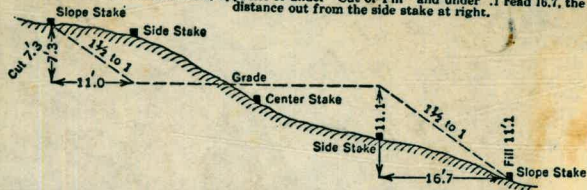


W
595

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING
Roadway of any Width. Side Slopes 1 1/2 to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



5
895

Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

MICROFILMED
JAN 13 1965

The paper in this book No. 270
 is made of 50% high grade rag stock
 with a WATER RESISTING surface sizing.

KEUFFEL & ESSER CO., N. Y.

10,892-2. y. cc, ys. cM.

3M

BM-624.19

+ - 7.28

HI-631.47

- 13.05

T.P. 618.42

+ - 2.73

HI-621.15

- 12.11

T.P. 609.64

NOTE - MAKE ALL PAYMENTS BY CHECKS

HI 610.19

- 10.13

3M 60 DEPARTMENT

M

INDEX

Profile of conduit ditch be-
tween siphon & Murray Res

Pages

1-17

Profile of high water mark on
La Mesa
~~Murray~~ Eucalyptus Ditch

18-28

DIS

In the figure
from the si



Cut &
Fill

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
23	1
24	1
25	1
26	1
27	1
28	1
29	1
30	1
31	1
32	1
33	1
34	1
35	1
36	1
37	1
38	1
39	1
40	1

Profile of ^{La Mesa} open ditch between
 near Eucalyptus Row
 Siphon and Murray Dam.

BM	5.31	644.82	639.51	UGGS.
0+17 E		7.7	637.1	
1+00 Lt.		5.5	639.3	
E		7.9	636.9	
Rt.		5.1	639.7	
2+00 E		8.0	636.8	
+75 Lt.		6.7	638.1	
E		8.0	636.8	
Rt.		5.0	639.8	
3+00 E		8.1	636.7	
4+00 E		8.1	636.7	
5+00 E		8.2	636.6	
6+ E		8.2	636.6	
7+ E		8.2	636.6	
+75 Lt.		6.1	638.7	
E		8.3	636.5	
Rt.		5.3	639.5	

12-5-43

1

Darby - King - Otton.

Course of Siphon outlet.

Bottom 5' wide - Top 13' wide - Rocky

Bottom 5' wide - Top 13' wide - Rocky

B. 5' W. - T 12' W. - Rocky

		624.82		
T.P.	5.00	643.89	57.93	638.89
8+ ♀			7.3	636.6
9+ ♀			7.4	636.5
10+ ♀			7.7	636.2
11+ ♀			7.5	636.4
12+ ♀			7.5	636.4
13+ ♀			7.6	636.3
14+ ♀			7.6	636.3
15+ ♀			7.8	636.1
16+ ♀			7.9	636.0
17+ ♀			8.0	635.9
T.P.	9.77	647.74	5.92	637.97
18+ ♀			10.3	637.4
♀			11.9	635.8
R.			9.0	638.7
19+ ♀			12.0	635.7
20+ ♀			11.8	635.9

B-6'w. - T - 13'w.

Rocky

647.74

+40 Lt. 10.0 637.7

E 11.9 635.8

Rt. 8.9 638.8

21+ E 11.9 635.8

+15 Lt. 8.7 639.0

E 12.0 635.7

Rt. 7.3 640.4

22+ E 12.0 635.7

23+ Lt 3.9 643.8

E 11.9 635.8

Rt. 3.8 643.9

24+ E 11.8 635.9

25+ E 12.0 635.7

26+ E 12.5 635.2

T.D. 4.36 643.44 8.66 639.08

B-5°W - T-14°W Rocky

B-5°W - T-13°W Rocky

B-42°W - T-22°W Rocky

643.44

27+ Lt 4.0 639.4

E 8.2 635.2

B-5'w-T-145'w Rocky

Rt 2.9 640.5

28+ E 8.1 635.3

29+ E 8.1 635.3

+90 Fence

30+ Lt 5.1 638.3

Beginning of Area with Sides and Bottom Grassy

E 8.5 634.9

B-45'w-T-12'w Sandy

Rt 6.0 637.4

31+ E 8.5 634.9

32+ E 8.3 635.1

33+ E 8.5 634.9

34+ E 8.4 635.0

35+ E 8.4 635.0

T.P. 5.67 643.53 5.58 637.86 ✓

36+ E 8.9 634.6

37+ E 9.1 634.4

643.53

5

38+ ♀ 8.9 634.6

39+ ♀ 8.6 634.9

40+ Lt 5.1 638.4

♀ 8.9 634.6

Rt 6.9 636.6

41+ ♀ 8.9 634.6

42+ ♀ 2.1 634.4

43+ ♀ 8.8 634.7

44+ ♀ 8.8 634.7

45+ ♀ 8.9 634.6

46+ ♀ 9.0 634.5

47+ ♀ 9.1 634.4

TP 3.83 642.10 5.26 638.29

48+ ♀ 7.8 634.3

49+ ♀ 7.9 634.2

B-45'w-T-13'w-

Sides - Bottom - Grassy
Slightly Rocky,

End of Grass Area - Rocky.

Slightly Sandy - Rocky

642.10

50+ Lt 4.2 637.9

Slightly Sandy - Rocky - Sides Grassy

♀ 7.8 634.3

B-4⁵'w - T-12'w

RT 6.2 635.9

51+ ♀ 8.0 634.1

+50 Sandy

52+ ♀ 8.0 634.1

53+ ♀ 8.0 634.1

Slightly sandy - Rocky Sides Grassy

54+ ♀ 8.0 634.1

55+ ♀ 8.2 633.9

Sandy - Grass - Sides & Bottom

56+ ♀ 8.3 633.8

57+ ♀ 8.3 633.8

58+ ♀ 8.6 633.5

59+ ♀ 8.6 633.5

Rocky - Grass - Sides

60+ Lt 4.2 637.9

♀ 8.3 633.8

B-4⁵'w - T-11⁵'w - Rocky - Grass - Sides

RT 6.0 636.1

61+ ♀ 8.4 633.7

Sandy - Grass - Sides & Bottom

642.10

T.P.	6A1	640.12	8.39	633.71
+85	Lt.		3.1	637.0
			7.1	633.0
	Rt.		6.9	633.2
+85	- 17' Rt of ♀		6.5	633.6
62+	♀		7.3	632.8
+30	Lt.		2.9	637.2
	♀		7.3	632.8
	Rt.		5.3	634.8
63+	♀		6.8	633.3
64+	Lt.		2.1	638.0
	♀		6.4	633.7
	Rt.		4.6	635.5
64+23			6.8	633.3
Set BM	4.03	642.71	1.44	638.68
65	♀		9.1	633.6
66	♀		9.4	633.3

Sandy - Grass - Sides and Bottom

B-5'W - T-10.5'W

Sandy - Grass - Sides and Bottom

B-5'W - T-15'W

Sandy - Grass - Sides & Bottom

B-5'W - T-16'W

Culvert Crossing Roadway

Conc. Culvert - 64+23

642.71

Kink-otter - 127-42

8

T	67 ♀	9.5	633.2
	68 ♀	9.6	633.1
	69 ♀	9.6	633.1
	70 ♀	9.4	633.3
	L+	5.3	637.4
	R+	6.9	635.8
	71 ♀	9.3	633.4
	72 ♀	9.6	633.1
	73 ♀	9.5	633.2
6	74 ♀	9.6	633.1
6	75 ♀	9.6	633.1
	76 ♀	9.7	633.0
	77 ♀	9.8	632.9
6	78 ♀	9.7	633.0
	79 ♀	9.9	632.8
	80	9.8	632.9
	L+	7.1	635.6
	R+	7.6	635.1

Sandy grass sides

" " "

Bot 5' w Top 12' w

Grass Bottom

Grass Sides

Bot 45' w Top 11' w

642.71

81	♀		9.9	632.8
J.P	4.31	641.22	5.80	636.91
82	♀		8.7	632.5
83	♀		8.9	632.3
84	♀		8.9	632.3
85	♀		9.0	632.2
86	♀		9.1	632.1
87	♀		9.2	632.0
88	♀		9.2	632.0
J.P	6.32	641.28	6.26	634.91
89	♀		8.8	632.5
90	♀		8.7	632.6
L+			4.8	636.5
8+			5.0	636.3
91	♀		9.0	632.3
92	♀		9.0	632.3
93	♀		9.0	632.3

Mud Bottom

Grassy sides

Mud Bottom

Grassy sides

Mud Bottom

Grassy sides

Bot. 45' w Top 13' w

641.28

94		9.1	632.2
T.P.	5.92	643.47	3.73 637.55
95	♀	11.3	632.2
96	♀	11.3	632.2
97	♀	11.4	632.1
98	♀	11.2	632.3
99	♀	11.3	632.2
100	♀	11.5	632.0
L+		8.0	635.5
R+		9.1	634.4
101	♀	11.6	631.9
101+60			
102	♀	11.9	631.6
103	♀	12.1	631.4
104	♀	12.2	631.3
105	♀	12.3	631.2
106	♀	12.4	631.1

Mud Bottom & sides

Bottom 45 W Top 13 W

Fence

Mud Bottom & Sides

143.41

T.P	7.29	639.71	11.05	632.42
107 ♀			9.7	630.0
108 ♀			9.8	629.9
109 ♀			10.9	628.8
110 ♀			10.9	628.8
Lt			4.8	634.9
Rt			5.4	634.3
111 ♀			11.0	628.7
112 ♀			11.4	628.3
113 ♀			11.6	628.1
114 ♀			11.7	628.0
T.P	11.68	639.40	11.99	627.72
115 ♀			11.7	627.7
116 ♀			12.2	627.2
117 ♀			12.3	627.1
118 ♀			12.7	626.7
119 ♀			12.7	626.7

Bottom 7.5 w Top 19.5 w

Gravel Bottom - Mud sides

639.46

120 Q		12.8	626.6
Lt		10.3	629.1
Rt		11.8	627.6
121 Q		12.8	626.6
T.P	3.85	622.63	10.62 628.78
122 Q		6.1	626.5
123 Q		6.2	626.4
124 Q		6.2	626.4
125 Q		6.2	626.4
126 Q		6.3	626.3
127 Q		6.2	626.4
128 Q		6.4	626.2
129 Q		6.4	626.2
Lt		3.7	628.9
Rt		5.7	626.9
130 Q		6.5	626.1
131 Q		6.5	626.1

Gravel Bottom Grassy Sides

Bottom 5.5' w Top 10' w

Sand Bottom

Sand Bottom

Bottom 7' w Top 16' w

632.63

1320 6.6 626.0

sand Bottom - Grassy sides

1334 6.8 625.8

1342 7.0 625.6

1350 7.1 625.5

1364 7.2 625.4

1372 7.3 625.3

T.P. 5.83 633.71 ✓ 4.25 627.89 ✓

1380 8.4 625.3

1390 8.6 625.1

1408 8.5 625.2

Bottom 5' in Top 13' W

Lt. 5.7 628.0

Rt. 6.1 627.6

1418 8.6 625.1

1420 8.6 625.1

T.P. 6.16 633.38 ✓ 6.49 627.22 ✓

1434 8.7 624.7

1440 8.7 624.7

633.50

1450		8.9	624.5
T.P	5.35	633.29	5.41
1460		8.7	624.6
1470		9.0	624.3
1480		9.0	624.3
1490		9.1	624.2
14960			
1500		8.9	624.4
LH		4.8	628.5
RH		6.6	626.7
1510		9.0	624.3
1520		9.2	624.1
1530		9.2	624.1
1540		9.3	624.0
1550		9.3	624.0
1560		9.5	623.8
1570		9.6	623.7

sand & Gravel Bottom Grassy Sides

Fe

Bottom 55' w Top 13' w

633.29

16

1580		9.7	623.6	Sandy Bottom	Grassy Sides
1590		9.9	623.4		
160 E		9.9	623.4		
LT		5.1	628.2	Bottom 5' w	Top 17' w
RT		5.9	627.4		
1610		10.0	623.3		
1 T.P	7.71	632.14	886	624.43	
1620		8.8	623.3		
1630		8.9	623.2		
1640		9.0	623.1		
1650		9.1	623.0		
1660		9.2	622.9		
1670		9.0	623.1		
1680		9.2	622.9		
1690		9.4	622.7	Gravel Bottom	
1700		9.8	622.3	Sand & Grass Bottom	Grassy Sides
LT		5.6	626.5	Bottom 5' w	Top 14' w
RT		5.4	626.7		

632.14

171	9.9	622.2
+35	9.9	622.2
+35	4.7	627.4
172 ϕ	9.9	622.2
Lt	7.2	624.9
Rt	7.2	624.9
173 ϕ	18.1	622.0
174 ϕ	10.5	621.6
174 + 82 ϕ	10.5	621.6
175 ϕ	13.5	618.6
175 + 38	12.9	619.2
175 + 40	37.4	594.7
B.M.	7.95	624.19

17

Top 4" Pipe crossing ditch

Top & Bottom 6' wood Flume

Rock Bottom & sides

Bottom of hole at end of ditch

Top Iron Pipe 15' Lt Sta 175+00

Elev. High Water Mark - (Euc. (Murray) Ditch)

TING
87700
12-15-43

(Notes reduced by
Mr. H. Dec. 17, 1943)

18

B.M. 7.50 647.81 639.51

Top Conc. Siphon

0.00 7.9 639.1

Water mark WING Siphon

1.00 8.0 639.0

2 8.3 638.7

3 8.5 638.5

4 8.6 638.4

5 8.6 638.4

6 8.7 638.3

7 8.7 638.3

8 8.9 638.1

9 9.0 638.0

10 8.6 638.4

11 8.8 638.2

12 8.9 638.1

13 8.7 638.3

14 8.4 638.6

15 8.4 638.4

	647.0 ✓			
T.P	10.85	648.70 ✓	9.16	637.85 ✓
16			10.7	638.0
17			10.7	638.0
18			10.8	637.9
19			10.8	637.9
20			10.8	637.9
21			11.1	637.6
22			10.2 ?	638.5
23			10.4	638.3
24			10.7	638.0
25			10.7	638.0
26			10.6	638.1
27			11.0	637.7
28			11.0	637.7
29			10.9	637.8
T.P	6.86	647.76 ✓	7.80	640.90 ✓
30			10.6	637.2

6.382

6.382

6.382

6.382

6.382

6.382

6.382

Hand to T-11

6.382

6.382

6.382

6.382

6.382

6.382

6.382

6.382

6.382

647.76 ✓

20

31		11.4	636.4	
32		11.7	636.1	
33		11.5	636.3	
34		11.1	636.7	
35		11.4	636.4	
36		11.4	636.4	
37		11.3	636.5	
38		11.0	636.8	
39		11.1	636.7	
40		11.4	636.4	
41		11.3	636.5	
42		10.9	636.9	
43		11.0	636.8	
T.P.	3.58	642.58 ✓	8.76	639.00 ✓
44		5.5	637.1	
45		6.0	636.6	
46		6.0	636.6	

64258

47			6.2	636.4
48			6.0	636.6
49			6.1	636.5
50			6.2	636.4
51			6.3	636.3
T.P.	3.07	640.78 ✓	4.87	637.71 ✓
52			4.9	636.4
53			4.5	636.3
54			4.7	636.1
55			5.0	635.8
56			5.0	635.8
57			4.9	635.9
58			4.9	635.9
T.P.	1.80	632.98 ✓	2.60	638.18 ✓
59			4.7	635.3
60			4.3	635.7
61			4.7	635.3

No. 1 Mt Park - Sta. 51

639.28 ✓

Darby - King - Otter
Continued 12-16-43

21

62		4.9	635.1
63		4.7	635.3
64		4.9	635.1
+23		5.3	634.7
BM Check		1.38	638.60 638.68
+65±		5.3	634.7
65		5.9	634.1
66		5.9	634.1
67		5.9	634.1
68		5.6	634.4
69		5.7	634.3
70		5.6	634.4
T.P.	1.65	641.54 ✓	0.09 ✓ 639.89
71		7.0	634.50
72		7.3	634.2
73		7.5	634.0
74		6.8	634.7

Culvert.

BM Cond. Culvert 64+23

Culvert.

641.54 ✓

22

75		7.1	634.4
76		7.5	634.0
77		7.5	634.0
78		7.5	634.0
79		7.5	634.0
80		7.6	633.9
81		7.3	634.2
82		7.8	633.7
83		7.4	634.1
T.P.	4.65	643.21 ✓	2.98 ✓
84		9.3	633.9
85		9.1	634.1
86		9.0	634.2
87		9.2	634.0
88		9.1	634.1
89		9.4	633.8
90		9.1	634.1

643.21 ✓

7	91		9.2	634.0	
7	92		9.0	634.2	
	93		9.4	633.8	
	94		9.1	634.1	
7	95		9.2	634.0	
8	96		9.2	634.0	
8	97		9.2	634.0	
8	98		9.5	633.7	
8	99		9.5	633.7	
7	100		9.8	633.4	
8	101		9.5	633.7	
8	102		9.7	633.5	
8	103		10.0	633.2	
8	104		10.0	633.2	
8	105		10.9	632.3	
8	TP	549	641.01 ✓	7.69 ✓	635.52 ✓
9	106		8.2	632.80	

641.01

7	107		8.4	632.6
7	108		9.1	631.9
	109		9.1	631.9
	110		9.8	631.2
7	111		9.7	631.3
8	112		9.7	631.3
	113		9.8	631.2
6	T.P.	7.61	642.52	6.10 634.91
6	114		13.0	629.5
7	115		13.0	629.5
8	116		13.0	629.5
8	117		13.1	629.4
8	118		13.3	629.2
8	119		14.5	628.0
	120		14.7	627.8
	121		14.8	627.7
5	T.P.	4.58	636.73	10.37 632.15

24

636.73 ✓

25

122			9.2	627.5
123			9.4	627.3
124			9.4	627.3
125			9.2	627.5
126			9.5	627.1
127			9.1	627.6
128			9.6	627.1
129			9.6	627.1
130			9.7	627.0
131			9.7	627.0
132			9.9	626.8
133			9.8	626.9
134			10.1	626.6
135			10.0	626.7
136			10.1	626.6
T.P.	7.41	633.13 ✓	11.01	625.72 ✓
137			6.5	626.6

138		6.5	626.6
139		6.8	626.3
140		6.7	626.4
141		6.8	626.3
142		6.9	626.2
143		6.9	626.2
144		7.0	626.1
T.P.	4.18	632.60	4.71 628.42
145		6.5	626.1
146		6.7	625.9
147		6.7	625.9
148		6.8	625.8
T.P.	4.41	632.13	4.88 627.72
149		6.5	625.6
150		6.5	625.6
151		6.9	625.2
152		7.1	625.0

632.13 ✓

153			6.9	625.2
154			6.9	625.2
155			7.0	625.1
156			7.1	625.0
157			7.2	624.9
158			7.2	624.9
159			7.0	625.1
160			7.3	624.8
T.P.	4.71	632.33 ✓	4.51	627.62 ✓
161			7.9	624.4
162			8.0	624.3
163			8.3	624.0
164			8.1	624.2
T.P.	5.20	632.11 ✓	5.42	626.91 ✓
165			7.8	624.3
166			7.8	624.3
167			7.7	624.4

27

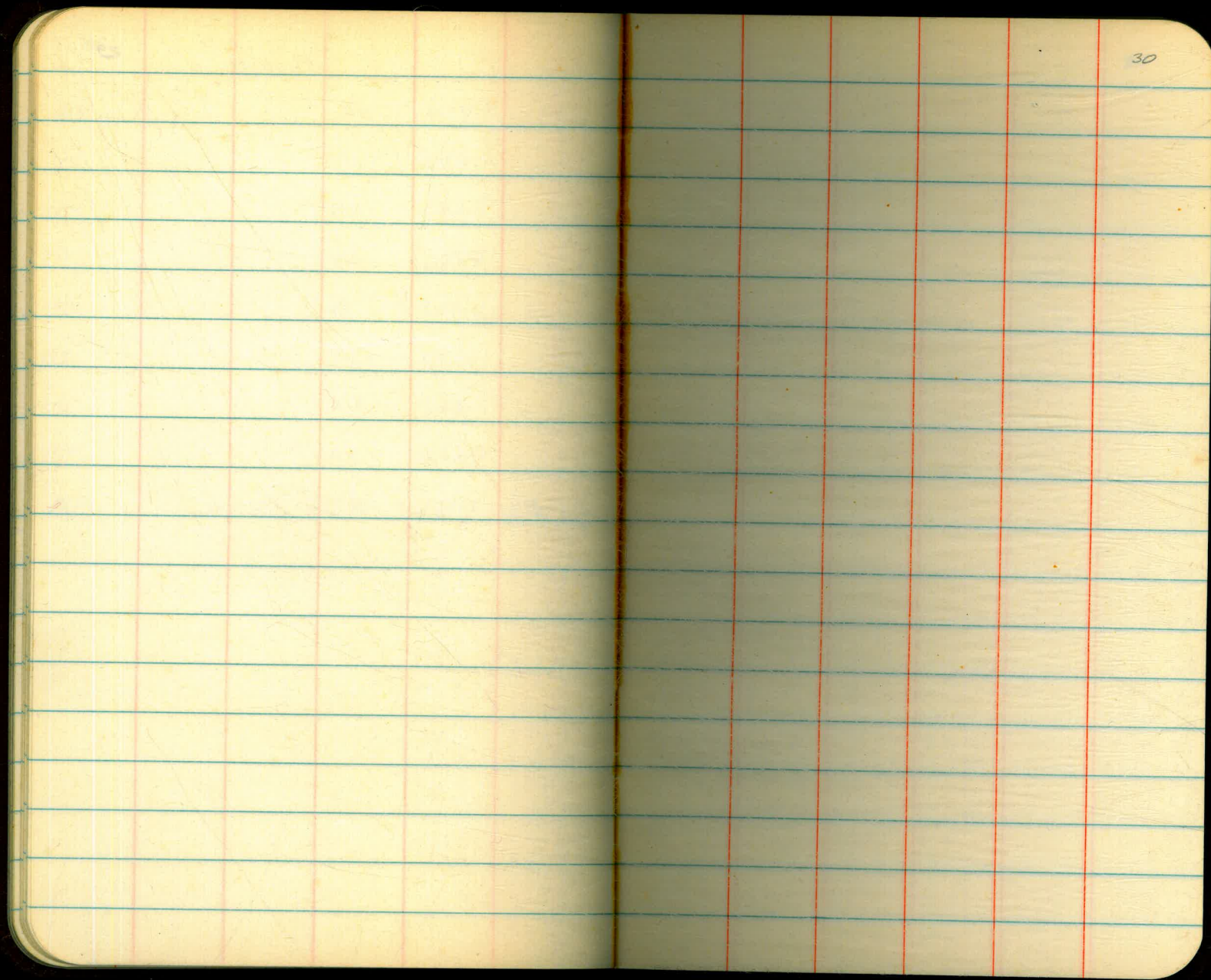
632.11 ✓

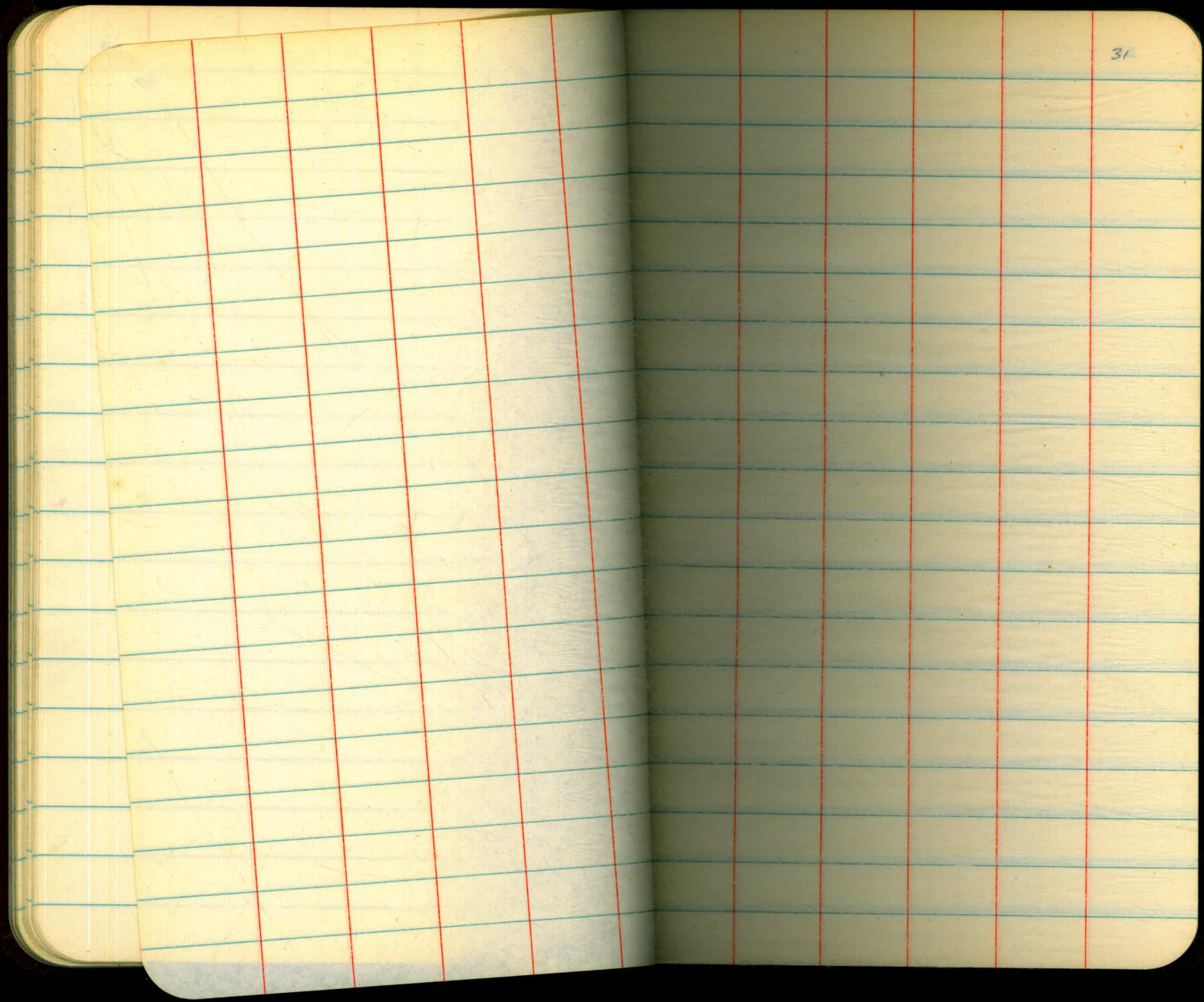
168	8.0	624.1
169	8.0	624.1
170	8.4	623.7
171	8.6	623.5
172	8.6	623.5
173	9.0	623.1
174	9.3	622.8
175	9.4	622.7
B.M.	7.80	624.31 624.19 ✓

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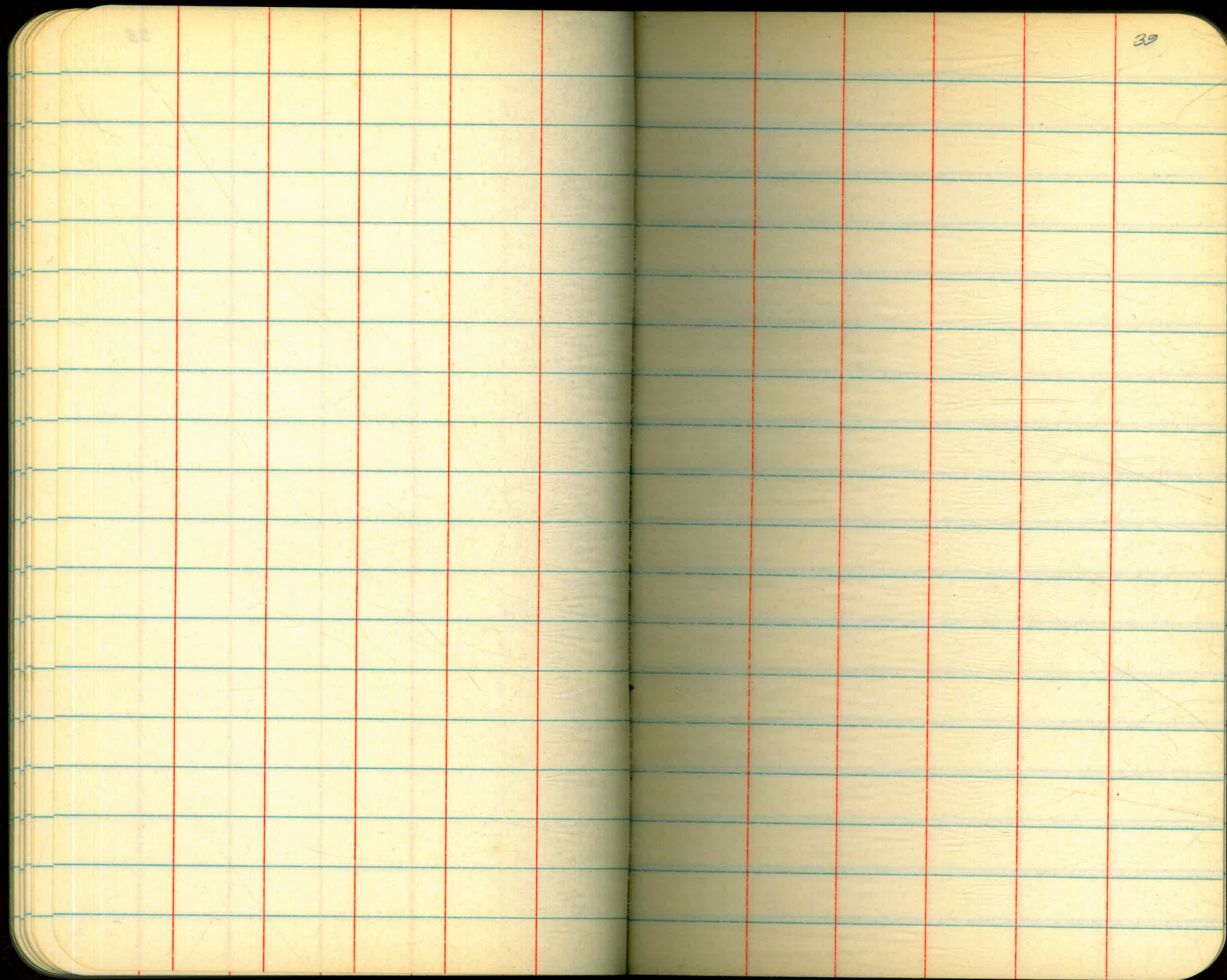
Flume Gauge.

Top Iron Pipe 15' Lt. Sta 175+00

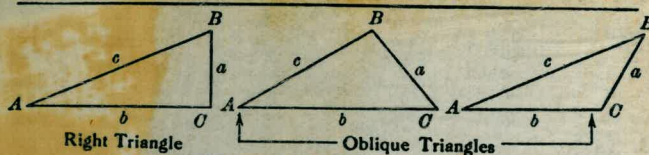




The image shows an open notebook with two facing pages. Both pages are cream-colored and feature light blue horizontal ruling. Vertical red lines create margins on both sides of the central gutter. The pages are blank, with no handwriting or printed text. The notebook is set against a solid black background.



TRIGONOMETRIC FORMULÆ



Solution of Right Triangles
 For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	Formulas
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given	Required	Formulas
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$ $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = 5° 10'. From Table, Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.
 Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. $\cosine 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.
 When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft. slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.