

30  
TRANSIT

397

W55

TRAVERSE TABLE FOR TRANSIT BOOK.

From 1° to 90° for a distance of 100.

Degrees.	DEGREES.		1/4 DEGREE.		1/2 DEGREE.		3/4 DEGREE.		Degrees.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
0			100.00	0.44	100.00	0.87	99.99	1.31	89
1	99.98	1.75	99.98	2.18	99.97	2.62	99.95	3.05	88
2	99.94	3.49	99.92	3.93	99.91	4.36	99.88	4.80	87
3	99.86	5.23	99.84	5.67	99.81	6.10	99.79	6.54	86
4	99.76	6.98	99.73	7.41	99.69	7.85	99.66	8.28	85
5	99.62	8.72	99.58	9.15	99.54	9.58	99.50	10.02	84
6	99.45	10.45	99.41	10.89	99.36	11.32	99.31	11.75	83
7	99.25	12.19	99.20	12.62	99.14	13.05	99.09	13.49	82
8	99.03	13.92	98.97	14.35	98.90	14.78	98.84	15.21	81
9	98.77	15.64	98.70	16.07	98.63	16.50	98.56	16.93	80
10	98.48	17.36	98.40	17.79	98.33	18.22	98.25	18.65	79
11	98.16	19.08	98.08	19.51	97.99	19.94	97.90	20.36	78
12	97.81	20.79	97.72	21.22	97.63	21.64	97.53	22.07	77
13	97.44	22.50	97.34	22.92	97.24	23.34	97.13	23.77	76
14	97.03	24.19	96.92	24.62	96.81	25.04	96.70	25.46	75
15	96.59	25.88	96.48	26.30	96.36	26.72	96.25	27.14	74
16	96.13	27.56	96.00	27.98	95.88	28.40	95.76	28.82	73
17	95.63	29.24	95.50	29.65	95.37	30.07	95.24	30.49	72
18	95.11	30.90	94.97	31.32	94.83	31.73	94.69	32.14	71
19	94.55	32.56	94.41	32.97	94.26	33.38	94.12	33.79	70
20	93.97	34.20	93.82	34.61	93.67	35.02	93.51	35.43	69
21	93.36	35.84	93.20	36.24	93.04	36.65	92.88	37.06	68
22	92.72	37.46	92.55	37.86	92.39	38.27	92.22	38.67	67
23	92.05	39.07	91.88	39.47	91.71	39.87	91.53	40.27	66
24	91.35	40.67	91.18	41.07	91.00	41.47	90.81	41.87	65
25	90.63	42.26	90.45	42.66	90.26	43.05	90.07	43.44	64
26	89.88	43.84	89.69	44.23	89.49	44.62	89.30	45.01	63
27	89.10	45.40	88.90	45.79	88.70	46.17	88.50	46.56	62
28	88.29	46.95	88.09	47.33	87.88	47.72	87.67	48.10	61
29	87.46	48.48	87.25	48.86	87.04	49.24	86.82	49.62	60
30	86.60	50.00	86.38	50.38	86.16	50.75	85.94	51.13	59
31	85.72	51.50	85.49	51.88	85.26	52.25	85.04	52.62	58
32	84.80	52.99	84.57	53.36	84.34	53.73	84.10	54.10	57
33	83.87	54.46	83.63	54.83	83.39	55.19	83.15	55.56	56
34	82.90	55.92	82.66	56.28	82.41	56.64	82.16	57.00	55
35	81.92	57.36	81.66	57.71	81.41	58.07	81.16	58.42	54
36	80.90	58.78	80.64	59.13	80.39	59.48	80.13	59.83	53
37	79.86	60.18	79.60	60.53	79.34	60.88	79.07	61.22	52
38	78.80	61.57	78.53	61.91	78.28	62.25	77.99	62.59	51
39	77.72	62.94	77.45	63.27	77.21	63.61	76.88	63.94	50
40	76.60	64.28	76.32	64.61	76.13	64.94	75.76	65.28	49
41	75.47	65.61	75.18	65.93	74.90	66.26	74.61	66.59	48
42	74.31	66.92	74.02	67.23	73.73	67.56	73.43	67.88	47
43	73.14	68.22	72.84	68.54	72.54	68.84	72.24	69.15	46
44	71.93	69.47	71.63	69.78	71.33	70.09	71.02	70.40	45
45	70.71	70.71							
Degrees.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Degrees.
	DEGREES		1/4 DEGREE.		1/2 DEGREE.		3/4 DEGREE.		

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*Crocker Quality*

TRANSIT BOOK



No. I

*Morena Reservoir*

MANUFACTURED BY

H. S. CROCKER CO.

SAN FRANCISCO AND SACRAMENTO CALIFORNIA

LORING & CO., AGENTS.  
762 FIFTH STREET,  
SAN DIEGO, CALIFORNIA

6.8  
123 096

MICROFILMED  
JAN 1965

Page 5 Beginning Traverse 130 Contour  
with Topog. of 66 contour  
9 Traverse line for Stadia of 66  
contour  
27 End of (above work)  
30 A line 130 Contour.  
35 A line close on 66 Contour Trav.

39 Cheque Angles,  
40 Sec. line com. to Sec. 23 & 24  
with ties to 66 contour Traverse,  
41 Blank.  
42 N & S sec 23 Tied to 66 C.T. (North side)  
43 N & S. & Sec. 23 Tied to 66 Contour  
traverse (South Side),  
44 Sec. line com. to sec. 23 & 24 with  
Ties to 66 Contour Traverse,  
45 Scratch.  
46 Triangulation N & S Sec 23.  
47 Levels. Marking Bays (121)  
48 X out.

Page 49  
to  
51

Profile Dam.

52 Sec. Com. to Secs. 23 & 24 with  
Ties to 49 contour.

53 N & S. & Sec 23, Ties to 49 Cont.

2

3.

4.

5. Traverse of 130' contour Morona Res<sup>o</sup>

with topography below the 130' contour  
Waterman

Feb 27, 1912 Hubbard, Sullivan - Pardo.

Sta	Dist	Lt	Rt	Cal to Maglo	Stadia	Vert angle
2	132.0	5° <sup>18</sup> <sub>17</sub>		N44°13'E N44°30'E	133	
1	92.1		7° <sup>18</sup>	N49° <sup>31/2</sup> 30'E N49°45'E	0.92	
				99°15' N86°33'E N87°E	6.20	- 6°35' 612.1
				98°42' N86°00'E N86°20'E	5.50	- 7°42' 540.2
1	92.1			84°25' N71°43'E N72°E	3.96	- 11°04' 381.6
				92°08' N79°26'E N80°E	2.33	- 2°0'18' 204.9
				132°08' S60°34'E S60°E	1.50	- 42°00' 82.8
		170°47'		S3°29'E S3°E	1.60	- 31°14' 117.2
		124°31'		S42°47'W S43°27'W	3.35	- 13°15' 312.1
0	118.3		5° <sup>56</sup> <sub>55</sub>	N42° <sup>13/2</sup> 25'E N43°E	119	
		5°17'	62°13'	N12°42'W		

Bal. RM

Sta	Dist.	L+	R+	Cal.	Mag	Stadia	Vert L.
6	105°	39°54'		S 84°36' E	20 1/2 S 84°20' E	1.06	Bal. A.W.V.
5	33 8		49 55°41 1/2'	35 S 44°42' E	S 44°30' E	0.34	
4	37 1		42°50'	35 1/2 N 79°33 1/2' E	N 80° E	0.38	
3	72 2	28 7 3/4 417°24'	98°34 1/2'	45 1/2 N 36°43 1/2' E	N 37°30' E	0.73	

7.  
Sta. Dist. Lt Rt Cal.B. Mag. Stadia Vert. L.

9 105<sup>6</sup> 10°49½' N3°26'E N4°E 1.065

□ UTR. R.M.W.

10°49½' 00°00'

9 140°07' S <sup>15½</sup> 14°09' W S 14°09' W

Ball. R.M.W.

True Course N 14°15½' E

error on left.

8 49<sup>8</sup> 32°00' N <sup>08½</sup> 54°02' E N 54°02' E 0.195

□

7 48<sup>0</sup> 9°22' N <sup>08½</sup> 86°02' E N 86°02' E 0.98

41°22' 140°07'

□

g.  
Sta. Dist. L+ R+ Cal. B Mag. Stadia Vert. L.

13 1164 3059' S57°41'E S57°30'E 117

D.K. 12/11/11

12 651 8°15' S53°42'E S53°30'E 065

11 2437 130°49' S61°57'E S61°30'E 2445

10 658 16°12' N12°46' W N12°25' W 066  
20°11' 139°09'

9.

Sta.	Dist.	L+	R+	Cal.B.	Mag.	Stadia	Vert. L.
				82°00'	S27°04'E S26°40'E	3.35	- 11°05' 322.8
				101°05'	S7°59'E S7°40'E	2.03	- 14°02' 191.1
				125°17'	S16°30'W S16°30'W	1.82	- 21°30' 157.6
				188°53'	S79°49'W S80°W	2.87	- 13°30' 271.4
				173°37'	S64°33'W S65°W	3.18	- 12°05' 304.3
				172°02'	S58°54'W S59°20'W	4.26	- 7°45' 418.4

15

32° 141°18' 38°42' N70°56'E N71°30'E

16

N32°14'E

16

141°20' S32°14'W

Topog. Morena Res-  
errisite

Waterman Rec.

Hubbard Trans.

Witte Rod.

March 11, 1912

I.P. □ A.

o.k. R.V.W.

True Course N32°14'E

Error 2 ft.

15

32° 30°46'

N70°53'E N71°5'E

0.315

14

60± 20°41'

51°27' 141°20'

S78°22'E S78°E

0.60

10

Sta.	Dist	Lt	Rt.	Ca/B.	M.B.	Stadia	Vert L.
78			128°00'	N68°00'W	N67°45'W	0.30	0°00' 30.0
17	137.4		52°38'	S16°00'E	S15°35'E	1.37	+1°09' 136.9
17							
		0°31'	0°31'	S68°07'E	S67°30'E	0.50	0°00' 50.0
			180°31'	N68°07'W	N67°30'W	1.30	0°00' 130.0
17			168°36'	N80°02'W	N79°30'W	2.65	0.00 265.0
16	898.2		89°08'	S68°38'E	S68°E	9.15	+4°20' 9.25 -3°44' 9.15
16			77°00'	S70°46'E	S70°10'E	3.30	-10°48' 318.3
16			93°28'	S54°18'E	S53°45'E	3.92	-12°06' 326.8
							1P N32°14'E
15			50°10'	S57°54'E	S58°30'E	2.80	-13°30' 264.7
				N70°56'E			

11

Sta. Dist. Lt Rt C.B. M.B. Stadia. Vert. L.

9°25' N85°54W N86°10E 170 -12°08' 162.5

137° 137°06' S33°35W S33°40W 155 -11°40' 148.7

173°15' S83°14W S83°25W 116 -17°15' 105.7

176°39' S79°50W S80°W 221 -10°05' 199.9

N88°09W 371 -4°37' 368.6

169°38' N88°09W N88°10W 590 -3°13' 588.2

N76°29½E

163°06½ S76°26½W S76°30E

I.P. A True bearing N76°29½E

20 582 -1°32'

17 578.8 33°18' S86°40E S86°30E 585 +2°35'

19 10ft south to lake. □

18 212.0 37°22' S53°22E S53°E 247 +1°09' □

16 16°55' S32°55E S32°40E 045 0.00 45.0

S16°E

12.

Sta.	Dist	Lt	Rt	Cal.B.	Mag.B.	Stadia	Vert.L.
			69°02'	N29°07'W	N29°W	0 69	-39°03' 41.7
23							
	129 <sup>8</sup>	116°45½		S81°51'W	S81°51'W	1 33	+7°12' —
22			72°05'		N53°29'W	N53°30'W	0 81 -9°10' 78.9
				42°55'	N61°31'E	N61°31'E	0 74 -11°00' 71.3
				57°30'	N76°06'E	N76°E	1 89 -1°40' 188.8
22							
	168 <sup>8</sup>	64°16½		N18°36½E	N18°45'E	1 70	-3°35' —
21							
		9°25'		N73°28E	N73°35E	2 50	-4°50' 248.2
		30°57'		N51°56'E	N52°E	1 41	-9°15' 137.4
				17°19'	S79°48'E	S79°40E	0 93 -14°14' 89.4
21							
	286 <sup>8</sup>			6°23½	N82°53'E	N83°E	2 89 -3°05' —
20							
				18°06'	S85°25'E	S85°15E	3 17 -5°40' 343.6
20							
					N76°29½E		

13

Sta	Dist	Lt	Rt	Cal.B.	Mag.B.	Stadia	VertL
			113°07'	N14°58'E	N15°E	3 37	-5°10' 334.3 4 ✓
			136°18'	N38°09'E	N38°10'E	2 79	-6°54' 275.0 3 ✓
			118°56'	N20°47'E	N21°E	2 20	-9°05' 214.6 2 ✓
			102°30'	N4°21'E	N4°30'E	1 37	-15°55' 126.6 1 ✓
			65°48'	N32°21'W	N32°10'W	1 20	-11°50' 162.8 8
			69°44'	N38°25'W	N38°15'W	3 38	-5°35' 334.7 1
			-	N43°45'W	-	3 34	-5°45' 330.6 6 ✓
			54°24'	N43°45'W	N43°35'W	5 10	-3°23' 508.3 5 ✓
			44°44'	N53°35'W	N53°30'W	3 16	-6°03' 312.5 4 ✓
			35°22'	N62°47'W	N62°40'W	2 23	-6°30' 289.3 3 ✓
			19°47'	N78°22'W	N78°15'W	1 19	-17°50' 103.3 2 ✓

23.

S81°5'W

14.

Sta	Dist	Lt	Rt	Cal.B	Stadia	Vert. L.	
				100° 27° 35'E			
			68° 35'	S 44° 03' E S 44° E	4.50	- 8° 40'	440.0 + 1
			72° 32'	S 40° 06' E S 40° E	4.75	- 8° 06'	465.03 ✓
			78° 44'	S 33° 54' E S 33° 51' E	4.74	- 8° 12'	464.0 2 ✓
			109° 21'	S 3° 17' E S 3° E	3.20	- 12° 33'	304.1 1 ✓
			127° 28'	S 14° 50' W S 15° W	2.40	- 17° 07'	219.1 2 ✓
			141° 00'	S 28° 22' W S 28° 30' W	2.86	- 14° 33'	268.0 1 ✓
		158° 37'		S 67° 22' W S 67° 30' W			I.P. Δ N 67° 22' 1/2 E
24	853		149° 08'	N 45° 59' E N 46° E	8.60	+ 2° 40'	□
23	853		145° 26'	N 47° 17' E N 47° 30' E	5.70	- 3° 06'	568.0 1 ✓
			146° 04'	N 47° 55' E N 48° E	4.10	- 4° 36'	407.3 6 ✓
			124° 30'	N 26° 21' E N 26° 30' E	3.79	- 5° 00'	376.1 5 ✓
23				S 81° 51' W			

15

Sta.	Dist	Lt.	Rt.	Cal B.	M.B.	Stadia	Vert. L.	
		50°45'		N57°02'E	N57°02'	0.72	-19°13'	64.2 2 ✓
		58°00'		S14°13'E	S14°13'	0.88	-42°30'	20.6 1 ✓
		97°15'		S25°08'W	S25°08'	0.85	-15°40'	78.8 6
		129°46'		S57°33'W	S57°33'	0.87	-15°45'	80.5 7
		160°00'		S87°47'W	S87°47'	1.20	-9°48'	116.5 9
		165°57'		N86°16'W	N86°16'	2.13	-5°58'	210.8 3
		167°26'		N59°39'W	N59°39'	3.14	-3°25'	312.8 2
25		157°34'		S87°21'W	S87°21'	3.43	-3°51'	391.4 ✓
32-19		55°02 1/2		S17°10 1/2 E	S17°10 1/2 E			to Sta. 49
25								
24	774.7	40°29 1/2		S72°13'E	S72°13'E	7.55	-3°00'	—
24		70°43'		S41°38'E	S41°38'E	3.88	-9°40'	377.0 5
				N67°22 1/2 E				

16

Sta	Dist	Lt	Rt	Cal B	M/B	Stadia	Vert. L
		162° 24'		S 71° 34' W	S 71° 30' E	0.79	-15° 32' 73.3 2
		152° 00'		S 81° 58' W	S 80° 30' E	1.77	-6° 45' 174.5 1
27	575.5	20° 27 1/2'		N 53° 57' E	N 54° E	5.84	+0° 35' —
26		6° 33'		N 67° 52' E	N 67° 50' E	1.26	-10° 00' 122.3 3
			34° 22'	S 71° 23' E	S 71° 20' E	0.49	-26° 44' 39.1 2
			154° 13'	S 48° 38' W	S 48° 30' W	0.69	-18° 30' 62.0 1
26	572.0	33° 22'		N 74° 25' E	N 74° E	5.745	+0° 15' —
25		23° 23'		N 84° 04' E	N 84° 30' E	4.70	-2° 38' 469. 6
		31° 33'		N 76° 14' E	N 76° 10' E	2.43	-5° 16' 241. 5
		39° 49'		N 67° 58' E	N 68° E	2.00	-6° 41' 197.3 4 ✓
		33° 15'		N 74° 32' E	N 74° 30' E	1.98	-9° 18' 145.0 3 ✓
25				S 72° 13' E			

17

Sta	Dist	Lt	Rt	Col B	MB	Stadia	Vert. L
	2907			N11°32'E		4.70	+0°25'
			75°29'	N87°01'E	N105°50'		-9°40'
			2°07'	N13°39'E	N13°30'	5.37	-2°25'
			3°31'	N15°03'E	N15°50'	10.70	-0°43'
			3°50'	N7°42'E	N7°30'	8.84	-1°03'
			11°01'	N0°31'E	N0°30'	6.62	-1°51'
			11°47'	N0°15'W	N0°10'	5.18	-2°35'
			16'10'	N4°45'W	N4°30'	3.88	-3°35'

28

2901	42°25½'			N11°32'E	N11°30'	2.98	+1°00'
------	---------	--	--	----------	---------	------	--------

27

	34°02'			N19°56'E	N20°00'	2.20	-3°50'
	25°09'			N28°49'E	N28°30'	1.09	-11°11'
	70°00'			S56°02'E	S56°00'	0.15	0°00'
				N53°05½'E			

18

Sta	Dist.	Lt	Rt	Cal. B	M.B.	Stadia	Vert. L.	
31	554		47°03'	S66°20'W	S66°20'W	565	+2°42'	☐
30.			47°23'	S66°40'W	S66°50'W	455	0°00'	☐
		16°24'		S2°53'W	S8°11'W	354	0°00'	
30	331 <sup>5</sup>			S19°17'W		834	-2°14'	☐ water line
29			18°41'	S31°58'W	S32°W	194	-4°06'	☐ P.O.T.
		0°18'		S18°59'W	S19°W	194	-4°06'	
		18°28'		S0°49'W	S0°50'W	043	-2°37'	
29	476 <sup>7</sup>	172°15'		S19°17'W	S19°W	480	-1°45'	☐ P.O.T. 15ft from waterline
28			162°22'	S6°06'E	S6°10'E	453	-3°20'	☐
			134°31'	S33°57'E	S34°E	390	-3°50'	
			125°51'	S42°37'E	S42°30'E	262	-5°24'	
28				N1°32'E				

19

Sta.	Dist.	Lt	Rt.	Cal.B.	M.B.	Stadia	Vert.	
						472 = 527		
			58°22'	S76°31'E	S76°30'	395	0°00'	395.0 >
			58°22'	S36°31'E	S36°30'	277	0°00'	277.0 ?
			0°00'	N85°07'E	N85°07'	053	0°00'	53.0 1
33		86°03'	57'	N56°W	N08°W	328	-0°50'	327
IP			47°20'	S85°07½W	S85°07'			see page 44
33								
32	411°		137°49'	S37°47½W	S38°W	416	-3°00'	<del>416</del>
IP								
			48°53'	S80°35'W				
32								
	296.8	84°17'		S32°03'W	S32°10'	300	-1°06'	<del>299.9</del> 4
31								
			2°28'	S68°48'W	S69°W	360	-4°35'	357.7 3
			38°19'	N75°21'W	N75°30'	182	-15°16'	111.6 2
			102°13'	N11°27'W	N11°16'W	097	-20°00'	81.6 1
31				S66°20'W				

see page 44

see page 44

see page 44

Sta.	Dist.	Lt.	Rt.	Cal. B	Mag. B	Stadia	Vert.		
				152°35'	S57°42'W	S57°45'W	460	0°00'	460. 6
				156°02'	S61°09'W	S61°15'W	320	0°00'	320. 5
				143°43'	S48°50'W	S48°50'W	259	0°00'	259. 9
				150°47'	S55°54'N	S56°W	206	0°00'	206. 3
				141°00'	S46°07'W	S46°10'W	174	0°00'	174. 2
✓				111°35'	S16°42'W	S16°50'W	278	0°00'	278. 1
✓				93°31'	S1°22'E	S1°E	250	0°00'	250. 5
✓				77°33'	S17°20'E	S17°10'E	324	0°00'	331. A
✓				63°23'	S31°30'E	S31°E	487	0°00'	487.0 3
✓				59°09'	S35°44'E	S35°30'E	673	0°00'	673. 2
✓				55°00'	S39°53'E	S39°50'E	440	0°00'	440. 1

March 15, 1912

81

Sta.	Dist	Lt.	Rt.	Cal.B.	M.B.	Stadia	Vert. L	
37	107 <sup>2</sup>		25°36'	N84°30'W	N84°20'W	109	+3°45'	108.5
36	642 <sup>2</sup>		164°46'	S69°53'W	S70°W	646	+3°12'	—
35				N85°07'W				B.S. = I.P.
		177°36'		S87°31'W	S87°40'W	268	-5°20'	265.6
		171°28'		N86°20'W	N86°20'W	192	-8°12'	188.1
35		88°10'		N3°03'W	N2°50'W	082	-21°14'	71.3
I.P.		29°49'		S85°07'W	S85°W			N85°07'W E
35								on line b/w sec. 23+24 to North
34 Underline						126	-6°10'	
35	533 <sup>6</sup>		77°09'	N65°03'W	N65°W	538	+2°06'	—
34.								see page 44 Trestle
	360 <sup>6</sup>		132°40'	S37°47'W	S38°W	364	+0°36'	—
33								see line b/w 23+24
			180°00'	S85°07'W	S85°W	459	0°00'	454. 8
			167°38'	S72°45'W	S72°30'W	400	0°00'	4.00, 7
33				N85°07'W				

Sta	Dist.	Lt	Rt	Co/B	M.B.	Stadia	Vert. L.		
39	3377			$32^{\circ}43\frac{1}{2}'$	$N68^{\circ}48'W$	$N68^{\circ}30'W$	370	0°00' —	□
38				$65^{\circ}35'$	$N35^{\circ}57'W$	$N35^{\circ}45'W$	265	-13°50' 249.8	□
				$92^{\circ}40'$	$N8^{\circ}52'W$	$N8^{\circ}35'W$	234	-18°15' 201.8	
				$106^{\circ}30'$	$N4^{\circ}58'E$	$N5^{\circ}20'E$	190	-22°02' 163.3 ✓	
38				$57^{\circ}28\frac{1}{2}'W$					O.S. = 37 □
38				$143^{\circ}51'$	$N59^{\circ}24'E$	$N60^{\circ}$	395	-13°15' 288.7 5	
				$146^{\circ}04'$	$N61^{\circ}34'E$	$N62^{\circ}12'E$	352	-11°15' 338.4 4	
				$155^{\circ}44'$	$N71^{\circ}14'E$	$N71^{\circ}50'E$	383	-9°30' 376.4 3	8
				$156^{\circ}49'$	$N73^{\circ}16'E$	$N72^{\circ}50'E$	426	-9°17' 414.6 2	
37				$149^{\circ}02'$	$N64^{\circ}32'E$	$N65^{\circ}E$	440	-8°34' 430.3 1	
38				$N84^{\circ}30\frac{1}{2}'W$					□
	966	$17^{\circ}01'$		$57^{\circ}28\frac{1}{2}'W$	$S78^{\circ}46'W$		097	-0°00' —	□
37				$N84^{\circ}30\frac{1}{2}'W$					□

Sta	Dist.	Lt	Rt.	Cal Bearing MB	Stadia	Vert. L.	
				124°08' N 20°00' E N 20°50' E	2 <sup>23</sup>	-3°06'	222 1
44	1703			9°57' S 75°58½ W S 76°25' W	1 <sup>88</sup>	-16°54'	□ on E. sec. 23 see page 43
43							□
42	144 <sup>2</sup>			168°57' S 65°56½ W S 66°10' W	1 <sup>45</sup>	-1°53'	□ I.P. = B.S.
I.P.		28°07'		S 76°56' W S 77°30' W			△
42							N 76°59½ E □ = 67
	185°			21°40' N 74°57' W N 74°30' W	1 <sup>85</sup>	0°00'	□
41				7°00' N 64°03' W N 63°40' W	3 <sup>50</sup>	-7°50'	□
							343.5 3
				12°50' N 58°13' W N 57°30' W	2 <sup>57</sup>	-11°20'	247.0 2
40				17°30' N 53°33' W N 53° W	1 <sup>72</sup>	-18°13'	158.7 1
41	82±	25°33½		S 83°23' W S 83°45' W	0 <sup>85</sup>	+9°47'	□
40	387°	2°15½		N 71°03½ W N 70°45' W	3 <sup>91</sup>	-2°45'	□ 15 ft. No. 130 cont.
39							□

sta	Dist	Lt.	Rt.	Cal. B.	M.B.	Stadia	Vert. L	H.O.	
45	60.4	101° 48 1/4		N 38° 38' W	N 37° 30'	0.60	0° 00'	—	
IP		36° 20 1/2		S 63° 09' W	S 63° 45'			—	
45	5.112		23° 36'	N 80° 30 1/2' W	N 70°	5.25	+6° 00'	—	
44									
				53° 56'	N 50° 11' W	4.13	-2° 30'	312.4	5
				49° 00'	N 60° 07' W	2.56	-3° 15'	255.2	4
				30° 23'	N 73° 44' W	2.52	-3° 10'	251.2	3
				39° 54'	N 69° 13' W	1.95	-6° 08'	143.3	2
		43° 23'		S 32° 20' W	S 32° 35' W	0.79	-4° 25'	78.4	1
				67° 23'	N 36° 44' W	0.35	-2° 35'	26.9	3
				124° 08'	N 20° 01' E	0.82	-10° 70'	79.4	2
44.				S 75° 53 1/2' W					



Sta	Dist	Lt.	Rt.	Cal. B.	M.B.	Stads	Vert. L
				69°23'	N0°04'W N0°04'	241	-16°16' 221.9 ✓
				108°02'	N38°25'E N88°36'	197	-19°14' 175.8 ✓
50.					N69°27'W		
51	174°	25°59'		S81°26'W	S6°15'	125	0°00' —
50	156°	20°35'		N69°37'W	N6°00'	157	0°00' —
49	89°	13°02'		N49°02'W	N4°10'	090	0°00' —
48	74°	56°00'		N36°00'W	N38°00'	074	0°00' —
47	93°	53°22'		S88°00'W	S88°00'	094	0°00' —
46				2°06'	N36°02'W N36°10'	374	-9°55' 362.2 ~
				22°15'	N16°23'W N16°23'	242	-16°10' 222.4 ✓
				57°24'	N18°46'E N18°46'	190	-22°10' 162.9 %
46				105°30'	N66°52'E N66°52'	266	-14°46' 248.6 ✓
					N38°38'W		

Sta	Dist	Lt.	Rt.	Cal. B.	M.B.	Stake	Feet	
0	181 <sup>3</sup>		19°31'	N67°45'E	168	182	0°00'	—
58	160 <sup>8</sup>		82°12'	N48°14E	149	162	+0°55'	—
57	5189	103	104°11'	N33°58'W	N33	523	+1°15'	—
56	1010		50°50'	S41°51'W	S43	101	0°25'	—
55	57 <sup>3</sup>	71°36'		S8°59'E	S89	057	-0°00'	—
54	54 <sup>5</sup>	25°40'		S62°37'W	S62	054	0°00'	—
53	71 <sup>5</sup>	3°58'		S88°17'W	S88	171	-0°00'	—
52	90 <sup>2</sup>		7°49'	N87°45'W	N87	1090	+1°35'	—
51								
			115°20'	N19°46'E	N19	164	-25°30'	133.5
			61°37'	N31°27'W	N31			
				S84°26'W	S84			
51								across lake to Sta 0
			61°23'	N8°14'W	N8	244	-20°16'	214.5 ✓
50				N69°37'W	N69			

27

Sta. Dist. Lt. Rt. Cal B MB. Stadia Vert.

57

— 12°31' S 80°41½ E — —

0

51

— 18°15' S 20°57½ E — —

0

10°05' S 2°37 E S 2° E 4<sup>10</sup> - 10°45' 395.4

12°46' S 25°28 E S 25° E 4<sup>00</sup> - 11°00' 385.4

0

I.P.

B.S. = I.P. S 12°42½ E

99°30' S 12°45' W

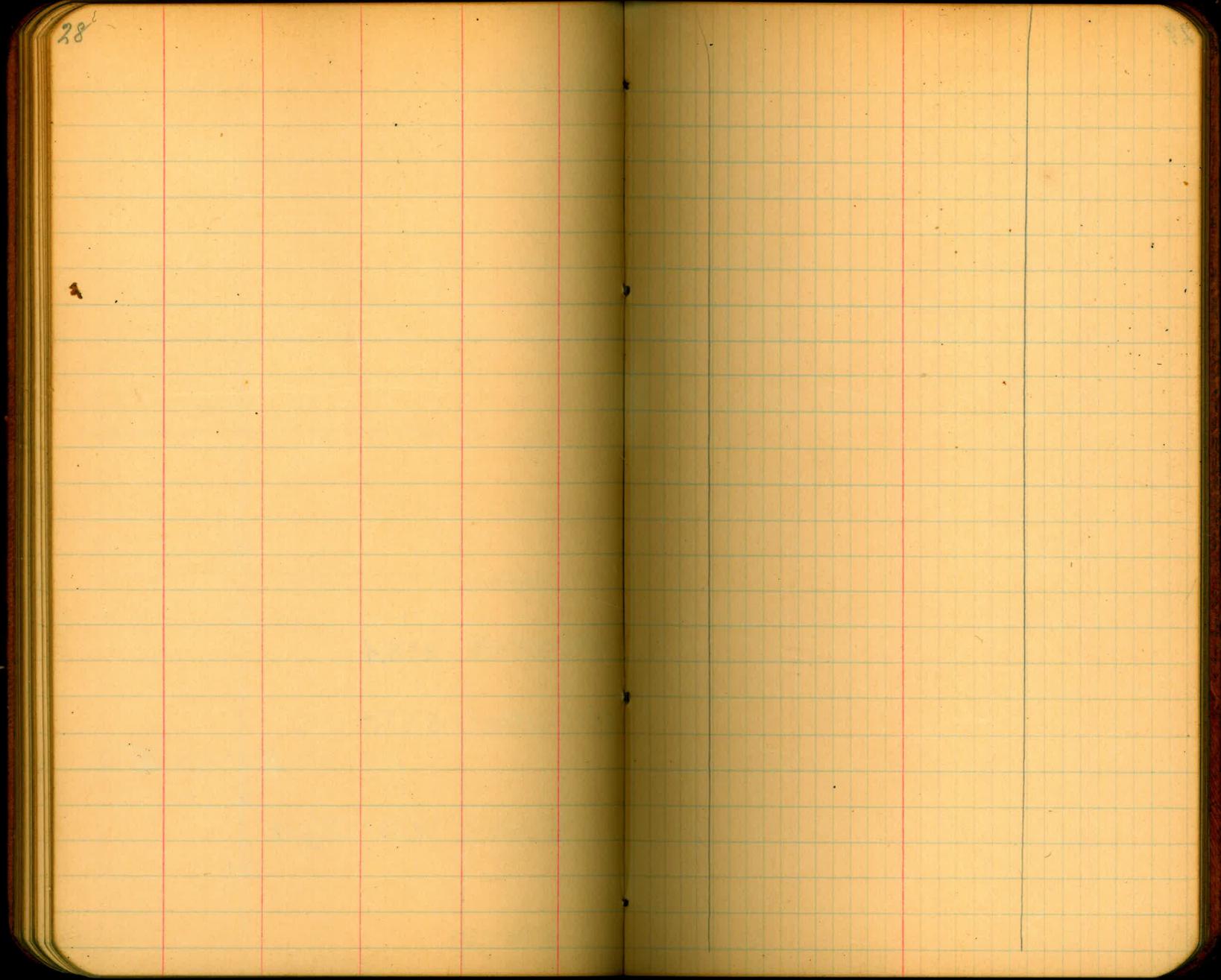
N 12°42½ W

I.P.

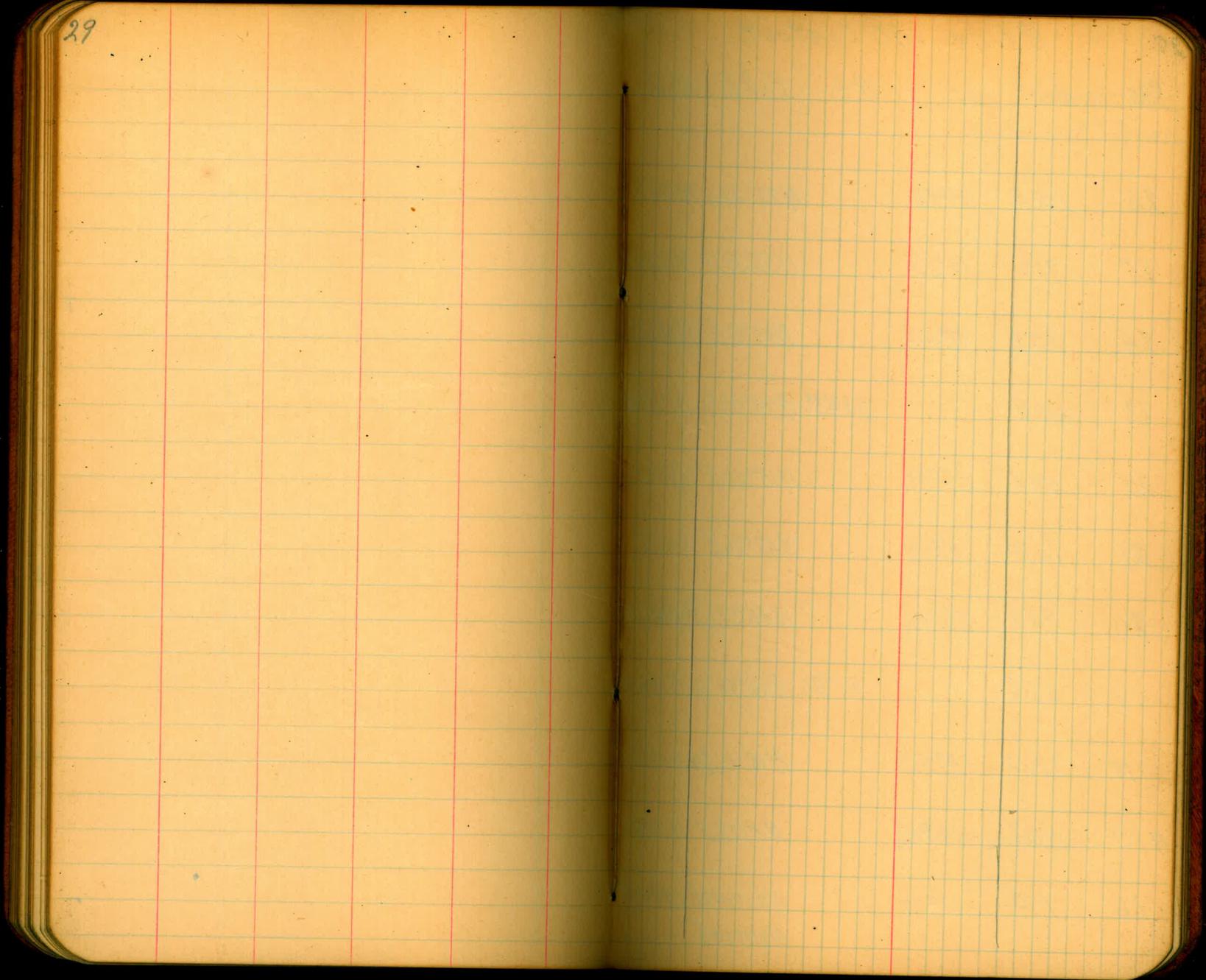
0

N 67°45' E

28



29



## A line 130. Contout.

Sta	Dist	Lt.	Rt.	Cal. B	M. B.	Stadia
26	112 <sup>0</sup>	19°43'		N72°22'W	N72°11'	112
25	70 <sup>2</sup>	84°53'		N52°39'W	N52°21'W	70
24	35 <sup>9</sup>	39°50'		N34°13'E	N34°30'E	35½
23	103 <sup>5</sup>		58°43'	N74°03'E	N74°36'E	103½
22	58 <sup>1</sup>	27°06'		N15°20'E	N16°E	58½
21	113 <sup>3</sup>	42°½		N42°26'E	N43°E	114
20	95 <sup>9</sup>	20°06'		N46°52½'E	N47°30'E	95½
19	63 <sup>8</sup>		85°26'	N66°58½'E	N67°30'E	64
18	106 <sup>1</sup>	19°50'		N18°37½'W	N18°11'W	106
A/7	72 <sup>1</sup>	19°34½'		N1°12½'E	N1°50'E	072
16	77 <sup>1</sup>	11°07'		N21°07'E	N21°45'E	078
				N32°14'E		

Waterman Rec.  
Hubbard. Trans.

A line begins.

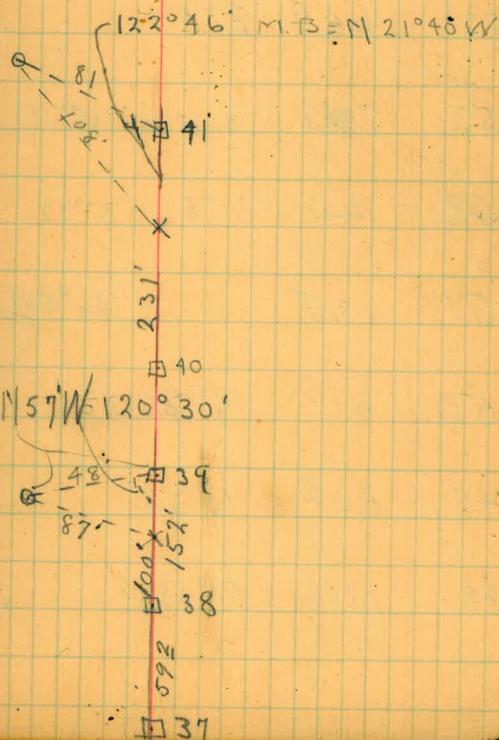
31

Sta.	Dist	Lt.	Rt.	Cal.B.	MB	Stadia.
36	70 <sup>9</sup>		141°53'	S45°09½'E	S45°E	70
35	103 <sup>0</sup>		37°53½'	N7°08½'W	N7°W	109
34	108 <sup>3</sup>	52°45'		N44°56'W	N44°55'W	109 <sup>5</sup>
33	91 <sup>0</sup>		12°10'	N7°49'E	N7°50'E	91
			119°27'	S42°2½'E		
						2. sec. 23 N42°E
32	115 <sup>5</sup>	36°04½'		N56°10½'E	N56°E	116
31	255 <sup>6</sup>		145°30'	S87°45'E	S87°40'E	257
						Waterman & Hubbard March 27, 1912
30	119 <sup>1</sup>	14°15'		N53°05'W	N53°W	120½
29	120 <sup>2</sup>	19°05½'		N38°50'W	N38°30'W	121
28	314 <sup>2</sup>	13°23½'		N29°44½'W	N29°30'W	316
27	263 <sup>9</sup>		61°01'	N11°21'W	N11°W	265

N 1/4 cor  
Sec. 23

27 N38°03'E  
 28 N9°21'W  
 29 N38°03'E  
 30 N9°21'W  
 31 N38°03'E  
 32 N9°21'W  
 33 N38°03'E  
 34 N9°21'W  
 35 N38°03'E  
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 97 N38°03'E  
 98 N9°21'W  
 99 N38°03'E  
 100 N9°21'W

Sta.	Dist.	Lt	Rt.	Cal. B.	M.B.	Stadia.
47	72 <sup>L</sup>		123°20	S36°21'W	S36°30'W	73
46	111 <sup>g</sup>	23°07'		S86°59'E	S86°50'E	112
45	92 <sup>g</sup>	27°00'		S63°52'E	S63°45'E	93
44	129 <sup>g</sup>	50°33'		S36°52'E	S36°50'E	130
43	114 <sup>o</sup>	29°15'		S13°41'W	S13°55'W	114
42	135 <sup>o</sup>		53°10'	S42°56'W	S43°05'W	134
41	113 <sup>Z</sup>		134°23	S10°14'E	S10°05'E	114
40	272 <sup>S</sup>	22°38'		N35°23'E	N35°30'E	274
39	52 <sup>g</sup>		55°35'	N58°01'E	N58°05'E	52
38	152 <sup>o</sup>	85°32'		N2°26'E	N2°30'E	153
37	59 <sup>g</sup>	46°52 <sup>1/2</sup>		N87°58'E	N88'E	59
				S45°09 <sup>1/2</sup> E		



Sta.	Dist.	Lt	Rt.	Cal. B.	M. B.	Stadia.
57	128 <sup>±</sup>	70°31'		N41°28½E	N41°30E	130
56	122 <sup>±</sup>	23°00'		S68°00½E	S67°50E	122
55	82 <sup>±</sup>		58°14'	S45°00½E	S44°55E	83
54	157 <sup>±</sup>	52°38'		N76°45½E	N76°50E	158
53	66 <sup>±</sup>	21°57'		S50°36½E	S50°30E	66
52	70 <sup>±</sup>		119°08½	S28°39½E	S28°30E	70 <sup>±</sup>
52	—		37°32'	S32°10½W	—	—
51	131 <sup>±</sup>		46°56½	S5°21½E	S5°10'E	132
50	87 <sup>±</sup>	18°37'		S52°18E	S52°E	88
49	50 <sup>±</sup>	15°29'		S33°41E	S33°30E	50 <sup>±</sup>
48	139 <sup>±</sup>	54°33'		S18°12E	S18°E	140

S36°21W

Mar. 28, 1912

△ B. S. = 1.18

□ F. S. = 1 P. N 32°14E

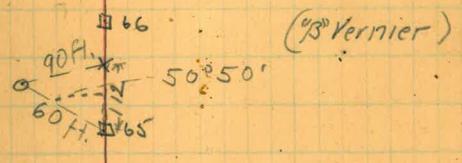
□

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□

Sta.	Dist	Lt.	TR.	Cal. Bearing	M.B.	Stadia.
68	612		43°49'	S59°03'E	S59°03'E	62.
67	790	35°31½'		N77°08'E	N77°08'E	80 -7°20'
66	1905	11°29½'		S67°20½'E	S67°20½'E	192 +1°30'
65	1804	2°59'		S55°51'E	S56°E	182.
64	1167		55°48'	S52°52'E	S53°00'E	118 +1°50'
64	—		102°06'	S71°17'W	—	—
63	1793	52°31½'		S30°49'E	S30°50'E	180
62	865		97°52'	S21°42½'W	S21°30'W	86-
61	671	7°49'		S76°09½'E	S76°05'E	67.
60	866	11°27½'		S68°20½'E	S68°20'E	87
59	1773	9°27'		S56°53'E	S57°00'E	179
58	1387		91°05½'	S47°26'E	S47°30'E	141
				N41°28½'E		



64  
B.S. = 16 N71°20'E

F.S. = 16 S71°20'W:

Sta.	Dist.	Lt.	Rt.	Cal. B.	MB.	Stadia.
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Continued page 2 Book I

A73-74

121°48' S 67°2½' W

FS. = I.P. S 67°22½' W

72

892

51°45½'

S 54°26½' E S 57°30'

71

472

59°19½' S 2°41' E S —

475

70

1402

27°35½' S 61°05½' E S 61°50'

141

69

768

30°28'

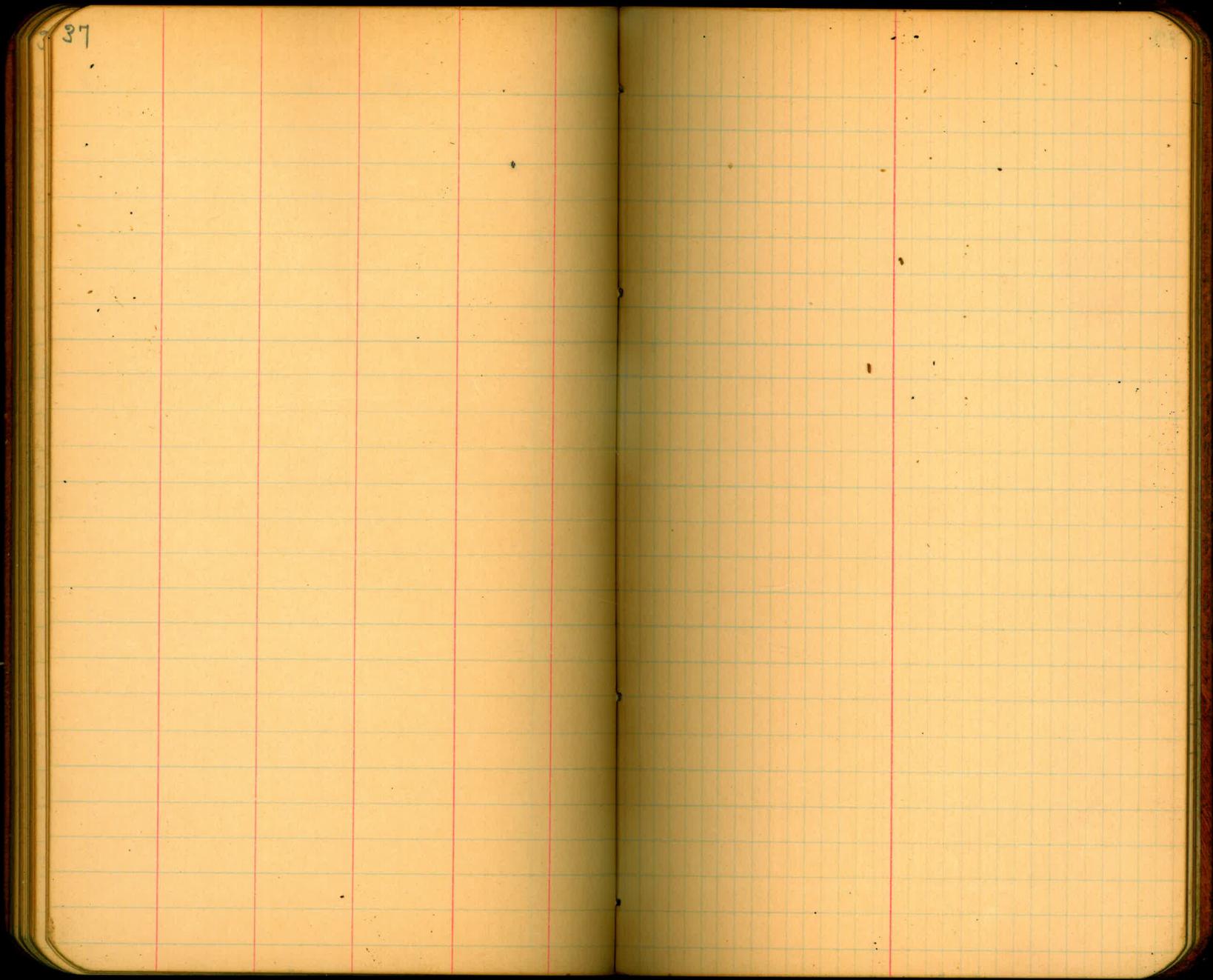
S 89°31' E S 89°30'

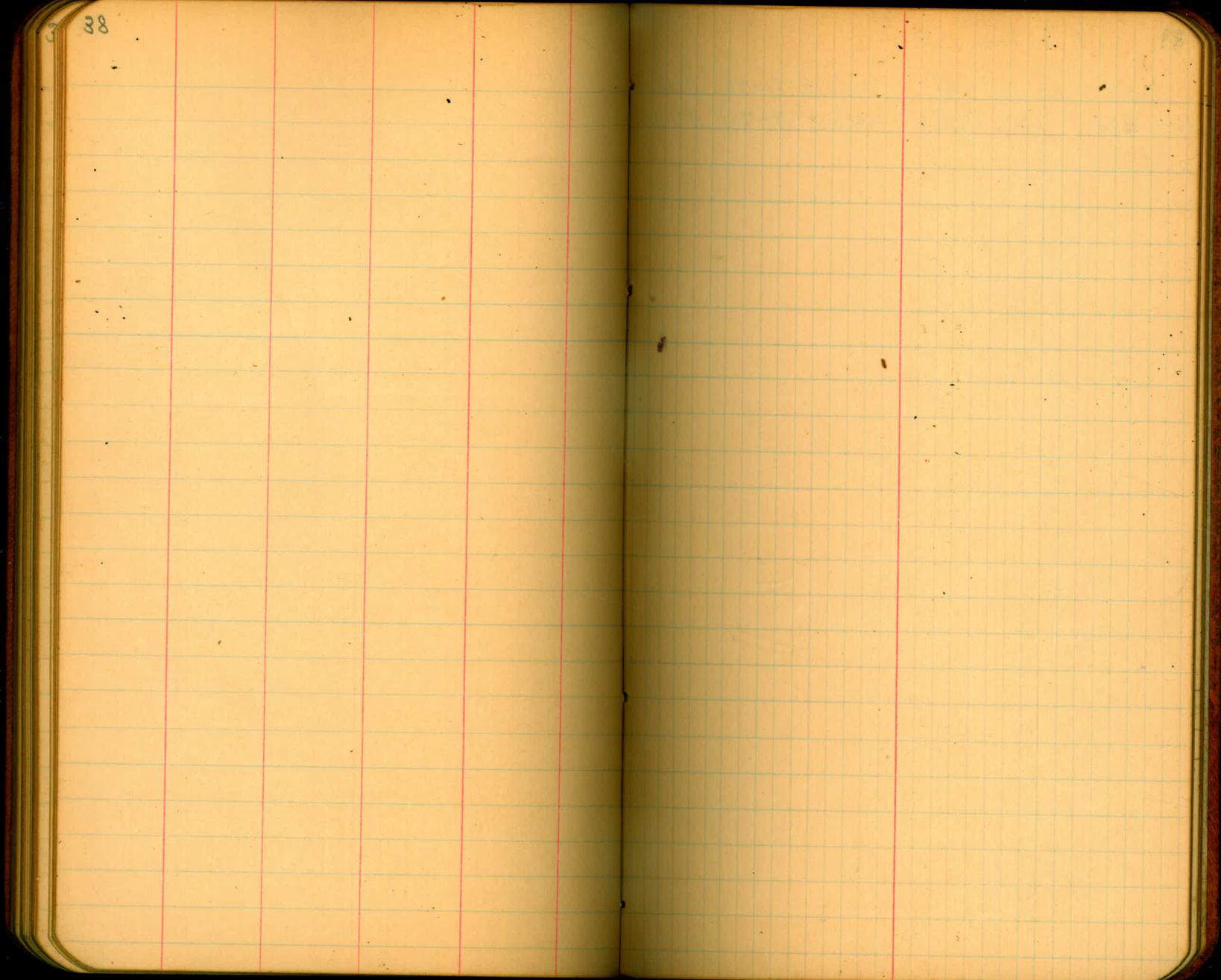
770

S 59°03' E

36.

Sta.	Dist.	Lt.	Rt.	Cal. B.	M. B.	Stadia.
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39 Ls From I.P.

Stas.	Lt	Rt	Double	Course	Needle
16- #64		3906	78° 12'	N71° 20' E	N71° 50' E

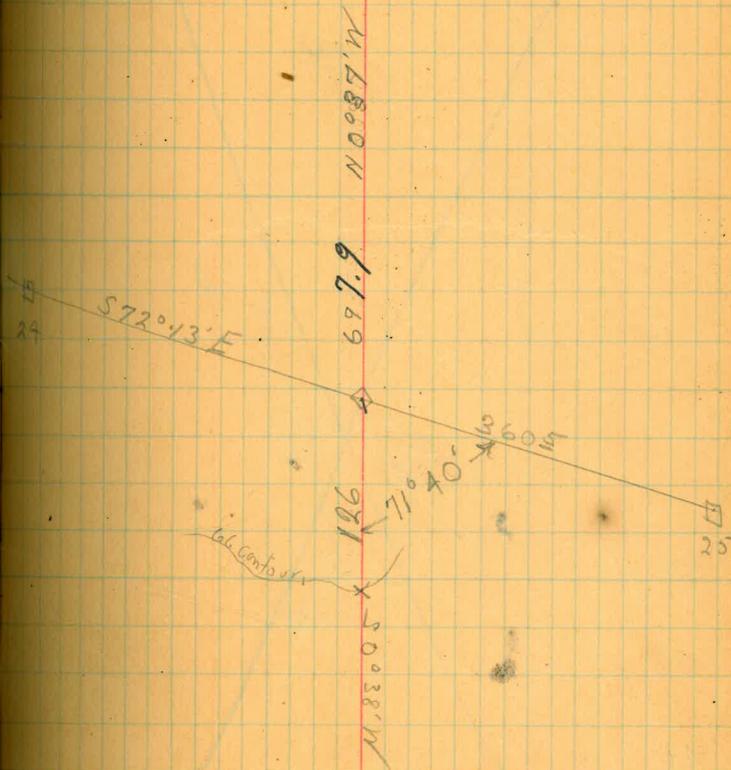
B.S. = I.P.

Tie 66 Contour + sec. line b/w sec  
23, + 24, March 17, 1912,

Dist.	rad	Vert. L
1622	174	- 15°05

8605	3 63	- 0°48
------	------	--------

17 N 13.  
Sec. corr.  $\square$  4.4" rdw post.  
23 24



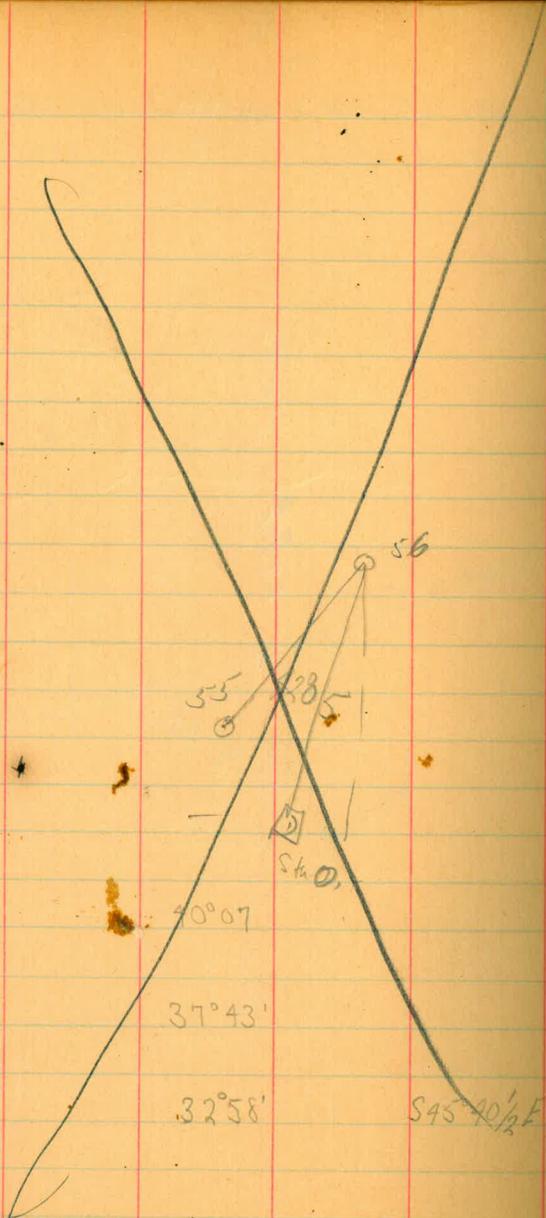
41

45.

46

49

50



55

56

Sta. 0

40°07'

37°43'

32°58'

S 45°40 1/2 E

S 12°42 1/2 W  
B.S = I.P.



43

+130.

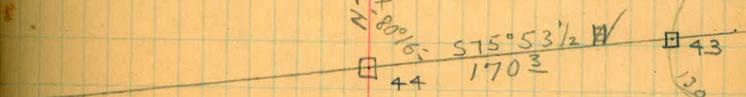
Tie of 66 contour line + 9  
sec. 23,

N

March 15, 1912

E sec 23 0 142 3 Ft. 180 Ft. N

Tie to 49 contour,



816 2 Ft.  
S 4° 21' E

o 150 contour.



S 42° 56' W

~~29 15~~

S 13 41 W

S 36° 52' E

~~27~~

S 63° 52' E

~~23 07~~

S 86° 59' E

~~123 20~~

S 36° 20' W

~~65 433~~

S 18° 12' E

~~25 29~~

S 39° 41' E

~~18 38~~

S 59° 18' E

R 46 56 1/2

S 5° 21 1/2' E

~~3 73~~

S 33° 09 1/2' W

~~4 1/2~~

~~N 32° 14' E~~

~~R 119 08 1/2~~

~~179 202~~

~~181 20 1/2~~

~~S 28 39 1/2' E~~

~~31 58~~

~~S 50 30 1/2' E~~

~~52 38~~

~~179 60~~

~~103 14 1/2' W~~

~~1/4~~

109 08

~~179 60~~

N 32° 14' E

147 46

~~179 60 1/2~~

153 07 1/2

~~26 52 1/2~~

~~179 60~~

60 51 1/2

~~119 08 1/2~~

~~37 08~~

~~52 1/2~~

~~10 1/2~~

~~N 32° 14' E~~

~~R 39° 06~~

~~N 71° 20' E~~

~~37 53~~

~~74 56~~

~~45 16~~

~~327~~

~~491~~

~~86 46~~

~~83 43~~

~~171 04~~

~~3 57~~

~~52~~

~~S 45 09 1/2' E~~

~~L 146 58 1/2~~

~~92 02~~

~~N 87 58 E~~

~~L 85 32~~

~~N 2° 26 E~~

~~6 535~~

~~N 58 01 E~~

~~2338~~

~~N 35 23 E~~

~~432 23~~

~~169 46~~

~~653 10~~

~~S 10 14 E~~

~~S 42° 56 W~~

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~~327~~

~~114~~

~~109° 08'~~

~~N 4° 27' W~~

~~N 74 9 E~~

~~N 44° 56' W~~

~~37 58 1/2~~

~~N 7° 08 1/2' W~~

~~N.W.~~

~~179 60~~

~~123 19~~

~~569 1~~

~~2158~~

~~43° 56'~~

~~N 56 10 1/2 E~~

~~N 4 21 W~~

~~119 60~~

~~60 31 1/2~~

~~119 28 1/2~~

~~569~~

~~416~~

~~153~~

~~60 33~~

~~119.27~~

~~56 10 1/2~~

~~175 37 1/2~~

~~3752~~

~~6~~

~~933~~

~~733~~

~~R 37° 58'~~

~~141 03~~

~~179 60 1/2~~

~~139 50 1/2~~

~~S 45 08 1/2 E~~

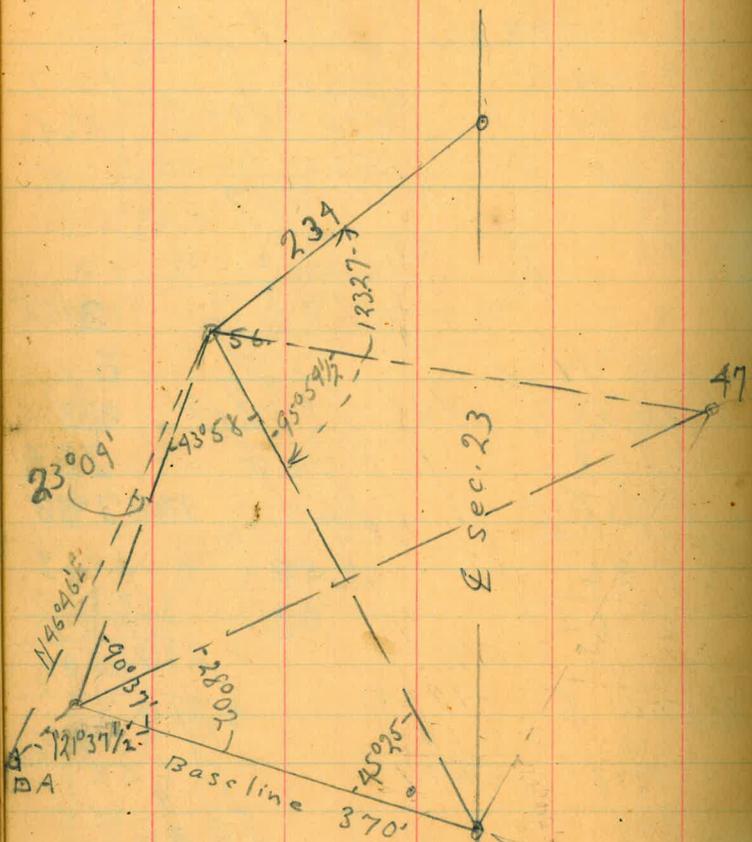
~~46 52 1/2~~

~~179 60 1/2~~

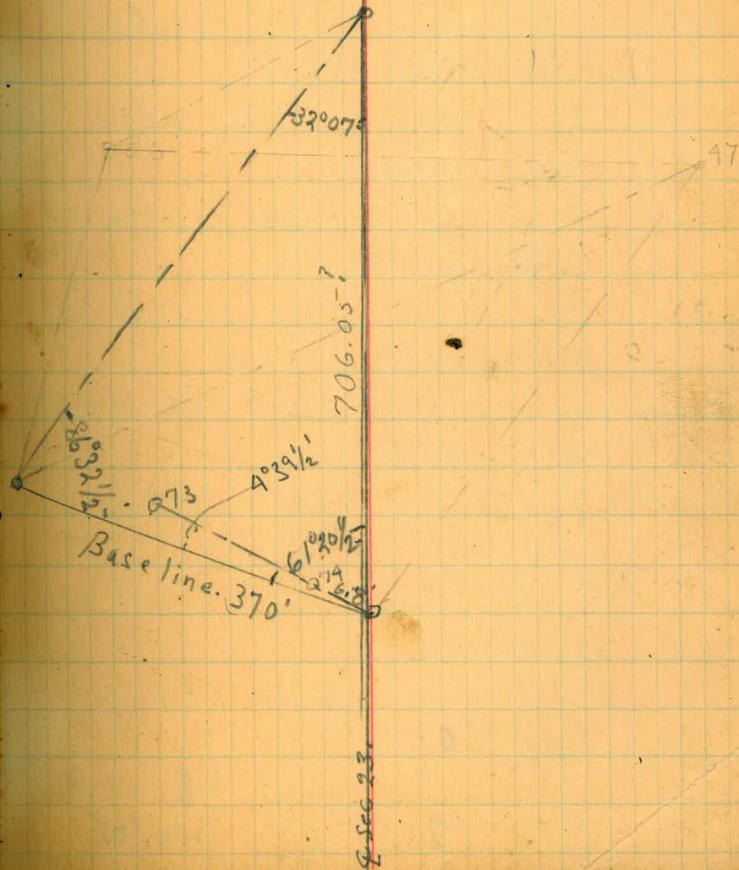
~~S 87 02 E~~

~~187 38 E~~

Triangles across lake tied to  
 Q. sec. 23. + 49 Level, etc.



March. 7, 1912  
 Hubbard  
 Waterman.



47

## Marking Bays @ 121.

Sta.	+	HI	-	EIV
B.M.				100.51
T.P.	112.9	111.80	0.72	111.08
T.P.	12.16	123.24	1.77	121.47
B.M.	2.28	123.95	3.91	119.88
				11984
B.M.				100.510
	9.20	110.330		
T.P.			1.075	109.255
	10.360	119.615		
T.P.			3.235	116.380
	7.960	124.340		
			5.660	118.68
	5.810	124.49		
			4.470	120.020
	3.850	123.87		
			4.03	119.840
				121.00
	2.595	123.595		
			5.535	118.060
	2.665	120.725		
			12.71	108.015
	-5.48	102.535	2.03	100.505

Water mark

119.87

119.87

48

Intersection of sec. line  
& 49. contour traverse, S. side

Sta.	Pist.	Lt	Rt	Cal. B.	Dist.
sec. line.					
4150 cont.	816.9				
	142.35				

Complete notes  
on page 53

North side.

56. (49 cont)	78° 17 1/2	N 34° 30' E
Do.	234.0	
0+00	12° 25'	Do.
117.9		
1+18		
500.9		
618		
208.5		
27. Sec corr.		

Feb. 6, 1912  
Hubbard,  
Waterman  
Paredes.

Stadia. Vert. L.

839	4° 40'
1477	10° 14'

846 1006' across lake.

237	0° 28'	□ 57-56 to inters. sec. line
132	13° 35'	□ A - □ 56 Do.
506	5° 30'	

454  
432  
280.9  
Sec. line  
73

49

Sta	+	H.I.	-	Rod	EIV	EIV
2+50		191.89		7.0		184.8
+57				5.9		135.9
+87				5.8		136.0
T.P.			10.58		131.26	
	-26	131.00		<del>6.0</del>		
+90				6.0		125.0
3+07				6.0		125.0
+08				7.7		128.3
+20				9.7		121.3
+20				14.8		116.2
2+92				12.0		119.0
2+88				15.5		115.5

} Lower profile.

50

Sta.	+	H/I	-	Rod.	ELY	ELY
		135.65				
S						
1+64				5.3		130.3
+68				7.8		127.8
+72				7.8		127.8
+73				10.7		124.9
+85				11.5		124.1
B.m.			15.6		120.05	(120.)

BM	6.13	154.41			148.28
1+66				4.4	150.0
+80				4.9	150.0
+95				6.2	148.2
2+96				9.4	145.0
2+00				8.6	145.8
+01				11.6	142.8
+05				11.4	143.0
T.P.	-1.00	141.84	11.57		142.84
+06				2.0	139.8
+12				2.5	139.3
+14				6.4	136.4
+37				5.0	136.8

51

## Profile Morena Dam,

Sta	+	HI.	-	Rod.	EV	EV.
B.M.					141.70	
	1.71	143.41				
S0+55						150.0
0+56						147.0
+60						147.0
+61				0.6		142.8
+64				0.6		142.8
+65				4.5		138.9
+74				4.0		139.4
+75				15.0		128.4
+94				14.2		129.2
+95				11.2		133.2
1+07				10.8		132.6
+09				6.7		136.7
+18						140.7
+20						150.0
+38						150.0
+44				11.2		132.2
+50				11.4		132.0
T.P.			11.29		132.12	
	3.53	135.65				131.3
+52				4.3		131.3
+56				4.3		132.1
+57				3.5		<del>132.1</del>
+63				2.7		132.9

Waterman, Level  
Hubbard, rod  
March 8, 1912.



Ties of 49 contour to sec 23  
Morena Rest.

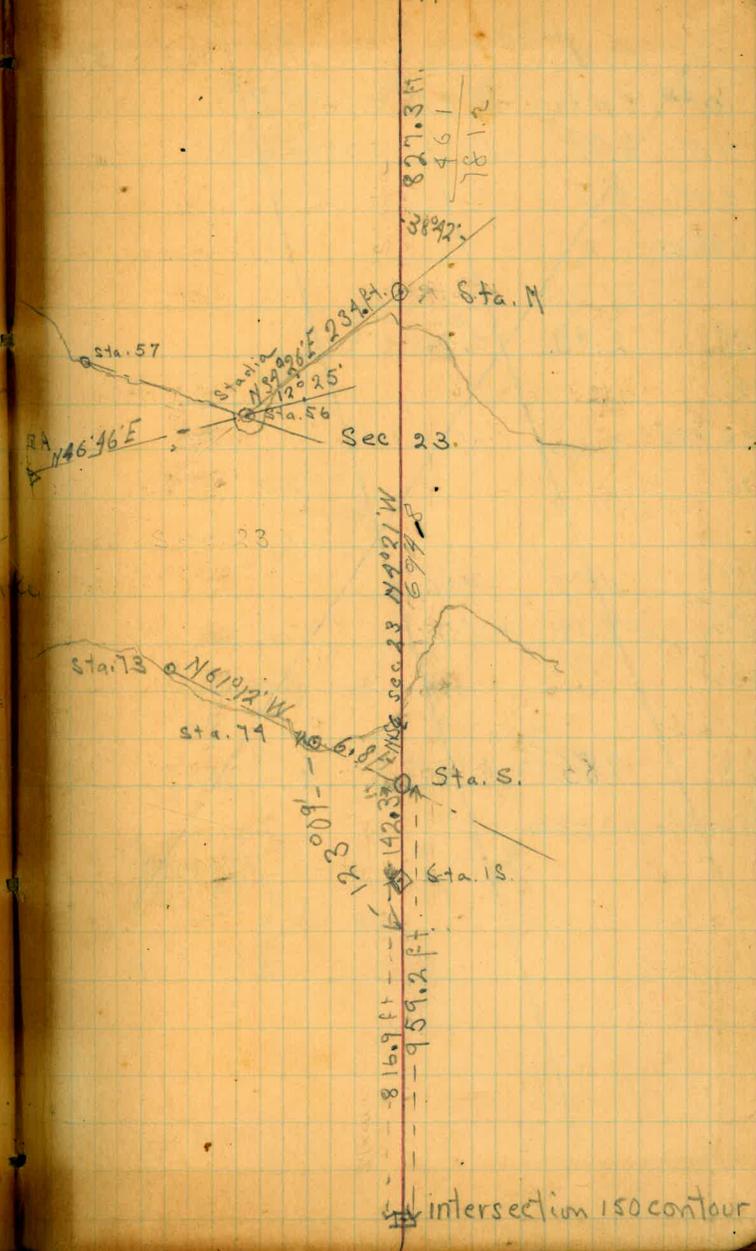
March 7, 1912  
Hubbard,  
Waterman,  
Paredes.

intersection 150. Stadia

Contour to sec. 23	Foot	Vert angle	reduced readings	dist
to Sta. 1S	8.27	+5°12'	816.9	
Sta. 1S - Sta. S.	1.97	-10°20'	142.27	142.3
Sta. 1S - Sta. M	8.46	-1°12'	845.68	847.1
Sta. M - M1	1.32	+13°49'	129.45	117.9
Sta. M1 - M2	5.06	+5°24'	501.65	500.9
M2 - M3	0.92	+4°30'	91.43	90.0
M3 - 1/4 water	1.20	-3°41'	119.51	118.0
Sta. 56 - Sta. M.	2.37	-0°39'	236.98	239.0

SEP. 23 1912

sec 19  
1/4 cor btw sec. 14 & 23



54

Sta	Prod	V.L	Dist
0.27	5.78	-8° 49'	5733.3
1N	2.78	-10° 37'	3+60.6
2.N	2.11	0° 00'	
2.6(49)			
3M	2.90	0° 00'	
18'			
26.492	3.00	0° 00'	
15'			
15'	4.97	0° 00'	
25'	7.17	+6° 02'	
35'			
28'	9.855	9° 06'	
1/4 work for	83+24		

17960  
 13735.50  
 6.50 225.48  
 2.72  
 3.78

12.000  
 2.565  
9.435

6.00  
 3.07  
2.93

12.00  
 9.83  
2.17

12.000  
 2.145  
9.855

14520  
 N 53° 05' W  
 17960  
 92.15  
58745 W

N 38° 03' E  
 13735  
 17960  
17558

43608  
 17460  
12350

90 40  
 N 66 10 E  
 424

37° 12'

Published by H. S. CROCKER COMPANY, Stationers, Drawing Materials, and Mathematical Instruments, San Francisco.

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

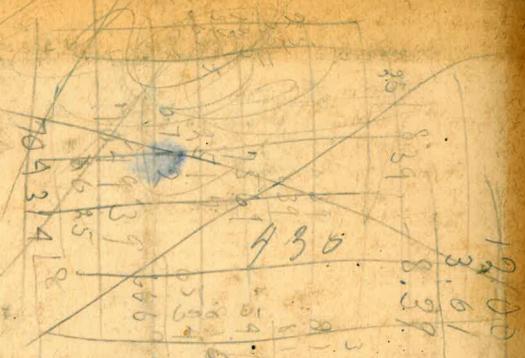
MINUTES.	LKS.	MINUTES.	LKS.	MINUTES.	LKS.
1	2 1/2	21	49	41	95 1/2
2	4 1/2	22	51 1/2	42	98
3	7	23	53 1/2	43	100 1/2
4	9 1/2	24	56	44	102 1/2
5	11 1/2	25	58 1/2	45	105
6	14	26	60 1/2	46	107 1/2
7	16 1/2	27	63	47	109 1/2
8	18 1/2	28	65 1/2	48	112
9	21	29	67 1/2	49	114 1/2
10	23 1/2	30	70	50	116 1/2
11	25 1/2	31	72 1/2	51	119
12	28	32	74 1/2	52	121 1/2
13	30 1/2	33	77	53	123 1/2
14	32 1/2	34	79 1/2	54	126
15	35	35	81 1/2	55	128 1/2
16	37 1/2	36	84	56	130 1/2
17	39 1/2	37	86 1/2	57	133
18	42	38	88 1/2	58	135 1/2
19	44 1/2	39	91	59	137 1/2
20	46 1/2	40	93 1/2	60	140

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						
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

5.50  
9.15  
1.095



17960  
19158  
38°06  
39  
179.60  
3807  
12,00  
6.99  
77° 12'  
12,00  
3,54  
506  
26  
134  
8.76  
17960  
4537  
66.8  
118/34°23'  
109°06/17.9

38 41  
77° 22'  
12,00  
3.73  
8.27  
138 03 W  
42  
22.29  
239.52  
114.52  
8.39

89.46  
23.06  
66.40  
118° 10'