

1057

DEYGEN
4

ENGINEER'S
FIELD BOOK
No. 1057

EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and
SURVEYING INSTRUMENTS

1057

Chicago New York San Francisco New Orleans Pittsburg Toronto

Distances from Center of Roadway for Cross-Sectioning
Roadway 16 feet wide. Side Slopes 1 on 1.
For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	0
1	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	1
2	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	2
3	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	3
4	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	4
5	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	5
6	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	6
7	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	7
8	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	8
9	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	9
10	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	10
11	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	11
12	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	12
13	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	13
14	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	14
15	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	15
16	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	16
17	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	17
18	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	18
19	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	19
20	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	20
21	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	21
22	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	22
23	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	23
24	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	24
25	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	25
26	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	26
27	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	27
28	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	28
29	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	29
30	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	30
31	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	31
32	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	32
33	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	33
34	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	34
35	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	35
36	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	36
37	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	37
38	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	38
39	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	39
40	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 30.6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be $30.6 + (20 - 16) \div 2$ or 2 ft. added to 30.6 = 32.6. For slopes of 1 on 1½ see inside of back cover.

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Gregor
Miller
Stam

Alignment of
Highway from No. Line
of Old Town
To Balboa Ave

T.P.S. Plotted-
542 } Greenwood
543 } To
551 } Knoxville
556 }
565 } 3-3-48-MQ
566 }
= Sta 28+28.17

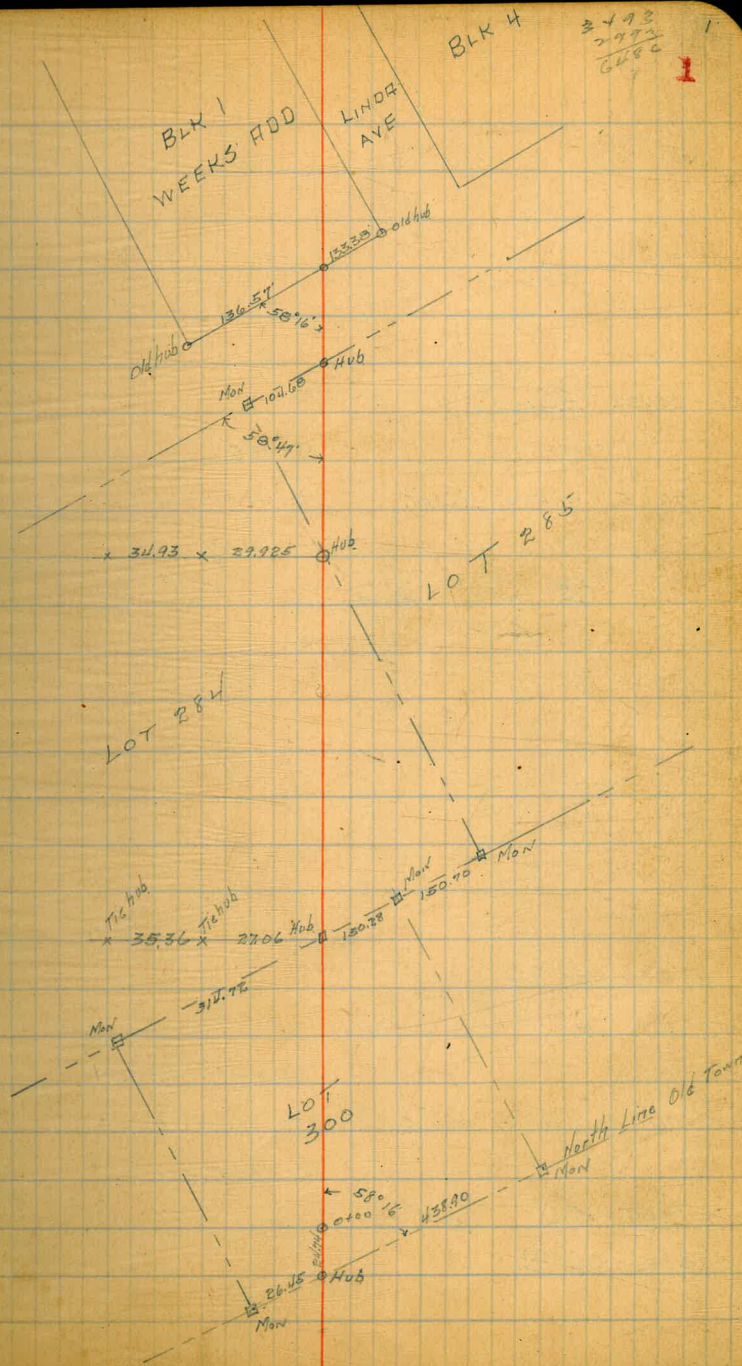
13+24.94 @ P.O.T.

12+95.05 @ P.O.T.

10+95.98 @ P.O.T.

5+23.73 @ P.O.T.

0+00



23+20.32 E.C.

$$R = 125'$$

22+76.65 Δ $42^\circ 01'$ Right.

$$st = 48.00'$$

$$Lc = 91.67$$

22+28.65 P.C.

17+08.38 = New E.C.

17+08.01 E.C.

$$R = 215' \quad 228.41$$

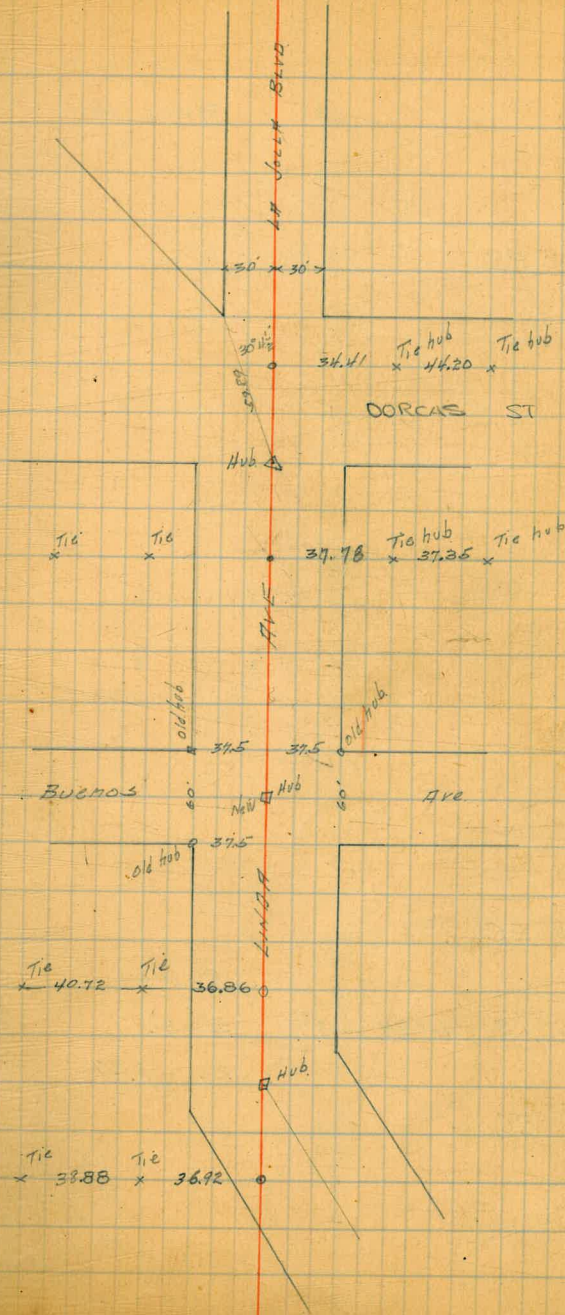
16+50.11 Δ $31^\circ 41' 30''$ Left $st = 61.02 \quad 61.82$

$$Lc = 48.92 \quad 176.34$$

15+89.09 P.C.

m.05 back.

15.82.04 = New P.C.



Plotted TPS. -

38 + 28.17 P.O.T.

35.66

36 + 89
1.99

32 + 23.60 E.C.

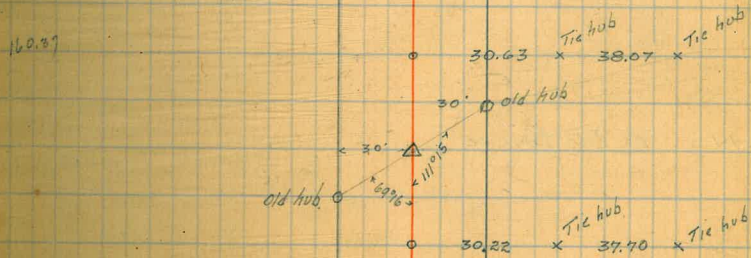
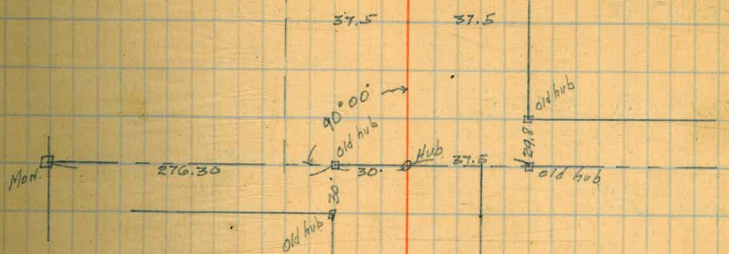
$R = 100$

31 + 88.70 Δ $41^{\circ}59'$ Left.

$st = 38.37$

$bc = 73.27$

31 + 50.33 P.C.



15.6

Plotted - T.P.S. - 580 M^oQ.
3-9-48

50 + 78.85 E.C.

Rad = 225

50 + 10.16 Δ 36° 14' 1/2" R.

st = 73.63

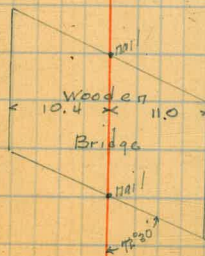
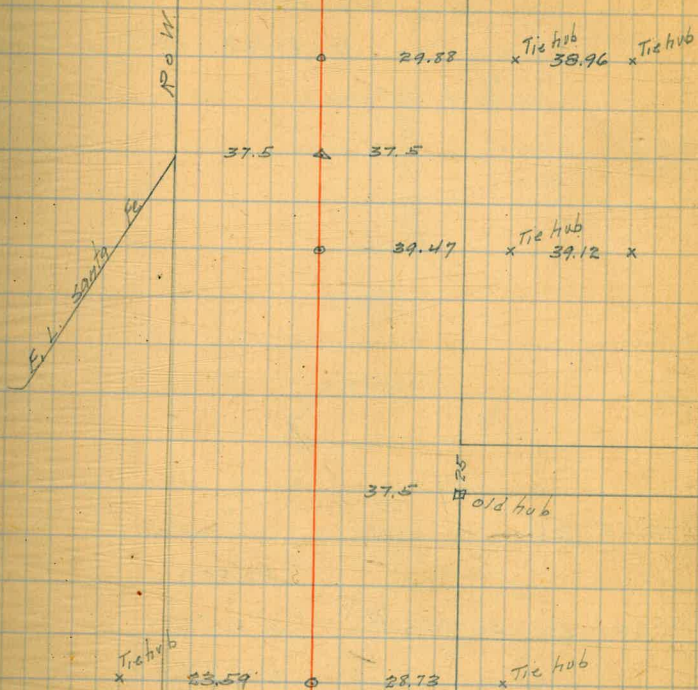
49 + 36.53 P.C.

Lc = 142.32

43 + 89.08 P.O.T.

41 + 60.99 = No. End Bridge

41 + 40.43 = So. End Bridge



Plotted TPS-580-583
 Knoxville to Asher
 3-9-48-MCQ

60+33.45 EC

R=500

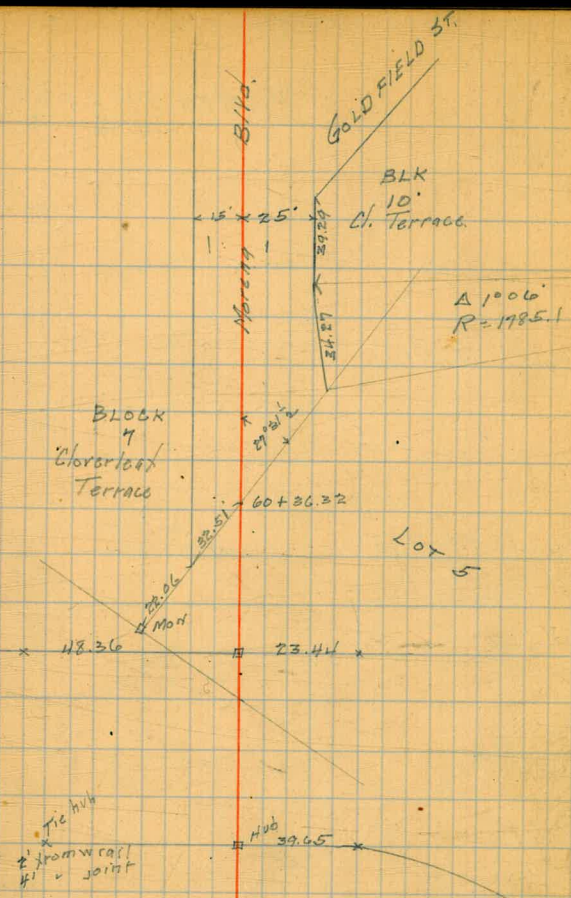
59+21.61 Δ $26^{\circ}05\frac{1}{2}'$ R

st=115.85

OC=227.69

53+05.76 PC

55+13.51 \odot POT.



Plotted TPS - 582-A 583
M^cQ 3-9-48

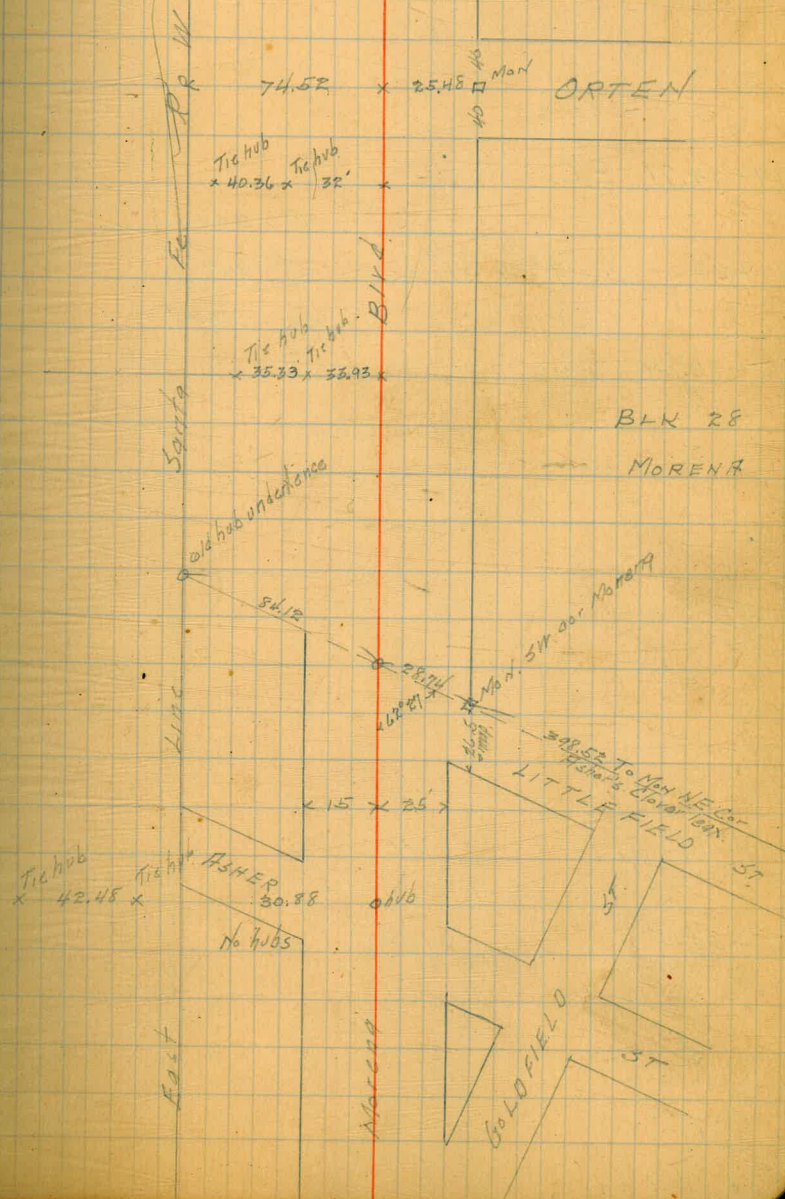
79+84.14 @ POT.

74+84.14 @ POT.

69+60.61

68+nd
66

65+34.14 @ POT.



99+74.71 E.C.

R=3000'

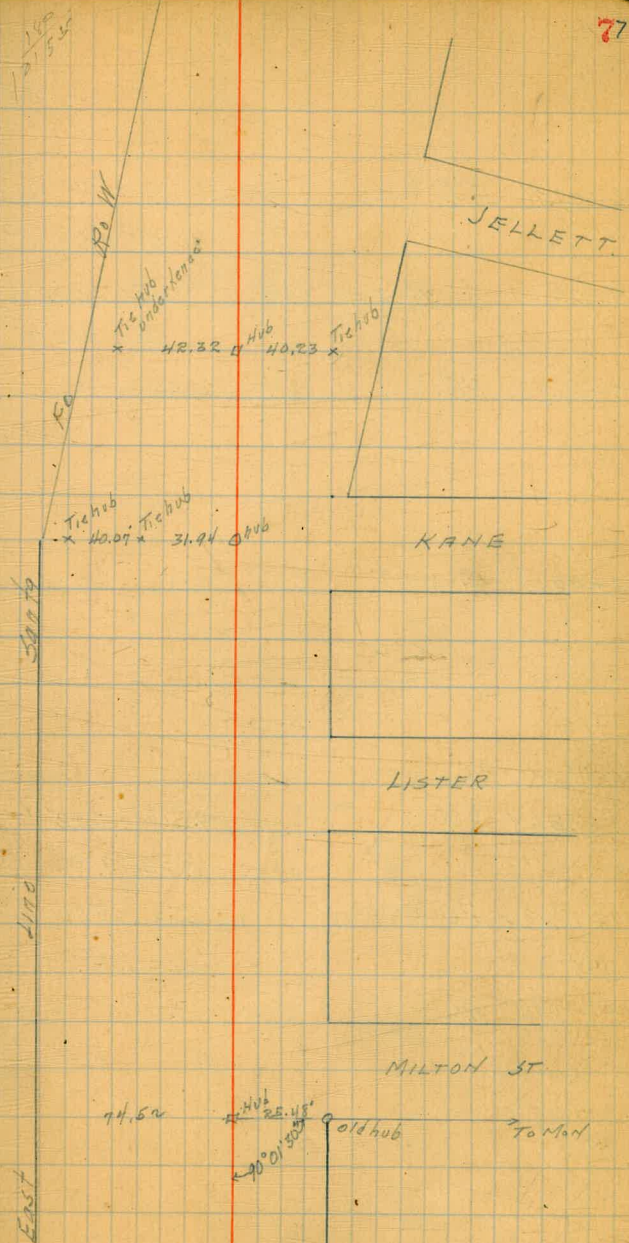
97+28.04 Δ 9°26'37" L

st 249.80

94+80.24 P.C.

lc 494.47

85+53.15



117 11 6 956
501.4
11 6 956
495.6

132+79.26 E.C.

R = 5799.65

129+23.27 Δ 7°02'30" Left

St = 356.79

Lc = 712.78

125+66.48 P.C.

122+00 O.P.O.T.

116+98.60 E.C.

Δ 19°25'23" L

R = 3889.83

112+08.62 P.O.C.

St = 665.71

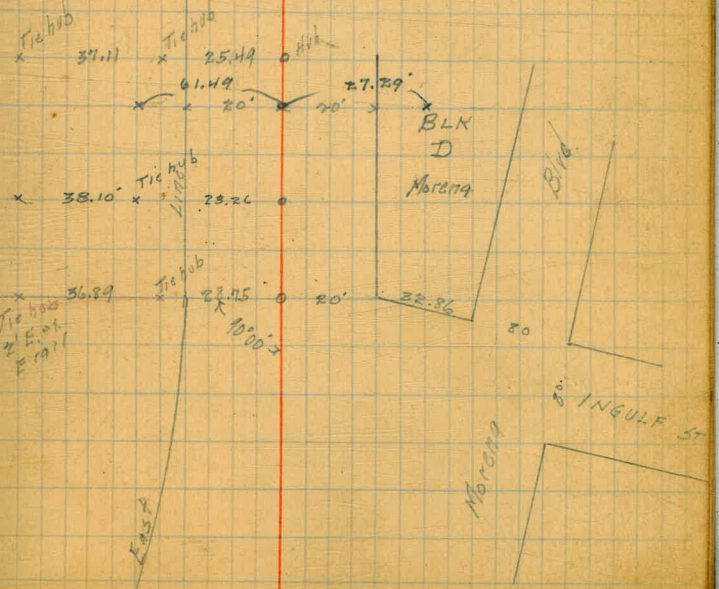
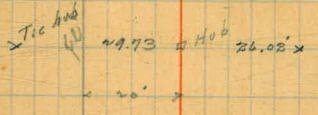
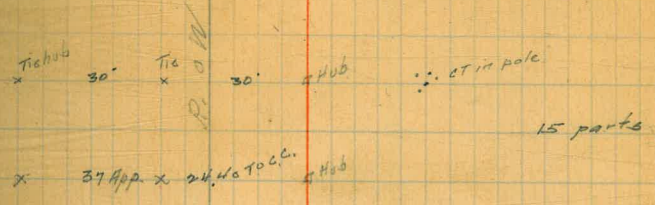
Lc = 1318.64

Δ 9'13"

107+18.63 P.O.C.

Δ 11°51'23"

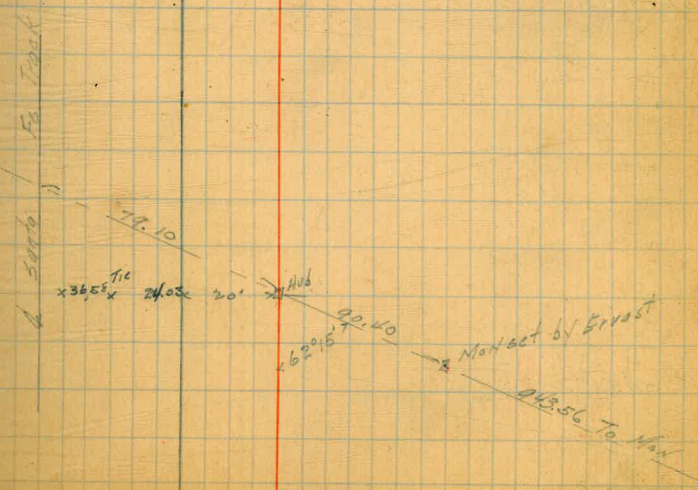
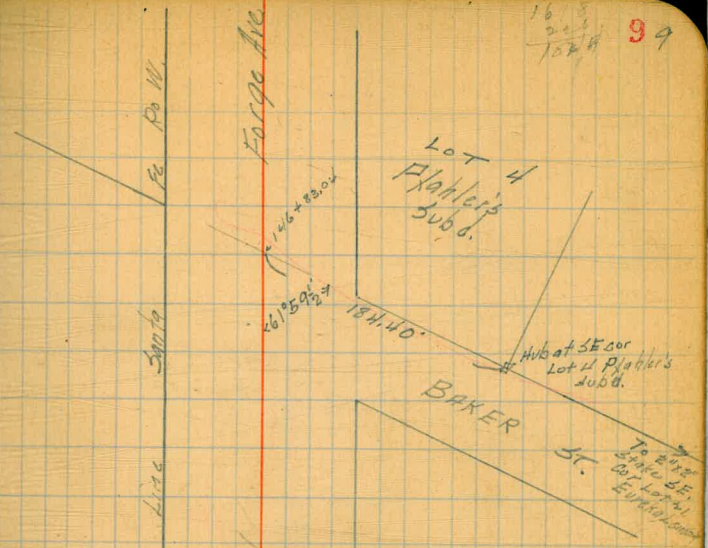
103+79.96 P.C.



146+83.04

138+76.97 @ P.O.T.

16
157# 99

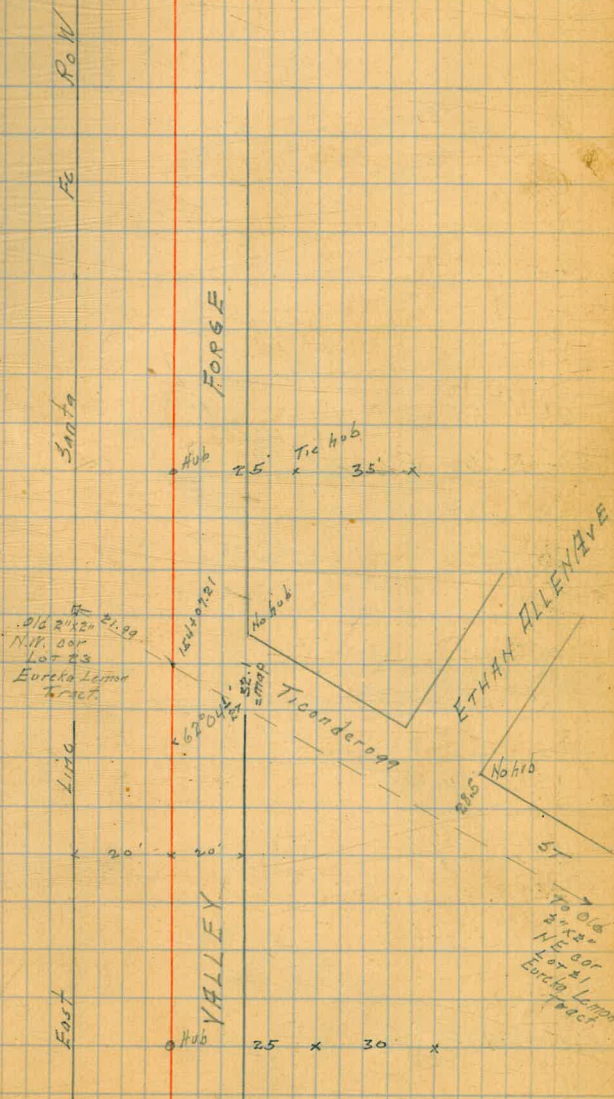


158+94.14 © P.O.T.

154+07.21

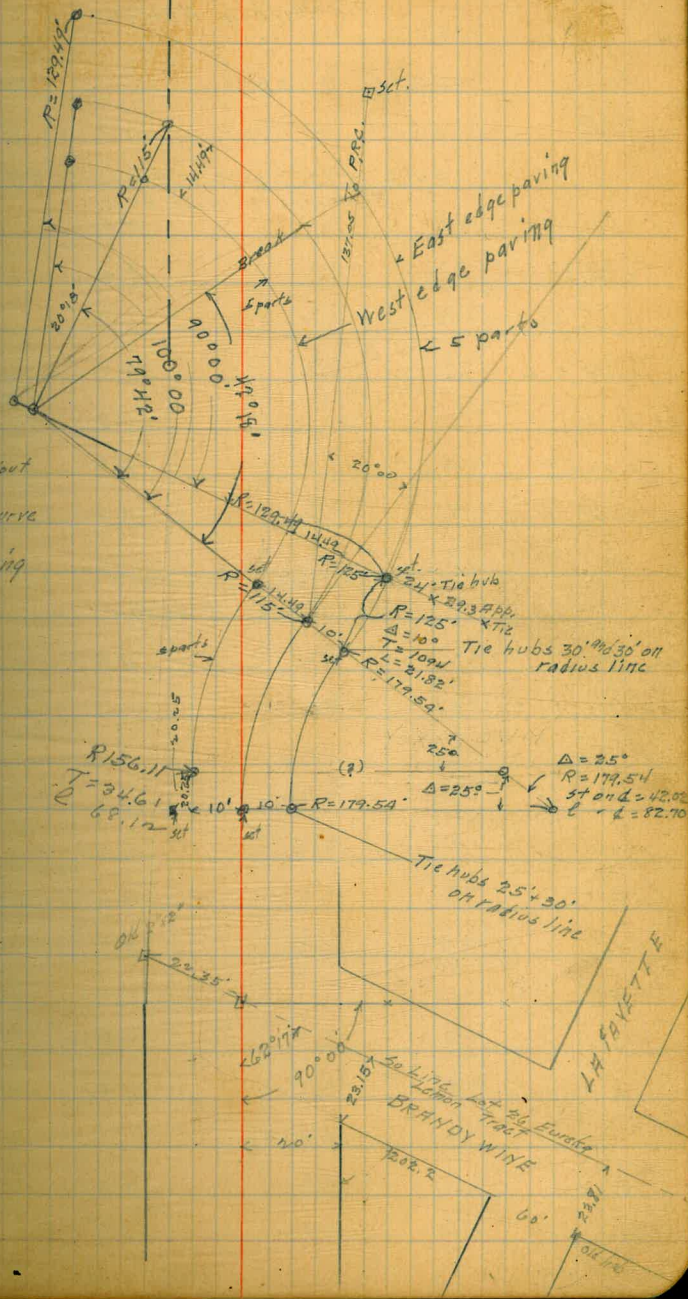
138+

147+94.14 © P.O.T.



65.14

← E.L. of Santa Fe R.O.W.



This shows layout of Goose neck curve at Santa Fe King

165+39.14 O POT.

Gregory

CROSS SECTION OF
Morena Blvd from N.L. of
Old Town
To Balboa Avenue.

17.22

12

B.M.	3.80	26.25			
TP	2.50	17.22	11.53	14.72	
E			9.5	7.7	
+ 15.5			3.0	14.2	
+ 22.38			2.8	14.4	
+ 10 = 6			2.5	14.4	
6 + 10			3.3	13.9	
+ 17.62			4.7	12.5	
+ 20			8.2	9.0	
W			8.6	8.8	
W			9.3	7.9	
+ 11.0			7.6	9.6	
+ 18.0			8.1	9.1	
+ 25.0			3.6	13.6	
+ 26			3.2	14.0 = edge	
6			3.0	14.2	
+ 15			3.1	14.1	
+ 21			3.1	14.1 = edge	
+ 31			8.8	8.4	
E			9.5	7.7	
E			10.6	6.6	
+ 16			8.9	8.3	

N.L. Old Town = 31. Pueblo Lot 300
Boulevard 20' wide here.

All distances given are on 6
2474 No. on 6 = Sta 0+00

+ 23	3.5	13.7
+ 25	3.3	13.9
6	2.9	14.3
+ 13	3.1	14.1
+ 15	4.4	12.8
+ 20	8.9	8.3
+ 28	8.0	9.2
W	8.6	8.6
W	10.7	6.5
+ 16	8.0	9.2
+ 17	9.2	8.0
+ 20	9.0	8.2
+ 25	5.4	11.8
+ 29	3.3	13.9
6	3.1	14.1
+ 15	3.4	13.5
+ 17	3.5	13.7
+ 28	8.3	8.9
E	10.8	6.4
E	10.3	6.9
+ 12	8.3	8.9
+ 22	3.2	14.0
+ 25	3.3	13.9
6	2.9	14.3

1+00

1+50

Not SW
Busses + Lin

17.22

+12	3.3	13.9
+15	5.5	11.7
+21	9.1	8.1
+28	8.3	8.9
+33	9.7	7.5
W	9.7	7.5
	2+00	
W	9.6	7.6
+14	8.3	8.9
+19	8.6	8.6
+25	5.6	11.6
+28	9.3	13.9
E	3.0	14.2
+15	3.1	14.1
+17	3.0	14.2
+28	7.9	9.3
E	9.4	7.8
	2+50	
E	11.5	5.7
+12	9.3	7.9
+23	3.6	13.6
+25	3.3	13.9
E	3.0	14.2
+12	3.2	14.0
+15	5.0	12.2
+20	8.0	9.2

Morena
13

+26	7.8	9.4
W	10.3	6.9
	3+00	
W	11.1	6.1
+20	8.0	9.2
+25	4.6	12.6
+27	3.2	14.0
E	4.9	14.3
+15	5.4	13.8
+19	3.6	13.6
+28	9.1	8.1
E	14.0	5.2
	3+50	
E	13.0	4.2
+12	10.5	6.7
+23	3.3	13.9
+25	3.3	13.9
E	2.8	14.4
+12.5	3.1	14.1
+15	4.8	12.4
+22	8.7	8.5
+25	8.2	9.0
W	10.8	6.4
	4+00	
W	11.6	5.6
+14	8.4	8.8

17.22

+19			8.3	8.9
+25			5.0	12.2
+28			3.0	14.2
6			2.7	14.5
+15			3.2	14.0
+17			3.3	13.9
+27			10.2	7.0
E			12.8	4.1
	4+50			
E			12.5	4.7
+16			9.0	8.2
+23			3.2	14.0
+25			3.1	14.1
6			2.6	14.6
+12			2.8	14.4
+15			4.9	12.3
T.P.	1.61	16.14	2.69	14.53
+20			7.4	8.7
+24			6.6	9.5
+38			11.1	5.0
W			11.0	5.1
	5+00			
W			11.2	4.9
+13			7.0	9.1
+20			6.9	9.2
+25			3.8	12.3

March 29

14

+28			2.0	14.1
6			1.6	14.5
+15			2.1	14.0
+16			2.3	13.8
+31			11.9	4.2
E			12.7	3.4
	5+50			
E			12.0	4.1
+11			11.0	5.1
+23			2.1	14.0
+25			2.1	14.0
6			1.6	13.5
+11			1.6	13.8
+15			4.3	11.8
+30			7.0	9.1
+24			7.3	8.8
W			11.8	4.3
	6+00			
W			11.2	4.9
+9			9.0	7.1
+20			6.6	9.5
+25			3.3	12.8
+27			2.1	14.0
6			1.7	14.4
+15			2.2	13.9
+17			2.3	13.8

16.14

+24	7.7	84
+29	9.6	6.5
E	10.5	5.6
6+50		
E	11.0	51
+12	10.0	6.1
+23	2.3	13.8
+25	2.2	13.9
♀	1.5	14.6
+12	1.9	14.2
+15	3.7	12.4
+20	7.3	8.8
+25	6.9	9.2
+35	9.7	6.4
W	10.0	6.1
7+00		
W	6.6	9.5
+15	6.0	10.1
+25	1.5	14.6
♀	1.2	14.9
+15	2.0	14.1
+18	2.2	13.9
+30	10.2	5.9
E	11.0	5.1

Mreng 15

7+50

E	10.6	5.5
+9	8.9	7.2
+21	1.0	15.1
+25	0.9	15.2
♀	0.4	15.7
+15	1.0	15.1
+25	1.6	14.5
W	0.6	15.5
8+00		
W	0.5	15.6
+20	0.8	15.3
+25	0.8	15.3
♀	0.3	15.8
+15	0.2	15.9
+26	0.2	15.9
E	6.0	10.1
T.P.	5.09	21.14
8+50		
E	8.6	12.5
+12	4.0	17.1
+25	4.7	16.4
♀	4.7	16.4
+15	5.0	16.1
+25	5.1	16.0
W	4.2	16.9

2114

9+00

W	16	19.5
+20	4.1	17.0
+25	4.3	16.8
♀	3.9	17.2
+15	4.3	16.8
+27	4.5	16.6
E	9.1	12.0

9+25

E	9.6	11.5
+12	6.1	15.0
+15	3.7	17.4
+25	3.9	17.2
♀	3.7	17.4
+15	3.8	17.3
+22	5.6	15.5
+28	5.5	15.6
+32	3.4	17.7
W	1.9	19.2

9+50

W	4.1	17.0
+5	5.9	15.2
+18	5.4	15.7
+25	3.7	17.4
♀	3.5	17.6
+15	3.8	17.3
+21	3.8	17.3

2114

Moreng 16

E

10.4

10.7

10+00

E	12.2	8.9
+11	10.8	10.3
+25	3.5	17.6
♀	3.2	17.9
+15	3.5	17.6
+28	4.5	16.6
+33	5.8	15.3
W	5.4	15.7

10+50

W	4.0	17.1
+10	3.7	17.4
+25	2.8	18.3
♀	2.8	18.3
+15	2.9	18.2
+27	10.2	10.9
E	11.3	9.8

11+00

E	9.1	12.0
+16	8.0	13.1
+25	8.4	17.7
+26	2.8	18.3
♀	2.6	18.5
+15	2.6	18.5
+25	2.8	18.3

edge

21.4

W			37	17.4
		11+50		
W			26	18.5
+25			2.3	18.8
Q			2.1	19.0
+14			2.4	18.7
+15			2.9	18.2
+18			4.5	16.6
E			5.0	16.1
		12+00		
E			2.5	18.6
+25			1.7	19.4
Q			1.7	19.4
+15			1.7	19.4
W			1.6	19.5
T.P.	5.17	25.71	0.60	20.54
		12+50		
W			4.0	21.7
+7			4.0	21.7
+25			5.4	20.3
Q			5.6	20.1
+12			5.4	20.3
+15			4.9	20.8
E			5.6	20.2
		13+00		
E			5.0	20.7

25.71

Morena

17

+25			4.4	21.3
+28			4.8	20.9
Q			4.6	21.1
+15			4.2	21.5
+33			3.1	22.6
W			3.1	22.6
		13+50		
W			3.9	21.8
+6			4.4	21.3
+9			5.0	20.7
+25			5.1	20.6
Q			5.1	20.6
+15			5.3	20.4
E			4.9	20.8
		14+00		
E			5.1	20.6
+25			5.5	20.2
Q			5.3	20.4
+15			5.5	20.2
W			5.2	20.5
		14+50		
W			5.4	20.3
+25			5.7	20.0
Q			5.5	20.2
+15			5.6	20.1
E			5.3	20.4
CHK	3.35	25.79	3.27	22.42 = 48

25.79

15+00

E	5.5	20.3
+25	5.6	20.2
+30	5.6	20.2
Q	5.7	20.1
+10	5.8	20.0
+15	5.8	20.0
W	5.6	20.2

15+50

W	5.4	20.4
+25	5.6	20.2
+30	5.6	20.2
C	5.5	20.3
+10	5.5	20.3
+15	5.4	20.4
+30	5.3	20.5
E	4.3	21.5

15+89.09 = P.C.
From this pt. E = 15' E of Q and W = 15' W of Q.

-5	4.9	20.9
-2	5.4	20.4
E	4.7	21.1
+5	5.1	20.7
+15	5.1	20.7
+25	5.1	20.7
+30 = W	5.4	20.4

25.79

16+50

15' W. of Q	5.1	20.7
+5	4.8	21.0
+15 = Q	4.5	21.3
+23	4.4	21.4
+25	4.2	21.6
+30 = E	4.9	20.9

17+08.01 = E.C.

E	4.2	21.6
+2	4.5	21.3
+5	4.5	21.3
+15	4.6	21.2
+25	4.8	21.0
+30 = W	5.0	20.8

17+50

W	4.5	21.3
+5	4.5	21.3
+15	4.4	21.4
+25	4.4	21.4
+30 = E	4.4	21.4

18+00

E	4.2	21.6
+5	4.2	21.6
+15	4.0	21.8
+25	4.2	21.6
+29	4.3	21.5
+30 = W	4.0	21.8
+35	4.0	21.8

March 18

25.79

18+50

W	3.1	22.4
+5	3.7	22.1
+15	3.6	22.2
+25	3.6	22.2
+30 = E	3.5	22.3

19+00

E	3.7	22.1
+5	3.7	22.1
+15	3.6	22.2
+25	3.6	22.2
+28	3.5	22.3
+30 = W	3.2	22.6
+35	3.1	22.7

19+50

W	3.0	22.8
+1	3.6	22.2
+5	3.7	22.1
+15	3.7	22.1
+25	3.8	22.0
+30 = E	3.8	22.0

20+00

E	5.1	20.7
+5	4.9	20.9
+15	4.7	21.1
+25	4.6	21.2

25.79

130 = W

W	4.4	21.4
+5	6.0	19.8
+15	5.8	20.0
+25	5.8	20.0
+30 = E	6.1	19.7
	6.5	19.3

21+00

E	7.3	18.5
+5	7.0	18.8
+15	6.8	19.0
+25	6.9	18.9
+30 = W	7.1	18.7

21+50

W	8.1	17.7
+5	7.9	17.9
+15	7.8	18.0
+25	8.1	17.7
+30 = E	8.2	17.6

22+00

E	8.6	17.2
+5	8.5	17.3
+15	8.1	17.7
+25	8.2	17.6
+30 = W	8.5	17.3
T.P.	4.67	22.10

22.55

$$\frac{15.0}{7.35} = \frac{15.6}{6.95}$$

Morang

19

 spk. SW.
 Blvd + Mac's
 Add 10/1/1966

2210

22+28.65 = PC.

W	4.5	17.6
+5	4.4	17.7
+15	4.3	17.8
+25	4.6	17.5
+30 = E	5.0	17.1
E + 35	5.1	17.0

22+50

-5	5.2	16.9
E	5.1	17.0
+5	4.7	17.4
+15	4.5	17.6
+25	4.6	17.5
+30 = W	4.6	17.5

23+00

W	5.2	16.9
+5	4.9	17.2
+15	4.7	17.4
+25	4.8	17.3
+30 = E	5.1	17.0
E + 5	5.0	16.9

23+20.32 = EC.

E - 5	4.3	17.8
-2	5.3	16.8
E	5.1	17.0
+5	5.0	17.1

2210

+15	4.8	17.3
+25	4.9	17.2
+30 = W	5.1	17.0

23+50

W	5.2	16.9
+5	4.9	17.2
+15	4.8	17.3
+25	5.1	17.0
+30 = E	5.2	16.9
+0.1	4.5	17.6
+5	4.1	18.0

24+00

-5	4.5	17.6
-0.2	4.6	17.5
E	5.0	17.1
+5	5.1	17.0
+15	5.0	17.1
+25	5.0	17.1
+30 = W	5.1	17.0

24+50

W	4.8	17.3
+5	4.8	17.3
+15	4.6	17.5
+25	4.7	17.4
+30 = E	4.9	17.2
+0.1	4.4	17.7
+5	4.1	18.0

22.10

25+00

-5	3.8	183
-E	4.0	181
+0.5	4.6	175
+5.0	4.2	179
+15	4.2	179
+25	4.5	176
+30=W	4.4	177

25+50

W	4.3	178
+5	4.2	179
+15	3.9	182
+25	4.2	179
+29	4.4	177
+30=E	3.6	185
+5	3.3	188

26+00

-5	2.8	193
E	3.5	186
+1	4.1	180
+5	3.9	182
+15	3.7	184
+25	3.9	182
+30=W	4.0	181

26+50

W	3.6	185
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22.10

Morena

21

+3	3.5	186
+15	3.3	188
+25	3.6	185
+28	3.9	182
+29	3.1	190
+30=E	2.9	192
+3	2.0	201
+5	1.9	202

27+00

-5	1.2	209
-2	1.2	209
E	2.1	200
+2	3.2	189
+5	3.1	190
+15	3.0	191
+20	3.0	191
+25	3.3	188
+30=W	3.4	187

27+50

W	3.3	188
+5	3.1	190
+10	2.9	192
+15	2.9	192
+25	3.0	191
+27	3.0	191
+30=E	1.6	205

+2		22.10	0.5	21.6
+5			0.3	21.8
		28+00		
-5			0.2	21.9
E			0.9	21.2
+4			2.7	19.4
+5			2.7	19.4
+15			2.4	19.7
+25			2.6	19.5
+30=W			2.9	19.2
T.P.	5.27	25.29	2.08	20.02
		28+50		
W			5.8	19.5
+5			5.4	19.9
+13			5.2	20.1
+15			5.3	20.0
+25			5.4	19.9
+27			5.5	19.8
+30=E			4.3	21.0
+1			3.2	22.1
+5			2.8	22.5
		29+00		
-5			2.3	23.0
E			4.3	21.0
+2			5.3	20.0
+5			5.2	20.1

+15			50	20.3
+25			51	19.9
+30=W			53	20.0
		29+50		
W			4.9	20.4
+5			4.9	20.4
+15			4.7	20.6
+25			4.8	20.5
+28			4.9	20.4
+30=E			4.0	21.3
+2			2.5	22.8
+5			2.3	23.0
		30+00		
-5			4.0	21.3
E			4.3	21.0
+5			4.3	21.0
+15			4.2	20.9
+25			4.9	20.4
+27			4.9	20.4
+28			4.4	20.9
+30=W			4.5	20.8
+5			5.7	19.6
		30+50		
-5			7.5	17.8
W			4.8	20.5
+3			4.3	21.0

25.29

+5	4.8	20.5
+15	4.5	20.8
+25	4.4	20.9
+28	4.4	20.9
+30 = E	4.0	21.3
+5	3.9	21.4

31+00

-5	3.5	21.8
-1	3.5	21.8
E	4.0	21.3
+5	4.0	21.3
+15	4.3	21.0
+24	4.6	20.7
+25	4.0	21.3
+30 = W	4.4	20.9
+5	5.1	20.2
T.P.	1.79	24.16
	2.92	22.37

31+50.33 = P.C.

-5	1.2	23.0
-2	1.2	23.0
W	2.6	21.6
+3	3.5	20.4
+5	3.7	20.5
+15	2.8	21.4
+25	2.3	21.9
+29.5	2.3	21.9

24.16

+30 = E	1.7	22.5
+5	1.3	22.9
	31+75	
-5	0.5	23.7
E	1.5	22.7
+3	2.4	21.8
+5	2.4	21.8
+15	2.7	21.5
+25	3.8	20.4
+30 = W	4.2	20.0
+5	1.6	22.6
+10	1.7	22.5

32+00

-10	2.1	22.1
-5	2.0	22.2
-1	4.8	19.4
W	4.8	19.4
+5	4.2	20.0
+15	3.3	20.9
+25	3.0	21.2
+27	2.7	21.5
+30 = E	2.3	21.9
+4	1.3	22.9
	32+23.60 = E.C.	
-5	2.3	21.9
-2	3.1	21.1

More 29

23

E	3.0	21.2
+1	3.7	20.5
+5	3.7	20.5
+15	4.1	20.1
+25	5.0	19.2
+29	5.3	18.9
+30=W	4.6	19.6
+3	2.3	21.9
+8	2.6	21.6
32+50		
-5	3.6	20.6
-0.2	3.6	20.6
W	4.5	19.7
+3.5	6.0	18.2
+5.0	6.0	18.2
+15	5.1	19.1
+25	4.8	19.4
+30=E	4.9	19.3
33+00		
E	6.9	17.3
+5	6.7	17.5
+15	6.8	17.4
+25	7.5	16.7
+27	7.7	16.5
+28	7.1	17.1
+30=W	7.1	17.1

33+50		Level	
W		8.8	15.4
+2		9.4	14.8
+5		9.0	14.2
+15		8.7	15.5
+25		8.7	15.5
+30=E		8.9	15.3
T.P.	0.09	15.21	9.04
34+00			15.12
E		1.8	13.4
+5		1.6	13.6
+15		1.6	13.6
+25		2.2	13.0
+27		2.1	13.1
+28		1.4	13.8
+30=W		1.3	13.9
34+50			
-5		5.0	10.2
-2		4.7	10.5
W		3.9	11.3
+2		3.3	11.9
+5		3.3	11.9
+15		3.1	11.8
+25		3.1	11.8
E		3.7	11.5
+3		3.8	11.4

15.21

35+00

-3	5.2	10.0
E	5.2	10.0
+5	5.2	10.0
+15	5.1	10.1
+25	5.7	9.5
+30 = W	7.0	8.2
+7	10.2	5.0
+15	10.9	4.3

35+50

-15	11.1	4.1
-10	10.8	4.4
-5	9.7	5.5
W	7.6	7.6
+2	6.6	8.6
+5	6.4	8.8
+15	6.1	9.1
+25	6.0	9.2
+30 = E	6.1	9.1
+3	6.2	9.0

36+00

-3	7.1	8.1
E	7.0	8.2
+5	6.8	8.4
+15	6.8	8.4
+25	6.7	8.5
+30 = W	7.8	7.4

15.21

+5	10.4	4.8
+15	11.6	3.6

36+50

-15	11.7	3.5
-5	10.5	4.7
W	8.7	6.5
+3	7.4	7.8
+5	7.2	8.0
+15	6.9	8.3
+25	7.2	8.0
+30 = E	7.4	7.8
+2	7.4	7.8

37+00

-15	7.1	8.1
E	7.1	8.1
+5	7.0	8.2
+15	7.0	8.2
+25	7.2	8.0
+30 = W	8.2	7.0
+3	9.7	5.5
+7	10.7	4.5
+15	11.6	3.6

37+50

-15	11.0	4.2
-10	11.1	4.1
-5	10.1	5.1

March 19

25

15.21

W
+5
+15
+25
+30 = E
+3
38+00
-2
E
+5
+15
+25
+28
+30 = W
+5
+10
+15

38+50

B.M. 8.12 14.23
-15
-5
W
+2
+5
+15
+25

6.11
7.30
10.13
10.6
10.1

7.7 7.5
7.2 8.0
6.9 8.3
6.9 8.3
7.1 8.1
7.3 7.9
6.9 8.3
6.9 8.3
6.7 8.5
6.6 8.6
6.6 8.6
6.9 8.3
7.6 7.6
9.9 5.3
10.5 4.7
10.8 4.4

6.11 RR. spk.
Left on 38+60

9.10 6.11
9.5 4.7
9.0 5.2
6.3 7.9
5.8 8.4
5.7 8.5
5.5 8.7
5.5 8.7

14.23

Mareng 26

+30 = E
+3
39+00
-2
E
+5
+15
+25
+30 = W
+5
+15
39+50
-15
-8
-4
W
+5
+15
+25
+30 = E
+2
40+00
-2
E
+5
+15

5.7 8.5
5.6 8.6
5.4 8.8
5.6 8.6
5.3 8.9
5.3 8.9
5.5 8.7
6.2 8.0
8.6 5.6
9.1 5.1
8.9 5.3
8.6 5.6
7.7 6.5
6.0 8.2
5.5 8.7
5.2 9.0
5.3 8.9
5.5 8.7
5.6 8.6
5.7 8.5
5.7 8.5
5.5 8.7
5.2 9.0

14.23

+25	56	86
+30=W	61	81
+2	65	77
+5	79	63
+8	85	57
+15	87	55
	40+50	
-15	83	59
-8	82	60
-3	62	80
W	58	84
+5	54	88
+15	51	91
+25	55	87
+30=E	59	83
+2	60	82
+7	81	61
+12	80	62
	41+00	
-15	82	60
-6	83	59
E	54	88
+5	49	93
+15	49	93
+25	53	89
+30=W	59	83

14.23

Morena 27

+4	80	62
+15	78	64
	41+13	
-22.5	87	55
-8	80	62
W	57	85
+1.5	50	92
+5	49	93
+15	47	95
+25	47	95
+28.5	48	94
+30=E	53	89
+7.5	83	59
+22.5	87	55
	41+23	
-22.5	92	50
-9	85	57
E	44	98
+5	45	97
+15	45	97
+25	48	94
+26.5	49	93
+30=W	52	90
+11.5	78	64
+22.5	77	65

14.23

41+37 = S.E. cor of Bridge

-22.5	8.4	5.8
-8	7.8	6.4
W	5.7	8.5
+5	4.3	9.9
+15	4.3	9.9
+25	4.3	9.9
+26.5	4.2	10.0
+29.5	6.7	7.5
+30 = E	11.1	3.1
+22.5	10.4	3.8

41+43 = S.W. cor of Bridge

-22.5	11.0	3.2
E	10.4	3.8
+5	9.9	4.3
+15	8.8	5.4
+26.5	4.6	9.8
+26.5	8.8	6.0
+30 = W	8.2	8.0
+22.5	8.9	5.3

41+58

-22.5	10.4	3.8
W	11.1	3.1
+5	9.6	4.6
+15	9.9	4.3
+25	9.7	4.5

14.2

March 28

+27.5
+29.5
+30 = E
+22.5

use for section
above only.

4.1	10.1
9.6	4.6
9.0	5.2
9.3	5.9

on floor

41+64

-22.5
-8.5
-8.0
E
+3
+5
+15
+25
+30 = W
+7.5
+22.5

8.3	5.9
8.8	5.4
7.3	6.9
5.2	9.0
4.3	9.9
4.2	10.0
4.1	10.1
4.1	10.1
9.1	5.1
7.0	4.2
10.7	3.5

41+75

-22.5
-5
W
+2
+5
+15
+25
+27.5
+30 = E

9.3	4.9
7.5	6.7
5.9	8.3
5.1	9.1
4.9	9.3
4.5	9.7
4.6	9.6
4.7	9.5
5.6	8.6

use for forward
section

14.23

+10.5	8.4	5.8
+22.5	8.2	6.0
42+00		
-15	7.8	6.4
-5	8.6	5.6
E	5.6	8.6
+5	5.5	8.7
+15	5.4	8.8
+25	5.6	8.6
+30=W	6.1	8.1
+2	7.6	6.6
+15	8.7	5.5
42+50		
-10	9.0	5.2
-5	8.8	5.4
W	7.2	9.0
+5	6.5	7.7
+15	6.2	8.0
+25	6.5	7.7
+30=E	6.8	7.4
+1	6.8	7.4
+4	8.3	5.9
+10	8.9	5.3
43+0		
-2	7.3	6.9
E	7.2	7.0

14.23

More 19

29

+5	7.0	7.2
+15	6.8	7.4
+25	7.2	7.0
+30=W	7.5	6.7
+2.5	7.8	6.4
43+50		
-3	8.0	6.2
W	7.9	6.3
+5	7.5	6.7
+15	7.2	7.0
+25	7.5	6.7
+30=E	7.8	6.4
+2	8.0	6.2
44+00		
-3	8.0	6.2
E	7.9	6.3
+5	7.8	6.4
+15	7.6	6.6
+25	7.8	6.4
W	8.2	6.0
44+50		
-5	8.5	5.7
W	8.4	5.8
+5	7.9	6.3
+15	7.8	6.4
+25	8.0	6.2
+30=E	8.2	6.0

		14.23		
BM ₁	2.54	8.60	8.37	5.86
		45+00		
E			2.6	5.8
+5			2.6	5.8
+15			2.5	5.7
+25			2.6	5.8
+30=W			3.0	5.4
+5			3.2	5.2
		45+50		
W			3.3	5.1
+5			3.1	5.3
+15			3.1	5.3
+25			3.0	5.4
+30=E			3.2	5.2
		46+00		
E			3.7	4.7
+5			3.6	4.8
+15			3.6	4.8
+25			3.6	4.8
+30=W			3.7	4.7
		46+50		
W			4.2	4.2
+5			4.1	4.3
+15			3.9	4.5
+25			4.2	4.2
+30=E			4.3	4.1

		8.4.	Morena	30
		47+00		
E			5.0	3.4
+5			4.7	3.7
+15			4.4	4.0
+25			4.6	3.8
+30=W			4.6	3.8
		47+50		
W			5.0	3.4
+5			4.9	3.5
+15			4.6	3.8
+25			5.1	3.3
+30=E			5.4	3.0
		48+00		
E			5.1	3.3
+5			5.0	3.4
+15			4.8	3.6
+25			5.2	3.2
+30=W			4.9	3.5
		48+50		
W			5.4	3.0
+5			5.2	3.2
+15			5.2	3.2
+25			5.3	3.1
+29			5.3	3.1
+30=E			4.8	3.6
+2			6.0	2.4
+5			7.3	1.1
+10			7.4	1.0

H₂
8.40

49+00

-10	7.7	0.7
-3	7.4	1.2
E	6.0	2.4
+5	5.8	2.6
+15	5.5	2.9
+25	5.2	3.2
+30=W	5.1	3.0

49+36.53 = PC.

W	5.3	3.1
+5	5.1	3.3
+15	5.6	2.8
+25	6.0	2.4
+30=E	6.0	2.4
+2	6.3	2.1
+5	7.6	0.8
+10	7.8	0.6
B.M.	7.57	10.33

49+75

-10	9.7	0.6
-5	9.5	0.8
-1	8.8	1.5
E	8.0	2.3
+5	8.1	2.2
+15	7.4	2.9
+25	6.9	3.4

10.33

Morena

31

+30=W

6.8 3.5

50+00

W	6.7	3.6
+5	6.9	3.4
+15	7.6	2.7
+25	8.2	2.1
+28	8.4	1.9
+30=E	8.1	2.2
+5	8.5	1.8
+10	8.9	1.4

50+25

-10	9.1	1.2
-3	8.8	1.5
-1	7.9	2.4
E	8.2	2.1
+5	7.9	2.4
+15	7.4	2.9
+25	7.0	3.3
+30=W	6.9	3.4

50+50

W	6.9	3.4
+5	6.8	3.5
+15	7.2	3.1
+25	7.7	2.6
+30=E	7.9	2.4
+1	7.0	3.3

2.76
3.57
6.60

RR 50K
RR 50+38

+5	10.33	8.6	1.7
+10		8.6	1.7
-10		7.7	2.6
-5		7.5	2.8
-1		6.9	3.4
E		7.4	2.9
+5		7.4	2.9
+15		7.1	3.2
+25		6.6	3.7
+30=W		6.7	3.6

50+7885=EC.

51+00

W		6.9	3.4
+5		6.7	3.6
+15		7.0	3.3
+25		7.1	3.2
+30=E		7.2	3.1
+1		6.5	3.8
+4		6.6	3.7

51+50

-5		6.0	4.3
E		5.9	4.4
+1		6.7	3.6
+5		6.4	3.9
+15		6.0	4.3
+25		6.0	4.3

10.33

March 19

32

+30=W		6.2	4.1
W		5.5	4.8
+5		5.5	4.8
+15		5.2	5.1
+25		5.7	4.6
+28		6.1	4.2
+30=E		5.6	4.7
+3		5.4	4.9

52+00

52+50

-4		1.9	8.4
-2.5		4.9	5.4
E		5.0	5.3
+1		5.3	5.0
+5		4.9	5.4
+10		4.5	5.8
+15		4.3	6.0
+25		4.5	5.8
+30=W		4.6	5.7

53+00

W		3.9	6.4
+5		3.9	6.4
+15		3.9	6.4
+25		4.2	6.1
+29		4.6	5.7
+30=E		4.4	5.9
+2.5		4.0	6.3

1033

53+50

-2	36	67
E	37	66
+1	41	62
+5	38	65
+15	34	69
+25	36	67
+30=W	38	65

54+60

W	37	66
+5	35	68
+15	32	71
+25	35	68
+29	37	66
+30=E	31	72
+3	30	73

54+50

-3	22	81
E	29	74
+1	32	71
+5	30	73
+15	28	75
+25	32	71
+30=W	34	69

55+00

-15	8.4	19
-----	-----	----

1033

-7

W

+5

+15

+25

+29

+30=E

+3

7.0

27

24

21

22

23

18

17

Morena

33

33

76

79

82

81

80

85

86

55+50

-4

-1

E

+5

+15

+25

+29

+30=W

+7

+11

+18

06

08

1.2

7.1

1.2

7.4

15

22

73

86

97

97

95

91

92

91

89

88

81

30

17

06

56+00

-20

-5

T.P. 8.69

W

+2

18.42

8.0

49

0.60

95

8.1

23

54

9.73

8.9

10.3

+5	1842	7.9	10.5
+15		7.7	10.7
+25		7.7	10.7
+30 = E		8.0	10.4
+1		7.3	11.1
+5		7.0	11.2

56+50

-5		5.6	12.8
-2		5.8	12.6
-1		6.3	12.1
E		6.1	12.3
+3		5.6	12.8
+5		5.6	12.8
+15		5.6	12.8
+25		6.0	12.4
+29		6.2	12.2
+30 = W		7.2	11.2
+9		14.5	3.9
+20		16.1	2.3

56+70

-20		14.2	4.2
-5		10.5	7.9
W.		7.6	10.8
-19	57+00	14.8	3.6
-7		12.8	5.6

18.42

W		8.1	10.3
+5		3.9	14.5
+15		3.6	14.8
+25		3.7	14.7
+30 = E		3.9	14.5
+3		4.5	13.9

57+50

E		1.3	17.1
+5		1.2	17.2
+15		1.1	17.3
+25		1.4	17.0
+30 = W		6.4	12.0
+7		11.1	7.3
+17		13.0	5.4
T.P.	11.93	26.45	3.90
			14.52

57+70

-15		19.4	7.1
-4		16.9	9.6
W		14.1	12.4
+5		10.1	16.4
+7		8.5	18.0
+9		8.8	17.7
+15		8.4	18.1
+25		8.4	18.1
+30 = E		8.4	18.1

26.45

58+05.76 = PC.

E	6.8	19.7
+5	6.6	19.9
+15	6.4	20.1
+20	6.6	19.9
+21	6.0	20.5
+25	6.3	20.2
+30 = W	9.9	16.6
+6	13.6	12.9
+20	16.8	9.7

58+25

-20	15.8	10.7
-10	13.5	13.0
-8	11.2	15.3
-2	8.3	18.2
W	7.8	18.7
+5	5.5	21.0
+9	5.4	21.1
+10	5.9	20.6
+15	5.8	20.7
+25	5.8	20.7
+30 = E	6.0	20.5

58+50

E	5.5	21.0
+5	5.4	21.1
+15	5.4	21.1

26.45

March 9

35

+20	5.3	21.2
+22	4.9	20.6
+25	5.1	21.1
+30 = W	7.1	19.4
+4.5	8.3	18.2

58+76

-3	5.9	20.6
W	5.2	21.3
+5	4.8	21.7
+9	5.1	21.4
+15	5.0	21.5
+25	5.0	21.5
+30 = E	5.1	21.4

59+00

E	4.9	21.8
+5	4.5	22.0
+15	4.7	21.8
+22	4.8	21.7
+25	4.2	22.3
+30 = W	4.3	22.2

59+50

W	3.6	22.9
+5	4.3	22.2
+15	4.3	22.2
+25	4.5	22.0
+30 = E	4.7	21.8

26.45

59+75

E	3.4	23.1
+2	4.7	21.8
+5	4.6	21.9
+15	4.3	22.2
+25	4.3	22.2
+29	4.1	22.4
+30=W	3.6	22.9

T.P.	6.54	59+89	3.54	22.91	on Mon.
W		29.45	7.0	22.5	
+1			7.2	22.3	
+5			7.3	22.2	
+15			7.4	22.1	
+25			7.9	21.6	
+26.5			7.5	22.0	
+27			6.8	22.7	
+30=E			5.9	23.6	

59+92

E	0.3	29.2
+0.2	3.8	25.7
+2	6.5	23.0
+5	7.4	22.1
+5.5	7.9	21.6
+15	7.6	21.9
+25	7.3	22.2
+30=W	7.1	22.4

60+08

W	7.4	22.1
---	-----	------

29.45

+5	7.4	22.1
+15	7.9	21.6
+23	8.1	21.4
+24	7.2	22.3
+25	6.9	22.6
+30=E	0.9	28.6

60+33.45

E	1.7	27.8
+35	2.0	27.5
+5	4.8	24.7
+7	7.1	22.4
+10	8.3	21.2
+15	8.3	21.2
+25	7.7	21.8
+30=W	7.7	21.8

60+50

W	8.0	21.5
+5	8.1	21.4
+15	8.6	20.9
+19	8.7	20.8
+20	7.7	21.8
+23	6.9	22.6
+25	4.4	25.1
+26	2.9	26.6
+30=E	2.5	27.0

36

2944

61+00

E		5.3	21.2
+2		5.5	21.0
+3		7.3	22.2
+5		7.6	21.9
+9		8.1	21.4
+10		9.6	19.9
+15		9.4	20.1
+25		9.0	20.5
+30 = W		8.9	20.6
T.P.	1.90	24.81	6.54
			22.91
			Mod.
W		5.7	19.1
+5		5.6	19.2
+15		5.7	19.1
+21		6.1	18.7
+25		5.5	19.3
+30 = E		5.1	19.7

62+00

E		6.3	18.5
+5		6.6	18.2
+7		6.9	17.9
+15		6.7	18.1
+25		6.6	18.2
+30 = W		6.8	18.0

248

62+50

W		7.9	16.9
+5		7.6	17.2
+15		7.5	17.3
+25		7.7	17.1
+27		7.5	17.3
+28		6.3	18.5
+30 = E		6.0	18.8

63+00

E		7.1	17.7
+1		7.3	17.5
+2		8.2	16.6
+5		8.4	16.4
+11		8.1	16.7
+15		8.2	16.8
+25		8.1	16.7
+30 = W		8.4	16.4

63+50

W		8.9	15.9
+5		8.6	16.2
+15		8.6	16.2
+25		9.2	15.6
+27		9.2	15.6
+28		8.1	16.7
+30 = E		7.9	16.9
T.P.	2.16	18.30	8.67
			16.14

March 29

37

18.30

64+00

E	2.0	16.3
+2	2.2	16.1
+3	3.5	14.8
+5	3.4	14.9
+10	2.9	15.1
+15	2.7	15.6
+25	2.7	15.6
+30=W	2.7	15.6

64+50

W	3.7	14.6
+5	3.6	14.9
+10	3.3	15.0
+15	3.5	14.8
+25	3.9	14.1
+28	2.7	15.6
+30=E	2.6	15.9

64+65

E	3.5	14.8
+5	4.1	14.2
+15	3.7	14.6
+21	3.6	14.7
+25	3.7	14.6
+30=W	3.8	14.5

64+86

W	4.1	14.2
---	-----	------

18.3

+5	3.9	14.4
+15	4.0	14.3
+25	4.2	14.1
+30=E	3.9	14.4

65+00

E	3.3	15.0
+4	3.7	14.6
+5	4.3	14.0
+15	4.1	14.2
+25	4.0	14.3
+30=W	4.2	14.1

$$\begin{array}{r} 14.2 \\ 19.4 \\ \hline 12.6 \\ 6.6 \end{array}$$

$$\begin{array}{r} 10.1 \\ 7.3 \end{array}$$

65+50

W	4.4	13.9
+5	4.2	14.1
+15	4.1	14.2
+25	4.6	13.7
+28	3.6	14.9
+30=E	3.3	15.0

66+00

E	3.5	14.8
+2	3.7	14.6
+5	4.7	13.6
+15	4.3	14.0
+25	4.5	13.8
+30=W	4.8	13.5

18.30

66+50

W	4.8	13.5
+5	4.4	13.9
+15	4.2	14.0
+25	4.9	13.4
+27	4.3	14.0
+28	3.6	14.7
+30=E	3.5	14.8

67+00

E	3.8	14.5
+2	3.8	14.5
+5	4.9	13.4
+15	4.6	13.7
+25	4.7	13.6
+30=W	5.0	13.3

67+50

W	5.2	13.1
+5	4.9	13.4
+15	4.8	13.5
+25	5.3	13.0
+28.5	4.0	14.3
+30=E	3.9	14.4

68+00

E	4.2	14.1
+1.5	4.2	14.1
+3	5.1	13.2

18.3

39

+5	5.3	13.0
+15	4.8	13.5
+25	5.0	13.3
+30=W	5.4	12.9

68+50

W	5.4	12.9
+5	5.2	13.1
+15	4.9	13.4
+25	5.3	13.0
+26	5.4	12.9
+28	4.1	14.2
+30=E	4.1	14.2

69+00

E	3.9	14.4
+2	3.9	14.4
+4	5.3	13.0
+5	5.2	13.1
+15	5.0	13.3
+25	5.1	13.2
+30=W	5.4	13.1

69+35

W	5.3	13.0
+5	5.2	13.1
+15	5.1	13.2
+25	5.3	13.0
+26	4.6	13.7
+30=E	4.1	14.2

1830

69+50

E	4.9	12.4
+4	5.1	13.2
+5	5.6	12.7
+15	5.2	13.1
+25	5.2	13.1
+30=W	5.3	13.0

69+54

W	5.3	13.0
+5	5.2	13.1
+15	5.2	13.1
+24	5.5	12.8
+25	4.6	13.7
+26	3.1	15.2
+30-E	3.0	15.3

T.P.	2.21	17.54	2.97	15.33
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70+00

E	2.4	15.1
+3	2.1	15.4
+5	2.9	14.6
+6.5	5.1	12.4
+15	4.6	12.9
+25	4.5	13.0
+30=W	4.6	12.9

70+50

W	4.6	12.9
---	-----	------

March 29

40

+5	4.3	13.2
+15	4.6	12.9
+24	5.3	12.2
+25	2.9	14.6
+27	2.2	15.3
+30=E	2.0	15.5

71+00

E	1.8	15.7
+4	2.0	15.5
+5	3.7	13.8
+6	5.3	12.2
+15	4.8	12.7
+25	4.6	12.9
+30=W	5.0	12.8

71+50

W	5.1	12.4
+5	4.9	12.6
+15	5.0	12.5
+23.7	5.6	11.9
+24	3.6	13.9
+25	2.8	14.7
+30=E	1.7	15.8

72+00

E	2.4	15.1
+3	2.5	15.0
+5	4.2	13.3

17.54

+6	6.0	11.5
+15	5.3	12.2
+25	5.3	12.2
+30=W	5.7	11.8
72+50		
W	5.8	11.7
+5	5.5	12.0
+15	5.6	11.9
+24	6.3	11.2
+25	4.1	12.4
+28	2.7	14.8
+30=E	2.6	14.9
73+00		
E	2.4	15.1
+2	2.6	14.9
+5	4.5	13.0
+6	6.7	10.8
+15	6.0	11.5
+25	6.0	11.5
+30=W	6.5	11.0
73+50		
W	6.8	10.9
+5	6.5	11.0
+15	6.4	11.1
+24	6.9	10.6
+25	5.5	12.0

BM. RR3PK Rt of 75+37 = 11.80

Morena

+28	4.1	13.4
+30=E	4.2	13.3
74+00		
E	5.3	12.2
+5	7.3	10.2
+10	6.7	10.8
+15	6.7	10.8
+25	6.8	10.7
+30=W	7.1	10.4
74+50		
W	7.1	10.4
+5	6.8	10.7
+15	6.9	10.6
+25	7.0	10.5
+26	6.4	11.1
+30=E	6.5	11.0
75+00		
-5	7.9	9.6
E	7.7	9.8
+5	7.2	10.3
+6	6.7	10.8
+15	6.9	10.6
+25	6.9	10.6
+30=W	7.2	10.3
T.P.	4.16	14.91
75+50		
W	4.6	10.3

14.91

+5	4.3	10.6
+15	4.4	10.5
+23	4.4	10.5
+25	4.2	10.7
+30 = E	3.7	11.2

76+00

E	4.4	10.5
+5	4.4	10.5
+7	5.1	9.8
+15	4.6	10.3
+25	4.4	10.5
+30 = W	4.5	10.4

76+50

W	4.5	10.4
+5	4.2	10.7
+15	4.5	10.4
+23	4.9	10.0
+25	4.2	10.7
+30 = E	4.1	10.8

77+00

E	3.8	11.1
+4	4.4	10.5
+5	4.7	10.2
+15	4.4	10.5
+25	4.3	10.6
+30 = W	4.5	10.4

14.91

42

77+50

W	4.6	10.3
+5	4.4	10.5
+15	4.4	10.5
+23	4.9	10.0
+25	4.5	10.4
+30 = E	4.1	10.8

78+00

E	3.9	11.0
+5	4.3	10.6
+6	4.8	10.1
+15	4.6	10.3
+25	4.5	10.4
+30 = W	4.7	10.2

78+50

W	4.8	10.1
+5	4.6	10.3
+15	4.7	10.2
+25	5.0	9.9
+30 = E	4.3	10.6

79+00

E	4.9	10.0
+5	4.8	10.1
+7	4.9	10.0
+15	4.6	10.3
+25	4.5	10.4
+30 = W	4.7	10.2

12.91

79+50

W	4.4	10.5
+5	4.2	10.7
+15	4.4	10.5
+21	4.7	10.2
+22	4.1	10.8
+25	4.4	10.5
+30 = E	4.4	10.5

80+00

E	4.1	10.8
+5	4.1	10.8
+15	4.2	10.7
+25	4.1	10.8
+30 = W	4.2	10.7

80+50

W	4.0	10.9
+5	3.9	11.0
+15	4.0	10.9
+23	4.4	10.5
+25	4.2	10.7
+30 = E	3.8	11.1

81+00

E	2.8	12.1
+3	2.8	12.1
+5	4.1	10.8
+15	3.8	11.1

14.9

43

+25	3.5	11.4
+30 = W	3.8	11.1

81+30

W	3.7	11.2
+5	3.5	11.4
+15	3.8	11.1
+23	4.2	10.7
+25	3.7	11.2
+28	1.6	13.3
+30 = E	1.6	13.3

81+80

E	1.1	13.8
+2	1.0	13.9
+4	2.7	12.2
+5	3.3	11.6
+7	3.8	11.1
+15	3.6	11.3
+25	3.4	11.5
+30 = W	3.6	11.3

82+25

W	3.5	11.4
+5	3.3	11.6
+15	3.5	11.4
+25	3.4	11.5
+30 = E	3.3	11.6

14.91

82+50

E	3.0	11.9
+5	3.1	11.8
+6	3.6	11.3
+15	3.5	11.4
+25	3.4	11.5
+30=W	3.6	11.3

83+00

W	3.4	11.5
+5	3.2	11.7
+15	3.4	11.5
+22	3.7	11.2
+25	1.9	13.0
+26	0.8	14.1
+30=E	0.8	14.1
T.P.	5.09	16.57
	3.43	11.48

83+50

E	2.3	14.3
+4	2.6	14.0
+5	3.4	13.2
+6	4.4	12.2
+8	4.6	12.0
+9.1	5.4	11.2
+15	5.0	11.6
+45	4.8	11.8
+30=W	5.0	11.6

16.6

84+00

W	5.3	11.3
+5	4.9	11.7
+15	5.0	11.6
+22	5.3	11.3
+25	3.9	12.7
+26	2.8	13.8
+30=E	2.8	13.8

84+50

E	2.8	13.8
+4	2.8	13.8
+5	4.1	12.5
+7	5.6	11.0
+15	5.4	11.2
+25	5.3	11.3
+30=W	5.6	11.0

85+00

W	5.9	10.9
+5	5.4	11.2
+15	5.5	11.1
+23	5.8	10.8
+25	4.6	12.0
+28	3.1	13.5
+30=E	3.1	13.5

85+33

E	2.9	13.7
---	-----	------

44

16.57

+3	30	13.6
+5	4.5	12.1
+6	5.8	10.8
+15	5.6	11.0
+25	5.6	11.0
+30 = W	5.6	11.0

85+60

W	5.8	10.8
+5	5.6	11.0
+15	5.7	10.9
+23	5.8	10.8
+25	5.0	11.6
+27	3.5	13.1
+30 = E	3.5	13.1

86+05

E	4.2	12.4
+5	5.3	11.3
+7	6.1	10.5
+15	6.0	10.6
+25	6.0	10.6
+30 = W	6.1	10.5

86+06

W	6.1	10.5
+5	6.0	10.6
+15	6.0	10.6
+25	6.0	10.6

16.6

45

+30 = E	5.9	10.7
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86+18

E	5.3	11.3
+5	5.9	10.7
+8	6.2	10.4
+15	6.1	10.5
+25	6.1	10.5
+30 = W	6.3	10.3

86+25

W	6.4	10.2
+5	6.2	10.4
+15	6.2	10.4
+22	6.2	10.4
+25	4.7	11.9

+30 = E

BM

86+50

E	3.72	12.85
+4	4.1	12.5
+5	4.2	12.4
+6	4.6	12.0
+8	5.5	11.1
+15	6.4	10.2
+25	6.3	10.3
+30 = W	6.3	10.3
	6.5	10.1

30K PTA
86+50

1657

87+00

W	6.6	10.0
+5	6.5	10.1
+15	6.5	10.1
+22	6.6	10.0
+25	5.2	11.4
+26	4.3	12.3
+30 = E	4.3	12.3

87+50

E	4.5	12.1
+5	5.0	11.6
+6	5.9	10.7
+8	6.7	9.9
+15	6.5	10.1
+25	6.5	10.1
+30 = W	6.7	9.9

88+00

W	6.7	9.9
+5	6.5	10.1
+15	6.6	10.0
+22	6.8	9.8
+25	6.1	10.5
+30 = E	5.5	11.1

88+50

E	6.9	9.7
+5	6.4	10.2

1657

Morena

46

+9	6.5	10.1
+9.5	7.0	9.6
+15	6.8	9.8
+25	6.8	9.8
+30 = W	6.9	9.7
T.P.	3.65	13.40

89+00

W	3.9	9.5
+5	3.8	9.6
+15	3.9	9.5
+19	3.9	9.5
+21	3.3	10.1
+25	3.6	9.9
+30 = E	4.3	9.1
+3	4.4	9.0

89+50

E	4.1	9.3
+5	3.4	10.0
+8	3.5	9.9
+10	4.1	9.3
+15	4.1	9.3
+25	4.1	9.3
+30 = W	4.2	9.2

90+00

W	4.5	8.9
+5	4.3	9.1

1340

+15	4.2	9.2
+20	4.1	9.3
+25	3.6	9.8
+30 = E	3.2	10.2

90+50

E	3.2	10.2
+5	3.4	10.0
+7	3.6	9.8
+9	4.5	8.9
+15	4.4	9.0
+25	4.4	9.0
+30 = W	4.5	8.9

91+00

W	4.6	8.8
+5	4.6	8.8
+15	4.6	8.8
+20	4.5	8.9
+22	4.0	9.4
+25	4.0	9.4
+30 = E	3.9	9.5

91+50

E	4.2	9.2
+5	4.4	9.2
+8	4.3	9.1
+9	4.7	8.7
+15	4.7	8.7

13.40

47

+25	4.7	8.7
+30 = W	4.7	8.7

92+00

W	4.9	8.5
+5	4.8	8.6
+15	4.7	8.7
+21	4.8	8.6
+22	4.4	9.0
+25	4.4	9.0
+30 = E	5.2	8.2
+5	5.3	8.1

92+50

E	4.4	9.0
+5	4.3	9.1
+8	4.3	9.1
+9	4.8	8.6
+15	4.7	8.7
+25	4.7	8.7
+30 = W	4.8	8.6

93+00

W	5.0	8.4
+5	4.9	8.5
+15	4.9	8.5
+20	4.9	8.5
+21	4.5	8.9
+25	4.9	8.5
+30 = E	5.0	8.4

1340

93+50

E	4.9	8.5
+5	4.1	9.3
+9	4.4	9.1
+10	5.0	8.4
+15	5.0	8.4
+25	5.1	8.3
+30=W	5.3	8.2

94+00

W	5.0	8.4
+5	4.8	8.6
+15	4.8	8.6
+20	4.8	8.6
+25	4.0	9.4
+30=E	3.6	9.8

94+50

E	4.3	9.1
+5	4.5	8.9
+15	4.5	8.9
+25	4.6	8.8
+30=W	4.9	8.5

94+80.24 = P.C.

W	4.6	8.8
+5	4.4	9.0
+15	4.4	9.0
+23	4.6	8.6

1340

48

+25	3.7	9.7			
+30=E	3.6	9.8			
T.P.	8.51	17.44	4.47	8.93	on PC/100

45+00

E	8.7	8.7
+5	8.4	9.0
+15	8.4	9.0
+25	8.4	9.0
+30=W	8.6	8.8

95+50

W	8.2	9.2
+5	8.0	9.4
+15	8.2	9.2
+20	8.3	9.1
+25	6.7	10.7
+30=E	6.6	10.8

96+00

E	5.4	12.0
+5	7.4	10.0
+9	8.0	9.4
+15	7.7	9.7
+25	7.8	9.6
+30=W	7.8	9.6

96+50

W	7.4	10.0
+5	7.1	10.3

17.44

+15	7.1	10.3
+23	7.5	9.9
+25	6.8	10.6
+28	6.4	11.0
+30 = E	5.1	12.3

97+00

E	5.9	11.5
+5	6.9	10.5
+11	6.4	11.0
+15	6.4	11.0
+25	6.7	10.7
+29	6.7	10.7
+30 = W	6.2	11.2

97+50

W	5.7	11.7
+5	5.6	11.8
+6	6.1	11.3
+15	5.9	11.5
+25	6.1	11.3
+30 = E	6.4	11.0

98+00

E	5.4	12.0
+5	5.2	12.2
+15	5.4	12.0
+20	5.3	12.1
+21	5.0	12.4

17.44

49

+25	5.1	12.3
+30 = W	5.5	11.9

98+50

W	5.0	12.4
+5	4.6	12.8
+14	4.2	13.2
+15	5.0	12.4
+25	4.7	12.7
+30 = E	4.6	12.8

99+00

E	4.0	13.4
+5	4.0	13.4
+11	4.2	13.2
+15	3.9	13.7
+25	4.4	13.0
+30 = W	4.3	13.1

99+50

B.M.	6.07	11.37	Mon. inside
W	3.6	13.8	Ry. house
+5	3.1	14.3	
+15	3.2	14.2	
+20	3.1	14.3	
+21	3.6	13.8	
+25	3.5	13.9	
+30 = E	3.1	14.3	

99+74.71 = E.C.

E	2.8	14.6
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17.44

+5		3.2	14.2
+7		3.2	14.2
+8		2.7	14.7
+15		2.8	14.6
+25		2.8	14.6
+30=W		3.3	14.1
T.P.	8.28	19.65	11.37 <i>For Month</i>

100+20

-10		7.6	12.1
-2		7.1	12.6
W		4.9	14.5
+5		4.4	15.3
+7		4.2	15.5
+15		4.2	15.5
+25		4.7	15.0
+27		4.7	15.0
+30=LE		4.6	15.1

100+50

E		4.2	15.5
+5		3.5	16.2
+15		3.8	15.9
+25		3.9	15.8
+27		4.2	15.5
+30=W		6.7	13.0
+5		6.8	12.9

19.65

50

-5	101+00	6.9	12.8
W		6.8	12.7
+5		5.5	14.2
+8		3.4	16.3
+15		3.4	16.3
+25		3.0	16.7
+30=E		3.1	16.6

101+25

E		2.9	16.8
+5		3.0	16.7
+15		3.3	16.4
+21		3.6	16.1
+24		5.9	13.8
+25		6.1	13.6
+30=W		6.7	13.0
+5		6.8	12.9

101+50

W		6.4	13.3
+5		6.1	13.6
+9		4.0	15.7
+15		4.2	15.5
+25		3.8	15.9
+30=E		3.0	16.7

102+00

E		4.0	15.7
+5		4.1	15.6

19.65

+15	4.3	15.4
+19	4.3	15.4
+21	5.1	15.3
+25	5.9	14.8
+30=W	6.2	13.5

102+50

W	6.0	13.7
+5	5.8	13.9
+15	4.9	14.8
+20	4.4	15.3
+25	4.3	15.4
+30=E	4.1	15.6

103+00

E	4.2	15.5
+5	4.4	15.3
+15	4.9	14.8
+25	5.6	14.1
+30=W	5.1	14.3
+5	5.7	14.0
T.P.	9.52	27.41
	1.76	17.89

103+13

-5	19.5	7.9
W	13.2	14.2
+5	13.0	14.4
+15	12.7	14.7
+25	12.1	15.3
+30=E	11.9	15.5
+5	12.3	15.1

27.4

51

103+19

-5	12.5	14.9
E	12.0	15.4
+5	12.3	15.1
+15	12.8	14.6
+25	13.1	14.3
+28	18.2	9.2
+30=W	18.4	9.0
+5	19.9	7.5
+15	21.4	6.0

103+21

-15	6.0
-5	7.1
W	8.7
+2	9.1
+4	12.8
+5	13.2
+8	14.4
+15	14.4
+24	14.6
+25	12.9
+30=E	11.6
+5	11.9

103+31

-5	12.4
-4	12.8

Apr 19

52

E		12.4
+5		11.9
+9		11.5
+10		12.9
+15		12.6
+20		12.0
+25		9.0
+30=W		5.8
+10		6.6
+15		8.5
	103+35	
-15		8.8
-7		6.8
W		7.5
+4		7.2
+4.1		6.8
+5		6.7
+9		6.0
+15		12.3
+22		9.7
+25		10.0
+30=E		10.6
+10		10.9
	103+39	
-10		11.1
E		10.9

+5		9.9
+8		9.3
+13		10.3
+15		6.5
+21		6.1
+22		7.5
+25		7.8
+30=W		8.5
+5		8.6
+6		10.6
+10		9.8
	103+43	
-10		10.5
-5		11.7
-4		9.2
W		8.8
+5		8.6
+6		10.6
+13		9.9
+15		5.4
+21		6.4
+21.1		9.2
+25		9.4
+30=E		9.7
+8		10.8

103+46

-8	10.7
E	9.7
+5	10.0
+7	10.1
+7.1	6.0
+15	10.5
+16	11.8
+22	11.5
+25	10.0
+26	9.5
+30 = W	9.9
+1	12.9
+7	11.8

103+58

-10	11.1
-6	12.0
-3	13.9
W	14.4
+1	11.9
+5	12.4
+6	12.6
+15	12.3
+25	9.6
+30 = E	8.3
+10	8.7

$\frac{48}{12.4}$ $\frac{53}{11.9}$ $\frac{159}{17.2}$

190

58

Morena

731

53

103+62

-10	10.2
E	9.6
+1	11.0
+5	12.5
+8	14.1
+12	12.9
+15	12.9
+25	13.1
+27	13.2
W	14.6
+8	11.6

103+79.96 = P.C.

-8	12.9
W	14.7
+5	14.6
+7	14.6
+15	15.3
+17	15.9
+21	15.9
+25	14.4
+26	14.0
+30 = E	9.7
+5	9.5
+10	11.2

103+94

-10	15.0
-4	10.9
E	14.5
+1	14.7
+5	15.3
+8	16.9
+14	16.8
+15	15.0
+25	15.0
+30=W	14.9
+5	14.0

104+09.0

-5	14.0
W	15.1
+5	15.1
+15	15.2
+20	15.6
+25	15.1
+30=E	14.6
+5	15.0

104+50

-5	14.9
E	14.8
+5	14.9
+14.5	15.0

+15	15.5
+25	15.2
+30=W	15.0
+5	14.2

105+00

-5	14.0
-2	15.6
W	15.7
+5	15.7
+15	15.7
+20	15.3
+25	15.4
+30=E	15.4
+5	15.4

105+09

-5	16.5
E	16.3
+5	16.4
+15	15.9

105+50

-5	14.2
-2	16.1
W	16.2
+5	16.3
+15	16.6
+17	17.3
+24	17.5
+25	17.2

+27 16.7
+30 = E 16.7
+5 16.8

106+00

-5 17.5
E 17.5
+5 17.9
+10 18.0
+15 17.3
+25 17.1
+30 = W 17.0
+2 16.8
+5 14.9

106+50

-5 15.7
-2 17.5
W 17.9
+5 18.0
+15 18.3
+25 18.9
+30 = E 18.9
+5 19.0

106+64

-5 19.1
E 19.2
+5 19.0

55
+15 18.7
+25 18.3
+30 = W 18.0
+5 18.9

107+00

-5 20.1
-2 19.7
-1.9 18.7
W 18.7
+5 18.7
+15 18.5
+25 19.3
+26 19.4
+30 = E 21.2
+5 21.8

107+50

-5 23.0
E 22.6
+2 22.4
+4 20.3
+5 20.1
+7 19.7
+15 19.9
+25 19.6
+30 = W 19.4
+3 19.7
+5 21.2

27.41

108+00

-5	22.5
-3	22.4
-2	20.5
W	20.3
+5	20.4
+15	20.6
+21	20.1
+24	20.8
+25	21.7
+28	24.4
+30 = E	24.7
+5	24.9

108+50

-5	25.9
E	25.5
+5	22.4
+6	21.8
+9	20.9
+15	20.8
+25	20.8
+30 = W	20.9
+2.5	20.4
+3.5	23.1
+5	23.6

109+00

-5	23.9
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6/56 277

56

-3	23.7
-2	22.0
W	21.7
+5	21.7
+13	21.8
+15	21.5
+25	21.8
+30 = E	25.5
+5	26.7
TP. 9.85 36.28	0.98 26.43

+0.3

109+50

-5	27.0
E	26.6
+5	22.8
+6	22.0
+9	21.7
+15	22.4
+17	22.6
+25	22.4
+30 = W	22.3
+2.5	22.6
+3	24.1
+5	24.0

110+00

-5	23.4
-3	22.9

W	22.9
+5	23.0
+12	23.1
+15	22.4
+19	21.9
+25	22.8
+30 = E	25.9
+5	26.4
110 + 50	
-5	26.4
E	25.7
+3	23.3
+5	23.0
+10	22.4
+15	23.2
+18	23.9
+25	24.0
+30 = W	24.1
+5	23.4
111 + 00	
-5	23.5
-2	24.7
W	24.9
+5	24.9
+12	24.9
+15	23.9

+20	23.0
+26	23.7
+29	24.2
+30 = E	25.2
+2	26.7
+5	27.1
111 + 50	
-5	27.2
E	26.7
+2	24.4
+5	23.9
+6	23.7
+12	24.0
+15	24.7
+17	25.3
+25	25.2
+30 = W	25.2
+5	23.3
112 + 00	
-5	23.5
W	25.7
+5	25.9
+13	26.1
+15	25.4
+18	24.6
+25	24.7
+29	24.7

+30 = E 26.2

+5 27.0

112+50

-5 26.7

-2 26.4

E 25.3

+5 25.3

+13 25.4

+15 25.8

+17 26.6

+25 26.5

+30 = W 26.4

+2 25.9

+5 24.0

113+00

-5 23.0

W 26.7

+5 27.0

+14 27.6

+15 27.0

+16 26.3

+25 26.4

+30 = E 26.4

+5 26.5

113+50

-5 27.9

E 27.4

+5 27.4

+15 27.4

+16 28.2

+25 28.1

+30 = W 28.1

+5 24.4

T.P.

114+00

-5 27.2

-3 28.7

W 29.2

+5 29.2

+13 29.3

+15 28.1

+25 28.0

+30 = E 28.0

+5 30.1

114+50

-5 30.5

-2 28.9

E 29.0

+5 28.9

+15 28.8

+17 30.0

+25 29.8

+30 = W 29.6

+5 26.9

29.6
35.8

29.6
35.8

36.28

115+00

-5 27.4
 W 30.2
 +5 30.4
 +12 30.8
 +15 29.8
 +25 30.1
 +30 = E 30.3
 +5 31.1

115+50

-5 31.3
 E 31.0
 +5 31.0
 +15 30.9
 +25 31.1
 +30 = W 31.3
 +5 28.8

116+00

-5 30.9
 W 32.0
 +5 32.1
 +13 32.2
 +15 32.8
 +24 32.4
 +25 32.9
 +27 34.1

6/2/23

59

+30 = E

+5

116+50

-5 37.0
 E 37.7
 +3 36.3
 +5 33.7
 +11 34.3
 +15 33.8
 +17 33.2
 +25 33.1
 +30 = W 33.0
 +5 31.8

116+88

-5 32.9
 -2 33.9
 W 33.9
 +5 34.0
 +12 34.2
 +15 34.5
 +17 35.4
 +21 34.9
 +24 35.1
 +25 35.5
 +30 = E 37.7
 +5 39.1

T.P.

116+98.6 = E.C.

36.28

117+04.0

-5	40.0
E	39.7
+2	39.4
+5	35.8
+8	35.1
+12	35.9
+15	35.2
+18	34.6
+25	34.5
+30 = W	34.5
+5	34.0

117+29

-5	34.3
W	35.0
+5	35.1
+15	35.3
+18	36.2
+22	35.5
+25	36.1
+26	36.5
+28	39.5
+30 = E	39.7
+5	40.4

117+51

-5	38.6
----	------

41.1

36.4
4.1

60

E	37.9
+3	36.8
+5	36.8
+10	36.9
+15	35.7
+25	35.4
+30 = W	35.2
+5	33.7

B.M.	11.29	46.13	1.44	34.84
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on EC
hub

118+01

-5	35.5
W	36.6
+5	36.6
+15	36.6
+17	36.9
+18	38.2
+25	38.7
+30 = E	39.1
+5	39.5

118+44

-5	41.7
E	41.3
+5	40.4
+7	40.0
+10	39.9
+12.5	37.8

+15	37.5
+25	37.4
+30 = W	37.3
+5	37.9

118+69

-5	38.8
W	37.6
+5	37.8
+15	38.2
+18	38.9
+20	40.6
+25	41.1
+30 = E	41.6
+5	42.4

119+00

-5	43.8
E	43.0
+5	41.9
+8	41.3
+11	39.5
+15	39.0
+22	38.5
+25	38.5
+30 = W	38.6
+2	38.7
+5	39.8

119+50

-5	41.0
-2	39.7
W	39.6
+5	39.7
+11	39.8
+15	40.5
+19	41.1
+21	42.1
+25	42.8
+29	43.3
+30 = E	44.0
+5	45.1

120+00

-5	46.5
E	45.5
+3	44.4
+5	44.1
+9	43.6
+12	42.0
+15	41.5
+21	40.9
+25	40.9
+30 = W	40.9
+3	41.1
+5	42.5

46.13

120+50

-5				44.1
-2				42.7
W				42.7
+5				42.6
+7				42.6
+15				42.9
+21				44.9
+25				45.3
+30 = E				47.3
+5				47.9
120+64				
-5				48.8
E				48.1
+3				47.8
+5				46.5
+6				45.8
+15				44.2
+25				44.1
+30 = W				44.1
+3				44.1
+5				45.1
T.P.	10.07	55.75	0.45	45.68
120+79				
-5				45.6
W				46.2
+5				46.2
+11				46.2

-12^g, Morena

62

+15				45.4
+24				45.2
+25				46.2
+27				48.0
+30 = E				48.7
+5				49.1
121+44				
-5				52.0
E				50.8
+4				48.4
+5				48.3
+15				47.4
+21				48.6
+25				49.0
+30 = W				49.4
+5				49.5
121+79				
-5				49.2
W				50.2
+5				50.0
+8				49.8
+12				48.3
+15				48.2
+24				49.1
+25				50.3
+27				52.6

55.75

+30 = E

53.0

+5

53.6

122 + 34

-5

54.9

E

54.2

+5

50.7

+15

49.5

+25

50.0

+30 = W

50.3

+5

49.6

122 + 74

-5

49.4

W

50.6

+5

50.8

+15

51.3

+23

51.6

+25

52.0

+27

52.5

+30 = E

54.0

+5

55.5

122 + 94

-5

53.6

E

52.8

+5

51.7

+10

52.0

+15

51.7

63

+18

51.6

+25

50.7

+27

50.4

+30 = W

49.3

+5

47.3

123 + 16

-5

49.4

W

50.7

+5

51.0

+15

51.6

+25

52.5

+30 = E

53.0

+5

53.7

123 + 79

-5

54.3

E

53.1

+5

52.8

+15

52.0

+25

51.2

+30 = W

50.9

+5

49.8

B.M.

52.19

123 + 94^{3.56}

-5

49.9

W

50.9

+5

51.3

+15

52.2

on hub

55.75

+ 25	52.8
+ 26	52.9
+ 30 = E	55.7
+ 5	56.8

124+14

- 5	55.9
E	54.2
+ 5	52.5
+ 15	52.0
+ 25	51.7
+ 30 = W	51.1
+ 5	50.3

124+39

- 5	50.2
W	51.4
+ 5	51.5
+ 15	51.7
+ 25	52.5
+ 30 = E	54.2
+ 5	54.7

124+44

- 5	56.8
E	56.3
+ 3	55.6
+ 5	52.2
+ 15	51.7

Morenq 64

+ 25	51.2
+ 30 = W	50.9
+ 5	49.6

124+59

- 5	48.8
W	49.8
+ 5	51.0
+ 15	51.7
+ 24	52.3
+ 25	53.6
+ 27	56.3
+ 30 = E	56.7
+ 5	57.1

124+66

- 5	57.6
E	56.5
+ 2	56.2
+ 5	52.4
+ 11	51.9
+ 15	51.6
+ 25	51.2
+ 27	52.1
+ 30 = W	52.0
+ 5	51.4

124+94

- 5	51.5
-----	------

W	52.3
+3	52.3
+5	51.5
+15	51.7
+23	52.3
+25	53.2
+27	54.2
+30 = E	55.0
+5	55.8
	125 + 14
-5	57.6
E	57.3
+2	56.8
+5	53.4
+6	52.3
+15	51.8
+25	51.1
+27	52.7
+30 = W	52.5
+5	51.9
	125 + 19
-5	52.9
W	53.5
+3	53.3
+4	51.3
+5	51.4

+15	51.6
+22	52.3
+25	54.0
+26	54.5
+30 = E	56.2
+5	56.8
	125 + 61
-5	57.1
E	56.7
+4	56.3
+5	55.1
+8	51.9
+15	51.4
+30 = W	51.2
+5	51.0
	125 + 00
-5	49.6
W	49.9
+5	50.3
+15	51.2
+24	51.4
+25	51.7
+27	52.5
+30 = E	52.7
+5	53.4

55.75

126+23 = 1.5x2' wood box

-5	52.2
E	50.8
+5	51.0
+9	51.2
+15	51.0
+25	49.9
+28	49.6
+30=W	48.6
+5	46.3

127+00

-5	49.9
W	50.8
+5	51.3
+8	50.9
+15	51.2
+24	51.2
+25	51.6
+30=E	53.5
+5	54.2

127+19

-5	56.8
E	55.2
+5	51.9
+6	51.2
+15	51.0

66

+24	50.6
+25	50.9
+27	51.5
+30=W	51.1
+5	49.8

127+50

-5	50.8
W	51.5
+4	51.7
+5	51.3
+7	50.5
+15	50.9
+24	51.3
+25	52.3
+28	54.2
+30=E	54.8
+5	56.3

128+00

-5	56.8
E	55.9
+4	51.6
+5	51.5
+15	50.4
+23	50.2
+25	50.4
+30=W	51.1
+5	51.0

49.5
51.5
39.5
16.0
48.9

55.75

128+50

-5 49.6
W 50.2
+5 50.4
+8 49.7
+15 50.0
+25 50.7
+28 54.7
+30 = E 55.1
+5 55.6

128+89 = old Culvert

-5 39.2
W 44.0

128+94

-5 52.0
E 50.6
+5 49.9
+9 49.4
+15 49.1
+25 47.6
+26 47.4
+30 = W 45.1
+5 42.2

129+44

-5 49.3
W 49.6

BM. 36K. Left 128+36 = 50.40

67

+1 48.0
+5 48.1
+15 48.3
+18 49.2
+25 50.2
+30 = E 55.2
+2 55.9
+5 56.4

130+00

-5 57.7
E 56.4
+3 52.1
+5 50.7
+6 50.0
+12 49.5
+15 48.1
+20 47.6
+25 47.6
+30 = W 47.6
+5 49.1

130+50

-5 48.6
W 47.3
+5 47.2
+13 47.5
+15 49.0

+16	49.7
+25	50.2
+26	50.3
+30 = E	52.7
+5	54.9

130+94

-5	53.7
E	51.2
+5	49.3
+10	49.3
+15	48.4
+17	47.8
+25	47.7
+30 = W	47.6
+5	48.1

131+24

-5	47.0
W	47.6
+5	47.7
+14	47.9
+15	48.4
+22	50.2
+25	50.3
+30 = E	50.7
+5	53.1

131+32

-5	53.5
E	50.3
+5	49.3
+15	48.2
+25	47.7
+30 = W	47.4
+5	46.7

131+69

-5	45.9
-2	47.3
W	47.6
+5	47.7
+15	48.0
+25	48.3
+27	48.4
+30 = E	51.9
+5	53.6

132+00

-5	52.8
E	50.2
+5	48.3
+15	48.0
+16	47.3
+25	47.2
+30 = W	47.2
+ 25 3	46.9
+5	45.2

53.1

45.7

55.75

132+50

-5 44.1
 W 46.5
 +5 46.7
 +10 47.2
 +15 47.8
 +25 48.2
 +30 = E 48.3
 +2 48.4
 +5 50.1
 T.P. 2.78 54.38 4.15 51.60

132+94

-5 50.3
 E 49.4
 +5 48.9
 +15 48.0
 +25 46.7
 +30 = W 46.1
 +5 42.7

133+44

-5 42.3
 W 45.7
 +5 46.3
 +10 47.0
 +15 47.0
 +16 47.3

+25 47.8
 +28 48.0
 +30 = E 50.4
 +5 50.9

133+69

-5 49.0
 E 48.1
 +5 47.7
 +13 47.2
 +15 46.7
 +25 46.2
 +30 = W 46.0
 +5 43.7

134+00

-5 43.1
 W 46.0
 +5 46.7
 +15 46.6
 +17 47.5
 +25 47.9
 +26 47.9
 +30 = E 49.7
 +5 50.4

134+50

-5 51.4
 E 50.6

50.8

54.38

+3	47.7
+5	47.5
+13	47.1
+15	46.3
+25	46.0
+30 = W	45.8
+5	43.7
135+00	
-5	41.0
W	44.7
+1	45.2
+5	45.4
+14	45.8
+15	46.3
+25	46.3
+30 = E	46.5
+5	47.3
135+27 = 2'x2' wood box	
-5	45.2
E	45.1
+4	46.4
+5	46.3
+15	46.2
+15	45.7
+25	45.1
+25	44.9

45.4
89.041.5
89.5
9.1

70

+30 = W	43.9	
+5	39.4	
135+69		
-5	40.8	
W	44.4	
+5	44.7	
+5	45.4	
+17	46.3	
+25	46.8	
+30 = E	47.1	
+5	47.3	
T.P. 247	49.78	
136+07		
-5	3.4	46 4
E	3.5	46 3
+5	3.4	46 4
+10	3.7	46 1
+15	4.7	45 1
+25	5.1	44 7
+30 = W	5.5	44 3
+5	8.5	41 3
136+14		
-15	11.1	38 7
-5	10.8	39 0
W	10.1	39 7
+19	10.1	39 7
+20	5.4	44 4
+5	5.4	44 4

49.78

+15	2.5	45 3
+25	3.5	46 3
+30=E	4.6	45 2
+1	7.3	42 5
+5	4.4	45 4

136+28

-10	3.3	46 5
-5	5.8	44 0
-2	8.5	41 3
E	4.7	41 1
+5	3.6	46 2
+15	4.7	45 1
+25	5.0	44 8
+30=W	5.2	44 6
+5	8.0	41 8

136+31

-5	8.7	41.1
-2	5.4	44.4
W	5.0	44 8
+5	4.8	45 0
+15	4.6	45 2
+21	4.1	45 7
+21.1	9.7	40 1
+25	9.4	40 4
+30=E	7.7	42 1
+3	7.0	42 8
+5	4.0	45 8

49.78

Morena

71

136+35

-5	4.0	45 8
-2.0	4.1	45 7
-2.9	7.1	42 4
E	7.2	42 6
+3	2.9	46 9
+5	3.6	46 2
+10	3.6	46 2
+15	4.5	45 3
+25	5.0	44 8
+30=W	5.1	44 7
+3	6.0	43 8
+5	8.3	41 5

136+44

-5	7.6	42 2
-2	4.9	44 9
W	4.9	44 9
+5	4.8	45 0
+15	4.5	45 3
+22	3.7	46 1
+25	3.9	45 9
+30=E	4.2	45 6
+5	4.0	45 8

137+00

-5	4.7	47.1
E	4.0	47.0

+5	46.1
+6	45.9
+15	45.0
+25	44.9
+30 = W	44.5
+5	42.7

137+50

-5	43.9
W	44.5
+5	44.6
+15	44.8
+17	45.7
+25	46.2
+27	46.3
+30 = E	46.5
+5	47.6

138+00

-5	49.0
E	48.6
+5	45.7
+12	45.3
+15	44.5
+25	44.3
+30 = W	44.2
+5	45.0

138+50

-5	44.1
W	43.9
+5	44.2
+15	44.7
+25	45.5
+26	45.7
+30 = E	48.0
+5	49.2

138+74

-5	48.5
E	48.3
+4	45.9
+5	45.5
+13	44.9
+15	44.4
+25	43.9
+30 = W	43.7
+5	44.4

138+94

-5	44.0
-3	43.6
W	43.6
+5	43.8
+15	44.3
+25	45.5
+30 = E	46.1
+5	47.1

49.78

139+50

-5	49.4
E	49.9
+4	45.7
+5	45.6
+14	44.5
+15	43.9
+25	43.6
+30=W	43.4
+2	43.8
+3	46.1
+5	46.4

140+00

-5	45.5
-3	45.4
-1	43.4
W	43.2
+5	43.5
+15	44.1
+24	45.4
+25	45.7
+30=E	47.4
+5	48.3

140+44

-5	47.1
-3	46.8

131 24.50
26 73

E	47.6
+5	46.3
+13	44.2
+15	43.7
+25	43.2
+30=W	42.9
+2.5	43.4
+3.5	44.8
+5	45.1

140+84

-5	45.6
-1	43.0
W	42.8
+5	43.0
+15	43.3
+17	44.1
+25	45.4
+30=E	46.1
+5	46.4

141+19

-5	46.9
E	47.6
+5	46.0
+11	44.2
+15	43.5
+25	42.7
+30=W	42.6

49.78

+2	42.9
+3	45.4
+5	46.1
141 + 64	
-5	45.0
-2	42.6
W	42.3
+5	42.6
+15	43.1
+25	45.0
+30 = E	45.9
+4	46.4
+5	47.0
142 + 00	
-5	46.6
-2	45.7
E	46.0
+5	45.0
+13	43.6
+15	42.6
+22	41.8
+25	41.9
+30 = W	42.1
+5	44.5
142 + 29	
-5	42.9

74

-3	43.0
-2	41.6
W	41.0
+5	41.4
+15	42.2
+25	44.9
+30 = E	45.1
+5	45.5
142 + 44	
-5	45.4
E	44.5
+5	44.0
+13	43.1
+15	42.1
+25	41.7
+27	41.6
+30 = W	38.5
+5	38.5
142 + 64	
-5	41.6
W	41.5
+5	41.7
+15	42.0
+17	42.7
+25	43.5
+30 = E	43.9
+5	44.3

49.78

143+00

-5	43.8
E	43.3
+5	43.5
+14	42.5
+15	41.3
+25	41.1
+30=W	40.8
+2	40.6
+5	39.3

143+29

-5	38.5
-1	40.4
W	40.4
+5	40.5
+15	40.8
+18	42.3
+25	42.9
+30=E	43.3
+5	43.7

143+59

-5	43.1
E	41.8
+5	41.1
+15	40.8
+25	40.7

+30=W

+2

+5

144+00

-5	40.3
-2	40.3
W	38.4
-5	37.9
-2	40.2
W	40.4
+5	40.6
+15	41.1
+25	41.4
+30=E	41.5
+4	42.2
+5	43.2

144+50

-5	43.0
-2	41.6
E	41.3
+5	41.1
+15	40.6
+25	40.6
+27	40.6
+30=W	39.9
+5	37.4

145+00

-5	38.2
W	40.2

75

T.P.	3.83	47.44	6.17	43.61
+5				40.3
+15				40.5
+25				40.9
+30 = E				41.0
+5				42.8
		145+44		
-5				42.9
E				42.5
+4				41.1
+5				41.0
+15				40.7
+25				40.4
+30 = W				40.2
+5				38.9
		145+69		
-5				38.2
W				40.2
+5				40.4
+15				40.8
+18				42.2
+25				42.5
+30 = E				42.7
+5				41.8
		146+00		
-5				42.7

E				42.5
+1				42.3
+5				41.9
+15				41.0
+25				40.3
+30 = W				40.0
+5				38.3
		146+50		
-5				38.6
-2				40.7
W				40.7
+5				40.9
+15				41.2
+18				42.1
+25				42.5
+30 = E				42.8
+5				42.6
		146+74		
-5				42.9
E				42.8
+5				42.4
+12				42.0
+15				40.9
+25				40.6
+30 = W				40.4
+5				38.2

47.44

147+09

-5	41.0
W	40.4
+5	40.5
+15	40.7
+18	42.3
+25	43.5
+27	43.9
+30 = E	44.1
+5	44.0

147+50

-5	43.7
E	44.4
+5	43.6
+12	42.5
+14	41.2
+15	40.7
+25	40.6
+30 = W	40.6
+2	40.6
+5	41.4

148+00

-5	42.7
-4	42.6
-1	40.8
W	40.7

B.M. 42.89 Left OK 147.765 on fence post

77

+5	40.6
+15	40.5
+18	43.0
+25	44.5
+26	45.2
+30 = E	45.6
+5	44.9

148+50

-5	46.5
-3	47.3
E	47.0
+3	46.5
+5	45.7
+9	43.9
+13	42.7
+15	41.5
+25	41.4
+30 = W	41.3
+3	42.6
+3.5	43.9
+5	43.9

148+94

-5	44.4
W	41.9
+1	41.5
+5	41.6
+14	41.7

47.44

+15	42.1
+17	43.5
+23	45.8
+25	46.0
+30 = E	46.6
+5	46.4

149+19

35	47.0
-2	45.1
E	45.3
+4	45.5
+5	45.3
+12	43.9
+15	42.1
+25	42.0
+30 = W	42.0
+3	43.1
+4	45.3
+5	45.3

149+54

-5	45.8
W	42.3
+5	42.3
+10	42.2
+15	42.7
+18	43.3

Morena 78

+24	46.6
+25	46.6
+30 = E	46.4
+5	47.5

149+77

-5	47.5
E	45.1
+3	44.3
+5	44.1
+15	42.9
+25	42.6
+30 = W	42.4
+5	45.9

149+84

-5	43.0
W	42.5
+5	42.6
+15	42.8
+20	43.7
+25	44.1
+30 = E	44.3
+5	45.4

150+03

-5	46.1
E	44.6
+5	44.2
+12	43.7

47.44

+15	42.9
+25	42.6
+30 = W	42.5
+5	43.9

150+06

-4.5	39.9
W	39.9
+5	39.9
+15	39.9
+17	40.1
+25	40.7
+30 = E	41.2
+5	43.1

150+12

-5	41.0
E	40.7
+5	40.4
+15	39.9
+25	40.6
+30 = W	40.9
+5	40.8

150+15

-5	40.7
W	42.7
+5	42.8
+15	42.9

79

+17	44.2
+25	44.0
+30 = E	43.8
+5	43.7

150+27

-5	46.4
E	45.8
+3	44.6
+6	44.3
+15	42.8
+25	42.9
+30 = W	43.1
+3	44.5
+6	43.3

150+54

-5	42.1
W	43.3
+5	43.3
+15	43.4
+25	44.3
+30 = E	44.8
+5	46.8

151+00

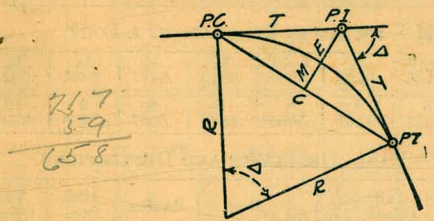
-5	44.8
E	43.8
+5	43.8

	47.44	
+15		43.8
+25		43.5
+27		43.5
+30=W		42.8
+5		39.7
	151+61	
-5		41.2
W		44.1
+5		44.1
+15		44.0
+25		43.7
+30=E		43.5
+5		43.2
	151+65.8	
-5		42.9
-4		38.9
E		36.9
+5		37.4
+15		38.2
+18		44.0
+25		43.9
+29.9		43.7
+30=W		36.6
+5		36.5

CONTINUED IN Book 1059

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

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417
39
658

CURVE FORMULAS

- Radius= $R = \frac{50}{\sin \frac{D}{2}}$ (1) Degree of Curve= D and $\sin \frac{D}{2} = \frac{50}{R}$ (2)
- Tangent= $T = R \tan \frac{\Delta}{2}$ (3) Length of Curve= $L = 100 \frac{\Delta}{D}$ (4)
- Middle ordinate= $M = R(1 - \cos \frac{\Delta}{2})$ (5) $= R \text{vers} \frac{\Delta}{2}$ (6)
- External= $E = T \tan \frac{\Delta}{4}$ (7) $= R \div \cos \frac{\Delta}{2} - R$ (8) $= R \text{exsec} \frac{\Delta}{2}$ (9)
- Long Chord= $C = 2 R \sin \frac{\Delta}{2}$ (10) $\Delta = \text{Central Angle}$

EXPLANATION AND USE OF TABLES

Stations.—Given P. I.—Sta. 161+60.35 to find Sta. of P. C. and P. T. $\Delta = 62^\circ 10'$ $D = 8^\circ 20'$. From Table IV for 1° curve $T = 3454.1$ and $\div 8\frac{1}{2} = 414.49$ ft. From Table V correction=.36 or $T = 414.85$ ft. P. C.—Sta. P.I.— $T = 157 + 45.50$. Also from (4) $L = 746.00$ and P. T.—Sta. P. C. + $L = 164 + 91.50$.

Offsets.—Tangent offsets vary (approximately) directly with D and with square of the distance. Thus tangent offset for Sta. 158 on above curve is 2.16 ft. found as follows. From Table III tangent offset for 100 ft.=7.27 ft. Distance= $158 - \text{Sta. P. C.} = 54.50$, hence offset= $7.27 (54.50 \div 100)^2 = 2.16$ ft. Also square of any distance divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(54.50)^2 \div (2 \times 688.26) = 2.16$ ft.

Deflections.—Deflection angle= $\frac{1}{2} D$ for 100 ft., $\frac{1}{4} D$ for 50 ft., etc. For c ft.—(in minutes) $.3 \times C \times D^\circ$ or—defl. for 1 ft. from Table III $\times C$. For Sta. 158 of above curve= $.3 \times 54.5 \times 8\frac{1}{2} = 136.2'$ or $2^\circ 16.2'$, or= $2.50 \times 54.5 = 136.2'$ from Table III. For Sta. 159 deflection angle= $2^\circ 16.2' + 8^\circ 20' \div 2 = 6^\circ 26.2'$, etc.

Externals.—May be found in similar manner to tangents. Thus E for curve above is 115.37 For from Table IV for 1° curve $E = 960.6$ for $8^\circ 20' = 960.6 \div 8\frac{1}{2} = 115.27$ and from Table V correction=.10 or $E = 115.37$ Or suppose $\Delta = 32^\circ$ and E is measured and found to be 42 ft. What is D ? From Table IV $E = 230.9$ and $\div 42 = 5.5$ or $D = 5^\circ 30'$.

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.
0	0	0	∞	1	90	1	∞	0	0
10	.0029	.0029	343.8	.99999	50	.7660	.7660	1.2843	.6428
20	.0058	.0058	171.9	.99998	40	.6428	.6428	1.5557	.7660
30	.0087	.0087	114.6	.99996	30	.5196	.5196	1.9613	.8660
40	.0116	.0116	85.94	.99993	20	.3962	.3962	2.5574	.9397
50	.0145	.0145	68.75	.99989	10	.2717	.2717	3.7071	.9848
1	.0175	.0175	57.29	.99985	89	.9848	.9848	6.0628	.1717
10	.0204	.0204	49.10	.99979	50	.7660	.7660	1.2843	.6428
20	.0233	.0233	42.96	.99973	40	.6428	.6428	1.5557	.7660
30	.0262	.0262	38.19	.99966	30	.5196	.5196	1.9613	.8660
40	.0291	.0291	34.37	.99958	20	.3962	.3962	2.5574	.9397
50	.0320	.0320	31.24	.99949	10	.2717	.2717	3.7071	.9848
2	.0349	.0349	28.64	.99939	88	.9848	.9848	6.0628	.1717
10	.0378	.0378	26.43	.99929	50	.7660	.7660	1.2843	.6428
20	.0407	.0407	24.54	.99917	40	.6428	.6428	1.5557	.7660
30	.0436	.0437	22.90	.99905	30	.5196	.5196	1.9613	.8660
40	.0465	.0466	21.47	.99892	20	.3962	.3962	2.5574	.9397
50	.0494	.0495	20.21	.99878	10	.2717	.2717	3.7071	.9848
3	.0523	.0524	19.08	.99863	87	.9848	.9848	6.0628	.1717
10	.0552	.0553	18.07	.99847	50	.7660	.7660	1.2843	.6428
20	.0581	.0582	17.17	.99831	40	.6428	.6428	1.5557	.7660
30	.0610	.0612	16.35	.99813	30	.5196	.5196	1.9613	.8660
40	.0640	.0641	15.60	.99795	20	.3962	.3962	2.5574	.9397
50	.0669	.0670	14.92	.99776	10	.2717	.2717	3.7071	.9848
4	.0698	.0699	14.30	.99756	86	.9848	.9848	6.0628	.1717
10	.0727	.0729	13.73	.99736	50	.7660	.7660	1.2843	.6428
20	.0756	.0758	13.20	.99714	40	.6428	.6428	1.5557	.7660
30	.0785	.0787	12.71	.99692	30	.5196	.5196	1.9613	.8660
40	.0814	.0816	12.25	.99668	20	.3962	.3962	2.5574	.9397
50	.0843	.0846	11.83	.99644	10	.2717	.2717	3.7071	.9848
5	.0872	.0875	11.43	.99619	85	.9848	.9848	6.0628	.1717
10	.0901	.0904	11.06	.99594	50	.7660	.7660	1.2843	.6428
20	.0929	.0934	10.71	.99567	40	.6428	.6428	1.5557	.7660
30	.0958	.0963	10.39	.99540	30	.5196	.5196	1.9613	.8660
40	.0987	.0992	10.08	.99511	20	.3962	.3962	2.5574	.9397
50	.1016	.1022	9.788	.99482	10	.2717	.2717	3.7071	.9848
6	.1045	.1051	9.514	.99452	84	.9848	.9848	6.0628	.1717
10	.1074	.1080	9.255	.99421	50	.7660	.7660	1.2843	.6428
20	.1103	.1110	9.010	.99390	40	.6428	.6428	1.5557	.7660
30	.1132	.1139	8.777	.99357	30	.5196	.5196	1.9613	.8660
40	.1161	.1169	8.556	.99324	20	.3962	.3962	2.5574	.9397
50	.1190	.1198	8.345	.99290	10	.2717	.2717	3.7071	.9848
7	.1219	.1228	8.144	.99255	83	.9848	.9848	6.0628	.1717
10	.1248	.1257	7.953	.99219	50	.7660	.7660	1.2843	.6428
20	.1276	.1287	7.770	.99182	40	.6428	.6428	1.5557	.7660
30	.1305	.1317	7.596	.99144	30	.5196	.5196	1.9613	.8660
40	.1334	.1346	7.429	.99106	20	.3962	.3962	2.5574	.9397
50	.1363	.1376	7.269	.99067	10	.2717	.2717	3.7071	.9848
	Cosin.	Cotg.	Tan.	Sine.	Angle.				

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.
16	.2756	.2867	3.487	.96126	74	.9613	3.487	.2867	.2756
10	.2784	.2899	3.450	.96046	50	.7660	1.2843	.6428	.6428
20	.2812	.2931	3.412	.95964	40	.6428	1.5557	.7660	.7660
30	.2840	.2962	3.376	.95882	30	.5196	1.9613	.8660	.8660
40	.2868	.2994	3.340	.95799	20	.3962	2.5574	.9397	.9397
50	.2896	.3026	3.305	.95715	10	.2717	3.7071	.9848	.9848
17	.2924	.3057	3.271	.95615	73	.9562	3.271	.3057	.2924
10	.2952	.3089	3.237	.95545	50	.7660	1.2843	.6428	.6428
20	.2979	.3121	3.204	.95459	40	.6428	1.5557	.7660	.7660
30	.3007	.3153	3.172	.95372	30	.5196	1.9613	.8660	.8660
40	.3035	.3185	3.140	.95284	20	.3962	2.5574	.9397	.9397
50	.3062	.3217	3.108	.95195	10	.2717	3.7071	.9848	.9848
18	.3090	.3249	3.078	.95106	72	.9511	3.078	.3249	.3090
10	.3118	.3281	3.048	.95015	50	.7660	1.2843	.6428	.6428
20	.3145	.3314	3.018	.94924	40	.6428	1.5557	.7660	.7660
30	.3173	.3346	2.989	.94832	30	.5196	1.9613	.8660	.8660
40	.3201	.3378	2.960	.94740	20	.3962	2.5574	.9397	.9397
50	.3228	.3411	2.932	.94646	10	.2717	3.7071	.9848	.9848
19	.3256	.3443	2.904	.94552	71	.9456	2.904	.3443	.3256
10	.3283	.3476	2.877	.94457	50	.7660	1.2843	.6428	.6428
20	.3311	.3508	2.850	.94361	40	.6428	1.5557	.7660	.7660
30	.3338	.3541	2.824	.94264	30	.5196	1.9613	.8660	.8660
40	.3365	.3574	2.798	.94167	20	.3962	2.5574	.9397	.9397
50	.3393	.3607	2.773	.94068	10	.2717	3.7071	.9848	.9848
20	.3420	.3640	2.747	.93969	70	.9397	2.747	.3640	.3420
10	.3448	.3673	2.723	.93869	50	.7660	1.2843	.6428	.6428
20	.3475	.3706	2.699	.93769	40	.6428	1.5557	.7660	.7660
30	.3502	.3739	2.675	.93667	30	.5196	1.9613	.8660	.8660
40	.3529	.3772	2.651	.93565	20	.3962	2.5574	.9397	.9397
50	.3557	.3805	2.628	.93462	10	.2717	3.7071	.9848	.9848
21	.3584	.3839	2.605	.93358	69	.9336	2.605	.3839	.3584
10	.3611	.3872	2.583	.93253	50	.7660	1.2843	.6428	.6428
20	.3638	.3906	2.560	.93148	40	.6428	1.5557	.7660	.7660
30	.3665	.3939	2.539	.93042	30	.5196	1.9613	.8660	.8660
40	.3692	.3973	2.517	.92935	20	.3962	2.5574	.9397	.9397
50	.3719	.4006	2.496	.92827	10	.2717	3.7071	.9848	.9848
22	.3746	.4040	2.475	.92718	68	.9272	2.475	.4040	.3746
10	.3773	.4074	2.455	.92609	50	.7660	1.2843	.6428	.6428
20	.3800	.4108	2.434	.92499	40	.6428	1.5557	.7660	.7660
30	.3827	.4142	2.414	.92388	30	.5196	1.9613	.8660	.8660
40	.3854	.4176	2.394	.92276	20	.3962	2.5574	.9397	.9397
50	.3881	.4210	2.375	.92164	10	.2717	3.7071	.9848	.9848
23	.3907	.4245	2.356	.92050	67	.9205	2.356	.4245	.3907
10	.3934	.4279	2.337	.91936	50	.7660	1.2843	.6428	.6428
20	.3961	.4314	2.318	.91822	40	.6428	1.5557	.7660	.7660
30	.3987	.4348	2.300	.91706	30	.5196	1.9613	.8660	.8660
40	.4014	.4383	2.282	.91590	20	.3962	2.5574	.9397	.9397
50	.4041	.4417	2.264	.91472	10	.2717	3.7071	.9848	.9848
	Cosin.	Cotg.	Tan.	Sine.	Angle.				

Handwritten calculations and notes at the top of the right page, including numbers like 5250, 15750, 10500, 120710, 3707, and 2473.

Handwritten calculations and notes at the top of the right page, including numbers like 55112, 255326, 170224, 25757, 85112, 340648, 2042685.

11 feet clearance



$$\begin{array}{r} 500 \\ 14 \\ \hline 48.9 \end{array}$$

2-12" D.S.

23+30

ABT. 17:00 or E Top pipe
34'

16.6

17.2

18.7

$$15 \overline{) 242} \begin{array}{r} 16 \\ 28 \end{array}$$

00400
00409

15 | 712.78

32

$$31 \overline{) 150} \begin{array}{r} 4 \\ 21 \\ 14 \end{array} \begin{array}{r} 15 \\ 5 \end{array}$$

$$\begin{array}{r} 5799.5 \\ 2. \\ \hline 5821.6 \\ 409 \\ \hline 5242185 \\ 2329860 \\ \hline 235228.155 \\ 476456 \\ \hline 2332 \end{array}$$

3.83
7.50

4978
47.44
48.01

6.17 43.61
6.13 40.51

6.12 47.89 = B.M. H 147+65

0.52 47.49
6.99 52.73 = B.M. Lt of 158+30

6.12 57.00

$$\begin{array}{r} 96 \\ 10.61 \\ \hline .51 \end{array}$$

$$\begin{array}{r} 75 \\ 41 \\ \hline 5 \end{array}$$

10.22

$$\begin{array}{r} 567 \\ 617 \end{array}$$

84

85

$$\begin{array}{r} 175 \end{array}$$

$$\begin{array}{r} 1137 \\ 310 \end{array}$$

$$\begin{array}{r} 4.90 \\ 7.5 \\ \hline 41.5 \\ 4.90 \\ \hline 3.93 \end{array}$$

$$\begin{array}{r} 6.12 \\ 13.10 \\ 3.93 \\ \hline 11.26 \end{array}$$

$$\begin{array}{r} 1380 \\ 3.97 \\ \hline 983 \\ 46 \\ \hline 14.47 \end{array}$$

14.47

$$\begin{array}{r} 7.77 \end{array}$$

2.5

4

5.4

12

17.7

16.60

1.4

15.16