CHAPTER 5

WATER INFRASTRUCTURE DESIGN AND CONSTRUCTION

5-1 GENERAL INFORMATION

A. System Design Criteria

The criteria for development of water infrastructure in the City of Peoria shall be in conformance with:

1. The approved edition of the Peoria Water System Master Plan. All new construction shall comply with the Master Plan. Directions for obtaining a PDF copy of the approved edition of the Water System Master Plan is on the website at http://www.peoriaaz.gov/content2.asp?ID=1443
2. The Arizona Department of Environmental Quality (ADEQ) Engineering Bulletin 10.
3. International Fire Code, approved edition.
4. The design engineer is responsible for evaluating site specific design conditions.
5. All other applicable City, State, County and Federal Codes and Guidelines.

B. Requirement to Connect

All developments, including single-family residences, are required to connect to the City's water system per Peoria City Code, Section 25-20. The connection to the City's water system and the extension of the waterline per City requirements are a condition of issuance of a building permit.

Waivers to this requirement may be granted by the Utilities Director if the connection is determined not to be feasible. A connection may be considered "not feasible" according to the following:

1. Single lot developments if such development is on a major arterial road.
2. The extension of the waterline is greater than 1320-feet from the City water system.
3. The applicant demonstrates the inability to obtain necessary easements upon reasonable pursuit.

Requests for a Temporary Revocable Water or Sewer Connection Waiver shall be applied for in writing at the engineering counter. The application is available on the website at http://www.peoriaaz.gov/content2.asp?ID=1435.

C. Water System Facilities

Water System Facilities include the: wells, recovery wells, booster stations, inline boosters, pressure reducing valves, lift stations, reservoirs, treatment facilities, and all other appurtenances required for proper treatment, conveyance, and service of water within the system.

It is the responsibility of the design engineer to review the approved edition of the Water System Master Plan and determine what additional water infrastructure is necessary to serve the proposed development. The Utilities Department will utilize the approved edition of the Water Master Plan and operational knowledge of the system to determine which facilities or upgrades are the requirements of the new development.

Contact the Utilities Department to discuss project specific design criteria for Water System Facilities including: wells, booster stations, inline boosters, pressure reducing valves, lift stations, and reservoirs.

D. Exceptions to the Design Guidelines

Any exceptions to Chapter 5 of the City of Peoria Infrastructure Design Guidelines must be approved in writing by the director of the Utilities Department or their designees.

5-2 TECHNICAL DESIGN REQUIREMENTS

A. General

1. *Materials* Refer to City of Peoria Standard Detail PE-101 for allowable materials.

2. *Looped System* All water systems must demonstrate redundancy (i.e. connected to two separate waterlines) as approved by the Engineering Department.

3. *Conveyance* Rights-of-way and easements shall be dedicated prior to any construction or with the Final Plat of the development.

4. *Pavement Replacement*. Pavement replacement type and compaction type shall be indicated per MAG Standard Details and Specifications on each sheet or as modified in the City of Peoria General Notes.

B. Classifications of Waterlines

The City of Peoria waterline system is based on a grid system with three basic classifications of waterlines. All development shall provide for water distribution and service lines of appropriate sizes and in standard locations. These are minimum requirements and the City may require larger sizes in unusual circumstances or in order to satisfy fire flow and pressure requirements.

1. *Transmission waterlines*. Larger than 16-inch in diameter. Size and location will be in accordance with the approved edition of the Peoria Water System Master Plan.

2. *Distribution waterlines.*

   a. Along section lines, 16-inch diameter lines.

   b. Along north-south midsection collectors (1/2 mile), 12-inch minimum diameter lines.

   c. Along east-west midsection collectors (1/2 mile), 8-inch minimum diameter lines.

   d. If the waterline deviates from the section line or mid-section line, as in the case of curvilinear roads, the waterline shall be sized as directed in this section.

   e. 8-inch minimum diameter lines shall be the standard in other locations.

3. *Service waterlines.*

   a. For single-family residential developments, standard sizes for metered taps shall be one-inch, 1.5 inches or two-inches. No smaller sizes will be allowed.

b. For all other types of development, service lines shall be sized per the design engineer.

c. Fire services lines shall be a minimum of six-inch. Smaller fire services must obtain written approval from the Fire Department.

d. Service taps are prohibited on any line, which is designed to service fire sprinkler systems or fire hydrants, on transmission waterlines, and on all waterlines larger than 16-inches.

e. Water service lines shall not be located under driveways or under concrete aprons adjacent to driveways.

C. Location of Waterlines

1. *Major Arterial Streets*. Waterline alignment shall be approved by the Utilities and Engineering Departments.

2. *Minor Arterial Streets*. Waterlines shall be offset from street centerline 13-feet north or east.

3. *Collector Streets*. Waterlines shall be offset from street centerline nine-feet north or east.

4. *Local Streets*. Waterlines shall be offset from street centerline six-feet north or east.

5. *Valve Locations*. Generally the intent is to locate the valve lids so that wheel line of normal vehicular traffic does not track over the casting. The location for the valve covers and lids should not be closer than 6-feet from the gutter line where possible.

6. *Alignment*. All waterlines shall be parallel to the street centerlines or property lines, or as close as possible.

7. *Separation.* Vertical and horizontal separation from sewer lines shall be in accordance with MAG Section 610.5 and MAG Standard Detail 404-1.

D. Easements

1. The minimum clear width of the easement for all waterlines shall be 20-feet. The minimum width for a shared easement with sanitary sewer shall be 30-feet. There is a minimum of 10-feet each side of the water facility. Larger easement widths will be required for deeper installations as determined by the Utilities or Engineering Departments.

2. Waterlines shall be centered in easements. No other parallel utilities shall be located within the water or sewer easement.

3. Water easements are to be dedicated for the specific use, maintenance and repair of the waterline, and any associated appurtenances. Water easements are to be dedicated as part of a Final Plat or by separate instrument with written approval from the Engineering Department.

4. Underground retention and above ground retention basins are not permitted to cross or be within designated public water or public sewer easements.

5. Meters, fire hydrants, and valves located on private property shall be contained within a dedicated public water easement, six-feet from the sides and 6-feet behind the appurtenance.

E. Cover and Depth

1. *Cover Requirements*. Minimum cover from finish grade to top of the pipe shall be:

   a. As specified by the design engineer, but no less than 60-inches for waterlines 12-inches in diameter and larger located in arterial streets, and for all waterlines 16-inches in diameter or larger, regardless of the location unless design conditions warrant additional cover.

   b. As specified by the design engineer, but not less than 48-inches for waterlines less than 12-inches in diameter for all locations (except arterial streets) unless design conditions warrant additional cover.

   c. Where cover is less than 4-feet (due to topography or facilities such as canals, washes, rivers, drainage basins etc.) an encasement per MAG Standard Detail 404-3, shall be constructed. This is allowed only with the written request by the design engineer and written approval by the Engineering Department.

2. *Plan Notation*. The proposed depth shall be clearly noted on each plan sheet.

   a. Any changes in depth required to avoid conflicting utilities shall be noted. The design plans shall detail the location and proposed elevation of each bend clearly. This can be done by using a standard detail that depicts the crossings in profile.

   b. All Waterlines in 12-inch and larger must be shown in plan and profile.

   c. To increase clarity, profiles of eight-inch waterlines may be required at the request of the plans reviewer.

3. Encasement or Casing:

   Additional protection per MAG Standard Details 404-1, 404-2, and 404-3 is required:

   a. Where cover is less than 4-feet (due to topography or potential conflicts with facilities such as canals, washes, or rivers).

   b. Where the bottom of pipe of the water line is between 1 to 2 feet above the top of pipe of any irrigation, storm drain, sanitary sewer, force main or other gray water pipe.

   c. Where the top of pipe of the water line is greater than 2-feet below any irrigation, storm drain, sanitary sewer, force main or other gray water pipe. Per MAG, no water lines are allowed to be located less than 2-feet below the bottom of the irrigation, storm drain, sanitary sewer, force main or other gray water pipe.

   d. Where sewerlines pass under a significant structure greater than 10-feet wide such as box culverts, railroads, highways, canals, etc. The sewerline(s) shall be installed inside a pipe casing as approved by the Engineering Department.

   e. As deemed necessary by the plan reviewer.

F. Miscellaneous Design Standards

1. Fire hydrant runs in excess of 100-feet in length require 8-inch diameter waterlines and additional valving.

2. Fire hydrants shall be installed on all dead end lines as close to the end as possible.

3. The maximum length for a dead end waterline is 400-feet unless approved in writing by the Engineering Department.

4. Combination Air/Vacuum release valves shall be installed at high points in the waterline and where the waterline changes slope or as required by the Engineering Department. The valves shall be installed per City of Peoria Standard Detail PE-395.

5. The City of Peoria water testing standards require at least one water sampling station per developed square mile. New residential developments are required to construct the water quality sampling stations per City of Peoria Standard Detail PE-371. Sampling station frequency and location will be coordinated by the Utilities Department during plan review.

6. Tapping Sleeves

   a. Tapping sleeves will not be allowed on Asbestos Cement Pipe sections. Replace the pipe section with ductile iron pipe and fittings as needed.

   b. Tapping sleeves are allowed to be installed on waterlines 12-inch and less in diameter. Tapping sleeves are not allowed to be installed on waterlines 16-inch or larger. Any exceptions must be approved in writing by the Utilities Department.

   c. Size on size connections are not allowed. Any exceptions must be approved in writing by the Utilities Department.

7. Thrust Restraint

   a. Mechanical Thrust Restraint may be provided with a Meg-a-Lug or equivalent mechanical restraint joint, as approved by the Engineering Department.

   b. Thrust Blocks will be concrete only per MAG Standard Details 301 and/or 340 and Class “B” concrete per MAG Specification 725.

8. Pipe Bedding Requirements

   Refer to City of Peoria Standard Detail PE-401. Bedding compaction densities shall be per MAG Specification Table 601-2. Specially designed and alternate beddings may be approved on a case by case basis by the Engineering Department.

9. Trench Backfill Requirements

   Refer to PE-401 Minimum trench backfill requirements shall be Type I per MAG Specification 601.4.3, with compaction densities per MAG Specification Table 601-2. Backfill requirements provided by the design engineer shall apply when such provisions are more restrictive than the MAG specification.

G. Fire Hydrants

1. *Materials and Details.*

   a. Fire hydrants shall be per City of Peoria Standard Details PE-360-1 (residential) or PE-360-2 (non-residential), as applicable.

   b. All of the hydrants that are connected to the City of Peoria distribution system must be public hydrants.

2. *Fire Flow and Number of Hydrants Required*

   a. The minimum required fire flow and minimum required number of fire hydrants are per Table B105.1 and Table C105.1 from the International Fire Code, approved edition.

   b. Reduction of fire flow up to 50% is possible, but not automatic, when the buildings have fire sprinkler systems installed. Formal request in writing shall be made to the Fire Department. Please include information of water availability, water purveyor, total building square footages, proposed usage, construction type of the buildings, sprinkler system information, and water storage information (if applicable). If approved, the Fire Department will issue a Fire Flow Reduction approval letter.

3. *Hydrant Spacing*

   a. Residential: 500-feet maximum in a single-family residential development.

   b. Non-Residential: Average Spacing shall be per Table C105.1 of the 2006 IFC, except for Fire-Flow up to 5000 gpm, the average spacing shall be 300-feet.

      300-feet maximum in a multi-family residential development.
      300-feet maximum in commercial/industrial areas.

   c. Collector Roads: 1000-feet maximum

   d. Arterial streets with 4 or more traffic lanes;
      Roadways with a traffic count of more than 30, 000 vehicles per day; or
      Roadways with median dividers.

      1000-feet maximum spacing on each side of the road in alternating positions, resulting in a hydrant every 500-feet along the roadway.

   e. For higher risk protection, determination shall be made by the Fire Department, regarding fire hydrant spacing, flow and pressure requirements.

4. *Private Hydrants: (owned and maintained by Private Water Companies)*

   a. Hydrants proposed in the service area of a private water company shall adhere to all City of Peoria standards unless otherwise approved by the Fire Department.

5. *Hydrant Markers:*

   a. Markers shall be as specified in City of Peoria Standard Detail PE-362.

   b. Hydrant Markers are required for all public or private hydrants.

H. Fire Flow Tests

Conduct Fire Flow Tests according to the City of Peoria *Fire Flow Testing Procedure* as published by the City of Peoria Fire Department on the City of Peoria website.

1. In order to accurately predict the strength of the distribution system a fire flow test is required. The flow test results are valid for 180-days.

2. Flow tests are not provided by the City. The developer shall be responsible for obtaining a qualified testing agent. Test results must be prepared by a registered engineer in the state of Arizona or by an individual or firm with a level II NICET certification in Fire Sprinklers.

3. It is required that the Fire Department observes the test and acknowledges approval of the flow. Contact the Fire Department to schedule the observation of the flow test.

I. Valves

1. *Materials and Details*.

   a. Refer to the City of Peoria Standard Detail PE-101 for allowable materials.

   b. Gate valves required to control the operation of the water system shall be installed per City of Peoria Standard Detail PE-270 and shall conform to MAG Detail 630. Gate valves shall be used for waterline sizes up to and including 16-inches in diameter.

   c. Butterfly valves shall be required on mains 24-inches in diameter and larger.

   d. Valves installation shall conform to City of Peoria Standard Details PE-270 and PE-398.

2. *Spacing*.

   a. Generally, there shall be two valves per tee and three valves per cross. However, it is preferred to limit the number of unnecessary inline valves. See the following criteria to help define when inline valves are necessary:

      i. Maximum spacing requirements per b. through e. below.
      ii. The maximum number of hydrants to be out of service per closure is two.
      iii. The maximum number of residential units to be out of service per closure is 20.
      iv. The maximum number of valves to isolate a segment of waterline is four.

   b. 500-feet maximum spacing of valves in industrial, commercial and multi-family districts.

   c. 800-feet maximum spacing of valves in single-family residential developments.

d. 1320-feet maximum spacing of valves on transmission mains 16-inch in diameter.

e. 2640-feet maximum spacing on transmission mains larger than 16-inches.

f. Any 8-inch and larger water line that will be extended in the future shall have a valve, along with a 20-foot minimum stub with cap and 2-inch curb stop, at the terminus per MAG Standard Detail 390-type A. (Type B in unimproved areas)

g. For all water lines crossing significant structures greater than 10-feet wide, such as drainage canals, and railroads, one valve shall be placed on each side of the structure as directed by the Engineering Department.

3. *Location*.

a. See City of Peoria Standard Detail PE-398 for valve locations from a tee and cross.

b. Valves shall not be located in valley gutters. The centerline of the valve shall be a minimum of 2-feet from the edge of the valley gutter.

c. All water valves located outside of paved areas shall have a "Curve-Flex" Utility Marker as manufactured by Carsonite (CFRM-400-Blue) or approved equal.

d. Valves shall be at least 3-feet clear of any constructed obstructions and 6-feet clear of any landscaping.

e. Consideration shall be given to the location of driveways, especially residential, adjacent to the valve cover whereby a vehicle or other obstruction may be temporarily located, to perpetually maintain the 6-foot clearance.

4. *Operation*.

a. Representatives of the Utilities Department are the only personnel authorized to operate water valves on the City's existing water system.

b. To request a water system shut down a "*Peoria Distribution System-Shut Down Request Form*" must be submitted. This form must be submitted at least 10-days in advance of any requests to shut down any lines in the City of Peoria's water distribution system and can be downloaded at: http://www.peoriaaz.gov/uploadedFiles/Peoriaaz/Departments/Engineering/Downloads/Water_System_Shutdown_Form.pdf

J. Water Services and Water Meters

1. *General*.

a. The size of the service will be as determined by the design engineer, sized and designed in accordance with requirements of the Uniform Plumbing Code and per the sizes herein.

b. There will be one service per lot and one meter per service line unless specific written request is submitted to the Engineering Department and written approval is acknowledged by the City.

c. A three-foot minimum separation is required between taps and an 18-inch minimum separation is required from any fittings or mainline joints

d. The Developer shall make all service taps.

f. The meter size shall be dictated by the service size. Manifolding is not permitted unless written approval is obtained from the Utilities Director.

2. *Standard Sizes and Fittings*.
Water services, pipe and fittings, whether new or replaced, shall be per City of Peoria Standard Detail PE-363.

3. *Water Meters two-Inch Diameter and Smaller.* Water meters 2-inch and smaller shall be located per City of Peoria Standard Detail PE-363. Water meters will be supplied and installed by the City of Peoria Meters Services Section. Meter shall be sized no more than one-half size smaller than the service size.

4. *Water Meters Larger than three-Inch Diameter*.
Water meters 3-inch and larger shall be installed above grade in accordance with City of Peoria Standard Detail PE-354. Water meters will be supplied by the City of Peoria Meters Services Section. Water Meters shall be installed by the Developer.

A 20-scale detail is required for all large meters (3-inch and larger). The design engineer must provide a detail on the plans which depicts the meter and backflow device including manufacturer and model number, vandal enclosure, fittings, landscape, and easements at the proposed location per City requirements. If there is a change to meter or backflow device, the detail must be modified as a plan revision prior to installation in the field.

5. *Location for Access, Maintenance, and Drainage Control*.

a. Water services installed outside of public right-of-way shall be contained within a dedicated easement for access, maintenance and reading of meters.

b. Water meters shall not be located in parking lots, driveways, or in areas of paving or where traffic may cause damage to the service, meter or meter box. Meters will not be fenced in and must be accessible at all times.

c. In landscape areas, proposed grading shall direct runoff to flow away from the meter installation.

d. Above ground vandal enclosures are required for all meters three-inch and larger.

K. Backflow Prevention

1. Backflow protection will be required on potable water supply lines for commercial facilities to prevent the possibility that the potable water system may become polluted or contaminated. Additional backflow prevention assemblies may be required to isolate potential internal hazards per reviewer request.

2. Containment (or secondary protection) will be installed at the service connection or downstream side of the water meter. The backflow assembly will be installed as close as possible to the water meter for domestic and landscape irrigation services, or as close as possible to the property line or main line tie-in for the fire sprinkler system. It is not permitted to combine the meter and the backflow into one assembly, there should be a minimum of 5-foot separation between the meter and backflow. A Reduced Pressure (RP) Principle Backflow Preventer shall be installed as standard containment protection. Any backflow prevention assembly other than an RP must have written approval from the

Utilities department or Building Safety Division. Installation of secondary backflow protection shall be according to City of Peoria Standard Details PE-351-1&2, PE-352-1 and/or PE-353-1&2.

3. Internal (or primary protection) may be required within the potable water system at the point of use to isolate potential internal hazards. Internal backflow assembly requirements will be determined during the plan review process. Installation of internal backflow assemblies shall be in accordance with City of Peoria Standard Detail PE-352-2.

4. All American Water Works Association classes 1, 2, and 3 fire systems 6-inches in size and larger or any system 3-inches in size and larger constructed of a piping material not approved as a potable water system material per the International Plumbing Code, latest adopted edition, shall have a Double Check Valve (DC). All American Water Works Association classes 4, 5, and 6 shall have a RP. In all other circumstances a RP is required.

5. Proposed fire lines less than 6-inches in size require special approval. If approved, all fire line services less than 6-inches in size and in excess of 150-feet from mainline tie-in to fire riser shall have at a minimum a DC located as close as possible to the property line or mainline tie-in. Fire lines less than 150 from the main line tie-in shall have a DC installed on the fire riser. Fire line backflow prevention assemblies shall be installed according to City of Peoria Standard Details 351-1&2 and/or 353-1&2. The Utilities Department and/or the Fire Community Services Division shall provide final approval for all backflow prevention assemblies and configurations. Fire sprinkler systems must be sized to allow for a minimum 10 psi head loss plus the losses associated with all fittings, valves, elbows, risers and additional appurtenances.

6. All backflow assembly installations shall be in accordance with International Plumbing Code, latest adopted edition, and current City of Peoria Code. Installation shall be completed by a qualified licensed contractor and comply with current City of Peoria Standard Details. Backflow assembly testing may only be conducted by City of Peoria Recognized Testers. The "Recognized Testers List" is available on the website at http://www.peoriaaz.gov/uploadedFiles/TESTER%20LIST(1).pdf
A final inspection will be required by a member of the Environmental/Building Safety Division prior to the issuance of a Certificate of Occupancy.

5-3 WATER RESOURCES AND WATER CONSERVATION

The criteria for guiding management of the essential and finite water resources available to the City of Peoria is *The Principles of Sound Water Management*.

A. Water, Sewer and Water Resources Impact Report (WSWR)

1. This report is required for all proposed developments. A report format is available for download on the website at http://www.peoriaaz.gov/content2.asp?ID=1435.

2. The WSWR report is required at the time of preliminary plat, first site plan submittal, or first submittal of any submittal that may impact the City's water and sewer infrastructure or water resource allocation (i.e. rezoning, conditional use, etc.).

3. After submitting the WSWR, projects identified to have any of the following criteria will be required to have a separate water resources review:

a. Annexation (within COP water service area)
b. Major or minor general plan amendment
c. 41 gross acres and larger in size
d. Excessively high water use (50% over general plan allocation)

4. During the water resources review, and in accordance with the guidelines in the Principles of Sound Water Management, the City will confirm the City's water allocation for the project. In order to approve water use in excess of the aforementioned water allocation, the City will require serious and measurable water conservation initiatives and/or acquisition of new water rights to be dedicated to the City.

B. Water Conservation

1. Serious and measurable water conservation initiatives are defined as initiatives that are enforceable by the City of Peoria that are proven to reduce the overall water use of a given development by utilizing water reduction measures **that are not already required** by current City requirements.

2. The developer may provide a **Water Conservation Plan** to the City of Peoria, which outlines the proposed serious and measurable water conservation initiatives. Prior to submitting the Water Conservation Plan, the developer must schedule a meeting with the City of Peoria- Water Conservation Group.

3. The Water Conservation Plan, at a minimum, must outline the following:

    a. Best management practices to be utilized
    b. Landscape/hardscape requirements
    c. Method of ensuring that these measures can be enforced by the City of Peoria
    d. Calculation of total proposed water use without conservation techniques
    e. Calculation of total proposed water use with conservation techniques
    f. An itemized list of water savings from each of the water saving initiatives proposed (Water reduction efforts already required by the City will not be counted. Only water savings above and beyond the current requirements will be considered.)

5-4 CONSTRUCTION

A. Construction

All construction shall be per the latest MAG Uniform Standard Details and Specifications for Public Works Construction and subject to City of Peoria modifications, latest edition.

B. Tie-ins to Existing System

Construction plans shall indicate that any tie-ins to the existing, active system shall be made only after completion of all new work and written approval of the City Engineering Inspector.

C. Pressure Testing

Pressure testing of new mains shall be by the contractor per MAG Section 610.15 and documented on City forms (available from the Engineering Inspectors), except fire sprinkler lines. Fire sprinkler lines shall be tested per the Uniform Fire Code adopted by the City. Water usage for line filling is to be reported to the Utilities Department on City forms.

D. Chlorination, Flushing and Bacteriological Testing

Chlorination and flushing of new mains shall be performed by the contractor per MAG Section 611 and Part V of ADEQ Engineering Bulletin No. 8, except as stated below.

1. *General.*

   a. Before being placed in service, all newly installed pipe, valves, hydrants, and appurtenances shall be flushed, disinfected, kept clean, and will be sampled for acceptable bacteriological analysis.

   b. Newly installed waterline will have a sample taken from each and every 500-foot interval, and at each end. For each hydrant lateral over 18-feet in length, a sample will be taken at the hydrant end. Hoses for sampling will not be allowed. On new waterline without hydrant, temporary sampling taps shall be provided, and then removed and plugged after acceptable bacteriological results are received. Hydrant used for sampling shall be fitted with an approved sampling tap.

   c. The contractor shall coordinate with the Engineering Department for the location of sampling taps.

2. *Pre-disinfection Flushing*
   a. Pipe shall first be flushed to remove any solid or contaminated material. Flushing velocity shall be at least 2.5 feet per second in the pipe. Flushing period shall be at least five minutes for every 150-feet of new pipe, but in no case less than 30 minutes.

   b. One 2-1/2 inch hydrant opening will, under normal pressure of 40 psi, provide this velocity in pipe sizes up to and including 12-inches.

   c. For pipe sizes exceeding 12-inch diameter, flushing taps size requirements are:

REQUIRED FLOW AND OPENING TO FLUSH WATERLINES

Pipe Diameter (inches)	Flow Required to Produce 2-1/2 feet per second (fps) Velocity in Waterline (gpm)	Number - Size (inch) of Taps Required for a 2-1/2 fps Flush
14	1200	3 – 2-inch, or 1 – 3-inch
16	1600	4 – 2-inch, or 1 – 4-inch
24	3600	4 – 3-inch, or 2 – 4-inch, or 1 – 6-inch
30	5625	4 – 4-inch, or 2 – 6-inch, or 1 – 8-inch
36	8100	2 – 6-inch, or 1 – 8-inch
42	11025	3 – 6-inch, or 1 – 10-inch

3. *Final Flushing and Testing.* Following chlorination, all treated water shall be flushed from the pipe until the replacement water treated throughout its lengths shows an absence of chlorine. If chlorine is normally used in the source of supply, tests shall show a residual not in excess of that carried in the system. Flushing velocity shall be at least 2.5-feet per second in the waterline. Flushing period shall be at least five minutes for every 150-feet of new waterline, but in no case less than 30 minutes. All hydrants on the new waterline shall be flushed to remove excess chlorine from the hydrant and hydrant branch.

4. *Documentation.* Document on City forms (available from the City Engineering Inspectors). Samples will be taken and tested by the City. Water usage for line filling and flushing is to be reported to the Utilities Department on City forms.

E. Protection of Monuments

The Developer is responsible for protecting and restoring if damaged, construction survey stakes and property corner monuments used by the City to locate the water services.

F. Existing Water System Facility Requirements

1. *Water Service Installations*. Requirements for lowering, extending and relocating meters are as follows;

   a. A construction permit is required for any work on the City water system regardless of the location of the facility. Construction permits can be obtained through the Engineering Department.

   b. The contractor or licensed plumber, shall obtain permission from the Meter Services Division to complete all work including meter disconnects and reconnects.

   c. Materials shall be copper and bronze in accordance with City of Peoria Standard Detail PE-363.

   d. The Contractor's representative shall be responsible for water customer notification.

2. *Fire Hydrant Setbacks and Waterline Relocations to Eliminate Conflicts*. All work shall be done by contractor including chlorination and testing requirements that apply to this type of work. Contractor shall not operate valves; Representatives of the Utilities Department are the only personnel authorized to operate water valves on the City's existing water system.

3. *Switch-overs and Abandonments*. Work will be done by contractor after written authorization by the City Utilities Department.

5-5 PLANS PREPARATION AND WATER INFRASTRUCTURE ACCEPTANCE

A. Submittal items

1. Plans shall be prepared per Chapter 1 of the City of Peoria Infrastructure Design Guidelines.

2. Utility Reports:

   Water, Sewer and Water Resources Impact Report (WSWR) - Required at Pre-Plat, first submittal of site plan, or for the first submittal of all rezoning applications. This is used to determine the potential impact that the development would have to the existing water and sewer infrastructure. This report will also be used to verify that the proposed density and water use of the proposed development is consistent with the City's general plan and the City's water allocation for the proposed parcel. Refer to the report template at http://www.peoriaaz.gov/content2.asp?ID=1435

   Final Water Network Analysis- Required for all sites in which watermain is extended/ looped in order to service the proposed development, in areas identified as having problematic or low pressures, or for buildings that have an unusually high water demand. The modeling in this report will be used to verify that adequate service and fire flows can be obtained with the proposed waterline construction. Refer to the report template at http://www.peoriaaz.gov/content2.asp?ID=1435

Master Water and Master Sewer Reports- When required, this report should show the infrastructure required for the utilities in the development to function per City of Peoria standards. Individual Final Water and Final Sewer Reports will be required for each parcel at the time of submittal. Individual phased reports should be consistent with the data, calculations, and assumptions shown in the Master Reports. Refer to Chapter 6 for additional information regarding Sewer Reports. Refer to the guidance memo at http://www.peoriaaz.gov/content2.asp?ID=1435

3. The completed Approval to Construct (ATC) application with signatures should be submitted during plan review. Sign-off from the "public water supply provider" on page 2 of 3 the ATC will be issued by the Uti*lities Department after the ATC* application has been submitted and will not be provided until the utility plans are substantially approved.

4. A copy of the ATC issued by Maricopa County Environmental Services Department (MCESD) and the Mylar cover sheet signed by MCESD must be submitted to Engineering prior to receiving final plan approval from the City.

B. Water Infrastructure Acceptance

Copies of the following documents must be submitted to the Engineering Department prior to acceptance of the waterline(s) by the City. Refer to Chapter 7 of this document for as-built requirements. Final Letter of Acceptance (FLOA) will be released by the City of Peoria Engineering Department after all other items have been completed.

1. "Water Accounting Form" indicating all water quantities used for line fill, flushed quantities and any other water used not recorded by water meters.

2. Waterline Flushing documentation.

3. Waterline Pressure Testing documentation.

4. Residual testing.

5. Waterline Disinfection and Bacteriological Testing documentation certified by a State of Arizona Registered Water Distribution Operator including laboratory analytical results.

6. A copy of the "Engineer's Certification of Completion".

7. A copy of the "Certificate of Approval of Construction" (AOC) issued by MCESD