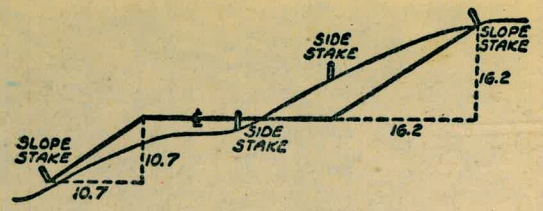


Distances from Side Stakes for Cross-Sectioning

Slope 1 to 1. Roadway of Any Width

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	0
1	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	1
2	2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	2
3	3.00	3.10	3.20	3.30	3.40	3.50	3.60	3.70	3.80	3.90	3
4	4.00	4.10	4.20	4.30	4.40	4.50	4.60	4.70	4.80	4.90	4
5	5.00	5.10	5.20	5.30	5.40	5.50	5.60	5.70	5.80	5.90	5
6	6.00	6.10	6.20	6.30	6.40	6.50	6.60	6.70	6.80	6.90	6
7	7.00	7.10	7.20	7.30	7.40	7.50	7.60	7.70	7.80	7.90	7
8	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.90	8
9	9.00	9.10	9.20	9.30	9.40	9.50	9.60	9.70	9.80	9.90	9
10	10.00	10.10	10.20	10.30	10.40	10.50	10.60	10.70	10.80	10.90	10
11	11.00	11.10	11.20	11.30	11.40	11.50	11.60	11.70	11.80	11.90	11
12	12.00	12.10	12.20	12.30	12.40	12.50	12.60	12.70	12.80	12.90	12
13	13.00	13.10	13.20	13.30	13.40	13.50	13.60	13.70	13.80	13.90	13
14	14.00	14.10	14.20	14.30	14.40	14.50	14.60	14.70	14.80	14.90	14
15	15.00	15.10	15.20	15.30	15.40	15.50	15.60	15.70	15.80	15.90	15
16	16.00	16.10	16.20	16.30	16.40	16.50	16.60	16.70	16.80	16.90	16
17	17.00	17.10	17.20	17.30	17.40	17.50	17.60	17.70	17.80	17.90	17
18	18.00	18.10	18.20	18.30	18.40	18.50	18.60	18.70	18.80	18.90	18
19	19.00	19.10	19.20	19.30	19.40	19.50	19.60	19.70	19.80	19.90	19
20	20.00	20.10	20.20	20.30	20.40	20.50	20.60	20.70	20.80	20.90	20
21	21.00	21.10	21.20	21.30	21.40	21.50	21.60	21.70	21.80	21.90	21
22	22.00	22.10	22.20	22.30	22.40	22.50	22.60	22.70	22.80	22.90	22
23	23.00	23.10	23.20	23.30	23.40	23.50	23.60	23.70	23.80	23.90	23
24	24.00	24.10	24.20	24.30	24.40	24.50	24.60	24.70	24.80	24.90	24
25	25.00	25.10	25.20	25.30	25.40	25.50	25.60	25.70	25.80	25.90	25
26	26.00	26.10	26.20	26.30	26.40	26.50	26.60	26.70	26.80	26.90	26
27	27.00	27.10	27.20	27.30	27.40	27.50	27.60	27.70	27.80	27.90	27
28	28.00	28.10	28.20	28.30	28.40	28.50	28.60	28.70	28.80	28.90	28
29	29.00	29.10	29.20	29.30	29.40	29.50	29.60	29.70	29.80	29.90	29
30	30.00	30.10	30.20	30.30	30.40	30.50	30.60	30.70	30.80	30.90	30
31	31.00	31.10	31.20	31.30	31.40	31.50	31.60	31.70	31.80	31.90	31
32	32.00	32.10	32.20	32.30	32.40	32.50	32.60	32.70	32.80	32.90	32
33	33.00	33.10	33.20	33.30	33.40	33.50	33.60	33.70	33.80	33.90	33
34	34.00	34.10	34.20	34.30	34.40	34.50	34.60	34.70	34.80	34.90	34
35	35.00	35.10	35.20	35.30	35.40	35.50	35.60	35.70	35.80	35.90	35
36	36.00	36.10	36.20	36.30	36.40	36.50	36.60	36.70	36.80	36.90	36
37	37.00	37.10	37.20	37.30	37.40	37.50	37.60	37.70	37.80	37.90	37
38	38.00	38.10	38.20	38.30	38.40	38.50	38.60	38.70	38.80	38.90	38
39	39.00	39.10	39.20	39.30	39.40	39.50	39.60	39.70	39.80	39.90	39
40	40.00	40.10	40.20	40.30	40.40	40.50	40.60	40.70	40.80	40.90	40
41	41.00	41.10	41.20	41.30	41.40	41.50	41.60	41.70	41.80	41.90	41
42	42.00	42.10	42.20	42.30	42.40	42.50	42.60	42.70	42.80	42.90	42
43	43.00	43.10	43.20	43.30	43.40	43.50	43.60	43.70	43.80	43.90	43
44	44.00	44.10	44.20	44.30	44.40	44.50	44.60	44.70	44.80	44.90	44
45	45.00	45.10	45.20	45.30	45.40	45.50	45.60	45.70	45.80	45.90	45
46	46.00	46.10	46.20	46.30	46.40	46.50	46.60	46.70	46.80	46.90	46
47	47.00	47.10	47.20	47.30	47.40	47.50	47.60	47.70	47.80	47.90	47
48	48.00	48.10	48.20	48.30	48.40	48.50	48.60	48.70	48.80	48.90	48
49	49.00	49.10	49.20	49.30	49.40	49.50	49.60	49.70	49.80	49.90	49
50	50.00	50.10	50.20	50.30	50.40	50.50	50.60	50.70	50.80	50.90	50

Distance of slope stake from side or shoulder stake for any width roadway, slope 1 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.

287.00 17. 39' Lt

282.7 outlet 2°-07' Lt

47 Sta @ 15°24' = 4579

+ 66.66 Levet

112.45 = Δ RT

162
142
8672
39072

IMPROVED TABLES
AND
INFORMATION

2003

DIRECTIONS FOR USE OF TABLES

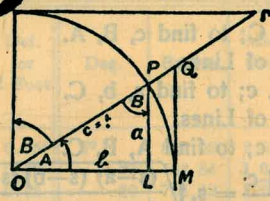
TABLE No. XIV

Distance of slope stake from side 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. VIII

To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of corrections. Degree of curve with a given I may be found by dividing tangent, (or external), opposite I by given tangent, (or external).

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



CITY ENGINEER'S OFFICE

TABLE II

TRIGONOMETRIC FORMULÆ.

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

$R = OB = c = 1$

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

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

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

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

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

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

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

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

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

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

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

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

Law of Lines $\frac{\sin A}{a} = \frac{\sin B}{B} = \frac{\sin C^1}{C}$

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

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

TABLE II — Continued
TRIGONOMETRIC FORMULÆ (continued)

in any triangle:

Given a, b, C; to find c, B, A.
Use Law of Lines.

Given A, B, c; to find a, b, C.
Use Law of Lines.

Given a, b, c; to find A, B, C.

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

$$\cos \tfrac{1}{2} A = \sqrt{\frac{s(s-a)}{bc}}$$

$$\tan \tfrac{1}{2} A = \frac{r}{s-a}$$

$$\tan \tfrac{1}{2} B = \frac{r}{s-b}$$

$$\tan \tfrac{1}{2} C = \frac{r}{s-c}$$

Area of a triangle:

$$\text{Area} = \tfrac{1}{2} ab \sin C$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

PRISMOIDAL FORMULA.

$$\text{Vol.} = \frac{h}{6}(B+b+4M)$$

h = altitude; b, B = bases; M = midsection

TABLE III
INCHES AND FRACTIONS OF AN INCH IN DECIMALS OF A FOOT

	0	1	2	3	4	5	6	7	8	9	10	11	
1/16	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219	1/16
1/8	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271	1/8
3/16	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323	3/16
1/4	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375	1/4
5/16	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427	5/16
3/8	.0313	.1146	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479	3/8
7/16	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531	7/16
1/2	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583	1/2
9/16	.0469	.1302	.2135	.2969	.3803	.4635	.5469	.6302	.7135	.7969	.8802	.9635	9/16
5/8	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688	5/8
11/16	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740	11/16
3/4	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792	3/4
13/16	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844	13/16
7/8	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896	7/8
15/16	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948	15/16
1	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	1.000	1
	0	1	2	3	4	5	6	7	8	9	10	11	

TABLE IV —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.

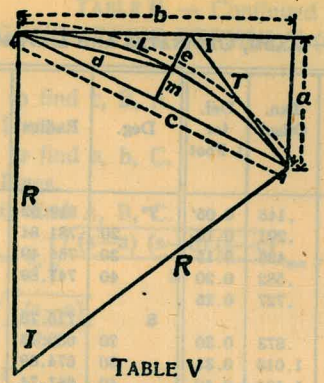


TABLE V

CURVE FORMULÆ FOR SIMPLE CURVES

COMPILED BY J. CALVIN LOCKE, C. E.

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

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

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

(5) $c = 2R \sin {}^1/_2\, I$ (6) $c = 2T \cos {}^1/_2\, I$

(7) $e = R \operatorname{exsec} {}^1/_2\, I$

(8) $e = R \tan {}^1/_2\, I \tan {}^1/_4\, I$ (9) $e = T \tan {}^1/_4\, I$

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

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

(12) $b = R \sin I$ (13) $b = a \cot {}^1/_2\, I$

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

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

(17) $d = \sqrt{2Rm}$ (18) $d = 2R \sin {}^1/_4\, I$ (19) $m = \frac{d^2}{2R}$

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

(21) $m = R \operatorname{vers} {}^1/_2\, I$ (22) $m = R \sin {}^1/_2\, I \tan {}^1/_4\, I$ (23) $m = {}^1/_2\, c \tan {}^1/_4\, I$

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

(26) $a = 2R\,(\sin^2 {}^1/_2\, I)^2$ (27) $a = R \operatorname{vers} I$ (28 $a = R \sin I \tan {}^1/_2$

(29) $a = b \tan {}^1/_2\, I$ (30) $a = T \sin I$ (31) $T = R \tan {}^1/_2\, I$

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

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

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

TABLE VI

SINES, COSINES, TANGENTS, COTANGENTS

deg.	sin 0′	tan 0′	sin 10′	tan 10′	sin 20′	tan 20′	sin 30′	tan 30′	sin 40′	tan 40′	sin 50′	tan 50′	deg.
0	0000	0000	0029	0029	0058	0058	0087	0087	0116	0116	0145	0145	89
1	175	0175	0204	0204	0233	0233	0262	262	291	291	320	320	88
2	349	349	378	378	407	407	436	437	465	466	494	495	87
3	523	524	552	553	581	582	610	612	640	641	669	670	86
4	698	699	727	729	756	758	785	787	814	816	843	846	85
5	872	875	901	904	929	934	958	963	987	992	1016	1022	84
6	1045	1051	1074	1080	1103	1110	1132	1139	1161	1169	190	198	83
7	219	228	248	257	279	287	305	317	334	346	363	376	82
8	392	405	421	435	449	465	478	495	507	524	536	554	81
9	564	584	593	614	622	644	/650	673	679	703	708	733	80
10	736	763	765	793	794	823	822	853	851	883	880	914	79
11	908	944	937	974	965	2004	994	2035	2022	2065	2051	2095	78
12	2079	2126	2108	2156	2136	186	2164	217	193	247	221	278	77
13	250	309	278	339	306	370	334	401	363	432	391	462	76
14	419	493	447	524	476	555	504	586	532	617	560	648	75
15	588	679	616	711	644	742	672	773	700	805	728	836	74
16	756	867	784	899	812	931	840	962	868	994	896	3026	73
17	924	3057	952	3089	939	3121	3007	3153	3035	3185	3062	217	72
18	3090	249	3118	281	3145	314	173	346	201	378	228	411	71
19	256	443	283	476	311	508	338	541	365	574	393	607	70
20	420	640	448	673	475	706	502	739	529	772	557	805	69
21	584	839	611	872	638	906	665	939	692	973	719	4006	68
22	746	4040	773	4074	800	4108	827	4142	854	4176	881	210	67
23	907	245	934	279	961	314	987	348	4014	383	4041	417	66
24	4067	452	4094	487	4120	522	4147	557	173	592	200	628	65
25	226	663	253	699	279	734	305	770	331	806	358	841	64
26	384	877	410	913	436	950	4462	986	488	5022	514	5059	63
27	540	5095	566	5132	592	5169	617	5206	643	243	669	280	62
28	695	317	720	354	746	392	772	430	797	467	823	505	61
29	848	543	874	581	899	619	924	658	950	696	975	735	60
30	5000	774	5025	5812	5050	851	5075	890	5100	930	5125	969	59
31	150	6009	175	6048	200	6088	225	6128	250	6168	275	6208	58
32	299	249	324	289	348	330	5373	371	398	412	422	453	57
33	446	494	471	536	495	577	519	619	544	661	568	703	56
34	592	745	616	787	640	830	664	873	688	916	712	959	55
35	736	7002	760	7046	783	7089	807	7133	831	7177	854	7221	54
36	878	265	901	310	925	355	948	400	972	445	995	490	53
37	6018	536	6041	581	6065	627	6088	673	6111	720	6134	766	52
38	157	813	180	860	202	907	225	954	248	8002	271	8050	51
39	293	8098	316	8146	338	8195	361	8243	383	292	406	342	50
40	428	391	450	441	472	491	494	541	517	591	539	642	49
41	561	693	583	744	604	796	626	847	648	899	670	952	48
42	691	9004	713	9057	734	9110	756	9163	777	9217	799	9271	47
43	820	325	841	380	862	435	884	490	905	545	926	601	46
44	947	657	967	713	988	770	7009	827	7030	884	7050	942	45
45	7071	1.0000	7092	1.0058	7112	1.0117	133	1.0176	153	1.0235	173	1.0295	44
deg.	60′ cos	60′ cot	50′ cos	50′ cot	40′ cos	40′ cot	30′ cos	30′ cot	20′ cos	20′ cot	10′ cos	10′ cot	deg.

TABLE IX

MIDDLE ORDINATES OF RAILS

Length of Rail (feet)

C o	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch	C o	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 X

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.

Alvarado Canyon Sewer East of Powers 11/23/38 5

Sewer Crossing #2-3-4-5-6-6A 7-8 +1 } 13—21 +25 +26

Levels - Soil bench above Adobe Falls 22+23

Sewer Crossing #9 24

Revision 376+47.08 to 386+44.80 P.28

Feeder to Grantville 386+44.80 To North P.29 -

Proposed Alvarado Canyon Sewer { 37 To 79

Also see 1873 / 2-11

For final line see F.B. 2040

Also - FB 1629 -
1631 -
1703
1873
2054
2040

Proposed Serra Alvarado Canyon

INDEXED
WK
DEC 27 1948

Dec. 10-48
Sisson
Smith
Becker
Berger
W O 21034

1

BM	1234	(95.42)	82.18	on Hub 2
407+39.0		1262	82.80	on Hub
+50		99	85.5	
408+0		97	85.7	
+50		77	87.7	
409+0		7.7	87.7	
+50		3.9	91.5	
+76		4.4	91.0	
+86 = 229+58 Capitan Pipe Line		8.6	86.8	on Ground
410+05.0° A 51°40' Rt		3.6	91.26	on Hub
+30		7.3	88.1	
+50		12.6	82.8	
TP	357	(86.39)	1260	(82.83)
+70		7.0	79.4	
411+0		8.5	77.9	
+50		8.3	78.1	
412+0		7.8	78.6	
+50		7.4	79.0	
413+0		7.1	79.3	

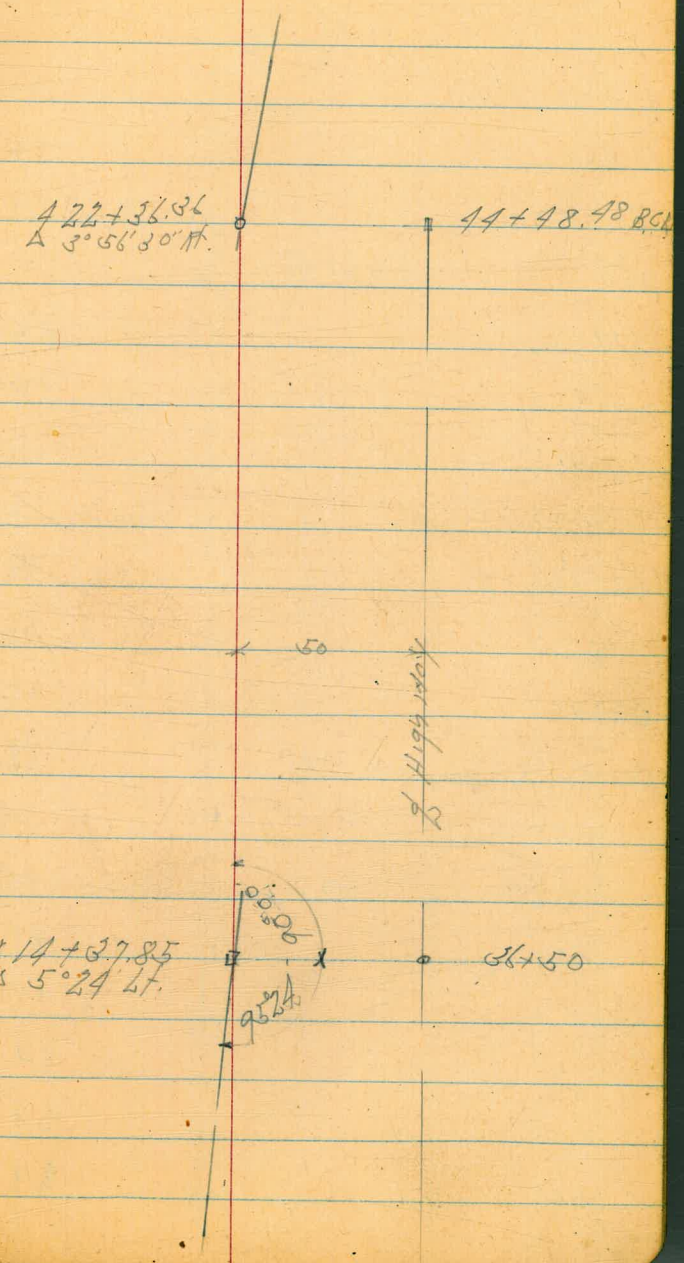
410+05.0° A 51°40' Rt.

See P 37 for change 2/4/49

407+39.0° A 5°30' Rt.

401+70.0° A 29°10' Lt. to #1629-18

	(86.89)		
413+50		6.7	79.7 ✓
414+0		5.5	80.9 ✓
+17		5.1	81.3 ✓
+25		7.6	78.8 ✓
+32.85 Δ 5°24' Rt		8.13	78.26 ✓ on Rt 6
+55		8.7	77.7 ✓
+71		6.8	79.6 ✓
+88		5.1	81.3 ✓
415+0		7.5	78.9 ✓
+45		10.2	76.2 ✓
+50		7.8	79.1 ✓
+60		5.0	81.4 ✓
416+0		4.6	81.8 ✓
+50		5.6	80.8 ✓
+85		5.3	81.1 ✓
417+0		6.8	79.6 ✓
+25		5.1	81.3 ✓
+50		7.1	79.3 ✓
+60		7.1	79.3 ✓



	(86.39)		
417+70		4.8	81.6 ✓
418+0		4.3	82.1 ✓
+50		2.7	83.7 ✓
TP	93.4 (93.96)	1.77	(84.67) ✓
419+0		9.1	84.9 ✓
+50		8.2	85.8 ✓
420+0		7.4	86.6 ✓
+50		6.7	87.3 ✓
421+0		5.9	88.1 ✓
+50		5.4	88.6 ✓
422+0		4.8	89.2 ✓
+ 86.86 A 3°56'30"Rt		5.07	88.89 ✓ on TP
+50		4.8	89.2 ✓
423+0		4.6	89.4 ✓
+50		5.1	88.9 ✓
424+0		5.2	88.8 ✓
+25		9.4	84.6 ✓
+13		9.1	84.9 ✓
+50		6.8	87.2 ✓

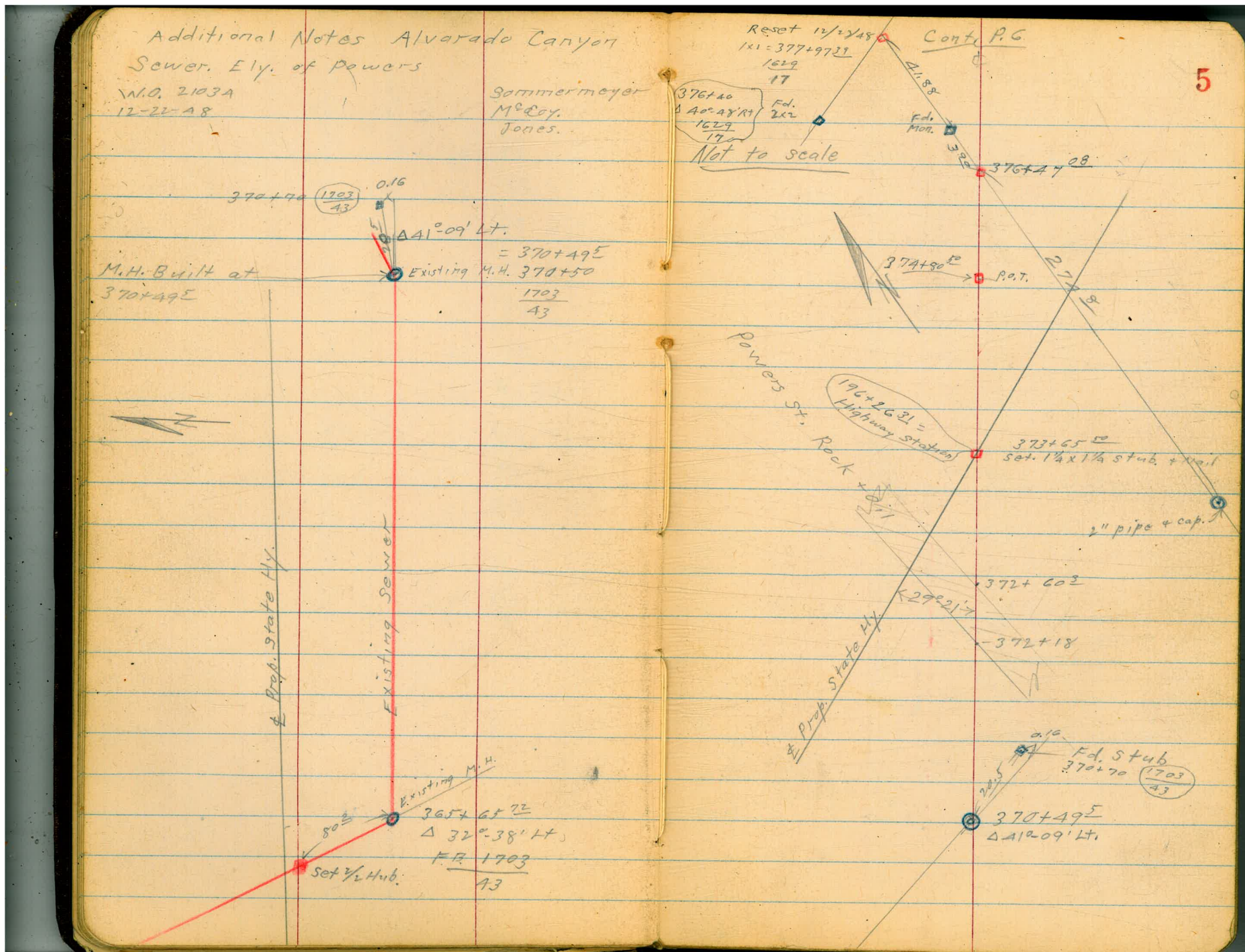
427+91.48 = 50 = 50+0 P.O.C.

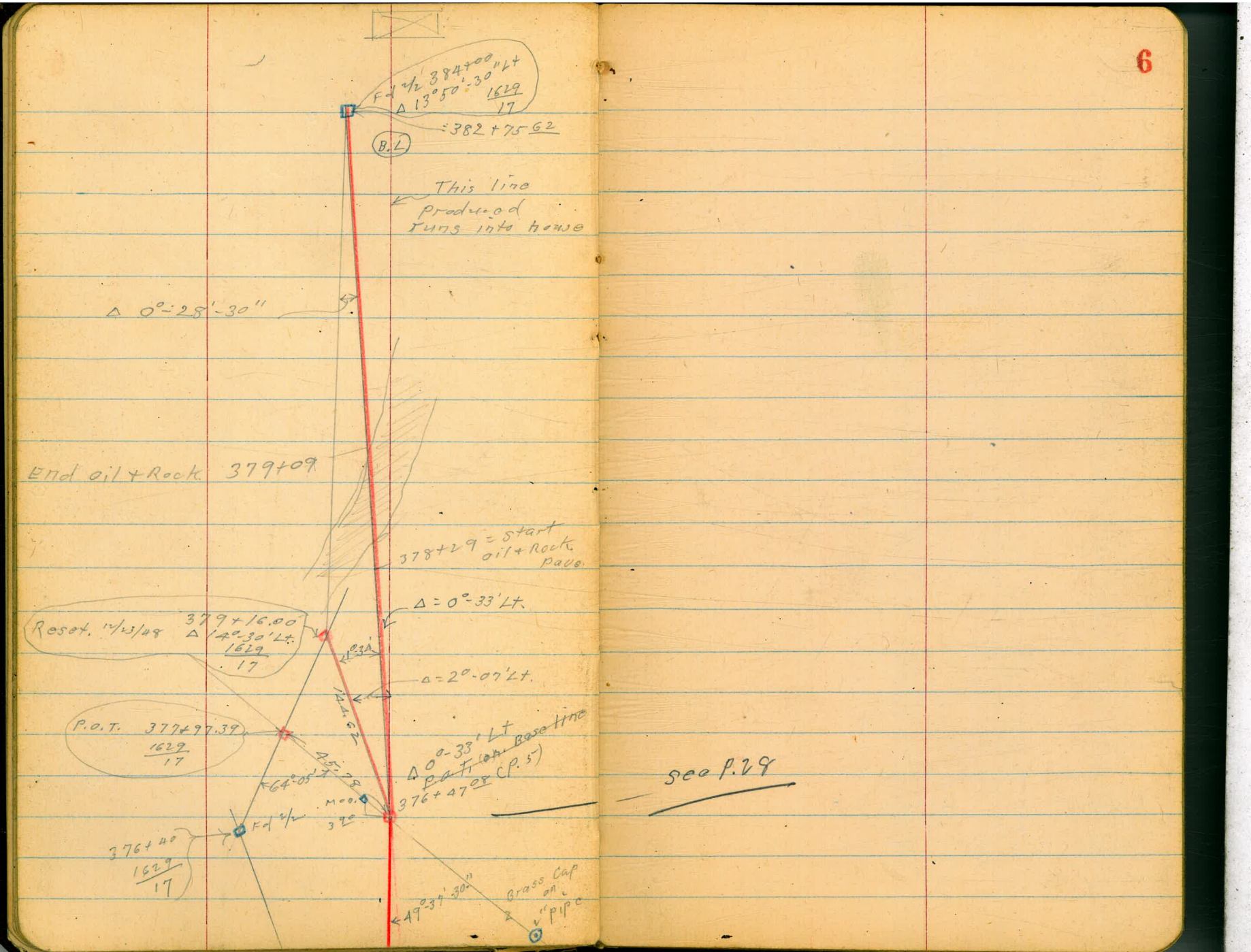
		(93.96) ✓		
425+0		5.3	88.7	✓
+50		5.5	88.5	✓
426+0		4.6	89.4	✓
+50		4.0	90.0	✓
427+0		4.5	89.5	✓
+50		4.2	89.7	✓
+91.48 =	50'N o/s 50+0 POC Hwy.	3.08	90.88	✓ on Hub
TP	6.03 (96.91) ✓	3.08	(90.88) ✓	
+91.48	38' Lt o/s	5.6	91.3	✓
"	50' " " "	18.6	83.3	✓
BM #68		0.81	(96.10) ✓	Spk 55' Lt 430+20 9593

Additional Notes Alvarado Canyon Sewer. Ely. of Powers

W.O. 2103A
12-22-48

Sommermeyer
McCoy.
Jones.




Fd 1/2 384+00 "Lt
Δ 13°50'-30" 1629 17
=382+75.62
B.L.
This line produced runs into house
Δ 0°-28'-30"
End oil + Rock 379+09
378+29 = Start oil + Rock pave
Δ = 0°-33' Lt.
Reset. 12/3/48 379+16.00
Δ 14°-30' Lt. 1629 17
Δ = 2°-07' Lt.
P.O.T. 377+97.39 1629 17
Δ 0°-33' Lt. P.O.T. (on Baseline)
376+47.08 (P. 5)
see P. 29
64°-05'-28"
Fd 1/2
376+40 1629 17
49°-34'-30"
Brass Cap on 1" pipe

Levels - 370+49.5 to 382+75.2 = 384+00

Sketch P. 5+6.

℄

+50

7.8

371+00

7.1
8.5

+58

71.6
9.0

+51

73.8
6.8

70.15
5.41
Rim

69.13
11.43
INVERT

(80.56)

370+49.5 = ℄ 41°.09' Lt.

7.28 (80.56) —— 73.28

73.28

B.M. # 57 1629/9

T.P 11.67 ⟨89.55⟩ 2.68 ⟨77.88⟩

373+50

+03 2' Rt = deadman

373+0

372+60 = End oil & Rock Pave.

+39

Powers

372+18 = start oil + Rock Pave. on

372+0

80.56

77.8
2.8

77.6
3.0

76.8
3.8

76.9
3.7

76.1
4.5

75.1
5.5

⟨80.56⟩

375+50	
375+00	
374+74	
+70	
+50	
374+00	
373+65 50 = Int. Hy ℄ (P.5)	
8955 ✓	

℄

85.0 ✓
4.6

87.3 ✓
2.2

89.0 ✓
0.5

79. ✓
10.3

78. ✓
11.3

77. ✓
12.1

77.73 ✓
11.82
stub

87.55 ✓

℄

378+29 = Start oil + Rock Pav. (P.6)

19' Lt = line Link fence wire + pipe
16' Lt = N. Edge Pave.
6' Lt = Edge Pave

378 ~

T.P. Mon. 5.163 - (86.82) ✓ 8.136 - (81.19) ✓

377+50

377 ~

376+47.08 L. 0°-33' Lt. (Page 6)

376 -

89.55

77.4 ✓
9.4

77.9 ✓
8.9

10.1 / 16 Pave 8.9 / 6 Edge Pave

(86.82) ✓

80.4 ✓
9.1

81.3 ✓
8.2

81.19 ✓
8.36
39 North on Mon.

81.35 ✓
8.20

83.0 ✓
6.6

(89.55) ✓

	0.2 Lt. = line of fence 2.5 Rt. = N. edge pave. 9.5 wide			
380+50		78.2 ✓ 8.6 5	79.9 ✓ 6.9	80.0 ✓ 6.8 2.5 pave
380+00	0.2 Lt = line of fence. 2' Rt. = N. edge pave.	78.1 ✓ 8.7 5	79.0 ✓ 7.8	79.1 ✓ 7.7 2 pave.
+50	1.2 Rt. = Edge Pave.	77.9 ✓ 8.9 5	79.5 ✓ 7.3	79.5 ✓ 7.3 1.7 N. Edge pave
379+09 =	End oil + rock pave.		79.1 ✓ 7.7	
379~	3.4' Lt = line of fence		78.9 ✓ 7.9	
378+50	9' Lt = line of fence 0 m. Pave. (9.5 wide)		78.1 ✓ 8.7	
			(86.82) ✓	

= 384 Loc 1629/17 (EL. = 80.9 1629/17)

382+75.62 = L. Lt.

+50

+32 = Cross chicken wire fence.

+28 = Cross barb wire fence

382+20

382 ~

16' Rt. = N. Edge Pave
381+50 13' Rt. = line of fence

7' Rt = Edge pave
381 ~ 3 Rt. = line of fence

3 Rt = N. edge pave
380+58 Cross link wire fence

80.8 ✓ EL.
6.0

79.3 ✓
7.5

75.7 ✓
11.1

76.4 ✓
10.4

79.3 ✓
7.5

78.7 ✓ 79.8 ✓ 81.1 ✓ 81.5 ✓
8.1/5 7.0 5.7/3 5.3/7

78.6 ✓ 80.2 ✓ 80.2 ✓
8.2/5 6.6 6.6/3 pave

(86.82) ✓

Sewer crossing #2

See 3644-B.

12-29-48
W.O. 21034

Sommer meyer
McCoy
Jones

Stakes set 10' west of ℄ sewer

#5
State B.M. = S.W. Cor. Conc. M.H. 131' Lt. of 40+00

90.51 ✓
5.09
95.60 ✓ A

South

30' R.P. to 1+00
1+30

North

	0+00	0+50	1+00	1+30
I.G—	83.00	84.50	86.00	86.90
	12.60	11.10	9.60	9.60
	9.5	7.7	4.60	0.3
C	3.10	C 3.2	C 5.00	C 9.30

0-40
20' R.P. to 0+00

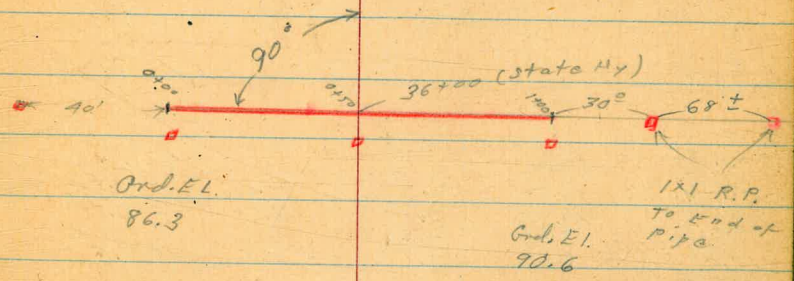
83.00
12.60
12.1
C 0.50

Ord. 88.0

Ord. 90.6

℄ State Highway

Elevations Are State data



Sewer Crossing #3 (3644-B)

Station Changed from 50+00 to 48+50

12-29-48
W.O. 21034

Sommermeyer
McCoy
Jones

Cut stakes set 10' west of ℄ sewer.

State B.M.#6. = 5/8" 9.11 / 50' Lt. of 50+00 = 96.62
393
100.55 ✗

	North			South
R.P. For	0+00	0+50	1+00	1+30
0-45	90.5	91.25	92.00	92.00
90.5	10.05	9.30	8.55	8.55
10.05	5.00	4.60	6.0	49
4.6	C 5.00	C 4.70	C 2.5	C 3.6
C 5.4				
	Grd 95.5	Grd. 95.4	Grd 94.0	

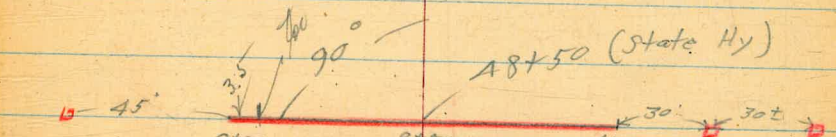
Toe Slope on No = 0+03.5

Toe slope = 0+96

Invert Elev...

℄ State Hy.

Elevations are state data.



0+00	0+50	1+00	1+30
90.5	91.06	92.00	92.00
10.05	9.55	8.55	8.55
4.6	4.5	6.0	49
C 5.14	C 4.3	C 2.5	C 3.6
	90.5		
	10.05		
	5.00		
	C 5.0		

0+00 Grd El. 95.5

1+00 Grd. El. in old creek bed. 94.0 can be filled 2' to 3'

Sewer Crossing #4

Highway ℄ Station = 67+90

See 1873/64 } 11/22/49

℄ State Hy

Elevations are State Data

Stakes set 10' West of ℄ sewer.

BM #80 = ½" pin 50' Rt of 70+00 — 167.37

1.09

168.46

12.00

156.46

0.65

157.11

8.43

148.68

6.05

154.73 – T #1

12.59

142.14

1.24

143.38 T #2

Grd Rod 0+00: 10.70

Grd. Rod 0+10: 11.76

3.76

C 8.00

Change 1-7-49

1+15 = C 3.03 + 7.00 Rod 10.03

1+10 Grd Rod = 9.50

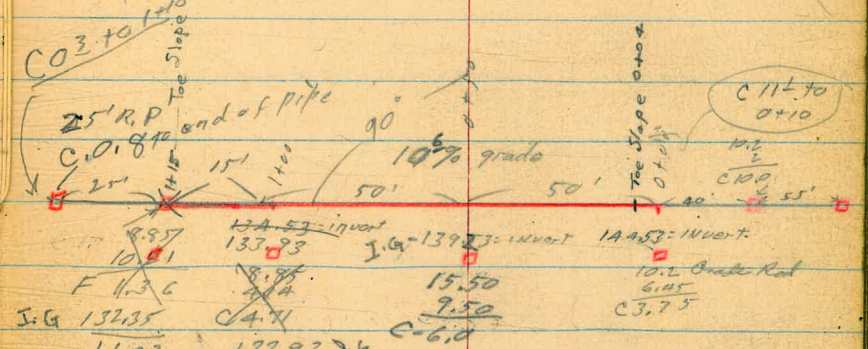
5.20

C 4.3

0+00 = C 3.75 + 6.95 + 10.70

T 143.38

T = 154.73



North

1+15	1+00	0+50	0+10	0+00
Grd	Grd.	Grd		Grd
135.4	137.6	145.4	151.3	149.3
	F 11	F 11	F 11	

1+15 = Toe slope

South

0+00 = Toe Slope

Grd 135.4

1873/66+27 See P 51 For Tie in

stop at 1+10 Changed 1/7/49

stop at 0+10

Sewer Crossing #5

Highway ℄ Sta. = 81+27.5

State B.M. #10 ½" Pin. 60' Lt. Sta. 83+50 El. = 233.85

2.43
236.28
12.01
224.27
1.17
225.44
12.02
213.42
0.02
213.44
12.32
201.12
2.21
203.33
4.82
198.51 = B.M. #1

State Hy 20' culvert R.P. Nt. of 82+00

Sewer extended north beyond toe of slope because of work road on north side of new highway.

198.51 B.M. #1
11.19
209.70
1.11
208.59
6.25
214.84 ✗
12.25
202.62 = 10' Lt. 1+05
0.73
203.35
12.25
191.10
3.81
194.91

0+00
206.0 ✓ Est.
7.73
213.73 = El. stake
42
214.15 ✗
205.00
8.75
1.24
C 7.51
at 0+05
Changed 1/7/49

Invert broke

Invert broke 0+05

℄ State Hy.

Elevations are State data.

1.1.8

1-10-49

See page 25 for 2nd stage in No. end.

214.87
4.87
0+00 Grd. 210.00
" Invert 206.00

194.91
55
189.41 = Grd El. 1+75
4
185.4 = Invert 1+75

11.8% Grade

2 1/2 @ 165' Lengths

40'
30'
(8° 08')
81+40
100'
81+15
65'
0+65
1+05
1+65
1+75
0+00
Sand
Sand
30'
50'

on ℄ 30' S. R.P.	0+00	0+65	1+05	out 1+75	40' N. R.P.
214.87 ✗	214.87 ✗	214.87 ✗	214.87 ✗	194.91	194.91
206.00	206.00	198.33	193.71	185.40 Invert out	185.40
8.87	8.87	16.54	21.16	9.31	9.51
1.32	1.14	7.94	12.25	0.17	1.36
C = 7.55	C = 7.73	C 8.60	C 8.91	C 9.39	Eq. 8.0
60		Nat. Grd. = 203 ℄	Nat. Grds 198 ℄		F 2.00
C 8.15 at 0+05	Nat. Grd. = 210 ℄				

1+65
186.58 D.G. 1.595
8.33 Rod.
1.47
C 6.86
Grd 191.4
Natural

Stop at 0+05 1/7/49

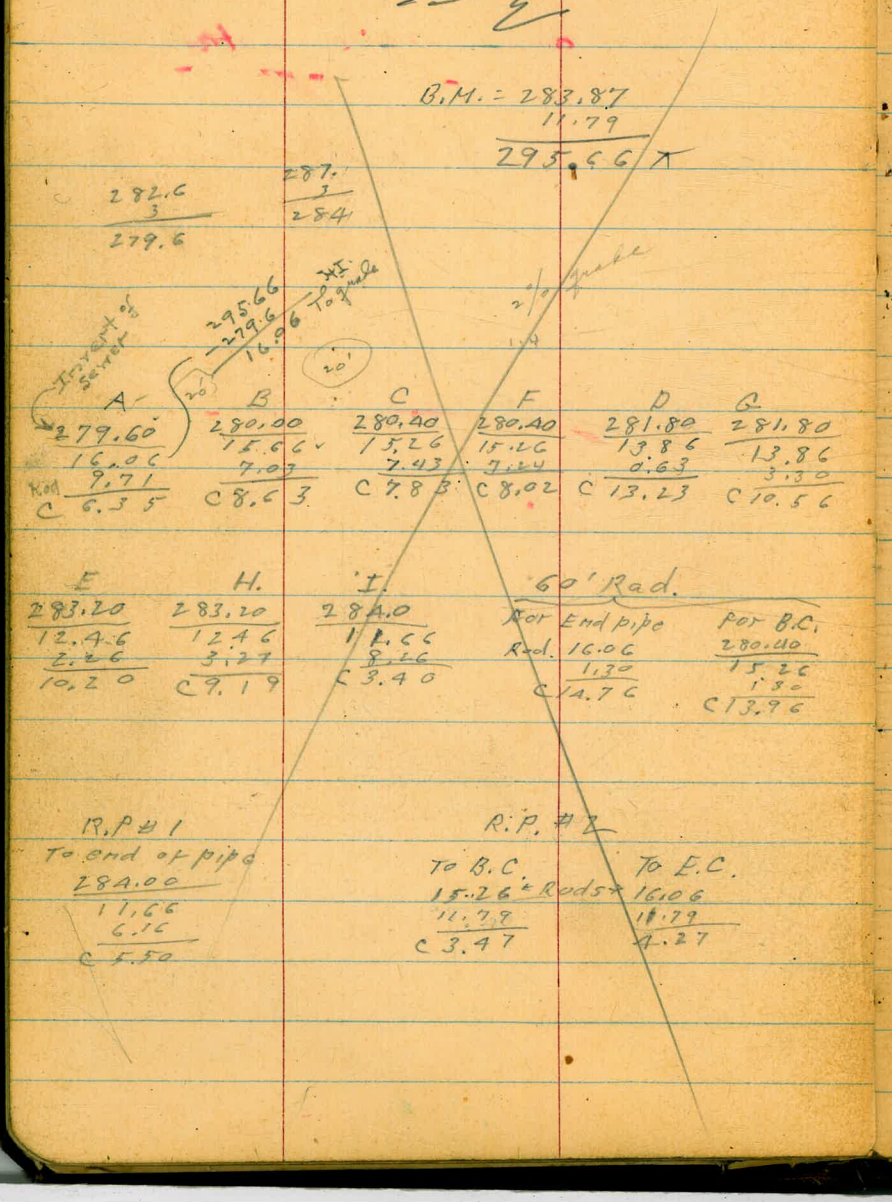
30' of 2' deep Irregular Fill 0+35 to 0+65

Stop at 1+50

Sewer Crossing # 6

Hy. Station 103+27

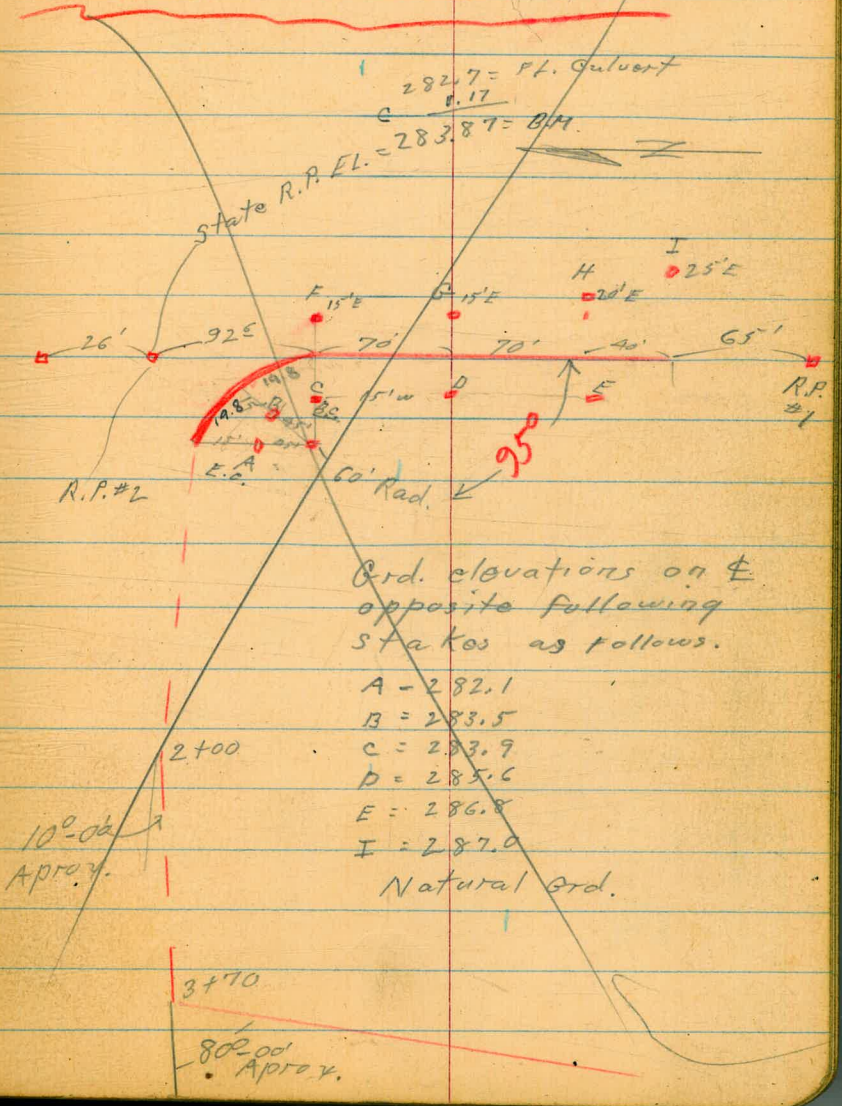
See page 26



El. Inlet - Culvert. = 287.3
Eh outlet Culvert = 282.7
} From State Field party

Grade of sewer = 3% below Culvert Invert.

Elevations are state datm.



Grd. elevations on ℄ opposite following stakes as follows.

A - 282.1
B = 283.5
C = 283.9
D = 285.6
E = 286.8
I = 287.0
Natural Grd.

Sewer crossing #6A

Highway ℄ Sta. = 130 + 50

B.M.# 16 - 1/4" Pin 50' Lt. 132+00 — 360.16 + 136 = 364.52

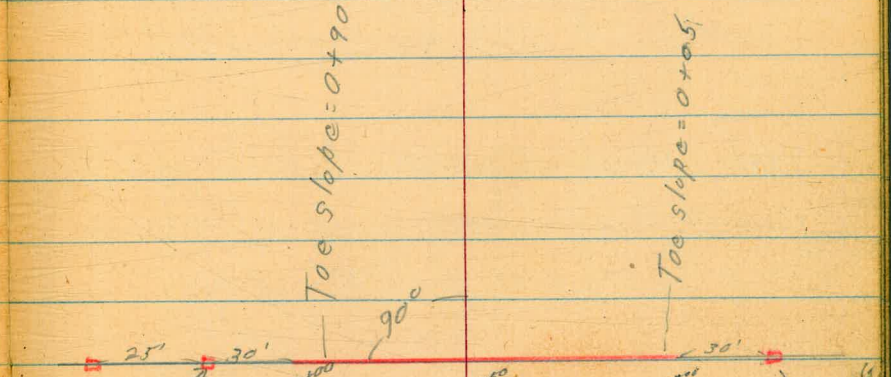
see 1873/16

State Hy. ℄

Elevations are State data

Stakes set 10' west sewer ℄

R.P. stakes on ℄ sewer



Sewer Crossing #7

Highway ℄ Sta. = 159+15

This sewer crossing is at 90° to state Highway 10.36 East of E.C. 159+04.64

~~State B.M. # 18 - ½" pin 68' Rt. 153+00 = 362.81~~

~~State B.M. # 19 ½" pin 50' Lt. Sta 162+00 374.06~~

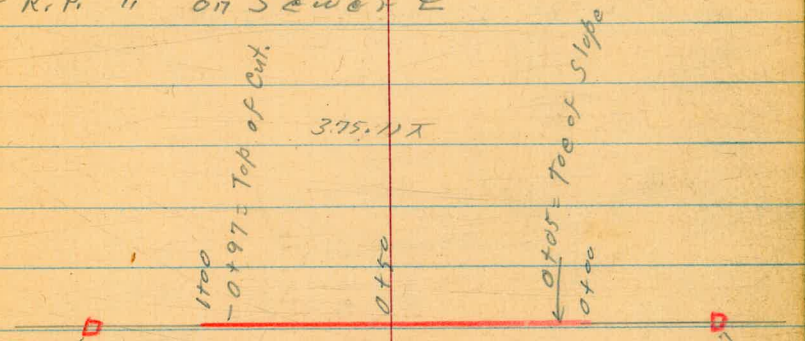
#18 Transferred to 90' Lt. 153+47.63

367.57
5.60
373.17
4.89
368.28
6.83
375.11

Elevations are state data

Stakes 10' west sewer ℄

+ R.P. " on Sewer ℄



364.00 ✓
11.11 ✓
176
C- 9.35 ✓

364.00 ✓
11.11 ✓
5.04
C 6.07 ✓

361.35
13.76 ✓
6.83
C- 6.93 ✓

358.70 ✓
16.41 ✓
12.39
C- 4.02 ✓

358.70
16.41 ✓
11.30
C- 5.11 ✓

1+00 Grd
EL. 370.0
Invert 364.00

0+00 Grd.
EL. = 362.7
Invert 358.70

Grd. Elevations below

1+00	0+50	0+15	0+05	0+00
370.0	368.4 Fill	367.2 Fill	362.7	362.7

Sewer Crossing #8

6/1951 Commenced

Highway & Sta. = 171+65

@ ARIZONA ST.

382.90
3.54
386.44
6.52
379.92 El W Head wall at E end

Elev Top of Pipe 375.55

6/22/51

State B.M. #20 Spike in Eucalyptus tree 68' Lt. sta. 167+44.96 EL.= 382.90
7.15
390.05

Grade at 1+12 = 378.40
.39
EL. at 1+00 = 378.01

378.40
7.49
385.89
3.31
389.20

378.40
374.80
3.60 (3.21)
336
240
224
160

389.20
378.01
11.19
4.19
C- 7.00 at 1+00

321
12
642
321
385.2

40' R.P. to North Now = 52' R.P. to end of pipe Now C- 11.06

20

State Hy.

Elevations are State data

3 stakes set, 10' west of ℄ sewer

Set 1"x4" stake 6/23/51 ELB 35' from end of pipe

Crossing Aprox ℄ of existing pavement

Culvert Head wall

Spike found RP 40 ft. N. of ℄

Spikes

1+00 = Top of curb

171+89

171+62

171+37

0+56

50' 56' 56' 50' 40' 60'

15.25 10.14 C-4.50

374.80 ok 15.25 6/22/51 10.16 C-5.09

11.65 0.99 C-10.67

378.40 1.16 4.16 C-7.49

376.60 13.45 7.14 C-6.31

Grd. 1+12 Cul at 1+00 EL.= 386.4 EL.= 365.7 = 383.0

Grd. at 0+56 EL.= 380.8

Invert 378.40

Invert 374.80

Grd will be cut 2+03' on N. end crossing

Note

Stop pipe at 1+00

0+00 = End pipe

State Hy.

Sewer Crossing #1

1-25-49
C.H.S.

Highway ℄ Station = 2+00

		Invert Exist M.H.	
		370+50 = 75.22	
		Rod	11.51
			86.73 x
372+25	75.43		2.64
	11.30		84.09
	3.98		12.69
	C 7.32		96.78
372+00	75.40		12.67
	11.33		84.09
	4.87		1.76
	C 6.46		85.85
371+75	75.37		7.99
	11.36	Stab. 370+75	77.86
	7.28	77.85	0.01
	C 4.08		
371+50	75.34		
	11.37		
	8.26		
	C 3.13		
371+25	75.31		
	11.42		
	8.38		
	C 3.04		
371+00	75.28		
	11.45		
	8.57		
	C 2.88		
370+75	75.25		
	11.48		
	8.88		
	C 2.60		
370+50	75.22		
	11.51		
	x		

Note. 7)
Elevations are U.S.G.S. Datum

21

374+50	75.70	
	21.08	
	11.25	
	C 9.83	
374+25	75.67	
	21.11	
	13.21	
	C 7.90	
374+00	75.64	
	21.14	
	13.17	
	C 7.97	
373+75	75.61	
	21.17	
	13.41	
	C 7.76	
373+50	75.58	
	21.20	
	12.66	
	C 8.54	
T.P.		
373+25	75.55	
	11.18	
	2.64	
	C 8.54	
373+00	75.52	
	11.21	
	3.11	
	C 8.10	
372+75	75.49	
	11.24	
	3.55	
	C 7.69	
372+50	75.46	
	11.27	
	3.93	
	C 7.34	

End of Encasement

	10'50.	20'50
374+85 =	75.74	75.74
	21.04	21.04
	1.75	1.11
	C 19.29	C 19.93
374+75	75.73	75.73
	21.05	21.05
	1.30	0.61
	C 19.75	C 20.44

Profile Along south bench Nl. Wly. form end of Prop. Sewer (P. 17)

℄

2+50

2+00 Δ 10° Lt. ↑

1+50

1+00

0+50

0+00 = End sewer ("A") page 17

4.43 (288.30) — 283.87

B.M. = R.P. #2 Page 17

Elevations are state data.

281.8 ✓
6.5

279.5 ✓
8.8

13.0/15 on lower bench

279.5 ✓
8.8

280.2 ✓
8.1

281.3 ✓
6.9

282.5 ✓
5.8

8.6

288.30

← State data.

℄

4+00 in canyon 20' to 25 lower

or side of canyon

271.3 ✓
17.0

3+70 Δ about 80° Lt. to follow bank.

277.6 ✓
10.7

3+85

277.8 ✓
10.5

273.2 ✓
15.1
15
on lower bench

3+00

288.30 ✓

Sewer
Crossing #9 - 141+00 (State Hy) sta.

State Hy ℄

Elevations are on State data.

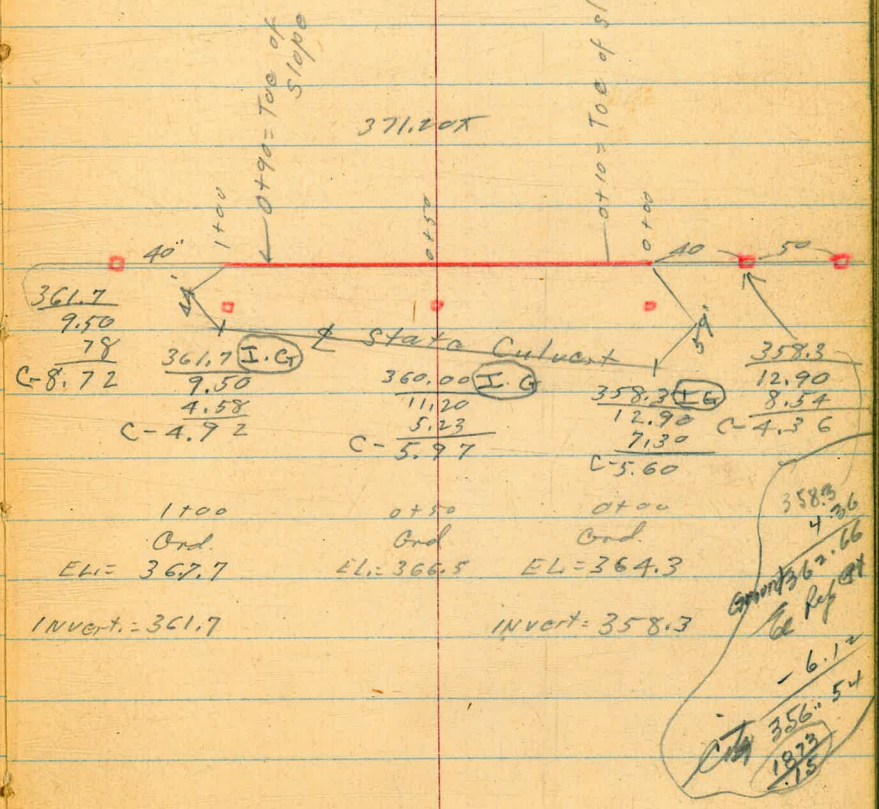
State B.M. #16 50' Lt 132+00 360.16
9.69
369.85
5.27
364.58
6.62
371.20 ℄

371.20
6.9
364.30

3.5
367.7

stakes set 10' west of sewer ℄.

R.P. " " on Sewer ℄



#5

10.66

Change in line - 1-9-49

From P. 16

Final stakes

Restake again

sketch Page 16

2/21/49

1+05 = 193.71

8.91

202.62 = EL Grd of 10' west cut stake

1.18

203.80 = ℄

198.0 Grd 85' Lt. ℄

B.M. = 0-30 (P. 16

Invert 206.00

Cut 7.55

El 30' R.P. = 213.55

2.26

215.81 ℄

13.30

202.51

2.68

205.19

11.41

193.78

Grd of invert at 1+50 = 188.35 ✓

203.80

15.45

5.42

C 10.03

0+30 = RP

215.81 ℄

206.00

09.81

2.26

C 7.55

0+00

206.00

9.81

1.63

C 8.18

0+65

198.33

17.48

9.01

C = 8.47

1.39

195.17 ℄

℄ Profile ℄ = 203.80

EL 193.6

10.2

1+50

EL = 198.6

1+05

EL = 203.6

0+65

EL = 209.0

0+05

1+75

1+05

215.81 ℄

193.61

22.20

13.30

C 8.90

1+50

205.19 ℄

188.40

16.79

6.91

C 9.88 ℄

185.40

19.79

11.41

C 8.38

1+65

201.02 ℄

186.58

14.44

7.97

C = 6.47

old 40' N. R.P. on ℄ Now is

55' North end of pipe = F 3.77

2+05 = 40' R.P. on ℄

195.17 ℄

185.40

9.77

10.66

F 9.89

1.18

F 2.07 = To invert at 1+65

1/10/49 - Use 165'

Page 16

Sewer Crossing # 6
Restake.

From Page 17

Sommermeyer
McCoy
Jones

2-4-49

B.M. 283.87 = 62' R.P. to North.
10.17
294.04 ✗
2.75
291.29 ✓
6.06
297.35 ✗ ✓

Elev. Invert of 2% grade.

294.04 ✗

297.35 ✗ 282.30
60' Rad

9	8	7	6	5
End ✓ 281.50	B.C. 292.30	281.50 ✓	281.90 ✓	282.30	283.00 ✓
15.85	15.05	12.54	12.14	11.74	11.04
0.64	0.64	9.67	5.35	5.48	2.75
C15.21	C14.41	C2.87	C6.79	C6.26	C8.29

4	3	2	1
283.70 ✓	284.80 ✓	285.90 ✓	285.90 ✓
13.65	12.55	11.45	11.45
1.20	3.08	9.57	8.02
C12.45	C9.47	C1.88	C3.43

Elevations on State data

Elev. — (Tie in to state Culvert)

state cut stake

103+27 = R.P 32' out from outlet end 150" x 176' Multiplate culvert.

294.04 ✗
12.09
281.95

Marked F 0.77 to Ft.

El. of Stake = 281.95 ✓

77 282.2

No. End Multiplate . EL.= 282.7
So. " " EL. = 287.0

State B.M. 92± North + 10' East of sewer B.C. (on line of state culvert.

stakes 10' west of ℄.

B.M.
283.87
9.25
293.12 ✗

Hwy. Sta. 103+17

Δ 38°-11'-50"
R = 60
L = 40
T = 20.78

Lowest point 286.3
Average Grd. = 286.9
Nat. Grd. 286.9 ft.
Ground
6.8 Rad

10.8
282.3 Grd. EL.

EL. 287.52

Pipe 2 3/16 thick

Set sewer at 281.50

Set Sewer At 2% Gr. = 285.90 Invert

287.0 = inlet 150" Multiplate
282.7 = outlet " "
State Elev.

8
21
2 3/16
3.1 3/16

285.90
2.62
288.52 =

Top of Casement 2.2 Above Grd.

Revision 376+47.08 to 386+44.80

2-3-49

Sommermeyer
McCoy
Jones

Levels - P. 33

For fences etc.
see 1873
52

28

on points called 59°09' in staking line 1950'

33°-50' ↗ 59°09' ↖

Δ 59°-09'-30" Rt.
= 388+90.75 { 1629 / 17

Fd. Hub

386+44.80

See Page 29

Levels 35 & 36

382+80.10 = P.O.T.
Δ 13°-50'-30" Rt.
(= old 384+00 FB 1629/17)

Fd. Hub

chicken wire fence
382+45

set Spike

381+52.15
Δ 16°-45'-30" Lt

Rerun
See 1873
29
7/12/49
to nies Power Pole etc

Δ 2°-49' Rt.

Fd. stub

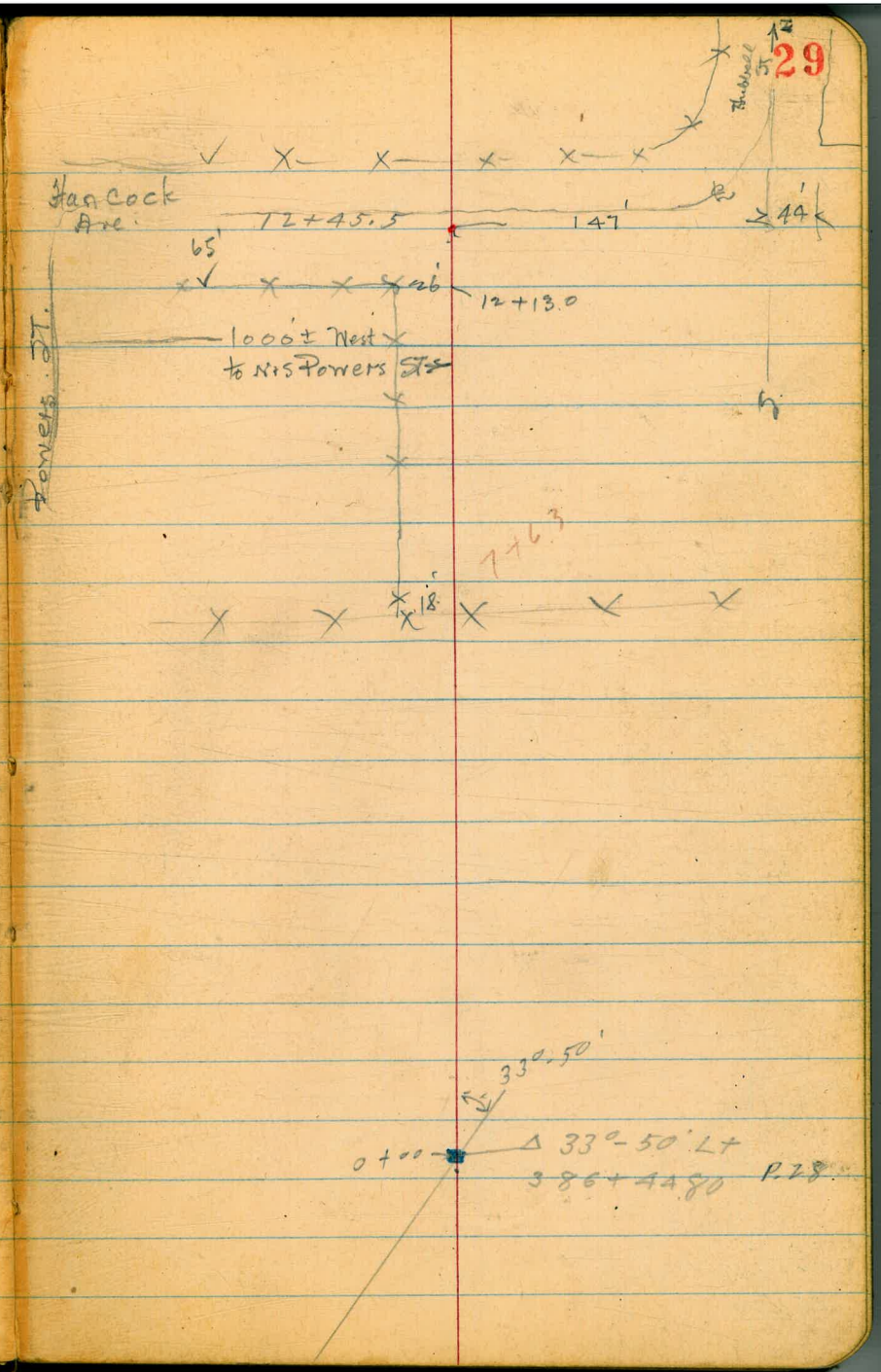
376+47.08 { 2003 / 5
Now = Δ 2°-49' Rt.
Was. Δ 0°-33' Lt.

Feeder line 386+44.80 to North.
To Grantville.

2-3-49

1/3/49.
Sommermeyer
McCoy
Jones

Levels - P. 30 - 32



Lateral to Grantville.

Sketch p. 29

1+05					64.4 ✓ 7.2
0+95					62.6 ✓ 9.0
0+80					62.9 ✓ 8.7
0+75					64.5 ✓ 7.1
T.P.	3.66	⟨71.58⟩ ✓	12.04	⟨67.92⟩ ✓	⟨71.58⟩ ✓
0+40					67.6 ✓ 12.4
0+00 (= old 387+64.70)					77.18 ✓ 2.78 Hub
Hub △ 387+64.70 FB 1629 17	2.78	⟨79.96⟩ ✓	—	77.18	⟨79.96⟩ ✓ 77.18

Finish Grade
N. T. No 3 Dwg 1415-D
= El. 71.00

18' Lt. = start N. + S. barb wire fence

7+63 Cross barb wire fence

7+00

6+00

T.P. 5.83 ⟨72.79⟩ 4.12 ⟨67.46⟩

5+00

4+00

3+00

2+60 16' Lt. = power pole

2+00

1+55 11' Lt. = ctr 1' power pole

⟨71.58⟩

67.6
5.2

67.
5.6
⟨72.79⟩

67.1
1.5

66.7
4.9

66.8
4.8

66.
5.3

⟨71.58⟩

0.42 72.06

12+45 LS = ℄ pave. on l

12+29 Sidge oil Pave

12+22 9' Lt. = 18" popper

fence

12+13 26' Lt = End of N.F.S. barb wire

12+00 10' Rt. = 24" popper

11+25 11' Rt. = 18" popper tree

11+00

10+00

4.48 (72.48) ✓ 4.79 (68.00) ✓

9+00

8+97 = Cross barb wire fence

8+00

(72.79) ✓

℄

72.06 ✓
0.42
Nail

71.5 ✓
1.00

69.5 ✓
3.0

68.0 ✓
4.5

67.9 ✓
4.6
(72.48) ✓

67.6 ✓
5.2

67.4 ✓
5.4

(72.79) ✓

Revision
376+47.08 to 386+44.80
Sketch P 28

379+00 6' Lt. = So. edge oiled road

378+50 8' Lt. = So. edge road

378+00 15' Lt. = So. Edge 10' wide oiled Road.

377+50

377+00

376+53 Bench Mk 1' Left

376+47.08 Stub Δ 2°-49' Rt.

Mon. 3 I No. of 376+47.08 P. 10

1.75 (82.94) — (81.19)

Mon (376+47.08) 81.69 + 6.74 = 87.43 Mag Nail

Sta. 376+00 Grade 84.6 2.8
" 376+36 " 84.8 2.6
" 376+09 " 79.9 7.5
374+89.6 " 78.8 8.6 Grade at Ext Sewer Xing

℄

80.N 2.7

80.1 2.8

79.3 3.6

81.0 1.9

81.5 1.4

81.35 1.59

(82.94)

(Service road to barn)

381+40 3 = start oiled road to South.

381+40 Southerly Side of Road.

381+37 = End 10' wide Cactus patch

381+25 7' Lt. = So edge oiled road

+05 = start 10' wide cactus patch

381+00 10' Lt. = So. edge oiled road

+85 = End 10' wide cactus patch

380+50 11' Lt. = So. edge oiled road

380+41 = start 10' wide cactus patch

T.P. 6.74 (86.65) 3.03 (79.91)

380+00 9° (Rt) = So. edge oiled road. 10' wide

+78 2 E Rt. = Ctr. dead man

+56 4 E' Rt. = Ctr. Pole # 279362

379+50 6 E Lt. = So. Edge road

(82.94)

4

81.98
4.67

83.0
3.7

83.3
3.3

83.0
3.6

83.1
3.5

(86.65)

81.8
1.1

81.
1.7

(82.94)

		℄
382+80 10 = P.O.T. = 384+00 17	FB 1629 / 17	80 8 ✓ / 5.8
382+30	18' Rt. = No. Edge oiled road	76.6 ✓ / 10.0
381+88		80.0 ✓ / 6.7
381+87	past Fence = Cross wire link + pipe	80.8 ✓ / 5.8
381+80	also = End service road 10± Rt. = So. edge oiled road and ℄ = No. Edge 10± wide oiled Road	81.05 ✓ / 5.60
381+52 15 (Δ)	at 90° to back Tang. 10' Rt. = S.w'ly. edge oiled service Road 12' Lt. = No. Edge oiled road = Spike. Δ 16° 45'-30" Lt.	81.77 ✓ / 4.88
381+48 - 7± Rt. = Pole # 503385 H		
⟨86.65⟩ ✓		⟨86.65⟩ ✓

4

386+44.15
388+52.
8.85

P-29

386+44.80 = 0+00 on Grantville line
= also 388+90.25 1629/17

386+14	77.2
385+80	80.1
385+30	81.1
384+80	79.0
384+50	76.6
383+80	76.2
383+54	77.4
383+40	79.7
383+04	80.2

8½ Elevation

Following Elevations from 1629/17

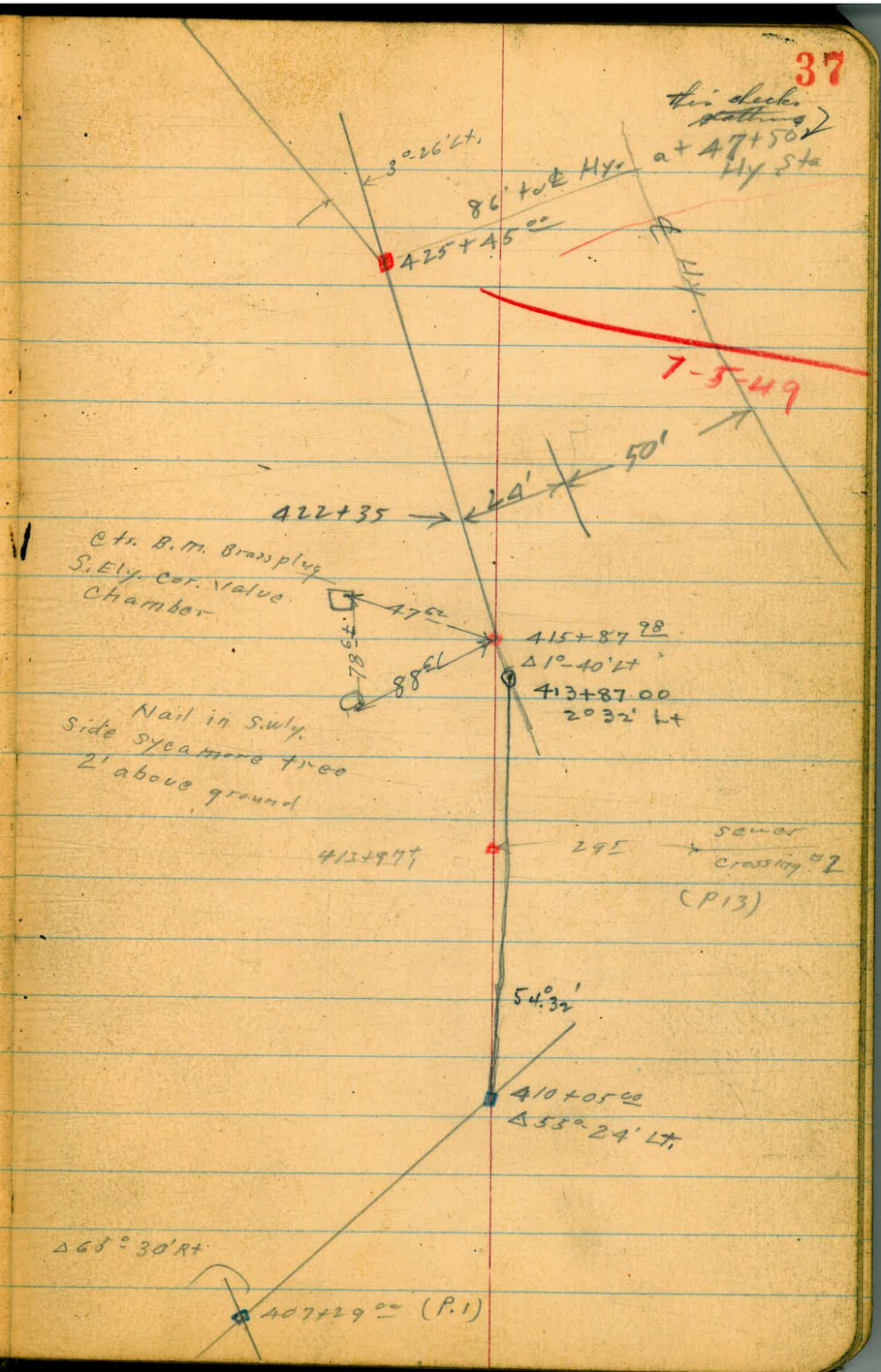
Elevations

Proposed Sewer Alvarado Canyon

2-4-49

Sommermeyer
McCoy
Jones

7-5-49
For new levels
See 1873/26



Cont. P 48

438+44 66
Δ 17°-30' Lt.

Do not use

New line

Abandon This line
from 430+92 East.
See opposite page.

432+72 20 P.O.T.

430+92 00
Δ 15°-12' Rt.
Δ = 26°-11'

See change
Made 7/5/49
1873
27

P.O.T. 432+65 99

430+92 00
Δ = 26°-11' RT.

℄

(P-14) ?
& State Hy.
sta. 484+50

15°-57' Lt.

93-41-30"

55.

303.58

50.

425+45
Δ 3°-26' Lt.

℄

Alvarado Canyon line Levels

Sketch P-37

Sommermeyer
McCoy
Allen

2/23/49

39

413+00					
+50					
412+00					
+50					
T.P.	4.36	(84.12) ✓	12.77	(79.76) ✓	
411+00					
+70					
410+50					
on Hub (Page 21)					
410+05 ±	0.27	(92.53) ✓		(92.26)	

℄

79.3 ✓	
4.8	
79.1 ✓	
5.0	
79.3 ✓	
4.8	
78.9 ✓	
5.2	
(84.12) ✓	
78.7 ✓	
13.8	
79.2 ✓	
13.3	
81.9 ✓	
10.6	
(92.53) ✓	

416+00

T.P. 9.83 (90.44) 3.51 (80.61)

415+87.98 Δ 1° 40' Lt. (P. 37)

+60

415+00

+50

414+—

Note: revised alignment on Map to place M.H. No. 9 Dwg 1416-D opposite this Sewer Xing #2. 23.7' from same

413+87.5 -29 Rt. = outlet 8" Diam. Sewer #2 Crossing

413+50

84.12

(90.44)

80.61
3.51
Hub

80.3
3.8

78.6
5.5

79.6
4.5

77.5
6.6

79.3 77.03
4.8 6.89
.295
invert

79.9
4.2

(84.12)

423 ~					
T.P.	10.49	(93.65) ✓	7.27	(83.17) ✓	
422 ~					
421 ~					
420 ~					
419+ ~					
418+ ~					
417+00					
416+50					
		(90.44) ✓			

	℄	
	83.5 ✓	
	10.1	
	(93.65) ✓	
	8.7 ✓	
	7.7	
	8.7 ✓	
	8.7	
	8.9 ✓	
	9.5	
	8.3 ✓	
	10.1	
	7.9.6 ✓	
	10.8	
	7.9.0 ✓	
	11.4	
	8.0.4 ✓	
	10.0	
	(90.44) ✓	

crossing # 3 (P. 11)

426+41 50' Rt. = outlet end sewer

+40

426 —

+75

425+45.00 = Δ 3°-26' Lt. P. 37 — on hub.

425 —

+70

+35

424+00

93.65 ✓

84.85 ✓

8.80 / 50 = invert

89.6 ✓
4.0

89.3 ✓
4.3

89.0 ✓
4.6

Penna
1893
3rd

89.1.2 ✓
4.53
on Hub.

87.8 ✓
5.8

87.0 ✓
6.7

84.6 ✓
9.0

84.0 ✓
9.7

93.65 ✓

Rerun

187.3
33

429+50

T.P. 8.00 ⟨100.30⟩ 1.35 ⟨92.30⟩

429 —

+71

+50

428 —

+50

427 —

426+55

⟨93.65⟩

93.3
7.0

⟨100.30⟩

92.6
1.0

92.1
1.5

84.3
9.3

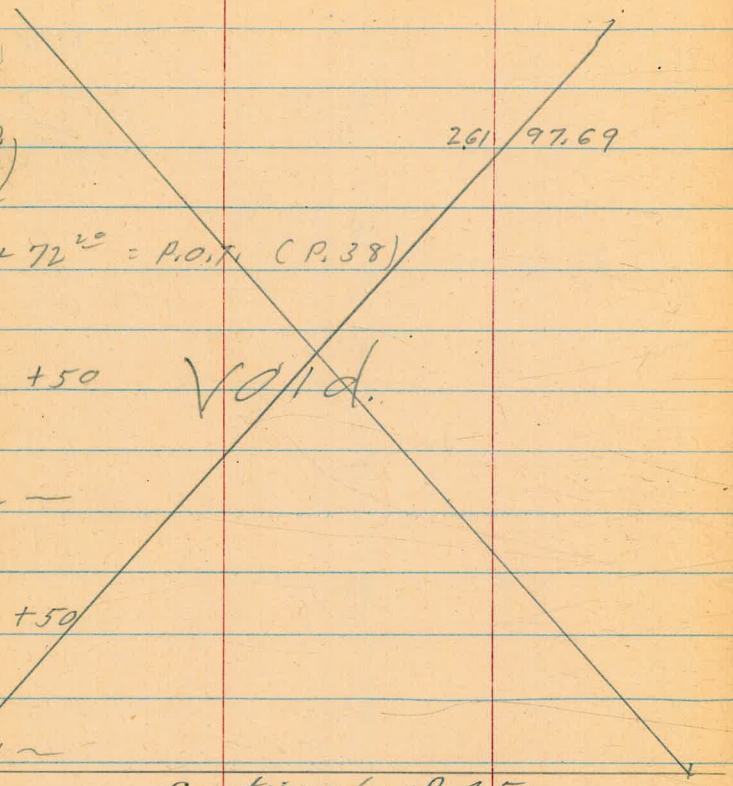
84.1
9.5

83.4
10.2

82.6
11.0

81.3
12.3

⟨93.65⟩



432+72.2 = P.O.T. (P.38)

+50

VOID.

432 ~

+50

431 ~

Continued - P.45

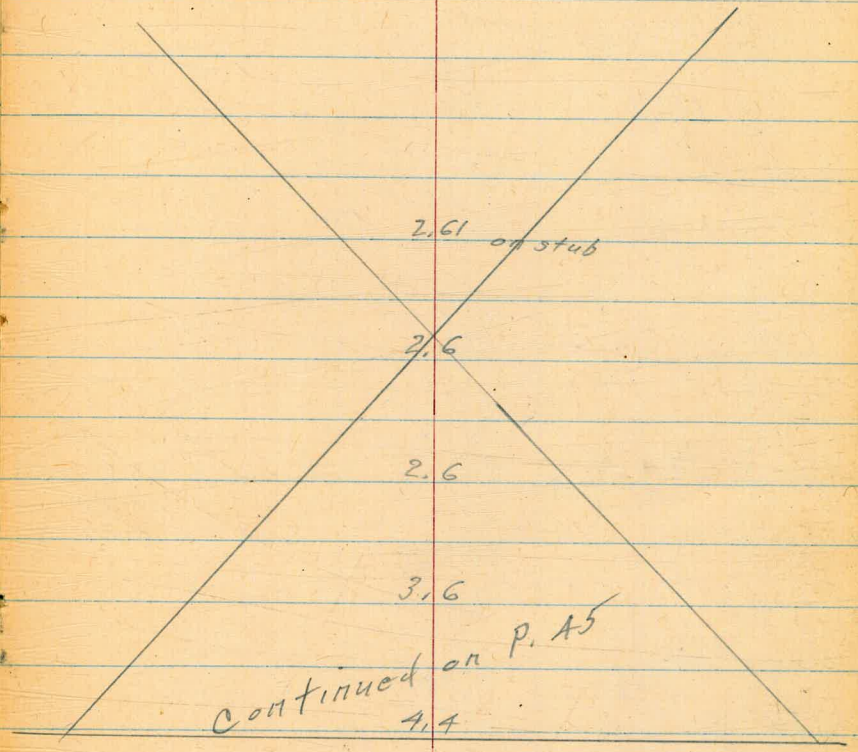
Now = Δ 26°-11' Rt. (P.38)

430+92.2 = ~~Δ 15°-12' Rt. (P-38)~~

+50

430 ~

<100.30>



continued on P. 45

95.85

4.45 on stub

94.8

5.5

94.1

6.2

Rerun
1873
3"

<100.30>

Sketch P.38

+35

96.9
7.6

+15

99.0
5.5

433 —

99.3
5.2

432+65 99 P.O.T.

99.66
4.83 on Hub.

+50

100.1
4.4

432 —

99.N
5.3

Revised 1873/33

+50

98.1
6.4

+48

96.7
7.8

431 —

95.8
8.7

430+92
A.T.6. 11 Rt.
P. 44

8.64 (104.49) — (95.85)

(104.49)

				℄
+50				100.2 ✓
				4.9
T.P.	4.42	⟨105.08⟩ ↓	3.83	100.66 ✓
				⟨105.08⟩ ✓
436 ~				100.1 ✓
				4.4
+50				99.9 ✓
				4.6
435 ~				99.3 ✓
				5.3
+50				99.3 ✓
				5.2
434 ~				97.9 ✓
				6.6
+91				97.8 ✓
				6.7
+84				92.2 ✓
				12.3
433+50				92.9 ✓
				11.6
	104.49			104.49 ✓

Penn
1873
3/5

Levels Cont. on P. 49

T. P. 7.06 ⟨108.78⟩ ✓ 3.36 ⟨101.72⟩ ✓

438 +44 66 = Δ 17° 30' Lt

+25

+05

438 ~

+90

+50

+20

437~

436+70

⟨105.08⟩ ✓

101.72 ✓
3.36
on stub.

102.6 ✓
2.5

102.5 ✓
2.6

100.8 ✓
4.3

99.4 ✓
5.7

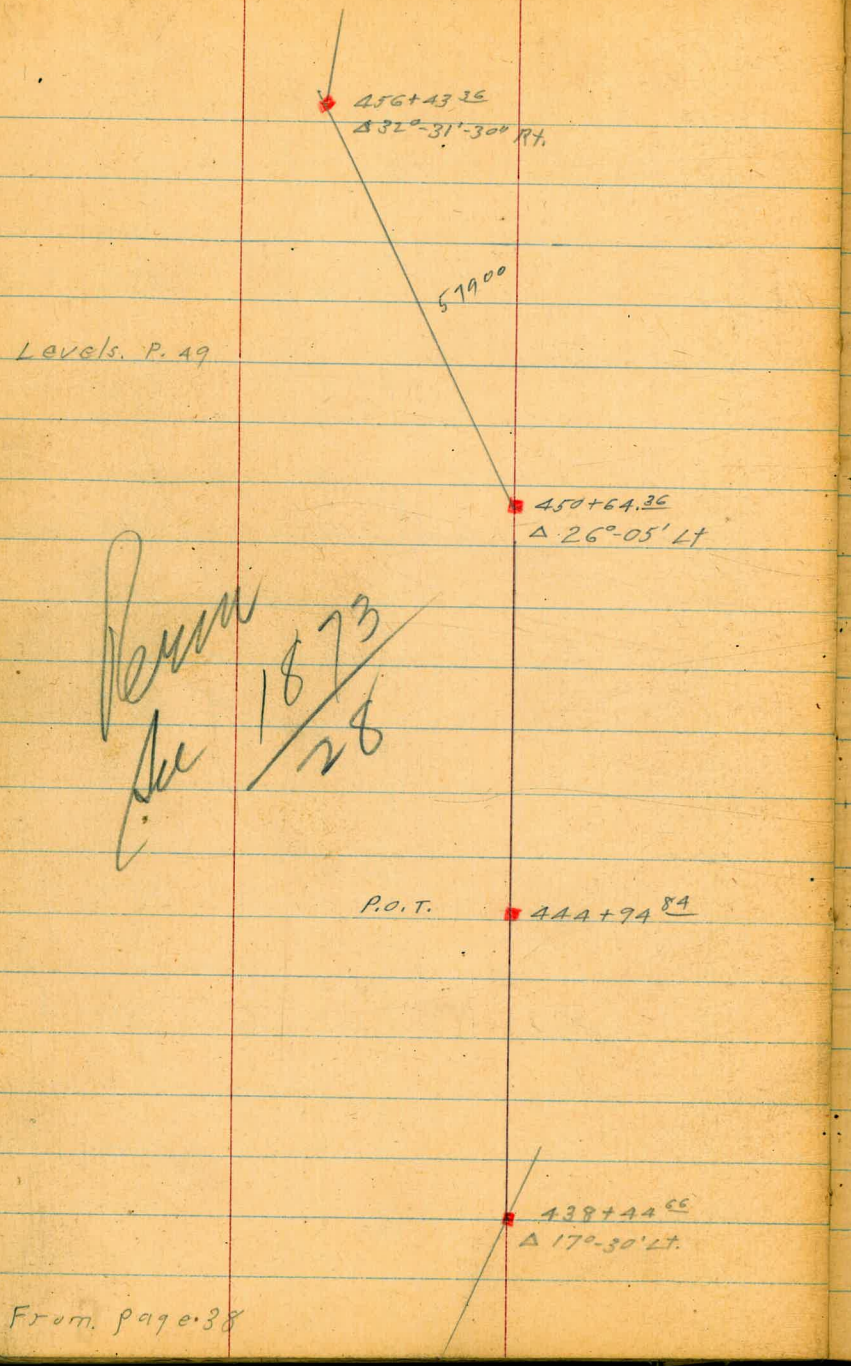
100.6 ✓
4.5

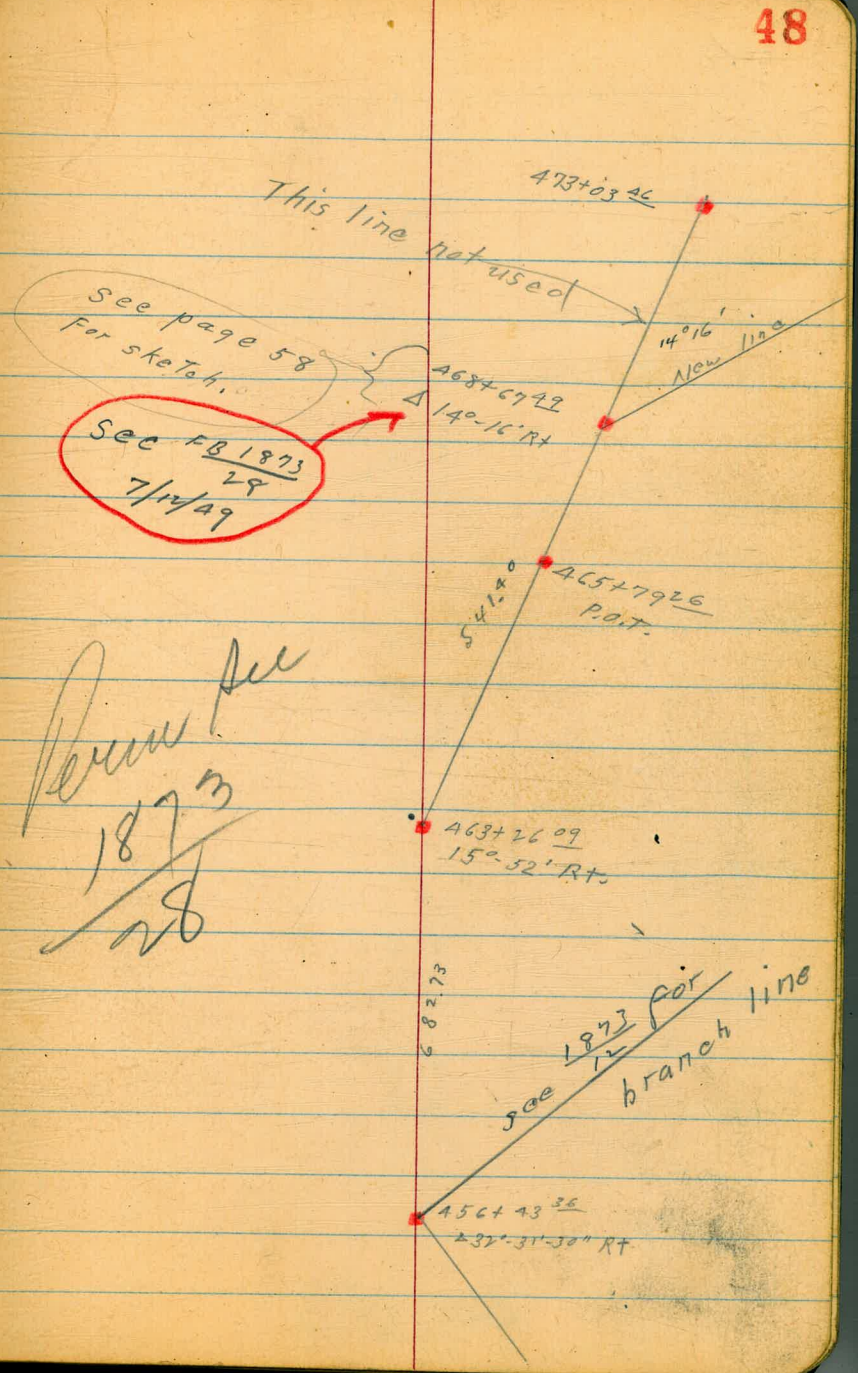
99.9 ✓
5.2

97.3 ✓
7.8

100.8 ✓
4.3
⟨105.08⟩ ✓

Perm
1873
35


456+43 36
Δ 32°-31'-30" Rt.
579.00
Levels. P. 49
450+64.36
Δ 26°-05' Lt
Penn Ac 1873/28
P.O.T.
444+94 84
438+44 66
Δ 17°-30' Lt.
From page 38


This line not used
473+03 46
See page 58 For sketch.
See FB 1873/28 7/12/49
468+67 42
Δ 14°-16' Rt
14°16' New line
465+79 26
P.O.T.
5°41'40"
Penn Ac 1873/28
463+26 09
15°-52' Rt.
682.73
see 1873/12 for branch line
456+43 36
Δ 32°-31'-30" Rt

Sketch - P. 48

442 ~

+70

+50

441 ~

+50

440 ~

+50

439 ~

438+50

<108.78>

From P. 47

105.2
3.6

104.8
4.0

102.8
6.0

101.6
7.2

103.0
5.8

102.5
6.3

101.8
7.0

101.6
7.2

101.7
7.1

<108.78>

+50

445 —

444+94.84 = P.O.T.

T.P. 7.36 ⟨115.98⟩ ✓ 0.16 ⟨108.62⟩ ✓

+50

444 —

+50

443

442+50

⟨108.78⟩ ✓

112.0 ✓
4.0

111.5 ✓
4.5

111.18 ✓
4.80
on Hub

⟨115.98⟩ ✓

108.7 ✓
0.1

107.5 ✓
1.3

106.4 ✓
2.4

106.1 ✓
2.7

105.6 ✓
3.2

⟨108.78⟩ ✓

℄

T.P. 8.16 (121.00) 3.14 (112.84)

450 ~

+50

449 ~

+50

448 ~

+50

447 ~

Read 4.8 at 44
Rod at Δ = 4.8

111.6 ground
4.8
116.4

+50

℄ X-ing #4 +44

126.3 Pk 15
Top 8" sewer pipe
+6.16
123.3 +10.2 Yer
120.0 +7.8 Yer
113.3

Dist
200' Stadia (Boot 0.2)
126' +4°37' Vert ∠ (Boot 0.2)
96' " " (Boot 1.1)
31' Level 3.1

79°00' off Back Line to ℄ X-ing #4 (P 15)

.08075 5000 Yer.
16.15 000 Rod
16' cuts
116.5
13.5 +8
1.6 +1.6 +1.26
1.6

446 ~

(115.98)

112.8
3.2

112.9
3.1

111.8
4.2

111.1
4.9

110.6
5.4

110.6
5.4

110.4
5.6

111.5
4.5

111.6
4.4

(115.98)

454 ~

+50

453 ~

+50

452 ~

+50

451 ~

450+64 36 = Δ 26° 05' Lt. (P. 48)

450+50

121.0 ✓

℄

117.2 ✓
3.8

116.5 ✓
4.5

115.9 ✓
5.1

115.3 ✓
5.7

114.5 ✓
6.5

114.0 ✓
7.0

113.7 ✓
7.3

113.50 ✓
7.50

113.1 ✓
7.9

121.00 ✓

458~

+50

457~

456+50

T.P. 7.58 ⟨127.67⟩ ✓ 0.91 ⟨120.09⟩ ✓

456+43.36 = Δ 32°-31'-30" Rt. (P. 48) Nov 1873 1 ✓

456~

+50

455~

454+50

⟨121.00⟩ ✓

℄

121.6 ✓
6.1

122.4 ✓
5.3

121.4 ✓
6.3

120.0 ✓
7.7
⟨127.67⟩ ✓

120.09 ✓
0.91
on Hub

119.6 ✓
1.4

119.6 ✓
1.4

119.0 ✓
2.0

118.1 ✓
2.9

⟨121.00⟩ ✓

T.P. 12.62 ⟨136.27⟩ ✓ 4.02 ⟨123.65⟩ ✓

462 ~

+50

461 ~

+50

460 ~

+75

+50

459 ~

458 + 50

⟨127.67⟩ ✓

123.3 ✓
4.4

122.5 ✓
5.2

121.6 ✓
6.1

121.0 ✓
6.7

120.9 ✓
6.8

120.9 ✓
6.8

121.8 ✓
5.9

122.8 ✓
4.9

121.9 ✓
5.8

⟨127.67⟩ ✓

+79 26 = P.O.T.

+50

465 ~

T.P. ~ 10.77 ⟨146.84⟩ 0.20 ⟨136.07⟩

+50

464 ~

+50

463 + 26 07 Δ 15°-52' Rt.

463 ~

462 + 50

⟨136.27⟩

139.49
7.35

138.9
7.9

136.7
10.1

⟨146.84⟩

134.9
1.4

131.5
1.8

129.1
7.2

126.29
9.98 on hub.

125.5
10.8

123.8
12.5

⟨136.27⟩

℄

470 ~

469 + 50

T.P. 12.53 (159.16) 0.21 (146.63) T.P. A

469 ~ Levels on Page 63

468 + 67.49 (Line Change 2/25/49 Δ 14°16' Rt.
See Pg. 48 + 58 for Sketch)

+ 50

468 ~

+ 50

467 ~

+ 50

466 ~

(146.84)

152.8
6.4

148.1
11.1

(159.16)

140.0
4.8

139.3
7.5

140.7
6.1

142.0
4.8

141.9
4.7

141.3
5.5

140.0
6.8

(146.84)

℄

Set. B.M.		2.61	167.89
473+03 ℄ = ℄ Redwood =			
473 —			
+50			
472 —			
T.P.	11.62	170.50	158.88
+50			
471 —			
470+50			
			159.16

167.89
2.61 on Hub.

167.9
2.6

165.3
5.2

161.3
9.2

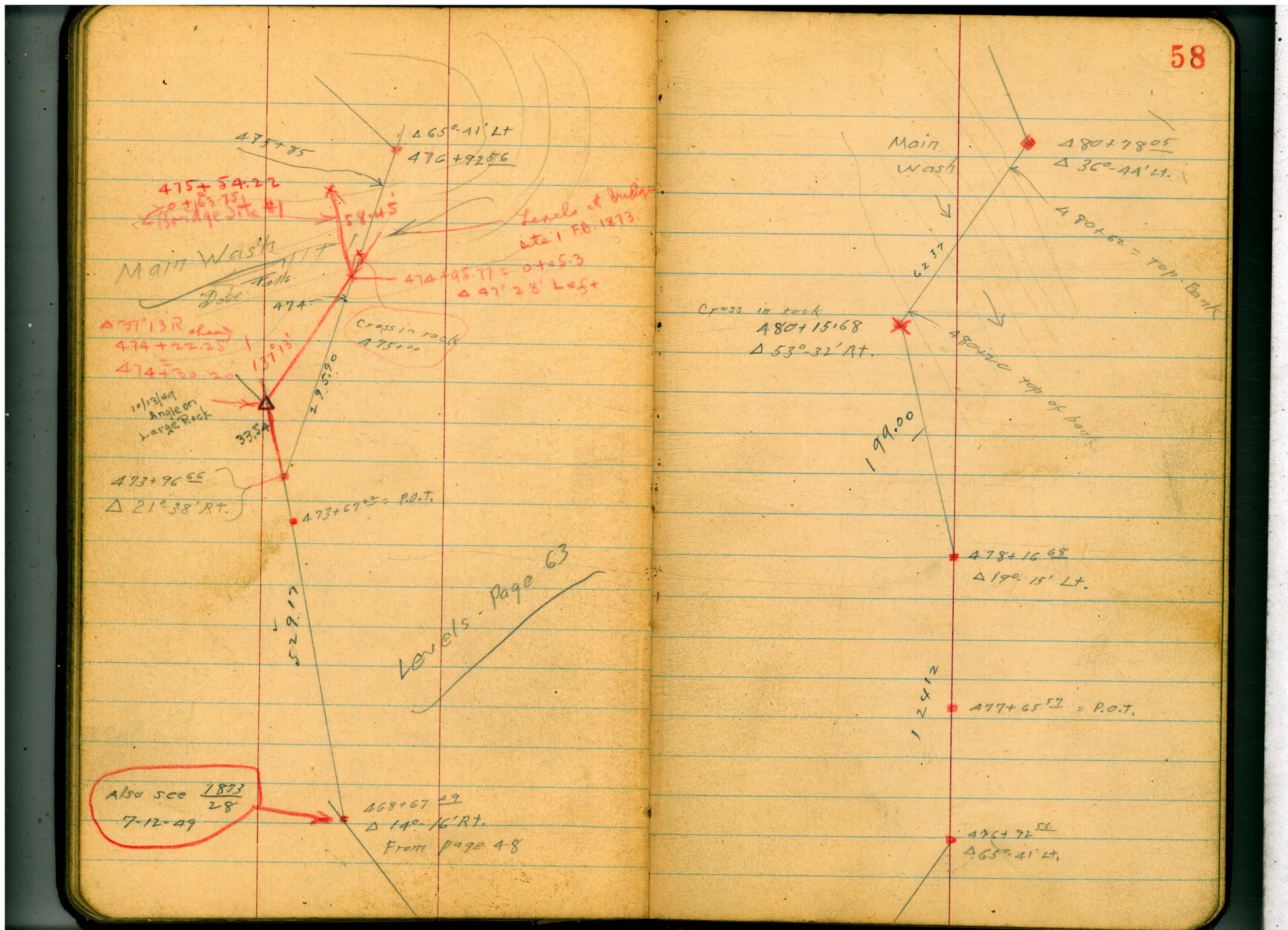
170.50

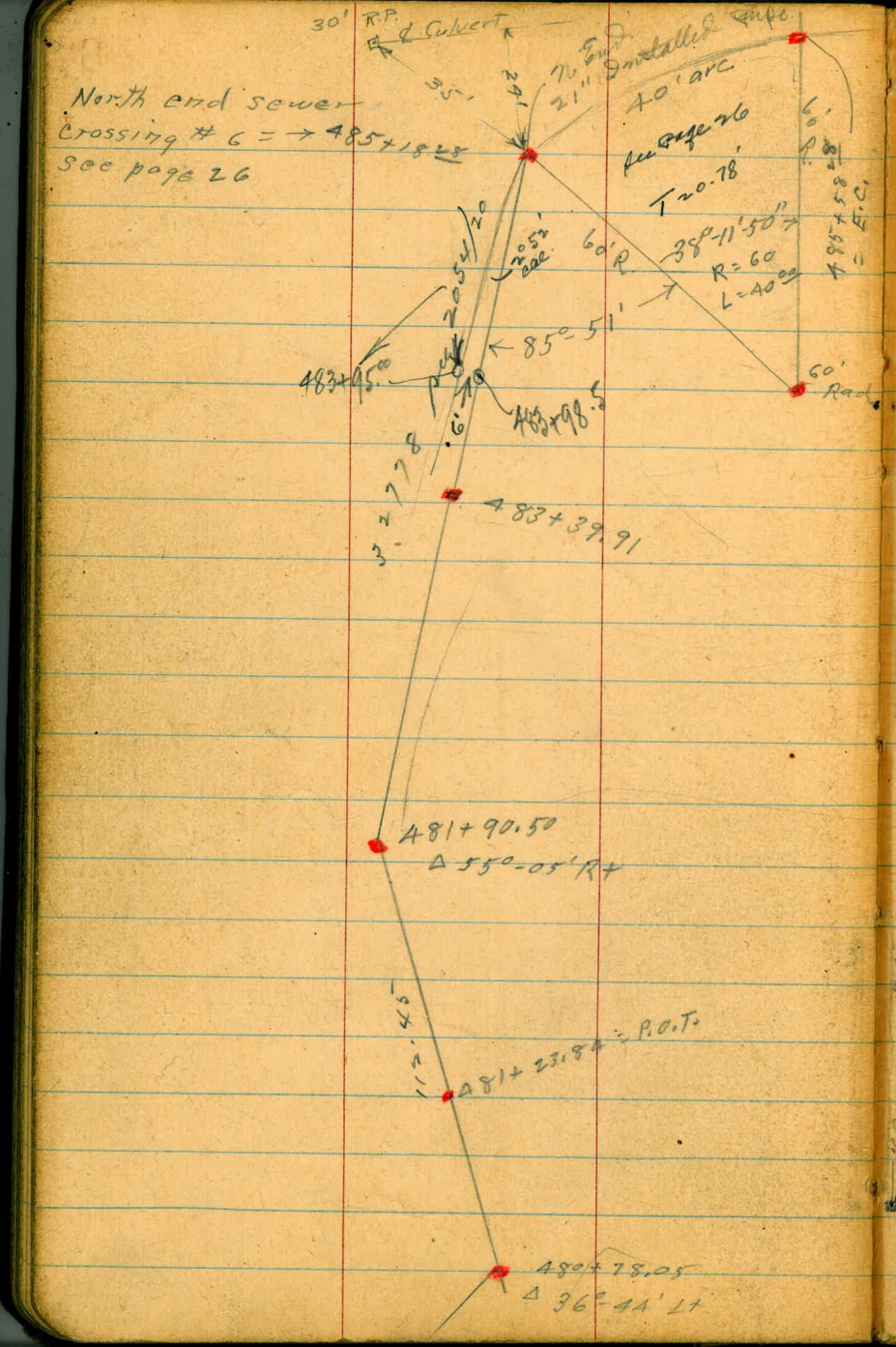
156.5
3.0

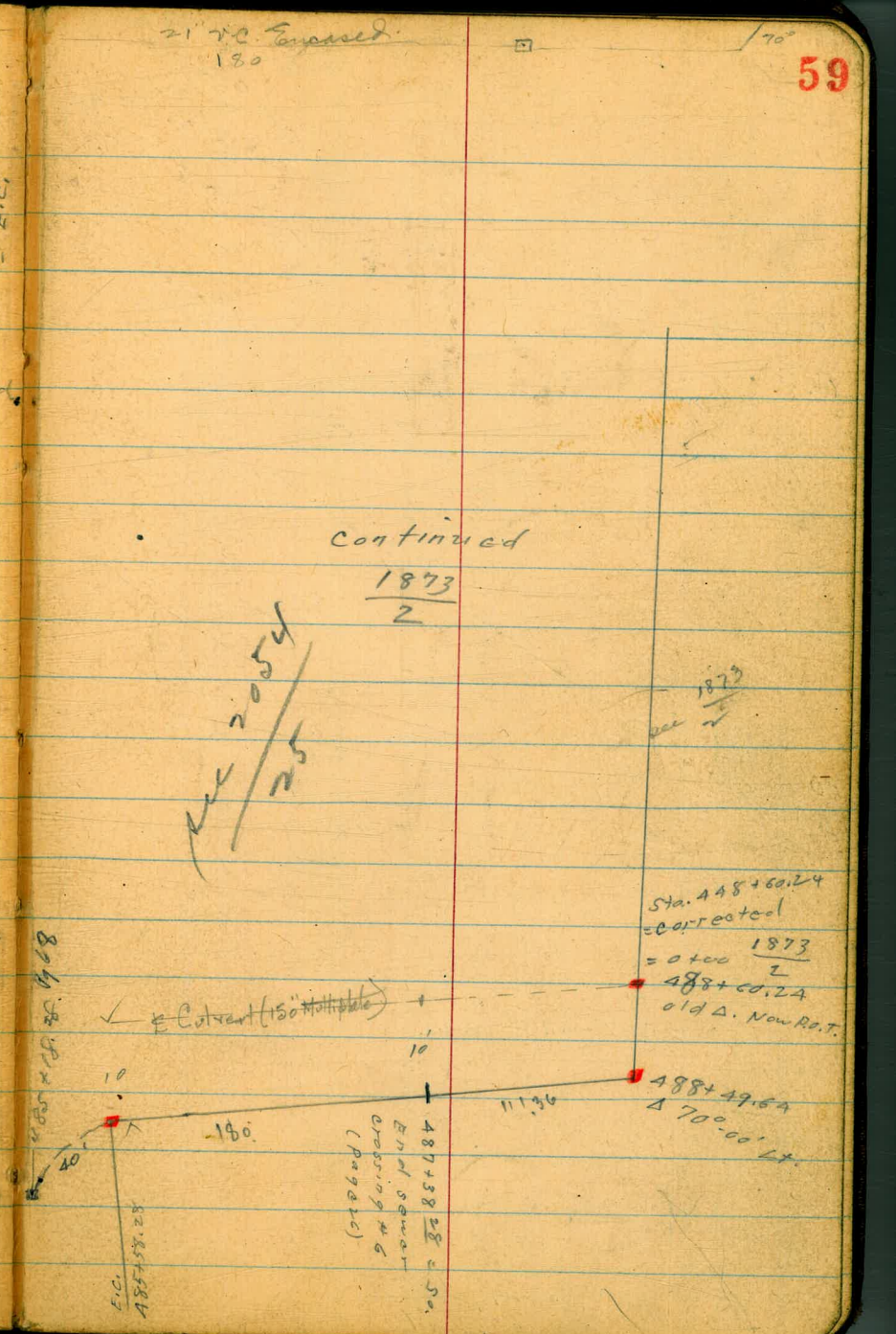
151.8
7.4

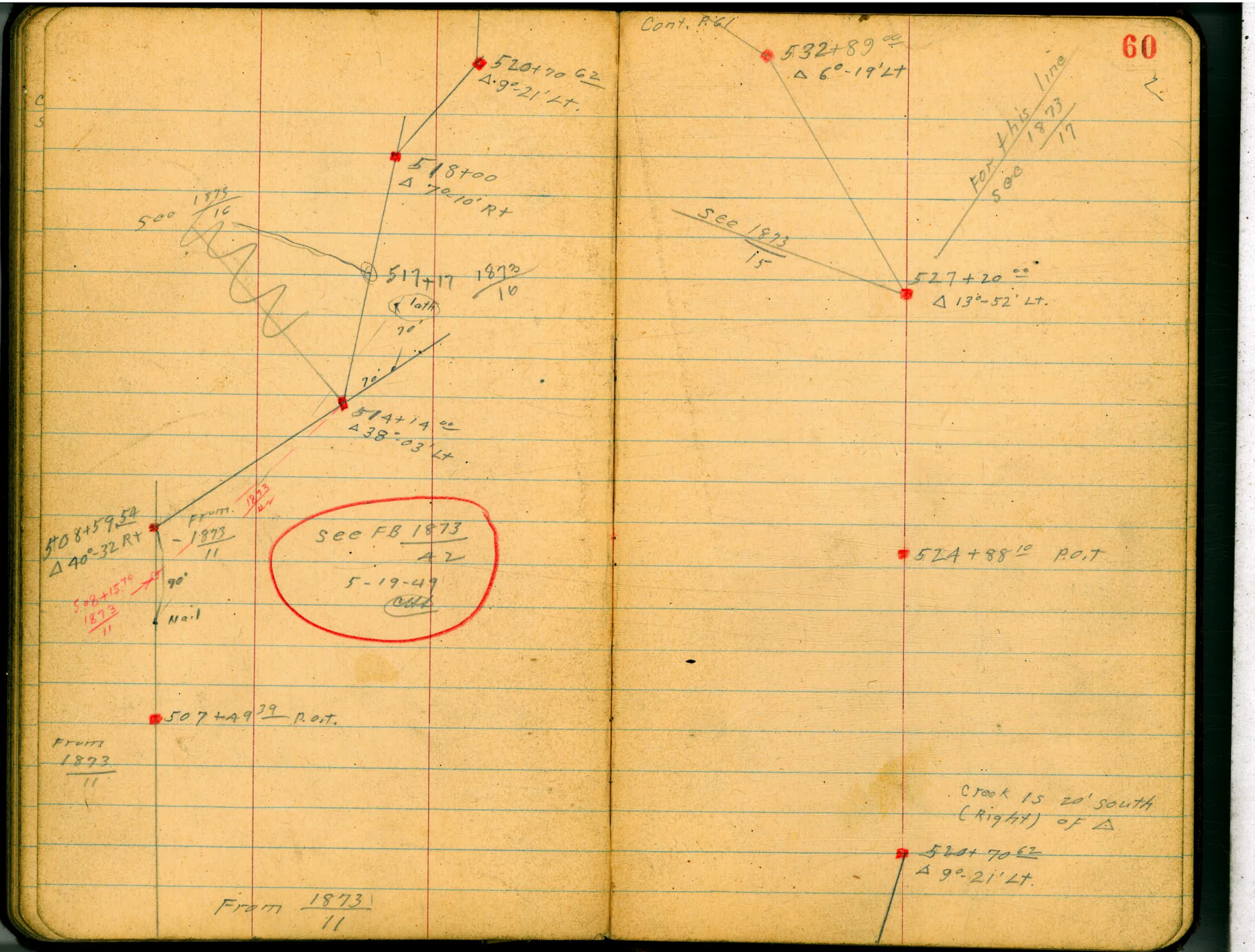
153.7
5.5

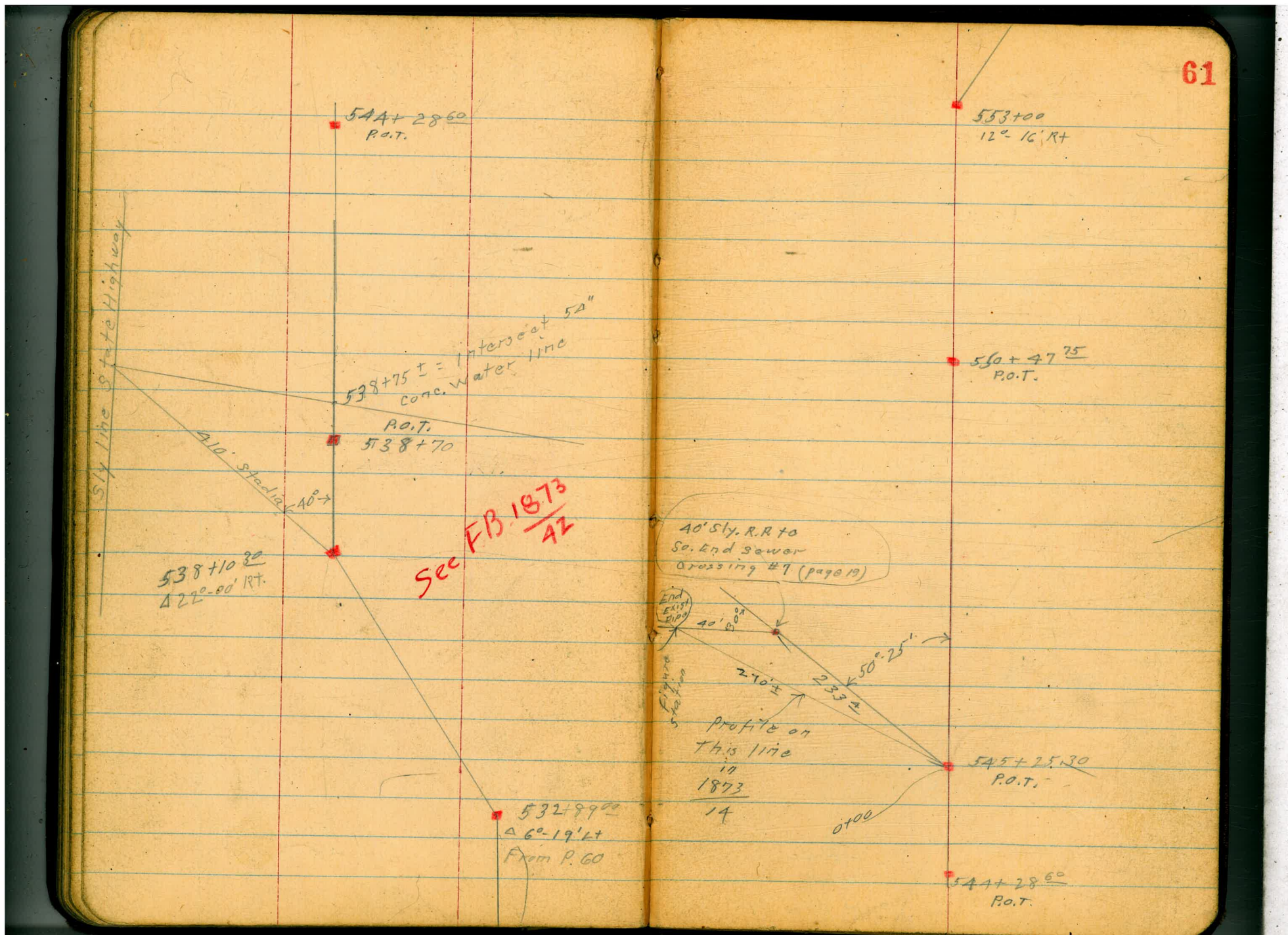
159.16

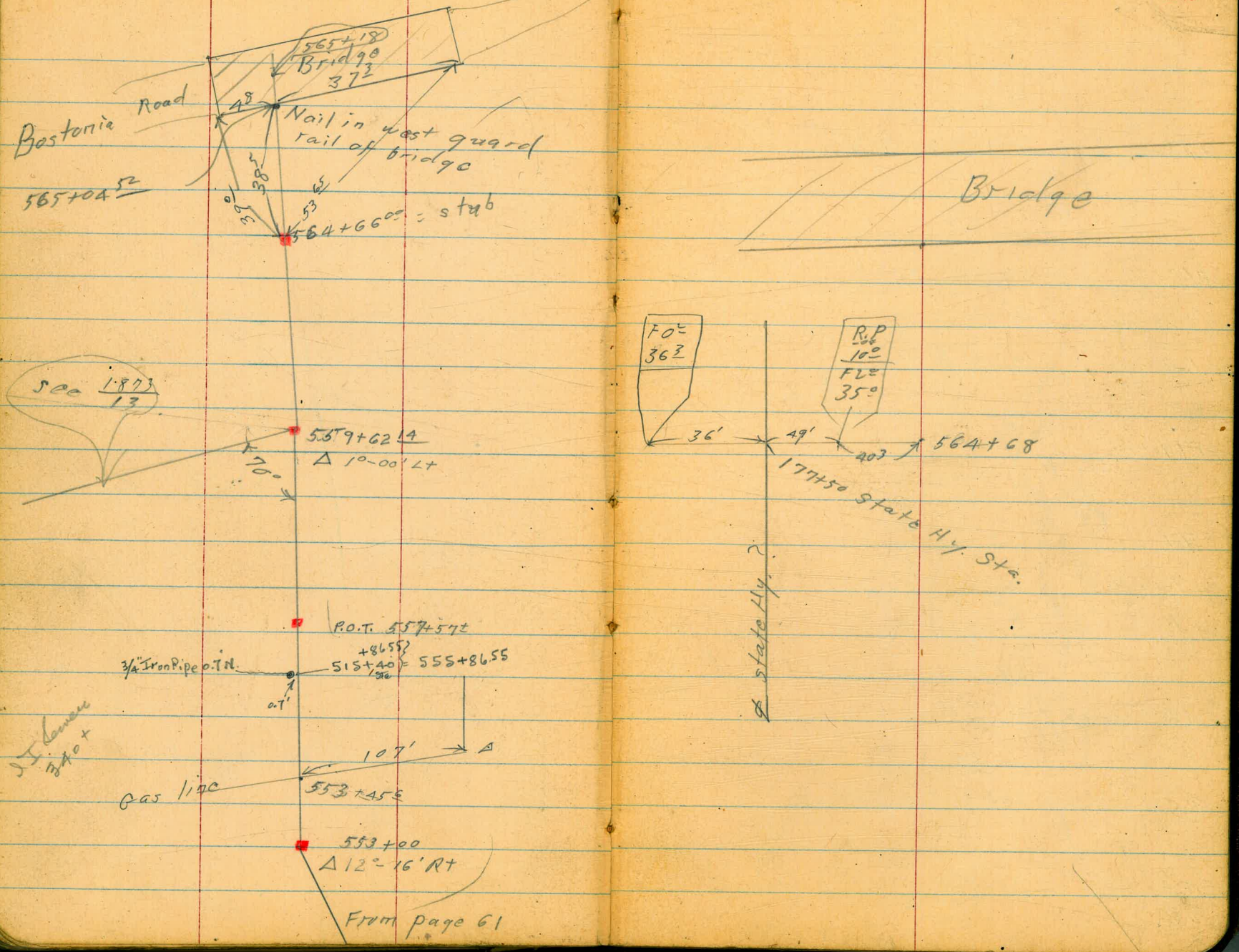

475+85
Δ 65°-41' Lt
476+92.56
475+54.22
0+63.75
Δ 58°-31' Lt #1
58.45
Levels at bottom
site 1 Feb. 1873.
Main Wash
Rocks
Dobe
474+95.71 = 0+53
Δ 47°-28' Left
474+
Δ 71°13' R ahead
474+22.25
474+30.20
137°13'
Cross in rock
473+00
10/13/deg
Angle on
Large Rock
33.54
29.90
473+96.66
Δ 21°-38' Rt.
473+67.22 = P.O.T.
52.97
Levels. page 63
Also see 1873/28
7-12-49
468+67.49
Δ 14°-16' Rt.
From page 4-8
Main
Wash
480+78.05
Δ 36°-44' Lt.
480+62 = top bank
62.37
Cross in rock
480+15.68
Δ 53°-32' Rt.
480+22.6 top of bank
199.00
478+16.68
Δ 19°-15' Lt.
477+65.57 = P.O.T.
1 41 N
476+92.56
Δ 65°-41' Lt.


30' R.P.
℄ Culvert
N. End 21" Installed Pipe
40' arc
T = 0.18'
38°-11'-50"
R = 60
L = 40.00
60' R.
60' Rad.
485+58.28 = E.C.
North end sewer
Crossing # 6 = → 485+18.28
See page 26
485+45.00
485+98.28
485+39.91
481+90.50
Δ 55°-05' Rt
481+23.84 = P.O.T.
480+78.05
Δ 36°-44' Lt


21" V.C. Exposed
180
70°
Continued
1873/2
Sta. 488+60.24 = Corrected = 0+00
488+60.24 old Δ. Now P.O.T.
℄ Culvert (150" Multiplate)
488+49.64
Δ 70°-00' Lt.
180.
11.36
40'
E.C. 487+58.28
Cross Section of Curve (Radial)
Sta. 487+58.28 = P.C.


Cont. P.G.L.
532+89 cc
Δ 6°-19' Lt
520+70 62
Δ 9°-21' Lt.
518+00
Δ 7°-10' Rt
500 1873/16
517+17 1873/10
lath
70'
70'
514+14 cc
Δ 38°-03' Lt.
508+59.54
Δ 40°-32 Rt
From 1873/11
- 1873/11
See FB 1873 A2
5-19-49
CLH
90°
Mail
508+15.70
1873/11
507+49.39 P.O.T.
From 1873/11
From 1873/11
for this line 1873/17
500
See 1873/15
527+20 cc
Δ 13°-52' Lt.
524+88.10 P.O.T
Creek is 20' South (Right) of Δ
520+70.62
Δ 9°-21' Lt.


544+28 60
P.O.T.
S½ line State Highway
538+75 ± = Intersect 54" conc. water line
P.O.T.
538+70
410' Stadia
40°
538+10 30
Δ 22°-00' Rt.
See FB 1873/42
532+89 00
Δ 6°-19' Lt
From P. 60
553+00
12°-16' Rt
560+47 75
P.O.T.
40' Sly. R.R to So. End Sewer Crossing #7 (page 19)
End Exist Pipe
40'
50° 25'
270'±
233'±
Figure Station
Profile on This line in 1873/14
545+25.30
P.O.T.
0+00
544+28 60
P.O.T.


565+18
Bridge
37½
Road
Bostonia
48°
Nail in west guard rail of bridge
565+04 52
38½
65
53
564+66 = stub
See 1·873/13
559+62.4
Δ 1°-00' Lt
70°
P.O.T. 557+57±
3/4" Iron Pipe o.T.N.
515+40 +8655 = 555+8655
0.7'
107'
Δ
Gas line
553 ±45±
553+00
Δ 12°-16' Rt
From page 61
FO±
36½
R.P.
10°
FL±
35°
36'
49'
40½
564+68
177+50 State Hy. Sta.
℄ State Hy.
Bridge

Sketch Page 58

473+96.66 Δ 21°-38' Rt. (P.58)

473+67.22 = P.O.T. (P.58)

473 + 20.
472 + 97.5
472 + 75

472+60

471+70

471 —

470+10

470 —

469 —

468+67.49 Δ 14°-16' Rt. (Page 56)

T.P."A" 138 (148.01) — (146.63)
P.56

Note. See page 68 for Correction

3/7/49

218.56 = Elev
217.9

these levels used

216.5 = Elev.
207.5 = " at trunk.

199.2
192.5

188.7 = Elev.

174.0 = Elev

169.6 = Elev.

160.2 Elev

158.7 = Elev.

143.3
4.7

139.6
8.39 on hub

(148.01)

216.14
- 8.64
207.50
- 8.3
199.2
6.7
192.5
3.8
188.7

10/7/49 Recheck Levels from 468+67.49 to 472+60 FB 2054 - 79

adjustment Also to be made

Established to Elev. shown on

Elev 2054 - 79

		⟨241.75⟩ ✓		228.8 ✓
T.P.	12.93	241.09	0.00	~~228.16~~
476 ~				
475+85	(P 58)			
475+52				
475+10				
475+02				
474+90				
474+40				
474 ~ start canyon.				
B.M. = 473+96 ⁶⁶		⟨228.8⟩		⟨218.56⟩
P.63	10.26	~~228+16~~		217.90

(Void (5+ 20.54 / 5+11)

should be 18.56 see page 68 for correction in Elevation

	224.5 ✓
	4.3
	224.3 ✓
	4.5
	207.6 ✓
	21.2
	203.3 ✓
	25.5
	214.4 ✓
	14.4
	214.4 ✓
	14.4
	201.6 ✓
	27.2
	218.5 ✓
	10.3
	⟨228.8⟩ ✓
	~~228.16~~

					244.7 ✓
479 ~					9.5
					253.0 ✓
478+45					1.2
					249.8 ✓
478+16.68 Δ 19°-15' Lt. (P.58)					5.0
					249.6 ✓
478					4.6
					245.8 ✓
477+50					8.4
		254.16 ✓		241.06 ✓	254.16 ✓
T.P.	13.10	253.50	0.69	240.40	~~253.50~~
					236.8 ✓
477 ~					4.9
					235.28 ✓
476+92.5 Δ 65°-41' Lt. (P.58)					6.47
					233.3 ✓
+60					8.4
					228.7 ✓
476+40		241.75 ✓			13.0
		~~241.09~~			241.75 ✓
					~~241.09~~

480+78.35 Δ 36°-44' Lt. (P.58)

480 +62

+61

480+32

480+31

480+22

480 +20

480+15.68 Δ 53°-22' Rt. (P.58)

T.P. 7.99 ⟨261.75⟩ ~~261.09~~ 0.40 ⟨253.76⟩ ~~253.10~~

479+80

479+50 ⟨254.16⟩ ~~253.50~~

℄

256.8
1.9

251.8
9.9

240.0
21.7

239.5
22.2

242.1
19.0

241.1
20.6

253.6
8.1

254.4
7.3
~~261.09~~
⟨261.75⟩

256.6
1.6

246.2
8.0
⟨254.16⟩
~~253.50~~

483~

+50

482~

Page
Check 32' Nly. R.P. T.40 275.17 = 281.95 + 0.12 = 275.83

T.P. 12.15 ⟨283.23⟩ ~~282.57~~ ⟨271.08⟩ 2.10 ~~270.42~~

481+90 50 Δ 55°-05' Rt. (P.59)

+65

481.2384 P.O.T (P.59)

T.P. 12.08 ⟨273.18⟩ ~~272.42~~ 0.65 ⟨261.10⟩ ~~260.44~~

275.7
7.5

274.4
8.8

271.8
11.4

⟨283.23⟩ ~~282.57~~

271.1
2.1

271.0
2.2

269.0
4.0

⟨273.18⟩ ~~272.52~~

473+96 ℄ Page 63.
Note corrected back to station
this 0.66 Error should be

State Elev. = 283.87
612.
City Elev = 277.75
277.09
.66

B.M. = 6" N.W. R.P. for
Multiplate Culvert. (P 26) 5.48 ~~277.09~~ (283.87)
as corrected 277.75 (State)

for Crossing See P. 26

485+18.28 = Δ + B.C. Ar. See P. 59

485 ~

484 ~

283.23 ✓
~~283.57~~

1.8.

35 / 158 / 193 / 278.4 / 273.5

35 / 200 / 2.35 / 275.4 / 2.73 / 275.4 / 3.25 / 272.00

10.17

35 / 8.6 / 121

35 / 123 / 1.58 / 275.4 / 273.82

277.75
3.51
281.26 XI
5.71
275.55 = Approx IG
7.1
274.16
7.5
273.76
7.8
273.46
8.4
272.86
10.17
271.09

Levels Cont. 1873 / 3

276.6 ✓
6.6

275.9 ✓
7.3

274.2 ✓
9.0

283.23 ✓
~~283.57~~

Prelim to Murray Blvd.

Sketch Pg 6v

509 —			321.4 ✓ 5.8
508+57.54 Δ	40°-32' Rt. (P.60)		322.58 ✓ 4.67
+50			322.4 ✓ 4.8
508 —			321.4 ✓ 5.8
507+50			320.1 ✓ 7.1
507+15			319.7 ✓ 7.5
507 —			321.2 ✓ 6.0
506+57	1873/11 dam produced.	intersect face of	322.0 ✓ 5.2
B.M.#4 1873/10	7.14 ⟨327.25⟩ ✓	⟨320.11⟩ ✓ 1873/10	⟨327.25⟩ ✓

Levels Cont. from

T.P. 4.03 ⟨335.17⟩ 0.63 ⟨331.14⟩

517~

516~

515~

514+14.00 = Δ 38°-03'-14. (AGO)

514~

513~

T.P. 6.34 ⟨331.77⟩ 1.82 ⟨325.43⟩

512~

511~

510+00

⟨327.25⟩

℄

328.0
3.8

326.9
4.9

326.8
5.0

326.18
5.59
on stub

326.4
5.4

326.4
5.4
⟨331.77⟩

325.0
2.2

322.5
4.7

321.5
5.7

⟨327.25⟩

521 ~

520+70 62 Δ 9°-21' Lt (P. 60)

520 ~

+50

519 ~

+70

+45

+22

518 Δ 7°-10' Rt. (P. 60)

335.17 ✓

330.1 ✓
5.1

330.18 ✓
4.99
on stub

329.4 ✓
5.8

329.6 ✓
5.6

326.4 ✓
8.8

325.2 ✓
10.0

326.0 ✓
9.2

330.7 ✓
4.5

331.15 ✓
4.02
on stub

335.17 ✓

+50

527+20.00 = Δ 13°-52' Lt. (P.60)

527 ~

526 ~

525 ~

524+88.10 = P.O.T. (P-60)

T.P. 6.37 ⟨340.02⟩ ✓ 1.52 ⟨333.65⟩ ✓

524 ~

523 ~

522 ~

⟨335.17⟩ ✓

334.3 ✓
5.7

335.41 ✓
4.61

335.7 ✓
4.3

335.9 ✓
4.1

334.5 ✓
5.5

334.54 ✓
5.48 ✓
⟨340.02⟩ ✓ on stub

333.3 ✓
1.9

332.6 ✓
2.6

331.8 ✓
3.4

⟨335.17⟩ ✓

T.P. 8.72 (346.46) 2.28 (337.74)

+50

530 ~

+92

creek

+50 cross

+

+46

529 ~

528+80

528+40

Cross creek

527+90

(340.02)

℄

337.5
2.5

336.6
3.4

335.0
5.0

333.7
6.3

336.0
4.0

334.9
5.1

333.9
6.1

333.3
6.7

332.7
7.3

(340.02)

T.P. 8.58 (353.48) 1.56 (344.90)

535+85

535+20

+85

+50

534~

533~

532+89 = Δ 6°-19' Lt. (P. 60)

+75

532~

531~

(346.46)

344.5
2.0

341.4
5.1

342.4
4.1

341.6
4.9

341.7
4.8

341.5
5.0

340.25
6.21
on stub.

341.8
4.7

340.5
6.0

338.8
7.7

(346.45)

T.P. 7.68 (359.24) 1.92 (351.56)

541+~

+40

540+30

+75

539~

538+75 = Aprox. crossing of 54" water line

538+10 30° Δ 22° Rt (P. 61)

538~

537~

536~

(353.48)

℄

351.7
1.8

349.6
3.9

347.9
5.6

348.7
4.8

347.9
5.6

347.1
6.4

348.30
5.18
on Hub

347.2
6.3

346.2
7.3

345.0
8.5

(353.48)

547 ~

T.P. 7.35 ⟨364.95⟩ ✓ 1.64 ⟨357.60⟩ ✓

546 ~

+75

+50

545+25.30 P.O.T. (P.61)

+50

544+45

544 ~

543 ~

542 ~

⟨359.24⟩ ✓

℄

359.0 ✓

6.0

⟨364.95⟩ ✓

357.0

2.2

355.8

3.4

353.5

5.7

355 30

3.94 on stub

351 7

7.5

355.3

3.9

354 3

4.9

352.9

6.3

35~ 9

6.3

⟨359.24⟩ ✓

T.P. 8.21 (375.38) ✓ 1.97 (367.17) ✓

555 ~

554 ~

553+00 = Δ 12°-16' Rt. (P. 61)

T.P. 6.64 (369.14) ✓ 2.45 (362.50) ✓

552 +

551+25

551 ~

550+47.75 P.O.T. (P. 61)

550 ~

549 ~

548 ~

(364.95) ✓

℄

367.1 ✓
2.0

365.6 ✓
3.5

364.35 ✓
4.79
(369.14) ✓ on stub

363.1 ✓
1.8

361.3 ✓
3.6

360.3 ✓
2.6

360.47 ✓
2.48
on stub

361.5 ✓
3.4

359.9 ✓
5.0

360.0 ✓
4.9
(364.95) ✓

℄

563~

562~

561~

+20

460+12

T.P. 8.77 ⟨380.49⟩ ✓ 3.66 ⟨371.72⟩ ✓

559+62 ⅓ Δ01°-06 Lt. (P.62)

559~

558~

557~

556~

374.9 ✓
5.6

374.5 ✓
6.0

372.4 ✓
8.1

369.5 ✓
11.0

372.7 ✓
7.8
⟨380.49⟩ ✓

371.72 ✓
3.66 on stub.

371.2 ✓
4.2

370.8 ✓
4.6

369.1 ✓
6.3

368.0 ✓
7.4
⟨375.38⟩ ✓

0, 4.5
1.5

565+18 ± Bridge. Corrected EL on deck:

B.M. = 383.00 (corrected EL.)
5.00
388.00
5.45
382.55

382.55 = EL. Bridge deck ± Bridge

382.89
C 1 2
389.01 state data

State B.M. = Chisel □ N.W. end Bridge

3.36 382.89 (Marked 389.12)
↖ City data

374.5 ✓
11.7

(386.25) ✓

565+04 ± West line bridge

T.P. 10.87 (386.25) 5.11 (375.38) ✓

375.38 ✓
5.11 on stub

564+66 stub. (A62

373.9 ✓
6.6

564+~

372.8 ✓
7.7

563+40

(380.49) ✓

(380.49) ✓

233.85
138
23523
1183
22340

82.9

81
73.5
4.6

79.3

563

Stat
N.W.C

56

T

56

56

563

A31+51.74 to A45+26.54 in 1631

+4.1 374180 450 3793.0

+4.5 3.21 112 64.2 321 321 357.52

950 1290 2240 112.0

5.6 35 91 5.6 40 187

8119 6.12 8121

106 91

×0.75 614 6.89

31.26 415-88 1538

2.66 43@.98 174

488+60.24 5.63 494 23 24

431+26.20 = P.O.T.

P.O.T. 29 25+63 Bl. off. 337.4

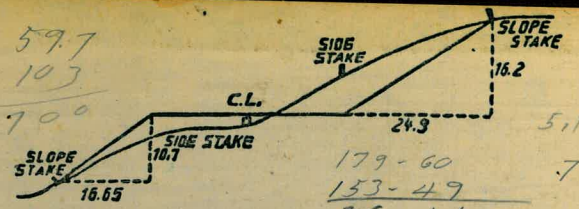
2 2×20 = Edge Fish Way 347.8

28×57 346.4

23×62 342.8

24×50 341.5

59.7 498.103 498.700



5.1

179-60 153-49 26 11

79.3

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	71.20	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

THE NATIONAL BLANK BOOK COMPANY
HOLYOKE MASSACHUSETTS
NEW YORK CHICAGO BOSTON SAN FRANCISCO