1276

BASIC

LEVEL 2000

380

Our Leather Bound Engineers Note Books are carried in the following rulings:

No. 380 LEVEL BOOK. Left and Right Hand Page the same as Left Hand Page of this Book.

No. 382 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 4 x 4 to the inch, Center Line Red.

No. 384 MINING TRANSIT BOOK. Left Hand Page as in this Book, Right Hand Page 8x8 to the inch, Center Line Red.

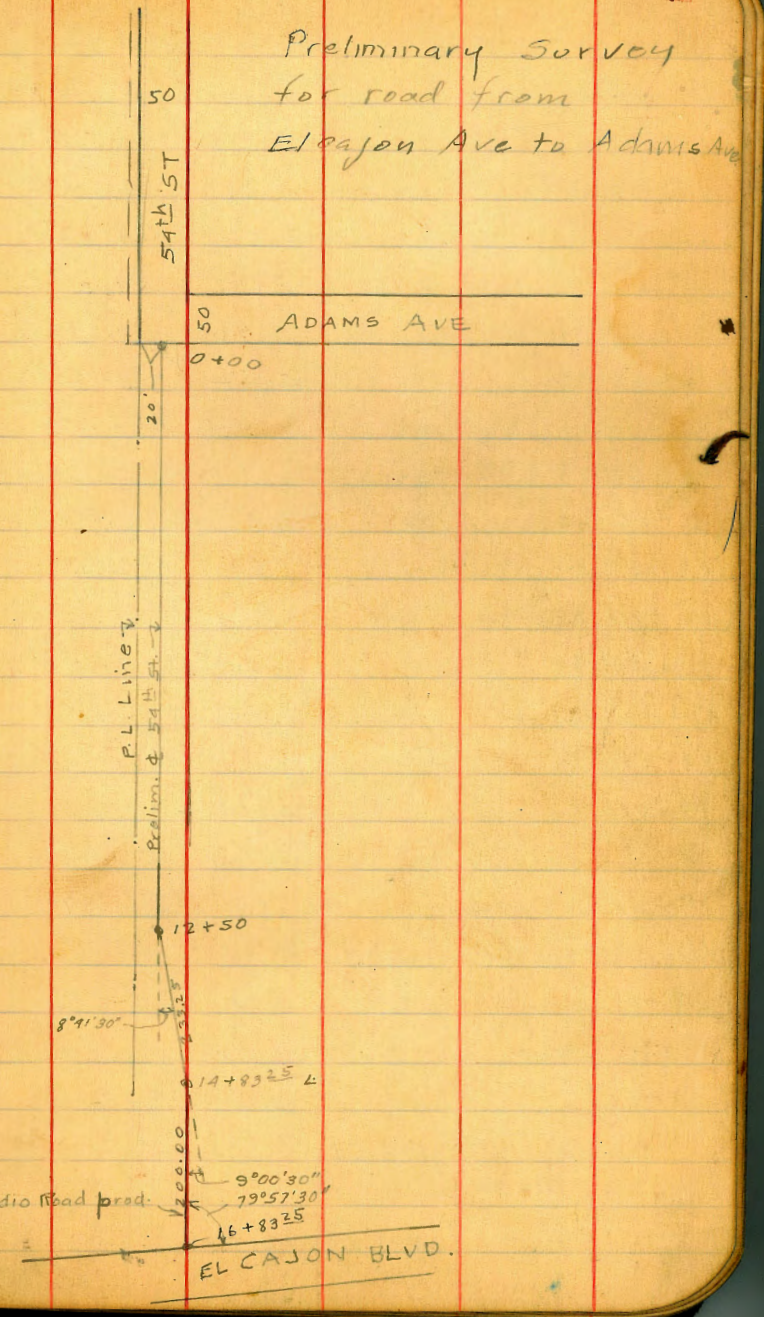
No. 385 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 8 vertical and 4 horizontal lines to the inch, Center Line Red.

We also carry the Note Books listed above, bound in extra strong Fabri-Hide (otherwise the same quality of book), which can be furnished at a somewhat lower price.

In ordering Fabri-Hide covered books, add the letter *"F"* to catalog number.

Line indexed [illegible] 7/2/30 HH

Preliminary Survey for road from El Cajon Ave to Adams Ave

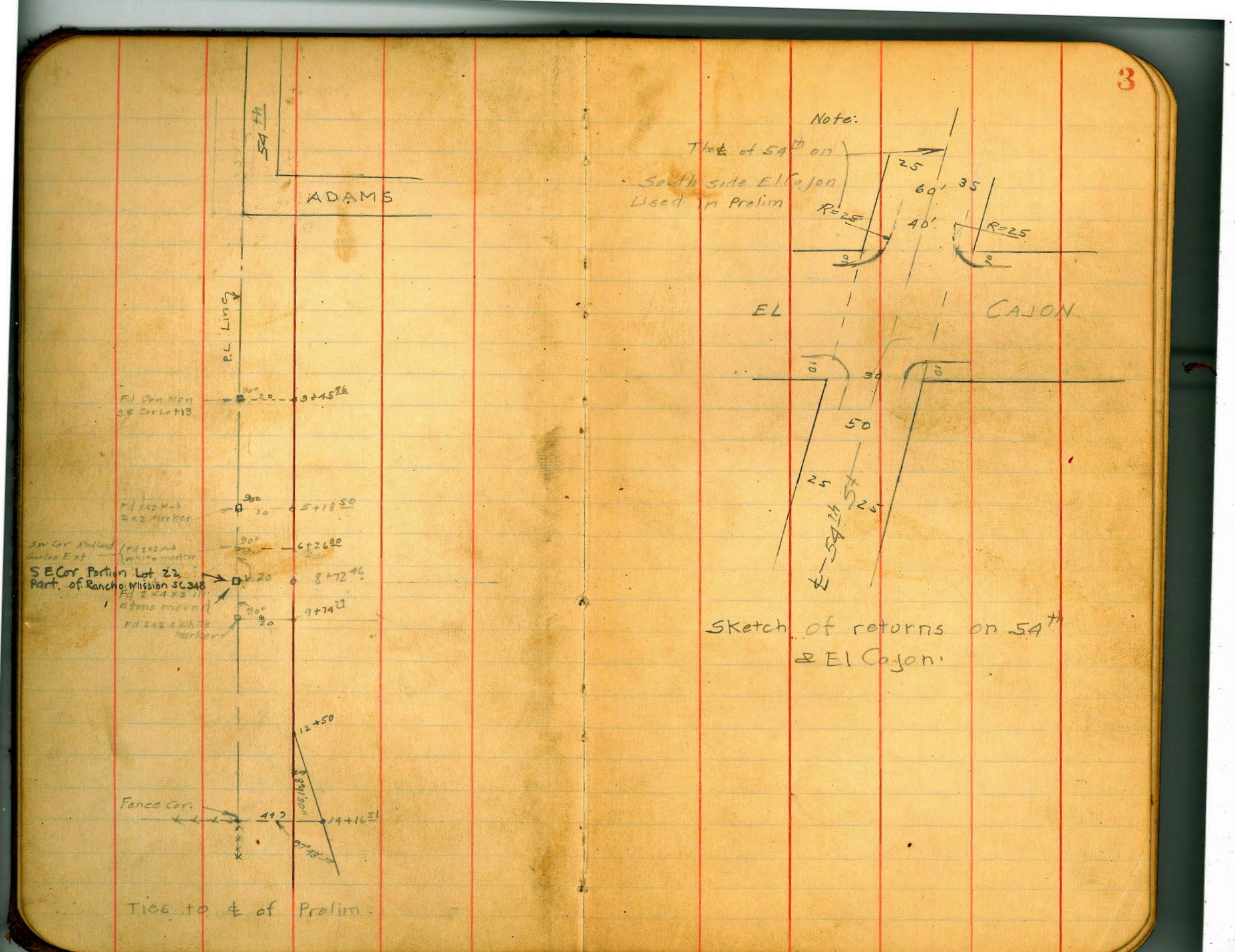


N.W. cor Mon El Cajon & 54th

Elevs of Stations Profile 54th E. Cajon to Adams

BM	7.58	409.64		402.06
16+83.25			6.62	403.02
16+50			6.20	403.44
16+00			5.60	404.04
15+50			6.24	403.40
15+00			5.75	403.89
14+83.25	4		5.46	404.18
14+50			5.52	404.12
14+00			6.44	403.20
13+50			16.9	392.7
13+00			16.3	393.3
12+50			7.37	402.27
12+00			5.22	404.42
11+50			5.30	404.34
11+00	2.72	407.46	4.90	404.74
10+50			3.74	403.72
10+00			5.01	402.45
9+50			5.95	401.51
9+00			7.89	399.57
8+50	0.24	395.72	11.78	395.68
8+00			6.19	389.73
T.P.	0.04	382.92	13.04	382.88
7+50			6.71	376.21
T.P.	0.10	370.59	12.43	370.49
7+00			7.67	362.92
T.P.	0.03	357.59	13.03	357.56

		↑ +	357.59	↓ −	
6+50				9.17	348.42
6+00				7.61	349.98
T.P.	12.29		369.62	0.26	357.33
5+50				1.31	368.31
T.P.	12.92		382.49	0.05	369.57
5+00				1.42	381.07
T.P.	12.54		395.01	0.02	382.47
4+50				10.97	384.04
4+00				1.56	393.45
T.P.	2.92		397.35	0.58	394.43
3+50				3.22	394.13
3+00				15.9	381.45
2+50				0.96	396.39
T.P.	12.33		408.72	0.96	396.39
2+00				5.70	403.02
1+50				4.33	404.39
1+00				2.90	405.82
T.P.	10.02		418.28	0.46	408.26
0+50				8.97	409.31
0+00				5.56	412.72
B.M. Pole # 76788				1.28	417.00


54th
ADAMS
P.L. Line
Fd Con Mon
S.E. Cor Lot 13
9+45.76
Fd 1½ Hub
2×2 Marker
5+18.50
S.W. Cor Portland
Cement Ext.
Fd 2×2 Hub
w/ white marker
6+26.80
S.E. Cor Portion Lot 22
Part of Rancho Mission SC 348
Fd 2"x24"x3" Iron
Stone mound
Fd 2×2 w/ White
marker
8+72.16
9+74.23
12+50
Fence Cor.
44.3
14+16.51
Tie to ℄ of Prelim.
Note:
℄ of 54th on
South side El Cajon
Used in Prelim
25
60'
35
R=25
40'
R=25
EL
CAJON
30
50
25
25
54th
Sketch of returns on 54th
& El Cajon.

Nov 26-28
Loudon. X Sec Evergreen st – Zola
Isbell + o Freeman
Morgan 70' st. 18' c b's 34' Roadway

B.M.	0.37	138.58		138.21	S.P. s.w. Zola & Willow
T.P.	1.21	127.03	12.76	125.82	
0+00 = N.L. Zola					
N.L.			3.0	1240	
+2	to bwall		3.0	1240	
+2	to bon wall		4.59	122 44	
+ 10±	to pvt end ret		5.39	121 64	
+10	gut		6.20	120 83	
c b	pav		6.01	121 02	
¼	✓		5.94	121 09	
℄	✓		6.04	120 99	
¼	✓		6.29	120 74	
c b	✓		6.60	120 43	
+8	gut end ret.		6.96	120 07	
+8	to c b		6.33	120 70	
E.L.			6.5	120 5	
0+05					
E.L.			6.0	121 0	
+5			6.2	1208	
c b			5.5	1215	
¼			5.0	1220	
℄			4.1	1229	
¼			3.6	1234	
c b			3.3	1237	
W.L.			2.7	1243	

0+25						1+00		127.03			
W.L.			2.7	124	3	IOE			12 8	114	2
cb			3.6	123	4	EL			12.3	1147	
¼			4.0	123	0	cb			11.4	1156	
℄			4.6	1224		¼			11.0	1160	
¼			5.2	1218		℄			10 5	1165	
cb			5.9	1211		¼			10.2	1168	
E.L.			7.5	1195		cb			9.8	1172	
IOE			8.2	1188		W.L.			9.1	1179	
0+50						1+25					
IOE			9.0	1180		W.L.			12.4	1146 ✓	
E.L.			8.7	1183		cb			13.4	1136 ✓	
cb			7.7	1193		¼			13 5	1135	
¼			7.0	1200		℄			13 5	1135	
℄			6.5	1205		¼			13 7	1133	
¼			5 8	1212		cb			13 9	1131	
cb			5.5	1215		E.L.			14.7	1123	
W.L.			4.3	1227		IOE			15 2	1118	
0+75						T.P.	0.37	115.08	12 32	114 71	
W.L.			6.4	1206		1+50					
cb			7.5	1195		IOE			6.5	1086 ✓	
¼			7.8	1192		EL			5.9	1092 ✓	
℄			8.3	1187		cb			5.5	1096 ✓	
¼			8 7	1183		¼			5.6	1095	
cb			9 3	1177		℄			5.8	1093	
E.L.			10.4	1166 ✓		¼			5 7	1094	
IOE			11.1	1159 ✓		cb			5 7	1094	

1+50					1+87		115.08		100.0	
cb+7		5.9	109.2	✓	20'W			19.0		
W.L.		5.4	109.7		T.P.	0.18	102.4	12.85	102.23	
10W		5.1	110.0		2+00 = S.L. Alcott.					
1+75					20W			14.9	87.5	
10W		11.6	103.5		12W			13.0	89.4	
W.L.		12.0	103.1	✓	W.L.			10.5	91.9	
cb		11.9	103.2	✓	+7			12.2	90.2	
1/4		11.8	103.3	✓	+14			14.5	87.9	
℄		11.4	103.7	✓	cb			18.5	88.9	
1/4		11.1	104.0	✓	1/4			10.6	91.8	
cb		10.7	104.4	✓	℄			8.2	94.2	
E.L.		10.6	104.5	✓	1/4			5.5	96.9	
10E		10.4	104.7	✓	cb			4.8	97.6	
1+87					+15			3.9	98.5	
10E		12.8	102.3	✓	E.L.			4.0	98.4	
E.L.		12.9	102.2	✓	12E			3.2	99.2	
cb		13.8	101.3	✓	20E			3.6	98.8	
1/4		14.6	100.5	✓	2+09					
℄		15.2	99.9	✓	20E			6.0	96.4	
1/4		15.7	99.4	✓	E.L.			6.7	95.7	
cb		16.3	98.8	✓	cb			8.9	93.5	
+6		17.3	97.8	✓	1/4			10.3	92.1	
+8		16.8	98.3	✓	℄			13.4	89.0	
W.L.		16.5	98.6	✓	1/4			17.3	85.1	
10W		16.7	98.4	✓	cb			19.5	82.9	
15W		18.1	97.0	✓						

2+09	102.41			
cb+15			15.5	86.9
W.L.			15.4	87.0
20W			16.7	85.7
26W			17.5	84.9
2+18 = 5 cb Alcott.				
30W			22.5	79.9
23W			21.1	81.3
W.L.			21.0	81.4
+16			24.4	78.0
cb			24.4	78.0
1/4			22.4	82.0
℄			19.1	83.3
+4			17.8	84.6
1/4			14.8	87.6
cb			12.9	89.5
E.L.			11.9	90.5
5E			11.2	91.2
25E			10.4	92.0
T.P. 0.90	90.48		12.83	89.58
2+26½ = 5¼ Alcott.				
30E			6.3	84.2
11E			2.0	88.5
E.L.			2.2	88.3
+17			5.4	85.1
cb			6.7	83.8

2+26½	90.48			
1/4			10.8	79.7
℄			13.1	77.4
1/4			14.7	75.8
cb			16.7	73.8
W.L.			14.4	76.1
15W			14.8	75.6
30W			16.5	74.0
40W			16.7	73.8
2+35 = ℄ Alcott.				
50W			23.2	67.3
30W			22.4	68.1
15W			21.3	69.2
W.L.			19.8	70.7
+2			21.1	69.4
+5			22.0	68.5
cb			21.0	69.5
1/4			19.3	71.2
℄			17.4	73.1
+3			16.0	74.5
1/4			15.0	75.5
cb			12.5	78.0
+2			11.0	79.5
E.L.			8.8	81.7
13E			8.4	82.1
35E			9.0	81.5
T.P. 0.36	79.99		12.85	79.63

78

79 99

MH & Alcott & Evergreen.

FL.	12.67	65.33
top	5.28	72.71

2 + 48 S. = N. ¼ Alcott.

35 E	0.6	77.4
22 E	+0.4	77.6
E.L.	2.4	75.6
cb	6.0	72.0
¼	7.4	70.6
+2	8.4	69.6
+6	7.4	70.6
℄	7.7	70.3
¼	7.7	70.3
+6	10.1	67.9
cb	10.6	67.4
+3	11.6	66.4
+10	12.4	65.6
w.l.	12.3	65.7
35 W	12.4	65.6
15 W	14.7	63.3
50 W	13.1	64.9

78

78 99

2 + 57 = Neb Alcott.

50 W	10.7	67.3
25 W	14.6	63.4
20 W	15.6	62.4
10 W	15.6	62.4
w.l.	16.1	61.9
+1	15.1	62.9
+10	15.4	62.6
+15	18.1	59.9
cb	18.0	60.0
+4	14.9	63.1
¼	13.3	64.7
℄	11.9	66.1
¼	11.6	66.4
cb	11.0	67.0
+8	9.7	68.3
E.L.	8.3	69.7
16 E	6.2	71.8
35 E	6.1	71.9

2 + 63

45 E	10.4	67.6
35 E	12.2	65.8
7 E	13.9	64.1
5 E	15.9	62.1

78

2+63	77.99		
E.L.		15.7	62.3
+8		17.4	60.6
+14		16.1	61.9
cb		16.5	61.5
+2		18.3	59.7
+6		19.0	59.0
¼		16.7	61.3
+4		20.0	58.00
℄		19.6	58.4
+6		18.7	59.3
¼		16.4	61.6
cb		14.4	63.6
W.L		10.6	67.4
10W		10.2	67.8
30W		5.3	72.7
2+70 = 0+00 = N.L Alcott			
30W		3.1	74.9
W.L.		9.4	68.6
Cb		12.2	65.8
¼		14.0	64.0
℄		15.9	62.1
+7		17.6	60.4
¼		20.4	57.6
+5		20.4	57.6
cb		19.6	58.4
+6		19.8	58.2

78

0+00	77.99		
cb+14		17.2	60.8
E.L.		17.0	61.0
6E		17.2	60.8
20E		16.4	61.6
43E		15.3	62.7
50E		14.1	63.9
0+05			
50E		16.6	61.4
17E		20.4	57.6
4E		20.0	58.0
1E		21.2	56.8
E.L.		21.4	56.6
+13		20.7	57.3
+15		18.0	60.0
cb		17.4	60.6
¼		15.5	62.5
℄		13.3	64.7
¼		11.6	66.4
cb		10.6	67.4
+5		9.9	68.1
+15		8.4	69.6
W.L		7.7	70.3
25W		2.4	75.6

0+12	77.99			
25W		+1.8	77.2	
W.L		2.8	75.2	
cb		7.1	70.9	
¼		8.3	69.7	
℄		9.2	68.8	
¼		11.4	66.6	
cb		13.6	64.4	
E.L		19.0	60.0	
5E.		18.2	59.8	
18E		22.0	56.0	
25E		22.6	55.4	
31		22.2	55.8	
32E		21.0	57.0	
38E		19.1	58.9	
50E		19.1	58.9	
T.P. 12.27	89.66	0.60	77.39	
0+22				
56E		34.8	54.9	
45E		34.6	55.1	
35E		31.1	58.6	
25E		28.2	61.5	
E.L		23.4	66.3	
+10		24.6	65.1	
cb		20.8	68.9	
¼		17.8	71.9	

0+22	89.66		
℄		16.0	73.7
¼		15.1	74.6
cb		13.4	76.3
W.L.		9.7	80.0
15W		6.3	83.4
0+40			
15W		+1.1	88.6
10W		0.4	89.3
W.L.		2.4	87.3
cb		5.1	84.6
¼		6.5	82.2
℄		9.6	80.1
¼		12.7	77.0
+3		13.1	76.6
cb		12.9	76.8
+10		15.2	74.5
E.L		14.2	75.5
35E		21.1	68.6
43E		25.3	64.4

0+59		89.66			0+92		102.38		
35E			14.5	75.2	25E			12.6	89.8
22E			11.7	78.0	EL			9.6	92.8
15E			10.1	79.6	+12			8.1	93.3
EL			8.2	81.5	cb			7.8	94.6
cb			4.9	84.8	1/4			7.3	95.1
1/4			3.7	86.0	℄			6.5	95.9
℄			2.4	87.3	1/4			5.6	96.8
1/4			0.6	89.1	cb			4.8	97.6
T.P.	12 8.5	102.38	0.13	89.53	WL			2.7	99.7
cb			12.1	90.3	10W			1.6	100.8
WL			9.1	93.3	T.P.	9.38	110.75	1.01	101.37
15W			7.2	95.2	1+14				
0+73					10W			7.3	103.4
15W			4.7	97.7	WL			8.2	102.5
WL			6.3	96.1	cb			9.8	100.9
cb			8.6	93.8	1/4			10.5	100.2
1/4			9.5	92.9	℄			11.1	99.6
℄			10.6	91.8	1/4			11.7	99.0
1/4			11.5	90.9	cb			12.5	98.2
cb			12.9	89.5	EL			14.4	95.3
EL			15.6	86.8	15E			15.7	95.0
15E			17.2	85.2					
25E			22.1	80.3					

1+40	110.75		
15E		11.8	98.9
E.L.		10.6	100.1
c.b		9.0	101.7
1/4		8.4	102.3
℄		7.9	102.8
1/4		7.5	103.2
c.b		7.0	103.7
+5		6.2	104.5
w.l.		5.3	104.4
1+60			
w.l.		3.3	107.4
c.b		4.4	106.3
1/4		5.1	105.6
℄		5.8	105.9
1/4		6.4	104.3
c.b		6.6	104.1
E.L.		7.9	102.8
15E		9.0	101.7
1+80			
15E		7.5	103.2
E.L.		6.5	104.2
c.b		5.9	104.8
1/4		5.5	105.2
℄		4.5	106.2
1/4		4.0	106.7

1+80	110.75		
c.b		3.4	107.3
w.l.		2.3	108.4
2+00 = S.L. Browning.			
w.l.		1.3	109.4
+2	back walk and ret	1.66	109.09
+10	top c.b and ret	2.08	108.67
+10	gut	2.53	108.22
c.b	Paw	2.53	108.22
1/4	"	2.60	108.15
℄	"	2.76	107.99
1/4	"	2.98	107.77
c.b	"	3.27	107.48
+8	gut	3.64	107.11
+8	top c.b and ret.	3.14	107.61
+16	back walk and ret.	3.55	107.20
E.L.		3.9	106.8

11075

0+00 = N.L Browning

E.L.			4.1	106.6
+2	backwalk	end ret	3.73	107.02
+9.5	to pcb	end ret.	3.34	107.41
+9.5	cut		3.85	106.90
cb	Pan		3.44	107.31
1/4	✓		3.15	107.60
℄	✓		2.90	107.85
1/4	✓		2.76	107.99
cb	✓		2.67	108.08
+8.5	cut and ret		2.61	108.14
+8.5	to pcb	✓ ✓	2.15	108.60
+15.2	back walk		1.69	109.06
N.L.			.06	110.1
0+03				
W.L.			+0.2	110.9
cb			1.5	109.2
1/4			2.5	108.2
℄			2.8	107.9
1/4			2.9	107.8
cb			3.2	107.5
+16			3.7	107.0
+17			3.0	107.7
EL			2.7	108.0

11075

0+07

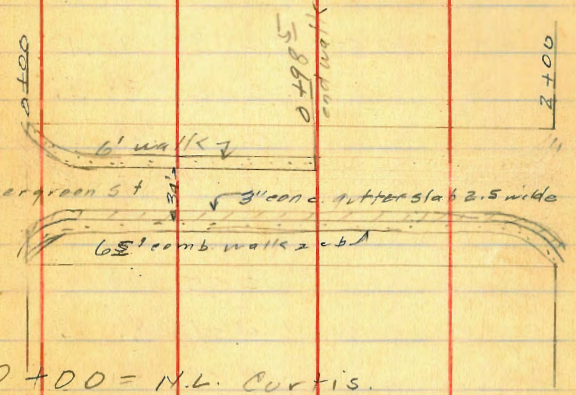
E.L.			3.4	107.3
+13			2.7	108.0
cb			2.8	107.9
1/4			2.0	108.7
℄			1.6	109.1
1/4			1.1	109.6
cb			0.8	109.9
W.L.			+0.2	110.9
0+25				
W.L.			0.9	109.8
cb			2.3	108.4
1/4			2.6	108.1
℄			3.1	107.6
1/4			3.6	107.1
cb			3.8	106.9
E.L.			4.7	106.0
5E			5.1	105.6
0+50				
5E			6.5	104.2
E.L.			6.3	104.4
cb			5.8	104.9
1/4			5.6	105.1
℄			5.3	105.4
1/4			4.8	105.9
cb			4.2	106.5

0+50	110.75				1+25	110.75			
W.L.			2.7	108.0	W.L.			6.5	104.2
0+75					cb			8.2	102.5
W.L.			3.7	107.0	1/4			8.8	101.9
cb			5.3	105.4	℄			9.5	101.2
1/4			6.1	104.6	1/4			10.2	100.5
℄			6.8	103.9	cb			10.8	99.9
1/4			7.4	103.3	E.L.			12.0	98.7
cb			7.8	102.9	5E			12.3	98.4
E.L.			8.9	101.8	T.P.	3.76	102.37	12.14	98.61
5E			9.1	101.6	1+50				
1+00					5E			5.6	96.8
5E			11.2	99.5	E.L.			5.2	97.2
E.L.			10.6	100.1	cb			3.7	98.7
cb			9.4	101.3	1/4			3.0	99.1
1/4			8.7	102.0	℄			2.3	100.1
℄			8.1	102.6	1/4			1.7	100.7
1/4			7.3	103.4	cb			1.0	101.4
cb			6.4	104.3	W.L.			0.0	102.4
W.L.			4.8	105.9	1+75				
					W.L.			1.4	101.1
					+11			1.9	100.5
					cb			2.6	99.8
					1/4			3.2	99.2
					℄			4.0	98.4
					1/4			4.7	97.7

1+75	102.37		
cb		5.4	97.0
E.L.		6.9	95.5
SE		7.4	95.0
1+96			
E.L.		8.8	93.6
+6		8.2	94.2
+10		8.8	93.6
+14		7.3	95.1
cb		6.9	95.5
¼		7.2	95.2
+½		6.3	96.1
¾		5.8	96.6
¼		4.9	97.5
cb		4.2	98.2
W.L.		2.8	99.6
2+00 = S.L. Curtis st.			
W.L.		8.3	94.1
+2½	back walk	9.32	93.05
+9½	top cb end ret	9.34	93.03
+9½	gut.	9.96	92.41
cb	Paw	9.92	92.45
¼	✓	10.01	92.36
¾	✓	10.12	92.25
¼	✓	10.40	91.97
cb	✓	10.74	91.63

Evergreen
102.37

2+00			
cb +7½	gut end ret	11.08	91.29
+7½	top cb end ret	10.22	92.15
+15½	back walk	10.26	92.11
E.L.		10.3	92.1



0+00 = N.L. Curtis.

E.L. +10½	top cb end ret	11.48	90.89 ✓
gut		11.98	90.39
cb	Paw	11.70	90.67
¼	✓	11.50	90.87
¾	✓	11.34	91.03
¼	✓	11.22	91.15
W cb	✓	11.16	91.21
+7½	gut end ret	11.16	91.21
+7½	top cb	10.42	91.95 ✓

10237

Note- E.S. & W.S Means edge of gutter slab on E. or West.

0+25 = B.S ref. (cb)				
wcb			12.42	89.95
gut			12.9	89.5
¼			13.2	89.2
℄			13.4	89.0
¼			13.7	88.7
TP	0 39	90.57	12.19	90.18
E.S			2.06	88.51
gut			2.18	88.39
Ecb			1.48	89.09
0+50				
Ecb			3.55	87.02
gut			4.21	86.36
E.S			4.08	86.49
¼			4.0	86.6
℄			3.7	86.9
¼			3.7	86.9
+35			3.4	87.2
+5			3.0	87.6
gut			3.1	87.5
wcb			2.66	87.91

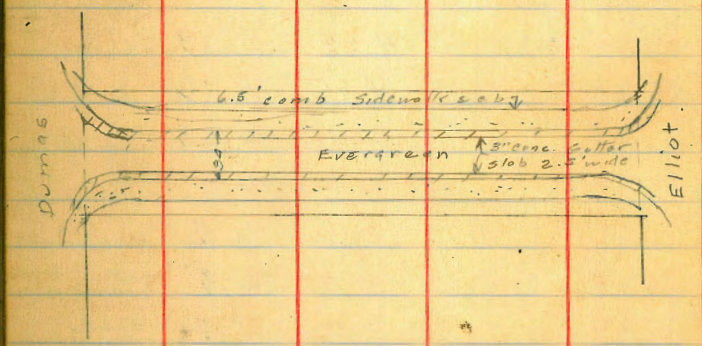
0+75		90.57		
wcb			4.60	85.97
gut			5.3	85.3
+3			4.7	85.9
+5			5.2	85.4
¼			5.2	85.4
℄			5.3	85.3
¼			5.7	84.9
+45			5.9	84.7
E.S.			6.12	84.45
gut			6.24	84.33
Ecb			5.54	85.03
0+98.5 = End wall on west.				
Ecb			7.41	83.16
gut			8.11	82.46
E.S			7.98	82.59
+45			7.7	82.9
¼			7.5	83.1
℄			7.1	83.5
¼			7.2	83.4
+6			7.3	83.3
gut			6.9	83.7
wcb			6.54	84.03
+6	back wall		6.36	84.21
+9			5.6	85.0
W.L.			3.6	87.0

1+25	90 57		
w.L.		5.7	84.9
+5		8.0	82.6
cb		8.4	82.2
+2		9.1	81.5
+5		8.9	81.7
¼		9.3	81.3
+4		9.2	81.4
℄		9.2	81.4
¼		9.5	81.1
gut		10.23	80.34
E.cb		9.49	81.08
1+50			
Ecb		11.47	79.10
gut		12.21	78.36
E.S.		12.05	78.52
cb+5		11.3	79.3
¼		11.1	79.5
℄		10.7	79.9
+3		10.8	89.8
+4		11.1	79.5
¼		10.9	79.7
cb		10.2	80.4
+11		9.8	80.8
w.L.		7.5	83.1

1+75 = B.C.	90 57 (cb)	ret on	East	
w.L.			9.2	81.4
+4			11.1	79.5
cb			11.7	78.9
+3			11.6	79.0
¼			12.0	78.6
℄			12.2	78.4
¼			12.6	78.0
+4.5			12.9	77.7
T.P.	2.35	80.11	12.81	77.76
E.S.			3.53	76.58
gut			3.67	76.44
Ecb			2.93	77.18
1+95				
EL +13 top cb			4.22	75.89
gut			4.95	75.16
E.S. EL +15.8			4.76	75.35
cb			4.1	76.0
+2			3.6	76.5
¼			3.3	76.8
℄			3.0	77.1
¼			2.9	77.2
cb			2.5	77.6
+4			2.0	78.1
+9			1.9	78.2
+16			1.7	78.4
w.L.			1.0	79.1

2+00 = S.L. Dumas St.
80.11

n.L.	back walk	3.02	77.09	
+9	top cb end ret.	3.07	77.04	
gut		3.69	76.42	
cb	Par.	3.59	76.52	
¼	✓	3.63	76.48	
℄	✓	3.78	76.33	
¼	✓	4.20	75.91	
E cb	✓	4.70	75.41	
+4 E.S		5.07	75.04	
+7	gut	5.30	74.81	
+7	top cb end ret.	4.61	75.50	
T.P.	1.30	4.30	75.81	



0+00 = N.L. Dumas
77.11

n.L. +10	top cb end ret.	1.37	75.74	
gut		1.95	75.16	
+12.8	M.S.	1.82	75.29	
cb	Par	1.79	75.32	
¼	✓	1.81	75.30	
℄	✓	1.87	75.24	
¼	✓	2.22	74.89	
cb	✓	2.67	74.44	
+5	E.S.	3.03	74.08	
+8	gut	3.10	74.01	
+8	top cb end ret.	2.60	74.51	
0+5 = Bk. rets.				
E cb		3.00	74.11	
gut		3.60	73.51	
E.S.		3.48	73.63	
¼		2.8	74.3	
℄		2.5	74.6	
¼		2.5	74.6	
M.S.		2.87	74.24	
gut		3.02	74.09	
cb		2.44	74.67	

77.11

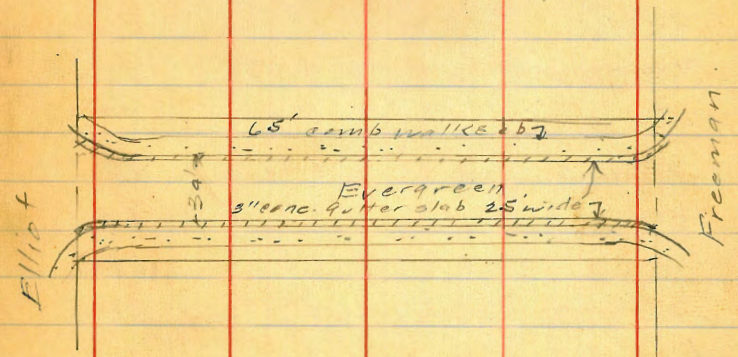
0+50		
web	3.37	73.74
gut	3.96	73.15
W.S.	3.83	73.28
1/4	3.7	73.4
℄	3.6	73.5
1/4	3.5	73.6
E.S.	4.45	72.66
gut	4.54	72.57
Ecb	3.97	73.14
0+75		
Ecb	5.01	72.10
gut.	5.61	71.50
E.S.	5.50	71.61
1/4	5.0	72.1
℄	4.6	72.5
1/4	4.7	72.4
W.S.	4.75	72.36
gut	4.90	72.21
Web	4.35	72.76

77.11

1+00		
web	5.26	71.85
gut	5.84	71.27
W.S.	5.71	71.40
1/4	5.5	71.6
℄	5.6	71.5
1/4	6.0.	71.1
E.S.	6.50	70.61
gut	6.62	70.49
Ecb	6.05	71.06
1+25		
Ecb	7.04	70.07
gut	7.62	69.49
E.S.	7.49	69.62
1/4	7.0	70.1
℄	6.4	70.7
1/4	6.5	70.6
W.S.	6.69	70.42
gut	6.85	70.26
Web	6.27	70.84

1+50			
wcb	7.13	69.98	
gut	7.71	69	40
w.s	7.61	69	50
1/4	7.5	69.6	
℄	7.3	69.8	
1/4	8.0	69.1	
E.S	8.45	68.66	
gut	8.57	68.54	
Ecb	8.00	69.11	
1+75 = B.C. rats			
Ecb	8.88	68.23	
gut	9.47	67.64	
E.S	9.34	67.77	
cb+7	9.0	68.1	
1/4	8.8	68.3	
+7	8.3	68.8	
℄	8.3	68.8	
1/4	8.4	68.7	
w.s.	8.50	68.61	
gut	8.60	68.51	
cb	8.03	69.08	

2+00 = 3.L. Elliot			
W.L. +10	top cb and ret	8.51	68.60
gut		9.23	67.88
+13	w.s.	8.94	68.17
+13	Pav	9.26	67.85
cb	✓	9.32	67.79
1/4	✓	9.34	67.77
℄	✓	9.41	67.70
1/4	✓	9.59	67.52
cb	✓	9.83	67.28
+5	E.S.	10.01	67.10
+8	gut	10.16	66.95
+8	top cb and ret	9.60	67.51



0+00 = NL. Elliot			
EL +10 top cb and rel		9.65	67.46
gut		10.18	66.93
+13	E.S.	10.09	66.02
cb	Paw:	9.88	67.23
¼	Paw	9.65	67.46
¢	✓	9.40	67.71
¼	✓	9.34	67.77
cb	✓	9.24	67.87
+5	✓	9.21	67.90
+5	W.S.	9.02	67.09
gut		9.28	67.83
+8	top cb and rel.	8.52	68.59
0+04			
WL +12½	w cb	9.53	67.58
gut		9.27	67.84
+15½	W.S.	8.97	68.14
cb		8.7	68.4
+4		8.6	68.5
¼		8.7	68.4
¢		9.2	67.9
¼		9.3	67.8
cb		9.7	67.4
+2½	E.S	9.99	67.12
+5	gut	10.15	66.96
+5	Ecb	9.57	67.57

0+25 = B.C. Rets		
Ecb	9.12	67.99
gut	9.72	67.39
E.S.	9.59	67.52
¼	9.1	68.0
¢	8.5	68.6
¼	8.4	68.7
W.S	8.76	68.35
gut	8.88	68.23
w cb	8.33	68.78
0+50		
w cb	7.72	69.39
gut	8.29	68.82
W.S.	8.15	68.96
¼	8.0	69.1
¢	8.0	69.1
¼	8.6	68.5
E.S.	9.17	67.94
gut	9.30	67.81
Ecb	8.72	68.39

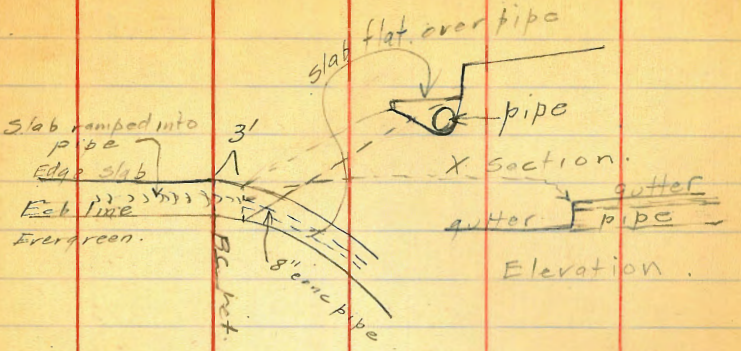
77.11

0+75		
Ecb	8.07	69.04
gut	8.65	68.46
E.S.	8.52	68.59
1/4	8.1	69.0
℄	7.6	69.5
1/4	7.3	69.8
+4	7.3	69.8
w.s.	7.48	69.63
gut	7.58	69.53
web	7.02	70.09
1+00		
web	6.42	70.69
gut	6.99	70.12
w.s.	6.87	70.24
cb+5	6.6	70.5
1/4	6.7	70.4
℄	7.0	70.1
1/4	7.6	69.5
E.S.	7.91	69.20
gut	8.05	69.06
Ecb	7.48	69.63

77.11

1+25		
Ecb	6.85	70.26
gut	7.42	69.69
Es.	7.3	69.8
1/4	7.1	70.0
℄	6.5	70.6
1/4	6.1	71.0
+3	6.1	71.0
w.s.	6.27	70.84
gut	6.38	70.73
web	5.76	71.35
1+50		
web	5.15	71.96
gut	5.75	71.36
w.s.	5.67	71.44
cb+5	5.6	71.5
1/4	5.6	71.5
℄	5.8	71.3
1/4	6.4	71.7
E.S.	6.71	70.40
gut	7.20	69.9
Ecb	6.23	70.88

1+75		77.11			
Ecb			5.60	71.51	
gut			7.00	70.11	
E.S.			5.87	71.24	
¼			5.7	71.4	
℄			5.2	71.9	
¼			5.0	72.1	
+3			4.9	72.2	
w.s.			5.03	72.08	
gut			5.12	71.99	
vicb			4.56	72.55	
2+00 = S.L. Freeman.					
W.L. +9½	top cb end ret		3.85	73.26	
gut			4.41	72.70	
+12½	w.s.		4.31	72.81	
cb	Pav		4.35	72.76	
¼			4.41	72.70	
℄			4.61	72.50	
¼			4.95	72.16	
cb			5.39	71.72	
+5½	E.S.		5.77	71.34	
+8	gut		5.87	71.24	
+8	top Ecb end ref		5.30	71.81	
F.L. Drain on E (pipe)			6.98		
gutter above pipe			6.00		
T.P.	7.39	84.50	0.00	77.11	(77.88)
BM.			6.62	77.88	P.P. N.W. Dr. Pole S.E. Freeman



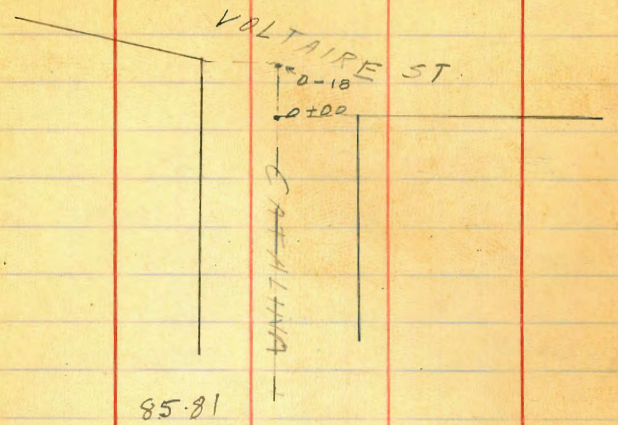
Drainage at S.L. Freeman on Ecb line Evergreen.

Levels on ℄ Catalina Blvd. From Voltaire to Point Loma Ave.

B.P. N.E. Warrington & Tennyson

B.M	9.99	95.67		85.68
T.P.	0.06	89.96	10.77	89.90
T.P.	0.20	73.89	11.27	73.69
T.P.	8.47	73.25	9.11	64.78
0 -18	= SL Voltaire on W		11.71	61.54
0 +00	= SL ✓ on E.		11.65	
0 +25			11.06	
0 +50			10.22	
0 +75			9.34	
1 +00			8.45	
1 +25			7.58	
1 +50			6.69	
1 +75			5.83	
2 +00			4.94	
2 +25			4.04	
2 +50			3.15	
2 +80	= N.L Udal		2.03	
3 +10	= ℄ Udal		1.00	
T.P.	12.70	85.81	0.14	73.11
3 +40	= S.L Udal		12.42	
3 +70			11.29	
4 +06			10.00	
4 +25			8.89	
4 +50			7.78	
4 +72.3	= M.H. top		6.93	
F.L.			9.95	75.86

No



N L Δ = 38°30' R = 570 L = 383.00 10 parts

	4+82.7 = B.C.		6.42	
①	5+21.3		4.71	
②	5+59.3		3.01	
③	5+97.6		1.44	
	6+11.9 = N.L. Tennyson		0.83	
	T.P.	12.46 98.13	0.14	85.67
④	6+35.9		12.09	
	6+39.2 = M.H. 4.2' W top		12.01	
	F.L.		16.21	81.92
	6+42.5 ℄ Tennyson		11.80	
	6+73.5 = S.L. ✓		10.48	
⑤	6+74.2		10.46	
⑥	7+12.5		8.76	
⑦	7+50.8		6.99	
⑧	7+89.1		5.32	

		98.13			
⑨ 8+27.9			3.61		
8+27.8	M.H. 2½'E top		3.68		
F.L.			9.45		
⑩ 8+65.7 P.R.C.			1.91		
∩ R	Δ = 27°56'11"	R = 790	L = 385.19 (10 parts)		
① ~~9+04.22~~			~~0+8~~		
T.P.	12.98	111.09	0.02	98.11	
① 9+04.22			13.21		
⑫ 9+42.74			11.60		
③ 9+81.26			9.95		
9+96.26 = N.L. Alicia Dr.			9.34		
④ 10+19.28			8.43		
10+29	M.H. 1½'E top		8.04		
F.L.			14.14		
10+29.63 = S.L. Alicia Dr.			8.07		
⑤ 10+58.30			6.84		
10+62.95 = S.L. Alicia Dr.			6.63		
⑥ 10+96.56			5.40		
⑦ 11+35.39			3.92		
⑧ 11+73.86			2.50		
12+06	M.H. 1½'E top		1.32		
F.L.			6.91		
⑨ 12+12.38			1.19		
T.P.	12.92	123.87	0.14	110.95	
⑩ 12+50.89 P.R.C.			12.60		

123.87

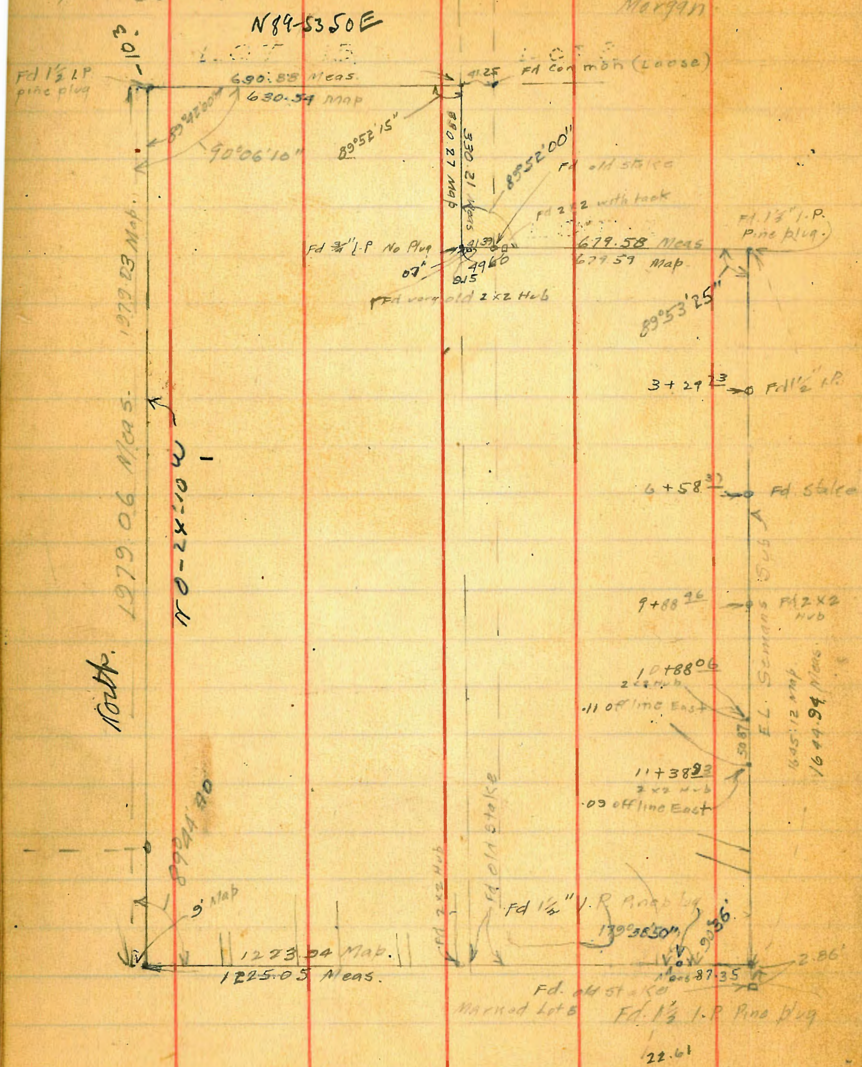
∩ L	Δ = 27°32'18"	R = 1348 (20 Parts)	L = 647.89		
① 12+83.28			11.49		
② 13+15.67			10.46		
③ 13+48.06			9.47		
13+49.60 = N.L. Atascadero St.			9.46		
13+67.26 = M.H. 1°E. top			9.00		
F.L.			16.25		
④ 13+80.45			8.90		
13+80.85 = ℄ Atascadero			8.89		
14+12.14 = S.L. Atascadero			8.37		
⑤ 14+12.84			8.37		
⑥ 14+45.24			7.79		
⑦ 14+77.63			7.20		
⑧ 15+10.02			6.61		
⑨ 15+42.41			6.02		
15+55 = M.H. 2°E top.			5.84		
F.L.			12.54		
⑩ 15+74.80			5.49		
⑪ 16+07.19			4.90		
⑫ 16+39.58			4.36		
⑬ 16+71.97			3.72		
⑭ 17+04.34			3.19		
⑮ 17+12.83 = N.L. Bernice			3.02		
⑮ 17+36.25			2.56		
17+46.25 = M.H. 2°E. top			2.36		
F.L.			9.56		

		123.87	
	17+47 28 ℄ Bernice	2.17	
16	17+69 41	1.98	
	17+82 24 ℄ St Bernice	1.72	
17	18+01 53	1.35	
18	18+33 92	0.76	
19	19+66 31	0.12	
	T.P.	0.00	123.87

Check Balboa Vista

Loudon
Isbell
Morgan

Nov 30-28



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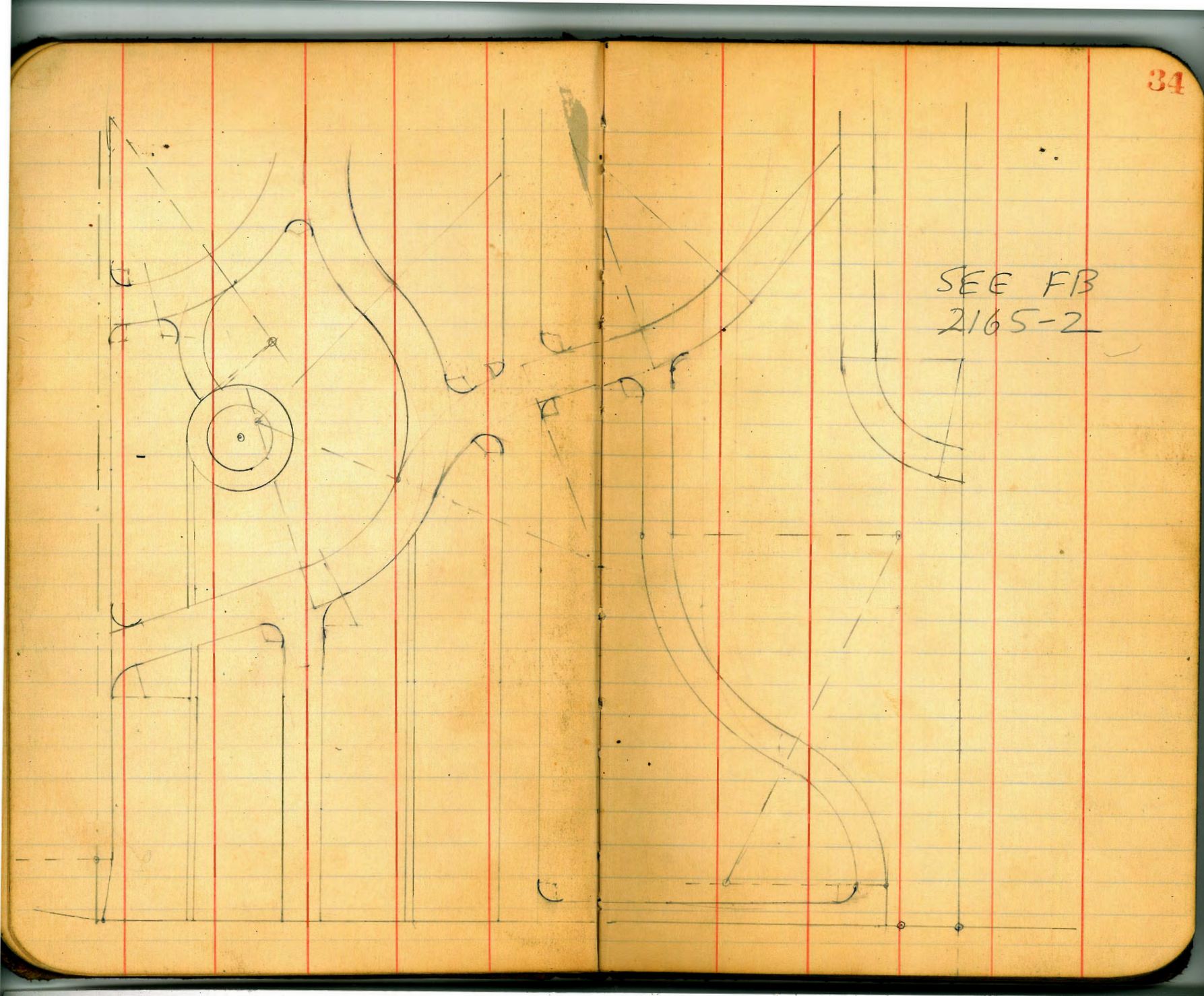
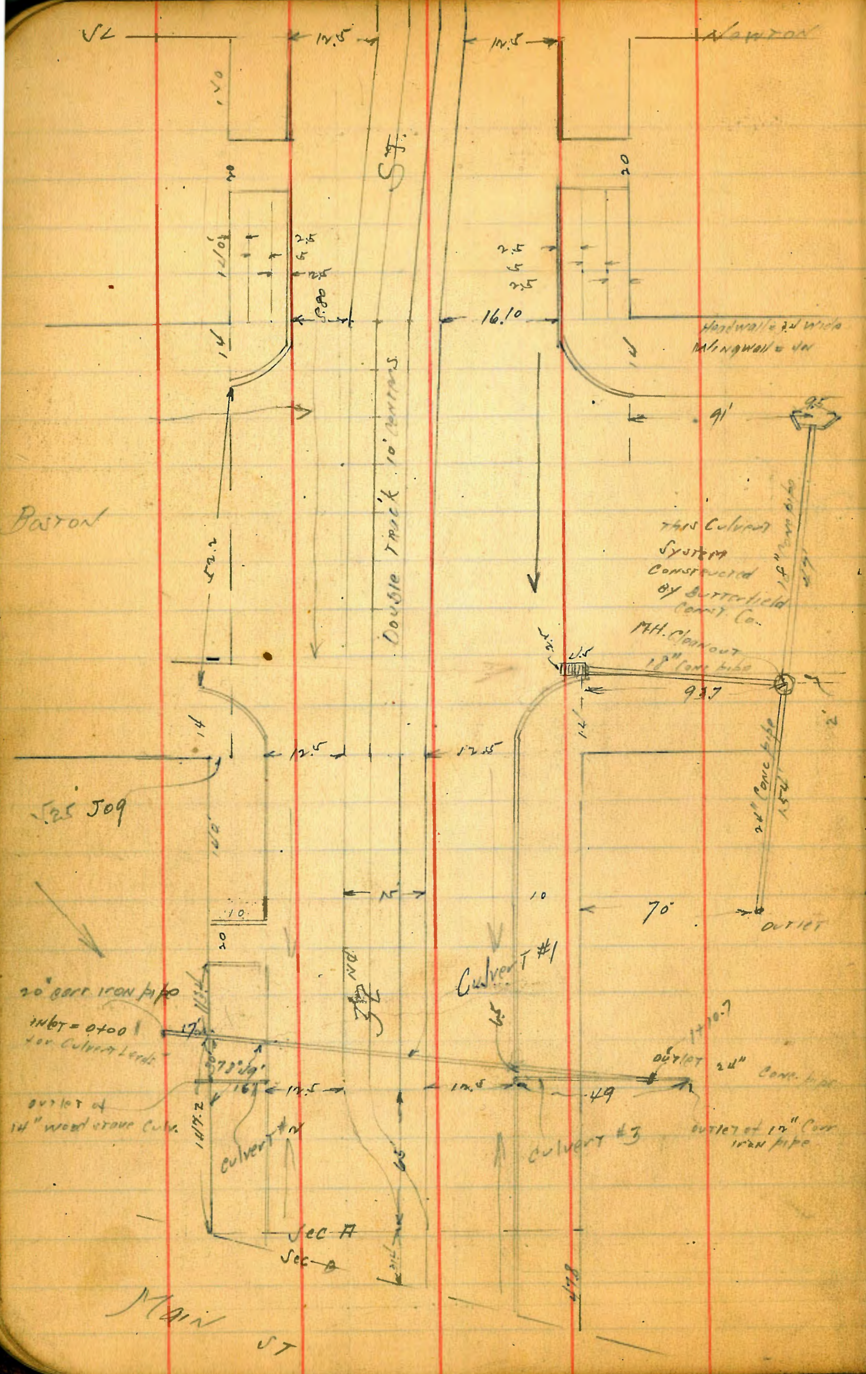
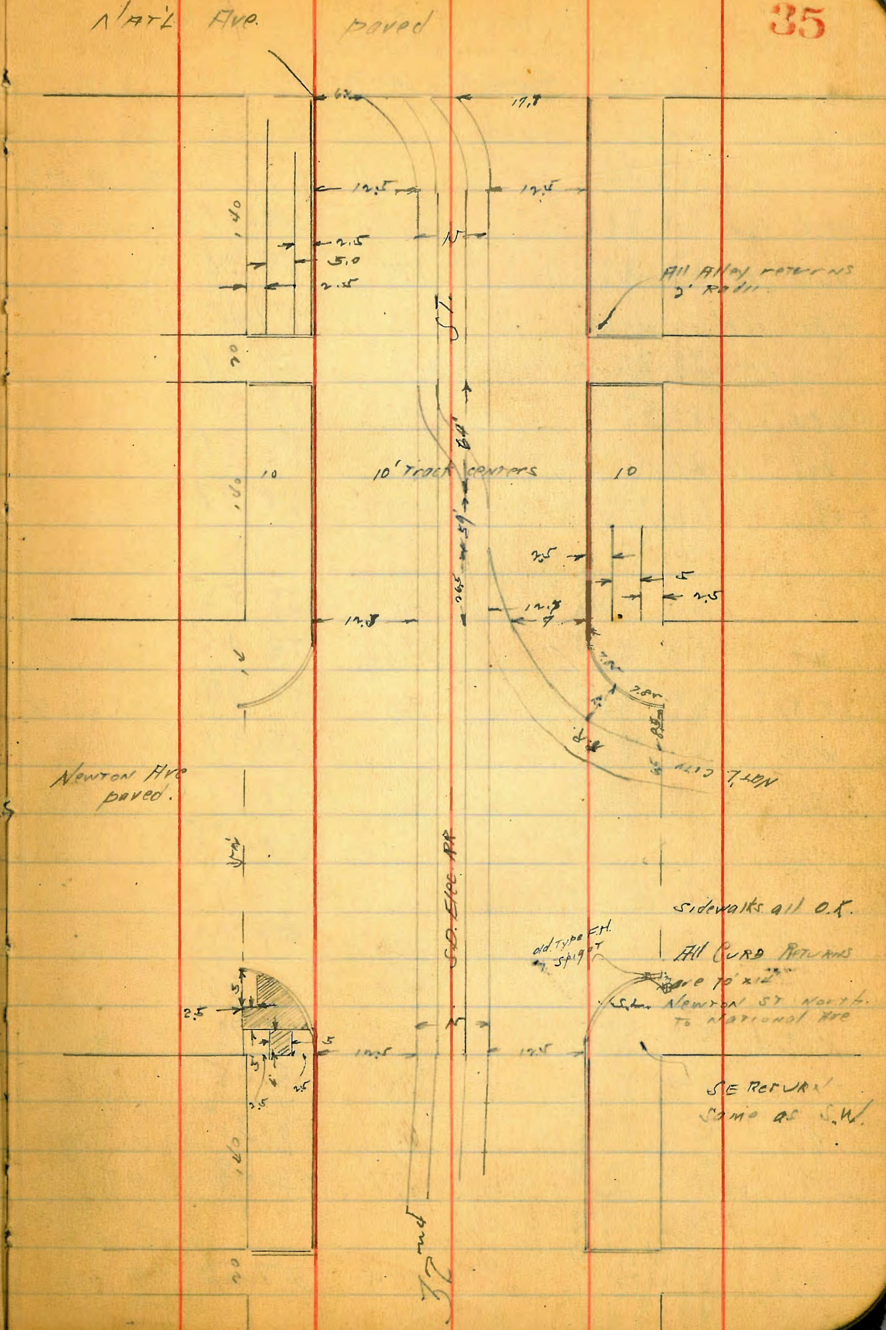


SEE FB
2165-2


Newton
St.
Double Track 10' centers
Boston
Headwalls 24" wide
Wingwalls 4'
This Culvert System Constructed by Butterfield Const. Co.
M.H. Cleanout
18" Conc pipe
24" Conc pipe
outlet
.35' Jog
Culvert #1
20" Corr. iron pipe
Inlet = 0+00 for Culvert Levels
outlet of 14" wood stave Culv.
culvert #N
outlet 24" Corr. pipe
outlet of 12" Corr iron pipe
Culvert #3
Sec A
Sec B
Main St


Nat'l Ave. paved
All Alley returns 3' Radii.
10' Track centers
St.
Newton Ave paved.
S.O. Elec RR
sidewalks all O.K.
old type F.H. & Spigot
All Curb Returns are 10' rad. Newton St North to National Ave
SE Return same as S.W.
3rd St

Moore 12/12/28

X Section of 32nd from S.L. of National to N.L. Main

See Pg 47

60' st.
10' cbs

Yardage Bk 12 - Pg 308 1-14-28 J.K. [?]

Cb Elev. Plotted 12-15-28 CBH

NOTE! E. Rail = E. Rail of E. Tr. W " = W " " W "

NW.B.P. Nat + 32	2.03	63.05		61.02
S L Nat'l = 00				
W cb Top cmt			3.06	59.99
gut on paving			3.77	59.28
W Rail of W Tr. cb+6.5			3.93	59.12
℄ of St on paving			3.58	59.47
E Rail of E Tr.			3.57	59.48
gut in paving			4.54	58.51
E cb Top			4.08	58.97
0+31				
E cb cmt.			4.50	58.55
gut			4.60	58.45
E Rail			4.11	58.94
W "			4.08	58.97
gut			3.7	59.35
W cb top			3.50	59.55
0+50				
W cb Top			3.75	59.30
gut			4.4	58.65
W Rail			4.27	58.78
E "			4.40	58.65
gut			4.7	58.35
E cb Top			4.77	58.28
1+00				
E cb Top cmt			5.55	57.50

63.05

gut	6.0	57.05
E Rail	5.24	57.81
W "	5.04	58.01
gut	5.1	57.95
W cb	4.54	58.51
1+40		
W Top alley return	4.93	58.12
W gut	5.3	57.75
W cb Top	5.09	57.96
gut	5.4	57.65
W Rail	5.55	57.50
E Rail	5.80	57.25
gut	6.4	56.65
E cb Top	6.08	56.97
E Top curb	5.87	57.18
E L gut	6.2	56.85
1+60		
E L gut	6.3	56.75
E L Top cb	6.22	56.83
E cb " "	6.44	56.61
gut	6.6	56.45
E rail	6.10	56.95
W "	5.85	57.20
gut	5.8	57.25
W cb Top cb	5.37	57.68
W L Top cb	5.14	57.91
" Gutter	5.2	57.85

63.05

2+00

W cb Top		6.10	57.02
gut		6.5	56.55
W rail		6.46	56.59
E "		6.68	56.37
gut		2.N	55.85
E cb Top		7.05	56.00
2+50			
E cb Top		7.38	55.27
gut		8.3	54.75
E rail		7.50	55.55
W "		7.19	55.86
gut		7.N	55.85
W cb Top		6.76	56.29
3+00 WL Newton = 80' wide		rd cbs	13' 1/2
W cb		7.55	55.50
gut		8.3	54.75
W rail		8.19	54.86
E "		8.57	54.48
E rail +5 = Natl City RR		8.80	54.25
gut		8.9	54.15
E cb Top		8.53	54.52
T.P.	3.07	57.70	8.52
N 6			
EL Top cb		3.23	54.47
" gut		3.9	53.8
+ 8.9 = E rail of Natl City RR		3.83	53.87
E rail out Tr.		3.N	54.18

57.70

3+00 cont'd

W rail		3.19	54.51
W cb gut		3.3	54.40
WL Top curb		2.36	55.34
" gut on paving		2.96	54.74
EL Top Northern rail Natl City RR		4.16	53.54
" " South " " " "		4.15	53.55
N 1/4			
WL on paving		3.01	54.69
W cb		3.N	54.50
W rail		3.46	54.24
E "		3.79	53.91
E cb		4.0	53.70
EL		4.N	53.50
℄			
EL		4.N	53.50
cb		4.0	53.70
E rail		3.93	53.97
W "		3.89	54.01
cb		3.6	54.10
WL on paving		3.36	54.34
S 1/4			
WL on paving		3.87	53.83
cb		4.1	53.60
W rail		3.90	53.80
E "		4.06	53.64

see sketch for location

57.70

Ecb	5.8	52.90
EL	5.1	52.60
S CURB		
EL Top CURB	5.20	52.50
" Gutter	5.6	52.10
cb	5.3	52.40
E Rail	5.38	52.32
W "	5.21	52.49
cb	4.6	53.10
EL gut. on paving	4.91	52.79
" Top cb	4.34	53.36
S. Newton 20+00		
W cb Top cmt.	4.21	53.49
gut	5.1	52.60
W rail	4.63	53.07
E "	4.77	52.93
gut	5.6	52.10
Ecb Top	5.21	52.49
0+50		
Ecb Top	7.13	50.57
gut	7.3	50.40
E rail	6.70	51.00
W "	6.56	51.14
gut	7.0	50.70
W cb Top	6.14	51.56

57.70

1+00		
W cb Top		
gut		
W rail		
E "		
1+00		
W cb Top	8.05	49.65
gut	8.7	49.00
W rail	8.51	49.19
E "	8.66	49.04
Ecb gut	9.4	48.30
Ecb Top	9.00	48.10
1+40		
EL Top cb	10.16	47.44
EL gut	10.5	47.20
Ecb Top	10.50	47.20
gut	11.1	46.60
E Rail	10.16	47.54
W "	10.02	47.68
gut	10.3	47.40
W cb Top cb	9.44	48.26
W L " "	9.46	48.44
" gut	9.7	48 00
1+60		
W L Top cb	9.97	47.73
W L gut	10.4	47.30
W cb Top cb	10.36	47.34
gut	11.0	46.70

	57.70			
W rail		10.80	46.90	
E "		10.97	46.73	
E cb gut		11.7	46.00	
" Top cb		11.33	46.37	
EL " "		11.08	46.62	
" gutter		11.3	46.40	
2+00				
E cb Top		12.84	44.86	
gut		13.3	44.40	
E rail		12.53	45.17	
W "		12.31	45.39	
W cb gut		12.5	45.20	
" Top cb		11.88	45.82	
T.P. 0.18'	45.16	12.7~	44.98	
3+50.				
W cb Top cb		12.6	43.90	
gut		13.0	43.16	
W rail		12.7	43.45	
E "		12.85	43.21	
E cb Top		13.7	42.89	
" gut		13.8	42.36	
3+00: NL Boston = 80' wide		14' cbs	13' rs	
E cb Top		14.14	41.02	
" gut		14.~	40.96	
E Rail		13.58	41.58	See sketch for
W "		13.~~	41.64	Location of rails

	45.16			
				Ground
W cb gut		3.3	41.86	
" Top		3.07	42.09	
N26° W				
WL Top cb		3.16	42.00	
gut		3.14	41.76	
cb		3.15	41.66	
W rail		2.75	41.41	
E "		3.77	41.39	
E cb (no)		4.3	40.86	
EL Top cb		4.16	41.00	
" gut		4.15	40.66	
N 1/4				
EL		4.8	40.36	
cb		4.45	40.66	
E Rail		3.89	41.27	
W "		3.9~	41.24	
cb		3.6	41.56	
WL		3.4	41.76	
℄ Boston				
WL		3.7	41.46	
cb		3.9	41.26	
W rail		4.04	41.12	
E "		4.04	41.12	
cb		4.7	40.46	
EL		5.0	40.16	

S 1/4

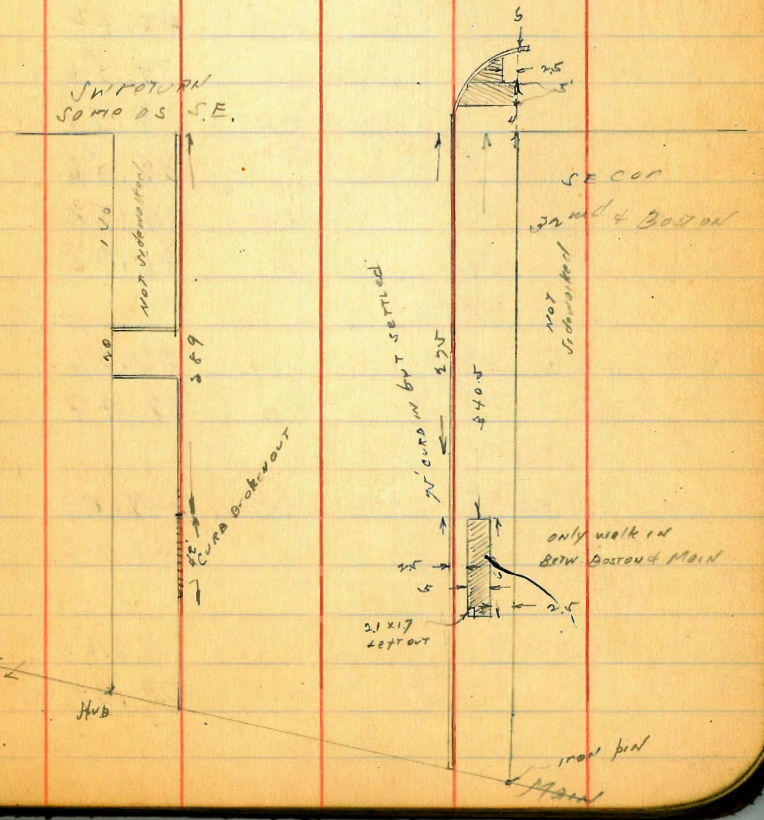
4.V.16

		EL.
EL	V.V	39.96
cb	V.0	40.16
E rail	4.V1	40.95
W. "	4.14	41.02
cb	4.0	41.16
V-I-I	3.6	41.56
S cb		
WL Top cb	3.60	41.56
" gut	4.0	41.16
cb	4.V	40.96
W rail	4.24	40.92
E "	4.33	40.83
cb	V.V	39.96
EL Top cb	V.10	40.06
" Top grating over C.B.	6.00	39.V
" Bottom Box EL.	8.V3	36.4
Rim of clean out M.H.	V.VV	39.61
EL of 18" pipe at M.H. from grating EL. ground	11.9V	33.V1
" " " " inlet at N cor of Boston	8.03	37.13
Top of Head wall " " "	4.V6	40.60
EL. of 18" pipe at MH. entering from North	1V.05	33.11
" " 24" " " "	13.VV	31.31
" " " " outlet		33.V6
S L Boston 0.0		
EL on ground	4.9	40.26
Ecb Top cb	5.17	39.99
gut	V.V	39.96

Butterfield Const Co. Private Culvert System

4.V.16

		Ground
E Rail	4.V1	40.65
W "	4.33	40.83
gut	4.4	40.76
W cb Top cmt	3.67	41.49
WL on ground	3.15	41.66



∫ Boston + 14		
W cb. Top cb	3.80	41.36
E cb "	5.17	39.99
0+40		
E cb Top	5.37	39.79
W cb "	4.15	41.01
0+50		
WL	4.1	41.06
W cb. Top	4.14	41.02
gut	4.6	40.54
W rail	4.6	40.55
E rail	4.84	40.22
gut	5.6	39.56
E cb Top	5.39	39.77
EL	5.6	39.56
0+60		
E cb Top	5.58	39.58
W cb Top	4.13	41.03
0+70		
W cb in Driveway	4.80	40.36
E " Top	5.76	39.40
0+80		
E cb Top Cmt	5.73	39.43
W " " "	4.14	41.02
0+90		
W cb Top	4.16	41.00
E " "	5.77	39.39

1+00		2nd
EL	5.4	39.76
E cb Top	5.82	39.31
gut	5.9	39.26
E Rail	5.17	39.99
W "	4.79	40.37
gut	5.0	40.16
W cb Top	4.19	40.97
WL	3.9	41.26
1+10		
W cb Top	4.43	40.93
E " "	5.75	39.41
1+40 = WL alley on West		
E cb Top	5.73	39.43
W cb "	4.49	40.87
W L " alley return	4.19	40.97
1+60 = EL alley on West		
W/L gut	4.7	40.46
" Top alley cb	4.45	40.91
W cb Top	4.43	40.73
gut	5.3	39.85
W rail	5.04	40.12
E "	5.17	39.99
gut	5.8	39.36
E cb Top	5.81	39.35
EL	5.7	39.46
1+80		
EL	5.8	39.36

45.16

2+00				
E cb Top			5.90	39.26
QuT			6.1	39.06
E Rail			5.93	39.83
W "			5.91	39.95
QuT			5.4	39.76
W E cb Top cb			4.81	40.35
W L			4.6	40.56
T.P	3+47	43.19	5.44	39.74
2+25				
W cb Top			2.93	40.26
E cb Top			4.13	39.06
2+50				
Eh			4.1	39.09
E cb Top			4.17	39.02
QuT			4.6	38.59
E Rail			3.64	39.55
W "			3.49	39.70
QuT			3.7	39.49
W cb Top			3.07	40.12
W L			3.0	40.19
2+75				
W cb Top			3.44	39.97
E " "			3.36	38.83
2+89				
E cb Top			4.41	38.78
W " " Broken end			3.34	39.87

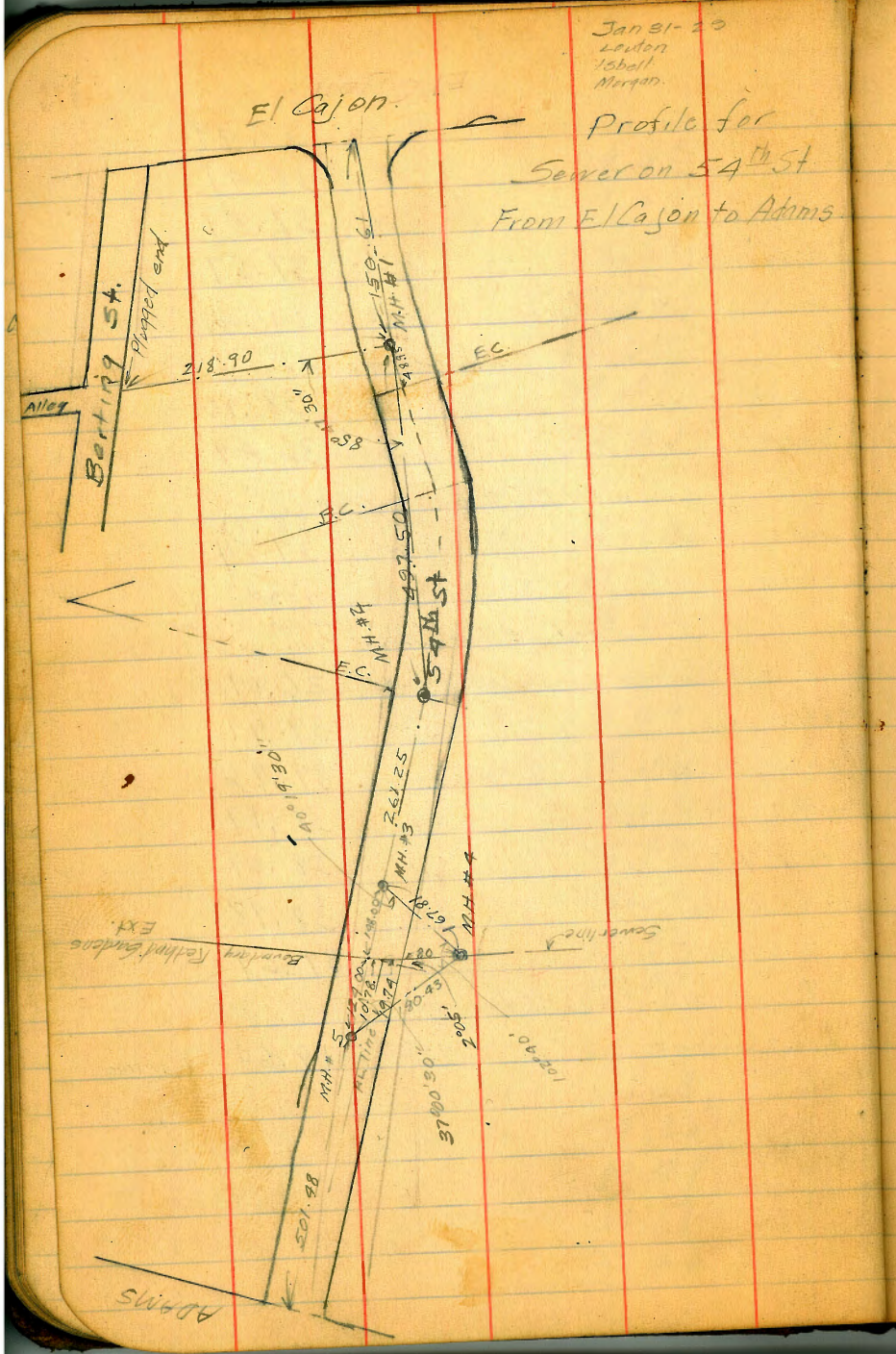
43.19

3rd rod

3+00			
W L		3.3	39.89
cb		3.7	39.49
QuT		4.0	39.19
W Rail		3.70	39.49
E rail		3.89	39.30
QuT		4.9	38.29
E cb Top CMT		4.47	38.62
Et		4.0	39.19
3+31			
E cb Top CMT on runway		5.46	37.73
W cb " " cb Broken end		3.48	39.71
3+40.5			
W cb Top		3.50	39.69
E cb " SUNken		5.65	37.54 Top cb Driveway
W end sidewalk outside		4.46	38.73
" " inside		4.35	38.84
3+45.5 = Send Driveway over curb on E cb line 3rd rod			
E cb		4.84	38.37
3+50			
E cb Top SUNken		4.70	38.49
QuT		4.9	38.29
E Rail		4.06	39.13
W " PT of curve of cross over		3.91	39.28 of W. Track
QuT		4.12	38.99
W cb		3.65	39.64
W L		3.3	39.89

3+96.5			
WL	3.7	39.49	
W cb Top	3.76	39.43	
gut	4.6	38.59	
℄ + 19.8 W rail W track	4.43	38.76	
E rail E "	4.48	38.64	
gut	5.1	38.09	
E cb Top CMT Northend of Long runway	4.78	38.47	ow curb line To oil station
4+01.5' S end sidewalk on east			
inside edge	4.49	38.70	
outside "	4.60	38.59	
E cb on Drive	5.06	38.13	
4+30.6 = Prop. Cor on West = NL MAIN ST = Sec A			
EL	4.7	38.49	
E cb on drive	5.03	38.16	
E rail	4.57	38.62	
℄ 3rd	4.6	38.59	
gut	4.6	38.59	
W cb Top cb	3.87	39.32	
WL	3.6	39.59	
Sec B = Diag. North line of MAIN ST	Sec = 39.83		
WL	3.6	39.59	
W cb Top cb	3.94	39.25	
gut. on paving	4.90	38.49	
1/4 " "	4.68	38.51	
℄ " "	4.73	38.46	

			El.	
C+3 = W Rail of E Tr		4.70	38.49	
1/4 on paving		4.78	38.41	
E cb " "		5.38	37.81	
EL " "		5.42	37.57	
check to BM SW COR MON 3rd md MAIN		4.59	38.60	4.59 = 0.01 error
Culvert #2 = 14" wood stave pipe				
INLET F.L.		5.09	38.10	
OUTLET "		6.70	36.49	
Culvert #3		Corr iron pipe		
Top curb		4.44	38.75	
INLET FL.		5.62	37.54	
OUTLET "			20.2 ±	
Culvert #1		= 30" Corr iron pipe at inlet and 24" Conc. pipe at outlet		
INLET = 30" Corr iron pipe = 0+00		16.3	26.89	Flow line
0+17.4 = WL		3.2	39.99	
0+17.4 Top cb		3.23	39.96	
0+37.5 gut		4.0	39.19	
0+68.4 gut		5.1	38.09	
" Top cb		4.41	38.78	
0+78.6 = EL		3.9	39.29	
TP	0.19	30.84	12.55 ±	30.65
1+10.7 = OUTLET			11.2 ±	19.60 Flow line



Sewer Profiles on 54th St.

El Cajon to Adams.

44

N.W. cor Mon El Cajon & 54th

BM	11.82	413.88		402.06
	M.H. #1 to N.L El Cajon			
M.H. 1 = 0+00			12.5	403.38
0+50			10.4	403.48
0+68			9.7	404.18
1+00			10.3	403.58
1+20			10.2	403.68
1+50.61 = N.L. El Cajon (Pavd)			10.54	403.34
	M.H. #1 to N.L Bertling St.			
M.H. 1. = 0+00			10.5	403.38
0+50			8.3	405.58
1+00			6.3	407.58
1+10			5.3	408.58
1+50			4.2	409.68
2+00			1.7	412.18
2+18.90 = N.L. Bertling.			1.1	412.78
	M.H. #1 to M.H. #2			
0+00 = M.H. #1			10.5	403.38
0+50			10.1	403.78
0+67			9.6	404.28
1+00			10.0	403.88
1+32			10.7	403.18
T.P.	6.42	407.76	12.54	401.34
1+53			7.7	400.06
1+73			12.2	395.56
1+95			16.3	391.46

		407.76		
2+13			26.2	381.56
2+37			14.6	393.16
2+58			10.6	397.16
2+83			5.5	402.26
3+00			4.2	403.56
3+50			3.6	404.16
4+00			3.6	404.16
4+50			3.5	404.26
4+99.59	=MH #2		4.0	403.76
	MH #2 to MH #3			
0+00 = MH #2				
0+50			4.4	403.36
1+00			5.0	402.76
1+50			6.7	401.06
2+00			10.7	397.06
T.P.	0.52	395.44	12.84	394.92
2+30			2.6	392.84
2+50			6.6	388.84
2+61.25	=MH #3		9.5	385.94
	MH #3 to MH #4			
0+00 = MH #3				
T.P.	0.00	382.54	12.90	382.54
0+54			9.7	372.84
T.P.	0.36	370.16	12.76	369.80
T.P.	0.13	357.27	13.02	357.14
0+95			0.6	356.67

				395.44 / 5.73 / 389.71 / 387.73
		357.27		
1+22			7.6	349.67
1+51			12.5	344.77
1+67.81	=MH #4		14.0	343.27
T.P.	12.10	356.67	12.70	344.57
MH #4 to MH #5				
1+80.93	=MH #4			
1+50			13.3	343.37
1+45			15.0	341.67
1+40			12.8	343.87
1+30			11.8	344.87
1+13			11.2	345.47
1+08			10.0	346.67
0+95			7.9	348.77
0+80			5.6	351.07
T.P.	12.59	369.11	0.15	356.52
0+55			11.4	357.71
T.P.	12.65	381.71	0.05	369.06
0+25			11.6	370.11
0+14			7.4	374.31
0+00 = M.H. #5			3.2	378.51
M.H #5 to ℄ Adams				
0+00 = M.H #5				
T.P.	13.00	394.50	0.21	381.50
0+50			14.4	380.1
0+75			9.3	385.2

		394.50			
1+05			4.1	390.4	
1+35			1.7	392.8	
T.P.	12.20	405.49	1.21	393.29	
1+65			13.7	391.79	
1+85			18.4	387.09	
2+07			29.1	376.39	
2+30			17.6	387.89	
2+43			11.2	394.29	
2+67			6.0	399.49	
2+80			4.2	401.29	
3+02			2.7	402.79	
3+45			1.5	403.99	
T.P	13.08	417.41	1.16	404.33	
3+80			12.9	404.51	
4+30			9.5	407.91	
4+80			5.7	411.71	
5+01	48 =	S.L. Adams	4.78	412.63	
5+26	48 =	℄ Adams	3.3	414.11	
B.M.	Feed Spring in Pole SW Adams St & Hudson Pl.		0.52	416.89	(416.98)

Xsec of 33rd CT Roadway

NOTL to BOUTON

See pg. 36

NMAP	Nail in 33rd	2.21	6.3.23		6.1.07
		1/4 Not/			
W 1/4		on po	Vardage	3.90	59.3
C			Bk 12 Pg 308	3.75	59.5
E 1/4				4.03	59.2
		0+31	2-19-21		
E 1/4			ft.	4.4	58.8
C				4.3	58.9
W 1/4				4.1	59.1
		0+50			
W 1/4				4.2	59.0
C				4.6	58.6
E 1/4				4.7	58.5
		1+00			
E 1/4				5.5	57.7
C				5.3	57.9
W 1/4				5.5	58.0
		1+40			
W 1/4				5.7	57.5
C				5.9	57.3
E 1/4				6.1	57.1
		1+60			
E 1/4				6.5	56.7
C				6.3	56.9
W 1/4				6.0	57.2

6.3.23

2+00			
W 1/4	6.6	56.2	
C	6.8	56.4	
E 1/4	7.1	56.1	
2+60			
E 1/4	7.9	55.3	
C	7.5	55.7	
W 1/4	7.4	55.8	
2+00 = NE Newton + 80' wide			
W 1/4	8.5	54.7	
C	8.7	54.5	
E 1/4	8.9	54.3	
N 6			
E 1/4	9.0	54.2	
C	9.0	54.2	
W 1/4	8.8	54.4	
N 1/4			
W 1/4	9.0	54.2	
C	9.2	54.0	
E 1/4	9.4	53.8	
Center			
E 1/4	9.6	53.6	
C	9.4	53.8	
W 1/4	9.2	54.0	
S 1/4			
W 1/4	9.5	53.7	
C	9.6	53.6	
E 1/4	9.8	53.4	

6323

C 6

E 1/4			10.1	53.1
C			9.9	53.3
W 1/4			10.0	53.2
	S 4 : Newton 0+00			
W 1/4			10.4	53.0
C			10.6	52.8
E 1/4			10.5	52.7
	0+50			
E 1/4			12.3	50.9
C			12.3	50.9
W 1/4			12.1	51.1
T.P.	1.40	52.18	12.45	50.78
	1+00			
W 1/4			3.0	49.2
C			3.1	49.1
E 1/4			3.4	48.8
	1+40			
E 1/4			5.0	47.2
C			4.7	47.5
W 1/4			4.6	47.6
	1+60			
W 1/4			5.3	46.9
C			5.4	46.7
E 1/4			5.7	46.5

57.18

Ground St

2+00

E 1/4	7.4	44.8
C	7.1	45.1
W 1/4	6.8	45.4
2+50		
W 1/4	8.8	43.4
C	8.9	43.3
E 1/4	9.2	43.0
3+00 ℄ N.L. Boston	20' in to 1/4 obs 13 1/2°	
E 1/4	10.8	41.4
C	10.5	41.7
W 1/4	10.5	41.7
N 6		
W 1/4	10.7	41.5
C	10.8	41.4
E 1/4	11.1	41.1
N 4		
E 1/4	11.3	40.9
C	11.0	41.2
W 1/4	10.9	41.3
Con		
W 1/4	11.0	41.2
C	11.1	41.1
E 1/4	11.5	40.7
S 1/4		
E 1/4	11.6	40.6
C	11.3	40.9
W 1/4	11.1	41.1

		11.18			
c e b					
W 1/4		11.2	41.0		
C. L.		11.4	40.8		
E 1/4		11.6	40.6		
St Boston					
E 1/4		11.7	40.5		
C		11.5	40.7		
W 1/4		11.3	40.9		
Back to S.W. Return		10.66	41.50	41.59	
				0.01 error	

3/5/29 Linden

X sec Alley between Nile & Boundary from Cooper to Myrtle
Con't from Book 1310 P. 79

49

		296.60			
T.P.	12.42	308.82	0.20	296.40	
		308.86 corrected.			
6+07					
E.L.			11.8	297.1	
+2			11.8	297.1	
+4			12.1	296.8	
+7			11.9	297.0	
℄			12.1	296.8	
W.L.			11.3	297.6	
6+20 = S.L. Thorn.					
W.L.	top eb		12.56	296.30	
W.L.	Pav		12.68	296.18	
℄	✓		12.78	296.08	
E.L.	✓		12.39	296.47	
E.L.	top eb		11.92	296.94	
Nile & Thorn. BM			5.17	303.65	303.69
0+00 = N.L. Thorn.					
E.L.	top eb		1089	297.97	
E.L.	pav		11.34	297.52	
℄	✓		11.80	297.06	
W.L.	✓		11.76	297.10	
W.L.	top eb		11.68	297.18	

Plotted 3/13/29 TF

0+05	30886		
E.L		7.0	301.9
+1		9.1	299.8
℄		9.3	299.6
+8		8.4	300.5
W.L		7.0	301.9
0+20			
W.L		6.0	302.9
+4		6.4	302.5
℄		6.1	302.8
+3		6.3	302.6
E.L		5.5	303.4
0+40			
E.L		4.6	304.3
℄		4.7	304.2
+3		5.0	303.9
W.L		4.9	304.0
0+50			
W.L		4.5	304.4
℄		4.6	304.3
+5		4.5	304.4
E.L		4.4	304.5
0+75			
E.L		3.9	305.0
+7		3.5	305.4
℄		3.6	305.3
+3		3.5	305.4

0+75	30886		
W.L		3.5	305.4
1+00			
W.L.		3.4	305.5
+6		3.0	305.9
℄		3.0	305.9
+5		3.1	305.8
+6		2.6	306.3
E.L		2.6	306.3
1+08 ± Single garage 13" East Conc. floor			
		2.13	306.73
1+25			
E.L		2.1	306.8
℄		1.9	307.0
+7		2.4	306.5
W.L		2.4	306.5
1+50			
W.L.		1.6	307.3
+7		1.7	307.2
℄		1.6	307.3
E.L		1.7	307.2
1+75			
E.L		1.0	307.9
+8		0.6	308.3
℄		0.7	308.2
+3		1.0	307.9
W.L		0.9	308.0

2+00		308.86		
W.L.			0.5	308.4
+2			0.5	308.4
℄			0.5	308.4
E.L.			0.6	308.3
T.P.	10.44	319.28	0.02	308.84
2+25				
E.L.			10.2	309.1
℄			10.3	309.0
W.L.			10.4	308.9
2+50				
W.L.			9.3	310.0
℄			9.2	310.1
E.L.			9.2	310.1
2+75				
E.L.			8.4	310.9
+2			8.5	310.8
℄			8.3	311.0
W.L.	fence 1½ in.		8.7	310.6
3+00				
W.L.	fence 1½ in.		8.1	311.2
+5			8.1	311.2
℄			7.9	311.4
+7			8.4	310.9
E.L.			8.1	311.2

3+25		319.28		
E.L.			7.3	312.0
℄			7.3	312.0
W.L.	fence 1½ in.		7.5	311.8
3+50				
W.L.			6.8	312.5
+3			7.2	312.1
℄			7.2	312.1
E.L.			7.2	312.1
3+75				
E.L.			6.9	312.4
℄			6.9	312.4
W.L.			6.9	312.4
3+82 = 3 end double garage			6' East	earth floor
			6.3	313.0
3+98 = N end Same garage			6' East	
			6.2	313.1
4+06				
W.L.			5.9	313.4
℄			6.0	313.3
E.L.			6.1	313.2
1³ E ℄ Single garage			earth floor. 6.0	313.3

4+30	319.28		
E.L.		5.4	313.9
+2		5.6	313.7
+7		5.7	313.6
℄		5.4	313.9
+7		5.4	313.9
W.L.		5.8	313.5
4+56			
W.L.		5.0	314.3
+3		5.4	313.9
℄		5.3	314.0
+8		5.4	313.9
EL		5.3	314.0
1⁶E ℄ garage earth floor		5.2	314.1
1+69 ℄ garage 1⁵ East earth floor.			
		5.0	314.3
4+75			
EL		4.8	314.5
+3		5.0	314.3
℄		5.0	314.3
+7		5.0	314.3
W.L.		4.7	314.6
4+96 ℄ garage 1² East earth floor.			
		4.4	314.9

5+00	319.28		
W.L		4.5	314.8
+5		4.2	315.1
℄		4.1	315.2
+2		4.3	315.0
EL		4.2	315.1
5+30 ℄ garage 1⁵ East earth floor.			
		3.8	315.5
5+30			
EL		3.9	315.4
℄		3.6	315.7
+6		3.8	315.5
W L		3.5	315.8
5+60			
W.L		2.9	316.4
+3		3.3	316.0
℄		3.4	315.9
EL		3.6	315.7
5+80			
EL		3.3	316.0
+5		3.4	315.9
℄		3.3	316.0
+8		3.1	316.2
W.L.		2.9	316.4

6+00	319.28			
W.L.		2.7	316.6	
+5		2.7	316.6	
℄		2.8	316.5	
+6		2.8	316.5	
E.L		3.2	316.1	
8+10 = S.L. Myrtle				
E.L		3.0	316.3	
+4		2.7	316.6	
℄		2.7	316.6	
+8		2.7	316.6	
W.L.		2.4	316.9	
T.P. 6.43 Niles Myrtle S.E. B.M	323.64	2.07	317.21	
		9.11	314.53	314.56

X Sec Alley Blk 65 Univ Hts

53

S.E. Elevation Ohio

3/6/29 Loudon

B.M	8.01	371.11		363.10
T.P.	5.83	371.45	5.49	365.62
Nob Line Meade				
E.L	Top ob		5.07	366.38
E.L	gut	371.45	5.84	365.61
℄	gut		5.84	365.61
W.L	gut		5.81	365.64
W.L	top ob		5.03	366.42
0+00 = N.L. Meade				
W.L	top ob		4.94	366.51
W.L	Pav		5.04	366.41
℄	"		5.31	366.14
E.L	"		5.14	366.31
E.L	top ob		5.01	366.44
0+16				
E.L			5.2	366.2
+3			5.1	366.3
+8			5.2	366.2
℄			5.1	366.3
+4			5.3	366.1
+9			5.2	366.2
W.L			5.0	366.4
0+35				
W.L.			5.3	366.1
+5			5.1	366.3
℄			5.1	366.3
+7			4.9	366.5

0+35	371.45		
E.L.		5.0	366.4
0+60			
E.L.		4.7	366.7
+1		5.1	366.3
℄		5.1	366.3
+3		5.1	366.3
W.L.		6.1	366.3
0+80			
W.L.		5.6	365.8
+8		5.3	366.1
+8		5.3	366.1
℄		5.5	365.9
+9		5.0	366.4
E.L.		5.0	366.4
1+05			
E.L.		6.1	365.3
+3		5.9	365.5
+5		5.9	365.5
℄		5.9	365.5
+7		5.8	365.6
W.L.		5.4	366.0

1+25	371.45		
W.L.		5.3	366.1
+4		5.7	365.7
+7		5.3	366.1
℄		5.3	366.1
+5		5.4	366.0
E.L.		5.3	366.1
1+40			
E.L.		5.0	366.4
+5		5.2	366.2
℄		5.2	366.2
+1		5.0	366.4
+3		5.2	366.2
W.L.		5.6	365.8
1+51			
W.L.		5.2	366.2
+7		5.2	366.2
℄		5.0	366.4
+3		4.8	366.6
+4		5.1	366.3
+6		5.0	366.4
E.L.		4.6	366.8

1+60	371.45		
EL.		4.2	367.2
+3		4.2	367.2
+7		5.1	366.3
℄		5.3	366.1
+3		5.3	366.1
w.L		5.6	365.8
1+80			
w.L.		5.4	366.0
+3		4.4	367.0
℄		4.2	367.2
+8		3.5	367.9
E.L		3.8	367.6
2+00			
EL		4.3	367.1
+2		4.2	367.2
+7		4.6	366.8
℄		4.5	366.9
w.L fence 0^3 in		4.9	366.5
2+25			
w.L fence 0^3 in.		3.7	367.5
+2		3.7	367.7
+7		4.2	367.2
℄		3.9	367.5
+5		3.7	367.7
E.L		3.9	367.5

2+37	371.45		
E.L		3.7	367.7
+3		3.5	367.9
℄		3.7	367.7
+2		3.7	367.7
+5		4.1	367.3
w.L fence 0^3 in.		3.6	367.8
2+58			
w.L fence 0^3 in.		3.4	368.0
+4		3.7	367.7
+7		3.7	367.7
℄		3.8	367.6
+3		3.7	367.7
E.L		3.2	368.2
2+78			
E.L.		2.4	369.0
+3		2.5	368.9
+7		3.0	368.4
℄		3.1	368.3
+4		2.9	368.5
w.L fence 0$^{.5}$ in		2.6	368.8
2+97 ± garage 6^2 w. earth floor			
		2.0	369.4

3+00	371.95		
W.L		2.3	369.1
+6		2.5	368.9
℄		2.4	369.0
+4		2.2	369.2
E.L.		1.8	369.6
T.P. 826	378.18	1.53	369.92
3+02 = Send. 4car garage 0.2 in on West Conc floor.			
		8.53	369.65
3+36½ = N end Same garage 0.3 West			
		8.47	369.71
3+19 ℄ garage.		7½ East Conc floor.	
		7.60	370.58
3+30	~~378.2~~		
E.L.		8.0	370.2
+6		8.7	369.5
℄		8.9	369.3
+5		8.9	369.3
W.L.		8.7	369.5
3+50			
W.L fence 1.9 in.		8.4	369.8
+7		7.9	370.3
℄		8.1	370.1
+2		8.1	370.1
+8		7.3	370.9
E.L.		6.8	371.4

3+70	378.18		
E.L.		7.0	371.2
+1		7.0	371.2
+5		7.4	370.8
℄		7.6	370.6
+3		7.6	370.6
W.L shanty 0.5 in		7.5	370.7
3+79 ℄ garage 0.5 in on West earth floor.			
		7.6	370.6
4+00			
W.L		7.5	370.7
+2		7.2	371.0
℄		6.9	371.3
+5		6.8	371.4
E.L		6.7	371.5
4+16			
E.L		6.10	372.2
℄		6.3	371.9
+5		6.8	371.4
W.L.		6.7	371.5
		Ramb extending into Alley.	
4+26 = S end double garage 2.1 East Conc floor			
ramb on E.L.		5.62	372.56
floor		4.85	373.33
4+46 = N end Same garage		1.9 East	
floor		4.80	373.38
ramb on E.L.		5.52	372.66

4+50	378.18		
W.L.	(378.2)	6.0	372.2
+3		5.6	372.6
+7		5.4	372.8
℄		5.3	372.9
+7		5.4	372.8
E.L.		5.4	372.8
4+65 = N end conc floor & ramp extending North from end of garage at 4+46			
ramp on E.L.		5.42	372.76
floor		4.89	373.29
4+70 = garage 4ft West		Conc floor	
		6.07	372.11
4+75			
E.L.		5.4	372.8
+5		5.5	372.7
℄		5.4	372.8
+8		5.6	372.6
W.L.		5.8	372.4
4+76.5 = S end double garage 0ft West Conc floor			
		5.42	372.76
4+99.5 = N end Same garage 0ft West.			
		5.45	372.73
4+91 = ℄ garage 6ft East		Conc floor	
ramp to 0.3 East floor		4.34	373.84
ramp 0.3 E		5.02	373.16

5+00	378.18		
W.L.	(378.2)	5.4	372.8
+4		5.1	373.1
℄		5.1	373.1
+5		5.0	373.2
E.L.		5.1	373.1
5+17			
E.L.		4.9	373.3
+4		5.0	373.2
℄		4.8	373.4
+6		4.9	373.3
W.L.		5.3	372.9
4 W ft garage	Conc floor	5.40	372.78
5+42 ℄ garage	0.5 West	Conc floor	
		5.28	372.90
5+42			
W.L.		5.3	372.9
+9		5.1	373.1
℄		5.0	373.2
+4		4.8	373.4
+5		4.7	373.5
E.L.		4.8	3734
5+51 = S end Rear garage 0.2 in on East Conc floor			
		4.00	374.2
5+81 = N end Same garage 0.2 East			
		4.00	374.2

5+81	378.18			
E.L.			4.0	374.2
+4			4.3	373.9
℄			4.4	373.8
+4			4.3	373.9
w.L.			4.2	374.0
5+92				
w.L.			4.2	374.0
+6			3.9	374.3
℄			4.0	374.2
+6			4.0	374.2
E.L.			3.7	374.5
6+01 = S.L. Monroe				
E.L.	top cb		2.48	375.70
E.L.	Pav		2.76	375.42
℄	"		3.07	375.11
w.L.	"		2.98	375.20
w.L.	top c6		2.90	375.28
Sub line Monroe.				
W.L.	top cb		3.23	374.95
W.L.	gut		3.79	374.39
℄	"		3.55	374.63
E.L.	gut		3.31	374.87
E.L.	top c6		2.61	375.57
T.P.	3.52	371.50	10.20	367.98
T.P.	5.42	371.13	5.77	365.71
B.M.	Beg.		8.06	363.07

368.10

Check B.M.'s La Jolla

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2/6/29 Loudon.

Girard & Pearl SE B.P.				
B.M.	1.37	116.42		115.05 (Datum)
T.P.	13.09	121.25	7.76	108.66
T.P.	12.53	133.89	0.39	121.36
T.P.	12.51	146.32	0.08	133.81
T.P.	0.65	144.83	2.14	144.18
Center & Eads S.E. Top wall B.M.			12.28	132.55
Center & Eads SE Top Conc Mail box post B.M.			9.67	135.16
B.M.	0.25	132.80		132.55
T.P.	0.39	120.31	12.88	119.92
T.P.	0.36	107.92	12.75	107.56
Center & Draper S.W. B.P. B.M			1.60	106.32
T.P.	0.02	94.94	12.00	94.92
T.P.	0.61	82.52	13.03	81.91
Center & La Jolla Blvd. N.E. B.P. B.M.	5.95	75.67	12.80	69.72
B.M.	9.30	77.70	7.27	68.40
T.P. S.W. 7 tack La Jolla Blvd. & Pearl.	9.87	75.27	12.30	65.40
B.M.			11.11	64.16
T.P. B.P. S.E. Pearl & Cuvier	13.08	88.11	0.24	75.03
B.M.			7.07	81.04
T.P.	12.47	100.25	0.33	87.78
T.P. S.E. 7 tack Pearl & Fay	12.14	112.25	0.14	100.11
B.M.	7.83	111.97	8.61	108.64
B.M. Beginning			1.45	115.02 (115.05)

S.W. 7 tack La Jolla Blvd & Marine Ave

Sta		+	H.I.	−	Elev.
I - 0+00			218.76	11.2	207.6
5				11.2	207.6
10				11.0	207.8
15				10.7	208.1
20				10.9	207.9
25				10.6	208.2
30				10.5	208.3
35				9.7	209.1
40				8.8	210.0
45				8.2	210.6
50				7.3	211.5
55				7.6	211.2
60				7.7	211.1
65				6.7	212.1
70				6.4	212.4
75				5.2	213.6
80				4.3	214.5
85				3.0	215.8
90				1.6	217.2
95				1.3	217.5
1+00				1.8	217.0
	T.P.			1.40	217.35
		4.90	222.25		

Sta		+	H.I.	−	Elev.
J - 1+00				2.4	219.8
95				2.3	219.9
90				4.4	217.8
85				4.5	217.7
80				5.5	216.7
75				6.3	215.9
70				8.4	213.8
65				8.4	213.8
60				8.5	213.7
55				8.3	213.9
50				8.4	213.8
45				9.7	212.5
40				11.6	210.6
35				11.6	210.6
30				12.1	210.1
25				12.2	210.0
20				12.5	209.7
15				12.3	209.9
10				11.9	210.3
5				11.9	210.3
0				12.2	210.0

Sta		+	H.I.	−	Elev
K-0+00				10.4	211.8
5				10.8	211.4
10				9.8	212.4
15				10.3	211.9
20				10.8	211.4
25				10.4	211.8
30				9.5	212.7
35				8.9	213.3
40				8.1	214.1
45				6.8	215.4
50				5.9	216.3
55				5.3	216.9
60				5.2	217.0
65				4.8	217.4
70				4.3	217.9
75				3.7	218.5
80				2.9	219.3
85				2.0	220.2
90				1.2	221.0
	T.P.			0.0	222.25
		6.60	228.85 ✓		
95				6.4	222.4
1+00				6.1	222.7

Sta		+	H.I.	−	Elev
L-1+00				3.8	225.0
95				4.8	224.0
90				5.9	222.9
85				7.0	221.8
80				7.0	221.8
75				7.8	221.0
70				8.4	220.4
65				8.8	220.0
60				8.7	220.1
55				9.4	219.4
50				10.4	218.4
45				11.3	217.5
40				12.5	216.3
35				13.9	214.9
30				14.1	214.7
25				14.9	213.9
20				15.5	213.3
15				15.2	213.6
10				15.3	213.5
5				16.3	212.5
0				16.3	212.5

Sta		+	H.I.	−	Elev.
M-0+00				14.7	214.1
5				14.3	214.5
10				14.0	214.8
15				13.9	214.9
20				13.4	215.4
25				13.3	215.5
30				12.8	216.0
35				12.0	216.8
40				10.5	218.3
45				9.4	219.4
50				8.4	220.4
55				7.5	221.3
60				6.5	222.3
65				6.0	222.8
70				5.8	223.0
75				5.4	223.4
80				4.7	224.1
85				4.0	224.8
90				3.5	225.3
95				2.4	226.4
1+00				1.8	227.0
	T.P.			0.80	228.05
		2.70	230.75	✓	

Sta		+	H.I.	−	Elev.
N-1+00.0				1.5	229.2
				2.1	228.6
				2.6	228.1
				2.9	227.8
				4.0	226.7
				3.6	227.1
				4.6	226.1
				5.4	225.3
				6.0	224.7
				7.1	223.6
				8.2	222.5
				9.4	221.3
				10.1	220.6
				11.4	219.3
				12.7	218.0
				13.2	217.5
				14.5	216.2
				14.6	216.1
				14.9	215.8
				15.4	215.3
				16.0	214.7

Sta		+	H.I.	−	Elev	Sta		+	H.I.	−	Elev
0 - 0+00				14.3	216.4	P. 1+90				0.5	233.6
5				13.6	217.1	95				1.1	233.0
10				13.0	217.7	90				1.8	232.3
15				12.6	218.1	85				2.3	231.8
20				12.1	218.6	80				2.5	231.6
25				11.3	219.4	75				3.4	230.7
30				10.1	220.6	70				4.2	229.9
35				9.0	221.7	65				5.1	229.0
40				8.1	222.6	60				5.4	228.7
45				7.5	223.2	55				6.3	227.8
50				6.1	224.6	50				7.3	226.8
55				4.8	225.9	45				8.4	225.7
60				3.8	226.9	40				9.2	224.9
65				2.8	227.9	35				10.2	223.9
70				2.0	228.7	30				11.2	222.9
75	T.P.			0.90	229.85	25				12.3	221.8
		4.30	234.15	✓		20				13.2	220.9
80				3.8	230.3	15				13.9	220.2
85				3.2	230.9	10				14.7	219.4
90				3.1	231.0	2+.5				15.1	219.0
95				3.0	231.1	1+.0				16.1	218.0
1+00				2.6	231.5						

STA		+	H.I.	−	Elev.
Q-0+00				14.8	219.3
5				14.0	220.1
10				13.2	220.9
15				12.4	221.7
20				11.5	222.6
25				10.6	223.5
30				9.3	224.8
35				8.4	225.7
40				7.3	226.8
45				6.4	227.7
50				5.2	228.9
55				4.0	230.1
60				3.3	230.8
65				2.9	231.2
70				2.3	231.8
75				1.5	232.6
80				0.8	233
85	T.P.			0.0	234.15
		6.70	240.85		
90				6.2	234.6
95				5.0	235.8
1+00				4.7	236.1

STA		+	H.I.	−	Elev.
R-1+00				1.8	239.0
				2.4	238.4
				3.9	236.9
				4.5	236.3
				5.2	235.6
				6.0	234.8
				6.5	234.3
				7.7	233.1
				8.4	232.4
				9.3	231.5
				9.9	230.9
				10.6	230.2
				11.7	229.1
				12.9	227.9
				14.0	226.8
				14.9	225.9
				16.1	224.7
				17.0	223.8
				17.6	223.2
				18.8	222.0
				19.8	221.0

Sta.		+	H.I.	−	Elev.
S-0+00				19.0	221.8
5				17.3	223.5
10				16.6	224.2
15				15.2	225.6
20				14.6	226.2
25				13.2	227.6
30				12.5	228.3
35				11.4	229.4
40				10.3	230.5
45				9.4	231.4
50				8.6	232.2
55				7.5	233.3
60				6.7	234.1
65				5.6	235.2
70				4.7	236.1
75				3.7	237.1
80				3.0	237.8
85				2.1	238.7
	T.P.			0.1	240.75
		8.0	248.75	✓	
90				9.0	239.7
95				8.2	240.5
1+00				7.2	241.5

Sta		+	H.I.	−	Elev.
T-1+00				4.7	244.0
				5.5	243.2
				6.4	242.3
				7.1	241.6
				8.0	240.7
				9.1	239.6
				10.2	238.5
				10.9	237.8
				12.4	236.3
				13.3	235.4
				14.3	234.4
				15.2	233.5
				16.1	232.6
				17.5	231.2
				18.7	230.0
				19.4	229.3
				20.7	228.0
				21.6	227.1
				22.7	226.0
				23.4	225.3
				25.0	223.7

Sta	+	H.I.	−	Elev.
U-1+00			2.0	246.7
95			2.5	246.2
90			4.5	244.2
85			5.2	243.5
80			6.3	242.4
75			7.0	241.7
70			8.5	240.2
65			9.6	239.1
60			10.6	238.1
55			11.9	237.8
50			12.4	236.3
45			13.2	235.5
40			14.6	234.1
35			15.5	233.2
30			17.1	231.6
25			18.2	230.5
20			19.6	229.1
15			20.1	228.6
10			21.3	227.4
5			22.8	225.9
0			23.6	225.1

Elm St. & Sec. 30th to Bancroft.

4-27-29 Miller.

BM	6.86	253.84		246.98	N.E. Elm + Dale
T.P.	4.08	257.55	0.37	253.47	
	00 =	E. Line of 30th St		(30' Rdw.)	
S. cmt. cb			1.58	255.97	
gutter pavmt			1.46	255.89	
1/4 "			1.44	256.11	
C "			1.33	256.22	
1/4 "			1.26	256.29	
gutter "			1.13	256.42	
N. cmt cb			0.78	256.77	
		40' E			
N. cmt. cb			0.14	257.41	
gutter			1.00	256.55	
1/4			0.8	256.7	
C			1.0	256.5	
1/4			1.4	256.1	
gutter			1.8	255.7	
S. cmt. cb.			1.25	256.30	
		40' E.			
S. cmt. cb			1.55	256.00	
gutter			2.2	255.3	
1/4			1.7	255.8	
C			1.3	256.2	
1/4			1.1	256.5	
gutter			1.1	256.4	
N. cmt. cb			0.18	257.37	

Plotted 5-4-29 - CBM

257.55

80' E

N. cmt. cb		0.67	256.88
gutter		1.5	256.0
1/4		1.4	256.2
C		1.7	255.8
1/4		2.2	255.4
gutter		2.6	255.0
S. cmt. cb		1.99	255.56
	120' S		
S. cmt. cb		2.76	254.79 ?
gutter		3.3	254.3
1/4		2.8	254.8
C		2.3	255.2
1/4		2.0	255.6
gutter		2.1	255.5
N. cmt. cb		1.24	256.31
	120' E		
N. cmt. cb		2.11	255.44
gutter		2.9	254.6
1/4		2.9	254.6
C		3.0	254.5
1/4		3.5	254.0
gutter		4.0	253.5
S. cmt. cb		3.59	253.96

257.55

140' E

S. cmt. cb		4.74	252.81
gutter		5.3	52.3
"4		4.8	52.8
e		4.3	253.2
"4		4.1	53.4
gutter		3.7	53.8
N. cmt. cb		3.10	254.45 figured. (1H driveway)

160' E.

N. cmt. cb		4.55	253.00
gutter		5.3	52.3
"4		5.3	52.3
e		5.6	251.9
"4		6.3	51.3
gutter		6.9	50.6
S. cmt. cb		6.19	251.36

200' E.

S. cmt. cb		9.38	248.17
gutter		9.8	47.7
"4		9.2	48.3
e		8.5	249.0
"4		8.4	49.1
gutter		8.6	49.0
N. cmt. cb		7.51	250.04

257.55

221.3 E = P.C 15° Rad. Ret.

Elm. St

N. cmt. cb		9.13	248.42
gutter		9.8	47.8
"4		9.9	47.7
e		10.1	247.4
"4		10.6	47.0
gutter		11.2	46.3
S. cmt. cb		11.02	246.53

226.3 E. = W. Line Fern St on cb. Rets. (31.8 Adw.)

S. cmt. cb		11.09	246.46
gutter pavmt		11.53	246.02
cb. line "		11.51	246.04
"4 "		10.88	246.67
e "		10.42	247.13
"4 "		10.21	247.34
cb. line "		10.05	247.50
gutter "		10.05	247.50
N. cmt. cb.		9.33	248.22
T.P.	1.24	245.91	12.90 244.65

00. = E. Line Fern St. on cb. Rets. (31.8 Adw.)

N. cmt. cb		0.22	245.69
gutter pavmt		1.04	244.87
cb. line "		1.05	244.86
"4 "		1.17	244.74
e "		1.38	244.53
"4 "		1.89	244.02
cb. line "		2.65	243.26

245.91

00 = E. Line Fern St. (con)

	2.66	243.25
S. gutter pavmt.		
S. emt. eb.	2.25	243 66
5' E = P.C. 15' Rad Returns (30' Rdwy)		
	2.39	243 52
S. emt. eb	2.8	43 1
gutter	2.1	43 8
1/4	1.7	244.2
C	1.3	44 6
1/4	1.3	44 6
gutter	0.34	245.57
N. emt. eb		
25' E		
	1.65	244.26
N. emt. eb	2.4	43 5
gutter	2.1	43.8
1/4	2.6	243.3
C	3.3	42.6
1/4	3.4	42 5
gutter	3.69	242.22
S. emt. eb		
35' E		
	4.43	241.48
S. emt. eb	4.0	41 9
gutter	3.9	42.0
1/4	3.1	242.8
C	2.6	43.3
1/4	2 5	43.4
+ 3	2.9	43.0
gutter	2.12	243.79
N. emt. eb		

245.97

81m. St.

55' E

N. emt. eb	3.20	242. 71
gutter	4.2	41.7
+ 4	3.7	42 2
1/4	3.7	42 2
C	4.0	241. 9
1/4	4.7	41. 2
gutter	5.4	40 5
S. emt. eb	5.49	240.42
75' E		
S. emt. eb	6.24	239.67
gutter	6.0	39.9
1/4	5.7	40.2
C	5.1	240.8
1/4	4.7	41.2
+ 3	4.8	41.1
gutter	5.4	40.5
N. emt. eb	4.34	241.57
100' E.		
N. emt. eb	5.83	240.08
gutter	6.6	39.3
1/4	6.1	39.8
C	6.5	239 4
1/4	7.1	38.8
gutter	7.7	38.2
S. emt. eb.	7.56	238.35

		245.91		
		150' E.		
S. cmt. cb		10.33	235.58	
gutter		10.5	35.4	
1/4		9.8	36.1	
℄		9.2	236.7	
1/4		8.9	37.0	
gutter		9.6	36.3	
N. cmt. cb		8.70	237.21	
		209.6 E. W. end catch basin ons.		
N. cmt. cb.		11.92	233.99	
gutter		12.8	33.1	
1/4		12.2	33.7	
℄		12.3	233.6	
1/4		12.7	33.2	
+ 4 ℄		13.2	32.7	
T.P.	2.17	235.23	12.85	233.06
+ 5 = N.W. cor. C.B		inlet	3.67	31.56
gutter = S.W. cor. C.B		inlet	3.68	31.55
S. cmt. cb			2.72	232.51
		208'. E. = E. End C.B. = Δ in S. cb. line		(30' Rdw.)
S. cmt. cb. also Top. C.B.			2.90	232.33
+ 2.5 = N.E. cor C.B.			2.87	32.36
1/4			2.3	32.9
℄			1.9	233.3
1/4			1.7	33.5
gutter			2.3	32.9
N. cmt. cb.			1.40	233.83

Elm St.

		235.23		
		218'. E. = W. Edge C.B. on N.		(28'.85 Rdw.
N. cmt. cb.			2.02	233.21
gutter on N.W. cor C.B.		inlet	3.05	31.18
N. cb + 2.5 = S.W. "	C.B	"	3.06	32.17
N. cb + 4			2.1	33.1
℄ Elm			2.7	232.5
S. gutter			3.6	31.6
S. cmt. cb			3.38	231.85
		222'. E = E. End C.B. on N. = Δ in N. cl.		(28'.3 rdw.)
S. cmt. cb			3.57	231.66
gutter			3.9	31.2
℄ Elm			3.0	232.2
2'.5 S of N. cb = S.E. Cor. C.B			2.18	233.05
N. cmt. cb. also Top. N.E. Cor. C.B			2.21	233.02
		252' E = E. End cmt. cbs. + walks = W. End Bridge		(18' Rdw)
N. cmt. cb also Boardwalk on Bridge			4.89	230.34
Gutter floor Bridge			5.35	229.88
℄ Bridge N " = ℄ Elm			5.35	229.88
gutter " "			5.28	229.95
S. cmt. cl also Board. walk of Bridge			4.80	230.43
		350. E on Bridge		
N. Edge Bridge Rdw.			4.80	228.43
℄ "			6.78	228.45
S. edge "		"	4.75	228.48

R35.23

412'. E = E. End Bridge = W. End cmt. els. & Walks. (18' Rdw)

S. cmt. el. also Board walk on Bridge		7.97	227.26
gutter Bridge floor		8.46	226.77
℄ Bridge " " = ℄ Elm.		8.50	~~227.73~~ 226.73
gutter " "		8.41	~~227.82~~ 226.82
N. cmt el also Board walk on Bridge		7.97	227.26
T.P. BM. BT	R.63	9.07	226.16

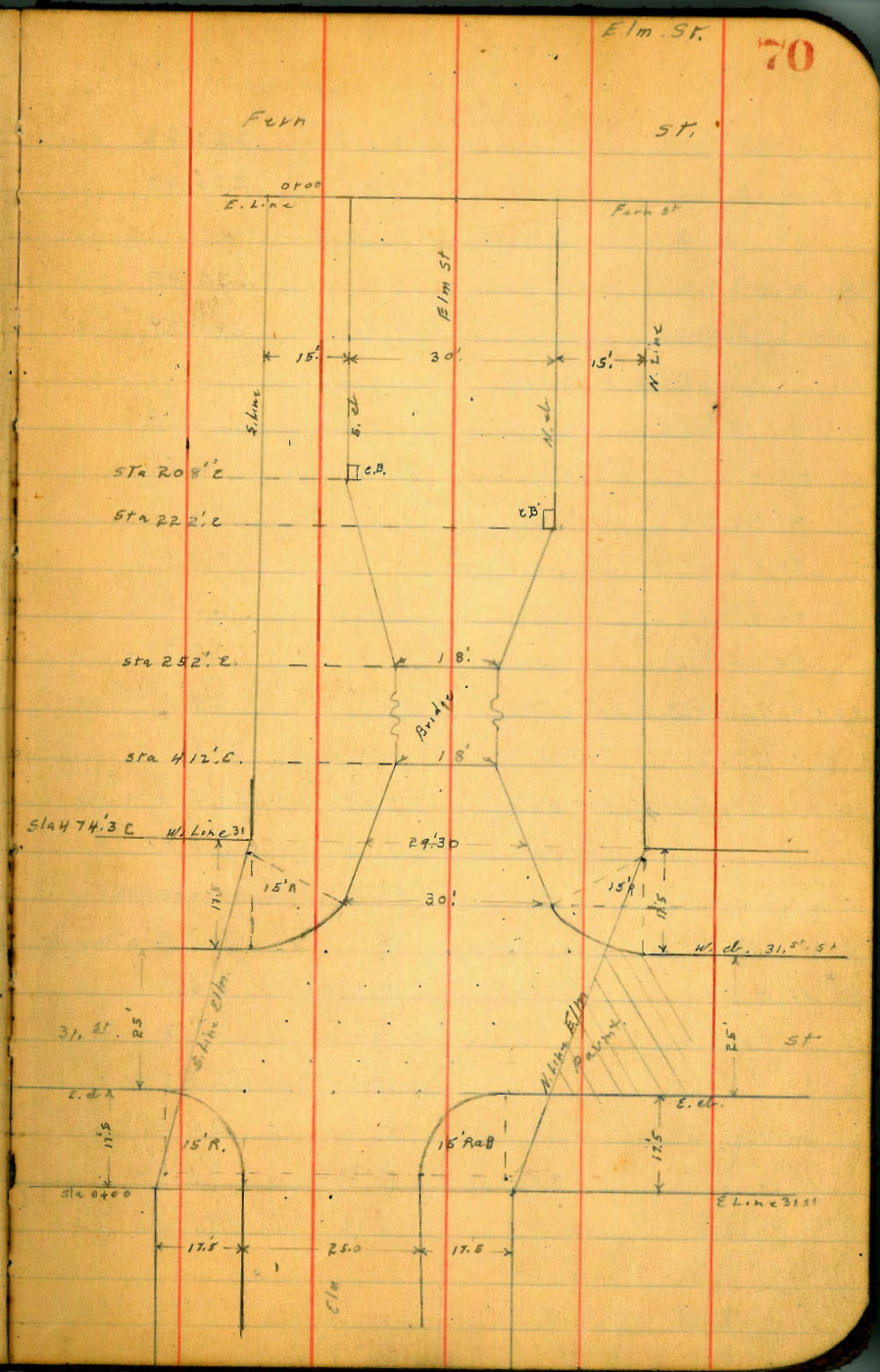
SW. 31st St ℄ Elm

474'.3 E = W. Line 31st St. (29'.3 Rdw)

N. cmt. el	2.16	226.63
gutter	2.5	26.3
"	2.6	26.2
e	2.7	226.1
"	3.1	25.7
gutter	3.4	25.4
S. cmt. el	2.62	226.17

4'.8 E. of W. Line = P.C. 15'R. el. Rds 30' Rdw.

S. cmt. el	2.69	226.10
gutter	3.4	25.4
"	3.0	25.8
e	2.7	226.1
"	2.5	26.3
gutter	2.4	26.4
N. cmt. el	2.16	226.63



228.79

11.15 E. of W. Line — 35.3 Bet. Return curbs

N. cmt. eb	2.13	226.66
S. cmt. eb	2.89	225.90
P.I. N. Line Elm on diagonal + N.W. eb. Ret.		
N.W. eb. Ret.	1.89	226.90
gutter S. End. pavmt.	2.50	226.29
W. eb. Line 31st St.		
N Line Elm	2.50	226.29
10's	2.3	26.5
20's	2.6	26.2
30's	3.0	225.8
40.5	3.4	25.4
50's	4.1	24.7
754's = P.C. 15' R. eb. Ret gutter	4.4	24.4
" " " " " " " cmt. eb	3.74	225.05
60's = S. Line Elm St. cmt. gutter to S	4.94	223.85 cmt. gutter 3' Wide
" " " " " " cmt. eb	4.29	224.50
W. 1/4 of 31st		
S. Line Elm	4.8	224.0
10' N	4.1	24.7
20' N	3.6	25.2
30' N	3.1	225.7
40' N	2.7	26.1
50' N	2.3	26.5
60' N. = N. Line Elm St on pavmt	2.34	226.43

228.79

℄ 31st St.

Elm St.

N. Line Elm St on pavmt	2.26	226.53
10' S	2.3	26.5
20' S	2.7	26.1
30' S	3.3	225.5
40' S	3.7	25.1
50' S	4.2	24.6
60's = S. Line Elm St	4.7	224.1
E. 1/4 31st St		
S. Line Elm St	4.8	224.0
10' N	4.2	24.6
20' N	3.9	24.9
30' N	3.5	225.3
40' N	3.0	25.8
50' N	2.5	26.3
60' N = N. Line Elm St	2.50	226.29
E. eb. Line 31st St.		
N. Line Elm St gutter pavmt.	2.68	226.11
" " " " cmt. eb.	2.08	226.71
5's gutter	2.9	25.9
cmt eb	2.65	226.14
7.7's = P.C. 15' R. eb. ret gutter	2.9	25.9
" " " " " " cmt. eb	2.69	226.10
10's	3.0	25.8
20's	3.2	25.6
30's	3.6	25.2
40's	4.0	24.8

228.79

E. el Line 31st St (con)

50' S			4.6	24.2
60's = S. Line Elm on Diagonal			4.7	224.1
62.7 S = P.C. 15' R. el. Rat gutter			5.0	23.8
" " " " " " " " " emt. el			4.61	224.18
65.2 S. = S. Line Elm st Produced from east			4.68	224.11 emt. el
" " " " " " " " "			5.37	223.45 3' emt. gutter To South

7.5 E. of E. el Line 31st St

S. emt. el			4.40	224.39
N. " "			2.71	226.08

15' E. of E. el. Line = P.C. 15' R. Rat. (25' Rdw)

N. emt. el			2.73	226.06
S. " "			4.61	224.18

00 = 17.5 E. of E. el. Line = E. Line 31st St. (25' Rdw.)

S. emt. el			4.70	224.09
gutter			5.1	23.7
1/4			4.5	24.3
C			4.1	224.7
1/4			3.7	25.1
gutter			3.6	25.2
N. emt. el			2.73	226.06
T.P.	0.09	226.25	2.63	226.16

50' E.

N emt. el			1.46	224.79
gutter			1.9	24.3
1/4			2.2	24.0
C			2.6	223.6

226.25

Elm St.

1/4		3.3	23.0
gutter		3.8	22.5
S. emt. el		3.40	222.85

100' E.

S. emt. el		4.66	221.59
gutter		5.6	20.6
1/4		4.5	21.7
C		3.9	222.3
1/4		3.7	22.5
gutter		3.6	22.6
N emt. el		2.81	223.44

125' E

N. emt. el		3.65	222.60
gutter		4.4	21.8
1/4		4.4	21.8
C		4.6	221.6
1/4		5.4	20.8
gutter		6.1	20.1
S. emt el		5.32	220.93

150' E

S. emt. el		5.98	220.27
gutter		6.7	19.5
1/4		6.2	20.0
C		5.2	221.1
1/4		5.0	21.2
gutter		5.0	21.2
N. emt. el		4.17	222.08

226.25

175' E

N. cmt. cb		4.70	221.55
gutter		5.4	20.8
"4		5.6	20.6
C		5.7	220.5
"4		6.5	19.7
gutter		7.2	19.0
S. cmt. cb		6.49	219.76

200' E

S. cmt. cb		7.08	219.17
gutter		7.7	18.5
"4		7.0	19.2
C		6.3	219.9
"4		6.1	20.1
gutter		6.2	20.0
N. cmt. cb		5.37	220.88

233.5 E = P.C. 15° R. cb. Returns (30' Rdw)

N. cmt. cb		6.17	220.08
gutter		6.9	19.3
"4		7.0	19.2
C		7.1	219.1
"4		7.7	18.5
gutter		8.4	17.8
S. cmt. cb		7.90	218.35

238.5 E = W. Line Edgemont St. (Paved) (26.7 Rdw)

S. cmt. cb		8.93	218.32
gutter pavmt.		8.54	217.71

226.25

Elm St.

cb. Line pavmt		8.48	217.77
"4 "		7.82	219.43
C "		7.30	218.95
"4 "		7.03	219.22
cb. Line "		6.89	219.36
gutter "		6.89	219.36
N. cmt. cb.		6.21	220.04

00 = E. Line Edgemont. (26.7 Rdw)

N cmt. cb		6.15	220.10
gutter pavmt		6.88	219.37
cb Line "		6.90	219.35
"4 "		7.11	219.14
C "		7.29	218.96
"4 "		7.91	218.34
cb Line "		8.43	217.82
gutter "		8.43	217.82
S. cmt. cb		7.87	218.48

5.8 = P.C. 15° R cb Returns (25' Rdw)

S. cmt. cb		7.88	218.37
gutter		8.3	18.0
"4		7.9	18.3
C		7.4	218.8
"4		7.2	19.0
gutter		7.1	19.1
N. cmt. cb		6.2	220.0
T. P.	7.47	227.37	6.35 219.90

220.05

227.37

60' E. of Edge cmt

N. cmt. el	6.93	220.44
gutter	7.6	19.8
" "	7.8	19.6
e	8.0	219.4
" "	8.6	18.8
gutter	9.2	18.2
S. cmt. el	8.66	218.71

123' E = W. Line Alley

5.67 S. of S. el = S. end cmt. walk + el	8.17	219.23 Top el.
" " " " " " " " "	8.5	18.9 gutter
S. el	8.25	19.12
" " gutter	8.5	18.9
" "	8.1	19.3
e	7.4	220.0
" "	7.3	20.1
N. el. gutter	7.2	20.2
N. cmt. el	6.48	220.89
5.67 N. of N. el. = N. edge cmt. el + walk	6.35	221.07 cmt. el
" " " " " " " " " "	6.8	20.6 gutter

143' E. = E. Line Alley

5.67 N. of N. el = N. edge cmt. el + walk	6.8	20.6 gutter
" " " " " " " " "	6.24	21.18 cmt. el
N. cmt. el	6.38	220.99
N. gutter	7.1	20.3
" "	7.3	20.1
e	7.5	219.9

227.37

Elm St.

" "	8.0	19.4
gutter	8.5	18.9
S. cmt. el	8.11	219.26
5.67 S. of S. el = S. Edge cmt + walk + el	8.03	219.34 cmt. el
" " " " " " " " " "	8.4	19.0 gutter

200' E.

S. cmt. el	7.74	219.63
gutter	8.3	19.1
" "	7.7	19.7
e	7.2	220.2
" "	7.1	20.3
gutter	7.0	20.4
N. cmt. el	6.04	221.33
264. E. = P.C. 27.5 R	el. Returns	(25' Rdw)
N. cmt. el	5.47	221.90
S. cmt. el.	7.27	220.10

265.5 E = W. Line 32nd St

S. cmt. el	7.30	220.07
gutter	7.6	19.8
" "	7.2	20.2
e	6.5	220.9
" "	6.3	21.1
gutter pavmt	6.10	221.27
N. cmt. el	5.47	221.90

24' E. of W. line 32nd = P.I. S. line Elm. on diagonal + S.W. cmt. eb. Return

N. eb. line = S. End Parmt.	5.09	221.28
6.45 S = N. ¼ on diagonal	5.7	21.7
12.90 S = ℄ " "	6.2	221.2
19.35 S = S. ¼ " "	6.7	20.7
25.8 S = S. eb. line " "	7.3	20.1
41.2 S = S.W. eb. Ret. in gutter	8.3	19.1
" " " " " Top eb.	7.27	219.40

26' E. of W. line 32nd St = W. eb. line

N. eb. line on S. end parmt	5.02	222.35
6.65 S = N. ¼ on diagonal	5.6	21.8
13' S = ℄ " "	6.2	221.2
19.55 = S. ¼ " "	6.7	20.7
26.1 S = S. eb line " "	7.3	20.1
41.15 = S. line " "	8.3	219.1

33.5 E of W. line = W. ¼ 32nd St.

N. eb Line on S. end Parmt	4.74	222.59
6.555 = N. ¼ on diagonal	5.4	22.0
13.1 S = ℄ " "	6.0	221.4
19.665 = S. ¼ " "	6.5	20.9
26.25 = S. eb " "	6.9	20.5
40.7 S = S line " "	7.8	219.6

41' E. of W. line = ℄ Roadway of 32nd St.

N. eb. line on S. end parmt	4.53	222.84
6.6 S = N. ¼ on diagonal	5.3	22.1
13.2 = ℄ " "	5.9	221.5
26 cc 19.8 = S. ¼ " "	6.3	21.1

Elm St

26.4 S = S. eb. line on diagonal	6.7	20.7
40.3 S = S. line " "	7.4	220.0

48.5 E. of W. line = E. ¼

N. eb. line on S. end. Parmt.	4.45	222.92
6.7 S = N ¼ on diagonal	5.3	22.1
13.4 = ℄ " "	5.8	221.6
20.1 = S. ¼ " "	6.3	21.1
26.8 = S. eb line " "	6.6	20.8
39.8 = S. line " "	7.3	220.1

56' E = E. eb. line 32nd St

N. eb. Elm on S. End parmt	4.44	222.93
6.8 S = N. ¼ on diagonal	5.3	22.1
13.6 S = ℄ " "	5.8	221.6
20.4 S = S. ¼ " "	6.2	21.2
27.2 S = S. eb Line " "	6.6	20.8
39.4 S = S. Line Elm "	7.1	220.3

38' E. = P.I. S. line Elm on diagonal & S.E. 20' R Ret

N. eb. line	4.47	222.90
6.8 S = N ¼ on diagonal	5.3	22.1
13.6 S = ℄ " "	5.8	221.6
20.4 S = S ¼ " "	6.3	21.1
27.3 S = S eb line " "	6.6	20.8
39.4 S = S. line Elm " "	7.1	220.3 Gutter
" " " " " " "	6.83	220.54 Top cmt. eb

227.37

75.5 E = E. End 20' R ch. Rat S.E. Cor. 32nd & Elm. (28' Rdw)

S. cmt. ch			5.53	221.84	
gutter			1.5	220.9	
S. l/4			5.9	21.5	
c			5.4	222.0	
N. l/4			5.0	22.4	
N ch Line S. end parmt.			4.62	222.75	
00 = 81.5 E. on N / 82.1 E. on N } E. Line 32nd St. (28' Rdw.)					10' ch. on S / 42.1 ch. on N.
N. cmt. ch			4.03	223.34	
gutter S. end parmt			4.68	222.69	
l/4			5.0	22.4	
c			5.2	222.2	
l/4			5.9	21.5	
gutter			6.4	21.0	
S cmt. ch			5.25	222.12	
		50' E			
S. cmt. ch			4.49	222.88	
gutter			5.2	22.2	
l/4			4.6	22.8	
c			4.1	223.3	
l/4			4.0	23.4	
gutter			4.0	23.4	
N. cmt. ch			3.24	224.13	
		100' E		224.96	
N. cmt. ch			2.41	~~225.96~~	
gutter			2.9	24.5	
l/4			3.1	24.3	
c			3.3	224.1	

227.37

Elm St.

l/4			3.9	23.5	
gutter			4.2	23.2	
S. cmt. ch			3.71	223.66	
		150' E			
S. cmt. ch			2.97	224.40	
gutter			3.5	23.9	
l/4			2.9	24.5	
c			2.3	225.1	
l/4			2.3	25.1	
gutter			2.2	25.2	
N. cmt. ch			1.60	225.77	
		200' E W. line	Bancroft	Paved intersection.	
N. cmt. ch			0.77	227.60	
gutter parmt.			1.59	225.78	
l/4	"		1.51	225.86	
c	"		1.72	225.65	
l/4	"		2.11	25.26	
gutter	"		2.77	224.60	
S. cmt. ch			2.17	225.20	
chk on BM.			7.11	220.26 = 220.18	S.E. 32nd & Elm
T.P.	8.39	228.36	7.40	219.97	
T.P. BM	12.52	238.68	2.20	226.16	S.W. Elm & 31st St.
T.P.	10.04	248.59	0.13	238.55	
T P	9.46	257.83	0.22	248.37	
chk on original BM.			10.84	246.99 = 246.98	N.W. Dale & Elm.

IMPROVED TABLES

AND

INFORMATION

4.79.
13.65
492.0

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope 1½ to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in left column and top row. The number in body of table in same row and column gives distance from side stake to slope stake. If ground is not level estimate the difference in elevation between the side stake and slope stake, lower target by this amount if cut, elevate if fill. Add this amount to cut or fill and find distance in table. Set up rod at this point, and line of sight should cut target. If it does not make the slight adjustment necessary.

TABLE No. 9.

To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of corrections.

Degree of curve with a given I may be found by dividing tangent, (or external), opposite I by given tangent, (or external).

The distance from a point on the tangent to the curve is very nearly the square of the tangent length divided by twice the radius.

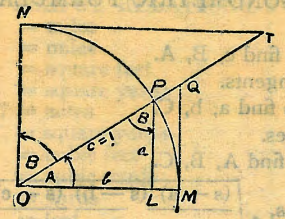


TABLE II

TRIGONOMETRIC FORMULÆ.

$\angle A = \angle MOP \qquad \angle B = \angle PON = \angle OPL$

$R = OB = c = 1$

$\sin A = \frac{a}{c} = \frac{a}{1} = a = \cos B = LP$

$\cos A = \frac{b}{c} = \frac{b}{1} = b = \sin B = OL$

$\tan A = \frac{a}{b} = \frac{MQ}{OM} = \frac{MQ}{1} = MQ = \cot B = MQ$

$\cot A = \frac{NT}{ON} = \frac{NT}{1} = NT = \tan B = NT$

$\sec A = \frac{OQ}{OM} = \frac{OQ}{1} = OQ = \csc B = OQ$

$\csc A = \frac{OT}{ON} = \frac{OT}{1} = OT = \sec B = OT$

$\text{vers } A = \frac{LM}{OP} = LM = \text{covers } B$ #

$\text{covers } A = \frac{OP - LP}{OP} = OP - LP = \text{vers } B$

$\text{exsec } A = PQ = \text{coexsec } B$

$\text{coexsec } A = PT = \text{exsec } B$

$\sin \tfrac{1}{2} A = \sqrt{\frac{1 - \text{Cos } A}{2}} \qquad \cos \tfrac{1}{2} A = \sqrt{\frac{1 + \text{Cos } A}{2}}$

$\sin 2A = 2 \sin A \cos A \qquad \cos 2A = \cos^2 A - \sin^2 A$

Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{B} = \frac{\sin C}{C}$

Law of Cosines $c^2 = a^2 + b^2 - 2ab \cos C$

Law of Tangents $\frac{a+b}{a-b} = \frac{\tan \frac{1}{2}(A+B)}{\tan \frac{1}{2}(A-B)}$

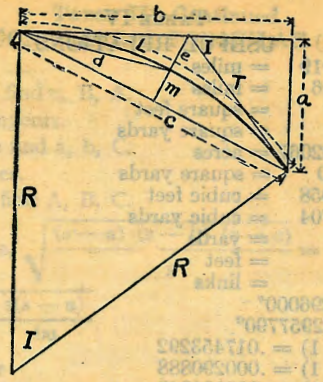


Table V

CURVE FORMULAE FOR SIMPLE CURVES

Compiled by J. Calvin Locke, C.E.

(1) $c = \sqrt{2Ra}$ (2) $c = \sqrt{a^2+b^2}$

(3) $c = \sqrt{2R\,(R-\sqrt{(R+b)\,(R-b)}} = \sqrt{2R(R-\sqrt{R^2-b^2})}$

(4) $c = 2\sqrt{m\,(2R-m)}$

(5) $c = 2R \sin \frac{1}{2} I$ (6) $c = 2T \cos \frac{1}{2} I$

(7) $e = R \operatorname{exsec} \frac{1}{2} I$

(8) $e = R \tan \frac{1}{2} I \tan \frac{1}{4} I$ (9) $e = T \tan \frac{1}{4} I$

(10) $b = \sqrt{a\,(2R-a)}$

(11) $b = \sqrt{\left(c+\frac{c^2}{2R}\right)\left(c-\frac{c^2}{2R}\right)} = \sqrt{c^2-\frac{c^4}{4R^2}}$

(12) $b = R \sin I$ (13) $b = a \cot \frac{1}{2} I$

(14) $R = \frac{a^2+b^2}{2a} = \frac{c^2}{2a}$ (15) $R = \frac{d^2}{2m} = \frac{c^2+4m^2}{8m}$

(16) $d = \sqrt{R\,(2R-\sqrt{(2R+c)\,(2R-c)}} = \sqrt{R(2R-\sqrt{4R^2-c^2})}$

(17) $d = \sqrt{2Rm}$ (18) $d = 2R \sin \frac{1}{4} I$ (19) $m = \frac{d^2}{2R}$

(20) $m = R \mp \sqrt{\left(R+\frac{c}{2}\right)\left(R-\frac{c}{2}\right)} = R \mp \sqrt{R^2-\frac{c^2}{4}}$

(21) $m = R \operatorname{vers} \frac{1}{2} I$ (22) $m = R \sin \frac{1}{2} I \tan \frac{1}{4} I$ (23) $m = \frac{1}{2} c \tan \frac{1}{4} I$

(24) $a = \frac{c^2}{2R}$ (25) $a = R - \sqrt{(R+b)\,(R-b)} = R - \sqrt{R^2-b^2}$

(26) $a = 2R (\sin^2 \frac{1}{2} I)^2$ (27) $a = R \operatorname{vers} I$ (28) $a = R \sin I \tan \frac{1}{2}$

(29) $a = b \tan \frac{1}{2} I$ (30) $a = T \sin I$ (31) $T = R \tan \frac{1}{2} I$

(32) $I = \frac{L}{R} \times 57.295780$ (33) $R = \frac{L}{I} \times 57.295780$

(34) $L = IR \times 0.01745329$ (35) $L = \frac{8d-c}{3}$

(36) Area Seg. $= \frac{LR - R^2 \operatorname{Sin} I}{2} = \frac{LR - Rb}{2}$

Table VI

SINES, COSINES, TANGENTS, COTANGENTS

deg.	sin 0′	tan 0′	sin 10′	tan 10′	sin 20′	tan 20′	sin 30′	tan 30′	sin 40′	tan 40′	sin 50′	tan 50′	deg.
0	0000	0000	0029	0029	0058	0058	0087	0087	0116	0116	0145	0145	89
1	175	0375	0204	0204	0233	0233	0262	262	291	291	320	320	88
2	349	349	378	378	407	407	436	437	465	466	494	495	87
3	523	524	552	553	581	582	610	612	640	641	669	706	86
4	698	699	727	729	756	758	785	787	814	816	843	864	85
5	872	875	901	904	929	934	958	963	987	992	1016	1022	84
6	1045	1051	1074	1080	1103	1110	1132	1139	1161	1169	190	198	83
7	219	228	248	257	279	287	305	317	334	346	363	376	82
8	392	405	421	435	449	465	478	495	507	524	536	554	81
9	564	584	593	614	622	644	650	673	679	703	708	733	80
10	736	763	765	793	794	823	822	853	851	883	880	914	79
11	908	944	937	974	965	2004	994	2035	2022	2065	2051	2095	78
12	2079	2126	2108	2156	2136	186	2164	217	193	247	221	278	77
13	250	309	278	339	306	370	334	401	363	432	391	462	76
14	419	493	447	524	476	555	504	586	532	617	560	648	75
15	588	679	616	711	644	742	672	773	700	805	728	836	74
16	756	867	784	899	812	931	840	962	868	994	896	3026	73
17	924	3057	952	3089	939	3121	3007	3153	3035	3185	3062	217	72
18	3090	249	3118	281	3145	314	173	346	201	378	228	411	71
19	256	443	283	476	311	508	338	541	365	574	393	607	70
20	420	640	448	673	475	706	502	739	529	772	557	805	69
21	584	839	611	872	638	906	665	939	692	973	719	4006	68
22	746	4040	773	4074	800	4108	827	4142	854	4176	881	210	67
23	907	245	934	279	961	314	987	348	4014	383	4041	417	66
24	4067	452	4094	487	4120	522	4147	557	173	592	200	628	65
25	226	663	253	699	279	734	305	770	331	806	358	841	64
26	384	877	410	913	436	950	4462	986	488	5022	514	5059	63
27	540	5095	566	5132	592	5169	617	5206	643	243	669	280	62
28	695	317	720	354	746	392	772	430	797	467	823	505	61
29	848	543	874	581	899	619	924	658	950	696	975	735	60
30	5000	774	5025	5812	5050	851	5075	890	5100	930	5125	969	59
31	150	6009	175	6048	200	6088	225	6128	250	6168	275	6208	58
32	299	249	324	289	348	330	5373	371	398	412	422	453	57
33	446	494	471	536	495	577	519	619	544	661	568	703	56
34	592	745	616	787	640	830	664	873	688	916	712	959	55
35	736	7002	760	7046	783	7089	807	7133	831	7177	854	7221	54
36	878	265	901	310	925	355	948	400	972	445	995	490	53
37	6018	536	6041	581	6065	627	6088	673	6111	720	6134	766	52
38	157	813	180	860	202	907	225	954	248	8002	271	8050	51
39	293	8098	316	8146	338	8195	361	8243	383	292	406	342	50
40	428	391	450	441	472	491	494	541	517	591	539	642	49
41	561	693	583	744	604	796	626	847	648	899	670	952	48
42	691	9004	713	9057	734	9110	756	9163	777	9217	799	9271	47
43	820	325	841	380	862	435	884	490	905	545	926	601	46
44	947	657	967	713	988	770	7009	827	7030	884	7050	942	45
45	7071	1.0000	7092	1.0058	7112	1.0117	133	1.0176	153	1.0235	173	1.0295	44
deg.	60′ cos	60′ cot	50′ cos	50′ cot	40′ cos	40′ cot	30′ cos	30′ cot	20′ cos	20 cot	10′ cos	10′ cot	deg.

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10′	58.34	.297	5° C.	10′	560.11	27.313	5° C	10′	1070.6	99.155	5° C
20′	66.67	.388	T	20′	568.53	28.137	T	20′	1079.2	100.75	T
30′	75.01	.491	.03	30′	576.95	28.974	.06	30′	1087.8	102.35	.10
40′	83.34	.606	E	40′	585.36	29.824	E	40′	1096.4	103.97	E
50′	91.68	.733		50′	593.79	30.686		50′	1105.1	105.60	
2°	100.01	.873	.001	12°	602.21	31.561	.006	22°	1113.7	107.24	.013
10′	108.35	1.024		10′	610.64	32.447		10′	1122.4	108.90	
20′	116.68	1.188		20′	619.07	33.347		20′	1131.0	110.57	
30′	125.02	1.364		30′	627.50	34.259		30′	1139.7	112.25	
40′	133.36	1.552		40′	635.93	35.183		40′	1148.4	113.95	
50′	141.70	1.752		50′	644.37	36.120		50′	1157.0	115.66	
3°	150.04	1.964	10° C.	13°	652.81	37.070	10° C.	23°	1165.7	117.38	10° C.
10′	158.38	2.188	T	10′	661.25	38.031	T	10′	1174.4	119.12	T
20′	166.72	2.425	.06	20′	669.70	39.006	.13	20′	1183.1	120.87	.19
30′	175.06	2.674	E	30′	678.15	39.993	E	30′	1191.8	122.63	E
40′	183.40	2.934	.003	40′	686.60	40.992	.011	40′	1200.5	124.41	.025
50′	191.74	3.207		50′	695.06	42.004		50′	1209.2	126.20	
4°	200.08	3.492		14°	703.51	43.029		24°	1217.9	128.00	
10′	208.43	3.790		10′	711.97	44.066		10′	1226.6	129.82	
20′	216.77	4.099		20′	720.44	45.116		20′	1235.3	131.65	
30′	225.12	4.421		30′	728.90	46.178		30′	1244.0	133.50	
40′	233.47	4.755		40′	737.37	47.253		40′	1252.8	135.35	
50′	241.81	5.100	15° C.	50′	745.85	48.341	15° C.	50′	1261.5	137.23	15° C.
5°	250.16	5.459	T	15°	754.32	49.441	T	25°	1270.2	139.11	T
10′	258.51	5.829	.09	10′	762.80	50.554	.19	10′	1279.0	141.01	.29
20′	266.86	6.211	E	20′	771.29	51.679	E	20′	1287.7	142.93	E
30′	275.21	6.606	.004	30′	779.77	52.818	.017	30′	1296.5	144.85	.038
40′	283.57	7.013		40′	788.26	53.969		40′	1305.3	146.79	
50′	291.92	7.432		50′	796.75	55.132		50′	1314.0	148.75	
6°	300.28	7.863		16°	805.25	56.309		26°	1322.8	150.71	
10′	308.64	8.307		10′	813.75	57.498		10′	1331.6	152.69	
20′	316.99	8.762		20′	822.25	58.699		20′	1340.4	154.69	
30′	325.35	9.230	20° C.	30′	830.76	59.914	20° C.	30′	1349.2	156.70	20° C.
40′	333.71	9.710	T	40′	839.27	61.141	T	40′	1358.0	158.72	T
50′	342.08	10.202	.13	50′	847.78	62.381	.26	50′	1366.8	160.76	.39
7°	350.44	10.707	E	17°	856.30	63.634	E	27°	1375.6	162.81	E
10′	358.81	11.224	.006	10′	864.82	64.900	.022	10′	1384.4	164.86	.051
20′	367.17	11.753		20′	873.35	66.178		20′	1393.2	166.95	
30′	375.54	12.294		30′	881.88	67.470		30′	1402.0	169.04	
40′	383.91	12.847		40′	890.41	68.774		40′	1410.9	171.15	
50′	392.28	13.413		50′	898.95	70.091		50′	1419.7	173.27	
8°	400.66	13.991		18°	907.49	71.421		28°	1428.6	175.41	
10′	409.03	14.582	25° C.	10′	916.03	72.764	25° C.	10′	1437.4	177.55	25° C.
20′	417.41	15.184	T	20′	924.58	74.119	T	20′	1446.3	179.72	T
30′	425.79	15.799	.16	30′	933.13	75.488	.32	30′	1455.1	181.89	.49
40′	434.17	16.426	E	40′	941.69	76.869	E	40′	1464.0	184.08	E
50′	442.55	17.065		50′	950.25	78.264		50′	1472.9	186.29	
9°	450.93	17.717	.007	19°	958.81	79.671	.028	29°	1481.8	188.51	.065
10′	459.32	18.381		10′	967.38	81.092		10′	1490.7	190.74	
20′	467.71	19.058		20′	975.96	82.525		20′	1499.6	192.99	
30′	476.10	19.746		30′	984.53	83.972		30′	1508.5	195.25	
40′	484.49	20.447		40′	993.12	85.431		40′	1517.4	197.53	
50′	492.88	21.161		50′	1001.7	86.904		50′	1526.3	199.82	
10°	501.28	21.887	30° C.	20°	1010.3	88.389	30° C.	30°	1535.3	202.12	30° C.
10′	509.68	22.624	T	10′	1018.9	89.888	T	10′	1544.2	204.44	T
20′	518.08	23.375	.19	20′	1027.5	91.399	.39	20′	1553.1	206.77	.59
30′	526.48	24.138	E	30′	1036.1	92.924	E	30′	1562.1	209.12	E
40′	534.89	24.913	.008	40′	1044.7	94.462	.034	40′	1571.0	211.48	.078
50′	543.29	25.700		50′	1053.3	96.013		50′	1580.0	213.86	

T = R tan ½ I E = R exsec ½ I

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10′	1598.0	218.7	5° C.	10′	2151.7	390.7	5° C.	10′	2743.1	622.8	5° C.
20′	1606.9	221.1	T	20′	2161.2	394.1	T	20′	2753.4	627.2	T
30′	1615.9	223.5	.13	30′	2170.8	397.4	.17	30′	2763.7	631.7	.21
40′	1624.9	226.0	E	40′	2180.3	400.8	E	40′	2773.9	636.2	E
50′	1633.9	228.4		50′	2189.9	404.2		50′	2784.2	640.7	
32°	1643.0	230.9	.023	42°	2199.4	407.6	.037	52°	2794.5	645.2	.056
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	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10′	1706.3	248.7	T	10′	2266.6	432.0	T	10′	2867.1	677.3	T
20′	1715.3	251.3	.26	20′	2276.2	435.6	.34	20′	2877.5	682.0	.42
30′	1724.4	253.9	E	30′	2285.9	439.2	E	30′	2888.0	686.7	E
40′	1733.5	256.5	.046	40′	2295.6	442.8	.075	40′	2898.4	691.4	.112
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	15° C.	50′	2363.5	468.4	15° C.	50′	2972.1	725.0	15° C.
35°	1806.6	278.1	T	45°	2373.3	472.1	T	55°	2982.7	729.9	T
10′	1815.7	280.8	.40	10′	2383.1	475.8	.51	10′	2993.3	734.8	.63
20′	1824.9	283.6	E	20′	2392.8	479.6	E	20′	3003.9	739.7	E
30′	1834.1	286.4	.070	30′	2402.6	483.4	.116	30′	3014.5	744.6	.168
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	20° C.	30′	2461.7	506.4	20° C.	30′	3078.7	774.7	20° C.
40′	1898.6	306.4	T	40′	2471.5	510.3	T	40′	3089.4	779.8	T
50′	1907.9	309.3	.53	50′	2481.4	514.3	.68	50′	3100.2	784.9	.84
37°	1917.1	312.2	E	47°	2491.3	518.2	E	57°	3110.9	790.1	E
10′	1926.4	315.2	.093	10′	2501.2	522.2	.151	10′	3121.7	795.2	.225
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	25° C.	10′	2561.0	546.3	25° C.	10′	3186.9	826.7	25° C.
20′	1991.5	336.3	T	20′	2571.0	550.4	T	20′	3197.8	832.0	T
30′	2000.9	339.3	.67	30′	2581.0	554.5	.85	30′	3208.8	837.3	1.05
40′	2010.2	342.4	E	40′	2591.0	558.6	E	40′	3219.7	842.7	E
50′	2019.6	345.5		50′	2601.1	562.8		50′	3230.7	848.1	
39°	2029.0	348.6	.117	49°	2611.2	566.9	.189	59°	3241.7	853.5	.283
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	30° C.	50°	2671.8	592.3	30° C.	60°	3308.0	886.4	30° C.
10′	2094.9	371.0	T	10′	2681.9	596.6	T	10′	3319.1	892.0	T
20′	2104.3	374.2	.80	20′	2692.1	600.9	1.02	20′	3330.3	897.5	1.27
30′	2113.8	377.5	E	30′	2702.3	605.3	E	30′	3341.4	903.2	E
40′	2123.3	380.8	.141	40′	2712.5	609.6	.227	40′	3352.6	908.8	
50′	2132.7	384.1		50′	2722.7	614.0		50′	3363.8	914.5	.340

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2	+	71°	4086.9	1308.2	+	81°	4893.6	1805.3	+
10′	3386.3	925.9	5° C.	10′	4099.5	1315.6	5° C.	10′	4908.0	1814.7	5° C.
20′	3397.5	931.6	T	20′	4112.1	1322.9	T	20′	4922.5	1824.1	T
30′	3408.8	937.3	.25	30′	4124.8	1330.3	.30	30′	4937.0	1833.6	.36
40′	3420.1	943.1	E	40′	4137.4	1337.7	E	40′	4951.5	1843.1	E
50′	3431.4	948.9		50′	4150.1	1345.1		50′	4966.1	1852.6	
62°	3442.7	954.8	.080	72°	4162.8	1352.6	.110	82°	4980.7	1862.2	.149
10′	3454.1	960.6		10′	4175.6	1360.1		10′	4995.4	1871.8	
20′	3465.4	963.5		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	10° C.	73°	4239.7	1398.0	10° C.	83°	5069.2	1920.5	10° C.
10′	3522.6	996.2	T	10′	4252.6	1405.7	T	10′	5084.0	1930.4	T
20′	3534.1	1002.3	.51	20′	4265.6	1413.5	.61	20′	5099.0	1940.3	.72
30′	3545.6	1008.3	E	30′	4278.5	1421.2	E	30′	5113.9	1950.3	E
40′	3557.2	1014.4		40′	4291.5	1429.0		40′	5128.9	1960.2	
50′	3568.7	1020.5	.159	50′	4304.6	1436.8	.220	50′	5143.9	1970.3	.299
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	15° C.	50′	4383.3	1484.4	15° C.	50′	5234.9	2031.4	15° C.
65°	3650.2	1063.9	T	75°	4396.5	1492.4	T	85°	5250.3	2041.7	T
10′	3661.9	1070.2	.76	10′	4409.8	1500.5	.91	10′	5265.6	2052.1	1.09
20′	3673.7	1076.6	E	20′	4423.1	1508.6	E	20′	5281.0	2062.5	E
30′	3685.4	1082.9		30′	4436.4	1516.7		30′	5296.4	2073.0	
40′	3697.2	1089.3	.240	40′	4449.7	1524.9	.332	40′	5311.9	2083.5	.450
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	20° C.	40′	4530.4	1574.7	20° C.	40′	5405.6	2147.5	20° C.
50′	3780.4	1134.8	T	50′	4544.0	1583.1	T	50′	5421.4	2158.4	T
			1.02				1.22				1.45
67°	3792.4	1141.4	E	77°	4557.6	1591.6	E	87°	5437.2	2169.2	E
10′	3804.4	1148.0	.321	10′	4571.2	1600.1	.445	10′	5453.1	2180.2	.603
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	25° C.	20′	4667.4	1660.5	25° C.	20′	5565.4	2258.0	25° C.
30′	3901.2	1202.0	T	30′	4681.3	1669.2	T	30′	5581.6	2269.3	T
40′	3913.4	1208.9	1.28	40′	4695.2	1678.1	1.53	40′	5597.8	2280.6	1.83
50′	3925.6	1215.8	E	50′	4709.2	1686.9	E	50′	5614.2	2292.0	E
69°	3937.9	1222.7	.403	79°	4723.2	1695.8	.558	89°	5630.5	2303.5	.756
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	30° C.	80°	4807.7	1749.9	30° C.	90°	5729.7	2373.3	30° C.
10′	4024.4	1272.1	T	10′	4822.0	1759.0	T	10′	5743.3	2385.1	T
20′	4036.8	1279.3	1.54	20′	4836.2	1768.2	1.84	20′	5763.1	2397.0	2.20
30′	4049.3	1286.5	E	30′	4850.5	1777.4	E	30′	5779.9	2408.9	E
40′	4061.8	1293.6		40′	4864.8	1786.7		40′	5796.7	2420.9	
50′	4074.4	1300.9	.485	50′	4879.2	1796.0	.671	50′	5813.6	2432.9	.910

$T = R \tan \frac{1}{2} I$ $E = R \operatorname{exsec} \frac{1}{2} I$

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9	+	101°	6950.6	3278.1	+	111°	8336.7	4386.1	+
10′	5847.5	2457.1	5° C.	10′	6971.3	3294.1	5° C.	10′	8362.7	4407.6	5° C.
20′	5864.6	2469.3	T	20′	6992.0	3310.1	T	20′	8388.9	4429.2	T
30′	5881.7	2481.5	.43	30′	7012.7	3326.1	.51	30′	8415.1	4450.9	.62
40′	5898.8	2493.8	E	40′	7033.6	3342.3	E	40′	8441.5	4472.7	E
50′	5916.0	2506.1		50′	7054.5	3358.5		50′	8468.0	4494.6	
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
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	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.
10′	6055.4	2606.8	T	10′	7224.7	3491.3	T	10′	8684.0	4674.2	T
20′	6073.1	2619.7	.86	20′	7246.3	3508.2	.103	20′	8711.5	4697.2	1.25
30′	6090.8	2632.6	E	30′	7268.0	3525.2	E	30′	8739.2	4720.3	E
40′	6108.6	2645.5		40′	7289.8	3542.4		40′	8767.0	4743.6	
50′	6126.4	2658.5	.401	50′	7311.7	3559.6	.536	50′	8794.9	4766.9	.721
94°	6144.3	2671.6		104°	7333.6	3576.8		114°	8822.9	4790.4	
10′	6162.2	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	15° C.	50′	7444.6	3664.5	15° C.	50′	8965.0	4909.9	15° C.
95°	6252.8	2751.3	T	105°	7467.0	3682.3	T	115°	8993.8	4934.1	T
10′	6271.1	2764.8	1.30	10′	7489.6	3700.2	1.56	10′	9022.7	4958.6	1.93
20′	6289.4	2778.3	E	20′	7512.2	3718.2	E	20′	9051.7	4983.1	E
30′	6307.9	2792.0		30′	7534.9	3736.2		30′	9080.9	5007.8	
40′	6326.3	2805.6	.604	40′	7557.7	3754.4	.806	40′	9110.3	5032.6	1.09
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	20° C.	40′	7696.3	3865.2	20° C.	40′	9289.2	5184.5	20° C.
50′	6457.3	2903.1	T	50′	7719.7	3884.0	T	50′	9319.5	5210.3	T
			1.74				2.08				2.52
97°	6476.2	2917.3	E	107°	7743.2	3902.9	E	117°	9349.9	5236.2	E
10′	6495.2	2931.6	.809	10′	7766.8	3921.9	1.08	10′	9380.5	5262.3	1.46
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	25° C.	20′	7934.6	4057.4	25° C.	20′	9598.9	5449.2	25° C.
30′	6649.6	3047.9	T	30′	7959.0	4077.2	T	30′	9630.7	5476.5	T
40′	6669.2	3062.8	2.18	40′	7983.5	4097.1	2.61	40′	9662.6	5504.0	3.16
50′	6688.8	3077.7	E	50′	8008.0	4117.0	E	50′	9694.7	5531.7	E
99°	6708.6	3092.7	1.02	109°	8032.7	4137.1	1.36	119°	9727.0	5559.4	1.83
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	30° C.	110°	8182.8	4259.7	30° C.	120°	9924.0	5729.7	30° C.
10′	6848.5	3199.6	T	10′	8208.2	4280.5	T	10′	9957.5	5758.6	T
20′	6868.8	3215.1	2.62	20′	8233.7	4301.4	3.14	20′	9991.0	5787.7	3.81
30′	6889.2	3230.8	E	30′	8259.3	4322.4	E	30′	10025.0	5817.0	E
40′	6909.6	3246.5		40′	8285.0	4343.6		40′	10059.0	5846.5	
50′	6930.1	3262.3	1.22	50′	8310.8	4364.8	1.63	50′	10093.0	5876.1	2.20

$T = R \tan \frac{1}{2} I$ $E = R \operatorname{exsec} \frac{1}{2} I$

TABLE X.

MIDDLE ORDINATES OF RAILS

Length of Rail (feet)

C ° ′	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch	C °	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch
0-20	17189	.08	.07	.06	.05	.04	.03	8	716.8	1.88	1.64	1.42	1.20	1.01	.84
0-40	8594	.16	.14	.12	.10	.08	.07	9	637.3	2.12	1.84	1.60	1.35	1.14	.94
1-0	5730	.24	.20	.18	.15	.13	.10	10	573.7	2.36	2.05	1.78	1.50	1.27	1.04
1-20	4297	.31	.27	.23	.20	.17	.13	11	521.7	2.59	2.26	1.95	1.65	1.39	1.15
1-40	3438	.39	.34	.29	.25	.21	.17	12	478.3	3.83	2.47	2.15	1.81	1.54	1.26
2-0	2865	.47	.41	.35	.30	.25	.20	13	441.7	3.05	2.66	2.30	1.96	1.66	1.36
2-20	2456	.55	.48	.41	.35	.29	.23	14	410.3	3.30	2.87	2.48	2.10	1.78	1.46
2-40	2149	.63	.55	.47	.40	.33	.27	15	383.1	3.54	3.08	2.68	2.26	1.91	1.57
3-0	1910	.71	.62	.53	.45	.38	.31	16	359.3	3.76	3.28	2.83	2.40	2.04	1.67
3-20	1719	.78	.68	.59	.50	.42	.35	17	338.3	4.00	3.48	3.02	2.57	2.16	1.78
3-40	1563	.86	.75	.65	.55	.46	.38	18	319.6	4.21	3.67	3.18	2.70	2.28	1.87
4-0	1433	.94	.82	.71	.60	.50	.42	19	302.9	4.45	3.89	3.36	2.86	2.41	1.98
4-20	1323	1.02	.89	.77	.65	.55	.45	20	287.9	4.70	4.09	3.55	3.00	2.54	2.09
4-40	1228	1.10	.96	.83	.70	.59	.48	22	262.0	5.16	4.44	3.84	3.30	2.80	2.29
5	1146	1.18	1.03	.89	.75	.63	.52	24	240.5	5.64	4.92	4.20	3.59	3.04	2.50
6	955.3	1.41	1.23	1.06	.90	.76	.62	26	222.3	6.07	5.29	4.58	3.88	3.29	2.70
7	819.0	1.65	1.44	1.24	1.05	.89	.73								

TABLE XI.

SHORT RADIUS CURVES

Radius Feet	Chord Feet	Central Angle	Deflection Angle	Deflection for 1 Foot
35	10	16-26	8-13	49.3
45	10	12-46	6-23	38.3
50	15	17-16	8-38	34.5
60	15	14-22	7-11	28.8
75	15	11-30	5-45	23.0
100	20	11-30	5-45	17.3
120	20	9-34	4-47	14.3
150	20	7-39	3-49	11.5
190	25	7-32	3-46	9.15
200	25	7-10	3-35	8.6
225	25	6-25	3-12	7.7
240	25	5-58	2-59	7.2
250	25	5-44	2-52	6.9
275	25	5-12	2-36	6.2
288	50	9-58	4-59	6.0
300	50	9-32	4-46	5.7
350	50	8-12	4-06	4.9
376	50	7-40	3-50	4.6
400	50	7-10	3-35	4.3
410	50	7-00	3-30	4.2

To find length of curve divide angle from P. C. to P. T. by central angle of chord and multiply by length of chord.

TABLE XII.

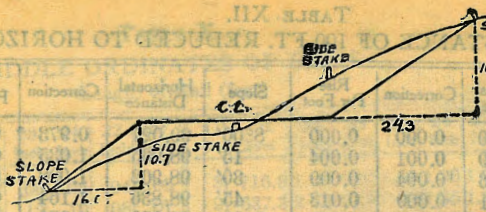
INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

Slope	Horizontal Distance	Correction	Rise Per Foot	Slope	Horizontal Distance	Correction	Rise Per Foot
0°00′	100.000	0.000	0.000	8°00′	99.027	0.973	0.139
15′	99.999	0.001	0.004	15′	98.965	1.035	0.143
30′	99.996	0.004	0.009	30′	98.902	1.098	0.148
45′	99.991	0.009	0.013	45′	98.836	1.164	0.152
1 00	99.985	0.015	0.017	9 00	98.769	1.231	0.156
15	99.976	0.024	0.022	15	98.700	1.300	0.161
30	99.966	0.034	0.026	30	98.629	1.371	0.165
45	99.953	0.047	0.031	45	98.556	1.444	0.169
2 00	99.939	0.061	0.035	10 00	98.481	1.519	0.174
15	99.923	0.077	0.039	15	98.404	1.596	0.178
30	99.905	0.095	0.044	30	98.325	1.675	0.182
45	99.885	0.115	0.048	45	98.245	1.755	0.187
3 00	99.863	0.137	0.052	11 00	98.163	1.837	0.191
15	99.839	0.161	0.057	15	98.079	1.921	0.195
30	99.813	0.187	0.061	30	97.992	2.008	0.199
45	99.786	0.214	0.065	45	97.905	2.095	0.204
4 00	99.756	0.244	0.070	12 00	97.815	2.185	0.208
15	99.725	0.275	0.074	15	97.723	2.277	0.212
30	99.692	0.308	0.078	30	97.630	2.370	0.216
45	99.657	0.343	0.083	45	97.534	2.466	0.221
5 00	99.619	0.381	0.087	13 00	97.437	2.563	0.225
15	99.580	0.420	0.092	15	97.338	2.662	0.229
30	99.540	0.460	0.096	30	97.237	2.763	0.233
45	99.497	0.503	0.100	45	97.134	2.866	0.238
6 00	99.452	0.548	0.105	14 00	97.030	2.970	0.242
15	99.406	0.594	0.109	15	96.923	3.077	0.246
30	99.357	0.643	0.113	30	96.815	3.185	0.250
45	99.307	0.693	0.118	45	96.705	3.295	0.255
7 00	99.255	0.745	0.122	15 00	96.593	3.407	0.259
15	99.200	0.800	0.126	15	96.479	3.521	0.263
30	99.144	0.856	0.131	30	96.363	3.637	0.267
45	99.087	0.913	0.135	45	96.246	3.754	0.271

TABLE XIII.

MINUTES IN DECIMALS OF A DEGREE.

0 30″	.00833	10′ 30″	.17500	20′ 30″	.34167	30′ 10″	.50833	40′ 30″	.67500	50′ 10″	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	13 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1½ TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	0
1	1.50	1 65	1 80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	1
2	3.00	3.15	3.30	3 45	3.60	3 75	3.90	4.05	4.20	4 35	2
3	4.50	4 65	4.80	4.95	5 10	5 25	5 40	5.55	5.70	5.85	3
4	6.00	6 15	6.30	6.45	6.60	6 75	6.90	7.05	7.20	7.35	4
5	7 50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	5
6	9 00	9 15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10 35	6
7	10.50	10 65	10.80	10.95	11.10	11.25	11.40	11.55	11 70	11.85	7
8	12.00	12 15	12.30	12.45	12.60	12.75	12.90	13 05	13.20	13.35	8
9	13 50	13 65	13 80	13 95	14.10	14.25	14.40	14 55	14.70	14.85	9
10	15.00	15 15	15 30	15 45	15.60	15.75	15.90	16.05	16.20	16 35	10
11	16 50	16 65	16 80	16.95	17 10	17.25	17.40	17.55	17.70	17.85	11
12	18 00	18 15	18.30	18 45	18.60	18 75	18.90	19.05	19.20	19 35	12
13	19 50	19 65	19.80	19.95	20.10	20.25	20 40	20.55	20.70	20.85	13
14	21.00	21 15	21.30	21.45	21 60	21.75	21.90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24 15	24 30	24 45	24 60	24.75	24 90	25 05	25.20	25.35	16
17	25.50	25 65	25.80	25 95	26.10	26 25	26 40	26.55	26.70	26.85	17
18	27.00	27 15	27.30	27 45	27.60	27.75	27.90	28.05	28 20	28.35	18
19	28 50	28 65	28 80	28.95	29.10	29.25	29.40	29.55	29.70	29.85	19
20	30 00	30 15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31 50	31 65	31.80	31.95	32 10	32 25	32.40	32.55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33.60	33 75	33.90	34.05	34.20	34.35	22
23	34 50	34 65	34.80	34.95	35.10	35 25	35 40	35.55	35.70	35 85	23
24	36 00	36 15	36.30	36 45	36.60	36.75	36.90	37.05	37 20	37.35	24
25	37.50	37.65	37 80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39 00	39 15	39.30	39 45	39 60	39.75	39.90	40.05	40.20	40.35	26
27	40 50	40 65	40 80	40.95	41.10	41.25	41 40	41.55	41.70	41.85	27
28	42 00	42 15	42.30	42.45	42.60	42 75	42.90	43.05	43.20	43.35	28
29	43 50	43 65	43.80	43 95	44.10	44 25	44 40	44.55	44.70	44 85	29
30	45 00	45 15	45.30	45 45	45.60	45.75	45.90	46.05	46 20	46.35	30
31	46.50	46.65	46.80	46 95	47.10	47 25	47.40	47.55	47.70	47.85	31
32	48 00	48.15	48.30	48 45	48.60	48 75	48.90	49.05	49 20	49.35	32
33	49 50	49 65	49.80	49.95	50.10	50.25	50.40	50.55	50.70	50.85	33
34	51 00	51.15	51.30	51.45	51.60	51 75	51.90	52.05	52.20	52.35	34
35	52 50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54 00	54 15	54.30	54 45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55 50	55 65	55.80	55.95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57 00	57.15	57.30	57 45	57.60	57 75	57.90	58.05	58.20	58 35	38
39	58 50	58.65	58 80	58.95	59.10	59 25	59.40	59 55	59.70	59.85	39
40	60 00	60 15	60 30	60 45	60 60	60.75	60 90	61.05	61 20	61.35	40
41	61.50	61 65	61 80	61 95	62 10	62 25	62.40	62 55	62 70	62.85	41
42	63 00	63.15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64.35	42
43	64.50	64 65	64 80	64.95	65.10	65 25	65 40	65.55	65.70	65.85	43
44	66 00	66 15	66.30	66.45	66.60	66 75	66.90	67.05	67.20	67.35	44
45	67 50	67 65	67 80	67.95	68.10	68.25	68 40	68.55	68.70	68.85	45
46	69 00	69 15	69 30	69.45	69.60	69.75	69.90	70.05	70.20	70.35	46
47	70 50	70 65	70 80	70 95	71.10	71.25	71 40	71.55	71.70	71.85	47
48	72.00	72 15	72.30	72.45	72.60	72.75	72.90	73 05	73.20	73 35	48
49	73 50	73 65	73.80	73.95	74.10	74.25	74.40	74.55	74.70	74.85	49
50	75.00	75.15	75.30	75.45	75.60	75.75	75.90	76.05	76.20	76.35	50

Computed by L. Leland Locke.

ENGINEERING DEPARTMENT.
CITY OF SAN DIEGO.
CALIFORNIA.