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DRAWING MATERIALS, MATHEMATICAL and
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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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The paper stock of this book is made 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.

Page 29 Blk. 37 City Hts Polk to Univ bet.
27 & 38

Page 34 1/4. Bancroft to 33rd

Page 38 Rigel from Main St N.

Page 51 55TH ST. Cross #828
Sec. Mission Valley Road to N.L. Marcellen track

P. 66 ALLEY BLK. 32 NORMAL Hts.

Wilkor. CHOLLAS VALLEY SEWER
 Bliss From Federal Blvd. to Boy.
 Isbell Alignment
 11-21-39

5+39.50 $\Delta 35^{\circ}04'$ Rt.

5+06.5 = Existing M.H. 4.05 ft.

4+67.82 = P.O.T. R. Wood Hub.

1+99.5 = Existing M.H. 36' Rt.

0+00 = 18.95' South of South 13' line Federal Blvd.
 = 31.95' South of " " " " " "

Indexed
 C.S.K.

1

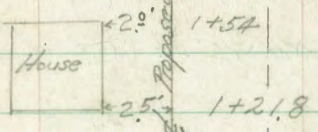
$\Delta 35^{\circ}04'$ Rt.
 5+39.50

← 4.05 → 5+06.5
 Existing M.H.

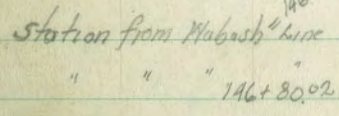
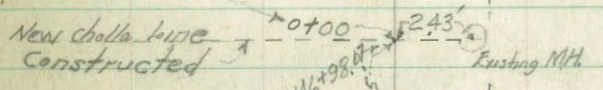
P.O.T. Hub.
 4+67.82

Trunk line
 Existing I.E.S.D.

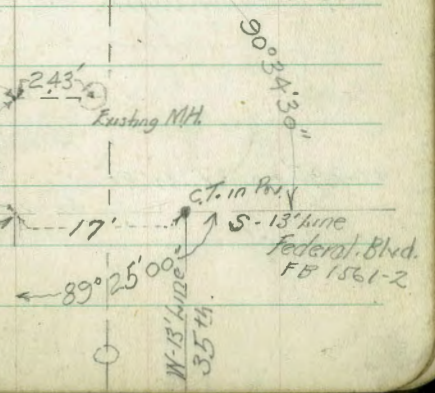
← 3.6 → 1+99.5
 Existing M.H.



Station of this proposed
 sewer =



For line North of Federal
 See F.B. 1870-24



Walker
Bliss
Isbell
11-21-39

CHOLLAS VALLEY SEWER

Alignment - Cont. from P-1

From Federal Blvd to Bay

15+11.38 = $\Delta 36^{\circ}19'00''$ Lt. = $\frac{1}{2}$ Alley 282.00' West of East
 14+92.63 = Existing M.H. 18.75' Lt.

13+14.45 = Int. S.W. edge Bridge

12+39.5 = Int. N.W. edge Bridge

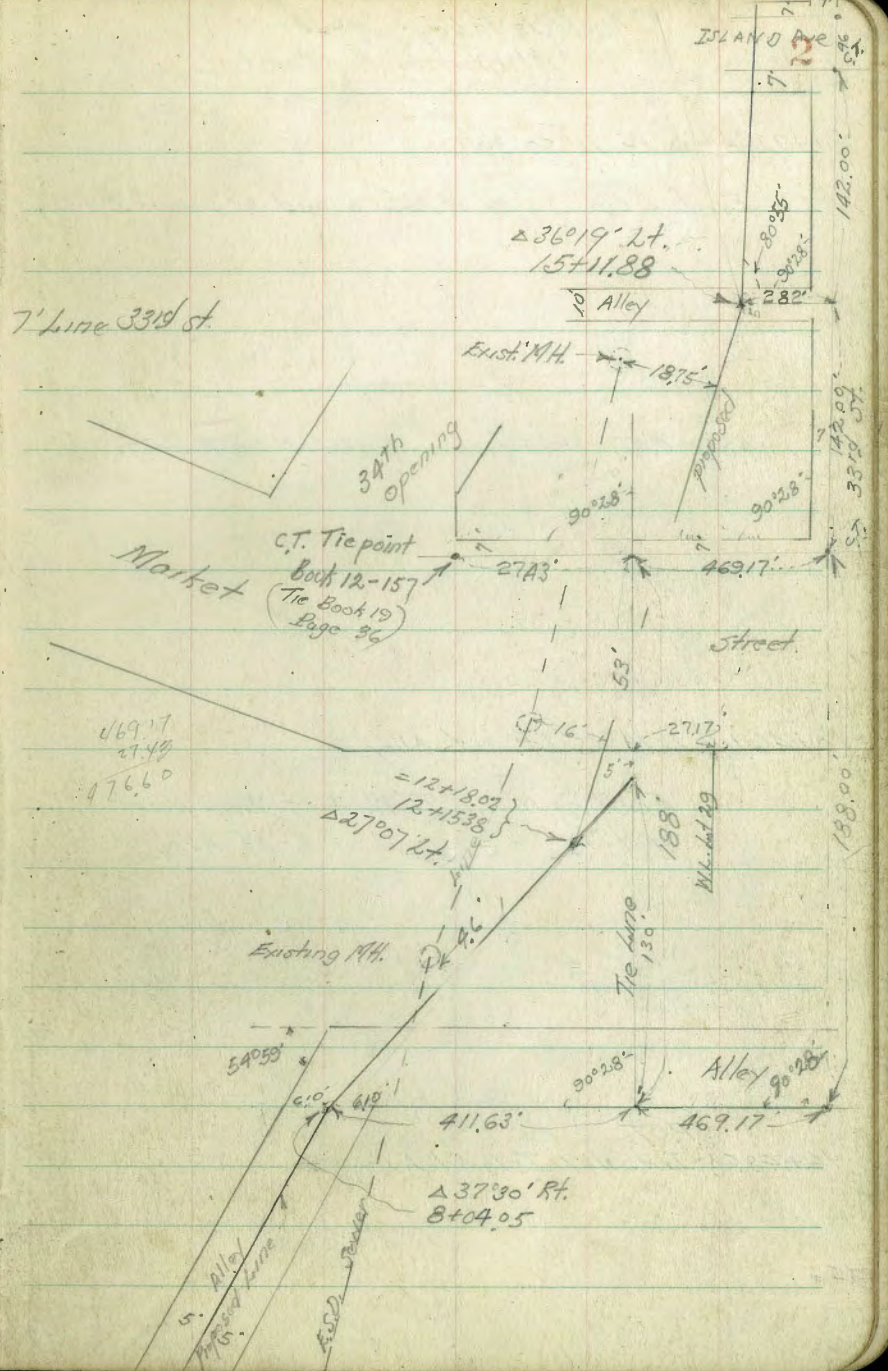
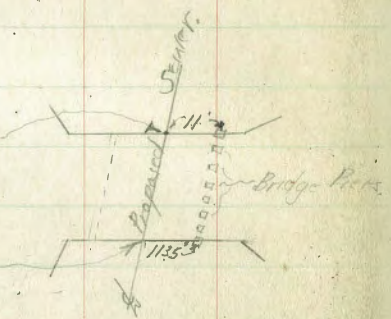
12+27.76 = Exist. M.H. 16' Lt.

= 12+18.02
 12+15.38 $\Delta 27^{\circ}07'$ Lt. } Equation

8+85.96 P.O.T. - Tack in both

8+31 = Exist. M.H. 4.6' Lt.

8+04.05 = $\Delta 37^{\circ}30'$ Rt.



Chollas Valley Sewer
Alignment - Cont.

21+72.54 = Δ Pt. $110^{\circ}50'30''$

Existing M.H. 7.6' Rt. of Above Δ and 0.7' South of Δ of Alley

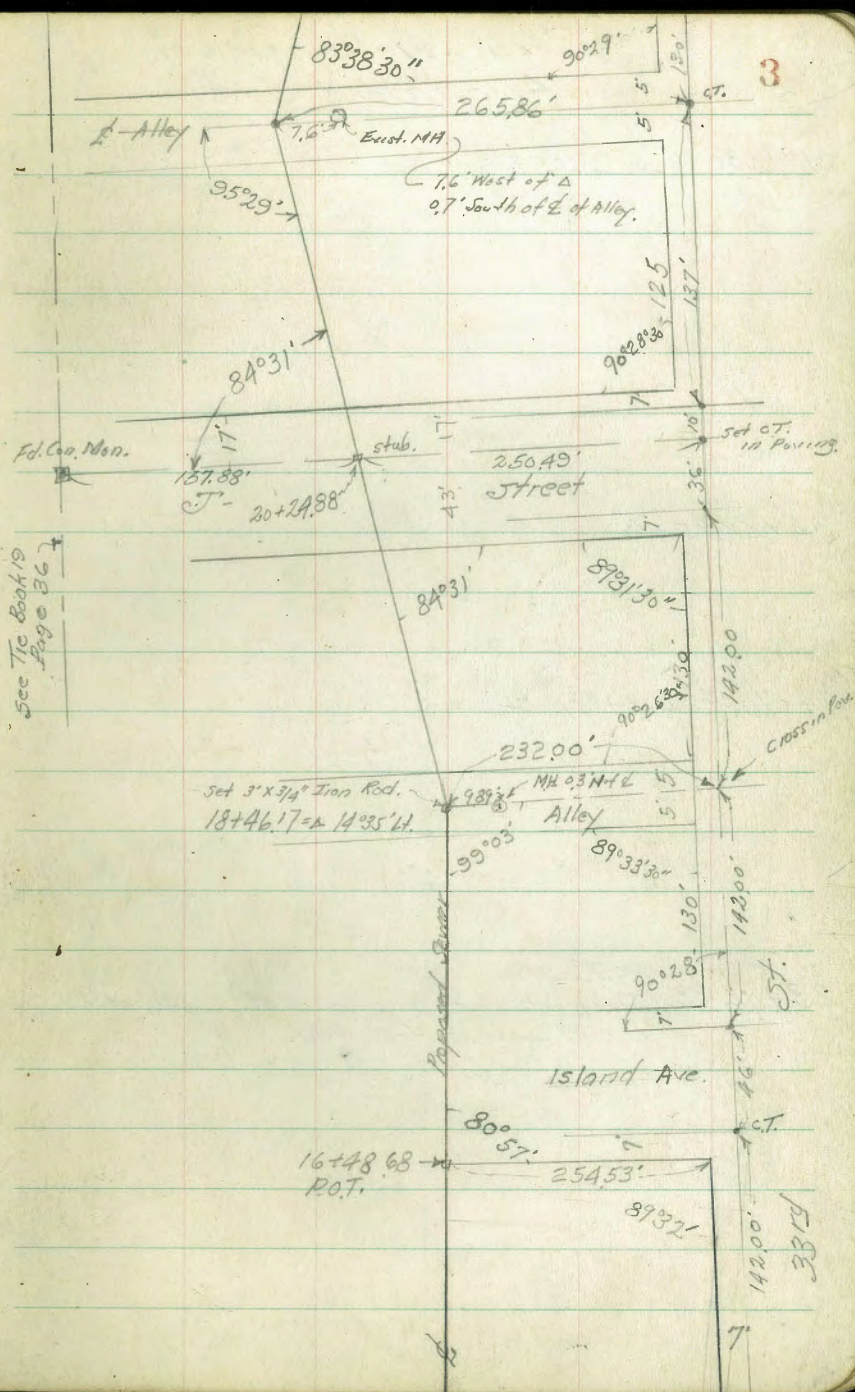
20+24.88 = P.O.T. Intersection South 13' line J-St.

250.49
157.88
408.37

18+46.17 = Δ $14^{\circ}35'$ Lt. = Δ Alley

Existing M.H. 9.89' West. of Angle point
and 15 0.3' North of Δ of Alley.

P.O.T.
16+48.68 Int. N.W. Island Ave



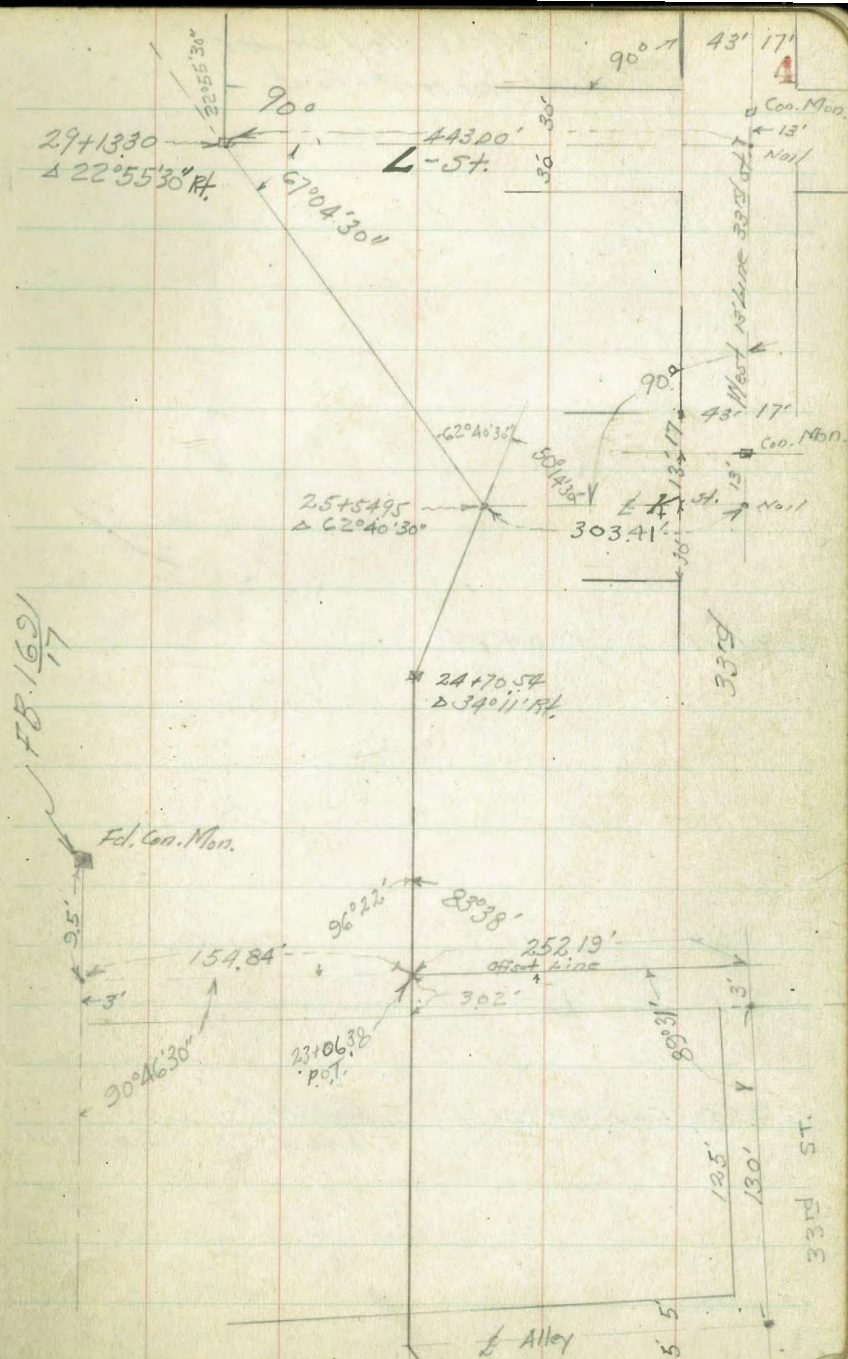
Chollas Valley Sewer
Alignment - Cont.

29+13.30 = Δ 22°55'30" Rt.

25+54.95 = Δ 62°40'30" Lt.

24+70.54 = Δ 34°11' Rt.

P.O.T.
23+06.38 = Intersection of a line 3.02' South of Bk. 7
117 19° Lorenz H-st Add.

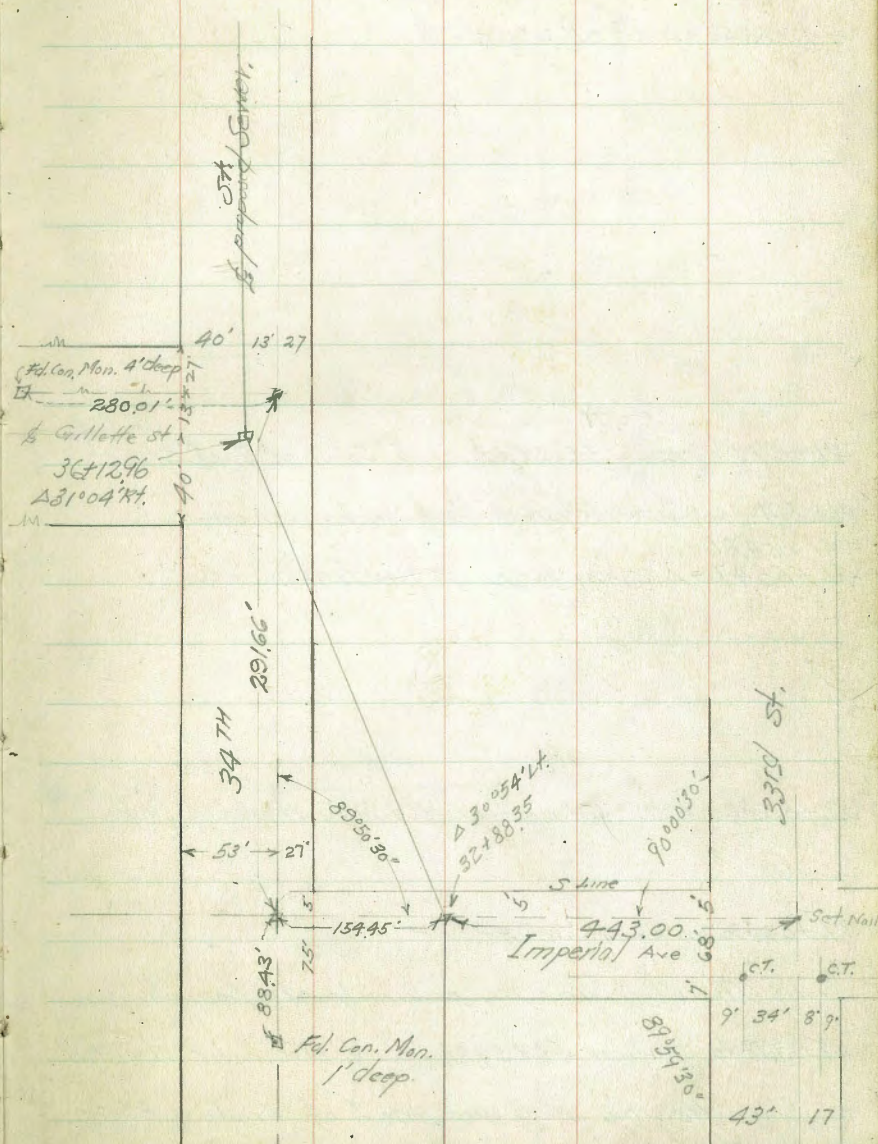


TS
PAGE

Chollas Valley Sewer
Alignment - Cont.

36+12.96 $\Delta 31^{\circ}04' Rt.$

32+88.35 = $\Delta 30^{\circ}54' Lt.$ Intersection of line
5' north of Skine Imperial



Chollas Valley Sewer
Alignment - Cont.

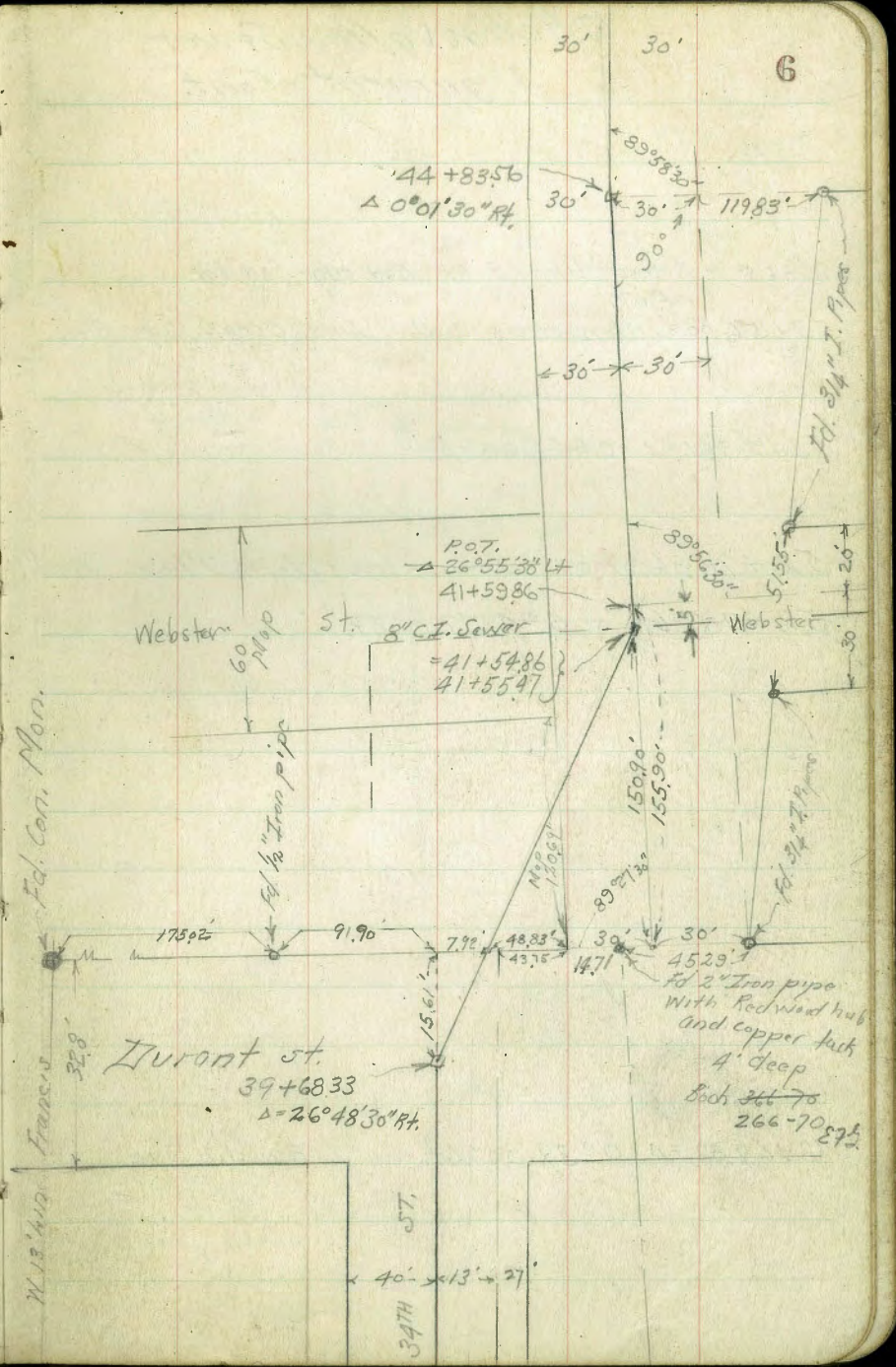
$44+83.56 = \Delta 0^{\circ}01'30'' \text{ Rt.}$

$41+59.86 = \text{P.O.T.}$
 $\Delta 26^{\circ}55'30'' \text{ Lt.}$ 5' South of $\&$ of Webster
 $41+54.26 = \text{Intersection } 8'' \text{ Cast Iron Sewer Main}$
 $= 41+54.86$
 $41+55.47 = \Delta 27^{\circ}41'30'' \text{ Lt.}$ } equation.

$39+85.82 = \text{P.O.T.} = \text{Intersection N.Y. line Stratford Park}$

$39+68.33 = \Delta 26^{\circ}48'30'' \text{ Rt.}$ ✓

Note: The above line was previously run from station
 $39+67.78$ to station $41+59.86$, but was later decided
to place the new M.H. over the $\&$ of Existing $8''$ sewer
in the $\&$ of Webster st. hence the equations.



Chollas Valley Sewer
Alignment - Cont.

53+65 = 1/2 Gas M.H. 13' RT = East edge Cor. Box
P.O.T.

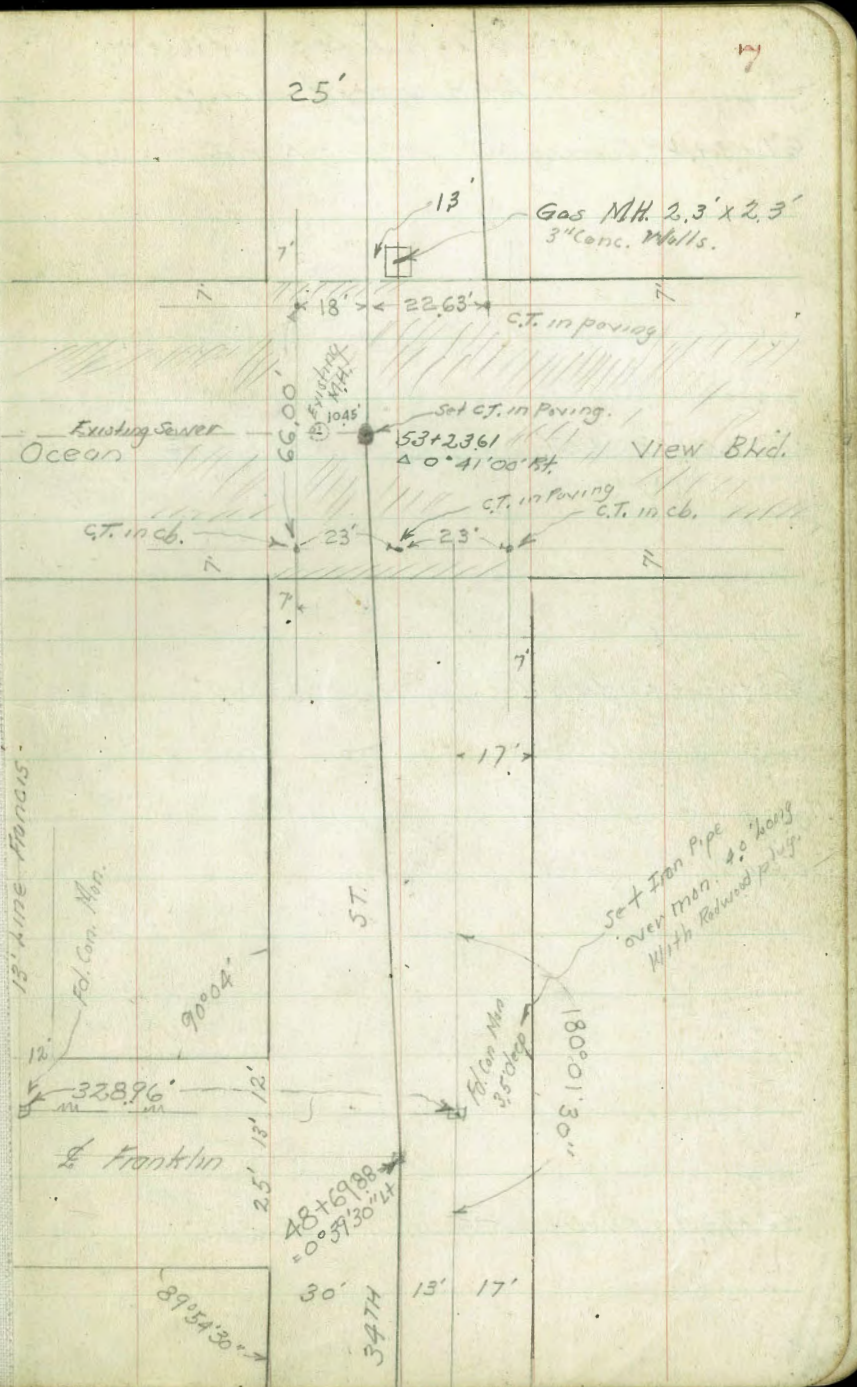
53+56.88 = Intersection South 7' line Ocean View Blvd.

53+2361 = Δ 0°41'00" RT

52+90.86 = P.O.T. = Intersection North 7' line Ocean View Blvd.

52+78.86 = Δ 0°46'00" RT

48+69.88 = Δ 0°39'30" Lt. = 1/2 Franklin Ave



Chollas Valley Sewer Alignment - Cont.

P.O.T.

61+34.4 = Existing M.H. 10' Lt. = A in Existing Sewer

P.O.T.

= North 7' line Martin on East.

59+51.13 = P.O.T. = Intersection of a line 12.12' South of N. line Martin on West.

P.O.T.

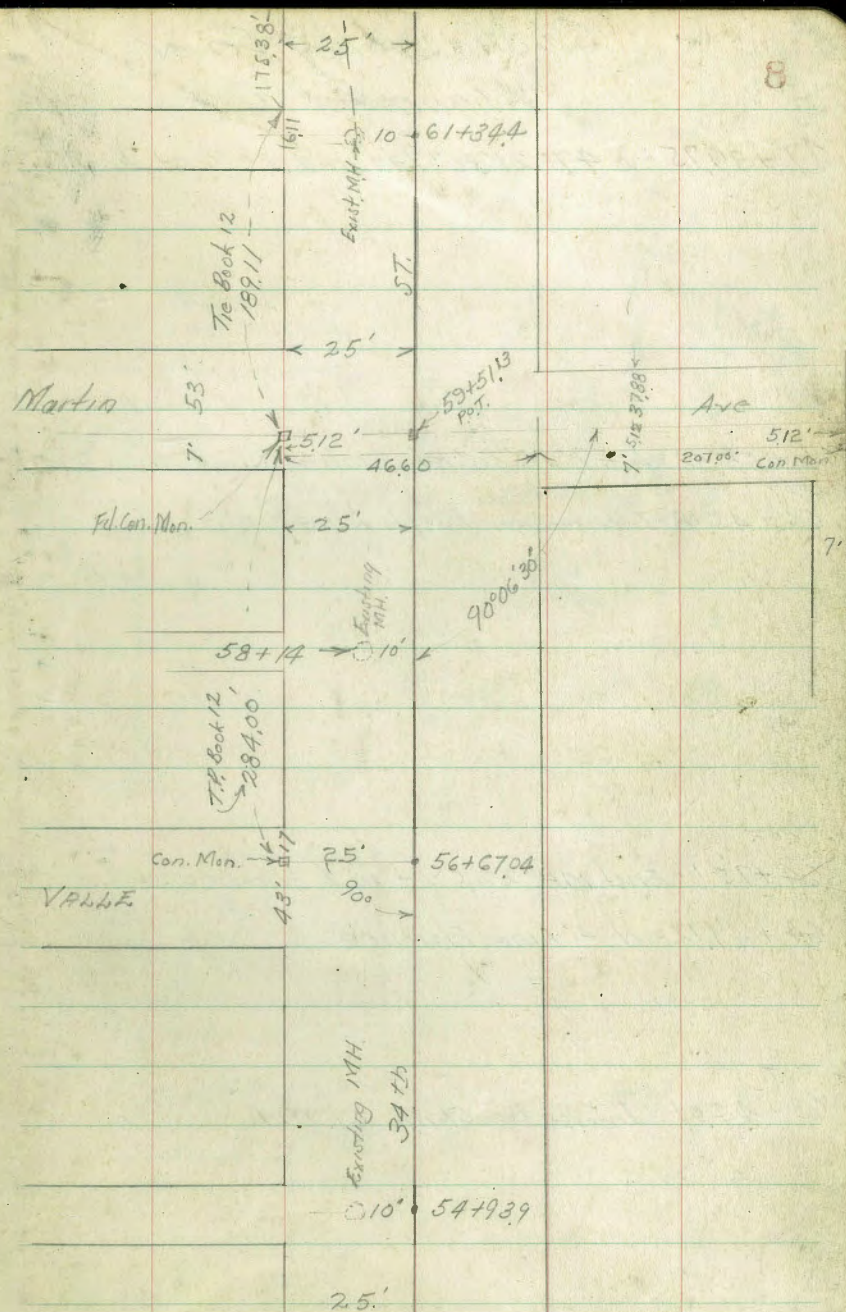
58+14 = Existing M.H. 10' Lt.

P.O.T.

56+67.04 = Con. Man. 25' Lt.

P.O.T.

54+93.9 = Existing M.H. 10' Lt.



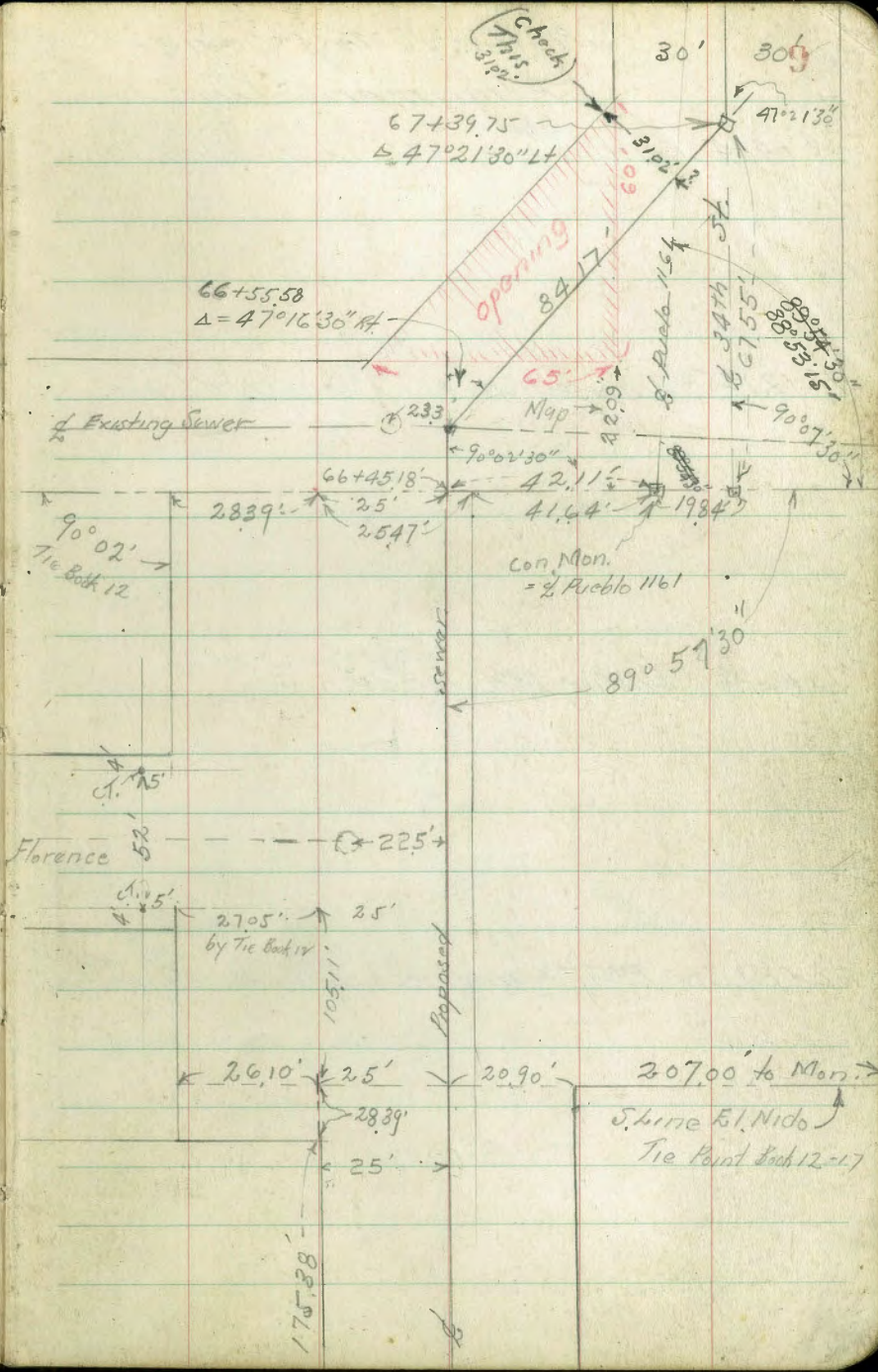
Chollas Valley Sewer Alignment - Cont.

67+39.75 = Δ 47° 21' 30" Lt. in & 34th St. to South.

66+55.58 = Δ 47° 16' 30" Rt. = intersection existing sewer
P.O.T.
66+45.18 = Intersection Pueblo line

P.O.T.
64+75.1 = Exist. N.H. 22.5' Lt. in & Florence St.
P.O.T.
64+49.12 = N 4' line Florence

P.O.T.
63+44.01 = Intersection Spine Ft. Nido



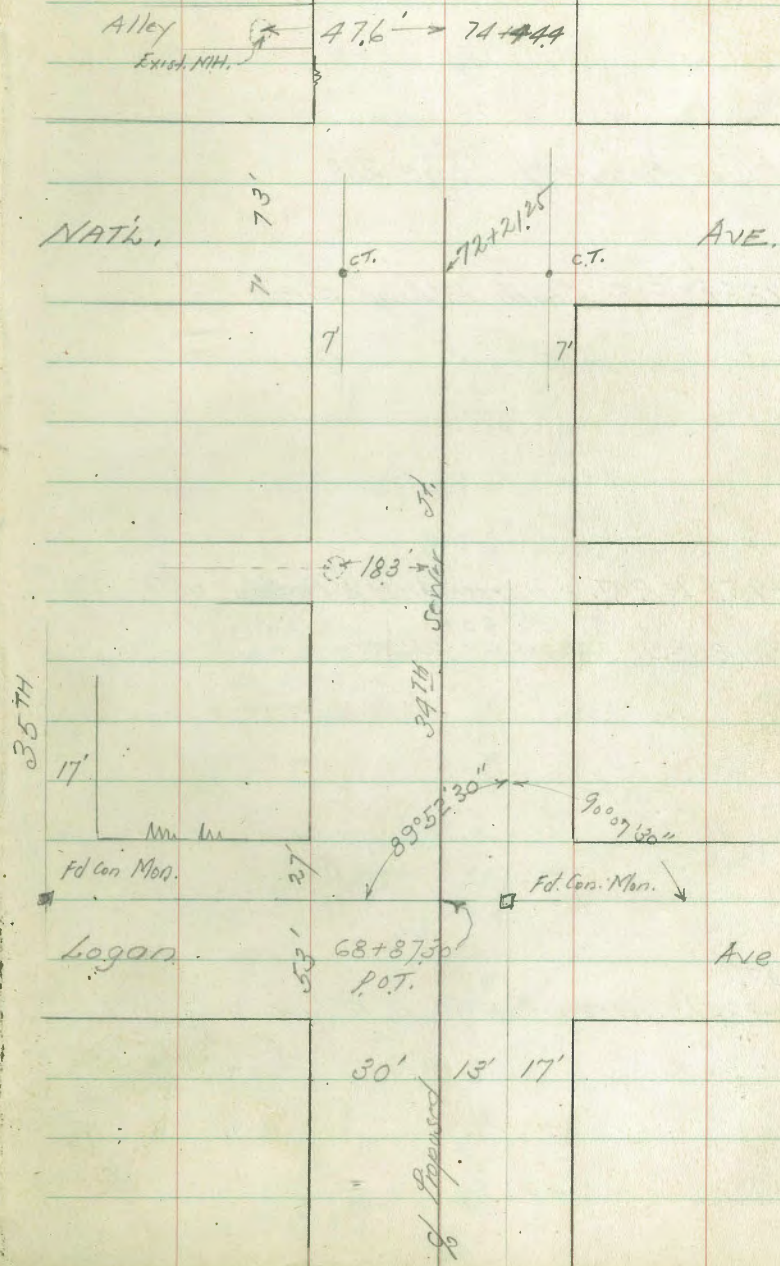
Chollas Valley Sewer
Alignment - Cont.

74+444 = Existing M.H. 47.6' Lt. in Alley

72+21.25 = Intersection N. 7' line Nat'l Ave.

70+64.2 = Existing M.H. 18.3' Lt.

68+87.30 = P.O.T. = intersection South 13' line Logan



Continued Page 23

81+18.64 = P.O.T. South 13' line Birch

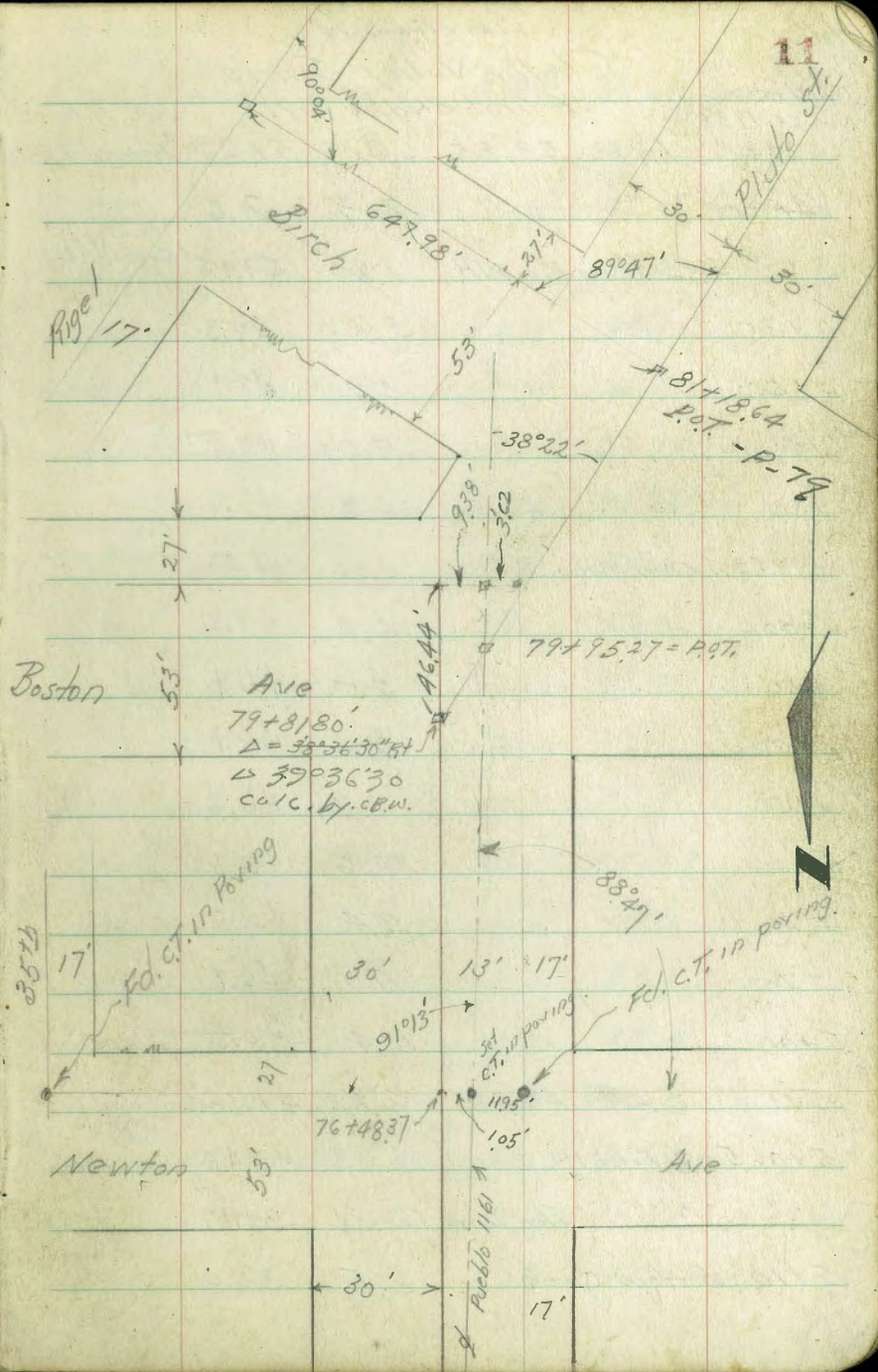
79+95.27 = P.O.T. = intersection of Aveble 1161

39°36'30"

79+81.80 = Δ 39°36'30" Pt.

P.O.T.

76+48.37 = intersection South 13' line Newton Ave



Walker
Bliss
Isbell
Nov 24-1939

"LEVELS"
Chollas Valley Jewers.

alignment
P-1

Federal Blvd. to Coy.

S.M. N.W. Cor.

Federal = 35 1/2

1.98	53.85	51.87	
0+00	2.3	51.6	
" "	243' Rt. on Rim MH	1.90	51.95
0+35	3.6	50.3	
+50	5.1	48.8	
1+00	6.0	47.9	
+50	6.3	47.6	
1+99.5 = 2' East. MH	6.80	47.05	
2+00	6.7	47.2	
+50	7.5	46.4	
3+00	7.8	46.1	
+50	7.7	46.2	
4+00	10.6	43.3	
+50	11.4	42.5	
+70	11.1	42.8	
5+00	13.4	40.5	
T.P.	5.46	46.48	12.83 41.02
5+06.5 = 2' East. MH. Rim	6.03	40.45	s. edge
" " " " " Flow line	12.31	34.17	
5+10 = Bottom Creek	8.5	38.0	

46.48

12

5+39.50 = Δ Rt. 35°04'	8.97	38.01	
6+00 in creek	10.0	36.5	
+50 " "	9.9	36.6	
7+00 " "	10.1	36.4	
+50 " "	10.4	36.1	
8+04.05 Δ Rt. 37°30'	10.5	36.0	
8+31 = 2' East. MH. Rim	8.78	37.70	4.6' Lt.
" " " " " Flow	14.74	31.74	
+35 in creek	11.2	35.3	
+50	9.6	36.9	
9+00	7.6	38.9	
" " 17' Lt. in creek	12.0	34.5	
9+50 = N.W. edge creek	11.1	35.4	
T.P. 1.88	37.31	11.05	35.43
10+00 = 2' creek	2.7	34.6	
+50 = creek	3.2	34.1	
11+00 in "	3.3	34.0	
+50 " "	4.0	33.3	
= 12+18.02			
12+15.38 = Δ 27°07' Lt.	5.66	31.65	
12+27.76 on Rim East. MH	2.28	35.03	16' Lt. off
+50 in creek	6.0	31.3	

		37.31	"LEVELS"		
13+00	in creek.		5.7	31.6	
+50	" "		5.4	31.9	
14+00	" "		6.7	30.6	Low point.
+50	" "		4.6	32.7	
15+11.88	= Δ 36°19'00" Rt.				
T.P.	9.14	40.11	6.34	30.97	on Baristake
14+92.63	Rim Flush M.H.		^{7.66} 5.24	34.87	
" "			^{6.01} 11.25	28.86	Flow From West.
" "			12.90	27.21	Flow to N+S
15+50	in Wash.		8.1	32.0	
16+00	" "		7.8	32.3	
+50	" "		8.0	32.1	
17+00	" "		9.3	30.8	
+30	" "		9.5	30.6	
+50	" creek.		11.4	28.7	
18+00			11.5	28.6	
+46.17	= Δ		11.67	28.44	Δ Alley.
T.P.	7.66	38.65			
+ sec. st. 100	on Rim M.H.		9.12	30.99	South edge
+ " " "	Flow " "		^{6.80} 15.92	22.73	24.19 Island
Chk. 8 M. Con. Map			3.55	35.10	+330°
				35.08	= B.M.
T.P.	2.71	33.70	7.66	30.99	

		33.70	Chollas Sewer		13
19+00	in Wash.		5.1	28.6	
+50	" "		3.8	29.9	
20+00	" "		2.4	31.3	
+15	" "		4.0	29.7	
+37	" "		3.7	30.0	
+43	" "		5.9	27.8	
+50	" "		3.7	30.0	
+70	" "		2.5	31.2	
21+00	" "		3.3	30.4	
+50			4.2	29.5	
+72.54	= Δ 11°50'30" Rt.		4.44	29.26	
7.6 Rt.	on Rim M.H.		2.69	31.01	Line Flows
" " "	Flow Line		^{7.55} 10.54	23.16	West
22+00			5.0	28.2	
" "	20' Lt. in Wash		6.7	27.0	
22+50			6.2	27.5	
+75	in Wash		8.1	25.6	
23+00			7.3	26.4	
+50			6.7	27.0	
+55	in Wash		8.8	24.9	
24+00			9.5	24.2	

	33.70	"Levels"	
24+25		7.7	26.0
+50		8.0	25.7
24+70	$54^\circ \Delta 32^\circ 11' \text{ Rt.}$	9.76	23.94
25+00		8.8	24.9
+25		7.4	26.3
T.P.	383	28.96	
+57.95	on Hub = $\Delta 62^\circ 40' 30'' \text{ Lt.}$	8.57	25.13
+80		6.5	22.5
26+00		5.8	23.2
+50		3.8	25.2
27+00		4.2	24.8
+50		4.7	24.3
28+00		4.9	24.1
+50		5.5	23.5
29+00		6.3	22.7
+13.30	$= \Delta 22^\circ 55' 30'' \text{ Rt.}$	6.63	22.33 on Hub.
+50		6.7	22.3
+70		6.8	22.2
30+00		8.1	20.9
+25		6.3	22.7
+50		6.9	22.1
+85		8.2	20.8

	28.96	Chollas Sewer	
31+00	in wash	10.4	18.6 channel
+50	"	10.1	18.9 "
T.P.	3.91	22.62	10.25 18.71
32+00		4.3	18.3 "
+88.35	$= 30^\circ 54' \text{ Lt.}$	3.99	18.63 on Hub. in channel
33+00		4.6	18.0 " "
+50		3.8	18.8 " "
34+00		3.1	19.5 " "
+50		2.5	20.1 in wash
35+00		2.3	20.3 " "
+50		3.4	19.2 " "
36+00		3.4	19.2
T.P.	3.77		
+12.96	$= \Delta 31^\circ 04' \text{ Rt.}$	21.76	4.63 17.99
+50		4.6	17.2
37+00		4.5	17.3
+50		6.5	15.3 in channel
38+00		6.5	15.3 in wash
+50		6.2	15.6 in channel
39+00		6.3	15.5 " "
68.33	$= \Delta 26^\circ 48' 30'' \text{ Rt.}$		
+67.78	$= \Delta 26^\circ 03' \text{ Rt.}$	7.26	14.50 on stake
40+00		7.3	14.5 in channel

	21.76	Levels		
40+50		6.9	14.9	in channel
41+00		6.4	15.4	" "
+55.47	Equation $\Delta 27^{\circ}41'30''$ Lt.			
+34.86				
+59.86	$\Delta 26^{\circ}55'30''$ Lt.			
42+00		7.29	14.47	" on stake
42+00		7.5	14.3	in channel
+50		7.6	14.2	
43+00		7.5	14.3	
+50		6.5	15.3	
T.P.	2.28	17.64	6.40	15.36
44+00		2.7	14.9	
+50		3.2	14.4	
+83.56	$\Delta 0^{\circ}01'30''$ Rt.			
45+00		3.10	14.54	on stake
45+00		3.1	14.5	
+20		3.0	14.6	
+50		7.0	10.6	in channel
46+00		6.8	10.8	" "
+50		7.3	10.3	" "
47+00		7.0	10.6	" "
+50		5.2	12.4	
48+00		3.6	14.0	
+69.88	Δ			
49+00		7.56	10.08	on stake
49+00		7.2	10.4	in channel

	17.64	Chollas Sewer		15
49+20		8.3	9.3	(Δ to West in channel)
+45		3.9	13.7	
+75		1.7	15.9	
50+00		1.4	16.2	
T.P.	8.25	24.17	1.72	15.92
+50		8.1	16.1	
51+00		8.2	16.0	
+50		9.0	15.2	
52+00		8.2	16.0	
+50		6.7	17.5	
check B.M. SE Top of Ocean View Blvd	1.99	22.18		3414
chk. B.M. S.E. Top Hydt.	7.13	17.04		17.22 = B.M. Δ 3319
52+89 = N edge Paving	4.76	19.41		ocean view
53+00 on "	5.09	19.08		
+23.61 = C.T.	4.86	19.31		
" 10.45' Lt. on Rim	4.75	19.42		
" " " " Flow East	9.05	15.12		Lower Flow is full of Rock & Sand could not get elevation. C.T. in Paving
T.P.	0.24	19.55	4.86	19.31
53+63.88 = Skine ocean view	0.40	19.15		53+23.61 sedge Paving

19.55 Levels

54+00	2.1	17.5	
+50	3.4	16.2	
+93.9 on Rim East MH	3.60	15.95	10' Lt.
" " Flow " "	8.68	10.87	"
55+00	3.6	16.0	
+50	4.0	15.6	
56+00	4.4	15.2	
+50	5.2	14.4	
57+00	5.8	13.8	
+50	6.5	13.1	
58+00	7.2	12.4	
+14 on Rim MH	7.57	11.98	10' Lt.
+14 " Flow Line	12.55	7.00	" "
+50	7.7	11.9	
59+00	8.1	11.5	
+51.13 = POT. on stub.	9.27	10.28	
60+00	8.7	10.9	
+50	8.9	10.5	
61+00	9.1	10.5	
+34.4 on Rim East MH	9.09	10.46	
" " Flowline "	14.39	5.16	

1955 Chollas Sewer

TP	9.21	19.67	9.09	10.16	16 E. edge MH.
67+44 = asphalt gutter			10.0	9.7	
9' Lt.			12.1	7.6	
62+00			9.8	9.9	
+50			9.4	10.3	
63+00			9.8	9.9	
+50			9.2	10.5	
64+00			9.0	10.7	
+50			8.2	11.5	
" " 9' Lt.			11.2	8.5	
64+75.1 on Rim East MH			8.29	11.38	22.5' Lt.
" " " Flow " "			16.59	3.08	" "
64+97 = 15" Elec Pole 1' Lt to pole			8.7	11.0	Natural Ground at Pole
65+50			10.3	9.4	
66+00			10.1	9.6	
+30			10.9	8.8	
+45.18 = intersection Pipe			3.9	15.8	
+55.58 = $\Delta 47^{\circ}16'30''$ Rt.			3.46	16.21	on stub.
23.3' Lt. on Rim East MH			1.86	17.81	
" " " " Flowline			15.3	2.51	
66+85			5.2	14.5	

	1967	Levels		
67+00		8.6	11.1	
+28		13.3	6.4	
+35		11.2	8.5	
+39.75 = Δ Lt. 47°21'30"		12.22	7.45	on R. Wood Hubs.
" 12' Rt.		16.0	3.7	
68+00		10.0	9.7	
" " 13' Rt.		15.5	4.2	
68+50		11.7	8.0	
69+00		11.4	8.3	
TP on Cap MH ^{5.10}	11.67	13.10	6.57	13' Rt of other 68+87.30
69+50		4.1	7.6	
70+00		4.5	7.2	
+50		4.7	7.0	
+64.2 on Rim MH.		5.95	5.72	18.3' Lt.
+69.2 " Flow "		^{3.70} 9.65	2.02	" "
71+00		4.7	7.0	
+50		5.2	6.5	
72+00		5.2	6.5	
+14.5 on edge Paving		5.39	6.28	N. line Nat'l. Ave.
+28.5 N. cb. line		5.90	5.77	in Gutter

	11.67	Chollas Sewer		17
72+54.5 = % Nat'l. on Paving	5.28	6.39		
72+80.5 = scb. " "	6.20	5.47		
+94.5 = Stone on " "	5.65	6.02		S.K. B.P. No. 1 39th
TP 2.14 8.94	4.87	6.80		6.82 = B.P.
				0.02 = difference
73+00		3.0	5.9	
+50		4.1	4.8	
74+00		4.3	4.6	
" " 10' Rt.		7.0	1.9	Mud Flat
74+44.4 = % MH 47.6' Lt.	4.15	4.79		Rim
" " " " on Flow	8.35	0.59		
74+50		5.0	3.9	
75+00		5.3	3.6	
" 7' Rt. = Mud Flat.	7.3	1.6		
75+50		5.8	3.1	
+95.5 = N edge Paving	7.07	1.87		" Newton Ave
76+09.5 on " "	7.15	1.79		
76+35.37 = % Newton on Paving	6.87	2.07		
76+61.37 = S Gut. " "	7.10	1.84		
76+75.37 = Sk. Newton " "	7.08	1.86		

"Levels"

Chollas Sewer

8.94

77+00	6.8	2.1	
+50	7.0	1.9	
" 10' Rt.	9.7	-0.8	Mud Flat
78+00	6.8	2.1	
+50	6.8	2.1	
79+00	7.2	1.7	
+50	10.1	-1.2	
T.P. 5.05 3.90			
79+81.81 = Δ 35° 26' 30" Rt. 37° 36' 30" Flt.	10.09	-1.15	on Pav. stake SW. 13' Hub 94' East Rock 1503-41
chk. 4" x 4" Redwood Post.	3.55	0.35	
80+00	2.6	1.3	
+35	2.8	1.1	
+50	5.2	-1.3	in Mud Flat
81+00	5.4	-1.5	" " "
+18.64 = POT. stake	5.05	-1.15	" " "
+50	4.9	-1.0	" " "
82+00	4.3	-0.4	✓
+50	4.4	-0.5	✓
83+00	4.8	-0.9	✓
+50	5.0	-1.1	

3.90

18

84+00	4.9	-1.0	in Mud Flat
+50	5.1	-1.2	✓
+99.81 = POT. stake	5.05	-1.15	✓
85+50	5.1	-1.2	✓
86+00	5.0	-1.1	✓
See P-21 - for change			
+77 = Δ 54° 00' Lt.	5.43	-1.53	✓
87+00	5.5	-1.6	
+50	5.6	-1.7	
88+00	5.5	-1.6	
T.P. 6.68 6.36	4.22	-0.32	Iron Pipe NELY cor Dalbergia 34th
+36	7.5	-1.1	100 x 150
+50 = N.W. edge small lake	9.1	-2.7	
89+00 in lake	9.3	-2.9	
+27 = S.W. edge lake	9.3	-2.9	
+33	7.3	-0.9	
+51 = N.W. Bank Channel	7.4	-1.0	Dalbergia
+57 = " Flow "	10.2	-3.8	
+63 = " " "	10.7	-4.3	
+80 = S.W. " "	10.0	-3.6	
+82 = " Bank "	7.6	-1.2	
+95 = Toe R.R. Slope	7.5	-1.1	

Chollas Sewer

π
6.36

TP	8.10	13.99	0.47	5.89	
90+18 = top RR fill		1.1	12.9		NW edge Top
9' Rt		5.2	8.8		
16' "		16.6	-2.6		
90+30 = " " "		1.0	13.0		SW edge Top
W' Rt		4.3	9.7		
90+50		13.4	0.6		
TP	2.39	3.88	12.50	1.49	on 2"x4"
90+79.50 = Δ 84°09'00" Lt.		4.75	-0.87		Pine stake
10' Rt. on E Alley		5.0	-1.1		Ely Bank
14' " " "		8.0	-4.1		Main Channel Ely Flow
91+00		6.0	-2.1		Main Channel
+50		5.3	-1.4		
+93		6.1	-2.2		
92+00 = Bottom Tide Slough		7.3	-3.4		NW edge
+25 = " " "		7.3	-3.4		E
+50		6.4	-2.5		
+65		7.3	-3.4		
+88		7.2	-3.3		Ely edge
+91	Top Bank	5.6	-1.7		

3.88

93+00		5.6	-1.7		
+50		5.2	-1.3		
94+00		5.3	-1.4		
+50		4.6	-0.7		
+95		4.3	-0.4		
95+06		2.9	1.0		
+50		2.1	1.8		
96+00		1.8	2.1		
+50		2.1	1.8		
+66		1.8	2.1		
+75		3.3	0.6		
TP	5.35				W 13' line
96+86.50 = P.O.T. Hub	6.44	2.79	1.09		Regl
97+00		5.2	1.2		
+50		4.7	1.7		
98+00		4.3	2.1		
+50		4.8	1.6		
98+89.94 = Δ Rt. 51°30'		4.95	1.49		on Hub
Chk. on Hub 12+98.55	Book 1503-41	5.46	0.98		see P-24
			0.97 = Hub		
			0.01 = Error		

Levels Cont. P. 20

Levels

Chollas Sewer

 π
6.44

99+00	5.0	1.4
+60	5.4	1.0
100+00	5.4	1.0
+50	6.0	0.4
+73 = Top Fill at main st.	4.6	1.8
+83 = Top " at main st.	0.6	5.8
+97.25 = int. cb. ^{WAY} " "	0.61	5.83
+97.25 = " Hby Guts on paving	1.26	5.18
101+00 on paving	1.12	5.32
+34.57 $\frac{1}{2}$ Main on pav.	0.81	5.63
+69.15 = SIX cb. line Main st.	1.44	5.00
+69.15 = " " " Top cb.	0.82	5.62
+83 = SIX Top Fill	0.5	5.9
+97	6.3	0.1
102+00	6.7	-0.3
102+35.30		
= 17+00 Book 1503-41	7.5	-1.1

Grade of Main raised since levels -

- were taken in Book 1503-41 -

- Hence the non-agreement of paving levels.

For Continuation Alignment & Levels

To M.H. in S. Fisher St. see Book 1503

	Pages	Pages
alignment	34-40	Levels - 41-44

(Levels on Page 22)

"Chollas Sewer Alignment"

"Alternate Line" From Stations

86+77 to E Rigel + Alley Blk. 250

$\Delta 89^{\circ}51' \text{ Lt.}$

$97+37.37 = 96+99.50 \text{ E. Rigel + Alley}$

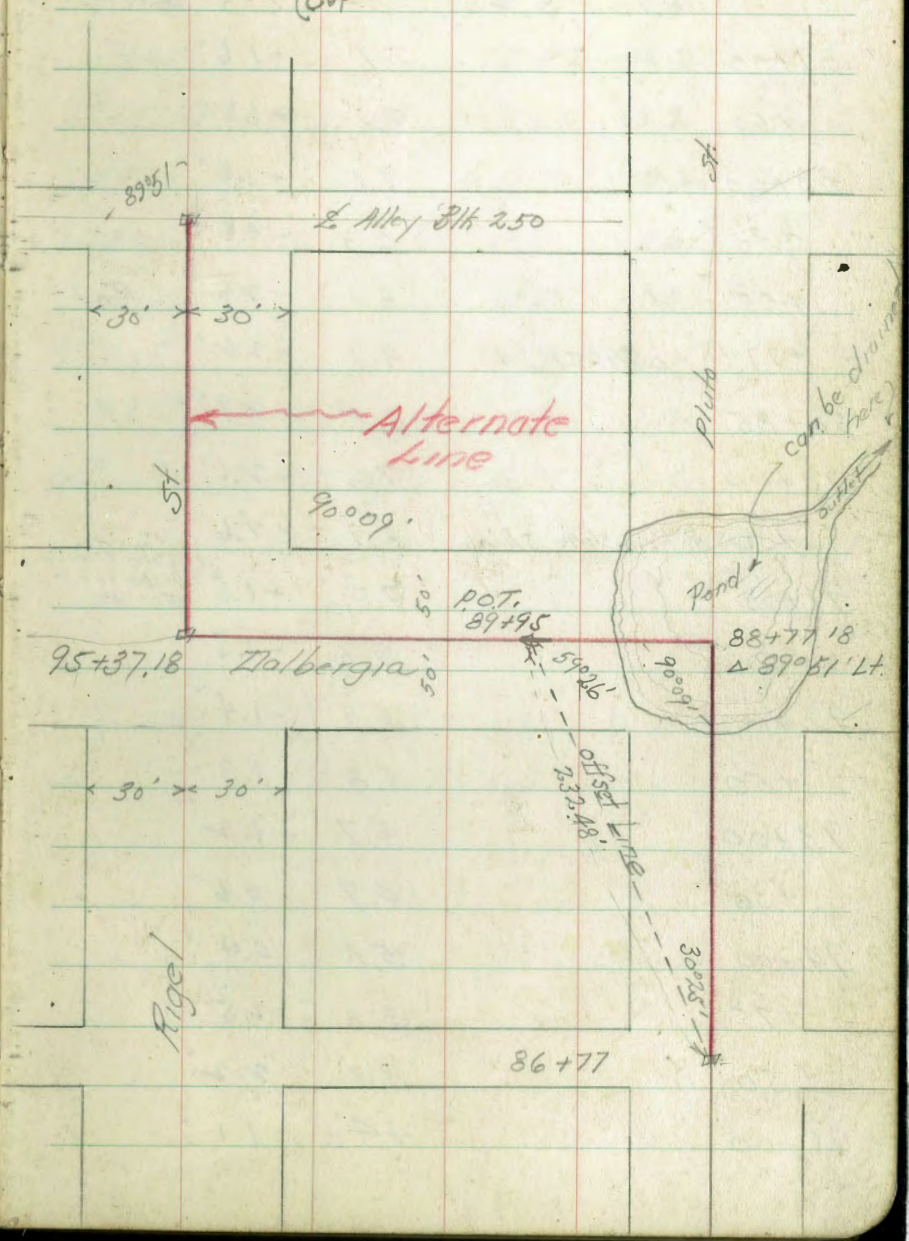
$95+37.18 = \Delta 89^{\circ}51' \text{ Rt.}$

$89+95 = \text{P.O.T. Stake at offset line}$

$88+77.18 = \Delta 89^{\circ}51' \text{ Lt.}$

$86+77 = \text{P.O.T.}$

See Book 15-69 p 70
(Copied in this book p 25)



LEVELS For

"Alternate Line" Page 2

	π ✓		
	6.98	5.45	-1.53
			R.M. & stake 86+77-P. 18
87+00		7.1	-1.6 ✓
+50		7.1	-1.6 ✓
88+00		7.1	-1.6 ✓
+30		6.3	-0.8 ✓
+55		8.1	-2.6 ✓ in Pond
+77.18 = $\Delta 89^{\circ}51'$ Lt.		8.1	-2.6 ✓ " "
89+85		8.2	-2.7 ✓ " "
90+00		7.6	-2.1 ✓ " "
+50 - Bottom tide slough		8.1	-2.6 ✓
91+00		7.0	-1.5 ✓ (weir channel) Dolbergia St. 80' Rt.
+50		7.0	-1.5 ✓
92+00		6.9	-1.4 ✓
+50		6.8	-1.3 ✓
93+00		6.7	-1.2 ✓
+30		4.9	0.6 ✓
94+00		5.1	0.4 ✓
+25		3.0	2.5 ✓
+50		3.3	2.2 ✓
95+00		4.4	1.1 ✓

 π ✓
5.45

22

95+10		4.7	0.8 ✓
+25		7.8	-2.3 ✓
95+37.18 = $\Delta 89^{\circ}51'$ Rt.		7.62	-2.2 ✓ in Dolbergia St. channel on Hub.
+80		5.3	0.2 ✓
96+00		4.9	0.6 ✓
+50		4.5	1.0 ✓
97+00		4.4	1.1 ✓
+37.37 = 96+99.50 P. 24		4.3	1.2 ✓
chk. on Hub 96+86.50 Page 19		4.35	1.0 ✓

1.09 = Hub Page 19
0.01 = Error.

Chollas Valley Sewer
Alignment
Cont. from Page 11

$90+79.50 = \Delta 84^{\circ}09'00'' \text{ Lt.}$

$90+24.50 = \text{P.O.T. stub. on old R.R. embankment}$

64.35
321.02
390.37

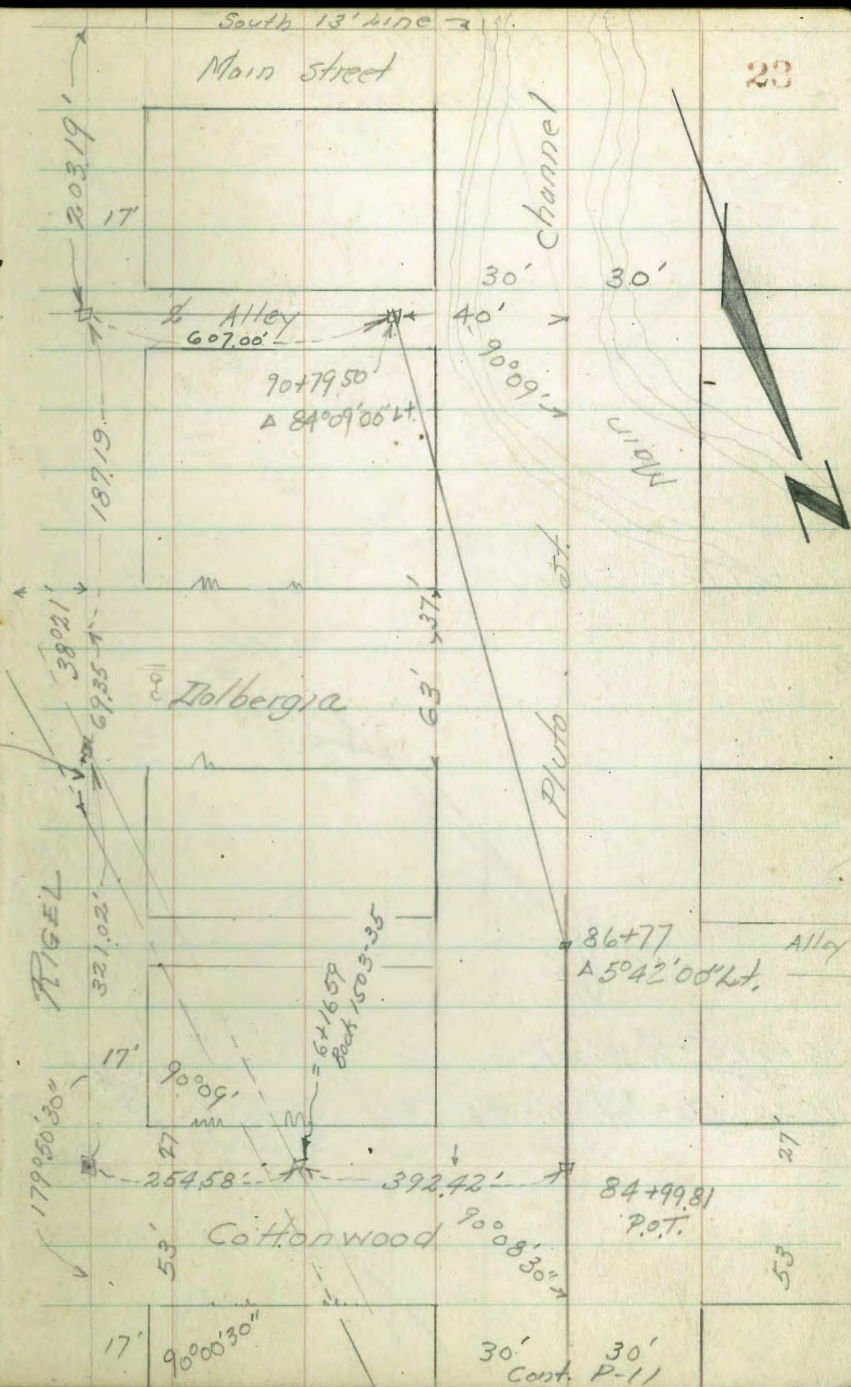
Calc
9.67 by CSK
FB 1503-35

$86+77 = \Delta 5^{\circ}42'00'' \text{ Lt.} = \% \text{ Alley}$

P.O.T.

$84+99.81 = \text{Intersection South 13' line Cottonwood}$

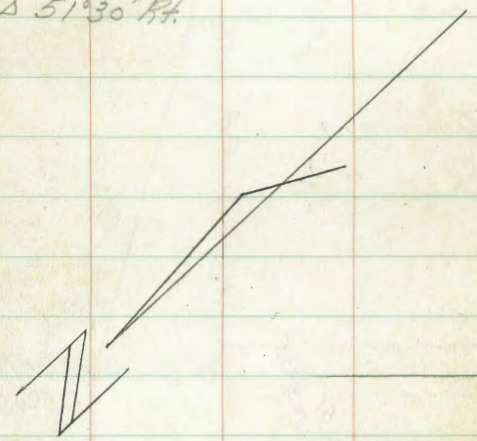
Pueblo
 of proposed sewer
 as shown in Book 1503-35
 1167



Walker
Bliss
Isbel

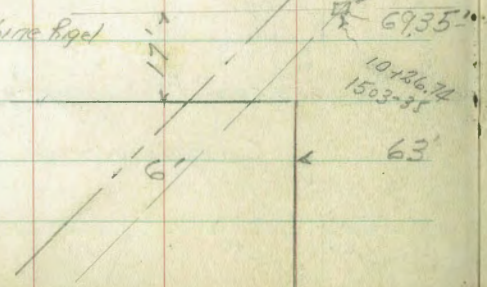
Chollas Valley Sewer Alignment

$98+89.94 = \Delta 51^{\circ}30' \text{ Rt.}$

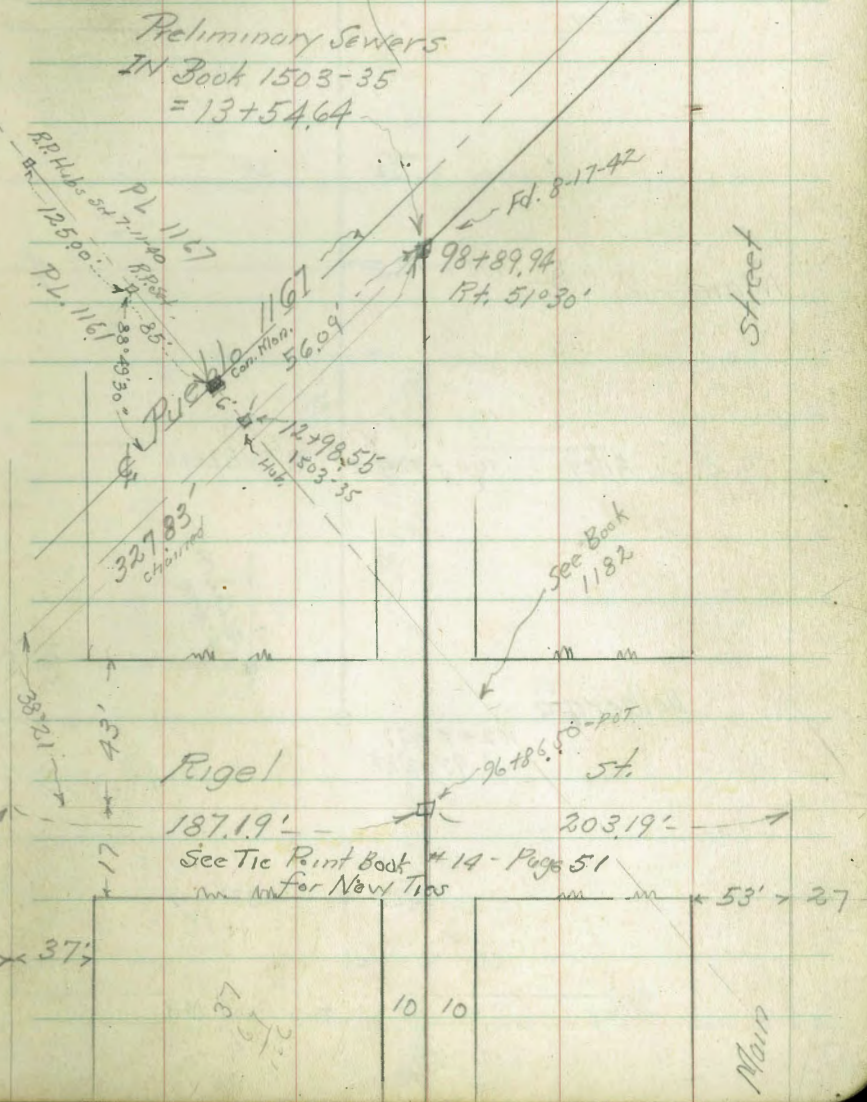


$96+99.5 = \text{Rigel}$
P.O.T.

$96+86.50 = \text{Int. W-13' line Rigel}$



Halberga St
Rigels 1161



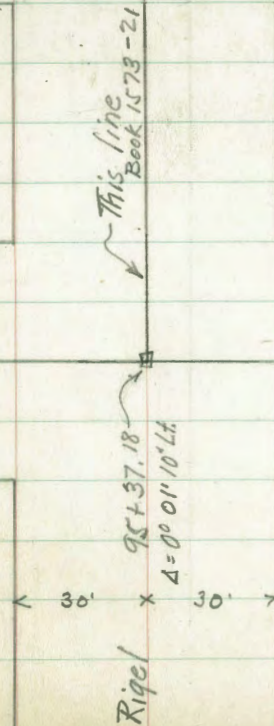
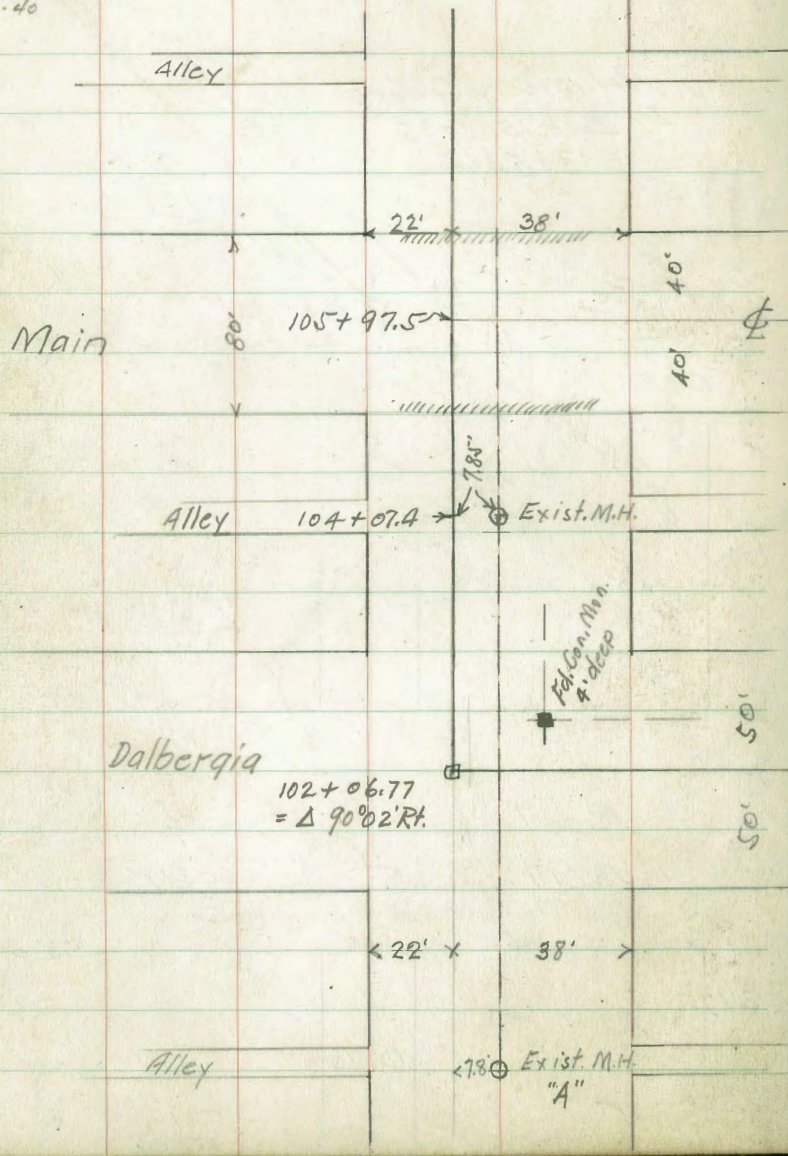
Street

Main

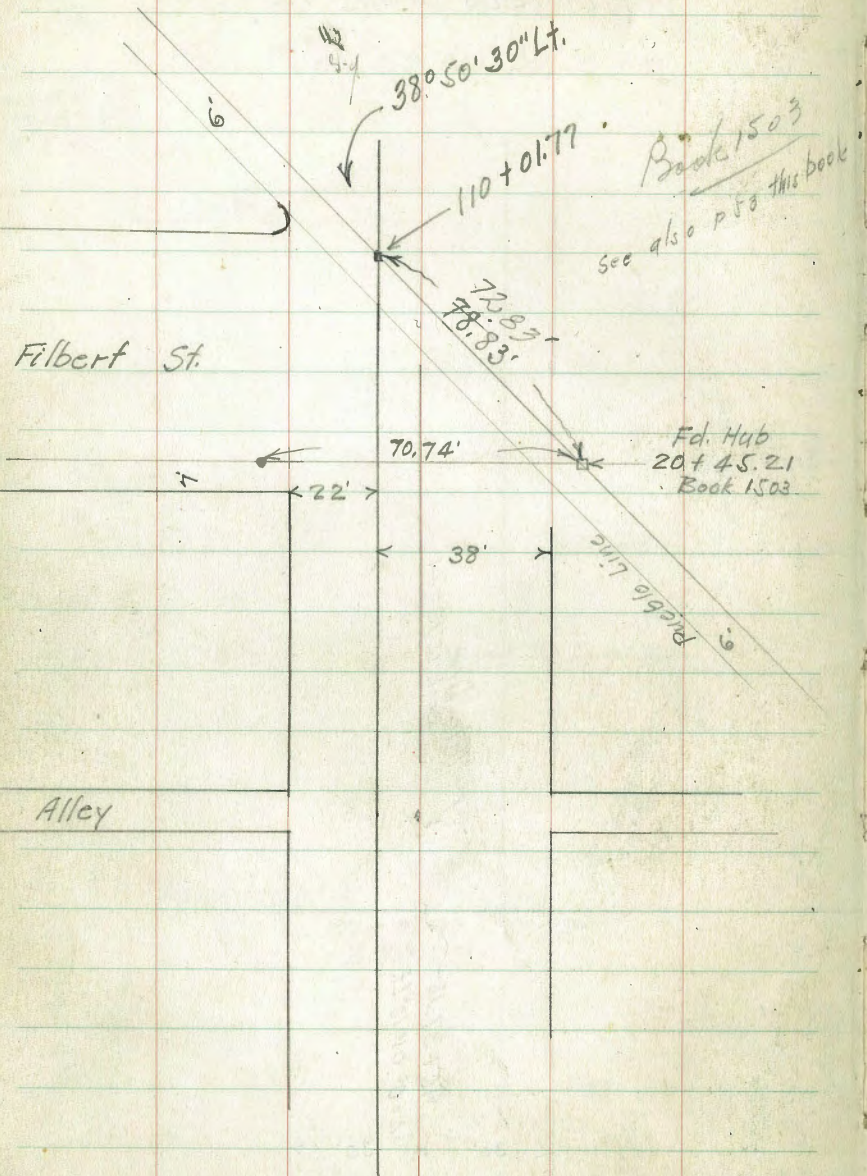
Walker
Bliss
Isbell
1-5-40
Copied from
Book 1569 p70
by G.R.H.
2-3-40

Preliminary Location
Proposed Change in Alignment
From Rigel St And Dalbergia.

FB 1569
(LEVELS Page 72)



Notes copied from Book 1569 page 71
by G.R.H. 2-3-40.



LEVELS For Sewer These notes copied from Book 1569-P 72 G.R.H. 2-3-40

9.74

27

Book 1573 P 19 chk. Hub 12+98.55 1502-	8.25	9.74	1.49	BM on Hub 98+89.94 ^{99.19}
			8.75	0.99
95+90		12.1	-2.4	in ditch
96+00		9.7	0.0	
+20		7.5	2.2	
+50		6.0	3.7	
97+00 on R.R. Fill		3.3	6.4	
20' Rt on Nat. Ground		9.3	0.4	
10' Lt. in Bottom ditch		12.0	-2.3	
97+50 on R.R. Fill		2.7	7.0	
98+00		4.3	5.4	
6' Rt on Nat. Ground		7.5	2.2	
6' Lt. " R.R. Fill		1.7	8.0	
20' Lt. in ditch		11.5	-1.8	
98+15 Nat. Ground		7.0	2.7	
+65 " "		6.9	2.8	
99+00		6.2	3.5	
6' Rt. Nat. Ground		7.2	2.5	
6' Lt. on R.R. Fill		2.6	7.1	
99+50		5.0	4.7	

100+00		5.5	4.2
12' Rt Nat. Ground		7.7	2.0
5' Lt. on R.R. Fill		2.5	7.2
100+50		5.2	4.5
101+00		3.4	6.3
7' Rt Nat. Ground		6.3	3.4
4' Lt. on R.R. Fill		1.8	7.9
101+50		4.2	5.5
102+06.77 = Δ 90°02' Rt		3.6	6.1
3' Lt. on R.R. Fill		2.0	7.5
18' Lt. in ditch		10.3	-0.6
102+10 Nat. Ground		7.0	2.7
+50 " "		7.0	2.7
103+00 " "		6.9	2.8
+50		7.0	2.7
104+00		7.2	2.5
+07.4 = Exist. M.H. 7.8' Rt		9.36	0.38 Rim
" = Flow to East		16.61	-6.87
" = Flow Main Line		17.41	-7.67
Rim M.H. "A"		6.27	3.47
Flow M.H. "A"		16.42	-6.68

9.74 ✓

These notes copied from
 Book 1569 - page 73.
 G.R.H. 2-3-40

25

104+50			7.8	1.9 ✓
105+00			8.3	1.4 ✓
+45			8.2	1.5 ✓
+52			4.6	5.1 ✓
T.P.	0.53	7.31 ✓	2.96	6.78 ✓
105+59.5 = N.L. Main. par.			2.61	4.70 ✓
+69.5 N. Cb. " "			2.77	4.54 ✓
+97.5 = ♀ Main on par.			2.29	5.02 ✓
106+25.5 = S. Cb. " " "			2.56	4.75 ✓
+37.5 = S.L. " " "			2.55	4.76 ✓
107+00			6.3	1.0 ✓
+50			6.8	0.5 ✓
108+00			6.6	0.7 ✓
+50			6.8	0.5 ✓
109+00			7.0	0.3 ✓
+50			6.8	0.5 ✓
110+01.77 = Δ 38°50'30" Lt			6.53	0.78 ✓
Chk. Hub	Book 1503 20+45.21		7.31	0.0 ✓

See Book 1503
 44

Prod. levels

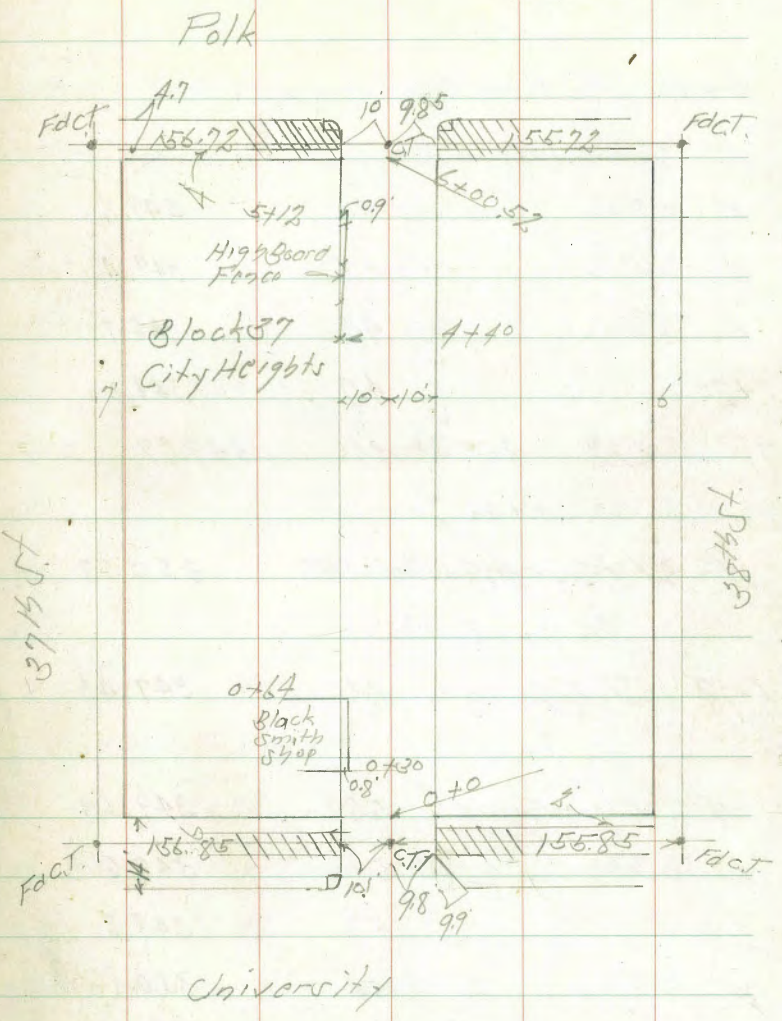
Cross Section Alley Block 37 City Hts.

BM	0.84	352.93	352.09	UNIV 37 1/2
0-14 - H Co University				
W	on Pavng	4.58	348.35	
±	" "	4.78	348.15	
E	" "	5.02	347.91	
0+10 - H Co University				
E	Top Cbt Pavng	4.34	348.59	
±	on "	4.26	348.67	
W	Top Cbt "	3.89	349.04	
0+30				
-4	= Conc Floor Block Smith's Shop So. Entrance	3.35	349.58	
W		3.7	349.2	
±		4.1	348.8	
E		4.2	348.7	
+10		4.3	348.6	
0+55				
-10		4.3	348.6	
E		4.2	348.7	
±		3.9	349.0	
+9.2	= Garage Oil Floor	3.20	349.73	

Red. Plot on profile 2452
 3/27/40 EKH

INDEXED
E.F.B.

March 25-40
Sisson
Hortberg
St Moore 29



3/27/40

3/27/40

352.93

0772

H + 0.8 = 1/2 Ply Post or Pole

1+0

H 3.1 349.8

1/2 3.5 349.4

F 4.2 348.7

+20 4.7 348.2

TP 6.22 355.49 3.66 349.27

1+06

H - 6' = 1/2 Garage Conc Floor 4.92 350.57

1+13

F - 9' = 1/2 Do Garage Conc Floor 6.06 349.43

1+28

-9 = 1/2 Do Garage Conc Floor 5.80 349.69

F 5.9 349.6

1/2 5.7 349.8

H 5.4 350.1

1+39

F - 9.3 = 1/2 Do Garage Dirt Floor 5.8 349.7

30

355.49

1+60

-7 = 1/2 Garage Conc Floor 4.52 350.97

H 4.6 350.9

1/2 5.1 350.4

F 5.0 350.5

+10 5.3 350.2

2+0

-10 4.2 351.3

F 4.2 351.3

1/2 4.1 351.4

H 3.9 351.6

2+09

H + 0.8 = 1/2 Ply Post Pole

2+23

H - 2.5 = 1/2 Garage Conc Floor 3.39 352.10

2+43

-2.5 = 1/2 Garage Dirt Floor 2.9 352.6

H 2.9 352.6

1/2 3.2 352.3

F 3.0 352.5

355.49

3+60

H -3.2 = Garage Conc Floor 1.80 353.69

3+80

- 2.3 353.2

F 2.0 353.5

L 1.9 353.6

H 1.7 353.8

TP 7.34 361.05 1.78 353.71

3+09

-3.1 = Garage Conc Floor 7.03 354.02

H 7.2 353.9

L 7.2 353.9

F 7.0 354.1

+0.2 = Wly Conc Apron 7.04 354.01

+1.2 = Garage Conc Floor 6.95 354.10

3+17

F -0.3 = 2.25' Conc Walk 6.90 354.15

3+46

F 6.2 354.9

L 6.4 354.7

361.05

H 6.3 354.8

+2.8 = Garage Conc Floor 6.18 354.87

3+50

H +0.7 = Wly Porch Pole

3+55

F -0.2 = Garage Wood Floor 6.10 354.95

3+89

H 5.2 355.9

L 5.4 355.7

F 5.4 355.7

+1.6 = 5.2' Conc Slab 5.17 355.88

4+12

-5.4 = Garage Conc Floor 4.82 356.23

F 5.0 356.1

L 5.0 356.1

+9.4 = Wly Porch Pole

H 5.5 355.6

4+43

F -5.3 = Garage Conc Floor 4.10 356.95

361.05

4+58

W	3.2	357.9
L	3.9	357.2
E	3.9	357.2
+5.8 = 1/2 Garage Conc Floor	3.91	357.14

4+79

E-9' = 1/2 Do Garage Conc F	2.75	358.30
-----------------------------	------	--------

4+98

E-9' = 1/2 Do Garage Conc F	2.71	358.34
-----------------------------	------	--------

5+0

E	3.0	358.1.
---	-----	--------

L	3.1	358.0
---	-----	-------

W	3.0	358.1
---	-----	-------

5+12.5

W+1.2 = 1/2 Porter Pole

TP	5.29	363.89	245	358.60
----	------	--------	-----	--------

5+29

W	5.5	358.4
---	-----	-------

L	5.2	358.7
---	-----	-------

E	5.2	358.7
---	-----	-------

363.89

32

+1' = 1/2 Conc Apron	5.02	358.87
----------------------	------	--------

+5' = 1/2 Do Garage Conc Floor	4.85	359.04
--------------------------------	------	--------

5+46.5

E-1' = 1/2 Conc Apron	4.88	359.01
-----------------------	------	--------

E-5' = 1/2 Do Garage Conc Floor	4.79	359.10
---------------------------------	------	--------

5+53

E = 1/2 Do Garage Conc Floor	4.44	359.45
------------------------------	------	--------

5+57

E	4.5	359.4
---	-----	-------

L	4.9	359.0
---	-----	-------

W = 1/2 Conc Apron	4.62	359.27
--------------------	------	--------

+2' = 1/2 Garage Conc Floor	4.41	359.48
-----------------------------	------	--------

5+70

W-0.3 = 1/2 Conc Walk Continued From Garage Apron	4.50	359.39
--	------	--------

5+72

E = 1/2 Do Garage Conc F.	4.47	359.42
---------------------------	------	--------

5+77

E = 1/2 Do Conc Floor	4.60	359.29
-----------------------	------	--------

5+90

W	4.8	359.1
---	-----	-------

363.89

S 5.0 358.9

F 4.7 359.2

6400.52 = SLPolk

I TopCb 5.34 358.55

Gutter on Paving 5.46 358.43

S " " 5.46 358.43

Gutter " " 5.28 358.61

H TopCb 5.12 358.77

6407.56 Polk

H on Paving 5.65 358.24

S " " 5.71 358.18

F " " 5.78 358.11

TP 0.48 353.58 10.79 353.10

BM 1.50 352.08

NXXBP

01144076

353.09

Cross Section 1/4 St
Bancroft to 33rd St

80' wide
20' Cb
10' 1/4 NEBP

BM 5.06 290.00 286.97 1/4 x Bancroft

H	3.5	286.5
Cb	5.0	285.0
d	6.4	283.6
Cb	8.3	281.7
S	10.7	279.3

1/4 Cb Bancroft

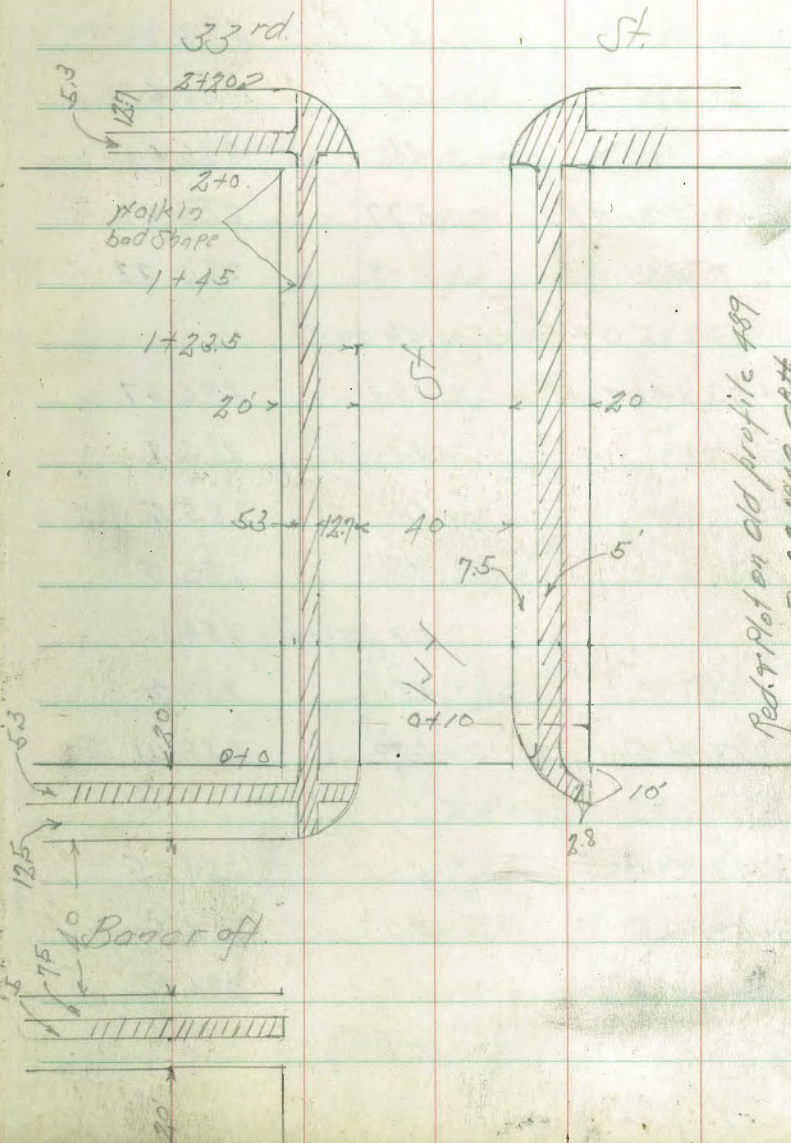
S	9.0	283.0
Cb	6.4	283.6
d	6.1	283.9
Cb	4.9	285.1
H. Top Cb	3.52	286.48
H Gutter on Paving	4.10	285.90

d Bancroft

H on Paving	3.38	286.62
Cb	4.5	285.5
d	5.6	284.4
Cb	6.2	283.8
S	6.7	283.3

INDEXED
EPB

March 26-40
Sisson
Hartberg
14 Moor. 34



290.00

F Cb of Bancroft.

S	7.0	283.0
Cb	6.1	283.9
£	5.4	284.6
Cb	4.6	285.4
H on Paving	3.77	286.23
H Top Cb	3.07	286.93

0 = 10 = End Cb on S.

H + 17.3 = Cb Top	3.73	286.27
Gutter	4.3	285.7
Cb	4.5	285.5
£	5.0	285.0
Cb	5.9	284.1
S	6.8	283.2
S Top Cb End	6.29	283.71 ✓

0 + 0 = E.L.

S + 17.3 = Cb Top	5.35	284.65
Gutter	5.7	284.3
Cb	5.8	284.2
1/4	5.3	284.7

290.00

35

£	4.8	285.2	^{2.07} 17.2
1/4	4.5	285.5	
Gutter	4.3	285.7	
H Cb Top	3.68	286.32 ✓	

0 + 10 = Cb E.C. on S

H Cb Top	3.59	286.41 ✓
Gutter	4.3	285.7
1/4	4.3	285.7
£	4.8	285.2
1/4	5.1	284.9
Gutter	5.8	284.2
S Cb Top	5.05	284.95

0 + 50

S Cb Top	4.85	285.15
Gutter	5.3	284.7
1/4	4.9	285.1
£	4.4	285.6
1/4	3.8	286.2
Gutter	4.0	286.0
H Cb Top	3.43	286.57 ✓

290.00

0+75

Hcb Gutter 10 Drive ✓ 4.41 285.59 ✓

1/4 4.0 286.0

1/2 4.3 285.7

1/4 4.9 285.1

Gutter 5.3 284.8

Scb Top 4.78 285.22

1+0

Scb Top 4.89 285.13

Gutter 5.4 284.6

1/4 5.0 285.0

1/2 4.4 285.6

1/4 4.1 285.9

Gutter 4.6 285.4

Hcb Top 4.10 285.90 ✓

1+23.5

Hcb Top: End 4.97 285.03 ✓

G 5.2 284.7

1/4 5.0 285.0

1/2 5.3 284.8

36

290.00

1/4 5.7 284.3

Gutter 6.4 283.6

Scb Top 5.56 284.44

1+50

Scb Top 7.03 282.97

G 7.9 282.1

1/4 7.4 282.6

1/2 7.0 283.0

1/4 6.8 283.2

Gutter 6.7 283.3

Hcb 6.1 283.9 ✓

1+75

Hcb 8.6 281.4 ✓

Gutter 9.1 280.9

1/4 9.2 280.8

1/2 9.4 280.6

1/4 9.6 280.4

Gutter 10.1 279.9

Scb Top 9.4 280.6

TP 1.98 281.14 10.78 279.23

281.14

2+0 = H.C. 33rd St.

S.Cb Top	3.15	277.99
Gutter on Paving	3.93	277.21
1/4 " "	3.47	277.67
1/2 " "	3.21	277.93 ✓
1/4 " "	3.31	277.83
Gutter " "	3.42	277.72
H.Cb Top	2.77	278.37 ✓

2+20 = H.Cb 33rd St.

H Top Cb	4.67	276.47
Gutter on Paving	5.37	275.77
Cb " "	5.01	276.13
1/4 " "	4.90	276.24
1/2 " "	4.96	276.18
1/4 " "	5.13	276.01
Cb " "	5.35	275.79
S Gutter " "	5.88	275.26
S Top Cb	5.17	275.97

BM

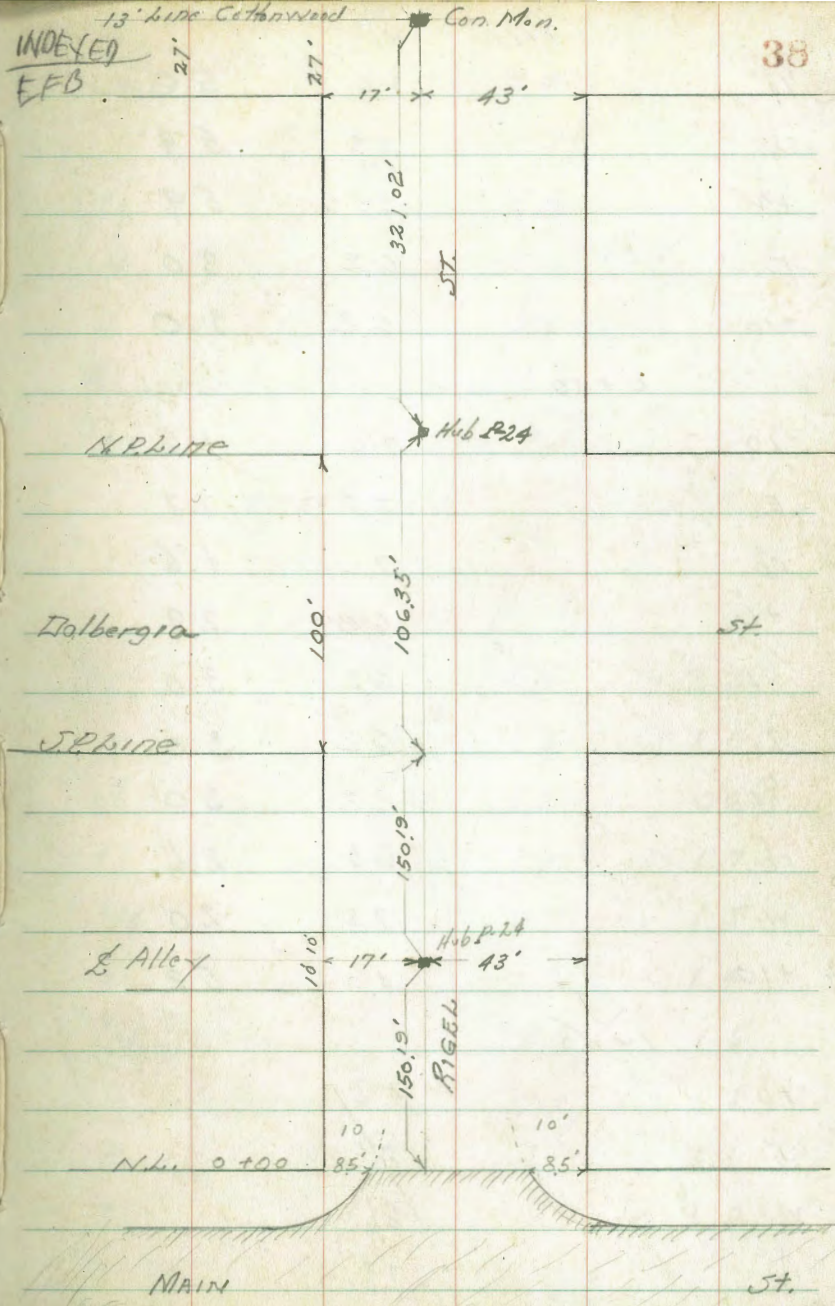
SERP
out 1st + 33rd St
278.61

37

Walter Bliss Isbell
 3-28-40
 CROSS SECTION RIGEL ST.
 From Main St. North
 To Cottonwood St.
 60' wide
 10' cbs.
 10' 1/4's

	8.07	9.16	1.09	B.M. on Hub. 2' alley 96+86.50 P.19
cb. Hub 12+98.55 Bvd. NO. 2-41	8.20	0.96		P.19 thru book
N line Main St. = 0+00				
E	2.8	6.4		
East line				
+8.5' = E top cb.	2.69	6.47		
Gut. on Boxing	3.33	5.83		
1/4 " "	3.03	6.13		
1/2 " "	3.16	6.00		
1/4 " "	3.28	5.88		
W cb + 1.5 = W Gut. on Box. at cb.	3.33	5.83		
" " on cb Return	2.68	6.48		
W	5.1	4.1		
0+08				
W-5	7.2	2.0		
W	7.2	2.0		
cb	4.9	4.3		
+3	7.6	5.6		
1/4	3.7	5.5		
1/2	3.6	5.6		

Red + Plot. on old profile # 773
 3/28/1940 G.B.H.



9.16

1/4	3.6	5.6
cb.	3.3	5.9
+2	3.3	5.9
E	6.2	3.0
+10	6.2	3.0
0+50		
-10	7.6	1.6
E	7.5	1.7
cb.	7.6	1.6
+6	6.3	2.9
1/4	6.2	3.0
2	6.2	3.0
1/4	6.2	3.0
cb.	6.6	2.6
W	7.2	2.0
+10	4.0	5.2
1+50		
-10	5.6	
-5	8.1	
W	8.6	
cb.	7.8	

9.16

39

+2	7.4	
1/4	7.7	
2	7.8	
1/4	7.6	
6	7.6	
E	7.1	
+10	7.4	
+50		
-70		
1+00		
-5	5.8	3.4
W	8.2	1.0
cb.	8.6	0.6
+7	7.5	1.7
1/4	7.7	1.5
2	7.8	1.4
1/4	7.6	1.6
cb.	7.7	1.5
E	7.1	2.1
+10	7.3	1.9

1250

-10	7.4	1.8
E	7.9	1.3
cb.	8.0	1.2
1/4	8.0	1.2
1/2	8.0	1.2
1/4	7.4	1.8
+5	8.3	0.9
cb.	8.4	0.8
+5	8.5	0.7
W	7.5	1.7
+10	7.2	2.0

2+00

-10	7.7	1.5
W	7.6	1.6
cb.	8.9	0.3
+7	8.9	0.3
1/4	8.1	1.1
+5	7.8	1.4
1/2	8.2	1.0
1/4	8.2	1.0

cb.	8.2	1.0
+5	8.4	0.8
E	8.0	1.2
+10	7.5	1.7

2+50

-10	7.7	1.5
E	7.5	1.7
cb.	8.5	0.7
1/4	8.4	0.8
1/2	8.3	0.9
+7	7.7	1.5
1/4	8.2	1.0
+3	8.9	0.3
cb.	8.9	0.3
W	8.1	0.5
+10	7.7	1.5

3+00.38 = Stone Wallburg

2+90

-10	7.7	1.5
W	8.9	0.3
cb.	8.1	0.5

1/4	8.6	0.6
+5	8.2	1.0
L	8.6	0.6
1/4	8.8	0.4
+7	8.7	0.5
cb.	8.2	1.0
E	7.3	1.9
+10	7.5	1.7
	3+00 38 = S Line Dalbergia	100' wide 16' cbs 17' 1/2"
-15	7.5	1.7
E	7.2	2.0
cb.	7.9	1.3
+4	8.9	0.3
1/4	9.0	-0.2
L	8.8	0.4
+7	7.6	1.6
1/4	7.6	1.6
cb.	7.3	1.9
W	7.3	1.9
+15	6.7	2.5

South cb.

-20	10.2	-1.0
-10	7.5	1.7
W	6.8	2.4
cb.	6.8	2.4
1/4	6.7	2.5
+5	7.2	2.0
L	9.4	-0.2
1/4	9.5	-0.3
+5	9.3	-0.1
cb.	8.1	1.1
+6	5.0	4.2
E	6.0	3.2
+15	6.7	2.5
	5 cb. +12'	
-15	4.6	4.6
E	1.0	8.2
cb.	7.8	1.4
+5	10.2	-1.0
1/4	10.3	-1.1
L	10.3	-1.1
+7	10.2	-1.0

on fill

+7		7.2	2.0
1/4		7.0	2.2
cb.		9.7	-0.5
W in channel		11.8	-2.6
+20 " "		11.9	-2.7

South 1/4

-35 = NLY Bank channel		9.0	0.2
-28 = " edge "		11.6	-2.4
W in "		12.0	-2.8
cb. " "		11.5	-2.3
1/4 " "		11.2	-2.0
1/2 = SLY edge "		10.7	-1.5
1/4		10.7	-1.5
+5		10.6	-1.4
cb.		8.8	0.4
E on Fill		3.4	5.8
+15 " "		3.0	6.2

South 1/4 +10'

E-20		9.1	0.1
E = SLY edge channel		10.9	-1.7
cb.		11.7	-2.0

1/4 in channel		11.3	-2.1
1/2 " "		11.3	-2.1
1/4 " "		11.6	-2.4
cb. " "		12.1	-3.1
W " "		12.2	-3.0
+10 = NLY edge channel		10.7	-1.5
+15 = NLY Bank "		8.6	0.6

E Halbergia

-15		8.3	0.9
-3 = NLY Bank channel		8.0	1.2
W		9.0	0.2
cb.		11.2	-2.0
+5 = NLY edge channel		11.8	-2.6
1/4 in channel		11.6	-2.4
1/2 " "		11.4	-2.2
1/4 " "		11.3	-2.1
cb. " "		11.4	-2.2
E " "		11.4	-2.2
+20 " "		11.4	-2.2
1/2 +6			
-20		11.4	-2.2

916

E in channel	11.4	-2.2
cb " "	11.3	-2.1
1/4 " "	11.1	-1.9
1/2 " "	11.0	-1.8
+7 = NLY Edge channel	11.3	-2.1
1/4	9.2	0.0
+7 = " Bank "	8.4	0.8
cb	6.8	2.4
W	8.1	1.1
+15	8.0	1.2
N 1/4		
-15	7.6	1.6
W	7.9	1.3
cb	7.4	1.8
1/4	8.7	0.5
+4	10.4	-1.2
1/2	10.6	-1.4
1/4	10.8	-1.6
+6	10.7	-1.5
cb	9.0	0.2
+4 = NLY Bank channel	7.9	1.3

916

6	9.3	-0.1	43
+10 NLY edge channel	11.3	-2.1	
+20 in channel	11.4	-2.2	
N cb			
-15	6.7	2.5	
E	7.0	2.2	
+6	6.4	2.8	
cb	8.1	1.1	
+5	9.5	-0.3	
1/4	9.9	-0.7	
1/2	9.6	-0.4	
1/4	9.2	0.0	
+5	7.4	1.8	
cb	7.6	1.6	
W	7.7	1.5	
+15	7.0	2.2	
N cb + 5'			
-15	7.0	2.2	
W	7.6	1.6	
cb	7.4	1.8	
+5	7.5	1.7	

916

1/4	89	03
1/2	94	-02
1/4	97	-05
+5	94	-02
cb.	95	07
E	82	10
+15	82	10

NLY line Dalbergia = 0+00

-15	78	14
E	75	17
cb.	75	17
+6	83	09
1/4	93	-01
1/2	90	02
1/4	86	06
1/8	76	16
cb.	74	16
W	72	20
+15	73	19

0+50

-10	64	28
-----	----	----

916

41

W	64	28
cb.	65	27
1/4	68	24
1/2	71	21
1/2	73	19
cb.	75	17
E	76	16
+10	73	19

1+00

-10	45	47
E	46	46
cb.	54	38
+7	50	42
1/2	55	37
1/2	52	40
1/2	55	37
cb.	52	40
W	51	41
+10	52	40

1+50

-10	36	56
W	36	56

cb.		3.5	5.7
1/4		3.6	5.6
d.		3.3	5.9
1/4		3.6	5.6
+ 2		3.6	5.6
+ 3		2.9	6.3
cb.		2.3	6.9
E		1.4	7.8
TP	8.37	15.48	20.5
	2+00		7.11
E		4.5	11.0
cb.		5.7	9.8
+7		6.4	9.1
+8		7.6	7.9
1/4		7.6	7.9
d.		7.2	8.3
1/4		7.8	7.7
cb.		8.0	7.5
W		8.3	7.2
+10		8.5	7.0

2+50

-5		5.6	9.9
W		4.9	10.6
cb.		4.5	11.0
+5		4.5	11.0
1/4		5.4	10.1
d.		4.7	10.8
1/4		4.7	10.8
+2		4.7	10.8
+5		3.0	12.5
cb.		2.4	13.1
E		2.0	13.5
	3+00.38 = S.W. Cottonwood.		
E		0.2	15.3
cb.		0.4	15.1
+5		0.7	14.8
+8		2.2	13.3
1/4		2.2	13.3
d.		2.0	13.5
1/4		2.3	13.2
+W		1.9	13.6
cb.		1.9	13.6

W	22	13.3
+10	31	12.4
chk. 13' Man Rigol + Cottonwood	0.74	14.74
chk. starting B.M.	14.91	1.07

~~1.09~~
0.02 Error

Walker - Record. Check Levels Cholla Valley Sewer

Bliss - Rod	on Construction Stakes	15+11.88	30.97
Isbell - X	OS Per. Grade Book 192-47-48	15+11.88	30.97
4-30-40		15+11.88	30.97
6.10		15+11.88	30.97
6.09	37.08	15+11.88	30.97
15+11.88	15' ⁴ / ₄ on Par. stake	4.32	32.76
+50	6' RT " " "	5.54	31.54
16+00	6' RT	4.79	32.29
+50	6" "	5.17	31.91
17+00	" "	6.39	30.69
+50	" "	7.25	29.83
18+00	6' Lt	8.35	28.73
	MH#5		
+46.17	on Rim 88' RT	6.10	30.98
18+46.17	on Rim S. edge	6.09	30.99
19+00	6' Lt. on stake	7.22	29.86
+50	" " " "	6.90	30.18
20+00	6' Lt.	6.52	30.56
T.P	394 33.89	7.13	29.95
20+50	6' Lt.	4.71	29.18
21+00	6' RT	3.40	30.49
+50	6" "	4.41	29.48
	MH#6		
+72.54	6.7' RT on Rim	2.82	31.07
"	on Rim S. edge	2.86	31.03

22+00	6' RT	4.84	29.05
+50	6" "	5.96	27.93
23+00	6" "	8.12	25.77
+50	6" "	9.20	24.69
24+00	" "	8.68	25.21
+50	" "	8.53	25.36
+70.54	MH#8 10' Lt.	9.14	24.75
T.P	541 30.16	9.14	24.75
25+00	7' RT on sill	1.37	28.79
+42.75	MH#8 10' RT	4.88	25.28
+93.62	6' RT	6.19	28.97
26+43.62	6' RT	5.03	25.13
+93.62	" "	5.31	24.85
27+43.62	" "	5.84	24.32
+93.62	" "	5.79	24.37
28+43.62	7" "	6.81	23.35
29+06.92	equation 10' RT	7.63	22.53
=29+13.3	497		
M.H.#9	T.P. 27.36	7.77	22.39
29+50	6' RT	4.96	22.40
30+00	6' RT	5.76	21.60

on stake
MH.

2736

30+50 6' Rt. 5.17 22.19

31+00 6' Lt. 8.39 18.97

+50 6' Rt. 8.00 19.36

32+00 6' Rt. 8.58 18.78

TP 3.41 22.19 8.58 18.78

+50 6' Lt. 4.14 18.05

+88.35 = MH #9 ¹⁰ 10' Lt. 3.92 18.27

33+50 2.72 19.47

34+00 2.12 20.07

Walker
#155
10/21/11

5-21-40 Grade changed between MH #4 and #9

in Grade Book 192 New stakes
set 8' Rt. of L.

Hence new check levels

3.65 34.62

30.97

E. 2 stakes
15+1188
p-47

15+11.88 = MH #4 1.85 32.77

+50 2.97 31.65

16+00 2.43 32.19

+50 2.83 31.79

17+00 3.68 30.94

+50 4.36 30.26

3462

48

18+00 6.38 28.24

+46.17 = MH #5 3.64 30.98

19+00 6.07 28.55

+50 4.99 29.63

20+00 4.54 30.08

+50 4.23 30.39

TP 2.97 33.36 4.23 30.39

21+00 2.98 30.38

+50 3.48 29.88

2.27 31.09 Ritt East MH

+72.54 = MH #6 3.84 29.52

22+00 4.48 28.88

+50 5.89 27.47

23+00 7.61 25.75

+50 8.31 25.05

24+00 8.34 25.02

+50 7.40 25.96

+70.54 = MH #7 8.32 25.04

25+00 4.62 28.74

(24+70.54) MH #7 3.80 29.56

~ CHECK LEVELS ~
 Cholla Valley JEWEL
 From Federal Blvd to MH #4

49

Grades, Book 192-55

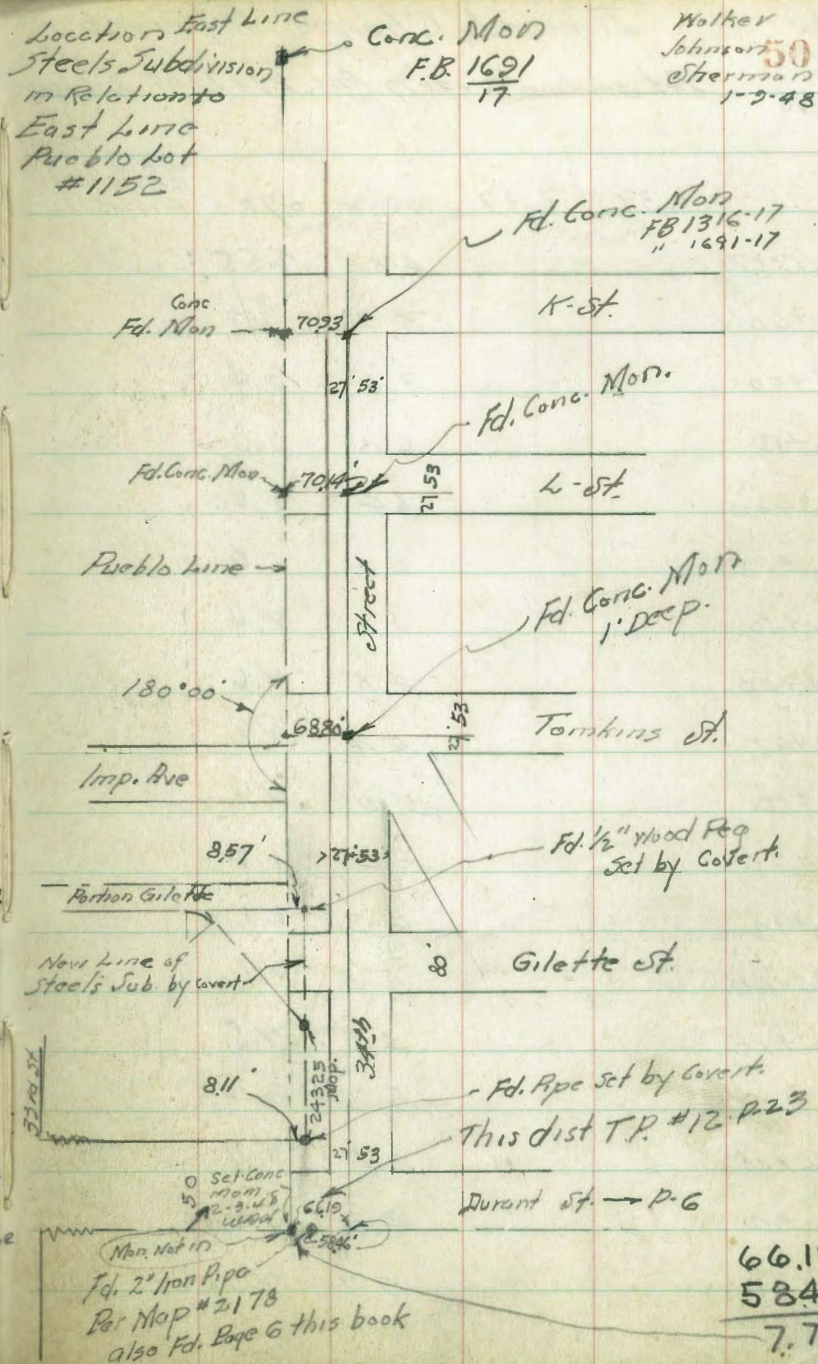
	1.16	53.03	51.87	N.W.B.P. 35+0 + Federal
0+00 on Rim MH			1.08	51.95
0+00 on cut			1.28	51.75
+50			3.59	49.44
1+00			5.30	47.73
+50			5.32	47.71
1+95			6.05	46.98
2+50			6.86	46.17
TP	4.19	50.36	6.86	46.17
3+00			4.38	45.98
+50			4.42	45.94
4			6.59	43.77
+50			8.56	41.80
+90			8.64	41.72
M.H. #1			12.10	38.26
TP	6.13	40.52	7.97	42.39
6+00			10.70	37.82
+50			8.74	39.78
7+00			8.46	40.06

Check Levels
Cont from p. 49
48.52

7+50		9.25	39.27
M.H. #2			
8+04.5		12.08	36.44
8+50		8.42	40.10
TP	8.11	45.34	11.29 37.23
9+00		6.45	38.89
+50		8.11	37.23
10+00		11.57	33.77
+50		11.17	34.17
11+00		9.74	35.60
+50		12.48	32.86
TP	3.73	36.59	12.48 32.86
12+15.38	} MH # 3		
= 12+18.2		3.41	33.18
12+50		4.66	31.93
13+00		4.62	31.97
+50		4.03	32.56
			32.00
13+90		4.59	36.00
14+50		3.61	32.98
15+11.88 = MH #4		5.59	31.00
		3.79	32.80

Fd 2" Iron Pipe
Per Map
2178

Location East Line
Steels Subdivision
in Relation to
East Line
Pueblo Lot
#1152

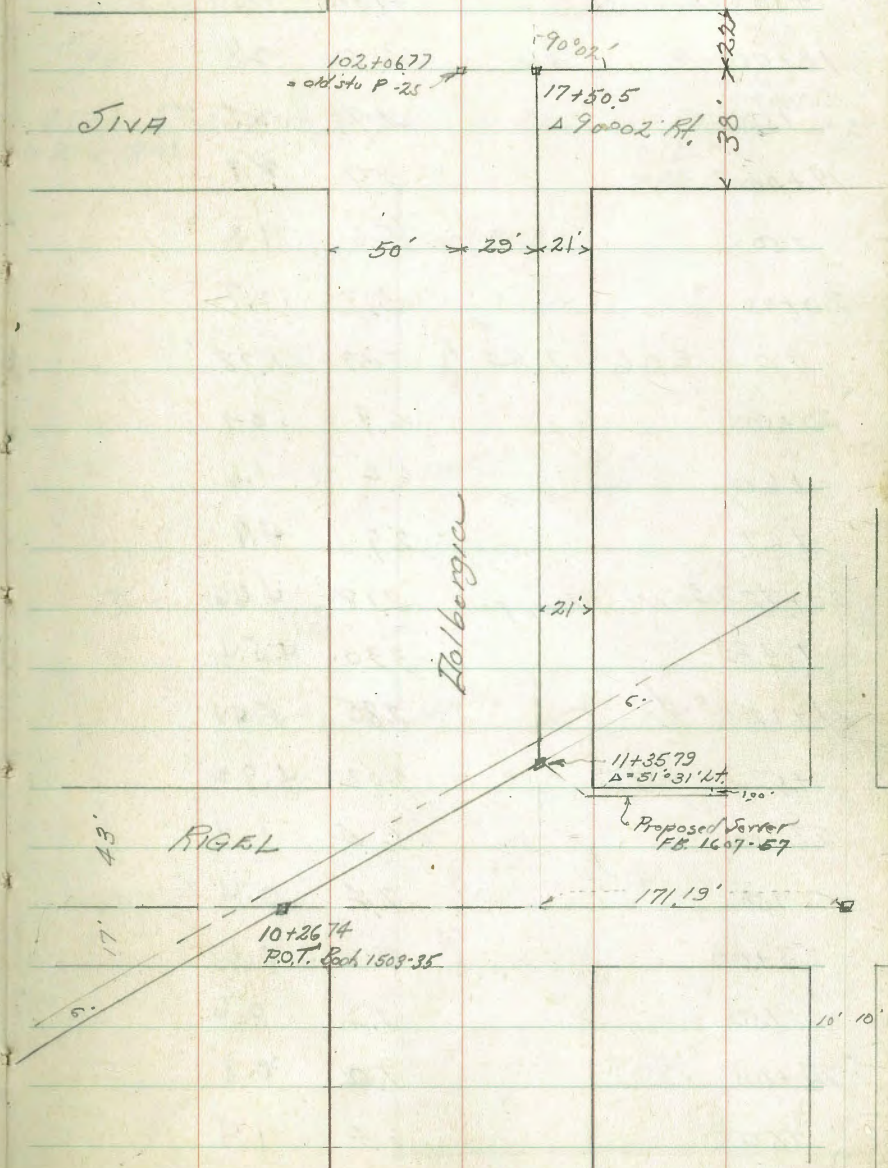


Proposed Change Alignment

Walker
Bliss
Isbell
7-12-40

bet station 11+35.79 and 21+18.09 Book 1503 -35-36

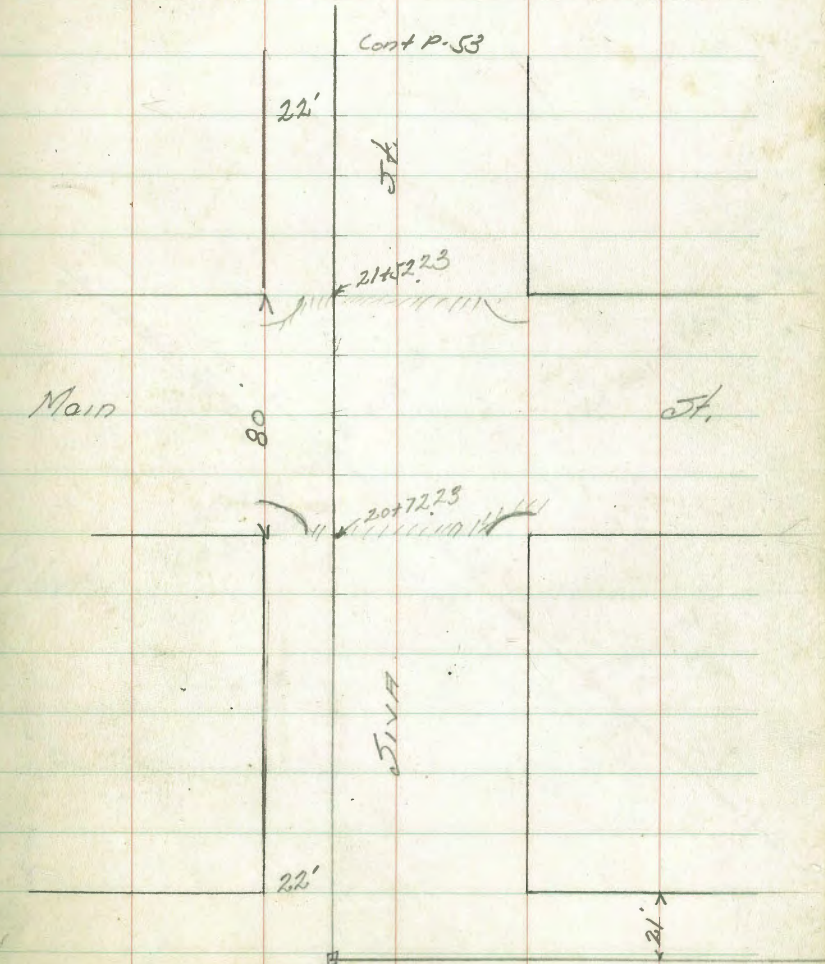
	6.39	7.37	0.98	on Hub 12+98.55 - 1553 P-19 - this book
11+35.79		4.82	2.55	in'
+60		5.7	1.7	
12+00		7.0	0.4	
+50		6.8	0.6	
13+00		6.4	1.0	
+25		6.4	1.0	
+50		5.0	2.4	
14+00		4.8	2.6	
+15		5.4	2.0	
+50		5.0	2.4	
+75		6.2	1.2	
+90		6.3	1.1	
15+00		5.3	2.1	
+10		4.9	2.5	
+50		5.2	2.2	
16+00		4.7	4.7	
+50		4.3	3.1	
+75		5.1	2.3	



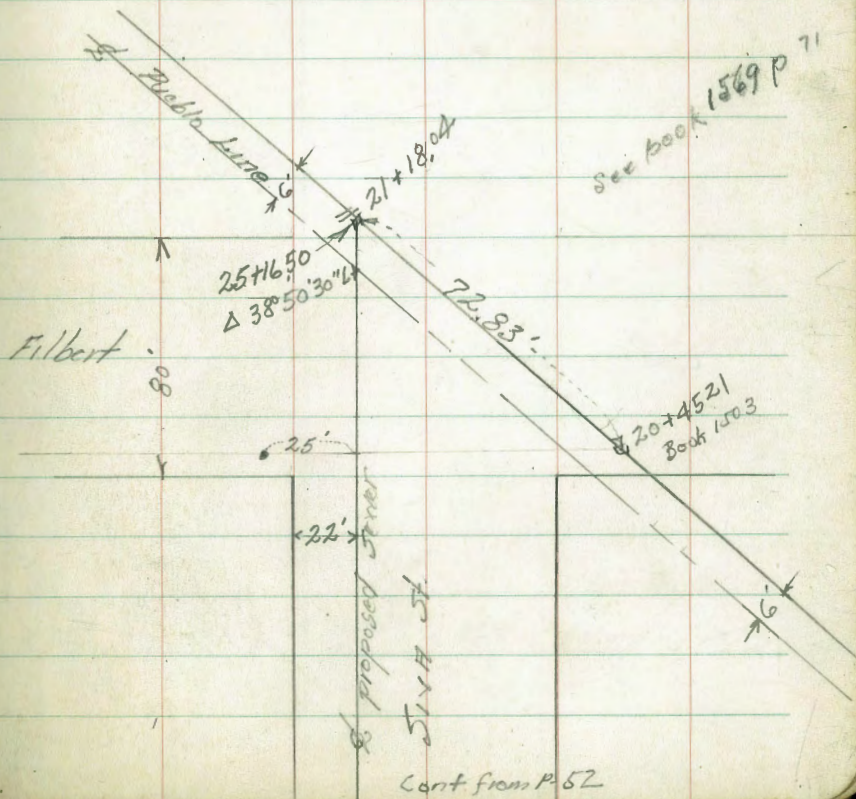
17+00	4.6	2.8
+50.5 ^{90°02'14"} = Δ 00 stub	4.80	2.57
18+00	4.6	2.8
+50	4.9	2.5
19+00	4.7	2.7
+50	5.6	1.8
20+00	5.7	1.7
TP 6.06 7.84	5.59	1.78
20+50	6.9	0.9
+60	6.2	1.6
+67	2.9	4.9
20+72.23 = Nk. Main par	3.18	4.66
+84.29	3.90	4.54
21+12.23 = 1/2 " "	2.80	5.04
+52.23 = 5/8 " "	3.02	4.82
22+00	6.4	1.4
+50	7.4	0.4
23+00	7.2	0.6
+50	7.2	0.6
24+00	7.0	0.8
+50	6.4	1.4

24+67	7.0	0.1
+90	6.5	1.3
+95	6.4	1.4
25+16.50 = Δ 38°50'30" Lt = 21+18.04	7.04	0.80
		0.78 = 0.02 Error

ch Hub
110 + 0177
Book 1169-73



Dolbergia

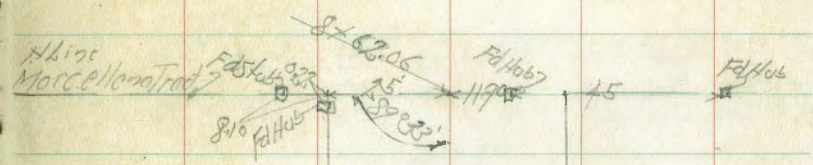


Cross Section 55th St.
Mission Valley Road to Myline
Marcellena Tract

INDEXED
E.F.B.

Hug 6-40
S 1880
North 6th 54
N Moore

See Book 1498-25



Marcellena
Tract

Lot 8

Lot 9

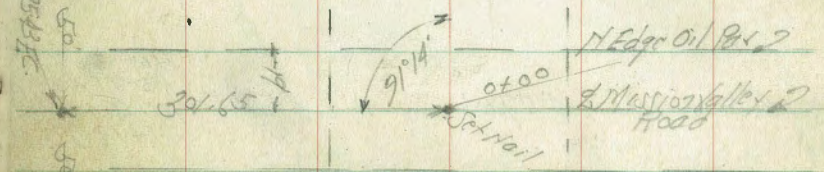
Old Hub
Out

Lot 7

Lot 10

55th St

R.P.
F 2
R 2
S 1880
H.C.



Hub out
Lot 11

75

F 4667 Stake
Lot 11 + 12

55th St 5-578 45760

Cross Section 55127
Mission Valley Road to Hwy Line
Marcelleno Tract

St. N S Pt. E

0+50

457.8	457.2	456.1	455.9	456.8	453.7	453.9	454.5	457.8	456.1
4.6	5.2	6.0	6.5	5.6	8.7	8.5	7.9	5.1	6.3
40'	30'	20'	5'		4'	20'	20'	35'	40'

452.37

TP 7.41 462.37 2.67 454.96

0+39

457.2	456.5	456.4	452.8	452.6	452.9	453.3	456.1
0.9	1.1	1.2	4.8	5.0	4.7	4.3	1.5
40'	20'	5'		5'	30'	38'	40'

0+24 = Top Cut

456.1	457.0	452.6	456.1	451.7	452.2	452.9	456.0
1.5	0.6	7.0	6.5	5.7	5.4	4.7	1.6
40'	15'	12'		20'	40'	42'	50'

0+19 = Nly Edge of Pavement

446.13	448.45	449.73	450.76	451.63	452.18	453.09
11.50	9.18	7.90	6.87	6.00	5.45	4.54
75 on Pav	40 on Pav	20 on Pav	20 on Pav	20 on Pav	40 on Pav	75 on Pav

0+0 = Mission Valley Road

446.59	448.72	449.83	450.84	451.74	452.65	453.84
11.04	8.91	7.80	6.79	5.84	4.98	3.70
75 on Pav	40 on Pav	20 on Pav	20 on Pav	20 on Pav	40 on Pav	75 on Pav

457.63

B.M. 5 5.98 457.63

451.65

Hub 50' Pt
6549543
Mission Valley Tract
1498-74

Notes Reduced & Profile made 8/7/40 C.B.H.
X X See Plot.

50' ST
80'

1+10

1+75

1+50

1+25

1+0

0+75

46237

H Z Rk

$\frac{453.8}{8.6}$	$\frac{453.8}{8.6}$	$\frac{455.8}{6.9}$	$\frac{455.2}{7.3}$	$\frac{455.6}{6.8}$	$\frac{455.0}{7.4}$	$\frac{454.8}{7.6}$	$\frac{453.9}{8.5}$	$\frac{453.4}{9.0}$
40'	30'	20'	5'		20'	29'	31'	40'

$\frac{454.0}{8.4}$	$\frac{453.9}{8.5}$	$\frac{454.1}{8.3}$	$\frac{455.7}{6.7}$	$\frac{456.0}{6.4}$	$\frac{455.6}{6.8}$	$\frac{455.4}{7.0}$	$\frac{454.4}{8.0}$
40'	20'	20'		2'	20'	28'	40'

$\frac{456.1}{6.3}$	$\frac{456.5}{5.9}$	$\frac{454.7}{7.7}$	$\frac{455.5}{6.9}$	$\frac{456.4}{6.0}$	$\frac{456.2}{6.2}$	$\frac{456.2}{6.2}$	$\frac{454.7}{7.7}$	$\frac{454.5}{7.9}$
40'	36'	15'	5'		20'	31'	34'	40'

$\frac{454.5}{7.9}$	$\frac{454.6}{7.8}$	$\frac{454.8}{7.6}$	$\frac{456.3}{6.1}$	$\frac{456.6}{5.8}$	$\frac{456.2}{6.2}$	$\frac{455.3}{7.1}$	$\frac{455.2}{7.2}$
40'	20'	5'		20'	31'	34'	40'

$\frac{455.2}{7.2}$	$\frac{456.1}{6.3}$	$\frac{456.6}{5.8}$	$\frac{455.9}{6.5}$	$\frac{456.4}{6.0}$	$\frac{456.4}{6.0}$	$\frac{456.5}{5.9}$
40'	30'	15'		20'	30'	40'

$\frac{465.0}{7.4}$	$\frac{455.5}{6.9}$	$\frac{456.3}{6.1}$	$\frac{456.3}{6.1}$	$\frac{457.1}{5.3}$	$\frac{455.2}{7.2}$	$\frac{455.7}{6.7}$	$\frac{456.2}{6.2}$	$\frac{456.8}{5.6}$	$\frac{455.7}{6.1}$
40'	20'	10'		8'	15'	25'	31'	32'	40'

46237

4+50

4+0

TP 0.89 452.19 11.07 451.30

3+50

3+0

2+50

2+25

462.37

A7

Z

R7

<u>446.2</u>	<u>446.4</u>	<u>446.4</u>	<u>447.2</u>	<u>447.3</u>	<u>447.3</u>	<u>449.2</u>	<u>447.0</u>	<u>446.7</u>	<u>446.5</u>
6.0	5.8	5.8	5.0	3.9	2.9	13.0	5.3	5.5	5.7
50	40	15	8	3	2.9	25	29	40	50

<u>448.2</u>	<u>447.7</u>	<u>448.0</u>	<u>448.3</u>	<u>450.8</u>	<u>450.8</u>	<u>450.3</u>	<u>450.3</u>	<u>447.9</u>	<u>447.1</u>	<u>447.7</u>
4.0	4.5	4.3	3.4	1.4	1.4	1.9	1.9	4.3	5.1	4.5
40	20	13	7	3	3	20	24	29	40	50

452.19

<u>449.5</u>	<u>450.4</u>	<u>450.4</u>	<u>449.6</u>	<u>451.8</u>	<u>451.8</u>	<u>451.6</u>	<u>451.5</u>	<u>450.0</u>	<u>448.9</u>	<u>448.6</u>
12.9	12.0	12.0	12.8	10.6	10.6	10.8	10.9	12.4	10.5	12.8
40	30	30	10	2	10.6	20	26	30	40	50

<u>451.7</u>	<u>451.9</u>	<u>450.9</u>	<u>453.4</u>	<u>453.2</u>	<u>452.8</u>	<u>452.8</u>	<u>450.9</u>	<u>451.0</u>
10.7	10.5	11.5	9.0	9.2	9.6	9.6	11.5	11.4
40	30	10	3	9.2	20	28	35	40

<u>452.5</u>	<u>452.1</u>	<u>452.6</u>	<u>454.2</u>	<u>454.6</u>	<u>454.1</u>	<u>454.0</u>	<u>452.7</u>	<u>452.7</u>
9.9	10.3	9.8	8.2	7.8	8.5	8.4	9.7	9.7
40	33	17	5	7.8	20	28	30	40

<u>453.3</u>	<u>453.4</u>	<u>452.6</u>	<u>455.2</u>	<u>455.1</u>	<u>454.6</u>	<u>454.6</u>	<u>454.6</u>
9.1	9.0	8.8	7.2	7.3	7.8	7.8	7.8
40	20	5	2	2	20	30	40

462.37

6775

6750

670

5775

5750

570

452.19

Lt. S Rt.

<u>4420</u>	<u>4400</u>	<u>4403</u>	<u>4415</u>	<u>4430</u>	<u>4439</u>	<u>4438</u>	<u>4423</u>	<u>4418</u>	<u>4424</u>
10.2	12.2	11.9	10.7	8.2	8.3	8.4	9.9	10.9	9.6
35	40	25	13	9		17	22	40	50

<u>4423</u>	<u>4408</u>	<u>4411</u>	<u>4438</u>	<u>4447</u>	<u>4445</u>	<u>4441</u>	<u>4432</u>	<u>4429</u>	<u>4438</u>
9.9	11.4	11.7	8.4	7.5	7.7	8.1	9.0	9.3	8.4
50	40	27	12	9		18	31	40	50

<u>4428</u>	<u>4434</u>	<u>4425</u>	<u>4425</u>	<u>4432</u>	<u>4455</u>	<u>4455</u>	<u>4455</u>	<u>4439</u>	<u>4438</u>	<u>4446</u>
9.4	8.8	9.7	9.7	9.0	6.7	6.7	6.7	8.3	8.4	7.6
50	40	25	15	10	5		20	24	40	50

<u>4432</u>	<u>4445</u>	<u>4447</u>	<u>4429</u>	<u>4436</u>	<u>4456</u>	<u>4459</u>	<u>4461</u>	<u>4449</u>	<u>4442</u>	<u>4457</u>
9.0	7.7	7.5	9.3	8.6	8.6	6.3	6.1	7.3	8.0	6.5
50	40	35	18	11	8	0.0	21	25	40	50

<u>4442</u>	<u>4439</u>	<u>4433</u>	<u>4441</u>	<u>4466</u>	<u>4467</u>	<u>4464</u>	<u>4450</u>	<u>4452</u>	<u>4465</u>
8.0	8.3	8.9	8.1	5.6	5.5	5.8	7.2	7.0	5.7
50	40	15	10	6		21	25	40	50

<u>4445</u>	<u>4453</u>	<u>4452</u>	<u>4448</u>	<u>4470</u>	<u>4470</u>	<u>4477</u>	<u>4449</u>	<u>4442</u>	<u>4457</u>
7.7	6.9	7.0	7.4	4.2	4.2	4.5	7.3	7.0	5.5
50	40	25	14	8		22	27	40	50

452.19

876206 = N.S. Marcellon tract

8+30

8+0

TP 3.25 445.32 10.12 442.07

7+50

7+25

7+0

452.19

Lt.		S		Rt.				
<u>4402</u>	<u>4387</u>	<u>438.6</u>	<u>439.1</u>	<u>439.9</u>	<u>439.5</u>	<u>439.1</u>	<u>438.9</u>	<u>438.9</u>
5.1	6.6	6.7	6.2	5.4	5.8	6.3	6.4	6.4
55	40	30	20	15		20	40	50

<u>4389</u>	<u>4391</u>	<u>439.7</u>	<u>440.5</u>	<u>440.5</u>	<u>440.4</u>	<u>439.3</u>	<u>439.3</u>	<u>439.0</u>
6.4	6.2	5.6	7.8	4.8	4.9	6.0	6.0	6.3
60	40	17	14		15	28	40	50

<u>439.1</u>	<u>439.5</u>	<u>440.3</u>	<u>441.3</u>	<u>441.2</u>	<u>441.2</u>	<u>440.0</u>	<u>439.5</u>	<u>439.3</u>
6.2	5.8	5.0	4.0	4.1	4.1	5.3	5.8	6.0
60	40	15	11		10	25	40	50

445332

<u>438.5</u>	<u>440.5</u>	<u>440.9</u>	<u>440.6</u>	<u>441.8</u>	<u>441.9</u>	<u>441.7</u>	<u>440.3</u>	<u>440.1</u>	<u>440.8</u>	<u>440.7</u>
12.7	11.7	11.3	11.6	10.4	10.3	10.5	11.9	12.1	11.4	11.5
60	40	35	17	10		15	26	30	40	50

<u>436.8</u>	<u>439.8</u>	<u>440.8</u>	<u>442.1</u>	<u>442.3</u>	<u>442.4</u>	<u>440.5</u>	<u>440.2</u>	<u>440.2</u>
15.4	12.4	11.4	10.1	9.9	9.8	11.7	12.0	12.0
60	40	13	9		16	20	40	50

<u>438.8</u>	<u>438.6</u>	<u>440.0</u>	<u>441.8</u>	<u>442.1</u>	<u>443.1</u>	<u>442.7</u>	<u>441.4</u>	<u>440.9</u>	<u>441.7</u>	<u>441.9</u>
12.7	12.6	12.2	10.4	9.1	9.1	9.2	10.8	11.3	10.5	10.3
60	45	25	13	10		18	21	33	40	50

452.19

BM

7.88

453.61

H.H. Fad Co
Missis & York Sts
79-150-57
453.71
1493-37

TP

7.68

461.49

3.06

453.81

TP

12.05

455.87

1.50

443.82

BM

4.31

441.01

2" G.W.P.P.
55.8' St
8462.062

445.22

Moore
8-24-40

Xsec Morell
Pac. to Oliver

80' wide
14' curbs
13' 1/4

SW 7' Mon. 2.77

26.30

23.53

Pacific
Morell

0 + 00 = N L P

W 1.4 24.7

cb 2.1 24.2

1/4 3.0 23.3

c 3.3 23.0

1/4 4.1 22.2

cb 4.4 21.7

E 5.1 21.2

0 + 50

-15 7.0 19.3

E 6.6 19.7

cb 6.2 20.1

1/4 5.8 20.5

c 5.1 21.2

1/4 4.8 21.5

cb 3.3 23.0

w 2.7 23.6

Reduced - Plot # 10-24-40
 Profile # 1268
 CBH

INDEXED

26.30

EFB
1/700

61

W 4.7 21.6

cb 5.4 20.9

1/4 6.4 19.9

c 6.6 19.7

1/4 7.4 18.9

cb 7.8 18.5

S 8.3 18.0

+15 9.0 17.3

0 + 50

-15 10.6 15.7

E 9.7 16.6

cb 8.9 17.4

1/4 8.3 18.0

c 7.7 19.1

1/4 7.4 18.9

cb 6.7 19.6

W 6.4 19.9

0 + 00

W 6.7 19.6

cb 7.1 19.2

24.30

1/4	8.1	18.2
c	8.5	17.8
1/4	10.2	16.1
c6	10.7	15.6
E	10.9	15.4
+15	12.6	13.7

7+20

-15	14.0	12.3
E	12.3	14.0
c6	12.0	14.3
1/4	11.5	14.8
c	10.2	16.1
1/4	9.3	17.0
ob	7.7	19.1
W-	6.7	19.6

2+50 SH Oliver

W	9.4	16.9
c6	10.4	15.9
1/4	11.6	14.7
c	11.9	14.4

26.30

62

1/4	12.7	13.6
c6	12.9	13.4
E	13.4	12.9
+15	14.0	12.3

Moore
8-24-40 Curb levels on MISSION Blvd.
Ventura Sly 250

SWBP 0.74 8.25' 7.51 Ventura
Seawall

T.P. 4.22 3.08' 9.39 - 1.14

approx. 44 c6 face

Wly Lane wly curb = B.h.

SW Ventura Pl. = 040

W Pav. 5.07 - 1.99

E c6 4.55 - 1.47

0 + 35

E c6 4.48 - 1.40

W Pav. 4.88 - 1.80

0 + 75

W c6 4.28 - 1.20

E " 4.24 - 1.16

1 + 00

E c6 4.07 - 0.99

W " 4.18 - 1.10

1 + 50

W c6 3.84 - 0.76

E " 3.80 + 0.72

3.08
INDEXED
EPB

63

1 + 65

E c6 3.73 - 0.65

W c6 3.80 - 0.72

1 + 89

W c6 3.58 - 0.50

E " 3.69 - 0.61

2 + 00

E c6 3.55 - 0.47

W " 3.55 - 0.47

2 + 50

W c6 3.21 - 0.13

E " 3.23 - 0.15

Fly Lane Ely Curb = B.h.

Sly Ventura = 040

E c6 4.60 - 1.52

W " 4.44 - 1.38

0 + 50

W c6 4.30 - 1.28

E Pav. 4.75 - 1.67

	0+90		
E	Par	4.48	-1.60
W	cb	4.32	-1.24
	1+00		
W	cb	4.24	-1.18
E	Par	4.74	-1.66
	1+14		
E	cb	4.24	-1.16
W	"	4.14	-1.06
	1+61		
W	cb	3.96	-0.88
E	"	3.96	-0.88
	1+85		
E	cb	3.85	-0.77
W	"	3.76	-0.68
	2+00		
W	cb	3.69	-0.61
E	"	3.69	-0.61
	2+50		
E	cb	3.42	-0.34

W cb 3.34 -0.26

Curve levels on Mission
San Fernando Pl. Nly 250'

SAN FERNANDO
S.W.B.P. 0.79 8.361 7.57 Seawall

Wly hane Wly cb = B.L.

Nly Fernando = 0+0

W cb 8.54 -0.18

E " 8.53 -0.17

0+50

E cb 8.49 -0.13

W " 8.43 -0.07

1+00

W cb 8.40 -0.04

E " 8.40 -0.04

1+50

E cb 8.26 +0.10

W " 8.26 +0.10

834

	2+00		
W	cb	8.18	+0.18
E	"	8.20	+0.16
	2+50		
E	cb	8.17	+0.24
W	"	8.06	+0.30

Ely Lane Ely cb = B.h.

W	cb	8.50	-0.14
E	"	9.08	-0.72

0+50

E	Par.	9.21	-0.85
W	cb	8.51	-0.15

1+00

W	cb	8.53	-0.17
E	Par.	9.19	-0.83

1+21

E	cb	8.69	-0.33
W	"	8.63	-0.27

1+50

W	cb	8.59	-0.23
---	----	------	-------

836

65

E	cb	8.52	-0.16
---	----	------	-------

2+00

E	cb	8.41	-0.05
---	----	------	-------

W	"	8.38	-0.02
---	---	------	-------

2+50

W	cb	8.25	+0.11
---	----	------	-------

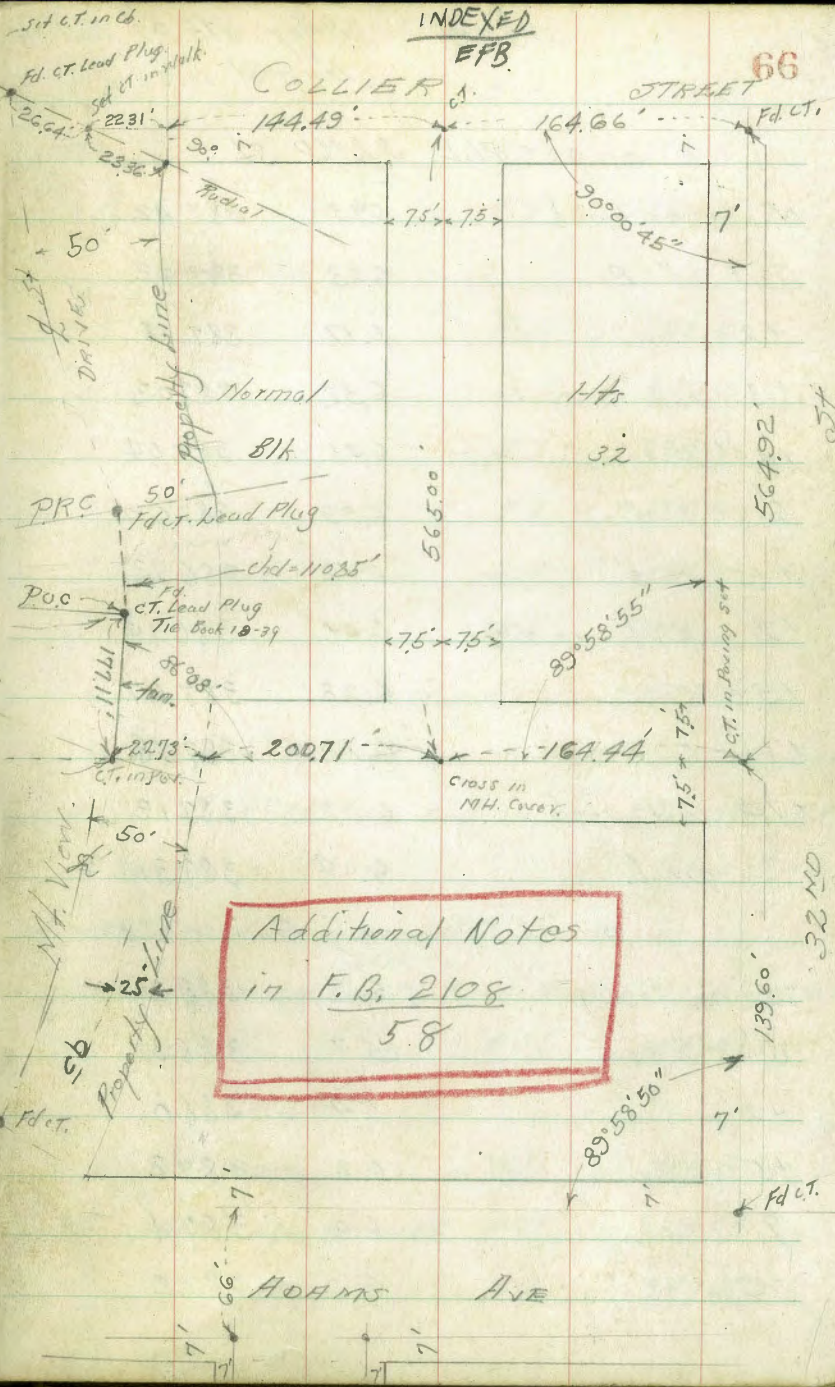
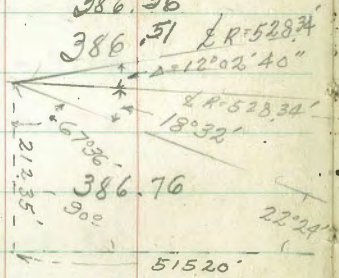
E	"	8.27	+0.09
---	---	------	-------

Walker, Sept. 19, 1940
 Bloss
 1564

CROSS SECTION ALLEY Bk 32

Normal Heights
 Between Adams and Collier

"	32nd "	Mt. View Drive		
	5.26	394.33	389.07	N.E. BR Adams Ave & Mt. View
T.P.	3.23	393.35	4.21	390.12
	0-12 = W. cb. line 32nd St. Alley East + West			
N top cb. Alley Rd.	6.15	387.20		
" Gut. on Riv.	6.66	386.69		
L " "	6.79	386.56		
S " "	6.84	386.51	2 R-528.74 = 12°02'40"	
S top cb. Alley Rd.	6.59	386.76	2 R-528.34 18°32'	
	0-05'			
S top cb.	6.17	387.18	51520'	
" Gut. on Parking	6.42	386.93		
+4 " "	6.55	386.80		
+5' in Water Ditch	6.8	386.6		
L on Riv.	6.56	386.79		
+3 " "	6.48	386.87		
+4.5 " "	6.60	386.75		
+5.5 " "	6.44	386.91		
N " "	6.40	386.95		
N top cb.	6.05	387.30		



Additional Notes
 in F.B. 2108
 5.8

564.92
 139.60
 32nd

0+00 = M.L. 32ND St

N	on top cb	5.93	387.42
Gut	" Pier	6.13	387.22
+2	" "	6.17	387.18
+3	" " sunken	6.32	387.03
+4.5'	" "	6.31	387.04
2	" "	6.33	387.02
+1.5'	" "	6.42	386.93
+2	" " in ditch	6.61	386.74
+3.5	" "	6.28	387.07
+5	" "	6.17	387.18
+7.4	= Gut. at cb	6.22	387.13
"	on cb.	6.04	387.31

0+02 = Beginning Fence 0.2' Back ✓

-5'		5.2	388.2
S		5.1	388.3
+2'		5.9	388.0
+5'		6.2	387.2
2		6.0	387.4
+3		6.2	387.2

2+5		5.8	387.6
N		4.9	388.5
+5		4.9	388.5
	0+15		
-5		4.5	388.9
N		4.5	388.9
2		4.7	388.7
+2.5		5.1	388.3
+4		4.7	388.7
S		4.8	388.6
+5'		4.8	388.6

0+26.5 = 1/2 Apricot Tree 0.2' in Alley on South

0+29.5 = 1/2 4"x4" Fence Post on ^{8"} Conc. Pier 0.2' in Alley

0+34 = " " " " " " " " 0.2' " "

0+36.5 = end Fence on South 0.1' Back.

0+26 = Beginning ^{2' wide} Conc. Walk on South 1' back Parallel to Alley
on Walk. 4.36 388.99

0+50

-6'	at house	4.4	389.0
-1'	on N edge Above Walk	4.47	388.88
S		4.4	389.0

393.35

Alley Blk 32 East & West
Normal Hts

393.35

68

L	3.9	389.5
+3.5	4.0	389.4
N	4.4	389.0
+10	4.2	389.2
	4.62	388.73 ✓
o + 66 = West end of Walk on South 1' Each		
o + 60.5 = Beginning Fence on 0.2' in Alley ✓		
o + 67		
- 5	4.1	389.3
N	4.1	389.3
+1	3.6	389.8
L	3.7	389.7
+3	3.8	389.6
S	4.4	389.0
+5	4.6	388.8
o + 84 = East edge of East entrance Garage on South		
S - 8' = L Entrance on Floor 3.96 389.39 ✓		
o + 84 = L Floor Pole 16" dia L Pole = 1.8' in Alley ✓		
o + 84.5 = Beginning Fence on South 0.4' in Alley ✓		
1 + 05.3 = End " " " " " " ✓		

1 + 00		
S - 5'	3.7	389.7
S	3.5	389.9
L	3.4	390.0
+4	3.4	390.0
N	3.6	389.8
+11	4.1	389.3
1 + 33 = end Fence on N 0.3' in Alley ✓		
1 + 49.94 = E Line North & South Alley		
N	3.3	390.1
L	3.6	389.8
S	3.5	389.9
+30	4.5	388.9
1 + 57.44 = L North & South Alley ✓		
S	3.8	389.6
L dirt	3.5	389.9
L on Rim MH	3.73	389.62 ✓
N	3.4	390.0
1 + 64.94 = W.L. North & South Alley		
N	3.4	390.0
+3	3.2	390.2

39335

Alley 8 1/2' 32 E-W
Normal Hts.

L 3.5 389.9

S 4.0 389.4

Elev.
1+643 = L Pole 12" dia on South L = 3.1' in Alley ✓

T.P. 4.30 394.42 3.23 390.12 on Rock ✓

2+00

-10 5.1 389.3

S 5.0 389.4

L 4.9 389.5

N 4.7 389.7

+10 4.6 389.8

2+15 = Beginning Fence on South 2' back ✓

-10 4.6 389.8

N 4.8 389.6

L 4.9 389.5

S 5.0 389.4

+15 5.4 389.0

2+50

-15 4.8 389.6

S 4.2 390.2

L 4.5 389.9

39442

69

L 4.4 390.0

N 4.5 389.9

+10 4.5 389.9

2+51 = L 10" Pole on South L = 1.5' in Alley.

2+54 = end Fence on South 1.2' back. ✓

2+60 = L Garage on South dirt Floor

Floor 4.6 389.8

2+80

N-10 4.5 389.9

N 4.4 390.0

L 4.2 390.2

S 4.6 389.8

+10 4.7 389.7

(2+95 = L Clothes line Pole on South with)

Conc. base 18" dia, 0.2' back = L base. ✓

3+00

-10 4.5 389.9

S 4.6 389.8

L 4.6 389.8

N 4.7 389.7

+10 4.6 389.8

39442

Alley 81k 32 E-W
Normal Hts.

3+30

-10		4.5	389.9
N		4.9	389.5
L		4.8	389.6
S		4.7	389.7
+11' at house		4.2	390.2
3+51 = E Elec Pole 14" dia 12' in Alley			
T.P.	5.27 394.34	5.35	389.07
3+58.15 = East line Mt. View Drive			
3+58.11 = East edge Exist. Por. Section taken Parallel to Prop.			
S+0.3' top cb.		4.97	389.87
" Gut. Paving.		4.84	389.50
L on "		5.18	389.16
N+0.06' on Gut Por		5.16	389.18
" " top cb.		4.95	389.39
3+69.35 = East edge Side Walk to Prop line			
N-0.06' on cb.		5.00	389.34
" " Gut.		5.25	389.09
L " Pav.		5.29	389.05
+7.2' " " Gut. at cb.		5.10	389.24
" " cb		4.66	389.68

39434

70

		Section taken Along cb line	
3+85.5 = E. cb. Mt. View			
S+0.3' on cb Ret		5.16	389.18
" " Gut.		5.75	388.59
L		5.75	388.59
N Gut.		5.65	388.69
+2' on PG. Alley Ret. cb		5.29	389.05
TP	5.25 395.37	4.22	390.12
Levels on North & South Alley 81k 32 Normal Hts.			
0+00 = North line of East and West Alley			
N		395.37	5.4 390.0
L			5.5 389.9
E			5.4 390.0
9010 → Floor = 5.59 → 389.78			
0+07.5 = L Garage on E 0.9' Back Conc. Floor ✓			
0+13 = Beginning Fence "A" on E 0.6' in Alley ✓			
0+16 = L Deadman on W 0.8' " " ✓			
0+18 = " " " " 0.4' " " ✓			
0+32.5 = d. Elec Pole 12" dia L = 1' in Alley. ✓			
0+35			
-5		6.0	389.4
E		5.8	389.6

	395.37	North & South Alley Blk 32 Normal Hts.	
0		5.1	3903
W		5.4	3900
+10		5.7	3897
0+50 = End of Fence "A" on E 0.3' in Alley			
-10		5.3	3901
-5		5.4	3900
W		5.3	3901
0		5.3	390.1
E		6.1	3893
+10		5.6	389.8
0+54 = South edge 4 Car Garage on West			
W-8.3 on toe Conc. Apron	4.81		390.56 ✓
W-10.2 " Garage Floor	4.67		390.70 ✓
0+75			
-15		6.2	3892
E		5.8	3896
0		5.5	3899
W		5.3	3901
+8.2 = toe Conc. Apron	4.83		390.54
+10.1 = on Garage Floor	4.68		390.69

	395.37		71
0+96 = North end 4 Car Garage on West.			
W-9.9 = Garage Floor	4.57		390.80
W-8.1 = toe Conc. Apron.	4.67		390.70
+100			
W-10'	5.1		3903
W	5.6		3898
0	5.4		3900
E	5.4		390.0
+15	5.6		3898
+120			
-20	5.5		3899
E	5.4		3900
0	5.1		3903
+5'	4.7		3907
W	4.8		390.6
+15	5.1		3903
+135			
-15	5.2		3902
W	5.0		3904
0	5.4		3900
E	5.5		3899
+15	5.4		390.0

North + South Alley
814 32
Normal 4 1/2

395.37

1+48 = L Tel Pole on E 9" dia L = 13" in Alley

1+50

-10	5.7	389.7
E	5.5	389.9
L	5.1	390.3
W	4.9	390.5
+15	5.1	390.3

1+70

-40	5.1	390.3
-15	5.1	390.3
W	4.5	390.9
+4	5.1	390.3
L	5.1	390.3
E	5.1	390.3
+25	5.2	390.2

1+73 = L Elec Pole on W 0.8' in Alley = L Pole

2+00

-20	5.0	390.4
E-2	5.4	390.0
E	5.0	390.4
+3	4.7	390.7

395.37

L	5.1	390.3 ⁷²
W	5.1	390.3
+25	5.1	390.3
2+06 = Garage	Floor = 4.59	390.78 ✓
2+20		

-15	5.0	390.4
W	5.4	390.0
L	5.3	390.1
E	4.8	390.6
+17 at House	4.6	390.8

2+00.5 = ^{South} Beginning Above House on E 1.7' Back ✓
 2+37 = ^{North} End " " " " 1.7' Back ✓
 39.0 ^{South edge}
 2+37.5 = Shed on E 0.3' in Alley ← GONE
 2+49.5 = North edge Shed on E 0.3' in Alley ✓
 2+49.5 = Beginning Fence "B" on E 0.5' in Alley ✓
 2+66.5 = End " " " " 0.6 " "

2+40

E-5' on Ground	4.9	390.5
E	4.8	390.6
L	5.1	390.3
+3	5.1	390.3
W	4.7	390.7

North And South Alley

Blk 32
Normal Hts

395.37

W+20	5.1	390.3
2+67 = South edge path House on E 0.1' in Alley ✓		
2+83 = N " " " " 0.1 Back ✓		
2+75		
-25	4.5	390.9
W	4.7	390.7
L	5.0	390.4
E	4.7	390.7
+5	4.7	390.7
Gone 2		
2+83 = South edge shed on E 0.6' in Alley ✓		
3+00 = N " " " " on Line ✓		
3+00 = Beginning Wire Fence "C" on E 0.8' Back ✓		
-10	4.5	390.9
E	4.2	391.2
L	4.5	390.9
L ^{+0.5} on Rim MH	5.00	390.37, 5' W of L ✓
W	4.0	391.4
+20	4.4	391.0
3+14 = L 11" Pole on W L = 1.1' in Alley ✓		

73

395.37

3+25		
25'	4.0	391.4
W-10	3.4	392.0
W	3.9	391.5
L	4.1	391.3
E	3.8	391.6
+35	4.4	391.0
3+50 = North end Fence "C" on E 0.9 Back ✓		
-35	4.4	391.0
E	3.9	391.5
L	3.9	391.5
W	3.9	391.5
+20	4.0	391.4
3+50 = Beginning Fence "D" on W 0.2 Back ✓		
T.P. 5.95	397.58	3.74 391.63
3+66 = Air Fence "D" on W 0.2' in Alley ✓		
3+78 = North end " " " " 5.6 1.2' Back ✓		392.0 ✓
		Dirt Floor ✓
3+78 = Beginning Dble Garage on W 1.2' Back ✓		
4+00 = end " " " " " " " " ✓		
-1.2' on dirt floor	5.6	392.0 ✓

	397.58	North & South Alley	
W	4+00 Cont	5.5	392.1 Htg
L		5.7	392.2
+4		5.7	391.9
E		5.5	392.1
+15		5.9	391.7
4+18.5	North end 5 Car Garage on W North entrance	4.4	393.2 Dirt Floor
4+25			
-15		5.0	392.6
E		5.0	392.6
L		5.2	392.4
W		4.7	392.9
+20		4.3	393.3
4+00	Beginning Wire "E" Fence on E 0.6 Back		
4+50	end " " " 0.4 "		
-20		4.2	393.4
W		4.1	393.5
L		4.3	393.3
E		4.2	393.4
+10		4.6	394.0
4+51	South end Garage on E on wire		
4+53.5	L 10" Pde on W L = 1.2' in Alley		

	397.58		
			71
			Dirt Floor
4+69	North end Garage on E 0.3' in Alley		
E - 6'	L Entrance ^{North} dirt Floor = 3.7	3.7	393.9
4+70.5	South end Garage on W 2.1' Back, North entrance		
4+72	L Deadman on W 11' in Alley		
4+87.5	North end Garage on W 1.5' Back, dirt Floor		
W - 7'	L North entrance	3.1	394.5
4+75			
-10'		3.7	393.9
E		3.7	393.9
L		3.9	393.7
+15'		3.9	393.7
+5'		3.5	394.1
W		3.5	394.1
+2' of Garage		3.4	394.2
5+00			
W - 5		3.2	394.4
W		3.3	394.3
L		3.6	394.0
E		3.6	394.0
+4' at house		3.4	394.2

North + South Alley
81k 32
Normal Hts.

	397.58	3.53	394.05
497.5' = Beginning Conc. Ret. Wall on E 0.3' Back			
5+2.5			
E - 0.2' on top Conc. Ret. Wall	3.85		393.73
E	4.5		393.1
L	4.6		393.0
W	4.5		393.1
+5	4.3		393.3
5+43.5 = Break in Grade of Ret. Wall on E			
W-5	5.4		392.2
W	5.5		392.1
+6	6.0		391.6
L	5.7		391.9
+5	5.6		392.0
E	5.1		392.5
+0.3' = top Wall	4.02		393.56 ✓
	5.05		392.53 ✓
5+50.2 = End Wall on E 0.3' Back			
5+50.5 = South Line Collier St.			
-0.25' on cb.	6.43		391.15
-0.25' " Gut.	6.59		390.99
E +5 on Pav.	6.86		390.72

	397.58		
L on Poring.	6.85		390.73
+7.2' = Gut on Pav.	6.60		390.98
+7.2' = on cb.	6.50		391.08
5+57.5 = 7' Line Collier			
W +0.38 on cb.	6.72		390.86
" " Gut Pav.	6.98		390.60
L on "	7.02		390.56
E +0.2' Gut at cb.	6.88		390.70
" " top cb.	6.54		391.04
5+62.5 = South cb. Collier St.			
E cb. on Ret.	6.67		390.91
E Gut. " Poring at cb.	7.20		390.38
L " "	7.22		390.36
W " "	7.30		390.28
W top cb. Alley Ret.	6.92		390.66
TP 4.50	395.25	6.83	390.75
chk TP on Rock P-69	5.12		390.13
			390.12
			0.01 Error

Level on Garage Floor on East NYS Alley 6.5.41
Block 32 Normal Hts 5.30.02

76

B.M. 4.06 394.86 390.80
0496 on
Floor Garage
02.11.41
Page 71

0481

E-1.8 = Wly Conc Approx 5.06 389.80

E-3.8 = Sly Do Garage
Conc Floor 4.93 389.93

0499

E-1.8 = Wly Conc Approx 5.05 389.81

E-3.8 = Wly Do Garage
Conc Floor 4.92 389.93

Final Alley Block B Altadena

INDEXED
EFB

177

Hotel - Widths measured
Outside 3" Headers

$15.00 \left. \begin{array}{l} 15.6 \\ 15.2 \end{array} \right\} = 15.3 = 14.80 \times 48 \frac{1}{2} = 719.28$
 $15.2 \left. \begin{array}{l} 15.2 \\ 15.2 \end{array} \right\} = 15.4 = 14.90 \times 50 = 745.00$
 $15.2 \left. \begin{array}{l} 15.1 \\ 15.1 \end{array} \right\} 15.15 = 14.65 \times 50 = 732.50$
 $15.1 \left. \begin{array}{l} 15.1 \\ 15.3 \end{array} \right\} 15.20 = 14.70 \times 49 = 720.30$
 $15.3 \left. \begin{array}{l} 14.9 \\ 14.9 \end{array} \right\} 15.10 = 14.60 \times 1 = 14.60$
 $14.9 \left. \begin{array}{l} 14.9 \\ 15.0 \end{array} \right\} 14.95 = 14.45 \times 50 = 722.50$

$15.00 = 15.00 = 14.50 \times 100 = 1450.00$

$15.00 \left. \begin{array}{l} 14.80 \end{array} \right\} 14.90 = 14.40 \times 50 = 720.00$

$14.80 = 14.80 = 14.30 \times 100 = 1430.00$

$14.80 \left. \begin{array}{l} 15.20 \end{array} \right\} 15.00 = 14.50 \times 50 = 725.00$

$15.20 \left. \begin{array}{l} 15.00 \end{array} \right\} 15.10 \quad 14.60 \times 50 = 730.00$
 $598.6 = 8,709.18$ Paving

Curb $88 + 5.5 = 14.3'$

S. Walk $2 \times 5 + 3.9 \times 5 = 29.50'$

Paving in THORN STREET $14.5 \times 4 = 58.00$
5.80

CRH 12-7-1940

5859.6

Upas 51986 2.50 St.

Dec. 6-90
 Simon 750 15.6
 Hartberg
 X Moore
 Orberal 510 15.2

750 15.1
 701 15.3
 410 14.9

750 15.0

340 15.0

7695 0 - M.H. 2.50 10m.

750 15.0

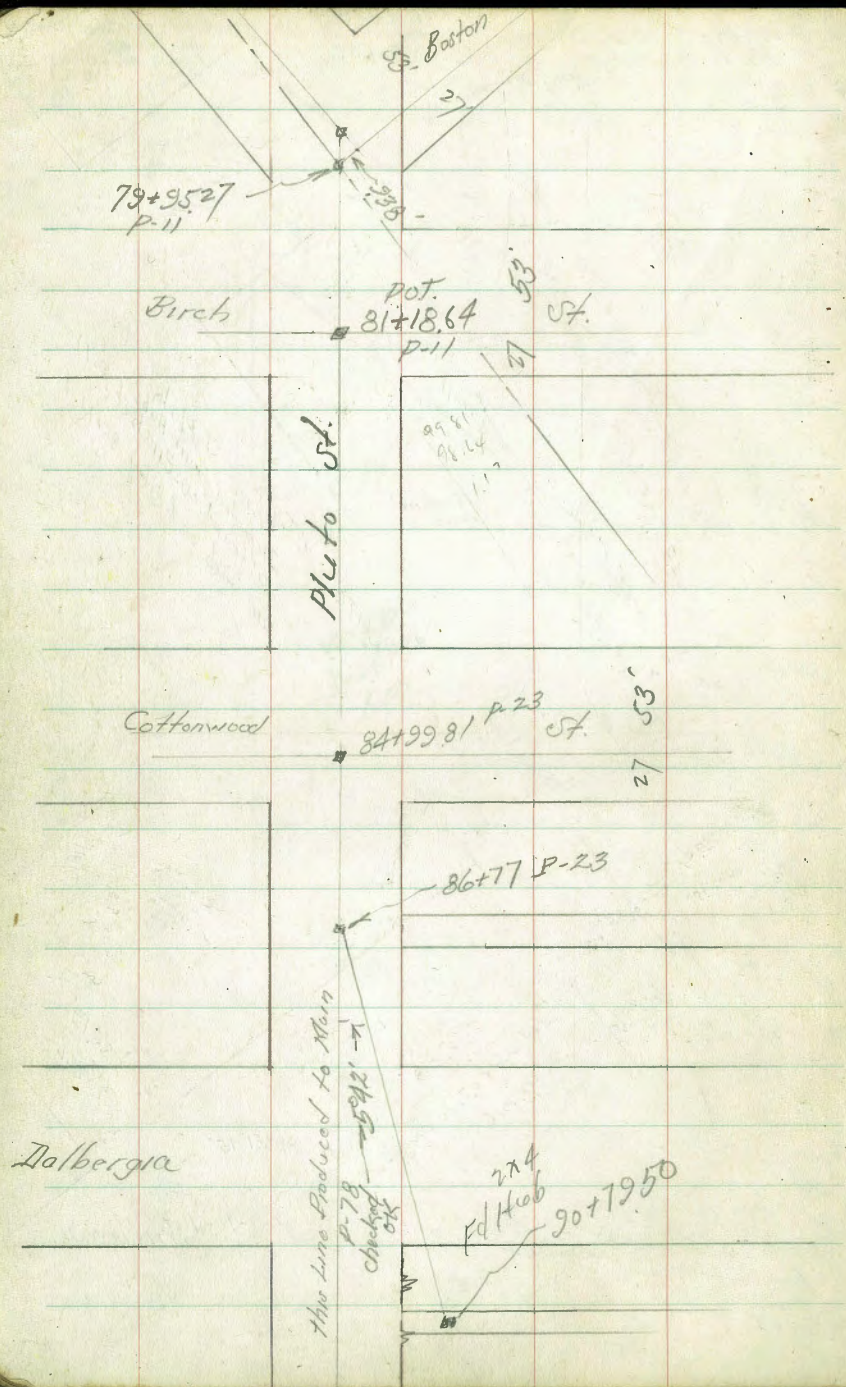
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750 14.8

110 14.8

750 15.2

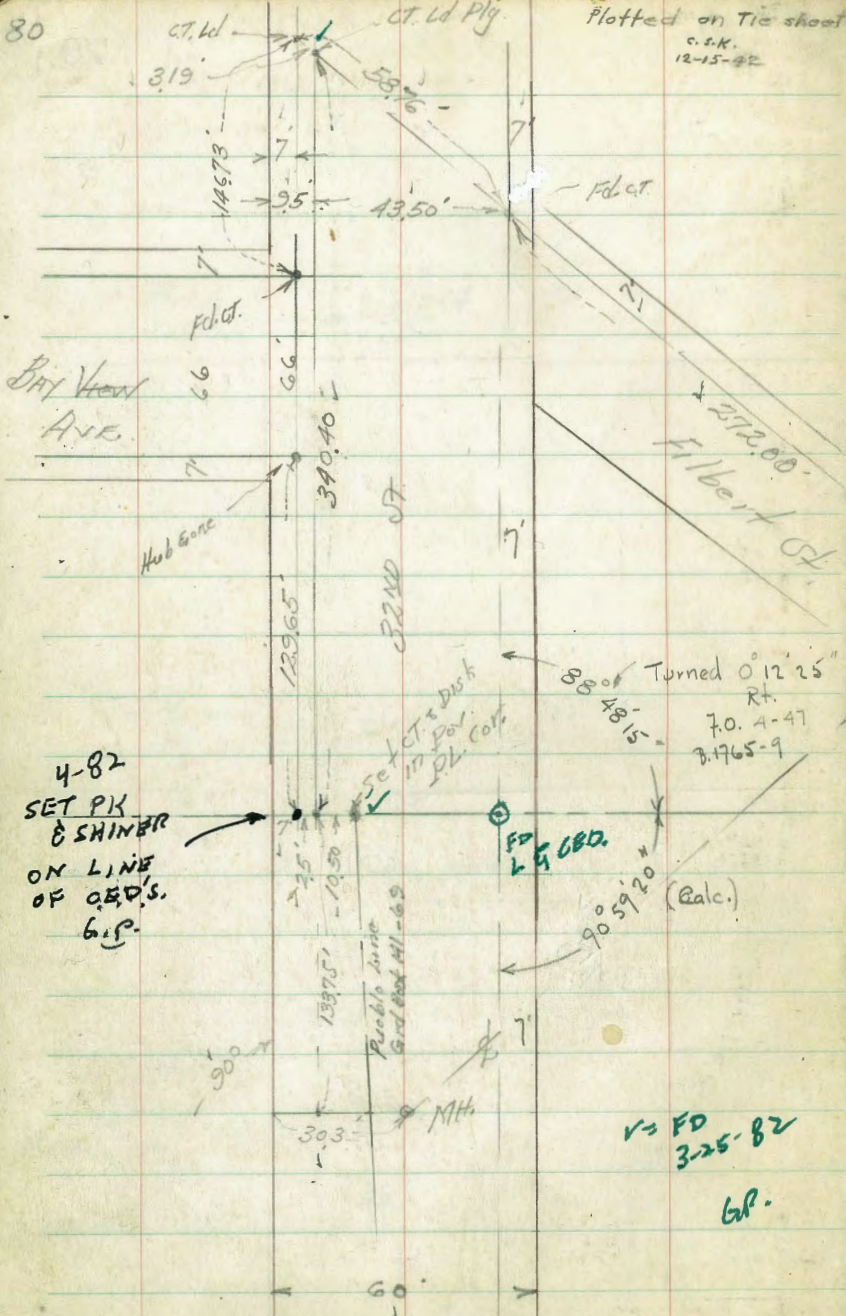




REGEL

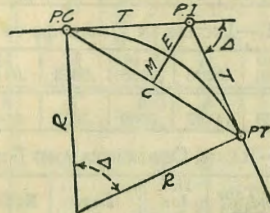
ST.

Plotted on Tie sheet
C.S.K.
12-15-22



DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

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CURVE FORMULAS

- Radius= $R = \frac{50}{\sin D/2}$ (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) 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 $+8\frac{1}{2}=414.49$ 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) $.3 \times C \times D^2$ or=defl. for 1 ft. from Table III $\times C$. For Sta. 158 of above curve= $.3 \times 54.5 \times 8\frac{1}{2} = 136.2'$ 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 I.—MINUTES IN DECIMALS OF A DEGREE.

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

TABLE II.—INCHES IN DECIMALS OF A FOOT.

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

TABLE III.—RADI, ORDINATES AND DEFLECTIONS.

Deg.	Radius	Mid. Ord.	Tan. Offset	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan. Offset	Def. for 1 Foot
0° 10'	34377.5	.036	.145	0.05'	7°	819.02	1.528	6.105	2.10'
20	17188.8	.073	.291	0.10	20'	781.84	1.600	6.395	2.20
30	11459.2	.109	.436	0.15	30	764.49	1.637	6.540	2.25
40	8594.42	.145	.582	0.20	40	747.89	1.673	6.685	2.30
50	6875.55	.182	.727	0.25					
1					8	716.78	1.746	6.976	2.40
10	5729.65	.218	.873	0.30	20	688.16	1.819	7.266	2.50
20	4911.15	.255	1.018	0.35	30	674.69	1.855	7.411	2.55
30	4297.28	.291	1.164	0.40	40	661.74	1.892	7.556	2.60
40	3819.83	.327	1.309	0.45					
50	3437.87	.364	1.454	0.50	9	637.28	1.965	7.846	2.70
	3125.36	.400	1.600	0.55	20	614.56	2.037	8.136	2.80
2					30	603.80	2.074	8.281	2.85
10	2864.93	.436	1.745	0.60	40	593.42	2.110	8.426	2.90
20	2644.58	.473	1.891	0.65					
30	2455.70	.509	2.036	0.70	10	573.69	2.183	8.716	3.00
40	2292.01	.545	2.181	0.75	30	546.44	2.292	9.150	3.15
50	2148.79	.582	2.327	0.80	11	521.67	2.402	9.585	3.30
	2022.41	.618	2.472	0.85	30	499.06	2.511	10.02	3.45
3					40	478.34	2.620	10.45	3.60
10	1910.08	.655	2.618	0.90	30	459.28	2.730	10.89	3.75
20	1809.57	.691	2.763	0.95	13	441.68	2.839	11.32	3.90
30	1719.12	.727	2.908	1.00	40	425.40	2.949	11.75	4.05
40	1637.28	.764	3.054	1.05	14	410.28	3.058	12.18	4.20
50	1562.88	.800	3.199	1.10	30	396.20	3.168	12.62	4.35
	1494.95	.836	3.345	1.15					
4					15	383.07	3.277	13.05	4.50
10	1432.69	.873	3.490	1.20	30	370.78	3.387	13.49	4.65
20	1375.40	.909	3.635	1.25	16	359.27	3.496	13.92	4.80
30	1322.53	.945	3.718	1.30	30	348.45	3.606	14.35	4.95
40	1273.57	.982	3.926	1.35	17	338.27	3.716	14.78	5.10
50	1228.11	1.018	4.071	1.40	18	319.62	3.935	15.64	5.40
	1185.78	1.055	4.217	1.45	19	302.94	4.155	16.51	5.70
5					20	287.94	4.374	17.37	6.00
10	1146.28	1.091	4.362	1.50	21	274.37	4.594	18.22	6.30
20	1109.33	1.127	4.507	1.55	22	262.04	4.814	19.03	6.60
30	1074.68	1.164	4.653	1.60	23	250.79	5.035	19.94	6.90
40	1042.14	1.200	4.798	1.65	24	240.49	5.255	20.79	7.20
50	1011.51	1.237	4.943	1.70					
	982.64	1.273	5.088	1.75	25	231.01	5.476	21.64	7.50
6					26	222.27	5.697	22.50	7.80
10	955.37	1.309	5.234	1.80	27	214.18	5.918	23.35	8.10
20	929.57	1.346	5.379	1.85	28	206.68	6.139	24.19	8.40
30	905.13	1.382	5.524	1.90	29	199.70	6.360	25.04	8.70
40	881.95	1.418	5.669	1.95	30	193.18	6.583	25.88	9.00
50	859.92	1.455	5.814	2.00					

Note. Chord Deflection=2 times tangent deflection.

TABLE IV.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10'	58.34	.30	10'	560.11	27.31	10'	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100.01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.68
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
20	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
30	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
40	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
50	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

(R-962) (R-962)

TABLE IV.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
31°	1589.0	216.3	41°	2142.2	387.4	51°	2732.9	618.4
10'	1598.0	218.7	10'	2151.7	390.7	10'	2743.1	622.8
20	1606.9	221.1	20	2161.2	394.1	20	2753.4	627.2
30	1615.9	223.5	30	2170.8	397.4	30	2763.7	631.7
40	1624.9	226.0	40	2180.3	400.8	40	2773.9	636.2
50	1633.9	228.4	50	2189.9	404.2	50	2784.2	640.7
32	1643.0	230.9	42	2199.4	407.6	52	2794.5	645.2
10	1652.0	233.4	10	2209.0	411.1	10	2804.9	649.7
20	1661.0	235.9	20	2218.6	414.5	20	2815.2	654.3
30	1670.0	238.4	30	2228.1	418.0	30	2825.6	658.8
40	1679.1	241.0	40	2237.7	421.4	40	2835.9	663.4
50	1688.1	243.5	50	2247.3	425.0	50	2846.3	668.0
33	1697.2	246.1	43	2257.0	428.5	53	2856.7	672.7
10	1706.3	248.7	10	2266.6	432.0	10	2867.1	677.3
20	1715.3	251.3	20	2276.2	435.6	20	2877.5	682.0
30	1724.4	253.9	30	2285.9	439.2	30	2888.0	686.7
40	1733.5	256.5	40	2295.6	442.8	40	2898.4	691.4
50	1742.6	259.1	50	2305.2	446.4	50	2908.9	696.1
34	1751.7	261.8	44	2314.9	450.0	54	2919.4	700.9
10	1760.8	264.5	10	2324.6	453.6	10	2929.9	705.7
20	1770.0	267.2	20	2334.3	457.3	20	2940.4	710.5
30	1779.1	269.9	30	2344.1	461.0	30	2951.0	715.3
40	1788.2	272.6	40	2353.8	464.6	40	2961.5	720.1
50	1797.4	275.3	50	2363.5	468.4	50	2972.1	725.0
35	1806.6	278.1	45	2373.3	472.1	55	2982.7	729.9
10	1815.7	280.8	10	2383.1	475.8	10	2993.3	734.8
20	1824.9	283.6	20	2392.8	479.6	20	3003.9	739.7
30	1834.1	286.4	30	2402.6	483.8	30	3014.5	744.6
40	1843.3	289.2	40	2412.4	487.2	40	3025.2	749.6
50	1852.5	292.0	50	2422.3	491.0	50	3035.8	754.6
36	1861.7	294.9	46	2432.1	494.8	56	3046.5	759.6
10	1870.9	297.7	10	2441.9	498.7	10	3057.2	764.6
20	1880.1	300.6	20	2451.8	502.5	20	3067.9	769.7
30	1889.4	303.5	30	2461.7	506.4	30	3078.7	774.7
40	1898.6	306.4	40	2471.5	510.3	40	3089.4	779.9
50	1907.9	309.3	50	2481.4	514.3	50	3100.2	784.9
37	1917.1	312.2	47	2491.3	518.2	57	3110.9	789.1
10	1926.4	315.2	10	2501.2	522.2	10	3121.7	795.2
20	1935.7	318.1	20	2511.2	526.1	20	3132.6	800.4
30	1945.0	321.1	30	2521.1	530.1	30	3143.4	805.6
40	1954.3	324.1	40	2531.1	534.2	40	3154.2	810.9
50	1963.6	327.1	50	2541.0	538.2	50	3165.1	816.1
38	1972.9	330.2	48	2551.0	542.2	58	3176.0	821.4
10	1982.2	333.2	10	2561.0	546.3	10	3186.9	826.7
20	1991.5	336.3	20	2571.0	550.4	20	3197.8	832.0
30	2000.9	339.3	30	2581.0	554.5	30	3208.8	837.3
40	2010.2	342.4	40	2591.0	558.6	40	3219.7	842.7
50	2019.6	345.5	50	2601.1	562.8	50	3230.7	848.1
39	2029.0	348.6	49	2611.2	566.9	59	3241.7	853.5
10	2038.4	351.8	10	2621.2	571.1	10	3252.7	858.9
20	2047.8	354.9	20	2631.3	575.3	20	3263.7	864.3
30	2057.2	358.1	30	2641.4	579.5	30	3274.8	869.8
40	2066.6	361.3	40	2651.5	583.8	40	3285.8	875.3
50	2076.0	364.5	50	2661.6	588.0	50	3296.9	880.8
40	2085.4	367.7	50	2671.8	592.3	60	3308.0	886.4
10	2094.9	371.0	10	2681.9	596.6	10	3319.1	892.0
20	2104.3	374.2	20	2692.1	600.9	20	3330.3	897.5
30	2113.8	377.5	30	2702.3	605.3	30	3341.4	903.2
40	2123.3	380.8	40	2712.5	609.6	40	3352.6	908.8
50	2132.7	384.1	50	2722.7	614.0	50	3363.8	914.5

66+48.14
64+49.12
1+96.06

TABLE IV.—TANGENTS AND EXTERNALS TO A 1° CURVE.

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

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.	
0	0	0	∞	1	90	1	∞	0	0	
10	.0029	.0029	343.8	.9998	50	.7660	.7660	1.2843	.6428	
20	.0058	.0058	171.9	.9996	40	.6428	.6428	1.5557	.7660	
30	.0087	.0087	114.6	.9994	30	.5000	.5000	2.0000	.8660	
40	.0116	.0116	85.94	.9993	20	.3420	.3420	2.9176	.9397	
50	.0145	.0145	68.75	.9993	10	.1736	.1736	5.7671	.9848	
1	.0175	.0175	57.29	.9993	89	.9848	.9848	5.7671	.1736	
10	.0204	.0204	49.10	.9992	50	.7660	.7660	1.2843	.6428	
20	.0233	.0233	42.96	.9991	40	.6428	.6428	1.5557	.7660	
30	.0262	.0262	38.19	.9990	30	.5000	.5000	2.0000	.8660	
40	.0291	.0291	34.37	.9989	20	.3420	.3420	2.9176	.9397	
50	.0320	.0320	31.24	.9989	10	.1736	.1736	5.7671	.9848	
2	.0349	.0349	28.64	.9989	88	.9848	.9848	5.7671	.1736	
10	.0378	.0378	26.43	.9989	50	.7660	.7660	1.2843	.6428	
20	.0407	.0407	24.54	.9989	40	.6428	.6428	1.5557	.7660	
30	.0436	.0436	22.90	.9989	30	.5000	.5000	2.0000	.8660	
40	.0465	.0465	21.47	.9989	20	.3420	.3420	2.9176	.9397	
50	.0494	.0494	20.21	.9988	10	.1736	.1736	5.7671	.9848	
3	.0523	.0524	19.08	.9988	87	.9848	.9848	5.7671	.1736	
10	.0552	.0553	18.07	.9988	50	.7660	.7660	1.2843	.6428	
20	.0581	.0582	17.17	.9988	40	.6428	.6428	1.5557	.7660	
30	.0610	.0612	16.35	.9988	30	.5000	.5000	2.0000	.8660	
40	.0640	.0641	15.60	.9988	20	.3420	.3420	2.9176	.9397	
50	.0669	.0670	14.92	.9987	10	.1736	.1736	5.7671	.9848	
4	.0698	.0699	14.30	.9987	86	.9848	.9848	5.7671	.1736	
10	.0727	.0729	13.73	.9987	50	.7660	.7660	1.2843	.6428	
20	.0756	.0758	13.20	.9987	40	.6428	.6428	1.5557	.7660	
30	.0785	.0787	12.71	.9987	30	.5000	.5000	2.0000	.8660	
40	.0814	.0816	12.25	.9987	20	.3420	.3420	2.9176	.9397	
50	.0843	.0846	11.83	.9986	10	.1736	.1736	5.7671	.9848	
5	.0872	.0875	11.43	.9986	85	.9848	.9848	5.7671	.1736	
10	.0901	.0904	11.06	.9986	50	.7660	.7660	1.2843	.6428	
20	.0929	.0934	10.71	.9986	40	.6428	.6428	1.5557	.7660	
30	.0958	.0963	10.39	.9986	30	.5000	.5000	2.0000	.8660	
40	.0987	.0992	10.08	.9985	20	.3420	.3420	2.9176	.9397	
50	.1016	.1022	9.788	.9985	10	.1736	.1736	5.7671	.9848	
6	.1045	.1051	9.514	.9985	84	.9848	.9848	5.7671	.1736	
10	.1074	.1080	9.255	.9985	50	.7660	.7660	1.2843	.6428	
20	.1103	.1110	9.010	.9985	40	.6428	.6428	1.5557	.7660	
30	.1132	.1139	8.777	.9985	30	.5000	.5000	2.0000	.8660	
40	.1161	.1169	8.556	.9985	20	.3420	.3420	2.9176	.9397	
50	.1190	.1198	8.345	.9985	10	.1736	.1736	5.7671	.9848	
7	.1219	.1228	8.144	.9985	83	.9848	.9848	5.7671	.1736	
10	.1248	.1257	7.953	.9985	50	.7660	.7660	1.2843	.6428	
20	.1276	.1287	7.770	.9985	40	.6428	.6428	1.5557	.7660	
30	.1305	.1317	7.596	.9985	30	.5000	.5000	2.0000	.8660	
40	.1334	.1346	7.429	.9985	20	.3420	.3420	2.9176	.9397	
50	.1363	.1376	7.269	.9985	10	.1736	.1736	5.7671	.9848	
	Cosin.	Cotg.	Tan.	Sine.	Angle.	Cosin.	Cotg.	Tan.	Sine.	Angle.

157
73
149.91

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.	
16	.2756	.2867	3.487	.96126	74	.4067	.4452	2.246	.91355	
10	.2784	.2899	3.450	.96046	50	.4094	.4487	2.229	.91236	
20	.2812	.2931	3.412	.95964	40	.4120	.4522	2.211	.91116	
30	.2840	.2962	3.376	.95882	30	.4147	.4557	2.194	.90996	
40	.2868	.2994	3.340	.95799	20	.4173	.4592	2.177	.90875	
50	.2896	.3026	3.305	.95715	10	.4200	.4628	2.161	.90753	
17	.2924	.3057	3.271	.95615	73	.4226	.4663	2.145	.90631	
10	.2952	.3089	3.237	.95545	50	.4253	.4699	2.128	.90507	
20	.2979	.3121	3.204	.95459	40	.4279	.4734	2.112	.90383	
30	.3007	.3153	3.172	.95372	30	.4305	.4770	2.097	.90259	
40	.3035	.3185	3.140	.95284	20	.4331	.4806	2.081	.90133	
50	.3062	.3217	3.108	.95195	10	.4358	.4841	2.066	.90007	
18	.3090	.3249	3.078	.95106	72	.4384	.4877	2.050	.89879	
10	.3118	.3281	3.048	.95015	50	.4410	.4913	2.035	.89752	
20	.3145	.3314	3.018	.94924	40	.4436	.4950	2.020	.89623	
30	.3173	.3346	2.989	.94832	30	.4462	.4986	2.006	.89493	
40	.3201	.3378	2.960	.94740	20	.4488	.5022	1.991	.89363	
50	.3228	.3411	2.932	.94646	10	.4514	.5059	1.977	.89232	
19	.3256	.3443	2.904	.94552	71	.4540	.5095	1.963	.89101	
10	.3283	.3476	2.877	.94457	50	.4566	.5132	1.949	.88968	
20	.3311	.3508	2.850	.94361	40	.4592	.5169	1.935	.88835	
30	.3338	.3541	2.824	.94264	30	.4617	.5206	1.921	.88701	
40	.3365	.3574	2.798	.94167	20	.4643	.5243	1.907	.88566	
50	.3393	.3607	2.773	.94068	10	.4669	.5280	1.894	.88431	
20	.3420	.3640	2.747	.93969	70	.4695	.5317	1.881	.88295	
10	.3448	.3673	2.723	.93869	50	.4720	.5354	1.868	.88158	
20	.3475	.3706	2.699	.93769	40	.4746	.5392	1.855	.88020	
30	.3502	.3739	2.675	.93667	30	.4772	.5430	1.842	.87882	
40	.3529	.3772	2.651	.93565	20	.4797	.5467	1.829	.87743	
50	.3557	.3805	2.628	.93462	10	.4823	.5505	1.816	.87603	
21	.3584	.3839	2.605	.93358	69	.4848	.5543	1.804	.87462	
10	.3611	.3872	2.583	.93253	50	.4874	.5581	1.792	.87321	
20	.3638	.3906	2.560	.93148	40	.4899	.5619	1.780	.87178	
30	.3665	.3939	2.539	.93042	30	.4924	.5658	1.767	.87036	
40	.3692	.3973	2.517	.92935	20	.4950	.5696	1.756	.86892	
50	.3719	.4006	2.496	.92827	10	.4975	.5735	1.744	.86748	
22	.3746	.4040	2.475	.92718	68	.5000	.5774	1.732	.86603	
10	.3773	.4074	2.455	.92609	50	.5025	.5812	1.720	.86457	
20	.3800	.4108	2.434	.92499	40	.5050	.5851	1.709	.86310	
30	.3827	.4142	2.414	.92388	30	.5075	.5890	1.698	.86163	
40	.3854	.4176	2.394	.92276	20	.5100	.5930	1.686	.86015	
50	.3881	.4210	2.375	.92164	10	.5125	.5969	1.675	.85866	
23	.3907	.4245	2.356	.92050	67	.5150	.6009	1.664	.85717	
10	.3934	.4279	2.337	.91936	50	.5175	.6048	1.653	.85567	
20	.3961	.4314	2.318	.91822	40	.5200	.6088	1.643	.85416	
30	.3987	.4348	2.300	.91706	30	.5225	.6128	1.632	.85264	
40	.4014	.4383	2.282	.91590	20	.5250	.6168	1.621	.85112	
50	.4041	.4417	2.264	.91472	10	.5275	.6208	1.611	.84959	
	Cosin.	Cotg.	Tan.	Sine.	Angle.	Cosin.	Cotg.	Tan.	Sine.	Angle.

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

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

TABLE IX.—CALCULATION OF EARTHWORK.

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

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

3+0815
112
3+11935

10
177°47'
88°53'30"

35815
96
30911

1st Alley South of Ocean View
 Reference Nail in olive tree N.E. of M.H.
 Elev. = 2.0' above R.R.D.
 " = 7.08. " Flow Line

S.E. 8 P. Nail + 3446 = 6.82

1157
 280
 1441
 1548
 107

89.60
 34.11
 55

3310
 202
 3108

86.7700
 89.9991
 177.19

35808
 14444
 19367

35808
 07
 358.15
 157.44
 20071

105+975
 102 06.77

390.73
 29

361.73

1750.5

2112.23

40
 2072.23

A-60

550.5
 14.5
 565.0

160

2

360

73.5

73.5

367.5

220

514.5

027.8

327.83

56.09

271.74

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)+2 or 2 ft. added to 41.9 =43.9. For slopes of 1 on 1 see inside of front cover.