1918-19

Market Lane

Ledger

OK

Marlette Lake
May 1, 1919

NB:- If you find the holes made Apr. 7, place a * on the May 1 measurements corresponding to them

Course 1 -

South Shore of Lake
From Tamarack
Northeast of 3 large
aspens in NE
direction parallel to
shore of lake to large
red tamarack with
dead top.

Every 25 feet, beginning
25 feet from Tamarack
at west end of Course.

Total Measurements ~~14~~ 20

Course 1 -

No. of Meas.	Depth of Lake	Course	Water Content	
1.	49	45	30	30
2	42	38.5	20	20
3	46.5	42		22
	1.5			
4	38.5			
Ret. 4	38.5	37.5		19.5
5	30	28		14
6	28	27		12.5
7	30.5	27.5		13.5
8	31	30		15

Course 1 (Cont.)

No. of Meas	Depth of Sound	Core	Water Content (Inches + Tenths)
9	29	26.5	14
10	31	30.5	15
11	35	31.8	16.5
12	36.3	33.5	17.5
~~13~~			
13	37.3	34.5	18.7
14	43.5	40	21.5
15	43	41	22.

Course 1- (Cont.)

No. of Meas.	Depth of Sound	Core	Water Content Inches + Tenths
16	39	35.5	19
17	41.5	40.5	
Open. 17	42.5	41	20.9
18	41.8	39.3	21.2
19	43.5	39.5	22.
20	40.5	36.5	19.3

20) 374.10
18.705

Course 2 –

In aspens. North & South
Every 25ft beginning
25 feet from Triple-blazed
aspen 7in. in clearing
to aspen (blazed) in center of grove.
Total Meas. 11 –

No. of Meas.	Depth of Snow	Core	Water Content Inches	Remarks
ax 1	40.6	39	20	Course 1 – 3rd meas. 1.5 to cut. from 48.5 – Do not subtract from 42"
2	28.5	28	11.5	
ax 3	51.5	48	24	We made 20 measurements instead of 14 in Course No. 1. Made more than one measurement in nearly every place – just to be certain we were correct.
ax 4	44.5	41	20	
ax 5	39.5	38 5	19	
6	48.5	46.3	22	

Course 2 - (Cont.)

No. of Meas	Depth	Core	Water Content
7	41.5	40	18
a x			
8	47		
Rem 8	47.5	43	21
9	41.5	38.7	18
a x			
10	37	35	17
a x			
11	46	43	28
		11)	213.50
	42.4		19.41

Holes in Course No 1 were filled with snow and packed over - avoided them - Marked "a x" over No. of Meas. where holes were found open in Course No. 2 in Aspen -

Began measurements at 9.30 a.m. & finished at 2:30 P.M. May 1st - 1919

Brought up earth or grass on every measurement - subtracted amt. from total before entering

Coverse 2 (Cont.)

No of Meas.	Depth Found	Core	Water Content (%)	Remarks
				in Bucket-
				Earth was brought up with core
				Apr. 7 made large plots-
				Avoided them-

— Notes —

Course 1 in the book is the course we measured last, that is, along the shore of the lake.

Course 2 is in the aspens.

Do not erase numbers you make, but write on next line below and mark Rem. (remeasurement). However, erase my Nos. 1, 2, 3 etc to suit your needs.

If core is more than 4 inches shorter than depth, measure again.

Make copy of measurements before mailing the book back to me. This will protect against loss, But better have book "registered". I will enclose stamps for it.

J. E. Church Jr.
358 Washington St.
Reno, Nevada

P.S.:- If there are bare spots at any of the points of measurement along the courses, mark such spots 0 in your record.

I am afraid that the dirt thrown upon the snow from the cores last time has caused large pits in the snow. Don't measure in these pits but if necessary move to one side of them where the snow is level.

JEC

I have called up Mr Leonard. He is willing to have you and Mr Harris do the work. Perhaps he has already called you up.

If in doubt regarding what to do call me up Rand, Main 1855R.

Marlette Lake
1920

May

May 3, 1920

Course at Markette Lake Burnaks —

The Column under "Depth" represents the depth to which the Corer penetrated —

The Column under "Core" represents the actual length of Core after the earth, grass or leaves had been removed from bottom of Corer

Continued Page 8

Course No 1

Marletta Lake

No Sample	Depth	Core	Weight water contents
1	52 ½	50	19.3
2	45 ½	45	16.7
3	42 ½	42	18.
4	39	37	11.9
5 X	32 ½	30	
5 Rem	32	30	14.6
6 X	24 ½	24 ½	
6 Rem.	24	24	9.6
			89.8

Course No 1 Core -

Sample	Depth	Core	Water Content
7	19	18	89.8
8	23	20	10.1
9	21'	20	9.
10	29. 1/2	29	11.1
11	36 1/2	36	13.5-
~~12~~ X	42 1/2	42	14.5- X
12 Rem	42 1/2	41	16.8
13	5-9	5-8	26.5-
14	48	47	18.5-
			205.3

Course No 1 Cont

Landfall	Depth	Crs	
15	45 1/2	44 1/2	18,
16	41 1/2	41	16.5
17	47 1/2	46	18.6
18 x	38 1/2		
Rm 18	38	37	14.5
Rm 19	41	38	14.74
20	36	36	15,

~~305.3~~ 302.3 ft Water Course

20) 302.3

15,12

Course Cors No 2 Starlett Tube

Sample Depth in Weight

I made the change in order to follow your instructions, as per post Card dated April 27th "To make the cor on the inside of tube as long as on the outside." So, column under "Cors" represents actual depth of snow -

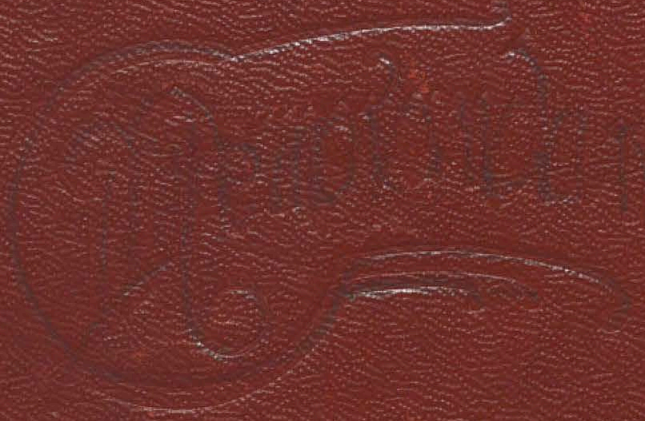
Sample No	Course Depth	No 2 Core	Weight in grains Hack Ballard
1	36	36	12
2	24	24	8.5
3 X	49.5		
3 Rem	50.5	50.1/2	19.5
4	46.	46	18.
5	34	34	10.5
6 X	47		
6 Rem.	48	47	17.5
7	44	44	18.6
			104.6

Course 202

Sample No.	Depth	Core	Weight with Cuttings
8 X	3-0		104.6
8 Rm	3-0	30	21.8
9	42	41	16.4
10	43	41	16.2
11	49	48	21.
	42.4		11) 180.0
			16.36

Av. of both courses 15.74 in.

Marlette Lake



W. S. Hill
343 Maple St
Reno
Nev.

Reno - Quincy	88.5
Quincy - Red Bluff	119.2
Red Bluff - Redding	31.9
Redding - Dunsmuir	65.0
Dun. - Klamath Falls	111.8
K.F. - Crater Lake	63.4
	479.8

Aug 4, 1921

Reno 4568

Lunch at Clio Grade 1/2

Night, beyond Quincy 46673

Inclearing 6,3 west Quincy

Aug 5, 1921

Lunch 8 miles beyond Chester at 4710

Night near edge Lassen National Forest 4729

Aug 6

Lunch at Red Bluff. Broke Spring

Night at Camp Ground at Redding. 4809

Aug 7, 1921

Lunch 3 miles beyond Dunsmuir. Night at Mt. Shasta 4943

Pictures

Thurs.

X

Fri Aug 5, '21

1. At Falls near night's camp.
2. View across Feather River Canyon showing rail. r.
3. Same farther on.
4. Mount Lassen from 4718

Sat.

5

Sun

5 Sac. River at Redding

6 Mt. Shasta - North Side

aug 8, 1921
Lunch North Kl. Falls
Night 10 miles beyond
Rocky Point, Mosquito
5021

Aug 9
Crater Lake
5053

5/5/

Aug. 10.

Mon.
1. Klamath River and
Canyon, 1800 feet
deep.

Tues.
2. Camp. (S. High picture)
3. Antha Creek Canyon
(Palisades)

Wed.
4. Camp.
5. Rode on trail to Gar. Peak
6. Lake from " "
1. Mt Shasta - Kl. Lake
2. Peak over Lake

Aug. 11

Aug. 12.
Lunch south of Crescent
Night at Bend.
5169
Population Bend - 6500

Aug. 13
Lunch on road
north of Madras.
Two Punctures, and
a flat next morning
Night at Maupin
5285 on
Detchutes River

Thurs.
3 Camp
4 Lake from trail
5. Mosq. bad
6

Fri.

Sat.
1, Palisades on
Crooked River. Central
Oregon.

Aug 14
Rained before got packed up.
Lunch 10 m. south The Dalles at farmer
Night - Hood River - 5363

Aug 15.
Noon and night at Eagle Creek
5395

Aug. 16
Lunch at falls.
Night Portland
5445

Aug. 17
Portland

Aug. 18
Portl. - Vancouver.
Richfield

Sun.

Mon.

Tue.

Wed.

Thurs.

About 5540 ft Pass.

Aug 19
Lunch at Public camp
Salem.
night Corvallis
5650

Aug. 20
Lunch at Eugene
camp ground.
Night at Cottage
Grove camp ground.
5722

Aug. 21.
Lunch - On road
south of Roseburg.
Night Grants Pass
5856

Fri 7th

Sat.

Sun.

Aug. 22 — Mon

Lunch south Medford
Night south of
Hornbrook at
5942

Aug. 23 — Tue

Layed over

Aug. 24 — Wed

Lunch near Sisson
Night 15 south
Dunsmuir,
6042

Aug. 25 — Thur

Lunch south Redding
Night Los Molinos
6120

Aug. 26
Lunch Chico
Night Roseville
6225

Aug 27
Lunch Auburn
Night near Cisco
6333

7 mi.

Sat.

222

Portland - Grants Pass	281.
G. P. - Medford	32.6
Medford - ~~Red Bluff~~ Dun.	108.8
Red B. - Marys.	90.3
M. - Roseville	34.0
Rose. - Reno	127.5
	674.2
Dun. - Redd.	65.0
Red. - Red Bluff	32.
	970
M - Rosevill = 34	771.2
R. Col. - 35	
69	

145.9
18.2
1.5
125

Cr. Lake - Port.	380
Port. - Reno	671.2
total	1051.2
1569	513
	1564.2

Cr. Lake - Bend, Ore.

0.0	Crater Lake
17.5	4 corners turn left
20.0	Bend.
0.0	Go north on Wall St.
7.1	Shave 7 winds
22.2	Redmonds Turn left on Main St. then turn right
28.2	Terrebonne
51.6	Madras
63.1	Galeway
89.6	Antelope
97.1	Shaniko
111.4	Bakeoven
123.4	Maupin
133.4	Tygh Valley
142.3	Kingsley
151.6	Dufur
167	The Dalles

00. The Dalles
93.6 Hood River Ore
92.4 ~~Cascade Locks~~ Portland.

Portland - Astoria 108.3

120
167
92.4
399.4

380
~~375~~
~~385~~
385
371
14
62

My Pictures.

I

3. Mossang 1st camp Aug. 5
4. Top of Sacramento Pass 6
5. Same. 6
6. Sacramento River at Redding 6

II

1. Mt. Shasta Between Siskiyou and Trinity 7
2 Klamath River at Spring 8
3 Klamath River - 8
4 Oceana Creek - Meadow 9
5 Crater Lake at arrival 9
6 " " from Rim 9

III

1 Lake in walk near Wizard 10
2 Orin and I in snow - by Crest 10
3 Camp at Lake 11
4 Me at Camp 12
5 Words take Camp "
6 From foot Trail "

IV

Aug
1 Between Madras and Waller, where we first struck Time - 5 pounds 13
2 Cascade Locks - Time - 3 15
3 Eagle Creek camp - morning 16
4 Portland - mixed pickles ? 19 20
5 Blackburn's - Cottage Grove 21
6 Grants Pass Camp 22

V

1 Washing Day - Near Hornbrook 23
2 Visiting Day " " 23

Song Book

August

~~Daisy at Golf Spring near Entrance 9~~

Fir and cone and Black flower

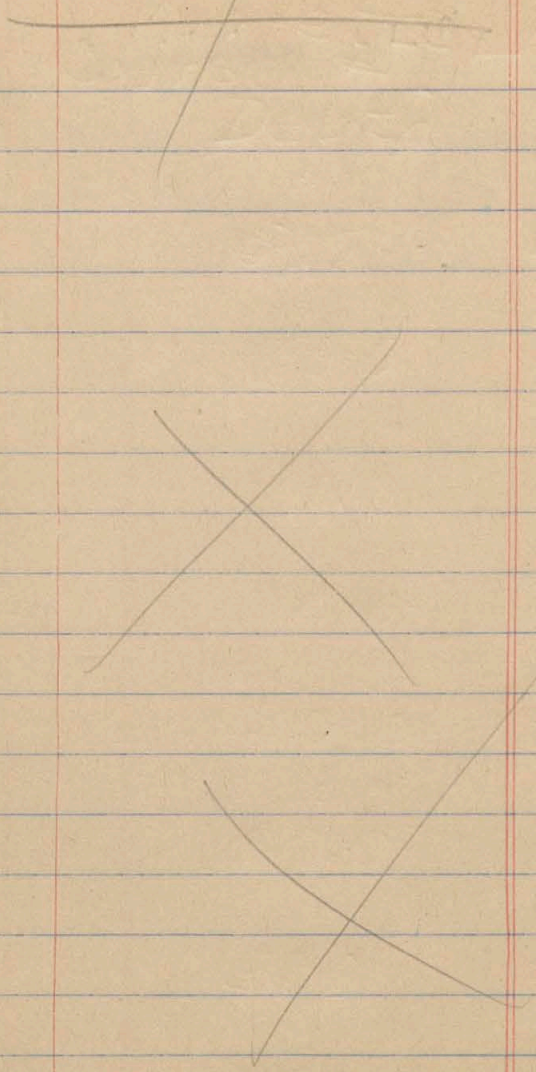
Crater Lake 9

April 3, 1923

Snow Survey

No.

over



Snow Survey
Marlette Lake
Course #1

April 3, 1923
Course #1

No.	Depth	core	Water Inches	Remarks
1.	~~59.5~~ 57.5	~~44.5~~ 43.5	22.0	Wet dirt
2.	53.5	49.5	24.2	Grass
3	40.0	34.5	17.0	"
4	32.0	28.0	13.5	Twigs
5	30.0	28.0	13.0	Grass
6	30.0	24.0	11.2	"
7	31.0	27.5	12.0	"
8	30.5	26.0	13.4	Dirt
9	31.5	29.0	14.0	"

No.	Depth	Core	Water	#	Remarks
10.	40.5	37.5	19.5		Grass
11.	46.0	38.5	22.0		"
12	63.0	49.0	26.5		wet dirt
13	52.0	49.0	24.5		"
14	50.5	45.0	23.5 23.5		"
15	51.5	44.0	24.3		"
16	52.0	47.5	24.0		"
17	53.5	40.0	21.0		"
18	45.0	41.0	20.2		"
19	40.0 30.0 32.5	36.0 27.0 26.0	18.0 14.0 14.0 15.2		dirt stump wood
20.	44.0	38.0	20.5		Dirt

384.8 / 19.24 Mean, 44.0%

Total 874.0 / 20) 43.7

Course #2 #2 april 3, 1923

Core	Depth	Core	Water	Remarks
1.	50	49.0	23.0	wet dirt
2	41.0	37.5	18.2	"
3	~~54~~ 54.5	54.0	26.0	"
4	(59.5) 59.6	57.5	28.5	"
5	53.5	50.0	23.0	"
6	66.5	60.5	28.0	"
7	63.5	61.5	30.0	"
8	~~65~~ 65.5	64.0	30.5	"
9.	54.0	52.0	24.7	"
10	43.5	43.0	22.5	"
11.	59.0	57.0	27.4	"

Total
11) 610.5
55.5

Av. 1 m
49.6

281.8
25.6 z

Rem. 46.1 z

22.43

Rem. 45.7 z

Gasoline

Speedometer = 4569

Reno	15 gal	@ 27¢ (29¢)	
Crescent City (near Trinidad)	5 "	@ 40¢	
Red Bluff	8	@ 25	
Dunsmuir	6 "	@ 31	
Klamath Falls	8	@ 31	
Crescent City	5	@ 40	
Bend	7	@ 34	
The Dalles	10	@ 30	
Portland	5	26	
"	7	"	
Corvallis	7	27½	
Roseburg	7	29½	
Medford	6	29½	
Redding	7	26	
Dunsmuir	5	31	
Chico	5	25	
Sac.	8	25	

14
25 | 350
23
100

oil

2 3
3 5
4
1
4
1

44.
31.9
104.8 — 20.6
72.9 | 75.9
31.9 | 65.0
140.9

51.6
73.2
157
2810

15.809 m.p.g.

120 m.p.g.

Run. cost per mile
$.01945
plus repairs = $.02735
cost gas = $29.16
" oil = 8.05
repairs = 15.00

4563
4568
95

4729
4663
66

5059
4568
491
.05
24.55
491
5 | 5
380

380
257
637

5363
4568
795
795
39.75

.195
40
535

Marlette Lake

March 25 - 1921.

1

OK

Station 6
Marette Lake.
Core I.

N 35 E

Friday, March 25, 1921.

VI

No.	Depth.	Core.	Water.	Remarks.
1	63	55	24.5	
2	70.7	67.2	25.7	
3	65	63	24.1	
4	52.8 ~~25.8~~ ?	51.3	19.9	
5	49.8	48	18.1	
6	46.5	45	18.3	
7	45.5	47.5	18	
8	47.5	43.2	18	
9	46.5	39	18.4	

No.	Depth.	Core	Water.	Remarks.
10	~~53~~	50.2	19.3	
11	59.2	56.7	21.6	
12	62	60.7	22.5	
13	73.5	70.5	29	
14	69.5	54.5	24.6	
	~~65~~	57	24	
15	64	60.5	~~24~~	
16	62	58.7	22.5	
17	63.5	59	23.9	hit rock
18	60	59.5	23.7	

No.	Depth	Core	Water C.	Remarks.
19	59.5	57.3	22.1	
20	58	56	21	

20) 116.5
58.3

20) 1166.5
58.3

20) 438.7
21.94 ft.

20) 443.7

22.19 in. = 97.2% Mar. 26, 1921.
Normal = 22.84 in.

— Foster, Red House.
Wm Harris, Marletta Lake.

Station 6

Mirlette Lake.

Course F.

Bearing

~~N 35° E~~

S 27° E

No.	Depth.	Core	Water	Remarks.
1	57.7	56.2	21	six in mere snow took dist
2	41	38.2	16	" "
3	64.2	55		
	67.5	65	27.2	took dist
4	64	56.5	26	" "
5	56.5	53.	22.5	
6	47	45.5		
	63.4	55.4	23.5	tree
7	66	52	27.	
8	65.5	62.	25	
9	55	52.5	21	

No. Depth. Core. Water C. Remarks.

57.70
41.00
67.50
64.00
56.50
63.40
66.00
65.50
55.00
54.50
64.50

59.6
11) 655.60
55
105
99
66
66

59.6
58.3
2) 117.9
58.95

Mallette Lake

Jan. 1925
Mar. 1925
Mar 1928
Mar. 1929
Mar. 1930
Mar. 1927 Jan.

FAST

FIELD BOOK

No. 382 F

Mailette Snow Survey
1924 — A. Shaver

Our Leather Bound Engineers Note Books are carried in the following rulings:

No. 380 LEVEL BOOK. Left and Right Hand Page the same as Left Hand Page of this Book.

No. 382 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 4 x 4 to the inch, Center Line Red.

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No. 385 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 8 vertical and 4 horizontal lines to the inch, Center Line Red.

We also carry the Note Books listed above, bound in extra strong Fabri-Hide (otherwise the same quality of book), which can be furnished at a somewhat lower price.

In ordering Fabri-Hide covered Books, add the letter *"F"* to catalog number.

Hor 30'	Depth Course	Core	#1. wt.	Remarks (1929)
1	42 ½	92	12	Wet dirt
2	43 ½	30	11	Moist dirt
3	36 ½	28	11	
4	32	32	9	dry dirt
5	40 ½	30	10 ½	wet dirt
6	32	25 ½	8	clean shoe
7	31 ¼	25 ½	9	" "
8	24 ½	18 ½	5 ½	" "
9	27	22	6 ¼	" "
~~8~~				
~~9~~				
10	133 / ~~38~~	30	9 / 91.3	moist dirt

Depth at stake - 3'9"

	Depth	Core	Wt.	Remarks.
11	34½	30	9½	dry dirt
12	30	23½	8	
13	39	36	10	dry snow
14	41	31	11	" "
15	34	24½	9	dry dirt
16	33	16	5	dry snow
17	27	27	8	" "
18	40	31	10	
19	31½	20½	6	" "
20	33	27	8	" "
	20) 720.8		Total 168.8	
	36.0		166.80	av. 8.34
			av 1+2	8.66

Coure # 2.

	Depth	Coure	Wt	Remarks
1	28	25	7½	very dry
2	33½	30	8½	dry coarse
3	33½	30½	9½	
4	40	28½	7½	" "
5	34	32½	9	
6	38½	34½	10½	
7	32	26	9	moist dirt
8	37	33	10½	clayey dirt
9	35	30	9½	" "
10	33	29	8.0	" "
11	34½	31	9.0	" "
11)	381.0 = 34.6		98.5	av. 8.95

March 30 1929

av. 1+ = 8.70 in.

Normal 22.84 in.

Sum depth 35.3 Water 8.70 = ~~38+~~ = 37.9 %

Survey - May 3 - '24

Shaver & Jayle -

Time: Lewis to Red House
1 hour 30 min.

Red House to Lake House, 1 hour 45 min around Lake.

No snow on either course.

Weather - Beautiful, low wind.

Sunday May 4 - return

Time: Lake (around) to Red House 1 hr - 20 m.

Red House to Lewis 52 minutes.

Record time - 2 hrs. 12 min.

January 2nd - 1925 Course #1

	Depth	core	W.C.
1	37	35	11.5
2	31	30	8.5
3	27	26	6.5
4	26	23	8.0
5	23	19	6.0
6	35	31	10.0
7	29.5	26	8.5
8	27	14	7.0
9	27	22	9.0
10	27	24	7.0
11	30	25	8.5
12	32	24	9.5
13	32	28	9.0
14	31	29	9.5
15	18	13	5.0
16	26	20	6.0
17	28	23	8.5
18	28	24	9.0
19	27	25	8.0
20	27	23	9.0
21	30	22	8.0
22	30	23	10.0

	Depth	Core	W. C.
23	27	23	8.5
24	24	21	8.0
25	22	18	7.0
average	28.06		8.22 = 36.0%

Normal Offset

25

Course #I

NO.	Depth	Core	Water Con.
1	41	33½	12½
	43	27	12
2	37½	24½	11
	33½	27	10
3	34½	22	10½
	29	23	9
4	25½	19	5½
	27	21	8½
5	24	20	8
	31	26	11
6	29½	22	9
	32½	23	10
7	42	31	13
	35	24½	9
8	35½	28	9
	36	25	7
9	35	27	9
	33	21½	8½
10	35	31	10½
	24	17	6
11	26	17	5
	37½	30	11
12	36	25	11

663.5

20) 663.5
12) 33.18
2 [illegible] 9 in

20) 189.0
9.4.5

No	Depth	Core	water Cont.
13	35	27½	11
	33	25	9½
14	32½	25	10
	32	22	9
15	31	24½	9
	38	26½	11½
16	33	25½	11
	31½	24	10
17	31½	24-¼	10½
	38-¼	29½	11
18	36	33½-½	11½-½
	32½	29	10
19	1167.0		339.5
20			

75ft

Course # II

No	Depth	Core	Water Cont	
1	38.0	29.0	11.0	Clear
2	31.0	25.0	8.5	Dry dirt.
3	35.0	32.5	10.5	Clean.
4	38.5	32.0	11.0	Clean.
5	37.0	32.0	11.5	Dry dirt.
6	38.5	32.0	11.5	" "
7	40.0	35.5	12.0	" "
8	34.5	31.5	11.5	Clean.
9	35.0	33.0	11.5	"
10	30.0	26.5	9.5	"
11	39.0	34.0	12.0	Dirt.

11) 39.6.5 / 3 9.0 = 20 ft Course II - 11) 120.5 / 10.95 = 11.0 = 50%.

" I. 9.5

2) 20.5 / 10.3

Sum boards - 3ft. 3in. = 2ft. 9 in. 3ft.

Course I " II

4 6 8

2) 10.3 / 8 8 / 150 / 132 / 180 / 176

Seas % 46.8 %

Normal 76.1 56 % = varies 10% - 29.8 %

Nearest 29.8 %

Nearly 29.8 %

33.2 / 36.0 / 69.2 / 2 / 34.6

10.30 / 6 9 2 / 3 3 8 0 / 3 1 1 4 / 1 6 0 8 / 2 6 2 7 6

Mar. 1, 1925 Clear & warm,
Course #1.

No.	Depth	Core	Water Cont		
1	74.0	46.0	9.6		Clear.
2	68.0	57.0	15.0		Clear.
3	68.0	63.0	19.0		Clear
4	63.0	55.0	14.0		"
5	56.5	52.0	13.0		"
6	54.0	38.0	15.0		"
7	32.0	37.0	13.0		"
8	55.0	52.0	18.0		"
9	53.0	51.0	19.0		"
10	58.5	49.5	18.0		"
11	64.5	63.0	21.0		"
12	67.5	43.5	25.0		"
				199.0	

	Depth	Core	water content		
13	60.0	53.5	19.0		Clear
14	67.0	67.0	22.5		Dirt
15	67.0	61.0	22.5		Clear
16	66.0	64.0	23.0		dirt
17	63.5 64.0	63.0 62.0	(19.5) 20.0		clear "
18	61.0	57.0	19.0		"
19	62.5	55.5	20.0		Dirt
20	58.5	56.0	19.0		Dirt
21	66.0	61.0	21.0		Clear
22	65.5 67.0	59.5 50.5	20.0 (18.5)		" "
23	61.0	51.0	21.5		"
24)	58.5	55.0	21.0		"
24	57.0	56.0	(21.0)	248.5	"

	depth	core	248.5 water content		
25	61.5	52.0	24.5		dirt.
26	62.5	60.0	22.5		dirt
27	63.0	60.0	23.0		"
28	69.0	67.5	24.5		"
29	75.0	71.0	27.5		"
30	58.0	54.0	20.0		"
31	59.5	58.0	19.5		"
32	64.0	58.5	21.5		"
33	69.0	66.0	23.5		"
34	72.0	69.0	24.0	479.0	Clear.
		END II		199.0	
35	34) 2124.5		678.0 at.	678.0	
	62.5		19.94	19.94	
36					

March 1st. 1935 Warm & clear

Course #2

NO	depth	core	water content	
1	65.0	56.0	22.5	Dirt
2	54.0	50.0	19.0	"
3	74.0	66.0	23.5	"
4	72.0	61.0	23.0	"
5	64.0	60.5	22.0	clear
6	71.5	65.0	24.0	dirt
7	66.5	59.5	23.0	clear
8	67.5	61.5	21.5	dirt
9	63.5	61.0	22.0	"
10	61.0	58.5	21.0	"
11	68.0	64.0	22.5	"
11)	729.0		246.0 11)	246.0 = 22.36
12	66.3	End of course #2	22.36	

av. 1+2
Depth 64.4 Dens. 32.8% W.C. 21.15
= 92.6% of Nat.

av. 1+2 = 21.15 in.
Normal 22.84 =
92.6% of Nat.

av. Summit + Marlette 81.3%
Tahoe City ?

Course #3 Mar 1, 1925.

Warm & clear.

NO.	depth	Core	Water Content	
1	71.0	65.5	23.0	dirt
2	75.5	71.0	23.0	"
3	72.0	69.5	25.0	"
4	78.0	66.0	23.0	"
5	54.0 73.5	54.0 56.5	18.5 21.0	clear stump, dirt
6	93.5	92.5	31.0	dirt
7	86.5	82.0	27.0	"
8	66.0 77.5	57.0 77.5	22.0 19.0	" "
9	71.0 72.0	63.0 64.0	22.5 23.0	clear
10	54.0 64.0	50.5 56.0	18.5 20.5	dirt
11	55.0 52.5	42.0 42.0	19.0 14.0	clear "
12	75.5	70.5	25.5	dirt

NO	depth	core	water content	
13	70.5	62.5	22.5	dirt
14	67.0	63.0	22.0	"
15	64.5 64.0	57.0 61.5	20.2 23.0	"
16	66.0	62.0	21.5	"
17	67.0	55.0	18.5	clear
18	69.5	61.5	24.5	dirt
19	73.0	69.5	23.5	clear
20	79.0	71.5	25.0	dirt.
		END #3		
	1438.5		465.5	

MAR. 29 (Sunday morning)

Course #1. Cloudy & windy

No	Depth	Core	Water Content
1.	65	59 1/2	23
2	64	58	24 1/2
3	55	49 1/2	23
4	53	47 1/2	21
5	52	44	19
6	67	54	24
7	60	55	24
8	57	52	23
9	54	47	21 1/2
10	48	45 1/2	24
11	51	48	21 1/2
12	59	52	23
			271.5

(1925)

Snow (3 in. new snow since measurement #3)

Dirt Wet

			271.5
13	59	50 1/2	22
14	60	48	25 1/2
15	43	38	14
16	57	53	22
17	56	53	22
18	61	47	24
19	60	48	22 1/2
20	62	52	23 1/2
21	62	55	23 1/2
22	68	63	27 1/2
23	60	52	28
24	55	46	22
			548.0

			548.0
25	52	47	20½
26	48	39	19
27	51	43	19½
28	47	41	19
29	55	38	20
30	48	40	18
31	56	50	22
32	65	50	26
33	66	61	25
34	70	57	27½
33		34)	764.5
34)	1,946.0		22.49
	57.2		

Dens. 39.3%

Reading at Post 60"

MAR (28)-29 (3 hr. new snow since noon Course 3)

Course 2 (Sunday)

(1925)

1	40	36	15½
2	47	41	17
3	61	54½	22½
4	63	56	23
5	55	47	19
6	68	56	23½
7	59	54	24
8	52	48	19½
9	52	48	20
10	52	44	20
11	65	55	23
12	11) 612.0 / 55.6		11) 227.0 / 20.64

Av. 1+2 56.4+2 = 31.57 = 94.2%

Dens 38.2%

MAR 28- (Sat evening)
Course #3 (New)

(1925)

No	Depth	Core	Water Cont	
1	56	52	20	
2	68	58	24	Soil moist
3	60	56	24	
4	58	46½	17	
5	46	42	16	
6	87	76	30	
7	76	68	28	
8	60	55	19	
9	58	54	20½	
10	45	40½	16	
11	55	30½	17	Dirt ½ inch
12	57	40½	19¼	

No	Depth	Core	Water Cont.
13	50	42	19
14	58	50	23
15	54	~~49~~	21
16	~~39~~	35	16
17	51	46	18½
18	69	57	26
18)	1047.0		372.3
19	58.2		20.68
	Dens. 35.6%		
20			

(1925)

Dirt-one inch

Dirt 1 inch

(Normal 22.02
94.2 %

MAY 2 (Saturday a.m.)

Course #1 – Very Clear

No.	Depth	Core	Water Content
1	43	37	19
2	38	30	13
3	29	22	11
4	29	25½	13
5	25	22	11½
6	36	33	19
7	38	33	19
8	33	30	16½
9	28	26	19
10	33	28	14½
11	31	25	13
12	38	22	12

Snow Wet

Dirt wet

Measurement on Post 3 ft.

No	Depth	Core	Water Content
13	40	30	19
14	36	31	13½
15	34	29	14
16	31	21	14
17	33	28	13
18	35	29	16
19	35	31	16
20	37	33	18
21	38	34	18
22	40	34	18
23	39	34	19½
24	35	29	17

No	Depth	Core	Water content
25	29	24	13
26	28	25	16
27	26	21	12
28	29	26	18
29	25	22	12
30	27	24	13
31	32	26	15 1/4
32	36	35	19 1/4
33	43	40	20
34	43	34	21 1/2
35	44	39	23
35)	1196.0 / 34.2		559.6 / 15.99

MAY 2 (Saturday A.M.)

Course #2

No	Depth	Core	Water Content
1	34	30	18
2	26	18	11 3/4
3	42	38	20 3/4
4	42	35	20
5	33	29	17 1/4
6	29	27	18 1/2
7	34	27	17
8	38	34	18 1/2
9	31	26	15
10	26	22	14 3/4
11.	40	36	20
12	38	32	18
(12)	413.0		209.7
	34.4		17.48

av. 1+2 . . . 16.74 in. = 73.3%

D. 34.8 Dens. 48.8% W.C. 16.74 in.

MAY 2 (Saturday a. m.)

Course #3.

No	Depth	Core	Water Content
1	44	31	17 3/4
2	25	22	11
3	38	34	18 1/2
4	42	38	20
5	32	27	17
6	30	25	13
7	38	33	18
8	31	21	12 1/4
9	31	29	15
10	28	25	14
11	46	42	22
12	67	57	30 1/2

No	Depth	Core	Water content.
13	53	45	27½
14	33	31½	18½
15	29	25½	18
16	40	39	22½
17	53	51	27½
18	20	18	12½
18)	680.0		335.6
	37.8		18,64 m.

April 2, 1926 AM
Course No. 1

NO	Depth	Core	Water Content	Remarks
1	34.5 32.0	25.5	13.0	Clear Dirt
2	30.0	27.5	13.5	Dirt
3	27.0	23.5	13.0	Dirt
4	22.0 19.5	20.5	11.5	Dirt
5	20.0	18.0	11.0	Clear
6	31.0	27.0	17.5	Clear
7	26.0	24.5	13.5	Clear
8	23.5	21.0	12.5	Dirt
9	27.5	24.0	14.5	Dirt
10	27.0	23.5	11.0	Clear
11	15.5	15.0	7.5	log
12	27.5	23.0	11.5	Clear

April, 2, 1926 A.M
Course No. 1.

No	depth	Core	Water Content	Remarks
13	32.5	31.0	16.0	Clear
14	27.0	26.0	12.0	Dirt
15	24.0	21.5	10.5	Clear
16	18.5	15.0	7.5	Dirt
17	19.5	18.0	8.5	Dirt
18	21.0	18.0	9.5	Clear
19	28.0 25.0	24.5	12.0 11.5	Dirt
20	24.5	22.0	10.5	Dirt
21	26.5	24.0	12.0	Clear
22	32.5	29.5	15.0	Dirt
23	33.5	30.5	18.0	Dirt
24	28.0	24.0	13.5	Dirt

April 2, 1926 AM

Course No. 1

No	depth	core	water Content	Remarks
25	29.0	23.0	12.5	Dirt
26	19.5	17.5	10.0	Dirt
27	18.0	15.5	8.5	Dirt
28	17.0	16.0	9.0	Clear
29	14.5	12.5	5.5	Dirt
30	17.0	16.0	7.5	Dirt
31	23.5	20.5	10.0	Dirt
32	25.5	23.5	11.0	Dirt
33	26.5	23.5	12.0	Dirt
34	28.0	23.5	12.0	Clear
34)	841.0		394.0	
	24.7		11.59	

April 2, 1926 6 A.M

Course No 2.

No	depth	core	water content	Remarks
1	28.5	26.5	17.0	Dirt
2	15.5	14.0	9.0	clear
3	17.5	13.5	9.0	Dirt
4	32.0	29.0	16.5	Dirt
5	27.5	24.5	13.0	Dirt
6	30.5	27.0	15.0	Dirt
7	29.0	23.0	13.5	Dirt
8	33.0	29.5	16.5	Dirt
9	25.0	21.0	12.5	Dirt
10	16.0	13.5	6.5	Dirt
11	31.5	28.0	14.0	Dirt
12	33.5	28.5	13.5	Dirt
12)	319.5		153.0	
	26.6		12.75	

April 2, 1926. P.M

Course No. 3

No.	depth	core	water content	Remarks
1	26.0	25.5	14.0	clear
2	26.0	23.0	13.5	Dirt
3	35.0	30.0	12.5	Dirt
4	31.0	30.0	11.0	Clear
5	16.0	16.0	7.5	~~clear~~ Brush
6	2.00 ~~28.5~~	28.5	13.5	Clear
7	39.0	36.0	18.0	Dirt
8	26.0	21.5	12.0	Dirt
9	23.5	22.0	11.5	Dirt
10	23.0	21.0	14.5	Clear
11	29.0	25.0	16.0	Dirt
12	26.5	23.0	15.0	Dirt

April 2 1926. AM.
Course No. 3

No	Depth	Core	Water Content	Remarks
13	23.5	20.5	7.5	Dirt
14	31.0	29.5	12.0	Dirt
15	26.0	21.0	9.5	Dirt
16	22.0	18.0	9.5	Dirt
17	31.5	29.0	15.5	Clear
18	36.0	30.5	13.5	Dirt
18)	500.0		226.5	
	27.8	D. 45.3	12.58	

Depth at Post 20'

Depth where post was 34'

Moved from last years position

2.50'

Jan. 3 - 1927

SNOW DEPTH. (Gouge at Fish Hatchery)

Shaver, Welsh, Elsie -

Measmts Record. chain

Course 1

	Depth	Core	Water	Remarks
1	37.0	~~34~~ 35	11.2	Moist Earth
2	37.0	31.5	12.5	"
3	23.0	18.0	6.0	clear
4	25.5	21.5	6.5	"
5	31.0	26.5	9.5	"
6	24.0	19.6	6.7	"
7	21.0	16.0	6.0	M. Earth
8	19.0	12.0	5.5	" "
9	17.5	13.0	5.5	cl

Course 1 - cont'd

10	21.5	15.0	6.0	Clear
11	25.0	18.0	8.0	"
12	23.5	17.0	10.0	"
13	~~24.5~~ 37.7	30.0	11.2	"
14	~~29.0~~ 30.0	27.0	11.0	Earth (Moist)
* 15	~~26.0~~ 5	19.5	9.5	" + Roots
16	~~28.0~~ 7.0	23.0	9.5	Earth. (Moist)
17	34.5	32.0	11.0	Clear
18	30.0	29.0	9.5	Earth (Moist)
19	25.5	25.0	7.20	"
20	~~24.5~~	24.0	7.8	Earth (Moist)
21	~~27.0~~ 6.0	15.0	5.8	"
Aver	26.98	22.24	8.37	

$$\text{Density} = \frac{8.37}{26.98} = 31.0\%$$

Course Z

	Depth	Core	water	Remarks
1	32.	25.0	9.2	Earth
2	25.0	22.5	8.0	C.l
3	39.0 ~~41.0~~	38.5	13.5	Earth (Moist)
4	38.5	36.0	11.9	"
5	33.0	31.5	10.5	"
6	34.5	29.0	10.5	"
7	33.5	31.0	10.7	"
8	31.0	25.0	10.0	"
9	33.0	32.0	10.5	"
10	27.0	26.0	8.5	Clear
11	35.5	34.0	11.0	Earth (Moist)
Aver	32.90	30.04	10.39	

$$\text{Density} = \frac{10.39}{32.90} = 31.6\%$$

Av. 1 + 2 = 9.38 in.

Normal ppn. 1 = 22.84 in.

Ratio Jan. 1 = 43.3%.

Course #3

	Depth	Core	Water	Remarks
1	35.5	33.0	11.0	Earth (Moist)
2	38.0	36.5	11.0	Clean
3	32.0	27.0	9.0	Earth (M)
4	37.5	30.0	11.5	E + Twigs
5	37.5	20.5	8.0	" limbs
6	48.0	47.0	15.0	Earth - Twig
7	43.5	42.5	13.0	Earth (M)
8	39.5	23.5	8.0	"
9	30.0	29.0	8.5	Clean.
10	33.0	22.0	8.2	Earth.
11	32.0	32.0	10.5	"
12	37.0	36.0	13.0	"

$\frac{15}{48} = 30\%$

COURSE #3 (Cont'd)

		DEPTH	CORE	WATER	
39	13	37.0	36.0	12.0	Earth-Roots
33	14	33.0	28.0	11.0	Clean
31	15.	29.0	28.0	10.0	Earth-2"
34	16.	33.5	33.0	12.0	Earth-2"
33	17.	32.0	32.0	14.0	Earth(4")At
Aver		35.76	31.53	10.92	

2nd Marker (Tree). End of course.
Jan. 3, 1927 10 45 A.M.
T. M.

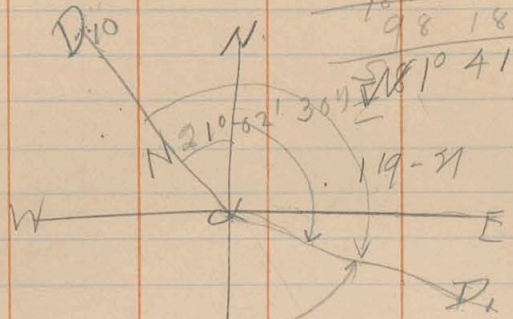
Density - $\frac{10.92}{35.76}$ = 30.6 %

$\frac{9.89}{}$ = Percent of seasons normal.

Aver. Density 3 courses - 31 %

Aver. Depth - 31.88"
" Water - 9.89"

3+36.1



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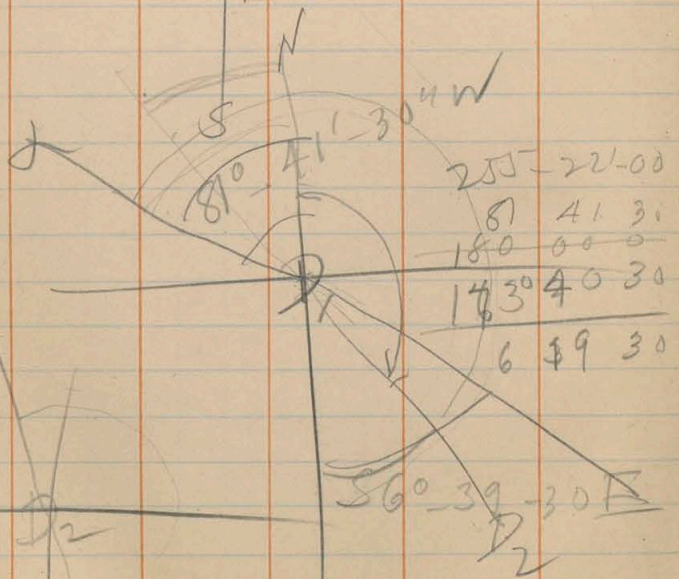
180 00 00
98 18 30
S 81° 41' 38" E

119-31



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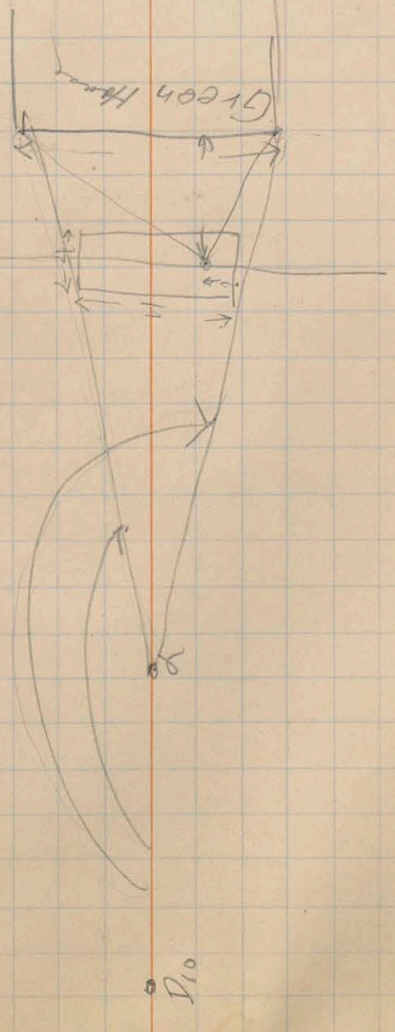
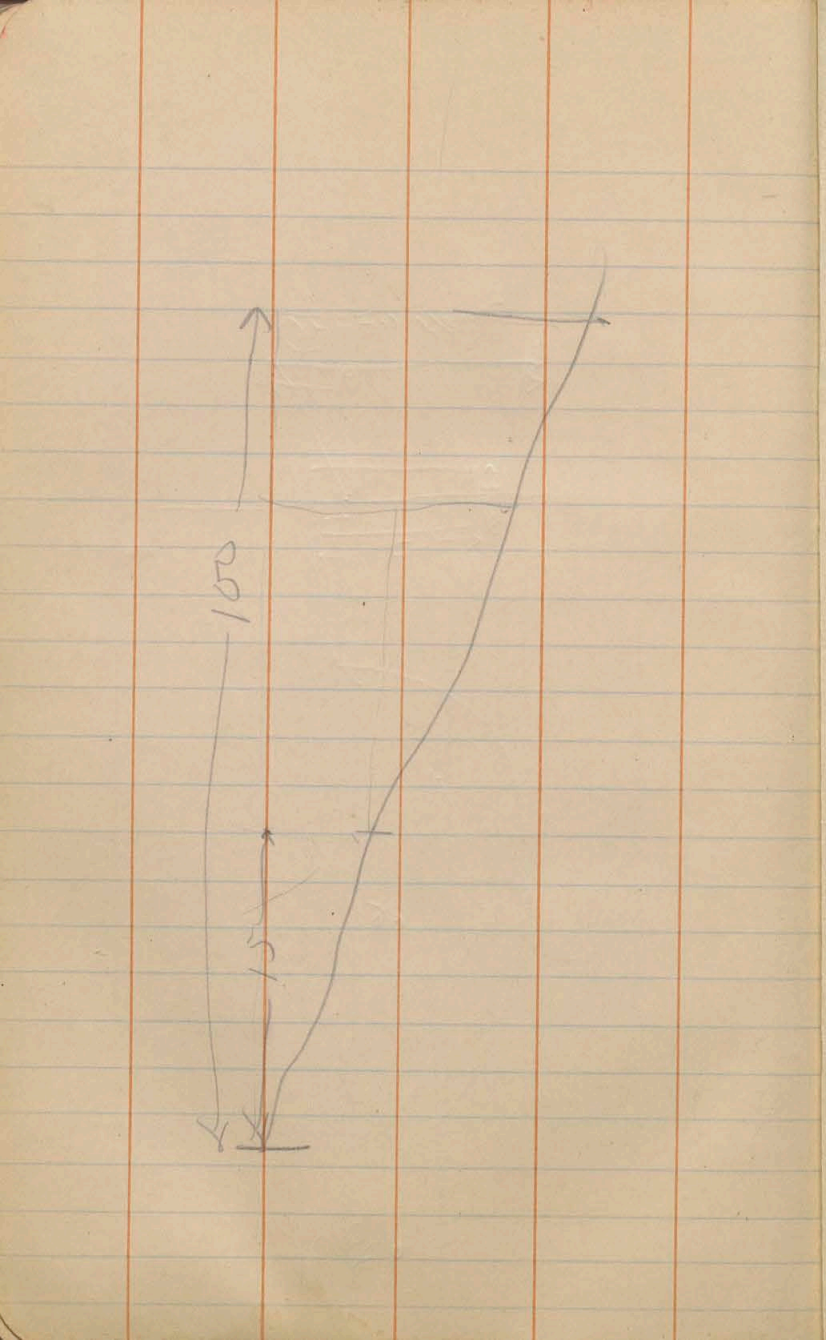
173° 40 30
6 19 30

S 60°-39-30 E





IMPROVED TABLES

AND

INFORMATION

DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope 1½ to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in left column and top row. The number in body of table in same row and column gives distance from side stake to slope stake. If ground is not level estimate the difference in elevation between the side stake and slope stake, lower target by this amount if cut, elevate if fill. Add this amount to cut or fill and find distance in table. Set up rod at this point, and line of sight should cut target. If it does not make the slight adjustment necessary.

TABLE No. 9.

To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of corrections.

Degree of curve with a given I may be found by dividing tangent, (or external), opposite I by given tangent, (or external).

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

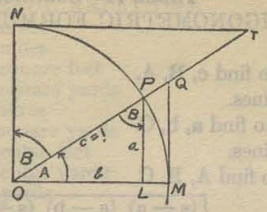


TABLE II

TRIGONOMETRIC FORMULÆ.

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

$R = OB = c = 1$

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

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

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

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

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

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

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

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

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

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

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

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

Law of Lines $\dfrac{\sin A}{a} = \dfrac{\sin B}{B} = \dfrac{\sin C}{C}$

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

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

TABLE II—Continued
TRIGONOMETRIC FORMULAE (continued)

In any triangle:

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

Use Law of Lines.

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

Use Law of Lines.

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

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

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

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

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

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

Area of a triangle:

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

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

PRISMOIDAL FORMULA.

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

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

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

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

TABLE IV
USEFUL RELATIONS.

Lineal feet	×.00019	= miles
Lineal yards	×.0006	= miles
Square inches	×.007	= square feet
Square feet	×.111	= square yards
Square yards	×.0002067	= acres
Acres	×4840	= square yards
Cubic inches	×.00058	= cubic feet
Cubic feet	×.03704	= cubic yards
Links	×.22	= yards
Links	×.66	= feet
Feet	×1.5	= links

360° = 21600′ = 1296000″

Radius = arc of 57.2957790°

Arc of 1° (radius = 1) = .017453292

Arc of 1′ (radius = 1) = .000290888

Arc of 1″ (radius = 1) = .000004848

$\pi = 3.141592654$

$\frac{\pi}{4} = 0.785398163$

$\frac{\pi}{6} = 0.523598776$

$\sqrt{\frac{4}{\pi}} = 1.128379167$

$\frac{\pi}{6} = 0.523598776$

$\frac{4.\pi}{3} = 4.188790205$

$\sqrt{\frac{1}{4}} = 0.564190$

$\sqrt[3]{\frac{6}{\pi}} = 1.240700982$

$\pi^2 = 9.869604401$

$\frac{1}{\pi^2} = 0.101321184$

$\sqrt{\pi} = 1.772453851$

$\frac{1}{\pi} = 0.3183099$

Curvature of Earth's surface = about 0.7 feet in 1 mile

Curvature in feet = 0.667 (Dist. in miles)²

Difference between arc and chord length, 0.05 feet in 11½ miles

Probable error of a single observation $= 0.6754\sqrt{\frac{\sum v^2}{n-1}}$

Error in chaining of 0.01 feet in 100 feet:

Due to—

1. Length of tape error of 0.01 feet
2. Alignment. One end 1.4 feet out of line
3. Sag of tape at centre of 0.61 feet.
4. Temperature difference of 15°
5. Difference of pull of 15 lbs.

STADIA REDUCTION FORMULÆ.

Horizontal Distance $= R - R \sin^2 a + C \cos a$

Vertical Distance $= R\ \tfrac{1}{2} \sin 2a + C \sin a$

$$R = \text{Reading} \times \frac{\text{distance from Object glass to cross hairs}}{\text{distance between cross hairs}}$$

C = distance from Object glass to cross hairs + distance from Object glass to center of instrument.

a = angle of elevation for mid Reading

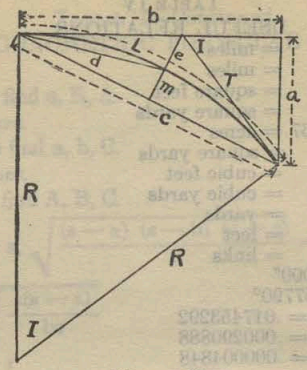


Table V

CURVE FORMULAE FOR SIMPLE CURVES

Compiled by J. Calvin Locke, C.E.

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

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

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

(5) $c = 2R \sin \frac{1}{2} I$ (6) $c = 2T \cos \frac{1}{2} I$

(7) $e = R \operatorname{exsec} \frac{1}{2} I$

(8) $e = R \tan \frac{1}{2} I \tan \frac{1}{4} I$ (9) $e = T \tan \frac{1}{4} I$

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

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

(12) $b = R \sin I$ (13) $b = a \cot \frac{1}{2} I$

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

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

(17) $d = \sqrt{2Rm}$ (18) $d = 2R \sin \frac{1}{4} I$ (19) $m = \frac{d^2}{2R}$

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

(21) $m = R \operatorname{vers} \frac{1}{2} I$ (22) $m = R \sin \frac{1}{2} I \tan \frac{1}{4} I$ (23) $m = \frac{1}{2} c \tan \frac{1}{4} I$

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

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

(29) $a = b \tan \frac{1}{2} I$ (30) $a = T \sin I$ (31) $T = R \tan \frac{1}{2} I$

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

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

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

Table VI

SINES, COSINES, TANGENTS, COTANGENTS

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

TABLE VI (continued)

SINES, COSINES, TANGENTS, COTANGENTS (continued)

deg.	sin 0′	tan 0′	sin 10′	tan 10′	sin 20′	tan 20′	sin 30′	tan 30′	sin 40′	tan 40′	sin 50′	tan 50′	deg.
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	1.2203	7753	1.2276	39
51	771	.2349	790	.2423	808	.2497	826	.2572	844	.2647	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3111	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.3597	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4106	175	.4193	35
55	192	.4281	208	.4370	225	.4460	241	.4550	258	.4641	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5204	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.5798	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.6426	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631	.7090	646	.7205	30
60	660	1.7321	8675	1.7437	8689	1.7556	8704	1.7675	8718	1.7797	8732	1.7917	29
61	746	.8040	760	.8165	774	.8291	788	.8418	802	.8546	816	.8676	28
62	829	.8807	843	.8940	857	.9074	870	.9210	884	.9347	897	.9486	27
63	910	.9626	923	.9768	936	.9912	949	2.0057	962	2.0204	975	2.0353	26
64	988	2.0503	9001	2.0655	9013	2.0809	9026	.0965	9038	.1123	9051	.1283	25
65	9063	.1445	075	.1609	088	.1775	100	.1943	112	.2113	124	.2286	24
66	135	.2460	147	.2637	159	.2817	171	.2998	182	.3183	194	.3369	23
67	205	.3559	216	.3750	228	.3945	239	.4142	250	.4342	261	.4545	22
68	272	.4751	283	.4960	293	.5172	304	.5386	315	.5605	325	.5826	21
69	336	.6051	346	.6279	356	.6511	367	.6746	377	.6985	387	.7228	20
70	397	2.7475	9407	2.7725	9417	2.7980	9426	2.8239	9436	2.8502	9446	2.8770	19
71	455	.9042	465	.9319	474	.9600	483	.9887	492	3.0178	502	3.0475	18
72	511	3.0777	520	3.1084	528	3.1397	537	3.1716	546	.2041	555	.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	.5764	10
80	9848	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	922	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.078	954	10.385	957	10.711	959	11.059	5
85	962	11.430	964	11.826	967	12.250	969	12.706	971	13.197	974	13.727	4
86	976	14.300	978	14.924	980	15.605	981	16.350	983	17.169	985	18.075	3
87	986	19.081	988	20.206	989	21.470	990	22.903	992	24.542	993	26.432	2
88	994	28.636	9995	31.242	9996	34.368	997	38.189	997	42.964	9998	49.104	1
89	9998	57.290	9999	68.750	9999	85.940	9999	114.58	1.000	171.88	1.000	343.77	0
deg.	60′ cos	60′ cot	50′ cos	50′ cot	40′ cos	40′ cot	30′ cos	30′ cot	20′ cos	30′ cot	10′ cos	10′ cot	deg.

TABLE VII

RODS IN FEET AND INCHES

Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches
1	16—6	21	346—6	41	676—6	61	1006—6	81	1336—6
2	33—0	22	363—0	42	693—0	62	1023—0	82	1353—0
3	49—6	23	379—6	43	709—6	63	1039—6	83	1369—6
4	66—0	24	396—0	44	726—0	64	1056—0	84	1386—0
5	82—6	25	412—6	45	742—6	65	1072—6	85	1402—6
6	99—0	26	429—0	46	759—0	66	1089—0	86	1419—0
7	115—6	27	445—6	47	775—6	67	1105—6	87	1435—6
8	132—0	28	462—0	48	792—0	68	1122—0	88	1452—0
9	148—6	29	478—6	49	808—6	69	1138—6	89	1468—6
10	165—0	30	495—0	50	825—0	70	1155—0	90	1485—0
11	181—6	31	511—6	51	841—6	71	1171—6	91	1501—6
12	198—0	32	528—0	52	858—0	72	1188—0	92	1518—0
13	214—6	33	544—6	53	874—6	73	1204—6	93	1534—6
14	231—0	34	561—0	54	891—0	74	1221—0	94	1551—0
15	247—6	35	577—6	55	907—6	75	1237—6	95	1567—6
16	264—0	36	594—0	56	924—0	76	1254—0	96	1584—0
17	280—6	37	610—6	57	940—6	77	1270—6	97	1600—6
18	297—0	38	627—0	58	957—0	78	1287—0	98	1617—0
19	313—6	39	643—6	59	973—6	79	1303—6	99	1633—6
20	330—0	40	660—0	60	990—0	80	1320—0	100	1650—0

TABLE VIII

LINKS IN FEET AND INCHES

Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches
1	0– 7.92	18	11–10.56	35	23– 1.20	52	34– 3 84	69	45– 6 48	86	56– 9 12
2	1– 3.84	19	12– 6.48	36	23– 9.12	53	34–11.76	70	46– 2 40	87	57– 5 04
3	1–11.76	20	13– 2.40	37	24– 5.04	54	35– 7 68	71	46–10 32	88	58– 0 96
4	2– 7.68	21	13–10.32	38	25– 0.96	55	36– 3 60	72	47– 6.24	89	58– 8 88
5	3– 3.60	22	14– 6.24	39	25– 8.88	56	36–11 52	73	48– 2 16	90	59– 4 80
6	3–11.52	23	15– 2 16	40	26– 4.80	57	37– 7.44	74	48–10 08	91	60– 0 72
7	4– 7.44	24	15–10.08	41	27– 0.72	58	38– 3.36	75	49– 6.00	92	60– 8 64
8	5– 3.36	25	16– 6.00	42	27– 8.64	59	38–11 28	76	50– 1 92	93	61– 4 56
9	5–11.28	26	17– 1.92	43	28– 4.56	60	39– 7 20	77	50– 9.84	94	62– 0 48
10	6– 7.20	27	17– 9.84	44	29– 0.48	61	40– 3 12	78	51– 5.76	95	62– 8 40
11	7– 3.12	28	18– 5 76	45	29– 8.40	62	40–11 04	79	52– 1.68	96	63– 4 32
12	7–11.04	29	19– 1 68	46	30– 4.32	63	41– 6.96	80	52– 9.60	97	64– 0 24
13	8– 6.96	30	19– 9.60	47	31– 0.24	64	42– 2 88	81	53– 5.52	98	64– 8.16
14	9– 2.88	31	20– 5.52	48	31– 8.16	65	42–10.80	82	54– 1.44	99	65– 4.08
15	9–10.80	32	21– 1 44	49	32– 4.08	66	43– 6.72	83	54– 9.36	100	66– .000
16	10– 6.72	33	21– 9.36	50	33– 0.00	67	44– 2 64	84	55– 5.28	101	66 –7.92
17	11– 2.64	34	22– 5.28	51	33– 7.92	68	44–10.56	85	56– 1.20	102	67– 3.84

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10′	58.34	.297	5° C.	10′	560.11	27.313	5° C	10′	1070.6	99.155	5° C
20′	66.67	.388	T	20′	568.53	28.137	T	20′	1079.2	100.75	T
30′	75.01	.491	.03	30′	576.95	28.974	.06	30′	1087.8	102.35	.10
40′	83.34	.606	E	40′	585.36	29.824	E	40′	1096.4	103.97	E
50′	91.68	.733		50′	593.79	30.686		50′	1105.1	105.60	
2°	100.01	.873	.001	12°	602.21	31.561	.006	22°	1113.7	107.24	.013
10′	108.35	1.024		10′	610.64	32.447		10′	1122.4	108.90	
20′	116.68	1.188		20′	619.07	33.347		20′	1131.0	110.57	
30′	125.02	1.364		30′	627.50	34.259		30′	1139.7	112.25	
40′	133.36	1.552		40′	635.93	35.183		40′	1148.4	113.95	
50′	141.70	1.752		50′	644.37	36.120		50′	1157.0	115.66	
3°	150.04	1.964	10° C.	13°	652.81	37.070	10° C.	23°	1165.7	117.38	10° C.
10′	158.38	2.188	T	10′	661.25	38.031	T	10′	1174.4	119.12	T
20′	166.72	2.425	.06	20′	669.70	39.006	.13	20′	1183.1	120.87	.19
30′	175.06	2.674	E	30′	678.15	39.993	E	30′	1191.8	122.63	E
40′	183.40	2.934	.003	40′	686.60	40.992	.011	40′	1200.5	124.41	.025
50′	191.74	3.207		50′	695.06	42.004		50′	1209.2	126.20	
4°	200.08	3.492		14°	703.51	43.029		24°	1217.9	128.00	
10′	208.43	3.790		10′	711.97	44.066		10′	1226.6	129.82	
20′	216.77	4.099		20′	720.44	45.116		20′	1235.3	131.65	
30′	225.12	4.421		30′	728.90	46.178		30′	1244.0	133.50	
40′	233.47	4.755		40′	737.37	47.253		40′	1252.8	135.35	
50′	241.81	5.100	15° C.	50′	745.85	48.341	15° C.	50′	1261.5	137.23	15° C.
5°	250.16	5.459	T	15°	754.32	49.441	T	25°	1270.2	139.11	T
10′	258.51	5.829	.09	10′	762.80	50.554	.19	10′	1279.0	141.01	.29
20′	266.86	6.211	E	20′	771.29	51.679	E	20′	1287.7	142.93	E
30′	275.21	6.606	.004	30′	779.77	52.818	.017	30′	1296.5	144.85	.038
40′	283.57	7.013		40′	788.26	53.969		40′	1305.3	146.79	
50′	291.92	7.432		50′	796.75	55.132		50′	1314.0	148.75	
6°	300.28	7.863		16°	805.25	56.309		26°	1322.8	150.71	
10′	308.64	8.307		10′	813.75	57.498		10′	1331.6	152.69	
20′	316.99	8.762		20′	822.25	58.699		20′	1340.4	154.69	
30′	325.35	9.230		30′	830.76	59.914		30′	1349.2	156.70	
40′	333.71	9.710	20° C.	40′	839.27	61.141	20° C.	40′	1358.0	158.72	20° C.
50′	342.08	10.202	T	50′	847.78	62.381	T	50′	1366.8	160.76	T
7°	350.44	10.707	.13	17°	856.30	63.634	.26	27°	1375.6	162.81	.39
10′	358.81	11.224	E	10′	864.82	64.900	E	10′	1384.4	164.86	E
20′	367.17	11.753	.006	20′	873.35	66.178	.022	20′	1393.2	166.95	.051
30′	375.54	12.294		30′	881.88	67.470		30′	1402.0	169.04	
40′	383 91	12.847		40′	890.41	68.774		40′	1410.9	171.15	
50′	392.28	13.413		50′	898.95	70.091		50′	1419.7	173.27	
8°	400.66	13.991		18°	907.49	71.421		28°	1428.6	175.41	
10′	409.03	14.582		10′	916.03	72.764		10′	1437.4	177.55	
20′	417.41	15.184	25° C.	20′	924.58	74.119	25° C.	20′	1446.3	179.72	25° C.
30′	425.79	15.799	T	30′	933.13	75.488	T	30′	1455.1	181.89	T
40′	434.17	16.426	.16	40′	941.69	76.869	.32	40′	1464.0	184.08	.49
50′	442.55	17.065	E	50′	950.25	78.264	E	50′	1472.9	186.29	E
9°	450.93	17.717	.007	19°	958.81	79.671	.028	29°	1481.8	188.51	.065
10′	459.32	18.381		10′	967.38	81.092		10′	1490.7	190.74	
20′	467.71	19.058		20′	975.96	82.525		20′	1499.6	192.99	
30′	476.10	19.746		30′	984.53	83.972		30′	1508.5	195.25	
40′	484.49	20.447		40′	993.12	85.431		40′	1517.4	197.53	
50′	492.88	21.161		50′	1001.7	86.904		50′	1526.3	199.82	
10°	501.28	21.887	30° C.	20°	1010.3	88.389	30° C.	30°	1535.3	202.12	30° C.
10′	509.68	22.624	T	10′	1018.9	89.888	T	10′	1544.2	204.44	T
20′	518.08	23.375	.19	20′	1027.5	91.399	.39	20′	1553.1	206.77	.59
30′	526.48	24.138	E	30′	1036.1	92.924	E	30′	1562.1	209.12	E
40′	534.89	24.913	.008	40′	1044.7	94.462	.034	40′	1571.0	211.48	.078
50′	543.29	25.700		50′	1053.3	96.013		50′	1580.0	213.86	

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10′	1598.0	218.7	5° C.	10′	2151.7	390.7	5° C.	10′	2743.1	622.8	5° C.
20′	1606.9	221.1	T	20′	2161.2	394.1	T	20′	2753.4	627.2	T
30′	1615.9	223.5	.13	30′	2170.8	397.4	.17	30′	2763.7	631.7	.21
40′	1624.9	226.0	E	40′	2180.3	400.8	E	40′	2773.9	636.2	E
50′	1633.9	228.4		50′	2189.9	404.2		50′	2784.2	640.7	
32°	1643.0	230.9	.023	42°	2199.4	407.6	.037	52°	2794.5	645.2	.056
10′	1652.0	233.4		10′	2209.0	411.1		10′	2804.9	649.7	
20	1661.0	235.9		20′	2218.6	414.5		20′	2815.2	654.3	
30′	1670.0	238.4		30′	2228.1	418.0		30′	2825.6	658.8	
40′	1679.1	241.0		40′	2237.7	421.4		40′	2835.9	663.4	
50′	1688.1	243.5		50′	2247.3	425.0		50′	2846.3	668.0	
33°	1697.2	246.1	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10′	1706.3	248.7	T	10′	2266.6	432.0	T	10′	2867.1	677.3	T
20′	1715.3	251.3	.26	20′	2276.2	435.6	.34	20′	2877.5	682.0	.42
30′	1724.4	253.9	E	30′	2285.9	439.2	E	30′	2888.0	686.7	E
40′	1733.5	256.5	.046	40′	2295.6	442.8	.075	40′	2898.4	691.4	.112
50′	1742.6	259.1		50	2305.2	446.4		50′	2908.9	696.1	
34°	1751.7	261.8		44°	2314.9	450.0		54°	2919.4	700.9	
10′	1760.8	264.5		10′	2324.6	453.6		10′	2929.9	705.7	
20′	1770.0	267.2		20′	2334.3	457.3		20′	2940.4	710.5	
30′	1779.1	269.9		30′	2344.1	461.0		30′	2951.0	715.3	
40′	1788.2	272.6		40′	2353.8	464.6		40′	2961.5	720.1	
50′	1797.4	275.3	15° C.	50′	2363.5	468.4	15° C.	50′	2972.1	725.0	15° C.
35°	1806.6	278.1	T	45°	2373.3	472.1	T	55°	2982.7	729.9	T
10′	1815.7	280.8	.40	10′	2383.1	475.8	.51	10′	2993.3	734.8	.63
20′	1824.9	283.6	E	20′	2392.8	479.6	E	20′	3003.9	739.7	E
30′	1834.1	286.4	.070	30′	2402.6	483.4	.116	30′	3014.5	744.6	.168
40′	1843.3	289.2		40′	2412.4	487.2		40′	3025.2	749.6	
50′	1852.5	292.0		50′	2422.3	491.0		50′	3035.8	754.6	
36°	1861.7	294.9		46°	2432.1	494.8		56°	3046.5	759.6	
10′	1870.9	297.7		10′	2441.9	498.7		10′	3057.2	764.6	
20′	1880.1	300.6		20′	2451.8	502.5		20′	3067.9	769.7	
30′	1889.4	303.5	20° C.	30′	2461.7	506.4	20° C.	30′	3078.7	774.7	20° C.
40′	1898.6	306.4	T	40′	2471.5	510.3	T	40′	3089.4	779.8	T
50′	1907.9	309.3	.53	50′	2481.4	514.3	.68	50′	3100.2	784.9	.84
37°	1917.1	312.2	E	47°	2491.3	518.2	E	57°	3110.9	790.1	E
10′	1926.4	315.2	.093	10′	2501.2	522.2	.151	10′	3121.7	795.2	.225
20′	1935.7	318.1		20′	2511.2	526.1		20′	3132.6	800.4	
30′	1945.0	321.1		30′	2521.1	530.1		30′	3143.4	805.6	
40′	1954.3	324.1		40′	2531.1	534.2		40′	3154.2	810.9	
50′	1963.6	327.1		50′	2541.0	538.2		50′	3165.1	816.1	
38°	1972.9	330.2		48°	2551.0	542.2		58°	3176.0	821.4	
10′	1982.2	333.2		10′	2561.0	546.3		10′	3186.9	826.7	
20′	1991.5	336.3	25° C.	20′	2571.0	550.4	25° C.	20′	3197.8	832.0	25° C.
30′	2000.9	339.3	T	30′	2581.0	554.5	T	30′	3208.8	837.3	T
40′	2010.2	342.4	.67	40′	2591.0	558.6	.85	40′	3219.7	842.7	1.05
50′	2019.6	345.5	E	50′	2601.1	562.8	E	50′	3230.7	848.1	E
39°	2029.0	348.6	.117	49°	2611.2	566.9	.189	59°	3241.7	853.5	.283
10′	2038.4	351.8		10′	2621.2	571.1		10′	3252.7	858.9	
20′	2047.8	354.9		20′	2631.3	575.3		20′	3263.7	864.3	
30′	2057.2	358.1		30′	2641.4	579.5		30′	3274.8	869.8	
40′	2066.6	361.3		40′	2651.5	583.8		40′	3285.8	875.3	
50′	2076.0	364.5		50′	2661.6	588.0		50′	3296.9	880.8	
40°	2085.4	367.7	30° C.	50°	2671.8	592.3	30° C.	60°	3308.0	886.4	30° C.
10′	2094.9	371.0	T	10′	2681.9	596.6	T	10′	3319.1	892.0	T
20′	2104.3	374.2	.80	20′	2692.1	600.9	1.02	20′	3330.3	897.5	1.27
30′	2113.8	377.5	E	30′	2702.3	605.3	E	30′	3341.4	903.2	E
40′	2123.3	380.8	.141	40′	2712.5	609.6	.227	40′	3352.6	908.8	.340
50′	2132.7	384.1		50′	2722.7	614.0		50′	3363.8	914.5	

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2	+	71°	4086.9	1308.2	+	81°	4893.6	1805.3	+
10′	3386.3	925.9	5° C.	10′	4099.5	1315.6	5° C.	10′	4908.0	1814.7	5° C.
20′	3397.5	931.6	T	20′	4112.1	1322.9	T	20′	4922.5	1824.1	T
30′	3408.8	937.3	.25	30′	4124.8	1330.3	.30	30′	4937.0	1833.6	.36
40′	3420.1	943.1	E	40′	4137.4	1337.7	E	40′	4951.5	1843.1	E
50′	3431.4	948.9		50′	4150.1	1345.1		50′	4966.1	1852.6	
62°	3442.7	954.8	.080	72°	4162.8	1352.6	.110	82°	4980.7	1862.2	.149
10′	3454.1	960.6		10′	4175.6	1360.1		10′	4995.4	1871.8	
20′	3465.4	966.5		20′	4188.5	1367.6		20′	5010.0	1881.5	
30′	3476.8	972.4		30′	4201.2	1375.2		30′	5024.8	1891.2	
40′	3488.3	978.3		40′	4214.0	1382.8		40′	5039.5	1900.9	
50′	3499.7	984.3		50′	4226.8	1390.4		50′	5054.3	1910.7	
63°	3511.1	990.2	10° C.	73°	4239.7	1398.0	10° C.	83°	5069.2	1920.5	10° C.
10′	3522.6	996.2	T	10′	4252.6	1405.7	T	10′	5084.0	1930.4	T
20′	3534.1	1002.3	.51	20′	4265.6	1413.5	.61	20′	5099.0	1940.3	.72
30′	3545.6	1008.3	E	30′	4278.5	1421.2	E	30′	5113.9	1950.3	E
40′	3557.2	1014.4	.159	40′	4291.5	1429.0	.220	40′	5128.9	1960.2	.299
50′	3568.7	1020.5		50′	4304.6	1436.8		50′	5143.9	1970.3	
64°	3580.3	1026.6		74°	4317.6	1444.6		84°	5159.0	1980.4	
10′	3591.9	1032.8		10′	4330.7	1452.5		10′	5174.1	1990.5	
20′	3603.5	1039.0		20′	4343.8	1460.4		20′	5189.3	2000.6	
30′	3615.1	1045.2		30′	4356.9	1468.4		30′	5204.4	2010.8	
40′	3626.8	1051.4		40′	4370.1	1476.4		40′	5219.7	2021.1	
50′	3638.5	1057.7	15° C.	50′	4383.3	1484.4	15° C.	50′	5234.9	2031.4	15° C.
65°	3650.2	1063.9	T	75°	4396.5	1492.4	T	85°	5250.3	2041.7	T
10′	3661.9	1070.2	.76	10′	4409.8	1500.5	.91	10′	5265.6	2052.1	1.09
20′	3673.7	1076.6	E	20′	4423.1	1508.6	E	20′	5281.0	2062.5	E
30′	3685.4	1082.9	.240	30′	4436.4	1516.7	.332	30′	5296.4	2073.0	.450
40′	3697.2	1089.3		40′	4449.7	1524.9		40′	5311.9	2083.5	
50′	3709.0	1095.7		50′	4463.1	1533.1		50′	5327.4	2094.1	
66°	3720.9	1102.2		76°	4476.5	1541.4		86°	5343.0	2104.7	
10′	3732.7	1108.6		10′	4489.9	1549.7		10′	5358.6	2115.3	
20′	3744.6	1115.1		20′	4503.4	1558.0		20′	5374.2	2126.0	
30′	3756.5	1121.7		30′	4516.9	1566.3		30′	5389.9	2136.7	
40′	3768.5	1128.2	20° C.	40′	4530.4	1574.7	20° C.	40′	5405.6	2147.5	20° C.
50′	3780.4	1134.8	T	50′	4544.0	1583.1	T	50′	5421.4	2158.4	T
			1.02				1.22				1.45
67°	3792.4	1141.4	E	77°	4557.6	1591.6	E	87°	5437.2	2169.2	E
10′	3804.4	1148.0	.321	10′	4571.2	1600.1	.445	10′	5453.1	2180.2	.603
20′	3816.4	1154.7		20′	4584.8	1608.6		20′	5469.0	2191.1	
30′	3828.4	1161.3		30′	4598.5	1617.1		30′	5484.9	2202.2	
40′	3840.5	1168.1		40′	4612.2	1625.7		40′	5500.9	2213.2	
50	3852.6	1174.8		50′	4626.0	1634.4		50′	5517.0	2224.3	
68°	3864.7	1181.6		78°	4639.8	1643.0		88°	5533.1	2235.5	
10′	3876.8	1188.4		10	4653.6	1651.7		10′	5549.2	2246.7	
20′	3889.0	1195.2	25° C.	20′	4667.4	1660.5	25° C.	20′	5565.4	2258.0	25° C
30	3901.2	1202.0	T	30′	4681.3	1669.2	T	30′	5581.6	2269.3	T
40′	3913.4	1208.9	1.28	40′	4695.2	1678.1	1.53	40′	5597.8	2280.6	1.83
50′	3925.6	1215.8	E	50′	4709.2	1686.9	E	50′	5614.2	2292.0	E
69°	3937.9	1222.7	.403	79°	4723.2	1695.8	.558	89°	5630.5	2303.5	.756
10′	3950.2	1229.7		10′	4737.2	1704.7		10′	5646.9	2315.0	
20′	3962.5	1236.7		20′	4751.2	1713.7		20′	5663.4	2326.6	
30′	3974.8	1243.7		30′	4765.3	1722.7		30	5679.9	2338.2	
40′	3987.2	1250.8		40′	4779.4	1731.7		40′	5696.4	2349.8	
50′	3999.5	1257.9		50′	4793.6	1740.8		50′	5713.0	2361.5	
70°	4011.9	1265.0	30° C.	80°	4807.7	1749.9	30° C.	90°	5729.7	2373.3	30° C.
10′	4024.4	1272.1	T	10′	4822.0	1759.0	T	10′	5746.3	2385.1	T
20′	4036.8	1279.3	1.54	20	4836.2	1768.2	1.84	20′	5763.1	2397.0	2.20
30′	4049.3	1286.5	E	30′	4850.5	1777.4	E	30′	5779.9	2408.9	E
40′	4061.8	1293.6	.485	40′	4864.8	1786.7	.671	40′	5796.7	2420.9	.910
50′	4074.4	1300.9		50′	4879.2	1796.0		50′	5813.6	2432.9	

T = R tan ½ I E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9	+	101°	6950.6	3278.1	+	111°	8336.7	4386.1	+
10′	5847.5	2457.1	5° C.	10′	6971.3	3294.1	5° C.	10′	8362.7	4407.6	5° C.
20′	5864.6	2469.3	T	20′	6992.0	3310.1	T	20′	8388.9	4429.2	T
30′	5881.7	2481.5	.43	30′	7012.7	3326.1	.51	30′	8415.1	4450.9	.62
40′	5898.8	2493.8	E	40′	7033.6	3342.3	E	40′	8441.5	4472.7	E
50′	5916.0	2506.1		50′	7054.5	3358.5		50′	8468.0	4494.6	
92°	5933.2	2518.5	.200	102°	7075.5	3374.9	.268	112°	8494.6	4516.6	.360
10′	5950.5	2531.0		10′	7096.6	3391.2		10′	8521.3	4538.8	
20′	5967.9	2543.5		20′	7117.8	3407.7		20′	8548.1	4561.1	
30′	5985.3	2556.0		30′	7139.0	3424.3		30′	8575.0	4583.4	
40′	6002.7	2568.6		40′	7160.3	3440.9		40′	8602.1	4606.0	
50′	6020.2	2581.3		50′	7181.7	3457.6		50′	8629.3	4628.6	
93°	6037.8	2594.0	10° C.	103°	7203.2	3474.4	10° C.	113°	8656.6	4651.3	10° C.
10′	6055.4	2606.8	T	10′	7224.7	3491.3	T	10′	8684.0	4674.2	T
20′	6073.1	2619.7	.86	20′	7246.3	3508.2	.103	20′	8711.5	4697.2	1.25
30′	6090.8	2632.6	E	30′	7268.0	3525.2	E	30′	8739.2	4720.3	E
40′	6108.6	2645.5	.401	40′	7289.8	3542.4	.536	40′	8767.0	4743.6	.721
50′	6126.4	2658.5		50′	7311.7	3559.6		50′	8794.9	4766.9	
94°	6144.3	2671.6		104°	7333.6	3576.8		114°	8822.9	4790.4	
10′	6162.2	2684.7		10′	7355.6	3594.1		10′	8851.0	4814.1	
20′	6180.2	2697.9		20′	7377.8	3611.7		20′	8879.3	4837.8	
30′	6198.3	2711.2		30′	7399.9	3629.2		30′	8907.7	4861.7	
40′	6216.4	2724.5		40′	7422.2	3646.8		40′	8936.3	4885.7	
50′	6234.6	2737.9	15° C.	50′	7444.6	3664.5	15° C.	50′	8965.0	4909.9	15° C.
95°	6252.8	2751.3	T	105°	7467.0	3682.3	T	115°	8993.8	4934.1	T
10′	6271.1	2764.8	1.30	10′	7489.6	3700.2	1.56	10′	9022.7	4958.6	1.93
20′	6289.4	2778.3	E	20′	7512.2	3718.2	E	20′	9051.7	4983.1	E
30′	6307.9	2792.0	.604	30′	7534.9	3736.2	.806	30′	9080.9	5007.8	1.09
40′	6326.3	2805.6		40′	7557.7	3754.4		40′	9110.3	5032.6	
50′	6344.8	2819.4		50′	7580.5	3772.6		50′	9139.8	5057.6	
96°	6363.4	2833.2		106°	7603.5	3791.0		116°	9169.4	5082.7	
10′	6382.1	2847.0		10′	7626.6	3809.4		10′	9199.1	5107.9	
20′	6400.8	2861.0		20′	7649.7	3827.9		20′	9229.0	5133.3	
30′	6419.5	2875.0		30′	7672.9	3846.5		30′	9259.0	5158.8	
40′	6438.4	2889.0	20° C.	40′	7696.3	3865.2	20° C.	40′	9289.2	5184.5	20° C.
50′	6457.3	2903.1	T	50′	7719.7	3884.0	T	50′	9319.5	5210.3	T
			1.74				2.08				2.52
97°	6476.2	2917.3	E	107°	7743.2	3902.9	E	117°	9349.9	5236.2	E
10′	6495.2	2931.6	.809	10′	7766.8	3921.9	1.08	10′	9380.5	5262.3	1.46
20′	6514.3	2945.9		20′	7790.5	3940.9		20′	9411.3	5288.6	
30′	6533.4	2960.3		30′	7814.3	3960.1		30′	9442.2	5315.0	
40′	6552.6	2974.7		40′	7838.1	3979.4		40′	9473.2	5341.5	
50′	6571.9	2989.2		50′	7862.1	3998.7		50′	9504.4	5368.2	
98°	6591.2	3003.8		108°	7886.2	4018.2		118°	9535.7	5395.1	
10′	6610.6	3018.4		10′	7910.4	4037.8		10′	9567.2	5422.1	
20′	6630.1	3033.1	25° C.	20′	7934.6	4057.4	25° C.	20′	9598.9	5449.2	25° C.
30′	6649.6	3047.9	T	30′	7959.0	4077.2	T	30′	9630.7	5476.5	T
40′	6669.2	3062.8	2.18	40′	7983.5	4097.1	2.61	40′	9662.6	5504.0	3.16
50′	6688.8	3077.7	E	50′	8008.0	4117.0	E	50′	9694.7	5531.7	E
99°	6708.6	3092.7	1.02	109°	8032.7	4137.1	1.36	119°	9727.0	5559.4	1.83
10′	6728.4	3107.7		10′	8057.4	4157.3		10′	9759.4	5587.4	
20′	6748.2	3122.9		20′	8082.3	4177.5		20′	9792.0	5615.5	
30′	6768.1	3138.1		30′	8107.3	4197.9		30′	9824.8	5643.8	
40′	6788.1	3153.3		40′	8132.3	4218.4		40′	9857.7	5672.3	
50′	6808.2	3168.7		50′	8157.5	4239.0		50′	9890.8	5700.9	
100°	6828.3	3184.1	30° C.	110°	8182.8	4250.7	30° C.	120°	9924.0	5729.7	30° C.
10′	6848.5	3199.6	T	10′	8208.2	4280.5	T	10′	9957.5	5758.6	T
20′	6868.8	3215.1	2.62	20′	8233.7	4301.4	3.14	20′	9991.0	5787.7	3.81
30′	6889.2	3230.8	E	30′	8259.3	4322.4	E	30′	10025.0	5817.0	E
40′	6909.6	3246.5		40′	8285.0	4343.6		40′	10059.0	5846.5	
50′	6930.1	3262.3	1.22	50′	8310.8	4364.8	1.63	50′	10093.0	5876.1	2.20

T = R tan ½ I E = R exsec ½ I

TABLE X.

MIDDLE ORDINATES OF RAILS

Length of Rail (feet)

C ° ′	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch	C °	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch
0-20	17189	.08	.07	.06	.05	.04	.03	8	716.8	1.88	1.64	1.42	1.20	1.01	.84
0-40	8594	.16	.14	.12	.10	.08	.07	9	637 3	2.12	1.84	1.60	1.35	1.14	.94
1-0	5730	.24	.20	.18	.15	.13	.10	10	573 7	2.36	2.05	1.78	1.50	1.27	1.04
1-20	4297	.31	.27	.23	.20	.17	.13	11	521 7	2.59	2.26	1.95	1.65	1.39	1.15
1-40	3438	.39	.34	.29	.25	.21	.17	12	478.3	3.83	2.47	2.15	1.81	1.54	1.26
2-0	2865	.47	.41	.35	.30	.25	.20	13	441.7	3.05	2.66	2.30	1.96	1.66	1.36
2-20	2456	.55	.48	.41	.35	.29	.23	14	410.3	3.30	2.87	2.48	2.10	1.78	1.46
2-40	2149	.63	.55	.47	.40	.33	.27	15	383.1	3.54	3.08	2.68	2.26	1.91	1.57
3-0	1910	.71	.62	.53	.45	.38	.31	16	359.3	3.76	3.28	2.83	2.40	2.04	1.67
3-20	1719	.78	.68	.59	.50	.42	.35	17	338.3	4.00	3.48	3.02	2.57	2.16	1.78
3-40	1563	.86	.75	.65	.55	.46	.38	18	319.6	4.21	3.67	3.18	2.70	2.28	1.87
4-0	1433	.94	.82	.71	.60	.50	.42	19	302.9	4.45	3.89	3.36	2.86	2.41	1.98
4-20	1323	1.02	.89	.77	.65	.55	.45	20	287.9	4.70	4.09	3.55	3.00	2.54	2.09
4-40	1228	1.10	.96	.83	.70	.59	.48	22	262.0	5.16	4.44	3.84	3.30	2.80	2.29
5	1146	1.18	1.03	.89	.75	.63	.52	24	240.5	5.64	4.92	4.20	3.59	3.04	2.50
6	955.3	1.41	1.23	1.06	.90	.76	.62	26	222.3	6.07	5.29	4.58	3.88	3.29	2.70
7	819.0	1.65	1.44	1.24	1.05	.89	.73								

TABLE XI.

SHORT RADIUS CURVES

Radius Feet	Chord Feet	Central Angle	Deflection Angle	Deflection for 1 Foot
35	10	16-26	8-13	49.3
45	10	12-46	6-23	38.3
50	15	17-16	8-38	34.5
60	15	14-22	7-11	28.8
75	15	11-30	5-45	23.0
100	20	11-30	5-45	17.3
120	20	9-34	4-47	14.3
150	20	7-39	3-49	11.5
190	25	7-32	3-46	9.15
200	25	7-10	3-35	8.6
225	25	6-25	3-12	7.7
240	25	5-58	2-59	7.2
250	25	5-44	2-52	6.9
275	25	5-12	2-36	6.2
288	50	9-58	4-59	6.0
300	50	9-32	4-46	5.7
350	50	8-12	4-06	4.9
376	50	7-40	3-50	4.6
400	50	7-10	3-35	4.3
410	50	7-00	3-30	4.2

To find length of curve divide angle from P. C. to P. T. by central angle of chord, and multiply by length of chord.

TABLE XII.

INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

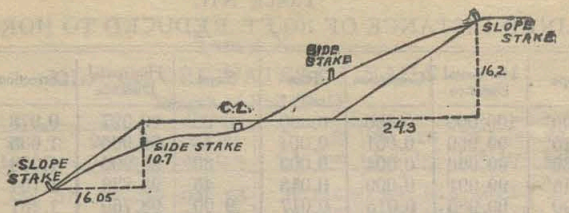
Slope	Horizontal Distance	Correction	Rise	Slope	Horizontal Distance	Correction	Rise
0°00′	100.000	0.000	0.000	8°00′	99.027	0.973	0.139
15′	99.999	0.001	0.004	15′	98.965	1.035	0.143
30′	99.996	0.004	0.009	30′	98.902	1.098	0.148
45′	99.991	0.009	0.013	45′	98.836	1.164	0.152
1 00	99.985	0.015	0.017	9 00	98.769	1.231	0.156
15	99.976	0.024	0.022	15	98.700	1.300	0.161
30	99.966	0.034	0.026	30	98.629	1.371	0.165
45	99.953	0.047	0.031	45	98.556	1.444	0.169
2 00	99.939	0.061	0.035	10 00	98.481	1.519	0.174
15	99.923	0.077	0.039	15	98.404	1.596	0.178
30	99.905	0.095	0.044	30	98.325	1.675	0.182
45	99.885	0.115	0.048	45	98.245	1.755	0.187
3 00	99.863	0.137	0.052	11 00	98.163	1.837	0.191
15	99.839	0.161	0.057	15	98.079	1.921	0.195
30	99.813	0.187	0.061	30	97.992	2.008	0.199
45	99.786	0.214	0.065	45	97.905	2.095	0.204
4 00	99.756	0.244	0.070	12 00	97.815	2.185	0.208
15	99.725	0.275	0.074	15	97.723	2.277	0.213
30	99.692	0.308	0.078	30	97.630	2.370	0.216
45	99.657	0.343	0.083	45	97.534	2.466	0.221
5 00	99.619	0.381	0.087	13 00	97.437	2.563	0.225
15	99.580	0.420	0.092	15	97.338	2.662	0.229
30	99.540	0.460	0.096	30	97.237	2.763	0.233
45	99.497	0.503	0.100	45	97.134	2.866	0.238
6 00	99.452	0.548	0.105	14 00	97.030	2.970	0.242
15	99.406	0.594	0.109	15	96.923	3.077	0.246
30	99.357	0.643	0.113	30	96.815	3.185	0.250
45	99.307	0.693	0.118	45	96.705	3.295	0.255
7 00	99.255	0.745	0.122	15 00	96.593	3.407	0.259
15	99.200	0.800	0.126	15	96.479	3.521	0.263
30	99.144	0.856	0.131	30	96.363	3.637	0.267
45	99.087	0.913	0.135	45	96.246	3.754	0.271

For each foot take one one-hundredth of each reading.

TABLE XIII.

MINUTES IN DECIMALS OF A DEGREE.

0 30″	.00833	10′30″	.17500	20′30″	.34167	30′10″	.50833	40′30″	.67500	50′10″	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	13 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	33 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000



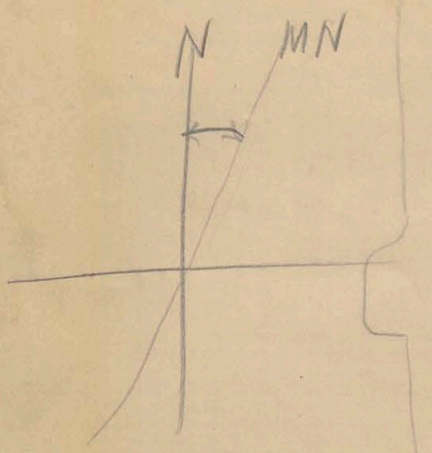
DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1½ TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	0
1	1.50	1 65	1 80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	1
2	3.00	3.15	3.30	3 45	3.60	3 75	3.90	4.05	4.20	4 35	2
3	4.50	4 65	4.80	4.95	5 10	5 25	5 40	5.55	5.70	5.85	3
4	6.00	6 15	6.30	6.45	6.60	6.75	6.90	7.05	7.20	7.35	4
5	7 50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	5
6	9 00	9 15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35	6
7	10.50	10 65	10.80	10.95	11.10	11.25	11.40	11.55	11 70	11.85	7
8	12.00	12 15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	8
9	13 50	13 65	13 80	13 95	14.10	14.25	14.40	14 55	14.70	14.85	9
10	15.00	15 15	15 30	15 45	15.60	15.75	15.90	16.05	16.20	16 35	10
11	16 50	16 65	16 80	16.95	17 10	17.25	17.40	17.55	17.70	17.85	11
12	18 00	18.15	18.30	18 45	18.60	18 75	18.90	19.05	19.20	19 35	12
13	19 50	19 65	19.80	19.95	20.10	20.25	20 40	20.55	20.70	20.85	13
14	21.00	21 15	21.30	21.45	21 60	21.75	21.90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24 15	24 30	24 45	24.60	24.75	24 90	25 05	25.20	25.35	16
17	25.50	25 65	25.80	25 95	26.10	26 25	26 40	26.55	26.70	26.85	17
18	27.00	27 15	27.30	27 45	27.60	27.75	27.90	28.05	28 20	28.35	18
19	28 50	28 65	28 80	28.95	29.10	29.25	29 40	29.55	29.70	29.85	19
20	30 00	30 15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31 50	31 65	31.80	31.95	32 10	32 25	32.40	32.55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33.60	33 75	33.90	34.05	34.20	34.35	22
23	34 50	34 65	34.80	34.95	35.10	35 25	35 40	35.55	35.70	35 85	23
24	36.00	36 15	36.30	36 45	36.60	36.75	36.90	37.05	37 20	37.35	24
25	37.50	37.65	37 80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39 00	39 15	39.30	39 45	39 60	39.75	39.90	40.05	40.20	40.35	26
27	40 50	40 65	40 80	40.95	41.10	41.25	41 40	41.55	41.70	41.85	27
28	42 00	42 15	42.30	42.45	42.60	42 75	42.90	43.05	43.20	43.35	28
29	43 50	43 65	43.80	43 95	44.10	44 25	44 40	44.55	44.70	44 85	29
30	45 00	45 15	45.30	45 45	45.60	45.75	45 90	46.05	46 20	46.35	30
31	46.50	46.65	46.80	46 95	47.10	47.25	47.40	47.55	47 70	47.85	31
32	48 00	48.15	48.30	48 45	48.60	48 75	48.90	49.05	49 20	49.35	32
33	49.50	49 65	49.80	49.95	50.10	50.25	50.40	50.55	50 70	50.85	33
34	51 00	51.15	51.30	51.45	51.60	51.75	51 90	52.05	52.20	52.35	34
35	52 50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54 00	54 15	54.30	54 45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55 50	55 65	55.80	55 95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57 00	57.15	57 30	57 45	57.60	57 75	57.90	58.05	58.20	58 35	38
39	58 50	58.65	58 80	58 95	59.10	59 25	59.40	59 55	59.70	59.85	39
40	60 00	60 15	60 30	60 45	60 60	60.75	60 90	61.05	61 20	61.35	40
41	61.50	61 65	61 80	61 95	62 10	62 25	62.40	62 55	62 70	62.85	41
42	63 00	63.15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64.35	42
43	64.50	64 65	64 80	64.95	65.10	65 25	65 40	65.55	65.70	65.85	43
44	66 00	66 15	66 30	66.45	66.60	66.75	66.90	67.05	67.20	67.35	44
45	67 50	67 65	67 80	67 95	68.10	68.25	68.40	68.55	68.70	68.85	45
46	69 00	69 15	69 30	69.45	69.60	69 75	69.90	70.05	70.20	70.35	46
47	70 50	70 65	70 80	70 95	71.10	71.25	71 40	71.55	71.70	71.85	47
48	72.00	72 15	72.30	72.45	72.60	72.75	72.90	73 05	73.20	73 35	48
49	73 50	73 65	73.80	73.95	74.10	74.25	74.40	74.55	74.70	74.85	49
50	75.00	75 15	75.30	75.45	75.60	75.75	75.90	76.05	76.20	76.35	50

Computed by L. Leland Locke.

Walter Monroe



$$31 \overline{)\,8.5\;6\;2\;3\;0}\;\;27$$

Marlett's Lane

1921-22 15¢

Pink Sheets

WYSELL-WILLIAMS CO.

REGD. U.S. PAT. OFF.

No. 702C

MADE BY
THE WYSELL-RE LIMS CO.
32 Clay St. and
SAN FRANCISCO, CAL.

Habits of a Man of Business

A sacred regard to the principles of justice forms the basis of every transaction, and regulates the conduct of the upright man of business.

He is strict in keeping his engagements.

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COMPILED BY THE
MYSELL-ROLLINS COMPANY
STATIONERY MANUFACTURERS

OK

Utah Lake

Courses I & II.

March 30, 1922

Mean summer stage at S end of Lake
7' 4"

Course # I.

No.	Depth.	Core	Water Equivalent.	
1	90	93.5	37.8	
2	86	85.6	31.5	= 36.6% dens.
3	87.8	79.6	32.3	
4	83	82.5	31.0	
5	76.5	73.5	29.0	Dry Grass
6	73.5	72.5	26.9	Dirty snow
7	71.0	68	26.5	
8	72.5	70.5	28	Dry grass
9	72	68	27.3	
10	73.5	71.3	27.8	" "
		765.0	298.4	

No.	Depth.	Core	Water.	Remark.
11	81	80	30.1 (29.8)	
12	87	84.5	33.2	
13	93.5	89	36.5	
14	91.0	89.5	36.8	
15	87.0	84.0	34.0	
16	84.0	79.5	30.5	
17	90.0	86.7	33.5	Wet grass.
18	82.0	75.0	[32.3 (core lost)	
	83.9	83.2	32.2	
19	84.0	81.5	32.0	
20.	72.0	71.5	28.2	

20) 1639.2 (82.0

(24.5 ÷ 20 = 31.23

av. 14-2 = 33.0

Course II.

No.	Depth.	Core	Water	Remarks.
1	86"	85.5	31.5	Dry dirt
2	75.0	75	28.8	
3	96.5	95.5	38.9	
4	93.5	92.5	36.5	
5	88	87.5	33.8	grass
6	93.5	92	34.8	Real dry
			204.3	

NO.	Depth.	Core	Date. 20413	Remarks.
7	92.6	92.1	37	Ice and dirt
8	94.5	94.5	36.9	
9	88.4	86.5	35.0	Wet, leaves - ice
10	85.8	82.9	33.0	Moist dirt
11	97.5	96.8	36.7	" "

11) 990.8
90.0

Av. 1+2
86.0 33.06

382.9
÷11 = 34.81

27' from blazed tamarack

not melting to any extent. all dirt at bottom just damp.

W.P.C.

Marlette Lake.

Courses I & II.

1922

April 30 1922

Course #I.

No.	Depth.	Core	Water	Remarks.
1	69	65	32.5	
2	67	67	32	
3	67	66	32	water soaked dirt
4	63	59.5	29.8	
5	59	51	27	
6	53	50.5	24	
7	50.5	38	19	
8	52	40	22.5	
9	53.5	38 5	19	Dirt
10	54.5	54	55	

No.	Depth.	Core	Water	Remarks.
11	62.5	60	30	
12	68	67	32.5	
13	76	74.5	37	
14	70.5	67	33.5	
15	70	68	31.5	
16	71	64	34	
17	71	60	33	
18	64	61	32.5	
19	62	60	31	
~~21~~				
20	62 / 1265.5	56	18.5 / 20) 586.3 / 29.32	

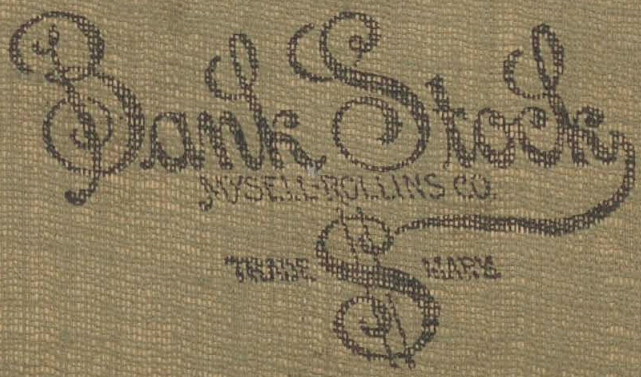
Av. 63.3.

Course # H.

No.	Depth.	Water	Core	Remarks.
1	65	29.5	65	
2	56	25.5	56	wet leaves
3	73	35	69	
4	72.5	31.5	71.5	wet leaves
5	57	26	56	
6	71	31.5	64	wet dirt
7	71.5	34	71.0	
8	73.5	33	71.0	
8	72.5	30.5	61.5	
9	68	30	64.5	
10	63.5	30	62.5	wet leaves
11	75	35	73.5	" "
	741	341		
	av. 67.8	31.0		av. 1+2 = 30.16 = 132.0%

av 1+2 - 65.64
Loss 46.0%

Marlette Lake
1921



No. 700

MADE BY
THE MYSELL-ROLLINS CO.
37 Clay Street
SAN FRANCISCO, CAL.

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COMPILED BY THE

MYSELL-ROLLINS COMPANY

STATIONERY MANUFACTURERS

OK

Marlette Lumber Survey. ~~Card~~

~~April~~

Sunday, May 1, 1921

(V)

Course I

No.	Depth.	Core.	Water Cont.	Remarks.
1	34.5	32.5	17.9	
2	39.5	38	18.1	
3	36.5	34.5	18	Core slipped a half an inch - Dirt
	35.7	35.4	18.1	Seance.
4	24.5	23.2	11.9	
5	26.6	23.2	11	
6	16.2	15.2	7.9	
7	15.8	15.6	7.1	
8	19.6	17.9	8.2	
9	18.9	16.9	7.3	
			125.5	

No.	Depth.	Core	Water Cont.	Remarks.
10	24.2	23.2	11.3	Dirt
11	30.5	29.8	14.9	
12	35.2	33.7	17.1	
13	52.8	46.3	25.9	Water - small creek in [illegible]
	53.1	46.8	26	
14	36.6	32.6	17.5	
	36.8	34.7	17	
15	32.7	30.7	15	
16	30.8	29.3	14.8	
17	36	29.3	14.9	Wet dirt + creek bottom
	31	25.5	13.2	
	31	29.9	14	Good + no dirt
18	29.6	28.2	13.8	

No.	Depth.	Core	Water Cont.
19	30	24	12
	29	28	12.2
20	28.5	24.5	13.5
	32.1	26.2	13.1
	30.2	25.2	15
21	599.2	20)	295.6
	29.96		14.78 in.
	=30.0		
22			
		20)	280
			14,00
23			
24			
25			

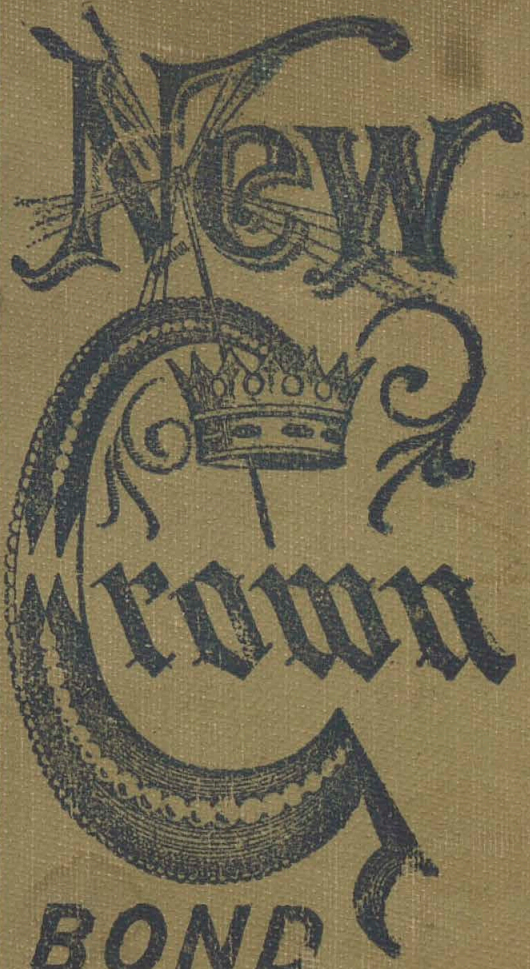
Remarks.

At side of log.
2 ft N.W. of last meas.

4 ft S.E. of last meas. } Hollow underneath
3 ft N of first " " }

Tahoe South

BLUE STOCK



Memorandum

Daggetts Pass
March 27. 1923

No.	Depth	Core	W. Q.	Remarks
1	34	30	13.5	
2	33	32	13.	
3	46	44	18.5	
4	34	32	13.5	
5	28	26	11.	
6	35	32.5	14.	
7	30	29	14.	
8	40.	39.	17.	
9	48.	46.	17.5	
10	36	34.5	15.5	
11	50.	49.	20.5	
12	47.	46.	18.5	
	461		186.5	

No.	D.	C.	W.C.	Remarks
13	37.	34.5	12.8	
14	36.	27.	13.	
15	19.	16.	7.5	
16	46.	42.	18.	
17	43.	33.	14.	
18	53.	52.5	20.	
19	56.	55.5	22.	
20	27.	26.5	10.5	
21	15.	15.	6.	
22	20.	17.5	6.8	
23	29.	28.	11.	
24	29.	28.	13.	
25	21.	19.5	8.	
26	16.	13.	6.5	
	447		169.1	

No.	D.	C.	W.C.	Remarks
27	50.	47.	20.5	
28	44.	42.5	18.	
29	28.	28.	11.	
30	30.	28.	12.	
31	36.	34.	15.	
32	47.	46.	18.	
33	25.	22.5	8.	
34	43.	40.	17.	
35	43.	42.5	15.	
36	54.	53.	20.5	
37	53.	52.	20.	
38	39.	36.	15.5	
39	37.	35.5	16.5	
40	37.	36.	16.5	
	566		223.5	

223.5
169.1
186.5

40 | 579.1 | 14.47
40
179
160
191
160
310
240
300

566
447
461

40 | 474 | 36.85
120
274
240
340
320
200

Average

D. C. W.C.

36.85 14.47 = 83.4

Density 39.26%

Freel Peak
Mar. 28. 1923
Course No. 1

No.	D.	C.	W.C.	Remarks
1	43	38.	18.	
2	40	37.	18.	
3	40.	38.5	18.	
4	38.	37.5	17.8	
5	35.	33.	17.	
6	39.5	38.5	18.	
7	39.	38.5	18.	
8	38.	36.5	17.2	
9	29.	27.	12.8	
10	40.	36.5	17.8	
11	38.	37.	17.5	
	419.5		190.1	

Hagan's Meadows.

No.	D.	C.	W.C.	Remarks
12	39.	37.5	18.2	
13	42.	40.5	19.	
14	35.	31.	14.5	
15	51.	48.5	20.5	
16	44.5	41.	18.3	
17	36.	33.5	16.	
18	35.	24.	12.	
19	28.	26.	12.5	
20	17.	14.	5.5	
	327.5		136.5	
	419.5		190.1	
	747.0		326.6	

Average

37.35 16.33

Hagans Meadows
Course #2

Mar. 28, 1923

No.	D.	C.	W.C.
1	40.	36.	19.
2	30.	25.	12.3
3	28.	27.	13.
4	36.	26.	11.
5	48.	42.	20.
6	41.	38.	16.8
7	19.	18.5	7.5
8	38.	35.	18.
9	47.5	44.	20.5
10	42.	39.	18.
11	43.	42.	20.
12	45.	40.5	20.8
	457.5		196.9

No.	D.	C.	W.C.
13	46.	42.	20.
14	44.	41.	19.5
15	33.	28.	13.2
16	48.	43.5	22.
17	45.	41.	20.
18	46.	42.5	20.
19	46.	43.	19.5
20	41.5	31.	14.2
	349.5		148.4
	457.5		196.9
	807.0	(20)	345.3
	8	Av.	17.2

Review → 20) 807.0 Average
40.35

35.35
37 35
72.70
36.35 38.85

17.26
16.33
33.59
16.79

Quality 46.1%
43.2
= 84.3%

37.35
20 | 747.
60
147
140
70
60
100
35

35
20 | 707.0
60
107
100
70
60
100

16.33
20 | 326.6
20
126
120
66
60
6.

17.26
20 | 345.3
20
145
140
53
40
13.

Lake Lucile
March 30. 1923

No.	D.	C.	W.C.	Remarks
1.	89.	88.	38.5	
2	74.	73,	34.	
3	103.	101.	48.5	
4	92.	91.	40.5	
5	103.	98.	47.	
6	91.	89.	41.8.	
7	96.	95.	42.2	
8	91.	88.	41.	x
9	106.	104.	48,5	
10	128.	120.5	60,	x
11	125.	120.	57.3	
12	127.5	126.5	55.5	x
	1225.5		554.8	

No.	D.	C.	W.C.	Remarks
13	108.5	102.	49.	
14	103.5	103.	46.	
15	116.	115.	54.	
16	117.	116.	55.	
17	114.	113.	52.	
18	113.	108.5	54.	
19	128.	126.5	56.8	
20	115.	113.	53.5	
21	122.5	122.	56.5	
22	133.	127.	67.5	
23	94.	91.	42.	
24	116	113.5	51.	
25	94.5	89.	43.	
26	105.	104.	50	
	1580.0		736.3	

No.	D.	C.	W.C.	
27	84	83.5	40	
28	86	85.-	41	
29	10.3	101.5	46.5	
30	117.5	117.5	52.5	
31	114.5	113.-	53.5	
32	120.	115.	57.-	
33	112.5	111.5	51.-	
34	113.-	111.-	50.5	X
35	128.	126.-	59.-	
36	100.5	196	48.5	
37	96.-	94.5	46.5	
	1175.0		546.0	
	Average			
	107.68		49.49	=103.5
	Density 46%			

X At old dead tree mouth three logs

11.75.—
15·80.—
12.25.5

37 | 3980.5 | 107.58
37×
280
259
215
185
300
296
4
0

49.49
546
730.3
554.8

37 | 1831.1
148
357
333
181
148
330
296
34

10758 | 49490 | 46.003
43032
64580
64548
32000

Daggetts Pass

wch 31

1928

No	Depth	Core	Weight
1	6	5	1.5
2	7½	5½	1.5
3	12	7½	2.5
4	11	9.5	2
5	14	11.5	5
6	11	8	2.5
7	14	13	4.5
8	5	4	1
9	19	15	6
10	10	8	3
11	24	17	8
12	20	14	5
13	11	10.5	3.5
14	6.5	6	2
			48.0

No	Depth	Core	Weight
15	6	5	1.5
16	22	15.5	8
17	24	17	7.5
18	35	25	10.5
19	9.5	8	2.5
20	7.5	~~8~~ 4	1.5
21	4	2.5	1
22	10	8	2
23	13	11	5
24	9.5	8	2
25	4.5	3	1.5
26	9.5	8	3
27	15	13	5.5
28	20	16	7.
			58.5

Daggetts (continued)

No	Depth	Core	Weight
29	8	7	2
30	4	3	1
31	14	13	6
32	32	23	11.5
33	11	8	5
34	29	21	10
35	10	10	4
36	30	21	10.5
37	17	14.5	6
38	25	19	~~9~~
38	540.5		65.0
	14.22		58.5
			48
			121.5
			4.5
			38 | 121.5 | 4.5
			150
			19.50
			19.0
			150
			4.5

131.7 average

14.2 \| 4.5
426
240
142
980

Hagens Meadows
Course #2
1928

no	Depth	Core	Weight
1	36	13	8
2			5
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

No	Depth	Core	Weight
13	12.5	Snow stuck	
14			
15			
16			
17			
18			
19			
20			

Hagans Meadows
Course #1 1928
April

1	24	11	5.5
2			
3	40		4.5
4	38	16	10
5	40	15	10.5
6	40	13	9
7	42	11	8.5
8	39	7	5
9			
10	✓		✓

7 | 263.00
37.57 ✓

7 | 53.00
7.57 ✓

37.57 | 7.57 | 20.
514
5600

LAKE LUCILLE.

1928 April 4

No	Depth	Core	Weight
1	125	Snow stuck	
2	106	84	34.5
3	113		
4	113		
5	97	45	27
6	136	120?	49
7	132		
8	146		
9	148	110	50.5
10	157	149	54
11	159	156	55.5
12	145	112	47
	1575		317.5 / 110.5 / 428 0