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What's the Meter?

What's the Meter? Water Meter Sizing Explained

As of July 2008, water meters for all customers are sized by PAWSD based upon a fixture count of the building. Although there may be a tendency to choose a meter that is larger than needed in order to conservatively estimate and accomodate water demand, accurate meter sizing is important for a host of reasons:

- Properly sized meters have a lower failure rate.
- Smaller meters require less maintenance than larger meters, in turn reducing the cost of water shut-offs and repair.
- Smaller meters have a lower Capital Investment/Water Resource Fee and basic service charge.
- Smaller meters encourage water conserving fixtures and practices.

The American Water Works Association (AWWA) recommends defining water demand using a flow recorder or manual fixture value calculations. Fixture values are provided by the Uniform Plumbing Code. The PAWSD Board of Directors has adopted the fixture count methodology. Fixture counts and Equivalent Units are determined by the following steps:

1. What fixtures are present?
2. What are their values given by the [Uniform Plumbing Code \(UPC\)](#) or the [International Plumbing Code \(IPC\)](#)? For example, a bathroom sink has a count of 1, and a dishwasher has a count of 4. Values vary depending upon the intended use of the fixture: will it be used generally throughout the day, or used very heavily for a short period of time, such as a toilet in a theater during intermission?
3. Are there fixtures not included in the first UPC table? If so, use the gallons per minute demand of each of these fixtures to assign it a fixture count. This can be done using a [second UPC table](#).
4. The values of all the fixtures are totaled and the meter size that is appropriate for that total fixture count is determined using the AWWA meter design criteria and Uniform Plumbing Code. Once the meter size is known, equivalent units are assigned which mirror the hydraulic ratio of that particular meter size to the base line 5/8" meter size. [This linked table shows the relationship.](#)

The result of these steps is an industry standard-based methodology for calculating Equivalent Units that reflects true demand.

Phone: 970-731-2691 email: info@pawsd.org
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Pagosa Area Water and Sanitation District
 100 Lyn Ave. / P.O. Drawer 4610, Pagosa Springs, CO 81147
 PHONE: (970) 731-2691 FAX: (970) 731-2693

RESIDENTIAL WATER METER SIZING WORKSHEET

Date: _____
 Name of Property Owner: _____
 Name of Contact Person: _____
 Name of Business (if applicable): _____

Contact Person Phone Number:
 Work: _____
 Cell: _____

Property Location

Street Address: _____
 Subdivision: _____ Block: _____ Lot: _____

Type of Fixture	Fixtures in New Structure	+	Fixtures in Existing Structure	-	Fixtures Removed	=	Total Fixtures	x	Fixture Unit Multiplier (choose ONE per row)		=	Total Fixture Unit Value
									Individual dwelling	3 or more dwellings		
Bar Sink		+		-		=		x	1.0	1.0	=	
Bathtub or combination bath/shower		+		-		=		x	1.5	1.5	=	
Bathroom sink, each set of faucets		+		-		=		x	1.0	0.5	=	
Bidet		+		-		=		x	1.0	0.5	=	
Clothes Washer, domestic		+		-		=		x	1.5	1.5	=	
Dishwasher, domestic		+		-		=		x	1.5	1.0	=	
Hose bibb		+		-		=		x	2.5	2.5	=	
Hose bibb, each additional		+		-		=		x	1.0	1.0	=	
Kitchen sink, domestic		+		-		=		x	1.5	1.0	=	
Laundry sink		+		-		=		x	2.0	1.0	=	
Lawn sprinkler, each full head		+		-		=		x	1.0	1.0	=	
Shower		+		-		=		x	1.5	1.5	=	
Toilet, 1.6 GPF gravity tank		+		-		=		x	2.5	2.5	=	
Toilet, 3.5 GPF gravity tank		+		-		=		x	3.0	3.0	=	
Whirlpool bath / combination bath/shr		+		-		=		x	4.0	4.0	=	
Other (Describe)												
Other (Describe)		+		-		=		x			=	

For explanations, see 1997 Uniform Plumbing Code and 2006 International Plumbing Code

Fixture Unit Subtotal: _____

Other Water Requirements: See Table E103.3(3)

Fixture Description: _____ GPM: _____ Number: _____ Calculated Fixture Units: _____
 Fixture Description: _____ GPM: _____ Number: _____ Calculated Fixture Units: _____
 Fixture Description: _____ GPM: _____ Number: _____ Calculated Fixture Units: _____

Total Fixture Units: _____

I affirm that the information given is correct. I acknowledge that the approval given for minimum meter size and maximum water capacity is based solely on the information provided above, and such determination is at the discretion of the Pagosa Area Water and Sanitation District. Any deviation under construction will require resubmission of corrected data for determination of adequacy of meter size.

Signature (Owner / Agent) _____

Date Signed _____

Instructions for the completion of Water Meter Sizing Worksheet

Matrix to Determine Meter Size and Water Demand

Complete the columns of the matrix by supplying the quantity and type of fixtures being added, remaining and/or removed. (Note: Relocated fixtures are considered "remaining" since there is no change in demand.) Accuracy of the fixture count is necessary to determine the appropriate meter size and Equivalent Units.

Fixtures in New Structure

In the "Fixtures in New Structure" column, list the number of new fixtures or the number of fixtures being added to an existing project under the appropriate fixture type.

Fixtures in Existing Structure

In the "Fixtures in Existing Structure" column, list the number of fixtures that will remain or that will be relocated during the construction phase of the project.

Fixtures Removed

In the "Fixtures Removed" column, list the number of fixtures that are actually being removed which will create a reduction in the water demand. Note: Replacing a sink with a new sink or a hose bibb with a new hose bibb, etc, does not constitute "Removed"; they are considered as "Fixtures in Existing Structure" (unless replacement is by fixtures of lower-flow capacity).

Other Water Requirements

There are some process water demands that are not listed, such as car washes. Each of these will be assigned a fixture unit count based upon its GPM demand. Make sure this information is provided.

Fixture Unit Multiplier

Each plumbing fixture is given a fixture unit value based upon the 1997 Uniform Plumbing Code. Fixture units are used for water meter sizing purposes. The unit count for each fixture is determined by multiplying the number of each fixture type by the appropriate number in the multiplier column. Only **ONE multiplier should be chosen per row.**

INDIVIDUAL DWELLING: Applies to single family residence or master metered duplex. In the case of a duplex, add ALL fixtures from both units. For example, if each duplex unit has one bathtub, the total number of bathtub fixtures is two.
3 OR MORE DWELLINGS: Applies to a master metered multi-residential unit building, where the number of individual units is three or more. When counting fixtures, total the number of like fixtures for ALL units. For example, in a four unit apartment building, if each unit has one kitchen sink, the total number of kitchen sink fixtures would be four.

Lawn Sprinkler Heads

Add all 1/4, 1/2, 3/4 and full irrigation heads to determine the total number of **full** sprinkler heads. For example, two 1/4 heads and one 1/2 head will equal one full head.

GPM (Gallons per Minute)

When any water requirement is listed by GPM demand, fixture unit count will be determined by using the 2006 Uniform Plumbing Code Table E103.3(3) - Table For Estimating Demand

FOR OFFICE USE ONLY - TO BE COMPLETED BY PAUSD STAFF

WATER USER FEES - RESIDENTIAL USERS (effective July 15, 2008)

Required Service Size and Equivalent Units Chart			
Fixture Unit Count	Meter Size	# Equivalent Units*	GPM**
0-30	5/8"	1	20
30.5-52	3/4"	1.5	30
52.5-127	1"	2.5	50
128-375	1.5"	5	100
376-700	2"	8	180
701-1950	3"	16	320
1951-3700	4"	25	500
3,701-8,200	6"	50	1,000

*EU designation represents hydraulic capacity ratio of meter size, as set forth by AWWA Manual M-6

**With approximate flow of 60 psi at meter

Monthly Basic Service Assessment***			
Meter Size	EU	Water	Water/Wastewater
5/8"	1	\$12	\$35
3/4"	1.5	\$18	\$52.50
1"	2.5	\$30	\$87.50
1.5"	5	\$60	\$175
2"	8	\$96	\$560
3"	16	\$192	\$560
4"	25	\$300	\$875
6"	50	\$600	\$1,750

*** does not include usage rates

FIXTURE COUNT TOTAL (from pg.1): _____

CORRESPONDING METER SIZE: _____

EU FOR BILLING: _____

EU CREDIT (if applicable): < _____ >

EU FOR FEE ASSESSMENT: _____

BASIC SERVICE FEE: \$ _____

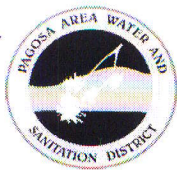
CIF/WRF FEE[±]: \$ _____

[±]for homes under 2000 ft² requiring 5/8 meter, lower CIF assessment may apply

NOTES / COMMENTS:

Prepared By: _____ Date: _____

PLEASE NOTE: FEE SCHEDULES ARE SUBJECT TO CHANGE



Pagosa Area Water and Sanitation District
 100 Lyn Ave. / P.O. Drawer 4610, Pagosa Springs, CO 81157
 PHONE: (970) 731-2691 FAX: (970) 731-2693

Account Number: _____
 Permit Number: _____

COMMERCIAL WATER METER SIZING WORKSHEET

Date: _____

Name of Property Owner: _____

Name of Contact Person: _____

Name of Business (if applicable): _____

Contact Person Phone Number: _____

Work: _____

Cell: _____

Property Location

Street Address: _____

Subdivision: _____ Block: _____ Lot: _____

Type of Fixture	Fixtures in New Structure	+	Fixtures in Existing Structure	-	Fixtures Removed	=	Total Fixtures	x	Fixture Unit Multiplier (choose ONE per row)		=	Total Fixture Unit Value
									General Use	Heavy Use Assembly		
Bar Sink		+		-		=		x	3.0		=	
Bathroom sink, each set of faucets		+		-		=		x	2.0		=	
Clinic sink		+		-		=		x	8.0		=	
Clothes Washer, domestic (8 lb)		+		-		=		x	3.0		=	
Clothes Washer, domestic (15 lb)		+		-		=		x	4.0		=	
Dental unit, cuspidor		+		-		=		x	1.0		=	
Dishwasher, domestic		+		-		=		x	1.5		=	
Drinking fountain or water cooler		+		-		=		x	0.5	0.8	=	
Hose bibb		+		-		=		x	2.5		=	
Hose bibb, each additional		+		-		=		x	1.0		=	
Kitchen sink, hotel or restaurant		+		-		=		x	4.0		=	
Laundry sink		+		-		=		x	2.0		=	
Lawn sprinkler, each full head		+		-		=		x	1.0		=	
Service sink or mop basin		+		-		=		x	3.0		=	
Shower		+		-		=		x	2.0		=	
Shower, continuous use		+		-		=		x	5.0		=	
Toilet, 1.6 GPF gravity tank		+		-		=		x	2.5	4.0	=	
Toilet, 3.5 GPF gravity tank		+		-		=		x	5.0	7.0	=	
Urinal, 1.0 GPF		+		-		=		x	3.0	5.0	=	
Urinal, greater than 1.0 GPF		+		-		=		x	5.0	6.0	=	
Urinal, flush tank		+		-		=		x	3.0	4.0	=	
Washfountain, circular spray		+		-		=		x	4.0		=	
Other (Describe)		+		-		=		x			=	
Other (Describe)		+		-		=		x			=	

For explanations, see 1997 Uniform Plumbing Code and 2006 International Plumbing Code

Fixture Unit Subtotal: _____

Other Water Requirements: See Table E103.3(3)

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Required Signatures:

Signature (Design Engineer) _____ Date Signed _____

Signature (Owner/Agent) _____ Date Signed _____

See reverse side for instructions

Pagosa Area Water and Sanitation District

Instructions for the completion of Water Meter Sizing Worksheet

Matrix to Determine Meter Size and Water Demand

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GENERAL USE: Applies to business, commercial, industrial and assembly occupancies other than those defined under "Heavy Use." Included are the public and common areas in hotels, restaurants and multi-dwelling buildings.

HEAVY USE: Applies to toilet facilities in occupancies that place a heavy, but intermittent, time-based demand on water supply system, such as schools, auditoriums, stadiums, race courses, theaters and similar occupancies where queuing is likely to occur during periods of peak use.

Lawn Sprinkler Heads

Add all 1/4, 1/2, 3/4 and full irrigation heads to determine the total number of **full** sprinkler heads. For example, two 1/4 heads and one 1/2 head will equal one full head.

GPM (Gallons per Minute)

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FOR OFFICE USE ONLY - TO BE COMPLETED BY PAUSD STAFF
WATER USER FEES - COMMERCIAL USERS (effective June 10, 2008)

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0-30	5/8"	1	20
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376-700	2"	8	180
701-1950	3"	16	320
1951-3700	4"	25	500
3,701-8,200	6"	50	1,000

*EU designation represents hydraulic capacity ratio of meter size, as set forth by AWWA Manual M-6

**With approximate flow of 60 psi at meter

Monthly Basic Service Assessment***			
Meter Size	EU	Water	Water/Wastewater
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1"	2.5	\$30	\$87.50
1.5"	5	\$60	\$175
2"	8	\$96	\$560
3"	16	\$192	\$560
4"	25	\$300	\$875
6"	50	\$600	\$1,750

*** does not include usage rates

FIXTURE COUNT TOTAL (from pg.1): _____

CORRESPONDING METER SIZE: _____

EU FOR BILLING: _____

EU CREDIT (if applicable): < _____ >

EU FOR FEE ASSESSMENT: _____

BASIC SERVICE FEE: \$ _____

CIF/WRF FEE: \$ _____

NOTES / COMMENTS:

Prepared By: _____ Date: _____

PLEASE NOTE: FEE SCHEDULES ARE SUBJECT TO CHANGE