

Notes

Electrolysis Surveys

FIELD BOOK

No. 400

W70

EUGENE DIETZGEN CO.,

Drawing Materials and Surveying Instruments.

NEW YORK.

CHICAGO.

SAN FRANCISCO.

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING
ROADWAY 20 FEET WIDE. SIDE SLOPES 1 TO 1.
FOR SINGLE TRACK EXCAVATION.

Copyright, 1902. No. 39340.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	0
1	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	1
2	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	2
3	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	3
4	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	4
5	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	5
6	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	6
7	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	7
8	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	8
9	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	9
10	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	10
11	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	11
12	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	12
13	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	13
14	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	14
15	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	15
16	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	16
17	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	17
18	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	18
19	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	19
20	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	20
21	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	21
22	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	22
23	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	23
24	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	24
25	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	25
26	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	26
27	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	27
28	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	28
29	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	29
30	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	30
31	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	31
32	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	32
33	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	33
34	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	34
35	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	35
36	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	36
37	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	37
38	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	38
39	49.0	49.1	49.2	49.3	49.4	49.5	49.6	49.7	49.8	49.9	39
40	50.0	50.1	50.2	50.3	50.4	50.5	50.6	50.7	50.8	50.9	40

Calculated by F. E. Paradis, C. E.

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Potential Survey

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WICKHOLLIER

1

Measurement Made at	Pipe to Rail	P to R when Car pulled	Pipe to Earth	P to E when Car pulled
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Lytton & Rosecrans	-0.3 v	-2.0 v	+0.2 v	+0.3 v
Tide St 300' E Lyt.	-0.2 v	-2.0 v	+0.2 v	+0.25 v
Tide St 800' E Lyt.	-0.2 v	-2.0 v	+0.1 v	+0.2 v
Hancock & Wetherby	-0.4 v	-4.0 v	+0.2 v	+0.4 v
Hancock & Wright	-2.0 v	-4.0 v	+0.2 v	+0.3 v
Hancock & Harastly	-4.0 v	-5.0 v	+0.2 v	+0.3 v
Harney & Conklin	-5.0 v	-11.0 v	+0.2 v	+0.3 v
La-bla Ave & Bordini	-1.0 v	-3.0 v	+0.1 v	+0.2 v
La-bla Ave & Harastly	-1.0 v	-2.0 v	+0.1 v	+0.15 v
India & Winder	-2.0 v	-5.0 v	+0.1 v	+0.2 v
India & Upac	-1.0 v	-5.0 v	+0.2 v	+0.4 v
India & Redwood	-1.0 v	-5.0 v	+0.2 v	+0.3 v
India & Palm	-0.4 v	-3.0 v	+0.2 v	+0.25 v
India & Nutmeg	-1.0 v	-5.0 v	+0.1 v	+0.2 v
Newport & Bacon	-4.0 v	-14.0 v	+0.1 v	+0.2 v
India & Juniper	-0.6 v	-0.3 v	+0.2 v	+0.25 v
Columbia & Ivy	+0.4 v	-4.40 v	-0.2 v	+0.4 v
State & Hawthorne	+1.0 v	-2.0 v	+0.2 v	+0.2 v
State & Elm	+1.0 v	-2.0 v	+0.3 v	+0.3 v
State & Ash	-1.4 v	-0.5 v	+0.3 v	+0.4 v
State & Broadway	+1.7 v	-12.2 v	+0.2 v	+0.3 v
State & E	+1.4 v	+2.3 v	+0.2 v	+0.3 v
State & G	+1.7 v	+2.0 v	+0.2 v	+0.32 v
State & H	+1.9 v	+2.3 v	-0.3 v	-0.42 v

2

Survey

Date	Time	Measurements Repeated	Notes
Apr. 15	10:15 AM		
	10:45 AM		
	11:30 AM		
	1:15 PM		
	2:30 PM		
	3:15 PM		
Apr. 16	9:30 AM		
	10:45 AM		
	11:45 AM		
	1:15 PM		
	1:15 PM		
Apr. 17	9:00 AM		
	10:15 AM		
	11:00 AM		
Apr. 23	11:00 AM		
May 8	10:30 AM		
	11:10 "		
	1:30 PM	Bad joint	
	2:00 "		
	2:30 "		
	3:00 "		
	3:30 "		
	4:00 "		
	4:30 "		

3

Potential

Measurements made at	Pipe to Rail	P to R when Car pulled	Pipe to Earth	P to E when Car pulled
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H & 25	-4.0 V	-14.0 V	+0.42 V	+0.45 V
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H & 18	-4.0 V	-9.0 V	+0.2 V	+0.3 V
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H & 21	-9.0 V	-13.0 V	+0.31 V	+0.31
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H & 16	-2.2 V	-8.0 V	+0.2 V	+0.25 V
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H & 14	-2.4 V	-5.2 V	+0.25 V	+0.1 V
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H & 12	-1.8 V	-6.4 V	+0.15 V	+0.2 V
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H & 10	-1.4 V	-8.2 V	+0.15 V	+0.25 V
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H & 8	-2.8 V	-10.0 V	+0.18 V	+0.2 V
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H & 6	-2.2 V	-4.0 V	+0.15 V	+0.1 V
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H & 4	-0.8 V	-3.2 V	-0.20 V	-0.10 V
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H & 2	-1.0 V	-2.2 V	+0.20 V	+0.35 V
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H & Front	+1.10 V	-0.8 V	-0.20 V	-0.30 V
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H & Columbia	+1.6 V	+2.2 V	-0.25 V	-0.40 V
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H & Arctic	+1.4 V	+2.1 V	-0.60 V	-0.40 V
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H & Atlantic	+1.6 V	+3.2 V	-0.45 V	-0.55 V
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Survey

H. St.

4

Date	Time	Measurements Repeated	Notes
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May 9	10:00 AM		Dry ground
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	11:30 AM		" "
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	11:00 AM		" "
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May 11	10:20 "		" "
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May 12	10:50 "		" "
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" "	11:15 "		" "
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" "	11:45 "		" "
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" "	1:15 "		" "
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" "	1:30 "		" "
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May 15-14	8:00 AM		
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" "	9:30 "		
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" "	10:20 "		
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" "	11:00 "		
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" "	12:15 "		
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" "	1:15 PM		
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5

POTENTIAL

Measurements
made atPipe
to
RailP to R
when
Car pulledPipe
to
EarthP to E
when
Car pulled

Date Time

SURVEY

F Street Line 6

G Street

Measurements
repeated

Notes

Measurements made at	Pipe to Rail	P to R when Car pulled	Pipe to Earth	P to E when Car pulled	Date Time	Measurements repeated	Notes
25" & D	-2.4 v	-4.8 v	+0.25 v	+0.2 v	May 11 11:28 AM		
25" & E	-1.0 v	-4.6 v	+0.1 v	+0.15 v	" " 11:52 "		Dry Ground.
25" & F	-2.8 v	-5.0 v	+0.2 v	+0.2 v	" " 1:15 PM		" "
F & 24	-2.4 v	-4.0 v	+0.15 v	+0.1 v	" " 1:30 "		" "
F & 22	-1.6 v	-5.0 v	+0.18 v	-0.1 v	" " 2:00 "		" "
F & 20	-2.2 v	-4.8 v	+0.2 v	-0.18 v	" " 2:30 "		" "
F & 18	-2.4 v	-6.0 v	+0.2 v	+0.15 v	" " 2:55 "		" "
F & 16	-1.0 v	-6.4 v	+0.1 v	-0.05 v	" " 3:15 "		Regulator Chamber
F & 14	-2.7 v	-6.6 v	+0.25 v	-0.2 v	" " 4:15 "		
F & 12	-0.4 v	-8.0 v	+0.15 v	+0.1 v	" 12 8:30 AM		
F & 10	-2.2 v	-10.0 v	+0.15 v	+0.2 v	" " 9:45 "		
F & 8	-3.1 v	-8.0 v	+0.10 v	+0.2 v	" " 10:00 "		
F & 6	-1.0 v	-4.2 v	+0.2 v	+0.1 v	" " 10:15 "		

G & 15"	+0.20 v	+0.40 v			May 13 11:30 AM		
G & 15"	+0.20 v	+0.30 v			" " 12:45 PM		
G & 16"	+0.25 v	+0.40 v			" " 1:00 "		

Measurements made at	Pipe to Rail	P to R when Car pulled	Pipe to Earth	P to E when Car pulled
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16" J	-1.8 v	-4.2 v	+0.2 v	+0.25 v
16" L	-1.8 v	-4.2 v	+0.2 v	+0.18 v
16" M	-1.6 v	-3.0 v	+0.15 v	+0.18 v
Logan & Sigbee	-3.4 v	-7.8 v	+0.2 v	+0.1 v
Logan & Crosby	-2.4 v	-7.4 v	+0.3 v	+0.25 v
Logan & Dewey	-6.2 v	-9.0 v	+0.25 v	+0.2 v
Logan & Sampson	-5.8 v	-8.2 v	+0.2 v	+0.1 v
Logan & 26"	-2.0 v	-7.8 v	+0.2 v	+0.3 v
National & 27"	-2.4 v	-12.0 v	+0.2 v	+0.1 v
National & 29"	-1.2 v	-12.8 v	+0.25 v	+0.1 v
National & 31"	-2.4 v	-18.4 v	+0.25 v	+0.35 v

16" 5t Line

Date	Time	Measurements Repeated	Notes
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May 12.14	2:30 PM		Dry Ground.
" "	3:00 "		" "
" "	3:30 "		" "
" "	4:00 "		" "
" "	4:30 "		" "
" 13 "	8:00 AM		
" "	9:00 "		
" "	9:45 "		
" "	10:15 "		
" "	11:00 "		
" "	11:30 "		

Measurements made at.	Pipe to Rail	P to R when Car pulled	Pipe to Earth	P to E when Car Pulled
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K & 6"	✓	✓	✓	✓
K 7	✓	✓	✓	✓
K	✓	✓	✓	✓
K	✓	✓	✓	✓
10th	✓	✓	✓	✓
10th	✓	✓	✓	✓

M & 11.	-2.40v	-4.40v	-0.15v	-0.25v	May 21-14	4:45 PM
M & 13	-2.00v	-3.80v	+0.20v	+0.05v	" "	4:00 PM
M & 15	-1.80v	-3.20v	+0.45v	+0.20v	" "	3:00 "
M & 19	-2.2 v	-4.8 v	+0.2 v	+0.25 v	May 13-14	2:30 PM
M & 21	-3.4 v	-5.2 v	+0.2 v	-0.05 v	" "	3:00 "
M & 25	-1.4 v	-4.6 v	+0.5 v	-0.5 v	" "	3:30 "
M & 27	-2.2 v	-5.2 v	+0.5 v	+0.25 v	" "	4:15 "
M & 28	-2.0 v	-5.4 v	+0.2 v	+0.3 v	" "	4:45 "
M & 29	-1.6 v	-4.0 v	+0.2 v	+0.15 v	" 14-14	8:00 AM
M & 31	-2.2 v	-5.2 v	+0.2 v	+0.18 v	" "	9:00 "
M & 33	-1.4 v	-3.8 v	+0.3 v	-0.05 v	" "	10:30 "
M & 35	-1.6 v	-4.2 v	+0.2 v	-0.10 v	" "	11:00 "
M & 36	-1.2 v	-6.8 v	+0.18 v	+0.45 v	" "	12:00 M
M & 38	-1.4 v	-8.0 v	+0.2 v	+0.05 v	" "	1:00 PM
M & 40	-2.0 v	-9.4 v	+0.2 v	+0.6 v	" "	2:30 "

Measurements

M St.

Date Time Repeated

Notes

Measurements Made at	Pipe to Rail	P to R when car pulled	Pipe to Earth	P to E when car pulled
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B &	✓	✓		
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B &	✓	✓		
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B & India	-0.60V	-2.2V	+0.2V	+0.25V
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B & State	-1.0V	-3.8V	+0.2V	+0.30V
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B & Front	-1.4V	-4.0V	+0.1V	+0.20V
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B & 2" Sts	-1.40V	-2.40V	+0.10V	+0.20V
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B & 4" Sts	-1.20V	-2.60V	+0.20V	+0.40V
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B & 6" Sts	-1.60V	-3.40V	+0.20V	+0.15V
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B & 8" Sts	-1.40V	-6.00V	+0.20V	+0.05V
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B & 10" Sts	-1.40V	-5.80V	+0.18V	+0.10V
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B & 12" Sts	-1.00V	-10.40V	+0.10V	-0.55V
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B & 14" Sts	-1.20V	-9.80V	+0.20V	+0.10V
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Date	Time	Measurements Repeated	Notes
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May 15-14	2:15 PM		
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" "	3:30 PM		
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" "	4:30 PM		
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May 16-14	8:00 AM		Dry Ground
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" "	9:30 "		" "
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" "	10:30 "		" "
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" "	11:45 "		" "
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" "	12:30 PM		" "
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May 18-	8:00 AM		Dry Ground
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" "	9:30 AM		" "
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Measurements
made atPipe
to
RailP to R
when
car pulledPipe
to
EarthP to E
when
car pulled

Date

Time

Meas'ts
repeated

Notes

K & 5	-1.0 v	-3.00 v	-0.10 v	-0.20 v	May 18	10:45 AM		Dry Ground
K & 7	-1.4 v	-3.60 v	+0.10 v	+0.15 v	"	12:00 "		" "
K & 9	-1.4 v	-3.80 v	+0.10 v	-0.05 v	"	1:00 PM		
K & 11	-1.6 v	-4.00 v	+0.18 v	-0.02 v	"	2:30 "		
K & 13	-1.8 v	-4.80 v	-0.05 v	-0.05 v	"	3:30 "		
K & 15	-1.4 v	-3.00 v	+0.20 v	-0.15 v	"	4:15 "		Dry Ground
K & 17	-0.85 v	-3.60 v	+0.25 v	+0.10 v	"	5:00 "		" "
K & 19	-1.40 v	-7.20 v	+0.30 v	+0.18 v	May 19	8:30 AM		
K & 21	-1.40 v	-4.40 v	+0.25 v	+0.15 v	"	10:00 "		
K & 23	-1.40 v	-4.40 v	+0.18 v	+0.18 v	"	11:45 "		Dry Ground
K & 25	-1.20 v	-4.20 v	+0.10 v	+0.15 v	"	12:30 PM		
25 & N	-1.20 v	-3.60 v	+0.20 v	+0.20 v	"	1:00 "		
Woolman & Evans	-0.80 v	-4.20 v	+0.20 v	+0.16 v	"	2:30 "		
Woolman & 28"	-1.00 v	-7.20	+0.20 v	-0.10 v	"	3:30 "		Dry Ground
Woolman & 30"	-1.00 v	-9.40	+0.20 v	-0.10 v	"	4:30 "		

Measurements made at	Pipe to Rail	P to R when Gr Filled	Pipe to Earth	P to E when Gr Filled	Date	Time	M'dnts. Repeated	Notes
10th & L	-2.60 V	-5.80 V	-0.16 V	+0.05 V	¹⁹¹⁴ May 22	8:00 AM		
8 & N	fr. -4.00 V to 0.20 V		-0.20 V	V	"	" 9:00 "		
6 & N	-4.20 V		-0.18 V	V	"	" 10:00 "		
6 & K	-1.40 V	-3.20 V	-0.15 V	-0.05 V	"	" 11:00 "		
6 & H	-0.80 V	-2.40 V	+0.2 V	-0.20 V	"	" 12:00 "		
6 & F	-1.40 V	-2.20 V	V	V	"	" 1:00 PM		
C & G	-0.80 V	-1.80 V	+0.30 V	+0.35 V	"	" 2:00 "		
C & A	-1.20 V	-2.00 V	+0.20 V	+0.18 V	"	" 3:00 "		
C & Ist.	-0.80 V	-1.80 V	+0.25 V	+0.15 V	"	" 4:00 "		
C & India	+0.40 V	-0.80 V	-0.10 V	-0.20 V	"	" 4:45 "		

Measurements Pipe P to R Pipe P to E
made of to Rail to when to when
at Rail Gr Pulled Earth Gr Pulled

3" x H	-1.40 v	-3.40 v	-0.18 v	-0.20 v
3" x F	-1.30 v	-3.80 v	-0.10 v	-0.05 v
3" x Bidway	-0.80 v	-1.40 v	+0.80 v	+0.90 v
3" x B	-1.20 v	-2.20 v	+0.20 v	+0.10 v
3" x Ash	-1.20 v	-2.40 v	+0.18 v	+0.05 v
3" x Cedar	-3.20 v	-3.00 v	+0.10 v	-0.10 v
3" x Elm	-1.80 v	-3.00 v	+0.20 v	+0.30 v
4" x Grape	-1.20 v	-5.40 v	+0.20 v	+0.15 v
4" x Hawthorne	1.80 v	-4.00 v	+0.18 v	+0.10 v
4" x Juniper	-1.40 v	-5.80 v	+0.15 v	+0.05 v
4" x Laurel	-1.20 v	-3.60 v	+0.20 v	+0.05 v
4" x Nutmeg	-2.00 v	-5.00 v	+0.20 v	+0.10 v
4" x Palm	-1.60 v	-4.20 v	+0.15 v	+0.05 v
4" x Redwid	-2.40 v	-6.60 v	+0.20 v	+0.10 v
3" x Spruce	-3.40 v	-7.60 v	+0.15 v	-0.05 v
1" x "	-4.00 v	-7.00 v	+0.20 v	-0.20 v
1" x Upas	-2.60 v	-8.20 v	+0.18 v	-0.15 v
1" x Brooks	-3.40 v	-6.20 v	+0.20 v	+0.10 v
1" x Penn.	-2.40 v	-4.20 v	+0.20 v	+0.18 v
1" x Univ Av.	3.20 v	-6.40 v	+0.18 v	-0.05 v
Wash x Front	-3.00 v	-4.40 v	+0.20 v	+0.25 v
Wash x Brandt	-2.40 v	-7.20 v	+0.25 v	+0.18 v

Misrite
Date Time Repeated

Notes

1914
May 23 8:00 AM

" " 9:00 "

" " 10:00 "

" " 11:00 "

" " 12:00 "

" 25 8:00 v

" " 9:00 "

" " 10:00 "

" " 11:00 "

" " 12:00 M

" " 1:00 PM

" " 2:00 "

" " 3:15 "

" " 4:30 "

" 26 8:00 AM

" " 9:00 "

" " 10:30 "

" " 12:00 M

" " 1:00 PM

" " 2:00 "

" " 3:30 "

" " 4:30 "

Dry Ground

Dry Ground

Dry Ground

Dry Ground

Dry Ground

Dry Ground

Measurements made at	Pipe to Rail	Pipe when Car pulled	Pipe to Earth	Pipe when Car pulled
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F. Bet. 24 + 25 th	+1.20	+3.20	0	0
F. Bet. 23 + 24 th	From - .60 to + .80	+3.20	- .40	- 0.05
F. Bet. 22 + 23 th	From - .60 to + .40	+4.05	- .10	0
S. E. Cor 21 + F.	- .60 to + .80	+3.60	- 0.15	- 0.05
F. Bet. 20 + 21	- .40 to + .80	+3.80	- 0.18	- 0.05
S. E. Cor. F + 19	- .40 to + .60	+4.80	- 0.18	- 0.05
S. E. Cor. F + 18	- .10 to + .10	+4.20	- 0.10	- 0.05
S. E. Cor. F + 17	- .20 to + .60	+2.80	- 0.25	- 0.25
F. Bet. 15 + 16 th	- .60 to + .60	+2.20	- 0.10	- 0.15
F. Bet. 14 + 15 th	From - .80 to + .60	+2.20	- 0.15	- 0.15
F. Bet. 13 + 14	From - .120 to + .40	to + .80	could not get Ground Test.	
F. Bet. 12 + 13	From - .80 to + .10	From - .80 to + .10	- 0.10	- 0.05
F. Bet. 11 + 12	From - .80 to + .10	From + .20 to - .40	- 0.10	- 0.15
H. Bet. 24 + 25	- .10 to + .80	+8.40	- 0.20	- 0.20
H. Bet. 22 + 24	- 0.90	+7.20	- 0.30	- 0.30
H. Bet. 21 + 22	- 0.90	+8.40	- 0.15	- 0.15
H. Bet. 20 + 21	- 0.80	+5.80	- 0.20	- 0.20
H. BET 19 + 20	- 0.90	+4.20	- 0.25	- 0.25
H. BET 18 + 19	- 0.80	+4.20	- 0.20	- 0.20
H. BET 17 + 18	- 1.20	+4.20	- 0.20	- 0.20
H. BET 16 + 17	- 0.80	+2.40	- 0.20	- 0.20
H. BET 15 + 16	- 0.60	+2.40	- 0.20	- 0.20

Measurements Repeated	Notes
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Date 1915
Time

April 19 th	1.15 P.M.
" "	2.00 "
" "	2.30 "
" "	3.00 "
" "	3.15 "
" "	3.45 "
" "	4.15 "
" "	20' 8.00 A.M.
" "	9.00 A.M.
" "	10.00 A.M.
" "	10.45 A.M.
" "	11.25 A.M.
" "	11.50 A.M.
" "	1.30 P.M.
" "	2.15 P.M.
" "	3.15 P.M.
" "	4.15 P.M.
" "	27 8.30 A.M.
" "	9.30 A.M.
" "	10.30 A.M.
" "	11.30 A.M.
" "	12.00 M.

Damp Ground.

" " " "

Dry " "

" " " "

Damp " "

Dry Fire HYD.

Damp " " "

Damp Fire HYD.

Dry " "

Damp " "

Stony, hard, Ground.

Dry Ground

Damp Ground

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

" " " "

POTENTIAL

Measurements made at	Pipe to Rail	P to R when Car Pulled	Pipe to Earth	P to E when Car Pulled
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Grand x 32"	-4.00 v	-16.00 v	+0.25 v	+0.10 v
" x 30"	-1.20 v	-12.00 v	+0.10 v	+0.20 v
" x 28"	-2.60 v	-14.00 v	+0.20 v	+0.25 v
" x 26"	-2.40 v	-8.40 v	+0.25 v	+0.05 v
Newton x	-1.80 v	-5.40 v	+0.25 v	+0.20 v
	-1.40 v	-7.20 v	+0.20 v	+0.10 v

SURVEY

Date	Time	Measurements Repeated	Notes
------	------	--------------------------	-------

May 20-14	8:00 AM		Dry Ground
" " "	10:00 "		" "
" " "	12:00 "		" "
" " "	1:30 PM		" "
" " "	3:00 "		" "
" " "	4:30 "		Damp Ground

POTENTIAL

SURVEY

Measurements Pipe P to R Pipe P to E
 to made at Rail Car pulled Earth Car Pulled

Date Time Reported

Notes

G	H. Bet 16+17st.	-0.13	+0.49	-0.19	-0.20	April 29 th	11 15 AM.	DAMP GROUND.
	H Bet 17+18"	-0.35	+1.34	-0.20	-0.25	" "	29 1 10 PM	" " " "
	H. Bet 18+19	-0.19	+1.17	-0.20	-0.20	" "	29 2 15 PM.	" " " "
	H. Bet 19+20	-0.55	+1.80	-0.30	-0.30	" "	29 3 00 PM.	" " " "
M	H. Bet 20+21	-0.69	+1.68	-0.25	-0.25	" "	29 4 00 PM.	" " " "
	H. Bet 20+22	-0.35	+1.56	-0.20	-0.25	MAY 3 rd	8 00 AM.	" " " "
	H. Bet. 22+24	-0.39	+2.26	-0.10	-0.10	" "	3 9 00 AM	" " " "
	H Bet 24+25	-0.75	+1.94	-0.20	-0.20	" "	3 10 00 AM.	" " " "

3 Ret D+E -0.73 -0.40 -0.18 -0.18 " " 24.15 4.00 PM.

POTENTIAL

Measurements made at	Pipe to Rail	P to R when or pulled	Pipe to Earth	P to E when or pulled
3 Bet C + D	-0.44	-0.27	-0.20	-0.20
3 Bet B + C	-0.19	-0.03	-0.18	-0.18
3 Bet A + B	-0.15	+0.02	-0.20	-0.18
3 Bet A + Ash	+0.16	+0.80	-0.20	-0.15
3 Bet Ash + Beech	+0.13	+0.81	-0.20	-0.18
3 Bet Beech + Cedar	+0.23	+1.79	-0.15	-0.10
3 Bet Cedar + Date	+0.25	+0.76	-0.18	-0.18
3 Bet Date + Elm	+0.27	+1.00	-0.20	-0.10
3 Bet Elm + Fir	+0.54	+1.27	-0.25	-0.05
Fir Bet. 3 + 4	+0.38	+1.69	-0.10	0.00
4 Bet Fir + Grape	+0.77	+1.95	-0.19	-0.18
4 Bet Grape + Hawthorne	+0.61	+1.81	-0.20	-0.20
4 Bet Hawthorne + Ivy	+0.60	+1.79	-0.15	-0.08
4 Bet Ivy + Juniper	+0.88	+1.86	-0.20	-0.20
4 Bet Juniper + Kalmia	+0.90	+2.00	-0.20	-0.20
4 Bet Kalmia + Laurel	+0.91	+2.03	-0.25	-0.25
4 Bet Laurel + Maple	+1.80	+2.30	-0.30	-0.30
4 Bet Maple + Nutmeg	+1.16	+2.12	-0.22	-0.20
4 Bet Nutmeg + Olive	+1.25	+2.36	-0.18	-0.18
4 Bet Olive + Palm	+0.76	+1.76	-0.20	-0.18
4 Bet Palm + Quince	+0.99	+2.70	-0.22	-0.20
4 Bet Quince + Redwood	+0.89	+2.88	-0.20	-0.18
4 Bet Redwood + Spruce	+0.87	+3.10	-0.21	-0.21
Spruce Bet. 3 + 4 Sts.	+1.00	+3.14	-0.18	+0.58
Spruce Bet 2 + 3 "	+1.07	+2.80	-0.20	-0.05

SURVEY

Date	Time	Measurements Repeated	Notes	
May 15	3 ³⁰	P. M.	Damp Ground	
May 24, 15	2 ⁴⁵	P. M.	" " " "	
May 24, 15	2 ⁰⁰	P. M.	" " " "	
May 24, 15	1 ⁰⁰	P. M.	" " " "	
May 24, 15	11 ⁰⁰	A. M.	" " " "	
May 24, 15	10 ⁰⁰	A. M.	" " " "	
May 24	9 ⁰⁰	A. M.	" " " "	
May 24	8	A. M.	" " " "	
MAY 22	3 ⁴⁵	P. M.	DAMP GROUND.	
"	22	3 ⁰⁰	" " " "	
"	22	2 ⁰⁰	" " " "	
"	22	1 ⁰⁰	" " " "	
"	22	11, 00	A. M.	" " " "
"	22	10, 00	" " " "	
"	22	9, 00	" " " "	
"	22	8, 00	" " " "	
"	21	3 45	P. M.	" " " "
"	21	2.58	" " " "	
"	21	2.00	" " " "	
"	21	1.10	" " " "	
"	21	11.10	A. M.	" " " "
"	21	10.00	" " " "	
"	21	9.10	" " " "	
"	21	8.00	" " " "	
"	20	4.00	P. M.	" " " "

Measurement MADE AT.	Pipe To Rail	P. To R. When Car Pulled	Pipe To Earth	P. To E. When Car Pulled	DATE TIME	REMARKS.
Spruce Bet. #1 + 2	+1.14	+3.41	-0.20	-0.08	MAY 20, 15 ³ P.M.	Damp Ground
1 st Bet Spruce + Thorn	+0.70	+3.12	-0.30	-0.20	" " 20 " 1 " "	" " " "
1 st Bet Thorn + Uplas	+0.85	+2.60	-0.20	-0.08	" " 20 " 11.10 A.M.	" " " "
1 st Bet Walnut + Uplas	+0.70	+2.90	-0.20	-0.10	" " 20 " 10.00 A.M.	" " " "
1 st Bet Brooks + Walnut	+0.80	+3.28	-0.20	-0.15	" " 20 " 9 " " "	" " " "
1 st Bet Walnut + Brooks	+1.07	+3.27	-0.18	-0.10	" " 20 " 8 " " "	" " " "
1 st Bet ^{ROBINSON} Brooks + Penn.	+1.04	+2.75	-0.05	+0.20	" " 19 " 4.15 P.M.	" " " "
1 st Bet Penn + Univ. Ave.	+1.13	+3.38	-0.10	+0.05	" " 19 " 3.45 " "	" " " "
1 st Bet Univ. Ave + Washington	+0.90	+2.97	+0.05	+0.45	" " 19 " 3.00 " "	" " " "
Washington Bet. First + Front	+0.97	+3.96	+0.05	+0.40	" " 19 " 2.00 " "	" " " "
Washington Bet. Front + Albatross	+0.87	+3.21	-0.15	-0.15	" " 19 " 1.00 " "	" " " "
Washington Bet. Albatross + Grant	+1.30	+3.52	-0.20	-0.15	" " 19 " 11.10 A.M.	Fire Hyd. SW. Cor. Albatross + Washington
Washington Bet. Grant + Dove Sts.	+1.46	+4.20	-0.15	0.00	" " 19 " 10.05 A.M.	Damp Ground
Washington Bet. Dove + Eagle	+1.20	+4.23	-0.15	-0.10	" " 19 " 9.00 " "	" " " "
Washington Bet. Eagle + Falcon	+0.97	+3.88	-0.18	-0.15	" " 19 " 8.00 " "	" " " "
Washington Bet. Falcon + Jackdaw	+0.94	+4.06	-0.20	-0.18	" " 18 " 4.15 P.M.	" " " "
Washington Bet. Hawk + Jackdaw	+0.93	+3.84	-0.15	-0.10	" " 18 " 3.45 " "	" " " "
Washington Bet. Hawk + Getti	+0.94	+2.92	-0.20	-0.20	" " 18 " 3.00 " "	" " " "
Washington Bet. Lewis + Getti	+0.79	+3.24	-0.20	-0.10	" " 18 " 2.00 " "	" " " "
Lewis Bet. 96's + Hawk Sts.	+0.68	+2.38	+0.00	+0.18	" " 18 " 1.00 " "	" " " "
Lewis Bet. 96's + Jackdaw	+0.83	+2.40	-0.15	-0.05	" " 18 " 11.10 A.M.	" " " "
Lewis Bet. 96's + Jackdaw	+0.73	+3.16	-0.15	+0.10	" " 18 " 10.00 " "	" " " "
Lewis Bet. Hooker + Inalls	+0.74	+2.68	-0.15	-0.10	" " 18 " 9.00 " "	" " " "
Lewis Bet. Randolph + Hooker	+0.72	+2.68	-0.18	-0.05	" " 18 " 8.00 " "	" " " "
Lewis Bet. Calkoun + Randolph	+0.73	+3.26	-0.20	-0.02	" " 17 " 4.00 P.M.	" " " "

Measurement	Pipe To	R. to R. When	Pipe To	P. to E When	DATE	TIME	REMARKS
Made At	Rail	car Pulled	Earth	car Pulled			
Fst. Bet 24+25	+0.09	+1.43	-0.20	-0.08	MAY 3	11 ¹⁵	A. M. Damp Ground
Fst. Bet 23+24	+0.08	+0.85	-0.25	-0.17	" 3	1 ⁰⁰	P. M. " " " "
Fst. Bet 22+23	+0.04	+1.16	-0.15	-0.12	" 3	2 ⁰⁰	" " " "
Fst. Bet 21+22	+0.05	+0.86	-0.15	-0.13	" 3	3 ¹⁰	" " " "
Fst. Bet 20+21	+0.21	+0.98	-0.15	-0.07	" 3	4 ⁰⁰	" " " "
Fst. Bet 19+20	-0.03	+0.90	-0.20	-0.16	" 4	8 ⁰⁰	A. M. " " " "
Fst. Bet 18+19	-0.20	+0.95	-0.15	-0.10	" 4	11 ⁰⁰	" " " "
Fst. Bet 17+18	-0.12	+1.20	-0.30	-0.25	" 4	2 ⁰⁰	P. M. " " " "
Fst. Bet 16+17	-0.30	+0.70	-0.20	-0.20	" 4	3 ²⁰	" " " "
Fst. Bet 15+16	-0.38	+0.42	-0.15	-0.10	" 5	8 ⁰⁰	A. M. " " " "
Fst. Bet 14+15	-0.12	+0.64	-0.15	-0.10	" 5	9 ⁰⁰	" " " "
Fst. Bet 13+14	-0.43	-0.23	0.00	0.00	" 5	10 ⁰⁰	" " " "
Fst. Bet 12+13	-0.36	-0.48	-0.15	-0.10	" 5	11 ⁰⁰	" " " "
Fst. Bet 11+12	-0.44	-0.25	-0.15	-0.15	" 5	1 ¹⁰	" " " "
Fst. Bet 10+11	-0.06	-0.19	-0.15	-0.15	" 5	2 ⁰⁰	" " " "
Fst. Bet 9+10	+0.08	-0.03	-0.15	-0.20	" 5	3 ¹⁰	" " " "
Fst. Bet 8+9	+0.05	+0.09	-0.15	-0.10	" 5	3 ⁴⁵	" " " "
Fst. Bet 7+8	-0.67	-0.56			" 5	4 ³⁰	" " Impossible to Get Ground

Measurement Made At.	Pipe To Rail	P. to R. When Car Pulled	Pipe To Earth	P. To E. When Car Pulled	DATE TIME	REMARKS
First Bet. C+D	-0.80	-0.72	-0.10	-0.10	MAY 13 153 ⁰⁰ P.M.	Damp Ground
" " " B+C	-0.69	-0.67	-0.15	-0.15	" " 13 " 4 ¹⁰ " "	" " " "
" " " A+B	-0.64	-0.43	-0.15	-0.15	" " 14 " 8 ⁰⁰ A.M.	Dry " "
" " " A+Ash	-1.10	-0.45	-0.25	-0.20	" " 14 " 9 ⁰⁰ " "	" " " "
" " " Ash+Beech	-1.08	-0.18	-0.22	-0.20	" " 14 " 10 ⁰⁵ " "	Damp " "
" " " Beech+Geoar	-1.02	-0.05	-0.30	-0.30	" " 14 " 11 ⁰⁰ " "	" " " "
" " " Geoar+Date	-0.98	+1.16	-0.15	-0.02	" " 14 " 1 ¹⁰ P.M.	" " " "
" " " Date+Elm	+0.78	+6.80	-0.10	+0.05	" " 14 " 2 ⁰⁰ " "	" " " "
" " " Elm+Fir	+0.60	+8.90	-0.25	-0.20	" " 14 " 3 ¹⁰ " "	" " " "
" " " Fir+Grape	+0.60	+8.54	-0.18	-0.22	" " 14 " 4 ⁰⁰ " "	" " " "
" " " Grape+Hawthorne	+0.44	+7.93	-0.15	-0.15	" " 15 " 8 ⁰⁰ A.M.	" " " "
" " " ^{Bet 9V+ Hawthorne}	+0.40	+7.71	-0.10	-0.10	" " 15 " 9 ⁰⁰ " "	" " " "
First Bet. 9V+ +Juniper	+0.40	+7.60	-0.07	-0.06	" " 15 " 10 ⁰⁰ " "	" " " "
First St Bet Juniper+Kalmia	+0.43	+8.23	-0.18	-0.10	" " 15 " 11 ⁰⁰ " "	" " " "
First St. Bet Kalmia+Laurel	+0.35	+8.73	-0.15	-0.10	" " 15 " 1 ⁰⁰ P.M.	" " " "

Measurement Made At	Pipe To Rail	P. To R. When Car Pull	Pipe To Earth	P. To E. When Car Pulled	DATE TIME	REMARKS
Kst Bet 10+11	+0.55	+1.39	-0.05	-0.05	MAY 8 4 ⁰⁰ P. M.	Damp Ground ^{Fire HYD} S.E. Cor 10+K
Kst Bet 11+12	+0.73	+1.58	-0.15	-0.08	" " 8 3 ⁰⁰ " "	" " " " ^{Fire HYD} N.E. Cor 11+K.
Kst. Bet 12+13	+0.86	+1.47	-0.10	-0.06	" " 8 2 ⁰⁰ " "	" " " " ^{Fire HYD} S.E. Cor. 12+K,
Kst. Bet. 13+14	+0.85	+1.66	-0.08	-0.05	" " 8 1 ⁰⁰ " "	" " " "
Kst Bet 14+15	+1.26	+1.52	-0.15	-0.15	" " 8 11 ¹⁰ A M	" " " "
Kst Bet 15+16	+0.83	+1.14	-0.15	-0.10	" " 8 10 ⁰⁰ " "	" " " "
Kst Bet. 16+17	+0.65	+1.56	-0.25	-0.15	" " 8 9 ⁰⁰ " "	" " " "
Kst. Bet 17+18	+0.63	+1.45	-0.25	-0.10	" " 8 8 ⁰⁰ " "	" " " "
Kst Bet 18+19	+0.69	+1.14	-0.35	-0.28	" " 7 4 ⁴⁰ P "	" " " "
Kst Bet 19+20	+0.57	+1.89	-0.25	-0.17	" " 7 3 ⁰⁰ " "	" " " "
Kst Bet 20+21	+0.48	+1.67	-0.30	-0.18	" " 7 2 ⁰⁰ " "	" " " "
Kst Bet 21+22	+0.48	+1.24	-0.25	-0.08	" " 7 1 ⁰⁰ " "	" " " "
Kst Bet 22+23	+0.64	+1.27	-0.20	-0.15	" " 7 11 ⁰⁰ A "	" " " "
K Bet 24+25	+0.62	+1.53	-0.15	-0.10	" " 7 10 ⁰⁰ " "	" " " "
45 St Bet K+L	+0.55	+1.81	-0.25	-0.20	" " 7 9 ⁰⁰ " "	" " " "
25 St. Bell + M.	+0.83	+1.34	-0.15	-0.05	" " 7 8 ⁰⁰ " "	" " " "
25 St Bet M+N	+0.70	+1.44	-0.10	-0.05	" " 6 3 ⁴⁵ P "	" " " "
Woolman Bet Dewey + 25	+0.65	+1.69	-0.15	-0.15	" " 6 2 ⁴⁵ " "	" " " "
Woolman Bet Dewey + EVANS	+0.63	+1.51	-0.25	-0.20	" " 6 1 ⁴⁵ " "	" " " "
Woolman Bet Sampson + Evans	+0.59	+1.74	-0.25	-0.20	" " 6 13 ⁴⁵ " "	" " " "

Measurement	Pipe To	P. To R When	Pipe To	P. To E When
Made At Woolman Bet	Rail	car pulled	Earth	Car pulled
28 + Sampson	+0.54	+1.45	-0.15	-0.10
Woolman Bet 28 + 29	+0.57	+2.15	-0.15	-0.10
" " " 29 + 30	+0.57	+2.15	-0.30	-0.15
" " + 30 St	+0.55	+2.49	-0.20	-0.05

DATE TIME

REMARKS

MAY 6.5 11⁰⁰ A.M.
 " " 6.10⁰⁰ " "
 " " 6.9⁰⁰ " "
 " " 6.8⁰⁰ " "

Damp Ground

" " " "

" " " "

Fire HYD. S. E. cor Woolman + 30

Measurement Made At	Pipe To Rail	P To R when car Pulled	Pipe To Earth	Pipe To Earth	DATE	TIME	REMARKS
State Bet. C + D	-1.41	-0.95	-0.05	-0.05	May 13	2 ⁰⁰ P M	Damp Ground
State Bet B + C	-1.22	-0.82	-0.10	-0.10	" 13	1 ⁰⁰ " "	" " " "
State Bet A + B	-1.13	-0.61	-0.05	-0.05	" 13	11 ⁰⁰ A "	" " " "
State Bet A + Ash	-1.18	-0.58	-0.20	-0.20	" 13	10 ¹⁰ " "	" " " "
State Bet Ash + Beech	-1.21	-0.57	-0.05	-0.05	" 13	9 ⁰⁰ " "	" " " "
State Bet Beech + Cedar	-1.47	-0.41	-0.20	-0.20	" 13	8 ⁰⁰ " "	" " " "
State Bet Cedar + Date	-1.18	-0.56	-0.20	-0.18	" 12	4 ⁰⁰ P "	" " " Fire HYD.
State + ELM	-1.11	-0.26	-0.10	-0.10	" 12	3 ⁰⁰ " "	" " " "
State Bet Grape + Fir	-0.95	+0.25	-0.20	-0.20	" 12	2 ¹⁰ " "	" " " "
State Bet Grape + Hawthorne	-0.76	+0.70	-0.15	-0.15	" 12	1 ⁰⁰ " "	" " " "
State Bet Hawthorne + Ivy	-0.78	+1.11	-0.20	-0.18	" 12	11 ⁰⁰ A "	" " " "
Cor. Ivy + Columbia	-0.32	+1.23	-0.50	-0.10	" 12	10 ¹⁰ " "	" " " Fire HYD.
" India + Juniper	-0.45	+1.28	-0.25	-0.25	" 12	9 ⁰⁰ " "	" " " Dry
" India + Kalmia	-0.60	+1.62	-0.20	-0.20	" 12	8 ⁰⁰ " "	" " " Damp " " "
India Bet Laurel + Maple	-0.15	+1.77	-0.15	-0.10	" 11	4 ⁰⁰ P "	" " " "
Cor India + Nutmeg	-0.37	+0.62	-0.00	-0.00	" 11	3 ⁰⁰ " "	" " " stony Ground could not get test
" India + Olive	-0.04	-0.44	+0.22	+0.18	" 11	2 ⁰⁰ " "	" " " Damp Ground
India Bet Palm + Quince	-0.28	+1.31	-0.22	-0.22	" 11	1 ⁰⁰ " "	" " " "
Cor India + Redwood	-0.28	+0.63	-0.20	-0.20	" 11	11 ⁰⁰ A "	" " " Fire HYD
India Bet Sassafras + Thorn	-0.23	+1.37	-0.20	-0.20	" 11	10 ⁰⁰ " "	" " " "
Cor India + Upas	-0.31	+1.37	-0.15	-0.15	" 11	9 ⁰⁰ " "	" " " Fire HYD
Cor India + Vine	-0.04	+1.96	-0.15	-0.05	" 11	8 ⁰⁰ " "	" " " stony Pipe
India Bet Willow + Chalmers	-1.11	+1.69	-0.20	-0.08	" 10	4 ⁰⁰ P "	" " " "
India Bet Harasty + Winter	+0.17	+1.11	-0.15	-0.05	" 10	3 ⁰⁰ " "	" " " "
Cor California + Harasty	+0.32	+1.45	-0.25	-0.05	" 10	2 ¹⁰ " "	" " " stony pipe

Measurement	Pipe To	P to R When	Pipe To	P to E When	DATE	Time	REMARKS
Made At	Rail	Car Pulled	Earth	car Pulled			
La Jolla Ave Sutherland	+0.38	+1.29	-0.10	+0.05	MAY 10.	10:10 PM	Damp Ground. Stand Pipe
La Jolla Ave Benini	+0.54	+1.39	-0.15	-0.05	" "	10 " 11 " A "	" " " " " "
La Jolla Ave. 2. B. So Trias	+0.27	+1.57	-0.18	+0.20	" "	10 " 10 " "	" " " " 16" main.
Trias + ^{Bet} Conness	+0.35	+1.85	-0.18	-0.03	" "	10 " 9 ⁰⁰ " "	" " " " "
cor Harnes + Calhoun	+0.57	+2.70	-0.25	-0.05	" "	10 " 8 ⁰⁰ " "	" " " " "

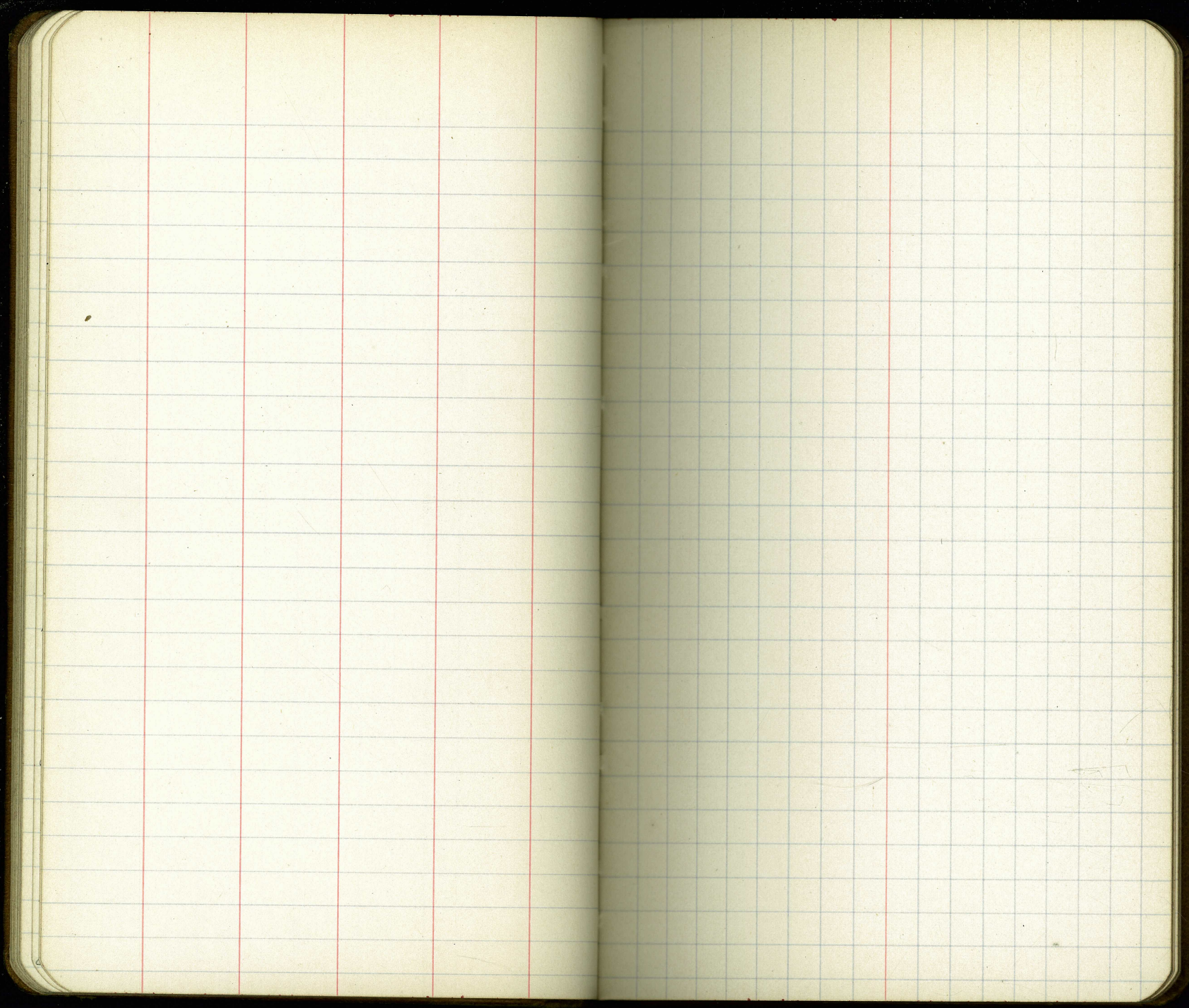


TABLE IV.—MINUTES IN DECIMALS OF A DEGREE.

.0167	11'	.1833	21'	.3500	31'	.5167	41'	.6833	51'	.8500
.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

TABLE V.—INCHES IN DECIMALS OF A FOOT.

3-32	1/8	3-16	1/4	5-16	3/8	1/2	5/8	3/4	7/8
.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
2	3	4	5	6	7	8	9	10	11
.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

TABLE VI.—RADIUS, ORDINATES AND DEFLECTIONS.

Radius	Mid Ord	Tan Def.	Chd. Def.	Def for 1 Foot	Deg.	Radius	Mid Ord.	Tan Def.	Chd. Def.	Def. for 1 Foot
34377.	.036	.145	.291	0.05'	7°	819.0	1.528	6.105	12.21	2.10'
17189.	.073	.291	.582	0.10	20'	781.8	1.600	6.395	12.79	2.20
11459.	.109	.436	.873	0.15	30	764.5	1.637	6.540	13.08	2.25
8594.4	.145	.582	1.164	0.20	40	747.9	1.673	6.685	13.37	2.30
6875.5	.182	.727	1.454	0.25	8	716.8	1.746	6.976	13.95	2.40
5729.6	.218	.873	1.745	0.30	20	688.2	1.819	7.266	14.53	2.50
4911.2	.255	1.018	2.036	0.35	30	674.7	1.855	7.411	14.82	2.55
4297.3	.291	1.164	2.327	0.40	40	661.7	1.892	7.556	15.11	2.60
3819.8	.327	1.309	2.618	0.45	9	637.3	1.965	7.846	15.69	2.70
3437.9	.364	1.454	2.909	0.50	20	614.6	2.037	8.136	16.27	2.80
3125.4	.400	1.600	3.200	0.55	30	603.8	2.074	8.281	16.56	2.85
2864.9	.436	1.745	3.490	0.60	40	593.4	2.110	8.426	16.85	2.90
2644.6	.473	1.891	3.781	0.65	10	573.7	2.183	8.716	17.43	3.00
2455.7	.509	2.036	4.072	0.70	30	546.4	2.292	9.150	18.30	3.15
2292.0	.545	2.181	4.363	0.75	11	521.7	2.402	9.585	19.16	3.30
2148.8	.582	2.327	4.654	0.80	30	499.1	2.511	10.02	20.04	3.45
2022.4	.618	2.472	4.945	0.85	12	478.3	2.620	10.45	20.91	3.60
1910.1	.655	2.618	5.235	0.90	30	459.3	2.730	10.89	21.77	3.75
1809.6	.691	2.763	5.526	0.95	13	441.7	2.839	11.32	22.64	3.90
1719.1	.727	2.908	5.817	1.00	30	425.4	2.949	11.75	23.51	4.05
1637.3	.764	3.054	6.108	1.05	14	410.3	3.058	12.18	24.37	4.20
1562.9	.800	3.199	6.398	1.10	30	396.2	3.168	12.62	25.24	4.35
1495.0	.836	3.345	6.689	1.15	15	383.1	3.277	13.05	26.11	4.50
1432.7	.873	3.490	6.980	1.20	30	370.8	3.387	13.49	26.97	4.65
1375.4	.909	3.635	7.271	1.25	16	359.3	3.496	13.92	27.84	4.80
1322.5	.945	3.781	7.561	1.30	30	348.5	3.606	14.35	28.70	4.95
1273.6	.982	3.926	7.852	1.35	17	338.3	3.716	14.78	29.56	5.10
1228.1	1.018	4.071	8.143	1.40	18	319.6	3.935	15.64	31.29	5.40
1185.8	1.055	4.217	8.433	1.45	19	302.9	4.155	16.51	33.01	5.70
1146.3	1.091	4.362	8.724	1.50	20	287.9	4.374	17.37	34.73	6.00
1109.3	1.127	4.507	9.014	1.55	21	274.4	4.594	18.22	36.44	6.30
1074.7	1.164	4.653	9.305	1.60	22	262.0	4.814	19.08	38.16	6.60
1042.1	1.200	4.798	9.596	1.65	23	250.8	5.035	19.94	39.87	6.90
1011.5	1.237	4.943	9.886	1.70	24	240.5	5.255	20.79	41.58	7.20
982.6	1.273	5.088	10.18	1.75	25	231.0	5.476	21.64	43.28	7.50
955.4	1.309	5.234	10.47	1.80	26	222.3	5.697	22.50	44.99	7.80
929.6	1.345	5.379	10.76	1.85	27	214.2	5.918	23.35	46.69	8.10
905.1	1.382	5.524	11.05	1.90	28	206.7	6.139	24.19	48.38	8.40
881.9	1.418	5.669	11.34	1.95	29	199.7	6.360	25.04	50.07	8.70
859.9	1.455	5.814	11.63	2.00	30	193.2	6.583	25.88	51.76	9.00

400' E of Junction, + 4 V. P.
 600' E " " + 2 MV.
 400' W of bend. + 1 MV.
 Opp. Dead end. + .3 MV.
 W. E. Branta Sp. + 2 V

60' E of St. 6-1. 10mv scale.
 400' 7-1 10MV scale.



DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 16 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	8.0	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	0
1	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7	10.9	1
2	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	2
3	12.5	12.7	12.8	13.0	13.1	13.3	13.4	13.6	13.7	13.9	3
4	14.0	14.2	14.3	14.5	14.6	14.8	14.9	15.1	15.2	15.4	4
5	15.5	15.7	15.8	16.0	16.1	16.3	16.4	16.6	16.7	16.9	5
6	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4	6
7	18.5	18.7	18.8	19.0	19.1	19.3	19.4	19.6	19.7	19.9	7
8	20.0	20.2	20.3	20.5	20.6	20.8	20.9	21.1	21.2	21.4	8
9	21.5	21.7	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	9
10	23.0	23.2	23.3	23.5	23.6	23.8	23.9	24.1	24.2	24.4	10
11	24.5	24.7	24.8	25.0	25.1	25.3	25.4	25.6	25.7	25.9	11
12	26.0	26.2	26.3	26.5	26.6	26.8	26.9	27.1	27.2	27.4	12
13	27.5	27.7	27.8	28.0	28.1	28.3	28.4	28.6	28.7	28.9	13
14	29.0	29.2	29.3	29.5	29.6	29.8	29.9	30.1	30.2	30.4	14
15	30.5	30.7	30.8	31.0	31.1	31.3	31.4	31.6	31.7	31.9	15
16	32.0	32.2	32.3	32.5	32.6	32.8	32.9	33.1	33.2	33.4	16
17	33.5	33.7	33.8	34.0	34.1	34.3	34.4	34.6	34.7	34.9	17
18	35.0	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	18
19	36.5	36.7	36.8	37.0	37.1	37.3	37.4	37.6	37.7	37.9	19
20	38.0	38.2	38.3	38.5	38.6	38.8	38.9	39.1	39.2	39.4	20
21	39.5	39.7	39.8	40.0	40.1	40.3	40.4	40.6	40.7	40.9	21
22	41.0	41.2	41.3	41.5	41.6	41.8	41.9	42.1	42.2	42.4	22
23	42.5	42.7	42.8	43.0	43.1	43.3	43.4	43.6	43.7	43.9	23
24	44.0	44.2	44.3	44.5	44.6	44.8	44.9	45.1	45.2	45.4	24
25	45.5	45.7	45.8	46.0	46.1	46.3	46.4	46.6	46.7	46.9	25
26	47.0	47.2	47.3	47.5	47.6	47.8	47.9	48.1	48.2	48.4	26
27	48.5	48.7	48.8	49.0	49.1	49.3	49.4	49.6	49.7	49.9	27
28	50.0	50.2	50.3	50.5	50.6	50.8	50.9	51.1	51.2	51.4	28
29	51.5	51.7	51.8	52.0	52.1	52.3	52.4	52.6	52.7	52.9	29
30	53.0	53.2	53.3	53.5	53.6	53.8	53.9	54.1	54.2	54.4	30
31	54.5	54.7	54.8	55.0	55.1	55.3	55.4	55.6	55.7	55.9	31
32	56.0	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.2	57.4	32
33	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6	58.7	58.9	33
34	59.0	59.2	59.3	59.5	59.6	59.8	59.9	60.1	60.2	60.4	34
35	60.5	60.7	60.8	61.0	61.1	61.3	61.4	61.6	61.7	61.9	35
36	62.0	62.2	62.3	62.5	62.6	62.8	62.9	63.1	63.2	63.4	36
37	63.5	63.7	63.8	64.0	64.1	64.3	64.4	64.6	64.7	64.9	37
38	65.0	65.2	65.3	65.5	65.6	65.8	65.9	66.1	66.2	66.4	38
39	66.5	66.7	66.8	67.0	67.1	67.3	67.4	67.6	67.7	67.9	39
40	68.0	68.2	68.3	68.5	68.6	68.8	68.9	69.1	69.2	69.4	40

Calculated by F. E. Paradis, C. E.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.00	7.15	7.30	7.45	7.60	7.75	7.90	8.05	8.20	8.35	0
1	8.50	8.65	8.80	8.95	9.10	9.25	9.40	9.55	9.70	9.85	1
2	10.00	10.15	10.30	10.45	10.60	10.75	10.90	11.05	11.20	11.35	2
3	11.50	11.65	11.80	11.95	12.10	12.25	12.40	12.55	12.70	12.85	3
4	13.00	13.15	13.30	13.45	13.60	13.75	13.90	14.05	14.20	14.35	4
5	14.50	14.65	14.80	14.95	15.10	15.25	15.40	15.55	15.70	15.85	5
6	16.00	16.15	16.30	16.45	16.60	16.75	16.90	17.05	17.20	17.35	6
7	17.50	17.65	17.80	17.95	18.10	18.25	18.40	18.55	18.70	18.85	7
8	19.00	19.15	19.30	19.45	19.60	19.75	19.90	20.05	20.20	20.35	8
9	20.50	20.65	20.80	20.95	21.10	21.25	21.40	21.55	21.70	21.85	9
10	22.00	22.15	22.30	22.45	22.60	22.75	22.90	23.05	23.20	23.35	10
11	23.50	23.65	23.80	23.95	24.10	24.25	24.40	24.55	24.70	24.85	11
12	25.00	25.15	25.30	25.45	25.60	25.75	25.90	26.05	26.20	26.35	12
13	26.50	26.65	26.80	26.95	27.10	27.25	27.40	27.55	27.70	27.85	13
14	28.00	28.15	28.30	28.45	28.60	28.75	28.90	29.05	29.20	29.35	14
15	29.50	29.65	29.80	29.95	30.10	30.25	30.40	30.55	30.70	30.85	15
16	31.00	31.15	31.30	31.45	31.60	31.75	31.90	32.05	32.20	32.35	16
17	32.50	32.65	32.80	32.95	33.10	33.25	33.40	33.55	33.70	33.85	17
18	34.00	34.15	34.30	34.45	34.60	34.75	34.90	35.05	35.20	35.35	18
19	35.50	35.65	35.80	35.95	36.10	36.25	36.40	36.55	36.70	36.85	19
20	37.00	37.15	37.30	37.45	37.60	37.75	37.90	38.05	38.20	38.35	20
21	38.50	38.65	38.80	38.95	39.10	39.25	39.40	39.55	39.70	39.85	21
22	40.00	40.15	40.30	40.45	40.60	40.75	40.90	41.05	41.20	41.35	22
23	41.50	41.65	41.80	41.95	42.10	42.25	42.40	42.55	42.70	42.85	23
24	43.00	43.15	43.30	43.45	43.60	43.75	43.90	44.05	44.20	44.35	24
25	44.50	44.65	44.80	44.95	45.10	45.25	45.40	45.55	45.70	45.85	25
26	46.00	46.15	46.30	46.45	46.60	46.75	46.90	47.05	47.20	47.35	26
27	47.50	47.65	47.80	47.95	48.10	48.25	48.40	48.55	48.70	48.85	27
28	49.00	49.15	49.30	49.45	49.60	49.75	49.90	50.05	50.20	50.35	28
29	50.50	50.65	50.80	50.95	51.10	51.25	51.40	51.55	51.70	51.85	29
30	52.00	52.15	52.30	52.45	52.60	52.75	52.90	53.05	53.20	53.35	30
31	53.50	53.65	53.80	53.95	54.10	54.25	54.40	54.55	54.70	54.85	31
32	55.00	55.15	55.30	55.45	55.60	55.75	55.90	56.05	56.20	56.35	32
33	56.50	56.65	56.80	56.95	57.10	57.25	57.40	57.55	57.70	57.85	33
34	58.00	58.15	58.30	58.45	58.60	58.75	58.90	59.05	59.20	59.35	34
35	59.50	59.65	59.80	59.95	60.10	60.25	60.40	60.55	60.70	60.85	35
36	61.00	61.15	61.30	61.45	61.60	61.75	61.90	62.05	62.20	62.35	36
37	62.50	62.65	62.80	62.95	63.10	63.25	63.40	63.55	63.70	63.85	37
38	64.00	64.15	64.30	64.45	64.60	64.75	64.90	65.05	65.20	65.35	38
39	65.50	65.65	65.80	65.95	66.10	66.25	66.40	66.55	66.70	66.85	39
40	67.00	67.15	67.30	67.45	67.60	67.75	67.90	68.05	68.20	68.35	40

Calculated by F. E. Paradis, C. E.