LAKE HODGES CONDUIT AS CONSTRUCTED. Division #1.

Station	Grades	Type of Construction	42 in. Pipe	Open Conduit	Steel Flume #	Covered Conduit
0+00	254.00					
		Monolithic Pipe	266.0			
2+66	253.73					
		Open conduit		452.0		
7+13.5	253.53					
		Steel Flume			18.0	
7+31.5	253.52					
		Open conduit		42.0		
7+70.5	253.50					
		Steel Flume			108.0	
8+78.5	253.39					
		Open conduit		581.0		
14+56.5	253.13					
		Steel Flume			183.0	
16+39.5	252.95					
		Open conduit		717.0		
23+53.5	252.63					
		Steel flume			63.0	
24+15.5	252.57					
		Open Conduit		318.0		
27+31.5	252.43					
		Steel Flume			18.0	
27+49.5	252.41					
		Open conduit		232.0		
29+78.5	252.31					
		Steel Flume			18.0	
29+96.5	252.30					
		Open conduit		95.0		
30+88.5	252.25					
		Steel Flume			33.0	
31+21.5	252.22					
		Open conduit		426.9		
35+45.4	252.02					
		Steel Flume			18.0	
35+63.4	252.01					
		Open conduit		302.1		
38+62.5	251.86					
		Steel Flume			33.0	
38+95.5	251.83					
		Open conduit		72.0		
39+64.5	251.80					
		Steel flume			78.0	
40+42.5	251.72					
		Open conduit		126.7		
41+66.2	251.67					
		Steel Flume			33.0	
41+99.2	251.64					
		Open conduit		67.8		
42+64.0	251.61					
		Steel Flume			33.0	
42+97.8	251.60					
		Open conduit		99.5		
43+95	251.54					
		Syphon Intake Box		10.0		

Station	Grades	Type of Construction	42 in. Pipe	Open Conduit	Steel Flume #	Covered Conduit
44+05	247.54					
		42" Pipe	261.5			
46+50	247.27					
		Siphon Outlet Box		10.0		
46+60	251.27					
		Open conduit		230.		
48+90	251.16					
		Siphon Intake Box		10.		
49+00	247.16					
		42" Pipe	300.7			
51+95	246.85					
		Siphon Outlet Box		10.		
52+05	250.85					
		Open conduit		103.9		
53+08.9	250.80					
		Covered Conduit				209.1
55+18	250.71					
		Open conduit		06.58		
55+22.98	250.71					
		Steel Flume			36	
55+58.98	250.67					
		Open conduit		02.53		
55+60.01	250.67					
		Covered conduit				151.5
57+11.51	250.59					
		Open conduit		02.4		
57+12.45	250.59					
		Steel Flume			18	
57+30.41	250.58					
		Open conduit		02.91		
57+31.1	250.58					
		Covered conduit				23.9
57+55	250.57					
		Open conduit		03.94		
57+57.44	250.58					
		Steel Flume			18	
57+75.44	250.55					
		Open conduit		02.2		
57+76.14	250.55					
		Covered Section				258.4
60+34.54	250.43					
		Open conduit		03.18		
60+36.22	250.43					
		Steel flume			63	
60+99.22	250.37					
		Open conduit		02.3		
61+01.02	250.37					
		Covered conduit				185.7
62+86.72	259.26					
		Open conduit		05.42		
62+90.64	250.26					
		Steel Flume			72	
63+62.64	250.20					
		Open conduit		02.62		

Sheet #3

Station	Grades	Type of Construction	42 in. Pipe	Open conduit	Steel Flume #	Covered Conduit
63+63.76	250.20					
		Covered conduit				664.95
70+28.71	249.82					
		Open conduit		22.90		
71+51.61	249.84					
=71+38		Siphon Intake Box		10		
71+48	245.84					
		42' Pipe	215			
73+63	245.62					
=73+50		Siphon Outlet Box		10		
73+60	249.62					
		Total	1043.2	4082.88	843	1493.55

Steel Flume extends 1.5 ft. at each end beyond the center of 1st and last Trestle bent.

LAKE HODGES CONDUIT AS CONSTRUCTED. Division #2 & #3

Station	Grades	Type of Construction	42 in. Pipe	Open conduit	Steel Flume #	Covered Conduit
73+60	249.62					
		Open conduit		342.6		
77+02.6	249.47					
		Steel flume			42.0	
77+44.6	249.43					
		Open conduit		645.6		
83+90.2	249.14					
		Covered conduit				8.0
83+98.2	249.13					
		Open conduit		174.9		
85+73.1	249.05					
		Steel Flume			36.0	
86+09.1	249.01					
		Open conduit		324.4		
89+33.5	248.86					
		Steel Flume			33.0	
89+66.5	248.83					
		Open conduit		193.2		
91+59.7	248.74					
		Covered conduit				10.0
91+69.7	248.73					
		Open conduit		901.0		
100+70.7	248.33					
		Siphon intake box		9.0		
100+79.7	244.33					
		42" Pipe	152.7			
102+29.0	244.16					
		Siphon Outlet Box		8.0		
102+37.0	248.16					
		Open conduit		736.7		

Sheet #4

Station	Grades	Type of Construction	42" Pipe	Open conduit	Steel Flume #	Covered Conduit
109+73.7	247.83					
		Steel Flume			18.0	
109+91.7	247.81					
		Open conduit		449.8		
114+41.5	247.61					
		Steel flume			33.0	
114+74.5	247.58					
		Open conduit		205.3		
116+79.8	247.49					
		Steel flume			54.0	
117+33.8	247.43					
		Open conduit		1401.8		
131+35.6	246.80					
		Covered conduit				10.0
131+45.6	246.81					
		Open conduit		822.8		
139+68.4	246.41					
		Covered conduit				10.0
139+78.4	246.40					
		Open conduit		671.6		
146+50	246.08					
		Covered conduit				10.0
146+60	246.07					
		Open conduit		1566.6		
162+26.6	245.53					
		Covered conduit				10.0
162+36.6	245.52					
		Open conduit	*	1621.6		
178+58.2	245.01					
		Covered conduit				15.0
178+73.8	244.99					
		Open conduit		244.2		
183+17.4	244.85					
		Covered conduit				8.0
183+25.4	244.85					
		Open conduit		881.3		
192+06.7	244.60					
		Open conduit		4.0		
192+10.7	243.60					
		42" Pipe	191.3			
194+02.0	244.44					
		Open conduit		1678.0		
210+80.0	243.94					
		Siphon Intake Box		8.0		
210+88.0	239.94					
		42" Pipe	1105.0			
221+86.0	242.88					
		Manhole		4.0		
(221+90.0	242.88					
(221+78.0		42" Pipe	686.0			
228+60.0	241.33					
		42" gate & Air Vent	1.4			
228+61.4	"					
		Open conduit		8.6		

Station	Grades	Type of Construction	42" Pipe	Open Conduit	Steel Flume #	Covered Conduit
228+70	242.27					
		Open Conduit		1080.0		
239+50	241.94					
		Unlined conduit				
245+50	241.52					
		Total	~~2122.0~~ 2135.	14183.0	216.0	81.0

Location of Special Structures

43+89.04	to	43+93.04	Sand traps		
44+17	to	45+32	Siphon Trestle #II		
45+24.40			Siphon Blow off.		
48+84.30	to	48+88.30	Sand trap		
49+52	to	51+32	Siphon Trestle #12		
49+75.42			Siphon Blowoff		
71+46.91	to	71+50.91	Sand trap		
72+13.53	to	72+82.53	Siphon Trestle #21		
72+79.53			Siphon Blowoff		
100+65	to	100+69	Sand traps	210+75 to 210+79	
101+36	to	101+90	Siphon Trestle #27		
101+49.3			Siphon Blowoff		
215+92.7			Siphon Blowoff		
225+53.6			Siphon Blowoff		

Location and number of units in flume trestles

Trestle No.	Length	Station	No. of units in bent
1	15	7+15	1
		7+30	1
2	105	7+72	1
		7+87	2
		8+02	2
		8+17	2
		8+32	3
		8+47	4
		8+62	3
		8+77	1
3	180	14+58	1
		14+73	1
		14+88	1
		15+03	1
		15+18	2
		15+33	4
		15+48	5
		15+63	8
		15+78	8
		15+93	6
		16+08	4
		16+23	2
		16+38	1
4	60	23+55	1
		23+70	2
		23+85	4
		24+00	2
		24+15	1
4A	15	27+33	1
		27+48	1
5	15	29+80	1
		29+95	1
6	30	30+90	1
		31+05	2
		31+20	1
7	15	35+46.9	1
		35+61.9	1
8	30	38+64	1
		38+79	2
		38+94	1
9	75	39+66	1
		39+81	1
		39+96	4
		40+11	4
		40+26	1
		40+41	1

Trestle No.	Length	Station	No.of Units in bent
10	30	41+67.7	1
		41+82.7	1
		41+97.7	1
10A	30	42+65.5	1
		42+80.5	1
		42+95.5	1
12	180	49+52	0
		49+67	1
		49+82	1
		49+97	1
		50+12	2
		50+27	1
		50+42	1
		50+57	1
		50+72	1
		50+87	1
		51+02	1
		51+17	2
		51+32	0
13	33	55+24.48	1
		55+33.48	1
		55+48.48	2
		55+57.48	1
14	15	57+13.91	1
		57+28.91	1
15	15	57+58.94	1
		57+73.94	1
16	60	60+37.72	1
		60+52.72	1
		60+67.72	3
		60+82.72	2
		60+97.72	1
18	69	62+90.64	1
		63+05.64	2
		63+20.64	6
		63+29.64	5
		63+44.64	4
		63+59.64	1
21	69	72+13.53	0
		72+22.53	0
		72+37.53	2
		72+52.53	5
		72+67.53	5
		72+82.53	0
24	33	85+74.6	1
	35	85+83.6	3
		85+98.6	2
		86+07.6	1

Trestle No.	Length	Station	No.of Units in bent
25	30	89+35	1
		89+50	3
		89+65	1
28	15	109+75.2	1
		109+90.2	1
29	30	114+43	1
		114+58	3
		114+73	1
30	51	116+81.3	1
		116+90.3	2
		117+02.3	4
		117+17.3	3
		117+32.3	1
22	39	77+04.1	1
		77+19.1	3
		77+34.1	1
		77+43.1	1

Total length of Trestles -	Flume	990
	Pipe Siphons	318
		1308

54-A

DESCRIPTION OF CARROLL CONDUIT

Beginning at a point whence Section corner common to Sections 18 and 19, Township 13 South, Range 2 West, and Sections 13 and 24, Township 13 South, Range 3 West, San Bernardino Meridian, bears South 28° 57' West, 3831.94 feet;

Thence South 70° 14' West 258.27 feet;

Thence South 50° 43' West 93.01 feet;

Thence on a 200 ft. Radius Curve to the right 31.65 feet;

Thence South 59° 47' West 151.24 feet;

Thence on a 200 ft. Radius Curve to the right 35.84 feet;

Thence South 70° 03' West 137.13 feet;

Thence South 58° 54' West 61.00 feet;

Thence South 27° 54' West 197.04 feet;

Thence on a 100 ft. Radius Curve to the right 43.23 feet;

Thence South 52° 40' West 62.53 feet;

Thence on an 80 ft. Radius Curve to the left 47.01 feet;

Thence South 19° 00' West 142.19 feet;

Thence on a 100 ft. Radius Curve to the right 22.69 feet;

Thence South 32° 00' West 134.38 feet;

Thence on a 200 ft. Radius Curve to the right 34.56 feet;

Thence South 41° 54' West 275.60 feet;

Thence on a 200 ft. Radius Curve to the left 28.27 feet;

Thence South 33° 48' West 271.68 feet;

Thence on a 200 ft. Radius Curve to the right 105.88 feet;

Thence South 64° 08' West 146.94 feet;

Thence on a 100 ft. Radius Curve to the right 60.85 feet;

Thence North 81° 00' West 15.55 feet;

Thence South 56° 40' West 119.68 feet;

Thence on a 100 ft. Radius Curve to the right 71.44 feet;

Thence North 82° 24' West 17.65 feet to a point on the east line of Section 13, Township 13 South, Range 3 West, San Bernardino Meridian, whence the corner common to Sections 18 and 19, Township 13 South, Range 2 West, and Sections 13 and 24, Township 13 South, Range 3 West, San Bernardino Meridian, bears South 1768.16 feet;

Thence continuing North 82° 24' West 81.28 feet;

Thence on a 100 ft. Radius Curve to the right 39.39 feet;

Thence North 59° 50' West 45.56 feet;

Thence South 82° 44' West 75.82 feet;

Thence on a 50 ft. Radius Curve to the right 71.00 feet;

Thence North 15° 54' West 95.68 feet;

Thence North 60° 38' West 38.62 feet;

Thence on a 50 ft. Radius Curve to the left 36.65 feet;

Thence South 77° 22' West 34.23 feet;

Thence South 31° 02' West 87.55 feet;

Thence on a 50 ft. Radius Curve to the right 38.83 feet;

Thence South 75° 32' West 10.74 feet;

Thence on a 70 ft. Radius Curve to the right 46.71 feet;

Thence North 66° 14' West 18.95 feet;

Thence on a 50 ft. Radius Curve to the left 44.27 feet;

Thence South 63° 02' West 17.21 feet;

Thence on a 50 ft. Radius Curve to the right 52.16 feet;

Thence North 57° 12' West 140.57 feet;

Thence South 70° 18' West 36.01 feet;

Thence on a 100 ft. Radius Curve to the left 37.52 feet;

Thence South 48° 48' West 77.09 feet;

Thence on a 40 ft. Radius Curve to the right 65.83 feet;
Thence North 36° 54' West 54.30 feet;
Thence on an 80 ft. Radius Curve to the left 60.55 feet;
Thence North 80° 16' West 110.64 feet;
Thence South 35° 12' West 80.24 feet;
Thence on a 40 ft. Radius Curve to the right 59.46 feet;
Thence North 59° 38' West 19.06 feet;
Thence on a 120 ft. Radius Curve to the left 43.98 feet;
Thence North 80° 38' West 94.78 feet;
Thence on a 30 ft. Radius Curve to the left 31.15 feet;
Thence South 39° 52' West 33.05 feet;
Thence on a 50 ft. Radius Curve to the right 48.00 feet;
Thence North 85° 08' West 305.27 feet;
Thence on a 70 ft. Radius Curve to the right 37.87 feet;
Thence North 54° 08' West 3.05 feet;
Thence on a 60 ft. Radius Curve to the left 65.10 feet;
Thence South 63° 42' West 8.30 feet;
Thence on a 60 ft. Radius Curve to the right 69.11 feet;
Thence North 50° 18' West 76.56 feet;
Thence on a 400 ft. Radius Curve to the left 167.55 feet;
Thence North 74° 18' West 161.47 feet;
Thence North 68° 18' West 41.32 feet;
Thence on a 100 ft. Radius Curve to the left 36.65 feet;
Thence North 89° 18' West 9.98 feet;
Thence on a 150 ft. Radius Curve to the right 56.29 feet;
Thence North 67° 48' West 9.34 feet;
Thence on a 70 ft. Radius Curve to the right 52.94 feet;
Thence North 24° 28' west 0.03 feet;

Thence on a 60 ft. Radius Curve to the left 87.44 feet;
Thence South 72° 02' West 33.65 feet;
Thence on a 50 ft. Radius Curve to the right 47.41 feet;
Thence North 53° 38' West 63.80 feet;
Thence North 76° 18' West 141.12 feet;
Thence on a 100 ft. Radius Curve to the left 28.51 feet;
Thence South 87° 22' West 13.26 feet;
Thence on a 100 ft. Radius Curve to the right 38.75 feet;
Thence North 70° 25' West 111.06 feet;
Thence North 76° 18' West 244.0 feet;
Thence South 77° 42' West 105.76 feet;
Thence on a 100 ft. Radius Curve to the right 31.42 feet;
Thence North 84° 18' West 56.92 feet;
Thence on a 200 ft. Radius Curve to the right 27.93 feet;
Thence North 76° 18' West 91.86 feet;
Thence South 61° 42' West 116.81 feet;
Thence on a 60 ft. Radius Curve to the right 37.35 feet;
Thence North 82° 38' West 41.10 feet;
Thence North 77° 38' West 52.12 feet;
Thence on a 200 ft. Radius Curve to the right 29.67 feet;
Thence North 69° 08' West 79.83 feet;
Thence on a 200 ft. Radius Curve to the right 40.14 feet;
Thence North 57° 38' West 89.67 feet;
Thence on a 100 ft. Radius Curve to the right 36.65 feet;
Thence North 36° 38' West 4.73 feet;
Thence on a 60 ft. Radius Curve to the left 48.35 feet;
Thence North 82° 48' West 164.96 feet;
Thence on a 100 ft. Radius Curve to the left 42.76 feet;

Thence South 72° 42' West 81.49 feet;

Thence on a 60 ft. Radius Curve to the right 57.60 feet;

Thence North 52° 18' West 72.33 feet;

Thence on a 100 ft. Radius Curve to the right 60.21 feet;

Thence North 17° 48' West 47.88 feet;

Thence North 85° 49' West 45.00 feet;

Thence on a 100 ft. Radius Curve to the left 21.82 feet;

Thence South 81° 41' West 95.05 feet;

Thence on a 400 ft. Radius Curve to the right 44.22 feet;

Thence South 88° 01' West 65.98 feet;

Thence on a 70 ft. Radius Curve to the right 73.30 feet;

Thence North 31° 59' West 2.13 feet;

Thence on a 100 ft. Radius Curve to the left 5.06 feet to a point whence a point 2640 feet north of the corner common to Sections 13, 14, 23 and 24, Township 13 South, Range 3 West, San Bernardino Meridian, bears West 383.46 feet;

Again beginning at a point whence a point 2640 feet north of the corner common to Sections 13, 14, 23 and 24, Township 13 South, Range 3 West, San Bernardino Meridian, bears East 695.19 feet;

Thence on an 80 ft. Radius Curve to the right 81.33 feet; from a tangent which bears South 53° 12' West;

Thence North 68° 33' West 46.78 feet to a point whence a point 2640 feet north of the corner common to Sections 13, 14, 23 and 24, Township 13 South, Range 3 West, San Bernardino Meridian, bears East 809.73 feet;

Again beginning at a point whence a point 2640 feet north

of the corner common to Sections 13, 14, 23 and 24, Township 13 South, Range 3 West, San Bernardino Meridian, bears East 961.19 feet;

Thence South 69° 47' West 37.90 feet;

Thence on a 100 ft. Radius Curve to the right 45.38 feet;

Thence North 84° 13' West 50.81 feet;

Thence on a 100 ft. Radius Curve to the right 28.80 feet;

Thence North 67° 43' West 17.60 feet to a point whence a point 2640 feet north of the corner common to Sections 13, 14, 23 and 24, Township 13 South, Range 3 West, San Bernardino Meridian bears East 1136.07 feet;

Again beginning at a point whence a point 2640 feet north of the corner common to Sections 13, 14, 23 and 24, Township 13 South, Range 3 West, San Bernardino Meridian, bears East 1566.08 feet;

Thence South 6° 45' West 10.77 feet;

Thence on a 50 ft. Radius Curve to the right 52.35 feet;

Thence South 66° 45' West 47.04 feet;

Thence on a 200 ft. Radius Curve to the right 24.43 feet;

Thence South 73° 45' West 40.58 feet;

Thence on a 100 ft. Radius Curve to the right 27.63 feet;

Thence South 89° 35' West 147.65 feet;

Thence on a 100 ft. Radius Curve to the right 47.12 feet;

Thence North 63° 25' West 42.19 feet;

Thence on a 100 ft. Radius Curve to the left 45.09 feet;

Thence North 89° 15' West 201.65 feet;

Thence on a 50 ft. Radius Curve to the left 67.63 feet;

Thence South 13° 15' West 94.40 feet;

Thence on a 100 ft. Radius Curve to the right 84.94 feet;

Th

Thence South 61° 55' West 30.34 feet;

Thence on a 60 ft. Radius Curve to the right 53.41 feet;

Thence North 67° 05' West 160.04 feet;

Thence South 19° 54' West 42.30 feet;

Thence South 22° 37' East 42.23 feet;

Thence on a 40 ft. Radius Curve to the right 49.57 feet;

Thence South 48° 23' West 107.52 feet;

Thence South 0° 52' West 61.10 feet;

Thence South 77° 09' East 123.60 feet;

Thence on a 150 ft. Radius Curve to the right 154.46 feet;

Thence South 18° 09' East 258.49 feet;

Thence on a 100 ft. Radius Curve to the right 59.34 feet;

Thence South 15° 51' West 206.23 feet;

Thence on a 100 ft. Radius Curve to the right 29.96 feet;

Thence South 33° 01' West 242.18 feet;

Thence on a 400 ft. Radius Curve to the right 41.89 feet;

Thence South 39° 01' West 180.35 feet;

Thence on a 100 ft. Radius Curve to the right 34.91 feet;

Thence South 59° 01' West 8.67 feet to a point on the North and South center line of Section 14, Township 13 South, Range 3 West, San Bernardino Meridian, whence the one-quarter corner common to Sections 14 and 23, Township 13 South, Range 3 West, bears South 0° 30' West 1119.9 feet;

Thence continuing South 59° 01' West 33.02 feet;

Thence on a 70 ft. Radius Curve to the left 40.56 feet;

Thence South 25° 49' West 174.60 feet;

Thence on a 100 ft. Radius Curve to the right 54.92 feet;

Thence South 57° 17' West 155.17 feet;

Thence on a 250 ft. Radius Curve to the right 245.80 feet;

Thence North 66° 23' West 167.50 feet;

Thence on a 25 ft. Radius Curve to the left 45.83 feet;

Thence South 8° 35' West 249.29 feet;

Thence on a 70 ft. Radius Curve to the right 70.41 feet;

Thence South 66° 13' West 95.62 feet;

Thence on a 100 ft. Radius Curve to the right 41.02 feet;

Thence South 89° 43' West 66.25 feet;

Thence on a 70 ft. Radius Curve to the right 46.43 feet;

Thence North 52° 17' West 62.46 feet;

Thence on a 20 ft. Radius Curve to the left 55.73 feet;

Thence South 31° 57' East 54.73 feet;

Thence on a 300 ft. Radius Curve to the left 46.25 feet;

Thence South 40° 47' East 81.45 feet;

Thence on a 100 ft. Radius Curve to the right 87.38 feet;

Thence South 9° 17' West 30.67 feet;

Thence on a 100 ft. Radius Curve to the right 56.78 feet;

Thence South 41° 49' West 249.06 feet to a point on the south line of Section 14, Township 13 South, Range 3 West, San Bernardino Meridian, whence the corner common to Sections 14, 15, 22 and 23/bears North 89° 42' West 1511.1 feet;

Twp 13 South, R 3 West, San Bernardino Meridian

Thence South 44° 33' West 290.26 feet;

Thence on a 100 ft. Radius Curve to the right 97.74 feet;

Thence North 79° 27' West 294.69 feet;

Thence on a 200 ft. Radius Curve to the left 47.12 feet;

Thence South 87° 03' West 89.48 feet;

Thence on a 100 ft. Radius Curve to the right 53.52 feet;

Thence North 62° 17' West 43.48 feet;

Thence on a 20 ft. Radius Curve to the left 45.86 feet;

Thence South 13° 39' East 32.55 feet;

Thence on a 200 ft. Radius curve to the right 226.31 feet;

Thence South 51° 11' West 49.69 feet;

Thence on a 200 ft. Radius curve to the right 54.69 feet;

Thence South 66° 51' West 575.01 feet to a point on the west line of Section 23, Township 13 South, Range 3 West, San Bernardino Meridian, whence the corner common to Sections 14, 15, 22 and 23, bears North 0° 12' East 702.5 feet;

Twp 13 South, Range 3 West, San Bernardino Meridian

Thence continuing South 66° 51' West 72.95 feet;

Thence on a 100 ft. Radius Curve to the right 30.54 feet;

Thence South 84° 21' West 344.54 feet;

Thence on a 120 ft. Radius Curve to the right 124.27 feet;

Thence North 36° 19' West 83.92 feet;

Thence on a 25 ft. Radius Curve to the left 42.99 feet;

Thence South 45° 09' West 136.54 feet;

Thence on a 100 ft. Radius Curve to the right 118.68 feet;

Thence North 66° 51' West 142.52 feet;

Thence on a 50 ft. Radius Curve to the left 59.05 feet;

Thence South 45° 29' West 31.07 feet;

Thence on a 200 ft. Radius Curve to the right 210.60 feet;

Thence North 74° 11' West 258.09 feet;

Thence on a 300 ft. Radius Curve to the right 48.87 feet;

Thence North 64° 51' West 275.71 feet;

Thence on a 100 ft. Radius Curve to the left 67.19 feet;

Thence South 76° 39' West 133.72 feet;

Thence on a 100 ft. Radius Curve to the right 66.32 feet;

Thence North 65° 21' West 244.56 feet;

Thence on a 200 ft. Radius Curve to the left 40.72 feet;

Thence North 77° 01' West 203.61 feet;

Thence on a 200 ft. Radius Curve to the left 38.40 feet;

Thence North 88° 01' West 227.93 feet;

Thence on a 200 ft. Radius curve to the right 22.22 feet; to a point on the easterly line of the Rancho San Dieguito, whence Corner No. 8, being the northeast corner of the said Rancho San Dieguito marked S D No 2, bears North 4° 50' West 3081.1 feet;

Thence continuing on said 200 ft. Radius Curve to the right 80.75 feet;

Thence North 58° 31' West 50.56 feet;

Thence on a 400 ft. Radius Curve to the left 162.20 feet;

Thence North 81° 45' West 385.91 feet;

Thence on a 100 ft. Radius Curve to the left 47.01 feet;

Thence South 71° 19' West 149.67 feet;

Thence North 85° 41' West 1142.07 feet;

Thence on a 100 ft. Radius Curve to the right 34.85 feet;

Thence North 65° 43' West 580.10 feet;

Thence on a 100 ft. Radius Curve to the right 51.16 feet;

Thence North 36° 25' West 203.96 feet;

Thence on a 500 ft. Radius Curve to the left 190.53 feet;

Thence North 58° 15' West 224.69 feet;

Thence on a 200 ft. Radius Curve to the right 47.71 feet;

Thence North 44° 35' West 322.49 feet;

Thence on a 300 ft. Radius Curve to the left 116.94 feet;

Thence North 66° 55' West 446.15 feet, whence a point on the San Dieguito Dam, which is the beginning of Distribution Line, bears North 88° 40' West 1864.25 feet, said point on San Dieguito Dam lying South 7° 03' West 1594.3 feet from Corner No. 7 Patent Survey, Rancho San Dieguito, a stone in mound of rock marked S. D. No. 3.

Description 1917 54-A

Beginning at a point where the Sec. corner common to Sections 18 and 19, T. 13 S. R-2 W. and Sec's 13 + 24. T. 13 S, R 3 W, S.B.M. bears South 28° 54' W. 3831.94 ft. Thence S 70° 14' W, 258.27 ft. Thence S 50° 43' W, 93.01 ft. Thence to the right along a 200 ft. radius curve 31.65 ft. Thence S 59° 47' W. 151.24 ft. Thence to the right along a 200 ft. radius curve 35.84 ft. Thence S 70° 03' W, 134.13 ft. Thence S 58° 54' W. 61.0 ft. Thence S 27° 54' W 197.04 ft. Thence to the right along a 100 ft. radius curve, 43.23 ft. Thence S 52° 40 W 62.53 ft. Thence to the left along an 80 ft. radius curve 47.01 ft, Thence S 19° 00 W. 142.19 ft. Thence to the right along a 100 ft. radius curve 33.69 ft. Thence S 32° 00 W. 134.35 ft. Thence to the right along a 200 ft. radius curve 34.56 ft. Thence S 41° 54' W 275.60 ft. Thence to the left along a 200 ft. radius curve 28.27 ft. Thence S 33° 48 W, 271.68 ft. Thence to the right along a 200 ft. radius curve 105.87 ft. Thence S 64° 08' W, 146.94 ft. Thence to the right along a 100 ft. radius curve 60.55 ft. Thence N 81° 04 W, 15.55 ft. Thence S 56° 40' W, 119.68 ft. Thence to the right along a 100 ft. radius curve 71.44 ft. Thence N 82° 24' W, 98.93 ft. Thence to the right along a 100 ft radius curve 39.39 ft. Thence N 59° 50 W, 45.56 ft. Thence S 82° 24 W, 75.82 ft. Thence to the right along a 50 ft. radius curve 71.00 ft. Thence N 15° 54' W. 95.68 ft. Thence N 40° 38' W 38.62 ft. Thence to the left along a 50 ft. radius curve 36.65 ft. Thence S. 77° 22' W, 34.23 ft. Thence S. 31° 02 W, 87.55 ft. Thence to the right along a 50 ft. radius curve 38.84 ft. Thence S. 75° 32' W, 10.74 ft. Thence to the right along a 70 ft. radius curve 46.71 ft. Thence N. 66° 14' W, 18.95 ft. Thence to the left

along a 50 ft. radius curve ——— 44.27 ft. Thence S63°02'W 17.21 ft. Thence ——— to the right along a 50 ft. radius curve ——— 52.16 ft. Thence N57°12'W. 140.57 ft. Thence S70°18'W 36.01 ft. Thence ——— to the left along a 100 ft. radius curve ——— 37.52 ft. Thence S48°48'W. 58.56 ft. Thence ——— to the right along a 40 ft. radius curve ——— 65.83 ft. Thence N36°54'W. 54.30 ft. Thence ——— to the left along an 80 ft. radius curve ——— 60.55 ft. Thence N80°16'W. 110.64 ft. Thence S35°12'W. 80.24 ft. Thence ——— To the right along a 40 ft. radius curve ——— 59.46 ft. Thence N59°38'W. 19.06 ft. Thence ——— to the left along a 120 ft. radius curve ——— 43.98 ft. Thence N80°38'W. 94.78 ft. Thence ——— to the left along a 30 ft. radius curve ——— 31.15 ft. Thence S39°52'W 33.05 ft. Thence ——— to the right along a 50 ft. radius curve ——— 48.00 ft. Thence N85°08'W. 305.27 ft. Thence ——— to the right along a 70 ft. radius curve ——— 37.57 ft. Thence N54°08'W. 3.05 ft. Thence ——— to the left along a 60 ft. radius curve ——— 65.10 ft. Thence S63°42'W, 8.30 ft. Thence to the right along a 60 ft. radius curve 69.11 ft. Thence N50°18'W ——— 76.56 ft. Thence ——— to the left along a 400 ft. radius curve ——— 167.55 ft. Thence N74°18'W, 161.47 ft. Thence N67°18'W. 41.32 ft. Thence ——— to the left along a 100 ft. radius curve ——— 36.65 ft. Thence N89°18'W, 9.98 ft. Thence ——— to the right along a 150 ft. radius curve ——— 56.29 ft. Thence N67°48'W. 9.34 ft. Thence ——— to the right along a 70 ft. radius curve ——— 52.94 ft. Thence N.24°22'W, 0.03 ft. Thence ——— to the left along a 60 ft. radius curve ——— 87.44 ft. Thence S.72°02'W 33.65 ft. Thence ——— to the right along a 50 ft. radius curve ——— 47.41 ft. Thence N53°38'W. 63.80 ft. Thence N76°18'W. 141.12 ft. Thence ——— to the left along a 100 ft. radius curve ——— 28.51 ft. Thence S87°22'W 13.26 ft. Thence ——— to the right along a 100 ft. radius

curve ——— 38.75 ft. Thence N70°26'W. 111.06 ft. Thence N76°18'W., 244.0 ft. Thence S.77°42'W. 105.76 ft. Thence ——— to the right along a 100 ft. radius curve ——— 31.42 ft. Thence N84°18'W. 56.92 ft. Thence ——— to the right along a 200 ft. radius curve ——— 27.93 ft. Thence N76°18'W, 91.86 ft. Thence S.61°42'W., 116.81 ft., Thence ——— to the right along a 60 ft. radius curve ——— 37.35 ft. Thence N82°38'W. 41.10 ft. Thence N.77°38'W., 52.12 ft., Thence ——— to the right along a 200 ft. radius curve ——— 29.67 ft. Thence N69°08'W, 79.83 ft. Thence ——— to the right along a 200 ft. radius curve ——— 40.14 ft. Thence N59°38'W 89.67 ft. Thence ——— to the right along a 100 ft. radius curve ——— 36.65 ft. Thence N36°38'W., 4.73 ft., Thence ——— to the left along a 60 ft. radius curve ——— 48.35 ft. Thence N82°48'W, 164.96 ft. Thence ——— to the left along a 100 ft. radius curve ——— 42.76 ft. Thence S.72°42'W. 81.49 ft. Thence ——— to the right along a 60 ft. radius curve ——— 57.60 ft. Thence N52°18'W., 72.33 ft., Thence ——— to the right along a 100 ft. radius curve ——— 60.21 ft. Thence N17°48'W., 47.58 ft. Thence N85°49'W, 45.0 ft. Thence ——— to the left along a 100 ft. radius curve ——— 21.82 ft. Thence S81°41'W., 95.03 ft. Thence ——— to the right along a 400 ft. radius curve ——— 44.22 ft. Thence S.88°01'W. 65.98 ft. Thence ——— to the right along a 70 ft. radius curve ——— 73.30 ft. Thence N31°59 W 2.13 ft., Thence ——— to the left along a 100 ft. radius curve ——— 47.12 ft. Thence N58°59'W. 12.48 ft. Thence ——— to the left along a 100 ft. radius curve ——— He.25 ft., Thence N85°29'W., 53.20 ft. Thence ——— to the right along a 400 ft. radius curve ——— 69.81 ft., Thence N75°29'W 50.19 ft. Thence ——— to the right along a 400 ft. radius curve ——— 69.81 ft. Thence N65°29'W, 21.45 ft.,

thence ——— to the right along 100 ft. radius curve ———
——— 37.57 ft, thence N43°59W, 18 ft. to an intersection with the line between Sec's 13 & 14 - T. 13 S. R. 3 W. if produced 2783.94 ft, North, from the corner common to Secs 13, 14, 23 + 24, T. 13 S, R. 3 W, S. B. M, thence continuing N43°59 W. 99.15 ft, thence N81°30'W 52.9+ ft, thence S. 32°29W, 57.76 ft., thence ——— to the right along a 60 ft. radius curve ——— 46.07 ft. thence S76°29W 25.04 ft. thence ——— to the right along a 200 ft. radius curve ——— 48.87 ft, thence N89°31'W, 166.70 ft., thence S 54°37' W, 89.34 ft. thence ——— to the right along a 50 ft. radius curve ——— 44.51 ft. thence N74°23'W, 34.85 ft., thence ——— to the left along a 50 ft. radius curve ——— 56.00 ft, thence S41°27'W, 83.25 ft, thence to ——— the right along an 80 ft. radius curve ——— to 97.74 ft, thence N68°33'W, 87.46 ft. thence ——— to the left along a 100 ft. radius curve ——— 72.72 ft, thence S.69°37'W, 83.16 ft, thence ——— to the right along a 100 ft. radius curve ——— 45.38 ft, thence N84°13'W, 50.81 ft, thence ——— to the right along a 100 ft. radius curve ——— 28.80 ft, thence N67°43'W 85.41 ft. thence ——— to the left along a 100 ft. radius curve ——— 41.02 ft, thence N88°47'W, 48.88 ft., thence ——— to the right along a 140 ft. radius curve ——— 87.96 ft. thence N55°13'W, 70.54 ft, thence S66°16'W, 154.71 ft, thence S, 6°45'W, 36.41 ft, thence ——— to the right along a 50 ft. radius curve ——— 52.36 ft., thence S66°45'W 47.21 ft. thence ——— to the right along a 200 ft. radius curve ——— 24.43 ft, thence S73°45'W, 40.58 ft., thence ——— to the right along a 100 ft. radius curve ——— 27.63 ft, thence S89°35'W, 147.65 ft, thence ——— to the right along a 100 ft. radius curve ——— 47.12 ft thence N63°25'W, 42.19 ft., thence ——— to the left along

a 100 ft. radius curve ———, 45.09 ft. thence N89°15W, 201.65 ft. thence ——— to the left along a 50 ft. radius curve ———, 67.63 ft. thence S13°15'W, 94.40 ft, thence ——— to the right along a 100 ft. radius curve ——— 84.94 ft. thence S61°55'W, 30.34 ft, thence ——— to the right along a 60 ft. radius curve ——— 53.41 ft, thence N67°05W 160.04 ft, thence S19°54'W, 42.30 ft, thence S.22°37'E, 42.23 ft, thence ——— to the right along a 40 ft. radius curve ——— 49.54 ft. thence S48°23'W, 107.52 ft, thence S0°52'W. 61.10 ft, thence S77°09'E, 123.60 ft, thence ——— to the right along a 150 ft. radius curve ——— 154.46 ft, thence S.18°09'E, 258.49 ft, thence ——— to the right along a 100 ft. radius curve ———, 59.34 ft thence S.15°51'W, 206.23 ft, thence ——— to the right along a 100 ft. radius curve ———, 29.96 ft, thence S.33°01'W 242.18 ft, thence ——— to the right along a 400 ft. radius curve ——— 41.89 ft, thence S.39°01'W, 190.35 ft. thence to the right along a 100 ft. radius curve ——— 34.91 ft. thence S59°01'W, 8.67 ft. to an intersection with the East line of the Staat Property; whence the quarter Corner bears S0°30'W, 1119.9 ft. common to ——— Sec's 14 + 23, T. 13 S, R. 3 W, S. B. M, thence continuing S.59°01'W, 33.02 ft, thence ——— to the left along a 70 ft. radius curve ——— 40.52 ft, thence S25°49'W. 174.68 ft, thence ——— to the right along a 100 ft. radius curve ———, 54.98 ft, thence S57°17'W. 155.17 ft, thence ——— to the right along a 250 ft. radius curve ——— 245.80 ft. thence N66°23'W, 167.50 ft. thence ——— to the left along a 25 ft. radius curve ——— 45.87 ft, thence S8°35'W, 249.29 ft. thence ——— to the right along a 70 ft. radius curve ———, 70.45 ft. thence S.66°13'W, 95.62 ft, thence ——— to the right along 100 ft. radius curve ——— 41.03 ft, thence S.89°43'W, 66.25 ft. thence

Beginning at a Point whence the Sec. Corner, common to Sections 14, 15, 22 & 23, T. 13 S, R. 3 W. S.B.M, bears N 89° 42' W, 1511.1 ft. Thence S. 44° 33' W, 290.26 ft, Thence to the right along a 100 ft. radius curve, 97.74 ft. Thence *

to the right along a 70 ft. radius curve 46.43 ft. Thence N 52° 17' W, 62.46 ft. Thence to the left along a 250 ft. radius curve, 55.73 ft. Thence S. 31° 57' E, 54.73 ft. Thence to the left along a 300 ft. radius curve, 46.25 ft. Thence S. 40° 47' E. 81.45 ft. Thence to the right along a 100 ft. radius curve 87.38 ft. Thence S 9° 17' W, 30.67 ft. Thence to the right along a 100 ft. radius curve 56.78 ft. Thence S 41° 49' W, 249.06 ft to an intersection with the South line of Sec. 14, T. 13 S, R. 3 W, S.B.M, whence the corner common to Secs 14, 15, 22 and 23, T. 13 S, R. 3 W. S.B.M, bears N 89° 42' W - 1511.1. Thence S 44° 33' W, 298.26 ft. Thence to the right along a 100 ft. radius curve 97.74 ft, Thence * N 79° 27' W 294.69 ft. Thence to the left along a 200 ft. radius curve 47.12 ft, Thence S. 87° 03' W, 89.48 ft. Thence to the right along a 100 ft. radius curve 53.52 ft. Thence N 62° 17' W, 43.48 ft. Thence to the left along a 20.0 ft. radius curve 45.84 ft, Thence S. 13° 39' E, 32.55 ft. Thence to the right along a 200 ft. radius curve, 226.31 ft, Thence S. 51° 11' W 49.69 ft, Thence to the right along a 200 ft. radius curve, 54.69 ft. Thence S. 66° 51' W, 575.01 ft. to an intersection with the line between Secs 22 and 23, T. 13 S, R. 3 W, S.B.M, whence the corner common to Secs 14, 15, 22 + 23, T. 13 S. R 3 W, S. B. M. bears N 0° 12' E, 702.5 ft. Thence continuing S. 66° 51' W 72.95 ft, Thence to the right along a 100 ft. radius curve 30.54 ft, Thence S 84° 21' W, 344.54 ft, Thence to the right along a 1200 ft. radius curve 124.27 ft, Thence N 36° 14' W. 83.92 ft, Thence to the left along a 25 ft. radius curve 42.98 ft. Thence S. 45° 04' W, 136.54 ft. Thence to the right along a 100 ft. radius curve, 118.68 ft

"7"

thence N66°51'W. 142.52 ft. thence ——— to the left along a 50 ft. radius curve ——— 59.05 ft. thence S4.5°31'W 31.07 ft. thence ——— to the right along a 200 ft. radius curve ——— 210.60 ft. thence N74°11'W. 258.09 ft. thence ——— to the right along a 300 ft. radius curve ——— 45.87 ft. thence N66°51'W. 275.71 ft. thence ——— to the left along a 100 ft. radius curve ——— 67.19 ft. thence S76°39'W. 133.72 ft. thence ——— to the right along a 100 ft. radius curve ——— 66.32 ft. thence N65°21'W 244.56 ft. thence ——— to the left along a 200 ft. radius curve ——— 40.72 ft. thence N77°01'W. 203.61 ft. thence ——— to the left along a 200 ft. radius curve. ——— 38.40 ft. thence N88°01'W. 227.93 ft. thence ——— to the right along a 200 ft. radius curve ——— 22.22 ft. to the intersection with the East line of Rancho San Dieguito, whence corner No 8, of said Rancho San Dieguito located by a rock marked S D. N 2 bears N4°50'W, 3081.1 ft.

30 37.3
43.3

Carroll Conduit.

Carry m.

Proposed to carry a safe yield of

M I = ___ sec. ft = 10.000 Acre ft. annually

Carroll System.

Hydraulic [illegible] Data.

Safe Yield. The safe yield arrived by Part was [illegible] 10,400 Acft.

Can Provide for 14,500 Acft ultimate -

Provide a maximum run- during Summer of 15% per month or 2200 Acre ft or 36 cu ft.

13-00
10.00

23.00

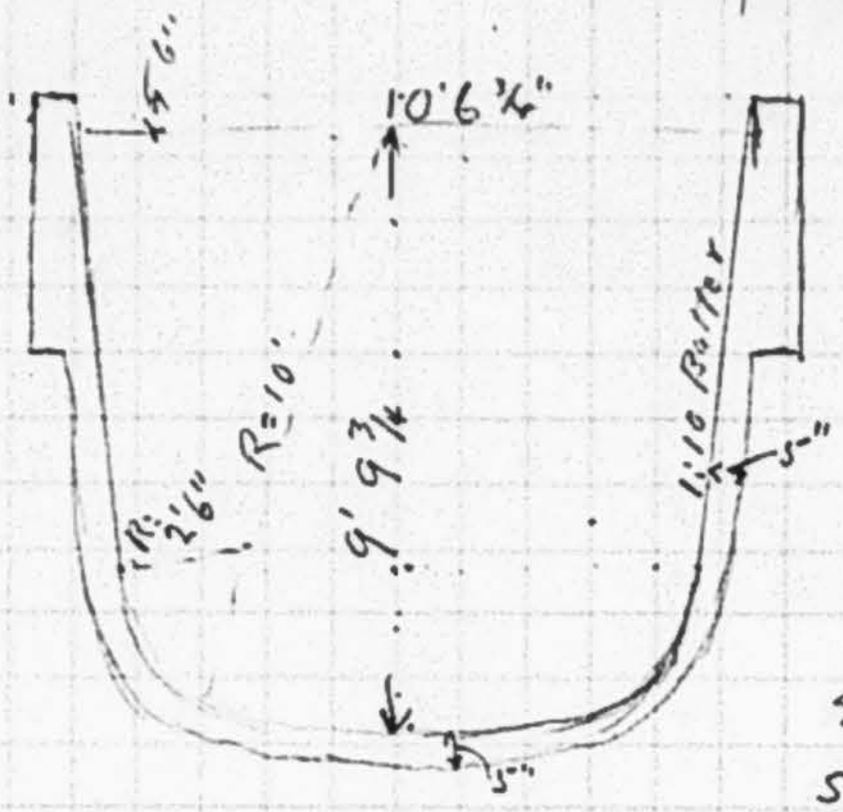
13-00
19 00
---
34 00

25-

4400
1900

3400.

Los Angeles Aqueduct. Conduit Sections

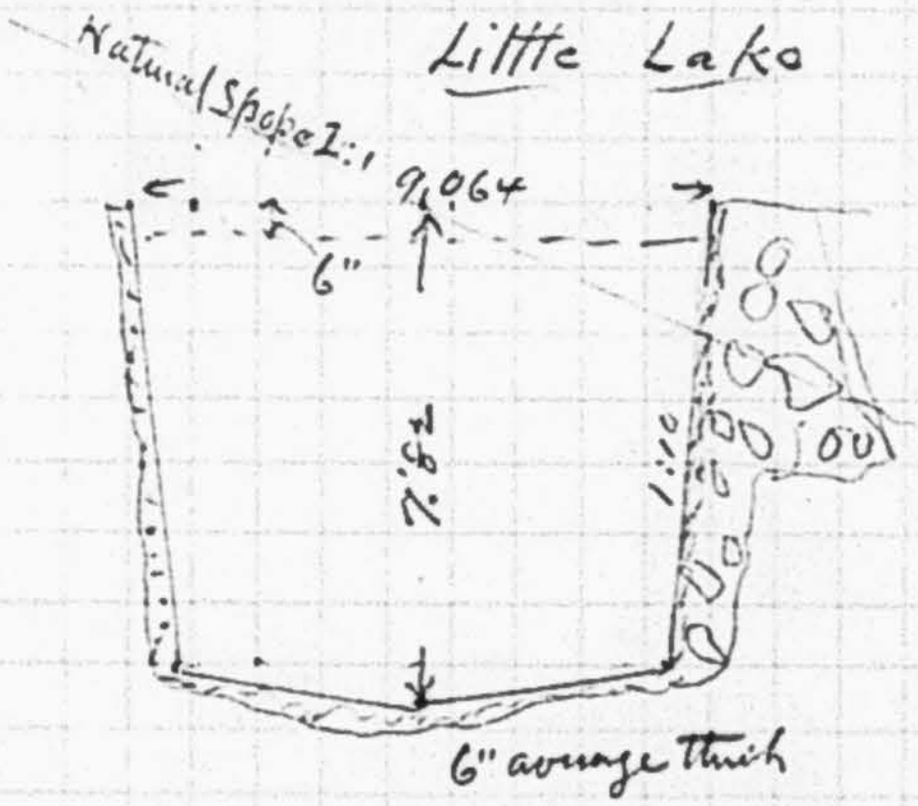


Red Rock, Dixie & Rose Valley -

Q = 430	excavation	4.06
S = .0004	concrete Conduit	0.561
n = .014	" Crown	0.159
A = 89.16	Steel in "	25.1#
R = 3.43		
C = 130		
V = 4.825		

Economical cost found to be for a flow 430 Q
S = .0004 + n = .014 when $\frac{\text{Depth}}{\text{Width}}$ = .97 to 1.00

Little Lake Bench Conduit.

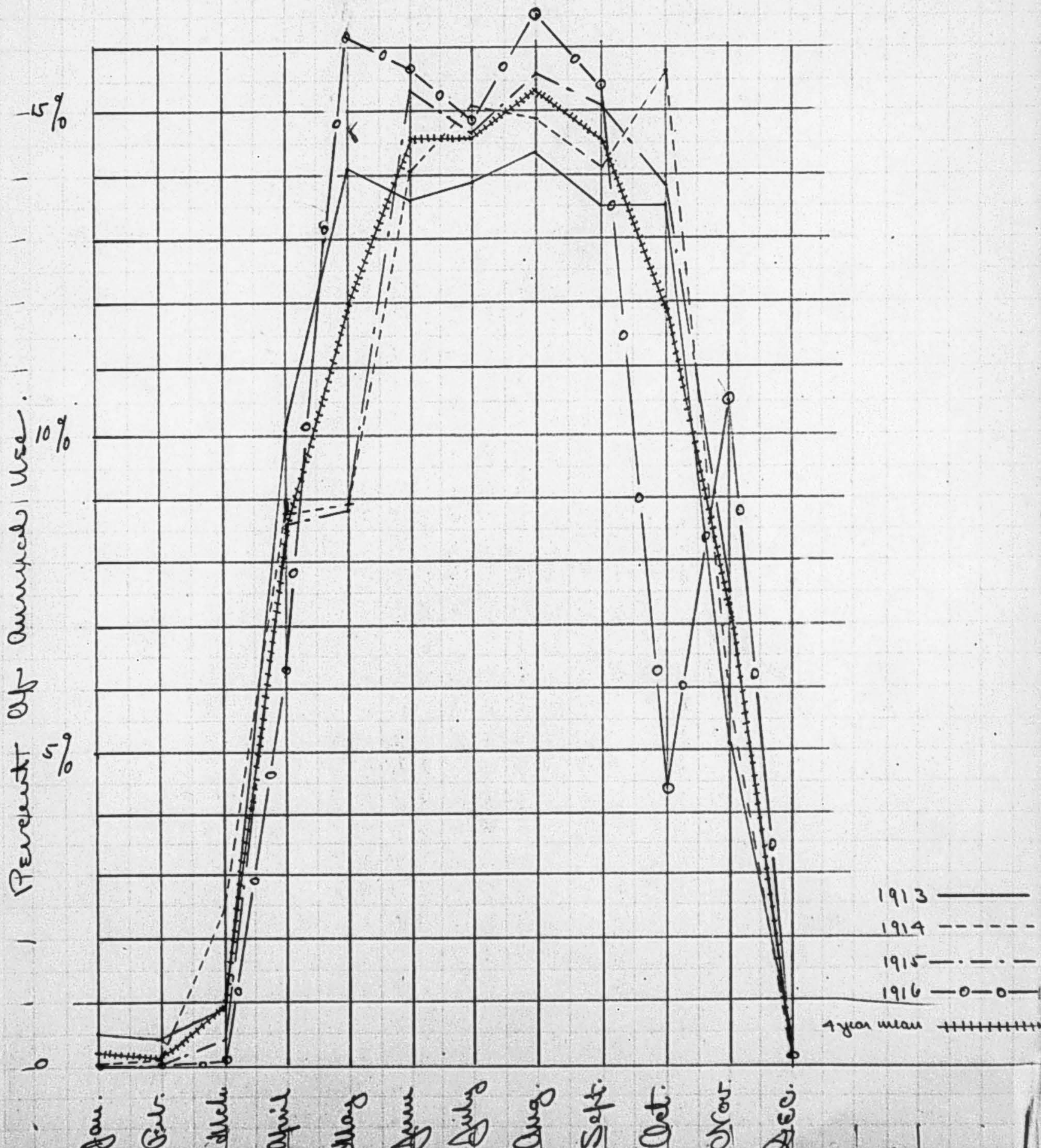


			unit cost	
Q = 429	excav.	2.91	1.00	2.91
S = .0009	Concrete	0.46	6.93	3.19
n = 014	Crown	0.12	7.62	0.93
A = 66.64 sq. ft.	steel	19#	3.1 cts	0.59
R = 2.865			Total Cost	7.62
C = 126.8				
V = 6.45				

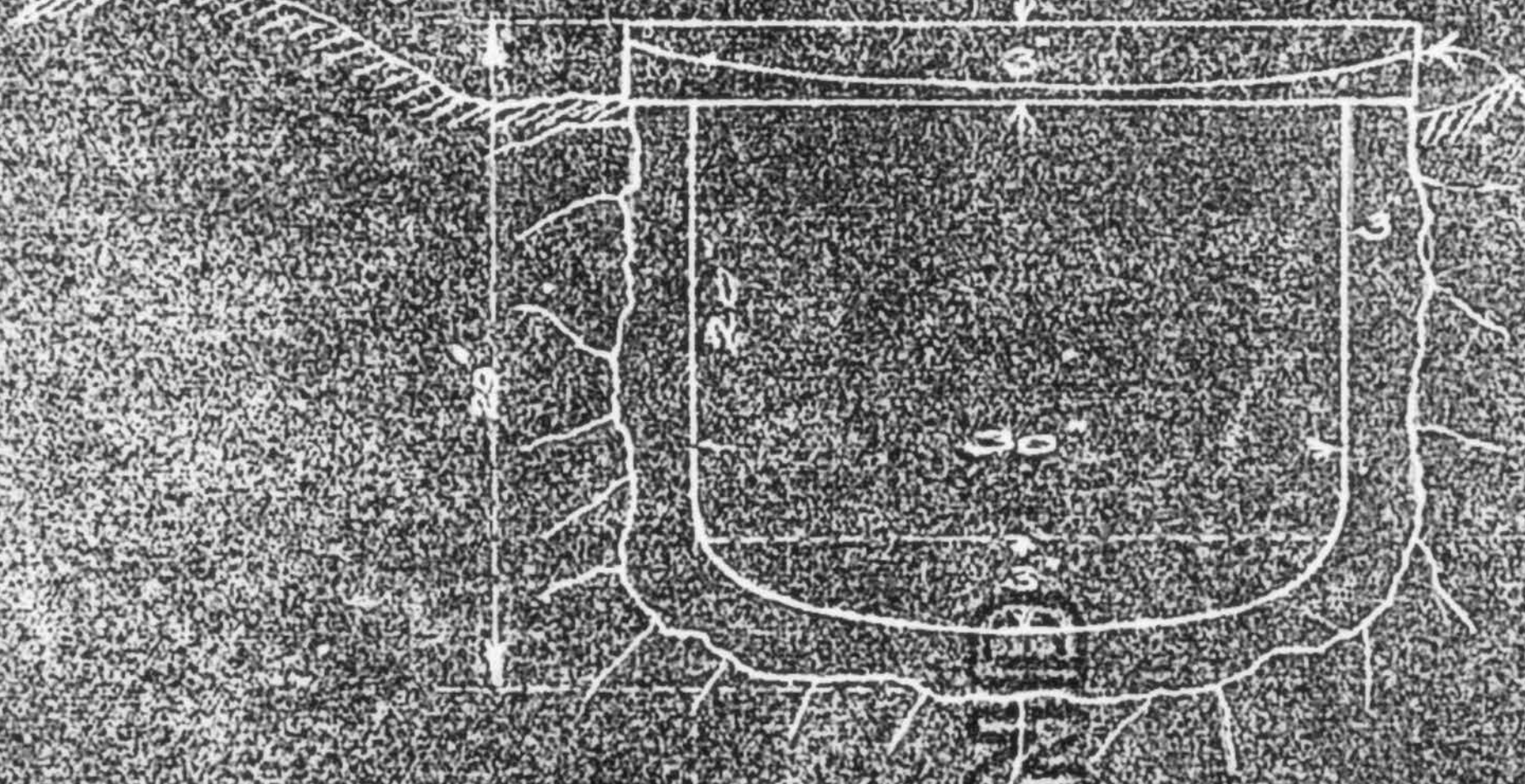
Economic sect Covered = $\frac{\text{Depth}}{\text{width}}$ = .97

" " uncovered = " = .55

Diagram Of Use Of Water At Hemet.
Showing Monthly Percentages Of Annual Use.



SECTIONAL SLAB COVER JOINTS



COTTONWOOD CREEK CONDUIT

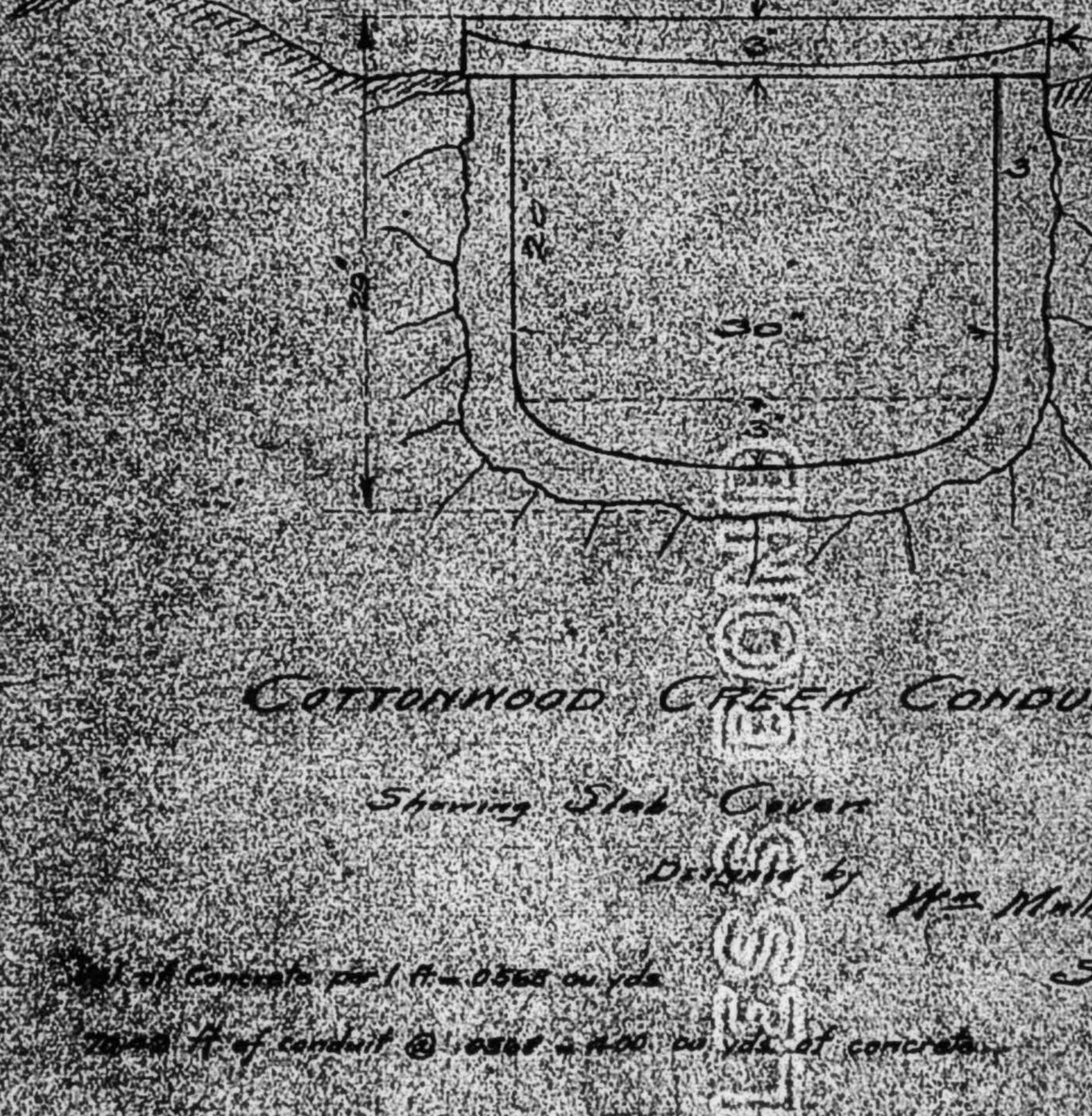
Showing Slab Cover

Drawn by Wm. McHardy

Supt. of

5-39-1

SECTIONAL SLAB COVER. 36"x18"



COTTONWOOD CREEK CONDUIT

Showing Slab Cover

Designed by Wm McHolland.

Sept - 07.

Vol of Concrete per l ft = .0568 cu yds

2000 ft of conduit @ .0568 = 400 cu yds of concrete

5-39-1

COTTONWOOD POWER-PLANT CONDUIT (Designed for 24 sec.ft.)

	Cubic Yds.	Cost per cu. yd.	Lin. ft.	Cost per lin.ft.	Total Cost.
Excavation -	3,176	$ .89	7,042	$ .40	$2,825.45
Lining -	956	9.95	7,042	1.35	9,500.89
		$10.84			
Back-fill - - - - - - -			7,042	.03	179.59
Engineering - - - - - -			7,042	.08	589.32
Average cost per foot - - - - - - - - -				$1.86	$13,095.15(Total)

Sand and rock averaged about 50 cents per c.y. concrete.

3,885 sacks of cement used, or an average of 1 barrel per cu.yd.

Mixture, 1 - 3 - 6.

Price of cement, $2. per sack. 17 barrels only at $5.40 per bbl.

Conduit.

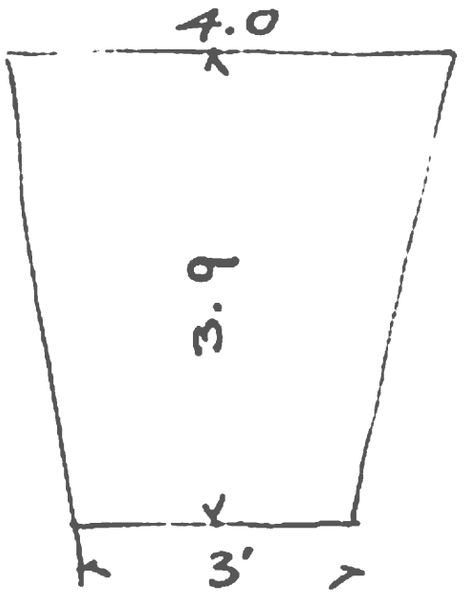
using $n = .015$ Kutter.

Slopes ½ to 1

Grade per 1000	Bottom width	Depth Water Surface	Q.
1	4	3.5	94
1	3	3.5	73
1	4	3	70
½	4	3.5	66
½	4	3	49.5
½	4	3.2	54.5
½	3.5	3.5	57.
½	3.5	4.0	72.

Adopt 3.5 4'2" for 68 sec ft.

$1'' = \frac{15}{50}$ $\frac{5}{250'}$



35.6 sq. feet

S. = .0005

Summary of Carroll Canal Estimate

Excavation Total 16961.2 Cu yds of Which

6700.8 Cu Yds Rock

10260.4 Cu Yds Earth

			Cu Yds Concrete
1448	Lin Feet	Steel Flume on Concrete Trestle = 0.08847 Cu Yds per ft =	128.11
313	Lin Feet	Concrete Flume on Concrete Trestle = 0.17745 Cu Yds per ft	55.54
1887	Lin Feet	Reinforced Concrete Pipe Syphon = 11.15 Sq. ft.	
9011	Lin Feet	of Ordinary Open Conduit = 0.1074 Cu Yds per ft =	967.78
3513	Lin Feet	Covered Conduit = 0.0617 cu yds per ft in Top, 0.1074 " " " lining = 0.1791 Cu Yds	629.18
8514	Lin Feet	Deep Conduit = 20.88 Sq ft or 0.228 Cu Yds	1941.19

GRAPEVINE DIVISION

S = 0.0017

Scale 3/8" = 1'

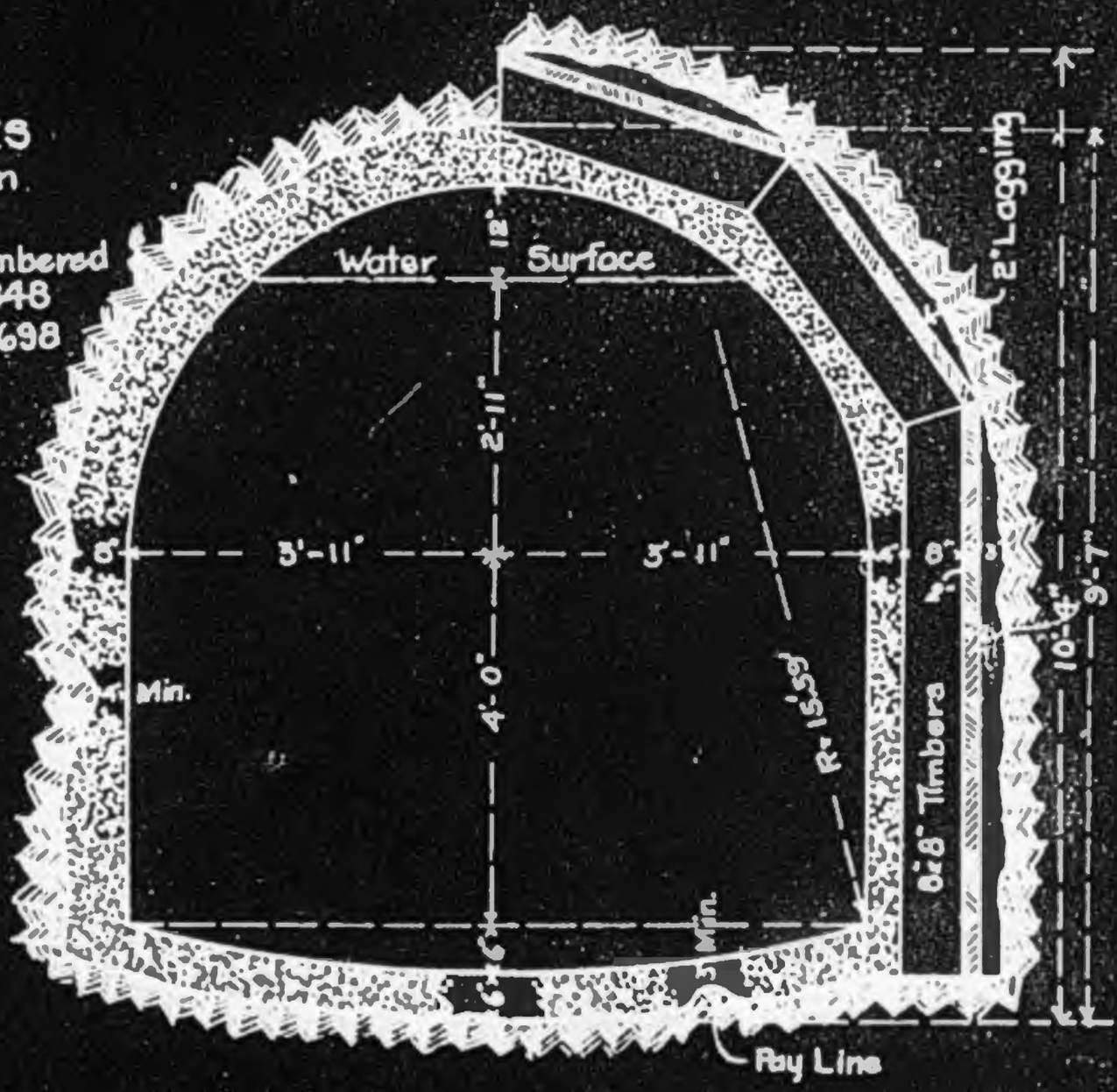
CONSTRUCTION QUANTITIES

Per Lineal foot of Tunnel Normal Section

	Unit	Timbered	Untimbered
Excavation	Cu Yds	3.514	2.848
Concrete in Lining	" "	.945	.698
Timbers	B.M.	32.0	
Spreaders	" "	5.0	
Shoulder Braces	" "	7.0	
Lagging	" "	47.0	

HYDRAULIC PROPERTIES

Slope	.0017
Capacity	434.13
Velocity	7.97
Area	54.462
Wetted Perimeter	22.499
Hydraulic Radius	2.42
n	.014
C	124.29



GRAPEVINE DIVISION

S = 0.0017 Scale $\frac{3}{8}$" - 1'

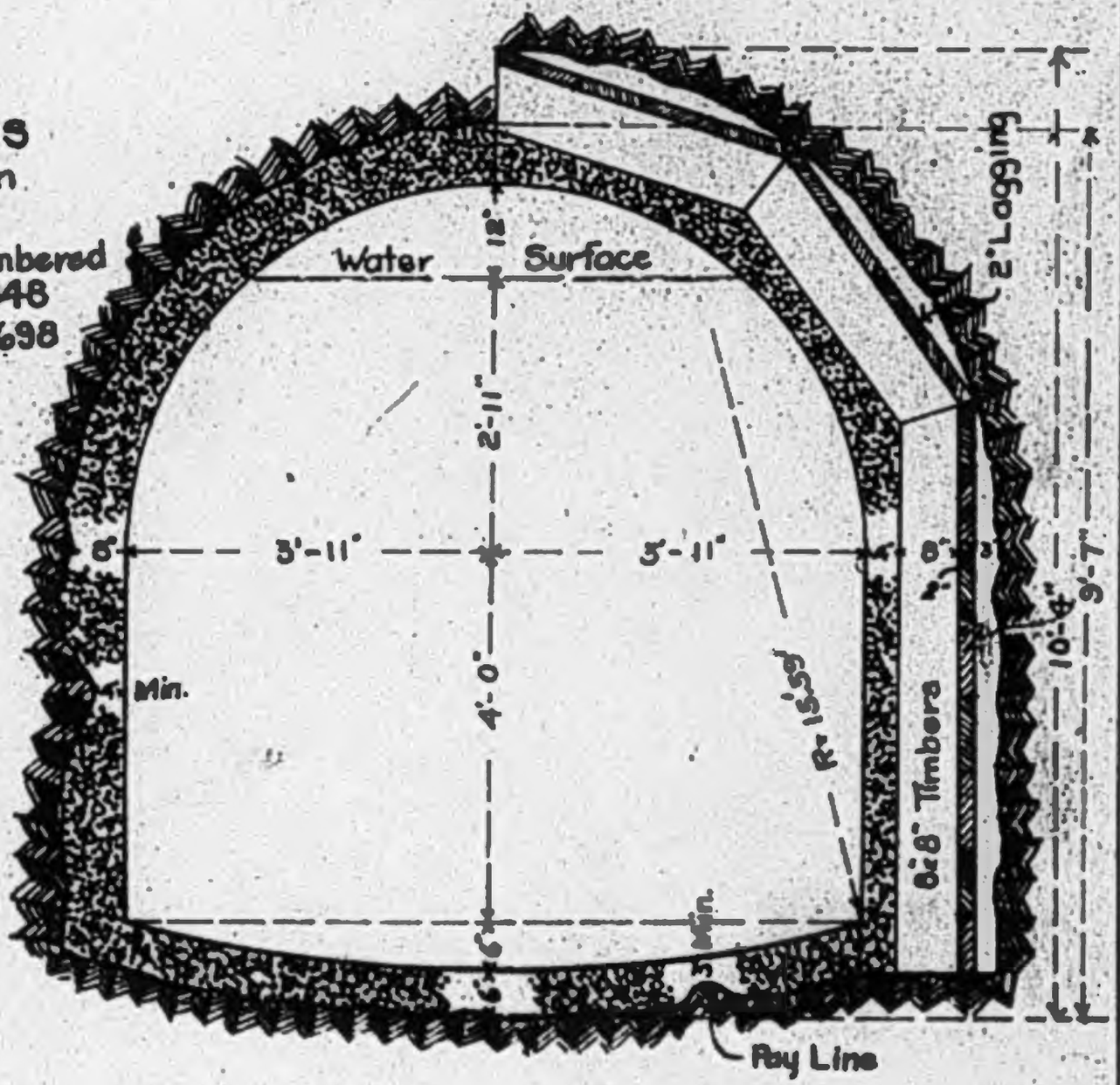
CONSTRUCTION QUANTITIES

Per Lineal foot of Tunnel Normal Section

	Unit	Timbered	Untimbered
Excavation	Cu Yds	3.514	2.848
Concrete in Lining	" "	.945	.698
Timbers	B.M.	32.0	
Spreaders	" "	5.0	
Shoulder Braces	" "	7.0	
Lagging	" "	47.0	

HYDRAULIC PROPERTIES

Slope	.0017
Capacity	434.13
Velocity	7.97
Area	54.462
Wetted Perimeter	22.499
Hydraulic Radius	2.42
n	.014
C	124.29



Hardest of 43 miles of tunnel 10 x 10
lined $22 (for a short distance $27

No timbering necessary in Hard Rock.

No lining necessary except to avoid friction
& possible seepage.

Mulholland says & should make
7 x 7 without lining perfectly safe figure

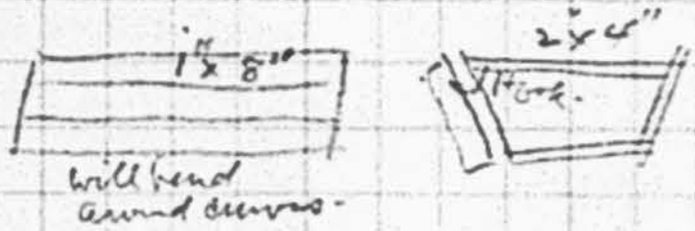
Notes on Spreckels contract
Cottonwood Cr. Del Zuma, Cal-

10 miles of ditch - decomposed granite
¾ mile of tunnels - $20 per ft. Hard Granite underlost money @ $15. 4.6" x 6.6" ft. Good miners took contract
@ $15 with Co. furnishing powder cost $2.50± - about even.
Grading Contract by Crowley + Shaver 75 cts
per yd. decomposed granite some shooting.
lost money.

Lining of Ditch.

sects

forms -



Cement 1 bbl to 1 yd-
Sand .65 C.Y. " 1 "
Crushed Rock + gravel. 1.00± " 1 "
1 yd

Gang averaged 14 batches per day in place.

Gang = 1 Foreman $4 4
1 Handy man 3 3
2 Helpers 2.50 5
8 men 2.00 16
$28.

½ per yd - for all handling-
does not include delivery of materials -

This ditch average 10 c.f. per running ft =
one gang would do 93 lineal ft per day average.

If mixer could be used $1.00 or less

¼ yd Charge - 9 H.P. Gasoline -

on basis of 3" thick.

Cost of Labor for lineing sidewalls of ditch pal sq foot by - hand $.074

Cost of Labor for lineing sidewalls of ditch lineing machine - =

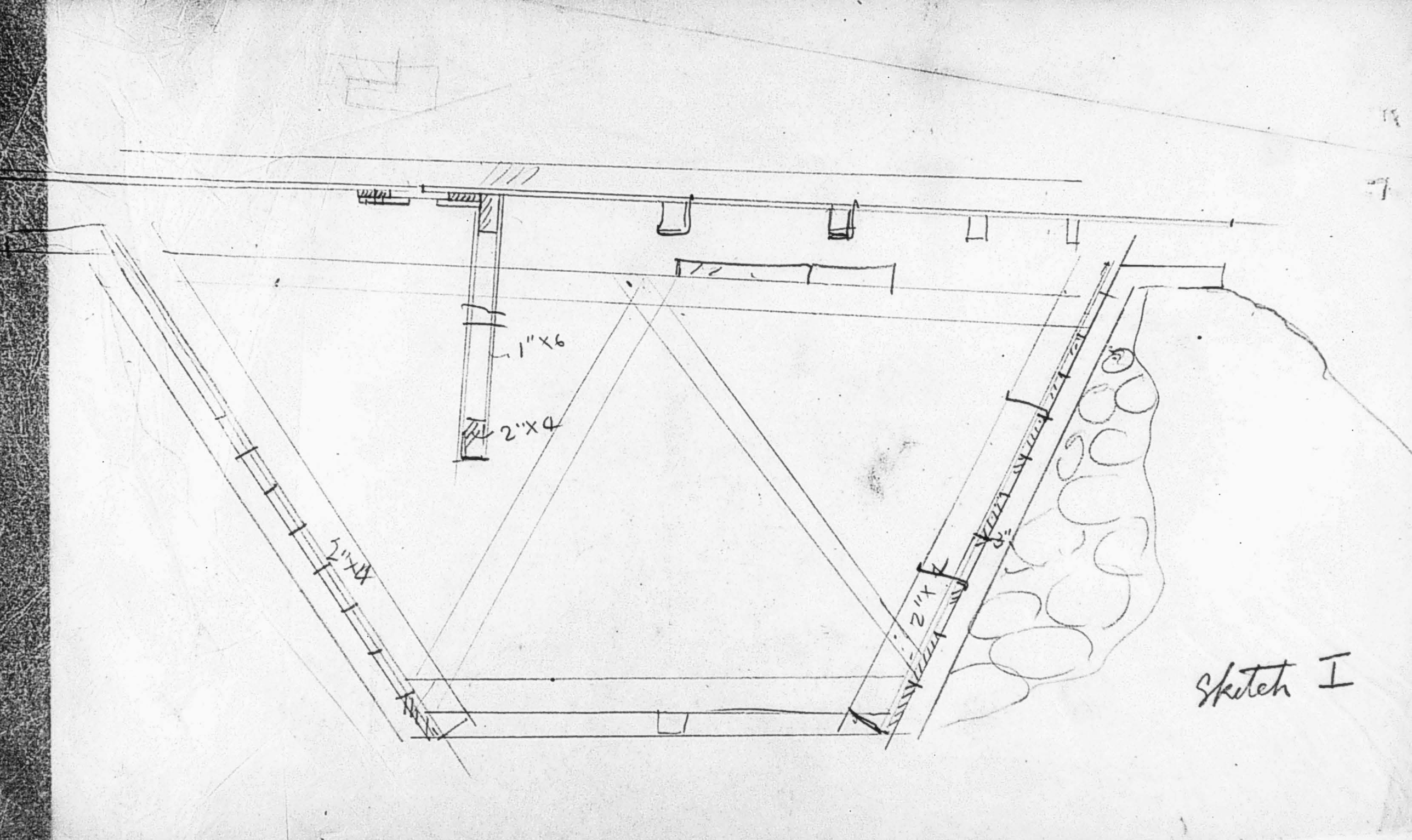
.0348 per sq ft

Cost of lumber for Forms 800ᵐ per Mile plated

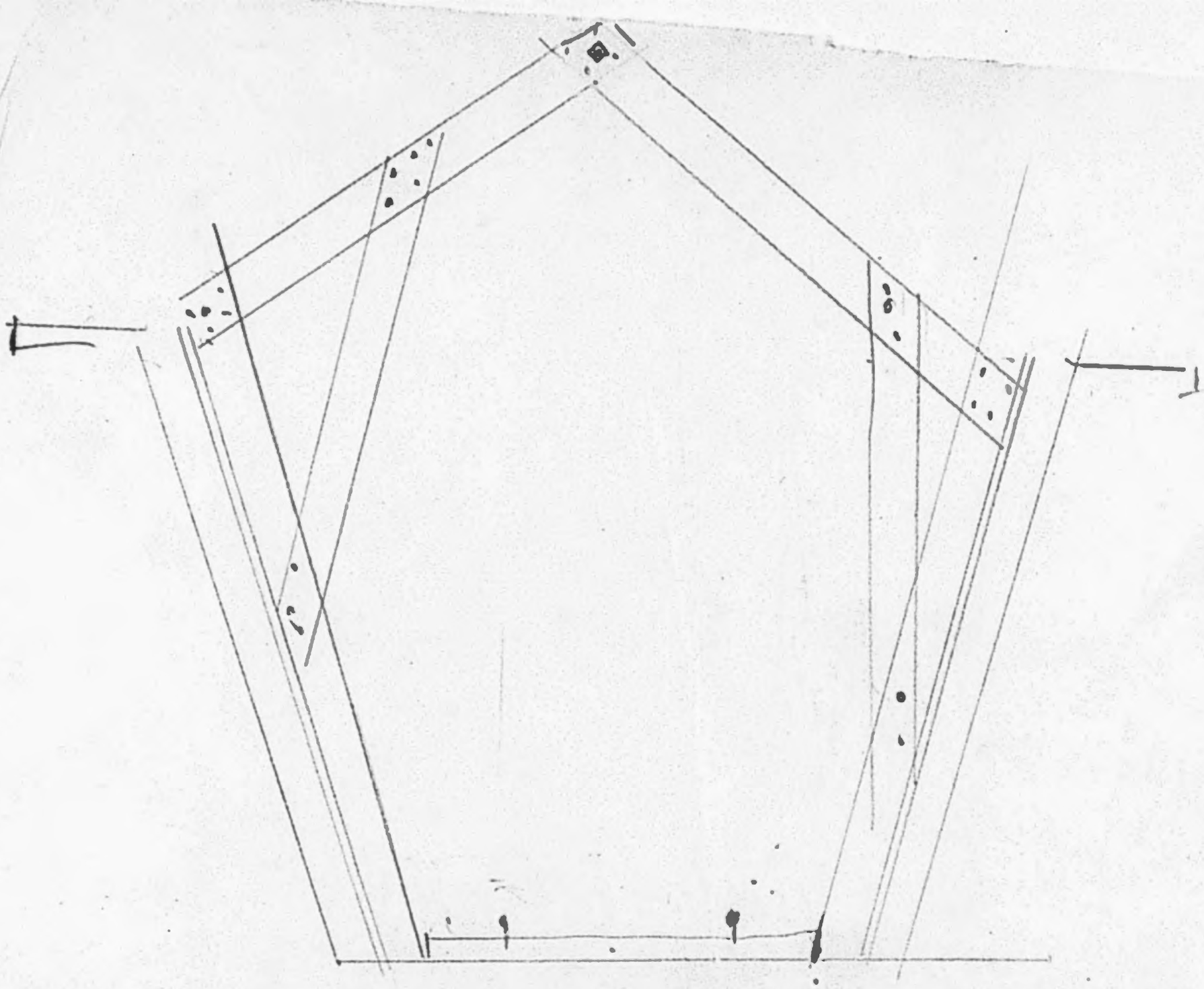
Forms are worth say 1 Cent per sq ft of ditch

expansion joint

Grouting in neat cement

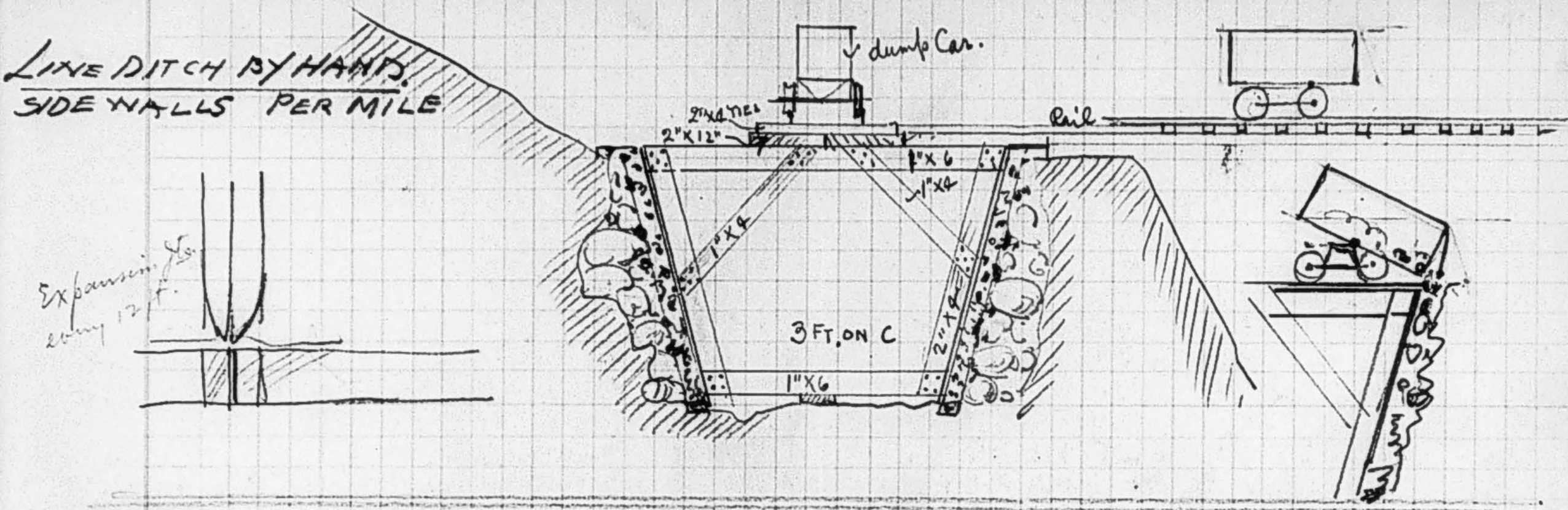


Sketch I



Sketch
II

LINE DITCH BY HAND.
SIDE WALLS PER MILE



1	tending Cement		2.00	2
3	"	Rock	2.00	6
2	"	Sand	2.00	4
1	Gas Engs		4.00	4
1	Foreman		4.00	4
2	Tampers		2.50	5
3	Car Men		2.00	6
2	carpenters		3.00	6
2	helpers		2.50	5
2	watchmen		2.00	4
	Gasoline			$46.00
				17.00

Cost 50 yds —

Smith Side dump Concrete Car ¼ yard capa.
2 to 4 Cars to Mixer depending on length of haul.

Capacity of Mixer moving setting ups
50 yds per day

1 Foreman	4.00
2 Carpenters	6.00
2 tampers	5.00

Table Showing Cu Yds Per Lin Foot Excavation for each Foot of ℄ Cut in Various Slopes

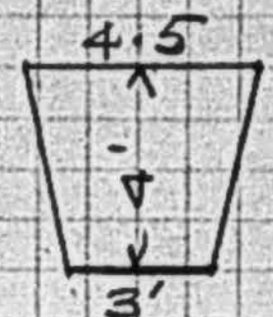
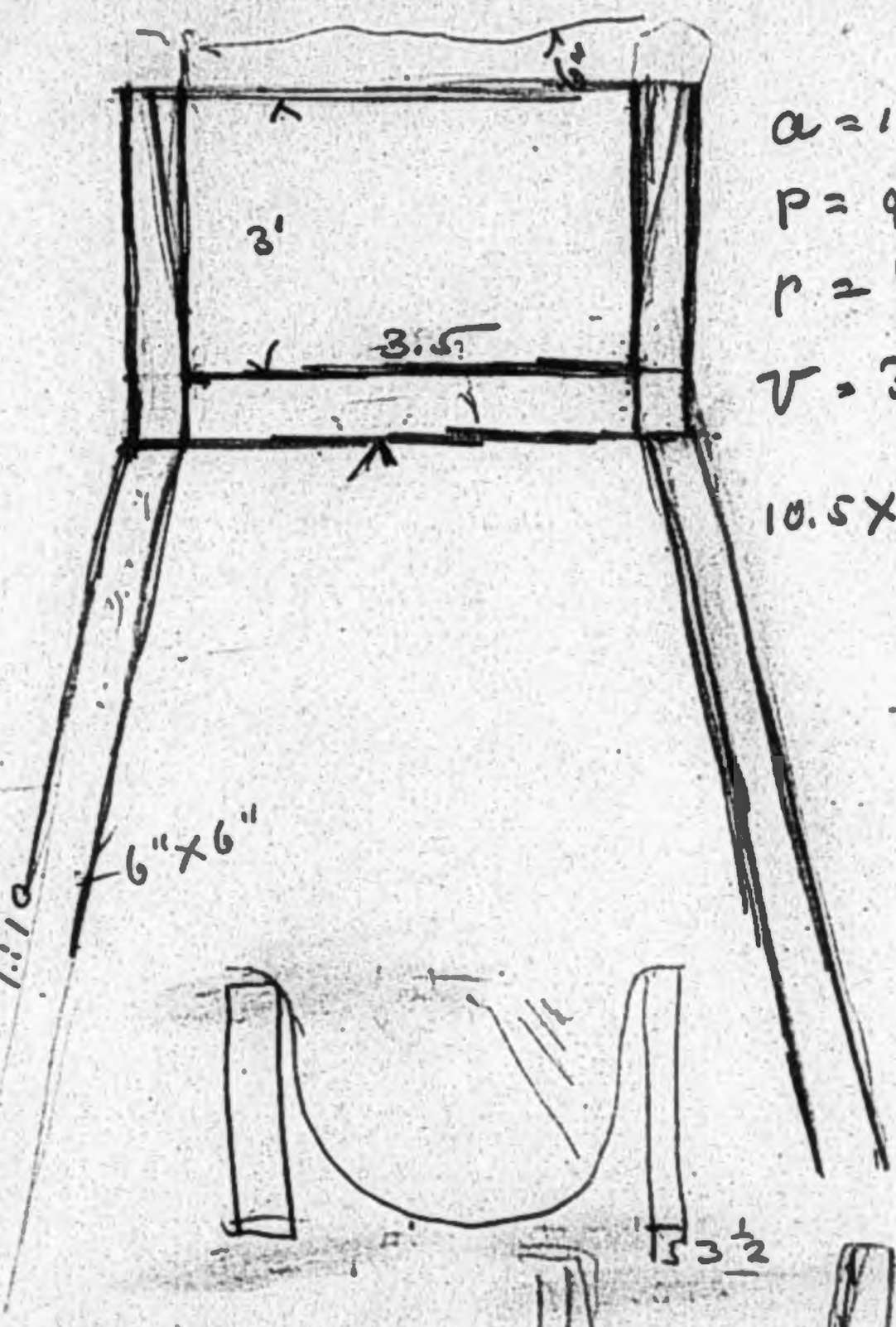
Depth of Cut	Slope 1 : 1	Slope 1 : 2	Slope 1 : 4	Level	Sec Taken Inside Dimension
0 ft	.09	.05	.04	.03	
1 ft	.20	.19	.17	.17	
2 ft	.37	.33	.33	.30	
3 ft	.56	.50	.49	.48	
4 ft	.80	.69	.67	.66	
5 ft	1.06	.92	.88	.87	
6 ft	1.41	1.16	1.13	1.10	

Table Showing Cu Yds per Lin Foot Excavation for each Foot of ℄ Cut in cuts from 7' to 10' deep incl Taken 3.5 ft wide at bottom & sides at ½ : 1 Slopes

Depth of Cut	Cu Yds
7 ft	1.85
8 ft	2.22
9 ft	2.67
10 ft.	3.15

Carroll Canal



a = 10.5

p = 9.5

r = 1.1

v = 3.34

10.5 x 3.34 = 35.2

300. ft

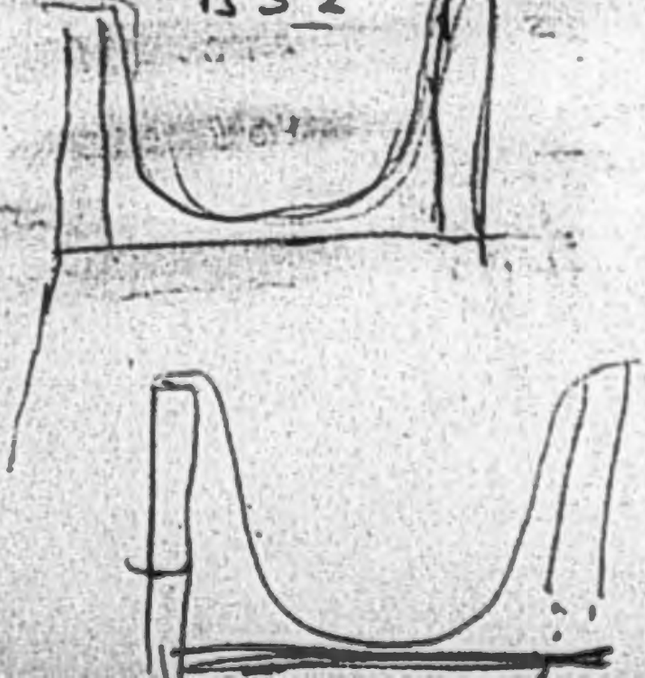
1:1.10

3.13
3.5
6.68
3.34

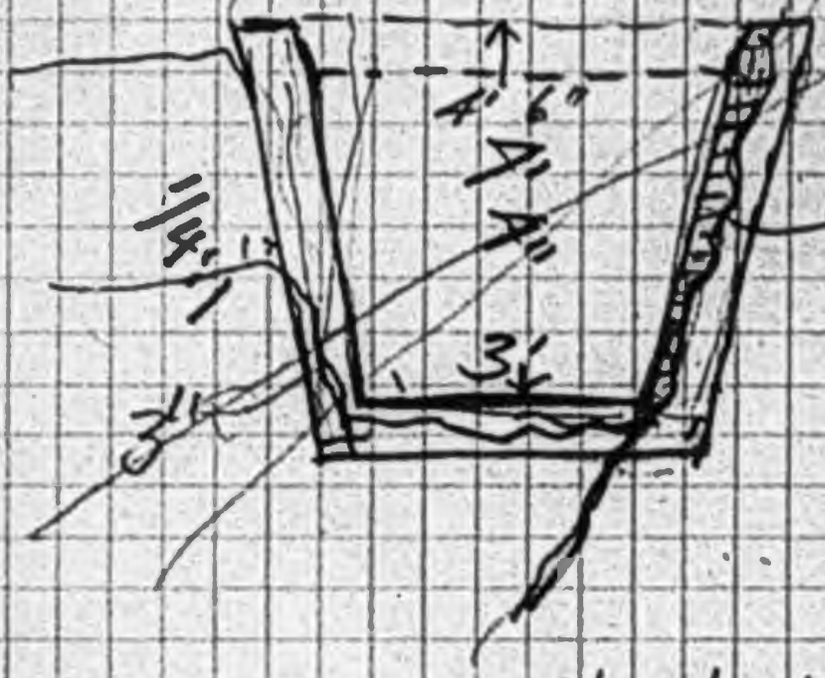
3½

12"
10

$\frac{10.5}{9.5} = 1.1$



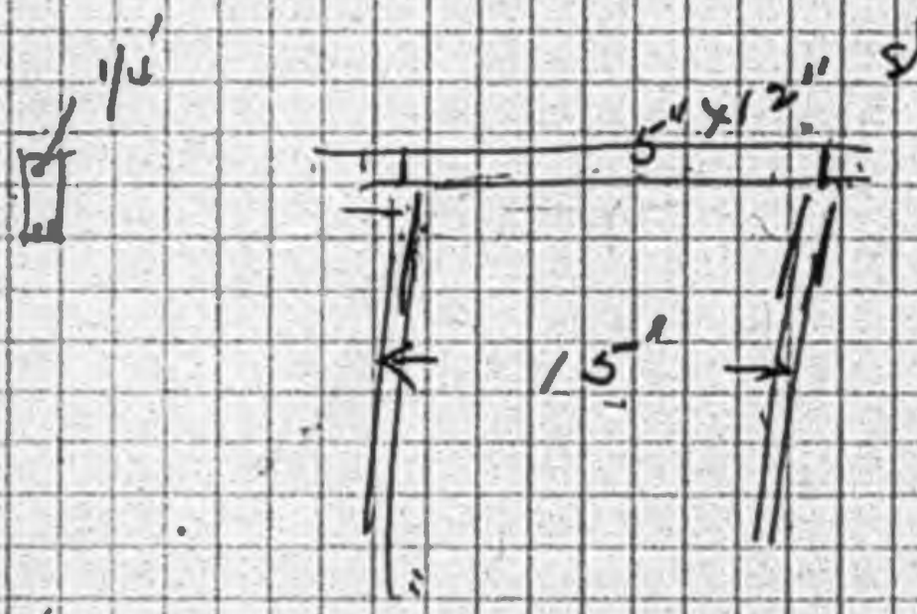
Open conduit



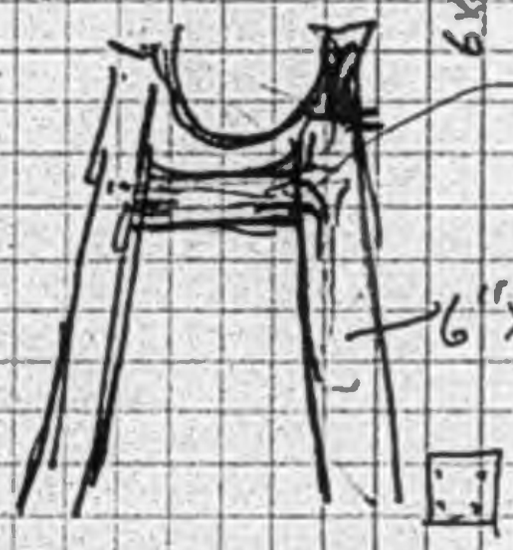
Covered conduit

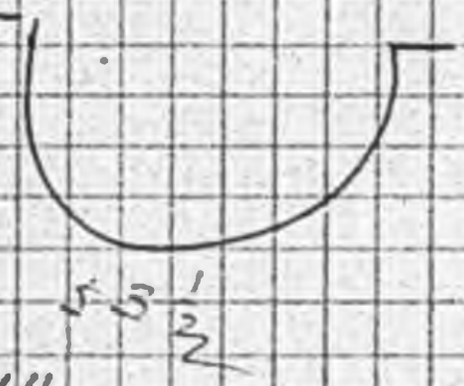
Duck Section

Flume Trestle



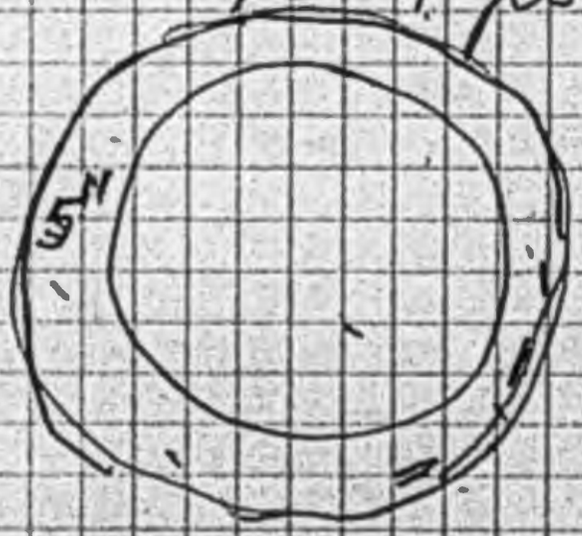
Steel 2-½" sq. bars.



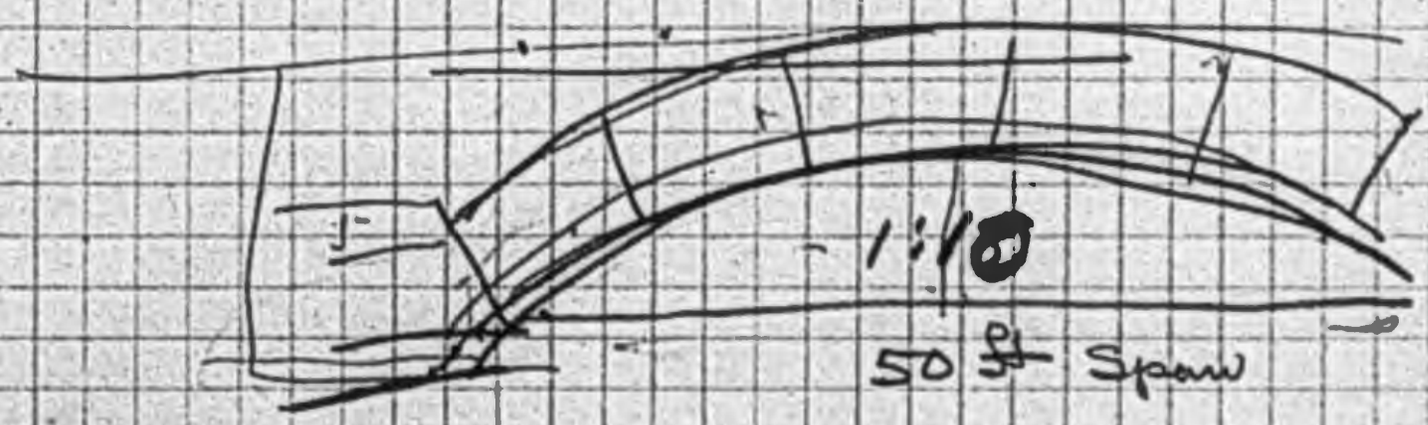


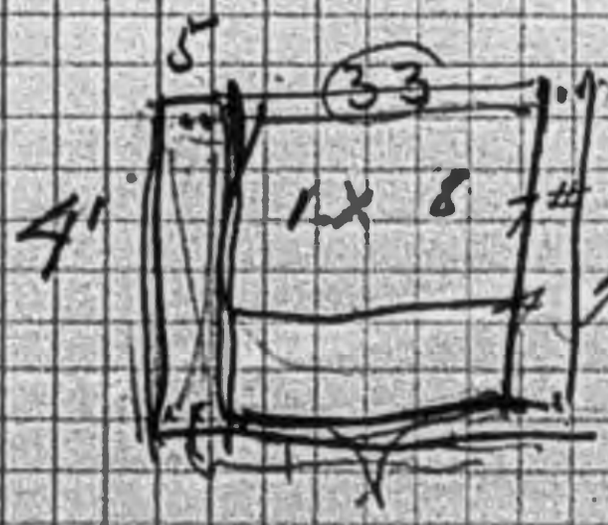
62.5'

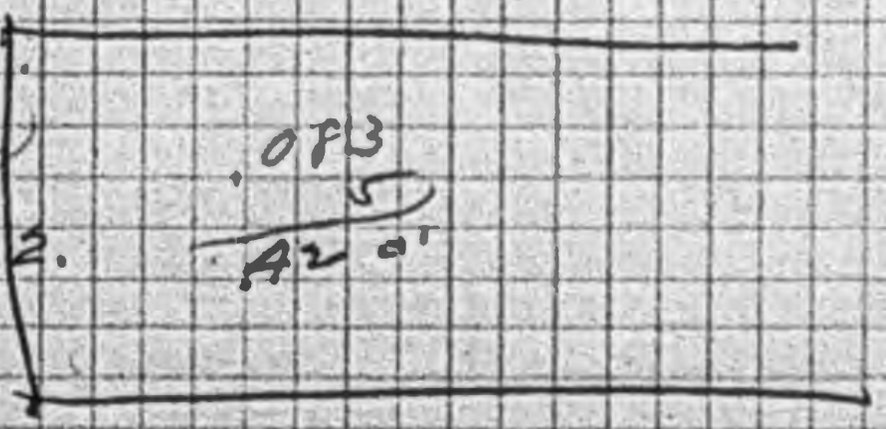
42" Reinforced Pipe



Pipe Arch







Grade

Elevation at 0+00			254.00
963 Syphon + Trestle @ 1		.96	
3037 Conduit @ .45		1.37	2.33
Elevation at 40+00			251.67
372 Syphon + Trestle @ 1		.38	
628 Conduit @ .45		.28	.66
Elevation at 50+00			251.01
221 Trestle @ 1		.22	
779 Conduit @ .45		.35	.57
Elevation at 60+00			250.44
145 Trestle @ 1		.14	
855 Conduit @ .45		.39	.53
Elevation at 70+00			249.91
256 Syphon + Trestle @ 1		.28	
714 Conduit @ .45		.32	.60
Elevation at 80+00			249.31
157 Trestle @ 1		.17	
1833 Conduit @ .45		.83	1.00
Elevation at 100+00			248.31
194 Trestle + Syphon @ 1		.19	
1806 Conduit @ .45		.81	1.00
Elevation at 120+00			247.31
50 Trestle @ 1		.05	
1950 Conduit @ .45		.88	.93
Elevation at 140+00			246.38
50 Trestle @ 1		.05	
950 Conduit @ .45		.43	.48
Elevation at 150+00			245.90
32 Trestle @ 1		.03	
968 Conduit @ .30		29	.32
Elevation at 160+00			245.58
50 Trestle @ 1		.05	
1950 Conduit @ .30		.58	.63
Elevation at 180+00			244.95
40 Bridge @ 1		.04	
1960 @ .30		.59	63
Elevation at 200			244.32

Elevation at 200+00			244.32
1050 Syphon @ 1	1.05		
1530 Conduit @ .30	.46		1.51
Elevation at 225+80			242.81
302 Conduit @ .30			.09
Elevation at 228+82			242.72
Same (Equation)			
Elevation at 232+976			242.72
1802.4 Conduit @ .30			.54
Elevation at 257			242.18

Elevation at 0+00 — 254.00 ✓

963 Syphon + Trunk @ 1 — .96
2037 Conduit @ .45 — 1.57 — 2.53

Elevation at 40+00 — 251.67 ✓

377 Syphon + Trunk @ 1 — .35
623 Conduit @ .45 — .28 — .63

Elevation at 50+00 — 251.01

271 Trunk @ 1 — .22
779 Conduit @ .45 — .35 — .57

Elevation at 60+00 — 250.44 ✓

145 Trunk @ 1 — .14
855 Conduit @ .45 — .39 — .53

Elev at 70+00 — 249.91 ✓

286 Syphon + Trunk @ 1 — .28
714 Conduit @ .45 — .32 — .60

Elev at 80+00 — 249.31 ✓

167 Trunk @ 1 — .17
1833 Conduit @ .45 — .83 — 1.00

Elev at 100+00 — 248.31 ✓

194 Trunk + Syphon @ 1 — .19
1806 Conduit @ .45 — .81 — 1.00

Elev at 120+00 — 247.31 ✓

50 Trunk @ 1 — .05
1950 Conduit @ .45 — .88 — .93

Elev at 140+00 — 246.38 ✓

82 Trunk @ 1 — .08
1918 Conduit @ .45 — .86 — .94

Elev at 160+00 — 245.44 ✓

50 Trunk @ 1 — .05
1950 Conduit @ .45 — .88 — .93

Elev at 180+00 — 244.51 ✓

40 Trunk @ 1 — .04
1960 Conduit @ .45 — .88 — .92

Elev at 200+00 — 243.59 ✓

1050 Syphon @ 1 — 1.05
1520 Conduit @ .45 — .69 — 1.74

Elev at 225+80 — 241.85

Elevation at 225+80 — 241.85
302 Conduit @ .45 — .14
241.71

Elevation at 226+82
Same
Elevation at 232+97.6 — 241.71
1802.4 @ .45 — .81
Elevation at 251 — 240.90

4' deep x 4' wide - 16 sq ft =

14 cu ft water per lin ft of flume = 14 × 62.5 = 875 lbs W per Lin ft of flume

3.5 ft of 2½" slat @ 32 lbs per foot - 11.2 lbs

875 lbs W of water
11.2 lbs W of bottom slats
987

5 | 493.5
98.7

25' Span mill

118.
51
67

169.
51.4
117.6
98.7
18.9 Exc

987
314
1501

51.4
5
257.0

51.4

169
124.4
25.

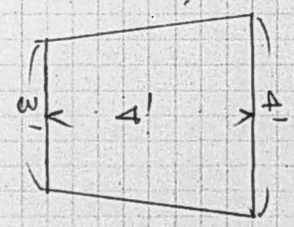
169.
150.1
18.9 Exc

Open Conduit Yardage Table

Showing cu yds per Lin Foot

Depth of Cut	Slope 1:1 cu yds	Slope 1:2 cu yds	Slope 1:4 cu yds	Slope 1:8 cu yds	Level cu yds
0 ft	.09	.049	.035		.032
1 ft	.19	.17	.17		.16
2 ft	.33	.31	.30	.30	.30
3 ft	.54	.47	.46	.46	.46
4 ft	.83	.654	.636	.627	.625
5 ft	1.193	.874	.830	.820	.820
6 ft	1.611	1.144	1.075	1.061	1.056
7 ft	2.164	1.477	1.379	1.358	1.348

Top of Section



For Carroll Conduit

(1)

Estimate of Cu Yds per foot on
Concrete trestles for Steel Flume
Assuming average height of bents at 15 ft
& Span of 15 ft

.5 x .5 x 30' = 7.50 cu ft in uprights
.5 x .5 x 5 = 1.25 Cu ft - struts
.833 x 1 x 15 = 12.50 - Cu ft - Stringers
.0333 x .5 .5 x 10 = 4.58 Cu ft - cross ties
25.83 cu ft
Sill 1 x 1 x 10 - 10.00 cu ft
27 | 35.83 Cu ft —
15 | 1.3270 Cu Yds
.08847 Cu Yds per lin foot

(2)

Estimate of Cu Yds per foot on Concrete Flume
Assuming average height of 5' 6"

4' x .833 x 2 x 25 = 166.666 = Grades
3.5 x .21 x 25 = 18.375 = Flow Slab
.5 x .5 x 15 = 3.750 = Bent cross brace
1 x 1 x 9 = 9.000 = Sill
27 | 197.791 = Total Cu ft
25 | 4.436 Cu Yds per 25' Section
.17745 Cu Yds per foot

6336.4
11260.4
17596.8

Carroll Canal.

Summary of Excavation.

Sheet	Yds E & LR	Yds S R	Yds Total
1	190.4 ✓	714.1 ✓	904.5 ✓
2	230.9 ✓	547.4 ✓	778.3 ✓
3	78.1 ✓	750.9 ✓	829.0 ✓
4	✓	1541.1 ✓	1541.1 ✓
5	347.1 ✓	735.9 ✓	1083.0 ✓
6	589.5 ✓	589.5 ✓	1179.0 ✓
7	667.9 ✓	668.1 ✓	1336.0 ✓
8	2090.5 ✓	580.5 ✓	2671.0 ✓
9	2938.0 ✓	573.3 ✓	3511.3 ✓
10	3128.0 ✓		3128.0 ✓
	10260.4 ✓	6700.8 ✓	16961.2 ✓

✓

10260.4
6700.8
16961.2 ✓

Excavation Computation
Carroll Canal

10 Pages ①

3 ft ℄ cut assumed except where greater is indicated on Profile

Stations based on Contour Survey by McFadden Feb 1917 Begins at Damsite 'C'

Sta	Dist	Slope	Average ℄ Cut	Cu Yds per Foot	Total Cu Yds	Classification E	L.R	S.R	Remarks
0+00						(10%)		(90%)	
	100	1:3	3.0	.50	5.0.	5. ✓		45.	
1+00									51.45 5.15 46.31
	105	1:4	3.0	.49	5.1.5	5.2 ✓		46.3	
2+05									
	55	Br.	—	—	—	—	—	—	
2+60									
	40	1:3	3.0	.50	2.0.0	2. ✓		18.	
3+00									
	100	1:3	3.0	.50	5.0.	5. ✓		45.	
4+00									
	100	1:3	3.0	.50	5.0.	5. ✓		45. ✓	
5+00									
	100	1:3	3.0	.50	5.0.	5. ✓		45. ✓	
6+00									
	100	1:3	3.0	.50	5.0.	5. ✓		45. ✓	
7+00									
	60	1:3	3.0	.50	3.0.	3. ✓		27 ✓	
7+60									
	48	Trestle	—						
8+08									
	62	1:3	3.0	.50	3.1.	3.1 ✓		27.9 ✓	
8+70									
	86	Trestle	—						
9+56									
	34	1:3	3.0	.50	1.7.	1.7 ✓		15.3 ✓	
10+00									
	100	1:3	3.0	.50	5.0.	5. ✓		45. ✓	
11									
	100	1:3	3.0	.50	5.0.	5. ✓		45. ✓	
12									
	100	1:3	3.0	.50	5.0.	5. ✓		45. ✓	
13									
	100	1:3	3.0	.50	5.0.	5. ✓		45. ✓	
14									
	110	1:2	3.0	.50	5.5.	5.5 ✓		49.5 ✓	
15+10						(50%)		(50%)	
	150	Trestle							
16+40									
	60	1:6	6.0	1.12	6.72	33.6 ✓		33.6 ✓	
17+10									
	90	1:6	4.0	.67	6.03	30.1 ✓		30.2 ✓	
18									
	100	1:4	3.0	.49	4.9.	24.5 ✓		24.5 ✓	
19									
	100	1:4	3.0	.49	4.9.	24.5 ✓		24.5 ✓	
20									
	50	1:4	3.0	.49	2.45.	12.2 ✓		12.3 ✓	
+50					904.5 ✓	190.4 ✓		714.1 ✓	

✓ R.A.M.

Sta	Dist	Slope	Average d Cut	Cu Yds Per Foot	Total Cu Yds	Classification E 50%	L	R	S R 50%
20+50									
	50	1:4	3.0	.49	24.5	12.3 ✓			12.2 ✓
21									
	100	1:3	3.0	.50	50.	25. ✓			25. ✓
22									
	100	1:2	3.0	.50	50.	25. ✓			25. ✓
23									
	40	1:2	3.0	.50	20	10. ✓			10. ✓
+40									
	100	Trestle	—	—		25%			75%
24+40									
	60	1:2	3.0	.50	30.	7.5 ✓			22.5 ✓
25									
	100	1:2	3.0	.50	50.	12.5 ✓			37.5 ✓
26									
	115	1:2	3.0	.50	57.5	14.4			43.1
27+15									
	65	Trestle	—	—					
+80									
	20	1:2	3.0	.50	10	2.5 ✓			7.5
29									
	90	1:2	3.0	.50	45.	11.3 ✓			33.7 ✓
+90									
	60	Trestle	—	—					
31+50									
	80	1:2	3.0	.50	40	10. ✓			30. ✓
32+30									
	70	1:3	3.0	.50	35.	8.7 ✓			26.3 ✓
33									
	100	1:3	3.0	.50	50.	12.5 ✓			37.5 ✓
34									
	90	1:3	3.0	.50	45.	11.3 ✓			33.7 ✓
+90									
	60	1:4	3.0	.49	29.4	7.4			22.0
35+50									
	80	Trestle	—	—					
+80									
	120	1:3	3.0	.50	60.	15. ✓			45. ✓
37									
	100	1:3	3.0	.50	50.	12.5 ✓			37.5 ✓
38									
	50	1:3	3.0	.50	25.	6.3 ✓			18.7 ✓
+50									
	84	Trestle	—	—					
39+34									
	71	1:4	3.0	.49	34.8	8.7 ✓			26.1 ✓
40+05									
		Trestle	—	—					
+65									
	35	1:4	3.0	.49	17.1	4.3			12.8
41									
	110	1:3	3.0	.50	55.0	13.7 ✓			41.3 ✓
42+10									
+50	40	Trestle	—	—					
					778.3 ✓	193.9 ✓			547.4 ✓

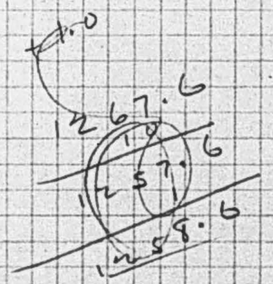
D.A.M.

Sta	Dist	Slope	Average d Cut	Cu Yds per ft	Total Cu Yds	Classification E 25%	L	R	S R 75%
42+50									
	50	1:3	3.0	.50	25.	6.2 ✓			18.8 ✓
43									
	50	1:2	3.0	.50	25.	6.2 ✓			18.8 ✓
44									
	65	1:4	3.0	.49	31.8	8.0			23.8 ✓
+65									
	257	Syphon	—	1.0	—				
47+22									
	108	1:3	3.0	.50	54.	13.5			40.5 ✓
48+30									
	20	Trestle	—	—	—				
+50						25.2			75%
	50	1:3	3.0	.50	25.	6.2 ✓			18.8 ✓
49									100%
	100	1:4	3.0	.49	49.				49. ✓
50									
	100	1:2	3.0	.50	50.				50. ✓
51									
	50	1:2	3.0	.50	25.				25. ✓
+50									
(?)	20	Trestle	—	—	—				
52+30									
	35	1:3	3.0	.50	17.5	4.4 ✓			13.1 ✓
+85									
	56	1:2	3.0	.50	28.	7. ✓			21. ✓
53+41									
	96	Trestle	—	—	—				
54+37									
	63	1:2	3.0	.50	31.5	7.9			23.6 ✓
55									
	100	1:3	3.0	.50	50.	12.5			37.5 ✓
56									
	50	1:3	3.0	.50	25.	6.2 ✓			18.8 ✓
+50									100%
	50	1:3	3.0	.50	25.				25. ✓
57									
	100	1:2	3.0	.50	50.				50. ✓
58									
	25	1:1	4.0	.56	14.				14. ✓
+25									
	45	Trestle	—	—	—				
+70									
	130	1:2	3.0	.50	65.				65. ✓
60									
	30	1:1	4.0	.80	24.				24. ✓
+30									
	24	Trestle	—	—	—				
+54	19	1:1	4.0	.80	15.2				15.2 ✓
+73		Trestle	—	—					
61+03	95	1:1	4.0	.80	76.				76. ✓
62									
	50	1:2	3.0	.50	25.				25. ✓
+50									
	50	1:2	6.0	1.16	58.				58. ✓
63									
	50	1:1	4.0	.80	40				40. ✓
+50					829.0	78.1			750.9

754.9 + 78.1 = 833.0

D.A.M.

Sta	Dist	Slope	Average ℄ Cut	Cu Yds per Foot	Total Cu Yds	Classification E	LR	SR
63+50								100%
	67	Trestle	—	—				
64+17								
	83	1:1	4.0	.80	6.64			66.4
65								
	114	1:2	3.0	.50	57.			57.
66+14								
	54	Trestle	—	—				
+68								
	32	1:1	4.0	.80	25.6			25.6
67								
	100	1:1	4.0	.80	8.0.			80.
68								
	100	1:2	3.0	.50	50.			50.
69								
	100	1:1	4.0	.80	8.0.			80.
70								
	43	1:2	4.0	.69	29.7			29.7
+43								
	67	1:2	4.0	.69	46.2			46.2
71+10		~~1:2~~	~~4.0~~					
	90	1:1	4.0	.80	72.			72.
72								
	100	1:1	4.0	.80	80.			80.
73								
	50	1:1	4.0	.80	40.			40.
+50								
	50	1:1	4.0	.80	40.			40.
74								
	100	1:2	3.0	.50	50.			50.
75								
	38	1:2	3.0	.50	19.			19.
+38								
	207	Syphon	—	1.0				
77+45								
	55	1:4	6.0	1.13	62.2			62.2
78								
	100	0:0	10.0	3.15	315.			315.
79								
	100	1:3	3.0	.50	50.			50.
80								
	100	1:2	3.0	.50	50.			50.
81								
	40	Trestle	—					
+40								
	60	1:2	3.0	.50	30.			30.
82								
	100	1:2	3.0	.50	50.			50.
83								
	100	1:2	3.0	.50	50.			50.
84								
	100	1:2	3.0	.50	50.			50.
85								
	100	1:2	3.0	.50	50.			50.
86								
	100	1:3	3.0	.50	50.			50.
87								
+96	96	1:3	3.0	.50	48.			48.
					1541.1			1541.1



D.A.M. ✓

Sta	Dist	Slope	Average ℄ ~~Cut~~	Cu Yds per Foot	Total Cu Yds	Classification E	LR	SR
87+96		~~1:3~~	~~3.0~~	~~1.50~~	~~45.~~			100%
	30	Trestle						
88+26								
	74	1:3	9.0	2.67	19.7			19.7
90								
+33	33	Trestle						
	67	1:3	3.0	.50	33.5			33.5
91						25%		~~25%~~
	100	1:3	3.0	.50	50.	12.5		37.5
92								
	100	1:3	3.0	.50	50.	12.5		37.5
93								
+60	60	1:3	3.0	.50	30.	7.5		22.5
	44	Trestle			—			
94+04								
	96	1:3	3.0	.50	48.0	12.0		36.
95								
+80	80	1:3	3.0	.50	40.	10.0		30.
	20	Trestle			—			
96								
	100	1:3	3.0	.50	50.	12.5		37.5
97								
	100	1:3	3.0	.50	50.	12.5		37.5
98								
	100	1:4	3.0	.49	49.	12.2		36.8
99								
	100	1:4	3.0	.49	49.	12.2		36.8
100								
	100	1:4	3.0	.49	49.	12.2		36.8
101								
	100	1:4	3.0	.49	49.	12.2		36.8
102								
	100	1:4	3.0	.49	49.	12.2		36.8
103								
	100	1:4	3.0	.49	49.	12.2		36.8
104+0								
	118	1:4	3.0	.49	57.8	14.4		43.4
105+18						—		
	162	ciphon		1.0	—			
106+80						50%		50%
	20	1:3	3.0	.50	10.	5.		5.
107								
	100	1:3	3.0	.50	50.	25.		25.
108								
	100	1:3	3.0	.50	50.	25.		25.
109								
	100	1:3	3.0	.50	50.	25.		25.
110								
	100	1:2	3.0	.50	50.	25.		25.
111								
	100	1:3	3.0	.50	50.	25		25.
112								
	100	1:3	3.0	.50	50.	25.		25.
113								
	100	1:3	3.0	.50	50	25.		25
114					1083.0	347.1		735.9

1148
30
1098

752.2
347.1
1099.3

D.A.M. ✓

Sta.	Dist.	Slope	Av. ℄ Cut	Cu Yds per Foot	Total Cu. Yds	Classification F	LR	SR
14								
	50	Fill						
+50								
	50	1:3	3.0	.50	25.	12.5		12.5
15								
	100	1:4	3.0	.49	49.	24.5		24.5
16								
	100	1:4	3.0	.49	49.	24.5		24.5
17								
	100	1:4	3.0	.49	49.	24.5		24.5
18								
	100	1:3	3.0	.50	50.	25.		25.
19								
	50	1:3	3.0	.50	25.	12.5		12.5
+50								
	32	Trestle		—	—			
+82								
	18	1:3	3.0	.50	9.0	4.5		4.5
20								
	100	1:2	3.0	.50	50.	25.		25.
21								
	100	1:2	3.0	.50	50.	25.		25.
22								
	50	Trestle		—	—			
22+50								
	50	1:2	3.0	.50	25.	12.5		12.5
23								
	100	1:2	3.0	.50	50.	25.		25.
24								
	100	1:2	3.0	.50	50.	25.		25.
25								
	100	1:2	3.0	.50	50.	25.		25.
26								
	100	1:2	3.0	.50	50.	25.		25.
27								
	100	1:2	3.0	.50	50.	25.		25.
28								
	100	1:3	3.0	.50	50.	25.		25.
29								
30	100	1:3	3.0	.50	50.	25.		25.
	100	1:3	3.0	.50	50.	25.		25.
31								
	100	1:3	3.0	.50	50.	25.		25.
32								
	100	1:3	3.0	.50	50.	25.		25.
33								
	100	1:3	3.0	.50	50.	25.		25.
34								
	100	1:3	3.0	.50	50.	25.		25.
35								
	100	1:3	3.0	.50	50.	25.		25.
36								
	100	1:3	3.0	.50	50.	25.		25.
37								
	100	1:4	3.0	.49	49.	24.5		24.5
38								
	100	1:4	3.0	.49	49.	24.5		24.5
139					1179.0	589.5		589.5

24" Culvert

D.G.M. ✓

Sta	Dist	Slope	Av ℄ Cut	Cu Yds per ft	Total Cu Yds	Classification F	LR	SR
139								
	100	1:4	3.0	.49	49.	24.5		24.5
140								
	100	0:0	3.0	.56	56.	28.		28.
41								
	100	0:0	3.0	.56	56.	28.		28.
42								
	100	0:0	3.0	.56	56.	28.		28.
43								
	100	1:4	3.0	.49	49.	24.5		24.5
44								
	109	1:3	3.0	.50	54.5	27.2		27.3
45+09								
	50	Trestle		—	—			
+59								
	41	1:3	3.0	.50	20.5	10.2		10.3
146								
	100	1:3	3.0	.50	50.	25.		25.
47								
	100	1:3	3.0	.50	50.	25.		25.
48								
	100	1:3	3.0	.50	50.	25.		25.
49								
	100	1:3	3.0	.50	50.	25.		25.
150								
	100	1:3	3.0	.50	50.	25.		25.
51								
	50	1:3	3.0	.50	25.	12.5		12.5
51+50								
	32	Trestle		—	—			
+82								
	118	1:3	3.0	.50	59.0	29.5		29.5
153								
	100	1:4	3.0	.49	49.	24.5		24.5
54								
	100	1:4	3.0	.49	49.	24.5		24.5
55								
	100	1:4	3.0	.49	49.	24.5		24.5
6								
	100	1:4	3.0	.49	49.	24.5		24.5
7								
	100	1:4	3.0	.49	49.	24.5		24.5
8								
	100	1:4	3.0	.49	49.	24.5		24.5
9								
	100	1:4	3.0	.49	49.	24.5		24.5
160								
	100	0:0	3.0	.56	56.	28.		28.
1								
	100	0:0	3.0	.56	56.	28.		28.
2								
	100	0:0	3.0	.56	56.	28.		28.
3								
	100	1:3	3.0	.50	50.	25.		25.
4								
	100	1:3	3.0	.50	50.	25.		25.
5								
	100	1:3	3.0	.50	50.	25.		25.
6					1336.0	667.9		668.1

D.G.M. ✓

Sta	Dist	Slope	Av ℄ Cut	Cu Yds per Foot	Total Cu Yds	Classification E	LR	SR
166								
+50	50	1:3	3.0	.50	25.	12.5		12.5
	50	Trestle		—				
167								
8	100	1:3	3.0	.50	50.	25.		25.
9	100	1:3	3.0	.50	50.	25.		25.
170	100	1:3	4.0	.69	69.	34.5		34.5
1	100	1:3	4.0	.69	69.	34.5		34.5
2	100	1:3	4.0	.69	69.	34.5		34.5
3	100	1:3	4.0	.69	69.	34.5		34.5
4	100	1:3	4.0	.69	69.	34.5		34.5
5	100	1:3	4.0	.69	69.	34.5		34.5
6	100	1:3	6.0	1.16	116.	58.		58.
7	100	1:3	4.0	.69	69.	34.5		34.5
8	100	1:3	4.0	.69	69.	34.5		34.5
9	100	1:3	4.0	.69	69.	34.5		34.5
180	100	1:3	4.0	.69	69.	34.5		34.5
1	100	1:3	4.0	.69	69.	34.5		34.5
2	100	1:3	5.0	.92	92.	46.		46.
3	100	1:3	4.0	.69	69.	34.5		34.5
						1000		
+40	40	Bridge		—				
4	60	1:3	5.0	.92	552.	552.		
5	100	1:4	5.0	.92	92.	92.		
6	100	0:0	4.0	.80	80.	80.		
7	100	0:0	5.0	1.06	106.	106.		
8	100	0:0	6.0	1.41	141.	141.		
9	100	0:0	6.0	1.41	141.	141.		
190	100	0:0	5.0	1.06	106.	106.		
1	100	0:0	5.0	1.06	106.	106.		
2	100	0:0	5.0	1.06	106.	106.		
3	100	0:0	4.0	.80	80.	80.		
					2671.0	3090.5		580.5

D.A.M. ✓

Sta	Dist	Slope	Av ℄ Cut	Cu Yds per Foot	Total Cu Yds	Classification E	LR	SR
193								
4	100	0:0	3.0	.56	56.	56.		
5	100	0:0	3.0	.56	56.	56.		
6	100	0:0	3.0	.56	56.	56.		
7	100	0:0	3.0	.56	56.	56.		
8	100	0:0	3.0	.56	56.	56.		
9	100	0:0	3.0	.56	56.	56.		
200	100	0:0	4.0	.80	80.	80.		
1	100	1:4	4.0	.67	67.	67		
2	100	1:4	5.0	.88	88.	88.		
3	100	1:4	5.0	.88	88.	88.		
4	100	1:4	4.0	.67	67.	67.		
5	100	1:4	3.0	.49	49.	49.		
6	100	1:4	3.0	.49	49.	49.		
7	100	1:3	5.0	.92	92.	92.		
8	100	1:3	5.0	.92	92.	92.		
9	100	1:3	5.0	.92	92.	92.		
210	100	1:3	5.0	.92	92.	92.		
11	100	1:3	5.0	.92	92.	92.		
12	100	1:3	4.0	.69	69.	69.		
13	100	1:3	4.0	.69	69.	69.		
14	132	1:3	4.0	.69	91.	91.		
15+32	1050	syphon		1.0	1050.0	1050.		
225+82	118	0:0	8.0	2.22	261.9	261.9		
7	100	0:0	10.0	3.15	315.			315
8	82	0:0	10.0	3.15	258.3			258.3
228+82 = 232+98	416	Equation			—			
234	102	0:0	3.0	.56	57.1	Adobe 57.1		
					3571.3 ✓	2938.0 ✓		573.3 ✓

D.A.M. ✓

Sta	Dist	Slope	Av Excav	Cu Yds per Foot	Total Cu Yds	Classification E	L R	S R
234+						Adobe		
	100	0:0	3.0	.56	56.	56		
5								
	100	0:0	3.0	.56	56.	56		
6								
	100	0:0	3.0	.56	56.	56		
7								
	100	0:0	4.0	.80	80.	80		
8								
	100	0:0	4.0	.80	80.	80		
9								
	100	0:0	4.0	.80	80.	80		
240								
	100	0:0	3.0	.56	56.	56		
1								
	100	0:0	6.0	1.41	141.	141		
2								
	100	0:0	8.0	2.22	222.	222		
3								
	100	0:0	9.0	2.67	267.	267		
4								
	100	0:0	10.0	3.15	315.	315		
5								
	100	0:0	12.0	4.23	423	423		
6								
	100	0:0	12.0	4.23	423	423		
7								
	100	0:0	10.0	3.15	315.	315		
8								
	100	0:0	9.0	2.67	267.	267		
9								
	100	0:0	7.0	1.85	185.	185		
250								
	100	0:0	5.0	1.06	106.	106		
1								
					3128.	3128		

D. A. M.

Concrete Pipe 205'

Open Conduit: .500 .554 .410 .644 ~~.100~~ .260 .150 .108 .188 .349 .647 .194 .327 .176 .018 .1270 .218 .2259 .659 .6192 1802 = 17225 × 302

Covered Conduit: .290 .275 .210 .080 ~~.100~~ 60 .120 .071 .145 .215 .300 .56 .213 .175 .160 ~~.24~~ 19? ~~.19~~ .245 .197 .682 = 3755 ~~60~~ +

Steel Cond. + Trestle: .55 .48 .86 .130 + Syphon .100 .160 .60 .96 .67 .54 .49 .33 .44 .50 .32 = 1064 .54

Low Trestle: .65 .30 .84 .40 .20 .80 .55 ~~.50~~ 45 .24 ~~.25~~ 32? .30 .20 .32 .50 .50 .40 = 695

Syphon: .257 .213 .162 .1048 + 1/2 = 1680 + 205 = 1885 × 2 = 1887

1064 + 697 + 384 = 3128

17525 × 302 = 5290755

17525 / 205 = 85 + 17109

3770 / 215 = 17 + 3513

1064 + 384 + 65 + 84 + 80 + 55 + 100 = 1448

218 + 6192 + 302 + 1802 = 8514

17525 + 8514 = 26039

17109 + 416 = 17525

205 + 17109 + 3573 + 1064 + 697 + 1680 = 24268 + 416 = 24684

17525 + 3770 + 1064 + 697 + 1680 = 24736

24736 / 684 = 36 + 257

1761

1680

14
15+32
16
17
18
19
20
21
22
23
24
25
+82
26
27
28
29
30

14
15+32
16
17
18
19
20
21
22
23
24
25
+82
26
27
28
29
30

132 1:3 4.0 .69 9.1 9.1

68
100
100
100
100
100
100
100
100
100
100
100
82

Syphon

1.00 68
100
100
100
100
100
100
100
100
100
100
100
82

968
1950
1960
1530
302
1802.4
8512.4

2453 72
1172
3.6257

245.9
242.27
15911
14050
1696

242.18
40 90
1.28

4156

4158

150
257
10100

415.6
96844

4612
1694.5

+2

+4

1696.12
44

10100
415.6
9684.4
3
29053 2
1.172
3.077
245.90
242.823

10100
1587.6
8512.4
3
25547 2
1172
3.726
245.90
242.174
180

415.6
1172.0
1587.6

122
1010
1172 @ 1 = 1.172
3.03
4.20
245.9
241.7

242.18
242.174
242.

:

2.H.

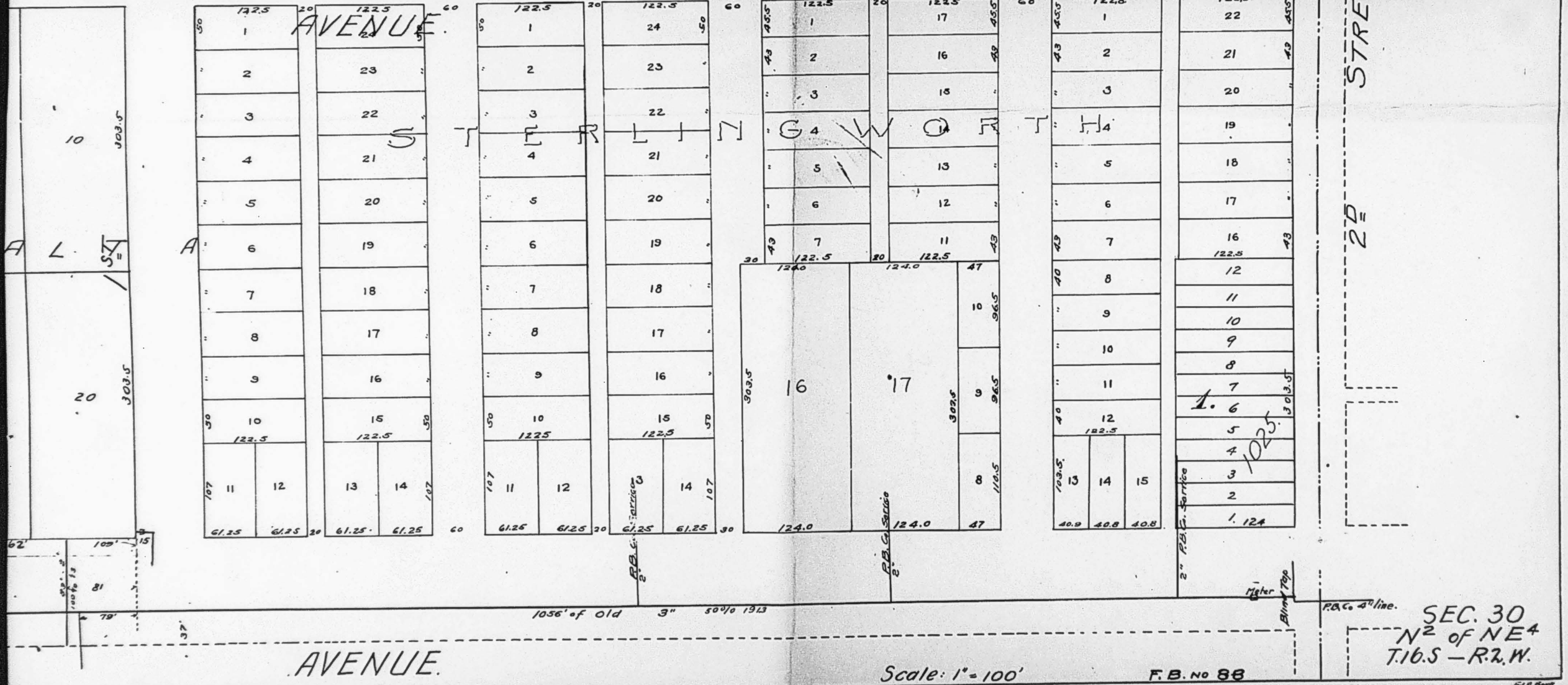
AVENUE.

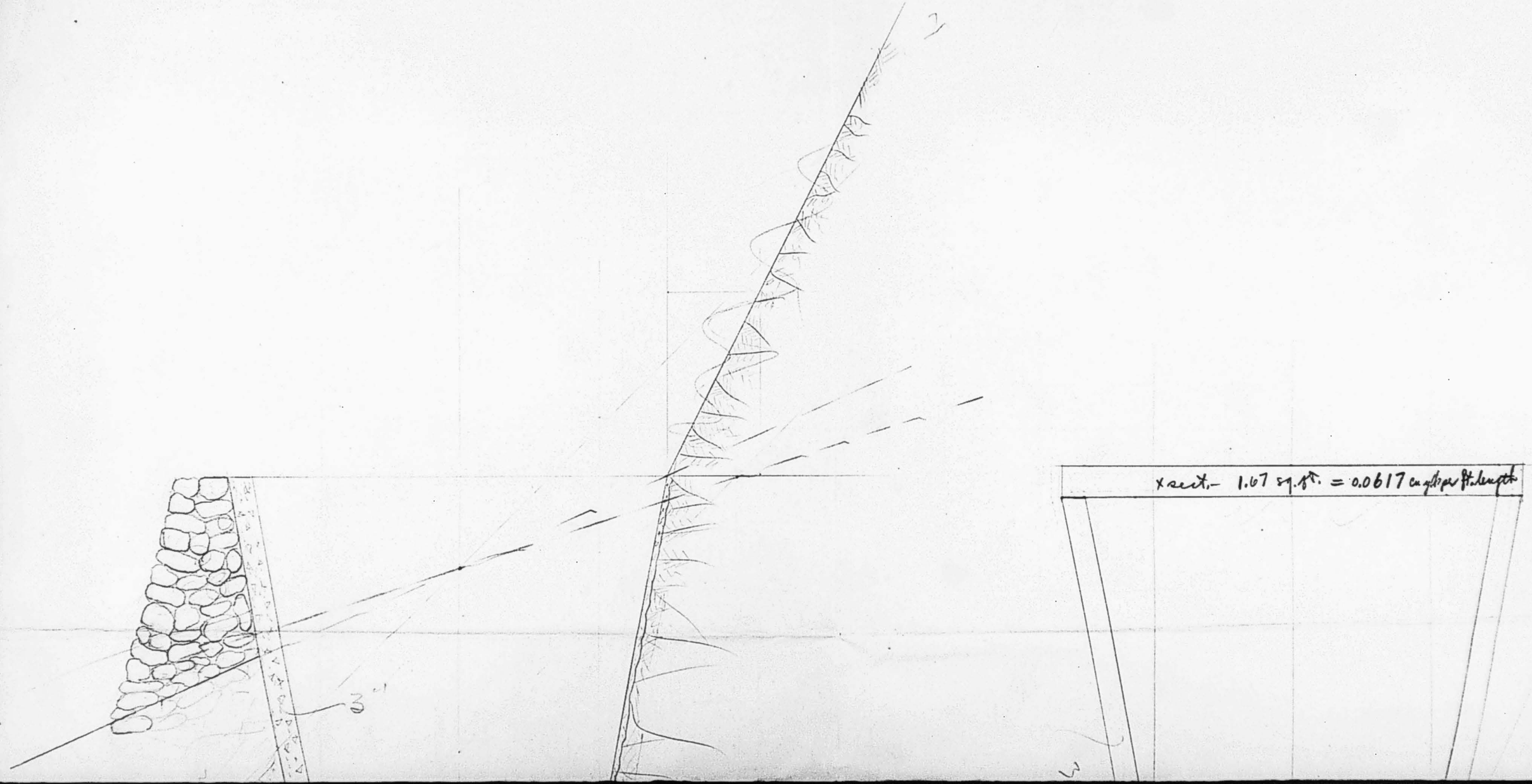
C.	Tract	D	Tract	E	Tract	F.	Tract	G.
A	A	A	A	A	A	A	A	A
B	B	B	B	B	B	B	B	B
C	C	C	C	C	C	C	C	C
D	D	D	D	D	D	D	D	D
E 10.	E 11.	E 12.	E 13.	E 14.	E 15.	E 16.	E 17.	E 18.
F	F	F	F	F	F	F	F	F
G	G	G	G	G	G	G	G	G
H	H	H	H	H	H	H	H	H
I	I	I	I	I	I	I	I	I
J	J	J	J	J	J	J	J	J
K	K	K	K	K	K	K	K	K

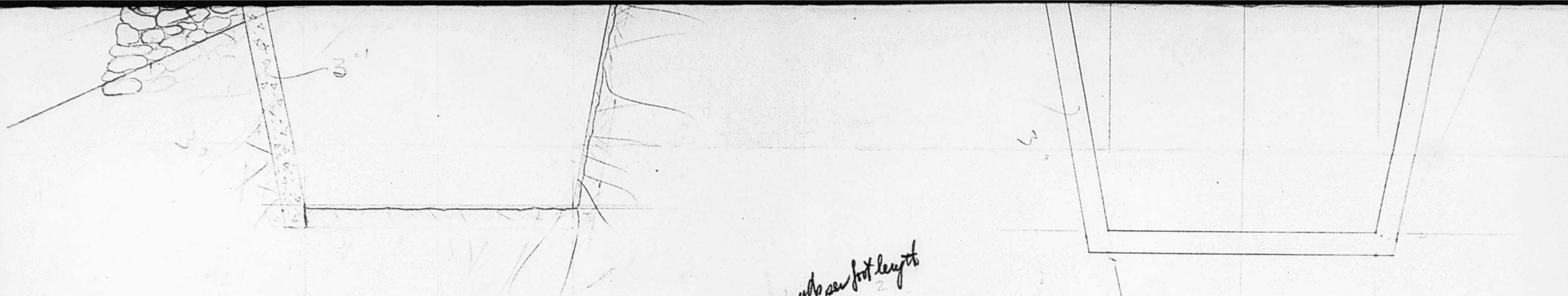
STREET. PROSPECT STREET PERFECT STREET LAKE VIEW STREET

AVENUE.

STREET


AVENUE.
STREET
AVENUE.
Scale: 1" = 100'
F.B. No 88
SEC. 30
N2 of NE4
T.16.S — R.2.W.
CORRECTED DEC. 1st 1912 J.P.M.
March 26th 1913 Ed. A. Barth
Corrected to Sept. 2, '13 J.P.M.
" Mar. 23, '14. R.M.
2. H.
Ed. A. Barth
1056' of Old 3" 50 o/o 1913
P.B.C. 4th line.
Meter
Blind Top
2" P.B.C. Service
1025
16
17


1
3:1
x sect.- 1.67 sq. ft. = 0.0617 cu. yds per ft. length
3



xsect area Conc. = 2.9 sq. ft. = 0.1074 cu. yds. per foot length

Inside surface area per foot of length = 11.15 sq. ft.

0.1074
0.0617
0.1791

1" = 1'

MONROE.

STREET.

33TH

1. STREET

2. STREET

3. STREET

8. STREET.

9.

MECHANIC

OLIVE

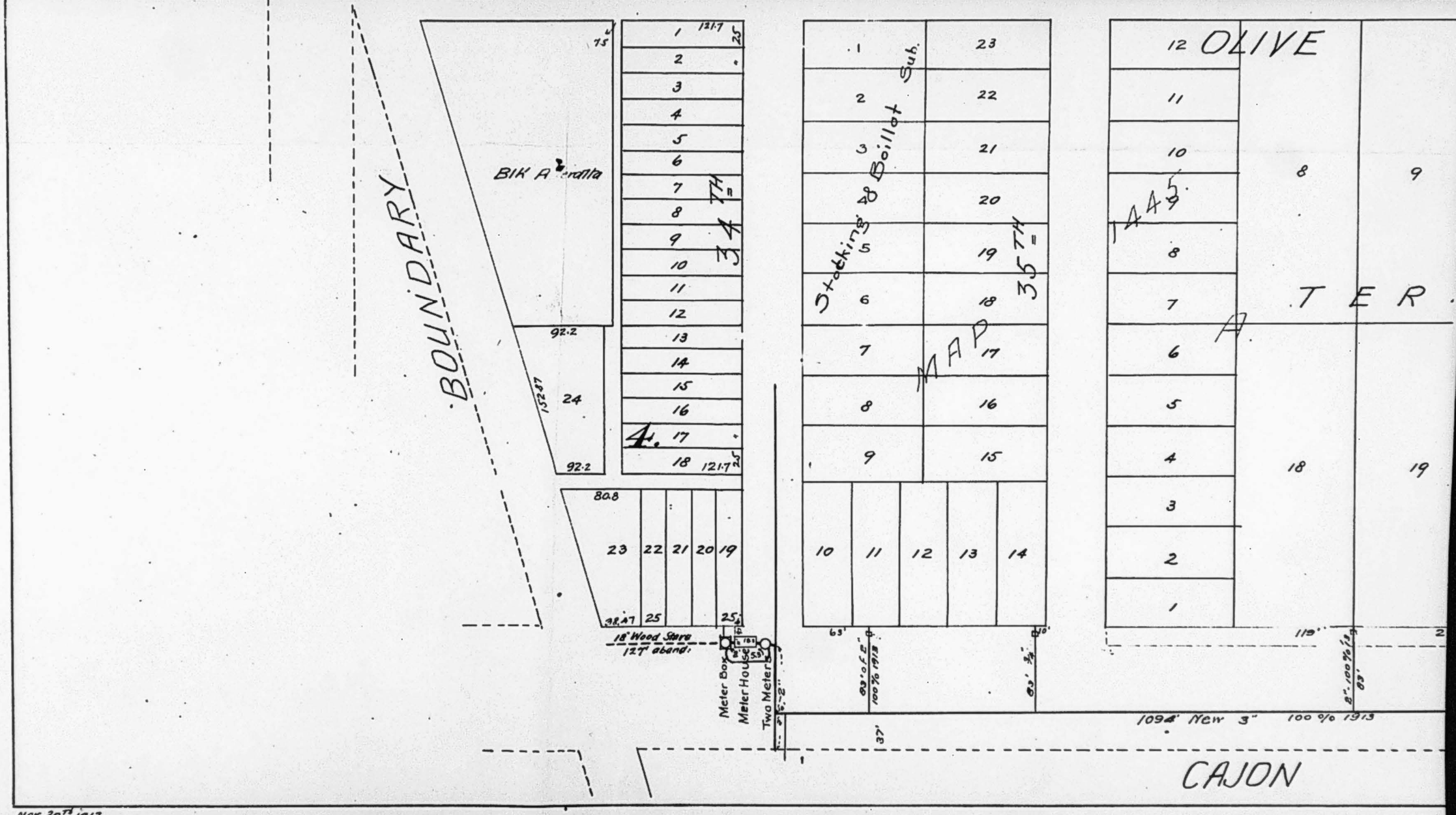
Tap

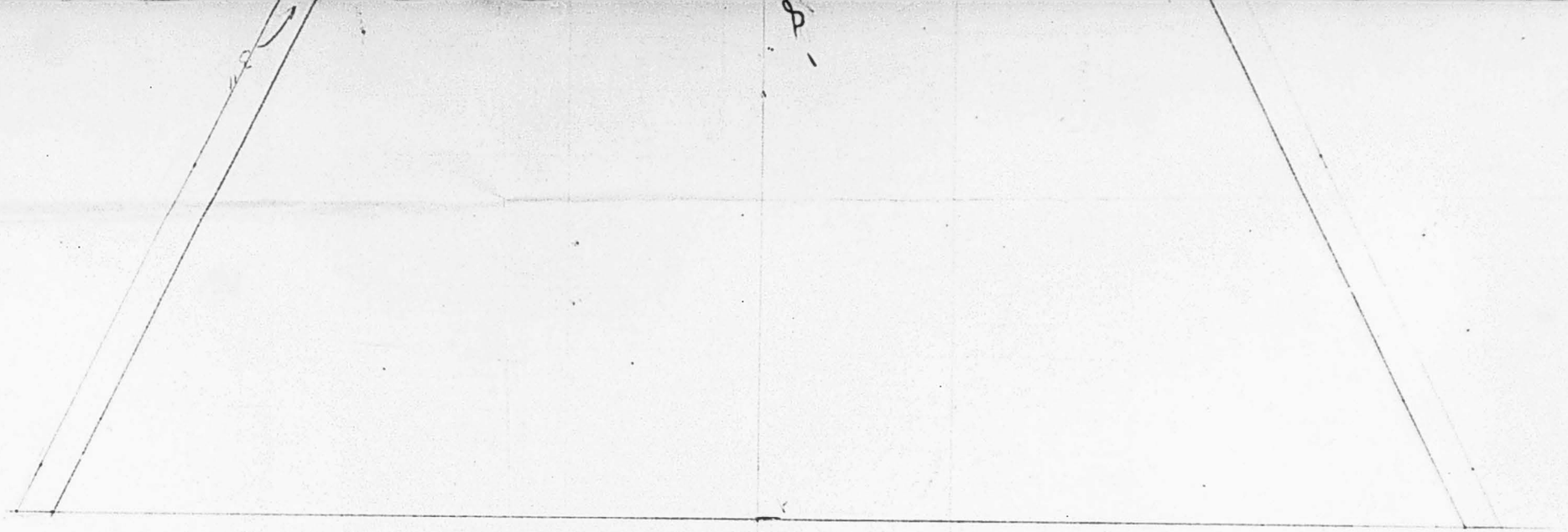
1" Stand

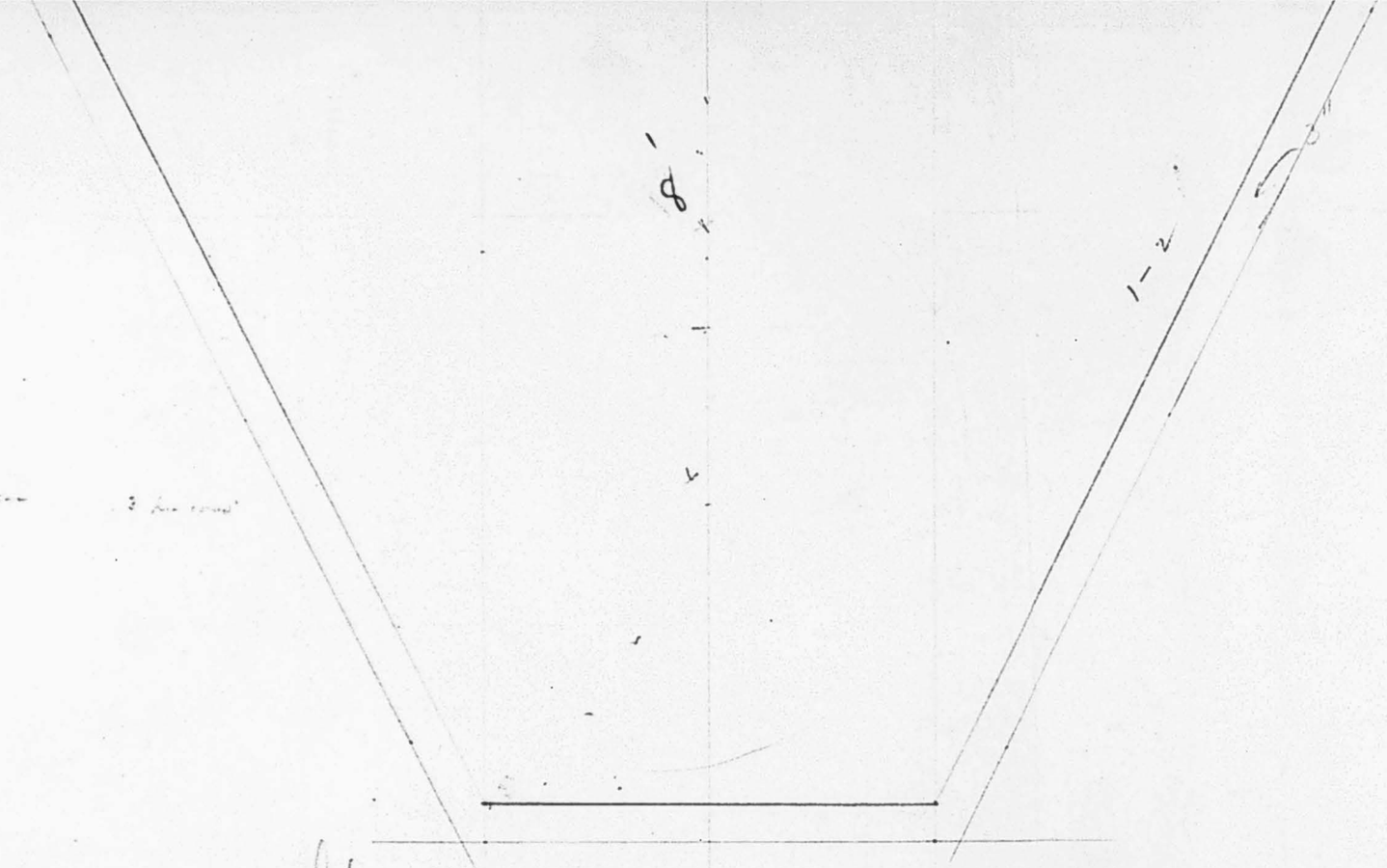
Tract B

Tract

Sub.


BOUNDARY
BIK A
34TH
35TH
Stocking & Boillot Sub.
MAP
OLIVE
TER
1445
CAJON
18" Wood Stave
127' aband.
Meter Box
Meter House
Two Meters
1094' New 3" 100% 1913
Nov 20th 1912





$8.25 \times \frac{14.13}{2} = 62.55$

$8.00 \times \frac{14}{2} = 56.00$

$62.55 - 56 = 6.55$

1" = 1'

x sect area = 6.55 sq ft. = 0.228 cu ft. per foot length.

Inside surface area per foot length = 20.88 sq. ft.

CARROLL CONDUIT - TYPES OF CONSTRUCTION

Station		Grades	Syphon	Open Conduit	Steel Flume	Covered Conduit
0+00 =	254.00					
		42" Pipe	265			
2+65	253.735					
		Open Conduit		450		
7+15	253.5325					
		Steel Flume			15	
7+30	253.5175					
		Open Conduit		42		
7+72	253.4986					
		Steel Flume			105	
8+77	253.3936					
		Open Conduit		581		
14+58	253.1322					
		Steel Flume			180	
16+38	252.9522					
		Open Conduit		717		
23+55	252.6295					
		Steel Flume			60	
24+15	252.5695					
		Open Conduit		318		
27+33	252.4264					
		Steel Flume			15	
27+48	252.4114					
		Open Conduit		232		
29+80	252.3070					
		Steel Flume			15	
29+95	252.2920					
		Open Conduit		95		
30+90	252.2493					
		Steel Flume			30	
31+20	252.2193					
		Open conduit		428		
35+48	252.0267					
		Steel Flume			15	
35+63	252.0117					
		Open conduit		242		
38+05	251.9028					
		Steel Flume			15	
38+20	251.8878					
		Open conduit		58.94		
38+63	251.8612					
		Steel Flume			30	
38+93	251.8312					
		Open conduit		73		
39+66	251.7984					
		Steel Flume			75	
40+41	251.7234					
		Open conduit		124		
41+65	251.6677					
		Steel Flume			30	
41+95	251.6377					

Station		Grades	Syphon	Open Conduit	Steel Flume	Covered Conduit
41+95	251.6377					
		Open Conduit		69		
42+64	251.6065					
		Steel Flume			15	
42+79	251.5915					
		Open Conduit		116		
43+95	251.5393					
		42" Pipe Syphon (or 287 slope)	265+			
46+60	251.2743					
		Open conduit		76		
47+36	251.2401					
		Steel Flume			15	
47+51	251.2251					
		Open conduit		139		
48+90	251.1626					
		42" Pipe (or 323 slope)	315+			
52+05	250.8477					
		Open conduit		95		
53+00	250.8048					
		Covered conduit				205
55+05	250.7126					
		Steel Flume			45	
55+50	250.6676					
		Covered conduit				160
57+10	250.5956					
		Steel Flume			15	
57+25	250.5806					
		Covered Conduit				30
57+55	250.5671					
		Steel Flume			15	
57+70	250.5521					
		Covered Conduit				269.35
60+39.35	250.4309					
		Steel Flume			60	
60+97	250.3709					
		Covered Conduit				21
61+18	250.3614					
		Steel Flume			45	
61+63	250.3164					
		Covered conduit				122
62+85	250.2615					
		Steel Flume			60	
63+45	250.2015					
		Covered Conduit				793
71+38	249.8447					
		42" Pipe (or 243 slope)	222+			
73+60	249.6227					
		Open Conduit		343		
77+03	249.4683					
		Steel Flume			39	
77+42	249.4293					
		Open Conduit		646		
83+88	249.1386					

Station		Grades	Syphon	Open Conduit	Steel Flume	Covered Conduit
83+88	249.1386					
		Steel Flume			15	
84+03	249.1236					
		Open conduit		169		
85+72	249.0476					
		Steel Flume			39	
86+11	249.0086					
		Open conduit		326		
89+37	248.8619					
		Steel flume			30	
89+67	248.8319					
		Open conduit		195		
91+62	248.7441					
		Steel Flume			15	
91+77	248.7291					
		Open conduit		893		
100+70	248.3273					
		42" Pipe (or 173 slope)	168+			
102+38	248.1593					
		Open conduit		738		
109+76	247.8272					
		Steel Flume			15	
109+91	247.8122					
		Open conduit		452		
114+43	247.6088					
		Steel Flume			30	
114+73	247.5788					
		Open conduit		204		
116+77	247.4870					
		Steel Flume			60	
117+37	247.4270					
		Open Conduit		2213		
139+50	246.4311					
		42" Pipe	40			
139+90	246.3911					
		Open conduit		635		
146+25	246.1054					
		42" Pipe	60			
146+85	246.0453					
		Open conduit		315		
150+00	245.9036					
		Open conduit		1210		
162+10	245.5406					
		42" pipe	30			
162+40	245.5106					
		open conduit		1605		
178+45	245.0291					
		42" pipe	35			
178+80	244.9941					
		Open conduit		1357		
192+37	244.5870					

Station		Grades	Syphon	Open Conduit	Steel Flume	Covered Conduit
192+37	244.5870					
		42" pipe (or 134 slope)	133			
193+70	244.4540					
		Open conduit		1710		
210+80	243.9410					
		42" pipe (or 1068 slope)	1060			
221+40	242.8810					
		Open conduit		150		
222+90	242.8360					
		42" pipe (or 566 slope)	555			
228+45	242.2810					
		Open conduit		1606		
244+51						
			3148	18,622.94	1098	1600.35

TABULATION SHOWING LENGTHS AND NUMBER OF STEEL BARS ORDERED BY CONTRACTORS FOR EACH UNIT OF TRESTLE.

Unit No. 1-B	2 pieces 1/2 x 15' 0" =	30' 0"
	2 " 1/2 x 18' 0" =	36' 0"
	4 " 1/2 x 4' 0"	16' 0"
	4 " 1/2 x 1' 0"	4' 0"
	Total Length ----------	86' 0"
	Total Number of Units ---	36
Unit No. 2	2 pieces 1/2 x 14' 0" =	28' 0"
	2 " 1/2 x 16' 0"	32' 0"
	4 " 1/2 x 4' 0"	16' 0"
	4 " 1/2 x 1' 0"	4' 0"
	Total Length ----------	80' 0"
	Total Number of Units ---	27
Unit No. 3	2 pieces 1/2 x 15' 6" =	31' 0"
	2 " 1/2 x 17' 6"	35' 0"
	4 " 1/2 x 4' 0"	16' 0"
	4 " 1/2 x 1' 0"	4' 0"
	Total Length ----------	86' 0"
	Total Number of Units ---	14
Unit No. 4	2 pieces 1/2 x 17' 0" =	34' 0"
	2 " 1/2 x 19' 0"	38' 0"
	4 " 1/2 x 4' 0"	16' 0"
	4 " 1/2 x 1' 0"	4' 0"
	Total Length ----------	92' 0"
	Total Number of Units --	5
Unit No. 5.	2 pieces 1/2 x 18' 0" =	36' 0"
	2 " 1/2 x 20' 0"	40' 0"
	4 " 1/2 x 4' 0"	16' 0"
	4 " 1/2 x 1' 0"	4' 0"
	Total Length ----------	96' 0"
	Total Number of Units ---	4
Unit No. 6	2 pieces 1/2 x 19' 6" =	39' 0"
	2 " 1/2 x 21' 6"	43' 0"
	4 " 1/2 x 4' 0"	16' 0"
	4 " 1/2 x 1' 0"	4' 0"
	Total Length ----------	102' 0"
	Total Number of Units ---	2
Unit No. 7	2 pieces 1/2 x 21' 0" =	42' 0"
	2 " 1/2 x 23' 0"	46' 0"
	4 " 1/2 x 4' 0"	16' 0"
	4 " 1/2 x 1' 0"	4' 0"
	Total Length ----------	108' 0"
	Total Number of Units ---	2
Cradle	2 hairpin pcs 1/2 x 8' 6" =	17' 0"
	2 " 1/2 x13' 6"	27' 0"
	1 " 1/2 x 8' 3"	8' 3"
	1 " 1/2 x 9' 4"	9' 4"
	2 " 1/2 x 5' 4"	10' 8"
	2 " 1/2 x 1' 9"	1' 6"
	2 " 1/2 x 1' 0"	2' 0"
	Total Length ----------	75' 9"
	Total Number of Cradles---	102
Girders	2 pieces 1/2 x 14' 11" =	29' 10"
	2 " 1/2 x 15' 9"	31' 6"
	1 " 1/2 x 9' 0"	9' 0"
	Total Length ----------	69' 6"
	Total Number of Girders -	180

Braces	4 pieces 1/2 x 4' 11" =	19' 8"
	Total Number of Braces --- 288	
Struts	1 piece 1/2 x 14' 6" =	14' 6"
	2 " 1/2 x 15' 6"	31' 0"
	Total Length ----------	45' 6"
	Total Number of Struts -- 24	
Cross-ties	2 pieces 3/8" x 6' 1" round	12' 2"
	Total Number of Cross-ties -- 760	
Slabs	9 pieces 3/8 x 2' 10" round	25' 6"
	Total Number of Slabs ------- 97	

Top Slat of Covered Conduit

4,800 pcs 3/8" x 6' 0" round 28,800 ft.

VOLCAN LAND AND WATER COMPANY

A Comparison of Alternate Routes for Delivering Water to the City of San Diego.

Route No. 1: Via: Carroll Pumping Plant and Pipe Line.

This route presumes the construction of Warner Dam, Warner Conduit, Carroll Dam, Carroll Pumping plant and Carroll-University Pipe line. The waters of the San Luis Rey will be impounded by Warner Dam and diverted by means of the Warner Conduit into the watershed of the Santa Ysabel River, flowing in the natural channel of the Santa Ysabel until impounded by the Carroll Dam. At this point the water will be pumped three hundred feet and then delivered through a gravity pipe line to the reservoir of the City of San Diego at University Heights. This system will deliver ten million gallons per day.

The estimated construction cost is as follows:

Warner Dam - 85 ft. high	$ 249,766.00
Warner Conduit - 6.3 miles	536,969.00
Carroll Dam - 90 ft. high	265,006.00
Carroll Pumping Plant	59,735.00
Carroll-University Pipe Line 21¼ miles	603,188.00
Total Estimated Construction Cost	$1,514,664.00

Estimated Operating Costs

Interest	$ 116,394.00
Depreciation	30,386.00
Taxes	18,184.00
Maintenance	34,000.00
Carroll Pumping Plant (fuel, labor, fixed chgs)	41,551.00
Total Operating Cost per Year	$ 240,515.00

This will deliver 10 million gallons per day at 6.6¢ per 1,000 gallons.

Route No. 2: Via: Pamo Conduit and San Celmente Reservoir.

This route presumes the diversion of the water of the San Luis Rey River by means of the Warner Dam and Conduit, into the channel of the Santa Ysabel River, where it will flow until divertad by a small dam into the Pamo Conduit. The Pamo Conduit will convey the water to the San Clemente Dam from whence it will be conducted by means of a gravity pipe line to the University Heights Reservoir. This system will deliver 13½ million gallons per day.

The estimated cost follows:

Warner Dam - 85 ft. high	$ 249,766.00
Warner Conduit - 6.3 miles	336,969.00
Pamo Diversion Dam	5,000.00
Pamo Conduit - 26.1 miles	1,073,400.00
San Clemente Dam - 20 ft. high	12,650.00
San Clemente-University Pipe Line 10.7 miles	202,004.00
Estimated total cost	$1,879,789.00

Estimated Operating Costs.

Interest	$ 149,823.00
Taxes	23,410.00
Maintenance	42,000.00
Depreciation	29,838.00
Estimated Total Annual Operating Cost	$ 245,071.00
Estimated Daily Operating Cost	$ 672.00

OR

5¢ per 1,000 gallons.

Route No. 3: Via: Pamo Dam, Pamo Conduit and San Clemente Reservoir

This route presumes the diversion of the water of the San Luis Rey River, by means of Warner Dam and Conduit into the channel of the Santa Ysabel River, along which it will flow until impounded by the Pamo Dam. From this point the water will be conveyed through the Pamo Conduit to the San Clemente Reservoir and thence through a gravity pipe line to the University Heights Reservoir. This system will deliver 16 million gallons daily.

The estimated cost follows:

Warner Dam - 85 ft. high	$ 249,766.00
Warner Conduit - 6.3 miles	336,969.00
Pamo Dam [illegible]t - 160 ft. high	425,000.00
Pamo Conduit - 24.8 miles	1,048,900.00
San Clemente Dam - 20 ft. high	12,650.00
San Clemente-University Pipe line - 10.7 miles	340,149.00
Estimated Total Cost	$2,413,434.00

Estimated Operating Cost

Interest	$ 193,075.00
Taxes	30,200.00
Maintenance	45,000.00
Depreciation	36,828.00
Estimated Total Annual Operating Cost	$ 305,103.00
Estimated Daily Operating Cost	$ 836.00

OR

5½¢ per 1,000 gallons.

COMPARISON

	Route No. 1.	Route No. 2.	Route No. 3.
Delivery in Million Gallons per day -------	10	13⅓	16
Estimated Construction cost ----------	$1,514,664.00	$1,879,789.00	$2,413,434.00
Estimated Annual Operating Cost ---	$ 240,615.00	$ 245,071.00	$ 305,103.00
Cost per thousand gallons ----------	6.6¢	5¢	5½¢

It should be noted that the above costs do not include the cost of lands and water rights.

C. E. Hickok.

(47-A)

GENERAL ESTIMATE OF CONDUIT.

Excavation	16991.4	Cu. Yds. Solid Rock @ $2.00 =		$33982.80
	3782.9	" " Loose " " 1.00 -		3782.90
	.3782.9	" " Earth " .40 -		1513.16
				39278.86
Open Conduit	12194.94	lin.ft. lined 3" Concrete @ 1.35 -		16463.17
This $1.35 price based on the bid of $13.50 per cu.yd.				
Covered Conduit	1600.35	lin. ft. @ $1.35 + 1.88-3.23 -		5169.13
This $1.88 price based on concrete at $22.50 per cu.yd.				
42" Reinforced Concrete Pipe	3148.	lin. ft. @$5.00 -		15740.00
Trestle supporting siphon	279.	lin ft. @ $3.75 -		1046.25
Steel Flume on Concrete Trestle - Trestle Including footings			$3.75	
Flume			3.04	
Freight			.08	
Steel Flume	1098	lineal feet @	6.87 -	7543.26
Inlet & outlet boxes - 12.75 cu. yds. for both				
Siphons each requiring 12.75 cu. yds. for intakes & outlets - 114.75 cy. yds. @ 22.50			-	2581.88
9 Deep Section	1605	lin. ft. 3" Concrete @ 1.62	-	2600.10
" "	1357	" " 3" " " 1.76	-	2388.32
" "	1860	" " 3" " " 2.16	-	4017.60
" "	1606	" " 3" " " 2.20	-	4336.20
				101164.77
				7500
				108665

To which must be added about $7500 for cement.

GENERAL ESTIMATE OF CONDUIT.

Excavation	16991.4	Cu. Yds.	Solid Rock @	$2.00 =	$33982.80
	3782.9	" "	Loose " "	1.00 -	3782.90
	.3782.9	" "	Earth "	.40 -	1513.16
					39278.86
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This $1.88 price based on concrete at $22.50 per cu.yd.					
42" Reinforced Concrete Pipe	3148.	lin. ft.	@ 5.00 -		15740.00
Trestle supporting siphon	279.	lin ft.	@ $3.75 -		1046.25
Steel Flume on Concrete Trestle - Trestle Including footings				$3.75	
Flume				3.04	
Freight				.08	
Steel Flume	1098	lineal feet	@	6.87 -	7543.26
Inlet & outlet boxes - 12.75 cu. yds. for both					
9 Siphons each requiring 12.75 cu. yds. for intakes & outlets - 114.75 cy. yds. @ 22.50				-	2581.88
Deep Section	1605	lin. ft.	3" Concrete @	1.62 -	2600.10
"	1357	"	" 3" "	" 1.76 -	2388.32
"	1860	"	" 3" "	" 2.16 -	4017.60
"	1606	"	" 3" "	" 2.20 -	4336.20
					101164.77
					30346.71
					131511.48
					3945.34
					135456.82

12194.94
1600.35
1605
1357
1860
1606
20223.29
1098
3148
24469.29

Conduit
Flume

3% for Engineering

Cement

Ed Fletcher Papers

1870-1955

MSS.81

Box: 47 Folder: 15

Business Records - Water Companies - Volcan Land and Water Company - San Dieguito System - San Dieguito Mutual Water Company - Carroll Conduit - Conduit design and estimate, with blue line map