APACHE JUNCTION WATER UTILITIES CFD

WATER DESIGN STANDARDS

2023 EDITION

Effective July 1, 2023

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WATER

1.0 DEFINITIONS

A. District. The word "District" or "Apache Junction Water District" means Apache Junction Water Utilities Community Facilities District, whose principal place of business is located at: 300 East Superstition Boulevard, Building D, Apache Junction, Arizona 85119 (Post Office Box 4768, Apache Junction, Arizona 85178-0014)

B. District's Authorized Representative. The words "District's Authorized Representative" means any member of the District, any of the District's Engineers, any District Project Manager or Superintendent of the District and/or such other person(s) designated in writing as the "District's Authorized Representative" by the District Director.

C. Contractor. The words "Contractor" or "Subcontractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.

D. Construction Drawings. The words "Construction Drawings" or "Plans" mean drawings or plans prepared by or on behalf of the District.

E. Shall or Will: A mandatory condition. When certain design criteria is described in a procedure, design, or detail it is mandatory that this condition be met.

F. Should: An advisory condition. Where the word “should” is used, it is considered to be advisable usage, recommended but not mandatory.

G. May: A permissive condition. A design or application is conditional.

1.1 GENERAL INFORMATION

A. These water design standards set forth a uniform engineering approach for determining water demand and minimum criteria for the design of a water distribution system. The standards are structured to accommodate engineers and designers who are preparing construction plans for public offsite and private onsite developments.

B. The City of Apache Junction ("City") has two (2) water companies supplying the City with water: Arizona Water Company ("AWC") and Apache Junction Water District ("District" or "AJWD"). Figure 1.1 shows the limits of service for each of the water companies.

C. New public water distribution facilities will be designed in accordance with District standards, specifications and details. Where these standards are silent, Maricopa Association of Governments ("MAG") Standard Specifications and Details, Arizona Department of Environmental Quality ("ADEQ") Bulletins No. 8 and No. 10, and American Water Works Association ("AWWA") Standards, will be used.

D. New private onsite water distribution facilities will be constructed in accordance with the International Plumbing and International Fire Codes as adopted by the City.

E. The latest edition of the Water Design Standards, Construction Specifications, Standard Detail Drawings, Rates, Fees, and Charges are available at the District's web site: www.ajwaterdistrict.org.

1.2 REGULATORY REQUIREMENTS

A. Private developers are responsible for regulatory compliance and for obtaining all required easements, permits, and licenses for their projects.

B. The City has adopted the following International Codes:

2017 International Accessibility Code
2017 National Electric Code
2018 International Swimming Pool and Spa Code
2018 International Fuel and Gas Code
2018 International Mechanical Code
2018 International Plumbing Code
2018 International Building Code
2018 International Residential Code
2018 International Fire Code
2018 International Existing Building Code
2018 International Energy Conservation Code

1.3 SUBMITTALS

A. MASTER PLANS

1. Master planned communities require the submittal of a water master plan. Water master plans are required in order to establish specific improvements and the sequence of those improvements.

B. WATER SYSTEM DESIGN REPORTS

1. All projects require a Water System Design Report ("Report"), unless the District determines a Report is unnecessary due to the size of the project. The purpose of the Report is to provide the District with the potential demands of the project and to verify that the District can supply the necessary domestic and fire flows required. A Fire Flow Demand Report will be included with the Water System Design Report.

C. ADEQ WATER SERVICE AGREEMENT

1. Developments are required to file a Water Service Agreement with the Arizona Department of Environmental Quality (ADEQ). This Agreement is completed and submitted by the project engineer along with the Approval to Construct (ATC) application. The District is required to sign the Agreement prior to submittal. Below is the pertinent information needed in the Agreement.

    a. Project name and address
    b. PWS Provider: Apache Junction Water District
    c. Address: 300 E. Superstition Blvd., Building D, Apache Junction, AZ 85119
    d. PWS Number: 11-039
    e. Contact: Michael Loggins, P.E.
    f. Title: Water District Director

D. ADEQ APPROVAL TO CONSTRUCT (ATC)

1. Prior to commencing construction, the project engineer will apply for, pay for, receive, and provide a copy of the Approval to Construct certificate to the District per A.A.C. R18-5-505 for the project.

E. ADEQ APPROVAL OF CONSTRUCTION (AOC)

1. The project engineer will complete and submit a Certificate of Completion along with all required documentation including testing data and as-builts to receive an Approval of Construction from ADEQ per A.A.C. R18-5-507.B.1

2. The newly constructed facility will not be operated until an Approval of Construction certificate is issued by ADEQ and a copy provided to the District. A.A.C. R18-5-507.A.

F. MATERIALS

1. Shop drawings and material submittals are a critical element of every construction project. They serve to provide the District, contractor and subcontractors with detailed information on the materials to be incorporated into the project. They are essential to assure compatibility, to allow the contractor and District to coordinate the installation of materials furnished by various trades and to identify materials which may have a long lead time that could impact the proposed schedule for the project.

1.4 WATER DEMANDS

A. AVERAGE DAY FLOWS

Developer/Engineer will provide a Water Design Report with the civil plan submittal, with the estimated demands based on the following:

1. Water main design will be based on average day flows, as listed in Table 1.4.1, plus fire flows.

2. Appurtenances (boosters, reservoirs, etc.) will be designed for peak hour of the maximum day with provisions for fire flow and emergency flows as required.

3. The peak hour demand is two (2) times the average day demand. Maximum day demand is one point seven (1.7) times the average day demand.

4. A minimum of 50 psi at peak hour.

5. System pressures should be maintained between sixty (60) and one hundred (100) psi for maximum day velocity.

6. The system should not exceed five (5) fps or a head loss of ten feet per 1000 feet (10 ft./1,000 ft.), whichever is limiting.

TABLE 1.4.1

AVERAGE DAY FLOWS

Proposed Development	Demand
❖ *Low Density Residential* less than 5 dwelling units per acre	360 gpd
❖ *Medium Density Residential* 6 to 10 dwelling units per acre	360 gpd
❖ *High Density Residential* 11 and greater dwelling units per acre	360 gpd
❖ *Commercial Office/Retail, Industrial Mix*	.5 gpd/sf
❖ *Active Adult*	225 gpd
❖ *Multi-Family/Apartments* • without landscaping or desert landscaping • with landscaping (turf)	180 gpd/unit 240 gpd/unit
❖ *Industrial* (does not include process water)	2,000 gpa/d
❖ *Restaurant*	1.5 gpd/sf
❖ *Hotel/Motel*	200 gpd/room
❖ *Schools* • without lunch and/or shower facilities • with lunch and/or shower facilities	75 gpd/person 125 gpd/person
❖ *Malls/Retail Areas*	0.5 gpd/sf
❖ *Car Wash*	35 gpv/day
❖ *MHP/RVP*	195 gpd/unit
❖ *Open Space/Right-of-Way*	1,786 gpa/day

6. If a proposed development does not fit one of the above areas, the maximum is not identified in Table 1.4.1 – Maximum Day Flows will be calculated at two-hundred twenty (220) gallons per person per day.

7. Maximum Day plus Fire Flow: minimum allowable pressure is 20 psi, maximum velocity is 10 fps, residential fire flow is 1,500 gpm for 2 hours, minimum water main diameter is 8 inches with a Hazen Williams 'C' factor of 120.

8. Population Density

   The population density for less than five (5) dwelling units per acre is three point two (3.2) persons per unit and two (2) persons per unit for population densities of six (6) or more dwelling units per acre.

1.5 DESIGN CRITERIA

A. PIPE SIZING

1. Public water main installation of pipe smaller than six (6) inches is not standard and will only be allowed when approved by the District Director in very unusual circumstances. 10, 14, 18, and 20-inch mains are not allowed. Transmission mains are low pressure mains used to transfer water to treatment facilities or booster stations. Transmission mains cannot be tapped for water service.

The minimum standards for Water Distribution pipe sizing is as follows:

Street Classification	Size
Local Streets	8-inch
Minor Collector (mid-section)	12-inch
Major Collector (section)	16-inch
Minor Arterials	16-Inch
Parkway, Freeway, or Interstate	24-inch or as directed by the District Director

2. Mains designed as single feed systems with more than one fire hydrant will be minimum of eight (8) inch diameter. An eight (8) inch diameter main configured as a looped system with a minimum of two feeds can serve up to six (6) fire hydrants.

3. An eight (8) inch diameter single feed water main is permitted only in cul-de-sacs with a maximum depth of two-hundred feet (200) and a maximum of one fire hydrant.

B. PIPE MATERIAL

1. All pipe for water mains will be ductile iron in 18 or 20-foot laying lengths, except for closure pieces or special applications. Pipe between six (6) inches and twelve (12) inches in diameter will be pressure class 350, pressure class 250 for fourteen (14) inch through twenty (20) inch, and pressure class 200 for twenty-four (24) inch thru thirty-six (36) inch.

2. All pipe fittings will be ductile iron that meet or exceed AWWA C110 and C153. Domestic preferred, Imports accepted.

3. All pipe and fittings will meet or exceed all applicable AWWA, ANSI, and NSF standards and specifications.

4. When necessary, restrained joints will be in accordance with District Standard Detail W-1-502. Mechanical joint wedge-action type joint restraints are acceptable for restraints of ductile iron pipe. Thrust blocks are not allowed in place of approved restrained joint systems. Thrust blocks can be used in addition to the approved restrained joint systems where a specific detail calls out for thrust blocking such as current Details W-1-401 and W-1-404, or when otherwise approved by the District.

5. All ductile iron pipe (DIP) mains will be protected from exterior corrosion. This protection consists of the factory applied exterior asphaltic coating and encasement inside a minimum 8 mil thick polyethylene protective wrapping. Detail W-1-301. Damage to the exterior coating or polyethylene will be repaired. Spec. 11w.

C. PIPE LOCATIONS

1. As a minimum, water mains will be installed along the entire frontage of the property being developed, when it is adjacent to public rights of way or public utility easements. The main will be extended from the ending point of the existing water main across the entire frontage of the property or properties needing water, at the property owner's expense. As expressed elsewhere in this chapter, to ensure adequate water pressure, circulation, and redundancy, water mains are required to be looped (feeds from a minimum of two sources) to create adequate flows to provide more than one path for water to flow to supply the project's demands and fire flows.

2. A five (5) foot minimum horizontal separation from any parallel underground utility is required. In all major streets and other active utility corridors, a utility conflict review will be required.

3. In streets, the water main will be placed under pavement but out of the wheel path of vehicular traffic.

4. Trench excavation per Construction Specifications Sections 4, 5, 13, 14 and Standard Detail W-1-100.

D. **INSTALLATION DEPTH**

1. Water mains will be installed to minimum depth measured from finished grade to top of pipe as follows:

Size	Minimum Depth
8-inch and smaller	36 inches
12-inch and 16-inch	48 inches
16-inch and smaller in major collectors	48 inches
20-inch and larger	Special Design

E. **VALVE STANDARDS, SPACING AND LOCATION**

1. Twelve (12) inch and smaller distribution mains:

   a. Maximum of eight hundred (800) feet spacing in industrial/commercial districts.

   b. Maximum of five hundred (500) feet spacing in residential areas.

   c. Maximum of thirty (30) single-family units or five (5) valves per shutdown.

   d. One valve is required on each side of major crossing, such as canals, washes, railroads, freeways, etc.

   e. One gate valve located between the main and fire hydrant.

   f. One gate valve located at each connection on tees and crosses, W-1-407, W-1-408.

2. Twelve (12) inch and larger transmission mains – a maximum of one thousand (1,000) foot spacing, or as determined by the District.

a. Epoxy Coated, Resilient Wedge gate valves are required on water mains forty-eight (48) inches in diameter and smaller. All gate valves will conform and must meet or exceed AWWA C-509 for 4-inch-12-inch and C-515 for 14-inch and greater valves. Mueller or Clow gate valves only.

b. Tapping sleeves and valves will be installed per District Standard Detail W-1-404. All wet taps will be performed by a Contractor approved by and witnessed by the District.

c. All valve boxes and covers will be installed per District Standard Detail W-1-405. All valve boxes used in the District will be manufactured for that specific purpose. No PVC pipe or other "field designed" boxes are allowed.

d. Pressure reducing and pressure sustaining valve stations will be of a two-stage design, i.e., a valve for normal and high flows, and a valve for low flows. Valves will be installed in a vault of an approved design behind the sidewalk. Valves and vault will be reviewed and approved by the District prior to ordering.

e. Approved air-vacuum valves will be installed on all water mains twelve (12) inches or larger in diameter at locations where the slope change from positive to negative, and vice versa. Maximum spacing is one thousand feet (1,000).

f. Water line valves will meet or exceed the pressure classification of the water line. Valve pressure rating should be noted on the plans.

g. One (1) Water sample station is required for every one hundred (100) residential service connections. Each station will be located near open space within a PUE, PUFE, or LPPUE. All locations are determined by the District.

F. WATER SERVICES

1. All water services two (2) inches in diameter and smaller will be type K soft copper tubing. The copper tubing will be handled so that kinks do not develop, causing a water restriction.

2. All brass service fittings will be approved by the District unless otherwise specified. Corporation stops, curb stops and angle stops will be ball style valves.

3. All service line fittings on services two (2) inch and smaller will be conductive compression style, with the exception of a corporation stop to saddle, which will be threaded. No soldered joints are allowed below ground, unless approved by the District.

4. Corporation stops at the main will be secured with brass or epoxy coated double strap brass saddles. No direct tapping of main lines for corporation stops will be allowed. Corporation stops will be MIPT or Taper inlet and conductive compression outlet.

5. Water services using corporation stops at the main will be tapped at approximately the 10 o'clock or 2 o'clock position on the main. Services tapped at 12 o'clock (straight up) will be used for air release/vacuum, pressure relief, and blow-off valves. Two (2) inch service taps will be at the 9 or 3 o'clock position. W-1-802

6. Water Services larger than two (2) inches on a pressurized water main will be installed per District Standard Detail W-1-803 through W-1-809. Live (wet) taps of water mains will be coordinated with the Water District's Inspector. Tapping sleeves will pass a pressure test at a minimum two hundred (200) psi for 60 minutes before the actual tap is made.

7. Pressure reducing valves are required on the customer side of the water meter when the static pressure consistently exceeds 99 psi. Ownership and maintenance of the pressure-reducing valve will be the customer's responsibility.

8. The Developer is responsible for the installation of all necessary water services for the development.

9. All new service taps for buildings including all single-family residential lots will be 1-inch.

10. A separate landscape irrigation tap and meter is required for irrigated areas over 10,000 sq.ft., or for all water features using 1,000 or more gallons per day.

11. Combination fire/domestic/landscape services are prohibited. Each demand requires a separate service connection. Combination fire/domestic services are allowed for single family/single lot residential developments only.

12. A single service line and a "master meter" can be used for two or more buildings located on the same lot or for apartment

developments, trailer courts or similar projects covering one lot. In these "master meter" applications where an assured, continuous supply must be maintained, the domestic development demand can be split and two (2) meters may be used, each with its own service connection and then manifolded on the customer side of the meter. Beyond meeting the need to provide an uninterrupted supply to a development, the manifolding of more than two (2) meters is prohibited. Developments using master meters must have a separate fire line and landscape connections.

13. Meter boxes for services two (2) inch and smaller will be polymer-concrete manufactured by Armorcast, per District standard Detail, W-1-810. Boxes will have vertical sides for ease of adjusting. Boxes will be molded to hold its shape and provide support in concrete, asphalt, or soft or sandy soil. Meter box lid will be polymer-concrete with a two (2) inch opening for an AMR touch-read antenna.

14. No meter boxes in traffic areas for services two (2) inches and smaller. Services three (3) inches and larger require a vault, outside of traffic areas.

15. The District will size water services to properly serve the proposed project being constructed. Service sizes will be plainly indicated on the plans submitted. Proposed water service sizes will be reviewed and approved by the District.

16. Single water services will not serve properties under separate ownership.

17. The contractor will install the water meter vault and provide the meter for all services over two (2) inch. Vaults will have full opening aluminum or polymer concrete covers with spring assist. Vaults will be installed per District Standard Details W-1-811 and W-2-811 and include the service inlet and outlet piping.

18. Services will be turned on and off by District personnel only. It is unlawful for anyone other than an employee for the District or someone under their direct supervision to operate valves that will activate or deactivate water services. Water services will only be turned on after a responsible individual has completed all appropriate paperwork to open an account and all applicable fees have been paid. Contact the District for a current list of charges and available services.

19. The customer will own, install, and maintain a shut off valve within eighteen (18) inches beyond the meter box as a condition of service.

G. WATER METERS

1. The District provides and installs all meters for all services at the owner or developer's expense. Meters two (2) inch and smaller will be Sensus brand, iPERL model, or District approved, with electronic ECR register and "Touch/Radio Read" meter reading system. Under certain circumstances, two (2) inch services may require a compound meter. For domestic service larger than two (2) inches, a Sensus C2 compound meter with electronic ECR register and "Touch/Radio Read" meter reading system will be used. Any domestic service two (2) inches and larger also require a backflow prevention device after the meter. All master metered and landscape services require a backflow prevention device.

2. Meters used for a system that is a combination of domestic use and fire protection will use a Sensus Omni+ F2 Fire Line assembly with ball valves and test ports. All iron parts on the meter will be epoxy coated inside and out. The combination service will require a backflow protection device after the meter. W-1-1002.

3. Large meters on potable lines not combined with fire systems three (3) inches and larger will be installed with a minimum two (2) inch bypass with valves to allow a continued water service when the meter must be repaired or replaced.

4. The architect, engineer or applicant will include the projected water flow rate requirements for the proposed water services on the project plans. As mentioned under the heading "Water Services", care should be taken in sizing meters and services to sufficiently supply the needs. The District will review the information provided on the plans and specifications and make the final determination of all meter size requirements. See Table 1.5.2 below.

Table 1.5.2

Water Meter Size	Maximum GPM
5/8" x 3/4"	20
1"	50
1½"	100
2"	160
3" Compound	500

4" Compound	1,000
6" Compound	2,000
8" Compound	2,700

5. Temporary fire hydrant meters required for obtaining construction water are ordered through the District. All fire hydrant meters require a backflow preventer which will be tested prior to installation and will be maintained by the applicant. Installation per Detail W-1-603. Contact the District for a current list of applicable charges and available meters.

H. BACKFLOW PREVENTION

1. The District is responsible for protecting the quality of the public water supply. To prevent contamination of the public water supply by backflow and cross connections, the District requires the applicant to complete and submit a completed Cross-Connection Survey at the time of plan submittal. The District will review the Survey to identify projects requiring backflow prevention and the approved type of assemblies to prevent a backflow condition.

2. If the subject property has a private well in addition to water service provided by the District, an RP (Reduced Pressure) backflow prevention device is required as a condition of service.

3. All required RP backflow prevention assemblies will be owned, installed, and maintained by the property owner as a condition of service.

4. Under no circumstances will the backflow prevention device be smaller than the size of the water service.

5. Installation of the backflow prevention assembly will be per the manufacturer's instructions by a licensed contractor at the owner's expense.

6. All backflow prevention assemblies will be tested upon installation and annually thereafter by a certified tester and results of that test forwarded to the District as a condition of service.

7. All services two (2) inches and larger require a backflow preventer. All master metered residential, all commercial and all industrial services will require backflow prevention. In some cases smaller services not in one of the preceeding catagories may require backflow protection as determined by the District.

8. All above ground backflow prevention assemblies three (3) inches and larger will be painted a neutral (earth tone) color to blend in with its surroundings.

9. All above-ground backflow prevention assemblies smaller than three (3) inches will be placed in protective cages painted a neutral (earth tone) color to blend in with its surroundings.

I. FIRE HYDRANTS

1. Fire hydrants in public rights-of-way or public properties will be installed per District Standard Details, W-1-600 through W-1-608 and the locations per W-1-400 and W-5-400.

2. Public hydrants will be painted chrome yellow and the bonnet color per NFPA 291. See Table 1.5.3 below. Private hydrants will be painted red. Non-potable flushing hydrants will be painted aluminum/silver and stenciled "EFFLUENT WATER" across the barrel in gloss black per Superstition Fire and Medical District requirements. (SFMD)

Table 1.5.3

Bonnet Color	Rated Capacity
Red	500 GPM or Less
Orange	500-999 GPM
Green	1000-1499 GPM
Light Blue	1500 GPM or more

3. Raised reflective pavement markers for fire hydrants to be installed per W-1-602.

4. All fire hydrants installed will have a minimum 5-1/4 inch main valve.

5. Fire hydrant lateral runs greater than 60 feet in length will be 8-inch ductile iron pipe.

6. Maximum spacing for fire hydrants on roads and streets is 500 feet. On principal and minor arterials with a raised median, fire hydrants will alternate sides every 500 feet. The maximum distance from a hydrant to the end of a dead-end street will not exceed 200 feet. (2018 IFC, Appendix C, Table C105.1) The Superstition Fire and

Medical District (SFMD) has final approval for hydrant spacing, location, and flow requirements.

7. All fire hydrants will have a minimum of eighteen (18) inches of clearance from the lowest nozzle to finished grade and four (4) inches from final grade to the safety flange connection.

8. A minimum clear distance of 6 feet around the fire hydrant is required.

9. Fire hydrants approved for installation on District water mains are:

   Mueller – Super Centurian 250
   Clow – Medallion

J. EASEMENT WIDTH

1.	Six (6) inch and Eight (8) inch main	Twenty (20)-foot minimum
2.	Twelve (12) inch main	Twenty-Five (25)-foot minimum
3.	Over twelve (12) inch	Width based on design

4. Additional easement width may be required by the District if, in its sole opinion, excessive laying depth of the pipe would require the additional width for construction and maintenance purposes.

K. WATER CONSTRUCTION REQUIREMENTS

1. All water main design will take into consideration the Water Construction Notes and ADEQ Standard Water Notes in Appendix A.

2. The District and the Contractor will verify the stationing, elevations, and type of pipe to be matched at all field closure points.

5. The Contractor will contact "Blue Stake" five (5) working days prior to construction.

6. The Contractor will pothole all existing utilities ahead of construction to allow for any necessary adjustments to the grade line. Repair of potholes in pavement, Detail W-1-101.

7. No other utilities will be installed in the same trench as the water main, unless approved by the District. Construction Specifications Section 5.

8. Vertical realignment by means of pipe deflection will not exceed 1/2 the pipe manufacturer's recommendation. Deflection angle information will be given on the plans. Vertical realignment by means of bends and offsets will be per District Details W-1-505, W-1-506, and W-1-507 for water mains six (6) inches to sixteen (16) inches in diameter. Larger applications will be on a case-by-case basis. Air/Vacuum valves are required on water mains 12-inch and larger to avoid the accumulation of air, Detail W-1-701.

9. One or more joints of pipe (18-feet minimum) will be installed on all stubs after valve installation and extend beyond existing or proposed pavement before terminating.

10. Any fittings or hydrants ***requiring*** the use of thrust blocking (kickers) versus wedge-type joint restraints will be wrapped in a minimum of 2 layers of 8 mil plastic sheeting and care will be taken to keep concrete separate from bolts, barrel drains, followers, etc. The use of concrete thrust blocks requires prior District approval.

11. Water/Sewer separation per ADEQ requirements, Section F, Engineering Bulletin No. 10. For extra protection, the sewer main will be mechanical joint ductile iron pipe or be concrete encased. Under no circumstances will the water main be encased in concrete. Construction Specifications Section 12.

12. Backfill and Compaction per Construction Specifications Sections 10 and 11.

13. All new water mains will be flushed and hydrostatic tested prior to being disinfected per AWWA C600/C605 and/or MAG Section 611. Construction Specifications Section 15.

14. All new water mains will be disinfected and flushed following AWWA Standard C651,latest edition, Arizona Department of Health Services Bulletin No. 8, latest edition, and Construction Specifications Section 16.

15. It is District policy to require the use of a fire hydrant meter by the Contractor to obtain construction water. A new water line will be filled through a hot tap and jumper meter connection, W-1-807, unless an alternate method is approved by the District. The Contractor will obtain a fire hydrant meter from the District and pay all fees and water bills.

16. If during the construction of a water main, the Contractor fails to or is unable to comply with a request of the District's Inspector, and it is necessary for the District's forces to do work that is normally the Contractor's responsibility, the District will be justified in billing the Contractor. Each incident requiring work by District forces will be covered by a separate billing at the current applicable rates.

1.6 PLAN SUBMITTAL and PREPARATION STANDARDS

The District requires the following items when submitting a project for review and approval:

- Water System Design Report
- Full Set of Civil Improvement Plans (PDF)
- Final Plat (if used)
- Engineer's Estimated Cost of Construction for Water Facilities
- Completed Cross-Connection Survey Form

Final water plan approval is required before any construction begins. An approved water plan set will be on site during construction at all times. Plan approval is valid for 1 year from the date of approval. If construction is not started within 1 year of approval, the water plans must be re-submitted for re-review, re-approval, and additional fees paid.

A. Plans will be on twenty-four (24) inch by thirty-six (36) inch sheets.

B. Symbols will be per MAG Standards supplemented by District Details.

C. Orientation of each plan sheet will be shown by a north arrow.

D. A general notes sheet(s) will contain ADEQ's General Water Notes and the District's "Water Construction Notes" listed in Appendix A.

E. Plans will be prepared and provided on Bond paper. Vellum, Linen, Mylar, or Sepias are not accepted.

F. A cover sheet is required on plans of more than two (2) sheets when Water Plans are not part of the general set.

G. Each sheet will be identified by sheet number and project name.

H. All sheets will have the Engineer's signed registration seal prior to submittal to the District for approval.

I. Cover sheet, when part of separate Water Plans, will contain:

1. Project Title
2. Developer (address, telephone number, contact name, and email)
3. Engineering Firm (address, telephone number, contact name, and email)
4. Appropriate signature approval blocks and utility review block
5. Properly oriented vicinity map
6. Properly oriented key map
7. General notes
8. Water materials list and estimated quantities
9. Appropriate processing numbers: (Subdivision, re-zoning, site plan, etc.) Quarter section, assessor parcel number(s) and associated Plan Tracking numbers
10. Legend
11. Index of plan sheets
12. Benchmarks used

J. The key map is a small map of the project site that provides a system overview and used to index the plan sheets. The key map will show the following:

1. All streets, alleys, easements, tracts and parcels identified.
2. Water mains, fire hydrants, valves and production facilities (tanks, booster, etc.)
3. Index of plan sheets indicated by single line with arrows showing beginning and end of each sheet.

K. The plan sheets will show the following to proper scale:

1. All streets, alleys and easements.
    a. Streets will be identified by name.

b. Streets, alleys and easements will be dimensioned at least once and at all breaks.

c. Monument line of streets will be shown.

2. All abutting lots will be identified by lot number, tract and subdivision name. Parcels will be identified by parcel number.

3. Location of all existing utilities, structures, paving and other topographic features affected by construction.

4. All connections to existing water lines with fittings clearly labeled and method of connection specified.

5. If applicable, proposed sewer main will be shown in a "lighter weight" line to identify it as being informational only and not a part of this plan.

L. Horizontal scale will be minimum one (1) inch equals forty (40) feet. Vertical scale will be one (1) inch equals two (2) feet.

M. Original plan sheets will be sufficiently clear to allow legible prints to be half-sized. The size of lettering and symbols will be one-eighth (1/8)-inch minimum. Refer to Development Services for information required on record drawings.

N. Each Plan Sheet Will Show:

1. Project Title

2. Sheet Number

3. North arrow and scale, vertical and horizontal

4. Existing utilities with size and location dimensioned in right-of-way.

5. New water main construction with valves, fire hydrants, tees, bends, crosses, taps, tapping sleeve and valves, and other appurtenances will be shown in bold.

6. Match lines to show continuation of lines from sheet to sheet.

7. Right-of-way limits will be shown in plan view.

8. Stationing is required and will be consistent across plan sets.

9. A profile is required for water mains 12-inch and larger and for all vertical water main realignments.

O. Location of fire hydrants and valves per District Standard Detail, W-1-400 and W-5-400.

P. All fittings will be identified, vertical and horizontal.

Q. Gate valve boxes per District Standard Detail, W-1-405.

R. Water meter service connections will be shown to each lot or parcel. Services may be stationed from street intersection monuments or from individual lot property lines, except on curved streets and in cul-de-sacs, where the connection must be stationed both on the main and from applicable property lines.

S. Water meter service connection locations in other than a residential subdivision must be out of traveled roadway and sidewalk. They may be located in planter areas, parking lot islands, road verges, etc., and should be equal with or higher than the sidewalk or curb to prevent flooding. Water meter locations must be easily accessible from a street or traveled way.

T. A Summary of Quantities table will be submitted with the water plans. Each item to be broken down by size and material.

ITEM	UNIT
Water Main	Linear Foot
Tees	Size/Each
Crosses	Size/Each
Caps or Plugs	Size/Each
Water Services	Size/Each
Water Meters	Size/Each
Fire Hydrants	Each
Tapping Sleeve & Valve	Size/Each
Pipe Encasement/Sleeving	Linear Foot
Valve Boxes & Covers	Each
Main Line Valves	Size/Each
Special Valves	Size/Each
Vertical Realignments	Each
Blow Offs	Size/Each
Meter Boxes	Size/Each
Air/Vacuum Valves	Size/Each
Sample Stations	Each
Landscape Services	Size/Each

Landscape Meters	Size/Each
Vandal Enclosures	Each

1.7 AS-BUILT DRAWINGS

For all water projects, the Developer or Engineer of Record responsible for the project will provide a complete set of construction as-builts at completion of the project, including a bound set of CAD files. As-Builts will be based on field survey information and field measurements. All survey work will be performed under the supervision of a Professional Land Surveyor registered in the State of Arizona. As-Built information will be recorded on the detail, plan and profile views of the approved construction drawings, including an update of the Quantities Table to reflect the true number. Incomplete, inaccurate, illegible, or poor-quality drawings will be rejected. All plan sheets must have a “AS-BUILT” stamp block and be signed and sealed by the surveyor.

END

APPENDIX A

ADEQ GENERAL WATER NOTES
APACHE JUNCTION WATER DISTRICT CONSTRUCTION NOTES

APPENDIX A

ADEQ GENERAL WATER NOTES:

1. In accordance with A.A.C. R18-5-504, all construction materials will be lead free, excluding leaded joints for cast iron pipes.
2. Each product added directly to water during production or treatment shall conform to ANSI/NSF Standard 60.
3. A material or product installed after January 1, 1993, that comes into contact with water or a water treatment chemical shall conform to ANSI/NSF Standard 61.
4. All pipes, valves and related appurtenances will conform to NSF Standard 61 and bear the NSF-pw seal of approval.
5. The water system will be designed using good engineering practice in accordance with Engineering Bulletin No. 10, as stated in A.A.C. R18-5-502.
6. A minimum pressure of 20 psi will be provided under all conditions of flow.
7. The contractor will be responsible for the excavation required or ordered by the engineer as stated in MAG 601.2.1.
8. The minimum cover to the top of pipe is 3 feet per Engineering Bulletin No.10.
9. All thrust restraint will be designed for a safety factor 1.5 or greater with maximum pressure conditions given in Engineering Bulletin No. 10.
10. The water main will be designed to maintain a slope without a local high point.
11. All water mains will be designed for a minimum of 150 psi with allowances for water hammer in accordance with the Engineering Bulletin No.10.
12. In accordance with A.A.C. R18-5-502(C), the water pipe will have a minimum horizontal separation of 6 feet and a minimum vertical separation of 2 feet above a sewer. If horizontal or vertical separation is not possible, pipes will be constructed with a pressure tested mechanical joint ductile iron pipe or an approved equal. In addition to the pipe construction, a water main will have a vertical separation of 18 inches if crossing below a sewer.
13. In accordance with A.A.C. R18-5-502(C), the water pipe and sewer manholes will not come in contact and will have a minimum horizontal separation of 6 feet from the center of the manhole.
14. In accordance with A.A.C. R18-5-502(C), the water pipe will have a minimum horizontal separation of 6 feet and minimum vertical separation of 2 feet from force mains or pressure sewers. If a sewer-force crosses above a water main within 6 feet vertically, the sewer main pipes will be encased in 6 inches of concrete or constructed with a pressure tested mechanical joint ductile iron pipe for 10 feet before and after the crossing.
15. In accordance with A.A.C. R18-5-502(C), sewer mains will be at least 50 feet away from a well. Sewer mains can be at least 20 feet away from the well if pressure tested without excessive leakage to (a) 50 psi to be used for gravity sewers; or (b) 150 psi to be used for force mains. Additionally, a well will be constructed at least 100 feet from (a) a septic tank or subsurface disposal; (b)

discharge or activity regulated under the Individual Aquifer Protection Permit; (c) underground storage; (d) hazardous waste facilities regulated under the Arizona Hazardous Waste Management Act.

16. All new waterlines will be pressure tested in accordance with current AWWA/ANSI C605 for PVC and AWWA\ANSI C600 for Ductile Iron Pipe.
17. All new water system components or equipment will be disinfected and flushed in accordance with Engineering Bulletin No. 8, Disinfection of Water Systems, or AWWA/ANSI C651-14.
18. After disinfection, all water system components or equipment will be bacteriologically tested by a Bacti test through an Arizona Department of Health Services certified laboratory.

APACHE JUNCTION WATER DISTRICT CONSTRUCTION NOTES:

A. Contractor will expose any lines being tied into to verify location.

B. Backfilling will not be done until lines are inspected and approved by the District Inspector or other Authorized District Representative.

C. Valves will be furnished and installed by the contractor according to Apache Junction Water District standards, M.A.G., and/or City of Apache Junction supplements.

D. Backflow prevention assemblies will be furnished and installed by the contractor according to Apache Junction Water District standards, M.A.G., and/or City of Apache Junction supplements. Assemblies two (2) inches and smaller will be placed in protective cage painted a neutral or earth tone color. Larger assemblies three (3) inches and above will be painted a neutral or earth tone color.

E. Fire hydrants will be furnished and installed by the contractor and will be painted chrome yellow after installation. Private fire hydrants will be painted red. Non-potable water flushing hydrants will be painted silver and be embossed with “EFFLUENT” across the barrel.

F. All service lines will be Type K copper tubing. The minimum size service line will be one (1) inch. Service lines will be continuous under pavement without a connection or extension. Details W-1-800 and W-1-802.

G. All service taps 2-inch and smaller will use lead-free bronze double strap service saddle.

APPENDIX A

H. All taps on existing water mains will utilize a ductile iron tapping sleeve appropriate for the pipe material being connected to.

I. Apache Junction Water District will install all meters after all paperwork is completed and the appropriate fees have been paid. Services up to two (2) inches will be installed per details W-1-800 and W-1-802. 3-inch and larger services will be installed in accordance with Apache Junction Water District standard details, W-1-603, W-1-803 thru W-1-806, W-1-808, and W-1-809.

J. Pavement replacement will be according to the jurisdiction having authority according to the terms and conditions of the permit issued.

K. Pothole repairs in pavement will be per detail W-1-101.

L. As-built drawings, signed and sealed by the subdivider's engineer or surveyor, must be submitted to and accepted by the District before final acceptance of the work. Bound CAD files are required upon acceptance of the as-builts.

FIGURE 1.1
WATER PROVIDERS

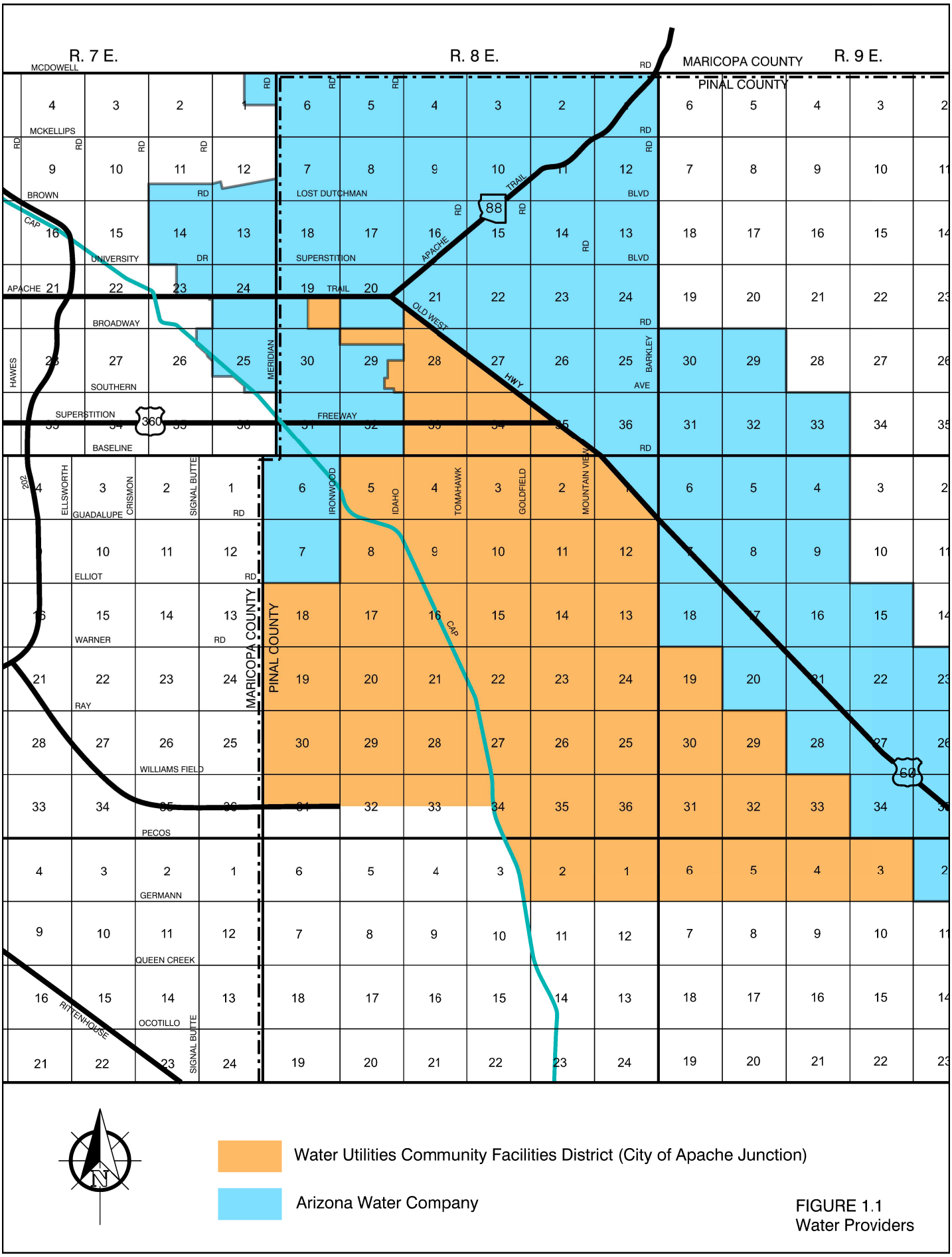

FIGURE 1.1
Water Providers