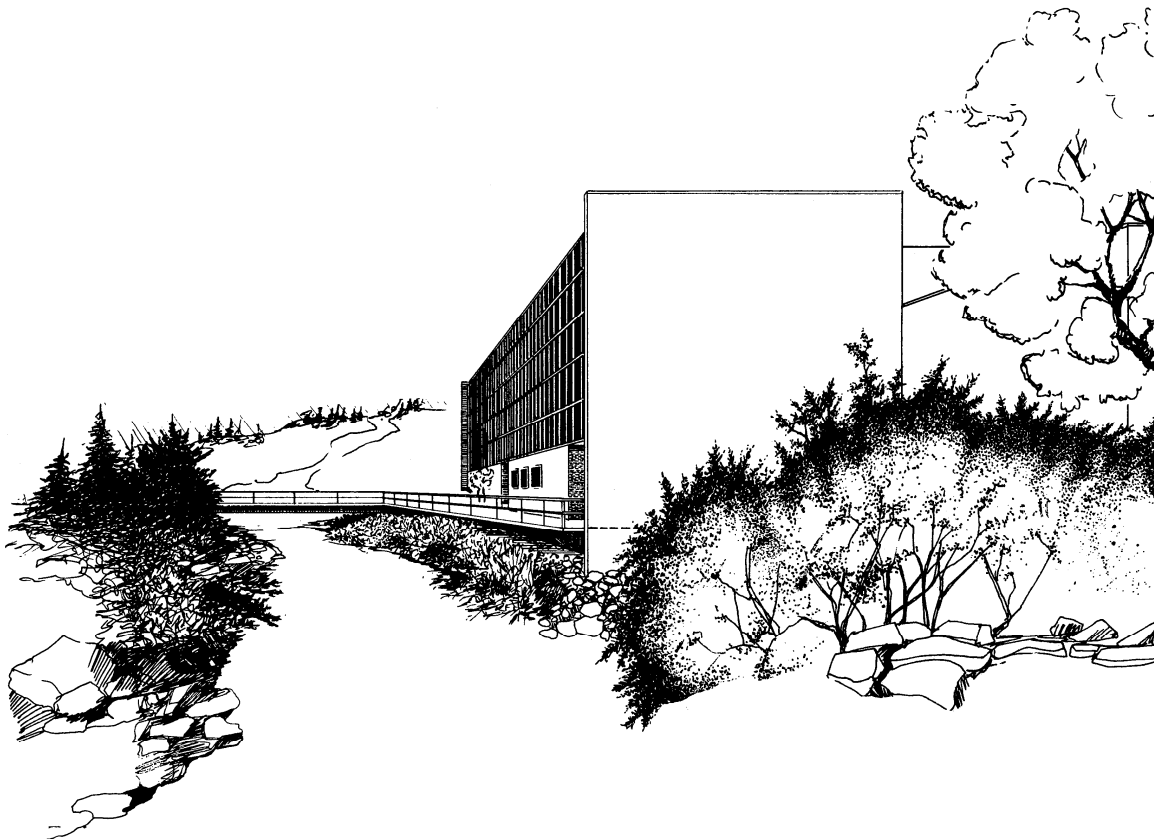


**4-Inch Master Meter Octave Ultrasonic Meter  
Accuracy Testing**

Prepared for

Master Meter

May 2011



**UTAH WATER RESEARCH LABORATORY**

**Utah State University  
Logan, Utah**

**Report No. 2413**

4-Inch Master Meter Octave Ultrasonic Meter  
Accuracy Testing

Submitted to:

Master Meter  
101 Regency Parkway  
Mansfield, TX 76063

By:

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May 2011

Hydraulics Report No. 2413

## **INTRODUCTION**

Utah State University was contracted by Master Meter to perform flow calibrations at the Utah Water Research Laboratory (UWRL) in Logan, Utah on a 4-inch Master Meter Octave Ultrasonic flow meter. The testing required that the meter be tested over a wide range of flows and that each flow be repeated for a determination of meter repeatability. Personnel from Master Meter indicated the range of flows to be tested and witnessed the testing. This test report summarizes the results of the testing.

## **TEST SETUP**

The 4-inch meter was installed in a straight section of 4-inch pipe and had approximately 50 diameters of straight pipe upstream from the meter and approximately 20 diameters of straight pipe downstream from the meter. In addition, a field service connection was simulated ten inches downstream from the meter to evaluate if its proximity had any effect on the meter's performance. Valves were used to regulate and control the flow. Figures 1 and 2 show the test installation.

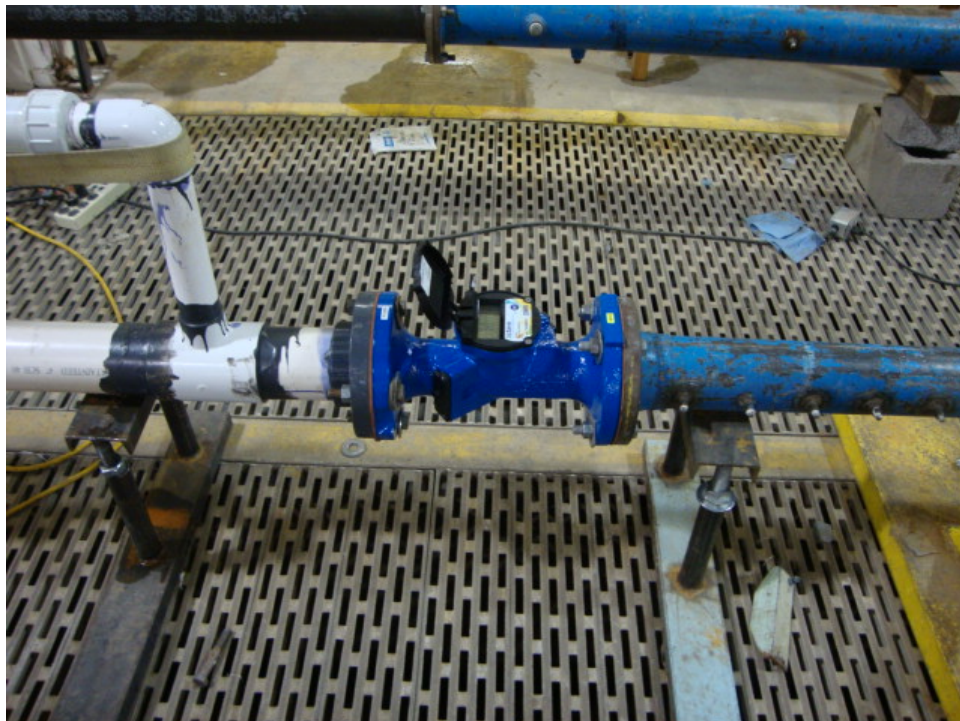


Figure 1. Meter installation.



Figure 2. Meter installation.

## ACCURACY TESTING

Table 1 shows the conditions under which the meter was tested.

Table 1. Flow conditions tested.

Meter Size	Nominal Flow Rates Tested (gpm) and Draft Volume (gal.)						
4-inch	0.0625	0.75	5	20	250	500	1000
Draft (gal.)	Varies	10	50	500	1200	2000	2800

The meters were tested using a gravimetric bench that was certified using NIST traceable weights. The weight of water of each draft and the water temperature were measured for each run.

## RESULTS

Table 2 shows the results of the testing and Figure 3 shows the results graphically. Notable are the facts that the 4-inch meter was capable of registering flow less than 0.1 gpm with the low flow cutoff disabled and that the meter performance was not affected by directing flow through a 2-inch field simulated connection that was 2.5 diameters downstream.

**Utah Water Research Laboratory**

**Flow Meter Calibration Data**

Meter Manufacturer **Master Meter**  
 Calibration Date **5/3/11**  
 Meter Calibration Location **6" Line**  
 End User  
 Installation **LAB**  
 S/N **104500184**  
 Model **4" Octave**  
 Tag  
 Pipe Setup  
 Upstream **4" std. steel**  
 Downstream **4" std. steel**

Certified by:



Calibration Performed by: **M. Johnson, Z. Sharp**  
 Witnessed by: **P. Turner, T. Kearn**

S.S. Prepared By: Mike Johnson 5/11

S.S. Checked By: Steven L. Barfuss, Blake Tullis

Run No.	Flow Key	Master Meter		Weight Tank			Flow			Indicated Volume			Temp. / Unit Wt.		
		Range in H2O	Trans. mA/Hz	Initial Weight lbs	Final Weight lbs	Time sec	Target gpm	Flow gpm	Volume gallons	Initial Vol. gallons	Final Vol. gallons	Volume gallons	Registry (%)	Temp. F	Unit. Wt. lb/gal
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1M		92.70	68.8	154.2		0.75	0.70	10.24	8092.04	8101.97	9.93	97.02%	48.3	8.344
2	1M		88.11	154.2	241.4		0.75	0.66	10.45	8101.97	8112.13	10.16	97.21%	49.3	8.343
3	1M		666.00	94.0	518.8		5	5.00	50.91	34441.51	34492.28	50.77	99.72%	46.4	8.344
4	1M		664.20	94.4	533.2		5	4.98	52.59	34492.28	34544.72	52.44	99.71%	47.7	8.344
5	1M		2698.00	50.0	4290		20	20.24	508.13	8415.87	8921.97	506.10	99.60%	45.9	8.344
6	1M		2689.00	4290.0	8555		20	20.17	511.12	8921.97	9430.31	508.34	99.46%	45.4	8.344
7	6M		1002.80	445.0	10750		250	250.70	1234.93	10215.02	11453.62	1238.60	100.30%	44.6	8.345
8	6M		1000.50	10750	21335		250	250.13	1268.49	11453.62	12724.80	1271.18	100.21%	44.6	8.345
9	6M		1973.60	70.0	17230		500	493.40	2056.43	13432.57	15498.29	2065.72	100.45%	44.7	8.345
10	6M		1966.60	60.0	17270		500	491.65	2062.42	15498.29	17568.91	2070.62	100.40%	44.7	8.345
11	6M		3953.00	75.0	24015		1000	988.25	2868.95	27261.48	30146.95	2885.47	100.58%	44.9	8.345
12	6M		4000.00	90.0	23670		1000	1000.00	2825.82	30146.95	32985.54	2838.59	100.45%	45	8.344
13	6M		0.00	68.8	123.4		1/16	0.08	6.54	9432.22	9438.01	5.79	88.47%	50.7	8.343
14	6M		1016.40	1035.0	9880		250	254.10	1059.98	33360.41	34423.38	1062.97	100.28%	45.1	8.344

104500184

Certified by:

