

SEWERAGE GRADES

17th W. OF Nth W. OF Hth S. OF Dth

19th W. OF H.

20th W. OF Nth S. OF Lth W. OF Lth S. OF C.

3rd W. OF I.

9

TRANSIT

F.B. 656

656

Table showing the difference of latitude and departure in running 80 chains at any course from 1 to 60 minutes.

Minutes.	Lks.	Minutes.	Lks.	Minutes.	Lks.
1	2½	21	49	41	95½
2	4½	22	51½	42	98
3	7	23	53½	43	100½
4	9½	24	56	44	102½
5	11½	25	58½	45	105
6	14	26	60½	46	107½
7	16½	27	63	47	109½
8	18½	28	65½	48	112
9	21	29	67½	49	114½
10	23½	30	70	50	116½
11	25½	31	72½	51	119
12	28	32	74½	52	121½
13	30½	33	77	53	123½
14	32½	34	79½	54	126
15	35	35	81½	55	128½
16	37½	36	84	56	130½
17	39½	37	86½	57	133
18	41½	38	88½	58	135½
19	44	39	91	59	137½
20	46½	40	93½	60	140

MICROFILMED

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Table for Running on Slopes.

In the following table the first column shows the angle, the second, the number of links to be added to a chain on the slopes, to make one chain, horizontal measurement.

Angle.	Cor. in links.	Angle.	Cor. in links.	Angle.	Cor. in links.	Angle.	Cor. in links.
0		0		0		0	
4	0-24	11	1-88	18	5-14	25	10-54
5	0-38	12	2-24	19	5-76	26	11-26
6	0-55	13	2-63	20	6-42	27	12-24
7	0-76	14	3-06	21	7-11	28	13-37
8	0-98	15	3-53	22	7-85	29	14-34
9	1-24	16	4-02	23	8-64	30	15-47
10	1-55	17	4-56	24	9-47	35	22-07

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Street	Pages	Location
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v. 20th	22-24	N. of L St
v. 20th	27-29	S. of G St
v. 31st	30-31	S. of L St
21st	32-34	N. of L St
20th	25-26	S. of I St

54
246

+159
287
346

17# N M M

Sta	Elev	Grade	Cut-
0	33.48	19.00	15' 4 1/2
+12	33.82	19.43	14' 3 9/16
+25	34.22	20.98	13' 2 1/2
+37	34.68	22.40	12' 2 3/8
+50	34.96	23.95	11' 0 1/8
+62	35.40	25.38	10' 0 1/2
+75	34.85	26.95	7' 9 1/2
+84	35.00	24.00	7' 0
H10	35.68	28.19	7' 4 7/8
+35	35.15	28.37	6' 7 8/16
+60	35.51	28.55	6' 2 1/2
+85	35.73	28.73	7' 0 1/2
2+10	35.38	28.91	6' 4 1/2
+35	35.17	29.09	6' 0 1/2
+60	34.99	29.27	5' 7 1/2
+85	34.50	29.46	5' 0 1/2
3+10	34.57	29.64	4' 9 1/2
+35	34.93	29.82	5' 1 1/2
+60	34.78	30.00	4' 7 3/4
+80	36.71	30.22	6' 4 9/16
4	35.85	30.43	5' 4 1/2

11.90 + 7.1700

72.42 / 1100

Y 17# 2 MU

D+59 N. Line W. St.

P.I.

S. Line L. St.

Grade 36.00

Imp. 35.50

L. St.

17th North of W St.

Sta	Elev.	Grade	cut.
+20	37.31	30.65	6.66 6' 8"
+40	37.20	30.87	6.33 6' 4"
+65	37.96	31.14	6.82 6' 9 1/8"
+90	39.18	31.42	7.76 7' 9 1/8"
5+15	39.72	31.68	8.04 8' 0 1/2"
+40	39.92	31.96	7.96 7' 11 1/2"
+65	39.49	32.23	7.27 7' 2"
+90	38.03	32.56	5.53 5' 6 3/8"
6+15	37.84	32.77	5.07 5' 0 7/8"
+40	35.53	33.04	5.49 5' 5 1/2"
+65	39.37	33.31	6.06 6' 0 3/4"
+90	35.44	33.59	5.35 5' 4 1/2"
7+15	39.22	33.86	5.36 5' 4 1/2"
+40	40.47	34.13	6.34 6' 4 1/2"
+60	41.09	34.35	6.74 6' 8 3/8"
+80	41.33	34.56	6.77 6' 9 1/4"
8	41.25	34.78	6.47 6' 5 7/8"
+20	40.89	35.00	5.89 5' 10 3/4"
+45	41.19	35.14	6.05 6' 0 7/8"
+70	40.96	35.27	5.69 5' 8 1/2"
+95	40.56	35.41	5.15 5' 1 7/8"

1.0869 11.00

W. Line S. St.

S. Line K. St.

Grade. 41.50 ✓

Deep. 41.00

K. St.

W. Line K. St.

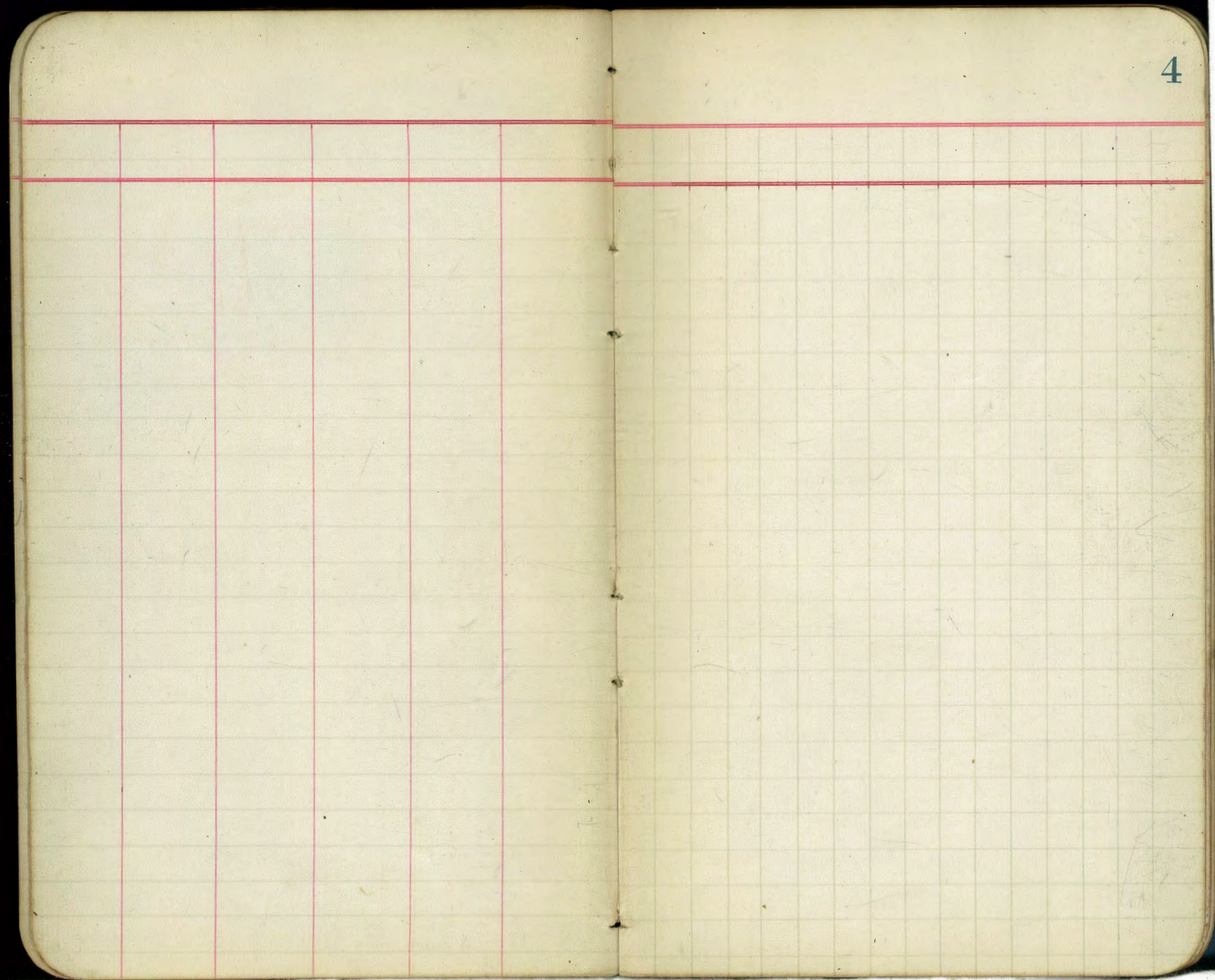
17th St North of W St

Sta	Elev.	Grade	cut.
9+20	41.03	35.55	5.48 5' 3 ³ / ₄ "
+45	40.92	35.68	5.24 5' 2 ⁷ / ₈ "
+70	40.89	35.82	5.07 5' 0 ⁷ / ₈ "
+95	40.88	35.95	4.93 4' 11 ¹ / ₈ "
10+20	41.76	36.09	5.67 5' 8"
+45	41.52	36.23	5.29 5' 3 ¹ / ₂ "
+70	41.64	36.36	5.28 5' 3 ³ / ₈ "
+95	42.08	36.50	5.58 5' 7"
11+20	41.87	38.00	3.87 3' 10 ¹ / ₄ "

5412110

Total length of pipe 11+25-

S. Line J. St. Grade. 43.00
 Flush Tank 42.50



17th N of A

Sta	Elev	Grade		
0	37.85	33.60	4.25	4' 3"
+41	38.42	34.24	4.18	4' 2 ¹ / ₈ "
+51	38.76	34.39	4.37	4' 4 ¹ / ₂ "
+61	38.94	34.55	4.39	4' 4 ³ / ₄ "
+71	39.23	34.71	4.52	4' 6 ¹ / ₄ "
+81	39.22	34.86	4.36	4' 4 ³ / ₈ "
+91	38.41	35.02	3.39	3' 4 ³ / ₄ "
+101	38.36	35.17	3.19	3' 2 ¹ / ₄ "
+09	38.43	35.30	3.13	3' 1 ¹ / ₈ "
+34	39.48	35.69	3.74	3' 8 ³ / ₈ "
+59	39.93	36.08	3.85	3' 10 ¹ / ₄ "
+84	40.46	36.47	3.99	3' 12 ¹ / ₈ "
2+09	40.48	36.86	3.62	3' 7 ¹ / ₂ "
+34	40.70	37.24	3.46	3' 5 ¹ / ₂ "
+59	41.16	37.63	3.53	3' 6 ³ / ₈ "
+84	40.96	38.02	2.94	2' 11 ¹ / ₄ "
3+09	41.47	38.41	3.06	3' 0 ³ / ₈ "
+34	40.91	38.80	2.11	2' 1 ³ / ₈ "
+59	41.71	39.19	2.52	2' 6 ¹ / ₄ "
+95	46.26	39.75	6.51	6' 6 ¹ / ₈ "

Y Angle 25° N.
P.C.

0+54 1/2 Lin Ht. Y

25 N of N 7 A P.T.

109
25
84

S.F.G. H- Grade 46.80

17th St - N of 9th

Sta	Elev	Grade	ems-
4+15	46.86	40.06	6.80 6 9 ¹ / ₈
+ 35	47.57	40.38	7.19 7 2 ¹ / ₂
+ 55	47.75	40.69	7.06 7 0 ³ / ₄
+ 75	47.38	41.00	6.38 6 4 ¹ / ₂ x
5	51.40	42.75	8.65 8 7 ¹ / ₂
+ 25	52.76	44.50	8.26 8 5 ¹ / ₄
+ 50	55.02	46.25	8.77 8 9 ¹ / ₄
+ 75	57.84	48.00	9.84 9 10 ¹ / ₈
6	60.45	49.75	10.70 10 8 ³ / ₈
+ 25	63.22	51.50	11.72 11 8 ¹ / ₂
+ 50	67.14	53.25	13.89 13 10 ¹ / ₄
+ 75	71.11	55.00	16.11 16 1 ¹ / ₈
7	73.79	56.75	17.04 17 0 ¹ / ₂
+ 25	76.62	58.50	18.12 18 1 ¹ / ₂
+ 50	79.49	60.25	19.24 19 2 ³ / ₄
+ 75	79.26	62.00	17.76 17 9 ¹ / ₄
+ 95	80.78	62.25	18.53 18 6 ¹ / ₈ x
8+15	81.79	62.50	19.29 19 3 ¹ / ₂
+ 35	82.14	62.75	19.39 19 4 ¹ / ₄
+ 55	82.46	63.00	19.46 19 3 ¹ / ₈ x

7.00/1.00

125/100

N 2 S St-

S. Line F. St. Supp. 69.00 ✓
 Grade 69.50
 F. St.
 N. Line F. St.

17th Sta - Not H

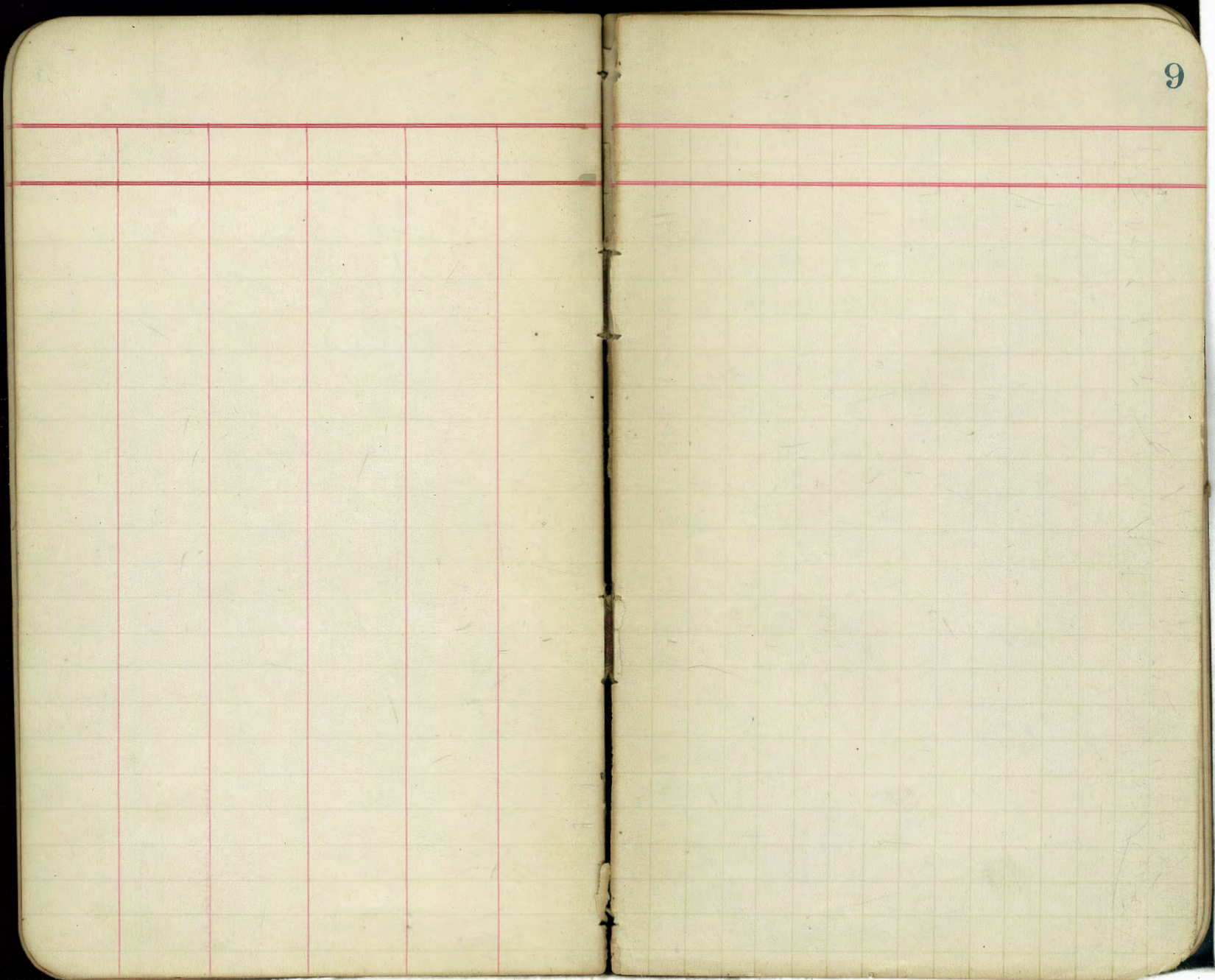
Sta	Elev	Grade	cut-	
8+80	91.05	64.14	26.91	26' 10 ³ / ₈
9+05	91.10	65.27	26.53	26' 6 ³ / ₈
+30	92.06	66.41	25.65	25' 7 ¹ / ₈
+55	92.52	67.55	24.97	24' 11 ¹ / ₈
+80	92.99	68.68	24.31	24' 3 ³ / ₈
10+05	93.77	69.82	23.95	23' 11 ³ / ₈
+30	94.33	70.95	23.38	23' 4 ⁵ / ₈
+55	94.87	72.09	22.78	22' 9 ³ / ₈
+80	95.43	73.23	22.20	22' 2 ³ / ₈
11+05	96.58	74.36	22.22	22' 2 ¹ / ₈
+30	97.24	75.50	21.74	21' 8 ¹ / ₈ x
+55	98.19	78.50	19.69	19' 8 ¹ / ₄ x

Completed May 3/18.

Total length of pipe 11+60

0011254 PM

Flush Land 83.00
 S. Line C. St. Grade 83.50



17th M- South of S

Sta	Elev	Grade	cut
0	53.20	43.60	9.60 9' 7 1/4"
+21	53.27	45.58	7.69 7' 8 1/4"
+31	52.90	46.52	6.38 6' 4 5/8"
+41	53.15	47.46	5.69 5' 8 1/4"
+51	53.41	48.40	5.01 5' 0 3/8"
+61	53.53	49.34	4.19 4' 2 1/4"
+71	56.38	50.28	6.10 6' 1 1/4"
+81	58.34	51.22	7.12 7' 1 1/2"
+89	59.90	51.97	7.93 7' 11 1/8"
1+14	68.47	54.33	14.09 14' 1 1/8"
+39	75.42	56.68	18.74 18' 8 1/8"
+64	84.32	59.03	25.29 25' 3 1/2"
+89	91.97	61.38	30.59 30' 7 1/8"
2+14	94.99	63.74	31.25 31' 3"
+39	95.30	66.09	29.21 29' 3 1/4"
+64	95.80	68.44	27.36 27' 4 1/8"
+89	97.68	70.79	26.89 26' 10 1/4"
3+14	99.59	73.15	26.44 25' 5"
+39	99.77	75.50	24.27 24' 3 1/4"
+67	99.14	78.50	20.64 20' 7 1/4"
Total length of pipe			3+72

at Y 13' West of road 17th M-

99.14
83
16.14

at 64 S. I.D. M-

PT 25' S of 22 S

N.E. about 1000 83.50 ✓

83.50

19th St North of Hst.

Sta	Elev	Grade	Dist
0	65.97	60.25	5.725 8 ⁷ / ₈
+18	66.76	60.67	6.096 1 ¹ / ₈
+28	67.27	60.90	6.376 4 ¹ / ₂
+38	67.81	61.13	6.686 8 ¹ / ₈
+48	68.26	61.36	6.906 10 ³ / ₈
+58	68.82	61.59	7.237 2 ³ / ₄
+68	69.38	61.82	7.567 6 ³ / ₄
+78	69.87	62.05	7.827 9 ¹ / ₈
+88	70.02	62.28	7.747 8 ¹ / ₈
+102	70.31	62.60	7.717 8 ¹ / ₈
+27	70.50	63.18	7.327 3 ³ / ₈
+32	71.40	63.76	7.677 8
+77	72.46	64.33	8.138 1 ¹ / ₈
+102	73.18	64.91	8.278 3 ¹ / ₄
+27	74.21	65.49	8.728 5 ⁷ / ₈
+52	75.67	66.06	9.619 7 ³ / ₈
+77	76.22	66.64	9.589 7
+102	76.52	67.22	9.329 3 ³ / ₈
+27	76.82	67.79	9.039 0 ³ / ₈
+52	77.38	68.37	9.019 0 ¹ / ₈
+86	76.78	69.15	7.637 7 ¹ / ₈

23068/110

= Y 11' west of mass 2 19th St
PC

+77 N.I.H.S.
P.T.

Insp. 75.50 ✓
S.I.S. Grade. 76.00

19th St - N of A

Sta	Elev	Grade	Dist	Grade
4+06	77.49	69.61	7.78	7' 9 ³ / ₄
+ 26	77.88	70.08	7.80	7' 9 ³ / ₄
+ 46	78.58	70.54	8.04	8' 0 ¹ / ₂
+ 66	78.99	71.00	7.99	7' 11 ⁷ / ₈ x
+ 91	79.68	71.13	8.55	8' 6 ⁷ / ₈
5+16	79.25	71.26	7.99	7' 11 ⁷ / ₈
+ 41	79.08	71.39	7.69	7' 8 ¹ / ₄
+ 66	79.00	71.53	7.47	7' 5 ⁷ / ₈
+ 91	78.97	71.66	7.31	7' 3 ³ / ₄
16+16	78.57	71.79	6.72	6' 8 ⁵ / ₈
+ 41	78.7	71.92	6.25	6' 3
+ 66	76.82	72.05	4.77	4' 9 ¹ / ₄
+ 91	76.44	72.18	4.26	4' 3 ¹ / ₈
27+16	78.31	72.32	5.99	5' 11 ⁷ / ₈
+ 41	80.31	72.45	7.86	7' 10 ⁷ / ₈
+ 66	81.14	72.58	8.56	8' 6 ³ / ₄ x
+ 86	80.13	72.68	7.45	7' 5 ³ / ₈
38+06	79.89	72.79	7.10	7' 1 ¹ / ₄
+ 26	79.70	72.89	6.81	6' 9 ³ / ₈
+ 46	78.86	73.00	5.86	5' 10 ³ / ₈ x
+ 71	78.94	73.36	5.58	5' 7

52631.100

S st

N2 b

S I F M - Grade. 79.50 ✓

Sample 79.00

F M

N2 F M

194 MIN of H

Sta	Elev	Grade	em-
8+96	79.08	73.73	5.35 5' 4 ³ / ₄
+ 9+21	79.69	74.09	5.60 5' 7 ¹ / ₂
+ 46	80.64	74.45	6.19 6' 2 ¹ / ₄
+ 71	81.55	74.81	6.74 6' 8 ³ / ₈
+ 96	81.77	75.18	6.59 6' 7 ¹ / ₈
10+21	82.19	75.54	6.65 6' 7 ¹ / ₈
+ 46	82.03	75.90	6.13 6' 1 ¹ / ₈
+ 71	81.95	76.26	5.69 5' 8 ¹ / ₄
+ 96	82.09	76.63	5.46 5' 5 ¹ / ₂
11+21	80.01	76.99	3.02 3' 0 ¹ / ₄
+ 46	80.58	77.35	3.23 3' 2 ³ / ₄
+ 66	81.16	77.64	3.52 3' 6 ¹ / ₄
+ 86	80.78	77.93	2.85 2' 10 ¹ / ₄
12+06	80.01	78.22	1.79 1' 9 ¹ / ₂
+ 26	79.98	78.51	1.47 1' 5 ⁷ / ₈
+ 51	80.88	78.87	2.01 2' 0 ¹ / ₄
+ 76	80.70	79.24	1.46 1' 5 ¹ / ₂
13+01	81.57	79.60	1.97 1' 11 ⁷ / ₈
+ 26	82.21	79.96	2.25 2' 3 ¹ / ₄
+ 51	83.24	80.32	2.92 2' 11 ¹ / ₄

21100000

S L E M - Grade 87.00

Drop 86.50

E M -

M L E M -

19th of NW 1/4 M-

Sta	Elev	Grade	cut-		
13+76	84.25	80.69	3.56	3' 6 ³ / ₄	145731 10
+ 14+01	85.56	81.05	4.51	4' 6 ¹ / ₈	
+ 14+26	86.86	81.41	5.45	5' 5 ³ / ₈	
+ 14+51	87.84	81.77	6.07	6' 0 ⁷ / ₈	
+ 14+76	89.06	82.14	6.92	6' 11"	
+ 15+01	89.70	82.50	7.20	7' 2 ³ / ₄ "	
+ 14+26	90.36	84.50	5.86	5' 10 ³ / ₄ "	
Total length of pipe				15+31	

S. I. S. Flush Tank Grade.

20th N of N Plug

H' 920' 1' 0"

Sta	Elev	Grade	cut-
0	33.33	28.10	5.23 5' 2 1/4"
+10	33.70	28.45	5.25 5' 3"
+20	34.07	28.80	5.27 5' 3 1/4"
+30	34.67	29.15	5.52 5' 6 1/4"
+40	35.36	29.50	5.86 5' 10 3/4"
+50	35.95	30.14	5.81 5' 9 3/4"
+56	36.23	30.53	5.70 5' 8 3/8"
+68	36.75	31.30	5.45 5' 5 1/8"
+93	38.57	32.91	5.66 5' 8"
1+18	40.58	34.52	6.06 6' 0 3/4"
+43	42.58	36.13	6.45 6' 5 3/8"
+68	44.46	37.74	6.72 6' 8 7/8"
+93	46.34	39.35	6.99 6' 11 7/8"
2+18	48.48	40.96	7.52 7' 6 1/4"
+43	50.13	42.56	7.57 7' 6 7/8"
+68	52.14	44.17	7.97 7' 11 7/8"
+93	53.73	45.78	7.95 7' 11 3/8"
3+18	55.69	47.39	8.24 8' 2 7/8"
+43	56.98	49.00	7.98 7' 11 3/4"
+63	57.54	49.25	8.29 8' 3 1/2"
+83	57.60	49.50	8.10 8' 1 1/4"

357.50

6.7356 1.00

Y 22' West of Center of 20th & N

+43 N 2 N 21

P.T.

25' N of N 2 N 31

68
25
73S I M 21 - Grade 56.50 ✓
56.00

M 21 -

20th St - N of N

Sta	Elv	Grade	em
4+03	57.58	49.75	7.83 7' 10"
+23	57.79	50.00	7.79 7' 9 ¹ / ₂ "
+44	58.98	51.57	7.47 7' 5 ¹ / ₂ "
+73	60.25	53.02	7.23 7' 2 ³ / ₄ "
+98	61.57	54.53	6.98 6' 11 ³ / ₄ "
6+23	62.71	56.04	6.67 6' 8"
+48	64.29	57.55	6.65 6' 7 ¹ / ₂ "
+73	65.71	59.06	6.65 6' 7 ¹ / ₈ "
+98	67.01	60.58	6.50 6' 6"
6+23	68.67	62.09	6.58 6' 7"
+48	70.35	63.60	6.75 6' 9"
+73	71.91	65.11	6.80 6' 9 ¹ / ₂ "
+98	73.54	66.62	6.92 6' 11"
7+21	74.63	68.00	6.63 6' 7 ¹ / ₂ "
+41	74.95	68.47	6.48 6' 5 ³ / ₄ "
+61	75.20	68.94	6.36 6' 4 ³ / ₈ "
+81	75.65	69.41	6.24 6' 2 ⁷ / ₈ "
8+01	75.97	69.88	6.09 6' 1 ¹ / ₈ "
+26	76.72	70.47	6.25 6' 3"
+51	77.18	71.06	6.12 6' 1 ¹ / ₂ "

60482100

N
N2 1/2 S1-

122 ss - Grade 75.00 ✓
 Duff 74.50
 2 S1
 N2 2 S1-

20th S-N of NM

Sta	Elev	Grade	cut-
8+76	77.81	71.65	6.16 6' 2"
9+01	78.41	72.24	6.17 6' 2"
+26	79.04	72.83	6.21 6' 2 1/2"
+51	79.82	73.42	6.40 6' 5"
+76	80.57	74.01	6.50 6' 6"
10+01	81.03	74.60	6.43 6' 5 1/8"
+26	81.68	75.19	6.49 6' 5 3/8"
+67	82.48	75.77	6.71 6' 8 1/2"
+76	82.98	76.36	6.62 6' 7 1/2"
11+03	83.59	77.00	6.89 6' 10 3/4"
+23	84.22	77.25	6.97 6' 11 1/8"
+43	84.56	77.50	7.06 7' 0 3/4"
+63	84.18	77.75	6.43 6' 5 1/8"
+83	83.79	78.00	5.79 5' 9 1/2" x
12+08	84.17	78.41	5.76 5' 9 1/8"
+83	84.59	78.82	5.67 5' 8"
+58	84.89	79.23	5.66 5' 8"
+83	85.32	79.64	5.78 5' 9 1/8"
13+18	85.95	80.05	5.90 5' 10 3/8"
+83	86.28	80.45	5.83 5' 10"

2.356 1/00

1.222 1/00

S L K M - grade 84.00 ✓
 Insp. 83.50
 K M - 11.03

N L K M

20th S-N of N

Sta	Elev	Grade	cut	
13758	86.86	80.86	6.00	6' 0"
+83	87.33	81.27	6.06	6' 0 ³ / ₄ "
14+08	87.83	81.68	6.15	6' 1 ⁷ / ₈ "
+83	88.00	82.09	6.33	6' 4"
+58	88.78	82.50	6.28	6' 3 ³ / ₈ "
+83	89.17	84.50	4.67	4' 8"
(Completed to 14+83 May 31/88)				
Total length of pipe 14+88				

1.662118

S. L. J. M. Shush house 89.50
89.00

$$\frac{836}{25}$$

20th St North of C. St.

Sta Elev Grade Cut.

Sta	Elev	Grade	Cut.
0			
+10			
+20			
+30			
+40			
+47			
+56			
+67			
+92			
1+17			
+42			
+67			
+92			
2+17			
+42			

P.L. 13' E of Dup. Hole.

1+42 N. L. C. St.

P.J.

Top Hill.

20th N-N of S

No	Elev	Grade	am-
0	81.83	76.90	4.934' 11 ¹ / ₈
+05	81.78	76.92	4.864' 10 ³ / ₈
+10	81.98	76.93	5.055' 0 ⁷ / ₈
+15	82.09	76.95	5.145' 1 ³ / ₄
+20	82.27	76.97	5.305' 3 ⁷ / ₈
+28	82.34	76.98	5.365' 4 ³ / ₈
+33	82.62	77.01	5.615' 7 ³ / ₈
+43	82.66	77.04	5.625' 7 ¹ / ₂
+53	82.94	77.08	5.865' 10 ³ / ₈
+63	83.50	77.11	6.396' 4 ³ / ₄
+73	83.57	77.14	6.436' 5 ¹ / ₆
+83	83.67	77.18	6.496' 5 ⁷ / ₈
+90	83.82	77.20	6.626' 7 ¹ / ₂
1+12	83.61	77.27	6.346' 4 ¹ / ₈
+37	83.98	77.36	6.626' 7 ¹ / ₂
+62	84.19	77.44	6.756' 9
+87	84.32	77.52	6.806' 9 ⁵ / ₈
2+12	84.56	77.61	6.956' 11 ³ / ₈
+37	84.72	77.69	7.037' 0 ³ / ₈
+62	85.06	77.70	7.297' 3 ¹ / ₂ x

11.810

76.13

76.63

Y.P.C 15 West of West 20th N

P.R.C

0+62 N2 S 1/4

0+87 X lateral

P.T.

51' N of N 2 S 1/4

20th St - N of E

Sta	Elev	Grade	cut
2+87	84.92	77.95	6.976' 11 ³ / ₄
3+12	85.10	78.12	6.986' 11 ³ / ₄
+ 87	85.07	78.30	6.776' 9 ¹ / ₄
+ 65	85.63	78.50	7.137' 1 ¹ / ₈ x
+ 90	86.20	79.25	6.956' 11 ³ / ₄
4+15	86.77	80.00	6.776' 9 ¹ / ₄
+ 40	87.98	80.75	7.237' 2 ³ / ₄
+ 65	88.68	81.50	7.187' 2 ³ / ₄ x
+ 90	89.03	81.98	7.057' 0 ⁷ / ₈
5+15	89.27	82.46	6.816' 9 ¹ / ₄
+ 40	89.57	82.93	6.646' 7 ³ / ₄
+ 65	90.12	83.41	6.716' 8 ¹ / ₂
+ 90	90.57	83.89	6.626' 7 ¹ / ₂
6+15	90.88	84.37	6.516' 6 ¹ / ₂
+ 40	91.25	84.85	6.406' 4 ¹ / ₂
+ 65	91.65	85.33	6.326' 3 ¹ / ₂
+ 90	92.45	85.80	6.656' 7 ¹ / ₂
7+15	92.99	86.28	6.716' 8 ¹ / ₂
+ 40	93.34	86.76	6.586' 7
+ 77	94.36	87.47	6.896' 10 ³ / ₄
+ 97	94.92	87.85	7.077' 0 ⁷ / ₈

S. L. H. H-Grade 85.50 ✓
 Drop. 85.00

H-11-

N. L. H-11-

S. L. H. H-Grade 94.00 ✓
 Drop. 93.50

20th St N. of I St.

Sta	Elev	Grade	Cut.
8+17	95.45	88.73	7.527 2 ⁷ / ₈
+37	96.26	88.62	7.647 7 ³ / ₄
+57	96.14	89.00	7.147 1 ³ / ₄
+82	96.15	89.36	6.796 9 ¹ / ₂
9+07	96.46	89.73	6.736 8 ³ / ₄
+32	96.64	90.09	6.556 6 ⁵ / ₈
+57	97.15	90.45	6.606 7 ¹ / ₄
+82	97.18	90.82	6.326 3 ⁷ / ₈
10+07	97.70	91.18	6.526 6 ¹ / ₂
+32	97.93	91.55	6.386 4 ⁵ / ₈
+57	98.41	91.91	6.506 6
+82	98.59	92.27	6.326 3 ⁷ / ₈
11+07	98.66	92.64	6.026 0 ¹ / ₄
+32	98.80	93.00	5.805 9 ¹ / ₄
+56	99.37	94.50	4.874 10 ¹ / ₄
Total length of pipe			11+61

I. St. (Completed to 8+17 May 31/00)

N. Side Est.

S. Side F. St. Flush Tank 99.50 ✓
99.00

25th St South of I St.

Sta	Elev.	Grade	Cut	
0	81.94	77.10	4.84	4' 10 ³ / ₈
+06	81.53	77.21	4.38	4' 4 ¹ / ₈
+12	81.95	77.29	4.66	4' 8
+19	82.11	77.41	4.70	4' 8 ³ / ₈
+29	82.41	77.57	4.84	4' 10 ¹ / ₈
+39	82.66	77.73	4.93	4' 11 ¹ / ₈
+49	83.27	77.89	5.38	5' 4 ¹ / ₈
+59	83.79	78.05	5.74	5' 8 ³ / ₈
+69	84.15	78.21	5.94	5' 11 ¹ / ₄
+79	84.28	78.37	5.91	5' 10 ³ / ₈
+87	84.32	78.50	5.82	5' 9 ³ / ₈
1+10	84.81	78.86	5.95	5' 11 ³ / ₈
+35	85.31	79.27	6.04	6' 0 ³ / ₄
+61	85.69	79.67	6.02	6' 0 ¹ / ₄
+85	86.34	80.07	6.27	6' 3 ¹ / ₄
2+10	86.69	80.48	6.21	6' 2 ¹ / ₂
+35	87.02	80.88	6.14	6' 1 ³ / ₄
+60	87.50	81.28	6.22	6' 2 ¹ / ₂
+85	88.12	81.68	6.44	6' 5 ¹ / ₄
3+10	88.58	82.09	6.49	6' 5 ³ / ₈
+35	88.99	82.50	6.49	6' 5 ³ / ₈

P.C. I 13' W. N. S. 2. 4 1/2

P.R.C.

O+60 S. 2. 1/2 I

P.T. 27' S. 2. 1/2 I

I

20th St South of I St.

Sta	Elev	Grade	Dist
3 + 60	89.96	84.50	5.485' 5 ³ / ₈ "
Total length of pipe . 3 + 65			

3 + 60 89.96 84.50 5.485' 5³/₈"
 Total length of pipe . 3 + 65

N. Line J. St Grade 89.50
 Flucht auf 89.00

20th St S of C

Sta	Elev	Grade	cut-
0	89.26	82.80	6.46 6' 5 ¹ / ₂
+10	90.28	82.91	7.37 7' 4 ¹ / ₂
+20	91.19	83.02	8.17 8' 2
+30	91.64	83.13	8.51 8' 6 ¹ / ₈
+41	92.74	83.26	7.48 7' 5 ³ / ₄ x
+66	88.58	83.54	5.04 5' 0 ¹ / ₂
+91	89.59	83.82	5.78 5' 2 ¹ / ₈
1+16	89.65	84.09	5.56 5' 6 ³ / ₄
+41	90.11	84.37	5.74 5' 8 ¹ / ₈
+66	90.38	84.65	5.73 5' 8 ³ / ₄
+91	91.00	84.93	6.07 6' 0 ¹ / ₈
2+16	91.49	85.21	6.28 6' 3 ¹ / ₈
+41	91.95	85.49	6.46 6' 5 ¹ / ₂
+66	92.62	85.77	6.85 6' 10 ¹ / ₄
+91	93.01	86.05	6.96 6' 11 ¹ / ₂
3+16	93.47	86.33	7.14 7' 1 ¹ / ₄
+41	93.95	86.61	7.34 7' 4 ¹ / ₄
+61	94.38	86.83	7.55 7' 6 ¹ / ₈
+81	94.35	87.05	7.30 7' 3 ¹ / ₈
4+01	94.43	87.28	7.15 7' 1 ¹ / ₈
+21	94.58	87.50	7.08 7' 1 x

PC = Y 22 west of center of C 420 = 4.1 feet

S L S M -

N L S M Grade 94.50 ✓

Susp. 94.00

S L S M -

S L S M -

20th N-S of C

Sta	Elev	Grade	cut
4+46	94.53	87.63	6.90 6 9 ³ / ₄
+71	94.39	87.75	6.64 6 17 ³ / ₄
+96	94.40	87.88	6.52 6 6 ¹ / ₄
5+21	94.34	88.00	6.34 6 4 ¹ / ₄
+46	94.38	88.13	6.25 6 3
+71	94.57	88.21	6.32 6 8 ³ / ₄
+96	94.58	88.38	6.20 6 2 ³ / ₄
6+21	94.81	88.50	6.31 6 3 ³ / ₄
+46	94.80	88.63	6.17 6 2
+71	94.82	88.75	6.07 6 0 ⁷ / ₈
+96	95.15	88.88	6.27 6 3 ¹ / ₄
7+21	95.31	89.00	6.31 6 3 ³ / ₄ x
+41	95.28	89.23	6.05 6 0 ⁵ / ₈
+61	95.43	89.45	5.98 5 11 ³ / ₄
+81	95.37	89.68	5.69 5 8 ¹ / ₄
8+01	95.20	89.90	5.30 5 3 ¹ / ₈
+26	95.24	90.16	5.06 5 0 ³ / ₄
+51	95.48	90.47	5.01 5 0 ¹ / ₈
+76	95.80	90.75	5.05 5 0 ⁷ / ₈
9+01	96.27	91.03	5.24 5 2 ⁷ / ₈

N L C Grade 95.50 ✓
 Imp 95.00

S L E.

20th S of C 81-

Sta	Elev	Grade	cut
9+26	96.44	91.31	5.13 5' 1 7/8
+51	96.70	91.59	5.11 5' 1 1/8
+76	97.11	91.88	5.23 5' 2 3/4
10+01	97.59	92.16	5.43 5' 5/8
+26	98.01	92.44	5.57 5' 6 1/2
+51	98.55	92.72	5.83 5' 10
+76	98.91	93.00	5.91 5' 8 3/4 x
11+02	99.30	94.00	4.80 4' 9 1/2 x
Total length of pipe			11+02

N2 7 1/2' flush to cut 99.50

21st St South of B

Sta	Elev	Grade	cut
0	96.05	89.65	6.40 6' 4 $\frac{1}{2}$ "
Killed Out.			
+13	96.55	89.78	6.77 6' 9 $\frac{1}{4}$ "
+23	96.54	89.88	6.66 6' 8"
+33	96.68	89.78	6.70 6' 8 $\frac{3}{8}$ "
+43	96.76	90.08	6.70 6' 8 $\frac{3}{8}$ "
+53	96.99	90.18	6.72 6' 8 $\frac{5}{8}$ "
+62	97.09	90.28	6.81 6' 9 $\frac{3}{8}$ "
+73	97.30	90.38	6.92 6' 11"
+78	97.36	90.43	6.93 6' 11 $\frac{1}{8}$ "
+95	97.42	90.50	6.92 6' 11"
+10	97.61	90.75	6.86 6' 10 $\frac{3}{8}$ "
+35	97.83	91.00	6.83 6' 10"
+60	98.00	91.25	6.75 6' 9"
+85	98.14	91.50	6.64 6' 7 $\frac{3}{4}$ "
2+10	98.53	91.75	6.77 6' 9 $\frac{1}{4}$ "
+35	98.72	92.00	6.72 6' 8 $\frac{7}{8}$ "
+60	99.04	92.25	6.79 6' 9 $\frac{1}{2}$ "
+85	99.14	92.50	6.64 6' 7 $\frac{3}{4}$ "
3+10	99.36	92.75	6.61 6' 7 $\frac{3}{8}$ "

-TY 3rd Sta cut - from 84.21
 PE

0+60 S. line of St

P.T.

25' S 32' E W

21¹⁴ S of S

Sta Elev Area cur

3+33 99.65 93.00 6.656 7¹/₂x+60 99.70 95.00 4.704 18³/₈

Total length of pipe 3+65

N E of M E Lush tank

21st N of S

Sta	Elev	known	cut
0	94.60	89.30	5.305 3 ⁷ / ₈
+11	95.18	89.45	5.735 8 ³ / ₄
+22	95.80	89.59	6.216 2 ¹ / ₂
+33	96.09	89.74	6.356 4 ¹ / ₄
+44	96.47	89.88	6.596 7 ¹ / ₈
+55	96.66	90.03	6.636 7 ¹ / ₈
+66	96.55	90.17	6.386 4 ¹ / ₈
+77	96.86	90.32	6.546 6 ¹ / ₂
+88	97.08	90.46	6.626 7 ¹ / ₂
+99	97.36	90.61	6.756 9
1+10	97.59	90.75	6.846 10 ¹ / ₈
+21	97.68	90.90	6.786 9 ³ / ₈
+24	97.68	90.94	6.746 8 ⁷ / ₈
+39	97.71	91.13	6.586 7
+64	98.10	91.46	6.646 7 ¹ / ₄
+89	98.37	91.79	6.586 7
2+14	98.78	92.12	6.666 8
+39	99.28	92.45	6.836 10
+64	99.65	92.78	6.876 10 ¹ / ₂
+89	99.88	93.11	6.776 9 ¹ / ₄

Y N 35 men of 21st S 21st N

8+89 N 2 S N

Y

PT

50' N of men 2 S N

21th St - Prof. 8

Sta	Elev	Grade	cut
3+14	100.18	93.44	6.74 6' 8 $\frac{1}{2}$ "
+ 39	100.47	93.77	6.70 6' 8 $\frac{3}{8}$ "
+ 64	100.79	94.10	6.69 6' 8 $\frac{1}{4}$ "
+ 94	101.46	94.50	6.96 6' 11 $\frac{1}{2}$ "
4+19	101.95	95.11	6.84 6' 10 $\frac{3}{8}$ "
+ 44	102.84	95.71	7.13 7' 1 $\frac{7}{8}$ "
+ 69	102.88	96.32	6.56 6' 6 $\frac{3}{4}$ "
+ 94	103.54	96.93	6.61 6' 7 $\frac{3}{8}$ "
5+19	103.71	97.53	6.18 6' 2 $\frac{1}{8}$ "
+ 44	104.21	98.14	6.07 6' 0 $\frac{7}{8}$ "
+ 69	104.97	98.75	6.22 6' 2 $\frac{9}{8}$ "
+ 94	105.45	99.35	6.10 6' 1 $\frac{1}{4}$ "
6+19	106.20	99.96	6.24 6' 2 $\frac{7}{8}$ "
+ 44	106.83	100.57	6.26 6' 3 $\frac{1}{8}$ "
+ 69	107.57	101.17	6.40 6' 4 $\frac{1}{8}$ "
+ 94	108.04	101.78	6.26 6' 3 $\frac{1}{8}$ "
7+19	108.65	102.39	6.26 6' 3 $\frac{1}{8}$ "
+ 44	109.47	102.99	6.48 6' 5 $\frac{3}{4}$ "
+ 69	110.20	103.60	6.60 6' 7 $\frac{1}{4}$ "
8+06	111.53	104.50	7.03 7' 0 $\frac{3}{8}$ "

2.42 71.119

BZ H St Grade 101.50 ✓
 H H Jump 101.00

H H H H

$$\begin{array}{r} 2376 \\ 1178 \\ \hline 798 \end{array}$$

BZ H St-Grade 111.50 ✓
 Jump 111.00

21st Nov 8

No	Ulv	Grade	cut
8+26	112.68	104.95	7.73 7' 8 ³ / ₄
+46	112.99	105.40	7.59 7' 17 ¹ / ₈
+66	113.45	105.85	7.60 7' 7 ¹ / ₄
+86	113.46	106.30	7.16 7' 2
9+11	113.49	106.87	6.62 6' 7 ¹ / ₂
+36	114.04	107.43	6.61 6' 7 ³ / ₈
+61	114.67	107.99	6.68 6' 8 ¹ / ₂
+86	115.20	108.56	6.64 6' 7 ³ / ₄
10+11	115.77	109.12	6.65 6' 7 ⁷ / ₈
+36	116.133	109.68	6.65 6' 7 ⁷ / ₈
+61	116.77	110.25	6.52 6' 6 ¹ / ₄
+86	117.16	110.81	6.35 6' 4 ¹ / ₄
11+11	117.49	111.37	6.12 6' 1 ¹ / ₂
+36	118.18	111.94	6.24 6' 2 ⁷ / ₈
+61	118.85	112.50	6.35 6' 4 ¹ / ₄
+85	119.79	114.50	5.29 5' 3 ¹ / ₂
Total length of pipe 11+90			

2.2002 1.00

L.S.

K.L.B.

L.F.M. - Flush tunnel

Moore
Road
Sveinsoe
11-27-41

Stadia Survey
Morena Creek

$\Delta = 26^{\circ}04' \text{ RT}$
26+19 11.17 193.54 4.90 188.37
T.P.

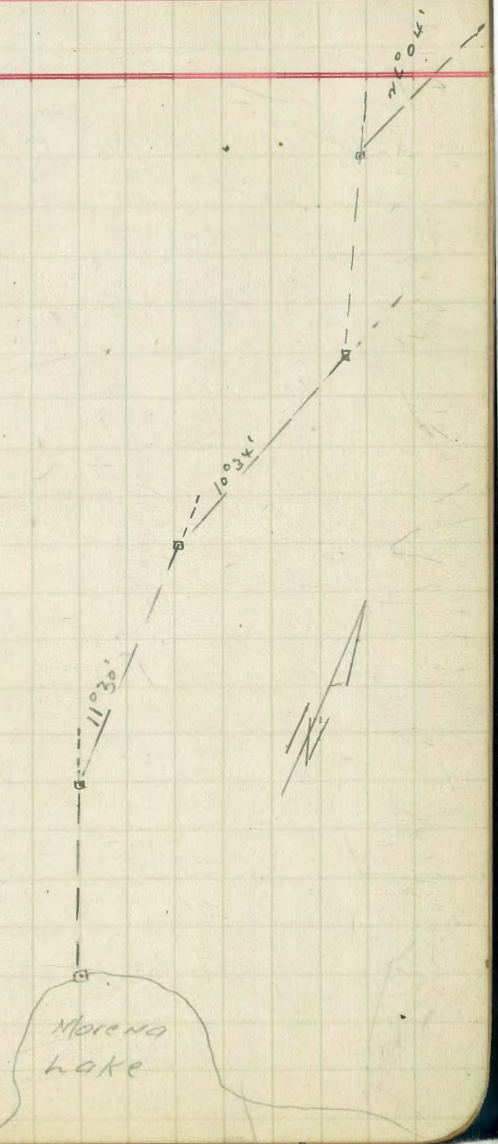
$\Delta = 17^{\circ}29' \text{ LT}$
17+32 11.25 187.27 4.92 176.02
T.P.

$\Delta = 10^{\circ}34' \text{ RT}$
11+66 11.50 180.94 5.08 169.44
T.P.

$\Delta = 11^{\circ}30' \text{ RT}$
4+96 10.42 174.52 5.15 164.10
T.P.

0+00 7.30 169.75 161.95
T.P.

Morena
DAM
Elevation Reading
11-27-41



$\Delta 66^{\circ}10'$ RT				
46+44 T.P.	4.60	210.93	4.87	206.33
60' RT of 46+44 on Δ split		10.3		200.6 = Δ Creek

41+47 T.P.	11.63	211.70	4.90	199.57
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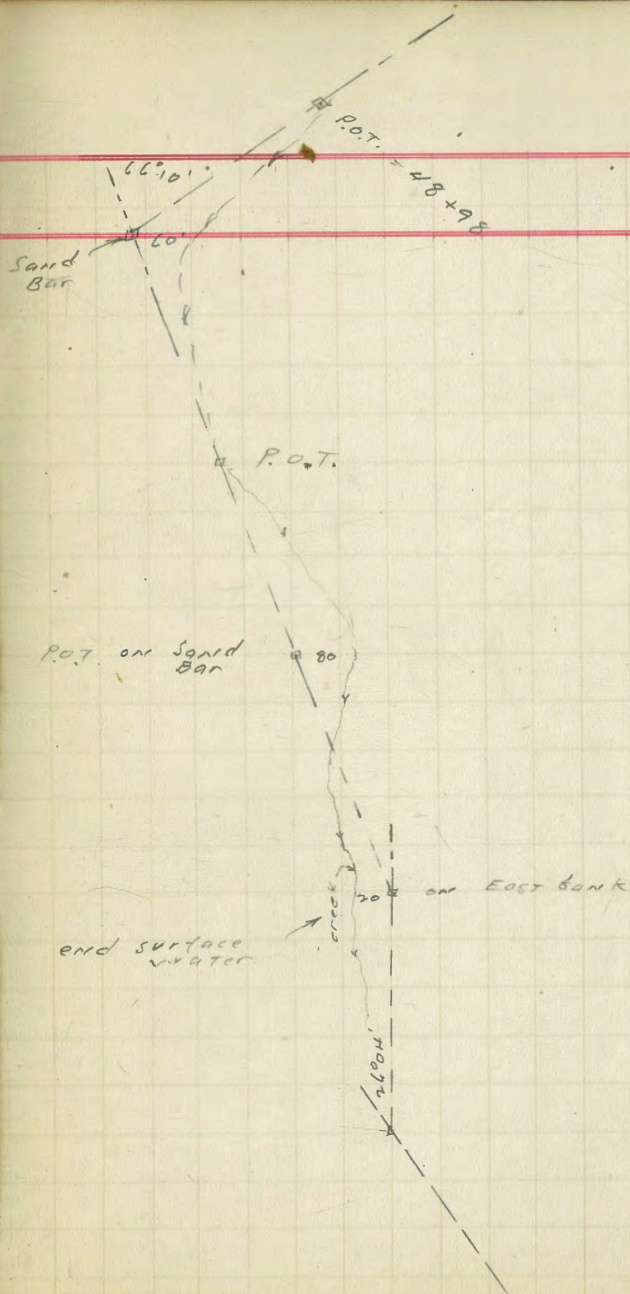
35+07 T.P.	9.45	204.27	4.80	195.07
80' RT. of 35+07 = Creek			7.7	

$\Delta = 49^{\circ}10'$ LT.				
31+09 T.P.	11.33	199.87	5.05	188.49

20' LT. on Δ split			8.0	= Δ Creek
---------------------------	--	--	-----	------------------

46+19	$\Delta 26^{\circ}04'$ RT			
-------	---------------------------	--	--	--

193.54
$\frac{2}{195.54}$



Sta = Base Calc.
74+03,

V. Δ = + 6°24' To Top of Falls
Slope = 1220
Horiz. D. = 1209.
Vert. D. = 135.3

Δ 44°13' LT

61+96

T.P.

4.23 725.30 T.P. Rock

Δ 39°17' RT

56+93

T.P.

10.20 229.53 4.95 219.33

Δ 15°56' LT

54+10

T.P.

12.00 224.28 4.54 212.26

P.O.T.

48+98

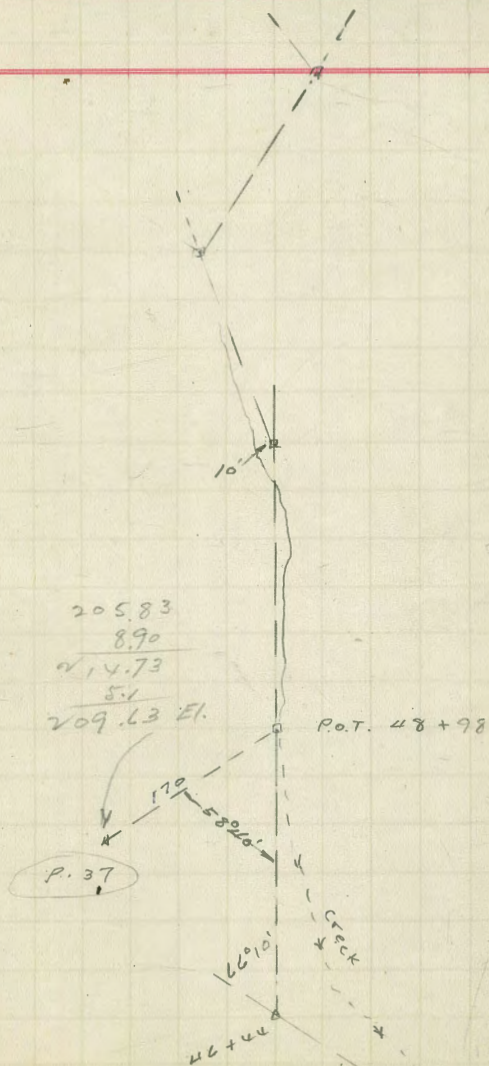
T.P.

10.95 216.78 5.10 205.83

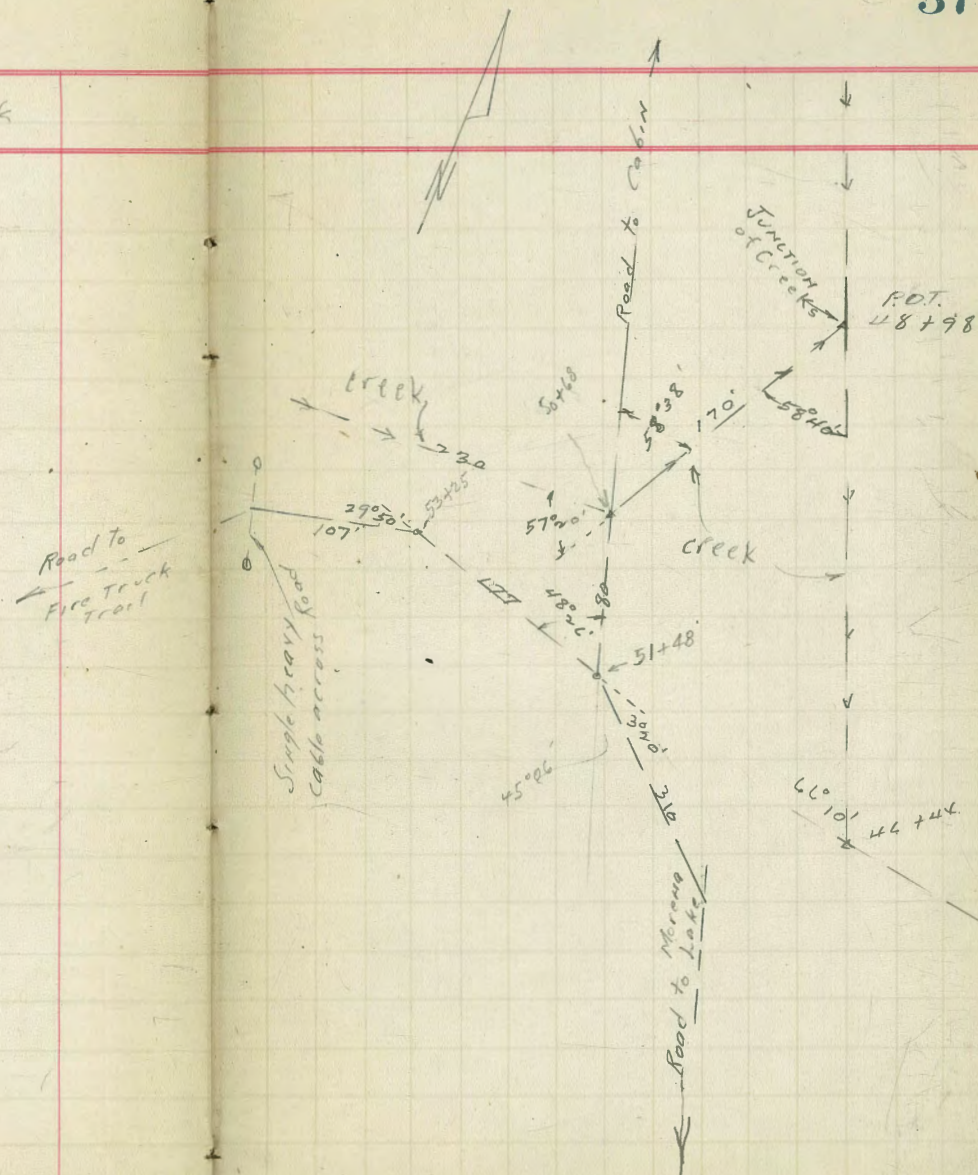
210.93

Cabin □ 450
50' Falls
Sta. 74+03

36



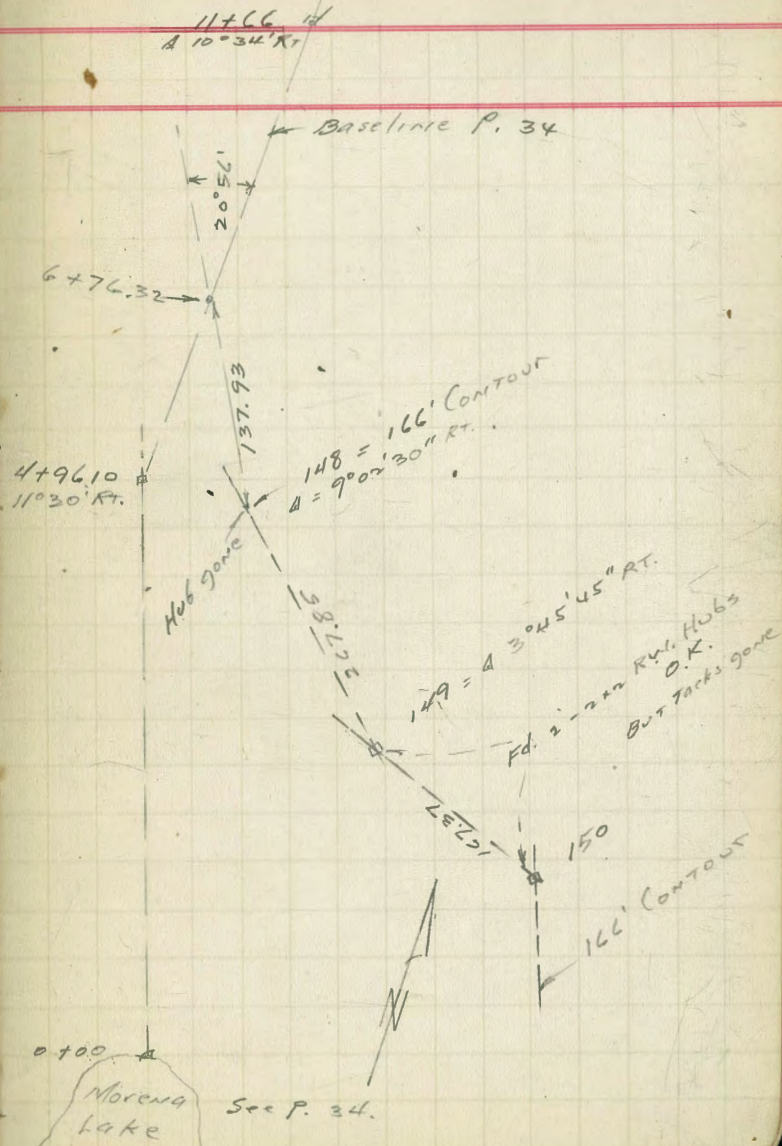
Location of Road
Upper Morena Creek



Tie to 166' Contour of
Morena Lake to Hook
Property in Morena Creek

Moore,
Rand
Svalindac
12-22-41.

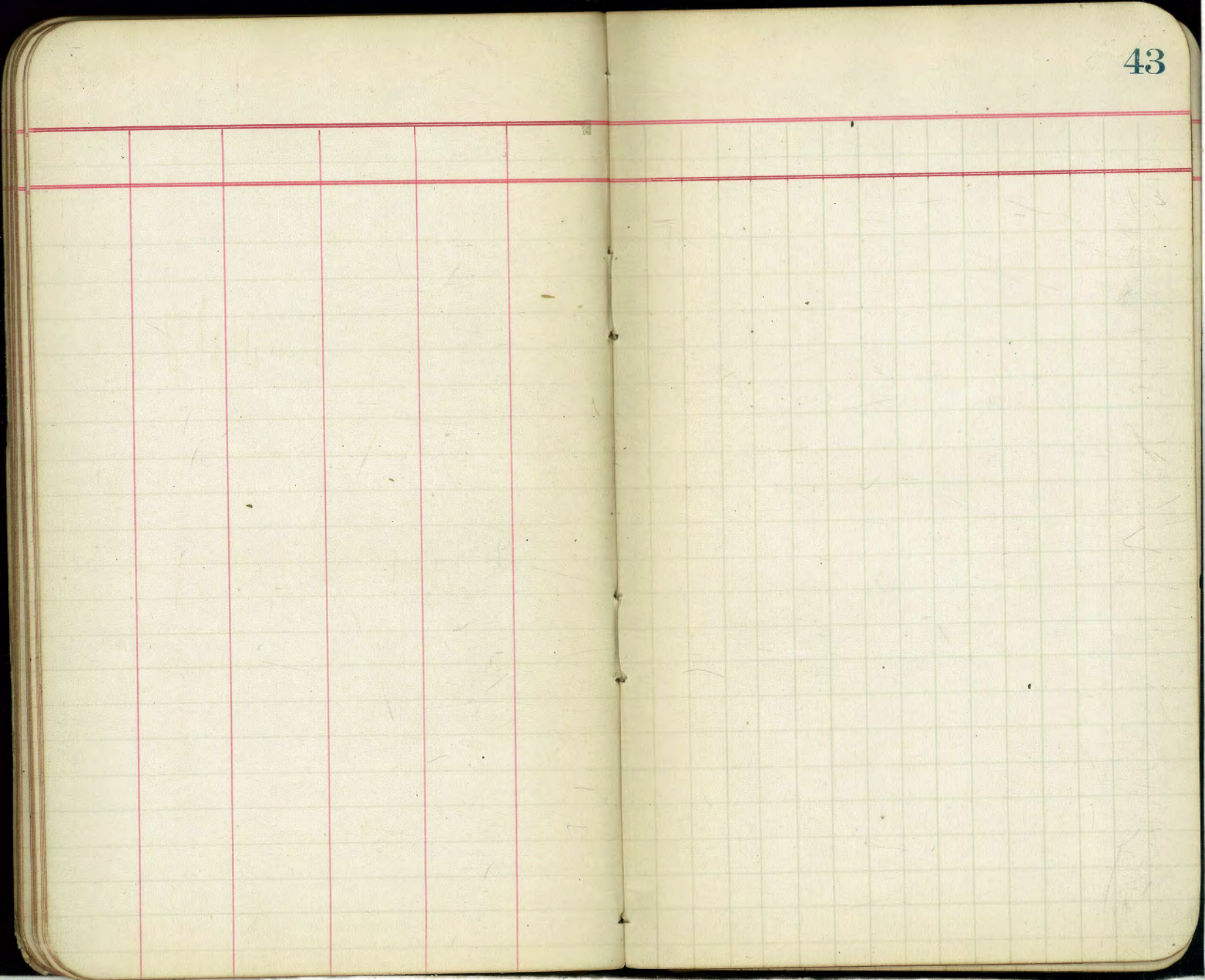
38

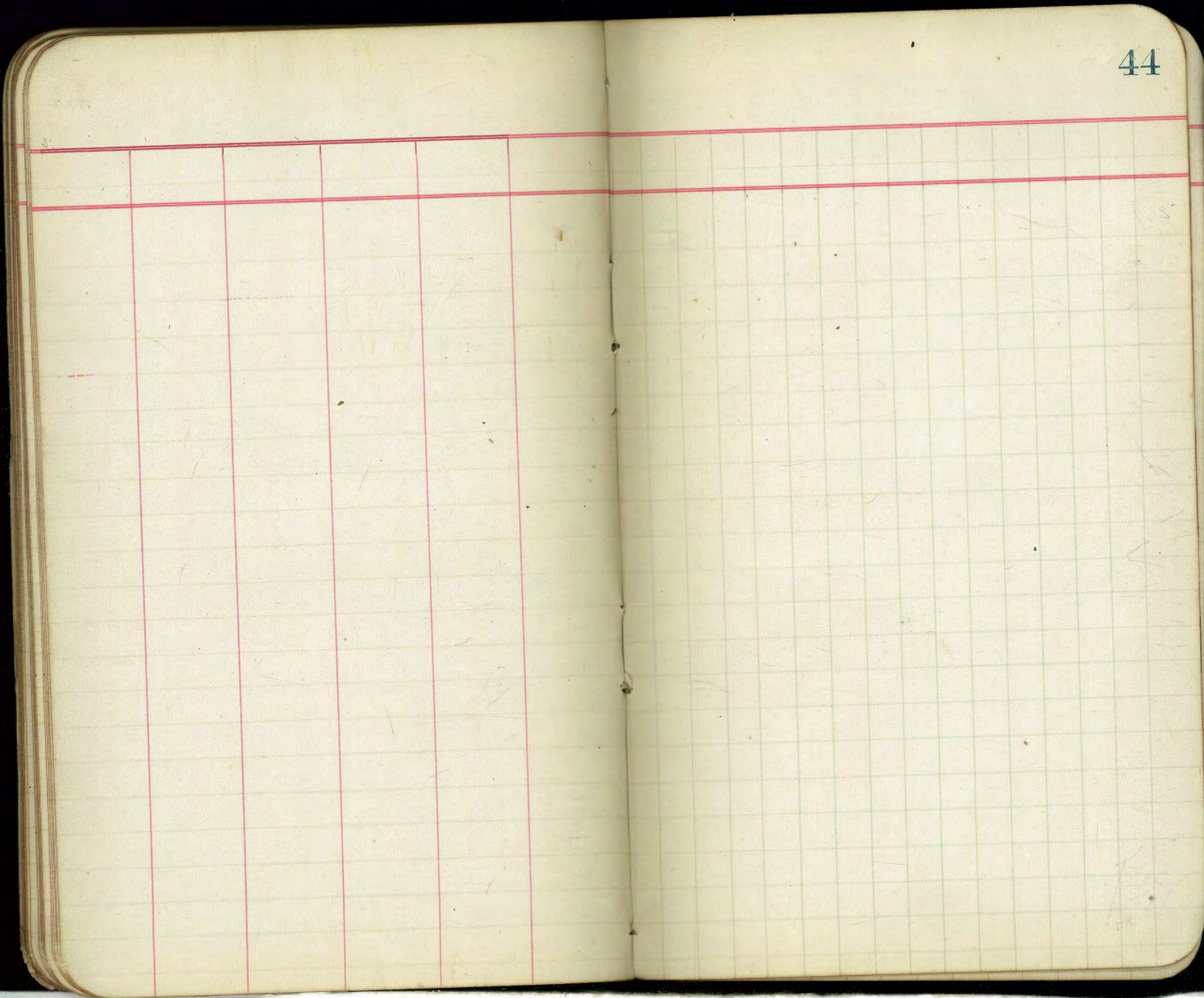


The image shows an open notebook with two pages. The left page is ruled with horizontal lines and has four vertical red lines, creating five columns. The right page is ruled with horizontal lines and has a vertical red line, creating two columns. The number 39 is printed in the top right corner of the right page. The notebook is placed on a white surface against a black background.

The image shows an open notebook with two pages. The pages are cream-colored and feature light blue horizontal ruling. The left page has a red vertical margin line on the left side and a red horizontal header line near the top. The right page has a red horizontal header line near the top. The number '40' is printed in the top right corner of the right page. The notebook is placed on a white surface against a dark background.

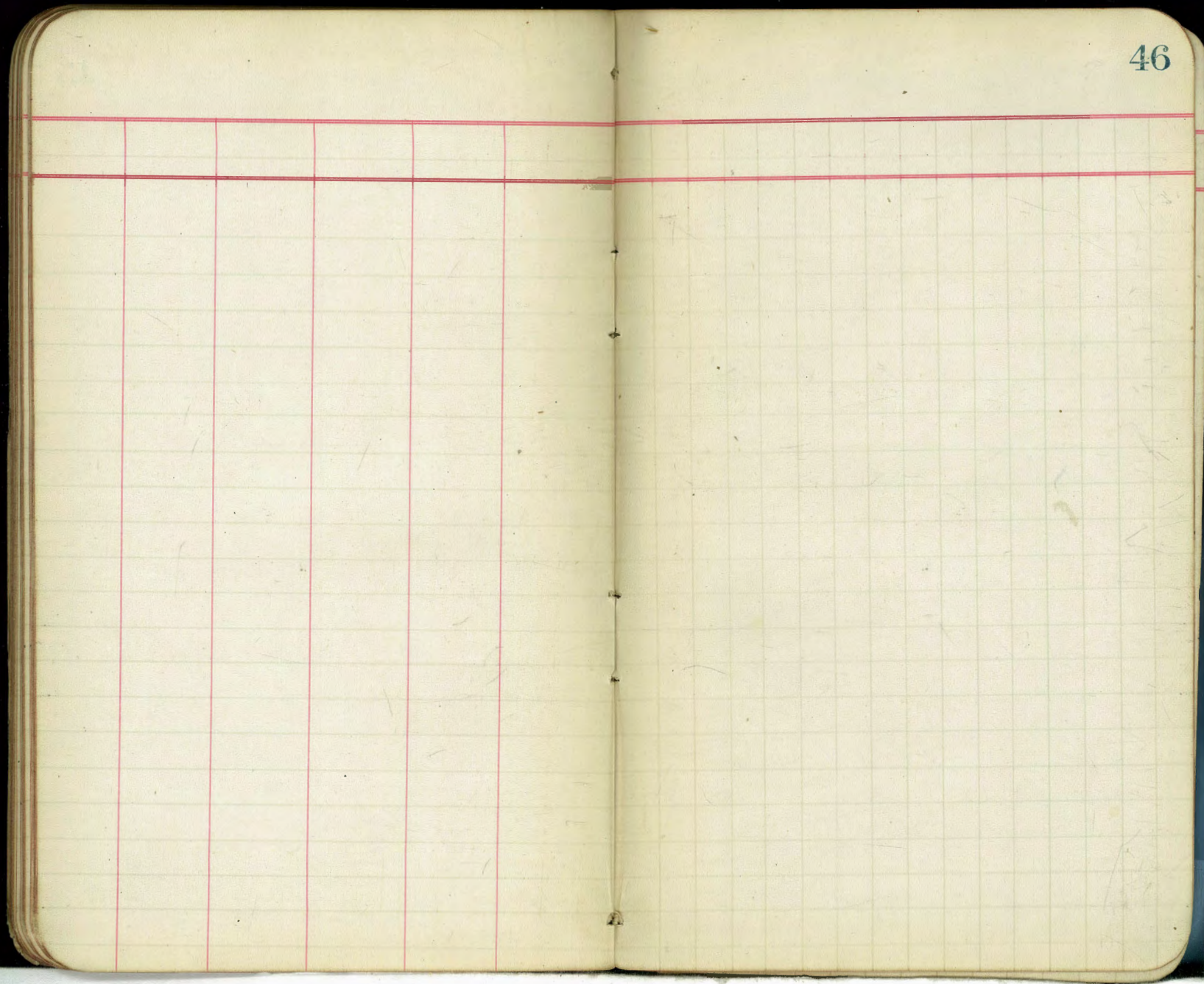
The image shows an open notebook with two pages. The left page is ruled with a vertical red margin line on the left side and a horizontal red header line near the top. The right page has a horizontal red header line near the top. The pages are cream-colored with light blue horizontal ruling. The notebook is bound in the center, and the pages are slightly aged. The number '42' is printed in the top right corner of the right page.



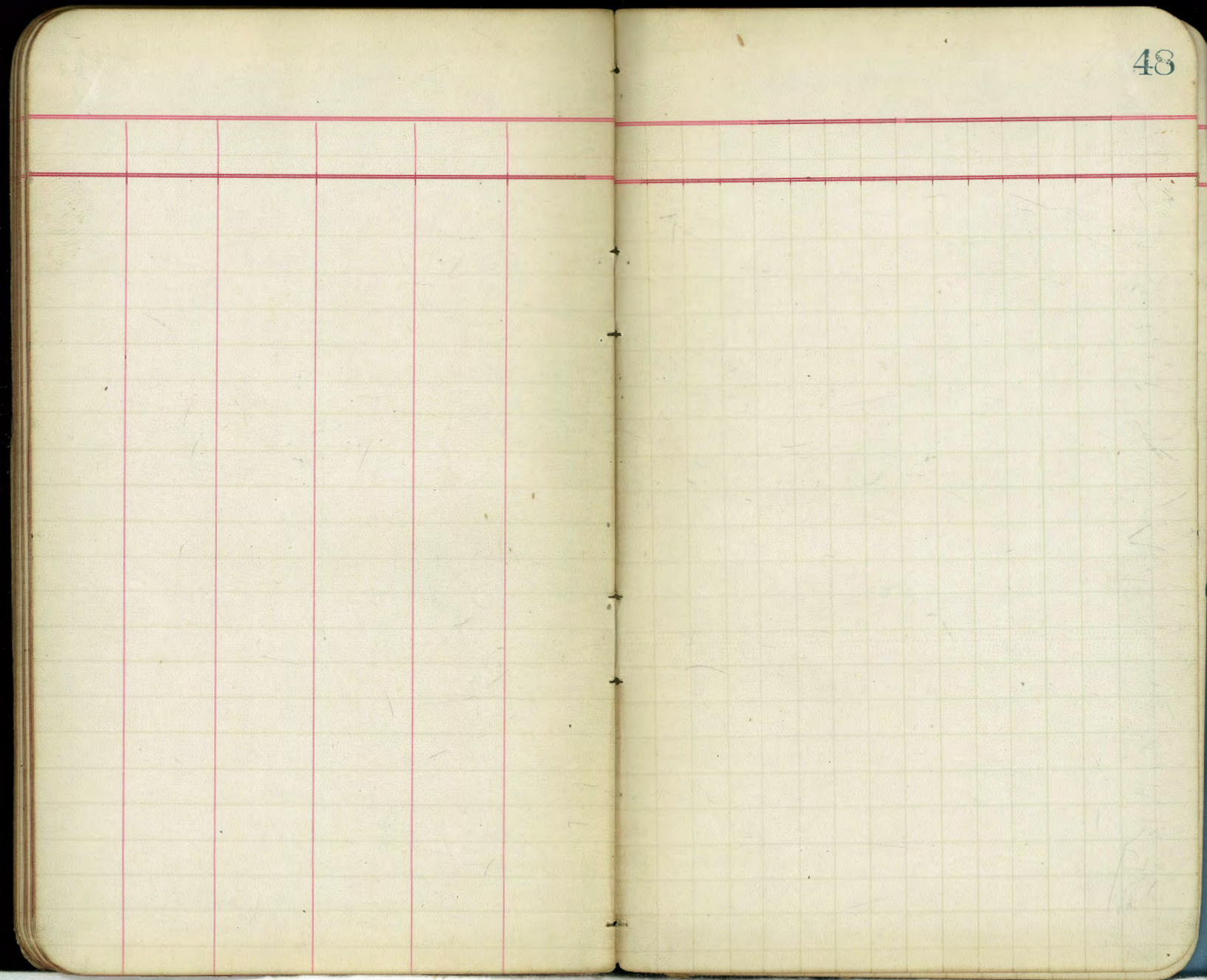


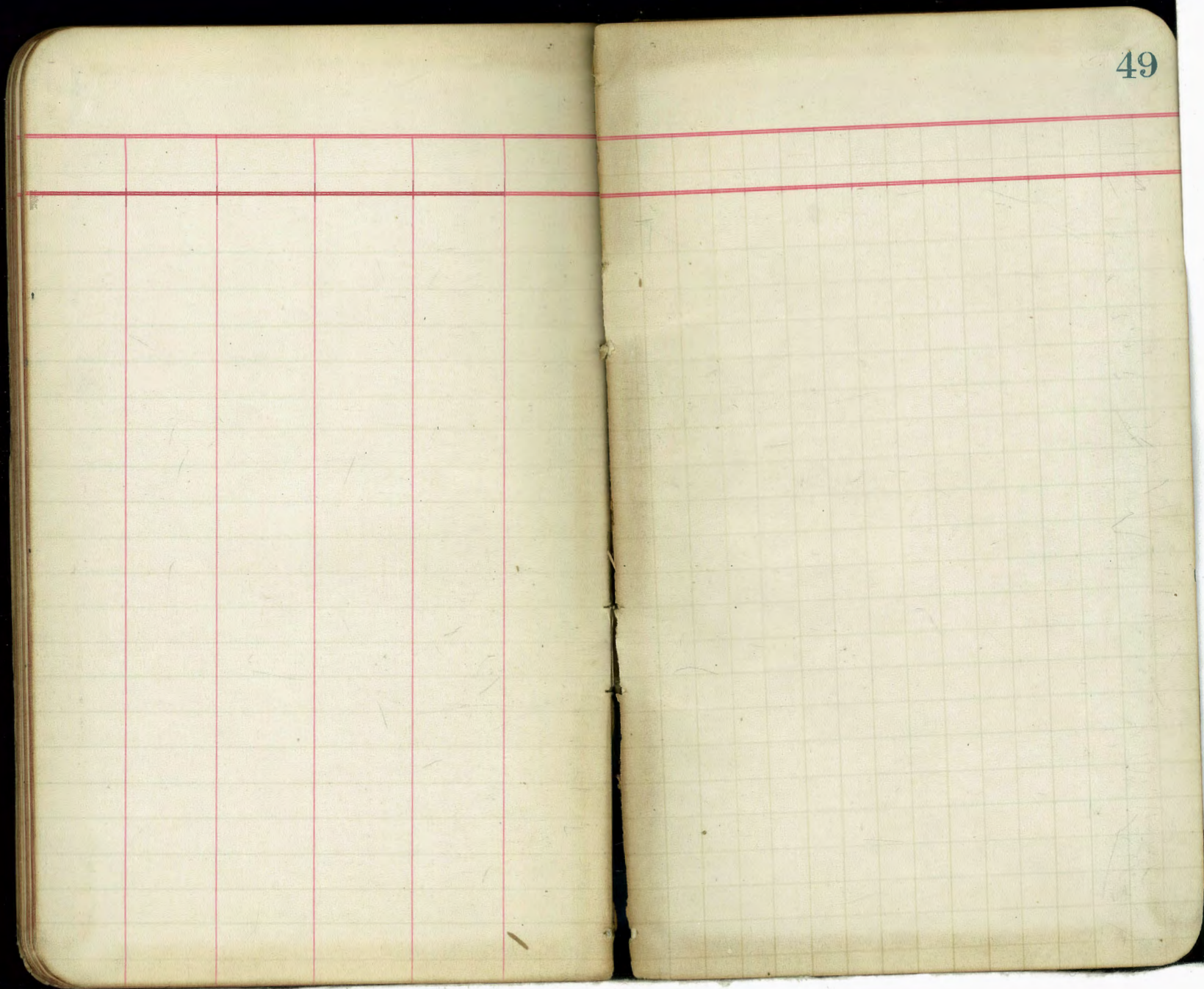
The image shows an open notebook with two pages. The left page is a ledger page with a grid of red lines. It has a top header section, a second horizontal line below it, and then a grid of 6 columns and 20 rows. The right page is a grid page with a top header section and a grid of 20 columns and 20 rows. The number '45' is printed in the top right corner of the right page. The notebook is bound in the center, and the pages are cream-colored.

46



The image shows an open notebook with two pages. The left page is ruled with a grid of red lines, creating a table with 6 columns and 20 rows. The right page is ruled with horizontal lines and has the number '47' printed in the top right corner. The notebook is placed on a white surface against a dark background.





18
 394
 0.89
 3.05

506
 494
 312

1071.7

1696
 1137
 1559

TRAVERSE TABLE FOR TRANSIT BOOK,
 From 1° to 90° for a distance of 100.

Degrees.	DEGREES.		¼ DEGREE.		½ DEGREE.		¾ DEGREE.		Degrees.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
0	100.00	0.44	100.00	0.87	99.99	1.31	81		
1	99.98	1.75	99.98	2.18	99.97	2.62	80		
2	99.94	3.49	99.92	3.93	99.91	4.36	80		
3	99.86	5.23	99.84	5.67	99.81	6.10	80		
4	99.76	6.98	99.73	7.41	99.69	7.85	80		
5	99.62	8.72	99.58	9.15	99.54	9.58	80		
6	99.45	10.45	99.41	10.89	99.36	11.32	80		
7	99.25	12.19	99.20	12.62	99.14	13.05	80		
8	99.03	13.92	98.97	14.35	98.90	14.78	80		
9	98.77	15.64	98.70	16.07	98.63	16.50	80		
10	98.48	17.36	98.40	17.79	98.33	18.22	80		
11	98.16	19.08	98.08	19.51	97.99	19.94	71		
12	97.81	20.79	97.72	21.22	97.63	21.64	71		
13	97.44	22.50	97.34	22.92	97.24	23.34	71		
14	97.03	24.19	96.92	24.62	96.81	25.04	71		
15	96.59	25.88	96.48	26.30	96.36	26.72	71		
16	96.13	27.56	96.00	27.98	95.88	28.40	71		
17	95.63	29.24	95.50	29.65	95.37	30.07	71		
18	95.11	30.90	94.97	31.32	94.83	31.73	71		
19	94.55	32.56	94.41	32.97	94.26	33.38	71		
20	93.97	34.20	93.82	34.61	93.67	35.02	71		
21	93.36	35.84	93.20	36.24	93.04	36.65	62		
22	92.72	37.46	92.55	37.86	92.39	38.27	62		
23	92.05	39.07	91.88	39.47	91.71	39.87	62		
24	91.35	40.67	91.18	41.07	91.00	41.47	62		
25	90.63	42.26	90.45	42.66	90.26	43.05	62		
26	89.88	43.84	89.69	44.23	89.49	44.62	62		
27	89.10	45.40	88.90	45.79	88.70	46.17	62		
28	88.29	46.95	88.09	47.33	87.88	47.72	61		
29	87.46	48.48	87.25	48.86	87.04	49.24	60		
30	86.60	50.00	86.38	50.38	86.16	50.75	59		
31	85.72	51.50	85.49	51.88	85.26	52.25	58		
32	84.80	52.99	84.57	53.36	84.34	53.73	57		
33	83.87	54.46	83.63	54.83	83.39	55.19	56		
34	82.90	55.92	82.66	56.28	82.41	56.64	55		
35	81.92	57.36	81.66	57.71	81.41	58.07	54		
36	80.90	58.78	80.64	59.13	80.39	59.48	53		
37	79.86	60.18	79.60	60.53	79.34	60.88	52		
38	78.80	61.57	78.53	61.91	78.26	62.25	51		
39	77.71	62.93	77.44	63.27	77.16	63.61	50		
40	76.60	64.28	76.32	64.61	76.04	64.94	49		
41	75.47	65.61	75.18	65.93	74.90	66.26	48		
42	74.31	66.91	74.02	67.24	73.73	67.56	47		
43	73.14	68.20	72.84	68.52	72.54	68.84	46		
44	71.93	69.47	71.63	69.78	71.33	70.09	45		
45	70.71	70.71							
Degrees.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Degrees.
Degrees.	DEGREES.		¼ DEGREE.		½ DEGREE.		¾ DEGREE.		Degrees.

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 37
 137