1691

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.

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1691

CITY ENGINEER'S OFFICE

N.E. Cor Wadsworth Olive

52.85
2 F 92

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

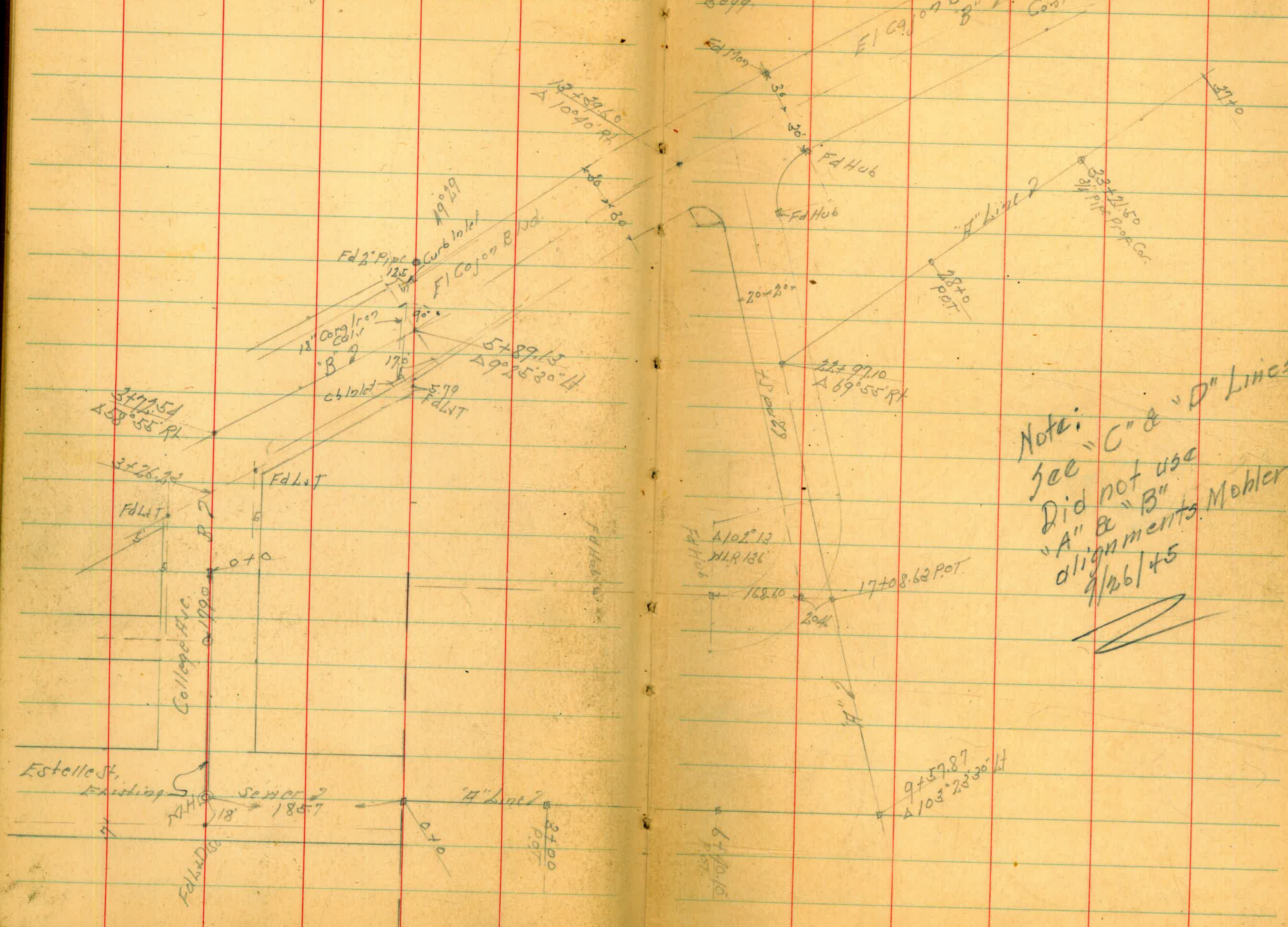
Made in U. S. A.

Proposed Sewer "A" Line
Estelle St. 62nd St + South of El Cajon Blvd.
"B" College Ave + El Cajon Blvd

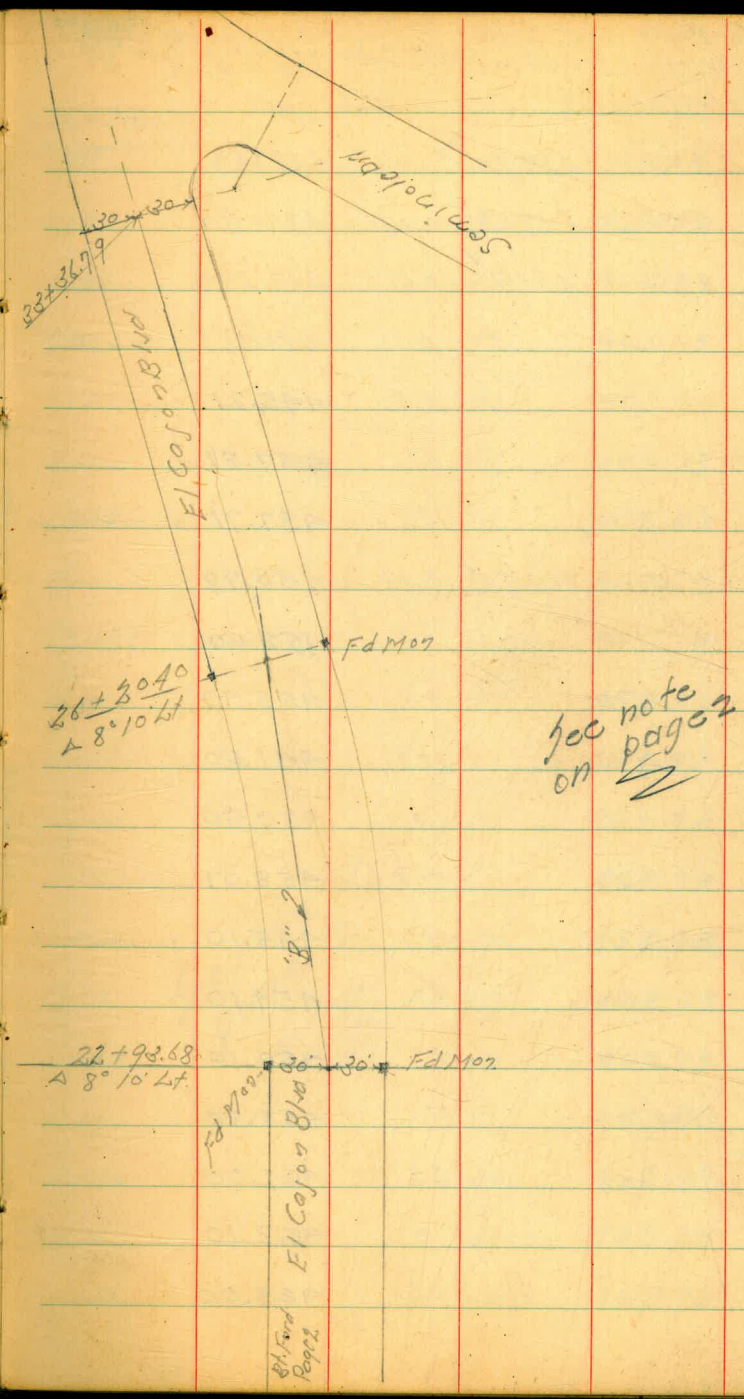
Aug. 27-45
Sisson
Bliss
Osborne
Begg

indexed
C.S.K.

Con't Page 3



Note:
See "C" & "D" Lines
Did not use
"A" & "B"
alignments Mohler
9/26/45



See note on page 2

Levels Proposed Sewer "A" Line
Estelle St. - 62nd St. x South of El Cajon Blvd.
Sketch Page 2

Indexed C.S.K.

BM	18.54	427.20		418.66	NW BP W E end Estelle x 60th St.
TP	12.81	439.88	0.13	427.07	
	12.64	451.91	0.61	439.27	
0+0			11.16	440.75	on Hub
+50			6.7	445.21	
1+0			4.1	447.81	
"	150' Lt of ℄		14.2	437.71	Bottom Gulch
TP	12.81	463.80	0.92	450.99	
+50			11.8	452.00	
2+0			8.4	455.40	
"	180' Lt of ℄		22.2	441.60	Bottom Gulch
+50			6.4	457.40	
3+0	P.O.T.		5.73	458.07	on Hub
"	190' Lt of ℄		18.7	445.10	Bottom Gulch
+50			4.7	459.10	
4+0			3.7	460.10	
"	200' Lt		13.3	450.50	
+50			2.8	461.00	
5+0			1.7	462.10	
+50			0.8	463.00	

Notes reduced by Marie Markovitch 9/6/45

Aug. 29 45
S. Jsop
Blvd
Osborne
Bag Rod

4

		468.80		
TP	468	467.93	0.55	468.25
6+0			4.2	463.73
+50			3.7	464.23
7+0			4.0	463.93
+50			4.3	463.63
8+0			5.2	462.73
+50			6.4	461.53
9+0			7.4	460.53
+57.87 = Δ 108° 28' 30" Lt.			10.79	457.14 on Hub
10+0			8.4	459.53
+12			6.1	461.83
+50			6.1	461.83
11+0			5.0	462.93
+50			5.0	462.93
12+0			5.2	462.73
+50			5.2	462.73
13+0			5.2	462.73
+50			5.0	462.93
14+0			4.6	463.33
+50			4.0	463.93

see note on page 2

		467.93			
TP	5.87	470.02 ✓	3.78	464.15	
15+0			5.6	464.42	
+50			5.3	464.72	
16+0			5.1	464.92	
+50			4.9	465.12	
17+0			4.8	465.22	
+08.63			4.87	465.15	on Hub
+50			5.0	465.02	
18+0			5.4	464.62	
+50			5.3	464.72	
19+0			4.8	465.22	
+50			4.8	465.22	
20+0			5.0	465.02	
TP	6.33	471.24 ✓	5.11	464.91	
+50			6.3	464.94	
21+0			6.2	465.04	
+50			6.0	465.24	
22+0			6.0	465.24	
+50			6.4	464.84	
+97.10	∠ 69°55' Rt		6.70	464.54	on Hub

		471.24 ✓			
23+50			6.4	464.84	
24+0			5.8	465.44	
+50			6.3	464.94	
25+0			5.8	465.44	
+50			5.9	465.34	
26+0			5.8	465.44	
+50			5.2	466.04	
27+0			5.3	465.94	
TP	3.38	469.46 ✓	5.16	466.08	
+50			3.2	466.26	
28+0	P.O.T		3.8	465.66	
+50			3.5	465.96	
29+0			4.0	465.46	
+50			5.1	464.36	
30+0			5.7	463.76	
+50			6.2	463.26	
31+0			6.6	462.86	
+50			5.8	463.66	
32+0			6.6	462.86	
+50			6.7	462.76	

		469.46			
33+0			7.6	461.86	
+50			8.0	461.46	
34+0			8.2	461.26	
+50			8.2	461.26	
35+0			8.2	461.26	
+50			7.8	461.66	
36+0			7.1	462.36	
+50			7.3	462.16	
37+0			7.9	461.6	
BM			3.94	465.52	N.W.B.P. El Cajon x 63rd St 465.66

Levels Proposed Sewer B Line
College Ave + El Cajon Blvd to Seminole Dr.
Sketch Page 2 + 3

B.M.	1.04	466.31 ✓		465.27	HWBP El Cajon Blvd + College Way
0+0	= Wly Existing Sewer College Way		13.8	452.51	
+50			9.8	456.51	
1+0			7.2	459.11	
+50			5.6	460.71	
2+0			4.4	461.91	
+50			3.1	463.21	
+84	= Sty Oil + Rock Pav.		2.35	463.96	
3+0			2.1	464.21	
+01	1 Rt of ℄ = Wly 6' Signal Trip				
+21.5	on Paving		1.90	464.41	
+35	" "		2.12	464.19	
+72.54	Δ 58° 55' Rt.		1.47	464.84	
TP	2.85	468.12 ✓	1.04	465.27	
4+0			3.36	464.76	
+50			3.74	464.38	
5+0			3.92	464.20	
+50			4.11	464.01	
+89.13 = Δ 9° 25' 30" Lt.			4.15	463.97	
Curb Inlet on Lt.			7.04	461.08	Flow Line

Indexed
c.s.k.

468.12 ✓

Aug-30-45
Sisson
Bliss
Osborne
Begg

7

Curb Inlet on Rt.			7.68	460.44	Flow Line
6+0			4.14	463.98	
+50			3.92	464.20	
7+0			3.65	464.47	
+50			3.45	464.67	
8+0			3.27	464.85	
+50			3.02	465.10	
9+0			2.83	465.29	
TP	4.57	469.41 ✓	3.28	464.84	
+50			3.93	465.48	
10+0			3.80	465.61	
+50			3.63	465.78	
11+0			3.60	465.81	
+50			3.58	465.83	
12+0			3.45	465.96	
+50			3.32	466.09	
13+0			3.15	466.26	
+39.60 = Δ 10° 46' Rt.			3.10	466.31	
14+0			3.02	466.39	
+50			2.98	466.43	

See note on page 2

		469.41 ✓			
15+0			2.92	466.49	
+50			2.83	466.58	
16+0			2.80	466.61	
+50			2.83	466.58	
17+0			3.05	466.36	
+50			3.37	466.04	
TP	2.85	468.41 ✓	3.85	465.56	N.W.B.P. El Coson +63 +481 465.66
18+0			2.63	465.78	
+50			2.85	465.56	
19+0			3.15	465.26	
+50			3.43	464.98	
20+0			3.63	464.78	
+50			3.83	464.58	
21+0			4.00	464.41	
+50			4.14	464.27	
22+0			4.11	464.30	
+50			4.23	464.18	
+93.68	Δ 8°10' Lt.		4.27	464.14	
23+0			4.27	464.14	
+50			4.31	464.10	

		468.41 ✓		
24+0			4.42	463.99
+50			4.51	463.90
25+0			4.57	463.84
+50			4.60	463.81
26+0			4.75	463.66
+20.40	Δ 8°10' Lt.		4.81	463.60
+50			4.96	463.45
27+0			5.32	463.09
+50			5.50	462.91
28+0			5.83	462.58
TP	3.24	465.43 ✓	6.22	462.19
+50			3.11	462.32
29+0			3.42	462.01
+50			3.73	461.70
30+0			4.00	461.43
+50			4.36	461.07
31+0			4.52	460.91
+50			4.87	460.56
32+0			5.33	460.10
+50			6.08	459.35

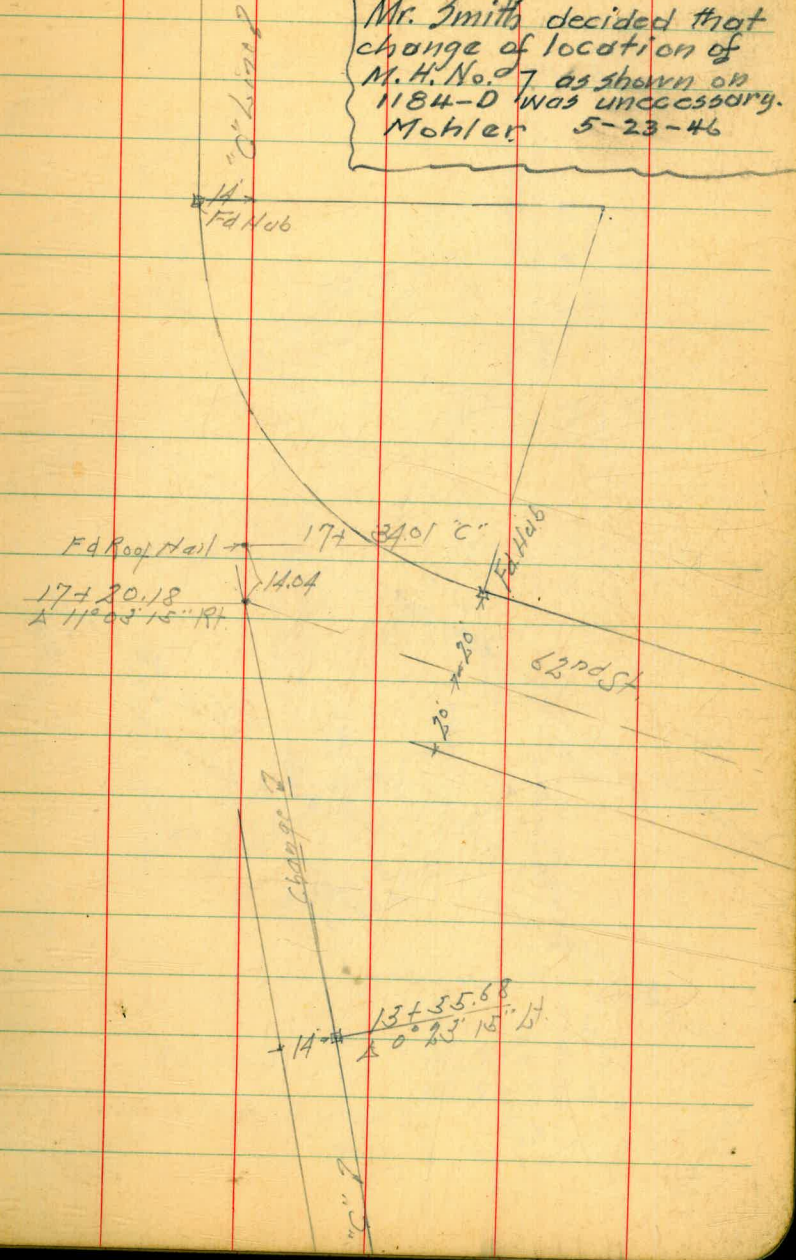
		465.43 ✓			
33+0			7.10	458.33	
+36.79			7.88	457.55	
TP	2.63	457.11 ✓	10.95	454.48	
BM			4.69	452.42	S.W. BP El Cajon & Rolando 452.46

Proposed Sewer Line Change
El Cajon Blvd + 62nd St
Original Page 13

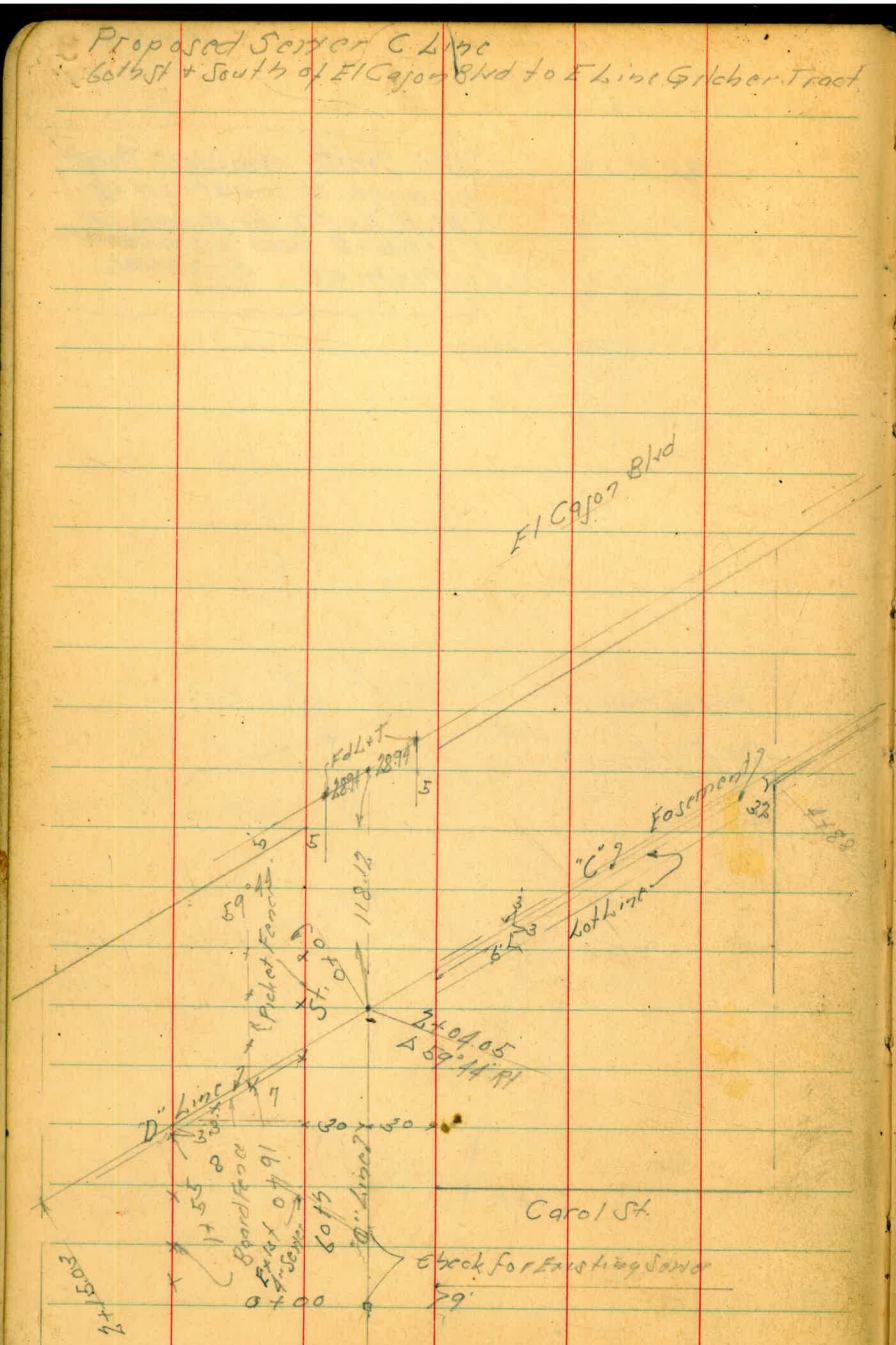
May 22-46
Sisson
Ofenstein
Waddel
Allen

9

Mr. Smith decided that change of location of M.H. No. 7 as shown on 1184-D was unnecessary.
Mohler 5-23-46

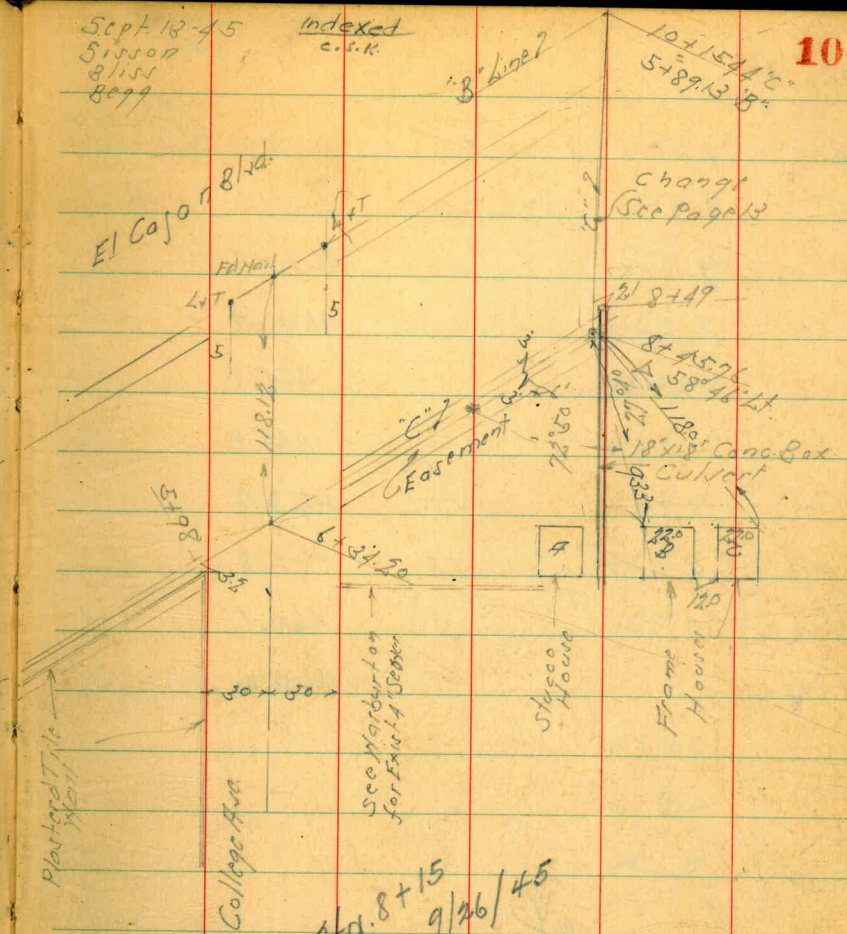


Proposed Sewer C Line
60th St + South of El Cajon Blvd to E Line Gilcher Tract



Sept. 18-45
Sisson
Bliss
Begg

Indexed
C.S.K.



O.K. up to Sta. 8+15
Mohler 9/26/45

Levels Proposed Sewer "D" Line

indexed
C.S.K.

Sketch Page 10

B.M.	4.90	470.17 ✓		465.27	N.W.B.P. El Cajon & College Way
TP	3.77	469.58 ✓	4.36	465.81	
0+0	"D" = 2+04.05 "C"		5.13	464.45	
+20			5.50	464.08	
+34	= Picket Fence		4.5	465.1	
+50			4.6	465.0	
1+0			5.9	463.7	
+50			6.8	462.8	
2+0			9.1	460.5	
+15.03			9.6	460.0	

O.K.

Levels Proposed Sewer "C" Line
60th St. + South of El Cajon Blvd to E Line Gilcher Tract

469.58 ✓ Bt. Ford

0+0	= ℄ 60th 9' S of SL Carol St.		13.5	456.1	on Oil & Rock Paving
+50			9.8	459.8	"
1+0			7.2	462.4	"
+50			5.8	463.8	"
2+04.05	= Δ 59°44' Rt.		5.13	464.45	"
+17	= Ely O+R Pav		5.1	464.5	
+25			5.0	464.6	
+50			3.9	465.7	
3+0			4.6	465.0	
+38.5	N+S Wire Fence				
+50			5.0	464.6	
+60			6.5	463.1	
4+0			7.7	461.9	
+20	= N+S Wire Fence				
+50			8.2	461.4	
5+0			7.9	461.7	
TP	4.80	466.75 ✓	7.63	461.95	
+50			5.3	461.5	
6+0			5.0	461.8	
+12			5.3	461.5	

O.K.

		466.75 ✓			
6+34.20 = ℄ College Ave			4.6	462.2	
+80			4.1	462.7	
7+0			3.5	463.3	
+50			4.5	462.3	
8+0			6.1	460.7	
+15	76 Rt of ℄ = Nly "A" House		5.60	461.15	on Floor
+45.76	Δ 58° 46' Lt		7.82	458.93	on Stub
+49	21 Rt of ℄ = ℄ x Nly 18" x 18" Box Culv.		9.96	456.79	Flow Line
+50			9.8	457.0	
9+0			8.8	458.0	
TP	7.63	467.71 ✓	6.67	460.08	
+32	3.5 Lt of ℄ = Ely Anchor Pole				
+50			8.0	459.7	
+53	1.5 Rt of ℄ = ℄ x Sly 18" Conc. Pipe Culvert.		8.91	458.80	Flow Line
+64.5 = Sly Conc Walk			4.16	463.55	
+78.7 = Sly Curb El Cajon			4.05	463.66	
"	Gutter on Paving		4.90	462.81	
+75.5	1.5 Lt of ℄ = Ely Anchor Pole				
10+15.44 = ℄ El Cajon = 5+89.13 "B"			3.72	463.99	

OK up to Sta 8+15

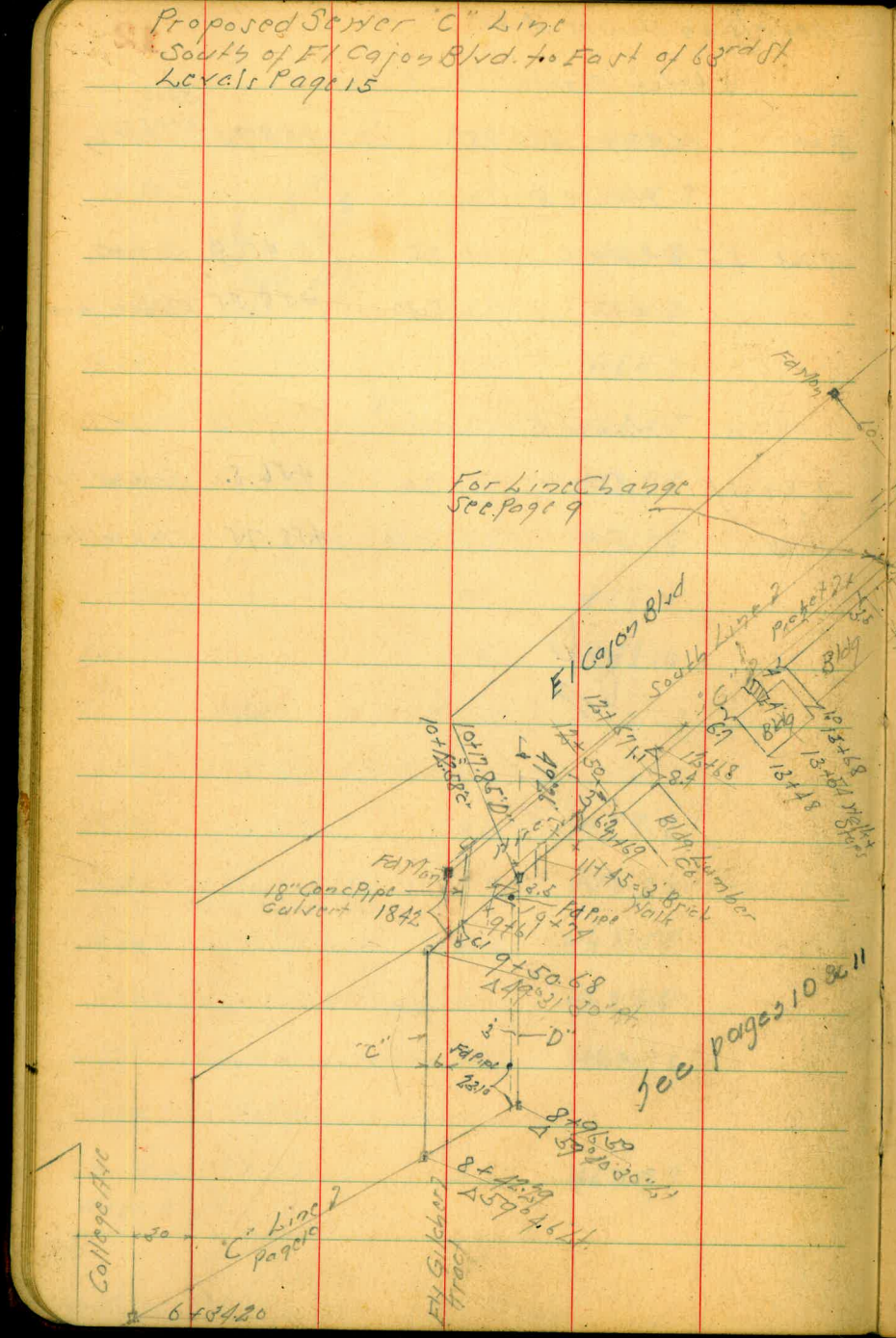
Levels on Houses B + C

Sketch Page 10

B.M.	4.92	463.85 ✓		458.93	Stub 8+45.76
House B					
93.3 S.E. 8+45.76 C			7.5	456.3	Ground
" " "			5.30	458.55	Floor of House
House C					
118.0' S.E. 8+45.76 "C"			7.0	456.8	Ground
" " " "			5.10	458.75	Floor of House

OK

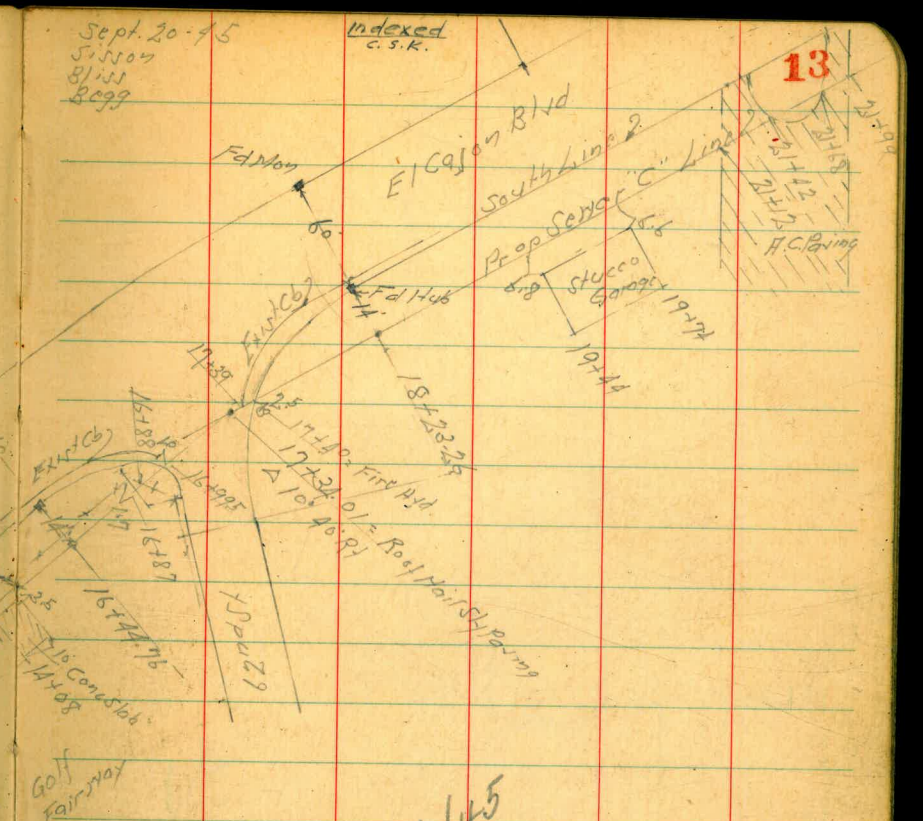
Proposed Sewer "C" Line
South of El Cajon Blvd. to East of 68th St
Levels Page 15



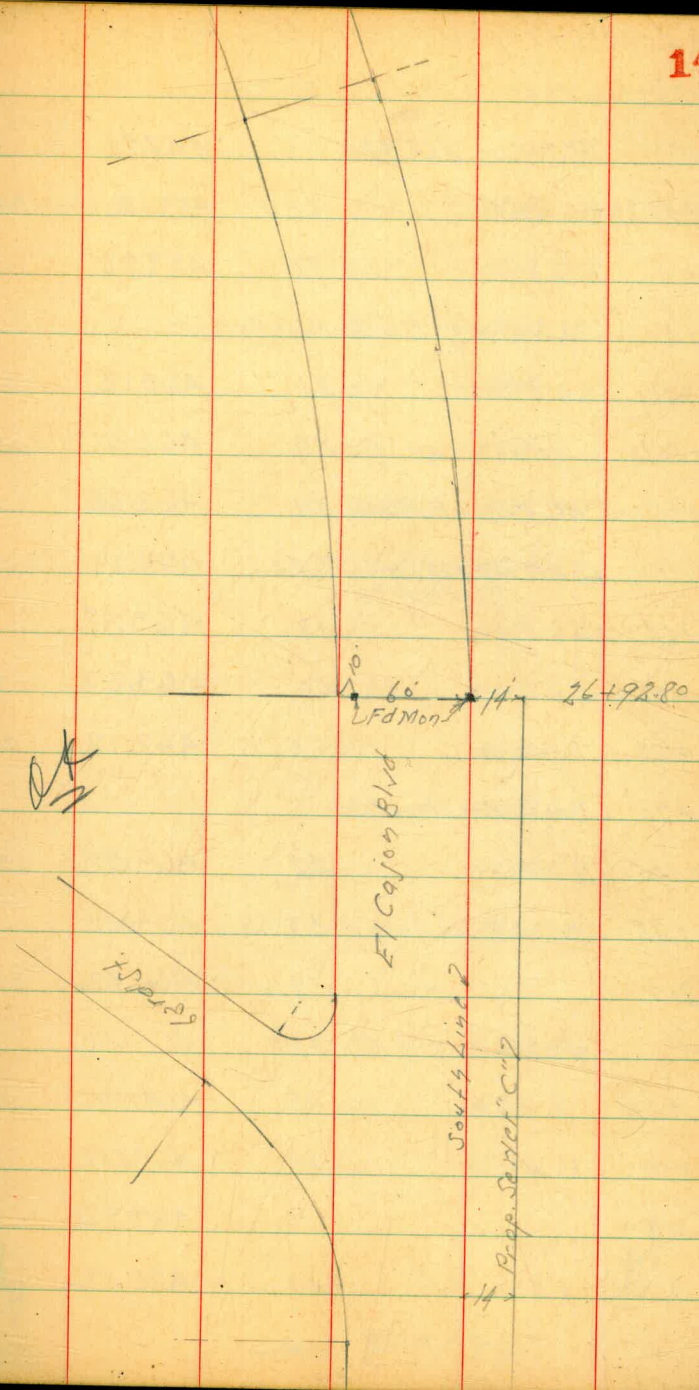
Sept. 20-45
Sisson
Bliss
Bragg

Indexed
C.S.I.

13



9/26/45
OK
Mohler



10
60
14
26+92.80
Fd Mon
El Cajon Blvd
62nd St.
South Line
Prop. Sewer "C"
14

Levels Proposed Sewer "C" Line Cost.

Sketch Page 13

BM	9.29	468.22		458.93	on Stub 8+45.76 old Page 12
8+42.29	Δ 59°46' Lt		9.04	459.18	on Stub
9+0			9.0	459.22	
+30	0.6' Rt of Δ - N½ Anchor Pole				
+31	"		8.1	460.12	
+50.68	Δ 49°31'30" Rt		5.71	462.51	on Stub
+61	= Rl. 18" Conc Pipe Culv.		5.9	462.32	
"	6.1 Rt = S½18" Conc Pipe Along Pipe		9.43	458.79	Flow Line
+64			4.8	463.42	
10+0			5.0	463.22	
+50			5.5	462.72	
+74	= Cross Wire Fence				
11+0			4.2	464.02	
+45	= N½ 3' Bitch Walk		3.8	464.42	
12+0			3.9	464.32	
IP	5.07	469.42	3.87	464.35	
+50			4.9	464.52	
13+0			4.8	464.62	
+50			4.7	464.72	
+54	= 4' Conc Walk		4.8	465.12	

		469.42			
14+0			5.8	464.12	
+08	on Conc Stub		5.13	464.29	
+50			5.4	464.02	
15+0	16 Lt = Picket Fence		5.3	464.12	
+50			5.4	464.02	
16+0			5.3	464.12	
+14.76	P.O.T.		5.07	464.35	on Stub
+87			4.6	464.82	
17+0			3.8	465.62	
+34.01	= Δ 10°40' Rt.		3.80	465.62	on Paving
+50			3.8	465.62	
18+0			3.8	465.62	
+50			3.8	465.62	
TP	5.41	470.71	4.12	465.30	
+96.5	N+S Lath Fence				
19+0			4.7	466.01	
+50			4.5	466.21	
20+0			4.6	466.11	
+10	4.5' Lt of Δ = S½18" Palm				
+28	Δ = Δ 40° Palm Tree				

MM 9/22/45

"C" Line

		470.71			
20+50			4.8	465.91	
+65	1.0' Rt = ½ 36" Palm Tree				
21+0			4.8	465.91	
+12	= Wly AC Paving		4.60	466.11	
+42	= Edge " "		4.66	466.05	
+54	2.4' Lt = 4" Pipe Elec. Sign				
+68	= " " "		4.80	465.91	
+99	= Ely. AC Paving		5.05	465.66	
22+50			5.7	465.01	
+90			6.9	463.81	
23+0			6.9	463.81	
TP	3.13	468.74	5.10	465.61	N.W. BP El Cajon + 63rd St 465.66
+50			5.9	462.84	
24+0			6.2	462.54	
+50			6.0	462.74	
25+0			5.6	463.14	
+50			5.6	463.14	
26+0			5.2	463.54	
+50			5.1	463.64	
+92.80	= BC Lt.		5.5	463.24	

O.K.

Levels "D" Line

Sketch Page 13

Dec. 4-45
Sisson
Bliss
Osborne

BM	7.70	466.88		459.18	on Stub 8+42.29 "C" Page 15
8+49	: Top Conc. Pipe Culv.		8.4	458.5	
+70			8.2	458.7	
+96.59	Δ 59°40'30" Lt		7.60	459.28	on Stub
9+0			7.5	459.4	
+50			6.1	460.8	
10+0			4.5	462.4	
+17.85 = 10+12.58 C"	Δ 49°26' Rt		3.73	463.15	on Stub

Walker Hardin Hunley

1-30-46

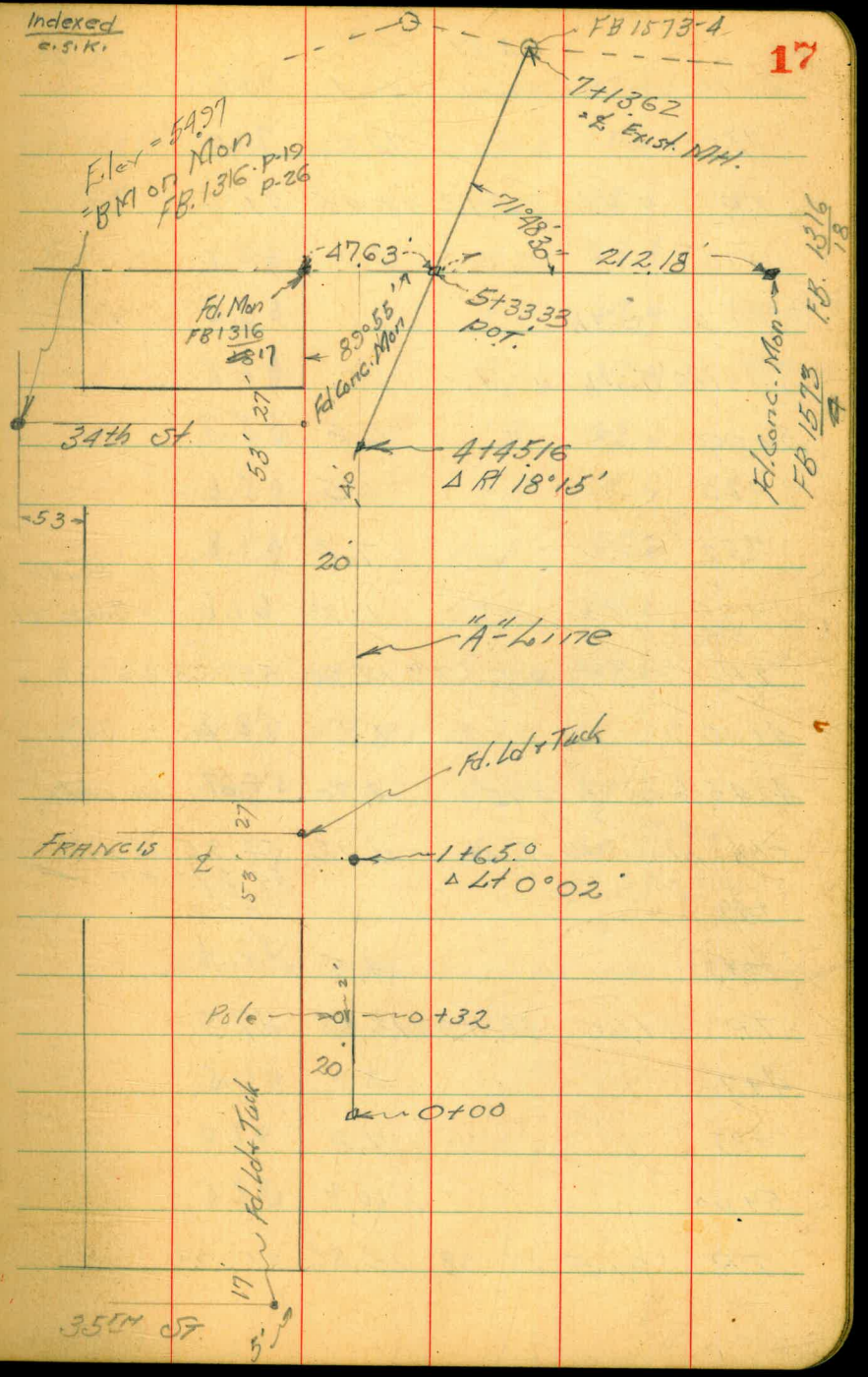
LOCATION And LEVELS FOR PROPOSED SEWER LINE on K-ST.

Between 35TH & 33rd St.

B.M. SW Ld & Tack					FB 1595/47
Pardee & K	12.61	100.06		87.45	
T.P.	1.52	100.87	0.71	99.35	
T.P.	4.80	93.01	12.66	88.21	
0+00 on stake			6.04	86.97	
" (50' Lt in yd.)			11.9	81.1	
+40			7.0	86.0	
+75			4.5	88.5	
+85			4.5	88.5	
1+00			5.7	87.3	
+30			9.2	83.8	
+40			11.2	81.8	
T.P.	3.27	83.97			
1+65 = Δ Lt 0°02'			12.31	80.70	
" 20' South = SL-K st.			3.4	80.6	
" 50 "			4.0	80.0	
" 100			4.9	79.1	
120' "			6.1	77.9	= N edge House on W. of Francis
1+95			4.4	79.6	Fill Ground

Cont. p. 18

Indexed
e.s.k.



Sewer Prelim.
Cont. from P-17

		83.97			
2+10	on Nut Ground		10.4	73.6	
+35			13.0	71.0	
T.P.	0.61	72.13	12.45	71.52	
+70			5.0	67.1	
(2+70)	20' South		7.1	65.0	
(2+70)	120' South	in Yd.	9.6	62.5	
3+00			6.4	65.7	
+20			6.5	65.6	
+32			7.3	64.8	
+55			11.0	61.1	50' South = Same El.
T.P.	0.64	59.87	12.90	59.23	
4+00			1.7	58.2	
4+45.16 = Δ Rt. 18°15			4.20	55.67	on stake
Chk. Mon BM P.17 34th + L. st			4.92	54.95	
~~+49~~				54.97 = BM / 0.02	
+49			4.5	55.4	
T.P.	1.60	48.79	12.68	47.19	
4+70			2.3	46.5	
+89			7.8	41.0	
5+00			10.3	38.5	
T.P.	0.15	36.08	12.86	35.93	

S.L.K. + Bdry Line Set BM. on Conc. Mon		36.08	3.21	32.87	
5+33.33 = P.O.T. on stake			4.46	31.62	
+65			8.0	28.1	
6+00			8.2	27.9	
+16			7.7	28.4	
+30			8.7	27.4	
+40			7.8	28.3	
+61 = Bank Creek			7.7	28.4	
+65	in edge	"	10.9	25.2	
7+12	in	"	12.0	24.1	
+13.62 - ℄ Exist. MH on Rim		"	9.04	27.04	MH Sealed
T.P.	11.88	47.81	0.15	35.93	
T.P.	11.46	58.69	0.58	47.23	
Chk. Mon			3.73	54.96	✓
				54.97 = BM. / 0.01	

Location Houses in this Vicinity

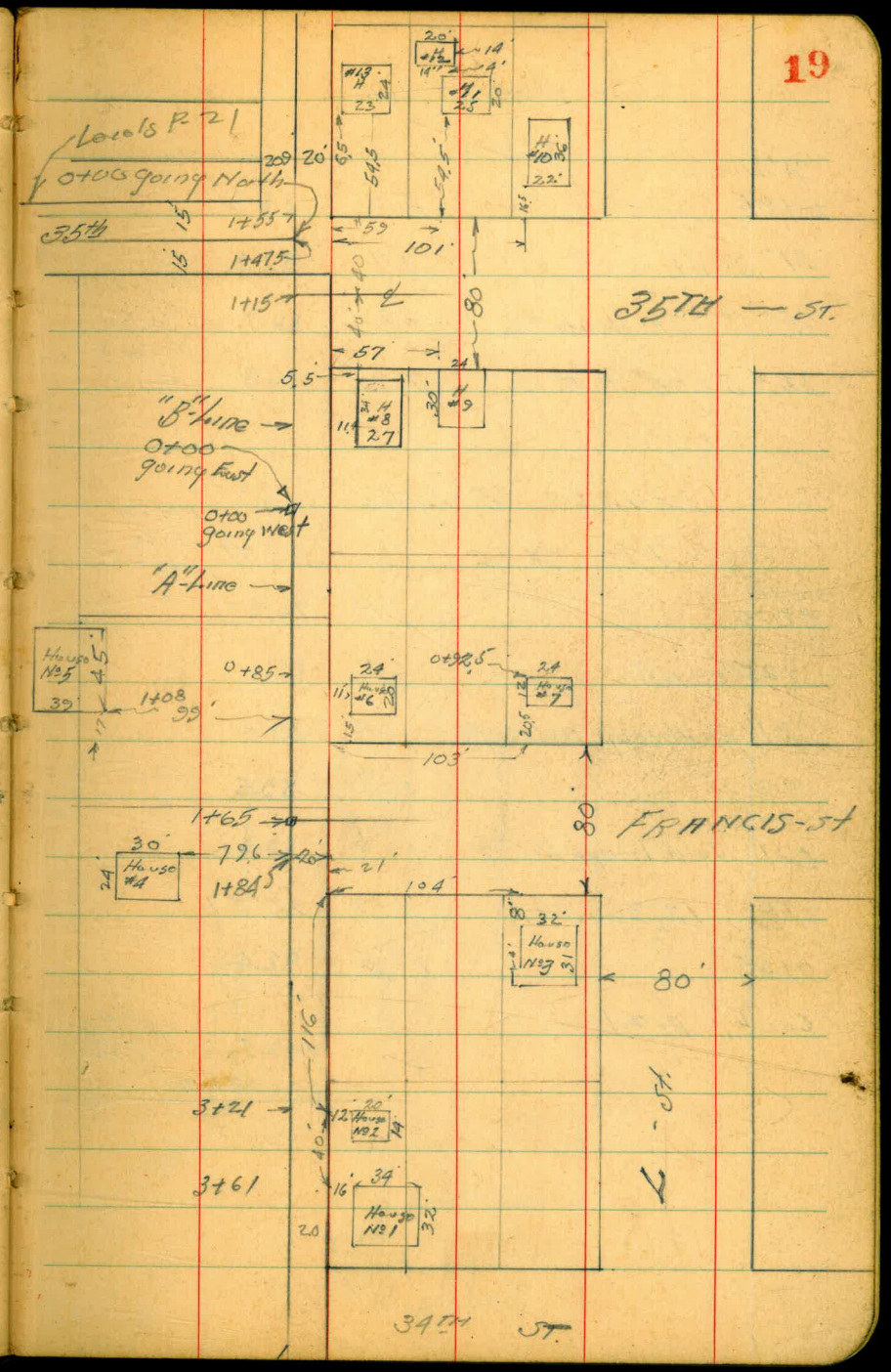
See P-19-20

Location Houses
in Vicinity Sewer Project
Page 17 = Location "

Cont. P-20

Levels on Ground at Houses.

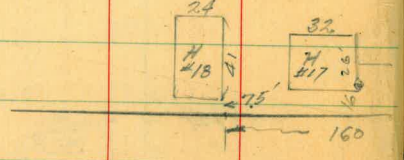
	15.70	71.37	55.67	BM on stake 4+45.6 P-18
3+61		10.9	60.5	
20' South		11.8	59.6	
70' " SE Cor House #1		11.1	60.3	Plumbing at this side of House
3+21		5.8	65.6	
20' South		8.1	63.3	
52' South SE Cor House #2		10.3	61.1	Plumbing at this side of House
				BM Stake 0+00
	6.53	93.50	86.97	
1+84.5		14.0	79.5	
45' N		16.1	77.4	
79.6 N = SE House No 4		14.5	79.0	
109.6 N = NE " "		18.2	80.3	Plumbing this Cor.
1+08		7.2	86.3	
48' N		7.2	86.3	
49' N on Rd. N & W		5.2	88.3	Plumbing at NW Cor.
99' N		2.2	91.3	
138' N = NW Cor House #5		+1.7	95.2	

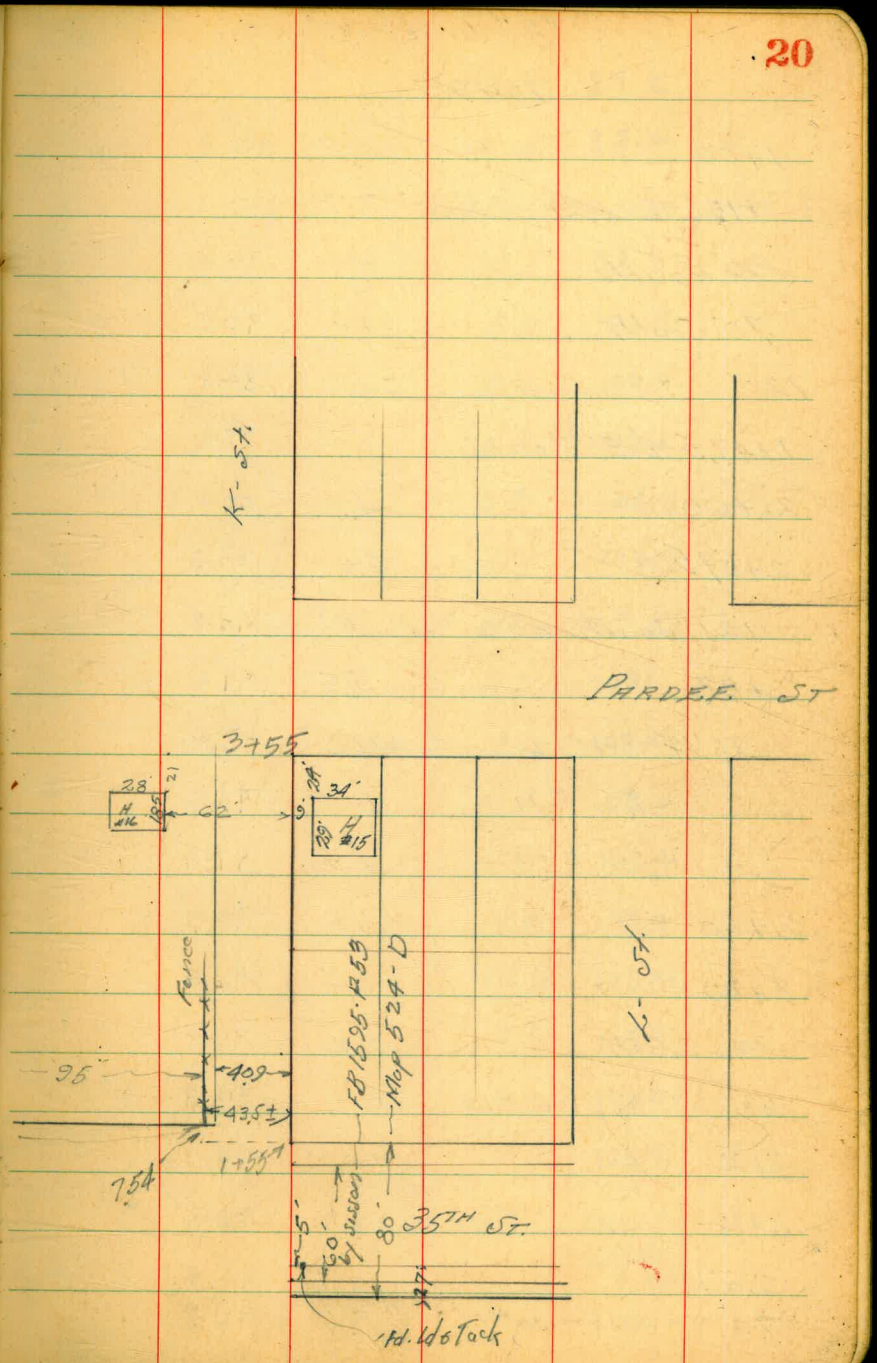


Cont. from P-19

	93.50			
"A" Line				
0+85		5.0	88.5	
31' South		5.7	87.8	
55' " SE House #6		6.8	86.7	plumbing this cor.
123' S=NE " #7		7.2	86.3	plumbing this cor.
LEVELS "B" Line				
	7.19	94.16	86.97	BM. on stake 0+00 P-17
0+00		7.19	86.97	
425		6.1	88.1	
31' South=opp. NW Cor #8		6.8	87.4	
73' "		10.7	83.5	
101' South=opp SW #9		10.6	83.6	
TP	12.36	10A.93	1.59	92.57
0+65			12.5	92.4

Cont. p-21





"B" Line Cont. from P. 20

10493

1+00	8.5	96.4	
+15± = ℄ 35th on South	7.3	97.6	
20' South	8.9	96.0	
70' South	14.4	90.5	
120' "	20.0	84.9	
1+47.5 = ℄ 35th on N	6.1	98.8	
2+00	4.5	100.4	
2+07.5	4.6	100.3	
121' South = NW Cor #10	14.1	90.8	Plumbing this Cor.
2+33	5.5	99.4	
85' Rt. = SW # 12	11.5	93.4	
NW # 11	11.5	93.4	
SW # 13	7.9	97.0	
2+60	6.6	98.3	
3+00	8.4	96.5	
20' South	9.2	95.7	
63' " opp. SW # 15	11.0	93.9	
3+20	10.7	94.7	
3+34	12.1	92.8	
20' N	10.4	94.5	
70' N = NE House #16	8.1	96.8	

10493

21

3+60	15.7	89.2	
3+95± = ℄ Pardee St.	16.5	88.4	

Levels ℄ 35th North from K St.

20' N of SL K St = 0+00	6.1	98.8	
+50	3.9	101.9	
1+00	2.2	102.7	
+18.5	1.8	103.1	
57' Rt. = SE Cor House # 17 (Plumbing this Cor.)	0.4	104.5	Uniform slope to ℄ St.
1+50	1.2	103.7	
T.P. 10.20 114.02	11.1	103.82	
1+83	9.9	105.1	
60' Rt. = SE Cor House # 18	7.0	107.0	
2+00	10.4	103.6	
+50	11.6	102.4	
70' W/S	14.6	99.4	
3+00	10.6	103.4	
+50	8.7	105.3	
+63.7 = ℄ J St.	8.0	106.0	
140' Rt. = NW Cor House # B 1595-56	7.1	106.9	Uniform slope to St.
Chk nail in Pole 3+27 on Rt	3.21	110.81	
		110.85	
		0.04	

Cont. P. 22

35th St Cont. from P-21

	114.02		
4+00		5.8	109.2
+50		2.4	111.6
(4+30)	25' Lt. = SW Cor House	3.6	110.4

℄ Levels – J-St. from ℄ 38th East

℄ 35th =0+00		8.0	106.0
+30		6.8	107.2
+32		5.8	108.2
+50		4.8	109.2
+75		3.4	110.6
+90		1.5	112.5
(135')	Lt. Rear Small House	+4.5	118.5
1+00		1.4	112.6
+55		1.1	112.9
180' Lt.	= NE Cor House	+4.0	118.0
1+75		1.3	112.7
95' Lt.	NW Cor "	+5.0	119.0

Uniform Slope to Lt. of St.

" "

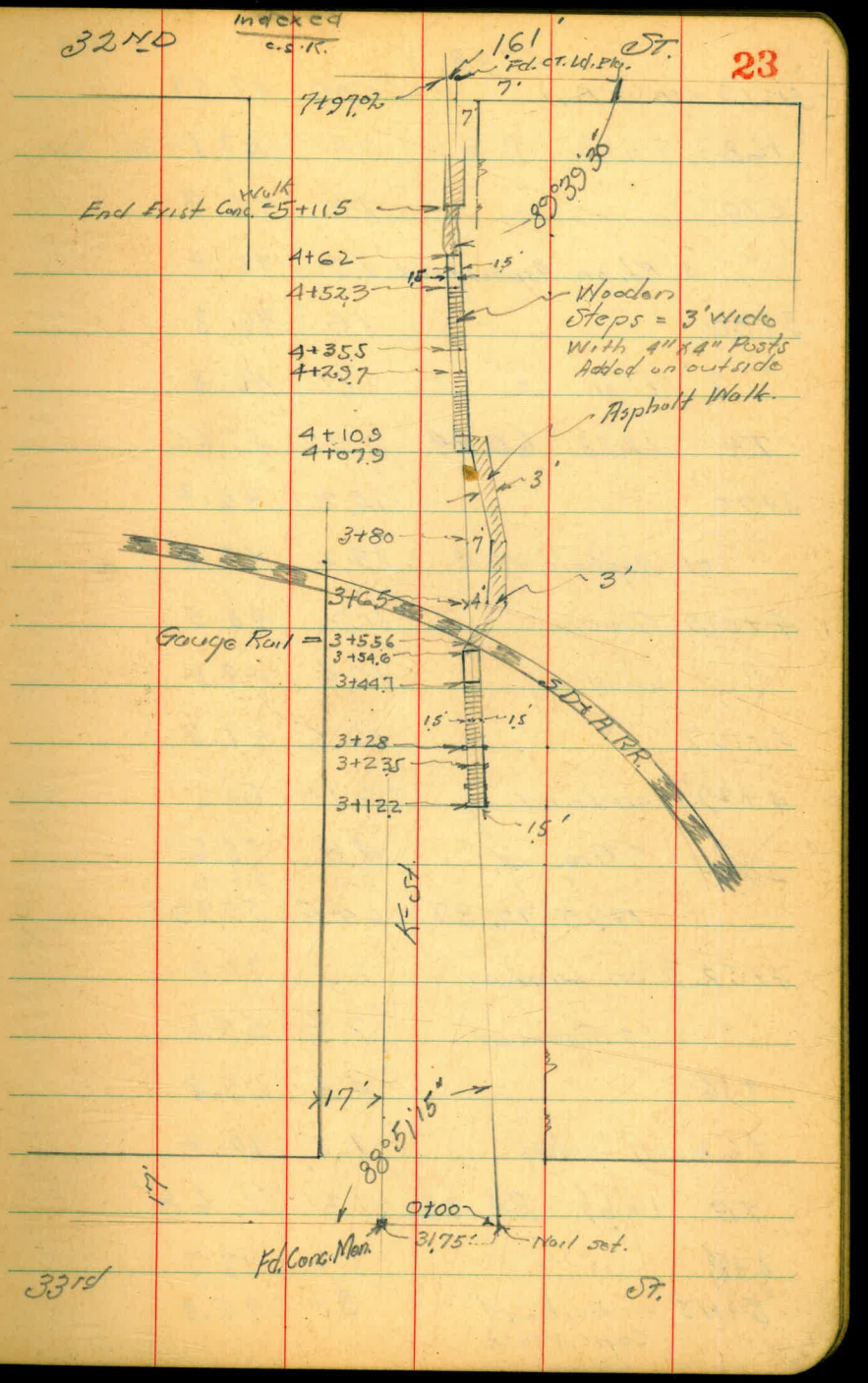
Cross Section of J-St. FB 1595-P-54

Walker
Hendricks
Hardin
Hunley

3-5-46

Location and Elevations on Existing Pedestrian Walk & Stairs Across SD&AR.R. on K St. West of 33rd St.

	2.76	84.28'		81.52	N.W. BP K St & 32nd
T.P.	2.56	73.48	13.36	70.92'	
T.P.	0.26	60.71'	13.03	60.45'	
T.P.	-0.10	47.91	12.70	48.01'	
T.P.	0.12	35.15'	12.88	35.03'	
0+00			6.4	28.8	
1+00			6.4	28.8	
2+00			6.1	29.1	
+90			5.4	29.8	
3+12.2	on Ground		4.8	30.2	
"	" Step		4.8	31.2	
T.P.	12.85	47.88'	0.12	35.03'	
3+23.5	on Landing		10.9	37.0	
3+28	" "		10.9	37.0	
"	Ground		13.6	34.3	
3+45	on Landing		1.3	46.6	
3+45	Ground		4.9	43.0	
3+55.6	= Gauge E. Rail		0.74	47.14	



		47.88		
3+61.9 = on W. Rail			0.39	47.59
+68			0.8	47.1
+70			1.6	46.3
" 5' Rt. on Asphalt Walk			1.5	46.4
3+80			1.6	46.3
" 7' Rt. on " "			1.1	46.8
T.P.	12.78	60.44	0.22	47.66
3+95			14.2	46.2
on Asphalt Walk			13.2	47.2
4+07.9 Ground			11.9	48.5
" Landing			10.6	49.8
4+10.9 "			10.6	49.8
4+29.7 on Landing			+0.10	60.5
" " Ground			4.8	55.6
4+35 " "			3.8	56.6
	12.90	72.89	0.45	59.99
4+52.3 on Landing			2.7	70.2
" " Ground			7.3	65.6
+56			4.6	65.8
+62 on Landing			2.5	70.4
T.P.	12.65	84.33	1.21	71.68
4+85			11.6	72.7
5+11.5 on East end Conc. Walk			9.0	75.3

		84.33		
chk. starting B.M.			2.81	81.52

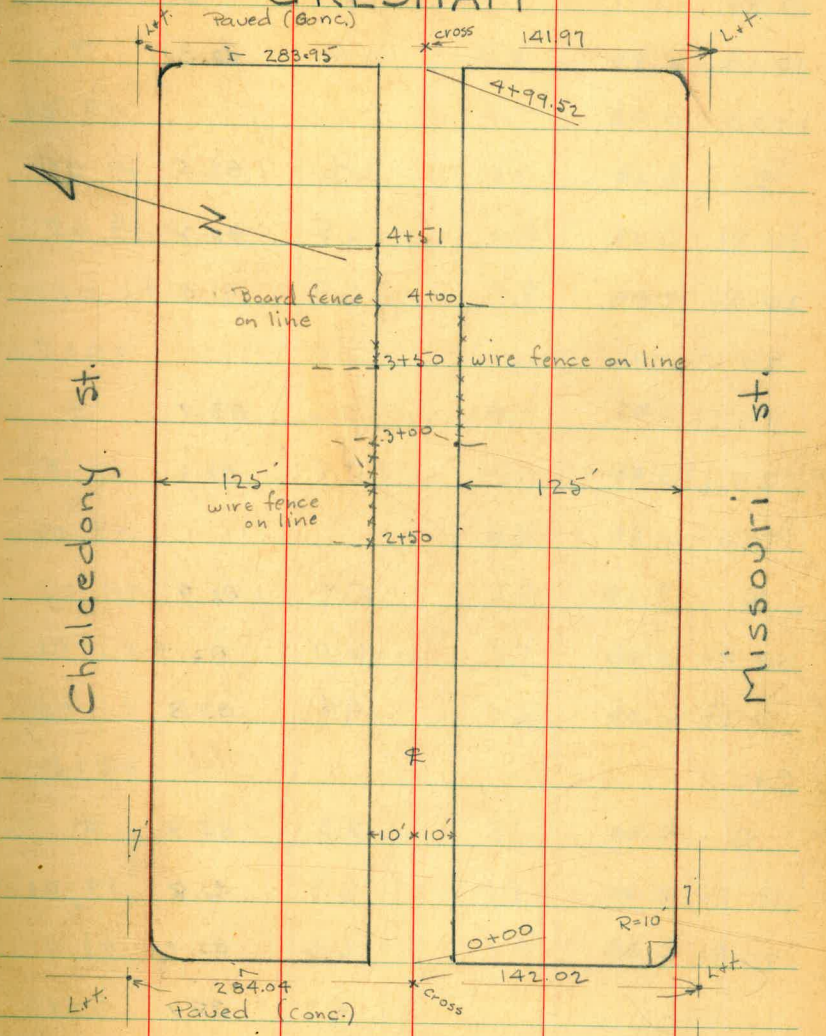
Osborne
Hendricks
Hardin
Hanley
3-7-46

X-Sect. ALley Block 6 20' wide
North Shore Highlands -

B.M. Top Hyd.				60.29	B.E. Fanuel + Emerald
	9.88	70.17	0.49	69.68	
	11.86	81.54	1.98	79.56	
	9.18	88.74			
0-20 = E. curbline Fanuel			℄ 9.36	79.38	on conc. pav.
10' Rt.			9.60	79.14	
10 Lt.			9.07	79.67	
0+00 = E.L. Fanuel					
℄			9.20	79.54	
10 Rt.	gut.		8.98	79.76	
	top cb.		8.85	79.89	
10 Lt.	gut.		8.85	79.85	
	top cb.		8.31	80.83	
0+20					
℄			7.1	81.6	
10 Rt.			7.6	81.1	
10 Lt.			6.7	82.0	
0+50					
℄			6.6	82.1	

Indexed
C.S.K.

GRESHAM



88.74

10 Rt.	7.1	81.6
10 Lt.	6.4	82.3
1+00		
℄	6.2	82.5
10 Rt.	6.5	82.2
20 Rt.	6.9	81.8
9.3 Lt. = Nyl. Pole		
10 Lt.	5.6	83.1
20 Lt.	5.8	82.9
1+50		
℄	5.8	82.9
10 Rt.	6.0	82.7
10 Lt.	4.9	83.8
2+00		
℄	5.3	83.8
10 Rt.	6.3	82.8
20 Rt.	6.6	82.1
10 Lt	4.6	84.1
20 Lt.	4.4	84.3
2+49 = 9.1 Lt. to Nyl. Pole		

88.74

2+50		
℄	4.5	84.2
15 Rt.	4.7	84.0
10 Rt.	5.9	82.8
20 Rt.	6.4	82.3
10 Lt.	3.8	84.9
3+00		
℄	4.1	84.6
3 Rt.	4.1	84.6
10 Rt.	5.5	83.2
20 Rt.	5.8	82.9
10 Lt.	3.7	85.0
20 Lt.	3.5	85.2
3+50		
℄	3.3	85.2
10 Rt.	3.9	84.8
10 Lt.	3.4	85.3
4+00		
℄	2.3	86.4
10 Rt.	2.8	85.9

4+00	88.74		
20 Rt.		3.2	85.5
9.3 Lt. = Nly Pole			
10 Lt.		2.0	86.7
20 Lt.		2.0	86.7
4+50			
℄		1.7	87.0
10 Rt.		2.0	86.7
10 Lt.		1.7	87.0
4+65			
℄		1.9	86.8
10 Rt.		2.0	86.7
10 Lt.		1.6	87.1
4+99.52 = W. Line Gresham			
℄ on conc. pave		5.94	82.80
10 Lt. gut.		5.63	83.11
Top cb.		5.00	83.74
10 Rt. gut.		5.67	83.07
top cb.		5.63	83.11
5+19.52 = W. curb line Gresham			
℄ on conc. pave		6.10	82.64

	88.74			
10 Lt.			5.69	83.05
10 Rt.			6.43	82.31
T.P.			8.86	79.88 ✓
	0.61	80.49	13.02	67.47 ✓
	0.56	68.03	7.73	60.30 ✓
check on S.E. Hyd.				60.29 ✓

Walker
Hendricks
Hunley
4-9-46

Location Proposed 24" Water Main on 13th St. From Commercial St to Harbor Drive

1+77.6 = Int. N Rail

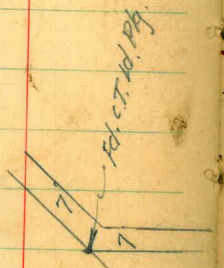
1+74.37 = P.O.T. = Rl Δ to N.E. 7' tuck Set Nail

1+65.74 = Int. N Rail

1+12 31.2' Lt. = Grating Inlet

0+00 = 22' North of Shine Commercial Ave

← To Lakeside



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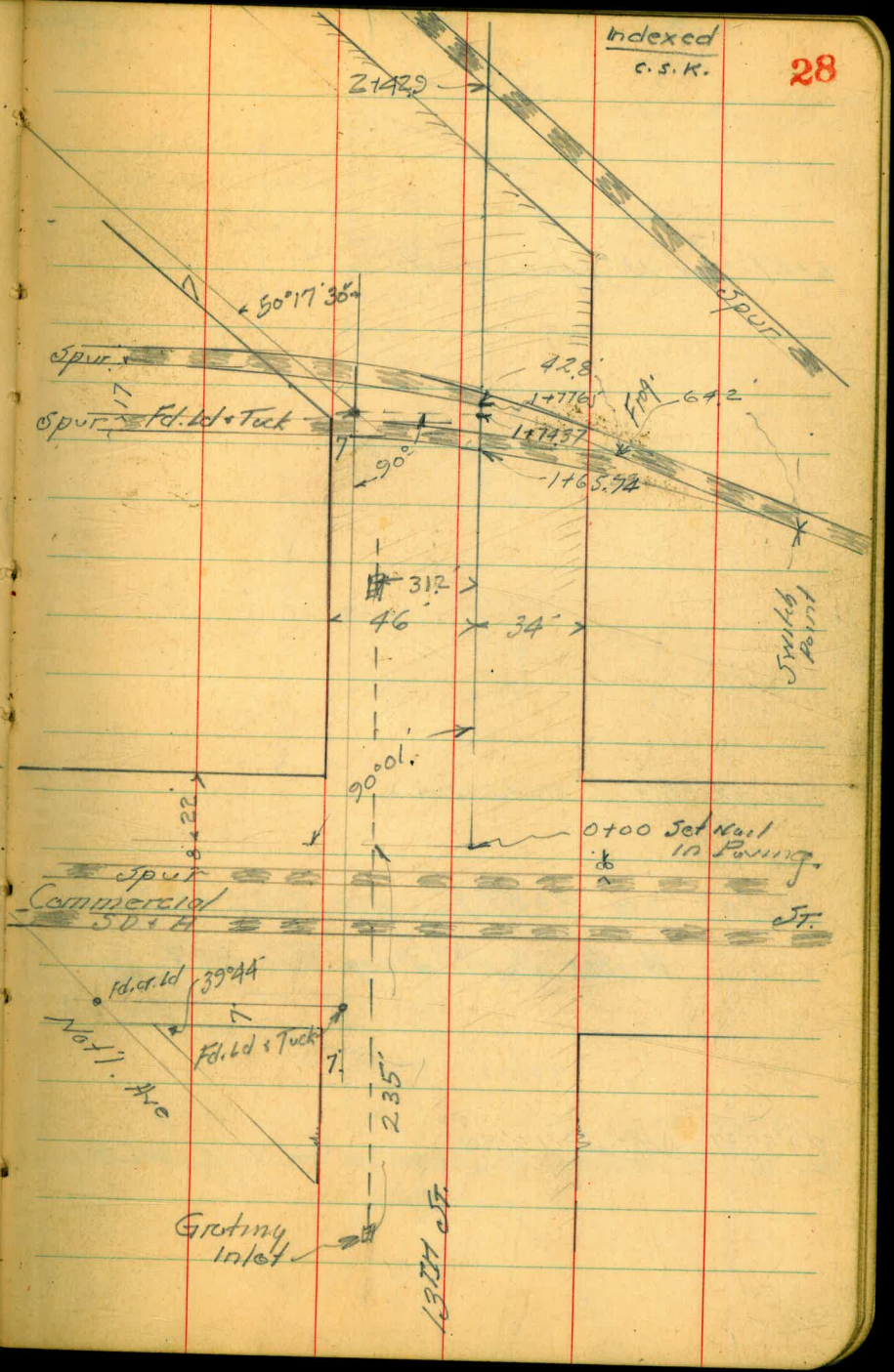
C.S.K.

28

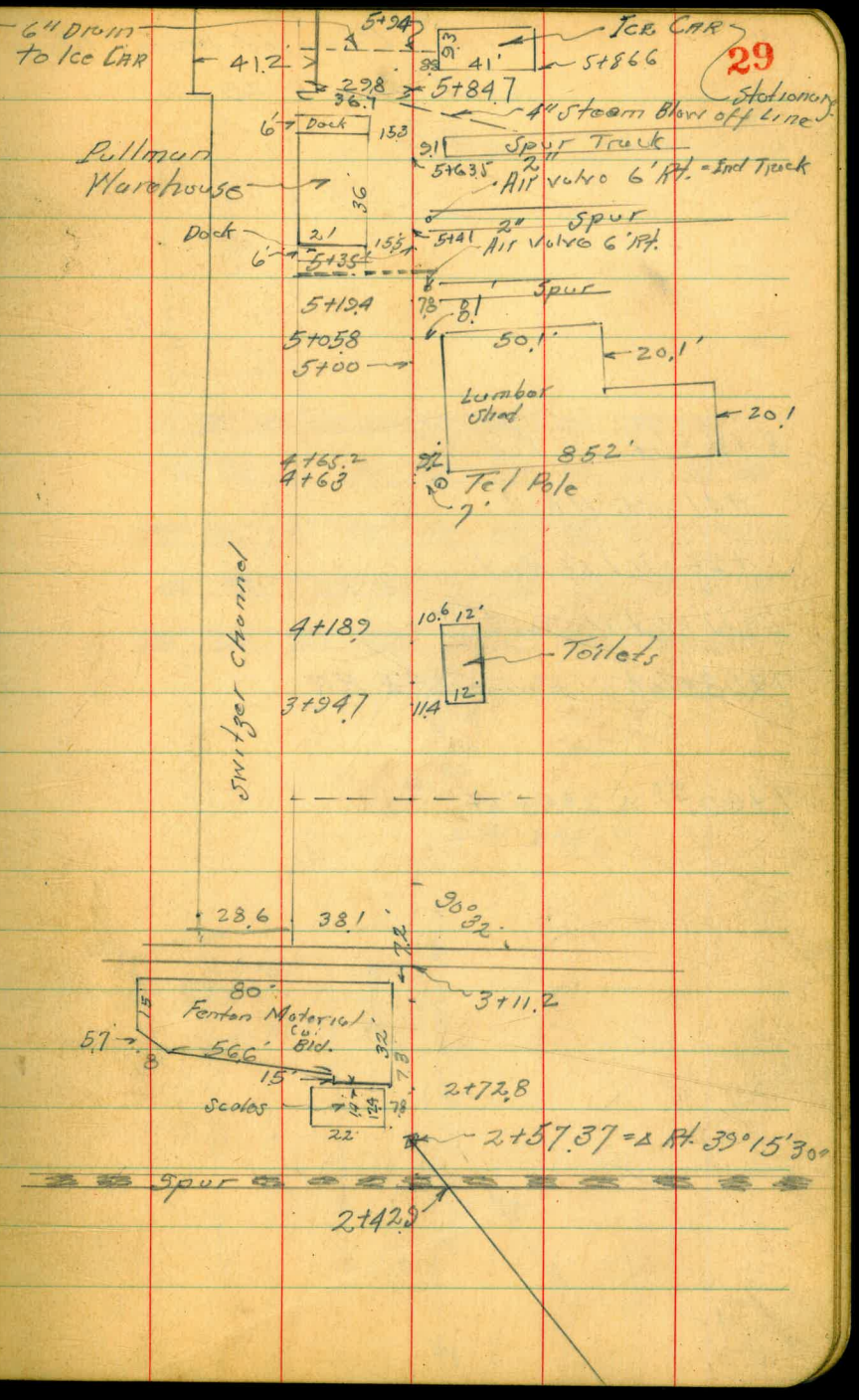


5+27 Int. 18" Conc. Culvert

3+63.2 = Int Wooden Drain

Note: Sta. 3+09.36 = Sta. 213+49.80 on Water Dept. Dwg. W.D. 807 JDC 1/21/47

2+57.37 Δ Rt. 39°15'30"



Location Proposed Water Main
Cont. from P. 29

8+56 = Int. N Rail

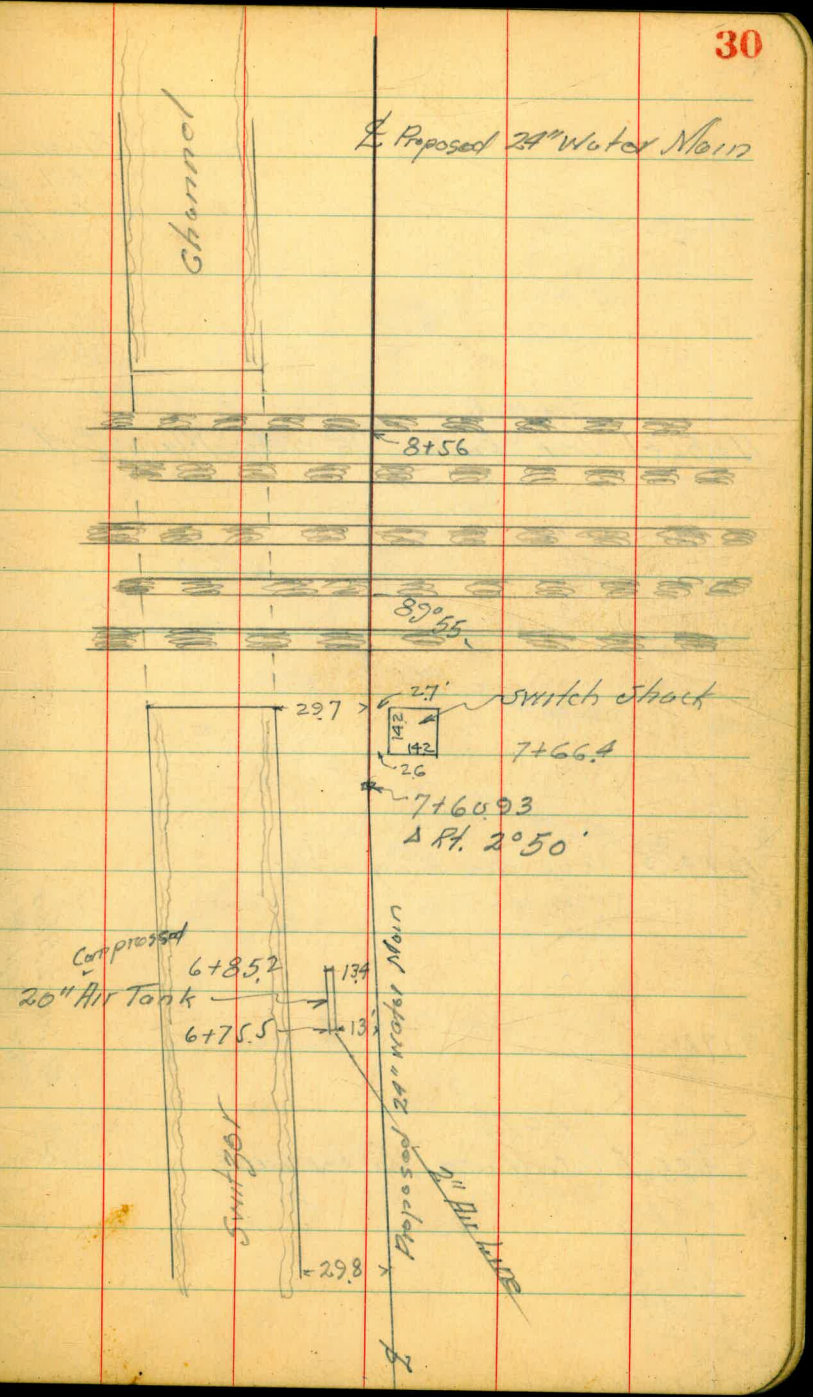
+41 = Int. N Rail

+26 - Int N Rail

8+11 = Int N Rail

7+98 = Int N Rail 50° R RR

7+60.93 Δ 2°50' Rt.

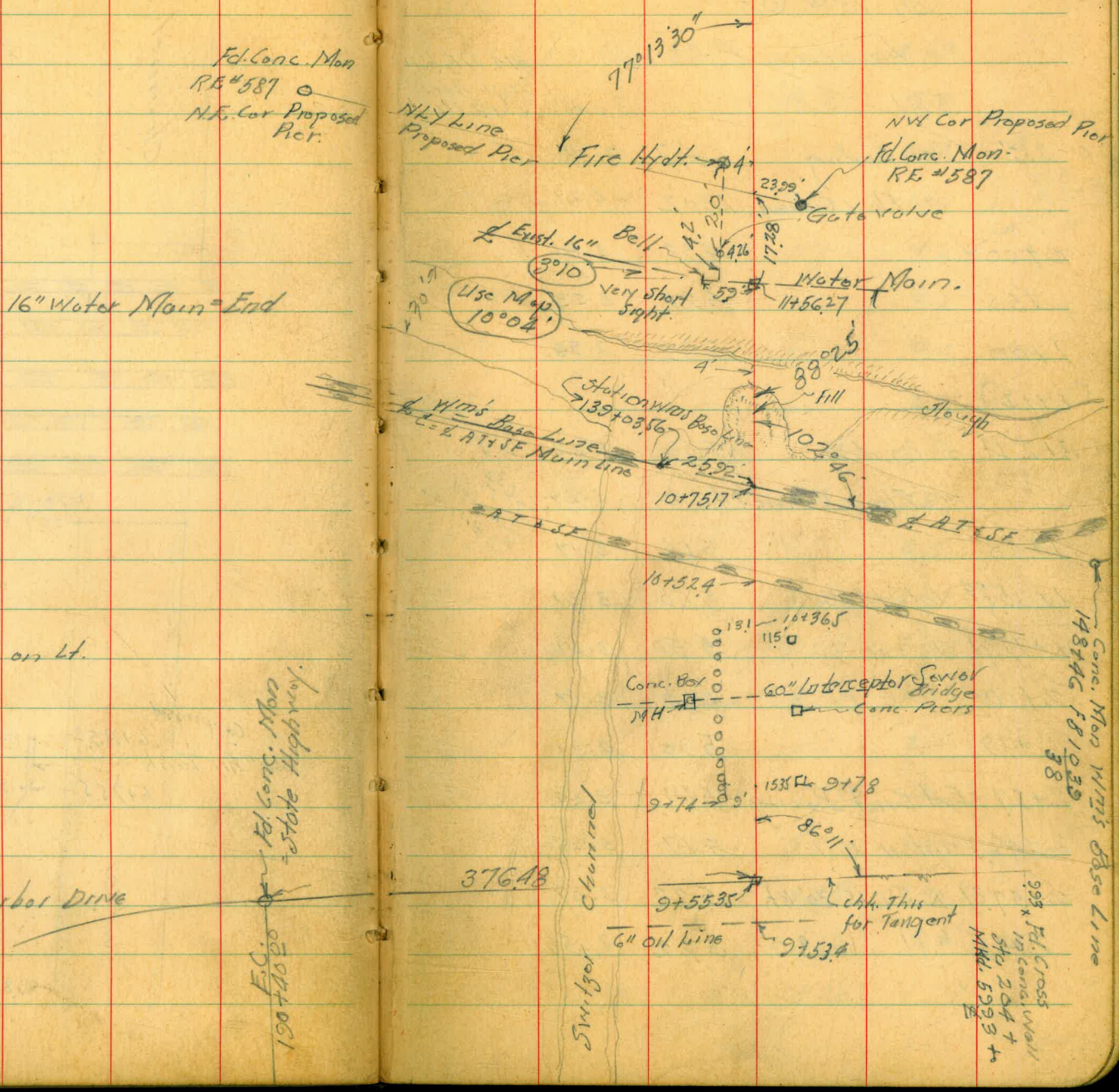


Set Hub.
11+56.27 = Int. = Existing 16" Water Main = End

10+36.5 = opp Wood Piling on Lt.

9+78

P.O.T.
9+55.35 = Int. N Line Harbor Drive



Walker Hendricks

Levels - Proposed 24" Water Main on 13th St.

Location P 28-31

BM. NE BP Imp. Acc. & 13th St

	5.81	8.81 ✓	3.00	
0-235'	on Grating	6.67	2.14	
	" Flow Culvert	12.02	-3.21	
0+00		4.93	3.88	
+50		5.28	3.53	
1+00		5.83	2.98	
(1+12)				
31.2' Lt	on Grating	5.59	3.22	✓
"	" Flow Culvert	14.26 (8.61)	-5.39	=6.32 Checked 4-17-46
1+50		5.64	3.17	
1+65.9	= Int. N Rail	5.50	3.31	
1+77.6	" N "	5.50	3.31	
2+00		5.64	3.17	
+19		5.98	2.91	
2+37	= End Exist Paving	5.57	3.24	
2+42.9	- Int N Rail	5.17	3.64	
2+57.87	Δ 32°15'30" Rt.	5.22	3.59	
TP	6.71	10.30 ✓	5.22	3.59

10 30 ✓

3+00		5.6	4.7
+11.2	on Rail	5.61	4.69
3+63.2		4.9	5.4
41' Lt.	- End 9" Pipe	11.23	-0.93
53' Rt	beg. 9" "	9.20	1.10
4+00		5.7	4.6
+50		6.0	4.3
5+00		6.2	4.1
5+27		6.6	3.7
30' Lt	on Flow Line 18" Pipe	12.06	-1.76
16' Rt	" " " "	8.8	1.5
5+50		6.6	3.7
6+00		7.3	3.0
TP	4.11 7.17 ✓	7.24	3.06
(5+94)	30' Lt. on Drain	8.00	-0.83
6+50		5.1	2.1
7+00		5.6	1.6
+60.93	Δ Rt. 2°50'	5.37	1.80
7+98	on N. Rail	4.45	2.72
8+00		4.8	2.4
TP	5.23 7.20 ✓	5.20	1.97

F.L. OR TOP PIPE?

7.20

8+60.7 = S Rail	4.50	2.70
9+00	4.3	2.9
+17	4.7	2.5
+23	6.7	0.5
+32	5.2	2.0
9+53.4	5.4	1.8
9+53.4 on 6" oil Line	8.00	-0.80
10+00	7.0	0.2
+35	6.9	0.3
+41	5.4	1.8
10+52 N Rail	4.91	2.29
+728 N " Main Line	4.70	2.50
+87	5.2	2.0
11+00	7.7	-0.5
+13	5.8	1.4
+23	8.3	-1.1
+32 = ℄ 4' channel	11.5	-4.3
+44	5.4	1.8
11+56.2	5.75	1.95

Notes Reduced 4.11.46

7.20

33

on Top 16" Water Main	9.2	-2.0
Chk. BM #5 FB 1597/43	7.49	-0.29 -0.40 = BM

Small RR Spike SW Cor. SD1 A RR Bridge 0.11 diff.
at Switzer channel

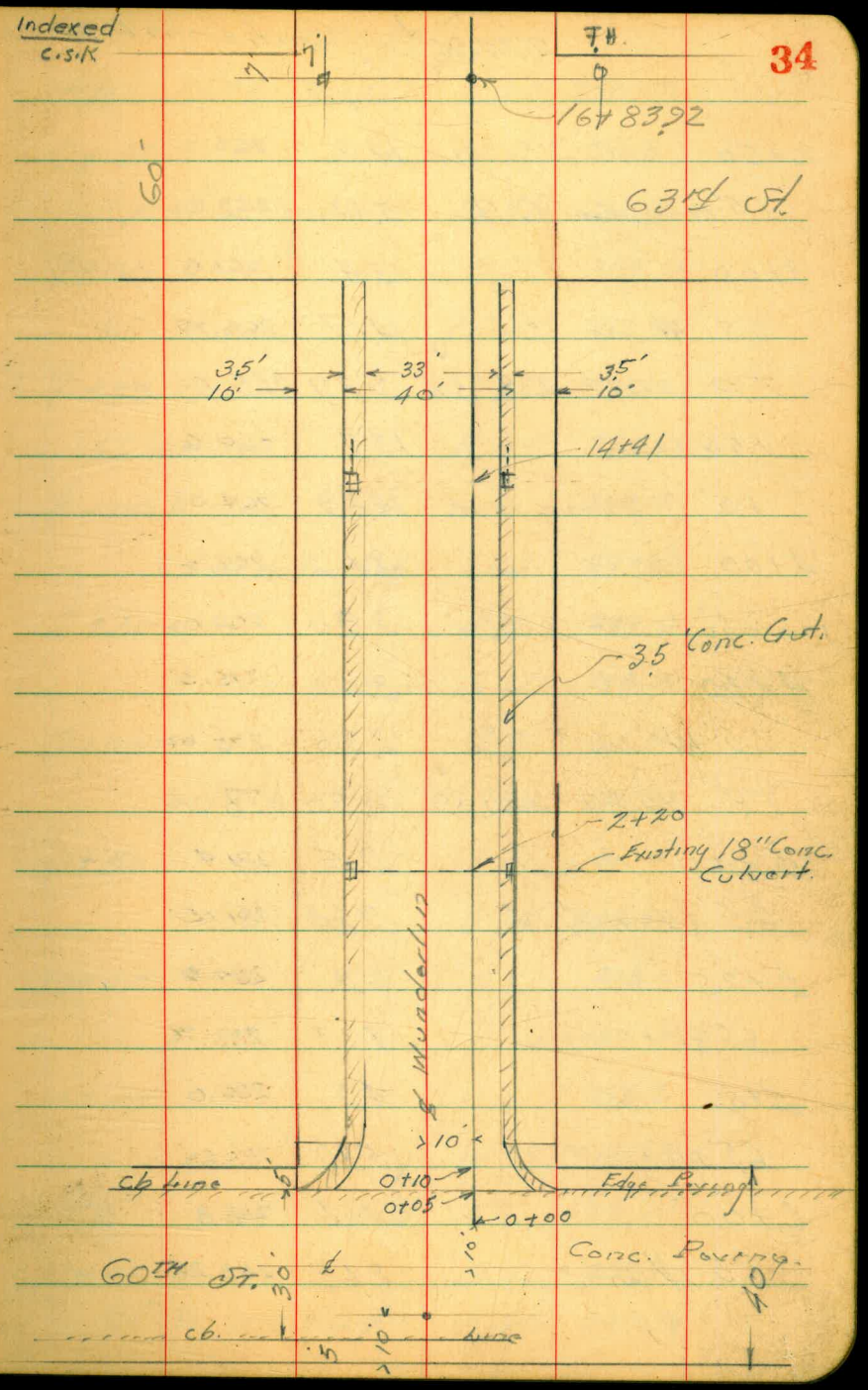
Walker
Hendricks
Hunley
5-6-46

LEVELS - PROPOSED 8" WATER MAIN on Wunderlin St. from 60th to 69th St.

BM.				BM. Ld. & Tack 10' E of W.L. 60th on ℄ Wunderlin FB. 1660-76
No 1	0.62	274.96 ✓	274.34	
0+00 = 10' East of ℄ of 60th St.				
0+00 on Conc. Pav.		1.05	273.91	
+05 = E. edge Conc. Paving		1.06	273.90	
0+15		1.7	273.3	
6.5' Rt. on Conc. Gut.		1.97	272.99	
0+50		5.4	269.6	
6.5' Rt " " "		5.73	269.23	
1+00		10.0	265.0	
6.5' Rt. on Conc. Gut.		10.45	269.51	
1+50		13.1	261.9	
6.5' " " "		13.84	261.12	
2+00		14.7	260.3	
6.5' Rt " " "		15.32	259.68	
2+20 = ℄ Grating		14.9	260.1	
6.5' Rt. on Gut.		15.58	259.38	
9' Rt. on Flare Culvert		21.39	253.57 ✓	
28' Lt. " " "		17.28	257.68 ✓	

Cont. P-35

Indexed
C.S.K



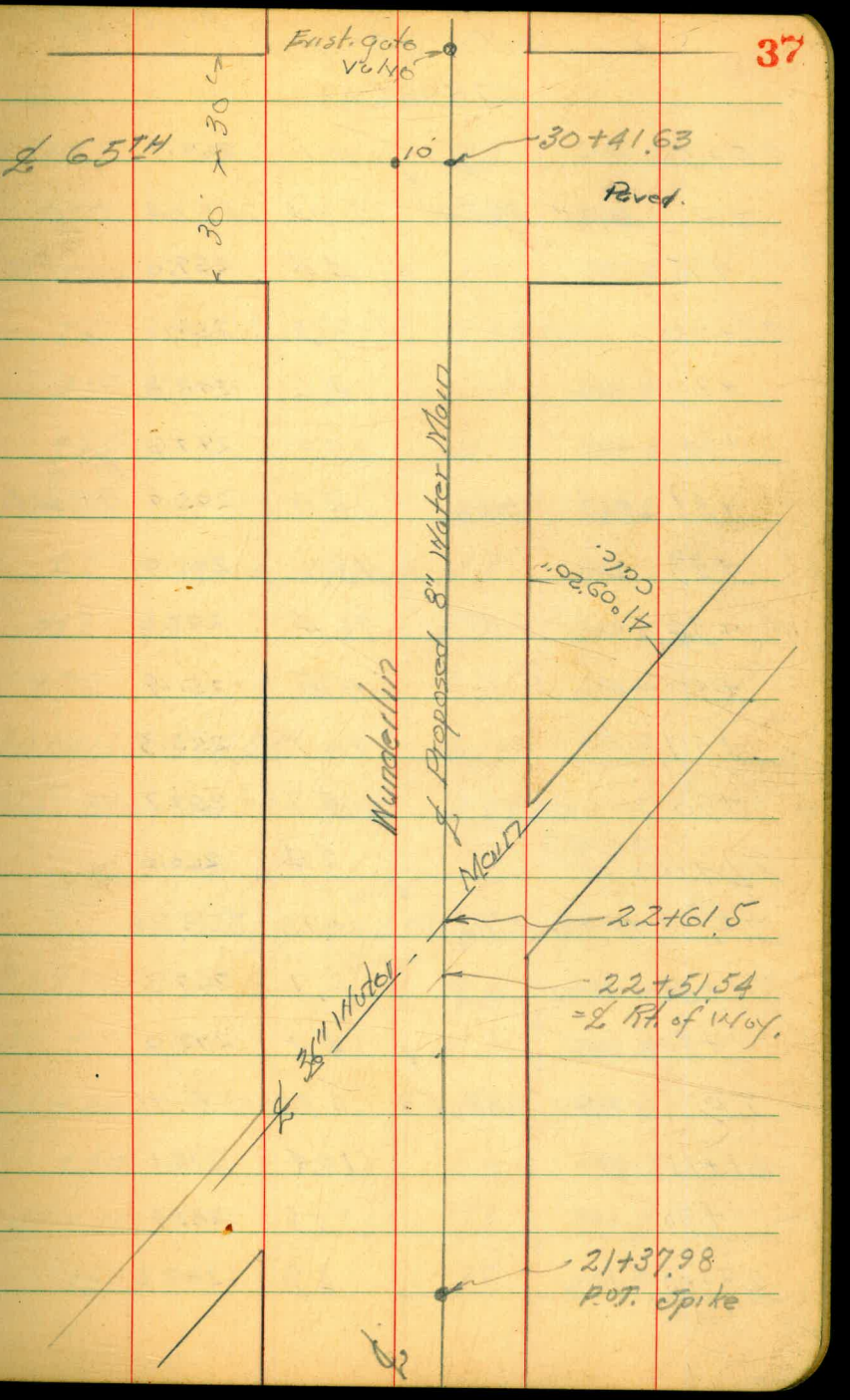
		274.96 ✓	Cont. from P-34	
2+50			14.8	260.2
6.5' Rt. on Conc. Gut.			15.44	259.52
3+00			13.4	261.6
6.5' Rt. on "			14.17	260.79
T.P.	12.73	278.32 ✓	2.37	265.59
3+50			13.7	264.6
6.5' Rt. on Conc. Gut.			14.29	264.03
4+00			9.1	269.2
6.5' " " "			9.30	269.02
4+50			3.0	275.3
6.5' Rt. " " "			3.30	275.02
T.P.	12.87	290.89 ✓	0.30	278.02
5+00			9.5	281.4
6.5' Rt. on Gut.			9.84	281.05
5+25			6.9	284.0
6.5' Rt " "			7.13	283.76
5+50			4.9	286.0
6.5' Rt " "			5.29	285.60
6+00			2.1	288.8
6.5' Rt. on "			2.63	288.26

		290.89 ✓ ✓		
T.P.	12.78	303.67	0.00	290.89
6+50			12.2	291.5
6.5' Rt. on Gut.			12.81	290.86
7+00			9.7	294.0
6.5' " " "			10.21	293.46
7+50			7.5	296.2
6.5' Rt " "			8.05	295.62
8+00			6.0	297.7
6.5' Rt. on Conc. Gut.			6.64	297.03
8+50			4.5	299.2
" " " " "			5.11	298.56
9+00			3.3	300.4
" " " " "			3.80	299.87
9+50			3.2	300.5
" " " " "			3.74	299.93
10+00			5.7	298.0
" " " " "			6.00	297.67
10+50			10.2	293.5
" " " " " ✓			10.39	293.28
T.P.	1.13	294.14	10.66	293.01
11+00			5.2	288.9
6.5' Rt on Gut.			5.40	288.74

	294.14 ✓	Cont. from P-35		
11+50		9.5	284.6	
6.5' Rt. on Conc. Gut.		9.89	284.25	
12+00		12.3	281.8	
" " " " "		13.10	281.0	
T.P.	11.42 293.50 ✓	12.06	282.08	
12+50		12.7	280.8	
6.5' Rt. on Conc. Gut.		13.42	280.1	
13+00		13.2	280.3	
" " " " "		13.85	279.65	
13+50		13.7	279.8	
" " " " " "		14.22	279.28	
14+00		13.7	279.8	
" " " " " "		14.30	279.20	
14+41 = ℄ Grating Inlets		Pipe Does not Cross ℄ at this Point		
28 Lt. on Flow 12" Pipe		15.90	277.60	
8' Rt. " " "		16.67	276.83	
6.5' " " Conc. Gut.		14.44	279.06	
℄		13.9	279.6	
14+75		13.2	280.3	
" " "		13.64	279.86	
15+00		11.9	281.6	
6.5' Rt. " "		12.64	280.86	

	293.50 ✓			
15+25		10.2	283.3	
6.5' Rt. on Conc. Gut		10.60	282.90	
15+50		7.5	286.0	
" " " " "		7.92	285.58	
16+00		0.7	293.93	
" " " " "		1.02	292.98	
T.P.	12.77 305.96 ✓	0.31	293.19	
16+30.9 = End Conc. Gut		8.9	297.1	
6.5' Lt. on " "		9.15	296.81	
16+50		6.5	299.5	
16+83.9 0° E. 7' Line 63rd St.		3.6	302.4	
T.P. BM No 2	12.82 317.29 ✓	1.49	304.47	SE Top Fire Hydt. 63rd & Wunderlin
17+00		13.3	304.0	
+50		7.5	309.8	
18+00		2.2	315.1	
T.P.	5.96 322.42 ✓	0.83	316.46	
+50		3.5	318.9	
18+75		3.2	319.2	
19+00		3.7	318.7	
+50		5.5	316.9	
20+00		8.4	314.0	

		322.42 ✓	✓ Cont from P-36		
T.P.	0.35	313.44 ✓	9.33	313.09	two nails in Pole
20+50			1.2	312.2	
21+00			1.6	311.8	
+25			2.0	311.4	
+50			2.3	311.1	
+75			6.0	307.4	
22+00			2.3	309.1	
+50			16.7	296.7	
		✓			Nail in 4"x4" Fence Post 20' Rt 22+31
T.P.	0.50	300.99	12.95	300.49	
22+61.5				10' Lt of 22+38	FB 1660 77
36" Existing Water Main on ℄ Wunderlin on Ground →			6.0	295.0	
22+61.5 on 36" Main →			8.00	292.99	
23+00			10.2	290.79	
		✓			
T.P.	0.52	288.41	13.10	287.89	
+50			3.0	285.4	
24+00			10.6	277.8	
+25			12.4	276.0	
24+50			12.4	276.0	
+75			13.1	275.3	
		✓			
T.P.	0.20	275.98	12.63	275.78	
25+00			2.7	273.3	
+25			6.2	269.8	



Wunderlin St. - Water Main - Proposed

		275.98 ✓		
25+50			11.1	264.9
T.P.	0.37	263.41 ✓	12.94	263.04
+75			4.4	259.0
26+00			8.9	254.5
+20			14.6	248.8
+30			15.8	247.6
+31 = Bottom Ditch			18.0	245.4 Ditch 90° to ℄
+33 "		"	18.0	245.4
+34			16.4	247.0
+50			11.5	251.9
+57			10.1	253.3
+90			5.7	257.7
27+00			3.4	260.0
T.P.	12.72	276.00 ✓	0.13	263.28
27+30			8.7	267.3
+50			4.0	272.0
T.P.	12.79	288.50 ✓	0.29	275.71
27+75			10.4	278.1
+90			5.6	282.9
28+00			4.2	284.3

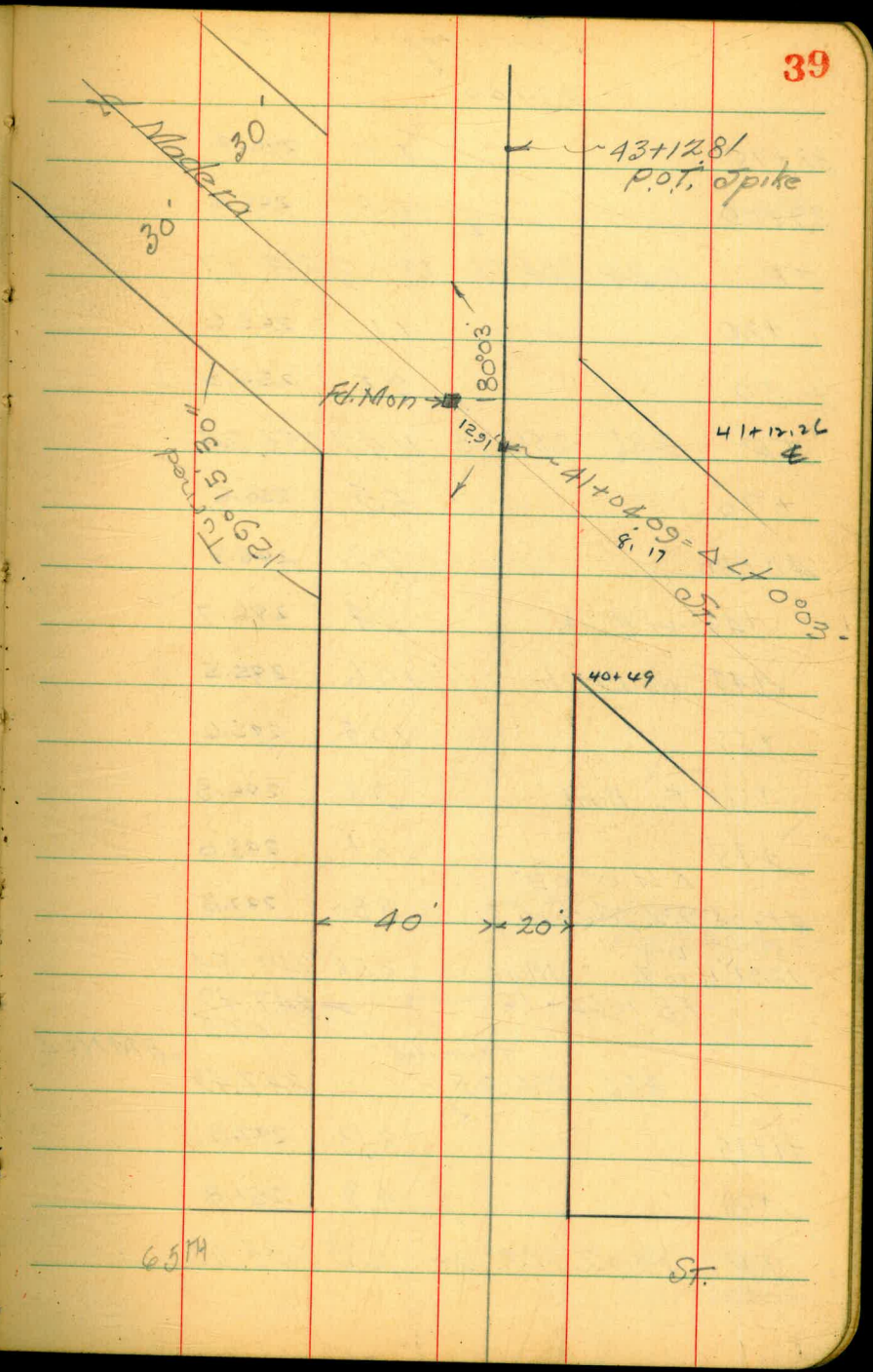
Cont. from P-37

		288.50		
28+25			2.2	286.3
+50			2.4	286.1
29+00		✓	1.0	287.5
T.P.	6.26	292.77	1.99	286.51
+50			4.4	288.4
+75			4.0	288.8
30+00			4.3	288.5
+12 = W edge Asphalt Walk			4.5	288.3
+17 on " "			4.9	287.9
+26 " " " Paving			6.3	286.5
30+41.63 = ℄ 6.5# on "			6.10	286.7
Chk. 5+60 Grd. 220 P-35			8.75	284.02 ✓
				284.10
				0.08
		Corrected ✓		Above
	7.56	291.66		284.10 =
	= Int Exist. Sewer			
30+56.63 on Pav.			5.5	286.2
30+71.63			4.9	286.8
31+00			5.1	286.6
+50			6.3	285.4
32+00			7.8	283.9
+50			8.8	282.9

Cont. from P-38

29166

33+00			9.1	282.6
+50			9.1	282.6
34+00			8.2	283.5
+50			8.3	283.9
35+00			9.0	282.7
SE. Top fire Hydt. 65th & Wanderlin				
BM. No 3			2.36	289.30
T.P.	7.63	28992	2.37	282.29
35+50			8.0	281.9
36+00			6.2	283.7
+25			4.5	285.4
+50			3.0	286.9
+80	2.7 Rt = Hedge	Elec. Pole	1.6	288.3
37+00			1.5	288.4
+25			1.6	288.3
+42			3.1	286.8
+59.66 = P.O.T.		on Hub	3.31	286.61
+65			3.7	286.2
38+00			8.7	281.2
T.P.	0.59	277.40	13.11	276.81
38+25			0.0	277.4
+50			3.2	274.2



		Cont. from P-39 ✓		
		277.40		
38+75			7.0	270.4
39+00			10.8	266.6
		✓		
T.P.	0.34	264.71	13.03	264.37
+20			1.1	263.6
+50			9.5	255.2
		✓		
T.P.	2.86	256.10	11.47	253.24
+70			5.5	250.6
40+00			7.2	248.9
+42	= W Bank		9.4	246.7
+43	in Ditch		10.6	245.5
+55	" "		10.5	245.6
+56	E Bank		9.8	246.3
+75			8.1	248.0
	Δ Lt 0°03'			
41+04.99	= ℄ Madera		8.30	247.8
12.91 Lt.	Disc. on ℄ " Mon		8.56	247.54
	F.B. 1664-16			247.49
				0.05
		π Corrected		= BM No 4
	8.56	256.05		247.49
		✓		
41+15			8.73	247.8
+50			4.3	251.8
		✓		
T.P.	13.02	268.94	0.13	255.92

68 Lt

47+00 P.O.T. Spike

44+31.64 P.O.T. Spike

Cont. from P. 40

		268.94			
41+72			12.0	256.94	
Note. for Location Poles etc. Cross Section Wunderlin					Madera to 69th see FB 1664-16
T.P.	12.24	281.13	0.05	268.89	
42+00			8.9	272.2	
+10			3.6	277.5	
+20			1.3	279.8	
T.P.	12.95	293.75	0.33	280.80	
+32			11.6	282.2	
+52			5.1	288.6	
+64			3.2	290.6	
T.P.	13.04	306.50	0.29	293.46	
42+77			11.6	294.9	
+87			10.2	296.3	
43+13			3.4	303.1	
T.P.	13.24	319.64	0.10	306.40	
+36			12.4	307.2	
+60			11.5	308.1	
+86			2.1	317.5	
T.P.	11.10	330.40	0.34	319.30	
44+11			7.0	323.4	

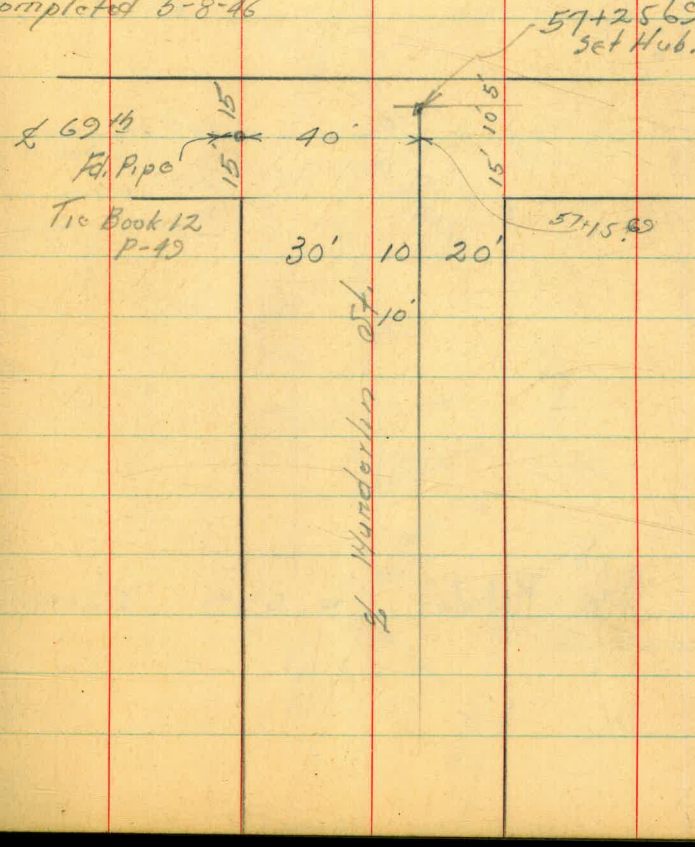
		330.40			
44+26			2.3	328.1	
+35			1.3	329.1	
T.P.	13.15	343.18	0.37	330.03	
+70			11.7	331.5	
45+00			9.0	334.2	
+50			4.2	339.0	
T.P.	7.43	350.09	0.52	342.66	
46+00			6.1	344.0	
+25			4.2	345.9	
+50			2.0	348.1	
+75			1.4	348.7	
47+00			1.8	348.3	
47+02 11' Rt BM. No 5			1.41	348.68	2 Nails in Elec. Pole
47+30			2.7	347.4	
+50			3.9	346.2	
+65			5.5	344.6	
48+00			9.4	340.7	
+50			13.2	336.9	
T.P.	2.02	339.16	12.95	337.14	
49+00			4.8	334.4	
+25			7.3	331.9	

		339.16 ✓			
49+50			9.9	329.3	
+75			10.8	328.4	
50+00			11.5	327.7	
+50			12.5	326.7	
51+00			12.7	326.5	
+50			12.6	326.6	
52+00			13.4	325.8	
T.P.	-0.02	326.12 ✓	13.02	326.14	
+50	= P.O.T.		2.1	324.0	
53+00	on Spike		4.28	321.84 ✓	FB1664-23
53+01	25' Rt.	Elec. Pole Two Nails	4.10	322.02	321.95
+50			7.0	319.1	
54+00			10.6	315.5	
T.P.	0.04	313.75 ✓	12.41	313.71	
+50			3.4	310.4	
55+00			8.5	305.2	
+50			13.3	300.4	
T.P.	0.28	301.75 ✓	12.28	301.47	
56+00			5.1	296.6	
+50			8.9	292.8	

Notes Reduced. 5-9-46

		301.75 ✓			
56+75			10.6	291.2	
57+00			11.4 ✓	290.4	
T.P.	4.03	293.18	12.60	289.15	
57+25.69 on Hub.			5.14	288.04	B.M. No 6
(57+15.69) 40'Lt. on Pipe 15+92 FB1664-24			1.77	291.41	
Chk. Flow 20" Steel Pipe			2.83	290.35 / 290.27	FB1664 24
				0.08	

Completed 5-8-46



X sec of Grape St. Kon 52' Road

Pacific to Harbor Dr.

0+55 end of Island

0+12

0+00 = W.L Pacific to North

T.P.	4.93	10.89	5.03	5.96 ✓	Fd. B.P.
T.P.	4.79	10.99	6.28	6.20	
B.M. Standard disk USGS H8 NW Com. Civic Center Bldg.	0.28	12.40		12.12 CITY DATUM	

Lt. = S. ℄ Sta. Rt. = N

5.88	5.17	5.86	6.16	5.96	5.54	5.6	6.5	
5.01	5.77	5.03	4.73	4.93	5.35	5.3	4.4	
2C	2C	13	Pav.	13	22	30	40	
C6	9T		4.30 Top Island		edge Pav.			
5.77	5.19	5.39	5.52	6.07	5.51	5.53	5.54	6.5
5.17	5.70	5.50	5.37	4.82	5.38	5.36	5.35	4.74
27	27	13	1.8	Top	1.8	13	2C	2C
C6	9T		Pav.	Island	Pav		9T	C6. end Ret
6.67	5.03	4.31	5.37	5.94	5.40	5.44	5.48	6.06
5.22	5.86	5.58	5.52	4.75	5.49	5.45	5.41	4.83
37	37	13	2	Top	2	13	30	30
C6	9T		Pav	Island	Pav.		9T	C6

Fd. B.P.

10.89

S.E. Cor. Grape & County Drive (Belt St.)

1+51.85 = E 1/4 Co Dr. ℄ parallel

1+48

1+43.08 Sec. parallel with Co. Dr.

1+32.90 Sec 90°

1+00

10.89

Lt ℄ Rt

5.96 6.11 6.31 6.48 6.36 5.93 6.4 6.4 6.8

4.93 4.78 4.58 4.41 4.53 4.96 6.5 4.7 4.1
41.27 27 13 13 33 26 32 41.27
Pav. edge

3.54

7.35
26 EL. 1.8 drain.

5.95 5.23 5.68 6.18 6.17 6.31 5.88 6.0 6.9 6.6 6.7

4.94 5.66 5.21 4.71 4.42 4.58 5.01 4.9 6.9 4.3 4.2
41.27 41.27 26,8 13 13 22 26 29 32 41.2
C6 9T Pav edge

5.91 5.29 6.09 6.43 6.24 5.69 5.4 6.6 6.7

4.98 5.60 4.80 4.46 4.65 5.20 5.5 4.3 4.2
26 26 13 13 22 30 34 40
C6 9T edge pav

5.93 5.22 5.97 6.31 6.11 5.64 5.7 6.6

4.96 5.67 4.92 4.58 4.78 5.25 5.2 4.3
26 26 13 Pav. 13 22 26 40
C6 9T edge Pav.

10.89

2+50 Sec. 90°

2+00 Sec. 90°

1+78.16 = W.L. Co. Dr. end 2" PLANT MIX and parallel

1+69.39 W 1/4 Co Dr. and parallel

1+60.62 ℄ Co. Dr.

10.89

L+		℄			P7	46
4.6	4.5	4.6	4.5	4.7	4.9	5.5
6.3 / 40	6.4 / 20	6.3 / 13	6.4	6.2 / 13	6.0 / 20	5.4 / 40
6.3	5.3	5.4	5.5	5.4	5.7	6.1
5.6 / 40	5.6 / 20	5.5 / 13	5.4	5.5 / 13	5.7 / 20	4.8 / 40
5.85	5.82	5.96	5.97	6.13	6.20	6.3
5.04 / 41.27	5.07 / 27	4.93 / 13	4.92	4.76 / 13	4.69 / 2V edge Pav.	4.6 / 41.27
6.07	6.06	6.20	6.31	6.32	6.33	6.4
4.82 / 41.27	4.83 / 27	4.69 / 13	4.58	4.57 / 13	4.56 / 2V Pav. edge	4.5 / 41.27
6.16	6.21	6.31	6.42	6.41	6.28	6.5
4.73 / 41.27	4.68 / 27	4.58 / 13	4.47	4.48 / 13	4.61 / 23 edge pav	4.4 / 41.27

10.89

		Lt			℄			Rt.	
3+87	Sec. Parallel		4.2	4.0	4.0	3.9	3.9	3.6	3.9
			6.7	6.9	6.9	7.0	7.0	7.3	7.2
			40 +	15 edge Pav.	Pav	13 Pav	19 Pav edge	26	40 +
3+64.13	Sec. on E.L. Harbor Dr. R/W	4.1	4.2	4.2	4.3	4.3	4.2	4.0	4.4
		6.8	6.7	6.7	6.6	6.6	6.7	6.9	6.5
		40 +	26	13	8 Pav edge	Pav	13	23 pav edge	40 + dirt
3+50.7		4.3	4.5	4.6	4.5	4.4	4.3	4.1	4.5
		6.6	6.4	6.3	6.4	6.5	6.6	6.8	6.4
		40 dirt	26 dirt	13 dirt	6 edge Pav.	Pav.	13 Pav	24 edge Pav	40 = SW Cor. Govt Yard
3+00	Sec 90°	5.1	4.9	4.7	4.5	4.5	4.5	5.0	
		5.8	6.0	6.2	6.4	6.4	6.4	5.9	← W edge gate
		40 dirt	26 dirt	13 dirt	Pav. edge	13 Pav.	26 Pav	40 Pav.	
2+79	Beg. Navy oil Pav. Sec. 90° Not worth Considering for grade	4.7	4.5	4.4	4.4	4.5	4.7	5.2	
		6.2	6.4	6.5	6.5	6.4	6.2	5.7	
		40 dirt	20 dirt	13 dirt	Pav. edge	13 Pav	26 Pav.	40	↑ Pav. E. edge Navy gate
	10.89				10.89				

4+49.83 W. edge 22' Pav. E. Lane

No Crown on 22' Con. strip Pav.

4+27.54 E. edge 22' Con. East Lane

4+19 = 0.1 Shoulder Sec. parallel

4+04 valley gutter Sec. Parallel

10.89

Lt = S ℄ Rt = N

3.76	3.50	3.34
7.13	7.31	7.55
40.9		40.8
3.95	3.78	3.53
6.94	7.11	7.36
40.9		40.8
3.9	3.8	3.6
7.0	7.1	7.3
40+		40+

3.2	3.1	3.1	3.1	3.0	2.4
7.7	7.8	7.8	7.8	7.9	8.0
40+	26 Pav edge	13 Pav.	Pav.	19 Pav edge	40+

10.89

6-18-46
Osborne
McCoy
Hardin

indexed C.S.R.

X-Sect. 20' Alley in Blk. 1 - Chester Park Add. See sketch in B. 1705 - P. 46 - Goes with Orange Ave notes.

℄ W = Lt. Rt = E.

0+41 = ℄ Single Gararge on Rt. - Dirt floor

0+36 - 9.9 Rt. = end Slat fence

0+10

0+00 = N.L. Polk Ave - 10' Rt = Beg. Slat fence

0-06.5 = N. cb. Line of Polk Ave (Paved A.C.)

	6.09	356.71	5.14	350.62	N.W. 46th + Orange
B.M.	1.82	355.76		353.94	

351.8	351.5	351.4					351.9	
4.9	5.2	5.3					4.8	
20	10						9.9 floor Gar.	
350.6	350.3	348.5	348.2	348.5	350.7	350.9	351.1	
6.1	6.4	8.2	8.5	8.2	6.0	5.8	5.6	
15	10	7		2	6	10	15	
347.73	347.83	347.24			347.46		347.71	
8.98	9.18	9.47			9.25	9.00		
9.9	9.9				9.9	99 = Top cb. end Alley Ret.		
Top. cb. End Alley Ret.	gut				gut			
347.06	347.67	346.99		346.95	346.99	347.62	346.81	
9.65	9.04	9.72		9.76	9.72	9.09	9.90	
45	10	10			10	10	45	
gut	Top cb 2' Rad. Ret. Alley	gut			gut	Top cb 2' Rad. Alley Ret	gut	
				356.71				

1+58 – 9.0 Rt. = end shed – 9.7 Rt. = S.W. Cor. 5'x4' shed.

1+50 – 8.9 Rt. = end pickett fence & Beg. small shed.

1+39 = ℄ Small old. on Rt. 13.1 floor Level low

1+29 = N. edge 3' Conc. walk & S. end of 6 Car. gararge Conc. floor & Apron

1+25

1+17 = ℄ Single Gar. Conc. floor

1+00 = 9.5 Rt. = End Lath fence & Beg. good Pickett fence

0+83 = ℄ Single gar. – Conc. floor

0+75

0+74 – 8' Lt. = ℄ P. pole

0+50 – 9.6 Rt. – Beg. Lath fence

	Lt.	℄		Rt
	354.24	354.01	353.8	353.2	353.3
	2.47	2.70	2.9	3.5	3.4
	14 = Conc. floor gar.	12 = Conc. edge apron	10		10
					353.56
	354.29	354.05			3.15
	2.42	2.66			13.1 floor of House
	14 floor gar.	12 edge of apron			
			354.0	353.6	353.5	352.1
			2.7	3.1	3.2	4.6
			10		10	25
	354.54					
	2.17					
	15 = floor Conc.					
		354.2	353.7	353.2	353.1	352.8
		2.5	3.0	3.5	3.6	3.9
		20	10		10	15
	353.80					
	2.91					
	15 = floor Conc					
		353.2	352.7	352.4	352.6	
		3.5	4.0	4.3	4.1	
		10	6		10	

356.71

2+50 = N. end Double gar. on Lt. and 9.5 Lt. = Beg. Lath fence. and 10' Rt. = beg. pickett fence

2+30 = N. end of Double gar. on Rt.

2+27 = N. end of 2.3' Conc. N.+S. walk on Lt. also S. end of Double gar. on Lt. - dirt floor.

2+14 = ℄ Single Gar. on Lt. Conc. walk shown below used as apron. Conc. floor

2+08 = Brk. in 2.3' Conc. walk on Lt.

2+02 = S. End Double gar. on Rt. Conc. floor

2+00 = N. side 5' Conc. walk on Lt. + S. end of 2.3' Conc. walk on Lt. N.+S.

1+93 - Single gar. on Rt. wood floor

1+89 = N. end 6 Car gar. Conc. floor + Apron

1+88 - 8.8 Rt. = end wire fence

1+63 - 9.8 Rt. = Beg. wire fence

1+62 - 7.9 Lt. = ℄ P. pole

Lt.	℄	Rt.
352.3	352.4	351.9
4.4	4.3	4.8
12 = floor gar.	10	10
352.1	351.2	5.5
4.6	15	15
352.28	353.52	352.5
4.43	3.19	4.2
13.6 = Conc. floor gar.	12.4 = edge of Conc. walk	11.7 - floor. gar.
353.70	353.61	354.01
3.01	3.10	2.70
14.5 = floor gar.	12.2 edge of walk = apron	12 on walk
352.23	353.94	353.7
4.48	2.77	3.0
13.5 = floor gar.	12 = edge Conc. walk	10
353.1	352.6	352.4
3.6	4.1	4.3
6		10
350.9	354.27	353.96
5.8	2.44	2.75
30	14 floor gar.	12 apron
352.4		
4.3		
12 = floor gar.		

356.71

3+70 = ℄ Single gar. on Lt - Conc. floor

3+63 = ℄ of 2.5 wide Conc. Steps in Conc. wall on Rt.

3+45 = ℄ Single gar. on Lt. - Conc. floor

3+27 = 8' Rt. = Beg. E. face of 3" Conc. wall + 93 Rt. = beg. pic. fence

3+00

apron. = ℄ Single gar. on Lt. - Conc. floor

2+93 = ℄ Single gar. on Rt. Conc. floor + 2 - 2' Conc. strip

2+78 - 9.7 Rt. = end pickett fence

2+75 = 8' Lt. = ℄ P. pole

2+68 = ℄ Single gar. on Lt. Dirt floor.

2+63 - 9.6 Lt. = end lath fence

T. P. 3.19 355.27 4.63 352.08

	Lt.	℄		Rt.	
351.03					
4.24					
13.3 Floor - gar.					
	350.8	350.2	350.30	349.35	349.32 399.1
	4.5	5.1	4.97	5.92	5.95 6.2
	10		6 = W. edge of top step	8.9 = W edge of Bottom step	11.2 = E. edge bot. step. 20
351.36					
3.91					
13.2 = floor gar.					
	350.8	350.9	350.40	350.58	349.5 399.4 — 399.1
	4.5	4.9	4.87	4.69	5.8 59 6.2
	10		7 W. edge of Living	8 = face Conc. wall	8.3 = Toe of 10 20 wall - showing Batter
	351.2	350.6	350.3	349.7	
	4.1	4.7	5.0	5.6	
	10		10	20	
352.29			350.47		350.49
2.98			4.80		4.78
12.7 = Conc. floor gar.			9.1 = edge of strip apron		13.1 = Conc. floor - gar. Not used as gararge
	352.3				
	3.0				
	10.6 = floor gar.				

355.27

4+45 = S. edge of irregular Conc. slab on ℄ against N. part of 3 car gar.

4+27 = S. end 3 car Gar. on ℄ - Conc. floor

4+22 = ℄ Gar. in N. side of Bld. - not used as gar. Conc. floor

4+15

4+10 = ℄ Double Gar. on ℄ - Conc. floor

3+97 = ℄ Single gar. on ℄ - Wood floor

3+87 = ℄ Single gar. on ℄ - Conc. floor

T.P.	5.04	355.46	4.85	350.42	Rock -4' Lt. 4+00

+ End Pickett fence 10.5 Rt.

3+78 = N. end 3" Conc. wall with 1' wide wing on end.

3+76 - 8.4 Lt. = ℄ P. pole

	Lt.		℄		Rt.
	350.73		350.51	350.4	350.1	350.1
	4.73		4.95	5.1	5.4	5.4
	= 14.2 SW. Cor. slab + floor gar		10 = ℄E Gar slab		10	20
	350.72					
	4.74					
	14 = floor					
						349.98
						5.98
						33 = floor
	351.1	350.8	350.2	349.8	349.8
	4.4	4.7	5.3	5.7	5.7
	20	10		10	20
	351.10				
	4.36				
	21 = floor				
		351.20			
		4.26			
		21 = floor			
	351.10				
	4.36				
	18 = floor gar.				
			355.46		
		350.9	350.2	350.45	350.54	349.4	349.4
		4.4	5.1	4.82	4.73	5.9	5.9
		10		8.1 w. edge of wing	9.1 = E. face wall	9.4 = Toe of wall showing batter	10
			355.27				

5+24 = N. end doub. gar. on Lt.

5+16 = N. end Conc. wall on Rt.
Rough Conc. slab in front of apron on S. half

5+01 = S. end Doub gar. on Lt. Conc. floor + apron

5+00

4+78 = S. end of 8" Conc. wall-foundation for pickett fence on Rt

4+77 - 8.5 Lt. = ℄ P. pole

4+76 = N. end Conc walk on Lt. + N. Cor. 2' Conc. E + W. walk

6' Tall - foundation same level as walk shown on W. side

4+66.5 = ℄ 34" x 30" Brick incinerator on Lt. 7.1 to E. side

4+60 = N. end of Conc. slab. on Lt. + S. end of N. + S. 3' Conc. walk

4+57 = N. end 3 car gar. on Lt.

	Lt.	℄	Rt.
	350.74	350.56	351.0	350.7	350.1
	4.72	4.90	4.5	4.8	5.4
	11.8 Floor	9.8 = edge apron		10	20
					350.94
					4.52
					10.1 = w. Top wall
	350.72	350.56	350.61		
	4.74	4.90	4.85		
	11.8 Floor gar.	9.8 edge apron	8 edge slab.		
			350.6	350.7	350.5	350.84	350.0
			4.9	4.8	5.0	4.62	5.5
			10		10	10.2 w. Top wall	15
						350.90	
						4.56	
						10.1 = w. face wall	
	350.69	350.63	350.57	350.6	350.4	350.0
	4.77	4.83	4.89	4.9	5.1	5.5
	12.8 on walk	9.5 Line of N. + S. walk	8.6 = E. edge 2' walk		10	15
	350.66	350.68				
	4.80	4.78				
	12.8 W. edge walk	9.5 = E. edge walk + slab.				
	350.74	350.53				
	4.72	4.93				
	14.3 floor gar. + wly slab.	5 = edge of slab.				

355.46

B.M. - NW. 46th ± Orange		3.89	353.95	353.94
T.P.	6.82	357.84	4.44	351.02

5+92.12 = S. cb Orange

Alley Ref on Lt.

5+77.12 = S.L. Orange - Note: 1' broken off S. end of

5+70 = N. end Conc. wall on Rt.

5+68 = 10.6 Lt. = ℄ 3' Conc. Walk

5+50

5+44 = S. end 11" Conc. wall on Rt. found. for small pickett fence

Note: Conc. slab from N. Cov. of Gar. below to end of wall
Same elev. as floor of gar.

5+34 = N. end walk on Lt. + ℄ Sin. gar. on Rt. - Conc. floor + apron

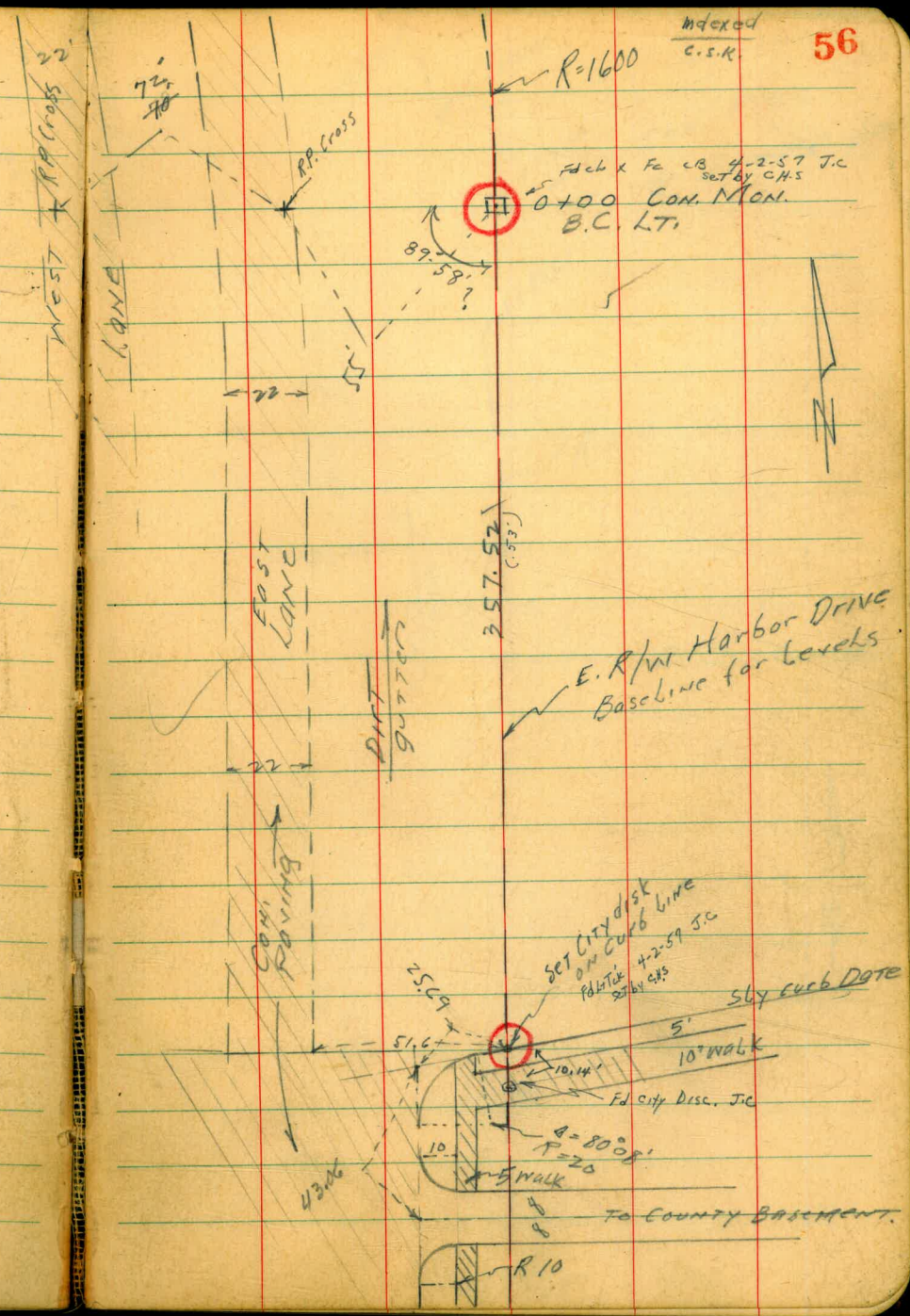
5+25 = S. end 5' N.+S. Conc. walk on Lt.

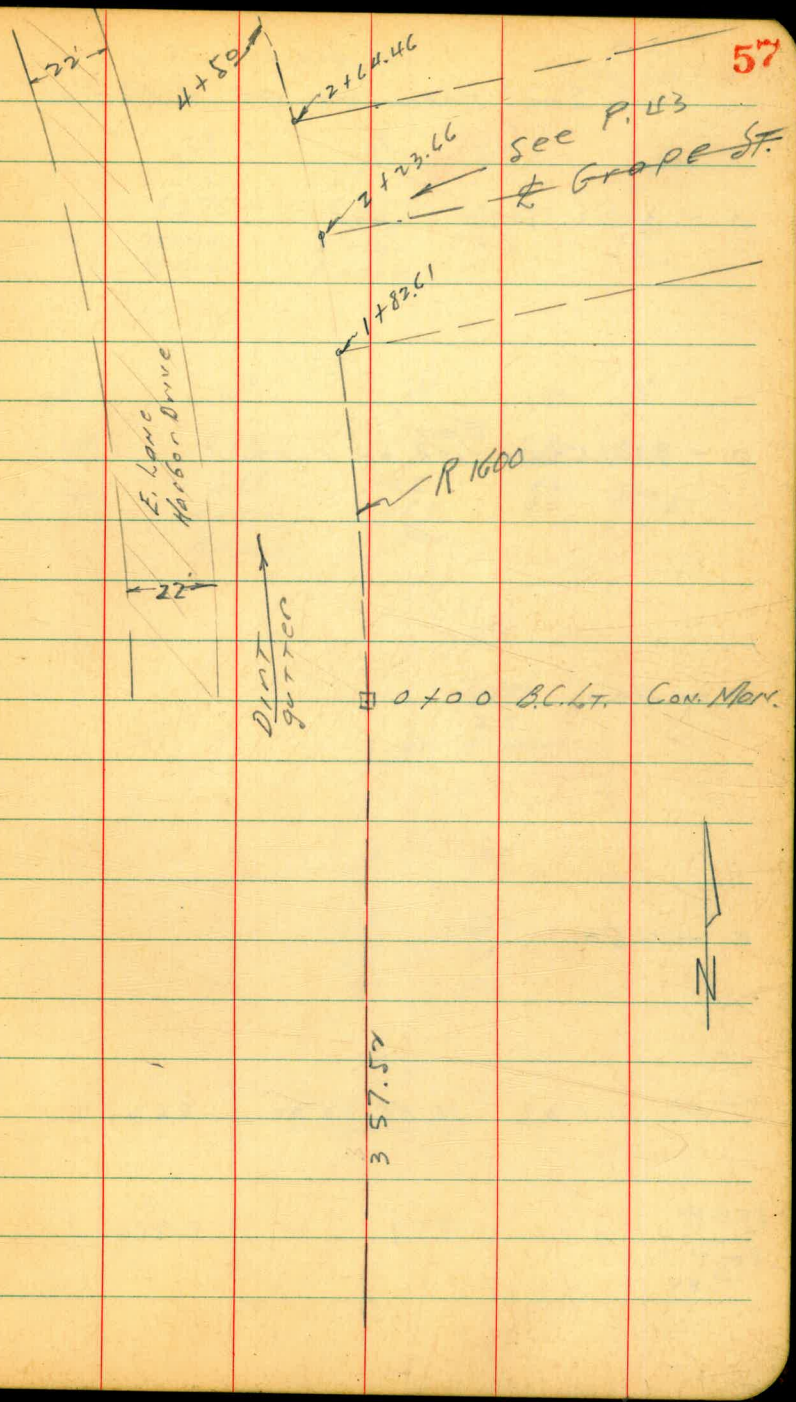
	Lt.	℄	Rt.	
	351.76	350.9	350.6	350.98
	3.70	4.6	4.9	4.48
	10		10	10
	Top cb.		gut.	Top cb.
351.77	351.3	351.3	351.13	
3.49	4.2	4.2	4.33	
9.9	9.9		10.1 = Top cb + gut. end Alley Ref.	
Top cb	gut.			
				351.80
				3.66
				10.2 = Top W. wall
351.81				
3.65				
10.6				
on walk				
	351.0	351.0	351.1	351.78
	4.5	4.5	4.4	3.68
	10		10	10.4
				Top wall
				351.06
				4.40
				15 on Conc walk
			351.82	
			3.64	
			10.4 = W. Top wall	
351.20			350.95	351.24
4.26			5.01	4.22
10.3 = edge walk			9.1 = edge apron	12.5 = floor gar.
351.17				
4.29				
10.7 = edge walk				

355.46

Levels on E gutter of
Harbor Drive at Grape St.

C. Moore
Sommermeyer
H. Moore
Begg
C-27-4C.




22'
4+50
2+64.46
2+23.66
See P. 43
℄ Grape St.
1+82.61
R 1600
E. Lane
Harbor Drive
22'
Dirt gutter
0+00 B.C. Lt. Con. Mon.
N
357.52

Secs taken at 90° ∠ Radials

0 - 331.7

0 - 357.52 = Set disk on curb.

0 - 400

0 - 450

T.P.	6.03	11.66	2.94	5.63
S.E.B.P. Graff Belt St. P. 44	2.61	8.57		5.96

∠T. = to West.

E.L. Harbor Drive

5.29 5.45 5.61 6.05

6.37 6.21 6.05 5.61

W. edge E. Lane — 51.7 E. edge E. Lane — 25 — Pav.

5.27 6.50 5.94 5.86 6.47

6.39 6.16 5.92 5.80 5.19

W. edge E. Lane — 51.6 E. edge E. Lane — 25 C6 P.I. Pav. — E.L. 97. — Top C&G 6

5.76

5.90

25

97. IN drive

5.79 6.42

5.87 5.24

25 25

97 C6

11.66

0 – 100 approx. B.C. Lt. of East Lane
Not Parallel
With R/W Line

0 – 150

0 – 200

0 – 250

0 – 300

11.66

Lt.

E.L. Harbor Dr. 59

4.90	5.13	5.2	4.2	4.7	4.9
6.76	6.53	6.5	7.5	7.0	6.8
	51.8	43	25	13	
Wedge E. Lane	E edge E Lane				
5.10	5.29	5.1	4.3	5.0	5.1
6.56	6.37	6.6	7.4	6.7	6.6
	51.7	42	24	13	
W edge E. La	E edge E Lane				
5.20	5.34	5.0	4.4	4.8	5.1
6.46	6.32	6.7	7.3	6.9	6.6
	51.8	41	23	15	
W. edge E. Lane	E edge E Lane				
5.27	5.38	5.1	4.7		5.31
6.39	6.28	6.6	7.0		6.4
	51.9	41	25		
W. edge E. Lane	E edge E Lane				
5.30	5.42	5.2	5.1		5.6
6.30	6.24	6.5	6.6		6.1
	51.7	30	20		
W. edge E. Lane	E edge E Lane				

11.66

1+50					
1+00					
0+50					
0+00 R/W	B.C. L.T.				
T.P.	4.28	8.61	7.33	4.33	
0 −50					4.80 / 6.86 W edge E. Lane
		11.66			

L.T.

E.L. Harbor Dr.

3.81	4.02	4.0	3.0	3.7	4.1
4.80	4.59	4.6	5.6	4.9	4.5
W edge E. Lane	60.6 E edge E. Lane	51	38	24	
4.06	4.26	4.2	3.3	3.8	4.3
4.55	4.35	4.4	5.3	4.8	4.3
W edge E. Lane	58.9 E edge E. Lane	50	34	25	
4.34	4.53	4	3.4	3.8	4.4
4.27	4.08	4.2	5.1	4.8	4.2
W edge E. Lane	56.9 E edge E. Lane	48	33	20	
4.38	4.02	4.5	3.5	3.9	4.5
4.03	3.79	4.1	5.1	4.7	4.1
W. edge E. Lane	54.5 E edge E. Lane	34	27	15	
		8.61			
5.03	4.9	4.0	3.9	4.3	4.5
6.63	6.8	7.7	7.8	7.4	7.2
52.5 E edge E. Lane	44	33	24	15	
		11.66			

LT.

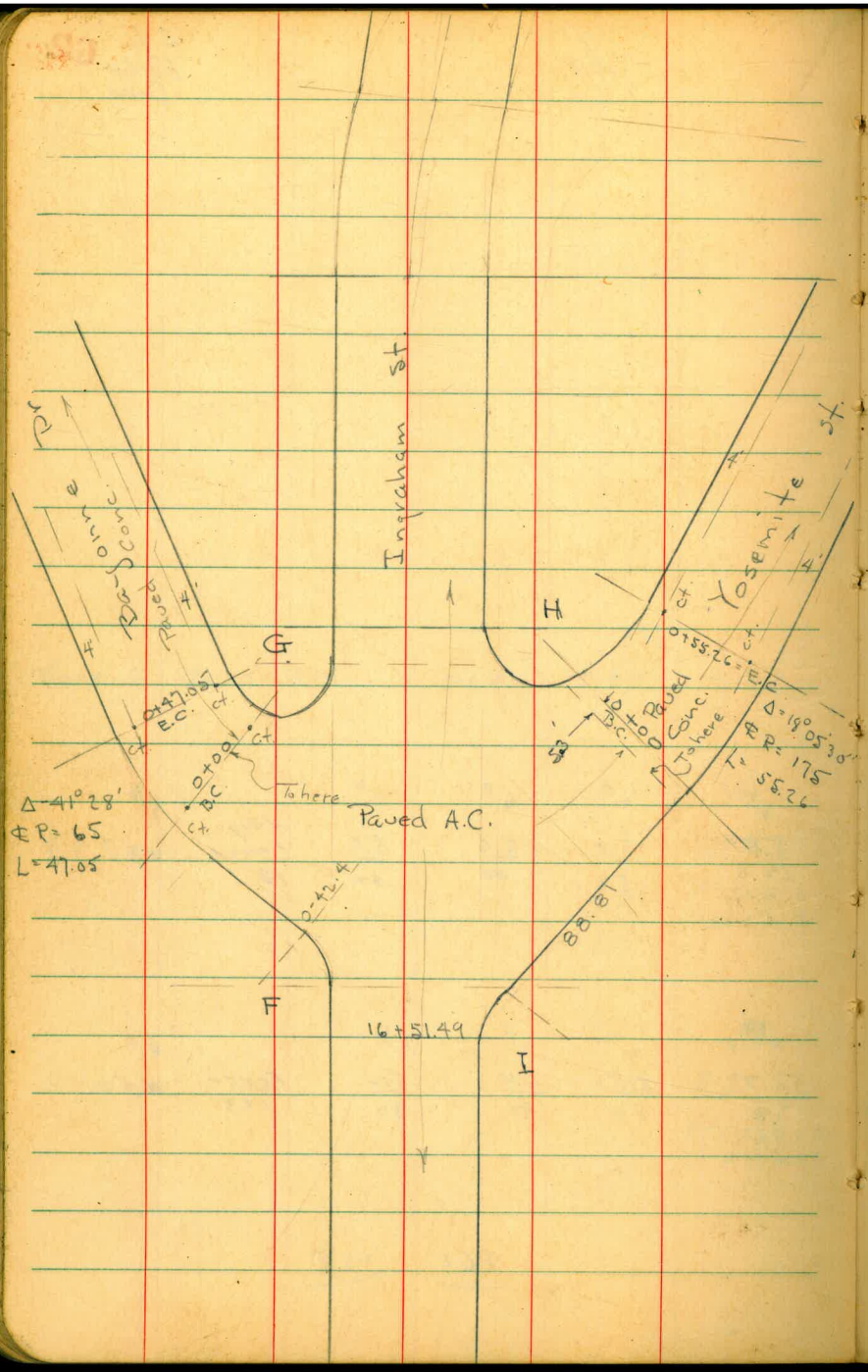
E. L. Harbor Drive

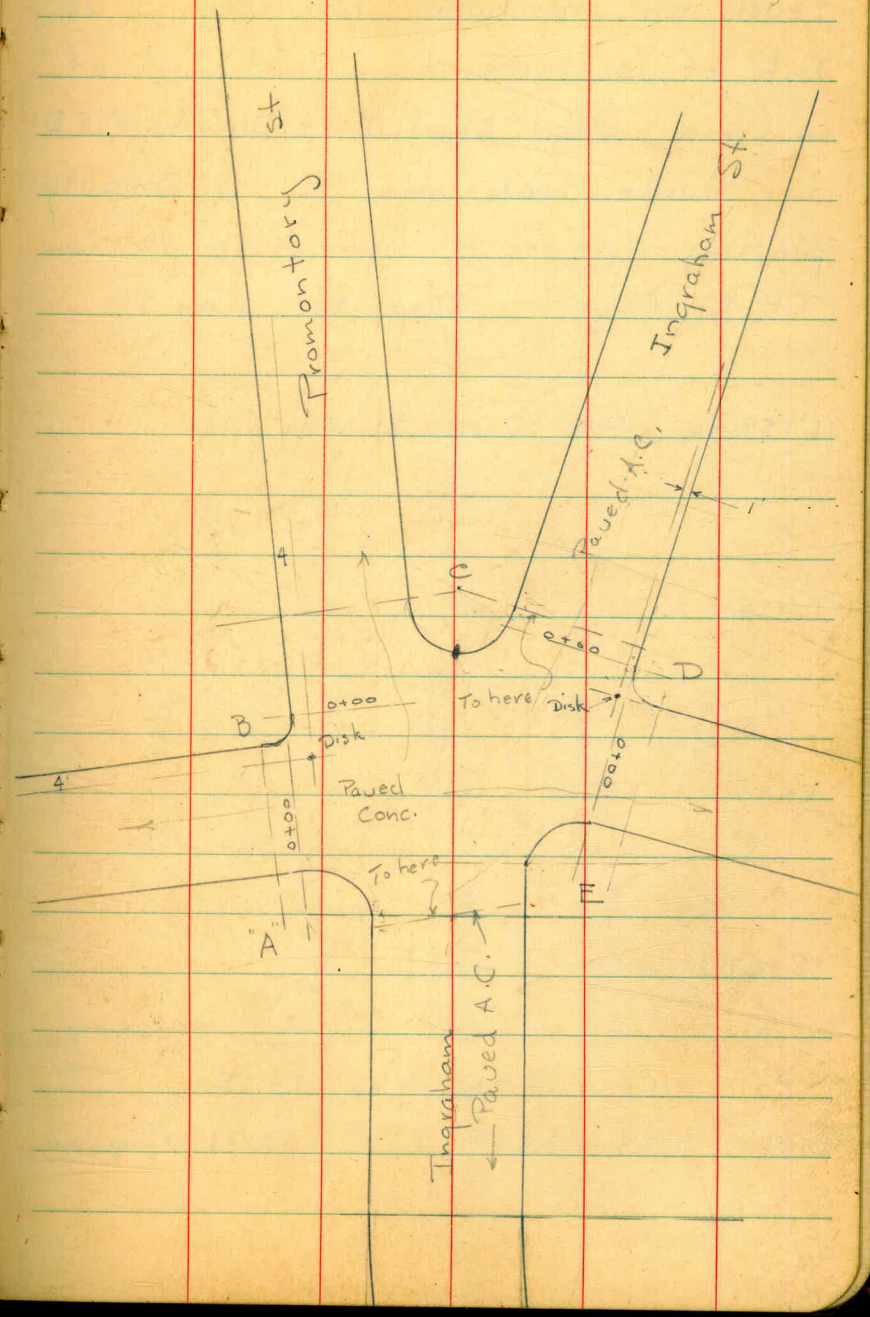
3+50	2.95 5.66 W. edge E Lane	3.15 5.46 63.4 E. edge E Lane	3.4 5.2 54	2.4 6.2 39	3.5 5.1 31	0.3 Fence 8.3	4.3 4.3	
3+00	3.15 5.46 W. edge E. Lane	3.39 5.22 63.5 E edge E. Lane	3.4 5.2 54	2.7 5.9 38	3.8 4.8 27	1.7 Navy Fence 0.9	4.5 4.1	
2+64.46 N. L. Grape St.		3.30 5.31 W. edge E. Lane	3.52 5.09 63 E. edge E. Lane	3.5 5.1 54	2.9 5.7 38	3.8 4.8 25	4.3 4.3	Con. Fence 5.3 Rt
2+23.66 ℄ Grape St.		3.51 5.10 W. edge E. Lane	3.73 4.88 62.3 E. edge E. Lane	3.7 4.9 53	3.1 5.5 39	4.1 4.5 20	4.3 4.3	
1+82.61 = S. L. Grape St.		3.69 4.92 W edge E Lane	3.89 4.72 61.5 E. edge E. Lane	3.8 4.8 53	3.0 5.6 39	4.1 4.5 28	4.1 4.5	
	8.61			8.61				

Lt.

E.L. Harbor Drive

Check to Orig. B.M.		2.64	5.97	5.96							
4+50				2.52 6.09 W. edge E L	2.80 5.81 62.8 E. edge E. Lane	2.9 5.7 53	2.0 6.6 40	3.0 5.6 32	Navy Fence 18	3.0 4.8	
4+00				2.70 5.91 W. edge E Lane	2.94 5.67 63.2 E. edge E. Lane	3.1 5.5 54	2.2 6.4 40	3.4 5.2 30	Fence 14.3	4.0 4.6	
		8.61					8.61				


Ingraham St.
Yosemite St.
Bayonne Pr.
Paved Conc.
G
H
F
I
0+47.05 E.C.
0+00 B.C.
To here
Paved A.C.
Δ-41°28'
℄ R= 65
L=47.05
0+55.26 E.C.
0+00 B.C.
Paved Conc.
To here
Δ=19°05'30"
℄ R= 175
T= 55.26
0-42.4
88.81
16+51.49


Promontory St.
Ingraham St.
Paved A.C.
C
D
B
E
"A"
0+00
Disk
To here
Paved Conc.
Ingraham
Paved A.C.

Levels on Ingraham. St. - from S. of Int. of Yosemite to N. of Int. of La Cima - Used sheet 11 of Drawing 595 D for Guide. took same sta. to simplify plotting - left off 1st. figure of sta. for Conv.

T.P 27 - P. 62 Map 1891 - sheet 3

16+59.46 Curb P.C on Rt.

16+25

16+00

15+67

T.P	3.60	32.42	5.63	28.82	N.E B.P. - Yosemite & Ingraham
B.M.	1.24	34.45		33.21	N.W. B.P. - La Cima & Ingraham

8-23-46

Osborne
McCoy
Hardin
W. Moore

Indexed
C.S.K.

Lt. = W. ℄ Rt. = E.

Lt. = W.		℄	Rt. = E.	
27.33	26.76	27.46	27.25	27.43
5.09 cb.	5.66 gut.	5.26	5.17 gut	4.69 cb.
27.76	27.19	27.50	27.38	27.95
4.66 18.33 Top	5.23 18.33 gut	4.92	5.04 18.33 gut	4.47 18.33 Top
28.02	27.51	27.78	27.66	28.20
4.40 18.33 Top cb.	4.91 18.33 gut	4.64	4.74 18.33 gut	4.22 18.33 Top
28.51	27.94	28.34	27.99	28.55
3.91 21.33 - edge of walk in Drive	4.48 18.33 gut	4.08 on Rim M.H.	4.43 18.33 gut	3.8 18.33 Top cb.
		32.42		

Station	Elevations	Readings
17+72.90 = cb. P.C. on Rt.	27.86, Lt. 27.28, 27.99, 28.22, Rt. 28.78	4.56 (1833 cb.), 5.14 (gut), 4.43, 4.20 (gut.), 3.64 (1833 = Top cb)
17+58.07 = Cb. PC on Lt.	27.80, 27.23, 27.89, 28.03, 28.17, 28.72	4.62 (18.33 cb.), 5.19 (gut.), 4.53, 4.39 (18.33), 4.25 (23.6 gut), 3.70 (23.6 cb.)
17+40	27.42, 26.92, 27.17, 27.89, 27.72, 28.05	5.00 (26.3 cb.), 5.50 (26.3 gut), 5.25 (18.33), 4.53, 4.70 (18.33), 4.37 (40)
17+25	27.00, 27.24, 27.69, 27.48, 27.66	5.42 (25), 5.18 (18.33), 4.73, 4.94 (18.33), 4.76 (25)
17+00	26.65, 26.83, 27.26, 27.23, 27.39, 27.45, 28.02	5.77 (25), 5.59 (18.33), 5.16, 5.19 (18.33), 5.03 (35), 4.97 (51.2 gut.), 4.40 (51.2 cb.)
16+80 = Cross gutter	27.03, 26.47, 26.50, 26.79, 27.01, 27.24, 27.77	5.39 (20.7 Top cb. on Ret.), 5.95 (20.7 gut.), 5.92 (18.33), 5.63, 5.41 (18.33), 5.18 (31 gut.), 4.65 (31 cb.)
16+69.20 = cb. P.C on Lt.	27.22, 26.66, 26.93, 27.11, 27.22, 27.77	5.20 (Top cb.), 5.76 (18.33 gut.), 5.49, 5.31 (18.33), 5.20 (20.9 gut.), 4.65 (20.9 Top cb. on Ret)

32.42

T.P.	7.47	37.25	2.64	29.78

19+89.21 = E.C.

19+50.57 = 1/2 Curve

Δ = 8°26'
R = 525'

19+11.94 = B.C.

18+80

18+40

18+00

	Lt.	℄	Rt.
	29.71	29.18	29.18	29.67	30.19
	2.71	3.24	2.74	2.75	2.23
	18.33 = cb.	gut.		gut.	18.33 = cb.
	29.22	28.70	29.33	29.42	29.94
	3.20	3.72	3.09	3.00	2.45
	cb.	gut.		gut	cb.
	28.78	28.25	29.01	29.18	29.75
	3.64	4.14	3.41	3.24	2.67
	cb.	gut		gut.	cb
	28.59	28.06	28.71	28.94	29.54
	3.85	4.36	3.71	3.48	2.88
	20.6 walk in Dr.	gut 18.33		gut.	cb
	28.25	27.73	28.46	28.68	29.31
	4.17	4.69	3.96	3.80	3.21
	cb.	gut.		gut	cb
	28.03	27.48	28.15	28.34	28.89
	4.39	4.94	4.27	4.08	3.53
	18.33 cb.	gut.		gut	18.33 cb.

32.42

22+26

22+11.47 = cb. P.C. on Lt.

21+80

21+55.36 = cb. P.C. on Rt.

21+00

20+50

20+00

	Lt.			Rt	
32.17	31.66	31.66	31.80	31.66	31.74	32.20
5.08	5.59	5.59	5.45	5.59	5.51	5.05
24	Lt	-18.33		18.33	38	38
Top cb. on Ret	92 Lt				gut	cb
	32.22	31.57	31.61	31.54	31.54	32.08
	5.03	5.08	5.44	5.71	5.71	5.17
	18.33	gut.		-15	30.8	30.8
	cb.					
31.89	31.29	31.52	31.25	31.29	31.87
5.36	5.96	5.73	6.00	5.96	5.38
cb	gut.		18.33	21	21
				gut.	cb.
31.62	30.97	31.29	31.08	31.65	
5.63	6.28	5.96	6.17	5.60	
20.8 =	gut		gut	18.33 = cb.	
walk in Dr.	30.96	30.40	30.41	31.46	
6.29	6.85	6.56	6.24	6.09	
cb	gut.		gut.	cb	
30.37	29.82	30.27	30.17	30.75	
6.88	7.40	6.98	7.08	6.50	
cb.	gut.		gut	cb.	
29.63	29.30	29.75	29.74	30.30	
7.42	7.95	7.50	7.51	6.95	
18.33	gut		gut	18.33 = cb.	
cb					

37.25

N.L. La Cima

Disk 1'W. of E.L. Ingraham +	4.66	32.59
check B.M.	4.05	33.20 ✓

22+76 = cb face on Return

22+60

22+38 = Cross gutter

32.50	32.51	32.55	33.14	32.63	32.55		32.42
4.75	4.74	4.70	4.11	4.62	4.70		4.83
42.4 = E	30	18.33	cb.	gut.	18.33		30
Promontory Prod.							
	32.19	32.24	32.30		32.25	32.17	
	5.06	5.01	4.95		5.00	5.08	
	30	18.33			18.33	30	
	31.78	31.70	31.85	31.83	31.80	31.83	32.38
	5.47	5.47	5.40	5.42	5.45	5.42	4.87
	30	18.33		18.33	29	51.3 gut.	51.3 cb.

37.25

Returns & Side Streets at int. La Cima & Ingraham

37.25 - P. 68

Ret "A" - See sketch - Dist around on cb. face = 45.3' - 3 parts 15.1 each

S. end = 22+1147 on Ingram	5.03	32.22	Top.
	5.68	31.57	gut.
15.1 N.	5.09	32.16	Top
	5.60	31.65	gut.
30.2 N.	5.05	32.20	Top
	5.60	31.65	gut.
45.3 N. = P.C.	5.09	32.16	top
	5.62	31.62	gut

Ret. "B" 31.9 around - 3 parts 10.6

S. end = P.C. on La Cima	4.88	32.37	Top.
	5.39	31.86	gut.
10.6 N	4.81	32.44	Top.
	5.31	31.94	gut.
20.2 N	4.71	32.54	Top
	5.12	32.13	gut

37.25

31.9 N = P.C. on Promontory	4.57	32.68	Top
	4.99	32.26	gut.

Ret. "C" 87' around - 5 parts 17.4'

P.C. on Promontory	4.16		Top.
	4.60	32.65	gut.
17.4 E. in Drive to Sta ser.	4.05	33.20	on walk opp.
	4.59	32.66	gut.
34.8 E. - in Dr.	4.05	33.20	walk
	4.67	32.58	gut.
52.2 E on cb.	4.08	33.17	Top cb.
	4.64	32.61	gut.
69.6	4.04	33.21	on walk
	4.62	32.63	gut.
87' E. = P.C. on Ingraham	4.08	33.17	Top. cb.
	4.60	32.65	gut.

Ret. "D" - 25.6 around - 3 parts 8.5			
Send = P.C. on La Cima	4.88	32.31	Top
	5.34	31.91	gut.
8.5 N.	4.86	32.39	Top
	5.24	32.01	gut.
17 N.	4.66	32.59	Top
	5.24	32.01	gut.
25.6 N. = P.C. on Ingraham	4.61	32.64	Top
	5.28	31.97	gut.
Ret. "E" 32.8 around - 3 parts 10.9			
S. end = 22+36.06 on Ingraham	5.05	32.20	Top.
	5.52	31.73	gut.
10.9 N.	4.96	32.29	Top.
	5.43	31.82	gut.
21.8 N.	4.87	32.38	Top
	5.42	31.83	gut.
32.8 N. = P.C. on La Cima	4.99	32.26	Top.
	5.46	31.79	gut.

ELev. on Side Sts.

0+17.8 = opp. Prop. P.C. on Rt. + cb. P.C. of Ret "B"

0+00 = Cb. P.C. of Ret. "A"

W. on LaCima - 0+00 = 17.8 E. of Prop. P.C. of Ret. "B"

1+00 = end.

0+50

0+12 = P.C. of curb Ret. on Rt. = Same as used in Ret. shots. - Ret. "C"

0+00

on LaCima + Promontory. - see sketch

N. on Promontory. 0+00 = opp. N.W. Prop. P.C. (10' Rad. = P.C. cb. Ret "B"

B.M.	4.44	37.65	33.21	N.W. B.P. LaCima + Ingraham

8-26-46
7.0.

Lt =		℄	Rt =	
32.09	31.52	32.01	31.85	32.38
5.56	6.13	5.64	5.80	5.27
15 cb	gut.		gut	15 cb.
32.17	31.64	32.00	32.06	32.17	32.56
5.48	6.01	5.65	5.59	5.48	5.09
15	15		15	26.4 gut.	26.4 Top cb. on Ret
34.75	34.31	34.70	34.57	35.07
2.90	3.34	2.95	3.08	2.58
15 cb.	gut.		gut.	15
33.66	33.28	33.69	33.48	33.94
3.99	4.37	3.96	4.17	3.71
15 cb.	gut.		15 gut.	15 cb.
32.89	32.45	32.85	32.64	33.09
4.76	5.20	4.80	5.01	4.56
15 cb.	15 gut		15 gut	15 cb.
32.69	32.26	32.73	32.67	32.66	33.14
4.96	5.39	4.92	4.98	4.99	4.51
15 Top cb	15 gut		15	17.3 gut.	17.3 cb. on Ret.

37.65

124+02.34
1+00 = end.

123+52.34
0+50

T.P	4.72	37.93	4.44	33.21

123+03.14
0+04.4 = cb. P.C. on Ret. "C"

123+02.34
0+00 =

122+99.01
0-04.1 = cb. P.C. on Ret. "D"

N. on Ingraham - 0+00 = Prop. P.C. on Ret. "D"

1+00 = end.

0+50

W. on La Cima - Cont.

	Lt.				Rt.	
	33.98	33.42	33.44	32.93	33.45	
	3.95	4.51	4.49	5.00	4.48	
	18.33=cb.	gut.		gut.	18.33=cb.	
	33.57	32.99	32.98	32.55	33.06	
	4.36	4.94	4.95	5.38	4.87	
	on walk opp.	18.33=gut. in Dr.		gut.	18.33=cb.	
	33.19	32.66	37.93	32.06	32.66	
	4.46	4.99	32.73 4.92	5.59	4.99	
	18.33	gut.		gut.	18.33=cb.	
	33.22	32.66	32.64	32.03	32.70	
	4.43	4.99	5.01	5.62	4.95	
	on walk opp.	18.33=gut. in Dr.		gut.	18.33=cb.	
	33.21	32.63	32.58	31.99	32.65	
	4.44	5.02	5.07	5.66	5.00	
	on walk opp.	18.9=gut. in Drive To Ser. Sta. on Ret.		gut.	18.33=cb.	
	31.57	31.15	31.48	31.20	31.71	
	6.08	6.50	6.17	6.45	5.94	
	15=cb.	gut.		gut.	15 cb.	
	31.86	31.38	31.79	31.62	32.11	
	5.79	6.27	5.86	6.03	5.54	
	cb. 15	gut.		gut.	15 cb.	
			37.65			

1+00 = end.

0+50

0+05.4 = Prop. P.C. + cb. P.C. on Ret. "D"

0+00 = cb. P.C. - Ret. E.

La Cima E. 0+00 = cb. P.C. on Ret. "E" = 5.4 W. of Prop. P.C. on Ret. "D"

	Lt.		℄		Rt.
	31.84	31.34	31.65	31.33	31.77
	6.09 15 = cb	6.59 gut	6.28	6.60 gut	6.16 15 = cb
	32.10	31.63	31.98	31.53	32.01
	5.83 15 = cb	6.30 gut	6.03	6.40 gut	5.92 15 = cb
	32.39	31.93	32.04	31.82	32.27
	5.54 15 = cb	6.00 gut	5.89	6.11 gut	5.66 15 = cb
	32.36	32.01	32.09	31.82	32.28
	5.57 16.2 Top cb. on Ret.	5.92 16.2 gut	5.92 15 5.84	6.11 gut	5.65 15 = cb

37.93

BM. 3.49	32.31		28.82	N.E. B.P.

Levels around Returns at int. of Yosemite + Bayonne - Ingraham - See sketch -

Ret. F - 28' - 3 parts 9.3 each			
S. end = 16+69.20 on Ingraham	5.10	27.21	Top
	5.58	26.73	gut
9.3 N.	5.25	27.06	Top
	5.80	26.51	gut
18.7 N.	5.33	26.98	Top
	5.89	26.42	gut
28. N = P.C. cb. = 0+42.4	5.43	26.88	Top
	5.98	26.33	gut
Ret G. - 54.7 around - 5 parts - 10.9 each.			
S. end = 0+00 on Bayonne	5.50	26.81	Top
	5.98	26.33	gut
10.9 N.	5.38	26.93	Top
	5.92	26.39	gut
21.8 N.	5.15	27.16	Top
	570	26.61	gut
32.7 N.	4.92	27.39	Top
	5.44	26.87	gut

32.31

4.38 N	4.75	27.56	Top
	5.26	27.05	gut
54.7 = P.C. = 17+58.07 on Ingraham	4.51	27.80	Top
	5.08	27.23	gut
Ret. H. - 64.2 around - 5 parts - 12.84 each.			
W. end = P.C. = 17+72.90 on Ingraham	3.53	28.78	Top
	4.06	28.25	gut
12.84 E.	3.58	28.73	Top
	4.12	28.19	gut
25.7 E.	3.54	28.77	Top
	4.07	28.24	gut
38.55 E.	3.51	28.80	Top
	4.05	28.26	gut
51.37 E.	3.41	28.90	Top
	3.96	28.35	gut
64.2 E. = P.C. = 0+00 on Yosemite	3.38	28.93	Top
	3.84	28.47	gut

Levels on Side Sts. - W. + N. on Bayonne St

the S. end of 9' opening on Lt.

0+47.05 = E.C. = S. end of 9.5 opening on Rt. + 3' N. of

0+38.5 = opp. brk to basin on Lt

0+29.5 = opp. Brk. down to catch basin on Rt.

0+00 = Prop. P.C. = B.C. of ℄ R 65' Δ 41°28' Curve

D-21.2

D-42.4 = P.C. Ref "F"

N.E. B.P.

B.M. 3.26 32.08 28.82

Levels on Bayonne St. W. + N. of Ingraham

See sketch.

Lt.		℄		Rt.	
25.75		24.58	25.88	25.26	26.38
6.33		7.50	6.20	6.82	5.70
15=cb.		15=Top of Grate		gut.	15
25.79	25.22		25.90	25.24	26.41
6.29	6.86		6.18	6.34	5.61
15=cb	gut			gut	15=cb.
25.90	25.44		25.98	26.04	26.55
6.18	6.64		6.10	6.04	5.53
15=cb.	gut.			gut.	15=cb.
26.25	25.82		26.40	26.33	26.82
5.83	6.26		5.68	5.75	5.26
15 cb	gut.			gut	15=cb.
26.56	26.03		26.45		
5.52	6.05		5.63		
15=cb	gut.				
26.88	26.32		26.80		
5.20	5.76		5.28		
15	15				
Top cb.	gut.				

32.08

1+50 = end.

1+00

0+66.6 = opp. Brk. on Rt.

0+63.5 = opp. Brk. on Lt.

Lt.		℄		Rt.
26.92	26.46	26.95	26.86	27.33
5.16	5.62	5.13	5.22	4.75
15 = cb.	qut.		qut.	15 = cb.
26.23	25.77	26.22	26.23	26.71
5.85	6.31	5.86	5.85	5.37
15 = cb.	qut.		qut.	15 = cb.
25.92	25.40	25.98	25.91	26.47
6.16	6.68	6.10	6.17	5.61
15 = cb.	qut.		qut.	15 = cb.
25.87	25.37	25.98	25.78	26.46
6.21	6.71	6.10	6.30	5.62
15 = cb.	qut.		qut.	15 = cb.

32.08

1+00 = end

0+55.26 = E.C.

0+27.63 = Middle of Curve

+ B.C. of curve ∠R = 175 Δ 18°05'30"

0+00 = Prop. P.C. + Cb P.C. of Ret. "H"

0-44.4

0-88.81 = P.C. Ret. I

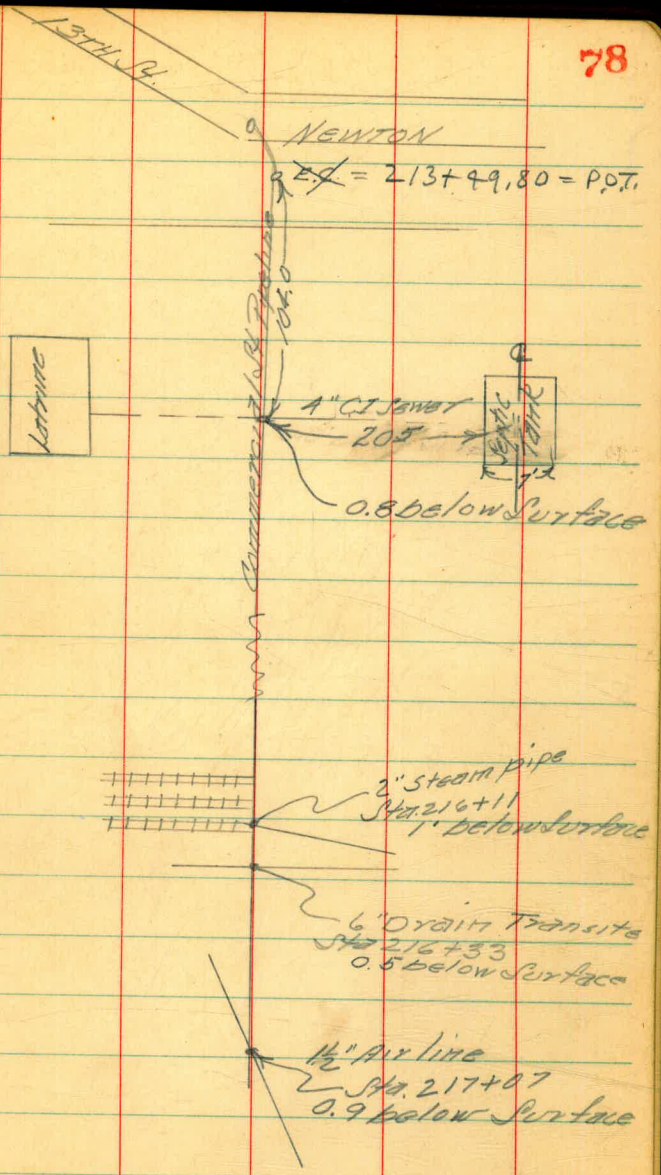
Levels on Yosemite N. of Ingraham.

Lt.		℄		Rt.
29.43	28.92	28.99	28.52	28.92
2.65 15 = cb.	3.16 gut.	3.09	3.56 gut.	3.16 15 = cb.
29.18	28.66	28.74	28.23	28.66
2.90 15 = cb	3.42 gut.	3.34	3.85 gut.	3.42 15 = cb.
29.02	28.62	28.66	28.08	28.62
3.06 15 = cb.	3.46 gut.	3.42	4.00 15 = gut in Dr.	3.46 19 = walk opp.
28.94	28.48	28.49	27.93	28.41
3.14 15	3.60 gut.	3.59	4.15 gut.	3.67 15 = cb
		27.78	27.50	28.05
		4.30	4.58 gut.	4.03 15 = cb.
		26.96	27.27	27.77
		5.12	4.81 gut.	4.31 15 = cb.

32.08 - P. 76

4/21/47
KING?

LOCATIONS & ELEVATIONS OF UNDERGROUND PIPES CROSSING ℄ OF COMMERCIAL ST. PIPE LINE



5-4-48
7.0.

Grade for Sewer hat # ①

Alley Block 1 - Chester Park add. - P.49

Top-end Rot E. side

9.03 356.74 347.71

Stake - 2' Back of W.L. 73' N. of N.L. Polk

3.59 F.L.

53.15 346.82 C 6.33

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

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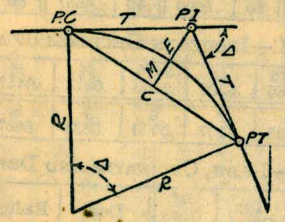


CURVE FORMULAS

Radius=R=$\frac{50}{\sin. D/2}$ (1) Degree of Curve=D and sin. $\frac{D}{2}=\frac{50}{R}$ (2)

Tangent=T=R tan $\frac{\Delta}{2}$ (3) Length of Curve=L=$100\frac{\Delta}{D}$ (4)

Middle ordinate=M= R(1—cos. $\frac{\Delta}{2}$) (5) =R 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 IV.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
91°	5830.5	2444.9	101°	6950.6	3278.1	111°	8336.7	4386.1
10′	5847.5	2457.1	10′	6971.3	3294.1	10′	8362.7	4407.6
20	5864.6	2469.3	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	102	7075.5	3374.9	112	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002.7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93	6037.8	2594.0	103	7203.2	3474.4	113	8656.6	4651.3
10	6055 4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073 1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94	6144.3	2671.6	104	7333.6	3576.8	114	8822.9	4790.4
10	6162.6	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234 6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	105	7467.0	3682.3	115	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344.8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96	6363.4	2833.2	106	7603.5	3791.0	116	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259.0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	107	7743.2	3902.9	117	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98	6591.2	3003.8	108	7886.2	4018.2	118	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	109	8032.7	4137.1	119	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	6808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100	6828.3	3184.1	110	8182.8	4259.7	120	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

Table V.—Corrections for Tangents and Externals.

These corrections are to be added to the approximate values, found by dividing the tangent, or external, for a 1° curve (Table IV) by the degree of curve, in order to obtain the true tangents, or externals. Intermediate values may be obtained by interpolation.

For Tangents Add

Central Angle	Degree of Curve													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
15°	.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.53	.58	.63	.68
20°	.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
25°	.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
30°	.10	.19	.29	.39	.49	.59	.69	.79	.89	.99	1.09	1.20	1.29	1.39
35°	.11	.22	.34	.47	.58	.69	.70	.81	.92	1.04	1.29	1.42	1.54	1.66
40°	.13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
45°	.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
50°	.17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
55°	.19	.38	.57	.76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
60°	.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
65°	.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
70°	.25	.51	.76	1.02	1.28	1.54	1.80	2.06	2.33	2.60	2.88	3.16	3.44	3.72
75°	.27	.56	.83	1.12	1.40	1.69	1.98	2.27	2.57	2.87	3.16	3.47	3.78	4.09
80°	.30	.61	.91	1.22	1.53	1.84	2.15	2.46	2.78	3.10	3.44	3.78	4.12	4.46
85°	.33	.66	1.00	1.33	1.68	2.02	2.36	2.70	3.05	3.40	3.77	4.14	4.55	4.89
90°	.36	.72	1.09	1.45	1.83	2.20	2.57	2.94	3.32	3.70	4.10	4.50	4.91	5.32
95°	.39	.79	1.19	1.55	2.00	2.40	2.80	3.20	3.61	4.02	4.40	4.98	5.38	5.83
100°	.43	.86	1.30	1.74	2.18	2.62	3.06	3.50	3.95	4.40	4.88	5.37	5.85	6.34
110°	.51	1.03	1.56	2.08	2.61	3.14	3.67	4.21	4.76	5.31	5.86	6.43	7.01	7.60
120°	.62	1.25	1.93	2.52	3.16	3.81	4.45	5.11	5.77	6.44	7.12	7.80	8.50	9.22

For Externals Add

Central Angle.	Degree of Curve													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°	.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°	.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	.046	.093	.142	.188	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°	.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.711	.845	.922	1.01
70°	.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	.095	.182	.286	.383	.480	.578	.678	.777	.877	.977	1.07	1.18	1.29	1.39
80°	.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91
90°	.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°	.174	.350	.522	.706	.985	1.06	1.25	1.43	1.62	1.80	1.99	2.18	2.38	2.58
100°	.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96
110°	.268	.536	.806	1.08	1.35	1.63	1.91	2.20	2.48	2.76	3.05	3.35	3.66	3.96
120°	.360	.721	1.08	1.45	1.82	2.19	2.57	2.95	3.33	3.72	4.11	4.50	4.91	5.32

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

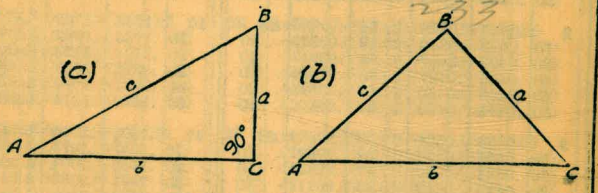
cos. $A=\frac{b}{c}$

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	$s=\frac{1}{2}(a+b+c)$, $\text{area}=\sqrt{s(s-a)(s-b)(s-c)}$

401
2+05 = WL
196

361
205
156

125
325
925

Orange

1+29 = ℄ 15" Dia. Gate Cover

351.30 = EL.
12' Lt.

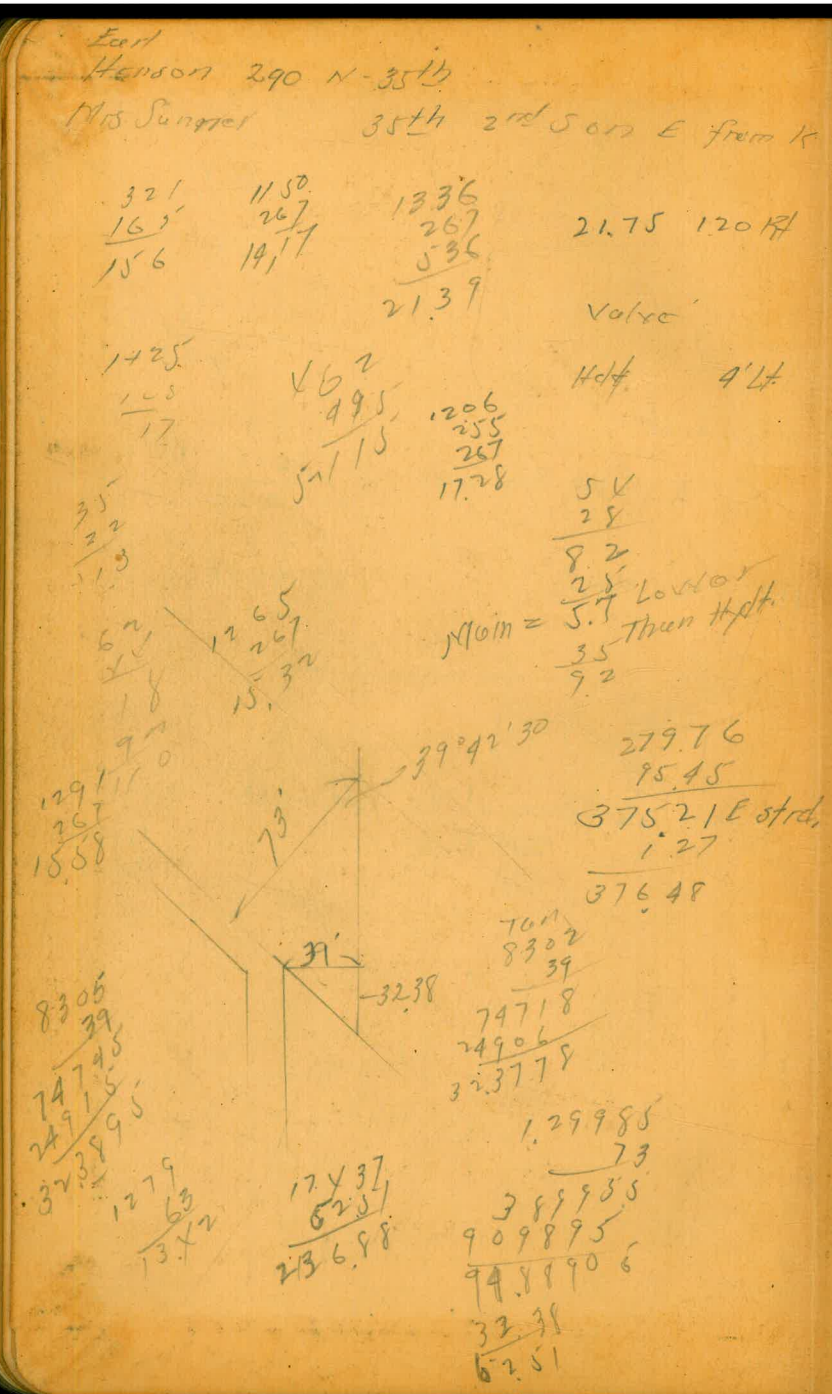
1+35 = ℄ = M.H.

351.73 = EL

Alley Blk. 7

2+63 = 11' Rt. ℄ Back of 20' Gar. on Rt.
Dirt floor

353.5
11 = El. floor
+ bot. of sill



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.

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