

8.

518

DIARY

F.B. 518

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 1½ see inside of back cover.

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Campbell
Engineer

By

518

ENGINEERING DEPARTMENT,
CITY OF
CALIFORNIA

Louis A. Bartlett

326 S. Pasadena Ave

Pasadena Cal

ADOLF FRESE OPTICAL CO.
Engineering and Drafting Supplies
Scientific Instruments and Repairing
716-718 SOUTH HILL STREET
LOS ANGELES, CAL.

5828
 4208
 2565

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EAST SAN DIEGO SEWER

June 1921 Part 1st

Sta

0	= 6+68.9	- Existing M/H. alley S.P.	Market
2+39.85	= 9+08.85	- M.H. Center Market St.	
6+45.83	= 13+14.73	M.H. " Allen N. Market	
9+63.33	= 16+32.23	M.H. S of F. St.	
12+65.75	= 19+34.65	M.H. Center F. St.	
14+94.75	= 21+63.65	M.H. " Lemon Grove	
17+55.13	= 24+24.03	M.H. " Benesch	
20+29.16	= 26+98.01	M.H. " Broadway	
22+19.16	= 28+88.06	M.H. " alby & C.	
25+98.46	= 32+67.36	M.H. " " "	
	= 26+76.10	M.H.	
29+38.07	= 30+15.7	M.H.	
32+83.57	= 31+61.2	M.H.	
33+71.52	= 34+49.2	M.H.	
37+13.66	= 37+91.3	M.H. & Pinnell & Ash	
38+53.66	= 39+31.3	M.H.	
39+90.86	= 40+68.3	M.H. & 36" & Ash	
43+70.66	= 44+48.3	M.H.	
47+58.66	= 48+26.3	M.H.	
49+46.66	= 50+24.3	M.H.	
51+27.66	= 52+05.3	M.H. ✓	
53+12.96	= 53+90.6	M.H. ✓	
54+98.96	= 55+77.6	M.H. ✓	
56+78.96	= 57+56.6	M.H. ✓	
57+42.66	= 58+20.3	M.H. = H. O. & S.D.	

ang R 31° 29' from M.H. 10th Street (348)

ang R 21° 12'

ang L 35° 12' (570)

ang L to Center line 35' at

2.88

ang R about 46° 12' (59.7)

ang L 41° 31'

ang R 9° 12' 9° 14' (63.9)

ang L 12° 34' 12° 11' (64.3)

ang R 90° 542.16 (71.15)

ang L 90° 424.2 (76.23)

ang L 90° (91.8)

ang R 48° 19' (93.03)

ang L 30° 34' (102.3)

ang L 30° 34' (103.11)

43813
310
47613

Revised Stationing East San Diego Outfall

B.M. 35.08
0
2+65
6+57.5
9+65.5 on extension Center 35th St

12+72.4
15+01.4
17+61.8
20+37.3
22+27.3
26+06.6 = 26+10.6

29+49.1
30+94.6
33+82.6

37+24.7
38+64.7

40+01.7

43+81.7

47+61.7

49+57.7

51+38.7

53+24.0

55+09.0

56+90

57+54 = Sta. 2 East San Diego Rec
57+00. Length San Diego Rec.

30+95.6
29+91.5
28+66.5

Bartlett & Wittman

City Monument Sec. 33rd + I ^{S.D.} 8961 P37

M.H. bet Market & I Aug R. 29° 35'

M.H. Market St Aug R. 25° 07'

M.H. center alley " L 37° 13'

M.H. " L 33° 28'

M.H. Center 7th St

M.H. Center Lemon Grove Ave

M.H. Center Broadway St

M.H. " Broadway

M.H. " Alley bet C & Broadway

M.H. " alley bet B & C

M.H. Aug L. 40° 37'

M.H. Aug R. 9° 02'

M.H. " L. 12° 34'

M.H. " R. 89° 40'

M.H.

M.H. Aug L. 89° 40'

M.H.

M.H.

M.H.

M.H. Aug R. 48° 19'

M.H.

M.H.

M.H.

M.H. Aug L. 3° 31'

Outfall, in San Diego Section
16" Pipe

B.M.		37.39	2.31	35.08
T.P.	2.56	3820	3.78	34.83
0	4.37			34.33 27.00
+50	5.76			33.54 27.36
1	5.98			32.72 27.72
+50	6.04			32.66 28.08
2	5.31			33.39 28.45
+50	5.72			32.98 28.81
+65	5.72			32.98 28.91
3	4.54			33.86 29.17
+50	2.77			35.93 29.53
4	2.90			35.80 29.90
+50	3.70			35.00 30.26
5	4.10			34.60 30.62
+50	2.12			36.58 30.98
T.P.	2.52	4823	11.65	36.58
6	11.10			37.13 31.35
+51	11.87			36.36 31.73
7	9.96			38.27 32.07
+50	5.20			43.03 32.43
8	4.56			43.67 32.80
+50	5.80			42.43 33.16
9	8.57			39.36 33.52
+50	7.92			40.31 33.88
+65	7.68			40.55 34.00

June 11th 1921 Bartlett & Witterman 3

Stakes on 6' offset West to Sta 9+65

Cement Man. N.E. Cor. 33rd + I. - Book 961. P. 37 ^{S.D. City}

Top M.H. Sta 0 - 7.6' deep

7.33 - 27.00 - 3 Manhole bet Marker + I

6.18

5.00

4.58

4.94

4.17

4.07

4.69

6.40

5.90

4.74

3.98

5.60

-

5.78

4.63

6.20

10.60

10.87

9.27

5.84

6.43

6.55

M.H. Aug R. 25° 07'

M.H. Aug L. 37° 13'

offset 6' west
M.H. Aug L. 33° 28'

Outfall - Continued

San Diego Section

4823

9+65 ⁵	8.77			39.46	34.05
10	6.08			42.15	34.37
T.P.	6.08	51.98	9.83	42.15	—
B.M.	3.37			48.61	—
+50	9.50			42.68	34.83
11	9.47			42.57	35.29
+50	6.02			45.96	35.75
12	5.73			46.25	36.21
+50	5.34			46.64	36.67
+724	5.08			46.90	36.88
13	4.93			47.05	37.13
+50	4.48			47.50	37.59
14	4.30	52.94		47.68	38.05
+50	3.51			48.47	38.51
T.P.	3.51	57.28	8.81	48.47	—
15+01 ⁴	4.15			53.13	39.00
15+11 ⁴	7.02			50.26	39.93
16	6.27			57.01	40.89
+50	5.60			51.68	41.85
17	5.26			52.02	42.81
+50	4.90			52.38	43.77
+618	4.95			52.33	44.00
18	4.54			52.74	44.55
+50	4.36			52.92	45.27
19	3.82			53.46	46.00

Stakes on 6' offset East from Sta. 9+65⁵
6' offset East.
M.H. Aug L. 3328

Nail & tin in Y of Olive Tree 25' W of line 10475

M.H. Carter F. St.

3.71

M.H. Carter Lumber Grove
M.H. 10' N. Carter Lumber Grove

M.H. E. Binesch

Outfall San Diego Section

57.28

19+50	2.01			55.27	46.72	
TP	2.01	62.39	7.12	55.27	—	
20	6.97			55.42	47.45	
+373	7.01			55.38	48.00	
+50	6.20			56.19	48.13	
B.M.	6.23			56.16	—	
21	5.71			56.68	48.65	
+50	5.59			56.80	49.18	
22	5.22			57.17	49.70	
+27.3	5.11			57.26	50.00	
+50	4.24			58.15	50.24	
23	3.17			59.22	50.77	
+50	2.59			59.80	51.30	
24	3.90			59.49	51.83	
TP	3.90	65.52	7.03	58.49	—	
+50	4.06			61.46	52.35	
25	7.37			58.15	52.88	
+50	6.12			57.40	53.40	
26+06.5	5.67			59.85	54.00	
B.M.	2.09	69.68	6.25	63.43	—	
+50	7.93					
27	7.34					
+50	7.60					
28	6.04					
+50	6.98					

8.55

7.97

7.38

8.06

8.03

7.62

7.47

7.28

7.91

8.45

8.50

6.66

9.11

5.27

6.00

5.85

4.54

4.54

4.54

4.54

4.54

4.54

4.54

4.54

4.54

4.54

4.54

4.54

4.54

4.54

4.54

M.H. & Broadway

Let stake N.E. Cor. Broadway & 35th

M.H. & alley Bet Bldg & C

← Grade sheet to here,

26+00.5

M.H. & alley Bet Bldg & C, Aug R400

Station in fence post opp Sta 26+06.5

Outfall. San Diego Section

		69.65			
29.	+49.1	6.32			
	+50	5.68			
30		5.01			
	+50	5.63			
+94.6	+95	3.32			
31	+50	3.62			
32		0.44			
TP		0.44	78.86	9.62	69.24 -
	+50	8.83			
33		8.40			
	+50	8.74			
	+82.6	8.00			
34		9.08			
	+50	6.28			
35		1.34			
	+50	6.00			
36		6.02			
	+50	4.04			
37		1.15			
TP		0.88	83.78	5.77	78.01 -
B.M.		5.64			78.14 ✓
37+24.7		5.75			78.03 71.0
37+24.7		5.52			78.26 71.00
	+50	5.73			78.05 71.36
38.		6.08			77.70 72.07

M.H. Aug L 40° 37'

M.H. Aug R. 9° 02'

33+82.6
2.28
30.94.6
1.55.5
29.49.1

M.H. Aug L 12° 34'

Old stake

39+31.3 78.23 to ch.
6' off at Right
6' " Left

78.03
78.26
78.05
77.70
71.42 75.9%

Outfall, San Diego Section

7

8378

38 + 50, 5.23

+ 64.2 5.35

39. 5.55

+ 50 2.50

T.P. 2.50

B.M. 2.45

40 + 01.7 1.20

+ 50 7.78

41. 9.44

+ 50 9.17

42. 10.23

+ 50 9.80

43. 8.48

+ 50 6.35

+ 81.7 8.70

T.P.

40 + 50 4.94

41. 6.65

+ 50 6.38

42. 7.35

+ 50 6.97

B.M. 6.81

43. 5.60

+ 50 3.47

78.55 72.79 5.76

78.40 73.0 5.40

78.23 74.29 3.94

81.28 76.11 5.17

81.28 —

91.50 —

92.75 78.2

23.64942

Old stake sta 40 + 68.3 91.586 check

6' offset to Right.

M.H.

88.0 city 961

91.16

9.88

81.28

86.20 78.25

7.95

84.51 78.52

5.99

84.78 78.78

6.00

83.81 79.04

4.74

84.19 79.31

4.88

84.35

85.56 79.57

5.99

87.69 79.83

7.86

9.52636

sp. skin in crotch of pepper tree 25' W of 42 + 50

Outfall San Diego Section

10103

53	445	96.58	86.74
+ 24	465	96.38	87.00
+ 50	518	95.85	87.42
54+00	3.17	97.86	88.23
+ 50	2.22	98.81	89.04
T.P.	2.22	106.38	7.57 98.81
55	6.96	99.42	89.85
+ 09	6.62	99.76	90.00
+ 50	5.64	100.74	90.67
56	5.24	101.14	91.50
+ 00	4.61	101.77	92.33
+ 90	4.57	101.81	93.00
57	4.68	101.70	93.31
+ 54	3.18	103.20	95.00
M.H.	3.21	103.07	

= 5750,

Sta 16	57.72	3.71	51.01
15+11.4	440	50.32	39.09
			39.09

14+00	55.17	7.49	47.68
14+85	207	53.10	38.83
	3.06	51.61	38.83

5750.5

9.84

9.38

9.43

9.63

9.77

9.57

9.76

10.07

9.64

9.44

8.81

8.39

8.20

8.20

8.20

old stake 103.11 to ch N.D. City Park 96

11.23

11.13

11-2 3/4

11-1 1/2

Mandole 10 7/8 Lumber

0.92

3.5

4.60

2.76

3.22

14.27

12.78 pipe

Outfall
San Diego Riv.

Copied from Book 961
p 46-47 by Wittman

✓

10.

		HI	+	Elev
B.M.		69.72	6.29	63.43
26+06 ² =				59.85
26+10 ²				54.2
26+50	8.20			61.52
27+00	7.29			62.43
+50	6.85			62.87
28	6.12			63.60
+50	7.09			62.63
29	5.96			63.76
+49 ¹	6.25			63.47
30	5.61			64.11
T.P. +50	5.55	74.61	10.44	64.17
+94 ²	8.55			66.06
31+50	7.70			66.91
32	6.22			68.39
+50	4.50			70.11
33	4.43			70.18
+50	4.29			70.32
+82 ²	4.44			70.17
34+10	2.76			71.85
T.P.	2.76	82.95	11.10	71.85
+50	10.64			72.31
35	10.58			72.37
+50	10.05			72.90
36	9.88			73.07
+50	8.10			74.85

Spike & Tin in Fence Post about 30'
R-M.H. West of Station 26+06

1.1816%

M.H. 43

M.H. Angle L. 40°37'

1.43143%

M.H. Angle R. 9°02'

1.17361%

M.H. Angle L. 12°34'

1.17557%

Outfall San Diego Section ✓

	-	H.I.	+	Elev.
37+00	5.22	8295	77.73	7056
+24 ²	4.80		78.15	—
37+24 ²			78.03	71 ²
37+24.7			78.26	71 ²

from p 6

7.17

Old Cen. Hub M.H. Angle R

Elev. 78.23

7.03

6' Offset to Right

7.26₁

6' Offset to Left

Outfall - East San Diego Section

6-23-21 Bartley K. Wittman

12

Sta 0 = Sta 57+54

103.20 96.00

7.20

23 Aug L. 250 31 from
line in San Diego Sec.

BM.		110.13	7.06	103.07
0 + 50	6.12			104.01 96.91
BM.	4.15			105.98
1 + 00	5.42			104.71 97.52
+ 50	5.00			105.13 98.73
2	3.40			106.73 99.64
+ 50	2.57			107.56 100.55
3	1.48	116.88	8.23	108.65 101.46
+ 50	7.27			109.61 102.37
4	6.67			110.21 103.28
+ 50	6.66			110.22 104.19
5	7.75			109.13 105.10
+ 50	7.22			109.66 106.01
6	4.95			111.93 106.58
+ 50	4.73			112.15 07.18
7	5.41			111.47 07.77
+ 50	2.48			119.40 08.36
8	1.71	122.91	7.74	115.17 08.95
+ 50	7.28			115.83 09.53
9	7.05			115.86 10.12
+ 50	8.34			114.57 10.71
10	8.02			114.89 11.30

old stake

7.10

mile stone in small tree, about 75' E of Sta 1400

6.89

6.40

7.09

7.01

7.19

7.24

6.93

6.03

4.03

3.66

5.34

4.97

3.70

6.04

6.22

6.10

5.74

3.86

3.59

550

M.H. 24

550

Outfall E. S. D. Section

		122.91			112.00
10 + 60	5.55			117.36	113.00
11	4.37			118.52	113.70
+ 50	5.85			117.06	114.57
12	7.18	127	130.19	8.55	121.64
+ 50	7.76				122.43
13	6.58				123.61
+ 50	6.46				123.73
14	6.20				123.99
+ 50	5.43				124.76
	4.29				125.90
+ 50	3.50				126.69
16 + 09.4	3.65				126.54
	2.45				127.74
M.H.	2.96	3733	10.09	127.29	
16 + 50	8.87			28.46	23.22
17	7.96			29.37	23.98
+ 50	7.25			30.08	24.78
18	6.60			30.73	25.49
+ 50	5.85			31.48	26.25
19	4.53			32.80	27.01
+ 50	6.04			31.29	27.77
20	4.03			33.30	12.82
+ 50	4.62			32.71	129.03
21	3.82			33.51	29.51
+ 50	3.42	42.58	8.67	33.91	29.99

5.36

4.86

4.82

2.49

6.20

6.11

6.42

5.67

5.05

4.95

5.22

5.13

3.94

old hub center pt

hub 27' E at R.A. to line from South

5.24

5.39

5.34

5.24

5.23

5.79

3.51

4.70

3.68

4.00

3.92

M.H.

25

509

26

M.H. Aug 2 12.21

396

M.H. 27

353

Outfall E. S. D. Section

4.258

22 766
+50 6.98
23 468
+58.5 6.50
24 563
+50 3.31
25 5.45
+50 2.39
26 TP 0.99 49.81 8.22
+57.2 7.15
27 6.81
+50 8.04
28 460
TP + 50 4.12 58.16 12.47
29 8.72
+50 7.09
30 4.71
+50 460
+85.5 4.74
B.M. 501
P.M. 2.66

34.92 30.97
35.60 30.95
37.90 31.43
36.03 132.0
36.95 132.65
39.27 33.44
37.13 34.22
40.19 35.01
41.59 35.79
42.66 136.20
43.00 137.65
41.77 38.75
45.21 39.86
45.69 40.96
49.44 42.07
51.07 43.17
53.45 44.28
53.56 45.38
53.40 146.7
58.15 146.5
55.50

16" Pipe

30855

445
465
647
403
431
583
291
518
580
596
535
502
535
473
737
790
917
818
723
6.06
5.00
5.00

28
M.H. aug R 24° 11'

29
M.H. aug L 20° 09' - 30°

30
M.H. Interior - Intersection
Outfall + Eastern Pipeline
153.10 h. chd

1x2 Atake 50' E of 30 + 85°

Eastern Intersector

PM,

0 9.18.
+ 50 9.32
1 8.25
+ 50 9.00
2 6.14
+ 50 4.84
3 5.21
+ 50 2.64
4 0.68
+ 27.3 9.12
+ 50 8.86
5 7.80
+ 50 6.65
6 5.40
+ 50 3.75
7 4.56
TP + 50 171
7 + 98 1027
8 + 50 10.22
9 8.69
T 58.5 6.63
PM, 6.71

162.88 9.41

158.17

58.40 146.54
53.26 147.70
54.33 149.07
53.08 150.43
56.44 151.80
58.02 153.16
57.37 154.52
59.92 155.89
61.80 157.25
62.91 158.62
63.47 159.51
64.23 159.64
65.38 160.77
66.63 161.90
68.28 163.03
67.47 164.16
70.32 165.28
71.60 166.37
71.65 167.54
73.18 168.67
75.24 170.00
75.16 -

72.03 10.13

81.87 11.05

14" Pipe

30

M.H. Sta 30 + 85.5. Outfall.

706

556

526

265

464

486

285

403

465

491

496

459

461

473

525

331

504

523

411

451

524

Old stake

31 M.H. Aug R. 15° 27'

34

M.H. Aug R. 7° 53'

1251/63

15

Eastern

14"

16

10	6.43	81.87		75.44	171.04	4.40
+10	4.58			77.29	72.29	5.00
11	3.16			78.71	73.55	5.16
T.P. +50	1.15	90.12	9.40	80.72	74.80	5.92
12	7.88			82.24	76.05	6.19
+10	9.11			81.01	77.31	3.70
13	6.24			83.88	78.56	5.32
+10	5.69			84.43	79.81	4.62
14	4.20			85.92	81.06	4.86
+25	2.84			87.28	81.69	5.59
+10	3.86			86.26	82.32	3.94
15	7.8	100.64	13.00	87.64	83.57	4.07
+50	10.20			90.44	84.82	5.62
16	8.88			91.76	86.08	5.58
+10	9.52			91.12	87.33	3.79
17	7.28			93.36	88.58	4.78
+10	5.57			95.07	89.84	5.23
18	2.82			97.82	91.09	6.73
+57	1.49			99.15	102.52	6.63
	205	207.94	9.35	198.57	194.2	5.12
	471			208.94		5.12

M. H. 3.5

3.2

36

M. H. ang R. 12 Blume interm
 5/12
 5/12
 VV
 " " ang pit 205.36 to check.

B. Line deflects L 92° 17'
 " " Length 4+21.7
 C " ang L 67° 25' Sta 24+24.8

3+3 Blk cor. Pearl & Hugo
 from Sta 2 on 6' offset line
 ang SW 96° 40' - 13.6'

B Line 8" Sewer

B.M.	211.98	1283	199.15	
0	12.83		199.15	193
0 + 50	4.25		207.73	96.91
1	7.35		204.63	200.82
+ 50	3.42		202.56	04.74
TP	0.95	23.73	12.70	11.03
2	9.85		13.88	08.65
+ 50	5.52		18.21	12.56
3	2.12		21.61	16.47
TP	0.40	32.95	9.62	28.83
+ 50	8.42		24.53	20.38
3 + 65	1.69		31.26	23.12
B.M.	310	35.11	5.26	29.85
4 + 21.7	1.06		34.05	226.0
			226.2	

Sta 18+57 E.I. Drop 11.11
Taken off Sta 18+57.21

615
1082
381
332
5235
5650
5141
415
814
805
735

old stake City elev. 229.9

6" Latral from North

37.

C, Line B^u Lower

		227.44	11.85	215.59	
0+00	11.85			15.59	205.5
0+50	6.29			21.15	13.05
1,	6.11			21.33	18.31
T.P. +50	292	34.92	10.40	24.52	19.56
2	8.09			26.83	22.82
4+00	3.68			31.24	26.07
+73.4	3.89			31.03	27.60
3, T.P.	2.64	44.86	12.58	32.28	29.14
+50	7.94			36.92	32.05
4	6.36			38.50	34.95
+50	2.90			41.96	37.85
T.P.	0.53	56.33	12.00	44.33	
5	10.28			46.05	40.75
+38.7	8.30			48.03	43.0
+50	7.43			48.90	43.61
6 T.P.	0.85	65.10	9.62	55.48	46.32
+50	8.97			56.13	49.02
7	6.94			58.16	51.73
+50	6.23			58.87	54.44
+97.4	1.13			63.97	57.00
mm	3.76			61.34	
				57.20	

F.B. 523
A

Aug 69°33' from Eastern

579	38
810	
502	
496	
401	
517	
343	
314	
487	
355	
411	
530	
503	
529	
916	
711	
643	
443	
697	
677	

6" Lateral from North
39 M.H. Aug L 31°15'

40 M.H. Aug L 20°26'

M.H. 41

6" Lateral from North

Eastern Continued

18+57.9M	210.18	11.03	199.15	93.00
19	12.22		197.96	94.25
+50	8.01		202.17	95.70
20	7.24		02.94	97.16
+50	7.38		02.80	98.61
21	3.52		06.66	00.07
+50	1.35		08.93	01.52
22	3.10		07.07	02.98
TP	0.79	21.07	07.39	—
+50	11.00		10.07	04.43
23	10.62		10.45	05.89
+50	8.09		12.98	07.34
24	11.45 (38)		14.76	08.80
+24.8	6.48		15.57	09.50
Bm.	7.29		13.78	—
+50	5.46		15.61	10.04
25	4.40		16.67	11.10
+50	3.22		17.85	12.16
26	TP	31.35	19.29	13.23
+48	13.3	12.06	18.0	—
+60	9.92		21.43	14.50
27	6.72		24.63	16.28
+50	4.42		26.93	18.51
28	5.96		25.39	20.73
+50.9	3.10		28.25	23.00
	3.18		28.17	—

6.15

36
MH Inlet,

3.71

6.47

5.78

4.19

6.59

7.31

4.10

5.64

4.56

5.64

5.96

6.09

5.57

5.57

5.69

6.06

6.93

8.35

8.42

4.66

5.25

old hub

Rate + 2.91

X

old hub

5.57

5.57

5.69

6.06

6.93

8.35

8.42

4.66

5.25

old hub

38
M.H. Intersect C. Line ang R2.01

old hub C. Line

5.57

5.57

5.69

6.06

6.93

8.35

8.42

4.66

5.25

old hub

6" lateral from M.

M.H. ang L 1°58'

43

Grade sheet
to him

Eastern - Continued

20

28+501		4085	12.60	28.25	23.00
29.	11.85			29.00	24.17
+50	9.63			31.22	25.36
30	7.47			33.38	26.55
+50	6.02			34.83	27.74
31	5.01			35.84	28.92
+50	7.21			36.64	30.11
32.	4.40			36.45	31.30
+50	5.08	48.42	12.65	35.77	32.49
33	8.00			40.42	33.68
+50	4.69			40.70	34.87
+77.6	4.30			44.12	35.50
+77.6	5.13			43.29	
				237.8	
				236.0	
				237.0	
		57.14	13.85	43.29	
34	14.05			43.09	36.45
+50	11.33			45.81	38.57
35.	9.50			47.64	40.69
+60.8	8.30			48.84	43.28
36	5.67			51.47	44.94
+50	3.05			54.09	47.06
37, TP	1.18	69.52	13.56	55.96	49.18

Continued on P. 23.

5.25
4.83
5.86
6.83
7.09
6.92
3.53
5.15
3.28
6.74
8.86

+2.3375

8.62
old hub D line. ⁴⁴ M.H. Aug R. 10° 17'
D line intersects Aug L. 67°
8" lateral from 71 232.8
Branch D joins 8" sewer
E. I.

6.64
7.24
6.95
5.56
6.53
7.03
6.78

4.244

M.H. Aug L. 23° 51'

D Line - 8" Pipe

0 = 33+77.6 Eastern	59.05	15.76	43.39	36.00
0 + 50	8.81		50.24	38.00
1	5.97		53.08	40.00
+ 50	13.76		45.29	41.99
2	71.23		47.82	43.99
+ 50	9.62		49.43	45.99
3	7.83		51.22	47.98
+ 50	5.73		53.32	49.98
4 T.P.	2.09	73.85	56.96	51.98
+ 50	17.25		56.60	53.97
5	12.43		61.42	55.97
+ 50	10.86		62.99	57.97
6	9.85		64.00	59.96
T.P.	0.55	88.57	15.27	73.30
T.P.	0.38	99.84	11.65	88.19
6 + 67	1.00		98.84	62.64
7 + 44	1.34		98.50	65.71
T.P.	16.44	83.40	0.00	83.40
Flare line Culvert	10.80		72.50	—
81	9.73		73.67	67.95
+ 50	8.30		75.10	69.95
9	7.74		75.66	71.95
+ 50	3.93		79.47	73.94
10 + 01.6	2.82		80.58	276.00
old stake	3.26		80.14	—

6' Offset Right

21

Angle L. 67° from Eastern 44
 729 old hub (D. line) Intersect with Eastern
 8" from North 237.8

12.24

13.08

3.30

3.83

3.44

3.24

3.54

4.98

2.63

5.45

5.02

4.04

307.5

522

13

M.H. 45

490

36.20

32.79

21 pipe

5.22

5.15

3.71

5.53

4.58

8103 11

8" from N. 276.00
 6" from S. 276.20
 M.H. End. 46

check level on D line

MM.
7+44, D. 6,10- 304.67 2.78 301.89
98.52

42 + 307 Eastern = 89.68 15.70 73.98 70.30
Sta 0 + 50 11.03 78.65 74.43
1 5.42 84.26 78.57
+ 47.5 1.38 88.30 82.50
old hub, 210 87.58 —

Eastern Contained

45 + 497 16.98 11.46 05.52 99.80
+ 75 8.27 08.71 99.85
46 - 5.75 11.23 99.90
+ 25 3.57 13.39 99.95
T.P. + 50 1.93 22.24 7.19 15.05 00.00
+ 75 5.45 16.79 00.05
47 4.09 18.15 00.10
+ 25 4.07 18.17 00.15
+ 50 3.23 19.01 00.20
+ 75 2.56 19.68 00.25
48 3.59 18.65 00.30
+ 25 6.81 15.43 00.35
+ 50 9.59 12.65 00.40
+ 75 10.72 11.52 00.45

curb M.W. av. Stockton Cluster

3.68 827 M.H. angles L. 129° 08'
4.22 from Eastern.
5.69
5.50

M.H. - End.
8" intersects 282.50 from North

5.72

MWH 51

8.86

11.33

13.44

15.05

16.74

18.05

18.02

18.81

19.43

18.35

15.08

12.25

11.07

M H 52

Eastern - Continued from P. 20

23

69.52

37+50	9.11			60.41	57.30
38.	5.84			63.68	53.42
+50	8.72			60.80	55.54
39.	3.58			65.94	57.67
+40.8	3.57			66.01	59.40
40.	2.05	83.67	16.20	67.47	61.53
+50	6.06			77.61	63.32
41.	5.60			78.07	65.11
+45	9.00			74.67	66.72
42.	11.10			72.57	68.69
+307	8.69			73.98	69.80
+50	8.53			75.14	71.11
T.P.	1.06	97.16	14.55	82.61	—
43.	10.57			86.59	74.57
+50	10.54			86.58	77.91
44+01.5	9.20			87.96	81.40
" L.	8.31			88.85	—
B.M.	8.32			88.84	—
T.P. +50	1.08	310.78	14.70	96.08	87.40
45	8.22			02.06	93.61
+49?	5.26			05.52	99.50
T.P.	2.69	20.58	12.49	08.09	—
46	9.35			11.23	99.90
+50	5.53			15.05	00.00
47	2.43			18.15	00.10

9.11				
10.26				
5.26				
8.27				
6.61	X			
5.94				
14.29				
12.96				
7.95				
3.88				
4.18	X			
4.03				
12.08				
8.67				
6.56	X			
8.68				
8.45				
5.72	X			
11.33				
15.05				
18.05				

47
M.H. Ang R. 6° 42'

E line intersects 70.30
Manhole Intersect E line
48

8" from 18.28500 - 294
M14 Ang R. 89° 05'
50

old hub. 44+03 old stationing

51
M.H. Ang L. 29° 01'

Grade sheet
from here

Eastern Continued

		20.58			
MM	1.30			19.28	—
47+50	1.57			19.01	0020
48.	1.93			18.65	0030
+ 50	7.93			12.65	0040
+ 75 ³	9.06	15.38	3.86	11.52	0045
49	5.19			10.19	0047
+ 25	6.45			08.93	0050
+ 50	7.78			07.60	0053
+ 75	9.01			06.37	0055
50.	10.17			05.21	0058
+ 25	10.65			04.73	0061
+ 50	11.29			04.09	0063
+ 75	11.00			04.38	0064
51	9.82			05.56	0068
+ 25	7.82			07.56	0071
+ 50	6.54			08.84	0074
+ 75	4.65			10.73	0076
52	3.02			12.36	0079
+ 10 ⁶	2.09			13.29	0080
+ 25	0.87	27.13	12.62	14.51	0900
+ 50	10.90			16.23	10.00
+ 75	9.21			17.92	10.63
53	7.80			19.33	11.26
+ 25	6.16			20.97	11.89
+ 50	4.94			22.19	12.52

cut. Fairmount check. 272

18.81

18.35

12.25

11.07

9.72

8.43

7.07

5.82

4.63

4.12

3.46

3.72

5.88

6.85

8.10

9.97

11.57

12.49

4.29

5.15

6.23

7.29

8.07

9.08

9.67

0.20

BM-332.07- N.W. Fairmount
+ Clark - Brass plug. B32 P8

MH #52

M.H. ally. E. 7 Fairmount Aug. 48° 12'

8" from North 308.0 cut 3.52

6" " South 301.2 cut 10.32

St. Grade MH. 311.45 - 5.270

0.1044

St. Grade - MH. 313.3
Grade - 3.570

Drop Manhole

8" stub from N. 06.00
cut 7'-3 1/2"

2.526

Eastern.

27.13

50 + 25 4.22
 54 + 25 4.23
 + 50 4.05
 + 75 3.77
 + 75 3.45
 55 3.31
 + 25 3.05
 + 45.6 2.74
 TP + 75 2.30
 56 8.60
 + 25 8.49
 + 50 8.16
 + 75 7.83
 57 7.34
 + 25 6.91
 + 50 6.50
 + 75 6.15
 58 5.75
 + 25 5.20
 + 50 4.72
 + 75.4 3.98
 59 3.72
 + 25 3.23
 + 50 2.57
 + 75 2.11

33.70

8.87

22.91 13.15
 22.90 13.78
 23.08 14.41
 23.36 15.04
 23.68 15.68
 23.82 16.31
 24.08 16.94
 24.39 17.46
 24.83 17.49
 25.10 17.51
 25.21 17.54
 25.54 17.56
 25.87 17.59
 26.36 17.61
 26.79 17.64
 27.20 17.66
 27.55 17.69
 27.95 17.71
 28.50 17.74
 28.98 17.76
 29.72 17.79
 29.98 17.81
 30.47 17.84
 31.13 17.86
 31.59 17.89

9.76
 9.12
 8.67
 8.32
 8.00
 7.51
 7.14
 6.93
 7.34
 7.59
 7.67
 7.98
 8.28
 8.75
 9.15
 9.54
 9.86
 10.24
 10.76
 11.22
 11.93
 12.17
 12.63
 13.27
 13.70

M#54

2.526

Grade sheet to here.

St. Grade 324.2 - 1.170
 X M.H. 1. Stud from N. 84
 321.00
 Let Highland
 + Caballo
 45th

0.10

(45th)
 But Caballo + Chamorro
 M.H. - 6" from N. 325.00

3370

60	1.56		32.14	17.91
+25	1.08		32.62	17.94
+554	0.95		32.75	17.97
Bin.	0.65	38.75	33.05	—
+564	5.82		32.93	17.97
+75	6.05		32.70	17.99
61	5.95		32.80	18.01
+25	5.96		32.79	18.04
+50	5.96		32.79	18.06
+75	5.95		32.80	18.09
to here			32.91	18.11
62	5.84		32.95	18.14
+25	5.80		33.08	18.16
+50	5.67		33.11	18.19
+75	5.64		33.10	18.21
to here			33.29	18.24
63	5.65		33.28	18.26
+25	5.46		33.57	18.29
+50	5.47		33.54	18.31
+75	5.24		33.52	18.34
64	5.21		33.60	18.36
+25	5.23		33.62	18.39
+50	5.15		33.81	18.42
+75	5.13		33.71	18.44
65	4.94		34.01	18.46
+25	5.04			
+50	4.74			

14.23	
14.68	0.10
14.78	
Brass plug NW, cor. Chamorro & Center	city notes 56
Offset East.	
14.96	
14.71	
14.79	
14.75	
14.73	
14.71	
14.80	
14.81	
14.92	
14.92	
14.89	✓
15.05	
15.02	
15.22	
15.23	
15.18	
15.24	
15.23	
15.39	
15.27	
15.55	

M.H. 57

		38.75				
65	+75	467		34.08	1849	15.59
66		468	40.36	6.33	34.07	1857
	+25	630			34.06	1854
	+50	630			34.06	1856
	+75	620			34.16	1859
67		589			34.47	1861
	+25	531			35.05	1864
	+50	506			35.30	1866
	+75	508			35.28	1869
M1		441			35.95	—
68		535			35.01	1871
	+25	549			34.87	1874
	+50	565			34.71	1876
	+75	576			34.60	1879
69		605			34.31	1881
	+25	612			34.24	1884
	+50	636			34.00	1886
	+75	640			33.96	1889
70		646			33.90	1891
	+25	652			33.84	1894
	+50	670	35.09	1.43	33.66	1896
	+75	196			33.13	1899
71		250			32.59	1901
	+25	312			31.97	1904
	+50	395			31.14	1906
						15.56
						15.52
						15.50
						15.57
						15.86
						16.41
						16.64
						16.59
						—
						16.30
						16.13
						15.95
						15.81
						15.50
						15.40
						15.14
						15.07
						14.99
						14.90
						14.70
						14.14
						13.58
						12.93
						12.08

0.10
0.10
Black NW cor. in curb,

M.H. 58

35.09

71+75 493
72 592

+25 673

+50 758

+75 850

73 935

+25 10.03

+50 10.95

+75 11.60

74 11.72

+163 11.52

B.M. 11.04

+163

+7.00

H.I.

31.05

7.97

+50 7.75

+75 76.93

75 76.35

+25 75.95

+50

+75 5.45

76 5.00

+25 4.61

+50 4.18

+75 3.66

77 3.07

+063 2.98

30.16 1909

29.17 1911

28.36 1914

27.51 1916

26.59 1919

25.74 1921

25.06 1924

24.14 1926

23.49 1929

23.37 1931

23.57 1933

24.05

23.57 319.50

23.08 319.88

23.30 20.16

24.12 20.45

24.70 20.73

25.10 21.01

25.60 21.29

26.05 21.58

26.44 21.86

26.87 22.14

27.39 22.42

27.98 22.71

28.07 23.78

11.07

10.06

9.22

8.35

7.40

6.53

5.82

4.88

4.20

4.06

4.24

Brass plug in curb. NW cor Howard & Chambrine

Revised Grade 9-6-21 Small

320.10

20.48

20.76

21.05

21.33

21.61

21.89

22.18

22.46

22.74

23.02

23.31

23.38

Howard St = Dwight St

(Old No. - 74 + 132)

M.H. Center Howard, 59

City Bm.

Richards

8-31-21

1.131 %

Grade Sheet #1

Raise 0.6

M.H. 60

Raise 0.6
Grade sheet to here

Chamoune - E.I

Raise 0.5

Smole
Richards
9-1-21

29

Sta	+	HI	-	Elev	Grade
77 +062	7.72	35.79		328.07	322.78
+25			7.31	28.48	22.98
+50			6.60	29.19	23.27
+75			5.88	29.91	23.56
78			5.00	30.79	23.84
+25			4.15	31.64	24.12
+50			3.43	32.36	24.40
+75			2.52	33.27	24.69
79			1.62	34.17	24.97
+25 TP			0.73	35.06	25.25
+50	8.29	43.35	7.36	35.99	25.53
+75			6.41	36.94	25.82
80			5.46	37.89	26.10
+25			4.56	38.79	26.38
+50			3.66	39.69	26.66
+75			2.64	40.74	26.95
81			2.04	41.31	27.23
+132			1.79	41.56	27.38
B.M.			2.32	341.03 (340.99)	

Revised Grades - 9-6-21

529	23.38	4.69
550	23.56	4.92
592	23.81	5.38
635	24.05	5.86
695	24.30	6.49
752	24.54	7.10
796	24.79	7.57
858	25.04	8.23
920	25.28	9.89
981	25.53	9.53
10.46	25.77	10.22
11.12	26.02	10.92
11.79	26.26	11.63
12.41	26.51	12.28
13.03	26.75	12.94
13.76	27.00	13.71
14.08	27.24	14.07
14.18	27.38	14.18

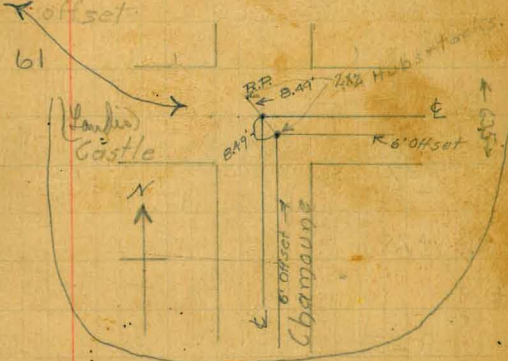
Grade
Sheet # 2

Brass plug - NW Cham

M.H. & Castle east 61
L.H. & Castle

Smale
Richards
9-2-21

NW cor Chamoune - (Brass plug)



R.P. 25' N. on alley &
M.H. #62 Alley Chamouné

2" Stub 1000 16TH (36+0.25)
 MH 63 Allen Mentone - Meola
 (R.R. 25' N. on 6 Allen)

Station	BS	Castle H.I. +351.05	FS	Elev.	Grade	2.2%
86+25			3.61	47.44	28.40	
+50			5.06	45.99	28.45	
+75			6.28	44.77	28.50	
87			7.70	43.35	28.55	
+25			9.86	41.19	28.69	
TP-87+25	0.95	+42.14				
+50			2.53	39.61	28.65	
+75			3.91	38.23	28.70	
88			5.04	37.10	28.75	
+25			5.75	36.39	28.80	
+50			6.28	35.86	28.85	
+75			5.83	36.31	28.90	
89			5.52	36.62	28.95	
+25			5.04	37.10	29.00	
+38 1/2			4.87	37.27	329.03	
TP-89+38 1/2	5.04	342.31		37.27		
+50			4.83	37.43	329.05	
+75			4.10	38.21	329.10	
90			3.63	38.68	329.15	
+25			3.06	39.25	329.20	
+50			2.81	39.50	29.25	
+75			2.93	39.38	29.30	
91			2.55	39.76	29.35	
+25			2.67	39.64	29.40	
+50			2.10	40.21	29.45	
TP-91+50	6.84	47.05		40.21		
+75			6.24	40.81	29.50	
92			5.56	41.49	29.55	



Synale Levels 31
Chisholm 9-21-21
Line staked 9-2-21

Grade Sheet #5 - Issued 9-21-21

Levels to here 9-21-21
8' step 100 ft
(89+36.9)
M.H. #64 - Alley Manito-Serra
R.R. 25' N. of E. alley

Grade Sheet #8
10-10-21

All Levels
be tied in to a Bench
for a check
Found
Oct 10, 1921
9:25 AM

Eastern Interceptor

Station	+	HI	-	Elev.	Grade
97 + 50		48.755	9.25	39.50	30.82
+ 75			11.47	37.285	30.87
TP-97+75	8.72	46.005	10.37	35.63	30.92
98			11.76	34.25	30.97
+ 25			12.74	33.26	31.02
+ 50			11.31	34.69	31.07
+ 75			9.10	36.90	31.12
99			7.46	38.52	31.17
+ 25 (33 MH)			6.61	39.39	31.22
+ 50			5.68	40.32	31.28
+ 82 MH			5.57	40.43	31.32
100			4.97	41.03	31.37
+ 25			4.10	41.90	31.42
+ 50			3.50	42.50	31.47
+ 75			3.15	42.85	31.52
101			2.88	43.12	31.57
+ 25			2.66	43.34	31.62
+ 50			2.09	43.91	31.67
+ 75			1.80	44.15	31.72
102			1.63	44.32	31.77
+ 25			1.98	44.025	31.82
+ 50			1.54	43.82	31.87
TP-102+50	1.34	45.365	2.10	43.26	31.92
+ 75			2.66	42.70	31.97
103			3.07	42.29	32.02
+ 25			3.67	41.69	32.07
+ 50					
+ 73 ¹⁸ MH					

Synale 10-10-21 33
Chisholm Staked.
Levels run with transit 10-13

Cut

8.68

6.40

4.71

3.28

2.24

3.62

5.78

7.35

8.17

9.04

+ 82 - M.H. # 67 1/2

7.11

7.66

10.48

11.03

11.33

11.55

11.72

12.24

12.43

12.55

12.20

11.95

11.34

10.73

10.27

9.62

RP (2x2) E 16' - (1x2) W 19' from E
MH # 68

Staked to here 7-21-21

Grade Sheet #11
Issued 10-17-21

RP (2x2) E 16' - (1x2) W 19' from E

M.H. 67 - 99 + 35

68 - 104 + 35

68 1/2 - 107 + 35

Grade Sheet #12 - Issued 12-19-21

Staked to here 10-10-21

Eastern Interceptor

Synale Chisholm staked 10-11-34
Levels run with transit 10-13

Sta.	+	HI	-	Elev.	Grade	Cut
		44.365			.2%	
104-			4.59	40.77	32.12	8.65
+25			5.73	39.63	32.17	7.46
+50			7.39	37.97	32.22	5.75
+75			8.78	36.68	32.27	4.41
105			11.15	334.215	32.32	0.189
IP 10.5	8.68	42.895		334.215		
+25			10.65	32.24	32.37	P 0.13
+50			11.90	30.99	32.42	F 1.43
+75			11.34	31.55	32.47	F 0.92
106			11.49	31.40	32.52	F 1.12
+25			10.58	32.31	32.57	F 0.26
+50			9.16	33.73	32.62	C 1.11
			6.90	35.99	32.67	3.32
107			4.21	38.68	32.72	5.96
+24.15			2.01	40.88	32.77	8.11
BM	Finish 10-13-21	2.85	340.545	340.63		
BM				340.63	340.63	
108+14.92	2.95	343.58	3.54	40.04	32.95	7.09
+50			3.99	39.59	33.02	6.57
+75			4.13	39.45	33.07	16.38
109			4.25	39.33	33.12	6.21
+25			4.60	38.98	33.17	5.81
+50			4.84	38.74	33.22	5.52
+75			5.07	38.51	33.27	5.24

2x2 Hubs + tacks on E + 6' offset E.
1x2 R.R. E 10' + W 15' from E.

M.H. #68 5' S of S.L. Univ.

Brass plug N.W. cor Univ. + Euclid (Book 82-Page 2)

Grade Sheet #

M.H. #69 - 11' E of Euclid - 5' N of N.L. Univ. Ave.

Eastern Interceptor ctd.

Small } 11-23-21 35
Chisholm }
Levels with transit

Sta.	+	HI	-	Elev.	Grade	Cut.
		343.58				
110			5.31	338.27	333.32	4.95
+25			5.56	38.02	33.37	4.65
+50			5.82	37.76	33.42	4.34
+75			5.97	37.61	33.47	4.14
111			6.32	37.26	33.52	3.74
TP	+25		6.48	337.10	33.57	3.53
+50	8.95	346.05	7.03	37.02	33.62	3.40
+75			8.80	37.25	33.67	3.58
112			8.27	37.78	33.72	4.06
+25			7.45	38.60	33.77	4.83
+50			6.60	39.45	33.82	5.63
+75			5.71	40.34	33.87	6.47
113			4.98	41.07	33.92	7.15
+25			4.22	41.83	33.97	7.86
+50			3.39	42.66	34.02	8.64
+75			2.72	43.33	34.07	9.26
114			1.75	44.30	34.12	10.18
IP			0.99	345.06	—	
+28.99	365	48.71	2.72	45.97	34.18	11.79
BM-	2.94	343.57			340.63	
	9.37	346.54	6.40	337.17		
114.11	9.47	354.32	1.69	344.85		

Grade Sheet #15 issued 11-19-21

MH #70 No R.P.

Grade Sheet #16 issued 11-19-21
Stakes on 3' offset W.

MH #71 2x2 Hub & track 5'E & 6'S of M.H. center
Angle to East

Brass plug Univ. & Euclid.

MH #71 2x2 on 10' offset at E end.

Eastern Interceptor - ctd.

Gradient - .2%

Small } 10-31
Chishdm }
Levels with transit.
Rods reduced by V.M.S.

34

Sta.	+	H.I.	-	Elev.	Grade	Gut
114 +29.31		354.32				
+50			6.35	45.97	334.18	11.79
+75			7.07	47.25	34.22	13.03
115			4.48	49.84	34.27	15.57
+25			3.41	50.91	34.32	16.59
+50			3.57	50.75	34.37	16.38
+75			4.27	50.05	34.42	15.63
115 + 30.33			5.56	48.76	34.47	14.29
TP ↑	4.22	352.42	6.12	348.20	34.48	13.72
116				348.20		
+25			4.53	47.89	34.52	13.37
+50			4.72	47.70	34.57	13.13
+75			4.85	47.57	34.62	12.95
117			5.29	47.13	34.67	12.46
+25			5.75	46.67	34.72	11.95
+50			6.42	46.00	34.77	11.23
+75			7.21	45.21	34.82	10.39
118			8.69	43.73	34.87	8.86
+25			10.67	41.75	34.92	6.83
TP	5.18	345.28	12.32	340.10	34.97	5.13
+50				340.10		
+75			5.74	39.54	35.02	4.52
+88.88			5.92	39.36	35.07	4.29
			5.77	339.51	35.10	4.41

MH #71 - on 10' offset Euclid
Polk #4 P.I. 2x2 on P.I. 6'S + 5'2"E
+ on paramen P.I. 6 N + W. of M.H.G.
6 1/2

Grade Sheet #17 - issued 11-2-'21

Relay B of Euclid
M.H. #72 - 2x2 Hub + tack on P.I.
6' offset S. + E. also N. + W. - 17' across G.

Grade Sheet #18 issued 11-3-'21

M.H. #73 - 2x2 Hubs + tacks 15'E + 13'W
of E.

Eastern Interceptor - ctd.

Smyale } 11-1-21 31
Chisholm }
Levels with transit.

Sta.	+	H.I.	-	Elev.	Grade 2%	Cut.
118+88.88	6.35	345.86		339.51	35.10	4.41
119-			6.77	39.19	35.12	4.07
+25			7.11	38.75	35.17	3.58
+50			6.70	39.16	35.22	3.94
+75			6.59	39.27	35.27	4.00
120			6.19	39.67	35.32	4.35
+25			5.02	40.84	35.37	5.47
+50			3.70	42.16	35.42	6.74
+75			2.41	43.45	35.47	7.98
121			2.37	43.49	35.52	7.97
+25			1.97	43.89	35.57	8.32
+50			2.11	43.75	35.62	8.13
+75			1.47	44.39	35.67	8.72
122			1.14	44.72	35.72	9.00
+18.59			0.32	345.54	35.76	9.78
TP 122+18.59	7.75	353.29		345.54		
BM-			2.66	350.63	350.60	
BM 122+18.59	6.17	51.71		345.54		
122+50			6.24	45.47	35.82	9.65
+75			5.93	45.78	35.87	9.91
123			5.63	46.08	35.92	10.16
+25			5.47	46.24	35.97	10.27
+50			4.96	46.75	36.02	10.73
+75			4.62	47.09	36.07	11.02

MH#73

Grade Sheet #19 - issued 11-3-21

ORANGE AVE.

At Alley Between Euclid & 48th

M.H. 74 - 2x2 Hub + tack - E 15' & W 15'
from & - 2x2 Hub + tack on 6' offset.

Grass plug - N.W. Euclid & Orange - Book 82 Page 2

Grade Sheet #20 - issued 11-8-21

Eastern Interceptor - Ctd.

Small } 11-7-21
Chisholm }
Levels with transit.

38

Sta.	+	HI	-	Elev.	Grade
		351.71			.2%
124			4.70	47.01	36.12
+25			4.45	47.26	36.17
+50			4.55	47.16	36.22
+75			4.31	47.40	36.27
125			4.35	47.36	36.32
TP A	4.21	51.57		47.36	
+25			4.38	47.19	36.37
+53 ⁵⁹			4.13	47.44	36.43
+75			4.53	47.04	36.47
126	7		4.70	46.87	36.52
+25			5.24	46.33	36.57
+50			5.28	46.29	36.62
+75			5.78	45.79	36.67
127			6.12	45.45	36.72
+25			6.34	45.23	36.77
+50			7.20	44.37	36.82
+75			8.45	43.12	36.87
TP A	4.96	48.08		43.12	
128			5.49	42.59	36.92
+25			6.66	41.42	36.97
+50			6.77	41.31	37.02
+88 ⁷⁸			6.22	41.86	37.10
TP			2.14	45.94	—
✓	7.62	53.56		45.94	—
BM			2.93	50.63	5.B. 350.60

Cut.

10.89

11.09

10.94

11.13

11.04

10.82

11.01

10.57

10.35

9.76

9.67

9.12

8.73

8.46

7.56

6.25

5.67

4.45

4.29

4.76

Grade Sheet #20 - issued 11-8-21

(TROJAN)
M.H. #75 - Bet. Orange & Florence
2x2 Hub + tack on 6' offset E.
2x2 - R.P. W 10' + E 15'

In Alley Blk 33, City Hts.

Grade Sheet #21 - issued 11-8-21

Now TROJAN AVE
M.H. 75 1/2 - @ Florence -
2x2 Hub + tack on 6' offset E.
2x2 R.P. - W 15' + E 15' from E.

Brass plug - NW Euclid + Orange.
Book 82 Page 2

Eastern Interceptor ctd.

Sta.	+	HI	-	Elev.	Grade .290	Cut
128+88.78				341.86	337.10	4.76
129	6.82	48.68	7.15	41.53	337.12	4.41
+25			6.62	42.06	37.17	4.89
+50			6.10	42.58	37.22	5.36
+75			5.61	43.07	37.27	5.80
130			4.87	43.81	37.32	6.49
+25			4.26	44.42	37.37	7.05
+50			3.82	44.86	37.42	7.44
+75			3.08	45.60	37.47	8.13
131			2.47	46.21	37.52	8.69
+25			0.80	47.88	37.57	10.31
TP 1	6.90	54.78				
+50			6.78	48.00	37.62	10.38
+75			6.22	48.56	37.67	10.89
132			5.61	49.17	37.72	11.45
+25			5.05	49.73	37.77	11.96
+50			4.86	49.92	37.82	12.10
+75			6.76	48.02	37.87	10.15
133			5.59	49.19	37.92	11.27
+12.54 S/S Pavement			6.66	48.12	37.94	10.18 ←
+27.75 N/S ✓			6.55	48.23	37.98	10.25
+37.78			6.23	48.55	37.99	10.56
TP 1	4.37	52.54				
BM			7.62	344.92	341.98	

BT - S.W. curb El Cajon at Euclid $\frac{3}{72}$

Grade 11-15-21 39
Chisholm
Levels with transit
Rods red. by V.M.S.

Grade Sheet #22 - issued 11-16-21

10.18 ← El Cajon Ave. - Sta. 133+17.62

10.56 M.H. 76 - Alley E of Euclid - 10' N of
pavement on El Cajon Ave.
(20.13' N of El Cajon Ave.)

2x2 Hubs + tacks at M.H. center - at
P.I. 6' offset E of line S + 6' N. of
line W (9.64' to M.H. center) - also 15' SW
on line with P.I. + M.H. center.
6" Stub N - Elev. 341.0 1x2 for stub 6'

Eastern Interceptor ctd.

Sta.	+	HI	-	Elev.	Grade
TP(133)				349.19	—
133 + 50	2.98	352.17	3.52	48.65	38.02
+ 75			3.72	48.45	38.07
134			3.88	48.29	38.12
+ 25			4.05	48.12	38.17
+ 50			4.40	47.77	38.22
+ 75			4.97	47.20	38.27
135			5.54	46.63	38.32
+ 25			5.65	46.52	38.37
TP 1				346.52	—
✓	4.28	350.80			
135 + 50			4.34	46.46	38.42
+ 75			4.75	46.05	38.47
136			4.53	46.22	38.52
+ 25			4.25	46.55	38.57
+ 50			4.05	46.75	38.62
+ 76.2			3.99	46.81	38.67
137			4.12	46.68	38.72
+ 35.54			3.93	46.87	38.79
BM			5.88	344.92	344.73
TP(137+35.54)				46.87	—
137 + 50	5.32	52.19	5.17	47.02	38.82
+ 75			5.08	47.11	38.87
138			4.79	47.40	38.92

Small 211-18-21
Chisholm
Levels with transit.

40

Cut.

10.63

10.38

10.17

9.95

9.55

8.93

8.31

8.15

Grade Sheet #23

8.04

7.58

7.70

7.98

8.13

8.14 M.H. #77 - RP stub 5' - 2x2 Hubs + tacks
25' N + 50' on alley E.

7.96

M.H. - RP 2x2 Hubs + tacks 6' N + 5'
at right angle E of sewer.
(St. Grade 346.02)

8.08

M.H. #78 - Stub N on Granada - 2x2 Hubs
+ tacks 50' N + 33.5' S on E Granada.
2x2 Hubs + tacks - at PI 6' offsets
N. (St. Grade - 346.53)

8.20

8.24

8.40

BP - On Scurb El Cajon - W/S Euclid - B72 P3.

38.67
37.99
136 + 76
133 + 38
3 38
.68

Eastern Interceptor ctd.

Small 12-3-21 41
Chisholm
Levels with transit.

Sta	+	HI.	-	Elev.	2% Grade	Cut.
138+25		352.19	4.62	47.57	338.97	8.60
+50			4.41	47.78	39.02	8.76
+75			4.23	47.96	39.07	8.89
139			4.09	48.10	39.12	8.98
+100			4.00	48.19	39.17	9.02
+125			3.77	48.42	39.22	9.20
+150			3.62	48.57	39.27	9.30
140 TP			3.35	48.84	39.32	9.52
+102	5.71	54.55	3.50	49.05	39.34	9.71
+25			3.40	49.15	39.37	9.78
+50			5.17	49.38	39.42	9.96
+75			4.89	49.66	39.47	10.19
141			4.78	49.77	39.52	10.25
+25			4.55	50.00	39.57	10.43
+50			4.23	50.32	39.62	10.70
TP +79 ³⁸			3.91	50.66	39.67	10.99
BM-	6.30	56.95	1.42	55.53	55.60	
TP 141+79 ³⁸				50.66		
142	5.49	56.15	5.30	50.85	39.72	11.13
+25			5.10	51.05	39.77	11.28
+50			4.97	51.18	39.82	11.36
+75			4.71	51.44	39.87	11.57
143			4.32	51.83	39.92	11.91
+25			3.97	52.18	39.97	12.21
+50			3.70	52.45	40.02	12.43

check chaining
Sta 140+10.9

140+10.2 - #79

141+79³⁸ #

M.H. #79 - E Menlo - Sierra alley. 2x2 Hub & tack on 6' offset N. at 90° to E.E.I.
Stub south - R.P. (2x2 hub & tack) on alley E 25' N + 25' S from M.H. center.
(Sta. 140+10.2) (St. Grade 349.35)

M.H. #80 - E Menlo - Stub N. - R.P. (2x2 hub & tack) on E Menlo (north) 25' N + S from M.H. c.
2x2 Hub & tack at M.H. center & on 6' offset N. at 90° to E. (St. Gr. 351.22)

B.P. - S.W. Menlo + El Cajon - B82 - P4

Grade Sheet #27

Eastern Interceptor ctd.

Sta.	+	HI	-	Elev.	Grade
143+75		56.15	3.48	52.67	40.07
144 TP			3.12	53.03	40.12
+25	5.39	58.42	5.17	53.25	40.17
+50			5.13	53.29	40.22
+75			4.91	53.51	40.27
145			4.72	53.70	40.32
+25			4.66	53.76	40.37
+50			4.40	54.02	40.42
+75			4.18	54.24	40.47
146			4.01	54.41	40.52
+29 ²¹			3.63	54.79	40.58
BM			5.51	352.91	352.91
TP 146+29 ²¹				354.79	—
+50	5.32	360.11	5.05	55.06	40.62
+75			4.81	55.30	40.67
147			4.58	55.53	40.72
+25			4.25	55.86	40.77
+50			3.93	56.18	40.82
+75			3.62	56.49	40.87
148			3.32	56.79	40.92
+25			3.10	57.01	40.97
+50			2.78	57.33	41.02
TP +75			2.45	57.66	41.07
149	5.36	363.02	4.96	58.06	41.12

Small 12-221 42
Chisholm
Levels with transit.

Cut

12.60

12.97

13.08

13.07

13.24

13.38

13.39

13.60

13.77

13.89

14.21

Grade Sheet #27

M.H. #81 - 4 Monte Vista. 2x2 Hub & tack at center & on 6' offset N. at 90° to E.
Stub N. 2x2 Hub & tack 25' N. & S. from center. (St. Grade - 354.17)
Set Mcover .6 below grade stake.

B.P. S.W. Montoya & El Cajon - B&P P4.

14.44

14.63

14.81

15.09

15.36

15.62

15.87

16.04

16.21

16.59

16.94

Grade Sheet #28

Eastern Interceptor - ctd.

Sta	+	HI	-	Elev.	Grade	Cut
		363.02			2.9%	
BM-			6.52	356.50	356.56	
149 +25			4.89	58.13	341.17	16.96
+50			4.72	58.30	41.22	17.08
+79			4.44	58.58	41.27	17.31
150			4.25	58.77	41.32	17.45
+25			4.38	58.64	41.37	17.27
+50			4.42	58.60	41.42	17.18
+75			4.61	58.41	41.47	16.94
151			4.60	58.42	41.52	16.90
+25			4.68	58.34	41.57	16.77
+50			4.79	58.23	41.62	16.61
+75			4.80	58.22	41.67	16.55
152 TP			4.80	358.22	41.72	16.50
+25	3.93	362.15	3.88	58.27	41.77	16.50
+50			4.01	58.14	41.82	16.32
+75			4.01	58.14	41.87	16.27
153			4.04	358.11	41.92	16.19
+29			3.90	58.25	41.98	16.27
BM-			4.97	357.18	357.30	

Continued on Page 71.

Single 12-8 43
Chisholm
Levels with transit.

BP-S.W. El Cajon + Chamouge - B82 P4
Grade Sheet #28

MH #82 2x2 Hubs + tacks at MH center
+ on 6' offset N. at 90° to E.I.
St. Grade - 357.6

Grade Sheet #29

2x2 Hub + tack at center + 6' N at 90° to E

MH #83

BP-S.W. El Cajon + Cabrillo - B82 P4

56+78.82 High N

Bench Marks E.S.D.

Bravo Plug.

347.95

341.01

324.01

335.97

333.05

331.99 332.07

344.98

347.15

355.60

352.97

356.56

56.53

357.30

356.12

354.70

352.00

343.54

352.00

MW. cer. Chamame Klamben

" Castle

" Howard

" Clark

" Cuilar

MW. Fairmont & Clark

BP. S.W. Euclid + El Cajon

✓ ✓ Sierra ✓ ✓

✓ ✓ Menlo + ✓ ✓

✓ ✓ Montana ✓ ✓

✓ ✓ Chamame ✓ ✓

✓ ✓ Cabrillo ✓ ✓

✓ ✓ Highland ✓ ✓

✓ ✓ Colonial ✓ ✓

✓ ✓ Fairmont ✓ ✓

Book 32 - P 4.

Central + Castle. B32 - P 18.

✓ ✓ Upr. B61 - P 52

Western Intersector. 12" sewer

7-12-21, Bartlett Richards & Brown.

45

30 + 80.5 =

0		5864	524	153.40	46.50
	+ 50			52.99	46.66
1				48.85	46.81
	+ 50			53.57	46.97
2				53.02	47.12
	+ 50			53.77	47.28
3				54.23	47.44
	+ 20			53.22	47.50
	+ 50			52.28	48.17
4				54.43	49.29
	+ 50			55.21	50.41
5	T.P.	67.75	12.04	55.21	51.53
	+ 50			58.81	52.65
6	+ 50			57.65	53.88
	+ 50			58.65	54.89
7				62.27	56.01
	+ 62.2			61.90	57.40
8				62.64	58.03
	+ 50			64.22	58.86
9				68.32	59.69
	+ 50			68.50	60.52
10	T.P.	78.04	11.57	66.47	61.35
	+ 50			67.36	62.18
11				68.54	63.01
	+ 50			69.64	63.84

Revised
Cuts

Smale 210-4-21
Chisholm

Aug from Outfall L. 29012'

30

0.3/25-

X

2.24

X

1.66

87

M.H.

88

M.H. Aug L. 4001'

Western Continued

12"

46

78.04

12	7.11			70.93	64.67
+50	6.25			71.79	65.50
+80	8.91			69.13	<u>66.05</u>
13	8.70			69.34	66.42
+50	4.62			73.42	67.34
14	3.85			74.19	68.26
+50	2.70			75.34	69.18
15 T.P.	2.30	88.82	13.08	75.74	70.11
+50	10.50			78.32	71.03
16	8.80			80.02	71.95
+50	6.32			82.50	72.87
17	5.19			83.63	73.80
<u>16+96.3</u>	5.90			82.92	—
17 +50	11.08			77.74	74.97
18	9.99			78.83	76.15
+50	8.60			80.22	77.32
19	8.28			80.54	78.50
T.P. +50	3.14	93.13	7.45	85.68	79.67
20	6.06			87.07	80.85
+50	6.09			87.04	82.02
21	5.07			88.06	83.20
+21.3	4.56			88.57	83.70
old hub	4.13	99.59	10.59	89.00	—
21+50	10.29			89.31	84.28

6.26

6.29

3.08

2.92

6.08

5.93

6.16

5.63

7.29

8.07

9.63

9.83

old hub

2.77

2.68

2.90

2.04

6.01

6.22

5.02

4.86

4.87

5.03

M.H. 89 Grade sheet there

1.844

M.H. 90

2.35

91
M.H. any R. 15° 23'

Western. Continued
8" from sta 26 + 202

12"

47

99.59

22.	9.40			90.19	85.30	4.89
+50	8.30			91.29	86.32	4.97
23.	9.15			90.44	87.34	3.10
+50	7.89			91.70	88.36	3.34
24.	6.10			93.49	89.38	4.11
+50	4.35			95.24	90.40	4.84
25.	4.61			94.98	91.42	3.56
+50	2.70			96.89	92.44	4.45
26.	1.07	09.82	1130	98.52	93.46	5.06
+202	11.78			98.04	93.87	4.17
+50	10.23			99.59	94.59	5.00
27.	11.32			98.50	95.79	2.71
+50	8.41			01.41	96.99	4.42
28.	8.42			01.40	98.20	3.20
+50	5.07			04.75	99.40	5.35
29.	3.87			05.95	00.60	5.35
+50	3.10			06.72	01.80	4.92
30.	2.49			07.33	03.00	4.33
+50	2.32			07.50	03.76	3.74
31.	1.94			07.88	04.52	3.36
+50	2.37	19.06	1161	07.45	05.28	2.17
32.	10.67			08.39	06.03	2.36
+50	6.86			12.20	06.79	5.41
33.	7.11			11.95	07.55	4.40

2.04

#92

194.2 - 8"

X ← Intersect Central line
M.H. ang L. 34047'

8" River

2.404

X

M.H. 93

15.17

Western Continued 84

		19.06			
33+55	5.08			13.98	18.38
34+08.7	3.03			16.03	209.20
old hub,	3.48	27.97	12.39	15.58	212.60
+50	11.14			16.83	13.19
35	9.80			18.17	13.90
+50	8.69			19.28	14.61
36	9.90			18.07	15.31
+50	6.77			21.20	16.02
37	5.15			22.82	16.73
+50	3.86			24.11	17.43
37+90	2.80			25.17	18.00
38	3.25			24.72	18.30
+50	3.54			24.43	19.81
39	1.04	38.46	11.50	26.91	21.32
+50	10.04			28.42	22.84
40	10.60			27.86	24.35
+50	9.17			29.29	25.86
41	5.73			32.73	27.38
+50	4.50			33.96	28.89
+93.3	4.09			34.37	30.20
old hub	4.45			34.01	—
42+50	2.58			35.88	31.35
43	0.59	47.84	9.97	37.87	32.36
+50	9.69			38.15	33.38

5.60

6.83

3.43

3.64

4.27

4.67

2.76

5.18

6.09

6.68

7.17

6.42

4.62

5.59

5.58

3.67

3.43

5.35

5.07

4.17

—

4.53

5.51

4.77

#94

Drop M.H. aug R. 2015.

1.416

X

M.H. 95

3.022

to here

X

M.H. 96

Western - Continued

4284

44	887			38.97	34.40
+50	764			40.20	35.41
45	612			41.72	36.43
+50	3.33	53.97	946	44.51	37.45
46	600			47.97	38.46
+50	476			49.21	39.48
47	500			48.97	40.50
+50	421			49.26	41.51
+93.3	420			49.27	42.40
old hub	460	59.81	1044	49.37	42.40
48+50	869			51.12	46.79
49	782			51.99	48.02
+50	681			53.00	49.25
50	78	2.57	69.21	57.24	50.48
+50	1080		11.97	58.41	51.70
51	10.41			58.80	52.93
+50	914			60.07	54.16
52	957			59.64	55.39
+25	867			60.54	56.00
+50	789			61.32	56.67
53	679			62.42	58.01
+20	695			62.26	
+50	462			64.59	59.36
54	375			65.46	60.70
T.P. +50	1.57	79.60	11.96	67.64	62.05
55	10.62			68.98	63.39

49

4.57

4.79

5.29

7.06

9.57

9.73

8.47

7.75

6.87

5.87

4.33

3.97

3.75

6.76

6.71

5.87

5.91

4.25

4.54

4.65

4.41

5.23

4.76

5.59

5.59

2.033

2.46

X

2.69

97

M.H. ang L. 20.00'

98

(Drop M.H.) ang R. 24' 12'

101

Manhole

Western - Cont'd

7960

55 +50	10.38			69.22	64.74
56.	9.42			70.18	66.08
+38	8.10			71.50	67.10
+50	2.85			71.75	67.43
57	7.04			72.57	68.77
+50	3.71			75.89	70.12
58. T.P.	1.80	89.30	11.50	77.80	71.46
+42	8.06			72.60	74.80
old link.	8.10			81.24	74.80
59.	7.63			81.20	
+50	8.81			81.67	75.55
60.	6.75			81.49	76.26
+50	6.01			82.55	76.85
61	4.04			83.29	77.50
+18.8	5.07			85.26	78.15
old link	5.47			84.23	78.40
+50	4.57			88.83	78.57
T.P.	1.17	00.78	12.61	84.71	79.83
62.	12.45			88.13	
+50	9.85			88.33	81.85
63.	12.34			90.93	83.87
+50	7.38			88.44	85.89
64.	7.70			93.40	87.90
+50	2.05			93.08	89.92
+76.3	0.40			98.73	91.94
old link	0.55	12.11	11.88	00.35	93.00
				94.50	
				00.23	

306-3

4.48					
4.10					
4.40					
4.32					
5.79					
5.77					
6.34					
8.64					
6.44					
6.12					
5.29					
5.70					
5.79					
7.11					
5.83 outlet					
5.66 inlet					
4.88 ✓					
6.48					
7.06					
2.55					
5.50					
3.16					
6.79					
7.38 outlet					
5.88 inlet					
End of 8" pipe					

2.69

101 1/2

Maulole L. Castle 6" line from C 267.30 cut. 4.20

102

M.H. } ang L 26° 18' 6" line from North

1.30

103

M.H. } ang R 7°
Thine joins ang L 55° 58'
278.4 cut 5.83

4.04

106

M.H. } ang L 9° 35'

Western Cont'd

6" Pipe Begins 64+763
312.11

65	1095			301.16	95.31
+50	823			0388	97.01
66	1142			00.69	98.72
+50	815			03.96	00.42
67 T.P.	185	16.88	6.62	10.26	02.13
+50	820			08.68	03.83
68+134.	747			09.41	06.00
old hub	767			09.21	08.80
Floor line Cul.	795			08.93	—
T.P.	079	27.87	11.78	16.09	—
Floor line North	12.48			15.39	—
22+128	1043			17.44	16.00
old hub	1114			16.73	—
+50	962			18.25	16.33
73 T.P.	9.00	27.42	8.55	18.87	16.77
+50	655			20.87	17.21
74	509			22.33	17.64
+50	584			21.58	18.08
+875	436			23.06	18.40
old line	488			22.54	—

580

6.87

1.97

3.54

8.13

4.85

3.41

0.61

07.95

12.48

1.44

1.92

2.10

3.66

4.69

3.50

4.66

341

Culvert

0.879

107 { Aug R 140 141
Inlet 28' above outlet
12' iron pipe to
culvert.

108 { Aug L 11° 33'
M.H. { 24' iron pipe
to culvert

109 { 6" stub North
M.H. End { 6" stub South

Grade checks

37490 27.97 280 25.17
38

3.24
3.85

24.73
24.17

41493 38.29 392 34.37
609 37.20

47493 54.65 538 49.27
Brand 225 52.40
47450 52.40 49.25
Brand 3.20 51.45

45 47.52 520 41.72
4.09 43.43

717 27.97
2.50
25.47
1.00
7.47

3.24
2.65
6.59
7.01

2.10
2.50
7.30
3.77

4.17
2.83
7.00

J Line

8^m line

Bm.

94.45 106.2 83.83

0	10.70			83.75	78.40
+ 50	10.37			84.08	80.01
1	6.15			88.30	81.62
+ 22.2	5.05			89.39	82.33
+ 50	4.40			90.05	83.24
2	3.31			91.14	84.85
T.P. + 50	0.62	02.38	8.05	93.83	86.46
3	9.66			92.72	88.07
+ 50	8.59			93.79	89.68
4	5.61			96.77	91.30
+ 60	6.02			96.36	93.23
5 + 14.7	2.26			00.12	95.00
old hub.	2.00			00.35	

53

61 + 18.8 old hub. p 50.

103

Diff ang from
Western 55° 58'

5.35

4.07

6.68

7.06

6.81

6.29

7.37

4.65

4.11

5.47

3.13

5.12

M.H.

32225

cut 6.85

6" from N 282.57
ang R. 0° 55'

105

M.H.

6" - 295.20. M.H.

cut 4.9 - 4.11"

I Line

8" Pipe

54

old hub

0	10.54	59.81	10.44	49.37	—
+50	8.52			49.25	42.40
1	8.18			51.29	45.12
+50	4.47	68.40	13.06	51.63	47.48
2	7.10			55.34	50.56
+50	8.17			61.30	53.29
3	2.41	76.74	10.75	60.23	56.01
TP	9.05			65.99	58.73
+50	7.88			67.69	61.45
4	2.06	84.83	10.15	68.86	64.18
TP + 50	9.15			74.68	66.90
5	7.33			75.68	69.62
+50	6.03			77.50	73.35
+84.3	5.20	92.69	13.06	78.80	74.20
old hub	11.92			79.63	—
6	7.05			80.77	75.10
+50	6.88			85.64	77.98
7	1.57	03.69	12.58	85.81	80.86
TP + 50	5.00			91.11	83.75
8	9.94			98.69	86.63
+50	6.18			93.70	89.51
9	5.31	11.47	11.09	97.51	92.39
TP + 50	7.98			00.38	95.28
10	1.78			03.49	98.16
+50	5.32			09.69	01.04
+87.4				06.15	03.20

47+93.3

Western

6.85

M.H. Same gals as
western Outlet

6.17

98

4.15

4.78

8.01

4.22

7.26

6.24

4.68

7.78

6.06

4.15

4.60

99

M.H. any R 2° { 6" line from
North 274.4
cut 4.40

5.67

7.66

4.95

7.36

12.06

4.24

5.12

5.10

5.33

8.65

2.95

#100

M.H. End,

{ 6" M.H. 303.4
cut 2.75

Central Interceptor

8" line.

B.M.	Sta	20	10.94	12.90	98.04	9
0 + 00	1320				97.74	94.20
+ 50	11.94				99.00	95.30
1	10.10				00.84	96.39
+ 50	9.02				01.92	97.49
2	7.07				03.87	98.58
+ 50	7.94				03.00	99.69
3	4.62				06.32	00.78
+ 50	3.46				07.48	01.88
4	2.24				08.68	02.97
+ 477	0.89	21.88	11.83	10.05	04.00	
5	10.70				11.18	05.42
+ 50	10.18				11.70	06.78
6	9.04				12.84	08.14
+ 50	8.31				13.57	09.49
7	6.25				15.63	10.85
+ 50	4.42				17.46	12.21
8	3.47				18.41	13.56
T.P. + 50	1.25	32.91	12.28	20.63	14.93	
9	10.92				21.99	16.28
+ 50	9.58				23.33	17.64
10	7.56				25.35	19.00
old hub	7.63				25.28	
+ 50	6.63				26.28	20.25
11	5.83				27.08	21.50

Sta 26 + 20 Western Interceptor.

ang 63° 57' from Wabash line
+ 92

3.54

3.70

4.45

4.43

5.29

3.31

5.54

5.60

5.71

6.05

5.76

4.92

4.70

4.08

4.78

5.25

4.85

5.70

5.71

5.69

6.35

Sta 10 -

6.03

5.58

2.19

110

X M.H. ang R. 160

Fluor
ang L
64° 30'

2.72

See page 60

113

X M.H. ang L 7°

2.12

Central Antennae

32,91

11 + 50	5.07			27.84	22.75
12,	3.05			29.86	24.00
T.P. + 50	0.81	44.19	12.09	32.10	25.25
13	10.83			33.36	26.50
+ 50	9.56			34.63	27.75
14	8.40			35.79	29.00
+ 50	6.52			37.67	30.25
15	4.25			39.94	31.50
+ 50	3.28			40.91	32.75
16	2.89			41.63	34.00
+ 50	1.84			42.35	35.00
Field hub,	2.13	54.75	12.69	42.06	
+ 50	11.07			43.68	35.92
17	9.23			47.52	37.46
+ 50	7.50			47.25	38.99
18	7.39			47.36	40.53
+ 50	7.34			47.41	42.06
19 T.P.	3.63	61.22	10.10	51.12	43.60
+ 50	8.37			52.85	45.14
20,	7.27		54.11	53.95	46.67
+ 50	7.66			53.56	48.21
21	6.75			54.47	49.74
T.P. + 50	1.92	68.25	8.95	59.30	51.28
22	8.03			60.22	52.82
+ 50	6.50			61.75	54.35

5.09
5.86
6.85
6.86
6.88
6.79
7.42
8.44
8.16
7.63
7.35

See Page 60

Note 6" Irrop in M.H. Sta. 41.6+20.

114
X M.H. Aug L. 9°
gline
Aug L. 94'07"

7.76
10.06
8.26
6.83
5.35 less 0.03
7.52
7.71
7.28 7.44
5.35
4.73
8.02
7.40
7.40

20.2
30.2

116
M.H. Aug L. 11° 56'

47.25
5.11
5.236
4.741
4.95

Central Continued

6825

23	540			62.85	55.89
+136	468			63.57	57.00
old hub.	490			63.30	
+50	434			63.91	57.52
24	232			65.93	59.36
T.P. +50	0.98	79.67	12.40	67.27	61.20
25	962			70.05	63.05
+50	902			70.65	64.89
26	666			73.01	66.73
+50	420			74.97	68.58
27. T.P.	225	87.88	1046	77.42	70.42
+50	929			78.59	72.26
+70	847			79.41	73.00
28	674			81.12	75.11
+50	537			82.51	78.62
29	225			85.63	82.13
T.P.	0.90	99.24	11.66	87.58	
T.P. +50	0.90	02.66	4.32	98.34	85.64
30.	4.96			97.68	89.15
+547	530			97.36	93.00
Center stake	4.95	10.75	13.04	97.71	
+75	5.75			05.00	98.30
T.P.	0.12	23.17	12.54	10.63	
T.P.	0.08	31.44	8.35	23.09	

696

657

639

657

607

700

576

628

639

700

633

641

601

389

350

1270

853

436

11.70

Summed.

117

X M.H. ang R. 530/15' } H line
ang L
386.07'

3.686

125

X M.H. ang L. 6° 21'

702

3305.6
3054.7
250.9

X 126 } 6" Nail
M.H. ang } 293.20
Ang L. 7°-36' } cut. 4'-1 7/8"
406' D. S. line Castle.

149

Central, Continued

3305
1.20

31.44

21+375	507			26.37	
33+054	454			26.90	96.74
0-9	454			26.90	21.80
0+304	374	(at M.H. 126 1/2)		27.68	21.10

33+50,	352			27.92	
Bm,	461			26.83	
T.P.	1295	21.10	2.61	18.49	
34 T.P.	10.94	12.03	1.89	10.14	98.15
+50	8.97			03.06	98.90
35	8.97			03.06	99.64
+50	773			04.30	00.38
+915	595			06.08	01.00
old hub.	625			05.78	

19+50	58.31	59.6	52.85		
20.	470		54.11		
+50	5.25		58.56		
21	484	62.57	51.0	54.47	
+50	325		59.22		

Bm,	3833	11.50	26.83		
	1.15		32.18		

M.H. #126 1/2
St. Grade
6.5' 10.5' 13' 15' 17' 19' 21' 23' 25' 27' 29' 31' 33' 35' 37' 39' 41' 43' 45' 47' 49' 51' 53' 55' 57' 59' 61' 63' 65' 67' 69' 71' 73' 75' 77' 79' 81' 83' 85' 87' 89' 91' 93' 95' 97' 99' 101' 103' 105' 107' 109' 111' 113' 115' 117' 119' 121' 123' 125' 127' 129' 131' 133' 135' 137' 139' 141' 143' 145' 147' 149' 151' 153' 155' 157' 159' 161' 163' 165' 167' 169' 171' 173' 175' 177' 179' 181' 183' 185' 187' 189' 191' 193' 195' 197' 199' 201' 203' 205' 207' 209' 211' 213' 215' 217' 219' 221' 223' 225' 227' 229' 231' 233' 235' 237' 239' 241' 243' 245' 247' 249' 251' 253' 255' 257' 259' 261' 263' 265' 267' 269' 271' 273' 275' 277' 279' 281' 283' 285' 287' 289' 291' 293' 295' 297' 299' 301' 303' 305' 307' 309' 311' 313' 315' 317' 319' 321' 323' 325' 327' 329' 331' 333' 335' 337' 339' 341' 343' 345' 347' 349' 351' 353' 355' 357' 359' 361' 363' 365' 367' 369' 371' 373' 375' 377' 379' 381' 383' 385' 387' 389' 391' 393' 395' 397' 399' 401' 403' 405' 407' 409' 411' 413' 415' 417' 419' 421' 423' 425' 427' 429' 431' 433' 435' 437' 439' 441' 443' 445' 447' 449' 451' 453' 455' 457' 459' 461' 463' 465' 467' 469' 471' 473' 475' 477' 479' 481' 483' 485' 487' 489' 491' 493' 495' 497' 499' 501' 503' 505' 507' 509' 511' 513' 515' 517' 519' 521' 523' 525' 527' 529' 531' 533' 535' 537' 539' 541' 543' 545' 547' 549' 551' 553' 555' 557' 559' 561' 563' 565' 567' 569' 571' 573' 575' 577' 579' 581' 583' 585' 587' 589' 591' 593' 595' 597' 599' 601' 603' 605' 607' 609' 611' 613' 615' 617' 619' 621' 623' 625' 627' 629' 631' 633' 635' 637' 639' 641' 643' 645' 647' 649' 651' 653' 655' 657' 659' 661' 663' 665' 667' 669' 671' 673' 675' 677' 679' 681' 683' 685' 687' 689' 691' 693' 695' 697' 699' 701' 703' 705' 707' 709' 711' 713' 715' 717' 719' 721' 723' 725' 727' 729' 731' 733' 735' 737' 739' 741' 743' 745' 747' 749' 751' 753' 755' 757' 759' 761' 763' 765' 767' 769' 771' 773' 775' 777' 779' 781' 783' 785' 787' 789' 791' 793' 795' 797' 799' 801' 803' 805' 807' 809' 811' 813' 815' 817' 819' 821' 823' 825' 827' 829' 831' 833' 835' 837' 839' 841' 843' 845' 847' 849' 851' 853' 855' 857' 859' 861' 863' 865' 867' 869' 871' 873' 875' 877' 879' 881' 883' 885' 887' 889' 891' 893' 895' 897' 899' 901' 903' 905' 907' 909' 911' 913' 915' 917' 919' 921' 923' 925' 927' 929' 931' 933' 935' 937' 939' 941' 943' 945' 947' 949' 951' 953' 955' 957' 959' 961' 963' 965' 967' 969' 971' 973' 975' 977' 979' 981' 983' 985' 987' 989' 991' 993' 995' 997' 999' 1001' 1003' 1005' 1007' 1009' 1011' 1013' 1015' 1017' 1019' 1021' 1023' 1025' 1027' 1029' 1031' 1033' 1035' 1037' 1039' 1041' 1043' 1045' 1047' 1049' 1051' 1053' 1055' 1057' 1059' 1061' 1063' 1065' 1067' 1069' 1071' 1073' 1075' 1077' 1079' 1081' 1083' 1085' 1087' 1089' 1091' 1093' 1095' 1097' 1099' 1101' 1103' 1105' 1107' 1109' 1111' 1113' 1115' 1117' 1119' 1121' 1123' 1125' 1127' 1129' 1131' 1133' 1135' 1137' 1139' 1141' 1143' 1145' 1147' 1149' 1151' 1153' 1155' 1157' 1159' 1161' 1163' 1165' 1167' 1169' 1171' 1173' 1175' 1177' 1179' 1181' 1183' 1185' 1187' 1189' 1191' 1193' 1195' 1197' 1199' 1201' 1203' 1205' 1207' 1209' 1211' 1213' 1215' 1217' 1219' 1221' 1223' 1225' 1227' 1229' 1231' 1233' 1235' 1237' 1239' 1241' 1243' 1245' 1247' 1249' 1251' 1253' 1255' 1257' 1259' 1261' 1263' 1265' 1267' 1269' 1271' 1273' 1275' 1277' 1279' 1281' 1283' 1285' 1287' 1289' 1291' 1293' 1295' 1297' 1299' 1301' 1303' 1305' 1307' 1309' 1311' 1313' 1315' 1317' 1319' 1321' 1323' 1325' 1327' 1329' 1331' 1333' 1335' 1337' 1339' 1341' 1343' 1345' 1347' 1349' 1351' 1353' 1355' 1357' 1359' 1361' 1363' 1365' 1367' 1369' 1371' 1373' 1375' 1377' 1379' 1381' 1383' 1385' 1387' 1389' 1391' 1393' 1395' 1397' 1399' 1401' 1403' 1405' 1407' 1409' 1411' 1413' 1415' 1417' 1419' 1421' 1423' 1425' 1427' 1429' 1431' 1433' 1435' 1437' 1439' 1441' 1443' 1445' 1447' 1449' 1451' 1453' 1455' 1457' 1459' 1461' 1463' 1465' 1467' 1469' 1471' 1473' 1475' 1477' 1479' 1481' 1483' 1485' 1487' 1489' 1491' 1493' 1495' 1497' 1499' 1501' 1503' 1505' 1507' 1509' 1511' 1513' 1515' 1517' 1519' 1521' 1523' 1525' 1527' 1529' 1531' 1533' 1535' 1537' 1539' 1541' 1543' 1545' 1547' 1549' 1551' 1553' 1555' 1557' 1559' 1561' 1563' 1565' 1567' 1569' 1571' 1573' 1575' 1577' 1579' 1581' 1583' 1585' 1587' 1589' 1591' 1593' 1595' 1597' 1599' 1601' 1603' 1605' 1607' 1609' 1611' 1613' 1615' 1617' 1619' 1621' 1623' 1625' 1627' 1629' 1631' 1633' 1635' 1637' 1639' 1641' 1643' 1645' 1647' 1649' 1651' 1653' 1655' 1657' 1659' 1661' 1663' 1665' 1667' 1669' 1671' 1673' 1675' 1677' 1679' 1681' 1683' 1685' 1687' 1689' 1691' 1693' 1695' 1697' 1699' 1701' 1703' 1705' 1707' 1709' 1711' 1713' 1715' 1717' 1719' 1721' 1723' 1725' 1727' 1729' 1731' 1733' 1735' 1737' 1739' 1741' 1743' 1745' 1747' 1749' 1751' 1753' 1755' 1757' 1759' 1761' 1763' 1765' 1767' 1769' 1771' 1773' 1775' 1777' 1779' 1781' 1783' 1785' 1787' 1789' 1791' 1793' 1795' 1797' 1799' 1801' 1803' 1805' 1807' 1809' 1811' 1813' 1815' 1817' 1819' 1821' 1823' 1825' 1827' 1829' 1831' 1833' 1835' 1837' 1839' 1841' 1843' 1845' 1847' 1849' 1851' 1853' 1855' 1857' 1859' 1861' 1863' 1865' 1867' 1869' 1871' 1873' 1875' 1877' 1879' 1881' 1883' 1885' 1887' 1889' 1891' 1893' 1895' 1897' 1899' 1901' 1903' 1905' 1907' 1909' 1911' 1913' 1915' 1917' 1919' 1921' 1923' 1925' 1927' 1929' 1931' 1933' 1935' 1937' 1939' 1941' 1943' 1945' 1947' 1949' 1951' 1953' 1955' 1957' 1959' 1961' 1963' 1965' 1967' 1969' 1971' 1973' 1975' 1977' 1979' 1981' 1983' 1985' 1987' 1989' 1991' 1993' 1995' 1997' 1999' 2001' 2003' 2005' 2007' 2009' 2011' 2013' 2015' 2017' 2019' 2021' 2023' 2025' 2027' 2029' 2031' 2033' 2035' 2037' 2039' 2041' 2043' 2045' 2047' 2049' 2051' 2053' 2055' 2057' 2059' 2061' 2063' 2065' 2067' 2069' 2071' 2073' 2075' 2077' 2079' 2081' 2083' 2085' 2087' 2089' 2091' 2093' 2095' 2097' 2099' 2101' 2103' 2105' 2107' 2109' 2111' 2113' 2115' 2117' 2119' 2121' 2123' 2125' 2127' 2129' 2131' 2133' 2135' 2137' 2139' 2141' 2143' 2145' 2147' 2149' 2151' 2153' 2155' 2157' 2159' 2161' 2163' 2165' 2167' 2169' 2171' 2173' 2175' 2177' 2179' 2181' 2183' 2185' 2187' 2189' 2191' 2193' 2195' 2197' 2199' 2201' 2203' 2205' 2207' 2209' 2211' 2213' 2215' 2217' 2219' 2221' 2223' 2225' 2227' 2229' 2231' 2233' 2235' 2237' 2239' 2241' 2243' 2245' 2247' 2249' 2251' 2253' 2255' 2257' 2259' 2261' 2263' 2265' 2267' 2269' 2271' 2273' 2275' 2277' 2279' 2281' 2283' 2285' 2287' 2289' 2291' 2293' 2295' 2297' 2299' 2301' 2303' 2305' 2307' 2309' 2311' 2313' 2315' 2317' 2319' 2321' 2323' 2325' 2327' 2329' 2331' 2333' 2335' 2337' 2339' 2341' 2343' 2345' 2347' 2349' 2351' 2353' 2355' 2357' 2359' 2361' 2363' 2365' 2367' 2369' 2371' 2373' 2375' 2377' 2379' 2381' 2383' 2385' 2387' 2389' 2391' 2393' 2395' 2397' 2399' 2401' 2403' 2405' 2407' 2409' 2411' 2413' 2415' 2417' 2419' 2421' 2423' 2425' 2427' 2429' 2431' 2433' 2435' 2437' 2439' 2441' 2443' 2445' 2447' 2449' 2451' 2453' 2455' 2457' 2459' 2461' 2463' 2465' 2467' 2469' 2471' 2473' 2475' 2477' 2479' 2481' 2483' 2485' 2487' 2489' 2491' 2493' 2495' 2497' 2499' 2501' 2503' 2505' 2507' 2509' 2511' 2513' 2515' 2517' 2519' 2521' 2523' 2525' 2527' 2529' 2531' 2533' 2535' 2537' 2539' 2541' 2543' 2545' 2547' 2549' 2551' 2553' 2555' 2557' 2559' 2561' 2563' 2565' 2567' 2569' 2571' 2573' 2575' 2577' 2579' 2581' 2583' 2585' 2587' 2589' 2591' 2593' 2595' 2597' 2599' 2601' 2603' 2605' 2607' 2609' 2611' 2613' 2615' 2617' 2619' 2621' 2623' 2625' 2627' 2629' 2631' 2633' 2635' 2637' 2639' 2641' 2643' 2645' 2647' 2649' 2651' 2653' 2655' 2657' 2659' 2661' 2663' 2665' 2667' 2669' 2671' 2673' 2675' 2677' 2679' 2681' 2683' 2685' 2687' 2689' 2691' 2693' 2695' 2697' 2699' 2701' 2703' 2705' 2707' 2709' 2711' 2713' 2715' 2717' 2719' 2721' 2723' 2725' 2727' 2729' 2731' 2733' 2735' 2737' 2739' 2741' 2743' 2745' 2747' 2749' 2751' 2753' 2755' 2757' 2759' 2761' 2763' 2765' 2767' 2769' 2771' 2773' 2775' 2777' 2779' 2781' 2783' 2785' 2787' 2789' 2791' 2793' 2795' 2797' 2799' 2801' 2803' 2805' 2807' 2809' 2811' 2813' 2815' 2817' 2819' 2821' 2823' 2825' 2827' 2829' 2831' 2833' 2835' 2837' 2839' 2841' 2843' 2845' 2847' 2849' 2851' 2853' 2855' 2857' 2859' 2861' 2863' 2865' 2867' 2869' 2871' 2873' 2875' 2877' 2879' 2881' 2883' 2885' 2887' 2889' 2891' 2893' 2895' 2897' 2899' 2901' 2903' 2905' 2907' 2909' 2911' 2913' 2915' 2917' 2919' 2921' 2923' 2925' 2927' 2929' 2931' 2933' 2935' 2937' 2939' 2941' 2943' 2945' 2947' 2949' 2951' 2953' 2955' 2957' 2959' 2961' 2963' 2965' 2967' 2969' 2971' 2973' 2975' 2977' 2979' 2981' 2983' 2985' 2987' 2989' 2991' 2993' 2995' 2997' 2999' 3001' 3003' 3005' 3007' 3009' 3011' 3013' 3015' 3017' 3019' 3021' 3023' 3025' 3027' 3029' 3031' 3033' 3035' 3037' 3039' 3041' 3043' 3045' 3047' 3049' 3051' 3053' 3055' 3057' 3059' 3061' 3063' 3065' 3067' 3069' 3071' 3073' 3075' 3077' 3079' 3081' 3083' 3085' 3087' 3089' 3091' 3093' 3095' 3097' 3099' 3101' 3103' 3105' 3107' 3109' 3111' 3113' 3115' 3117' 3119' 3121' 3123' 3125' 3127' 3129' 3131' 3133' 3135' 3137' 3139' 3141' 3143' 3145' 3147' 3149' 3151' 3153' 3155' 3157' 3159' 3161' 3163' 3165' 3167' 3169' 3171' 3173' 3175' 3177' 3179' 3181' 3183' 3185' 3187' 3189' 3191' 3193' 3195' 3197' 3199' 3201' 3203' 3205' 3207' 3209' 3211' 3213' 3215' 3217' 3219' 3221' 3223' 3225' 3227' 3229' 3231' 3233' 3235' 3237' 3239' 3241' 3243' 3245' 3247' 3249' 3251' 3253' 3255' 3257' 3259' 3261' 3263' 3265' 3267' 3269' 3271' 3273' 3275' 3277' 3279' 3281' 3283' 3285' 3287' 3289' 3291' 3293' 3295' 3297' 3299' 3301' 3303' 3305' 3307' 3309' 3311' 3313' 3315' 3317' 3319' 3321' 3323' 3325' 3327' 3329' 3331' 3333' 3335' 3337' 3339' 3341' 3343' 3345' 3347' 3349' 3351' 3353' 3355' 3357' 3359' 3361' 3363' 3365' 3367' 3369' 3371' 3373' 3375' 3377' 3379' 3381' 3383' 3385' 3387' 3389' 3391' 3393' 3395' 3397' 3399' 3401' 3403' 3405' 3407' 3409' 3411' 3413' 3415' 3417' 3419' 3421' 3423' 3425' 3427' 3429' 3431' 3433' 3435' 3437' 3439' 3441' 3443' 3445' 3447' 3449' 3451' 3453' 3455' 3457' 3459' 3461' 3463' 3465' 3467' 3469' 3471' 3473' 3475' 3477' 3479' 3481' 3483' 3485' 3487' 3489' 3491' 3493' 3495' 3497' 3499' 3501' 3503' 3505' 3507' 3509' 3511' 3513' 3515' 3517' 3519' 3521' 3523' 3525' 3527' 3529' 3531' 3533' 3535' 3537' 3539' 3541' 3543' 3545' 3547' 3549' 3551' 3553' 3555' 3557' 3559' 3561' 3563' 3565' 3567' 3569' 3571' 3573' 3575' 3577' 3579' 3581' 3583' 3585' 3587' 3589' 3591' 3593' 3595' 3597' 3599' 3601' 3603' 3605' 3607' 3609' 3611' 3613' 3615' 3617' 3619' 3621' 3623' 3625' 3627' 3629' 3631' 3633' 3635' 3637' 3639' 3641' 3643' 3645' 3647' 3649' 3651' 3653' 3655' 3657' 3659' 3661' 3663' 3665' 3667' 3669' 3671' 3673' 3675' 3677' 3679' 3681' 3683' 3685' 3687' 3689' 3691' 3693' 3695' 3697' 3699' 3701' 3703' 3705' 3707' 3709' 3711' 3713' 3715' 3717' 3719' 3721' 3723' 3725' 3727' 3729' 3731' 3733' 3735' 3737' 3739' 3741' 3743' 3745' 3747' 3749' 3751' 3753' 3755' 3757' 3759' 3761' 3763' 3765' 3767' 3769' 3771' 3773' 3775' 3777' 3779' 3781' 3783' 3785' 3787' 3789' 3791' 3793' 3795' 3797' 3799' 3801' 3803' 3805' 3807' 3809' 3811' 3813' 3815' 3817' 3819' 3821' 3823' 3825' 3827' 3829' 3831' 3833' 3835' 3837' 3839' 3841' 3843' 3845' 3847' 3849' 3851' 3853' 3855' 3857' 3859' 3861' 3863' 3865' 3867' 3869' 3871' 3873' 3875' 3877' 387

BM-MH10 1.17 126.52 1.25.35

7
10.9 115.62
9.1 117.42
8.1 118.41
5.89 120.63
4.53 121.99
3.19 23.33
1.17 25.35

12.73 138.08 125.35

10.750 11.83 5

11.750 11.51

12.750 10.24 27.84

13.750 8.22 29.86

14.750 5.98 32.70

15.750 4.72 33.86

16.750 3.45 35.72

17.750 2.16 35.72

18.750 2.16 46.29

19.750 1.87 42.24

20.750 2.58 41.55

21.750 3.20 40.83

126.52
118.41
8.11
26.50
20.63
5.89

26.50
20.63
5.89

26.50
20.63
5.89

26.50
20.63
5.89

26.50
20.63
5.89

Central Interceptor

New grade stakes - 8-27-'21
Smole + Richards

BM -

Sta 16+20	2.60	44.66		142.06	
16+20			2.33	42.33	35.00
16			3.00	41.66	34.00
15+50			3.72	40.94	32.75
15			4.72	39.94	31.50
14+50			6.98	37.68	30.25
14			8.83	35.83	29.00
13+50			10.00	34.66	27.75
13 TP	1.87	35.23	11.30	33.36	26.50
12+50			3.12	32.11	25.25
12			5.30	29.93	24.00
11+50			7.27	27.96	22.75
11			8.13	27.10	21.50
10+50			8.92	26.31	20.25
10 TP	1.11	26.53	9.81	25.42	19.00
9+50			3.00	23.53	17.64
9			4.48	22.05	16.28
8+50			5.77	20.76	14.93
8			8.13	18.40	13.56
7+50			9.02	17.51	12.21
7+00			10.85	15.68	10.85

68

Sta 16+20 - Old center hub

7.33 6' offset E. MH 114

7.66

8.19

8.44

7.43

6.83

6.91

6.86

6.86

5.93

5.21

5.60

6.06

6.42

5.89

5.77

5.83

4.84

5.30

4.83

See Page 55

MH 113

F Line

8" Dives

4+47.7		22.99	12.94	10.05	—
0	12.65			10.34	04.20
+50	10.14			12.85	07.80
1	5.73			17.26	11.40
T.P.	2.23	33.71	12.95	20.76	—
+50	8.68			25.03	15.00
2	4.25			29.46	18.60
+19.4	4.27			29.44	20.00
old hub,	7.40			26.31	—
T.P.	0.68	44.58	11.50	33.03	—
+50	8.73			35.85	30.52
T.P.	0.20	56.83	12.45	44.38	—
3	2.74			54.09	47.71
T.P.	0.83	67.51	11.51	56.00	—
T.P.	1.18	76.60	10.27	66.33	—
3+50.3	5.01			71.59	65.00
old hub	4.97			71.63	—

1110
ang L from Central Line 64°30'

6.14

5.05

5.86

10.03

10.86

9.44

5.33

6.38

6.59

7.20

34.377

112

M.N.

8" Survey North

265.00

Ang 36°40' to Cherokee pt

G. Line - 6" line

Old Hub 16+20	Central	52.49	10.43	42.06	
0	10.24			42.25	35.20
+50	12.01			40.48	32.70
+65	3.20			43.79	37.15
1				48.79	41.03
T.P.	0.95	63.65	12.11	51.54	
+50	10.34			53.31	46.58
2	T.P.	0.60	74.40	71.35	63.05
+50	8.67			65.73	57.68
3		6.20		68.20	63.23
+34	1.95			72.45	67.00
Old hub.	2.15			72.25	

		53.92	11.84	42.06	
0 +65	10.13			43.79	37.15

7.05
3.78
6.64
7.76

6.73
10.92
8.05
4.97
5.45

6.64

114
300 M.H. } 0.2 3/8" above
Central line
16 + 20
x Mankole,

10.10

115
M.H. } 6" N. & S.
26800
1' above Gline

M.H.

H. Line 8⁹

Aug L. 380 07' from Central line

23 + 36 = 0		74.63	11.28	63.35	57.00
0 + 50	11.00			63.63	58.39
1	11.88			62.75	59.78
+ 50	8.70			65.93	61.17
2	7.56			67.07	62.56
+ 50	6.13			68.50	63.95
3	3.60			71.03	65.34
+ 50	2.45			72.18	66.73
T.P. + 95.7	0.78	86.81	12.96	73.85	68.00
4 + 50	12.25			74.56	70.08
5	11.45			75.36	72.00
+ 50	7.24			79.57	73.91
T.R. + 90	3.48	79.70	73.7	83.33	75.43

4 Line 6"		86.81	12.96	73.85	
0 = 3 + 97.5 H.					68.20
T.P. + 50.	0.27	97.04	10.50	86.54	83.04
T.P.	0.47	04.26	7.69	96.57	
0 + 92.4	0.65			03.61	96.00

6 + 31	10.70			80.00	77.00
mm,	8.52			82.18	
+ 50	7.86			82.84	77.53
7	6.43			84.27	78.94
+ 50	5.43			85.27	80.34

old line, Central line p. 57 { same grade as Central.
4117

5.24
2.97
4.76
4.57
4.55
5.69
5.45
5.85
4.48
3.36
5.66
7.90

2.78

x 3.825

x 3009

2.613

118 { x line joins
x M.H. Aug L 310 12' aug TR 63.50'
6" line
0' - 2 3/4" above

0' - 2 3/8" above grade of 3 + 95.7 H. line
4118

268
M.H. { 6" line from N.
same elev.

x M.H. Aug R. 400 55'
119

3.60
old line
5.31
5.33
4.93

64

4,48
4,33
5,27
5,36
4,82
4,79
6,40

2.813

120

X M.H. Aug R. 42°

18 line joint
6" line
Same elev.
ang 75° 20' 2
from 8 line

Same elev. at 94333 N. line

X

x

三

4

2.

6

32

0.

4.87
5.45
7.91
16.55
14.41
9.61
Bross
9.8

X

18

10

0

11

X

1

4

H, Line Continued

2652

14 - 582
+ 50 4.93
+ 90 586
15 + 41.3 9.32
old hub. 1195

20.74 1039
21.63 1060
20.70 1077
17.24 1100
14.61

10.35
11.03
9.93
6.24

0.432

124 { 8" M. 311.0
cut 6.24
M.H. { 6" A. 311.20
cut 6.04

65

Western Interceptor

Aug 6-1921
Ford-Smale

66

Sta	+	H1	-	Elev	Grate		Cut
47+93.3				49.27			
47+93.3	898	58.18	898	49.20	45.40	3.80	3-9 $\frac{1}{2}$
48+50			705	51.13	46.79	4.34	4-4 $\frac{1}{8}$
49			618	52.00	48.02	3.98	3-11 $\frac{3}{4}$
+50 +50m			516	53.02	49.25	3.77	3-9 $\frac{1}{4}$
50			094	57.24	50.47	6.77	6-9 $\frac{1}{4}$
+50	713	6437	596	58.41	51.70	6.71	6-8 $\frac{3}{8}$
51			531	58.86	52.93	5.93	5-11 $\frac{1}{8}$
+50			432	60.05	54.16	5.89	5-10 $\frac{5}{8}$
52			474	59.63	55.39	4.24	4-2 $\frac{7}{8}$
+25			384	60.53	56.00	4.53	4-6 $\frac{3}{8}$

Central Interceptor -
New Grade - 9-6-'21

BM -	11.22		254.11	46.67
20 + 50		65.33	11.75	53.58 - 48.21
21			10.89	54.44 - 49.74
+ 50			6.00	59.33 - 51.28
22			5.09	60.24 - 52.82
+ 50			3.53	61.80 - 54.36
23			2.40	62.93 - 55.89
+ 36			1.95	63.38 - 57.00

Smale -
Richards - 9-6-'21

67 -

Sta. 20+00 M.H. Hub 6" offset.

5.37	5' 4 1/2"
4.70	4' 8 1/2"
6.05	8' 9 1/2"
7.42	7' 5 1/8"
7.44	7' 5 1/4"
7.04	7' 1/2"
6.38	6' 4 5/8" M.H.

Grade Sheet
Issued 9-6

Western Interceptor-

Smale } 10-4-21
Chisholm

68.

Sta	+	Revised	Grades	Elev	Grade	Cut
BM-Sta-0+50	5.70	58.69		152.99		
0+00			5.06	53.63	46.50	7.13
+50			5.70	52.99	46.66	6.33
1			8.43	50.26	46.81	3.45
+50			5.15	53.54	46.97	6.57
2			5.54	53.15	47.12	6.03
+50			4.95	53.74	47.28	6.46
3			4.48	54.21	47.44	6.77
+20			5.48	53.21	47.50	5.71
TP	9.03	62.24		53.21		
+50			9.50	52.74	48.17	4.57
4			7.75	54.49	49.29	5.20
+50			7.06	55.18	50.41	4.77
5			7.01	55.23	51.53	3.70
+50			3.47	58.77	52.65	6.12
6+05			4.71	57.53	53.88	3.65
+50			3.63	58.61	54.89	3.72
TP			3.76	58.48		
✓	8.51	67.09		58.48		
7			4.77	62.32	56.01	6.31
+62.2			5.12	61.97	57.40	4.57
TP 7+62.2	9.86	71.83		61.97		
8			9.11	62.72	58.03	4.69
+50			7.54	64.29	58.86	5.43
9			8.44	63.39	59.69	3.70

M.H. #30

Grade Sheet
Issued 10-5

Levels 10-4-21 M.H. #87

Grade Sheet
Issued 10-6

M.H. #88 Levels 10-5-21

1.6670

Western Interceptor - ctd.

Sta.	+	HI 171.83	-	Elev.	Grade
9+50			8.50	163.33	60.52
10			5.32	66.51	61.35
+50			4.30	67.53	62.18
11			3.24	68.59	63.01
+50			2.11	69.72	63.84
TP 11+50	5.91	75.63		69.72	
12			4.62	71.01	64.67
+50			3.70	71.93	65.50
TP 12+50	9.50	81.43		71.93	
13			11.78	69.65	66.42
+50			7.91	73.52	67.34
14			7.14	74.29	68.27
+50			5.98	75.45	69.19
15			5.58	75.85	70.11
+50			3.00	78.43	71.03
16			1.35	80.13	71.95
TP 16+00	6.82	86.95		80.13	
+50			4.33	82.62	72.88
17			3.18	83.77	73.8
TP 17+00	6.84	90.61		83.77	
+50			12.37	78.24	74.98
18			11.42	79.19	76.15
+50			9.99	80.62	77.33

Revised Grades Small Chisholm 10-6-21 69

Cut

2.32

6.16

5.35

5.58

5.88

6.34

6.43

3.23

6.18

6.02

6.26

5.74

7.40

8.18

9.74

9.92

3.26

3.04

3.29

Grade Sheet
Issued 10-12-21

MH #89

1.844%

Grade Sheet
Issued 10-11-21

2.351% MH 90

Grade Sheet
Issued 10-11-21

Western Interceptor

Sta.	+	HI	-	Elev.	Grade
		190.61			
19+00			9.73	180.88	78.50
+50			4.80	85.81	79.68
20			3.42	87.17	80.83
+50			3.45	87.16	82.03
21			2.42	88.17	83.20
+213			1.90	88.71	183.7
TP 21+213	10.93	198.74		183.71	—
+50			9.20	89.54	84.28
22			8.44	90.30	85.30
+50			7.31	91.43	86.32
23			8.16	90.58	87.34
+50			6.92	91.82	88.36
24			5.27	93.52	89.38
+50			3.15	95.59	90.40
25			3.59	95.20	91.42
+50			1.73	97.01	92.44
TP 25+50	5.28	202.29		197.01	—
26			3.69	198.60	93.45
26+203			4.13	198.16	193.87

Revised Grades

Small } 10-7-21
Chisholm } 70

Cut

2.38
6.13
6.24
5.13
4.99
5.01

Grade Sheet #
Issued 10-11-21

2038% MH #91

5.26
5.00
5.11
3.24
3.46
4.14
5.19
3.78
4.57

Grade Sheet
Issued 10-11-21

5.15
4.29

MH #92
Intersection with Central Int. ←
Relined + levels - 10-7-21 to here

Eastern Interceptor -
continued from Page 43

Small R 12-12-21 71
Chisholm
Levels with transit.

Sta.	+	H.I.	-	Elev.	Grade	Cut.	
152 - TP				358.22			
153+29	353	61.75	3.50	358.25	341.98	16.27	M.H. #83
+50			3.51	58.24	42.02	16.22	
+75			3.64	58.11	42.07	16.04	
154			3.66	58.09	42.12	15.97	
+25			3.82	57.93	42.17	15.76	
+50			3.98	57.77	42.22	15.55	
+75			3.97	57.78	42.27	15.51	
155			4.11	57.64	42.32	15.32	Grade Sheet #30
BM -	3.39	61.03	5.01	56.02	356.12		B.P. S.W. El Cajon & Highland B&P4
+25			3.43	57.60	42.37	15.23	
+50			3.50	57.53	42.42	15.11	
+75			3.71	57.32	42.47	14.85	
156			3.73	57.30	42.52	14.78	
+25			3.91	57.12	42.57	14.55	
+50			4.08	56.95	42.62	14.33	
+78 ⁶²		Center	4.25	56.78	42.68	14.10	M.H. #84 E Highland Ave. N. 2x2 Hub + tack at P.T. of 6' offsets N. & S. 2x2 Hub + tack on E Highland Ave. N. - 25' N. & S. of M.H. center - for 6' stub N.
TP 156+50				56.95			
157	3.26	60.21	3.58	56.83	42.72	14.11	
+25			3.80	56.41	42.77	13.64	
+50			4.14	56.07	42.82	13.25	
+75			4.39	55.82	42.87	12.95	
158			4.62	355.59	342.92	12.67	160+004 M.H. 85 Drains'd 163+46 ³³ 86-alley

Eastern Interceptor - ctd from Page 71

Small
Chisham 12-12-21 72
Levels with transit.

Sta.	+	HI 60.21	-	Elev.	Grade
158+25			4.89	355.32	342.97
+50			5.28	54.93	43.02
+75			5.55	54.66	43.07
159			5.71	54.50	43.12
BM			5.56	54.65	354.70
+25 TP			6.11	54.10	43.17
+50	2.96	57.06	3.38	53.68	43.22
+75			3.72	53.34	43.27
160+00+ MH			4.00	53.06	43.32
+25			4.33	52.73	43.37
+50			4.68	52.38	43.42
+75			4.94	52.12	43.47
161			5.09	51.97	43.52
+25			5.04	52.02	43.57
+50			5.13	51.93	43.62
TP +75			4.99	52.07	43.67
162	4.75	56.82	4.86	51.96	43.72
BM			4.91	51.91	352.00
+25			4.88	51.94	43.77
+50			5.05	51.77	43.82
+75			4.81	52.01	43.87
163			4.77	52.05	43.92
+25			4.54	52.28	43.97
+46.33 +50.4			4.36	352.46	344.01

exist sewer

163+33

Cut

12.35

11.91

11.59

11.38

10.93

10.46

10.07

9.74

9.36

8.96

8.65

8.45

8.45

8.31

8.90

8.24

8.17

7.95

8.14

8.13

8.31

8.45

8.45

8.45

8.45

8.45

8.45

8.45

8.45

8.45

BPS. W. El Cajon & Colonial - B32 P4
Grade Sheet # 30 - 1-3-22

MH #85 - E Orangewood N. 2x2 Hub & tack
at center & at P.I.s. 6 offsets N. & S. 2x2 Hub & tack
for stub - 25' N. & S. from M.H. center.
St. Gr. 353.24.

Grade Sheet # 32 - 1-3-22

BP - S.W. curb El Cajon & Fairmount - B32 P4

M.H. #86 - E Fairmount - Pauly alley at E. El Cajon.

MH 155 to 156 - for Kennedy
5th - Stockton alley.

6+00	6.11	69.10	62.99	57.77
+25	0.76	63.46	6.45	62.65
+50				59.96
				60.96
				61.96
				61.96

4.43	207.49	203.06
------	--------	--------

1.50	205.99	98.53
------	--------	-------

98.90

7.46

4)2.562

10-4

5-2

2.5-1

600

562

38

63.41

59.96

3.45

59.96

3.45

60.25

073

4

292

63.41

60.96

2.45

63.41

60.25

3.16

607.3

98.90

75

75

75

75

75

75

75

75

75

75

75

75

75

75

75

75

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75

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75

75

75

75

7.75 353.29 345.54
2.66 .63

3.25 96.26 93.00
+23 2.63 94.56 3.93 92.93 93.34
+48 2.68 93.58 93.72
+10 3.29 92.97 93.15

+90

94.34

1+000

94.49

+25

94.86

+50

95.28

1.49

.1

1.49

.41

1.49

.23

4.47

2.98

3.427

1.49

.48

1.197

596

715.7

.16

96.26
93.15
3.11

96.26
93.34
2.92

1.49

.25

7.45

2.98

3.725

4.149

4.86

3.7

5.23

94.34

No	Depth
1	5.5
2	5.5
3	6.5
4	10.0
5	12.0
6	8.5
7	8.0
8	7.5
9	7.0
10	6.0
11	6.5
12	6.5
13	7.5
14	5.5

	4.16	97.02	92.86
0 + 00		4.02	93.00
+ 10		3.87	93.15
+ 23		3.68	93.34
+ 48		3.39	93.72
+ 75		3.00	94.02
+ 90		2.68	94.34

94.34
15
4.87

149
90
13410

Tunnel

1.95	334.02		332.07
2.97	327.74	9.05	324.97
2.40	322.48	7.86	320.08
		11.09	311.39
			311.45

F-.06.

TP-6-~~20~~ C-Line

7.37	62.85		55.48	46.32
------	-------	--	-------	-------

9.16

6+50

6.73	56.12	49.02
------	-------	-------

7.10

7

4.75	58.10	51.73
------	-------	-------

7.37

+50

4.33	58.52	54.44
------	-------	-------

4.08

TP

3.94	65.26	1.53	61.32	57.00
------	-------	------	-------	------------------

7+974

1.41	63.85	57.00
------	-------	-------

6.85

E I.

133+50

7.03	50.76	43.73
------	-------	-------

+77.5

6.65	44.11	35.50
------	-------	-------

8.61

34

7.67	43.09	36.45
------	-------	-------

6.54

+50

5.04	45.72	38.57
------	-------	-------

7.15

35

3.31	47.45	40.69
------	-------	-------

6.76

+60.8

1.63	49.13	43.28
------	-------	-------

5.85

6.90	333.41	326.51
------	--------	--------

3.71	329.70
------	--------

BP-NW-Gabrillo + Center

Estimate (No 1)

To July 9"

5 265' of 16" pipe @ 1.79 = 9424.35

175 yds. due Kennedy 706 8.26

Balance to be paid when job complete 2356.09

78

49+577

3.07

52.60

12+60 300
5+50

96.81
4.02
2.79

149
75
-45
943
10175

96.74
93
3.74

33 05.6
3054.7
250.9

96.81
3.34
3.47

93.15
149
48
1192

1.49
23
447
298
342

96.81
93.15
3.66

2.51 3.74
251
1230
1004
2260
2257

96.81
3.72
3.09

556
7152

96.81
4.16
92.65

Spike NW Sisson + Castle. 61/12

BP. N.W. Sisson + Klauber.

96.81

+48

+75

+90

3.09 93.72

2.79 94.02

2.47 94.34

PM-

3.20 346.30 334.78

0.48 40.77 6.01 40.29

10.23 30.54

10.14 30.63

2.04 32.58 30.54

6.23 26.35 (26.37

1.47 22.38 11.67 20.91

1.75 12.21 11.92 10.46

1.60 309.65 12.16 300.05

4.12 96.81 8.76 292.69 ✓

+10 3.66 4.03 292.77 93.15

+23 3.47 93.34

Prices

6" Concrete	1.04
8" "	1.30
10" "	1.74
12" "	1.65
14" "	1.76
16" "	1.79
Manholes	60.00 each + 3.10 per ft.
6" Cast Iron Pipe	2.00

1-3-6 Concrete 14.00 per yd.

Check levels to ref. hub at M.H. 126 1/2 - Central + Castle.

0.42	43.76	34	343.54	B.M. Central + Klouber
TP	1.38	34.86	10.48	33.48

8.03 26.83 6'S

8.13 26.73 10'S

S.W. cor. culvert N.E. cor 7.94 26.92
Central + Castle.

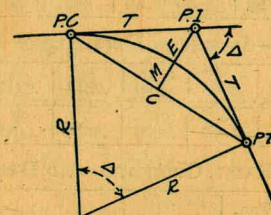
5.70 32.62 5.8 26.82

5.12 27.50

11.12 21.50

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

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



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= $E = T \tan \frac{\Delta}{4} = R \cos \frac{\Delta}{2} (1 - \cos \frac{\Delta}{2})$ (8) $= R \text{exsec} \frac{\Delta}{2}$ (9)

Long Chord= $C = 2 R \sin \frac{\Delta}{2}$ (10) Δ =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—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 91.37. For from Table IV for 1° curve $E=960.6$ for $8^\circ 20'=960.6 \div 8 \frac{1}{2}=91.27$ 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 $\div 42=5.5$ 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	0	1	∞	0	0	90
10	.0029	.0029	343.8	.99985	50	10	.1421	.1405	7.115	.99027	82
20	.0058	.0058	171.9	.99960	40	20	.1449	.1465	6.968	.98986	50
30	.0087	.0087	114.6	.99915	30	30	.1478	.1495	6.827	.98944	40
40	.0116	.0116	85.94	.99849	20	40	.1507	.1524	6.691	.98902	30
50	.0145	.0145	68.75	.99756	10	50	.1536	.1554	6.561	.98858	20
1	.0175	.0175	57.29	.99639	89	1	.1564	.1584	6.435	.98814	10
10	.0204	.0204	49.10	.99499	50	10	.1593	.1614	6.314	.98769	81
20	.0233	.0233	42.96	.99339	40	20	.1622	.1644	6.197	.98723	50
30	.0262	.0262	38.19	.99160	30	30	.1650	.1673	6.084	.98676	40
40	.0291	.0291	34.37	.98968	20	40	.1679	.1703	5.976	.98629	30
50	.0320	.0320	31.24	.98756	10	50	.1708	.1733	5.871	.98580	20
2	.0349	.0349	28.64	.98531	88	2	.1736	.1763	5.767	.98531	10
10	.0378	.0378	26.43	.98299	50	10	.1765	.1793	5.671	.98481	80
20	.0407	.0407	24.54	.98059	40	20	.1794	.1823	5.576	.98430	50
30	.0436	.0437	22.90	.97812	30	30	.1822	.1853	5.485	.98378	40
40	.0465	.0466	21.47	.97558	20	40	.1851	.1883	5.396	.98325	30
50	.0494	.0495	20.21	.97298	10	50	.1880	.1914	5.309	.98272	20
3	.0523	.0524	19.08	.97033	87	3	.1908	.1944	5.226	.98218	10
10	.0552	.0553	18.07	.96753	50	11	.1937	.1974	5.145	.98163	79
20	.0581	.0582	17.17	.96458	40	20	.1965	.2004	5.066	.98107	50
30	.0610	.0612	16.35	.96149	30	30	.1994	.2035	4.989	.98050	40
40	.0640	.0641	15.60	.95826	20	40	.2022	.2065	4.915	.97992	30
50	.0669	.0670	14.92	.95490	10	50	.2051	.2095	4.843	.97934	20
4	.0698	.0699	14.30	.95141	86	4	.2079	.2126	4.773	.97875	10
10	.0727	.0729	13.73	.94779	50	12	.2108	.2156	4.705	.97815	78
20	.0756	.0758	13.20	.94404	40	10	.2136	.2186	4.638	.97754	50
30	.0785	.0787	12.71	.94017	30	20	.2164	.2217	4.574	.97692	40
40	.0814	.0816	12.25	.93618	20	30	.2193	.2247	4.511	.97630	30
50	.0843	.0846	11.83	.93207	10	40	.2221	.2278	4.449	.97566	20
5	.0872	.0875	11.43	.92785	85	5	.2250	.2309	4.390	.97502	10
10	.0901	.0904	11.06	.92351	50	13	.2278	.2339	4.331	.97437	77
20	.0929	.0934	10.71	.91905	40	10	.2306	.2370	4.275	.97371	50
30	.0958	.0963	10.39	.91447	30	20	.2334	.2401	4.219	.97304	40
40	.0987	.0992	10.08	.90978	20	30	.2363	.2432	4.165	.97237	30
50	.1016	.1022	9.788	.90498	10	40	.2391	.2462	4.113	.97169	20
6	.1045	.1051	9.514	.90008	84	5	.2419	.2493	4.061	.97100	10
10	.1074	.1080	9.255	.89509	50	14	.2447	.2524	4.011	.97030	76
20	.1103	.1110	9.010	.89000	40	10	.2476	.2555	3.962	.96959	50
30	.1132	.1139	8.777	.88481	30	20	.2504	.2586	3.914	.96887	40
40	.1161	.1169	8.556	.87952	20	30	.2532	.2617	3.867	.96815	30
50	.1190	.1198	8.345	.87414	10	40	.2560	.2648	3.821	.96742	20
7	.1219	.1228	8.144	.86867	83	5	.2588	.2679	3.776	.96667	10
10	.1248	.1257	7.953	.86312	50	15	.2616	.2711	3.729	.96593	75
20	.1276	.1287	7.770	.85749	40	10	.2644	.2742	3.683	.96517	50
30	.1305	.1317	7.596	.85178	30	20	.2672	.2773	3.647	.96440	40
40	.1334	.1346	7.429	.84599	20	30	.2700	.2805	3.606	.96363	30
50	.1363	.1376	7.269	.84012	10	40	.2728	.2836	3.566	.96285	20
	Cosin.	Cotg.	Tan.	Sine.	Angle.						74

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.		Angle	Sine.	Tan.	Cotg.	Cosin.	
16	.2756	.2867	3.487	.96126	74	24	.4067	.4452	2.246	.91355	66
10	.2784	.2899	3.450	.96046	50	10	.4094	.4487	2.229	.91236	50
20	.2812	.2931	3.412	.95964	40	20	.4120	.4522	2.211	.91116	40
30	.2840	.2962	3.376	.95882	30	30	.4147	.4557	2.194	.90996	30
40	.2868	.2994	3.340	.95799	20	40	.4173	.4592	2.177	.90875	20
50	.2896	.3026	3.305	.95715	10	50	.4200	.4628	2.161	.90753	10
17	.2924	.3057	3.271	.95615	73	25	.4226	.4663	2.145	.90631	65
10	.2952	.3089	3.237	.95545	50	10	.4253	.4699	2.128	.90507	50
20	.2979	.3121	3.204	.95459	40	20	.4279	.4734	2.112	.90383	40
30	.3007	.3153	3.172	.95372	30	30	.4305	.4770	2.097	.90259	30
40	.3035	.3185	3.140	.95284	20	40	.4331	.4806	2.081	.90133	20
50	.3062	.3217	3.108	.95195	10	50	.4358	.4841	2.066	.90007	10
18	.3090	.3249	3.078	.95106	72	26	.4384	.4877	2.050	.89879	64
10	.3118	.3281	3.048	.95015	50	10	.4410	.4913	2.035	.89752	50
20	.3145	.3314	3.018	.94924	40	20	.4436	.4950	2.020	.89623	40
30	.3173	.3346	2.989	.94832	30	30	.4462	.4986	2.006	.89493	30
40	.3201	.3378	2.960	.94740	20	40	.4488	.5022	1.991	.89363	20
50	.3228	.3411	2.932	.94646	10	50	.4514	.5059	1.977	.89232	10
19	.3256	.3443	2.904	.94552	71	27	.4540	.5095	1.963	.89101	63
10	.3283	.3476	2.877	.94457	50	10	.4566	.5132	1.949	.88968	50
20	.3311	.3508	2.850	.94361	40	20	.4592	.5169	1.935	.88835	40
30	.3338	.3541	2.824	.94264	30	30	.4617	.5206	1.921	.88701	30
40	.3365	.3574	2.798	.94167	20	40	.4643	.5243	1.907	.88566	20
50	.3393	.3607	2.773	.94068	10	50	.4669	.5280	1.894	.88431	10
20	.3420	.3640	2.747	.93969	70	28	.4695	.5317	1.881	.88295	62
10	.3448	.3673	2.723	.93869	50	10	.4720	.5354	1.868	.88158	50
20	.3475	.3706	2.699	.93769	40	20	.4746	.5392	1.855	.88020	40
30	.3502	.3739	2.675	.93667	30	30	.4772	.5430	1.842	.87782	30
40	.3529	.3772	2.651	.93565	20	40	.4797	.5467	1.829	.87743	20
50	.3557	.3805	2.628	.93462	10	50	.4823	.5505	1.816	.87603	10
21	.3584	.3839	2.605	.93358	69	29	.4848	.5543	1.804	.87462	61
10	.3611	.3872	2.583	.93253	50	10	.4874	.5581	1.792	.87321	50
20	.3638	.3906	2.560	.93148	40	20	.4899	.5619	1.780	.87178	40
30	.3665	.3939	2.539	.93042	30	30	.4924	.5658	1.767	.87036	30
40	.3692	.3973	2.517	.92935	20	40	.4950	.5696	1.756	.86892	20
50	.3719	.4006	2.496	.92827	10	50	.4975	.5735	1.744	.86748	10
22	.3746	.4040	2.475	.92718	68	30	.5000	.5774	1.732	.86603	60
10	.3773	.4074	2.455	.92609	50	10	.5025	.5812	1.720	.86457	50
20	.3800	.4108	2.434	.92499	40	20	.5050	.5851	1.709	.86310	40
30	.3827	.4142	2.414	.92388	30	30	.5075	.5890	1.698	.86163	30
40	.3854	.4176	2.394	.92276	20	40	.5100	.5930	1.686	.86015	20
50	.3881	.4210	2.375	.92164	10	50	.5125	.5969	1.675	.85866	10
23	.3907	.4245	2.356	.92050	67	31	.5150	.6009	1.664	.85717	59
10	.3934	.4279	2.337	.91936	50	10	.5175	.6048	1.653	.85567	50
20	.3961	.4314	2.318	.91822	40	20	.5200	.6088	1.643	.85416	40
30	.3987	.4348	2.300	.91706	30	30	.5225	.6128	1.632	.85264	30
40	.4014	.4383	2.282	.91590	20	40	.5250	.6168	1.621	.85112	20
50	.4041	.4417	2.264	.91472	10	50	.5275	.6208	1.611	.84959	10
				66							58
	Cosin.	Cotg.	Tan.	Sine.	Angle.		Cosin.	Cotg.	Tan.	Sine.	Angle.

5000 24.1000 0.114
 1000 24.1000 0.114
 1000 24.1000 0.114

ang L 9° 05' 150 6 7° 36'

5.04 32.51
 3.085 42.925
 (3.81 58.165)
 13.05 38.98
 1.98 350.88 348.90

2.75 42.13
 4.09 42.32 12.65 38.23
 5.04 37.28
 48.925

7 470 3.085 6
 2.30 33+05
 2.81

Central

4+4775
 10
 16+20
 20
 23+36
 28
 30+55 547
 35+88 4915

H
 3+95.75
 6+31 — 48° 55'
 9+332 R 0+347
 11+46
 13+09.8 R 30° 45'
 15+41.3
 G
 3+50.3 5+843
 10+876

24+248

at C. line Aug R. 2° 06'

C line 2+73.4 angpt.

Hammer 55 5+387
 Bat 50 7+974

26+60 ang L 16° 14'
 28+50.9 m H ang R
 33+776 " D ang L 67°
 35+60.8 ang L 23° 01'
 39+408 " R 6° 42'
 42+30? " L 129° 08' E line

44+015 — R 89° 05'
 45+49? L 29° 01'
 L 8° 12'
 48+75.3

1+475E
 61+18.8 J
 64+76.227
 68+158
 72+128
 74+175 L
 2° 00'

Western

3+20
 7+622 Δ
 12+50
 17+25
 21+21.3
 26+20.2 Central
 30+00
 34+08.7
 38+00
 41+933
 45+00
 47+93 I
 53+20
 58+42

ENGINEERING DEPARTMENT
CITY OF EAST SAN DIEGO

EAST SAN DIEGO, CALIFORNIA.

November 4, 1921.

Mr. V. M. Smale,
City Engineer's Office,
East San Diego, Calif.

Dear Sir:-

Reference to change in alignment in the Branch D on Kennedy's job, please be advised that the following change has been authorized.

Instead of a manhole at station 5, there will be a manhole located at station 4 plus 00 and one at station 8 plus 00. (840) The location of the manhole at station 4 will be on the same line as originally staked by Mr. Bartlett. The location of the manhole at station 8 will be ten feet easterly from the line located by Mr. Bartlett.

The location of the manhole 46 at the end of the line will be the same as originally located. Sta. 1003.2

I have given Mr. Kennedy the offsets from the stakes now in and he states that he contemplates no trouble in constructing the work without additional stakes at the present time.

Yours Truly,

EPF/csk

cc to
J. V. Smale.

E. Paul Ford
City Engineer

522
13 578.21
518.20

518

ENGINEERING DEPARTMENT
CITY OF
SAN DIEGO,
CALIFORNIA.

74 16 1/2
330
7706 3
75.80
88.7
20.5
4435
4435
6209
66.9685
6767
77
77.44
77.4
81.004
1.81
1.601
104

DISTANCES FROM CENTER OF ROADWAY FOR
CROSS-SECTIONING.

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 $41.9 + (20 - 16) \div 2$ or 2 ft. added to 41.9 = 43.9. For slopes of 1 on 1 see inside of front cover.