

# Water Meter Replacement Projects

## Coordination, Planning, Execution

Presenter:

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READING | LITITZ | POTTSVILLE | MOUNTAINTOP | PITTSBURGH

# Meter Projects



Water System	No. of Customers	Meter	Other Modifications	Radio Read	Smart meter
Borough of Orwigsburg	1,500	Neptune	Meter Horn, w /shut off valve and check valve	Yes Partial*	Yes
Borough of Jim Thorpe	1,750	Sensus SR II	Meter Horn, w /shut off valve and check valve	Yes Drive-By	No
West Cocalico Twp.	900	Master Meter	None	Yes Drive-By	Yes
North Penn Water Authority	1,800	Sensus iPerl	Resetter w/ shut off valve and check valve	Yes Drive-By	Yes
North Penn Water Authority	28,500	Sensus	MXU Replacement Only		
Town of North East, MD	2,600	Sensus iPerl	Resetter w/ shut off valve and check valve	AMI – Tower Base Station	Yes

# WHY?

(Justification)



## 1. Meter Age

### a. Pennsylvania Code Chapter 65

- 1" meter or less → 20 years

## 2. Meter Accuracy

### a. Pennsylvania Code Chapter 65

- Meter with error greater than 4% shall not remain in service

### b. Water Quality

- Changes in system water over the last 20 to 30 years

### c. Business End / Bread and Butter

- Revenue

### d. Touch every meter/ account

## 3. Unaccounted-For Water



# Lets Look at Some Meters









# Select a Meter



1. Different technologies
  1. Positive Displacement
  2. Multi – Jet (Master)
  3. Single – Jet
  4. Fluidic Oscillator (Elster)
  5. Ultrasonic (Badger)
  6. Magnetic (Sensus iPerl)
2. Local Support and Service
3. Have Meter Manufacturers do Presentations
  1. Develop a matrix / comparison
4. Ask For and Check References
5. Ask the Manufacturers to set up Visits / Field Trips
  1. Meet with both operation and office staff



# Matrix



<b>2014 Lead Requirements</b>	Yes (100% Composite Meter)	Yes
<b>AWWA Standard</b>	C-700 & C-704	C-713
<b>Accuracy</b>	1/10 <sup>th</sup> of a GPM (Guaranteed) Can read to 1/25 <sup>th</sup> gpm	1/8 <sup>th</sup> of a GPM
<b>1<sup>st</sup> Installation</b>	2009	2000
<b>Meter Size</b>	5/8" x 3/4", 3/4", and 1"	5/8" x 3/4", 3/4", and 1"
<b>Battery</b>	Meter – 20 Years (Warranty) Transmitter – 10/10 Years Cannot replace / sealed	15 years (was 20 years recently reduced to 15 yrs) Can be replaced, but meter must be removed. Battery not replaceable in field.
<b>Radio Study</b>	Done by meter manufacturer	Done by meter manufacturer
<b>Radio</b>	One Tower 2 watts of power	Two Towers 2 watts of power
<b>FCC License</b>	Owned by meter manufacturer  No Annual Fee	North East to apply for and maintain FCC License. Annual Fee (\$400 - \$500)

# Matrix



<b>Transmitters</b>	Cut hole in cast iron lid –or- replace with a composite lid Can accommodate single or dual meter installations	Cut hole in cast iron lid –or- replace with a composite lid
<b>Transmitters H2O Traffic Rated</b>	Yes	Yes
<b>Tower to Office Transmission</b>	Cell Line / Phone Line \$40- \$45 Monthly Fee	6 Watt Radio (Potential for interference)
<b>Data</b>	6 hours intervals  24 reads / day / meter	5 hour intervals  24 reads / day / meter
<b>Data Storage</b>	13 months	No data storage
<b>Real Time Information</b>	Yes	No (to be available in the next year)
<b>Installation</b>	Have Trained / Qualified Installers Manufacturer does not do installation	None Manufacturer can provide installation service
<b>Annual Fees</b>	Yes - \$_____	No packages – on a as needed basis
<b>Emergency Support</b>	6 person team w/ technical qualifications	2 – person team (sales team)

# Ordinances and the like



- Review Ordinances, Regulations, Specifications, Standard Diagrams
  - Make sure they are current
  - Do they properly cover, meters, backflow prevention, customers and water company responsibilities, etc.
- Keep Legal Council involved





# Scope of Meter Work



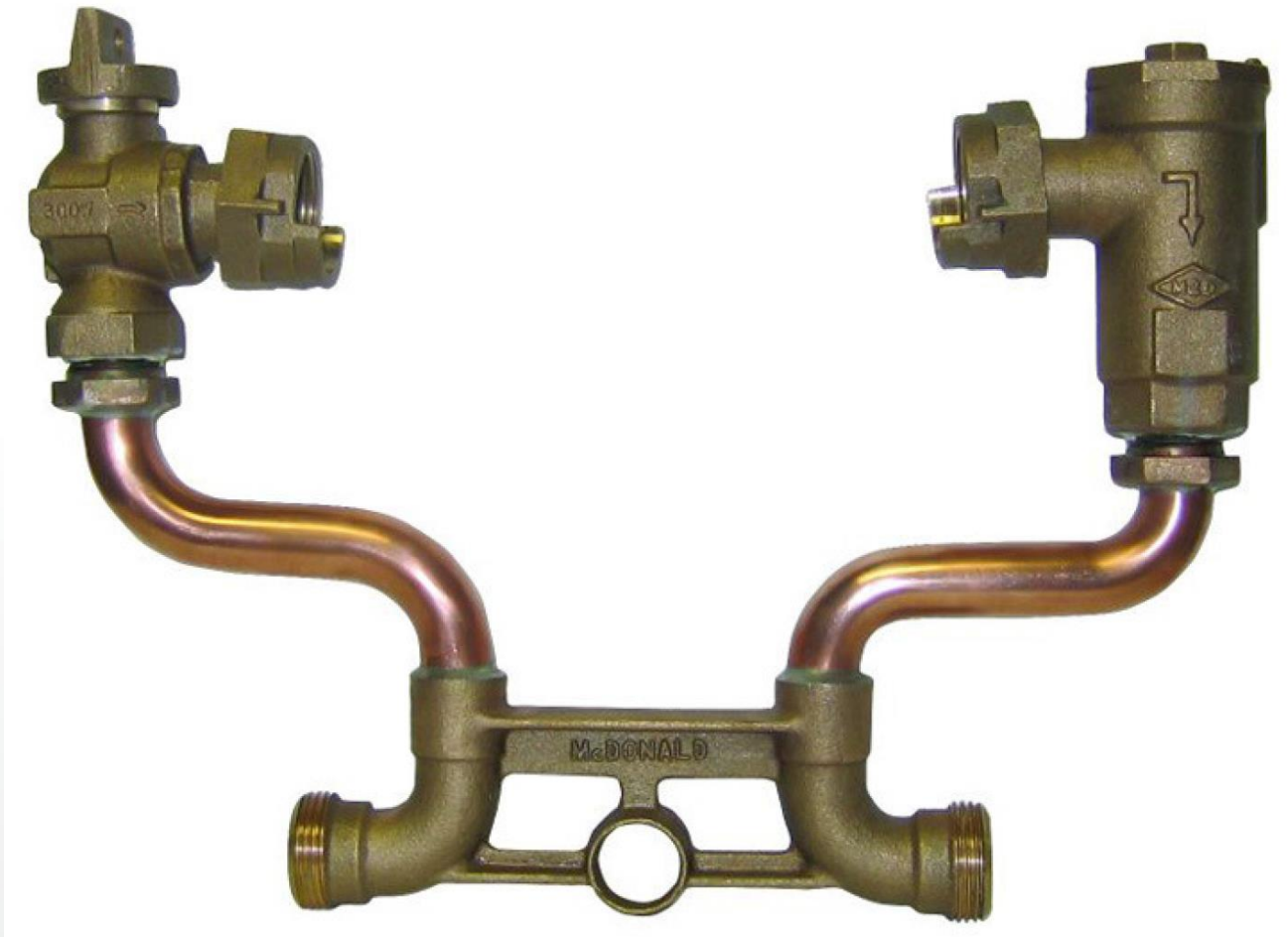
- Meter Replacement (select a meter)
- What Else??
  - Meter Horn
    - More plumbing involved
    - Horizontal and Vertical Applications
  - Meter Resetter
    - Installed in “meter space” / easier install
  - Check Valve
  - Shut off Valve
  - Ground Wire

# Meter Horn Assembly



05/03/2010

# Resetter



# Scope of Meter Work



- Meter Replacement
- What Else??
  - Meter Horn
    - More plumbing involved
    - **Horizontal and Vertical Applications**
  - Meter Resetter
    - Installed in “meter space” / easier install



# Incorrect Installation



Meter needs to be horizontal

# Check Valve - Plumbing Code



- Thermal Expansion Control (IRC P2903.4)
  - A means for controlling increased pressure caused by thermal expansion shall be installed....
- Backflow prevention device or check valve (IRC P2903.4.2)
  - Where a backflow prevention device, check valve or other device is installed on a water supply system using storage water heating equipment such that thermal expansion causes an increase in pressure, a device for controlling pressure shall be installed.

# Thermal Expansion Tank



- Plumbing Regs
- Cost to the Customer
  - Needs Board / Council Support
- Installation and Payment
  - Option 1 – Customer already has a tank
  - Option 2 – Customer to install tank 
    - (pay all costs including permits)
  - Option 3\* – Water Company's Contractor to install tank   
(Example: costs to be applied to customers water bill and paid over a 2 year period) \*Water Company to front costs

# Commercial / Industrial



- Commercial / Industrial
  - Don't Panic / Remember (Business End)
  - First → Get a complete list
  - Review Quantity
  - Review Usage vs. Metered Service
  - Review Backflow Prevention
  - Conduct a Site Visit / Take Photos



# Commercial / Industrial



- First → Get a complete list

Meter Size	Quantity
1" Meter	14
1-1/2" Meter	7
2" Meter	8
4" Meter	2
6" Meter	1

- Larger meters, if not changed out can get a new register head to adapt to the new metering system.

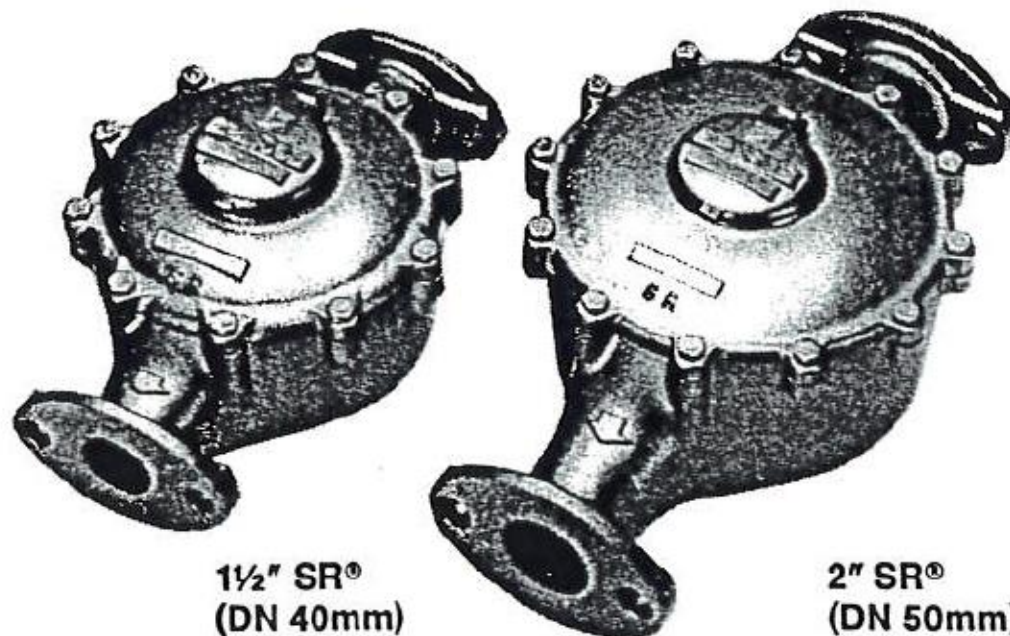
# Commercial / Industrial



- Review each customer and water use
  - Has the type of business changed
    - Once a factory is now a warehouse
    - Once a manufacturing plant is now a distributor

Senario: Both buildings have a 2" water meter

Usage: 20,000 gpd reduced to 500 gpd



1½" SR®  
(DN 40mm)

2" SR®  
(DN 50mm)

<b>SERVICE</b>	Measurement of cold water with flow in only one direction
<b>*NORMAL OPERATING FLOW RANGE</b>	1½" (DN 40mm) size: 5 to 100 gal/min. (1.1 to 23.0 m³h) 2" (DN 50mm) size: 8 to 160 gal/min. (1.8 to 36.0 m³h)
<b>ACCURACY</b>	100% ± 1.5% of actual thruput
<b>LOW FLOW REGISTRATION</b>	1½" (DN 40mm) size: 95% at 1½ gal/min. (0.35 m³h) 2" (DN 50mm) size: 95% at 2 gal/min. (0.45 m³h)

# Commercial / Industrial



- Backflow Prevention
  - Has the business type changed
    - A home adds a beauty salon
    - A home adds a auto garage
    - A clothing shop is now a dentist office.
  - Review applicable backflow prevention

Note: Make sure Ordinances are current

# Commercial / Industrial

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- Site Visit
  - Take Photos for attachment to Bidding Documents











# Accounting



- Touch Every Account
  - Be Prepared!!
  - Review all accounts / spend time with office staff
    - Estimated accounts
    - Services with no meter
  - Billing Codes
- Meter Software  $\leftarrow \rightarrow$  Billing Software Link
  - Fee Involved from Billing Software
  - Perform Sample Data Runs



**Ready to Bid**

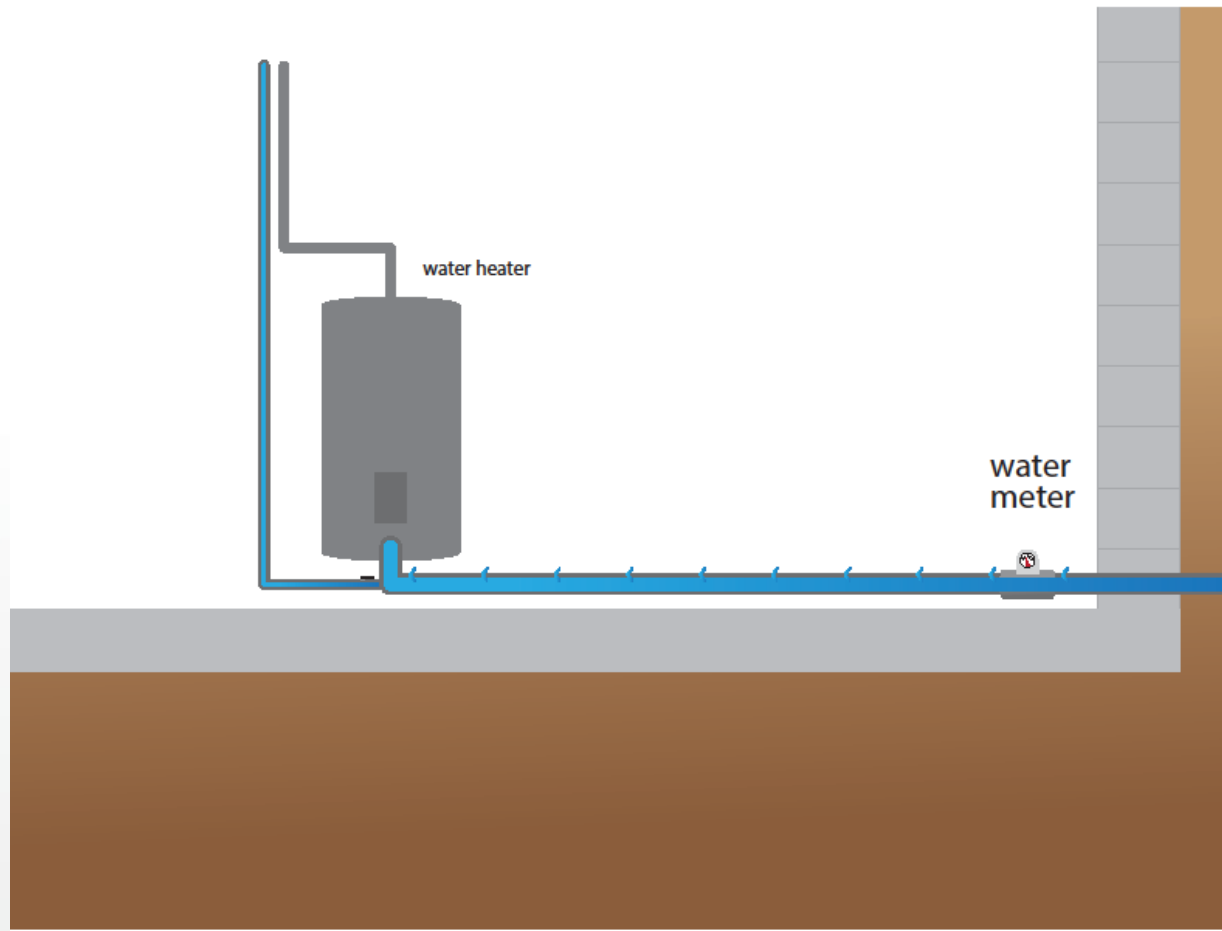


# Public Notification

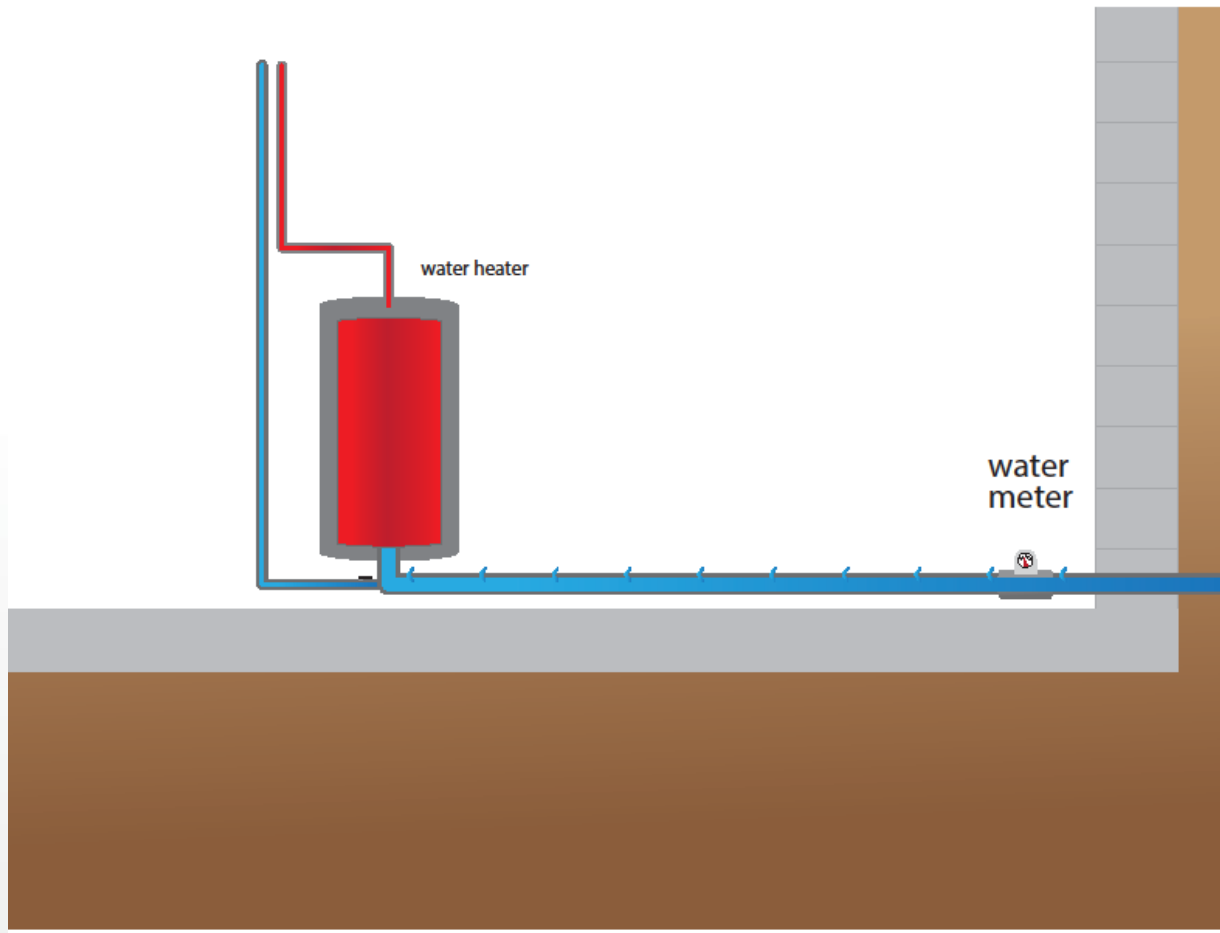


- Letters to Customers
  - Notification of project
  - When will it start
  - Set up appointment (adult must be at home)
  - Costs (Thermal Expansion Tank)
- Public Meeting
  - Review project / Respond to questions

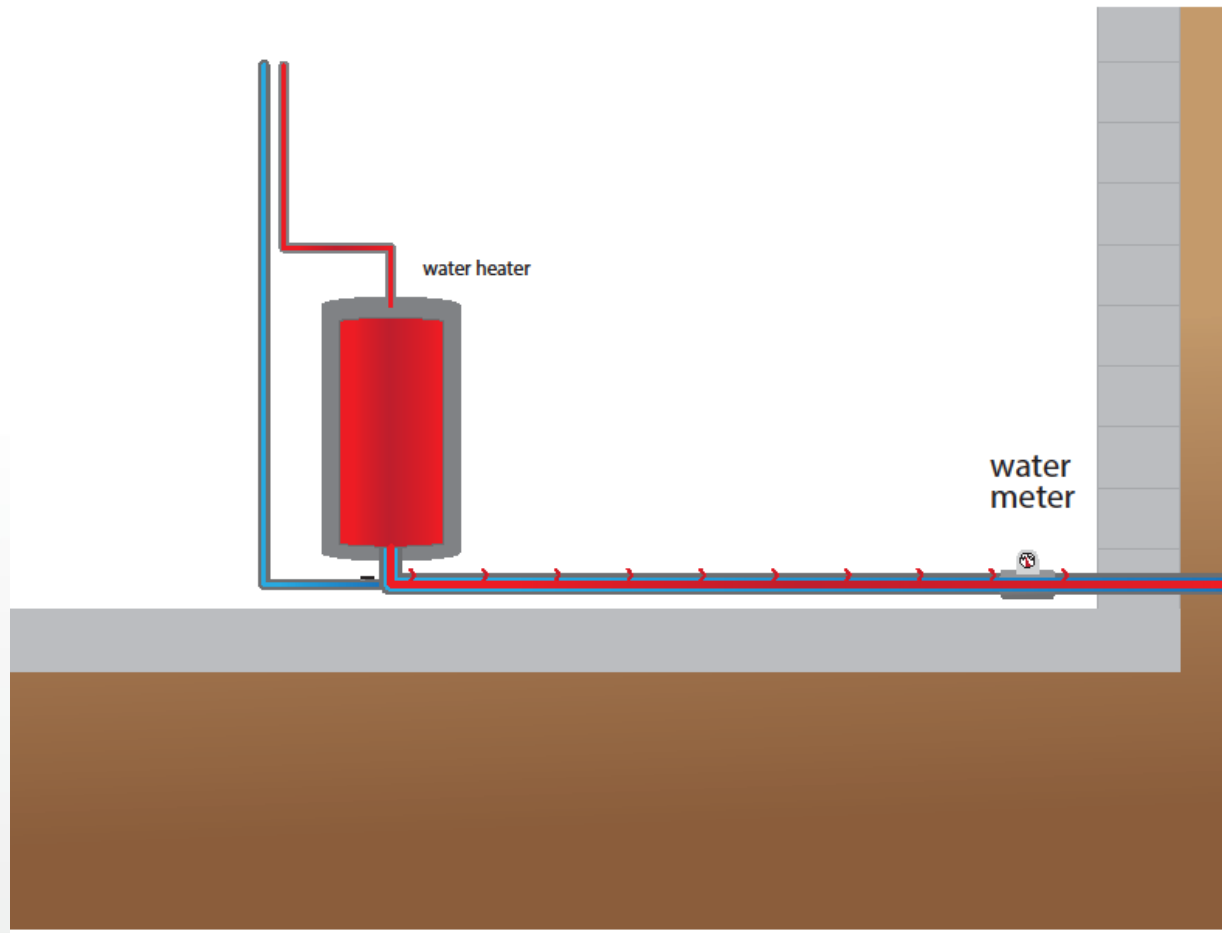
# Thermal Expansion



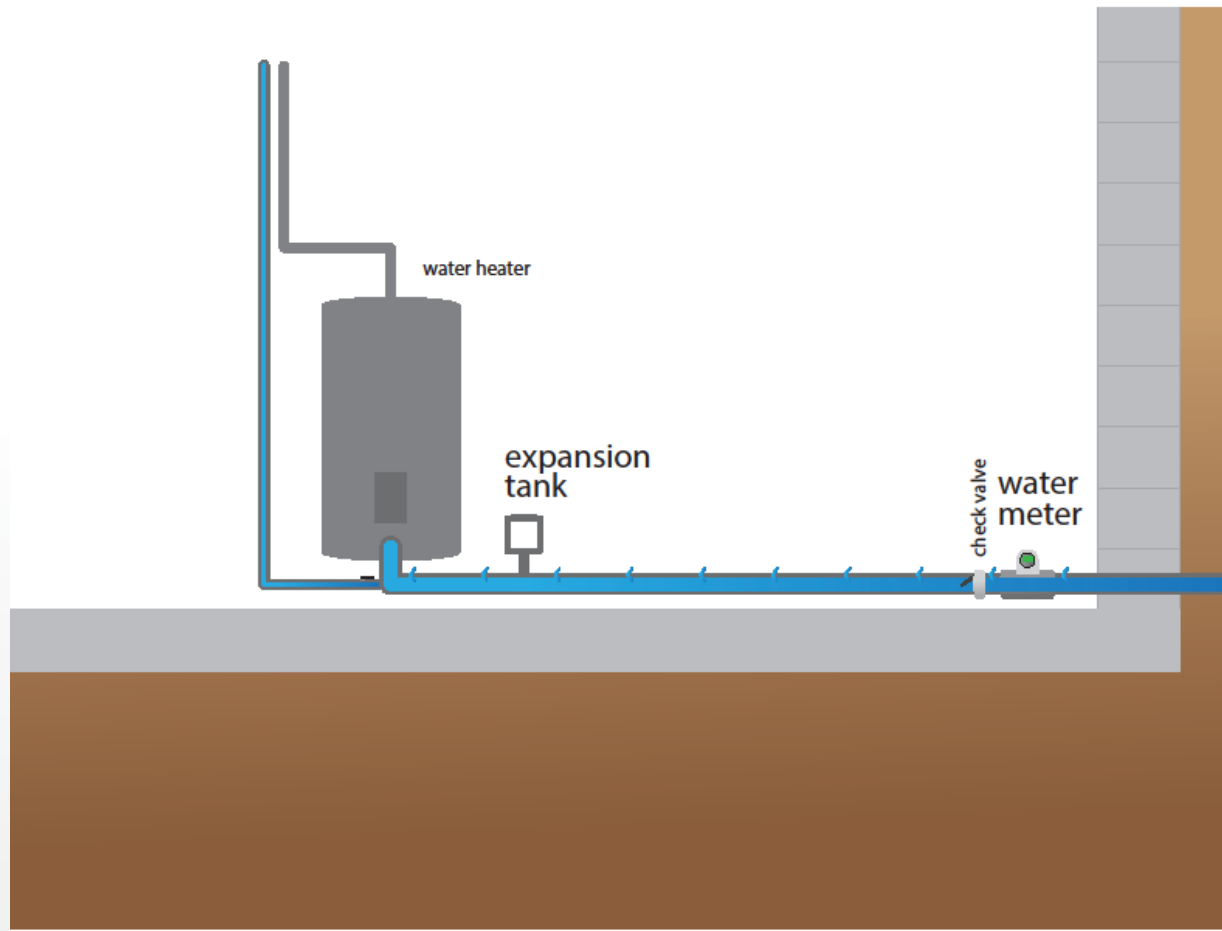
# Thermal Expansion



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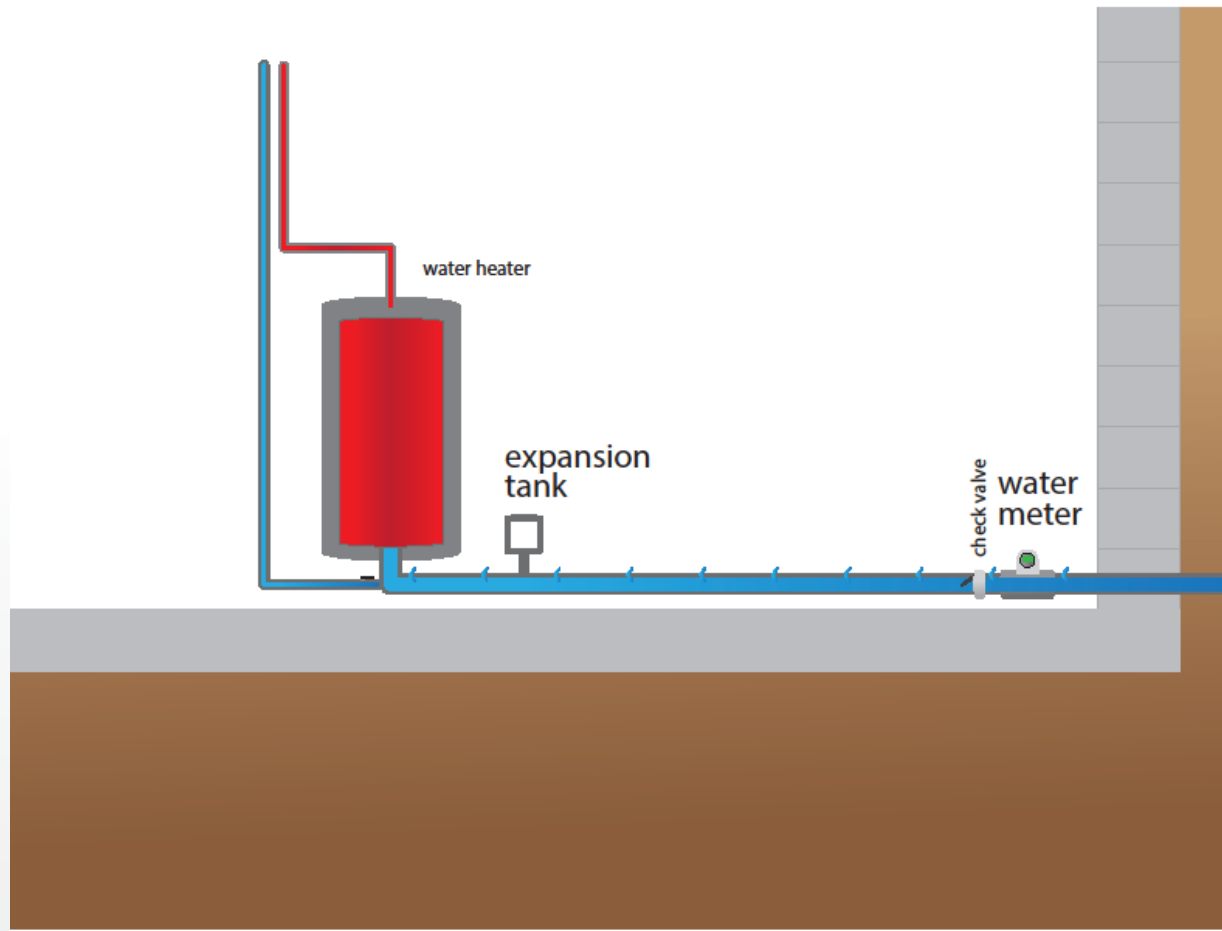


# Thermal Expansion

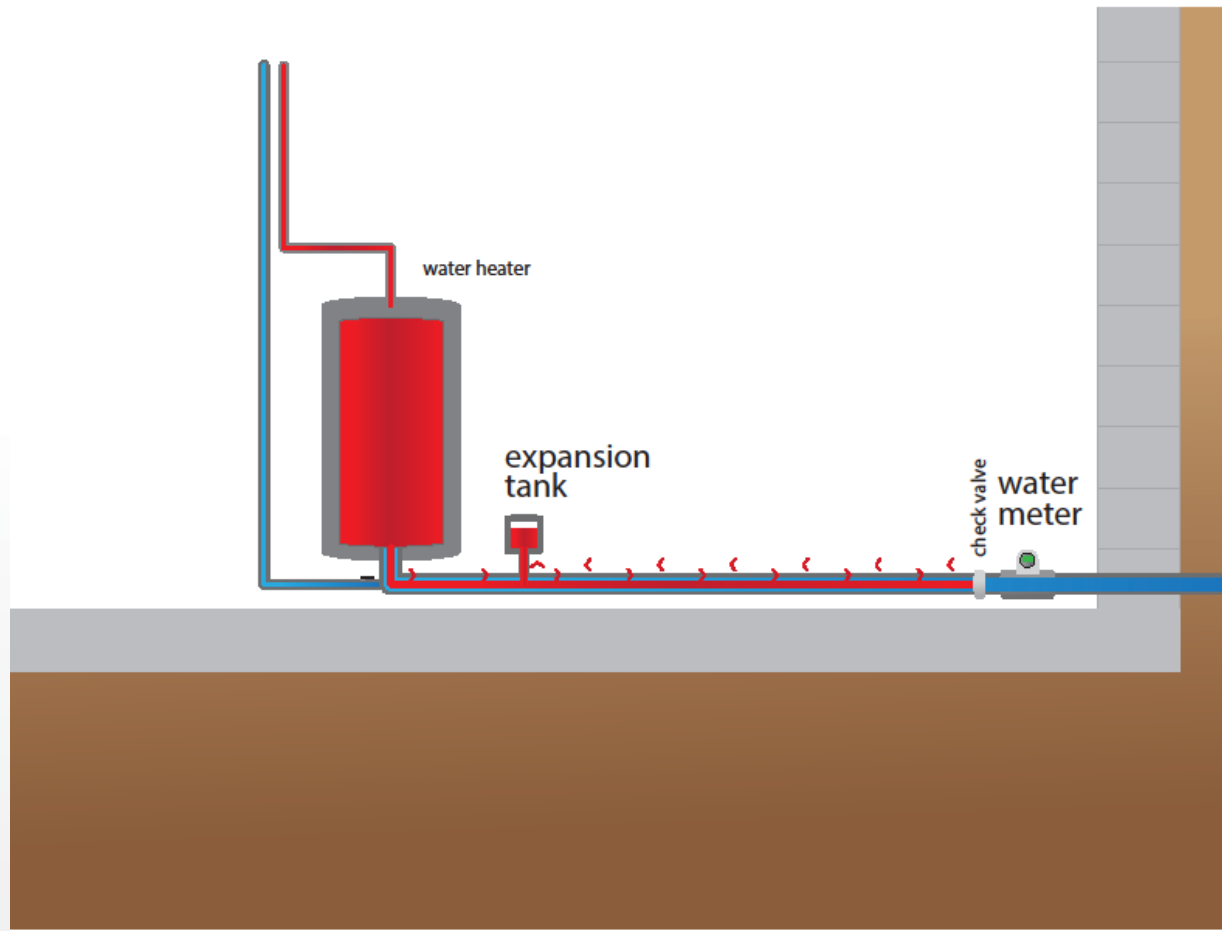




# Thermal Expansion



# Thermal Expansion



**UNDER COSTRUCTION**



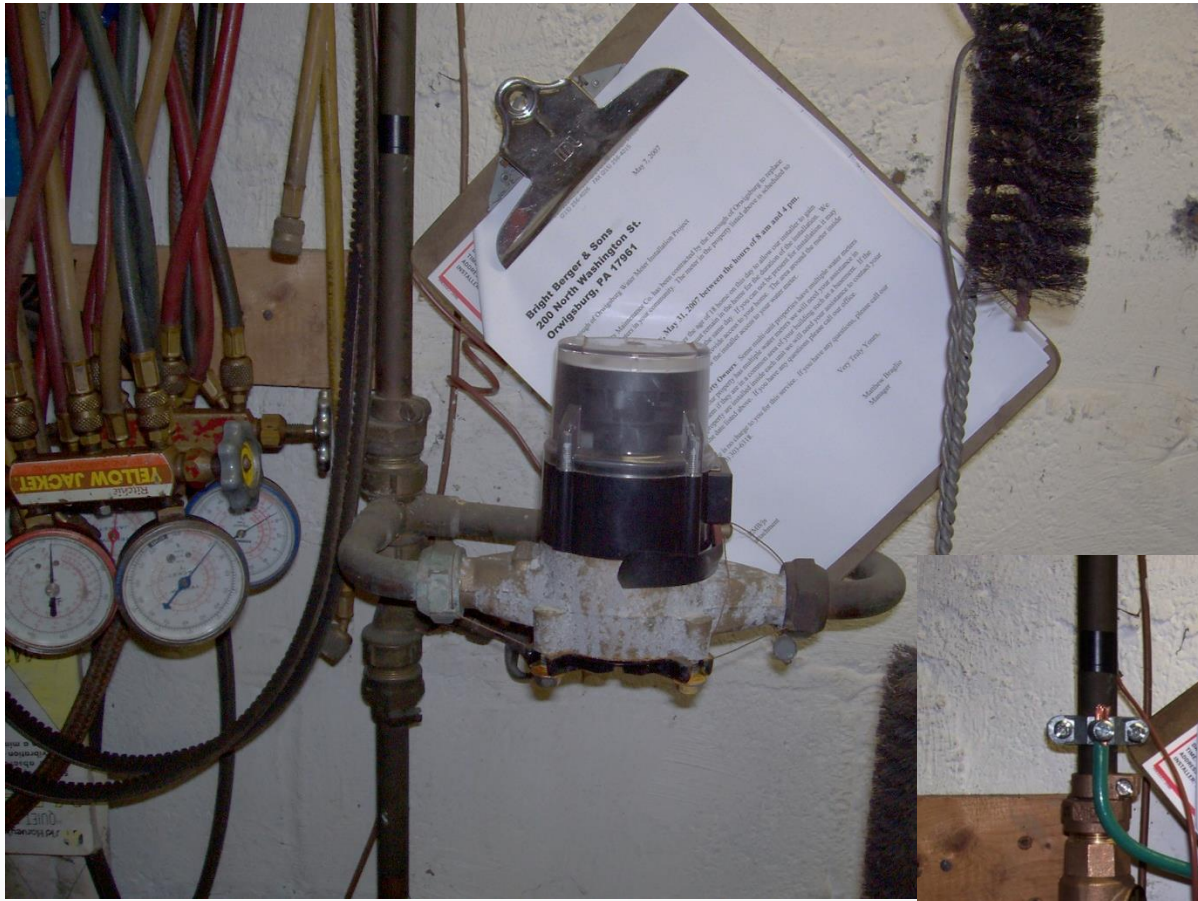
**Meters Being Installed**

**Question: How is the  
work Inspected?**

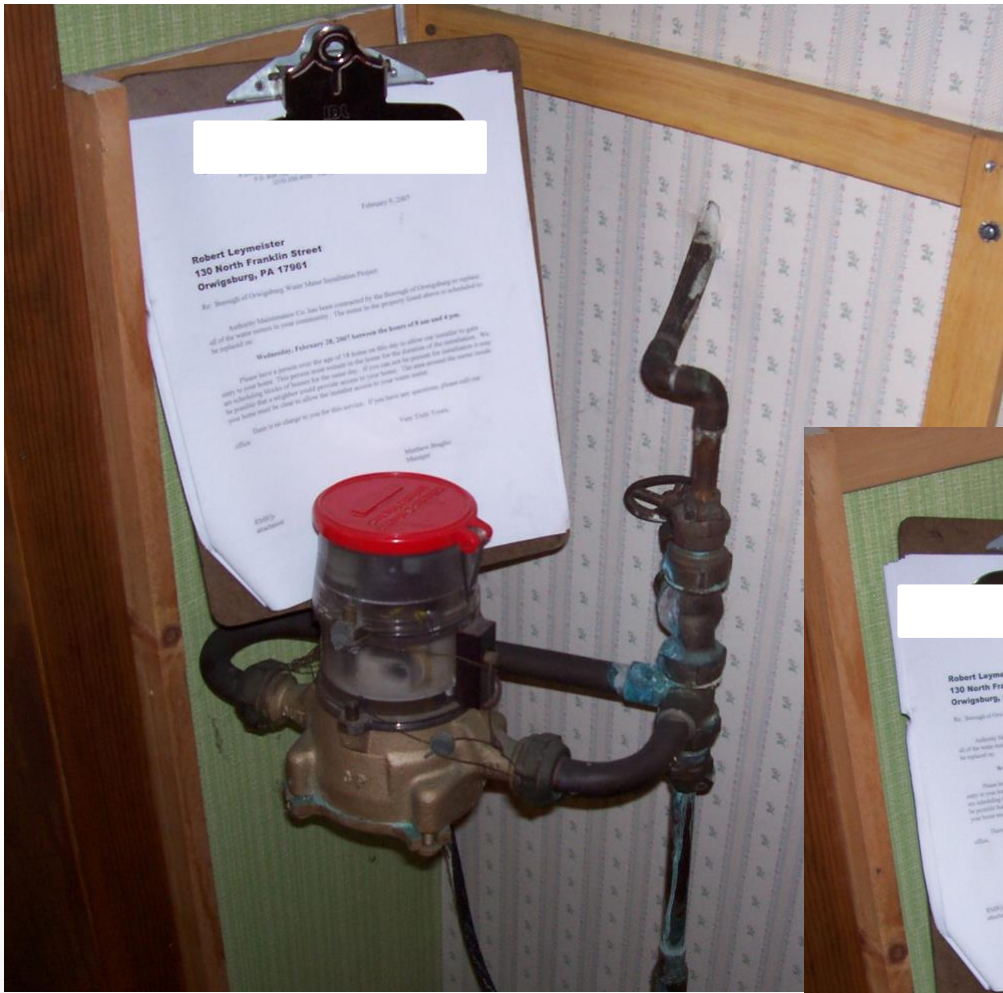
# Inspection



- Photos & Change Out Forms
  - Define all details in the bid package
  - To be submitted with pay request







# Photo Files



























4137.62 Water Meter Replacement ▶ Meter Installation Photos ▶ PHOTOS Revised 8 21 13 ▶ Clearview Drive

Name	Date modified	Name	Date modified	Type	Size
2013-06-24 west cocalico payment 1	10/12/2014 1:14 P	10 Clearview Drive (1).JPG	6/28/2013 12:33 PM	JPEG image	690 KB
Blainsport Road	10/12/2014 1:14 P	10 Clearview Drive (2).JPG	6/28/2013 12:33 PM	JPEG image	685 KB
Blue Lake Road	10/12/2014 1:15 P	10 Clearview Drive.JPG	6/28/2013 12:32 PM	JPEG image	653 KB
Brendan Road	10/12/2014 1:16 P	30 Clearview Dr (1).JPG	6/27/2013 1:24 PM	JPEG image	112 KB
Brunners Grove Road	10/12/2014 1:16 P	30 Clearview Dr (2).JPG	6/27/2013 1:24 PM	JPEG image	111 KB
Cedar Court	10/12/2014 1:15 P	30 Clearview Dr.JPG	6/27/2013 1:24 PM	JPEG image	82 KB
Chapel View Drive	10/12/2014 1:16 P	40 Clearview Dr (1).JPG	6/27/2013 1:24 PM	JPEG image	116 KB
Circle Drive	10/12/2014 1:15 P	40 Clearview Dr (2).JPG	6/27/2013 1:24 PM	JPEG image	116 KB
Clearview Drive	10/12/2014 1:15 P	40 Clearview Dr.JPG	6/27/2013 1:24 PM	JPEG image	83 KB
Creamery Road	10/12/2014 1:17 P	45 Clearview Dr (1).JPG	6/27/2013 1:48 PM	JPEG image	86 KB
Creek Road	10/12/2014 1:14 P	45 Clearview Dr (2).JPG	6/22/2013 8:45 AM	JPEG image	92 KB
Farrow Lane	10/12/2014 1:17 P	45 Clearview Dr (3).JPG	6/22/2013 8:45 AM	JPEG image	84 KB
Galen Hall Road	10/12/2014 1:16 P	45 Clearview Dr.JPG	6/22/2013 8:45 AM	JPEG image	86 KB
Highland Court	10/12/2014 1:15 P	55 Clearview Dr (1).JPG	6/27/2013 1:23 PM	JPEG image	94 KB
Hollow Road	10/12/2014 1:15 P	55 Clearview Dr (2).JPG	6/27/2013 1:23 PM	JPEG image	126 KB
Jenich Drive	10/12/2014 1:16 P	55 Clearview Dr.JPG	6/27/2013 1:23 PM	JPEG image	93 KB
Joshua Circle	10/12/2014 1:15 P	60 Clearview Dr (1).JPG	6/27/2013 1:21 PM	JPEG image	122 KB
Krueger Road	10/12/2014 1:14 P	60 Clearview Dr (2).JPG	6/27/2013 1:21 PM	JPEG image	123 KB
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Lincoln Avenue	11/12/2014 2:24 P	180 Creamery Rd (1).JPG	7/22/2013 8:30 PM	JPEG image	119 KB
Main Street	10/12/2014 1:16 P	180 Creamery Rd (2).JPG	7/22/2013 8:30 PM	JPEG image	120 KB
Meadow Road	10/12/2014 1:16 P	180 Creamery Rd.JPG	7/22/2013 8:30 PM	JPEG image	84 KB
Mechanic Street	10/12/2014 1:15 P	200 Creamery Rd (1).JPG	7/22/2013 8:30 PM	JPEG image	98 KB
Parkview Drive	10/12/2014 1:16 P				
Pelham Road	10/12/2014 1:17 P				
Pheasant Lane	10/12/2014 1:17 P				
Redstone Circle	10/12/2014 1:15 P				
Reinholds Road	10/12/2014 1:17 P				
Resh Road	10/12/2014 1:16 P				
Ridge Road	10/12/2014 1:16 P				
Rose Drive	10/12/2014 1:16 P				
Route 897	10/12/2014 1:15 P				



# Photo Files



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 105WoodviewDrive_after_42007.JPG	4/20/2007 8:27 AM	JPEG image	735 KB
 105WoodviewDrive_before_42007.JPG	4/20/2007 8:18 AM	JPEG image	833 KB
 106CountryViewLane_after_42007.JPG	4/20/2007 10:14 AM	JPEG image	730 KB

1"

# Water Meter Change Out Form



Name 71250  
GREENLY, ROBIN  
 Address 113 REDSTONE CIRCLE PA ZIP \_\_\_\_\_  
REINHOLDS PA 17569  
 Account No. \_\_\_\_\_ Date \_\_\_\_\_

**Old Meter Information**

Size (circle one) 5/8" 5/8" x 3/4" 1" 1-1/2" 2"  
 Meter Serial Number 4801 89252 EID\* \_\_\_\_\_  
 Reading when Removed In 1103040 out 1180500 No. of Stationary Zeros \_\_\_\_\_  
 Meter Manufacturer Sensus Meter Type SR

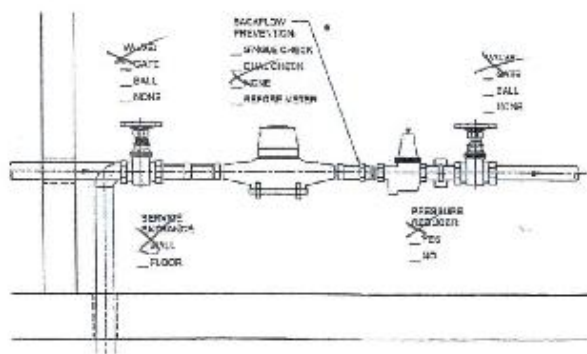
\* EID - Electronic ID Number

**New Meter Information**

Size (circle one) 5/8" 5/8" x 3/4" 1" 1-1/2" 2"  
 Meter Serial Number 9581682 EID 07910877  
 Reading when Installed 0 No. of Stationary Zeros 1

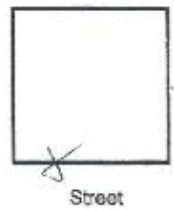
### Existing Meter Assembly Information

#### STANDARD METER ASSEMBLY



**07910877**

#### Meter Location



Installer Name \_\_\_\_\_

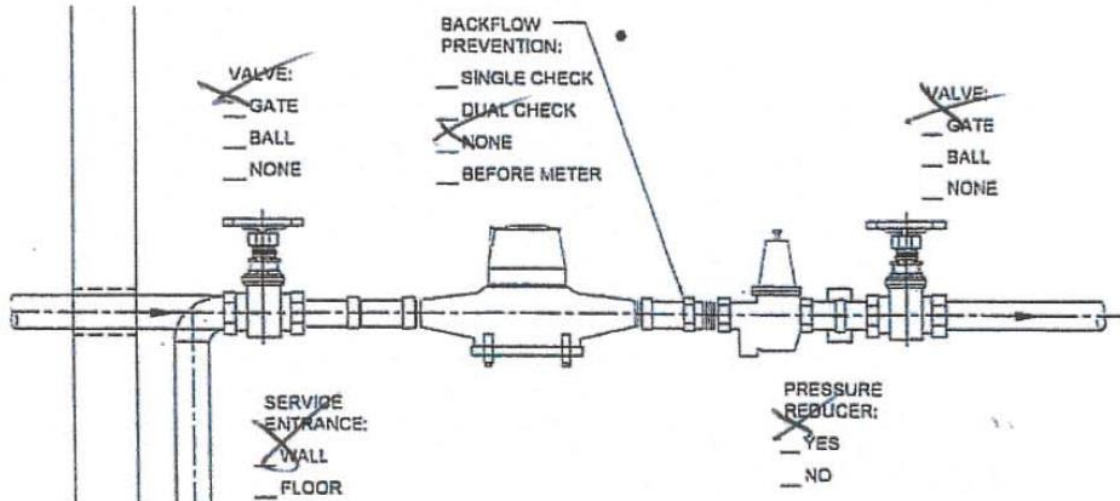


# STANDARD METER ASSEMBLY



07910877

Meter Location



Street

# WHY?

(Justification)



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