

**INSTRUCTIONS FOR WATER PLAN CHECKLIST - FIRST DESIGN REVIEW**

- Refer to the Tucson Water Standard Specifications and Details, 2001 Edition. This manual can be obtained from Tucson Water Mapping/GIS, 791-2631. It is not yet available online.
- Refer to the Tucson Water Design Standards Manual, online at [www.tucsonaz.gov/water/dsm.htm](http://www.tucsonaz.gov/water/dsm.htm).
- The following instructions correspond to the numbering on the Water Plan Checklist - First Design Review.

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**ITEMS TO BE SUBMITTED WITH PLAN**

- ATTACH ALL REQUIRED DOCUMENTS WHEN MAKING A SUBMITTAL FOR REVIEW.
- Include the applicable review fee with your submittal. If you don't know the amount, call 791-4718. Tucson Water accepts cash, check, or money order. Checks should be payable to the City of Tucson.

**1. A current copy of the water plan with engineer's stamp**

- CHECK YOUR WORK BEFORE SUBMITTING FOR REVIEW.
- ADDRESS ALL REDLINE COMMENTS ON A PREVIOUS REVIEW PRIOR TO SUBMITTAL.
- Use a highlighter on a congested redline when addressing comments to make sure you don't overlook anything.
- If you have questions or concerns about a master plan requirement, call the master plan reviewer prior to design submittal. If you have questions or concerns about a design requirement, call the design reviewer prior to submittal.
- Plans stamped by P.E. if required by law. Stamps dated on or after March 8, 2008 shall display a registration expiration date.

**2. Approved master plan redlines with Tucson Water comments (Originals)**

- Originals or full-size color copies of the approved master plan are required.

**3. New unrecorded easement descriptions accompanied by current Title Report (2 months old maximum) and/or recorded legal descriptions for existing easements**

- The entire public water system shall be within a public right-of-way or within a common area or easement dedicated for public use.
- New Easements to be Dedicated by Docket/Page  
DO NOT SUBMIT MULTIPLE COPIES OF THE SAME EASEMENT DESCRIPTION OR TITLE REPORT.  
DO NOT RECORD NEW EASEMENTS FOR THE PUBLIC WATER SYSTEM YOURSELF.

Documents for new easements shall conform to Tucson Water and C.O.T. Real Estate requirements.

**Format:** The legal description shall include a graphic exhibit. There shall be no discrepancy between the easement description and the graphic exhibit. The easement can be described by its boundaries, centerline, or location within a prescribed area. The document shall be stamped and signed by a Registered Land Surveyor or Registered Civil Engineer. The document shall be stapled in the upper left corner. Stamps dated on or after March 8, 2008 shall display a registration expiration date.

The unrecorded easement description shall conform to Pima County Recorder's Office requirements.

- It shall have a title stating the nature of the document. The title shall include the words "public water easement" or "public utility easement".
- The easement description shall be an original or a copy of the original, sufficiently legible for making certified copies from the photographic or micrographic record.
- It shall have original signatures or carbon copies of original signatures.
- It shall be no larger than 8 1/2 inches wide by 14 inches long, and shall have a print size no smaller than ten point type.
- It shall have at least a one-half inch margins, top, bottom, left, and right.

**Title Report:** The easement description shall be accompanied by a title report for the property the easement is crossing. The title report shall be no more than two months old at the time of submittal. It shall reflect the current ownership of the property. If sale of the property is imminent, notify the design reviewer at the time of document

submittal and upon sale provide an updated title report. All pages of the document shall be stapled in the upper left corner or otherwise securely fastened.

If an easement crosses multiple properties, separate easement descriptions and title reports shall be submitted for each. Attach a sticky-note to the front of each document identifying the corresponding property.

Any document which modifies a previously recorded document shall state the recording date, and docket and page or sequence number of the document being modified.

New easement descriptions shall be reviewed by Tucson Water. Upon plan acceptance, the easement documents will be forwarded to C.O.T. Real Estate for recordation. Construction of the water system can commence prior to recordation, but the project will not be finalized and accepted into the public water system, nor will application for water meters be accepted, until all applicable easements have been recorded.

- **New Easements to be Dedicated by Final Plat**

Follow the procedure for submittal of Final Plats, as noted in #5 below.

- **Existing Easements**

Recorded easements for the public water system must be dedicated to the City of Tucson, Pima County, Tucson Water, All Utility Companies, or To the Public. An easement dedicated from one private party to another private party is not acceptable for installation and maintenance of the public water system. The dedication must not place any unacceptable limits or restrictions on Tucson Water's access or ability to maintain the public water system. The easement must be located and sized appropriately to accommodate the proposed water system. A copy of the recorded document shall be submitted to Tucson Water for the first design review.

- **Abandonment of Existing Easements**

Follow the procedure for "New Easements to be Dedicated by Docket/Page", as noted above. The unrecorded description for the abandonment shall identify the recording date, and docket and page or sequence number of the document being abandoned. A copy of the recorded easement shall be submitted along with the unrecorded abandonment description and title report.

- Refer to #13 and #14 in the instructions below.

#### **4. Itemized cost estimate with plan name referenced**

- Cost estimate shall be to Tucson Water format.
- Submit both pages of the 2-page cost estimate.
- Obtain estimated costs from your contractor or manufacturer. Tucson Water does not provide this information.
- The cost estimate must be thorough and accurate.
- Pipe material shall be called out. Linear feet of new pipe on the cost estimate shall match linear feet of new pipe in the general notes on the water plan. Pipe shall include all fire hydrant and fire service laterals.
- If the project is installing both potable and reclaimed main, submit two cost estimates. Staple them together in the upper left-hand corner.
- If the design of the system changes during the review process, or during revision of an approved plan, a revised cost estimate must be submitted.

#### **5. Final plat, recorded or not, or Record of Survey, or recorded legal description reflecting current property limits**

- All projects within a subdivision, whether residential or commercial, shall be submitted for first design review with a full-size copy of the Final Plat, whether recorded or not.
- If the plat is already recorded, the Book and Page number shall be called out on the water plan as a subtitle in the title block.
- If the plat is not yet recorded, it must reflect the Final Plat as it will be recorded. The configuration of public and private streets and the layout of lots, easements, and common areas shall be in their final draft stage. Street names and lot numbers shall be labeled. The General Notes and Dedications of public and private streets, easements and common areas shall be complete.
- If the plat is not yet recorded, the general construction notes on the water plan shall state that the water plan will not be finalized until the Final Plat has been recorded. The project will not be accepted into the public water system and applications for water meters will not be accepted until the water plan has been finalized.
- A Tentative Plat, while useful during master plan review, is not an acceptable alternative to a Final Plat for design review.
- If the subject property is not within a formal subdivision, the first design review submittal shall include either a record of survey or recorded legal description reflecting current property boundaries.

## 6. Improvement plans or site development plan

- Improvement plans and development plans shall be full-size and shall include, but not be limited to, sewer, grading, drainage, and paving plans.
- The consultant shall provide off-site improvement plans for projects which include off-site water construction.
- The consultant shall make every effort to verify and provide documentation for all existing utilities in the vicinity of the proposed water construction.

## 7. Underground electric layout

- A full-size copy of the electric layout is required.
- The street configuration, street names, lot layout, and lot numbers on the electric plan shall match the water plan.
- The electric plan shall include the location of all electric pedestals, transformers, and junction boxes.
- If the electric plan has not been completed at the time of first design submittal, the layout of electric pedestals, transformers, and junction boxes, as they will be located on the electric plan, can be plotted onto a copy of the tentative plat or final plat and submitted in lieu of the electric plan. They must be clearly shown, either plotted in a contrasting color, or otherwise highlighted for visibility. When the electric plan becomes available, the consultant shall verify the accuracy of the electric system on the water plan, and make necessary changes if warranted.

### ITEMS TO BE ADDRESSED ON PLAN

#### 1. 24" x 36" water plan to Tucson Water format with standard title block & current Tucson Water logo & inspector's as-built block

- A full-size copy of the water plan shall be submitted for review. Do not submit the original until you are instructed to do so at the end of the review process.
- All sheets shall include a title block, revision block, engineer's seal block, consultant's logo, Tucson Water logo, and Bluestake logo. The title block, revision block, seal block, Tucson Water logo, and Bluestake logo shall be in compliance with current standards.
- In addition, the cover sheet shall include an acceptance signature block, location map, owner/developer label, and inspector's as-built block, all in compliance with current standards. The plan number shall be written vertically in the upper-right corner adjacent to the sheet border. The cover sheet of multi-sheet plans shall include a sheet index and site plan.
- If space permits, locate the general construction notes and legend on the cover sheet. If necessary, the general construction notes and legend can be located on sheet 2.
- You can obtain electronic copies of the Tucson Water logo and the inspector's as-built block from Mapping/GIS, 791-2658.
- Because developer-financed projects under review are filed alphabetically, do not begin the name of your project with an article ("a", "the") or with a numeral.
- The project name shall include the building, pad, or lot numbers to be served by this project.

#### 2. Standard north arrow and scale in upper right corner of each plan sheet

- You can obtain an electronic copy of the Tucson Water north arrow from Mapping/GIS, 791-2658.
- A north arrow, with the scale called out below, is required on the location map, site plan, and on each applicable plan sheet.
- North arrows shall be located in the upper-right corner of each plan view.
- When possible, orient plan views with the north arrow pointing to the top or left side of the sheet.
- The scale called out below the north arrow shall match the scale in the title block on each respective sheet.
- Plans shall be prepared at the standard engineering scale which best suits the project. Plans must be clear, legible, uncluttered, and allow ample space on each sheet for "as-built" notes by the inspector.

#### 3. Standard location plan on cover sheet with C.O.T. ward or County Supervisor district identified adjacent to location map and latitude, longitude, and source of data called out below the location map

- Each plan requires a location map in the upper-right corner of sheet 1.
- It shall be labeled "Location Map".
- The scale, 3" = 1 mile, shall be called out below the north arrow.
- The location map shall be 3" x 3" minimum and 7"(H) x 6"(W) maximum.
- The project site shall be centered in the location map.
- The boundary of the project site, including any offsite installation, shall be shown and the area shall be hatched.
- The project site shall be labeled "This Project" outside the location map, with an arrow pointing to the site.
- If the project is part of a phased overall plan, all phases shall be shown and labeled, but only this phase shall be hatched.

- Section corners, major streets and watercourses, city or town boundaries, private water company boundaries, and any other existing conditions which may affect the project shall be labeled.
- The following information shall be labeled below the "Location Map" title: The section, township, and range, the City of Tucson ward number or the Pima County district number, the latitude and longitude and the source of information used to obtain those coordinates. (Specify north latitude and west longitude or use signed numbers, remembering that latitude -110° is in southern Arizona and 110° is in central China.)

#### **4. Cover sheet with match lines, main sizes, and zones called out on site plan**

- Match lines on the cover sheet shall clearly and accurately reference interior plan sheets. Overlapping boxes are not an acceptable alternative.
- All proposed onsite and offsite waterlines shall be shown and labeled, including lateral mains, regardless of their length. Proposed mains shall be shown in their entirety. Break-lines are not acceptable.
- All existing mains connecting to the new water system and all existing mains in the vicinity of the project site shall be shown and labeled.
- All new and existing waterline labels shall be in standard Tucson Water note boxes; solid note boxes for new mains and dashed note boxes for existing mains.
- If a project is installing both reclaimed and potable mains, clearly identify each note box as either "Reclaimed" or "Potable".
- All mains shall be labeled as "new" or "existing".
- All new and existing waterlines shall be labeled with the main size.
- All new and existing waterlines 16" and larger shall be labeled with pipe material, as required for corrosion review.
- All existing waterlines shall be labeled with the installation document number
- All existing waterlines to be abandoned shall be labeled "to be abandoned". Use a solid note box for this label; the main is existing but the abandonment is per this plan.
- All new and existing waterlines, except reclaimed mains, shall be labeled with the zone.
- Standard note formats for new and existing waterlines are provided in #36 below.
- If a water zone boundary exists in the vicinity of the project or is established per the project, the zone boundary shall be clearly shown and labeled on all applicable sheets.

#### **5. Cover sheet site plan reflects interior sheets & shows all elements of the water system except water services**

- The cover sheet must reflect interior plan sheets. Check your work before submitting.
- Basic geographical features<sup>1</sup> shall be shown on the site plan.
- Show the overall boundary of the property to be served.
- Show the boundary of any offsite water construction per this plan.
- If the full extent of the property to be served is too large for the sheet at the appropriate scale, you can use break lines together with property line dimensions.
- Show individual lot lines and lot numbers if the project serves a subdivision.
- Show simple building footprints if the project serves a commercial site or an unsubdivided multi-family residential site. Label the buildings.
- Show all public rights-of-way and private streets pertinent to the project. Label all street names.
- Show and label all common areas within subdivisions.
- Show all easements pertinent to this project. Do not label easements on the site plan.
- Show and label all well sites, boosters, reservoirs, and other production facilities in the vicinity of the project.
- Show and label all new waterlines.
- Show and label all existing waterlines in the vicinity of the project.
- Show and label all new and existing protected mains.
- Show and label all existing mains to be abandoned.
- If there are parallel mains, new or existing, leave "daylight" between them to ensure that all waterlines are clearly visible.
- Show all appurtenances to the new and existing water system, with the exception of water services. This includes, but is not limited to, tapping sleeves, tees, crosses, valves, reducers, horizontal and vertical bends, air release valves, fire hydrants, fire services, drain valve assemblies, and corrosion test stations. Do not label these items on the site plan.
- Show and label any new or existing closed valves-zone boundaries (CV-ZB).

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<sup>1</sup> In the GIS sense. Specifically does NOT include contours. DOES include boundaries, easements, property lines, building footprints, rights-of-way, parking lot outlines, storage area outlines, common areas, detention and retention basins, and washes. Does not include drainage structures, unless they cross new pipe. (In consultation with the author.)

- If any portion of the site plan is not clear and legible due to congestion, provide appropriate details on the cover sheet.
- Label all adjacent properties with subdivision name and book and page numbers, or label as "unsubdivided".
- If this project is installing new protected mains, label all participating and non-participating parcels.
- If new offsite easements are being dedicated by docket and page for this project, or if there are multiple property owner's who will be granting easements to be dedicated by docket and page, each applicable parcel shall be labeled with the tax assessor's parcel number, the owner's name, mailing address, and telephone number.
- Show and label city or town boundaries.
- Show and label phase lines if this project is a phase of an approved overall master plan.
- Show and label zone boundaries in the vicinity of this project.
- Show and label all match lines corresponding to interior plan sheets.
- Other than city boundaries, phase lines, zone boundaries, and match lines, the new public water system shall be the boldest line work on the site plan. It shall stand out from everything else and be clearly identifiable.
- Do not show any line work or notes not applicable to the water project.
- Prepare the site plan at the standard engineering scale which best suits the project.
- If necessary, the general construction notes and legend can be located on sheet 2.

#### **6. General notes and legend on cover sheet**

- Tucson Water New Development makes available to all consultants a list of general construction notes typical to water plans.
- General construction notes shall be located on either the cover sheet or sheet 2.
- Notes 1 through 7 shall be included on all water plans.
- Notes 8 through 28 shall be included on water plans if applicable to the project, and as instructed by either the master plan reviewer or design reviewer.
- Additional notes specific to a project may be required by either the master plan reviewer or design reviewer.
- Order the notes on your plan in the same sequence as the list of typical general notes.
- General notes included in SD 105 shall not be duplicated on the water plan.
- If the consultant chooses to add additional notes not required by Tucson Water, they shall be located at the bottom of the list on the plan.
- The construction water cost for note 2 will be provided by the design reviewer, based on the cost estimate.
- The rate of fire flow GPM for note 3 must match the approved master plan. The responsible fire department provides the fire flow duration requirement (generally 2-4 hours). If there is no duration requirement, the space shall be left blank.
- The zone, pressures, and peak day + fire flow for note 4 must match the approved master plan.
- The linear feet of new pipe for note 5 must be accurate and it must match the linear feet of new pipe on the cost estimate. It must include all fire hydrant and fire service laterals, and laterals for water services larger than 2".
- The spaces reserved for dates in note 18 shall be left blank. The dates will be filled in on the plan by the design reviewer at the time of plan acceptance. "Protected Main" designation begins on the date of plan acceptance and continues 15 years thereafter.
- The legend shall be located on the cover sheet or sheet 2.
- All symbols, line types, and abbreviations used on the plan shall be included in the legend. Symbols which are not used on the plan shall not be included in the legend.<sup>2</sup>
- Symbols, line types, and abbreviations used on the plan shall match the legend.

#### **7. Basis of bearing & basis of elevation called out**

- Basis of bearing and basis of elevation shall be called out either under their own heading or as part of the general notes.

#### **8. Responsible party for fire service billing identified**

- The responsible party for fire service billing shall be identified in the general notes.
- Only projects installing fire services for private fire protection systems shall include this note. Public fire hydrants are not a billable item.

#### **9. Owner/Developer information and consultant's logo on cover sheet**

- Owner/Developer information shall be labeled on the cover sheet, identifying the name of the owner, mailing address, telephone number, and contact person.

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<sup>2</sup> To be less restrictive, if an abbreviation does not appear in the current Tucson Water Standard Specifications and Details list of abbreviations, then it needs to be in the legend.

- Only one contact person shall be identified on the plan.
- The contact person must be either the legal owner of the property or the representative of the owner, with legal authority to sign documents in his behalf.
- The contact person listed on the plan must be person who will sign the Tucson Water Construction Agreement.
- If new easements are to be dedicated by docket/page for this water project, the name of the Owner must match the name of the owner on the title report. See #3 above, in the first section of these instructions.
- If ownership of the property changes during the course of review, the plan must be changed also. If ownership of the property changes after the plan has been accepted, but prior to finalization, a formal revision is required. Follow standard revision procedures.
- Two options are shown below for labeling the Owner/Developer:

<u><b>OWNER/DEVELOPER</b></u>	<u><b>OR</b></u>	<u><b>OWNER</b></u>
OWNER'S NAME		OWNER'S NAME
MAILING ADDRESS		
TELEPHONE NUMBER		<u><b>C/O DEVELOPER</b></u>
CONTACT PERSON		MAILING ADDRESS
		TELEPHONE NUMBER
		CONTACT PERSON

- The consultant's logo shall be located above the bottom border of each plan sheet, to the left of the title block and revision block.
- The logo shall include the mailing address, telephone number, and fax number. The text shall be large enough to be legible.

**10. Lettering and symbol size acceptable & legible (1/8" min.)**

- Tucson Water microfilms all plans upon finalization. Items smaller than 1/8" are not legible after microfilming.
- The size requirement is applicable for all plan sheets, including the cover sheet.
- It is applicable to the site plan and legend, all plan sheets and profiles, all details, all notes and dimensions.
- It applies to all symbols including survey monuments and all utilities, new and existing.
- The only exceptions are the smaller print in the official Bluestake logo, and portions of the title block, revision block, inspector's as-built block, and consultant's logo.
- Due to the size of the symbols, it often appears in plan view that some items are not in the exact location intended by the designer. This is often true for water services, fire hydrants, fire services, air release valves, corrosion test stations, and drain valve assemblies. In these cases, simple details shall be provided showing the intended location of these items. The details shall include dimensions where applicable.

**11. Project boundary & lot lines with adjacent properties identified**

- Show the overall boundary of the property to be served.
- Show the boundary of any offsite water construction per this plan<sup>3</sup>.
- If the full extent of the property to be served is too large for the sheet at the appropriate scale, you can use break lines together with property line dimensions.
- Show individual lot lines and lot numbers if the project serves a subdivision.
- Label all adjacent properties with subdivision name and book and page numbers, or label as "unsubdivided".

**12. Rights-of-way, full width shown, with street names labeled public or private**

- Show the full width of all rights-of-way, whether the proposed water system is to be installed along it's length or the proposed water is to be connected to an existing system within the right-of-way.
- All streets must include street names on the cover sheet site plan, interior sheet plan views, and applicable details.
- Lateral streets adjacent to the project site must also include street names.
- All streets must be labeled as "public" or "private".

**13. Show applicable easements, existing & proposed, & label easements**

- Refer to SD 340.
- Easements shall be 15' wide, minimum. Water facilities shall be 7.5', minimum, from the edge of the water easement. Easements containing more than one water facility, or other utilities in addition to water, shall be sized to maintain the required distance from the edge of the easement in addition to the required separation between utilities.

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<sup>3</sup> Refers to the boundary of offsite construction removed at some distance, and not obviously connected to the project by new mains (as when main replacement is required to support a project). Dimensions on broken section lines or roadway centerlines would be required.

- The easement shall be shown on the cover sheet site plan and all applicable interior sheets.
- The easement shall be labeled on interior sheets, including the type and width of the easement and the record of dedication.
- The easement shall be labeled "Public Water Easement" or "Public Utility Easement". The easement label on the plan must match the recording document.
- Refer to #3 above, in the first section of these instructions.
- Refer to #36 below for standard easement labels.
- Do not show or label easements not applicable to the water project.

**14. Plan matches easement descriptions; P.O.B., bearings, distances, etc. called out on the recording document**

- New easements and abandonments of existing easements to be dedicated by docket/page shall be labeled on the plan with all P.O.B.'s, bearings, distances, curve data, and reference points, exactly as in the easement description and graphic exhibit.
- CHECK ALL EASEMENT DATA PRIOR TO SUBMITTAL. THE DATA ON THE PLAN, IN THE WRITTEN EASEMENT DESCRIPTION, AND IN THE EASEMENT DESCRIPTION GRAPHIC EXHIBIT MUST MATCH EXACTLY.
- Easement data may be labeled directly on the plan, in easement data tables, or on a separate plan sheet reserved for that purpose.
- Refer to #3 above, in the first section of these instructions.

**15. Inverts or vertical separation called out at all water / sewer crossings and potable / reclaimed crossings**

- All vertical and horizontal separations between potable water, reclaimed water, and sewer must be labeled on the plan and must be in compliance with Tucson Water SD 106.
- Reclaimed mains in the vicinity of potable mains shall comply with the separation criteria for pressurized sanitary sewer lines.
- Reclaimed mains in the vicinity of sanitary sewer lines shall be considered potable with respect to required separations.
- You can call out vertical separations by referring to invert elevations, in which case you must account for the thickness of the pipe walls, or you can refer to the elevation at the top of one pipe and the bottom of the other. In both cases, the actual separation shall also be called out. Whichever option you choose, be consistent throughout the plan.
- CHECK YOUR WORK BEFORE SUBMITTING FOR REVIEW.
- If an error is found during PC-DEQ review, an "Approval to Construct" will not be granted and a formal plan revision will be required.

**16. Existing water system shown correctly**

- The existing water system in the vicinity of the proposed water construction shall be shown clearly, thoroughly, and accurately.
- If this project is dependant upon another proposed water project which is not yet accepted, constructed, or finalized, a general note on the water plan will state that this project will not be finalized until the finalization of the supporting water project. The supporting water project shall be shown and labeled on your plan as an existing water system. If the supporting project is not yet accepted, request a copy of that plan from your master plan or design reviewer.
- Verify the existing water system by obtaining all applicable Tucson Water maps, plans, and work orders.
- Tucson Water Mapping/GIS develops, maintains, and distributes 1/4-section base maps of the public water system.
- Determine the exact location of your project within the section-township-range.
- Each base map encompasses one 1/4-section. It shows and identifies basic geographical features as well as a detailed representation of the public water system. All installation documents are referenced on the base map.
- Contact Mapping/GIS for copies of all applicable 1/4-section base maps. If your project borders on a section line or 1/4-section line, request all adjacent maps.
- Hard-copies of the base maps can be obtained at Tucson Water Mapping/GIS, 310 W. Alameda, 1<sup>st</sup> Floor, between 8am and 4:30pm. Arrive at least 30 minutes prior to closing to allow time to be served. The first copy of each map is provided free of charge.
- PDF copies of the base maps can be emailed to you. Call 791-2658 between 6am and 4:30pm. There is no charge for this service.
- If you are not familiar with Tucson Water 1/4-section base maps, you can request a symbol and abbreviation sheet.
- 1/4-section base maps show the entire public water system, including, but not limited to, potable mains, reclaimed mains, protected mains, valves, reducers, bends, air release valves, drain valve assemblies, corrosion test stations, fire hydrants, fire services, water services, pressure reducing valves, well sites, booster sites, and reservoir sites. Sizes, materials, and installation documents are also identified.

- If you require more information than is provided on the base map, for example, the depth of an existing main at your proposed connection point, you can obtain the installation document from Tucson Water Mapping/GIS.
- Installation documents include plans (PN), work orders (WO), blue work orders (BWO), operation & maintenance work orders (O & M), found-in-field documents (FIF), and files (FN).
- Hard copies of all documents can be obtained at Tucson Water Mapping/GIS, 310 W. Alameda, 1<sup>st</sup> Floor, between 8am and 4:30pm. Arrive at least 30 minutes prior to closing to allow time to be served. The first copy of each document is provided free of charge.
- PDF copies of most documents can be emailed to you. Call 791-2658 between 6am and 4:30pm. There is no charge for this service.
- The existing system in the vicinity of new water construction shall be shown and labeled on the site plan, interior plan sheets, profiles, and all applicable details and street sections.
- CHECK YOUR WORK FOR ACCURACY AND LEGIBILITY BEFORE SUBMITTING.

#### **17. Existing and proposed paving, utilities, drainage facilities, and other obstructions in the vicinity of new water construction**

- Show proposed pavement in roadways, parking lots, access lanes, etc., by enclosing it with curbing. Indicate the type of curbing, e.g., vertical, wedge, ribbon, etc., by using line styles as reflected in the legend. (You will have to add them.) If strip paving is proposed, indicate it using a distinctive line style or edge hatching identified in the legend. Avoid fill hatching, which will obscure information. Do not show parking lines, markings, etc., for the same reason. Indicate the type of pavement covering mains if other than aggregate/asphalt.
- Show proposed sidewalks using lines with hatching or stippling employed sparingly if at all. Include a detail (with a profile, if necessary) to show the relationship of above-ground appurtenances, such as fire hydrants and water services, to the pavement, curbing, and surrounding obstructions like fences, walls, and slopes.
- Show existing pavement using the standard edge hatching for roadways, parking lots, access lanes, etc. If existing sidewalks are shown on the plan (not necessary unless within 15 feet of a right-of-way containing proposed water lines), do so using lines without hatching.
- Show all utilities, existing and proposed, approaching water mains within 15 feet.
- Show private water lines (irrigation, for example) if and only where they cross new public water mains or parallel new public water mains within 7.5 feet or within an easement. Use line breaks to terminate private lines as soon as they exit an easement or leave the circle of influence (7.5' radius) of a main. Crowding or crossing public mains with private lines is not a recommended practice. Bluestake will not mark private lines, and Tucson Water crews may not be aware of them if they have to excavate for maintenance. This represents a potential hazard to the crew and to property.
- Show and label unpaved roadways.
- Label minimum vertical separation at utility/water crossings.
- Vertical and horizontal separations for private water/public water shall be the same as for sewer/water per SD 106. Drainage structures shall be shown and labeled if crossing proposed water mains or paralleling them within 15 feet. Drainage/water crossings shall include a detail if vertical bends are used on the new water main to cross over or under the drainage structure. Drainage/water crossings not requiring vertical bends on the new water main shall be labeled with the vertical separation.

#### **18. Development tied down; Sta. 10+00 on survey monument w/applicable stationing**

- The initial station shall be labeled 10+00. It shall be located on a monument or other survey marker, new or existing, above ground, permanent, and visible.
- When possible, an existing survey marker is preferable to a proposed survey marker.
- The monument or survey marker and the initial station shall be clearly labeled on the water plan.
- Property pins do not provide an ideal location for the initial station, but in a remote area there may be no other option.
- The initial station shall not be located at a point of connection, an existing water valve, or referenced to an adjacent water project or any associated improvement plan.
- When the existing survey marker is a distance from the project site, break lines are acceptable, for example, along a street centerline or a section line.
- Provide tic-marks and station callouts from the initial station to the associated point(s) of connection.
- Station equations are acceptable at points of connection, intersections of centerlines, lateral main connections, etc.
- *Interpretation of the above:* The connection of new pipe to the existing system must be stationed with respect to a new or existing survey monument either directly or by a station equation (STA. 12+93, 15' LT, street name = STA. 0+00, street name or "new water line"). After that, as long as there is an easement description, or a right-of-way centerline, or a visibly distinct boundary of a common area (defined geometrically by the final plat) to which the pipe runs parallel, there is no further need for markers. In a commercial development, the fact that the pipe may be on the centerline of the easement makes a marker hard to depict on a plan, so there's a reason for not placing one.

We do need a legal description of the easements in commercial developments because that is what is recorded by the City's real estate division. To record the easement, we need a title report that is less than two months old. As to the description of the easement on the plan, we require that you (1) label the true point(s) of beginning (POB), and (2) tie the POB to an existing survey monument.

**19. Dimension from connections to all existing valves that may need to be closed during connection**

- All existing valves that may need to be closed during a proposed connection must be accurately shown and dimensioned on the applicable interior plan sheet. Do not overlook valves on lateral mains that may need to be closed.
- Break lines are acceptable for locating and dimensioning valves that are remote to the proposed connection point.
- All proposed connections to the existing system require dimensions to existing valves, including fire hydrants or fire services to be installed on existing mains.

**20. Phase lines**

- Show and label phase lines on all applicable sheets if this project is a phase of an approved overall master plan.
- If finalization of this project requires prior finalization of another phase, the water system of the other phase shall be shown and labeled as existing on this plan, regardless of whether or not the other phase is accepted, constructed, or finalized yet. If the other phase is changed during its review process or revised after it has been accepted, the change shall be reflected on this plan also.
- If this phase is not dependant upon an adjacent phase, and the adjacent phase is in the review process but not yet accepted, it is your choice whether or not to show the water system of the adjacent phase on this plan. If you choose to show the adjacent water system, it shall be labeled as "future" rather than "new", "proposed", or "existing". Note boxes labeling future waterlines shall be dashed, as for existing pipes. If the adjacent water project has been assigned a plan number, it shall be called out in the note box on this plan. If the adjacent phase is changed during its review process or revised after it has been accepted, the change shall be reflected on this plan also.
- The water system, lot lines, and lot numbers of all adjacent phases shall be plotted with a lighter pen weight to clearly distinguish them from this project.

**21. All new water system plotted BOLD**

- Other than city boundaries, phase lines, zone boundaries, and match lines, the new public water system shall be the boldest line work on the plan. It shall stand out from everything else and be clearly identifiable. This includes, but is not limited to, valves, drain valve assemblies, air release valves, water services, fire hydrants, and fire services.
- Do not break new mains for lettering or dimensions.
- Do not obscure any part of the new water system with lettering, note boxes, leader lines, etc.

**22. Main sizes, configuration acceptable per master plan review w/comment compliance**

- Subsequent to master plan approval, the plan shall remain in compliance to all master plan conditions and requirements.
- Any proposed change to pipe size, pipe configuration, connection to the existing system, or other master plan condition, requires an additional master plan review and associated review fee.
- Proposed phasing of a project requires an additional master plan review and associated review fee.

**23. PVC pipe within a curved easement or right-of-way**

- The following table indicates the minimum radius that can accommodate deflection of PVC. Any PVC installed with a lesser radius requires horizontal bends.

Pipe Diameter	Radius
6"	144'
8"	189'
10"	231'
12"	275'

**24. Abandon existing mains**

- All existing mains to be abandoned shall be shown and labeled on the site plan and all applicable interior plan sheets, profiles, and details.
- The abandonment symbol shall be shown in all appropriate locations on the site plan and interior plan sheets and in the legend.
- Solid note boxes shall be used for system abandonment. The water system is existing but the abandonment is per this plan.

## 25. Profile for 12" & larger mains

- Profiles are required for all mains 12" and larger.
- Stations in the profile must line up vertically with stations in the plan view.
- The profile must match the plan view. All appurtenances to the pipe, except water services, shall be shown, stationed, and labeled.
- The pipe shall be labeled.
- All utilities and drainage structures which cross the pipe shall be shown and labeled in the profile. Vertical separation between the utility or drainage structure shall be dimensioned.
- The minimum depth of cover shall be dimensioned.
- If the profile includes a connection to the existing system, the connection shall be stationed and labeled and the existing main shall be shown and labeled.
- Grade breaks shall be stationed and the pipe slope shall be labeled between each grade break.

## 26. Protected mains, proposed & existing, with applicable notes

- Developer-financed mains which are in a right-of-way, common area, or easement adjacent to a non-participating parcel may be designated as a "Protected Main".
- A non-participating parcel is a property which is not served by this project and which is not contributing financially to this project.
- Only the portion of new main adjacent to a non-participating parcel may be designated as protected.
- Protected main status remains in effect for 15 years from the date of plan acceptance.
- Protected main designation offers the owner/developer of this project the opportunity to recoup a portion of his cost. If the owner of a non-participating parcel applies for a water service or a connection for the purpose of extending the main, he will be assessed a fee based upon the size of the protected main and the linear feet of frontage of the non-participating parcel adjacent to the protected main.
- Only parcels which have frontage along the protected main will be assessed a protected main fee.
- If this plan installs a new protected main, all appropriate symbols and notes shall be added to the general construction notes, legend, site plan, and interior plan sheets:
  - General Construction Note: See #27 on the list of standard general construction notes.
  - Legend: Include the symbols for new protected main and participating parcels. Call out the linear feet of new protected main.
  - Site Plan: Label new protected mains, participating parcels, and non-participating parcels. Use the appropriate symbol for protected mains and participating parcels.
  - Interior Plan Sheets: Label new protected mains.
- All new and existing protected mains shall be labeled on the site plan and all applicable interior plan sheets as shown in #36 below.
- If this project is required to pay a protected main fee, you will be instructed to add a special note to the general construction notes. See #29 on the list of standard general construction notes.

## 27. Corrosion test stations for ductile iron or concrete cylinder, 16" or larger, new & existing; show & label (must be reviewed by CTS Unit - submit two copies of water plan.)

- Refer to the Tucson Water Design Standard Manual, Section 8-11.
- Proposed transmission mains which are 16" or larger, and the pipe material is welded steel, concrete cylinder, prestressed concrete cylinder, or ductile iron, shall be reviewed by the Corrosion Control Unit for corrosion prevention and monitoring.
- Projects connecting to an existing transmission main 16" or larger, and the pipe material is welded steel, concrete cylinder, prestressed concrete cylinder, or ductile iron, shall be reviewed by the Corrosion Control Unit for corrosion prevention and monitoring.
- Projects which include any improvements that may disturb existing corrosion monitoring equipment shall be reviewed by the Corrosion Control Unit.
- If this project requires review by the Corrosion Control Unit, submit two copies of the water plan to New Development for the first design review. One copy will be forwarded to the Corrosion Control Unit.
- Upon completion of the corrosion review, the redlined plan will be returned to the design reviewer, who will forward it to the consultant.
- Depending upon the location and nature of the project, the Corrosion Control Unit may require a Pre-Design Corrosion Report.
- Any questions regarding Corrosion Control Unit requirements or the Pre-Design Corrosion Report shall be directed to the Corrosion Control Unit, 791-2648.

- All redline comments and requirements in the accompanying letter shall be addressed on the water plan prior to the next submittal for design review. Return the Corrosion Control Unit redline and letter to the design reviewer with your next submittal.
- The water plan will not be accepted until all Corrosion Control Unit requirements have been satisfied.
- All plans which include corrosion control requirements shall add the following note to the general construction notes on the water plan:  
 "This project will not be finalized until the Final Corrosion Report has been approved by the Tucson Water Corrosion Control Unit. Call 791-2648."
- All questions and correspondence regarding the Final Corrosion Report shall be directed to the Corrosion Control Unit, 791-2648.

**28. Valving acceptable (2 for tee, 3 for cross and maximum spacing between in-line valves maintained)**

- Refer to the Tucson Water Design Standard Manual, Section 8-08.
- All tees for main extensions shall have two valves; one valve on each main except the one which principally supplies the water flow. This does not include tees for fire hydrants or fire services.
- All crosses at main connections shall have three valves, one valve on each main except the one that principally supplies flow.
- Distribution mains are defined as mains 16" and smaller which include water service taps.
- Shut-off valves on distribution mains in residential areas are required every 660' maximum.
- Shut-off valves on distribution mains in commercial areas are required every 500' maximum.
- When the distance between tees or crosses exceeds the maximum valve spacing requirements, additional valves are required between the tees and crosses. It is preferable to locate an in-line valve at a fire hydrant or fire service tee rather than a location where there's no above-ground water system appurtenance.
- Gate valves are generally used for mains 12" and smaller, providing the depth of cover above the gate valve bonnet is 3' minimum.
- Gate valves may be used for 16" distribution mains providing the depth of cover above the gate valve bonnet is 44" minimum.
- Transmission mains are defined as a 16" main that has no water service taps and all mains 24" and larger.
- Isolation valves on 16" transmission mains are required every 1,320' maximum.
- Isolation valves on 24" to 36" transmission mains are required every 2,640' maximum.
- Isolation valves on transmission mains larger than 36" are required every 5,280' maximum.

**29. Air release valves**

- Refer to the Tucson Water Design Standard Manual, Section 8-08, Tucson Water SD 330 and SD 331.
- Air release valves (ARV's) are required in waterlines at all critical high points where there are no other connections, such as fire hydrants or water services, that would otherwise permit accumulated air to be released.
- Typical sizing of ARV's is as follows:

<u>PIPE SIZE</u>	<u>ARV SIZE</u>
Less than 12"	3/4"
12"	1"
16"	2"
24"	2"
Larger than 24"	Contact the manufacturer for recommendation

**30. Stubs, drain valve assemblies**

- Refer to the Tucson Water Design Standard Manual, Section 8-08, Tucson Water SD 400 and SD405 and SD 500.
- Stubs are generally used only on fire services and laterals of less than 5' for the purpose of future fire hydrant installation.
- It is preferable to terminate a short lateral intended for future main extension with a drain valve assembly (DVA) rather than a stub. The DVA is easier to locate in the future and allows flushing of the system prior to connection.
- A DVA per SD 400 can be installed closer to the nearest in-line than a modified drain valve assembly (MDVA) per SD 405, which incorporates into the assembly an in-line valve and a minimum 25' pipe length prior to the 2" riser.
- Where space is limited for the installation of a DVA, the two 45° bends in the 2" riser can be replaced with one 90° bend. In this case, a special detail shall be added to the plan.
- DVA's are preferable to MDVA's in the following situations:
  - At the end of a short main that has no possibility of being extended in the future.
  - At the end of a main that may be extended in the future, but has no water services taps between the end of the main and the nearest in-line valve, and the valve is less than 200' from the end of the main.
- MDVA's are preferable to DVA's in the following situations:

- At the end of a main that may be extended, if there are water service taps between the end of the main and the nearest in-line valve.
- At the end of a main that may be extended, if the distance between the end of the main and the nearest in-line valve approaches the maximum spacing between valves.
- DVA's shall not be located in washes, retention/detention areas, sidewalks, or driveways.

### **31. Fire hydrants per Fire Department requirements**

- Refer to the Tucson Water Design Standard Manual, Section 8-08 and Tucson Water SD 500.
- Any proposed changes to site use, lot configuration, street layout, or changes to the fire protection system, including the location or number of fire hydrants, will require an additional review by the fire authority. Comments and authorizing signature by the fire authority will be required before the plan review process continues.
- Fire hydrants shall comply with SD 500.
- Fire hydrants shall be located on level ground, minimum 5' from all obstructions and slopes. If the street section indicates a sloped shoulder where fire hydrants will be installed, provide an additional detail showing how compliance will be met at hydrant locations.
- The fire hydrant lateral, from tee to shoe, shall be 6 linear feet minimum.
- Fire hydrant laterals greater than 40 linear feet require a valve at the tee and an additional valve within 10' of the hydrant location. All valves shall also be shown on the site plan.
- Fire hydrant laterals connecting to a distribution main with more than 60" of cover must be adjusted to a depth of no more than 48" prior to the shoe location. Provide a detail showing how this will be accomplished. Show, station, and label all vertical bends. All vertical bends shall also be shown in plan view and on the site plan.
- Fire hydrants shall be located between 2' and 7' behind the back of vertical or wedge curbs. Check the length of all fire hydrant laterals for accuracy prior to submittal.
- Horizontal bends shall be avoided on fire hydrant laterals when possible. Fire hydrant laterals with one or more horizontal bend require a valve at the tee and a valve after the horizontal bend, within 10' of the hydrant.
- Fire hydrants located behind strip paving shall be between 6' and 10' beyond the edge of strip paving. A ribbon curb which is flush with the paving is considered strip paving, and the hydrant shall be between 6' and 10' beyond the back of a ribbon curb. Hydrants less than 10' from the edge of strip paving require protection poles. Protection poles shall be shown in plan view and called out in the note box. The number and location of protection poles shall be based upon site conditions and shall comply with SD 500.
- If an existing fire hydrant is relocated or abandoned, the existing hydrant, lateral, and shoe shall not be re-used. Special notes are required, as shown in #36 below.

### **32. Existing service tie-overs, renewals, relocations, and abandonments**

- Show and label all existing water services located within the frontage of the project site.
- Show and label all existing water services located in the vicinity of proposed connections to the existing system.
- Show and label all existing water services that may need to be tied-over to a proposed water main or relocated or abandoned.
- Include the symbol for existing water services in the legend if applicable to this project.
- See #36 below for some standard water service notes.

### **33. Meters located at property to be served, 30" minimum separation between service taps**

- Refer to the Tucson Water Design Standard Manual, Section 8-08 and Tucson Water SD's 309-314.
- Tucson Water's policy allows one water service per residential lot.
- Tucson Water's policy allows one water service per building. The water service shall be sized to meet the projected demand. If a water service larger than 2" is required, contact Tucson Water, New Meters, 791-5164, regarding installation requirements, site requirements, and cost.
- Single water services shall be 1" or larger. A 1" water service can accommodate a 5/8" meter or a 1" meter.
- Split services shall be 1" and can only accommodate two 5/8" meters. If a fire suppression system is to be installed a dedicated 1" single WS and 1" meter will be required. In addition, water adequacy of split services shall be evaluated for domestic usage level and F.F.E., balance between units, width of right-of-way, number of building stories, and proximity to the upper water zone boundary.
- The lot numbers in the title block shall correspond to the lots that are to be served per this water plan.
- If, due to the location of the water service, it is not clear which lot or building is to be served by a specific water service (or fire service) the label for the water service shall call out the lot or building number.
- A water service includes the tap into the main, the water service line, the angle meter stop, and the meter box.
- Water meters are not installed until the project has been finalized and accepted into the public water system.
- Water services (and fire hydrants and fire services) are not allowed within areas of proximity to sewer lines, wherein the separation between water and sewer requires extra protection per SD 106.

- Do not tap water services into lowered mains or risers in the area of drainage crossings.
- Do not tap water services into tees or bends.
- Do not tap water services between tees and the adjacent in-line valve.
- Water service taps shall maintain 3' minimum separation from tees, bends, valves, etc.
- Maintain minimum 30" separation between water service taps.
- Water services that are not perpendicular to the station line require two station callouts; one at the tap and one at the meter box location.
- The consultant shall evaluate the possible need for irrigation services.
- When a water service is not clearly intended to serve a particular lot or building, the water service label shall call out the intended use (irrigation, maintenance building, swimming pool, clubhouse, etc.)
- See #36 below for some standard water service notes.
- CHECK YOUR WORK FOR ACCURACY BEFORE SUBMITTAL, ESPECIALLY LARGE SUBDIVISIONS. VERIFY THAT EACH INTENDED LOT HAS A WATER SERVICE, AND THAT MULTIPLE SERVICES ARE NOT CALLED OUT FOR A SINGLE LOT AND THAT THE LOT NUMBERS IN THE TITLE BLOCK MATCH THE LOTS BEING SERVED PER THIS PLAN.

**34. Electric pedestals & transformers dimensioned 10' minimum from services, hydrants, ARV's & DVA's**

- See #7 above, in the first section of these instructions.
- Provide dimensions from all water services, fire hydrants, air release valves, and drain valve assemblies to any nearby electric pedestal or transformer. A minimum 10' separation must be maintained.

**35. Static pressure zones identified, w/closed valves, and zone boundaries labeled**

- If a water zone boundary exists in the vicinity of the project or is established per the project, the zone boundary shall be clearly shown and labeled on all applicable sheets.
- Closed valves, new or existing, which establish zone boundaries, shall be labeled on all applicable sheets, including the site plan on the cover sheet. Examples of closed valve notes are included in #36 below.
- Pressure regulating valves or boosters, new or existing, which establish zone boundaries, shall be labeled on all applicable sheets including the site plan on the cover sheet.
- Zone boundaries often indicate areas of high or low water pressure. In these cases you will be instructed to include the appropriate general construction note. See notes 25 and 26 on the standard list of general construction notes.

**36. Notes in standard note boxes**

- Notes for new water system shall be in solid note boxes.
- Notes for existing or future water system shall be in dashed note boxes.
- Only box water notes.
- All leader lines from note boxes shall be clear and accurate.
- Do not obscure important information or plan features with note boxes or leader lines.
- All waterlines shall be labeled, new and existing. All mains 16" and larger shall be labeled with pipe material, as required for corrosion review. All existing waterlines shall be labeled with the installation document number.
- If a project is installing both reclaimed and potable water systems, clearly identify each note box as either "Reclaimed" or "Potable".
- Water service notes are not typically boxed, but are placed adjacent to each water service. An exception might be if only a few water services are installed per the plan, or if water services are being installed on existing mains, or if existing water services are being relocated or abandoned. Note boxes are often used in these cases to make sure they are not overlooked.
- All valve callouts shall include box and cover (B & C).
- Directional abbreviations, e.g. S & E, to indicate valves south and east, are not typically a part of valve callouts. If used, the reviewer is likely to direct their removal.
- Notes shall be written in a standard Tucson Water format. Following are some examples of typical notes:

NEW 6" WATERLINE "A" ZONE	STA. 1+23.45, 6' RT. 1 - 12" X 6" TAPPING SLEEVE 1 - 6" VALVE, B & C
EXISTING 6" WATERLINE FN 123-1967 "A" ZONE	CONNECT TO EXISTING 12" PVC  STA. 1+23.45, 6' RT.
NEW 16" DIP WATERLINE "A" ZONE	1 - 12" X 6" TEE 1 - 12" VALVE, B & C 1 - 6" VALVE, B & C

EXISTING 16" PVC WATERLINE  
WO 123-2001  
"A" ZONE

NEW 12" PROTECTED MAIN  
"A" ZONE

EXISTING 12" PROTECTED MAIN  
PN 2-123-2001  
"A" ZONE

EXISTING 4" MAIN TO BE ABANDONED  
FIF 123-1974  
"A" ZONE

**RECLAIMED**  
NEW 12" MAIN

**POTABLE**  
NEW 12" MAIN  
"A" ZONE

**RECLAIMED**  
EXISTING 16" DIP WATERMAIN  
PN 2-123-2001

**POTABLE**  
EXISTING 16" PVC WATERMAIN  
"A" ZONE

STA. 1+23.45, 6' RT.  
1 - 3/4" ARV PER SD 330

STA. 1+23.45, 6' RT.  
1 - 2" MODIFIED DVA PER SD 405

**CAUTION:**  
EXISTING 2" HIGH PRESSURE EL PASO  
GAS LINE THE CONTRACTOR SHALL  
CONTACT JOHN SMITH, 555-5555,  
AT LEAST 48 HOURS PRIOR TO  
CONSTRUCTION.

**CAUTION:**  
EXISTING 2" LOW PRESSURE EL PASO  
GAS LINE.

15' PUBLIC WATER EASEMENT  
BY FINAL PLAT

15' PUBLIC WATER EASEMENT  
DKT. 1234 PG. 4567

STA. 1+23.45, 6' RT.  
1 - 12" X 6" CROSS  
2 - 6" VALVES, B & C  
1 - 12" X 8" REDUCER  
1 - 8" VALVE, B & C

STA. 1+23.45, 6' RT.  
1 - 8" X 6" TEE  
1 - 6" VALVE, B & C  
13 LF 6" DIP  
1 - 6" FH  
PER SD 500

STA. 1+23.45, 6' RT.  
1 - 6" X 4" TEE  
1 - 4" VALVE, B & C  
18 LF 4" PIPE  
STUB FOR 4" FIRE SERVICE  
PER SD 340

STA. 1+23.45, 6' RT.  
EXISTING 8" CLOSED VALVE  
TO REMAIN CLOSED  
"A - B" ZONE BOUNDARY

STA. 1+23.45, 6' RT.  
1 - 8" VALVE, B & C  
CONTRACTOR TO LEAVE VALVE CLOSED  
"A - B" ZONE BOUNDARY

STA. 1+23.45, 6' RT., PASEO REDONDO =  
STA. 7+89.01, 2' LT, ALAMEDA STREET  
1 - 8" X 8" TEE  
2 - 8" VALVES, B & C

STA. 1+23.45, 6' RT.  
1" WS

STA. 1+23.45, 6' RT.  
1" SPLIT WS

STA. 1+23.45, 6' RT.  
EXISTING 3/4" WS  
METER NO. 1234567890  
1234 W. 34<sup>TH</sup> ST.  
TO REMAIN

15' PUBLIC WATER EASEMENT  
DKT. \_\_\_\_\_ PG. \_\_\_\_\_

EX. 15' PUBLIC WATER EASEMENT  
(DKT. 1234 PG. 4567)  
TO BE ABANDONED  
DKT. \_\_\_\_\_ PG. \_\_\_\_\_

**37. Stationing is accurate, with station equations if applicable**

- Provide station equations at all applicable<sup>4</sup> intersections of centerlines and at all water callouts within intersections.

<sup>4</sup> "Applicable" meaning whenever the centerline of the roadway and that of the pipe are different.

- Provide station offsets where applicable.
- Large offsets are not acceptable for lateral mains. It is preferable to provide a station equation at the point of connection and station the lateral main independently.
- CHECK ALL STATIONS FOR ACCURACY BEFORE SUBMITTING FOR REVIEW.

### **38. Dimension rights-of-way, waterlines, utilities, pavement, centerline, etc.**

- Rights-of-way
- Dimension full width of right-of-way. Dimension from edge of right-of-way to centerline. If the construction centerline differs from right-of-way centerline, label it and dimension to the centerline. If there is a section line within the right-of-way, label it and dimension to the centerline. Dimension from edge of paving to centerline. If the roadway is unpaved, label as unpaved, and dimension from the edge of the roadway to the centerline. Dimension all utilities, new and existing, to the centerline. If there are public utility easements adjacent to the right-of-way, show, label, and dimension to the edge of the right-of-way. Dimension the sidewalk from the back of curb and from the edge of the right-of-way. Dimensioning the front edge of the sidewalk to the back of the curb, and the back edge of the sidewalk to the edge of the right-of-way is critical in determining the placement of water services and fire hydrants.

Dimensions can be labeled directly on the plan or they can be provided in street section details.

All rights-of-way must be thoroughly dimensioned whether the proposed water system is to be installed along its length or the proposed water is to be connected to an existing system within the right-of-way.

- Easements  
Dimension the width of the easement (15' minimum). Dimension from the waterline to the edge of the easement (7.5' minimum). Dimension from the waterline to any other utilities, new or existing, within the easement.
- Common Areas  
Dimension the width of the common area if the sides are parallel. Dimension from the waterline to the edge of the common area (7.5' minimum). Dimension from the waterline to any other utilities, new or existing, within the common area.
- The standard location for waterlines in rights-of-way shall be 10' south or west of the centerline when possible. Refer to the Tucson Water Design Standard Manual, Section 8-08, for additional information.
- All main segments not parallel to the centerline of right-of-way, edge of easement, or edge of common area require the bearing of the main to be labeled.
- Standard utility separations shall be maintained. The standard water/sewer minimum horizontal separation is 6' without extra protection. Refer to SD 106 for specifics regarding horizontal and vertical water/sewer separations. The standard minimum horizontal separation between water mains and other utilities is 5'. Refer to the Tucson Water Design Standard Manual, Section 8-08, for specifics regarding horizontal and vertical utility/water separations.
- Inclusion of a joint use trench on a plan is contingent upon prior approval by the manager of the Tucson Water Construction Section, 791-2665. Provide written authorization to the design reviewer. If the proposed joint use trench differs from SD 108, a special detail shall be added to the water plan.
- All gas lines crossing or in the vicinity of new water construction require a special "caution" note. See #36 above for an example.

### **39. Special details**

- The most common special details added to water plans are street sections and drainage crossing details.
- Tucson Water SD 107, "Drainage Facilities Crossing Details", is obsolete and not acceptable for water projects.
- Water mains above drainage structures with the standard depth of cover and the required 1' minimum vertical separation and which do not require vertical bends to accomplish the crossing do not require a drainage crossing detail. The elevation of the bottom of water and the top of drainage structure as well as the vertical separation shall be called out.
- All other drainage crossings require a special detail. Examples of acceptable drainage crossing details are available from Tucson Water, New Development, 791-4718.

### **40. Erase behind lettering, symbols, and other pertinent information**

- Erase behind all lettering, symbols, and note boxes.
- Do not break new mains for lettering or dimensions.
- Locate all notes, dimensions, lot numbers, street names, etc..., in a manner that does not obscure any part of the new water system or other pertinent feature of the plan.
- All lettering shall read from the bottom or right side of the sheet.

## ADDITIONAL COMMENTS

- There shall be no line work on the plan that is not clearly identified. Remove from the plan all linework and notes that are not applicable to the project.
- All plans are subject to additional requirements specific to the water project.
- Please be aware, PC-DEQ plan review is required for most water plans prior to construction. PC-DEQ has been mandated by the state of Arizona to review for compliance to all plan requirements per all authorizing agencies. Any errors on the plan, regardless of how minor, may result in PC-DEQ declining issuance of "Approval To Construct", thus requiring a formal plan revision to bring the plan into compliance before the project can proceed. Check your work prior to submittal to avoid delays.

### Revisions:

05/04/2009 — Updated to current practice.

In "ITEMS TO BE SUBMITTED WITH PLAN" #1, Added the requirement for the P.E. stamp, moved from another location and consolidated with the expiration date rule.

In "ITEMS TO BE SUBMITTED WITH PLAN" #3, deleted the requirement for a 2" margin, as this applies to the dedication page of easements only.

In "ITEMS TO BE ADDRESSED ON PLAN" #1, explicitly required that drawing formats comply with current standards.

In "ITEMS TO BE ADDRESSED ON PLAN" #3, changed the term "location plan" to "location map" to provide consistency with adjacent instructions. Enhanced instructions about "source of data".

In "ITEMS TO BE ADDRESSED ON PLAN" #17, added and refined instruction about representing paving and obstructions on plans. The changes reflect intent to eliminate clutter from plans and to provide improved guidance for the treatment of private water lines.

In "ITEMS TO BE ADDRESSED ON PLAN" #28, modified text to match the language of the corresponding design standard (8-08).

In "ITEMS TO BE ADDRESSED ON PLAN" #33, changed "main" to "station line" in order to correctly station water services when the main and the station line are not parallel.