GRADE
151

Long 116° - 55' - 30" W
Lat N 32° - 42' - 0 ← San Miguel Aeroplane Beacon

Pacific Beach 95 ft Mr. Scott

66913
30
20.073 00

7.96
1.57
20.53
20
1851

10
10 10.4

Mar. NW8P 330.99 18.75
42nd " " " 334.71
40th S.W8P 327.53
Central NW8P 330.04

41.86

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41.86

Western Pressure Line from Pump House #1. Pressure Line To North Line Diamond and then Gravity to Settling Tank

	+	↑	−	Elev	Elev Flow Line Grade	Cuts
B.M. RR Spike Pole at Pump House	8.98	8.98		0.00		
0+00 Pump Hous					-5.00	
1-			7.65	0.83	-4.83	5.66
5-53.56						
#1			6.60	1.88	-4.64	6.52
#2			5.86	2.62	-4.95	7.07
#3			5.62	2.86	-4.26	7.12
#4			4.93	3.55	-4.07	7.62
#5 3+20.06 # 707			5.32	3.16	-3.88	7.04
1-90 Δ R.			5.22	3.26	-3.74	7.00
1-90.02 Δ L.			5.88	2.60	-3.60	6.20
5-54.						
#1			5.54	2.94	-3.91	6.35
#2			4.65	3.83	-3.22	7.05
#3			4.87	4.11	-3.03	7.14
#4	4.66	5.55	4.59	3.89	-2.84	6.73
#5 5+90.08 Δ L			4.63	3.92	-2.65	6.57
1-90 Δ R 6+30.08			4.25	4.30	-2.51	6.81
1-20 6+50.08 # 708			4.52	4.03	-2.44	6.47
3-51.67 #0 Δ			4.67	3.88	-2.26	6.14
#1			4.76	3.79	-2.09	5.88
#2			4.97	3.58	-1.91	5.49
#3 Δ L			5.19	3.36	-1.79	5.10
3-95			4.69	3.91	-1.59	5.50
#1			4.86	3.69	-1.43	5.12
#2 9+40.08			5.12	3.43	-1.25	4.68
#3 #709			4.52	4.03	-1.08	5.11
7-50.3						
#1						
#2						

3

	+	HI	−	Elev Stake	Elev Flow Line Grade	cuFs
		8.55				
#3			4.12	4.43	-0.90	5.33
#4			3.30	5.25	-0.73	5.98
#5			3.10	5.95	-0.55	6.00
#6			2.81	5.74	-0.38	6.12
13+50 OS 8.59						
#7. #710 8 Line Grade		15.99	1.65	6.90	-0.20	7.10
5-50			8.59	6.90	+0.44	6.46
#1			8.52	6.97	+1.08	5.89
#2			7.00	8.99	+1.72	6.77
#3			6.68	8.81	+2.36	6.95
#4			5.91	9.58	+3.00	6.58
16+00 OS						
#5 #711			5.57	9.92	3.69	6.28
7-50			4.80	10.69	4.28	6.41
#1			5.13	10.36	4.92	5.44
#2			4.77	10.72	5.56	5.16
#3	25' West + on walk		2.94	12.55	6.20	6.35
#4			2.52	12.97	6.89	6.13
#5			1.84	13.65	7.48	6.17
#6			6.65	14.12	8.11	6.01
19+50 OS						
#7 #712	7.12	20.77	6.2	14.55	8.74	5.81
2-98 23 Δ1			5.88	14.89	9.34	5.55
#1			5.80	14.97	9.87	5.10
#2			4.80	15.97	10.91	5.56
3-91.80			3.78	16.99	10.94	6.05
#1			2.80	17.97	11.47	6.50
#2	8.07	26.04	7.92	18.12	12.00	6.12
23+04 OS			7.43	18.61	12.62	5.99
#3 #713						
3-48 47						
#1						

+ in Paving 15' N.
+ in Walk 15' West
A 4°-05'-00"

	HI 26.04	–	Elev	Elev flow line	cuts
#2		6.54	19.50	– 13.25	6.25 –
#3 Δ L +0.5-00		6.59	19.50	– 13.87	5.63 –
2-41.90					
#1		6.16	19.88	– 14.41	5.47 –
#2 Δ R 9-05-00		5.21	20.83	– 14.95	5.88 –
3-41.27					
#1		5.44	20.60	– 15.49	5.11 –
#2		5.30	20.74	– 16.04	4.70 –
#3 # 719		4.80	21.24	– 16.60	4.64 –
7-50					
#1		4.29	21.75	– 17.99	4.26 –
#2		3.02	23.02	– 18.38	4.64 –
#3		1.73	24.31	– 19.27	5.04 –
#4	5.15	1.05	24.99	– 20.16	4.83 –
#5		7.10	26.04	– 21.05	4.99 –
#6		6.31	26.83	– 21.94	4.89 –
#7 3078		5.16	27.98	– 22.83	5.15 –
3-48.34					
#1		4.11	29.03	– 23.69	5.34 –
#2		3.22	29.92	– 24.55	5.37 –
#3 Δ L 48°07		2.17	30.97	– 25.41	5.56 –
3-45.07					
#1		2.72	30.42	– 26.27	4.15 –
#2		1.76	31.38	– 27.12	4.26 –
3240 # 17=00		1.21	31.93		
#3 Connect Gravity Line		7.65	31.94	– 28.00	3.94 –
3-95					
#1		6.50	33.09	– 27.81	5.28 –
#2		5.91	33.68	– 27.62	6.06 –
#3 #18		5.04	34.55	– 27.43	7.12 –
3-45					
#1		4.57	35.02	– 27.24	7.78 –
#2		3.92	35.67	– 27.05	8.62 –

+ in walk S line Emerald
15'W
+ in paving
15'W 33.14

1.78 00

39.59

26.04 + 4.77 = 30.81 – 21.27 = 9.54

31.94 BM + 4.83 = 36.77 HI – 13.80 = 23.97 Elev flow

5

+	H.I. 39.59	−	Elev Stake	Elev Flow Line	Cuts
2+70					
#3 ℄ 19 46		3.23	36.36	26.86	9.50
2-47 17		2.90	36.69	26.66	10.03
#1 3+64 94		2.92	37.17	26.96	10.71
#2 ℄ 20		1.70	37.89	26.27	11.62
3-45		0.67	38.92	26.08	12.84
#1		2.73	39.85	25.89	13.96
#2 3 66	42.58	1.82	40.76	25.70	15.06
4+44 98		4.61	37.97	25.51	12.96
#3 #2 Δ L 9°-05		12.42	30.16	25.33	4.83
4-43 85		11.57	31.01	25.14	5.87
#1		7.39	35.19	24.96	10.23
#2 6.90	41.59	7.01	34.58	24.77	9.81
#3		5.92	35.67	24.59	11.08
8+50 74		5.63	35.86	24.41	11.45
#4 #23 Δ R. 9°-05		4.58	37.01	24.21	12.80
3-44 33		4.77	36.82	24.01	12.81
#1		6.05	35.54	23.82	11.72
#2 #24 2.51		3.75	39.30	23.64	10.66
#3 9+88 78 Δ 90°-00-00	38.05	5.36	32.69	23.47	9.22
3-44 27		7.52	30.53	23.29	7.24
#1		6.41	31.64	23.13	8.51
#4 Δ 70°-41-00 ℄					
#3 Incores N68					
2-36 50					
#1					
5 Piers 12'c/c ℄					
#2 + End Twsl. 2.76	34.35	6.96	31.59	22.97	8.62
#2 7.29	28.74	12.90	21.45	22.92	F 11.15
#3		13.05	15.69	22.86	F 7.17
#4		12.74	16.00	22.80	F 6.80
#5		5.10	23.64	22.74	C 0.90

HI	Footings	Elev stake	Elev Grade	C.Y.
38.05				
39.35	6.96	31.59	10.00	21.59
	13.05	15.69	11.5	9.19
	12.74	16.00	15.00	1.00
	5.10	23.64	19.00	4.64

	+	HI 28.74	−	Elev	Elev Grade
T.P.	10.63	39.01	0.36	28.38	
C-99					
#1			5.77	33.23	22.55
#2 M.M. #6			3.12	35.89	22.26
S-59.90					
#1			0.87	38.14	22.12
#2	3.45	41.95	0.51	38.50	21.89
#3			3.09	38.86	21.66
#4			5.16	36.79	21.92
TP	2.30	31.82	12.43	29.52	
#5 S.End Trestle S. Pier 12'			9.79	22.03	21.19
#2			12.41	19.41	21.14
#3			6.30	25.52	21.08
TP	0.72	28.26	4.28	27.54	
1-45 S.End #1 Piers			0.81	27.95	20.89
#2			11.35	16.91	20.89
#3 End Piers			6.00	22.26	20.79
1-46 B.T.P.	12.68	40.71	0.23	28.03	
M.M. #8	Δ 5°-49'-00" L		10.94	30.27	20.74
4-99.75					
#1			2.19	38.52	20.52
#2			6.50	34.21	20.31
#3			11.17	29.54	20.09
T.P.	0.16	28.12	1.75	27.96	
#4	1.94	20.44	9.62	18.50	19.88
#2			9.06	11.38	19.83
#3			8.87	11.57	19.78
T.P.	11.22	31.05	0.61	19.83	
#4			10.99	20.11	19.72
#5 N End Trestle			9.80	26.25	19.67
1-39 T.P.	11.96	42.70	0.31	30.79	
DN. H #1 #1		47.57	~~7.05~~ 5.85	~~35.65~~ 41.72	19.50
4-50					
#1	7.91	48.89	1.27	41.43	19.30

Cuts.	Footings	Elev Stake	Elev Grade	Cuts
10.68				20.84
13.53			21.14	16.91
			19.41	3.93
16.02			1.73	
16.61				
17.20				
15.37 HI				
0.84				
F 1.73		19.91	17.00	2.91
C 9.44				
6.56		27.95	19.00	8.95
F 3.93		16.91	12.40	4.51
C 1.47		22.26	19.00	3.26
C 9.53				
18.00				
13.90				
9.45				
F 1.38		18.50	17.00	1.50
F 8.45		11.38	9.50 13.00	1.88
F 8.21		11.57	6.60	4.97
C 0.39		20.11	15.00	5.11
C 4.58		26.25	17.00	9.25
16.15				
4-2 22.13				

	+	HI	−	Elev		Cuts
		48.84		45.57		26.98
		47.57 fr changes	2.00	~~45.67~~		
#2			9.48	~~49.36~~	19.10	~~25.26~~
			3.65	93.92		25.03
#3			~~5.54~~	~~93.25~~	18.89	~~24.36~~
			8.89	3868		20.00
#4			~~13.99~~	~~35.35~~	18.68	~~16.67~~
1- 45.90						
" Surface of tank			3.76	95.08	18.50	26.58
15 East						
RWH elev	5.95	53.52	0.77	98.07		
Check out on BM S-18 Lorin & Acco Blvd			1.99	96.08		

Western Interceptor from Pump House #1 North to DE South of Diamond

BM N.W.Spk Pole Pump House 0+00 #1		6.78	#2 6.78		0.00	-5.91	Cuts
1-42 38 #99A				588 ~~576~~	0.90	-575	665
5-57-63 #1	57.63 / 28.81			5.57	1.21	-553	674
#2				4.62	2.16	-532	7.98
#3				9.29	2.99	-510	7.59
#4				5.54	1.24	-989	6.13
#5 #1 Oliver 7-50				9.75	2.03	-967	6.70
#1				4.92	1.86	-947	6.33
#2				5.10	1.68	-927	5.95
#3		5.82	8.27	4.33	2.95	-907	6.52
#4				5.29	2.98	-387	6.85
#5				5.10	3.17	-367	6.89
#6				5.52	2.75	-347	6.22
#7 #2 A 0-58-00 R ✓ 9-93-75 #1				4.94	3.83	-327	7.10
#2				4.98 ~~4.87~~	3.29 3.40	309 -292	6.38 ~~5.56~~ 6.32
#3				4.55	3.72	-274	5.95
#4 #3 A 0-58-00 L 3-95 #1				4.89	3.38	-257	5.95
#2				5.59	2.68	-239	5.07
#3 connect 5 Line Thomas				5.29	2.98	-221	5.19
connect N Line Thomas		7.00	10:35	5.48	2.79	-203	4.82
3-95 #1				4.92	3.35	-171	5.06
#2				6.92	3.93	-153	4.96
#3 #5				6.59	3.76	-135	5.11
				4.97	5.88	-1.17	7.05

						cuts
		#2. 10.35				
3-45						
#1			6.09	4.31	-0.85	5.16
#2 connect S line Grand			5.98	9.87	-0.54	5.91
#3 Grand connect N. line Grand			9.01	6.34	-0.22	6.56
3-45			2.88	7.97	+0.64	6.83
#1			2.00	8.35	+0.96	7.39
#2	8.12	16.98	1.99	8.86	+1.27	7.59
#3 #7			7.57	9.81 9.41	-1.59	8.22 7.82
3-45						77
#1			7.08	9.90	-2.13	7.85
#2 connect S line Hornblende			6.66	10.32	-2.67	7.65
#3 connect N line Hornblende			7.23	9.75	-3.21	6.59
3-45			6.39	10.59	-4.17	6.42
#1			4.71	12.27	-4.71	7.56
#2 #9 Δ 9°-05-00			4.03	12.95	-5.25	7.70
#3 4-93 85			3.15	13.83	-5.79	8.04
#1	#3.85 4 17.40 3.55		2.95	14.03	-6.31	7.72
#2			2.56	14.42	-6.83	7.59
#3	7.41	22.52	2.07	14.91	-7.36	7.55
#4 #10 Garnet 4-93 85			7.41	15.11	-7.90	7.74
#1			6.99	15.53	-8.42	7.11
#2			6.77	15.75	-8.95	6.80
#3			5.50	17.02	-9.97	7.55
#4 #11 3-45			9.68	17.84	-10.00	7.84
#1			9.89	17.63	-10.72	6.91
#2 connect S Line Felspar			2.36	20.16	-11.44	8.72
#3			3.25	19.27	-12.16	7.11

		H.I. 22.52			cuts
Connect N Line Felsper 3-45 #1			1.64	20.88 – 13.44	7.44 –
#2			1.76	20.76 – 14.17	6.59 –
#3 #13	10.25 7°05'-00 R.	31 51	1.95	21.07 – 14.90	6.17 –
3-45 #1			1.26	21.26 – 15.64	5.62 –
#2			10.09	21.42 – 16.37	5.05 –
#3 Connect S Line Emerald			8.82	22.49 – 17.10	5.59 –
Connect N Line Emerald 3-45 #1			8.14	23.37 – 17.84	5.53 –
#2			6.12	25.39 – 19.04	6.35
#3 2-45 #1			5.35	26.16 – 19.76	6.40 –
#2 Dead End			4.66	26.85 – 20.48	6.37 –
			4.18	27.33 – 21.20	6.13 –
			3.27	28.24 – 21.92	6.32 –
			2.57	28.94 – 22.65	6.29
T.P.	9.85	39.59	1.77	29.74	

Monday
July 15, 1929

Final Grades Wet Line from Mn. Hole #85 to Mn. Hole #8~

	+	H.I.	−	Elev Stake	Elev flow line	Cut
BM.	4.36	5.69		1.33		
M.H. 0+00 #85			9.68	-3.99	-8.51	4.52
0+25			9.63	-3.94	-8.57	4.63
0+50			9.35	-3.66	-8.64	4.98
0+75			9.42	-3.73	-8.70	4.97
1+00			9.85	-4.16	-8.77	4.61
1+25			9.17	-3.48	-8.83	5.35
1+50			9.26	-3.57	-8.90	5.33
1+75			9.3~	-3.63	-8.96	5.33
2+00			9.18	-3.49	-9.03	5.54
2+25			9.27	-3.58	-9.09	5.51
2+50			9.32	-3.63	-9.16	5.53
2+75			9.30	-3.61	-9.2~	5.69
3+00			9.34	-3.65	-9.29	5.64
3+12 50 M.H. #83			9.33	-3.64	-9.32	5.68
3+25			9.18	-3.49	-9.35	5.86
3+50			9.42	-3.73	-9.41	5.68
3+75	7.61	3.90	9.40	-3.71	-9.48	5.77
4+00			7.62	-3.72	-9.54	5.82
4+25			7.64	-3.74	-9.61	5.87
4+50			7.70	-3.80	-9.67	5.87
4+75			7.55	-3.65	-9.74	6.09
5+00			7.78	-3.88	-9.80	5.92
5+25			7.63	-3.73	-9.87	6.14

continued page 76

00416
Fine
11.600

Jac. 004 / 612

06/25
20
10
8
40

877 903
851 877
0.26 0.26

Alley North of Diamond
from Alley West of Allison to D.E. East of
Jewell

						cuts
Mu Hole						
0700 #18	5.31	39.82		34.51	27.96	7.05
4-96 87						
#1			5.40	39.42	27.76	6.66
#2			4.70	35.12	28.07	7.05
#3			5.04	34.78	28.38	6.40
#4 + 209			4.77	35.05	28.64	6.36
3-49 86						
#1			4.29	35.53	29.01	6.52
#2			3.81	36.01	29.34	6.67
#3 connect W. Line of Allison	837	9911	4.08	35.74	29.66	6.08
E. Line Allison Connect			8.12	35.99	30.19	5.80
5-50						
#1			6.31	37.80	30.52	7.28
#2			6.32	37.79	30.85	6.94
#3			6.09	38.02	31.18	6.84
#4			5.51	38.60	31.52	7.08
#5 #206			5.15	38.96	31.85	7.11
5-58						
#1			4.83	39.28	32.23	7.05
#2			4.49	39.62	32.61	7.01
#3			4.15	39.96	32.99	6.97
#4			3.74	40.37	33.38	6.99
#5 #207 E. Bayard	885	9965	3.31	40.80	33.76	7.04
5-58						
#1			7.88	41.77	34.57	7.20
#2			6.87	42.78	35.38	7.40
#3			6.40	43.25	36.19	7.06
#4			5.66	43.99	37.01	6.98
#5 #208			5.04	44.61	37.82	6.79

		#1 I 99.65				
5-50 #					378	cuts
#1			4.44	45.21	38.52	6 69
#2			3.65	96.00	39.22	6 78
#3			3.23	96.42	39.92	6 50
#4			2.98	97.17	40.62	6 55
#5 Connect NHino Coss	9.37	57.45	1.57	98.08	41.3	6 76
connect Ehmi Coss			8.89	48.56	42.94	6.12
5-58 #1			7.91	49.54	43.14	6.40
#2			7.05	50.40	43.84	6.56
#3			6.86	50.59	44.54	6.05
#4			6.24	51.24	45.24	5.97
#5 #210			5.39	52.06	45.94	6.12
5-58 #1			4.45	53.00	46.75	6 25
#2			3.51	53.94	47.56	6.38
#3			2.63	54.82	48.38	6.44
#4			1.86	55.59	49.14	6.90
#5 #211 & Davies	11.10	67.13	1.92	56.03	50.00	6.03
5-58 #1			9.88	57.25	50.90	6.35
#2			9 11	58.02	51.80	6 22
#3			8.12	59.01	52 70	6.31
#4			7.60	59.53	53.60	5 93
#5 #212			6.13	61.00	54.50	6.50
5-50 #1			5.08	62.05	55 28	6.77
#2			4.23	62.90	56.06	6.84
#3			2.84	64.29	56.84	7 95
#4			2.55	64.58	57.62	6 96

		H.I 67.13			cuts
connect #5 W.Line Everts			2.97	69.16 - 58.40	5.76 -
Connect E.Line Everts	9.14	73.36	2.91	69.22 - 58.86	5.36 -
5-50 #1			8.18	65.18 - 59.29	5.89 -
#2			7.62	65.74 - 59.72	6.02
#3			6.98	66.38 - 60.15	6.23 -
#4			6.18	67.18 - 60.58	6.60 -
#5 #214			5.97	67.89 - 61.01	6.88 -
5-50 #1			9.72	68.64 - 61.94	7.20 -
#2			9.31	69.05 - 61.88	7.17 -
#3			3.66	69.70 - 62.31	7.39 -
#4			2.95	70.91 - 62.74	7.67 -
connect #5 W.Line Fanuel			3.11	70.25 - 63.18	7.07 -
connect E.Line Fanuel	9.35	79.95	2.76	70.60 - 63.50	7.10 -
5-50 #1			6.93	73.02 - 63.93	9.09
#2			6.96	73.99 - 64.36	9.13 -
#3			6.27	73.68 - 64.79	8.89 -
#4			6.16	73.79 - 65.22	8.57 -
#5 #216			5.54	74.41 - 65.65	8.76 -
5-50 #1			4.95	75.00 - 66.08	8.92 -
#2			9.02	75.97 - 66.52	9.45 -
#3			9.57	75.38 - 66.95	8.93 -
#4			4.18	75.77 - 67.38	8.39 -
#5 Connect W.Line 6-20			6.28	73.67 - 67.82	5.85 -
connect E.Line Gresham	8.11	81.84	6.22	73.73 - 68.14	5.59 -
5-50 #1			6.97	74.87 - 68.55	6.32 -
#2			7.07	74.77 - 68.99	5.78 -

		H.I. 81.84			cuts
#3			6.75	75.09 – 69.38	5.71 –
#4			5.91	75.93 – 69.79	6.14 –
#5 #218			5.34	76.50 – 70.21	6.29 –
5-58 #1			9.60	77.24 – 70.69	6.55 –
#2			3.28	78.56 – 71.17	7.39 –
#3			2.55	79.29 – 71.65	7.64 –
#4			2.15	79.69 – 72.14	7.55 –
#5 219 & Hames 6.39		86.65	1.58 ~~4.97~~	80.26 – 72.62	7.64 –
5-58 #1			6.95	80.20 – 73.08	7.12 –
#2			6.07	80.58 – 73.55	7.03 –
#3			5.77	80.88 – 74.01	6.87
#4			5.47	81.18 – 74.47	6.71 –
#5 #220			5.30	81.35 – 74.94	6.41 –
5-58 #1			5.09	81.56 – 75.75	5.81 –
#2			4.08	82.57 – 76.56	6.01 –
#3			3.18	83.47 – 77.37	6.10 –
#4			2.37	84.28 – 78.19	6.09 –
#5 #221 6.50	& Ingraham 13.22	98.92	0.95	85.70 – 79.00	6.70 –
#1			10.06	88.86 – 80.15	8.71 –
#2			8.98	89.94 – 81.30	8.64 –
#3			8.16	90.76 – 82.45	8.31 –
#4			7.70	91.22 – 83.60	7.62 –
#5			5.90	93.02 – 84.75	8.27 –
#6 #222 6-50	applo & Scott		4.31	94.61 – 85.90	8.71 –
#1			3.37	95.55 – 86.60	8.95 –
#2			3.52	95.40 – 87.30	8.10 –

		9892				cuts
#3			2.73	96.19 –	88.00 –	8.19 –
#4	809	104.62	2.39	96.53 –	88 70 –	7.83 –
#5			7.57	97.05 –	89.40 –	7 65 –
#6 # 223	& Jewell		7.23	97.39 –	90.10	7 29 –
5-58						
#1			6 52	98 .10 –	91.37	6 .73 –
#2			6 00	98.62 –	92 65	5 .97 –
# 3			5.02	99.60 –	93.93	5 .67 –
#4			3.53	101.09 –	95 20	5 .89 –
#5 #224			1.98	102.64 –	96.98	6 .16 –
3-55						
#1	1206	116.15	0.53	104.09 –	97 69	6 .90 –
#2			10.53	105.62 –	98 90	6 .72 –
#3 Dead End			8 46	107.69 –	100.11	7 .58 –
TY	2.93	115 95	3.13	113.02		
3E 8S Lamont Dia Check Kent CM			10.13	105 82 –		

Alley North of Missouri
From Alley West of Allison to W. Line
Gresham

98.13
668
5481
634
48.47

						cuts
#21 0+00 W.In 4-53.1	Drop 8:29	47.92		39.68	33.50	6.18 –
#1			7.87	40.05	33.97	6.08 –
#2	53.2 21.248		7.40	40.52	34.95	6.07 –
#3			7.18	40.74	34.93	5.81 –
#4 #225 3-57.50			6.95	40.97	35.41	5.56 –
#1			6.08	41.84	35.93	5.91 –
#2			5.45	42.47	36.44	6.03
#3 connect W.Line Allison			4.75	43.17	36.96	6.21 –
00 connect E.Line Allison 5-50			4.11	43.81	37.68	6.13 –
#1			3.48	44.44	38.13	6.31 –
#2			2.95	44.97	38.58	6.39 –
#3			2.39	45.53	39.03	6.50 –
#4			2.18	45.74	39.48	6.26 –
#5 #221 5-58	7.69	53.76	1.85	46.07	39.93	6.14 –
#1			7.09	46.67	40.95	6.22 –
#2			6.32	47.44	40.97	6.47 –
#3			5.57	48.19	41.49	6.70 –
#4			5.63	48.13	42.02	6.11 –
#5 #228 & Bgd 5-58			5.23	48.53 47	42.59	5.99 – 5.93
#1			4.01	49.75	43.29	6.46 –
#2			3.39	50.37	44.05	6.32 –
#3			2.46	51.30	44.80	6.50 –
#4			1.66	52.10	45.56	6.54 –
#5 #229 5-50	8:65	61.98	0.43	53.33	46.31	7.02 –

			H.I. 61.98			
						cuts
#1			8.95	52.93	96.96	597
#2			8.54	53.44	97.61	583
#3			8.30	53.68	98.26	542
#4			7.95	54.53	98.91	562
#5	connect Kime Cass		6.24	55.74	99.56	618
5-50	connect E Line Cass		4.61	57.37	50.60	677
#1			3.91	58.07	51.25	682
#2			3.44	58.54	51.90	664
#3			3.13	58.85	52.55	630
#4			2.57	59.41	53.20	621
#5	#231	10.01	1.80	60.18	53.85	633
5-58 #1			9.94	60.75	54.72	603
#2			8.68	61.51	55.59	592
#3			6.98	63.21	56.96	675
#4			6.08	64.11	57.33	678
#5	#232 & Dawas		5.03	65.16	58.20	696
5-58 #1			4.34	65.85	59.10	675
#2	Set 6° South		3.85	66.34	60.00	634
#3			2.49	67.70	60.90	680
#4			1.69	68.50	61.80	670
#5	#233	7.87	77.42	0.64	69.55	62.70	685
5-50 #1				6.87	70.55	63.98	707
#2				5.75	71.67	64.26	741
#3				4.94	72.48	65.04	744
#4				3.34	74.08	65.82	826
#5	connect Milne Events			5.03	72.39	66.60	579
5-50							

684
50 60
57.49

HI
77.92

						cuts
connect						
00 RLine Eve. Is				9.51	72.91 - 67.08	5.83 -
5-50						
#1				3.24	74.18 - 67.56	6.62 -
#2				3.16	74.26 - 68.05	6.21 -
#3				2.61	74.81 - 68.54	6.27 -
#4				1.79	75.63 - 69.02	6.61 -
#5 #235	10.29	86.46		1.25	76.17 69.51	6.66 -
5-50						
#1				9.19	77.32 - 69.99	7.33 -
#2				7.99	78.47 - 70.98	7.99 -
#3				7.42	79.04 - 70.97	8.07 -
#4				6.53	79.93 - 71.95	8.48 -
connect						
#5 NLine Tangent				7.57	78.89 - 71.94	6.95 -
connect						
00 RLine Tangent				4.75	79.71 - 72.26	7.45 -
5-50						
#1				4.38	82.08 - 72.63	9.45 -
#2				3.47	82.99 - 73.01	9.98 -
#3				2.91	83.55 - 73.39	10.16 -
#4				2.83	83.63 - 73.76	9.87 -
#5 #237	3.01	87.34		2.13	84.33 74.19	10.17 -
5-50						
#1				2.63	84.71 - 74.52	10.19 -
#2				2.08	85.26 - 74.90	10.36 -
#3				0.83	86.51 - 75.28	11.23 -
#4				0.05	87.29 75.66	11.63 -
connect						
#5 NLine Gresham				4.43	82.91 - 76.04	6.87 -
connect						
00 RLine Gresham				12.47	74.87 -	
5-50						
#1						
#2						
#3						

For Grades & Cuts East of Gresham. See Field Grade Book 142 Page 46

#4

#5 #239
5-58
#1

#2

#3

#4

#5 #240 & Haines
5-58
#1

#2

#3

#4

#5 #241
5-58
#1

#2

#3

#4

#5 #242 & Ingraham
6-50
#1

#2

#3

#4

#5

#6 #243
6-50
#1

#2

#3

#0

#5

#6 #294 L. Jewell
5-58
#1

#2

#3

#4

#5 #295
5-58
#1

#2

#3

#4

#5 #296
5-58
#1

#2

#3

#4

#5 #297
9-52 50
#1

#2

#3

#4 D.E. W. of Lamont

Alley North of Wilbur
from E line of Allison To Connection with existing sewer W line of Graham

	7.67	74.69		67.02	
TP	8.69	77.01	6.37	68.32	Cut
0+00 Connect E line Allison			8.07	68.94	63.29	5.65
5-50					
#1			4.70	72.31	69.29	8.02
#2			5.97	71.54	65.29	6.25
#3			9.3	72.69	66.29	6.40
#4			2.84	74.17	67.29	6.88
#5 ℄ 338			1.79	75.22	68.29	6.93
5-58					
#1	10.42	86.76.	0.67	76.34	69.95	6.89
#2			9.50	77.26	70.61	6.65
#3			8.11	78.65	71.77	6.88
#4			6.30	80.46	72.93	7.53
#5 ℄ 339 ℄ Elm			5.39	81.37	74.09	7.28
5-58					
#1			4.27	82.49	74.67	7.82
#2			5.01	81.75	75.25	6.50
#3			4.84	81.92	75.83	6.09
#4			4.03	82.73	76.41	6.32
#5 ℄ 340			3.26.	83.50	76.99	6.51
5-50					
#1	8.28	92.42	2.6	84.14	77.55	6.59
#2			7.69	84.73	78.11	6.62
#3			7.34	85.08	78.67	6.41
#4			6.91	85.51	79.23	6.28
#5 Connect W line Cass			5.75	86.67	79.79	6.88
Connect E line Cass			5.30	87.12	80.93	6.19
5-50					
#1			4.59	87.83	81.79	6.04

		HI 92.42			cuts
#2			3.54	88.88 – 82.65	6.23 –
#3			2.47	89.95 – 83.51	6.44 –
#4	10:96	102.47	0.91	91.51 – 84.37	7.14 –
#5 #342			10.90	92.07 – 85.23	6.84 –
5-58 #1			9.08	93.39 – 86.79	6.60 –
#2			7.54	94.93 – 88.36	6.57 –
#3			5.76	96.71 – 89.93	6.78 –
#4			3.84	98.63 – 91.49	7.14 –
#5 #393 & Curves			2.98	99.99 – 93.06	6.93 –
5-58 #1	13.27	115.32	0.42	102.05 – 94.69	7.36 –
#2			11.01	104.31 – 96.30	8.01 –
#3			8.76	106.56 – 97.93	8.63 –
#4			7.18	108.14 – 99.55	8.59 –
#5 #394			5.31	110.01 – 101.18	8.83 –
5-50 #1			4.31	111.01 – 102.58	8.43 –
#2			3.14	112.18 – 103.98	8.20 –
#3			1.37	113.95 – 105.38	8.57 –
#4	12.54	127.62	0.24	115.08 – 106.78	8.30 –
#5 N Line Eyelets			13.36	11 4.26 – 108.18	6.08 –
Connect E Line Eyelets			12.83	11 4.79 – 109.18	5.61 –
5-50 #1			7.24	120.38 – 110.42	9.96 –
#2			6.01	121.61 – 111.66	9.95 –
#3			4.70	122.92 – 112.90	10.02 –
#4			3.79	123.83 – 114.14	9.69 –
#5 #396			3.31	124.31 – 115.39	8.92 –
5-50 #1			3.04	124.58 – 116.63	7.95 –

		HI 127.62				cuts
#2	11.54	137.89	1.32	126.30	117.86	8.44 –
#3			9.55	128.34	– 119.10	9.24 –
#4			8.06	129.83	– 120.39	9.99 –
#5 connect W line Panuel connect E line of Panuel			8.53	129.36	– 121.58	7.78 –
5-50			7.51	130.36	– 122.36	8.00 –
#1			4.01	133.88	– 123.21	10.67 –
#2			2.59	135.35	– 124.06	11.29 –
#3	3.16	139.18	1.87	136.02	– 124.91	11.11 –
#4			2.96	136.22	– 125.76	10.46 –
#5 #398 5.9.89			2.67	136.51	– 126.61	9.90 –
#1	14.81 / 5.10 / 9.71		3.36	135.82	– 127.00	8.82 –
#2			3.10	136.08	– 127.39	8.69 –
#3			2.35	136.83	– 127.78	9.05 –
#4			1.51	137.67	– 128.18	9.49 –
#5 Connect Existing sewer W line Gresham			3.04	136.14	– 128.57	7.57 –
BM.						

Alley North of Beryl from The E Line of Allison East to W. Line of Gresham H.I.

BM NW 7° cpTK walk Bayard & Beryl	6.17	73.20		67.03		
					Grade	Cuts
E Line 0+00 Allison			10.29	62.91	56.10	6.81
5-50 #1			8.33	64.87	56.95	7.92
#2			7.76	65.44	57.80	7.64
#3			8.22	64.98	58.65	6.33
#4			7.35	65.85	59.51	6.34
#5 #325 5-58			5.94	67.26	60.36	6.90
#1			4.39	68.86	61.34	7.52
#2			3.15	70.05	62.33	7.72
#3	5.52	77.31	1.41	71.79	63.31	8.98
#4			4.32	72.99	64.29	8.70
#5 #326 E Bayard 5-58			5.68	71.63	65.28	6.35
#1			5.12	72.19	65.79	6.45
#2			4.50	72.81	66.21	6.60
#3			4.20	73.11	66.67	6.44
#4			4.00	73.31	67.13	6.18
E 5 #327 5-50			3.33	73.98	67.60	6.38
#1	7.95	82.95	2.81	74.50	68.00	6.50
#2 Block 3° Long			7.52	74.93	68.40	6.53
#3			6.46	75.99	68.80	7.19
#4			5.96	76.49	69.17	7.32
#5 W Line 25° Cass connect E Line Cass 5-49 40			5.06	77.39	69.60	7.79
#1			4.11	78.34	70.62	7.72
			3.08	79.37	71.49	7.88

		H.I 82.95			cuts	81.34 Mark 541 t 87.45 HT 372 83.53	87.25 175 85.50
#2			184	80.61 - 72.36	8.25 -		
#3	874	89.94	1.25	81.20 - 73.23	7.97 -		
#4			8.92	81.02 - 74.11	6.91 -		
#5 #329 5-58			8.60	81.34 - 74.98 8353	6.36 - 6.81 -		
#1			6.60	~~83.34~~ - 76.72	~~6.62~~ -	out Replace	
#2			4.42	85.52 - 78.96	7.06 -		
#3			2.85	87.09 - 80.20	6.89 -		
#4 & Daves	9.58	98.46	1.06	88.88 - 81.94	6.94 -		
#5 #330 5-58			8.21	90.25 - 83.68	6.57 -		
#1			6.69	91.77 - 85.18	6.59 -		
#2			5.22	93.24 - 86.69	6.55 -		
#3			9.01	99.45 - 88.19	6.26 -		
#4			2.63	95.83 - 89.69	6.14 -		
#5 #331 5-50			1.34	97.12 - 91.20	5.92 -		
#1	9.86	107.88	0.94	98.02 - 92.49	5.53 -		
#2			8.52	99.36 - 93.79	5.57 -		
#3			7.34	100.54 - 95.09	5.45 -		
#4			5.78	102.10 - 96.38	5.72 -		
#5 connect W line Events connect E line Events			9.93	102.95 - 97.68	5.27 -		
5-50			9.38	103.50 - 98.54	4.96 -		
#1	7.75	115.48	0.15	107.73 - 99.51	8.22 -		
#2			7.09	108.39 - 100.98	7.91 -		
#3			6.27	109.21 - 101.45	7.76 -		
#4			6.62	108.86 - 102.43	6.43 -		
#5 #333 5-50			4.71	110.77 - 103.40	7.37 -		
#1			5.41	110.07 - 104.37	5.70 -		

		HI. 115.98			cots
#2			4.98	111.00 – 105.34	5.66 –
#3			2.88	112.60 – 106.31	6.29 –
#4	8:43	123.89	0.02	115.96 107.29	8.17 –
connect W.Line #5 Fanuel connect to Line Fanuel			8.02	115.87 – 108.26	7.61 –
5-50			7.17	116.72 – 108.76	7.96 –
#1			9.10	119.79 – 109.13	10.66 –
#2			3.52	120.37 – 109.51	10.86 –
#3			2.85	121.09 – 109.89	11.15 –
#4			1.97	121.92 – 110.26	11.66 –
#5 #335 5-49 89	5:76	127.98	1.67	122.22 – 110.64	11.58 –
#1			5.59	122.39 – 111.02	11.37 –
#2			5.02	122.96 – 111.40	11.56 –
#3			5.29	122.74 – 111.78	10.96 –
#4			4.85	123.63 – 112.16	11.47 –
connect #5 W Line Graham			8.05	119.93 – 112.59	7.39 –
TP	11:97	139.18	0.77	127.21	

Alley North of Loring from the East Line of Allison to Gresham

					cuts
BM NW 1" Tack Lawr Bayard	4.69	71.72		67.03	
TP S.C. Top Hy Wilbur Allison	9.69	77.35	9.06	67.66	
TP	12.15	88.03	1.97	75.88	
E line of Allison					
0+00			11.81	76.22 – 70.42	5.80 –
4-99 87					
#1			8.25	79.78 – 71.57	8.21 –
#2			7.14	80.89 – 72.71	8.16 –
#3			6.13	81.90 – 73.86	8.04 –
#4 #350			5.76	82.27 – 75.01	7.26 –
5-97 90					
#1			5.31	82.72 – 76.06	6.66 –
#2			4.85	83.18 – 77.12	6.06 –
#3			3.61	84.42 – 78.17	6.25 –
#4			2.75	85.28 – 79.22	6.06 –
Δ 1° 14' 00" L					
#5 #351	11.67	98.07	1.63	86.40 – 80.28	6.12
5-47 20					
#1			10.48	87.59 – 81.33	6.26 –
#2			8.85	89.22 – 82.39	6.83 –
#3			7.73	90.34 – 83.44	6.90 –
#4			6.24	91.83 – 84.50	7.33 –
E Bayard					
#5 #352			5.00	93.07 – 85.55	7.52 –
5-49 89					
#1			4.98	93.09 – 86.00	7.09 –
0.56 long					
#2			4.30	93.77 – 86.44	7.33 –
#3			3.95	94.12 – 86.89	7.23 –
#4			2.83	95.24 – 87.34	7.90 –
Δ 1° 54' 00" R					
#5 #353			3.27	94.80 – 87.79	7.01 –
5-59 53					
#1			2.25	95.82 – 88.36	7.96 –
360 long					
#2 Watch Grades 727		103.45	1.89	96.18 – 88.93	7.25 –
W Line					
#3 Cass			6.31	97.14 – 89.54	7.60 –

		103.45			
E Line Coss			6.27	97.18 – 90.72	cuts 6.46 –
5-49.90					
#1			6.00	97.45 – 9169	5.76 –
#2			5.21	98.24 – 92.67	557 –
#3			4.03	99.9– – 93.64	5 78 –
#4			2.69	100.76 – 94.6–	6.14 –
#5 #355	12.19	114.66	0.98	102.47 – 95.59	6 88 –
5-58					
#1			10.81	10385 – 97.74	6.11 –
#2			8.85	105.81 – 99.30	6.51 –
#3			7.01	107.65 – 101.16	6.99 –
#4			5.39	109.27 – 103.01	6.26 –
#5 #356			3.86	110.80 – 104.87	5 93 –
5-58					
#1	11.42	123.69	2.39	112.27 – 106.72	5.55 –
#2			8.94	114.75 – 10858	6.17 –
#3			6.46	117.23 – 110.94	6.79 –
#4			4.17	119.52 – 112 29	7.23 –
#5 #357	11.36	133.49	1.56	122.13 – 114.15	7.98 –
5-58					
#1			9.23	124.26 – 115 89	8.37 –
#2			7.39	126 10 – 117 63	8.47 –
#3			5.88	127.61 – 119 37	8.24 –
#4			4.72	128.77 – 121.12	7.65 –
#5 #358			3.92	129.57 – 122.85	6.72 –
5-58					
#1			2.48	131.01 – 129.07	6.94 –
#2	10.65	143.20	0.94	132.55 – 125 29	7.26 –
#3			10.07	133,13 – 126.51	6 62 –
#4			9.44	133.76 – 127.73	6.03 –
#5 #359			7 95	135.25 – 128 94	6.31 –

#359 5-58		143.20			128.94	cuts
#1			6.42	136 78	131 03	5.75
#2			3.63	139 57	133.12	6.45
#3	11.57	153.00	1 77	141.43	135.21	6.22
#4			9.47	143 53	137.30	6.23
#5 #360 (Franvel)			7.42	145 58	139.38	6.20
5-58 #1			5.47	147.53	140.72	6 81
#2			3.39	149.61	142.05	7.56
#3			2.44	150.56	143.38	7.18
#4	7.40	158.88	1.52	151.48	144.72	6 76
#5 #361			6.44	152 94	146.05	6.39
5-58 #1			6.73	152.15	146 63	552
#2 (51' Set Back 5' Edge of Bank 63')			5.90	152 98	147.21	5.77
#3			4.81	154 07	149 79	6.28
#4			4.07	154 81	148 37	6 99
#5 #362 (Gresham)			3.86	155.02	148.95	6.07

Alley North of Hyacinth from the E line of Allison East to E Gresham

H.I.

		93.16			
					cuts
E line of 100 Allison 4-99 82			9.18	83.98 - 77.88	6.10 -
#1	4987 / 1876		6.62	86.54 - 78.98	7.56 -
#2			5.58	87.58 - 80.07	7.51 -
#3			4.64	88.52 - 81.17	7.35 -
#4 #363 5-97 90			3.77	89.39 - 82.27	7.12 -
#1	#1140 / 2375.50		3.18	89.98 - 83.22	6.76 -
#2			2.95	90.71 - 84.18	6.53 -
#3	9.99	101.4 -	1.73	91.48 - 85.19	6.29
#4			8.83	92.59 - 86.10	6.99 -
#5 #364 5-97 90			7.91	93.51 - 87.06	6.45 -
#1			6.76	94.66 - 88.02	6.64 -
#2			5.98	95.49 - 88.97	6.97 -
#3			5.03	96.39 - 89.93	6.46 -
#4			4.59	96.85 - 90.89	5.96 -
#5 #365 E Bayard 5-94 89			2.60	98.82 - 91.85	6.97 -
#1			1.55	99.87 - 93.01	6.86 -
#2	10.12	111.08	0.46	100.96 - 94.18	6.78 -
#3	#1165 / 2376.70		8.74	102.34 - 95.35	6.99 -
#4			7.38	103.70 - 96.51	7.19 -
#5 #366 4-94 65			6.27	104.81 - 97.68	7.13 -
#1			5.55	105.53 - 98.20	7.33 -
#2	#1165 / 2376.80		4.46	106.62 - 98.73	7.89 -
#3			3.71	107.37 - 99.25	8.12 -

		#7 111.08			
					cuts
connect Myrtle Cass E Kunie Cass connect 5-50 #4			3.67	107.91 - 99.78	7.63 -
#1			2.23	108.85 - 100.74	8.11 -
#2	7.9 ~	115.91	1.59	109.99 - 101.99	7.55 -
#3			6.96	110.45 - 102.59	7.91 -
#4			6.14	110.77 - 103.14	7.63 -
#5 #368 5-57 #5			5.89	111.02 - 103.74	7.28 -
#1	57.28		1.27	109.64 - 109.90	4.74 -
#2	28.2		5.17	111.74 - 106.06	5.68 -
#3			1.76	115.15 - 107.22	7.93 -
#4	11.09	127.90	0.55	116.36 108.38	7.98 -
#5 #369 L Davies 5-58			10.37	117.03 109.54	7.49 -
#1			8.23	119.17 - 112.15	7.02 -
#2			5.43	121.97 - 114.76	7.21 -
#3			2.93	124.47 - 117.37	7.10 -
#4	11.27	137.94	0.73	126.67 - 119.98	6.69 -
#5 #370 5-58			8.93	129.01 - 122.59	6.42 -
#1			6.75	131.19 - 124.39	6.80 -
#2			4.46	133.48 - 126.19	7.29 -
#3			3.24	134.70 - 127.99	6.71 -
#4	12.07	147.94	2.07	135.87 - 129.79	6.08 -
#5 #371 L Everts 5-58			9.02	138.92 - 131.58	7.34 -
#1			7.74	140.20 - 133.38	6.82 -
#2			6.39	141.55 - 135.18	6.37 -
#3			4.83	143.11 - 136.98	6.13 -

H I
147 94

						cuts
#4			2.86	145.08	138.78	6.30
#5 #372 5-58	13.24	160.52	0.66	147.28	140.57	6.71
#1			11.59	148.93	142.37	6.56
#2			9.80	150.72	144.17	6.55
#3 2% long.			8.31	152.21	145.97	6.24
#4			6.27	154.25	147.77	6.48
#5 #373 & Fanvel 5-58			4.31	156.21	149.56	6.65
#1			2.34	158.18	151.36	6.82
#2	12.69	172.85	0.36	160.16	153.16	7.00
#3			10.87	161.98	154.96	7.02
#4			9.47	163.38	156.76	6.62
#5 #374 5-58			8.06	164.79	158.55	6.24
#1			6.26	166.59	159.42	7.17
#2			5.54	167.31	160.29	7.02
#3			3.81	169.04	161.16	7.88
#4			3.73	169.12	162.03	7.09
#5 #375 & Gresham			3.93	168.92	162.90	6.02
	0.34	167.78	5.41	167.44		
			12.76	155.02	#362 & Gresham Alley North boring	

15502
1276
167.78
0.34
167.44
5-41-1
172.85 H1
12.68
160.16
0.36
160.52 H1
13.24
147.28

Alley North of Tourmaline from #39 Western Inter. East to 290 East of Davis

81-21
6890
12-7

BM-Tie out Hub #39 Western Inc	12 53	90.07		77.54		
Δ 96°-50'-00"R #39						
0+00 W. Int.						
2-39-40						
#1			12 53	81.21 77.54	68.99	8.55
#376					78.67	4.17
#2 Δ 20°-35'-00"R.			12 37	77 70	79.50	3.20
6-53 70			5 31	84 76	80 02	9.74
#1	10.60	98.27	2 40	87.67	81.10	6.57
#2			9 16	89.11	82.18	6.93
#3		53.70 2/0 3+22.0	6 75	91 52	83 26	8.26
#4			5.04	93.23	84.34	8.89
#5			3.76	94.51	85.42	9.09
#6 Connect Wilme Allison			5 16	93 11	86.99	6.62
Connect Chime Allison			5.24	93.03	87.74	5.29
4-44 45		94.74 2.74				
#1			3.53	94.74	88 23	6.51
#2			3.09	95 18	88.72	6.96
#3	11 36	107.47	2.16	96.11	89.27	6.84
#378						
#4			10.23	97.24	89.70	7.54
5-50						
#1			9.39	98.08	90 25	7 83
#2			8.79	98.68	90 80	7 88
#3			8.55	98 92	91 35	7.57
#4			8.49	98.98	91.90	7.08
#379						
#5			8.17	99.30	92 95	6 85
5-50 cg						
#1			6.57	100.90	93.41	7.99
#2			9.51	10296	94.37	8.59
#3			1.99	10548	95.33	10.15
#4	9.25	116.10	0.62	10685	96.29	10.56

see page 79

	+	H.I. 116.10	−	Elev Stake	Elev Grade Flow Line	cuts
						changed ↙ See cuts & Bar'd 12 & NE
#380						
#3 & Bayard				8.33	107.77	97.26	10.51 —
5-9484						
#1				7.47	108.63	98.12	10.51 —
#2				7.98	108.12	98.98	9.14 —
#3				7.63	108.47	99.84	8.63 —
#4				7.28	108.82	100.70	8.12 —
#5 #381				5.90	110.20	101.57	8.63 —
4-93 75						
#1				6.12	109.98	103.14	6.84 —
#2				5.14	110.96	104.72	6.24 —
#3				2.94	113.16	106.30	6.86 —
connect #4 Y line Cass	11.27	125.92	1.45	124.65	107.87	6.78 —
connect 5 line Cass &			& 8.95	116.97	109.10	7.87 —
5-50			8.63	117.29	110.07	7.22 —
#1			7.77	118.15	111.02	7.13 —
#2			7.17	118.75	111.96	6.79 —
#3			5.68	120.24	112.91	7.33 —
#4			5.08	120.84	113.85	6.99 —
#5 #383			9.25	121.67	114.80	6.87 —
5-58						
#1			3.94	121.98	115.20	6.78 —
#2 1° Long			3.57	122.35	115.61	6.74 —
#3			3.58	122.34	116.02	6.32 —
#4			3.62	122.30	116.42	5.88 —
#5 #384 & Davies	10.12	133.39	2.65	123.27	116.83	6.44 —
5-58						
#1			7.96	125.43	118.33	7.10 —
#2			7.07	126.32	119.89	6.48 —
#3			6.37	127.02	121.34	5.68 —
#4			4.97	128.42	122.85	5.57 —
#5 #385 End			2.58	13081	12436	~~5.45~~ 6.45 ✓
TP	5.98	138.72	0.65	132.79		
			5.11	133.61		

Western Interceptor from Alley North of Hyacinth Westerly to # 37 and then N.West to # 46 and then due North to # 47

B.M. SW. Top Hydrant Lenny & Allison	818 +2.9	80.15 93.76		71.97 ~~91.87~~					
T.P.	6.97	85.77	135	78.80		Cuts			
Witness ot oo Allison			2.33 ~~9.57~~	83.42 -	66.75	16.69 -	5081 / 703.27		
9-50 81			4.30	81.47 -					
#1	~~5.69~~	~~87.32~~	~~11.53~~ 9.31	~~81.63~~	66.95	14.52 -			
#2		5.85 / 703.27	10.72 7.94	76.96 -	67.15	9.31 -			
#3			~~8.86~~ 7.88	78.33 -	67.35	10.98 -			
#4 △ 59°~~35~~-00" R. #37 57'			~~9.28~~ 5.73	77.89 -	67.55	10.34 -			
9-95 #1			7.13 10.27	80.04 -	67.73	12.31 -			
#2			11.65 6.98	75.50 -	67.91	7.59 -			
#3			7.88 9.19	79.29 -	68.09	11.20 -			
#4 #38			~~5.58~~ 3.08	81.58 -	68.27	13.31 -			
3-95 #1		4.5% Grade 17.80 1.28.0	~~4.96~~ 2.22	82.69 -	68.45	14.24 -			
#2			~~3.60~~ 1.53	83.55	68.63	14.92 -			
#3 1-47 80 #39			~~2.91~~ 8.23	84.24 -	68.81	15.43 -	E/ev Stake	E/ev Grade	
#4	1.04	78.58	9.60	~~77.72~~	68.99	12.22 -			
13-12' Piers #1 7.30			10.03	68.55 -	69.03	F. 0.48	68.55	67.00	1.55 -
TP #2 12'	1.96	68.27	12.27 3.38	66.31 - 64.89 -	69.08	F. 4.19	64.89	62.00	2.89 -
#3 12'			5.44	62.83 -	69.13	F. 6.30	62.83	59.00	3.83 -
#4 12'			5.82	59.45 -	69.18	F. 9.73	59.45	58.00	1.45 -
#5 12' Against Wrought Iron	Set Nail +3.00	0.71 ± 0	5.55	62.72 -	69.22	F. 6.50	62.72	58.00	4.72 -
#6 27° TP out Wrought Iron	8.96	68.81	8.42	59.85		Left foot.			
#7 12°			5.58	63.23 -	69.33	F. 6.10	63.23	56.00	7.23 -
#8 12°			4.10	64.71 -	69.37	F. 4.66	64.71	58.00	6.71 -
#9 12°			5.49	63.32 -	69.42	F. 6.10	63.32	59.00	4.32 -
#10			4.28	64.53 -	69.97	F. 4.94	64.53	60.00	4.53 -

		HI				Cuts	Elev Station	Elev Grade	
		68.81							
#1	12.69	81.34	0.16	68.65	69.51	F 0.86	68.65	61.00	7.65
12° #12			4.62	74.72	69.56	7.16	76.72	63.00	13.72
12° #13			7.37	73.97	69.61	4.36	73.97	64.00	9.97
2-35.73 T.P	13.20	91.94	2.60	78.74					
#1			9.00	82.94	69.74	13.20			
#40 & Sapphire	Drop Manhole				69.89	15.95			
#2 Δ 30°-43'-00" R			6.10	85.84	80.00	5.84			
3-59.17									
#1			9.39	87.55	80.54	7.01			
#2			2.91	89.03	81.08	7.95			
#41 #3	9.88	99.07	2.75	89.19	81.62	7.57			
3-99.17									
#1		24.17	8.65	90.42	82.06	8.36			
#2		13.25	7.5	91.55	82.50	9.05			
5' off the Slant #42 Turquoise			06 SR						
#3		Surface	10.03	89.09	82.95				
Connect existing Sewer 8" SDR 35 at the N Line Turquoise		0.53	10.24		83.91				
3-53.78									
#1	53.78		4.11	99.96	83.95	11.01			
#2	14.32		3.82	95.25	84.99	10.76			
#43 #3	11.23	106.46	3.84	95.23	85.03	10.20			
4-98.13					89.00	6.23			
#1		44.13	9.96	96.50	90.20	6.30			
#2		19.52	8.63	96.33	91.40	5.93			
#3			8.45	98.01	92.60	5.41			
#44 #4 & Agate	Left at				93.81				
9-93.13									
#1	43.13		5.53	100.93	94.89	6.04			
#2	17.26		4.52	101.94	95.97	5.97			
#3			3.74	102.72	97.05	5.67			
#45 #4	10.25	114.37	2.34	104.12	98.13	5.99			
7-47.86									
#1	47.96		7.73	106.64	99.85	6.79			
#2	33.50		5.57	108.80	101.57	7.23			
#3	22.54		3.91	110.46	103.80	7.16			

		H.I 119.37				Cut
#4			3.34	111.03	105.02	6.01
#5			2.98	111.89	106.74	5.15
#6	12.88	126.86	0.39	113.98	108.97	5.51
#96 #7			1.95	115.91	110.19	5.22
6-53 33 #1			8.21	118.65	112.11	6.54
#2			5.89	121.02	114.03	6.99
#3	10.25	133.34	3.77	123.09	115.95	7.14
#9			7.74	125.60	117.87	7.73
#5			6.66	126.68	119.79	6.89
#97 #6 End Interceptor Alley N of Van Nuys Tied in West Set AM Mon NW Prop Corner			6.18	127.16	121.71	5.45
			5.80	127.54		

Eastern Interceptor from Mn. Hole #82 S. to Mn Hole #80

	+	++	−	Elev		cuts
B.M. on Step of Kendall Mansion						
Set on original location Mn Hole	5.98	9.35		+3.37		
0+00 #82			9.78	−0.43	10.13	9.70
6-25						
#1			9.72	−0.37	10.19	9.82
#2			9.65	−0.30	10.25	9.95
#3			8.47	+0.88	10.31	11.19
#4			12.94	−3.59	10.37	6.78
#5	6.94	3.03	13.26	−3.91	10.93	6.52
#6			7.11	−4.08	10.98	6.90
1-26 50					−7.00	3.12
#1 Mn. Hole #81			6.91	−3.88	−10.54	4.68
1-23 50						
#1			7.03	−4.00	10.62	6.62
6-25						
#1			7.18	−4.15	10.68	6.53
#2			6.82	−3.79	10.73	6.94
#3			7.47	−4.34	10.79	6.45
#4	12.15	9.07	6.11	−3.08	10.85	7.77
#5					10.91	
#6					10.98	
1-27 50						
#1 Mn. Hole #80					−11.16	
			5.63	+3.43 BM		

Sewer & of Sapphire
from the W Line of Allison West to D.E.

	1-81	109.39		107.58	
					cuts
W Line of too Allison 9-95 55			11.80	97.59 - 90.09	750 -
#1	494	101.31	13.02	96.37 - 90.41	596 -
#2			5.83	95.98 - 90.73	975 -
#3			6.50	99.81 - 91.05	376 -
#4 Dead End			5.19	96.12 - 91.37	975 -
check out on Alley South of Sapphire			6.78	99.53	
			8.07	93.24	

Sewer & Bayard from #380
South to D.E. and Then North 335' to #389

	686	114.40			Cuts
0+00 #380			6.86	107.54 – 97.26	10.28 –
2-95					
#1			9.19	105.26 – 97.58	7.68 –
#2 D.E. 90' South			11.82	102.58 – 97.89	4.69 –
0+00 #380	Tied out 12'+18' NE		6.86	107.54 – 97.26	10.28 –
6-55 83 #6183					
#1			5.60	108.80 – 99.16	9.64 –
#2 55 83			3.03	111.37 – 101.06	10.31 –
#3 55 83	12.13	125.98	0.55	113.85 – 102.96	10.89 –
#4 55 83			9.34	116.64 – 109.86	11.78 –
#5 55 83			6.81	119.17 – 106.76	12.41 –
#6 49 83 #389		125.98	9.77	121.21 – 108.65	12.56 –

5.5.83 6183 335 #389

114.40
6.86
10771

Sewer Alley North of Sapphire
from #91 Western Intercepter West 90' to
Dead End and Then East 180' to Dead End

	9.88	99.07	90' West	89.19		Reset 30' Wrong cuts
0+00 #91	3.87	93.06		89.19	81.62	7.57
3-90						
#1			9.02	89.04	81.90	7.14
#2			5.94	87.62	82.18	5.44
#3			6.51	86.55	82.96	4.09
0+00 #91	9.88	99.07	East 180'	89.19	83.12	6.07
9-95						
#1			7.87	91.20	84.56	6.64
#2			6.42	92.65	86.00	6.65
#3			9.59	94.98	87.94	7.04
#4 Dead End			3.63	95.94	88.88	6.56

Sewer Alley North of Sapphire from the E Line of Allison to Dead End East.

HI.

	9.83	112.94				cuts
0+00 E Line Allison 3-50 83			10.71	101.73	97.99	9.29
#1			5.73	106.71	98.56	8.15
#2			9.05	108.39	99.63	8.76
#3 #388 4-98 75			3.00	109.44	100.70	8.74
#1			1.90	110.59	101.72	8.82
#2			1.55	110.89	102.74	8.15
#3	10.97	122.26	1.15	111.29	103.76	7.53
#4 Dead End			9.70	112.56	104.79	7.77

Sewer Alley North of Sapphire from #389 & Bayard West 170' to Dead End.

0+00 #389 4-92 50	9.77	125.98		121.21	108.65	12.56
#1			5.67	120.31	108.95	11.36
#2			6.60	119.38	109.24	10.14
#3			8.31	117.67	109.54	8.13
#4 DE.			9.32	116.66	109.84	6.82

Sewer Alley North of Sapphire
from #389 & Bayard East to & Forrest

						cuts
		122.26				
0+00 #389	11.53	132.74	0.94	121.21	110.15	11.06
5-99 59						
#1			10.57	122.17	111.91	10.76
#2			11.05	121.69	112.67	9.02
#3			10.01	122.73	113.93	8.80
#4			9.30	123.44	115.20	8.29
#5 #390			8.95	124.29	116.97	7.82
4-98 75						
#1			6.64	126.10	117.78	8.32
#2			5.69	127.05	119.09	7.96
#3			4.34	128.40	120.40	8.00
#4 connect W Line Cass			3.26	129.48	121.72	7.76
#5 connect E Line of Cass			& 2.82	129.92	122.95	6.97
	7.43	138.72	1.45	131.29	123.25	8.04
5-50						
#1			5.87	132.85	123.66	9.19
#2			4.56	134.16	124.07	10.09
#3			4.35	134.37	124.48	9.89
#4			5.47	133.25	124.89	8.36
#5 #392			5.03	133.69	125.30	8.39
5-58						
#1			4.10	134.62	125.71	8.91
#2			4.36	134.36	126.11	8.25
#3			4.25	134.47	126.52	7.95
#4			5.08	133.64	126.92	6.72
#5 #393 & Garces	TP 6.07	139.79	5.11	133.72	127.33	6.39
5-58						
#1			5.73	134.06	127.79	6.32 ✓
#2			5.67	134.12	128.19	5.98 ✓

		139.79					
#3			5.46	134.33	128.55	5.78	✓
#4			4.25	135.54	128.95	6.59	✓
#5 #394 5-58			2.90	136.89	129.36	7.53	✓
#1 TP.	10.71	148.90	1.60	138.19	131.27	6.92	✓
#2			8.94	139.96	133.19	6.77	✓
#3			7.03	141.87	135.10	6.77	✓
#4			4.81	144.09	137.02	7.07	✓
#5 & Events #395 5-58	11.09	157.39	2.60	146.30	138.93	7.37	✓
#1			9.08	148.31	140.84	7.47	✓
#2			7.44	149.95	142.76	7.19	✓
#3			5.20	152.19	144.67	7.52	✓
#4			3.57	153.82	146.58	7.24	✓
#5 #396 5-58	10.18	166.26	1.31	156.08	148.50	7.58	✓
#1			8.41	157.85	150.91	7.44	✓
#2			7.03	159.23	152.32	6.91	✓
#3			5.13	161.13	154.23	6.90	✓
#4			2.55	163.71	156.15	7.56	✓
#5 #397 & Fanuel The Bld.			1.72	164.54	158.07	6.47	✓

Sewer 5' North of the South Line of Turquoise from #42 East 990' to D.E.

				Ele. Stake	Ele. Grade	
	6.64	98.25		91.61		cuts
#9 Otoo Western Inc. 4-55			10.19	88.06	-82.95	5.11
#1			6.96	91.29	-84.43	6.86
#2			4.39	93.86	-85.92	7.94
#3	11.93	107.66	2.52	95.73	-87.70	8.33
#4 #398 4-55			9.86	97.80	-88.89	8.91
#1			8.99	98.67	-90.37	8.30
#2			7.96	99.70	-91.86	7.84
#3			6.64	101.02	-93.34	7.68
#4 D.End. BM S.E. Turquoise + Allison Top Hy.			5.69	101.97	-94.83	7.14
			0.08	107.58		

Server Alley North of Turquoise

From #93 Western Intercepter East to ℄ Tunnel

	+	^	−	Elev ~		cuts
BM #93	11.31	106.54		95.23		
0+00 #93	11.31	106.54		95.23	85.03	10.20
5-50 ℄						
#1			8.75	97.79	87.22	10.57
#2			7.23	99.31	89.42	9.89
#3			5.80	100.74	91.61	9.13
#4			4.68	101.86	93.81	8.05
#5 #399			2.99	103.55	96.00	7.55
5-51						
#1	12.02	117.25	1.31	105.23	97.63	7.60
#2			10.60	106.65	99.26	7.39
#3	Left out				100.89	
#4	Last		7.57	109.68	102.52	7.16
#5 #400	Left out				104.16	
5-49						
#1			4.49	112.76	104.64	8.12
#2			3.21	114.04	105.12	8.92
#3			1.86	115.39	105.60	9.79
#4	6.05	123.08	0.22	117.03	106.08	10.95
#5 #401			6.93	116.15	106.56	9.59
5-48						
#1			3.66	119.42	107.04	12.38
#2			8.23	114.85	107.52	7.33
#3			7.27	115.81	108.00	7.81
#4			12.81	110.27	108.98	1.29
#5 #402	11.51	133.91	0.68	122.90	108.96 / 116.00	13.94 / 6.90
5-47						
#1			7.29	126.62	117.08	9.54
#2			6.51	127.40	118.16	9.24

240 checked Sept 1940

240 checked Sept 1940

240 checked Sept 1940

Drop Manhole

#235 checked Sept 1940

	+	↑ 133.91	−	Elev Stake	Elev Flow Line	Cuts
#3			5.24	128.67	119.29	9.43
#4			3.86	130.05	120.32	9.73
#5 #403	10.11	142.54	1.48	132.93	121.40	11.03
5-97 #1			7.87	134.67	122.48	12.19
#2			6.30	136.29	123.56	12.68
#3			5.30	137.29	124.64	12.60
#4			6.00	136.54	125.72	10.82
#5 #404			5.34	137.20	126.80	10.40
5-97 #1	10.77	150.46	2.85	139.69	127.90	11.79
#2			8.92	141.59	129.00	12.59
#3			7.57	142.89	130.10	12.79
#4			6.79	143.67	131.20	12.47
#5 & Cass			5.95	144.51	132.30	12.21
5-58 #1			5.21	145.25	132.88	12.37
#2			4.23	146.23	133.96	12.27
#3			2.74	147.72	134.09	13.63
#4	9.97	152.90	2.53	147.93	134.62	13.31
#5 #406			4.82	148.08	135.20	12.88
5-57 #1			5.35	147.55	135.78	11.77
#2			6.16	146.74	136.36	10.38
#3			6.63	146.27	136.94	9.33
#4			6.91	145.99	137.52	8.47
#5 & Danes #407	10.18	155.23	7.85	145.05	138.10	6.95
5-56 #1			9.94	145.29	138.91	6.38
#2			9.65	145.58	139.72	5.86
#3			9.16	146.07	140.54	5.53

2335 Elevated Sept. 1940

2336 Elevated Sept. 1940

84 Long 5 Watch Grades

2 6° Short Watch Grades

5 Sta. 28700

132.30
126.80
239 550 (230
478
72
717

9774
2359
9774
230
143220
9548
1098020

1 9774
3884
5158
230
90

					Elev Flow Line	Cuts
		155.23				164.57
#4			7.23	148.00	141.35	6.65
#5 #908 5-58			5.62	149.61	142.16	7.45
#1 TP.	12.08	163.85	3.46	151.77	144.25	7.52
#2			10.08	153.77	146.34	7.43
#3			7.88	155.97	148.43	7.54
#4			4.72	159.13	150.52	8.61
#5 #909 & Encls 5-58			2.49	161.36	152.60	8.76
#1 TP.	12.57	175.78	0.64	163.21	154.69	8.52
#2			10.25	165.53	156.78	8.75
#3			7.94	167.84	158.87	8.97
#4			6.44	169.34	160.96	8.38
#5 #910 5-58	58		4.31	171.47	163.04	8.43
#1	58		2.25	173.53	163.62	9.91
#2	68	1.00%	1.09	174.69	164.20	10.49
#3	58		2.25	173.53	164.88	8.65
#4	48		1.72	174.06	165.46	8.60
#5 #911 & Fence Encl.			1.13	174.63	165.94	8.69

Sewer in Alley North of Agate
From #95 Western Interceptor East to 290'
East of Dawes

#45 0+00 5-50.90	10.36	114.49		104.13	9813	6.00
#1			8.65	105.84	- 99.35	6.49 -
#2			7.04	107.95	- 100.57	6.88 -
#3			5.87	108.62	- 101.79	6.83 -
#4			4.51	109.98	- 103.02	6.96 -
#5 #41 5-51			2.64	111.85	- 104.25	7.60 -
#1	10.32	124.25	0.56	113.93	- 105.78	8.15 -
#2			9.57	114.68	- 107.31	7.37 -
#3			7.76	116.49	- 108.84	7.65 -
#4 last 53			5.95	118.30	- 110.37	7.93 -
#5 #413 5-50 #48			4.87	119.38	- 111.90	7.48 -
#1			3.39	120.86	- 113.40	7.46 -
#2			2.09	122.16	- 114.90	7.26 -
#3	12.32	135.56	1.01	123.24	- 116.90	6.84 -
#4			11.16	124.90	- 117.90	6.50 -
#5 #414 5-50			9.62	125.94	- 119.40	6.54 -
#1			7.85	127.71	- 120.90	6.81 -
#2			5.59	129.97	- 122.40	7.57 -
#3			3.75	131.81	- 123.90	7.91 -
#4			2.07	133.49	- 125.40	8.09 -
#5 #415 6-50	7.88	143.07	0.37	135.19	- 126.90	8.29 -
#1			6.51	136.56	- 127.40	9.16 -
#2			4.83	138.24	- 127.90	10.34 -

		H I 193..07				cuts
#3			3.20	139.87	128.90	1147 —
#4			5.31	137.76	128.90	8.86
#5			6.39	136.68	129.90	7.28 —
#6 #916 Drop Mg. Hole			6 78	136.29	12990	539
9-50 T.P	12.69	153.37	2 34	14 0.73	13600	0.29
#1			7.55	145 82	137.50	8.32
#2			5.19	148.18	139.00	9.18
#3			3 95	149 92	140.50	9.42 —
#4 #917	12 78	165.13	1.02	152.35	142.00	10.35
9-47 LT						
#1			9.85	155.28	143.41	11.87 —
#2	60 Long	4917 18866 9.1	7.82	157.31	14483	12.48 —
#3			6.17	158.96	146.24	12.72 —
#4 #918 & Case			5.12	160.01	14766	12.35 —
5-58						
#1			3.17	161.96	148.06	1390 —
#2			1.14	163 99	148.97	15.52 —
#3	212	166.35	0 90	164.23	148.88	15.35 —
#4			3.09	163.26	149.28	1398 —
#5 #919			4.48	161.87	14969	12.18 —
5-58						
#1			4.31	162.04	150.09	11.95 —
#2			4.21	162.14	150.50	11.64 —
#3			5 78	160.57	150.91	9.66 —
#4			7.41	158.94	151.31	7.63 —
#5 #920 & Saw 3		150 Short	8.29	158.11	151.72	6.39 —
5-58						
#1			9.29	157.06	152.97	4.09 —
#2			7.67	158.68	154.23	4.45 —
#3			4 72	161 63	155.49	6 14 —
#4			1.56	164.79	156.74	8.05 —
#5 #921 End			0.17	166.18	158.00	8.18 —

Alley North of Archer from #96 West Interceptor East to 300' East of the E Line of Coss

	+	π	−	Elev Sta	Elev Flow Line	Cuts
0+00 #96	12.55	128.26		115.91	110.19	5.22
5-50.48						
#1			11.17	117.09	111.52	5.57
#2			9.26	119.00	112.84	6.16
#3			7.98	120.28	114.17	6.11
#4			5.21	123.05	115.99	7.06
#5 #424			3.68	129.58	116.82	7.76
5-51						
#1	12.27	138.42	2.11	126.15	118.45	7.70
#2			9.39	129.03	120.08	8.95
#3			7.39	131.03	121.71	9.32
#4 Last 25 long			5.55	132.87	123.34	9.53
#5 #425 53 Allison			3.81	139.61	129.98	9.63
6-50						
#1 #427			2.07	136.35	126.18	10.17
#2	7.70	144.68	1.94	136.98	127.38	9.60
#3			7.17	137.51	128.58	8.93
#4			6.88	137.80	129.78	8.02
#5			5.76	138.92	130.98	7.94
#6 #426			4.78	139.90	132.18	7.72
6-50						
#1			3.35	141.33	133.53	7.80
#2	11.55	154.64	1.59	143.09	134.88	8.21
#3			9.82	144.82	136.23	8.59
#4			7.85	146.79	137.58	9.21
#5			5.84	148.80	138.93	9.87
#6 #427			4.95	150.19	140.28	9.91

	+	H.I. 159.69	−	Elev Stake	Elev Story Line	
					190.28	cuts
#1			2.39	152.25	191.63	10.62
#2			1.22	153.42	192.98	10.44
#3	13.08	161.63	6.09	148.55	194.33	4.22
#4			5.36	156.27	145.68	10.59
#5			4.36	157.27	147.03	10.24
#6 #428	10.42	167.85	4.20	157.93	148.38	9.05
5-57 74 #1			9.05	158.80	149.94	8.86
#2			7.82	160.03	151.50	8.53
#3			5.33	162.52	153.06	9.96
#4			5.98	161.87	159.62	7.25
^ #4 T.P.	12.95	179.59	1.21	166.64	156.17	14.68
#5X & Cass	Drop Mn Hole		8.79	170.85	165.00	5.85
6-56 67 #1			6.90	173.19	165.96	7.23
#2			5.91	174.18	166.92	7.26
#3			4.18	175.91	167.88	7.53
#4			4.63	174.96	168.85	6.11
#5			4.56	175.03	168.82	6.21
#6 Dead End			1.45	178.19	170.78	7.36
T.P.	11.96	187.02	4.53	175.06		

Alley North of Van Nuys from Mn Hole #47 Western Interceptor East 70980' East of the E Line of Allison

	+	H.I	−	Elev. State	Elev. Flow Line	Cuts
0+00 #47 W. Inter Ceptor	9.37	136.52		127.15	121.71	5.44
6-32 P						
#1	12.95	143.60	5.87	130.65	123.5	7.13
#2			10.81	132.79	125.33	7.46
#3			7.65	135.95	127.14	8.81
#4			5.74	137.86	128.95	8.91
#5			1.96	141.64	130.78	10.86
#6 #431	12.28	154.63	1.25	142.35	132.59	9.76
9+98.00						
#1			11.44	143.19	135.34	7.85
#2			7.04	147.59	138.10	9.49
#3			4.39	150.24	140.86	9.38
#4 #432 & Allison			2.98	152.15	143.61	8.54
4-50						
#1	7.01	160.95	0.69	153.99	144.06	9.88
#2			5.96	155.99	144.51	10.98
#3			9.53	156.42	144.96	11.96
#4 #433			9.42	156.53	145.41	11.12
4-50						
#1			4.88	156.07	145.86	10.21
#2			6.14	154.81	146.31	8.50
#3			7.22	153.73	146.76	6.99
#4 #434	11.31	166.16	6.10	154.85	147.21	7.64
5-56						
#1			7.35	158.81	150.74	8.07
#2 T.P.	12.97	178.87	2.34	163.82	154.27	9.55
			0.26	165.90		
#3			11.81	167.06	157.80	9.26
#4			8.91	169.96	161.33	8.63

15-9.83
14.7
7.64

	+	H.I.	−	Elev Stake	Elev Floor Line	cuts
		178.87				
#5 #935 5-56			5.96	172.91	−164.85	8.06
#1			9.12	174.75	−165.69	9.06
#2			3.37	175.50	−166.53	8.97
#3			2.89	175.98	−167.37	8.61
#4	11.31	187.02	3.16	175.71	−168.21	7.50
#5 #936			9.04	177.98	−169.05	8.93
#5 End #936			~~1.90~~	~~185.62~~	~~−169.05~~	

164.85
147.21
17.64
15
26

353
1507.4 −
353
1542.7 −
353
1578.0 −
353
1613.3 −
353
1648.6 −

Eastern Interceptor from Mn. Hole #80 South to Mn. Hole #78

BM	0.70	2.32		1.82	
0700					-11.16
5-25					
#1			6.51	-3.99	-11.22
#2			6.63	-4.11	-11.27
#3			6.95	-3.93	-11.34
#4			6.55	-4.03	-11.40
#5			6.14	-3.62	11.46
1-2350 Mn Hole #79					-7.00
14-25			6.56	-4.04	11.50
#1			6.07	-3.55	-11.56
#2			6.95	-4.43	-11.62
#3			6.33	-3.81	-11.68
#4			6.99	-3.97	-11.74
#5			6.84	-4.32	-11.80
#6			6.95	-4.43	-11.86
#7			7.09	-4.57	-11.92
#8			6.68	-4.16	-11.98
#9			6.95	-4.43	-12.04
#10			7.09	-4.57	-12.10
#11			7.07	-4.55	-12.16
#12 TP	6.53	4.60	4.95	-1.93	-12.22
#13					-12.28
#14. Mn. Hole #78					-6.00
					-12.34
TP	12.26	8.06	8.80	4.20	
checksighting			6.23	1.83	
check BM			4.62	3.44	

cuts	
+7.23	
7.16	
7.41	
7.37	
7.89	
2.96	
7.96	
8.01	
7.19	
7.87	
7.77	
7.98	
7.93	
7.35	
7.8~	
7.61	
7.53	
7.61	
~~10.29~~	

Stake for Mn. Hole #80. Set on 20'. R.P. West

9.3 ~		BM.
4.64		3.43
4.68	Elev stake	589.
-11.16	Elev Grade	932 MZ
C 15.84		

Sewer Nettleship Tye Tract Block 1
from Mn Hole # 12 Western Int. East

				Old story 3565 New R'NE	
	11.33	96.98			
D.M.H	Tiedout 12' N. East				
0+00 #1 ~	~~9.51~~	~~46.98~~	9.51	37.47 – 29.60	1287 –
9-99.00					
#1			8.93	38.55 – 24.91	1369 –
#2			6.73	40.25 – 25.22	15.03 –
#3			5.77	41.21 – 25.53	1568 –
#4 #14 Δ			12.94	34.04 – 25.85	8.19 –
1-30 89					
#1 #16 Δ	Tiedout 12' North		5.23	41.75 – 28.55	13.20 –
5-50 60					
#1			9.66	42.32 – 30.57	1175 –
#2			5.21	41.77 – 32.60	9.17 –
#3			5.99	40.99 – 34.62	6.37 –
#4	10.95	57.89	0.04	46.94 – 36.65	10.29 –
#5 D.E			7.88	50.01 – 38.67	11.34 –
T.P.	13.21	70.88	0.22	57.67 –	
T.P.	5.99	73.78	2.59	68.29 –	
check on BM Lonny Stophy + Allison			1.70	~~72.08~~ 71.97	
				0.11	

2/9/29

Sewer Alley North of Reed West of Allison

	+	HI	−	Elev	Elev flowline	cuts
	3.33	6.91		3.58		
#3 West 0+00 Intr. 3-90				=	−2.57	set
#1		✓	4.54	2.37	−2.29	4.66
#2			4.57	2.34	−2.01	4.35
#3 O. End			5.22	1.69	−1.73	3.42

Sewer Alley North of Thomas West of Allison

	+	HI	−	Elev	Elev flow	Line
	4.21	9.96		5.25		
#2 0+00 West Int. 3-90					−1.17	set
#1			9.82	4.69	−0.90	5.59
#2			9.71	4.75	−0.64	5.39
#3 O. End			9.98	4.98	−0.37	4.85

Eastern Interceptor from Mn Hole #80 S. to Pump House #2

	+	HI	−	Elev		cuts
BM.	7.595	11.020		3.425		
#80 - 00 5.25			10.36	0.66	− 11.16	11.82
#1			9.21	1.81	− 11.22	13.03
#2			9.18	1.84	− 11.27	13.11
#3			9.45	1.57	− 11.34	12.91
#4			9.68	1.34	− 11.40	12.79
#5			10.88	0.14	− 11.46	11.60
1-23 50 Drop					− 7.00	9.17
Mn Hole # 79 14-25			8.85	2.17	− 11.50	13.67
#1			9.16	1.86	− 11.56	13.42
#2			8.19	2.83	− 11.62	14.45
#3			6.585	4.44	− 11.68	16.12
#4			6.33	4.69	− 11.74	16.43
#5			6.88	4.14	− 11.80	15.94
#6			6.59	4.43	− 11.86	16.29
#7			7.86	3.16	− 11.92	15.08
#8			7.76	3.26	− 11.98	15.24
#9			8.30	2.72	− 12.04	14.76
#10	3.915	6.925 Now + 4.88	8.01	3.01	− 12.10	15.11
#11			4.625	1.800	− 12.16	13.96
#12			9.96 4.95	−0.08 1.97	− 12.12	+12.14
#13			5.90 2.86	−1.02	− 12.28	+11.26
Drop Mn Hole #78			9.28	+0.60	− 6.00 Branch	+6.60
#14 7-25			4.87 2.99	4.55	− 12.34 Trunk	+12.94
#1			4.53 6.08	1.89 −1.20	− 12.40	14.29 11.29
#2			4.63 3.39	1.79 +1.46	− 12.96	+14.25
#3			4.94	1.48	− 12.52	14.00

0.27

1935 | 4000 2870 | 1300 0095 | 25 27 175 50 0675

11.50 11.16 034

11.16 06 11.22 06 11.28 06 11.34 06 11.40 06 11.46

1228 109 13.37 | 338 324 +0.14 | 12.46 125 11.21

324 135 1.89

4.99 324 175

433 +04#1 324 +4.09

BM 1.98 1764

324 270 +0.54 Mn Hole #78

3.24 449 − 1.75

1.34 92 1-88

	+	HI	−	Elev	
		6.925 Now + 9.88			
#4			9.28	+2.14	−12.58
#5			9.68	+1.74	−12.64
#6			6.345	+0.08	−12.70
#7			6.70	−0.28	−12.77
1-23 30 Mn. Hole #77			9.81	+1.61	−12.82
5-25					
#1			9.65	−3.23	−12.88
#2			9.94	−3.52	−12.94
#3			6.94	−0.52	−13.00
#4			2.97	+3.45	−13.06
#5			6.27	+0.15	−13.12
1-16 30 Mn. Hole #76	11.825	8.90	9.350	−2.925 −2.04	−13.16
12-25 88					
#1			7.63	+1.27	−13.22
#2			8.59	+0.31	−13.28
#3			10.58	−1.68	−13.34
#4 30 88			11.47	−2.57	−13.40
#5			12.17	−3.27	−13.48
#6 2088			12.61	−3.71	−13.52
#7			12.69	−3.79	−13.58
#8			11.38	−2.48	−13.64
#9			12.71	−3.81	−13.70
#10			12.55	−3.65	−13.76
#11			12.02	−3.12	−13.83
#12 Drop Mn. Hole #75			10.66	−1.76	−9.00 Branch −13.90 Trunk
11-25 95					
#1			10.75	−1.85	−13.96
#2			12.10	−3.20	−14.02
#3			11.69	−2.79	−14.08

14.72		6800 6925 0.395	6925
14.38			
12.78			
12.49			
14.43		9350 6925 3925	
9.65			
9.42			1190 2925 8.975
12.48			
16.51		1023 293 1316	
13.27			
+11.12 Newstake 10.23			BM − 3.52 + 865 427.513
19.99			7.17 Rod on Mn. Hole Station
13.59			−2.04 −13.16 Elev flow line Mn. Hole #76 +11.12
11.66			
10.83			−2.09 44
10.21			+2.40 499 −2.59
9.81			
9.79		2.00 499 7.9	
11.16		−2.00 499	1290 115 7.125
9.89		+2.00 0.50 1.62	
10.11			
10.71			
7.24			
12.14			
12.11			
10.82			
11.29			

6785 6925 0.370		
	11825 2925 8.900	
		+2.90 410 −1.70
		+2.40 211 0.129
	+2.90 277 0.37	−2.02
	−2.04	−.20 13.16 11.12

	+	HI 8.90	−	Elev	cuts				
#4			11.81	−2.91	−14.14	11.23 −		2.925 11.82 14.795	11.90 2.925 8.975 2.150 95
#5			10.49	−1.59	−14.20	12.61 −			11.825 2.925 8.900
#6			5.10	+3.80	−14.26	18.06 −			
#7			2.87	+6.03	−14.32	20.35 −			
#8		+3.48	1.96	+7.44 (2.33)	−14.38	21.82 −	6.795 2.15 8.975	6.795 12.33 19.125 8.725 10.400	11.825 2.925 8.900
#9			~~2.07~~ 8.06	−.464 +6.83 −.955	−14.44	~~21.27~~ 9.99			
#10 Pump House			~~.34~~	+.656	−14.52	~~21.08~~ −	11.17 .670 9.47	11.17 8.975 .195 9 17.87	
#1 ~.195 Short			8.93 8.975 −0.045	−0.03	−14.57	14.59 −			
						14.98 .393 11.555		14.98 11.555 3.425	
T.P.	11.17 ~~+0.33~~	11.87 ~~+9.125~~	2.20	6.70					
	11.77	22.07	7.57	10.30					
	4.915	26.710	0.275	21.795					
			3.70	23.01					
T.P.	4.29	24.53	6.97	20.240					
	5.84	25.54	9.83	19.70					
	2.23	14.98	12.79	12.75					
			11.555	3.425					

Level Circuit from Church Steps S.E Orange & Estrella North on Estrella to El Cajon Easton El Cajon to Radio Drive South on Radio Drive to Orange and West on Orange to Starting BM. To check line Previously Run

BM	4.19	352.59		348.95	S.E Church	steps Orange & Estrella
TP	10.59	350.23	12.95	339.64		
	5.97	353.67	2.03	348.20		
	8.96	358.28	3.85	349.82		
	12.065	367.455	2.89	355.39		
	13.01	378.82	1.695	365.81		
	11.94	390.38	0.38	378.44		
BM			7.22	383.16	50th & El Cajon	
TP	9.95	392.61	2.72	387.66		
	3.75	390.59	5.77	386.84	51st	
	0.68	379.45	11.82	378.77		
BM.			5.08	379.37	52nd	
	12.33	391.03	0.75	378.70		
	9.28	399.55	0.76	390.27		
			5.63		53rd SW	BP
	9.97	404.68	4.34	395.21		
	4.07	407.84	0.91	403.77	BM SE BP	Radio Drive & 54th
	0.38	395.51	12.71	395.13		
	1.92	385.16	12.27	383.24		
	0.78	373.06	12.88	372.28		
	2.44	363.23	12.27	360.79		
			9.43	353.80	BM Boston	
	7.80	358.44	12.59	350.64		

(cont page 75)

Bill Bliss
Joe Doermit Rod
J. Jacobszoon Rod
P. Kiernan
4/9/09

Orange Ave Bench Levels
Estrella East

BM	1.84	350.29		348.45	BP. S.E. Church Steps Estrella x Orange	
TP	2.08	339.17	13.20	337.09		
Set BM	1.88	334.83	6.22	332.95	S.E. BP 49th	
TP	3.35	331.55	6.63	328.20		
Set BM	0.67	321.55	10.67	320.88	S.E. BP 50th	
Set BM.	9.53	321.07	10.01	311.54	S.E. BP	Altadena
TP	12.83	333.23	0.67	320.40		
Set BM	13.02	344.70	1.55	331.68	S.E. B.P. 51st	
TP	13.04	357.06	0.68	344.02		
TP	12.86	369.38	0.54	356.52		
TP	12.53	381.12	0.79	368.59		
Check BM			3.54	377.58	S.E. BP 52nd	
TP	11.56	391.49	1.19	379.93		

	+	HI. 391.99 Orange	− Ave BM's (cont.)	Elev	376.83
T.P.	2.63	393.71	0.91	391.08	
TP	1.04	382.04	12.71	381.00	
Set BM	10.36	380.60	11.80	370.24	South side of Orange
IP	10.23	388.99	1.84	378.76	
IP	1.96	389.02	1.93	387.06	
IP	0.99	376.83	12.63	376.39	
Check BM	2.95	366.75	13.03	363.80	SW Top Headwall
				363.75	← Recorded Elev
				0.05	error
TP	5.52	359.30	12.97	353.78	
TP	11.82	369.94	1.18	358.12	
T.P.	12.63	382.04	0.53	369.41	
T.P.	12.93	394.54	0.93	381.61	
T.P.	13.06	406.73	0.87	393.67	
Set BM	0.985	404.355	2.86	403.87	S.E Brass

B Plug in Cb. Inlet. Approx Halfway between 52nd y Radio Drive or 54th In Swale E ost of 52nd

54th or Radio Drive

plug El Cajon + 54th

	+	H.I. 404.355	−	Elev		
Set BM	3.74	399.105	8.99	395.365	NW County Road + El Cajon	7° TK.
TP	2.61	389.400	12.315	386.790		
T.P.	1.69	380.690	10.90	379.000		
Set BM	11.94	386.385	6.245	374.445	S.E. BP. 52nd + El Cajon	
T.P.	5.585	391.270	0.70	385.685		
check BM			4.365	386.905	SW BP 51st + El Cajon	
				386.820	Recorded	
				0.085	error	
IP	3.41	392.29	2.44	388.83		
TP	3.90	383.13	13.01	379.23		
TP	6.12	379.88	9.37	373.76		
Set BM	2.035	378.250	3.665	376.215	NW BP Manzanita Ave	+ Florence
TP	1.21	366.980	12.980	365.770		
Set BM			4.06	362.92	NW Winona + Florence	
TP	1.36	356.965	11.375	355.605		

Continued Page 69

9/11/09

Bench Levels Sassafras

India East Thorn to Union | to Columbia. | Columbia to Thorn

BM.	13.21	98.09		84.88	S E B.P.
I.P.	12.90	109.87	0.62	97.47	
T.P.	13.03	122.51	0.39	109.48	
T.P.	13.17	135.16	0.52	121.99	
Set BM			9.16	126.00	NW BP Columbia & Sassafras
I.P.	12.56	147.50	0.22	134.94	
T.P.	12.975	159.610	0.865	146.635	
Set BM			5.295	154.315	S E BP Columbia & Thorn
T.P.	12.17	170.795	0.985	158.625	
T.P.	12.92	182.870	0.895	169.950	
T.P.	12.630	194.420	1.08	181.790	
Set BM			7.165	187.255	S.E. B.P. State & Thorn
T.P.	13.105	206.330	1.195	193.225	
T.P.	13.025	218.705	0.650	205.680	
Set B.M.			11.025	207.680	NW BP Thorn & Union
T.P.	13.21	231.130	0.785	217.920	
T.P.	6.76	236.945	0.945	230.185	
check BM East side	Kite Approx	Near S of curve 125 No/Ups	1.89	235.105	

194.4 W
6.50
188.33

135.16
5.93
129.73

India & Sassafras

BM	10.55	245.655		235.105
IP	12.555	257.480	0.73	244.925
Check BM. NE	Kite & Brooke		1.45	256.03
				256.00 Record
				0.03 error

Sassafras BM's (cont'd)

BM	2.795	190.050		187.255	S.E.B.P. Thorn + State
T.P.	1.695	179.465	12.23	177.82	
Set BM	0.68	167.000	13.145	166.320	N.W. BP
TP	0.950	154.825	12.625	154.375	
TP	0.565	142.965	12.925	142.400	
TP	0.920	130.660	13.225	129.740	
TP	0.985	118.845	12.800	117.860	
TP	1.405	107.325	12.925	105.920	
T.P.	1.285	95.440	13.170	94.155	
check out on starting BM			10.52	84.92	S.B.B.P. Sassafras + India

Sassafras + State

Orange Ave Bench Levels (Cont'd)

		HI 356.965				
Set BM	2.76	350.985	8 74	348.225	S E BP Estrella &	Florence
T.P.	12 70	352.035	11 65	339.335		
check BM			3565	348.970	S E Church steps.	Estrella & Orange
				348.950		
				0.020	error	

4/18/29.

Bench Levels El Cajon 54th East

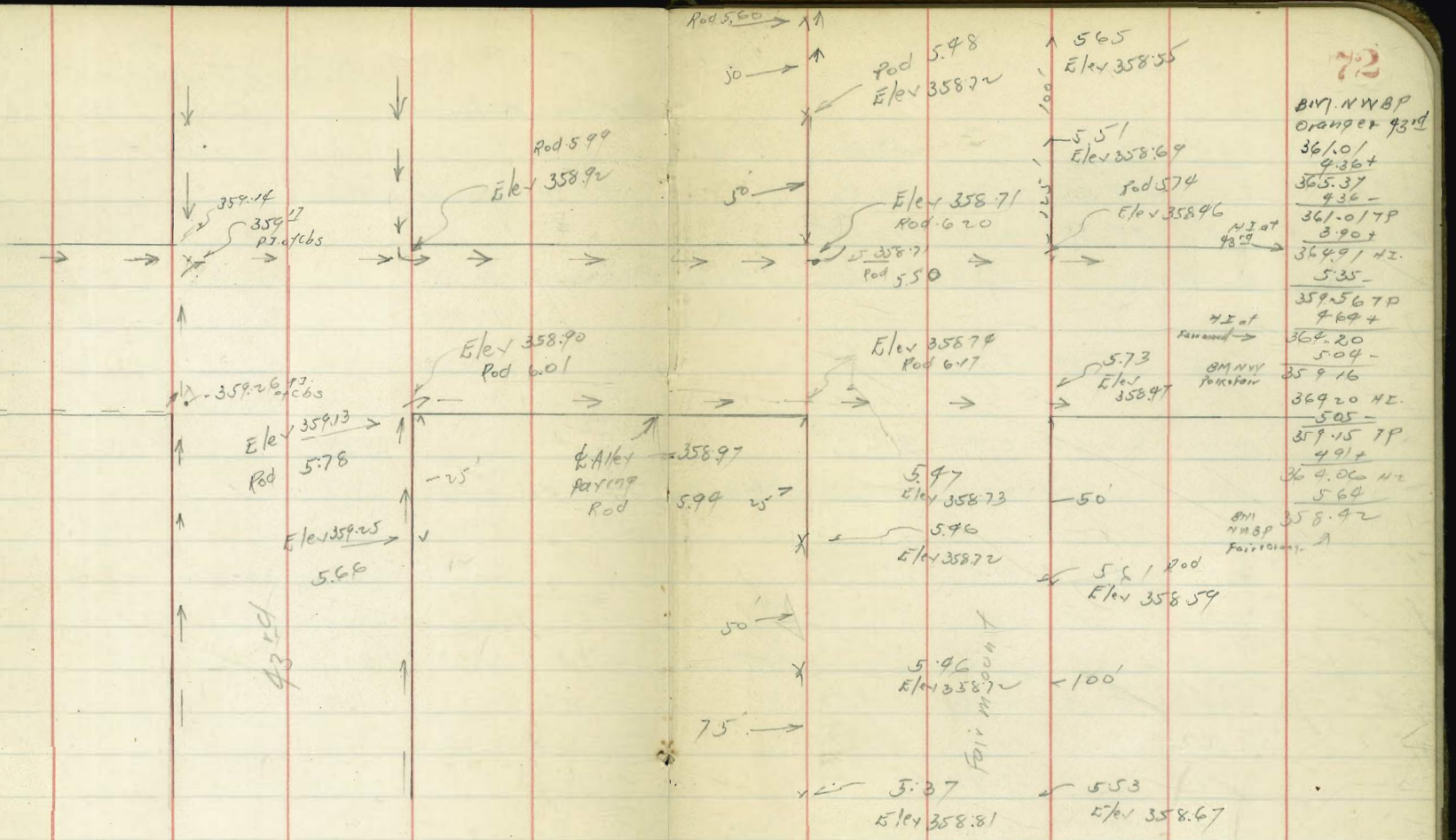
	to +	H.I.	−	Elev	
BM	12.24	916.01		903.77	SE BP El Cajon 54th or Radio Drive
TP	8.46	923.99	0.98	915.53	
Set BM			9.67	914.32	NE BP Dayton
T.P.	10.64	932.31	2.32	921.67	
checked BM			10.13	922.18	NW BP 55th
TP	12.55	943.76	1.10	931.21	
Set BM.			5.97	937.79	NE BP 56th
TP	12.64	955.84	0.61	943.15	
T.P.	12.85	968.93	0.26	955.58	
check BM	~~11.4~~	~~51~~	11.06	957.37	NW BP El Cerrito Drive NW1
TP	10.22	977.51	11.4	967.29	
Set BM			6.19	971.32	NW BP 58th
TP.	4.91	970.28	12.14	965.37	
Check BM			12.92	957.36	
TP	2.78	966.05	7.02	963.27	
Set BM			6.10	959.95	NE BP El Cerrito Pl over Madison
TP	3.77	962.75	7.07	958.98	
Set. B.M			6.38	956.37	SE BP El Cerrito Drive + Monte
Check BM			3.86		SE Top Pl

May 7, 1909

Bench Levels Division St.

National North East & Highland

BM	12.64	21.52		8.88	N.E. B.P.	Division + National
TP	11.01	31.78	0.75	20.77		
Set BM			2.85	28.93	N.E. Top Hy	" " Delbergia or Cottonwood
TP	11.44	41.93	1.79	29.99		
Set BM	9.30	49.70	1.03	40.90	N.W.B.P.	Anthony Drive
T.P.	11.19	60.18	0.71	48.99		
Set BM	0		2.90	57.28	N.W. B.P.	91st
TP	13.18	73.16	0.20	59.98		
TP	5.74	78.11	0.79	72.37		
Set BM			4.36	73.75	N.W. 7c	TK Marine View
T.P.	1.13	66.92	12.32	65.79		
	0.80	55.68	12.04	54.88		
TP	0.49	43.31	12.86	42.82		
Set BM			0.94	42.37	N.E. Top Hy	2 Block East of Marine View
TP	1.33	90.03	4.61	38.70		
Set BM			6.70	33.33	N.W. B.P.	Highland + Division



BM. NWBP
Orange 93rd
361.01
9.367
365.37
436 -
361.017P
3.907
364.91 HI.
5.35 -
359.567P
4.694
362.20
5.09 -
359.16
364.20 HI.
5.05 -
359.15 TP
4.91 +
364.06 HI.
5.64
358.42
BM NWBP Fairbanks

Bench Levels from Highland, Division St North

BM	1.64	39.97		33.33	NW BP	Division & Highland	
TP	11.70	44.06	2.61	32.36			
TP	10.91	54.58	0.39	93.67			
Set BM			2.36	52.22	BP/Sq W Line	in Paving on the South Line of of Paving	Produced Eastly 0.50 inside
TP	6.05	54.99	5.64	48.94			
TP	12.17	6.6.69	0.97	54.52			
Set BM			10.23	56.46	BP in	Culvert Headwall N.W. Cor Highland and	
TP	12.59	78.71	0.57	66.12			
TP	12.83	91.01	0.53	78.18			
Set BM			7.18	83.83	Spike	in Pole County BM. Marked Elev 90.401 East Side of Highland. Telephone Pole To Dot Hill North of	Black Letters on White Field
TP	7.05	95.51	2.55	88.46			
TP	2.16	87.35	10.32	85.19			
TP	9.74	83.17	8.92	78.43			
Set BM	2.32	74.59	10.90	72.27	N.W. BP	Highland & Keefer Direct	70.68 70.47 0.21
Check BM			4.12	70.47 70.68	S.E. Top	Hydrant Newton & Highland	

0.21 error

April 26. 1929

Slope stakes outfall Tank

BM. SEBP. 2.94 53.96 45.99

Slope 1-1

#1. S. Side Tank Elev. Bottom ditch 21.00

Elev Ground at Stake 48.40 27.4 East of ditch

21.00

27.40 Slope stake 27.4 E
27.4 out
Rod on Stake

5.0 48.4

#2 N Side Tank Elev. Bottom ditch 21.00 Elev stake

5.5 47.9

21.0

26.9 Above ditch

Stake 26.9 C
26.9 out

#3. N.N. Side Tank

8.7 44.7 Elev

21.0

23.7

Stake Marked

23.8 out

23.8 Cut

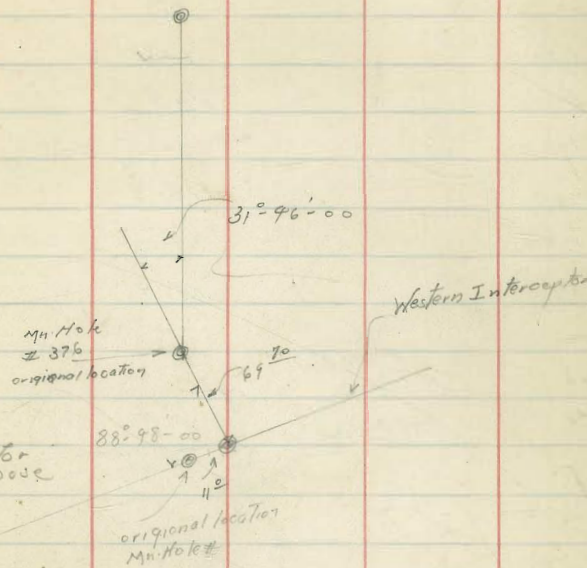
+	HI (cont from page 63)	−	Elev	
	358 94			
12.12	367.02	3.54	359.90	
11.95	375.18	3.29	363.73	BM Headwall Orange Radio Pole
13.15	387.53	0.80	374.38	
3.99	389.49	1.88	385.65	
0.67	376.77	13.04	376.10	
		6.56	370.21	BM Culvert Headwall
10.76	382.70	9.83	371.94	
11.95	393.47	1.18	381.52	
0.17	386.66	6.98	386.49	
		9.10	377.56	BM 52nd + Orange
1.62	375.77	12.51	374.15	
1.27	369.02	13.02	362.75	
0.30	351.23	13.09	350.93	
1.34	339.34	13.23	338.00	
		7.65	331.69	BM 51st
1.07	327.38	13.03	326.31	
3.24	317.59	13.03	314.35	
		6.05	311 54	BM Altadena
10.97	327.84	0.72	316.87	
		6.96	320.88	BM 50th
8.06	339.89	1.01	326.83	
11.07	344.02	1.94	332.95	BM 49th
8.92	350.81	1.63	342.39	
		2.35	348.46	BM S.E. church Steps Orange + Estrella
			348 95	
			0.01	

	+	HI	−	Elev stake	Elev flow line	cut	
		390					6+25 85 3 12.50 37 13.35
		cont from Page 12					
5+50			5.85	−1.95	−9.93	7.98	
5+75			4.73	−0.83	−10.00	9.17	
6+00			4.48	−0.58	−10.06	9.48	
6+25 85 MH #82			4.36	−0.44	−10.13	9.69	
check BM steps Kendall Mansion			0.55	3.35 337 2.02 error			

Line "A" 692°

Alley North of Tourmaline

Mn Hole #376 = 00	3.09	87.85		84.76
of 00			1.7	
+ 12			4.1	
+ 20			6.3	
+ 30			10.2	
+ 46			11.3	
+ 59			9.9	
+ 69 70			8.1	
check			10.25	



Pump House #1: Grades for Steel line Connect 10915 from Southern Interceptor to pump House

BM.	505	28.06	23.01	—	
of 25		9.11	18.95	— 1895	.00
of 60 Connect concrete pipe		6.30	21.76	— 19.07	2.69 —
of 84 End Steel Line		.665	4.41	— 19.15	2.26 —

0.357%

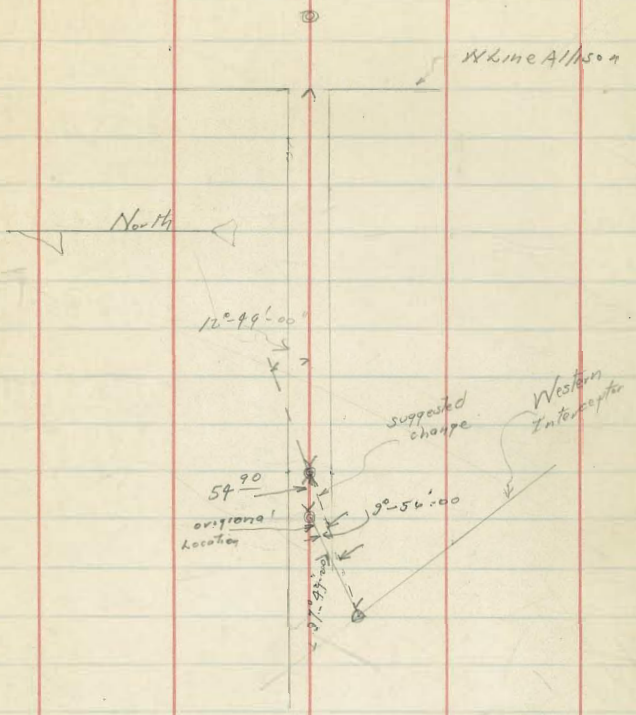
Line B

Levels for suggested Line change from Mn Hole # 122 80

0+0.	3.09	87.85		84.76
0+00			0.3	
+50			1.2	
+60			1.9	
+80			8.6	
1+00			13.3	
+10			19.0	
Mn Hole 122 80			13.9	
Check				

107° 95'-00
99 49
9 .5%

78



Line "C" original location

Levels on ℄ from Mh Hole #376 to

	+	HI	−	Elev					
BM #	2.20	86.96		84.76					
0+00			0.8	86.2					
+ 05			2.1	84.9					
+ 10			3.7	83.3					
+20			6.6	80.4					
+30			11.1	75.9					
+35			12.3	74.7					
+41			13.6	73.4					
+50			13.8	73.2					
+62			13.8	73.2					
+70			13.0	74.0					
Checkout			9.41	77.55					
BM #376	2.33	87.10		84.76	80.02				
0+00			0.9	86.2					
+ 4			1.3	85.8					
+ 10			2.7	84.4					
+18			5.6	81.5					
+33			11.0	76.1	74.89	1.3			
+36			11.1	76.0	74.51	1.50			
+50			13.0	74.1	72.17	2.0			
+55			11.9	75.2	71.39	3.8			
+63			12.0	75.1	68.99				
69.9 Mh Hole			9.9	77.2					
Checkout			9.54	77.6					

69.9

79

8002
6899
1103
5.51

8002
551
7451

1576

1103
70
403
350
530
490
40

15764

1570
50
7550
3150
3888
785
72.17

1570
20
31400

1570
33
4710
4710
51810

8002
518
7484

1570
55
7550
7550
86350

8002
863
71.39

76.1
748
13

Levels for Pier Footings Western Intercepter

					Footing Elev
BM	1.09	78.57		7753	
#1			8.6	70.0	67.0
TP	1.96	68.26	12.27	64.30	
#2			3.7	64.6	62.00
#3			7.5	60.8	59.0
#4			7.8	60.5	58.0
#5 Begin N.T. Pipe			7.5	60.8	58.0
#6 out		Carried overlapping with N.T. Pipe			
#7 TP	8.96	68.81	8.91	59.85	—
#8			8.8	60.0	58.0
#9			7.9	60.90	59.0
#10			7.2	61.60	60.0
#11			5.1	63.7	61.0
TP	1.69	81.34	0.16	68.65	
#12			11.2	70.1	63.0
#13			11.8	70.5	64.0

cuts

3.0

2.60

1.80

2.50

2.80

2.00

1.90

1.60

2.70

7.10

6.50

IMPROVED TABLES AND INFORMATION

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

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

TABLE No. 9.

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

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

ance from a point on the tangent to y nearly the square of the tangent y twice the radius.

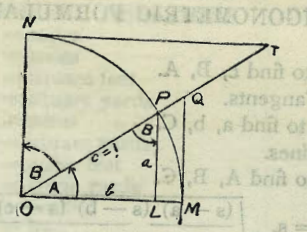


TABLE II

TRIGONOMETRIC FORMULÆ.

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

$R = OB = c = 1$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TABLE VI (continued)

SINES, COSINES, TANGENTS, COTANGENTS (continued)

deg.	sin 0′	tan 0′	sin 10′	tan 10′	sin 20′	tan 20′	sin 30′	tan 30′	sin 40′	tan 40′	sin 50′	tan 50′	deg.
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	1.2203	7753	1.2276	39
51	771	2349	790	.2423	808	.2497	826	.2572	844	.2647	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3111	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.3597	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4106	175	.4193	35
55	192	4281	208	.4370	225	.4460	241	.4550	258	.4641	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5204	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.5798	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.6426	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631	.7090	646	.7205	30
60	660	1.7321	8675	1.7437	8689	1.7556	8704	1.7675	8718	1.7797	8732	1.7917	29
61	746	.8040	760	.8165	774	.8291	788	.8418	802	.8546	816	.8676	28
62	829	.8807	843	.8940	857	.9074	870	.9210	884	.9347	897	.9486	27
63	910	.9626	923	.9768	936	.9912	949	2.0057	962	2.0204	975	2.0353	26
64	988	2.0503	9001	2.0655	9013	2.0809	9026	.0965	9038	.1123	9051	.1283	25
65	9063	.1445	075	.1609	088	.1775	100	.1943	112	.2113	124	.2286	24
66	135	.2460	147	.2637	159	.2817	171	.2998	182	.3183	194	.3369	23
67	205	.3559	216	.3750	228	.3945	239	.4142	250	.4342	261	.4545	22
68	272	.4751	283	.4960	293	.5172	304	.5386	315	.5605	325	.5826	21
69	336	.6051	346	.6279	356	.6511	367	.6746	377	.6985	387	.7228	20
70	397	2.7475	9407	2.7725	9417	2.7980	9426	2.8239	9436	2.8502	9446	2.8770	19
71	455	.9042	465	.9319	474	.9600	483	.9887	492	3.0178	502	3.0475	18
72	511	3.0777	520	3.1084	528	3.1397	537	3.1716	546	.2041	555	.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	.5764	10
80	9848	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	922	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.078	954	10.385	957	10.711	959	11.059	5
85	962	11.430	964	11.826	967	12.250	969	12.706	971	13.197	974	13.727	4
86	976	14.300	978	14.924	980	15.605	981	16.350	983	17.169	985	18.075	3
87	986	19.081	988	20.206	989	21.470	990	22.903	992	24.542	993	26.432	2
88	994	28.636	9995	31.242	9996	34.368	997	38.189	997	42.964	9998	49.104	1
89	9998	57.290	9999	68.750	9999	85.940	9999	114.58	1.000	171.88	1.000	343.77	0
deg.	60′ cos	60′ cot	50′ cos	50′ cot	40′ cos	40′ cot	30′ cos	30′ cot	20′ cos	30′ cot	10′ cos	10′ cot	deg.

5.3 5.3

TABLE VII

RODS IN FEET AND INCHES

Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches
1	16—6	21	346—6	41	676—6	61	1006—6	81	1336—6
2	33—0	22	363—0	42	693—0	62	1023—0	82	1353—0
3	49—6	23	379—6	43	709—6	63	1039—6	83	1369—6
4	66—0	24	396—0	44	726—0	64	1056—0	84	1386—0
5	82—6	25	412—6	45	742—6	65	1072—6	85	1402—6
6	99—0	26	429—0	46	759—0	66	1089—0	86	1419—0
7	115—6	27	445—6	47	775—6	67	1105—6	87	1435—6
8	132—0	28	462—0	48	792—0	68	1122—0	88	1452—0
9	148—6	29	478—6	49	808—6	69	1138—6	89	1468—6
10	165—0	30	495—0	50	825—0	70	1155—0	90	1485—0
11	181—6	31	511—6	51	841—6	71	1171—6	91	1501—6
12	198—0	32	528—0	52	858—0	72	1188—0	92	1518—0
13	214—6	33	544—6	53	874—6	73	1204—6	93	1534—6
14	231—0	34	561—0	54	891—0	74	1221—0	94	1551—0
15	247—6	35	577—6	55	907—6	75	1237—6	95	1567—6
16	264—0	36	594—0	56	924—0	76	1254—0	96	1584—0
17	280—6	37	610—6	57	940—6	77	1270—6	97	1600—6
18	297—0	38	627—0	58	957—0	78	1287—0	98	1617—0
19	313—6	39	643—6	59	973—6	79	1303—6	99	1633—6
20	330—0	40	660—0	60	990—0	80	1320—0	100	1650—0

TABLE VIII

LINKS IN FEET AND INCHES

Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches
1	0- 7.92	18	11-10.56	35	23- 1.20	52	34- 3 84	69	45- 6 48	86	56- 9 12
2	1- 3.84	19	12- 6.48	36	23- 9.12	53	34-11.76	70	46- 2 40	87	57- 5 04
3	1-11.76	20	13- 2.40	37	24- 5.04	54	35- 7 68	71	46-10 32	88	58- 0 96
4	2- 7.68	21	13-10.32	38	25- 0.96	55	36- 3 60	72	47- 6.24	89	58- 8.88
5	3- 3.60	22	14- 6.24	39	25- 8.88	56	36-11 52	73	48- 2 16	90	59- 4 80
6	3-11.52	23	15- 2.16	40	26- 4.80	57	37- 7 44	74	48-10 08	91	60- 0 72
7	4- 7.44	24	15-10.08	41	27- 0.72	58	38- 3 36	75	49- 6 00	92	60- 8 64
8	5- 3.36	25	16- 6.00	42	27- 8.64	59	38-11 28	76	50- 1 92	93	61- 4 56
9	5-11.28	26	17- 1.92	43	28- 4.56	60	39- 7 20	77	50- 9.84	94	62- 0 48
10	6- 7.20	27	17- 9.84	44	29- 0.48	61	40- 3 12	78	51- 5 76	95	62- 8 40
11	7- 3.12	28	18- 5.76	45	29- 8.40	62	40-11 04	79	52- 1.68	96	63- 4 32
12	7-11.04	29	19- 1.68	46	30- 4.32	63	41- 6.96	80	52- 9 60	97	64- 0 24
13	8- 6.96	30	19- 9.60	47	31- 0.24	64	42- 2.88	81	53- 5 52	98	64- 8 16
14	9- 2.88	31	20- 5.52	48	31- 8.16	65	42-10.80	82	54- 1 44	99	65- 4 08
15	9-10.80	32	21- 1 44	49	32- 4.08	66	43- 6.72	83	54- 9 36	100	66- .000
16	10- 6.72	33	21- 9.36	50	33- 0.00	67	44- 2.64	84	55- 5 28	101	66 -7 92
17	11- 2.64	34	22- 5.28	51	33- 7.92	68	44-10.56	85	56- 1.20	102	67- 3.84

Garnet = Stays 3° off ⊥ to Alley So of Garnet
5°. off at Stone Garnet =

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10′	58.34	.297	5° C.	10′	560.11	27.313	5° C	10′	1070.6	99.155	5° C
20′	66.67	.388	T	20′	568.53	28.137	T	20′	1079.2	100.75	T
30′	75.01	.491	.03	30′	576.95	28.974	.06	30′	1087.8	102.35	.10
40′	83.34	.606	E	40′	585.36	29.824	E	40′	1096.4	103.97	E
50′	91.68	.733		50′	593.79	30.686		50′	1105.1	105.60	
2°	100.01	.873	.001	12°	602.21	31.561	.006	22°	1113.7	107.24	.013
10′	108.35	1.024		10′	610.64	32.447		10′	1122.4	108.90	
20′	116.68	1.188		20′	619.07	33.347		20′	1131.0	110.57	
30′	125.02	1.364		30′	627.50	34.259		30′	1139.7	112.25	
40′	133.36	1.552		40′	635.93	35.183		40′	1148.4	113.95	
50′	141.70	1.752		50′	644.37	36.120		50′	1157.0	115.66	
3°	150.04	1.964	10° C.	13°	652.81	37.070	10° C.	23°	1165.7	117.38	10° C.
10′	158.38	2.188	T	10′	661.25	38.031	T	10′	1174.4	119.12	T
20′	166.72	2.425	.06	20′	669.70	39.006	.13	20′	1183.1	120.87	.19
30′	175.06	2.674	E	30′	678.15	39.993	E	30′	1191.8	122.63	E
40′	183.40	2.934	.003	40′	686.60	40.992	.011	40′	1200.5	124.41	.025
50′	191.74	3.207		50′	695.06	42.004		50′	1209.2	126.20	
4°	200.08	3.492		14°	703.51	43.029		24°	1217.9	128.00	
10′	208.43	3.790		10′	711.97	44.066		10′	1226.6	129.82	
20′	216.77	4.099		20′	720.44	45.116		20′	1235.3	131.65	
30′	225.12	4.421		30′	728.90	46.178		30′	1244.0	133.50	
40′	233.47	4.755		40′	737.37	47.253		40′	1252.8	135.35	
50′	241.81	5.100	15° C.	50′	745.85	48.341	15° C.	50′	1261.5	137.23	15° C.
5°	250.16	5.459	T	15°	754.32	49.441	T	25°	1270.2	139.11	T
10′	258.51	5.829	.09	10′	762.80	50.554	.19	10′	1279.0	141.01	.29
20′	266.86	6.211	E	20′	771.29	51.679	E	20′	1287.7	142.93	E
30′	275.21	6.606	.004	30′	779.77	52.818	.017	30′	1296.5	144.85	.038
40′	283.57	7.013		40′	788.26	53.969		40′	1305.3	146.79	
50′	291.92	7.432		50′	796.75	55.132		50′	1314.0	148.75	
6°	300.28	7.863		16°	805.25	56.309		26°	1322.8	150.71	
10′	308.64	8.307		10′	813.75	57.498		10′	1331.6	152.69	
20′	316.99	8.762		20′	822.25	58.699		20′	1340.4	154.69	
30′	325.35	9.230		30′	830.76	59.914		30′	1349.2	156.70	
40′	333.71	9.710	20° C.	40′	839.27	61.141	20° C.	40′	1358.0	158.72	20° C.
50′	342.08	10.202	T	50′	847.78	62.381	T	50′	1366.8	160.76	T
7°	350.44	10.707	.13	17°	856.30	63.634	.26	27°	1375.6	162.81	.39
10′	358.81	11.224	E	10′	864.82	64.900	E	10′	1384.4	164.86	E
20′	367.17	11.753	.006	20′	873.35	66.178	.022	20′	1393.2	166.95	.051
30′	375.54	12.294		30′	881.88	67.470		30′	1402.0	169.04	
40′	383 91	12.847		40′	890.41	68.774		40′	1410.9	171.15	
50′	392.28	13.413		50′	898.95	70.091		50′	1419.7	173.27	
8°	400.66	13.991		18°	907.49	71.421		28°	1428.6	175.41	
10′	409.03	14.582	25° C.	10′	916.03	72.764	25° C.	10′	1437.4	177.55	25° C.
20′	417.41	15.184	T	20′	924.58	74.119	T	20′	1446.3	179.72	T
30′	425.79	15.799	.16	30′	933.13	75.488	.32	30′	1455.1	181.89	.49
40′	434.17	16.426	E	40′	941.69	76.869	E	40′	1464.0	184.08	E
50′	442.55	17.065		50′	950.25	78.264		50′	1472.9	186.29	
9°	450.93	17.717	.007	19°	958.81	79.671	.028	29°	1481.8	188.51	.065
10′	459.32	18.381		10′	967.38	81.092		10′	1490.7	190.74	
20′	467.71	19.058		20′	975.96	82.525		20′	1499.6	192.99	
30′	476.10	19.746		30′	984.53	83.972		30′	1508.5	195.25	
40′	484.49	20.447		40′	993.12	85.431		40′	1517.4	197.53	
50′	492.88	21.161		50′	1001.7	86.904		50′	1526.3	199.82	
10°	501.28	21.887	30° C.	20°	1010.3	88.389	30° C.	30°	1535.3	202.12	30° C.
10′	509.68	22.624	T	10′	1018.9	89.888	T	10′	1544.2	204.44	T
20′	518.08	23.375	.19	20′	1027.5	91.399	.39	20′	1553.1	206.77	.59
30′	526.48	24.138	E	30′	1036.1	92.924	E	30′	1562.1	209.12	E
40′	534.89	24.913	.008	40′	1044.7	94.462	.034	40′	1571.0	211.48	.078
50′	543.29	25.700		50′	1053.3	96.013		50′	1580.0	213.86	

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10′	1598.0	218.7	5° C.	10′	2151.7	390.7	5° C.	10′	2743.1	622.8	5° C.
20′	1606.9	221.1	T	20′	2161.2	394.1	T	20′	2753.4	627.2	T
30′	1615.9	223.5	.13	30′	2170.8	397.4	.17	30′	2763.7	631.7	.21
40′	1624.9	226.0	E	40′	2180.3	400.8	E	40′	2773.9	636.2	E
50′	1633.9	228.4		50′	2189.9	404.2		50′	2784.2	640.7	
32°	1643.0	230.9	.023	42°	2199.4	407.6	.037	52°	2794.5	645.2	.056
10′	1652.0	233.4		10′	2209.0	411.1		10′	2804.9	649.7	
20	1661.0	235.9		20′	2218.6	414.5		20′	2815.2	654.3	
30′	1670.0	238.4		30′	2228.1	418.0		30′	2825.6	658.8	
40′	1679.1	241.0		40′	2237.7	421.4		40′	2835.9	663.4	
50′	1688.1	243.5		50′	2247.3	425.0		50′	2846.3	668.0	
33°	1697.2	246.1	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10′	1706.3	248.7	T	10′	2266.6	432.0	T	10′	2867.1	677.3	T
20′	1715.3	251.3	.26	20′	2276.2	435.6	.34	20′	2877.5	682.0	.42
30′	1724.4	253.9	E	30′	2285.9	439.2	E	30′	2888.0	686.7	E
40′	1733.5	256.5	.046	40′	2295.6	442.8	.075	40′	2898.4	691.4	.112
50′	1742.6	259.1		50	2305.2	446.4		50′	2908.9	696.1	
34°	1751.7	261.8		44°	2314.9	450.0		54°	2919.4	700.9	
10′	1760.8	264.5		10′	2324.6	453.6		10′	2929.9	705.7	
20′	1770.0	267.2		20′	2334.3	457.3		20′	2940.4	710.5	
30′	1779.1	269.9		30′	2344.1	461.0		30′	2951.0	715.3	
40′	1788.2	272.6		40′	2353.8	464.6		40′	2961.5	720.1	
50′	1797.4	275.3	15° C.	50′	2363.5	468.4	15° C.	50′	2972.1	725.0	15° C.
35°	1806.6	278.1	T	45°	2373.3	472.1	T	55°	2982.7	729.9	T
10′	1815.7	280.8	.40	10′	2383.1	475.8	.51	10′	2993.3	734.8	.63
20′	1824.9	283.6	E	20′	2392.8	479.6	E	20′	3003.9	739.7	E
30′	1834.1	286.4	.070	30′	2402.6	483.4	.116	30′	3014.5	744.6	.168
40′	1843.3	289.2		40′	2412.4	487.2		40′	3025.2	749.6	
50′	1852.5	292.0		50′	2422.3	491.0		50′	3035.8	754.6	
36°	1861.7	294.9		46°	2432.1	494.8		56°	3046.5	759.6	
10′	1870.9	297.7		10′	2441.9	498.7		10′	3057.2	764.6	
20′	1880.1	300.6		20′	2451.8	502.5		20′	3067.9	769.7	
30′	1889.4	303.5		30′	2461.7	506.4		30′	3078.7	774.7	
40′	1898.6	306.4	20° C.	40′	2471.5	510.3	20° C.	40′	3089.4	779.8	20° C.
50′	1907.9	309.3	T	50′	2481.4	514.3	T	50′	3100.2	784.9	T
37°	1917.1	312.2	.53	47°	2491.3	518.2	.68	57°	3110.9	790.1	.84
10′	1926.4	315.2	E	10′	2501.2	522.2	E	10′	3121.7	795.2	E
20′	1935.7	318.1	.093	20′	2511.2	526.1	.151	20′	3132.6	800.4	.225
30′	1945.0	321.1		30′	2521.1	530.1		30′	3143.4	805.6	
40′	1954.3	324.1		40′	2531.1	534.2		40′	3154.2	810.9	
50′	1963.6	327.1		50′	2541.0	538.2		50′	3165.1	816.1	
38°	1972.9	330.2		48°	2551.0	542.2		58°	3176.0	821.4	
10′	1982.2	333.2	25° C.	10′	2561.0	546.3	25° C.	10′	3186.9	826.7	25° C.
20′	1991.5	336.3	T	20′	2571.0	550.4	T	20′	3197.8	832.0	T
30′	2000.9	339.3	.67	30′	2581.0	554.5	.85	30′	3208.8	837.3	1.05
40′	2010.2	342.4	E	40′	2591.0	558.6	E	40′	3219.7	842.7	E
50′	2019.6	345.5		50′	2601.1	562.8		50′	3230.7	848.1	
39°	2029.0	348.6	.117	49°	2611.2	566.9	.189	59°	3241.7	853.5	.283
10′	2038.4	351.8		10′	2621.2	571.1		10′	3252.7	858.9	
20′	2047.8	354.9		20′	2631.3	575.3		20′	3263.7	864.3	
30′	2057.2	358.1		30′	2641.4	579.5		30′	3274.8	869.8	
40′	2066.6	361.3		40′	2651.5	583.8		40′	3285.8	875.3	
50′	2076.0	364.5		50′	2661.6	588.0		50′	3296.9	880.8	
40°	2085.4	367.7	30° C.	50°	2671.8	592.3	30° C.	60°	3308.0	886.4	30° C.
10′	2094.9	371.0	T	10′	2681.9	596.6	T	10′	3319.1	892.0	T
20′	2104.3	374.2	.80	20′	2692.1	600.9	1.02	20′	3330.3	897.5	1.27
30′	2113.8	377.5	E	30′	2702.3	605.3	E	30′	3341.4	903.2	E
40′	2123.3	380.8	.141	40′	2712.5	609.6	.227	40′	3352.6	908.8	
50′	2132.7	384.1		50′	2722.7	614.0		50′	3363.8	914.5	.340

T = R tan ½ I E = R exsec ½ I

Table X.

MIDDLE ORDINATES OF RAILS

Length of Rail (feet)

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

Table XI.

SHORT RADIUS CURVES

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

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

Table XII.

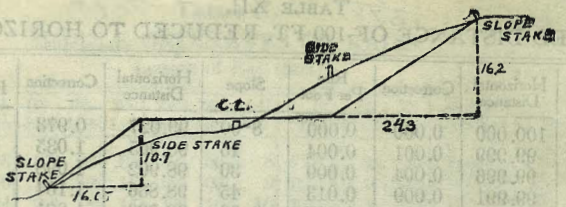
INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

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

Table XIII.

MINUTES IN DECIMALS OF A DEGREE.

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



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

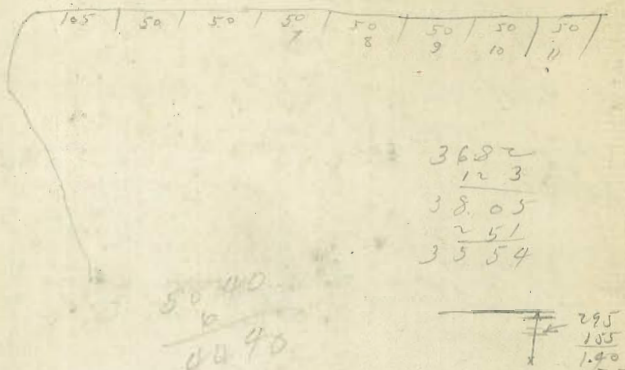
SLOPE 1½ TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	0
1	1.50	1 65	1 80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	1
2	3.00	3.15	3.30	3 45	3.60	3 75	3.90	4.05	4.20	4 35	2
3	4.50	4 65	4.80	4.95	5 10	5 25	5 40	5.55	5.70	5.85	3
4	6.00	6 15	6.30	6.45	6.60	6 75	6.90	7.05	7.20	7.35	4
5	7 50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	5
6	9 00	9 15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35	6
7	10.50	10 65	10.80	10.95	11.10	11.25	11.40	11.55	11 70	11.85	7
8	12.00	12 15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	8
9	13 50	13 65	13 80	13 95	14.10	14.25	14.40	14 55	14.70	14.85	9
10	15.00	15 15	15 30	15 45	15.60	15.75	15.90	16.05	16.20	16 35	10
11	16 50	16 65	16 80	16.95	17 10	17.25	17.40	17.55	17.70	17.85	11
12	18 00	18.15	18.30	18 45	18.60	18 75	18.90	19.05	19.20	19 35	12
13	19 50	19 65	19.80	19.95	20.10	20.25	20 40	20.55	20.70	20.85	13
14	21.00	21 15	21.30	21.45	21 60	21.75	21.90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24 15	24 30	24 45	24 60	24.75	24 90	25 05	25.20	25.35	16
17	25.50	25 65	25.80	25 95	26.10	26 25	26 40	26.55	26.70	26.85	17
18	27.00	27 15	27.30	27 45	27.60	27.75	27.90	28.05	28 20	28.35	18
19	28 50	28 65	28 80	28.95	29.10	29.25	29.40	29.55	29.70	29.85	19
20	30 00	30 15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31 50	31 65	31.80	31.95	32 10	32 25	32.40	32.55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33.60	33 75	33.90	34.05	34.20	34.35	22
23	34 50	34 65	34.80	34.95	35.10	35 25	35 40	35.55	35.70	35 85	23
24	36.00	36 15	36.30	36 45	36.60	36.75	36.90	37.05	37.20	37.35	24
25	37.50	37.65	37 80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39 00	39 15	39.30	39 45	39 60	39.75	39.90	40.05	40.20	40.35	26
27	40 50	40 65	40 80	40.95	41.10	41.25	41 40	41.55	41.70	41.85	27
28	42 00	42 15	42.30	42.45	42.60	42 75	42.90	43.05	43.20	43.35	28
29	43 50	43 65	43.80	43 95	44.10	44 25	44 40	44.55	44.70	44 85	29
30	45 00	45 15	45.30	45 45	45.60	45.75	45.90	46.05	46 20	46.35	30
31	46.50	46.65	46.80	46 95	47.10	47 25	47.40	47.55	47.70	47.85	31
32	48 00	48.15	48.30	48 45	48.60	48 75	48.90	49.05	49 20	49.35	32
33	49 50	49 65	49.80	49.95	50.10	50.25	50.40	50.55	50.70	50.85	33
34	51 00	51.15	51.30	51.45	51.60	51 75	51.90	52.05	52.20	52.35	34
35	52 50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54 00	54 15	54.30	54 45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55 50	55 65	55.80	55.95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57.00	57.15	57.30	57 45	57.60	57 75	57.90	58.05	58.20	58 35	38
39	58 50	58.65	58 80	58.95	59.10	59 25	59.40	59 55	59.70	59.85	39
40	60 00	60 15	60 30	60 45	60 60	60.75	60 90	61.05	61 20	61.35	40
41	61.50	61 65	61 80	61 95	62 10	62 25	62.40	62 55	62 70	62.85	41
42	63 00	63.15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64.35	42
43	64.50	64 65	64 80	64.95	65.10	65 25	65 40	65.55	65.70	65.85	43
44	66 00	66 15	66.30	66.45	66.60	66.75	66.90	67.05	67.20	67.35	44
45	67 50	67 65	67 80	67.95	68.10	68.25	68.40	68.55	68.70	68.85	45
46	69 00	69 15	69 30	69.45	69.60	69.75	69.90	70.05	70.20	70.35	46
47	70 50	70 65	70 80	70 95	71.10	71.25	71 40	71.55	71.70	71.85	47
48	72.00	72 15	72.30	72.45	72.60	72.75	72.90	73 05	73.20	73 35	48
49	73 50	73 65	73.80	73.95	74.10	74.25	74.40	74.55	74.70	74.85	49
50	75.00	75.15	75.30	75.45	75.60	75.75	75.90	76.05	76.20	76.35	50

Computed by L. Leland Locke.

359.03 364.23 533 358.90 364.23 520 364.23 87.09 5 07 359.03 87.09 5 58 81.51 364.23 5 18 359.05 359.16 9.04 7 55 359.19 364.23 5 11 359.12 98.87 1 89 96.98 1 98 0 98 102.47 364.23 9.97 359.26 364.23 5 06 359.17 364.23 5 29 358.94 60 145 1.5 220 NLine Alley 1/2 = 1/9 .12 125.15 1/9 060 .175 9/070 2.0 1080 2.0 15 20 55 9 1/9 = 0.5 Crown 8 1/4 = 0.6 " 7 1/2 = 0.7 " 6 5/8 = 0.8 5 5/8 = 09 9 3/9 = 1.0 90 57. 10 11/12

Turquoise - St. Top Hy 107.58
Loring + Allison SW Top Hy 54.99
B.M. & Tie out Hub. Mn Hole # 39 77.53
Loring + Allison SW Top Hy 71.97



Hub & Dart 195.05 Not Turquoise
11.95 +
156.50 HI.
0.09 -
156.41 TP
9.99 +
166.35