EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and SURVEYING INSTRUMENTS

Chicago New York San Francisco New Orleans Pittsburg Toronto

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

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

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

1804

CITY ENGINEER'S OFFICE

9+50
8+75
Dwight
+39/4

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

Made in U. S. A.

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Johnson
12-3-47

BALBOA PARK

Topography Control Data

Base Line Retracement

of Line Shown on Large Hard Copy in office City Engineer

(Calc. Slopes & offsets see P-75)

Cont. P-3

Stations

~~22+69.48~~

~~22+70.23~~ = P.O.T. Set Hub.

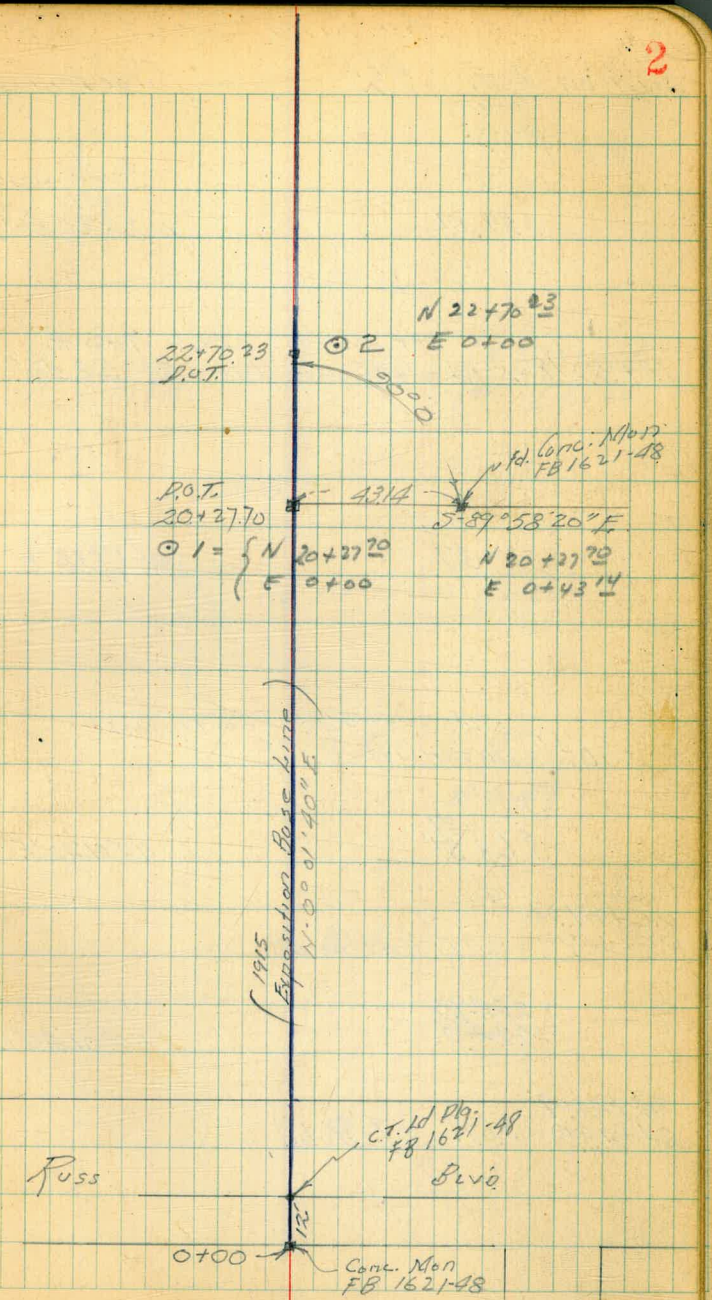
20+27.03 } Ahead Equation.

20+27.70 = Fd. Conc. Mon Ld. Plg. No Tack (Set Disk in Ld. Plg.)

back

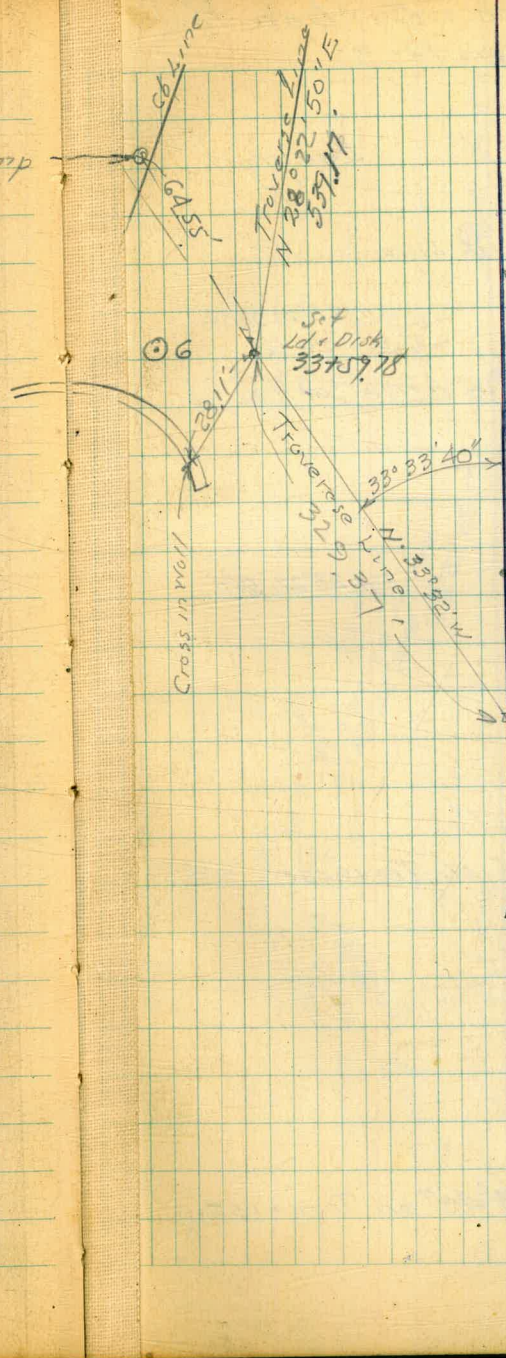
⊙ = Control No.

2



Base Line Cont. from P. 2

Station	Dist. Chained Horiz.	Def.: △	True Bearing
			Ref. Cross in Lamp Post. Base
	539.17		N 28°22'50" E
33+59.78 = △ Rt.	Set Ld. Plg. & Disk in Concrete Walk	def △ Rt. 61°54'50"	
	329.37		N 33°32' W
30+30.41	△ Rt. 33°33'40" on Traverse Set Hub		
	363.37		N 0°01'40" E
26+67.02 ~~26+67.10~~	P.O.T. Set Hub		
	229.93 ~~224.0~~		N 0°01'40" E
24+42.09 ~~24+43.10~~	= P.O.T. Set Hub.		

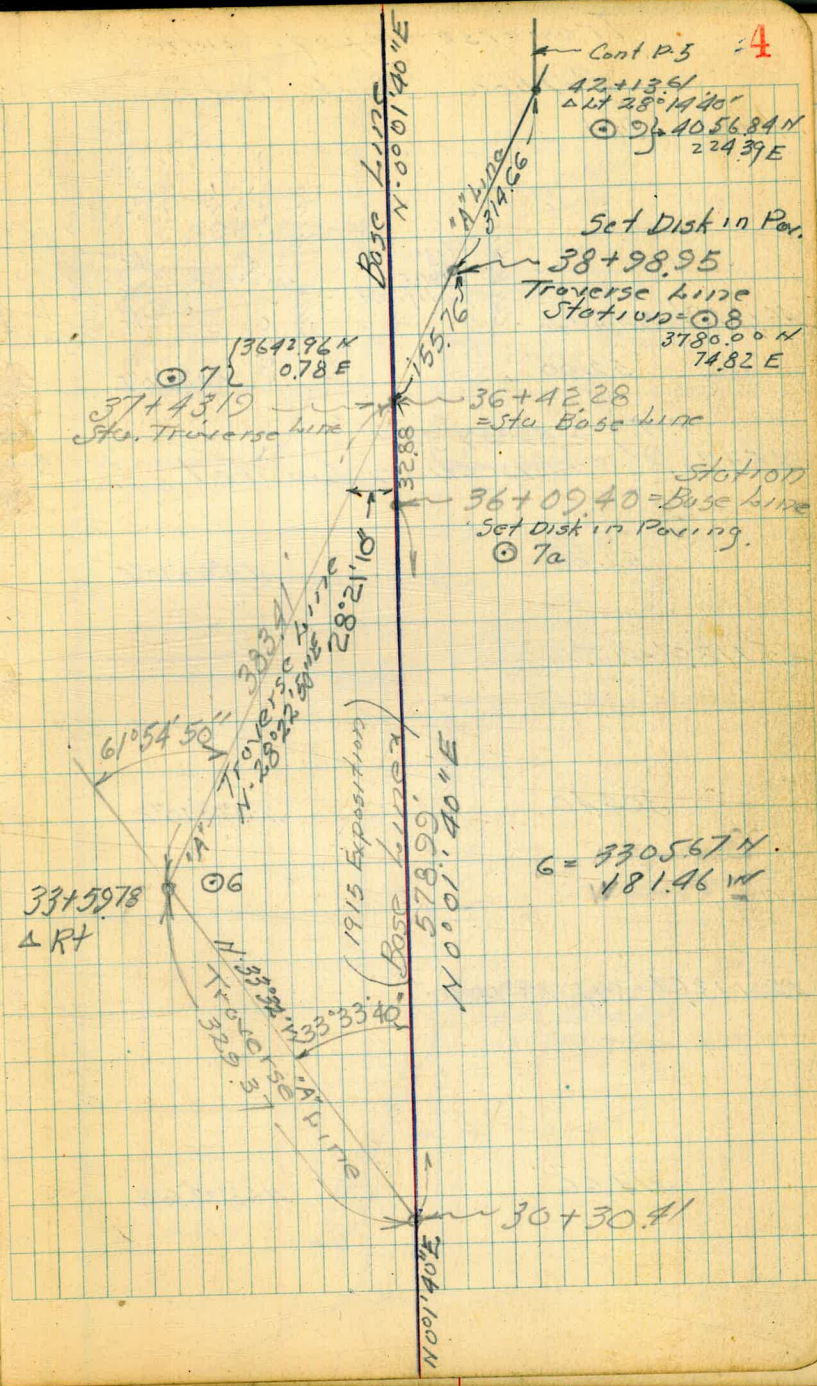


⊙6 = { N 3340567 / W 181.46

⊙5 N 3031.08 ✓ / E 0.49 ✓

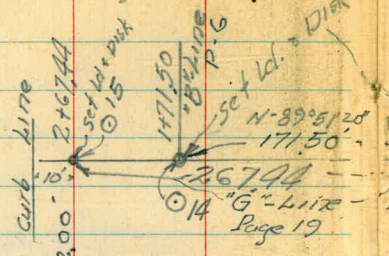
Base Line - Balboa Park
Cont. from P-3

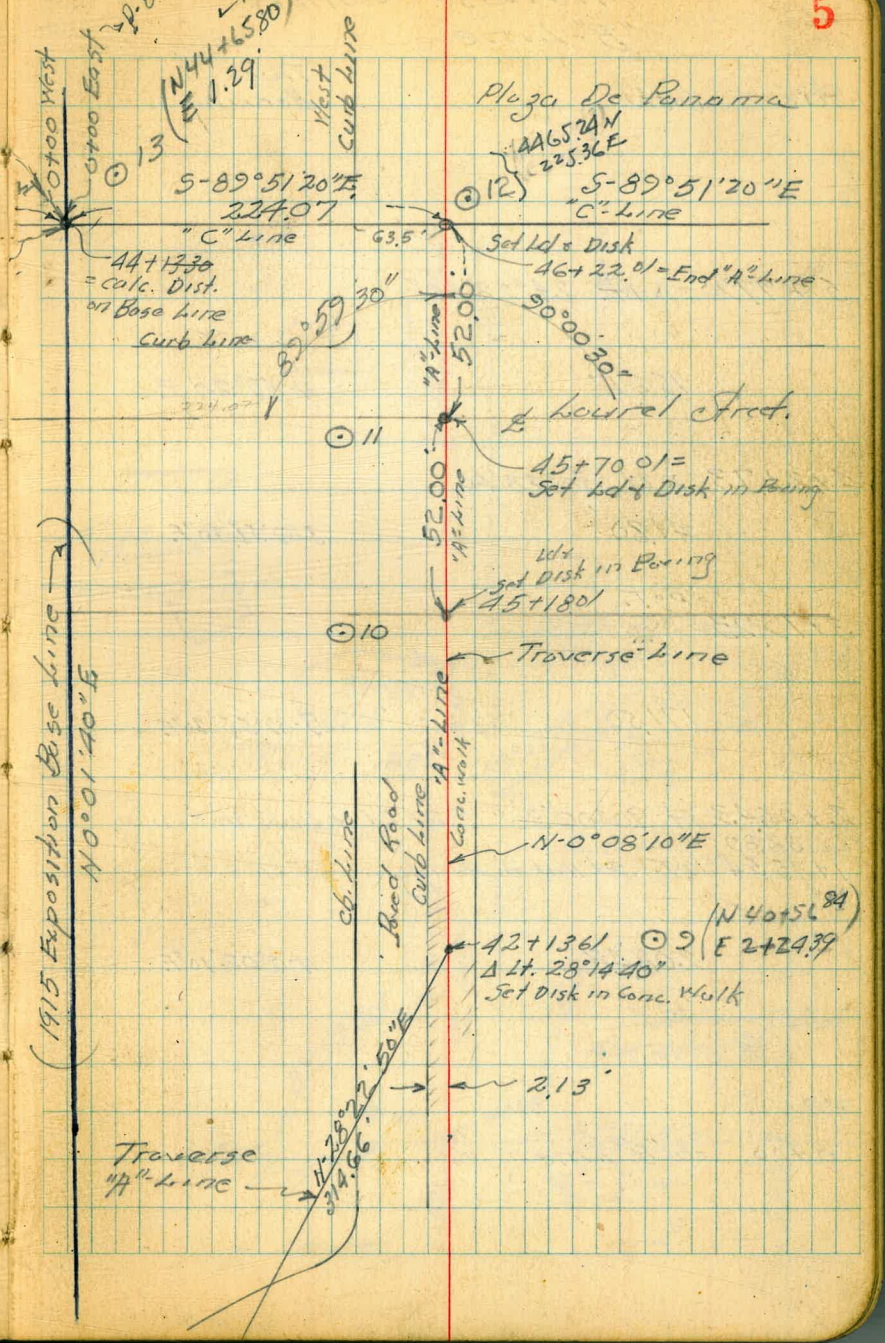
Station	Dist.	True Bearing
Cont. on P-5		
38+98.95 = P.O.T. on Traverse Line		
	155.76	N-28°22'50"E
37+43.19 = P.O.T. on Traverse Line Set Hub		
	383.41	N 28°22'50"E
33+59.78 = Δ Rt 61°54'50" on Traverse		
30+30.41 = Δ Lt. 33°33'48" on Traverse		



Traverse - Topog. Control
Balboa Park Cont. from P.4

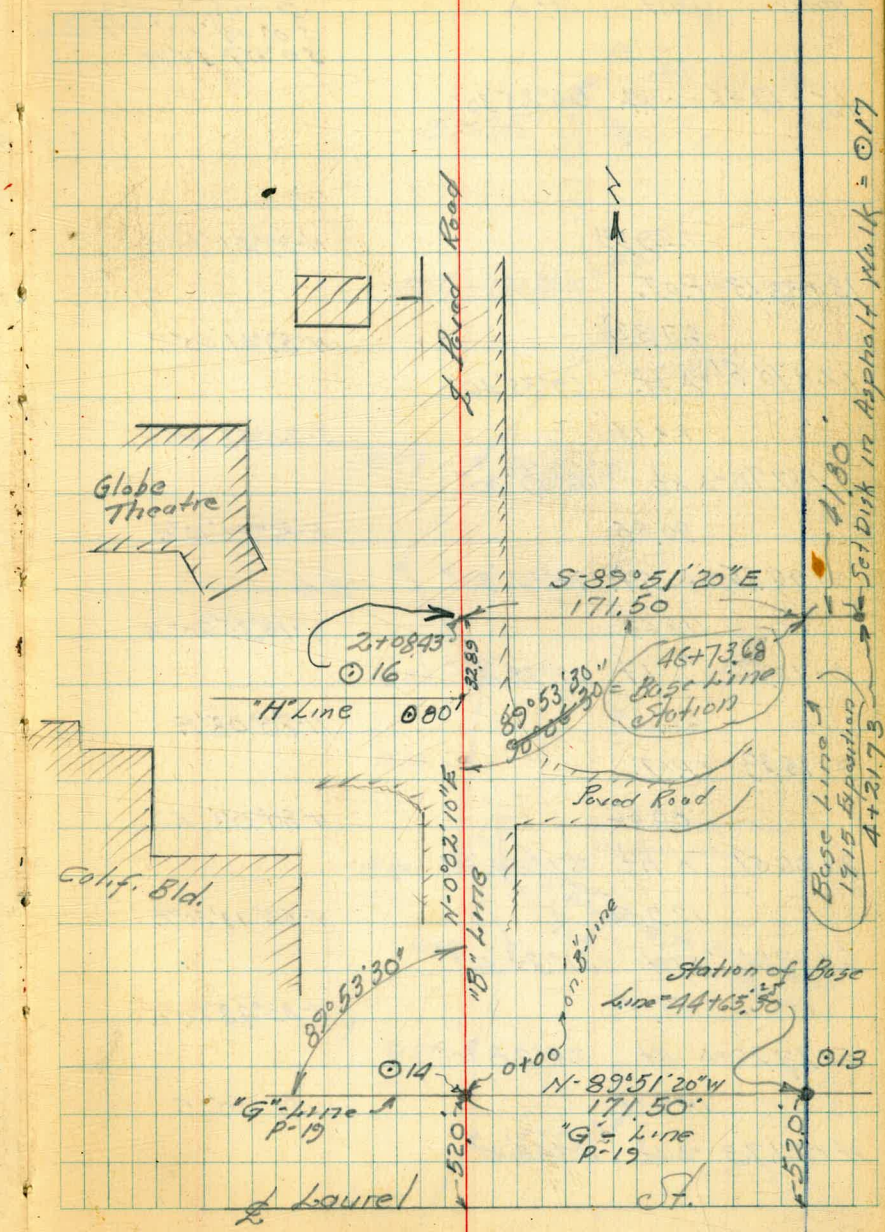
Station	Dist.	
46+22.0' = End "A" Line		
	52.00'	N 0°08'10"E
P.O.T. Δ 89°59'30"		
45+70.0' = Intersection Laurel St. ℄		
	52.00'	N 0°08'10"E
45+18.0' = P.O.T.		
	304.40	N 0°08'10"E
42+13.61' = Δ Lt 28°14'30"		
	314.66'	N 28°22'50"E





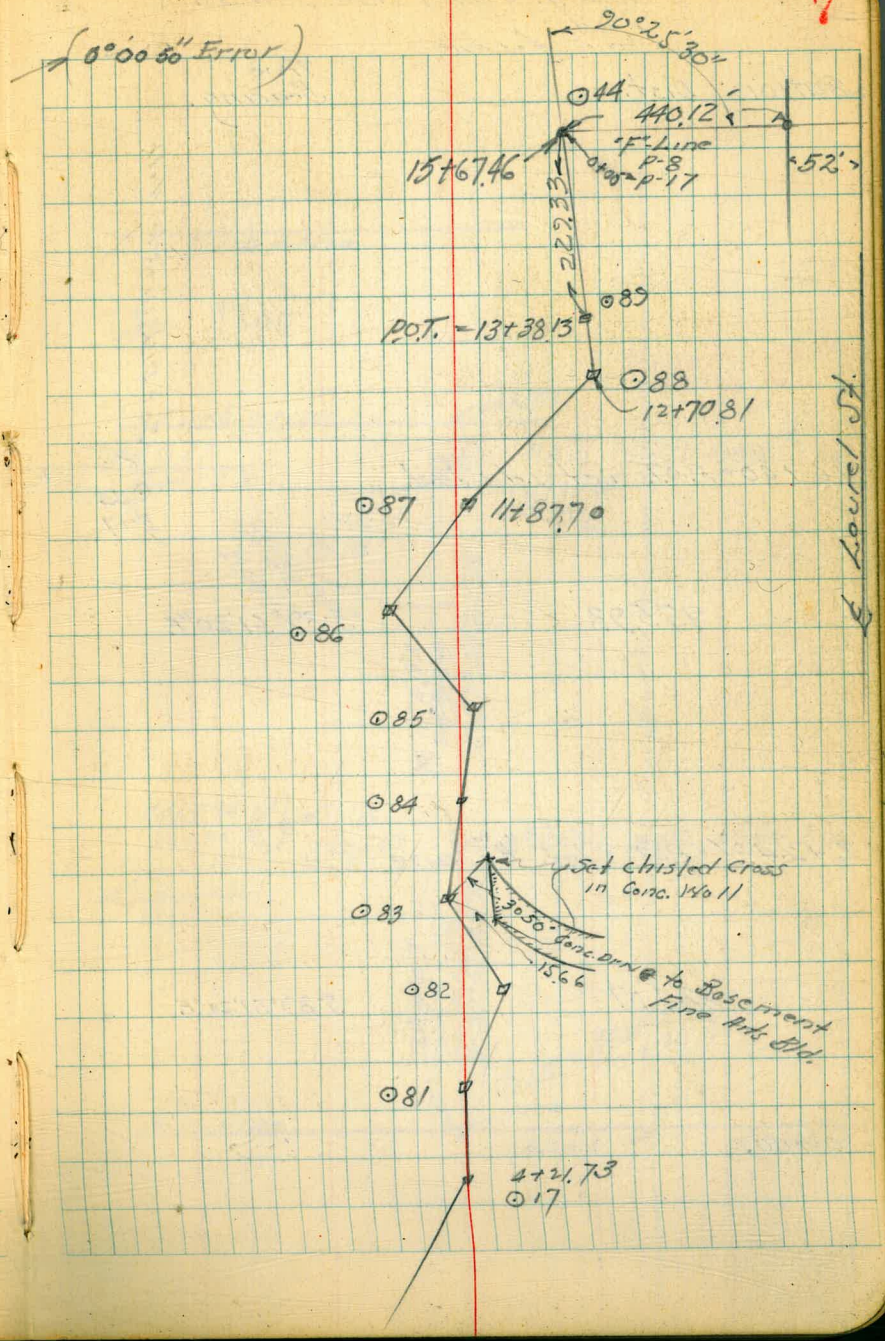
Traverse Control
"B"-Line

Sta.	Dist.	True Bearing	
5 + 77.90 =	Δ Rt. 24°28'20"		
	156.17	N. 59°20' E	
4+21.73	Δ Lt 30°48'40"		
	41.80	S 89°51'20" E	
3+79.93	= P.O.T.		
	171.50	S-89°51'20" E	
2+08.43	Rt 90°06'30"		Set Ld & Disk in Paving
32.89			
1+75.54	P.O.T.		Set Nail in Paving
	208.43	N-0°02'10" E	
0+00	on "B" Line		



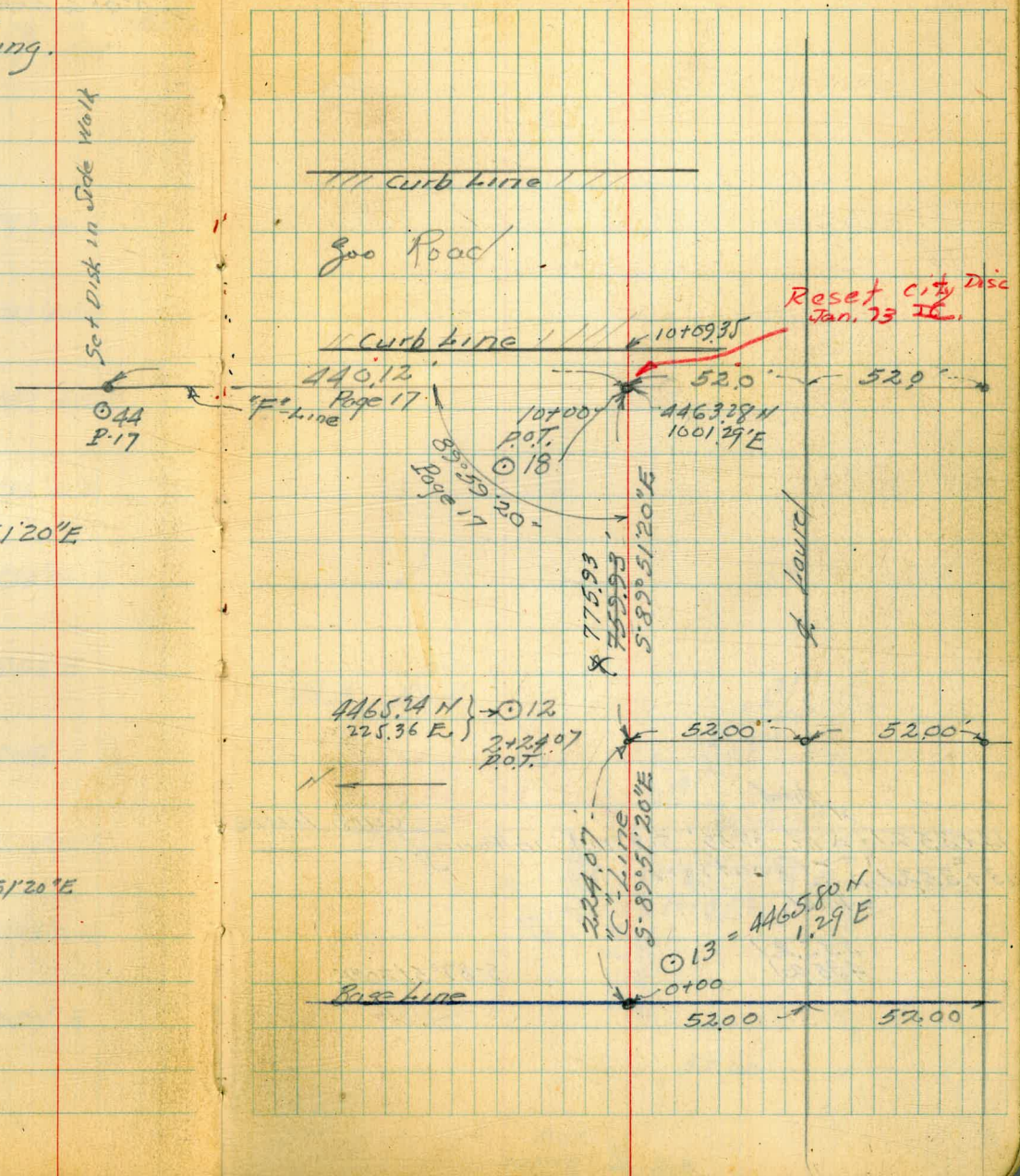
"B"-Line Cont. from P-6

Station	Dist.	Def ∆	True Bearing 50°08' - 00°01' = "F"-Line 50°07'10" W
15+67.46 = ∆ Rt.		90°25'30"	
	229.33		N-89°41'40" E
13+38.13 = P.O.T.			
	67.32		N-89°41'40" E
12+70.81 = ∆ Lt.		69°35'40"	
	83.11		S-20°42'40" E
11+87.70 = ∆ Rt.		66°09'30"	
	90.85		S-86°52'10" E
10+96.85 = ∆ Rt.		74°32'30"	
	118.63		N-18°35'20" E
9+78.22 = ∆ Lt.		61°32'40"	
	62.89		N-80°08' E
9+15.33 = P.O.T.			
	88.82		N-80°08' E
8+26.51	∆ Rt	27°54'30"	
	129.50		N-52°13'30" E
6+97.01	∆ Lt.	31°34'50"	
	119.11		N-83°48'20" E
5+77.90 = ∆ Rt		24°28'20"	
	156.17		N-59°20' E
4+21.73 = ∆ Lt		30°48'40"	



Topog. Control - Balboa Park
"C" - Line

Station	Dist.	True Bearing.
10+00 = P.O.T. Set Ld & Disk		
	775.93	S-89°51'20"E
2+24.07 = P.O.T. = Int. "A"-Line		
	224.07	S-89°51'20"E
0+00 =		



14+35.21 = Δ Rt. 89°59' Set Disk in Paving.
13+35.21

→ Ahead
→ Equation
→ back

335.21
435.21

S-89°51'20"E

Curb Line

Park Blvd.

Reset with City Disc Jan. '73

elv. 28.86

1446.43 N
1336.50 E

⊙19

"C" Line

S-0°07'40"W

14+35.21 = 13+35.21 } Equation

89°59'

335.21
435.21

"C" Line

S-89°51'20"E

℄ Lane

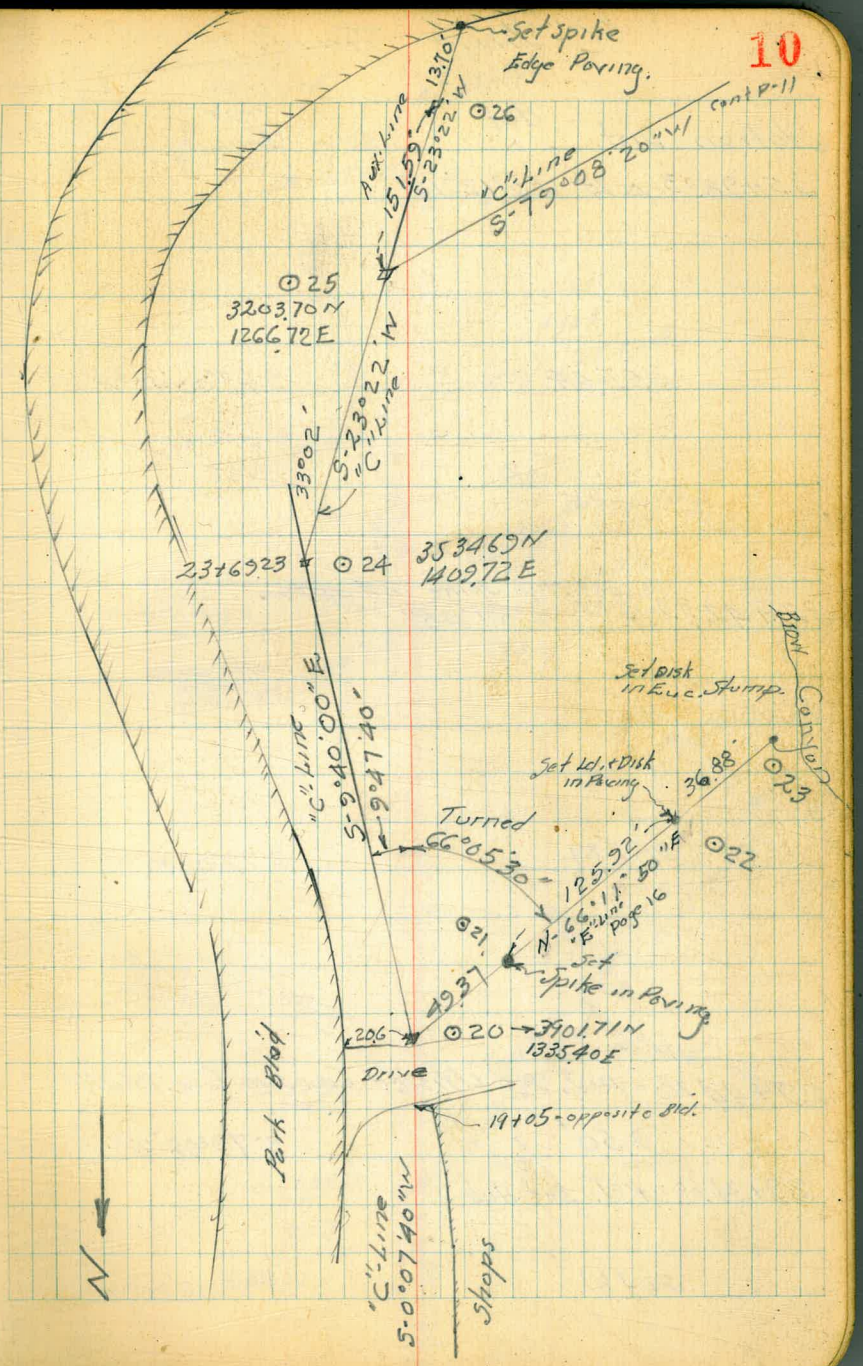
52.00'

P.O.T.
10+00
P-8

⊙18

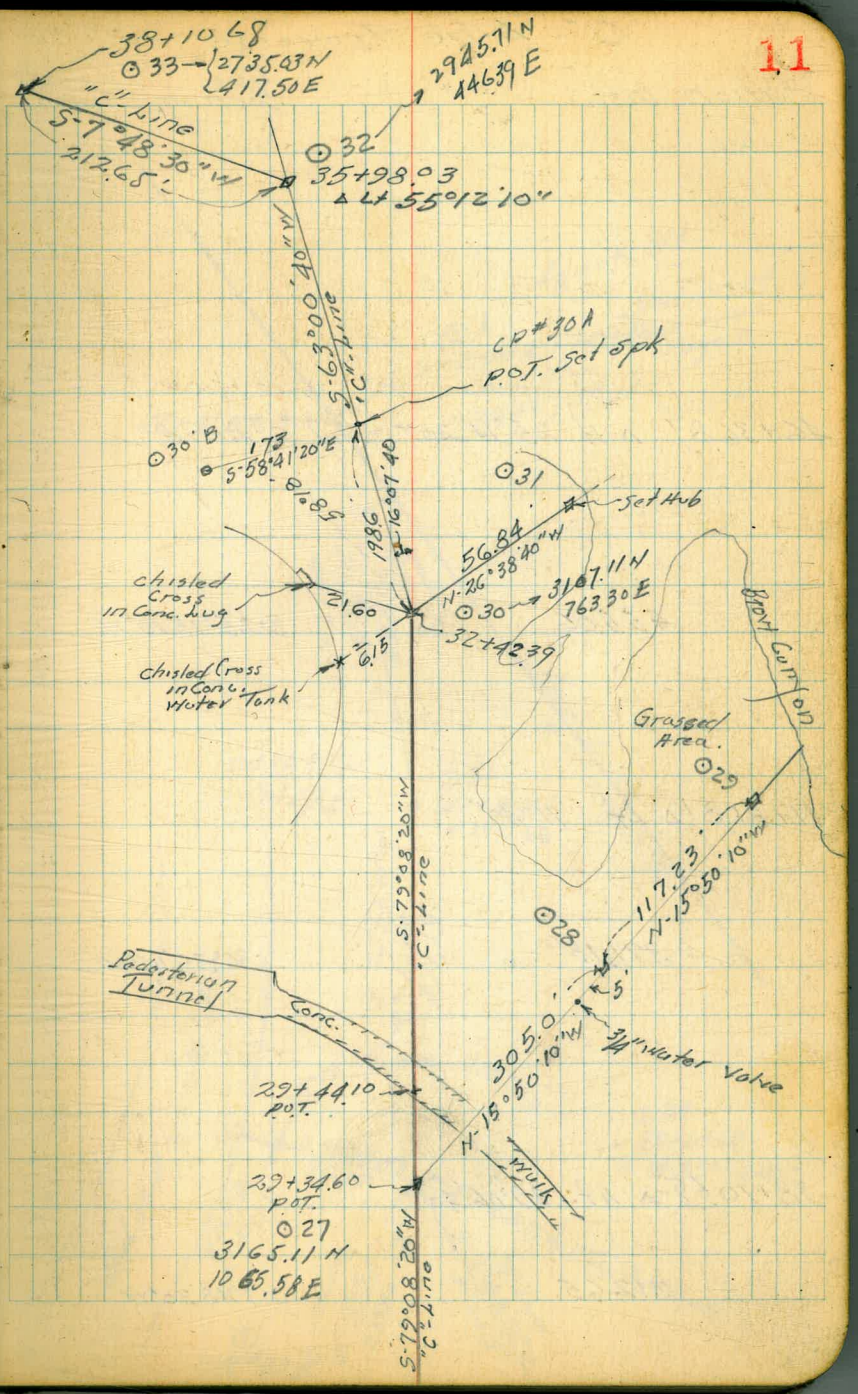
"C"-Line Traverse

Station	Dist.	True Bearing
29+34.60 = P.O.T. Set Hub		
	204.81	
27+29.79 = Δ Rt 55°46'20"		
	360.56	S-23°22'W
23+69.23 Set Hub Δ Rt. 33°02'		
	442.60	S-9°40'E
19+26.63 Set Hub = Disk Δ Lt. 9°47'40"		
	491.42	S-0°07'40"W



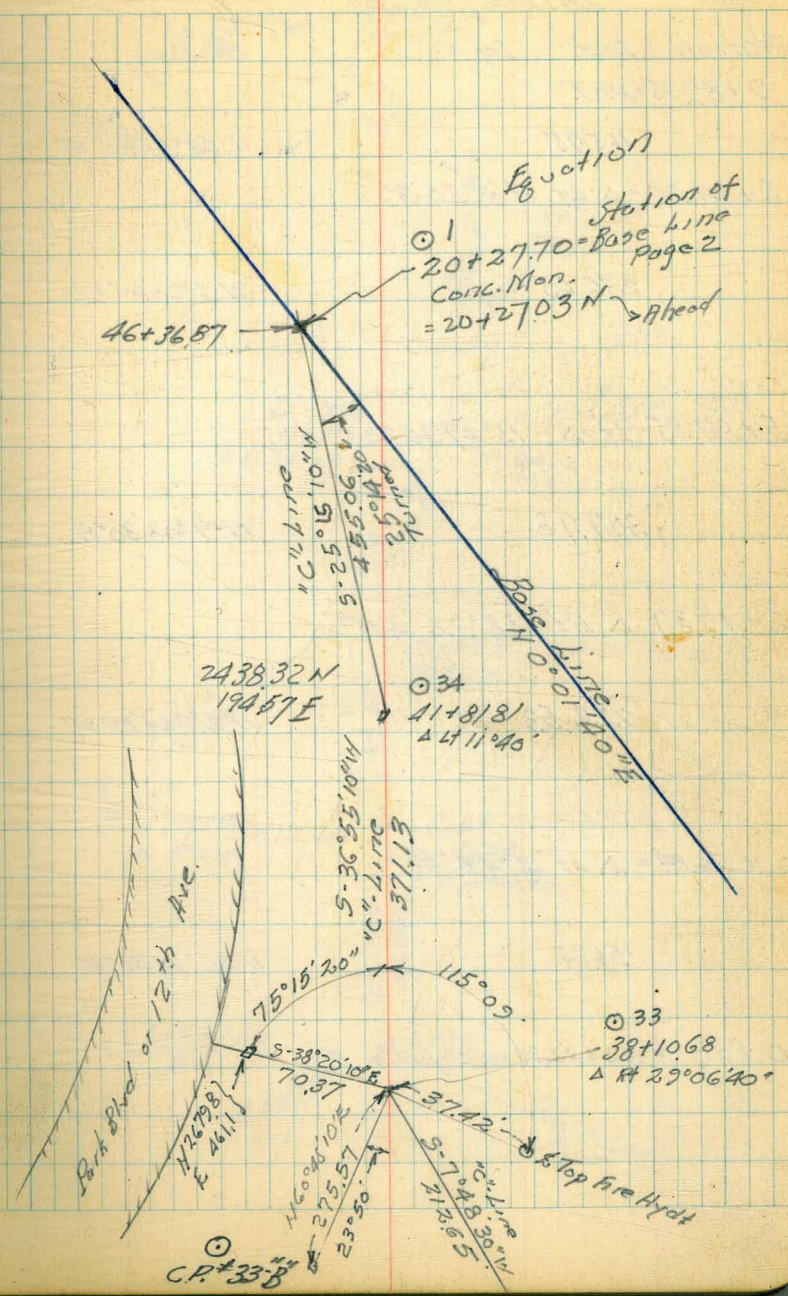
"C" Line Traverse

Station	Dist.	def △	True Bearing.
35+98.03		△ Lt 55°12'10"	
	355.64		S-63°00'40"W
32+42.39 Lt.		Set ~~Hub~~ Spike in Hard Pan 16°07'40"	
	298.29		S-79°08'40"W
29+44.10 = P.O.T. Set Chisled Cross in Conc. Walk			
	9.50'		S-79°08'20"W
29+34.60 = P.O.T. Set Hub			
	304.81		S-79°08'20"W



"C"- Line Traverse

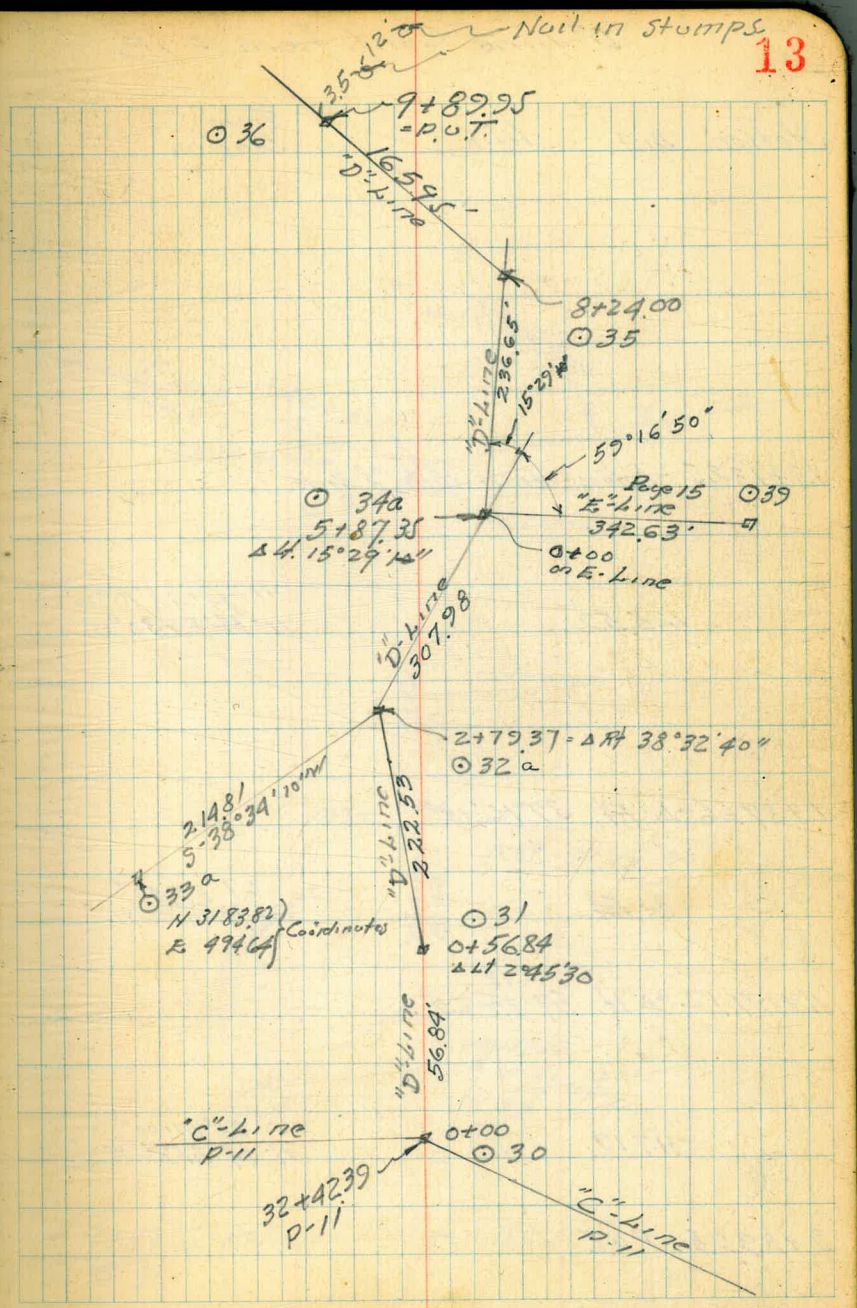
Station	Dist.		True Bearing.
46+36.87		Δ Lt 25°14'20" = End "C"-Line	
	455.06		S-25°15'10"W
41+81.81		Δ Lt 11°40'	
	371.13'		S-36°55'10"W
38+10.68		Δ Rt. 29°06'40"	
	212.65		S-7°48'30"W



"D" Line · Traverse · Topog. Control

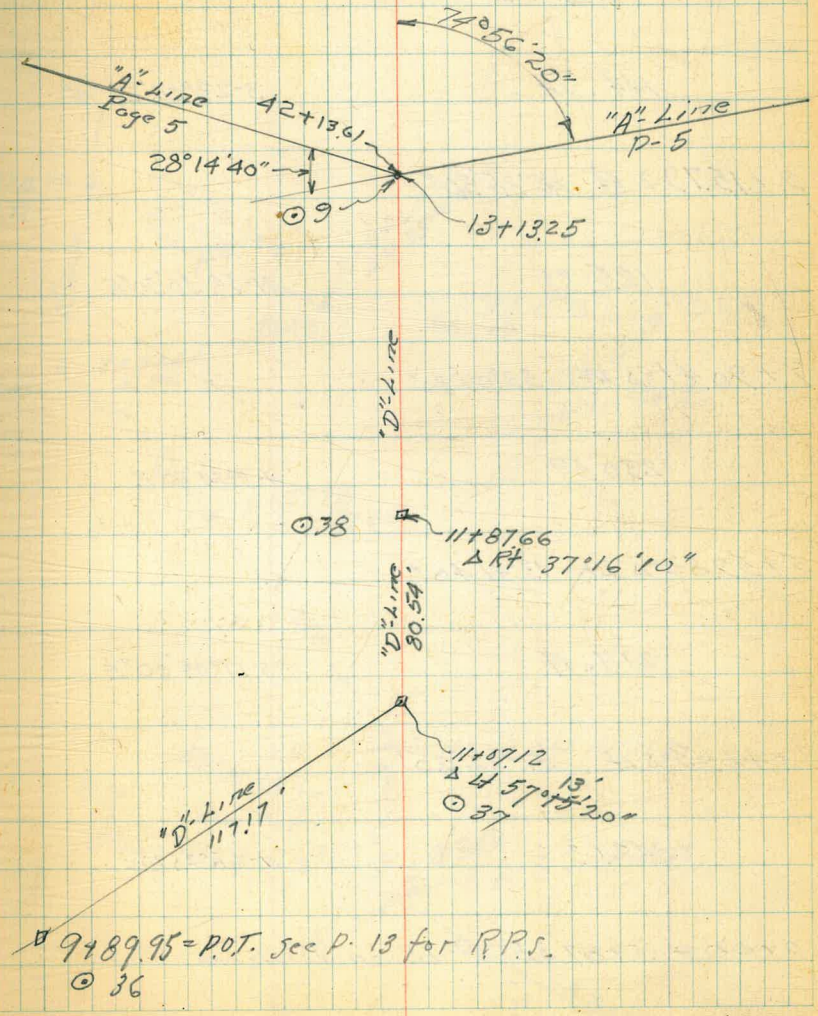
Balboa Park

Station	Dist.	Def Δ	True Bearing.
9+89.95 = P.O.T.			
	165.95		N·59°51'00"W
8+24.00 = Δ Lt 48°30'30"			
	236.65		N·6°20'30"W
5+87.35 = Lt Δ 15°29'10"			
	307.98		N·9°08'30"E
2+79.37 Δ Rt 38°32'40			
	222.53		N·29°24'10"W
0+56.84 = Δ Lt 2°45'30			
	5684		N·26°38'40"W
0+00 = 32+42.39 on "C"-Line P-11			



"D"-Line Cont. from P. 13

Station	Dist.	def. Δ	True Bearing
13+13.25 = Intersection With "A"-Line			
	125.59'		N 74°48'10" W ~~N-74°50'30" W~~
11+87.66 = Δ Rt. 37°16'10"			
	80.54		67°55'40" ~~S-67°55'30" W~~
11+07.12 = Δ Lt. 57°~~15~~13'20			
	117.17		54°51'00" ~~N-54°51'15" W~~
9+89.95 = P.O.T.			



"E"-Line Traverse
Topog. Control - Balboa Park

10+60.03 = Δ Lt. 35°00'00"

144.24 S-23°06'20"W

9+15.79 Δ Rt 146°35'30"

125.38 N-56°30'50"E

7+90.41 = Δ Rt 53°09'30"

230.59 N-3°21'20"E

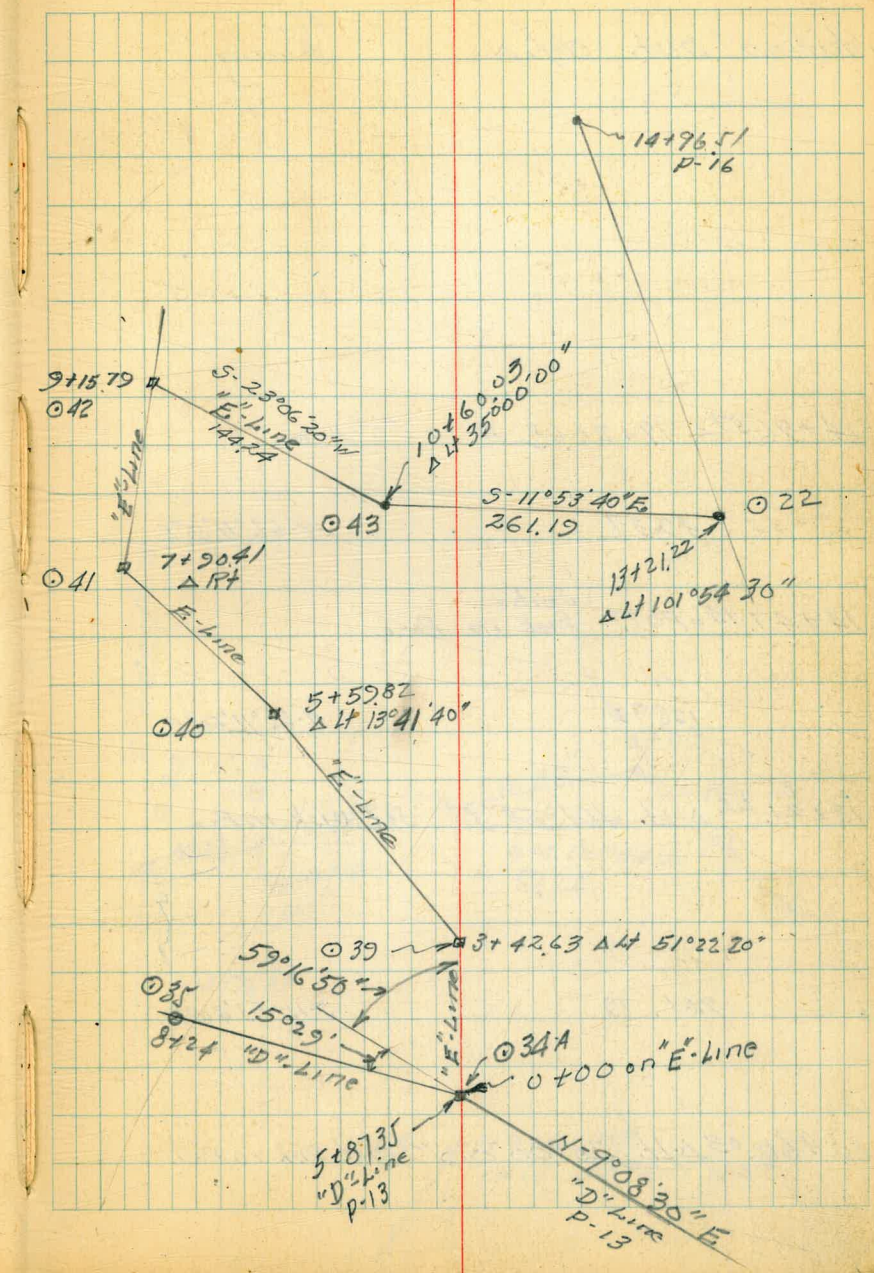
5+59.82 = Δ Lt. 13°41'40"

217.19 N-17°03'00"E

3+42.63 = Δ Lt 51°22'20"

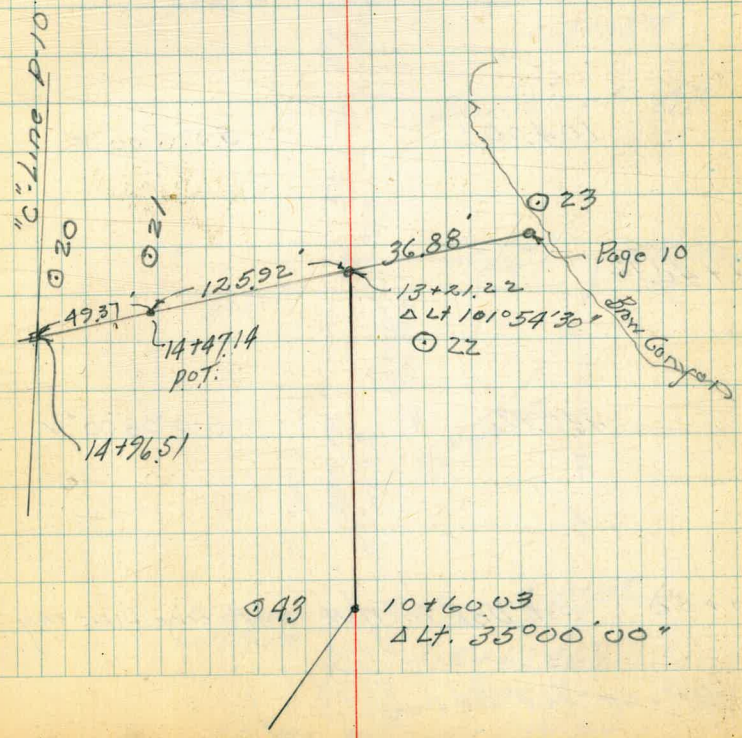
342.63 N-68°25'20"E

0+00 = 5+87.35 P-13 on "D"-Line



"E"-Line Cont. from P-15

Station	Dist.	def. Δ	True Bearing
14+96.51 = 19+26.63 P-10 = "C"-Line			
	49.37		N-66°11'50"E
14+47.14 = P.O.T.		Spike Disk in Pav.	
	125.92		N-66°11'50"E
13+21.22		Δ Lt. 101°54'30	Set Disk in Pav.
	261.19		S-11°53'40"E
10+60.03		Δ Lt. 35°00'00"	Set Disk in Pav.



"F"- Line Traverse

Topog. Control

Balboa Park

8+61.32

302.57 58°14'50" W

5+58.75 81°53'50" Lt

14.63 N-89°51'20" W

5+44.12 = ∠ Rt. 90°00'40"

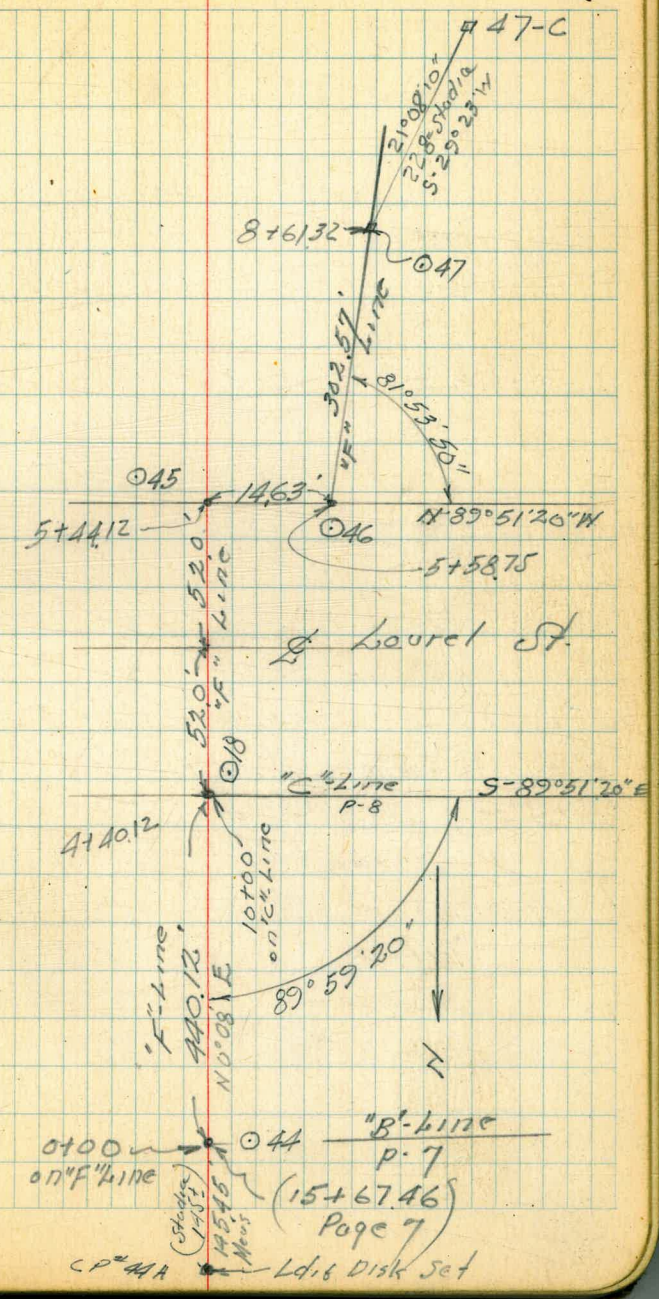
104.00' S-0°08'00" W

4+40.12

440.12' S-0°08'00" W

0+00 Set Disk in Walk North edge Drive Way

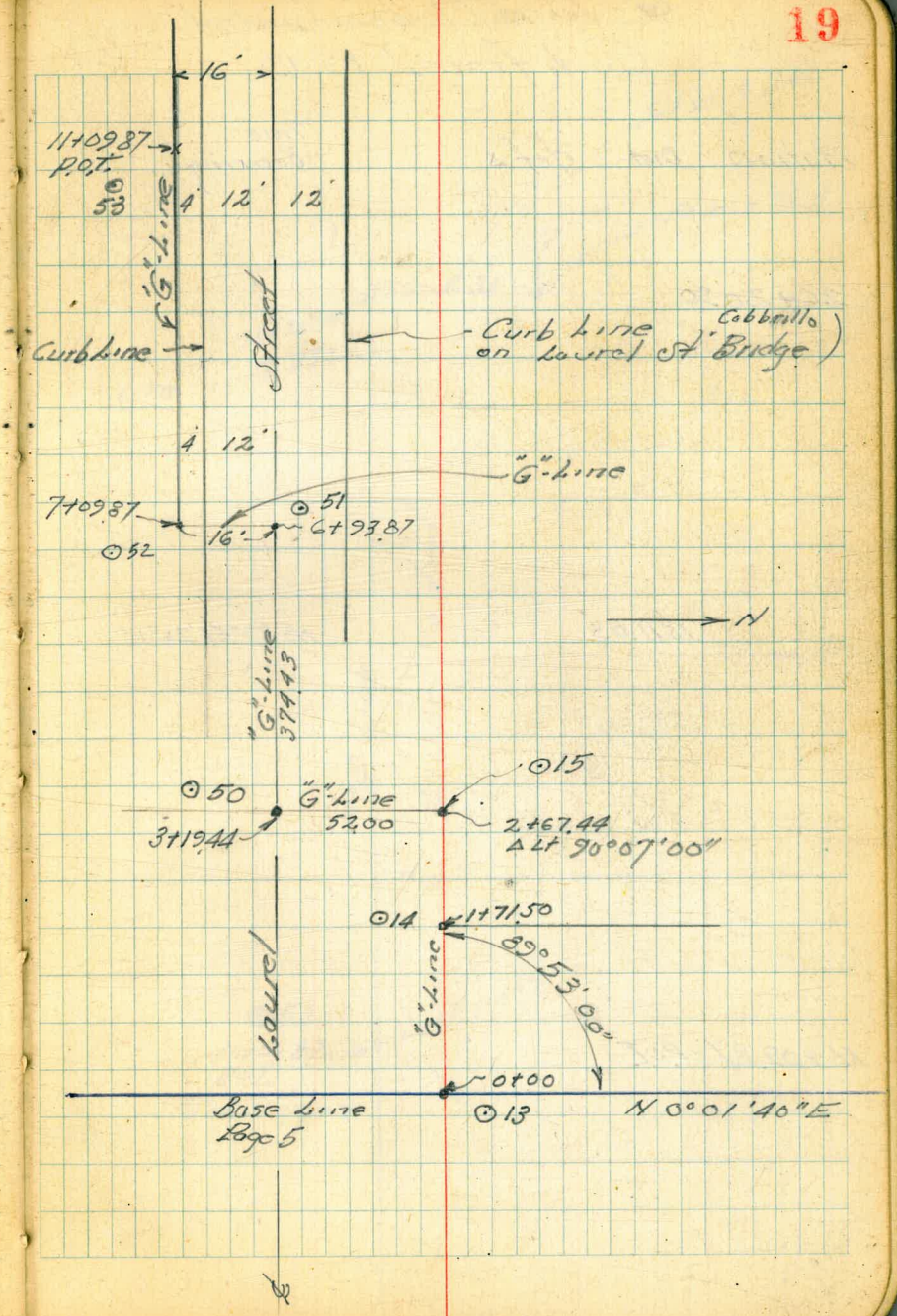
0-145' - CP "44A Set Disk



"G" Line Traverse - Topog. Control

Balboa Park

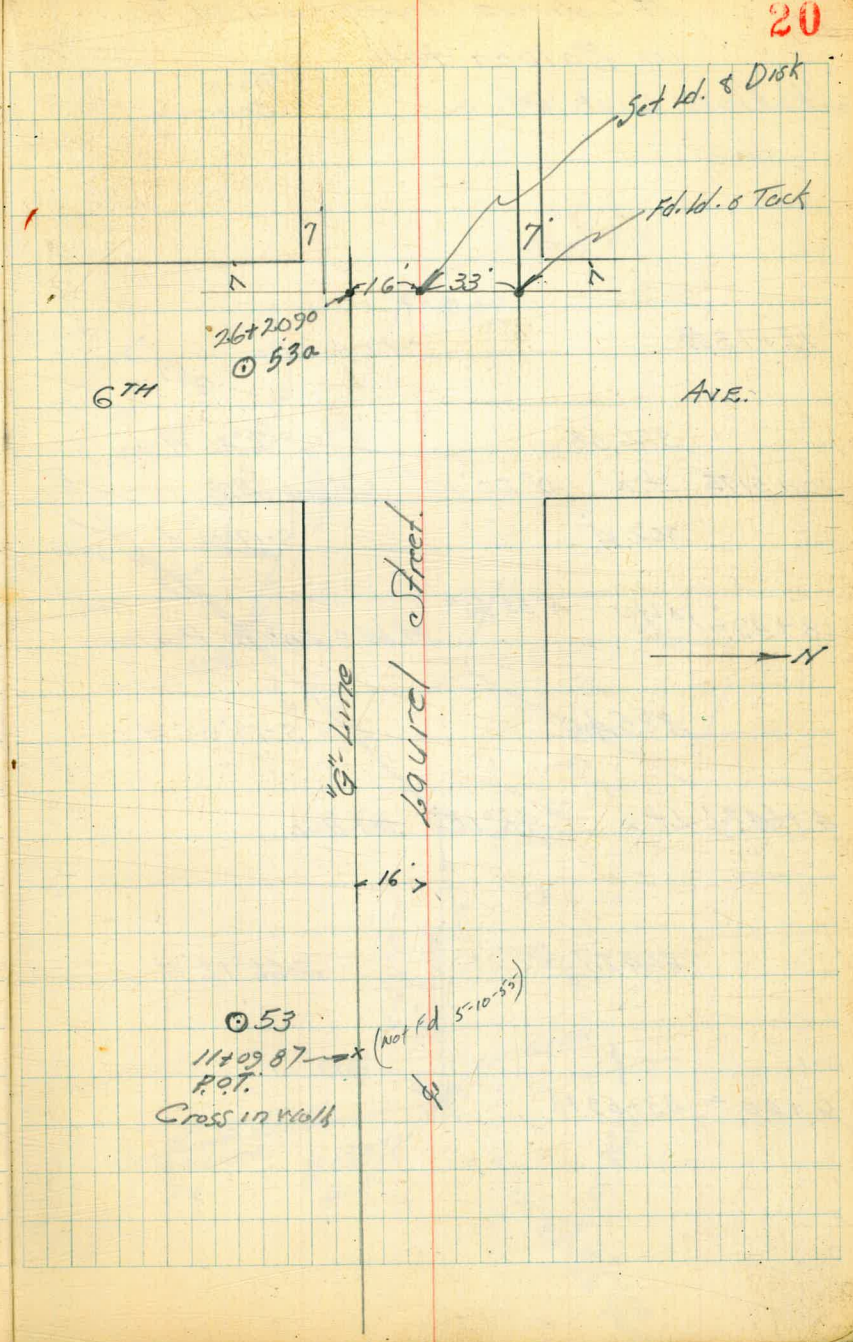
Station	Dist.	def. Δ	True Bearing.
11+09.87 = P.O.T. Chisled Cross in Side Walk			
	400.0'		N-89°51'20"W
7+09.87 = Δ Rt.		90°07'00"	Set Ld & Disk
	16'		S-0°01'40"W
693.87 = Δ Lt.		90°07'00"	Set Nail in Pav.
	374.43		N-89°51'20"W
3+19.44 Δ Rt		90°07'00"	Set Nail in Paving
	52.0'		S-0°01'40"W
2+67.44 Δ Lt.		90°07'00"	Ld & Disk
	95.94		N-89°51'20"W
1+71.50 = P.O.T.			
	171.50		N-89°51'20"W
0+00 = Base Line			Ld & Disk



"G" Line Topog. Control

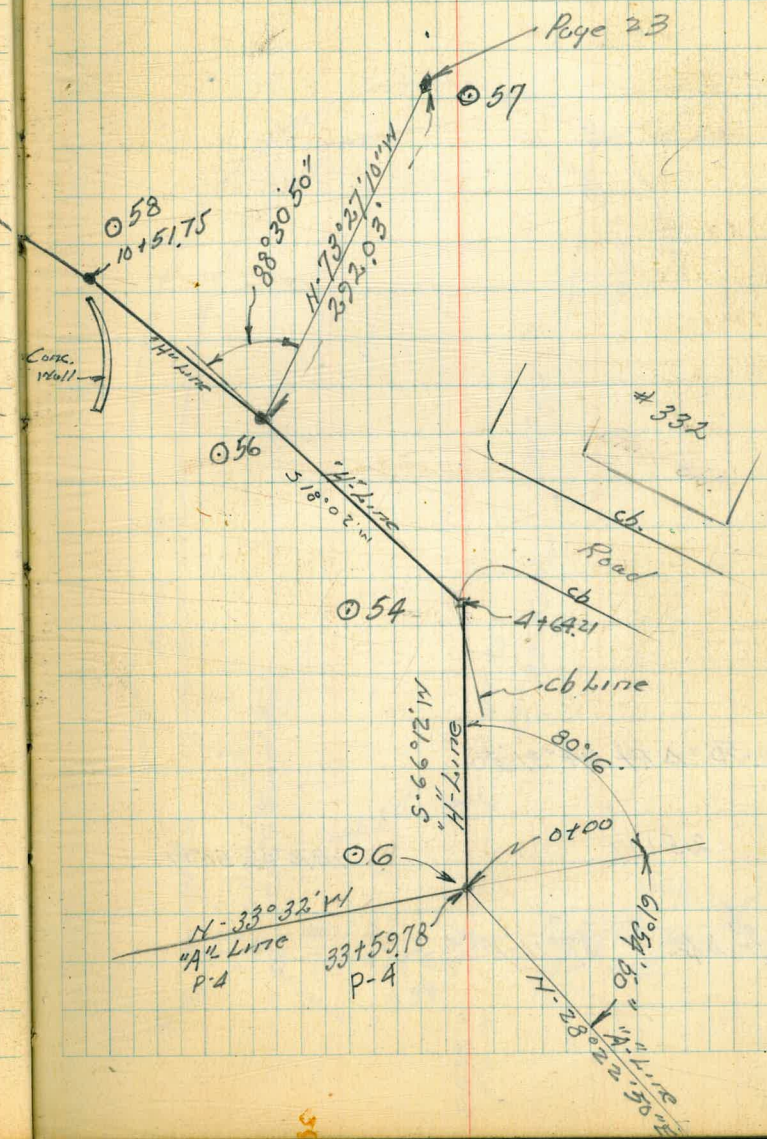
Cont. from P-19

Station	Dist.	def ∆	True Bearing
26+20.90			
	1511.03'		N-89°51'20" W
11+09.87 = P.O.T.			



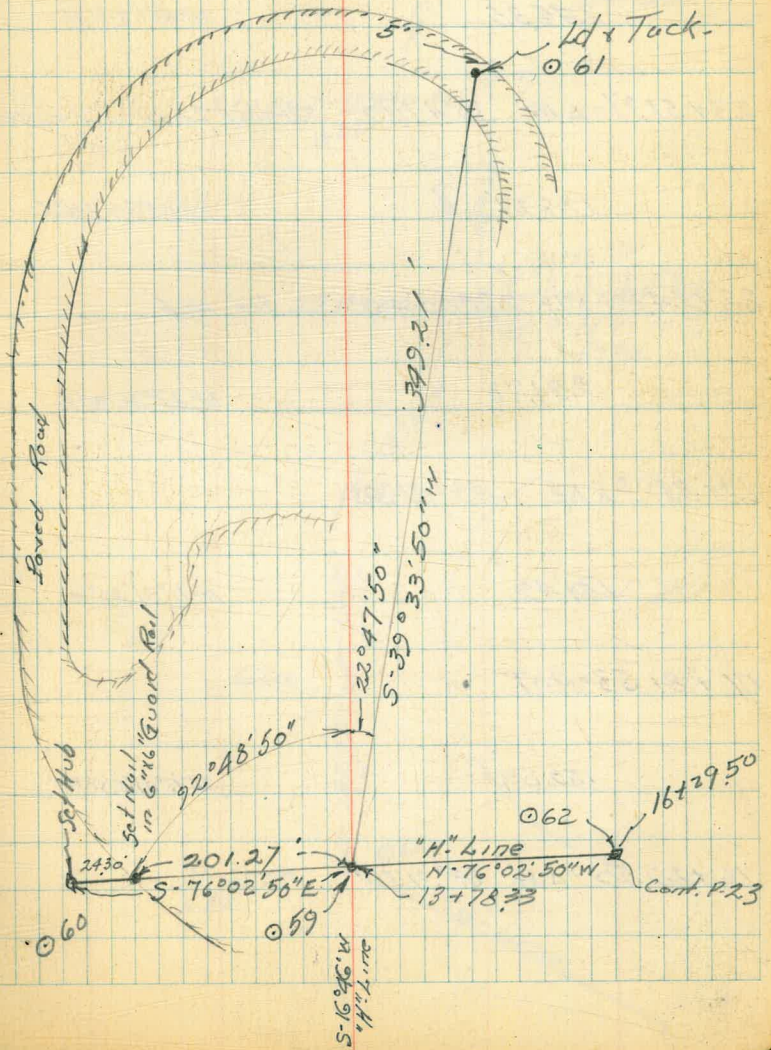
"H" Line - Topog. Control Traverse
in Balboa Park

Station	Dist.	Def. ∆	True Bearing	
13+78.33				Set Disk in Pav.
	326.58		S-16°46'W	
10+51.75	Lt. ∆	0°20'10"		Set Disk Ld Plg.
	202.14'		S-17°06'10"W	Ford Bowl
8+49.61	∆ Lt	0°55'50"		Set Ld & Disk in Paving
	385.40		S-18°02'W	
4+64.21	Lt ∆	48°10'		Set Hub
	464.21		S-66°12'W	
0+00 =	33+59.78			



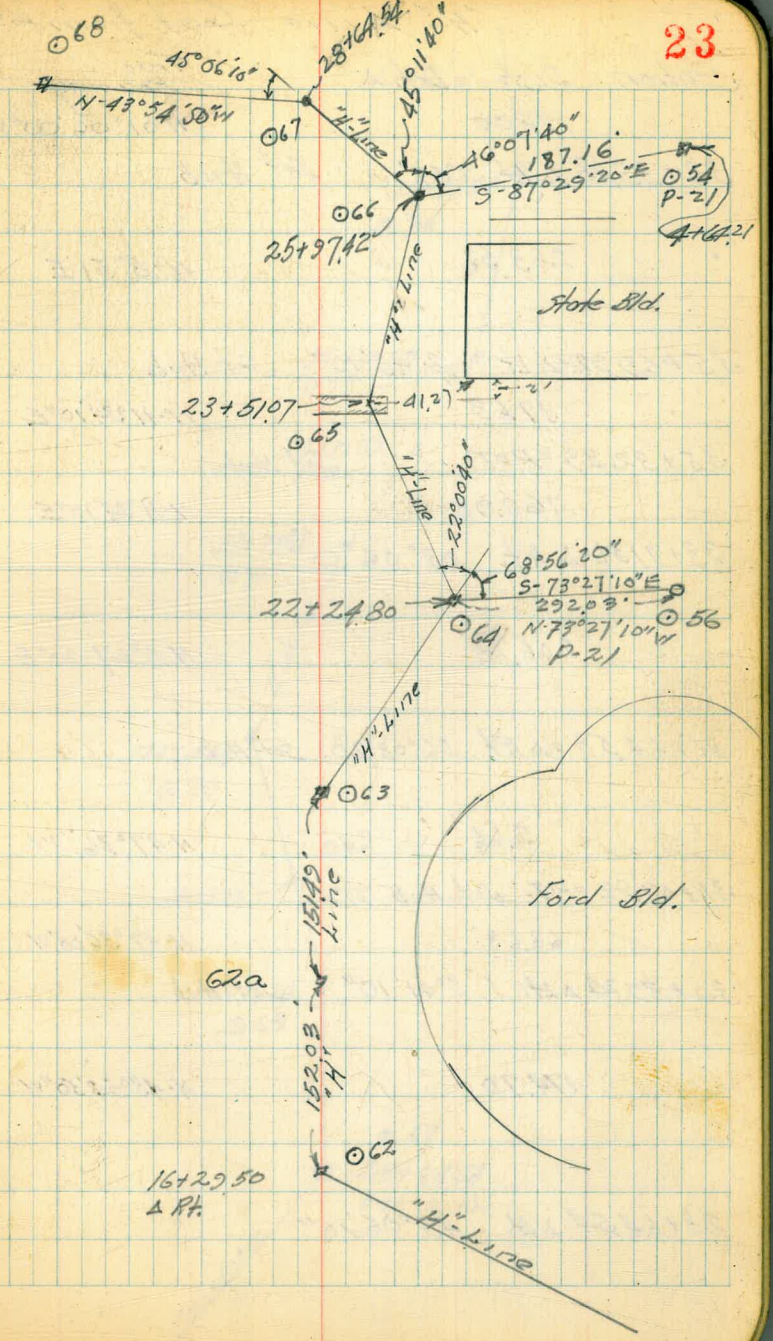
"H" Line Cont. from P-21

Station	Dist.	Def. Δ	True Bearing
16+29.50 = Δ Rt		64°31'30	
	251.17		N-76°02'50"W
13+78.33 Δ Rt.		87°11'10"	



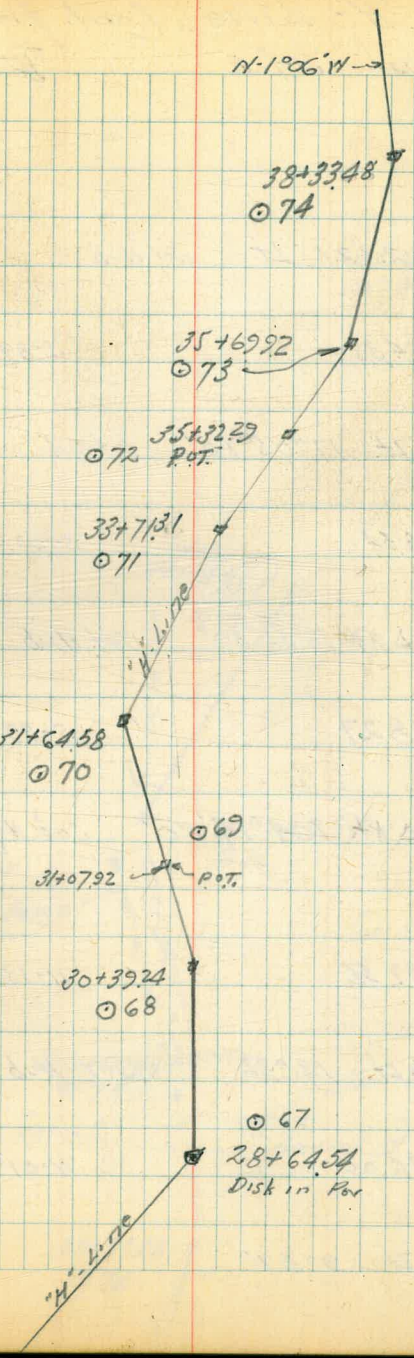
"H" Line Cont. from P-22

Station	Dist.	Def ∆	True Bearing
28+64.54 ∆		45°06'10"	Set Disk in Paving
	267.12		N-1°11'20"E
25+97.42 ∆ Lt.		45°11'40"	Set Disk in Paving
	246.35'		N-46°23'E
23+51.07 = ∆ Rt		30°47'10	chisled Cross in Conc. Walk
	126.27'		N-15°35'50"E
22+24.80 ∆ Lt.		22°00'40"	Set Hub
	291.78		N-37°36'30"E
19+33.02 ∆ Rt		49°07'50	
	151.49'		N-11°31'20"W
17+81.53 = P.O.T.			
	152.03'		N 11°31'20"W
16+29.50 = ∆ Rt.		64°31'30"	



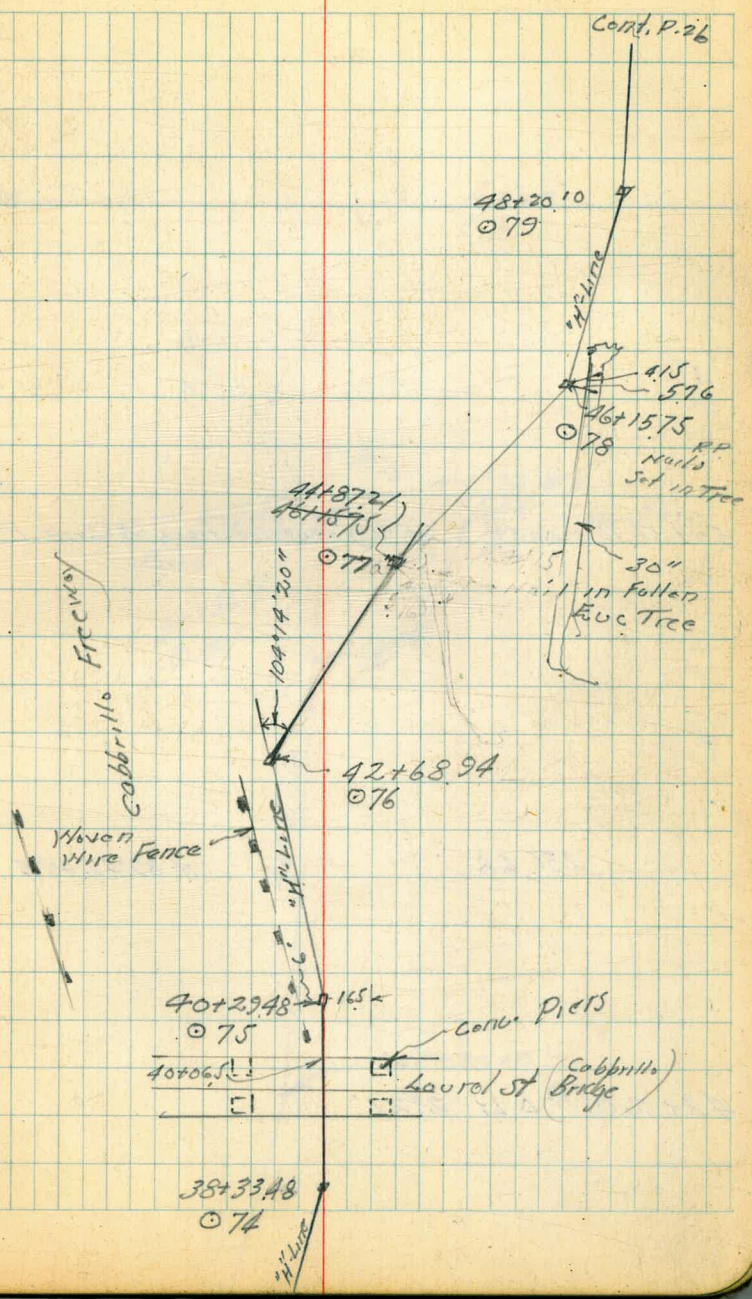
"H" Line Cont. from P. 23

Station	Dist.	Defl. Δ		True Bearing
	196.00			N 01°06'00" W
38+33.48 Δ Lt		9°57'	Set Hub	
	263.56			N-8°51' E
35+69.92 = Δ Lt		2°43'10"	Set Hub	
	37.63			N-11°34'10" E
35+32.29 = P.O.T.			Set Hub	
	160.98			N-11°34'10" E
33+71.31 = Δ Rt.		03°06'50"		
	206.73			N 8°27'20" E
31+64.58 = Δ Rt.		56°03'20	Set Hub	
	56.66'			N-47°36' W
31+07.92 = P.O.T.			Set Hub	
	68.68'			N-47°36'00" W
30+39.24 Δ Lt.		3°41'10"	Set Hub	
	174.70			N-43°54'50" W
28+64.54 Δ Lt.		45°06'10"		



"H" Line Cont. from P. 24

Station	Dist.	Def. Δ		True Bearing
48+20.10		Δ 2°21' Lt	Set Hub	
	204.35			S-87°56'20"E
46+15.75 = Δ Lt.		17°05'10"	Set Hub.	
	128.54			S-70°51'10"E
44+87.21 = Δ Rt		18°36'30"	Set Hub	
	218.27			S-89°27'40"E
42+68.94 = Δ Rt.		104°14'20"	Set Hub	
	239.46			N-13°42'W
40+29.48 = Δ Lt.		12°36	Set Hub	
	196.00			N-01°06'00"W
38+33.48 = Δ Lt		9°57'		

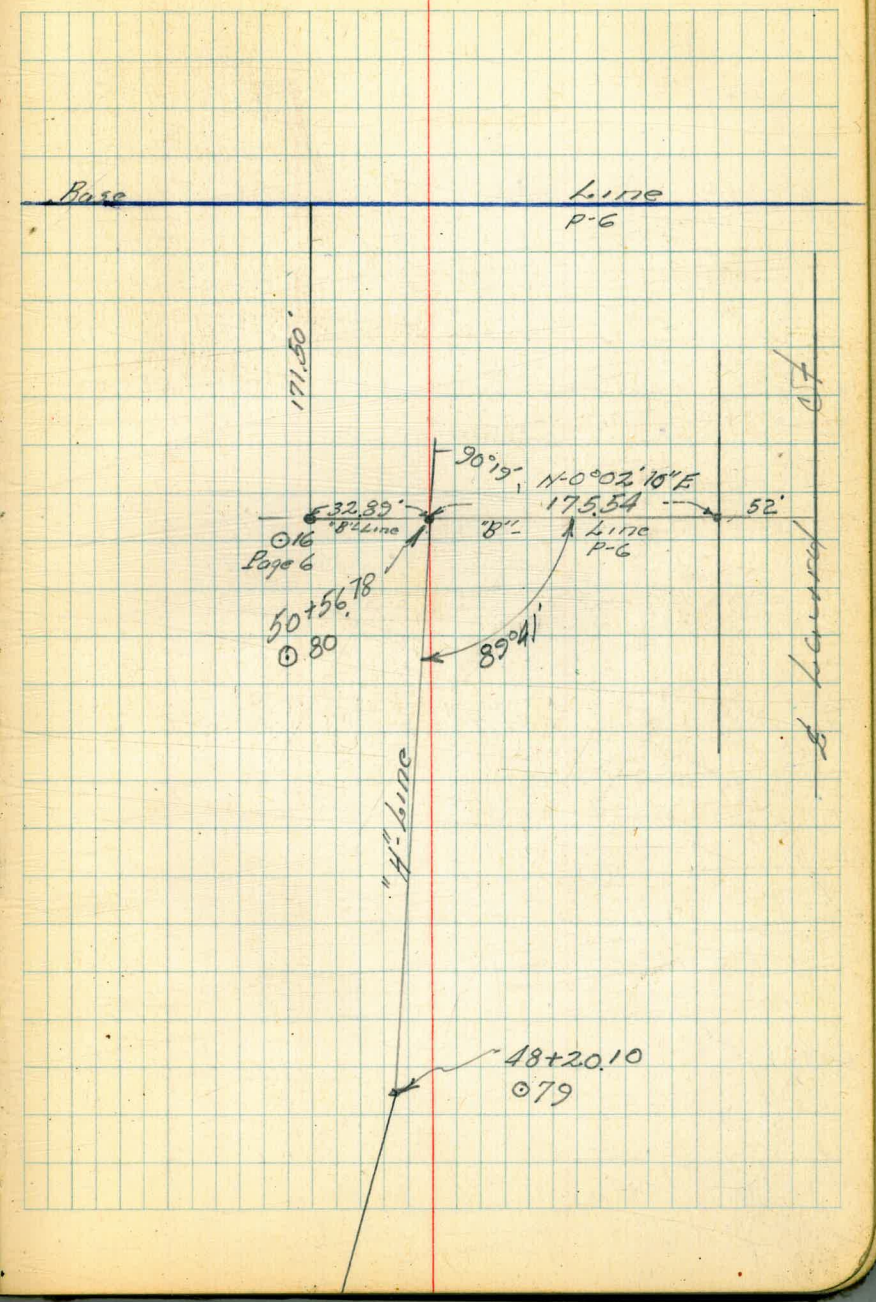


"H"- Line Cont. from P-25

50+56.78 = Δ Rt. 90°19' = Intersection "B"-Line P-6

236.68 N-89°42'40"E

48+20.10 Δ Lt 2°21'

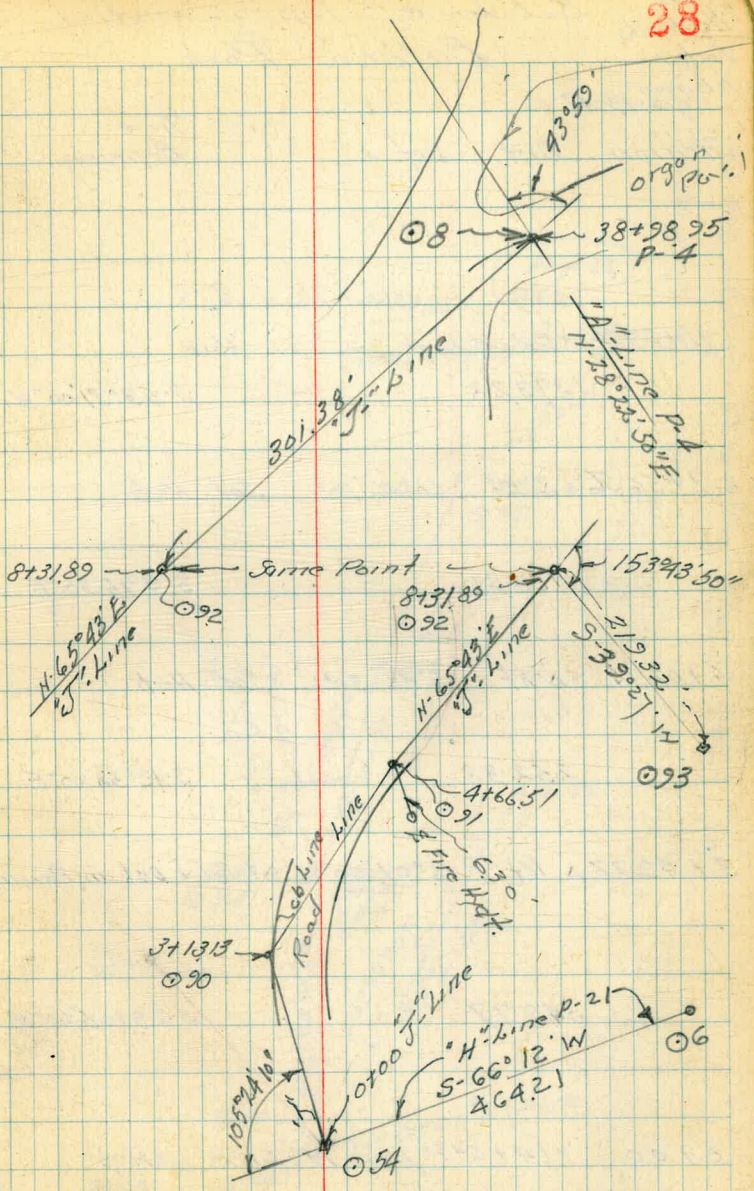


Walker
Hendricks
Hacker
Johnson 12-18-47

"J"-Line Traverse – Topog. Control

Balboa Park.

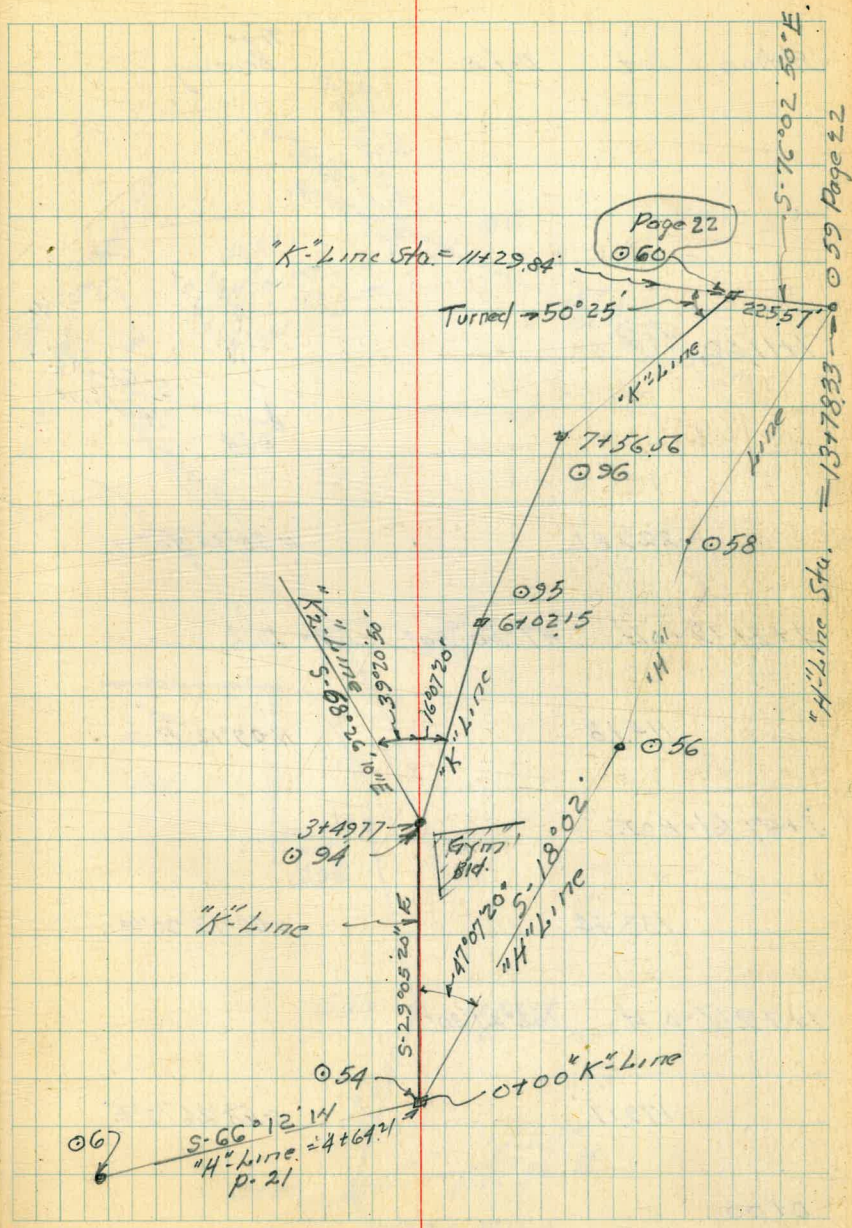
Station	Dist.	Def ∆	True Bearing
11+33.27 = intersection "A" Line P-4 = End "J" Line			
	301.38'		N-72°20'40"E
8+31.89 ∆ Rt		6°37'40"	Set Disk in Paving.
	365.38		N-65°43'00"E
4+66.51 ∆ Rt		21°48'50"	Set Disk Paving.
	153.38		N-43°54'10"E
3+13.13 ∆ Rt.		52°18'10"	Set Disk in Paving inside of Curb
	313.13		N 08°23'50"W
0+00 = (4+64.21 on "H" Line P-21)			



Walker
Hendricks
Becker
Johnson
12-19-47

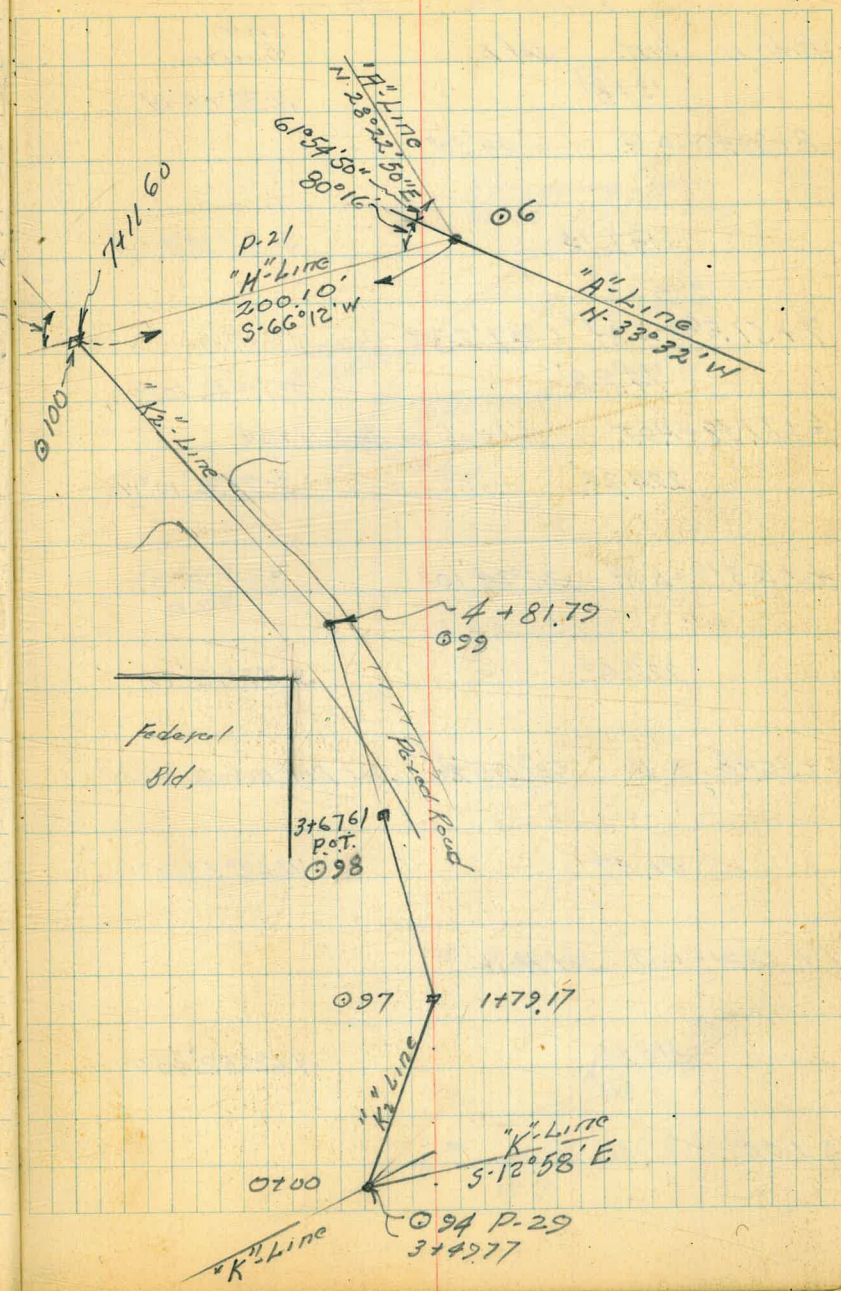
"K"-Line - Topog. Control
Balboa Park

Station	Dist.	Def. Δ	True Bearing
11+29.84 = End "K" Line			Hub
	373.28'		S-53°31'00"W
7+56.56 = Δ Rt		60°46'30"	Set Hub
	154.41'		S-7°15'30"E
6+02.15 = Δ Rt		5°42'30"	Set Hub
	252.38		S-12°58'00"E
3+49.77 Δ Rt		16°07'20	Set Ld & Disk in Paving
	349.77'		S-29°05'20"E
0+00 = (4+64.21) on "H"-Line			= Hub



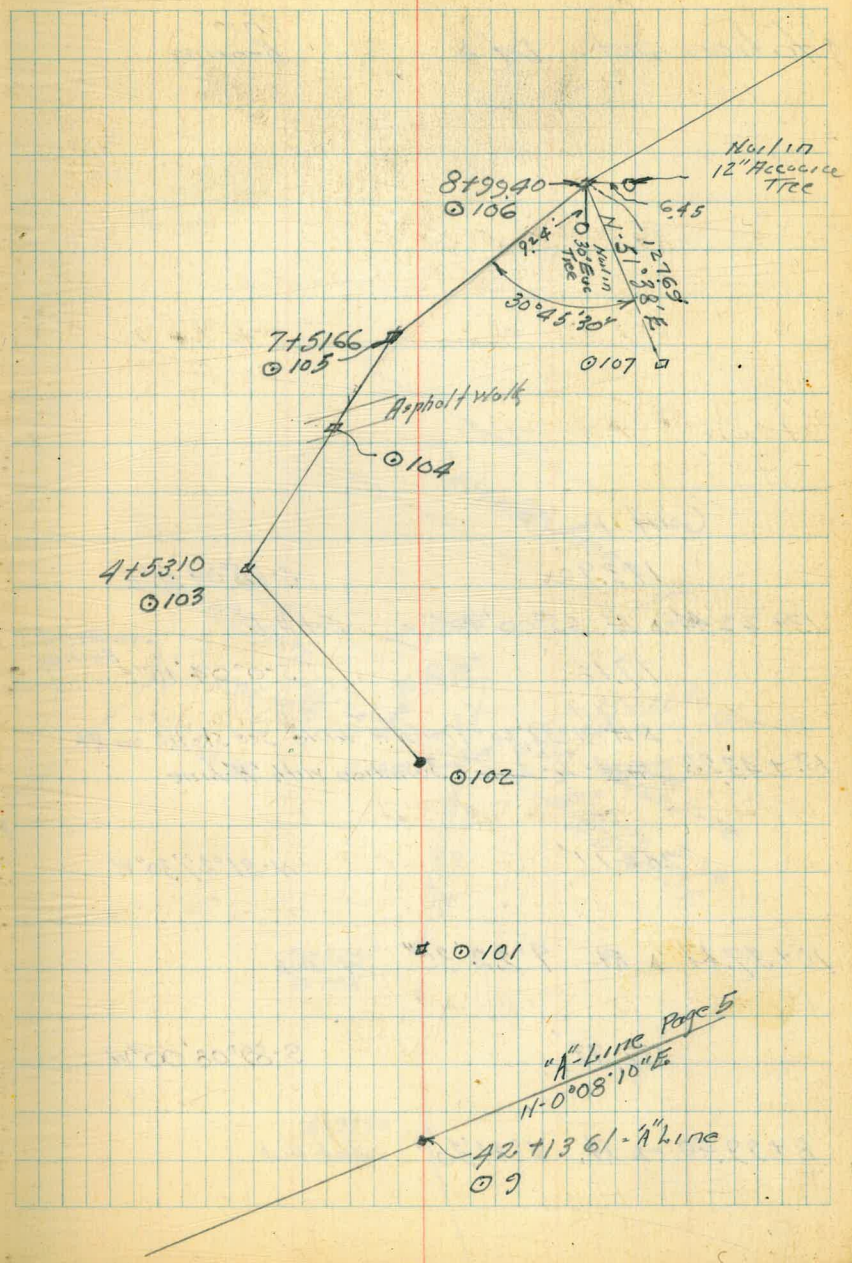
12-19-47 "K2"- Line Traverse Topog. Control

Station	Dist.	Def ∆	True Bearing
7+11.60			
	229.81		N-38°38'30" W
4+81.79 = ∆ Lt.		47°50'50"	Ld + Disk
	114.18		N-09°12'20" E
3+67.61 = P.O.T.			
	188.44		N-09°12'20" E
1+79.17 = ∆ Lt.		102°21'30"	
	179.17'		S-68°26'10" E
0+00			



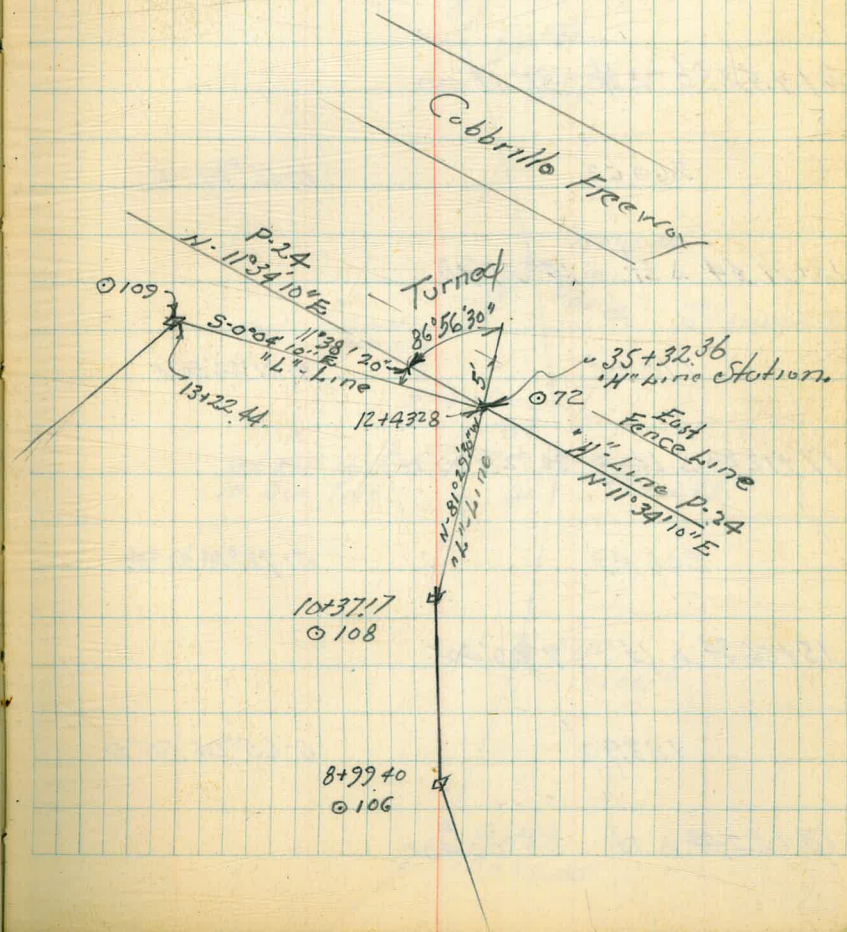
"L" Line Topog. Control
Balboa Park

Station	Dist.	Def Δ		True Bearing
	137.77			S-89°08'W
8+99.40	Δ Rt.	6°44'30"		
	147.74			S-82°23'30"W
7+51.66 =	Δ Rt	6°47'20"		
	74.28'			S-75°36'10"W
6+77.38 =	P.O.T.		Set Hub in Asphalt Walk	
	224.28'			S-75°36'10"W
4+53.10 =	Δ Rt	21°24'10"		
	222.62			S-54°12'W
2+30.48	Δ Lt.	62°55'20"	Set Disk in Conc. Walk	
	111.57'			N 62°52'40"W
1+18.91 =	P.O.T.	Set Hub		
	118.91			N 62°52'40"W
0+00				



"L" Line Cont. from P-31

Station	Dist.	Def ∆	True Bearing
Cont. P-33			
	183.90'		S-65°04'50"E
13+22.44 = ∆ Lt		65°00'40"	Set Hub
	79.16'		S-0°04'10"E - Corrected Bearing
∆ Lt. 11°38'20" from "H" Line See Sketch on Rt			
12+43.28 = ~~End~~ - "L" Line = Junction with "H" Line			
	206.11'		N-81°29'30"W
10+37.17	∆ Rt.	9°22'30"	Set Hub
	137.77'		S-89°08'00"W
8+99.40	= ∆ Rt.	6°44'30"	Set Hub.



"L" - Line Cont. from P-32

23+14.80 = Δ Rt 30°16'50"

60.78 N-23°55'50"E

22+54.02 Rt 38°59'50

101.96 N-15°04 W

21+52.06 = Δ Lt 81°31'00

260.62 N-66°27' E

18+91.44 Δ Lt. 14°55'30

178.61 N-81°22'30"E

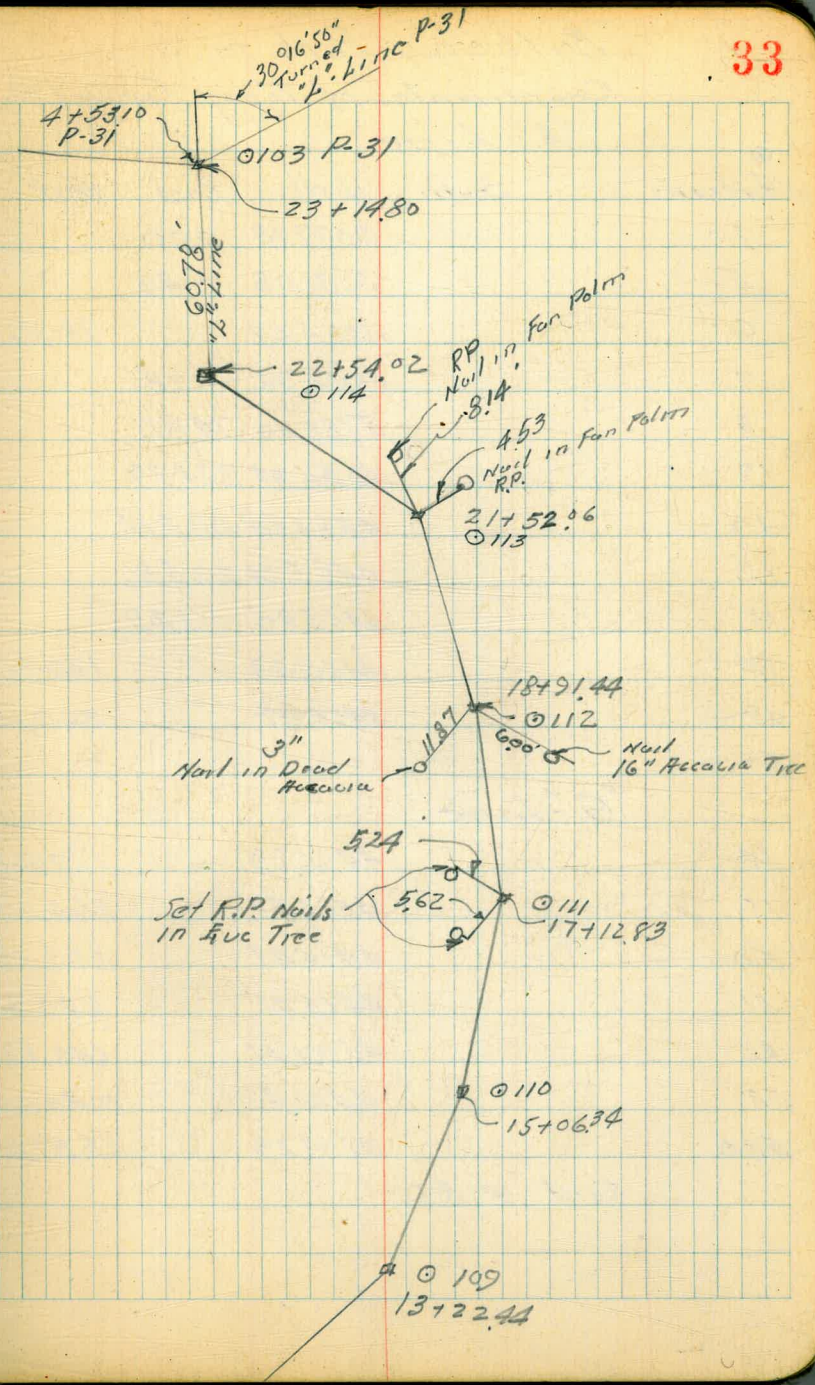
17+12.83 Δ Lt = 26°23'00" Lt

206.49 S-72°14'30"E

15+06.34 Δ Lt 7°09'40"

183.90' S-65°04'50"E

13+22.44 Δ Lt. 65°00'40"



~ Balboa Park ~

Coördinates of Topog. Control Points

"A"-Line

Stations	South	North	East	West
1		2027.03	0.00	
5		3031.08	0.49	
6		3305.67		181.46
7		3642.96	0.78	
8		3785.00	74.82	
9		4056.84	224.39	
10		4361.24	225.11	
12		4465.24	225.36	
13		4465.80	1.29	
~~14~~		~~4466.23~~		~~170.21~~
~~15~~		~~4466.47~~		~~366.15~~
~~5a~~				
"G"-Line				
14		4466.23		170.21
15		4466.47		266.15
50		4414.47		266.18
51		4415.41		640.61
52		4399.41		640.62
53		4400.42		1040.62
53a		4404.23		2551.65

Cont p. 35

Balboa Park —
Coordinates Topog Control

⊙ Stations		North	East	West
	"B"-Line			
16		4674.66		170.08
17		4674.12	43.22	
81		4753.77	177.55	
82		4766.62	295.96	
83		4845.96	398.31	
84		4861.18	485.82	
85		4871.96	547.48	
86		4984.40	585.60	
87		4979.44	676.31	
88		4901.70	705.70	
89		4902.06	773.02	
44		4903.28	1002.35 1002.31 use this	
	"C"-Line			
12		4465.24	225.36	
18		4463.28	1001.29	
19		4462.43	1336.50	
20		3971.01	1335.40	
24		3534.69	1409.72	
25		3203.70	1266.72	
27		3165.11	1065.58	
30		3107.11	763.30	
32		2945.71	446.39	
33		2735.03	417.50	
34		2438.32	194.57	
1		2026.75	0.44	
	=	2027.29	= 0.00	

C.P. # 26 N 3064.50 1206.60 E

C P # 29 N 3556.77 950.36 E

C.P. # 28 = N 3458.54 982.35 E

C.P. # 33-B = N 2869.69, E 657.94 } Coördinate

Balboa Park

Topog Control Coordinates

"D"- Line

⊙ Stations	North	East	West
31	3157.91	737.81	
32A	3351.78	628.56	
34 A	3655.85	677.49	
35	3891.05	651.35	
36	3986.59	515.66	
37	4054.05	419.86	
38	4023.79	345.22	
9	4056.71	224.02	

"E"- Line

39	3781.86	996.11	
40	3989.50	1059.79	
41	4219.69	1073.29	
42	4288.87	1177.86	
43	4156.20	1121.26	
22	3900.62	1175.09	
21	3951.44	1290.30	
20	3971.37	1335.47	
⊙ on "E"-Line	3971.01	1335.40	

"J"- Line

90	3428.11		651.92
91	3538.62		545.56
92	3688.88		212.51
8	3780.29	74.67	
8 on "A"-Line =	3780.00	74.82	

C.R.# 23 3885.72 N 1141.36 E

Balboa Park

Topog. Control - Coördinates

Stations	North	East	West
"F"-Line			
18	4463.28	1001.29	
45	4359.28	1001.05	
46	4359.32	986.42	
47	4059.88	943.02	
47-C	3861.2	831.1	
"H"-Line			
54	3118.34		606.19
56	2751.87		725.50
58	2558.67		784.95
59	2245.97		879.16
62	2306.53		1122.92
62-A	2455.50		1153.29
63	2603.24		1183.55
64	2835.09		1005.49
65	~~2596.71~~ 2956.71 ?		971.54
66	3126.65		793.19
67	3393.71		787.65
68	3519.56		908.82
69	3565.87		959.54
70	3604.08		1001.38
71	3808.56		970.98
72	3966.27		938.69
73	4003.14		931.14

Cont. P-38

Balboa Park

"H" Line Coördinates

Cont. from P-37

Station		North	East	West
74		4263.56		890.59
75		4459.52		894.35
76		4692.17		951.06
77		4690.12		732.80
78		4647.96		611.37
79		4640.41		407.15
80		4641.60		170.47
16		4674.49		170.45
	16 on "B" Line	4674.66		170.08 — use
		Error = 0.17		0.37

K Line

94		2812.69		436.14
95		2566.75		379.51
96		2413.12		360.00
60		2191.63		660.13
	60 on "H" Line	2191.58		660.24
		0.05		0.11

K2 Line

97		2746.84		269.51
98		2932.85		239.36
99		3045.56		221.09
100		3225.06		364.59

Balboa Park

Topog. Control Coordinates

"L" Line

Stations	North	East	West
101	4111.05	118.56	
102	4161.91	19.26	
103	4031.69		161.30
104	3975.92		378.54
105	3957.45		450.49
106	3937.89		596.93
108	3935.81		734.68
72	3966.30		938.52
109	3887.14		938.42
110	3809.65		771.64
111	3746.67		574.99
112	3773.46		398.40
113	3877.59		159.49
114	3976.05		185.99
103	4031.61		161.34

Walker
Hendricks
Becker
Williams
4-26-48

300 - Topog. Control
— Freeland Project —

5+17.02 = Δ Lt. 95°35' Set Nail in Pav.

CP#5
N-481.11
E 1121.32

231.11

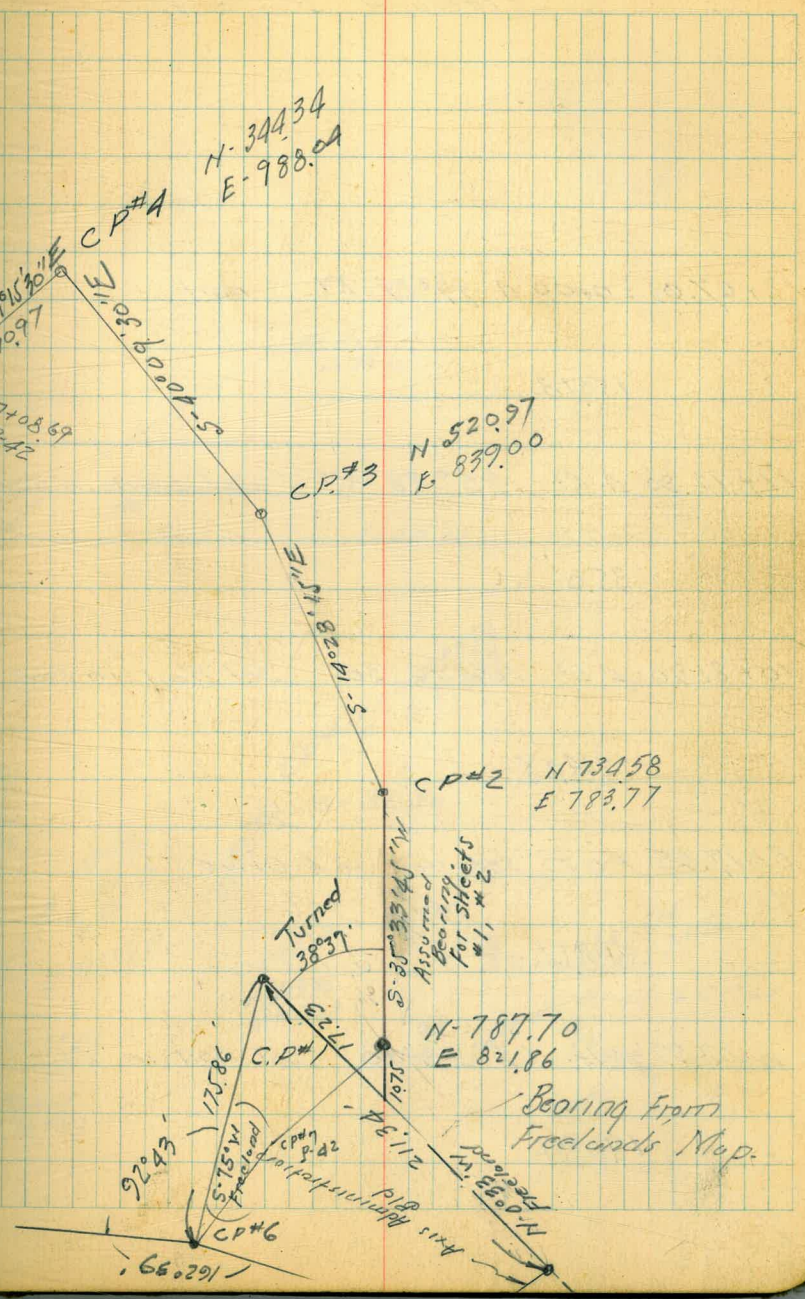
2+85.91 Δ Lt. 25°41'15" Set Nail in Pav.

220.61

0+65.3 = Δ Lt 50°02'00" Set Nail in Pav.

65.3

0+00 = Nail Δ Rt 36°07'06"45



~ 300 Topog. Control
Freeland Project

12+67.03 = 0+00 Δ 99°29' Rt. Nail

150.13

11+16.90 Δ Rt. 25°28' Rt Set Nail in pave

35.0'

10+81.90 = Δ Lt. 106°16'30" Set Nail in Pave

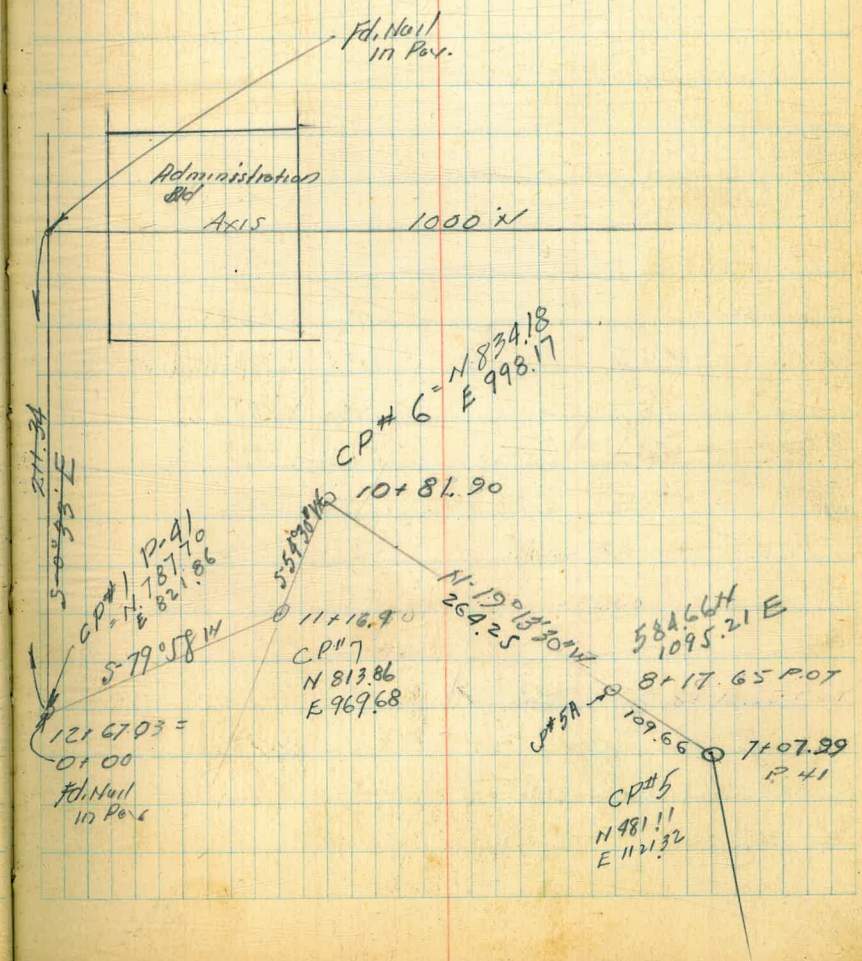
264.25

8+17.65 P.O.T. Set Nail in Drive

109.66

7+07.99 = Δ Lt. 63°29'30" Set Nail in Pave

190.97



4-26-48 Levels for Zoo Topo Control
Hendricks (Freeland Project)
Becker
Williams

See P. 41 & 42

B.M. 0+00			6.25	279.64	(279.62)
			3.29	282.60	
T.P.	1.07	285.89	5.37	284.82	(Freeland ~~284.92~~)
			4.97	285.22	
T.P.	4.79	290.19	5.54	285.40	
T.P.	5.04	290.94	5.34	285.90	
TP	10.47	291.24	2.30	280.77	
			5.34	277.73	
			4.70	278.37	
TP	3.50	283.07	7.65	279.57	
			7.60	279.62	
B.M	3.67	287.22			283.55

on Nail 12+67.73 = 0+00 CP#1
on Nail 11+17.50 (+16.90) CP#7
on Nail 10+82.62 (81.90) CP#6
on Nail 8+18.35 (17.65) P.O.T. #5A
on Nail 7+08.69 (07.99) CP#5

on Nail 5+17.72 (02) CP#4
on Nail 2+86.61 (85.91) CP#3
on Nail 2+29.24 P.O.T.
on Nail 0+65.3 CP#2
on Nail 0+00 CP#1

& Top of Stairway West Entrance to Zoo Cafe
from Freelands Contour Map Sheet 3
Job No. A 912

300 - Topog. Control
— Freeland Project —
North of Administration Bld

174' N-77°06'E

6+65 = Δ Rt 72°12 Set Nail in Pav.

45'

6+20 = P.O.T. Set Nail in Pav

225' N-4°54'E

3+95.00 = Δ Lt 43°01' Set Nail in Paving.

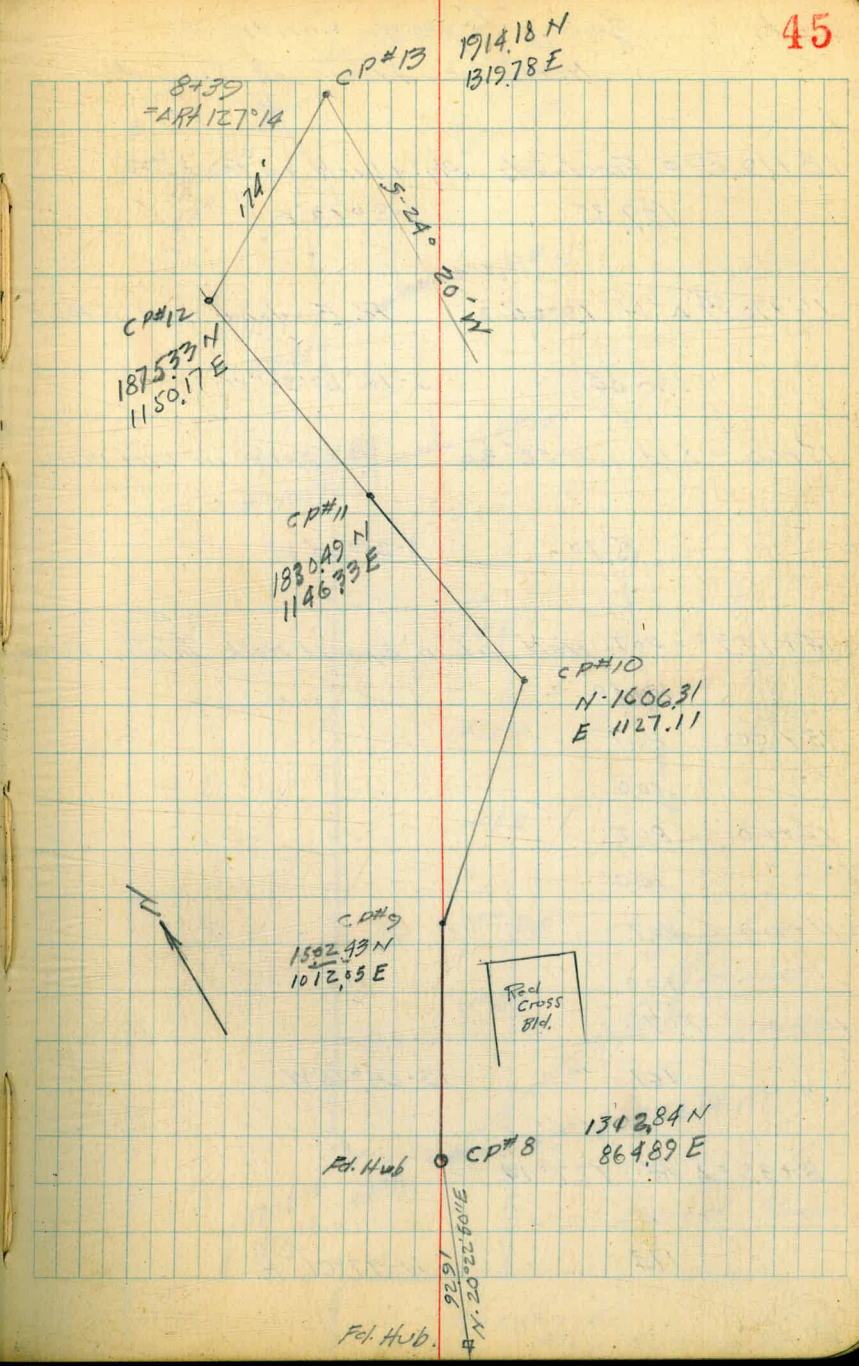
155 N-47°55'E

2+40 Δ Rt 10°06' Set Nail in Paving

240' N-37°49'E

0+00 = Δ Rt 17°26'10" Fd. Hub

92.91' N-20°22'50"E



Zoo. Topog. Control
North of Administration Bld.

18+19.89 = Freelands Ply. + Disk in Front Cafe

129.35 S-2°53'E.

16+90.54 Δ Lt 19°20'30 Fd. Freelands Nail in Pav

190.54 S-16°27'30" W

15+00 = Δ Lt 7°52'30" Set Spike in Dirt Walk

85.70 S-24°20' W

14+19.30 = P.O.T. Nail Set in Asphalt Walk 2' South of N end in Front Red Cross Bldg.

114.30

13+00 P.O.T.

100

12+00 P.O.T.

100

11+00 P.O.T.

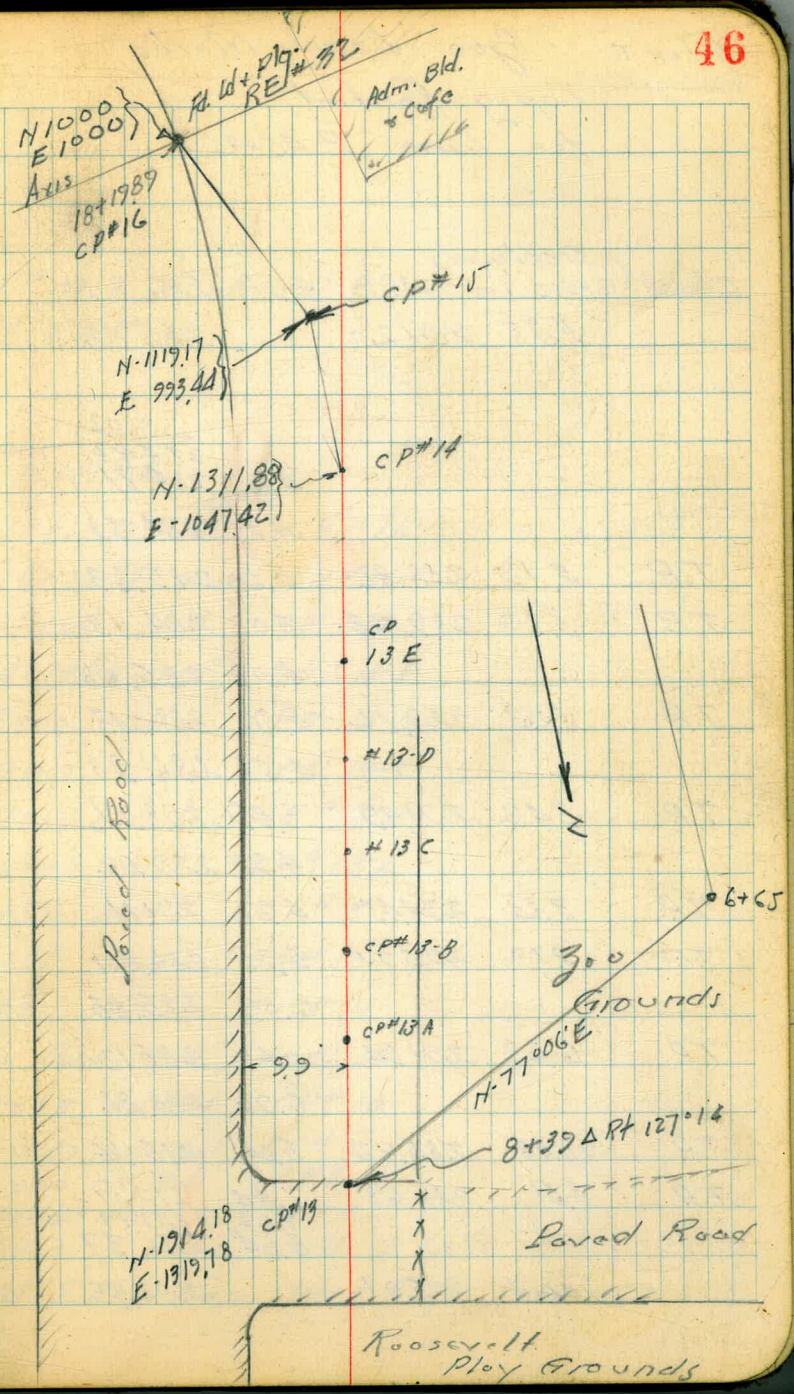
100

10+00 P.O.T.

161 S-24°20' W

8+39 = Δ Rt 127°14

174 N-77°06' E



Becker π
Williams-Rod

Zoo Bench Marks
Topog. Control
for Line P-4546

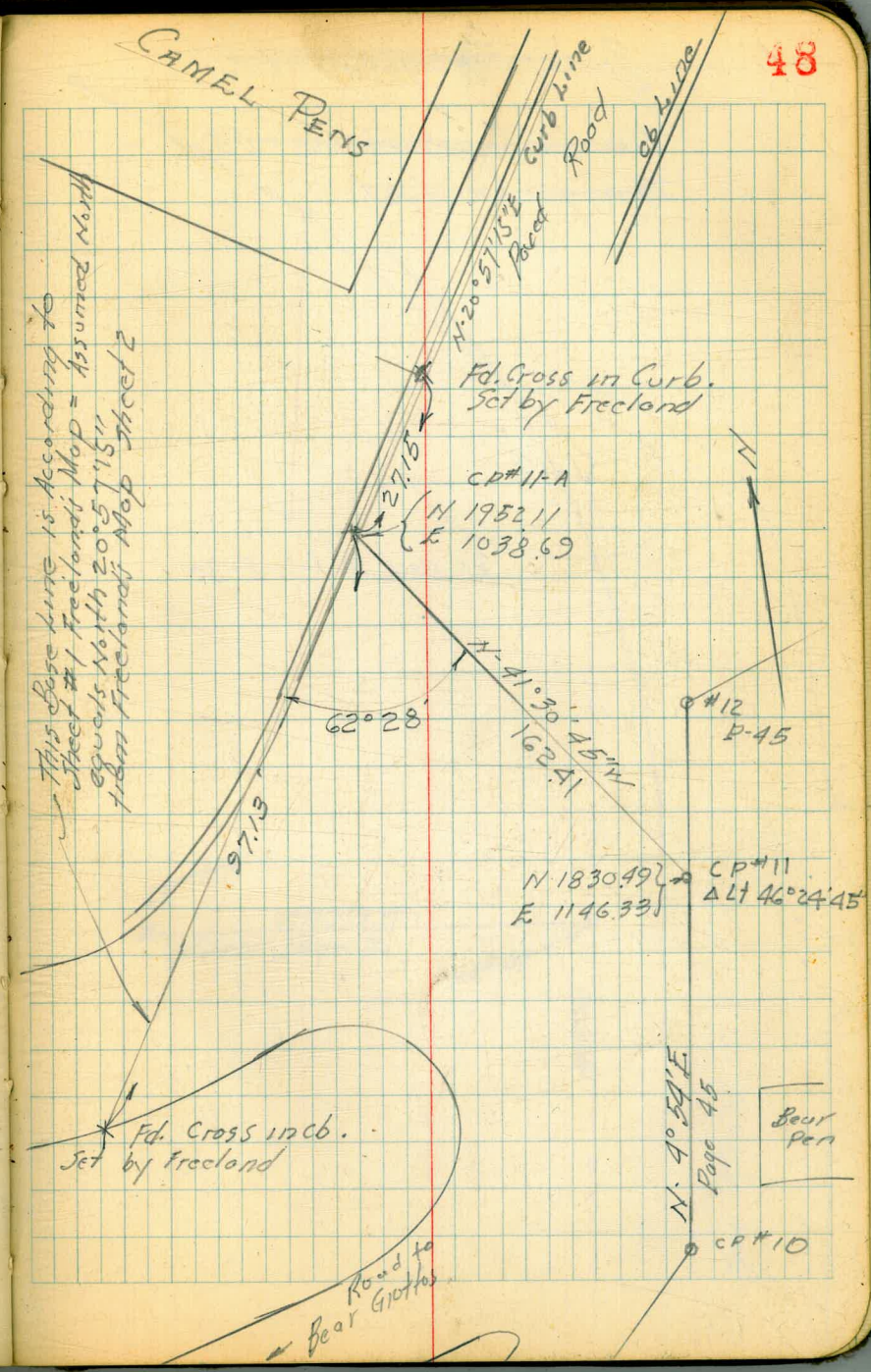
Check (Freelands cross in curb)			4.93	286.27 ✓
	5.35	291.20		285.85
				002
				284.82
			4.01	284.81
			4.31	284.51
T.P.	5.19	288.82	5.60	283.63
T.P.	5.10	289.23	5.03	284.13
			4.08	285.08
T.P.	3.03	289.16	5.36	286.13
			4.51	286.98
T.P.	3.43	291.49	6.39	288.06
			4.93	289.52
T.P.	3.34	294.45	4.60	291.11
T.P.	9.10	295.71	5.33	286.61
			6.09	285.85
T.P.	6.82	291.94	0.60	285.12
			6.90	278.82
T.P.	10.08	285.72	5.04	275.64
T.P.	3.51	280.68	7.84	277.17
			7.62	277.39
			8.64	276.37
	1.46	285.01		283.55

CP# 11-A Sketch P-49
B.M. CP# 11

chk
10+81.90
18+19.95 RE#32 Disk CP #16
16+90.54 Nail CP#15
15+00 Nail CP 14
14+14.30 Nail CP #13-E
13+00 Nail CP# 13-D
12+00 Nail CP# 13-C
11+00 Nail CP #13-B
10+00 Nail CP# 13-A
8+39 Nail CP#13
6+65 Nail CP#12
6+20 Nail # CP 11
on Rock West Side Road
3+95 on Nail CP#10
2+40 on Nail CP# 9
0+00 on Hub CP #8
Hub by Light Pole East Rim Fern Canyon
Nail in 2 Road North of Cafe Bld
B.M. 2 Top step. West Cafe Entrance

300 Topog. Control

Cont. from P-45

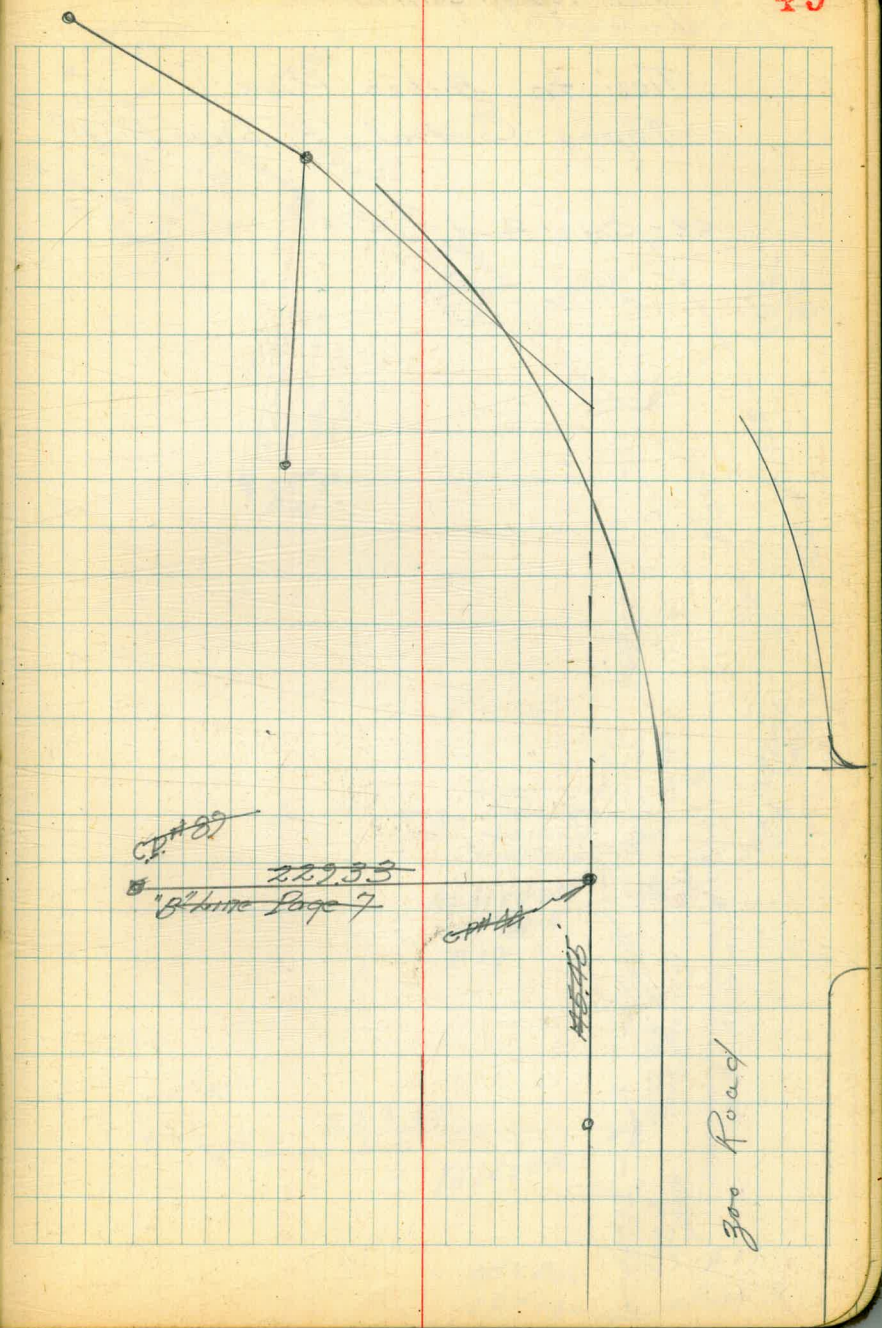


~~Zoo Topog. Control~~

~~Ties into Balboa Park~~ -
~~Topog. Control~~

Void

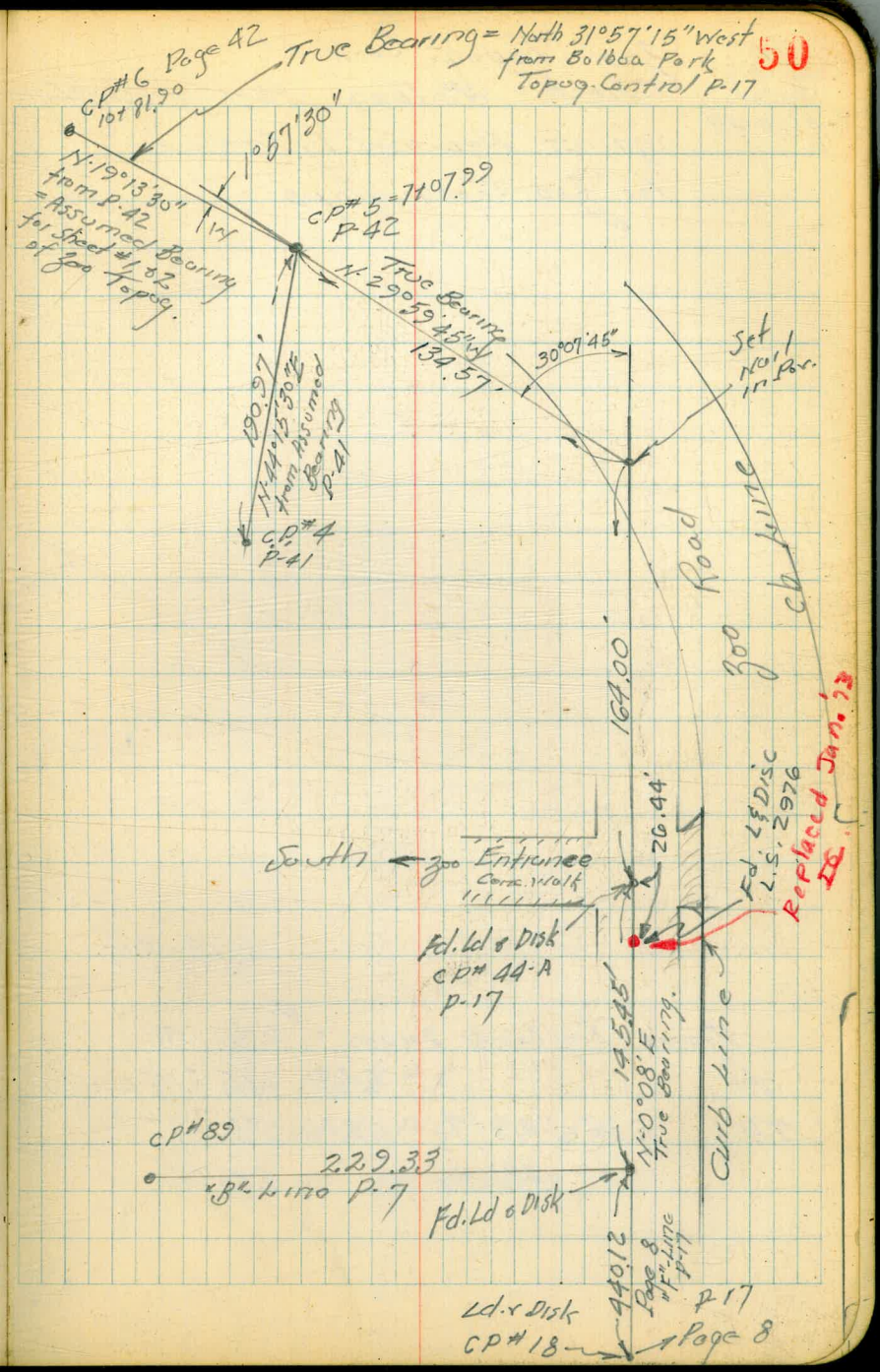
See new sketch P-50



Zoo. Topog. Control

Ties to Balboa Park
Topog Control "B" Line P-7

C.P. = Control Point



Walker
Henchcks
Becker
5-10-48

Zoo Topog. Control
Check Balboa Park Bench Marks
against Elev. used by Freeland
for Zoo Topog. Maps

0.13 = diff.

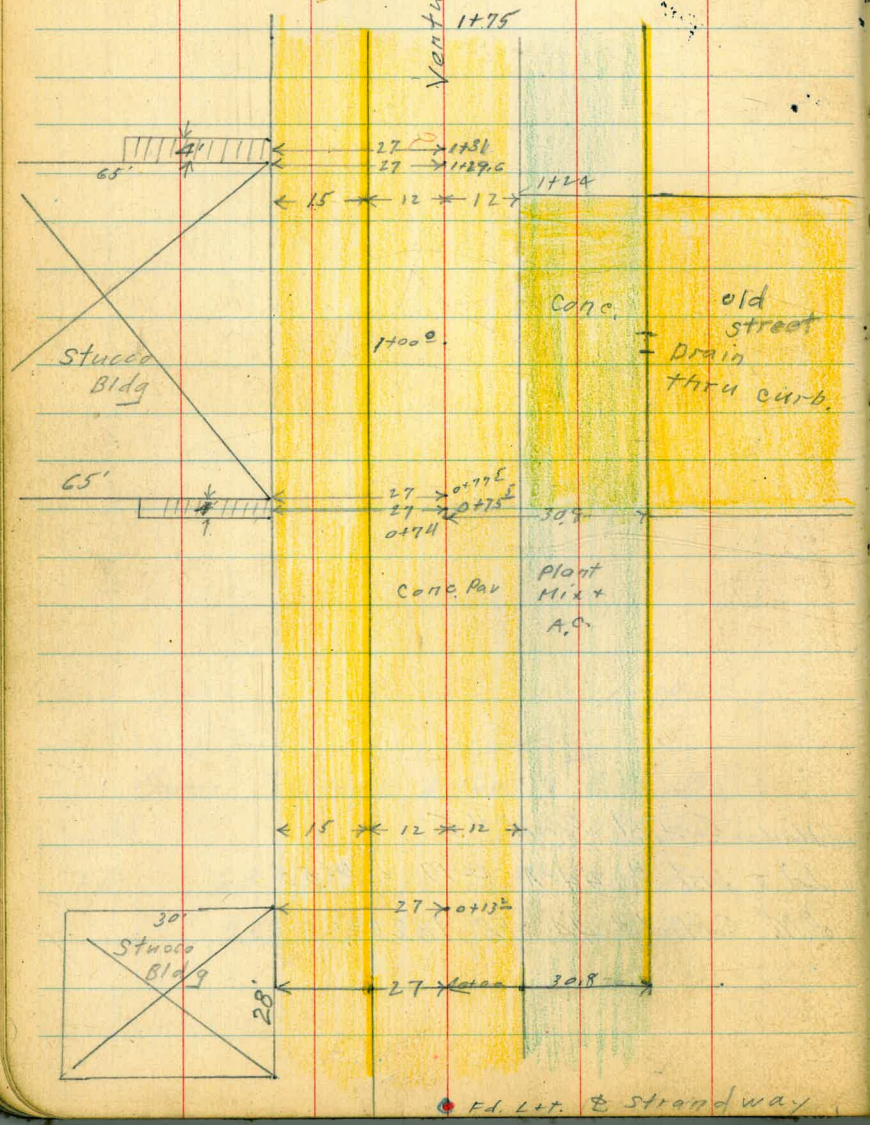
From Freelands Datum =				285.13
chk			6.69	285.27 Park Datum
TP	6.37	291.96	6.37	285.59
	9.61	291.96		282.35

Nail Control Point #5
Ld & Disk # 44-A P-17 & P-50
B.M. Control # 44 FB 1820-9

VENTURA + MISSION Blvd.
X-Sec. 300' All directions

5-19-48
W.O.# 31519

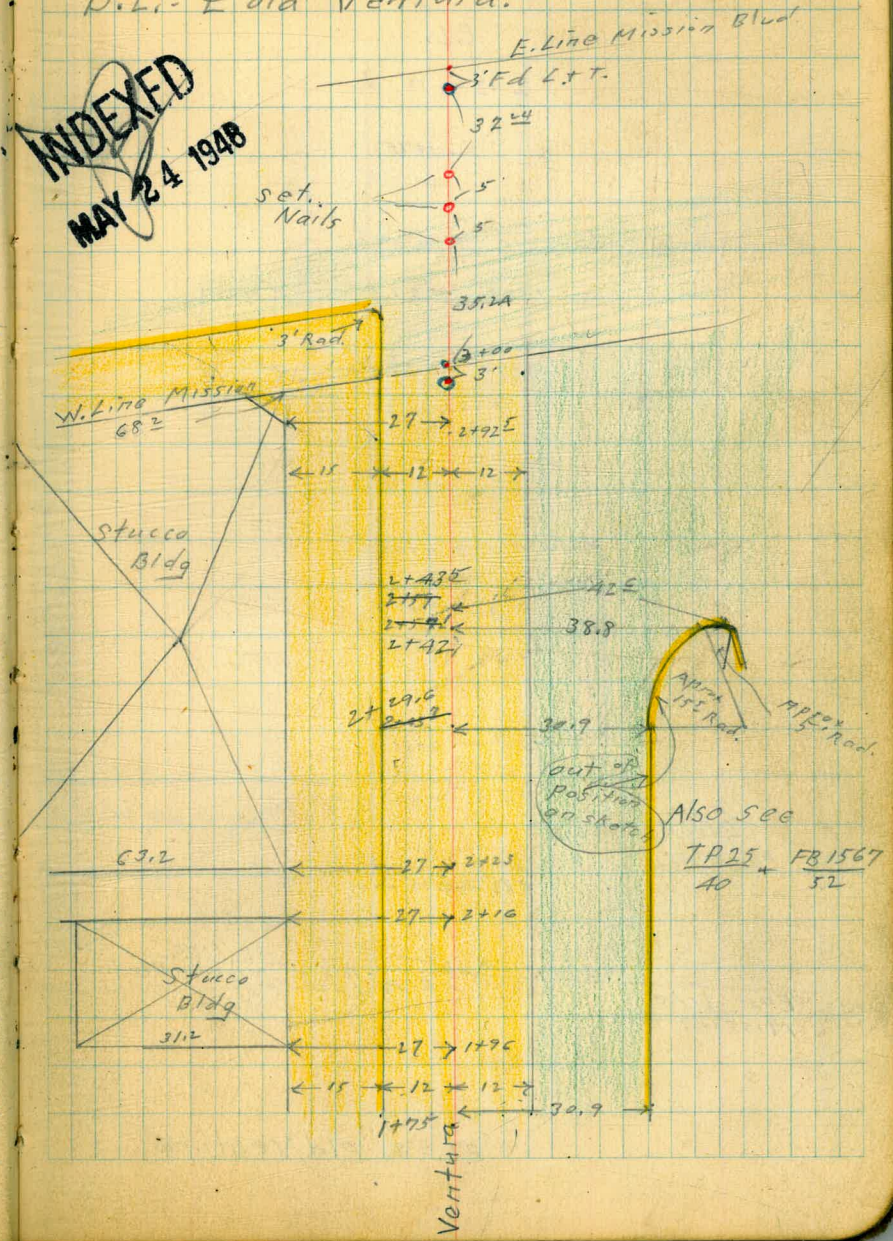
Sommermeyer
McCoy.
W. Moore
Sherman



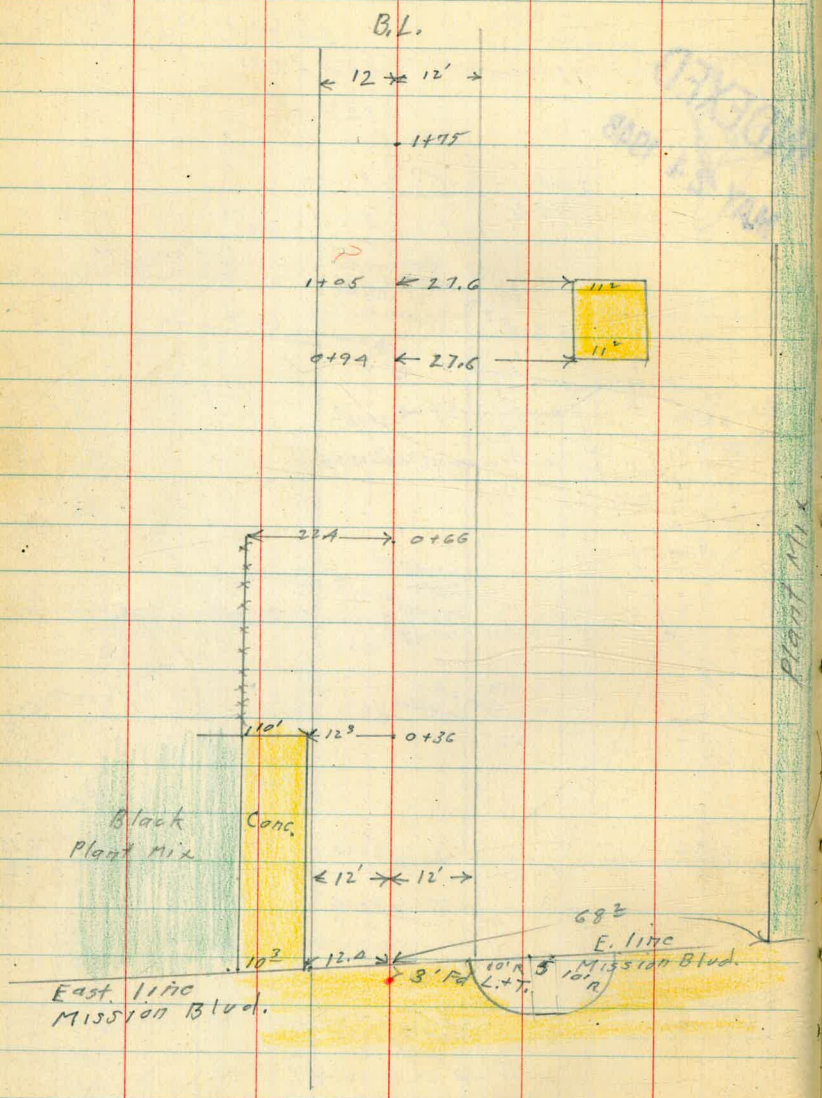
60751 & 75591 B.L.
W.O. 32073

52

B.L. = & old Ventura.

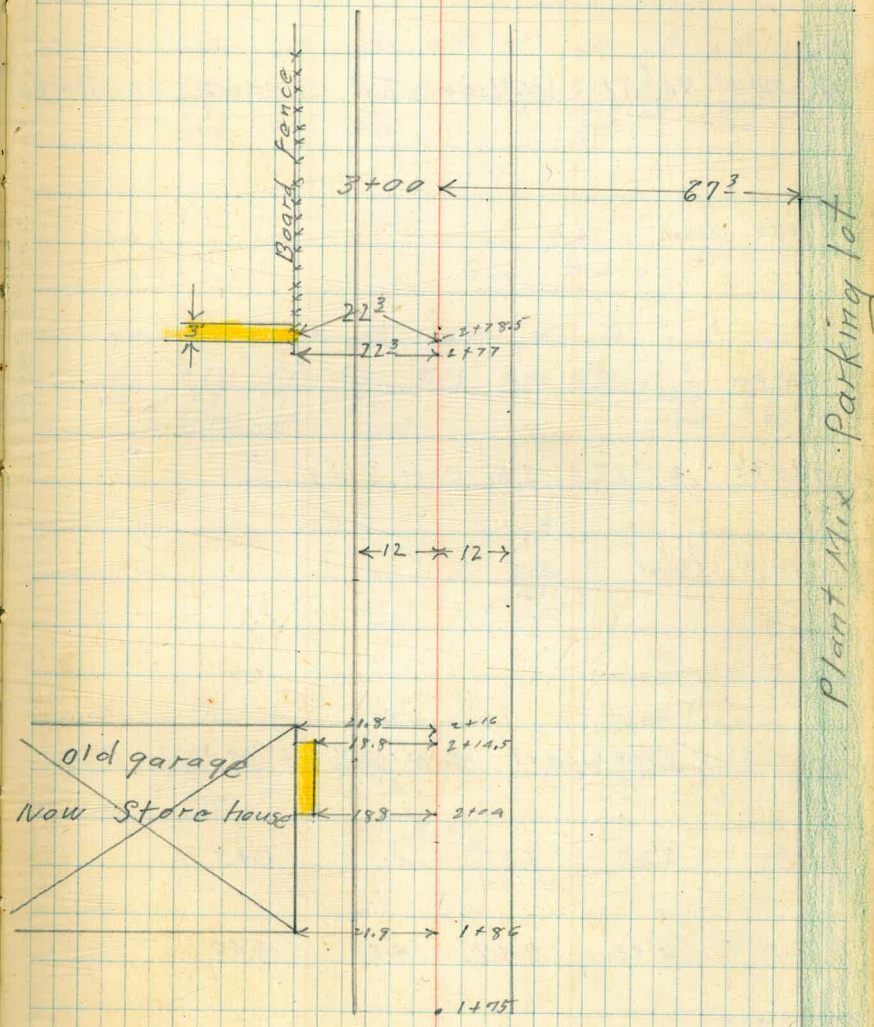


Ventura Place



B.L. = ℄ old Ventura

B.L. ℄ old Ventura



Ventura

℄ 1+26.5 T.P. Lt.	4.96	5.25	8.40	0.29
0+75 4	27' Lt = ℄ 4' wide stairway			
0+74	31 5 Rt. = W. line old street on South,			
+50 Cont.				
0+50				
0+13 2	27' Lt. = S.E. Cor. Bldg			
0+00 Cont.				
0+00	= 300' West of Wly line Mission Blvd,			
T.P.	3.26	8.69	4.06	5.43
T.P.	4.83	9.49	4.83	4.66
B.P. Sea wall + Santa Barbara	2.46	9.49	—	7.03
B.P. Sea Wall + Ventura.		gone		7.51

B.L.

1.91	1.64							
6.78	7.05							
27.1	27							
Top - bottom step.	walk							
1.67	1.49	0.92	0.90	0.97	0.93	1.65	0.94	0.99
7.02	7.20	7.77	7.79	7.72	7.76	7.04	7.75	7.70
27	12	12		12	30.8	cl	31.5	41
walk	cl.	Gutt			Gut		conc	conc.
					2.2		2.1	
					6.5		6.6	
					31.5		40	
					Grd			
2.2	2.20	2.12	1.59	1.56	1.75	1.89	1.78	2.37
6.5	6.49	6.57	7.10	7.13	6.94	6.80	6.91	6.32
40	27	12	12		12	25	30.8	30.8
	Edge walk	cl	G				Gutt	cl
					3.5			
					5.2			
					41			
					Grd			
3.65	3.49	3.31	2.76	2.96	3.42	3.44	3.31	
5.04	5.20	5.38	5.93	5.73	5.27	5.25	5.38	Drive
27	27	12	11.9		12	25	30.8	30.8
Floor of store.	N. Edge walk	cl	G				G	cl
				8.69				

Notes Reduced 1-19-49
H Remington

1+22 27 Lt. = store doorway

1+07 27 Lt. = store doorway

1+00 30 8 Rt. = ℄ 5' wide drain thru curb

0+88 - 27 Lt. = store doorway

+78 Cont.

0+78

0+77 5 27' Lt. = S.W. Cor. Bldg.

5.25

1.45
3.80
27
Floor

1.45
3.80
Floor
27

1.48	1.31	1.13	0.56	0.43	0.34	0.34	1.33	0.36
3.77	3.94	4.12	4.69	4.82	4.91	4.91	3.92	4.89
27	24.7	cb	G		12	30.8 pav	30.8 top cb	40

1.56
3.69
27
Doorway

0.84	0.87
4.41	4.38
31.5 conc	41 conc.

1.60	1.39	0.86	0.77	0.81	0.77	0.68	1.54
3.65	3.86	4.39	4.48	4.44	4.48	4.37	3.69
27 walk Edge	cb	G		12	22	30.8 G	30.8 cb

7.14

5.25

1+96 27' Lt. = S.W. Cor. Bldg.

1+55

1+34 on walk

1+31 Cont.

1+31 27' Lt. = ℄ stairway

1+29 ℄ 27' Lt. = S.E. Cor Stucco Bldg

1+24 East line street to South.

5.25

-0.07	-0.23	-0.10	-0.12	-0.51	-0.35	-0.45	+0.19	+0.39
5.32	5.48	5.95	5.97	5.76	5.60	5.70	5.06	4.86
27	12 cl	G.		12	22	30.9 G	cl	40

0.52	0.35	-0.18	-0.15	0.06	0.23	0.15	0.76	1.02
4.73	4.90	5.43	5.40	5.17	5.02	5.10	4.49	4.23
27	12 cl	12 G		12	22	30.9 G	cl	40

0.96	0.85	0.68
4.29	4.40	4.57
27	24.8	12 cl.

1.07	0.82
4.18	4.43
31.5	41

1.95	1.19	0.88	0.71	0.21	0.23	0.46	0.56	0.45	1.12
3.30	4.06	4.37	4.54	5.04	5.02	4.79	4.69	4.80	4.13
27.5 Top Bottom step.	27	24.8	cl	G		12	22	30.9 G	30.9 cl

1.45	1.02	0.86	0.32	0.32	0.52	0.54	1.13	0.63	0.61
3.80	4.23	4.39	4.93	4.93	4.73	4.71	4.12	4.62	4.64
27	24.8	cl	G		12	30.9 G.	cl.	31.5	41

5.25

VENTURA.

2+43.5 — 42.5 Rt. = E.C. cl. (see sketch p 52 rt)

2+42 — 38.8 Rt. = cl. P.C.C.

2+29.6 — 30.9 Rt. = cl. B.C.

2+27 — 27' Lt. = Store doorway

2+23 — 27' Lt. = S.W. Cor Bldg.

2+22

2+16 — 27' Lt. = S.E. Cor. store Bldg.

2+06 — 27 Lt. = store doorway

B.L.

-0.42
5.67
42.6
top cl

-0.73	-1.02	-1.31	-1.31	-1.15	-0.98	-0.90	-0.89
5.98	6.27	6.56	6.56	6.40	6.23	6.15	6.14
27	cl.	12 G		12	22	30.9	42.6 pav

-1.31	-0.90	-0.28
6.56	6.15	5.53
	38.8 G	38.8 cl. P.C.C.

-0.64	-0.89	-1.19	-1.17	-0.96	-0.81	-0.81	-0.23	-0.08
5.89	6.14	6.44	6.42	6.21	6.06	6.06	5.48	5.33
27 walk	cl.	G		12	22	30.9 G	cl BC	40

-0.53
5.78
27
doorway

-0.64	-0.83	-1.13	-1.08	-0.85	-0.75	-0.81	-0.17	+0.03
5.89	6.08	6.38	6.33	6.10	6.00	6.06	5.42	5.22
27	ea	G		12	22	30.9 G	cl	40

-0.16
5.43
27

Ventura.

T.P. L&T. 2+97 ℄ 6.35 4.62 6.98 —1.73

3+00 W.L. Mission Blvd. (Along Line of M.B.)

2+93.5 28.5 Lt. on store floor

2+92.5 = 27' Lt. = Δ in Bldg. at door way

2+73 27' Lt. = ℄ door way

2+62 27' Lt. = ℄ door way

2+4.9 27' Lt. = ℄ door way

5.25

B.L.

-1.29	-1.46	-1.65	-1.76	-1.65	-1.58	-1.53	-1.55
6.54	6.71	6.90	7.01	6.90	6.83	6.78	6.80
27	ct.	12 ℄		12	22	30.9	40

-0.95
6.20
28.5
on floor.

-1.00
6.25
27
doorway

-0.89	-0.92	-1.13	-1.40	-1.44	-1.32	-1.12	-1.10	-1.11
6.44	6.17	6.38	6.65	6.69	6.57	6.37	6.35	6.36
27 doorway	27 walk	ct	12 ℄		12	22	30.9	40

-0.49	-0.78
5.74	6.03
27 doorway	27 walk

5.25

1+05 27' Rt. = N.E. Cor. valve chamber

0+94 27' Rt. = N.W. Cor. valve chamber

0+80

0+66 22.4 Lt. = End board fence

+ drive way under construction

0+64 68' Rt. = ℄ 14' wide gas pump island

12' Lt. = start board fence

0+36 12' Lt. = End pav. (conc. + Black)

22' = End conc. start black top (P. 53)

station yard.

12' Lt. = start conc. slab in service

0+00 = Ely line Mission Blvd. (Along line of M.B.)

4.62

							-0.16	-0.15
							4.78	4.77
							27.6	38.8
							N.E. Cor	S.E. Cor.
							-0.20	-0.15
							4.82	4.77
							27.6	38.8
							N.W. Cor	S.W. Cor
-0.9	-0.9	-1.4	-1.6	-0.8	-0.5	-0.37		
5.5	5.5	6.0	6.2	5.4	5.1	4.99		
40	22	12		20	40	68 pav.		
				-0.40		-0.16		
				5.02		4.78		
				68		114		
						So. End conc. slab		
-0.86	-1.17	-1.68	-1.7	-1.8	-1.2	-1.1	-0.88	
5.48	5.79	6.30	6.3	6.4	5.8	5.7	5.50	
30	22	12.3 pav	12		20	65	68 Edge pav.	
-1.80	-1.88	-1.93	-1.83	-2.11	-1.70	-1.38	-1.31	-1.22
6.42	6.50	6.55	6.45	6.73	6.32	6.00	5.93	5.84
35	22.7	12.4	12.1		12	37	68.1	68.2
			End off or on Pav.		End conc	Start conc	End conc	N.W. Cor Paved Service Station yard

4.62

t.R.L.&T. 3'w.
w.Line M.B.
℄ Ventura.

Ventura
Cont. P.63 6.35 −1.73

of oil pavement.

3+00 22^2 Lt. = line of fence 68^2 Rt. = line

2+78.5 22^3 Lt. = ℄ 3' wide Conc. walk.

2+77 22^2 Lt. = start board fence

2+50

$2+14^5$ 18^8 Lt. = End Conc. Apron

2+04 18^8 Lt. = start Apron to door

1+86 21^8 Lt. = S.W. Cor. Bldg.

1+70

1+20

4.62

B.L.

-0.4	-0.4	-0.9	-0.6	+0.6	+1.0	+1.1
5.0	5.0	5.5	5.2	4.0	3.6	3.5
40	22	12		30	60	68.2

-0.08	+0.17
4.70	4.45
40	22.3
walk	walk

~~Dis~~

-0.2	-1.2	-1.0	-0.9	+0.4	+0.8	+1.0
4.8	5.8	5.6	5.5	4.2	3.8	3.6
40	26	12		30	60	68.2
						oil pav

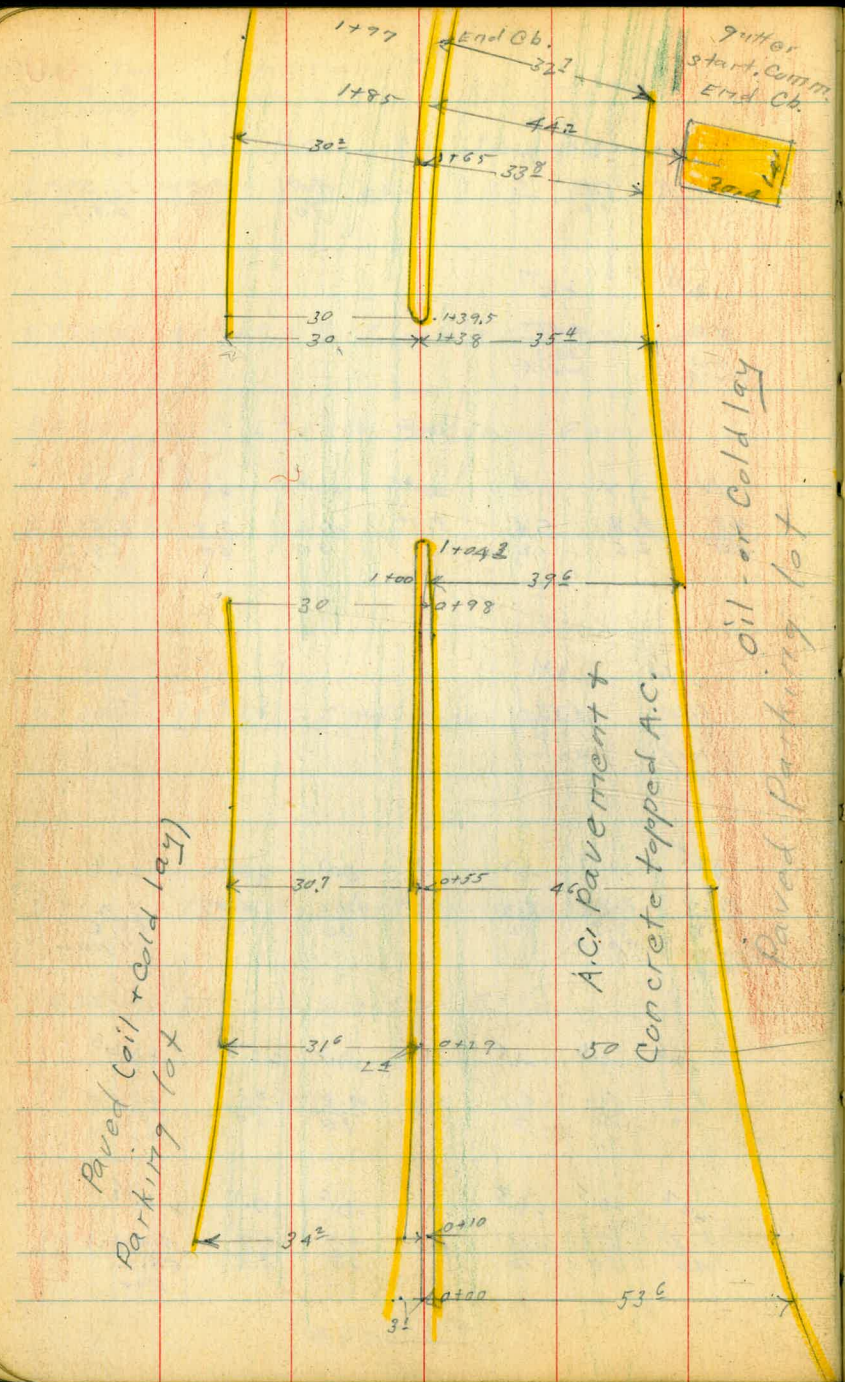
-0.68	-0.91
5.30	5.53
21.8	18.8
Bldg	Apron
Floor	

-0.65	-0.93	-1.2	-1.1	0.0	+0.6	+0.9
5.27	5.55	5.8	5.7	4.6	4.0	3.7
21.8	18.8	12		30	60	68.2
Bldg.	Apron					oil pav.
Floor.						

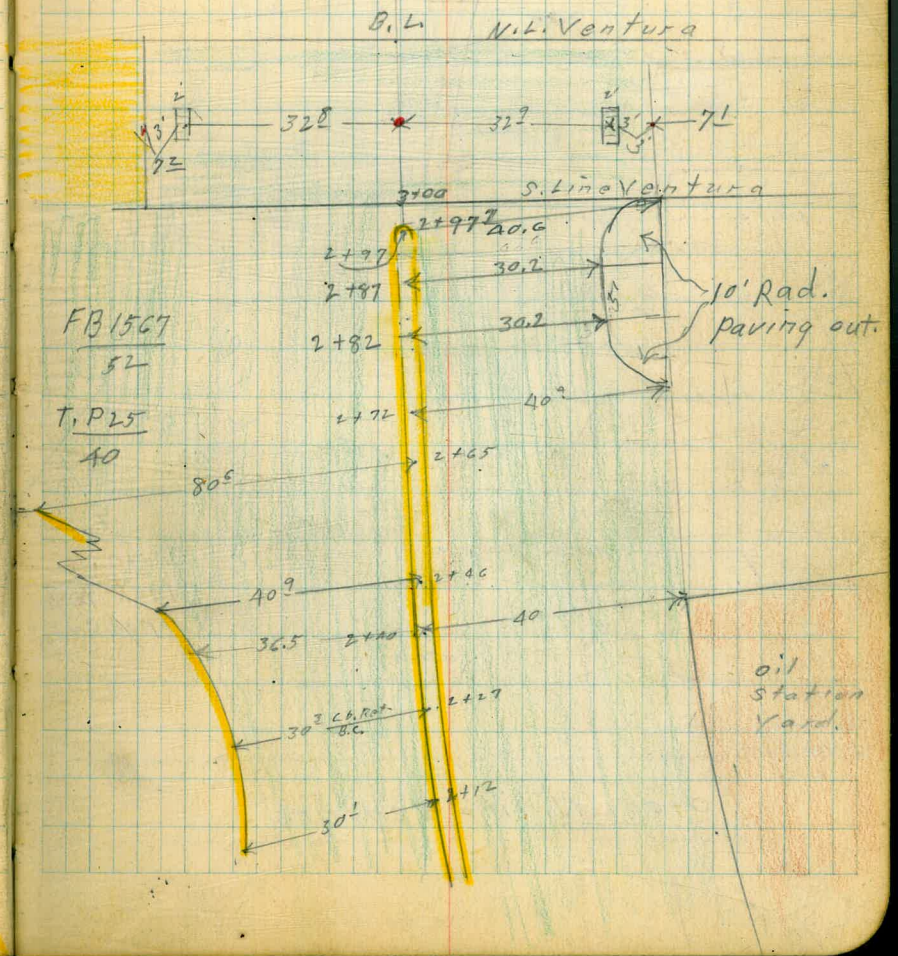
-0.6	-0.6	-1.5	-1.3	-0.2	+0.3	+0.60
5.2	5.2	6.1	5.9	4.8	4.3	4.02
40	30	12		30	60	68.2
						pav

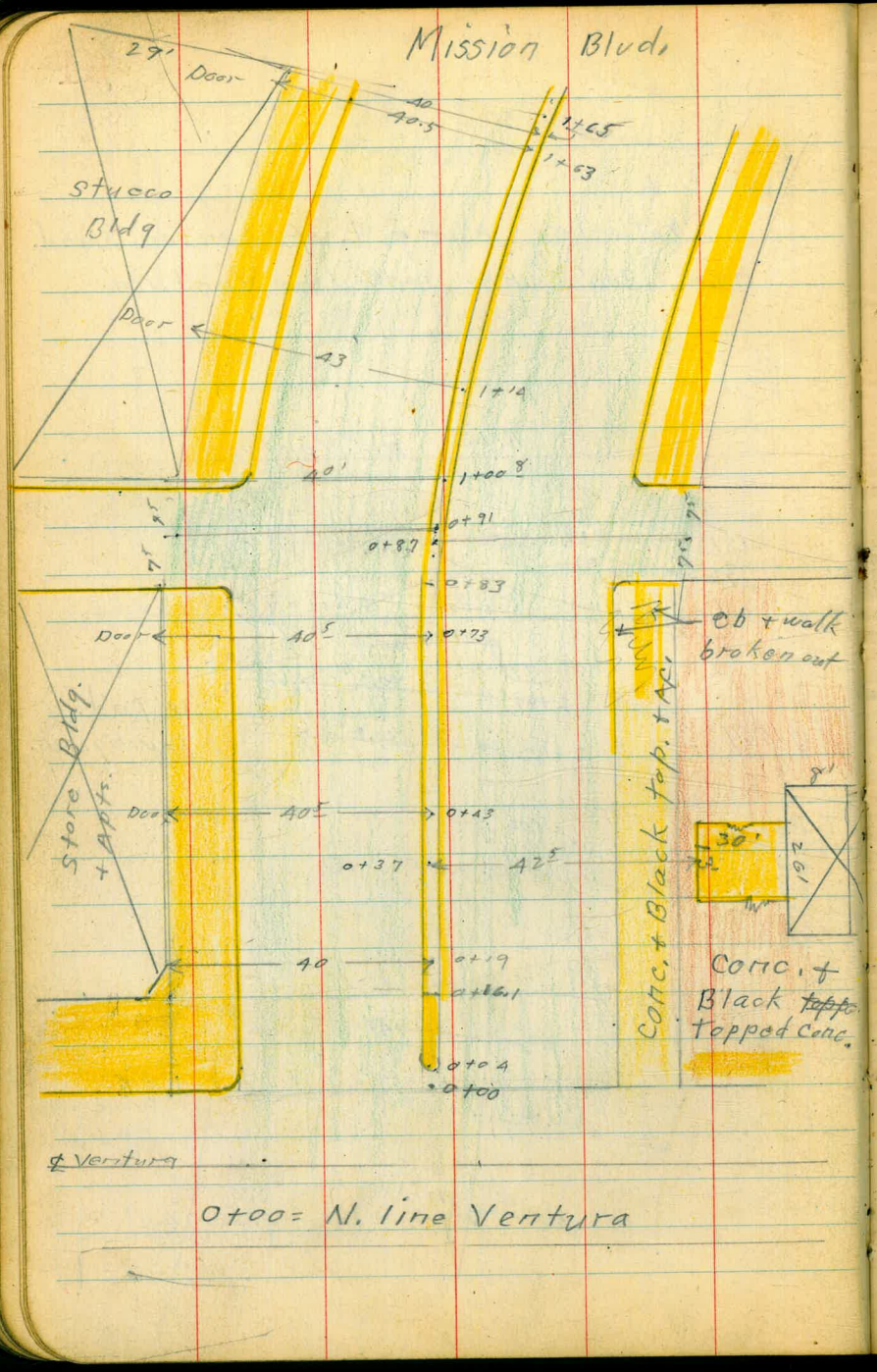
-0.7	-0.5	-1.5	-0.5	-0.3	-0.1	+0.18
5.3	5.1	6.1	6.1	4.9	4.7	4.44
40	30	12		30	60	68.2
						pav

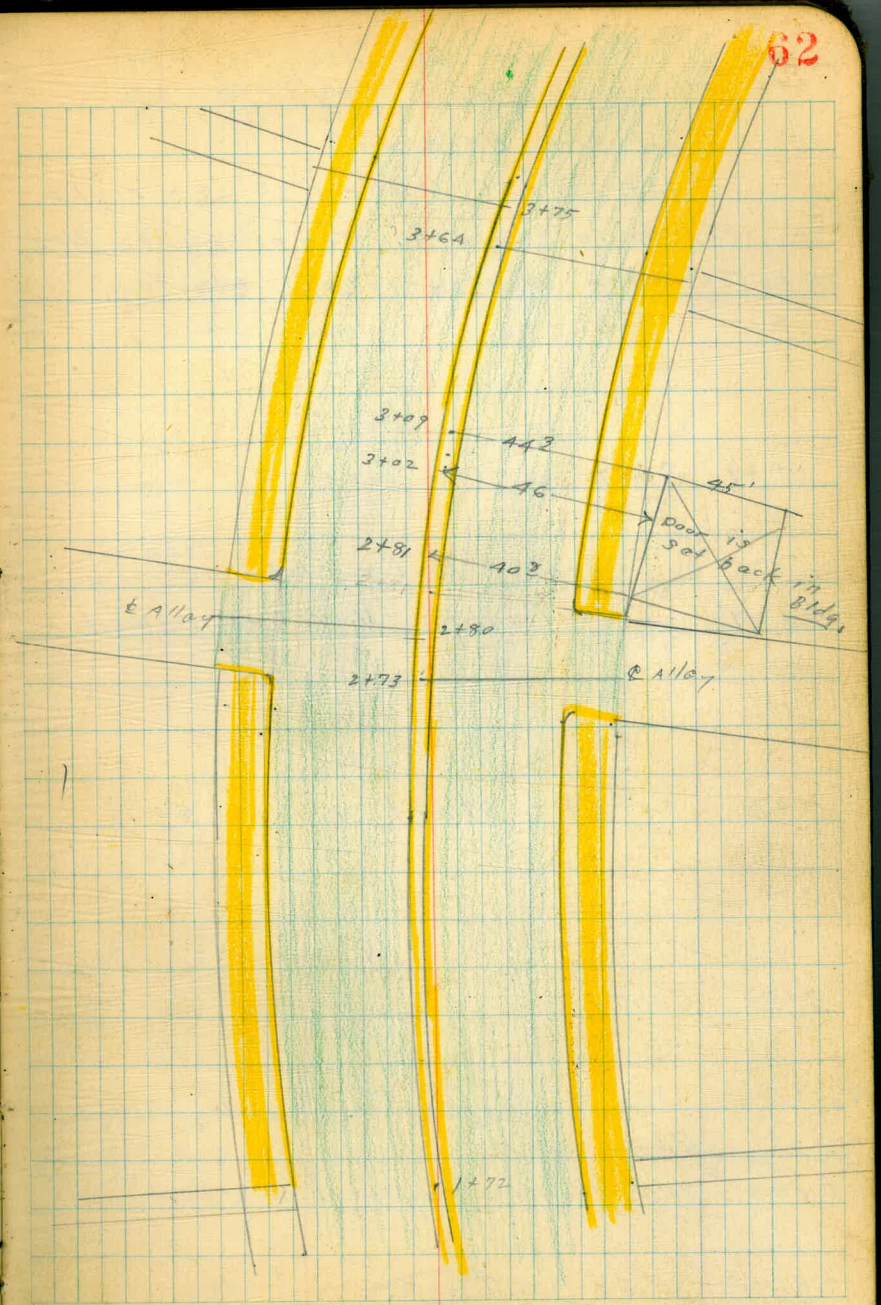
4.62



Stationing Along ℄ of center island.
0+00 = 300' South - South line Ventura




Mission Blvd.
29'
Door
40
40.5
1+65
1+63
Stucco Bldg
Door
43
1+14
40'
1+00.8
0+91
0+87
0+83
Door
40.5
0+73
Cb + walk broken out
Store Bldg. + Apts.
Door
40.5
0+43
0+37
42.5
30'
8'
192
40
0+19
0+16.1
0+04
0+00
Conc. + Black top. + Acc.
Conc. + Black ~~topped~~ Topped Conc.
℄ Ventura
0+00 = N. line Ventura


3+75
3+64
3+09
44.3
3+02
46
45'
Door 3rd back 13 Bldg.
2+81
40.3
℄ Alley
2+80
2+73
℄ Alley
1+72

Mission Blvd

0+55 Cont. Sketch - Page 10

prom. here on

1.85 Lt. + Rt. Gutters 2° Lt. + right

regular width. Top of curbs are

0+55 Here center island starts

+29 Cont.

area (Parking lot + service station)

0+29 50 Right = N.W. cor. paved

0+10 34° Lt. = start curb (N+S)

0+00 Cont.

B.L. =

0+00 = 300' South - south line Ventura.

T.P. From page 60 5.68 3.95 — -1.73

	+0.1	0.0	+0.10	B.L.	-0.19	-0.14			
	3.9	4.0	3.85		4.14	4.09			
	65	31.5	30.7 cl		46 cl	60			
-0.60	-0.40	-0.25	+0.48	+0.4	+0.33	-0.36	-0.66	-1.00	
4.55	4.35	4.20	3.47	3.6	3.62	4.31	4.61	4.95	
30.7 G	45	2 G	1.85 cl		1.85 cl	2 G	23	46 G	
	-0.3	+0.2	+0.25		-0.03	-0.05			
	4.3	3.8	3.70		3.98	4.00			
	40	31.5	30.7 cl.		60	75			
-0.42	-0.26	-0.14	+0.57	+0.5	+0.45	-0.25	-0.46	-0.75	-0.13
4.37	4.21	4.09	3.38	3.5	3.50	4.20	4.41	4.70	4.08
30.6 G	15	2.0 G	2.3 cl		1.8 cl	2 G	24	G 50	cl 50
	+0.30	-0.39							
	3.65	4.34							
	34.2 Top cl.	34.2 G							
+0.24	-0.14	-0.39	+0.4						
3.71	4.09	4.34	3.6						
135 cl. old road	135 G old road	119	85						
-0.2	-0.33	-0.13	-0.01	+0.70	+0.7	+0.62	-0.10	-0.29	-0.69	-0.02	+0.2
4.2	4.28	4.08	3.96	3.25	3.3	3.33	4.05	4.24	4.64	3.97	3.8
50	34	16	3.1 G	3 cl.		1.8 cl	2 G	25	53.6 G	53.6 cl.	75

3.95 H.I.

Reduced 1-19-48
H Remington

1+39[5] ℄ start ℄ island.

1+38[0] 30' Lt.= start curb.

1+04[3] ℄ = End center island

1+00 Cont. 88' Lt= cb. old street.

1+00

0+98 30' Rt.= End cb.

3.95

-0.36	-1.07	-0.82	-0.03	-0.73	-1.05	-1.33	-0.55
4.33	5.02	4.77	3.98	4.68	5.00	5.28	4.50
30	30	15	℄	℄	15	35.4	45
cb	G		cb.	pav		in drive	

-1.06	-0.36
5.01	4.33
30	30
pav.	cb.

+0.11	-0.59
3.84	4.54
℄	℄
cb.	pav.

-0.35	-0.77	-0.96	-0.39	-0.36	-0.15
4.30	4.72	4.91	4.32	4.31	4.10
88	88	70	50	50	75
cb	G				
old.	M. Blvd.				

-0.84	-0.63	-0.49	+0.22	+0.2	+0.08	-0.59	-0.83	-1.15
4.79	4.58	4.44	3.73	3.8	3.87	4.54	4.78	5.10
30	15	G	cb		Cb.	G	20	39.6
								in drive

-0.13	-0.82
4.08	4.77
30	30
cb	G

3.95

2+27 30' Lt. = Curb' P.C.C.

2+12 Cont.

2+12 30' Lt. = Cb. P.R.C.

1+97 32' Rt. = End Cb. + Start Gutter Comm.

1+85 Cont.

base + drive (conc)

1+85 44' Rt. = ℄ 14' wide Gasoline pump

3.95

-1.57 5.52 G.

-1.15 5.10 Cb. P.C.C.

-0.87 4.82 40.8 Back of walk

-1.05 5.00 30.1 Cb.

-0.97 4.92 47

-0.69 4.64 75

-1.49 5.44 30 G

-1.29 5.24 15

-1.06 5.01 G

-0.40 4.35 Cb

-0.5 4.5

-0.55 4.50 Cb

-1.19 5.14 G

-1.33 5.28 15

-1.54 5.49 32.2

-0.90 4.85 32.7 Cb.

-1.51 5.46 32.7 G.

-0.76 4.71 45.5 → Back of old walk

-1.03 4.98 35 Edge old walk

-0.89 4.94 30 Cb.

-1.35 5.30 30 G

-0.65 4.60 44.2

-0.38 4.33 74.6 Back edge Conc.

-1.19 5.14 15

-0.99 4.94 G

-0.28 4.23 Cb

-0.3 4.3

-0.45 4.40 Cb

-1.10 5.05 G

-1.26 5.21 16

-1.48 5.43 33 G

-0.82 4.77 37 Cb.

3.95

2+97[7] = End ℄ Island.

2+65 Cont

2+65 80[6] Lt. = End cl.

2+46 40[9] Lt. = Cl. Rot. E.C.

2+40 Cont

station yard.

2+40 40' Rt. = N.W. Cor Paved Service

3.95

-0.71	-1.43
4.66	5.38
℄	℄
cl	pav

-0.53	-1.14	-1.37
4.48	5.09	5.32
80.6	80.6	50
End cl	pav	

-1.76	-1.45	-1.32	-0.58	-0.7	-0.71	-1.32	-1.45	-1.67	-1.40
5.71	5.40	5.27	4.53	4.7	4.66	5.27	5.40	5.62	5.35
30	15	G	cl.		Cl	G	15	30	40

-0.93	-1.41
4.88	5.36
40.9	40.9
Cl	pav

-1.10	-1.55		-1.32
5.05	5.50	Drive	5.27
36.5	36.5	30	40
cl.	G	Cl	of 1
			pav.

-1.68	-1.35	-1.25	-0.57	-0.6	-0.63	-1.26	-1.38	-1.57
5.63	5.30	5.20	4.47	4.6	4.58	5.21	5.33	5.52
30	15	G	Cl		Cl	G	15	30
								G

0+43 40' Lt = doorway

0+19 40' Lt = Δ in Bldg (Page 62)

0+04 ℄ = start 4' wide center island

T.P. 5.10 3.37 5.68 −1.73

3+24 = 0+00 Cont.

0+00 = N. line Ventura.
station yard.

= 0+00
3+24 40' Rt. = start paved service

3+12 = Along ℄ Ventura.

3+00 Along So. line Ventura

3.95

−1.00	−1.13
4.37	4.50
40.5	40
Floor	walk

−0.73	−1.42
4.10	4.79
℄	℄
ch.	pav.

3.37

−1.45	−1.65
5.40	5.60
40	40
top ch.	pav

−1.69	−1.94	−2.08	−1.60	−1.45	−1.68	−2.16	−1.83
5.64	5.89	6.03	5.55	5.40	5.63	6.11	5.78
33	33	30	15		15	30	40
top ch. E.C.	pav						

−1.76	−2.20	−2.09	−1.60	−1.50	−1.66	−2.22	−2.42	−2.12
5.71	6.15	6.04	5.55	5.45	5.61	6.17	6.37	6.07
40	32.8	30	15		15	30	32.9	40
	ct & grate						ct & grate	

−1.70	−1.95	−1.58	−1.44	−1.59	−2.01	−1.73
5.65	5.90	5.53	5.39	5.54	5.96	5.68
40	30	15		15	30	40

0+91 90° to ℄ Alley on Lt.

0+87 90° to ℄ Alley on Rt.

T.P. 6.01 4.28 5.10 -1.73

0+83 40' Lt. = End Bldg

0+82 30' Lt. = B.C. Alley Ret.

0+73 40^E Lt. = doorway

0+50

+drive, 72^E Rt. = ℄ Bldg.

0+37 42^E Rt. = ℄ 13' wide Conc. pump island

3.37

-1.55	-1.86	-1.47	-1.34	-0.59	-0.6
5.83	6.14	5.75	5.62	4.87	5.1
40	30 G	15	G	Ck	

-0.8	-0.81	-1.47	-1.51	-2.00	-1.69
5.1	5.09	5.70	5.79	6.28	5.97
	Ck	G	15	G 30	40

4.28

-1.48	-1.53
4.85	5.20
30	30
Ck. B.C.	Pav

-1.17
4.54
40.5
Floor

-1.19	-1.55	-1.93	-1.51	-1.34	-0.65	-0.8	-0.85	-1.47	-1.59	-2.11	-1.76
4.56	4.92	5.30	4.88	4.71	4.02	4.2	4.22	4.79	4.96	5.48	5.17
40	30 Ck	30 G	15	G	Ck.		Ck	G	15	30	40

-1.43	-0.87	-0.87
4.80	4.24	4.24
42.5	72.5	72.5
Conc	Conc	Bldg Floor

3.37

1+63 40' Lt. = ℄ doorway

1+40 Cont.

1+40

1+14 43' Lt. on floor of new Bldg.

1+01 30' Lt. = Alley ob. Ret. E.C.

1+00 40' Lt. = S.E. Cor. New Bldg.

0+97 30' Rt. = Alley ob. Ret. E.C.

4.28

-0.76	5.04
40	Floor

-0.76	-1.23	-1.27	-1.4	-2.2
5.04	5.51	5.55	5.7	6.5
40	37.5	30	40	60
walk at Bldg	walk	ob		

-1.71	-1.33	-1.29	-0.49	-0.7	-0.69	-1.32	-1.49	-1.92	-1.73
5.99	5.61	5.57	4.77	5.0	4.97	5.60	5.77	6.20	6.01
30	15	G	ob		ob	G	15	30	30
G								G	ob

-0.72	-1.10	-1.31	-1.36
5.00	5.38	5.59	5.64
doorway	walk	walk	ob
43	40	37.5	30

-1.39	-1.76
5.67	6.04
30	30
ob. E.C.	G

-2.00	-1.78
6.28	6.06
30	30
G	ob. E.C.

4.28

2+50 Cont.

2+50

2+00

T.P. 5.70 4.50 5.48 −1.20

1+65½

1+65 Cont.

conc. ramp to Bldg from walk.
37.5 Lt. = inside of walk. = end
1+65 40' Lt = N.E. Cor. Bldg.

4.28

-1.2	-1.1	-0.97	-1.36	-1.3	-1.8
5.7	5.6	5.47	5.88	5.8	6.3
60	40	30 cl	30 cl.	40	60

-1.44	-1.08	-0.98	-0.76	-0.4	-0.43	-1.06	-1.25	-1.59
5.94	5.58	5.48	4.76	4.9	4.93	5.55	5.75	6.09
30 G	15	G	cl		cl	G.	15	30 G

-1.12	-1.56	-1.17	-1.19	-0.39	-0.6	-0.57	-1.16	-1.39	-1.75	-1.51	-1.5
5.62	6.06	5.67	5.69	4.89	5.1	5.07	5.66	5.89	6.25	6.01	6.0
30 cl	30 G	15	G	cl	4.50	cl.	G 2	15	30 G	30 cl	40

-1.2
5.5
40
Grd.

-0.80	-1.16	-1.22	-1.59	-1.5
5.08	5.44	5.50	5.87	5.8
40 at Bldg	37.5 walk	30 cl	30 cl	40

-1.64	-1.24	-1.26	-0.46	-0.6	-0.67	-1.26	-1.45	-1.56
5.92	5.52	5.54	4.74	4.9	4.95	5.54	5.73	6.14
30 G	15	G	cl		cl.	G	15	30 G

4.28

2+90 30' Lt. = Alley Rot. E.C.

2+83 30' Rt. = Alley Cl. Rot E.C.

2+81 40' Rt. = S.W. Cor Bldg under Const.

2+80 (30' Lt) = 90° to ℄ Alley on Lt.

2+73 = 90° to ℄ Alley on Rt. (30' Rt)

2+70 30' Lt. = Alley Rot. B.C.

2+63 30' Rt. = Alley Rot. B.C.

4.50

-0.90	-1.32
5.40	5.82
30	30
Cl	C.

-1.55	-1.31
6.05	5.81
30	Cl
C.	30

-0.83	-1.39	-1.00	-0.89	-0.19	-0.3
5.33	5.89	5.50	5.39	4.69	4.8
40	30	15	C	Cl	

-0.3	-0.40	-1.04	-1.21	-1.56	-1.19
4.8	4.90	5.54	5.71	6.08	5.69
	Cl	C	15	30	40

-1.07	-1.41
5.57	5.91
Cl	C
30	30

-1.59	-1.38
6.09	5.88
C	Cl
30	30

4.50

Mission Blvd.

4+00	Cont.			
4+00				
3+50				
T.P.	5.54	4.35	5.69	-1.19
3+09	44' Rt. = N.W. Cor. Bldg. under Const.			
3+02	46' Rt. = ℄ door way			
3+00	Cont.			
3+00				
		4.50		

B.L.

-0.6	-0.6	-0.61	-1.06	-0.8	-0.5		
5.0	5.2	4.96	5.41	5.2	4.9		
60	40	30 cl.	30 cl.	40	60		
-1.08	-0.72	-0.63	+0.09	0.0	-0.11	-0.80	-0.92	-1.32
5.43	5.07	4.98	4.26	4.4	4.46	5.15	5.27	5.67
30 G	15	G	cl.		cl.	G	15	30 G
-1.0	-0.75	-1.22	-0.81	-0.75	-0.05	-0.1	-0.25	-0.57	-1.02	-1.41	-1.18	-1.2
5.4	5.10	5.57	5.16	5.10	4.40	4.5	4.60	5.22	5.39	5.74	5.53	5.6
40	30 cl.	30 G	15	G	cl.		cl.	G	15	30 G	30 cl.	40

4.35

-0.50
5.00
40
on Floor

-1.1	-0.9	-0.83	-1.27	-1.2
5.6	5.4	5.33	5.77	5.7
60	40	30 cr.	30 cl.	40
-1.24	-0.95	-0.90	-0.17	-0.3	-0.36	-0.98	-1.15	-1.55
5.74	5.45	5.40	4.67	4.8	4.86	5.48	5.65	6.05
30 G	15	G	cl.		cl.	G	15	30 G

4.50

Mission Blvd

B.P. Santa Barbara & Sea Wall			3.71	7.05	7.03
T.P	11.26	10.76	5.46	-0.50	
T.P.	5.25	4.96	4.64	-0.29	
		4.50			

Additional Levels Mission Blvd
& Ventura Place

Sketch Page 61-62

0+91 = ℄ Grating on Lt. just a Sump.

0+73 = Door Way on Lt

0+43 " " "

0+19 " " "

℄ Ventura Place = Catch Basins Rt+Lt.

TP	5.64	4.13	6.93	-1.51	Lt. of ℄ Mission Blvd N Curb Ventura
TP	2.74	5.42	6.82	2.68	BP Seaward & Santa Barbara
BM	2.47	9.50		7.03	

Feb. 4-49
Sirsor
Smith
Becker
Barger

74

M.O. 21519

Lt = W

Rt = E

℄ Mission Blvd

-5.9
10.0
Bottom Dirt

-1.93
6.06
Weld Wing
0.5 Grate
25 Feet 15 14.5

-1.09
5.22
60.5 on Conc Floor
in Bldg

-1.13
5.26
50.5 on Conc Floor
in Bldg

-1.21
5.34
40.5 on Conc Floor
Market

-1.04
5.19
40.5 on Conc
Floor Flo
Bldg.

-1.02
5.15
40 on Conc Floor
of Cafe

-5.65
9.78
32.8
Bottom Box

-2.24
6.39
32.8 ℄ 22.5 Ft
Rt of
Platform Grate

4.13 ℄

-2.53
6.66
32.9
on Conc Box
Grate

-7.96
12.09
32.9
Bottom Box

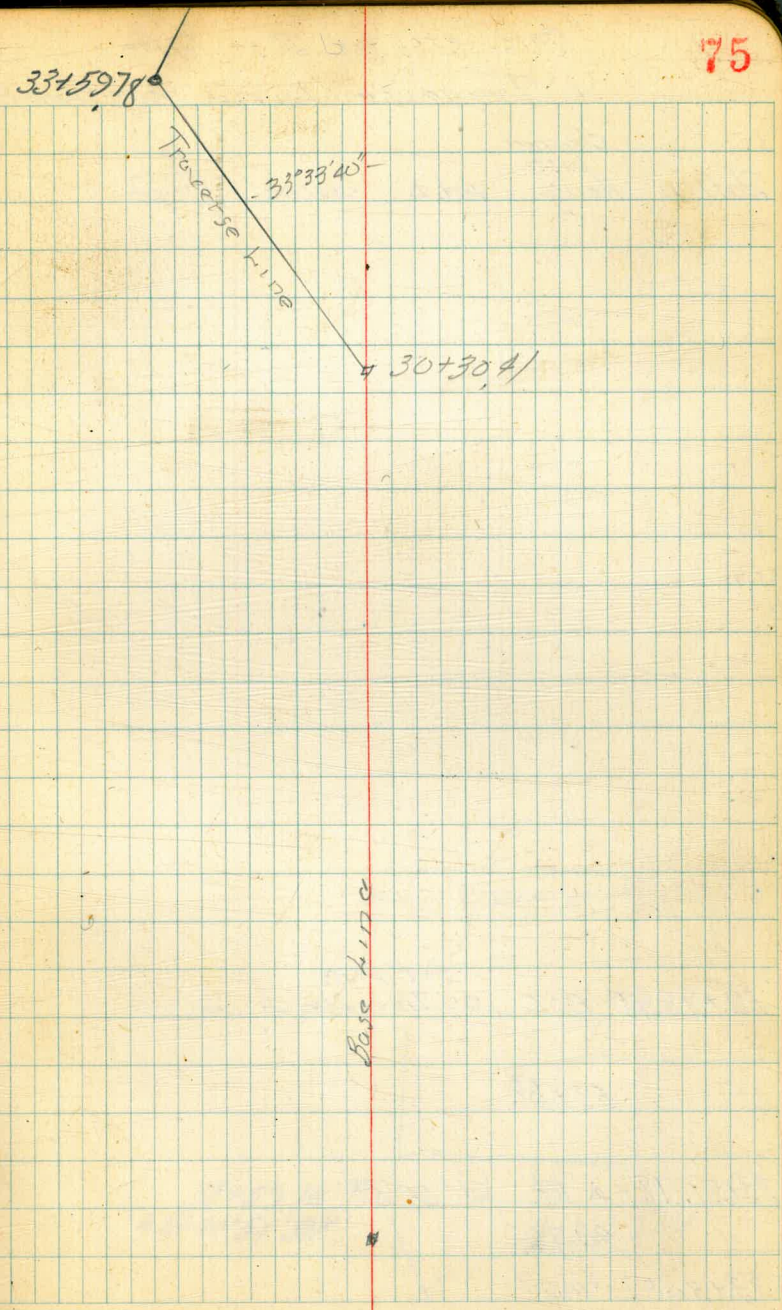
Balboa Park Calculations etc.

for Base Line Retracement

Shown Sketch P-2

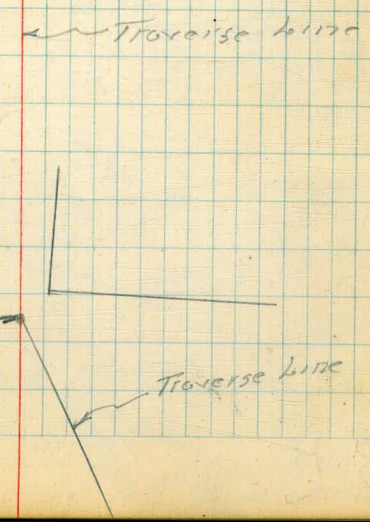
Cont. on P-76

Station	Dist. Horiz.	Meas Vert Δ	Cosine	Slope
33+30.02	-.18 = Correction			
	299.97	0°46	.99991	300'
30+30.41 = Δ Lt.	Set Hub	33°33'40"		
	66.50	11°37	.97952	67.89
29+63.91 = Null				
	-0.18			
	296.99	+8°07	.98998	300
26+67.10 = P.O.T.	Set Hub.			
	-0.05 Correction			
	212.94	10°25	.98352	216.51
24+54.21	Null ~~Hub~~ ~~Set Hub.~~			
	11.33			
24+42.88	Set Hub.			
	-11.33			
	-0.04 = Correction Null			
	184.02	-13°26	.97264	189.20
22+70.23 = P.O.T.	Set Hub			
	147.53	5°15	.99580	148.15
21+22.7	Null			
	~~95~~ 95.00			
20+27.70 = Mon. Starting Point.				



Calc. etc. for Base Line
& Traverse Line Cont. from P. 75

Station	Chained Dist. Horiz.	Vert. Δ	Cosine	Slope
38+98.95 = P.O.T.		Set Disk on Traverse Line		
	539.67			
33+59.78 = Δ Rt.		61°54'50		
	29.76			
33+30.02 = Hol				

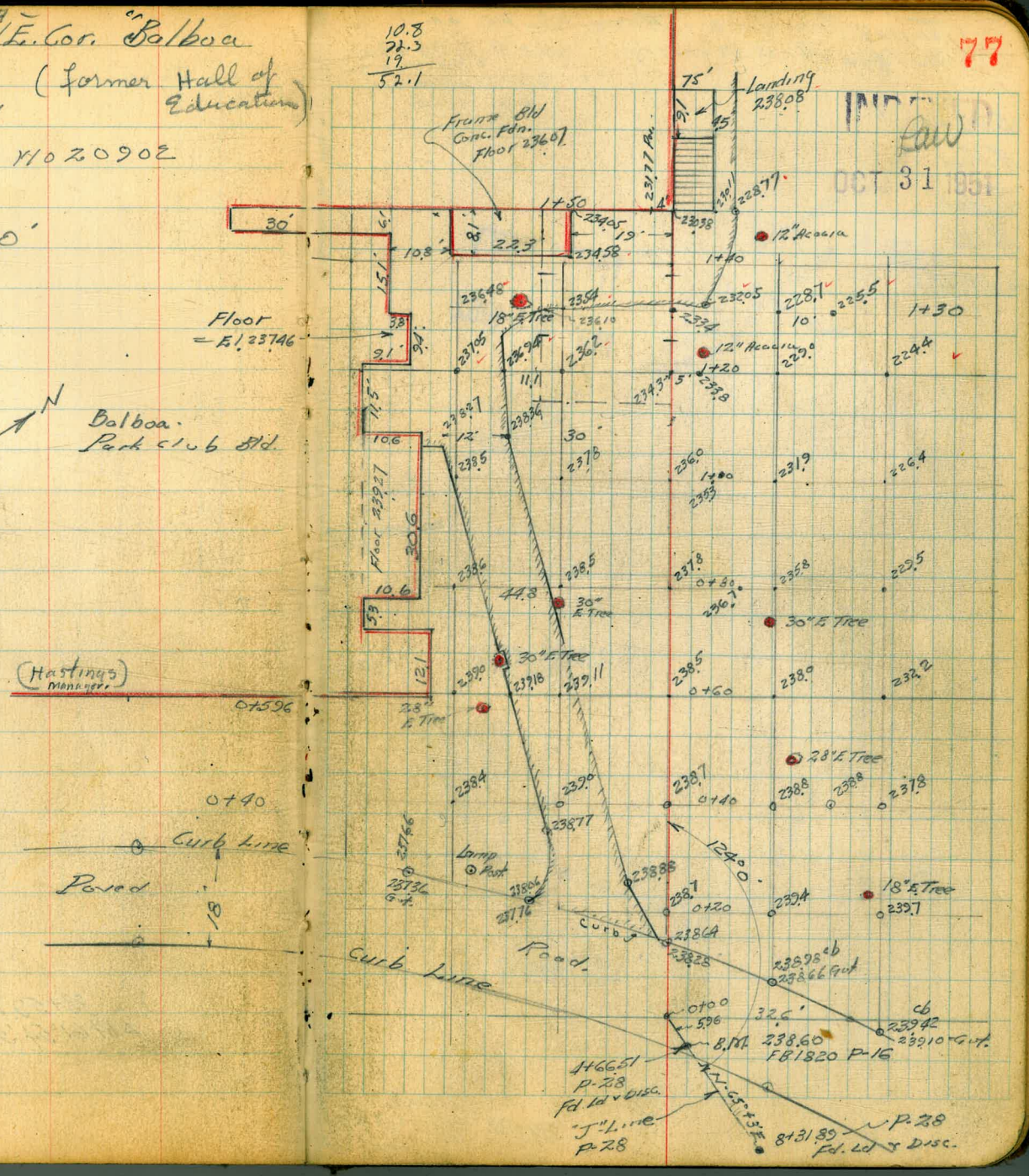


Topography ~ AREA ~ N.E. Cor. "Balboa Park Club Bld." (former Hall of Education) in Balboa Park

Walker
Pope
Hoffman
Allen
10-30-51

Y10 20902

Scale 1" = 30'



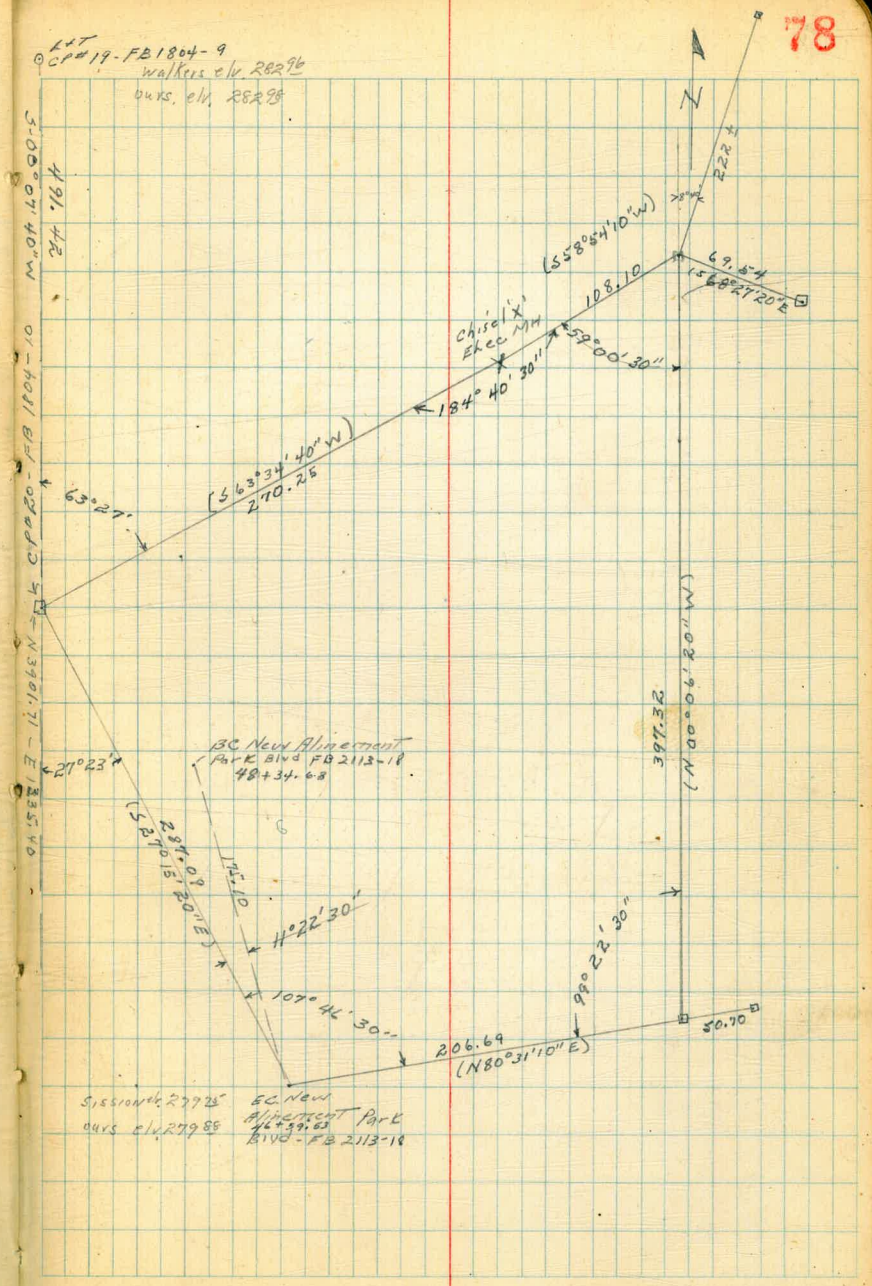
238.20
236.07
2.13

Topog Traverse - Area North of
Balboa Park Nursery WO# 20637

Smith
Allen
Taylor
Parks
5-14-52

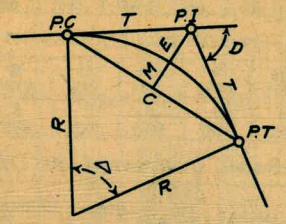
walkers elv. 281.74
our elv. 280.87

BM 283.28 N.W.B.P. Park Blvd. Laurel



100.38
100.46
100.33
100.46
28.20
429.83
491.41
61.58

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES



CURVE FORMULAS

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

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

Middle ordinate$=M=R(1-\cos. \frac{\Delta}{2})$ (5)$=R\text{vers}\frac{\Delta}{2}$ (6)

External$=E=T\tan\frac{\Delta}{4}$ (7)$=R\div\cos.\frac{\Delta}{2}-R$ (8)$=R\text{exsec}\frac{\Delta}{2}$ (9)

Long Chord$=C=2\ R\sin.\frac{\Delta}{2}$ (10) Δ=Central Angle

EXPLANATION AND USE OF TABLES

Stations.—Given P. I.=Sta. 161+60.35 to find Sta. of P. C. and P. T. $\Delta=62°\ 10'$ $D=8°\ 20'$. From Table IV for 1° curve T=3454.1 and ÷8⅓=414.49 ft. From Table V correction=.36 or T=414.85 ft. P. C.=Sta. P.I.—T=157 +45.50. Also from (4) L=746.00 and P. T.=Sta. P. C.+L=164+91.50.

Offsets.—Tangent offsets vary (approximately) directly with D and with square of the distance. Thus tangent offset for Sta. 158 on above curve is 2.16 ft. found as follows. From Table III tangent offset for 100 ft.=7.27 ft. Distance=158—Sta. P. C.=54.50, hence offset=7.27 $(54.50\div100)^2$=2.16 ft. Also square of any distance divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(54.50)^2\div(2\times688.26)$=2.16 ft.

Deflections.—Deflection angle=½ D for 100 ft., ¼ D for 50 ft., etc. For c ft.=(in minutes) .3 x C x D° or=defl. for 1 ft. from Table III x C. For Sta. 158 of above curve=.3 x 54.5 x 8⅓=136.2′ or 2° 16.2′, or=2.50 x 54.5=136.2′ from Table III. For Sta. 159 deflection angle=2° 16.2′ +8° 20′ ÷2=6° 26.2′, etc.

Externals.—May be found in similar manner to tangents. Thus E for curve above is 115.37. For from Table IV for 1° curve E=960.6 or 8° 20′=960.6÷8⅓=115.27 and from Table V correction=.10 or E=115.37 ft. Or suppose Δ=32° and E is measured and found to be 42 ft. What is D? From Table IV E=230.9 and ÷42=5.5 or D=5° 30′.

17529
4937
12592
36.88
212.17

31944
374.43
69387

26+2090
11 09 87
15 11 03

H

0
1
2
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32
33

Federal co. Books
1308-79 = Laurel & Pk. Blvd
1384-79 " 6th
1584-2 - Laurel & 7th & 6th
1549-2 - Pepper. Grove

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1½
For Single Track Embankment.

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

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For same slopes but other widths of roadbed correct above figures by one-half difference in width of roadbed; thus in example above for 20 ft. roadbed distance will be 41.9 + (20—16) ÷ 2 or 2 ft. added to 41.9 = 43.9.
For slopes of 1 on 1 see inside of front cover.

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