

Water and Wastewater Design Standards Quick Reference Guide

Follow the link to access the complete Design Standards Manual: [DSM](#)

WATER

[Minimum new water service connection size](#)

The minimum service connection for all new **domestic** service connections **shall be minimum** 1-inch.

Note: If a house remodel initiates a Plumbing Code Review, existing residential accounts with a 3/4-inch service tap and a 5/8-inch meter may upgrade to a 3/4-inch meter while keeping the original 3/4-inch tap, provided the City's Plumbing Code considers a 3/4-inch meter adequate. This exception also applies to new single-family developments on a single lot with an existing 3/4-inch tap. These properties may be able to use the current 3/4-inch tap if a 3/4-inch meter meets the City's Plumbing Code requirements.

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[Domestic service connections for ADU and Middle housing](#)

This type of development shall only have one service connection, with no exception. The sizing of the meter connections shall meet the minimum requirements of the City Code, building code, fire code, and this design standards manual.

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[Can a water meter be sold off of a substandard main?](#)

Substandard Mains - (mains smaller than 6-inches in diameter) new service connections will only be allowed for a **single-family residence on a single lot where adequate fire protection has been verified, or a No Fire Service Acknowledgment form is signed**. Page 46 of the WSD Design Standards Manual

[Can a hydrant meter be sold off a transmission main?](#)

Hydrant meters cannot be sold off a transmission main. The closest distribution main hydrant shall be used even though it might not be the most convenient location to the project site. If no other main is available WSD approval shall be required.

[Largest Distribution Main for All Water Services](#)

When multiple distribution mains in the same pressure zone are adjacent to a development, all service connections shall be taken from the largest diameter main, or as approved by WSD through the Technical Appeal process.

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[Exposing ACP water mains](#)

Where a trenching operation crosses under an existing 12-inch or smaller AC P waterline and 4-feet or more of the ACP pipe is exposed, the contractor shall remove that part of the exposed water line to the limits show in MAG Standard Detail 403-3 and replace that section of pipe.

Page 13 of the WSD Design Standards Manual Note #3

[Water Stubs or Taps Ahead of Paving](#)

City of Phoenix does not allow new stubs or taps ahead of paving unless the property owner can provide a conceptual design report (e.g. Water/Wastewater Master Plans, Functional Segment Water /Wastewater Master Plans, etc.) and a preliminary site plan demonstrating the appropriate sizing and location of the mains or stubs for the specific parcel, usually at preliminary site plan approval stage. This applies to connections, such as water/sewer stubs, water/sewer mains, and service taps for fire lines and/or domestic use, to a proposed new main.

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The request for taps ahead of paving off new mains may be approved by WSD, through technical appeal process. Taps off existing water mains require an approved building permit per City Code 37-42 and 37-44.

Page 36 of the WSD Design Standards Manual

Separate Service for Each Demand

A combination of fire, domestic and landscape meters is prohibited. Each demand requires a separate service connection (PCC 37-73 & UFC 1001.6.1). There are two exceptions to the rule; the domestic service and landscape meter can be combined if the landscape area is less than 10,000 square feet or all water features having a daily consumption of less than 1,000 gallons per day; A fire line service and domestic service can be combined if the project is a qualified adaptive reuse project as outlined in TRT00518.

Page 48 & 49 of the WSD Design Standards Manual

Mixed Use Developments

Mixed Use Developments - (residential and commercial) require a separate meter and separate onsite plumbing for each type of use. This includes high-rise buildings with retail spaces below and residential units above, all in one structure. Refer to WSD Procedure P-106 for additional information.

Page 48 of the WSD Design Standards Manual

Water Pressure Zone

Zones operate nominally within a static pressure range between 40 and 100 PSI. The minimum water pressure of 40 PSI at the customer's meter. (25 PSI during fire flow events) Per plumbing code, any home that exceeds 80 PSI or greater will need a PRV.

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Encroachments Within a Water Easement

Water easements shall be free of all obstructions and shall always be accessible to City service equipment. No buildings, sport courts, swimming pools, fences, shade structures, appurtenances, concrete pads, nor permanent structures of any kind shall be constructed upon, over or under any water easements. Any encroachment into a water easement requires WSD approval through a technical appeal.

Page 10 of the WSD Design Standards Manual

List of Acceptable Plants and Trees in Utility Easements

Page 14 - 16 of the WSD Design Standards Manual. Minimum horizontal separation distance for trees are 10 ft or 6-ft with root barriers.

Upsizing Water Main Requirements for Downtown Core Area

The Downtown Core Area: This area is defined as between 7th Street to 7th Avenue and Jackson Street to the I-10 Freeway. All new developments that occur within these boundaries require 12-inch water mains. Existing mains 6-inches in diameter and smaller are considered substandard within the Downtown Core Area and shall be replaced with 12-inch mains. Exception, any water mains that are 8-inches or 10-inches do not need to be replaced unless upsizing is needed for fire flow.

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Water Valve Spacing

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Water Services Spacing

A 5-foot separation between services is required.

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[Pre-Stressed Concrete Cylinder Pipe \(PCCP\)](#)

[Design Manuals, Checklists, Details and Policies | City of Phoenix](#)

[RCP Main Tapping Procedure](#)

[Design Manuals, Checklists, Details and Policies | City of Phoenix](#)

[What are the requirements for crossing or working near transmission water main 24” and larger?](#)

A MOPO is required for any work activities that might impact the normal operations of the City's critical water systems for mains 24-inch and larger.

Refer to page 37 of the WSD Design Standards manual

SEWER

[Service Connections in Manholes](#)

Service connections shall connect to existing/new sewer mains or manholes and require a plan submittal of an S-511, S-512 or S-512D detail. No more than 4 taps per manhole.

Page 66 of the WSD Design Standards Manual

[Clean Outs Not Permitted Within the ROW](#)

If the property owner/developer chooses to connect to an existing clean out at the end of a sewer main, the clean out shall be removed and replaced with a manhole.

Page 64 of the WSD Design Standards Manual

[What are the requirements for sewer service connections for ADU and Middle Housing?](#)

ADU and Middle Housing Unit shall share sewer services with the property lot. Shared sewer service tap from the existing single-family home and ADU/Middle Housing Unit are still considered as a single-family residential tap. If not technically feasible, ADU and Middle Housing may be allowed to have separate sewer taps connecting to the City's wastewater system through the technical appeal process. The separate sewer taps for ADU and Middle Housing will be considered as commercial sewer taps and mapped with an “ADU (Middle Housing) Sewer Tap” annotation in WaterNet.

Refer to page 65 of the WSD manual

[When NEW Septic Systems may be Allowed](#)

COP does not allow private sewer systems when a public sanitary sewer is “available”. Therefore, COP will require that all properties within the service area connect to the public sewage system. However, if a property falls into one of the following exceptions, the sewer main extension will not be required:

- a. A new single residence on a single lot whose closest lot line is more than 250 feet from an existing public sanitary sewer main.
- b. A new commercial or residential development that is provided with COP water but is outside COP limits. Septic requirements for properties outside of COP limits are ultimately determined by the property's jurisdiction (i.e., County, Town of Cave Creek, or Paradise Valley).

Page 72 of the WSD Design Standards Manual

[When Existing Septic Systems May Remain In Use](#)

Existing residential or commercial septic systems that are properly permitted, operational, and have been deemed adequate by the County to continue serving the site, are allowed to remain. In addition, if a single residence or commercial development increases the calculated sewer flows to the system (per approved

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plumbing code), and the existing septic system has capacity to accept the increase in flows, the developments may remain on the existing septic system.

Any development on an existing septic system shall be required to connect to COP's public sewer system if one of the following occurs:

- a. The existing septic system needs major repairs.
- b. The existing septic system needs to be upgraded/increased in size in order to accept an increase in calculated sewer flows (per approved plumbing code).
- c. The existing septic system needs to be relocated on the property.

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Encroachments on Sewer Easement

Sewer easements shall be free of all obstructions and shall always be accessible to City service equipment. No buildings, sport courts, swimming pools, fences, shade structures, appurtenances, concrete pads, nor permanent structures of any kind shall be constructed upon, over or under any water or sewer easements. Any encroachments into a sewer easement require WSD approval through a technical appeal.

Page 10 of the WSD Design Standards Manual

List of Acceptable Plants and Trees in Utility Easements

Page 14-16 of the WSD Design Standards Manual. Minimum horizontal separation distance for trees are 10 ft or 6-ft with root barriers.

Sewer Stubs or Taps Ahead of Paving

City of Phoenix does not allow new stubs or taps ahead of paving unless the property owner can provide a conceptual design report (e.g. Water/Wastewater Master Plans, Functional Segment Water /Wastewater Master Plans, etc.) and a preliminary site plan demonstrating the appropriate sizing and location of the mains or stubs for the specific parcel, usually at preliminary site plan approval stage. This applies to connections, such as water/sewer stubs, water/sewer mains, and service taps for fire lines and/or domestic use, to a proposed new main. The request for taps ahead of paving off new mains may be approved by WSD, through technical appeal process. Taps off existing sewer mains require an approved building permit per City Code 28-27 and 28-32.

Page 36 of the WSD Design Standards Manual

No Sewer Stub-Out or Knock-Outs from Manhole Allowed

Page 64 of the WSD Design Standards Manual

New DIP Sanitary Sewers (Extra Protection) Must Use the New CIPP Lining

Per MAG Specifications and the COP Supplement Section 750, DIP may be used for sewer mains 8 inches through 54 inches in diameter. When DIP is used, it shall have Cured-in-Place Pipe (CIPP) lining in accordance with the proposed COP Supplement Section 751 - Ductile Iron Sanitary Sewer Lines.

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Extra protection of Existing and New VCP sewer main

What are the requirements for extra protection on VCP sewer mains?

1. Method One: Replacing VCP sewer main from MH to MH with DIP sewer main with CIPP lining. The DIP sewer main must be restrained at a minimum of 10 ft beyond the crossing location at both directions and has no joints for a minimum of 6 ft beyond the crossing location at both directions.
2. Method Two: CIPP lining the VCP sewer main from MH to MH.

Note: Concrete encasement of new or existing VCP sewer mains as extra protection method is not allowed.

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What are the requirements for crossing or working near sewer force mains or gravity mains 24-inch and larger?

A Maintenance of Plant Operation (MOPO) is required in any situation where planned activities might impact the normal operations of the City's critical wastewater systems for any gravity sewer main 24-inch and larger or 8-inch force mains or larger.

Refer to page 40 of the WSD Design Standards Manual

FIRE

Clearance Requirements for Fire Hydrants

All fire hydrants shall maintain a 6-foot horizontal clearance from any utility and above ground structures.

Page 58 of the WSD Design Standards Manual

Fire Hydrant Spacing

For Single Family - 500'.

For Multi-Family & Commercial – 300'.

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Fire Hydrant in a Cul-De-Sac

Place hydrant within 10 feet at the end of a dead-end water main that is greater than 100 feet in length to facilitate flushing and maintenance of the water main. However, a fire hydrant and valve may be placed directly at the end of a dead end main only if the hydrant is public and it's apparent that the water main cannot be extended any further, for example in cul-de-sacs or at the end of a water pressure zone.

No hydrant will be required on a cul-de-sac if all houses are within 350 feet of a hydrant and the dead-end water main is less than 100 feet. The water main shall end with a tapped cap and a corporation stop, with a valve box and lock as approved by WSD.

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Fire Flow Demands for Single Family Home Sprinkler System

Fire flows are to be taken off of distribution mains only. The minimum GPM for residential homes that are 3600 s.f. or less, shall be 1000GPM, which can be provided through a looped 6-inch water main or a dead end 8-inch water main. The standard size for a fire line connection shall be 4-inches or larger. Any fire line less than 4-inch shall will require a locked open meter.

Fire Line System

A fire line is a private pipe system connected directly to the City water system. A fire line connection to the City's water mains must start with a control valve and ends with a back flow preventor at or near the property line. A fire line connection cannot be made to the end of a dead end main. All maintenance of the private fire line is the responsibility of the property owner and begins at the control valve.

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OTHER MISCELLANEOUS ITEMS

Utilities Vertical Separation Chart

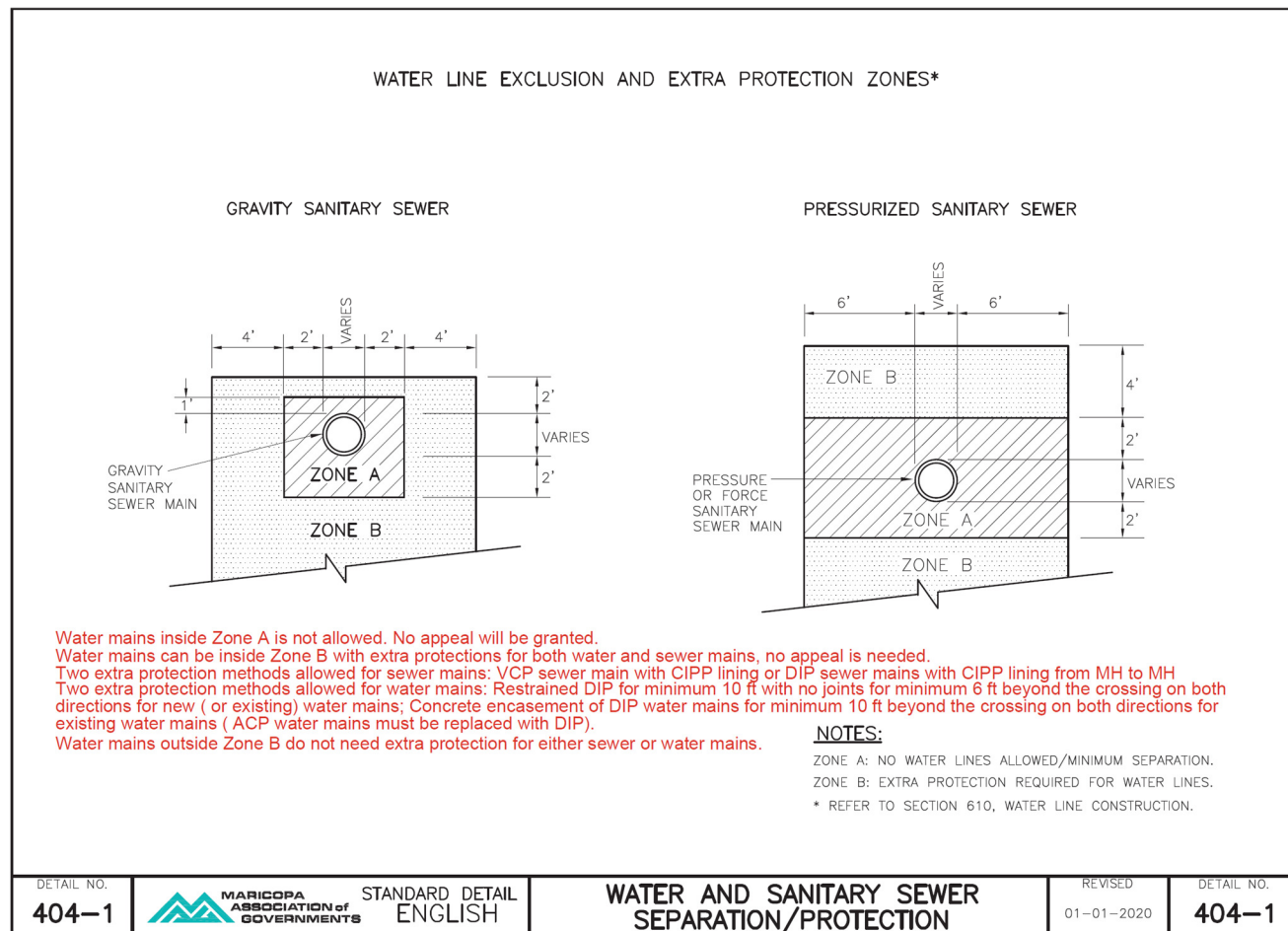
Page 13 of the WSD Design Standards Manual

Utilities Horizontal Separation Chart

Page 12 of the WSD Design Standards Manual

When Extra Protection is Required

See the map below:



Technical Appeal Process and Fees

All technical appeals must be submitted to wsd.appeals@phoenix.gov for prescreening. A completed application, narrative, exhibits, and all supporting documentation relevant to the technical appeal must be submitted for review. After prelog has been completed and the signed application has been returned, the submission process continues through SHAPEPHX on the City of Phoenix website. If an account does not exist, one must be created.

Land Lock Questions Concerning Building Code Modification

Per Chapter Code 37-48 and 28-29 it does not allow water or sewer services to cross through property lines. A building code modification with PDD may be needed. **WSD approval is required first and typically requires a Technical Appeal.**

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Standard Main Locations Within a Local Street and Private Accessway

In a 50-foot COP right of way, water and sewer mains shall be 9-feet off center of street. Private Accessway (29.16' with 8' PUE on both sides), water and sewer mains shall be 6-feet off center of street. For other street cross sections, please refer to the City of Phoenix Standard Utility Locations.

Water and Sewer Main Abandonment Types Accepted

1. Remove
2. Crush in place (not allowed for ACP)
3. Grout filled

All the existing lateral water/sewer service connections shall be transferred to the new mains.
Page 35 of the WSD Design Standards Manual

Industrial Pretreatment Permit Requirements

All industrial facilities are required to submit a Preliminary Survey. Facilities that are determined to have processes listed in the *United States Code of Federal Regulations* Title 40 (40 CFR Part 400 through 40 CFR Part 471) will be required to apply for an Industrial Wastewater Discharge Permit, including Prohibited Discharge processes. By-pass of pre-treatment requires WSD approval through a technical appeal.
Page 67 of the WSD Design Standards Manual

Potholing

Contractor to locate existing gas line in the field prior to construction. If in conflict with the proposed water line, contractor is to vertically re-align the waterline to obtain the required 1' of vertical separation, and under the direction of the city inspector.

For Water Stationing Refer to Policy 68

Water/Sewer Policies | City of Phoenix Only City's datum is acceptable.

For Sewer Stationing Refer to Policy 69

Water/Sewer Policies | City of Phoenix Only City's datum is acceptable.

Large Water Ordinance G-7237

Developments that use an average of 250,000-gallons of water or more per day are required to provide a Water Conservation Plan. In addition, developments that use an average of 500,000-gallons of water or more per day are required to demonstrate a minimum of 30% water reuse in the Water Conservation Plan.

The Water Conservation Plan must be reviewed and approved by the Water Services Department (WSD) prior to preliminary site plan approval.

For any questions, please contact the following:
Water Department (602) 463-0502
Email: wsd.dev.stips@phoenix.gov