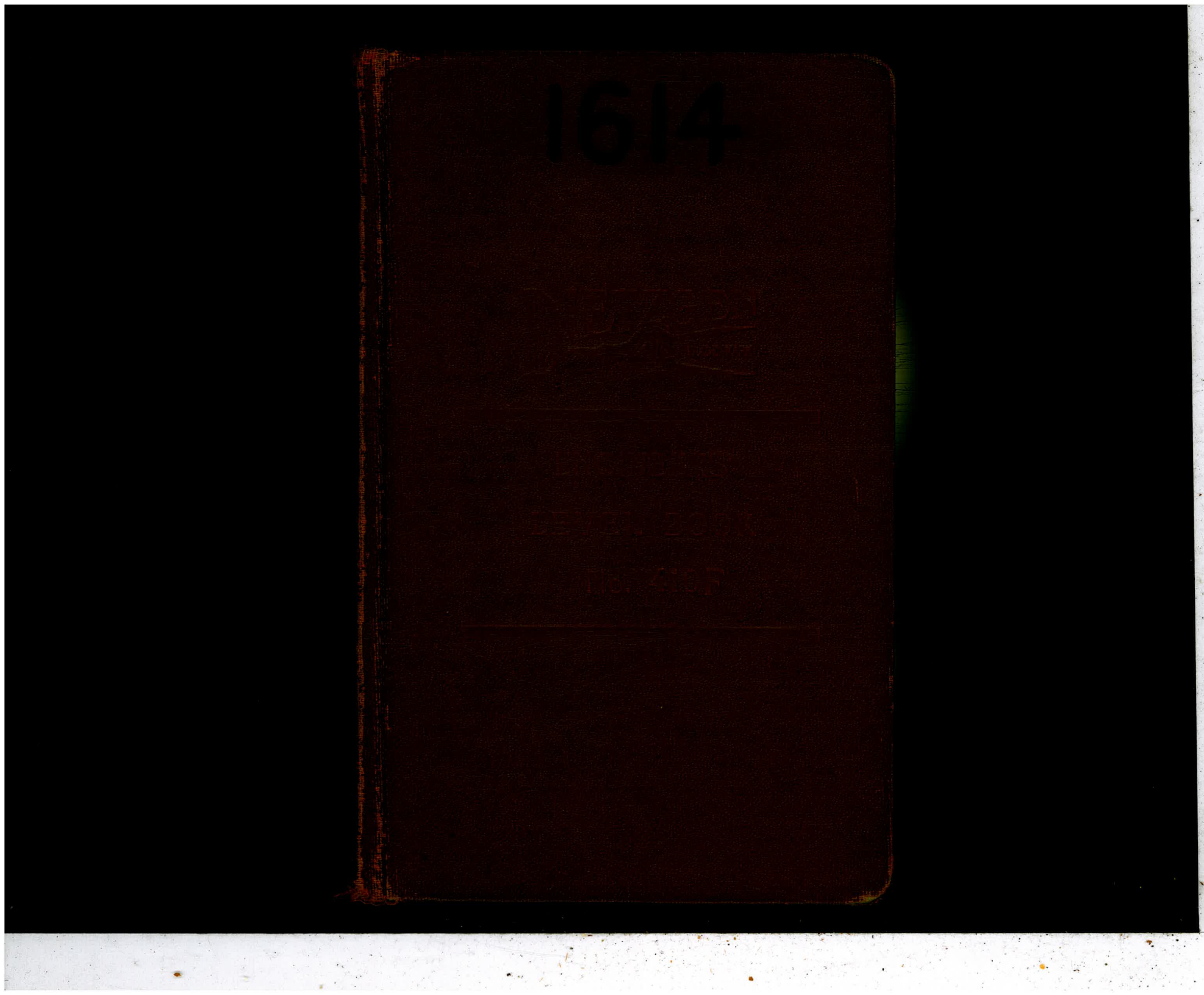

1614

EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and SURVEYING INSTRUMENTS

Chicago New York San Francisco New Orleans Pittsburg Toronto

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

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

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

1614

CITY ENGINEER

Levels Cont. from Page 80

		89.78			
54+65	Top Switzer Fill		5.4	79.4	
54+82.62	= Δ Rt 7°51		5.07	79.71	on Spike
55+13	= N Top Switzer Dam		4.7	80.1	Fill
+22	= Top Conc. = N. Face Dam		8.91	75.87	
+23	Reservoir Basin		10.2	74.6	
+29	" "		14.6	70.2	
56+00	" "		14.1	70.7	
+50	" "		13.4	71.4	
57+00	" "		13.2	71.6	
T.P.	3.33	76.41	11.70	73.08	
200' Lt. in Now	Reservoir Basin		15.1	61.3	
57+45	POT Stake P-79		4.10	72.31	
58+00			5.4	71.0	
+79	= S. Bank Wash		5.0	71.4	
59+00	in Wash		6.7	69.7	
+50	" "		6.6	69.8	
+60	= N Bank		4.8	71.6	
60+00			4.2	72.2	
+87	= S Bank		1.4	75.0	
T.P.	9.33	84.82	0.92	75.49	

Cont. P-1

Levels Cont from P. 0

84.82

60+90	S edge channel	12.4	72.4	✓
61+00	" "	12.6	72.2	✓
62+00	" "	9.6	75.2	✓
63+50	" "	9.6	75.2	✓
64+00	" "	8.0	76.8	✓
65+00	" "	7.0	77.8	✓
10' Ctr in Pocket		9.6	75.2	✓
65+25 - N Edge channel		8.1	76.7	✓
+30 N Bank		5.8	79.0	✓
66+00		4.2	80.6	✓ Same as 66+22.9 10-26
66+14.9 = 66+22.9	Equation	3.08	81.74	
			81.75	
			0.01 Error	

Walker
Wells
D. Farmer
10-25-41

10/30/41 Checked RTM

— BENCH MARKS —

Along Route of 11TH ST SEWER
from Jigsbee And Colton Street
to 11TH And A-St.

T.B. 1397-39

	9.50	16.40 ✓		6.90
T.P. #1	7.59	20.14 ✓	3.85	12.55 ✓
TP #2	9.73	24.72 ✓	5.15	14.99 ✓
TP #3	7.48	31.41 ✓	0.79	23.93 ✓
TP #4	0.30	28.64 ✓	3.07	28.34 ✓
TP #5	4.02	20.30 ✓	12.36	16.28 ✓
TP #6	0.90	19.69 ✓	1.51	18.79 ✓
TP #7	5.20	17.71 ✓	7.18	12.51 ✓
TP #8	6.93	19.42 ✓	5.22	12.49 ✓
TP #9	8.43	24.59 ✓	3.26	16.16 ✓
TP #10	7.67	31.63 ✓	0.63	23.96 ✓
TP #11	0.26	28.31 ✓	3.58	28.05 ✓
TP #12	2.17	18.69 ✓	11.79	16.52 ✓
TP #13	3.54	17.37 ✓	4.86	13.83 ✓
TP #14	10.03	23.03 ✓	4.37	13.00 ✓
TP #15	5.63	27.04 ✓	1.62	21.41 ✓
TP #16	8.77	30.81 ✓	5.00	22.04

Cont. P-3

20' North of N. line Colton on E.L. Jigsbee

B.M. #3. Copper Disk in Redwood Plug 2½" Galv. Pipe
B.M. #4-B NE Tack Main And Jigsbee St
B.M. #5-B SW. BP Newton " Jigsbee St
B.M. #6-B NE. BP National " Jigsbee St.
B.M. #7-B NW. BP Logan " Jigsbee St.
B.M. #8-B Cop Tack South Ld 7' line Logan And East 8' line 17th
B.M. #9-B. Cop. Tack E 7' line 17th And 3' N.W. Commercial St.

B.M. #10-B NE. BP Commercial And 16th
B.M. #11-B SE. Tack Imperial " 16th
B.M. #12-B NE. BP L-St. And 16th
B.M. #13-B SE. Tack K-St. " 16th
B.M. #14-B. SW. Tack K-St. " 15th
B.M. #15-B NW. BP K-St. " 14th
B.M. #16-B NW. Tack K-St. " 13th
B.M. #17-B NW. BP K-St " 12th
B.M. #18-B NW. Tack K-St " 11th

BENCH MARKS Cont. from P. 2

		30.81		
TP #17	10.14	38.67	2.28	28.53
TP #18	7.08	45.51	0.24	38.43
TP #19	7.22	51.37	1.36	44.15
TP #20	8.58	56.97	2.98	48.39
TP #21	8.86	64.33	1.50	55.47
TP #22	9.40	73.37	0.36	63.97
TP #23	7.14	80.16	0.35	73.02
TP #24	9.62	87.03	2.75	77.41
TP #25	5.95	90.97	2.01	85.02
Ch. N.W.		BM #1 State Highway	6.60	84.37

State Highway = 84.40
0.03 Error.

Completed 10-27-41

Walker = Notes.
Wells = X
D. Farmer = Red

BM #19-B S.W. B.P. J-St. And 11th St.
BM #20-B N.W. B.P. Island Ave " 11th St.
B.M. #21-B N.W. 7 Tack MARKET And 11th St.
BM " 22-B N.W. B.P. G-St. And 11th St.
BM #23-B N.W. B.P. F-St. " 11th St.
B.M. #24-B N.W. B.P. E-St. " 11th St.
B.M. #25-B N.E. 7 Tack Broadway & 11th St.
B.M. #26-B N.W. B.P. C St. & 11th St.
B.M. #27-B S.E. 7 Tack B St. & 11th St.
BM #28-B N.W. B.P. A-St. " 11th St.

Walker
Wells
D. Forrow
10-27-41

10/20/41
Ck. W.

CHECK LEVELS

~~BENCH MARKS~~

OVER 11TH ST. SEWER Line of BMs.

As run on Pages 2, And 3 this book

				Mean Elev. BMs	
	6.27	19.54 ✓	13.27	13.27	
T.P.#1	10.05	16.95 ✓	12.64 ✓	6.90 ✓	6.90 ✓
T.P.#2	7.23	19.78 ✓	4.40	12.55 ✓	12.55 ✓
T.P.#3	9.91	24.91 ✓	4.78	15.00 ✓	14.995 ✓
T.P.#4	8.31	32.25 ✓	0.97	23.94 ✓	23.935 ✓
T.P.#5	0.44	28.79 ✓	3.90	28.35 ✓	28.345 ✓
T.P.#6	3.97	20.25 ✓	12.51	16.28 ✓	16.28 ✓
T.P.#7	0.50	19.28 ✓	1.47	18.78 ✓	18.785 ✓
T.P.#8	7.28	19.76 ✓	6.80	12.48 ✓	12.483 ✓
T.P.#9	8.36	24.52 ✓	3.60	16.16 ✓	16.16 ✓
T.P.#10	7.37	31.33 ✓	0.56	23.96 ✓	23.96 ✓
T.P.#11	0.42	28.47 ✓	3.28	28.05 ✓	28.05 ✓
T.P.#12	2.50	19.01 ✓	11.96	16.51 ✓	16.515 ✓
T.P.#13	3.80	17.62 ✓	5.19	13.82 ✓	13.825 ✓
T.P.#14	10.30	23.29 ✓	4.63	12.99 ✓	12.995 ✓
T.P.#15	5.49	26.89 ✓	1.89	21.40 ✓	21.405 ✓
T.P.#16	8.67	30.70 ✓	4.86	22.03 ✓	22.035 ✓

Cont. Page 5

F.B. 1597-39

B.M.#2 Conc. Mon. 17' East of W line Beardsley And 20' N.N.W. Colton 20' N N.E. Colton on E Line Sigsbee St.

B.M.#3 Copper Disk in Redwood Plug 2½ Galv. Pipe

B.M.#4-B P.2 N.E. 7' tack Main And Sigsbee st

B.M.#5-B S.W. B.P. Newton Ave " Sigsbee St.

B.M.#6-B N.E. B.P. National " " Sigsbee St.

B.M.#7-B N.W. B.P. Logan Ave " Sigsbee St.

B.M.#8-B C.L. South 7' Line Logan E 8' Line 17th

B.M.#9-B E 7' Line 17th And 3' N.N.W. Commercial St.

B.M.#10-B N.E. B.P. Commercial And 17th St.

B.M.#11-B S.E. 7' tack Imperial Ave & 16TH ST.

B.M.#12-B N.E. B.P. L-St. And 16TH

B.M.#13-B S.E. 7' tack K-ST. And 16TH ST.

B.M.#14-B S.W. 7' tack K-St. " 15th St

B.M.#15-B N.W. B.P. K-St " 14TH ST.

B.M.#16-B N.W. 7' tack K-St. " 13th St

B.M.#17-B N.W. B.P. K-ST. " 12th Ave.

B.M.#18-B N.E. 7' tack K-ST. " 11th Ave.

Check Levels.
Bench Marks
Cont. from P-4

		30.70			
T.P.#17	992	38.44	218	28.52	28.525
T.P.#18	788	46.31	0.01	38.43	38.43
T.P.#19	734	51.49	216	44.15	44.15
T.P.#20	893	57.32	310	48.39	48.39
T.P.#21	924	64.72	1.84	55.48	55.475
T.P.#22	937	73.35	074	63.98	63.975
T.P.#23	866	81.68	033	73.02	73.02
T.P.#24	892	86.32	428	77.40	77.405
T.P.#25	5.99	91.00	131	85.01	85.015
Chk. BM.#28			664	84.36	84.365

BM.#19-B.S.W. B.P. J-St. And 11TH Ave
BM.#20-B N.W. B.P. Island Ave And 11TH Ave
BM.#21-B N.W. 7' Tack Marked " 11th "
BM.#22-B N.W. B.P. G-St. " 11th "
BM.#23-B N.W. B.P. F-St " 11th "
BM.#24-B N.W. B.P. E-St " 11th "
BM.#25-B N.E. 7' Tack Broadway & 11TH Ave
BM.#26-B N.W. B.P. C-St " 11th "
BM.#27-B S.E. 7' Tack B-St. " 11TH Ave
BM.#28-B N.W. B.P. A-St. " 11th Ave

Preliminary Profile Levels

Walker Wells Furlow 10-28-41

for Proposed 11th St. Trunk Sewer

from 11th and Russ Blvd.

to Beardsley and Colton Ave

Location F.B. 1611-31-55

BM #28-B

5275 ⟨89.64⟩ ⟨84.365⟩

℄ Russ Blvd.			
109+36.39 = △Rt 0°09'	7.76	81.88	
109+56.39 = S.C.B. box on Pcv.	7.43	82.21	
109+66.39 = SL. on Piping	7.21	82.43	
110+00 on Pcv	6.77	82.87	
+50 " "	5.47	84.17	
110+79.35 = N.L. A-St.	5.30	84.34	
+88.35 N.C.B. A-St. on Pcv	5.29	84.35	
111+00 on Pcv.	4.89	84.75	
111+14.35 = ℄ A-St. on Pcv.	4.69	84.95	
24' Lt. on Rim MH.	4.05	85.59	
" " " Flow " =	20.68	68.96	
111+40.35 = S.C.B. on Pcv.	5.40	84.24	
111+54.35 = SL. " "	5.20	84.44	Not in Use
111+56.7 19' Lt. on Rim MH.	4.45	85.19	
" " " Flow " =	8.75	80.89	
112+00 on Pcv.	5.40	84.24	
113+00 " "	5.20	83.74	
114+00	6.38	83.26	
+54.7 = N.L. B-St.	6.65	82.99	

Indexed LM

⟨89.64⟩

114+68.7 = N.C.B. B-St. on Pcv.	6.91	82.73	
114+87.47 = N. Rail N. Track	6.09	83.55	
114+94.7 = ℄ B-St. on Pcv.	6.14	83.50	
114+95.5 = MH 24' Lt. on Rim	5.50	84.14	
" " " " Flow =	23.65	65.99	18.15 below Rim
115+02.15 = South Rail S. Track	6.16	83.48	
115+20.7 = S.C.B. B-St. on Pcv.	6.41	83.23	
115+34.7 = SL. B-St. " "	6.64	83.00	
115+35.1 = MH 19' Lt. on Rim	5.85	83.79	
116+00 on Pcv.	7.82	81.82	
T.P. 0.23 ⟨85.25⟩	4.62	⟨85.02⟩	BM #27
117+00 on Pcv	5.34	79.91	
118+00 " "	7.25	78.00	
118+30 " "	7.79	77.46	
118+35.06 = N.L. C-St. on Pcv.	7.68	77.57	
+49.06 = N.C.B. C-St. " "	7.60	77.65	
118+75.06 = ℄ C-St. " "	7.62	77.63	
24.6' Lt. on Rim MH	7.35	77.90	
" " " " Flow " =	16.83 24.18	61.07	16.83 below Rim.
119+01.06 = S.C.B. C-St. on Pcv.	8.01	77.24	
119+15.06 = SL. C-St. " "	8.01	77.24	Not in Use
19' Lt. on Rim MH.	7.34	77.91	
" " " " Flow "	2.04 9.38	75.87	

11th St. Sewer.

	⟨85.25⟩			
120+00 on Pav.		9.53	75.72	
121+00 " "		11.38	73.87	
T.P.	0.09 ⟨73.88⟩	11.46	⟨73.79⟩	
122+00 on Paving.		1.95	71.93	
122+10		2.00	71.88	
122+15.27 = N.L. Broadway.		1.93	71.95	
122+23.3 = N edge cleanout Rim		1.94	71.94	
Flow line "		3.44	70.44	
122+29.27 = N.C.L. Bdwy. on Pav.		1.91	71.98	
122+45 on Pav.		2.17	71.71	
+4.78 = N Rail Car Track		2.35	71.53	
122+55.27 = L Bdwy. on Pav.		2.31	71.57	
+62.58 = South Rail Car Track		2.34	71.54	
122+72.60 = Gas MH. Rim		2.36	71.52	
122+81.27 = S.C.L. Bdwy. on Pav.		2.73	71.15	
122+95.27 = S.L. " "		3.15	70.73	
19' Lt. on Rim MH		3.01	70.87	MH. Sealed.
123+03 on Pav.		3.71	70.17	
124+00 " "		5.52	68.36	
125+00 " "		7.85	66.03	
+95.38 = N.L. E-St.		10.01	63.87	
126+09.38 = N.C.L. E-St.		10.05	63.83	on Paving.

11th St. Sewer. 7

Preliminary Level ⟨73.88⟩

126+35.38 = L. E-St. on Pav.	10.14	63.74	
+61.38 = S.C.L. E " "	10.70	63.18	
+75.38 = S.L. " " "	10.98	62.90	
19' Lt. on Rim MH.	10.35	63.53	MH. Sealed.
T.P. 1.495 ⟨65.47⟩ (T corrected)	9.89	63.99 / 63.975 = BM. / 0.015	BM. #24-8
127+00 on Pav.	3.18	62.29	
128+00 " "	5.69	59.78	
129+00	8.18	57.29	
129+75.78 = N.L. F-St. Pav	10.02	55.45	
129+89.78 N.C.L. on Pav	10.41	55.06	
130+00	10.15	55.32	
130+07.7 = N Rail N Track	10.10	55.37	
130+15.78 = L F-St. on Pav	10.26	55.21	
130+23.68 = S Rail S Track	10.37	55.10	
+41.78 = S.C.L. on Pav.	10.69	54.78	
130+55.78 = S.L. F-St	11.07	54.40	
+55.3 19' Lt. on Rim MH	10.48	54.99	

	(65.47)	11th St. Sewer.	
T.P. 002	(54.66)	10.83	(54.64)
131+20 on Paving.		1.60	53.06
132+00 " "		3.20	51.46
133+00 " "		5.30	49.36
+56.14 = N.L.G.-St. on Pav.		6.37	48.29
+70.14 = N Cb. G-St " "		6.41	48.25
+78 on Pav		6.37	48.29
133+96.14 = L G-St. on Pav.		6.58	48.08
134+22.14 = Scb G-St. on Pav.		7.25	47.41
+36.1 = MH 191 Lt. on Rim		7.01	47.65
" " " Flow			
134+31.14 SL.G-St. on Pav.		7.46	47.20
134+41.14 = L Rt. 0°00'30"		7.52	47.14
135+00 on Pav.		8.20	46.46
136+00 " "		9.28	45.38
137+00 " "		10.28	44.38
+36.05 = N.L. on Pav. Market St		10.54	44.12
T.P 114.	(45.29)	10.50	(44.16)
			44.15 = BM. 21
			001
137+52.05 = N.Cb. on Pav.		1.44	43.85
+67		1.03	44.26

Preliminary Levels	(45.29)	11th St. Sewer.	8
137+78.6 = N Rail N Track.		0.93	44.36
137+86.05 = L MH.		0.93	44.36
+93.35 = S Rail S Track		0.95	44.34
138+08		1.58	43.71
+20.05 Scb. MH.		2.35	42.94
138+36.05 = SL. "		2.23	43.06
192 Lt. on Rim MH		1.63	43.66
139+00 on Pav.		3.35	41.94
140+00 " "		4.93	40.36
141+00 " "		6.60	38.69
+36.59 = N.L. Island Ave		7.07	38.22
+50.59 = N Cb. " "		7.19	38.10
+76.59 = L " "		7.43	37.86
142+02.59 = Scb " "		8.29	37.00
+16.59 = SL. " "		8.61	36.68
+16.7 = MH. Rim 193 Lt.		8.17	37.12
143+00 on Paving.		10.51	34.78
144+00 " "		12.71	32.58
T.P 0.35.	(33.43)	12.21	(33.08)
145+00		3.13	30.30

Cont. p. 9

		11th St. Sewer.	
	(33.43)		
145+17 = NL. J-St.		3.52	29.91
+31 = N℄ "		3.58	29.85
+57 ℄ "		3.90	29.53
+83 = S℄. "		4.64	28.79
+97 = SL. "		5.02	28.41
145+96 on Rim MH. 19' Lt.		4.49	28.94
" Flow			
146+00 on Rim		5.04	28.39
147+00 " "		7.35	26.08
148+00 " "		9.61	23.82
+97.32 = NL. K-St.		11.79	21.64
149+11.32 = N℄		11.83	21.60
149+22.32 Δ Lt. 90°03'		11.80	21.63
T.P. 3.47	(25.50)	11.40	(22.03) BM #18-8
+41.32 = ℄ 11th		3.84	21.66
+67.32 = E℄ 11th		3.95	21.55
+81.32 = EL. 11th		3.96	21.54
150+00		4.11	21.39
151+00		4.38	21.12
+81.58 = NL. 12th		4.55	20.95
+93.5 = ℄ 2x2.5' Grating		5.02	20.48

Preliminary Levels	(25.50)	11th St. Sewer	
151+95.58 = N℄. 12th		4.79	20.71
152+21.58 = ℄ 12th		5.23	20.27
+47.58 = E℄ "		5.61	19.89
+61.58 = E.L. "		5.92	19.58
153+00		7.29	18.21
154+00		10.92	14.58
T.P. 5.81	(18.81)	12.50	(13.00) BM #16-8
154+61.86 = NL. 13th St.		6.14	12.67
8.5 Lt. on Hd. Wall		5.96	12.91
" " " Flow. Drain		7.05	11.76
154+77 = ℄ Culvert		6.33	12.48
10' Lt. on Rim Cleanout		6.19	12.62
" Flow "		7.39	11.42
155+00		6.27	12.54
+27 = ℄ Culvert		6.16	12.65
10' Lt. on Rim cleanout		6.10	12.71
" " " Flow "		7.25	11.56
+41.86 = EL 13th		6.16	12.65
8' Lt. on Hd. Wall		5.91	12.90
" " " Flow		7.09	11.72
156+00		5.95	12.86
157+00		5.57	13.44

	(18.81)	11TH St. Sewer	
157+42.45 = W.L. 14th St.		5.20	13.61
+56.45 = W.C.b. 14th St.		5.12	13.69
+82.45 = L. "		5.10	13.71
158+08.45 = E.C.b. "		5.18	13.63
+22.45 = E.L. "		5.23	13.58
10' Lt. on Grating.		5.71	13.10
159+00		4.93	13.88
159+85 Δ Rt 102°15"		4.66	14.15
160+00		4.58	14.23
161+00		4.10	14.71
162+00		2.77	16.04
161+94 157' Rt on Rim MH.		2.75 5.60	16.06 1 Flush Trap MH Not in Use
" Flow		8.35	10.46
162+18.49 = W.L. 15th		2.53	16.28
+32.49 = W.C.b. "		2.20	16.61
TP 0+00 Boulder Canyon Line	9.92 (26.46)	2.27 (16.54)	F.B. 1613 = locations of Line
= 162+41.49 = Δ Lt 1°15'45"		9.67	16.79
+58.49 = L. 15th		9.40	17.06
+84.49 = E.C.b. 15th		8.90	17.56
+98.49 = E.L. "		8.61	17.85
163+00		8.51	17.95

	(26.46)	11TH St. Sewer	
164+00		4.96	22.00
+91		0.70	25.76
+98.29 = W.L. 16th		0.12	26.34
8' Lt. on Hd. Wall		+0.05	26.51
165+00		0.16	26.30
TP	0.79 (27.23)	0.02	(26.44)
165+12.29 = W.C.b. 16th		0.78	26.45
+30.85 = W. Rail W. Truck		0.24	26.99
+38.29 = L. 16th		0.08	27.15
+45.57 = E. Rail E. Truck		0.00	27.23
T.P.	3.37 (29.81)	0.79	(26.44)
165+58.29 Δ Rt 89°55'45"		2.13	27.68
+73.3 = MH 4' Rt. on Rim		2.27 (2.33)	27.54
" " " " Flow		8.60	21.21
+99.29 = S.C.b. K-St.		2.17	27.64
166+09.2		2.37	27.44
4' Lt. on Hd. Wall		1.80	28.01
" " " Float		2.67	27.14
166+13.29 = S.L. K St.		2.58	27.26
+14.6 = on Rim MH 20.2 Rt.		3.00	26.81
" " Flow " "		1.95	24.86
167+00		3.68	26.13

11th St. Sewer

(29.81)

168+00	4.95	24.86
169+00	6.33	23.48
+08.5 N.L. end Inlet	6.94	23.37
6' Lt. on Toe "	6.53	23.28
169+13.89 = N.L. L-St.	6.37	23.44
4' Lt. on Hd. Wall	5.84	23.97
5' Lt. " Flow Inlet	7.06	22.75
169+27.89 = N cb - L-St	6.60	23.21
20' Lt. on Hd Wall	5.80	24.01
" " " Flow	7.13	22.68
20.5' Rt. on Rim cleanout	7.33	22.48
" Flow "	= 8.78	21.03
chk. BM 12-B	5.82	(23.99)
582 (π Corrected. 29.78)		(23.96 = BM)
169+53.9	7.31	22.47
4.1' Rt. on Rim Sewer MH	7.44	22.34
" " " Flow "	→ 12.54	17.24
169+64.9 41' Lt. on Rim	7.50	22.28
" " " " Top Water Main	= 10.20	19.58
+79.89 = S.cb. L-St.	8.16	21.62
+93.89 = SL. L-St.	8.22	21.56
4' Lt. on Hd Wall	7.89	21.89
" " " Flow	8.68	21.10

Flow = 5.10 below Rim.

Water Main MH

Water Main = 12" or 16"

Preliminary levels

11th St. Sewer

(29.78)

170+00	8.57	21.21
171+00	10.50	19.28
172+00	12.29	17.49
TP 1.00	(18.47) 12.31	(17.47)
7.56 S on Rim MH 19.4' Rt	2.18	16.29
+93.82 = N.L. Imp. Arc.	2.30	16.17
4' Lt. on Hd. Wall	1.91	16.56
" " " Flow	2.90	15.57
173+07.82 = N cb. Imp. Arc	2.56	15.91
	2.33	16.14
+08 = on Rim cleanout 45' Lt.		
" Flow "	4.83	13.64
20' Rt. on Rim "	2.80	15.67
" " " Flow "	5.15	13.32
173+26.22 = N Rail N Track	2.63	15.84
+33.82 = L Imp.	2.75	15.72
4.1' Rt. on Rim Sewer MH	2.86	15.61
" " " Flow "	5.38	10.23
	8.24	
173+41.37 = S Rail S Track	2.84	15.63
+59.82 = S cb.	2.94	15.53
+69.1 app. " end Hd. Wall	2.93	15.54
4' Lt. on Hd. Wall	2.37	16.10
" " " Flow	3.35	15.12

Flow = 2.50 = 13.64 below Rim.

Flow = 2.35 below Rim

Flow = 5.38 = ~~10.23~~ below Rim

Preliminary levels ⟨18.47⟩ 11TH ST. SEWER

173+74.6 opp. toe of Inlet	3.21	15.26	
4' Lt. on toe Inlet	3.39	15.08	
174+00	3.50	14.97	
175+00	4.63	13.84	
176+00	5.73	12.74	
+68.5 = opposite Toe Inlet	6.49	11.98	
6' Lt. on Flow at Lb.	6.80	11.67	
176+74.00 △ Lt 12°13'30"	6.30	12.17	
6' Lt. on Hd. Wall	5.93	12.54	
" " " Flow	7.19	11.28	
176+89 = ℄ culvert	6.50	11.97	
23.6' Rt. on Rim cleanout	7.00	11.47	
" " " " Flow	9.05	9.42	
17.5' Lt. on Hd. Wall	5.97	12.50	
" " " Flow Inlet	7.22	11.25	
176+97 on Rim MH 9.3' Rt.	7.88	10.59	Flow Sewer MH = 4.10 below Rim
" Flow " " →	11.98	6.49	
177+05.07 = N Rail N Track SD+A	6.62	11.85	
+25.2 = S " S " "	6.64	11.83	
177+35.42 = △ 77°43'15" H.	7.18	11.29	
ch. 8M to 10-B	6.00	⟨12.47⟩	
		⟨12.485 = BM⟩	
		0.015 Error.	

T.P. 9.56	⟨21.77⟩	6.26	⟨12.21⟩ E. Line 16TH St.
177+42.42 = end of Paving		10.63	11.14
178+00		9.7	12.1
179+00		7.6	14.2
+83.2 on Rim MH 19.5' Lt.		4.09 (6.58)	17.68 Flow line = 6.58 below Rim.
" " Flow " " "		10.67	11.10
180+00		5.1	16.7
+15.23 = ▷ Rt. 89°55'15"		5.0	16.8
+22		5.0	16.8
+36.23 = St. Commercial		3.4	18.4
+38		1.4	20.4
180+87.14 POT. Stake		1.72	20.05
181+40		2.7	19.1
+43		4.5	17.3
+44		7.1	14.7
+48		8.6	13.2
+52 in Wash		10.4	11.4
+57.3 10.5 Rt. on Rim MH		8.79 (6.56)	12.98
" " " " Flow "		15.35	6.42
+67 = Sedge Wash		9.0	12.8
+68 on Bank "		7.8	14.0

			11TH St. Sewer
	⟨21.77⟩		
181+83.4 = MH 31' Rt. Rim		8.52	13.25
" " " Flow =		15.62	6.15
182+00		8.7	13.1
+64		8.6	13.2
+66		7.5	14.3
TP 10.37	⟨26.65⟩	5.49	⟨16.28⟩ BM #8-B
182+74.7 = N edge Walk		12.05	14.60
+81.9 = N. C6. Logan Ave		12.08	14.57
+86.9 " N Gut. Paving		12.43	14.22
183+00 on Paving		11.91	14.74
+11.45 = N Rail N Truck		11.49	15.16
+30.65 S Rail S "		11.08	15.57
183+45.18 Δ Lt. 50°29'		11.11	15.54
184+00		8.63	18.02
185+00		3.87	22.78
T.P. 6.80	⟨32.59⟩	0.86	⟨25.79⟩
186+00		5.17	27.42
+10.99		4.66	27.93
6' Rt. = ℄ outlet on Flow		5.97	27.12
+16.4 6' Rt. on Rt. Wall		4.05	28.54
" " Flow		5.39	27.20

Preliminary Levels ⟨32.59⟩

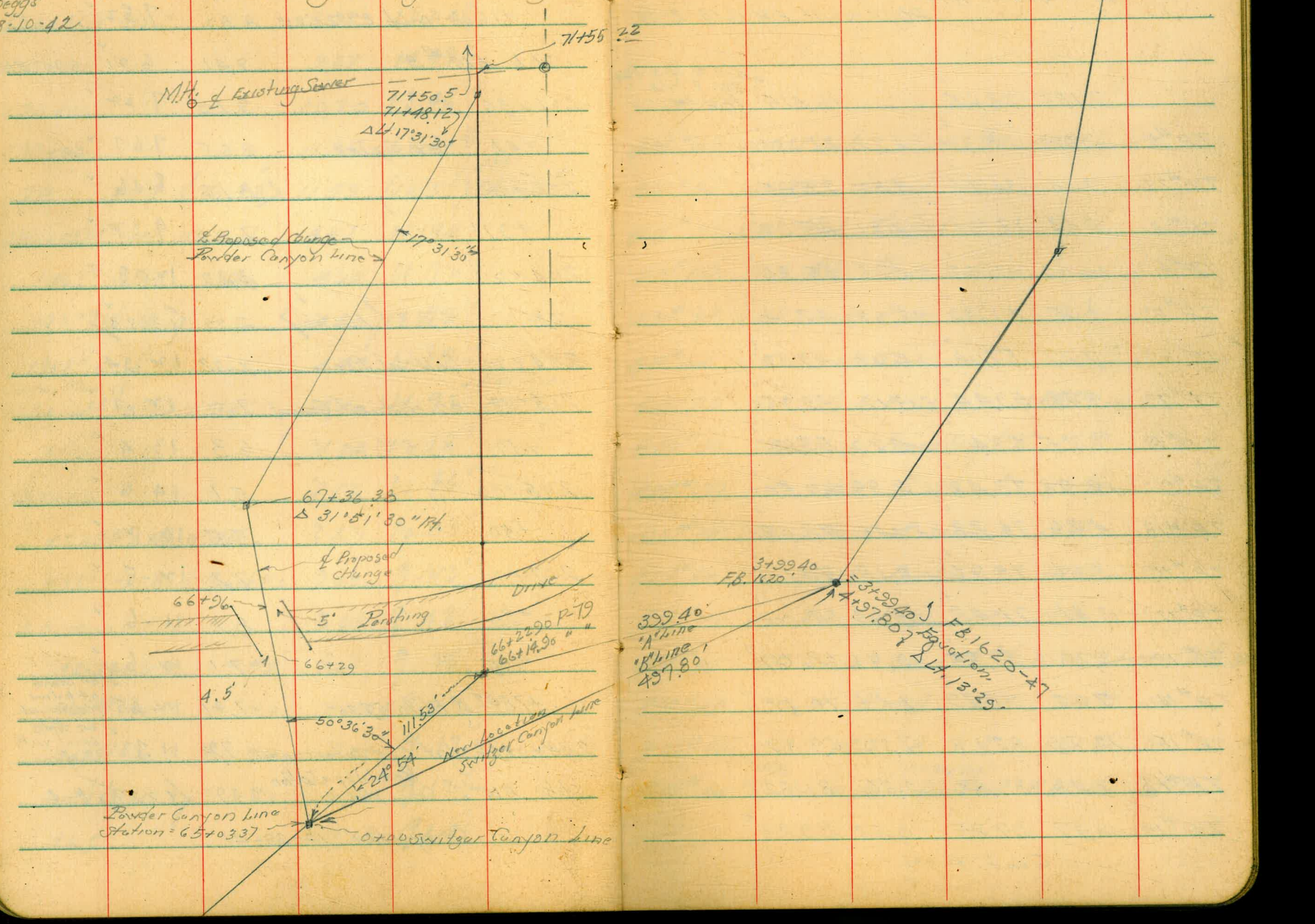
		11TH St. Sewer
186+16.44 = W.C6. Sigsbee	4.24	28.35
+26.94	3.97	28.62
+49.94 = Δ 89°56' Rt.	3.55	29.04
+56 = ℄ Culvert	3.55	29.04
26.5' Lt. on Rt. Wall	3.11	29.48
26.5 " " Flow	4.84	28.25
186+70.99 = SL. Logan	3.54	29.05 beginning Cone Pav
187+00	4.31	28.28
188+00	6.15	26.44
189+00	7.99	24.60
+71.47 = NL. National Ave	9.42	23.17
+85.47 = N C6. " "	9.75	22.84
190+00	9.50	23.09
+11.47 = ℄ National "	9.57	23.02
+37.47 = S C6 "	10.06	22.53
+51.47 = SL. National "	10.06	22.53
TP 0.21	⟨24.16⟩	8.64 ⟨23.95⟩ BM #6-B
191+00	2.78	21.38
192+00	4.88	19.28
193+00	6.81	17.35
+51.78 = NL. Norton Ave.	7.81	16.35

		11TH ST. Sewer	
	〈24.16〉		
193+91.78 = ℄ Newton		8.56	15.60
194+31.78 = S.L. "		8.92	15.24
195+00		9.67	14.49
196+00		10.70	13.46
197+00		11.85	12.31
TP 3.77	〈16.32〉	11.59	〈12.57〉 BM #4 12.55
197+32.22 = N.L. Main St.		4.37	11.95
+46.22 = N.C.L. " St.		4.60	11.72
+72.22 = ℄ Main		4.40	11.92
+98.22 = S.C.L. "		4.43	11.89
S. Line Main St = 198+12.22 = Δ Lt. 0°35'		4.40	11.92 End Conc. Paving.
+60		4.14	12.18
199+00		4.56	11.76
+62.23 Δ Rt. 0°35'		6.29	10.03
+93.27 = N Rail Track #1		7.09	9.23
200+00		6.84	9.48
+20.12 = N Rail " #2		7.07	9.25
+27.27 = N " " #3		7.10	9.22
+40.07 = N " " #4		7.15	9.17
+53.06 = N " " #5		7.15	9.17
+65		7.18	9.14

Preliminary Levels		11th ST. SEWER		
	〈16.32〉			
201+00		8.36	7.96	
+16.08 Δ Lt 87°20'20"		8.80	7.52	
chk. BM #3		9.41	6.91	6.90 = BM
201+36		9.10	7.22	
+41.08 = E.L. Sigsbee		8.65	7.67	
202+00		8.16	8.16	
+97		7.00	9.32	
204+00		4.29	12.03	
T.P. 6.33	〈19.66〉	2.99	〈13.33〉	
204+21 = End of Proc.		7.32	12.34	
205+00 on Natural Ground		7.0	12.7	
+50 " " "		6.3	13.4	
206+00 " " "		5.1	14.6	
+50 " " "		5.5	14.2	
207+00 " " "		7.2	12.5	
+30 " " "		8.1	11.6	
+55 " " "		7.1	12.6	
+78.42 Δ Rt 10°59'30"		7.21	12.45	on stake 0.4 below Nat. Ground.
208+09.42 = Int 60" Interceptor		7.93	11.73	on stake Level with Surface.
chk. BM #2 Conc. Mon. Boardsley & Colton		6.39	〈13.27〉	P-4
Completed 10-29-41				

Walker
Bliss
Hardin
Beggs
8-10-42

Proposed Change in Powder Canyon Sewer "A" Line To Avoid Cutting Through Pershing Drive



Walker.
Wells
J. Furrow
11-14-41

Powder Canyon Trunk Sewer
Bench Marks.

from 15th And K-St.
to Univ. Ave

Alignment F.B. 1613-2-34

	7135	23.65		16.515	B.M. # 14-8 Page 4 SW. 7'tack K-St. And 15th
T.P. #1	6.77	28.70	1.72	21.93	
TP #2	7.38	32.73	3.35	25.35	
TP #3	7.44	37.36	2.81	29.92	
TP #4	10.04	45.62	1.78	35.58	
TP #5	8.95	51.89	2.68	42.94	
TP #6	7.27	57.08	2.08	49.81	
TP #7	5.48	59.44	.312	53.96	
TP #8	7.75	63.43	.376	55.68	
TP #9	12.98	73.48	2.93	60.50	
TP #10	4.26	76.28	1.46	72.02	
TP #11	3.86	73.96	6.18	70.10	
TP #12	3.41	71.43	5.94	68.02	
TP #13	9.18	71.85	8.76	62.67	
TP #14	7.22	77.39	1.68	70.17	
TP #15	12.29	82.18	7.50	69.89	
TP #16	7.98	89.80	0.36	81.82	
TP #17	8.47	97.75	0.52	89.28	

Cont. P-17

Indexed
C.S.K.

B.M. #29 NW. 7'tack J St. And 15TH St.
B.M. #30 NW. BP Island " " "
B.M. #31 SE. 7'tack Market " " "
B.M. #32 N.E. BP G-St. " " "
B.M. #33 SW. 7'tack. F-St. " " "
B.M. #34 SE 7'tack E-St. " " "
B.M. #35 SW. 7'tack. E-St. " 16th "
B.M. #36 SE 7'tack Broadway And 16th "
B.M. #37 NE. 7'tack C-St. " 16th "
B.M. 38 SE 7'tack B-St. " 16th "
B.M. #39 SW. 7'tack B-St. " 17th "
B.M. #40 NW. BP B-St. " 18th "
B.M. #41 C.T. on W 7'Line 19th And North 7'Line 18th St.
B.M. #42 SE BP B-St. And 20th St.
B.M. #43 SW. 7'Mon A-St. " 21st St.
B.M. #44 = #20 Spike in Fork Euc Tree (Tree = 30" dia) 9' Rt Sta. 56+18

Powder Canyon

Bench Marks Cont. from P16

		97.75 ✓		
TP #18	4.41	94.22 ✓	7.94	89.81 ✓
TP #19	12.71	102.59 ✓	4.34	89.88 ✓
TP #20	7.63	107.38 ✓	2.84	99.75 ✓
TP #21	10.20	114.33 ✓	3.25	104.13 ✓
TP #22	12.66	124.79 ✓	2.20	112.13 ✓
TP #23	10.60	129.01 ✓	6.38	118.41 ✓
TP #24	6.85	130.31 ✓	5.55	123.46 ✓
TP #25	12.80	140.48 ✓	2.63	127.68 ✓
TP #26	12.69	148.84 ✓	4.33	136.15 ✓
TP #27	12.56	158.98 ✓	2.42	146.42 ✓
TP #28	5.28	163.74 ✓	0.52	158.46 ✓
TP #29	6.52	166.56 ✓	3.70	160.04 ✓
TP #30	12.49	176.02 ✓	3.03	163.53 ✓
TP #31	11.32	185.57 ✓	1.77	174.25 ✓
TP #32	1.79	186.74 ✓	0.62	184.95 ✓
TP #33	12.85	194.57 ✓	5.02	181.72 ✓
TP #34	8.62	197.17 ✓	6.02	188.55 ✓
TP #35	6.77	201.63 ✓	2.31	194.86 ✓
TP #36	7.73	208.03 ✓	1.33	200.30 ✓

Pershing Pipe & Powder Canyon Road

BM #45 Brass Plug S.E. Cor Cobble stone Bridge FB 1613-19

BM #46 = Chisel cross on Iron Ring MH (West edge) 22' Rt 71+55.26

BM #47 = Spike in West side Elec. Pole #C 1724 9.5' Rt Sta. 77+92

BM #48 = " " " " #C 1764 9.5 Rt Sta. 81+41

BM #49 = " " " " #C 1824 9' Rt " 85+55.81

BM #50 = " " East side Elec Pole #C 1884 10.5' Rt " 90+47

BM #51 = Chisel cross in MH Rim, West edge 38' Rt on diag. 94+60.4

on ℄ Stake 98+18.10

BM #52 Spike in East side Elec. Pole #C-2593=40'Lt of Sta 102+64

BM #53 " " " " " " #C-2699=80'Lt 108+50

BM #54 " " " " " " #C-2795-75'Lt. 112+90

BM #55 " " " " " " #C 2931 = 38'Lt 118+10

BM #56 " " " " " " #C 3065 = 65'Lt. 123+00

BM #57 " " " " " " #C 3225 = 110'Lt 128+70

BM #58 NE Cor Hd. Wall Box Culvert Marked by "Arrow" chisled. 55'Lt. 131+70

BM #59 N.E. BP PC. of Bct. Upas & Florida Sts.

BM #60 S.E. Top Fire Hydt.

Powder Canyon Bench Marks

Cont. from P-17

		208.03 ✓		
TP 37	11.34	219.05 ✓	0.32	207.71 ✓
TP #38	7.97	224.54 ✓	2.98	216.57 ✓
TP #39	10.71	230.65 ✓	4.60	219.94 ✓
TP #40	11.34	235.97 ✓	6.02	229.63 ✓
TP #41	12.06	246.26 ✓	1.77	234.20 ✓
TP #42	11.79	257.77 ✓	0.28	245.98 ✓
TP #43	12.39	269.74 ✓	0.42	257.35 ✓
check B.M.				
TP #44	12.17	277.98 ✓	3.93	265.81 ✓

Record
265.96 = BM BP
0.14 = difference

TP #45	11.18	289.10 ✓	0.06	277.92 ✓
check B.M.			2.14	286.96 ✓

Record
287.08 = BM
0.12 = difference

Profile Levels Page 19

BM #61 = chisled cross in South Hd. Wall 10' Rt on Cypress & 149+99.40

BM #62 = chisled cross in Iron Rim MH East side 33' Lt 154+26.7

BM #63 = " " " " " " " " 43' Lt 161+60.7

BM #64 = NW. BP Univ. Ave. And Alabama St.

BM #65 = SW. BP Univ. Ave And Florida St.

Walker
Wells.
D. Farrand
11-17-41

POWDER HOUSE CANYON

Indexed C.S.K. Rebecca checked 12/22/41

TRUNK SEWER

Preliminary levels for Profile of Ground Line, from 15th and K-St. to Univ. Ave.

Alignment in F.B. 16 10-2-37

BM #14-B SW. 7' fr. J-St.

Location Revised See Page 68-A

2.5' South of N.L. K-St.		9.205 (25.72)		16.515 K-15th P-16
=0+00	on Pav.		8.96	16.76
+11	" "		9.56	16.16
0+25 = N.L. K-St.	on Pav.		9.25	16.47
+50	on Pav.		8.68	17.04
1+00	" "		8.04	17.68
+50	" "		7.34	18.38
2+00	" "		6.65	19.07
+50	" "		5.99	19.73
3+00	" "		5.27	20.45
+22.2 =	Opp. East MH.		5.10	20.62
17.8' Rt	on Rim M.		4.81 5.45	20.91
" "	Top Sewer Pipe Flow		13.46	12.26 Sewer Const. through this MH.
3+25.11 =	S.L. J-St.	on Pav.	5.11	20.61
3+39.11 =	S.C.L.	" "	4.88	20.84
3+65.11 =	L. J-St.	" "	4.34	21.38
		(25.72)		
3+91.11 =	N.C.L.	on Pav.	4.15	21.57
4+05.11 =	N.L. J-St.	"	4.12	21.60
4+50	on Pav.		3.54	22.18
5+00	" "		3.10	22.62
T.P.	6.64	π corrected (28.57)	3.81	(21.93) BM (21.91) 0.02 Error
check BM = 29				
5+50	on Paving		5.49	23.08
6+00	" "		5.03	23.54
+50	" "		4.55	24.02
7+05.11 =	S.L. Island	on Pav.	4.02	24.55
+19.11 =	S.C.L.	" "	3.72	24.85
+45.11 =	L.	" "	3.30	25.27
(7+45.4) 17.4' Rt	on Rim MH.		3.25	25.32
" " "	Flow "	Line from West = 13.14		15.43
" " "	Flow Line, North & South		13.57	15.00
7+66.4			6.21	22.36
8.5' Lt.	on Rim Cleanout		3.28 3.68	25.29
" " "	Flow "		6.91	21.66
43.8 Rt	on Rim "		3.36 3.53	25.21
" " "	Flow "		5.89	22.68
7+85.11 =	N.L. Island	on Pav.	3.09	25.48
T.P.	7.51	π corrected (32.96)	3.23	(25.35) 15th N.W. BR (25.34) N. Island
check BM = 30				
8+00	on Pav.		7.41	25.45

Powder House Canyon Sewer

⟨32.86⟩			
8+56 on Pavmg.	6.86	26.00	
9+00 " "	6.16	26.70	
+50 " "	5.46	27.40	
10+00 " "	4.86	28.00	
(9+335)	5.64	27.22	
17.35' Rt. on Rim NH.	5.24	27.62	
" " " Flow from West =	15.51	17.35	
" " " Flow North + South	15.79	17.07	
10+50 on Pavmg	4.16	28.70	
+765 = ΔH 0°04'21"	3.52	29.34	
(10+81.57) 16.95 Rt on Rim NH.	3.35 (10.82)	29.51	
" " " Flow NH.	14.17	18.69	
10+8464 = St. Market st	3.48	29.38	
11+00.64 = South Cb " "	3.94	28.92	
(11+02.10) 5.6' Rt. on cleanout Rim	3.79 (2.06)	29.07	
" " Flow "	5.85	27.01	
" 31' Rt. on Rim cleanout	3.65 (1.54)	29.21	
" " " " Flow "	5.19	27.67	
T.P 8.60 check BM #31 ⟨38.52⟩	2.94	⟨29.92⟩	SE-7 Tuck Market +15th
20' Rt. on Flow	11.97	26.55	
11+02.10 20' Rt on grating	9.63	28.89	
11+13	8.83	29.69	
+296 on S Rail Track	8.25	30.27	

⟨38.52⟩			
11+4939 = N Rail	8.27	30.25	
+58	8.53	29.99	
(11+673)			
7.7' Lt. on Rim cleanout	8.99 (2.45)	29.53	
" " " Flow "	11.44	27.08	
42.15' Rt. on Rim	8.72 (1.19)	29.80	
" " " Flow	10.21	28.31	
11+68.64 = N Cb NH.	9.15	29.37	
+8464 = N.L. "	8.58	29.94	
18.6' Rt. on Flow NH =	18.63	19.89	
18.6 Rt. on Rim NH.	8.53	29.99	
12+00	8.59	29.93	
13+00	7.13	31.39	
14+00	5.60	32.92	
+936 = St. G-St	4.37	34.15	
15+00 on Pav.	4.32	34.20	
15100.4 = NH 3.8' Rt. on Rim	4.19 (11.10)	34.33	
" " " " Flow	15.29	23.23	
15+07.67 = S. Cb G-St.	4.16	34.36	
T.P 11.11 check BM #32 ⟨46.69⟩	2.93	⟨35.58⟩ = BM ⟨35.59⟩ NE. G-15th	
(15+08.3) 21.8 Lt. on grating	12.92 (1.65)	33.77	
" " " Flow	14.57	32.12	
15+29.67 Δ Lt. 0°07'	11.84	34.85	

Cont. p-21

Location Revised See Page 68-71 Page 67-71

(46.69) Powder House Canyon Sewer

15+31.6 = Int. East. Sewer	11.78	34.91
22.55 Lt. on Rim MH	11.65	35.04
" " " Flow MH	24.35	22.34
18.13 Rt on Rim MH	11.78	34.91
" " " Flow MH	24.88	21.81
15+58.1 = ℄ Drain opposite Lt	11.60	35.09
22.1 Lt. on Grating of Drain	12.11	34.58
" " " Flow Line	13.66	33.03
15+73.6 = NL G-St.	14.58	35.11
16+00	10.96	35.73
+50	9.68	37.01
17+00	8.47	38.27
+50	7.25	39.44
18+00	6.00	40.69
+50	4.87	41.82
+74.15 = SL. E-St.	4.29	42.40
19+00	3.92	42.77
+06.22 on S. Rail Car Track	3.92	42.77
+22.95 = N Rail	3.92	42.77
19+38.3	4.16	42.53
30' Lt on Grating	4.72	41.97
" " " Flow	6.87	39.82

(46.69) Powder House Canyon Sewer

(19+38.3)		
54.5 Rt on Grating	4.27	42.42
" " " Flow	6.42	40.27
T.P. 967 Check BM #33 (52.61)	3.75	(42.94)
19+54.15 = NL, E-St	10.15	42.46
20+00	8.96	43.65
+55.	7.72	44.89
21+09.5	6.35	46.26
17.55 Rt. on Flow, Line from E	11.28	41.33
17.55 Rt on Rim MH.	5.94	46.67
" " " Flow, Line from West	12.30	40.31
" " " Flow " North + South	23.20	29.41
21+50	5.41	47.20
22+00	4.34	48.27
+54.69 = SL. E-St	2.96	49.65
22+69.64 = ℄ Drain Pipe	2.84	49.77
57.2 Rt. on grating	2.86	49.75
" " " Flow	4.66	47.95
T.P. 812 Check BM #34 (57.93)	2.80	(49.81)
21.1 Lt on grating	8.61 (3.18)	49.32
" " " Flow	11.79	46.14
22+77.49 = Δ Rt 90°01'20"	8.10	49.83
T.P. 846 (58.27)	8.12	(49.81)
+96.5 = MH 14.7' Lt on Rim	8.30 (19.03)	49.97
" " " " Flow	27.33	30.94

Rec Pages 68-71

Powder House Canyon

	(58.27)		
23+34.49	= E. Line 15TH St.	8.48	49.79
+50		8.50	49.77
24+00		7.55	50.72
+50		6.63	51.64
25+00		5.52	52.75
+34.88	= WL 16th	4.72	53.55
+57.88	= ℄ Lt 90°02'	4.20	54.07
+72.8		4.14	54.13
17.05 Rt on Rim MH		3.83	54.44
" " " Flow	(Inaccessible)		
25+97.3	= ℄ Surface Drain	4.10	54.17
13.7 Lt on Rim cleanout		4.31	53.96
" " " Flow	"	5.49	52.78
41.9 Rt " Rim	"	3.68	54.59
" " " Flow	"	4.91	53.36
26+14.88	= NL E. St.	4.30	53.97
T.P. Check BM #35	6.36 (60.32)	4.30	(53.96 - BM 53.97)
26+50		6.35	53.97
27+00		6.28	54.04
+50		5.82	54.50

Sewer

	(60.32)		
28+00		5.44	54.88
+50		5.17	55.15
29+00		4.86	55.46
+18.2	S. Rail Track #1	4.69	55.63
+26.82	= N " " #1	4.64	55.68
+42.30	S " " #2	4.72	55.60
+46.46	= N " " #2	4.68	55.64
+47.90	= S Rail " #3	4.68	55.64
+52.65	= N " " #3	4.72	55.60
+57.92	= S " " #4	4.75	55.57
+62.66	= N " " #4	4.72	55.60
29+60.29		4.79	55.53
15.7 Rt on Rim MH		4.49	55.83
" " " Flow	(Inaccessible)		
(29+39.3)	33.4' Rt on Rim MH	4.65 (12.32)	55.67
" " "	Flow "	16.97	43.35
T.P. Check BM #36	7.55 (63.23)	4.65	55.68 - BM (55.67)
29+95.26	= NL Broadway	7.69	55.54
	on top Pipe from N	23.94	39.29
(29+955)	17.3' Rt on Rim MH	7.98 (11.06)	55.85
" "	Flow to South	25.44	37.79
(29+80)	55.4 Rt on grating	In lot 7.94	55.29
" " "	Flow	10.08	53.15

See Pages - 68 - 71

(63.23) Powder House Canyon Sewer

30+50	7.02	56.21	✓
31+00	6.39	56.84	✓
+50	5.80	57.43	✓
32+00	5.20	58.03	✓
+50	4.60	58.63	✓
32+95.75 = SL. C-St.	4.12	59.11	✓
33+09.75	3.94	59.29	✓
33+35.75 = ℄ C-St.	3.30	59.93	✓
(33+60) 6' Lt. on Grating.	2.96 (3.60)	60.27	✓
" " " Flow	6.56	56.67	✓
T.P. 1256 Chk. BM #37 (73.06) ✓	2.73	(60.50) ✓	N.S. 7" tuck C-℄ 16th
33+75.75 = NL. C-St.	12.61	60.45	✓
34+00	12.14	60.92	✓
35+00	8.83	64.23	✓
36+00	5.50	67.50	✓
(36+73.97) 17.6 Rt. on Rim MH.	2.14	70.92	✓
" " " " Flow " (Inaccessable)			
~~36+75.93 = Stone B-St.~~			
T.P. Chk. BM #32 6.31 (78.33) ✓	1.03	(72.02 / 72.03) ✓	72.02 = BM
36+75.93 = SL. B-St.	8.40	69.93	✓
36+98.93 = Δ Rt 90°01'15"	7.57	70.76	✓
Storm Drain MH. Rim	→ 7.30	71.03 ✓	7.75 South of B-St
" " " Flow	→ 12.30	66.03 ✓	3.6' East of WL. 16th

(78.33)

37+15.93 = ℄ 16th.	6.48	71.85	✓
+29	6.00	72.33	✓
37+55.93 = EL. 16th St on Conc. Paving	6.10	72.23	✓
38+00 on Conc. Pav.	6.31	72.02	✓
39+00 " " "	7.45	70.88	✓
+56.27 = WL. 17th	8.01	70.32	✓
+70.27 = WCb.	8.19	70.14	✓
+96.27 = ℄ 17th St.	7.83	70.50	✓
24' Rt. on Rim MH.	8.60	69.73	✓
" " " Flow " (Inaccessable)			
T.P. 1.25 Chk. BM #39 (74.35) ✓	8.23	(70.10) ✓	S.W. 7" tuck B-St ℄ 17th St
40+22.27 = E.Cb. 17th	4.27	70.08	✓
40+36.27 = E.L. 17th	4.24	70.11	✓
41+00	5.42	68.93	✓
42+00	7.51	66.84	✓
+36.36 = WL. 18th	8.21	66.14	✓
+50.36 = WCb.	8.37	65.98	✓
+63	7.91	66.44	✓
+76.36 = ℄ 18th	7.70	66.65	✓
43+02.36 = E.Cb. 18th	8.40	65.95	✓
43+16.36 = E.L. 18th	8.38	65.97	✓

See Pages 68-71

T.P.	3.19	(74.35)	
Chk. BM #40		(71.2)	c.34 (68.02 = N.W. B.P. / 68.01 B-St. Hub 18th)
43+50			5.75 65.46 ✓
44+00			6.82 64.39 ✓
45+00			8.99 62.22 ✓
T.P.	8.35		✓ N.W. 7th Hub
Chk. BM #41		(71.02)	8.54 (62.67 B-St. Hub 19th)
45+17.34 = W.L. 19th St.			9.13 61.89 ✓
			9.11 61.91 ✓
+21.85 = P.O.T. this Line = Δ in Alternate Line			
45+57.34 = ℄ 19th			8.73 62.29 ✓
+83.34 = E. ℄ 19th			9.15 61.87 ✓
+97.34 = E.L. 19th			9.26 61.76 ✓
		Flow Small Line = 16.81	54.21 ✓ Flow Small Line
46+00.5 17'Lt. on Rim MH			8.88 62.14 ✓
" " Flow, North Stub			17.89 53.13 ✓ Flow Large Line
46+60			7.67 63.35 ✓
47+00.			6.68 64.34 ✓
End Conc. Pav.			
+98.42 = W.L. 20th			3.94 67.08 ✓
48+12.42 = W. ℄ 20th			3.44 67.58 ✓
+38.42 = ℄ 20th			2.60 68.42 ✓
48+61.20 = Δ Lt. 58°51'			2.10 68.92 ✓
T.P.	9.03		70.17 ✓ S.E. B.P.
Chk. BM #42		79.20 ✓	0.82 (70.16 B-St. Hub 20th)
(48+38.42) 17'Lt. on Rim MH			10.97 68.23 ✓ 4 Way MH. All Flow Lines at same Elev.
" " " Flow			17.24 61.96

		(79.20)	Powder House Canyon Sewer
48+78			10.36 68.84 ✓
		on Patch over Conc.	
+92 = Approx. ℄ 20th			10.16 69.04 ✓
49+00			9.98 69.22 ✓
+09± N. Cut. B-St.			9.45 69.75 ✓
+09± on N. ℄ "			9.10 70.10 ✓
+13			7.8 71.4 ✓
		on Pav. Stake	
+27.83 = P.O.T. = W.L. (20th)			6.57 72.63 ✓
+30			6.0 73.2 ✓
+75.			5.1 74.1 ✓
50+00			5.1 74.1 ✓
+40			5.8 73.4 ✓
51+00			8.5 70.7 ✓
+50			9.4 69.8 ✓
52+00			9.7 69.5 ✓
+50			9.9 69.3 ✓
53+00			10.3 68.9 ✓
+25.24 = Δ Rt. 17°48'20"			10.18 69.02 ✓ on stake
T.P.	12.23		69.89 = B.M. Conc. A-218
Chk. BM #43		(82.12)	9.32 (69.88) ✓ on Sewer Line
53+70			12.7 69.4 ✓
54+00			11.7 70.4 ✓
+35			9.7 72.4 ✓

All figures revised 68.71 See Page

Used

(82.12)

54+75	8.7	73.4	
55+00 - beginning Fill section	7.8	74.3	to Switzer Dam.
+40 on Fill = Top Dam	2.4	79.7	
+85 " " = " "	1.2	80.9	
55+85.17 = Δ H. 22°37' on Fill Ground.	1.37	80.75	on Stake
+96 on top Dam	1.2	80.9	
56+05.14 = Toe of Fill Switzer Dam	4.3	77.8	
31.50 Lt. on top Conc. Wall	6.35	75.77	
" " " Ground.	7.5	74.6	
T.P. 5.38 chk. B.M. #44 (87.20)	0.30	(81.82)	in Fork Euc. Tree 9' Rt. 56+18
56+50	9.0	78.2	
+70 in Fill	8.0	79.2	
+75 = Bottom Ditch.	11.6	75.6	
+86 in Fill	8.3	78.9	
45' Lt. on Nat. Ground.	14.3	72.9	
10' Rt. " " "	7.0	80.2	
57+00 in Fill	6.9	80.3	
10' Rt. on Nat. Ground	7.0	80.2	
57+50 in Fill	6.4	80.8	
58+00 " "	6.0	81.2	
10' Lt. on Top Fill	5.8	81.4	
18' Lt. " toe "	9.4	77.8	

(87.20) Border House Canyon Sewer

58+44 = P.O.T. in Fill	5.76	81.44	on Stake
12' Lt. = Toe Fill	11.3	75.9	
58+75 Side of Slope	8.9	78.3	
7' Rt. = Top Fill	4.7	82.5	
5' Lt. = Toe "	11.6	75.6	
58+94.25 = P.O.T. Stake	11.85	75.35	End of Fill Section
59+10 = South Bank Main channel	12.2	75.0	
+14 = Bottom " "	17.8	69.4	
+50 " " "	16.2	71.0	
60+00 " " "	15.0	72.2	
+50 " " "	14.9	72.3	
61+00 " " "	16.0	71.2	
+40 " " "	14.2	73.0	
61+60 " " "	13.9	73.3	
62+00 " " "	12.0	75.2	
+50 on Island	11.5	75.7	
+80 " "	10.6	76.6	
+85 in channel	12.4	74.8	
63+00 " "	12.0	75.2	
+08 " "	12.4	75.0	
+30 " "	11.3	75.9	

		(87.20)		
63+50	in channel	10.4	76.8	
64+00	" "	10.2	77.0	
T.P.	12.97 (89.80)	10.37	(76.83)	
+50	in channel	12.3	77.5	
65+00	" "	11.2	78.6	
+45		11.6	78.2	
+50		8.5	81.3	
+75		10.2	79.6	
66+00		9.5	80.3	
+22.9	∆ Lt. 29°12'15"	8.05	81.75	on Hub
+40		10.6	79.2	
+65		10.0	79.8	
+78.34		7.2	82.6	
33.2' Rt. on diag. = Rim MH		6.94 (7.62)	82.86	
" " " " on Flow	"	14.56	75.24	
67+00		7.1	82.7	
+30 = Toe Fill Leaching Drive		6.5	83.3	
+40 = Top " "		3.0	86.8	
+52.25 = South edge Paving		3.30	86.50	
+78.08 = ℄ Road Survey		3.01	86.79	
68+05.47 = N edge Road		3.10	86.70	

		(89.80)	Powder House Canyon Sewer	
68+26 = N edge Road		3.3	86.5	
+32		2.3	87.5	
+48 = Toe Fill		4.3	85.5	
69+00		4.5	85.3	
T.P. Chk. BM #45	4.43 (94.24)	+0.01	(89.81)	Brass Plug. Cobble stone Bridge Parking & Powder Canyon Road.
+50		8.6	85.6	
+80 on E. Bank	channel	9.6	84.6	
1' Lt. in Bottom	"	13.8	80.4	
+85	" " "	13.8	80.4	
69+40	" " "	13.0	81.2	
+45 on Bank		9.3	84.9	
+65		7.0	87.2	
8' Lt.		12.5	81.7	
71+00		6.5	87.7	
28' Lt. on E. Bank	channel	8.9	85.3	
35' Lt	channel	12.1	82.1	
71+55.26 = Int. Sewer	Existing.	6.1	88.1	
23' Rt. on Rim MH.		4.36 (4.30)	89.88	
" " " Flow,	Line from West	10.66	83.58	
T.P. Chk B.M. #46	12.45 (102.33)	4.36	(89.88)	Cross on Rim MH. 22' Rt. 71+55.26
72+00		13.7	88.6	

Powder House Canyon Sewer

72+50		12.8	89.5
73+00		11.9	90.4
+50		11.0	91.3
+82.5		10.3	92.0
21' Rt. on Rim MH		9.82 (5.35)	92.51
" " " Flow		15.17	87.16
74+00		10.2	92.1
+16 = Toe Fill		9.1	93.2
+34 = Top "		4.8	97.5
74+41.19 = P.O.T.		4.55	97.78
+80 = Top Fill		4.3	98.0
+90 = Toe Fill		8.7	93.6
75+00		8.8	93.5
+50		7.8	94.5
76+00		7.8	94.5
35' Lt. on East Bank channel		9.0	93.3
38' Lt. in "		11.3	91.0
76+50		6.9	95.4
77+00		7.0	95.3
+50		6.0	96.3
T.P. 849 Chk B.M. #47	(108.24)	2.57	99.75 (99.76)

Street Sweepings.

" "

" "

on Stake Street Sweepings

BM Spike in Pole 9.5' Rt. 77+92

Powder House Canyon Sewer Levels

78+00		10.2	97.3
+50		9.5	98.7
79+00		8.7	99.5
+50		7.6	100.6
80+00		6.8	101.4
+35		6.1	102.1
14.5		7.7	100.5
+60		7.1	101.1
(80+82). 21' Rt. on Rim MH		7.25 (5.30)	100.99
" " Flow "		12.55	95.69
80+92		8.4	99.8
+98 South side in channel		9.7	98.5
81+18 " " N side.		8.7	99.5
+20		8.0	100.2
81+30		7.7	100.5
+35		6.6	101.6
T.P. 8.23 Chk BM #48	(112.36)	4.10	104.13 (104.14)
+57.20 = P.O.T.		10.16	102.20
82+00		9.6	102.8
+50		7.7	104.7

P. 17

	112.36		
82+75	7.0	105.4	✓
+81 on South Bank channel	8.2	104.2	✓
+83 in channel	11.0	101.4	✓
83+00 " "	10.1	102.3	✓
+28.6 " "	9.3	103.1	✓
on Flow North & South	13.70	98.66	✓
21.2 Rt. on Rim M.H.	6.70 (6.29)	105.66	✓
" " " Flow, Line from West	12.98	99.38	✓
83+50 in channel	8.7	103.7	✓
84+00 " "	8.7	103.7	✓
+40 " " N edge	8.3	104.1	✓
+52	6.6	105.8	✓
+85	5.1	107.3	✓
85+00	3.0	109.4	✓
3' Rt. on W Bank	3.4	109.0	✓
12' Rt. " " edge channel	8.9	103.5	✓
85+25	1.3	111.1	✓
Chk. B.M. #49		112.13	
T.P. 5.85 (117.98)	0.20	(112.16)	✓
+47.66 = P.O.T.	7.30	110.68	✓
86+00	8.1	109.9	✓
60' Rt. on W Bank	9.1	108.9	✓
65' Rt. in W edge channel	12.3	105.7	✓

(117.98) ✓

86+50	7.1	110.9	✓
87+00	6.8	111.2	✓
+35	6.0	112.0	✓
+50	4.9	113.1	✓
87+83	4.8	113.2	✓
19.4' Rt. on Rim M.H.	5.09 (7.58)	112.89	✓
" " = Top Pipe "	12.67	105.31	✓ Pipe Capst. through M.H. Floor inaccessable
88+00	4.6	113.4	✓
+40 = ℄ Bank channel	4.8	113.2	✓
+47 ℄ edge "	8.0	110.0	✓
+70 = N " "	9.0	109.0	✓
+75 N Bank "	5.4	114.6	✓
89+00	5.0	113.0	✓
+25	6.2	111.8	✓
+30	5.1	117.9	✓
+50	4.2	113.8	✓
90+00	3.0	115.0	✓
T.P. 7.02 (122.17)	2.83	(115.15)	✓
		118.41 = B.M.	
Chk. B.M. #50 P-17	3.75	118.42	✓
90+60	5.5	116.7	✓
+25 = P.O.T. on Stake	4.80	117.37	✓

	⟨122.17⟩		
91+00		4.9	117.3
+20		5.0	117.2
+36	on S. Bank channel	5.6	116.6
+37	" " edge "	9.5	112.7
+55	= " N " "	8.3	113.9
+60	= N. Bank "	5.2	117.0
92+00		4.5	117.7
+50		3.6	118.6
+80	= S. Bank "	2.9	119.3
+81	S. edge "	3.2	117 0
+90	in "	5.6	116.6
93+00	" "	4.2	118.0
+23	N " "	4.5	117.7
+28	N Bank "	2.5	119.7
+50		1.6	120.6
TP	8.83 ⟨128.82⟩	2.18	⟨119.99⟩
93+90	= Δ Lt 8°50'	7.59	121.23 on Stake
94+08	S. Bank channel	7.4	121.4
+09	" edge "	10.4	118.4
+25	in "	9.6	119.2

	⟨128.82⟩ Boulder House Canyon Sewer.		
94+60.4	= Int. Sewer Produced	7.9	120.9
	diag. on Floor, Line to East	10.45	118.37
38' Rt.	on Rim MH.	5.35 5.35	123.47
"	" " Floor, North & South line	13.90	114.92
Jct. BM	= 51	5.35	⟨123.47⟩
95+00	in channel	7.9	120.9
+10	" "	6.3	122.5
30	N Bank.	6.1	122.7
96+00		5.0	123.8
+36		5.0	123.8
+50		3.8	125.0
96+64.04	Δ Rt 24°41'40"	3.11	125.71 on Stake
TP	7.02 ⟨132.73⟩	3.11	⟨125.71⟩
96+85	in channel = E. edge	7.0	125.7
97+00	" "	8.0	124.7
+50	" "	8.9	123.8
98+00	N Bank.	5.9	126.8
+18.10	= Δ Lt. 16°40'20"	5.04	127.69 on Rev. Stake
+50		5.1	127.6
+85		3.9	128.8
99+00		4.0	128.7
+50		3.3	129.4

		(132.73)			on Bank 2'Lt & 99+45
T.P.	9.02	(138.33)	3.42	(129.31)	
100+00			8.5	129.8	
16' Rt. on W Bank channel			5.9	132.4	
18' Rt. on W edge "			10.6	127.7	
43' Rt. " E " "			10.2	128.1	
100+50			7.8	130.5	
101+00			6.7	131.6	
+50			5.9	132.4	
101+68			6.0	132.3	
+75			6.7	131.6	
+82			6.0	132.3	
+92			5.6	132.7	
+95			7.1	131.2	
102+00			7.2	131.1	
(101+92) 22.2' Rt. on Rim MH			5.43 4.51	132.90	
" " " Top Pipe Floor "			9.97	128.36	Pipe Const. through this MH
34' Rt. on W edge Bank of channel			2.9	135.4	
44 Rt. " " " " "			7.2	131.1	
102+12 in Wash			7.2	131.1	
+15			5.1	133.2	
+50			4.5	133.8	
103+00			3.6	134.7	

		(138.33)		
Chk. BM # 52. P. 17		2.18	(136.15)	
103+50		2.9	135.4	
+60 = S. edge Bank		2.9	135.4	
62 = " " channel		4.9	133.4	
104+00 in "		4.1	134.2	
+35 " " N edge		4.0	134.3	
+38 on Bank " "		1.7	136.6	
+50		1.5	136.8	
T.P.	12.62 (149.81)	1.14	(137.19)	
105+00		11.6	138.2	
+05		10.8	139.0	
+10		10.7	139.1	
+15		11.4	138.4	
+50		10.4	139.4	
106+00		8.8	141.0	
46' Lt. = E Bank channel		9.2	140.6	
48' " " E edge "		12.3	137.5	
106 +50		6.8	143.0	
107+00		5.0	144.8	
+30		3.9	145.9	

	⟨149.81⟩		
107+50		3.7	146.1
+65		4.6	145.2
+95		4.3	145.5
108+00		6.1	143.7
+18		6.1	143.7
+23		7.2	142.6
+32		7.0	142.8
+37		5.9	143.9
+55 = S. Bank channel		5.4	144.4
+59 = S edge "		7.3	142.5
+80 in "		7.7	142.1
+85 " "		6.0	143.8
109+00 " "		6.3	143.5
(108+92.5) on Rim MH 308'W		5.06 5.48	144.75
" " Flow " "		10.54	139.27
109+15 = N edge Channel		5.9	143.9
+20 = N Bank "		3.2	145.9
+40		2.8	147.0
TP 8.16 Chk BM #53	⟨154.58⟩	3.39	⟨146.42⟩
109+50		8.2	146.4
110+05 = S. Bank channel		8.1	146.5

	⟨154.58⟩		
110+10 = S. edge Channel		10.3	144.3
+66 = N " "		9.7	144.9
+67 = N Bank "		6.8	147.8
111+00		6.4	148.2
+50		5.1	149.5
112+00		4.5	150.1
+45 = Bank of Channel		3.4	151.2
+52 = S. edge "		6.1	148.5
+67 in "		7.0	147.6
+80 in "		6.7	147.9
+85 in "		5.0	149.6
113+00 " "		4.1	150.5
+15 " "		3.4	151.2
+33 N edge "		5.5	149.1
+35 N Bank "		2.2	152.4
+50		1.7	152.9
TP 8.47	⟨161.29⟩	1.76	⟨152.82⟩
Chk. BM #54		2.81	⟨158.48⟩
			158.46 = B.M.
114+00		6.4	154.9
+38 = S Bank Channel		6.6	154.7
+45 = in "		9.1	152.2
2' Rt. on E Bank "		6.2	155.1

	⟨161.29⟩		
114+70 = N edge channel		8.5	152.8
+75 N Bank "		5.5	155.8
115+00		4.8	156.5
+50		3.4	157.9
+62 = S Bank channel		2.9	158.4
+65 = S. edge "		4.8	156.5
+88 = N " "		4.6	156.7
+92 = N Bank "		3.3	158.0
116+00		3.0	158.3
+35		3.3	158.0
+50		2.4	158.9
TP	8.24 ⟨166.91⟩	2.62	⟨158.67⟩
(115+92) 32.2' Rt. on Rim Mk		9.22 (6.38)	157.69
" " Flow "		15.60	151.31
117+00		6.7	160.2
117+58.60 ∠ Rt 7°09'		5.41	161.50 on stake
3' Lt.		6.7	160.2
8' Lt.		5.4	161.5
6' Rt. on W Bank, channel		5.4	161.5
7' Rt. " " edge "		8.0	158.9
diag. 47.5 Rt. = Δ Mk. on Rim	46.52' on Rim	5.11 (6.72)	161.80
" " on Flow, Line to NE = 11.83			155.08
" " " " North, South Line = 12.43			154.48

	⟨166.9⟩		
117+65 on S Bank channel		5.6	161.3
+75 on S edge "		7.0	159.9
118+00 in channel		6.8	160.1
2' Lt. = W edge channel		6.8	160.1
4' Lt. on W Bank "		4.8	162.1
20' Lt.		5.0	161.9
16' Rt. = E. edge channel		6.5	160.4
20' Rt. on E Bank "		5.2	161.7
118+50 in channel		6.6	160.3
119+00 " "		5.9	161.0
2' Lt. = W edge "		5.9	161.0
5' Lt. = W Bank "		3.5	163.4
15' Lt. = E. edge "		3.5	163.4
12' Rt. = E. Bank "		5.6	161.3
17' Rt.		4.3	162.6
T.P. 3.36 chk. BM "55	⟨166.89⟩ π corrected	3.36	163.53 = BM. ⟨163.55⟩
119+50 in channel		5.0	161.9
120+00 " "		4.5	162.4
8' Lt. = W edge "		4.5	162.4
10' Lt. " Bank "		2.1	164.8
20' Lt.		2.0	164.9
10' Rt. = E edge "		4.2	162.7
12' Rt. = E Bank "		2.8	164.1

Note: for Elev. of Mk at 119+67½ see P-42

	(166.89)			
25' Rt.		1.3	165.6	
120+50 in channel		4.0	162.9	
121+00 in "		3.2	163.7	
7' Lt. = W edge "		3.2	163.7	
13' Lt. on W Bank "		0.1	166.8	
20' Lt.		+0.2	167.1	
13' Rt. on E edge "		3.2	163.7	
15' Rt. " E. Bank "		0.3	166.6	
20' Rt.		0.0	166.9	
121+21.03 = Int. East Sewer		3.2	163.7	on ground in channel
+50 in channel		2.8	164.1	
122+00 " "		2.2	164.7	
6' Lt. = W edge "		2.2	164.7	
16' Lt. = W Bank		+4.3	171.2	
25' Lt.		+5.3	172.2	
12' Rt. = E. edge channel		2.2	164.7	
15' Rt. = E. Bank "		+1.3	168.2	
25' Rt.		+1.3	168.4	
T.P.	12.34 (177.26)	1.97	(164.92)	
122+50 in channel		11.7	165.6	
123+00 " "		11.5	165.8	

	(177.26)	Powder House Canyon Sewer.		
4' Lt. in channel		11.3	166.0	
5' Lt. " " on Hard Pan		10.1	167.2	
7' Lt. = W edge channel		9.6	167.7	
14' Lt. on W Bank "		2.3	175.0	
25' Lt.		2.0	175.3	
16' Rt. = E edge "		11.2	166.1	
17' Rt. = E Bank "		5.4	171.9	
25' Rt.		5.4	171.9	
123+50 in channel		10.4	166.9	
124+00 " "		9.4	167.9	
18' Lt. = W edge "		8.1	169.2	
23' Lt. = " Bank "		+0.4	177.7	
30' Lt.		+0.4	177.7	
13' Rt. = E. edge "		10.0	167.3	
15' Rt. on " Bank "		2.3	175.0	
25' Rt.		2.3	175.0	
T.P.	13.07 (186.88)	3.45	(173.81)	on Rock
Chk BM # 56-P-17		1.90	(184.98)	
	1.90 (186.85)		184.95 - BM	
Drop on Rim MH	20.6' Standing Manhole = 19.54	8.42	178.43 / 167.31	Sta 125+09.43
" Flow " "	to South = 21.42		165.43	"
T.P.	7.56 (181.34)	13.07	(173.78)	on Rock

124+55 = N edge channel	13.0	168.3	✓
23' Lt. = WLY " "	13.0	168.3	✓
28' " " " Bank	4.6	176.7	✓
35' Lt.	4.0	177.3	✓
3' Rt. on NELY Bank	8.2	173.1	✓
10' "	9.0	172.3	✓
124+75 on ELY Bank	7.6	173.7	✓
5' Lt. = " edge Channel	13.0	168.3	✓
124+88	6.1	175.2	✓
+90	7.5	173.8	✓
125+09.43 = 125+34.43 } Equation ΔLt 4°59'15"	8.63	(172.71) on Stake	✓
10' Lt. = E Bank channel	9.0	172.3	✓
18' Lt. " edge "	12.3	169.0	✓
10' Rt.	7.9	173.4	✓
18' Rt	5.4	175.9	✓
Powder Canyon Road			
24' Rt. = W edge Paving	6.3	175.0	✓
125+75	8.6	172.7	✓
126+00	8.1	173.2	✓
45' Lt on E Bank channel	7.8	173.5	✓
50' Lt = " edge "	12.6	168.7	✓

126+50	6.5	174.8	✓
127+00	4.8	176.5	✓
+50	2.9	178.4	✓
+67	2.5	178.8	✓
+80	3.7	177.6	✓
128+00	3.1	178.2	✓
60' Lt on E Bank Wash	7.1	174.2	✓
75' Lt in Main channel	9.0	172.3	✓
TP 12.17	(191.08) 2.43	(178.91)	✓
+48	9.9	181.2	✓
+51 in Wash	11.3	179.8	✓
+53	9.6	181.5	✓
+70	8.5	182.6	✓
9' Lt. = E Bank channel	11.7	179.4	✓
14' Lt. E edge "	14.8	176.3	✓
128+85 " " Bank "	9.3	181.8	✓
5' Lt. " " "	12.2	178.9	✓
15' Rt.	5.8	185.3	✓
128+90 E Bank "	10.4	180.7	✓
+92 " edge "	15.9	175.2	✓
129+05 = " " "	15.3	175.8	✓
5' Rt. on Bank	10.0	181.1	✓
10' Rt	9.0	182.1	✓

	〈191.08〉		
18'Lt. = N edge channel	13.2	177.9	✓
23'Lt. " Bank "	12.3	178.8	✓
129+40 = N Ly Bank "	13.0	178.1	✓
+23	11.6	179.5	✓
7'Lt. = E edge "	14.4	176.7	✓
20'Lt. W " "	14.5	176.6	✓
129+50	11.1	180.0	✓
+92	9.3	181.8	✓
129+96	10.3	180.8	✓
130+00	10.5	180.6	✓
32'Lt = E. Bank channel	10.6	180.5	✓
37'Lt in E. edge "	12.3	178.8	✓
130+37	10.4	180.7	✓
+40	9.6	182.5	✓
+50	9.2	182.9	✓
+85	7.7	183.4	✓
+87	6.9	184.2	✓
+93	8.4	182.7	✓
+98	7.0	184.1	✓
131+07 = Upas & Ext. Toe Fill	8.0	183.1	✓
+18	3.8	187.3	✓

	〈191.08〉		
131+30.59 = POT. Stake	3.26	187.82	✓
+36 on Berm	2.9	188.2	✓
+38.8 = S edge crushed Rock	3.90	187.18	✓
+55.49 = ℄ Upas & Extension	3.66	187.42	✓
+72 = N edge Paving	3.71	187.37	✓
+74 on Berm	2.7	188.4	✓
+78 " " (N edge)	2.7	188.4	✓
+88 = Toe Slope = End Fill Sta 6+00	6.0	185.1	✓
132+00	5.4	185.7	✓
51'Lt. = E. Bank channel	5.5	185.6	✓
52'Lt. " edge "	9.6	181.5	✓
chk. BM #57	9.35	〈181.73〉 181.72 = BM	✓
T.P. 9.26 chk BM #58 〈197.81〉 π corrected	2.51	〈188.57〉 188.55 = BM Upas & Powder House Canyon Sewer Cross in Hdwall	✓
132+50	10.9	186.9	✓
25'Lt. = E. Bank channel	11.3	186.5	✓
26'Lt. " edge "	15.1	182.7	✓
133+00	11.0	186.8	✓
+47	8.5	189.3	✓
+73	8.1	189.7	✓
134+00	8.0	189.8	✓
134+04 △ Rt. 15°38'20"	7.43	〈190.38〉	✓
34'Lt. = E. Bank channel	8.3	189.5	✓
39'Lt. in E. edge "	13.0	184.8	✓

Location Revised see Page 7

		〈197.81〉			
(134+04) 65' Lt = E Bank ch.			9.0	188.8	on diag. Toward M.H.
" 68' " edge "			12.9	184.9	" "
" 84 W " "			13.0	184.8	" "
" 88' W Bank "			9.1	188.7	" "
" 110.45 Lt. on Rim M.H.			8.19	189.62	" "
Flow to South			14.54	183.27	Drop M.H.
" " " " Flow from N.W.			12.11	185.70	
134+10			8.2	189.6	
+40			5.4	192.4	
+50			5.3	192.5	
135+00			4.6	193.2	
+10			5.1	192.7	
+45			4.8	193.0	
+74 = W Berm Powder Canyon Rd			3.0	194.8	
136+00 W edge Pav. " "			3.05	194.76	
+45 = S " Conc. Paving			3.83	193.98	Park Line ±
136+69.64 Δ Lt 13°59 on Conc. "			4.29	193.52	Cross in Pav.
+75.3 on Rim MH 11.6' Lt.			4.46	193.35	
" " Flow " "			10.56	187.25	
T.P. chk BM #59	9.50	〈204.36〉	2.95	〈194.86〉	N.E.B.P. Upas & Florida
137+00 on Conc. Paving			10.75	193.61	
138+00 " " "			9.74	194.62	

Powder House Canyon Sewer.

		204.36			
139+00 on Conc. Pav.			8.74	195.62	
140+00 " " "			7.74	196.62	
+20 " " "			7.48	196.88	
+54.10 = Δ Rt. 90°04'			6.96	〈197.40〉	
on Rim MH E Florida & Myrtle			6.97	197.39	
Flow North & South Line			10.22	194.14	
" Flow 6" Line to East			9.70	194.66	
140+69.10			6.70	197.66	
+79.10 = E.L. Florida			5.94	198.42	End of Conc. Paving
Chk. BM #60			4.06	〈200.30〉	S.E. top Hyd. Myrtle & Florida
141+00			4.5	199.9	
+46			1.2	203.2	
T.P.	12.50	〈216.53〉	0.33	〈204.03〉	
141+75			7.0	209.5	
142+00			2.1	214.4	
T.P.	11.67	227.34	0.86	215.67	
+15			10.6	216.7	
+30			8.2	219.1	
142+44.10 = Δ 90°04' Lt.			6.62	〈220.72〉	on stake
+70			3.2	224.1	
143+00			1.8	225.5	
+35			2.4	224.9	

		227.34 ✓			✓
143+57.17 = P.O.T.			3.19	224.15	Pav. Stake
+70			3.8	223.5	✓
144+00			7.3	220.0	✓
+50			8.3	219.0	✓
144+85			9.7	217.6	✓
145+25			9.4	217.9	✓
+50			10.1	217.2	✓
+85			10.3	217.0	✓
146+00			9.3	218.0	✓
+15			8.5	218.8	✓
+75			9.0	218.3	✓
147+06			9.7	217.6	✓
+30			9.4	217.9	✓
+40			10.0	217.3	✓
+55			9.5	217.8	✓
+65			11.0	216.3	✓
T.P.	4.76	221.92 ✓	10.18	(217.76)	✓
+78			10.0	214.9	✓
147+83.9			8.8	213.1	✓
4.6 Lt. on Rim MH			10.48	211.44	✓
" " " Flow " (Rim Frozen)			Flow inaccessible		

(221.92)

147+90	9.9	212.0	✓
148+32 = Toe Fill	9.0	212.9	✓
+46 on Fill	4.7	217.2	✓
+70 = South Bank channel	7.4	214.5	✓
1' Lt in channel	11.6	210.3	✓
+78 South Bank "	8.1	213.8	✓
+83 = " edge "	11.6	210.3	✓
149+00 = in "	10.9	211.0	✓
10' Lt = W edge "	10.7	211.2	✓
7' Rt = E " "	10.7	211.2	✓
149+47 = N edge "	10.0	211.9	✓
+48 = N Bank "	7.6	214.3	✓
15' Rt = E edge "	7.6	214.3	✓
149+70	6.6	215.3	✓
4' Rt = W Bank "	7.0	214.9	✓
7' Rt = W edge "	9.9	212.0	✓
22' Rt = E " "	9.5	212.4	✓
149+92.3	3.7	218.2	✓
3.6 Rt on Wing Wall	4.6	217.3	✓
4.2 Rt on Bottom "	8.0	213.9	✓
5' Rt. in Pocket channel	12.2	209.7	✓

	221.92	2.7		
149+99.1 = South end Box Culvert			219.2	
8' Rt. = W. inside edge		8.03	213.89	Floor Line
TP	11.67		219.94	BM chiseled cross in Hdl. wall
Ck 8 m=61 R18	231.61	1.96	219.96	10' Rt 149+99.40
150+09.7		12.0	219.6	
49' Lt. on Rim NW		11.57	220.04	
" " Floor "		21.50	210.11	
150+21		11.9	219.7	
+22		12.5	219.1	
150+27.2		11.3	220.3	
3' Rt		14.5	217.1	
3.8' Rt. on Wing Wall		14.0	217.6	
5' Rt. in W edge channel		17.4	214.2	
150+38		11.0	220.6	
10' Lt.		11.0	220.6	
2' Rt. = W edge "		16.7	214.9	
17' Rt. = E " "		16.7	214.9	
150+42 = W " "		15.7	215.9	
8' Lt.		10.4	221.2	
150+45		10.7	220.9	
2' Rt. = W edge "		15.5	216.1	
15' Rt. = E " "		15.5	216.1	
10' Lt.		10.7	220.9	

Powder House Canyon

231.61		Tower	
150+63	10.3	221.3	
10' Lt.	10.3	221.3	
2' Rt. = W edge channel	15.6	216.0	Main channel 13' lower
150+65 " " "	15.6	216.0	"
+85	14.9	216.7	
2' Rt. in Main "	16.3	215.3	W edge
12' Lt.	6.0	225.6	
20 Lt	5.5	226.1	
151+00	13.0	218.6	
4' Rt. = W edge channel	16.0	215.6	
16' Rt. = E " "	16.0	215.6	
6' Lt.	7.0	224.6	
10' Lt.	4.3	227.3	
151+08	12.0	219.6	
+10	8.6	223.0	
2' Rt.	9.0	222.6	
5' Rt.	15.8	215.8	
10' Lt.	7.0	224.6	
151+25	8.5	223.1	
2' Rt. = W edge channel	15.4	216.2	
18' Rt. = E " "	15.4	216.2	
10' Lt.	4.5	227.1	

(231.61)

151+50		9.0	222.6
1' Rt.		11.6	220.0
4' Rt. W edge channel		14.5	217.1
10' Rt. in "Main"		15.0	216.6
5' Lt.		8.3	223.3
10' Lt.		6.1	225.5
152+00		8.3	223.3
2' Rt.		12.5	219.1
7' Rt. in Main channel		14.5	217.1
10' Lt.		7.5	224.1
152+25		12.8	218.8
3' Lt.		11.8	219.8
4' Lt.		9.8	221.8
10' Lt.		8.5	222.8
4' Rt. = W. edge	"	14.5	217.1
152+35 " "	"	14.2	217.4
3' Lt. W Bank	"	10.9	220.7
10' Lt.		11.9	219.7
10' Rt. E. edge	"	14.5	217.1
152+68 = E. "	"	13.5	218.1
10' Lt. = W "	"	13.5	218.1
3' Rt.		12.0	219.6

(231.61) Powder House Canyon Sewer

10' Rt.		10.1	221.5
152+90		10.3	221.3
153+00		10.2	221.4
4' Lt. = E. Bank channel		10.0	221.6
9' Lt. = " edge "		13.4	218.2
20' Lt. = W " "		13.4	218.2
10' Rt.		10.0	221.6
153+65		7.9	223.7
154+00		5.7	225.9
10' Rt.		3.4	228.2
14' Lt. = E. Bank "		6.1	225.5
21' Lt. = E. edge "		11.8	219.8
31' Lt. = W " "		11.8	219.8
154+25		2.9	228.7
+50		4.3	227.3
+65		6.8	224.8
+76.7		6.6	225.0
ch4 BM #62 - p18			
TP	12.97 (237.60)	6.98	(224.63)
4.9' Lt. on Rim MH		12.97	224.63
" " " Flow "		17.46	220.14
154+85 = E. Bank channel		12.4	225.2

Both lines same River

Powder House Canyon Sewer

	(237.60)		
154+86 = S.E. edge channel		15.3	222.3
155+25 = N.W. " "		13.6	224.0
25' Rt. E. " "		13.9	223.7
10' Lt. = Top Bank "		10.2	227.4
155+50 = N.W. Bank "		10.0	227.6
+75		8.7	228.9
156+00		4.9	232.7
10' Lt		4.9	232.7
8' Rt		5.8	231.8
20' Rt = W. Bank channel		10.4	227.2
21' Rt " edge "		13.1	224.5
31' Rt. E. " "		13.1	224.5
T.P.	7.66 (244.88)	0.38	(237.22)
156+40		6.7	238.2
10' Rt		7.0	237.9
156+70		4.3	240.6
157+00		4.8	240.1
2' Rt.		4.8	240.1
3' Rt		7.6	237.3
12' Rt.		12.9	232.0
24' Rt = W. Bank channel		14.4	230.5
25' Rt. W. edge "		19.4	225.5

	(244.88)		
157+14 = Nat Ground		10.7	234.2
+25 = Toe Fill		10.2	234.7 Robinson Ave
+40 in "		5.4	239.5
		6.36	238.52 in Fill
157+70.10 = P.O.T. & Robinson Ave			on stake
10' Rt = Toe Fill on Nat. Ground		11.2	233.7
10' Lt. in Fill		0.4	244.5
157+83 = End Fill		5.3	239.6 Nat'l. Ground
T.P.	8.43 (253.07)	0.24	(244.64) Conglomerate
158+05 = Nat. Ground Hard Rock		9.4	243.7
+25		2.8	250.3
10' Rt		8.6	244.5
7' Lt		2.6	250.5
158+33.42 = P.O.T.		3.21	249.86 on stake
+50		3.1	250.0
+90		4.0	249.1
+95		3.2	249.9
159+00		4.7	248.4
10' Rt.		6.7	246.4
10' Lt.		2.6	250.5
159+15		5.5	247.6
+40		8.2	244.9

	⟨253.07⟩		
160+00		9.6	243.5
+50		8.6	244.5
160+85		7.5	245.6
161+00		8.4	244.7
+30		7.5	245.6
+60.7		7.8	245.3
5.3' Lt. = ℄ MH on Rim		7.09	245.98
" " " " Flow Line NE.	= 14.25		238.82
" " " " Flow	14.49 = N+S out		238.58
TP 11.77			
Chk BM # 63	⟨257.75⟩	7.09	⟨245.98⟩
162+00		11.6	246.2
+50		10.4	247.4
+60		9.7	248.1
+75		9.8	248.0
163+00		9.7	248.1
43' Rt. = W Bank channel		13.4	244.4
46' Rt. " edge "		19.0	238.8
163+23		8.0	249.8
5.6' Lt. = ℄ MH on Rim		16.57 7.89	249.86
" " " " NE Flow		18.47	239.28
" " " " Flow N+S	= 18.76		238.99
163+50		7.8	250.0
+90		6.6	251.2

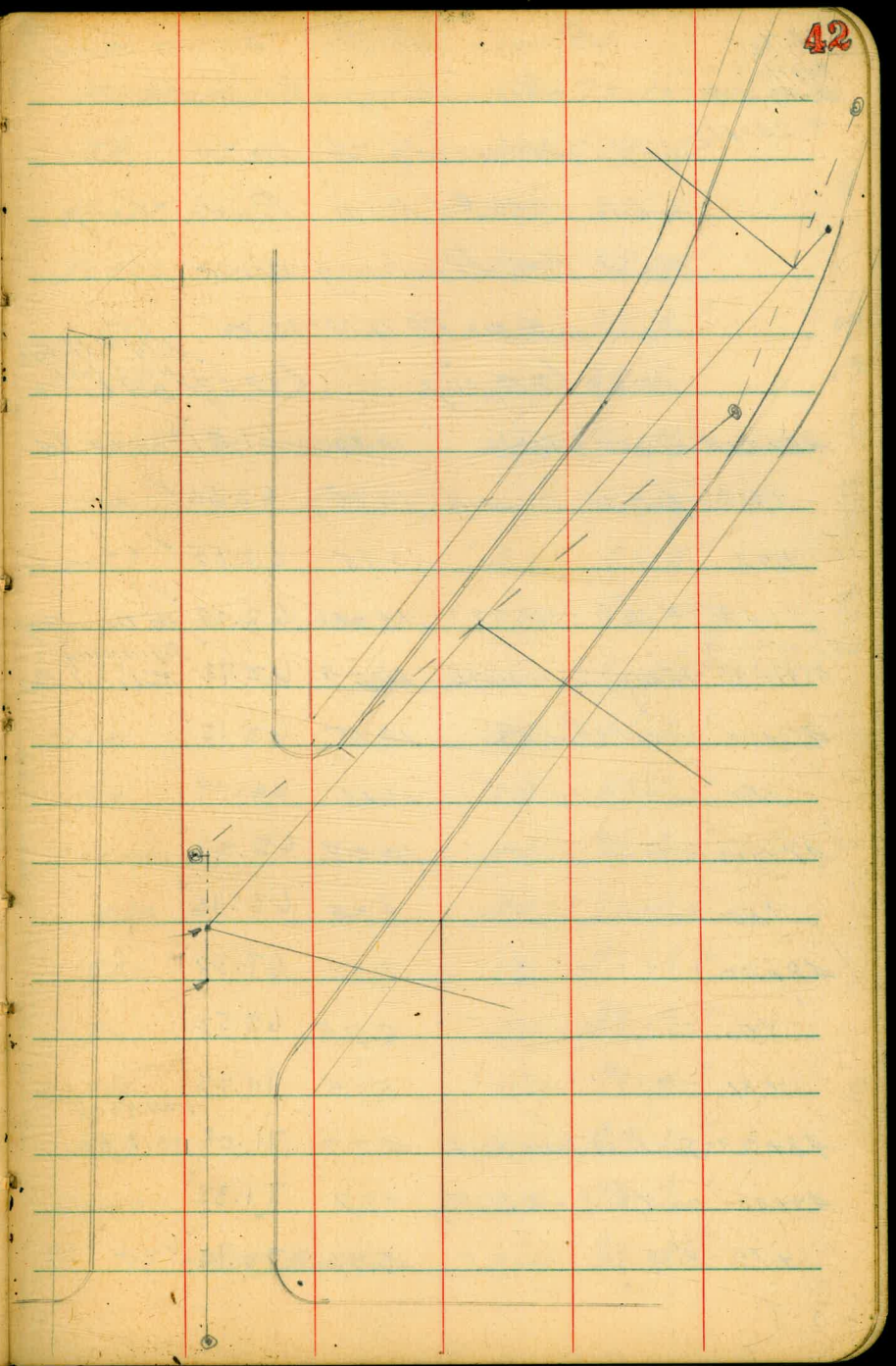
	⟨259.75⟩	Powder House Canyon Sewer.	
164+00		6.8	251.0
	Univ. Ave		
+21 = Toe Fill		5.1	252.7
+30 in "		1.0	256.8
TP	13.23 ⟨269.97⟩	10.1	⟨256.74⟩
TP	7.55 ⟨275.21⟩	2.31	⟨267.66⟩
164+54.12 = SL Univ. Ave		4.0	271.2 in Fill
4.5			
164+58.62 = Sedgs Sidewalk		2.50	272.71
+68.12 = S.C.L. Univ.		2.74	272.47
" " Gut. on Boring.		3.22	271.99
164+86.7 S Rail Car Track		2.45	272.76
+94.12 = ℄ Univ. Ave		2.57	272.70 in Fill on Boring.
Chk BM # 64 D-18		9.41	⟨265.89⟩ SW BR Univ of Alabama
			265.81 = BM
			0.01
Hand Level Filed Existing Drains			
on South Side Univ. opp 164+13			
164+13			
28' Rt. Flow 36" culvert			240.5
42' Rt. Flow 48" "			240.1
49' Rt. " 48" "			240.0

Wallace Wells Fattorini 11-25-41

Elevations Existing M.H.
Powder House Canyon Sewer Prelim.

BM. #55-R-17

	7.16	(170.69)	(163.53)
129+67.6	℄ MH. 17A Rim	6.56	164.13
	on Flow 8" line to West	11.06	159.63
	" " 6" " " "	12.58	158.11
	" Top Pipe North & South line	11.82	158.87



Walker
Wells
O. Fappani
11-24-41

Powder House Canyon Sewer

Preliminary Profile Levels.

~ Alternate line ~

from 19th And B to Powder Canyon Road And Pershing Drive

Alignment, see F.B. 1613-35-39

B.M. #41-P.16 NW 7" tree Bet B & 19th

12.63	⟨75.30⟩	⟨62.67⟩	
45+21.85 = Δ 90°03'45" Lt	13.39	61.91	on C.T. Ld.
+38.85 = E B.St. on Conc. Pav	12.74	62.56	
+52 " " " "	12.75	62.55	
+64.85 = N cb. " " "	13.01	62.29	In Driveway
45+74.35 = N edge Conc. Walk.	12.57	62.73	Beginning Rock & Oil Pav.
46+00 on Oil & Rock Pav.	12.15	63.15	
+50 " " " "	11.11	64.19	
47+00 " " " "	10.07	65.23	
+50 " " " "	8.94	66.36	
48+00 " " " "	7.92	67.38	
+50 " " " "	6.78	68.52	
+81 " " " "	5.05	70.25	
48+93 = South cb line A-St	4.22	71.08	on Rock & Oil Pav.
49+00 on Rock & Oil Pav.	3.97	71.33	
+19 = Δ A " " "	4.56	70.74	

* Not used See 11-28-41

⟨75.30⟩

49+45 = End Rock & Oil Pav.	2.20	73.10	N cb Line A-St on Lt.
T.P. 12.89	⟨87.11⟩	1.08	⟨74.22⟩
49+72		9.6	77.5
50+00		7.9	79.2
+50		4.4	82.7
+70		2.3	84.8
50+80.03 Δ Rt 73°58'45"		1.65	⟨85.46⟩ on stake
T.P. 3.91	⟨93.37⟩	1.65	⟨85.46⟩
51+02.7		8.9	86.5
5' Rt on diag. ° N.H. Rim		8.84	86.53
" " " " " Flow		13.82	81.55 Note: Inter. Taken on NW edge Flow toward cut b.
51+40		7.9	87.5
+50		6.3	89.1
52+00		4.1	91.3
+50		3.4	92.0
+60		2.9	92.5
+65		5.5	89.9
+80		5.0	90.4
+83		1.8	94.1
53+00		2.5	92.9
53 +17 = P.O.T. Pav. stake		2.31	93.06

Not used See Pg 68-71 *

Alternate Line

Cont. from P. 43

53+21		(95.37)	2.4	93.0	✓
+46			12.2	83.2	✓
TP	0.93	(84.27)	12.03	(83.34)	✓
+58			1.9	82.4	✓
+68			5.6	78.7	✓
+73			9.4	74.9	✓
+80			11.4	72.9	✓
+82 = ℄ Wash			13.0	71.3	✓
8' Rt.			12.9	71.4	✓
10' Rt.			18.0	66.3	✓
53+90			10.0	74.3	✓
+95			10.3	74.0	✓
53+98.82 = Δ 26°23'15" Lt.			12.05	72.22	✓ on stake
61.73 Rt on diag = Top Dam			8.98	75.29	✓
54+50			15.3	69.0	✓
18' Rt. W Bank channel			14.7	69.6	✓
30' Rt. W edge "			21.7	62.6	✓
TP	4.70	(76.19)	12.78	(71.49)	✓
54+70			6.7	69.5	✓
+85			4.6	71.6	✓

(76.19)

54+88 = ℄ Wash	8.0	68.2	✓
27' Lt on Lip culvert	+7.8	84.0	✓
54+91	5.9	70.3	✓
55+00 = W Bank channel	5.4	70.8	✓
3' Rt	7.8	68.4	✓
12' Rt = W edge "	12.0	64.2	✓
10' Rt	2.4	73.8	✓
55+20 = W edge "	4.6	71.6	✓
2' Rt	7.4	68.8	✓
55+32	7.0	69.2	✓
+42 = W edge Bank "	4.6	71.6	✓
2' Rt	6.5	69.7	✓
15' Rt = W edge channel	12.1	64.1	✓
55+75	5.2	71.0	✓
5' Lt	5.2	71.0	✓
7' Rt = W Bank "	5.0	71.2	✓
15' Rt " edge "	12.9	63.3	✓
56+00 = W edge Bank "	5.0	71.2	✓
8' Rt " " "	12.4	63.8	✓
56+45	5.9	70.3	✓
9' Rt = W Bank "	4.7	71.5	✓
14' Rt = W edge "	11.4	64.8	✓

Alternate Line

Cont. from P-44

	⟨76.19⟩		
57+00		6.3	69.9
3' Rt. = Top Bank		5.8	70.4
10' Rt. = Toe "		8.7	67.5
25' Rt. = W edge channel		10.3	65.9
57+17		5.6	70.6
+21		6.6	69.6
+50		6.0	70.2
58+04		4.0	72.2
13.5' Rt. on Rim MH		5.65 (5.38)	70.54
" " " Flow "		11.03	65.16
50' Rt. = W Bank channel		7.9	68.3
55' " = W edge "		9.2	67.0
58+07		3.2	73.0
+18		5.5	70.7
+50		6.8	69.4
59+00		6.0	70.2
40' Rt. = W Bank channel		6.0	70.2
41' Rt. = W edge "		8.4	67.8
59+30		5.9	70.3

Not used See Pg 68.71

		⟨76.19⟩		
59+40			1.1	75.1
TP	6.46	⟨81.45⟩	1.20	⟨74.99⟩
60+00			8.1	73.3
H5.98 = P.O.T. Hole			7.02	74.43
60+50			7.3	74.1
61+00			7.2	74.2
5.3 Ht. on top Sewer.		Existing Trunk	11.75	69.70
210' Rt. = W. Bank channel			8.4	73.0
220' Rt. = W edge channel			9.9	71.5
61+50			6.9	74.5
62+00			6.6	74.8
+15			4.7	76.7
+30			6.1	75.3
55' Rt. = W Bank channel			6.4	76.0
56' Rt. " edge "			7.6	73.8
62+60			5.5	75.9
63+00			4.7	76.7
63+50			4.0	77.4
64+00			4.0	77.4
7' Rt.			3.6	77.8
17' Rt. = E. Wash			5.0	76.4
50' Rt. = W edge Main channel			6.0	75.4

on Int. of Existing Sewers

Alternate Line Cont. from P45

		⟨81.45⟩		
T.P.	11.69	⟨90.05⟩	3.09	⟨78.36⟩
64+27			12.5	77.5
+30 in Wash			14.2	75.8
+36 " "			14.2	75.8
+40			12.6	77.4
+50			11.7	78.3
+94 = W Bank channel			11.7	78.3
+95			12.2	77.8
65+00			12.2	77.8
5' Rt. = Wedge channel			14.1	75.9
65+45 in "			12.7	77.3
8' Rt. in channel Pocket			14.8	75.2
65+65 = E. edge channel			13.3	76.7
+70 = E. Bank "			11.7	78.3
66+00			11.0	79.0
+40			9.8	80.2
66+59.54 = 66+22.90 P-26			8.30	⟨81.75⟩
Sh4 B.M. #45 P.17			0.23	⟨89.82⟩

89.81 - B.M.
0.01 Error.

Not used See P9 68-11

Walker
Wells
D. Furrow
11-26-41

Powder House Canyon Sewer
Preliminary Profile Levels
~ Alternate Line ~
from Station 134+04 to 140+59.05 in Myrtle St.

Alignment FB 1613 - 40-41

* 4.83 (199.69) (194.86) BM #59 P-17 NE. BP Upon Flange

134+04 = Δ Rt 19°05'			
+50	7.1	192.6	
135+00	6.0	193.7	
+25	5.7	194.0	
+60.3 Powder Canyon Rd. W edge Oiled Pav.	5.25	194.44	
136+00 on oiled Pav.	4.80	194.89	
+49.25 South edge Conc. Pavement	5.65	194.04	
+85.14 Δ Lt 17°36' " "	5.41	194.28	
+97.5 Conc. Pav. at cb	5.66	194.03	
+97.5 on Top cb	4.86	194.83	
137+00 on Conc. Walk	4.84	194.85	
+50 on Conc. Walk	4.48	195.21	
138+00 " " "	3.94	195.75	
+50 " " "	3.40	196.29	
139+00 " " "	2.98	196.71	
+55 on cb	3.46	197.23	
+55.1 on Conc Pav	3.10	196.59	

(199.69)

139+73 = N Gut. on Conc. Pav	2.99	196.70	at N cb
+73 on top cb	2.27	197.42	
140+00 on Conc. Walk	1.96	197.73	
+24 " " "	1.71	197.98	
+37.5 Int. cb. Rod on cb	1.27	198.42	
+37.5 " " " " Conc. Pav.	2.03	197.66	
Reference 140+59.05 = Δ Rt 90°04' = 140+74.10 "A" Line	1.71	197.98	
Chk. Cross 140+59.10 "A" Line	2.30	(197.39)	P-36

197.40 = Cross P 36
.01 Error.

See Page 72

Not Used

Walker.
Wells
12-15-41

11th St. Sewer, Preliminary Levels
for Proposed Change in Alignment
from K-St And 16th To Logan Ave
And 17th St.

Alignment, = F.B. 1611 - 47-51

SE 7' tack K-st & 16th	1.33	(29.38)		(28.05)	BM #13-B P-4
165+20.29 = Δ Rt 89°55'45"			2.74	26.64	on Nail
+27.9	= N Rail Car Track (Abandoned)		2.67	26.71	
+55.79	= S.L. K-st.		3.24	26.14	
166+00			3.57	25.81	
167+00			4.81	24.57	
168+00			6.08	23.30	
+76.4			7.19	22.19	
65' Rt. on Hd. Wall inlet			7.38	22.00	
" " " Flow			8.61	20.77	
168+91.8 = Int. Drain, on Pav.			7.24	22.14	
21.5 Rt. on Hd. Wall			7.43	21.95	
" " " Flow			8.71	20.67	
169+00			7.55	21.83	
+01.5 = opp MH. on Rt.					
26' Rt. on Rim			8.10	21.28	
" " " Flow					

12/16/41 Reduced & Plotted on Profile

		(29.38)		
169+55.9 = S.L. L-St.			9.18	20.20
170+00			10.02	19.36
171+00			11.80	17.58
TP	1.68	(18.92)	12.14	(17.24)
172+00			3.19	15.73
+55.8² = N.L. Imp. Ave			3.97	14.95
65' Rt. on Hd. Wall			4.45	14.47
" " " Flow			5.62	13.30
172+61.7 = N Rail Track #1			3.78	15.14
+69.5 = S " " #1			3.82	15.10
+79.3 = N " " #2			4.01	14.91
+85.7 = S " " #2			4.07	14.85
+88.5 = N " " #3			4.14	14.78
+93.4 = S " " #3			4.14	14.78
+98.5 = N " " #4			4.21	14.71
173+03.4 = S " " #4			4.21	14.71
172+70 = Int. Drain			3.81	15.11
22' Rt. on Hd. Wall			4.58	14.34
" " " Flow			5.92	13.00
173+35.8² = S.L. Imp. Ave.			4.71	14.21
174+00			5.45	13.47

Cont. P-49

	(18.92)	
	Cont. from P. 48	
175+00	6.61	12.31
176+00	7.78	11.14
+05	7.83	11.09
6.5' Rt. on Hd. Wall down	8.10	10.82
" " " Floor	9.20	9.72
176+44.09 = Δ Lt 89°56'43"	8.14	10.78
+54.44 = W Rail Cur Track #1	7.58	11.36
+69.14 = E " " " " #2	7.30	11.62
+74	7.22	11.70
+88 on cb. Rt.	6.72	12.20
TP 92.3 (21.46) E.L. 16th	6.69	(12.23)
= 177+02.09 = E edge Walk	8.88	12.58
+50 on ground.	7.7	13.8
178+00	6.2	15.3
+50	5.2	16.3
179+00	3.9	17.6
+02.82 = W.L. 17th	4.0	17.5
+17	4.4	17.1
+42.8 = Int Sewer from N.	3.8	17.7
179+72.82 = Δ Rt 89°55'15"	3.35	18.11

	(21.46)	
179+94.8 = N Rail S Ch.	2.92	18.54
+99.5 = S " "	2.95	18.51
180+34	4.7	16.8
+45	2.6	18.9
+48	1.3	20.2
181+00	1.4	20.1
+50	2.4	19.1
+57	8.1	13.4
+62	10.2	11.3
+77	10.8	10.7
+78	7.6	13.9
180+04.8 = Int Sewer (Shots not taken in order)		
30' Rt. on Rim MH	3.69	17.77
" " " Flow "	10.30	11.16 Line to East
" " " "	10.30	11.16 Line to North.
182+00	8.2	13.3
+58	8.6	12.9
+82 = N edge Walk	6.97	14.49 Logan Axe
+94.9 = N cb. Line Logan	7.32	14.14 on Boring
183+19.35 = N Rail N, Track	6.39	15.07
+38.56 = S Rail S, "	5.98	15.48

Cont. P. 50

2146

183+53.12 Δ Lt 50°24'	6.05	15.41	✓
183+55.72 } P.T.			✓
=183+45.18 } Equation	5.92	15.54	✓ P-13

Walker
Bliss
Hurdin
Beggs
8-10-42

LEVELS for Proposed Chunga Sewer "A" Line
In Powder Canyon
As Located on Page 15

1.34	(83.09)	(81.75)	El. Stake 66+22.9 P-26
65+03 = Δ Lt 50°36'30"	5.29	77.80	✓
+25	6.5	76.6	✓
3' Rt on Bank	4.0	79.1	✓
20' Lt. in channel	6.6	76.5	✓
65+50 " "	6.6	77.1	✓
66+00	6.0	77.1	✓
66+29	6.0	77.1	✓
45' Lt. at Bridge in chan.	6.6	76.5	✓
17.5' Rt. " " " "	5.4	77.7	✓
66+96	5.3	77.8	✓
5' Rt. in chan. at Bridge	5.3	77.8	✓
15.2' Lt. " " "	5.5	77.6	✓
67+36.38 = Δ Rt 31°51'30"	4.59	(78.50)	✓
T.P. 10.54 (89.04)	4.59	(78.50)	✓ on Δ Stake
12' Lt. = W edge channel	10.5	78.5	✓
10' Rt. = E " "	11.5	77.5	✓

(89.04) ✓

67+55 in channel	11.5	77.5	✓
+72 " " East edge	10.6	78.4	✓
+77 in Bank " "	7.6	81.4	✓
68+00	6.7	82.3	✓
+50	6.2	82.8	✓
35' Lt. from E. Bank	6.9	82.1	✓
38' Lt. in " edge channel	8.9	80.1	✓
60' Lt. " W " "	9.0	80.0	✓
69+00	5.3	83.7	✓
30' Lt. E Bank "	6.4	82.6	✓
33' Lt. " edge "	8.9	80.1	✓
52' Lt. W " "	9.0	80.0	✓
69+36 = S Bank "	6.2	82.8	✓
+40 = S edge "	9.5	79.5	✓
+52 " N " "	8.8	80.2	✓
+56 N Bank "	7.2	81.8	✓
69+67	6.0	83.0	✓
+90	4.7	84.3	✓
39' Rt = W Bank	5.4	83.6	✓
40' " W edge	8.8	80.2	✓
51' " E "	8.8	80.2	✓

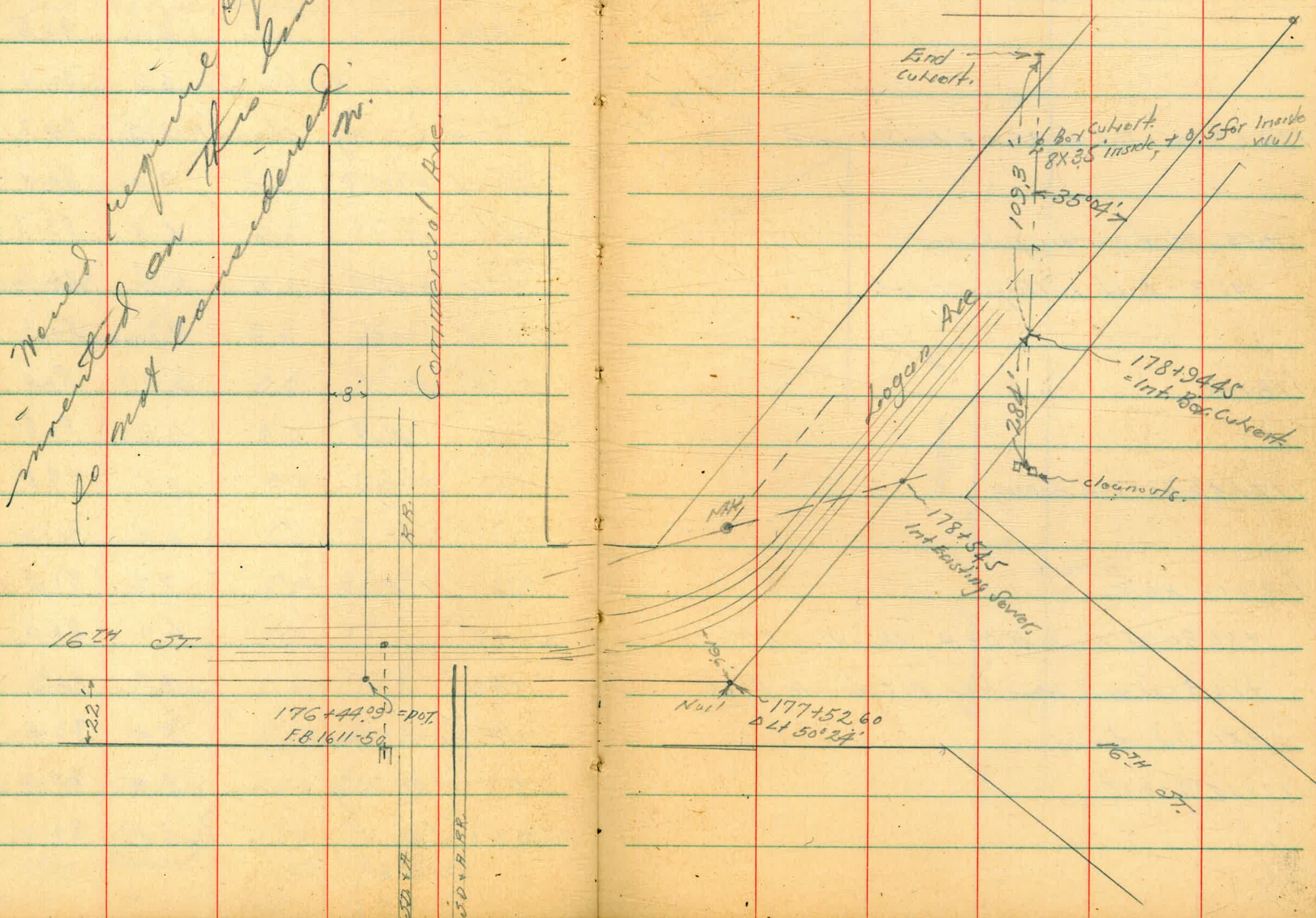
Cont. P 73

Walker
Wells
12-15-11

Alternate Line Trunk Sewer.
from 16th & Commercial to 17th & Logan

Levels P-53

Would require lifter inverted on this line so not considered. M.



= 183+45.18 } Equation.
181+81.98
2.60

181+79.38 = P.O.T.

178+94.45 = Int & 3.5 x 8' Box Culvert

+54.5 = Int existing Sewer.

+42.3 = E. & 16th produced.

178+00

177+52.60 = ℄ 17th 50°24'

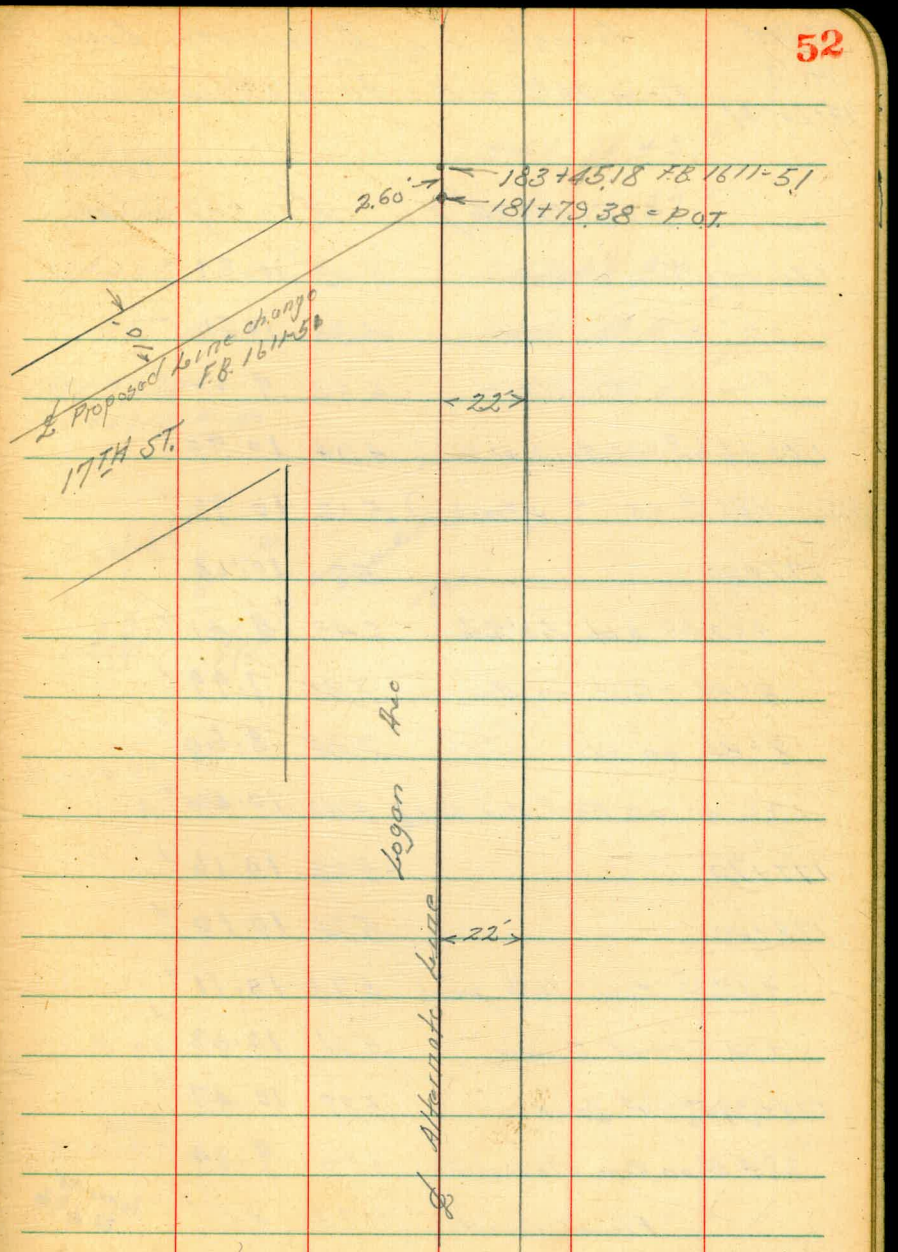
177+13 = B.C. W Track
Car Track.

+86.30 = S Rail SD+A Abandoned Track

+66.3 = N Rail Mainline to Lakeside SD&A.

+51 = Int drain

176+44.99 = P.O.T.



Walker Wells (12-15-41)

Levels for Alternate Line from 16th & K to 17th Logan.

	5.06 (1584)	(10.78)	1767+44.09 Null P-49
176+51 = Int. Drain	5.03	10.81	
22' Rt. on Hd. Wall	5.33	10.51	
" " " Flow	6.62	9.22	
176+66.3 = N Rail, N Truck	4.94	10.90	
+86.3 = S " S Truck	5.12	10.72	
177+00	5.70	10.14	
+52.60 Δ Lt. 50°24	6.43	9.41	
8' Rt. = Cent. on Pav.	7.85	7.99	
8' Rt. on Cb.	7.28	8.60	
19.6' Rt on Rail Cur Truck	5.42	10.42	on bisector Δ
177+70	5.68	10.16	
178+00	5.74	10.10	
+42.3 E. Cb. 16th prod.	5.73	10.11	
+54.5 = Int Sewer	5.81	10.03	on Paving
178+94.5 - Int Drain	5.37	10.47	
28.4 Rt on Rim Cleanout	6.50	9.34	South Cleanout
" " " Flow Culvert	11.73	4.11	Sewer op. El 4.84
109.3' Lt. on Top Culvert	3.71	12.13	
" " " Flow "	7.87	7.97	

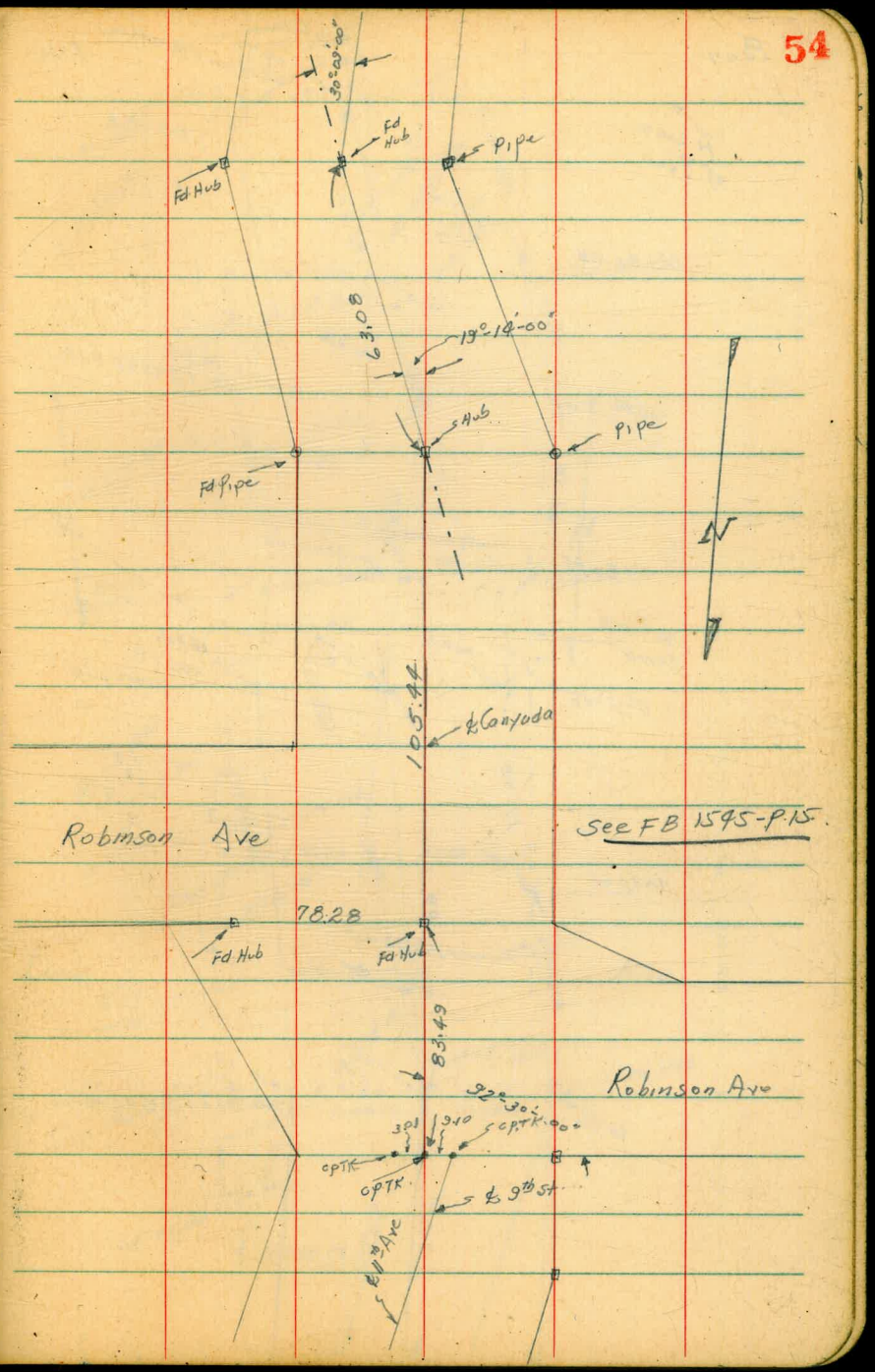
1584

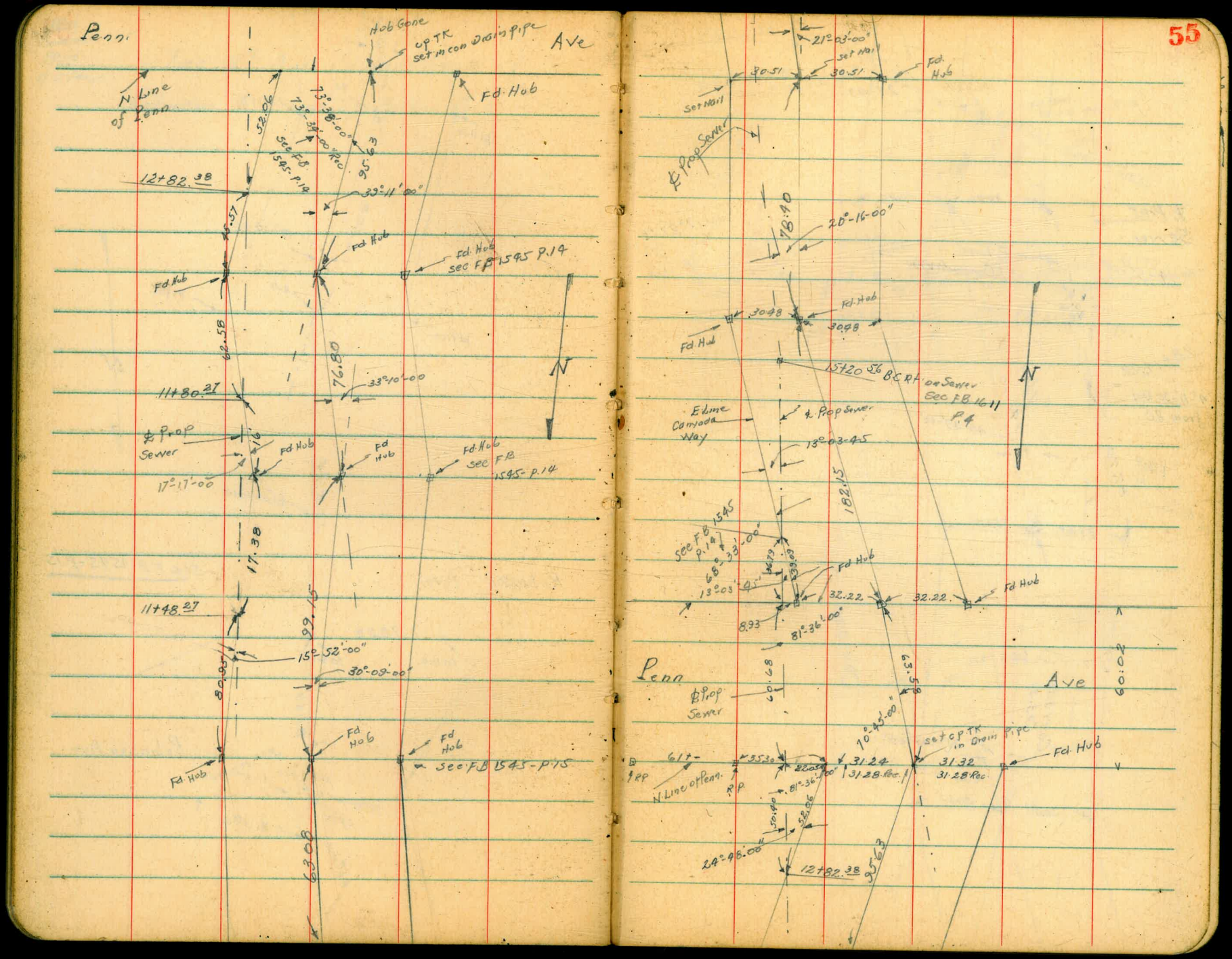
179+00	5.41	10.43
180+00	3.97	11.87
181+00	2.42	13.42
+50 = Break in Grade	1.43	14.41
181+79.38 = 183+53.12 P-50	0.43	15.41

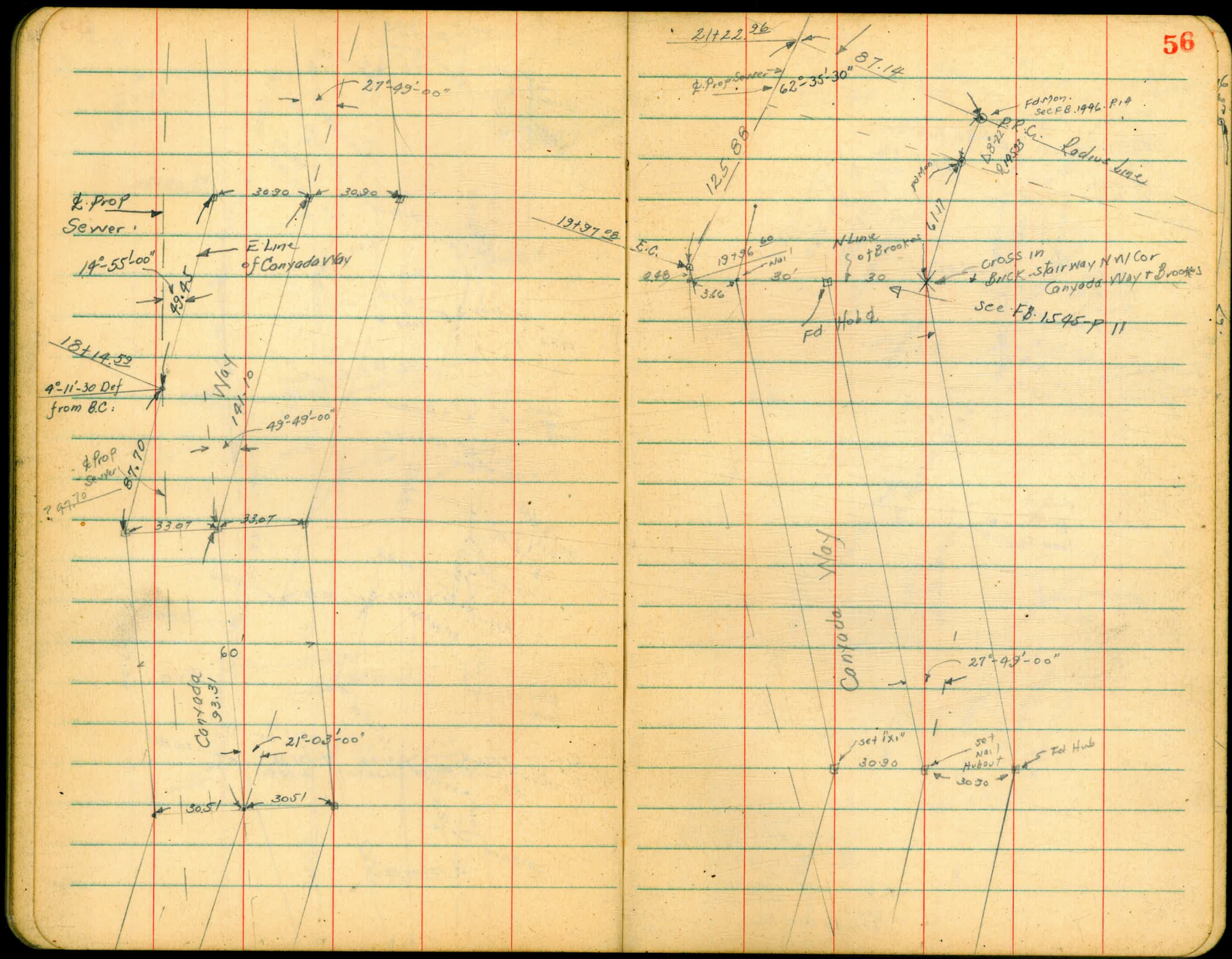
12/17/41 Line not used in Office

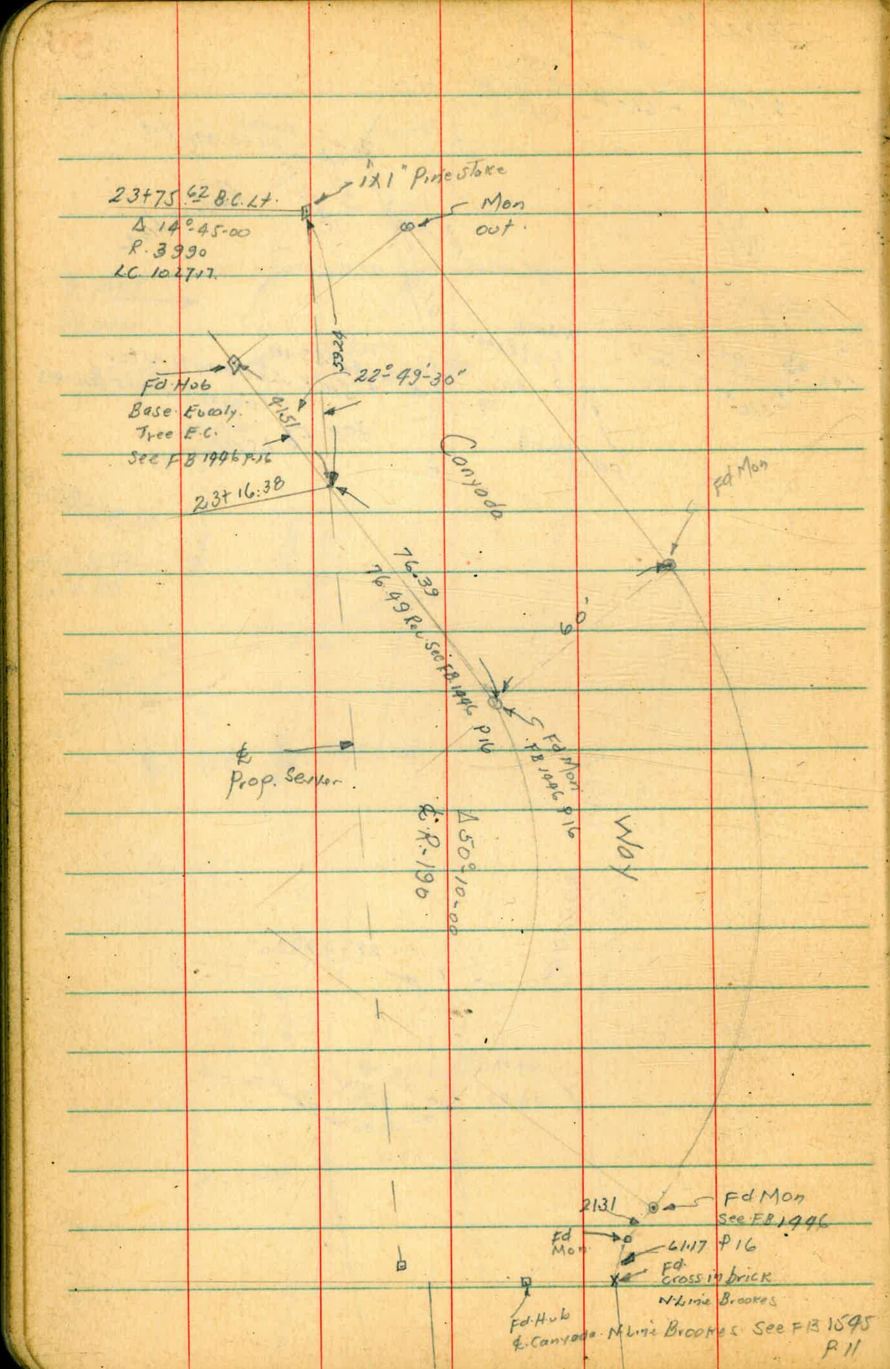
Bliss
Sommer-Myer
Begg
1/17/42

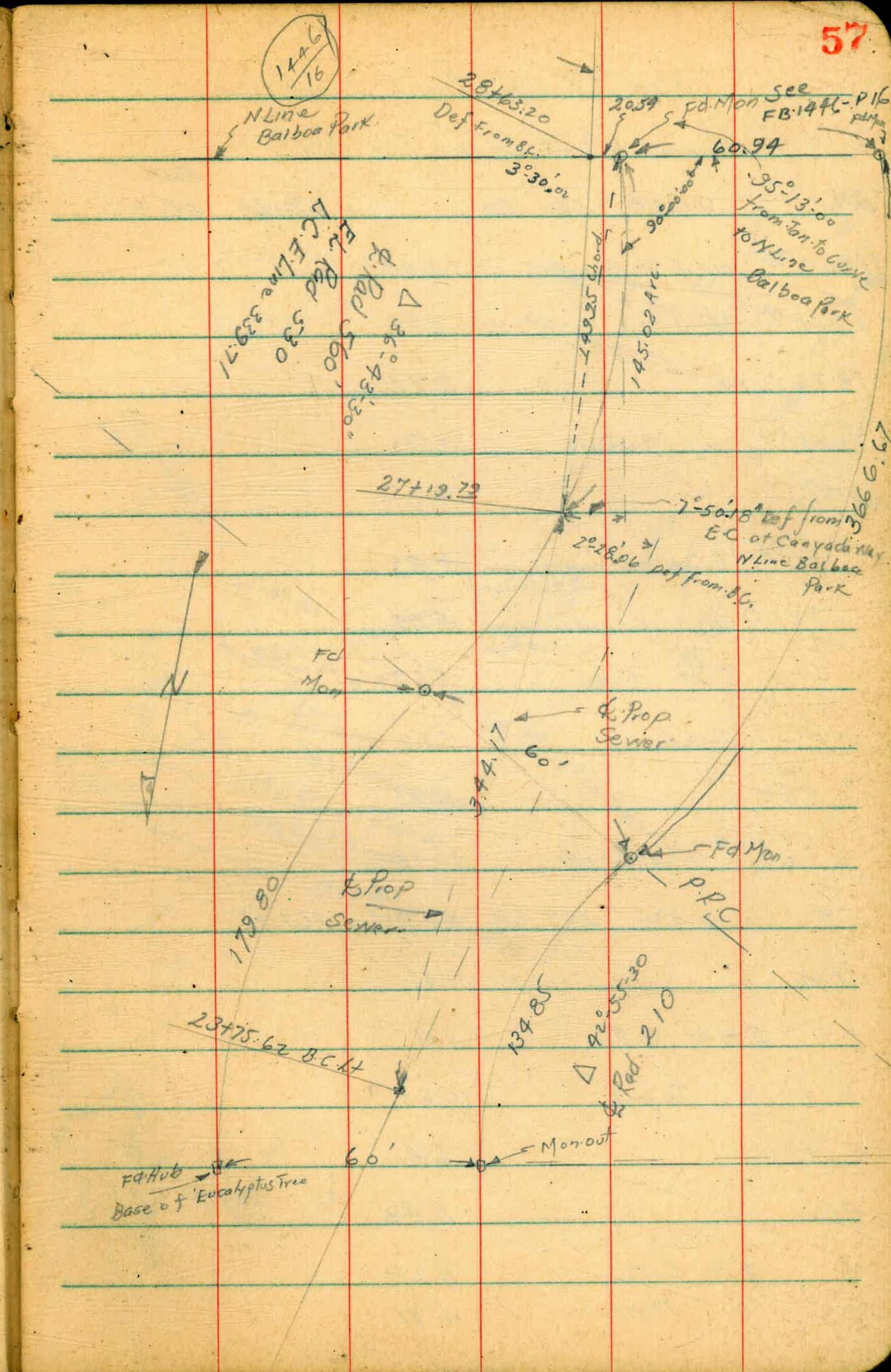
Ties 11th Ave Sewer South of
Robinson to N. Line of Balboa Park.




Penn.
Ave
Hub Gone
cp TK set in con Drain Pipe
Fd. Hub
N. Line of Penn.
73°-38'-00" Rec
See F.B. 1545 P.14
95.63
12+82.38
33°-11'-00"
45.57
Fd Hub
Fd. Hub
See F.B. 1545 P.14
60.58
76.80
33°-10'-00"
11+80.27
℄ Prop Sewer
17°-17'-00"
17.38
11+48.27
99.15
15°-52'-00"
30°-09'-00"
80.95
Fd Hub
See F.B. 1545 - P.15
63.08
21°-03'-00"
Set Nail
30.51
Fd. Hub
℄ Prop Sewer
18.90
20°-16'-00"
30.48
15+20.26 BC RP on Sewer
See F.B. 1611 P.4
E Lane Camoda Way
18°-03'-45"
182.15
See F.B. 1545 P.14
68°-33'-00"
13°-03'-45"
39.69
32.22
8.93
81°-36'-00"
Penn
Ave
℄ Prop Sewer
60.68
63.58
10°-45'-00"
set cp TK in Drain Pipe
617+-
RP
N. Line of Penn.
35.30
22.05
31.24
31.28 Rec.
31.32
81°-36'-00"
50.40
58.06
24°-46'-00"
12+82.38
95.63


27°-49'-00"
℄ Prop Sewer
30.90
30.90
E. Line of Conyada Way
14°-55'-00"
49.45
18+14.59
4°-11'-30 Def from B.C.
Way
141.10
49°-49'-00"
℄ Prop Sewer
87.70
33.07
33.07
60'
Conyada
93.31
21°-03'-00"
30.51
30.51
21+22.96
87.14
℄ Prop Sewer
62°-35'-30"
125.88
Fd Mon. See FB. 1496. P. 14
P.C.
Radius Line
Δ 8°22'
R 1433
Mon
19+97.08
E.C.
19+96.60
Nail
30'
N Line of Brooks
6.17
0.48
3.86
Cross in Brick Stairway N W Cor Conyada Way & Brooks
See FB. 1545-P 11
Fd Hub
Conyada Way
27°-49'-00"
set 1"x1"
30.90
set Nail Hubout
30.90
Fd Hub

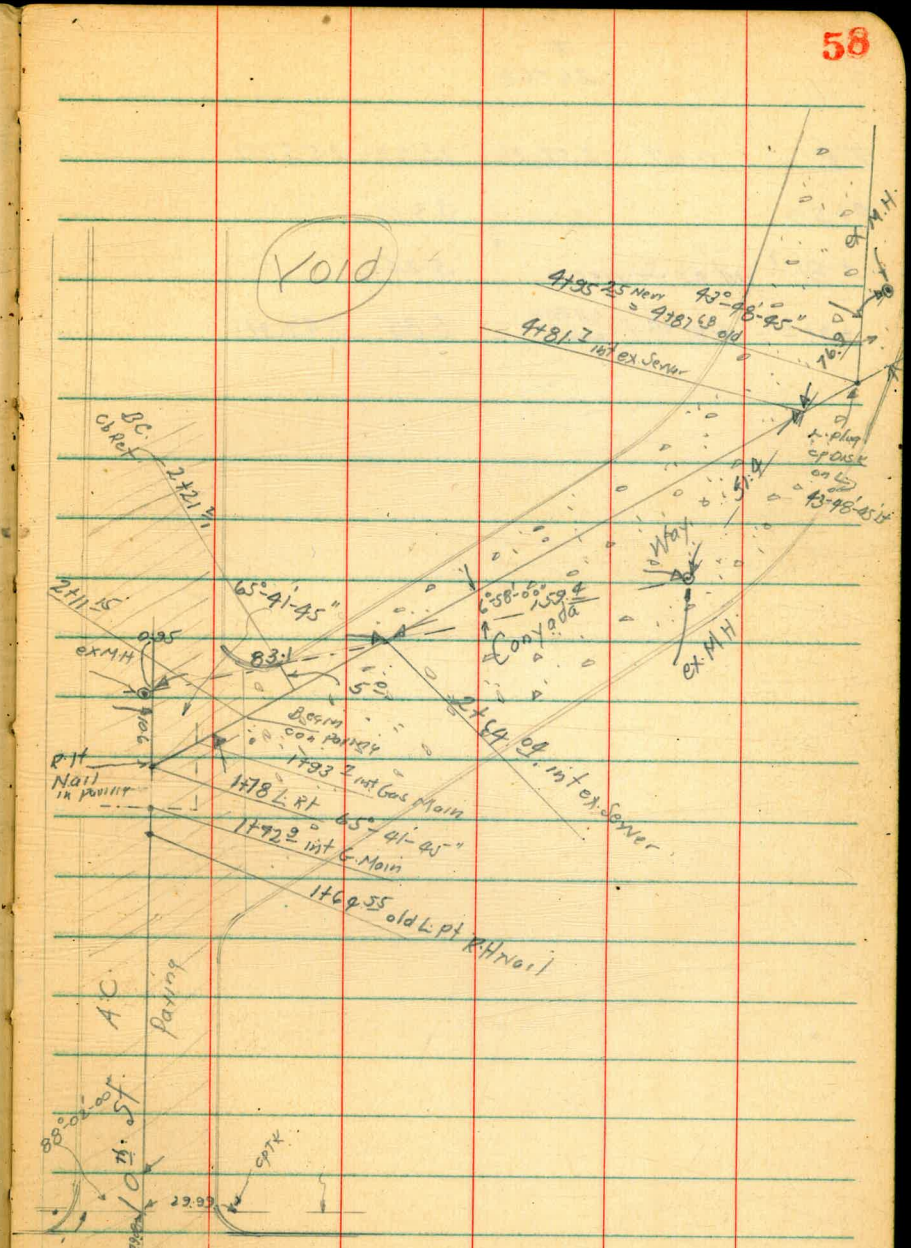

23+75.62 B.C. Lt.
1"x1" Pine stake
Mon out
Δ 14°45'00
R. 3990
L.C. 1027.17
Fd Hub
Base Eucaly. Tree E.C.
See F.B 1446 P.16
23+16.38
22°49'30"
Canyada
Fd Mon
76.39
76.49 Rec. See F.B 1446 P16
60'
Fd Mon
F.B. 1446 P16
℄ Prop. Sewer
℄ R. 190
Δ 50°10'00
Way
2131
Fd Mon
See F.B 1446
Fd Mon
61.17 P16
Fd Cross in brick
N Line Brookes
Fd Hub
℄ Canyada - N Line Brookes See F.B 1595 P.11


1446
16
N Line Balboa Park
28+63.20
Def from B.C.
3°30'00
20.59
Fd Mon See FB 1446 - P 16
60.94
95°13'00 from Tan to Curve to N Line Balboa Park
℄ Rad. 560
Δ 36°43'30"
℄ Rad. 530
L.C. ℄ Line 339.71
149.35 Chord
145.02 Arc
27+19.73
7°50'15" Def from E.C. of Canyada Way N Line Balboa Park
2°28'06" Def from B.C.
366.67
N
Fd Mon
℄ Prop Sewer
60'
344.17
Fd Mon
P.R.C.
℄ Prop Sewer
179.80
23+75.62 B.C. Lt
134.85
Δ 92°55'30
℄ Rad. 210
Fd Hub
Base of Eucalyptus Tree
60'
Mon out

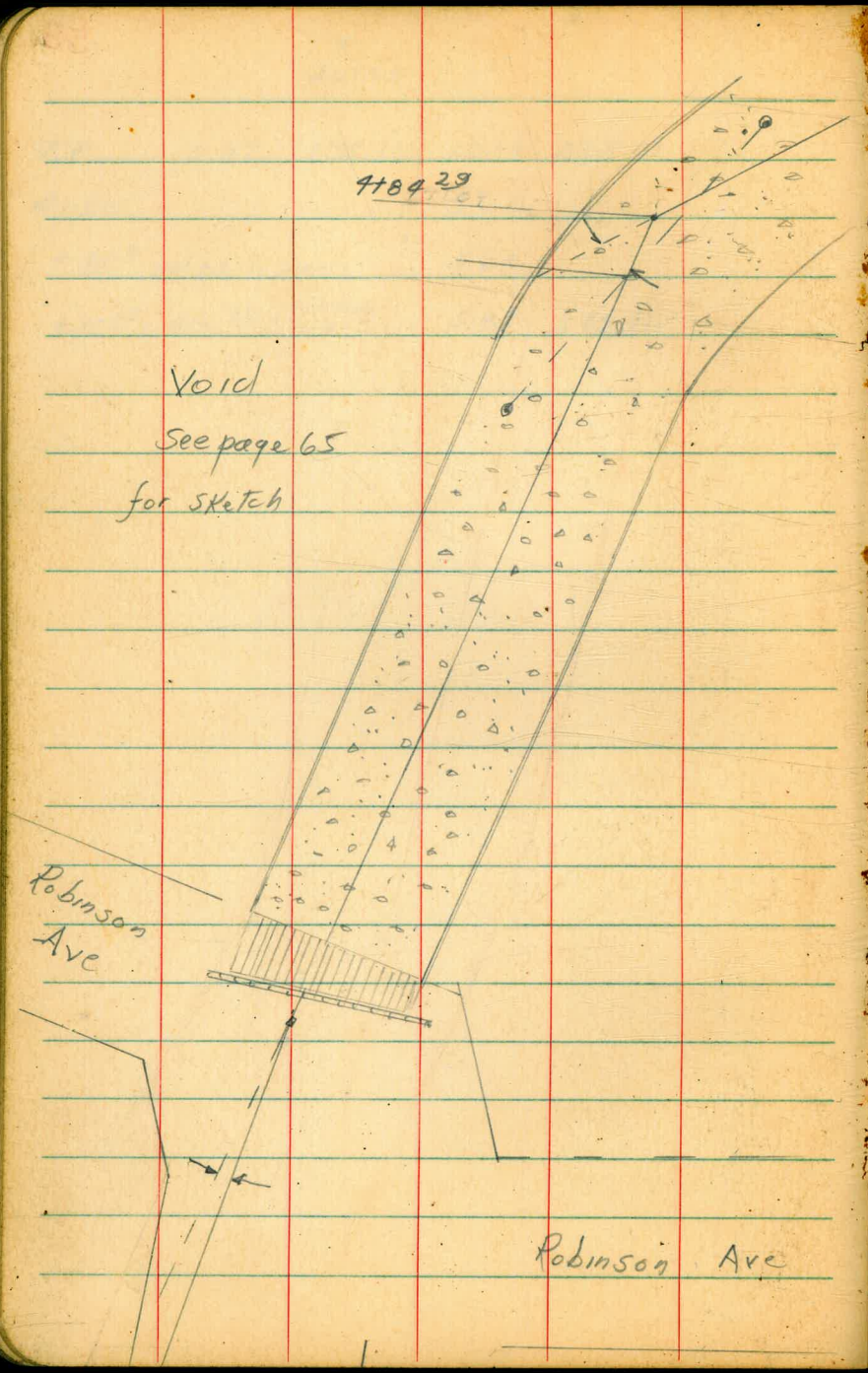
Line Change & Profile Levels for

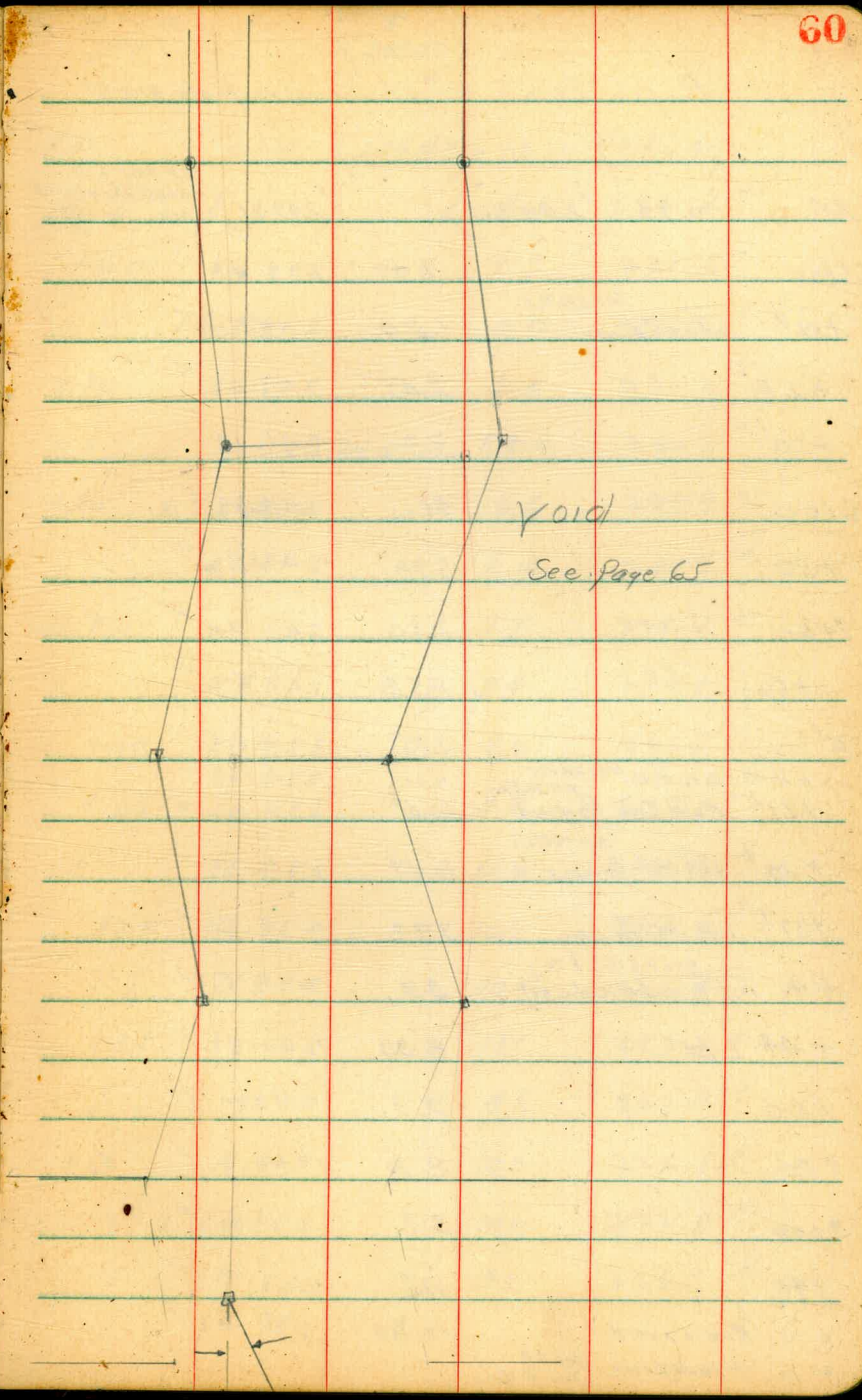
Change 11th St Sewer S. of Univ

BM.	10.04	280.28		270.24	State Hiway BM. #16
1+64.55	old L.pt Non POT		3.03		
1+72.9	int Gas Main		3.04	VOID	
1+78 L Rt			2.77		
1+93.7	int Gas Main		3.50		
2+00			4.00		
+11.15	Begin con paving		4.83		
+21.2	EC cb Ref 1 int 6" Natural TO F.H		5.87		
" "	5' Lt Gutter		5.69		
" "	Top cb		5.18		
+50			8.75		
+64.09	int ex Sewer		10.18		
T.P	0.32	267.68	12.92	267.36	
3+00			1.31		
" "	5.8 Lt Gutter		1.11		
" "	Top cb		0.63		
+50			6.41		
4+00			11.48		
"	8' Lt Gutter		11.28		
"	Top cb		10.77		



		T 267.68			
T.P.	0.07	255.16	12.59	255.09	
4+50			3.20		
+81.7	Int ex. Sewer		5.24		
+95.25 =	4+87.68 L.	CP Disk L.P.	5.85	249.31	


4+84 29
Void
See page 65
for sketch
Robinson
Ave
Robinson Ave


Void
See Page 65

Profile Levels. 11th St Sewer. from 4+87⁶⁸

Rd & ch 1/31/42

Sta.	+	H.I.	−	Elev.	
BM	0.19	249.50		249.31	CP Disk L.P. 4+84 29 = 4+87 68 Line See 1611 12
5+00			1.07	248.43	✓
+02⁹ Int ex. Sewer (see sketch)			1.24	248.26	✓
+28			2.45	247.05	✓
+50			3.32	246.18	✓
6+00			4.62	244.88	✓
+50			5.98	243.52	✓
7+00			7.30	242.20	✓
+50			8.58	240.92	✓
8			9.75	239.75	✓
+1.6 Rt L to ex M.H (see FB 1611 p 12 for flow)			10.02	239.48	✓
+21¹ End Con Paving			10.07	239.43	✓
+29¹ Int ex. Sewer (see sketch)			10.17	239.33	✓
+37¹ End A.C. Paving			9.97	239.53	✓
+40 int ex 24 culvert (see FB 1611 P 12)			9.9	239.6	✓
+44 L Lt			8.99	240.51	✓
+60			9.3	240.2	✓
+80			8.8	240.7	✓
9+00			9.7	239.8	✓
+40			11.6	237.9	✓
" " Rim ex M.H			10.83	238.67	✓
" " Flowline (see FB 1611 P 13.)					

Sta.	+	H.I.	−	Elev.	
		249.50			
T.P.	0.08	236.48	13.10	236.40	
10			2.1	234.4	✓
+60			4.9	231.6	✓
" " 1.8 Rt			0.0	236.5	✓
+70			5.3	231.2	✓
" " 2.5 Rt			+4.2	240.7	✓
+90 Bottom Bank			6.6	229.9	✓
" " 4' Rt			+4	240.5	✓
11+00			7.1	229.4	✓
" " 2' Rt			3.4	233.1	✓
+50			9.0	227.5	✓
+65			9.4	227.1	✓
12			11.6	224.9	✓
+20			12.5	224.0	✓
" " 2' Rt			10.1	226.4	✓
+35			13.1	223.4	✓
" " 2.1 Rt			8.6	227.9	✓
+50			14.0	222.5	✓
" " 1' Rt			14.0	222.5	✓
" " 2' Rt			9.8	226.7	✓

		(236.48)		
+60			14.6	221.9
" 1Rt			14.6	221.9
" 2 "			11.0	225.5
T.P.	0.10	(224.00)	12.58	(223.90)
13+00			3.1	220.9
+35	int ex 24" culvert		4.0	220.0
" "	23' Rt flow line		5.43	218.57
" "	25 Lt " "		7.95	216.05
+63. ex M.H. 5' Lt. Rim			4.64	219.36
+77 Lt			5.64	218.36
14+00			6.0	218.00
Set BM.	S.E. Prop Hub Pond Canada		6.39	217.61
check Lt 12.50	orig Line Roll-p14		4.94	219.06
+50			7.6	216.4
15+00			9.2	214.8
" "	2' Rt		8.6	215.4
+20			9.8	214.2
" "	2' Rt		8.1	215.9
+40			10.2	213.8
+45			9.3	214.7
" "	2 Rt		8.3	215.7
" "	1 Lt		10.3	213.7

		(224.00)		
+65			8.8	215.2
" "	2' Rt		8.2	215.6
" "	1.5 Lt		10.8	213.2
+70			10.2	213.8
" "	2' Rt		8.6	215.4
" "	2' Lt		10.9	213.1
16+00			11.1	212.9
" "	2' Rt		10.2	213.8
+50			12.2	211.8
+70			12.8	211.2
T.P.	3.56	(214.77)	12.79	(211.21)
17+00			5.1	209.7
+10.35 Lt Rt	on Stake		5.75	209.02
+20			5.1	209.7
" "	2' Rt		4.2	210.6
" "	2 Lt		5.6	209.2
+30			4.1	210.7
" "	2' Rt		1.8	213.0
" "	2 Lt		4.7	210.1
" "	3 "		5.8	209.0

	(214.77)		
19+77	7.0	207.8	✓
" " 3'Rt Top Bank	3.4	211.4	✓
" " 2'Lt Bottom "	9.9	204.9	✓
+98	3.5	211.2	✓
" " 2'Lt	7.7	207.1	✓
" " 4' "	9.9	204.9	✓
20+09	4.7	210.1	✓
" " 2'Lt	5.6	209.2	✓
" " 4 "	10.6	204.2	✓
20+20	6.2	208.6	✓
" " 2'Lt	6.5	208.3	✓
+24	9.7	205.1	✓
+35 - ex MH Rim .37'Lt	9.91	204.86	✓
+35 " " Flow Line 860 before Rim	18.51	196.26	✓
+50	11.1	203.7	✓
+53	9.8	205.0	✓
+60	8.9	205.9	✓
" " 3'Lt	11.4	203.4	✓
+90	12.7	202.1	✓
" " 2'Rt	11.6	203.2	✓
" " 2'Lt	14.9	199.9	✓
T.P. 446	(206.58)	12.65	(202.12) ✓

	(214.77)		
+40	2.5	212.3	✓
" " 2'Rt	1.7	213.1	✓
" " 2'Lt	3.8	211.0	✓
" " 4' "	6.0	208.8	✓
+50	3.5	211.3	✓
" " 2'Rt	2.7	212.1	✓
" " 2'Lt	4.7	210.1	✓
" " 5'Lt	6.2	208.6	✓
+70	5.4	209.4	✓
" " 2'Lt	6.1	208.7	✓
18+00	6.8	208.0	✓
" " 2'Lt	7.4	207.4	✓
+12	7.7	207.1	✓
+50	8.3	206.5	✓
+69.3 ex MH 63'Lt Rim	8.17	206.60	✓
19+00	9.3	205.5	✓
+49	10.0	204.8	✓
+50	9.4	205.4	✓
+61	9.6	205.2	✓
" " 2'Rt	7.8	207.0	✓

	(206.58)		
21+00		9.5	202.1
" " 2' Lt		6.7	199.9
+20		7.2	199.4
+50		7.5	199.1
+72.07 Int ex Sewer		7.8	198.8
" ex M.H Rim 58.38 Hot Int	See sketch	7.94	198.64
" " Flow Line		12.34	194.24
22+00.46 Lt		8.70	197.9
125.2 Int ex 30" Drain		8.9	197.7
" " 35.2 Rt Flow Line		11.88	194.70
" " 24' Lt Flow Line		13.46	193.12
+50		9.8	196.8
23		10.8	195.8
+30		11.4	195.2
+50		12.0	194.6
+54		11.3	195.3
24		10.9	195.7
+20		11.9	194.7
" " 2' Lt		12.7	193.9
+30		14.0	192.6

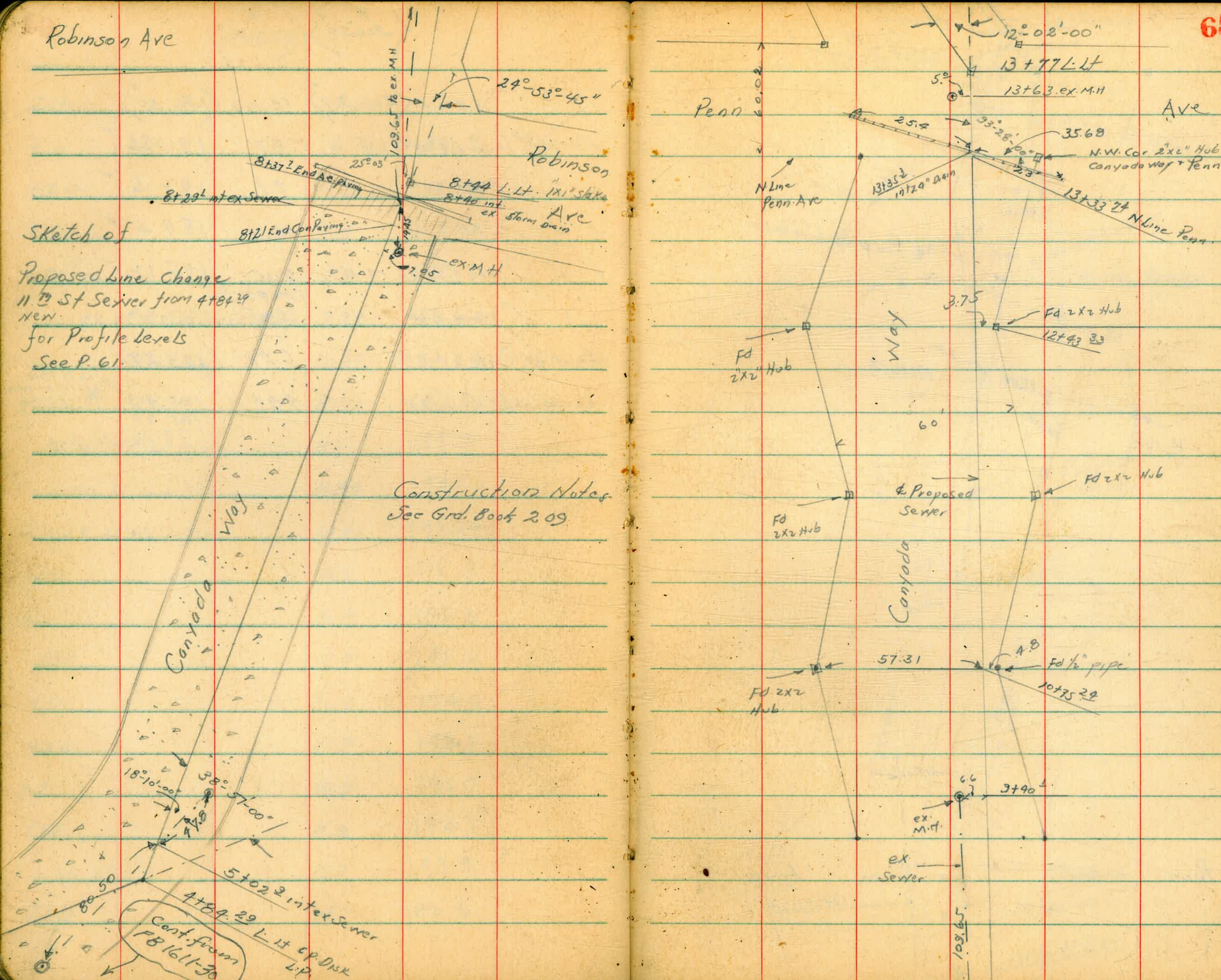
	(206.58)			
T.P.	3.72	(200.27)	10.03	(196.55)
24+35.29 New = 24+07.99 old			8.71	191.56
" " 2' Rt			7.7	192.6
" " 2' Lt			10.9	189.4
" " Rt. Rim of M.H			5.15	195.12
			790 below Rim	
" " Flow Line			13.05	187.22
Check B.C. Curve 23+75.61			6.98	(193.29)
Check State Highway B.M.			9.84	195.43
				195.34
				0.09 Diff

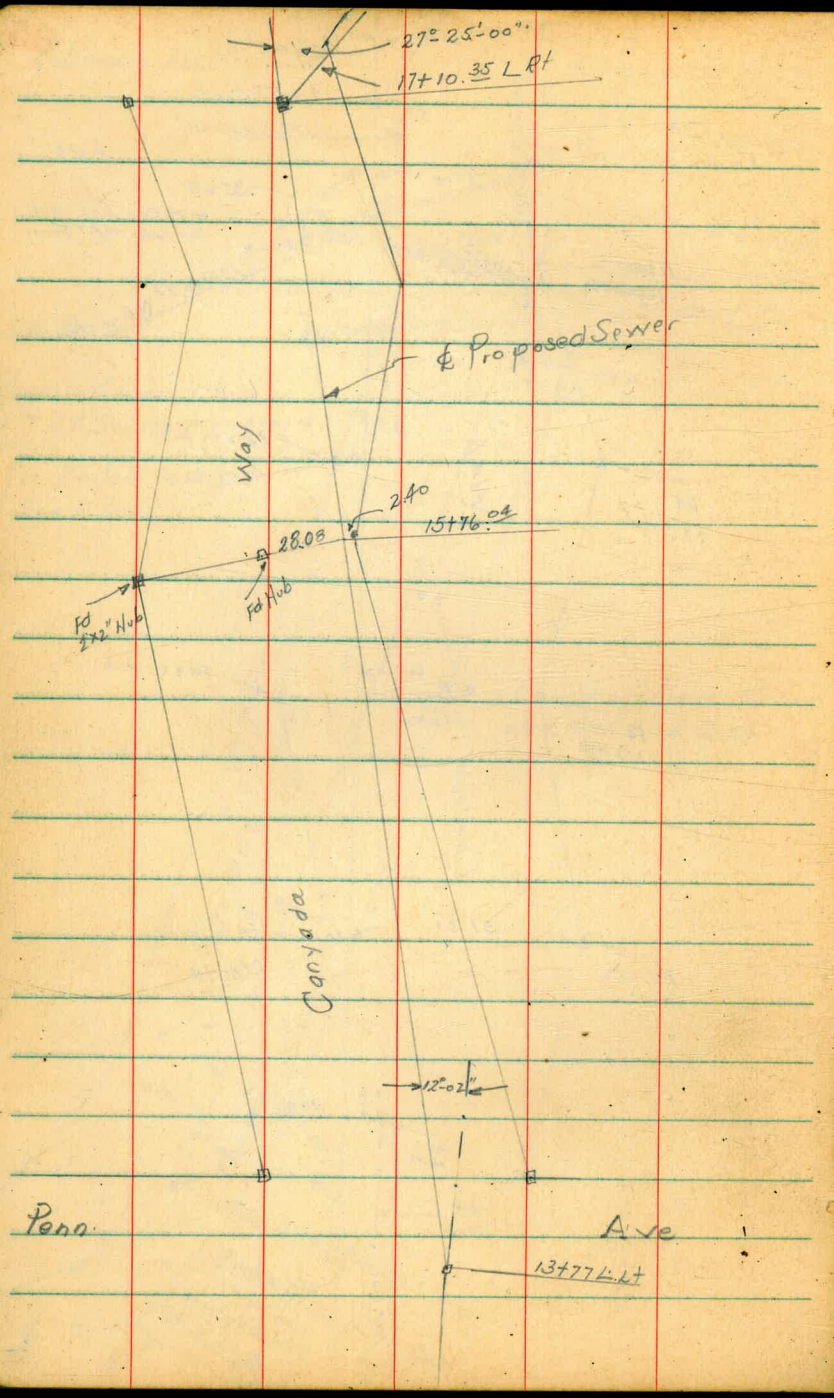
Note: This checks original line of levels

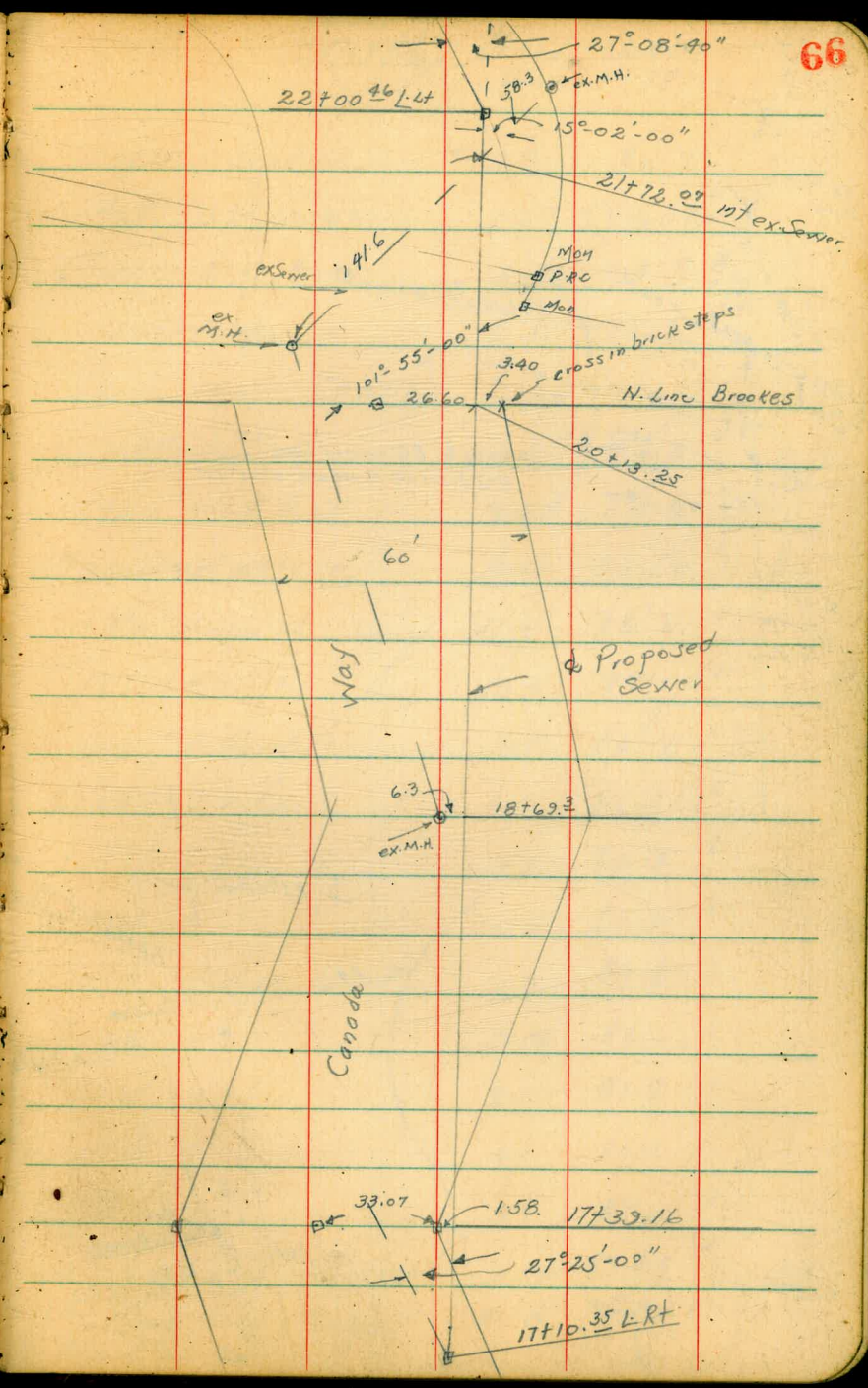
Robinson Ave

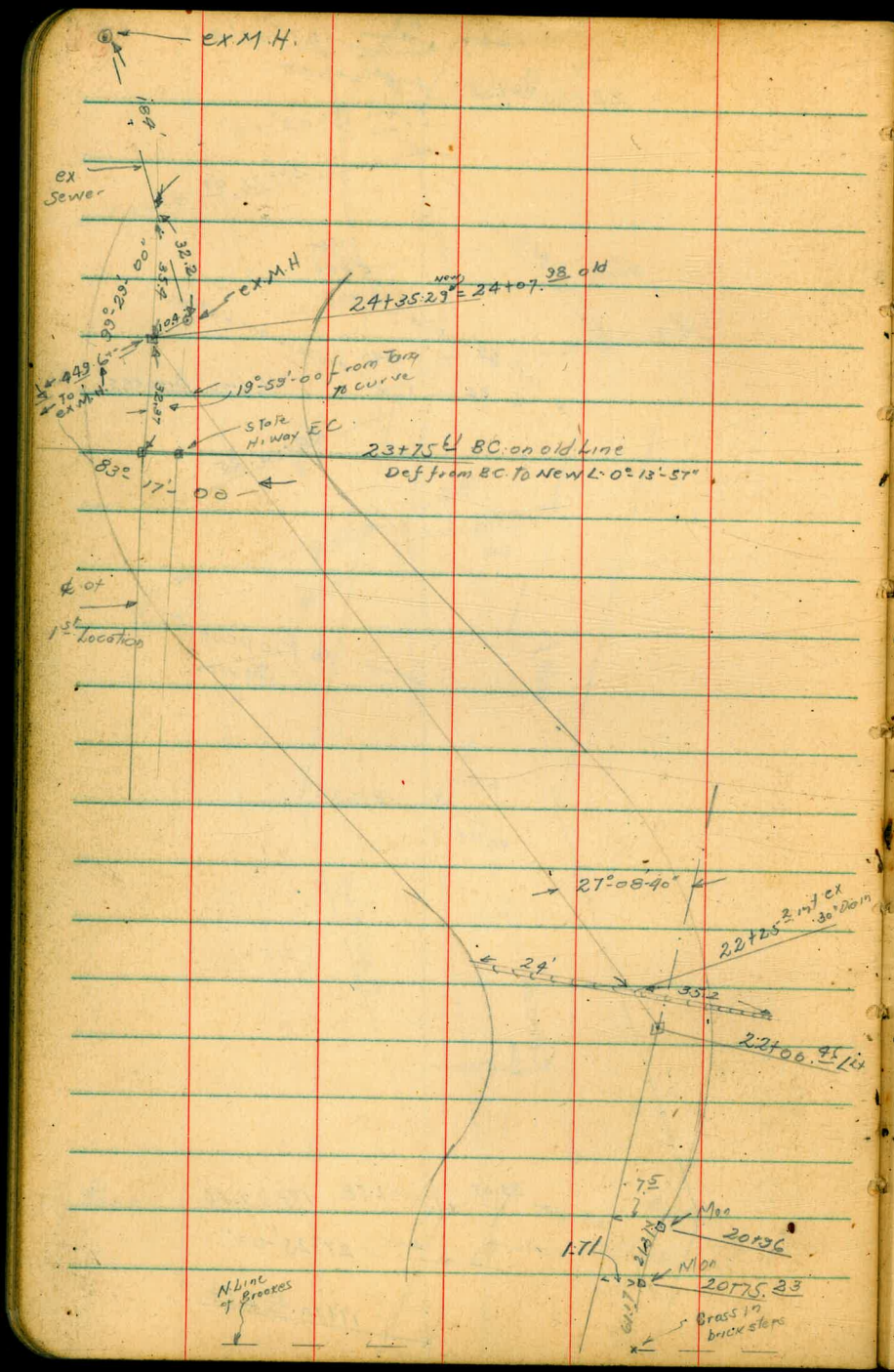
Sketch of
Proposed Line Change
11th St Sewer from 4+84.29
New
for Profile Levels
See P. 61

Construction Notes
See Grd. Book 209




27°-25'-00"
17+10.35 L Rt
℄ Proposed Sewer
Way
2.40
15+76.04
28.08
Fd 2x2" Hub
Fd Hub
Canada
12°-02"
Penn
Ave
13+77 L Lt


27°-08'-40"
22+00.46 L Lt
38.3
ex. M.H.
15°-02'-00"
21+72.07
init ex. Sewer
ex Sewer
14.16
Mon
P.R.C
Mon
ex M.H.
101°-55'-00"
3.40
cross in brick steps
26.60
N. Line Brookes
20+13.25
60'
Way
℄ Proposed Sewer
6.3
18+69.3
ex. M.H.
Canada
33.07
1.58
17+39.16
27°-25'-00"
17+10.35 L Rt



67

		(8336)	Levels cont from P 75	
65+66 = E. Bank ch.		33	80.1	✓
+65.17 = ⊗ Lt 62°27'		327	(80.09)	✓
66+00 = E. Bank ch.		35	79.9	✓
+02 = S edge "		61	77.3	✓
T.P.	9.01	(9.002)	2.35	(81.01)
66+85 = WLY edge ch.			124	77.6 ✓
+90 WLY Bank			94	80.6 ✓
67+20.75 = ⊗ Rt 48°07'30"			942	80.60 ✓
+39 = N edge ch.			118	78.2 ✓
+87 = E " "			109	79.1 ✓
+96 = E Bank			93	80.7 ✓
69+28 = S Bank			69	83.1 ✓
+31 " edge ch.			97	80 3 ✓
+53 N " "			100	80.0 ✓
+58 N Bank "			62	83.8 ✓
70+60			50	85.0 ✓
+65 in ch.			81	81.9 ✓
+75 " "			81	81.9 ✓
80			50	85.0 ✓
71+48 = 71+56.22 } Equation ⊿ Lt 19°22'15"			202	87.99 ✓ on stake
Cht. Brooks - Cobble Bridge			0.18	89.84 ✓
P/4 P. 26				89.81 ✓
				.03 Error

C.B. Walker
Wells
Hordin
3-15-42

Profile Levels, Proposed change "A" Line
Border Canyon Trunk Sewer.
from K- and 15th St. to 19th & B-Sts.
Alignment change in FB. 1613-42-54

Sta. 7 Tuk:				B.M. #4-8
K-St & 15th	7.795 (24.31)		(16.515)	P-16
0+00		6.92	17.39	
+11		7.33	16.98	
+25		7.01	17.30	
+50		6.55	17.76	
1+00		5.98	18.33	
+50		5.47	18.84	
2+00		4.97	19.34	
+50		4.43	19.88	
3+25.11 = SL - J-St.		3.63	20.68	
+39.1		3.60	20.71	
+65.11 = ℄ " "		3.26	21.05	
+91.11 = N.C.b " "		2.83	21.48	
4+05.11 = N.L. " "		2.61	21.70	
+50		2.04	22.27	
5+00		1.65	22.66	
TP	7.89 (30.82)	1.38	(22.93)	

Replacing Notes on Pages 19-24

	(30.82)		
5+50		7.72	23.10
6+00		7.22	23.60
+50		6.78	24.04
7+05.11 = St. Island		6.18	24.64
+12.11 = S.C.b " "		5.96	24.86
+45.11 = ℄ "		5.51	25.31
+71.11 = N.C.b "		5.46	25.36
+85.11 = N.L. "		5.48	25.34
2' Rt. on Hd. Wall of Drain.		5.58	25.24
" " Flow Line		7.06	23.76
8+00		5.51	25.31
+50		4.77	26.05
9+00		4.18	26.64
See Page 73 for Sketch			
9+17.5 = Bond Conc. Slab		3.93	26.89
+23.9		3.34	27.48
7' Rt. on Slab		3.34	27.48
7' Rt. " Gut. at Slab		4.18	26.64
9' Rt. " " at C.b.		4.30	26.52
9' Rt. " C.b. at Street		3.65	27.17

⟨30.82⟩ Powder Canyon Cont. from P. 68			
9+48.4 = N end scales		3.34	27.48
7 Rt. on Gut. of slab		3.30	27.52
7' Rt. " " " cb.		3.88	26.94
9' Rt. " Gut. of cb		3.95	26.87
9' Rt. on cb. of st.		3.34	27.48
9+54.7 = N end Conc. slab		3.36	27.46
10+00		2.82	28.00
+50		2.15	28.67
10+84.64 = S.L. Market st		1.36	29.46
T.P. chk. S.E. 7' tack Mkt + 13th	7.73 ⟨37.65⟩	0.90	⟨29.92⟩
11+02.1 = Int. Drain		8.47	29.18
23' Rt. on Grating		8.29	29.36
23 Rt. on Flow		9.49	28.16
11+29.67 = S Rail Car Track		7.37	30.28
+44.59 = N Rail N "		7.44	30.21
11+67.3 Int. Drain		7.97	29.68
11+84.64 = N.L. Market		7.74	29.91
7' Rt. on Hd Wall Drain		7.82	29.83
7' " " Flow		8.90	28.75
9' Rt. on cb.		7.31	30.34

⟨37.65⟩			
12+00		7.54	30.11
+50		6.86	30.79
13+00		6.14	31.51
+50		5.48	32.17
14+00		4.77	32.88
+50		4.05	33.60
14+93.67 = S.L. G-st		3.51	34.14
15+07.67 = S cb.		3.31	34.34
+28.67 = Δ Lt 0°07'		2.78	34.87
+59.67 = N cb - G-st		2.56	35.09
on Box at inlet		3.02	34.63
" Flow "		5.02	32.63
15+73.67 = N.L. G-st		2.48	35.17
16+00		1.79	35.86
+50		0.60	37.05
T.P.	11.12 ⟨48.19⟩	0.58	⟨37.07⟩
17+00		9.95	38.24
+50		8.72	39.47
18+00		7.51	40.68
+50		6.23	41.96
+74.15 = S.L. - F-st		5.63	42.56

	⟨4.819⟩	Powder Canyon	
18+88.15 = S.C.b. - F-St.		543	42.76
19+06.22 = S Rail S Track		545	42.74
+22.45 = N Rail N Track		542	42.77
19+40.15 = N C.b. - F-St		558	42.61
19+59.15 = Δ Rt 1°54'30"		561	42.58
20+44.20 Δ Lt 1°54'30"		368	44.51
21+00		232	45.87
+50		125	46.94
T.P. 7.25	⟨54.77⟩	0.67	⟨47.52⟩
22+00		666	48.11
+54.99 = Sh. - E - St.		527	49.50
+68.49 = S.C.u.t.		500	49.77
+77.49 = Δ Rt 90°01'20		5.00	49.77
+97.49 = E.L. 15th		5.02	49.75
23+50		429	50.48
24+00		340	51.37
+50		232	52.45
+97.88 = W.L. 16th		124	⟨53.53⟩
T.P. 5.92	⟨59.74⟩	0.95	⟨53.82⟩
Ch. 8 M. #35		5.80	53.94
5.80	⟨59.76⟩ * Corrected		53.96
25+18.1 = W.C.b. 16th		588	53.88

	⟨59.76⟩		
25+30.3 = W Rail W Track		542	54.34
+45.02 = E " E "		522	54.54
25+67.88 = Δ Lt 90°02		526	54.50
25+95 = N.C.b. on E.St Eastside		519	54.57
26+19.88 = N.L. E-St.		523	54.53
27+00		510	54.66
28+00		474	55.02
29+00		445	55.31
+15.26 = S.L. Broadway		437	55.39
+23.1 = S Rail Track #1		422	55.54
+30.7 = N " " " #1		412	55.64
+58 = N " " " #4		415	55.61
Flow Line Inlet SE Return		6.7	53.1
" " " NE "		6.7	53.1
29+95.26 = N.L. Broadway		434	55.42
T.P. 8.13	⟨63.99⟩	3.90	⟨55.86⟩
31+00		7.30	56.69
32+00		607	57.92
+95.75 = S.L. C-St.		502	58.97
33+18.75 = Δ Rt. 90°01'15		426	59.73
+38.75 = E.L. 16th		472	59.27

	(63.99)		
34+00		6.15	57.84
35+00		8.40	55.59
+39.36 = WL. 17th St.		9.17	54.82
Flow Drain S.V. Ref. 17th		11.9	52.1
35+79.36 = Δ Rt 0°37'			on Nail Δ 17th St.
T.P.	6.95 (61.33)	9.61	(54.38) 35+79.36
(35+47) 200'± Rt. Storm Drain MH	Flow = 18.97		42.36 60" Culvert
" Rim =	1.47		59.86
S.E. Ref. Rim Cleanout		7.41	53.92
" " Flow "		11.01	50.32
36+19.36 = E.L. 17th		7.73	53.60
T.P.	11.67 (66.05)	6.95	(54.38)
37+00		11.68	54.37
38+00		10.84	55.21
+19.7 = WL. 18th on N		10.68	55.37
38+59.7 = Δ 0°35'45"		10.08	55.97
3.7' Lt. - ℄			
38+91.3 = MH on Rim		9.50	56.55
" Flow Line		15.89	50.16
38+96.7 on Grading		9.74	56.31 4' Rt.
" Flow		11.94	54.11 "
39+00		9.56	56.49
40+00		5.58	60.47

	(66.05)		
41+00.96 = WL. 19th		1.54	64.51
41+10.8 = MH 4' Lt. Rim =		1.05	65.00
Flow =		14.87	51.18
T.P.	4.84 (69.88)	1.01	(65.04)
41+57.46 Δ Rt 89°35'15"		3.81	66.07
42+03.96 = N. ℄ C-St.		3.33	65.95 on Par.
+17.46 = WL. C-St.		3.62	66.26
43+00		4.84	65.04
44+00		6.41	63.47
45+00		8.00	61.88
45+40.23 = Δ Rt 89°33'15"		7.89	61.99
S.E. Ref. Grading		8.7	61.2
" " Flow inlet N.W. Tract B-St + 19th		11.7	58.2
Cht. B.M. #91 P-24		7.19	62.69
			62.67 = B.M. 0.02 Error
23.7' West of Elmo 15th 20' N. WL. E-St. Elev. Storm Drain MH. 15th + E-St.			
5.46 (55.23)			49.77 Δ 22+77.49 P-70
Rim MH		5.20 16 25	50.03
60" Flow Line		=21.45	33.78

Walker
Hardin
Reed
4-1-42

Powder Canyon Trunk Sewer

"A" Line Levels for Proposed Change

As Located in F.B. 1613 Page ~~55-56~~ 57-58

B.M. N.F.B.R. Florida + Upas P.36

	4.91 (199.77)		(194.86)
134+04 = P.O.T. Stake New line		915	190.62
134+50 = ~~P.O.T. Δ Rt. 30°28'45"~~		6.35	193.42 on Fill
134+80 on Nat. Ground		7.8	192.0
134+67 = Δ Rt. 10°56'		6.25	193.52
135+00 on Fill		5.9	193.9
135+00 on Nat. Ground		7.1	192.7
135+50 on Fill		5.0	194.8
135+50 on Nat. Ground		6.5	193.3
136+19 on " "		5.6	194.2
+20 = edge Creek		8.0	191.8
136+95 in Wash S. edge		2.6	190.2
~~6.2~~ 5' Rt. on Flow 30" pipe		10.9	188.9
136+39.3 8' Rt. on Paving		6.66	193.11
136+63 in Wash N edge		9.4	190.6
+68		5.9	193.9
136+~~87~~ 835 = Int. ch. on Pav.		~~6.0~~ 6.11	193.66
" on ch.		5.94	194.53
~~2' Rt. on Conc. Pav.~~		6.11	

199.77 ✓ 4/3/42 JN

137+13.29 = Δ Lt.			
137+30.29 = P.O.T. cross in Walk.			
~~137+30.87 Δ Lt. 7°53'~~		4.66	195.11
138+00 on Walk.		3.94	195.83
139+00 " "		2.88	196.89
140+00		1.91	197.86
+28 on ch. Int.		0.95	198.82
" " Gut. Conc. Pav.		1.77	198.00
140+49.97			
~~140+50 = Δ 90°04' Rt.~~		1.39	198.38
140+99.47			
= 140+54.10 P.O.T. cross in Pav.		2.37	197.40

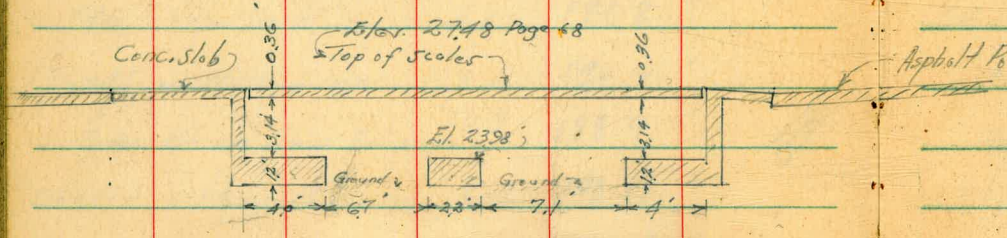
Levels cont. from P-50

(89.64)

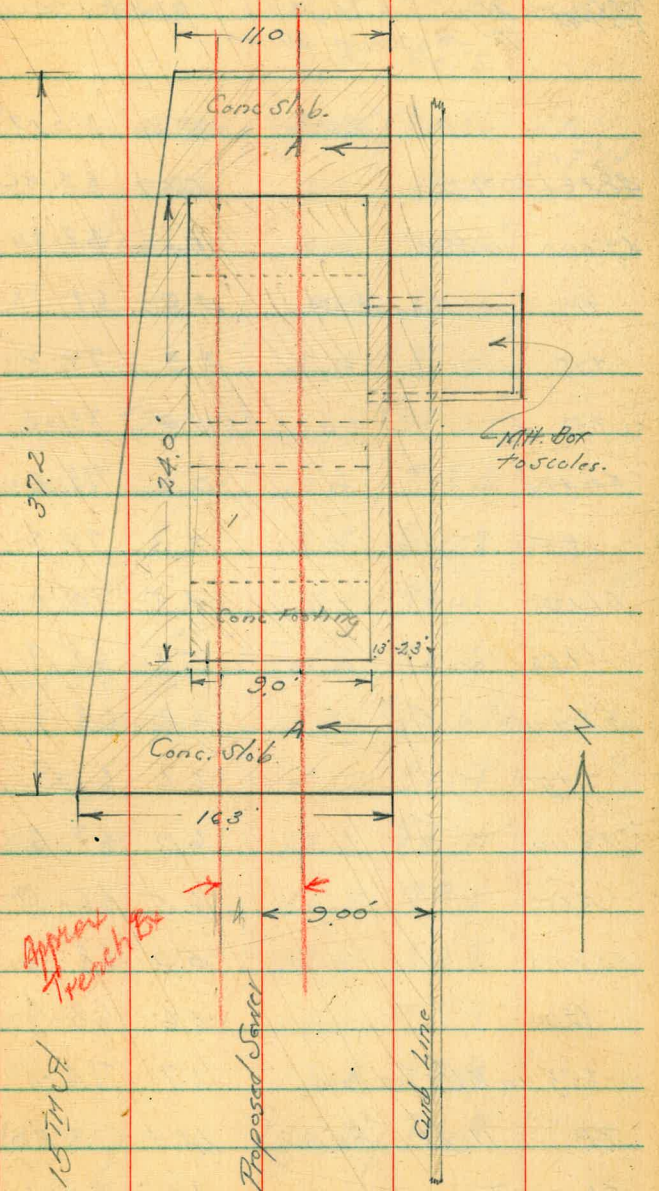
70+50		3.5	85.5 ✓
+63 = W Bank	channel	3.9	85.1 ✓
+65 = SW edge	"	7.1	81.9 ✓
+80 = NE "	"	7.1	81.9 ✓
+86 = NE Bank	"	3.9	85.1 ✓
71+00		3.1	85.9 ✓
71+48.12	ΔLt. 17°31'30"		
71+52.3	Equation	1.03	(88.01) on stake
Chk Starting Elev.		7.30	(81.74)
			81.78
			0.04 Error

Walker
Osborne
Harding
Hazen
1-15-93

Detail Concrete Footings for Scales on 15th St. Bet. Island & Market St



Elev. Section A-A



Walker
Hurlip
Reed
7-27-42

Powder Canyon Sewer
Levels for Proposed Change in Alignment from 20th & B St. to Pershing Drive

	4.36 (74.53)		70.17	S.B.P. 20th & B St.
48+61.20 = Δ Lt.		5.57	68.96	
49+00 on Pov.		5.59	68.94	
+10 = N.C.L. line B St		4.80	69.73	on Path.
+25		2.3	72.2	
+50		1.4	73.1	
50+00		0.9	73.6	
+50		2.3	72.2	
51+00		4.5	70.0	
+50		5.6	68.9	
52+00		6.2	68.3	
+50		6.6	67.9	
53+00		6.9	67.6	
+50		6.5	68.0	
54+00		5.9	68.6	
+20		5.6	68.9	
+55 in Fill = Toe Dam		1.7	72.8	
T.P.	11.72 (85.02)	1.23	(73.30)	
54+72 = Top of Dam		4.9	80.1	Fill

(85.02)

54+89.92 = Δ Rt 56°48'	5.12	79.90	on Stake.
55+50	4.5	80.5	
56+23.70 = Δ Lt. 46°30'	4.26	(80.76)	in Fill
+47.9 = N.L.Y. Line Dam	9.2	75.8	30.7' Lt. Top Conc.
57+00 in Natl Ground	5.4	79.6	
58+00 " " "	4.2	80.8	
59+00 " " "	2.0	83.0	
T.P. 11.23 (96.16)	0.09	(84.93)	
60+00 in Natl Ground	10.6	85.6	
61+00 " " "	8.4	87.8	
62+00 " " "	6.1	90.1	
63+00	4.6	91.6	
Not Ground			
64+00 Δ Lt. 41°23'30"	3.49	(92.67)	on Stake
+29 in Fill	4.5	91.7	
+43 = Toe Fill	13.2	83.0	
65+00 Basin	16.7	79.5	
+43 = Bank	15.7	80.5	
+52 = Wash	18.3	77.9	
+68 = "	18.9	77.9	
+70 = N Bank	16.3	79.9	

	⟨96.16⟩				
66+00			15.5	80.7	✓
+22 = S Bank Wash			15.8	80.4	✓
+25 = S edge Switzer Channel			17.3	78.9	✓
+60 N " " "			17.3	78.9	✓
+75 N Bank			16.0	80.2	✓
67+00			14.5	81.7	✓
+24.21 = POT. = 66+22.90 P-26 } Equation			14.42	⟨81.74⟩ 81.75 0.01 Error	P-26

Alignment See Page 77

Levels for New change of Line as Located P-76 from 54+82.62 to 71+48

56 12 = ℄ Euc Tree 2' dia 4' Rt ℄

56+32 " " " 2.5" 2' Lt ℄

56+46 " " " 2.5 3' Rt ℄

7/15/47 Rdcs & plotted etc.

	3.10	⟨75.41⟩		⟨72.31⟩	Elev Stake 57+45 = POT. P-79 P = 0 = Levels
57+00			4.3	71.1	✓
58+00			3.0	72.4	✓
+05			4.3	71.1	✓
+50 = S edge ch.			5.8	69.6	✓
59+42 N " "			6.0	69.4	✓

		⟨75.41⟩			
59+43 = N Bank ch.			3.1	72.3	✓
60+00			3.4	72.0	✓
+50			3.8	71.6	✓
+56			1.3	74.1	✓
TP	8.95	⟨83.36⟩	1.00	⟨74.41⟩	
61+00			8.6	74.8	✓
+22 = S Bank ch.			8.7	74.7	✓
+25 S edge "			9.8	73.6	✓
62+45 N " "			9.6	73.8	✓
+50 N Bank "			6.0	77.4	✓
63+00 ℄			6.6	76.8	10' Rt = ch
+13			6.6	76.8	✓
+23 = Pocket ch.			7.6	75.8	✓
+40 " "			7.7	75.7	✓
+44 Bank " "			6.3	77.1	✓
+95			5.5	77.9	✓
64+05			6.5	76.9	✓
+13			5.0	78.4	✓
65+00 in ch.			5.3	78.1	✓
27 Rt. = Int. Switzer & Powder } channels			8.8	74.6	Pocket
65+51			6.6	76.8	✓

Cont P-67

Walker
Hardin
Wirt

9-14-42

71+55.22 = Equation
71+48.0 = Δ Lt 19°22'15"

F.B. 1613

71+55.22 M.H.

M.H. 71+48 = Δ Rt. 19°22'15"

114°28'

Levels P-75

67+20.75
Δ Rt. 48°07'30"

Levels P-75

99.00

R.P. Cross in End Hd Wall
65+65.17
= Δ Lt 62°27'

R.P. = Nail & Tin Tag in Pole

124.8'

M.H.

48.5'

25°21'

Existing Sewer

143°27'

New Levels This Portion
Date - 10-26-43
F.B. 1620-59

Levels P-75

Also Portion Rerun Across Channel on Opp Page

South Line Balboa Park

Cal Revision B.M. at 54+50 at S. Toe Dam
Δ R 5°30'

Toe Dam.
54+82.62 P.O.T. on Cal Change
(= Δ Rt. 5°13'25")
S. Toe Dam.

48+69.61 P.T. ℄
Δ Lt (64°25'30") Cal Revision 64°42' Δ Lt

Indexed
c.s.k.

"C" Line F.B. 1651-12

22°30'

22°30'

= 3+99.4

4+64.45

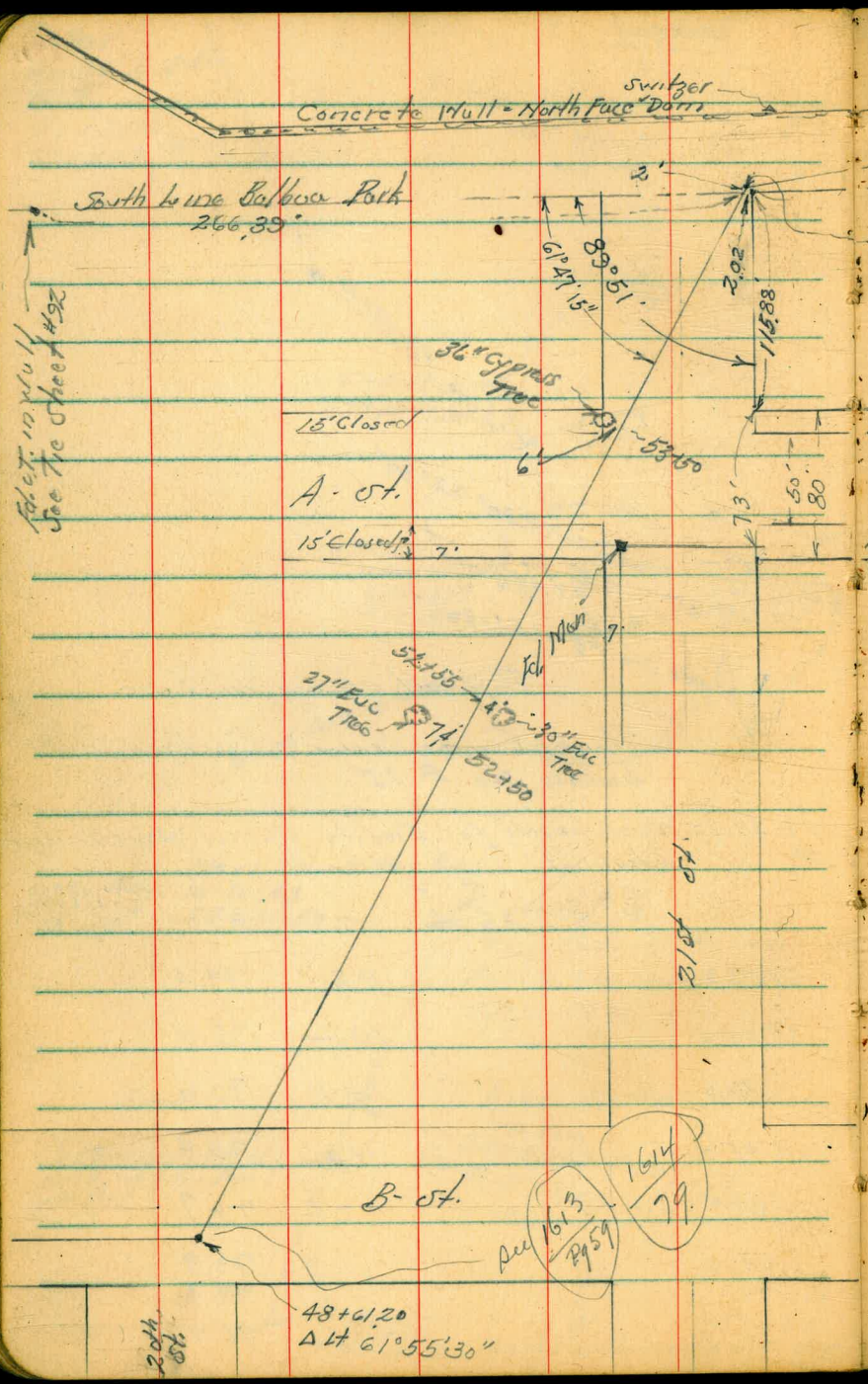
4G4.45'
"C" Line
F.B. 1651-12

Levels see F.B. 1651-30

Proposed change in line
Powder Canyon Sewer & Switzer Sewer
Levels See P. 75

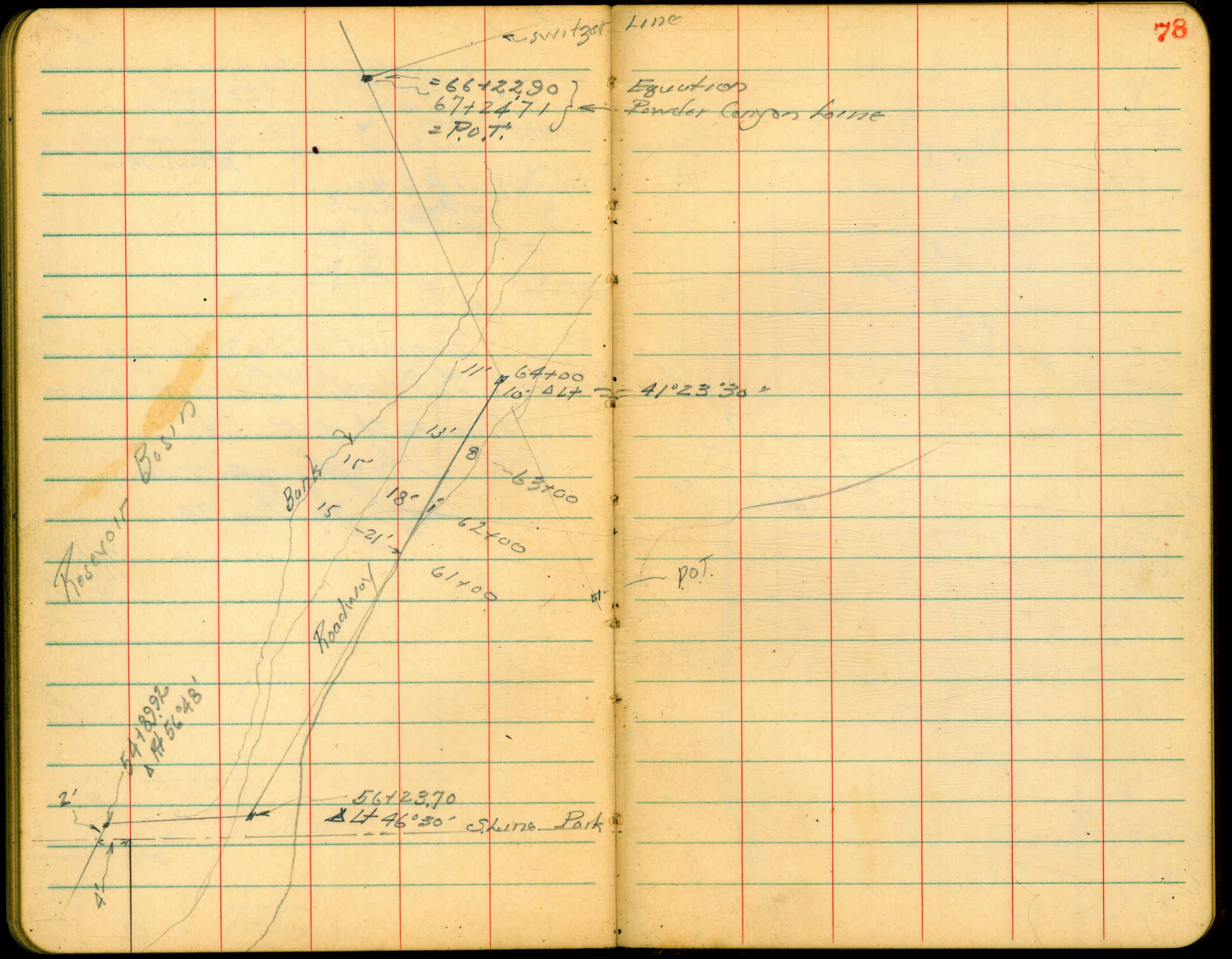
6-23-43 New Levels for Profile across New Switzer Channel

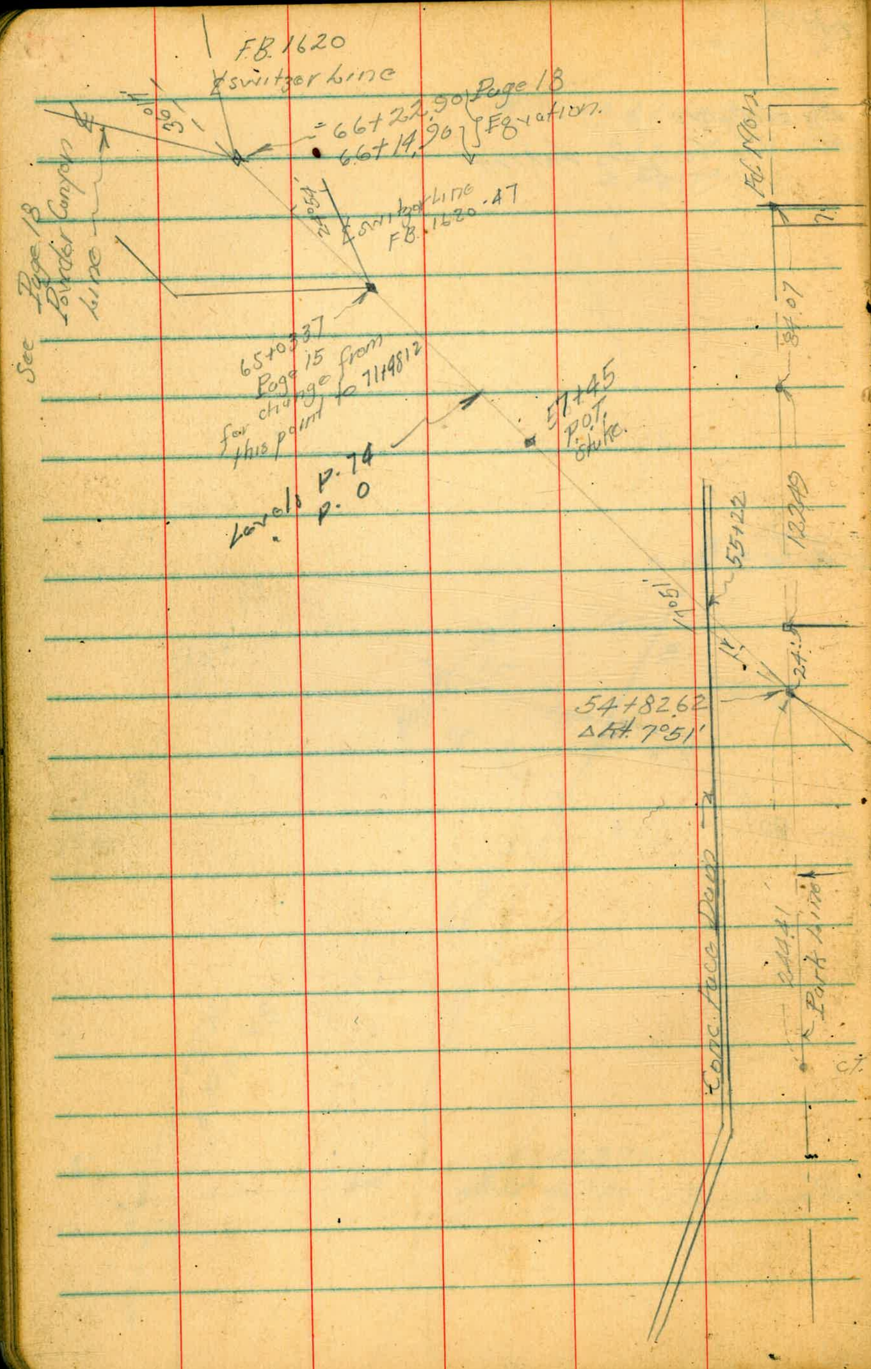
	5.15	85.24		80.09	Elev Stake 65+65.17 = Δ Page 67
61+20			11.2	74.0	
62+00			10.2	75.0	
+10			15.1	70.1	
63+50			14.8	70.4	
64+57			12.5	72.7	
65+10			11.3	73.9	
65+19			7.3	77.9	
65+50			8.5	76.7	

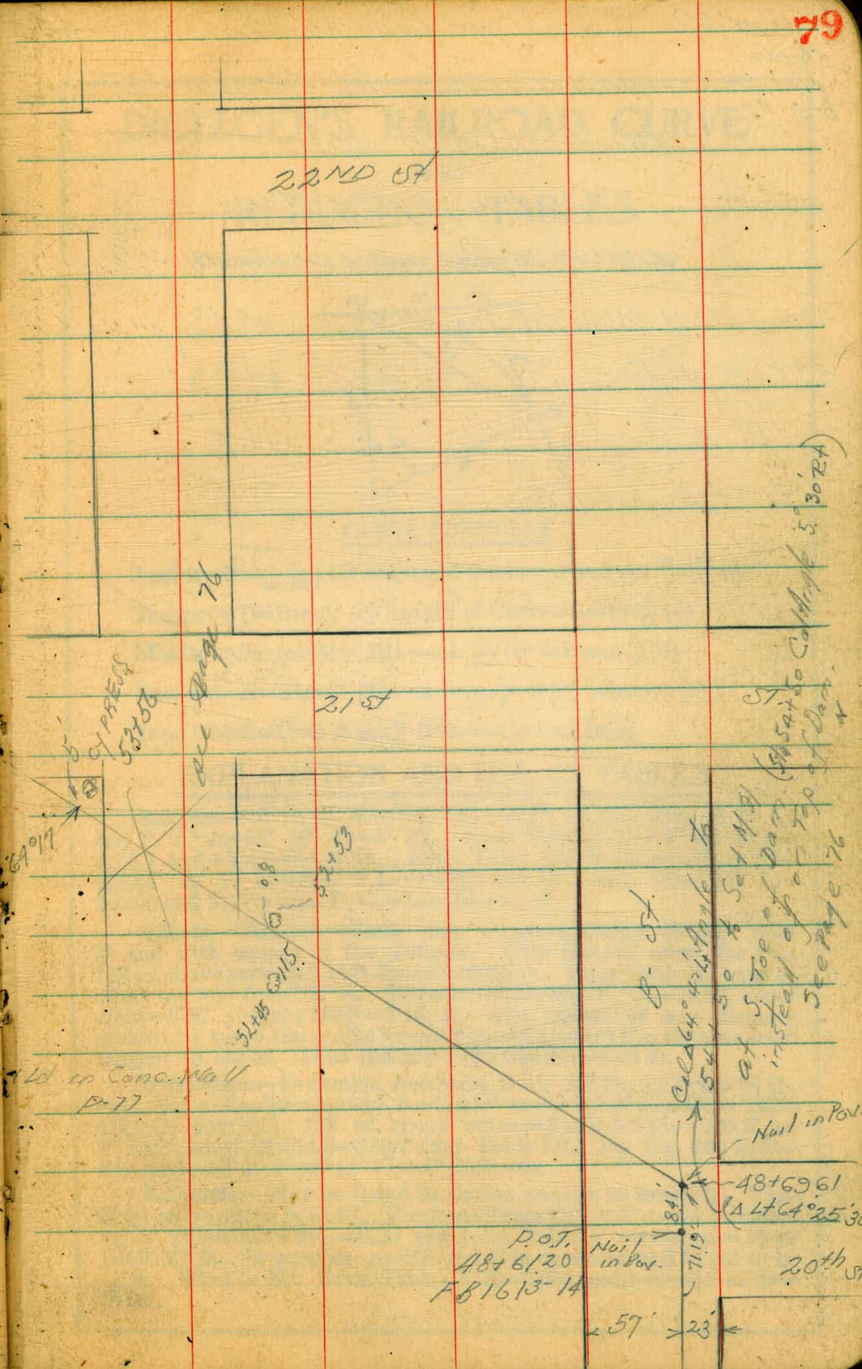


Proposed Line Change
Powder Canyon Sewer
from 20th & B - St.
To Pershing Drive.
Levels See Page 74

Walker
Hurdin
Reed
8-27-42


Switzer Line
=66+22.90
67+24.71
=P.O.T.
Equation
Powder Canyon Line
64+00
10° Δ Lt
= 41°23'30"
11'
13'
8
15'
18'
21'
Basin
Reservoir
Basin
15
63+00
62+00
61+00
Roadway
P.O.T.
54+89.92
Δ Rt 56°48'
2'
56+23.70
Δ Lt 46°30'
Shuma Park


F.B. 1620
Switzer Line
66+22.90 Page 13
66+14.90 Elevation
See Page 13
Powder Canyon Line
Switzer Line
F.B. 1620-47
65+03.37
Page 15 for change from this point to 71+98.12
57+45
P.O.T. Stake
Levels P. 74
P. 0
55+22
54+82.62
Δ Lt 7°51'
Conc. Face Dam
Park Line


22ND St.
21 St.
Cypress
53+56
See Page 76
64°17'
52+53
53+15
52+05
Cut Lid in Conc. Wall
P-77
B- St.
Calc. 64°42' Angle to set 50 to Set M.H. at S. Toe of Dam instead of on Top of Dam.
See Page 76
(55+54.30 Calc. Angle 5° 30' Rt.)
Nail in Pav.
48+69.61
(Δ Lt 64°25'30")
P.O.T.
48+61.20
F.B 1613-14
Nail in Pav.
20th St.
57'
23'

Walker 80 Levels for Proposed Line change
Hurlin
Reed
8-3-42 from 20th & B - to Pershing Drive

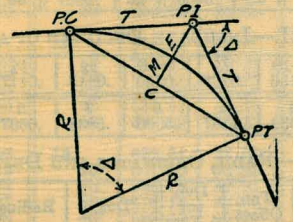
Powder Canyon Line

Location proposed change P-79

	4.61	74.78	70.17	S.E.B.P. 20th & B Sts.
48+69.6	Δ H 64°25'30"	5.65	69.13	on Nail
49+00	on Por	4.85	69.93	
+16	" "	3.8	71.0	
+18.4	on Patch Por.	3.3	71.5	
+40		1.2	73.6	
50+00		1.0	73.8	
+50		2.5	72.3	
51+00		4.8	70.0	
+50		6.0	68.8	
+75		6.7	68.1	
52+50		7.9	66.9	
53+00		7.8	67.0	
+56		7.2	67.6	
+80	Toe Hwy Fill	7.0	67.8	
+85	Top " "	2.7	72.1	
54+54	Toe Swingar Fill	2.3	72.5	on Hwy Fill
T.P	10.19	84.78	0.19	74.59

Cont. on Page 0

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES



16
13
42
21
4
22
4
173

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 vers $\frac{\Delta}{2}$ (6)

External=E=T tan $\frac{\Delta}{4}$ (7) =R÷cos. $\frac{\Delta}{2}$ —R (8)=R 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. Δ=62° 10′ D=8° 20′. From Table IV for 1° curve T=3454.1 and÷8⅓=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÷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÷(2 x 688.26)=2.16 ft.

Deflections.—Deflection angle=½ D for 100 ft., ¼ D for 50 ft., etc. For c ft.=(in minutes) .3 x C x D° or=defl. for 1 ft. from Table III x C. For Sta. 158 of above curve=.3 x 54.5 x 8⅓=136.2′ or 2° 16.2′, or=2.50 x 54.5=136.2′ from Table III. For Sta. 159 deflection angle=2° 16.2′ +8° 20′÷2=6° 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° 20′=960.6÷8⅓=91.27 and from Table V correction=.10 or E=91.37 ft. Or suppose Δ=32° and E is measured and found to be 42 ft. What is D? From Table IV E=230.9 and÷42=5.5 or D=5° 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	⅛	3–16	¼	5–16	⅜	½	⅝	¾	⅞
.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.—Radii, 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	8	716.78	1.746	6.976	2.40
1	5729.65	.218	.873	0.30	20	688.16	1.819	7.266	2.50
10	4911.15	.255	1.018	0.35	30	674.69	1.855	7.411	2.55
20	4297.28	.291	1.164	0.40	40	661.74	1.892	7.556	2.60
30	3819.83	.327	1.309	0.45	9	637.28	1.965	7.846	2.70
40	3437.87	.364	1.454	0.50	20	614.56	2.037	8.136	2.80
50	3125.36	.400	1.600	0.55	30	603.80	2.074	8.281	2.85
2	2864.93	.436	1.745	0.60	40	593.42	2.110	8.426	2.90
10	2644.58	.473	1.891	0.65	10	573.69	2.183	8.716	3.00
20	2455.70	.509	2.036	0.70	30	546.44	2.292	9.150	3.15
30	2292.01	.545	2.181	0.75	11	521.67	2.402	9.585	3.30
40	2148.79	.582	2.327	0.80	30	499.06	2.511	10.02	3.45
50	2022.41	.618	2.472	0.85	12	478.34	2.620	10.45	3.60
3	1910.08	.655	2.618	0.90	30	459.28	2.730	10.89	3.75
10	1809.57	.691	2.763	0.95	13	441.68	2.839	11.32	3.90
20	1719.12	.727	2.908	1.00	30	425.40	2.949	11.75	4.05
30	1637.28	.764	3.054	1.05	14	410.28	3.058	12.18	4.20
40	1562.88	.800	3.199	1.10	30	396.20	3.168	12.62	4.35
50	1494.95	.836	3.345	1.15	15	383.07	3.277	13.05	4.50
4	1432.69	.873	3.490	1.20	30	370.78	3.387	13.49	4.65
10	1375.40	.909	3.635	1.25	16	359.27	3.496	13.92	4.80
20	1322.53	.945	3.718	1.30	30	348.45	3.606	14.35	4.95
30	1273.57	.982	3.926	1.35	17	338.27	3.716	14.78	5.10
40	1228.11	1.018	4.071	1.40	18	319.62	3.935	15.64	5.40
50	1185.78	1.055	4.217	1.45	19	302.94	4.155	16.51	5.70
5	1146.28	1.091	4.362	1.50	20	287.94	4.374	17.37	6.00
10	1109.33	1.127	4.507	1.55	21	274.37	4.594	18.22	6.30
20	1074.68	1.164	4.653	1.60	22	262.04	4.814	19.08	6.60
30	1042.14	1.200	4.798	1.65	23	250.79	5.035	19.94	6.90
40	1011.51	1.237	4.943	1.70	24	240.49	5.255	20.79	7.20
50	982.64	1.273	5.088	1.75	25	231.01	5.476	21.64	7.50
6	955.37	1.309	5.234	1.80	26	222.27	5.697	22.50	7.80
10	929.57	1.346	5.379	1.85	27	214.18	5.918	23.35	8.10
20	905.13	1.382	5.524	1.90	28	206.68	6.139	24.19	8.40
30	881.95	1.418	5.669	1.95	29	199.70	6.360	25.04	8.70
40	859.92	1.455	5.814	2.00	30	193.18	6.583	25.88	9.00

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	115.66
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
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

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	779.8
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	790.1
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

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

FOR SUB-CHORDS ADD										Excess of arc per 100 ft.	LONG CHORDS				
D	10	20	30	40	50	60	70	80	90		D	200	300	400	500
4°	.00	.00	.01	.01	.01	.01	.01	.01	.00	.02	1	199.99	299.97	399.92	499.85
6	.00	.01	.01	.02	.02	.02	.02	.01	01	.05	2	199.97	299.88	399.70	499.39
8	.01	.02	.02	.03	.03	.03	.03	.02	.01	.08	3	199.93	299.73	399.32	498.63
10	.01	.02	.03	.04	.05	.05	.05	.04	.02	.13	4	199.88	299.51	398.78	497.57
12	.02	.04	.05	.06	.07	.07	.07	.05	.03	.18	5	199.81	299.24	398.10	496.20
14	.02	.05	.07	.08	.09	.10	.09	.07	.04	.25	6	199.73	298.90	397.26	494.53
16	.03	.06	.09	.11	.12	.12	.12	.09	.05	.33	7	199.63	298.51	396.28	492.57
18	.04	.08	.11	.14	.15	.16	.15	.12	.07	.41	8	199.51	298.05	395.14	490.31
20	.05	.10	.14	.17	.19	.20	.18	.15	.09	.51	9	199.38	297.54	393.86	487.75
22	.06	.12	.17	.21	.23	.24	.22	.18	.10	.62	10	199.24	296.96	392.42	484.90
24	.07	.14	.20	.25	.28	.28	.26	.21	.12	.74	12	198.90	295.63	389.12	478.34
26	.09	.17	.24	.29	.32	.33	.31	.25	.15	.86	14	198.51	294.06	385.22	470.65
28	.10	.19	.27	.34	.37	.38	.36	.29	.17	1.00	16	198.05	292.25	380.76	461.86
30	.11	.22	.31	.39	.43	.44	.41	.33	.19	1.15	18	197.54	290.21	375.74	452.02
32	.13	.25	.36	.44	.49	.50	.47	.38	.22	1.31	20	196.96	287.94	370.17	441.15
34	.15	.28	.40	.50	.55	.57	.53	.43	.25	1.48	22	196.32	285.44	364.06	429.30
36	.17	.32	.45	.56	.62	.64	.59	.48	.28	1.66	24	195.63	282.71	357.43	416.53
38	.18	.36	.51	.62	.70	.71	.66	.53	.31	1.86	26	194.87	279.76	350.30	402.89
40	.21	.40	.56	.69	.77	.79	.73	.59	.35	2.06	28	194.06	276.59	342.69	388.43
42	.23	.44	.62	.76	.85	.87	.81	.65	.38	2.28	30	193.18	273.20	334.61	373.20
44	.25	.48	.68	.84	.94	.96	.89	.72	.42	2.50	32	192.25	269.61	326.08	357.28
46	.27	.52	.75	.92	1.02	1.05	.98	.78	.46	2.74	34	191.26	265.81	317.12	340.73
48	.30	.57	.81	1.00	1.12	1.14	1.06	.86	.50	2.99	36	190.21	261.80	307.77	323.61
50	.32	.62	.89	1.09	1.21	1.24	1.15	.93	.55	3.24	38	189.10	257.60	298.03	305.99
52	.35	.67	.96	1.18	1.31	1.35	1.25	1.01	.59	3.52	40	187.94	253.21	287.94	287.94
54	.38	.73	1.04	1.28	1.42	1.46	1.35	1.09	.64	3.80	42	186.72	248.63	277.51	269.54
56	.41	.78	1.12	1.38	1.53	1.57	1.46	1.17	.69	4.09	44	185.44	243.87	266.78	250.85
58	.44	.84	1.20	1.48	1.65	1.69	1.57	1.26	.74	4.40	46	184.10	239.93	255.78	231.95
60	.47	.91	1.29	1.59	1.76	1.81	1.68	1.35	.80	4.72	48	182.71	233.83	244.51	212.92

NOTE.—When a chord of less than 100 ft. is used the corrections given in the above table should be added to the nominal length of chord to get the length which should be used in order that the 100 ft. points will check with those obtained by using the standard 100 ft. chord. Thus in locating a 14° curve by 25 ft. chords measure 25′.06 for each chord. Long chords are useful in passing obstacles.

TABLE VII.—MIDDLE ORDINATES FOR RAILS IN FEET.

Deg. of Curve	LENGTH OF RAILS							Deg. of Curve	LENGTH OF RAILS.						
	32	30	28	26	24	22	20		32	30	28	26	24	22	20
1°	.022	.020	.016	.013	.011	.009	.008	16°	.356	.313	.273	.236	.200	.170	.139
2	.045	.038	.034	.029	.025	.021	.017	17	.378	.333	.290	.252	.213	.180	.148
3	.067	.058	.051	.044	.037	.031	.026	18	.400	.351	.306	.265	.225	.190	.156
4	.089	.079	.069	.060	.050	.042	.035	19	.423	.371	.324	.280	.238	.201	.165
5	.112	.099	.086	.074	.063	.053	.044	20	.445	.392	.341	.296	.250	.212	.174
6	.134	.117	.102	.088	.076	.064	.052	21	.466	.410	.357	.309	.262	.222	.182
7	.156	.137	.120	.104	.088	.074	.061	22	.487	.430	.375	.325	.275	.233	.191
8	.179	.158	.137	.119	.100	.085	.070	23	.509	.450	.390	.338	.287	.243	.199
9	.201	.175	.153	.133	.112	.095	.078	24	.531	.469	.408	.354	.299	.253	.208
10	.223	.196	.171	.148	.125	.106	.087	25	.552	.486	.424	.367	.311	.263	.216
11	.245	.216	.188	.163	.139	.117	.096	26	.573	.506	.441	.382	.323	.274	.225
12	.268	.236	.206	.179	.151	.128	.105	27	.594	.524	.457	.396	.335	.284	.233
13	.290	.254	.222	.192	.163	.138	.113	28	.618	.545	.475	.411	.348	.294	.242
14	.312	.275	.239	.207	.175	.148	.122	29	.638	.564	.491	.424	.361	.303	.250
15	.334	.295	.257	.223	.188	.159	.131	30	.660	.583	.508	.438	.374	.313	.259

SLOPE REDUCTIONS.

When distances are measured on a slope they may be reduced to the equivalent horizontal distance by the following approximate rule:—subtract from the slope distance the square of the rise divided by twice the slope distance. Thus for a slope distance of 250.3 ft. and a rise of 15 ft. correction=$15^2 \div 2 \times 250.3$=.45 (by slide rule) or horizontal distance=250.3—.45=249.85. When vertical angle=V. A. is measured horizontal distance=slope distance—slope distance (1—Cos. V. A.). Thus for slope distance of 248.7 ft. and V. A. of 4° 20′ from Table VIII Cos=.99714 and correction=1—.99714=.00286 per foot or total of .286×2½ (near enough)=.57 and horizontal distance=248.7—.57=248.13 ft.

TRIGONOMETRICAL FORMULAS.

See fig. (a).

sin. $A=\frac{a}{c}$

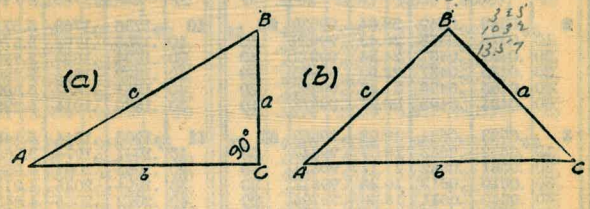
cos. $A=\frac{b}{c}$

tan. $A=\frac{a}{b}$

cot. $A=\frac{b}{a}$

sec. $A=\frac{c}{b}$

cosec. $A=\frac{c}{a}$



FORMULA FOR SOLVING TRIANGLES.

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

DIAGRAM FOR OBTAINING HORIZONTAL AND VERTICAL DISTANCES FROM STADIA READINGS

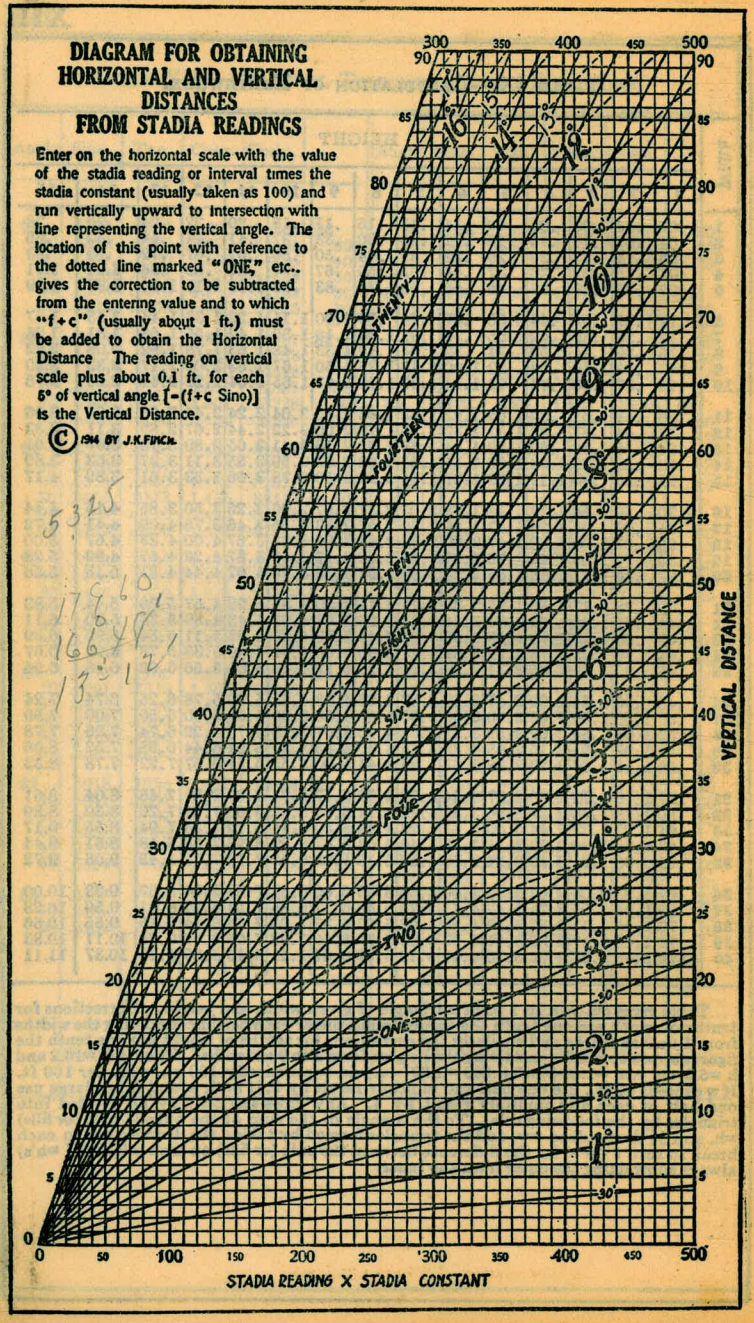
Enter on the horizontal scale with the value of the stadia reading or interval times the stadia constant (usually taken as 100) and run vertically upward to intersection with line representing the vertical angle. The location of this point with reference to the dotted line marked "ONE," etc.. gives the correction to be subtracted from the entering value and to which "f+c" (usually about 1 ft.) must be added to obtain the Horizontal Distance The reading on vertical scale plus about 0.1 ft. for each 5° of vertical angle [-(f+c Sino)] is the Vertical Distance.

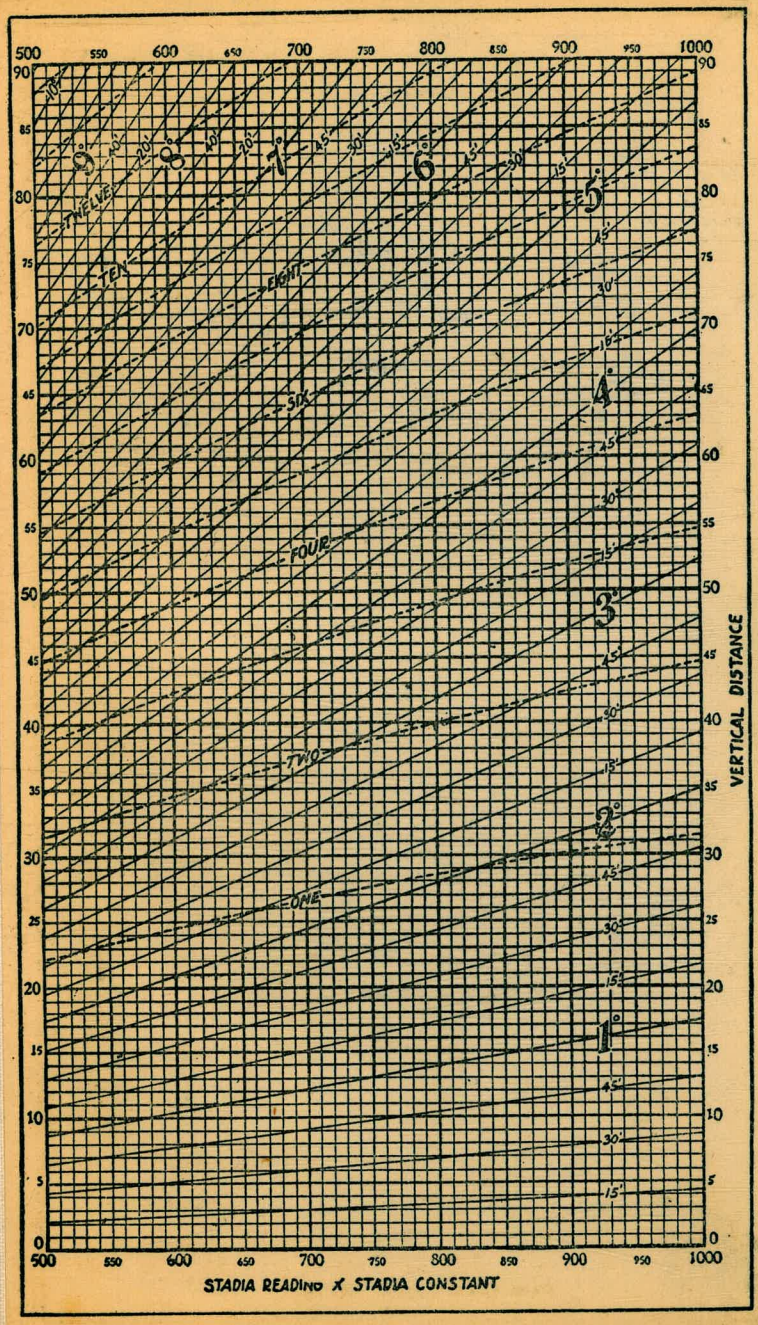
5375

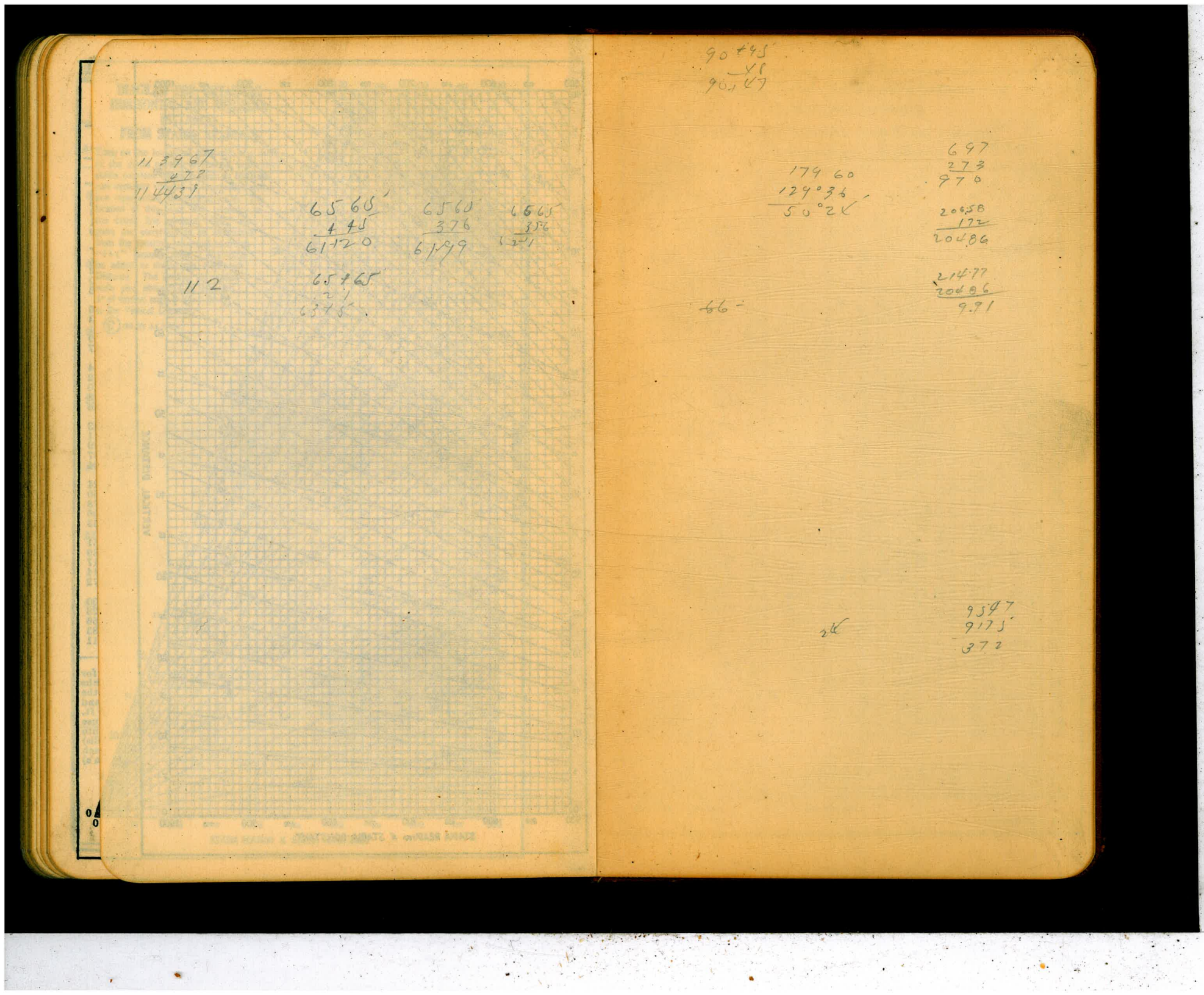
17610'

16648'

13° 12'







DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1½

For Single Track Embankment.

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

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For 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.