



**COP Project (KIVA) No.:** \_\_\_\_\_ **Project Name:** \_\_\_\_\_

**Reviewed By:** \_\_\_\_\_ **Phone:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Professional Engineer:** \_\_\_\_\_ **Phone:** \_\_\_\_\_

The purpose of this checklist is to offer comments on plan design for construction of water main pipe (12" lines and smaller), fittings, and fire hydrants and to set the minimum submittal requirements for water main plans. Source of water development code and design policy is the Water Services Department Design Standards Manual for Water and Wastewater Systems.

This checklist serves to minimize redline comments on the check prints and to maintain consistency among plan reviewers on plans for public water main construction (12" lines and smaller) in the public right-of-way or public water easement. For water mains greater than 12 inches please call the City of Phoenix Water Department at 602-495-5601 for submittal information. Plan approval and issuing permits depends on compliance with the comments made on the check prints and this checklist. The professional engineer of record shall satisfy themselves of the completeness and accuracy of the design.

A completed checklist must be attached to the water plans when submitted for first review. The following Certification Statement must be signed by the professional engineer of record certifying that all applicable requirements on this checklist have been met.

Plan review correction cycles and/or approvals are valid for 12 months. Additional review fees (see Fee Schedule – Phoenix City Code, Chapter 9, Appendix A.2) shall be charged for extensions/reinstatements to update expired plan reviews.

**CERTIFICATION**

**I CERTIFY THAT THE REFERENCED PLANS COMPLY WITH ALL APPLICABLE CITY ORDINANCES AND STANDARDS, INCLUDING FEDERAL, STATE AND COUNTY REQUIREMENTS AND REGULATIONS. IN ADDITION, I CERTIFY THAT THIS CHECKLIST HAS BEEN COMPLETED ENSURING ALL ITEMS LISTED ARE PROPERLY ADDRESSED. I UNDERSTAND THAT IF I FAIL TO ADDRESS ALL APPLICABLE ITEMS IN THIS CHECKLIST, THE PLANS MAY BE IMMEDIATELY RETURNED TO ME WITHOUT ANY FORMAL REVIEW BEING PERFORMED.**

PROFESSIONAL ENGINEER'S NAME: \_\_\_\_\_

PROFESSIONAL ENGINEER'S SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

Please complete and return this checklist and the check prints with your next submittal. Discussion of redline comments on plans or this checklist should be directed to the plan reviewer listed above.

Professional engineer of record (**ENG**) must fill out all boxes in the first column as either  (Addressed) or  (Not Applicable).

Civil plan reviewer (**RVW**) shall check the second column as  (Required) when requirements have not been properly addressed.

### REQUIRED SUBMITTALS

#### ENG RVW

- Plan sheets shall be 24" X 36"; submit four (4) sets of Water main plans, one (1) copy of the approved preliminary Site plan for major projects **OR** one (1) copy of the first review Site plan mark-up for minor projects, Utility Conflict Notices form the appropriate utility companies **OR** a printed disclaimer on the cover sheet (if work is on a local or residential street), a signed agreement form indicating standard or repayment agreement, a completed Application for Main Extension form, a sealed cost estimate, a signed and sealed Water Design Report by the professional engineer of record, a completed Notice of Intent form, a completed Approval to Construct form, a completed Environmental Responsibility form, and a completed and signed Water Main Checklist.

**Note:** If submitting through the Electronic Plan Review system, multiple copies of submittal documents are not required.

### GENERAL REQUIREMENTS

#### ENG RVW

- Symbols shall be per M.A.G. Specifications and Details supplemented by Water Services Department Details.
- Orientation of each plan sheet shall be shown by a north arrow and scale of drawing (North arrow is to be up or to the right).
- A cover sheet is required on plans of two (2) sheets or more.
- Each sheet shall be identified by sheet number, project name, and match lines.
- All sheets shall have the Civil Engineer's Arizona registration seal with original signature and date prior to any plan submittal.
- All plan sheets shall be sufficiently clear to allow legible prints to be reproduced from microfilm. The size of lettering and symbols shall be 1/8 inch minimum. Shading or zip tape is not permitted. All proposed water mains, fittings, and services shall be shown with thick solid lines on the plan's sheets. Refer to Water Services Department Design Standards Manual (P-68) for information required on record drawings ("As-Builts").
- This project is subject to a waterline repayment as redlined on the plans. Any questions shall be directed to the Civil Services Permit Counter, 602-262-6551 (voice) or 602-534-5500 (TTY). These fees shall be paid prior to the issuance of construction permits.
- D.I.P. required in major (mile) and collector (half-mile) streets, and all easements (MINIMUM PRESSURE CLASS 350 PIPE).
- All line valves and fittings must be restrained per the City of Phoenix Supplement to M.A.G. Specifications, section 750.3.
- All Ductile Iron Pipe water mains will be polyethylene wrapped per C.O.P. Supplement to M.A.G. Specifications Section 750.2 and M.A.G. Specifications Section 610.6.2 and 610.6.3.
- Joint restraint limits per M.A.G. Standard Detail 303-1 and 303-2 must be shown on all water main construction plans which require a profile in addition to plan view.
- When the proposed water main comes in conflict with another utility and a vertical re-alignment is necessary, the re-alignment must be approved on the proposed Water Main Plan **or** the Professional engineer must submit a separate Water – Vertical Re-alignment Plan (Detail DCE-D01) per the Water – Vertical Re-alignment Checklist. The Water – Vertical Re-alignment Detail can be located at the following website: [phoenix.gov/waterservices/design/engdetails/index.html](http://phoenix.gov/waterservices/design/engdetails/index.html).

**COVER SHEET REQUIREMENTS**

**ENG RVW**

- Appropriate processing numbers including: KIVA #, CPWT#, and city Quarter Section # in lower right corner.
- Provide a project title block with name and address of project.
- Provide a project description.
- Provide the Owner and Developer's name, address, and telephone number. Owner must be listed on the Arizona Corporation Commission website if they are a corporation.
- Provide Professional engineer's name, address, and telephone number.
- Provide a vicinity map with a north arrow oriented up or to the right.
- Provide an index of plan sheets if more than one plan sheet is included.
- Provide Signature Approval Block. (In lower right-hand corner)

**APPROVED FOR:  
THE CITY OF PHOENIX**

\_\_\_\_\_  
**HEALTH DELEGATE  
PLANNING & DEVELOPMENT DEPARTMENT**

\_\_\_\_\_  
**DATE**

- Provide an As-Built Certification Statement as follows:

**AS-BUILT CERTIFICATION:**

**I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.**

\_\_\_\_\_  
**REGISTERED ENGINEER**

\_\_\_\_\_  
**DATE**

**REGISTRATION NUMBER** \_\_\_\_\_

- Key map is required on plans with more than two (2) sheets. A key map is a small-scale map of the project site that provides a system overview and is used to index the plan sheets. The key map shall clearly show the following:
  - All streets with names, alleys, easements, tracts, and parcels shall be identified or shown "un-subdivided."
  - Water mains with types and sizes, fire hydrants, valves and production facilities (tanks, boosters, etc.) proposed and existing.
  - Index of plan sheets indicated by single line with arrows showing beginning and end of each sheet.
  - Identify all pressure zones.
- Provide a Blue Stake notification decal.

ENG RVW

- For arterial or collector streets provide utility conflict transmittal letter, along with all responses from each utility company. The following disclaimer can only be used for local or residential streets. Do not use for major or collector streets:

I hereby certify that all utility companies with facilities in the area of this project have been contacted and the data provided is shown on this plan. I agree to indemnify, defend, save and hold harmless the City of Phoenix, its officers, officials, agents, employees and volunteers from any and all claims, demands, actions, liabilities, damages, losses, or expenses incurred for any utility conflicts that may arise.

\_\_\_\_\_  
Professional engineer's Signature and seal

\_\_\_\_\_  
Date

- Elevation datum and benchmarks (city datum required). Please dial 602-495-2050, Voice, [www.phoenix.gov/streetssite/Documents/Benchmarks.pdf](http://www.phoenix.gov/streetssite/Documents/Benchmarks.pdf) or 602-534-5500 TTY, to obtain city datum for the existing benchmark closest to the project site. Equations cannot be used. Note on Plans NGVD 29 (National Geodetic Vertical Datum 1929).
- Provide a material list for Right-Of-Way or easement work only and a separate list for on-site pipe length. Please provide two (2) separate lists.

**NOTES FOR WATER PLANS:**  
(**ALL** notes to appear on cover sheet)

- Planning & Development Department's Civil/Site Inspection Staff shall be notified 48 hours before any construction begins telephone 602-262-7811.
- All water valve boxes shall be per City of Phoenix Supplement to M.A.G. Specifications and Details P1391, type A only.
- All construction in City of Phoenix Right-of-Way, or easement, is to conform to M.A.G. Specifications and Details and City of Phoenix Supplement to M.A.G. Specifications and Details, unless modified on the plans.
- All Ductile Iron Pipe water main valves, fittings, and bends shall be restrained. Restrained joint requirements and approved restraining system are shown in City of Phoenix Supplement to M.A.G. Specifications, section 750.3. The length of the restraints must be per M.A.G. Standard Detail 303-1 and 303-2. Thrust blocks are not allowed to be used in lieu of approved restrained joint systems. Thrust blocks can be used in addition to the approved restrained joint systems where a specific City of Phoenix Supplement to M.A.G. Standard Detail calls out for thrust blocking, such as current details, P1343, P1351, and P1360 or when otherwise approved by the Water Services Department.
- The following M.A.G. Details are specifically **NOT** approved:
- 302-1 Joint Restraint with Tie Rods
  - 302-2 Joint Restraint with Tie Rods – Anchor Blocks
  - 321 Standard Water Meter Vault
  - 345-1 3", 4", and 6" Water Meter
  - 345-2 4" and 6" Water Meter with On-site Fire Hydrants
  - 370 Vertical Realignment of Water Mains
  - 381 Anchor Blocks for Vertical Bends
  - 390 Curb Stop with Flushing Pipe
  - 391-1 Valve Box Installation
- Compaction shall comply with M.A.G. Section 601 & City of Phoenix Supplements.
- New water lines are to be built in accordance with the City of Phoenix "Standard Utility Locations".

ENG RVW

- This set of plans has been initially reviewed by the City of Phoenix. Such review is part of the process that developer(s)/contractor(s) must go through in order to obtain a Construction Permit. The results of such initial review shall not dictate the City of Phoenix's final determination as to the acceptability of the plans, nor shall it prevent the City of Phoenix from requiring errors and omissions, as found on plans, be addressed by developer(s) /contractor(s), where such errors and omissions cause the plans to be in violation of or inadequate under applicable federal/state/county/local codes, ordinances, regulations, or other laws. This reviewed and stamped set of plans must be kept at the construction site at all times.
- Pipe deflection shall be per manufacturers' recommendations.
- All work must comply with requirements of the current City of Phoenix "Traffic Barricade Manual".
- The contractor is to notify the public that will be affected by any shutdowns a minimum of 48 hours in advance.
- A six (6) foot minimum horizontal separation from any underground utility shall be provided for sewer mains, sewer services, water mains, and water services. The minimum horizontal separation is measured from outside of sewer main, sewer service, water main, or water service to outside of underground utility.
- A one (1) foot minimum vertical separation from any dry underground utility crossing shall be provided for sewer mains, sewer services, water mains, and water services. The minimum vertical separation is measured from outside of sewer main, sewer service, water main, or water service to outside of dry underground utility.
- A two (2) foot minimum vertical separation shall be provided between any sewer main and storm drain crossing a water main. The minimum vertical separation is measured from outside of water main to outside of sewer main or storm drain main. See M.A.G. Standard Detail 404 for additional information and/or provisions for clearance.
- Exceptions or deviations from the above minimum clearances must be approved and shown on the approved water and sewer plans. When utility conflicts are found during construction, all changes and revisions must be preceded by an approved plan revision.
- Any and all more stringent requirements required by Federal, State, County, or Local codes or ordinances take precedence.
- Water services shall be installed perpendicular to the water main. Water services at the end of cul-de-sacs may vary as necessary but will be approved on a case by case basis.
- All services shall run in a straight line from the water main to the meter box.
- Neither water service meter box nor any portion of a water service shall be installed under an existing or proposed driveway or sidewalk ramp.
- Concrete or asphalt damaged during the course of construction shall be removed and replaced in kind prior to final inspection.
- Record drawing submittals must comply per the Water Services Department Engineering Policy P-68. A copy of the policy can be obtained in the department's website:  
<http://phoenix.gov/waterservices/design/engpolicies/index.html>
- In accordance with AAC R-18-4-213, all materials added after January 1, 1993 which may come into contact with drinking water shall conform to National Sanitation Foundation Standards 60 and 61.

**ENG RVW**

- Place the following note on each sheet of the plans:**  
Per Phoenix City Code, Chapter 2, Section 2-28, these plans are for official use only and may not be furnished for inspection or copying, except as specifically stated in the City Code, or as required by law.
- Asphalt restoration is required for any street cut. Refer to Street Pavement Cut Policy (TRT 00164 and Ordinance G-6308).
- Plan approval is valid for 12 months. Prior to plan approval expiration, all associated permits shall be purchased, or the plans shall be resubmitted for extension of plan approval. The expiration, extension, and reinstatement of Civil Engineering plans and permits shall follow the same guidelines as those indicated in the Phoenix Building Construction Code Administrative Provisions Section 105.3 for Building permits.

**OPTIONAL NOTES FOR WATER PLANS:**

- For Lot Nos. \_\_\_\_\_, the contractor is responsible for installing the water service. When the service is ready for the wet tap, the contractor is to contact the Planning & Development Department Civil/Site Inspector to coordinate with the City of Phoenix Water Distribution staff to install the wet tap. The contractor is responsible to pay the City of Phoenix for the wet taps on a time and materials basis.
- This plan is approved subject to completion of lines labeled "EXISTING" which have been proposed as part of another development. The developer of this project may be required to construct those lines per city requirements prior to receiving service for this project.

**PLAN SHEETS REQUIREMENTS:**

**The plan sheets shall show the following to proper scale:**

- Provide a title block on all sheets.
- All sheets shall be numbered with match lines (if required) and street names.
- Orientation of each water line shall be shown by a north arrow (up or to the right) and a scale of the drawing.
- All existing and proposed utilities shall be shown with size, material, and location in right-of-way in plan and profile.
- Proposed finished grades at centerline of water shall be shown in profile with a solid line. Existing grades of ground surface at centerline of water shall be shown with a dashed line.
- Provide 3'-0" minimum horizontal clearance between water services.
- Provide 6'-0" minimum horizontal clearance between water and sewer lines, water and sewer services, and between sewer mains and all other utility lines, outside of pipe to outside of pipe.
- Use City of Phoenix "Standard Utility Locations".

**ENG RVW**

- Show encasements of water and sewer lines per M.A.G. Standard Detail 404 in plan and profile. Double protection is required when sewer crosses over water.
- Show all utilities in plan and profile. Where city utilities cross other utilities, show complete dimensional data measured from street monument lines.
- Show all streets, alleys and easements. Streets shall be identified by name. Streets, alleys and easements shall be dimensioned at least once and at all breaks. Monument line of streets shall be shown. Show both sides of the streets.

- Locate all existing and proposed utilities, structures, paving, and other topographic features affected by construction.
- Existing and proposed sewer main size and location must be shown. Sewer main shall be shown in a "lighter weight" line to identify it as being information only and not part of this construction plan. Label as existing or proposed.
- Joint restraint limits per M.A.G. Standard Detail 303-1 and 303-2 must be shown on all water main construction plans which require a profile in addition to plan view.
- Indicate the locations of the beginning(s) and the end(s) of the construction, and all valves, fire hydrants, pipe fittings, and service connections. Their locations must be shown by stationing and dimensioning from appropriate monument lines, or in their absence, appropriate easement references. No dimensioning from points of curvature or tangency is acceptable. The drawings must clearly indicate the specific points of reference.

**NOTE:** In all cases where the pipe is constructed within or parallel, in close proximity, with the right-of-way, all stationing and dimensioning must be from the nearest appropriate monument line and monument line intersection.

- The water services stationing shown must specify the location of the taps at the main and their intended use called out, i.e., domestic or irrigation. Their locations must be measured perpendicular or radial relative to the appropriate right-of-way monument line or easement centerline. Service tap locations must be indicated by using the following method throughout the plan set. All stationing rounded to nearest foot. No negative stationing allowed.

**NOTE:** Stationing in the same general direction along a straight or curvilinear pipe run starting with the nearest appropriate monument line intersection, or in their absence, appropriate easement line references shall be designated as 0 + 00. The relative stationing of all monument line intersections along such pipe runs must also be shown. When monument line intersection occurs along such pipe runs, the plans preparer begins the stationing again with station 0 + 00 at the intersection and repeats this process to the end of the pipe run. Do not locate 0 + 00 at the closed end of a cul-de-sac or similar type street.

- Water main taps are to be called out as follows:  
Install a/an \_\_\_\_\_" X \_\_\_\_\_" tapping sleeve and valve, box and cover. Abbreviation is acceptable: TS & V, B & C. Specify type of valve box to be used. An example: 12" X 8" TS & V, B & C per M.A.G. Detail 340 and City of Phoenix Supplement Detail P1391. When the tap size is the same as the size of main to be tapped conform to MAG Specifications Subsection 630.4.2(A) (1).

- Installation of pipe to be called out as follows:  
"Installation of \_\_\_\_" D.I.P. Class \_\_\_\_\_. Polyethylene wrap, per C.O.P. Supplement to M.A.G. Specifications Section 750.2 and M.A.G. Specifications Section 610.6.2 and 610.6.3."

- Existing valves to be shut down during construction shall be shown with city valve numbers as shown on the City of Phoenix Quarter Section map. One existing valve shall be shown and labeled, with the city valve number, on each side of a new tap in case an emergency shutdown is required.

- All existing valves shown on the plan shall be labeled with city valve numbers as shown on the City of Phoenix Quarter Section map.

**ENG RVW**

- A profile is required for 12" lines in major streets and for all size of lines in special situations where conflicts arise with other utilities. In profile, vertical scale shall be 1" = 2' or 1" = 4'. Horizontal scale shall not be smaller than 1" = 40'. For major streets and cases of unusual topography or complex situations where more detail is necessary, then the scale shall be 1" = 20'.
- On combo water/sewer plans, as well as water plans where only a plan view is required, a construction note callout must be shown at all tees, bends, dead ends, line valves, and fittings that reads:  
"Joints must be restrained per M.A.G. Standard Details 303-1 and 303-2 and City of Phoenix Supplement to M.A.G. Specifications, section 750.3."

- All piping to end with (size of pipe)" x 2" tapped cap with ball valve rated 300 psi or greater.
  - Provide existing and proposed paving. Shading is not allowed. Cross-hatching is acceptable.
  - When replacing curb, gutter, and sidewalk, show, and label, existing and proposed concrete. Construct sidewalk ramps to accommodate access per ADA requirements. One half (1/2) sack slurry backfill is highly recommended.
  - Pavement replacement thickness and type are to be per M.A.G. and City of Phoenix Supplement Section 336 and City of Phoenix Detail P1200 - Type B. Curb and gutter replacement shall be a minimum of one (1) full section, per M.A.G. Standard Detail 220. Sidewalk replacement shall be a minimum of one (1) full panel per City of Phoenix Detail P1230. At the discretion of the City of Phoenix Planning & Development Civil/Site Inspector, tunneling under existing curb and gutter, in City of Phoenix R.O.W., will be allowed. Tunneling under existing sidewalk will not be allowed in the City of Phoenix R.O.W.
  - Water mains shall be six feet (6') minimum from property line unless there is an adjacent P.U.E. on site.
  - Provide minimum water main easement per Table 3.1 in the Water and Sewer Design Standards Manual.
  - Valves shall be located at point of curvature of the curb return at intersections and at property lines in mid-block.
  - Location of fire hydrants and valves at intersections shall be referenced from the nearest monument line.
  - All fittings shall be identified and stationed.
  - Fire hydrant placements to be per the City of Phoenix Water Services Department Design Standards Manual for Water and Wastewater Systems, section 4.8.
  - Fire hydrants shall be located in accordance with City of Phoenix Supplement to M.A.G. Detail P1362.
  - Mid-block fire hydrants shall be located on the lot line between two lots and a minimum of four feet (4') away from driveway wings.
  - Meter service connections shall be shown to each lot or parcel. Services may be stationed from street intersection monuments, except on curved streets and in cul-de-sacs where the tap will be angled, therefore, the tap must be stationed on the main and dimensioned to the applicable property line. Intended use of the service shall be noted, i.e., domestic, irrigation, etc.
  - Meter box locations must be out of traveled roadway/walk/driveway. They may be located in planter areas, parking lot islands, etc., and should be set sufficiently above finished grade to minimize flooding. Meter locations shall be easily accessible from a street or traveled way and must be located in right-of-way or easements.
- ENG RVW**
- When the Water Services quarter section data indicates leaded joint pipe, the Professional engineer shall add a special note on the plan regarding leaded joint pipe, "Hand Dig If Necessary" and, "Use Caution When Excavating".
  - Discussion of redline comments on plans or in this checklist should be directed to the plan reviewer.



**WATER DESIGN REPORT:**

- Peak flow plus fire flow water demand.
- Must maintain a pressure between 50 and 100 PSI during peak day conditions and a velocity of less than or equal to 5 FPS.
- Must maintain a pressure above 25 PSI during a fire flow event and a velocity not to exceed 10 FPS.
- The professional engineer shall provide flow calculations and any necessary computer models for the items listed above in order to provide documentation for the basis of design. The professional engineer shall provide a clear, understandable schematic of the system showing the junction nodes, pipes, etc. for any computer modeling. The professional engineer shall also provide input data which shows the pipe diameter, pipe lengths, system demands, pipe flows AND output data that show pressures, velocities, head loss, and flow rates.

**PLANS FOR REVISION**

- All original plan approvals, signatures, and seals are to remain on the revised plans.
- All plans revised after the original approval shall be resubmitted for review and approval. The nature of the revisions must be called out on the cover sheet and on the sheet(s) which have been revised. The revision number itself shall consist of a numeral within a triangle next to each revision. Δ Changes on each plan sheet shall be highlighted with "clouding".
- All revised sheets, including the cover sheet are to be re-sealed, signed and dated.
- New approval signature block is required to be added to the cover sheet for approval of the revisions.

**APPROVED FOR:  
THE CITY OF PHOENIX**

\_\_\_\_\_  
**HEALTH DELEGATE  
PLANNING & DEVELOPMENT DEPARTMENT**

\_\_\_\_\_  
**DATE**

**EXTENSIONS**

All plans submitted for extension require a new signature block and are to be re-signed by the submitting designer. Plan extensions are to be highlighted with "clouding" as specified in the plan revision process above. The plan sealant shall note that this change is a plan extension. A new approval signature block is required to be added to the coversheet for approval of the extension. All plan extensions must have prior approval by completing the Plan Review Extension Application. The Plan Review Extension Application can be found at the following site: <http://www.phoenix.gov/development/siteandcivil/civil/>. Provide a copy of the approved application with the plan submittal.

Plan approvals for extension are valid for a period of 12 months from the date of plan approval.