

CASTLE ROCK WATER

**ORDINANCE: USE OF THE INTERNATIONAL  
ASSOCIATION OF PLUMBING AND  
MECHANICAL OFFICIALS (IAPMO) PEAK  
WATER DEMAND CALCULATOR FOR  
RESIDENTIAL SERVICE LINE SIZING**

SEPTEMBER 3, 2024



# CRITERIA MANUAL

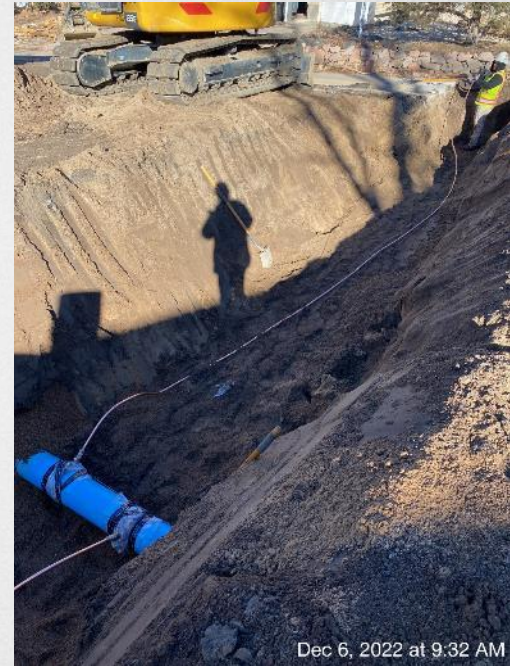
## BACKGROUND INFORMATION

- Consider Proposal for High Efficiency Toilet Code Change with Goal of 0.8 Gallon per Flush Toilets
- Presented to EDC Subcommittee June 2022
- Plumbing Manufacturers International (PMI) concerns:
  - Water age / quality (Legionella)
    - ✓ Bacteria that causes Legionnaires disease and Pontiac fever
    - ✓ Naturally occurs in fresh water
    - ✓ Transmitted by breathing in mist or swallowing water into lungs
    - ✓ High Efficiency Toilets with current internal plumbing sizing could increase water age & lose disinfectant
  - Solids transport
    - ✓ Minimum velocity of 2 fps to transport solids

# CRITERIA MANUAL

## STUDY

- Look at supply side and drain side plumbing
- 2018 International Plumbing Code (IPC) is approved code
- Service line size performed using Appendix E of the IPC
- Appendix E assumes all fixtures are on for service line sizing
- IAPMO provides a different approach



# CRITERIA MANUAL

## STUDY

- IAPMO Water Demand Calculator
  - Uses a statistical approach to determine peak demand
  - Reduces peak flow
  - Reduces required pipes sizes
- Drain side plumbing reviewed separately

**Water Demand Calculator® (WDC v2.2)**

PROJECT NAME :   
 Click for Drop-down Menu →

Thursday, August 22, 2024  
2:30 PM

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

99<sup>th</sup> Percentile Demand Flow

Hunter Number

Stagnation Probability

Method of Computation

↓ Select Units for Water Demand ↓




← CLICK BUTTON →



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## STUDY RESULTS

- Supply Side Study Results:
  - Legionella development in residential properties is low (85 – 110 deg F needed for ideal growth)
    - ✓ Water heaters are typically set at 110 – 130 deg F and water is turned over every 7 days
  - A typical single person uses enough water daily to turned-over water is plumbing twice per day

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## STUDY RESULTS

- Drain Side Plumbing Study Results:
  - The minimum slope for a sewer service line needs to be 2% to achieve the 2 fps velocity for solids transport
    - Town Code currently sets this standard
  - Residential customers have higher flow fixtures like showers and washing machines to help flush the service line

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## DEVELOPMENT COMMUNITY

- Presented to the EDC Subcommittee a total of 6 times
- Presented to the Developers Roundtable
- Sent results to IAPMO and PMI

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## BENEFITS & RECOMMENDATIONS

- Benefits
  - ✓ Water Conservation
  - ✓ Lower costs for internal plumbing \$850 savings per house
  - ✓ Improved Water Age
  - ✓ Supports move to 0.8 gallon per flush toilets
  
- Recommendations
  - ✓ Water Commission
  - ✓ Staff





PROPOSED MOTION:

“ I move to approve Ordinance 2024-019 as introduced by title.”

ALTERNATE MOTIONS:

*“I move to approve the Resolution as introduced by title, with the following conditions: (list conditions).”*

*I move to continue this item to the Town Council meeting on \_\_\_date to allow additional time to (list information needed).”*



**THANK YOU**