953	0.047	0.031	45	98.556	1.444	0.169
2 00'	99.939	0.061	0.035	10 00'	98.481	1.519	0.174
15	99.923	0.077	0.039	15	98.404	1.596	0.178
30	99.905	0.095	0.044	30	98.325	1.675	0.182
45	99.885	0.115	0.048	45	98.245	1.755	0.187
3 00'	99.863	0.137	0.052	11 00'	98.163	1.837	0.191
15	99.839	0.161	0.057	15	98.079	1.921	0.195
30	99.813	0.187	0.061	30	97.992	2.008	0.199
45	99.786	0.214	0.065	45	97.905	2.095	0.204
4 00'	99.756	0.244	0.070	12 00'	97.815	2.185	0.208
15	99.725	0.275	0.074	15	97.723	2.277	0.212
30	99.692	0.308	0.078	30	97.630	2.370	0.216
45	99.657	0.343	0.083	45	97.534	2.466	0.221
5 00'	99.619	0.381	0.087	13 00'	97.437	2.563	0.225
15	99.580	0.420	0.092	15	97.338	2.662	0.229
30	99.540	0.460	0.096	30	97.237	2.763	0.233
45	99.497	0.503	0.100	45	97.134	2.866	0.238
6 00'	99.452	0.548	0.105	14 00'	97.030	2.970	0.242
15	99.406	0.594	0.109	15	96.923	3.077	0.246
30	99.357	0.643	0.113	30	96.815	3.185	0.250
45	99.307	0.693	0.118	45	96.705	3.295	0.255
7 00'	99.255	0.745	0.122	15 00'	96.593	3.407	0.259
15	99.200	0.800	0.126	15	96.479	3.521	0.263
30	99.144	0.856	0.131	30	96.363	3.637	0.267
45	99.087	0.913	0.135	45	96.246	3.754	0.271

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

TABLE XIII.
MINUTES IN DECIMALS OF A DEGREE.

0 30"	.00833	10' 30"	.17500	20' 30"	.34167	30' 10"	.50833	40' 30"	.67500	50' 10"	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	18 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	23 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE $1\frac{1}{2}$ TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0 30	0 45	0 60	0 75	0 90	1 05	1 20	1 35	0
1	1 50	1 65	1 80	1 95	2 10	2 25	2 40	2 55	2 70	2 85	1
2	3 00	3 15	3 30	3 45	3 60	3 75	3 90	4 05	4 20	4 35	2
3	4 50	4 65	4 80	4 95	5 10	5 25	5 40	5 55	5 70	5 85	3
4	6 00	6 15	6 30	6 45	6 60	6 75	6 90	7 05	7 20	7 35	4
5	7 50	7 65	7 80	7 95	8 10	8 25	8 40	8 55	8 70	8 85	5
6	9 00	9 15	9 30	9 45	9 60	9 75	9 90	10 05	10 20	10 35	6
7	10 50	10 65	10 80	10 95	11 10	11 25	11 40	11 55	11 70	11 85	7
8	12 00	12 15	12 30	12 45	12 60	12 75	12 90	13 05	13 20	13 35	8
9	13 50	13 65	13 80	13 95	14 10	14 25	14 40	14 55	14 70	14 85	9
10	15 00	15 15	15 30	15 45	15 60	15 75	15 90	16 05	16 20	16 35	10
11	16 50	16 65	16 80	16 95	17 10	17 25	17 40	17 55	17 70	17 85	11
12	18 00	18 15	18 30	18 45	18 60	18 75	18 90	19 05	19 20	19 35	12
13	19 50	19 65	19 80	19 95	20 10	20 25	20 40	20 55	20 70	20 85	13
14	21 00	21 15	21 30	21 45	21 60	21 75	21 90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23 10	23 25	23 40	23 55	23 70	23 85	15
16	24 00	24 15	24 30	24 45	24 60	24 75	24 90	25 05	25 20	25 35	16
17	25 50	25 65	25 80	25 95	26 10	26 25	26 40	26 55	26 70	26 85	17
18	27 00	27 15	27 30	27 45	27 60	27 75	27 90	28 05	28 20	28 35	18
19	28 50	28 65	28 80	28 95	29 10	29 25	29 40	29 55	29 70	29 85	19
20	30 00	30 15	30 30	30 45	30 60	30 75	30 90	31 05	31 20	31 35	20
21	31 50	31 65	31 80	31 95	32 10	32 25	32 40	32 55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33 60	33 75	33 90	34 05	34 20	34 35	22
23	34 50	34 65	34 80	34 95	35 10	35 25	35 40	35 55	35 70	35 85	23
24	36 00	36 15	36 30	36 45	36 60	36 75	36 90	37 05	37 20	37 35	24
25	37 50	37 65	37 80	37 95	38 10	38 25	38 40	38 55	38 70	38 85	25
26	39 00	39 15	39 30	39 45	39 60	39 75	39 90	40 05	40 20	40 35	26
27	40 50	40 65	40 80	40 95	41 10	41 25	41 40	41 55	41 70	41 85	27
28	42 00	42 15	42 30	42 45	42 60	42 75	42 90	43 05	43 20	43 35	28
29	43 50	43 65	43 80	43 95	44 10	44 25	44 40	44 55	44 70	44 85	29
30	45 00	45 15	45 30	45 45	45 60	45 75	45 90	46 05	46 20	46 35	30
31	46 50	46 65	46 80	46 95	47 10	47 25	47 40	47 55	47 70	47 85	31
32	48 00	48 15	48 30	48 45	48 60	48 75	48 90	49 05	49 20	49 35	32
33	49 50	49 65	49 80	49 95	50 10	50 25	50 40	50 55	50 70	50 85	33
34	51 00	51 15	51 30	51 45	51 60	51 75	51 90	52 05	52 20	52 35	34
35	52 50	52 65	52 80	52 95	53 10	53 25	53 40	53 55	53 70	53 85	35
36	54 00	54 15	54 30	54 45	54 60	54 75	54 90	55 05	55 20	55 35	36
37	55 50	55 65	55 80	55 95	56 10	56 25	56 40	56 55	56 70	56 85	37
38	57 00	57 15	57 30	57 45	57 60	57 75	57 90	58 05	58 20	58 35	38
39	58 50	58 65	58 80	58 95	59 10	59 25	59 40	59 55	59 70	59 85	39
40	60 00	60 15	60 30	60 45	60 60	60 75	60 90	61 05	61 20	61 35	40
41	61 50	61 65	61 80	61 95	62 10	62 25	62 40	62 55	62 70	62 85	41
42	63 00	63 15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64 35	42
43	64 50	64 65	64 80	64 95	65 10	65 25	65 40	65 55	65 70	65 85	43
44	66 00	66 15	66 30	66 45	66 60	66 75	66 90	67 05	67 20	67 35	44
45	67 50	67 65	67 80	67 95	68 10	68 25	68 40	68 55	68 70	68 85	45
46	69 00	69 15	69 30	69 45	69 60	69 75	69 90	70 05	70 20	70 35	46
47	70 50	70 65	70 80	70 95	71 10	71 25	71 40	71 55	71 70	71 85	47
48	72 00	72 15	72 30	72 45	72 60	72 75	72 90	73 05	73 20	73 35	48
49	73 50	73 65	73 80	73 95	74 10	74 25	74 40	74 55	74 70	74 85	49
50	75 00	75 15	75 30	75 45	75 60	75 75	75 90	76 05	76 20	76 35	50

88 = R. C. 34 4.65
12.19 7.29
4

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

2.7
217
62
837



