

Book 5-A, Dr. 12

Dr 12-BK.5A

FIELD BOOK

360 A

29-W1
29-W2

29-W2

29-W1

KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND

SURVEYING INSTRUMENTS.

NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.

FOR SINGLE TRACK EXCAVATION.

"Copyright, 1895, by Keuffel & Esser Co."

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

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

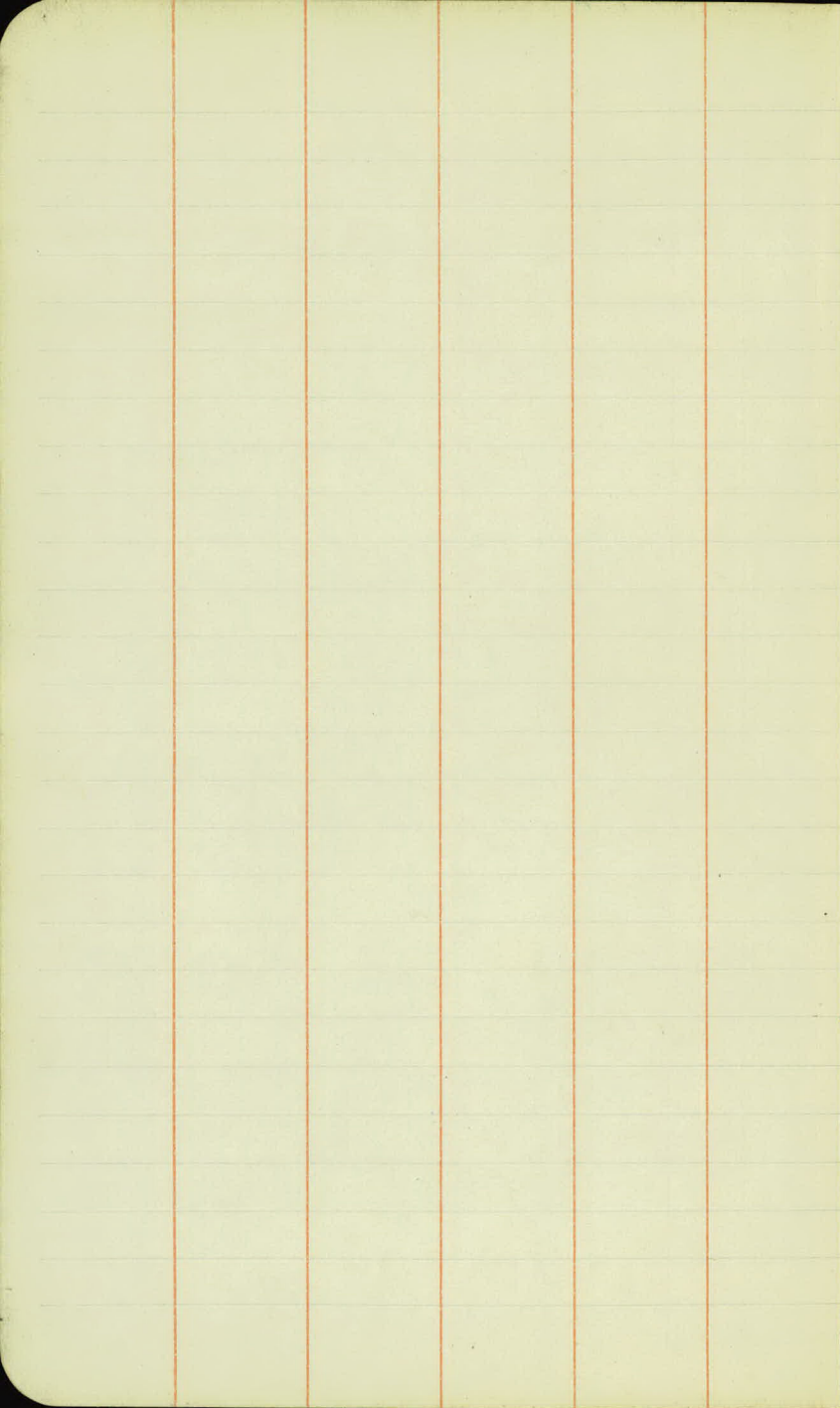
For Keith's Railroad Curve Tables see end of book.

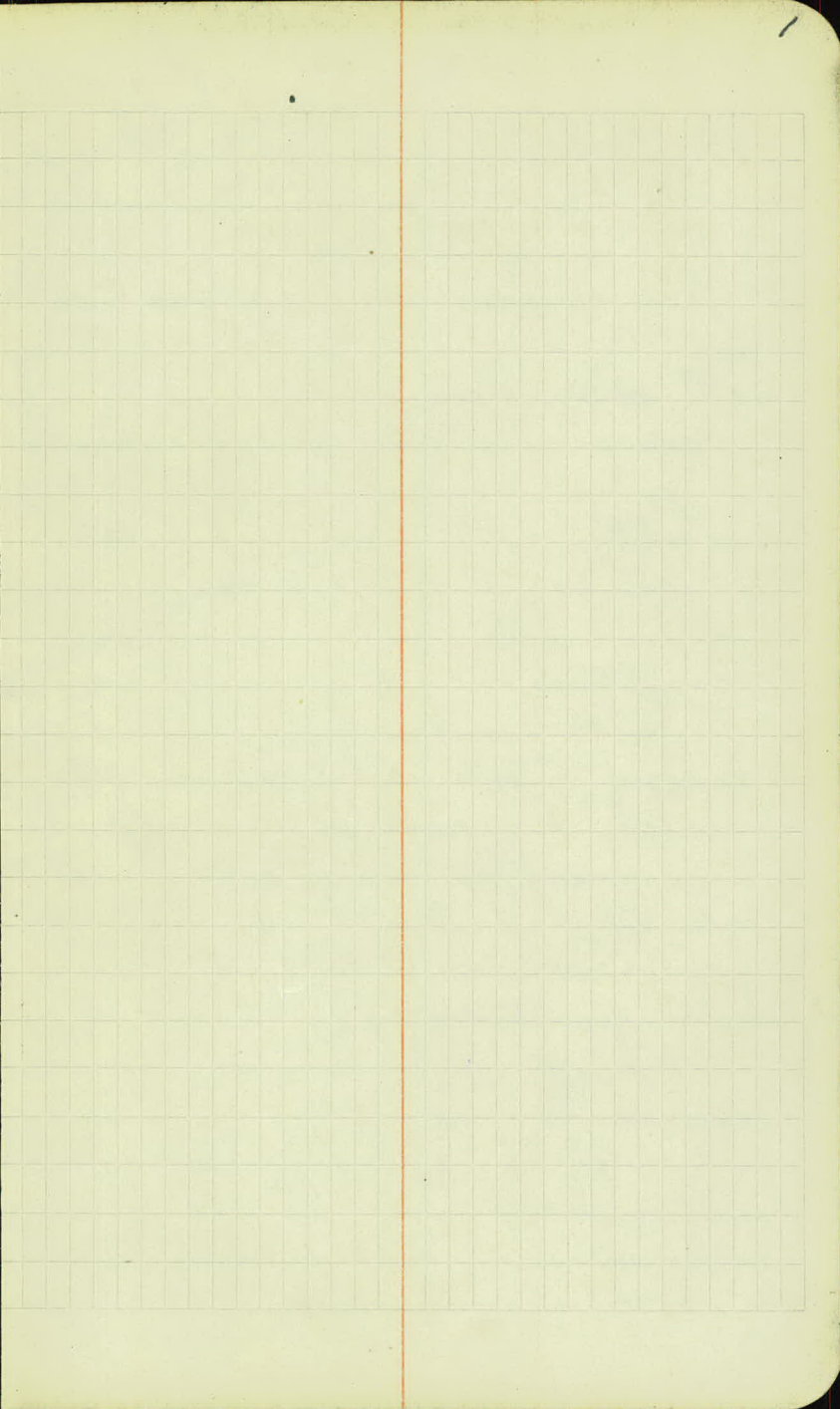
PROJ #29-W1 Co. ROAD "C"

STA TO	STA.	DESCRIPTION.	PAGE TO	PAGE
0+00	64+68	ALIGNMENT.	2	3
0+00	64+68	ORIGINAL X SECTIONS	5	10

PROJ #29-W2 SOUTH ST.

0+00	40+13	ALIGNMENT.	40	41
0+00	40+13	ORIGINAL X SECTIONS	42	49





STA.	POINT.	Δ LT	Δ PT
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33+72 ⁷⁴	POT		
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26+35 ⁸	P I	0°-26	
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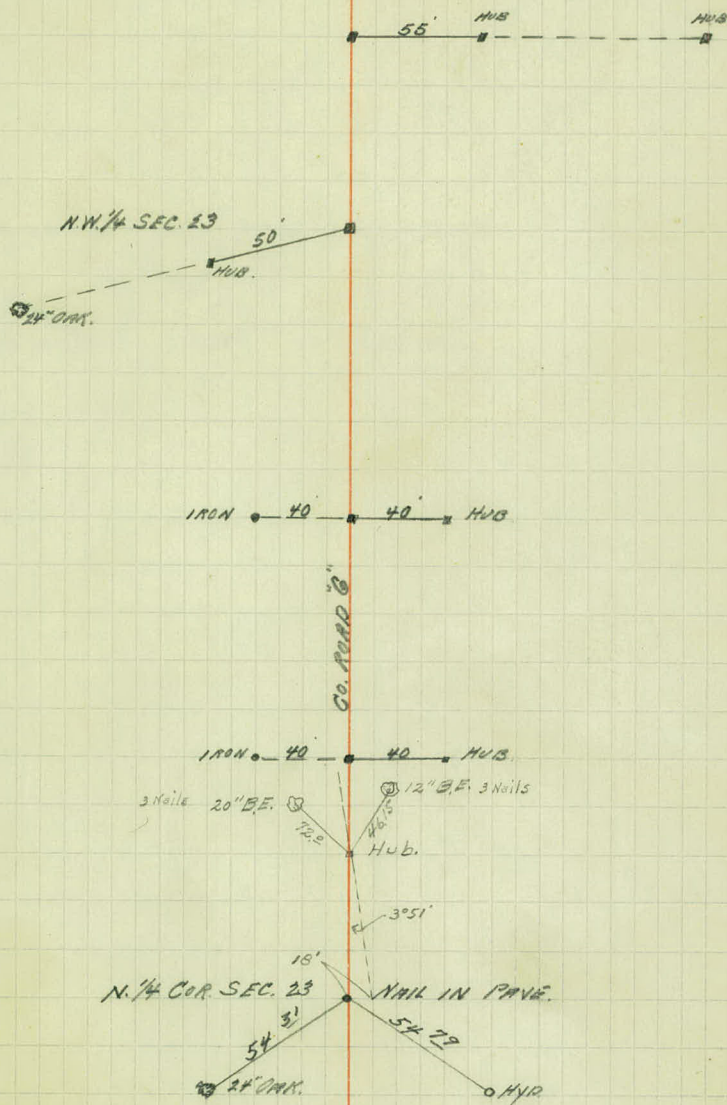
20+72 ⁵⁸	P.O.T.		
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17+62 ⁸⁴	P.O.T.		
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2+662	Δ PT.		3°51'
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0+00

3-25-30



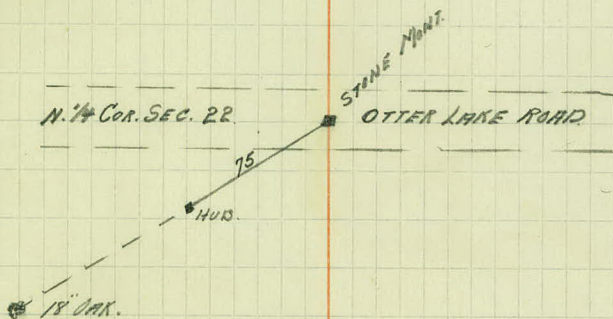
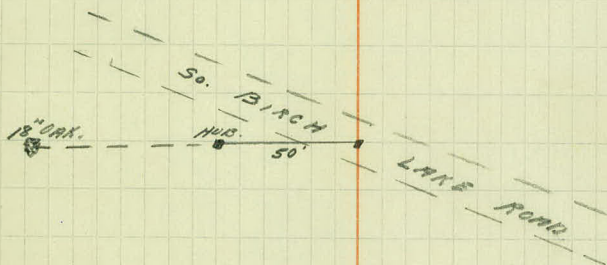
STA POINT Δ LT Δ RT

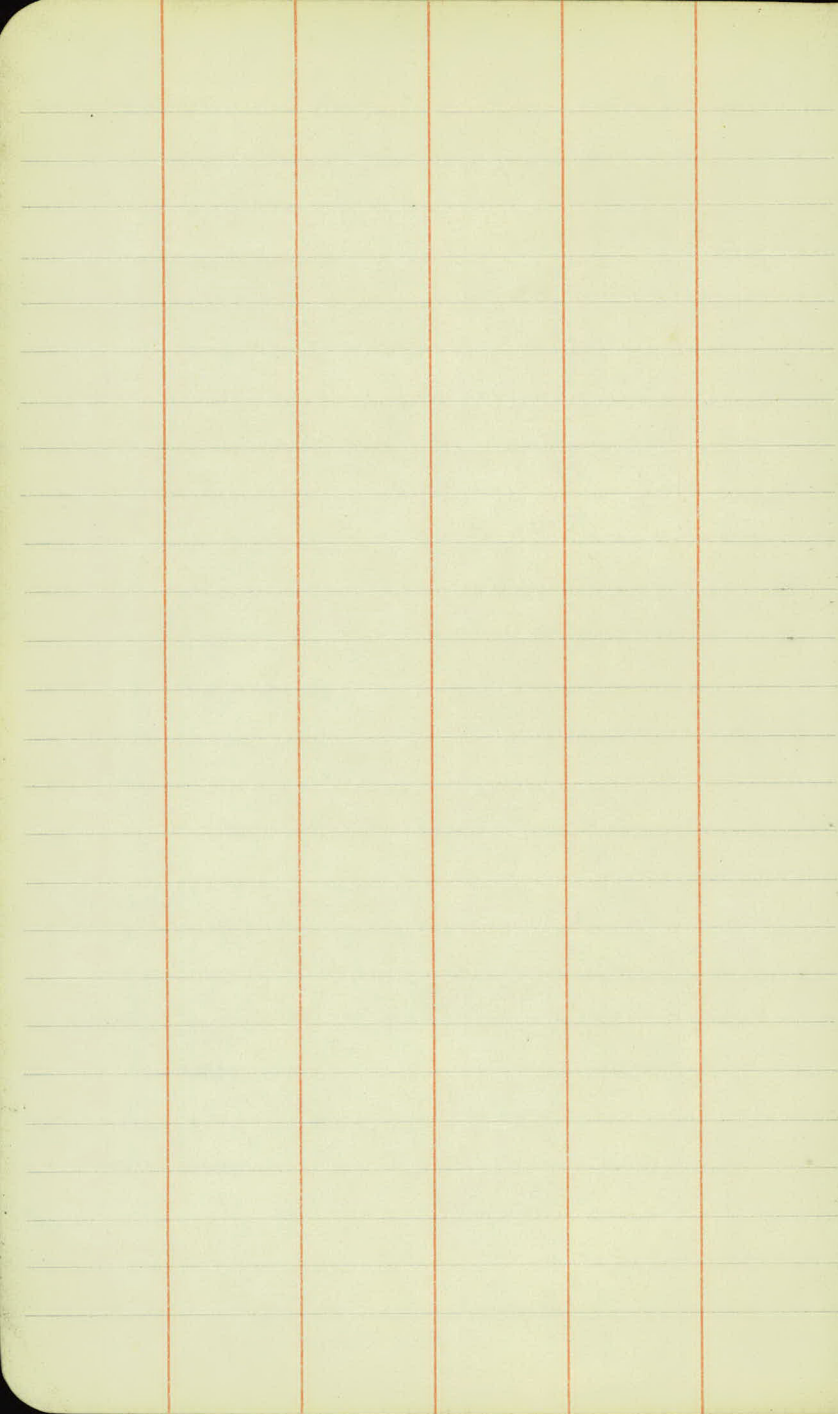
64+68¹² P.O.T.

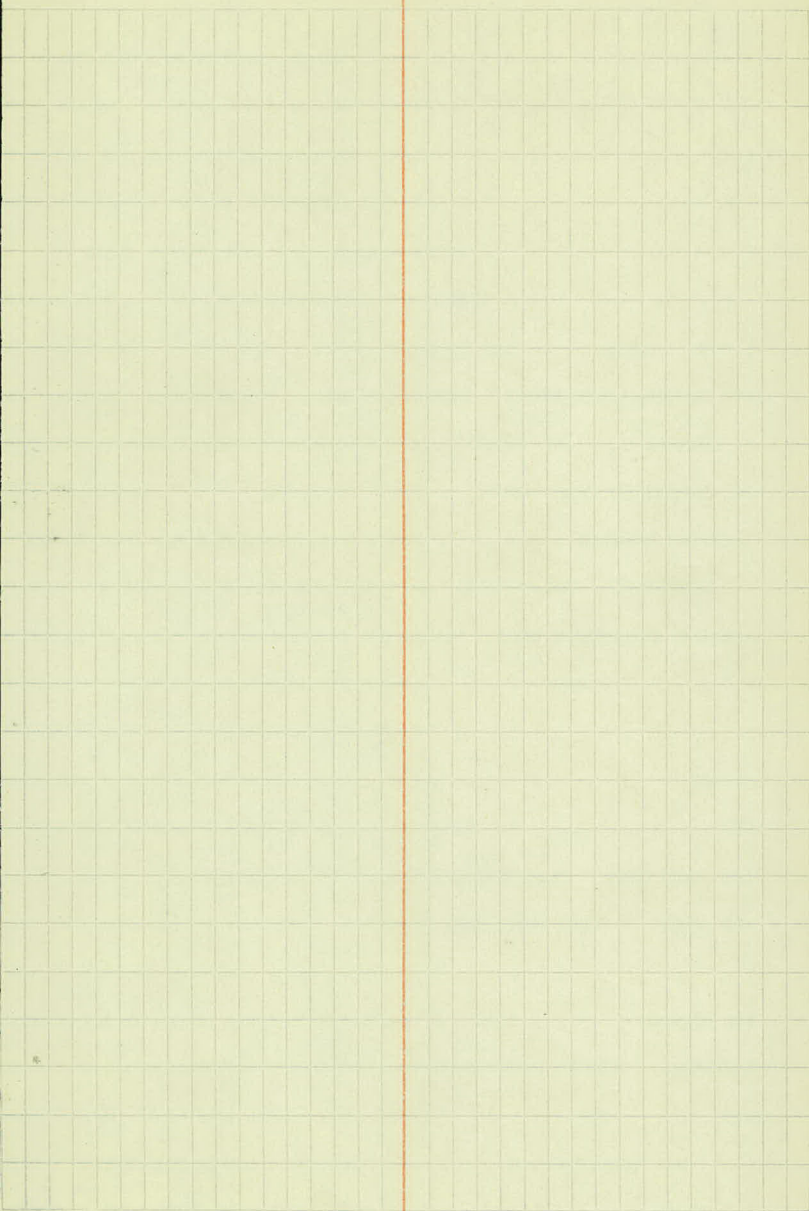
52+52²⁴ P.I.

0°-23'

3-25-30







Sta + H.I. - Grade G.R.

B.M. 2.35 942.69 940.34

3 36.6 - 6.1

+50 36.8 - 5.9

4 36.7 - 6.0

+50 36.2 - 6.5

5 35.6 - 7.1

6 34.4 - 8.3

TP 1.39 936.09 7.99 934.70

7 33.3 - 8.8

8 32.5 - 9.6

4+

4

Copy 5
Rt. Notes taken
by Weber M.M.W.

$$\begin{array}{cccccccccccccccc} \frac{9}{3} \frac{41}{140} & \frac{10}{180} \frac{41}{124} & \frac{42}{140} & \frac{41}{130} & \frac{47}{115} & \frac{50}{110} & \frac{47}{118} & \frac{48}{118} & \frac{52}{122} & \frac{46}{134} & \frac{47}{140} & \frac{48}{140} & \frac{49}{143} & \frac{50}{123} \end{array}$$

$$\begin{array}{cccccccccccccccc} \frac{9}{3} \frac{41}{140} & \frac{10}{180} \frac{41}{124} & \frac{42}{140} & \frac{41}{130} & \frac{47}{115} & \frac{41}{113} & \frac{42}{118} & \frac{44}{118} & \frac{47}{128} & \frac{39}{134} & \frac{37}{140} & \frac{41}{119} & \frac{42}{125} & \frac{43}{114} \end{array}$$

$$\begin{array}{cccccccccccccccc} \frac{36}{338} & \frac{49}{180} & \frac{34}{140} & \frac{38}{130} & \frac{49}{124} & \frac{49}{112} & \frac{47}{113} & \frac{50}{123} & \frac{52}{127} & \frac{46}{124} & \frac{51}{127} & \frac{47}{140} & \frac{52}{118} & \frac{49}{112} \end{array}$$

$$\begin{array}{cccccccccccccccc} \frac{60}{30} & \frac{60}{18} & \frac{49}{140} & \frac{53}{133} & \frac{60}{128} & \frac{61}{117} & \frac{57}{109} & \frac{61}{124} & \frac{62}{129} & \frac{69}{133} & \frac{60}{140} & \frac{62}{118} & \frac{65}{119} \end{array}$$

$$\begin{array}{cccccccccccccccc} \frac{72}{292} & \frac{71}{180} & \frac{66}{140} & \frac{73}{128} & \frac{72}{119} & \frac{63}{115} & \frac{67}{117} & \frac{70}{124} & \frac{73}{131} & \frac{73}{140} & \frac{70}{180} & \frac{73}{294} \end{array}$$

$$\begin{array}{cccccccccccccccc} \frac{79}{298} & \frac{82}{180} & \frac{74}{140} & \frac{77}{133} & \frac{83}{125} & \frac{82}{118} & \frac{84}{119} & \frac{84}{119} & \frac{84}{129} & \frac{78}{133} & \frac{77}{140} & \frac{85}{180} & \frac{84}{292} \end{array}$$

$$\begin{array}{cccccccccccccccc} \frac{33}{301} & \frac{35}{180} & \frac{24}{140} & \frac{31}{132} & \frac{37}{126} & \frac{35}{118} & \frac{33}{118} & \frac{36}{118} & \frac{44}{131} & \frac{39}{134} & \frac{38}{144} & \frac{38}{180} & \frac{42}{118} \end{array}$$

$$\begin{array}{cccccccccccccccc} \frac{44}{306} & \frac{47}{180} & \frac{42}{140} & \frac{43}{132} & \frac{50}{125} & \frac{47}{118} & \frac{47}{118} & \frac{49}{118} & \frac{55}{129} & \frac{52}{135} & \frac{51}{140} & \frac{54}{180} & \frac{54}{326} \end{array}$$

Sta	+	H.I. ✓	-	Grade	G.R.
		936.09			
9				31.8 -	4.3
10				31.4 -	4.7
11				31.1 ✓	5.0
	T.R.	3.53	935.37	4.25	931.84
12				30.9 -	4.5
13				30.7 -	4.7
14				30.5 ✓	4.9
		3.34	934.70	4.01	931.36
15				30.3 -	4.4
16			27.2	30.1 -	4.6
17			27.3	29.9 ✓	4.8
		3.20	934.28	3.62	931.08
18			29.4	29.7 -	4.6
19			27.5	29.6 -	4.7
20			27.6	29.6 -	4.7

Lt.

E

Rt.

6

$$\begin{array}{r} \times \\ 5.0 \end{array} \begin{array}{r} \times \\ 5.9 \end{array} \begin{array}{r} 5.7 \\ 140 \end{array} \begin{array}{r} 5.4 \\ 133 \end{array} \begin{array}{r} 6.6 \\ 128 \end{array} \begin{array}{r} 6.9 \\ 123 \end{array} \begin{array}{r} 5.3 \\ 111 \end{array} \begin{array}{r} 4.2 \\ 102 \end{array} \begin{array}{r} 4.9 \\ 119 \end{array} \begin{array}{r} 6.9 \\ 115 \end{array} \begin{array}{r} 6.6 \\ 131 \end{array} \begin{array}{r} 6.4 \\ 140 \end{array} \begin{array}{r} \times \\ 6.1 \\ 18 \end{array} \begin{array}{r} \times \\ 6.4 \\ 33.2 \end{array}$$

$$\begin{array}{r} \times \\ 5.7 \end{array} \begin{array}{r} \times \\ 5.5 \end{array} \begin{array}{r} 5.5 \\ 140 \end{array} \begin{array}{r} 5.5 \\ 132 \end{array} \begin{array}{r} 6.4 \\ 127 \end{array} \begin{array}{r} 5.4 \\ 122 \end{array} \begin{array}{r} 5.0 \\ 114 \end{array} \begin{array}{r} 4.9 \\ 121 \end{array} \begin{array}{r} 6.2 \\ 129 \end{array} \begin{array}{r} 6.4 \\ 140 \end{array} \begin{array}{r} \times \\ 5.6 \\ 18.0 \end{array} \begin{array}{r} \times \\ 6.2 \\ 31.0 \end{array}$$

$$\begin{array}{r} \times \\ 3.9 \end{array} \begin{array}{r} \times \\ 3.9 \end{array} \begin{array}{r} 3.4 \\ 140 \end{array} \begin{array}{r} 4.0 \\ 118 \end{array} \begin{array}{r} 4.6 \\ 114 \end{array} \begin{array}{r} 4.3 \\ 114 \end{array} \begin{array}{r} 4.6 \\ 119 \end{array} \begin{array}{r} 5.6 \\ 125 \end{array} \begin{array}{r} 6.2 \\ 133 \end{array} \begin{array}{r} 4.6 \\ 140 \end{array} \begin{array}{r} 4.9 \\ 150 \end{array} \begin{array}{r} \times \\ 5.4 \\ 18.0 \end{array} \begin{array}{r} \times \\ 5.3 \\ 29.6 \end{array}$$

$$\begin{array}{r} \times \\ 4.4 \end{array} \begin{array}{r} 4.2 \\ 140 \end{array} \begin{array}{r} 4.2 \\ 118 \end{array} \begin{array}{r} 4.4 \\ 116 \end{array} \begin{array}{r} 5.7 \\ 121 \end{array} \begin{array}{r} 7.0 \\ 122 \end{array} \begin{array}{r} 6.0 \\ 123 \end{array} \begin{array}{r} 5.3 \\ 130 \end{array} \begin{array}{r} 4.6 \\ 140 \end{array} \begin{array}{r} 5.4 \\ 140 \end{array} \begin{array}{r} \times \\ 5.3 \\ 19.6 \end{array}$$

$$\begin{array}{r} \times \\ 6.2 \end{array} \begin{array}{r} \times \\ 5.6 \end{array} \begin{array}{r} 5.3 \\ 140 \end{array} \begin{array}{r} 5.6 \\ 133 \end{array} \begin{array}{r} 6.3 \\ 129 \end{array} \begin{array}{r} 5.4 \\ 124 \end{array} \begin{array}{r} 4.9 \\ 115 \end{array} \begin{array}{r} 4.7 \\ 122 \end{array} \begin{array}{r} 6.4 \\ 123 \end{array} \begin{array}{r} 7.2 \\ 124 \end{array} \begin{array}{r} 6.4 \\ 127 \end{array} \begin{array}{r} 5.3 \\ 140 \end{array} \begin{array}{r} 5.7 \\ 140 \end{array} \begin{array}{r} \times \\ 6.4 \\ 12.6 \end{array} \begin{array}{r} \times \\ 5.6 \\ 27.6 \end{array}$$

$$\begin{array}{r} \times \\ 6.8 \end{array} \begin{array}{r} 6.4 \\ 140 \end{array} \begin{array}{r} 6.5 \\ 133 \end{array} \begin{array}{r} 7.2 \\ 129 \end{array} \begin{array}{r} 8.1 \\ 121 \end{array} \begin{array}{r} 7.0 \\ 117 \end{array} \begin{array}{r} 5.6 \\ 117 \end{array} \begin{array}{r} 7.4 \\ 121 \end{array} \begin{array}{r} 7.4 \\ 123 \end{array} \begin{array}{r} 7.2 \\ 123 \end{array} \begin{array}{r} 6.4 \\ 140 \end{array} \begin{array}{r} \times \\ 7.3 \\ 22.8 \end{array} \begin{array}{r} \times \\ 6.6 \\ 22.4 \end{array}$$

$$\begin{array}{r} \times \\ 5.9 \end{array} \begin{array}{r} \times \\ 5.6 \end{array} \begin{array}{r} 6.4 \\ 140 \end{array} \begin{array}{r} 5.8 \\ 126 \end{array} \begin{array}{r} 5.8 \\ 120 \end{array} \begin{array}{r} 6.8 \\ 118 \end{array} \begin{array}{r} 5.1 \\ 115 \end{array} \begin{array}{r} 5.9 \\ 124 \end{array} \begin{array}{r} 6.8 \\ 129 \end{array} \begin{array}{r} 5.7 \\ 140 \end{array} \begin{array}{r} \times \\ 6.5 \\ 22.2 \end{array} \begin{array}{r} \times \\ 5.6 \\ 27.2 \end{array}$$

$$\begin{array}{r} \times \\ 4.9 \end{array} \begin{array}{r} \times \\ 4.9 \end{array} \begin{array}{r} 5.7 \\ 140 \end{array} \begin{array}{r} 6.0 \\ 117 \end{array} \begin{array}{r} 5.0 \\ 113 \end{array} \begin{array}{r} 5.8 \\ 116 \end{array} \begin{array}{r} 6.6 \\ 120 \end{array} \begin{array}{r} 5.5 \\ 140 \end{array} \begin{array}{r} 5.5 \\ 20.6 \end{array} \begin{array}{r} \times \\ 5.9 \end{array} \begin{array}{r} \times \\ 4.7 \end{array} \begin{array}{r} 20.4 \end{array}$$

$$\begin{array}{r} \times \\ 4.9 \end{array} \begin{array}{r} \times \\ 5.1 \end{array} \begin{array}{r} 4.9 \\ 140 \end{array} \begin{array}{r} 4.6 \\ 119 \end{array} \begin{array}{r} 5.0 \\ 118 \end{array} \begin{array}{r} 4.1 \\ 112 \end{array} \begin{array}{r} 4.5 \\ 118 \end{array} \begin{array}{r} 5.4 \\ 122 \end{array} \begin{array}{r} 4.1 \\ 140 \end{array} \begin{array}{r} 4.3 \\ 18.6 \end{array} \begin{array}{r} \times \\ 5.1 \end{array} \begin{array}{r} \times \\ 4.2 \end{array} \begin{array}{r} 30.8 \end{array}$$

$$\begin{array}{r} \times \\ 4.7 \end{array} \begin{array}{r} \times \\ 4.7 \end{array} \begin{array}{r} 4.5 \\ 140 \end{array} \begin{array}{r} 4.4 \\ 119 \end{array} \begin{array}{r} 4.9 \\ 118 \end{array} \begin{array}{r} 3.8 \\ 116 \end{array} \begin{array}{r} 4.9 \\ 118 \end{array} \begin{array}{r} 4.2 \\ 140 \end{array} \begin{array}{r} 4.2 \\ 18.0 \end{array} \begin{array}{r} \times \\ 4.2 \end{array} \begin{array}{r} \times \\ 4.3 \end{array} \begin{array}{r} 30.0 \end{array}$$

$$\begin{array}{r} \times \\ 5.2 \end{array} \begin{array}{r} \times \\ 5.1 \end{array} \begin{array}{r} 5.1 \\ 140 \end{array} \begin{array}{r} 5.1 \\ 119 \end{array} \begin{array}{r} 5.6 \\ 117 \end{array} \begin{array}{r} 4.8 \\ 115 \end{array} \begin{array}{r} 5.5 \\ 117 \end{array} \begin{array}{r} 4.9 \\ 140 \end{array} \begin{array}{r} 4.7 \\ 18.2 \end{array} \begin{array}{r} \times \\ 4.9 \end{array} \begin{array}{r} \times \\ 4.9 \end{array} \begin{array}{r} 28.5 \end{array}$$

$$\begin{array}{r} \times \\ 4.7 \end{array} \begin{array}{r} 5.0 \\ 140 \end{array} \begin{array}{r} 5.0 \\ 119 \end{array} \begin{array}{r} 4.8 \\ 117 \end{array} \begin{array}{r} 5.2 \\ 118 \end{array} \begin{array}{r} 4.2 \\ 118 \end{array} \begin{array}{r} 5.0 \\ 140 \end{array} \begin{array}{r} 4.9 \\ 18.2 \end{array} \begin{array}{r} 5.0 \\ 28.7 \end{array}$$

Sta.	+	H.I.	✓	-	Grade	G.R.
		934.28				
21		27.5			29.7	6.8 3.94 4.6
22		27.4			29.8	6.9 3.84 4.5
23		27.3	✓		29.9	7.0 3.74 4.4
T.R.	4.61	934.58		4.31	929.97	
24		27.2			30.0	7.1 3.64 4.3
25		27.1			30.1	7.2 3.54 4.2
		(932.64 H.I. RT.)				
26		27.0	✓		30.2	7.3 3.44 4.1
B.M.	1.54	934.56		1.54	933.04	933.02
27		26.8	✓		30.2	7.8 4.4 1.8
B.M.	2.08	935.10		1.54	933.04	933.02
28		26.9			30.1	8.2 5.0 8.2
29		27.0	✓		30.0	8.1 5.1 8.1
T.R.	4.20	933.67		5.63	929.47	
30		27.1			29.9	6.6 3.8 6.6
31		27.2			29.8	6.5 3.9 6.5
32		27.3			29.7	6.4 4.0 6.4

Sta + H.I. ✓ - Grade G.R.

933.67

33 27.4 29.6 - 6.3 4.1^{6.3}

34 ✓ 27.5 29.5 - 6.2 4.2^{6.2}

B.M. 2.94 933.82 2.81 930.86 930.88

35 29.5 - 4.3

36 29.5 - 4.3

37 29.6 - 4.2

38 29.7 ✓ 4.1

T.R. 6.68 936.18 4.32 929.50

39 29.8 - 6.4

40 30.1 - 6.1

41 30.9 - 5.3

42 31.7 - 4.5

43 32.2 ✓ 4.0

T.R. 4.06 936.63 3.61 932.57

44 32.3 - 4.3

24

PL

$\begin{array}{r} \times \\ 4.5 \\ \hline 30.7 \end{array}$
 $\begin{array}{r} \times \\ 5.0 \\ \hline 19.8 \end{array}$
 $\begin{array}{r} 4.4 \\ 13 \end{array}$
 $\begin{array}{r} 4.9 \\ 18 \end{array}$
 $\begin{array}{r} 4.7 \\ 5 \end{array}$
 $\begin{array}{r} 5.5 \\ 8 \end{array}$
 $\begin{array}{r} 3.7 \\ 5 \end{array}$
 $\begin{array}{r} 5.3 \\ 5 \end{array}$
 $\begin{array}{r} 4.7 \\ 8 \end{array}$
 $\begin{array}{r} 4.8 \\ 33 \end{array}$
 $\begin{array}{r} \times \\ 4.9 \\ \hline 19.6 \end{array}$
 $\begin{array}{r} \times \\ 4.8 \\ \hline 30.2 \end{array}$

$$\begin{array}{ccccccccccc} \frac{5.1}{30.6} & \frac{5.3}{20.2} & \frac{5.2}{13} & \frac{5.2}{11.8} & \frac{5.0}{7} & \frac{5.8}{4} & \frac{4.0}{1} & \frac{5.0}{3} & \frac{5.0}{33} & \frac{4.9}{19.4} & \frac{5.1}{30.6} \end{array}$$

$\frac{5.4}{27.3}$ $\frac{5.2}{19.4}$ $\frac{5.1}{13}$ $\frac{5.3}{22}$ $\frac{5.0}{6}$ $\frac{6.0}{3}$ $\frac{4.3}{12}$ $\frac{5.1}{3}$ $\frac{5.3}{13}$ $\frac{5.0}{33}$ $\frac{5.1}{19.6}$ $\frac{5.0}{30.9}$

$\frac{4.8}{28.2}$ $\frac{4.9}{19.8}$ $\frac{4.7}{33}$ $\frac{5.0}{22}$ $\frac{4.8}{6}$ $\frac{5.6}{4}$ $\frac{3.6}{3}$ $\frac{4.3}{15}$ $\frac{4.7}{33}$ $\frac{4.8}{33}$ $\frac{4.8}{18.4}$ $\frac{4.7}{28.4}$

$$\begin{array}{r} \times \\ 4.9 \\ \hline 279 \end{array} \quad \begin{array}{r} \times \\ 5.1 \\ \hline 178 \end{array} \quad \begin{array}{r} \times \\ 4.8 \\ \hline 135 \end{array} \quad \begin{array}{r} \times \\ 4.7 \\ \hline 15 \end{array} \quad \begin{array}{r} \times \\ 4.3 \\ \hline 10 \end{array} \quad \begin{array}{r} \times \\ 5.8 \\ \hline 5 \end{array} \quad \begin{array}{r} \times \\ 3.7 \\ \hline 5 \end{array} \quad \begin{array}{r} \times \\ 5.9 \\ \hline 5 \end{array} \quad \begin{array}{r} \times \\ 4.9 \\ \hline 133 \end{array} \quad \begin{array}{r} \times \\ 4.7 \\ \hline 190 \end{array} \quad \begin{array}{r} \times \\ 4.9 \\ \hline 279 \end{array}$$

$\begin{array}{r} \times \\ 4.8 \\ 27.9 \end{array}$
 $\begin{array}{r} \times \\ 5.2 \\ 20.2 \end{array}$
 $\begin{array}{r} 4.7 \\ 33 \end{array}$
 $\begin{array}{r} 5.2 \\ 19 \end{array}$
 $\begin{array}{r} 5.0 \\ 7 \end{array}$
 $\begin{array}{r} 5.8 \\ 4 \end{array}$
 $\begin{array}{r} 3.9 \\ 4 \end{array}$
 $\begin{array}{r} 4.9 \\ 33 \end{array}$
 $\begin{array}{r} \times \\ 4.6 \\ 18.0 \end{array}$
 $\begin{array}{r} \times \\ 4.8 \\ 27.9 \end{array}$

$\begin{array}{r} \times \\ 7.2 \\ \hline 27.8 \end{array}$
 $\begin{array}{r} \times \\ 7.2 \\ \hline 19.6 \end{array}$
 $\begin{array}{r} 7.2 \\ 133 \end{array}$
 $\begin{array}{r} 7.3 \\ 118 \end{array}$
 $\begin{array}{r} 7.0 \\ 7 \end{array}$
 $\begin{array}{r} 8.1 \\ 15 \end{array}$
 $\begin{array}{r} 6.2 \\ 15 \end{array}$
 $\begin{array}{r} 6.4 \\ 15 \end{array}$
 $\begin{array}{r} 6.5 \\ 11 \end{array}$
 $\begin{array}{r} 7.4 \\ 33 \end{array}$
 $\begin{array}{r} \times \\ 7.1 \\ \hline 19.4 \end{array}$
 $\begin{array}{r} \times \\ 7.3 \\ \hline 27.6 \end{array}$

$$\begin{array}{r} \times \\ 7.0 \\ \hline 27.6 \end{array} \quad \begin{array}{r} \times \\ 6.9 \\ \hline 19.6 \end{array} \quad \begin{array}{r} 6.7 \\ 133 \end{array} \quad \begin{array}{r} 6.7 \\ 8 \end{array} \quad \begin{array}{r} 8.7 \\ 4 \end{array} \quad \begin{array}{r} 6.2 \\ 17 \end{array} \quad \begin{array}{r} 7.2 \\ 53 \end{array} \quad \begin{array}{r} \times \\ 6.9 \\ \hline 19.6 \end{array} \quad \begin{array}{r} \times \\ 7.0 \\ \hline 27.6 \end{array}$$

$$\frac{6.2}{27.6} \quad \frac{6.8}{21.0} \quad \frac{6.3}{33} \quad \frac{6.6}{19} \quad \frac{6.7}{4} \quad \frac{5.2}{12} \quad \frac{5.4}{15} \quad \frac{6.1}{33} \quad \frac{6.3}{33} \quad \frac{6.2}{19.3} \quad \frac{6.3}{27.0}$$

$\frac{1.9}{28.4}$
 $\frac{5.4}{20.2}$
 $\frac{4.7}{13.3}$
 $\frac{5.7}{12.2}$
 $\frac{4.9}{11.0}$
 $\frac{3.9}{9.9}$
 $\frac{4.1}{9.9}$
 $\frac{4.7}{11.4}$
 $\frac{5.9}{13.3}$
 $\frac{4.9}{18.8}$
 $\frac{5.0}{28.2}$

$\frac{40}{220}$ $\frac{48}{196}$ $\frac{41}{133}$ $\frac{42}{121}$ $\frac{38}{8}$ $\frac{31}{12}$ $\frac{35}{12}$ $\frac{41}{15}$ $\frac{43}{33}$ $\frac{42}{18.4}$ $\frac{43}{28.5}$

$$\frac{x}{\frac{10}{29.4}} \quad \frac{x}{\frac{4.5}{18.4}} \quad \frac{4.4}{33} \quad \frac{4.5}{20} \quad \frac{4.1}{9} \quad \frac{3.3}{9} \quad \frac{3.7}{9} \quad \frac{4.5}{15} \quad \frac{4.6}{33} \quad \frac{x}{\frac{4.5}{18.4}} \quad \frac{x}{\frac{4.7}{28.4}}$$

Sta + H.I. - Grade G.R.
 936.63 ✓

45 32.1 - 4.5

46 31.7 - 4.9

47 31.5 ✓ 5.1

TP 503 936.14 510.2

931.11

48 31.3 - 4.8

49 31.3 - 4.8

50 31.2 - 4.9

51 31.0 - 5.1

52 30.6 ✓ 5.5

B.M. 1.60

933.39

4.37

931.77

931.79

53 30.0 - 5.4

54 29.3 - 4.1

55 28.6 - 4.8

56 27.9 - 5.5

✓
933.39

57

27.2 ✓ 6.2

T.P.

6.20

✓
934.11

5.48

937.91

58

26.9 - 7.2

59

27.5 - 6.6

60

28.8 - 5.3

61

30.2 - 3.9

62

✓
31.2 ✓ 2.9

T.P.

5.26

✓
938.01

1.36

932.75

63

31.9 - 6.1

64

✓
32.3 ✓ 5.7

B.M.

5.13

✓
938.15

5.02

932.99

933.02

+37

32.4 - 5.8

4+44+

$$\begin{array}{r} \times \\ 6.6 \\ 28.4 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 1.0 \\ 18 \\ \hline \end{array}$$

$$\begin{array}{r} 6.8 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 5.8 \quad 6.2 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 6.1 \\ 33 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 5.7 \\ 19.0 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 5.9 \\ 29.4 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 10.9 \\ 25.4 \\ \hline \end{array}$$

$$\begin{array}{r} 10.8 \\ 35 \\ \hline \end{array} \quad \begin{array}{r} 10.6 \quad 7.2 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 10.9 \\ 33 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 10.8 \\ 22.2 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 10.6 \\ 26.0 \\ \hline \end{array}$$

$$\begin{array}{r} 10.6 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 10.6 \quad 6.6 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 11.0 \\ 33 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 11.0 \\ 26.8 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 6.1 \\ 27.8 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 6.4 \\ 20.2 \\ \hline \end{array}$$

$$\begin{array}{r} 6.9 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 6.3 \quad 5.9 \\ 28 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 6.0 \\ 19.4 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 6.0 \\ 28.0 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 7.0 \\ 28.8 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 7.1 \\ 18.4 \\ \hline \end{array}$$

$$\begin{array}{r} 4.4 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 4.0 \\ 15 \\ \hline \end{array} \quad \begin{array}{r} 2.7 \\ 19 \\ \hline \end{array} \quad \begin{array}{r} 3.9 \\ 19 \\ \hline \end{array} \quad \begin{array}{r} 4.9 \\ 33 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 3.7 \\ 18.4 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 3.9 \\ 29.0 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 2.2 \\ 30.0 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 2.3 \\ 19.2 \\ \hline \end{array}$$

$$\begin{array}{r} 2.3 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 2.3 \\ 19 \\ \hline \end{array} \quad \begin{array}{r} 1.9 \\ 13 \\ \hline \end{array} \quad \begin{array}{r} 1.2 \\ 13 \\ \hline \end{array} \quad \begin{array}{r} 2.2 \\ 33 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 1.9 \\ 20.0 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 2.0 \\ 30.3 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 6.0 \\ 29.1 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 6.4 \\ 18.6 \\ \hline \end{array}$$

$$\begin{array}{r} 6.0 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 6.9 \\ 19 \\ \hline \end{array} \quad \begin{array}{r} 6.0 \\ 13 \\ \hline \end{array} \quad \begin{array}{r} 4.8 \\ 13 \\ \hline \end{array} \quad \begin{array}{r} 5.9 \\ 33 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 5.3 \\ 19.6 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 6.0 \\ 29.1 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 6.5 \\ 27.8 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 6.2 \\ 19.0 \\ \hline \end{array}$$

$$\begin{array}{r} 6.4 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 5.9 \\ 12 \\ \hline \end{array} \quad \begin{array}{r} 6.0 \\ 10 \\ \hline \end{array} \quad \begin{array}{r} 5.4 \\ 10 \\ \hline \end{array} \quad \begin{array}{r} 6.6 \\ 18 \\ \hline \end{array} \quad \begin{array}{r} 6.6 \\ 33 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 6.7 \\ 20.0 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 6.2 \\ 28.2 \\ \hline \end{array}$$

$$\begin{array}{r} \times \\ 6.4 \\ 28.4 \\ \hline \end{array} \quad \begin{array}{r} \times \\ 6.4 \\ 19.4 \\ \hline \end{array}$$

$$\begin{array}{r} 6.2 \\ 33 \\ \hline \end{array} \quad \begin{array}{r} 6.0 \\ 16 \\ \hline \end{array} \quad \begin{array}{r} 7.05 \\ 17 \\ \hline \end{array} \quad \begin{array}{r} 8.5 \\ 17 \\ \hline \end{array} \quad \begin{array}{r} 8.2 \\ 12 \\ \hline \end{array} \quad \begin{array}{r} 5.0 \\ 23 \\ \hline \end{array} \quad \begin{array}{r} 4.7 \\ 33 \\ \hline \end{array}$$

B.M	3.81	936.83 ✓		933.02 ¹
64+68				
64+54				
64+43				
64+37				
64+05	CROSS DRAIN	18" X 48' P ³		
64+00				
63+00				
62+00				
61+00				
	2.76	932.77 ✓	6.82	930.01 ✓
60+00				
59+00				
58+50	CROSS DRAIN	18" X 48' P ³		

LEFT

RIGHT

5-5-30

44 48 67 63 40 33 3.5 49 5.1 49
50 45 41 30 25 19 3.1 12 21 28 55

47 49 69 67 41 3.2 33 3.7 5.3 5.3
33 29 27 23 16 3.6 8 18 28 32 35

49 50 68 67 40 3.5 3.3 3.8
33 29 25 22 17 3.5 15 24 38

48 48 68 66 44 (4.0) 3.6 3.3
33 29 26 23 18 3.6 20 33

7.0
23

7.0
28

54 5.1 7.1 7.1 45 (4.3) 4.5 70 7.1 5.0 5.0
33 29 26 23 18 4.3 18 25 28 32 33

48 49 87 27 50 (4.9) 5.5 2.8 28 46 46
33 30 25 21 16 5.0 18 24 28 32 33

49 48 94 94 59 (5.6) 5.7 94 9.4 4.9 4.9
33 30 26 23 17 5.8 18 23 27 32 33

69 69 106 106 70 (6.6) 6.7 108 108 65 67
33 31 27 22 17 6.7 18 24 28 32 33

46 49 7.1 7.1 41 (4.0) 4.0 7.2 7.2 4.6 4.5
33 31 28 23 18 3.8 18 23 29 32 33

93 89 48 (5.3) 5.0 9.6 9.5
33 25 18 4.7 18 27 33

10.5
23

10.5
25

932.77 ✓

58 +00

57 +00

56 +00

6.33 934.01 ✓ 5.09 927.68 ✓

55 +00

54 +00

53 +00

B.M. 4.25 936.04 ✓ 2.25 931.76 ✓ 931.79 ✓

52

May. 6-30
warm Cloudy. Windy

51

50

49

48

47

T.P. 4.87 936.75 ✓ 4.16 931.88 ✓

LEFT.

RIGHT.

5-5-30.

9.4	9.3	5.9	(5.9)	5.5	9.4	9.4
33	24	18	5.6	18	26	33

6.1	6.0	8.6	8.6	5.8	(5.6)	5.9	8.2	8.2	5.4	5.5
33	28	26	22	17	5.5	18	22	27	29	33

5.5	5.5	7.5	7.5	5.0	(4.9)	5.2	7.7	7.7	5.4	5.4
33	28	26	22	17	5.2	18	23	26	29	33

5.8	5.8	8.1	8.1	5.5	(5.4)	6.8	8.2	8.2	6.2	6.2
33	29	26	22	17	5.6	18	22	26	29	33

5.2	5.4	7.5	7.5	5.0	(4.7)	4.9	7.3	7.3	5.5	5.5
33	29	26	22	18	4.7	18	22	26	29	33

5.1	5.1	6.6	6.6	4.2	(4.0)	4.1	6.5	6.5	4.9	4.9
33	28	26	22	18	3.9	18	22	26	29	33

5.3	5.3	7.5	7.5	5.3	(4.1)	5.2	8.0	8.0	5.7	5.7
33	30	27	22	18	5.2	18	22	27	31	33

4.7	4.8	7.5	7.3	4.7	(4.0)	4.9	7.1	7.3	4.7	4.7
33	30	27	23	18	4.8	18	23	27	31	33

4.6	4.6	7.3	7.0	4.9	(4.9)	5.0	6.8	7.0	4.5	4.6
33	31	28	23	18	4.7	18	24	28	31	36

4.2	4.6	7.5	7.3	4.6	(4.7)	4.6	7.0	7.4	4.4	4.4
33	31	28	23	18	4.7	18	23	28	31	33

5.2	5.5	7.4	7.3	4.5	(4.7)	4.5	7.2	7.3	5.6	5.6
33	31	28	23	18	4.5	18	23	28	31	33

4.9	5.1	7.1	7.0	4.3	(4.5)	4.5	6.8	7.2	5.5	5.5
33	31	28	23	18	4.5	18	22	28	30	33

Sta	+	H.I.	-	Elev.
		936.75 ³ ✓		
46				
45				
44				
43				
42				
41				
40				
39				
T.P.	5.76	934.48 ⁵ ✓	8.03	928.72✓
38				
37				
36				
35				

Left

L

Right

$\frac{5.1}{33}$	$\frac{5.6}{30}$	$\frac{7.4}{27}$	$\frac{7.2}{22}$	$\frac{4.9}{18}$	$\frac{5.1}{48}$	$\frac{4.9}{18}$	$\frac{7.8}{24}$	$\frac{7.8}{29}$	$\frac{6.1}{31}$	$\frac{6.1}{33}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{4.5}{33}$	$\frac{4.8}{32}$	$\frac{7.8}{28}$	$\frac{7.3}{22}$	$\frac{5.2}{18}$	$\frac{4.7}{48}$	$\frac{5.8}{18}$	$\frac{7.5}{21}$	$\frac{7.8}{28}$	$\frac{5.5}{31}$	$\frac{5.5}{33}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{4.3}{33}$	$\frac{4.3}{32}$	$\frac{7.5}{28}$	$\frac{7.0}{22}$	$\frac{5.0}{18}$	$\frac{4.5}{48}$	$\frac{5.1}{18}$	$\frac{7.2}{22}$	$\frac{7.6}{28}$	$\frac{4.8}{31}$	$\frac{4.7}{33}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{4.6}{33}$	$\frac{4.8}{32}$	$\frac{7.6}{28}$	$\frac{7.4}{22}$	$\frac{5.0}{18}$	$\frac{4.6}{49}$	$\frac{5.1}{18}$	$\frac{7.2}{22}$	$\frac{7.6}{28}$	$\frac{4.8}{32}$	$\frac{4.9}{33}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.2}{33}$	$\frac{5.5}{31}$	$\frac{8.6}{28}$	$\frac{8.1}{22}$	$\frac{5.7}{18}$	$\frac{5.1}{53}$	$\frac{5.5}{18}$	$\frac{8.0}{22}$	$\frac{8.0}{28}$	$\frac{5.6}{31}$	$\frac{5.6}{33}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{6.9}{33}$	$\frac{6.9}{30}$	$\frac{8.4}{28}$	$\frac{7.8}{22}$	$\frac{6.1}{17}$	$\frac{5.9}{58}$	$\frac{5.8}{18}$	$\frac{8.1}{21}$	$\frac{8.4}{27}$	$\frac{6.9}{30}$	$\frac{6.9}{33}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{7.2}{33}$	$\frac{7.5}{29}$	$\frac{9.0}{27}$	$\frac{8.6}{21}$	$\frac{6.6}{18}$	$\frac{6.7}{6.5}$	$\frac{6.5}{18}$	$\frac{8.5}{22}$	$\frac{9.0}{28}$	$\frac{7.6}{29}$	$\frac{7.8}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{7.6}{33}$	$\frac{7.6}{30}$	$\frac{9.2}{28}$	$\frac{9.0}{23}$	$\frac{6.9}{18}$	$\frac{7.0}{6.8}$	$\frac{7.0}{18}$	$\frac{8.8}{22}$	$\frac{9.4}{28}$	$\frac{7.8}{29}$	$\frac{7.8}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.4}{33}$	$\frac{5.4}{30}$	$\frac{7.1}{28}$	$\frac{7.0}{22}$	$\frac{4.6}{18}$	$\frac{4.9}{4.5}$	$\frac{4.5}{18}$	$\frac{6.6}{22}$	$\frac{7.0}{29}$	$\frac{5.6}{30}$	$\frac{5.6}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.5}{33}$	$\frac{5.5}{31}$	$\frac{7.3}{29}$	$\frac{6.8}{23}$	$\frac{4.6}{18}$	$\frac{4.9}{4.5}$	$\frac{4.8}{18}$	$\frac{6.6}{22}$	$\frac{7.1}{28}$	$\frac{5.6}{30}$	$\frac{5.6}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.5}{33}$	$\frac{5.6}{30}$	$\frac{7.4}{28}$	$\frac{7.0}{23}$	$\frac{4.5}{18}$	$\frac{5.0}{4.6}$	$\frac{4.8}{18}$	$\frac{6.8}{22}$	$\frac{7.2}{28}$	$\frac{5.5}{30}$	$\frac{5.5}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.7}{33}$	$\frac{5.8}{32}$	$\frac{7.8}{29}$	$\frac{7.1}{23}$	$\frac{5.1}{18}$	$\frac{5.0}{4.8}$	$\frac{4.4}{18}$	$\frac{7.5}{23}$	$\frac{7.7}{29}$	$\frac{5.6}{32}$	$\frac{5.6}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

934.48.

34

33

32

31

30

T.P

5.0

934.91 ✓ 4.57

929.91 ✓

29

28

27

+ 44

+ 34

± Ditch 36" x 57' Q.M.

+ 25

B.M.

1.3

934.³⁴35

1.89

933.04

933.02 ✓

26

Left

±

Right

$\frac{6.0}{33}$	$\frac{6.0}{31}$	$\frac{8.0}{30}$	$\frac{7.6}{24}$	$\frac{5.0}{18}$	$\frac{5.0}{4.8}$	$\frac{4.8}{18}$	$\frac{7.5}{23}$	$\frac{7.9}{29}$	$\frac{5.9}{31}$	$\frac{5.9}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.4}{33}$	$\frac{5.4}{32}$	$\frac{7.6}{30}$	$\frac{7.4}{23}$	$\frac{4.8}{18}$	$\frac{4.9}{4.7}$	$\frac{4.7}{18}$	$\frac{7.3}{23}$	$\frac{7.8}{28}$	$\frac{5.7}{30}$	$\frac{5.7}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.5}{33}$	$\frac{5.5}{32}$	$\frac{7.7}{30}$	$\frac{7.4}{24}$	$\frac{4.6}{18}$	$\frac{4.8}{4.8}$	$\frac{4.8}{18}$	$\frac{7.4}{23}$	$\frac{7.7}{28}$	$\frac{5.6}{31}$	$\frac{5.6}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.0}{33}$	$\frac{5.0}{32}$	$\frac{7.3}{29}$	$\frac{7.1}{24}$	$\frac{4.5}{18}$	$\frac{4.7}{4.6}$	$\frac{4.6}{18}$	$\frac{7.2}{23}$	$\frac{7.4}{28}$	$\frac{5.4}{31}$	$\frac{5.4}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.1}{33}$	$\frac{5.1}{32}$	$\frac{7.4}{29}$	$\frac{7.1}{24}$	$\frac{4.5}{18}$	$\frac{4.6}{4.5}$	$\frac{4.5}{18}$	$\frac{7.4}{23}$	$\frac{7.6}{28}$	$\frac{5.6}{31}$	$\frac{5.6}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.5}{33}$	$\frac{5.5}{32}$	$\frac{7.8}{29}$	$\frac{7.4}{25}$	$\frac{4.8}{18}$	$\frac{4.9}{4.7}$	$\frac{4.9}{18}$	$\frac{7.6}{24}$	$\frac{7.9}{29}$	$\frac{5.8}{32}$	$\frac{5.8}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.5}{33}$	$\frac{5.5}{32}$	$\frac{8.0}{29}$	$\frac{7.5}{24}$	$\frac{4.7}{18}$	$\frac{4.8}{4.5}$	$\frac{4.5}{18}$	$\frac{7.5}{24}$	$\frac{7.7}{29}$	$\frac{5.9}{32}$	$\frac{5.9}{33}$
------------------	------------------	------------------	------------------	------------------	-------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.9}{38}$	$\frac{5.9}{33}$	$\frac{8.0}{31}$	$\frac{7.9}{25}$	$\frac{4.9}{18}$	$\frac{4.7}{4.6}$	$\frac{4.6}{18}$	$\frac{7.3}{24}$	$\frac{7.7}{29}$	$\frac{6.2}{32}$	$\frac{6.1}{33}$
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$\frac{5.2}{40}$	$\frac{5.5}{32}$	$\frac{8.1}{30}$	$\frac{8.1}{26}$	$\frac{5.0}{18}$	$\frac{5.0}{4.6}$	$\frac{5.0}{19}$	$\frac{7.5}{26}$	$\frac{7.5}{29}$	$\frac{5.0}{32}$	$\frac{5.2}{33}$
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Flowline

$\frac{12.0}{33}$	$\frac{12.5}{29}$	$\frac{5.0}{18}$	$\frac{4.9}{4.5}$	$\frac{4.9}{19}$	$\frac{12.2}{28}$	$\frac{11.8}{33}$
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$\frac{5.5}{33}$	$\frac{5.5}{31}$	$\frac{8.8}{30}$	$\frac{8.8}{27}$	$\frac{4.9}{18}$	$\frac{4.9}{4.5}$	$\frac{4.9}{20}$	$\frac{9.0}{26}$	$\frac{9.0}{29}$	$\frac{6.0}{32}$	$\frac{5.7}{33}$
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spike in 18" Oak 38' RT. Std. 26 + 50

$\frac{14.0}{40}$	$\frac{4.4}{32}$	$\frac{8.0}{29}$	$\frac{7.7}{24}$	$\frac{4.4}{18}$	$\frac{4.1}{4.1}$	$\frac{4.1}{18}$	$\frac{7.2}{25}$	$\frac{7.5}{29}$	$\frac{4.1}{31}$	$\frac{4.0}{40}$
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Sta.	+	H.I. ³⁴ 934.35	-	ELEV.
25				
24				
23				
22				
21				
20				
19				
18				
T.F.	4.68	935.11	392	^{4.2} 930.43
B.M.	4.14	935.50	375	931.36
17				May. 21-30
+06.		18' x 18'		P.E. Culvert.
16				
15				
14				

Left

L

Right

$\frac{5.2}{40}$	$\frac{5.3}{29}$	$\frac{7.3}{27}$	$\frac{7.1}{23}$	$\frac{4.1}{18}$	$\frac{4.1}{40}$	$\frac{7.1}{24}$	$\frac{7.1}{28}$	$\frac{5.1}{30}$	$\frac{5.1}{40}$	
$\frac{5.1}{40}$	$\frac{4.8}{29}$	$\frac{7.3}{27}$	$\frac{7.0}{23}$	$\frac{4.3}{18}$	$\frac{4.4}{18}$	$\frac{7.2}{23}$	$\frac{7.4}{27}$	$\frac{5.1}{30}$	$\frac{5.1}{40}$	
$\frac{5.5}{40}$	$\frac{6.0}{29}$	$\frac{7.4}{27}$	$\frac{7.1}{22}$	$\frac{4.5}{18}$	$\frac{4.5}{18}$	$\frac{7.2}{23}$	$\frac{7.2}{26}$	$\frac{6.0}{28}$	$\frac{6.1}{33}$	$\frac{6.0}{40}$
$\frac{4.6}{40}$	$\frac{4.6}{30}$	$\frac{7.8}{27}$	$\frac{7.6}{22}$	$\frac{4.8}{18}$	$\frac{4.8}{18}$	$\frac{7.4}{22}$	$\frac{7.7}{27}$	$\frac{4.6}{30}$	$\frac{4.7}{40}$	
$\frac{4.4}{40}$	$\frac{4.5}{30}$	$\frac{7.7}{27}$	$\frac{7.6}{22}$	$\frac{5.0}{18}$	$\frac{4.8}{18}$	$\frac{7.6}{22}$	$\frac{7.7}{27}$	$\frac{4.5}{30}$	$\frac{4.7}{40}$	
$\frac{4.9}{40}$	$\frac{4.9}{29}$	$\frac{7.7}{26}$	$\frac{7.6}{22}$	$\frac{5.0}{18}$	$\frac{5.2}{18}$	$\frac{7.7}{22}$	$\frac{7.7}{26}$	$\frac{5.1}{29}$	$\frac{5.1}{40}$	
$\frac{5.2}{40}$	$\frac{5.2}{29}$	$\frac{7.8}{28}$	$\frac{7.6}{22}$	$\frac{5.2}{18}$	$\frac{5.1}{18}$	$\frac{7.9}{22}$	$\frac{7.8}{27}$	$\frac{5.0}{29}$	$\frac{4.7}{40}$	
$\frac{4.6}{40}$	$\frac{4.8}{29}$	$\frac{7.3}{27}$	$\frac{7.1}{23}$	$\frac{4.9}{18}$	$\frac{4.7}{18}$	$\frac{7.6}{23}$	$\frac{7.5}{27}$	$\frac{4.4}{30}$	$\frac{4.4}{40}$	
$\frac{5.8}{40}$	$\frac{5.7}{30}$	$\frac{8.4}{28}$	$\frac{8.6}{23}$	$\frac{5.6}{18}$	$\frac{5.8}{18}$	$\frac{8.6}{24}$	$\frac{8.7}{28}$	$\frac{5.1}{31}$	$\frac{5.1}{40}$	
$\frac{6.1}{40}$	$\frac{6.1}{30}$	$\frac{8.8}{28}$	$\frac{8.8}{24}$	$\frac{5.9}{18}$	$\frac{5.7}{18}$	$\frac{8.2}{24}$	$\frac{8.5}{28}$	$\frac{6.1}{30}$	$\frac{5.7}{34}$	$\frac{6.4}{40}$
$\frac{7.0}{32}$	$\frac{7.6}{30}$	$\frac{6.6}{27}$	$\frac{7.6}{26}$	$\frac{7.4}{22}$	$\frac{5.5}{18}$	$\frac{6.1}{23}$	$\frac{7.8}{27}$	$\frac{6.5}{28}$	$\frac{6.5}{40}$	
$\frac{6.5}{40}$	$\frac{6.8}{32}$	$\frac{6.9}{27}$	$\frac{7.5}{26}$	$\frac{7.1}{22}$	$\frac{5.2}{18}$	$\frac{7.5}{22}$	$\frac{7.5}{26}$	$\frac{7.1}{29}$	$\frac{6.4}{40}$	

Sta.	+	H.I.	-	Elev.
13		935.50		
12				
B.M.	4.82	936.18	414	931.36
11		{Very Windy}		May. 23-30 P.M.
10				
9				
8				
7				
T.P.	8.30	941.62	2.86	933.32
6				
5+50				
5				
+50				
4				

Left

E

Right

$\frac{5.6}{33}$	$\frac{6.5}{29}$	$\frac{6.2}{26}$	$\frac{6.6}{25}$	$\frac{6.4}{21}$	$\frac{4.8}{18}$	$\frac{4.8}{48}$	$\frac{5.1}{18}$	$\frac{7.2}{22}$	$\frac{7.3}{26}$	$\frac{5.7}{28}$	$\frac{5.6}{40}$
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$\frac{4.5}{40}$	$\frac{5.0}{29}$	$\frac{5.0}{19}$	$\frac{5.8}{18}$	$\frac{4.6}{50}$	$\frac{6.0}{18}$	$\frac{5.0}{19}$	$\frac{5.3}{32}$	$\frac{4.8}{40}$
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Spike in Tree.

$\frac{3.7}{40}$	$\frac{4.0}{32}$	$\frac{5.2}{30}$	$\frac{5.2}{19}$	$\frac{6.3}{18}$	$\frac{5.2}{52}$	$\frac{6.3}{18}$	$\frac{5.2}{19}$	$\frac{5.2}{29}$	$\frac{5.2}{40}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.8}{40}$	$\frac{6.0}{30}$	$\frac{5.0}{28}$	$\frac{4.8}{19}$	$\frac{5.8}{18}$	$\frac{4.8}{49}$	$\frac{5.9}{18}$	$\frac{4.8}{19}$	$\frac{4.8}{30}$	$\frac{6.0}{32}$	$\frac{6.2}{40}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{5.8}{40}$	$\frac{6.4}{31}$	$\frac{4.9}{29}$	$\frac{4.6}{19}$	$\frac{5.1}{18}$	$\frac{4.5}{45}$	$\frac{5.5}{18}$	$\frac{4.5}{19}$	$\frac{4.6}{30}$	$\frac{6.5}{33}$	$\frac{6.5}{40}$
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$\frac{4.5}{40}$	$\frac{4.5}{31}$	$\frac{3.7}{29}$	$\frac{3.7}{19}$	$\frac{4.8}{18}$	$\frac{3.9}{39}$	$\frac{4.7}{18}$	$\frac{3.7}{19}$	$\frac{3.7}{29}$	$\frac{5.6}{32}$	$\frac{5.6}{40}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{3.0}{40}$	$\frac{3.8}{30}$	$\frac{2.7}{29}$	$\frac{2.6}{19}$	$\frac{3.8}{18}$	$\frac{2.7}{27}$	$\frac{3.7}{18}$	$\frac{2.6}{19}$	$\frac{2.9}{29}$	$\frac{4.3}{31}$	$\frac{4.0}{40}$
------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------	------------------

$\frac{6.3}{40}$	$\frac{7.2}{26}$	$\frac{7.2}{19}$	$\frac{8.3}{18}$	$\frac{7.1}{7.1}$	$\frac{8.0}{17}$	$\frac{7.2}{19}$	$\frac{7.2}{29}$	$\frac{6.7}{34}$	$\frac{6.6}{40}$
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$\frac{6.2}{40}$	$\frac{6.6}{29}$	$\frac{6.6}{19}$	$\frac{7.6}{18}$	$\frac{6.5}{6.5}$	$\frac{7.5}{18}$	$\frac{6.6}{19}$	$\frac{6.6}{29}$	$\frac{7.0}{30}$	$\frac{6.6}{40}$
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$\frac{5.5}{40}$	$\frac{6.0}{29}$	$\frac{6.0}{19}$	$\frac{6.9}{18}$	$\frac{5.7}{5.7}$	$\frac{6.7}{18}$	$\frac{5.9}{19}$	$\frac{5.9}{29}$	$\frac{6.4}{40}$
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$\frac{4.0}{40}$	$\frac{4.9}{30}$	$\frac{5.4}{29}$	$\frac{5.4}{19}$	$\frac{6.3}{18}$	$\frac{5.2}{5.2}$	$\frac{6.3}{18}$	$\frac{5.4}{19}$	$\frac{5.3}{30}$	$\frac{4.9}{33}$	$\frac{4.9}{40}$
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$\frac{2.4}{40}$	$\frac{2.6}{33}$	$\frac{4.9}{30}$	$\frac{4.9}{19}$	$\frac{5.9}{17}$	$\frac{4.9}{4.9}$	$\frac{5.9}{18}$	$\frac{5.1}{19}$	$\frac{5.1}{30}$	$\frac{3.9}{31}$	$\frac{4.0}{38}$	$\frac{3.3}{40}$
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94162

3+50

3

+50

2

B.M.

1.27 940.35 940.34

Left

£

Right

$$\frac{2.5}{40} \quad \frac{2.5}{33} \quad \frac{4.8}{30} \quad \frac{4.8}{19} \quad \frac{5.8}{18} \quad \frac{4.8}{4.6} \quad \frac{5.7}{17} \quad \frac{4.8}{19} \quad \frac{4.8}{31} \quad \frac{3.0}{33} \quad \frac{3.0}{37} \quad \frac{2.5}{40}$$

$$\frac{3.1}{40} \quad \frac{3.0}{33} \quad \frac{5.0}{32} \quad \frac{4.6}{19} \quad \frac{5.7}{18} \quad \frac{5.0}{4.6} \quad \frac{5.6}{17} \quad \frac{4.6}{19} \quad \frac{4.8}{30} \quad \frac{3.8}{31} \quad \frac{3.6}{40}$$

$$\frac{4.5}{40} \quad \frac{4.5}{16} \quad \frac{4.5}{4.5} \quad \frac{4.9}{17} \quad \frac{4.5}{18} \quad \frac{4.5}{40}$$

$$\frac{6.0}{30} \quad \frac{5.3}{29} \quad \frac{5.3}{22} \quad \frac{6.4}{20} \quad \frac{5.5}{13} \quad \frac{5.3}{5.3} \quad \frac{5.3}{14} \quad \frac{5.0}{31} \quad \frac{5.0}{40}$$

Top Hyd. 2+50

			Co.	Yds
			Lt	Rt.
			Fill	Fill
64+05	= 18" x 48' P ₃	X Dr. ✓		
64+00	=		2.0	10.0
58+50	= 18" x 48' P ₃	X Dr. ✓		
55+08	= Side Dr. 15" x 20' C.M.	✓		11.0
" "	" " " " " "	✓	11.0	
52+52 ^{2d}	↳ Otter Lake 275" x 36' C.M.	Side Dr. ✓	Lt + Rt.	
39+07	Side Dr. 15" x 20' C.M.	✓	11.0	
33+28	" " 15" x 20' C.M.	✓		12.5
26+35.8	X Dr. 36" x 57' C.M. (26' Extension)	✓		
26+16	Side Dr. 15" x 20' C.M.	✓	16.0	
26+10	" " 15" x 20' C.M.	✓		19.0
20+44	" " 15" x 20' C.M.	✓		11.0
20+44	" " " " " "	✓	16.0	
16+06	X Dr. 18" x 48' P ₃	✓		

24' Lt F.E.

24' Rt. F.E.

24' Lt + 24' Rt.

26' Lt. F.E.

26' Rt. F.E.

28' Lt F.E.

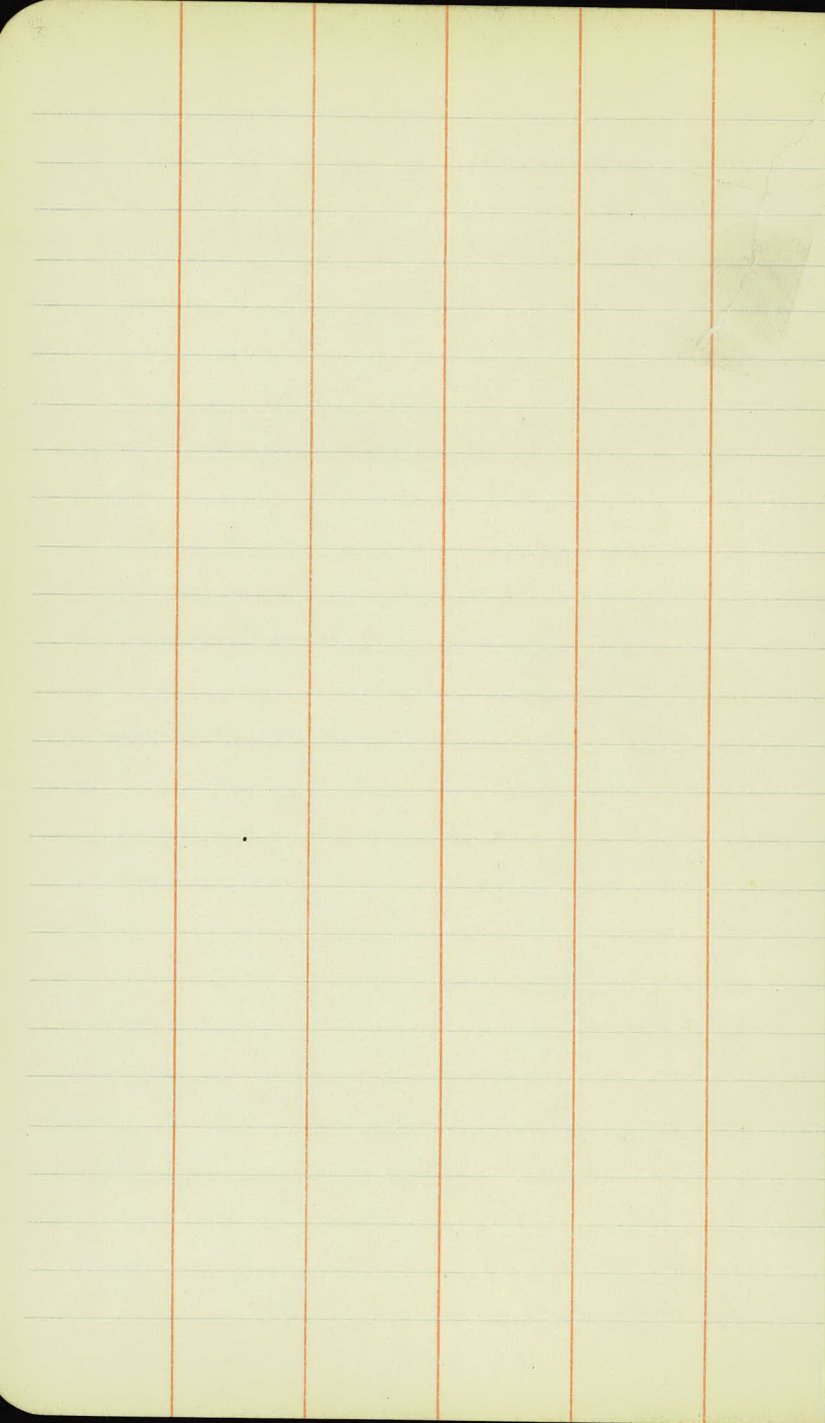
27' Rt. F.E.

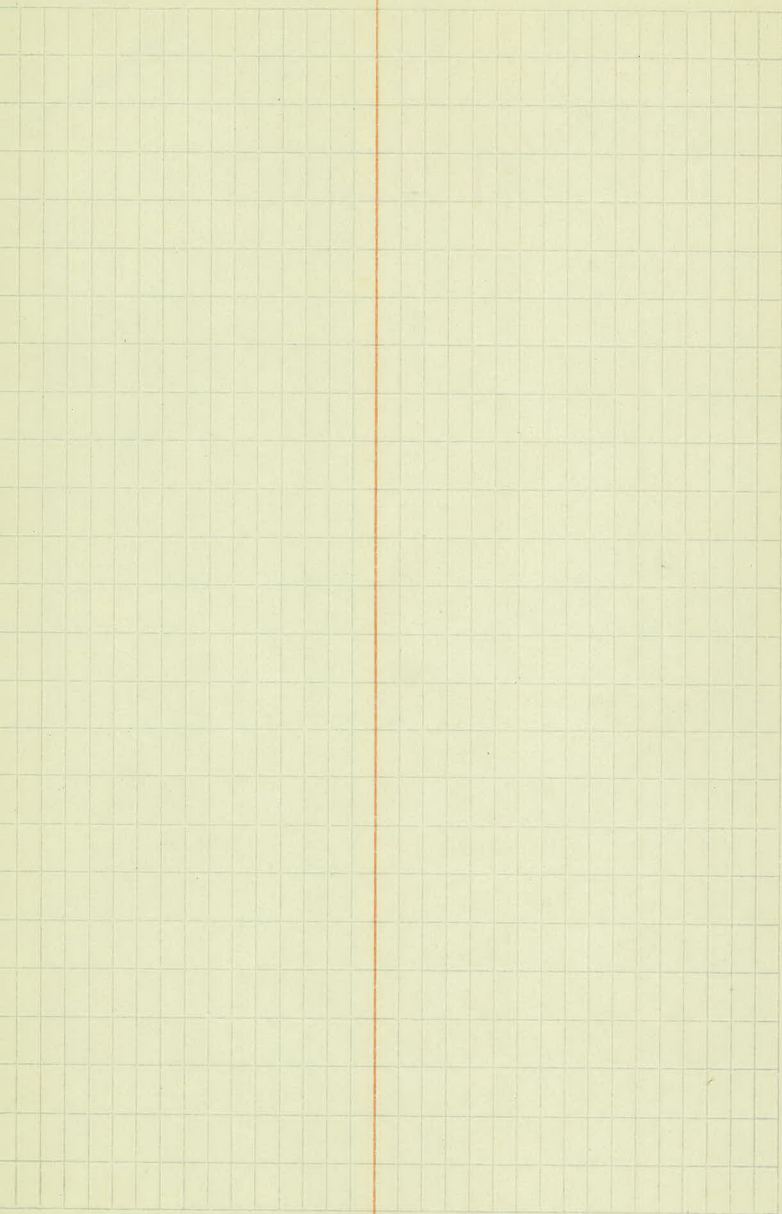
24' Rt } $\neq$ Plotted St.

24' Lt }

24' Lt + Rt.







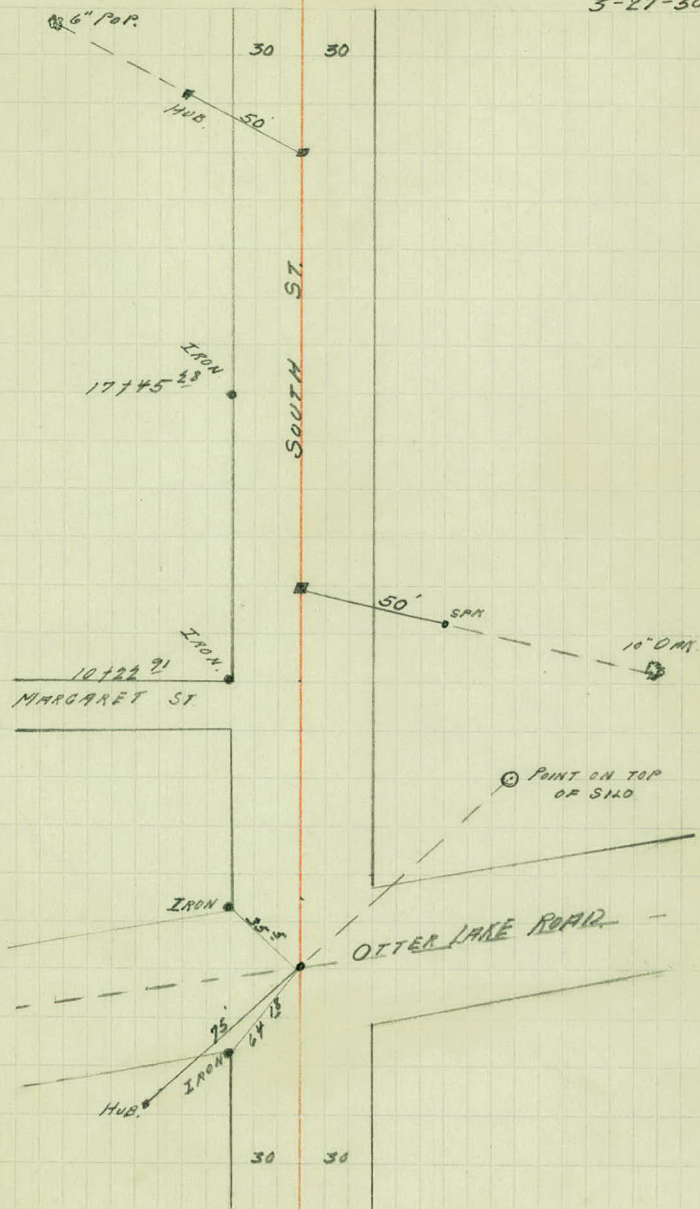
STA	POINT	Δ LT	Δ RT
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23+00 ⁶⁵	P.I.		0°-19
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14+06 ⁸	P.O.T.		
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0+00			
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3-27-30

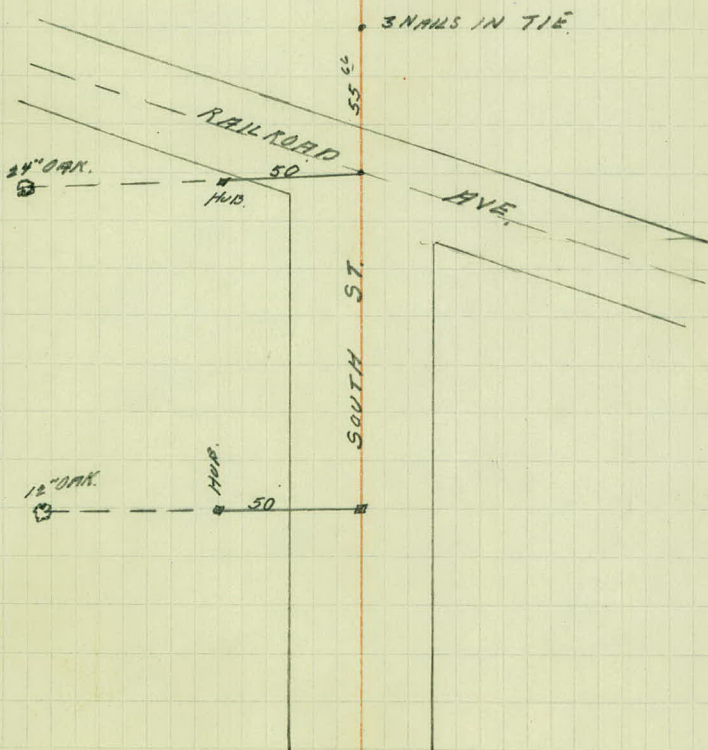


STA.	POINT	Δ LT.	Δ RT.
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40+13 ⁵	P.O.T.		
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29+13 ⁵⁹	P.O.T.		
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3-27-30



B.N.	3.36	934.24 ✓	930.90	
0+00			29.3	2.0
+27			29.4	4.9
+50			29.45	4.8
1+00			29.6	4.7
+50			29.75	4.5
2+00			29.9	4.3
+50			30.05	4.2
3+00			30.2	4.1
+50			30.35	3.9
4+00			30.5 ✓	3.8
	5.09	935.86 ✓	3.49	930.77
+50			30.65	5.2
5+00			30.8	5.1

4-5-30

ON SPR IN T.P. 100 N OT 50.

4.5
30

4.5
30

2/4.8 5/5.8 50 4.8 5.6 4.9 4.6 4.8 5.5 5.2 4.5 4.8 1/0.5
2/0.0 4/-10 30 16 15 7 10.2 6 14 15 27 30 1/0.07

50 4.5 5.5 4.3 4.3 4.4 5.9 5.3 5.3 7/5.8 5/5.1
30 18 15 5 10.5 4 12 14 30 1/0.5 2/-0.5

4/5.0 2/5.4 51 4.8 5.5 4.0 4.0 4.5 4.9 4.9 8/4.8 7/4.8
2/0.4 4/-0.8 30 17 15 3 10.6 5 11 30 1/0.2 2/-0.2

9/5.2 4/5.6 52 5.1 5.6 5.3 4.4 4.3 4.4 5.1 4.9 4.8 6/4.9 5/4.8
-0.7 4/-1.1 30 18 16 11 4 10.2 5 11 12 30 1/0.4 2/-0.5

8/5.1 2/6.1 55 5.1 6.2 5.9 4.9 4.6 4.9 5.2 4.8 4.0 7/5.0 4/4.7
2/0.8 1/5/-1.8 30 18 15 7 4 -0.3 7 10 17 13 1/0.7 2/-0.4

8/5.2 6/5.9 51 5.0 5.9 5.4 4.8 4.4 4.5 5.1 5.4 5.1 5.1 4/5.4 6/5.1
-1.0 1/5/-1.7 30 17 16 13 5 -0.2 4 13 14 17 30 1/0.2 2/-0.9

4/4.9 4/5.5 52 5.1 5.6 5.2 4.5 4.1 4.4 4.8 4.9 4.6 4.9 4.9 3/4.9 9/4.7
-0.9 1/5/-1.5 30 19 17 12 5 -0.1 7 8 10 11 15 30 1/0.9 2/-0.7

4/4.7 1/5.3 4.9 4.7 5.4 5.0 4.0 3.9 4.1 4.7 4.4 4.8 5.3 5.2 5/4.9 2/5.1
0.8 1/5/-1.4 30 19 18 13 5 0.0 6 9 12 15 22 30 1/0.10 2/-1.2

4.4 1/5.1 4.6 4.5 5.2 4.5 3.3 3.3 3.7 4.1 3.6 4.6 4/4.1
0.7 1/5/-1.4 30 18 17 11 4 10.4 7 11 12 30 2/-0.4

6.2 1/6.4 6.4 6.1 6.7 5.8 5.2 4.7 5.1 5.8 5.4 5.9 6.3 7/5.7 6/6.1
1.0 1/5/-1.2 30 21 19 11 6 10.5 5 10 12 16 30 1/0.05 2/-0.9

1 2/6.6 6.3 6.2 6.7 5.7 4.7 4.4 4.9 5.5 5.2 6.1 6.4 5/5.2 5/6.1
2 1/5/-1.5 30 18 17 10 4 10.7 6 12 13 20 30 1/0.01 2/-1.0

✓
935.86

+50

30.86

5.0

6 +00

30.9

5.0

+50

30.9

5.0

7 +00

30.9

5.0

+50

30.8

5.1

8 +00

30.7

5.2

+50

30.5

5.4

9 +00

30.4

5.5

+50

30.15

5.7

10 +00

✓ 296

29.9

✓

6.0

B.M.

4.74

934.79

5.77

930.09

930.0

+23

29.8

5.0

150 293

11 +00

29.0

29.4

5.4

4-5-30

$$\begin{array}{r} \overset{x}{6.3} \quad \overset{5}{1.3} \quad \overset{5}{1.7} \quad 6.3 \quad 6.1 \quad 4.6 \quad 5.9 \quad 5.0 \quad 4.7 \quad \overset{(5.0)}{5.0} \quad 5.6 \quad 5.2 \quad 6.0 \quad \overset{6}{1.5} \quad \overset{8}{1.5} \\ \hline 1.3 \quad 1.7 \quad 3.0 \quad 2.1 \quad 1.7 \quad 1.2 \quad 7 \quad 10.3 \quad 7 \quad 10 \quad 12 \quad 3.0 \quad 1.5 \quad 2.0 \end{array}$$

$$\begin{array}{r} \overset{1}{1.5} \quad \overset{5}{0.7} \quad \overset{5}{1.0} \quad 5.9 \quad 5.6 \quad 6.4 \quad 5.9 \quad 4.9 \quad 4.4 \quad 4.2 \quad \overset{(5.0)}{4.4} \quad 5.1 \quad 4.5 \quad 5.1 \quad 5.9 \\ \hline 0.7 \quad 1.0 \quad 3.0 \quad 1.9 \quad 1.7 \quad 1.3 \quad 8 \quad 6 \quad 10.8 \quad 5 \quad 11 \quad 12 \quad 14 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{1}{1.5} \quad \overset{9}{0.4} \quad \overset{9}{1.3} \quad 5.6 \quad 5.4 \quad 5.9 \quad 5.1 \quad 4.3 \quad 3.9 \quad \overset{(5.0)}{4.1} \quad 4.6 \quad 4.4 \quad 4.9 \quad 5.5 \\ \hline 0.4 \quad 1.3 \quad 3.0 \quad 2.1 \quad 1.8 \quad 1.3 \quad 6 \quad 11.1 \quad 6 \quad 7 \quad 12 \quad 15 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{x}{1.5} \quad \overset{9}{0.5} \quad \overset{9}{1.3} \quad 5.6 \quad 5.5 \quad 6.0 \quad 4.9 \quad 4.1 \quad 4.0 \quad \overset{(5.0)}{4.2} \quad 4.9 \quad 5.2 \quad 5.9 \\ \hline 0.5 \quad 1.3 \quad 3.0 \quad 2.0 \quad 1.8 \quad 1.1 \quad 6 \quad 11.0 \quad 6 \quad 1.1 \quad 14 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{x}{1.1} \quad \overset{9}{0.1} \quad \overset{9}{1.3} \quad 6.1 \quad 5.9 \quad 6.6 \quad 5.0 \quad 4.4 \quad 4.1 \quad \overset{(5.0)}{4.6} \quad 5.3 \quad 5.8 \quad 6.2 \\ \hline 0 \quad 1.3 \quad 3.0 \quad 1.9 \quad 1.7 \quad 1.0 \quad 6 \quad 11.0 \quad 7 \quad 11 \quad 19 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{5}{1.1} \quad \overset{5}{1.4} \quad \overset{5}{1.0} \quad 6.5 \quad 6.3 \quad 6.8 \quad 5.6 \quad 4.7 \quad 4.6 \quad \overset{(5.0)}{4.8} \quad 5.7 \quad 6.5 \quad 6.5 \\ \hline 1.1 \quad 1.4 \quad 3.0 \quad 2.0 \quad 1.8 \quad 1.1 \quad 4 \quad 10.6 \quad 6 \quad 11 \quad 21 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{x}{1.6} \quad \overset{4}{1.2} \quad \overset{4}{1.0} \quad 6.6 \quad 6.6 \quad 7.1 \quad 6.2 \quad 5.6 \quad 4.9 \quad 4.8 \quad \overset{(5.0)}{5.0} \quad 5.6 \quad 5.6 \quad 6.2 \quad 6.2 \\ \hline 1.2 \quad 1.0 \quad 3.0 \quad 2.0 \quad 1.8 \quad 1.4 \quad 8 \quad 4 \quad 10.6 \quad 8 \quad 12 \quad 13 \quad 22 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{x}{1.5} \quad \overset{8}{0.1} \quad \overset{8}{1.2} \quad 6.5 \quad 6.5 \quad 7.1 \quad 6.0 \quad 5.0 \quad 4.9 \quad \overset{(5.0)}{5.2} \quad 5.3 \quad 6.0 \quad 6.1 \\ \hline 0 \quad 1.2 \quad 3.0 \quad 2.0 \quad 1.7 \quad 1.1 \quad 5 \quad 10.6 \quad 8 \quad 13 \quad 22 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{1}{1.6} \quad \overset{3}{0.9} \quad \overset{3}{1.0} \quad 6.5 \quad 6.4 \quad 7.1 \quad 6.1 \quad 5.1 \quad 4.9 \quad \overset{(5.0)}{5.1} \quad 5.6 \quad 6.0 \quad 6.3 \\ \hline 0.9 \quad 1.0 \quad 3.0 \quad 2.2 \quad 1.7 \quad 1.6 \quad 5 \quad 10.8 \quad 6 \quad 9 \quad 14 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{x}{1.5} \quad \overset{6}{1.1} \quad \overset{6}{1.0} \quad 6.2 \quad 5.8 \quad 6.5 \quad 6.4 \quad 6.0 \quad 5.6 \quad 5.9 \quad \overset{(5.0)}{6.0} \quad 5.7 \quad 6.1 \quad 5.6 \quad 5.3 \\ \hline 1.1 \quad 1.0 \quad 3.0 \quad 2.1 \quad 1.9 \quad 1.5 \quad 10 \quad 4 \quad 10.1 \quad 8 \quad 9 \quad 13 \quad 16 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{x}{1.5} \quad \overset{9}{0.5} \quad \overset{9}{1.0} \quad 5.5 \quad 5.5 \quad 5.1 \quad 6.0 \quad 5.6 \quad 4.8 \quad \overset{(5.0)}{5.0} \quad 5.6 \quad 5.2 \quad 5.0 \quad 5.1 \quad 5.2 \\ \hline 0.5 \quad 1.0 \quad 3.0 \quad 3.3 \quad 3.0 \quad 2.0 \quad 2.0 \quad 8 \quad 4 \quad 0.0 \quad 7 \quad 11 \quad 22 \quad 3.0 \end{array}$$

$$\begin{array}{r} \overset{1}{1.4} \quad \overset{4}{0.1} \quad \overset{4}{1.0} \quad 5.4 \quad 5.4 \quad 5.8 \quad 6.4 \quad 5.3 \quad 4.6 \quad 5.1 \quad \overset{(5.0)}{5.9} \quad 6.6 \quad 5.4 \quad 5.5 \\ \hline 0 \quad 1.0 \quad 3.0 \quad 3.3 \quad 3.0 \quad 2.3 \quad 2.1 \quad 1.3 \quad 4 \quad 10.3 \quad 6 \quad 14 \quad 14 \quad 3.0 \end{array}$$

73479 ✓

+50

28.7

29.15

5.6

12

28.4

28.9

5.9

+50

28.1

28.61

6.2

13

27.8

28.24

6.6

+50

27.5

27.78

7.0

14

27.0

27.25

7.5

+20

27.4

7.4

+50

26.4

26.64

8.2

15

25.8 ✓

25.9 ✓

8.7

3.08

730.22

7.65

727.14

+50

25.0

25.15

5.1

16

24.2

24.3

5.9

+50

23.4

6.8 ✓

B.M.

5.78

730.21 ✓

5.78

724.44

724.4

4-7-29

$$\begin{array}{r} 0/5.9 \\ 1-0.3 \end{array} \quad \begin{array}{cccccccccccc} 61 & 56 & 69 & 54 & 48 & 51 & 58 & 66 & 56 & 55 & 55 \\ 33 & 22 & 21 & 13 & 4 & 10.5 & 11 & 12 & 15 & 30 & 33 \end{array} \quad \begin{array}{r} 0/5.5 \\ 3/10.1 \end{array}$$

$$\begin{array}{r} 1/5.3 \\ 0.6 \end{array} \quad \begin{array}{cccccccccccc} 55 & 53 & 51 & 64 & 53 & 49 & 50 & 56 & 65 & 56 & 54 & 55 \\ 33 & 30 & 23 & 20 & 14 & 4 & 10.9 & 5 & 12 & 13 & 30 & 33 \end{array} \quad \begin{array}{r} 0/5.4 \\ 3/10.5 \end{array}$$

$$\begin{array}{r} 0/5.0 \\ 1/1.2 \end{array} \quad \begin{array}{cccccccccccc} 52 & 50 & 51 & 59 & 52 & 45 & 46 & 5.3 & 6.2 & 5.1 & 52 & 51 \\ 33 & 30 & 23 & 22 & 16 & 4 & 11.6 & 4 & 10 & 12 & 30 & 33 \end{array} \quad \begin{array}{r} 0/5.2 \\ 3/11.0 \end{array}$$

$$\begin{array}{r} 0/5.9 \\ 1/0.7 \end{array} \quad \begin{array}{cccccccccccc} 59 & 59 & 59 & 66 & 57 & 48 & 50 & 56 & 68 & 54 & 53 & 55 \\ 33 & 30 & 24 & 21 & 14 & 4 & 11.6 & 4 & 11 & 12 & 30 & 33 \end{array} \quad \begin{array}{r} 0/5.3 \\ 3/11.3 \end{array}$$

$$\begin{array}{r} 0/6.7 \\ 1/0.3 \end{array} \quad \begin{array}{cccccccccccc} 68 & 67 & 66 & 71 & 62 & 55 & 58 & 61 & 67 & 58 & 56 & 56 \\ 33 & 30 & 24 & 23 & 15 & 5 & 11.2 & 5 & 10 & 11 & 30 & 33 \end{array} \quad \begin{array}{r} 0/5.6 \\ 3/11.4 \end{array}$$

$$\begin{array}{r} 0/6.5 \\ 1/1.0 \end{array} \quad \begin{array}{cccccccccccc} 65 & 65 & 62 & 73 & 62 & 55 & 57 & 6.3 & 67 & 58 & 5.5 & 5.5 \\ 33 & 30 & 24 & 23 & 16 & 4 & 11.8 & 5 & 9 & 11 & 30 & 33 \end{array} \quad \begin{array}{r} 0/5.5 \\ 3/12.0 \end{array}$$

$$\begin{array}{cccccccccccc} 66 & 61 & 59 & 68 & 60 & 53 & 58 & 67 & 56 & 54 & 54 \\ 33 & 30 & 24 & 22 & 17 & 5 & 8 & 10 & 30 & 33 \end{array}$$

$$\begin{array}{r} 0/6.0 \\ 1/2.2 \end{array} \quad \begin{array}{cccccccccccc} 61 & 60 & 59 & 69 & 67 & 64 & 66 & 71 & 7.5 & 70 & 56 & 54 & 55 \\ 33 & 30 & 24 & 21 & 15 & 4 & 11.4 & 4 & 7 & 9 & 10 & 30 & 33 \end{array} \quad \begin{array}{r} 0/5.4 \\ 3/12.8 \end{array}$$

$$\begin{array}{r} 0/5.6 \\ 1/3.3 \end{array} \quad \begin{array}{cccccccccccc} 55 & 56 & 58 & 23 & 72 & 7.9 & 80 & 5.5 & 5.8 & 5.7 \\ 33 & 30 & 24 & 21 & 11 & 11.0 & 11 & 13 & 30 & 33 \end{array} \quad \begin{array}{r} 0/5.8 \\ 3/13.1 \end{array}$$

$$\begin{array}{r} 0/1.0 \\ 1/4.1 \end{array} \quad \begin{array}{cccccccccccc} 0.8 & 1.0 & 1.3 & 42 & 37 & 41 & 5.2 & 2.2 & 2.6 & 3.0 & 3.1 \\ 33 & 30 & 23 & 19 & 4 & 11.0 & 11 & 14 & 24 & 30 & 33 \end{array} \quad \begin{array}{r} 0/3.0 \\ 3/12.1 \end{array}$$

$$\begin{array}{r} 0/2.2 \\ 1/3.7 \end{array} \quad \begin{array}{cccccccccccc} 21 & 22 & 26 & 54 & 47 & 50 & 51 & 57 & 49 & 60 & 61 \\ 30 & 30 & 22 & 18 & 4 & 10.9 & 7 & 12 & 13 & 30 & 33 \end{array} \quad \begin{array}{r} 0/6.0 \\ 3/10.1 \end{array}$$

$$\begin{array}{r} 0/5.0 \\ 1/1.8 \end{array} \quad \begin{array}{cccccccccccc} 4.7 & 5.0 & 5.8 & 7.7 & 6.9 & 7.3 & 81 & 70 & 98 & 102 \\ 33 & 30 & 21 & 18 & 4 & 10.5 & 10 & 20 & 31 & 33 \end{array} \quad \begin{array}{r} 0/8.5 \\ 15/17 \end{array}$$

930.21 ✓

17 +00

22.6

7.4

+50

21.9

8.3

18 +00

16.0

21.4

✓ 142 8.8

B.M.

0.54

924.97 ✓

5.78

924.43

4.63

924.09 ✓

5.51

919.46 ✓

+50

15.95

21.04

81 3.1

19

15.9

20.9

82 3.2

+50

15.85

20.8 ✓

82 3.3

4.62

923.99 ✓

4.72

919.37

20

15.80

20.9

82 3.1

+50

20.95

3.0

21

21.0

3.0

+50

21.05

2.9

22

21.1

2.9

4-8-29

(7.6)

$$\begin{array}{r} 9/25 \\ 1/19 \end{array} \quad \begin{array}{cccccccccccc} 8.1 & 8.4 & 9.3 & 9.8 & 9.7 & 9.9 & 10.3 & 11.4 & 11.6 & 11.5 & 11.6 \\ 33 & 30 & 20 & 11 & 4 & 23 & 5 & 8 & 18 & 30 & 33 \end{array} \quad \begin{array}{r} 0/16 \\ 19/-40 \end{array}$$

(4.3)

$$\begin{array}{r} 5/13 \\ 1/-30 \end{array} \quad \begin{array}{cccccccccccc} 11.6 & 11.5 & 11.4 & 10.6 & 10.5 & 10.6 & 10.4 & 11.6 & 12.1 & 12.1 \\ 33 & 30 & 10 & 8 & 3 & 23 & 5 & 7 & 30 & 33 \end{array} \quad \begin{array}{r} 8/17 \\ 1/-34 \end{array}$$

(8.4)

$$\begin{array}{r} 8/11.4 \\ 2/12.8 \end{array} \quad \begin{array}{r} 1/11.4 \\ 1/12.2 \end{array} \quad \begin{array}{r} 0/11.5 \\ 1/-2.7 \end{array} \quad \begin{array}{cccccccccccc} 11.4 & 11.6 & 10.8 & 10.9 & 11.0 & 12.1 & 11.8 & 11.2 \\ 33 & 9 & 7 & 21 & 4 & 8 & 30 & 33 \end{array} \quad \begin{array}{r} 5/11.7 \\ 2/-2.5 \end{array} \quad \begin{array}{r} 6/11.9 \\ 1/-3.1 \end{array} \quad \begin{array}{r} 0/11.8 \\ 2/12.4 \end{array}$$

(3.1)

$$\begin{array}{r} 1/5.2 \\ 12.9 \end{array} \quad \begin{array}{r} 3/5.4 \\ 1/12.7 \end{array} \quad \begin{array}{r} 5/5.3 \\ 1/2.2 \end{array} \quad \begin{array}{cccccccccccc} 5.7 & 5.7 & 5.6 & 6.1 & 4.8 & 4.7 & 4.9 & 4.9 & 5.6 & 5.8 & 5.7 \\ 22 & 33 & 30 & 18 & 8 & 6 & 2 & 7.8 & 3 & 4 & 30 & 33 \end{array} \quad \begin{array}{r} 5/5.8 \\ 1/12.3 \end{array} \quad \begin{array}{r} 5/5.6 \\ 2/12.5 \end{array} \quad \begin{array}{r} 0/5.8 \\ 1/-2.7 \end{array}$$

(3.2)

$$\begin{array}{r} 5.2 \\ 13.0 \end{array} \quad \begin{array}{r} 0/5.2 \\ 1/13.0 \end{array} \quad \begin{array}{r} 6/5.6 \\ 1/-2.4 \end{array} \quad \begin{array}{cccccccccccc} 5.3 & 5.5 & 5.5 & 4.8 & 4.6 & 4.7 & 5.0 & 5.6 & 5.9 & 6.4 \\ 33 & 10 & 6 & 4 & 2 & 7.5 & 3 & 4 & 16 & 33 \end{array} \quad \begin{array}{r} 7/5.7 \\ 1/-2.5 \end{array} \quad \begin{array}{r} 6/5.8 \\ 2/12.4 \end{array} \quad \begin{array}{r} 4/5.8 \\ 2/12.4 \end{array}$$

(2.3)

$$\begin{array}{r} 5.6 \\ 12.6 \end{array} \quad \begin{array}{r} 3/5.5 \\ 2/12.7 \end{array} \quad \begin{array}{r} 0/5.3 \\ 1/-2.0 \end{array} \quad \begin{array}{cccccccccccc} 5.0 & 5.2 & 5.7 & 4.9 & 4.7 & 4.9 & 5.2 & 6.2 & 5.5 & 5.5 & 5.9 \\ 33 & 14 & 6 & 4 & 7 & 4 & 2 & 3 & 5 & 8 & 18 & 33 \end{array} \quad \begin{array}{r} 0/6.2 \\ 2/12.0 \end{array} \quad \begin{array}{r} 2/5.4 \\ 2/12.8 \end{array} \quad \begin{array}{r} 4/5.6 \\ 2/12.3 \end{array}$$

(3.1)

$$\begin{array}{r} 4.9 \\ 5.3 \end{array} \quad \begin{array}{r} 5/5.3 \\ 1/-2.2 \end{array} \quad \begin{array}{cccccccccccc} 5.1 & 5.3 & 5.5 & 4.9 & 4.8 & 5.3 & 5.9 & 5.4 & 5.7 \\ 33 & 22 & 6 & 5 & 7.7 & 3 & 4 & 9 & 33 \end{array} \quad \begin{array}{r} 7/5.6 \\ 1/-2.5 \end{array} \quad \begin{array}{r} 3/5.5 \\ 2/12.7 \end{array} \quad \begin{array}{r} 7/5.5 \\ 2/12.7 \end{array}$$

(3.0)

$$\begin{array}{r} 1/5.5 \\ 1/-2.5 \end{array} \quad \begin{array}{cccccccccccc} 5.0 & 5.4 & 5.6 & 4.7 & 4.3 & 4.7 & 5.6 & 5.9 \\ 33 & 22 & 5 & 4 & 7.5 & 3 & 5 & 33 \end{array} \quad \begin{array}{r} 0/5.7 \\ 1/-2.7 \end{array}$$

(5.0)

$$\begin{array}{r} 6/5.4 \\ 1/-2.4 \end{array} \quad \begin{array}{cccccccccccc} 5.4 & 5.3 & 5.3 & 4.8 & 4.8 & 4.9 & 5.8 & 5.6 & 5.9 \\ 33 & 17 & 5 & 3 & 1.8 & 5 & 5 & 11 & 33 \end{array} \quad \begin{array}{r} 3/5.9 \\ 1/-2.9 \end{array}$$

(2.9)

$$\begin{array}{r} 1/5.4 \\ 1/-2.5 \end{array} \quad \begin{array}{cccccccccccc} 5.2 & 5.2 & 6.0 & 4.8 & 4.9 & 5.2 & 5.8 & 5.5 & 5.6 \\ 33 & 17 & 10 & 8 & 2.0 & 4 & 5 & 12 & 33 \end{array} \quad \begin{array}{r} 9/5.5 \\ 1/-2.6 \end{array}$$

(2.5)

$$\begin{array}{r} 9/5.5 \\ 1/-2.6 \end{array} \quad \begin{array}{cccccccccccc} 5.4 & 5.7 & 5.7 & 4.7 & 4.8 & 4.9 & 5.7 & 5.6 & 5.9 \\ 33 & 13 & 4 & 2 & 7.9 & 5 & 7 & 13 & 33 \end{array} \quad \begin{array}{r} 0/5.6 \\ 1/-2.7 \end{array}$$

		723.79 ✓				
	+50				21.15 ✓	2.8
		5.19	724.36 ✓	4.82	719.17	
23					21.2	3.2
	+50				21.25	3.1
24					21.3	3.1
	+50				21.35	3.0
25					21.4	3.0
	+50				21.5	2.9
26					21.6	2.8
	+50				21.9	2.5
27					22.1 ✓	2.3
		10.97	731.69 ✓	3.64	720.72 ✓	
B.M.		6.99	731.61 ✓	6.99	724.70 ✓	724.62
	+60				22.5	9.1

4-10-80

$$\begin{array}{r} \textcircled{28} \\ 1 \frac{0}{5.8} \quad \underline{52 \ 53 \ 52 \ 55 \ 48} \quad \underline{47 \ 49 \ 54 \ 53 \ 54} \quad 3 \frac{0}{5.0} \\ 1 \frac{6}{-2.5} \quad 33 \ 37 \ 12 \ 4 \ 2 \ -19 \ 5 \ 7 \ 22 \ 33 \quad 1 \frac{6}{-2.2} \end{array}$$

$$\begin{array}{r} \textcircled{33} \\ 1 \frac{0}{5.5} \quad \underline{55 \ 56 \ 56 \ 48} \quad \underline{48 \ 49 \ 56 \ 57 \ 56} \quad 1 \frac{0}{5.7} \\ 1 \frac{6}{-2.3} \quad 33 \ 13 \ 3 \ 1 \ -7.6 \ 6 \ 8 \ 21 \ 33 \quad 1 \frac{6}{-2.5} \end{array}$$

$$\begin{array}{r} \textcircled{31} \\ 1 \frac{0}{5.4} \quad \underline{57 \ 56 \ 56 \ 58 \ 49} \quad \underline{49 \ 51 \ 60 \ 56 \ 58} \quad 1 \frac{0}{5.2} \\ 1 \frac{6}{-2.3} \quad 33 \ 18 \ 7 \ 4 \ 1 \ -18 \ 6 \ 8 \ 16 \ 33 \quad 1 \frac{6}{-2.5} \end{array}$$

$$\begin{array}{r} \textcircled{31} \\ 1 \frac{0}{5.9} \quad \underline{55 \ 56 \ 56 \ 46} \quad \underline{48 \ 49 \ 58 \ 59 \ 56 \ 57} \quad 1 \frac{0}{5.2} \\ 1 \frac{6}{-2.8} \quad 33 \ 17 \ 5 \ 1 \ -7.4 \ 5 \ 7 \ 12 \ 22 \ 33 \quad 1 \frac{6}{-2.5} \end{array}$$

$$\begin{array}{r} \textcircled{30} \\ 1 \frac{0}{5.7} \quad \underline{59 \ 57 \ 56 \ 47} \quad \underline{48 \ 48 \ 57 \ 57 \ 57} \quad 2 \frac{0}{5.8} \\ 1 \frac{6}{-2.7} \quad 33 \ 15 \ 3 \ 2 \ -7.8 \ 6 \ 8 \ 22 \ 33 \quad 1 \frac{6}{-2.8} \end{array}$$

$$\begin{array}{r} \textcircled{30} \\ 1 \frac{0}{5.7} \quad \underline{56 \ 56 \ 54 \ 50} \quad \underline{50 \ 48 \ 57 \ 57 \ 60} \quad 1 \frac{0}{5.5} \\ 1 \frac{6}{-2.7} \quad 33 \ 14 \ 3 \ 1 \ -20 \ 7 \ 9 \ 20 \ 33 \quad 1 \frac{6}{-2.5} \end{array}$$

$$\begin{array}{r} \textcircled{29} \\ 1 \frac{0}{5.6} \quad \underline{56 \ 58 \ 59 \ 57} \quad \underline{49 \ 49 \ 52 \ 60 \ 56} \quad \underline{56} \quad 3 \frac{0}{5.8} \\ 1 \frac{6}{-2.7} \quad 33 \ 22 \ 9 \ 1 \ -20 \ 4 \ 7 \ 11 \ 21 \ 33 \quad 1 \frac{6}{-2.9} \end{array}$$

$$\begin{array}{r} \textcircled{24} \\ 1 \frac{3}{5.7} \quad \underline{58 \ 56 \ 50 \ 45} \quad \underline{45 \ 45 \ 44 \ 51 \ 58 \ 58} \quad \underline{60} \quad 9 \frac{0}{5.4} \\ 1 \frac{6}{-2.9} \quad 33 \ 12 \ 5 \ 3 \ -7.4 \ 4 \ 10 \ 14 \ 20 \ 27 \ 33 \quad 1 \frac{6}{-2.6} \end{array}$$

$$\begin{array}{r} \textcircled{26} \\ 1 \frac{6}{5.7} \quad \underline{58 \ 55 \ 47 \ 42} \quad \underline{40 \ 41 \ 43 \ 53 \ 57} \quad 2 \frac{0}{5.3} \\ 1 \frac{6}{-3.2} \quad 33 \ 13 \ 6 \ 4 \ -7.5 \ 6 \ 16 \ 17 \ 33 \quad 1 \frac{6}{-2.8} \end{array}$$

$$\begin{array}{r} \textcircled{23} \\ 1 \frac{0}{5.7} \quad \underline{54 \ 58 \ 53 \ 45} \quad \underline{39 \ 38 \ 41 \ 49 \ 47} \quad \underline{41 \ 36} \quad 1 \frac{0}{5.0} \\ 1 \frac{6}{-3.4} \quad 33 \ 24 \ 11 \ 4 \ -7.6 \ 7 \ 11 \ 17 \ 24 \ 30 \ 33 \quad 1 \frac{6}{-2.7} \end{array}$$

$$\begin{array}{r} \textcircled{41} \\ 3 \frac{0}{9.3} \quad 9 \frac{0}{10.5} \quad \underline{119 \ 116 \ 103} \quad \underline{91 \ 96} \quad \underline{90 \ 87 \ 93 \ 57 \ 52} \quad 2 \frac{0}{5.6} \\ -0.2 \quad 1 \frac{9}{-1.4} \quad 33 \ 30 \ 18 \ 9 \ 11 \ 10 \ 1 \ 7 \ 20 \ 26 \ 33 \quad 1 \frac{6}{-2.5} \end{array}$$

931.61 ✓

28

22.7

8.9

+75

22.9

8.7

29

23.0

8.6

+50

23.0

8.6

30

23.0

8.6

+25

22.9

8.7

31

22.7

8.9

+50

4.47

926.78 ✓

9.30

22.4 ✓

9.2

922.31

32

22.1

4.7

+60

22.0

4.8

2.
193

4.
190

33

21.9

4.9

+50

B.N.

2.14

4.4 ✓

22.2

924.62

4-10-30

(49)

$$\begin{array}{r} 8/70 \\ 2/71.9 \end{array} \quad \begin{array}{cccccccccccccccc} 73 & 75 & 61 & 72 & 75 & 82 & 68 & 67 & 70 & 77 & 44 & 42 & 42 & 9/42 \\ 33 & 30 & 16 & 14 & 12 & 10 & 12 & 1 & 6 & 15 & 17 & 22 & 30 & 33 & 2/747 \end{array}$$

(47)

$$\begin{array}{r} 0/3.2 \\ 3/15.5 \end{array} \quad \begin{array}{cccccccccccccccc} 36 & 32 & 37 & 53 & 61 & 50 & 45 & 51 & 56 & 31 & 32 & 9/34 \\ 33 & 28 & 19 & 17 & 12 & 5 & 14 & 6 & 11 & 18 & 20 & 33 & 2/753 \end{array}$$

(46)

$$\begin{array}{r} 0/3.2 \\ 3/15.4 \end{array} \quad \begin{array}{cccccccccccccccc} 31 & 31 & 52 & 57 & 50 & 54 & 60 & 32 & 33 & 33 & 9/33 \\ 33 & 17 & 15 & 12 & 13 & 6 & 10 & 18 & 20 & 30 & 33 & 2/753 \end{array}$$

(46)

$$\begin{array}{r} 9/37 \\ 2/749 \end{array} \quad \begin{array}{cccccccccccccccc} 36 & 38 & 40 & 56 & 50 & 55 & 56 & 40 & 39 & 9/40 \\ 33 & 26 & 14 & 12 & 13 & 6 & 10 & 18 & 20 & 33 & 2/746 \end{array}$$

(46)

$$\begin{array}{r} 8/43 \\ 2/743 \end{array} \quad \begin{array}{cccccccccccccccc} 42 & 43 & 41 & 59 & 57 & 54 & 57 & 61 & 45 & 48 & 7/48 \\ 33 & 30 & 16 & 14 & 5 & 13 & 2 & 4 & 11 & 13 & 33 & 2/758 \end{array}$$

(47)

$$\begin{array}{r} 6/44 \\ 2/743 \end{array} \quad \begin{array}{cccccccccccccccc} 43 & 44 & 48 & 65 & 57 & 51 & 46 & 54 & 61 & 51 & 59 & 59 & 4/56 \\ 33 & 27 & 17 & 14 & 9 & 4 & 14 & 1 & 6 & 11 & 14 & 30 & 33 & 2/751 \end{array}$$

(49)

$$\begin{array}{r} 5/32 \\ 2/757 \end{array} \quad \begin{array}{cccccccccccccccc} 50 & 50 & 56 & 85 & 79 & 74 & 77 & 85 & 84 & 95 & 100 & 105 & 4/95 \\ 33 & 30 & 31 & 14 & 11 & 11 & 5 & 4 & 11 & 14 & 24 & 30 & 33 & 2/784 \end{array}$$

(92)

$$\begin{array}{r} 7/1 \\ 2/1 \end{array} \quad \begin{array}{r} 3/101 \\ 4/09 \end{array} \quad \begin{array}{cccccccccccccccc} 65 & 70 & 75 & 103 & 94 & 90 & 91 & 101 & 112 & 125 & 133 & 124 & 131 & 7/11.0 \\ 33 & 27 & 21 & 16 & 10 & 4 & 10 & 1 & 8 & 15 & 21 & 26 & 38 & 33 & 1/18 \end{array}$$

(47)

$$\begin{array}{r} 4/66 \\ 1/19 \end{array} \quad \begin{array}{r} 8/55 \\ 4/08 \end{array} \quad \begin{array}{cccccccccccccccc} 34 & 40 & 67 & 58 & 54 & 53 & 64 & 81 & 91 & 93 & 3/89 \\ 33 & 24 & 18 & 11 & 4 & 0 & 8 & 12 & 28 & 33 & 1/42 \end{array}$$

(48)

$$\begin{array}{r} 16/72 \\ 1/24 \end{array} \quad \begin{array}{cccccccccccccccc} 37 & 40 & 58 & 73 & 66 & 64 & 65 & 72 & 84 & 90 & 95 & 9/90 \\ 33 & 30 & 31 & 18 & 10 & 5 & 17 & 16 & 10 & 20 & 33 & 1/72 \end{array}$$

(49)

$$\begin{array}{r} 10/69 \\ 1/20 \end{array} \quad \begin{array}{cccccccccccccccc} 55 & 54 & 73 & 68 & 62 & 60 & 63 & 67 & 80 & 89 & 9/82 \\ 33 & 22 & 19 & 16 & 9 & 4 & 14 & 8 & 11 & 33 & 17/33 \end{array}$$

(46)

$$\begin{array}{r} 8/58 \\ 1/12 \end{array} \quad \begin{array}{cccccccccccccccc} 31 & 43 & 66 & 62 & 56 & 54 & 56 & 63 & 70 & 78 & 81 & 5/76 \\ 33 & 24 & 20 & 17 & 12 & 6 & 10 & 9 & 11 & 23 & 33 & 1/30 \end{array}$$

✓
926.78

34					22.5	4.3
+50					23.0	3.8
35					23.5	3.3
+20					23.7	3.1
+50					24.0	2.8
36					24.5	2.5
	7.37	932.56	1.59	725.19	✓	
+50				25.0		7.4
37					25.5	7.1
B.M.	2.44	932.53	2.44	930.12	✓	930.0
+50				25.9		6.6
38					26.2	6.3
+50					26.6	5.9
39					26.8	5.7

4-10-30

$$\begin{array}{r} 59 \\ 6 \end{array} \begin{array}{l} 4\frac{5}{11} 4 \\ 1 \end{array} \begin{array}{l} 23 \\ 33 \end{array} \begin{array}{l} 31 \\ 26 \end{array} \begin{array}{l} 51 \\ 23 \end{array} \begin{array}{l} 61 \\ 20 \end{array} \begin{array}{l} 52 \\ 13 \end{array} \begin{array}{l} 46 \\ 6 \end{array} \begin{array}{l} 50 \\ 07 \end{array} \begin{array}{l} 55 \\ 9 \end{array} \begin{array}{l} 66 \\ 12 \end{array} \begin{array}{l} 74 \\ 22 \end{array} \begin{array}{l} 78 \\ 33 \end{array} \begin{array}{l} 9\frac{0}{70} \\ 7\frac{0}{27} \end{array}$$

$$\begin{array}{r} 56 \\ 78 \end{array} \begin{array}{l} 5\frac{4}{9} 8 \\ 1 \end{array} \begin{array}{l} 16 \\ 33 \end{array} \begin{array}{l} 27 \\ 25 \end{array} \begin{array}{l} 54 \\ 21 \end{array} \begin{array}{l} 49 \\ 14 \end{array} \begin{array}{l} 47 \\ 12 \end{array} \begin{array}{l} 47 \\ 9 \end{array} \begin{array}{l} 50 \\ 7.2 \end{array} \begin{array}{l} 52 \\ 7 \end{array} \begin{array}{l} 69 \\ 10 \end{array} \begin{array}{l} 77 \\ 22 \end{array} \begin{array}{l} 79 \\ 33 \end{array} \begin{array}{l} 5\frac{5}{57} \\ 1\frac{0}{57} \end{array}$$

$$\begin{array}{r} 9\frac{48}{75} \\ 7.5 \end{array} \begin{array}{l} 6\frac{4}{4} 4 \\ 1 \end{array} \begin{array}{l} 15 \\ 33 \end{array} \begin{array}{l} 20 \\ 30 \end{array} \begin{array}{l} 27 \\ 27 \end{array} \begin{array}{l} 46 \\ 23 \end{array} \begin{array}{l} 45 \\ 16 \end{array} \begin{array}{l} 42 \\ 9 \end{array} \begin{array}{l} 47 \\ 7.4 \end{array} \begin{array}{l} 50 \\ 7 \end{array} \begin{array}{l} 64 \\ 12 \end{array} \begin{array}{l} 71 \\ 23 \end{array} \begin{array}{l} 79 \\ 33 \end{array} \begin{array}{l} 7\frac{1}{38} \\ 1\frac{0}{38} \end{array}$$

$$\begin{array}{r} 4\frac{1}{10} \\ 7.0 \end{array} \begin{array}{l} 4\frac{3}{13} 4 \\ 1 \end{array} \begin{array}{l} 19 \\ 33 \end{array} \begin{array}{l} 26 \\ 28 \end{array} \begin{array}{l} 41 \\ 25 \end{array} \begin{array}{l} 41 \\ 19 \end{array} \begin{array}{l} 54 \\ 13 \end{array} \begin{array}{l} 31 \\ 9 \end{array} \begin{array}{l} 32 \\ 07 \end{array} \begin{array}{l} 40 \\ 4 \end{array} \begin{array}{l} 53 \\ 13 \end{array} \begin{array}{l} 55 \\ 23 \end{array} \begin{array}{l} 60 \\ 33 \end{array} \begin{array}{l} 6\frac{0}{20} \\ 1\frac{0}{20} \end{array}$$

$$\begin{array}{l} 10 \\ 33 \end{array} \begin{array}{l} 22 \\ 28 \end{array} \begin{array}{l} 22 \\ 20 \end{array} \begin{array}{l} 27 \\ 9 \end{array} \begin{array}{l} 34 \\ 9 \end{array} \begin{array}{l} 36 \\ 16 \end{array} \begin{array}{l} 37 \\ 29 \end{array} \begin{array}{l} 42 \\ 33 \end{array}$$

$$\begin{array}{r} 5 \\ 2 \end{array} \begin{array}{l} 06 \\ 33 \end{array} \begin{array}{l} 12 \\ 30 \end{array} \begin{array}{l} 23 \\ 26 \end{array} \begin{array}{l} 25 \\ 22 \end{array} \begin{array}{l} 18 \\ 18 \end{array} \begin{array}{l} 16 \\ 12 \end{array} \begin{array}{l} 23 \\ 6 \end{array} \begin{array}{l} 30 \\ 07 \end{array} \begin{array}{l} 34 \\ 9 \end{array} \begin{array}{l} 30 \\ 11 \end{array} \begin{array}{l} 38 \\ 10 \end{array} \begin{array}{l} 47 \\ 27 \end{array} \begin{array}{l} 57 \\ 33 \end{array} \begin{array}{l} 7\frac{1}{18} \\ 5\frac{0}{18} \end{array}$$

$$\begin{array}{r} 5\frac{1}{10} \\ 6\frac{1}{10} \end{array} \begin{array}{l} 55 \\ 33 \end{array} \begin{array}{l} 62 \\ 27 \end{array} \begin{array}{l} 69 \\ 22 \end{array} \begin{array}{l} 65 \\ 19 \end{array} \begin{array}{l} 65 \\ 15 \end{array} \begin{array}{l} 69 \\ 10 \end{array} \begin{array}{l} 74 \\ 10.2 \end{array} \begin{array}{l} 79 \\ 5 \end{array} \begin{array}{l} 84 \\ 15 \end{array} \begin{array}{l} 87 \\ 23 \end{array} \begin{array}{l} 95 \\ 33 \end{array} \begin{array}{l} 5\frac{8}{10} \\ 2\frac{0}{10} \end{array} \begin{array}{l} 9\frac{8}{10} \\ 1\frac{0}{10} \end{array}$$

$$\begin{array}{r} 3\frac{1}{10} \\ 6\frac{1}{10} \end{array} \begin{array}{l} 52 \\ 35 \end{array} \begin{array}{l} 55 \\ 30 \end{array} \begin{array}{l} 62 \\ 23 \end{array} \begin{array}{l} 61 \\ 19 \end{array} \begin{array}{l} 59 \\ 15 \end{array} \begin{array}{l} 63 \\ 9 \end{array} \begin{array}{l} 69 \\ 10.2 \end{array} \begin{array}{l} 73 \\ 7 \end{array} \begin{array}{l} 79 \\ 18 \end{array} \begin{array}{l} 92 \\ 33 \end{array} \begin{array}{l} 3\frac{8}{11} \\ 2\frac{0}{11} \end{array} \begin{array}{l} 9\frac{7}{10} \\ 1\frac{0}{10} \end{array}$$

$$\begin{array}{r} 2\frac{5}{10} \\ 4\frac{1}{10} \end{array} \begin{array}{l} 45 \\ 33 \end{array} \begin{array}{l} 54 \\ 23 \end{array} \begin{array}{l} 54 \\ 18 \end{array} \begin{array}{l} 54 \\ 14 \end{array} \begin{array}{l} 57 \\ 9 \end{array} \begin{array}{l} 65 \\ 10.1 \end{array} \begin{array}{l} 71 \\ 11 \end{array} \begin{array}{l} 80 \\ 21 \end{array} \begin{array}{l} 87 \\ 33 \end{array} \begin{array}{l} 9\frac{1}{14} \\ 1\frac{0}{14} \end{array} \begin{array}{l} 9\frac{7}{10} \\ 1\frac{0}{10} \end{array}$$

$$\begin{array}{r} 9\frac{1}{10} \\ 2\frac{1}{10} \end{array} \begin{array}{l} 42 \\ 33 \end{array} \begin{array}{l} 42 \\ 30 \end{array} \begin{array}{l} 51 \\ 22 \end{array} \begin{array}{l} 42 \\ 14 \end{array} \begin{array}{l} 50 \\ 8 \end{array} \begin{array}{l} 51 \\ 10.6 \end{array} \begin{array}{l} 60 \\ 9 \end{array} \begin{array}{l} 72 \\ 24 \end{array} \begin{array}{l} 76 \\ 33 \end{array} \begin{array}{l} 2\frac{1}{10} \\ 2\frac{0}{10} \end{array} \begin{array}{l} 2\frac{8}{10} \\ 2\frac{0}{10} \end{array}$$

$$\begin{array}{r} 4\frac{4}{10} \\ 2\frac{4}{10} \end{array} \begin{array}{l} 41 \\ 33 \end{array} \begin{array}{l} 41 \\ 25 \end{array} \begin{array}{l} 50 \\ 22 \end{array} \begin{array}{l} 47 \\ 14 \end{array} \begin{array}{l} 46 \\ 11 \end{array} \begin{array}{l} 46 \\ 7 \end{array} \begin{array}{l} 54 \\ 10.5 \end{array} \begin{array}{l} 60 \\ 13 \end{array} \begin{array}{l} 65 \\ 25 \end{array} \begin{array}{l} 69 \\ 33 \end{array} \begin{array}{l} 2\frac{1}{10} \\ 1\frac{0}{10} \end{array} \begin{array}{l} 2\frac{1}{10} \\ 1\frac{0}{10} \end{array}$$

$$\begin{array}{r} 4\frac{4}{10} \\ 2\frac{4}{10} \end{array} \begin{array}{l} 37 \\ 30 \end{array} \begin{array}{l} 41 \\ 23 \end{array} \begin{array}{l} 49 \\ 21 \end{array} \begin{array}{l} 46 \\ 17 \end{array} \begin{array}{l} 45 \\ 11 \end{array} \begin{array}{l} 47 \\ 6 \end{array} \begin{array}{l} 53 \\ 10.4 \end{array} \begin{array}{l} 57 \\ 12 \end{array} \begin{array}{l} 66 \\ 33 \end{array} \begin{array}{l} 2\frac{1}{10} \\ 1\frac{0}{10} \end{array} \begin{array}{l} 2\frac{1}{10} \\ 1\frac{0}{10} \end{array}$$

✓
732.53

+50

27.0

5.5

40

27.3

5.2

+13.5

27.4

✓ 5.1

B.M.

2.44

930.09

21+53 CROSS DRAIN 24"X48'

4-10-30

$$\begin{array}{r} 4/3.9 \\ 2/1.6 \end{array}$$

$$\begin{array}{cccccccc} 34 & 40 & 47 & 46 & 46 & 48 & 51 & 58 \\ 33 & 23 & 20 & 15 & 11 & 4 & 10.4 & 15 \end{array}$$

$$\begin{array}{r} 4/6.1 \\ 2/-0.6 \end{array}$$

$$\begin{array}{r} 3/5.7 \\ 1/-0.2 \end{array}$$

(5.0)

(5.2)

(5.1)

$$\begin{array}{r} 4/3.4 \\ 2/1.8 \end{array}$$

$$\begin{array}{cccccccc} 31 & 37 & 40 & 37 & 40 & 44 & 50 & 52 \\ 33 & 24 & 22 & 19 & 14 & 7 & 10.2 & 4 \end{array}$$

$$\begin{array}{r} 5/6.2 \\ 2/-10 \end{array}$$

$$\begin{array}{r} 4/5.9 \\ 1/2.7 \end{array}$$

$$\begin{array}{cccccccc} 31 & 36 & 34 & 37 & 45 & 51 & 55 & 62 \\ 32 & 31 & 25 & 16 & 5 & & 7 & 10 \end{array}$$

$$\begin{array}{r} 150 \\ 24 \end{array}$$

$$\begin{array}{r} 17.9 \\ 24 \end{array}$$

Sta	+	H.I.	-	Elev
	4.39	935.29 ✓		930.90 ✓

0+00

+27

+40

X Drain = 15" x 34' C.M.

+50

1

+50

2

+50

3

+50

4

+50

5

50

		Left				Right				
$\frac{6.0}{30}$	$\frac{6.0}{23}$	$\frac{7.2}{21}$	$\frac{7.2}{17}$	$\frac{5.7}{14}$	(60) 55	$\frac{5.4}{25}$	$\frac{5.2}{50}$			
$\frac{6.0}{30}$	$\frac{6.0}{23}$	$\frac{7.2}{21}$	$\frac{7.2}{17}$	$\frac{5.7}{14}$	(59) 54	$\frac{5.4}{20}$	$\frac{5.4}{30}$			
$\frac{7.5}{16} \leftarrow$ Flomline $\rightarrow \frac{8.1}{18}$										
$\frac{6.0}{30}$	$\frac{5.8}{22}$	$\frac{7.6}{20}$	$\frac{7.3}{16}$	$\frac{5.8}{13}$	(58) 54	$\frac{5.8}{13}$	$\frac{7.8}{17}$	$\frac{8.0}{20}$	$\frac{6.2}{21}$	$\frac{6.2}{30}$
$\frac{6.1}{30}$	$\frac{6.0}{21}$	$\frac{7.5}{20}$	$\frac{7.4}{16}$	$\frac{5.7}{13}$	(57) 55	$\frac{5.8}{13}$	$\frac{7.4}{16}$	$\frac{7.5}{19}$	$\frac{5.8}{21}$	$\frac{5.8}{30}$
$\frac{6.3}{30}$	$\frac{6.3}{22}$	$\frac{7.5}{20}$	$\frac{7.5}{16}$	$\frac{5.6}{13}$	(56) 55	$\frac{5.7}{13}$	$\frac{7.2}{16}$	$\frac{7.4}{19}$	$\frac{5.7}{21}$	$\frac{6.0}{30}$
$\frac{6.5}{30}$	$\frac{6.2}{22}$	$\frac{7.6}{20}$	$\frac{7.4}{16}$	$\frac{5.6}{13}$	(54) 52	$\frac{5.5}{13}$	$\frac{7.2}{16}$	$\frac{7.2}{20}$	$\frac{5.6}{22}$	$\frac{5.6}{30}$
$\frac{6.1}{20}$	$\frac{6.1}{21}$	$\frac{7.2}{19}$	$\frac{7.2}{16}$	$\frac{5.4}{13}$	(52) 52	$\frac{5.3}{13}$	$\frac{7.2}{16}$	$\frac{7.2}{19}$	$\frac{6.2}{21}$	$\frac{6.2}{30}$
$\frac{6.2}{30}$	$\frac{6.0}{21}$	$\frac{7.1}{20}$	$\frac{7.1}{16}$	$\frac{5.1}{13}$	(51) 51	$\frac{5.1}{13}$	$\frac{7.1}{16}$	$\frac{7.1}{19}$	$\frac{5.8}{21}$	$\frac{6.0}{30}$
$\frac{5.8}{30}$	$\frac{5.8}{21}$	$\frac{7.0}{20}$	$\frac{6.7}{16}$	$\frac{5.0}{13}$	(49) 48	$\frac{4.8}{13}$	$\frac{6.8}{16}$	$\frac{6.8}{20}$	$\frac{5.5}{21}$	$\frac{6.2}{30}$
$\frac{5.6}{30}$	$\frac{5.5}{21}$	$\frac{6.8}{20}$	$\frac{6.6}{17}$	$\frac{5.0}{13}$	(48) 47	$\frac{5.1}{13}$	$\frac{6.6}{16}$	$\frac{6.7}{19}$	$\frac{5.3}{21}$	$\frac{5.5}{30}$
$\frac{5.8}{30}$	$\frac{6.0}{20}$	$\frac{6.6}{19}$	$\frac{6.6}{16}$	$\frac{4.9}{13}$	(46) 48	$\frac{5.0}{13}$	$\frac{6.5}{16}$	$\frac{6.7}{19}$	$\frac{5.7}{20}$	$\frac{5.7}{30}$
$\frac{5.8}{30}$	$\frac{5.8}{20}$	$\frac{6.7}{19}$	$\frac{6.7}{16}$	$\frac{4.7}{13}$	(45) 46	$\frac{4.9}{13}$	$\frac{6.4}{16}$	$\frac{6.6}{19}$	$\frac{5.6}{20}$	$\frac{5.7}{30}$

Sta	+	H.I.	-	Elevation
		935.29		

+50

6

+50

7

T.P.	2.73	934.04	3.98	931.31
------	------	--------	------	--------

+50

8

+50

9

+50

10

+23

B.M.			3.94	930.10	930.0
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11

Left

L

Right

$\frac{5.6}{30}$	$\frac{5.6}{21}$	$\frac{6.6}{20}$	$\frac{6.6}{16}$	$\frac{4.5}{13}$	$\frac{4.4}{4.4}$	$\frac{4.8}{13}$	$\frac{6.5}{16}$	$\frac{6.5}{19}$	$\frac{5.3}{21}$	$\frac{5.3}{30}$
$\frac{5.3}{30}$	$\frac{5.2}{21}$	$\frac{6.5}{20}$	$\frac{6.3}{16}$	$\frac{4.5}{13}$	$\frac{4.4}{4.2}$	$\frac{4.4}{13}$	$\frac{6.2}{16}$	$\frac{6.2}{20}$	$\frac{5.2}{21}$	$\frac{5.3}{30}$
$\frac{5.0}{30}$	$\frac{5.0}{21}$	$\frac{6.4}{19}$	$\frac{6.4}{16}$	$\frac{4.4}{13}$	$\frac{4.4}{4.1}$	$\frac{4.4}{13}$	$\frac{6.0}{16}$	$\frac{6.1}{20}$	$\frac{4.8}{21}$	$\frac{5.1}{30}$
$\frac{5.0}{30}$	$\frac{4.7}{21}$	$\frac{6.3}{19}$	$\frac{6.2}{16}$	$\frac{4.4}{13}$	$\frac{4.4}{4.1}$	$\frac{4.5}{13}$	$\frac{6.2}{16}$	$\frac{6.1}{20}$	$\frac{4.8}{21}$	$\frac{5.2}{30}$
$\frac{4.1}{30}$	$\frac{4.3}{21}$	$\frac{5.2}{19}$	$\frac{5.0}{16}$	$\frac{3.1}{13}$	$\frac{3.1}{3.1}$	$\frac{3.4}{13}$	$\frac{5.2}{16}$	$\frac{5.3}{19}$	$\frac{4.0}{21}$	$\frac{4.5}{30}$
$\frac{4.5}{30}$	$\frac{4.5}{20}$	$\frac{5.3}{19}$	$\frac{5.3}{16}$	$\frac{3.5}{13}$	$\frac{3.3}{3.3}$	$\frac{3.7}{13}$	$\frac{5.2}{16}$	$\frac{5.4}{19}$	$\frac{4.2}{21}$	$\frac{4.5}{30}$
$\frac{4.7}{30}$	$\frac{4.7}{20}$	$\frac{5.5}{19}$	$\frac{5.5}{16}$	$\frac{3.6}{13}$	$\frac{3.5}{3.6}$	$\frac{3.8}{13}$	$\frac{5.4}{16}$	$\frac{5.5}{19}$	$\frac{4.4}{21}$	$\frac{4.4}{30}$
$\frac{4.8}{30}$	$\frac{4.8}{20}$	$\frac{5.7}{19}$	$\frac{5.6}{16}$	$\frac{3.9}{13}$	$\frac{3.6}{3.7}$	$\frac{3.7}{13}$	$\frac{5.5}{16}$	$\frac{5.5}{19}$	$\frac{4.0}{21}$	$\frac{4.2}{30}$
$\frac{4.7}{30}$	$\frac{4.7}{20}$	$\frac{6.0}{19}$	$\frac{6.0}{16}$	$\frac{4.1}{13}$	$\frac{3.8}{3.8}$	$\frac{4.1}{13}$	$\frac{5.7}{16}$	$\frac{5.7}{19}$	$\frac{4.3}{21}$	$\frac{4.4}{30}$
$\frac{4.7}{30}$	$\frac{4.2}{22}$	$\frac{5.7}{21}$	$\frac{5.7}{16}$	$\frac{4.1}{13}$	$\frac{4.0}{4.0}$	$\frac{4.3}{13}$	$\frac{5.5}{15}$	$\frac{5.5}{18}$	$\frac{3.3}{20}$	$\frac{3.4}{30}$
$\frac{4.8}{33}$	$\frac{6.2}{29}$	$\frac{5.6}{20}$	$\frac{5.6}{16}$	$\frac{4.4}{13}$	$\frac{4.2}{4.1}$	$\frac{4.2}{13}$	$\frac{5.4}{15}$	$\frac{5.5}{19}$	$\frac{4.3}{21}$	$\frac{4.3}{33}$
$\frac{4.6}{33}$	$\frac{4.7}{29}$	$\frac{7.4}{26}$	$\frac{7.3}{20}$	$\frac{5.0}{13}$	$\frac{4.6}{4.6}$	$\frac{5.0}{13}$	$\frac{7.0}{18}$	$\frac{7.4}{26}$	$\frac{4.7}{28}$	$\frac{4.6}{33}$

Station	+	H.I.	-	Elev.
		934.04		

+50

12

+50

13

+50

14

T.P.	5.26	931.83	7.47	926.57
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+20

+50

15

+50

16

+50

T.P.	4.17	927.47	8.53	923.30
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Left

£

Right

$\frac{5.3}{3.3}$	$\frac{4.9}{3.0}$	$\frac{7.8}{2.6}$	$\frac{7.7}{2.0}$	$\frac{5.3}{7.3}$	$\frac{4.8}{5.2}$	$\frac{5.3}{7.3}$	$\frac{7.7}{1.9}$	$\frac{7.8}{2.6}$	$\frac{4.7}{2.9}$	$\frac{4.6}{3.3}$
-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

$\frac{4.7}{3.3}$	$\frac{4.6}{3.0}$	$\frac{8.2}{2.6}$	$\frac{8.2}{2.1}$	$\frac{5.6}{7.3}$	$\frac{5.1}{5.4}$	$\frac{5.8}{7.3}$	$\frac{7.8}{1.9}$	$\frac{7.8}{2.6}$	$\frac{4.6}{3.0}$	$\frac{4.6}{3.3}$
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$\frac{4.5}{3.3}$	$\frac{4.4}{3.0}$	$\frac{8.2}{2.6}$	$\frac{8.2}{2.0}$	$\frac{6.0}{1.3}$	$\frac{5.4}{5.8}$	$\frac{5.8}{1.3}$	$\frac{8.0}{2.0}$	$\frac{8.2}{2.6}$	$\frac{4.4}{3.1}$	$\frac{4.4}{3.3}$
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$\frac{5.1}{3.3}$	$\frac{5.1}{3.0}$	$\frac{9.0}{2.7}$	$\frac{8.8}{2.1}$	$\frac{6.5}{1.3}$	$\frac{5.8}{6.3}$	$\frac{6.5}{1.3}$	$\frac{8.4}{1.9}$	$\frac{8.6}{2.5}$	$\frac{4.5}{3.0}$	$\frac{4.7}{3.3}$
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$\frac{6.2}{3.3}$	$\frac{5.9}{3.0}$	$\frac{9.3}{2.6}$	$\frac{9.3}{2.1}$	$\frac{6.9}{1.3}$	$\frac{6.2}{6.8}$	$\frac{6.8}{1.3}$	$\frac{8.8}{1.9}$	$\frac{9.1}{2.5}$	$\frac{4.7}{3.0}$	$\frac{4.7}{3.3}$
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$\frac{5.8}{3.3}$	$\frac{5.7}{3.0}$	$\frac{9.5}{2.6}$	$\frac{9.5}{2.0}$	$\frac{7.5}{1.3}$	$\frac{6.2}{7.3}$	$\frac{7.4}{1.3}$	$\frac{9.5}{1.8}$	$\frac{9.5}{2.4}$	$\frac{4.7}{3.0}$	$\frac{4.7}{3.3}$
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Top Hub on £ 54. 14 + 2.6

$\frac{3.4}{3.3}$	$\frac{3.3}{3.0}$	$\frac{7.3}{2.6}$	$\frac{7.3}{2.0}$	$\frac{5.3}{1.4}$	$\frac{4.1}{5.3}$	$\frac{5.9}{1.3}$	$\frac{7.4}{1.8}$	$\frac{7.4}{2.4}$	$\frac{2.5}{3.0}$	$\frac{2.4}{3.3}$
-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

$\frac{3.2}{3.3}$	$\frac{3.0}{3.0}$	$\frac{7.5}{2.5}$	$\frac{7.5}{2.0}$	$\frac{5.9}{1.4}$	$\frac{5.2}{5.6}$	$\frac{5.7}{1.3}$	$\frac{7.7}{1.8}$	$\frac{7.8}{2.3}$	$\frac{2.5}{3.0}$	$\frac{2.5}{3.3}$
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$\frac{2.5}{3.3}$	$\frac{2.5}{3.1}$	$\frac{8.3}{2.5}$	$\frac{8.1}{1.9}$	$\frac{6.7}{1.1}$	$\frac{5.9}{6.2}$	$\frac{6.3}{1.3}$	$\frac{8.1}{1.8}$	$\frac{8.4}{2.3}$	$\frac{2.7}{3.0}$	$\frac{2.7}{3.3}$
-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

$\frac{2.4}{3.3}$	$\frac{2.5}{3.1}$	$\frac{9.0}{2.4}$	$\frac{8.8}{1.9}$	$\frac{7.2}{1.4}$	$\frac{6.6}{7.1}$	$\frac{7.4}{1.4}$	$\frac{9.3}{1.9}$	$\frac{9.4}{2.4}$	$\frac{4.6}{3.0}$	$\frac{4.7}{3.3}$
-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

$\frac{3.5}{3.3}$	$\frac{3.7}{3.0}$	$\frac{9.7}{2.4}$	$\frac{9.7}{1.8}$	$\frac{7.9}{1.3}$	$\frac{7.5}{7.7}$	$\frac{7.8}{1.3}$	$\frac{10.0}{2.0}$	$\frac{10.4}{2.5}$	$\frac{7.5}{3.0}$	$\frac{7.8}{3.3}$
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$\frac{6.3}{3.3}$	$\frac{6.6}{3.0}$	$\frac{10.6}{2.4}$	$\frac{10.5}{1.4}$	$\frac{8.6}{1.4}$	$\frac{8.4}{8.5}$	$\frac{8.8}{1.3}$	$\frac{10.8}{1.8}$	$\frac{7.3}{2.3}$	$\frac{10.8}{2.4}$	$\frac{11.7}{3.3}$
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927.47

Sta.	+	H.I.	-	Elev.
B.M.	1.11	925.54 [✓]	3.0	924.47 [✓] 924.4
17				

+50

18

+50

19

+50

20

+50

21

+50

+51

X Dr. 24" x 32' C.M.

22

+50

Left

±

Right

spike in 8" oak Lt Sta. 16 + 85

$$\frac{3.2}{33} \quad \frac{4.1}{23} \quad \frac{5.2}{21} \quad \frac{5.2}{17} \quad \frac{3.2}{13} \quad \frac{2.9}{30} \quad \frac{3.3}{13} \quad \frac{2.2}{19} \quad \frac{7.3}{33}$$

$$\frac{7.2}{33} \quad \frac{7.2}{18} \quad \frac{4.0}{13} \quad \frac{3.6}{3.8} \quad \frac{4.4}{13} \quad \frac{7.4}{17} \quad \frac{7.4}{33}$$

$$\frac{7.2}{17} \quad \frac{4.7}{13} \quad \frac{4.1}{4.4} \quad \frac{4.5}{13} \quad \frac{7.5}{17}$$

$$\frac{7.2}{\text{water}} \quad \frac{7.6}{15} \quad \frac{5.4}{13} \quad \frac{4.1}{5.1} \quad \frac{5.7}{13} \quad \frac{8.4}{17} \quad \frac{7.2}{\text{water}}$$

$$\frac{8.0}{16} \quad \frac{6.1}{13} \quad \frac{4.6}{6.2} \quad \frac{6.2}{13} \quad \frac{8.5}{16}$$

$$\frac{8.0}{16} \quad \frac{6.4}{13} \quad \frac{4.7}{6.4} \quad \frac{6.6}{1.2} \quad \frac{8.6}{15}$$

$$\frac{8.7}{15} \quad \frac{6.4}{13} \quad \frac{4.1}{6.4} \quad \frac{6.6}{13} \quad \frac{8.5}{15}$$

$$\frac{8.2}{17} \quad \frac{6.0}{13} \quad \frac{4.1}{5.7} \quad \frac{5.8}{13} \quad \frac{8.2}{16}$$

$$\frac{8.2}{16} \quad \frac{5.5}{13} \quad \frac{4.1}{5.5} \quad \frac{5.5}{13} \quad \frac{8.2}{16}$$

$$\frac{7.6}{16} \quad \frac{5.4}{13} \quad \frac{4.1}{5.3} \quad \frac{5.6}{13} \quad \frac{8.0}{16}$$

$$\frac{7.7}{16} \quad \text{Flowline} \quad \frac{7.7}{16} \quad \frac{5.4}{13} \quad \frac{8.2}{16}$$

$$\frac{7.7}{16} \quad \frac{5.8}{13} \quad \frac{4.3}{5.2} \quad \frac{5.1}{13} \quad \frac{7.5}{17}$$

Sta.	+	H.I.	-	Elev.
		925.54		

23

T.P.	6.78	926.72	5.60	919.94
------	------	--------	------	--------

+50

24

+50

25

+50

26

+50

27

+60

T.P.	7.70	930.52	3.90	922.82
------	------	--------	------	--------

28

+75

Left.

L

Right

$$\begin{array}{r} 7.5 \\ 16 \end{array} \quad \begin{array}{r} 5.1 \\ 13 \end{array} \quad \begin{array}{c} 13 \\ 5.1 \end{array} \quad \begin{array}{r} 5.2 \\ 13 \end{array} \quad \begin{array}{r} 7.7 \\ 17 \end{array}$$

Top So. End Cross Drain Sta. 2.1 + 5.1

$$\begin{array}{r} 8.8 \\ 16 \end{array} \quad \begin{array}{r} 6.5 \\ 13 \end{array} \quad \begin{array}{c} 5.1 \\ 6.2 \end{array} \quad \begin{array}{r} 6.4 \\ 13 \end{array} \quad \begin{array}{r} 8.8 \\ 17 \end{array}$$

$$\begin{array}{r} 8.8 \\ 16 \end{array} \quad \begin{array}{r} 6.2 \\ 13 \end{array} \quad \begin{array}{c} 6.1 \\ 6.1 \end{array} \quad \begin{array}{r} 6.3 \\ 13 \end{array} \quad \begin{array}{r} 8.8 \\ 17 \end{array}$$

$$\begin{array}{r} 8.3 \\ 17 \end{array} \quad \begin{array}{r} 6.2 \\ 13 \end{array} \quad \begin{array}{c} 5.9 \\ 5.9 \end{array} \quad \begin{array}{r} 6.3 \\ 13 \end{array} \quad \begin{array}{r} 8.5 \\ 17 \end{array}$$

$$\begin{array}{r} 8.5 \\ 17 \end{array} \quad \begin{array}{r} 6.0 \\ 13 \end{array} \quad \begin{array}{c} 5.7 \\ 5.7 \end{array} \quad \begin{array}{r} 6.2 \\ 13 \end{array} \quad \begin{array}{r} 8.2 \\ 17 \end{array}$$

$$\begin{array}{r} 8.5 \\ 16 \end{array} \quad \begin{array}{r} 5.7 \\ 13 \end{array} \quad \begin{array}{c} 5.4 \\ 5.4 \end{array} \quad \begin{array}{r} 5.6 \\ 13 \end{array} \quad \begin{array}{r} 8.4 \\ 17 \end{array} \quad \begin{array}{r} 8.1 \\ 33 \end{array}$$

$$\begin{array}{r} 8.3 \\ 17 \end{array} \quad \begin{array}{r} 5.5 \\ 13 \end{array} \quad \begin{array}{c} 5.1 \\ 5.0 \end{array} \quad \begin{array}{r} 5.4 \\ 13 \end{array} \quad \begin{array}{r} 7.6 \\ 17 \end{array} \quad \begin{array}{r} 8.0 \\ 33 \end{array}$$

$$\begin{array}{r} 8.3 \\ 18 \end{array} \quad \begin{array}{r} 5.3 \\ 13 \end{array} \quad \begin{array}{c} 4.8 \\ 4.6 \end{array} \quad \begin{array}{r} 4.4 \\ 13 \end{array} \quad \begin{array}{r} 8.0 \\ 18 \end{array} \quad \begin{array}{r} 8.1 \\ 33 \end{array}$$

$$\begin{array}{r} 8.1 \\ 33 \end{array} \quad \begin{array}{r} 8.0 \\ 18 \end{array} \quad \begin{array}{r} 4.5 \\ 13 \end{array} \quad \begin{array}{c} 4.6 \\ 4.3 \end{array} \quad \begin{array}{r} 4.6 \\ 13 \end{array} \quad \begin{array}{r} 7.0 \\ 17 \end{array} \quad \begin{array}{r} 7.0 \\ 22 \end{array} \quad \begin{array}{r} 5.9 \\ 33 \end{array}$$

$$\begin{array}{r} 7.0 \\ 33 \end{array} \quad \begin{array}{r} 5.5 \\ 20 \end{array} \quad \begin{array}{r} 6.4 \\ 19 \end{array} \quad \begin{array}{r} 6.2 \\ 16 \end{array} \quad \begin{array}{r} 4.4 \\ 13 \end{array} \quad \begin{array}{c} 4.7 \\ 4.0 \end{array} \quad \begin{array}{r} 4.1 \\ 13 \end{array} \quad \begin{array}{r} 6.0 \\ 16 \end{array} \quad \begin{array}{r} 6.0 \\ 21 \end{array} \quad \begin{array}{r} 0.8 \\ 27 \end{array} \quad \begin{array}{r} 0.4 \\ 33 \end{array}$$

$$\begin{array}{r} 6.0 \\ 33 \end{array} \quad \begin{array}{r} 5.8 \\ 25 \end{array} \quad \begin{array}{r} 10.0 \\ 20 \end{array} \quad \begin{array}{r} 9.7 \\ 16 \end{array} \quad \begin{array}{r} 8.0 \\ 13 \end{array} \quad \begin{array}{c} 7.8 \\ 7.6 \end{array} \quad \begin{array}{r} 8.0 \\ 13 \end{array} \quad \begin{array}{r} 9.5 \\ 16 \end{array} \quad \begin{array}{r} 9.6 \\ 21 \end{array} \quad \begin{array}{r} 3.0 \\ 30 \end{array} \quad \begin{array}{r} 2.8 \\ 33 \end{array}$$

$$\begin{array}{r} 2.7 \\ 33 \end{array} \quad \begin{array}{r} 2.2 \\ 30 \end{array} \quad \begin{array}{r} 9.3 \\ 21 \end{array} \quad \begin{array}{r} 9.2 \\ 16 \end{array} \quad \begin{array}{r} 7.5 \\ 13 \end{array} \quad \begin{array}{c} 7.6 \\ 7.2 \end{array} \quad \begin{array}{r} 7.4 \\ 13 \end{array} \quad \begin{array}{r} 9.0 \\ 17 \end{array} \quad \begin{array}{r} 9.2 \\ 22 \end{array} \quad \begin{array}{r} 2.2 \\ 30 \end{array} \quad \begin{array}{r} 2.2 \\ 33 \end{array}$$

Sta.	+	H.I.	-	Elev.
		930.52		

29

+50

30

+25

31

+50

T.P.	5.47	927.83 ✓	8.16	922.36 ✓
------	------	----------	------	----------

32

+60

+67 X Drain = 18" x 34' C.M. New.

33

+50

B.M.

3.17	924.66 ✓	924.67
------	----------	--------

34

+50

Left

L

Right

$\frac{2.1}{3.3}$	$\frac{2.2}{3.0}$	$\frac{9.0}{2.1}$	$\frac{9.0}{1.7}$	$\frac{7.7}{1.3}$	$\frac{7.5}{7.2}$	$\frac{7.5}{1.3}$	$\frac{9.1}{1.7}$	$\frac{9.1}{2.2}$	$\frac{2.2}{3.0}$	$\frac{2.0}{3.3}$
$\frac{2.6}{3.3}$	$\frac{2.7}{3.0}$	$\frac{9.1}{2.1}$	$\frac{9.1}{1.8}$	$\frac{7.7}{1.4}$	$\frac{7.5}{7.2}$	$\frac{7.6}{1.3}$	$\frac{9.0}{1.6}$	$\frac{9.0}{2.1}$	$\frac{3.0}{2.9}$	$\frac{2.8}{3.3}$
$\frac{3.2}{3.3}$	$\frac{3.2}{2.9}$	$\frac{9.4}{2.2}$	$\frac{9.4}{1.8}$	$\frac{7.6}{1.4}$	$\frac{7.5}{7.0}$	$\frac{7.5}{1.3}$	$\frac{9.1}{1.6}$	$\frac{9.1}{2.1}$	$\frac{3.8}{2.8}$	$\frac{3.8}{3.3}$
$\frac{3.2}{3.3}$	$\frac{3.4}{2.8}$	$\frac{9.4}{2.1}$	$\frac{9.2}{1.7}$	$\frac{7.5}{1.4}$	$\frac{7.6}{7.2}$	$\frac{7.5}{1.3}$	$\frac{9.1}{1.7}$	$\frac{9.1}{2.1}$	$\frac{4.6}{2.7}$	$\frac{5.0}{3.3}$
$\frac{3.9}{3.3}$	$\frac{4.1}{2.7}$	$\frac{9.4}{2.1}$	$\frac{9.3}{1.7}$	$\frac{7.8}{1.3}$	$\frac{7.7}{7.4}$	$\frac{7.7}{1.3}$	$\frac{10.0}{1.7}$	$\frac{10.0}{2.0}$	$\frac{8.4}{2.2}$	$\frac{9.0}{3.1}$
$\frac{5.5}{3.3}$	$\frac{6.1}{2.5}$	$\frac{10.0}{2.1}$	$\frac{9.7}{1.6}$	$\frac{8.1}{1.3}$	$\frac{8.1}{7.8}$	$\frac{8.3}{1.3}$	$\frac{10.2}{1.6}$	$\frac{12.2}{2.7}$	$\frac{12.0}{3.3}$	
$\frac{4.6}{3.3}$	$\frac{5.5}{2.1}$	$\frac{8.0}{2.0}$	$\frac{7.8}{1.6}$	$\frac{5.9}{1.3}$	$\frac{5.7}{5.5}$	$\frac{5.8}{1.3}$	$\frac{10.0}{2.0}$	$\frac{10.6}{3.3}$		
$\frac{4.6}{3.3}$	$\frac{6.8}{2.1}$	$\frac{8.7}{1.9}$	$\frac{8.6}{1.6}$	$\frac{6.2}{1.3}$	$\frac{5.8}{5.8}$	$\frac{6.0}{1.3}$	$\frac{9.9}{2.1}$	$\frac{11.7}{3.3}$		
$\frac{4.5}{3.3}$	$\frac{6.4}{2.1}$	$\frac{8.5}{2.0}$	$\frac{8.5}{1.6}$	$\frac{6.2}{1.3}$	$\frac{5.8}{6.0}$	$\frac{6.0}{1.3}$	$\frac{9.9}{1.9}$	$\frac{10.0}{3.3}$		
$\frac{4.0}{3.3}$	$\frac{6.5}{2.1}$	$\frac{7.7}{2.0}$	$\frac{7.7}{1.6}$	$\frac{5.5}{1.3}$	$\frac{5.9}{5.7}$	$\frac{6.0}{1.3}$	$\frac{8.6}{1.8}$	$\frac{9.2}{3.3}$		
$\frac{4.2}{2.5}$	$\frac{6.0}{2.4}$	$\frac{6.5}{2.0}$	$\frac{7.3}{1.9}$	$\frac{7.3}{1.6}$	$\frac{5.5}{1.3}$	$\frac{5.5}{1.3}$	$\frac{8.1}{1.7}$	$\frac{9.0}{3.3}$		
$\frac{2.8}{3.3}$	$\frac{3.8}{2.4}$	$\frac{7.0}{2.0}$	$\frac{7.0}{1.6}$	$\frac{5.2}{1.3}$	$\frac{4.9}{5.0}$	$\frac{5.0}{1.3}$	$\frac{8.4}{1.9}$	$\frac{9.0}{3.3}$		

	+	H.I.	-	Elev.
35		927.83 ✓		
+20				
+50				
36				
+50				
T.P.	6.88	931.99 ✓	2.72	925.11 ✓
37				
+50				
38				
+50				
39				
+50				
40				

Left

L

Right

$\frac{2.4}{33}$	$\frac{4.0}{26}$	$\frac{6.3}{21}$	$\frac{6.3}{17}$	$\frac{4.8}{13}$	$\frac{4.3}{46}$	$\frac{4.6}{13}$	$\frac{7.8}{18}$	$\frac{9.0}{33}$	
$\frac{4.8}{33}$	$\frac{3.5}{27}$	$\frac{6.0}{21}$	$\frac{6.0}{17}$	$\frac{4.2}{13}$	$\frac{4.4}{4.5}$	$\frac{4.6}{13}$	$\frac{6.5}{17}$	$\frac{7.1}{33}$	
$\frac{2.2}{33}$	$\frac{4.2}{23}$	$\frac{5.2}{22}$	$\frac{5.2}{19}$	$\frac{3.8}{14}$	$\frac{3.8}{4.2}$	$\frac{4.4}{13}$	$\frac{4.8}{15}$	$\frac{5.2}{33}$	< Dump
$\frac{1.6}{33}$	$\frac{3.3}{25}$	$\frac{5.3}{23}$	$\frac{5.3}{19}$	$\frac{3.4}{13}$	$\frac{2.7}{3.7}$	$\frac{4.2}{13}$	$\frac{6.1}{16}$	$\frac{6.0}{19}$	$\frac{5.5}{20}$
$\frac{0.8}{33}$	$\frac{1.9}{24}$	$\frac{4.4}{21}$	$\frac{4.5}{18}$	$\frac{2.9}{13}$	$\frac{2.6}{2.9}$	$\frac{3.4}{13}$	$\frac{5.3}{15}$	$\frac{5.3}{18}$	$\frac{4.0}{20}$
$\frac{4.6}{33}$	$\frac{5.7}{24}$	$\frac{8.0}{20}$	$\frac{8.0}{16}$	$\frac{6.6}{13}$	$\frac{6.5}{6.6}$	$\frac{6.9}{13}$	$\frac{9.3}{16}$	$\frac{9.3}{18}$	$\frac{7.5}{20}$
$\frac{3.8}{33}$	$\frac{5.0}{22}$	$\frac{7.7}{19}$	$\frac{7.5}{16}$	$\frac{6.0}{13}$	$\frac{6.1}{6.1}$	$\frac{6.7}{13}$	$\frac{8.4}{15}$	$\frac{8.5}{18}$	$\frac{7.3}{19}$
$\frac{3.5}{33}$	$\frac{4.2}{24}$	$\frac{7.3}{19}$	$\frac{7.3}{17}$	$\frac{5.6}{13}$	$\frac{5.8}{5.6}$	$\frac{5.8}{13}$	$\frac{7.7}{16}$	$\frac{7.7}{19}$	$\frac{6.0}{21}$
$\frac{3.5}{33}$	$\frac{4.0}{25}$	$\frac{7.1}{21}$	$\frac{6.8}{16}$	$\frac{5.5}{13}$	$\frac{5.4}{5.2}$	$\frac{5.5}{13}$	$\frac{7.3}{16}$	$\frac{7.4}{19}$	$\frac{5.7}{21}$
$\frac{3.0}{33}$	$\frac{3.6}{25}$	$\frac{7.0}{21}$	$\frac{7.0}{16}$	$\frac{5.5}{13}$	$\frac{5.2}{5.2}$	$\frac{5.3}{13}$	$\frac{7.2}{16}$	$\frac{7.2}{24}$	$\frac{5.8}{25}$
$\frac{2.7}{33}$	$\frac{3.3}{24}$	$\frac{6.5}{21}$	$\frac{6.4}{16}$	$\frac{5.0}{13}$	$\frac{5.0}{4.8}$	$\frac{4.9}{13}$	$\frac{6.7}{16}$	$\frac{6.7}{26}$	$\frac{5.8}{27}$
$\frac{2.4}{33}$	$\frac{2.8}{25}$	$\frac{4.7}{22}$	$\frac{4.5}{17}$	$\frac{4.0}{15}$	$\frac{4.1}{4.2}$	$\frac{4.2}{13}$	$\frac{6.3}{17}$	$\frac{6.6}{28}$	$\frac{6.2}{29}$

Sta

+

H.I.

-

Elev

931.99 ✓

+13.5

B.M.

1.81

930.18 930.09

Left

L

Right

$$\frac{3.0}{33}$$

$$\frac{3.5}{20}$$

$$\frac{4.6}{3.8}$$

$$\frac{4.0}{12}$$

$$\frac{5.6}{16}$$

$$\frac{6.6}{29}$$

$$\frac{6.1}{29}$$

$$\frac{6.7}{33}$$

Cu. Yards
Cut Fill

0+40	= X Drain = 18" x 32' CM. ✓		
3+50	Field Ent. No Culvert		5.1
3+62	" " " "		5.5
10+33	" " " "		2.0
10+38	" " " "		3.0
21+51	X Drain 24" x 32' CM. ✓	"	
30+82	Side Drain 10" x 20' CM. ✓	Old	8.0
33+87	" " 12" x 20' CM. ✓	New	8.0
32+67	X Drain 18" x 34' CM. ✓	New	
35+41	Side Dr. 15" x 12' CM ^{dd} (New) 12" x 4' CM	Old	6.0
36+88	" " 12" x 24' CM	Old	8.0
37+94	" " 12" x 16' CM	Old	4.0
38+13	" " 12" x 20' CM ✓	New	10.0

16' Lt 18' Rt.

Lt

Rt.

Rt

Lt.

Lt 16 Rt.

Rt

Lt

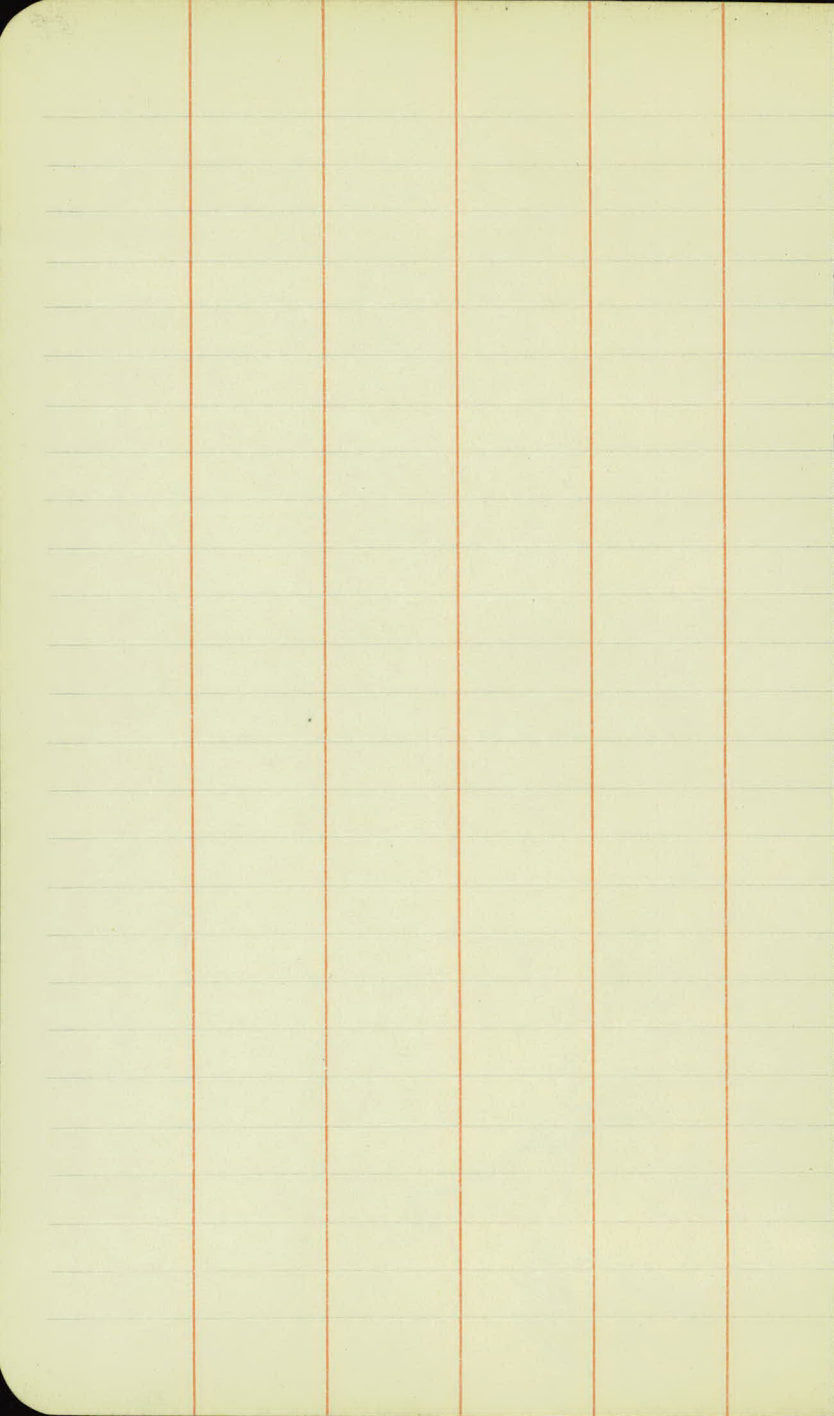
Lt 12 Rt

Lt.

Lt

Rt

Lt



KEITH'S RAILROAD CURVE TABLES.

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HOW TO USE KEITH'S TABLES.

EXAMPLE.

Wanted a Curve with an Ext. of about 12 ft. Angle
of Intersection or I. P.= $23^{\circ} 20'$ to the R. at Station
542+72.

Ext. in Tab. IV opposite $23^{\circ} 20' = 120.87$
 $120.87 \div 12 = 10.07$. Say a 10° Curve.

Tan. in Tab. IV opp. $23^{\circ} 20' = 118.31$
 $118.31 \div 10 = 118.31$.

Tab. V. correction for A. $23^{\circ} 20'$ for a 10° Cur.=0.16
 $118.31 + 0.16 = 118.47 = \text{corrected Tangent.}$

(If corrected Ext. is required find in same way)

Ang. $23^{\circ} 20' = 23.33^{\circ} \div 10 = 2.3333 = \text{L. C.}$

$2^{\circ} 19\frac{1}{2}' = \text{def. for sta. } 542$	I. P.=sta.	542+72
$4^{\circ} 49\frac{1}{2}' = \text{ " " " } +50$	Tan.=	1.18.47
$7^{\circ} 19\frac{1}{2}' = \text{ " " " } 543$	B. C.=sta.	541+53.53
$9^{\circ} 49\frac{1}{2}' = \text{ " " " } +50$	L. C.=	2.33.33
$11^{\circ} 40' = \text{ " " " } 543+$	E. C.=sta.	543+86.86
86.86		

$100 - 53.53 = 46.47 \times 3' (\text{def. for 1 ft. of } 10^{\circ} \text{ Cur.}) = 139.41' =$
 $2^{\circ} 19\frac{1}{2}' = \text{def. for sta. } 542.$

Def. for 50 ft.= $2^{\circ} 30'$ for a 10° Curve.

Def. for 36.86 ft.= $1^{\circ} 50\frac{1}{2}'$ for a 10° Curve

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

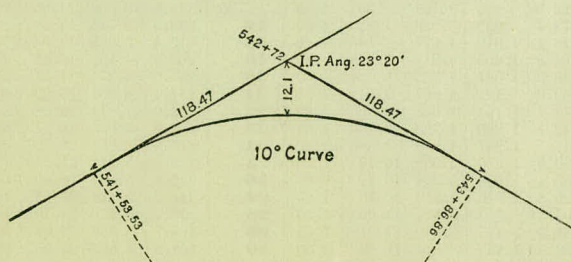


TABLE I. — Minutes in Decimals of a Degree.

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

TABLE II. — Inches in Decimals of a Foot.

1-16	3-32	$\frac{1}{8}$	3-16	$\frac{1}{4}$	5-16	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

TABLE III. — Radii, Ordinates and Deflections.

Deg.	Radius	Mid. Ord.	Tan. Def.	Chd. Def.	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan. Def.	Chd. Def.	Def. for 1 Foot
0° 10'	34377.	.036	.145	.291	0.05'	7°	819.0	1.528	6.105	12.21	2.10'
20	17189.	.073	.291	.582	0.10	20'	781.8	1.600	6.395	12.79	2.20
30	11459.	.109	.436	.873	0.15	30	764.5	1.637	6.540	13.08	2.25
40	8594.4	.145	.582	1.164	0.20	40	747.9	1.673	6.685	13.37	2.30
50	6875.5	.182	.727	1.454	0.25	8	716.8	1.746	6.976	13.95	2.40
1	5729.6	.218	.873	1.745	0.30	20	688.2	1.819	7.266	14.53	2.50
10	4911.2	.255	1.018	2.036	0.35	30	674.7	1.855	7.411	14.82	2.55
20	4297.3	.291	1.164	2.327	0.40	40	661.7	1.892	7.556	15.11	2.60
30	3819.8	.327	1.309	2.618	0.45	9	637.3	1.965	7.846	15.69	2.70
40	3437.9	.364	1.454	2.909	0.50	20	614.6	2.037	8.136	16.27	2.80
50	3125.4	.400	1.600	3.200	0.55	30	603.8	2.074	8.281	16.56	2.85
2	2864.9	.436	1.745	3.490	0.60	40	593.4	2.110	8.426	16.85	2.90
10	2644.6	.473	1.891	3.781	0.65	10	573.7	2.183	8.716	17.43	3.00
20	2455.7	.509	2.036	4.072	0.70	30	546.4	2.292	9.150	18.30	3.15
30	2292.0	.545	2.181	4.363	0.75	11	521.7	2.402	9.585	19.16	3.30
40	2148.8	.582	2.327	4.654	0.80	30	499.1	2.511	10.02	20.04	3.45
50	2022.4	.618	2.472	4.945	0.85	12	478.3	2.620	10.45	20.91	3.60
3	1910.1	.655	2.618	5.235	0.90	30	459.3	2.730	10.89	21.77	3.75
10	1809.6	.691	2.763	5.526	0.95	13	441.7	2.839	11.32	22.64	3.90
20	1719.1	.727	2.908	5.817	1.00	30	425.4	2.949	11.75	23.51	4.05
30	1637.3	.764	3.054	6.108	1.05	14	410.3	3.058	12.18	24.37	4.20
40	1562.9	.800	3.199	6.398	1.10	30	396.2	3.168	12.62	25.24	4.35
50	1495.0	.836	3.345	6.689	1.15	15	383.1	3.277	13.05	26.11	4.50
4	1432.7	.873	3.490	6.980	1.20	30	370.8	3.387	13.49	26.97	4.65
10	1375.4	.909	3.635	7.271	1.25	16	359.3	3.496	13.92	27.84	4.80
20	1322.5	.945	3.781	7.561	1.30	30	348.5	3.606	14.35	28.70	4.95
30	1273.6	.982	3.926	7.852	1.35	17	338.3	3.716	14.78	29.56	5.10
40	1228.1	1.018	4.071	8.143	1.40	18	319.6	3.935	15.64	31.29	5.40
50	1185.8	1.055	4.217	8.433	1.45	19	302.9	4.155	16.51	33.01	5.70
5	1146.3	1.091	4.362	8.724	1.50	20	287.9	4.374	17.37	34.73	6.00
10	1109.3	1.127	4.507	9.014	1.55	21	274.4	4.594	18.22	36.44	6.30
20	1074.7	1.164	4.653	9.305	1.60	22	262.0	4.814	19.08	38.16	6.60
30	1042.1	1.200	4.798	9.596	1.65	23	250.8	5.035	19.94	39.87	6.90
40	1011.5	1.237	4.943	9.886	1.70	24	240.5	5.255	20.79	41.58	7.20
50	982.6	1.273	5.088	10.18	1.75	25	231.0	5.476	21.64	43.28	7.50
6	955.4	1.309	5.234	10.47	1.80	26	222.3	5.697	22.50	44.99	7.80
10	929.6	1.346	5.379	10.76	1.85	27	214.2	5.918	23.35	46.69	8.10
20	905.1	1.382	5.524	11.05	1.90	28	206.7	6.139	24.19	48.38	8.40
30	881.9	1.418	5.669	11.34	1.95	29	199.7	6.360	25.04	50.07	8.70
40	859.9	1.455	5.814	11.63	2.00	30	193.2	6.583	25.88	51.76	9.00

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

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

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

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
31°	1589.0	216.3	41°	2142.2	387.4	51°	2732.9	618.4
10'	1598.0	218.7	10'	2151.7	390.7	10'	2743.1	622.8
20	1606.9	221.1	20	2161.2	394.1	20	2753.4	627.2
30	1615.9	223.5	30	2170.8	397.4	30	2763.7	631.7
40	1624.9	226.0	40	2180.3	400.8	40	2773.9	636.2
50	1633.9	228.4	50	2189.9	404.2	50	2784.2	640.7
32	1643.0	230.9	42	2199.4	407.6	52	2794.5	645.2
10	1652.0	233.4	10	2209.0	411.1	10	2804.9	649.7
20	1661.0	235.9	20	2218.6	414.5	20	2815.2	654.3
30	1670.0	238.4	30	2228.1	418.0	30	2825.6	658.8
40	1679.1	241.0	40	2237.7	421.4	40	2835.9	663.4
50	1688.1	243.5	50	2247.3	425.0	50	2846.3	668.0
33	1697.2	246.1	43	2257.0	428.5	53	2856.7	672.7
10	1706.3	248.7	10	2266.6	432.0	10	2867.1	677.3
20	1715.3	251.3	20	2276.2	435.6	20	2877.5	682.0
30	1724.4	253.9	30	2285.9	439.2	30	2888.0	686.7
40	1733.5	256.5	40	2295.6	442.8	40	2898.4	691.4
50	1742.6	259.1	50	2305.2	446.4	50	2908.9	696.1
34	1751.7	261.8	44	2314.9	450.0	54	2919.4	700.9
10	1760.8	264.5	10	2324.6	453.6	10	2929.9	705.7
20	1770.0	267.2	20	2334.3	457.3	20	2940.4	710.5
30	1779.1	269.9	30	2344.1	461.0	30	2951.0	715.3
40	1788.2	272.6	40	2353.8	464.6	40	2961.5	720.1
50	1797.4	275.3	50	2363.5	468.4	50	2972.1	725.0
35	1806.6	278.1	45	2373.3	472.1	55	2982.7	729.9
10	1815.7	280.8	10	2383.1	475.8	10	2993.3	734.8
20	1824.9	283.6	20	2392.8	479.6	20	3003.9	739.7
30	1834.1	286.4	30	2402.6	483.4	30	3014.5	744.6
40	1843.3	289.2	40	2412.4	487.2	40	3025.2	749.6
50	1852.5	292.0	50	2422.3	491.0	50	3035.8	754.6
36	1861.7	294.9	46	2432.1	494.8	56	3046.5	759.6
10	1870.9	297.7	10	2441.9	498.7	10	3057.2	764.6
20	1880.1	300.6	20	2451.8	502.5	20	3067.9	769.7
30	1889.4	303.5	30	2461.7	506.4	30	3078.7	774.7
40	1898.6	306.4	40	2471.5	510.3	40	3089.4	779.8
50	1907.9	309.3	50	2481.4	514.3	50	3100.2	784.9
37	1917.1	312.2	47	2491.3	518.2	57	3110.9	790.1
10	1926.4	315.2	10	2501.2	522.2	10	3121.7	795.2
20	1935.7	318.1	20	2511.2	526.1	20	3132.6	800.4
30	1945.0	321.1	30	2521.1	530.1	30	3143.4	805.6
40	1954.3	324.1	40	2531.1	534.2	40	3154.2	810.9
50	1963.6	327.1	50	2541.0	538.2	50	3165.1	816.1
38	1972.9	330.2	48	2551.0	542.2	58	3176.0	821.4
10	1982.2	333.2	10	2561.0	546.3	10	3186.9	826.7
20	1991.5	336.3	20	2571.0	550.4	20	3197.8	832.0
30	2000.9	339.3	30	2581.0	554.5	30	3208.8	837.3
40	2010.2	342.4	40	2591.0	558.6	40	3219.7	842.7
50	2019.6	345.5	50	2601.1	562.8	50	3230.7	848.1
39	2029.0	348.6	49	2611.2	566.9	59	3241.7	853.5
10	2038.4	351.8	10	2621.2	571.1	10	3252.7	858.9
20	2047.8	354.9	20	2631.3	575.3	20	3263.7	864.3
30	2057.2	358.1	30	2641.4	579.5	30	3274.8	869.8
40	2066.6	361.3	40	2651.5	583.8	40	3285.8	875.3
50	2076.0	364.5	50	2661.6	588.0	50	3296.9	880.8
40	2085.4	367.7	50	2671.8	592.3	60	3308.0	886.4
10	2094.9	371.0	10	2681.9	596.6	10	3319.1	892.0
20	2104.3	374.2	20	2692.1	600.9	20	3330.3	897.5
30	2113.8	377.5	30	2702.3	605.3	30	3341.4	903.2
40	2123.3	380.8	40	2712.5	609.6	40	3352.6	908.8
50	2132.7	384.1	50	2722.7	614.0	50	3363.8	914.5

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

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
61°	3375.0	920.2	71°	4086.9	1308.2	81°	4893.6	1805.3
10'	3386.3	925.9	10'	4099.5	1315.6	10'	4908.0	1814.7
20	3397.5	931.6	20	4112.1	1322.9	20	4922.5	1824.1
30	3408.8	937.3	30	4124.8	1330.3	30	4937.0	1833.6
40	3420.1	943.1	40	4137.4	1337.7	40	4951.5	1843.1
50	3431.4	948.9	50	4150.1	1345.1	50	4966.1	1852.6
62	3442.7	954.8	72	4162.8	1352.6	82	4980.7	1862.2
10	3454.1	960.6	10	4175.6	1360.1	10	4995.4	1871.8
20	3465.4	966.5	20	4188.5	1367.6	20	5010.0	1881.5
30	3476.8	972.4	30	4201.2	1375.2	30	5024.8	1891.2
40	3488.3	978.3	40	4214.0	1382.8	40	5039.5	1900.9
50	3499.7	984.3	50	4226.8	1390.4	50	5054.3	1910.7
63	3511.1	990.2	73	4239.7	1398.0	83	5069.2	1920.5
10	3522.6	996.2	10	4252.6	1405.7	10	5084.0	1930.4
20	3534.1	1002.3	20	4265.6	1413.5	20	5099.0	1940.3
30	3545.6	1008.3	30	4278.5	1421.2	30	5113.9	1950.3
40	3557.2	1014.4	40	4291.5	1429.0	40	5128.9	1960.2
50	3568.7	1020.5	50	4304.6	1436.8	50	5143.9	1970.3
64	3580.3	1026.6	74	4317.6	1444.6	84	5159.0	1980.4
10	3591.9	1032.8	10	4330.7	1452.5	10	5174.1	1990.5
20	3603.5	1039.0	20	4343.8	1460.4	20	5189.3	2000.6
30	3615.1	1045.2	30	4356.9	1468.4	30	5204.4	2010.8
40	3626.8	1051.4	40	4370.1	1476.4	40	5219.7	2021.1
50	3638.5	1057.7	50	4383.3	1484.4	50	5234.9	2031.4
65	3650.2	1063.9	75	4396.5	1492.4	85	5250.3	2041.7
10	3661.9	1070.2	10	4409.8	1500.5	10	5265.6	2052.1
20	3673.7	1076.6	20	4423.1	1508.6	20	5281.0	2062.5
30	3685.4	1082.9	30	4436.4	1516.7	30	5296.4	2073.0
40	3697.2	1089.3	40	4449.7	1524.9	40	5311.9	2083.5
50	3709.0	1095.7	50	4463.1	1533.1	50	5327.4	2094.1
66	3720.9	1102.2	76	4476.5	1541.4	86	5343.0	2104.7
10	3732.7	1108.6	10	4489.9	1549.7	10	5358.6	2115.3
20	3744.6	1115.1	20	4503.4	1558.0	20	5374.2	2126.0
30	3756.5	1121.7	30	4516.9	1566.3	30	5389.9	2136.7
40	3768.5	1128.2	40	4530.4	1574.7	40	5405.6	2147.5
50	3780.4	1134.8	50	4544.0	1583.1	50	5421.4	2158.4
67	3792.4	1141.4	77	4557.6	1591.6	87	5437.2	2169.2
10	3804.4	1148.0	10	4571.2	1600.1	10	5453.1	2180.2
20	3816.4	1154.7	20	4584.8	1608.6	20	5469.0	2191.1
30	3828.4	1161.3	30	4598.5	1617.1	30	5484.9	2202.2
40	3840.5	1168.1	40	4612.2	1625.7	40	5500.9	2213.2
50	3852.6	1174.8	50	4626.0	1634.4	50	5517.0	2224.3
68	3864.7	1181.6	78	4639.8	1643.0	88	5533.1	2235.5
10	3876.8	1188.4	10	4653.6	1651.7	10	5549.2	2246.7
20	3889.0	1195.2	20	4667.4	1660.5	20	5565.4	2258.0
30	3901.2	1202.0	30	4681.3	1669.2	30	5581.6	2269.3
40	3913.4	1208.9	40	4695.2	1678.1	40	5597.8	2280.6
50	3925.6	1215.8	50	4709.2	1686.9	50	5614.2	2292.0
69	3937.9	1222.7	79	4723.2	1695.8	89	5630.5	2303.5
10	3950.2	1229.7	10	4737.2	1704.7	10	5646.9	2315.0
20	3962.5	1236.7	20	4751.2	1713.7	20	5663.4	2326.6
30	3974.8	1243.7	30	4765.3	1722.7	30	5679.9	2338.2
40	3987.2	1250.8	40	4779.4	1731.7	40	5696.4	2349.8
50	3999.5	1257.9	50	4793.6	1740.8	50	5713.0	2361.5
70	4011.9	1265.0	80	4807.7	1749.9	90	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836.2	1768.2	20	5763.1	2397.0
30	4049.3	1286.5	30	4850.5	1777.4	30	5779.9	2408.9
40	4061.8	1293.6	40	4864.8	1786.7	40	5796.7	2420.9
50	4074.4	1300.9	50	4879.2	1796.0	50	5813.6	2432.9

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

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
91°	5830.5	2444.9	101°	6950.6	3278.1	111°	8336.7	4386.1
10'	5847.5	2457.1	10'	6971.3	3294.1	10'	8362.7	4407.6
20	5864.6	2469.3	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	102	7075.5	3374.9	112	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002.7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93	6037.8	2594.0	103	7203.2	3474.4	113	8656.6	4651.3
10	6055.4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94	6144.3	2671.6	104	7333.6	3576.8	114	8822.9	4790.4
10	6162.6	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234.6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	105	7467.0	3682.3	115	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344.8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96	6363.4	2833.2	106	7603.5	3791.0	116	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259.0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	107	7743.2	3902.9	117	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98	6591.2	3003.8	108	7886.2	4018.2	118	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	109	8032.7	4137.1	119	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	6808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100	6828.3	3184.1	110	8182.8	4259.7	120	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

Table V. Corrections for use with table IV,

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Δ		For Tangents Add													
ANGLE	CURVE	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°		.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
15°		.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.53	.58	.63	.68
20°		.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
25°		.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
30°		.10	.19	.29	.39	.49	.59	.69	.79	.89	.99	1.09	1.20	1.29	1.39
35°		.11	.22	.34	.47	.58	.69	.70	.81	.92	1.04	1.29	1.42	1.54	1.66
40°		.13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
45°		.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
50°		.17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
55°		.19	.38	.57	.76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
60°		.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
65°		.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
70°		.25	.51	.76	1.02	1.28	1.54	1.80	2.06	2.33	2.60	2.88	3.16	3.44	3.72
75°		.27	.56	.83	1.12	1.40	1.69	1.98	2.27	2.57	2.87	3.16	3.47	3.78	4.09
80°		.30	.61	.91	1.22	1.53	1.84	2.15	2.46	2.78	3.10	3.44	3.78	4.12	4.46
85°		.33	.66	1.00	1.33	1.68	2.02	2.36	2.70	3.05	3.40	3.77	4.14	4.55	4.89
90°		.36	.72	1.09	1.45	1.83	2.20	2.57	2.94	3.32	3.70	4.10	4.50	4.91	5.32
95°		.39	.79	1.19	1.55	2.00	2.40	2.80	3.20	3.61	4.02	4.49	4.98	5.38	5.83
100°		.43	.86	1.30	1.74	2.18	2.62	3.06	3.50	3.95	4.40	4.88	5.37	5.85	6.34

For Externals Add

ANGLE	CURVE	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°		.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°		.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°		.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°		.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°		.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°		.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°		.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°		.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°		.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°		.046	.093	.142	.183	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°		.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°		.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.771	.845	.922	1.01
70°		.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°		.095	.182	.286	.383	.480	.578	.678	.777	.877	.977	1.07	1.18	1.29	1.39
80°		.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°		.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91
90°		.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°		.174	.350	.522	.706	.985	1.06	1.25	1.43	1.62	1.80	1.99	2.18	2.38	2.58
100°		.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96

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

Degree of Curve	Radius 50 sin. def. ang.	$\frac{1}{2}$ sub chord R = sin of def. angle				Length of arc for 100 ft.
		12.5 Ft.	15 Ft.	20 Ft.	25 Ft.	
30°	193.18	1° 51'	2° 17'	2° 58'	3° 43'	101.15
32°	181.39	1° 59'	2° 25'	3° 10'	3° 58'	101.33
34°	171.01	2° 06'	2° 33'	3° 21'	4° 12'	101.48
36°	161.80	2° 13'	2° 41'	3° 33'	4° 26'	101.66
38°	153.58	2° 20'	2° 49'	3° 44'	4° 40'	101.85
40°	146.19	2° 27'	2° 57'	3° 55'	4° 54'	102.06
42°	139.52	2° 34'	3° 05'	4° 07'	5° 08'	102.29
44°	133.47	2° 41'	3° 13'	4° 18'	5° 22'	102.53
46°	127.97	2° 48'	3° 21'	4° 29'	5° 36'	102.76
48°	122.92	2° 55'	3° 29'	4° 40'	5° 50'	103.00
50°	118.31	3° 02'	3° 38'	4° 51'	6° 04'	103.24
52°	114.06	3° 09'	3° 46'	5° 02'	6° 17'	103.54
54°	110.11	3° 16'	3° 54'	5° 13'	6° 31'	103.84
56°	106.50	3° 22'	4° 02'	5° 23'	6° 44'	104.14
58°	103.14	3° 29'	4° 10'	5° 34'	6° 57'	104.43
60°	100.00	3° 35'	4° 18'	5° 44'	7° 11'	104.72

CURVE FORMULAS.

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

$$T = \frac{50 \tan \frac{1}{2} I}{\sin D}$$

$$\sin D = \frac{50}{R}$$

$$\sin D = \frac{50 \tan \frac{1}{2} I}{T}$$

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

$$R = \frac{50}{\sin D}$$

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

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

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

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

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

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

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

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

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

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

To find angle for a given distance and deflection.

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

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

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

RIGHT ANGLE TRIANGLES.—Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

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

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

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

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

Natural Sines

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

DEG.	60'	50'	40'	30'	20'	10'	DEG.	60'	50'	40'	30'	20'	10'	DEG.
80	9848	9853	9858	9863	9868	9872	9	9868	9872	9876	9880	9884	9888	0
81	9877	9881	9886	9890	9894	9898	8	9894	9898	9902	9906	9910	9914	1
82	9903	9907	9911	9914	9918	9922	7	9918	9922	9926	9930	9934	9938	2
83	9925	9929	9932	9936	9939	9942	6	9939	9942	9946	9949	9953	9956	3
84	9945	9948	9951	9954	9957	9959	5	9957	9959	9962	9965	9968	9971	4
85	9962	9964	9967	9969	9971	9974	4	9971	9974	9977	9979	9982	9985	3
86	9976	9978	9980	9981	9983	9985	3	9983	9985	9987	9989	9991	9993	2
87	9986	9988	9989	9990	9992	9993	2	9992	9993	9994	9995	9996	9997	1
88	9994	9995	9996	9997	9997	9998	1	9997	9998	9999	1.0000	1.0000	1.0000	0
89	9998	9999	9999	9999	1.0000	1.0000	0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0

DEG.	60'	50'	40'	30'	20'	10'	DEG.
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Natural Cosines

Natural Tangents

DEG.	0'	10'	20'	30'	40'	50'	DEG.	0'	10'	20'	30'	40'	50'	DEG.	
0	0000	0029	0058	0087	0116	0145	89	40	8391	8441	8491	8541	8591	8642	49
1	0175	0204	0233	0262	0291	0320	88	41	8693	8744	8796	8847	8899	8952	48
2	0349	0378	0407	0437	0466	0495	87	42	9004	9057	9110	9163	9217	9271	47
3	0524	0553	0582	0612	0641	0670	86	43	9325	9380	9435	9490	9545	9601	46
4	0699	0729	0758	0787	0816	0846	85	44	9657	9713	9770	9827	9884	9942	45
5	0875	0904	0934	0963	0992	1022	84	45	1.0000	1.0058	1.0117	1.0176	1.0235	1.0295	44
6	1051	1080	1110	1139	1169	1198	83	46	1.0355	1.0416	1.0477	1.0533	1.0599	1.0661	43
7	1228	1257	1287	1317	1346	1376	82	47	1.0724	1.0786	1.0850	1.0913	1.0977	1.1041	42
8	1405	1435	1465	1495	1524	1554	81	48	1.1106	1.1171	1.1237	1.1303	1.1369	1.1436	41
9	1584	1614	1644	1673	1703	1733	80	49	1.1504	1.1571	1.1640	1.1708	1.1778	1.1847	40
10	1763	1793	1823	1853	1883	1914	79	50	1.1918	1.1988	1.2059	1.2131	1.2203	1.2276	39
11	1944	1974	2004	2035	2065	2095	78	51	1.2349	1.2423	1.2497	1.2572	1.2647	1.2723	38
12	2126	2156	2186	2217	2247	2278	77	52	1.2799	1.2876	1.2954	1.3032	1.3111	1.3190	37
13	2309	2339	2370	2401	2432	2462	76	53	1.3270	1.3351	1.3432	1.3514	1.3597	1.3680	36
14	2493	2524	2555	2586	2617	2648	75	54	1.3764	1.3848	1.3934	1.4019	1.4106	1.4193	35
15	2679	2711	2742	2773	2805	2836	74	55	1.4281	1.4370	1.4460	1.4550	1.4641	1.4733	34
16	2867	2899	2931	2962	2994	3026	73	56	1.4826	1.4919	1.5013	1.5108	1.5204	1.5301	33
17	3057	3089	3121	3153	3185	3217	72	57	1.5399	1.5497	1.5597	1.5697	1.5798	1.5900	32
18	3249	3281	3314	3346	3378	3411	71	58	1.6003	1.6107	1.6212	1.6319	1.6426	1.6534	31
19	3443	3476	3508	3541	3574	3607	70	59	1.6643	1.6753	1.6864	1.6977	1.7090	1.7205	30
20	3640	3673	3706	3739	3772	3805	69	60	1.7321	1.7437	1.7556	1.7675	1.7797	1.7917	29
21	3839	3872	3906	3939	3973	4006	68	61	1.8040	1.8165	1.8291	1.8418	1.8546	1.8676	28
22	4040	4074	4108	4142	4176	4210	67	62	1.8807	1.8940	1.9074	1.9210	1.9347	1.9486	27
23	4245	4279	4314	4348	4383	4417	66	63	1.9626	1.9768	1.9912	2.0057	2.0204	2.0353	26
24	4452	4487	4522	4557	4592	4628	65	64	2.0503	2.0655	2.0809	2.0965	2.1123	2.1283	25
25	4663	4699	4734	4770	4806	4841	64	65	2.1445	2.1609	2.1775	2.1943	2.2113	2.2286	24
26	4877	4913	4950	4986	5022	5059	63	66	2.2460	2.2637	2.2817	2.2998	2.3183	2.3369	23
27	5095	5132	5169	5206	5243	5280	62	67	2.3559	2.3750	2.3945	2.4142	2.4342	2.4545	22
28	5317	5354	5392	5430	5467	5505	61	68	2.4751	2.4960	2.5172	2.5386	2.5605	2.5826	21
29	5543	5581	5619	5658	5696	5735	60	69	2.6051	2.6279	2.6511	2.6746	2.6985	2.7228	20
30	5774	5812	5851	5890	5930	5969	59	70	2.7475	2.7725	2.7980	2.8239	2.8502	2.8770	19
31	6009	6048	6088	6128	6168	6208	58	71	2.9042	2.9319	2.9600	2.9887	3.0178	3.0475	18
32	6249	6289	6330	6371	6412	6453	57	72	3.0777	3.1084	3.1397	3.1716	3.2041	3.2371	17
33	6494	6536	6577	6619	6661	6703	56	73	3.2709	3.3052	3.3402	3.3759	3.4124	3.4495	16
34	6745	6787	6830	6873	6916	6959	55	74	3.4874	3.5261	3.5656	3.6059	3.6470	3.6891	15
35	7002	7046	7089	7133	7177	7221	54	75	3.7321	3.7760	3.8208	3.8667	3.9136	3.9617	14
36	7265	7310	7355	7400	7445	7490	53	76	4.0108	4.0611	4.1126	4.1653	4.2193	4.2747	13
37	7536	7581	7627	7673	7720	7766	52	77	4.3315	4.3897	4.4494	4.5107	4.5736	4.6382	12
38	7813	7860	7907	7954	8002	8050	51	78	4.7046	4.7729	4.8430	4.9152	4.9894	5.0658	11
39	8098	8146	8195	8243	8292	8342	50	79	5.1446	5.2257	5.3093	5.3955	5.4845	5.5764	10
DEG.	60'	50'	40'	30'	20'	10'	DEG.	60'	50'	40'	30'	20'	10'	DEG.	

DEG.	0'	10'	20'	30'	40'	50'	DEG.
80	5.6713	5.7694	5.8708	5.9758	6.0844	6.1970	9
81	6.3138	6.4348	6.5606	6.6912	6.8269	6.9682	8
82	7.1154	7.2687	7.4287	7.5958	7.7704	7.9530	7
83	8.1443	8.3450	8.5555	8.7769	9.0098	9.2553	6
84	9.5144	9.7882	10.078	10.385	10.711	11.059	5
85	11.430	11.826	12.250	12.706	13.197	13.727	4
86	14.300	14.924	15.605	16.350	17.169	18.075	3
87	19.081	20.206	21.470	22.903	24.542	26.432	2
88	28.636	31.242	34.368	38.189	42.964	49.104	1
89	57.290	68.750	85.940	114.588	171.885	343.770	0
DEG.	60'	50'	40'	30'	20'	10'	DEG.

Natural Cotangents

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES $1\frac{1}{2}$ TO 1.

FOR SINGLE TRACK EMBANKMENT.

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

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

MADE IN GERMANY.

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