

MUNSON CTR-CHARDON RD.

4

LEVEL BOOK

1307

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

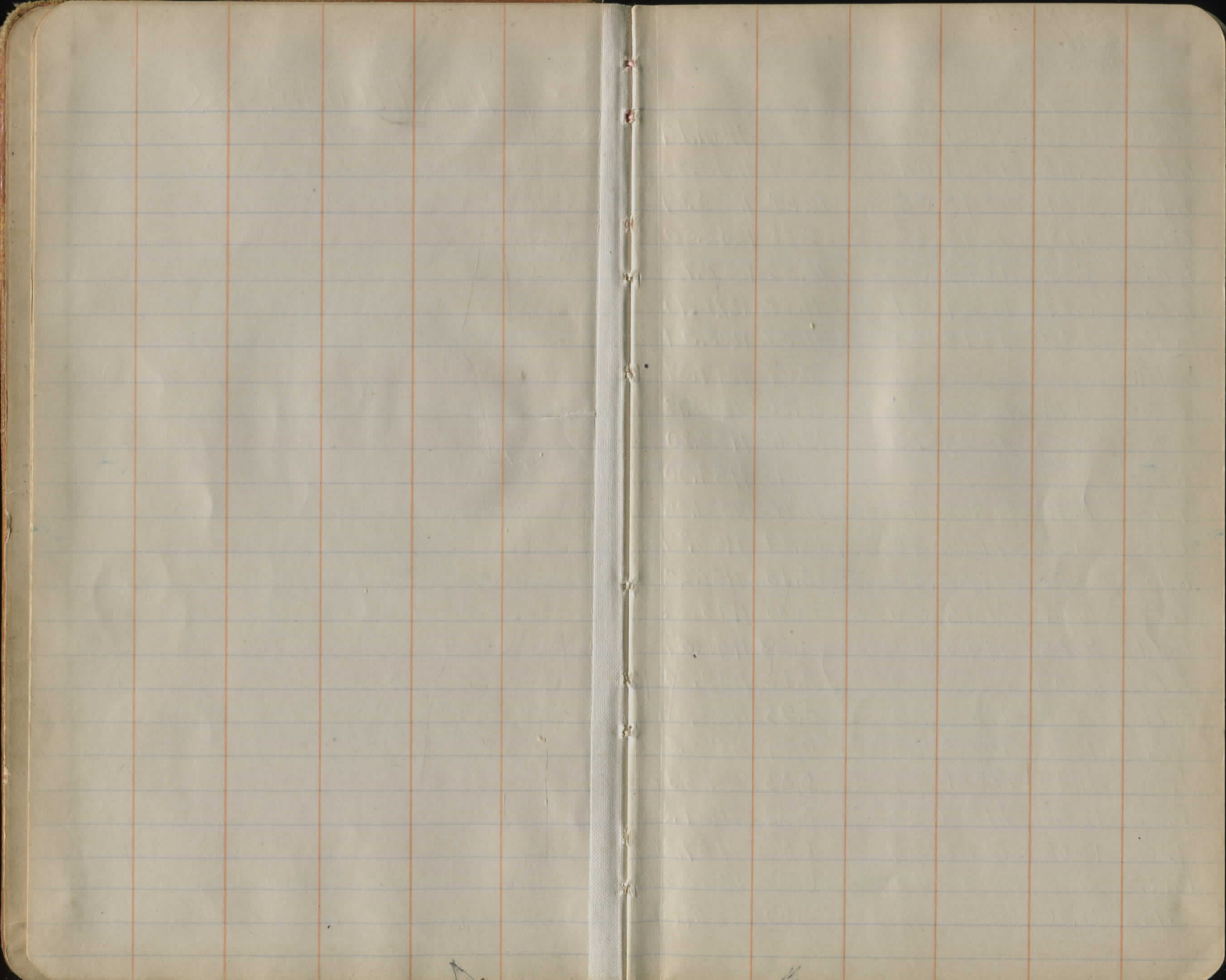
~~Road~~
MUNSON Center North
CHARDON-AUBURN RD Sec
N-O & WILSON MILLS RD. Sec
I-J-K-L-M & VILLAGE
Bench Marks, Sections &
Drainage & Grades

(4)

INDEX

Bench Marks 1-4

Sections & Drainage 5-38



9-8-'19 P.M.
Hann &
"Drake"
Thompson.

B.M. ^{14H#15}	0.60	1261	76	—	1261.16	S.E. Cor. porch floor, Hirtz House.
T.P.	1.05	1251	04	11.77	1249.99	
B.M.#0	8.51	1249	38	10.17	1240.37	Tacks in top of small stump 0-40, 30' Rt.
T.P.	1.18	1243	68	6.88	1242.50	
T.P.	0.59	1233	32	10.95	1232.73	
T.P.	0.21	1221	91	11.62	1221.70	
T.P.	8.10	1218	04	11.97	1209.94	
B.M.#1				0.67	1217.37	Root Maple Lt. 35' sta. 14+58
T.P.	0.14	1205	92	12.26	1205.78	
T.P.	0.53	1193	73	12.72	1193.20	
B.M.#2				9.43	1184.30	Root of Hickory Lt., front of Miller's.
T.P.	0.45	1182	41	11.77	1181.96	
T.P.	0.53	1170	40	12.54	1169.87	
T.P.	0.16	1158	38	12.18	1158.22	
T.P.	0.57	1145	90	13.05	1145.33	
B.M.#3	9.25	1150	82	4.33	1141.57	X on W. wall of bridge E. end.
T.P.	10.49	1160	19	1.12	1149.70	
B.M.#4 ^{9-5-19 P.M.}	4.65	1163	89	0.95	1159.24	Root of Maple 'Lt. sta.
T.P.	10.10	1173	75	0.24	1163.55	
T.P.	11.49	1184	81	0.43	1173.32	
T.P.	12.90	1197	29	0.43	1184.38	
T.P.	10.05	1207	25	0.08	1197.20	
B.M.#5				6.58	1200.67	on root of 24" Locust 'Lt. sta.
T.P.	11.76	1218	96	0.05	1207.20	

Sta.	B.S.	H. I.	F.S.	Elev.	
T.P.	12.59	1231.32	0.23	1218.73	
T.P.	12.25	1243.38	0.19	1231.13	
T.P.	12.43	1255.71	0.10	1243.28	
B.M.#6			3.70	1252.01	
T.P.	10.67	1266.28	0.10	1255.61	on root 14" Elm 'Rt. Sta.
T.P.	11.18	1276.49	0.97	1265.31	
T.P.	11.21	1287.39	0.31	1276.18	
T.P.	12.96	1299.14	1.21	1286.18	
T.P.	11.43	1309.90	0.67	1298.47	
T.P.	12.06	1321.76	0.20	1309.70	
T.P.	11.96	1333.39	0.33	1321.43	
B.M.#7			3.66	1329.73	on root of 24" Maple 'Lt. Sta.
T.P.	0.85	1328.49	5.75	1327.64	
T.P.	1.52	1319.49	10.52	1317.97	
B.M.#8			6.25	1313.24	W. root 39" Maple 'Lt. Sta.
T.P.	1.33	1310.03	10.79	1308.70	
T.P.	0.13	1298.22	11.94	1298.09	
T.P.	13.09	1306.72	4.59	1293.63	
B.M.#9			1.03	1305.65	W. root 14" Walnut 'Rt. Sta.
T.P.	10.55	1316.10	1.17	1305.55	
T.P.	11.03	1325.87	1.26	1314.84	
T.P.	10.94	1336.54	0.27	1325.60	
B.M.#10	7.19	1343.11	0.62	1335.92	N. root 16" Maple 30' 'Rt. Sta. 119+40

Sta.	B.S.	H.	I.	F.S.	Elev.	
		1343	11			
T.P.	3.92	1346	08	0.95	1342.16	
B.M. #11	1.59	1342	92	4.75	1341.33	N.W. root 12" Maple 25' Rt. Sta. 138+10
T.P.	0.54	1333	53	9.93	1332.99	
T.P.	0.90	1321	42	13.01	1320.52	
T.P.	0.65	1309	55	12.52	1308.90	
T.P.	0.27	1298	35	11.47	1298.08	
T.P.	3.75	1290	61	11.49	1286.86	
Temp BM				5.11	1285.50	x on Lt parapet
B.M. #12				3.70	1286.91	2 nails in top old apple stump. 30' Lt. Sta. 158+85
T.P.	5.07	1290	87	4.81	1285.80	
B.M. #13				3.88	1286.99	SW. root 20" Elm 30' Rt. Sta. 165+50
T.P.	5.67	1289	37	7.17	1283.70	
B.M. #14	2.87	1288	23	4.01	1285.36	W. root 14" Elm 18' Rt. Sta. 177+45
T.P.	9.02	1290	07	7.18	1281.05	
B.M. #15				1.41	1288.66	E. root 28" Maple 25' Rt. Sta. 191+05
T.P.	9.62	1299	09	0.60	1289.47	
T.P.	10.97	1306	36	3.70	1295.39	
B.M. #16				0.57	1305.79	W. root 12" Maple 25' Lt. Sta. 201+75
T.P.	0.93	1295	39	11.90	1294.46	
B.M. #17				7.63	1287.76	N. root 10" Maple 25' Rt. Sta. 209+40
T.P.	0.86	1289	34	6.91	1288.48	
T.P.	0.84	1277	73	12.45	1276.89	
B.M. #18	1.23	1267	34	11.62	1266.11	S. root 10" Maple 30' Lt. Sta. 117+90
T.P.	0.35	1255	47	12.22	1255.12	

H. I.

Sta.	B.S.	1255	47	F.S.	Elev.
T.P.	0.45	1242	82	13.10	1242.37
B.M. #19	1.37	1234	08	10.11	1232.71
T.P.	7.35	1237	90	3.53	1230.55
U.S.G.S. B.M.				5.13	1232.77

S. root 30" Elm 20' Lt. Sta. 225+75

U.S.G.S. B.M. tablet ^{SW¹/₄ COURT WASHINGTON ST. CHARDON} in Usher house.

9-16-'19

Harry
Drake
Thompson

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

B.M.#0 7.14 1248.01 1240.87
0 10.9 37.1

+05 10.5 37.5

+10 9.8 38.2

+17 7.9 40.1

1 3.8 44.2

T.P. 8.99 1254.18 2.82 1245.19

2 7.1 47.1

+50 7.7 46.5

3 11.4 42.8

T.P. 1.94 1244.45 11.67 1242.51

4 7.8 36.7

5 10.6 33.9

Lt. £ Rt

Tasks in top of small stump 25' rt. Sta. 0-40

12.3	-1.4	0.0	+1.9				
20		12.9	9.0				
-0.6	-0.7	-0.5	0.0	+1.3	+1.7	+2.1	
11.1	11.2	11.0	10.5	9.2	8.8	8.4	
20	9	8		12	21	29	
+1.8	+1.3	-0.8	0.0	+0.8	+1.3	+2.1	
8.0	8.5	10.6	9.8	9.0	8.3	7.7	
20	9	5		10	18	27	
+1.6	+1.8	-1.6	0.0	+0.4	+1.2	+0.9	+2.7 +4.4
6.3	6.1	9.5	7.9	7.5	6.7	7.0	5.2 3.5
19	11	4		10	19	20	24 30
+0.4	+0.4	-1.0	-0.7	0.0	+0.1	-0.6	+0.8 +3.0
34	34	4.8	4.5	3.8	2.7	4.4	3.0 0.8
20	10	7	5		9	12	14 25

+3.1	+2.7	-0.7	-0.4	0.0	+0.5	+5.6	
9.2	7.6	7.8	7.5	7.1	6.6	1.5	
25	19	12	9		8	20-25	

+6.1	+5.5	-0.1	0.0	0.0	+5.6	
1.6	2.2	7.8	7.7	7.7	2.1	
25	18	10		5-8	20-25	
+8.9	+7.7	-0.2	0.0	0.0	-0.4	+2.7 +2.0
2.5	3.1	11.4	11.4	11.4	11.8	8.7 9.4
25	20	7	6		6	15 25

+3.8	+0.7	-0.6	-0.2	0.0	-0.1	-0.9	+0.2 +1.0
11.0	7.1	8.4	8.0	7.8	7.7	8.7 7.6	6.3
0.5	15	14	10		8	9 10	25

+1.4	+0.2	-0.6	0.0	0.0	+0.2	-0.4	+0.1 -1.2 -0.6 -0.6
9.2	10.4	11.2	10.6	10.6	10.4	11.0	10.6 11.5 11.1 11.2
15	20	14	17		3	5	7 9 13 25

H. I.
Sta. B.S. 1214.45 F.S. Elev

T.P. 2.59 1236.59 10.45 1234.00

G 4.3 32.3

+48 = 18' 12" C.I.P. station

7 7.0 29.6

+50 9.9 26.7

18 14.6 22.0

T.P. 1.62 1225.98 12.23 1224.36

9 12.7 13.3

T.P. 0.39 1214.76 11.61 1214.37

10 8.4 06.4

T.P. 2.57 1209.86 7.47 1207.29

11 7.8 02.1

H. & Rt.

2 1/2 x 3 Store Box

21' 2'

good corner

No floor

98.2

FL

FL

FL

FL

+2.1 0.0 +0.6 0.0 -1.7 -4.2 -4.4
 22 43 37 43 6.0 8.5 8.7
 25-23 19 17 2 8 15-25
 +4.6 +4.0 +1.6 +0.4 +0.8 0.0 +0.8 -3.3 -6.5
 2.4 3.0 5.4 6.2 6.7 7.0 6.2 10.3 12.0
 25 23 18 15 13 4-5 15 25
 +9.9 +9.0 +0.5 -0.2 +0.4 0.0 +0.5 +0.1 +0.8 -0.4 -2.1
 -0.0 0.9 9.4 10.9 9.5 9.9 9.4 9.8 9.1 10.3 12.0
 30 22 16 8 7 5 8 9 7 25
 +12.8 +6.4 +1.6 -0.9 0.0 0.0 0.0 -1.0 +2.8 -0.9
 1.8 8.2 13.0 15.0 14.6 14.6 14.6 15.6 11.8 15.5
 30-25 17 9 5 4 7 10 13 25

+15.2 +5.6 -0.9 0.0 0.0 0.0 -1.0 +3.1 +4.7 -0.2
 -2.5 7.1 13.6 12.7 12.7 12.7 13.7 9.6 8.0 12.9
 28 16 7 6 5 7 14 17 25

lt
 ends of 10/59
 +6.3 +1.3 +0.9 +0.3 0.0 +0.2 -1.0 -0.2 -0.6 -2.6
 2.1 7.1 7.3 8.2 8.4 8.2 9.4 8.6 9.0 11.0
 28 18 13 10 4 7 8 9 25

+0.3 +1.4 0.0 -1.3 -1.6 -3.4 -1.5 -1.8 -0.6
 7.5 6.7 7.8 9.1 9.4 11.2 9.3 9.6 8.4
 25 17-2 2 9 12 13 19 25

-0.6 +4.3 +4.6 +7.4 0.0 +1.8 +0.9 +3.1
 12.3 7.4 7.1 7.3 11.7 9.9 10.6 8.0
 FL 13 10 2 0.2 FL 4 7 15

Sta. B.S. H. I. F.S. Elev.
 12 1209 86 8.8 01.1
 13 4.4 05.5

-1.9 +0.4 +0.8 +0.6 -0.4 0.0 -0.2 +2.1
 107 84 80 82 92 88 90 67
 25 21 11 4 2 9 25
 -1.6 -2.1 -1.8 -2.6 -0.1 0.0 +3.8
 69 65 62 70 45 44 06
 25 23 20-9 8 3 25

T.P. 11.59 1219 80 16.5 1208.21

14 5.5 14.3

-1.1 -5.1 -4.6 -4.8 0.0 +2.5 +2.3 +2.9
 66 106 101 103 55 3.0 3.2 2.6
 25 19 17-11 7 3 13 25

B.M. #1 2.93 1217.37

E. root 24" Maple 35' Lt. Sta + 55

15 4.8 15.0

-0.7 -2.9 -4.6 -4.0 -4.3 0.0 +3.8
 55 77 84 88 91 48 1.0
 27 22 15 12 5 4-25

16 12.7 07.1

+1.4 -3.3 -2.3 -2.7 0.0 +5.2
 113 100 130 154 127 7.5
 25 18 12 7 5-25

T.P. 0.19 1208.32 11.67 1208.13

17 10.9 97.4

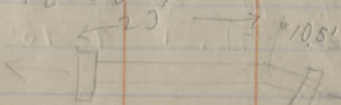
+1.2 -1.1 -0.7 -0.8 0.0 +2.6 +2.7 +4.6
 97 120 114 117 149 8.3 8.2 6.3
 25 19 17 3 3 10 25

T.P. 0.13 1196.56 11.89 1196.43

18 6.7 89.9

-0.5 +0.3 -0.1 +0.6 0.0 -0.9 -0.6 -0.4
 72 64 68 61 67 7.6 7.3 7.1
 25 20 13 3 5 6 25

1 1/2 x 1 1/2 stone box



7.1 99.5 ✓

no floor
 good condi.

Lt. & Rt.

-0.9 -1.4 -3.2 0.0 0.0
 80 87 103 71 71
 25 10 13 12.6 10.5 0.0

19 1196.56 10.6 86.0

B.M. # 2.05 1186.35 12.27 1184.29

20 3.3 83.1

21 9.1 77.3

T.P. 0.23 1175.60 10.98 1175.37

22 6.7 68.9

23 14.3 61.3

T.P. 0.16 1164.80 10.96 1164.64

24 11.6 53.2

T.P. 0.02 1154.08 10.74 1154.06

25 6.6 47.5

-0.1 0.0 -0.3 +2.7 +4.9

107 106 10.9 7.9 5.7
25 21-3 3 10 25

S.E. root 20" Hickory 35' Lt. Sta 19+10

-0.4 -0.7 0.0 +2.3

3.7 4.0 3.3 1.0
25 13 25

+1.1 -1.9 -0.5 -0.1 -0.6 0.0 +0.1 +2.7 +5.6
3.6 11.0 9.6 9.2 8.7 9.1 9.0 6.4 3.5
25 20 18 2 1 3 6 25

+2.1 -1.0 +0.3 +0.8 0.0 +5.2 +6.2

4.6 7.7 6.9 5.9 6.7 1.5 0.5
25 20 18 2 10 25

+2.2 -1.0 0.0 +0.4 0.0 +0.3 +3.3 +4.3

12.1 15.3 14.3 13.9 14.3 14.0 11.0 10.0
25-22 16 14 8 5 12 25

+2.0 -0.9 -0.1 +0.3 0.0 -0.6 +2.9 +5.0

9.6 12.5 14.5 11.3 11.6 12.2 8.7 6.9
25-20 16 14 7 6 12 25

-0.1 -0.3 +0.1 0.0 +0.1 -0.5 +0.8 -1.7

6.7 6.9 4.5 4.6 6.5 7.1 5.8 4.9
25 8 9 4 6 6 12 25



1154.08

26 10.5 43.6

T.P. 0.57 1144.84 9.81 1144.27

27 4.2 40.6

28 5.3 39.5

29 5.0 39.8

30 6.4 38.4

31 4.8 40.0

29+15 4.1 40.7

B.M. 3 3.30 1141.57
 3.30 1141.54
 3.6 41.2
 3.6 41.2

30 3.8 41.0

EXR9 5.2 39.6
 6.8 38.0
 7.2 37.6

+0.1 -0.6 -0.1 0.0 0.0 -0.4 +0.9 +0.7

$\frac{10.4}{25-15} \frac{11.1}{13} \frac{10.6}{11} \frac{10.5}{3} \frac{10.5}{6} \frac{10.9}{10} \frac{9.6}{10} \frac{9.8}{25}$

+0.2 -0.4 +0.3 0.0 +0.2 -0.3 +1.1 +0.3

$\frac{4.0}{25-12} \frac{4.6}{10} \frac{3.9}{8} \frac{4.2}{11} \frac{4.0}{14} \frac{4.5}{17} \frac{3.1}{17} \frac{3.9}{25}$

+0.3 -0.2 0.0 -0.2 +0.3 +0.5

$\frac{5.0}{25} \frac{5.5}{10} \frac{5.3}{15} \frac{5.5}{15} \frac{5.0}{21} \frac{4.8}{25}$

-1.7 -2.0 -1.4 0.0 0.0 +0.2 -0.4 -1.9

$\frac{6.7}{25} \frac{7.0}{11} \frac{6.4}{9} \frac{5.9}{9} \frac{5.0}{5} \frac{4.8}{5} \frac{5.7}{12} \frac{6.9}{25}$

100' RT. ON X Road
 200' " " " "

-5.4 -3.7 -2.2 0.0 +0.4 -0.1 -2.6

$\frac{9.5}{12} \frac{7.8}{7} \frac{6.3}{5} \frac{4.1}{12} \frac{3.7}{15} \frac{4.3}{15} \frac{6.7}{19}$

at S.E. Cor. W. ~~part~~ wall (+56)
 & bridge S. end (+91)
 " " " "

-3.1 -2.1 0.0 +0.2 -2.3

$\frac{6.3}{10} \frac{5.9}{4} \frac{3.8}{14} \frac{3.6}{14} \frac{6.1}{17}$

EXRd (+45)
 50' W
 100' W

1144.84.

31 5.4 39.4
 T.P. 11.60 1150.99 5.45 1139.39

32 9.9 44.1

33 5.1 44.9

C&E 1.90 42.1

34 3.1 47.9

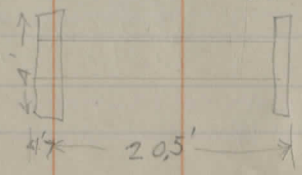
T.P. 7.20 1155.42 2.77 1148.22

35 7.7 47.7

+85 & stone culvert.

1 1/2 x 2 Box
 No floor

Good Corrd.



5.2 50.2

-2.0 -1.3 0.0 0.0 -1.5
7.1 6.7 5.4 5.1 6.9
 25-16 3 14 16-25

+1.0 +0.5 -0.2 0.0 +0.2 -1.6
8.9 9.1 10.1 9.9 9.7 11.5
 25 10 5 3-18 20-25

+2.4 +0.9 0.0 -0.3 -1.2 -1.5 -0.6
2.3 3.8 4.7 5.0 5.9 6.2 5.3
 25 8 8 23 25 30

A. rail (Q=71)

+1.8 +0.9 0.0 0.0 +0.6
1.0 2.2 3.1 3.1 2.5
 25-14 3 7 23-25

+4.5 +2.9 0.0 +1.3 +0.9 +1.1
3.2 4.8 7.7 6.4 6.8 6.6
 25-21 7 6 14 25

-1.7 -1.2 -3.2 +1.5 0.0 -0.5 -0.2 +1.0 -3.4
6.9 6.4 8.4 3.6 5.2 5.7 5.1 4.5 8.6
 10 5 FL. 0.5 10 18 20.5 FL.

1155 42
36 5.8 49.6

37 4.2 51.2

38 2.3 53.1

T.P. 7.73 1162.34 0.81 1159.61

B.M.# 3.08 1159.26

39 4.6 57.7

T.P. 11.06 1172.90 0.50 1161.84

40 9.4 63.5

41 6.0 66.9

T.P. 11.75 1182.46 2.19 1170.71

42 10.2 72.3

43 5.4 77.1



-1.0	-1.2	-0.2	0.0	+0.4	+0.5	-0.3
6.8	7.0	6.0	5.8	5.4	5.3	6.1
2.5	1.4	4		3	1.8	2.5
-2.1	-1.4	-0.3	0.0	-0.1	-0.6	
6.3	5.6	4.5	4.2	4.3	4.8	
2.5	1.3	5		1.8	2.5	
+2.3	+1.4	-0.1	-0.4	+0.2	0.0	+0.1
0.0	4.9	2.4	2.7	2.1	2.3	2.3
2.5	1.6	1.2	7	5	1.3	1.5
						20.25

Root 20" Maple 18 "Lt. Sta. 38+60

+3.8	+2.8	+0.7	-0.4	+0.8	0.0	+0.1	+1.5
6.8	1.8	3.9	5.0	3.8	4.6	4.5	3.1
2.5	1.5	8	6	4		1.4	11-25

+0.9	+0.3	-0.6	0.0	+0.2	-0.6	+1.2			
8.5	9.1	10.0	9.4	9.2	10.0	8.2			
2.5-1.9	7	3		11	1.4	21-25			
+3.9	+3.5	+1.0	-0.4	+0.5	0.0	+0.5	+0.3	+2.5	+2.9
2.1	2.5	5.0	6.4	5.5	6.0	5.5	5.7	3.5	3.1
2.5	1.9	7	5	3		1.4	1.5	2.0	2.5

+2.4	+1.8	-0.4	+0.8	0.0	+0.5	+0.1	+2.8		
7.8	8.8	10.6	9.8	10.2	9.7	10.1	7.7		
2.5	1.0	6	4-3		1.5	1.6	20-25		
-0.1	+0.6	-0.8	+0.2	0.0	-0.4	-0.3	-0.4	+0.5	+1.2
5.5	4.3	6.2	5.2	5.4	5.8	5.7	5.8	4.9	4.2
2.5	6	1	3-2		3	1.3	1.5	1.8	2.5

1182.46

44 2.7 79.8
T.P. 12.08 1192.37 2.17 1180.29

45 9.8 82.6

46 5.6 86.8

47 1.5 90.9

T.P. 11.61 1202.35 1.63 1190.74

48 8.3 94.1

B.M. #5 1.66 1200.69

49 4.6 97.8

T.P. 10.88 1212.30 0.93 1201.42

50 3.1 99.2

T.P. 12.15 1224.25 0.20 1212.10

+0.4 +0.7 -0.1 -0.9 0.0 0.0 0.0 +1.2
2.3 2.0 2.8 3.6 2.7 2.7 2.7 1.5
25 15 6 5 3 14 25

+2.5 +2.4 +1.7 -0.6 +0.1 0.0 +0.1 -0.2 +0.2 +1.4
7.3 7.7 8.1 10.4 9.7 9.8 9.7 10.0 9.6 8.4
25 17 8 4 3-2 12 15 17 25

+3.1 +2.5 -0.8 0.0 0.0 -0.3 -0.7 +0.6 +1.9
2.5 3.1 6.4 5.6 5.6 5.9 6.3 5.0 3.7
25 8 4 3-2 4-15 16 18 25

+1.5 -0.2 -1.0 0.0 -0.6 -1.5
0.0 1.7 2.5 1.5 2.1 3.0
25 4 2 6-18 25

-0.7 -0.5 0.0 0.0 -0.6 -1.1 -1.7
9.0 8.8 8.3 8.9 9.4 10.0
25-13 3 5 6-18 21 25

E. root 24" locust 25' Lt. Sta. 48+50

+2.6 +0.7 +0.2 0.0 +2.3 +1.4 +1.6 +2.8 +1.3
2.0 3.9 4.4 1.6 2.3 3.3 3.0 1.8 3.5
25 14 5 2 11 14 17 25

-2.7 -1.4 -0.8 0.0 +0.3 -0.4 -0.1 +0.8 -0.1 -0.6
6.0 4.5 3.3 3.1 2.8 3.5 3.2 2.5 3.2 3.7
25 15 2 2 3 15 14-17 14 25

1224³ 2.5

51 5.5 20.8

T.P. 11.04 1234 86 0.43 1223.82

52 6.1 28.8

T.P. 11.81 1246.19 0.48 1234.38

53 9.9 36.3

54 3.0 43.2

T.P. 11.83 1256 84 1.18 1245.01

55 8.5 48.3

B.M.#₁₆ 4.80 1251.01
1252.14

56 6.4 50.4

T.P. 10.63 1266.06 1.11 1255.43

57 10.2 53.9

+3.1 +1.9 0.0 -0.2 0.0 -0.3 -0.4 +0.3 +1.9
0.7 1.6 3.5 3.7 3.5 3.8 3.7 3.2 1.6
25 14 9 2 8 8 18 25

+4.6 +4.1 0.0 0.0 -0.7 -0.4 -0.6 -0.1 -0.6 -1.0
4.5 2.0 6.1 6.1 6.8 6.5 6.7 6.7 6.7 7.1
25 20 11 4 9 12 15 17 25

+3.1 +2.7 +1.3 +1.1 0.0 -0.3 -0.8 -0.4 -1.3 -0.9
6.8 7.2 8.6 8.8 9.9 10.2 10.7 10.3 11.2 10.8
25 21 17 14 10 3 9 18 19 15-25
Rock in roadway

+3.5 +3.0 +0.3 +0.9 0.0 -0.4 -0.6 -0.4 -0.1
-0.5 0.0 2.7 2.1 3.0 3.4 3.6 3.4 3.1
25 15 10 8 2 9 12 16-25

+1.8 +0.7 +0.2 -0.6 +0.2 0.0 -0.1 0.0 +0.4 -0.2
6.7 7.8 8.3 9.1 8.3 8.5 8.6 8.5 8.1 8.7
25 15 8 6 3 6 12 16 25

wh. post 14" E/W. 38' Pt. 579.55 + 85

+5.4 +4.7 +3.6 +1.0 0.0 +0.8 +0.2 +0.3 +0.2 +0.7
1.0 1.7 2.8 5.4 6.1 5.6 6.2 6.1 6.2 5.7
25 14 7 3 2 8 19 21 25

+6.2 +3.3 0.0 +0.3 0.0 +0.1 -0.6 +2.0
4.0 6.9 10.2 9.9 10.2 10.1 10.8 8.2
25 5 2 9 17 19 25

12.66.06.

58 4.0 62.1

T.P. 11.55 12.76.17 1.44 1264.62

59 11.5 64.7

60 7.2 69.0

61 2.0 74.2

A.M. 9-10-13 very windy
Piedler
Marion
Thompson

T.P. 11.96 12.86.07 2.06 1274.11

62 8.3 77.8

63 2.8 83.3

T.P. 5.53 12.90.17 1.43 1284.64

64 3.2 87.0

65 4.7 85.0

66 1.0 89.5

+4.0	+2.4	+1.7	00	-0.5	-0.6	-0.3	-0.8	+0.4	+0.1
0.0	1.6	2.3	4.0	4.5	4.6	4.3	4.8	3.0	3.9
2.5	12	4		5	10	16	18	20	25

+4.9	+4.5	+3.0	00	+0.1	00	-0.4	+1.0	+2.7
6.6	7.0	8.5	11.5	11.4	11.5	11.9	10.5	9.1
2.5	18	7		4	14	16	21	25

+5.3	+4.8	+2.9	00	+0.5	+0.2	-0.8	+0.6	+1.3
1.9	2.4	4.3	7.2	6.7	7.0	8.0	6.6	5.9
2.5	18	7		2	13	15	19	25

+0.5	+1.7	+1.4	00	-1.1	-0.9	-1.0	-1.6	-0.7	0.0
1.5	0.3	0.6	2.0	3.1	2.9	3.0	3.6	2.7	2.0
2.5	9	3		3	7	14	16	18	25

+2.4	+1.5	+0.2	0.0	-1.4	-1.3	-1.7	-0.4	-0.3	
5.9	6.8	8.1	8.3	9.7	9.6	10.0	8.7	8.6	
2.5	15	3		4	7	14	17	22	25

+1.6	+0.2	00	-0.4	-3.5	-3.4	-3.6	-2.5
1.2	2.6	2.8	3.2	6.3	6.2	6.4	5.3
2.5	10		2	7	14	2	25

+1.6	+1.1	-0.1	0.0	0.0	-2.9	-2.7	-3.1	-3.3	-2.1
1.6	2.1	3.3	3.2	3.2	6.1	5.9	6.3	6.5	5.8
2.5	18	8		2	8	12	20	22	25

+0.7	+0.6	+0.1	00	-0.9	00	-0.3	-0.2
4.0	4.1	4.5	4.7	5.6	4.7	5.0	4.9
2.5	14	6		2	13	21	26

+2.0	+0.8	00	00	-3.5	-3.1	-3.4	
1.0	0.2	1.0	1.0	4.3	1.1	4.1	
2.5	10	9		4	9	11	15

Sta. B.S. H. I. F.S. Elev.
 67 12.90 17 3.0 87.2

+3.5 0.0 0.0 -0.4 +0.1 0.0 -0.9
 -0.5 3.0 3.0 3.4 2.9 3.0 3.2
 25-20 3 4 9 21 25

64+90 12" corrugated G.I.P. 18' 3" 100%

section same as at Sta. 65

T.P. 11.62 1298.73 3.06 1287.11

68 8.2 90.5

-2.4 -1.4 0.0 0.0 +0.1 -0.8
 10.6 9.6 8.2 8.2 8.1 9.0
 25 9 6 2 5-25

69 5.2 93.5

+2.6 +2.6 0.0 +0.1 -0.4 +0.8 +1.1
 2.5 2.6 5.2 5.1 5.6 4.4 4.1
 26 5 3 14 18 25

T.P. 10.67 1309.05 0.35 1298.38

70 9.1 1300.0

+1.7 +1.4 -0.3 +0.1 0.0 +0.2 -0.1 +1.7 +2.6
 7.4 7.7 9.4 9.0 9.1 8.7 9.2 7.4 6.5
 25 19 11 8 5 5 12 76 25
 3.6 +3.1 +1.6 -0.8 0.0 0.0 -0.1 -1.1 +2.1 +3.1
 -2.0 -1.5 0.0 2.4 1.6 1.6 1.7 2.7 -0.5 -1.5
 25 18 12 8-7 6 7 9 17 25

T.P. 10.82 1319.40 0.47 1308.57

72 4.3 15.1

+3.8 +2.9 -0.3 +0.3 0.0 0.0 -1.0 +1.1 +1.2
 0.6 1.4 4.6 4.0 4.3 4.3 5.3 3.2 3.1
 25 15 11-9 8 7 9 14 25

T.P. 11.55 1330.67 0.28 1319.12

73 9.6 21.1

+3.6 +2.0 -0.1 +0.2 0.0 0.0 -0.7 0.0 -0.2 0.0
 6.0 7.6 9.7 9.4 9.6 9.6 10.3 9.6 9.5 9.6
 25 17 13-12 10 5 7 11 21 25

H. I.
Sta. B.S. 1330.67 F.S. Elev. 1329.73
B.M.#7 0.37 1330.60 0.87 1329.80

74 3.2 27.4

75 1.4 29.2

T.P. 2.92 1332.45 1.07 1329.53

+75 3.5 29.0

76 4.2 28.3

77 5.8 26.7

78 5.4 27.1

(Try to drain to the North)

+50 4.6 27.9

79 5.7 26.8

T.P. 1.40 1227.93 5.92 1226.53

80 3.2 24.7

E. root 24" Maple 35' Lt. Sta. 73+80

+1.3 +1.1 0.0 +0.3 0.0 0.0 -0.8 -0.5 -1.9
 $\frac{1.3}{25} \frac{2.1}{15} \frac{3.2}{12-11} \frac{2.9}{10} \frac{3.2}{5} \frac{4.0}{7} \frac{3.7}{10} \frac{5.1}{25}$

+1.6 +0.6 +0.2 0.0 0.0 -1.6 -0.8
 $\frac{-0.2}{25} \frac{0.8}{16} \frac{1.2}{6} \frac{1.4}{6} \frac{1.4}{7} \frac{3.0}{18} \frac{2.2}{25}$

+1.2 +1.4 0.0 0.0 0.0 +0.9 +0.8
 $\frac{2.3}{25} \frac{2.1}{16} \frac{3.5}{13-9} \frac{3.5}{8} \frac{3.5}{16} \frac{2.0}{16} \frac{2.7}{25}$
 +1.1 +1.0 -0.2 -0.6 +0.2 0.0 +0.5 -0.3 +1.5 +1.2
 $\frac{3.1}{25} \frac{3.2}{19} \frac{4.4}{16} \frac{4.8}{12} \frac{4.0}{9} \frac{4.2}{7} \frac{3.7}{9} \frac{4.5}{14} \frac{2.7}{14} \frac{3.0}{25}$

-0.7 +0.2 0.0 -0.1 -1.2
 $\frac{6.5}{25-13} \frac{5.6}{8} \frac{5.8}{8} \frac{5.9}{8} \frac{7.0}{25}$

+1.6 +1.3 -0.4 -0.2 0.0 -0.2 +0.2 -0.5
 $\frac{3.8}{25} \frac{4.1}{21} \frac{5.8}{17} \frac{5.6}{10} \frac{5.7}{7} \frac{5.6}{7} \frac{5.2}{11} \frac{5.3}{25}$

+1.3 +1.0 -0.5 -0.2 0.0 -0.5 +0.8 0.0
 $\frac{3.3}{25} \frac{3.6}{15} \frac{5.1}{13} \frac{4.8}{8} \frac{4.6}{5} \frac{5.1}{5} \frac{3.8}{13} \frac{4.6}{25}$

+1.9 +0.9 -0.4 -0.2 0.0 -0.1 -0.5 +1.0 +0.9
 $\frac{3.8}{25} \frac{4.8}{14} \frac{6.1}{11} \frac{5.3}{8} \frac{5.7}{8} \frac{5.8}{8} \frac{6.3}{7} \frac{4.7}{9} \frac{4.8}{25}$

+1.6 +0.6 -0.4 -0.1 0.0 -0.3 +1.1 +0.7
 $\frac{1.6}{25} \frac{2.0}{12} \frac{3.6}{10} \frac{3.3}{7} \frac{3.2}{7} \frac{3.5}{7} \frac{2.1}{10} \frac{2.5}{25}$

1327.93

81 4.2 23.7

82 4.8 23.1

+90 Location for 18" C.I.P.
Section same as 83

83 5.0 22.9

84 4.8 23.1

T.P. 6.27 1329.73 4.47 1323.46

85 5.8 23.9

86 4.5 25.2

87 4.2 25.5

88 5.6 24.1

89 7.4 22.3

T.P. 1.76 1322.95 8.54 1321.19



+0.9 +0.2 -0.4 +0.1 0.0 -0.4 +0.3 -0.1
 $\frac{3.3}{25} \frac{4.0}{15} \frac{4.6}{10} \frac{4.1}{7} \frac{4.2}{7} \frac{4.6}{7} \frac{3.9}{8} \frac{4.3}{25}$

+0.2 -0.1 -0.4 -0.1 0.0 -0.1 -0.6 -0.3 -1.1
 $\frac{4.6}{25} \frac{4.9}{11} \frac{5.2}{9} \frac{4.9}{6} \frac{4.8}{6} \frac{4.2}{5} \frac{5.4}{8} \frac{5.1}{9} \frac{5.2}{25}$

-0.3 -0.7 -0.2 0.0 0.0 -0.3 -0.9 -0.5 -1.2
 $\frac{5.3}{25} \frac{5.7}{15} \frac{5.2}{11} \frac{5.0}{8} \frac{5.0}{5} \frac{5.3}{5} \frac{5.9}{8} \frac{5.5}{11} \frac{6.2}{25}$

+0.1 -0.2 -0.6 -0.2 0.0 -0.4 -1.0 -0.4 -0.7
 $\frac{4.7}{25} \frac{5.0}{13} \frac{5.4}{9} \frac{5.0}{6} \frac{4.8}{6} \frac{5.2}{6} \frac{5.8}{8} \frac{5.2}{10} \frac{5.5}{25}$

+0.9 -0.1 -0.7 -0.4 0.0 -0.3 -0.7 0.0 +0.1
 $\frac{4.9}{25} \frac{5.2}{11} \frac{6.5}{9} \frac{6.2}{7} \frac{5.8}{7} \frac{6.1}{8} \frac{6.5}{8} \frac{5.8}{11} \frac{5.7}{25}$

+0.4 -0.2 -0.9 -0.5 0.0 -0.5 -0.8 -0.2 -0.3
 $\frac{4.1}{25} \frac{4.7}{12} \frac{5.4}{10} \frac{5.0}{7} \frac{4.5}{7} \frac{5.0}{6} \frac{5.3}{9} \frac{4.7}{11} \frac{4.8}{25}$

+0.6 +0.2 -0.3 0.0 0.0 -0.4 -0.6 0.0
 $\frac{3.6}{25} \frac{4.0}{12} \frac{4.6}{9} \frac{4.2}{6} \frac{4.2}{6} \frac{4.0}{6} \frac{4.3}{8} \frac{4.2}{10} \frac{2.5}{25}$

+1.0 +0.5 -0.8 -0.2 0.0 -0.2 -0.5 +0.2 +0.6
 $\frac{4.6}{25} \frac{5.1}{14} \frac{6.4}{11} \frac{5.8}{7} \frac{5.6}{7} \frac{5.3}{5} \frac{6.1}{7} \frac{5.4}{10} \frac{6.0}{25}$

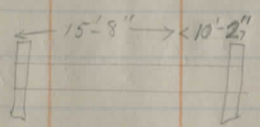
+1.5 +0.5 -0.7 -0.2 0.0 -0.2 -0.4 +0.4 +1.0
 $\frac{5.9}{35} \frac{6.9}{14} \frac{8.1}{10} \frac{7.6}{7} \frac{7.4}{7} \frac{7.6}{5} \frac{7.0}{7} \frac{7.0}{10} \frac{6.4}{25}$

30
1322 95

90 2.8 20.2

91 4.5 13.5

92 6.3 16.7



stone 1/2' x 1/2' base
No floor
6A 16.6

+03

B.M. 5.68 1318 92 9.72 1313.24
1313.24
1313.23

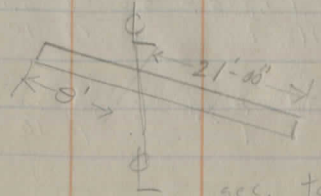
+24
3-15-12 KM.
awful windy

93 6.8 12.1

94 9.9 09.0

T.P. 1.71 1310 41 10.22 1308.70

+27



12" C.I.P. solid
27 07.7

sec. taken thru Culvi

+1.8 +0.3 -0.5 -0.2 0.0 -0.2 -0.5 +0.1 +0.2 +0.7

1.0 3.5 3.3 3.0 2.8 3.0 3.3 2.7 1.6 2.1
2.5 13 10 8 7 8 10 20 25

+0.9 +0.2 -0.5 0.0 0.0 -0.2 -0.5 +0.1 -0.9 -1.4

3.6 1.3 5.0 1.5 1.5 4.7 5.0 4.4 5.4 5.9
2.5 14 13 11 9 1 6 8 20 25

+1.2 +0.6 -1.0 +0.6 0.0 +0.2 -1.4 -1.2 -0.4 -0.1 -0.8

5.1 5.7 7.3 5.7 6.3 6.1 7.7 7.5 6.7 6.1 7.1
2.5 21 18 14 8 11 14 16 21 21

0.0 -2.0 -1.8 -0.8 +0.4
6.1 8.4 9.2 7.2 6.0
5 10.5 15 16 22

longer Rd and
if necessary

+0.9 +0.5 0.0 -0.5 -0.4 -1.1 -0.2 +0.9

2.4 2.7 3.0 3.8 3.7 4.4 3.5 2.7
2.5 8 7 17 18 20 21 25

+3.0 +2.5 +0.1 -1.2 -0.2 0.0 -0.1 -1.0 +2.0 +2.7

3.8 4.0 6.7 8.0 7.0 6.8 6.9 7.8 4.8 4.1
2.7 21 13 12 8 11 13 15 18 25

+2.3 +0.8 -1.5 -0.2 0.0 -0.3 -1.1 -0.1

7.0 5.1 1.4 10.1 9.9 10.2 11.0 10.0
2.5 14 9 2 15 17-19 21-25

-1.9 -1.5 0.0 0.0 +0.9 -0.2 +1.2

1.4 4.2 2.3 2.7 1.8 2.9 1.6
3.0 9.5 7 19 2.15 2.5
FL FL

1310.41

95 6.5 03.9

T.P. 1.13 130/26 10.28 1300.13

96 8.2 1293.1

T.P. 1.48 1291/40 11.34 1289.92

97 57 85.7

+60 11.1 80.3

T.P. 0.72 1281/21 10.91 1280.99

98 3.1 78.1

(98+92 old N.G. G.I.R. Name needed)

99 6.8 77.4

100 11.8 69.4

T.P. 0.06 1270.26 11.01 1270.20

101 3.3 67.0

✓

+1.1	+1.2	-0.7	-0.2	0.0	-0.4	-0.5	+2.0	+3.2
<u>5.4</u>	<u>5.3</u>	<u>7.2</u>	<u>6.7</u>	<u>6.5</u>	<u>6.9</u>	<u>7.0</u>	<u>4.5</u>	<u>3.3</u>
25	15	10	8		7	12	15	25

+4.4	-0.5	+0.1	0.0	+0.1	-0.7	+0.1	-0.3	+4.3	+4.7
<u>3.8</u>	<u>8.7</u>	<u>7.8</u>	<u>8.2</u>	<u>8.1</u>	<u>8.2</u>	<u>8.1</u>	<u>8.5</u>	<u>3.9</u>	<u>3.5</u>
25	20	12	7		4	5	9	12	17
								25	25

+1.3	+1.5	-0.9	+0.2	0.0	-0.4	-0.7	-1.8	-0.5	+1.6
<u>4.4</u>	<u>4.2</u>	<u>6.6</u>	<u>5.5</u>	<u>5.7</u>	<u>6.1</u>	<u>6.4</u>	<u>7.5</u>	<u>6.2</u>	<u>4.1</u>
20	16	10	7		7	12	15	17	25

+1.3	+2.1	-0.1	+0.0	0.0	0.0	+0.2	+1.9
<u>9.8</u>	<u>9.0</u>	<u>11.2</u>	<u>10.5</u>	<u>11.1</u>	<u>11.1</u>	<u>10.3</u>	<u>9.2</u>
20	15	8	5		9-14	19	25

+0.6	0.0	+0.1	-0.5	-0.2	0.0	-0.3	-0.5	+0.1	+0.6
<u>2.5</u>	<u>3.1</u>	<u>3.0</u>	<u>3.5</u>	<u>3.3</u>	<u>3.1</u>	<u>3.4</u>	<u>3.6</u>	<u>3.0</u>	<u>2.5</u>
25	16	9	7	5		14	17	20	25

+1.4	+0.8	-0.3	+1.3	0.0	0.0	+1.1	-0.2
<u>5.4</u>	<u>6.0</u>	<u>7.1</u>	<u>5.5</u>	<u>6.8</u>	<u>6.8</u>	<u>5.7</u>	<u>7.0</u>
25	11	9	5		14	13	25

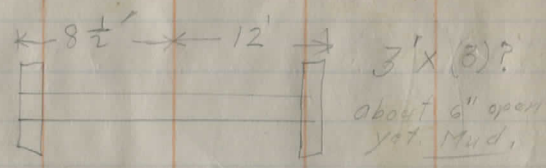
+4.7	-1.3	0.0	0.0	-0.1	-0.2	+4.4
<u>11.1</u>	<u>10.1</u>	<u>11.8</u>	<u>11.8</u>	<u>11.9</u>	<u>12.0</u>	<u>7.1</u>
20-25	7	4		11	14	20-25

+1.5	-0.4	-0.5	-0.2	0.0	+0.1	-0.2	-0.4
<u>1.8</u>	<u>0.7</u>	<u>3.8</u>	<u>3.5</u>	<u>3.3</u>	<u>3.3</u>	<u>3.5</u>	<u>3.7</u>
25	17	11	8	4	6	13	18-25

1270.26

102 4.6 65.7

103 4.3 66.0



+14

Temp. B.M. 8.17 1275.35 3.08 1267.18

104 7.9 67.5

105 6.5 68.9

106 4.0 71.4

T.P. 10.35 1285.17 0.53 1274.82

107 9.0 74.2

108 F.P. 2.6 82.6

T.P. 12.29 1295.65 1.81 1283.36



-0.7 -0.1 0.0 -0.3 -0.9
 5.2 4.7 4.6 4.5 5.5
 25-18 8 13 25

-1.3 0.0 0.0 -0.1 -0.8 -0.9 -1.4
 5.6 4.3 4.3 4.1 5.1 5.3 5.7
 25-14 6 10 15 18- 25

-2.1 0.0 -1.8 -4.1
 6.2 4.1 5.9 8.1
 Ft. 12.5 12.5

sw. con. 8th page set

-1.2 -0.5 0.0 0.0 -0.3 -2.1
 9.1 8.4 8.9 8.7 8.2 10.0
 25 12 10 14 20-25

-1.0 -0.5 0.0 0.0 -0.1 -0.7
 7.5 7.0 6.5 6.5 6.6 7.3
 25 14 10 14 25

+2.3 +1.7 -0.2 0.0 -0.6 -1.0 +0.3 +2.3
 1.7 2.1 4.2 4.0 4.6 5.0 3.7 1.7
 25 19 11 10 13 13 25

+3.6 +3.1 0.0 +0.3 +0.2 0.0 +0.2 0.0 -0.8 +2.3 +3.1
 5.4 5.8 9.0 5.7 8.8 9.0 8.8 9.0 9.8 6.7 5.9
 25 19 14 10 6 12 13 17 25

+3.6 -0.4 -0.1 0.0 -0.1 -0.8 +3.7 +4.7
 1.0 3.0 2.7 2.6 2.7 3.4 -1.1 -2.1
 25-20 15 12 8 11 17 25

12 95 65

Fair
Hot
109
5/20/19
HARRIS
HARRISON
GRAVE

0.1 89.6

T.P. 1112 1306 19 0.58 1295.07

B.M.#9

0.46 ^{1305.07} 1305.73

110 9.3 96.9

111 3.8 02.4

T.P. 10.28 1315 88 0.59 1305.60

112 8.9 07.0

113 4.5 11.4

T.P. 10.48 1325 76 0.60 1315.28

114 10.1 15.7

115 5.7 20.1

T.P. 10.06 1334 91 0.91 1324.85

+3.6	+3.4	-0.7	+0.2	0.0	+0.5	-0.7	+4.0	+4.5
25	27	68	59	61	5.6	6.3	2.1	1.6
25	21	17	14		8	11	20	25

N.W. root, 14" walnut 30' RT, Sta. 111 +0.2

+2.8	+0.8	-1.1	-0.2	0.0	0.0	-0.6	+0.5	+2.2	+3.4
6.5	8.5	11.1	9.5	9.3	9.3	9.9	8.8	11	5.9
25	18	16	13		4	8-7	9	14	25

+1.9	-0.8	+0.3	0.0	+0.1	-0.8	+1.8	+2.8
1.9	4.6	3.5	3.8	3.7	4.4	2.0	1.0
25-20	16-15	14		4	6-7	72	25

+1.8	-0.3	-0.1	0.0	-0.2	-0.3	+2.3	+2.9
7.1	9.2	9.0	8.9	9.1	9.2	6.6	6.8
25-16	13	9		6	9	13	25

+1.8	+1.5	-0.7	-0.1	0.0	+0.1	-0.6	+1.2	+2.4
2.7	3.0	5.2	1.6	4.5	4.4	5.1	3.3	6.1
25	14	11	9		6	8-10	14	25

+2.1	-0.2	0.0	+0.1	-0.2	+2.0	+2.1
9.0	10.3	10.1	10.0	10.3	8.1	8.0
25	13	10	10	13	18	25

+2.3	+1.3	-0.2	0.0	0.0	-0.1	-0.2	+0.7	+2.2
3.7	4.1	5.9	5.7	5.7	5.8	5.9	5.8	3.0
25	12	9	7		9	12	15	21-25

✓

1342.71

125 4.6 38.1

T.P. 4.77 1342.96 4.52 1338.19

126 4.6 38.4

127 4.9 38.1

+85 20'-12" G.I.P. (Fall) \rightarrow

128 4.7 38.3

129 4.1 38.9

130 3.4 39.6

131 2.7 40.3

132 2.0 41.0

T.P. 6.51 1347.58 1.89 1341.07
✓

0.0	-0.6	-1.1	-0.6	0.0	-0.1	-0.7	-0.6
4.6	5.2	5.7	5.2	4.6	4.7	5.3	5.2
25	11	10	8		11	18	25

+0.4	-0.6	-1.4	-0.3	0.0	-0.3	-0.9	-0.1
4.2	5.2	6.0	4.0	4.6	4.5	5.5	4.7
25	12	11	7		10	16	25

+0.4	-0.6	-0.5	-1.0	-0.1	0.0	0.0	-0.8	-1.0	-0.5
4.5	5.5	5.4	5.9	5.0	4.9	4.5	5.7	5.9	5.4
25	14	10	9	7		10	14	19	25

+0.1	-0.8	-1.1	-0.4	0.0	-0.2	-1.6	-0.9	
4.6	5.5	5.8	5.1	4.7	4.9	6.3	5.6	2.5
25	17	10	7		10	14	17	

some section

some section

+0.7	+0.3	-1.0	0.0	-1.0	-0.2	+0.9
2.0	2.4	3.7	2.7	3.7	2.7	1.8
25	15	12		10	12	25

+1.1	+0.1	-0.4	0.0	-0.5	+0.2	+2.0
0.9	1.2	2.4	2.0	2.5	1.8	0.0
25	14	13		9	11	22-25

1347 58

133 5.0 42.6

134 4.4 43.2

135 4.7 42.9

136 4.3 43.3

137 4.3 43.3

138 6.2 41.4

B.M.# 11 2.17 1343 50 6.28 1341.30

139 3.5 40.0

140 5.5 38.0

141 8.2 35.3

142 11.2 32.3

T.P. 0.42 1332 28 11.04 1331.86

✓

+1.6	+0.6	-0.1	-0.7	0.0	-0.6	+0.6	+1.6
3.4	4.4	5.1	5.7	5.0	5.6	4.4	3.4
25	20	13	12		8	11	20-25

0.0	-0.2	0.0	-0.5	+0.1	+0.8
4.4	4.6	4.4	4.9	4.3	3.6
25	16		9	11	25

0.0	-0.2	-0.5	0.0	0.5	+0.5
4.4	4.9	5.2	4.7	5.2	4.2
25	16	12		7	8-25

-0.5	-1.0	-0.6	0.0	-0.4	-1.3	-0.5	-0.4
4.0	5.3	4.9	4.3	1.7	5.6	4.8	4.7
25-15	14	11		4	7	8	25

-0.1	-0.6	-1.0	0.0	-0.4	-1.3	-0.4	+0.2
4.4	4.9	5.3	4.3	4.7	5.6	4.7	4.1
25	13	12		6	9	10	25

+1.1	+0.1	-0.5	0.0	-0.6	+0.8	+0.9
5.1	6.1	6.7	6.2	6.8	5.4	5.3
25	14	12		8	11	25

W.M. cont 12" Maple 25' Rth. Sta. 138+85

+1.2	+0.1	-0.4	0.0	-0.6	+0.3	+0.4
2.3	3.4	3.7	3.5	4.1	3.2	3.1
25	15	13		8	12	25

+2.2	+0.7	-0.2	-0.7	-0.2	0.0	-0.2	-0.9	+0.9	+2.0
3.3	4.8	5.7	6.2	5.7	5.5	5.1	6.4	4.6	3.5
25-17	14	10	9	8		6	8	13	16

+2.1	-1.0	-0.3	0.0	-0.2	-0.5	+2.5	+2.6
6.1	9.2	8.5	8.2	8.4	8.1	5.7	5.6
25-17	10	9		4	6.8	12	25

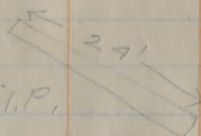
+2.9	+2.5	-0.4	-0.1	0.0	-0.3	+2.3	+2.7
8.3	8.7	11.6	11.3	11.2	11.5	9.0	8.6
25	21	11	9		6	10	18-25

13.32 RB

143

3.6

28.7



¹⁴²+82: 24'-12" C.I.P.
one end broken in-

144

11.4

20.9

T.P. 3.97 1324 41 11.84 1320.44

145

5.7

18.7

+30 16' 12" G.I.P. 6.3 18.2
(should have 18" C.I.P.) (same location)

146

6.4

18.0

+70

4.0

20.4

147

4.8

19.6

148

8.6

15.8

✓

+1.9 +2.3 -0.6 -0.1 0.0 +0.2 +1.5 +1.9

1.7	1.3	1.2	3.7	3.6	3.4	2.1	1.7
25	18	12.11	10		8	12	25

+3.1 +2.3 +2.2 -0.8 -0.3 0.0 -0.3 +4.2

8.3	9.1	9.2	12.2	11.7	11.4	11.7	7.2
25	18	13	7	3		15	25

-0.8 -0.1 -0.6 -0.2 0.0 -0.1 -0.5 -1.9

6.5	3.8	6.3	5.3	5.7	5.8	6.2	7.6
25	10	6	5		9	12	25

-0.7 -0.2 -1.1 +0.1 0.0 0.0 -1.1 -1.2 -2.7

6.9	6.4	7.3	6.1	6.2	6.2	7.3	7.1	8.9
25	11	6	5		9	10	21	50

bank begins at +60

+4.9 +3.9 +1.2 -0.1 0.0 -0.2 +0.3 -0.8

1.5	2.5	5.2	6.5	6.4	6.6	6.1	7.2
25	17	12	8		13	12	25

+2.3 +1.4 -0.5 0.0 -0.5 -0.1 -0.6

1.7	2.5	4.5	4.0	4.5	4.1	4.6
25	13	8		13	15	25

+2.9 +1.4 -0.4 0.0 -0.5 +0.2 -0.2

1.9	3.1	5.2	4.8	5.3	4.6	5.9
25	13	10		11	18	25

+3.5 +0.6 -0.9 -0.3 0.0 -0.2 +2.0 +1.6

5.1	8.0	8.5	8.9	8.6	8.7	6.6	7.0
25	22	15	12	10	7	11	25

1324.41
149 12.1 12.3

T.P. 118 1313.47 12.12 1312.29

150 4.1 09.4

151 10.8 02.7

T.P. 2.15 1303.66 11.96 1301.51

152 4.3 99.4

153 7.6 96.1

154 12.1 91.6

T.P. 170 1293.44 11.92 1291.74

155 4.3 89.1

156 6.0 87.4 ✓

+2.7 -0.6 0.0 -0.5 +1.7 +1.3
 $\frac{9.1}{25} \frac{12.7}{17} \frac{12.1}{17} \frac{12.6}{4} \frac{10.1}{9} \frac{10.8}{25}$

+2.5 +2.0 -0.6 -0.1 0.0 -0.6 +2.4 +2.6
 $\frac{1.9}{25} \frac{2.1}{23} \frac{4.7}{17} \frac{4.2}{14} \frac{4.1}{3} \frac{4.7}{4} \frac{1.7}{4} \frac{1.5}{25}$

+5.0 -0.3 0.0 -0.5 +4.2 +4.8 +4.4
 $\frac{5.8}{25} \frac{11.1}{15} \frac{10.8}{4} \frac{11.3}{7} \frac{6.6}{20} \frac{6.0}{25} \frac{6.1}{25}$
 Both ends at +2.5

+2.0 +1.3 -0.7 4.0 0.0 +0.1 +0.4 +0.2 -1.3
 $\frac{2.3}{25} \frac{3.0}{17} \frac{5.0}{12-11} \frac{7.2}{10} \frac{4.3}{10} \frac{4.2}{6} \frac{3.9}{8} \frac{4.1}{17} \frac{5.6}{25}$

+4.9 +0.7 0.0 +0.7 0.0 +0.1 -0.7 +3.4 +3.0
 $\frac{2.7}{25} \frac{6.9}{12} \frac{7.6}{14} \frac{6.7}{11} \frac{7.6}{11} \frac{7.5}{4} \frac{8.3}{5.6} \frac{4.2}{12} \frac{4.0}{25}$

+2.6 +1.5 -0.4 0.0 0.0 -0.5 +0.4 +0.6
 $\frac{9.5}{25} \frac{10.6}{15} \frac{12.5}{11} \frac{12.1}{7} \frac{12.1}{11} \frac{12.6}{11} \frac{11.7}{12} \frac{11.5}{25}$

+3.2 +0.1 -0.3 -1.8 -0.2 0.0 -0.7 +1.6 +2.2 +1.6
 $\frac{1.1}{25} \frac{4.2}{17} \frac{4.6}{14} \frac{6.1}{13-12} \frac{4.5}{11} \frac{4.3}{11} \frac{5.0}{7} \frac{2.7}{11} \frac{2.1}{17} \frac{2.7}{25}$

+2.8 +1.9 +0.2 +0.1 -1.0 -0.3 0.0 -0.1 -0.6 +1.1 +0.6
 $\frac{3.2}{25} \frac{4.1}{26} \frac{5.8}{15} \frac{5.9}{11} \frac{9.0}{9.8} \frac{6.3}{7} \frac{6.0}{6} \frac{6.1}{8-10} \frac{6.6}{13} \frac{4.9}{25} \frac{5.1}{25}$

1293.44

157 7.4 86.0

T.P. 3.59 1289.79 7.24 1286.20

158 4.0 85.8

8'4" x 11'2" x

+35 4.5 85.3

2' x 2'

stone Culvert - No floor - poor Cond.

B.M. #12 2.89 1286.90

159 5.2 84.6

160 5.6 84.2

161 5.4 84.4

160+98 16'-12" C.I. P. (sectional),

Prains Rt

✓

+1.6 +0.7 -0.2 0.0 0.0 -0.4 +0.2 -0.3

5.8	6.7	7.6	7.4	7.4	7.8	7.2	7.7
25	11	8		9	12	13	25

0.1 -0.8 -1.8 -0.5 0.0 0.0 -1.3 -0.5 -1.5

7.1	7.8	5.8	4.5	4.0	4.0	5.3	4.5	5.5
25	14	13	7		7	11	12	25

-0.6 -2.6 -2.9 0.0 -3.1 -3.3

5.1	7.1	7.1	4.5	7.6	7.8
17	14	9	FL	12 FL	25

Tacks on top stump 30' Lt. Sta. 157+95

+1.4 +0.8 -0.5 +0.1 0.0 -0.5 0.0 +0.7

3.8	4.4	5.7	5.1	5.2	5.7	5.2	4.5
25	20	17-19	15		14	15	20-25

+2.6 +2.2 +0.4 -0.4 +0.1 0.0 -0.4 +1.2 +1.9

3.0	3.4	5.2	6.0	5.5	5.0	6.0	4.4	3.7
25	27	15	14-13	11		8	10	17-25

0.0 -0.7 -1.6 -0.4 0.0 -0.1 -0.7 -0.9 -1.3

5.4	6.1	7.0	5.8	5.4	5.5	6.1	6.3	6.7
25	13	12-14	9		8	10	20	25

160+95 catch basin on Rt. 13' Rt.

161+15 " " " " 15' Rt.

1289.78

162 5.2 84.6

163 3.5 86.3

164 2.3 87.5

T.P. 4.28 1291.73 2.34 1287.45

+50 3.8 87.9

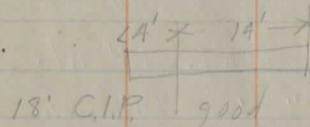
165 4.8 86.9

B.M. #13 4.73 1286.94
1287.00

166 6.8 84.9

167 7.1 84.6

+27 6.9 84.8



+2.5	+0.2	-0.6	-0.2	0.0	-0.3	-0.3	+0.2	+0.9
<u>2.7</u>	<u>5.0</u>	<u>5.8</u>	<u>5.4</u>	<u>5.2</u>	<u>5.5</u>	<u>6.0</u>	<u>5.0</u>	<u>4.3</u>
25-20	14	12-10	7		7-0	12	13	2.5

+1.9	+0.3	-0.3	-0.4	0.0	-0.2	+0.4
<u>1.6</u>	<u>3.2</u>	<u>3.8</u>	<u>3.9</u>	<u>3.5</u>	<u>3.7</u>	<u>3.1</u>
25-12	10	8		12	15-25	

+1.8	+1.2	+0.3	+0.1	-0.7	0.0	-0.2	+0.3
<u>0.5</u>	<u>1.1</u>	<u>2.0</u>	<u>2.2</u>	<u>3.0</u>	<u>2.3</u>	<u>2.5</u>	<u>2.0</u>
25	20	15	9	8	14	15-25	

+2.3	+0.5	-0.5	0.0	-0.2	+1.3	-0.1
<u>1.5</u>	<u>3.3</u>	<u>4.3</u>	<u>3.8</u>	<u>4.0</u>	<u>3.5</u>	<u>3.9</u>
25	10	7		15	10	2.5

+3.5	+1.3	+0.8	-0.3	0.0	-0.2	+0.3	-0.2
<u>1.3</u>	<u>3.5</u>	<u>4.0</u>	<u>5.1</u>	<u>4.8</u>	<u>5.0</u>	<u>4.5</u>	<u>5.0</u>
25	17	10	7		10	18	2.5

S.W. root 20" Elm 30' Pt. Sta. 165+50

+3.5	+2.8	0.0	-0.6	0.0	0.0	-0.2	+0.4	+0.8
<u>3.3</u>	<u>4.0</u>	<u>6.8</u>	<u>7.4</u>	<u>6.8</u>	<u>6.8</u>	<u>7.0</u>	<u>6.4</u>	<u>6.0</u>
25	17	5	4	3		17	18	2.5

+1.9	+0.3	-0.5	0.0	0.0	-0.3	-1.0	-0.6	-0.8
<u>5.2</u>	<u>6.8</u>	<u>7.6</u>	<u>7.1</u>	<u>7.1</u>	<u>7.4</u>	<u>8.1</u>	<u>7.7</u>	<u>7.5</u>
25	9	7	5		16	18	19	2.5

+1.1	-0.3	-1.1	-1.3	0.0	-1.3	-2.6
<u>5.8</u>	<u>7.2</u>	<u>8.0</u>	<u>8.7</u>	<u>6.9</u>	<u>8.1</u>	<u>9.5</u>
25	9	8	4	FL	14	25

1291 73

168 7.2 = 84.5

+75 6.3 85.4

T.P. 2.73 1288.36 6.10 1285.63

169 3.4 85.0

170 4.7 83.7

+95 \leftarrow 6' x 12' \rightarrow
12" G.I.P. 4.3 84.1

171 4.3 84.1

172 4.6 83.8

173 3.9 84.5

T.P. 4.21 1289.40 3.17 1285.19

+2.5 +1.6 -0.3 -0.8 -0.1 0.0 -0.3 -0.7 -0.3 +0.3
 $\frac{4.7}{25} \frac{5.6}{13} \frac{7.5}{8} \frac{8.0}{5} \frac{7.3}{4} 7.2 \frac{7.5}{15} \frac{7.7}{18} \frac{7.5}{22} \frac{6.9}{25}$

+3.3 +2.0 -0.3 -1.0 -0.2 0.0 +0.1 -0.8 +1.3
 $\frac{3.0}{25} \frac{4.3}{11} \frac{6.6}{6} \frac{7.3}{4} \frac{6.5}{3} 6.3 \frac{6.2}{16} \frac{7.1}{20} \frac{5.0}{25}$

+4.0 +2.0 -1.0 -0.3 0.0 +0.1 -1.2 +1.4
 $\frac{-0.6}{25} \frac{1.4}{13} \frac{1.4}{5} \frac{3.7}{3} 3.4 \frac{3.3}{16} \frac{4.6}{18} \frac{2.0}{25}$

+1.9 +0.2 -1.0 -0.3 0.0 -0.1 -1.0 -0.5 -0.7
 $\frac{2.8}{25} \frac{4.0}{9} \frac{5.7}{6} \frac{5.0}{5} 4.7 \frac{4.8}{15} \frac{5.7}{19} \frac{5.2}{20} \frac{5.4}{25}$

0.0 -0.5 -1.8 0.0 -2.0 -2.7 goes into
 $\frac{4.3}{18} \frac{4.8}{13} \frac{6.1}{6} 4.3 \frac{6.3}{12} \frac{7.0}{25}$ field tile

+0.9 -0.1 -0.5 -1.6 +0.1 0.0 0.0 -1.3 -1.8 -1.1
 $\frac{3.4}{25} \frac{4.4}{16} \frac{4.8}{11} \frac{5.3}{9} \frac{4.2}{5} 4.3 \frac{4.3}{12} \frac{6.6}{13} \frac{6.1}{17} \frac{5.4}{18-25}$

+1.6 +1.2 +0.1 -0.4 -1.1 -0.3 0.0 -0.2 -1.2 -0.2
 $\frac{3.0}{25} \frac{3.4}{17} \frac{4.5}{15} \frac{5.0}{9} \frac{5.7}{8} \frac{4.3}{7} 4.0 \frac{4.8}{13} \frac{5.8}{16} \frac{4.8}{18-25}$

+2.4 +1.6 -0.4 -1.1 -0.3 0.0 -0.3 -0.9 -0.3
 $\frac{1.2}{25} \frac{2.3}{17} \frac{4.3}{10} \frac{5.0}{8} \frac{4.2}{6} 3.0 \frac{4.6}{14} \frac{4.1}{18} \frac{4.3}{19-25}$



1289.40

174 4.4 85.0

175 4.5 84.9

+07 $\begin{array}{|c|} \hline 6' \times 11' \\ \hline \end{array}$ → 4.1 85.0

10" x 10" wooden box.

Empties into field Drain on Rt.

176 4.7 84.7

177 4.6 84.8

B.M.# 1285.36
4.02 1285.38

178 4.7 84.7

179 5.0 84.4

180 6.0 83.4

181 6.0 83.4 ✓

+2.1	-0.1	-0.9	-0.2	0.0	-0.4	-1.0	+0.2
23	4.5	5.3	4.6	4.4	4.8	5.4	4.2
25	20	8	7	6	7.6	18	21-25

+0.3	-0.4	-0.9	-1.4	+0.2	0.0	+0.2	-1.6	-1.0	-0.8
4.2	4.3	5.4	5.9	4.3	4.5	4.3	4.1	5.5	5.3
25	22	15	13	7	6	15	16	18	2.5

-0.4	-1.3	-1.6	0.0	-1.7	-2.5
4.2	5.7	6.9	4.4	6.1	6.9
17	14	6.4		11.4	17

+0.5	-0.2	-0.7	0.0	0.0	-0.2	-1.1	-0.7
4.2	4.3	5.4	4.7	4.7	4.9	5.8	5.4
25	14	13	12		10	13	14-25

+0.5	+0.3	0.0	-0.4	-0.2	-0.9
4.1	4.3	4.6	5.0	4.8	5.5
25	16		10	11	25

W. root 14" El/pt 13' FT. Sta. 177+45

0.0	-0.3	-1.1	-0.2	0.0	-0.3	-1.1	-0.6	-1.1
4.7	5.0	5.8	4.3	4.7	5.0	5.8	5.3	5.8
25	13	12	6		12	17	18	25

-0.9	-0.6	-1.3	-0.7	0.0	-0.8	-1.4	-1.0	-1.1
5.9	5.6	6.3	5.7	5.0	5.8	6.4	6.0	6.1
25	15	14	10		9	12	13	25

+1.0	0.0	-0.6	-0.2	0.0	-0.3	-0.8	-0.3	-0.2
5.0	6.0	6.6	6.2	6.0	6.3	6.8	6.3	6.2
25	17	15	12		8	10	12	25

+1.4	-1.0	-0.5	0.0	-0.5	-1.0	-0.3	-0.2
4.6	4.0	4.5	6.0	6.5	7.0	6.3	6.2
25	16	13		8	11	14	25

Sta. B.S. H. I. F.S. Elev.
 B.M. #14 2.79 12 88.15 = 1285.36

w. root 14" Elm 18' Rt. Sta. 177 + 45

182 → 5.1 83.1

+1.4 +0.9 -1.3 -0.4 0.0 -0.4 -1.2 +0.4 +0.5
 $\frac{3.7}{25} \frac{4.2}{21} \frac{6.1}{16} \frac{5.5}{12} \frac{5.1}{9} \frac{5.5}{9} \frac{6.3}{12} \frac{4.7}{14} \frac{4.6}{25}$

183 5.9 82.3

+1.2 +0.8 -1.1 -0.2 0.0 -0.5 -1.3 +1.5 +1.8
 $\frac{4.7}{25} \frac{5.1}{21} \frac{7.0}{16} \frac{6.1}{10} \frac{5.0}{9} \frac{6.1}{9} \frac{7.2}{13} \frac{4.4}{18} \frac{4.1}{25}$

184 7.0 81.2

+1.8 +1.5 -1.9 -0.6 0.0 -0.4 -1.4 +1.6 +1.9
 $\frac{5.2}{25} \frac{5.5}{20} \frac{8.9}{14} \frac{7.6}{11} \frac{7.0}{9} \frac{7.4}{9} \frac{8.1}{12} \frac{5.1}{17} \frac{5.1}{25}$

185 9.0 79.2

+2.8 +2.5 -0.8 -0.4 0.0 -0.2 -0.7 +1.8 +2.4
 $\frac{6.2}{25} \frac{5.5}{19} \frac{5.8}{13} \frac{5.1}{9} \frac{9.1}{9} \frac{9.2}{8} \frac{9.7}{11} \frac{7.2}{16} \frac{6.6}{25}$

186 11.0 77.2

+2.8 +2.5 -1.4 0.0 0.0 -0.3 -1.0 +2.0 +2.6
 $\frac{8.2}{25} \frac{8.5}{20} \frac{12.4}{14} \frac{11.0}{10} \frac{11.0}{9} \frac{11.3}{8} \frac{12.0}{10} \frac{5.8}{14} \frac{8.4}{25}$

T.P. 226 12 79.46 10.95 12 77.20

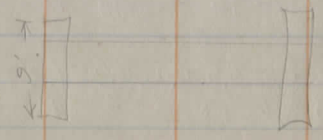
187 5.6 73.9

+4.8 +4.3 -0.8 -0.1 0.0 -0.1 -0.7 +3.4 +3.9
 $\frac{0.8}{25} \frac{1.3}{21} \frac{6.1}{15} \frac{5.7}{12} \frac{5.6}{9} \frac{5.7}{8} \frac{6.3}{10} \frac{2.8}{17} \frac{1.7}{25}$

188 7.2 72.3

+2.2 +1.1 -0.7 -0.2 0.0 -0.4 +0.4
 $\frac{5.0}{25} \frac{6.1}{17} \frac{7.9}{18} \frac{7.4}{11} \frac{7.2}{11} \frac{7.6}{12} \frac{6.8}{12} \frac{6.8}{25}$

< 12.5 x 12.5' >



6.7 72.8

0.0 0.0 0.0
 $\frac{6.7}{11} \frac{4.7}{11} \frac{4.7}{11}$

4 x 4 stone box.
 stone floor. Good cond. ✓

Sta	B.S.	H. I.	F.S.	Elev.
189	1279.46		5.7	73.8
190			0.7	78.8

T.P. 1253 1291.18 0.81 1278.65

+7.5 6.5 84.7

191 5.6 85.6

192 3.8 87.4

193 2.4 88.8

B.M. #5 ^{1288.60} 2.59 1288.64

T.P. 11.33 1300.78 1.73 1289.45

194 11.2 89.6

195 9.3 91.5

✓

+0.3	-0.5	-0.9	+0.1	0.0	-0.4	-1.1	-0.6	-0.4	+0.7
6.0	6.2	6.6	5.8	5.7	6.1	6.8	6.3	6.1	5.0
2.5	1.6	1.5	1.0		4.	8	9	10	2.5

+3.7	-1.3	-0.2	0.0	0.0	-0.7	+5.5	+6.0
-3.0	4.0	0.7	0.7	0.7	1.4	-4.8	-5.3
2.5	1.5	1.0		3	6	13	2.5

+3.2	0.0	-0.2	-1.3	+0.1	0.0	0.0	-0.7	+3.3
3.3	6.5	6.7	1.8	5.4	6.5	6.5	7.2	3.3
2.5	1.9	1.5	1.4	8		7	10	1.9-2.5

+2.7	+0.2	-0.3	-1.4	0.0	0.0	-0.1	-0.9	+0.2	+2.4
2.9	5.4	5.3	7.0	5.4	5.6	5.7	6.5	5.4	3.5
2.5	2.0	1.5	1.3	9	11	6	9	12	11-2.5

+1.3	+0.1	-1.0	-0.2	0.0	-0.1	-1.0	+0.8
2.5	3.7	4.8	4.0	3.8	3.9	4.8	3.9
2.5	1.0	8.6	7		12	14	11-2.5

+0.4	-0.1	-1.2	-0.4	0.0	-0.2	-1.0	+0.3
2.0	2.3	3.6	2.3	2.1	2.6	3.4	2.1
2.5	1.0	8.7	5		14	17	19-2.5

Forest 28" Apple 2.5' Ft. Sta. 191+0.5

+0.9	+0.3	-0.6	-0.2	0.0	-0.1	-0.4	+0.7	+1.1
10.3	10.7	11.3	11.4	11.2	11.3	11.6	10.9	10.1
2.5	8	7	7		16	18	20	2.5

+2.4	+0.5	-0.7	-0.3	0.0	0.0	-0.6	+0.9	+1.1
6.9	8.8	10.0	9.6	9.3	9.3	9.8	8.1	8.2
2.5	7	4	2		14	16	18	2.5

H. I.
Sta. B.S. 1300.78 F.S. Elev.
196 6.0 94.8

+50 4.7 96.1

197 5.3 95.5

198 6.0 94.8

+40 5.9 94.9
24' of 12" C.I.P. →

199 6.1 94.7

200 4.0 96.8

T. P. 8.72 1306.59 2.91 1297.87

201 6.7 99.9

B.M. #16 0.77 1305.82

+3.7 +2.2 -0.3 0.0 -0.1 -0.5 +0.4 +0.9
2.8 3.2 4.3 4.0 6.1 6.5 5.6 5.1
25 11 7 15 17 19 25

+4.2 +2.9 -0.7 0.0 0.0 +0.2 -0.2 +1.7
0.5 1.8 5.1 4.1 1.7 4.5 4.2 3.0
25 9 5 1 15 17 19-25

+3.5 +2.1 -1.0 0.0 0.0 -0.1 -0.5 +1.5
1.8 3.2 4.3 5.3 5.3 5.1 5.8 3.8
25 12 4 3 15 16 21-25

-0.3 -1.2 -0.1 0.0 -0.6 -1.1 -0.4 -1.0
6.3 7.2 8.1 6.0 6.6 7.1 8.1 7.0
25-8 5 2 17 19 22 25

-0.4 -0.9 -1.4 -0.3 0.0 -0.3 -1.6 -2.0
6.3 6.3 7.3 6.2 5.9 6.2 7.5 7.8
16 7 4.5 3 17 20 25

+1.8 +1.2 +0.2 -0.7 -0.1 0.0 +0.1 -0.6 +0.5
1.3 4.5 5.2 6.5 6.2 7.1 8.0 6.7 5.6
25 13 2 3 3 14 20 21-25

+4.0 +3.1 -0.2 -1.0 -0.6 0.0 -0.1 -0.6 +0.1 +1.2
0.2 0.3 4.2 5.0 4.6 4.0 4.1 4.1 3.9 3.8
25 16 7 6 4 14 16 17 25

+3.7 +2.8 +0.6 -0.4 -0.2 0.0 0.0 -0.5 +0.1 +1.6
3.0 3.9 6.1 7.1 6.7 6.7 6.7 7.5 6.6 5.1
25 13 7 5 4 15 16 25

1/2 foot 12" Maple 25' L. Sta. 201 + 95

1306 59

202 4.1 02.5

750 6.1 00.5

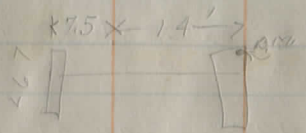
203 11.4 95.2

T.P. 0.04 12.96 49 10.1A 12.96.45

204 8.7 87.8

205 9.9 86.6

106 9.8 86.7



2x2 stone plank floor
N. end back

Temp. Q.M. 98.2 7286.67

206 9.1 87.1

+2.8 +2.1 +0.3 -0.5 -0.1 0.0 -0.1 +1.2

1.3 3.0 3.3 4.6 4.2 4.1 4.2 2.9
2.5 14 9 8 5 7.2 17-25

+4.6 +3.7 -0.5 -0.1 0.0 -0.3 -0.4 +2.5 +2.8

4.3 2.9 6.6 6.2 6.1 6.9 6.5 3.6 3.2
2.5 12 7 5 9 11 7.8 2.5

+8.0 +7.3 -0.1 +0.1 0.0 -0.2 +5.9 +6.6

3.1 4.1 1.5 1.3 1.1 1.6 5.5 4.1
2.5-2.3 7.6 5 3 11 2.8 2.5

+2.3 -0.9 0.0 0.0 -0.1 -0.4 +0.9

1.9 9.6 8.7 8.7 8.8 3.1 7.8
2.5-18 6.4 2 13 15-17 22-25

-3.6 -4.1 -0.6 0.0 -0.1 -2.9 -2.9

4.3 1.0 10.5 9.9 10.0 12.8 12.8
2.5 12 4 12 17 2.5

-5.5 -0.4 0.0 0.0 -5.5

5.5 10.2 5.8 5.8 15.3
7.5 6 12 14FL

FL

-0.1 0.0 -0.5 -0.2 0.0 -0.1 -0.7

8.5 9.4 9.9 9.6 9.1 0.5 10.1 5.5 9.1
2.5 7 5 5 9.2 16-25

H. I.
 570 B.S. 19.96.49 F.S. Elev
 +50 72 89.3

T.P. 10.92 13.01 8.9 5.52 12.90.97

207 9.4 92.5

+75 6.7 95.2

208 8.7 93.7

209 15.0 86.9

T.P. 0.70 12.90.04 12.55 12.89.34

B.M. #17 12.87.00
 2.25 12.87.10

210 6.0 84.0

+60 26'-12" v.l.p.
 K¹⁰ X 16' 7
 6.6 83.4
 ✓

+4.8 +3.8 +1.8 -0.5 -0.1 0.0 +0.1 -0.3 +0.2 +1.5 +3.7
 $\frac{21}{25} \frac{31}{17} \frac{51}{13} \frac{77}{7} \frac{73}{3} \frac{7.2}{9} \frac{71}{12-14} \frac{7.5}{15} \frac{7.0}{20} \frac{5.7}{20} \frac{3.5}{2.5}$

+7.8 +6.3 -0.1 +0.1 0.0 -0.2 -0.5 +6.0 +7.2
 $\frac{1.6}{25} \frac{31}{18} \frac{95}{7} \frac{33}{3} \frac{9.4}{70} \frac{9.4}{12} \frac{9.7}{20} \frac{3.8}{2.5}$

+6.7 +5.7 +0.7 +0.1 0.0 -0.3 +3.9 +6.7
 $\frac{0.0}{25} \frac{1.0}{18} \frac{6.0}{9} \frac{6.6}{7} \frac{6.7}{9} \frac{7.0}{17} \frac{2.8}{25} \frac{0.0}{25}$

+5.4 +4.4 -0.6 -0.2 0.0 -0.2 +2.8 +4.4
 $\frac{2.8}{25} \frac{3.8}{16} \frac{8.8}{7} \frac{8.4}{6} \frac{8.2}{10} \frac{8.4}{13} \frac{5.4}{13} \frac{3.8}{15}$

+5.1 +4.6 -0.8 -0.4 0.0 +0.1 -0.2 +1.6 +2.8
 $\frac{9.8}{25} \frac{11.4}{16} \frac{15.8}{8} \frac{15.4}{8} \frac{15.0}{8} \frac{14.2}{10} \frac{15.2}{13} \frac{13.4}{17} \frac{13.1}{25}$

N. Post Oak Maple 25' H. 570, 209 +40

+0.5 +0.8 -0.3 -1.2 -0.4 0.0 -0.2 -1.4 -1.0 -0.7
 $\frac{5.5}{25} \frac{5.2}{23} \frac{6.3}{12} \frac{7.2}{5.7} \frac{6.0}{5} \frac{6.7}{11} \frac{7.4}{14-16} \frac{7.0}{17} \frac{6.1}{25}$

-1.6 -2.1 -0.3 0.0 -0.5 -4.6
 $\frac{2.7}{15} \frac{2.7}{10} \frac{6.9}{13} \frac{6.4}{9} \frac{6.9}{9} \frac{2.7}{10} \frac{2.7}{10} \frac{1.6}{16}$

Sta. B. S. 1290.04 H. I. F. S. Elev.

P. 11 67 83.3
P. 12 5.5 84.5

T. P. 7.19 1292.06 5.27 1284.77

P. 13 4.8 87.3

+75 3.5 88.6

P. 14 4.1 88.0

P. 15 11.2 80.9

T. P. 0.58 1281.13 11.51 1280.00

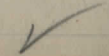
P. 16 9.5 71.6

T. P. 1.02 1271.44 10.71 1270.42

P. 17 5.7 65.7

B.M. #18 5.27 1271.38 5.27 1266.17

1266.17



+0.5 -0.1 -0.6 -0.4 0.0 -0.6 -2.1 -2.5

62 68 73 71 67 73 81 9.2
25-18 11 10 5 13 20 25

+3.5 +2.1 -1.0 0.0 0.0 0.0 -0.7 +1.3 +1.7

2.0 3.1 0.5 5.5 5.5 5.5 6.2 4.2 3.8
25 12 7.5 5 5 14.16 18 2.5

+2.0 +0.6 -0.1 0.0 -0.1 -1.0 +0.3 0.0

2.8 4.2 4.2 4.8 4.9 5.2 4.5 4.8
25 11 6 10 12.14 16 2.5

+2.8 +2.3 +0.1 -0.7 -0.1 0.0 -0.3 -1.1 +0.1 +1.8

0.1 1.2 3.4 4.2 3.6 3.5 3.8 4.6 3.1 1.7
45 21 11 10.8 5 10 12.14 17 2.5

+4.1 +2.9 -0.7 -0.1 0.0 0.0 -0.9 +1.5 +2.5

0.0 1.2 4.8 4.3 4.1 4.1 5.0 3.0 1.6
25 16 11 7 7 12 15 2.5

+5.0 +3.8 +0.5 -0.9 0.0 0.0 -0.2 -0.8 +0.9 +3.0 +3.7

0.7 1.4 10.7 12.1 11.3 11.2 11.4 12.0 10.3 8.2 7.5
25 21 15 14 12 4 7 9 15 25

+4.9 -0.5 +0.2 0.0 -0.2 -0.8 +2.5 +3.7

4.6 14.2 5.3 9.5 9.7 10.3 3.0 5.8
25 23 15.14 11 3 5 10 20-25

0.0 +0.1 -0.8 -0.1 0.0 -0.1 -0.8 -0.3 -2.6

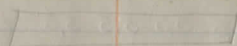
5.7 5.6 6 5.8 5.7 5.8 6.5 6.0 8.3
25 16 11.2 10 5 7-9 10 2.5

S. root 10" Maple 30 'lt. Sta. 217+90

1271.38

+40

14" G.I.P.



← 13 1/2 * 10.5 →



6.0 64.8

218

9.1 62.3

+25

9.9 61.5

T.P. 2.59 1260 91 : 13.06 1258.32

219

5.8 55.1

220

12.2 48.7

T.P. 1.66 1250 99 11.58 1249.37

221

6.4 44.6

222

10.7 40.3

T.P. 0.99 1241 19 10.59 1240.40

-0.8	-0.8	+0.4	0.0	-0.2	-1.0	-1.7
7.4	7.4	6.2	6.6	6.8	7.6	8.3
17	14	13		10	11	23
	FL1				FL1	

+2.5	+1.4	-0.6	-0.2	0.0	-0.4	-1.3	+1.2	+1.7
6.6	7.8	9.7	9.3	9.1	9.5	10.4	7.0	7.4
25	18	10	8		10	11-12	16	20-25

+4.0	+1.9	-0.4	+0.1	0.0	-0.3	-1.3	+3.7
5.9	8.0	10.3	9.8	9.3	10.2	11.2	8.2
25	12	8	6		11	13-15	20-25

+6.8	+6.3	+0.5	+0.7	+0.2	0.0	+0.1	-0.2	+6.1	+6.3
-1.0	-0.8	5.0	5.1	5.2	5.8	5.7	6.0	-0.3	-0.5
25	20	12	9	5		9	12	19	25

+5.4	+5.0	+0.6	-0.6	+0.2	0.0	-0.2	-1.1	-0.2	+2.4
6.6	7.2	11.6	12.3	12.0	12.2	12.4	13.3	12.4	9.8
25	20	17	13	11		10	12	14	18-25

+3.6	-0.1	-1.1	-0.2	0.0	-0.2	-0.9	0.0	+1.1	+1.6	
2.8	6.5	7.5	6.6	6.7	6.6	7.3	6.4	5.3	4.8	
25	19	13	11	9		9	11	12	17	25

+3.8	+3.8	-0.5	0.0	0.0	-0.1	-0.7	+0.2	+1.6	+2.3
6.2	6.2	4.2	4.7	4.7	10.8	11.4	10.5	9.1	8.1
25	16	10.3	6		10	11-12	14	17	25



H. I.
Sta. B.S. 1241 19 F.S. Elev.

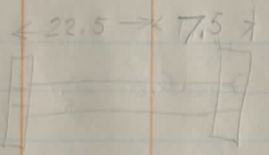
223 42 37.0

224 6.5 34.3

225 8.1 33.1

B.M. #19 844 1232.75

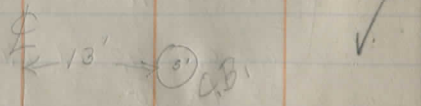
+97° 1050 307



+73 99 31.3

2 1/2 x 12 1/2' Storage Box
plank floor } Good Cond.
12" corr. cover }

13' from Φ to inside edge
of catch basin



+1.6 -0.2 -1.0 -0.2 0.0 -0.3 -0.9 +0.2 +1.8
2.5 4.7 5.2 4.7 4.2 4.5 5.1 4.0 2.1
25-16 12-11 10 5 10 13 14 2.5

0.0 -0.2 -1.1 -0.3 0.0 0.0 -0.6 -0.1
6.9 7.1 8.0 7.2 6.9 6.9 7.5 7.0
25 11 10-9 7 10 12-14 15-25

-1.6 -0.8 -0.3 -1.9 -0.6 0.0 -0.2 -1.4 -0.8 -1.1
9.7 8.9 8.7 10.0 8.7 8.1 8.3 9.5 8.9 9.2
25 20 14 12 10 8 11 12 2.5

s. root 30" Elm 20 Lt. Sta 225 + 75

s. curb Water St. End of improvement.

9.0 4.1 -4.4 -4.7
9.9 14.0 14.3 14.6
7.5 FL 16 FL inlet
to C. Basin

11-12-20

Sta	B.S.	H. I.	F.S.	Elev.	
B.M.	4.05	1289.41		1285.36	
174				85.77	3.64
173				85.67	3.74
T.P.	4.00	1288.49	5.52	1283.89	
172				85.57	2.92
171				85.47	3.02
170				85.37	3.12
169				85.27	3.22
T.P.	4.01	1287.39	3.11	85.38	
168				85.17	4.22
167				85.47	3.92
166				86.57	2.82
B.M.	5.18	1292.17	2.40	1286.99	
165				88.07	4.10

39

Lt.		Rt.	
stake	ground	ground	stake
$\frac{20.7}{20.2}$	$\frac{C1.0}{17.2}$	$\frac{F1.2}{15.7}$	$\frac{F1.2}{16.9}$
$\frac{C0.5}{19.0}$	$\frac{C0.2}{18.8}$	$\frac{F1.8}{15.2}$	$\frac{F1.7}{16.2}$
$\frac{F1.0}{17.1}$	$\frac{F1.1}{18.1}$	$\frac{F2.1}{14.2}$	$\frac{F2.4}{15.2}$
$\frac{F1.4}{15.7}$	$\frac{F1.9}{14.9}$	$\frac{F2.7}{14.4}$	$\frac{F2.6}{15.4}$
$\frac{F0.4}{17.2}$	$\frac{F1.0}{16.2}$	$\frac{F1.9}{14.9}$	$\frac{F1.9}{15.9}$
$\frac{C2.1}{21.7}$	$\frac{C2.0}{20.7}$	$\frac{F0.7}{16.7}$	$\frac{F0.8}{17.7}$
$\frac{C0.7}{20.7}$	$\frac{C1.3}{19.7}$	$\frac{F1.1}{16.1}$	$\frac{F1.0}{17.1}$
$\frac{C0.3}{18.9}$	$\frac{C0.1}{17.9}$	$\frac{F1.4}{15.7}$	$\frac{F1.5}{16.7}$
$\frac{C1.7}{21.0}$	$\frac{C1.5}{20}$	$\frac{F1.8}{15.0}$	$\frac{F1.7}{16.0}$
$\frac{C1.7}{20.5}$	$\frac{C1.3}{19.5}$	$\frac{F1.0}{16.3}$	$\frac{F0.7}{17.3}$

164	1292 17	881.2	4.05	$\frac{C0,8}{20,0}$	$\frac{C0,8}{19,0}$	$\frac{F0,5}{17,0}$	$\frac{F0,5}{18,0}$	stake	
163		867.2	5.45	$\frac{C1,3}{20,5}$	$\frac{C1,2}{19,5}$	$\frac{0,0}{17,8}$	$\frac{0,0}{18,8}$		
162		85.53	6.64	$\frac{C1,5}{20,4}$	$\frac{C1,1}{19,4}$	$\frac{F0,5}{17,0}$	$\frac{F0,2}{18,0}$		
T.P.	3,85 1289 17	6,85 85,32							
161		85.02	3.55	$\frac{F1,4}{16,5}$	$\frac{F1,5}{15,5}$	$\frac{F2,1}{14,6}$	$\frac{F1,8}{15,6}$		
160		85.92	3.25	$\frac{F1,0}{16,9}$	$\frac{F1,2}{15,9}$	$\frac{C0,2}{18,0}$	$\frac{C0,2}{19,0}$		
P.T.	(widened pt 2' & bank 32)	86.11	3.06	$\frac{F0,2}{19,9}$	$\frac{F0,1}{18,8}$	$\frac{276}{17,3}$	$\frac{F0,3}{18,3}$		
	11-15-20 \leftarrow old								
B.M.	399 1290 89	1286.90							
P.I.	+702	86.31	4.58	$\frac{F1,0}{25,0}$	$\frac{F1,2}{24,0}$	$\frac{F2,0}{14,8}$	$\frac{F2,0}{15,8}$	490	
P.C.	(widened 2' banked 0.3)	86.54	4.35	$\frac{F0,6}{19,9}$	$\frac{F0,7}{18,8}$	$\frac{4,05}{15,4}$	$\frac{F1,6}{16,4}$		
157		86.97	3.92	$\frac{C0,7}{19,4}$	$\frac{C0,4}{18,4}$	$\frac{F0,1}{16,7}$	$\frac{F0,5}{17,7}$		
156		88.32	2.57	$\frac{C0,8}{19,0}$	$\frac{C0,2}{18,0}$	$\frac{0,0}{17,8}$	$\frac{C0,2}{18,8}$		
T.P.		90.13	0.76						
	1260 1302 08	1,41 1289.48							

130208

155				90.13	11.25	$\frac{F0.7}{17.3}$	$\frac{F1.0}{16.3}$	$\frac{C0.9}{19.1}$	$\frac{C0.7}{20.1}$
154				93.82	8.26	$\frac{F0.1}{18.1}$	$\frac{F0.4}{17.1}$	$\frac{F1.7}{15.2}$	$\frac{F1.5}{16.2}$
153				97.82	4.26	$\frac{F0.7}{17.1}$	$\frac{F1.1}{16.1}$	$\frac{C1.5}{20.0}$	$\frac{C1.0}{21.0}$
152				01.82	0.26	$\frac{F1.0}{16.5}$	$\frac{F1.5}{15.5}$	$\frac{F2.1}{14.6}$	$\frac{F2.0}{15.6}$
T.P.	1134	1313	17	0.25	1301.83				
151				05.82	7.35	$\frac{F2.7}{16.2}$	$\frac{F3.1}{15.2}$	$\frac{C1.6}{20.1}$	$\frac{C1.7}{21.1}$
150				09.82	3.35	$\frac{F1.1}{16.5}$	$\frac{F1.5}{15.5}$	$\frac{C2.5}{21.5}$	$\frac{C2.5}{22.5}$
T.P.	1093	1323	58	0.52	12.65				
149				13.82	2.74	$\frac{F1.6}{16.4}$	$\frac{F1.6}{15.4}$	$\frac{C0.4}{18.3}$	$\frac{C0.4}{17.3}$
148				17.82	5.76	$\frac{F1.3}{16.4}$	$\frac{F1.6}{15.4}$	$\frac{0.0}{17.8}$	$\frac{F0.1}{18.8}$
147				20.42	3.16	$\frac{C1.8}{21.1}$	$\frac{C1.6}{20.1}$	$\frac{F0.4}{17.1}$	$\frac{F0.4}{18.1}$
146				20.22	3.36	$\frac{C2.5}{22.0}$	$\frac{C2.2}{21.0}$	$\frac{F2.1}{14.6}$	$\frac{F1.7}{15.6}$
145				20.27	3.31	$\frac{F2.0}{15.6}$	$\frac{F2.1}{14.6}$	$\frac{F2.0}{14.7}$	$\frac{F2.0}{15.7}$
TR	1287 1053	1335 1333	74 40	0.71	1322.87				

1333 40
~~1335 77~~

144

23.62

9.78

→ 29.12

142+90

4.23

T.P.

9.99

1341 94

145 131.95

142

33.37

8.55

141

36.82

5.12

140

38.54

2.10

T.P.

8.58

1347 90

2.62 1339.32

139

41.32

6.58

B.M.

6.55

1347 88

9.55
1341.35
1347.33

138

42.62

5.26

137

43.89

4.04

136

44.02

3.86

135

44.12

3.76

134

44.08

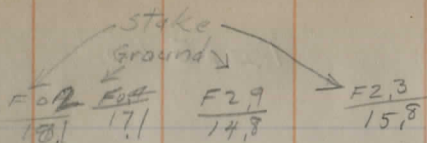
3.80

T.P.

2.05

1345 13

4.80 1343.08



$\frac{C2.1}{23.3}$

$\frac{C3.0}{22.2}$

$\frac{C2.1}{20.9}$

$\frac{C2.5}{21.9}$

$\frac{C1.2}{20.0}$

$\frac{C0.8}{19.0}$

$\frac{C2.0}{20.8}$

$\frac{C2.0}{21.8}$

$\frac{C0.8}{19.5}$

$\frac{C0.5}{18.5}$

$\frac{C1.3}{19.7}$

$\frac{C1.4}{20.7}$

$\frac{C0.8}{19.8}$

$\frac{C0.7}{18.8}$

$\frac{C0.2}{18.0}$

$\frac{C0.4}{19.0}$

$\frac{F0.9}{17.1}$

$\frac{F1.1}{16.1}$

$\frac{F0.2}{16.4}$

$\frac{F0.8}{17.4}$

$\frac{F0.4}{18.1}$

$\frac{F0.4}{17.1}$

$\frac{F0.3}{17.3}$

$\frac{F0.2}{18.3}$

$\frac{F1.0}{17.0}$

$\frac{F1.2}{16.0}$

$\frac{F0.5}{17.0}$

$\frac{F0.3}{18.0}$

$\frac{F1.1}{17.1}$

$\frac{F1.1}{16.1}$

$\frac{F1.3}{15.8}$

$\frac{F1.1}{16.8}$

$\frac{F1.4}{16.5}$

$\frac{F1.5}{15.5}$

$\frac{F0.9}{16.4}$

$\frac{F0.8}{17.4}$

$\frac{F1.0}{17.1}$

$\frac{F1.1}{16.1}$

$\frac{F0.4}{17.1}$

$\frac{F0.3}{18.1}$

134513

133				43.22	1.91	$\frac{F0.5}{17.7}$	$\frac{F0.7}{16.7}$	$\frac{C0.7}{18.8}$	$\frac{C1.0}{19.8}$
132				42.22	2.91	$\frac{F0.5}{17.5}$	$\frac{F0.8}{14.5}$	$\frac{F0.9}{17.1}$	$\frac{F0.2}{18.1}$
131				41.22	3.91	$\frac{F0.5}{17.1}$	$\frac{F0.9}{16.4}$	$\frac{F0.7}{16.7}$	$\frac{F0.5}{17.7}$
130				40.22	4.91	$\frac{F0.7}{17.2}$	$\frac{F1.0}{16.2}$	$\frac{F1.1}{16.1}$	$\frac{F1.0}{17.1}$
129				39.39	5.74	$\frac{F1.4}{16.7}$	$\frac{F1.2}{15.7}$	$\frac{F1.5}{15.5}$	$\frac{F1.4}{16.5}$
128				38.90	6.23	$\frac{F1.4}{16.4}$	$\frac{F1.6}{15.4}$	$\frac{F1.9}{14.9}$	$\frac{F1.6}{15.9}$
T.P.	506	1373	62	6.57	1038.56				
127				38.75	4.87	$\frac{F0.6}{17.7}$	$\frac{F0.9}{16.4}$	$\frac{F1.5}{15.5}$	$\frac{F1.5}{16.5}$
126				38.94	4.68	$\frac{F0.6}{17.5}$	$\frac{F0.8}{16.5}$	$\frac{F1.5}{15.5}$	$\frac{F1.2}{16.5}$
125				39.30	4.32	$\frac{F1.5}{16.0}$	$\frac{F1.8}{15.0}$	$\frac{F1.7}{15.2}$	$\frac{F1.6}{16.2}$
124				39.66	3.96	$\frac{F0.8}{17.2}$	$\frac{F1.0}{16.2}$	$\frac{F1.9}{14.9}$	$\frac{F1.8}{15.9}$
123				40.02	3.60	$\frac{F0.6}{17.5}$	$\frac{F0.8}{16.5}$	$\frac{F1.2}{16.0}$	$\frac{F1.1}{17.0}$
122				39.60	4.02	$\frac{F0.8}{17.2}$	$\frac{F1.0}{16.2}$	$\frac{F0.8}{16.5}$	$\frac{F0.8}{17.5}$

1343 62

121

3840

5.22

$\frac{F04}{173}$

$\frac{F06}{168}$

$\frac{F08}{165}$

$\frac{F06}{175}$

120

3720

6.42 ✓

$\frac{F07}{172}$

$\frac{F10}{162}$

$\frac{F13}{158}$

$\frac{F11}{168}$

B.M.

r24-21
cold!!!!!!
snow

7.68 1335.97

B.M.

1.70

1337 62

1335.92

119

35.60

2.02

$\frac{F04}{180}$

$\frac{F05}{170}$

$\frac{F12}{160}$

$\frac{F11}{170}$

118

3320

4.42

$\frac{C05}{15.0710}$

$\frac{F08}{169}$

$\frac{00}{179}$

117

3000

7.62

$\frac{F07}{15.0710}$

$\frac{C12}{19.5}$

$\frac{01.6}{20.5}$

T.P.

2.93

1328 86

11.69 1325.93

116

2600

2.86

$\frac{C20}{150.710}$

$\frac{C18}{20.9}$

$\frac{C2.0}{21.4}$

115

2146⁰

7.20²⁶

$\frac{C08}{17.5}$

$\frac{C05}{18.5}$

$\frac{F08}{16.5}$

$\frac{F0.4}{17.5}$

114

1720

11.66

$\frac{C08}{19.8}$

$\frac{C07}{18.8}$

$\frac{C05}{18.5}$

$\frac{C0.6}{19.5}$

T.P.

0.80

1317.13

11.73

17.13

113

1312.80

1.33

$\frac{C0.3}{19.1}$

$\frac{C03}{18.1}$

$\frac{C03}{18.1}$

$\frac{C0.0}{19.1}$

112

0832

8.81

$\frac{C05}{19.5}$

$\frac{C0.5}{18.5}$

$\frac{C11}{19.3}$

$\frac{C12}{20.3}$

T.P.

0.75

1306 29

11.59

105.54

111

0325

3.89 ✓

$\frac{F12}{16.7}$

$\frac{F14}{15.7}$

$\frac{C17}{20.2}$

$\frac{C17}{21.2}$

1306 29

110				97.59	3.87
T.P.	0.85	1295.54	116.0	1294.69	
109				91.20	4.34
188				84.50	10.74
T.P.	0.46	1284.17	11.53	1284.01	-33
				84.80	
107				78.60	6.07
T.P.	0.76	1275.70	9.53	1274.94	
106				72.58	3.12
105				70.20	5.50
104				68.40	7.30
T.P.	3.01	1270.79	8.63	1267.07	
103				66.89	3.90
102				67.10	3.69
101				67.98	2.81
T.P.	9.45	1278.41	1.83	1268.96	

$\frac{F1A}{16.5}$	$\frac{F15}{15.5}$	$\frac{C2.2}{21.0}$	$\frac{C2.5}{22.0}$
$\frac{F1.6}{15.8}$	$\frac{F2.0}{14.8}$	$\frac{C2.3}{21.2}$	$\frac{C2.7}{22.1}$
$\frac{F2.4}{15.5}$	$\frac{2.6}{14.58}$	$\frac{C1.7}{20.3}$	$\frac{C2.2}{21.3}$
$\frac{C1.8}{22.2}$	$\frac{C1.0}{21.2}$	$\frac{C0.8}{21.0}$	$\frac{C0.8}{22.0}$
$\frac{C0.7}{21.0}$	$\frac{C0.6}{20.6}$	$\frac{F1.1}{18.1}$	$\frac{F0.2}{19.1}$
$\frac{F2.0}{17.8}$	$\frac{F2.0}{16.8}$	$\frac{F1.8}{17.0}$	$\frac{F1.8}{18.0}$
$\frac{F1.7}{17.7}$	$\frac{F1.9}{16.9}$	$\frac{F1.9}{16.9}$	$\frac{F1.2}{17.9}$
$\frac{F1.2}{17.6}$	$\frac{F2.1}{16.6}$	$\frac{F1.8}{17.0}$	$\frac{F1.8}{18.0}$
$\frac{F2.1}{17.6}$	$\frac{F2.1}{16.8}$	$\frac{F1.9}{16.7}$	$\frac{F1.9}{17.7}$
$\frac{C0.5}{21.4}$	$\frac{C0.4}{20.4}$	$\frac{F1.4}{17.6}$	$\frac{F1.3}{18.6}$



127841

100

71.10

7.31

$$\frac{C3,0}{23,1}$$

$$\frac{C2,9}{22,1}$$

$$\frac{C1,7}{20,0}$$

$$\frac{C2,0}{21,0}$$

99

75.48

2.93

$$\frac{C0,2}{18,8}$$

$$\frac{0,0}{17,8}$$

$$\frac{0,0}{17,8}$$

$$\frac{F0,2}{18,8}$$

T.P. 11.45 1288 39

1.47 1276.94

98

81.60

6.79

$$\frac{F3,3}{16,8}$$

$$\frac{F3,4}{15,8}$$

$$\frac{F3,7}{16,4}$$

$$\frac{F3,7}{17,8}$$

97

88.60

-2.9
~~7.79~~

$$\frac{F1,9}{15,0}$$

$$\frac{F2,5}{14,0}$$

$$\frac{F3,4}{15,8}$$

$$\frac{F3,0}{16,8}$$

T.P. 11.05 1299.19

0.25 1288.19

96

95.60

3.59

$$\frac{C1,8}{21,1}$$

$$\frac{C1,6}{20,1}$$

$$\frac{C2,2}{21,0}$$

$$\frac{C,22}{22,0}$$

T.P. 11.76 1310 25

0.70 1298.49

95

02.60

7.65

$$\frac{C2,4}{22,3}$$

$$\frac{C2,4}{21,3}$$

$$\frac{C4,5}{24,5}$$

$$\frac{C4,7}{25,5}$$

T.P. ^{9.56} 8.52 1317 86

0.91 1309.39

94

9.56 1317 80 - ^{1310.290M}

09.22

8.58

$$\frac{C1,6}{21,0}$$

$$\frac{C1,5}{20,0}$$

$$\frac{F0,7}{16,4}$$

$$\frac{F1,0}{17,4}$$

B.M. 9.44

09.22

93

13.60

8.20

$$\frac{F0,3}{14,7}$$

$$\frac{F0,7}{16,7}$$

$$\frac{F2,4}{14,1}$$

$$\frac{F1,5}{15,1}$$

2-10-21

9.44 Hanna, Grad. 1322.68

13.60

92

5.36 17.32

5.36

$$\frac{F1,3}{16,5}$$

$$\frac{F0,8}{16,5}$$

$$\frac{F0,8}{17,5}$$

set at 18 curv.

91

19.40

3.28

$$\frac{F0,3}{15,0}$$

$$\frac{F0,5}{17,0}$$

$$\frac{F1,5}{15,5}$$

$$\frac{F1,4}{16,5}$$

90

21.20

4.48

118

C0,3

$$\frac{C0,1}{17,9}$$

$$\frac{C0,2}{18,0}$$

C0,8

118

T.P. 8.09 1329 59

1.18 1321.50

1329 59

89				23.00
88				24.80
87				26.27
86				25.80
85				25.00
T.P.	3.47	1327	97	5.07 1324.50
84				24.20
83				23.63
82				24.40
81				25.10
T.P.	7.31	1331	51	3.77 1329.20
80				26.10
79				27.10
78				28.25

47
stake lat

GRD	5.77	C0.6	$\frac{C0.3}{18.1}$	$\frac{C0.2}{18.0}$	C0.3	4.77
657						
	4.77	C0.3	$\frac{C0.2}{18.0}$	$\frac{F0.1}{17.6}$	F0.1	4.57
	3.32	F0.3	$\frac{F0.4}{17.1}$	$\frac{F0.6}{16.8}$	F0.7	4.02
	3.79	F0.4	$\frac{F0.8}{16.5}$	$\frac{F0.8}{16.5}$	F0.6	4.37
	4.50	F0.5	$\frac{F0.7}{16.7}$	$\frac{F0.8}{16.5}$	F0.8	5.27
	3.77	F1.0	$\frac{F1.1}{16.1}$	$\frac{F1.5}{15.5}$	F1.5	5.27
	4.34	F0.8	$\frac{F1.0}{16.2}$	$\frac{F1.5}{15.5}$	F1.3	5.6
	3.57	F1.1	$\frac{F1.0}{16.2}$	$\frac{F1.8}{15.0}$	F1.8	5.37
	2.57	F1.2	$\frac{F1.4}{15.6}$	$\frac{F1.5}{15.5}$	F1.5	4.07
	5.11	F0.5	$\frac{F0.7}{16.7}$	$\frac{F0.6}{16.9}$	F0.5	5.61
	4.11	C1.0	$\frac{C0.8}{19.0}$	$\frac{C0.5}{18.5}$	C0.6	4.57
	3.26	F1.4	$\frac{F1.5}{15.4}$	$\frac{F1.1}{16.1}$	F1.0	4.66

1131 51

77				288.0	
T.P.	707	1333	62	4.96	1326.55
76				29.20	
75				29.60	
B.M.	391	1333	64	391	1329.73
74				28.15	
73				23.64	
T.P.	0.80	1322	01	12.43	1321.21
72				16.00	
71				09.09	
T.P.	0.28	1310	7	11.82	1310.19
70				02.00	
T.P.	0.65	1298	78	12.34	1298.13
69				95.38	
68+50				93.00	
68				91.38	
67				90.00	
T.P.	1.17	1291.77		8.18	1290.60

48

slake / offset

2.71	5.11	F2.7	F2.9 14.8	F2.8 14.6	F2.8	5.51
4.42	5.11	F0.8	F1.2 16.0	C0.5 18.5	C0.6	3.82
4.02	3.51	C0.5	C0.3 18.1	F0.5 17.0	F0.5	4.51
5.49	4.89	C0.6	C0.4 18.4	F1.8 15.0	F1.8	3.82
10.64	12.44	F1.8	F2.0 14.7	C0.5 18.5	C0.2	11.04
6.01	3.91	C2.4	C2.4 21.4	C0.2 18.0	C0.4	5.01
13.01	11.11	C1.2	C1.1 19.4	C1.1 19.4	C1.1	11.91
8.47	8.37	F0.4	F0.5 17.0	F0.2 17.4	F0.1	8.57
3.40	2.5	C0.6	C0.4 18.4	F2.6 14.2	F2.0	5.40
5.78	5.68	C0.1	C0.1 17.9	F1.8 15.0	F1.6	7.38
7.40	5.30	F1.9	F1.7 14.7	F1.8 15.0	F1.7	7.40
8.75	5.11	C0.6	C0.5 18.5	F2.7 14.4	F3.8	8.75

Transposed

set at 25' offset. slake or 10.6 off-
set at 25' offset. slake or 10.6 off-
set at 25' offset. slake or 10.6 off-
set at 25' offset. slake or 10.6 off-

1291.77

66 89.00 2.77

65 88.00 3.77

64 86.64 5.13

T.P. 0.10 1287.00 4.87 1286.90

63¹⁶_{19.5} 83.16 3.8462¹⁵₁₈ 79.32 7.08

T.P. 3.43 1277.46 12.97 1274.03

61¹⁴_{17.5} 75.48 1.9860¹⁴_{21.5} 71.67 5.82

T.P. 4.37 1269.22 12.41 1264.85

59¹⁶₂₀ 5.56 1270.41 67.8058¹⁴_{20.5} 63.86 6.45

T.P. 1.30 1261.11 10.60 1259.81

57¹⁶₂₀ 59.82 1.19

B.M. 1261.15 9.14 52.01 1251.97

56¹⁶_{19.2} 54.50 6.65

T.P. 0.34 1252.35 1252.01

2.77 $\frac{0.77}{C2.0} \frac{C1.8}{2.04} \frac{F3.1}{15.2} \frac{F2.7}{}$ at 25' offset stake 4.9
off 9.8'3.77 $\frac{3.77}{F2.0} \frac{F2.0}{14.7} \frac{F2.7}{14.4} \frac{F3.3}{}$ 15.6
set over at 30' line.5.13 $\frac{5.13}{C1.6} \frac{C1.4}{19.9} \frac{F2.5}{14.2} \frac{F1.5}{}$ 15.8
set over at 30' line
room fill
6.3

Nail in W side T.P. at 61. 1 1/2 ft above ground

3.84 $\frac{3.84}{C1.0} \frac{C1.0}{19.2} \frac{F3.5}{16.0} \frac{F1.8}{}$ 5.69
set at 30' offset stake
14.0 out.7.08 $\frac{7.08}{C0.3} \frac{C0.1}{17.9} \frac{F3.1}{15.2} \frac{F1.8}{9.47}$ off 9.8'1.98 $\frac{1.98}{C1.9} \frac{C1.8}{20.4} \frac{F2.3}{14.3} \frac{F0.8}{}$ 3.77 at 30' + 6.2
out 15.7'5.82 $\frac{5.82}{C2.4} \frac{C2.3}{21.0} \frac{F2.9}{14.8} \frac{F2.9}{}$ 3.771.72 $\frac{1.72}{C1.7} \frac{C1.5}{20.0} \frac{F4.0}{17.0} \frac{F3.1}{}$ 4.52
2.616.45 $\frac{6.45}{C1.4} \frac{C1.3}{19.7} \frac{F2.6}{14.7} \frac{F2.5}{}$ 8.151.19 $\frac{1.19}{C1.2} \frac{C1.1}{19.4} \frac{F4.0}{17.0} \frac{F4.4}{}$ 5.596.65 $\frac{6.65}{C1.0} \frac{C0.9}{19.1} \frac{F3.5}{16.2} \frac{F3.6}{}$ 10.25

125235

55 ¹⁷ 20⁴ 47.70

54 ²¹ 27 40.70

T.P. 113 1241.96 1152 1240.83

53 ²⁰ 26¹ 33.70

T.P. 147 1234 26 917 1232.79

52 ¹⁸ 25 26.70

51 ²⁰ 24 19.70

T.P. 0.31 1222.70 1187 1222.59

50 ¹⁵ 20 12.70

T.P. 2.82 1214 61 1091 1211.79

T.P. 5.04 1206.70 1295 1201.66

49 05.70

BM. 604 1201.66

48 4.98 1199 48 1220 1194.50

48 98.70

47 92.16

T.P. 2.21 1189.42 1227 1187.21

46 88.40

T.P. 2.99 1190 20

4.65 ²³ $\boxed{C2.3}$ $\frac{C2.1}{20.9}$ $\frac{C0.9}{19.8}$ $\boxed{C0.8}$ 3.85

11.65 ²⁰ $\boxed{C6.6}$ $\frac{C6.5}{27.5}$ $\frac{C2.0}{20.9}$ $\boxed{C2.1}$ 9.55

8.24 ¹⁷ $\boxed{C6.3}$ $\frac{C6.2}{26.8}$ $\frac{C1.7}{20.3}$ $\boxed{C1.8}$ 9.05

7.56 ²¹ $\boxed{C7.4}$ $\frac{C7.2}{28.5}$ $\frac{C1.5}{20.0}$ $\boxed{C1.5}$ 9.06

14.56 ¹⁰ $\boxed{C3.9}$ $\frac{C3.8}{23.5}$ $\frac{C2.0}{21.6}$ $\boxed{C2.7}$ 11.80

1.91 ⁸ $\boxed{F6.4}$ $\frac{F6.5}{22.0}$ $\frac{F3.9}{16.8}$ $\boxed{F3.8}$ 5.71

7.20 $\boxed{F6.7}$ $\frac{F6.4}{21.8}$ $\frac{F5.5}{20.0}$ $\boxed{F5.5}$ 6.50

1.00 ⁷ $\boxed{F5.4}$ $\frac{F5.7}{20.4}$ $\frac{F4.3}{17.6}$ $\boxed{F4.4}$ 6.80

7.8 ⁴ $\boxed{F5.7}$ $\frac{F5.6}{20.7}$ $\frac{F5.3}{20.6}$ $\boxed{F5.8}$ 9.59

7.32 ⁷ $\boxed{F0.3}$ $\frac{F0.5}{17.0}$ $\frac{F1.9}{14.9}$ $\boxed{F2.0}$ 9.92 ^{set at 25' offset, stake out 10.10}

01.02 ⁰ $\boxed{C1.5}$ $\frac{C1.3}{19.7}$ $\frac{F2.0}{14.7}$ $\boxed{F2.3}$ 3.32

1.80

119020

45

85.06

5.14

F0.2

 $\frac{F0.3}{17.3}$ $\frac{F2.6}{14.2}$

F2.9

2.04

44

81.49

8.71

F1.3

 $\frac{F1.3}{15.9}$ $\frac{F2.4}{14.2}$

F2.2

10.91

T.P.

1.48

1179.95

11.73

1178.17

43

77.62

2.33

F0.3

 $\frac{F0.3}{17.3}$ $\frac{F0.1}{17.6}$

C0.1

2.23

42

73.48

4.17

C1.3

 $\frac{C1.3}{19.7}$ $\frac{C1.4}{19.8}$

C1.7

4.7

41

69.06

10.99

C1.4

 $\frac{C1.3}{19.7}$ $\frac{F2.0}{14.7}$

F1.9

12.71

T.P.

1.64

1169.75

11.84

1168.11

40

64.40

5.35

O.O

 $\frac{C0.1}{17.9}$ $\frac{F0.9}{16.4}$

F0.4

5.75

39

59.70

10.05

C1.6

 $\frac{C1.4}{19.8}$ $\frac{F0.6}{16.9}$

F0.4

10.45

B.M.

1.22

1160.46

10.53

1159.22

38

55.30

5.16

F0.7

 $\frac{F0.9}{16.4}$ $\frac{F1.9}{14.9}$

F1.8

6.96

5-6-21 Fair

B.M.

0.10

1159.34

1159.24

37

52.70

6.64

F2.6

 $\frac{F2.8}{14.6}$ $\frac{F1.4}{15.6}$

F1.2

2.77

T.P.

2.92

1154.01

8.25

1151.09

36

50.60

3.41

F2.4

 $\frac{F2.7}{14.4}$ $\frac{F0.6}{16.9}$

F0.4

2.81

35

49.70

4.31

C2.2

 $\frac{C2.0}{20.1}$ $\frac{F1.1}{14.1}$

F1.0

5.31

34

49.00

5.01

C0.8

 $\frac{C0.7}{18.8}$ $\frac{F0.8}{16.5}$

F0.8

5.81

slope set 10' from end of stk.

33

46.30

7.71

C1.7

 $\frac{C1.6}{20.1}$ $\frac{F1.0}{16.3}$

F1.0

5.71

10' off set

T.P.

2.17

1145.95

10.23

1143.78

1145 95

32				42.20	3.66	F0.3	F0.5 17.0	F1.0 16.3	F0.9	4.5	
T.P.	7.42	1146.03	7.34	138.61							
31				40.20	5.75 4.83	F3.5	F3.7 14.4	F3.0 15.0	F3.2	8.03	
30				41.20	3.33		F1.7 set at 10	F2.4 set at 11		6.23	
29				40.33	4.70	F3.2	F3.1 15.2	F1.6 15.4	F1.7	6.0	
28				41.00	4.03	F3.0	F3.1 15.2	F2.5 14.0	F2.3	6.33	
27				41.99	3.04	F1.2	F1.2 16.0	F2.3 14.3	F2.4	5.94	
B.M.			4.51	1141.52 1141.57	Com. Brq-						
31	4.51	1146.08		40.20	5.83	F2.4	F2.6 14.2	F1.7 15.2	F2.2	5.03	
30				41.20	4.88		F0.7 set at 10'	F1.5 set at 14'		6.38	
29				40.33	5.75	F2.2	F2.0 14.8	F0.6 16.9	F0.7	6.45	
28				41.00	5.08	F1.9	F2.0 14.8	F1.4 15.8	F1.7	6.78	
27				41.99	4.09	F0.2	F0.1 17.6	F1.3 15.8	F1.3	5.39	
26				44.44	1.64	0.0		F0.7 16.7	F0.7	2.34	
T.P.	10.64	1154.34	2.40	1143.68			transposed Lt.				

1154 34

25

T.P. 10.10 1164 18

24

T.P. 10.37 1173 02

23

22

T.P. 10.74 1181.10

22

21

T.P. 7.87 1186 85

21

20

T.P. 10.63 1194.93

19

18

T.P. 11.36 1205 12

17

T.P. 11.10 1215 70

16

T.P. 7.79 1222 05

50.55

1154.08

57.25

1162.65

63.85

70.65

1170.36

70.65

77.35

1178.98

77.35

83.95

1184.36

89.05

94.28

1193.76

1200.85

1204.60

07.65

1114.26

3.79

6.93

9.07

2.37

10.45

3.75

9.50

2.90

5.88

0.65

4.27

8.05

F2.9

F3.3

F2.9

F.1.1

F0.6

F1.6

F3.4

F4.1

F4.2

F3.2

F3.1

F3.8

F2.8

F.1.1

F0.5

F1.5

F3.3

F4.1

F4.2

F3.2

F1.9

F3.8

C1.5

C1.5

C4.4

C5.4

C0.4

C7.1

F4.8

C0.4

C5.3

F1.9

00

C1.6

C1.6

C4.4

C5.6

C0.5

C1.3

F4.7

C0.6

C5.4

5.67

4.73

7.17

6.05

3.90

2.40

4.57

5.35

3.67

2.65

1222 05

20 15
B.M. 4.69 13.21
12/7.37
12/7.30

30 14
T.P. 4.45 1213 53 12.97 1209.08
13 08.25
T.P. 7.44 1210 82 10.15 1203.38
12 05.15

11 5-6-21 P.M. cont.
5-7-21 A.M. start
T.P. 6.80 1213 61 4.01 1206.81
10 09.05
T.P. 11.26 1223.69 1.18 1212.43
9 16.05
T.P. 9.97 1230 90 2.76 1220.93
9 16.05

8 23.05
T.P. 11.50 1240 72 1.68 1229.22
8 23.05

7+50 26.50
T.P. 8.04 1237 26 11.50 1229.22
7+50 26.50

7 29.55

8.84 ^{11.24} F2.7 $\frac{F2.5}{14.0}$ $\frac{C5.2}{26.6}$ C9.1 2.74

10.70 ^{12.60} F1.9 $\frac{F1.3}{15.0}$ $\frac{C5.9}{26.6}$ C6.1 4.50

5.28 ^{10.08} F4.8 F4.9 $\frac{FO.2}{17.5}$ C0.2 5.08

5.67 ^{9.87} F3.2 $\frac{F3.3}{15.6}$ $\frac{F3.3}{15.6}$ F3.3 8.97

6.24 ^{7.44} F1.2 $\frac{F1.4}{15.8}$ $\frac{F3.8}{16.8}$ F3.0 7.24

4.56 ^{5.86} F1.3 $\frac{F1.6}{15.4}$ $\frac{F4.7}{18.7}$ F5.0 9.50

7.64 $\frac{C1.0}{19.2}$ C0.6 7.04

14.85 ^{13.35} C13.5 $\frac{C13.1}{29.6}$

7.85 $\frac{C0.5}{18.5}$ C0.0 7.85

17.67 ^{4.97} C12.7 $\frac{C12.5}{29.0}$

14.22 3.42 $\frac{C10.8}{27.1}$ $\frac{C10.6}{27.1}$

10.76 $\frac{FO.4}{17.1}$ F0.6 11.30

7.71 ^{5.11} C2.3 $\frac{C2.0}{18.5}$ $\frac{F3.5}{16.0}$ F3.8 11.51

1237 26

6 33.05
 5 36.05
 T.P. 11.15 1246 86 1.55 1235.7
 4 39.75
 T
 3 44.85
 T.P. 10.12 1255 09 1.89 1244.97
 3 44.85
 2+50 47.45
 2 48.00
 1 44.70
 T.P. 3.73 1248 31 1.95 1244.58
 End, 742 1230.89
 0+50 41.85

4.21 ⁴³ 0.0 $\frac{F02}{17.5}$ $\frac{F51}{18.2}$ F5.0 92.1
 1.21 ³¹ F1.7 $\frac{F20}{14.7}$ $\frac{F31}{15.2}$ 2.8 40.1
 7.11 ⁷³ F2.2 $\frac{F28}{14.6}$ $\frac{F27}{14.4}$ F2.6 7.1
 2.01 $\frac{C01}{17.7}$ C0.3 1.7
 10.24 ²⁵⁴ C7.7 $\frac{C72}{23.6}$
 7.64 ²⁵¹ C5.1 $\frac{C50}{25.3}$ $\frac{C14}{19.8}$ C1.6 6.09
 7.09 ^{4.79} C2.3 $\frac{C2.1}{21.7}$ $\frac{C14}{19.8}$ C1.7 5.19
 10.39 ¹⁰³⁹ 0.0 $\frac{00}{18.7}$ $\frac{C10}{19.3}$ C1.3 9.09
 6.46 ⁶⁷⁶ F0.3 $\frac{F1.0}{16.3}$ C1.6 Lt. side set at 12' 4.8C

Grade Stakes

Set 1' inside of berm on Rt.

B.M.	10.24	1251	11		1240.87
0+20	127	-3	11.89	11.59	39.52
+50	10.0	-6	9.86	9.26	41.85
1	7.3	-5	6.91	6.41	44.70
2	4.7	-5	3.61	3.11	48.00
2+50	4.5	-5	4.16	3.66	47.45
3	7.3	-4	6.66	6.26	44.75
1+50	5.7	-2	4.81	4.61	1246.50
4	11.6	-		11.36	38.75
T.P.	0.50	1240	25	11.36	1239.75
5	4.0		4.20		36.05
6	7.7		7.20		33.05
7	11.7	-3	11.0	10.70	29.55
T.P.	0.34	1229	57	11.02	1229.23
8	7.1	-7	6.72	6.52	23.05
T.P.	0.44	1216	92	13.09	1216.48
9	2.7	-5	1.38	0.87	16.05
10	8.8	-5	8.37	7.87	09.05
11	12.7	-4	12.44	12.34	04.58
12	12.7	-4	12.17	11.77	05.15
13	9.1	-1	8.77	8.57	08.25
T.P.	10.06	1218	21	8.77	1208.15
14	7.1		6.86		11.35
B.M.					1217.33
B.M.					1217.37

B.M.	2.03	1219	40		1217.37
14+50	7.6	-2	6.70	6.50	12.90
15	7.4	-3.5	6.49	6.19	13.21
16	12.7	-12	11.95	11.75	07.65
T.P.	0.24	1206	83	12.81	1206.59
17	6.1		5.98		00.85
18	12.2		12.55		94.28
T.P.	0.07	1193	82	13.08	1193.75
19	5.5		4.77		89.05
B.M.					1184.33
20	10.4		9.87		83.95
T.P.	0.27	1181	19	12.90	1180.92
21	4.0		3.84		77.35
22	11.1		10.54		70.65
T.P.	0.27	1168	99	12.47	1168.72
23			5.04		63.95
24	12.7	-2	11.94	11.74	57.25
T.P.	0.11	1156	11	12.99	1156.00
25	6.5	-3	5.86	5.56	50.55
26	12.4	-2	11.87	11.67	44.44
T.P.	3.21	1146	38	12.94	1143.17
+50	4.4	-2	3.73	3.53	42.85
27	5.4	-3	4.69	4.39	41.99
28	6.5	-3	5.69	5.38	41.00
29	6.6	-1	6.15	6.05	40.33
B.M.			4.86		1141.52

B.M	8.40	1149.97		1141.57
30	8.9		✓ 8.77	41.20
31	10.3		✓ 9.77	40.20
32	8.2		✓ 7.68	42.29
33	8.9		✓ 3.67	46.30
T.P.				
34	1.5		✓ 0.97	49.00
T.P.	8.92	1157.92	0.97	1149.00
35	8.9		✓ 8.22	49.70
36	7.5		✓ 7.32	50.60
37	5.8		✓ 5.22	52.70
38	3.6	-2	✓ 2.82	2.62 55.30
T.P.	12.77	1169.66	1.03	1156.89
39	10.8		✓ 9.96	59.70
40	6.0		✓ 5.26	64.40
41	1.5		✓ 0.60	69.06
T.P.	12.70	1182.07	0.29	1169.37
42	9.2		✓ 8.59	73.48
43	5.1		✓ 4.45	77.62
44	2.0	-3	✓ 0.88	0.58 81.49
T.P.	12.39	1193.45	1.01	1181.06
45	9.4	-3	✓ 8.69	8.39 85.06
46	6.0	-3	✓ 5.35	5.05 88.40
47	1.6		✓ 1.29	92.16
T.P.	11.44	1204.62	0.21	1193.18

1204.62

48	6.4		✓ 5.92	98.70
T.P.	5.65	1208.35	1.92	1202.70
B.M.			7.65	1200.70
49	3.1		✓ 2.65	05.70
T.P.	11.66	1218.27	1.74	1206.61
50	5.9		✓ 5.57	12.70
T.P.	12.18	1229.74	0.71	1217.56
51	10.2		✓ 10.04	19.70
52	3.3		✓ 3.04	26.70
Temp. B.M. S.W. cor.			3.50	1226.24
Pepp's Stop stone -				

6-13-'21 - Slope Stakes -

Hot
windy

B.M.	3.34	1288	70		1285.36
178				3.13	85.57
179				3.63	85.07
180				4.13	84.57
181				4.63	84.07
T.P.	4.40	1287	47	5.63	1283.97
182				3.90	83.57
183				4.40	83.07
184				5.31	82.16
T.P.	5.00	1283	75	8.72	1278.75
185				3.33	80.42
186				5.89	77.86
187				9.28	74.47
188				10.78	72.97
T.P.	9.47	1282	99	10.23	1273.52
189				6.92	76.07
190				1.52	81.47

Hanna
Grau sr.
Grau jr.

59

Note: slopes set out 1 Ft.

3.13	4.23	$\frac{F1.1}{16.8}$	$\frac{F1.3}{15.8}$	$\frac{F1.8}{15.0}$	$\frac{F1.8}{16.0}$	4.23
3.63	4.73	$\frac{F1.2}{16.5}$	$\frac{F1.5}{15.5}$	$\frac{F1.5}{15.5}$	$\frac{F1.4}{16.5}$	5.03
4.13	5.23	$\frac{F1.5}{14.8}$	$\frac{F1.9}{14.8}$	$\frac{F1.5}{15.5}$	$\frac{F1.4}{16.5}$	5.53
4.63	6.23	$\frac{F1.4}{15.4}$	$\frac{F1.6}{15.4}$	$\frac{F1.1}{16.1}$	$\frac{F1.0}{16.1}$	5.63
3.90	5.10	$\frac{F1.2}{14.9}$	$\frac{F1.9}{14.9}$	$\frac{0.0}{17.7}$	$\frac{C0.2}{17.7}$	3.70
4.40	5.50	$\frac{F1.1}{15.0}$	$\frac{F1.8}{15.0}$	$\frac{C0.7}{18.8}$	$\frac{C0.8}{18.8}$	3.60
5.31	6.51	$\frac{F1.2}{14.0}$	$\frac{F2.5}{14.0}$	$\frac{C0.7}{18.8}$	$\frac{C0.9}{18.8}$	4.41
3.33	1.63	$\frac{C1.7}{20.0}$	$\frac{C1.5}{20.0}$	$\frac{C0.8}{18.8}$	$\frac{C1.0}{18.8}$	2.83
5.89	3.89	$\frac{C2.0}{20.6}$	$\frac{C1.9}{20.6}$	$\frac{C1.8}{20.5}$	$\frac{C1.8}{20.5}$	4.09
9.28	5.28	$\frac{C4.1}{23.7}$	$\frac{C4.0}{23.7}$	$\frac{C3.0}{22.2}$	$\frac{C3.2}{22.2}$	6.08
10.78	1.08	$\frac{C0.7}{18.5}$	$\frac{C0.5}{18.5}$	$\frac{F0.8}{16.5}$	$\frac{F0.7}{16.5}$	11.48
6.92	9.32	$\frac{F2.9}{14.6}$	$\frac{F2.8}{14.6}$	$\frac{F2.7}{14.4}$	$\frac{F2.5}{14.4}$	9.72
1.52	1.52	$\frac{F2.5}{16.4}$	$\frac{F3.7}{16.4}$			

		1282	99		
T.P.	8.34	1289	57	1.76	1281.23
190				8.10	81.47
191				3.73	85.81
B.M.	5.15	1293	80	0.92	1292.65
192				5.63	88.17
193				4.33	89.47
194				2.73	91.07
T.P.	9.75	1301	85	1.70	1292.10
195				8.58	93.27
196				6.08	95.77
197				5.13	96.72
198				5.59	96.26
199				5.05	96.80
T.P.	11.45	1306	93	6.37	1295.48
200				8.47	98.46
201				5.81	01.12

8.10			Ground	$\frac{C2.7}{19.4}$	$C3.3$	4.80	
				1.1 slope			
3.73	3.63			$\frac{F0.4}{17.1}$	$\frac{C0.4}{16.9}$	$C1.1$	2.63
5.63	5.23			$\frac{C0.1}{17.6}$	$\frac{0.0}{17.7}$	$C0.2$	5.23
4.33	4.43			$\frac{F0.3}{17.4}$	$\frac{F1.1}{16.1}$	$F1.1$	5.43
2.73	3.63			$\frac{F0.7}{16.6}$	$\frac{F1.7}{15.2}$	$F1.6$	4.33
8.58	9.18			$\frac{C0.1}{17.9}$	$\frac{F2.1}{14.6}$	$F2.2$	19.78
6.08	3.48			$\frac{C2.6}{21.5}$	$\frac{F1.4}{15.7}$	$F1.1$	7.18
5.13	3.13			$\frac{C1.8}{20.4}$	$\frac{F1.4}{15.7}$	$F1.2$	6.33
5.59	7.49			$\frac{F1.9}{14.6}$	$\frac{F1.9}{14.9}$	$F2.0$	7.59
5.05	5.25			$\frac{F0.9}{16.4}$	$\frac{F2.0}{14.7}$	$F1.8$	6.25
8.47	6.27			$\frac{C1.6}{17.9}$	$\frac{F2.0}{14.7}$	$F2.0$	10.47
5.81	5.41			$\frac{C2.4}{18.7}$	$\frac{F1.7}{15.2}$	$F1.3$	7.11

1.1 slope

1306 93

202 4.14 0279

B.M. 1.10 1306.89 1.10 1305.83

T.P. 5.56 1305.42 7.03 9986

203 7.70 97.72

T.P. 1.62 1293.99 13.05 1292.37

Temp B.M. 5 P.M. 6-13-21

B.M.

6-25-21

S.P. 4.62 1291.46 1286.84

204 ~~0.94~~ 91.52

205 4.15 87.31

206 1.74 89.72

T.P. 12.71 1303.63 0.54 1290.92

207 9.51 94.12

T.P. 10.23 1305.57 8.29 1295.34

+75 10.22 95.35

208 10.72 94.85

T.P. 1.89 1295.14 12.32 1293.25

209 5.97 89.17

B.M. 7.38 1287.76

T.P. 5.87 1288.41 12.60 1282.54

P.M. 6-20-21
Sat.

60

4.14 4.1 $\boxed{C2.5}$ $\frac{11}{11}$ $\frac{C2.3}{18.8}$ $\frac{0.0}{16.5}$ $\frac{11}{11}$ $\boxed{C0.4}$ 37.47.70 180 $\boxed{C5.9}$ $\frac{11}{11}$ $\frac{C5.5}{18.0}$ $\frac{C3.6}{20.1}$ $\boxed{C4.0}$ 370

S.W. Cor Lt. Parapet.

0.6 $\boxed{F1.1}$ $\frac{F1.4}{15.6}$ $\frac{F4.4}{17.8}$ $\boxed{F4.1}$ $\frac{9.0}{4.0}$
 $\frac{1.04}{1.0}$ 4.14.15 $\frac{F4.7}{28.0}$ $\frac{F5.0}{19.0}$ $\frac{F2.1}{14.6}$ $\boxed{F3.0}$ $\frac{4.15}{2.5}$
 $\frac{4.15}{4.7}$ 7.01.74 $\boxed{F2.5}$ $\frac{F3.2}{15.4}$ $\frac{F3.4}{15.8}$ $\boxed{F3.2}$ $\frac{1.74}{4.0}$
 $\frac{4.20}{2.5}$ 9.23.51 $\boxed{C6.7}$ $\frac{C6.5}{27.5}$ $\frac{C6.0}{26.7}$ $\boxed{C6.2}$ $\frac{9.51}{3.5}$
 $\frac{6.7}{6.7}$ 2.210.22 $\boxed{C6.7}$ $\frac{C6.6}{27.4}$ $\frac{C6.2}{27.0}$ $\boxed{C6.4}$ $\frac{10.22}{3.8}$
 $\frac{3.52}{6.7}$ 6.910.72 $\boxed{C4.7}$ $\frac{C4.4}{24.3}$ $\frac{C2.7}{21.8}$ $\boxed{C3.1}$ $\frac{10.72}{7.6}$
 $\frac{6.62}{4.7}$ 7.65.97 $\boxed{C3.4}$ $\frac{C3.3}{22.9}$ $\frac{F0.7}{16.7}$ $\boxed{F0.7}$ $\frac{5.97}{6.6}$
 $\frac{2.57}{3.4}$ 0.7

210			3.74	84.67
211			4.04	84.37
212			2.24	86.17
T.P.	8.76	1293	2 C	3.91 1189.50
212			7.09	86.17
213			5.29	87.97
214			5.07	88.19
215			11.37	81.89
T.P.	0.25	1280	99	12.52 1280.74
216			6.10	74.89
T.P.	1.91	1271.02		11.88 1269.11
217			2.75	68.27
B.M.			4.92	1266.10
218			8.63	62.37
T.P.	3.05	1261	67	12.40 1258.62
219			4.78	56.89
T.P.	1.10	1262	72	3.05 1258.62
219			5.83	56.89
T.P.	5.68	1255	32	13.08 1249.64

3.74	F0.1	F0.2 17.4	F2.0 14.7	F1.7 15.7	3.74 5.44 1.7
4.04	F0.5	F0.7 16.7	F1.8 15.0	F1.6	4.04 5.60 1.6
2.24			F2.3 14.3	F2.2	2.24 2.80 0.6
7.09	C1.6	C1.4 19.9			
5.29	C0.8 19.4	C0.6 18.4	F0.7 17.4	F0.1	5.29 5.37 0.1
5.07	C.1.1	C3.8 23.4	C2.1 20.9	C.2.5	5.07 5.15 0.1
11.37	C3.6	C3.3 22.7	C2.6 21.6	C2.7	11.37 8.67 2.7
6.10	F2.7	F3.6 16.2	C0.1 17.9	C0.5	6.10 5.60 0.5
2.75	F.F2.6	F3.2 15.4	F3.7 14.4	F3.6	2.75 2.35 0.4
8.63	C2.7	C2.0 20.7	C1.5 20.0	C.1.7	8.63 6.93 1.7
4.78			C.4.2 24.0	C.4.3	4.78 5.13 0.3
5.83	C5A	C5.2 25.5			5.83 5.4 0.4

1255 32

220

3.93 51.39

3.93
4.73
2.18

F0.8

F1.8
15.0

F2.7
14.4

F1.2

3.93
5.27
1.34

221

9.30 46.02

9.30
7.18
2.12

C2.2

C2.2
21.0

F0.5
17.0

F0.2

9.30
9.30
0.0

T.P. 1.85 145 09

222

12.08 143.24
3.64 41.45

3.64
1.14
2.5

C2.5

C2.3
21.2

C0.6
18.6

C0.9

3.64
2.74
0.9

223

7.01 38.08

7.01
6.51
0.5

C0.5

C0.4
18.7

F0.6
16.9

F0.4

7.01
3.41
0.9

224

9.58 35.51

9.58
10.68
1.1

F1.1

F1.2
15.0

F1.5
15.5

F1.3

9.58
10.88
1.3

225

12.02 33.07

12.02
12.52

F0.5

F0.4
17.1

F1.1
16.1

F1.0

12.02
13.02
1.0

B.M. 3.25

.12.34 1232.75

92.71

Grade Stakes

720-21

Sta	B.S.	H. I.	F.S.	Elev
B.M.	2.35	1338	27 ^{set 10'}	1335.92
117	9.0	-3	8.57	8.27
T.P.	2.21	1329	52	10.96
116	3.9			3.52
115	8.8	-0.2	48.06	7.86
114	13.5	-0.5	12.32	12.32
T.P.	0.52	1317	47	12.57
113	5.8	-0.5	5.17	4.67
112	19.2	-0.3	9.45	9.15
T.P.	0.40	1306	31	11.56
111	3.6			3.06
110	9.5	-0.2	8.79	8.79
T.P.	0.27	1294	18	12.40
109	3.8	-0.3	3.28	2.98
108	10.1	-0.2	9.58	9.38
T.P.	-0.02	1281	48	12.48
107	10	-0.4	3.48	3.08
106	9.3	-0.1	9.00	8.90
105	12.1	-0.3	11.58	11.28
T.P.	1.22	1271	11	11.59
104	3.9	-0.5	3.21	2.71
103	5.2	-0.5	4.72	4.22
102	5.9	-0.5	4.51	4.01
Temp B.M.	4.05	1271	23	4.05

63

1271 23

101	4.1	-0.4	3.65	3.25	67.98
100	0.7	-0.1	0.23	0.13	71.10
T.P.	9.43	1280	43	0.23	1271.00
99	5.8	-0.3	5.25	4.95	75.48
T.P.	10.47	1290	07	0.83	1279.60
98	9.0	-0.8	9.27	8.47	81.60
97	3.3	-1.3	2.77	1.47	88.50
T.P.	11.09	1300	48	0.68	1289.39
96	6.2	-0.9	5.78	4.88	95.60
T.P.	10.37	1310	33	0.52	1299.96
95	8.7	-0.5	8.23	7.73	02.60
94	2.2	-0.5	1.61	1.11	09.22
T.P.	6.59	1315	70	1.22	1309.11
B.M.				2.99	1313.21
93	2.8	-0.2	2.70	2.10	13.60
B.M.	4.11	1340	03		1335.92
118	2.0	-0.5	7.33	6.83	33.20
119	5.5	-0.6	5.03	4.43	35.60
120	3.8	-0.5	3.33	2.83	37.20
121	2.5	-0.4	2.03	1.63	38.40
122	1.4	-0.5	0.93	0.43	39.60
T.P.	4.11	1343	21	0.93	1339.10
123	4.2	-0.5	3.69	3.19	40.02
124	4.7	-0.5	4.05	3.55	39.66
125	5.0	-0.5	4.41	3.91	39.30

1343 21

126	48	-02	4.47	4.27	38.94
127	5.0	-01	4.56	4.16	38.75
128	5.0	-02	4.51	4.31	38.90
129	4.4	-01	3.72	3.82	39.39
130	3.7	-02	3.19	2.99	40.22
T.P.	7.32		1347 34	3.20	1340.01
131	7.1	-0.4	6.51	6.12	41.22
132	6.1	-0.4	5.51	5.12	42.22
133	4.8	-02	4.32	4.12	43.22
134	3.8	-0.1	3.74	3.26	44.02
135	4.1	-0.3	3.52	3.22	44.12
136	4.1	-0.7	3.72	3.32	44.32
T.P.	4.77		1348 08	4.03	1343.31
B.M.				4.77	1341.31
S.P.	4.56		1345 8.9		1341.33
137	2.7	-02	2.25	2.05	43.84
138	4.1	-0.4	3.67	3.27	42.62
139	5.8	-0.5	5.07	4.57	41.32
140	7.1	-0.5	6.79	6.35	39.54
141	10.0	-0.4	9.47	9.07	36.82
142	13.1	-1	12.04	12.50	33.39
T.P.	1.72		1334 60	13.01	1332.88
143	4.9			5.48	29.12
144	11.2	-02	11.13	10.98	23.62
T.P.	2.18		1324 41	12.37	1328.23
145	5.1	-0.5	4.64	4.14	20.7

220-21

1224 41

146	5.1	-0.5	4.69	4.19	20.22
147	4.8	-0.5	4.39	3.99	20.42
148	7.4	-0.5	7.09	6.59	17.82
149	11.3	-0.8	10.89	10.59	13.82
T.P.	2.88		1215 44	11.85	1212.56
150	5.7	-0.2	5.82	5.62	09.82
151	10.9	-0.5	10.12	9.62	05.82
T.P.	1.32		1204 12	12.64	1202.80
152	3.6	-0.7	3.05	2.30	01.82
153	7.4	-0.5	6.80	6.30	97.82
154	11.8	-0.7	11.00	10.30	93.82
T.P.	1.70		1293 35	12.47	1191.65
155	4.0	-0.5	3.72	3.22	90.13
156	5.6	-0.3	5.33	5.03	87.32
157	6.9	-0.1	6.45	6.38	86.97
P.C.	7.4	-0.8	7.11	6.81	86.54
P.L.	8.3	-0.5	7.54	7.04	86.31
P.F.	8.6	-0.6	7.84	7.34	86.11
T.P.	4.09		1489.46	7.98	1275.37
B.M.				2.56	1186.90
158	4.6	-0.6	3.84	3.24	86.22
P.T.	4.1	-0.6	3.95	3.35	86.11
160	4.6	-0.6	4.14	3.54	85.92
161	4.2	-0.6	4.44	3.84	85.62
162	4.7	-0.5	4.34	3.93	85.53
163	3.2	-0.3	3.04	2.74	86.72

1289.46

164	2.0	-0.2	1.54✓	1.34	88.12
165	2.2	-0.4	1.79✓	1.39	88.07
T.P.	1.38		1188	72	2.12 1187.34
B.M.				1.73	1186.99
166	2.7	-0.3	2.45✓	2.15	86.57
167	2.6	-0.2	3.45✓	3.25	85.47
168	3.7	-0.2	3.75✓	3.55	85.17
169	3.7	-0.2	3.65✓	3.45	85.27
170	4.5	-0.4	3.75	3.35	85.37
T.P.	4.89		1189	41	4.20 1184.52
171	5.1	-0.6	4.54✓	3.94	85.97
172	5.4	-0.7	4.54✓	3.84	85.57
173	4.6	-0.7	4.14✓	3.74	85.67
174	4.4	-0.6	4.24✓	3.64	85.77
175	4.6	-0.6	4.14	3.54	85.87
176	4.8	-0.6	4.04✓	3.44	85.97
177	4.8	-0.6	4.04✓	3.41	86.00
B.M.				4.0✓	85.35
B.M.	3.25		1288	61	1285.36
178	4.0	-0.5	3.54✓	3.04	85.57
179	4.4	-0.5	4.04✓	3.54	85.07
180	5.1	-0.5	4.54✓	4.04	84.57
181	5.3	-0.4	4.94✓	4.54	84.07
182	5.4	-0.3	5.34	5.04	83.57
T.P.	2.24		1285	55	5.30 1283.31
183	3.1	-0.3	2.79✓	2.48	83.07

1285.55

184	4.3	-0.4	3.79✓	3.39	82.16
185	5.0	-0.4	5.53✓	5.13	80.42
186	7.2	-0.3	7.99✓	7.69	77.80
187	10.3	-0.1	11.18✓	11.08	74.47
T.P.	3.93		1278	31	11.17 1274.39
188	5.7	-		5.34✓	72.97
189	3.2	-0.4	2.69✓	2.29	76.07
T.P.	12.61		1288	63	2.29 1276.02
190	8.2	-0.5	7.66✓	7.16	81.47
191	3.8	-0.5	3.29✓	2.79	85.84
B.M.				-0.05	125.58

8-10-21
Fair

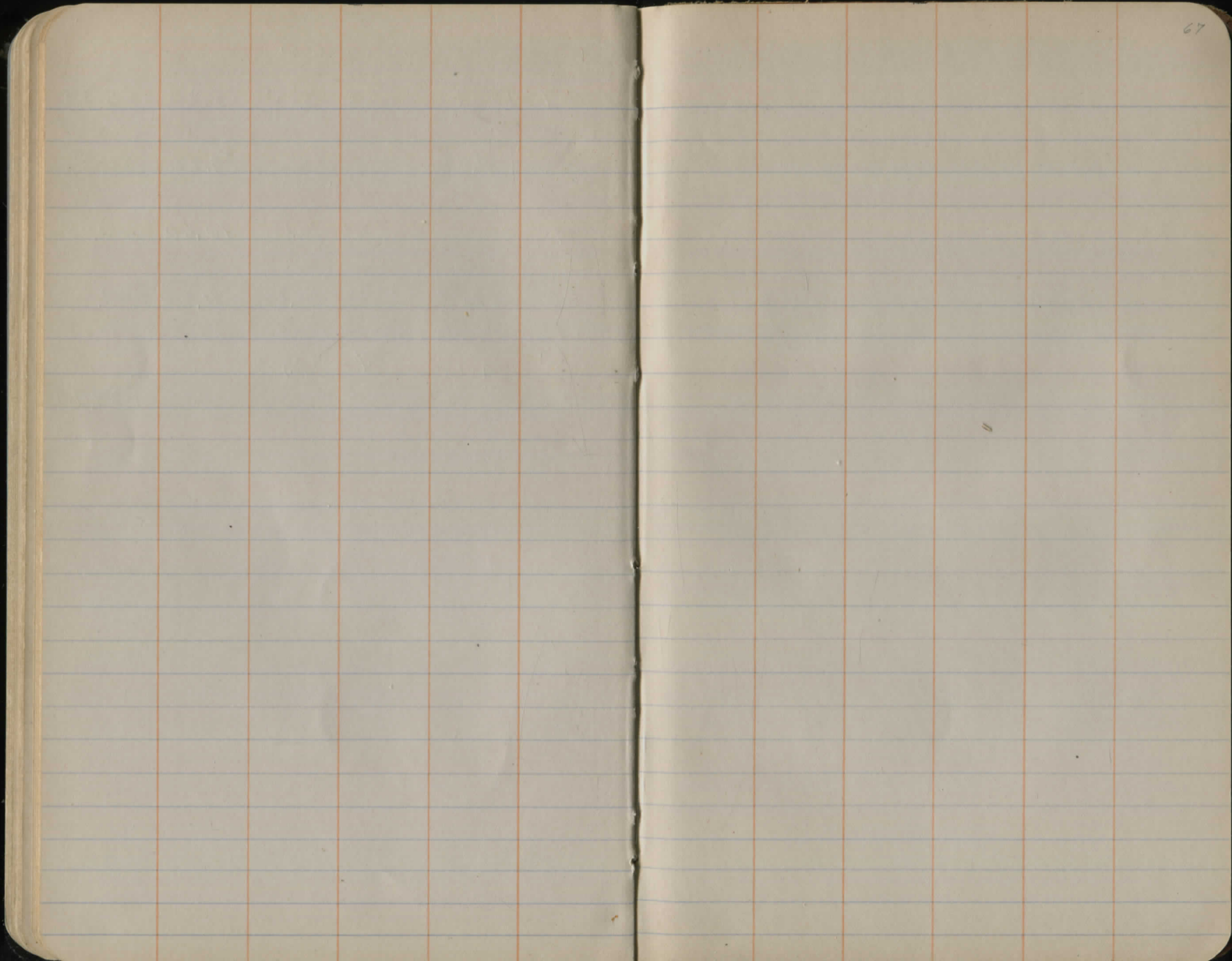
B.M.	5.50	1335	23		1329.73
74	7.5	-		✓ 7.08	28.15
75	5.7			✓ 5.63	29.60
76	6.7	-01	6.13✓	6.05	29.20
77	7.7	-0.3	6.73✓	6.43	28.80
78	8.0	-0.4	7.38✓	6.98	28.25
79	8.6	-0.4	8.23✓	7.83	27.40
80	9.9	-0.4	9.23✓	8.83	26.40

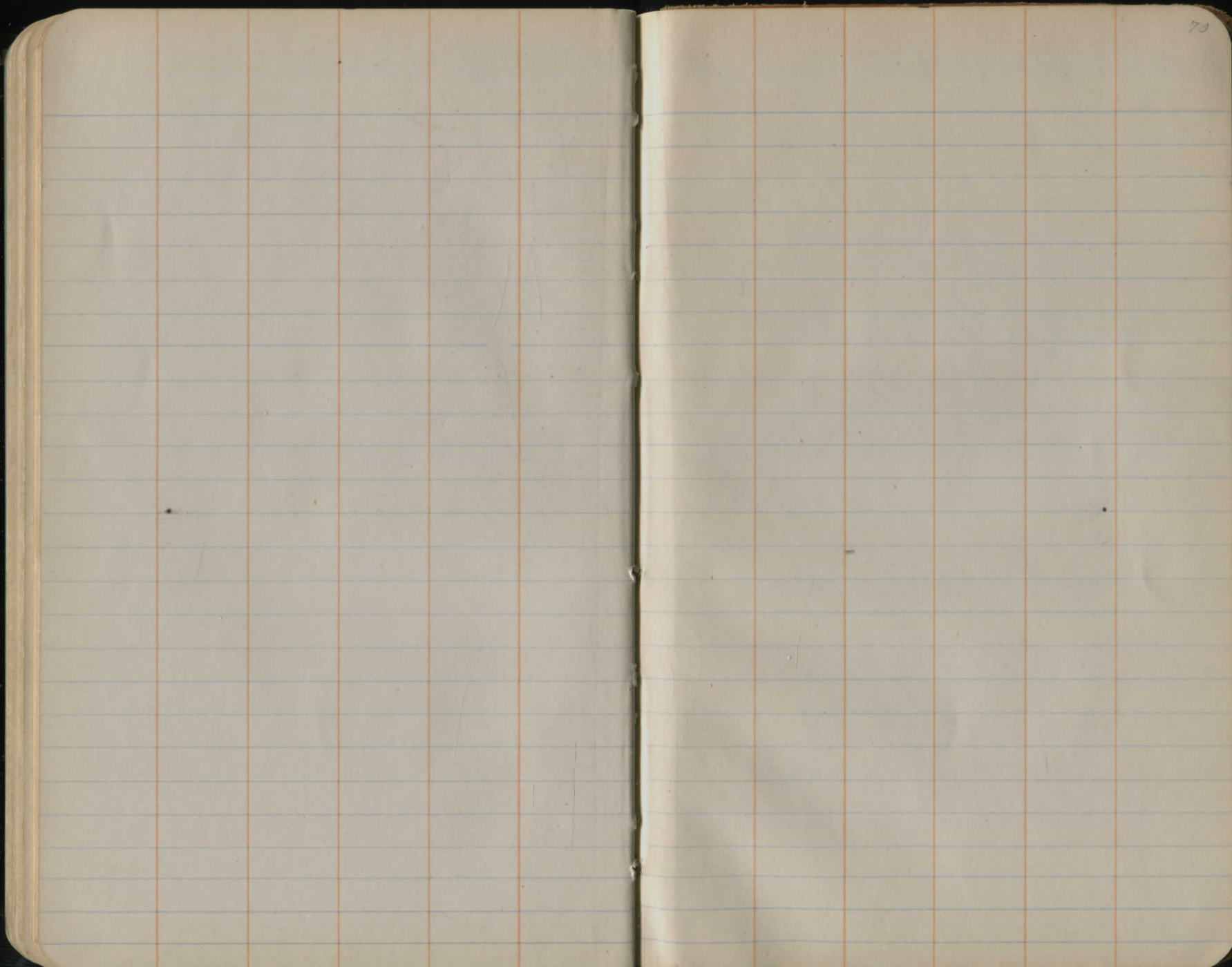
To Downings graded by Summers eye.

73	13.5	-0.4	12.63✓	12.23	23.00
T.P.	0.58	1323	18	12.63	1322.60
72	7.8	-0.2	7.38✓	7.18	16.00
T.P.	1.19	1312	20	12.17	1311.01
71	4.4	-0.5	3.70✓	3.20	09.00
70	11.5	-0.6	10.80✓	10.20	02.00
T.P.	0.91	1300	20	12.5	1299.69

13.00 60

69	5.9	-0.3	5.52✓	5.22	95.38
68	9.4	-		✓ 9.22	91.38
67	11.90	-0.3	10.90✓	10.60	90.00
66	13.00	-0.6	12.20	11.60	89.00
65	14.10	-0.7	13.30✓	12.60	88.00
T.P.			12.86	12.86	88.00 1287.74





105
5
925

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope 1 1/2 to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in

left column and top row. The number in heavy

of table in same row and column gives distance

level estimate the difference in elevation between the side stake and slope stake by this amount if cut, elevate it fill. Add this amount

to cut. Set up rod at this point. The height should cut target. If it does not make the right adjustment

necessarily.

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.

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope $1\frac{1}{2}$ to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in left column and top row. The number in body of table in same row and column gives distance from side stake to slope stake. If ground is not level estimate the difference in elevation between the side stake and slope stake, lower target by this amount if cut, elevate if fill. Add this amount to cut or fill and find distance in table. Set up rod at this point, and line of sight should cut target. If it does not make the slight adjustment necessary.

TABLE No. 9.

To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of corrections.

Degree of curve with a given I may be found by dividing tangent, (or external), opposite I by given tangent, (or external).

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

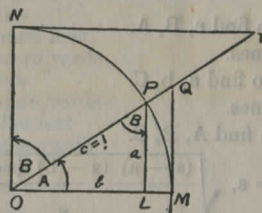


TABLE II
TRIGONOMETRIC FORMULÆ

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

$$R = OB = c = 1$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TABLE II—Continued
TRIGONOMETRIC FORMULAE (continued)

In any triangle:

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

Use Law of Lines.

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

Use Law of Lines.

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

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

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

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

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

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

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
$\frac{7}{8}$	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844
$\frac{15}{16}$	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896
$\frac{1}{1}$	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948
	.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 (Dist. in miles)²

Difference between arc and chord length, 0.05 feet in 11½ miles

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

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 FORMULAE.

Horizontal Distance = R - R sin² a + C cos a

Vertical Distance = R ½ sin 2 a + 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)

deg	sin 0'	tan 0'	sin 10'	tan 10'	sin 20'	tan 20'	sin 30'	tan 30'	sin 40'	tan 40'	sin 50'	tan 50'	deg
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
50	660	.1918	679	.1988	698	.2059	716	.2131	735	.2203	753	.2276	39
51	771	.2349	790	.2423	808	.2497	826	.2572	844	.2647	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3111	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.3597	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4106	175	.4193	35
55	192	.4281	208	.4370	225	.4460	241	.4550	258	.4641	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5204	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.5798	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.6426	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631	.7090	646	.7205	30
60	660	.7321	8675	.7437	8689	.7556	8704	.7675	8718	.7797	8732	.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	.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	3.2041	555	3.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	.5764	10
80	9848	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	922	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.0778	954	10.3855	957	10.7111	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	998	57.290	999	68.750	999	85.940	999	114.58	1.000	171.88	1.000	343.77	0
deg	60'	60'	50'	50'	40'	40'	30'	30'	20'	30'	10'	10'	deg
cos	cot	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
								86	56- 9.12
								87	57- 5.04
								88	58- 0.96
								89	58- 8.88
								90	59- 4.80
								91	60- 0.72
								92	60- 8.64
								93	61- 4.56
								94	62- 0.48
								95	62- 8.40
								96	63- 4.32
								97	64- 0.24
								98	64- 8.16
								99	65- 4.08
								100	66- 0.00
								101	66- 7.92
								102	67- 3.84

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10'	58.34	.297	5° C.	10'	560.11	27.313	5° C.	10'	1070.6	99.155	5° C.
20'	66.67	.388	T	20'	568.53	28.137	T	20'	1079.2	100.75	T
30'	75.01	.491	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	E	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° C.	10'	610.64	32.447	10° C.	10'	1122.4	108.90	10° C.
20'	116.68	1.188	T	20'	619.07	33.347	T	20'	1131.0	110.57	T
30'	125.02	1.364	T	30'	627.50	34.259	T	30'	1139.7	112.25	T
40'	133.36	1.552	.03	40'	635.93	35.183	.06	40'	1148.4	113.95	.10
50'	141.70	1.752	E	50'	644.37	36.120	E	50'	1157.0	115.66	E
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	T	20'	669.70	39.006	T	20'	1183.1	120.87	T
30'	175.06	2.674	.06	30'	678.15	39.993	.13	30'	1191.8	122.63	.19
40'	183.40	2.934	E	40'	686.60	40.992	E	40'	1200.5	124.41	E
50'	191.74	3.207	.003	50'	695.06	42.004	.011	50'	1209.2	126.20	.025
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	T	20'	720.44	45.116	T	20'	1235.3	131.65	T
30'	225.12	4.421	.03	30'	728.90	46.178	.06	30'	1244.0	133.50	.09
40'	233.47	4.755	E	40'	737.37	47.253	E	40'	1252.8	135.35	E
50'	241.81	5.100	E	50'	745.85	48.341	E	50'	1261.5	137.23	E
5°	250.16	5.459	15° C.	15°	754.32	49.441	15° C.	25°	1270.2	139.11	15° C.
10'	258.51	5.829	.09	10'	762.80	50.554	.19	10'	1279.0	141.01	.29
20'	266.86	6.211	E	20'	771.29	51.679	E	20'	1287.7	142.93	E
30'	275.21	6.606	.004	30'	779.77	52.818	.017	30'	1296.5	144.85	.038
40'	283.57	7.013	T	40'	788.26	53.969	T	40'	1305.3	146.79	T
50'	291.92	7.432	E	50'	796.75	55.132	E	50'	1314.0	148.75	E
6°	300.28	7.863	20° C.	16°	805.25	56.309	20° C.	26°	1322.8	150.71	20° C.
10'	308.64	8.307	T	10'	813.75	57.498	T	10'	1331.6	152.69	T
20'	316.99	8.762	T	20'	822.25	58.699	T	20'	1340.4	154.69	T
30'	325.35	9.230	.03	30'	830.76	59.914	.06	30'	1349.2	156.70	.09
40'	333.71	9.710	E	40'	839.27	61.141	E	40'	1358.0	158.72	E
50'	342.08	10.202	E	50'	847.78	62.381	E	50'	1366.8	160.76	E
7°	350.44	10.707	20° C.	17°	856.30	63.634	20° C.	27°	1375.6	162.81	20° C.
10'	358.81	11.224	T	10'	864.82	64.900	T	10'	1384.4	164.86	T
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	E	40'	890.41	68.774	E	40'	1410.9	171.15	E
50'	392.28	13.413	E	50'	898.95	70.091	E	50'	1419.7	173.27	E
8°	400.66	13.991	25° C.	18°	907.49	71.421	25° C.	28°	1428.6	175.41	25° C.
10'	409.03	14.582	T	10'	916.03	72.764	T	10'	1437.4	177.55	T
20'	417.41	15.184	T	20'	924.58	74.119	T	20'	1446.3	179.72	T
30'	425.79	15.799	.03	30'	933.13	75.488	.06	30'	1455.1	181.89	.09
40'	434.17	16.426	E	40'	941.69	76.869	E	40'	1464.0	184.08	E
50'	442.55	17.065	E	50'	950.25	78.264	E	50'	1472.9	186.29	E
9°	450.93	17.717	30° C.	19°	958.81	79.671	30° C.	29°	1481.8	188.51	30° C.
10'	459.32	18.381	T	10'	967.38	81.092	T	10'	1490.7	190.74	T
20'	467.71	19.058	T	20'	975.96	82.525	T	20'	1499.6	192.99	T
30'	476.10	19.746	.03	30'	984.53	83.972	.06	30'	1508.5	195.25	.09
40'	484.49	20.447	E	40'	993.12	85.431	E	40'	1517.4	197.53	E
50'	492.88	21.161	E	50'	1001.7	86.904	E	50'	1526.3	199.82	E
10°	501.28	21.887	30° C.	20°	1010.3	88.389	30° C.	30°	1535.3	202.12	30° C.
10'	509.68	22.624	T	10'	1018.9	89.888	T	10'	1544.2	204.44	T
20'	518.08	23.375	.19	20'	1027.5	91.399	.39	20'	1553.1	206.77	.59
30'	526.48	24.138	E	30'	1036.1	92.924	E	30'	1562.1	209.12	E
40'	534.89	24.913	E	40'	1044.7	94.462	E	40'	1571.0	211.48	E
50'	543.29	25.700	.008	50'	1053.3	96.013	.034	50'	1580.0	213.86	.078

T = R tan ½ I

E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10'	1598.0	218.7	5° C.	10'	2151.7	390.7	5° C.	10'	2743.1	622.8	5° C.
20'	1606.9	221.1	T	20'	2161.2	394.1	T	20'	2753.4	627.2	T
30'	1615.9	223.5	T	30'	2170.8	397.4	T	30'	2763.7	631.7	T
40'	1624.9	226.0	.13	40'	2180.3	400.8	.17	40'	2773.9	636.2	.21
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°	2794.5	645.2	.056
10'	1652.0	233.4	10° C.	10'	2209.0	411.1	10° C.	10'	2804.9	649.7	10° C.
20'	1661.0	235.9	T	20'	2218.6	414.5	T	20'	2815.2	654.3	T
30'	1670.0	238.4	.03	30'	2228.1	418.0	.03	30'	2825.6	658.8	.03
40'	1679.1	241.0	E	40'	2237.7	421.4	E	40'	2835.9	663.4	E
50'	1688.1	243.5	E	50'	2247.3	425.0	E	50'	2846.3	668.0	E
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	E	40'	2295.6	442.8	E	40'	2898.4	691.4	E
50'	1742.6	259.1	.046	50'	2305.2	446.4	.075	50'	2908.9	696.1	.112
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	.03	20'	2334.3	457.3	.03	20'	2940.4	710.5	.03
30'	1779.1	269.9	E	30'	2344.1	461.0	E	30'	2951.0	715.3	E
40'	1788.2	272.6	E	40'	2353.8	464.6	E	40'	2961.5	720.1	E
50'	1797.4	275.3	E	50'	2363.5	468.4	E	50'	2972.1	725.0	E
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	.40	10'	2383.1	475.8	.51	10'	2993.3	734.8	.63
20'	1824.9	283.6	E	20'	2392.8	479.6	E	20'	3003.9	739.7	E
30'	1834.1	286.4	.070	30'	2402.6	483.4	.116	30'	3014.5	744.6	.168
40'	1843.3	289.2	T	40'	2412.4	487.2	T	40'	3025.2	749.6	T
50'	1852.5	292.0	T	50'	2422.3	491.0	T	50'	3035.8	754.6	T
36°	1861.7	294.9	20° C.	46°	2432.1	494.8	20° C.	56°	3046.5	759.6	20° C.
10'	1870.9	297.7	T	10'	2441.9	498.7	T	10'	3057.2	764.6	T
20'	1880.1	300.6	.03	20'	2451.8	502.5	.03	20'	3067.9	769.7	.03
30'	1889.4	303.5	E	30'	2461.7	506.4	E	30'	3078.7	774.7	E
40'	1898.6	306.4	E	40'	2471.5	510.3	E	40'	3089.4	779.8	E
50'	1907.9	309.3	E	50'	2481.4	514.3	E	50'	3100.2	784.9	E
37°	1917.1	312.2	25° C.	47°	2491.3	518.2	25° C.	57°	3110.9	790.1	25° C.
10'	1926.4	315.2	.093	10'	2501.2	522.2	.151	10'	3121.7	795.2	.225
20'	1935.7	318.1	T	20'	2511.2	526.1	T	20'	3132.6	800.4	T
30'	1945.0	321.1	T	30'	2521.1	530.1	T	30'	3143.4	805.6	T
40'	1954.3	324.1	.03	40'	2531.1	534.2	.03	40'	3154.2	810.9	.03
50'	1963.6	327.1	E	50'	2541.0	538.2	E	50'	3165.1	816.1	E
38°	1972.9	330.2	30° C.	48°	2551.0	542.2	30° C.	58°	3176.0	821.4	30° C.
10'	1982.2	333.2	T	10'	2561.0	546.3	T	10'	3186.9	826.7	T
20'	1991.5	336.3	.03	20'	2571.0	550.4	.03	20'	3197.8	832.0	.03
30'	2000.9	339.3	E	30'	2581.0	554.5	E	30'	3208.8	837.3	E
40'	2010.2	3									

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	1.02	50'	4544.0	1583.1	1.22	50'	5421.4	2158.4	1.45
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	25° C.	78°	4639.8	1643.0	25° C.	88°	5533.1	2235.5	25° C.
10'	3876.8	1188.4	T	10'	4653.6	1651.7	T	10'	5549.2	2246.7	T
20'	3889.0	1195.2	.128	20'	4667.4	1660.5	.153	20'	5565.4	2258.0	.183
30'	3901.2	1202.0	E	30'	4681.3	1669.2	E	30'	5581.6	2269.3	E
40'	3913.4	1208.9	.403	40'	4695.2	1678.1	.558	40'	5597.8	2280.6	.756
50'	3925.6	1215.8		50'	4709.2	1686.9		50'	5614.2	2292.0	
69°	3937.9	1222.7		79°	4723.2	1695.8		89°	5630.5	2303.5	
10'	3950.2	1229.7		10'	4737.2	1704.7		10'	5646.9	2315.0	
20'	3962.5	1236.7		20'	4751.2	1713.7		20'	5663.4	2326.6	
30'	3974.8	1243.7		30'	4765.3	1722.7		30'	5679.9	2338.2	
40'	3987.2	1250.8		40'	4779.4	1731.7		40'	5696.4	2349.8	
50'	3999.5	1257.9		50'	4793.6	1740.8		50'	5713.0	2361.5	
70°	4011.9	1265.0	30° C.	80°	4807.7	1749.9	30° C.	90°	5729.7	2373.3	30° C.
10'	4024.4	1272.1	T	10'	4822.0	1759.0	T	10'	5746.3	2385.1	T
20'	4036.8	1279.3	1.54	20'	4836.2	1768.2	1.84	20'	5763.1	2397.0	2.20
30'	4049.3	1286.5	E	30'	4850.5	1777.4	E	30'	5779.9	2408.9	E
40'	4061.8	1293.6	.485	40'	4864.8	1786.7	.671	40'	5796.7	2420.9	.910
50'	4074.4	1300.9		50'	4879.2	1796.0		50'	5813.6	2432.9	

T = R tan ½ I

E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9	+	101°	6950.6	3278.1	+	111°	8336.7	4386.1	+
10'	5847.5	2457.1		10'	6971.3	3294.1		10'	8362.7	4407.6	
20'	5864.6	2469.3	5° C.	20'	6992.0	3310.1	5° C.	20'	8388.9	4429.2	5° C.
30'	5881.7	2481.5	T	30'	7012.7	3326.1	T	30'	8415.1	4450.9	T
40'	5898.8	2493.8	.43	40'	7033.6	3342.3	.51	40'	8441.5	4472.7	.62
50'	5916.0	2506.1	E	50'	7054.5	3358.5	E	50'	8468.0	4494.6	E
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
10'	5950.5	2531.0		10'	7096.6	3391.2		10'	8521.3	4538.8	
20'	5967.9	2543.5		20'	7117.8	3407.7		20'	8548.1	4561.1	
30'	5985.3	2556.0		30'	7139.0	3424.3		30'	8575.0	4583.4	
40'	6002.7	2568.6		40'	7160.3	3440.9		40'	8602.1	4606.0	
50'	6020.2	2581.3		50'	7181.7	3457.6		50'	8629.3	4628.6	
93°	6037.8	2594.0	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.
10'	6055.4	2606.8	T	10'	7224.7	3491.3	T	10'	8684.0	4674.2	T
20'	6073.1	2619.7	.86	20'	7246.3	3508.2	.103	20'	8711.5	4697.2	1.25
30'	6090.8	2632.6	E	30'	7268.0	3525.2	F	30'	8739.2	4720.3	E
40'	6108.6	2645.5	.401	40'	7289.8	3542.4	.536	40'	8767.0	4743.6	.721
50'	6126.4	2658.5		50'	7311.7	3559.6		50'	8794.9	4766.9	
94°	6144.3	2671.6		104°	7333.6	3576.8		114°	8822.9	4790.4	
10'	6162.2	2684.7		10'	7355.6	3594.2		10'	8851.0	4814.1	
20'	6180.2	2697.9		20'	7377.8	3611.7		20'	8879.3	4837.8	
30'	6198.3	2711.2		30'	7399.9	3629.2		30'	8907.7	4861.7	
40'	6216.4	2724.5		40'	7422.2	3646.8		40'	8936.3	4885.7	
50'	6234.6	2737.9	15° C.	50'	7444.6	3664.5	15° C.	50'	8965.0	4909.9	15° C.
95°	6252.8	2751.3	T	105°	7467.0	3682.3	T	115°	8993.8	4934.1	T
10'	6271.1	2764.8	1.30	10'	7489.6	3700.2	1.56	10'	9022.7	4958.6	1.93
20'	6289.4	2778.3	E	20'	7512.2	3718.2	E	20'	9051.7	4983.1	E
30'	6307.9	2792.0	.604	30'	7534.9	3736.2	.806	30'	9080.9	5007.8	1.09
40'	6326.3	2805.6		40'	7557.7	3754.4		40'	9110.3	5032.6	
50'	6344.8	2819.4		50'	7580.5	3772.6		50'	9139.8	5057.6	
96°	6363.4	2833.2		106°	7603.5	3791.0		116°	9169.4	5082.7	
10'	6382.1	2847.0		10'	7626.6	3809.4		10'	9199.1	5107.9	
20'	6400.8	2861.0		20'	7649.7	3827.9		20'	9229.0	5133.3	
30'	6419.5	2875.0	20° C.	30'	7672.9	3846.5	20° C.	30'	9259.0	5158.8	20° C.
40'	6438.3	2889.0	T	40'	7696.3	3865.2	T	40'	9289.2	5184.5	T
50'	6457.3	2903.1	1.74	50'	7719.7	3884.0	2.08	50'	9319.5	5210.3	2.52
97°	6476.2	2917.3	E	107°	7742.2	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	.18	30'	7959.0	4077.2	.261	30'	9630.7	5476.5	3.16
40'	6669.2	3062.8	E	40'	7983.5	4097.1	E	40'	9662.6	5504.0	E
50'	6688.8	3077.7	1.02	50'	8008.0	4117.0	1.36	50'	9694.7	5531.7	1.83
99°	6708.6	3092.7									

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.

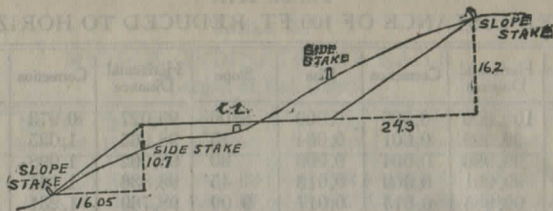
TABLE XII.
INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

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	0.026	30	98.629	1.371	0.165
45	99.953	0.047	0.031	45	98.556	1.444	0.169
2 00	99.939	0.061	0.035	10 00	98.481	1.519	0.174
15	99.923	0.077	0.039	15	98.404	1.596	0.178
30	99.905	0.095	0.044	30	98.325	1.675	0.182
45	99.885	0.115	0.048	45	98.245	1.755	0.187
3 00	99.863	0.137	0.052	11 00	98.163	1.837	0.191
15	99.839	0.161	0.057	15	98.079	1.921	0.195
30	99.813	0.187	0.061	30	97.992	2.008	0.199
45	99.786	0.214	0.065	45	97.905	2.095	0.204
4 00	99.756	0.244	0.070	12 00	97.815	2.185	0.208
15	99.725	0.275	0.074	15	97.723	2.277	0.212
30	99.692	0.308	0.078	30	97.630	2.370	0.216
45	99.657	0.343	0.083	45	97.534	2.466	0.221
5 00	99.619	0.381	0.087	13 00	97.437	2.563	0.225
15	99.580	0.420	0.092	15	97.338	2.662	0.229
30	99.540	0.460	0.096	30	97.237	2.763	0.233
45	99.497	0.503	0.100	45	97.134	2.866	0.238
6 00	99.452	0.548	0.105	14 00	97.030	2.970	0.242
15	99.406	0.594	0.109	15	96.923	3.077	0.246
30	99.357	0.643	0.113	30	96.815	3.185	0.250
45	99.307	0.693	0.118	45	96.705	3.295	0.255
7 00	99.255	0.745	0.122	15 00	96.593	3.407	0.259
15	99.200	0.800	0.126	15	96.479	3.521	0.263
30	99.144	0.856	0.131	30	96.363	3.637	0.267
45	99.087	0.913	0.135	45	96.246	3.754	0.271

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

TABLE XIII.
MINUTES IN DECIMALS OF A DEGREE.

0 30"	.00833	10' 30"	.17500	20' 30"	.34167	30' 10"	.50833	40' 30"	.67500	50' 10"	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	13 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE $1\frac{1}{2}$ 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

Computed by L. Leland Locke.

B.M. 1232.77

21.4
10.7
11.7

6.9
2.5
10.4

21.9
11.1
10.9

20.7
16

18.7
14.1
4.7

12

66.0

17.7

14 18.0

2.48
11.59
8.2

4.5

20.9
14.0
6.9

5.5
3.4
2.1

5.5
2.6
2.9

1.7
3.8
5.5

21

14

4.00
11.75
2.75

21.9

