

1666

DEI ZED  
1875

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ENGINEERS  
LEVEL BOOK  
No. 410F

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# EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and  
SURVEYING INSTRUMENTS

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  $1\frac{1}{2}$  see inside of back cover.

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# 1666

## CITY ENGINEER'S OFFICE

INDEXED

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The paper stock of this book is made of a high grade 50% rag paper having a water resisting surface. This book is sewed with Bing Special Enamel Waterproof Thread.

Made in U. S. A.

1 <sup>st</sup> Ave.	Between	Brooklyn Market	2-13
3 <sup>rd</sup> Ave.		Fir St. Ash St.	14-47
3 <sup>rd</sup> Ave.		A B.	48-49
Date St		2 4	50-51
Fir		3 4	52-57

Walker  
Hogard  
Harden  
4-18-44

Cross Section 1st Ave. 52' 14' Cbs.  
From South Line Broadway Ave. <sup>Ready</sup> 13' 14 1/2.  
To North Line Market Street  
(for Street Car Track removal project)

37.22

1+00 Cont.

2

INDEXED

12.68 37.22

24.54

SW 82  
E-st  
+ 1st Ave

0+00 = Spine Broadway Ave

Wcb. 5.80 31.42

Gut. 6.33 30.89

W'1/4 5.48 31.74

L on Burn MH 5.15 32.07

E'1/4 5.12 32.10

E Gut. 5.04 32.18

E Top cb. 4.22 33.00

0+50

E Top cb 5.36 31.86

" Gut. 6.07 31.15

E'1/4 6.07 31.15

L 6.13 31.09

W'1/4 6.35 30.87

W Gut. in Drive 7.43 29.80

1+00

W Gut. in Drive 8.51 28.66

W'1/4 7.55 29.67

L 7.23 29.99

E'1/4 7.15 30.07

Gut. 7.22 30.00

E Top cb. 6.51 30.71

1+50

E Top cb. 7.70 29.52

E Gut. 8.36 28.86

E'1/4 8.26 28.96

L 8.37 28.90

W'1/4 8.59 28.63

W Gut. 9.56 27.66

W Top cb. 9.03 28.19

2+00

W Gut. in Drive 10.62 26.60

" 1/4 9.69 27.53

L 9.39 27.83

E'1/4 9.32 27.90

E Gut. 9.43 27.79

E cb. 8.87 28.40

Reduced C.F.  
Sections Plotted  
Paper 5.13.44

	37.22	First Ave.
2.50		
E. Gut. in Drive	10.51	26.71
E 1/4	10.41	26.81
L	10.37	26.85
W 1/4	10.80	26.42
W. Gut.	11.65	25.57
W Top cb.	11.00	26.22 14' 65.
2+854 - W.L. E-St	13' 45	
W Top cb.	11.76	25.46
W Gut.	12.23	24.99
W 1/4	11.43	25.79
L	11.11	26.11
E 1/4	11.10	26.12
E Gut.	11.24	25.98
E Top cb.	10.77	26.45
TP 6.09 30.63	12.68	24.54
N cb. E-St.		
E.L. on cb.	4.03	26.60.
" " Gut.	4.88	25.75
cb.	4.85	25.78
E Gut.	4.85	25.78
" 1/4	4.77	25.86

	30.63	3
L	4.79	25.84
W 1/4	5.07	25.56
W. Gut.	5.75	24.88
W.L. Gut.	5.79	24.84
" on cb.	5.31	25.32
N 1/4 E-St		
W.L.	5.67	24.96
W. Gut.	5.88	24.75
1/4	5.19	25.44
L	4.95	25.68
E 1/4	4.96	25.67
E Gut.	5.04	25.59
E.L.	4.76	25.87
L E-St		
E.L.	4.65	25.98
E Gut.	5.17	25.46
E 1/4	5.16	25.47
L	5.16	25.47
W 1/4	5.40	25.23
W Gut.	5.96	24.67
W.L.	5.75	24.88

3063

S<sup>1</sup>/<sub>4</sub> E-St.

W.L. 6.11 24.52

W Gut 6.16 24.47

W<sup>1</sup>/<sub>4</sub> 5.51 25.12

E 5.35 25.28

E<sup>1</sup>/<sub>4</sub> 5.29 25.34

E Gut 5.40 25.23

E.L. 5.00 25.63

South cb E-St

E.L. DD Gut 5.60 25.03

" " cb 5.18 25.45

E cb Gut 5.63 25.00

E<sup>1</sup>/<sub>4</sub> 5.40 25.23

E 5.46 25.17

W<sup>1</sup>/<sub>4</sub> 5.70 24.93

W Gut 6.49 24.14

W.L. " 6.51 24.12

" Top cb 6.10 24.53

0+00 = S.L. E-St

W Top cb 6.15 24.48

" Gut 6.79 23.84

3063

4

W<sup>1</sup>/<sub>4</sub> 5.91 24.72

E 5.69 24.94

E<sup>1</sup>/<sub>4</sub> 5.64 24.99

E Gut 6.00 24.63

E Top cb 5.25 25.38

0+50

E Top cb 6.58 24.05

E Gut 7.27 23.36

E<sup>1</sup>/<sub>4</sub> 6.86 23.77

E 6.82 23.81

W<sup>1</sup>/<sub>4</sub> 7.03 23.60

W Gut 10 DEING 7.84 22.79

1+00

W cb 8.42 22.21

Gut 8.86 21.77

W 8.11 22.52

E 7.96 22.67

E<sup>1</sup>/<sub>4</sub> 7.95 22.68

E Gut 8.43 22.20

E cb 7.72 22.84

Cont. p. 5

3063

First Ave

	1+50			
E. cb		904	21.59	
E. Gut		964	20.99	
E'1/4		918	21.45	
ℓ		916	21.47	
W'1/2		928	21.35	
W. Gut		994	20.69	
W Top cb		938	21.25	
	2700			
W Top cb		1050	20.13	
" Gut		1102	19.61	
" 1/4		1041	20.22	
ℓ		1036	20.27	
E'1/2		1036	20.27	
E. Gut		1089	19.74	
E. cb		1026	20.37	
	2+50			
E. cb		1145	19.18	
" Gut		1206	18.57	
TR	2.71	22.06	11.32	12.31
E'1/4		2.88	19.14	

2+50

22.02

5

ℓ		2.85	19.17	
W'1/2		2.93	19.09	
W Gut in Drive		3.54	18.48	
	2+96			
W cb		4.10	17.92	
Gut = Flow inlet		4.61	17.41	
+2 " "		4.49	17.53	
+3		4.32	17.63	
W'1/4		4.12	17.90	
ℓ		3.86	18.16	
E'1/4		3.96	18.06	
+11		4.45	17.57	
Gut. Flow inlet		4.58	17.44	
E. cb		4.00	18.02	
	3+006 = H.L. F-st.			
E. cb		4.06	17.96	
Gut Flow inlet		5.18	16.84	
+2 " "		5.15	16.87	
" on Hd. wall		4.09	17.93	
E'1/4		3.95	18.07	
ℓ		3.97	18.05	

2202

W 1/4	417	17.85
#11 on Hd. Well	413	17.89
" " Flow Inlet	513	16.89
W East " "	513	16.89
W Top 1/4	409	17.93

N. G. L. 1/2 F-st

W.L. on cb	401	18.01
" on Flow	423	17.09
#95 " Hd. Well	404	17.98
W Gut	420	17.82
" 1/4	422	17.80
E	411	17.91
E 1/4	401	18.01
E cb	417	17.85

E.L. on Hd. Well	411	17.91
" " Flow Inlet	513	16.89

N 1/4 - F-st

E.L.	429	17.73
cb.	427	17.75
1' N-1/4 24' x 22' <sup>Rim</sup> = cleanout	426	17.76
E 1/4	426	17.76

2202

6

E	438	17.64
W 1/4	440	17.62
#12	442	17.60
W Gut	438	17.64
W 1/4	447	17.55

32.9' South of N.L. F-st - N Rail N Track

W.L. on Rail	453	17.49
cb " "	442	17.53
W 1/4 " "	451	17.51
E	449	17.53
1/4	437	17.65
cb	433	17.69
E.L.	429	17.73

E - F-st

E.L.	439	17.63
cb	446	17.56
1/4	453	17.49
E	449	17.53
W 1/4	462	17.40
W cb	454	17.48
W.L.	457	17.45



2202

First Ave

47.7' South of N. E. St. = South Rail S. Track

W.L. on Rail	4.65	17.37
w cb. " "	4.63	17.39
W 1/4 " "	4.66	17.36
E " "	4.65	17.37
E 1/4 " "	4.59	17.43
E cb. " "	4.50	17.52
E.L. " "	4.46	17.56

South 1/4 - East

E.L.	4.58	17.44
E cb.	4.60	17.42
+1	4.57	17.45
E 1/4	4.65	17.37
E	4.80	17.22
W 1/4	4.77	17.25
+12 <sup>22' N</sup> = 2x2 Cleanout	4.72	17.30
W cb.	4.72	17.30
W.L.	4.80	17.22

5 1/4 + 5.4

W.L.	4.94	17.08
cb.	4.84	17.18

2202

7

W cb. +7 = Wedge Gw. MH.	4.66	17.36
" +108 = E " " "	4.67	17.35
W 1/4	4.80	17.22
E <sup>Poring</sup> Sags	4.96	17.06
E 1/4	4.69	17.33
E cb.	4.77	17.25
E.L.	4.75	17.27

5 cb.

E.L. cb.	5.10	16.92
" Floor Inlet	5.25	16.07
+07' on Hdg Wall	5.09	16.93
E cb.	4.95	17.07
E 1/4	4.80	17.22
E	5.07	16.95
W 1/4	4.93	17.09
W cb.	5.02	17.00
W.L. cb. = Pw.	5.12	16.90
" Floor	5.23	16.09
chk S.W. BP F. St. S. St.	5.12	16.90

16.92 = BM  
0.02 diff

Cont. p. 8

2202

South Loop F-d = 0+00

W'cb	5.11	16.91
Gut	5.93	16.09
+2'	5.93	16.09
+2 <sup>2</sup> on Hd. well	5.11	16.91
W'1/4	5.09	16.93
E Rim MH	5.09	16.93
E'1/4	5.07	16.95
+11 on Hd well	5.15	16.87
11.1 " Flow	6.14	15.88
Gut. "	6.14	15.88
E Top cb	5.09	16.93
0+05		
E cb	5.28	16.74
" Gut	6.22	15.80
+2	6.02	16.00
+44	5.44	16.58
E'1/4	5.14	16.88
E <sub>o</sub>	5.10	16.92
W'1/4	5.13	16.89
+6	5.34	16.68

2202

8

+11 = Flow outlet	5.20	16.12
W' Gut	5.90	16.12
W'cb	5.17	16.85
0+50		
W'cb	5.52	16.50
" Gut	6.16	15.86
1/4	5.55	16.47
E <sub>o</sub>	5.60	16.42
E'1/4	5.56	16.46
+10	6.01	16.01
E Gut	6.50	15.52
E Top cb	5.70	16.32
1+00		
E cb	6.29	15.73
E Gut	6.79	15.23
E'1/4	6.18	15.84
E <sub>o</sub>	6.05	15.97
W'1/4	6.00	16.02
Gut	6.52	15.50
cb	5.95	16.07
Cont. p-9		

22.02

First Ave

1750

W Top cb	6.42	15.60
" Gult	6.92	15.04
1/4	6.50	15.52
1/2	6.67	15.35
E 1/4	6.66	15.36
Gult	7.36	14.66
E Top cb	6.91	15.11

2100

E Top cb	7.40	14.62
" Gult	7.87	14.15
E 1/4	7.07	14.95
1/2	7.10	14.92
W 1/4	7.00	15.02
W Gult	7.40	14.62
" Top cb	6.80	15.22

2150

W Top cb	7.37	14.65
" Gult	7.83	14.19
" 1/4	7.46	14.56
1/2	7.61	14.41

2202

9

E 1/4	7.66	14.36
E Gult	8.48	13.54
E Top cb	8.10	13.92
T.P.	5.16	19.63
	7.55	14.47
3100.5 = N.L. G-St		
E Top cb	6.18	13.45
E Gult	6.44	13.19
E 1/4	5.77	13.86
1/2	5.53	14.10
W 1/4	5.55	14.08
W Gult	5.82	13.81
W Top cb	5.26	14.37
N cb		
W.L. out cb	5.22	14.41
" Gult	5.55	14.08
cb	5.79	13.84
1/4	5.60	14.03
1/2	5.60	14.03
E 1/4	5.83	13.80
cb	6.48	13.15
E.L. Gult	6.14	13.49
" Top cb	6.43	13.20

SW. 1/4  
G. 1st Ave  
14.48:00

1963

N 1/4 - G-st

EL.	6.23	13.40
Gut.	6.43	13.20
E 1/4	5.86	13.77
L	5.63	14.00
W 1/4	5.57	14.06
Gut.	5.78	13.85
W.L.	5.25	14.38

S-G-st

W.L.	5.14	14.49
cb.	5.76	13.87
1/4	5.57	14.06
L	5.64	13.99
E 1/4	5.81	13.82
E Gut.	6.48	13.15
E.L.	6.11	13.52

S 1/4 - G-st

E.L.	6.24	13.39
cb.	6.58	13.05
E 1/4	5.81	13.82
L	5.60	14.03

1963

10

W 1/4	5.56	14.07
W Gut.	5.82	13.81
W.L.	5.25	14.38

S. cb - G-st

W.L. Top cb	5.17	14.46
Gut.	5.56	14.07
cb. Gut.	5.94	13.69
W 1/4	5.53	14.10

L	5.67	13.96
E 1/4	5.81	13.82

E cb	6.25	13.88	14.95
------	------	-------	-------

E.L. Gut.	6.56	14.07
" Top cb	6.25	13.38

0700 - S.L. G-st

E cb.	6.30	13.33
" Gut.	6.25	12.68
" 1/4	5.87	13.76

L	5.62	13.94
W 1/4	5.62	14.01

W Gut.	6.10	13.53
--------	------	-------

W Top cb.	5.23	14.40
-----------	------	-------

1963

First Ave.

0750

W Top cb. 5.60 14.03

" Gut 6.46 13.17

" 1/4 5.99 13.64

L 6.01 13.62

E 1/4 6.19 13.44

E Gut 7.32 12.31

E Top cb. 6.62 13.01

1700

E Top cb. 6.94 12.69

E Gut 7.56 12.07

E 1/4 6.53 13.10

L 6.38 13.25

W 1/4 6.38 13.25

W Gut 6.88 12.75

" Top cb 6.02 13.61

1750

W Top cb. 6.46 13.17

" Gut 7.26 12.37

" 1/4 6.78 12.85

L 6.82 12.81

1963

11

E 1/4 6.87 12.76

E Gut 7.85 11.78

E Top cb. 7.23 12.40

2700

E Top cb 7.58 12.05

E Gut 8.27 11.36

E 1/4 7.26 12.37

L 7.21 12.42

W 1/4 7.19 12.44

W Gut 7.63 12.00

" Top cb 6.87 12.76

TP 5.08 17.57 7.14 12.49

2752 = N end inlet on East.

W cb 5.27 12.30

Gut 5.95 11.62

1/4 5.51 12.06

L 5.47 12.10

E 1/4 5.57 12.00

E Floor inlet 6.49 11.08

E cb 5.81 11.76

2755 = S end inlet on East

17.57

First Ave.

E Top cb = Paving	5.75	11.82
1/4	5.59	11.98
E	5.50	12.07
W 1/4	5.51	12.06
W cut	6.01	11.56
W 1/4 = 10	5.28	12.29
2+95 = N end inlet		
W Top cb	5.66	11.91
Gut = Flow inlet	6.32	11.25
+3' " "	6.29	11.28
W 1/4	5.70	11.87
E	5.78	11.79
E 1/4	5.92	11.65
Gut Paving - cb. Else	6.07	11.50
3+00 = N.E. Market		
Top Top E. cb. = Paving	6.12	11.45
1/4	6.00	11.57
E	5.87	11.70
W 1/4	5.73	11.84
+10 on Hd wall	5.69	11.88
+10' " Flow inlet	6.78	10.79
W Gut. " "	6.82	10.75
W Top cb.	5.65	11.92

First Ave.

12

17.57		
chk SW BP Market & First Ave	5.67	11.90
		11.93 - BM.
		0.03 diff.
(Completed 4-12-44)		
68' hauler of 17 1/4		
Additional bench - 1st Ave & Market St		
	4.66	16.56
		11.90
		Above S.M.
-5' on Gut.		5.57
" " cb.		4.63
W. " "		4.62
" " Gut		5.62
1' South on Hd Wall		4.64
W+0.1 on Hd Wall		4.62
W cb. on Paving		4.59
+1.0' on Run Cleanout Box		4.60
W 1/4		4.62
E on Pav		4.71
W Run		4.70
E "		4.68
1/4		4.82
E. cb. on Pav		5.13
Else. Guts		5.71
" Top cb.		5.13

16.56		First Ave Cont.	
N 1/4 Market = 17' South of E			
E.L.	4.84		
cb.	4.65		
5' N 1' W	4.69	Rim Cleanout	Box
E 1/4	4.58		
+5.5' = E. Rail	4.59		
+10.2' = W. Rail	4.56		
L	4.51		
W 1/4	4.47		
W cb.	4.41		
W L	4.42		
N Rail of Market St		= 42.6' South of N.E. Market	
W on Rail	4.25		
cb	4.28		
W 1/4	4.37		
L	4.42		
E 1/4	4.53		
E cb	4.56		
E L	4.64		
chk starting BM	4.66	11.90	✓

4-19-44  
Walker  
Hazard  
Hudson  
Boggs.

CROSS SECTION 3rd Ave. 80' wide  
From N. Linn Fir St. to S.L. Ash  
And from N.L. 8-st to S.L. Broadway Ave  
52' Building 12' 1/2  
13' 1/2

INDEXED

	2.51	167.47		164.96	N.W. B.P. 4th & Fir St.
TR	1.53	164.99	4.01	163.46	
N.L. Fir St.					
E. Top cb. = Row to South & West	0.58	164.91			
Flow inlet	1.68	163.31			
E 1/4	0.94	164.05			
L	1.32	163.67			
W 1/4	1.70	163.29			
W. Gut	2.53	162.46			
cb.	1.22	163.00			
N cb. Fir					
W.L. on cb.	2.10	162.89			
" Gut	2.85	162.14			
W cb.	2.43	162.56			
" 1/4	1.69	163.30			
L	1.22	163.70			
E 1/4	0.97	164.02			
E G	0.73	164.26			

16499

14

F.L. on Hd wall inlet	0.62	164.37			
" " Flow	1.65	163.34			
N 1/4					
E	0.82	164.10			
cb.	0.88	164.11			
1/4	1.06	163.93			
L	1.38	163.61			
W 1/4	1.66	163.33			
w cb.	2.02	162.97			
W.L.	2.34	162.65			
L					
W.L.	2.11	162.88			
w cb.	1.87	163.12			
" 1/4	1.63	163.36			
L on Rim MH	1.38	163.61			
E 1/4	1.12	163.87			
cb.	0.99	164.00			
E	1.08	163.91			
S 1/4					
E	1.28	163.71			
E. cb.	1.11	163.88			



	164.99	31 <sup>st</sup> Ave
E 1/4	11.5	163.89
+4	12.1	163.78
+6	132	163.67
Lo	144	163.55
W 1/4	172	163.27
Wcb	198	163.01
W.L.	227	162.78
S cb. Fir st		
W.L. Top cb.	210	162.89
" Gut.	272	162.27
Wcb	231	162.68
W 1/4	190	163.09
Lo	153	163.46
E 1/4	142	163.57
Ecb	150	163.49
E. Gut = Top cb	159	163.40
0100 = S.L. Fir		
E Top cb	160	163.39
Gut on Flow outlet	328	161.71
+23	328	161.71
+23 on Top	170	163.29

	164.99	15
E 1/4	1.95	163.04
Lo	2.06	162.93
W 1/4	2.21	162.78
W. Gut	2.57	162.42
W Top cb	2.10	162.89
0105		
W cb.	2.51	162.48
" Gut.	2.95	162.04
W 1/4	2.53	162.46
Lo	2.37	162.62
E 1/4	2.35	162.64
+10.7 Flow outlet	3.27	161.72
Gut " "	3.32	161.67
E Top cb	2.00	162.99
0150		
E Top cb	5.60	159.39
Gut	6.18	158.81
1/4	5.82	159.17
Lo	5.61	159.38
W 1/4	5.87	159.12
W Gut	6.43	158.56
W Top cb.	6.24	158.75

164.99

3<sup>rd</sup> Ave.

1+00

W Top cb		10.13	154.88
" Gut.		10.28	154.71
W 1/4		9.83	155.16
L		9.57	155.42
E 1/4		9.74	155.25
E Gut.		10.15	154.84
" Top cb		9.66	155.33
TR	0.56	152.64	12.91 152.08
	1+50		
E Top cb		1.31	151.33
" Gut.		1.84	150.80
" 1/4		1.37	151.27
L		1.19	151.45
W 1/4		1.47	151.17
W Gut.		1.87	150.77
W cb		1.45	151.19
	2+00		
W Top cb		5.42	147.22
" Gut.		5.75	146.89
" 1/4		5.33	147.31

of Drive  
+ 1.12

152.64

16

L		5.16	147.48
E 1/4		5.33	147.31
E Gut.		5.70	146.94
E Top cb		5.11	147.53
	2+50		
E Top cb		2.28	143.36
E Gut.		2.77	142.87
E 1/4		2.30	143.34
L		2.08	143.56
W 1/4		2.22	143.35
W Gut.		2.70	142.94
W Top cb		2.37	143.27
TR	0.49	140.32	12.81 132.83
	3+00.7	North line	E 1/4 st.
chk BMBP		0.94	139.38
			14' cb 13' 11.45. NW E 1/4 + 2.14
W cb		0.94	139.38
Gut.		1.35	138.97
W 1/4		0.74	139.58
L		0.45	139.87
E 1/4		0.75	139.57

? Tree

E. Gnd.	130	139.02
E. cb	0.93	139.39
N. cb	E. film st	
E. L. Top cb	0.90	139.42
" Gnd.	1.64	138.68
cb	1.63	138.69
E. 1/4	1.28	139.04
L.	1.05	139.27
W. 1/4	1.24	139.08
W. cb	1.44	138.88
W. Gnd.	1.65	138.67
" Top cb	0.98	139.34
N. 1/4		
W. L.	1.85	138.47
cb	1.63	138.69
W. 1/4	1.56	138.76
L.	1.44	138.88
E. 1/4	1.62	138.70
E. cb	1.20	138.92
E. L.	1.62	138.70
L. E. film st		

E. L.	1.82	138.43
cb	2.12	138.13
E. 1/4	1.92	138.40
L. film W. H.	1.62	138.70
W. 1/4	1.89	138.43
W. cb	1.95	138.37
W. L.	2.15	138.17
S. 1/4		
W. L.	2.65	137.67
cb	2.41	137.91
W. 1/4	2.28	138.04
L.	2.07	138.25
E. 1/4	2.26	138.06
cb	2.64	137.68
E. L.	2.47	137.85
S. cb		
E. Top cb	2.93	137.39
" Gnd.	3.36	136.96
cb	3.27	137.05
E. 1/4	2.64	137.68
L.	2.43	137.89

W 1/4	2.63	137.69
W cb.	2.99	137.33
W.L. Gcut.	3.35	136.97
" Top cb.	2.95	137.37
Stk. Elm = 0700		
W	2.94	137.38
Gcut.	3.54	136.78
1/4	3.14	137.18
E	2.95	137.37
E 1/4	3.17	137.15
E Gcut.	3.72	136.60
E Top cb.	2.93	137.39
0750		
E Top cb.	6.73	133.59
" Gcut.	7.44	132.88
" 1/4	6.74	133.58
E	6.63	133.69
W 1/4	6.88	133.44
W Gcut. in Drive	7.54	132.78
1700		
W Top cb.	11.00	129.32

W Gcut.	11.57	128.75
" 1/4	10.83	129.49
E	10.58	129.74
1/4	10.72	129.60
Gcut.	11.24	129.08
cb.	10.56	129.76
TR	0.05	127.45
	1750	127.40
E cb.	1.49	125.96
Gcut.	2.08	125.37
1/4	1.69	125.76
E	1.54	125.91
W 1/4	2.15	125.30
W Gcut.	2.84	124.61
W Top cb.	2.24	125.21
2700		
W cb.	6.29	121.16
Gcut.	6.80	120.65
1/4	6.10	121.35
73	6.01	121.44
+4	5.84	121.61

	12745	3rd Ave.	
L	5.36	122.09	
+2	5.25	122.20	
+7	5.31	122.14	
+10	5.54	121.91	
1/2	5.56	121.89	
E Gut.	5.96	121.49	
E cb	5.43	122.02	
	2+50		
E cb	9.65	117.80	
Gut.	10.18	117.27	J
1/2	9.89	117.56	
L	9.66	117.79	
+9	9.94	117.51	-
+10	10.10	117.35	
W 1/4	10.21	117.24	
W Gut.	11.28	116.17	
W cb	10.85	116.60	
T.P.	2.46	117.42	12.49 114.96
cb	NW 8P Cedar + 30'	2.37	108.05 108.09 - BM 4.04 diff.

	117.42	114.37	119.72	19
3+00.8 = N.L.	Date			
W cb	5.09	112.33		
Gut.	5.51	111.91		
1/2	4.11	113.31		
+3	3.93	113.49		
+0	3.77	113.65		
L	3.28	114.14		
+3	3.18	114.24		
+10	El South	3.33	114.09	
E 1/4	3.39	114.03		
E Gut.	3.62	113.73		
cb	3.05	114.37		
	N cb			
E.L.	2.82	114.60		
Gut.	3.58	113.84		
cb	3.76	113.66		
1/4	3.74	113.68		
+10	3.52	113.90		
L	3.66	113.76		
+10	4.05	113.37		
+11	4.20	113.22		

11742

3<sup>rd</sup> Ave

W <sup>1/4</sup>	433	113.09
W <sup>1/2</sup> cb	537	112.05 <sup>used for</sup> <del>see 817 P-50</del>
W.L. Gut	583	111.59
" Top cb.	515	112.27 = 817 P-50
N <sup>1/4</sup> Date st.		
W.L.	546	111.96
Gut.	501	112.41
1/4	440	113.02
E	373	113.69
+3	364	113.78
1/2	385	113.57
E cb.	390	113.52
EL.	342	114.00
E Date		
EL.	348	113.94
cb.	404	113.38
1/4	389	113.53
E	377	113.65
+10	418	113.24
1/2	437	113.05
cb.	426	112.46
W.L.	543	111.99

11742

20

S <sup>1/4</sup> Date		
W.	579	111.63
cb.	522	112.20
1/4	451	112.91
E	378	113.64
+4	369	113.73
1/2	394	113.48
cb.	409	113.33
E.	364	113.78
S cb. Date st.		
EL. on cb.	347	113.95
" " Gut	399	113.43
cb.	428	113.14
1/4	403	113.39
E	395	113.47
W <sup>1/2</sup>	467	112.75
cb.	574	111.68
W.L. Gut.	639	111.03
" Top cb.	573	111.69
0+00 = S.L. Date		
W Top cb	552	111.90
" Gut.	597	111.45

0+00 Cont. 117.42

31st Ave.

W 1/4	4.85	112.57
L	4.09	113.33
+3'	3.98	113.44
+10	4.05	113.37
E 1/4	4.17	113.25
E Gut.	4.48	112.94
E cb. Top.	3.57	113.75
0+50		
E Top cb	3.81	113.61
" Gut.	4.68	112.74
" 1/4	4.33	113.09
L	4.31	113.11
W 1/4	4.24	112.48
W Gut.	6.09	111.33
W Top cb	5.61	111.81
T.P.	5.72	117.63
1+00		
W Top cb	5.24	111.69
" Gut.	6.45	111.18
" 1/4	5.30	112.33
L	4.57	113.06
+2	4.49	113.14

117.63

21

E 1/4	4.68	112.95
Gut.	5.05	112.58
E Top cb	4.18	113.45
1+25		
E Top cb	4.22	113.41
" Gut.	5.13	112.50
" 1/4	4.78	112.85
+2	4.78	112.85
+11	4.60	113.03
L	4.72	112.91
W 1/4	5.43	112.20
W Gut.	6.60	111.03
" Top cb	6.06	111.57
1+50 = Brk		
W	6.10	111.53
" Gut.	6.65	110.98
" 1/4	5.59	112.04
L	4.93	112.70
+2	4.85	112.78
+11	4.96	112.67
1/4	4.98	112.65
E Gut in Alley way.	5.17	112.46

117.63

319 Ace

1475

E. Top cb.	4.87	112.76
" Gut.	5.73	111.90
" 1/4	5.43	112.20
+2	5.42	112.21
+3	5.32	112.31
+11	5.30	112.33
L	5.39	112.24
1/4	6.08	111.55
W Gut.	7.22	110.41
Top cb.	6.67	110.96
2.700		
cb.	7.15	110.48
W Gut.	7.78	109.85
" 1/4	6.60	111.03
+4	6.30	111.33
L	5.91	111.72
+2	5.77	111.86
+11	5.92	111.69
E 1/4	5.99	111.64
E Gut.	6.27	111.36
E Top cb.	5.46	112.17

117.63

22

2.750

E. Top cb.	6.59	111.04			
" Gut.	7.41	110.22			
E 1/4	7.15	110.48			
+2	6.97	110.66			
L	7.08	110.55			
W 1/4	7.79	109.84			
W Gut.	8.92	108.71			
" Top cb.	8.38	109.25			
TR	3.21	111.25	2.59	108.04	NOT B'D Cedar + 1/2 108.02
3+00.8 = N.L. Cedar 27.					
W Top cb.	3.25	108.00			
" Gut.	3.66	107.59			
" 1/4	South	2.59	108.66		
L	2.01	109.24			
+2	1.87	109.38			
1/4	1.95	109.30			
E Gut.	2.09	109.16			
" Top cb.	1.21	110.04			
N cb.					
E.L. on cb.	1.49	109.76			
" " Gut	2.18	109.07			



	111.25	31 <sup>st</sup> Ave
H. cb Cedar		Cont. from P. 22
sect.	2.57	108.68
E 1/4	2.45	108.80
+11	2.35	108.90
to	2.45	108.80
W 1/4	2.05	108.20
W Gut	3.69	107.56
W.L. Gut	4.10	107.15
" Top cb	3.27	107.98
		N 1/4 Cedar st
W.L.	4.42	106.83
" Gut	3.97	107.28
" 1/4	2.52	107.73
+2	3.48	107.77
+3	3.34	107.91
to	2.91	108.34
+2	2.82	108.43
E 1/4	2.94	108.31
+5	2.99	108.26
		2' N = 1/2 Tol MH 2 Sides
E. Gut	3.02	108.16
E.L.	2.56	108.69

	111.25	23
		E Cedar st
E.L.	3.13	108.12
Gut.	3.56	107.69
1/4	3.43	107.80
+11	3.33	107.92
to	3.39	107.86
W 1/4	3.97	107.28
W Gut	4.42	106.83
+12 = 1/2 Sewer MH	4.99	106.26
W.L.	4.99	106.26
		South 1/4 Cedar
W.L.	5.79	105.46
Gut.	5.11	106.14
1/4	4.49	106.76
to	3.89	107.36
+2	3.80	107.45
E 1/4	3.95	107.30
E Gut.	4.22	107.03
E.L.	3.86	107.39
		South 1/4 cb Cedar st
E.L. Top cb	4.39	106.86
" Gut.	4.85	106.40

11125

31st Ave

South Cb. Cedar Cont.

E. Gut. 4.88 106.37

" 1/4 4.50 106.75

+4 4.44 106.81

+5 4.36 106.89

+11 4.22 106.96

L 4.38 106.87

W 1/4 4.98 106.27

W Gut. 6.12 105.06

+6 6.59 104.66

W L-Gut. 6.75 104.50

" Top cb 6.37 104.88

0+00 = SL Cedar St.

W Top cb 6.37 104.88

" Gut. 6.72 104.46

" 1/4 5.70 105.55

L on Run NW 5.00 106.25

+2 4.87 106.38

E 1/4 5.03 106.22

E Gut. 5.20 106.05

" Top cb 4.41 106.84

11125

24

0+50

E Top cb 7.44 103.81

" Gut. 8.12 103.06

" 1/4 7.98 103.27

+11 7.81 103.44

L 7.92 103.33

W 1/4 8.52 102.73

" Gut. 2.66 101.59

" Top cb 2.22 102.03

1+00

12.06

W cb 12.06 99.19

" Gut. 12.50 98.75

" 1/4 11.47 99.78

L 10.93 100.32

+2 10.84 100.41

E 1/4 11.02 100.23

E Gut. 11.28 99.97

E Top cb 10.54 100.71

TR 1.96 100.15 12.46 98.72

1+50

E Gut in Drive 3.22 96.93

	1750	100.15	31st Ave
E 1/4		2.95	97.20
+11		2.70	97.45
L		2.80	97.35
W 1/4		3.32	96.83
W. Gut.		4.20	95.95
W. cb		3.73	96.42
	2100		
W Top cb.		6.58	93.61
" Gut.		7.01	93.14
" 1/4		6.20	93.95
L		5.79	94.36
+2		5.71	94.44
+7		5.75	94.40
+10		5.91	94.24
E 1/4		5.92	94.23
E. Gut.		6.36	93.89
L. Top cb		5.60	94.55
	2150		
E. Top cb.		8.68	91.47
" Gut.		2.33	90.82
" 1/4		8.91	91.24

	100.15	31st Ave.	25
+3		8.86	91.29
+6		8.75	91.40
+11		8.69	91.46
L		8.76	91.39
W 1/4		9.18	90.97
" Gut.		2.81	90.34
" Top cb		2.40	90.75
TR	3.63	91.58	12.20
	3100	= N.L.	Beech st.
W Top cb.		3.66	87.92
" Gut.		4.02	87.56
" 1/4		3.38	88.20
L		2.96	88.62
+2		2.92	88.64
+8		3.05	88.53
+10		3.23	88.35
" 1/4		3.24	88.34
E. Gut.		3.74	87.84
" Top cb.		2.95	88.63
		N. cb.	Beech
E. Top cb.		3.06	88.52
" Gut.		3.87	87.71
		W S	West

N.W. 8 P.  
Beech & 31st  
8801 - Record.

9158

3rd Ave

E. Gut.	386	87.72
" 1/4	364	87.94
+2	362	87.96
+4	349	88.09
+11	338	88.20
L	341	88.17
+2	357	88.01
+10	372	87.86
W 1/4	375	87.83
W Gut.	410	87.48
W.L. Gut.	441	87.17
" Top 6	368	87.90
N 1/4 Beeds		
W.L.	426	87.32
W Gut	411	87.47
" 1/4	396	87.62
L	359	87.99
E 1/4	379	87.79
E Gut.	398	87.60
E.L.	368	87.90
L Beeds		
E.L.	384	87.74

9158

3rd Ave.

26

cb.	422	87.36
1/4	406	87.52
+5	385	87.73
+12	381	87.77
L Rim MH	390	87.68
+1	382	87.76
1/4	417	87.41
cb	433	87.25
W	444	87.14
S 1/4		
W	490	86.68
cb	471	86.87
1/4	451	87.07
L	403	87.55
+4	399	87.59
+8	403	87.55
1/4	425	87.33
+1	436	87.22
E Gut.	455	87.03
E.L.	428	87.30

MH sunk

	9158	31 <sup>st</sup> Ave
S cb. Beech		
E.L. Top cb.	4.61	86.97
" Gut.	5.02	86.56
cb.	5.06	86.52
"1/2	4.62	86.96
+2	4.60	86.98
+5	4.35	87.23
+11	4.32	87.26
ℓ	4.42	87.16
+9	4.62	86.96
"1/4	4.79	86.79
W cb.	5.25	86.33
W.L. Gut.	5.64	85.94
" Top cb.	5.26	86.32
O+00 = S.L. Beech		
W Top cb.	5.16	86.42
" Gut.	5.55	86.03
" H <sub>1</sub>	5.15	86.43
+8	5.04	86.54
ℓ	4.84	86.74
+2	4.76	86.82
+7	4.74	86.84

	9158	31 <sup>st</sup> Ave	27
+11	5.00	86.58	
E "1/4	5.02	86.56	
E Gut.	5.48	86.10	
E Top cb.	4.82	86.76	
1' South <sup>from this point</sup> = uniform to South	4.67	86.91	
O+15			
E Top cb.	5.32	86.19	
E Gut.	6.17	85.41	
E "1/4	5.58	86.00	
+2	5.55	86.03	
+5	5.35	86.23	
ℓ	5.33	86.25	
W "1/4	5.74	85.84	
W Gut.	6.36	85.22	
" Top cb.	5.92	85.66	
O+50			
W Top cb.	7.59	83.99	
" Gut.	7.99	83.59	
" "1/4	7.37	84.21	
ℓ	6.87	84.71	
+7	6.91	84.67	
+10	7.11	84.47	
E "1/4	7.15	84.43	

9158

37 Ave

E. Gut	7.64	83.94
E. Top cb	6.86	84.72
1+00		
E. Top cb	9.18	82.40
" Gut	9.82	81.76
" 1/4	9.51	82.07
+6	9.30	82.28
L	9.24	82.34
W 1/4	9.75	81.83
" Gut	10.48	81.18
Top cb	9.98	81.60
1+50		
W Top cb	12.37	79.21
" Gut	12.85	78.73
" 1/4	12.09	79.99
L	11.52	80.06
+7	11.53	80.03
+10	11.80	79.78
1/4	11.86	79.72
E. Gut	12.08	79.50
E. cb	11.37	80.21

9158

28

TP	3.63	82.12	18.09	78.42
2+00				
E. Top cb			4.12	78.00
" Gut			4.84	77.28
1/4			4.63	77.49
+2			4.62	77.50
+6			4.42	77.70
+11			4.10	77.72
L			4.46	77.66
+9			4.75	77.37
W 1/4			4.39	77.13
" Gut. in Drive			5.77	76.35
cb 1' South			5.36	76.76
2+50				
W cb			7.73	74.39
" Gut			8.21	73.91
" 1/4			7.36	74.76
+3			7.28	74.84
+5			7.15	74.97
L			6.88	75.24
+4			6.83	75.29
+9			6.83	75.29

	2150 Cont	82.12		3rd Ave.
E 1/4			6.93	75.19
E Cont.			7.10	75.02
" cb.			6.56	75.56
	31009	N.L. Ash		
E cb.			8.72	73.40
" Cont.			9.28	72.84
" 1/4			2.28	72.84
+2			9.29	72.83
+4			9.09	73.03
+11			8.99	73.13
L.			9.08	73.04
+9			9.40	72.72
+11			9.68	72.44
1/4			9.74	72.38
W			10.57	71.55
cb.			10.22	71.90
TR	5.36	75.70	11.78	70.34
				5.rr. B.P. Ash = 3rd.
				70.41 = Record
				N cb. Ash.
W.L. on cb.	FL = S		3.75	71.95
" " Cont.	Wh = W		4.56	71.14
cb.			4.17	71.53

	7570		3rd Ave	29
W 1/4			3.62	72.08
+3			3.33	72.37
L.			3.02	72.68
+2			2.93	72.77
+7			3.00	72.70
1/4			3.25	72.45
+6	6' South of T&E 1/4	2.5 dia.	3.37	72.33
E Cont.			3.25	72.45
E.L. Cont.			2.97	72.73
" Top cb.			2.28	73.42
				N 1/4 Ash
E.L.			3.14	72.56
cb.			3.68	72.02
1/4			3.56	72.14
+4			3.35	72.35
L.			3.33	72.37
+9			3.60	72.10
W 1/4			3.91	71.79
W Cont.			4.19	71.57
W.L.			4.34	71.36

L. Ash.

WL.	4.53	71.17
cb.	4.33	71.37
1/4	4.15	71.55
+3	3.93	71.77
L	3.58	72.12
+8	3.55	72.15
E 1/4	3.81	71.89
cb.	3.93	71.77
E.L.	3.89	72.31
S 1/4		
E.L.	3.90	71.80
cb.	4.30	71.40
1/4	4.12	71.58
+5	3.84	71.86
L	3.85	71.85
+9	4.18	71.52
W 1/4	4.40	71.30
+5' 3' dia. 1944 4' South Gas	4.49	71.21
cb.	4.77	70.93
WL.	4.96	70.74

South cb. Ash.

WL. cb.	5.35	70.35
" Gut.	5.71	69.99
cb.	5.36	70.34
+9	4.78	70.92
W 1/4	4.70	71.00
L	4.22	71.48
+7.5 = Rail on Box	4.25	71.45
1/4	4.41	71.29
Ecb. Gut.	4.80	70.90
E.L. Gut.	4.74	70.96
Ecb. Top cb.	4.19	71.51
0 + 00 = South Line Ash.		
E. Top cb.	4.36	71.34
" Gut.	5.08	70.62
1/4	4.78	70.92
+2	4.78	70.92
+4	4.66	71.04
+12	4.59	71.11
L	4.67	71.03
+10	4.92	70.78



75.70

31st Ave

W 1/4	5.05	70.65
W Gut.	5.77	69.93
* Top cb	5.38	70.32
0+50		
W Top cb	7.40	68.30
Gut.	7.78	67.92
1/4	7.06	68.64
+3	6.20	68.80
2	6.68	69.02
+3	6.59	69.11
+7'	6.66	69.04
E 1/4	6.80	68.90
E Gut.	7.23	68.47
E Top cb	6.35	69.35
1+00		
E Top cb	8.50	67.20
E	8.26	66.44
1/4	8.89	66.81
+5	8.65	67.05
+11	8.58	67.12
2	8.68	67.02

75.70

31st Ave.

1/4	9.09	66.61
+5 = 1/2 3'div. MH Gas	9.26	66.44
W Gut.	9.87	65.83
W Top cb	9.42	66.28
15' W of E 1+20" E Gas Valve Control	9.81	65.89
TD 6.20 70.41	11.49	64.21
1+50		
W Top cb	6.20	64.21
Gut.	6.71	63.70
1/4	5.90	64.51
+3	5.86	64.55
+0	5.73	64.68
2	5.45	64.96
+2	5.41	65.00
1/4	5.68	64.73
E Gut.	6.07	64.34
E cb	5.25	65.16
2+00		
E Top cb	7.80	63.11
* Gut.	8.09	62.32
1/4	7.77	62.64

	2100 Cont.	7041	31 <sup>st</sup> Ave
E 1/4 12			7.74 62.67
+4			7.64 62.77
711			7.46 62.95
2			7.52 62.89
710			7.91 62.50
1/4			7.98 62.43
+5	3' dia. MH Gas 4' South		8.26 62.15
W Gut			8.66 61.75
W Top cb.			8.19 62.22
	2150		
W Gut	10' Dene		10.85 59.56
" 1/4			10.06 60.35
+3			9.22 60.42
2			9.68 60.73
+2			9.55 60.86
710			9.78 60.63
1/4			9.82 60.59
E Gut			10.17 60.24
E Top cb.			9.36 61.05
	3700.6 - N.L. A - St.		
E cb.	W-L-W		11.46 58.95
" Gut.	E-L-5		12.20 59.21

5821

	7041	31 <sup>st</sup> Ave	32
E 1/4		11.86 58.55	
711		11.75 58.66	
2		11.76 58.65	
W 1/4		12.11 58.30	
" Gut.		12.89 57.52	
W Top cb.		12.39 58.02	
T.P.	5.53 63.16	12.78 57.63	
	N cb - A - St.		
W.L. Top cb.		5.26 57.90	
" Gut.		5.95 57.21	
W cb.		5.57 57.59	
" 1/4		5.12 58.04	
2		4.78 58.38	
1/4		4.85 58.31	
cb.		5.11 58.05	
E.L. Gut.		4.99 58.17	
" cb.		4.21 58.95	
	N 1/4 - A		
E		4.90 58.26	
Gut.		5.30 57.86	
1/4		5.02 58.14	

N 1/2 Cont.

L	4.97	58.19
W 1/4	5.29	57.87
W cb.	5.49	57.67
W.L.	5.71	57.45
L - A - St		
W.L.	5.73	57.43
cb.	5.56	57.60
1/4	5.40	57.76
L R. 100 Mt.	5.19	57.97
E 1/4	5.17	57.99
E cb.	5.37	57.79
E.L.	4.97	58.19
South 1/4 - A - St		
E.L.	5.31	57.85
E cb.	5.60	57.56
E 1/4	5.35	57.81
+8'	5.23	57.93
L	5.30	57.86
W 1/4	5.57	57.59
+A	3.7' dia Gas Mt. 4' dia	5.57 57.59

W Gut	5.82	57.34
W.L.	6.08	57.08
S cb. - A St		
W.L. Top cb.	6.20	56.96
" Gut	6.69	56.47
Gut.	6.31	56.85
1/4	5.75	57.41
L	5.51	57.65
+9'	5.42	57.74
E 1/4	5.51	57.65
E Gut	5.82	57.34
E.L. Gut	5.70	57.46
" Top cb.	5.12	58.04
S.L. - A St. Cont. to "B" page 48 this Book		
E Top cb.	5.24	57.92
" Gut.	6.08	57.08
" 1/4	5.82	57.34
L	5.86	57.30
W 1/4	6.09	57.12
Gut.	6.71	56.45
W Top cb.	6.22	56.94

Cont. P. 34

Note: Stripped from St. A to N. E. St. per A.E. Bruns.

63.16

TP 1.96 52.04 1308 50.08

TP 8.22 53.76 6.50 45.54

chk N.W. BR - B-4 1/4 3.62 50.14

50.35

0.21

TP 4.03 53.58 4.21 49.55

TP 0.18 48.14 5.62 47.96

TP 4.80 47.55 5.39 42.75

chk SW BR Broadway - 31st 8.14 39.41

39.45 = Recoid  
0.04 diff.

Cross Section 31st Ave from N.W. B-st.

To S.W. Broadway.

8.14 47.59

39.45

SW BR

31st + Broadway.

TP 5.53 48.32 4.80 42.79

TP 5.85 49.61 4.56 43.76

N.W. B-st

E Top cb 4.15 45.46

" Gut 4.92 44.69

" 1/4 4.64 44.97

4. 4.71 44.90

2 + 27 00 Recoid MH. 4.70 44.91

" 4.89 44.72

W Gut. 5.75 43.86

" cb 5.22 44.39

N cb B-st

W.L. on cb 5.20 44.41

" Gut 5.81 43.80

W cb 5.54 44.07

" 1/4 4.93 44.68

E 4.79 44.82

E 1/4 4.74 44.87

3'div. Tol MH

710 7.5' South 4.62 44.99

E cb 4.82 44.79

E.L. 4.81 44.80

" on cb 4.36 45.25

N 1/4

E.L. 4.68 44.93

cb 4.71 44.90

1/4 4.85 44.76

E 4.91 44.70

W 1/4 5.03 44.58

4961

3rd Ave.

W/Cb	5.17	44.44
W/L	5.36	44.25
32.9' South of N.W. Rd. = N Rail <sup>N.</sup> Track		
W/L on Rail	5.20	44.41
cb " "	5.05	44.56
1/4 " "	4.99	44.62
L " "	4.88	44.73
1/2 " "	4.86	44.75
cb " "	4.75	44.86
E.L.	4.53	45.08
L - B-st.		
E.L.	4.52	45.09
cb	4.71	44.90
E 1/4	4.84	44.77
L	4.84	44.77
W 1/4	4.86	44.75
cb.	5.03	44.58
W/L	5.18	44.43
48.2' S. of <sup>N</sup> / <sub>2</sub> South Rail of S. Track		
W/L on Rail	5.18	44.43
cb " "	5.00	44.61

4961

35

W 1/4 on Rail	4.92	44.69
L " "	4.92	44.69
E 1/4 " "	4.90	44.71
cb " "	4.78	44.83
EL " "	4.59	45.02
S 1/4 - B-st		
EL	4.89	44.72
Abandoned		
1/4 South on Rail	4.91	44.70
Ecb	4.94	44.67
4' South " "	5.05	44.56
10.1 " " "	5.14	44.47
Ecb + 4.2' = E Rail Turnout <sup>To East.</sup>	4.97	44.64
+ 11.3 = W " "	4.29	44.62
E 1/4	5.03	44.58
+ 10.3 on W Rail	5.06	44.55
L	5.06	44.55
W 1/4	4.93	44.68
74.8 = E Rail	4.87	44.74
1/4 + 4 5' <sup>L 3' x 3 Geos MH</sup>	4.97	44.64
W cb.	5.10	44.51
76 = E Rail	5.10	44.41
W E W "	5.21	44.40

	49.61	3rd Ave
S cb - B-St		
W 1/2 cb	5.26	44.35
" Gut	5.82	43.79
W cb on W Rail	5.26	44.35
+6 " E "	5.15	44.46
+12 " W "	5.09	44.52
W 1/4	5.26	44.55
+44 = E Rail	5.04	44.57
+55 = W "	5.05	44.56
+103 = E "	5.18	44.48
L	5.09	44.52
+23 = E Rail	5.14	44.47
+42 = W "	5.11	44.50
+71 = E "	5.10	44.51
+98 = E Rail	5.16	44.47
E 1/4	5.14	44.47
+35 = W "	5.15	44.46
+9 2.3 N = 2 Rmt MH	5.10	44.51
+10 = E Rail	5.18	44.43
E cb	5.35	44.26
E Gut	5.46	44.15
E.L. Top cb	5.13	44.48

	49.61	3rd Ave
0+00 = S.L. - B-St		
E cb	5.19	44.42
" Gut	5.70	43.91
+124 = E Rail	5.32	44.29
W 1/4	5.32	44.29
+48 = x1 "	5.22	44.39
+58 = E "	5.21	44.40
+106 = W " Int Rails 2.5' south - E	5.26	44.35
L on Rmt MH.	5.24	44.37
+3 = Int. Rails	5.24	44.37
+76 on Rail	5.23	44.38
+82 " "	5.22	44.39
W 1/4 " "	5.27	44.34
+52 " "	5.29	44.32
W Gut	5.83	43.78
W cb	5.31	44.30
0+20		
W cb	5.50	44.11
" Gut	6.01	43.60
+116 on Rail	5.38	44.23
1/4	5.34	44.27
+134 " "	5.40	44.21

	48.61	31st Ave.	
1/2 + 5.7' Rail		543	44.13
7.8 "		539	44.22
10.2 "		541	44.20
L on Rail		540	44.21
+2.9 " "		539	44.22
+8' E "		544	44.17
1/4		541	44.20
E Gult		576	43.85
E 6		525	44.36
	0 + 50		
E 6		538	44.23
" Gult		585	43.76
TP 468	48.67	562	43.92
E 1/2		467	44.00
+5.6 - E Rail		469	43.98
+8 on "		466	44.01
+10.3 " "		466	44.01
L " "		473	43.94
+2.8 " "		473	43.94
+4.5' " "		471	43.96
+7.1 " "		470	43.97

	48.67	31st Ave.	37
+9.3 on Rail		470	43.97
W 1/2		466	44.01
W Gult		534	43.33
" Top 6		482	43.85
	0 + 65	Dble Track S from this point	
W Gult		542	43.25
1/4		476	43.91
+5.6 = W Rail		483	43.84
	E Rail W Track	484	43.83
L		486	43.81
	W " E "	485	43.82
	E " E "	480	43.87
1/4		470	43.97
E Gult in Drive		510	43.57
	1 + 00		
E 6		474	43.93
Gult		523	43.44
E 1/4		501	43.66
	E Rail E Track	507	43.60
	W " " "	504	43.63
L		500	43.67

	4867	3rd Ave
E Rurl W Truck	5.11	43.56
W " " "	5.26	43.41
1/4	5.00	43.67
W Gut.	5.75	42.92
" cb	5.13	43.54
1+50		
W cb	5.42	43.25
" Gut	6.10	42.57
1/4	5.38	43.29
W Rurl W Truck	5.43	43.24
E " " "	5.39	43.28
1/2	5.34	43.33
W E "	5.37	43.30
E " "	5.35	43.32
1/4	5.37	43.30
E Gut.	5.55	43.12
" cb	5.14	43.53
2+00		
E cb	5.33	43.34
" Gut	5.85	42.82
1/4	5.76	42.91

	4867	3rd Ave	38
E Rurl E Truck	5.72	42.95	
W " " "	5.73	42.94	
1/2	5.72	42.95	
E W "	5.68	42.99	
W "	5.70	42.97	
1/4	5.70	42.97	
Gut.	6.56	42.11	
cb.	5.87	42.80	
2+50			
W cb.	6.36	42.31	
" Gut.	7.08	41.59	
+7	6.25	42.42	
1/4	6.04	42.63	
W Rurl	6.01	42.66	
E "	6.00	42.67	
1/2	5.97	42.70	
W Rurl	6.07	42.60	
E "	6.06	42.61	
1/4	6.13	42.54	
Gut.	6.08	42.59	
cb.	5.63	43.04	



48.67

3rd Ave.

2+96			
E 1/2	577	42.90	
Gut Flow Inlet	6.38	42.29	
+1 " "	6.37	42.30	
1/2	6.26	42.41	
TP 4.88	47.90	5.65	43.02
E Rail	5.57	42.33	
W "	5.56	42.34	
♀	5.50	42.40	
E "	5.53	42.37	
W "	5.54	42.36	
1/4	5.55	42.35	
1/6	5.92	41.98	
+12 Flow Inlet	6.68	41.22	
Gut " "	6.75	41.15	
Top cb	5.89	42.01	
3+00 = N1, C-st			
W cb	5.95	41.95	
Gut Flow Inlet	6.21	40.99	
+1 " "	6.31	40.99	
+2 " "	6.03	41.87	
1/2	5.51	42.39	

47.90

39

W Rail	5.68	42.32	
E "	5.57	42.33	
♀	5.47	42.43	
W "	5.60	42.30	
E Rail	5.61	42.29	
E 1/2	5.41	42.49	
+12	4.97	42.93	
+12 Flow	5.75	42.15	
Gut	5.75	42.15	
cb	4.96	42.94	
N cb C-st			
E L cb	4.93	42.97	
" Gut Flow Inlet	5.72	42.18	
+3	4.92	42.98	
Gut	5.09	42.81	
+7 on Rim Tol MH 7' South	5.39	42.51	
1/2	5.43	42.47	
E Rail	5.59	42.31	
W "	5.60	42.30	
♀	5.57	42.33	
2' S Rim MH	5.57	42.33	

47.90

W Rail w/ Truck	5.59	42.31
1/4	5.62	42.28
Cent	5.92	41.98
W.L. cb = Parc.	6.14	41.76
+01 on Flow outlet	7.07	40.83
N 1/4		
W.L.	6.00	41.90
cb.	5.85	42.05
1/4	5.67	42.23
W Rail	5.72	42.18
E "	5.63	42.27
L	5.59	42.31
W Rail	5.60	42.30
E "	5.58	42.32
+11 1' N 3' dim. Tel MH	5.46	42.44
1/4	5.44	42.46
cb.	5.22	42.68
E.L.	5.02	42.88
L C-st		
FL	4.98	42.92
cb.	5.25	42.65

47.90

3rd Ave 40

E 1/4	5.43	42.47
E Rail	5.56	42.34
W "	5.57	42.33
L Rim <sup>Sowor.</sup> MH	5.55	42.35
E Rail	5.71	42.19
W "	5.75	42.15
" 1/4	5.73	42.17
cb.	5.87	42.03
W.L.	6.05	41.85
S 1/4 - C-st		
W.L.	6.10	41.80
Cent	5.85	42.05
+8 55' South Gw MH 3x3	5.69	42.31
1/4	5.67	42.23
W Rail	5.75	42.15
E "	5.71	42.19
L	5.63	42.27
W Rail	5.70	42.30
E "	5.60	42.30
1/4	5.45	42.45
cb.	5.21	42.69
E	5.09	42.86

4790		31st Ave	
S. cb - C - st			
E L cb	5.06	42.84	
" Gut.	5.31	42.59	
cb.	5.41	42.49	
T5	3' N on Run MH	5.42	42.48
" 1/4		5.48	42.42
E Rul	5.65	42.25	
W "	5.65	42.25	
2		5.60	42.30
E Rul	5.70	42.20	
W "	5.71	42.19	
" 1/4		5.68	42.22
Gut.	6.18	41.72	
W.L. Gut.	6.62	41.21	
" cb	6.22	41.68	
D 100 - S.L. C - st			
W cb	6.12	41.71	
Gut.	6.48	41.42	
" 1/4	5.72	42.18	
W Rul	5.68	42.22	
E Rul	5.70	42.20	
2 on Run MH	5.53	42.37	
W Rul	5.64	42.26	
E "	5.65	42.25	

4790		41	
E 1/4	5.55	42.35	
E Gut.	5.51	42.39	
" cb.	5.10	42.80	
0+50			
E Gut.	5.46	42.44	
" 1/4	5.65	42.25	
E Rul	5.61	42.29	
" "	5.62	42.28	
2	5.63	42.27	
E Rul	5.68	42.22	
W "	5.69	42.21	
W 1/4	5.71	42.19	
Gut.	6.48	41.42	
cb.	6.14	41.76	
1+00			
W cb.	6.17	41.74	
Gut.	6.50	41.40	
0+82	3' x 3' Gus MH 10' E of W cb.	5.80	42.10
" 1/4		5.77	42.13
W Rul	5.80	42.10	
E "	5.79	42.16	

47.90

31st Ave

L	5.64	42.26
W Rail	5.60	42.30
E "	5.63	42.27
1/4	5.65	42.25
Gut.	5.76	42.14
cb.	4.98	42.92
17.50		
Ecb	5.12	42.78
Gut.	5.86	42.04
1/4	5.66	42.24
E Rail	5.65	42.25
Ref + 3 on E Rail Turnout	5.58	42.32
W Rail	5.63	42.27
L	5.63	42.27
E "	5.74	42.16
W	5.81	42.09
1/4	5.84	42.06
Gut.	6.56	41.34
cb.	6.21	41.69
21.00		
W	6.33	41.57
Gut.	6.69	41.21

47.90

42

W 1/4	5.89	42.01
W Rail	5.93	41.97
E "	5.87	42.03
L	5.73	42.17
W "	5.68	42.22
E "	5.65	42.25
1/4	5.70	42.20
Gut.	5.73	42.17
Ecb.	5.23	42.67
T.P.	4.78	47.52
21.50		
Ecb.	4.98	42.54
Gut.	5.72	41.80
E 1/4	5.36	42.16
E Rail	5.31	42.21
W "	5.31	42.21
L	5.40	42.12
E Rail	5.52	42.00
W "	5.56	41.96
W 1/4	5.53	41.99
W Gut.	6.46	<del>42.56</del>
W Top cb.	6.05	41.47

near NE cor  
3rd & Broadway  
on walk

A106

47.52

2+70.3 = NL Broadway on W

W Top cb	6.06	41.96
" Gut.	6.50	41.02
" 1/4	5.60	41.92
W Rail	5.63	41.89
E "	5.61	41.91
L	5.43	42.09
W Rail	5.29	42.23
E "	5.32	42.20
E 1/4	5.40	42.12
E Gut.	5.73	41.79
" cb	5.03	42.49
2+90.3 = Ncb on W		
E cb	5.03	42.49
Gut on Floor isolated	5.93	41.59
0.2' South on Hd-Well	5.09	42.49
Gut + 6'	5.57	41.95
5' South	5.39	42.13
E 1/4	5.39	42.13
E Rail	5.39	42.13

47.52

43

W Rail E Track	5.43	42.09
L	5.54	41.98
E " W "	5.72	41.80
W " " "	5.76	41.76
W 1/4	5.72	41.73
W Gut.	6.44	41.08
W.L. Gut	6.80	40.72
" Top cb	6.26	41.26
N 1/4 on West		
W.L.	6.41	41.11
cb	6.13	41.39
1/4	5.86	41.66
W Rail W Track	5.86	41.66
E " "	5.83	41.69
L	5.56	41.96
W " E " on Parking	5.51	42.01
E " " " "	5.38	42.14
E 1/4	5.29	42.23
T.P. 4.89 47.63	4.78	42.74
+ 7' 8" South on Rim MH	5.37	42.26
E cb on Pav.	5.29	42.34
11.7' N = NL on E on Top cb Pav.	5.15	42.48

	4763	3rd Ave
N 1/4 Cont. of 6 10' west of NL on E	5.60	42.03
E.L. on N 1/4 on W		
N 1/4 on W Cont.		
E cb + 2' on cb Ref.	5.13	42.50
E.L. on Walk	5.08	42.55
	5.12	42.51
3.7' South on cb Ref. of N cb on E		
Cont. on Floor Inlet	5.94	41.69
0.2' W on Hd Wall	5.14	42.49
6' South of N cb. on E	5.34	42.29
13' South of N cb		
N 1/4 on E.L. 3rd	5.40	42.23
41.85 + 0.6 Section of N Rail of N Trunk on Beachway		
E.L. on Rail	5.45	42.18
cb " "	5.61	41.98
+45 6' N on Rim MH	5.50	42.13
E 1/4 on N Rail	5.88	41.75
+1 7' N on Rim MH	5.64	41.99
E Rail on 3rd	5.98	41.65
W 1/4 E Trunk on 3rd	6.05	41.58
E on Rail	6.07	41.56
E Rail W Trunk 3rd	6.11	41.52
W " " "	6.19	41.49

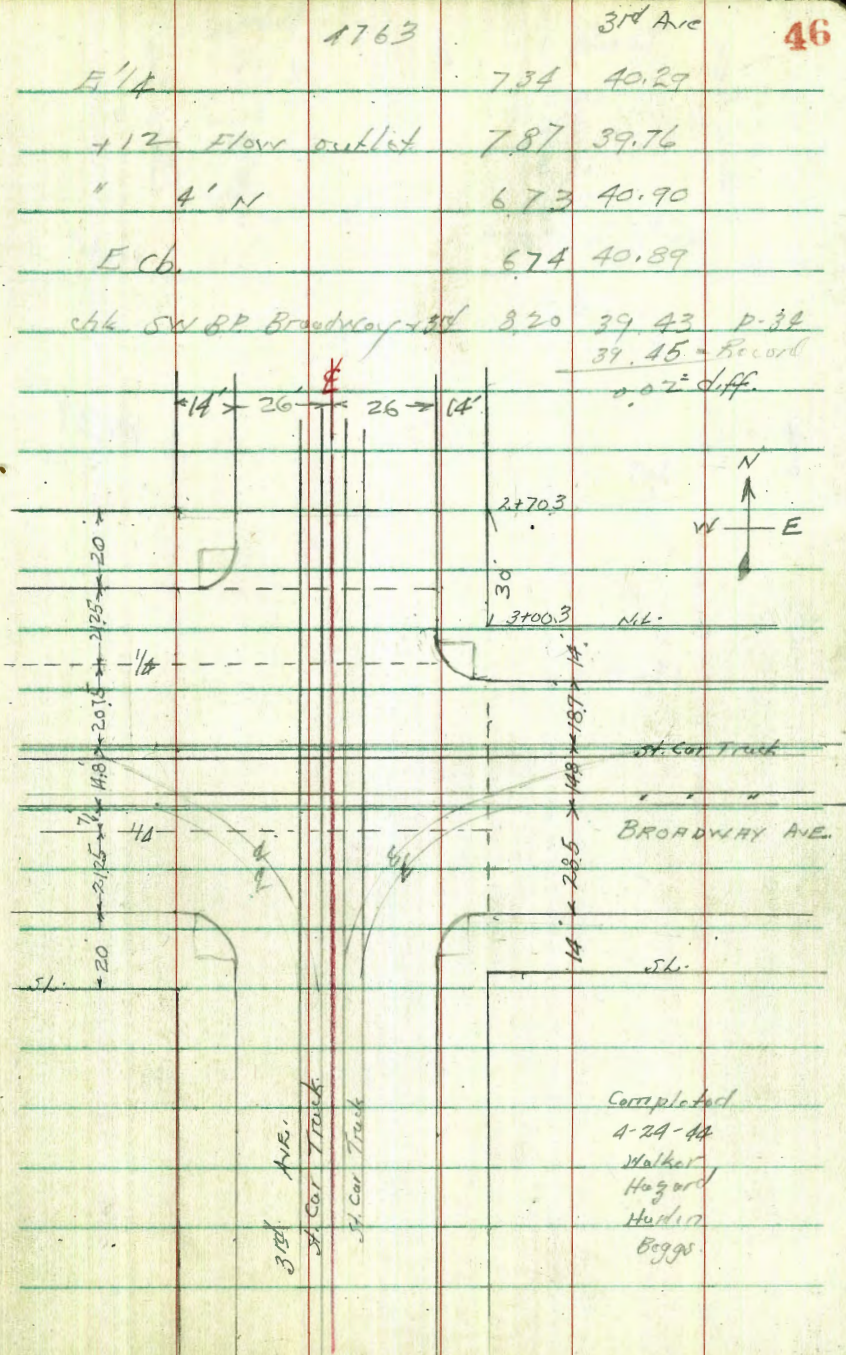
on E.L. 3rd

	4763	44
W 1/4 on Rail	6.27	41.36
W cb. " "	6.41	41.22
W.L. " "	6.62	41.01
7.2' South of d. St. on W = 1' between 2d & 3d Trunk		
W.L. on Rail	6.61	40.98
+7 on Rail Turnout	6.59	41.04
W cb. on Paving	6.94	41.19
1/4 " "	6.32	41.31
W Rail W Trunk on 3rd	6.27	41.36
E " " " "	6.21	41.42
E on Paving	6.17	41.46
W Rail E Trunk "	6.16	41.47
E " " "	6.10	41.53
1/4 on Pav.	5.97	41.66
E cont	5.77	41.92
+6.5 on Rail Turnout	5.70	41.93
E.L. - Pav.	5.57	42.06
South Rail		
E.L. on Rail	5.77	41.86
South 1/3' " Turnout	5.77	41.86
" 8.3' " "	5.89	41.74
E.L. +110 " "	5.91	41.72

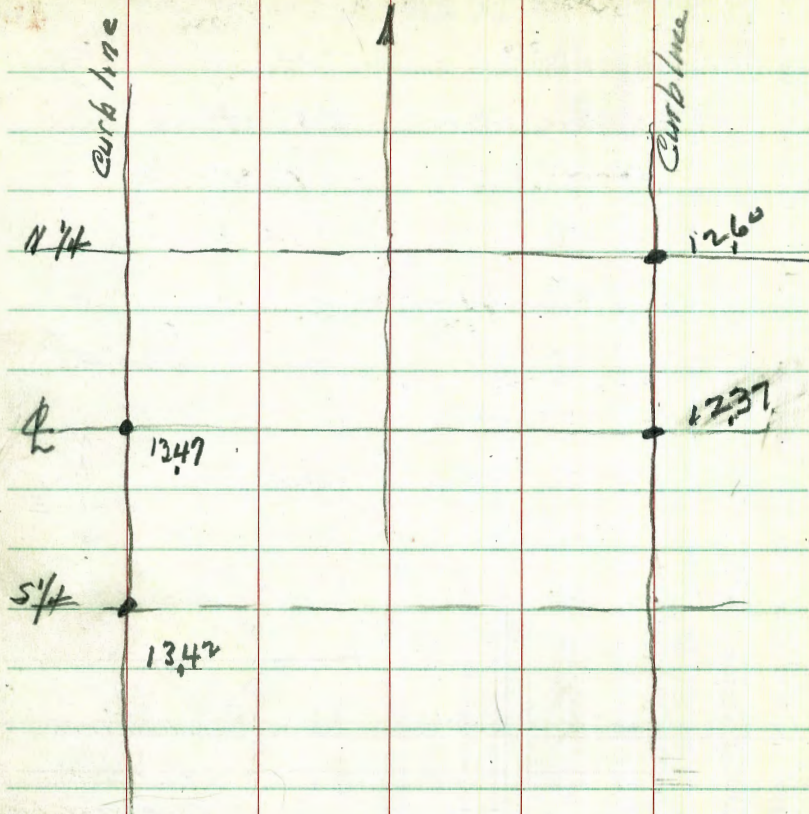
South Rail Cont.			
E cb	2' South Rail	5.99	41.64
	34' N on "	5.91	41.72
E 1/4	on Rail	6.21	41.42
E Rail	E Track 3rd	6.25	41.38
W "	" "	6.82	41.31
L		6.35	41.28
E "	W "	6.36	41.27
W "	" "	6.48	41.23
W 1/4	on Rail	6.46	41.17
+7'	on " Turnout	6.54	41.09
W cb	" "	6.59	41.04
+4'	" "	6.66	40.97
W.L.		6.85	40.78
5 1/4 Broadway on W			
W.L.	on W Rail Turnout	6.95	40.68
5.3	South on Rail	7.14	40.49
W cb	on Paving	6.76	40.87
5' N	" Rail	6.68	40.95
W cb + 5.5"	8.5' South on Gas Mth	6.91	40.72
+6.5	on Rail Turnout	6.74	40.89
W 1/4	" "	6.62	41.01

W Rail	W Track on 3rd	6.54	41.09
E "	" "	6.49	41.14
L	on Paving	6.43	41.20
W Rail	E Track "	6.43	41.20
E "	" "	6.36	41.27
1/4	on Rail Turnout	6.30	41.33
+6.5	" "	6.17	41.46
E cb		5.96	41.67
+6.5	on Rail	5.96	41.67
E.L.	" "	5.88	41.75
South cb. Broadway			
E.L.	on cb	6.66	40.97
"	Floor inlet	7.76	39.87
1' N	on Hd wall	6.70	40.93
E Feet		6.56	41.07
+1	on Rim 2'x2' closet	6.60	41.09
+10	" Rail Turnout	6.78	40.85
E 1/4	" "	6.88	40.75
E Rail	E Track 3rd	6.87	40.76
E Rail	+3' Turnout	6.89	40.74
W Rail		6.88	40.75
+2'	on Rail Turnout	6.89	40.74

	47.63	3rd Ave
4	6.88	40.75
W Rail w/Track	6.90	40.73
E " E "	6.93	40.70
W 1/2	7.04	40.59
13 4' N on Turn Mt.	6.85	40.83
+3 on Rail Turnout	7.08	40.55
+9 " " "	7.25	40.38
wcb. on Paving.	7.80	39.83
+4	8.14	39.49
W.L. on Gut.	8.43	39.20
" " cb.	8.20	39.43
South Line on W		
wrcb.	8.25	39.38
" Gut.	8.46	39.17
1/2	7.66	39.97
1.5' on Rail Turnout	7.57	40.06
W Rail w/Track	7.39	40.24
E " W "	7.34	40.29
4	7.38	40.25
W " E "	7.31	40.32
E " " "	7.27	40.36
13' on Rail Turnout.	7.35	40.28







west

$$\begin{array}{r} 1437 \\ \underline{510} \\ 1947 \\ \underline{6} \\ 1341 \text{ £} \end{array}$$

$$\begin{array}{r} 695 \\ 1342 \text{ } \frac{5}{4} \end{array}$$

East

47

$$\begin{array}{r} 1345 \\ \underline{53} \\ 1875 \\ \underline{615} \\ 1260 \text{ } \frac{1}{2} \end{array}$$

$$\begin{array}{r} 638 \\ \underline{1237} \text{ £} \end{array}$$

Walker  
Hogurd  
Hogurd  
Beggs  
5-23-44

Cross Section 3rd Ave  
Between A and B-streets.

INDEXED

St. W Top cb  
Shimo - Post  
Page 33

423 61.17 56.94

0+2.5 = 25' South of St. A-st.

W cb	5.25	55.92
+7	5.23	55.94
" Gut	5.76	55.41
1/4	5.03	56.14
2/4	4.80	56.37
1/4	4.77	56.40
E. Gut in Drive	5.14	56.03
	0+50	
E. cb	5.37	55.80
" Gut	6.16	55.01
" 1/4	5.82	55.35
2/4	5.89	55.28
W 1/4	6.04	55.13
+6	6.31	54.86
W Gut	6.81	54.36
" Sp.	6.30	54.87
	1+00	
W Top cb.	8.95	52.82
" Gut	8.96	52.21

Reduced & Plotted  
May 24 & 31st  
S.B.H.

Indexed  
C.S.K

61.17

+7		8.41	52.76
+10	2' N - 1/4	3" Gut MH	8.19
W 1/4		8.13	53.04
2/4		8.05	53.12
E 1/4		7.95	53.22
+9	1' South - 2.25' Tol	MH	8.06
E. Gut		8.24	52.93
" Top cb.		7.35	53.82
	1+50		
E Top cb.		2.64	51.53
" Gut.		10.35	50.82
" 1/4		2.97	51.20
2/4		10.04	51.13
+10		10.18	50.98
W 1/4		10.24	50.93
+6		10.50	50.67
" Gut.		11.07	50.10
W cb		10.48	50.69
T.D.	2.29	52.28	11.18
	2+00		
W Top cb.		4.54	48.44
" Gut.		4.91	48.07

	2100 Cont.	52.98		
cb +7			4.39	48 59
W 1/4			4.14	48 84
E			3.92	49 06
E 1/4			3.87	49 11
E			4.21	48 77
"Top cb.			3.46	49 52
	2.750			
E Top cb.			5.52	47 46
" Gut.			6.33	46 65
" 1/4			5.96	47 02
E			6.05	46 93
W 1/4			6.20	46 78
+6			6.62	46 36
W Gut.			7.08	45 90
" Top cb.			6.51	46 47
	2+85			
W Top cb.			7.24	45 04
" Gut.			8.48	44 50
+7			7.96	45 02
+8.3	4'S on R. 2.5'x2.5' Gut MH		8.04	44 94
1/4			2.71	45 27

	52.98	49
E	7.54	45.44
E 1/4	7.51	45.47
E Gut. in Drive	7.73	45.25
2+93.5 = N end 2.5'x5' Grating on E		
E cb.	7.39	45.59
Grating	8.07	44.91
E 1/4	7.85	45.13
1/2	7.83	45.15
1/4	8.07	44.91
+6		
W Gut.	8.35	44.63
W Gut.	8.91	44.07
" Top cb.	8.31	44.67
2+95 = N end 2'x3' Grating inlet on W		
on Grating	9.01	43.97
N.H. 8-st 1-34		
chk W Top cb.	8.58	44.40
		44.39
		0.01 diff

Walker  
Hazard  
Hurdin  
8995  
5-23-44

Additional barrels  
Dote St. Between 2nd and 4th Ave

			on cb. W.L. 3rd N cb - Dote
P-20	4.76	117.03	112.27
	0+00 =	W.L. 3rd Ave	going West
	0+15		
N Top cb	5.31	111.72	
" Gut	6.15	110.88	
1/4	5.85	111.18	
1/2	5.89	111.14	
5/16	6.27	110.81	
S Gut	6.94	110.09	
S Top cb	6.38	110.65	
	0+50		
S Top cb	8.79	108.24	
S Gut	9.22	107.81	
5/16	8.43	108.60	
1/2	7.90	109.13	
+3	7.84	109.19	
1/4	7.83	109.20	
N Gut	8.09	108.94	
N 1/2	7.11	109.92	

INDEXED

WK

APR 12 1949

50

117.03  
1+00 West

N Top cb	9.82	107.21	
" Gut	10.64	106.39	
N 1/4	10.60	106.43	
1/2	10.79	106.24	
5/16	11.48	105.55	
S Gut	12.38	104.65	
S Top cb	12.07	104.96	
	E.L. Dote = 0+00 going East from 3rd		
	0+15		
S Top cb	2.67	114.36	
" Gut	3.13	113.90	
5/16	2.50	114.53	
1/2	2.31	114.72	
N 1/4	2.43	114.60	
N Gut	2.56	114.47	
N Top cb	1.96	115.07	
T.P.	8.94 / 23.75	2.22	114.81
	0+50		
N Top cb	7.30	116.45	
" Gut	8.02	115.73	

12375  
0+50 Cont.

N <sup>1</sup> / <sub>4</sub>	7.92	115.83	
E	7.82	115.73	
S <sup>1</sup> / <sub>4</sub>	8.16	115.59	
S. Gut.	8.85	114.90	
S Top cb.	8.36	115.39	
1+00 East			
S Top cb.	6.81	116.94	
S Gut.	7.35	116.40	
S <sup>1</sup> / <sub>4</sub>	6.58	117.17	
E	6.19	117.56	
N <sup>1</sup> / <sub>4</sub>	6.16	117.59	
N Gut.	6.33	117.42	
N Top cb.	5.45	118.30	
chk Top cb on E-L-Date	10.01	113.74	<sup>0+00</sup> P-21
		113.75	
		0.01	
Between Film & Date			
10.44	124.19	113.75	Above cb.
chk 2+50 South <sup>1</sup> / <sub>4</sub> Film	6.38	117.81	.01 diff.
" " "Gut.	6.94	117.25	.02 diff.
2+10 South of Film st			
E Top cb.	2.99	121.20	
" Gut.	3.59	120.60	

12419

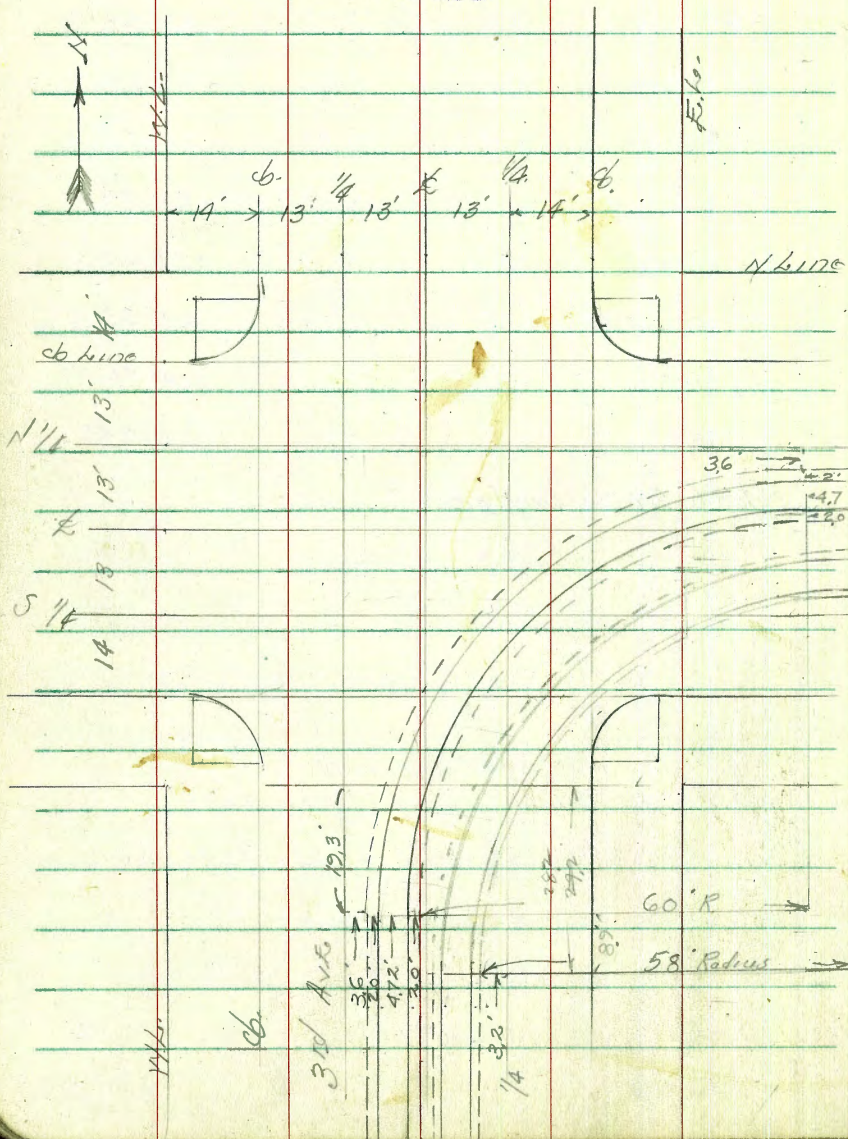
51

T.P.	2.110 7.95	128.55	3.59	120.60
E <sup>1</sup> / <sub>4</sub>			7.46	121.09
+2.4			7.46	121.09
+4			7.32	121.23
+11			7.22	121.33
E			7.33	121.22
+8			7.82	120.73
+9			7.95	120.60
W <sup>1</sup> / <sub>4</sub>			8.02	120.53
W Gut.			8.74	119.81
W Top cb			8.30	120.25
chk cb 2+00 on E-P19			6.53	122.02 ✓

Walker  
Hogard  
Hardin  
Beggs  
5-23-44

Cross Section - Fir St.  
From 3rd to 4th St.

INDEXED



~~INDEXED~~  
C.S.K.

4.56 162.52

NW 852  
164.96 4th & Fir

W 1/4 3rd Ave

S-19.3 opp PC. 8.02 161.50

3' E on shoulder #2 8.00 161.52

St. 6' E on " #2 6.60 162.92

E 3rd

S-29.2 07' W 8.53 160.99

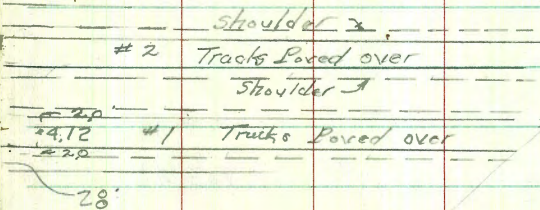
E  
Shoulder #2

" 8.50 161.02

1.1 E-W Shoulder #1 8.43 161.09

cont P-53

FIR ST.



L 3rd Cont 16252

S-292	9.8' E = E shoulder #1	5.56	160.96
S.L.	23' E E shoulder #2	6.59	162.93
"	82' E on W " #1	6.48	163.04
S 1/4	23' E " E " #1	6.52	163.00
S cb 3rd			
L	15' W = W shoulder #2	6.07	163.45
	20' N on " " "	6.02	163.50
	87' E " E W " "	6.03	163.49
E 1/4 3rd			
S cb.	23' E W shoulder #1	5.87	163.65
	51' N = E " #2	5.83	163.69
S 1/4	52' N = W " "	5.68	163.84
E cb 3rd			
S cb.	12' E = E shoulder #1	6.07	163.45
	10.8' N W " "	5.67	163.85
S 1/4	56' W E " #2	5.66	163.86
	50' N " " #2	5.58	163.94
L	3' W W " "	5.51	164.01
	13' N " " "	5.54	163.98

16252

Eir st.

0+00 = Eir 319

Reduced  
to 1944  
May 31-1944  
2.514

S cb.		6.10	163.42
Gut. = same		6.10	163.42
+87 = S shoulder #1		5.94	163.58
S 1/4		5.79	163.73
+55 = N " #1		5.65	163.87
+105 = S " #2		5.58	163.94
L		5.59	163.93
+65 = N " #2		5.53	163.99
N 1/4		5.37	164.15
+70.3 on Hd wall		5.18	164.34
N Gut on " "		5.14	164.38
" " " Flow		5.24	164.28 <sup>3' x 1.8'</sup> inlet
0+03			
N Gut = Pass = Inlet		5.86	163.66
+2		5.81	163.71
+7		5.39	164.13
N 1/4		5.42	164.10
+53 = N shoulder #2		5.53	163.99
L		5.59	163.93
+13 = S " "		5.60	163.92

	169.52	Fir 57
L + 6.2 = N Shoulder #1	5.66	163.86
S 1/4	5.85	163.67
+2.8 = S " "	5.94	163.58
S Gut	6.34	163.18
S cb.	6.08	163.44
O + 15		
S. cb.	6.17	163.35
S Gut.	6.66	162.86
S 1/4	6.05	163.47
+1.5 = S Shoulder #1	6.01	163.51
+9.9 = N " "	5.74	163.78
1/2	5.70	163.82
+1 = S " #2	5.65	163.87
+9.5 = N " #2	5.14	163.88
N 1/4	5.61	163.91
N Gut	5.83	163.69
N Top cb.	5.18	164.34
TP 4.82 162.78	4.56	164.26
O + 50		
N Top cb.	5.28	164.50
N Gut.	6.07	163.71

	169.78	Fir 57	54
N 1/4	6.02	163.76	
N Shoulder #2	6.01	163.77	
S " "	5.96	163.82	
L	6.02	163.76	
N " #1	6.08	163.70	
S " #1	6.34	163.44	
S 1/4	6.56	163.22	
S Gut	7.32	162.46	
S Top cb.	6.92	162.86	
1700			
S Top cb.	7.38	162.40	
S Gut.	7.82	161.96	
S 1/4	6.77	163.01	
S Shoulder #1	6.54	163.24	
N " "	6.20	163.58	
L	6.11	163.67	
S " #2	6.95	163.73	
N " #2	6.05	163.73	
N 1/4	5.99	163.79	
N Gut.	5.91	163.87	
N Top cb.	5.22	164.56	



1+50			
N Top cb	5.10	164.68	
N Gut	5.78	164.00	
N 1/4	6.03	163.75	
N Shoulder #2	6.02	163.76	
S "	6.18	163.60	
S 1/4	6.22	163.56	
S "	6.31	163.47	#1
S "	6.70	163.08	#2
S 1/4	6.99	162.79	
S Gut	8.29	161.49	
S Top cb = 8th in cb	7.78	162.00	Apparant
1+85			
S Top cb	8.20	161.58	
S Gut	8.67	161.01	
1/4	7.10	162.68	
+35 = S Shoulder #1	6.83	162.95	
+121 = N "	6.38	163.40	#1
S	6.36	163.42	
11' W 1' N = P.C. 4th = S Shoulder #2	6.26	163.52	
" 27' N " N " #2	6.04	163.74	
S + 2.5 = S Shoulder #2	6.20	163.58	

S + 11.4 = N Shoulder #2	6.01	163.77	
N 1/4	6.02	163.76	
N Gut	5.70	164.08	
N Top cb	5.06	164.72	
1+96			
N Gut in Drive	5.68	164.10	
+10.3 = N Shoulder #2	5.98	163.80	
N 1/4	6.00	163.78	
+7.2 = S "	6.07	163.71	
+12.3 = N "	6.36	163.42	#1
S	6.38	163.40	
+6.3 = 8th	6.62	163.16	
+9 = S "	6.86	162.92	#1
S 1/4	7.31	162.47	
+10.5 = <sup>on</sup> Grating Inlet	8.72	161.06	2.5 x 5'
S Gut, Grating Inlet	8.81	160.97	
S cb	8.37	161.41	
2+005 = W.K. 4th Ave			
S cb	8.44	161.34	
S Gut in Parking	8.42	161.36	little higher than cb.
" " Floor inlet	9.47	160.31	
+2.5 on Pav.	8.48	161.30	

	169.78	Fir St.
S <sup>1/2</sup>	7.38	162.40
+6 = S Shoulder #1	6.77	163.01
+7 = S <sup>1/2</sup>	6.60	163.18
S	6.37	163.41
+22 = N Shoulder #1	6.28	163.50
+73 = S " #2	6.00	163.78
N <sup>1/2</sup>	5.97	163.81
+42 = N " "	5.94	163.84
N Gut.	5.66	164.12
cb.	4.85	164.93
	2+07.5	
N cb.	4.83	164.95
Gut.	5.56	164.22
+32 = N Shoulder #2	5.83	163.95
N <sup>1/2</sup>	5.87	163.91
+12 = S " "	5.87	163.91
+8 = N " #1	6.18	163.60
S	6.30	163.48
+45 = S " #1	6.53	163.25
S <sup>1/2</sup>	7.34	162.44
S Gut.	8.46	161.32
S cb. = lower than Gut.	8.48	161.30

	169.78	Fir St.	56
	2+14.5		
S <sup>1/2</sup> on cb.	8.45	161.33	
" " Flow	9.84	159.94	
S-4 on Flow outlet	2.84	159.94	
" " cb.	8.73	161.05	
S cb. on Flow	8.13	161.65	
S <sup>1/2</sup>	7.25	162.53	
+12 = S Shoulder #1	6.29	163.49	
S	6.27	163.51	
+9 = N " #1	6.02	163.76	
N <sup>1/2</sup>	5.85	163.93	
+07.5 " #2	5.67	164.11	
cb.	5.56	164.22	
+13 = N " #2	5.54	164.24	
N Gut.	4.82	164.96	
N Top cb.	4.81	164.97	
N Gut Flow outlet <sup>25'</sup>	6.11	163.67	
+5 " "	5.24	164.54	
" on cb.	4.68	165.10	
	2+27.5		
N	4.77	165.01	
cb.	5.26	164.52	

16978

Fir St.

57

N 1/4	5.72	164.06
E	6.30	163.48
S 1/4	6.98	162.80
Sch.	7.63	162.15
SW.	8.44	161.34
chk Station BM	4.82	164.26 ✓

on Resurfaced Area

Extra Section = 2' E of W of 4th

N.L.	4.86	164.92
Ch.	5.47	164.31
1/6	5.98	164.00
E	6.21	163.57
S 1/4	7.13	162.65
Sch.	7.98	161.80
SW.	8.43	161.35
+5	9.80	159.98

Walker  
Hogart  
Hordin  
10-19-44

REPAVING - 1st AVE.  
BROADWAY to E-5th

B.M. SY/ P. + 1st = 24.54  
11.27  
35.75\*

INDEXED

E- WK  
APR 12 1949

STREET

2582 -0.03	2590 -0.05	2592 -0.02	2590 -0.06	2571 ✓	2559 -0.03	2490 -0.03	
2600	2618 -0.06	2619 -0.10	2614 -0.06	2595 -0.07	2584 -0.07	2505	
2675	2693 -0.11	2693 -0.08	2685 0.0	2659 -0.05	2646 -0.05	2560	2450
2795	2800 -0.10	2800 -0.14	2791 -0.03	2780 -0.04	2757 -0.04	2666	2400
		-94' → 24' ←					
2895	2907 -0.13	2910 -0.15	2898 -0.08	2880 -0.08	2867 -0.04	2772	1450
		← 13' → 13' →					
3005 -0.06	3014 -0.07	3012 -0.03	3005 -0.12	2987 -0.12	2977 -0.09	2878	1100
3115	3122 -0.07	3120 -0.05	3112 -0.03	3094 -0.03	3087 ✓	2984	0400
3225	3225	3224	3209 -0.03	3189 -0.04	3178 -0.04	3090	0700

BROADWAY

AVE.

REPAIRING 319 AVE  
Between B and Broadway Ave.

42.70 -0.05	42.56 -0.10	42.53 -0.14	42.42 -0.06	42.28	42.07	
42.77 -0.10	42.57 -0.12	42.53 -0.13	42.43 -0.15	42.30	42.05	
42.83 -0.06	42.56 -0.10	42.53 -0.15	42.44 -0.10	42.32	42.04	
42.74 -0.03	42.93 -0.08	42.55 -0.03	42.53 -0.08	42.45 -0.00	42.35	41.87
42.90 +0.05	42.38 -0.15	42.67 -0.15	42.54 -0.12	42.48 -0.06	42.38	41.33
42.50 +0.04	42.61 -0.17	42.75 -0.17	42.77 -0.11	42.78 -0.06	42.68	41.73
42.70 +0.44	42.88 -0.15	43.08 -0.15	43.10 -0.14	43.12 -0.11	43.02	42.15
43.59 +0.93	43.16 -0.12	43.40 -0.10	43.43 -0.11	43.45 -0.11	43.35	42.58
43.79 +0.47	43.44 -0.06	43.73 -0.10	43.75 -0.10	43.78 -0.10	43.68	43.00
43.02 +0.07	43.52 -0.02	43.85 -0.02	43.87 -0.01	43.90 -0.17	43.80	
43.65 +0.08	43.67 -0.03	43.96 -0.03	43.98 -0.06	44.02 -0.27	43.92	43.30
44.50 +0.12	43.70 -0.03	44.05 -0.03	44.08 -0.02	44.10 -0.20	44.01	43.43
44.20 +0.51	43.85 -0.05	44.25 -0.05	44.28 -0.12	44.32 -0.10	44.21	43.68
44.70 +0.47	43.95 -0.05	44.38 +0.05	44.30 +0.05	44.25 -0.05	44.35	43.88

INDEXED

WK

APR 12 1949

AVE.

3RD

B-

1/4 E

ST.

4.98	4.79	4.73	4.60	4.41	4.22	
4.83 +0.04	4.87 +0.05	4.67 +0.05				
42.34 +0.13	42.22 +0.01	42.14 +0.05	41.94 -0.06	41.66 1/4	41.39	
42.49 41.59	42.17 -0.03	42.16 -0.07	42.05 -0.10	41.79	41.21	
41.70.2	41.85 -0.05	42.12 -0.03	42.15 -0.05	42.13	41.92	41.05
41.50	41.92 -0.01	42.14 -0.01	42.17 -0.06	42.15	41.94	41.10
41.00	42.02 -0.02	42.20 -0.03	42.22 -0.01	42.18	41.99	41.72
41.50	42.14 -0.02	42.26 -0.01	42.27 +0.08	42.22	42.05	41.34
41.00	42.25 -0.08	42.32 -0.06	42.32 -0.07	42.26	42.11	41.46
01.50	42.35 +0.10	42.38 -0.14	42.37 -0.11	42.30 -0.05	42.16	41.44
01.25	42.40					
01.00	42.45 -0.07	42.44 -0.07	42.42 -0.08	42.34 +0.03	42.22	41.42
42.55 -0.07	42.49 -0.03	42.46 -0.13	42.37 +0.09	42.24	41.77	
42.63 +0.05	42.53 -0.03	42.50 -0.15	42.40 -0.14	42.26	42.06	

S/4 C-street

2E  
E.Rail

N-Rail N Track

20.75  
21.45

47.99

47.97

Walter Hazard Hardin  
 8-B-45  
 Reset Grades on 3rd Ave  
 Between 8th and Broadway  
 for Resurfacing of Car Co. Trucks

**INDEXED**

Station	2' E of E Truck Grades	E of St. Grades
0+65	43.98	44.02
0+80 <sup>2</sup> Beginning of st. car work	43.87	43.90
1+00	43.75	43.78
150	43.43	43.45
2+00	43.10	43.12
250	42.77	42.78
296	42.54	42.48
N.L.C "A" 3+00	42.53	42.45
N.C.B "C"	42.53	42.44
N 1/4 "	42.53	42.43
S 1/4 "	42.53	42.42
S 1/4 "	42.50	42.40
scb " 5 L "C" "H" = 0+00	42.46	42.37
	42.42	42.34
750	42.37	42.30
1+00	42.32	42.26
750	42.27	42.22

Cont P 61

3943 = S.W. BR. Broadway & 3rd

688+ 2' E E Rail

46,31x

Station	2' E E Rail	2' E E Rail	2' E E Rail	2' E E Rail	2' E E Rail	2' E E Rail
4398	43.87	43.75	43.43	43.10	42.77	
	2.44	2.56	2.88	3.21	3.54	
	2.58	2.66	3.06	3.35	3.76	
	-0.14	-0.10	-0.18	-0.14	-0.22	
4402	43.90	43.78	43.45	43.12	42.78	
	2.41	2.53	2.86	3.19	3.53	
	2.59	2.82	3.00	3.27	3.57	
	-0.18	-0.19	-0.14	-0.08	-0.04	
2' E E Rail						
2196	3+00	6	1/4	E	5/4	
4254	42.53	42.53	42.53	42.53	42.50	
	3.77	3.78	3.78	3.78	3.81	
	3.88	3.86	3.91	3.88	3.92	
	-0.11	-0.08	-0.13	-0.10	-0.11	
4248	42.45	42.44	42.43	42.42	42.40	
	3.83	3.86	3.87	3.88	3.91	
	3.87	3.96	3.99	4.01	4.08	
	-0.04	-0.10	-0.12	-0.13	-0.18	
2' E E Rail						
566	0+00	0+50	1+00	1+50		
4246	42.42	42.37	42.32	42.27		
	3.85	3.94	3.93	4.04		
	3.94	3.91	4.02	4.03		
	-0.09	-0.02	-0.08	-0.04	-0.02	
4237	42.34	42.30	42.26	42.22		
	3.94	3.97	4.01	4.05		
	4.05	4.02	4.04	4.13		
	-0.11	-0.05	-0.03	-0.06	-0.04	

318 No Repairing St. Car Track  
Cont. from P-60

Station	2' E.E. Rail Grade	E St. Grade
2140	42.22	42.18
750	42.17	42.15
2170 <sup>3</sup> on West - W Broadway	42.15	42.13
1466 on W	42.16	42.05
N 1/4 " "	42.14	41.94
4' H N Rail Broadway	41.81	41.67

INDEXED

4631 X Page 60  
4.19 -  
42.12 TP 2' E.E. Rail

4524	2+00	+50	+703	N 1/4	N 1/4	4' H N Rail
4684 T.	42.22	42.17	42.15	42.16	42.14	41.81
468	4.37			4.43	4.45	4.78
3943	4.38			4.50	4.40	4.72
7167	-0.01			-0.07	+0.05	+0.06
46.89 T						
	42.18	42.15	42.13	42.05	41.94	41.67
	4.13	4.44	4.46	4.54	4.65	4.92
	4.19	4.53	4.64	4.79	4.90	5.05
	-0.06	-0.09	-0.18	-0.23	-0.25	-0.13

3rd Ref. - Resurfacing  
from from Fir St  
to A St

	West Gutter	West 1/4	2' West W Rail	2' St.
N. L. Fir St.	162.49	163.32		163.72

INDEXED

North curb	162.70	163.40		163.72
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North 1/4	163.02	163.41		163.67
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Should be 163.15

2	163.45?	163.38	164.04	163.62
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South 1/4	163.05	163.30	163.74	163.57
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South 1/4	162.77	163.20	163.48	163.50
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Ste. Fir St = 0 + 100	162.45	162.78	162.92	163.02
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0 + 0.5	162.07	162.50	162.56	162.65
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0 + 50	158.61	159.18	159.28 10.05 10.20 -0.15	159.41
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1 + 00	154.71	155.24	155.33 2.18 2.32 -0.16	155.45
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2'E E. Rail	East 44	East Gutter
	164.08	164.43

	164.05	164.30
--	--------	--------

	163.99	164.17
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	163.92	164.04
--	--------	--------

	163.86	163.90
--	--------	--------

	163.64	163.63	163.68
--	--------	--------	--------

	163.22	163.15	163.41
--	--------	--------	--------

	162.71	162.76	161.65
--	--------	--------	--------

159.33	159.26	158.82
10.00		
10.12		
-0.12		

155.37	155.30	154.86
2.12		
2.20		
-0.08		

4th of Fir St.

N.W. BR = 164.96 - P.M  
 4.37 +  
 163.33 +  
 1.36 -  
 156.87 + P  
 0.62 +  
 157.49 = N



Station	West Gutter	West 1/4	2' W W Rail	Σ
1+50	150.80	151.30	151.39 6.80 6.31 -0.21	151.49
2+00	146.90	147.36	147.44 18.05 10.17 -9.12	147.53
+50	142.99	143.47	143.50 1.30 1.41 -0.11	143.57
N.L. Elm St				-144.78
3+00.7	139.00	139.58 <sup>.60</sup>	139.74 <sup>.64</sup> 5.08 5.20 -0.12 -0.06	139.70 <sup>.70</sup>
N cb	138.90	139.16	139.20 5.58 5.69 -0.11	139.22
N 1/4	138.72	138.92	138.94 5.84 6.02 -0.18	138.94
Σ Elm St	138.40	138.58	138.62 6.16 6.35 -0.19	138.65
5/4	137.96	138.27	138.24 6.54 6.74 -0.20	138.25
Σ cb	137.40	137.76	137.92 6.86 7.10 -0.24	137.88
Σ L. Elm St				-144.78
= 0+00	136.81	137.27	137.33 7.45 7.61 -0.16	137.40

2' East East Rail	East 1/4	East Gutter	
151.41	151.34	150.90	157.49 T 12.71 - 144.78 TP 0.02 + 144.80 T 5.40
147.45	147.38	146.94	139.40 139.38 = P- 5.40 + Corrected = 144.78 T
143.49	143.42	142.98	
139.79	139.65	139.02	
139.16	139.09	138.74	
138.84	138.79	138.46	
138.52	138.46	138.15	
138.15	138.09	137.71	
137.76	137.69	137.20	
137.27	137.19	136.65	

Stations	West Gutter	West 1/4	2' W West Row	2
0+50	132.83	133.52	133.64 11.14 11.32 -0.18	133.78
1+00	128.77	129.50	129.64 2.53 2.67 -0.14	129.82
+50	124.71	125.46	125.62 6.55 6.85 -0.30	125.86
2+00	120.65	121.42	121.65 10.57 10.80 -0.23	121.90
+50	116.29	117.38	117.58 2.35 2.70 -0.35	117.94
+75	114.11			
N.L. Date of				
3+00.8	111.95	113.33	113.55 4.39 4.60 -0.21	114.02
N 6/8	112.08	113.12	113.33 4.61 4.84 -0.23	113.72
N 1/4	112.45	113.19	113.32 4.62 4.91 -0.29	113.62
2	112.50	113.13	113.27 4.67 4.87 -0.20	113.53

ETical	2' E E Row	East 1/4	East Gutter
133.67	133.61	132.90	
11.11 11.21 -0.10			
12.276	12.271	12.215	
2.41 2.56 -0.15			
125.85	125.81	125.40	
6.32 6.41 -0.09			
121.94	121.91	121.51	
10.23 10.28 -0.05			
118.03	118.01	117.35	
1.50 2.36 -0.86			
		115.18	
114.15	114.15	113.85	
3.78 3.83 -0.05			
113.87	113.88	113.67	
4.07 4.25 -0.18			
113.72	113.73	113.56	
4.22 4.36 -0.14			
113.60	113.61	113.45	
4.34 4.41 -0.07			

144.78 K  
12.80 -  
131.28 TP  
0.19 +  
132.17 K  
12.37 -  
119.80 TP  
0.13 +  
119.93 K  
6.16 -  
113.77  
Date p. 21/13.75

N.V. B.P. Col. 1 + 3RD

P-22 108.04  
9.90 +  
117.94 K

Stations	West. Gutter	West. 1/4	2' West West Rail	ℓ	2' East. E Rail	East. 1/4	East Gutter
S 1/4 Duto st.	112.30	113.03	113.17 4.77 5.03 -0.26	113.44	113.55 4.39 4.46 -0.07	113.53	113.34
S 6. "	111.80	112.78	112.98 4.26 5.20 -0.94	113.34	113.48 4.46 4.56 -0.10	113.48	113.23
S. Line Duto st = 0700	111.52	112.62	112.82 5.12 5.37 -0.25	113.20	113.35 4.59 4.70 -0.11	113.34	113.10
+50	111.35	112.54	112.74 5.20 5.45 -0.25	113.10	113.21 4.73 4.84 -0.11	113.18	112.89
1700	111.18	112.30	112.52 5.41 5.61 -0.20	112.88	113.00 4.94 4.28 -0.04	112.98	112.68
+25	111.10	112.23	112.42 5.52 5.73 -0.21	112.77	112.90 5.04 5.08 -0.04	112.88	112.58
+50	111.01	112.12	112.31 5.63 5.90 -0.27	112.66	112.80 5.14 5.29 -0.15	112.78	112.47
+75	110.50	111.58	111.75 6.19 6.39 -0.20	112.14	112.27 5.67 5.72 -0.05	112.25	111.95
2.100	109.92	111.05	111.22 6.72 6.92 -0.20	111.62	111.74 6.20 6.31 -0.11	111.72	111.40
+50	108.77	109.87	110.04 7.90 8.08 -0.18	110.40	110.54 7.40 7.45 -0.05	110.53	110.30

Stations	West Gutter	West 1/4	2' West W Rail	E
NL Cedar St = 3+00.8	107.62	108.59	108.86 9.08 9.29 -0.21	109.18
N CB	107.57	108.23	108.38 3.56 3.75 -0.19	108.65
N 1/4	107.33	107.81	107.94 10.00 10.23 -0.23	108.18
E	106.85	107.38	107.48 10.46 10.68 -0.22	107.70
S 1/4	106.16	106.86	106.98 10.96 11.20 -0.24	107.20
S CB	105.25	106.28	106.45 11.49 11.72 -0.23	106.72
SL Cedar = 0+00	104.50	105.63	105.81 12.13 12.38 -0.25	106.16
+50	101.64	102.73	102.91 88. 2.12 2.32 -0.20 -0.17 99.96	103.19
+100	98.82	99.84	100.00 5.03 5.35 -0.18 97.04	100.22
+50	96.40	96.90	97.10 7.93 8.22 -0.29 -0.23	97.25

2' East E Rail	East 1/4	East Gutter	K P-65 = 117.94 K 12.99 - 104.95 TP. 0.08 + 105.03 K
109.34	109.34	109.20	
8.60 8.66 -0.06			
108.81	108.81	108.73	
9.13 9.14 -0.01			
108.31	108.32	108.24	
9.63			
107.81	107.82	107.71	
10.13 10.18 -0.05			
107.33	107.33	107.15	
10.61 10.64 -0.03			
106.83	106.83	106.58	
11.11 11.28 -0.07			
106.32	106.33	106.11	
11.62 11.73 -0.11			
103.32	103.32	103.07	
1.71 1.75 -0.04			
100.72	100.81	100.63	
4.71 4.78 -0.07			
97.32	97.30	96.99	
7.71 7.83 -0.12			

Stations	West Cut	West 1/4	2'W W Rail	2
2700	9218	9405	9412 9419 10.84 410 <del>276</del>	9428
750	9036	9115	9120 9128 202 235 <del>033</del> <del>025</del>	9131
N.W. Beech = 3700	8758	8826	8838 253 270 +047	8854
N 1/4	8758	8788	8792 299 307 <del>008</del>	8802
N 1/4	8748	8771	8775 316 329 <del>047</del>	8782
2	8729	8747	8751 340 350 <del>018</del>	8758
S 1/4	8694	8722	8727 364 385 <del>023</del>	8734
S 1/4	8645	8687	8695 396 413 <del>017</del>	8705
S.W. Beech = 0700	8605	8657	8666 425 448 <del>023</del>	8678
+15	8532	8587	8596 495 506 <del>011</del>	8609

2' East E Rail	E 1/4	East Gutter
9432 1071 1080 <del>009</del>	9429	9395
9132 198 207 <del>009</del>	9128	9091
8848 243 250 <del>007</del>	8840	8787 ✓
8807 289 292 <del>004</del>	8800	8780
8779 312 317 <del>005</del>	8779	8764
8756 335 339 <del>004</del>	8756	8741
8732 358	8732	8709
8701 390 394 <del>004</del>	8697	8661
8673 418 435 <del>017</del>	8668	8615
8605 486 490 <del>004</del>	8600	8550

T P. 66 = 105,03 K  
 1250 -  
 9253 TP  
 8777  
 9330 K  
 536  
 p. 25  
 Ch NWBP  
 Beech 34  
 8794  
 8995-811  
 001

NW 1/4 Beech  
 34  
 8795  
 296 +  
 96914

Stations	West Cutler	West 1/2	2 <sup>nd</sup> West W Rul	Σ
0250	83.63	84.22	84.32 6.59 6.68 -0.09	84.47
1700	81.22	81.86	81.97 8.94 9.08 -0.14	82.16
+50	78.81	79.51	79.83 11.28 11.21 -0.07	79.85
2700	76.40	77.15	77.28 4.35 4.50 -0.15	77.54
+50	73.29	74.79	74.93 6.70 8.87 -0.17	75.23
3700 2 = N.L. Ash	71.58	72.44	72.58 9.05 9.26 -0.21	72.92
N 66	71.65	72.21	72.32 9.31 9.54 -0.23	72.50
N 1/4	71.60	71.97	72.06 9.57 9.82 -0.25	72.31
Σ	71.38	71.71	71.79 9.84 10.06 -0.22	71.92
S 1/4	70.98	71.43	71.50 10.13 10.34 -0.21	71.63

2 <sup>nd</sup> East E Rul	E 1/2	East Cut.	Σ
84.46 6.45 6.47 -0.02	84.41	83.98	90.91 K P 67 12.27 77.94 TP 3.69 81.63 K 11.39 70.34 TP
82.19 8.73 8.84 -0.11	82.14	81.76	
79.90 11.01 11.17 -0.16	79.87	79.54	
77.62 4.01 4.15 -0.14	77.60	77.32	
75.34 6.79 6.43 -0.14	75.23	75.10	
73.06 8.57 8.76 -0.19	73.06	72.88	
72.60 9.03 9.20 -0.17	72.60	72.49	
72.24 9.39 9.50 -0.11	72.24	72.13	
71.95 9.68 9.73 -0.05	71.94	71.77	
71.67 9.96 10.04 -0.08	71.65	71.41	

3rd Ave - Resurfacing Cont. -  
from P 68

SYNBP  
Ash 3rd 69

	West	West 1/4	2 <sup>1</sup> / <sub>4</sub> West 1/4 Rail	ℓ
Station	Gutter			
5cb Ash	70.49	71.08	71.18 3.15 3.32 0.17	71.34
5L Ash = 0+00	70.00	70.72	70.83 3.50 3.68 -0.18	71.03
+50	67.93	68.75	68.85 5.48 5.70 -0.22	69.02 69.08
+100	65.96	66.68	66.77 7.56 7.21 -0.15	66.95 66.97
+50	63.79	64.60	64.69 9.64 9.83 -0.19	64.87 64.89
+200	61.72	62.53	62.61 11.72 11.90 -0.18	62.80 62.81
+50	59.65	60.45	60.53 3.34 3.73 -0.19	60.72 60.73
3+00.6 = NL - A st	57.58	58.37	58.45 5.62 5.76 -0.14	58.65
N 6	57.76	58.21	58.31	58.45
N 1/4	57.71	58.48	58.14	58.26

2 <sup>1</sup> / <sub>4</sub> E	E 1/4	E Gutter	
E Rail			
71.39 2.54 3.28 -0.11	71.36	71.05	
71.05	71.01	70.66	
3.28 3.41 -0.13			
69.00	68.95	68.53	
5.33 5.13 -0.10			
66.93	66.88	66.47	
7.40 7.52 -0.12			
64.86	64.81	64.41	
9.47 9.58 -0.11			
62.79	62.74	62.35	
11.54 11.68 -0.14			
60.72	60.67	60.29	
3.35 3.48 -0.13			
58.64	58.60	58.24	
5.43 5.52 -0.09			
58.45	58.42	58.12	
58.26	58.24	57.97	

70.34 - P. 68  
3.99 +  
74.33 X  
12.71 -  
61.62 TP  
2.45 +  
64.07 X  
6.06  
chk  
NW Top cb  
NL. A st.  
58.01  
58.02 - P. 32  
OPT ERROR.

Stations	West Gutter	West 1/4	2 1/4 W. Rail	L
L. A-st.	57.61	57.93	57.97	58.07
S 1/4	57.38	57.71	57.76	57.88
Sch.	57.02	57.49	57.55	57.69
Slane A-st.	56.98	57.26	57.34	57.47

2 1/4 E. Rail	E 1/4	East Gutter
58.07	58.05	57.80
57.88	57.86	57.60
57.70	57.67	57.37
57.50	57.46	57.12



Intersection 3rd and Fir  
 - 2 Tracks and 2' from Tracks

Station

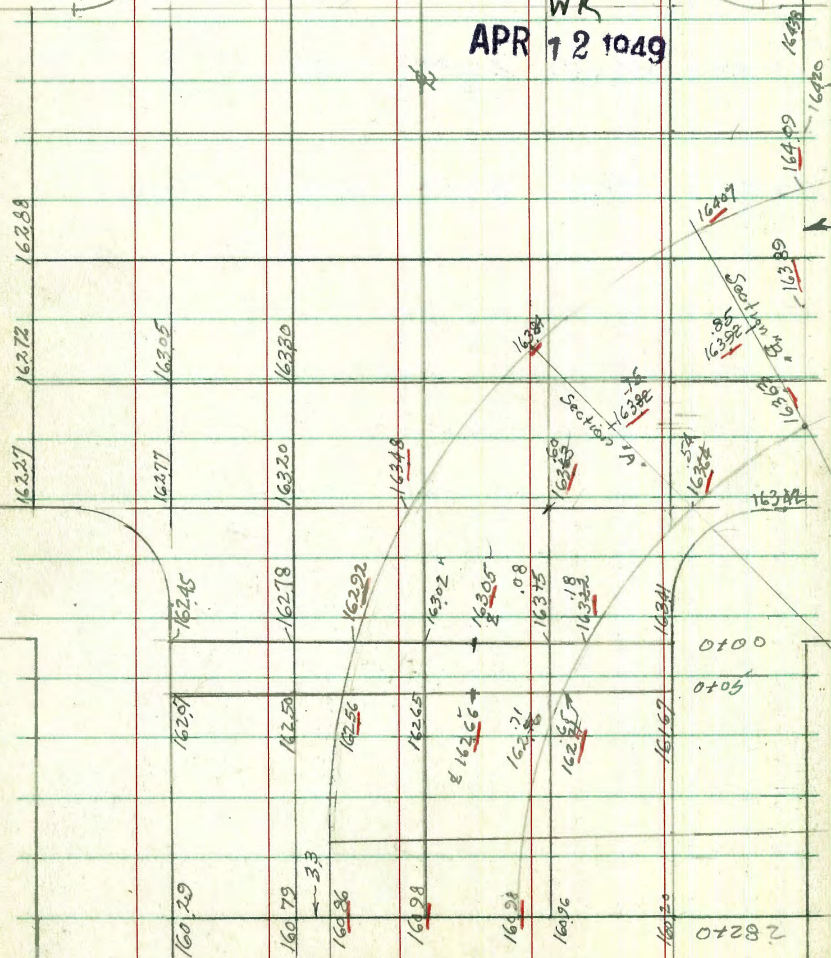
31st AVE.

INDEXED

INDEXED

WK

APR 12 1949



16361 = BM  
 489 +  
 16300 +

R177 M4 P-14  
 0128.2  
 2' W W Rail

Between  
 Track

2' E  
 E Rail

71

16086	16098	16098
7.14		7.02
7.20		7.02
-0.06		-0.00

0705		16265
16256	16266	16271
5.44		5.35
5.51		5.52
-0.07		-0.17

(Revised)  
 2' E Rail

0710		16322	16318
16292	16305	16322	16318
5.08		4.78	4.82
5.22		4.96	4.96
-0.12		-0.18	-0.14

5cb	16360		
16348	16363	16364	16354
4.52		4.56	4.46
4.72		4.58	4.58
-0.18		-0.12	-0.12

FIR  
 Section "A"

16384	16382	16364	16354
4.16		4.36	4.46
4.28		4.58	4.58
-0.07		-0.12	-0.13

SECTION "B"

16407	16392	16363
3.73		4.37
3.99		4.53
-0.06		-0.16

SECTION "C" EL 3rd

16409	16389	16363
3.91		4.37
3.96		4.51
-0.05		-0.14

8.91 / R = 68.7

2.82

R = 58

Cross Section Alley Block C Redland Gardens  
 From Madison Ave. to Adams Ave  
 Between 56th + 57th Sts

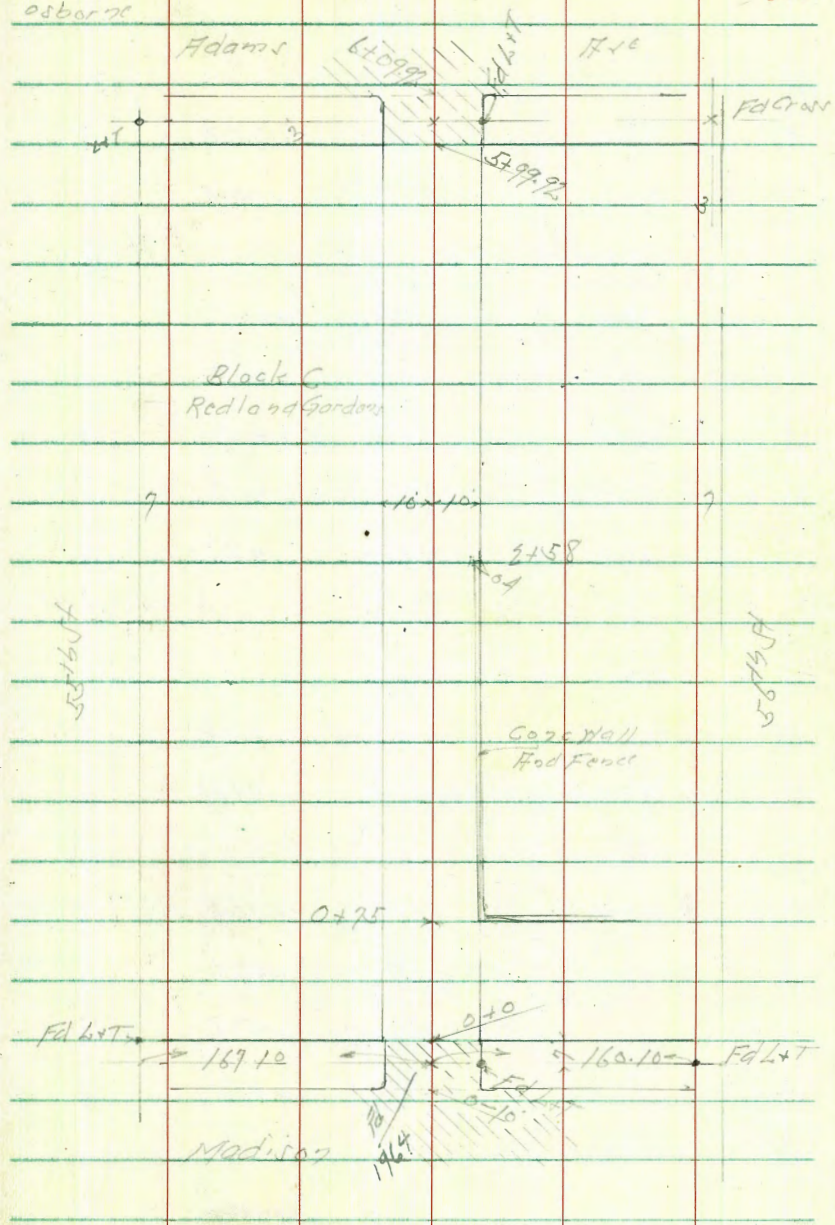
BM	12.85	446.50	433.65	SE 8P Adams + 56th St
TP	6.44	451.37	1.57	444.93
TP	7.92	448.32	10.97	440.90
0+10 = H.C. Line Madison Ave				
F	on Pavement	11.19		429.13
±	"	11.87		436.45
±	"	12.47		435.85
0+0 = H.L. Madison				
±	Top Cb + Pav	11.94		436.38
±	on Pavement	11.77		436.55
F	Gutter on "	11.20		432.12
F	Top Cb	10.61		432.71
0+05				
F		8.5		439.8
+4		10.9		437.4
±		11.4		436.9
+7		11.3		432.0
±		10.5		432.8
0+30				
±		8.7		439.6

INDEXED

Platted A.S.B.

Oct. 9-15  
 Sisson  
 Blinn  
 Osborn

Indexed  
 C.S.K.



448.32

Z	9.3	439.0
+8	8.5	439.8
F	7.9	440.4
0+60		
E	6.4	441.9
+2	7.0	441.3
Z	7.1	441.2
H	7.0	441.3
+15	8.0	440.3

0+75

H +11 = Hly Post + Tel Pole		
F	5.7	442.6
E = Sky Conc Wall + Hor Pole	3.63	444.67

1+0

-15	6.8	441.5
H	5.7	442.6
+2	4.7	442.6
Z	5.2	442.1
+8	4.9	443.4
F	3.7	444.6
E Top Conc Wall	3.05	445.27

448.32

1+50

F	2.0	446.3
+0.5 = Top Conc Wall	1.07	442.25
+2	2.1	446.2
+6	3.2	445.1
Z	3.4	444.9
+7	3.6	444.2
H	4.9	443.4
+15	5.7	442.6

2+0

-15	5.0	443.3
H	3.1	445.2
Z	3.6	445.7
+9.7 = Ground	1.7	446.6
+9.7 = Top Conc Wall	1.12	442.20

2+25

H +10 = Hly Post + Tel Pole

2+50

E +0.3 = Top Conc Wall	0.90	447.42
" " = Ground	1.9	446.4

73

448.32

2		2.3	446.0	
W		2.8	445.5	
+1.5		4.4	443.9	
	2 + 64			
W-3.5 = 2	Do Garage	2.8	445.5	Dirt Floor
TP	5.97	451.99	2.30	446.02
	2 + 8.5			
W-8' = 2	Do Garage	6.15	445.89	Conc Floor
	3 + 0			
-15		6.8	445.2	
W		5.9	446.1	
2		5.7	446.3	
+7		5.4	446.6	
+9.3 =	Wly Board Fence Wly Lath Fence	4.7	447.3	
F		4.2	447.5	
	3 + 5.0			
F		4.0	448.0	
+0.7 =	Lath Fence	5.0	447.0	
2		5.2	446.8	
W		5.7	446.3	
+1.5		6.3	445.9	

74

451.99

		3 + 5.5		
W + 2.2 =	Wly Conc Apron	5.21	446.78	
		3 + 5.8		
W-3.2 =	Wly Garage	5.16	446.83	Conc Floor
		3 + 7.3		
W-3.4 =	Wly Garage	5.17	446.82	Conc Floor
		3 + 7.5		
W + 2.1 =	Wly Conc Apron	5.35	446.64	
W + 1.2 =	Wly Power Pole			
F - 0.2 =	Wly Lath Fence + Wly Hedge			
		4 + 0		
-15		6.0	446.0	
W		5.4	446.6	
2		4.9	448.1	
F		4.5	447.5	
+0.4 =	Wly Conc Walk	4.20	442.79	
		4 + 5.0		
F =	Wly Hedge	4.6	442.4	
2		4.9	442.1	
+9.5 =	Wly Board Fence			

	451.99		
W	4.9	442.1	
+10	5.5	446.6	
	4+78		
F-0.5 Bottom 6"x6" Drainage to Wall	4.55	446.44	Floor level
F-0.5 = Sly Top Conc Wall	2.82	449.17	
	4+91		
F-0.3 = Wly Conc Wall	2.10	448.89	Top Wall
	4+91.5		
F-0.3 = Sly Conc Apron	4.14	447.55	
	5+0		
-10	5.8	446.2	
W	5.1	446.9	
Z	5.1	446.9	
F = Wly Conc Apron	4.47	447.52	
	5+20.5		
F = Wly Conc Apron	4.56	447.43	
	5+24		
W+0.8 = Wly Power + Tel Pole Also Wly Board Fence + Sly Express Hedge			
	5+35		
F	4.9	442.1	

	451.99		
Z	5.5	446.5	
W	5.4	446.6	
+10	5.8	446.2	
	5+65		
-10	6.4	445.6	
W	6.0	446.0	
Z	5.9	446.1	
+6	5.8	446.2	
F	5.1	446.9	
	5+76		
W = Wly Express Hedge			
	5+85		
F	5.3	446.7	
+5	6.3	445.7	
Z	6.7	445.3	
W	6.5	445.5	
TP	3.96	448.88	7.07
	5+99.2		= S.L. Adams
W Top C6	4.08	444.80	
W Gutter on Paving	4.20	444.68	

448.88

2	on Paving	4.14	444.74
---	-----------	------	--------

F	Gutter on Paving	3.73	445.15
---	------------------	------	--------

E	Top Curb	3.21	445.67
---	----------	------	--------

6 to 9.92 = 5 Cb Line Hdams

F	on Paving	3.78	445.10
---	-----------	------	--------

d	" "	4.25	444.63
---	-----	------	--------

N	" "	4.82	444.06
---	-----	------	--------

TP	306	440.51	11.93	437.95
----	-----	--------	-------	--------

BM		6.88	433.63	433.65
----	--	------	--------	--------

SE 80

Hdams 1455 1/2

Survey for Drainage R/W

CANON ST  
AT YELL ST.

Ref. T.P. #26/14/40

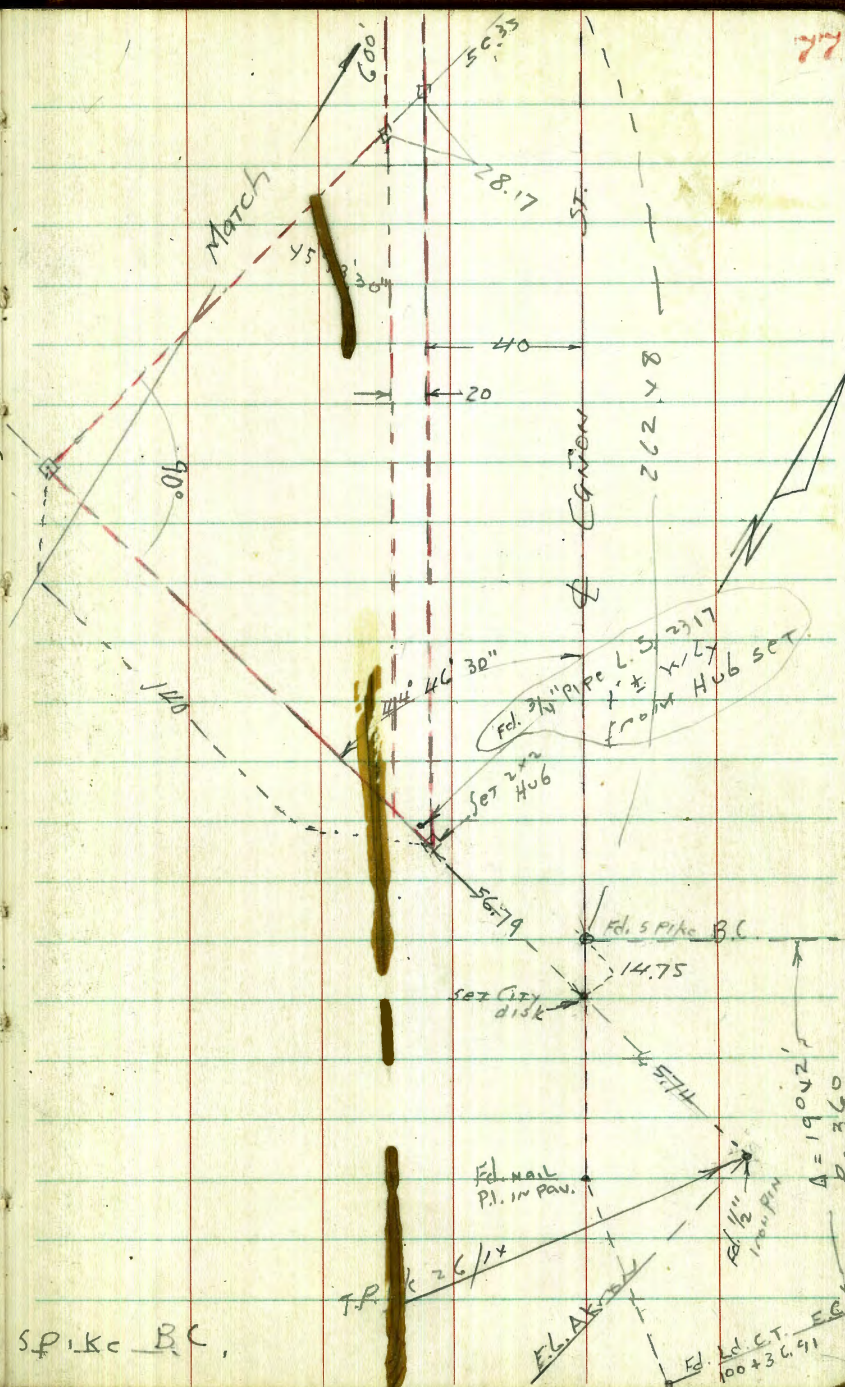
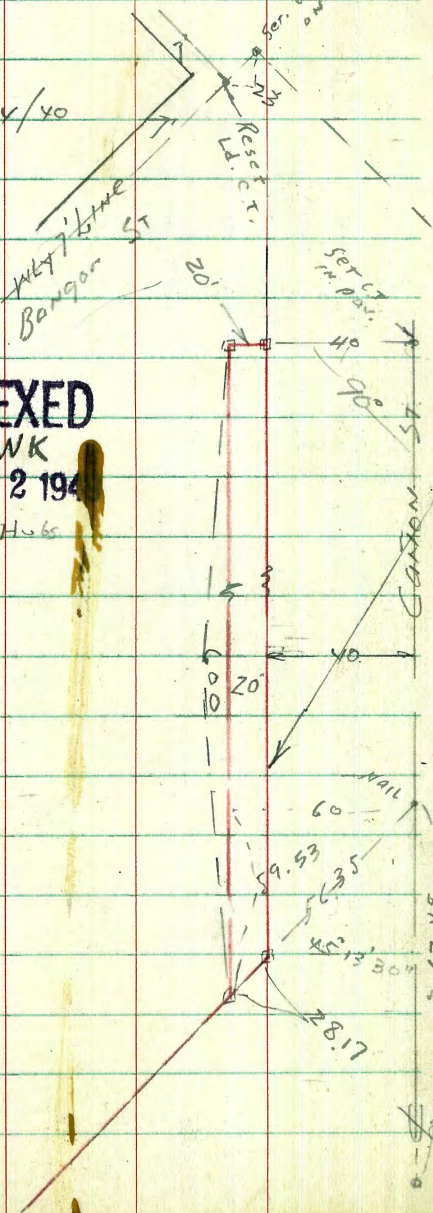
W.O. 25001

Moose  
B-99  
Sheridan  
D. 513304

X-11-49

**INDEXED**  
WK  
APR 12 194

D = Set 2x2 RW Hubs



SP. KC BC

T.P. #26/14

Ed. nail  
P.I. in Pav.

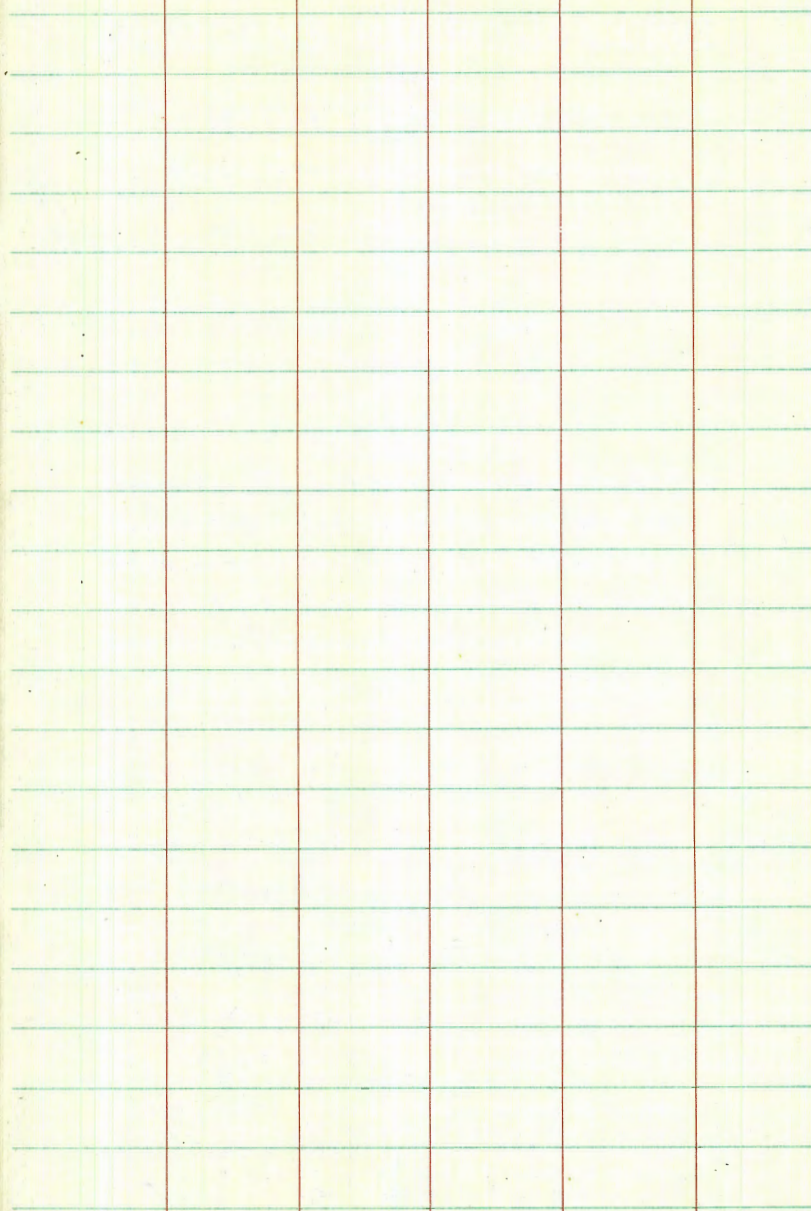
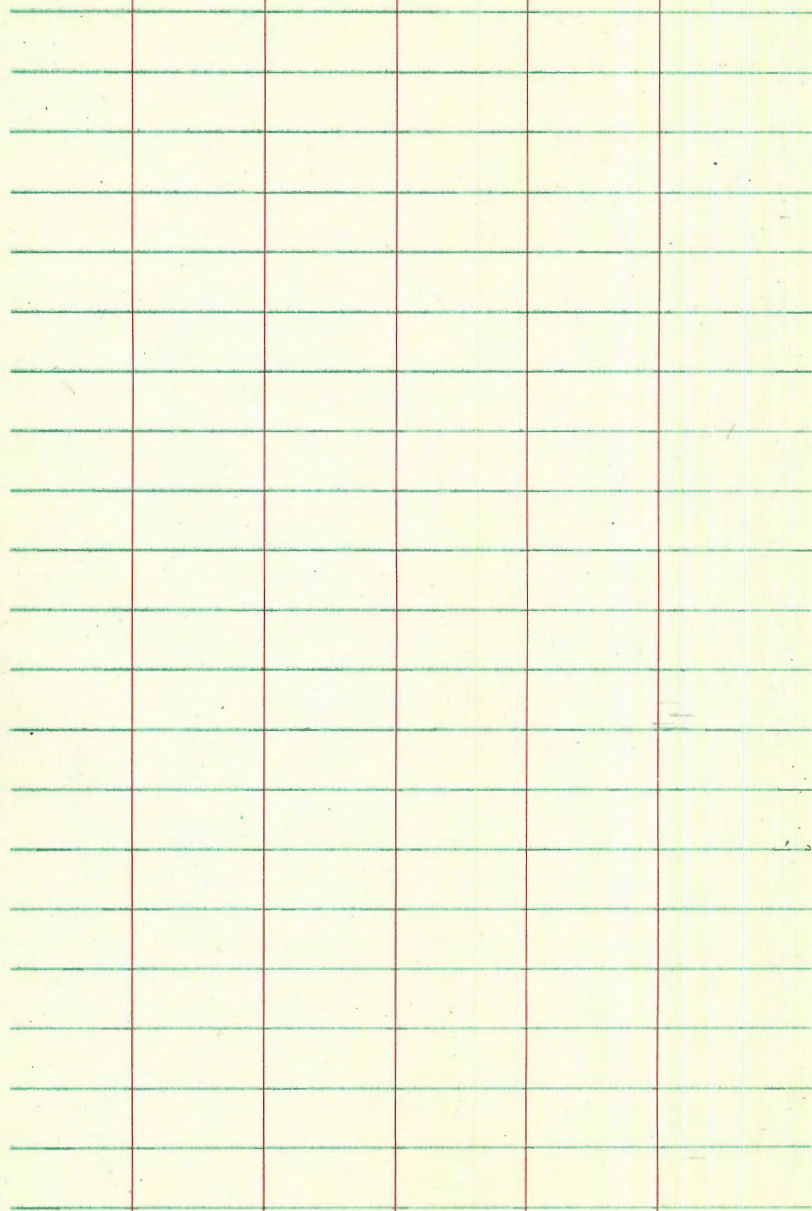
Ed. 1/2  
in Pav. Pin

Ed. 1/2 C.T. E.C.  
100+36.91

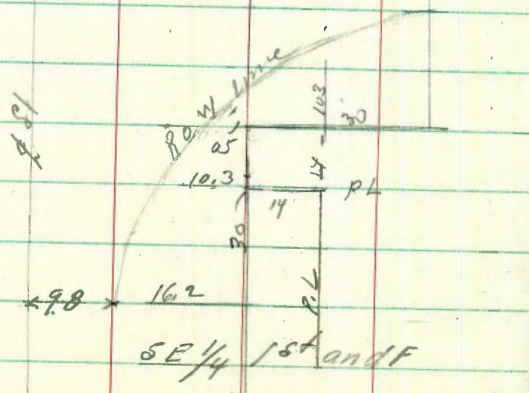
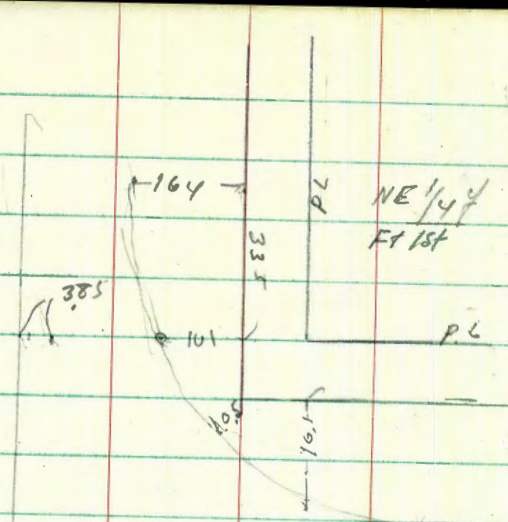
A = 19042  
R = 360





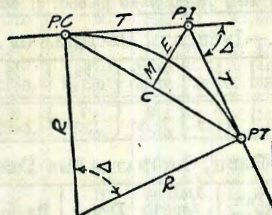


26  
95  
22



# DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

Copyright, 1914, by Eugene Dietzgen Co., New York City



11709  
325  
113.75 ✓

## 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  $1^\circ$  curve  $T = 3454.1$  and  $+8\frac{1}{3} = 414.49$  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 — 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 =  $.3 \times 54.5 \times 8\frac{1}{3} = 136.2'$  or  $2^\circ 16.2'$ , or =  $2.50 \times 54.5 = 136.2'$  from Table III. For Sta. 159 deflection angle =  $2^\circ 16.2' + 8^\circ 20' + 2 = 6^\circ 26.2'$ , etc.

**Externals.**—May be found in similar manner to tangents. Thus  $E$  for curve above is 91.37. For from Table IV for  $1^\circ$  curve  $E = 960.6$  for  $8^\circ 20' = 960.6 \div 8\frac{1}{3} = 91.27$  and from Table V correction = .10 or  $E = 91.37$  ft. 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  $+42 = 5.5$  or  $D = 5^\circ 30'$ .

TABLE VI.—CORRECTIONS FOR SUB-CHORDS AND LONG CHORDS.

Table with columns for 'FOR SUB-CHORDS ADD' (D, 10, 20, 30, 40, 50, 60, 70, 80, 90) and 'LONG CHORDS' (D, 200, 300, 400, 500). Includes an 'Excess of arc per 100 ft.' column. Data rows range from 4 to 68 degrees.

NOTE.—When a chord of less than 100 ft. is used the corrections given in the above table should be added to the nominal length of chord to get the length which should be used in order that the 100 ft. points will check with those obtained by using the standard 100 ft. chord.

TABLE VII.—MIDDLE ORDINATES FOR RAILS IN FEET.

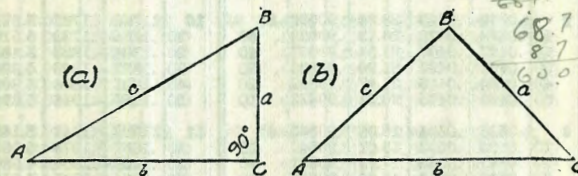
Table with columns for 'DEG. OF CURVE' and 'LENGTH OF RAILS'. Rows range from 1 to 30 degrees. Each degree has multiple columns for different rail lengths.

SLOPE REDUCTIONS.

When distances are measured on a slope they may be reduced to the equivalent horizontal distance by the following approximate rule:— subtract from the slope distance the square of the rise divided by twice the slope distance. Thus for a slope distance of 250.3 ft. and a rise of 15 ft. correction=15^2 ÷ 2 × 250.3=45 (by slide rule) or horizontal distance=250.3-45=249.85.

TRIGONOMETRICAL FORMULAS.

- sin. A = a/c
cos. A = b/c
tan. A = a/b
cot. A = b/a
sec. A = c/b
cosec. A = c/a



FORMULA FOR SOLVING TRIANGLES.

Given Sought. Right triangles. See fig. (a).
a, c A, B, b sin. A = a/c, cos. B = b/c, b = sqrt((c+a)(c-a))
a, b A, B, c tan. A = a/b, cot. B = b/a, c = sqrt(a^2 + b^2)
A, a B, b, c B = 90 - A, b = a cot. A, c = a/sin. A
A, b B, a, c B = 90 - A, a = b tan. A, c = b/cos. A
A, c B, a, b B = 90 - A, a = c sin. A, b = c cos. A
Given Sought. Oblique triangles. See fig. (b).
A, B, a b b = (a sin. B) / sin. A
A, a, b B sin. B = (b sin. A) / a
a, b, C A - B tan. 1/2(A - B) = ((a-b) tan. 1/2(A+B)) / (a+b)
c, b, c A If s = 1/2(a+b+c), sin. 1/2 A = sqrt(((s-b)(s-c)) / (bc))
cos. 1/2 A = sqrt(s(s-a) / (bc)), tan. 1/2 A = sqrt(((s-b)(s-c)) / (s(s-a)))
sin. A = 2 \* sqrt(s(s-a)(s-b)(s-c)) / (bc)
A, B, C, a area area = (a^2 sin. B sin. C) / (2 sin. A)
A, b, c area area = 1/2 bc sin. A
a, b, c area s = 1/2(a+b+c), area = sqrt(s(s-a)(s-b)(s-c))

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.		Angle	Sine.	Tan.	Cotg.	Cosin.	
°						°					
32	.5299	.6249	1.600	.84805	58	30	.6225	.7954	1.257	.78261	30
10	.5324	.6289	1.590	.84650	50	40	.6248	.8002	1.250	.78079	20
20	.5348	.6330	1.580	.84495	40	50	.6271	.8050	1.242	.77897	10
30	.5373	.6371	1.570	.84339	30	39	.6293	.8098	1.235	.77715	51
40	.5398	.6412	1.560	.84182	20	10	.6316	.8146	1.228	.77531	50
50	.5422	.6453	1.550	.84025	10	20	.6338	.8195	1.220	.77347	40
33	.5446	.6494	1.540	.83867	57	30	.6361	.8243	1.213	.77162	30
10	.5471	.6536	1.530	.83708	50	40	.6383	.8292	1.206	.76977	20
20	.5495	.6577	1.520	.83549	40	50	.6406	.8342	1.199	.76791	10
30	.5519	.6619	1.511	.83389	30	40	.6428	.8391	1.192	.76604	50
40	.5544	.6661	1.501	.83228	20	10	.6450	.8441	1.185	.76417	50
50	.5568	.6703	1.492	.83066	10	20	.6472	.8491	1.178	.76229	40
34	.5592	.6745	1.483	.82904	56	30	.6494	.8541	1.171	.76041	30
10	.5616	.6787	1.473	.82741	50	40	.6517	.8591	1.164	.75851	20
20	.5640	.6830	1.464	.82577	40	50	.6539	.8642	1.157	.75661	10
30	.5664	.6873	1.455	.82413	30	41	.6561	.8693	1.150	.75471	49
40	.5688	.6916	1.446	.82248	20	10	.6583	.8744	1.144	.75280	50
50	.5712	.6959	1.437	.82082	10	20	.6604	.8796	1.137	.75088	40
35	.5736	.7002	1.428	.81915	55	30	.6626	.8847	1.130	.74896	30
10	.5760	.7046	1.419	.81748	50	40	.6648	.8899	1.124	.74703	20
20	.5783	.7089	1.411	.81580	40	50	.6670	.8952	1.117	.74509	10
30	.5807	.7133	1.402	.81412	30	42	.6691	.9004	1.111	.74314	48
40	.5831	.7177	1.393	.81242	20	10	.6713	.9057	1.104	.74120	50
50	.5854	.7221	1.385	.81072	10	20	.6734	.9110	1.098	.73924	40
36	.5878	.7265	1.376	.80902	54	30	.6756	.9163	1.091	.73728	30
10	.5901	.7310	1.368	.80730	50	40	.6777	.9217	1.085	.73531	20
20	.5925	.7355	1.360	.80558	40	50	.6799	.9271	1.079	.73333	10
30	.5948	.7400	1.351	.80386	30	43	.6820	.9325	1.072	.73135	47
40	.5972	.7445	1.343	.80212	20	10	.6841	.9380	1.066	.72937	50
50	.5995	.7490	1.335	.80038	10	20	.6862	.9435	1.060	.72737	40
37	.6018	.7536	1.327	.79864	53	30	.6884	.9490	1.054	.72537	30
10	.6041	.7581	1.319	.79688	50	40	.6905	.9545	1.048	.72337	20
20	.6065	.7627	1.311	.79512	40	50	.6926	.9601	1.042	.72136	10
30	.6088	.7673	1.303	.79335	30	44	.6947	.9657	1.036	.71934	46
40	.6111	.7720	1.295	.79158	20	10	.6967	.9713	1.030	.71732	50
50	.6134	.7766	1.288	.78980	10	20	.6988	.9770	1.024	.71529	40
38	.6157	.7813	1.280	.78801	52	30	.7009	.9827	1.018	.71325	30
10	.6180	.7860	1.272	.78622	50	40	.7030	.9884	1.012	.71121	20
20	.6202	.7907	1.265	.78442	40	50	.7050	.9942	1.006	.70916	10
							.7071	1.	1.	.70711	45
											°
	Cosin.	Cotg.	Tan.	Sine.	Angle.		Cosin.	Cotg.	Tan.	Sine.	Angle.

TABLE IX.—CALCULATION OF EARTHWORK.

Width	HEIGHT														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.02	.04	.06	.07	.09	.11	.13	.15	.17	.18	.20	.22	.24	.26	.28
2	.04	.07	.11	.15	.18	.22	.26	.30	.33	.37	.41	.44	.48	.52	.56
3	.06	.11	.17	.22	.28	.33	.39	.44	.50	.56	.61	.67	.72	.78	.83
4	.07	.15	.22	.30	.37	.44	.52	.59	.67	.74	.81	.89	.96	1.04	1.11
5	.09	.19	.28	.37	.46	.56	.65	.74	.83	.93	1.02	1.11	1.20	1.30	1.39
6	.11	.22	.33	.44	.56	.67	.78	.89	1.00	1.11	1.22	1.33	1.44	1.55	1.67
7	.13	.26	.39	.52	.65	.78	.91	1.04	1.16	1.30	1.42	1.55	1.68	1.81	1.94
8	.15	.30	.44	.59	.74	.89	1.04	1.19	1.33	1.48	1.63	1.78	1.92	2.08	2.22
9	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50
10	.18	.37	.56	.74	.93	1.11	1.30	1.48	1.67	1.85	2.04	2.22	2.41	2.59	2.78
11	.20	.41	.61	.82	1.02	1.22	1.43	1.63	1.83	2.04	2.24	2.44	2.65	2.85	3.06
12	.22	.44	.67	.89	1.11	1.33	1.56	1.78	2.00	2.22	2.44	2.67	2.89	3.11	3.33
13	.24	.48	.72	.96	1.20	1.44	1.68	1.92	2.16	2.41	2.65	2.89	3.13	3.37	3.61
14	.26	.52	.78	1.04	1.30	1.55	1.81	2.08	2.33	2.59	2.85	3.11	3.37	3.63	3.89
15	.28	.56	.83	1.11	1.39	1.67	1.94	2.22	2.50	2.78	3.06	3.33	3.61	3.89	4.17
16	.30	.59	.89	1.18	1.48	1.78	2.07	2.37	2.67	2.96	3.26	3.56	3.85	4.15	4.44
17	.31	.63	.94	1.26	1.57	1.89	2.20	2.52	2.83	3.15	3.46	3.78	4.09	4.41	4.72
18	.33	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00
19	.35	.70	1.06	1.41	1.76	2.11	2.46	2.82	3.17	3.52	3.87	4.22	4.57	4.92	5.28
20	.37	.74	1.11	1.48	1.85	2.22	2.59	2.96	3.33	3.70	4.07	4.44	4.81	5.18	5.56
21	.39	.78	1.17	1.55	1.94	2.33	2.72	3.11	3.50	3.89	4.28	4.67	5.06	5.44	5.83
22	.41	.81	1.22	1.63	2.04	2.44	2.85	3.26	3.67	4.07	4.48	4.89	5.30	5.70	6.11
23	.43	.85	1.28	1.70	2.13	2.56	2.98	3.41	3.83	4.26	4.68	5.11	5.54	5.96	6.39
24	.44	.89	1.33	1.78	2.22	2.67	3.11	3.56	4.00	4.44	4.89	5.33	5.78	6.22	6.67
25	.46	.92	1.39	1.85	2.31	2.78	3.24	3.70	4.17	4.63	5.09	5.56	6.02	6.48	6.94
26	.48	.96	1.44	1.92	2.41	2.89	3.37	3.85	4.33	4.82	5.30	5.78	6.26	6.74	7.24
27	.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
28	.52	1.04	1.55	2.07	2.59	3.11	3.63	4.15	4.67	5.18	5.70	6.22	6.74	7.26	7.78
29	.54	1.07	1.61	2.15	2.68	3.22	3.76	4.30	4.83	5.37	5.91	6.44	6.98	7.52	8.06
30	.56	1.11	1.67	2.22	2.78	3.33	3.89	4.44	5.00	5.55	6.11	6.67	7.22	7.78	8.33
31	.57	1.15	1.72	2.30	2.87	3.44	4.02	4.59	5.17	5.74	6.32	6.89	7.46	8.04	8.61
32	.59	1.18	1.78	2.37	2.96	3.56	4.15	4.74	5.33	5.92	6.52	7.11	7.70	8.30	8.89
33	.61	1.22	1.83	2.44	3.05	3.67	4.28	4.89	5.50	6.11	6.72	7.33	7.94	8.55	9.17
34	.63	1.26	1.89	2.52	3.15	3.78	4.40	5.04	5.67	6.29	6.93	7.56	8.18	8.81	9.44
35	.65	1.30	1.94	2.59	3.24	3.89	4.53	5.18	5.83	6.48	7.13	7.78	8.42	9.08	9.72
36	.67	1.33	2.00	2.67	3.33	4.00	4.66	5.33	6.00	6.67	7.33	8.00	8.67	9.33	10.00
37	.68	1.37	2.06	2.74	3.42	4.11	4.79	5.48	6.17	6.85	7.54	8.22	8.91	9.59	10.28
38	.70	1.41	2.11	2.82	3.52	4.22	4.92	5.63	6.33	7.03	7.74	8.44	9.15	9.85	10.56
39	.72	1.44	2.17	2.89	3.61	4.33	5.05	5.78	6.50	7.22	7.95	8.67	9.39	10.11	10.83
40	.74	1.48	2.22	2.96	3.70	4.44	5.18	5.92	6.67	7.41	8.15	8.89	9.63	10.37	11.11

Table gives cu. yds. in 1 ft. of a triangle of given width and height. Corrections for tenths of width are one tenth the values found under each height considering the widths from 1 to 9 as tenths and similarly the corrections for tenths of height are one tenth the figures opposite width considering the heights from 1 to 9 as tenths. Thus if  $w = 16.2$  and  $h = 5.3$ , cu. yds. =  $1.48 + .028 + .089 = 1.597$  cu. yds. or practically 160 cu. yds. per 100 ft. If  $w$  exceeds 40 ft., use one half and multiply result by 2, if both  $w$  and  $h$  are large use one half of each and multiply result by 4. Any cross-section may be divided into triangles by the following rule. To the triangle of the sum of the outside cuts (or fills) =  $h$ , and  $\frac{1}{2}$  the roadbed =  $w$ , add the triangles formed by taking the distance out to each break in turn (=  $w$ 's) by the difference between the cuts (or fills) on each side of it (=  $h$ 's) always subtracting the outer from the inner.

Cross Section 1st Ave - St. Broadway to N. Market  
 " " 3rd Ave SL. " to N. 6th  
 " " 3rd " SL. A.H. to N. 1st St

1090 ✓ 11763  
 959  
 108.04

2750 E side 3rd } chkr Gnt.  
 South Elm } Elev. P-19

14142 1/4  
 58 36 = N side } FIX  
 51428 = S side }  
 E 14732 = E side } 3rd  
 W 14736 = W side }

58.0  
 29.8  
 28.2  
 29.9

DISTANCES FROM CENTER OF ROADWAY FOR  
 CROSS-SECTIONING. 567

Roadway 16 feet wide. Side Slopes 1 on 1 1/2  
 For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	0
1	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7	10.9	1
2	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	2
3	12.5	12.7	12.8	13.0	13.1	13.3	13.4	13.6	13.7	13.9	3
4	14.0	14.2	14.3	14.5	14.6	14.8	14.9	15.1	15.2	15.4	4
5	15.5	15.7	15.8	16.0	16.1	16.3	16.4	16.6	16.7	16.9	5
6	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4	6
7	18.5	18.7	18.8	19.0	19.1	19.3	19.4	19.6	19.7	19.9	7
8	20.0	20.2	20.3	20.5	20.6	20.8	20.9	21.1	21.2	21.4	8
9	21.5	21.7	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	9
10	23.0	23.2	23.3	23.5	23.6	23.8	23.9	24.1	24.2	24.4	10
11	24.5	24.7	24.8	25.0	25.1	25.3	25.4	25.6	25.7	25.9	11
12	26.0	26.2	26.3	26.5	26.6	26.8	26.9	27.1	27.2	27.4	12
13	27.5	27.7	27.8	28.0	28.1	28.3	28.4	28.6	28.7	28.9	13
14	29.0	29.2	29.3	29.5	29.6	29.8	29.9	30.1	30.2	30.4	14
15	30.5	30.7	30.8	31.0	31.1	31.3	31.4	31.6	31.7	31.9	15
16	32.0	32.2	32.3	32.5	32.6	32.8	32.9	33.1	33.2	33.4	16
17	33.5	33.7	33.8	34.0	34.1	34.3	34.4	34.6	34.7	34.9	17
18	35.0	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	18
19	36.5	36.7	36.8	37.0	37.1	37.3	37.4	37.6	37.7	37.9	19
20	38.0	38.2	38.3	38.5	38.6	38.8	38.9	39.1	39.2	39.4	20
21	39.5	39.7	39.8	40.0	40.1	40.3	40.4	40.6	40.7	40.9	21
22	41.0	41.2	41.3	41.5	41.6	41.8	41.9	42.1	42.2	42.4	22
23	42.5	42.7	42.8	43.0	43.1	43.3	43.4	43.6	43.7	43.9	23
24	44.0	44.2	44.3	44.5	44.6	44.8	44.9	45.1	45.2	45.4	24
25	45.5	45.7	45.8	46.0	46.1	46.3	46.4	46.6	46.7	46.9	25
26	47.0	47.2	47.3	47.5	47.6	47.8	47.9	48.1	48.2	48.4	26
27	48.5	48.7	48.8	49.0	49.1	49.3	49.4	49.6	49.7	49.9	27
28	50.0	50.2	50.3	50.5	50.6	50.8	50.9	51.1	51.2	51.4	28
29	51.5	51.7	51.8	52.0	52.1	52.3	52.4	52.6	52.7	52.9	29
30	53.0	53.2	53.3	53.5	53.6	53.8	53.9	54.1	54.2	54.4	30
31	54.5	54.7	54.8	55.0	55.1	55.3	55.4	55.6	55.7	55.9	31
32	56.0	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.2	57.4	32
33	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6	58.7	58.9	33
34	59.0	59.2	59.3	59.5	59.6	59.8	59.9	60.1	60.2	60.4	34
35	60.5	60.7	60.8	61.0	61.1	61.3	61.4	61.6	61.7	61.9	35
36	62.0	62.2	62.3	62.5	62.6	62.8	62.9	63.1	63.2	63.4	36
37	63.5	63.7	63.8	64.0	64.1	64.3	64.4	64.6	64.7	64.9	37
38	65.0	65.2	65.3	65.5	65.6	65.8	65.9	66.1	66.2	66.4	38
39	66.5	66.7	66.8	67.0	67.1	67.3	67.4	67.6	67.7	67.9	39
40	68.0	68.2	68.3	68.5	68.6	68.8	68.9	69.1	69.2	69.4	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 41.9. 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 41.9 + (20 - 16) ÷ 2 or 2 ft. added to 41.9 = 43.9. For slopes of 1 on 1 see inside of front cover.