

Notes
Electrolysis Surveys

From-June 1915

To-Sept 1915

CROSS SECTION BOOK

1310

No. 1.

W73

Pipe To Rail

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1 1/4 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.

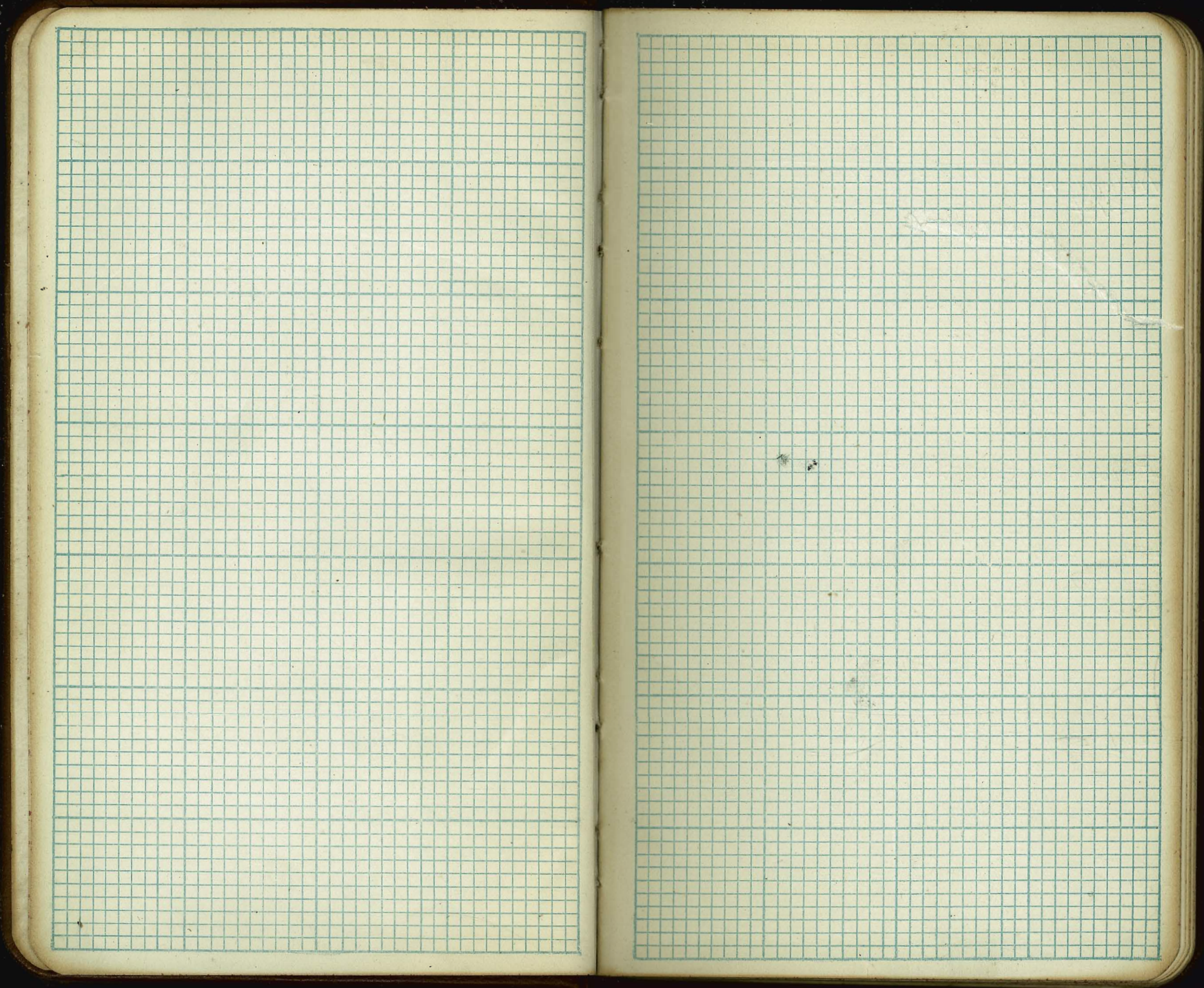
MICROFILMED

JAN X 6 1965

INDEX

Car Line	Page.
No. 1.	1 to 14
Adams Ave	15 to 20
Short Line	21 to 24
No. 2.	25 to 40
State St.	41 to 47
Mission Hills	49 to 58
K St Line	59 to 64
M St Line	65 to 70
1 st St Line	71 to 74

Field men
Geo. Kingston
Walter Pray



1.
Reading Pipe To Rail ~~Nat~~ Car Line
Car Pulling Pipe To Earth

Made At Volts

Avg Max Volts Time

National St
37 St June, 12 1915
-14.00 -26.00 - .38 8 AM.

Bet 29 & 30 -11.37 -22.00 - .20 9 AM.

Bet 28 & 29 -10.30 -24.00 - .20 10 AM

Bet 27 & 28 -9.30 -18.00 - .19 11 AM

Bet 26 & 27 -9.92 -20.00 - .18 12 M

36 St Street
Bet. Nat & Logan -8.72 -12.00 - .20 1 P.M.

Logan
Bet 26 & Sampson -8.80 -16.00 - .19 2 P.M.

Bet
Sampson & Evans -7.40 -14.00 - .20 3 P.M.

Bet June 14 1915
Dewey & Evans -6.95 -14.00 - .20 8 AM

Bet June 15 1915
Dewey & Crosby -5.47 -16.00 - .25 8 AM.

Bet
Beardsley & Crosby -5.25 -8.00 - .25 9 AM

Bet
Beardsley & Sigbee -7.55 -10.00 - .30 10 AM

1.
Reading

Made At

National
31/27

Bet 29 & 30

Bet 28 & 29

Bet 27 & 28

Bet 26 & 27

26th Street

Bet Nat & Logan

Logan

Bet 26 & Sampson

Bet

Sampson & Evans

Bet

↙ Dewey & Evans

Bet

Dewey & Crosby

Bet

Beardsley & Crosby

Bet

Beardsley & Sigbee

Reading	Pipe To Rail		Nal Car Line	
	Car Pulling		Pipe To Earth	
Made At	Volts		Volts	
	Avg	Max	Volts	Time
Logan Bet Sigsbee & 16th 16th Bet	-4.27	-7.20	-.20	10:58 AM
M & N	-2.40	-3.60	-.30	11:45 AM
L + M	-1.59	-2.20	-.20	1 PM.
K + L	-1.69	-2.60	-.20	1:50 PM
<u>June 16</u>				
J + K	-1.36	-1.90	-.20	11 AM
I + J	-1.29	-2.00	-.20	11:50 AM
H + J	-1.30	-2.10	-.30	1 PM.
<u>H. Bet</u>				
15 + 16	-2.10	-4.40	-.20	1:45 PM.
14 + 15	-1.73	-3.40	-.20	2:30 PM
13 + 14	-1.59	-4.00	-.20	3:15 PM
12 + 13	-1.41	-3.40	-.20	4 PM.
<u>June 17</u>				
11 st.	-1.55	-3.20		8 AM

Reading

Made At

Logan
Bet
Sigsbee + 16th16th

Bet

~~M + N~~

L + M

K + L

J + K

I + J

H + I

H. Bet

15 + 16

14 + 15

13 + 14

12 + 13

11st.

Reading	Pipe To Rail	No. Car Line	
	Car Pulling	Pipe To Earth	
Made At	Volts		
	Avg	Max	Volts Time
Ort. 9 ^{and}			
10th	-.75	-1.80	-.15 8 ⁵⁰ AM
✓ 9th	-.65	-1.00	-.18 9 ⁴⁰ AM
8th	-.52	-1.20	-.21 10 ³⁰ AM
7th	-.52	-1.60	-.18 11 ²⁰ AM
	June 18 1913		
6th	-.24	-.30	-.20 11 ⁵⁰ AM
Ort. 5th Bet			
G + H	-.26	-.40	-.15 3 ⁴⁵ PM
F + G	+.43	+.80	-.25 5 ³⁰ AM
E + F	+.31	+.70	-.20 6 ¹⁵ AM
D + E	+.28	+.70	-.20 7 AM
C + D	+.35	+.80	-.20 7 ⁵⁰ AM
B + C	-.35	-.80	-.15 8 ³⁰ AM
A + B	-.41	-.90	-.20 9 ¹⁵ AM

Reading

Made At

Ortt. ^{and}

10th

✓ 9th

8th

7th

6th

Ortt. 5th Bet

G + H

F + G

E + F

D + E

C + D

B + C

A + B

Reading Pipe To Rail **Not Car Line**
 Made At Car Pulling Pipe To Earth
 Volts

Avg Max Volts Time

On 5th Bet.

H + Ash -.69 -1.00 -.15 3:45 PM

Ash + Beech -.81 -1.30 -.21 4:30 PM

Beech + Cedar -1.29 -2.00 +.05 5:15 PM

Cedar + Date -1.47 -2.60 -.05 6 PM

June 19

Date + Elm -1.39 -2.20 -.20 8 AM

Elm + Fir -1.33 -2.40 -.20 9 AM

Fir + Grape -1.43 -2.40 -.20 10 AM

Grape + Hawth. -1.20 -1.80 -.20 11 AM

Hawth. + Ivy -1.50 -2.20 -.20 1 PM

Ivy + Juniper -1.54 -2.60 -.20 2 PM

Juniper + Kal. -1.58 -2.40 -.10 3 PM

June 21

Kal. + Laurel -1.90 -2.80 -.10 8 AM

11:11 AM

Reading

Made At

On 5th Bel

H + Ash

Ash + Beech

Beech + Cedar

Cedar + Date

Date + E. lm

E. lm + Fir

Fir + Grape

Grape + Hawth.

Hawth. + Ivy

Ivy + Juniper

Juniper + Kal.

Kal. + Laurel

Reading Pipe To Rail **Not Car Line**
 Made At Car Filling Pipe To Earth
 Volts

	Avg	Max	Volts	Time
On 5 th Bet	<u>June 21 1915</u>			
Larch & Maple	-2.29	-4.40	-.15	2 ³⁰ PM.
Maple & Nutmeg	-2.56	-4.20	-.18	3 ¹⁵ PM.
Nutmeg & Olive	-2.75	-4.40	-.20	4 PM.
Olive & Palm	-2.24	-2.60	-.15	8 AM
	<u>June 22 1915</u>			
Palm & Quince	-1.88	-3.20	-.15	9 AM.
Quince & Redwood	-2.26	-3.20	-.18	10 AM.
Redwood & Spruce	-2.24	-3.60	-.20	11 AM.
Spruce & Thorn	-2.40	-4.90	-.20	12 M.
Thorn & Upas	-3.50	-5.40	-.02	1 ³⁰ PM.
Upas & Walnut	-3.26	-4.80	-.02	2 ³⁰ PM.
Walnut & Brooks	-3.35	-5.20	-.02	3 ³⁰ PM.
	<u>June 24 1915</u>			
Brooks & Anderson	-3.15	-5.00	-.02	8 AM

Reading
Made At

On 5th Bet

Larch & Maple

Maple & Nutmeg

Nutmeg & Olive

Olive & Palm

Palm & Quince

Quince & Redwood

Redwood & Spruce

Spruce & Thorne

Thorne & Upas

Upas & Walnut

Walnut & Brooks

Brooks & Alderson

Reading Pipe To Rail No. 1 Car Line
 Made At Cart Polling Pipe To Earth
 Volts

	Avg	Max	Volts	Time
011.5th Bet.				
Anderson + Perm Ave	-2.90	-4.60	-.02	9 AM
Perrin + Evans	-2.92	-4.20	-.02	10 AM
Evans + Robinson	-2.91	-5.00	-.03	11 AM
Robinson + University	-2.72	-3.80	-.12	11 ⁵⁰ AM
011. University Ave Bet.				JUNE 25
5th + 6th	-3.35	-5.40	-.05	8 AM
6th + 7th	-3.44	-5.40	-.03	9 AM
7th + 8th	-3.50	-6.06	-.03	10 AM
8th + 9th	-3.24	-6.20	-.05	10 ⁵⁰ AM
9th + 10th	-3.06	-4.40	-.05	11 ³⁰ AM
10th + Vermont	-3.81	-6.40	-.02	1 ³⁰ PM
Vermont + Rich.	-3.95	-6.40	-.02	2 ¹⁵ PM
Richmond + Univ. Blvd	-4.02	-6.20	-.03	3 PM

Reading

Made At

07.5th + Bet.

Andersen + Perin. Au.

Penn + Evans

Evans + Robinson

✓ Robinson University
 07. University
 Bet

5th + 6th6th + 7th7th + 8th8th + 9th9th + 10th10th + Vermont.

Vermont + Rich.

Richmond + Univ. B.

Reading Pipe To Rail No. 1 Car Line
 Made At Car Telling Pipe To Earth
 Volts
 Avg Max Volts Time

On Univ. Blvd.
 Bet

Univ. Ave + Blaine -4.00 -7.20 -.04 3:45 PM

June 26

Blaine + Lincoln -4.00 -6.00 -.04 8 AM

Lincoln + Campus -4.76 -7.40 -.05 9 AM

Campus + El Cajon -4.91 -9.60 -.13 10 AM

El Cajon + Meade -5.18 -10.60 -.09 11 AM

Meade + Monroe -4.72 -8.50 -.09 12 M

ON Park Blvd.
 Between

Monroe + Madison -3.18 -4.60 -.06 1 PM

Madison + Adams -3.11 -5.60 -.04 2 PM

Reading

Made 171

On Univ. Blvd.
Bet.

Univ Ave + Blaine

Blaine + Lincoln

Lincoln + Camp

Camp + E. Cajon

E. Cajon + Meade

Meade + Monroe
ON Park Blvd.
Between

Monroe + Madison

Madison + Adams

Reading Made At	Pipe to Rail Adams Ave Line		Time
	Avg	Max	
Car Polling Pipe to Earth			
Volts			
ON Adams AVE			
Bet			
Pk Blvd + Geo.	-3.00	-3.80	-12 8 AM
Georgia + Florida	-2.29	-2.60	-.38 9 AM
Florida + Alabama	-2.25	-2.80	-.19 9 ⁴⁵ AM
Alabama + Miss.	-3.12	-4.80	-.03 10 ²⁰ AM
Miss + Louisiana	-3.41	-6.60	-.04 11 ⁴⁵ AM
Louisiana + Texas	-3.18	-4.00	-.03 1 PM
Texas + Arizona	-3.93	-6.40	1 ⁵⁰ PM
Hamilton + Oregon	-4.27	-6.80	-.02 2 ⁴⁰ PM
Idaho + Utah	-3.60	-5.00	-.12 3 ⁴⁵ PM
Utah + Kansas	-5.34	-9.00	-.03 4 PM
Kansas + Nebraska	-5.12	-11.00	-.04 8 AM
Nebraska + Ohio	-4.70	-11.00	-.24 9 AM

Reading

Made At

Off Adams AVE
Bet.

Tk. Blvd + Geo.

Georgia + Florida

Florida + Alabama

Alabama + Miss.

Miss + Louisiana

Louisiana + Texas

Texas + Arizona

Hamilton + Oregon

Idaho + Utah

Utah + Kansas

Kansas + Nebraska

Nebraska + Ohio

Reading Made At	Pipe To Rail	Adams Ave Line		Time
	Car Trolling	Pipe To Earth		
	Volts			
	Avg	Max	Volts	
On Adams Ave Between				
Ohio + Boundary	-5.49	-10.00		10 AM
Boundary + 32 nd	-4.14	-6.80	-.03	11 AM
33 + 34 th	-4.40	-7.60	-.12	1 PM
35 th + 36 th	-4.65	-10.00	-.09	2 PM
39	-4.28	-8.00	-.04	3 PM
40 + 41	-4.36	-7.60	-.05	3 ⁴⁵ PM
41 + 42	-5.90	-10.00	-.10	8 PM
42 + 43	-5.50	-9.40	-.12	9 AM
43 + 44	-5.28	-10.00	-.07	10 AM
44 + Mission Drive	-5.13	-8.00	-.07	11 AM
Miss. Dr. Bonnie Brae	-5.91	-10.00	-.02	1 PM
Bonnie Brae + Bridg	-6.00	-10.20	-.03	2 PM

Reading

Made At

On Adams Ave
Between

Ohio + Boundary

Boundary + 32[#]

33[#] + 34[#]

35[#] + 36[#]

39

40 + 41

41 + 42

42 + 43

43 + 44

W + Mission Trive

Miss. Dr. Bonnie Brae

Bonnie Brae Brdg.

Reading Pipe To Rail *Adams Ave Line*
 Made At Car Pulling Pipe To Earth

Volts

Avg Max Volts Time

Adams Ave Bet

Terrace Drive

Kensington Dr

-5.55 -9.50 -.08 3^{PM}

Kensington Dr

Marlborough

-6.32 -10.40 -.13 3⁴⁵ PM

Reading

Made At

Adams Ave Bet

Terrace Drive

Kensington Dr

Kensington Dr

Marlborough

Reading Pipe to Nail **Short Line**
 Made At Car Rolling Pipe to Earth
 Volts

Avg Max Volts Time

On Univ. Ave
 Bot. July 3/15
 30th + Kansas -3.84 -7.00 +.42 8 AM

Kans. + Granada — — — —

Gran. + Utah -3.86 -4.80 — 9 AM

Utah + Idaho -4.18 -6.40 -.02 10 AM

Idaho + Oregon -3.62 -6.60 11 AM

Oregon + Hamilton -4.00 -7.20 -.20 12 M

Hamilton + Arizona -3.80 -6.40 -.02 1 PM

Ariz. + Texas -4.40 -7.60 -.12 2 PM

Texas + Louisiana -4.33 -7.60 +.01 3 PM

July 6/15

Louis. + Miss. -4.11 -6.20 9:30 AM

Miss. + Alabama -4.44 -6.40 10:30 AM

Ala. + Florida -4.45 -5.60 -.02 11:15

Reading

Made At

On Univ. Ave

Eot.

30th & Kansas

Kans. & Grand

Grand & Utah

Utah & Idaho

Idaho & Oregon

Oregon & Hamilton

Hamilton & Arizona

Ariz. & Texas

Texas & Louisiana

Louis. & Miss.

Miss. & Alabama

Ala. & Florida

Reading Made At	Pipe To Rail		Short Line	Pipe To Earth	Time
	Avg	Max			
Onthiv. Ave	July 6/15				
at P.R. Blvd Bet	-4.31	-5.60	.20		1 PM
P.R. Blvd + Centre	-4.34	-8.40	.04		2 PM
Centre + Herbert	-4.39	-7.10	.07		3 PM
Junction	-4.39	-6.80	.02		3 ⁴⁵ PM

Reading Pipe To Frail No. 2 Car Line
 Made At Car Pulling Pipe To Earth
 Volts

Avg Max Volts Time

Conklin Ave

July 7/15

Fairmont

-6.42 -11.00 +.12 9³⁰_{AM}

set

Hawley V. Hyde

-5.92 -10.00 +.12 10³⁰_{AM}

Hyde Copeland

-5.92 -12.00 +.07 11¹⁵_{AM}

Copeland Stockton

-6.48 -11.00 +.36 1^{PM}

Stockton Conklin

-6.27 -13.00 +.10 2^{PM}

Conklin Hugo

-5.32 -10.00 +.24 2⁴⁵_{PM}

Hugo Sisson

-4.98 -10.00 +.23 3⁴⁵

July 8/15

Sisson Haley

-5.13 -12.00 +.14 8^{AM}

Haley Thomas

-5.20 -8.20 +.12 9^{AM}

Thomas Freed

-7.13 -13.00 +.08 10^{AM}

Freed Cherokee

-4.88 -10.00 +.50 10⁴⁵

Cherokee Sorey

Reading Pipe To Rail No. 2 Car Line
 Car Polling Pipe To Earth
 Made At Volts
 Avg Max Volts Time

On University
 Bet July 8/3

Streyt Wilson -4.70 -10.00 +.50 11³⁰ AM

Wilson Pacific -4.04 -6.00 +.12 1 PM

Pacific & Swift -4.41 -6.80 +.20 2 PM

Swift & Wabash -4.89 -8.00 +.40 3 PM

Wabash & Mission -4.06 -5.40 — 3⁴⁵ PM

July 9

Bancroft +32 -4.70 -5.60 8 AM

31 -3.37 -4.60 -.02 9 AM

31 + Grimm -3.39 -5.60 +.02 9⁴⁰ AM

Ohio -3.39 -4.00 +.01 10³⁰ AM

On 30th
 Bet

Univ. & Nightman -3.81 -7.20 +.30 11¹⁵ AM

Night & Gunn -3.42 -5.40 +.02 1 PM

Reading Pipe To Rail Naz Car Line
 Made At Car Pulling Pipe To Earth
 C Volts
 Avg Max Volts Time

On 30th

Gunnlands -3.93 -5.40 -.02 1⁵² PMLands Thught -3.60 -6.80 -.02 2⁴⁵ PMThught Capps -4.01 -6.20 +.01 3³⁰ PM

July 10

Capps Martle -4.94 -8.60 +.02 8 AM

Martle Ups
on Ups -4.69 -8.60 -.02 9 AM30 & Ray
on 30 -4.94 -7.40 -.02 10 AM

Ups & Thorn -5.00 -8.60 -.02 11 AM

July 12

Thorn & Rowd -5.34 -9.60 -.02 1 PM

Rowd & Quince -4.30 -5.60 — 2 PM

Quince & Palm -5.42 -7.48 -.04 3 PM

Olive -5.15 -7.40 -.05 4 PM

July 15

Lands & Bridge -4.89 -7.20 -.03 10 AM

Reading Pipe To Rail No. 2 Car Line
 Made At Car Pulling Pipe To Earth
 Volts
 Avg Max Volts Time

On 30

Larch-Kalmia -5.15 -8.00 -.03 11 AM

Kalmia-Juniper -5.11 -7.00 -.02 10 PM.

Juniper-Ivy -5.00 -7.60 -.01 2 PM.

Ivy-Hawthorne -4.96 -7.80 -.02 3 PM.

Hawthorne-Grape -4.82 -7.20 -.03 3⁴⁵ PM.
 July 16/15Grape-Fir -4.76 -10.60 -.03 9⁴⁵ AMFir + Elm -4.97 -8.40 +.01 10³⁰ AMElm + Date -5.60 -9.00 -.04 11¹⁵ AM

Date Cedar -5.69 -8.40 .04 1 PM.

Beech Cedar -4.81 -8.00 -.03 2 PM.
 ON Beech

Date -5.17 -8.00 — 3 PM.

Date + 29 -4.79 -8.00 -.04 3⁴⁵ PM

Reading Made At	Pipe To Rail	No. 2 Car Line		Time
	Car Pulling	Pipe To Earth		
	Volts			
	Avg	Max	Volts	
On Beech Bet	July 17/15			
Granada + 26 On 28 th	-4.68	-6.20	1.06	8 AM
Beech + Ash	-5.32	-8.20	1.07	9 AM
Ash + H	-4.84	-7.00	1.04	10 AM
B	-4.48	-8.20	1.05	11 AM
On B Bet				
26 + 27	-4.50	-6.40	1.07	12 PM
26 + 25 On 25 Bet	July 19			
B + C	-2.61	-4.60	1.03	8 AM
C + D	-2.17	-3.00	1.01	8 ⁴⁵ AM
On D Bet				
SEC Car 24	-2.18	-3.00	—	9 ³⁰ AM
SEC Car 23	-2.41	-3.40	1.02	10 ⁴⁵ AM
SW Car 22	-1.82	-3.00	1.06	11 ³⁰ AM
SEC Car 21	-1.52	-2.60	1.09	1 PM

Reading

Pipe To Nail No. 2 Car Line

Made At

Car Pulling Pipe To Earth

Volts

Avg Max Volts Time

On P

SE Car 20 -1.24 -1.40 -.08 2 PM

20 + 19 -1.32 -2.20 -.08 3 PM

SE 18 -.88 -1.30 -.04 3⁴⁵ PM

July 20, 1915

18 + 17 -1.20 -2.00 -.05 8 AM

SE 16 -1.30 -2.20 .03 9 AM

16 + 15 -.95 -1.20 .03 9⁴⁵ AM15 + 14 -.72 -1.60 -.11 10³⁰ AM14 + 13 -.85 -1.20 -.07 11¹⁵ AM

13 + 12 +.12 +.60 -.03 1 PM

12 + 11 -.40 -.90 -.07 2 PM

July 21

10 -.35 +1.00 -.05 9¹⁵ AM8 + 9 -.30 +.80 — 8³⁰ AM

Reading Made At	Pipe To Rail		No. 2 Car Line	
	Avg	Max	Volts	Time
OND				
8 + 7	-25	+80	-10	7:45 AM
7 + 6	-17	-60	-13	6:30 AM
6 + 5	+35	+60	-08	5:45 AM
	July 22/15			
5 + 4	+34	+60	-07	5:45 AM
3	+40	+80	-40	6:30 AM
3 + 2	+25	+50	-19	7:15 AM
2 + 1	+116	+160	-19	8 AM
1 + Front	+133	+180	-14	8:45 AM
Front + Union	+110	+160	-04	9:30 AM
State	+2.10	+2.60	—	10:15 AM
Columbia	+2.23	+3.00	+01	11 AM
Cal. + India	+2.53	+3.20	+03	11:45 AM

Reading Made At	Pipe to Rail	No 2. Car Line	
	Car Rolling	Pipe to Earth	
	Volts		
	Avg	Max	Volts Time

On D

Friday Atlantic	+2.31	+2.80	.03	12:30 PM
-----------------	-------	-------	-----	----------

Friday Atlantic	+2.40	+3.00	.08	1:15 PM
-----------------	-------	-------	-----	---------

Reading	Pipe To Rail	State St. Line		
Made At	Car Polling Pipe To Earth			
	Volts			
	Avg	Max	Volts	Time
On State	July 23/13			
Bet				
D & C	+1.27	+1.70	+1.01	8:30 AM
C + B	+1.48	+1.90	-1.02	9:30 AM
B + A	+1.03	+1.60	-1.08	10:15 AM
A + Ash	+1.86	+1.40	-1.05	11:30 AM
Ash + Beech	+1.13	+1.80	-1.53	1:45 PM
Beech + Cedar	+1.69	+1.40	-1.04	2:45 PM
Cedar + Date	+1.90	+1.40	-1.07	3:30 PM
	July 24			
Date + Elm	+1.76	+2.00	-1.03	8 AM
Elm + Fir	+1.64	+1.80	-1.04	9 AM
Fir + Grape	-1.75	-2.60	-1.04	11 AM
Grape + Hawthorne	-1.16	-3.40	-1.04	12 M
Hawthorne + Ivy	+2.25	-4.00	-1.04	1 PM

Reading Pipe To Rail *State Street Line*
 Car Pulling Pipe To Earth

Made At Volts
 Avg Max Volts Time
 July 26

SE Cor Ivy & Del. -2.09 -4.00 -.09 8 AM

SE Cor of
 Indiana & Lorimer -2.07 -4.40 -.03 9 AM

On Indiana
 Bet

Kalamazoo & Lorimer -1.93 -4.60 -.05 10 AM

Kalamazoo & Laurel -2.65 -4.40 -.09 11 AM

Laurel & Maple -2.42 -5.00 -.03 1 PM

Maple & Nutmeg -2.55 -4.40 -.04 2 PM

Olive -2.17 -4.00 -.04 3 PM

Olive & Palm -2.07 -4.40 +.06 3:45 PM

Palm & Quince
 July 29/15

Quince & Redwood -2.12 -6.00 -.08 8 AM

Redwood & Spruce -2.20 -4.40 +.08 9 AM

Spruce & Passaic -4.20 -9.20 +.05 10 AM

Reading Made At	Pipe To Rail	State St. Line		
	Car Polling	Pipe To Earth		
	Volts			
	Avg	Max	Volts	Time
On India				
Upas	-3.86	-8.00	-.01	11 AM
Vine				
	July 28, 1915			
Willow & Chalmers	-1.89	-3.20	-.03	8 AM
Winder				
Navasthys Winder	-2.79	-6.20	-.04	9 AM
On California Bet.				
Haras. + Clayton				
Sutterland On La Valle Ave				
NE Cor Noell	-2.26	-4.00	-.05	10 AM
Estudillo				
Wright				
Pardini	-2.20	-4.20	-.03	11 AM
Texas + Ampudia	-3.69	-9.40	-.05	1 PM

Reading Made At	Pipe To Rail		State Street Line	
	Avg	Max	Volts	Time
Harney	-10.73	-23.00	-08	2 ³⁰ PM
End of Line	-13.72	-38.00		3 ⁰⁰ PM

Reading	Pipe to Trail	Mission Hills Line		
Made At	Car Pulling	Pipe to Earth	Volts	
	Avg	Max	Volts	Time
Or. Fy. Stockton Bet				July 29/15
Trins + Hortensia	-6.90	-12.00	-.11	9 ²⁵ AM
Hortensia + Wetherby	-8.53	-14.00	-.12	10 ¹⁵ AM
Wetherby + Pine	-8.11	-14.00	-.08	11 ⁰⁵ AM
Pine + Arden Way	-7.36	-11.00	-.07	1 PM
A. Way + St James	-6.74	-13.00	-.06	2 PM
St. J. + Hermes Wy	-7.00	-11.00	-.05	3 ^{PM}
Her. Wy + Stevens on Lewis	-7.12	-12.00	-.04	3 ⁴⁵ PM Aug 3/15
Stevens + Calhoun	-6.34	-11.00		8 AM
Calhoun	-7.62	-11.00	-.07	9 AM
Randolph	-6.54	-11.00	-.08	10 AM
Hooker + Kite	-5.94	-9.00	-.08	11 AM
Kite + Jackdaw	-7.10	-10.50	-.08	12 PM

Reading Made At	Pipe to Rail Mission Hills Line		Time
	Avg	Max	
On Lewis St Bet.			
Jackdaw + Ibis	-7.01	-10.00	-08 2 PM
Ibis + Hawk On Hawk Bet.	-6.35	-10.00	-04 3 PM
Lewis + Th. Shrike Aug 5, 1915	-7.95	-14.00	-04 3 ⁴⁵ PM
W. S. + Washington On Washington	-6.82	-10.40	-05 8 AM
Hawk + Goldfinch	-5.63	-10.00	+10 9 AM
G. Finch + Falcon	-4.89	-8.40	-02 10 AM
Falcon + Eagle	-5.88	-15.00	-07 11 AM
Eagle + Dove	-6.09	-10.00	-05 12 ³⁰ PM
Dove + Brant	-5.51	-9.80	-04 1 ³⁰ PM
Brant + Albatross	-5.92	-12.00	-03 2 ³⁰ PM
Albatross + Front Aug 6, 1915	-6.38	-12.00	-09 3 ³⁰ PM
Front + 1st	-6.00	-8.60	-02 8 AM

Reading *Pipe To Rail Mission Hills Line*
 Made At *Car Pulling Pipe To Earth*

Volts

Avg Max Volts Time

ON 2nd FET

Aug 6

-10

Wash + Univ Ave -5.36 -9.20 1.84 9 AM

Univ + Robinson -5.35 -9.40 1.86 10 AM
 -15.2

Rob + Penn -5.14 -8.20 1.60 11 AM
 -14.4

Penn + Brooks -4.45 -7.00 1.26 1 PM
 -14.4

Brooks + Walnut -5.27 -8.00 1.14 2 PM
 -12.4

Natv + Upas -4.93 -8.20 1.06 3 PM
 -10.4

Upas + Thorn -4.52 -8.40 .932 3:45 PM
 -10.4

Aug 7

Thorn + Spruce -5.30 -7.40 .852 8 AM

ON SPRUCE

1st + 2nd -4.95 -7.60 .86 9 AM

2nd + 3rd -5.09 -9.20 .85 10 AM

3rd + 4th -4.55 -6.00 — 11 AM
 ON 4th

Spruce + Pdw -4.35 -7.40 .83 12 AM

Reading Made At	Pipe To Pail		Mission Hills Line	
	Car Pulling	Pipe To Earth	Volts	Time
ON. 417				
Palm & Quince	-3.46	-5.00	-.04	1 PM
Quince & Palm	-3.37	-5.00	-.03	2 PM
Palm & Olive	-3.30	-4.80	-.05	3 PM
	Aug 9/15			
Olive & Nutmeg	-2.67	-4.00	-.06	8 AM
Maple & Nutmeg	-2.39	-4.00	-.08	9 AM
Maple & Laurel	-2.33	-3.00	-.10	10 AM
Kalmia & Laurel	-2.12	-3.00	-.06	11 AM
Juniper & Kalmia	-2.15	-3.20	-.03	11 ³⁰ AM
Juniper & Ivy	-1.92	-2.60	-.04	1 PM
Ivy & Hawthorn	-2.42	-3.60	-.04	2 PM
Hawthorn & Grape	-2.51	-4.20	-.07	3 PM
Grape & Fir	-3.06	-4.80	-.04	3 ⁴⁵ PM

Reading Made At	Pipe To Nail	Mission Hills Line		Time
	Car Pulling	Pipe To Earth		
Volts				
	Avg	Max	Volts	
ON. Fir			Avg 10/5	
Ash + Spruce ON Spruce	-2.44	-3.40	.03	8 AM
Fir + Elm	-0.85	-2.00	.11	9 AM
Elm + Date	-0.80	-2.20	.08	10 AM
Date + Cedar	-1.06	-2.00	.11	11 AM
Cedar + Beech	-1.81	-3.80	.10	1 PM
Beech + Ash	-1.75	-2.20	.08	2 PM
Ash + A	-1.10	-1.80	.10	3 PM
A + B	-0.57	-0.90	.07	3 ⁴⁵ PM

Reading
Made At

Pipe To Pail
Car Telling
Pipe To Earth

K. St. Line

Volts

Avg Max Volts Time

On K. St

Aug 12/15

6th -1.32 -2.20 10^{AM}

7th -2.13 -4.00 -.05 9^{AM}

8th -1.68 -3.20 -.08 8^{AM}

Aug 13/15

9th -1.50 -2.40 3⁴⁵_{PM}

10th -1.95 -3.00 +.01 3^{PM}

11th -2.00 -3.60 -.12 2^{PM}

12th -3.24 -4.80 -.13 1^{PM}

13th + 14th -3.12 -4.20 -.04 11^{AM}

14th + 15th -3.15 -4.40 -.08 10^{AM}

15 + 16 -2.76 -4.40 -.09 9^{AM}

16 + 17 -3.08 -4.00 -.10 8^{AM}

Aug 12/15

17 + 18 -3.76 -5.20 -.11 3⁴⁵_{PM}

Reading Made At	Pipe To Rail		K. St Line	Pipe To Earth
	Car Trolling			
Volts				
	Avg	Max	Volts	Time
On K. St.				
18 + 19	-3.42	-4.80	-.18	2:50 PM
19 th + 20 th	-3.69	-5.60	-.30	2 PM
20 th + 21 st	-3.56	-6.40	-.10	1 PM
21 st + 22 nd	-2.90	-5.40	-.19	11 AM
22 nd + 23 rd	-3.82	-6.70	-.12	10 AM
24 th + 25 th	-3.33	-5.40	-.07	9 AM
On 25 th				
M + L	-2.95	-4.40	-.12	8 AM
	Aug 11/15			
L + M	-2.90	-4.20	-.05	3:45 PM
M + N	+3.63	-6.40	-.11	3 PM
On Noolman				
25 + Dewey	-3.83	-5.60	-.03	2 PM
Dewey + Evans	-4.54	-6.80	-.02	1 PM
Evans + Sampson	-4.53	-8.80	-.11	11 AM

Reading Made At	Pipe To Rail	K. St. Line		Time
	Car Pulling	Pipe To Earth		
	Volts			
	Avg	Max	Volts	

On Woolman

Simpson + 28	-5.05	-8.00	-.08	10 AM
--------------	-------	-------	------	-------

28 + 29	-7.90	-13.00	-.15	9 AM
---------	-------	--------	------	------

30 th	-8.18	-14.00	-.08	8 AM
------------------	-------	--------	------	------

Reading Made At	Pipe To Nail	M. St Line	Car Pulling Pipe To Earth	Volts	Time
	Avg	Max	Volts	Time	
On 10 th Bet					
	Aug 14/15				
K+L	-3.29	-5.40	-0.3		11 ^{AM}
L + M	-2.82	-5.60	-0.2		1 ^{PM}
On M St.					
10 th + 11 th	-3.28	-5.60	-0.2	+0.3	2 ^{PM}
11 th + 12 th	-2.63	-3.40			3 ^{PM}
	Aug 16/15				
13 th	-3.18	-4.40	+0.3		8 ^{AM}
14 th	-3.01	-3.60	-0.2		9 ^{AM}
15 th	-1.96	-3.60	-0.9		10 ^{AM}
15 th + 16 th	-2.46	-4.00	-0.18		11 ^{AM}
17 th	-3.06	-5.80	-0.8		1 ^{PM}
18 th	-3.02	-5.40	-0.9		2 ^{PM}
19 th	-2.58	-3.40	-0.8		3 ^{PM}
20 th	-2.82	-5.20	-0.7		3 ⁴⁵ PM

Reading Made At	Pipe To Rail	M. St Line	Car Pulling Pipe To Earth	Volts	Avg	Max	Volts	Time
on 19 st								Aug 18/15
21 st				-3.00	-3.80	.33		8 AM
22 nd				-3.52	-5.20	.14		9 AM
24 + 25				-2.82	-4.00	-.07		10 AM
25 + 26				-3.21	-5.00	-.09		11 AM
26 + 27				-3.16	-5.00	-.06		1 PM
								JUNE 7
27 + Evans				-2.69	-5.10	-.18		3 ⁵³ PM
								JUNE 8/15
Evans + Hensley				-3.62	-7.40	-.18		8 AM
28 + 29				-2.88	-6.80	-.18		9 AM
29 + 30				-3.50	-9.40	-.18		10 AM
30 + 31				-2.81	-3.80	-.19		11 AM
31 + 32				-3.09	-9.20	-.19		1 PM
32 + 33				-5.19	-9.60			2 PM

Reading Pipe to Rail
 Made At Car Pulling Pipe to Earth
 Volts
 Avg Max Volts Time

21 19.57

21 51

22 102

24 12.5

25 12.6

26 12.7

27 Evans

Evans & Hensley

28 12.9

29 13.0

30 13.1

31 13.2

32 13.3

Reading Made At	Pipe To Rail M. St. Line		Pipe To Earth	Time
	Avg	Max		
On M St.	June 8/15			
33+34	-4.80	-8.40	-.20	2:50
200 ft. E. of Bridge	-5.11	-8.40	-.30	3:45
	JUNE 9/15			
35+36	-5.11	-11.00	-.02	8:11 AM
36	-5.33	-8.60	-.20	9:11 AM
FAK+37	-5.02	-8.40	-.19	11:11 AM
37+38	-5.69	-8.00	-.20	3:45 PM
38+39	-5.65	-14.00	-.21	2:30 PM
40	-5.33	-8.60	-.20	11:11 AM

Reading Made At	Pipe to Rail 1st Street Line		Pipe to Earth	Volts	Time
	Avg	Max			
On 1st St.	- June 10/15				
Railway + C	+ .84	+ 1.40	- .20		9 ⁵⁰ AM
C + B	+ .50	+ 1.20	- .20		10 ³⁰ AM
B + A	+ .47	+ 1.10	- .20		11 ²⁰
Ash + Ash	+ .43	- 1.00	+ .15		1 PM
	+ 1.00				
Ash + Beech	- .30	- 1.80			1 ⁵⁰ PM
Beech + Cedar	- .60	- 2.00	- .15		2 ³⁰ PM
Cedar + Date	- 1.34	- 3.60	- .20		3 ²⁰ PM
Date + Elm	- 3.22	- 7.60	- .20		4 ¹⁵ PM
	June 11				
Elm + Fir	- 5.48	- 8.00	- .18		8 AM
Fir + Grape	- 6.09	- 10.00	- .18		9 AM
Grape + Hawth.	- 7.96	- 14.00	- .18		10 AM
Haw. + Ivy	- 6.72	- 12	- .20		11 AM

Reading Rail To Pipe 1st. Street Line
 Made At Car Pulling Pipe To Earth
 Volts
 Avg Max Volts Time

On 1st St.

Ivy & Juniper -4.24 -7.80 -.19 1³⁰ PM

Juniper & Kalmia -4.32 -6.80 -.15 2³⁰ PM

Laurel -5.04 -9.20 -.19 3³⁰ PM

Reading

Rail to Pipe

Made At

Car Pulling Pipe to Earth

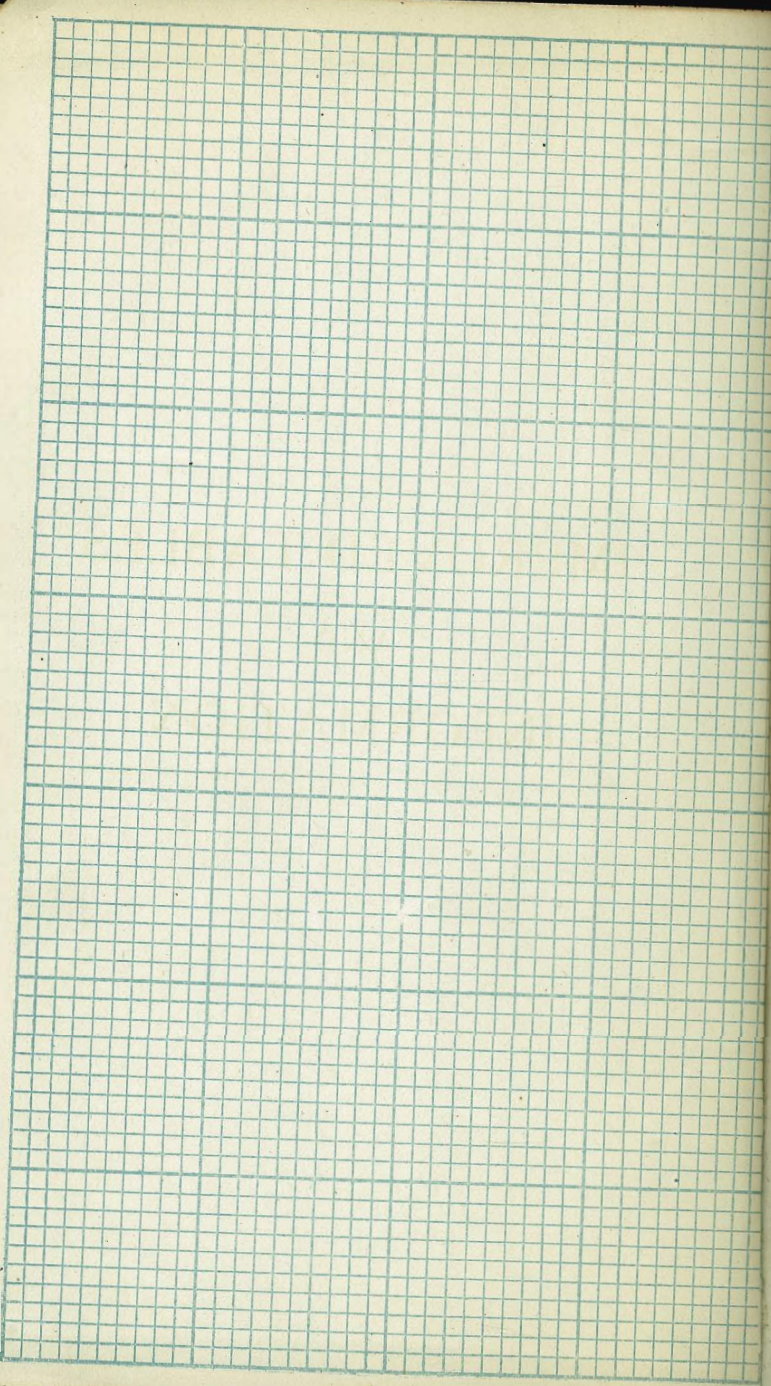
Volts

Avg Max Volts Time

Reading Made At	Rail To Pipe		Pipe To Earth	
	Avg	Max	Volts	Time

Reading
Made At

H
A



DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder
stake for any width roadway, slope $1\frac{1}{2}$ 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

IMPROVED TABLES

AND

INFORMATION

TABLE No. 2.

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 T may be found
by dividing tangent, (or external), opposite T 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.

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1 TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
1	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1
2	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2
3	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3
4	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	4
5	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	5
6	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	6
7	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	7
8	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	8
9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	9
10	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	10
11	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	11
12	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	12
13	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	13
14	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	14
15	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	15
16	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	16
17	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	17
18	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	18
19	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	19
20	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	20
21	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	21
22	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	22
23	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	23
24	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	24
25	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	25
26	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	26
27	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	27
28	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	28
29	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	29
30	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	30
31	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	31
32	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	32
33	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	33
34	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	34
35	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	35
36	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	36
37	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	37
38	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	38
39	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	39
40	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	40
41	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	41
42	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	42
43	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	43
44	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	44
45	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	45
46	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	46
47	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	47
48	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	48
49	49.0	49.1	49.2	49.3	49.4	49.5	49.6	49.7	49.8	49.9	49
50	50.0	50.1	50.2	50.3	50.4	50.5	50.6	50.7	50.8	50.9	50