1674

EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and SURVEYING INSTRUMENTS

Chicago New York San Francisco New Orleans Pittsburg Toronto

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

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

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

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1674

CITY ENGINEER'S OFFICE

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.

	192.05	Cont. from P-69		
(62+75) 3' Lt 14" E.T.				
62+67		7.3	184.8	
+84 1' Rt. 14" E.T.				
+94 7' Rt. 6" E.T.				
63+02 8' Rt 8" " "				
T.P. 035	179.77	12.63	179.42	
+09		0.8	179.0	
+18 = Int. curb		0.90	178.9	Paved 16' Road
" on Gut. Pav.		1.81	177.96	
+40 5.3' Rt = cb.				
10.9 Lt = "				
+50		2.84	176.93	6.6' Rt = cb
+65 = PC. Road 7.7' Rt. = cb				
64+00		4.33	175.44	
+20		5.23	174.54	
dirg dist. = 18" Lt. on Flow outlet.		9.10	170.67	8" Drain
(64+08) 13' Rt. on Rim		3.68	176.09	Sewer Rt.
		7.35	172.42	
" " " " Flow		11.03	168.74	
64+50		7.07	172.70	
65+00		10.16	169.61	

Cont. P. 1

Cont. from P- 0

179.77 ✓

65+147.77 = B.C. Lt.			14.00	165.77	
T.P.	0.27	167.11 ✓	12.93	166.84	
65+75			3.46	163.65	N E. Cor. Excto. 42' Lt
+82 opp S E Cor. Excto			4.00	163.11	S E. Cor Excto 63' Lt.
65+88 5.7' Lt. 18" Ext. T.					
3.7' Lt. = cobble cb.					
65+99 = Int. cobble cb. on Gut			5.46	161.25	
" on " "			4.56	162.55	
66+13 = Int cobble cb.			6.15	160.96	
" on Gut.			7.13	159.98	
66+25			7.75	159.36	
66+31.07 = E.C. } Equation = 66+30.87			8.01	159.10	
4' Lt. = cb.					
66+345 = Int Conc. Box Culvert. (Days Not over 25.125)			8.14	158.97	Length 77 on Paving
" on Top " "			8.74	158.37	
66+50			8.64	158.47	
94' Rt = P.C. (Short R on Rt) cb.					
54' Lt.					
67+00			9.62	157.49	
4' Rt = cb.					
98' Lt = "					

167.11

(67+25) 22' Rt = cb

" 10.2' Lt = "

67+50			10.95	156.16
3.2' Rt = cb.				
9.3' Lt = "				
68+00			12.5	154.6
6.1' Rt = cb.				
6.2' Lt = "				
T.P.	0.59	156.13 ✓	11.57	155.54 ✓

Cont. F8 1678 P- 6

✓

Walter Hazard Hardin 9-19-44

SURVEY - PROPOSED WATER MAIN Across BALBOA PARK on Thorn St. Projection from 28th & Thorn Sts. to 7th Ave & Laurel Sts.

Revised

0+07 Set P.O.T. Nail in Paving

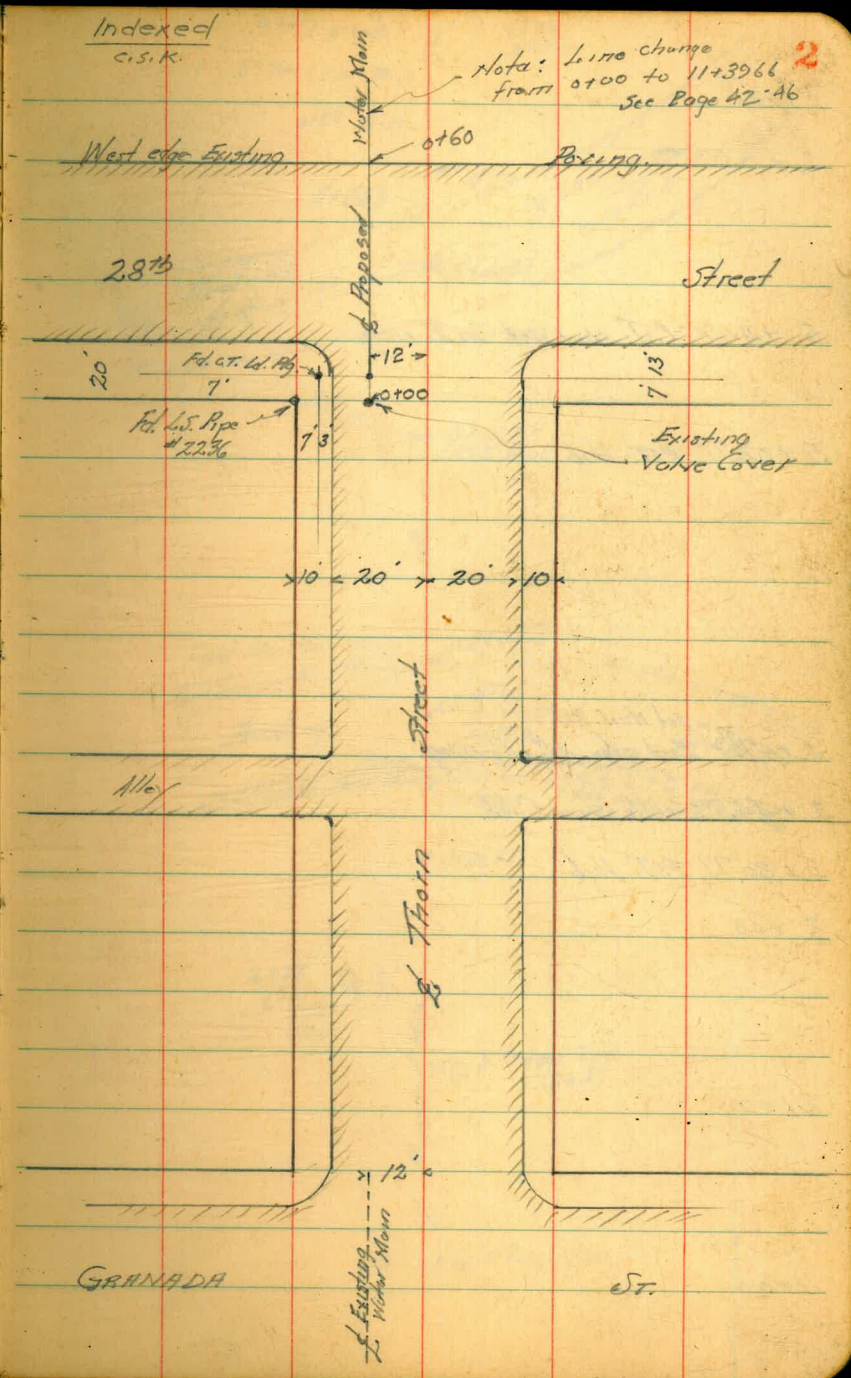
0+00 = East Line 28th St.

See Pages 41 to 45

Find Location - Proposed 36" Water Main

30th & Thorn to Sta. 11+41.51 =	Book - 1674 - 41-45
Sta. 11+39.66 to 17+04.67	" " 5-6
" 17+04.67 to 40+02.93 =	" 1678 51-54
" 40+52.73 " 42+08.29	" 1674 - 56
" 42+08.29 " 73+11.02 =	" 1678 - 31-38
" 72+39.73 " 84+	" 1674 - 62-64

Indexed
C.S.K.



6+00

5 +40.91 = P.O.T. Nail set in Paving.

5 +02.77 = P.O.T. Hub.

3 +47.96 = Set Nail P.O.T.
East edge A.C. Paving.

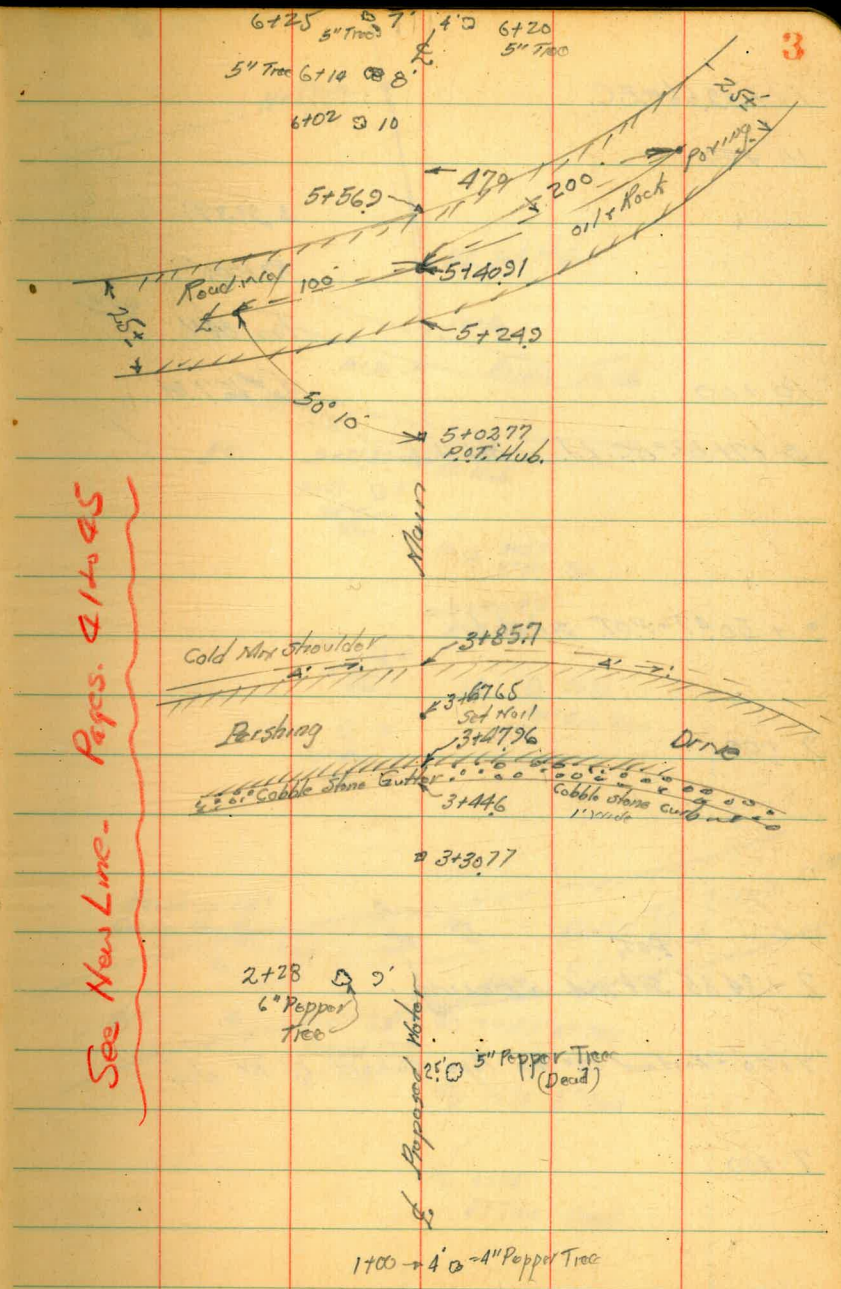
3 +44.6 = Cobble Stone Curb.

3 +30.77 = P.O.T. Hub

3 +00

2+00

1+00



See New Line - Pages. 41 to 45

11+39.66 = E.C.

11 +00

Δ 9°37'

R=1000'

Tan 84.11

L=167.84

10 +00

9 +71.82 = B.C. Lt. Set Hub.

9 + 50.47 = P.O.T. Set Hub.

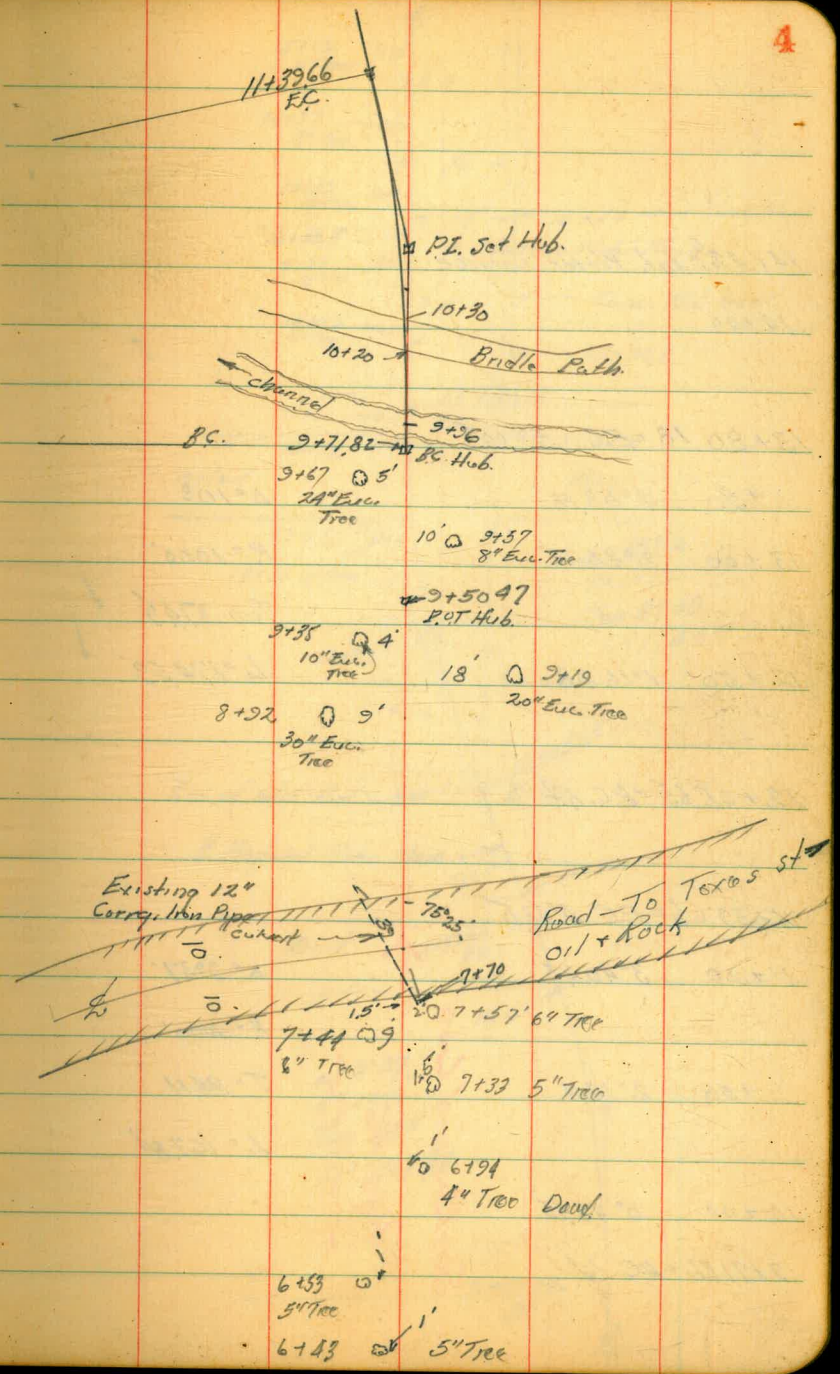
9 +00

P.O.T.

7 +84.85 Set Nail in Paving.

7+70 = East end 12" Iron Pipe Culvert 1.5' Rt of ℄

7 +00



14+42.5 = Int. Water Service

14+00

13+80.18 = E.C. 5° 00'

+50 4° 08.18'

13+00 2° 42.23'

12+50 1° 16.28

12+05.65 = B.C. ℞

11+39.66 = E.C. 4° 48.5'

11+00 3° 40.35'

+50 2° 14.4

10+00 0° 48.95'

9+71.82 = B.C. ℞

See Revised Line Page 45

Δ = 10°

R = 1000'

Tan 87.49'

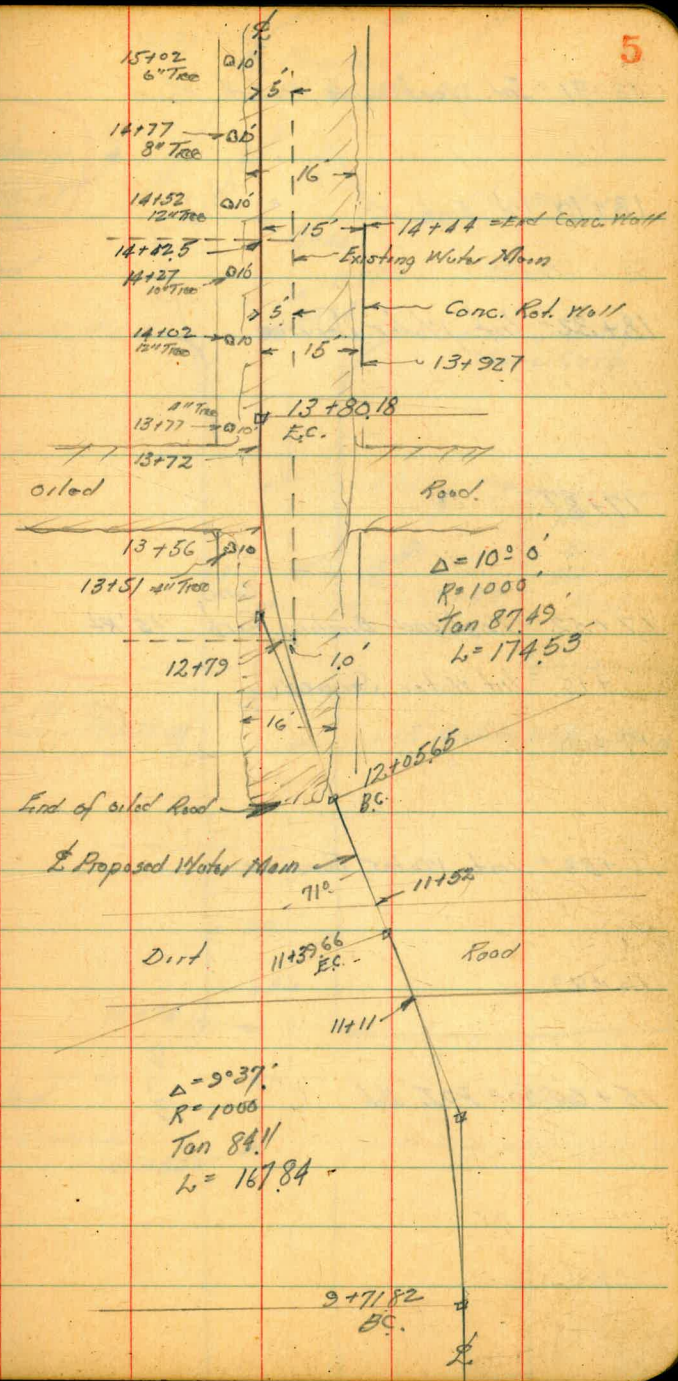
L = 174.53'

Δ = 9° 37'

R = 1000'

T = 84.11'

L = 167.84'



18+91 = Int. West side oiled Road

18+70 = Int. East " " "

18+32 = Int. Water Service

17+81

17+52 = East end Existing Conc. Curb 15' Rt.

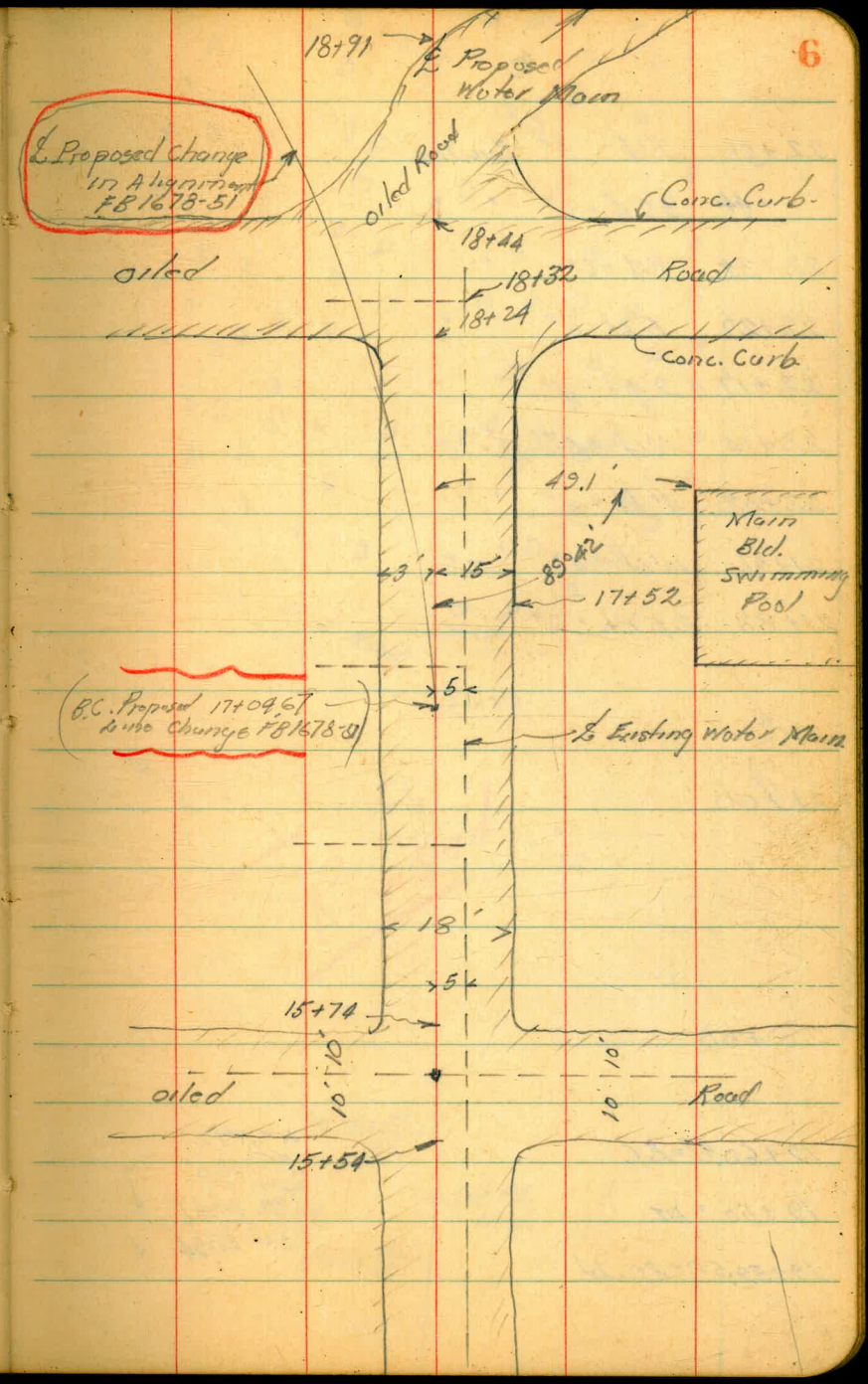
+15 = Int. Water Service

17+00

16+38 = Int. Water Service

16+00

15+64.50 = P.O.T. Hob



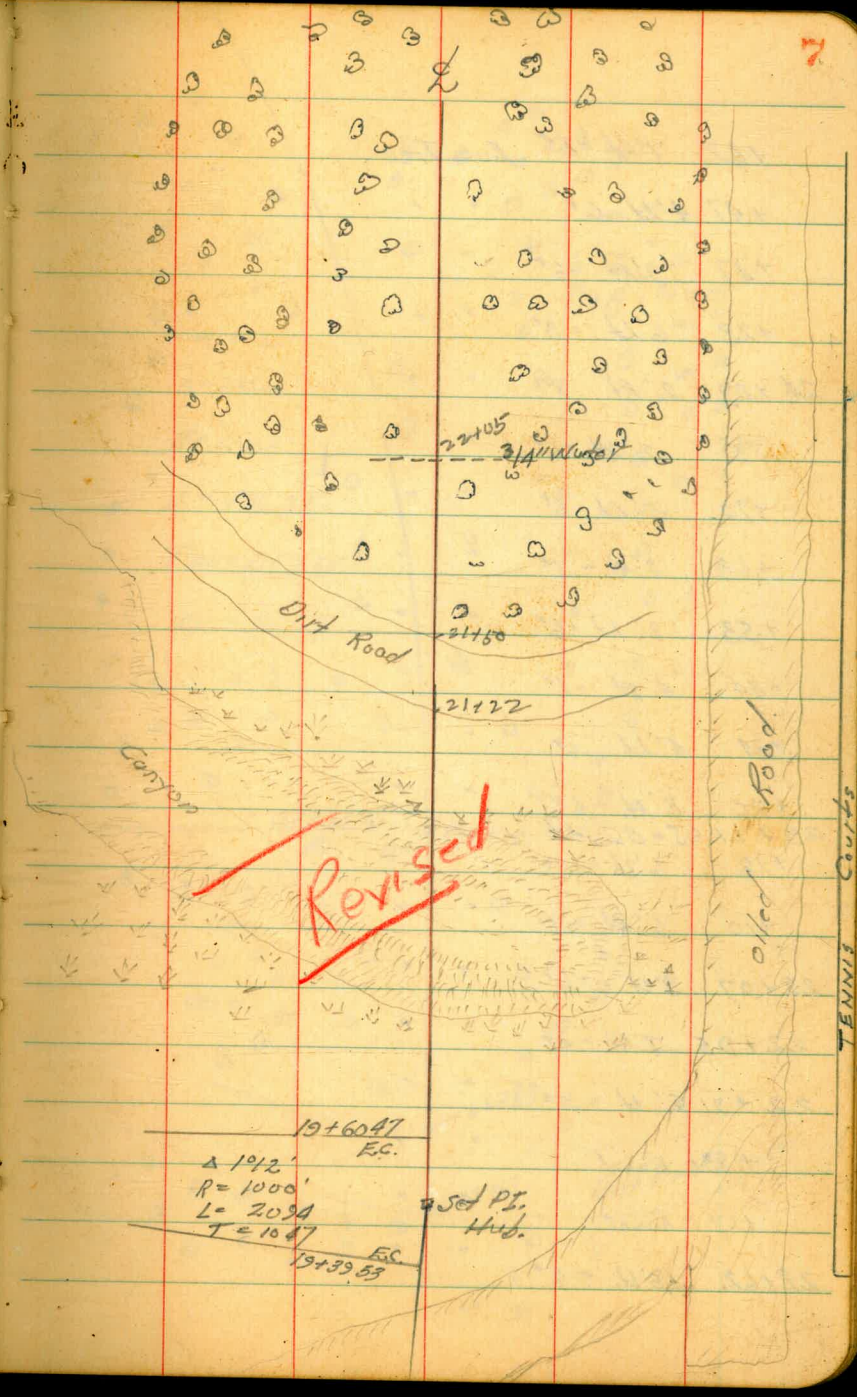
22+51 9' Lt. 5" Euc. Tree
+44 3.5' Rt = 6" " "
22+32 9' Rt = 6" " "
22+29 5' Lt = 6" " "
22+17 9' Rt = 4" " "
22+14 4' Lt = 5" " "
22+02 4' Rt = 6" " "
21+96 10' Lt = 4" " "
21+88 2.5' Rt = 6" " "

21+00

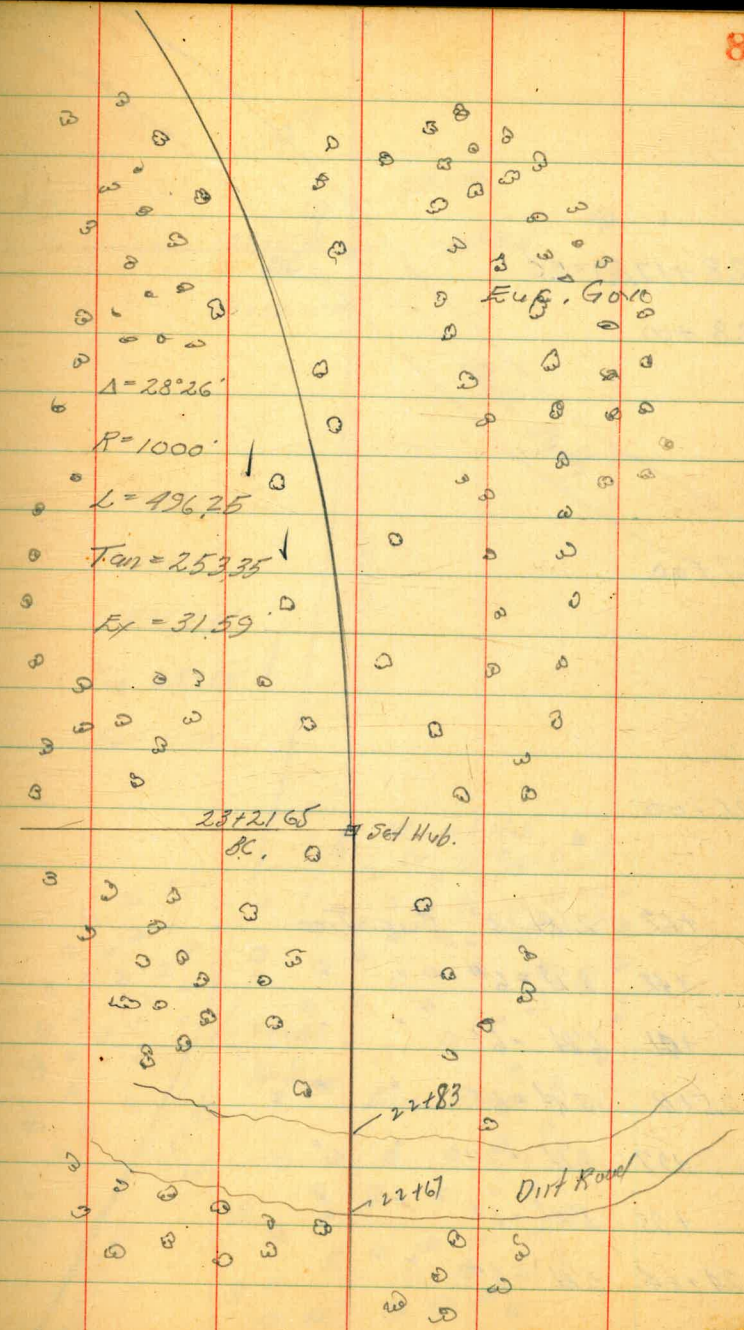
20+00

19+60.47 = E.C.
19+50 = P.I.
19+39.53 = B.C. Lt.

Δ = 1°12'
R = 1000'
Tan 10.47 ✓
L = 20.94 ✓



+62	7' Lt. = 6"	Euc. Tree
+47	4' Lt. 6"	" "
+47	9' Rt = 6"	" "
+23	6' Lt. = 3"	" "
24 +09	2' Rt. 8"	" "
+88	2' Rt = 6"	" "
+70	5' Lt. 6"	" "
+63	8' Rt = 7"	" "
+53	8' Lt. = 6"	" "
+44	4' Rt = 6"	" "
+34	4' Lt 6"	" "
+26	8' Rt. = 6"	" "
23 + 21.65 = BC. Lt.		
+18	6' Lt = 5"	" "
+10	6' Rt. = 7"	" "
23+07	9' Lt = 6"	" "
22+95	7' Rt = 4"	" "
22+91	6' Lt = 5"	" "
+83 = Road		" "
+67 = Road		" "
22+62	1.5' Lt. = 6"	" "



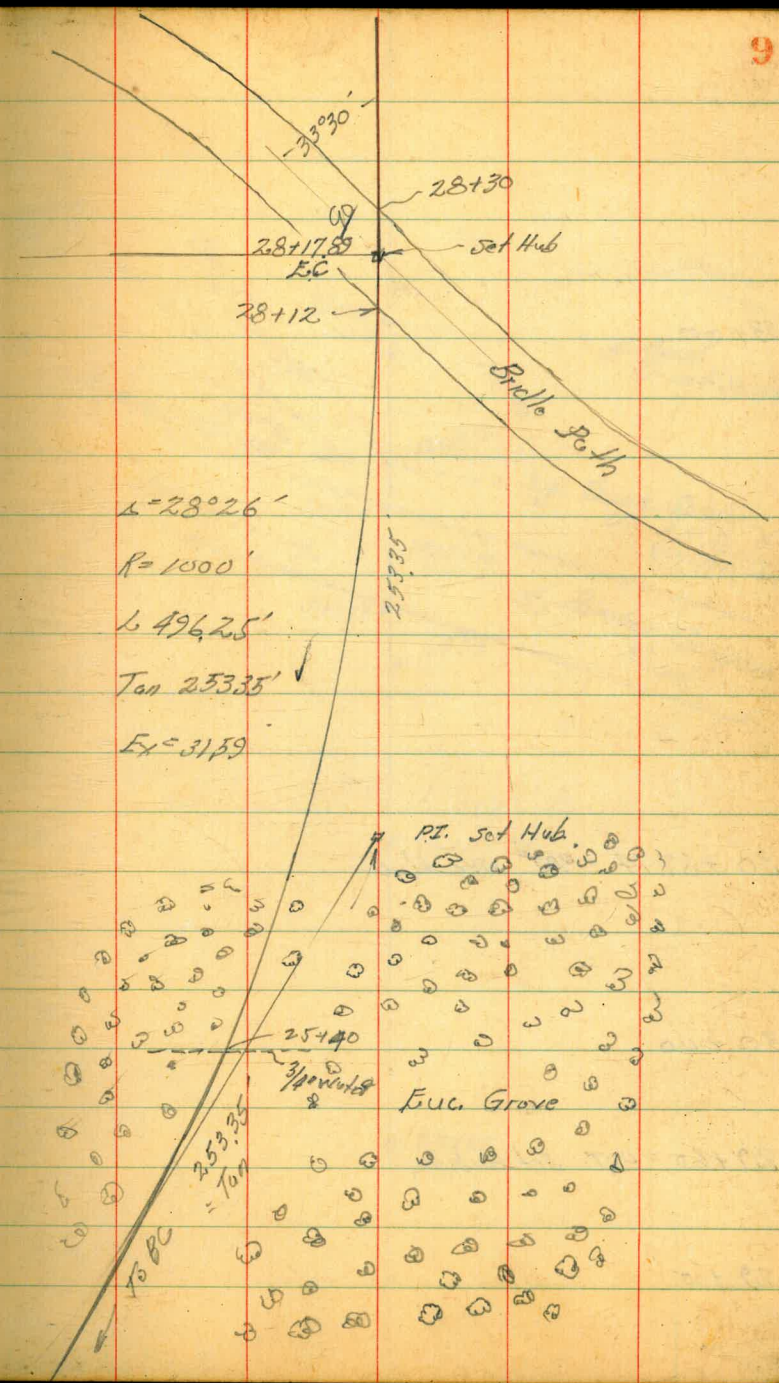
28 +17.89 = EC

28 +00

27+00

26+00

+62	2' Rt. = 8"	Euc. Tree
+42	8' Rt. = 6"	" "
+41	6' Rt = 6"	" "
25+11	3' Rt = 6"	" "
+97	6' Lt = 7"	" "
+95	8' Rt = 6"	" "
24+64	5' Rt = 6"	" "



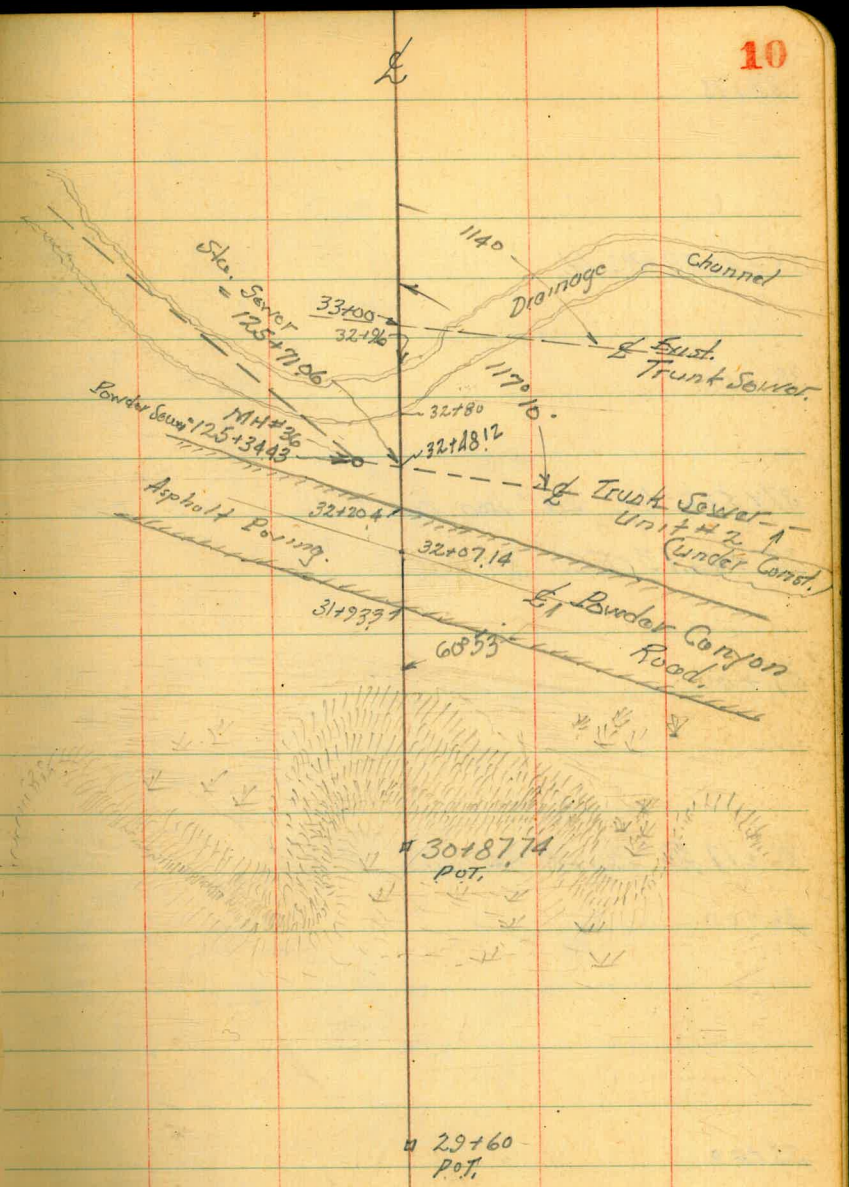
33+00

30+87.74 = P.O.T. Set Hub.

30+00

29+60 = P.O.T. Set Hub.

29+00



38+75

38+49.53 = B.C. Lt.

38+00

37+53.8 = 1st 24" Iron Pipe Culvert 9' Rt. = N end.
11' Lt. = S "

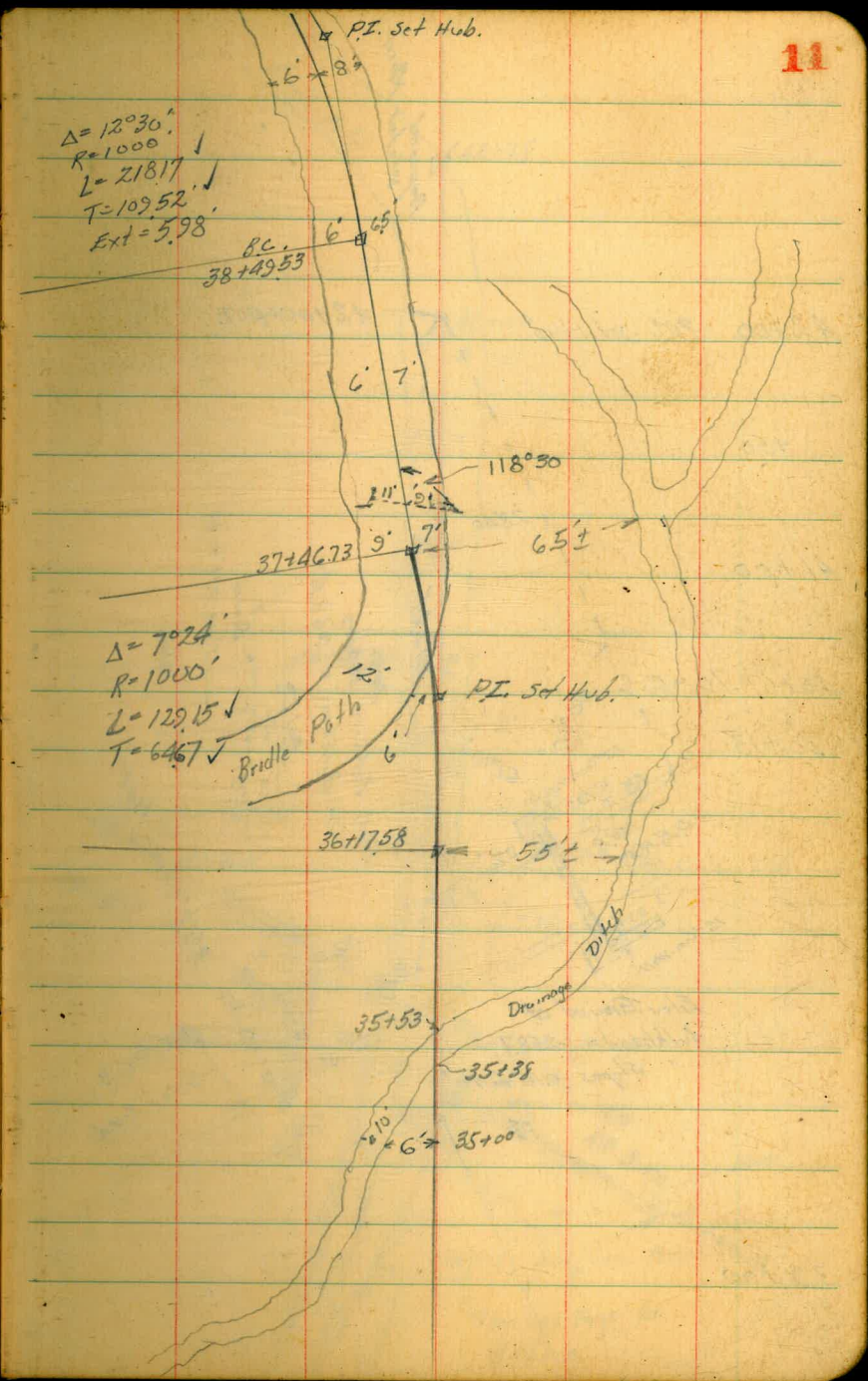
37+46.73 = E.C. Set Hub

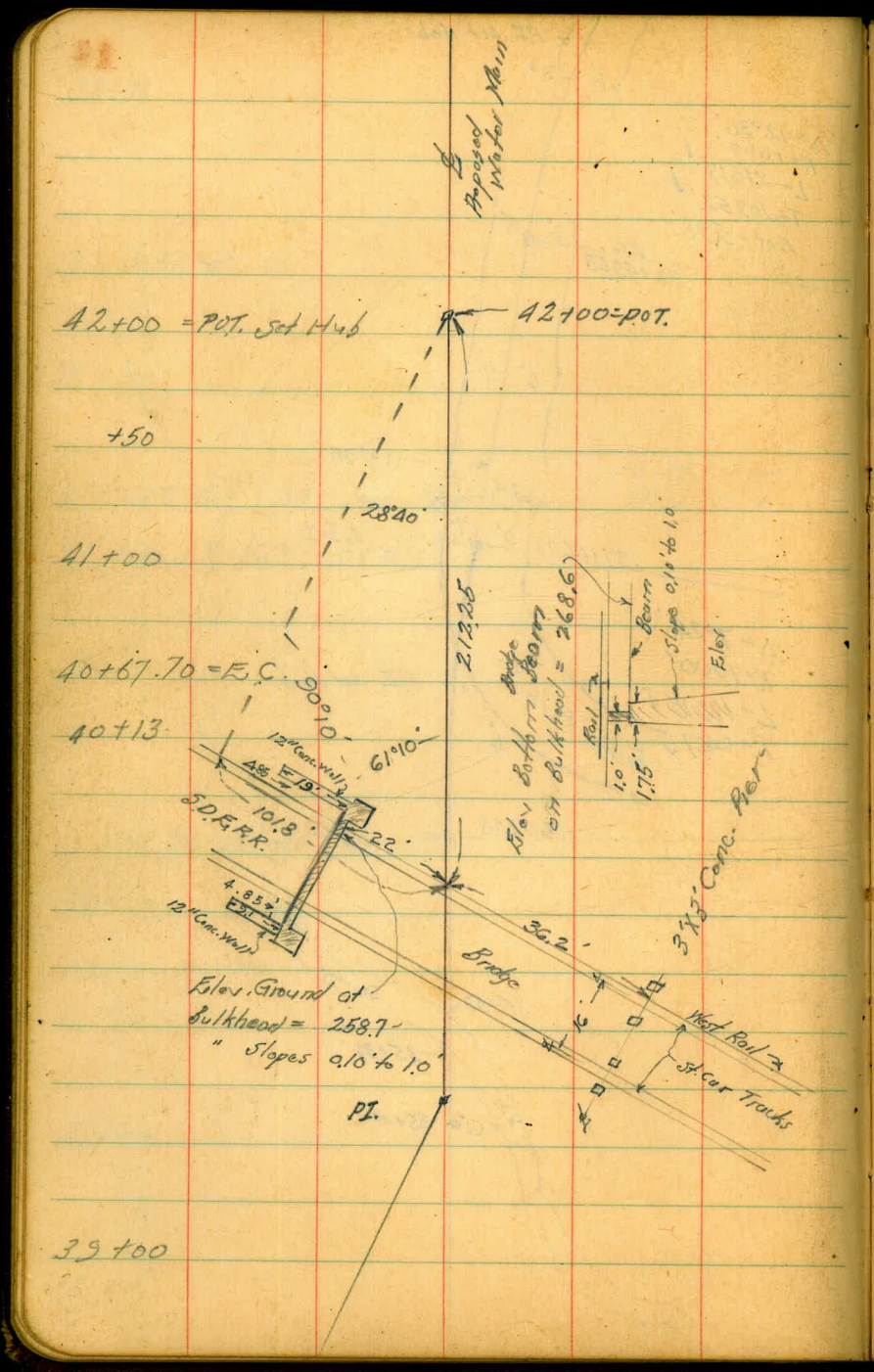
37+00

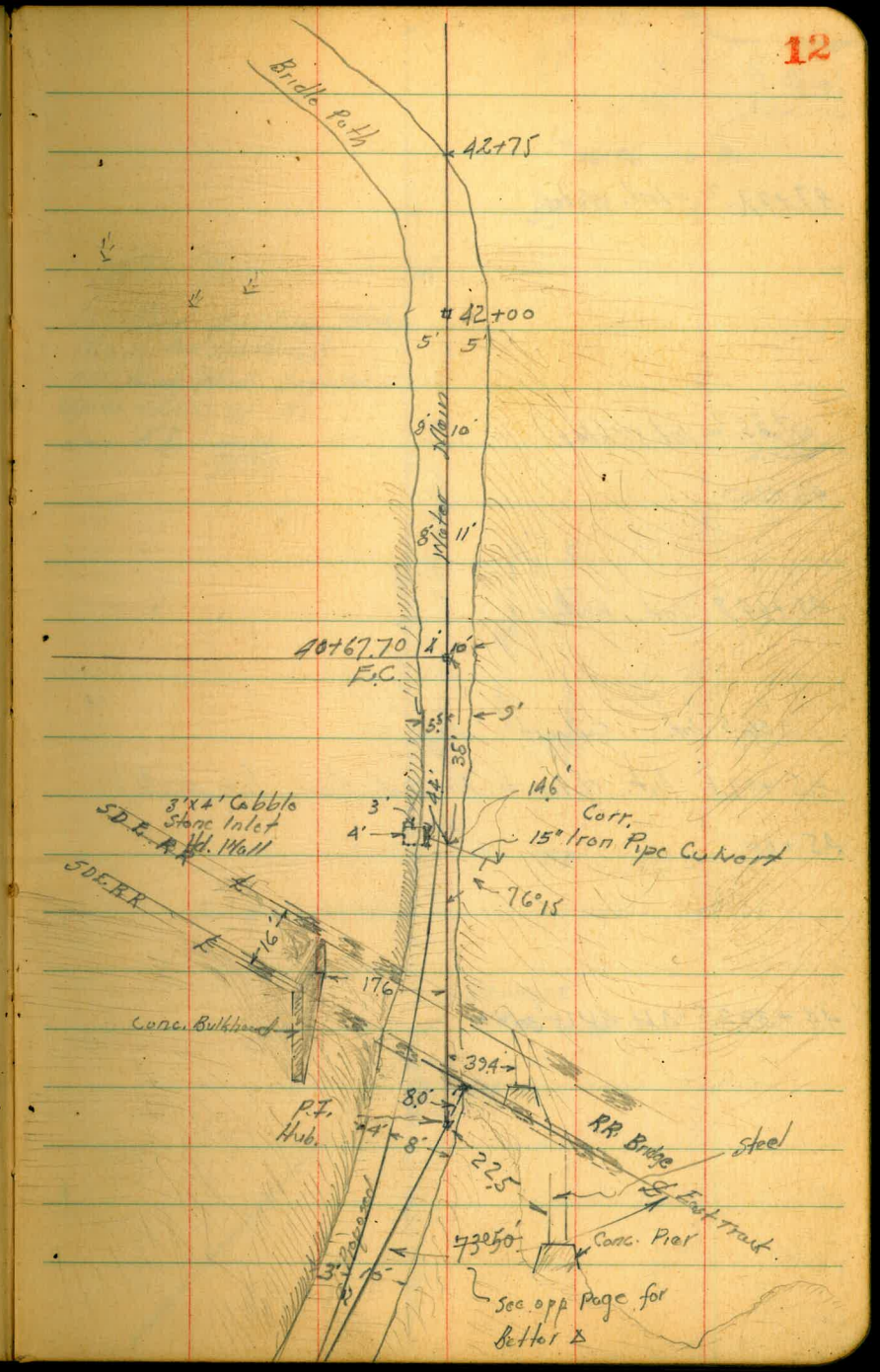
36+17.58 = B.C. Lt. Set Hub

36+00

35+00




Proposed Water Main
42+00 = P.O.T. Set Hub
42+00 = P.O.T.
+50
28°40'
41+00
212.35
40+67.70 = E.C.
90°10'
40+13
61°10'
12" Conc. wall
4.85
19'
10.8'
22'
S.D.E.R.R.
4.85'
12" Conc. wall
Elev. Bottom Beam at Bulkhead = 268.6
Beam
Slope 0.10' to 1.0'
Elev.
Rail
1.0'
17.5'
3'x3' Conc. Pier
36.2'
Bridge
Elev. Ground at Bulkhead = 258.7
" Slopes 0.10' to 1.0'
West Rail
St. Car Tracks
P.I.
39+00


Bridle Path
42+75
42+00
5'
5'
8'
10'
Water Main
8'
11'
40+67.70
E.C.
10'
5.5'
9'
35'
14.6'
3'x4' Cobble Stone Inlet
Hd. Wall
3'
4'
Corr.
15" Iron Pipe Culvert
S.D.E.R.R.
76°15'
16'
17.6'
Conc. Bulkhead
39.4'
8.0'
P.I.
Hub.
4'
8'
22.5'
R.R. Bridge
Steel
East Track
Proposed
3'
16'
73°50'
Conc. Pier
See opp. Page for Better

47+27.2 = Int. Water

+35.7 Int. Water.

46+00

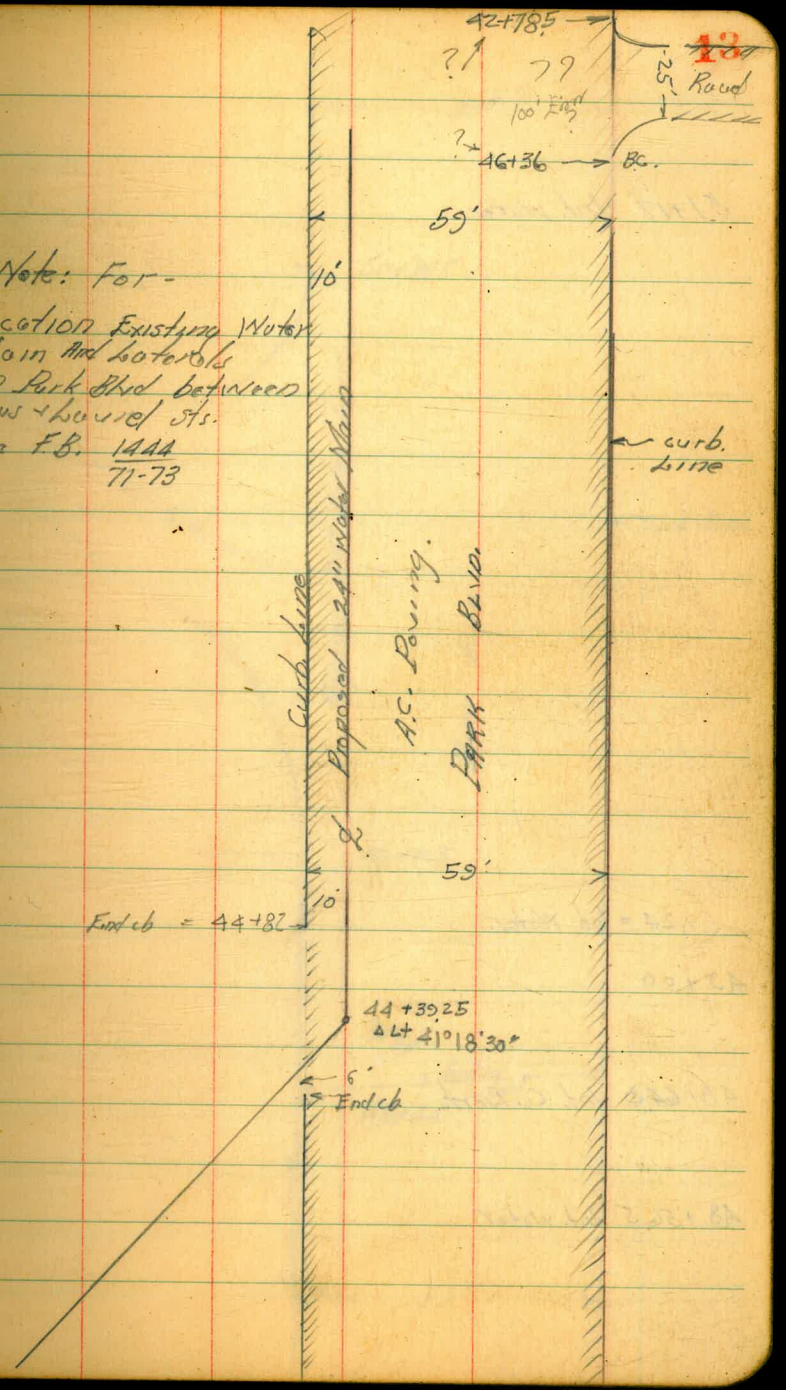
45+69.8 Int. Water.
72
65

+56.5 - Int. Culvert

45+07.6 - Int. Water to Fire Hyd. Riser (No Hydt.)

45+00

44+39.25 = ΔLt. 41°18'30"



Note: For -
Location Existing Water Main and laterals on Park Blvd between Upus + Buried Sts.
See F.B. 1444
71-73

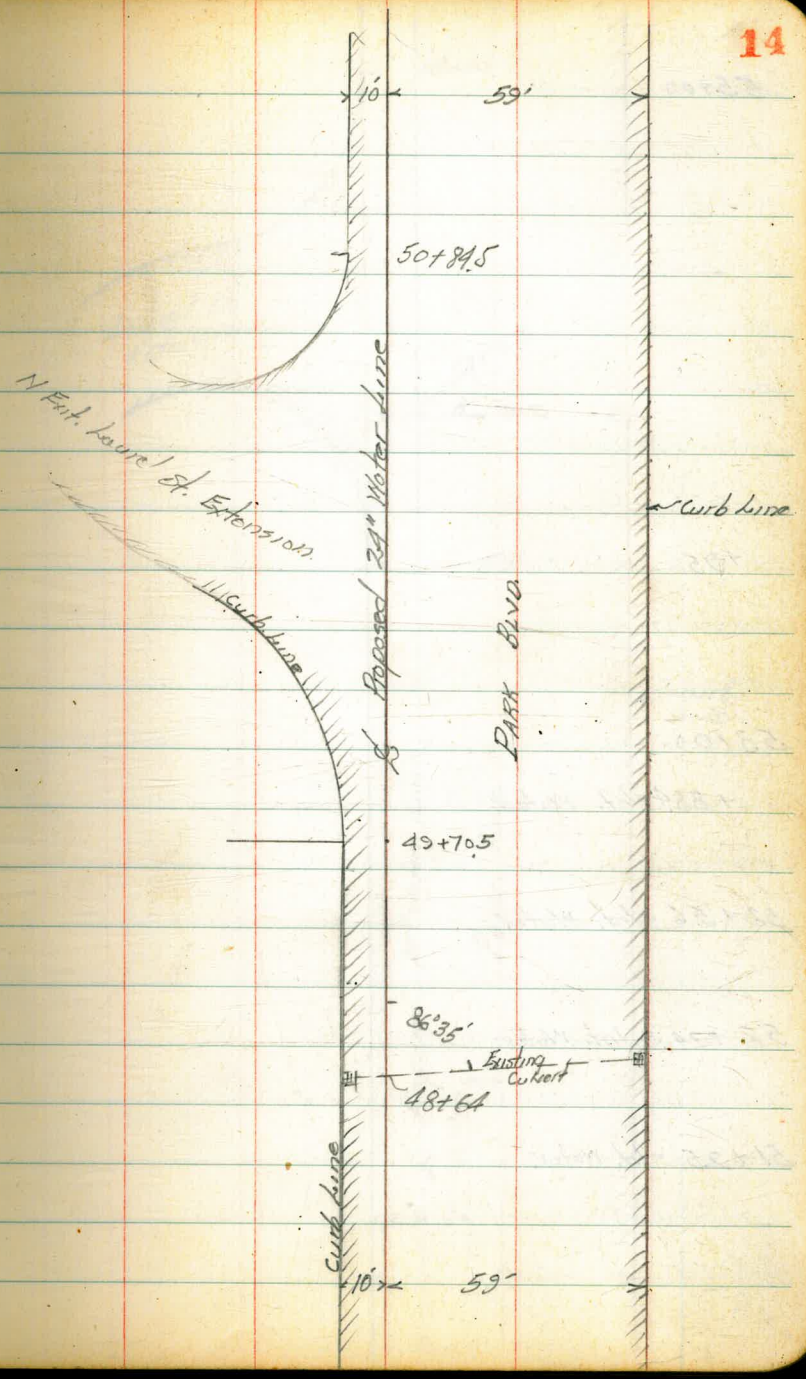
51+17 = Int. Water

+24 = Int. Water.

49+00

48+64.0 = Int. Culvert.

48+56.5 = Int. Water



55+00

+95

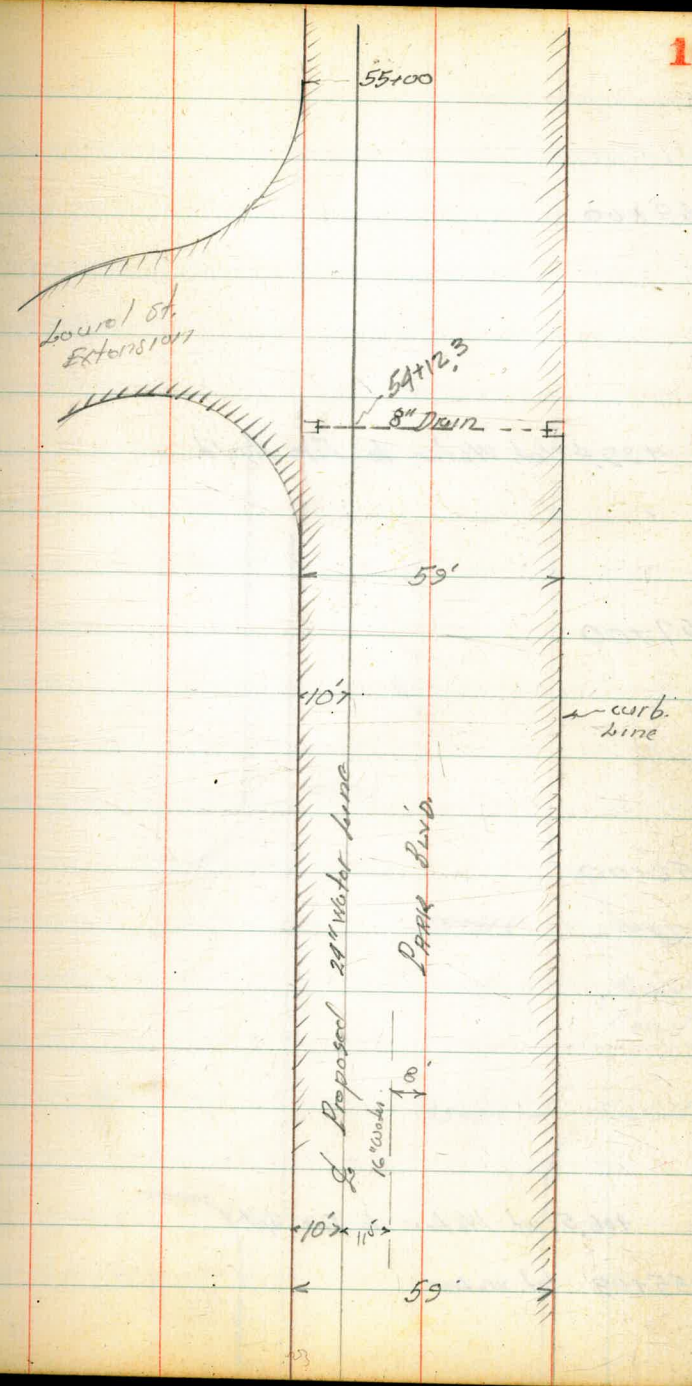
53+00

+88.4 = Int. Water

52+56 = Int. Water

52+34.3 Int. Water

51+95 = Int. Water



61+

59+00

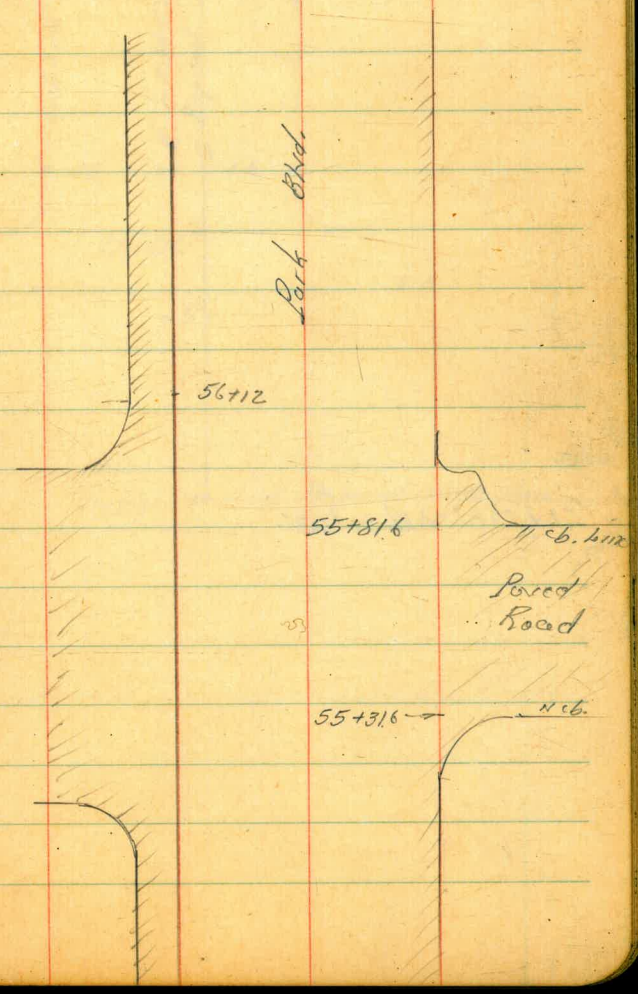
+99.4 int. Water to Fire Hydt.

57+00

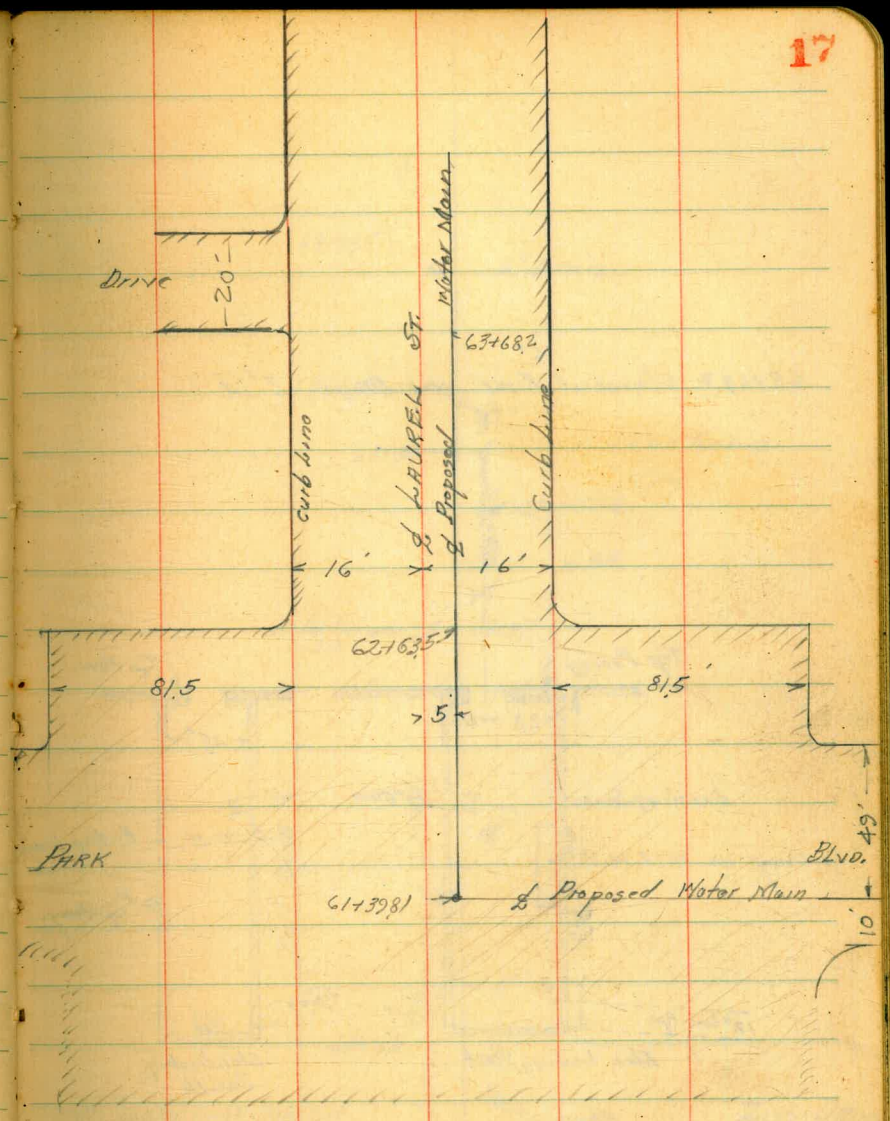
56+00

+06.5 int. Water to Fire Hyd.

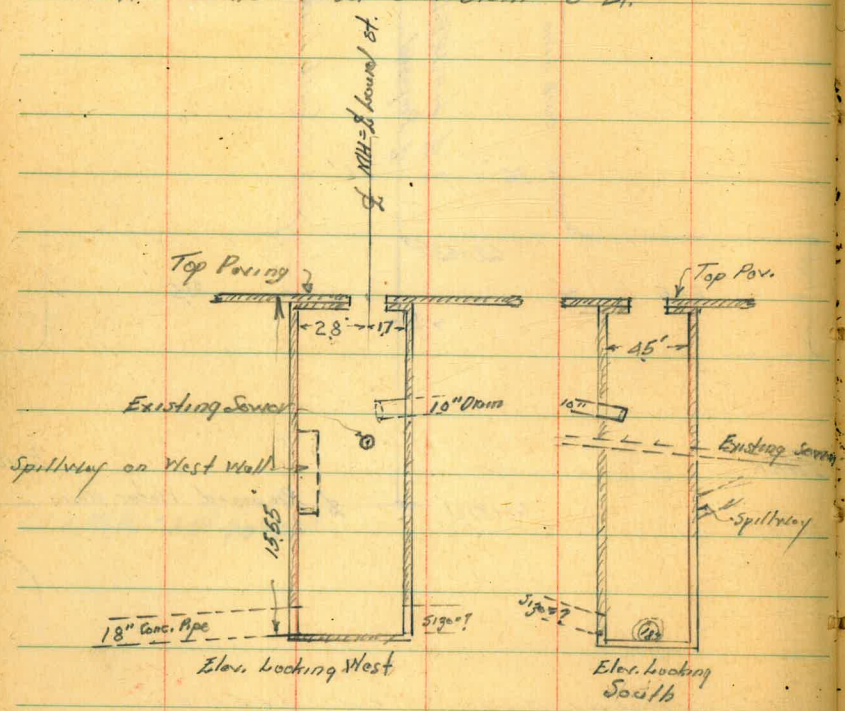
55+03 Int. Water



61+39.81 = ΔRt. 90°03'

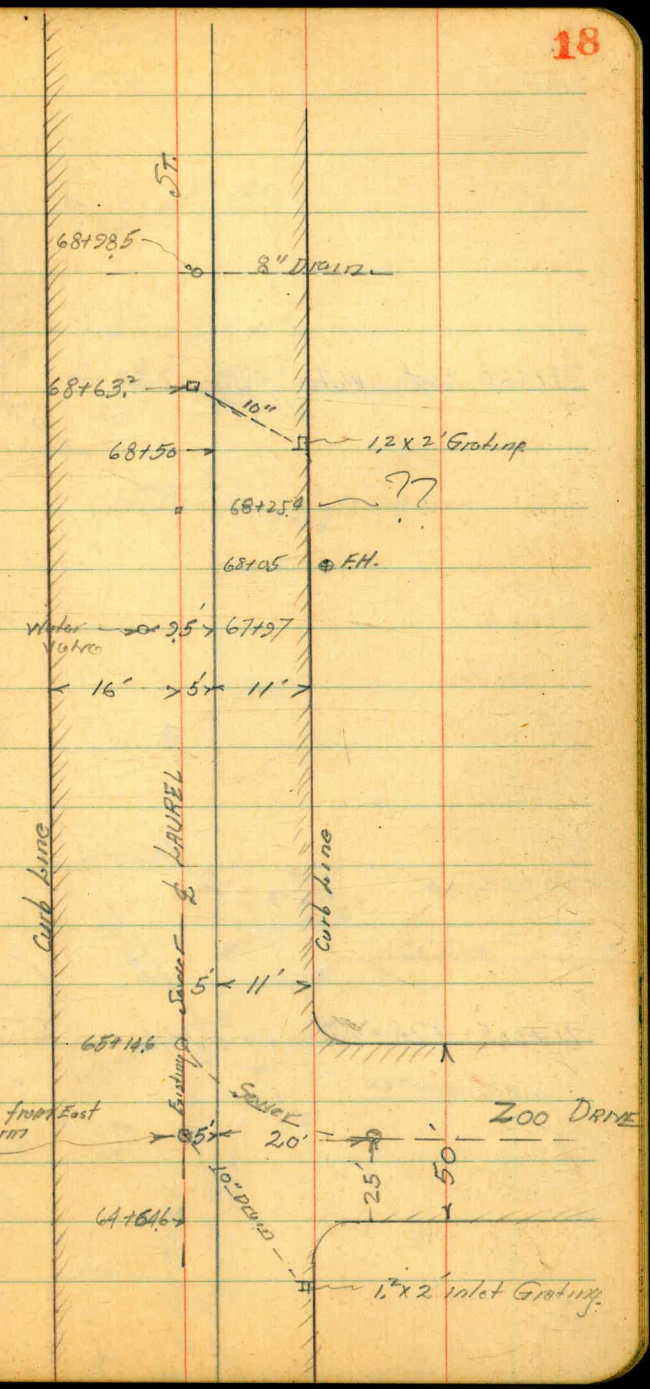


68+63.2 Cleanout 6" Riser over Drain 3' Lt.



Above

CA +89.8 opp. MH. Storm Drain 5' Lt. of MH.



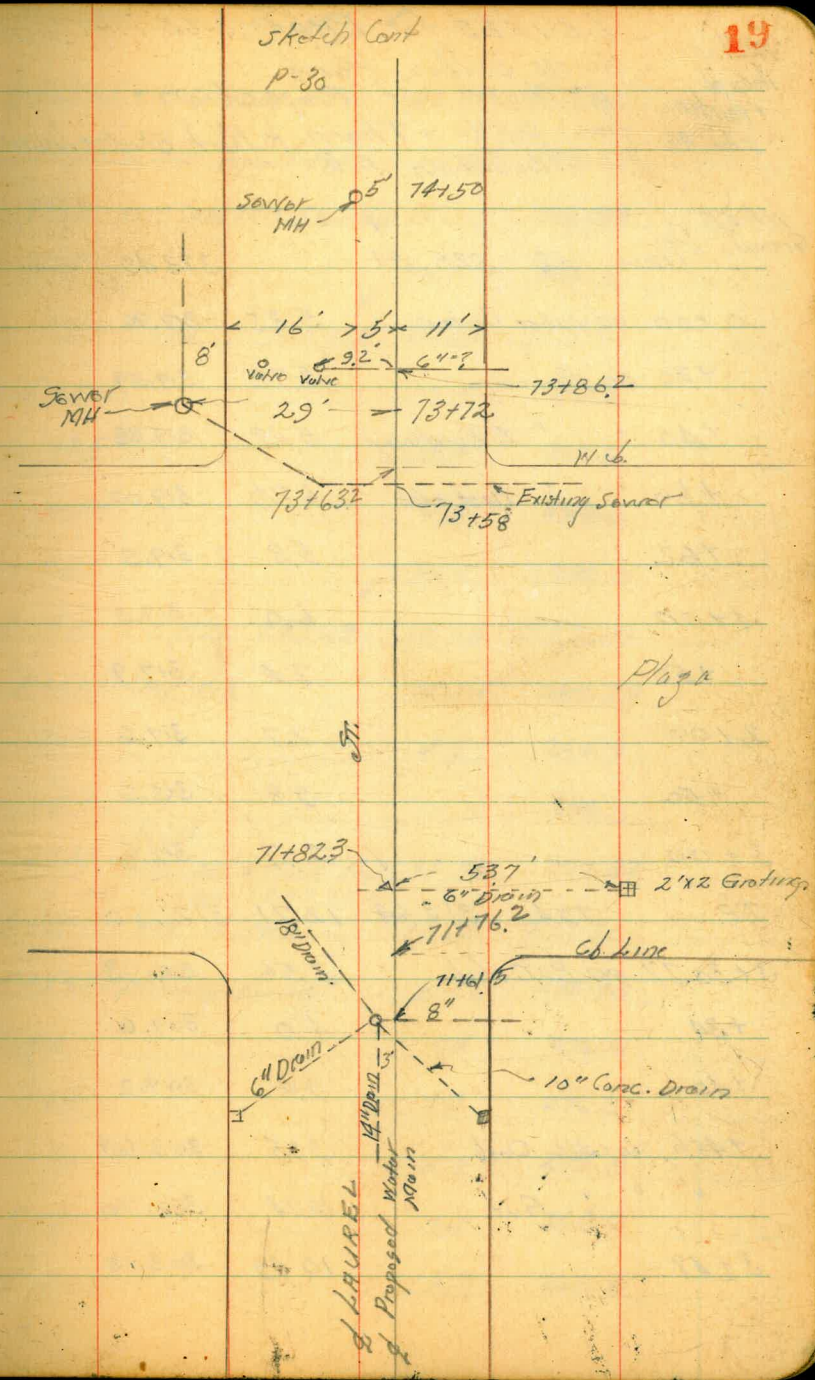
Note: Sewer Line from East Built thru this Storm Drain MH
MH. Very Deep on South Side

73+86.8 = int Water - Size = 6"?

71+61.5 3' Lt. = Storm Drain MH.

Sketch Cont

P-30



Walker
Hazard
Hurdin
9-22-44

LEVELS for PROPOSED WATER MAIN
Across Balboa Park
on Thorn St. Projection
from 28th & Thorn to Park Blvd & Laurel
Location P-2

NE B.P. Granada & Thorn	1.82	325.31 ✓		323.49
0+00 on valve Cover			5.35	319.96
+20 on Paving.			5.72	319.59
+40 " " ℄ Roadway			5.43	319.88
+60 " " West edge			6.29	319.02
+62			5.8	319.5
1+00			6.0	319.3
+50			7.4	317.9
2+00			7.7	317.6
+50			9.8	315.5
3+00		✓	12.7	312.6
T.P.	1.04	313.64	12.71	312.60
3+30.77 on P.O.T. Hub			3.56	310.08
+34			4.0	309.6
+40			9.4	304.2
+44.6 on cobble Curb.			9.95	303.69
" " " Gut			10.94	302.70
3+48			10.49	303.15

		313.64 ✓		
3+67.65 = P.O.T. Nail in Pav.			10.02	303.62
+85.7 = W edge Asphalt Pav			10.05	303.59
+89.7 " " Cold Mix. Shoulder			10.05	303.59
+94			10.1	303.5
T.P.	1.14	302.05 ✓	12.73	300.91
4+00			0.5	301.6
+25			3.4	298.6
+50			7.5	294.6
+65			10.1	292.0
T.P.	0.52	289.63 ✓	12.94	289.11
5+02.77 = P.O.T. Hub.			4.24	285.39
+07			4.9	284.7
+23			11.3	278.3
+24.9 = East Edge Oil & Rock Pav			11.76	277.87
T.P.	0.69	277.99 ✓		
5+40.91 = P.O.T. Nail & Ring			12.33	277.30
5+56.9 = West edge Paving			2.06	275.93
5+61			1.4	276.6
+65			1.7	276.3
+75			5.2	272.8
6+00			9.4	268.6
+25			12.7	265.3

		277.99 ✓			
T.P.	0.37	265.65 ✓	12.71	265.28	
6+50			2.6	263.0	
7+00			6.6	259.0	
7+62			10.1	255.6	
7+70 in Ditch			14.1	251.6	
1.5' Rt. on Flow 12" pipe			14.6	251.0	
7+73			12.3	253.8	
7+74 = East edge Paving			12.24	253.91	
7+84.85 = ℄ Paving			11.86	253.79	P.O.T. on Wall
+95 = W edge Paving			11.94	253.71	
T.P.	2.54	255.23 ✓	12.96	252.69	
8+00			1.9	253.3	
+10			3.2	252.0	
12' Lt. on Flow outlet			5.6	249.6	12" Pipe
8+25			4.8	250.4	
+50			4.6	250.6	
9+00			4.4	250.8	
+25			6.3	248.9	
+50.47 on P.O.T. Hub			9.09	246.14	
9+71.82 = B.C. Lt. on Hub			12.91	242.37	
+87 E. Bank channel			16.6	238.6	

		255.23 ✓			
9+93			19.1	236.13	
10+14			17.1	238.1	
10+20			16.0	239.2	
+29			15.5	239.7	
+33			12.4	242.8	
+38			10.3	244.9	
+50			8.5	246.7	
+75			5.9	249.3	
11+00			3.4	251.8	
T.P.	10.81	266.00 ✓	0.04	255.19	
11+06			10.2	255.8	
+08			10.2	255.8	
+09			11.1	254.9	
11+39.66 on Hub			10.99	255.01	
+54			10.7	255.3	
+62			7.1	258.9	
+75			4.7	261.3	
12+05			1.7	264.3	
12+05.65 = B.C. on Hub			2.23	263.77	
+15 on Oiled Road			1.2	264.8	
+50 " " "			0.4	265.6	

		266.00		
TP	11.65	277.43	0.22	265.78
13+00	on oiled Road		10.6	266.8
+50	" " "		10.0	267.4
13+80.18	= E.C. on Hub.		8.98	268.45
14+00	on oiled Road		8.0	269.4
+50	" " "		5.5	271.9
15+00	" " "		1.7	275.7
T.P.	3.61	280.80	0.24	277.19
+50	on oiled Road		2.3	278.5
+64.50	P.O.T. on Hub.		1.96	278.84
16+00	on oiled Rd		2.1	278.7
+50	" " "		2.5	278.3
17+00	" " "		3.7	277.1
+52	" " "		5.5	275.3
15' Rt.	on cb.		4.94	275.86
18+00	on oiled Rd.		6.9	273.9
15' Rt	" cb.		6.28	274.52
18+34	= ℄ North & South Rd.		7.5	273.3
+44	on oiled Rd		7.7	273.1
18+91	= W edge oiled Road.		10.1	270.7
19+00			10.4	270.4

		280.80			
19+39.53	B.C. ℄		11.6	269.2	
19+50 T.P.	2.50	271.21	12.09	268.71	on P.I. Hub.
19+60.47	= E.C.		3.0	268.2	
20+00			4.2	267.0	
+07			9.0	262.2	
+17			10.7	260.5	
+30			16.4	254.8	
+48	= Bothorn Canyon		24.2	247.0	
+55	" "		24.2	247.0	
+60			19.8	251.4	
+75			15.9	255.3	
+93			8.8	262.4	
21+00			7.8	263.4	
+22	= East edge Road		6.4	264.8	
+50	W. " "		5.6	265.6	
22+00			4.5	266.7	
+50			4.7	266.5	
23+00			5.6	265.6	
23+21.65	B.C. ℄ on Hub.		6.07	265.14	
+50			7.4	263.8	
+60			7.8	263.4	

		271.21			
24+00			6.5	264.7	
+50			5.6	265.6	
24+70			5.6	265.6	
25+00			6.6	264.6	
+50			9.3	261.9	
T.P.	0.69	262.38	9.52	261.69	
25+62.78	on ℄ of Curve P.O.C.		2.01	260.37	opp. P.I. on Bisector
26+00			4.8	257.6	
+50			9.1	253.3	
27+00			13.3	249.1	
T.P.	0.37	249.75	13.00	249.38	
+50			4.8	245.0	
+74			6.2	243.6	
+80			7.6	242.2	
28+00			8.7	241.0	
+10			9.5	240.2	
+11	= East edge Bridle Path		10.1	239.6	
28+17.89	= E.C. on Hub		10.11	239.68	
+30			9.8	240.0	
+40			10.3	239.4	

		249.75		
+50			9.5	240.2
+75			9.4	240.4
+80			10.1	239.6
29+00			10.1	239.6
+45			12.6	237.2
T.P.	0.73	237.53	12.95	236.80
29+60	P.O.T. on Hub		2.50	235.0
29+80			4.2	233.3
30+00			6.5	231.0
+20			8.6	228.9
+59			14.6	222.9
T.P.	0.57	225.68	12.42	225.11
30+87.74	T.P. 0.29 = P.O.T. Hub	216.20	9.77	215.91
31+00			4.2	212.0
+15			10.5	205.7
T.P.	0.51	204.92	11.79	204.41
31+40			11.0	193.9
T.P.	0.25	192.19	12.38	191.94
31+65			8.4	183.8
+67			9.9	182.3
+73			11.7	180.5

		192.19 ✓		
31+75			11.0	181.2
+85			14.8	177.4
T.P.	1.03	181.80 ✓	11.42	180.77
31+87			5.8	176.0
+93.3 = East edge Powder Canyon Rd			5.67	176.17
32+07.14 P.O.T. on Nail Approx. 2"			5.46	176.34
+20.4 = W edge "			5.84	175.96
+33			6.4	175.4
+38			9.1	172.7
Powder Canyon Trunk Sewer Chk. cut stake 125+3443 MH #36			9.69	172.11 ✓ Grd. Book 214-20
				172.05
				0.06 = difference
32+77 = E Bank channel			9.4	172.8
+80 " Flow "			12.9	168.9
+96 W " "			12.7	169.1
+97			9.2	172.6
33+00 = ℄ Existing Trunk Sewer			8.9	172.9
10' Rt. on Slab Conc. on Pipe			12.0	169.8
33+10			8.8	173.0
+18			9.9	171.9
+33			10.0	171.8
+35			8.9	172.9

		181.80 ✓		
33+50			8.1	173.7
+55			6.3	175.5
+60			5.2	176.6
+66			2.1	179.7
T.P.	9.13	190.81 ✓	0.12	181.68
34+00			6.8	184.01
+23			1.3	189.5
+42			+0.7	191.5
+70			+0.2	191.0
35+00			0.0	190.8
T.P.	10.95	201.55 ✓	0.21	190.60
6' on Bank channel			11.5	190.0
10' " N edge Flow "			16.4	185.2
35+25			10.5	191.0
+35 Int. N Bank ch.			12.4	189.2
+39 N edge Flow ch.			14.5	187.0
+50 S " " "			15.2	186.4
+57 Int. W Bank "			8.4	193.2
+70			6.4	195.2
T.P.	12.20	213.16 ✓	0.59	200.96
+87			13.7	199.5

		213.16			
35+87			2.6	203.6	
36+17.58 = B.C. Lt. on Hub.			5.54	207.62	
+35		✓	2.4	210.8	
T.P.	10.48 ~~9.48~~	223.06 ~~222.06~~	0.58	212.58	
36+62			6.0	217.1	
+82			3.2	219.9	
+97 = Int. edge Bridle Path			+6.2	223.3	
T.P.	12.89	235.75 ✓	0.20	222.86	
37+28			9.9	225.8	
37+46.73 = E.C. on Hub			7.81	227.94	
+53.8 = Int. 24" Culvert			7.0	228.8	
11' Lt. on diag. = Send Flow inlet			9.10	226.65	
9' Rt " " " " outlet			10.0	225.8	
38+00			3.2	232.6	
T.P. +49.53 = B.C. Lt.	12.04	247.51 ✓	0.28	235.47	on Hub.
+75			10.4	237.1	
39+04			8.2	239.3	
+59			2.2	245.3	
22.5' Rt. of P.T.			11.30	236.21	on E. Pier
T.P.	11.73	259.05 ✓	0.19	247.32	
40+13			8.9	250.2	

		259.05			
40+32.7 Int. of 15" Iron Pipe Culvert			7.1	252.0	Ground
4.4' Lt. on Hd Wall			5.53	253.52	
4.4' Lt. of Turn on Flow Inlet			9.1	250.0	
14.6' Rt " " " " outlet			10.25	248.80	
40+60			3.7	255.4	
+67.70 = E.C. on Hub.			2.22	256.83	
T.P.	12.85	271.58 ✓	0.32	258.73	✓
41+00			9.1	262.5	
+50			1.6	270.0	
T.P.	12.80	283.54 ✓	0.84	270.74	
42+00 on Hub			7.22	276.32	
+15			6.5	277.0	
+50			5.7	277.8	
43+00			3.9	279.6	
+50			1.3	282.2	
T.P.	8.78	292.05 ✓	0.27	283.27	
+80			8.3	283.8	
44+03			5.3	286.8	
+09			3.9	288.2	
			4.42	287.63	
44+24.10 = Int. E. Ch. Lime Rock Blvd. on paving.					
T.P. 59' Rt. on ch. 672		294.87 ✓	3.90	288.15	
44+39.25 = Δ Lt. 41°18'30			6.81	288.06	on Wall

294.87

44+50 on Paving	6.77	288.10	
45+00	6.56	288.31	
10' Lt. on cb.	6.40	288.47	
45+56.5 = Int. Culvert	6.14	288.73	
5.7' Lt. on Grating	6.51 / .195	288.36	
" " " Flow 8" Pipe	8.46	286.41	
44.7 Rt. on Grating	6.52 / .19	288.35	
" " " Flow 8" Pipe	8.42	286.45	
46+00	5.76	289.11	
10' Lt. on cb.	5.62	289.25	
46+50	5.29	289.58	
47+00	4.78	290.09	
10' Lt. on cb.	4.64	290.23	
+50	4.26	290.61	
48+00	3.83	291.04	
10' Lt. on cb.	3.66	291.21	
+50			
48+64 = Int. Culvert	3.38	291.49	
8.8' Lt. on Grating.	3.87	291.00	
" " " Flow	5.11	289.76	Small Pipe Size = ?
49+00	3.27	291.60	
10' Lt. on cb.	3.08	291.79	

294.87

49+50			3.26	291.61	
50+00			3.18	291.69	on cb 49+70.5
T.P.	4.33	296.24	2.96	291.91	
+50			4.58	291.66	
51+00			4.54	291.70	
10' Lt. on cb.			4.34	291.90	
+50			4.59	291.65	
52+00			4.77	291.47	
10' Lt. on cb.			4.56	291.68	
+50			5.03	291.21	
53+00			5.40	290.84	
10' Lt. on cb.			5.20	291.04	
+50			5.72	290.52	
54+00			6.21	289.33	
+12.3 = Int. 8" Culvert			6.02	290.22	
5.7' Lt. on Grating			6.22 / .195	290.02	
" " Flow			8.17	288.07	
+50			6.15	290.09	
T.P.	4.53	294.95	5.82	290.42	on cb 55+00
55+00			4.88	290.07	
+50			4.90	290.05	

		294.95			
56+00			5.10	289.85	
+50			5.43	289.52	
57+00			5.75	289.20	
10' Lt. on cb.			5.20	289.75	
+50			6.04	288.91	
58+00			6.33	288.62	
10' Lt. on cb.			5.72	289.23	
+50			6.59	288.36	
59+00			6.95	288.00	
10' Lt. on cb			6.29	288.66	
+50			8.67	286.28	
T.P.	6.23	291.63	9.55	285.40	
60+00			7.66	283.97	
10' Lt. on cb.			7.05	284.58	
+50			8.51	283.12	
T.P.	4.18	287.25	8.56	283.07	Lower 8 Mk. Blvd.
				283.28 = Record.	
61+00			4.11	283.14	
+39.81 = Δ Rt. 90°03'			4.14	283.11	
+50			4.21	283.04	
62+00			4.61	282.64	

		287.25			
62+63.5			5.38	281.87	
63+00			5.99	281.26	
+50			7.88	279.37	
64+00			10.35	276.90	
+50			11.88	275.37	
+57	11' Rt on Grating		12.51	274.74	
"	" Flow 10" Conc Pipe		14.76	272.49	
T.P.	2.58	277.84	11.99	275.26	
64+89.8			3.15	274.69	
5' Lt. on Rim MH			3.18	274.66	
"	" Top Cutout in MH		8.73	269.11	
"	" Flow "		9.70	268.14	
"	on Top Sewer		9.92	267.92	Goes thru MH.
64+84.8	20' Rt. on Sewer Rim MH		8.42	269.42	
"	" " " " "				
"	on Flow Sewer		11.57	266.27	
65+14.6			3.62	274.22	
5' Lt. on Rim Sewer MH			3.62	274.22	
" " "	Flow Sewer		11.87	265.97	
65+60			3.93	273.91	
66+00			4.67	273.17	
+50			5.36	272.48	

		277.84 ✓		
67+00			6.00	271.84
+50			6.75	271.09
68+00			7.45	270.39
+50			8.20	269.64
	11' Rt. on 1.2'x2' Grating		8.63	269.21
	" " Flow 10" Pipe		10.45	267.39
68+25.9	on Sewer Cleanout Cover		7.86	269.98
"	" Flow Sewer		14.51	263.33
68+63.2	3' Lt. on Cleanout Cover		8.34	269.50
	" " Flow Drain		11.35	266.49
68+98.5	17' Lt. on Cleanout Cover		8.96	268.88
	" " Flow 8" Pipe		11.89	265.95
69+00			8.90	268.94
T.P.	2.51	270.80 ✓	9.55	268.29
+50			2.51	268.29
70+00			3.22	267.58
+50			3.93	266.87
71+00			4.55	266.25
+25	5' Lt. on Rim MH.		4.96	265.84
	" Flow		9.49	261.31

		270.80 ✓		
71+27	11' Rt. on 1.2'x2' Grating.		4.45	266.35
	" " Flow		7.13	263.67
71+61.5	3' Lt. on Rim MH		5.51	265.29
	3' Lt. Flow 10"		8.88	261.92
	" " " 8" MH		8.99	261.81
71+76.2	= Int. with Produced cb line		5.40	265.40
72+00			5.75	265.05
+50			6.39	264.41
73+00			7.00	263.80
+50			7.61	263.19
+63.2	= Int. cb line Produced		7.85	262.95
73+72	29' Lt. on Rim MH		7.25	263.55
	" " Flow Sewer		13.59	257.21
74+00			8.36	262.44
+24.5	5' Lt. on Rim MH. Sewer		8.78	262.02
	" " " Flow "		13.83	256.97
+50			9.12	261.68
T.P.	1.15	262.67 ✓	9.28	261.52
75+00			1.97	260.70
+50			2.96	259.71
76+00			3.96	258.71

	262.67			
75+94	11' Rt. on 1.2'x2' Grating		4.34	258.33
	" " " Flow 6" Drain		6.20	256.47
76+07	3' Lt. on Cover cleanout		4.28	258.39
	" " " Flow "		10.84	251.83
76+50			4.97	257.70
77+00			5.95	256.72
+50			6.95	255.72
+73	11' Rt. on 1.2'x2' Grating		7.74	254.93
"	" " Flow 6" Drain		9.76	252.91
T.P.	0.81	255.83	7.65	255.02
77+28.6	5' Lt. on Rim MH.		1.76	254.07
"	"		5.00	250.83
"	" " Flow		6.04	249.79
	" " on Flow 14" Conc. Drain		7.84	247.99
+50			2.06	253.77
79 +00			3.01	252.82
+27.8	3' Lt. Storm Drain Rim MH		3.70	252.13
	" on Flow 19"		10.01	245.82
	2' " " 6"		9.90	245.93
79 +50			4.09	251.74

	255.83			
79+78.3			4.61	251.22
"	12' Rt. on 1.2'x2' Grating		4.98	250.85
"	" " Flow 6" Drain		6.70	249.13
80+00			5.11	250.72
+50			6.11	249.72
T.P.	4.86	255.77	4.92	250.91
T.P.	0.35	254.47	1.65	254.12
80+77.00	Δ Rt.		5.34	249.13
+90.5	= N Curb Level		5.33	248.67
"	on cb		5.33	249.18
80+95	2.8' Lt. on NE Cor. Grating		6.01	248.46
	4.8' " " Flow 6" Drain		8.08	246.39
81+06.1	= at int. South Side 8" Wall		5.39	249.08
"	on Top Wall		1.94	252.53
+07.5	N Side Wall		10.1	244.4
T.P.	0.68	242.82	12.33	242.14
81+43	Δ Lt 16°		5.39	237.43

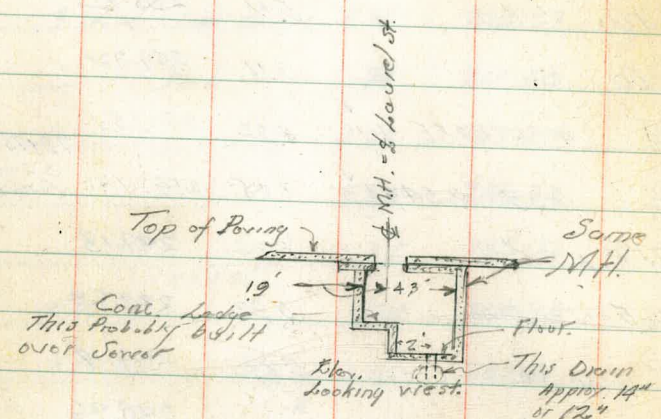
79+75 on South Fire Hydt

on Sidewalk

on Ground.

on Hob.

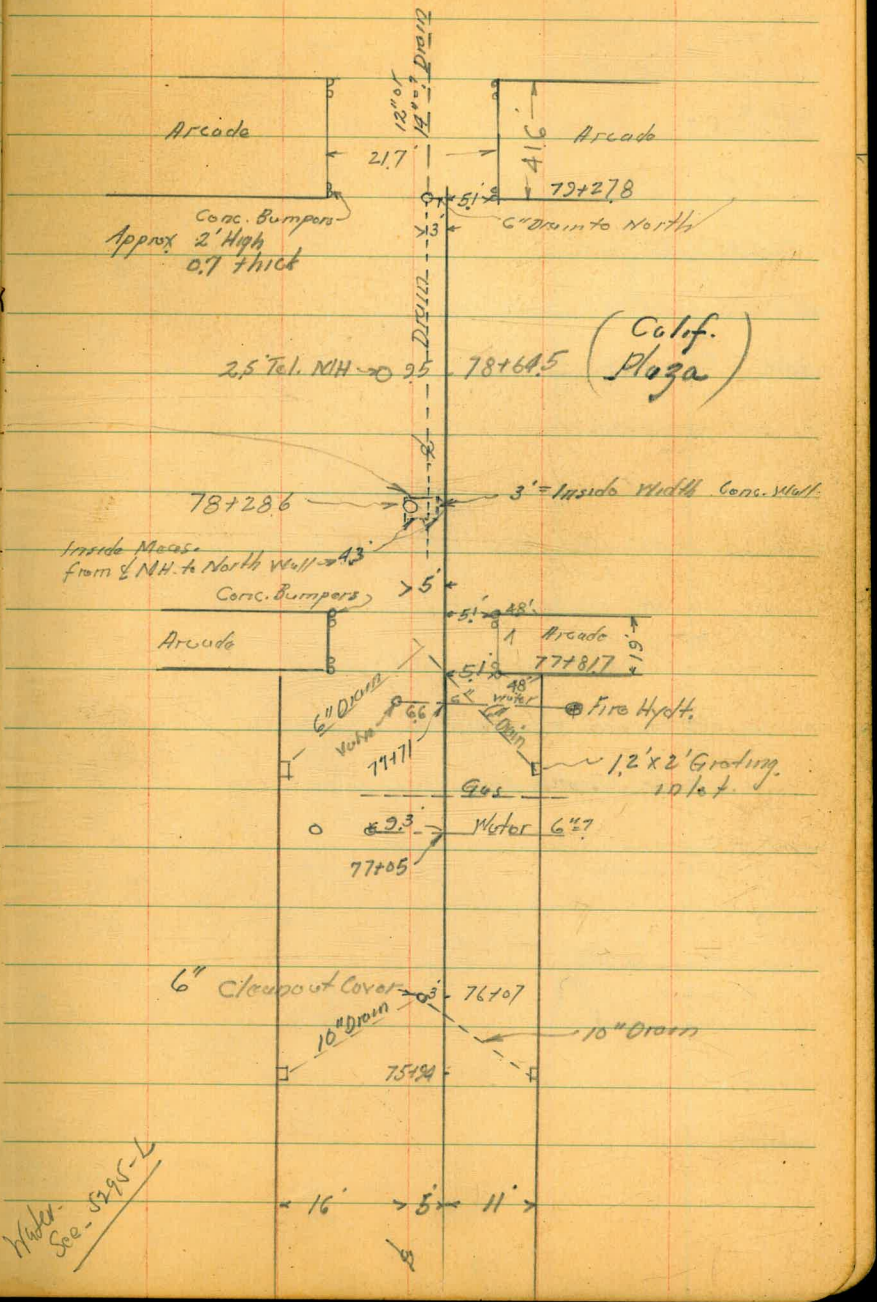
Levels Cont. P-36



77+71 = Int. 6" Water Main

77+30.3 = Int Gas Main

77+05 = Int 6"? Water



+75 1.7' Rt. -6" E.T.
+68 7.3' Lt. 24" E.T.
+64 5.5' Rt. 10" E.T.

81+43 = Δ Lt. 16°00'

+39 = 3" Ac. 7' Lt.
+38 " " 7' Rt.

81+30 0.5' Lt. 12" Stump 2' High.

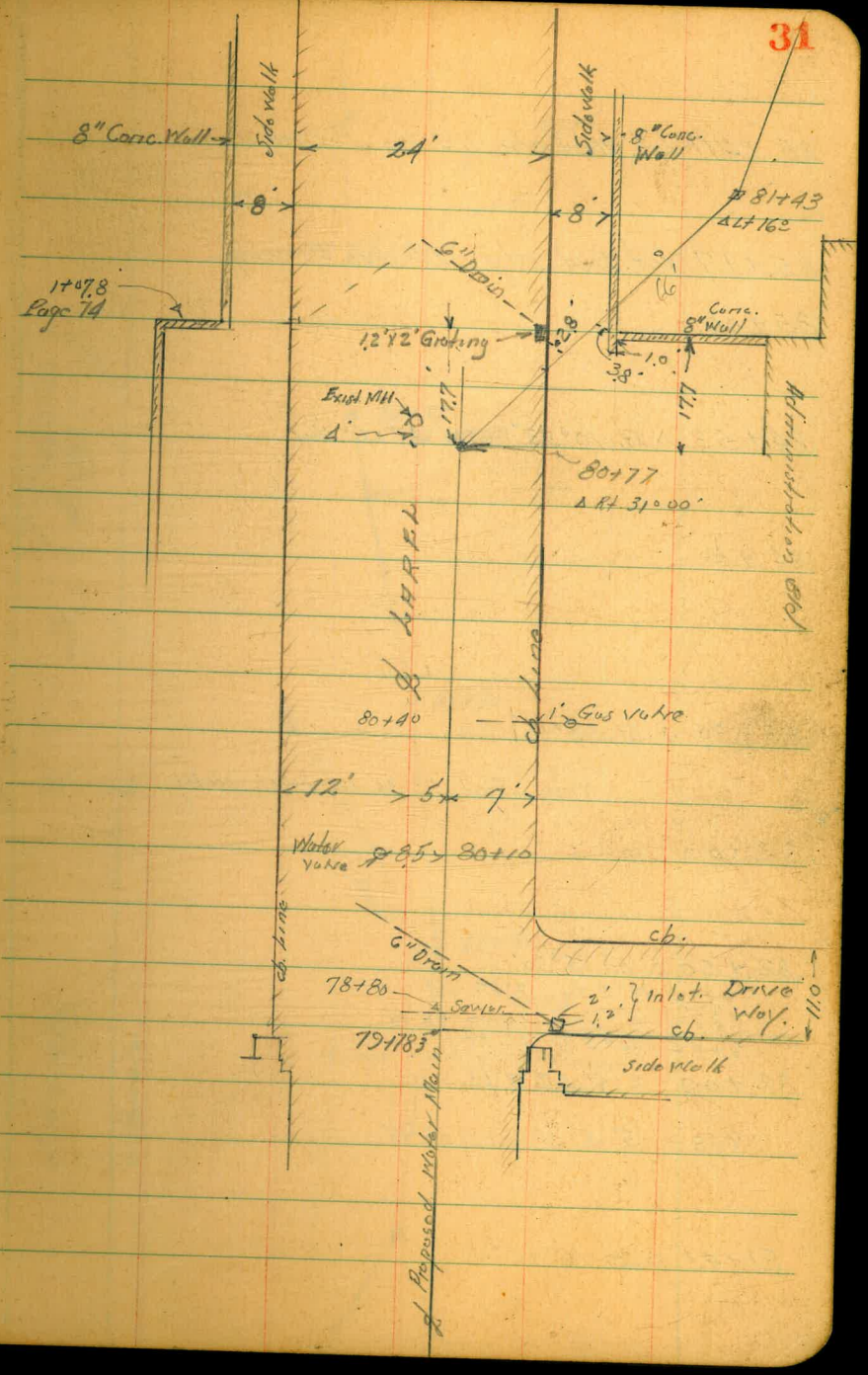
81+25 8.5' Rt. = South Edge 30" E. Tree

80+77.00 = Δ Rt. 31°00' Set Nail in Paving

(Note: All trees (of good size 10' or less from ℄) from Station 81+25 are located from ℄ proposed Water Main to inside Edge Tree.

Trees More than 10' from ℄ See P. 79.

2nd Note: Mr. Rhodes Wants all Trees outside of ditch to be Saved and that plans to so Specify.)



85 + 47.7 = Int. West edge 11th Ave Paving.

85 + 17 = Int. East edge 11th Ave Paving

85 + 00

84 + 53 Δ Rt. 10°33' Set 2"x2" Hub

84 + 00

83 + 30 Δ Lt. 7°0'

Location Trees Cont. P-36 in Level Notes

83 + 00

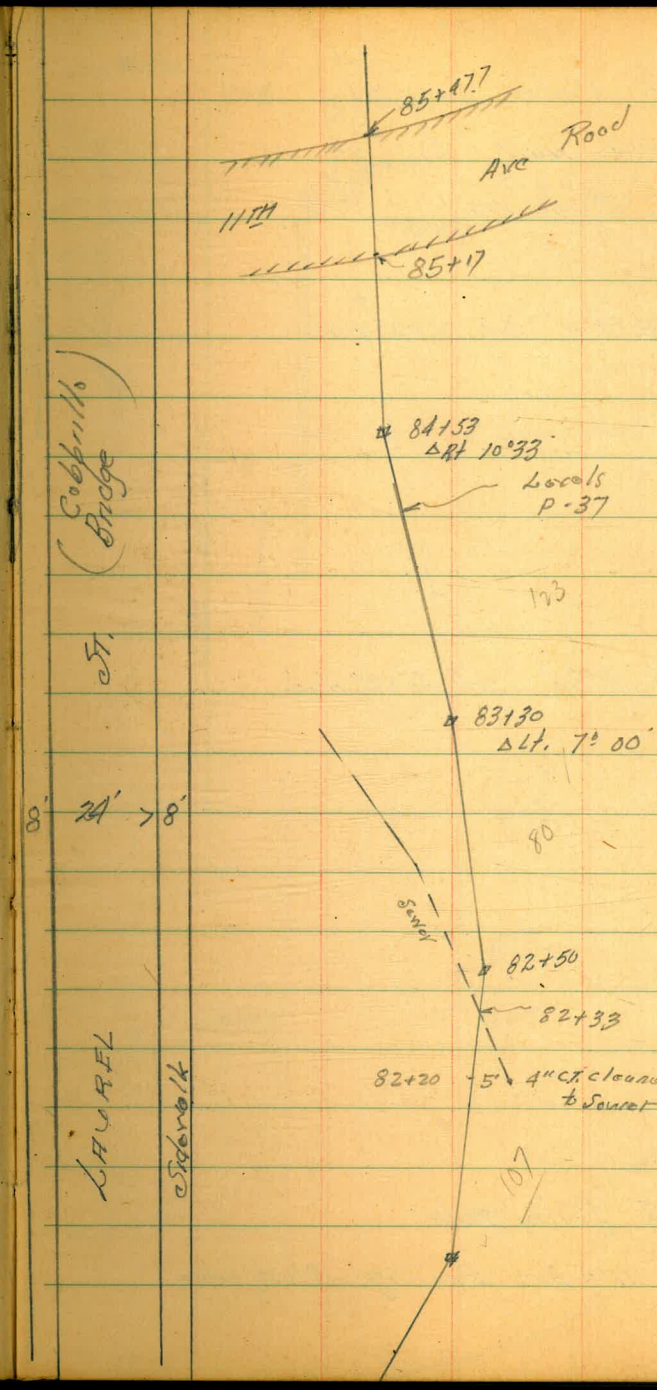
82 + 50 Δ Lt. 16°30'

+39.4 14" E Tree 7' Lt.
+33 6" Dead Tree 44' Rt.
+0.3.4 20" E.T. 3.6' Rt.

82 + 00 2-2" E.T. 9' Lt.

+88 = 5" E Stump 15' Rt.

81 + 43 Δ Lt. 16°00'



89 + 86 = Int. Water Service

+75.29 = P.O.T. Nail

89+73.1 = Int. 8" Conc. Wall

89 + 08.3' = Δ Rt. 30°24' Set 2"x2" Hub.

89 + 00

88 + 00

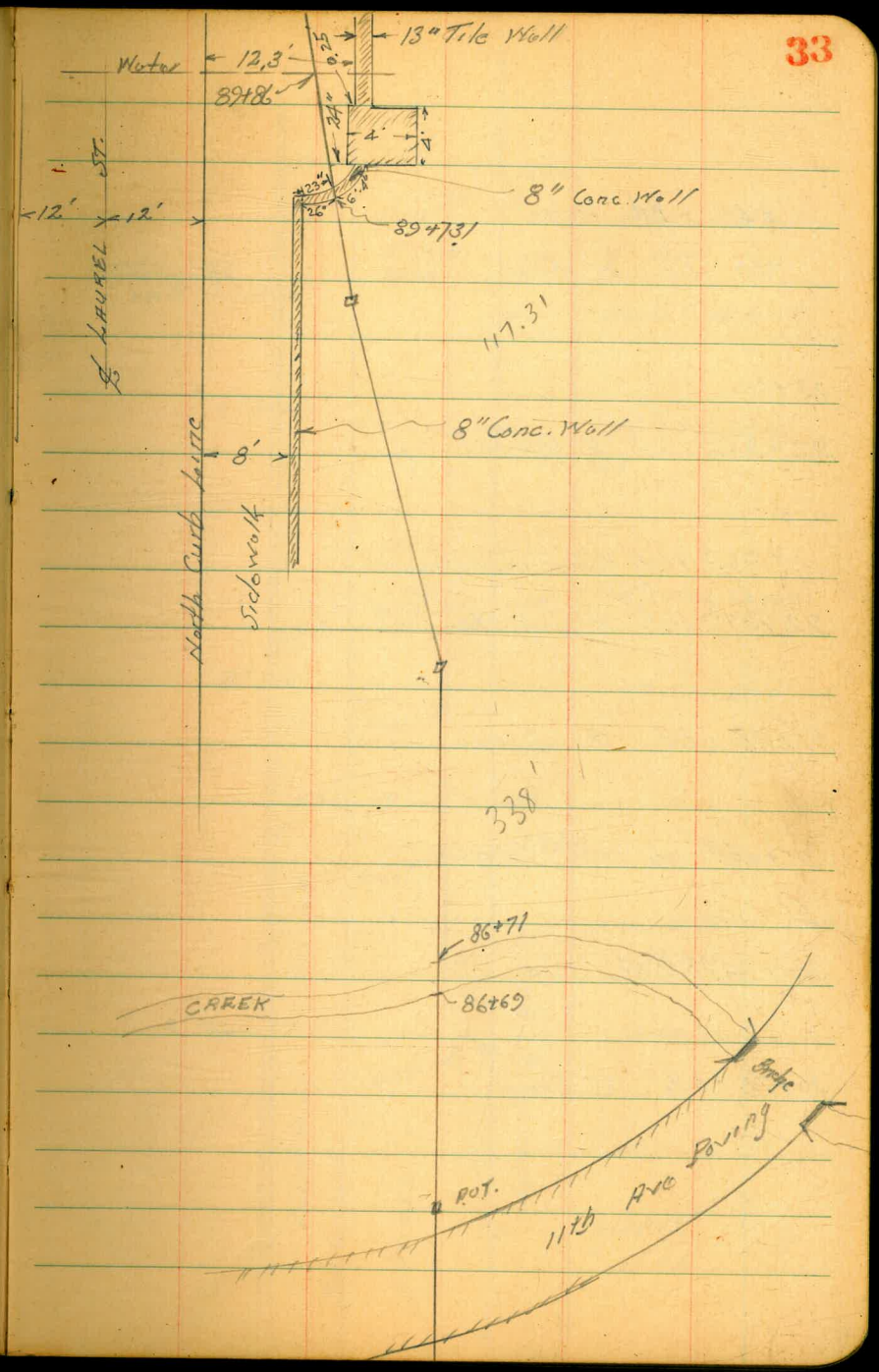
87+91 = Δ Lt. 14°36' Set 2"x2" Hub.

87 + 00

86+00

+50.02 = P.O.T. Paving stake

85+47.7 = Int. 11th Ave Paving. West edge



+48 = Int. Water

+46 = Int 4" Water

93+00

92+94.5 = Int. 8" Drain

+26.3 = Int. Water Service

92+07.0 = Int. 4" Water

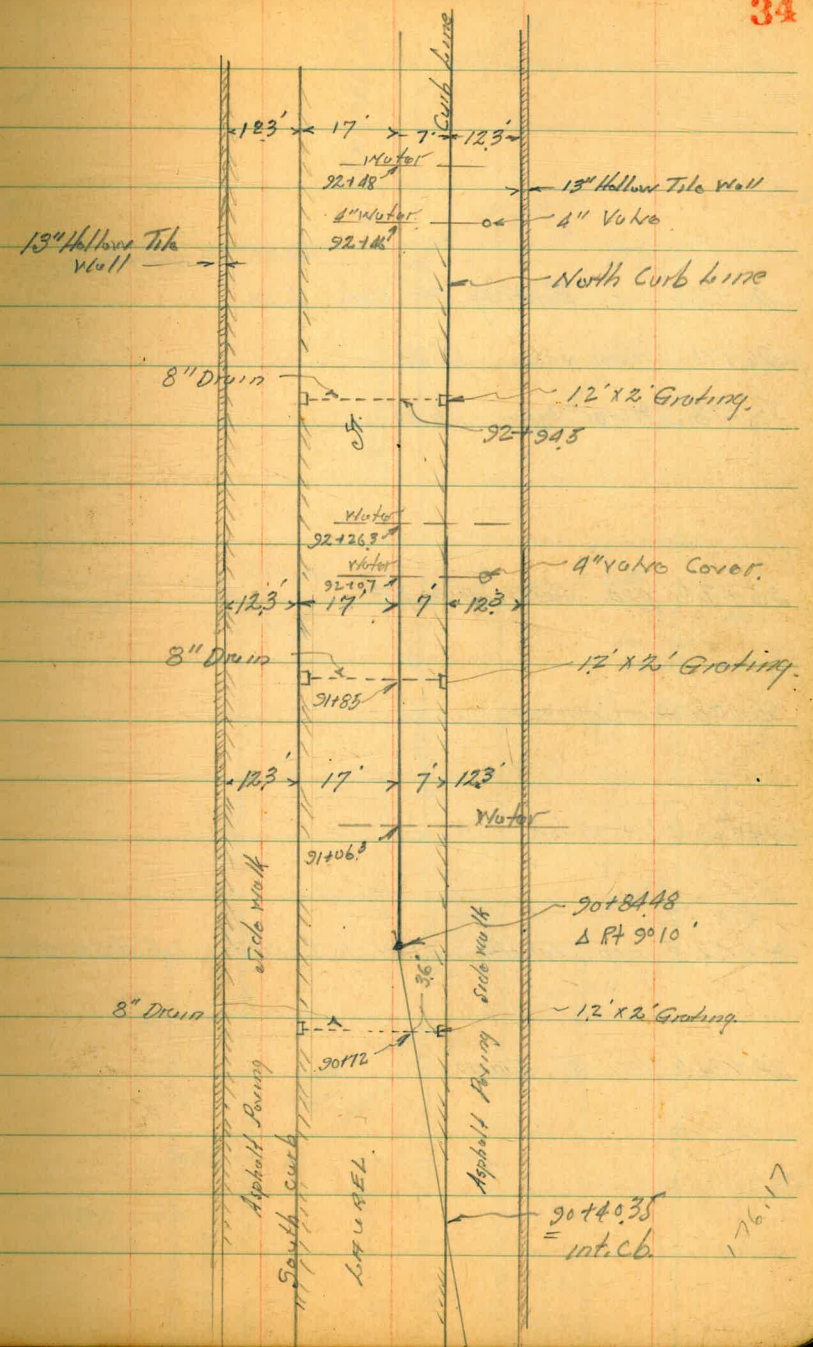
91+85 = Int. 8" Drain

91+06.3 = Int. Water Service

91+00

90+84.48 = Δ Rt. 9°10'

90+72 = Int. 8" Drain



96+22.00 = Int. Existing 24" Water Line

96+19 = Water valve 1.6' Rt

96+18 Water valve 1.6' Rt

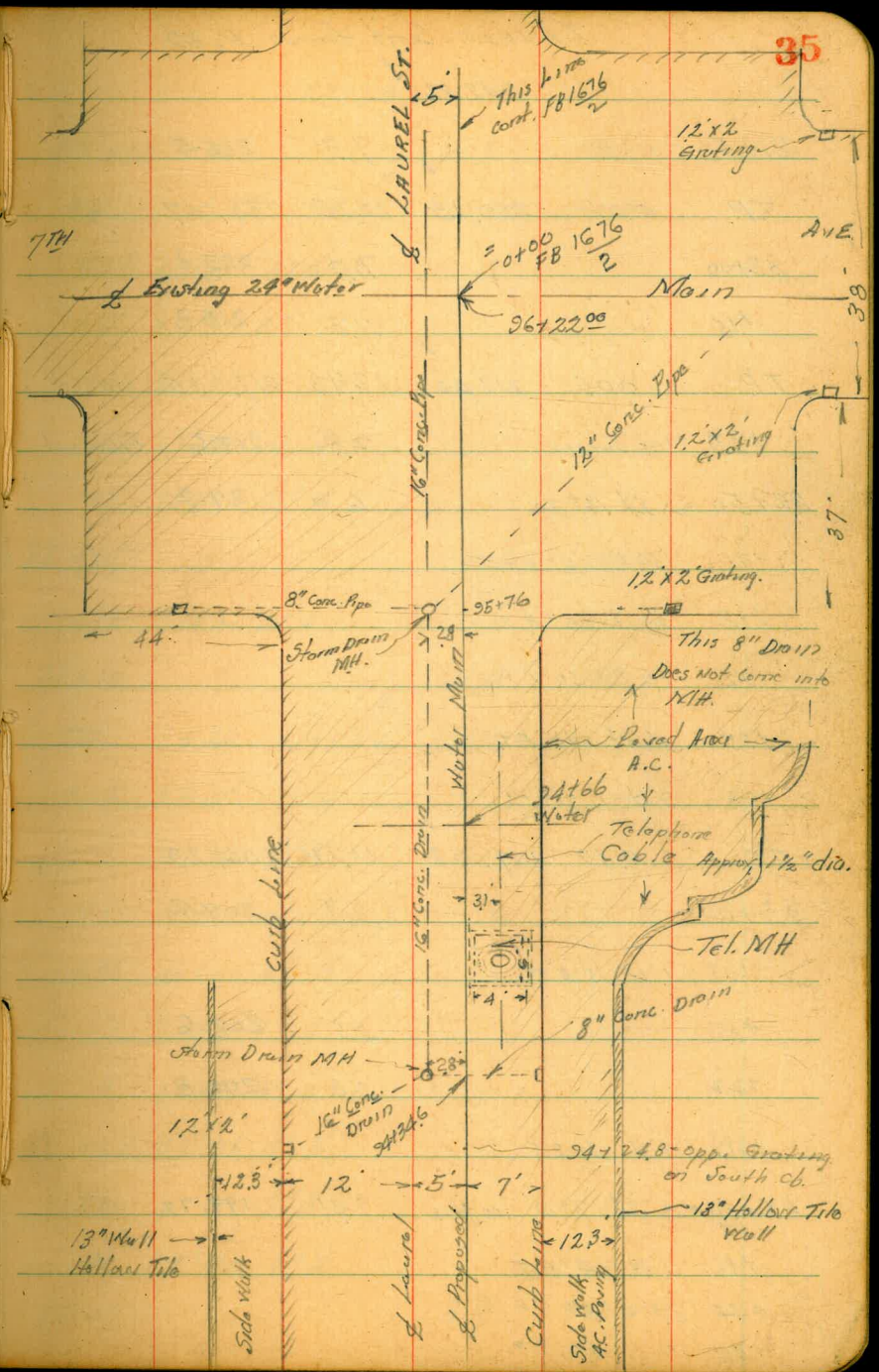
95+76 opp. Storm Drain MH

95+03 = Int. Water

94+66 = Int. Water

94+52.4 opp. Tel MH. 3.1' Rt to ℄ Tel MH. 2.4' diameter

94+34.6 = Int. 8" Drain



LEVELS Cont from P. 29

		242.82 ✓			
81+50			7.3	235.5	
T.P.	0.06	230.13 ✓	12.75	230.07	
82+00			7.0	223.1	
+15			11.8	218.3	
T.P.	0.05	217.40 ✓	12.78	217.35	
+33 = Int. Survey			2.8	219.6	Ground
82+50 = Δ Lt 16°30			6.0	211.4	
+75	7.5' Lt.	6" E.T.			
+83	2' Lt.	5" A.T.			
+92	1.5' "	4" "			
+95	5' Rt	18" E.T.			
+98	9' Lt	20" "			
T.P.	0.79	207.08 ✓	11.11	206.29	
83+00			2.7	204.4	
+03	1' Lt	3" A.T.			
+15			4.5	202.6	
+22			6.3	200.8	
+28.5	7' Lt	30" E.T.			
83+30 = Δ Lt 7°0' on Hub			7.31	199.77	
+36	9' Rt	= 4" E.T.			
+44	3.3'	5" " "			
+46	"	6" " "			

		207.08 ✓			
83+50			10.9	196.✓	
T.P.	0.27	194.47 ✓	12.88	194.20	
+55	1.8' Lt.	8" E.T.			
+57	2.3' "	8" " "			
+60	3.5' Rt	3" E.T.			
+68	0.2' Lt.	2" A			
+69	3.3' Rt	10" E			
83+85			7.1	187.4	
+96	5' Lt. =	12" A			
84+00			11.4	183.1	
T.P.	0.29	181.91 ✓	12.85	181.62	
+06	5.8' Lt.	6" A			
"	6.1' Rt.	6" A			
+15	1' Rt.	10" Stump			
+21	on Line	6" "			
"	9.2' Rt	8" A			
"	6.3' Lt	5" A			
+28	5.8' Rt.	4" A			
+30	4' "	3" A			
+36	8.3' Rt	4" A			
84+27			8.7	173.✓	

		181.91 ✓			
84+40	4.7' Lt. 4" A				
+49	3' Lt. 5" A				
T.P.	0.28	169.50 ✓	12.69	169.22	
84+53 = Δ Rt. 10°33'			6.40	163.1	on Hub
+58	68' Lt. = 6" E				
"	2' Lt 6" Stump with 3" Tree				
+63	5.3' Rt 18" E				
+71	1.5' Rt 6" E				
+73	7' Lt. 4" E				
+78	1.2' Lt = 3/4" Water valve				
+80	2' Lt 3" E				
+79	2.2' Rt 2" A				
+86	1' Rt 3" A				
84+75			15.3	154.2	
T.P.	0.03	156.70 ✓	12.83	156.67	
84+98	2' Lt. 5" E				
84+86			8.1	148.6	
+93			9.4	147.3	
85+00			12.0	144.7	
+08			13.6	143.1	

		156.70 ✓			
T.P.	0.93	146.30	11.33	145.37	
85+12			10.4	135.9	
+17 = E edge 14th Ave Paving			10.53	135.77	
32.3' L "			11.05	135.23	
+47.7			12.15	134.15	
+50.02 = P.O.T.			11.75	134.55	Pav. Stake
+57 = 12" Redwood Stump 46' Rt					5' High
+88			11.9	134.4	
+90			12.8	133.5	
86+00			13.2	133.1	
+15			13.5	132.8	
+50			12.6	133.7	
+68 = E Bank Creek			12.7	133.6	
+69 " edge Channel			13.9	132.4	
+79 W " "			14.0	132.3	
+82 W Bank			11.3	135.0	
+95			11.4	134.9	
87+00			7.0	139.3	
+05			5.2	141.1	
+14			0.7	146.2	
T.P.	12.40	158.35 ✓	0.35	145.95	
87+23	12.5' Rt 24" Cy.				

158.35

87+32	8' Rt 8" Cy.			
+27			6.4	152.0
T.P.	11.95	170.12 ✓	0.18	158.17
87+46	7.8' Rt 8" Cy.			
+57	7.7' " 10" "			
+58	8' Lt. = 36" Euc. Tree		100'	
87+50			9.2	160.9
+64	5.2' Rt 10" Cy.			
+68	2' Rt. 5" "			
+72	1.5' Rt. 5" "			
T.P.	12.37	182.38 ✓	0.11	170.01
+71	5.7' Rt 6" Cy.			
+83	3.3' Rt 8" "			
87+91 = Δ 14°36' on Hub.			5.41	176.97
+96	6.5' Lt 12" Cy			
88+00			1.6	180.8
"	3.2' Rt 8" A			
T.P.	12.73	194.87 ✓	0.24	182.14
+07	0.4' Rt = 5" A			
+11	1.2' Lt 6" A			
+18			7.4	187.5

194.87 ✓

88+32			2.4	192.5	
T.P.	11.99	206.86 ✓	0.00	194.87	Pencil cross in Bridge
88+46	4' Lt - 16" Cy.		6.8	200.1	
T.P.	12.20	218.69 ✓	0.37	206.49	
+73	= 10' Rt. 14" Cy				
+78	8.3' Lt = 28" Cy				
"	6.5' Rt = 20" Cy.				
88+84			3.6	215.1	
"	5.2' Lt = 3" Pine				
+90	6.1' Lt. 16" Cy.				
+95	1' Lt = 3" Pine				
T.P.	12.25	230.88 ✓	0.06	218.63	
89+00	7.5' Rt 6" Tree				
"	2.7' Lt. 6" Pine				
+03	2.8' Rt 8" Tree				
+08.31 = Δ Rt 3°24			5.8	225.1	
+20	7.6' Rt. 5" Pepper				
T.P.	9.91	240.79 ✓	0.00	230.88	
89+34			8.6	232.2	
+37			7.1	233.7	
89+44	5' Rt. 5" Pepper Tree				
+48	9.9' Rt. 24" Base 5 Trees = Acacia				

240.79

89+59	3.2' Rt = 10" Tree			
+60		0.1	240.7	
T.P.	9.54	250.15 ✓	0.18	240.61
89+66		7.3	242.8	
+73.1	at Wall on ground	6.9	243.2	
"	on Wall	1.45	248.70	
+73.8 = on Asphalt Walk at Wall		4.93	245.22	
90+00		5.07	245.08	
+40.35 = N cb.		5.14	245.01	
"	on Gut.	5.61	244.54	
+50		5.65	244.50	
+72		5.48	244.67	
"	3.6' Rt. on Grating.	5.63	244.52	
"	" on Flow 8" pipe	7.74	242.41	
90+84.48 △ Rt. 9°10'		5.42	244.73	Wall
91+00		5.46	244.69	
+50		5.44	244.71	
+85	= Int. 8" Drain	5.38	244.77	
"	5.7' Rt. on Grating.	5.61	244.54	
"	" " " Flow 8" pipe	7.57	242.58	
92+00		5.40	244.75	

250.15 ✓

T.P. 92+50	6.31	251.05 ✓	5.41	244.74	on Wall
92+94.5 = Int. 8" Drain			6.29	244.76	
"	5.8' Rt. on Grating.		6.51	244.54	
"	" on Flow		8.66	242.39	
93+00			6.29	244.76	
+50			6.20	244.85	
94+00			5.71	245.34	
+34.6 = Int. 8" Drain			5.31	245.74	
"	5.6' Rt. on Grating.		5.57	245.48	
"	" " Flow 8" pipe		8.49	242.56	
"	2.8' Lt. on Rim MH		5.35	245.70	
"	" " Flow		11.07	239.98	
	" " 8"		10.78	240.27	
94+50			5.17	245.88	
+52.4	opp Tel MH.		5.17	245.88	
"	3.1' Rt. Rim Tel. MH		5.20	245.85	
"	" " Bottom "		11.57	239.48	
95+00			4.66	246.39	
+50			4.10	246.95	
~~94~~		Cont.	P-40		

Notes Reduced. 10-17-88

✓

251.05

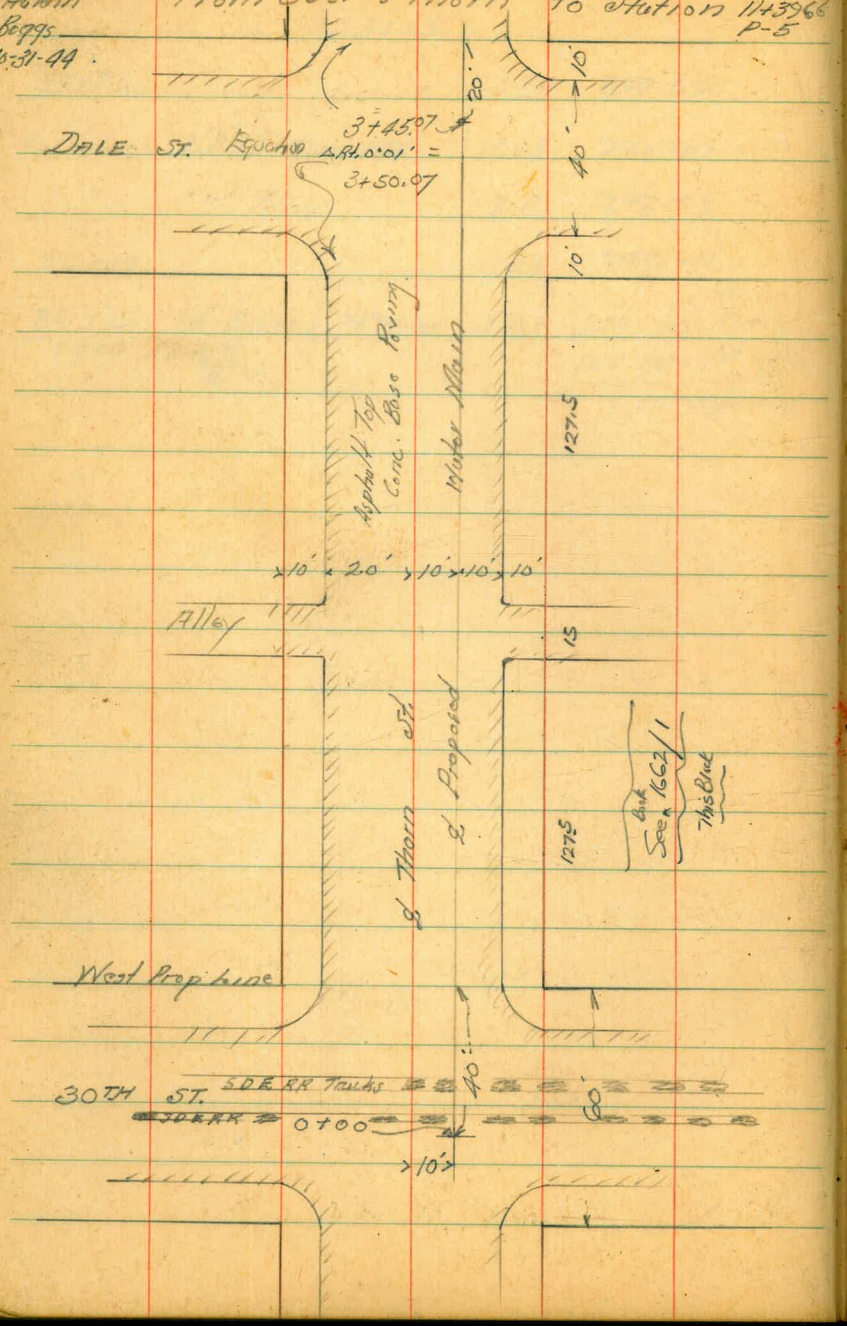
95+76		3.73	247.32
"	2.8' Lt. Rim MH	3.65	247.40
"	" Flow "	8.56	242.49
96+00		3.45	247.60
96+22 = Int. Existing 24" Water = 0+00 F.B. $\frac{1676}{2}$		3.29	247.76 ✓ Nail in Paving.

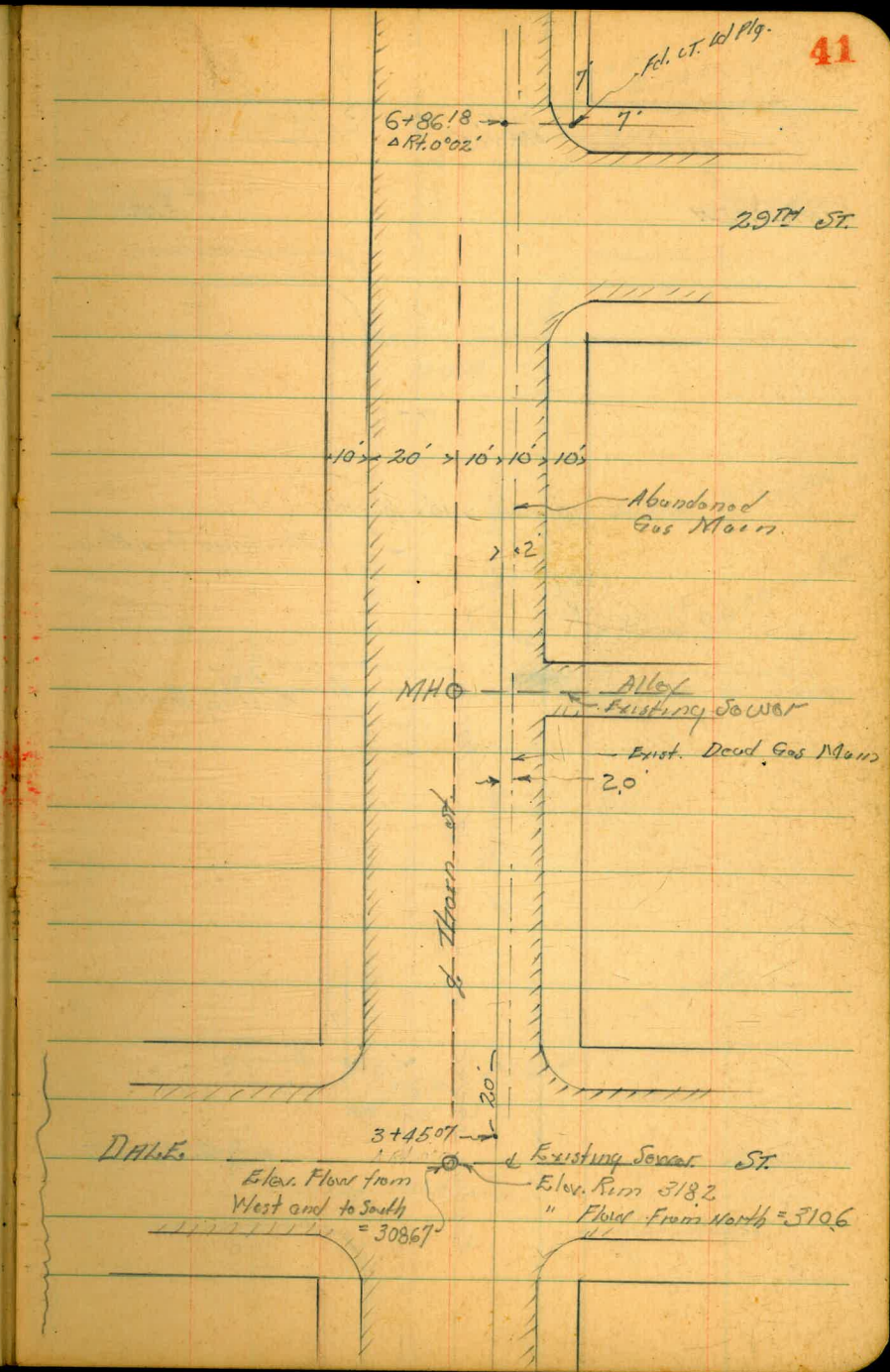
247.86 = F.B. $\frac{1676}{2}$

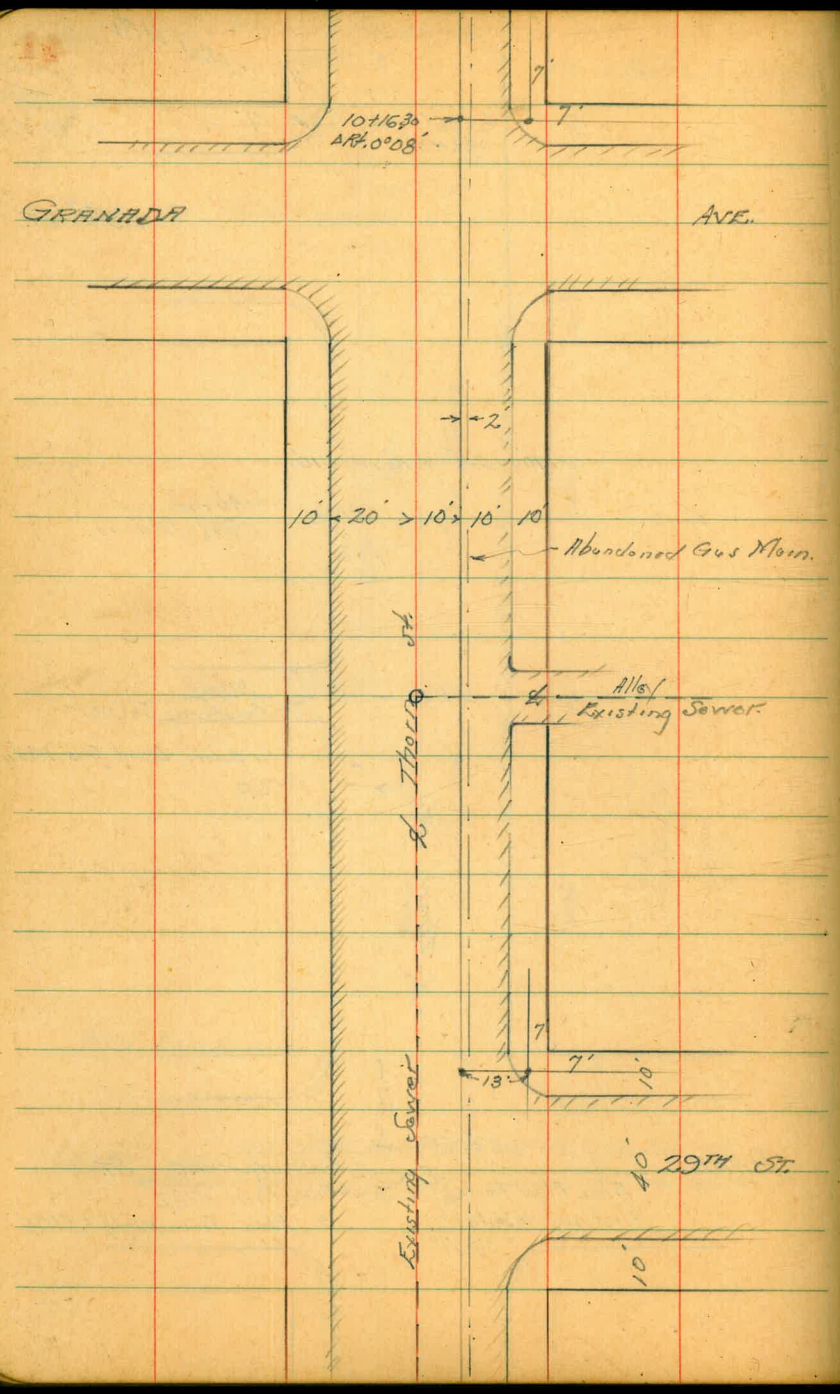
0.10 = difference

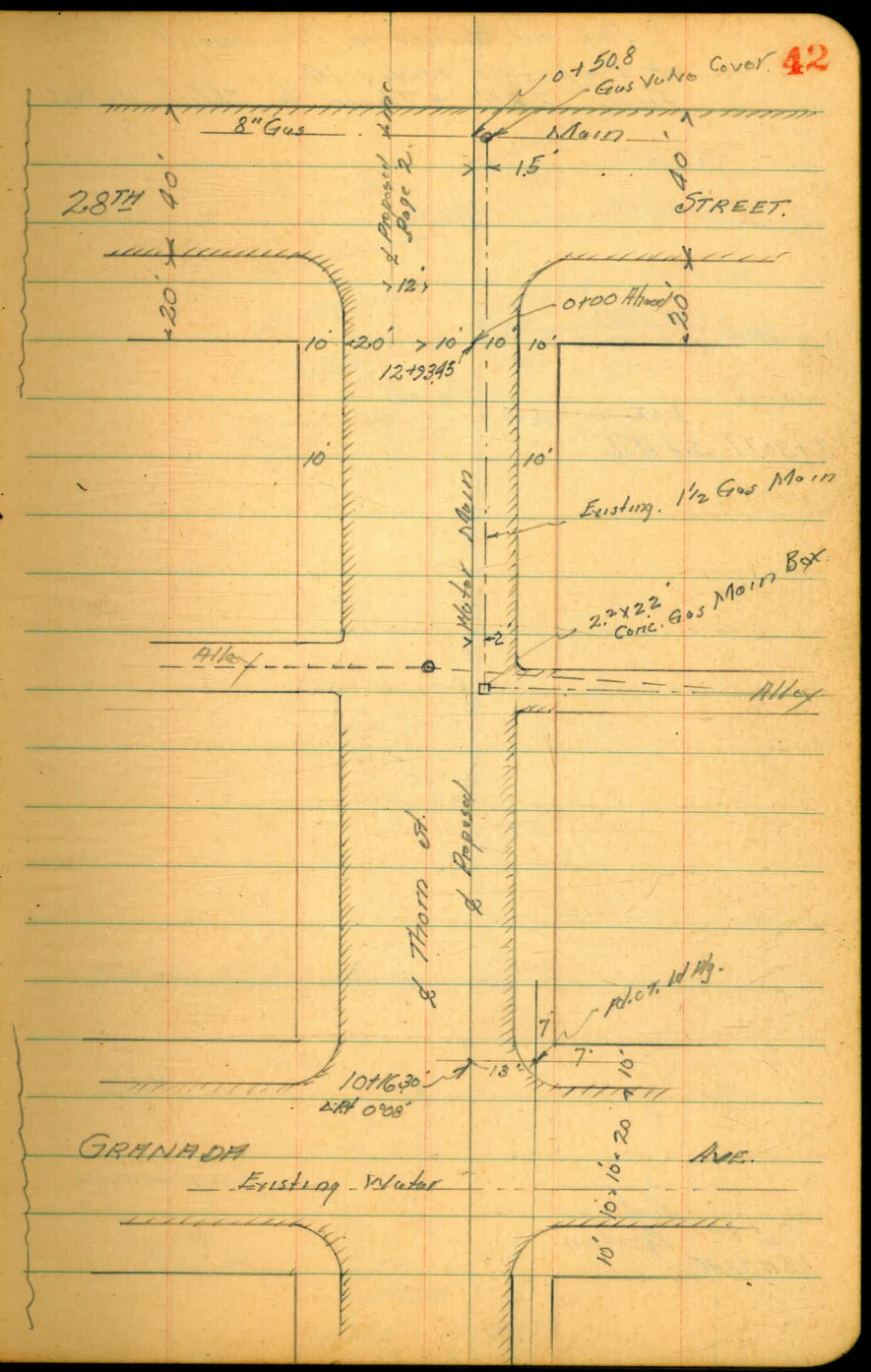
Walker
Hardin
Beggs
10-31-44

LOCATION - PROPOSED WATER MAIN
From 30th & Thorn to Station 1+43.66
P-5





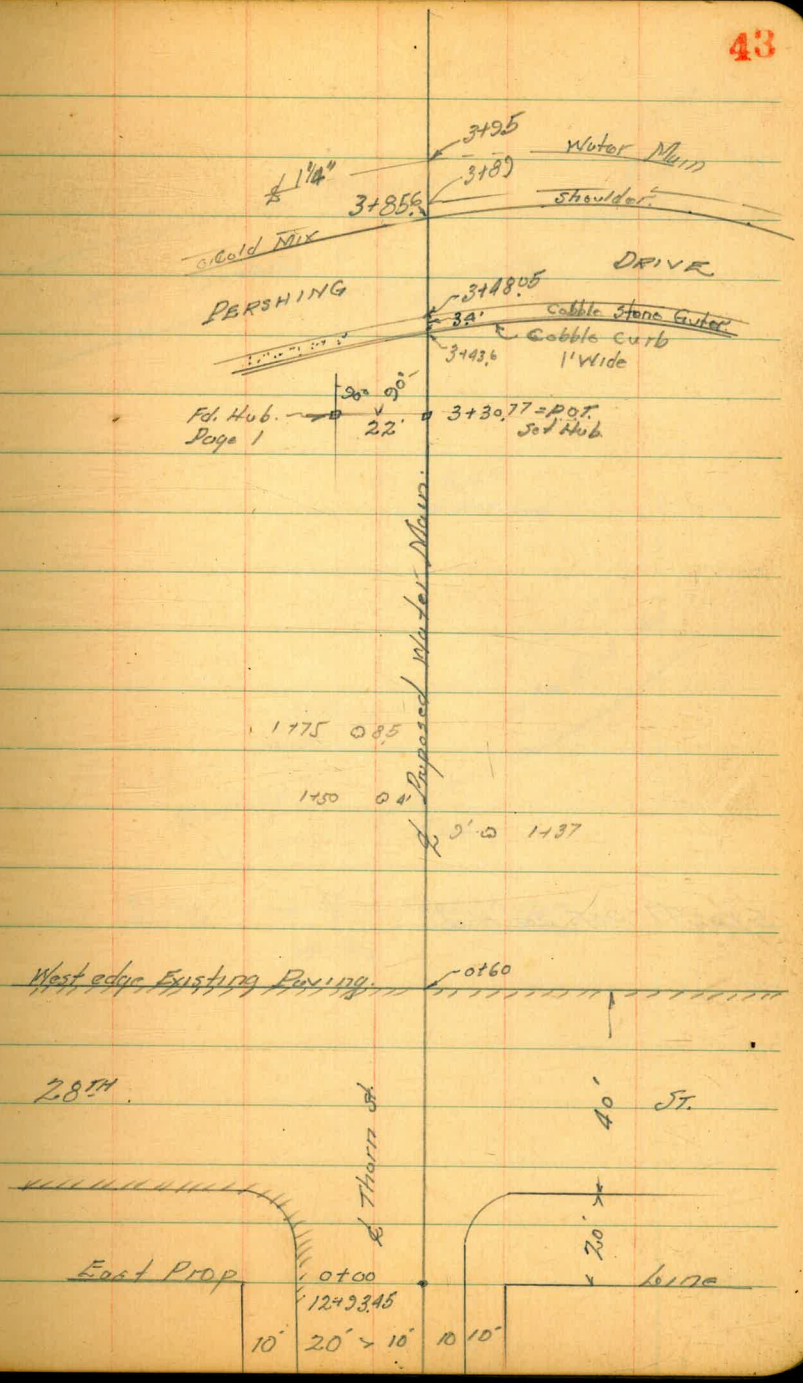

GRANADA
AVE.
10+16.30
Δ Rt. 0°08'
7'
7'
2'
10' 20' 10' 10' 10'
Abandoned Gas Main.
℄ Thorn St.
Alley
Existing Sewer
7
7'
10'
13'
Existing Sewer
40'
29TH ST.
10'

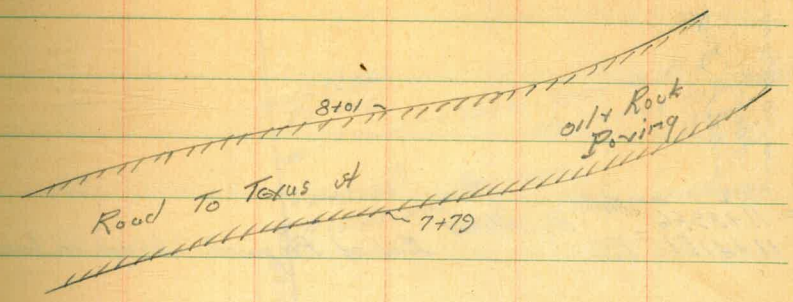

0+50.8
Gas Valve Cover
8" Gas
Main
1.5'
28TH
40'
STREET.
℄ Proposed Page St.
12'
20'
0+00 Ahead
10' 20' 10' 10' 10'
12+93.45
20'
10'
10'
Existing 1½ Gas Main
Water Main
2.2'x2.2' Conc. Gas Main Box
2'
Alley
Alley
℄ Thorn St.
℄ Proposed
pl. of 1d Wg.
7
7'
10'
13'
10+16.30
Δ Rt. 0°08'
GRANADA
AVE.
Existing Water
10' 10' 20'
10'

℄ Proposed change in Alignment
of Proposed Water Main
from 28th & Thorn to Station 11+39.66

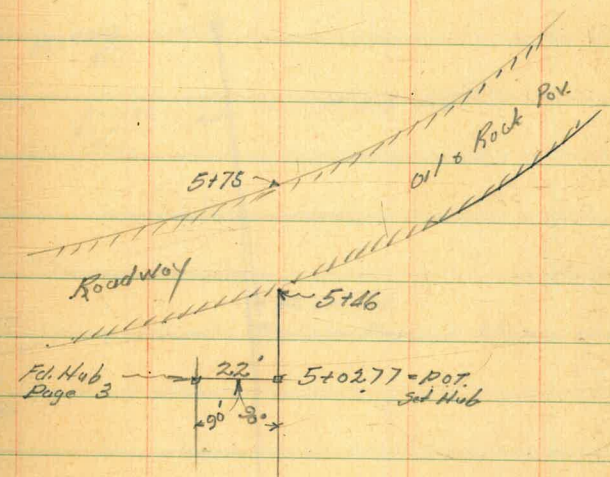
P.O.T.
3+30.77 Set Hub

0+00 Ahead
= Equation
12+93.45





6+86.45
Set P.O.T. Hub.

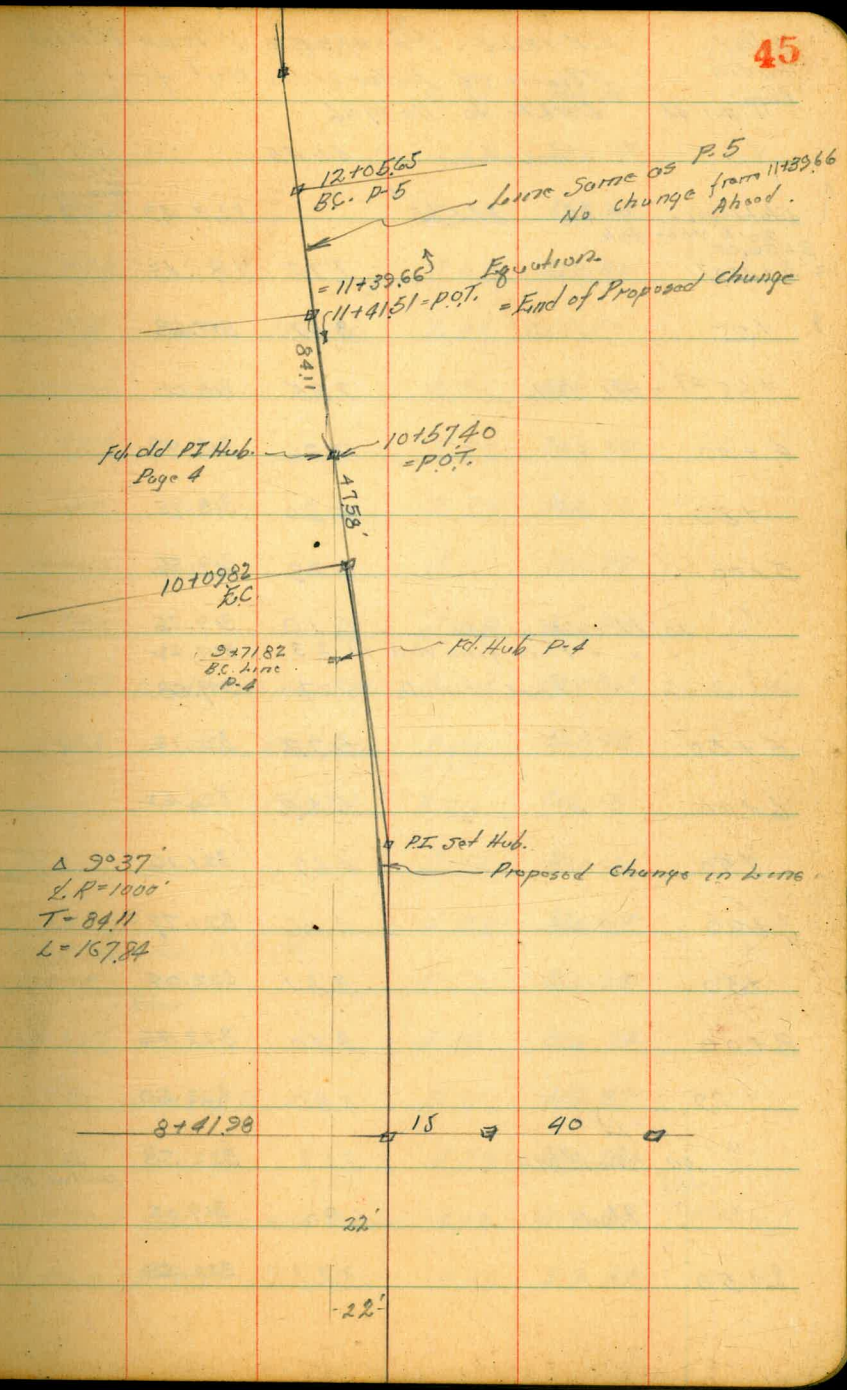


5+02.77 = P.O.T. Set Hub.

→ No change Ahead ← Cont. P. 5 →

= 11+39.66 Ahead Equation
11+41.51 = E.C. End of Proposed Change in Line

8+41.98 = B.C. H.



Walker
Hardin
Beggs 11-1-44

LEVELS - PROPOSED WATER MAIN
Thorn St. Extension West from
DALE to 11+39.66

Location P-41-45

Stations - 236	325.85		323.49	NE. BR Granada & Thorn.
20' E W.L. Dale 3+50.07 = = 3+45.07		7.72	318.13	
+55.		8.17	317.68	
+65.07 = W.L. Dale		7.85	318.00	
4+00		7.36	318.49	
+50		6.90	318.95	
5+00		6.29	319.56	
" 10' Lt. on Rim MH		6.10	319.75	
" " " Flow from West		11.23	314.62	
" " " Flow " North		16.27	309.58	
5+50		5.73	320.12	
6+00		5.23	320.62	
+50		4.69	321.16	
7+00		4.06	321.79	
+50		3.81	322.04	
8+00		3.40	322.45	
+29		3.35	322.50	
" 10' Lt. on Rim MH		3.27	322.58	
" " Flow "		3'5'3 6.80	319.05	Shallow MH.
8+50		3.27	322.58	

		32585			
9+00			2.34	322.91	
+50			2.68	323.17	
+63			2.67	323.18	
+78			3.03	322.82	
T.P.	1.47	324.96	2.36	323.49	
10+00			2.26	322.70	
+23			2.72	322.24	
+50			2.83	322.13	
11+00			3.17	321.79	
+50			3.53	321.43	
+55	2' Rt = 2'x2' Gas MH		3.64	321.32	on Gas MH.
+58	10' Lt. on Rim MH		3.48	321.48	
" " " Flow "			5'3'5 8.83	316.13	
12+00			3.90	321.06	
+50			4.29	320.67	
12+33.45 = EL. 28½ St = 0+00 - Ahead			4.62	320.34	
0+07			4.72	320.24	
+20	in Valley Gut.		5.09	319.87	
+40			4.78	320.18	
+50.8	opp Gas Valve Cover		5.02	319.94	Valve = 1.5' Rt. of ℄
+60	= Wedge Pav.		5.59	319.37	

	324.96		
0+62		5.2	319.8
1+00		5.3	319.7
+37	9' Rt = 4" Pepper Tree		
+50		6.2	318.8
"	10' Lt 4" Pepper (Dead)		
1+75		5.7	319.3
"	2.5' Lt = 8" Pepper		
2+00		7.0	318.0
+40		7.4	317.6
"	3.5' Rt. = 10" Pepper		
2+50		8.2	316.76
+85		9.9	315.1
3+00		11.1	313.9
T.P.	0.25 313.66	12.25	312.71
3+30.77 = P.O.T.		2.8	310.9
chk 22' Lt. on old Hub.		3.58	310.08
chk Nail in ℄ Pav. 3+67.8' old Line		10.04	303.62
3+36		3.4	310.3
+41		7.6	306.1
+44.6	on 1' Wide Cobble Curb.	8.33	305.33
"	" Gut.	9.23	304.43

	313.66		
3+48	E. edge Asphalt Pav.	8.79	304.87
+68	on " "	8.42	305.24
+88	" W edge Pav.	8.54	305.12
+93		9.0	304.7
T.P.	0.12 305.61	8.17	305.49
3+95	on 1¼" Water	1.5	304.1
+96		1.9	303.7
4+00		2.3	303.3
"	3.8' Lt = N edge Tree cluster 24" dia = Total dia.		
4+15	3.8' Lt = N " " 6" dia		
+18	3.5' Rt. = S edge cluster Trees 16" dia " "		
+22	2.5' Lt. N " Cluster Trees 16" "	5.1	
+26	5' Rt = S " 10" Tree		
+30	7' Rt = S " 12" Trees (two)		
4+50		9.6	296.6
T.P.	0.13 292.90	12.84	292.77
4+70		0.2	292.7
+87		3.6	289.3
5+02.77		5.76	287.14
(5+00)	8' Lt. 6" Olive Tree		
+07	1' Lt. 5" " "		
"	9' Rt 6" " "		

		292.90		
5+08			6.5	286.4
(5+18) 3' Rt. 3" olive Tree				
5+26			10.0	282.9
T.P.	0.03	279.85 ✓	13.08	279.82
5+43			3.8	276.0
+46 on E. edge Pave.			4.08	275.77
+57 on "			4.22	275.63
+67 " "			4.92	274.93
+75 = " W " "			6.0	273.8
+80			4.9	275.0
+88			5.8	274.0
6+00			9.5	270.4
+25			13.5	266.4
T.P	0.67	267.83 ✓	12.69	267.16
6+41 = ℄ Small Tree on Line				
+50			4.6	263.2
(6+62) 6' Rt. Small Tree Bush.				
(6+67) 7' Lt. 4" olive				
(6+72) 3' Rt. 6" "			6.3	261.5
6+86.45 on P.O.T. Hub			8.04	259.79

Small Tree on Line

✓

		267.83		
(6+92) 5' Lt. = 6" Tree				
(7+25) 7' Lt 4" Cottonwood				
(7+40) 3' Rt 5" "				
7+50			11.9	255.9
T.P.	2.99	258.71 ✓	12.11	255.72
(7+58) 1' Lt = 5" Cottonwood				
7+70			3.5	255.2
+75 = ℄ Drainage Ditch			6.2	252.5
+77			5.2	253.5
7+79 = East edge Paving			5.24	253.97
+90 on "			4.88	253.83
8+01 W " "			4.91	253.80
+06			5.5	253.2
+20			6.8	251.9
8+41.98 = B.C. Lt. on Hub			7.31	251.40
9+00			8.1	250.6
(9+19) 20" E Tree 0.7' Lt. = H edge				
9+20			7.8	250.9
+50			12.8	246.4
T.P.	3.47	249.63 ✓	12.55	246.16
9+58			5.0	244.6
" 4' Lt. = 10" E. Tree				

on Hub 9+50.47 p. 21

✓

249.63 ✓

9+70		6.6	243.0
+81		8.4	241.2
9+90 = E. edge Channel		14.2	235.8
+97 W " "		14.2	"
+98 Top Bank "		13.3	236.3
10+09.87 = E.C. on Hub		12.69	236.98
+14		12.2	237.8
+20 = E. edge Bridle Path		10.0	239.6
+30 W. " " "		10.1	239.5
+34		7.0	242.6
+40		4.6	245.0
T.P. 11.97 ✓			
10+57.4 = P.O.T. Hub. 259.43		2.17	247.46
+70		10.6	248.8
11+00		11.7	247.7
+02		11.6	247.8
+08		3.8	255.6
+11		3.8	"
+13 E. edge Road		4.5	254.9
11+41.51 = 11+39.66 } P.O.T. = Equation Ahead No change from Here West,		4.41	255.02 on Hub P-21
			255.01 " "
			0.01 diff.

Notes Reduced 11-15-24

← Cont. Page 21

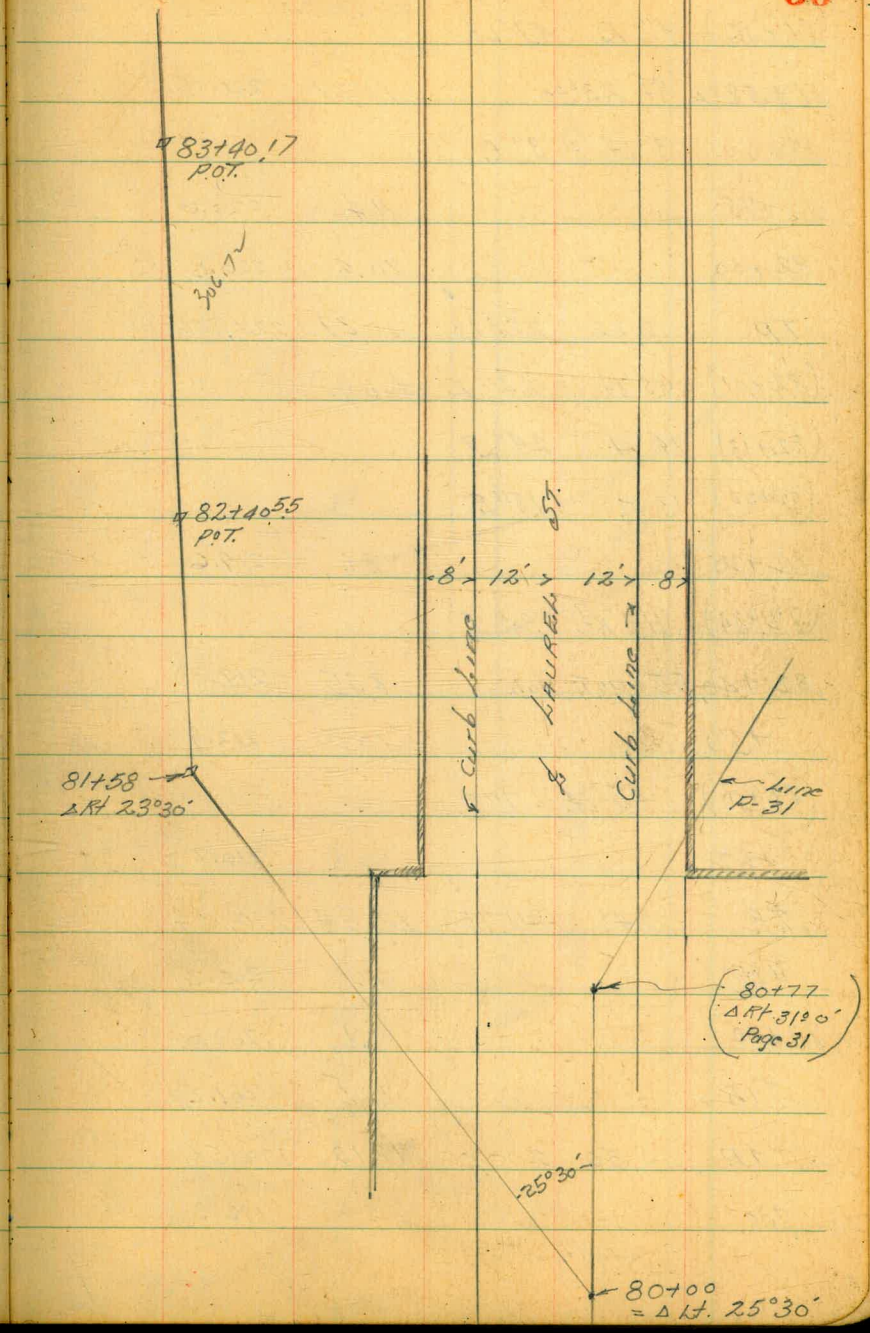
✓ ✓✓✓

Walker
Hardin
Beggs 11-4-44

Alternate Line of Proposed Location Water Main on South Side Cabbrillo Bridge

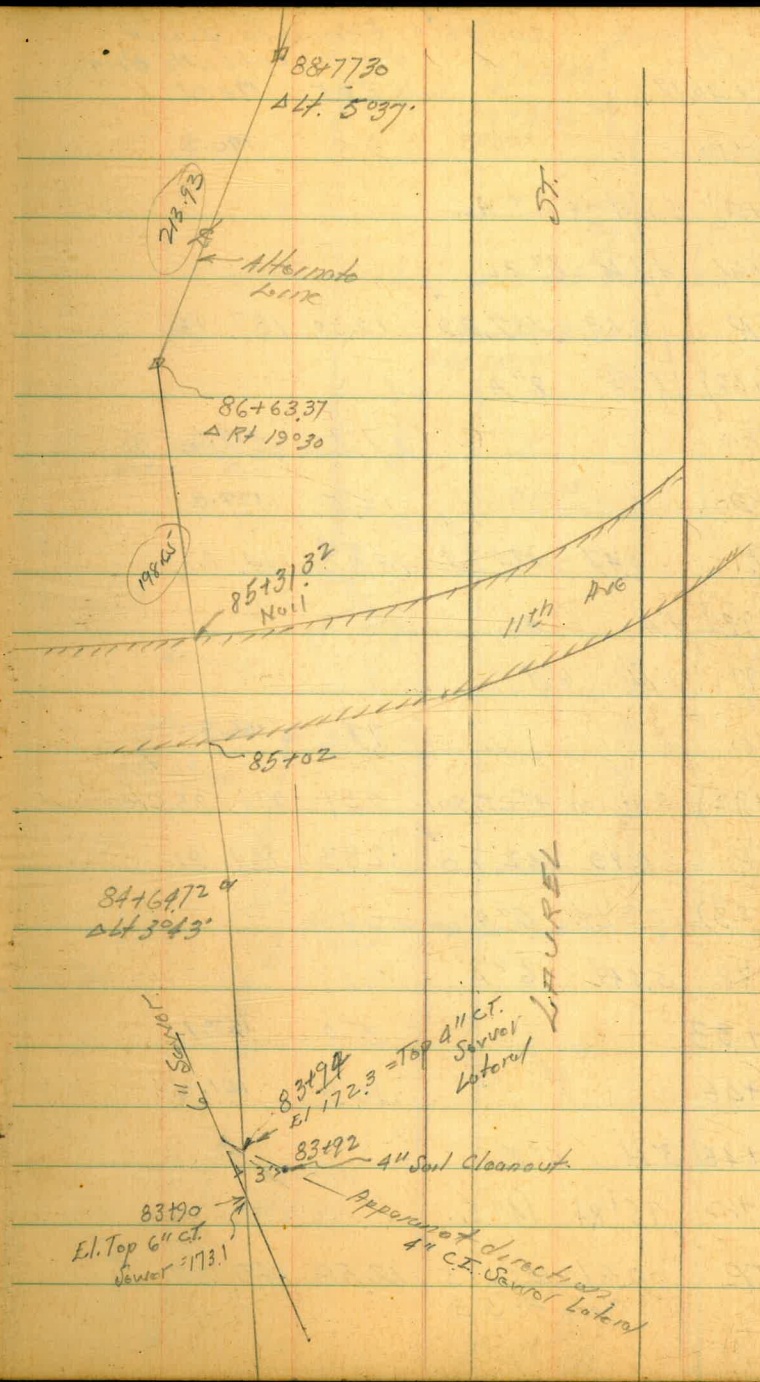
Note: Trees Located from Edge Nearest ℄ of Proposed Pipe

Stations				B.M. Top Fire Hyd. P.29
	0.99	255.11		254.12
80+00	Δ Lt. 25°30		4.39	250.72
+34	Toe Asphalt Ramp		5.18	249.93
+39.7	on South Curb		4.82	250.29
(80+56)	12.5' Lt. Nedge	36" E Tree		
80+72.0	N edge Conc. Wall		5.14	249.97
"	" " " on Top		1.90	253.21
80+74	on Ground at S. side Wall		6.1	249.0
+90			9.7	245.4
80+94	4" A 5.5' Rt.			
(80+96)	6" Accacia Tree on Line			
T.P.	1.39	243.89	12.61	242.50
81+00			2.4	241.5
(81+07)	= 30" E 12.5' Rt.			
+20			10.6	233.3
T.P.	0.31	231.43	12.77	231.12
(81+28)	8' Rt. 20' E			
81+33			4.2	227.2
(81+42)	6' Rt. 24" E		7.2	224.2
(81+52)	8.5' Rt. 24" E Stump.			



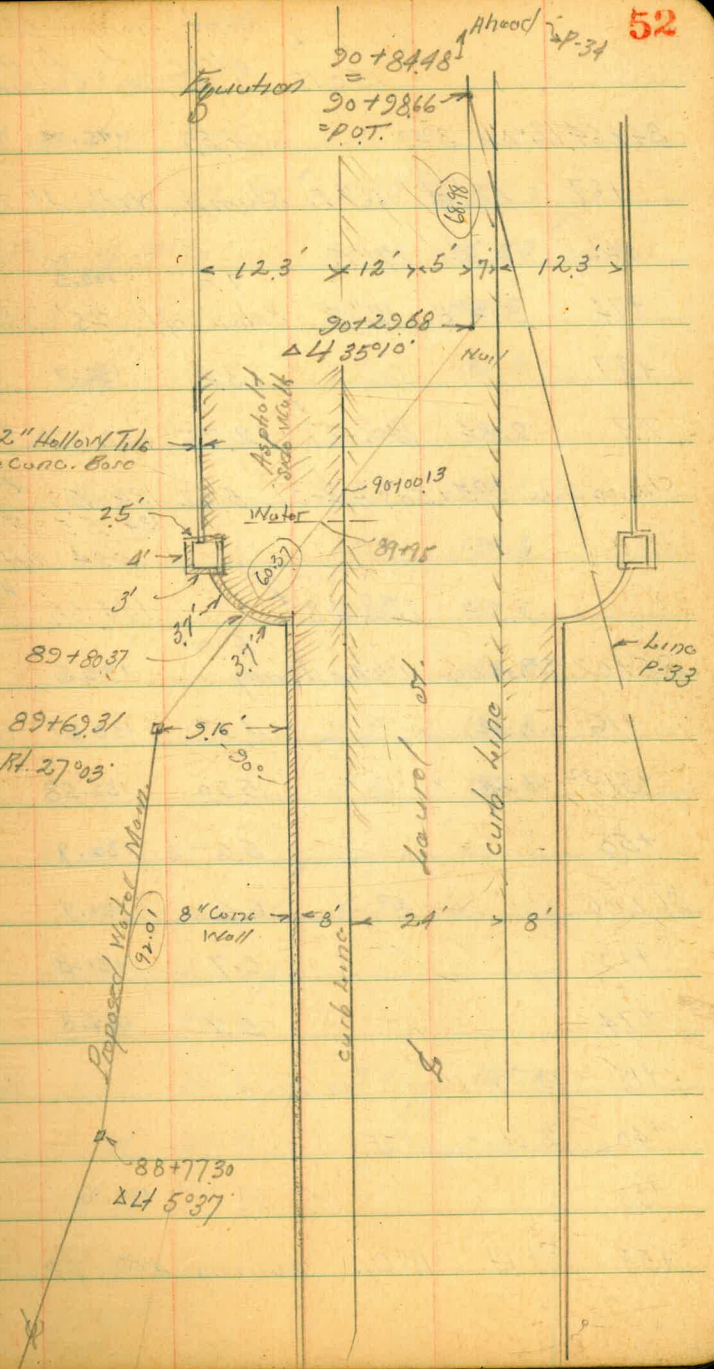
		23143 ✓	Alternate Line S. Side Cabrillo Bridge	
(81+56)	4" E	47' Lt.		
81+58 = △	Rt. 23°30		10.37	221.06
81+60	3' Lt.	3" E		
+75			11.4	220.0
82+00			10.6	220.8
T.P.	2.12	22318 ✓	10.37	221.06
(82+01)	65' Rt.	= 24" E	Stump	
(82+13)	14' Rt	24" E		
(82+24)	13' Rt	18" E		
82+20			3.6	219.6
(82+34)	11.3' Rt.	30" E		
82+40	55 = P.O.T.	Hub	8.35	217.83
+50			10.3	212.9
(82+50)	65' Lt.	7" E		
+62			12.8	210.9
T.P.	1.41	211.75 ✓	12.84	210.34
+85			6.6	205.2
83+00			8.7	203.0
+12			10.5	201.2
T.P.	0.50	200.06 ✓	12.19	199.56
+30			4.8	195.3

cont. P-52



		200.06	Alternate Line S-Side	Cubbrillo Bridge	
83+40.17			7.05	193.01	
+50			9.8	190.3	
(83+56)	5.5'Rt	= 6" Ac.			
(83+61)	4.7'Lt	8" Ac			
T.P.	0.13	187.29	12.90	187.16	
(83+68)	1'Rt	8" A			
+80			7.7	179.6	
+90			12.5	174.8	
T.P.	0.47	174.74	13.02	174.27	
(83+92)	4'Lt	6" Ac			
(83+97)	1'Lt	6" A			
84+10			7.8	166.9	
(83+92)	3'Rt. on	4" C.I. Soil	0.39	174.35	Cleanout
T.P.	0.19	162.10	12.83	161.91	
(84+23)	0.3'Lt	5" A			
+28	5.5'Rt.	6" A			
84+33			5.0	157.1	
+46			10.9	151.2	
(84+48)	3'Lt	6" E			
+62	7.5'Rt	14" E.			
T.P.	0.61	150.13	12.58	149.52	

Cont. P-53



Cont. from P. 52
Alternate Line
S. Side Cobbrillo Bridge

		150.13			
84+64.72 = Δ Lt 3°43'			4.39	145.74	on Hub.
+67	18' Lt	16" E	Stump with 4" Tree		
+66	12' Lt	17" E			
			7.6	142.5	
+74	5.2' Rt	12" E	Broken off 25' Above Ground		
+87			13.4	136.7	
T.P.	2.84	140.21	12.76	137.37	
Chk. on stake 85+50.02 P-37			5.62	134.59	
				134.55 = P-37	
				0.04 diff.	
		π Corrected			
	3.93	138.48		134.55	Above Stake
			5.0		
85+02 = East edge 11th Ave Paving				133.5	
+16	on Paving.		4.97	133.51	
+31.32	Lt edge "		5.90	132.58	
+50			5.6	132.9	
86+00			6.6	131.9	
+12			6.7	131.8	
+14			5.7	132.8	
+18 = 10" Willow on Line					
+40	2' Lt = 6" E				
+50			3.9	134.6	
+55	9' Rt.	18" Cy.	Leaning 45° S.E.		

		138.48			
86+63	8.9' Lt	2.4" Cy.			
+64	10.4' Rt.	30" Cy.			
T.P.	12.09	147.78	2.79	135.69	
86+63.37 = Δ Rt. 19°30'			12.11	135.67	on Hub.
+68 = E Bank Creek			12.3	135.5	
+71	" edge "		17.0	130.8	
+78	W " "		17.0	"	
+81	" Bank "		13.7	134.1	
+85			13.3	134.5	
+90			10.5	137.3	
+95			9.4	138.4	
87+00			11.5	136.3	
+02			5.2	142.6	
+05	1.5' Rt	6" Cy.			
T.P.	13.03	160.51	0.30	147.48	
+18	8.4' Lt.	12" Cy.			
+22	3.7' Lt	8" "			
87+30	5' Rt.	6" "	9.4	151.1	
+31	5.1' Lt	6" "	Also 6" Cy on Line		
+40	2.3' Rt.	8" "			
+42	3.1' Lt.	8" "			
+45	8.5' Lt.	6" "			
+35	8.5' Rt	10" "			

		160.51		Alternate Line S-Side Cubbrillo Bridge
87+50			3.8	156.7
"	5" cy on Line			
"	11.3' Lt.	6" cy.		
+58	1.3' Lt	6" "		
"	6.8' Lt	10" cy.		
+61	9.5' Rt	5" cy.		
"	13.5 Rt.	6" "		
T.P.	13.11	173.62	0.00	160.51
87+67			10.4	163.2
"	7.5' Rt	8" cy		
"	2.9 Lt	10" cy.		
"	10.5 Rt	5" "		
87+73	6.4' Lt	8" "		
+76	2.7' Lt	8" "		
+77	1.3' Rt	6" "		
"	8.7 "	5" "		
87+80			5.5	168.1
+84	3.5' Lt	10" cy.		
"	7.5"	10" cy		
+85	0.7' Rt.	8" "		
"	8.1 "	4" "		
+86	11.1' Lt.	6" "		
+87	13.9	5" "		

		173.62		
87+98			1.1	172.5
"	6.1' Lt.	12" cy.		
+92	5.7 Rt	6" "		
+96	10.3' Lt	12" cy		
+99	12.4' Lt	14" cy		
"	7.4' Lt.	5" cy		
T.P.	8.79	182.03	0.38	173.24
T.P.	9.87	192.04	+0.14	182.17
88+03	9.3' Rt	10" cy.		
"	12.5' Lt	12" "		
+07	4' Rt	12" "		
+10	12.6' Lt	14" "		
+14	12" A on Line			
+15			8.7	183.3
+16	11.3' Lt	12" cy.		
"	4.6' Rt	3" A		
+20	8.7' Lt	4" A		
+26	1.8' Lt.	9" A		
"	6.4' Lt	4" A		
+29	10.5' Lt.	16" cy		
+32	4' Rt.	6" A		
+33	7' Lt.	16" cy		

on 3.14 H.P.
11' Lt
88+08

		192.04	Alternate Line S Side Cobbrillo Bridge		
88+30			1.1	190.9	
T.P.	12.29	203.89	0.44	191.60	
88+35	12' Rt	12" cy.			
+38	3' Lt	10" cy	Leaning 20° N.E.		
+39	8' Lt	8" A			
+49	9.2' Rt	18" cy.			
+57	16.5' Lt	24" cy.			
+64	6.5' Lt	14" cy			
"	10.7 Lt	16" "			
88+60			0.5	203.9	
T.P.	13.28	216.87	0.30	203.59	
+70	14.5' Rt	12" Pine			
+74	15' Rt	10" cy.			
+75	9.8' Lt	16" cy			
88+77.30 = Δ	5°37' Lt.		6.9	210.89	on Hub
+87			1.7	215.2	
T.P.	12.22	228.61	0.48	216.39	
+87	10' Rt	5" Pine			
+90	12.5' Rt	24" cy.			
93	7' Rt	8" Pine			
89+00			8.4	220.2	
+02	11.4' Rt	6" cy.			
+09	6.8' Lt	14" cy			

		228.61			
89+13	12.8' Lt.	12" Pine.			
89+10			5.1	223.5	
+15			2.2	226.4	
T.P.	12.09	240.24	0.46	228.15	
89+28	5.9' Lt	14" A	Leaning 20° E		
+31	7.8' Lt	5" cy			
+36	2.1' Lt	12" Stump	3' High.		
+37			7.5	232.7	
+57	4' Lt.	12" Tree	2.8	237.4	
89+69.31 Δ Rt 27°03'					
T.P.	10.05	250.03	0.26	239.98	on Hub
+76	10" Tree on Line				
+80.37	on Ground at Wall		8.6	241.4	
+80.37	on Wall		1.33	248.7	
+81.04	" "		1.33	"	
"	on Side Walk at Wall		4.71	245.32	
89+00.13	on Curb.		5.21	244.82	
"	" Gut.		5.57	244.46	
90+29.68 = Δ Lt. 35°10'			5.27	244.76	on Wall
+50	on Pole.		5.28	244.75	
90+98.66 = P.O.T. = 90+84.48 P-39			5.30	244.73	
				244.73	
				000	

Notes Reduced. 11-15-22

Walker
Hazard
Hardin
Begg
1-2-45

Proposed Change in Line of Portion of Proposed Water Line Across Balboa Park from 28th & Thorn to 7th Ave.

Change in Line from 38+49.53 to 7th Ave

42+00

+50

41+00

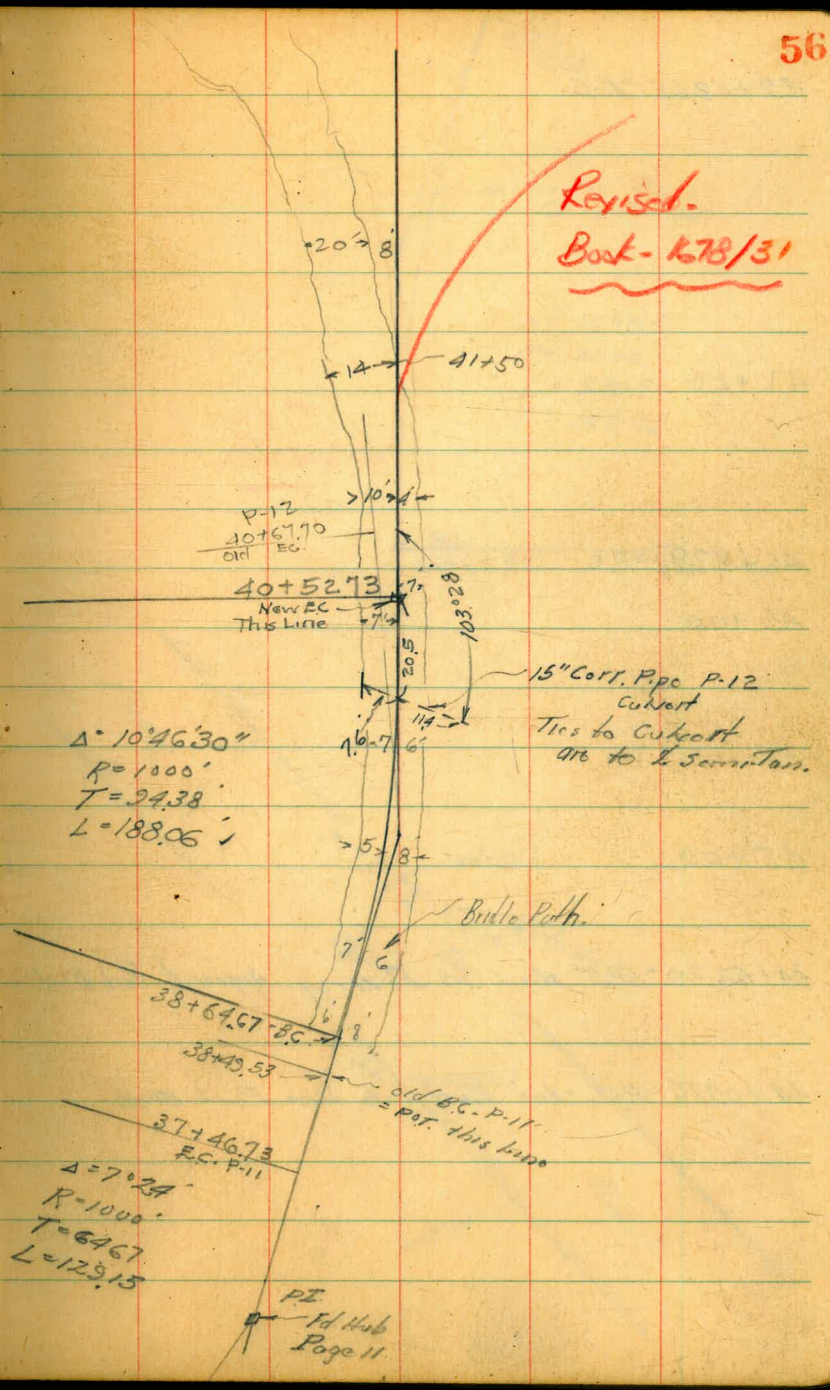
40+52.73 = E.C. Set 2"x2" Redwood 0.3' below Surface

40+00

+50

39+00

38+64.67 = B.C. Set 2"x2" Redwood Hub.



49+03.68 = E.C.

47 +00

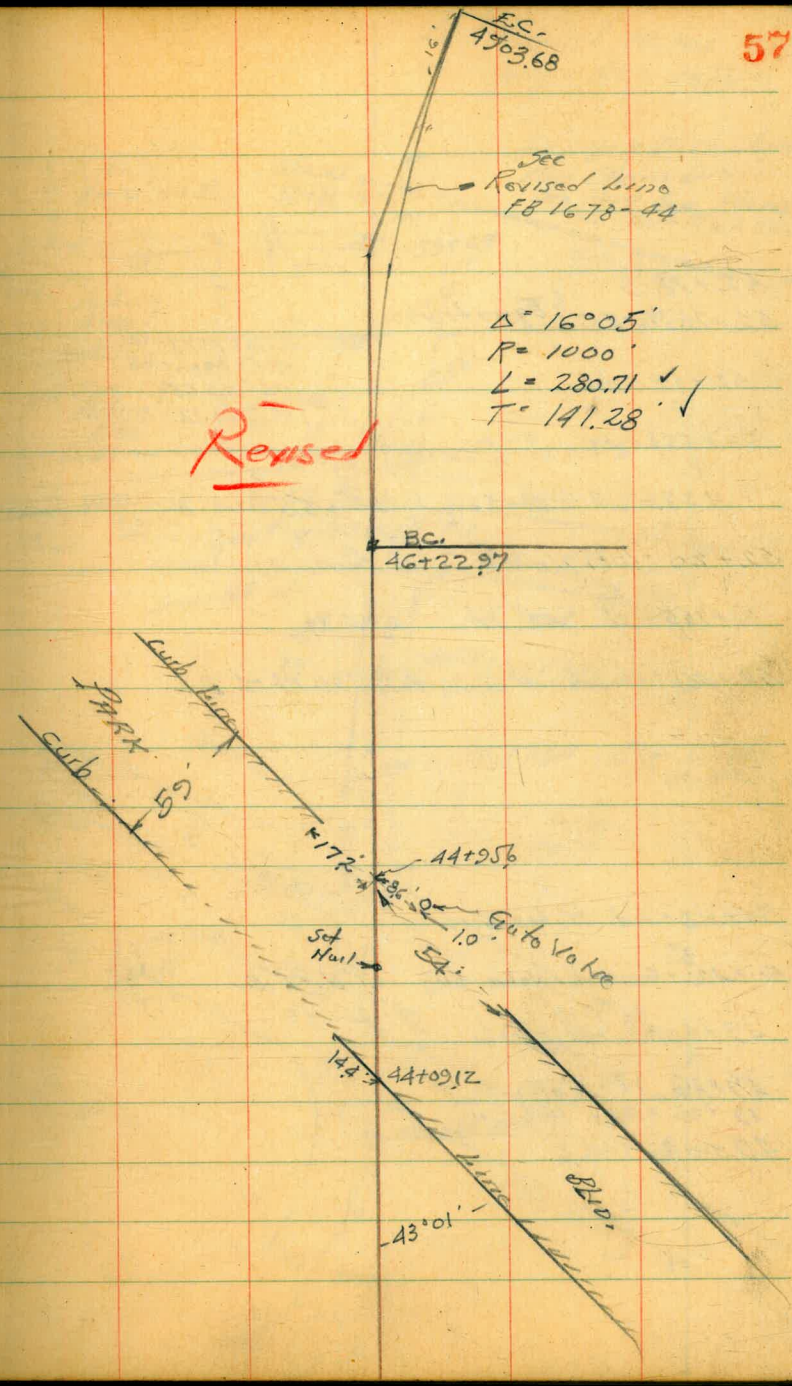
46+22.97 = B.C.

46 +00

45 +00

44+52.20 = R.O.T. Nail in Paving Approx ℄ Park Blvd.

44 +09.12 = R.O.T. = Int. East curb line Park Blvd.



Additional Notes on Topog. See 1678

= 52+78.19
52+78.33 = EC } Equation.

52+68 = PI.

Δ = 1°11'
R = 1000'
L = 20.65
T = 10.32

52+57.68 = BC

+28.6 2.5' Rt. = S. edge 3.3' x 3.3' Conc. Box Gas Valve

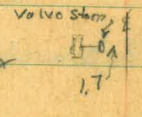
52+20 = Int. North & South Sewer

51+76.5 End cb = 4.6' Lt 20.4' Rt.

51+46 = Abandoned Water Gate Valve 9.9' Rt = E Box.

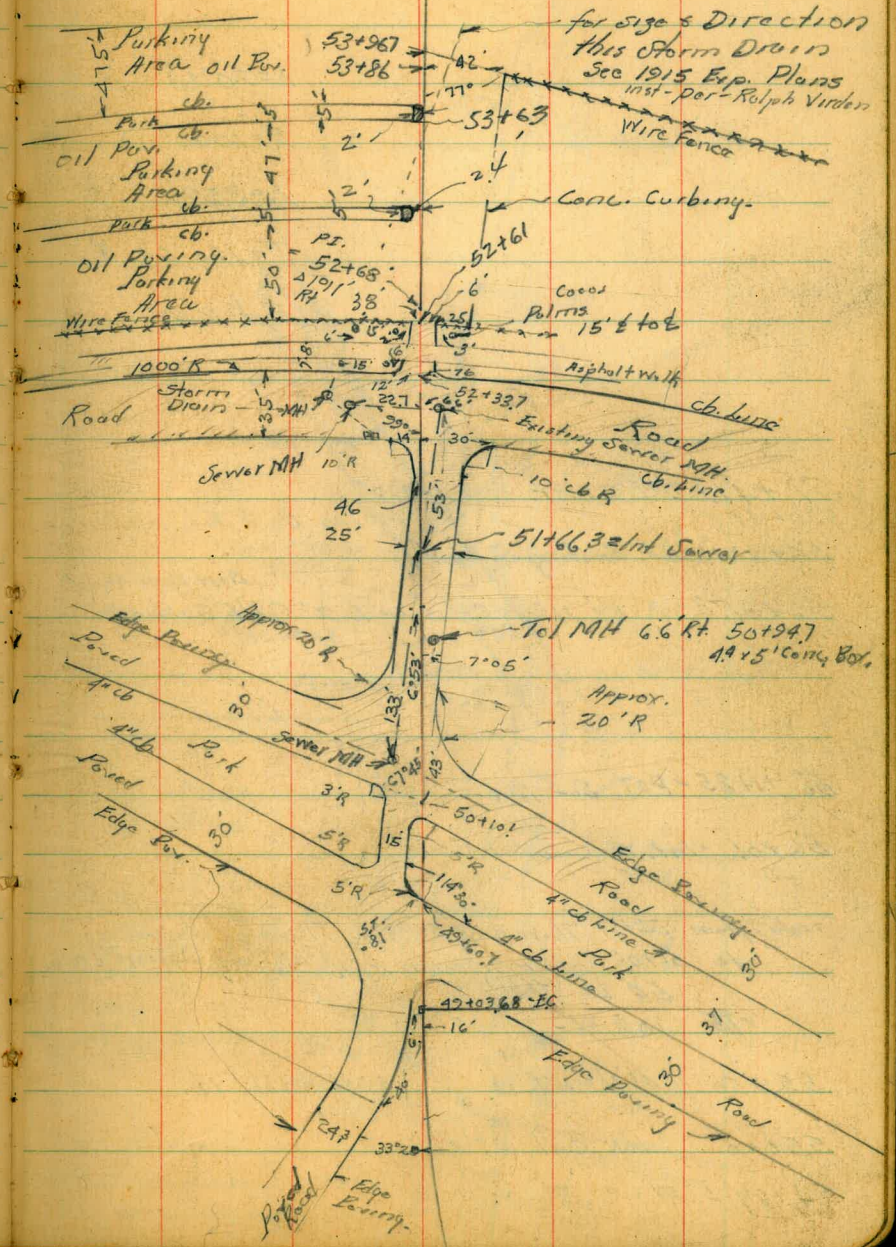
50+53 = Int. Water Service

50+42.5 = Conc. Water Valve Box 1.7' Lt. = E Box



49+60.68 int curb.

49+26.18 = E edge Pav
49+19 = Edge Patch "
49+03.68 = E.C



60+98.83 = E.C.

Δ = 20°28'

R = 1000'

L = 357.21' ✓

T = 180.53 ✓

Ext. 16.16'

57+41.62 = B.C. Rt. Equation.

57+41.85 Int. on Back Tan. produced

56+88.48 = Int. Existing Sewer East Edge Road

56+81.13 = Δ Rt 11°04'30" = Cross in ℄ 2' Cobble Gutter

56+11.85 = P.O.T. Set Hub

56+06 = Int. N Cobble Curb on curve

Note. from 54+89. There are 8 Cocos Plumosa Palms. to 56+06 4' N x cobble curb (Spaced 20' c to c) Average 6" dia.

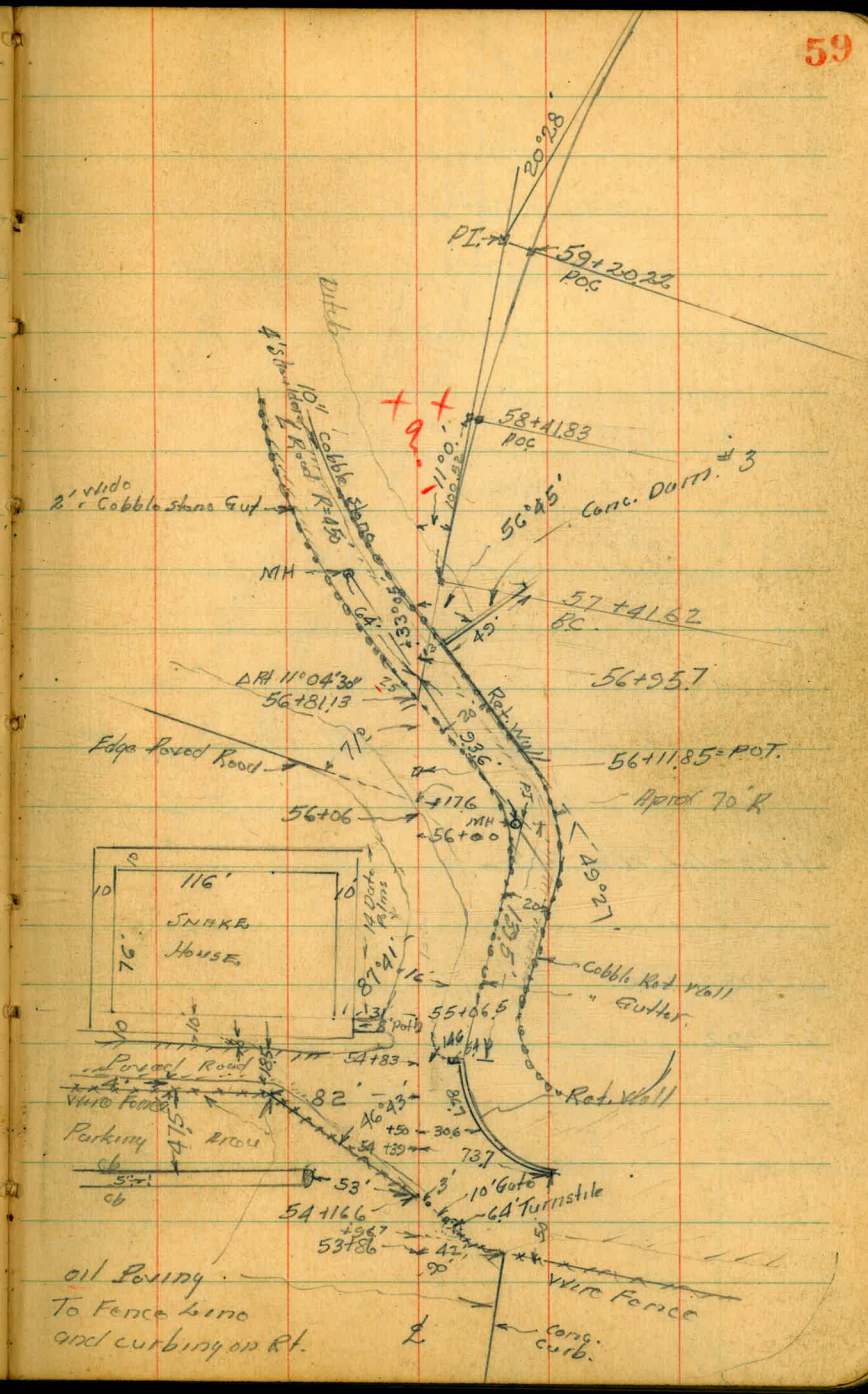
54 Lt. = Cobble cb

+75 10.8 Rt. " "

55+50 4' Lt = cobble cb 12' Rt = cobble cb.

55+00 Cobble Curb 4.8' Rt.

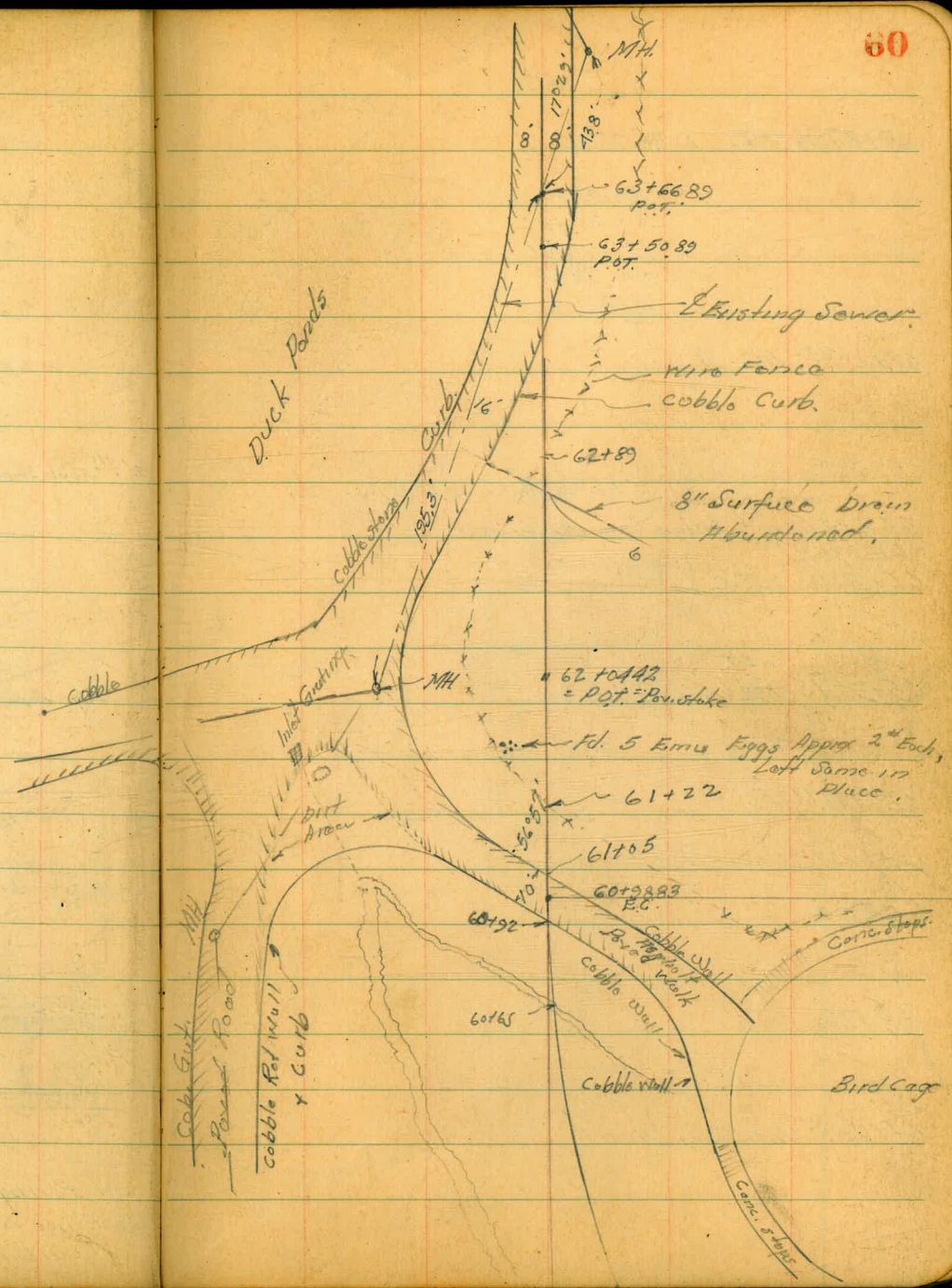
54+89 4' Rt = " "



61+22 = Int Wire Fence

60+98.83 = E.C.

60+92



68+87.86 = P.I. Δ Rt. 25°36'

R = 340'
Δ = 25°36'
L = 151.91
T = 77.24
Ex = 8.16

68+10.62 = B.C. Rt

Top of Box = 0.6' below paving.

66+34.5 = Int. Existing Conc. Box Culvert.
= 66+30.87
66+31.07 = E.C. } Equation.

65+92.75 = P.I. = Δ Lt 52°54'30"

Δ 52°54'30"
R = 90'
L = 83.10
T = 44.78

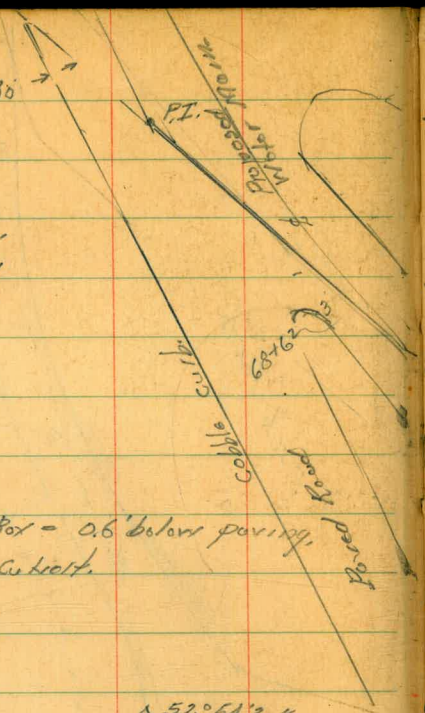
65+47.97 = B.C.

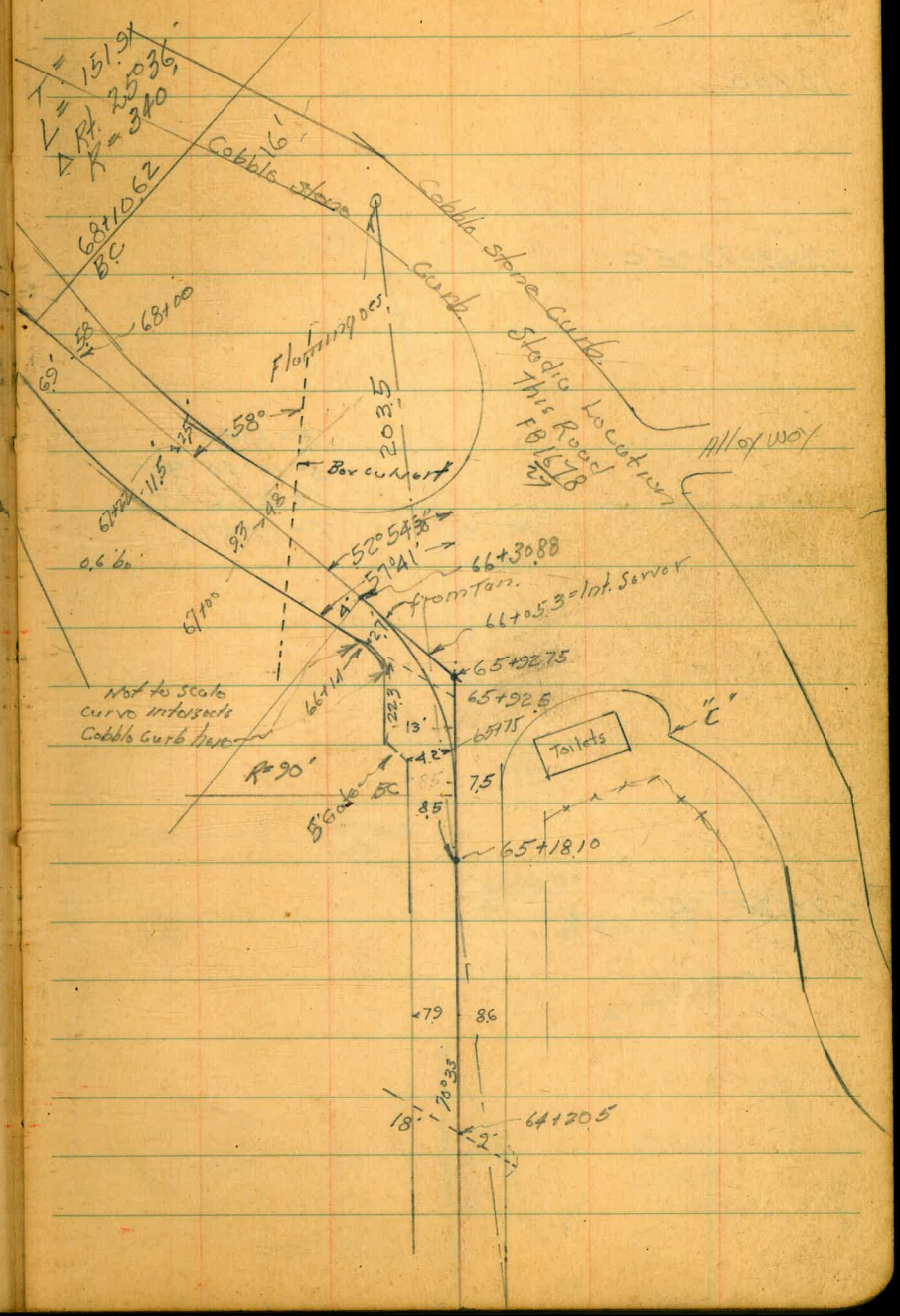
+18.10 = Int. Sewer

65+00

64+50

64+20.5 = Int. Conc. Drain. 8" dia.



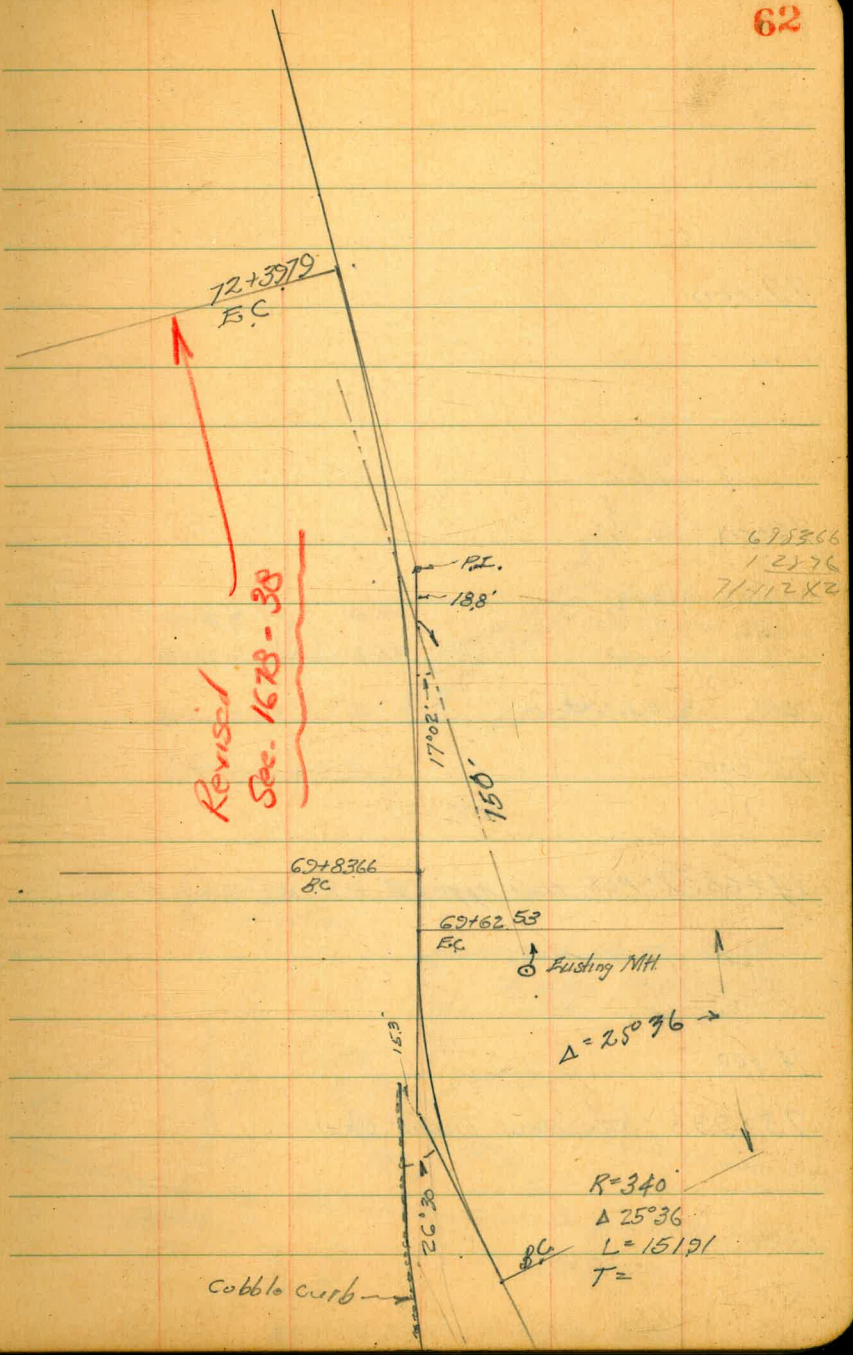


73+00

72+39.79 = E.C.

R = 1000'
Δ = 14°40'30"
L = 256.13
T = 128.76

69+62.53 = E.C.



77+00

76+00

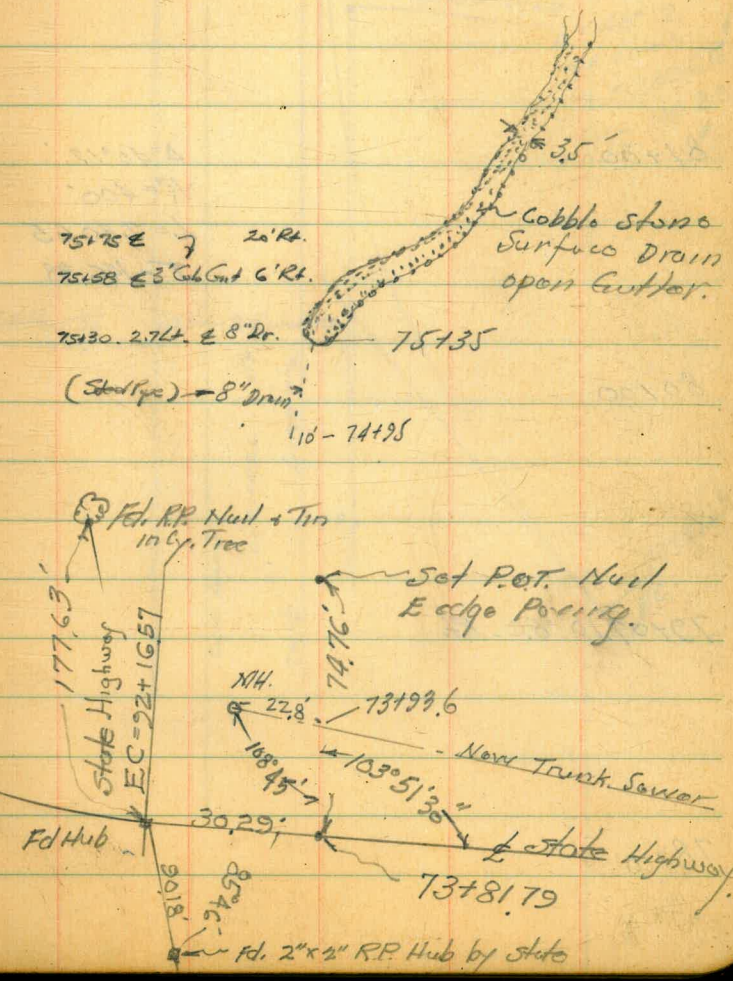
75+11. 3/16" Hyd. C'Lt.

75+00

74+68.39 = P.O.T. Nail Approx ℄ 11th St Concrete Paving

74+00

73+93.6 Int. New Trunk Sewer.



81+87.75 = E.C.

81 +75

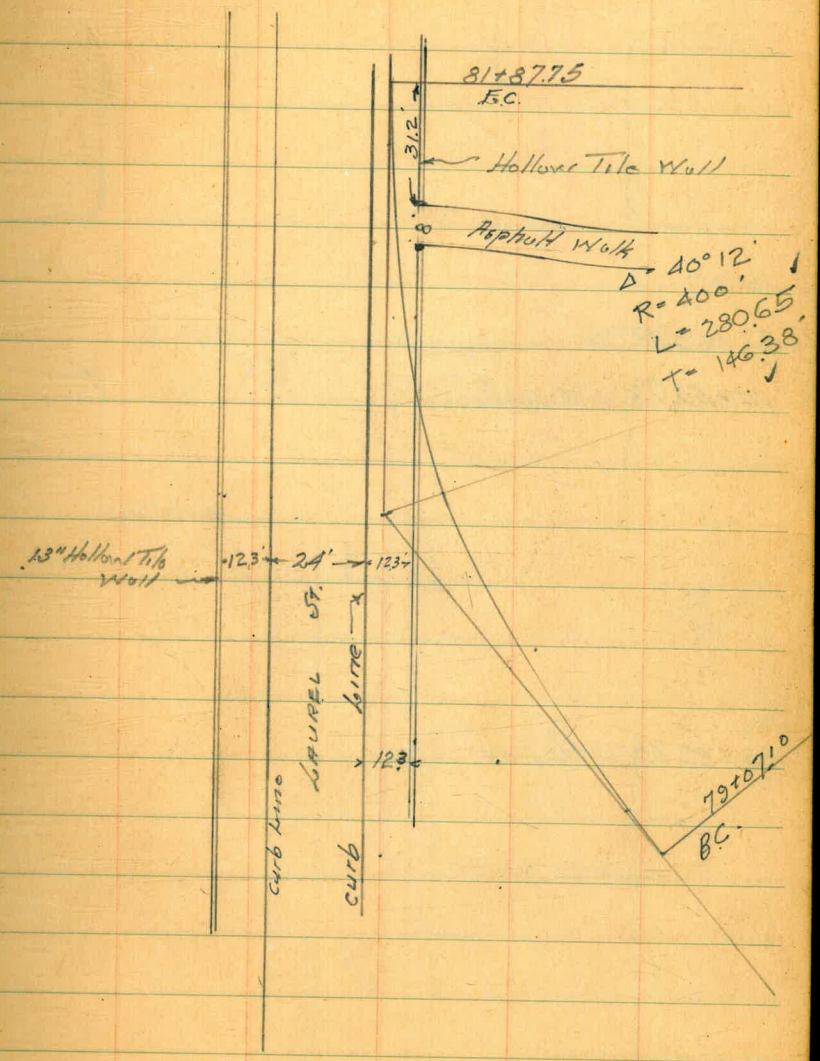
81+00

Δ = 40°12'
R = 400'
L = 280.65
T = 146.38

80+00

79+07.10 = B.C. Rt.

78+00

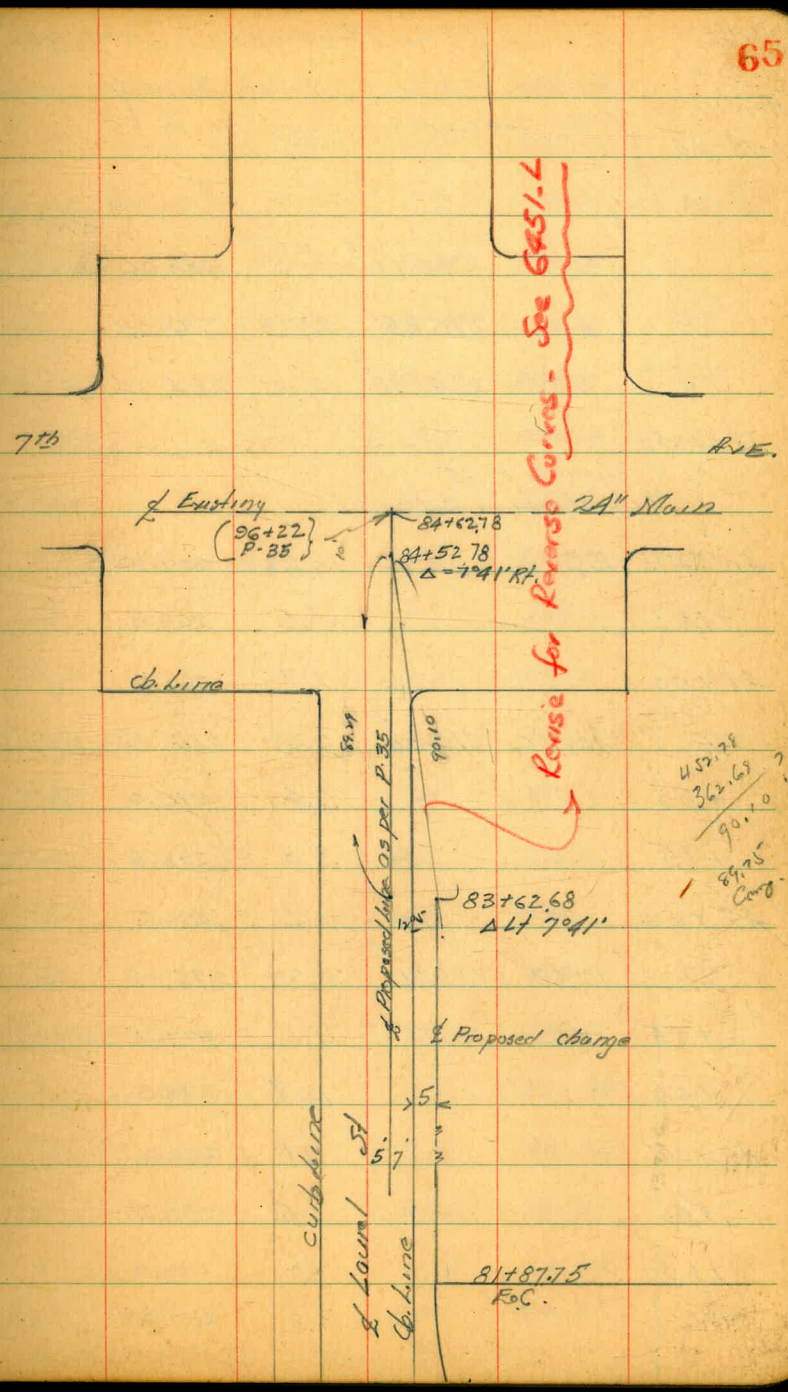


82+62.78

84+52.78 = Δ Rt 7°41'

83+62.68 = Δ Lt. 7°41'

81+87.75 = E.C.



Walker
Hogard
Hardin
1-10-45

LEVELS ~ PROPOSED CHANGE ~
of Line - Water Main Survey 05
per Location Pages 56 to 65

	0.70	288.76		288.06	BM. P-25 on Nail 44+39.25
T.P.	0.82	276.85	12.73	276.03	
T.P.	0.29	264.33	12.81	264.04	
38+49.53					
Levels P-25 ~ No change in Profile					
40+52.73 = E.C. on Hub.			10.28	254.05	
+78			5.5	258.8	
41+00			1.7	262.6	
T.P.	12.76	276.80	0.29	264.04	
+50			6.4	270.4	
+75			3.0	273.8	
42+00			0.6	276.2	
T.P.	12.63	288.66	0.77	276.03	
+15			11.6	277.1	
+50			10.7	278.0	
43+00			9.1	279.6	
+50			6.5	282.2	
+83			4.8	283.9	
+96			0.8	287.9	

		288.66		
44+09.12 = E.C. Park Blvd			0.58	288.08
" on Gut. Boring			1.09	287.57
44+52.20 on Nail in "			0.29	288.37
+95.6 " Gut. of Wtr Line			0.58	288.08
T.P.	11.19	299.69	0.16	288.50
45+03			10.8	288.9
+50			9.3	290.4
46+00			6.2	293.5
+22.97 = B.C. on Hub.			5.69	294.00
+50			4.6	295.1
+67			3.9	295.8
47+00			3.4	296.3
+50			3.5	296.2
48+00			4.1	295.6
+37			4.6	295.1
+50			5.0	294.7
49+03.68 = E.C. on Hub			6.64	293.05
+09 on Patch Pav.			6.75	292.94
+26.18 = E. edge "			7.31	292.38
+60.7 = Gut at cb.			8.32	291.37
" on cb.			7.75	291.94
+71			8.3	291.4

2 · Lt. - N edge 8" U.S. ARMY TEL POLE.

299.69

50+04.5 = Int. curb for curve 5'R		9.44	290.25
T.P.	0.91 291.16	9.44	290.25
50+04.5 on Paving		1.14	290.02
+35		1.85	289.31
15.8 Lt. = ℄ Sewer MH Rim		1.95	289.21
" " " on Flow		4.90	286.26
+42.5 = Water Gate Box 1.5x1'		1.7 Lt = ℄ Box	
(+78) 2' Rt = ℄ 1.5x2' Grating (Plugged)			
50+94.7		3.45	287.71
6.6' Rt. = ℄ Tel MH		3.23	287.93
51+51 = Int. 1¼" Water Service		5.56	285.60
+76.5 opp end cb.		6.34	284.82
4.6' Lt. on Gut.		6.21	284.95
" " " cb.		5.81	285.35
52+00		7.19	283.97
+20		6.73	284.43
6.3' Rt. on Rim		6.79	284.37
" " " Flow to East.		11.15	280.01
" " " Flow North & South		14.94	276.22
2.3' Lt on Sewer MH Rim		6.74	284.42
" " " Flow "		15.05	276.11
6.2' South of Above MH = ℄ Storm Drain MH		6.77 = Rim 284.39 13.87 = Flow 277.29	11.2' E of W cb.

291.16

52+33.7 = W Gut. of Roadway		7.13	284.03
+40.7 = E edge Asphalt Walk		6.65	284.51
+48.7 = W " " "		6.58	284.58
+57.68 = B.C. Rt		7.37	283.79
+78.33 = E.C.		8.82	282.34
53+00		9.53	281.63
+13.5 opp curbing		9.98	281.18
2.4' Lt. on cb.		9.2	282.0
+50		10.73	280.43
+63		10.87	280.29
0.2' Lt.		10.32	280.84
54+00		11.37	279.79
T.P.	2.80 282.63	11.33	279.83
+21.2 = E Edge Paving West of Fence		2.85	279.78
+50 on Paving		3.26	279.37
55+00 " "		4.04	278.59
+50 " "		4.84	277.79
56+06 = Gut. = W. edge Paved Road		5.87	276.76
+11.85 on Hub		5.87	276.76
(56+04) 52' Rt = S edge 8" Cocos Palm			
(56+20) 35' Lt. N. edge 8" Cocos Palm			
56+22 = Top of slope (Hardpan)		6.8	275.8
T.P.	1.51 271.24	12.90	269.73

opp end cb Return in Drive	
in Drive	
6.4' Lt 4" Palm	
3' Lt = 4" Palm	

	271.24				
56+37			3.1	268.1	
+50			11.1	260.1	
T.P.	2.86	261.56	12.54	258.70	
	from Back Ten		5.80	255.76	
(56+88.48)	93.6' Rt on ℄ Sewer = Rim MH			252.76	
	NE Flow = 8.80				Drop MH
	" " Flow MH.		10.35	= Southwest	251.21
56+72			12.9	248.7	
T.P.	0.80	249.42	12.94	248.62	
+78	on cobble wall		3.1	246.3	
+81.13	= Δ Rt 11°		4.61	244.8	℄ 2' Cobble Gut.
+83	= edge Box.		4.15	245.27	
			14.0	235.2	Top MH.
+88.48	on Back Ten Produced		64' Lt.	on Rim MH	
	64' Lt on Flowline.		18.87	230.53	FL
	" " Flow MH				
			6.43	242.99	
57+10.6	= W Gut at Cobble Ret. Wall				
	on Wall		5.69	243.73	10" Cobble Ret. Wall
+11.5	" Ground at Wall		10.5	238.9	
S end Conc. Dam	on Dam		7.43	241.99	
" " "	" Ret Wall		4.40	245.02	
(57+11)	8' Rt. = S edge	20" E Tree			
T.P.	5.43	242.65	12.20	237.22	on Rock E Cobble Gutter
+17			3.8	238.8	
+31			10.1	232.6	
+41.62	= B.C. Rt		12.6	230.05	
+50	8' Rt. = 14" E. Tree.				

	242.65				
+53	= ℄ 5' Ditch		14.9	227.8	
+70	= W edge "		15.9	226.8	(6" Tree) 1' Lt. 11' Rt. = 16" E.T.
+84			15.0	227.6	1' Rt. 6" E.T.
58+00			13.2	229.4	
T.P.	0.58	237.26	5.97	236.68	
+11			7.3	230.0	
+12.5	= ℄ 3' Wide Wash opp N end Conc. Dam		9.3	228.0	
9.2' Lt	on Top N end Dam		11.7	225.6	
58+41.83	= POC on Hob.		10.16	227.10	
10' Lt.			15.2	222.06	
10' Rt.			5.2	232.1	
58+50			11.6	225.7	4' Rt. 8" E.T. (55+57) 10' Lt.
+63			13.5	223.8	16" E.T.
59+00			13.2	229.1	
10' Rt.			8.4	228.9	
10' Lt.			18.5	218.8	
15' Lt.	in old Path.		23.2	214.1	
+20			15.6	221.7	
T.P.	0.34	225.21	12.39	224.87	
+45			7.1	218.1	
10' Rt.			3.1	222.1	
8' Lt.			10.1	215.1	
13' Lt.			13.0	212.2	

225.21 ✓

59+52			7.5	217.7	
+54			8.9	216.3	
+56			7.5	217.7	
+70			9.5	215.7	
+85			12.8	212.4	6' Lt 4" E. Tree
T.P.	0.32	212.96 ✓	12.57	212.64	
60+00			4.8	208.2	
10' Rt.			1.2	211.8	
" Lt			8.9	204.1	
+30			11.6	201.4	2' Rt 16" E. Tree
(60 +35) 2' Lt. 4" E. Tree					
+41 2' Rt 20" E "					
TP	2.45	202.68 ✓	12.73	200.23	
+50			5.0	197.7	8' Lt. 16" E. Tree
+60			7.1	195.6	
+65 in creek			9.3	193.4	
+70			7.8	194.9	
77			6.7	196.0	1.5' Lt. 16" E. Tree
+92 at Conc. Wall			8.0	194.7	
" on Wall			4.48	198.20	
+93 " Gut. Paving			5.10	197.58	

✓

202.68 ✓

60+98.83 = E.C.			6.05	196.63	
61+05 = W edge Pav.			6.72	195.96	
" on cobble Curb			5.93	196.75	
+10			6.4	196.3	
+19			2.0	200.7	61+17 5' Rt 5" E. Tree
+27			1.4	201.3	2' Rt 10" E Tree
+37 6' Rt. 6" E. Tree					
+42 2' Lt. 16" "			1.1	201.6	
+58			+0.5	203.2	1.5' Rt 14" E.T
+66 5' Lt. = 5" E Tree					
+68 6' Rt 10" E "					
+89 2' Lt 4" " "					
+97			+0.4	203.1	6" Tree on Line
+99 9' Lt. 6" E. Tree					
62+20			3.3	199.4	
10' Lt.			6.5	196.2	
6' Rt			1.5	201.2	
T.P.	0.90	192.05 ✓	11.53	191.15	
+45 1' Rt. 6" E.T.					
+51 5.5' Rt. 14" E.T.			2.0	190.05	
+58 33' Lt. 2-6" E. Tree					

Cont. P. 0 (Front of this Book)

✓

Location Trees North Side
Cobbrille Bridge Cont. from p. 79

Station.			
4+62	32' Rt	16"	Euc. Tree Sore
+58	43' "	5"	Acacia Tree
+65	49'	"	" "
+74	50' "	6"	" "
+78	37 "	18"	Euc Tree
+76	5' "	6"	" "
+91	39' "	10"	" "
+96	60' "	18"	" "
5+00	43' "	6"	" "
+09	= East edge Pave		11th Ave Road
+38	W' "	"	" " "
+44	3' Rt	10"	Euc. Tree
+49	6' "	14"	" "
+58	15"	10"	" "
+60	41'	12"	" "
6+62	= East edge Creek		
+69	W' "	"	
+87	21' Rt	5"	Tree
+94	7' Rt	30"	Cypress 80' High Sore

7+09	8' Rt	6"	Cypress
+10	17' "	8"	"
+11	12'	6"	"
+18	18' "	4"	"
+21	5' "	6"	"
"	14' "	6"	"
"	24' "	8"	"
+25	10' "	10"	"
+25	50' "	24"	" 80' High Sore
+31	18' "	5"	"
"	23' "	12"	"
"	44' "	6"	"
"	56' "	12"	"
7+36	5' "	6"	"
+40	4' "	3"	"
+38	23' "	6"	"
+41	6'	4"	"
+44	14' "	3"	"
+45	9' "	4"	"
+46	23' "	4"	"
+52	13' "	6"	"

Cont. 7'

Location Trees - North Side
Cabbrillo Bridge Cont. from P-70

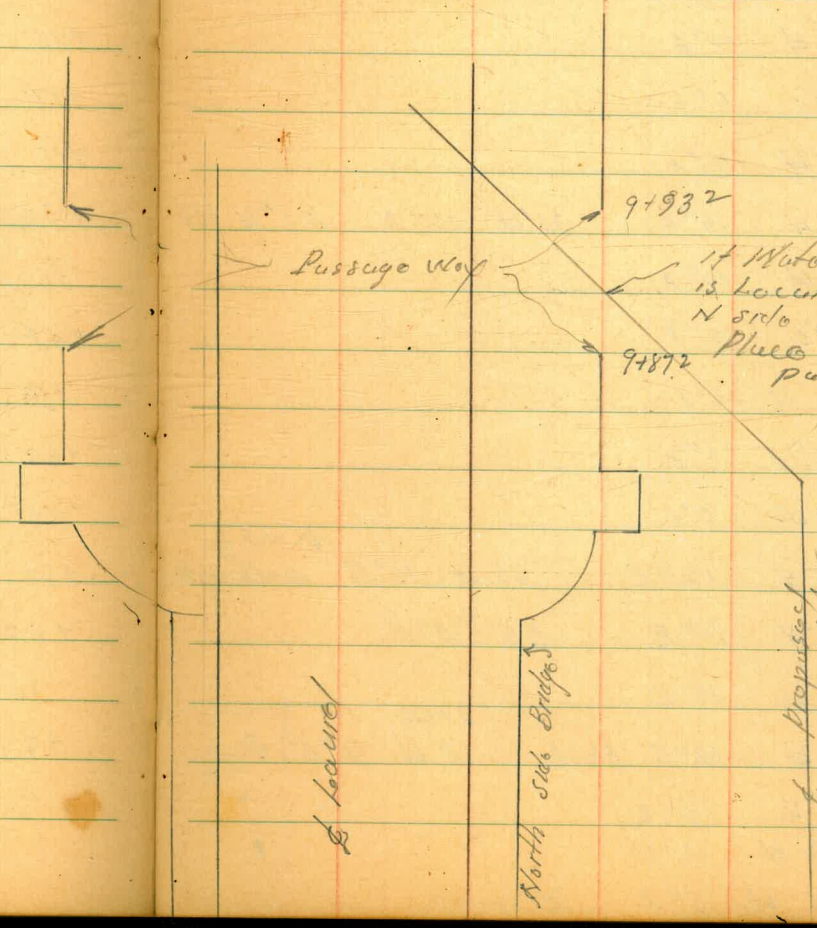
7+56 -	26' Rt.	= 36" Euc. Tree	100' High - Save
+60	21' "	4" Cypress	
+66	42' "	8" "	
"	0	4" "	
+67	19'	5" "	
+69	39'	5" "	
+70	7'	10" Euc. Tree	
+71	38'	5" Cypress	
+70	42'	" "	
+77	20' Rt	= 33" Euc. Tree	90' High - Save
"	53' "	= 20" Cypress "	
7+80	11'	6" "	
+81	24	5" "	
+83	41'	8" "	
+86	19'	5" "	
+94	17'	6" "	
"	30	12" "	
+96	51'	12" "	
"	56	24" "	
+99	39'	6" Acacia	
"	26	5" Cypress	

8+00	12" Rt	= 12" Acacia Tree	
+05	17' "	9" " "	
+06	35 "	" " "	
+05	52' "	6" " "	
+10	33'	6" " "	
+13	17'	5" " "	
+14	50' "	12" " "	
+15	15'	4" " "	
+17	58'	16" Cypress	
+18	62'	14" "	
+32	56'	16" "	
+36	65' Rt	18" "	
+43	15' "	16" "	
+50	41'	16" "	
+60	44.5	12" "	
+64	35'	18" "	
+70	"	12" "	
+72	10'	28" "	
"	30	14" "	
+77	43'	16" "	
"	27	20" "	

Location Trees N-side
Cabbrillo Bridge

8+84	40' Rt.	16" Cypress
+86	10'	14" "
+90	50'	16" "
+92	45'	10" "
+96	11' Rt.	6" Pine
9+00	17' Rt.	8" Tree
+02	2' Rt.	24" Date Palm
+00	22' Rt	6" Tree
+07	32' "	16 . Cypress
+14	27 "	24" "
+16	24 "	16" "
+18	42 "	10" "
+22	41' "	8" "
+26	40' "	8" "
+28	36' "	10" "
"	32 "	4" "
"	28' "	18" "
9+33	21' "	12" Accacia
+37	26 "	5" "
+40	12' "	5" "

9+46	17' Rt.	24" Base 5 Trees Accacia
+55	8' "	10" Tree



Walker
Hardin
Boggs 11-1-44

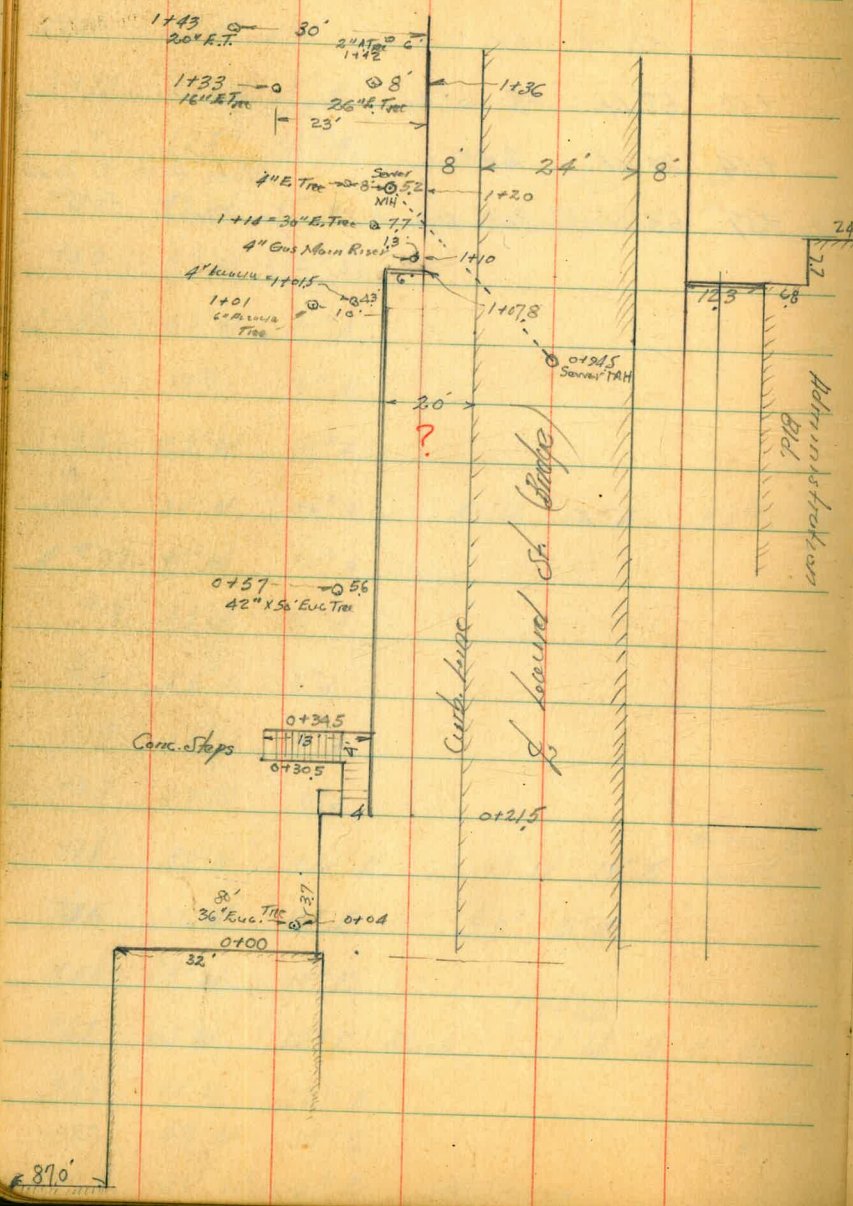
Location Additional Trees.
South side Cubbrillo Bridge

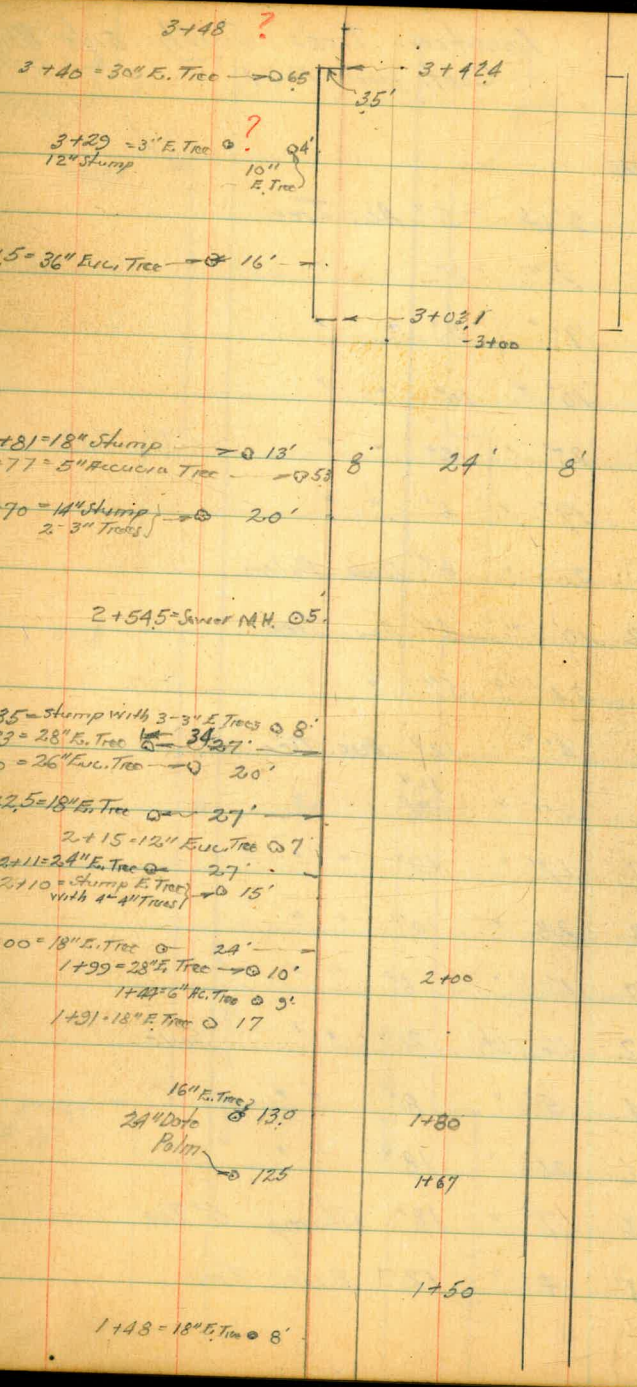
Station					
1+20	37' Lt.	4" A			
3+73	30' Lt.	8" A			
"	37.5'	12" A			
3+62	49' Lt.	6" A	60' Lt.	12" Dead A	Nothing to East 10' South
+52	57' Lt.	12" A			
3+~~82~~ 85	62' Lt.	10" A			
"	59'	6" A			
3+88 -	29' Lt.	16" A			
+91	24' Lt.	16" A	35' Lt.	12" A	52' Lt = 6"
4+02	41' Lt.	10" A			
+16	33' Lt.	10" A			
+19	41' Lt.	6" A			
+29	25' Lt.	6" A			
+27	47' Lt.	6" A			
+44	35' Lt.	12" E	68' Lt	16" E	Do Not go south of this
+46	32' Lt	16" E.	58' "	5" E	
+55	34' Lt	10" E			
+63	45' Lt	12" E	Black.	(4+66 67' Lt. 18" E)	Same
+70	40' Lt.	18" E			"
+72	49' Lt	14" E			"
4+65	56' Lt.	5" E	18" Stump		

6+20	47' Lt.	24" Willow	Leaning.
"	39' Lt	6"	"
6+22	50' Lt	6"	"
+50	63' Lt.	~~63~~ 20" cy.	Leaning
+54	84' Lt.	24" cy.	Make line 95' South s. edge.
+59	63' Lt	30" cy.	= E. edge Creek.

Walker
Hardin
Boggs
10-3-44

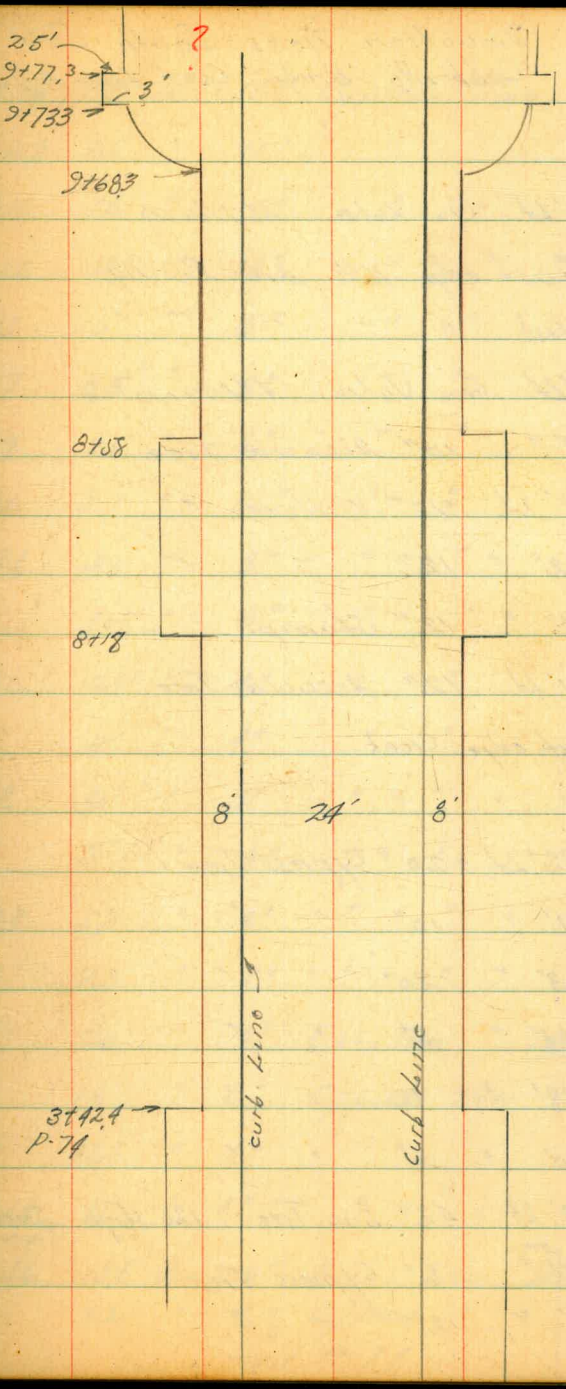
Location Trees, Sewers, Gas Mains, etc. on South Side Cobbrillo Bridge From East end Bridge to West end To Determine Location for Proposed 24" Water Main





Location Trees South side Bridge
Cont. from P-74

Stations			
3+78	9' Lt	5"	Ac. Tree
+85	3' "	8"	" "
"	19' "	5"	" "
3+88	10' "	10"	" "
+93	25' "	12"	" "
4+00	19' "	6"	" "
+13	20' "	6"	Date Palm
+22	10' "	4"	Ac. Tree
+31	24 "	5"	" "
+39	4' "	12"	Euc. Tree
+41	27' "	~~12"~~ 16"	" "
+47	17' "	10"	" "
+53	23' "	10"	" "
+57	1' "	6"	" "
+62	16' Lt.	20"	" " Save
+64	5' "	8"	" "
+66	25' "	18"	" " "
+76	7' "	18"	Stump 5" Tree
+85	4' "	12"	Euc. Tree



Location Trees South Side
Cobbrello Bridge Cont. from P-75

Station.

4+90.7 1' Lt. = Gas Valve 4" Main
5+03 East edge 11th Ave Paving
+32 West " " " "
5+41 1' Lt. Gas Valve 4" Main
+44 3' " 10" Acacia Tree
6+07 8' Lt. = 10" Willow "
+13 12' " 12" " "
6+16 4' " 12" Stump.
+14 31' Lt. 12" Acacia Tree
6+62 = East edge Creek
+70 = W " "
+74 42' Lt. = 20" Cypress Tree
+80 31' " 10" " "
" 23' " 20" " "
+86 44' " 6" " "
+88 28' " 12 " "
+90 40' " 6" " "
+97 13' Lt. = 42" Euc. Tree 120' High Save
" 9' " 6" Cypress Tree
" 3' " 12" " "

6+94 35' Lt. = 12" Cypress Tree
7+09 26' " 10" " "
+11 16' " 6" " "
+12 4' " 10" " "
+15 10' " 5" " "
+17 0.5' " 6" " "
+19 21' " 6" " "
+20 27 " 16" " "
+26 35 " 8" " "
" 30' " 6" " "
+30 25' " 4" " "
" 11' " 4" " "
+32 30' " 5" " "
" 3' " 8" " "
+33 37 " 6" " "
+37 28' " 4" " "
+39 20' " 16" Euc. Tree Save
" 16' " 6" Cypress Tree
" 12' " 4" " "
7+44 17' " 4" " "
+46 13.5' " 28" Euc. Tree 80' High Save
" 22' " 6" Cypress "
Cont P. 77

Location Trees South Side
Cobbrillo Bridge Cont. from P 76

Station			
7+51	24' Lt.	5"	Cypress Tree
"	31' "	"	" "
+52	37 "	"	" "
"	41' "	"	" "
+55	9' "	4"	" "
+57	23' "	6"	" "
+59	10' "	10"	" "
"	3' "	4"	" "
+62	21' "	5"	" "
"	30' "	20"	Euc. Tree 60' High Save
+65	22' "	10"	" " " " "
+67	24' "	4"	Cypress Tree
+68	5' "	10"	Euc. Tree
+71	13' "	5"	" "
+72	17' Lt.	24"	" " 85' High Save
+70	29' Lt.	8"	Cypress Tree
+77	37' Lt.	4"	" "
+78	32' "	5"	" "
+79	44' "	10"	" "
+83	10' "	5"	" "

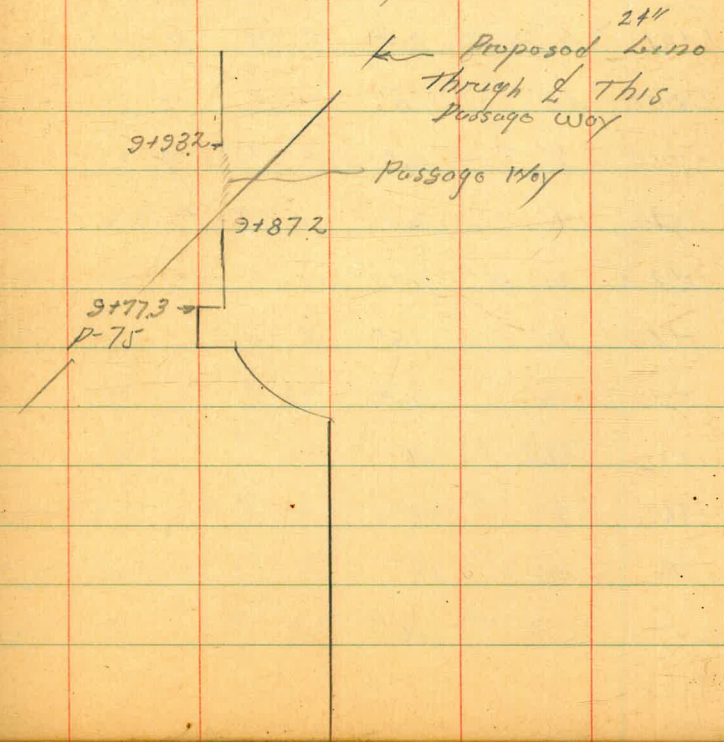
Station			
7+84	21' Lt.	30"	Euc. Tree 100' High, Save
+85	37' "	5"	Cypress Tree
+86	26' "	8"	" "
"	1' "	4"	" "
+91	34' "	6"	" "
+98	32' "	10"	" "
"	8' "	5"	" "
8+02	35' "	12"	" "
+04	3' "	4"	" "
+07	14' "	4"	" "
+08	36' "	10"	Accacia Tree
+09	31' "	3"	" "
"	3' "	3"	" "
+21	12' "	5"	Date Palm
"	32' "	10"	Accacia
+23	25' "	6"	"
+27	25' "	5"	"
+26	16' "	12"	Cypress
+27	42' "	14"	"
+29	36' "	12"	"

Cont P-78

Location Trees South Side
Cobbrillo Bridge
Cont. from P-77

Station				
8+35	31' Ht.	6"	Cypress	
+36	36' "	10"	Accacia	
+40	16' "	18"	Cypress	Save
+55	41' "	24"	"	"
+58	33' "	16"	"	"
"	29' "	14"	"	"
"	6' "	12"	Pine	"
8+62	8' "	10"	Cypress Tree	
+67	25' "	12"	"	"
+71	33' "	16"	"	" Save
+75	25' "	8"	"	"
+78	11' Ht.	5"	Pine	
+81	7' Ht.	24"	Cypress Tree	Save
+84	11' "	10"	Pine	Save
+92	7' "	6"	Cypress	
9+03	26' Ht.	16"	"	"
+19	21' "	16"	Accacia (Rare)	
+24	24' "	5"	Cypress	
+27	37' "	20"	Accacia	
9+17	32' Ht.	5"	Pine Tree	
+34	32' "	4"	Accacia	
+45	31' "	14"	"	clump
+47	28' "	6"	"	clump
+48	31' "	14"	Pepper	clump
+50	15' "	12"	Tree	
+54	26' "	8"	"	
+66	6' "	12"	"	
"	18' "	12"	"	

Small Shrubs to 7th from 9+77.3



Location Trees - North Side
Cobbrillo Bridge

Station.				
1+25	17' Rt.	= 30"	Euc. Tree,	Save
+47	4' "	24"	" "	"
+56	7' "	28"	" "	"
+69	6' "	"	" "	"
+72	17' Rt.	"	" "	"
+76	28 "	6"	" "	
+82	41 "	12"	" "	
1+90	19' "	28"	" "	Save
1+94	6' Rt.	20"	" "	Save
2+01	38' "	18"	" "	"
+10	8' "	16"	" "	"
+26	6' "	20"	" "	"
+28	20' Rt.	30"	" "	"
+40	36' "	16"	" "	"
+50	18' "	20"	" "	"
+56	29.5"	36"	" "	"
+62	7' "	18"	" "	"
+66	17' "	12"	" "	"
2+70	28 "	16"	" "	"
2+74	6' Rt.	= 18"	Euc. Tree	Save
+82	27'	= 16"	" "	"
+86	6' "	12"	" "	"
+76	32' "	6"	" "	
2+93	17' "	16"	" "	"
"	51' "	18"	" "	"
2+96	35 "	24"	" "	"
3+04	19' "	18"	" "	"
+14	12' "	18"	" "	"
+12	26' "	6"	Acacia	
3+20	25' "	16"	Euc. Tree	"
3+24	16'	18"	" "	"
+27	33' Rt.	=30"	Euc "	Save
+43	8.5	12"	" "	
+44	46 Rt	6"	" "	
+46	" "	6"	" "	
"	56' "	6"	" "	
+41	54'	"	" "	
+50	55'	"	" "	"
+55	38'	"	" "	"
+57	37 "	6"	" "	

Station

3+67	42' Rt	7"	Euc. Tree
+70	5' Rt.	12"	Euc. Tree
+80	56' "	8"	" "
+82	2' "	6"	Acacia
+85	21 "	5"	"
+96	31 "	12"	"
4+05	27 "	6"	"
+07	39 "	6"	"
4+14	43' "	7"	"
+16	19 "	5	"
+21	23' "	4"	"
"	40' "	10"	"
"	1' "	5"	"
+29	50 "	8"	"
+32	42' "	12"	"
+44	15' "	18"	Euc.
"	44 "	4"	Acacia
"	55 "	12"	"
+48	38' "	12"	"

Cont. P-70

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

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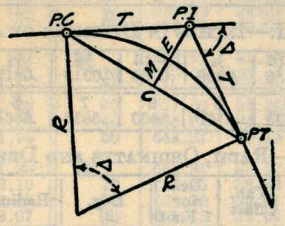

CURVE FORMULAS

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

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

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

External$=E=T\tan\frac{\Delta}{4}$ (7) $=R\div\cos.\frac{\Delta}{2}-R$ (8)$=R\text{x}\sec\frac{\Delta}{2}$ (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 $(54.50)^2\div(2\text{x}688.26)$=2.16 ft.

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

Externals.—May be found in similar manner to tangents. Thus E for curve above is 91.37. For from Table IV for 1° curve E=960.6 for 8° 20′=960.6÷8⅓=91.27 and from Table V correction=.10 or E=91.37 ft. Or suppose Δ=32° and E is measured and found to be 42 ft. What is D? From Table IV E=230.9 and ÷42=5.5 or D=5° 30′.

Table I.—Minutes in Decimals of a Degree.

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

Table II.—Inches in Decimals of a Foot.

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Table III.—Radii, Ordinates and Deflections.

Deg.	Radius	Mid. Ord.	Tan. Offset	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan Offset	Def. for 1 Foot
0° 10′	34377.5	.036	.145	0.05′	7°	819.02	1.528	6.105	2.10′
20	17188.8	.073	.291	0.10	20′	781.84	1.600	6.395	2.20
30	11459.2	.109	.436	0.15	30	764.49	1.637	6.540	2.25
40	8594.42	.145	.582	0.20	40	747.89	1.673	6.685	2.30
50	6875.55	.182	.727	0.25					
					8	716.78	1.746	6.976	2.40
1	5729.65	.218	.873	0.30	20	688.16	1.819	7.266	2.50
10	4911.15	.255	1.018	0.35	30	674.69	1.855	7.411	2.55
20	4297.28	.291	1.164	0.40	40	661.74	1.892	7.556	2.60
30	3819.83	.327	1.309	0.45					
40	3437.87	.364	1.454	0.50	9	637.28	1.965	7.846	2.70
50	3125.36	.400	1.600	0.55	20	614.56	2.037	8.136	2.80
					30	603.80	2.074	8.281	2.85
2	2864.93	.436	1.745	0.60	40	593.42	2.110	8.426	2.90
10	2644.58	.473	1.891	0.65					
20	2455.70	.509	2.036	0.70	10	573.69	2.183	8.716	3.00
30	2292.01	.545	2.181	0.75	30	546.44	2.292	9.150	3.15
40	2148.79	.582	2.327	0.80	11	521.67	2.402	9.585	3.30
50	2022.41	.618	2.472	0.85	30	499.06	2.511	10.02	3.45
					12	478.34	2.620	10.45	3.60
3	1910.08	.655	2.618	0.90	30	459.28	2.730	10.89	3.75
10	1809.57	.691	2.763	0.95	13	441.68	2.839	11.32	3.90
20	1719.12	.727	2.908	1.00	30	425.40	2.949	11.75	4.05
30	1637.28	.764	3.054	1.05	14	410.28	3.058	12.18	4.20
40	1562.88	.800	3.199	1.10	30	396.20	3.168	12.62	4.35
50	1494.95	.836	3.345	1.15					
					15	383.07	3.277	13.05	4.50
4	1432.69	.873	3.490	1.20	30	370.78	3.387	13.49	4.65
10	1375.40	.909	3.635	1.25	16	359.27	3.496	13.92	4.80
20	1322.53	.945	3.718	1.30	30	348.45	3.606	14.35	4.95
30	1273.57	.982	3.926	1.35	17	338.27	3.716	14.78	5.10
40	1228.11	1.018	4.071	1.40	18	319.62	3.935	15.64	5.40
50	1185.78	1.055	4.217	1.45	19	302.94	4.155	16.51	5.70
5	1146.28	1.091	4.362	1.50	20	287.94	4.374	17.37	6.00
10	1109.33	1.127	4.507	1.55	21	274.37	4.594	18.22	6.30
20	1074.68	1.164	4.653	1.60	22	262.04	4.814	19.08	6.60
30	1042.14	1.200	4.798	1.65	23	250.79	5.035	19.94	6.90
40	1011.51	1.237	4.943	1.70	24	240.49	5.255	20.79	7.20
50	982.64	1.273	5.088	1.75					
					25	231.01	5.476	21.64	7.50
6	955.37	1.309	5.234	1.80	26	222.27	5.697	22.50	7.80
10	929.57	1.346	5.379	1.85	27	214.18	5.918	23.35	8.10
20	905.13	1.382	5.524	1.90	28	206.68	6.139	24.19	8.40
30	881.95	1.418	5.669	1.95	29	199.70	6.360	25.04	8.70
40	859.92	1.455	5.814	2.00	30	193.18	6.583	25.88	9.00

Note. Chord Deflection=2 times tangent deflection.

Table IV.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10′	58.34	.30	10′	560.11	27.31	10′	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100.01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

Table IV.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
91°	5830.5	2444.9	101°	6950.6	3278.1	111°	8336.7	4386.1
10′	5847.5	2457.1	10′	6971.3	3294.1	10′	8362.7	4407.6
20	5864.6	2469.3	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	102	7075.5	3374.9	112	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002.7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93	6037.8	2594.0	103	7203.2	3474.4	113	8656.6	4651.3
10	6055.4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94	6144.3	2671.6	104	7333.6	3576.8	114	8822.9	4790.4
10	6162.6	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234.6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	105	7467.0	3682.3	115	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344.8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96	6363.4	2833.2	106	7603.5	3791.0	116	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259.0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	107	7743.2	3902.9	117	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98	6591.2	3003.8	108	7886.2	4018.2	118	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	109	8032.7	4137.1	119	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	6808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100	6828.3	3184.1	110	8182.8	4259.7	120	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

Table V.—Corrections for Tangents and Externals.

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

For Tangents Add

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

For Externals Add

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

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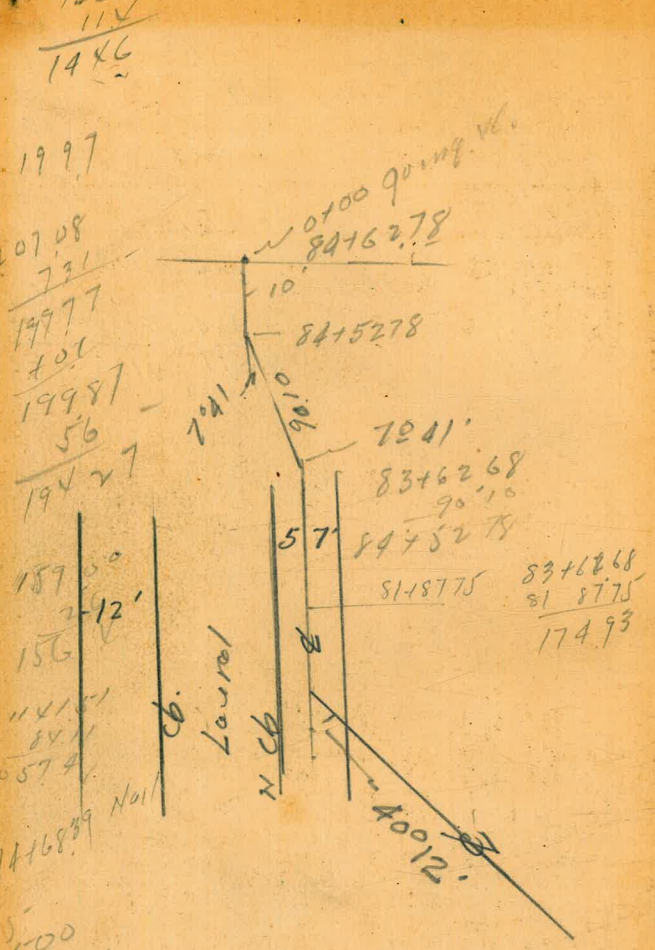

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

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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