

1652



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DEPARTMENT OF THE INTERIOR  
BUREAU OF GEOLOGICAL SURVEY

No. 403F

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1652

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 1/2 see inside of back cover.  
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CITY ENGINEER'S OFFICE  
ENGINEERING DEPARTMENT  
CITY OF SAN DIEGO,  
CALIFORNIA.

This Field Book is manufactured of a High Grade 50% Rag Paper having a WATER RESISTING SURFACE, and is sewed with Bing Special Enamel Waterproof thread.

Made in U. S. A.

Posted in Bench Books 2-4-44. C.S.K.

Crown Pt. and Pacific Beach Levels

				city datum	
B.M. B.P. curb	6.515	28.195		21.68	X
T.P. #1	7.81	33.225	2.78	25.415	
T.P. #2	6.53	36.985	2.77	30.455	
T.P. #3 on B.P.	5.88	39.745	3.12	33.865	X
T.P. #4	6.20	42.875	3.13	36.615	
T.P. #5	1.048	38.331	5.592	37.283	
T.P. #6	0.51	29.156	9.685	28.646	
T.P. #7 Fd. B.P.	0.185	21.651	7.69	21.466	X
T.P. #8	5.065	22.41	4.306	17.345	
T.P. #9	5.47	23.575	4.305	18.105	
T.P. #10 B.P. curb	5.90	25.375	4.10	19.475	X
T.P. #11	5.738	27.525	3.588	21.787	

at More AM. cloudy, little wind.  
12-2-44. P.M. clear " "

21.68 Walker. SW Corner Moorland Pl. & Crown Pt. Drive  
derived from USCG 1930. BK. 1423-3  
2069 USGS  
9.51  
21.68 CITY

Fd. B.P. NW. Cb. Ingraham & Moorland Pl. Sisson B.M.  
see X sec of La Mancha St. etc.  
in Crown Pt.

Fd. B.P. Cb. NE Cor. Frontera & Moorland Pl. Walker's B.M.  
on SE Cor. IS GONE

1945 Fd. B.P. NE Cor. Frontera & La Playa

1

27.525

T.P. #12 4.99 21.89 8.625 18.90

T.P. #13 3.575 14.435 11.03 10.86

T.P. #14 8.664 21.282 1.817 12.618

T.P. #15 8.064 27.968 1.378 19.904

T.P. #16 7.357 33.187 2.138 25.83

T.P. #17 3.365 32.968 3.584 29.603

T.P. #18 1.96 27.588 7.34 25.628

#19

T.P. Fd. BM 3.273 24.446 6.415 21.173

T.P. #20 3.565 22.121 5.89 18.556

T.P. #21 3.05 18.061 7.11 15.011

T.P. #22 2.77 14.736 6.095 11.966

T.P. #23 4.374 12.73 6.38 8.356

↓

T.P. 12.618  
3.068  
15.686  
5.493  
10.193

Fd. BM BP NW Frontcat Estrella

10.225 = Walker

This B.P. has been driven below top of curb. Seats battered.

Walker

Fd.

21.185 BM BP NW Pacific Beach Dr. & Gresham

12.73

424 Fd.  
T.P. BM.B.P. 1.667 9.055 5.342 7.388 X

T.P. 425 2.74 4.555 7.24 1.815

T.P. 426 5.20 5.045 4.71 -0.155

T.P. 427 3.895 4.60 4.34 0.705

T.P. 428 4.845 5.125 4.32 0.28

T.P. 429 5.27 6.265 4.33 0.795

check to BM.

4235 2.03 X 2.045

T.P. 430 3.34 4.695 4.91 1.355

T.P. 431 4.74 3.555 5.88 -1.185

434  
T.P. BM. 5.67 3.865 5.36 -1.805 X -1.73

T.P. 433 6.62 8.91 1.575 2.29

check to BM

1.925 6.985 X 6.995

Posted in Bench Books 2-4-44, C.S.K.

13

Walker  
740 Fd. BM.B.P. NW Pacific Beach Dr. & EVERTS

S.E. B.P. Bayard & Pacific Beach Dr.

BM. B.P. 66. N.E. Cor. Pacific Beach Dr. & Mission Blvd.  
The curb shows evidence of having settled.

B.M. B.P. N. end Mission Beach seawall

1<sup>st</sup> Leveling

Check Levels from VSC&G B.M.

S end Mission Bay Bridge across channel  
of Bay Inlet To B.M. B.P. Top S. end

Mission Beach Seawall 12-8-42 CSM

East B.M. B.P. curb	2.706	14.941	12.235	VSC&G DATUM
------------------------	-------	--------	--------	----------------

T.P.	0.89	10.521	5.31	9.631
------	------	--------	------	-------

T.P.	2.54	7.961	5.10	5.421
------	------	-------	------	-------

T.P.	5.078	9.309	3.68	4.281
------	-------	-------	------	-------

T.P.	9.45	11.699	7.06	2.249
------	------	--------	------	-------

T.P.	3.78	13.749	1.73	9.969
------	------	--------	------	-------

T.P.	2.77	13.174	3.345	10.404
------	------	--------	-------	--------

T.P.	3.725	14.334	2.565	10.609
------	-------	--------	-------	--------

T.P.	3.745	14.799	3.28	11.054
------	-------	--------	------	--------

T.P.	5.035	15.604	4.23	10.569
------	-------	--------	------	--------

T.P.	5.60	17.659	3.545	12.059
------	------	--------	-------	--------

↓

indexed  
c.s.k.

14

all rod shots 150', except across  
inlet channel, where at a - tide it took  
a 500' shot to span water.

9' S of S. end M. Bay Bridge Top of E cb. see 1423-6

Here took 2 shots of approx. 500'  
This not so good. Too far.

1  
17.659

T.P. 4.84 16.899 5.58 12.079

check to B.M.B.P. 0.715 16.184  $\checkmark$  16.14

0.044

2<sup>nd</sup> Leveling 12-11-44.

across Bay Bridge 150' shots

B.M.B.P. 5.074 20.544 15.47  $\checkmark$  Walken  
= VSC+G

T.P. 2.11 16.247 6.405 14.137

T.P. on B.P. 6.345 18.515 4.057 12.19  $\checkmark$  12.235

T.P. 5.145 21.41 2.45 16.265

T.P. 3.805 21.36 3.855 17.555

T.P. 3.54 20.80 4.10 17.26

T.P. 3.74 20.175 4.345 16.455

T.P. 0.815 16.535 4.455 15.74

T.P. 3.86 13.835 6.56 9.975

5

VSC+G Walker 1423-4  
Top S. end Mission Beach Seawall1423-5  
N.E. Co. Bacon & W. Pt. Loma Blvd. 115' S. of old RR.Walker  
on B.M.B.P. E. curb 9' S. of S. end Bay Bridge  
This curb evidently is settling some  
See FB. 1423-19. for check made in  
Jan. 11, 1938. 0.033 diff.

13.835

T.P. 5.555 13.14 6.25 7.585

T.P. 5.265 14.435 3.97 9.17

T.P. 5.22 15.06 4.615 9.82

T.P. 6.21 16.52 4.75 10.31

T.P. 5.22 17.24 4.50 12.02

T.P. 5.395 17.17 5.465 11.775

check to B.M. 1.02 16.15  $\frac{16.14}{0.01} =$

Walker  
BM B.P. Top S. end Mission Beach Sea wall



Indexed  
C.S.M.

12-11-42  
C.S.M.

Transfer of Temp. B.M.<sup>s</sup>  
from O.B. Trunk Sewer  
to Con. Man<sup>s</sup>  
Ocean Beach to Old Town.

5.115 5.645 0.488 See below  
0.53 <sup>CITY</sup> DATUM

B.M. B.P. in Con. Man. 4.985 0.66 Subject to  
Correction  
Stipulated 0.69 see p. 19 0.67  
12-15-42 Stipulated con.  
7.548 10.545 ✓ 2.997 = City Datum  
12.007  
9.01  
2.997

Fd. USGS B.M. 4.405 6.14 16.99 USGS  
6.119  
5.871: City  
0.269  
Crown  
↑ This B.M. was destroyed about  
12-30-1944, by St. Dept. acct.  
of new curb const.  
See p. 13 for new elev. transfered  
12-15-42

4.835 5.323 0.488 See 1647-78  
City datum

check to USGS B.M. 4.79 0.533 6.66 USGS  
6.119  
0.541  
0.008  
Crown

See 1647 P 78 El. 0.488  
1423 P 25

0.53 has been accepted in the Past  
B.M. B.P. S.W. curb Midway & Rosecrans

Wly. line of Gaines, 2' S. of S. Midway Curb  
and approx. Curb grade.

12.007 = USCG Walker 1423-6  
approx. 100' Wly of  
B.M. B.P. & Top W end hdwall Triple box Culv. w. Pt. Loma Blvd.  
on Midway

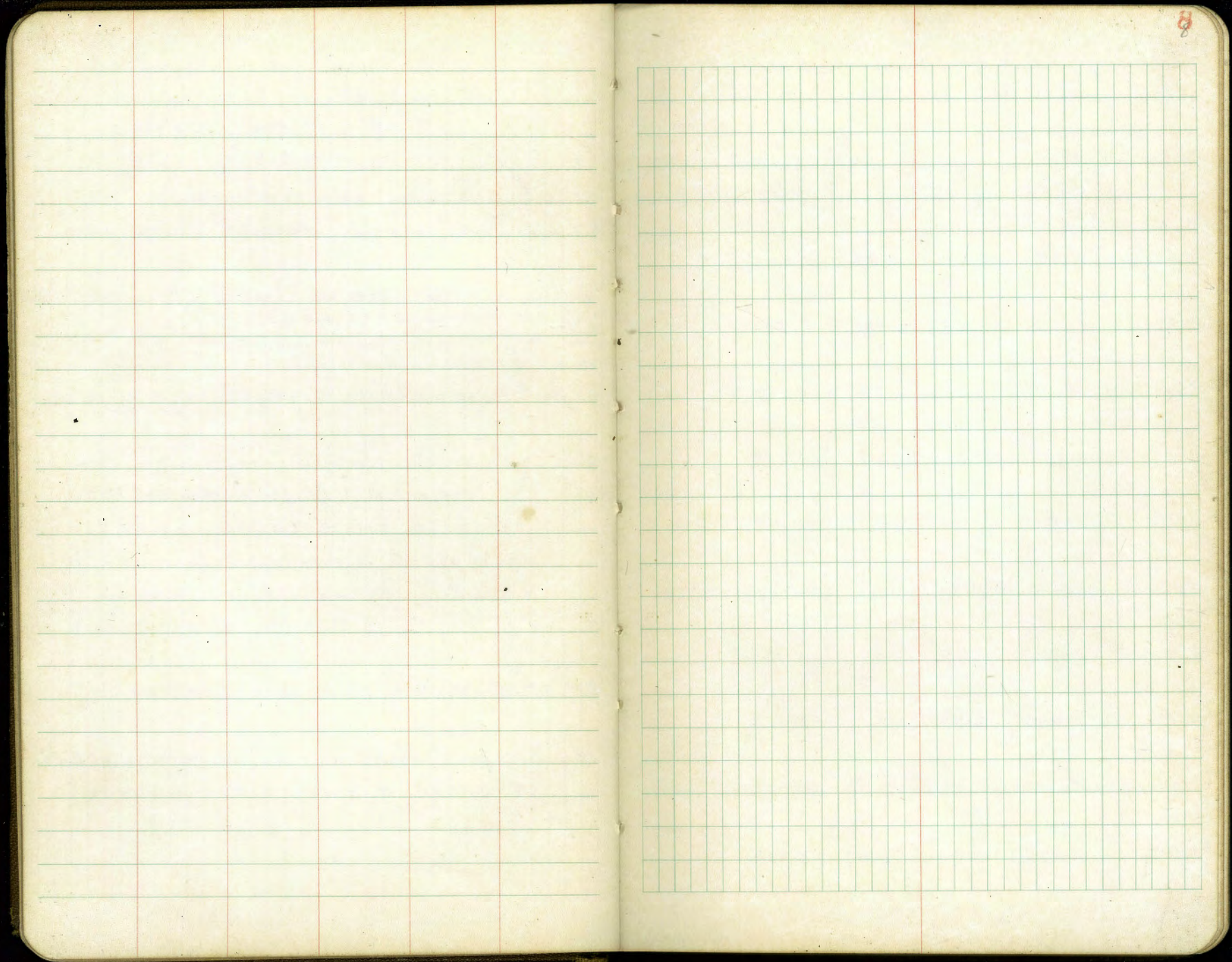
3d order leveling Midway and  
chisel sq. Top curb Ret. NW Cor. w. Pt. Loma Blvd

Various El.<sup>s</sup> fd. for Walker B.M. on Curb  
8.887 = USGS see 1423-26 Levels from La Playa

12.007 = USCG Walker 1423-6  
7.90 = City CS Moore 1446-4 = (approx  
See Levels La Playa to Mission Bay Cross Section  
of Sewer

B.M. B.P. S.W. curb Ret. Midway & Rosecrans

chisel sq. on E. Cb. RETURN on inside edge of Curb  
NWly Cor. Midway & Rosecrans



Indexed  
as is

Check Levels from Bacon St.  
on W. Pt. Loma Blvd. Fly to Seaside St.

15.47 USC&G  
9.01  
6.46 = City Datum

T.P. 7.85 19.195 0.81 11.345

T.P. 6.67 23.255 2.56 16.635

check to B.M. 3.80 19.255

T.P. 3.85 25.215 1.89 21.365

T.P. 6.39 27.785 3.82 21.395

T.P. 5.49 29.70 3.575 24.21

T.P. 5.86 31.67 3.89 25.81

T.P. 5.965 34.45 3.185 28.485

T.P. 4.215 34.455 4.21 30.24

T.P. 4.096 32.904 5.647 28.808

CONTD P10

12-14 yr. clear  
Moore Cool  
Little wind

1473-5 B.M. B.P. in curb Nely Bacon St. and  
W. Pt. Loma Blvd.  
115.5 ft. from old RR.

1944 <sup>walked</sup> B.M. B.P. N.E. Cor. Lotus & W. Pt. Loma Blvd

Fd. B.M. B.P. <sup>in</sup> Curb S.W. Sunset Cliffs & W. Pt. Loma Blvd

Fd. B.M. B.P. Sely W. Pt. Loma Blvd. & Ebers St.

32.904 from P 9

T.P. 6.17 34.686 4.388 28.516

check to U.S.G.S. B.M. 6.253 28.433

12-15-uv.

0.152 28.585

28.433

above elev.

T.P. 1.343 19.058 10.87 17.715

T.P. 6.37 24.453 0.975 18.083

T.P. 5.935 29.601 0.787 23.666

T.P. 4.132 28.303 5.43 24.171

T.P. 2.92 25.718 5.505 22.798

T.P. 2.334 22.89 5.162 20.556

T.P. 0.35 15.405 7.835 15.055

T.P. 2.528 9.738 8.195 7.21

Set B.M. B.P. in Con. Man. 4.92 4.818

✓

U.S.G.S. STAND disk in Con. Man. 10' N of S.W. of west Pt. Loma Blvd. + 15' W of W.L. of Seaside ST. Mkcd. H CO 1938 Bench Mark 34' <sup>above</sup> sea level 4' inside So. curb of Blvd.

checking to B.M. on Sewer Levels

9.738 T. Fwd.

T.P. 2.303 8.791 3.25 6.488

check to RR Spike Top uv. 4.186 4.615 4.66  
P/c on old RR Trestle  
Sewer STA 178482

dif. 0.045

See 1634-46

BUT see

1634-P in

I was on level  
not from

Sunset cliffs and was  
at 800' or above water 150'  
My Level loop would  
check to 0.025 error

check Levels to W. Pt. Loma Blvd. + Midway  
Sec P. 15

B.M. Man.  
4.94  
1677-3

5' wily and 1' nily of S.W.ly Cor. of  
W. Pt. Loma Blvd. and Rialto ST.  
8" deep or below grade

Indexed  
C.S.K.

Check Levels Walker Circuit 1423-4 to

VSGS BM. Stan. disk, Con. Post 1938 H 59 Reset 1941  
Mission Beach.

BM. BP. 0.275 8.045 16.58 = Walker  
9.01  
7.57 = City DAT.

T.P. 4.73 6.095 6.98 1.365

T.P. 4.467 4.715 5.847 0.248

check to VSGS 1938 H 59 Reset 1941  
STON. disk Con. Post  
3.46 1.255 0.108?

T.P. 4.23 5.385 3.56 1.155

T.P. 5.515 8.847 2.053 3.334

check to Orig. BM. on Seawall  
Walker.  
1.276 7.571 7.570  
0.001  
error

Recheck for possible  
1' error in Rod reading

BM BP  
Top Seawall 0.663 8.433 7.57

T.P. 4.74 6.093 6.88 1.353

T.P. 4.45 4.695 5.848 0.245

check to VSGS 1938 H 59  
Reset 1941.  
3.445 1.25 1.255  
0.005

C Moore 12-21-42  
W Cloudy, Cool.  
Little wind

1423-4 VSGDG

SW Top Seawall San Fernando Pl. & M.B. Seawall

6.227 ← THIS MUST BE elev. of old BM.  
6.119 NOT THE RESET OF 1941  
0.108

269' N of M.L. San Fernando Pl. on E Mission Blvd.  
Con. Post Set here. Island Curb on divided Lane Blvd

See P. 14

269' N of San Fernando Pl.  
180 ft. was old location given

12-21-44.  
Check Levels, San Juan Pl. & Top Seawall

To U.S.G.S Sw Con. San Juan Pl. & Mission Blvd.

B.M.B.P. 2.76 9.834 City DOT 7.072

Fd. U.S.G.S chisel square Top curb 9.678 0.154

Check Levels from Walkers USC+G

to U.S.G.S. 1938 H 58

B.M.B.P. 6.285 11.261 City DOT 4.976

T.P. B.P. curb 4.965 11.927 4.299 6.962

T.P. 4.298 11.265 4.96 6.967

check to U.S.G.S B.M. 3.967 7.298  $\frac{13.119}{6.119} - 7.00$

T.P. 2.903 9.743 4.425 6.84

T.P. 4.685 8.743 5.685 4.058

check back to B.P. B.M. NE Cor Thomas & Ocean Blvd. 3.77 4.973  $\frac{4.976}{0.003}$

16.082 = 1423-3 = Walker USC+G

9.01  
7.072

B.P. Top Seawall & San Juan Pl.

6.07 = U.S.G.S

6.119 Sw Con. San Juan Pl. & Mission Blvd.

- 0.049 dif. of 0.203 High according to Walker

14.095 = USC+G in 1423-9

10-27-42.

13.986 = USC+G Walker, 1449-2

9.01  
4.976

curb has settled.

see also Levels in Pac. B. sewer bk. for this B.M.

B.P. in NE curb on Ocean Blvd. & Thomas

Fd. City B.M.B.P. in curb SE Cor Ocean Blvd & Grand

Stand. disk in Con. Post. MKd. 1938 H 58 13' 38' W of E Mission Blvd. & 117' N of E Grand

FROM P. 7

Transfer CITY B.M. to new  
CITY CON. MON. AT INTERSEC. of  
W. PT. LOMA Blvd. and Midway

7.664 10.659

7.997 = City Dat.

GR BK 213-75

5.59

Set CITY CON. MON. plug <sup>with Brass</sup> 4.974 5.685

Please Note!

U.S.G.S. should be notified of the  
loss of chiseled sq. B.M. on old curb.  
See P. 7 and figure correction  
to CITY MON. from their level net.

Moore  
1-4-1943.

13

8.869 = U.S.C.G. 1<sup>st</sup> order leveling  
La Jolla to San Diego

2.891  
11.760 U.S.C.G.

12.007 - 11.76 = 0.247 Has this  
Culv. settled?  
diff. See also 1423-2C.

12.007 = U.S.C.G. Dat. according to 1423-2 (Walker) 1930

7.01  
4.997

B.M. B.P.  $\frac{1}{2}$  top v. hd. wall of Triple  
Box Culv. on Midway, approx. 100'  
Wly of W. PT. LOMA Blvd.

approx. 412' SWly from  $\frac{1}{2}$  of Intersec  
of Midway and W. PT. LOMA Blvd.  
and 9' Sly from Slyline of W. PT.  
LOMA Blvd., which is on the NWly cor.  
of the new CITY FIRE STA. SITE.

FROM P. 7

11.99 = U.S.G.S. <sup>3<sup>rd</sup> order leveling</sup> chisel sq. Top cb Midway +  
W. PT. LOMA Blvd.

4.405

16.395

7.548

8.847 = Brass Plug on Triple Box Culv.

8.847

12.007 = F.B. 1423 U.S.C.G.

2.891

11.738

11.738

0.269 Lower

Check Levels, Mission Beach

AMUSEMENT CENTER

USGS

4.113 11.746 7.633

T.P. 4.847 11.328 5.265 6.481

check to USGS B.M. 4.002 7.326

7-4-43.

117

Found per description "E 61 1927" Stand. disk / 1<sup>st</sup> order leveling La Jolla to San Diego

Marked "  
 for U.S.G.S. Stand. disk ^ 1938 H 59" Reset 1941  
 500' S. of above B.M. and 269' N. of N.E.  
 of San Fernando Place on E of Mission Blvd.  
 Con. Post betw. Island Curbs of Divided Hwy.  
 See P. 11 this bk.

7.326

6.119

1.207 = City or 1.255 from Walker 1423-4.

This Con. Post B.M. must have been  
 reset by STATE Hwy. Engr. 1941, after  
 new paving job was completed.

Please call their office for new Elev.  
 as the location data does not check.



Check Levels from  
W. Pt Loma Blvd. & Rialto

indexed  
e.s.k.

Moore clear P.M.  
1-7-43. Windy

13

to " " " " " Midway

Contd. From p. 10

CITY DAT.

3.492 8.31

4.818 ✓

T.P. #1 3.068 6.063 5.315 2.995

T.P. #2 5.092 6.233 4.922 1.141

T.P. #3 5.47 7.163 4.54 1.193

T.P. #4 5.105 8.763 3.505 3.658

T.P. #5 4.608 9.551 3.82 4.943

T.P. #6 4.296 9.298 4.549 5.007

T.P. #7 3.449 8.157 4.59 4.708

T.P. #8 4.61 7.957 4.81 3.347

T.P. #9 4.825 8.212 4.57 3.387

T.P. #10 4.715 8.66 4.267 3.945

T.P. #11 5.012 9.841 3.831 4.829

Contd. opp. page

P. 10  
CITY  
COAT  
MON. SW Cor. W. Pt. Loma Blvd & Rialto St.

2.241 ✓

T.P. #12 4.333 9.824 4.35 5.491 ✓

FB. 1423-8226

check to B.M. BP T.P. # of 7021 2.803

W. hdwl of Triplic Box

Corner at W. Pt. Loma Blvd  
and Midway

17.007  
9.01  
7.997

Check Levels

Indexed  
6.516

Ingraham & Moorland to

" " Garnet

BM.B.P. 2.709 36.574 City DAT. T.P. #3  
33.865 X See P. 1

T.P. #1 2.413 32.346 6.441 29.933

T.P. #2 3.948 30.745 5.549 26.797

Set B.M. & Ld. C.T. 4.302 26.443 X

T.P. #3 6.417 32.731 4.431 26.314

T.P. #4 6.075 36.186 2.62 30.111

T.P. #5 5.95 39.822 2.314 33.874

T.P. #6 6.587 44.06 2.349 37.473

T.P. #7 6.77 48.023 2.807 41.253

T.P. #8 <sup>Ld. C.T.</sup> 5.301 50.166 3.158 44.865 X

T.P. #9 3.851 49.916  
~~3.82~~ ~~49.885~~ 4.101 46.065

T.P. #10 4.92 50.652 4.184 45.732

Contd. P. 17

1-8-43 clear posted-c.s.k.  
6 AM Light Wind  
T.P. dist. 140

16

BM.B.P. NW curb Ingraham & Moorland H.

E Ld. C.T. Ingraham & La Playa

Set B.M. on E Ld. C.T. Ingraham & Fortuna

P.D. leveled against Level

Set BM on Ld. 4CT	4.52	46.132	X
T.P. #11	5.205	51.974	3.883 46.769
T.P. #12	2.73	50.356	4.348 47.626
T.P. #13	2.865	49.941	3.28 47.076 ✓
T.P. #14	5.87	52.869	2.942 46.999
T.P. #15	7.355	57.897	2.327 50.542
T.P. #16	5.495	61.463	1.929 55.968
T.P. #17	5.478	65.079	1.862 59.601
T.P. #18	5.578	67.175	3.482 61.597
check to USC + G	stand. Disk Top Curve	4.37	62.805 X
" " City Brass Plug		4.439	62.736 X ↓

5.7' Line of Pacific Beach Dr. + E. of Ingraham to 50.

Top of S.E. Ingraham + Reed

check to BM B.P. in Curve

N.E. Ingraham + Grand Ave

Note!  
See Levels  
old town to P.B.  
Trunk Sewer  
Book

Getting quite windy, this P.M.

Tidal w. = E) 68.799 = 1st. Order Leveling #  
USC + G STAND. disk in Top cb stamped "49 1934"  
SE Cor Ingraham + Garnet

CITY BM BP S.E. cb. Ingraham + Garnet

See above Severn Book 1697/159

62639

.102  
24.

Ingraham to Frontera

B.M. L.D. CT 4.06 50.192 46.132 ✓ See p. 17

T.P. #1 9.35 57.453 2.089 48.103

T.P. #2 1.167 57.049  
1.164 57.046 1.571 55.882

T.P. #3 0.079 44.828 12.30 44.749

T.P. #4 0.666 34.453 11.041 33.787

check to T.P. #18 P. 2 8.79 25.663 25.628

Set City Con. Mon. B.P. 4.121 30.332 ✓

Check front walker B.M. Pac. Beach Drive  
to Con. Mon. 4600 and Gresham

5.85 27.035 21.185 P. 2

T.P. 6.61 32.541 1.104 25.931

check to City Mon. 2.23 30.311 30.332  
0.021

B.M. L.D. CT. 50.7' line of Pac. Beach Dr. and  
E. of Ingraham to the So.

0.035 High. (This last T.P. is not so good.)  
workers have been digging here

Set City Mon. Brass plug on SE. Cor. of Pacific Beach Drive  
and Frontera St. Mon. is 1' S. of inside edge of walk  
" about 1/2" high. on E. h. of Frontera St.

Walker B.M. 1423-  
B.M. B.P. in curb NW Pacific Beach Dr. + Gresham

check to City Mon. Front Walker Circuit  
1930 - B.M. 1423

Indexed  
C.S.K.

Check Level Circuit

Midway + Rosecrans to

" " W. PT. Loma Blvd

				CITY DAT.
STARTING B.M.	5.435	5.923		0.488 ✓
check to USGS B.M.		5.39	0.533	6.56
T.P. #1	4.445	5.244	5.126	0.797
check to New CITY Cant. Man		4.623	0.619	✓
T.P. #2	4.601	5.58	4.263	0.979
T.P. #3	5.375	6.063	4.894	0.688
T.P. #4	5.184	6.443	4.804	1.261
T.P. #5	4.975	6.795	4.623	1.84
T.P. #6	4.83	6.867	4.758	2.037
T.P. #7	4.505	6.874	4.498	2.369
T.P. #8	4.675	6.844	4.705	2.169

Cont'd P. 20

1-9-43 clear, cont.  
Moore little wind posted-C.S.K.

CITY F.B. 1423  
B.M. BP SW1 Top 66 Midway + Rosecrans  
Both of these B.M.'s will be destroyed. Please  
Notify USC&G office  
USGS chiseled 5g. Crn. Top NW. Ret. Midway +  
Rosecrans

4.6  
6.12  
0.54

Sec P. 7 This BK.  
SWly Cor. Midway + Gaines  
0.6 on wly Gaines + 2.5 at 566 of Midway

6.844 Contd. from P. 19

T.P. #9	1.705	7.205	1.344	5.50
T.P. #10	3.95	7.125	4.03	3.175
T.P. #11	4.188	6.551	4.762	2.363
T.P. #12	4.201	6.171	4.581	1.97
T.P. #13	5.098	6.604	4.665	1.506
T.P. #14	4.35	5.949	5.005	1.599
T.P. #15	3.975	5.307	4.617	1.332
T.P. #16	4.255	5.204	4.358	0.949
T.P. #17	5.775	6.764	4.215	0.989
T.P. #18	5.87	10.554	2.08	4.684
T.P. #19	3.947	9.913	4.588	5.966
Check to City Brass Plug		7.095	2.818	

W. E. Top Triple Box Culy about 100' wly of  
 W. Ft. Loma Blvd. & Midway  
 See P. 15 This BK. ✓  
 also 1423 - P. 8 tnc

Check Levels From Federal Bldg. State + Fst 4109  
 Broadway + Pacific Highway to Civic Center  
 City Datum

BM	9-1917	0.135	23.649	23.516	* Std. Dirc Vert. 460' Ground Hgt. Co. Federal Bldg. State + Fst	
TP	BM	8.135	24.096	7.688	15.961	1/2 B.P. SW Fst + State 15.957
TP		7.335	27.461	3.97	20.126	
TP	BM	6.100	30.066	3.495	23.966	* SW B.P. F + U 109 23.97
TP		6.635	33.161	3.540	26.526	SW Cor Broadway + U 109 11.8.80
TP		7.50	37.291	3.37	29.791	
BM	4250			1.14	26.151	* SW Dirc Vert. 2075 Hgt. SE Cor Fst. Co. Court House Front 131. 15.13 U.S.G.
TP		4.215	30.741		26.526	SW Cor Broadway + U 109
TP		1.725	25.202	7.264	23.477	
TP	BM	6.315	22.407	9.11	16.092	* SW B.P. Broadway + Columbia 16.19
BM	157-1921	1.523	19.268	4.664	17.743	* N. W. Y. MC Std. Dirc. E of Main Est
TP		2.77	16.258	6.78	12.488	

Extensions Checked 4.9.23 (A. 21452)

						Clear 140m. No Wind	Feb 16. 42 5.3504 8.1111 2.499 Rod
							16.258
TP	BM	6.30	15.690	6.863	9.390	SW B.P. Broadway + Ketchikan 9.46	
TP		5.434	13.904	7.220	8.470		
BM	157-1926						0.605
TP		2.730	9.099	7.535	6.369	Std. Dirc Vert. 19419 Station Hgt. Broadway	13.299
BM						SW B.P. Broadway + Pacific Highway 4.83	4.664
TP		4.375	8.849	4.625	4.474		
TP		4.580	8.954	4.475	4.374		
TP		6.245	9.364	5.835	3.119		
TP		5.420	10.720	4.064	5.300		
TP		6.325	12.400	4.645	6.075		
BM	H2 4565 1938					Std. Dirc Vert. 35 W of S.E. Cor Civic Center 13.280	0.275
BM	H5 4565					Std. Dirc Vert. 35 W of S.E. Entrance Civic Center 18.299	0.250

Check Levels Market + 9th St to  
 Post office Bldg 9th + F St.  
 City Datum

BM 10.785 44.295 32551

BM 9.215 51.687 1.823 42.472

TP 7.925 58.357 1.255 50.432

BM 3.972 60.504 1.825 56.532

BM H17 USGS 3.302 57.202  
 6.12  
 63.322

Indexed  
 as. K.  
 Feb. 16-43  
 5:30  
 8:00  
 8:00  
 N.H.B.P. 1/2  
 Market 9th  
 16th - P 21

N.H.B.P. 1/2  
 Market 9th  
 42.47

N.H.B.P.  
 F 49th  
 56.53

Sta. Disc Vert  
 H17  
 8th + 12th  
 9th + 5th  
 Post Office  
 63319

Bench Mark Nat. History Museum  
 Laurel + Park Blvd.  
 City Datum

BM 4.812 288.092 282.28

USGS Sta. Disc  
 BM H 19-282 1938 6.098 281.994

Bench Mark Laurel St East of 6th  
 West Entrance Balboa Park

BM 6.405 256.355 249.95

BM 2.793 254.755 4.395 251.950

USGS 1938  
 BM H 18-256 4.365 250.388  
 See Page 25

Bench Mark 5th Ave University N.E. Cor  
 Rt of Entrance Security Commercial Bank

BM 4.790 294.730 289.94

USGS 64  
 BM 1927 0.75 292.98

Feb 17-43  
 5:30  
 8:00  
 8:00

N.H.B.P. 1/2  
 Laurel + Park Blvd  
 Nat. History  
 Museum  
 1st Floor East  
 in Conc. Wall  
 8th + 12th  
 Cor of Wall  
 287.955

N.H.B.P. 1/2  
 Laurel + 5th

Sta. Disc  
 E of 12th  
 N Side of 5th  
 6.12  
 251.508  
 Top of Wall  
 at N. South  
 Side of Court  
 256.467

N.H.B.P. 1/2  
 University  
 5th + 7th

Sta. Disc Vert  
 Glass Enclosed  
 Rt of Entrance  
 Security Commercial  
 Bank  
 300.15



Bench Mark University of Georgia  
From University + Control.

x

BM 7.69 311.57 300.88

1711 8P  
University  
Control.

TP 10.153 319.933 1.79 309.78

TP 2.950 318.726 4.157 315.776

TP 1.945 312.518 8.153 310.573

USGS 461

BM 1927

2.180

310.338

6.12  
316.458

1

Std. Director  
University of  
Georgia  
So. Reforming  
Hall, College  
Hall of Philosophy  
316.516

Check Levels From Federal Bldg. State + Fst.  
To 6th + Laur

	City Datum	For #8. Page 42			
BM 9-1917	0.108	23.624	23.516	23.516	Std noted for Federal Bldg State + Fst
BM	5.996	21.957	7.663	15.961	SWBP 1/2 F + State 15.957
TP	6.946	25.916	2.987	18.970	
TP	6.422	28.338	4.010	21.906	
TP	7.543	32.956	2.925	25.413	
TP	9.370	39.856	2.470	30.486	
BM			4.912	34.944	SWBP 1/2 B + Union 34.93
TP BM	6.030	41.530	4.356	33.500	SWBP 1/2 B + Fst 33.50
BM			4.60	36.93	SW Lead 40.80 B + Fst 36.93
TP	7.625	46.385	2.770	38.760	
TP	11.973	57.113	1.245	45.140	
TP BM	6.360	61.823	1.650	55.463	SWBP 1/2 H + 2nd Fst 55.51
TP	6.192	65.732	2.283	59.540	

Indexed  
c.s.t.

		65.732			
BM			5.302	60.430	SWBP H + 2nd Fst 60.44
TP	11.998	77.365	0.865	65.367	
BM			2.402	74.963	SWBP H + 2nd Fst 75.01
	Note Page 42 For North 7				
TP	10.265	87.445	0.187	77.178	
TP	10.018	96.951	0.510	86.933	
BM			4.940	92.011	SWBP B + 2nd Fst 92.05
TP	11.165	107.253	0.863	96.888	
TP	9.310	116.437	0.126	107.127	
TP	11.233	126.835	0.835	115.602	
TP	11.990	138.385	0.440	126.395	
TP BM	12.647	150.512	0.520	137.865	SWBP 1/2 H + 2nd Fst 137.94
TP	10.175	160.477	0.210	150.302	
TP	10.825	170.902	0.400	160.077	

Cloudy  
Cool  
No wind

Feb 19. 43  
S. J. 1077  
8199 Red 74

Federal Bldg To 6th Ave + Laurel

		170.902				
BM		5.898	165.004		N.W. BP 1/2 Firs + 1/2 164.96	
TP	10.422	181.082	0.242	170.660		
TP	10.700	190.827	0.955	180.127		
BM		7.985	182.842		N.W. BP 1/2 Grass + 1/2 182.96	
TP	8.880	199.227	0.480	190.347		
BM		3.890	195.337		N.W. BP 1/2 Hardwood + 1/2 195.43	
TP	9.758	208.132	0.853	198.374		
TP BM	11.070	216.477	2.725	205.407	N.W. BP 1/2 144 + 45 205.49	
TP BM	10.275	225.185	1.567	214.910	N.W. BP 1/2 144 + 45 215.00	
TP	11.302	236.142	0.345	224.840		
BM		6.252	229.89		N.W. BP 1/2 Juniper + 1/2 229.98	
TP	6.555	242.281	0.416	235.726		
TP BM	10.123	249.877	2.527	239.754	N.W. BP Kalmia + 1/2 239.87	

Feb. 20-43  
S. 1900  
Blunt  
Bepp Rech 5

		249.877			
TP	6.666	254.628	1.845	248.032	
BM	5.466	255.244	4.800	249.832	N.W. BP 1/2 Laurel + 1/2 249.95
BM	5.433	255.277	3.400	251.844	N.W. BP Laurel + 1/2 251.93
BM H 18-256		5.005		250.272	SH 011c Folgs SH Laurel 144 + 45 250.459
					Also Page 22

Recheck of Line From Court House on Front St.  
to 6th Laurel #2

BM	4250	1.065	37.216	36.151	Std. Dev. 2005 N.J. State Survey County Court Ho Front St Page 21
TP	6.030	37.103	6.143	31.079	
TP	5.700	40.108	2.695	34.408	
BM	5.900	41.396	4.612	35.196	S.W. 8 P 1/2 8 x Front 35.50
BM	6.864	43.780	4.48	36.916	S.W. Lead 8 x 15 x 11 36.93
TP	7.622	48.180	3.232	40.548	
TP	10.852	58.472	0.560	47.620	
BM	6.470	61.930	2.012	55.46	Page 22 N.W. 8 P 1/2 8 x 2nd Ave 55.51
TP	5.922	65.078	2.774	59.156	
BM	9.800	70.218	4.660	60.418	N.W. 8 P 8 x 4th Ave 60.44
TP	8.132	78.220	0.130	70.088	
BM	11.797	86.752	3.265	74.955	S.W. 8 P 80 x 4th 75.01
TP	9.200	95.628	0.324	86.128	

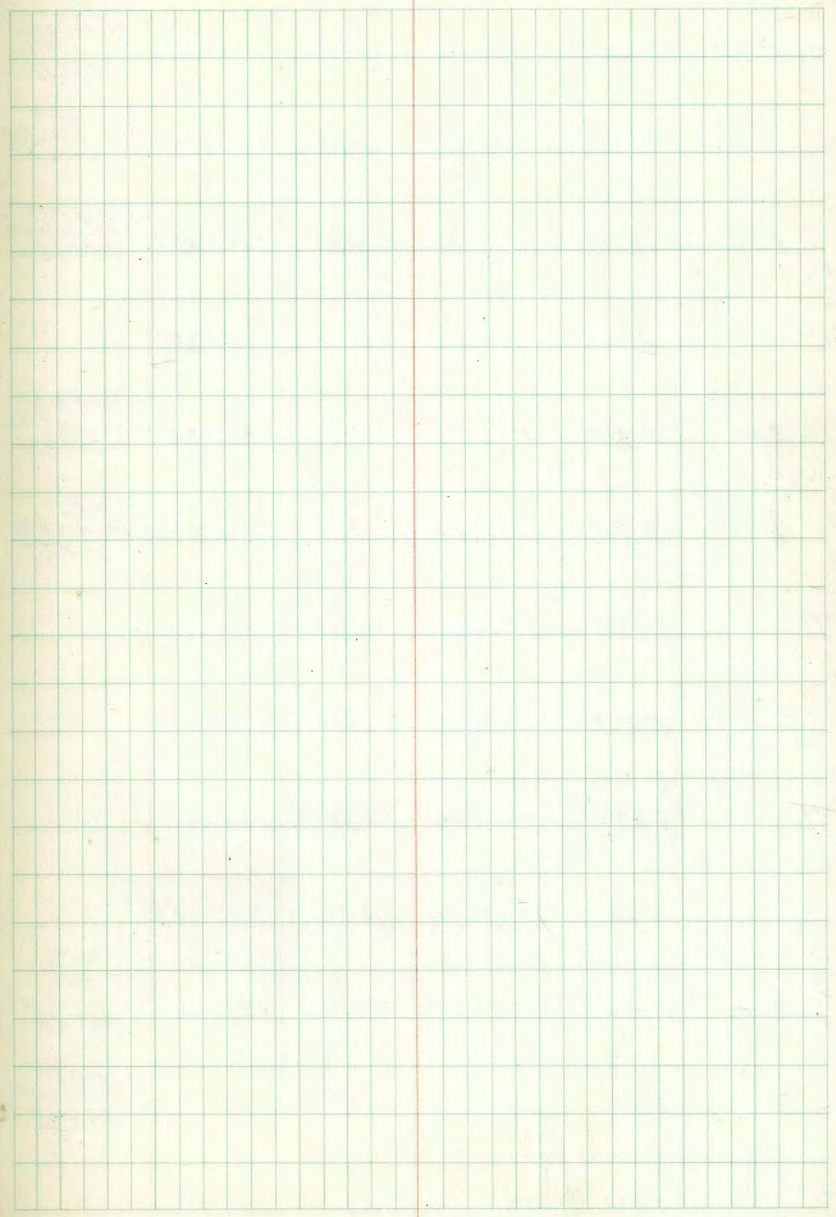
Feb. 23. 42  
Simon  
8155 T  
8099 Rod 95628

Clear  
Cool  
No Wind  
Indexed  
C.S.K.

BM	11.165	103.158	3.625	91.793	BM 11.165 Rec'd by 11/11/11 9206
TP	10.910	112.561	0.507	102.651	
TP	9.168	122.074	0.655	112.906	
TP	8.635	130.529	0.180	121.894	
TP	9.445	139.894	0.080	120.449	
BM	12.655	150.494	2.055	137.839	N.W. 8 P 81 x 11th 137.94
TP	10.378	160.570	0.302	150.192	
TP	7.155	166.375	1.350	159.220	
BM	11.075	176.040	1.410	164.966	N.W. 8 P 81 x 11th 164.96
TP	9.480	184.240	1.280	174.760	
BM	9.835	192.640	1.435	182.805	N.W. 8 P 81 x 11th 182.76
TP	7.490	197.797	2.333	190.307	

Re Check Court House on Front St.  
to 6th + Laurel

	197797				
BM	11.805	207.100	2.502	195.295	H.W.B.P. Howlbornt 195.43
BM	11.550	216.922	1.728	205.572	H.W.B.P. 14 + 15th Fl 205.49
BM	9.200	224.067	2.055	214.867	H.W.B.P. 11 + 15th Fl 215.00
TP	8.450	231.489	1.028	223.039	
BM	11.855	241.684	1.660	229.829	H.W.B.P. Juniper + 5th 229.93
BM	10.002	249.701	1.985	239.699	S.W.B.P. Kalmia 16th 239.87
TP	7.142	254.058	2.785	246.916	
BM			4.280	249.778	H.W.B.P. Laurier + 5th Fl 249.95



Check Levels From Laurel + 6 1/2" A.C. to USGS 61-1927  
 5th Ave + University Ave. Security Commercial Bank

	USGS	City Datum	Station	Height
BM H18-286	5.005	255.242	250.272	250.272
TP BM	6.650	258.559	2.433	251.909
BM	6.770	262.204	3.125	255.434
TP	6.710	267.499	1.415	260.789
BM	9.210	276.161	0.548	266.951
BM	7.280	282.551	0.890	275.271
TP	6.415	287.296	1.670	280.881
TP	5.815	289.846	2.265	284.021
TP	5.930	291.846	3.930	285.916
TP	4.810	292.316	4.340	287.506
BM	6.270	293.656	4.930	287.386
BM	50.50	294.051	4.655	289.001
TP	1.260	286.786	8.625	285.426

Feb 28-73  
 Sidson  
 8133  
 3099

✓ Indexed  
 C.S.K.

120

	USGS	City Datum	Station	Height
TP	2.350	279.361	9.805	276.981
TP	11.366	286.931	2.760	275.571
TP	7.370	292.501	1.800	285.131
TP	4.800	291.832	5.469	289.032
BM	2.900	290.157	3.575	286.257
TP	6.090	291.624	4.623	285.534
TP	5.810	292.929	2.445	288.179
TP	5.410	294.909	4.49	289.499
BM	4.790	294.714	4.985	289.927
BM	661-1927		0.75	293.399
				289.94
				293.964
				293.399

Station Descriptions:  
 Station East of 6th St. side of Tool House  
 Top of Pillar  
 S. side Laurel  
 N.W. B.P. 4" Laurel + 6 1/2" 251.93  
 S.W. B.P. 4" Maple + 6 1/2" 255.48  
 S.W. B.P. 4" 01150 + 6 1/2" 267.02  
 N.W. B.P. Palm + 6 1/2" 275.27  
 N.W. B.P. 4" U.S. University 5th Ave 286.27  
 S.W. B.P. 4" Rt. of Exit to Security Commercial Bank 5th Ave 300.15

Notes:  
 Taken From Page 22  
 USGS  
 BM 661-1927

Bench Levels Market St. + 10th Ave To  
9th - 10th - 11th Ave And Imperial Ave

Indexed  
C.S.K.

BM	5.420	38.940	23.52	37.188	X NWBP Market 19th BM Book Record R. 22 Used 33.51
TP	3.00	40.188	1.722	37.188	
BM	2.105	35.570	6.723	33.465	NWBP 15th and 10th 33.48
BM	1.592	28.515	8.647	26.923	NWBP 15th + 10th 25.92
TP	1.533	21.593	8.455	20.060	
BM	2.290	16.240	7.643	12.950	Set NWBP 15th + 10th
TP	1.198	9.876	7.562	8.678	
BM			3.370	6.506	Set NWBP Imperial + 9th Ave
BM	3.606	11.142	2.240	7.536	Set NWBP Imperial + 10th Ave
BM	3.786	10.250	4.678	6.464	Set NWBP Imperial + 11th Ave
BM	4.478	7.848	6.880	3.27	NWBP Imperial 12th Ave 3.23
BM	7.484	10.430	4.902	2.946	NWBP Imperial + 13th 3.00
TP	5.390	12.870	2.450	6.980	

Feb. 24. 18  
3.8500  
3.899

Rain  
Cool

29

TP	7.402	16.022	2.75	8.620	12.370
TP	5.490	20.910	0.802	15.220	
TP	6.505	24.550	2.665	18.045	
TP	6.615	28.855	2.010	22.240	
BM	7.910	32.255	3.510	25.345	NWBP 15th + 10th 25.48
BM			2.758	30.497	NWBP Market + 15th 30.50 16th - 21

Check Levels From 5<sup>th</sup> Fl. + University  
 To Georgia + University  
 City Datum

BM	2.670	292.650	289.980	289.980	Per 289.960 289.859 289.980
BM	3.935	287.985	8.60	284.05	NW B.P. University 5 <sup>th</sup> Fl. Reference 5/31-1927 NW B.P. Univ. + 6 <sup>th</sup> 289.87
TP	6.130	289.655	4.460	283.525	
TP	4.510	288.690	5.475	284.180	
BM			1.885	283.805	NW Hole No. 8 P Univ. + 9 <sup>th</sup> 283.76
TP	7.345	289.530	6.505	282.185	
TP	6.510	293.960	2.08	287.450	
BM	7.16	296.985	4.125	289.825	NW B.P. University Vermont 289.73
TP	6.705	300.510	3.18	293.805	
TP	6.740	304.255	2.995	297.515	
TP	7.950	308.370	5.825	300.420	
BM	5.670	308.770	5.570	302.800	NW B.P. Univ. + Herbert 302.68
BM	8.21	312.220	4.460	304.01	NW B.P. Univ. + Center 303.88

X X Indexed  
 C.S.K.

					312.220
TP	9.105	319.030	2.295	309.925	
TP	3.615	320.075	2.570	316.460	
TP	3.425	314.360	9.140	310.925	
BM	1927		387	310.490	310.469

Cloudy  
 Cool  
 Feb. 25-43  
 5.00 AM  
 3111 T  
 3199 Rod

Sta Director  
 Univ. Georgia  
 So. Robinson Hall  
 Column 26 ft  
 of North Plate  
 316.526



Recheck From 56 H.S. & University H.S.  
 To Georgia University & Vandyke University  
 Corrected to Ref to 461-1927

BM	2.792	292.772		289.960 289.98 Ref. to 6-61-1927	N.W.B.P. University of Georgia
BM	3.270	287.820	8.722	284.050 0.80	N.W.B.P. Univ. of Va.
TP	5.493	289.018	4.295	283.525	
BM	4.707	289.155	4.570	284.448	Sol N.W.B.P. Univ. of Va.
BM	3.998	287.805	5.348	283.807 7.87	Sol N.W.B.P. Univ. of Va.
BM	7.313	289.455	5.663	282.142 1.22	Sol N.W.B.P. Univ. of Va.
TP	8.305	295.618	2.142	287.313	
BM			5.788	289.830 8.10	S.W.B.P. Univ. of Vermont 289.73
TP	6.888	299.884	2.622	292.996	
BM	6.605	303.875	2.614	297.270 2.50	Sol S.W.B.P. Univ. of Richmond
TP	7.490	308.180	3.185	300.690	
BM	5.550	308.320	5.410	302.770 302.75	S.W.B.P. Univ. of Herbert 302.68
BM	7.910	311.887	4.343	302.977 9.57	N.W.B.P. Univ. of Center

Index  
 e.s.k.

TP	9.010	311.887	1.650	310.237 2.17	
BM	5.203	320.267	2.183	317.064 0.04	Sol N.W.B.P. Univ. of Va.
TP	0.685	312.635	8.317	311.950	
BM			2.188	310.447 310.487 316.56	Sol Univ. of Georgia Sol. Ref. to Sol. Ref. to Sol. Ref. to Sol. Ref. to
TP	0.695	301.323	12.005	300.630 6.12	
TP	0.812	293.132	9.003	292.320	
BM	0.580	287.752	5.960	287.172 1.52	S.W.B.P. Univ. of Florida 287.08
TP	0.205	276.645	11.312	276.440	
TP	3.643	269.788	10.500	266.145	
BM			3.792	265.996 9.76	N.W.B.P. University of Florida 265.96
TP	11.575	281.038	0.325	269.463	
	7.590	287.606	1.022	280.016	
BM			5.530	282.076 1.05	S.W.B.P. Univ. of Maryland 281.99

		287.686			
TP	9.372	296.616	0.382	287.224	
BM	11.240	306.373	1.483	295.113 295.133	Set Unit Louis 1000
TP	11.652	317.943	0.082	306.291	
TP	0.580	309.501	9.022	308.921	
	7.612	307.950	9.163	300.338	
BM	8.225	314.870	1.405	306.545 5.5	S.F.B.P Unit Herald 306.50
TP	10.245	324.903	0.212	314.658	
BM			2.882	322.021 001	S.F.B.P Unit Hilotterrae
TP	11.726	336.487	0.142	324.761	
TP	11.963	348.129	0.321	336.166	
BM			9.238	338.891 871	H.F.Mon Unit Oregon
BM			1.898	346.231 211	H.W.B.P Unit 1000 346.05

32

BM	9.276	348.161		338.891 871	H.F.Mon Unit Oregon
TP	6.793	351.627	3.327	344.834	
TP	6.065	355.292	2.400	349.227	
TP	6.252	358.334	3.210	352.082	
TP	5.618	360.072	3.880	354.454	
BM			3.892	356.18 355.98	H.W.B.P Unit 356.03
BM			3.662	354.41 .21	Set H.F.B.P Unit 1000
TP	4.510	359.765	4.817	355.255	
TP	6.275	361.777	4.263	355.502	H.W.B.P Unit 0.10 355.31
BM Set	3.975	362.105	3.647	358.130 110	H.W.B.P Unit 1100
BM Set	2.375	359.253	5.227	354.878 18.58	H.W.B.P Unit 1000
BM Set	0.540	352.565	7.228	352.005 352.025	S.W.B.P Unit 1000
TP	0.170	340.652	12.083	340.482	

		340.652			
BM	1.013	334.373	7.292	333.360	
TP	1.645	327.418	8.600	325.773	
BM			5.285	322.133	
TP	9.427	335.550	1.335	326.083	
TP	10.912	346.224	0.238	335.312	
TP	9.505	355.289	0.440	345.784	
TP	7.001	360.677	1.613	353.676	
BM	6.002	364.802	1.877	358.800	
BM	3.645	365.225	3.222	361.580	
BM	3.518	364.118	4.625	360.600	
BM	3.932	363.480	4.570	359.348	
BM	2.287	359.845	5.922	357.552	
BM	1.563	353.606	7.802	352.062	

March 1, 43  
 St. John's Univ  
 8099 Rod  
 N.W.B.P.  
 Univ  
 Secondary  
 333.44

N.W.B.P.  
 Univ  
 322.15

N.W.B.P.  
 Univ  
 358.86

N.W.B.P.  
 Univ  
 361.53

N.W.B.P.  
 Univ  
 360.61

N.W.B.P.  
 Univ  
 359.54

N.W.B.P.  
 Univ  
 357.52

N.W.B.P.  
 Univ  
 352.09

BM	5.728	351.362	7.982	345.624	
BM	5.858	353.140	4.080	347.282	
TP	6.020	355.672	3.488	349.652	
BM	5.352	357.501	3.523	352.149	
TP	3.892	357.808	3.585	353.916	
BM	6.802	359.660	4.950	352.858	
TP	5.408	362.722	2.345	357.315	
BM			0.620	362.103	
TP	4.713	363.174	4.262	358.461	
BM			4.790	358.384	

N.W.B.P.  
 Univ  
 345.85

N.W.B.P.  
 Univ  
 347.34

N.W.B.P.  
 Univ  
 351.93

N.W.B.P.  
 Univ  
 352.858

St. John's Univ  
 Van Dyke  
 362.396

N.W.B.P.  
 Univ  
 358.25

Re Check University 13974 to University  
Van Dyke

BM 6.420 353.702 347.282  
NW BP  
Univ. 13974  
Page 33

TP 6.075 356.137 3.640 350.062

BM 3.995 352.142  
NW BP  
University  
Central

TP 6.020 358.147 4.010 352.127

TP 4.18 358.102 4.225 353.922

BM 7.645 360.512 5.235 352.867  
NW BP  
Univ  
Marlboro

TP 5.525 362.822 3.215 357.297

USC 99 J61-1927  
BM 0.700 362.122  
5404 Vent  
Univ Van Dyke  
Box 48129  
NYC  
368346

TP 5.05 363.427 4.445 358.277

BM 5.032 358.395  
NW BP  
Univ  
Van Dyke

March 6-43  
515507  
811517  
3099 Rod  
Indexed  
e.s.k.

Check Levels University + Van Dyke to  
Hoover High School

City BM	5.530	363.914		358.384	JWBP University Van Dyke 1933
TP	5.595	364.869	4.640	359.274	
TP	4.405	364.414	4.860	360.009	
TP	4.550	364.059	4.905	359.509	
BM	4.855	363.954	4.960	359.099	JWBP Polk + Fairmount
TP	4.900	363.819	5.035	358.919	
TP	2.445	361.809	5.455	358.364	
TP	3.535	358.249	7.095	354.714	
BM	6.180	358.319	6.110	352.139	JWBP EICajon + Fairmount 352.03
BM	5.820	360.549	3.590	354.729	JWBP with EICajon + Fairmount 354.72
TP	6.430	363.029	3.950	356.599	
U.S.S 1938 H20 BM	2.82	363.549	2.30	360.729	Std Disc Vert 2 Fast Boonier E of Main East Hoover High School 366.988
TP	3.310	363.754	3.105	360.444	

March 6-13  
SUNNY  
BLIND  
8:29 AM

Indexed  
C.S.K.

Clear  
Cool  
No Wind

March 8-13  
75

		363.754			
BM	3.06	359.509	7.305	356.449	JWBP EICajon + Fairmount 356.58
BM	5.265	358.134	6.630	352.879	JWBP EICajon + 4614 353.00
BM	3.765	354.829	7.070	351.064	JWBP EICajon + Mentis
BM	5.255	352.349	7.735	347.094	JWBP EICajon + 4714 347.26
TP	2.865	351.364	3.850	348.499	
TP	4.610	348.650	7.324	344.040	
BM			10.825	337.825	JWBP Mentis + 4714 337.94

Check Levels From University + Herbert  
to Horace Mann (Old Normal School)

BM	5.265	308.030		302.750 302.770	350.865 350.865
TP	5.045	312.230	0.845	307.185	350.865
TP	7.040	315.685	3.585	308.645	350.865
TP	7.550	322.045	0.190	315.495	350.865
TP	10.545	332.255	0.335	322.710	350.865
TP	11.395	343.920	0.730	322.525	350.865
TP	6.055	349.505	0.470	312.150	350.865
TP	4.550	348.735	5.320	344.185	350.865
TP	6.825	350.865	4.695	344.040	350.865
BM		7.205		343.660 343.640	350.865
USGS 3555D BM		0.960		349.905 349.885	350.865

March 8-43  
3.5502  
31.55 x  
3.999 Rd  
S.W. BP  
University  
Herbert  
Page 83  
S.E. Top Hyd  
Blair + Normal  
S.E. Top Hyd  
Blair + Normal  
S.E. Top Hyd  
Blair + Normal  
S.E. Top Hyd  
Blair + Normal  
S.W. BP  
University  
Herbert  
B.P. W.L.  
Normal 10.451  
Normal 10.451  
343.58  
St. Discy  
S. Side Main Est.  
Face Balustrade  
Herbert  
350.865  
350.865

Indexed  
c.s.k.

TP	4.615	348.680	6.800	344.065	350.865
TP	4.995	349.425	4.250	344.430	350.865
TP	0.230	339.760	9.895	339.530	350.865
TP	0.865	328.365	12.260	327.500	350.865
TP	2.165	320.545	9.935	318.430	350.865
TP	0.145	315.830	5.060	315.485	350.865
TP	3.585	311.940	7.275	308.355	350.865
TP	1.160	308.335	4.765	307.175	350.865
BM		-5.565		302.770 (302.735)	350.865

S.E. Top Hyd  
Blair + Normal  
S.E. Top Hyd  
Blair + Normal

Check Levels From Market St + 47<sup>th</sup> St to  
Federal Blvd + 47<sup>th</sup> Also University + Van Dyke  
Cont From 1642 P27

BM	7.770	139.870	132.10 132.025	8P JCB Market 100 W of 47 <sup>th</sup> St 1642-27
TP	11.890	151.650	0.110	139.760
TP	12.025	163.500	0.175	151.475
TP	12.045	174.975	0.570	162.930
TP	12.085	186.720	0.340	174.635
TP	6.020	191.435	1.805	185.415
BM	5.510	192.680	4.265	187.170 8 LxT Hilltop + 47 <sup>th</sup> 186.81
TP	5.185	194.700	3.165	189.515
TP	10.075	201.890	2.885	191.815
TP	9.175	210.660	0.405	201.485
TP	8.195	218.625	0.230	210.430
TP	8.255	224.565	2.315	216.310
TP	8.470	231.910	1.125	223.440

Indexed  
E.S.R.  
Cloudy  
Cool  
Slight Wind

March 9-43  
Sun  
Blust T  
Begg Red.

				231.910	1
BM	Didnt Find LxT	3.49	228.42	2 LxT Federal Blvd + 47 <sup>th</sup> St 228.05	
USGS order					
BM	1.490	229.765	3.635	228.275 228.200	2 HxT Cor Federal Blvd. + 47 <sup>th</sup> St 228.05 231.91
TP	0.120	219.465	10.420	219.345	
TP	0.050	208.545	10.970	208.495	
TP	0.405	197.740	11.210	197.335	
TP	0.180	185.710	12.210	185.530	
TP	0.580	174.430	11.860	172.850	
TP	0.170	163.580	11.020	163.410	
TP	0.320	152.535	11.365	152.215	
TP	0.220	143.540	9.215	143.320	Top Fire Hyd E of Pen 47 <sup>th</sup> Belt + 47 <sup>th</sup> W of Federal
TP	8.775	149.415	2.90	140.640	
BM		4.560	144.855	1 HxT Cor JX Coner 47 <sup>th</sup> St Chollar Creek	

March 10. 93 PM  
Start Federal 474

		149.415		
TP	11.525	160.270	0.580	148.835
TP	11.740	171.900	0.210	160.160
TP	11.450	183.185	0.165	171.735
TP	12.00	194.980	0.205	182.980
TP	11.540	206.290	0.230	194.750
TP	12.230	218.300	0.220	206.070
TP	12.225	230.525	0.00	218.300
TP	11.405	241.770	0.160	230.365
BM	0.580	240.390	1.960	239.81
TP	0.250	228.495	12.145	228.245
TP	0.045	216.795	11.745	216.750
TP	0.080	205.030	11.845	204.980
TP	0.175	193.555	11.65	193.380

4 Chisel Sq.  
at Edge paving  
Top of Ridge  
Top of 10' ridge  
0.04785 of  
Fairmount

March 11. 43  
Cloudy  
Cool

		193.555		
TP	0.125	182.240	11.44	182.115
TP	0.685	171.120	11.795	170.445
TP	0.205	159.710	11.625	159.505
BM	10.850	159.210	11.350	148.360
				K.B.P. F.H. or C.H. Home Ave + Fairmount 148.05
TP	11.635	170.770	0.075	159.125
TP	11.405	182.105	0.070	170.700
TP	12.125	192.975	0.255	181.850
TP	12.080	205.935	0.120	193.855
TP	12.010	217.895	0.050	205.885
TP	12.220	230.035	0.080	217.815
TP	12.065	242.040	0.060	229.975
TP	12.085	254.050	0.075	241.965



		254.050		
TP	14.740	265.690	0.100	265.950
TP	9.595	273.760	1.525	264.165
TP	8.610	282.240	0.130	273.630
BM	8.920	289.400	1.760	280.480
				N.H.B.P. Maple + Fairmount 280.17
TP	8.260	297.555	0.105	289.295
TP	5.310	301.175	1.690	295.865
TP	4.280	302.105	2.350	297.825
BM	5.650	302.155	4.60	297.505
				J.F.B.P. Olive + Fairmount
TP	8.245	310.490	0.910	302.245
TP	8.155	318.000	0.645	309.845
TP	6.925	321.835	2.090	314.910
BM	7.180	325.480	2.535	318.300
				J.F.B.P. Terry + Fairmount
TP	8.360	332.625	1.215	324.265

		332.625		
BM	7.865	340.160	0.330	332.295
				N.H.B.P. Wright + Fairmount
TP	6.675	344.165	2.730	337.430
BM	6.370	347.565	2.910	341.195
				N.H.B.P. Dix 1961 + Fairmount 340.89
TP	7.660	351.895	5.330	344.225
TP	7.295	356.745	2.445	349.450
TP	5.810	359.555	3.000	353.745
BM	6.185	361.775	3.965	355.590
				N.H.B.P. Wright + Fairmount 355.33
TP	5.560	363.140	4.195	357.580
TP	6.200	365.115	4.225	358.915
TP	4.610	364.190	5.535	359.580
TP	5.120	364.310	5.000	359.190
BM		5.690	358.62	358.62
				N.H.B.P. University 420244

Check Levels From March 12-43 to  
 University Ave & 32nd St.  
 Levels Carit From Federal Bldg. Station F.S. 1642 P 24  
 J.S.G.S.  
 BM 557-1938 7.730 152.680 144.950  
 TP 11.07 161.820 1920 150.750  
 TP 9.00 167.745 3.075 158.745  
 BM 8.865 175.785 0.825 166.920  
 TP 12.085 187.545 0.825 175.460  
 TP 5.290 191.330 1.505 186.040  
 BM 3.775 187.555  
 TP 8.425 198.125 1.630 189.700  
 BM 2.615 197.565 3.175 194.950  
 BM 11.095 205.775 2.885 194.680  
 TP 9.060 214.565 0.270 205.505  
 TP 8.895 222.610 0.850 213.715  
 BM 7.145 227.220 2.525 220.075

N.E. M. 30th St. Dir.  
 Marked 30767  
 1642 P 24

S.E. B.P.  
 F + 30767  
 166.99

N.W. B.P.  
 F + 30767  
 187.63

S.E. B.P.  
 Broadway  
 + 30767  
 195.08

S.W. B.P.  
 C.S. + 30767  
 197.96  
 Ch. Sub 417

N.E. B.P.  
 B + 30767  
 220.14

9 47 Indexed  
 C.S.K.  
 227.220  
 Clear Cool Slight Wind  
 March 12-43  
 Sisson  
 Blight  
 Beeg Red  
 TP 6.200 222.915 0.505 226.715  
 TP 7.720 238.250 2.385 230.520  
 TP 4.235 238.080 4.405 233.845  
 BM 2.940 234.910 6.110 231.970  
 TP 5.400 232.550 7.760 227.150  
 TP 9.520 240.785 1.285 231.265  
 TP 12.070 252.570 0.285 240.500  
 TP 12.025 263.400 1.195 251.275  
 TP 9.215 272.235 0.380 263.020  
 TP 7.915 279.590 0.560 271.675  
 TP 5.015 279.830 4.775 274.815  
 BM 8.540 285.450 2.920 276.910

S.E. B.P.  
 Beach + Far 207  
 232.07

N.W. B.P.  
 Horizon  
 + Far  
 277.04

		285.450			
BM	3.520	287.420	1.550	283.900	N.W. BP Kaly + Fern 284.01
TP	5.650	289.090	3.980	283.440	
TP	6.060	291.485	3.665	285.425	
TP	7.540	295.130	3.895	287.590	
BM	7.735	299.72	3.145	291.985	S.W. BP Kaly + Fern 31.00 292.05
BM	6.595	304.030	2.285	297.435	S.W. BP Kaly + Fern 32.00 297.52
TP	5.215	304.222	5.023	299.007	
BM	1.080	302.212	3.090	301.132	S.W. BP Kaly + Fern 33.00 301.11
TP	0.785	291.130	11.867	290.345	
TP	10.270	298.625	2.875	288.255	
TP	10.065	306.700	1.990	296.635	
BM	2.220	306.225	2.695	304.005	N.E. BP Palm + Fern 304.03 07 N by. Plug
TP	2.843	300.473	8.595	297.630	

March 15-43 cloudy  
5:55 AM Cool  
Glen Rod 300.473

TP	1.670	295.025	7.118	293.355	
TP	11.687	306.152	0.560	294.465	
TP	10.290	316.165	0.277	305.875	
TP	9.112	325.428	0.400	315.765	
BM	8.75	332.740	1.428	323.990	S.W. BP Kaly + Fern 323.90
BM	6.495	336.987	2.248	330.492	S.W. BP Kaly + Fern 330.35
TP	6.163	339.395	3.755	333.232	
TP	5.985	341.910	3.470	335.925	
BM	7.425	345.945	3.400	338.510	N.W. BP Landing 338.47
TP	6.143	350.498	1.590	344.355	
BM	7.550	354.070	3.978	346.510	S.W. BP Wright 346.40
BM		2.035	352.035		S.W. BP Wright 352.005 Page 62

#3 Check Level Ash + 4<sup>th</sup> H.I.C. to  
University H.I.C. + 5<sup>th</sup> H.I.C.

Page 24 For South

BM	10285	85.248		74.963	SM BP Ash + 4 <sup>th</sup> H.I.C. Page 24
TP	9.972	94.918	0.302	84.946	
BM	10.726	102.754	2.910	92.008	SM BP Beach + 4 <sup>th</sup>
TP	10.623	113.207	0.150	102.584	
TP	10.282	122.906	0.582	112.624	
TP	10.408	132.412	0.902	122.004	
TP	7.685	139.599	0.498	131.914	
BM	10.975	148.839	1.735	137.864	NW BP Fir + 4 <sup>th</sup>
TP	9.945	158.501	0.283	148.556	
TP	7.920	166.251	0.180	158.321	
BM	10.610	175.613	1.248	165.003	NW BP Fir + 4 <sup>th</sup>
TP	9.795	184.883	0.525	175.088	
BM	9.260	192.108	2.025	182.848	NW BP Grass + 4 <sup>th</sup>

Indexed  
C.S.N.

192.108

March 17-43  
S. 207 T  
S. 105 Rod.

TP	8.485	199.403	1.190	190.918	
BM	8.075	202.433	4.055	195.348	NW BP Horn + 5 <sup>th</sup> H.I.C. + 4 <sup>th</sup> H.I.C.
TP	7.938	209.706	1.655	201.768	
BM	11.095	216.531	4.270	205.436	NW BP Horn + 4 <sup>th</sup> H.I.C.
BM	10.753	225.689	1.595	214.936	NW BP Horn + 5 <sup>th</sup> H.I.C.
TP	7.880	232.894	0.675	225.014	
BM	8.812	238.728	2.978	229.916	NW BP Juniper + 5 <sup>th</sup>
TP	6.565	242.313	2.980	235.748	
BM	8.680	248.471	2.522	239.791	NW BP Kalmia + 5 <sup>th</sup>
TP	8.132	254.872	1.731	246.740	
BM	6.382	256.262	4.992	249.880	NW BP Laural + 5 <sup>th</sup>
BM	6.718	258.608	4.272	251.890	NW BP Laural + 6 <sup>th</sup>

258.608

BM 6.510 261.920 3.188 255.220 SW BP  
Maple 614

TP 7.653 266.870 2.712 259.217

TP 6.115 271.162 1.823 265.047

BM 9.330 276.290 4.202 266.960 SW BP  
Olney 614

BM 6.820 282.098 1.012 275.278 NW BP  
Palmy 614

TP 6.135 287.210 1.023 281.075

TP 5.483 289.758 2.935 284.275

TP 5.345 291.781 3.322 286.436

BM 5.997 293.388 4.390 287.391 SW BP  
Thorpe 614

BM 5.125 294.138 4.375 289.015 SW BP  
Elport 614

TP 3.282 290.490 6.930 287.208

TP 0.237 280.282 10.445 280.045

280.282

TP 10.235 282.337 8.180 272.102

TP 9.498 291.765 0.070 282.267

TP 5.165 291.947 4.983 286.782

BM 3702 289.977 5.672 286.275 NW BP  
Evans Place  
4875 711

TP 6.210 291.682 4.505 285.472

TP 5.515 293.792 3.405 288.277

TP 5.256 294.600 4.448 289.344

BM 4.640 289.960 NW BP  
University  
4875 711

For East Page 31

#2. Check Levels University Hill + 32nd St to University Hill + 39th St.

BM	2.395	354.420	352.025	NWBP University Hill + 32nd St
TP	0.128	342.826	11.722	342.698
TP	2.545	338.021	7.350	335.476
BM	2.450	335.805	4.666	333.355 NWBP University Hill + Boundary
TP	2.305	328.575	9.535	326.270
BM	7.328	329.458	6.445	322.130 NWBP University Hill
TP	9.765	338.708	0.515	328.943
TP	10.860	349.366	0.202	338.506
TP	10.005	358.961	0.410	348.956
TP	5.803	361.041	3.723	355.238
BM	5.505	364.320	2.226	358.815 NWBP University Hill + 35th St
BM	3.678	365.273	2.725	361.595 NWBP University Hill + 35th St
BM	4.047	364.660	4.660	360.613 NWBP University Hill + 35th St

Indexed  
c.s.K.

Cloudy  
Cool  
Windy

March 17-43  
Season at  
Bliss Rod.

144

BM	3.410	362.970	15.100	359.560 NWBP University Hill + 35th St
BM	1812	359.380	5.402	357.568 NWBP University Hill + 35th St
BM	1.678	352.736	7.322	352.058 NWBP University Hill + 35th St
BM	5.750	351.391	8.095	345.641 NWBP University Hill + 35th St
BM		-4.093	347.298	NWBP University Hill + 39th St

Cont Page 34

Check Levels From Market 23010th to  
 Home Ave. & Fairmount  
 Levels Cont From Federal Bldg. Statey Est 1642-P 2A  
 USGS  
 BMS-57-198 8.355 153.305 144.950  
 NE No. 15000  
 March 18-23  
 151.145

TP	11.430	163.005	1.730	151.575
TP	9.745	168.505	2.245	160.760
BM	8.875	170.792	1.588	166.917
TP	1.505	166.447	5.850	164.942
TP	0.988	155.200	12.235	154.212
TP	0.813	146.731	9.282	145.918
TP	0.228	134.787	12.172	134.559
TP	0.215	123.187	11.815	122.972
TP	0.553	112.575	11.165	112.022
TP	0.308	102.270	10.613	101.962
BM	0.317	94.504	8.083	94.187
TP	0.640	85.344	9.800	84.704

Indexed  
 C.S.K.  
 Cloudy  
 Cold  
 Windy  
 85.344  
 March 18-23  
 515509  
 31151 T  
 8299.90d  
 145

TP	5.044	85.773	4.615	80.729
TP	5.145	89.215	1.703	84.070
TP	1.140	78.545	11.810	77.405
TP	1.004	71.499	8.050	70.495
TP	1.320	66.884	8.935	62.564
BM	1.682	63.388	5.178	61.706
TP	2.693	57.541	8.540	54.848
BM	4.790	56.758	5.673	51.968
USGS BM	6.895	59.077	4.576	52.182
TP	6.050	60.532	4.595	54.482
TP	5.385	62.139	8.778	56.754
TP	6.360	64.299	4.200	57.939

S&BP  
 F+30th St  
 NE 8 P 1/2"  
 Federal Bldg  
 + 3512  
 51.87  
 S&BP  
 F+30th St  
 94.16

NE 8 P 1/2"  
 Federal Bldg  
 + 3512  
 51.87  
 S&BP  
 F+30th St  
 58.280

		64.299			
TP	4.540	65.804	2.035	61.264	1/2 Federal Bldg Opp. Private Road to Post
TP	5.860	68.102	2.562	62.242	
TP	6.846	71.610	3.238	64.764	
TP	6.598	73.678	2.532	69.078	
TP	5.476	79.034	2.118	72.558	
B.M.		4.074	74.96		2 1/2 T 85 F P 1/2 Federal Bldg Home Ave
B.M. Set	5.260	80.612	3.682	75.352	1 1/2 B.P. 5 1/2 Conc Br. Federal Bldg Home Ave
TP	6.910	84.719	2.803	77.809	
TP	7.185	89.884	2.020	82.699	
TP	7.915	96.169	1.630	88.254	
TP	7.084	102.128	1.125	95.044	
TP	6.525	107.491	1.162	100.966	
TP	6.878	113.482	0.887	106.604	

		113.482			cloudy Cool No wind	March 19-43 S. 1104 Bliss Capp Rod	46
TP	5.980	116.577	2.885	110.597			
TP	6.625	120.467	2.745	113.832			
TP	7.970	125.707	2.730	117.737			
TP	9.300	130.433	4.628	121.079			
TP	8.505	135.271	3.666	126.766			
TP	5.958	138.754	2.275	132.996			
TP	6.646	143.274	2.126	136.628			
TP	8.133	149.443	1.964	141.310			
TP	8.165	157.524	0.084	149.359			
B.M.		9.300	148.224			1 1/2 B.P. 1/4 Cor Home Ave Fairmount 14826 Page 32	



Check Ledgers From Federal Bldg. & Home Hwa  
to Federal Bldg & 47th St

BM	6.288	81.640	75.355	218 P 3rd Cor Bldg Federal Bldg Home Hwa	
TP	8.201	87.673	2.168	79.422	
TP	8.763	95.766	0.670	87.003	
TP	6.837	101.293	1.310	94.456	
TP	0.575	92.213	9.055	92.238	
TP	6.235	95.606	3.442	89.371	
TP	7.223	99.769	3.060	92.546	
TP	7.310	103.472	3.607	96.162	
TP	6.610	107.315	2.767	100.705	
TP	9.343	115.772	0.886	106.429	
TP	9.905	125.185	0.492	115.280	
TP	11.104	135.524	0.765	124.420	Page 5 of 10 100 Foj 86 Pt
TP	11.230	146.496	0.258	135.266	

Indexed  
e.s.R.

Clear  
✓ Harm  
No Hind  
146.496  
March 20-43  
5.5507  
Bliss  
Beeg, Rod

TP	11.490	157.936	0.050	146.446
TP	11.405	169.149	0.192	157.744
TP	11.315	180.469	0.195	168.954
TP	11.452	191.697	0.224	180.245
TP	12.113	203.742	0.068	191.629
TP	11.690	214.991	0.441	203.301
TP	8.875	223.763	0.103	214.888
TP	7.634	229.512	1.885	221.878
BM	4565 3rd order	-1.330	228.182	204.50 Page 37

204 50  
Page 37

Check Levels From Market 301st to Foot of 261st  
 Along Main St. Sigbee + 181st to Market St.  
 Level's Cont From Federal Hwy State + Fst.

USGS	3.71	557.1908	2.608	147.558	144.950	NE Monsta. Dr. Market + 301st 151.745 1642P24
Reference to Above BM			2.765	144.793	144.793	Chise/USA 5614 - NW Ch Ref. Mark of 1830th 150.99
TP	0.458	136.046	11.970	135.588		
TP	1.045	124.996	12.095	122.951		
BM	0.095	113.991	11.10	113.896		SWBP 1510nd 17-18 + 301st 113.83
TP	0.398	102.284	12.105	101.886		
TP	0.418	90.942	11.760	90.524		
TP	3.953	83.585	11.310	79.632		
BM	2.052	79.013	6.624	76.961		SWBP 151430th St. 77.01
TP	2.705	75.016	6.702	72.311		
TP	5.575	77.061	6.530	71.486		
BM	5.000	78.966	3.095	73.966		SEBP 151430th St. 73.98
TP	5.007	79.930	4.043	74.923		

March 22-43  
 S.W. Co.  
 @ 1155T  
 8099 Rod

						Cloudy Cool Windy
						Note this line Approx. 3.5 Miles Long
						Indexed e.s. 11.
BM	3.950	78.903	4.977	74.953		NW BP 15180th St 74.97
TP	4.810	77.081	6.632	72.271		
TP	5.435	76.901	5.615	71.466		
TP	6.316	79.427	3.790	73.111		
TP	11.553	88.992	1.988	77.439		
TP	7.108	89.850	6.250	82.742		
BM Set	1.660	89.593	1.917	87.933		Set NW BP Ocean View Blvd 4301st
TP	2.210	80.902	10.871	78.722		
TP	9.480	80.327	10.085	70.847		
TP	1.70	77.897	4.130	76.197		SE Top of Hill Gravelly spots 76.76
TP	2.523	72.635	7.785	70.112		
BM	1.023	65.978	7.680	64.955		NW BP National Ave 4301st 64.91

	65.978			
TP	0.940	57.913	9.005	56.973
BM	1.865	49.913	9.865	48.048
				S.W. BP Boston 20th St 48.05
BM Set	2.815	44.845	8.883	44.030
				Set H.W. BP Main 20th St
TP	4.247	44.302	4.790	40.055
BM	2.415	40.452	6.265	38.037
				S.W. BP Main 29th St 38.00
TP	1.693	33.700	8.445	32.007
U.S.C. & G.				
BM (5-1916)	3.815	31.750	5.765	27.935
				Chisel/Grass 5'6" of 28th St 15' N of Main 29th St 5' N of Fire 1st 27.87 36.88
TP	3.155	29.395	5.510	26.240
TP	0.512	23.964	5.943	23.452
				SE Top Fire H. Main 29th St
TP	2.920	17.669	10.215	13.749
U.S.C. & G.				
BM (4-1916)		5.311	12.358	12.28
				Shank of Std. O.I. S. Face of F.H. but S.D. & H. Bridge 25' on line 27th St Ext. code 21.39

Clear  
Warm  
No Wind AM  
Windy PM

March 23-23 Start  
Sisson  
Bliss T  
Beag Rod

Start  
Occasion  
4 30th

149

TP	3.405	26.857		23.452
				SE Top Fire H. Main 27th St Opp. Page
TP	4.808	27.500	4.165	22.692
TP	3.505	24.821	6.184	21.316
TP	3.565	23.201	5.185	19.636
U.S.C. & G.				
BM (7-1916)			2.723	20.478
				Std Dir. Vert. to Foundation Wall of Std. O.I. Co. H. 65' Foot of 28th St SE Cor. 28th St 29.45
TP	7.043	26.679	3.565	19.636
TP	6.331	30.767	2.243	24.436
Set BM	4.585	31.672	3.680	27.087
				Set H.W. BP Main Schley
TP	5.038	33.200	3.510	28.162
BM	6.245	33.740	5.705	27.495
				S.E. BP Main 45th St 27.48
TP	5.025	34.540	4.205	29.535
TP	4.330	34.520	4.353	30.190

		34.520			March 24 43 PM J. S. 500 T 8099 Rod
TP	4.172	33.330	5.362	29.158	
BM	2.932	31.600	5.662	27.668	NW BP Main + F-105 27.53
TP	4.135	30.463	5.272	26.328	
BM	4.503	29.534	5.432	25.031	NW BP Main + D. 104 24.96
TP	4.280	28.132	5.682	23.852	
BM	5.262	27.524	5.870	22.262	SE NW BP Main + Crossby 22.18
TP	4.450	26.686	5.288	22.236	✓
TP	2.335	23.479	5.542	21.144	
TP	2.382	19.314	6.547	16.932	
TP	6.532	20.291	5.555	13.759	
TP	7.322	25.275	2.338	17.953	
BM	8.120	32.130	1.265	24.010	NE BP National + Sigsbee 23.94
BM	1.942	30.367	3.705	28.425	NW BP Logan + Sigsbee 28.42

		30.367			Clear Cool No wind	March 25 43 S. 500 T Bliss 8099 Rod	150
BM	5.155	28.667	6.855	23.512		NE BP Kearney + Sigsbee 23.50	
TP	11.620	36.479	3.808	24.859			
TP	9.786	45.679	0.586	25.893			
BM	7.608	51.603	1.684	43.995		SE BP Imperial + 18 1/2 St.	
TP	7.748	55.726	3.625	47.978			
BM	7.065	58.174	4.617	51.109		NE BP L. + 18 1/2 St. 51.04	
BM	7.835	61.829	4.180	53.994		NE BP K + 18 1/2 St. 53.96	
BM	2.230	58.194	5.865	55.964		NE BP J + 18 1/2 St. 55.90	
BM	4.356	56.274	6.270	51.924		SW BP Wood Arch + 18 1/2 St. 51.90	
BM			5.315	50.959		NE BP Market + 18 1/2 St. 50.90	
				50.895			

F.R. # 1642 Page 22

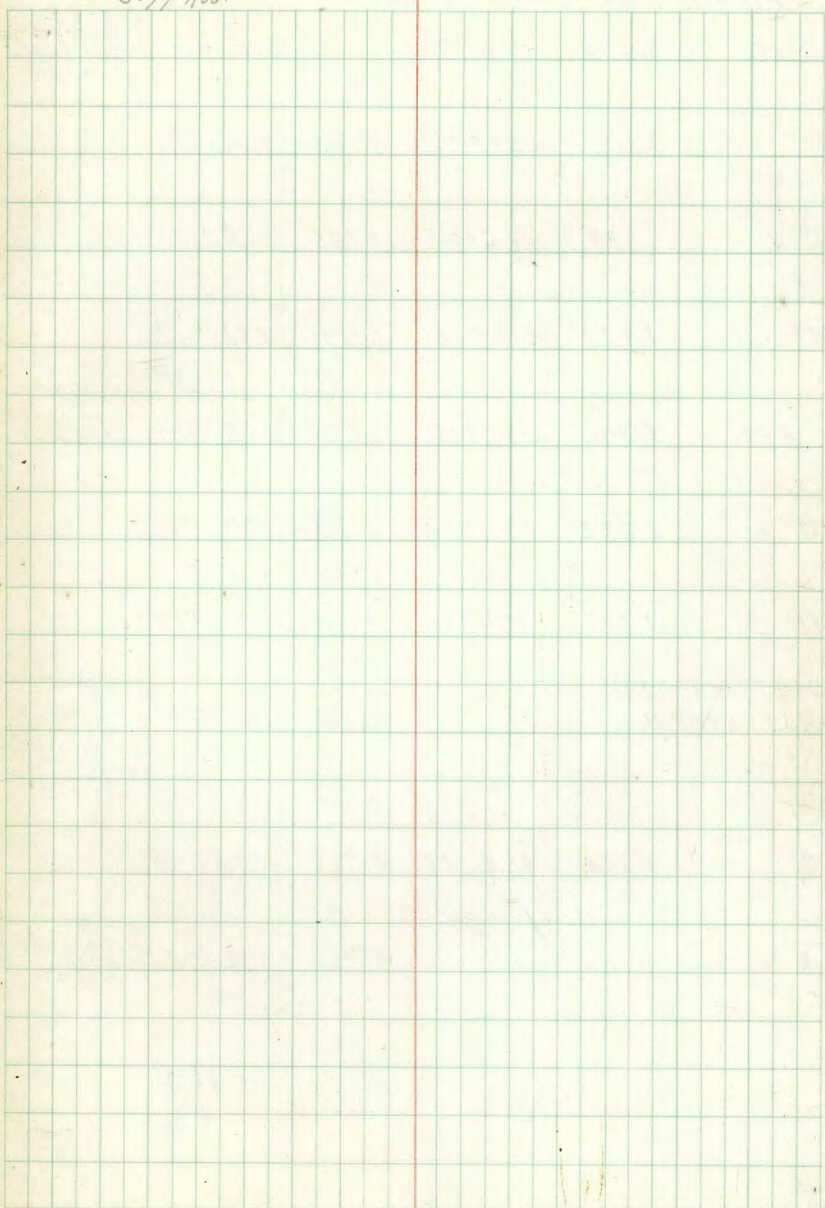
Check Levels From Market v 18th St to  
 U.S.G.S. BM 20th St v 8th City Bldg.  
 Levels Cont From Federal Bldg State v FOT

BM	9.438	60.233		50.895	H.F.B.P. Market + 18th St 1642-22
BM	12.190	70.653	1.870	58.463	H.W.B.P. 9th v 18th St 58.44
BM	10.195	79.986	0.862	69.791	S.W.B.P. F v 18th St 69.87
TP	7.688	87.524	0.150	79.836	
BM	5.395	90.269	2.650	84.874	S.W.B.P. F v 18th St 84.90
BM	7.975	92.204	6.040	84.229	S.W.B.P. Broadway v 18th St 84.30
TP	0.263	88.312	4.155	88.049	
TP	2.381	78.589	12.104	76.208	
TP	4.372	72.007	10.954	67.635	
TP	2.098	66.900	7.205	64.802	
TP	5.504	69.824	2.580	64.320	
U.S.G.S. H22-1938 BM. Stdbisc			3.309	66.515	Bldg NYC Co. 20th St F of Entrance Conc. Foundation
			66.527	72.647	

March 25-13  
 5:30 PM  
 8:15 PM  
 8:29 Rod.

Clear  
 Cool  
 No Wind

Indexed  
 C.S.K.



Check Levels From University Fev 28 1938

to USGS BM Woodrow St. Wm Jr. H.S.  
Level Cont From Page 33

BM 8.374 353.978 345.604 NWBP  
University  
303 8 24 31  
Page 33

TP 7.127 359.955 1.150 352.828

TP 6.788 365.103 1.640 358.315

TP 6.943 369.786 2.260 362.843

BM 6.700 374.816 1.670 368.116 NWBP  
01000901384  
368.11

TP 6.525 377.501 3.840 370.976

TP 3.160 377.221 3.440 374.061

USGS H21-1938  
BM Stone 1.650 375.571 Woodrow St. Wm Jr. H.S.  
W. Sid. Front  
Entrance Top  
Eye Block for  
Lamp Post  
381.843

TP 4.755 378.258 3.718 373.503

BM 4.780 373.478 SWBP  
F100122 Blvd  
+ 373.50  
373.50

✓  
H10043  
3/28

Indexed  
C.S.M.

March 25-43  
Sisson  
8115 T  
Begg Red

Clear  
Cool  
Slight Wind

Empty grid area on the right page of the notebook.

Check Levels From Market St + 47th St  
 South of 47th St East on Imperial Ave  
 To 69th St.

BM	0.710	132.735	132.025	B.P. 566 Market St of 47th St Page 37
TP	3.960	124.781	11.914	120.821
TP	0.873	115.639	10.015	114.766
TP	0.235	104.310	11.564	104.075
TP	0.344	94.876	9.778	94.532
TP	4.001	91.105	7.772	87.104
BM	0.602	85.057	6.650	84.455 W.F. 8P 1st St South S.D. + H.R.R. 8/10/49
TP	5.585	80.636	10.006	75.051
TP	5.198	80.549	5.285	75.551
TP	11.985	90.874	1.660	78.889
TP	11.745	102.154	0.465	90.409
TP	9.257	111.186	0.225	101.929
TP	3.974	114.975	0.185	111.001
BM	9.150	121.385	2.740	112.235 S.F. 8P Imperial 47th St 11.17

Clear  
 Warm  
 Slight Wind PM  
 Indexed  
 c.s.k.  
 121.385

April 29-43  
 S. J. 500  
 B. J. 501  
 8099 Rod  
 58

TP	12.088	133.071	0.402	120.983
TP	6.668	139.539	0.200	132.871 Holl. Pole St. Imperial 8th Escalero 48th St
BM	1.584	137.955	1.877	137.955 Imperial 48th 187.89
TP	8.670	148.039	0.170	139.269
TP	6.682	149.486	3.235	142.804
TP BM	8.020	156.526	0.980	148.506 Chipp. X Co. S.F. Imperial 49th St
TP	11.215	167.281	0.560	155.966
TP	11.895	179.081	0.095	167.186
TP	8.987	187.158	0.910	178.171
BM Set	4.269	189.390	2.037	185.121 B.P. 10 Curb S.F. Imperial 5th Churchward
TP	1.190	182.405	8.175	181.215
TP	1.807	173.447	10.765	171.640

		172.447			
TP	2.01	165.827	9.620	162.817	
TP	3.365	160.470	8.722	157.105	
BM		4.970	155.500		2 1/2 ft Imperial Ave + 52nd St.
TP	7.090	163.700	3.860	156.610	
TP	2.980	160.355	6.325	157.375	
TP BM	4.692	159.912	5.125	155.220	2 1/2 ft Imperial + 53rd St.
TP	6.203	162.852	3.363	156.549	
BM	5.148	165.015	2.985	159.867	Chisel P.S.F. Imperial + 54th Hwy of Cal.
TP	5.302	165.492	4.825	160.190	
TP	6.232	168.561	3.163	162.329	
TP	3.110	166.069	5.602	162.959	
TP	1.426	156.932	10.562	155.506	
TP	3.782	151.426	9.288	147.644	

April 30-43  
S. 5507 N  
8099 Rod.

		151.426			
TP	6.323	154.111	3.632	147.788	
TP	5.727	154.506	5.332	148.779	
TP	8.550	162.392	0.664	153.842	
BM	4.403	166.303	0.492	161.900	NE Nail Road Imperial + Mar 119 161.71
TP	7.215	168.950	4.568	161.735	May 2-43
TP	11.302	179.432	0.820	168.130	
BM		6.532	172.900		Way 2 1/2 hrs S 138 1/2 E of 26th 172.77
TP	6.323	183.283	2.472	176.960	
TP	6.618	187.433	2.468	180.815	
TP	12.265	199.180	0.518	186.915	
TP	8.843	207.818	0.205	198.975	
TP	5.651	212.847	0.622	207.196	



		212.847			
BM	1.202	212.884	0.165	212.682	SE Top of Hyd Imperial 46575 212.65
TP	8.037	216.673	5.248	208.636	
TP	8.465	224.848	0.290	216.383	
TP	6.490	229.046	2.292	222.556	
TP	4.590	226.258	7.278	221.768	
BM			2.593	222.765	SE Top of Hyd Imperial 46575 222.64
BM	4.152	225.420	5.090	221.268	Sch. EP SE 1/2 Imperial 46575
TP	6.178	227.393	4.205	221.215	
TP	7.313	233.816	0.890	226.503	
BM			3.330	230.486	Lat 572nd Imperial W. L. Hoodman 230.30
TP	4.350	233.924	4.242	229.574	
TP	5.448	235.534	5.828	230.086	
TP	6.992	239.964	2.562	232.972	

		239.964			
TP	8.392	245.992	2.364	237.600	
TP	8.445	253.017	1.420	244.572	
TP	5.263	254.738	3.542	249.475	
TP	5.880	256.770	3.848	250.890	

BM 15.190 253.580  
 Tap 2" Pipe  
 Sub Box Calc.  
 Imperial  
 4691551  
 253.44

Check Levels From Imperial & Churchyard  
 Along Euclid Avc. to Bridge South of Market  
 Also to Euclid & Federal Blvd.

BM	2690	188.791	185.121	89796
TP	0.643	179.629	9795	178.996
TP	0.827	168.774	11752	167.887
TP	0.538	157.310	12.002	156.772
TP	0.370	145.680	12.000	145.310
TP	2.155	139.993	7.842	137.838
TP	0.340	133.521	6.802	133.191
B.M.		0.561	132.970	
TP	0.048	121.321	12.258	121.273
TP	0.708	109.974	12.055	109.266
TP	5.083	108.477	6.580	103.394
B.M.		4.028	104.449	

89796  
 1st Imp. Period  
 See Churchyard  
 Page 53

2 L & T  
 Groveland Dr.  
 + Euclid

89796  
 1st Imp. Period  
 See Churchyard  
 Page 53

Note: For above B.M. See Bliss Survey  
 of Encanto Section

May 5 43  
 Still  
 8999

Cloudy  
 Warm  
 No Wind

Indexed  
 C.S.R.

May 10 43 36

BM	4404	108.853	104.449	
	7.684	116.071	0.466	108.387
	9.572	125.065	0.578	115.493
	0.903	118.117	7.851	117.214
	6.505	119.872	4.750	113.367
	10.190	127.280	2.782	117.090
	10.945	137.701	0.524	136.756
	11.075	148.224	0.492	137.209
	11.126	159.168	0.242	148.042
	5.668	164.658	0.178	158.990
B.M.	8548	168.871	4.335	160.323
	8.945	176.428	1.388	167.483
	9.590	185.556	0.462	175.966
	9.903	194.741	0.718	184.833
	8.860	203.131	0.470	194.271
	8.875	210.838	1.168	201.963
	2.748	208.354	5.232	205.606
	9.924	216.065	2.219	206.141
	11.402	226.929	0.538	215.527
B.M.		0.828	226.101	

89796  
 1st Imp. Period  
 See Churchyard  
 Page 53

L & T # 2  
 Hilltop E 10  
 Line Euclid  
 160.07

89796  
 1st Imp. Period  
 See Churchyard  
 Page 53

Check Levels From Imperial + 54105  
Along 541st to Bridge South of Market St

Indexed  
e.s.k.

Chisel 255  
Imperial 4  
541st  
Hwy. of Alameda  
Page 54

BM 1.828 161.695 157.867

TP 1.243 152.933 10.105 151.590

TP 0.864 142.117 11.680 141.253

TP 0.863 131.447 11.533 130.584

TP 4.169 126.068 9.548 121.899

BM 4.785 121.283

BPS 466 of  
Bridge on 541st  
South of Market  
121.05

Check Levels From Imperial + 65th St.  
 Along 65th St. - Klauber - Hix - Paradise - Toolay  
 Minnet - Federal Blvd. to 47th St.

BM	0.680	221.948		221.268	S.E. BP Imperial + 65th St Page 55
	11.223	227.723	5.448	216.500	
	11.691	239.324	0.090	227.633	
	11.535	250.694	0.165	239.159	
	11.417	261.918	0.193	250.501	
	10.765	272.465	0.218	261.700	
BM		5.308		267.157	4 447 Brooklyn + 65th St
	11.018	282.927	0.556	271.909	
	10.242	292.135	0.124	282.793	
BM		6.055		287.080	4 447 Wunderlin + 65th St 286.90
	11.202	304.253	0.090	293.045	
	9.805	312.960	0.098	304.155	
BM set	10.922	323.302	1.590	312.570	B.P. 52. Broadway at Foot Parking 65th St.

May 5-43  
 Sisseton  
 8099  
 Indexed  
 223302  
 Cloudy May 6-43  
 Cool  
 No wind  
 150

TP	11.680	334.599	0.383	322.919	
	12.293	346.696	0.196	334.403	
	12.250	358.660	0.286	346.410	
	12.095	370.516	0.239	358.421	
	11.110	381.096	0.520	369.986	
	10.250	390.911	0.435	380.661	
BM		3.125		387.7615	Top of Hyd 66th Klauber 1st 1st 1st Bittern
	11.380	402.224	0.067	390.844	
	11.388	413.414	0.198	402.026	
	11.388	424.424	0.378	413.036	
	10.305	434.143	0.586	423.838	
BM		3.263		430.880	S.W. Cor. 3rd Ripe Klauber + Sumitar 420.24

	434.1434			
0.642	427.615	7.170	426.973	
B.M		2.592	425.023	Lvt. Klaubert Eider
0.612	417.172	11.055	416.560	
1.930	407.839	11.265	405.909	
B.M		5.412	402.427	Lvt. Klaubert #47 xst.
0.275	396.968	11.146	396.693	
0.171	385.157	11.982	384.986	
0.104	372.969	12.292	372.865	
0.264	361.220	12.013	360.956	
0.661	349.891	11.990	349.230	
B.M	8.233	353.004	5.120	344.771 SF Top F Hyd Radio + AHix
12.060	364.543	0.521	352.483	
12.122	376.537	0.128	364.415	

	376.537			
12.212	388.414	0.325	376.202	
11.989	400.282	0.121	388.293	
11.858	411.912	0.228	400.054	
11.357	423.063	0.206	411.706	
11.560	434.540	0.083	422.980	
B.M	10.065	444.236	0.369	434.171 Top Fire Hyd SF Springfield Paradise
11.282	454.875	0.643	443.593	
9.255	464.176	0.054	454.821	
2.820	465.486	1.510	462.666	
5.408	462.504	7.390	458.096	
0.256	459.605	4.155	459.349	
10.01	448.471	12.135	447.470	
0.472	440.479	8.464	442.007	

Cloudy  
Cool  
No Wind  
May 7-1943  
5.5500 K  
8899

	440.479			
TP	0.191	428.482	12.188	428.291
TP	2.189	419.601	11.070	417.412
BM		7.958	411.643	
Reference to Above BM		3.247	416.354	
TP	0.609	408.102	12.108	407.493
	0.048	396.150	12.000	396.102
	0.190	384.139	12.201	383.949
	0.035	372.197	11.977	372.162
	0.058	360.218	12.037	360.160
	0.100	348.172	12.146	348.072
	0.141	336.360	11.953	336.219
	0.427	324.894	12.093	324.267
	0.671	313.505	11.860	312.834

SE Top of Hill  
Toolbox  
Minnett.  
Top of Hill  
New Prop. Cor.  
Toolbox  
Minnett.

	313.505			
	0.052	301.325	12.232	301.273
	1.209	290.636	11.898	289.427
	1.325	279.887	12.074	278.562
BM Set	2.900	275.786	7.001	272.886
	2.382	272.936	6.232	269.554
	3.425	272.504	5.869	267.635
	2.182	267.328	5.258	267.146
	1.452	263.157	7.123	262.205
	0.050	253.864	9.843	253.814
	3.918	247.570	10.212	243.652
BM Fd	2.252	243.165	3.657	243.913
	3.125	243.412	5.878	243.287
BM Set	2.063	237.867	5.608	237.804

48 P. P. I. of  
Paper Pole on  
Minnett St.  
Federal Blvd

Lead Nail  
5x Top Ring  
Nail Bridge  
57-108 on  
Federal Blvd

Chip 1/2  
Hx of Cult. Hart  
111-H-0.83  
W Side Federal

May 8-43

237.867 ✓

0.742 237.327 9.282 238.585  
238.585

2.112 225.571 7.868 225.459

BM scl 1.149 228.243 6.477 217.094  
Chisel #  
H.M. of Culvert  
H-0.52  
N. Side Federal

0.352 209.507 9.088 211.507  
211.507

Ref. to USGS  
5-59-1938  
B.M. Fd.  
See Bottom  
Opp. Page  
2.288 200.665 11.120 198.377  
202.665  
Chisel #  
H.M. of Culvert  
H-0.52  
N. Side Federal  
204.36  
6.26  
198.30

3.150 198.208.432 5.383 197.282

BM scl 3.553 197.385 6.600 193.832  
Chisel #  
H.M. of Culvert  
H-0.52  
N. Side Federal

6.160 198.208.165 2.380 197.005

6.782 203.793 3.154 197.011

6.518 207.273 3.038 198.755  
200.755

10.870 215.640 1.503 205.770

10.240 228.628 0.252 218.388

7.117 233.667 ✓ 0.078 228.550

May 10-43

231.667 ✓  
233.667 ✓

Clear  
Hot  
Slightly Windy

01

B.M. 1.752 227.994 5.425 226.211  
228.242  
Chisel #  
H.M. of Culvert  
Federal Blvd  
8.1  
Fairing  
Euclid Hill

1.738 223.614 8.118 221.876

5.292 222.540 6.366 217.248

6.953 227.011 2.482 218.058  
220.058

6.535 229.003 2.543 227.468  
231.003

7.148 235.123 3.028 227.975

5.700 237.303 3.520 229.603  
231.603

4.845 238.440 3.708 233.595

3.220 235.852 5.818 230.622  
232.622

USGS  
B.M. ✓ 5.513 228.339  
230.339  
Chisel #  
H.M. Federal  
47135 Conc  
801 St. S. 90  
234.33 USGS  
Page 137

Check USGS B.M. 5-59-1938 to Reference of Same  
B.M. 10.987 209.364 ✓ 198.377  
Chisel #  
H.M. of Culvert  
H-0.52  
N. Side Federal

USGS  
B.M. (5-59-1938) 10.648 208.716  
215  
Std Disc Conc  
Post USGS  
Federal Blvd  
8 Road to  
Emerald Hills  
Golf Course  
214.725

Re Check of Levels Federal Bldg  
Winneth St. West.

BM	3073	275.959		272.886	1/2 BP Pl of Paper Pak 27 Winneth St. W. of Federal Page 50
TP	3648	273.204	6.400	269.556	Fd Peg
TP	3446	270.515	6.135	267.069	Fd Peg

3.367 267.148 Fd Peg  
Page 50

Check Levels Federal Bldg. And  
Winneth St East. to U.S.G.S BM May 11, 32

					Indexed C.S.K.
BM	5844	278.730		272.886	1/2 BP Federal Bldg Winneth St
TP	6688	281.850	3.568	275.162	
TP	7408	288.656	0.602	281.248	
U.S.G.S					
BM S.D.-679			1.268	287.388	Chisel H. H. D. of C. S. K. 6002 N. E. St 07 Winneth St 07 S. E. Federal Bldg 273.45 C. 12 287.31



Check Levels From Horace Mann School  
Along El Cajon Blvd. to 73rd St.

USGS 23550.

BM	0.970	350.855	349.885	349.885	349.885	349.885	349.885
TP	3.820	349.673	5.002	345.853			
BM	4.616	348.257	6.082	343.641			
	0.820	341.042	8.045	340.212			
	0.324	329.814	11.552	329.490			
	0.645	319.736	10.723	319.091			
	0.990	308.796	11.930	307.806			
BM	6.912	307.496	8.212	300.584			
	10.210	216.771	0.935	206.561			
	10.367	326.466	0.672	316.099			
	6.690	331.204	1.952	324.514			
BM	3.421	329.442	5.183	326.021			
BM	7.710	329.570	7.582	321.860			

Std. Dev. Vert.  
E. of El Cajon Blvd.  
Horace Mann Sch.  
350.930  
Page 36

BP 112  
Informal USG  
Horace Mann Sch.  
343.58

SJY BP  
El Cajon Blvd  
Florida St  
300.65

H.F. BP  
El Cajon  
Louisiana  
325.99

SJY BP  
El Cajon  
Texas  
321.92

Indexed  
e.s.k.

cloudy  
Cool  
Windy

May 16, 1943  
5:15 PM  
8099 Red

33

				329.570			
	10.758	339.742	0.586	328.984			
	11.302	250.814	0.230	329.512			
	10.952	361.663	0.103	350.911			
	10.156	371.731	0.088	361.575			
BM	8.283	376.645	3.368	368.363			
	5.068	380.189	1.525	375.121			
	4.230	379.373	5.046	375.143			
	3.484	376.512	6.245	373.028			
	3.945	374.071	6.386	370.126			
	3.352	370.802	6.621	367.450			
BM	4.703	369.318	6.187	364.615			
	4.350	367.980	5.688	363.620			
BM	4.270	367.381	4.869	363.111			

H.F. BP  
El Cajon  
Horace Mann Sch.  
368.35

H.F. BP  
El Cajon  
V. de la

SJY Screen  
Heavy Cross  
El Cajon  
30th South  
Florida St.

SJY BP  
El Cajon  
0.710 ft  
363.10

El Cajon Blvd

		367.381			
BM	8.840	371.353	4.868	362.513	SMBP El Cajon 711.2018 362.77
	6.305	376.588	1.068	370.285	
BM	6.972	379.888	3.672	372.916	SMBP El Cajon To West 372.93
	3.762	380.780	2.870	377.018	
	2.875	377.210	6.445	374.335	
	5.751	377.309	5.652	371.558	
	4.981	378.815	2.175	373.824	
BM	5.400	379.785	4.420	374.385	SMBP El Cajon 433rd St 374.32
BM	6.565	382.497	3.943	375.842	SMBP El Cajon Fulton
BM	5.175	384.060	3.522	378.885	SMBP El Cajon 3475th 378.92
BM	5.655	385.055	4.660	379.400	SMBP El Cajon 3475th 379.27
BM	4.800	385.799	4.056	380.999	SMBP El Cajon 3575th 380.82
BM	3.278	383.812	5.265	380.334	SMBP El Cajon 11.1502 380.08

J.L. (380.48)  
6-4-57 correct

Cloudy  
Cool  
Slight Wind

May 15. 43  
515502  
8099

		382.812			
BM	3.919	382.028	5.705	378.109	SMBP El Cajon 3575th 377.94
BM	3.585	380.033	5.590	376.438	SMBP El Cajon Cherokee 376.16
BM	4.292	377.844	6.471	373.552	SMBP El Cajon 3725th 373.50
	5.264	378.928	4.270	373.574	
USGS H21-1938					
BM Std One		3287		375.651	Hoodrop Wilson Jr High School W Side Front Foot Top Corner Block for Lamp 375.843 Page 52
USGS H21					
BM	1.055	376.706		375.651	
	3.820	374.164	6.362	370.344	
	3.586	371.112	6.638	367.526	
BM	5.162	371.229	5.045	366.067	SMBP El Cajon 4015th 366.05
BM	4.635	369.354	6.510	364.719	SMBP El Cajon Coolidge Ave 364.66
BM	5.109	369.598	4.865	364.429	SMBP El Cajon 41st St 364.42

E1 Cajon Blvd

		369.598 ✓			
BM	4690	369.903	4.385	365.213	SW BP E1 Cajon + Northridge 365.14
BM	4562	369.015	5.450	364.453	SW BP E1 Cajon + 42nd St 36296
	5.248	368.518	5.745	363.270	
BM	5.113	368.783	4.848	363.670	SW BP E1 Cajon + Van Dyke 363.58
+	1.32	359.242	10.864	357.919	
BM	6.085	358.275	7.052	352.190	SW BP E1 Cajon + Fairmount 352.03
BM	6.055	360.845	3.485	354.790	SW BP E1 Cajon + 42nd St 354.72
	5.502	361.752	4.595	356.250	
	5.497	362.507 ✓	4.742	357.010	
USGS H20-1938					Std Disc Vert + East Bonita E of Main St Hwy 111 + School 366.988 Page 35
BM	2115	363.902	1.720	360.787	
	2160	363.662	3.400	360.502	
BM	3066	359.648	7.080	356.582	SW BP E1 Cajon + 56th St 366.59
BM	5.155	358.155 ✓	6.648	352.000	SW BP E1 Cajon + 161st St 358.00

Clear  
Warm  
No Wind  
358.155 ✓

May 17-43  
5:00 AM  
31155 T  
3099 Rad

BM	2145	354.325	6.975	351.180	SW BP E1 Cajon + Main St
BM	4.20	351.415	7.11	347.215	SW BP E1 Cajon + 47th St 347.20
	6.570	352.430	5.555	345.860	
	5.885	355.400	2.915	349.515	
BM	5.885	357.420	3.865	351.525	SW BP E1 Cajon + 51st St 351.52
BM	9.075	364.442	2.053	355.367	SW BP E1 Cajon + 49th St 356.87
	10.520	374.717	0.255	364.187	
	9.690	384.127	0.270	374.447	
BM	8.265	391.427	0.975	383.162	SW Lead E1 Cajon + 50th St 383.15
	4.720	392.425	3.722	387.705	
BM	2668	389.203	5.590	386.805	SW BP E1 Cajon + 51st St 386.77
	1.564	379.612	11.155	378.048	

Clear  
Warm  
Windy

May 18. 13  
S. 8:05  
Bliss T  
8999 Rod.

	379.612			
	9.868	384.992	4.488	375.124
	11.875	396.363	0.504	384.488
BM	6.145	400.013	2.495	392.868
	5.508	401.306	4.215	395.798
	8.650	405.771	4.185	397.121
BM	10.400	414.143	2.028	403.743
	8.097	420.276	1.564	412.579
BM	5.860	425.126	1.410	419.266
BM	8.735	430.861	3.000	422.136
	8.440	438.613	0.688	430.173
BM	12.025	449.783	0.915	437.698
	10.465	459.856	0.392	449.391
BM	11.465	468.789	2.532	457.322

S.W. B.P.  
El Cajon  
4.53.45  
393.88

S.W. B.P.  
El Cajon  
4.54.25  
403.77

N.E. B.P.  
El Cajon +  
Dayton  
419.31

N.W. B.P.  
El Cajon  
4.55.31  
422.19

N.E. B.P.  
El Cajon  
4.56.15  
437.77

N.W. B.P.  
El Cajon  
El Cerrito Dr.

468.789

	8.205	475.251	1.743	467.046
BM	6.975	478.243	3.983	471.268
	0.675	473.818	5.100	473.143
BM	3.025	469.103	7.740	466.078
	4.035	470.135	3.003	466.100
	3.830	470.645	3.330	466.815
	4.248	470.093	4.900	465.745
BM	3.400	468.606	4.887	465.206
	5.085	469.616	4.075	464.531
	5.225	470.356	4.485	465.131
	4.715	470.751	4.320	466.036
BM	3.135	468.641	5.245	465.506

N.W. B.P.  
El Cajon  
4.58.25  
471.38

N.W. B.P.  
El Cajon  
4.59.25  
466.12

N.W. B.P.  
El Cajon +  
College Star  
465.27

N.W. B.P.  
El Cajon  
4.59.25  
465.66

El Cajon Blvd.

468.641 ✓

2.923 468.149 4.415 464.226

3.752 467.332 4.570 463.579

2.760 465.702 5.390 461.942

2.190 462.382 5.510 460.192

2.280 457.647 7.015 455.367

4.768 457.620 4.795 452.852

BM 3.700 456.072 5.248 452.372

S.M.B.P.  
El Cajon +  
Rolando  
452.46

1.240 447.047 10.265 445.807

2.312 439.009 10.350 436.697

10.295 446.774 2.530 436.479

2.283 454.692 0.365 446.409

6.410 458.452 2.650 452.042

BM 6.015 459.882 4.785 453.667

S.M.B.P.  
El Cajon  
453.667  
453.70

May 19-43  
S.M.B.P.  
811017  
8299 Rod

Clear  
Hot  
Windy P.M.

167

459.682 ✓

5.585 461.679 5.588 456.094

BM 5.450 462.774 4.355 457.324

S.M.B.P.  
El Cajon  
457.40

4.400 461.999 5.175 457.599

BM 4.975 461.656 5.318 456.681

S.M.B.P.  
El Cajon  
456.75

7.030 466.321 2.365 459.291

BM 6.845 471.001 2.165 464.156

S.M.B.P.  
El Cajon  
464.25

5.770 474.691 2.080 468.921

BM 8.625 481.556 11.760 472.931

S.M.B.P.  
El Cajon  
472.05

6.360 487.376 0.540 481.016

BM 2.845 483.191 17.030 480.346

S.M.B.P.  
El Cajon  
480.46

3.645 481.131 5.705 477.486

BM 8.135 488.351 0.915 480.216

S.M.B.P.  
El Cajon  
480.35

May 20-43  
E. Carr  
Hot  
Wind in PM

	488.351 ✓		
9.060	495.136	2.275	486.076
8.878	501.914	2.100	492.036
2.010	497.742	7.182	494.732
			cbigala W. Cor 1/2 mile S.W. of La Mesa
12.280	508.117	1.905	495.837
12.195	520.082	0.230	507.887
8.858	528.718	0.222	519.860
2.087	524.335	6.470	522.248
0.595	513.837	11.093	513.242
0.175	501.707	12.305	501.532
2.042	501.929	7.820	492.887
9.984	511.123	0.790	501.139
10.080	518.499	2.704	508.419
0.450	508.939 ✓	10.01	508.489

508.939 ✓

1.075	499.389	10.625	498.314
0.166	489.251	10.304	489.085
0.608	479.717	10.142	479.109
1.208	471.639	9.286	470.431
0.387	461.703	10.323	461.316
0.805	452.526	10.182	451.521
USGS 261-1937			
BM	18.585	443.741	
			Std. Disc. Top 500 ft S.W. Cor. Park & Wash. La Mesa 1/2 mile S.W. of La Mesa 449.50
			✓
For Re Check Back Page 69			

Re Check of Levels From Gov. BM 261-1927  
 At Parks + West La Mesa. Clin. H. to El Cajon + 73rd St.

BM	7.250	450.991	443.741	Std Bign Top Conc. Pad Parks + West La Mesa Clin. H.
	8.980	459.801	0.170	450.821
	10.854	470.430	0.225	459.576
	10.532	480.742	0.220	470.210
	12.150	492.710	0.182	480.560
	12.080	504.730	0.060	492.650
	11.260	515.710	0.280	504.450
	0.840	514.775	1.775	513.935
	2.150	508.270	8.055	506.720
	1.340	498.480	11.730	497.140
	12.061	510.191	0.350	498.130
	12.020	521.821	0.390	509.801
	7.055	528.336	0.540	521.281

Indexed  
 0.15.16.

May 20, 1943  
 5:50 P  
 8:27 P  
 8:15 Rod.

159

	0.880	523.126	6.090	522.246
	0.700	511.826	12.000	511.126
	0.495	500.803	11.518	500.308
	6.208	499.141	7.870	492.933
	3.080	498.711	3.510	495.631
	0.450	490.631	8.530	490.181
	4.880	487.556	7.955	482.676
BM	7.340	480.216		473.615

Check Levels From Horace Mann School  
 Park Blvd. Madison Ave. 301 St. Adams Ave  
 Van Dyke to El Cajon Blvd.

BM	4.570	348.211		348.641	SFBP Normal Pa 96.63
	4.605	346.815	6.001	342.210	
	6.750	347.980	5.585	341.230	
	5.465	349.330	4.115	342.865	
BM	6.640	351.640	4.230	345.000	SFBP Monroeville Pa 4.98
	7.165	355.690	3.115	348.525	
	4.270	356.150	3.910	351.780	
	0.920	344.960	12.110	344.040	
	0.795	325.715	10.04	334.920	
BM	5.870	335.015	6.570	329.145	SFBP Madison Florida 329.09
BM	9.210	340.145	4.080	330.935	SFBP Madison Alabama 330.91
BM	6.30	346.265	0.180	339.965	SF Lead BP out Madison Mississippi 340.06
BM	6.680	348.960	3.985	344.280	SFBP Madison Louisiana 342.31

May 26 43 Cloudy  
 5:30 AM Cool  
 8:15 AM No Wind  
 8:99 Rod 348.960 V

Indexed  
 S.S.K.

170

BM	10.870	356.825	3.005	345.965	SF Lead BP out Madison Texas 348.03
	12.330	369.017	0.138	356.687	
	11.515	380.462	0.070	368.947	
BM	6.510	385.462	1.510	378.952	SFBP Madison Hornell 378.99
BM	3.520	384.517	4.525	380.907	SFBP Madison Oregon 381.05
BM	4.620	383.422	5.715	378.202	SFBP Madison Idaho 378.85
	3.825	381.867	5.380	378.042	
	9.40	386.547	4.720	377.147	
	5.775	392.182	0.140	386.407	
	5.475	393.717	3.940	388.242	
BM	5.450	394.767	4.400	389.317	SFBP Madison 301 St 389.38
	5.280	395.807	4.240	390.527	



		395.807			Cloudy AM Cool
BM	3.055	394.242	4.620	391.187	May 27-43 Clear PM Warm Slight Wind 8:55 AM 8:15 AM 8:29 AM
					SE BP Adams + Boundary 390.96
BM	3.260	392.522	4.980	389.262	NFBP Adams + Mountain View 389.09
					NW Chisler Base of Light Post Adams 382.23
	4.310	390.792	6.040	386.482	
					SW Chisler Base of Light Post Adams + Bancroft
	5.865	390.772	5.885	384.907	
					NFBP Adams + Fellon
BM			4.155	388.617	
	5.250	394.012	4.010	388.762	
					SW BP Adams + 34130 389.25
B.M.	6.270	395.892	4.390	389.622	
	5.970	397.332	4.530	391.362	
					SE BP Adams + Massfield 392.78
BM	4.490	397.332	4.490	392.842	
					SE Top. F.Hyd Adams + 3670.56
	2.370	396.002	3.70	393.632	
					SE Chisler in walk Adams + Wilson
	3.685	394.147	5.540	390.462	
					SE Chisler in walk Adams + 363
	3.705	391.967	5.885	388.262	

					171
				391.967	
					SE Chisler in walk Adams + Bancroft
	2.625	388.902	5.690	386.277	
	2.270	383.252	7.920	380.982	
					SE Top. F.Hyd Adams + East Mt. View Dr.
	1.545	378.732	6.065	377.187	
					SE BP Adams + 376.14 370.87
BM	1.755	372.747	7.740	370.992	
					SE Top. F.Hyd Adams + Base of Light Post W. End Bridge
	0.695	365.962	7.180	365.267	
	1.880	360.692	7.150	358.812	
					Chisler SW Cb. Rd. Adams + Terrocco Dr.
X	7.220	360.277	7.635	353.057	
	7.292	363.769	3.800	356.477	
					SE Chisler in walk Adams + Newington Dr.
	5.185	366.591	2.363	361.406	
	2.920	364.909	4.602	361.989	
BM			6.329	358.580	SE Chisler Adams + Fellon + Po. 358.50
	2.552	360.923	6.538	358.371	

	360.923 ✓			
7.320	365.183	3.060	357.863	
4.588	365.871	2.900	361.283	
BM Set 4.700	362.990	7.581	358.290	SFBP Boise - Lamp Post Hollam, H.C. & Van Dyke
3.002	359.480	6.512	356.478	
0.530	349.450	10.560	348.920	
5.380	342.917	11.913	337.527	
10.848	353.710	0.055	342.862	
6.348	358.593	1.465	352.245	
10.767	365.190	4.170	354.423	
5.567	369.127	1.630	363.560	
BM 4.260	368.835	4.652	364.475	H.C. B.P. Hollam & Cape Land 364.47
4.622	368.635	4.822	364.013	
5.130	368.982	4.783	363.852	

June 1, 1943  
Sissou X  
8099 Rod

Cloudy  
Cool  
No Wind  
368.982 ✓

12

BM

5.038  
✓  
MQ. 3-19-48

363.644

SFBP  
E. Corod  
Van Dyke  
Rec. 363.36  
E. Corod 363.67  
Page 65

Check Levels From University + 32<sup>nd</sup> St.  
Lincoln - 30th St to Adams Ave.

B.M.	4867	356.902	352.035	S.F.B.P. University + 32 <sup>nd</sup> St. Page 41
	2.180	352.414	6.668	350.234
	11.278	355.444	8.248	344.166
	10.172	365.155	0.461	354.983
	5.125	367.452	2.828	362.327
B.M.	5110	368.207	4.355	363.097 S.F.B.P. Lincoln + 7/1/2015 362.92
B.M.	4790	367.197	5.800	362.407 S.F.B.P. Lincoln + 0.510 362.11
	5.785	367.247	5.735	361.462
	5.920	368.352	4.815	362.432
B.M. Set		1.250	364.102	N.W. Ch. and A Point + 30 <sup>th</sup> W. End Ch. Ref.
	5.625	370.237	3.740	364.612
	5.295	371.822	2.810	366.427
B.M. Set	4.260	371.747	1.335	367.487 N.W. Ch. and A Howard South W. End Ch. Ref.

index  
c.s. 15  
Clear  
Hot  
Slight Wind

June 30. 43  
S.W. 500  
21.5 V  
3299 Rod  
173

	4.730	370.147	6.330	365.417
B.M.	4890	369.512	5.525	364.622 S.F.B.P. Hood + Cross + 30 <sup>th</sup> S.F. 2/1/2015 364.115 P. 63
	5.225	370.387	4.350	365.162
	4.540	370.117	4.810	365.577
B.M.	7685	373.367	4.425	365.682 S.F.B.P. Hood + 30 <sup>th</sup> 0.21 365.80
	7.360	379.917	0.810	372.557
	5.630	382.867	2.680	377.237
B.M.	6.460	385.422	3.905	378.962 S.F.B.P. Moore + 2015 378.95 Curran + 40
	6.410	388.957	2.875	382.547
	5.860	391.712	3.105	385.852
	5.77	393.502	3.980	387.732
B.M.		4.105	389.397	S.F.B.P. Adams Ave + 30 <sup>th</sup> St 389.317 Page 70

Re Check Levels From El Cajon Blvd  
And 301st to Adams Ave + 301st.

6-30-43  
J.F.B.P.  
85997  
Blk Rod  
System  
Hoodcroft  
El Cajon 301st  
page 73

Indexed  
c.s.k.

174

B.M. 5.150 369.772 364.622 ✓ J.F.B.P. Hoodcroft El Cajon 301st page 73

4.950 370.192 4.520 365.242

B.M. 7.02 372.692 4.520 365.672 J.F.B.P. Meade + 301st

816 379.832 1.020 371.672

B.M. 5.75 384.712 0.87 378.962 J.F.B.P. Meade + 301st

6.90 388.852 2.76 381.952

7.39 392.602 3.64 385.212

5.44 393.802 4.24 388.362

B.M. 4.42 389.382 J.F.B.P. Meade + 301st

✓ m<sup>2</sup> 3-19-48

Large empty grid on the right page of the notebook, intended for data recording or calculations.

Check Levels From University Ave. And  
Louisiana to Madison Ave + Louisiana

B.M.	10.745	305.858	295.113	SEBP University + Louisiana Page 32
	4.02	305.953	392.5	301.933
	5.97	305.153	6.770	299.183
	5.448	306.286	4.315	300.838
B.M.	6.705	310.518	2.473	SE Top Fire Hydrant P.O. 14 + Louisiana 303.74
	9.905	319.653	0.77	309.748
	12.12	331.633	0.14	219.513
	5.00	335.283	1.35	330.283
	3.144	331.792	6.635	328.648
B.M.	6.328	332.340	5.78	SEBP E. Co. 102 + Louisiana 326.021 P. 63
	6.28	335.855	2.765	329.575
B.M.	6.282	338.950	3.187	SEBP Madison + Louisiana 332.70
	5.57	340.670	3.79	335.160

Index of  
c.s.k.

Clear  
Cool  
No Wind

340.670 ✓

July 1-1943  
SUSCO  
81557  
8299 Rod.

15

B.M.	6.250	342.618	3.302	337.318	SE Flood No. 1149 Madison + Louisiana 342.35
	5.852	346.325	3.145	340.473	
B.M.			3.950	342.375	SEBP Madison + Louisiana 342.38 Page 70

Bench Levels Kensington Heights

BM	5238	366.644		361.406	S.F.C. No. 12 Inside of Wall Adams St. C. + Kensington Dr. Page 71
	6758	369.100	4.802	362.342	
	3745	368.635	4.210	364.890	
BM Set	5.588	368.495	5.728	362.907	S.F.C. No. 12 Jefferson + Marlborough
	3800	367.007	5.228	363.207	
BM Set	2.525	363.297	6.225	360.772	N.E.B.P. N. End Curb Return Canterbury Dr. Marlborough
	6675	367.602	2.370	360.927	
BM Set	5.702	370.322	2.982	364.620	N.E.B.P. N. End Curb Return Hortford Terr. Marlborough
	1.218	365.270	6.370	363.952	
BM Set	6.510	366.408	5.272	359.898	N.E.B.P. N. End Curb Return Hortford Terr. Marlborough
	7.520	373.066	0.862	365.546	
BM Set	6.270	375.626	3.710	369.356	S.F.B.P. So. End Curb Return Bedford Dr. Marlborough
	6710	380.318	2.018	373.608	

✓

Indexed  
C.S.H.

July 1, 1943  
51507 T 176  
8155 Rod  
3997 Plugs

				380.318	✓
BM Set	6.750	384.266	2.802	377.516	N.E.B.P. N. End Cb. Return Ridgeway Marlborough
	4.695	386.558	2.403	381.863	
BM Set	5.525	386.631	5.452	381.106	S.F.B.P. East End Cb. Return Parisgans + Marlborough
	2.328	382.386	6.573	380.058	
	4.140	381.101	5.425	376.961	
	2.940	379.166	4.875	376.226	
BM	2.523	374.919	6.770	372.278	N.E. Chiswell N. End Cb. Ret. Bedford + Canterbury
	3.250	373.121	3.048	369.871	
BM	1.848	369.472	5.497	367.624	S.F.C. No. 12 S. End Cb. Ret. Middlesex + Canterbury
BM	6.500	370.360	5.612	363.860	S.F.C. No. 12 S. End Cb. Ret. S. Hempstead + Canterbury
	1.790	367.390	1.760	365.100	
	6.765	366.847	7.208	360.082	

✓

366.847 ✓

4.290 365.952 5.185 361.662

B.M. 5.758 367.628 4.082 361.870  
NW Corner of  
Fence  
Worfolk  
Canterbury

2.583 365.733 4.478 363.150

4.005 364.030 5.708 360.025

B.M. 3.782 360.750 7.062 356.968  
SW Corner of  
S. End of Rectory  
Sussex Dr.  
Kensington Dr.

B.M. 8.603 365.588 3.765 356.985  
SW Corner of  
S. End of Rectory  
Jefferson  
Kensington Dr.

5.022 366.722 3.888 361.700

B.M. 5.308 ✓ 361.414  
SE Corner of  
Inside of Walk  
Adams Street  
Kensington  
381,406

2-23-45 Block I. Weeks Ad.

Sammermeyer  
vt Moore  
B 999

Morena

Moreno Blvd P.C.

P.I

3" x 4" Conci. Air  
Hose Standard base  
30.6 0+138

Naples

Moreno

11.8 16.0  
10.6  
22.9 0+955  
← this shed is  
to be torn down

29.5 1.5  
Ergo  
House  
2.4  
0+16  
0+17

Set 3x2

Morena  
Naples

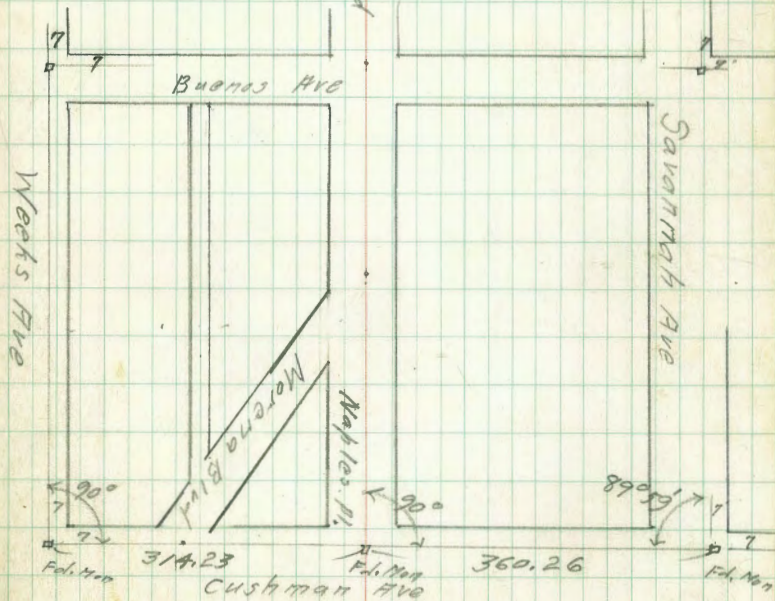
Indexed  
C.S.K

77 1/2

TPS-551  
9-7-48 M<sup>4</sup>Q

Set lath on  
South line Naples.

Morena Blvd



Buena Vista Ave

Weeks Ave

Savannah Ave

Morena Blvd

Naples

314.23

Cushman Ave

360.26

Ergo

Ergo

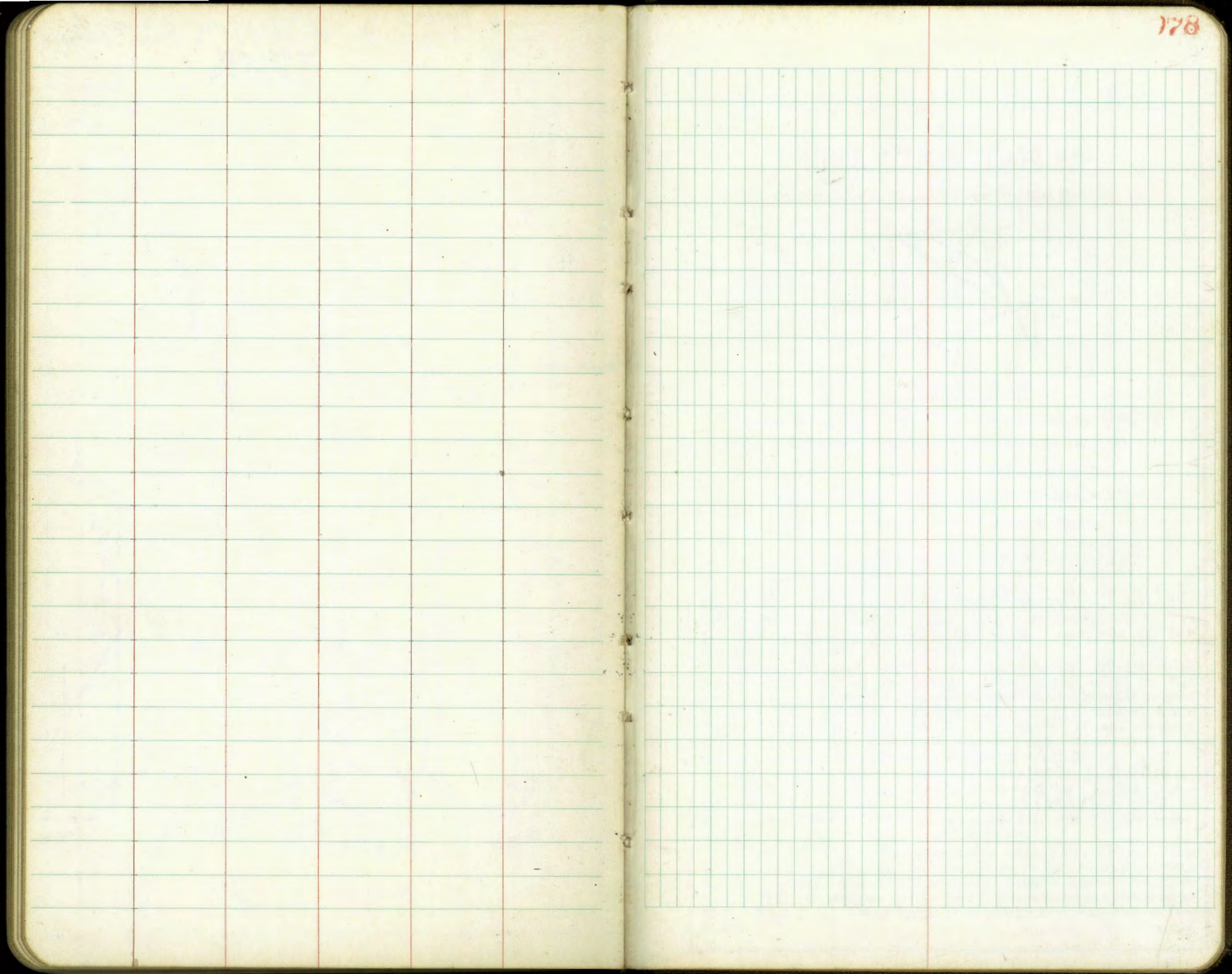
Ergo

90°

90°

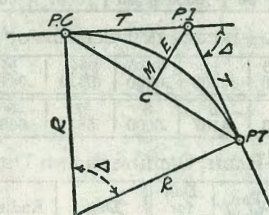
89° 50'





# 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— $E = T \tan \frac{\Delta}{4}$  (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)  $\Delta$ —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  $\div 8\frac{1}{8} = 414.49$  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)  $.3 \times C \times D^2$  or = defl. for 1 ft. from Table III  $\times C$ . For Sta. 158 of above curve =  $.3 \times 54.5 \times 8\frac{1}{8} = 136.2'$  or  $2^\circ 16.2'$ , or =  $2.50 \times 54.5 = 136.2'$  from Table III. For Sta. 159 deflection angle =  $2^\circ 16.2' + 8^\circ 20' \div 2 = 6^\circ 26.2'$ , etc.

**Externals.**—May be found in similar manner to tangents. Thus  $E$  for curve above is 115.37. For from Table IV for  $1^\circ$  curve  $E = 960.6$  for  $8^\circ 20' = 960.6 \div 8\frac{1}{8} = 115.27$  and from Table V correction = .10 or  $E = 115.37$  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  $D = 5^\circ 30'$ .

687 N. end M.B. Seawall  
6.995 = worked

**DISTANCES FROM CENTER OF ROADWAY FOR  
CROSS-SECTIONING.**

Roadway 16 feet wide. Side Slopes 1 on 1½  
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 some 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.

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