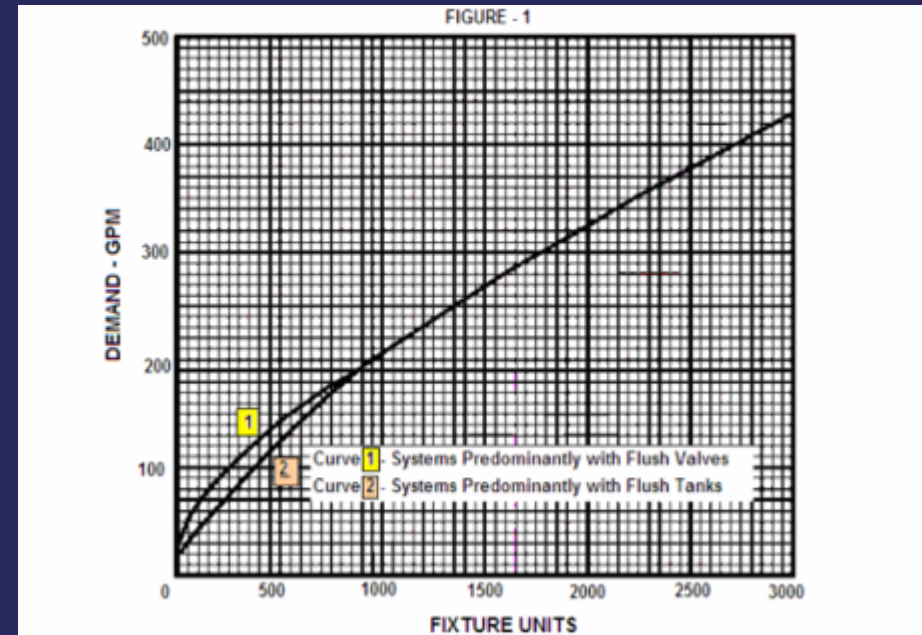


Residential Meter Sizing

2023 OPSC Appendix M

Residential plumbing systems have historically been sized based on the “Hunter’s Curve”, developed by Roy Hunter in the 1920’s.





As plumbing fixtures have become more efficient, and building use patterns have diversified, questions have arisen as to whether that is still an accurate way to size modern residential plumbing systems.



History

In 2011, the International Association of Plumbing and Mechanical Officials (IAPMO) sponsored an in-depth study to examine and revise water system sizing guidelines for residential uses.

History



The results of that study led to IAPMO's Water Efficiency and Sanitation Standard (WE•Stand) in 2017 and the Uniform Plumbing Code in 2018.

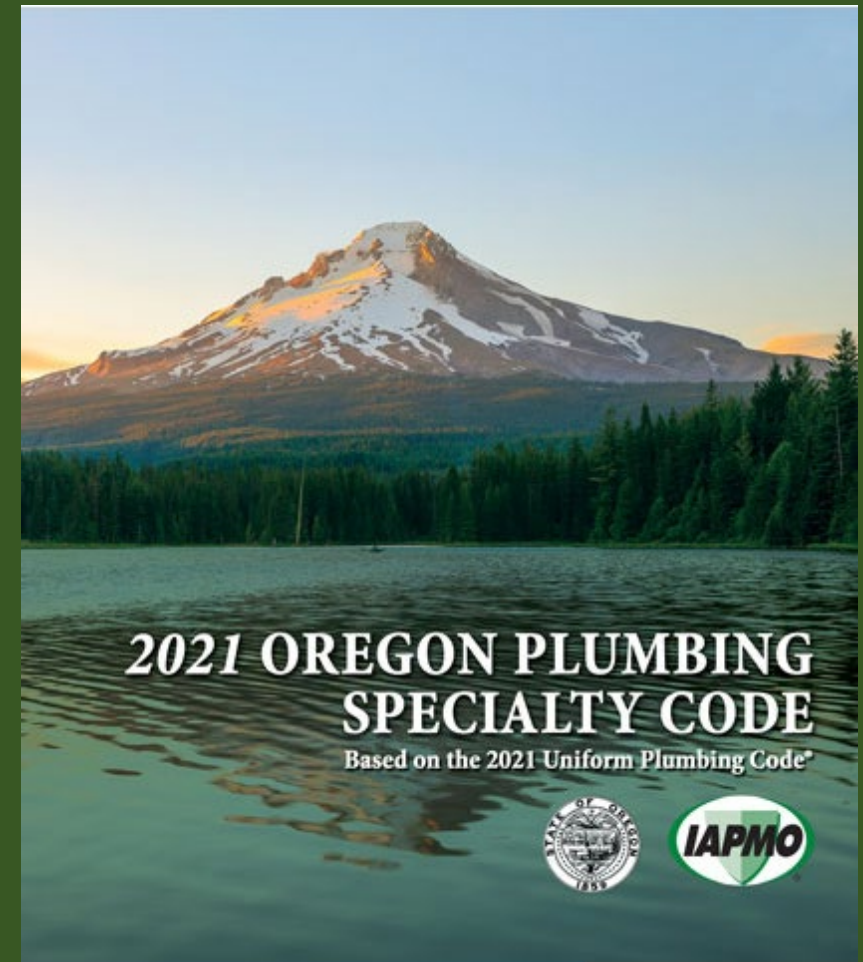
History

In 2021, the Oregon Plumbing Specialty Code adopted those guidelines as “Appendix M”.

Appendix M

Peak Water Demand Calculator

This appendix provides a method for estimating the demand load for the building water supply for single- and multi-family dwellings with water-conserving plumbing fixtures, fixture fittings, and appliances.



**Appendix M only applies to residential dwelling units,
both single and multi-family, and not to any
commercial or industrial use.**



Accessory Dwelling Units



Single Family Homes



**Townhomes and
attached housing**



Apartment buildings

Commercial guidelines under development by IAPMO

The Portland Water Bureau has received requests to allow water meters and service sizes to be based on the guidelines in Appendix M



We have adopted a policy to allow applicants to request meters based on the flow demand indicated by the IAPMO Water Demand Calculator.

IAPMO has developed a tool to calculate water demand for residential projects – the IAPMO Water Demand Calculator, which is available on their website for download.

PROJECT NAME: Total Number of Apartments in the Building → 0
 Click for Drop-down Menu → Total Apartments in this Calculation → 0

Tuesday, May 14, 2024
7:37 AM

FIXTURE GROUPS	FIXTURE	ENTER TOTAL NUMBER OF FIXTURES	PROBABILITY OF USE (%)	ENTER FIXTURE FLOW RATE (GPM)	MAXIMUM RECOMMENDED FIXTURE FLOW RATE (GPM)
Bathroom Fixtures	1 Bathtub (no Shower)	0	1.00	5.5	5.5
	2 Bidet	0	1.00	2.0	2.0
	3 Combination Bath/Shower	0	5.50	5.5	5.5
	4 Faucet, Lavatory	0	2.00	1.5	1.5
	5 Shower, per head (no Bathtub)	0	4.50	2.0	2.0
	6 Water Closet, 1.28 GPF Gravity Tank	0	1.00	3.0	3.0
Kitchen Fixtures	7 Dishwasher	0	0.50	1.3	1.3
	8 Faucet, Kitchen Sink	0	2.00	2.2	2.2
Laundry Room Fixtures	9 Clothes Washer	0	5.50	3.5	3.5
	10 Faucet, Laundry	0	2.00	2.0	2.0
Bar/Prep Fixtures	11 Faucet, Bar Sink	0	2.00	1.5	1.5
Other Fixtures	12 Fixture 1	0	0.00	0.0	6.0
	13 Fixture 2	0	0.00	0.0	6.0
	14 Fixture 3	0	0.00	0.0	6.0

COMPUTED RESULTS FOR PEAK PERIOD CONDITIONS

Total No. of Fixtures in Calculation

99th Percentile Demand Flow

Hunter Number

Stagnation Probability

Method of Computation

↓ Select Units for Water Demand ↓

← CLICK BUTTON ←

How it works

Complete the Residential Meter Request Form for residential uses

- Input data used in IAPMO Water Demand Calculator
- Use the provided chart for meter sizing guidelines

Water Flow Demand	Meter Size
1-25 GPM (gallons per minute)	5/8"
26-35 GPM	3/4"
36-55 GPM	1"
56-100 GPM	1.5"
101-160 GPM	2"
161-500 GPM	3"
501-1,000 GPM	4"
1,001-2,000 GPM	6"
2,001-3,400 GPM	8"

For mixed-use projects, both forms will be required.
For strictly residential/multi-family projects, only the Residential Meter Request form will be required.

Complete the W-4 form for commercial uses

- Title 21 requires a separate meter for commercial use in new construction
- Will be renamed to Commercial Meter Sizing form

Advantages

For applicant

- More control given to plumbing professionals to chose the right size of water meter
- Lower installation and SDC costs
- Lower costs to meet smaller backflow assembly requirements

For Water Bureau and our customers

- Better water conservation
- Improved water quality
- Will allow more accurate sizing of water mains

Keep this in mind

- This is not just a new form for the Portland Water Bureau – this is a new orientation toward meter sizing. Developers will work with plumbing professionals to determine the correct meter size for their residential project.
- We've turned over meter sizing responsibility to the developer, which means that the developer is now responsible for ensuring that the project has the right size water service and meter.
- We will ask for additional verification from a licensed plumber if an applicant requests a smaller size meter than indicated by the WDC. An approved Design Exception from the Water Bureau will also be required.

IAPMO

<https://www.iapmo.org/we-stand>

2023 Oregon Plumbing Specialty Code

<https://epubs.iapmo.org/2023/OPC/>

Resources