

UTAH POWER & LIGHT COMPANY
DONNONS RATING STATION.

	1914. Date	Time	Meter Number	G.H.	Disch.		
July	27	2:15p	1843	479	227.83		4
Oct.	19	11:00a	1351	490	207.92		10
Nov.	6	10:00a	1351	495	211.36	Mean 212.06	13
Nov.	6	10:00a	1843	495	212.75		18
Nov.	9	2:00 p	1351	505	221.00	Mean 220.33	25
Nov	9	2:00p	1843	505	219.66		28

LOST CREEK To flume

Nov.	7,1914	10:30a	1351		2.76		34
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UPPER GUARD QUARTERS. T o flume.

Nov.	6,1914	2:45 p	Weir	36	0.79		38
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LOWER GUARD QUARTERS. To flume.

Nov.	7,1914	4: pm		est	0.05		42
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BRIDAL VEIL FALLS. To flume.

Nov.	7,1914	12:30 p			4.42		
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NUNN'S STATION

July	27,1914	10:00 a	1843	463	236.84		53
Oct.	19,1914	3:00 p	1351	413	203.76		58
Nov.	6, 1914.	3:30 p	1843	416	209.33	Mean 209.44	63
Nov.	6, 1914	3:30 p	1351	416	209.59		70

TUNNEL STATION .

Date	Time	Meter Number	G.H.	Disch.			
Nov.	10,1914	12:50 p	1351	578	217.30	Mean 216.34	77
Nov.	10,1914	12.50 p	1843	578	215.37		82

UTAH POWER & LIGHT COMPANY

Copy of pages 17 - 18 - Part II.
 Commissioner's Report 1915.
 Referring to Utah Power & Light Co.

UTAH POWER AND LIGHT FLUME.
 "Donnons"

1915 Date	Time	G.H.	Disch.	
7 - 9	2:00 p	474	224.64	90
7 - 19	9:10 a	482		
7 - 19	9:40	485		
8 - 3	11:40	497		
5 - 8		464	214.75	85
6 - 3	2:35 p	499	240.60 239.75	87

LOST CREEK.

7 - 9	11:15 a		3.45	102
5 - 8	3:15 p		6.41	93

BRIDAL VEIL FALLS

7 - 9			4.11	97
5 - 8	2:10 p		2.23	94

UPPER GUARD QUARTERS.

7 - 9	10:45 a		.50	101
5 - 8	4:10 p	18	.30	100

LOWER GUARD QUARTERS.

5 - 8		est	.05	98
7 - 9	10:40	est	.05	99

U. P. L. FLUME.

		Total in flume		
7 - 9		Total	232.75	
5 - 8		"	223.51	

Utah Power & Light Flume

Donnons Station.

1916. Date	Time	G.H.	Disch.	
5 - 13	6:34 p	469		
5 - 13	Installed Stillwell.			
5 - 16	9:45 a	469	228.65	107
5 - 24	6:14 p	465		
5 - 23	9:28 a	469		
6 - 5	5:14 p	469		
6 - 10	9:09 a	469		
6 - 30	3:42 p	461		
7 - 6	4:06 p	469		
7 - 30	11:39 a	481		
8 - 4	10:00 a	473		
8 - 11	12:06 p	467		
8 - 14				
8 - 13	5:01 p	461		
9 - 5	9:02 a	486		
9 - 6	5:44 p	487		
9 - 9	8:32 a	487	198.93	110
9 - 20	9:09 a	484		
9 - 21	10:44 a	486		
10- 9	10:15 a	470	218.76	113
10-13	10:32 a	468	220.33	116
10-21	2:50 p	4625	218.60	120

OLMSTEAD PLANT.

7 - 16-16 8:30 pm Mr. Bennett calls "One wheel out we are turning water down river. I go to mouth of canyon and keep gages at old points. Leave Olmstead at Midnight.

7 - 17 Power Co. using more water, expect to get full load this a.m., and gates to old points to draw regular distribution.

7 - 17 Called Major Anderson asking for steady flow until Sept. 1.

7 - 22 Reports trouble last night and this morning-Another Hot Bearing.

7 - 24 Marked all canals at head U.P. & L. Co. putting on load at North Wheel.
I return home at 5 p.m.

Aug. 31 Bennett phones "We are putting on another Well"

BRIDAL VEIL FALLS DISCHARGE into
Utah Power & Light Co. Flume

1916 Date	Time	G.H.	Disch.	
Oct. 9	4:15 p	122	3.80	122
Oct. 13		est	3.80	
Oct. 21		est	3.80	

UTAH POWER & LIGHT COMPANY

Provo Canyon.

The Utah Power & Light Company diverts the greater part of the Provo River by means of a timber dam, located about five miles above the mouth of the Provo Canyon.

From the dam the water is carried along the North side of the canyon in a rectangular wooden flume, and is conveyed to the power house at Olmstead by three circular steel pipes, and returned to the river above the points of diversion of all canals of the Utah Valley, excepting the Timpanogus Canal and the Provo Reservoir Company canal.

This company also uses a small flow for irrigation, which is specified in the "Chidester Decree".

In addition to the flow diverted at the dam, "Lost Creek", "Upper Guard Quarters Springs, and "Lower Guard Quarters Springs," are diverted into the flume. And at the Bridal Veil Falls a pumping plant is installed that may direct a flow from river into the flume.

November 6-9, 1914, I went over the whole length of flume to determine the "Point of minimum capacity."

On November 9th, 1914, after the rating No. 4 at "Donnons", at a point 300 feet below gate house, run of water surface was 0.65 foot below top of siding, and crest of waves 0.40 foot below top of siding. At a point 271 feet below gate house, flume appears to have been raised, making a break in grade line at this point run of water surface was 0.60 foot below top of siding, and crest of waves 0.54 foot below top of siding. This is "point of minimum capacity". At 130 feet below gate house surface run of water was 1. foot below top of siding, and marked by a nail, there is also a nail at 0.86 foot below top of siding, wave crest is 0.57 foot below top of siding and marked by a nail.

(Copy of Page 62) Commissioner's Report 1914.

At the "Donnons Rating Station" gage height is 0.84 foot below top of flume, and from this point down to the enlarged flume near the tunnel the surface run ranges from 0.84 foot to 1.80 foot below top of siding.

From the upper end of the enlarged section to the pressure box the flume is built to permit of a small storage for "peak loads".

The field work on the measurements of this flume and the discharge, was done with the greatest care and precision.

You will note from the accompanying details that two meters were used, No. 1351 and No. 1843, both of which were in perfect condition and fully equipped.

Immediately after the rating of November 10th, ~~with~~ I delivered these instruments to the United States Geological Survey for individual ratings by the Bureau of Standards. I received the instruments with the individual ratings on each in December.

Where the flume measurements were made by both meters, they were mounted on the same rod, at distances apart of approximately one-half the depth of flow, and were run at the same time. Meter No. 1351 was timed by New York Standard Watch No. 5509953. Meter No. 1843 was timed by Swiss Movement Watch marked -VXX-.

During all of the time of these measurements in November, except one watch while making the ratings, I kept both watches in my possession, and on November 14th, delivered them to the Chipman Jewelry Company of Provo, for certificate of correctness, which I submit herewith.

The discharge shown on the details and on the rating curve are all calculated on the Bureau of Standards rating of meters, and are corrected for watch error.

For the season of 1914, three rating stations were selected.

The Donnon Rating Station is about 1,000 feet below the point of diversion, Herewith I submit cross-section of this station, and details of four ratings. Between the time of July 27, 1914 and October 19, 1914, the flume near this station was changed.

Ratings Nos. 2,3,24, when platted for rating curve as shown by "Segment of Rating Curve" describe practically a straight line, that is the discharge varies directly with the gage height. Assuming this condition to continue to gage height, 5.39, and that an increase in depth of 0.34 foot at the point of "Minimum Capacity" will also cause an increase in depth of the same amount at Donnons Rating Station, then the Maximum flume capacity at the point of Minimum Capacity is approximately 248 second feet.

The Nunns Rating Station is located about 600 feet below the pressure box of the Nunns Plant, herewith is submitted detail cross-section of flume, and details of ratings.

The Tunnel Rating Station is located about 60 feet above the spillway, near the tunnel, herewith is submitted a detail cross-section of flume, and details of ratings.

On November 6,7, and 9, I made measurements of the inflow to flume as follows:

Lower Guard quarters	.....	0.05	sec.ft.
Upper Guard quarters	.....	0.79	" "
Bridal Veil Falls	.....	4.42	" "
Lost Creek	.....	<u>2.76</u>	" "
Total	.....	8.02	" "

And also measured the leakage at Nunns pressure box which was 0.53 sec.ft.

Flow at these stations was marked for future reference.

On November 10, 1914, I visited, from 9: am to 9:30 am., Upper Guard quarters, Lower Guard quarters, Leakage at Nunns, Bridal veil Falls inflow to flume, and Lost Creek, and find all flowing the same as when measured.

Gage Heights at Donnons Rating Station were observed as follows:

Nov.10, 1914.	Time	G.H.
	9:45 a..	4.99
	10:00 a	4.99
	10:15 a	4.99
	10:30 a	4.99

A constant gage height of 4.99, and by rating curve a discharge

of 215.3 second-feet.

Caleb Tanner and Theo. Farley Jr. goto Tunnel Rating Station this morning to note the gage heights. At 10:30 a.m. I leave Donnons Rating Station, arriving at Tunnel Rating Station at 11:30 a.m. Mr. Tanner and Mr. Farley, report "no fluctuations" by gage points, three gage nails are set in spillway and the Stillwell in flume.

During the time ~~xxx~~ from 11:30 a.m. to 4: p.m. still-well and gage nails are observed, every two to three minutes, and during this time, absolutely no fluctuations occurred; denoting the same flow at head.

The gage height was 5.78 feet and discharge 216.34 sec.feet. then the losses in transmission are shown:

Inflow	215.3	Sec.ft.	Discharge at Tunnel	216.34
	<u>8.02</u>	" "	Leakage at Nunns'	<u>.53</u>
Total	223.32			216.87

Loss in transmission 6.45 second-feet.

There is approximately 3.84 second-feet going over spillway the remaining 212.5 second-feet going through plant on this date.

Provo, Utah, November 14, 1914.

T. F. Wentz,

Provo, Utah.

Dear Sir: In accordance with your verbal request, I have this day tested "Stop watch number 5509953 New York Standard" as follows: Watch was started at 11:05 am and run continuously for one hour, until 12:05 P.M. and stopped, it registered 59 minutes 56.9 seconds, or 3.1 seconds slow per hour.

Also at your verbal request I have tested "Swiss Movement watch marked -vxx- as follows:

Watch was started at 11:05 A.M. and run continuously for one hour, until 12:05 P.M. and stopped, it registered 59 minutes 57.1 seconds, or 2.9 seconds slow per hour.

In each of these tests the time of one hour was measured by "21 Jeweled Waltham Watch Number 17121783, which is in perfect condition and is keeping perfect time.

Resp. Submitted,

Chipman Jewelry Company

(signed) By Del Chipman
Manager.

Observation and test made by Dell Chipman.

Watches delivered and received by T. F. Wentz.

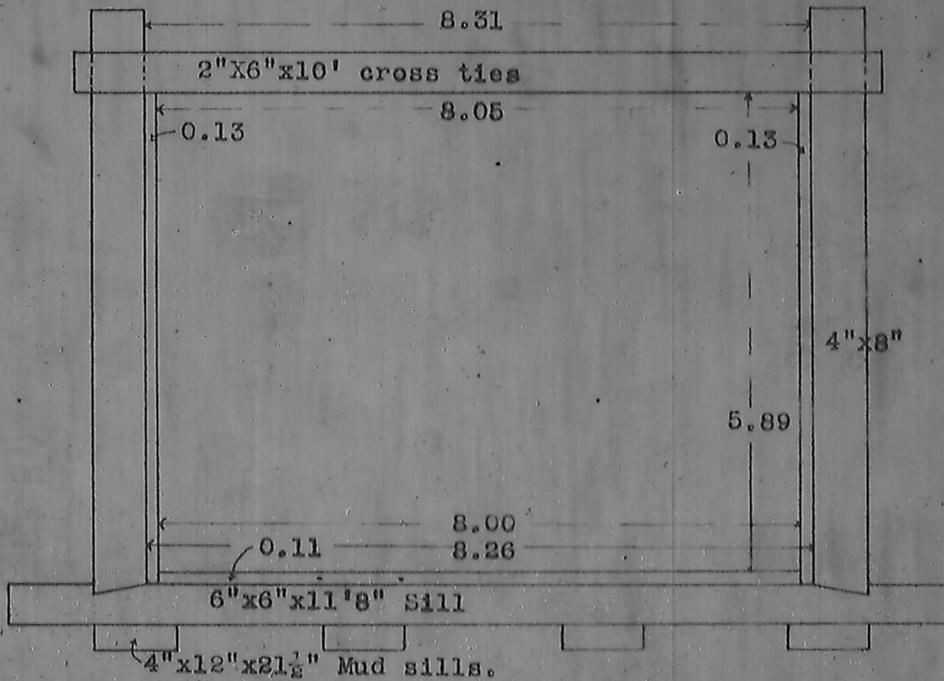
(Copy)

UTAH POWER & LIGHT COMPANY PLUMB.

Provo Canyon.

Section

"Donnon's Rating station"



Scale 1 inch equals 2 feet.

Actual and precise measurements are shown in feet and decimals. Custom lumber dimensions in feet and inches.

Nov. 7, 1914.

T. P. Wentz

Caleb Tanner

Observer's.

UTAH POWER & LIGHT CO. FLUME

Provo Canyon.

No. 1

"Donnons Rating Station"

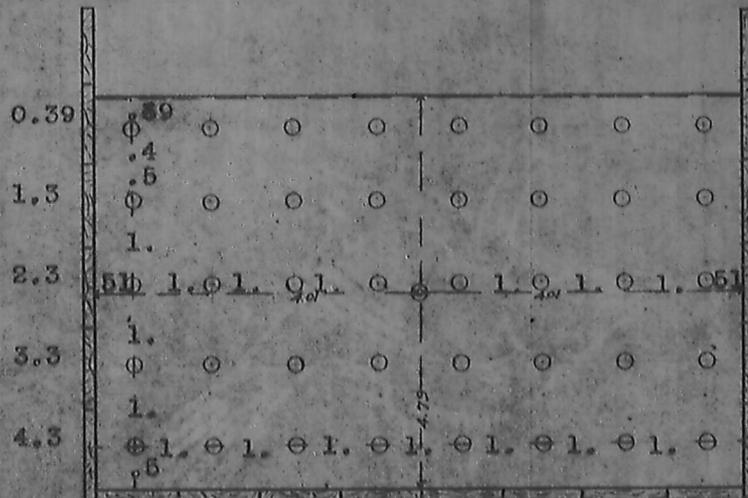
Sketch showing locations of meter velocity observations of rating of July 27, 1914, made by T.F. Wentz and Caleb Tanner.

Meter No. 1843, on rating Nov. 24, 1914, by Bureau Of Standards, Chevy Chase, Maryland. Watch "Swiss movement marked -VXX-"

Depth of flow 4.79 feet.

Area 38.42

Average width of conduit 8.02 feet.



Number of velocity observations 40. Small circles denote location of Mean velocity 5.34 feet per second. Meter observations.

Discharge 327.83 second-feet.

Scale 1 inch equals 2 feet.

Calculations made Dec. 31, 1914.

by T.F. Wentz

UTAH POWER & LIGHT CO. FLUME.

Provo Canyon

No 2

" Donmons Rating Station "

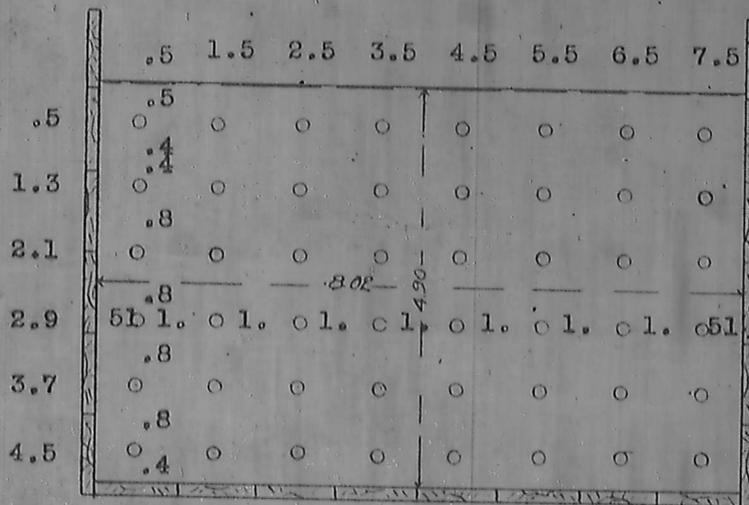
Sketch showing locations of meter velocity observations of rating of Oct., 19, 1914., made by T.F.Wentz and Caleb Tanner.

Meter No. 1351, on rating of Nov. 24, 1914, by Bureau Of Standards, Chevy Chase, Maryland. Watch "New York Standard No. 5509953"

Depth of flow 4.90 feet.

Area 39.30 square feet.

Average width of conduit 8.02 feet.



Number of Velocity observations 48.

Mean Velocity 5.29 feet per second.

Discharge 207.92 second feet.

Computations made by

T.F.Wentz

Caleb Tanner.

Note; Small circles denote location of meter observations.

Scale 1 inch = 2 feet.

Sketch Made by T.F.Wentz

Jan. 1, 1915.

UTAH POWER & LIGHT CO. FLUME.

No 3

Provo Canyon.

"Donnons Rating Station"

Sketch showing locations of meter velocity observations of rating of Nov. 6, 1914, made by T.F. Wentz and Caleb Tanner.

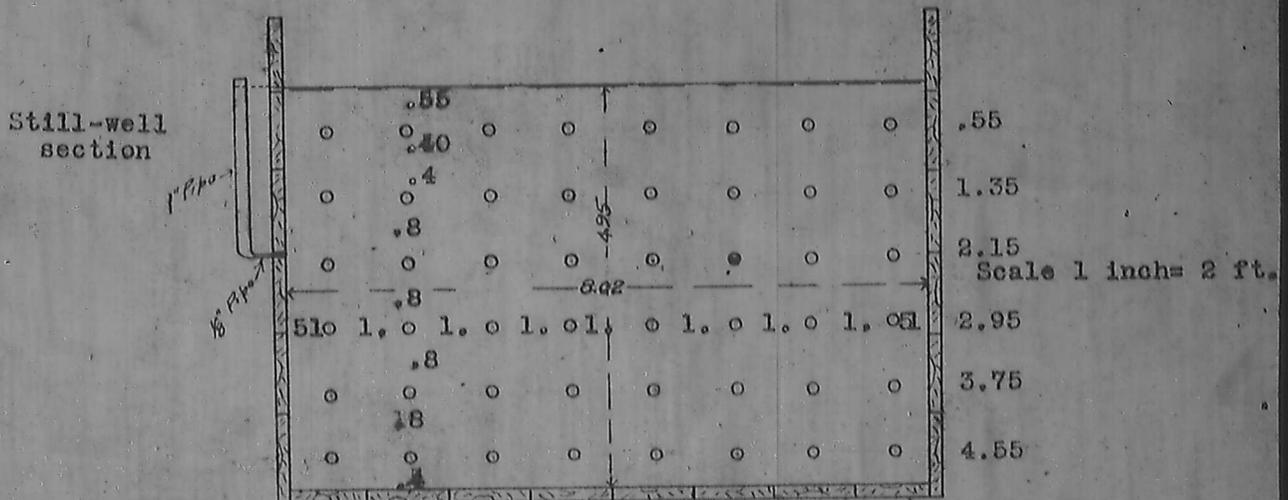
Meter No. 1843, on rating of Nov. 24, 1914, by Bureau of Standards, Chevy Chase Maryland. Watch "Swiss movement marked -vxx-"

And Meter No. 1351, on rating of Nov. 24, 1914, by Bureau of Standards, Chevy Chase, Maryland, Watch "New York Standard No. 5509953"

Depth of flow 4.95 feet.

Area 39.70 square feet.

Average width of conduit 8.02 feet.



Number of Velocity Observations by each meter 48.

Mean Velocity by Meter No 1843, 5.359 feet per second.

Mean Velocity by Meter No. 1351, 5.324 feet per second.

Discharge by meter No. 1843, 212.75 second feet.

Discharge by meter No. 1351, 211.36 second-feet.

Mean discharge meter No. 1843 and meter No. 1351, 212.06 second feet.

Note; Small circles on sketch denote location of meter observations.

Computations made by

Sketch made by T.F. Wentz.

T.F. Wentz

Dec. 31, 1914.

Caleb Tanner.

UTAH POWER & LIGHT CO. FLUME.

No 4

Provo Canyon

"Donnons Rating Station"

Sketch showing location of meter velocity observations of rating of Nov.9,1914,made by T.F.Wentz and Caleb Tanner.

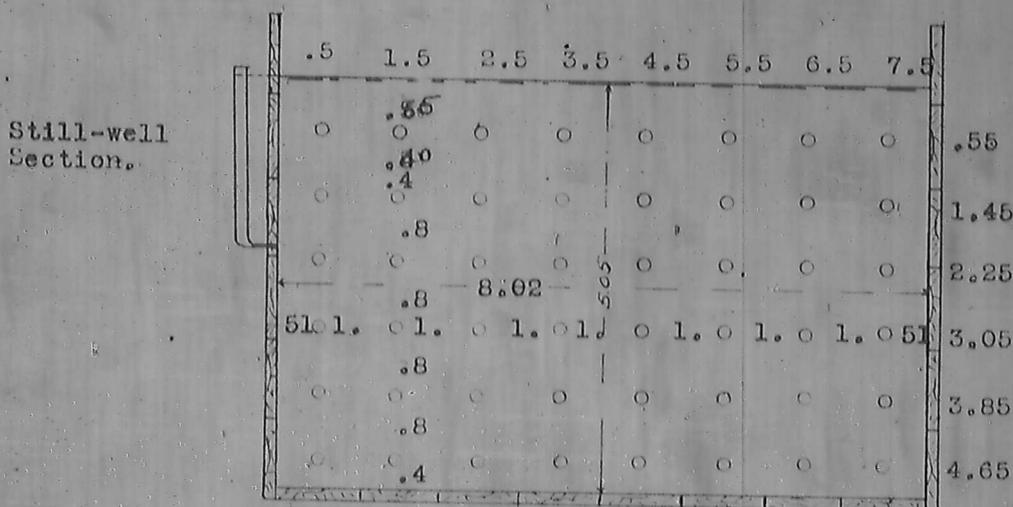
Meter No. 1843,on rating Nov.24,1914,by Bureau Of Standards,Chevy Chase, Maryland. Watch "Swiss movement marked -vxx-"

And Meter No.1351,on rating of Nov.24,1914,by Bureau Of Standards,Chevy Chase,Maryland, Watch "New York Standard No.5509953."

Depth of flow 5.05 feet.

Area 40.50 square feet.

Average width of conduit 8.02 feet



Number of observations by each meter 48.

Mean Velocity by Meter No.1843 5.424 feet per second.

" " " " " 1351 5.457 " " "

Discharge by meter No.1843 219.66 second feet.

" " " " " 1351 221.00 " "

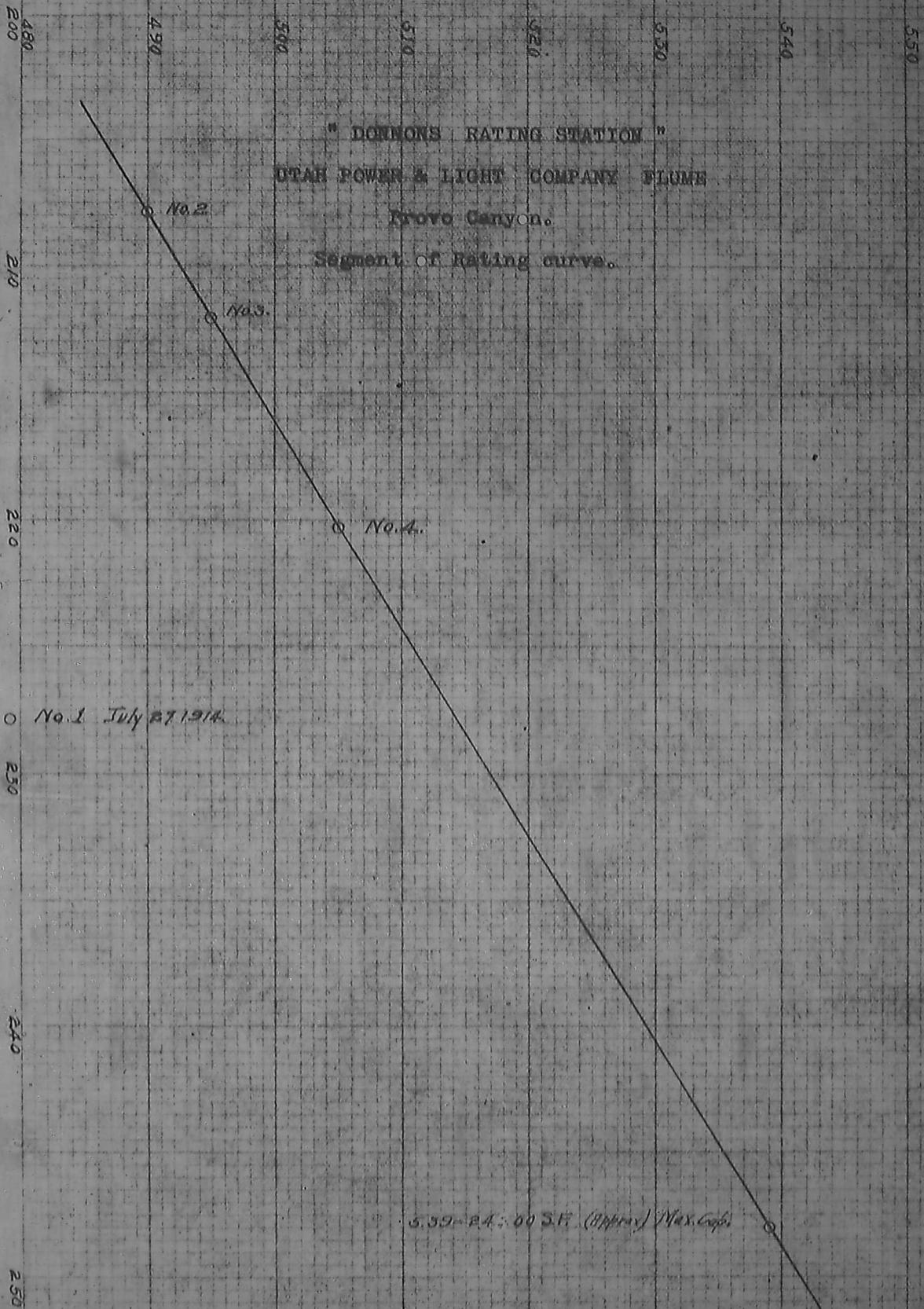
Mean discharge by meter No.1843 and meter No.1351, 220.33 second feet.

Note; Small circles on sketch denote location of meter observations.

Sketch made by T.F.Wentz

Computations made by
T.F.Wentz.

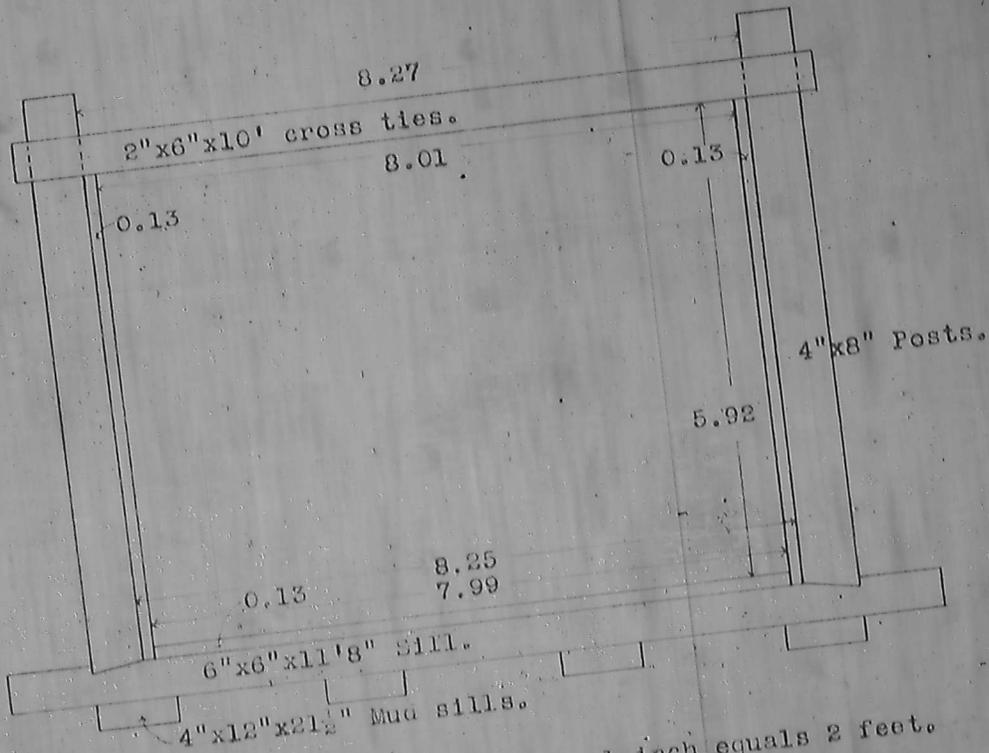
Jan.,1,1915



1/20 X

UTAH POWER & LIGHT COMPANY FLUME.
Provo Canyon.

Section
"Nunn's Rating Station"



Scale 1 inch equals 2 feet.

Actual and precise measurements are shown in feet and decimals. Custom lumber dimensions in feet and inches.

Nov. 7, 1914.

T.F. Wentz

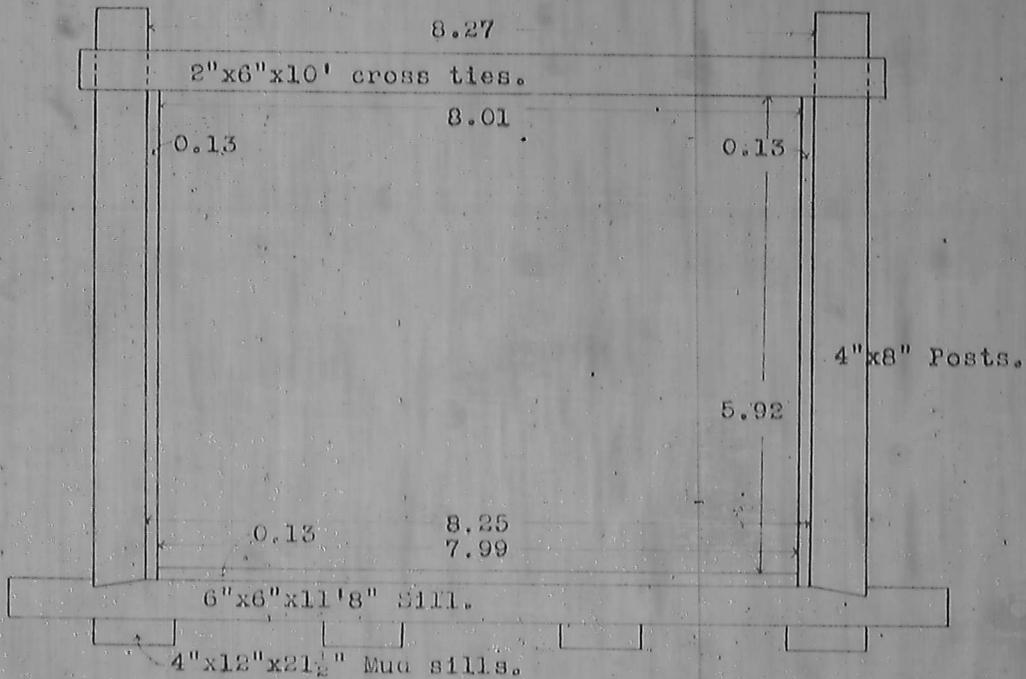
Caleb Tanner Obser'r.

UTAH POWER & LIGHT COMPANY FLUME.

Provo Canyon.

Section

"Nunn's Rating Station"



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Nov. 7, 1914.

T.F. Wentz

Caleb Tanner Obser's.

UTAH POWER & LIGHT CO. FLUME.

Provo Canyon.

" Nunns Rating Station "

Sketch showing location of meter velocity observations of rating of Nov. 6, 1914, made by T.F. Wentz and Caleb Tanner.

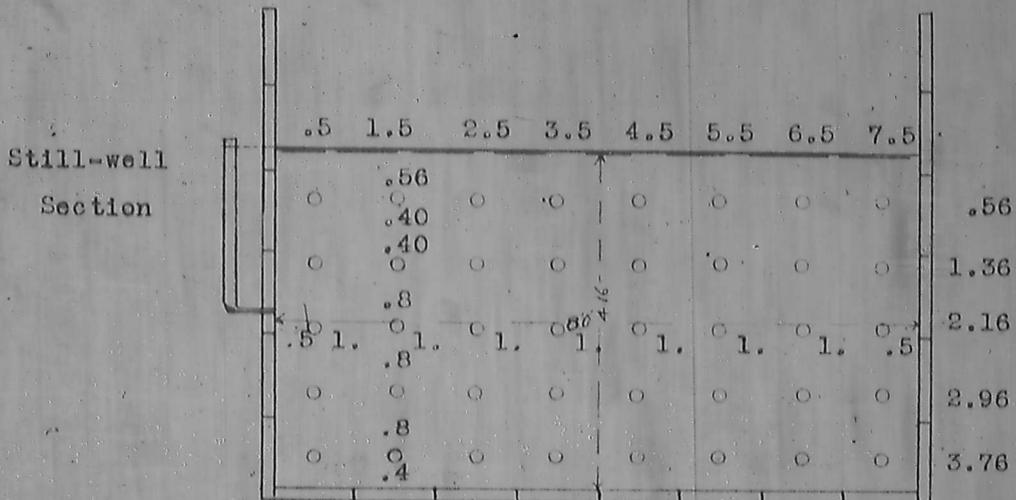
Meter No. 1843, on rating of Nov. 24, 1914, made by the Bureau Of Standards, Chevy Chase, Maryland. Watch "Swiss movement marked -vxx-"

And meter No. 1351, on rating of Nov. 24, 1914, made by the Bureau Of Standards at Chevy Chase, Maryland. Watch "New York Standard No. 5509953."

Depth of flow 4.16 feet

Area 33.28 square feet.

Average width of conduit 8.00 feet.



Number of observations by each meter 40.

Mean velocity by meter No. 1843, ^{6.29} feet per second.

" " " " " 1351 6.298" # " "

Discharge by meter No. 1843 209.33 second feet.

" " " " 1351 209.59 " " "

Mean discharge by meter 1843 and meter No. 1351, 209.44 second-feet.

Note; Small circles on sketch show location of meter observations.

Computations made by
T.F. Wentz.

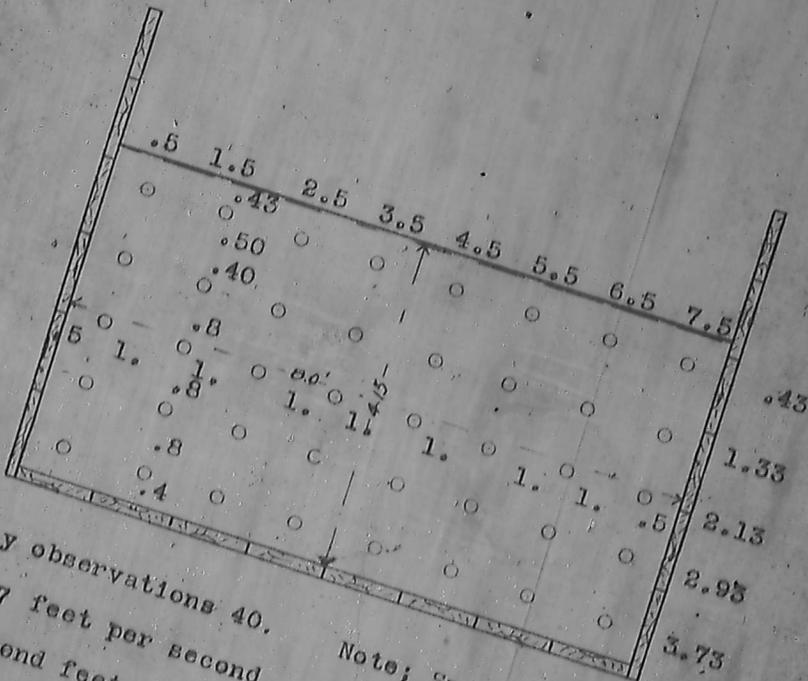
Sketch made by

T.F. Wentz.

Jan. 1, 1915.

UTAH POWER & LIGHT CO. FLUME
 Prove Canyon.

"Nanns Rating Station"
 Sketch showing location of meter observations of rating of Oct. 19, 1914,
 made by T.F. Wentz and Caleb Tanner.
 Meater No. 1351, on rating Nov. 24, 1914, by Bureau Of Standards, at Chevy
 Chase, Maryland. Watch "New York Standard No. 5509953"
 Depth of flow 4.13 feet. Area 33.04 square feet.
 Average width of conduit 8.00 feet.

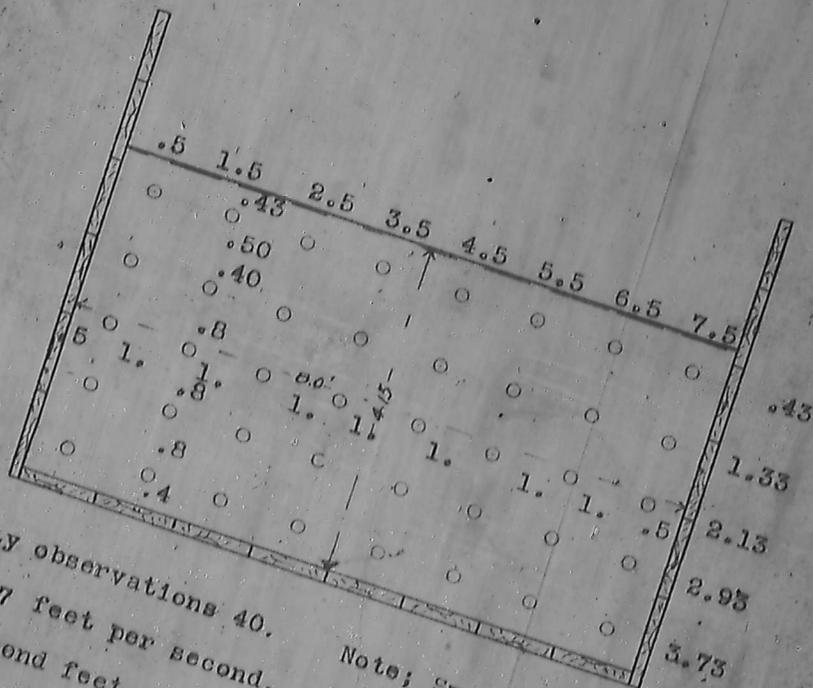


Number of velocity observations 40.
 Mean velocity 6.167 feet per second.
 Discharge 203.76 second feet.
 Computations by
 T.F. Wentz.

Note: Small circles denote location
 of meter observations.
 Scale 1 inch = 2 feet.
 Sketch made by T.F. Wentz
 Jan. 1, 1915.

UTAH POWER & LIGHT CO. FLUME.
 Provo Canyon.
 "Nunns Rating Station"

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 Meter No. 1351, on rating Nov. 24, 1914, by Bureau of Standards, at Chevy
 Chase, Maryland. Watch "New York Standard No. 5509953"
 Depth of flow 4.13 feet. Area 33.04 square feet.
 Average width of conduit 8.00 feet.



Number of velocity observations 40.
 Mean velocity 6.167 feet per second.
 Discharge 205.76 second feet.
 Computations by
 T.F. Wentz.

Note: Small circles denote location
 of meter observations.
 Scale 1 inch = 2 feet.
 Sketch made by T.F. Wentz
 Jan. 1, 1915.

UTAH POWER & LIGHT CO. FLUME.

Provo Canyon.

"Nunns Rating Station" "

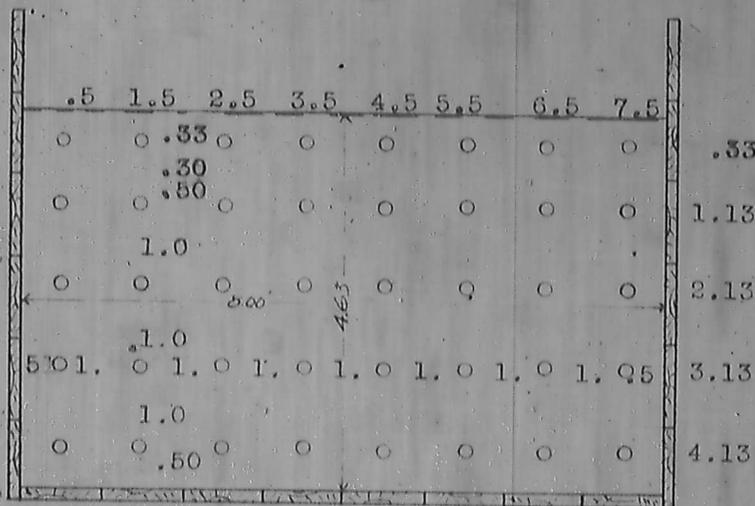
Sketch showing location of meter velocity observations of rating of July 27, 1914, made by T.F. Wentz, and Caleb Tanner.

Meter No. 1843, on rating Nov. 24, 1914, by the Bureau of Standards, Chevy Chase, Maryland. Watch "Swiss movement marked -vxx-"

Depth of flow 4.63 feet.

Area 37.04 square feet.

Average width of conduit 8.00 feet.



Number of velocity observations 40.

Note; Small circles denote location of meter observations.

Mean velocity 6.392 feet per second.

Scale 1 inch = 2 feet.

236.74

Discharge second-feet.

Sketch made Jan. 1, 1915, by

Computations by

T.F. Wentz.

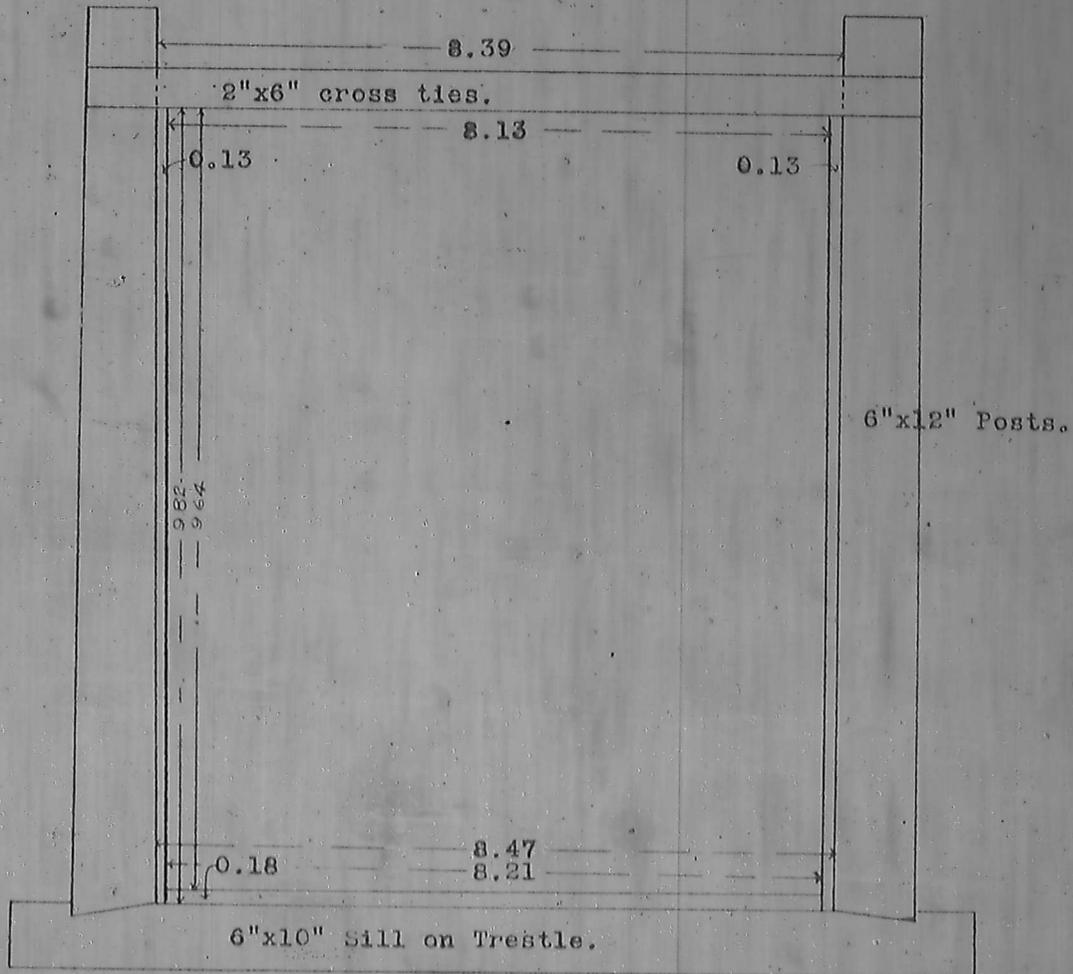
T.F. Wentz.

UTAH POWER & LIGHT COMPANY FLUME.

Provo Canyon.

Section

"Tunnel Rating Station"



Scale 1 inch equals 2 feet.

Actual and precise measurements are shown in feet and decimals, custom lumber dimensions in feet and inches.

Nov. 10, 1914.

T. F. Wentz.

Caleb Tanner. Obser'g.

Theo. Farley Jr.

UTAH POWER & LIGHT CO. FLUME.

Provo Canyon.

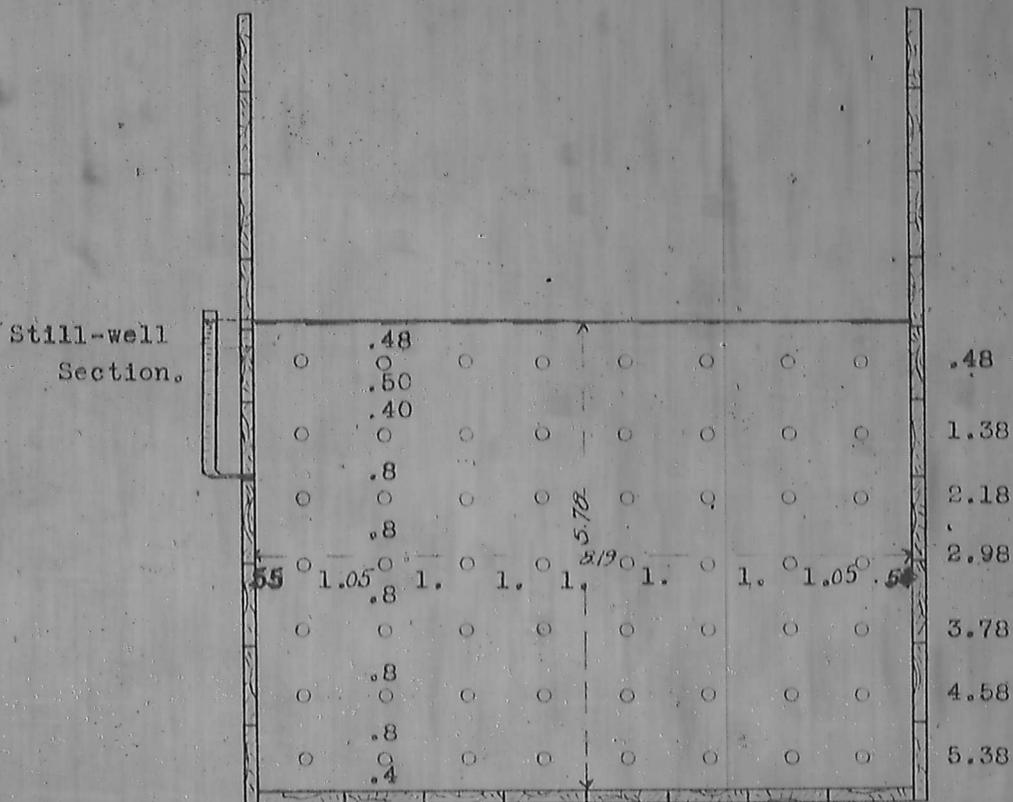
" Tunnel Rating Station "

Sketch showing location of meter velocity observations of rating of Nov. 10, 1914, made by T.F. Wentz and Caleb Tanner.

Meter No. 1843, on rating of Nov. 24, 1914, by the Bureau of Standards, Chevy Chase, Maryland. Watch "Swiss movement marked -vxx-"

And Meter No. 1351, on rating of Nov. 24, 1914, by Bureau of Standards, Chevy Chase, Maryland. Watch "New York Standard No. 5509953"

Depth of flow 5.78 feet. Average width of conduit 8.19 ft. Area 47.34 Sq.ft.



Number of observations by each meter 56.

Mean velocity by meter No. 1843 4.55 feet per second.

" " " " " 1351 4.59 " " "

Discharge by meter No. 1843, 215.37 second feet.

" " " " 1351 217.30 " "

Mean discharge by meter No. 1843 and meter No. 1351, 216.34 second-feet.

Note. Small circles on sketch show location of meter observations.

Computations made by

T.F. Wentz.

Sketch made by

T.F. Wentz

Jan. 2, 1915.