City of Phoenix
WATER SERVICES DEPARTMENT

From: Jim Swanson
Assistant Water Services Director

Date: October12, 2021

To: Jason Blakely
Assistant Planning & Development Director

Subject: 2021 Update to the Design Standards Manual for Water and Wastewater Systems

The Water Services Department (WSD) has updated its Design Standards Manual for Water and Wastewater Systems. The updates were vetted by various WSD sections, Planning and Development Department (PDD) staff, and reviewed and approved by the Development Advisory Board. This updated version of the manual is intended to replace the 2017 version currently available. Generally, changes to the manual include corrections, clarifications, technical updates, and new appendices with additional design guidelines.

The new design standards will be available on the following website after October 18, 2021: https://www.phoenix.gov/waterservices/publications/design-manuals/systems.

Both the 2021 and the 2017 versions of the manual can be used for design for the remainder of the calendar year. Effective January 1, 2022, new projects that come into the City are required to use the 2021 manual.

Please share this information with your staff. An Excel file listing the 2017 to 2021 changes are also available and being provided with this memo.

WSD values our partnership with PDD to ensure that water and wastewater infrastructure is properly designed and constructed. If you have any questions or need additional information related to this request, please contact Jose M. Rodriguez, P.E. at (602)495-7684 or jose.m.rodriguez@phoenix.gov.

Thank you,

10/13/21
Jim Swanson, Assistant Water Services Director

CC: Kyry Tek
Patty Kennedy
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Keith Kesti
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2021 Design Standards Manual for Water and Wastewater Systems

Proposed changes and updates

Number	Chapter	Section	Subsection	Type of Revision	Existing language	Revised Language
1	Appendix A - Website Links	Specification and Details		General updates	New link	Salt River Project – Water Construction and Engineering Standards https://www.srpnet.com/water/services/WE/default.aspx
2	Appendix A - Website Links	Specification and Details		General updates	https://www.phoenix.gov/waterservices/publications/design-manuals/systems	https://www.phoenix.gov/waterservices/publications
3	Appenix B -Definitions and Terms	-	Service Connection	General updates	*A private connection to the public water or sewer system. For domestic/landscape water, the meter is the point of connection. For a fire line, the point of connection is the fire line valve nearest to the public water main . For sewer, the point of connection is at the public sewer main/manhole*	*A private connection to the public water or sewer system. For domestic/landscape water, the meter is the point of connection. For a fire line, the point of connection is the fire line valve nearest to the public water main . For sewer, the point of connection is at the public sewer main/manhole. A water service connection goes up to the end of right-of-way and ends at the meter. The pipe needs to be the same size of the tap in the right of way, and meet the applicable code*
4	Appenix C - Acronyms	-	WRDP	Typos and Corrections	Removed *WRDP - Water Resources and Development Planning*	Added *ADP - Asset and Development Planning*
5	I - Introduction	A - Purpose of the Manual		General updates	*The Water Services Department (WSD) has other design manuals available for other facilities (booster stations, lift stations, reservoirs, and pressure reducing valve stations) located on our website.*	*The Water Services Department (WSD) has implemented a separate addendum to provide design standards for projects along existing and future METRO light rail corridors. In addition, WSD has other design manuals available for other facilities (booster stations, lift stations, reservoirs, and pressure reducing valve stations). These additional design guidelines are located on our website. See Appendix A for reference.*
6	I - Introduction	B - Authority		Code Updates	*The design standards set forth in this manual are adopted pursuant to the authority granted in ARS 9-672 and Section 37-2, 37-3 and 28-3 of the Phoenix City Code (PCC).*	*The design standards set forth in this manual are adopted pursuant to the authority granted in ARS 9-276 and 48-572 and Section 37-2, 37-3, 37-17,28-3, and 28-16 of the Phoenix City Code (PCC).*
7	I - Introduction	D - Revisions and Public Comments		General updates	*This manual may be revised periodically. Proposed revisions will be posted in the City of Phoenix Water Services Department (WSD) website for a period of 30 days prior to implementation unless the revision is required to comply with Federal, State, County, and City laws, regulations, ordinances or codes. To review proposed revisions, go to WSD website.* *All proposed revisions will be listed on this page. If proposed revisions are listed, all comments received during the public comment period will be considered and responded to. New appendix for all changes* *At any time if you have a comment on WSD Design Standards Manual, you may send an email to WSD through the link provided on the website. These comments will also be reviewed and responded to.*	Section Deleted.
8	III - General Water and Sewer Design Criteria	A - General Deisgn Criteria/Considerations	1	General updates	*All appropriate agency levels affected within the Federal, State, County, and City involvement need to be contacted for their individual design requirements. These requirements will need to be addressed in a top down priority to avoid approval conflicts. This includes areas that are outside the city limits but served by the City of Phoenix water and sewer system.*	*All appropriate agency levels affected within the Federal, State, County, and City involvement need to be contacted for their individual design requirements. Additionally, utility owners and rail road companies may have additional requirements and permitting processes that all developments need to follow when working near or crossing their facilities. This includes the need to obtain a construction license or a "no conflict" document which will be required at the time of purchasing a water or sewer service from utility owners like SRP.* *These requirements will need to be addressed in a top-down priority to avoid approval conflicts. This includes areas that are outside the city limits but served by the City of Phoenix water and sewer system.*
9	II - Development Coordination by Department	B - Planning and Development Department	1	Typos and Corrections	*1. Roles and Functions*	*1. Role and Functions*
10	III - General Water and Sewer Design Criteria	A - General Deisgn Criteria/Considerations	5	General updates	N/A - New Paragraph	*A comprehensive investigation of all nearby existing and proposed utilities will need to be conducted in order to avoid possible conflicts. In areas with a large number of utilities, including the Downtown Core Area, additional quality levels of Subsurface Utility Engineering needs to be considered to avoid issues arising during construction.*
11	III - General Water and Sewer Design Criteria	B - Locations, Alignment, and Easement Requirements for Water and Sewer Mains	2(b)	Technical Updates	*Infill Developments and Single Family Attached option (SFA) as shown in Figure 2, Infill and SFA Option with Cutoff Wall, and Figure 3, Infill and SFA Option with Reinforced Slab. The development must be within…*	*Infill Developments and Single Family Attached option (SFA) as shown in Figure 2, Infill and SFA Option Private Access Way, The development must be within …*
12	III - General Water and Sewer Design Criteria	B - Locations, Alignment, and Easement Requirements for Water and Sewer Mains	2(a)	Typos and Corrections	*Private accessways shall be constructed per COP Supplement Detail P-1020 and per Figures 1, 2, or 3, whichever applies per options a. or b. mentioned above.*	*Private accessway's shall be constructed per COP Supplement Detail P-1020-1 and P-1020-2 per Figures 1 or 2, whichever applies per options a. or b. mentioned above*

2021 Design Standards Manual for Water and Wastewater Systems

Proposed changes and updates

Number	Chapter	Section	Subsection	Type of Revision	Existing language	Revised Language
13	III - General Water and Sewer Design Criteria	B - Locations, Alignment, and Easement Requirements for Water and Sewer Mains	2(g)	Technical Updates	*h. Building foundations shall be designed to prevent a building collapse or damage by limiting the deflection of the foundation due to loss of soil beneath the foundation in the event of a water main break. A certified statement from a structural engineer registered in Arizona is required. At a minimum, one of the following alternatives shall be met:* *1. Option 1 - Cutoff Wall: As represented in Figure 2, Infill and SFA Option with Cutoff Wall, construct a cut-off wall around the perimeter foundation adjacent to the street. The cut-off wall shall be a minimum of two feet deep and one foot thick and shall be constructed of 500 psi (minimum) concrete. The cut-off wall is to be constructed along the front edge of the foundation and it must wrap at least 10 feet along the structure's sides. The cut-off wall is intended to provide a barrier between the building and the water main in the event of a water or force main break, and thus reducing the potential damage to the building. The cut-off wall shall be designed by the developer's structural engineer, based on the above requirements or soils report, whichever is more stringent.* *2. Option 2 - Reinforced Slab: As represented by Figure 3, Infill and SFA Option with Reinforced Slab, design the foundation strong enough to resist sagging in the event of ground loss beneath the foundation caused by scouring from a water or force main break. The foundation along the side of the home facing the street shall be designed with a 5 foot cantilever. The allowable deflection at the free edge of the cantilever shall be calculated as L/360 for slabs with stucco, L/240 for other brittle finishes and L/480 for brick veneer exteriors. The distance L used in the equation should be taken as twice the length of the cantilever. Therefore, for a slab supporting stucco exterior housing, the post tensioning and slab thickness shall be designed as required to limit the deflection at the free end of the overhang to be less than 0.33-inches of differential deflection between the edge of slab and 10 feet inward. The stresses in the slab and overhang shall be kept at or below the City's building code requirements. All other applicable design cases including center edge lift, etc., shall also be evaluated using the appropriate stress and deflection criteria.*	*h. In the event that water main distance to the edge of the building foundations is 15 feet or less, the foundations shall be designed to prevent a building collapse or damage by limiting the deflection of the foundation due to loss of soil beneath the foundation in the event of a water main break. A certified statement from a structural engineer registered in Arizona is required. At a minimum, one of the following alternatives shall be met:* *1.Option 1 - Cutoff Wall: Construct a cut-off wall around the perimeter foundation adjacent to the street. The cut-off wall shall be a minimum of two feet deep and one foot thick and shall be constructed of 500 psi (minimum) concrete. The cut-off wall is to be constructed along the front edge of the foundation and it must wrap at least 10 feet along the structure's sides. The cut-off wall is intended to provide a barrier between the building and the water main in the event of a water or force main break, and thus reducing the potential damage to the building. The cut-off wall shall be designed by the developer's structural engineer, based on the above requirements or soils report, whichever is more stringent.* *2.Option 2 - Reinforced Slab: Design the foundation strong enough to resist sagging in the event of ground loss beneath the foundation caused by scouring from a water or force main break. The foundation along the side of the home facing the street shall be designed with a 5-foot cantilever. The allowable deflection at the free edge of the cantilever shall be calculated as L/360 for slabs with stucco, L/240 for other brittle finishes and L/480 for brick veneer exteriors. The distance L used in the equation should be taken as twice the length of the cantilever. Therefore, for a slab supporting stucco exterior housing, the post ¬tensioning and slab thickness shall be designed as required to limit the deflection at the free end of the overhang to be less than 0.33-inches of differential deflection between the edge of slab and 10 feet inward. The stresses in the slab and overhang shall be kept at or below the City's building code requirements. All other applicable design cases including center edge lift, etc., shall also be evaluated using the appropriate stress and deflection criteria.*
14	III - General Water and Sewer Design Criteria	B - Locations, Alignment, and Easement Requirements for Water and Sewer Mains	2	Technical Updates	Removed old Figure 2 and 3	Added new Figure 2
15	III - General Water and Sewer Design Criteria	B - Locations, Alignment, and Easement Requirements for Water and Sewer Mains	3(f)(3)	Clarifications based on Technical Appeals	*If parallel City water or sewer mains are to be located in the same easement, the adjusted minimum easement width for the overlapping easements shall be the sewer easement width plus an additional 7 feet.*	*If parallel City water or sewer mains are to be located in the same easement, the adjusted minimum easement width for the overlapping easements shall be the greater of the water or the sewer easement width, based on size and depth of the mains, plus an additional 7 feet.*
16	III - General Water and Sewer Design Criteria	B - Locations, Alignment, and Easement Requirements for Water and Sewer Mains	3(f)(7)	Clarifications based on Technical Appeals	*The access road shall have a minimum width of 12 feet and shall be paved or constructed of a minimum of 6 inch thick stabilized decomposed granite or as approved by WSD through the Technical Appeal process.*	*The access road shall have a minimum width of 12 feet and shall be paved or constructed of a minimum of 6 inch thick stabilized decomposed granite or other material as approved by WSD.*
17	III - General Water and Sewer Design Criteria	B - Locations, Alignment, and Easement Requirements for Water and Sewer Mains	3(f)(7)	General updates	*The maintenance of access roads in the water easements is the responsibility of the property owner or homeowners association and shall be indicated as such in the Conditions, Covenants, and Restrictions (CC&R's).*	*The maintenance of access roads within water and sewer easements is the responsibility of the property owner or homeowners association and shall be indicated as such in the Conditions, Covenants, and Restrictions (CC&R's)….*
18	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 7	Technical Updates	*Clearances around pre-stressed concrete cylinder pipe (PCCP) will require 4 foot vertical clearance or as required by the WSD.*	*When crossing Prestressed Concrete Cylinder Pipe (PCCP), the General Requirements for Working Around Prestressed Concrete Cylinder Pipe must be followed. See Section IV(D)(14).*
19	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 7	Technical Updates	N/A - New Footnote	Footnote 2 - *Minimum separation required by WSD. Utility Owner may require greater separation.*
20	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 7	Code Updates	3 feet from distribution, transmission and fire lines	6 feet distribution, transmission and fire lines
21	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 7	Technical Updates		Use same requirements as Distribution main
22	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 7	Code Updates	3 feet from sewer mains and sewer services	6 feet from sewer mains and sewer services
23	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 8	Technical Updates	N/A - New Footnote	Footnote 2 - *Mimimum separation required by WSD. Utility owner may require a greater separation. Refer to the link in Appendix A, page iii,for SRP Irrigation Requirements.*
24	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 8	Technical Updates	*Clearances around pre-stressed concrete cylinder pipe (PCCP) will require 4 foot vertical clearance or as required by the WSD.*	*When crossing Prestressed Concrete Cylinder Pipe (PCCP), the General Requirements for Working Around Prestressed Concrete Cylinder Pipe must be followed. See Section IV(D)(14).*
25	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 8	Technical Updates	6 inches from Storm Drain and Irrigation	1 foot from Storm Drain and Irrigation
26	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 8	General updates	*2- Extra protection is required for water mains and private fire line services that are between 1 and 2 feet above sewer. Refer to note below.* *3 - Extra protection is required for sewer service connections with less than one foot of vertical clearance. Refer to note below.* *4 - Extra protection is required. Refer to note below.*	*2 - Extra protection is required for water mains and private fire line services that are between 1 and 2 feet above sewer main, storm drain or irrigation line, and less than 1 foot above a sewer service. Extra protecion also required when water mains and private fire lines services are installed below sewer main, storm drain or irrigation line. Refer to note below*
27	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 8	Technical Updates	N/A - New Footnote	Footnote 2 - *Mimimum separation required by WSD. Utility owner may require a greater separation. Refer to the link in Appendix A, page iii,for SRP Irrigation Requirements.*
28	III - General Water and Sewer Design Criteria	C - Horizontal and Vertical Separation Requirements	Figure 8	Technical Updates		Use same requirements as Distribution main

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Proposed changes and updates

Number	Chapter	Section	Subsection	Type of Revision	Existing language	Revised Language
29	III - General Water and Sewer Design Criteria	D - Submittals	2 (a)(3)	Typos and Corrections	*Provide a site map/location of the development showing major streets and physical features such as canals, floodplains…*	*Provide a site map/location of the development showing major (arterial) streets and physical features such as canals, floodplains…*
30	III - General Water and Sewer Design Criteria	D - Submittals	2(b)	Typos and Corrections	*NOTE: These design parameters supersede the minimum requirements in Chapter IV, Pipe Sizing for Distribution Mains that states the prescribed minimum requirement of 12-inch mains in major streets…*	*NOTE: These design parameters supersede the minimum requirements in Chapter IV, Pipe Sizing for Distribution Mains that states the prescribed minimum requirement of 12-inch mains in major (arterial) streets…*
31	III - General Water and Sewer Design Criteria	D - Submittals	2(e)	Clarifications based on Technical Appeals	*The design report shall be signed and sealed by an Arizona Registered Professional Civil Engineer.*	*The design report shall be signed and sealed by an Arizona Registered Professional Civil Engineer. A full design report documenting the requirements above may not be required if a main is to be installed to meet City Code Section 37-33 or needs to be upsized in accordance with the Downtown Master plan. For these type of projects, a signed and sealed memo stating the purpose of the improvements may be adequate for the submittal requirements for plan review, as approved by WSD.*
32	III - General Water and Sewer Design Criteria	D - Submittals	6	Technical Updates	N/A - New section	*6. Water Asset Management Information* *WSD utilizes a comprehensive asset management program to provide maintenance for all water and wastewater assets, such as hydrants, valves, water service line tap, manholes, sewer lateral tap, and cleanouts, and others.* *For private developments, wherein there is a transfer of assets to the Water Service Department that includes water and/or wastewater main facilities, minimal asset information will need to be provided. Figure 10 Sample WAM Information shows a sample table that will need to be completed as part of the Record Drawings cover page. Information for items marked with an "X" on this figure does not need to be provided. The cost per unit column is an estimated material cost and can be taken from the Planning and Development Departments Engineers Cost Estimate form. As an alternative to adding this information on the cover sheet, the developer may create an Excel spreadsheet to be submitted with the Record Drawings.* *For Capital Improvement Projects, the design process will need to be coordinated internally with the GIS & Asset Management Team to identify the assets that will need to be inventoried during construction. A detailed Asset Management spreadsheet will be created as part of the final design of the project. For some assets, GPS coordinates will needs to be provided. This information must meet the requirements of WSD guide specification 01782 – RECORD DOCUMENTS.*
33	IV - Water Distribution and Transmissiton Systems	B - Water Main Design Criteria Applicable to Both Distribution and Transmission Mains	1	Code Updates	*The water main extension policy of the COP is contained in Article II of Chapter 37 of the Phoenix City Code. As set forth in the Code, developers must pay all costs for constructing water mains necessary to afford adequate service during peak demands, including fire flow. Under certain circumstances, as described in Section 37-35 of the Code, repayment of the cost of "offsite" water mains (approach mains) may be available. For procedures on water repayments, refer to WSD Policy P-77, which is available on WSD's website. For website link refer to Appendix A, page ii.*	*The water main extension policy of the COP is contained in Article II of Chapter 37 of the Phoenix City Code. As set forth in the Code, developers must pay all costs for constructing water mains necessary to afford adequate service during peak demands, including fire flow. Per section.(37-33) water mains must be installed in all streets bounding an entire development regardless of whether it does or does not directly service the property being developed. Under certain circumstances, as described in Section 37-35 of the Code, repayment of the cost of "offsite" water mains (approach mains) may be available. For procedures on water repayments, refer to WSD Policy P-77, which is available on WSD's website. For website link refer to Appendix A, page ii.*
34	IV - Water Distribution and Transmissiton Systems	B - Water Main Design Criteria Applicable to Both Distribution and Transmission Mains	2	Code Updates	*Downtown Core Area: This area is defined as between 7th Street to 7th Avenue and Jackson Street to the I-10 Freeway. Refer to Figure 13, Boundary Map for Downtown Core Area, for the boundaries of the Downtown Master Plan. All new developments that occur within these boundaries require 12-inch water mains. Existing mains 6-inch in diameter and smaller are considered substandard within the Downtown Core Area and shall be replaced with 12-inch mains. All substandard mains shall be abandoned, left in place or as directed by WSD.*	*Downtown Core Area: This area is defined as between 7th Street to 7th Avenue and Jackson Street to the I-10 Freeway. Refer to Figure 14, Boundary Map for Downtown Core Area, for the boundaries of the Downtown Master Plan. All new developments that occur within these boundaries require 12-inch water mains. Existing mains 6-inch in diameter and smaller are considered substandard within the Downtown Core Area and shall be replaced with 12-inch mains. Water mains that are 8 and 10-inches in diameter may remain in service if it can be demonstrated that they can adequately meet the projects total water needs, including fire flow. All substandard mains shall be abandoned, left in place or removed as directed by WSD.*
35	IV - Water Distribution and Transmissiton Systems	B - Water Main Design Criteria Applicable to Both Distribution and Transmission Mains	2	Clarifications based on Technical Appeals	*Water mains smaller than 4-inch shall be replaced regardless of the type of project being submitted with the exception of one new single family residence.*	N/A - Removed paragraph from this subsection and modified language. See comment #37
36	IV - Water Distribution and Transmissiton Systems	B - Water Main Design Criteria Applicable to Both Distribution and Transmission Mains	8	Technical Updates	N/A - New paragraph	*For distribution and transmission mains 16-inches and larger, the need for cathodic protection and pipe material selection shall be evaluated and designed based on the City of Phoenix document, "Requirements for Corrosion Protection Design Standards Development Report for Large Diameter Ductile Iron, Steel, CCP and RCP Water Transmission Pipelines" found in Appendix D.*
37	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	2	Technical Updates	N/A - New paragraph	*NOTE: For all developments, with the exception of a single family residence on a single lot, mains 4 inches or smaller within the streets bounding the entire development shall be removed and replaced pursuant to PCC 37-33.*
38	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	2	General updates	*Figure 14 – Minimum Water Main Sizing within COP Grid System*	*Figure 14 – Minimum Water Main Sizing within COP Distribution Grid System*
39	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	3	General updates	N/A - New paragraph	*c. Water mains constructed in washes and floodways shall have their crowns at least 2 feet below the 100 year storm scour depth and shall be constructed with restrained ductile iron pipe (DIP). The restrained DIP shall extend a minimum of 10 feet on each side of the 100 year storm scouring.*
40	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(b)(1)	Clarifications based on Technical Appeals	*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.*	*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.*
41	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(b)(3)	Technical Updates	*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. Contact a Fire Protection Engineer with the Planning and Development Department to determine fire protection requirements.*	*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. Adequate Fire Protection may not be available due to the size of the main, and submitting a Non-Fire Service Acknowledgement form may be required prior to purchasing the service. Contact a Fire Protection Engineer with the Planning and Development Department to determine fire protection requirements for a single family residence.*

Proposed changes and updates

Number	Chapter	Section	Subsection	Type of Revision	Existing language	Revised Language
42	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(b)(4)	Technical Updates	N/A - New paragraph	*4. When service connections are allowed to be made from a Reinforced Concrete Pipe (RCP) or a Concrete Cylinder Pipe (CCP) distribution main, those connections will be in accordance with the guidance document "Procedure for Water Tapping Services into Reinforced Concrete Pipe (RCP) or Concrete Cylinder Pipe (CCP)" found in Appendix E.*
43	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(c)(1)	Technical Updates	*1. Meter Boxes/Vaults – All meters shall be installed in a meter box/vault. The meter box/vault shall be located within the public ROW, water easement or PUE. In addition, each meter must be located out of a driveway, paved area or sidewalk. If a meter box must be located in a paved area, a traffic rated meter box and separation pavers or expansion joints around a meter box shall be required. Meters 3-inches and larger require a meter vault. See vault detail W-500 on WSD's website. For the website link refer to Appendix A, page ii.*	*1. Meter Boxes/Vaults – All meters shall be installed in a meter box/vault. The meter box/vault shall be located within the public ROW, water easement or PUE. In addition, each meter must be located out of a driveway, paved area or sidewalk. If a meter box must be located in a paved area, a traffic rated meter box and separation pavers or expansion joints around a meter box shall be required. The meter shall be installed in accordance with COP Supplement Detail P-1363. Meters 3-inches and larger require a meter vault. See vault detail W-500 on WSD's website. For the website link refer to Appendix A, page ii.*
44	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(c)(4)	Technical Updates	*Spacing – A minimum 3 foot separation is required between water service connections.*	*Spacing and Cover – A minimum 3-foot separation is required between water service connections. Meter service connections shall maintain a 30-inch minimum cover per COP Supplement Detail P-1342.*
45	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(c)(6)	Technical Updates	*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).*	*Separate Service for Each Demand - A combination of fire, domestic and landscape meters is prohibited. Each demand requires a separate service connection. A combination of domestic and landscape meter is allowed except for landscape areas noted in section d(3) below. A combination of a fireline and domestic service cannot be combined except for qualified Adaptive Reuse projects as outlined in TRT00518.*
46	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(c)(8)	General updates	N/A - New paragraph	*8. Service Connection - A service connection goes up to the end of right-of-way and ends at property line. The pipe needs to be the same size of the tap.*
47	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(c)(9)	General updates	N/A - New paragraph	*9. Service Connections shall be installed perpendicular to the water main within the right of way or easement.*
48	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(d)(3)	General updates	*Landscape - A separate landscape irrigation tap and meter is required for irrigated areas over 10,000 square feet, or 1,000 gallons or more per day (PCC Section 37-53(b) (1).*	*Landscape - A separate landscape irrigation tap and meter is required for landscape watering of all landscaped areas over 10,000 square feet, or for all water features having a daily consumptive use 1,000 gallons or more per day (PCC Section 37-53(B)). For commercial developments, it is recommended to consider a separate landscape meter beyond those required by City Code to reduce Development Occupational Fees (DOF) and wastewater treatment fee that can result from having a combined meter.*
49	IV - Water Distribution and Transmissiton Systems	C - Additional Criteria Only Applicable to Distribution Mains.	5(d)(6)	Typos and Corrections	Figure 16 - Water Meters and Sizing Guidelines	Corrected designation for 1 -1/2" meter as well as footnotes for Column 3 and Column 4 to match PDD TRT/DOC/00142
50	IV - Water Distribution and Transmissiton Systems	D - Additional Criteria Only Applicable to Transmission Mains.		Typos and Corrections	*D. TRANSMISSION MAINS*	D. ADDITIONAL DESIGN CRITERIA ONLY APPLICABLE TO TRANSMISSION MAINS
51	IV - Water Distribution and Transmissiton Systems	D - Additional Criteria Only Applicable to Transmission Mains.	1	Technical Updates	*Transmission mains 16-inches in diameter shall be ductile iron pipe (DIP). Transmission mains 16-inches through 42-inches in diameter, regardless of location, shall be DIP, concrete cylinder pipe (CCP), or steel cylinder pipe. Mains 48-inches in diameter and larger shall be DIP or steel cylinder pipe. The pipe shall conform to the applicable MAG Specifications and the COP Supplements thereto.*	*Transmission mains up to 24 inches in diameter shall be ductile iron pipe (DIP). Transmission mains over 24 inches through 42-inches in diameter, regardless of location, shall be DIP, concrete cylinder pipe (CCP), or steel cylinder pipe. Mains 48-inches in diameter and larger shall be DIP or steel cylinder pipe. The pipe shall conform to the applicable MAG Sp ecifications and the COP Supplements thereto.*
52	IV - Water Distribution and Transmissiton Systems	D - Additional Criteria Only Applicable to Transmission Mains.	3	General updates	*3. Cover* *Minimum cover from finished grade to the top of the exterior surface of the pipe shall be 6.5 feet for 16-inch water mains and larger. If finished grade cannot be identified, increased depth may be required.*	*3. Transmission Main Cover* *Minimum cover from finished grade to the top of the exterior surface of the pipe shall be 6.5 feet for 16-inch water mains and larger. Water mains constructed in washes and floodways shall have their crowns at least 2 feet below the 100 year storm scour depth and shall be constructed with restrained ductile iron pipe (DIP). The restrained DIP shall extend a minimum of 10 feet on each side of the 100 year storm scouring. If finished grade cannot be identified, increased depth may be required.*
53	IV - Water Distribution and Transmissiton Systems	D - Additional Criteria Only Applicable to Transmission Mains.	13	Technical Updates	N/A - New paragraph	*13. Crossing of Transmission Mains* *Whenever a utility crosses perpendicular over or under a transmission main, a minimum of 2-foot vertical clearance as measured from the outside of the pipe to the outside of the crossing utility, must be maintained. When crossing transmission mains, a shutdown and de-energizing, following WSD procedure and with WSD approval, may be required.*
54	IV - Water Distribution and Transmissiton Systems	D - Additional Criteria Only Applicable to Transmission Mains.	14	Technical Updates	N/A - New paragraph	Section not added due to length. Refer to DSM Section IV(D)(14) for additional information for new requirements when working near a Prestressed Concrete Cylinder Pipe.
55	IV - Water Distribution and Transmissiton Systems	E - Fire Line Systems	2(a)	Technical Updates	*a. The standard size for fire line connections shall be 4-inches or larger. Fire lines smaller than 4-inches will require a meter. The meter will be installed by city forces after application and will be locked in the open position.*	*a. The standard size for fire line connections shall be 4-inches or larger. Fire lines smaller than 4-inches will require a meter. The meter will be installed by the City with an approved application and will be locked in the open position. Meters on fire lines shall be sized to deliver the required fire flow. Refer to meter size table and riser fire flow requirements.*
56	IV - Water Distribution and Transmissiton Systems	E - Fire Line Systems	2(c)	Code Updates	If the Fire Department determines that a fire pump system is needed requiring a redundant water source (i.e. two fire line connections), the water supply shall be provided from multiple water mains serving the same pressure zone. If two water mains are not available and the fire lines shall connect from a single source, WSD must review the proposed connections prior to PDD approval.	*If the Fire Department determines that a fire pump system is needed requiring a redundant water source (i.e. two fire line connections), the water supply shall be provided from multiple water mains serving the same pressure zone. If two water mains are not available and the fire lines shall connect from a single source, WSD must review the proposed connections prior to PDD approval (I.F.C 2018, Code 914.3.1.2.).*
57	IV - Water Distribution and Transmissiton Systems	E - Fire Line Systems	2(e)	Technical Updates	N/A - New paragraph	*• Minimum cover over the fire line shall be determined by the City of Phoenix adopted Plumbing Codes.*
58	IV - Water Distribution and Transmissiton Systems	E - Fire Line Systems	2(g)	Technical Updates	N/A - New paragraph	*g. When fire line connections are allowed to be made from a Reinforced Concrete Pipe (RCP) or a Concrete Cylinder Pipe (CCP) distribution main, those connections will be in accordance with the guidance document "Procedure for Water Tapping Services into Reinforced Concrete Pipe (RCP) or Concrete Cylinder Pipe (CCP)" in Appendix E*

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Proposed changes and updates

Number	Chapter	Section	Subsection	Type of Revision	Existing language	Revised Language
59	IV - Water Distribution and Transmissiton Systems	F - Irrigation Systems	-	Code Updates	*In accordance with Section 37-113 of the PCC, a Landscape Water Permit is required for irrigation of large turf-related facilities. A large turf-related facility is defined as a site that has 5 or more acres of turf or high-water-use landscaping. Schools, parks, cemeteries, and golf courses typically fall into this category.* *A permit application may be obtained from WSD Water Resources Development Planning - Water Conservation Office. A permit may be issued after a Water Conservation and Non-Potable Water Use Plan is submitted and approved by WSD. A condition of the permit will be that non-potable water shall be used for irrigation unless the cost of providing non-potable water would be prohibitively high to the developer or WSD. WSD shall make that determination. The developer will need to enter into a contract for the sale and use of non-potable water before the service connection can be approved.*	*In accordance with Section 37-110 and 37-112 of the PCC, a Landscape Water Permit is required for irrigation of turf-related facilities. A turf-related facility is defined as a site that has 10 or more acres of turf or high-water-use landscaping. Schools, parks, cemeteries, and golf courses typically fall into this category.* *A permit application must be obtained from WSD Water Resources - Water Conservation Office.. WSD shall make the determination of when potable or non-potable water is acceptable for use per PCC and State requirements. The developer will need to enter into a contract for the sale and use of non-potable water before the service connection can be approved.*
60	IV - Water Distribution and Transmissiton Systems	G - Fire Hydrant Requirements	1(e)	Technical Updates	*Place hydrant within 30 feet of a dead end water main greater than 100 feet in length to facilitate flushing and maintenance of the water main….*	*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…*
61	IV - Water Distribution and Transmissiton Systems	G - Fire Hydrant Requirements	2(a)	General updates	*Existing fire hydrants on major streets, collector streets or any other streets not divided by raised median islands …*	*Existing fire hydrants on major (arterial) streets, collector streets or any other streets not divided by raised median islands …*
62	IV - Water Distribution and Transmissiton Systems	G - Fire Hydrant Requirements	6	Technical Updates	N/A - New paragraph	*Exceptions:* *Fire Hydrants located on bypass assemblies for water transmission mains. These will need to be approved by the Water Services Department on a case by case basis.*
63	V - Waste Water Collection Systems	B - Gravity Mains	1	Technical Updates	*...For pipes 15-inches and smaller, WSD prefers VCP to be used unless DIP is necessary for extra protection….*	*...For pipes 15-inches and smaller, WSD requires VCP to be used unless DIP is necessary for extra protection …*
64	V - Waste Water Collection Systems	B - Gravity Mains	1(c)	Technical Updates	*DIP and fittings: 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 be lined with Protecto 401 ceramic epoxy.*	*DIP and fittings: 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.A copy of the specification is included in Appendix F.*
65	V - Waste Water Collection Systems	B - Gravity Mains	3	Technical Updates	*Gravity sewers shall be designed and constructed to provide mean velocities of not less than the velocities shown in Figure 20, Design Slopes, based on Manning's formula, flowing full, and using an "n" value of 0.013. The minimum slopes required to maintain the minimum mean velocity are shown in Figure 20, Design Slopes.*	*Gravity sewers shall be designed and constructed to provide velocities of not less than the velocities shown in Figure 23, Design Slopes, based on Manning's formula, flowing full, and using an "n" value of 0.013. The minimum slopes required to maintain the minimum velocity are shown in Figure 23, Design Slopes.*
66	V - Waste Water Collection Systems	C - Manholes	c	Technical Updates	N/A - New paragraph	*c. A manhole shall not discharge flows in more than one downstream direction unless approved by WSD.*
67	V - Waste Water Collection Systems	C - Manholes	7	Technical Updates	*Drop sewer connections for public sewer mains into a manhole shall conform to MAG Standard Detail 426.*	*Drop sewer connections for public sewer mains into a manhole shall conform to MAG Standard Detail 426 as modified by Standard Detail S-512D.*
68	V - Waste Water Collection Systems	D - Service Connections	1 (c)	Technical Updates	*The portion of the sewer tap located within the ROW shall be designed in accordance with the slopes set forth in the City's currently adopted plumbing code (IPC/UPC).*	*The portion of the sewer tap located within the ROW shall be designed in accordance with the slopes set forth in the City's currently adopted plumbing code (IPC/UPC). Only VCP or DIP service connections are allowed within the ROW.*
69	V - Waste Water Collection Systems	D - Service Connections	1(e)	Technical Updates	N/A - new subsection	*e. Service Connection goes up to the end of right-of-way and ends at property line. For commercial development, the pipe needs to be the same size of the service tap.*
70	V - Waste Water Collection Systems	D - Service Connections	2(e)	Clarifications based on Technical Appeals	*e. Any development that cannot be served through a gravity sewer system and requires a lift station with a capacity less than 1 million gallons per day (MGD).*	*e. Any single subdivision or development that cannot be served through a gravity sewer system and requires a lift station with a capacity less than 1 million gallons per day (MGD). The entire sewer system upstream of the service connection at the public gravity sewer will remain privately owned and maintained. Private sewers within a subdivision will be subject to approval of the PDD's Subdivision Committee by means of a Technical Appeal. Any encroachment of the private system into public ROW will require a revocable permit as dictated by the Street Transportation Department.*
71	V - Waste Water Collection Systems	D - Service Connections	4	General updates	*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. The details are available on WSD's website. For website link refer to Appendix A, page ii.*	*Service connections shall connect to existing sewer mains or manholes. Service connections into an existing manhole require a plan submittal of an S-511, S-512 or S-512D detail. The details are available on WSD's website. For website link refer to Appendix A, page ii. Service connections on new sewer mains or manholes can be shown on the construction drawings and do not need a separate detail, provided they contain all the required documentation.*

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Number	Chapter	Section	Subsection	Type of Revision	Existing language	Revised Language
72	V - Waste Water Collection Systems	G - Septic Systems within the City of Phoenix	1	Code Updates	City Code 28-25, Private Sewage Systems - Construction and maintenance within the City prohibited generally, states the following: "Except as provided in this chapter, it shall be unlawful to construct or maintain within the City a privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of sewage." City Code 28-26, Private Sewage Systems - When permitted to be constructed and maintained in sanitary manner, states the following: "Where a public sanitary sewer is not available within the City, or in any area under the jurisdiction of the City, the building sewer shall be connected to a private sewage disposal system, complying with the provisions and recommendations of the Arizona Department of Health Services and the Sanitary Code of the County Health Department. Such private sewage disposal system shall be constructed, maintained, and operated at all times in a sanitary manner."	*City Code 28-25, Private Sewage Systems - Construction and maintenance within the City prohibited generally, states the following: "Except as expressly provided in this chapter, it is unlawful to construct or maintain within the City or an area of the City jurisdiction a private sewer system, including any privy, privy vault, septic tank, cesspool, onsite wastewater treatment system, or other facility intended or used for the disposal of sewage.."* *City Code 28-26, Private Sewage Systems - Limited instances permitted; to be constructed and maintained in sanitary manner, states the following: "Only in those limited instances in which there is no public sewer available to connect to may a home or building located within the City or an area of the City's jurisdiction connect to a private sewer system. The private sewer system must be designed, installed, maintained, and operated or used at all times in strict conformance with State and County private sewer system requirements. When a public sewer becomes available for connection, the home or building must discontinue its use of the private sewer disposal system and connect to the public sewer."*
73	V - Waste Water Collection Systems	G - Septic Systems within the City of Phoenix	2	Clarifications based on Technical Appeals	*COP does not allow private sewer systems when a public sanitary sewer is "available"….*	*COP does not allow private sewer systems…*
74	VI - Technical Appeals	A - Purpose of Appeal		Typos and Corrections		Various corrections.
75	VI - Technical Appeals	B - Developer Technical Appeals		General updates	N/A - New Paragraph	*The Committee will typically hear cases within ten working days after a complete application is received and fees are paid. A decision in writing will typically be provided within five working days after the committee reaches a final decision.*