MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 0209, INSTALLATION OF WATERLINES

0209.0302 Material Delivery and Storage.

ADD THE FOLLOWING:

All pipe, fittings and accessories shall be handled in a manner that will ensure installation in a sound, undamaged condition. Equipment, tools and methods used in handling and installing pipe and fittings shall not damage the pipe and fittings. Pipe and fittings in which the lining has been damaged shall be replaced. With written permission from the Engineer, small and readily accessible damaged areas or manufacturing imperfections may be repaired per the manufacturer's recommendations.

All pipe coating and polyethylene wrap, which has been damaged, shall be repaired by the Contractor before the pipe is installed.

0209.0303 Sequence.

MODIFY PARAGRAPH ONE AS FOLLOWS:

Change '24"' to '12"'.

0209.0307 Water Shutoffs.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

The Contractor is required to coordinate all requests for valve closure with the MDWID Inspector. The Contractor shall provide MDWID with a written schedule of all planned interruptions in service a minimum of 5 days prior to the said interruption. The Contractor shall notify all affected water users as determined by MDWID in writing, on MDWID forms, a minimum of 48 hours prior to the planned interruption unless otherwise specified by MDWID. Said notification shall include time of water shutoff, duration of outage, and Contractor's name and phone number that may be accessed 24 hours a day for the purpose of addressing inquiries from affected water users.

In the event of damage to an existing water main, the Contractor shall immediately notify MDWID. MDWID personnel shall operate all valves necessary to effect repairs. Repairs to existing water mains shall be performed by MDWID personnel unless otherwise authorized. When authorized by MDWID, emergency repairs made by the Contractor shall be performed under the supervision of MDWID and shall continue non-stop until water service is restored. If the Contractor is responsible for damage to existing water mains, repairs shall be at the Contractor's sole expense.

0209.0309 Trench Excavation.

(1) Trenches.

ADD THE FOLLOWING TO THE FIRST PARAGRAPH:

Blasting will not be permitted.

ADD A PARAGRAPH AS FOLLOWS:

Restoration of Wash Surfaces: The contractor shall restore all excavations in wash beds (as shown on the drawings or as required by these specifications) to original conditions. The top 18" of the excavation in the wash shall be backfilled with native soil and blended with adjacent soil to eliminate any weak spot for erosion. The wash bed shall be resurfaced to original condition. In addition, all excavations in paved or unpaved drainage ways, as shown on the drawings or required by these specifications, shall be restored to original condition or better.

(3) Surplus Material.

CHANGE PARAGRAPH ONE AS FOLLOWS:

Unless otherwise indicated on the project plans or specified in the special specifications, surplus excavated material shall be removed from the job site and disposed of by the contractor in a manner approved by the Engineer and in accordance with the requirements found in Pima County/City of Tucson Standard Specifications for Public Improvements Section 0107.

Shortages of material caused by the disposal of any material by the contractor before fill quantities are satisfied shall be replace at the contractor's expense.

(c) Obstructions.

REMOVE THIS SECTION:

0209.0310 Bedding Material.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Imported pipe bedding/shading material shall be sourced from washed materials and meet the following sieve analysis and plasticity requirements**:**

Sieve Size	Percent Passing
1 inch	100

#4	60-100
#200	0 - 10

Max. P.I. = 5
Max L.L. = 30

All sieve analysis shall be certified and submitted to the Owner prior to the start of construction.

Bedding/shading material deemed as unsuitable by the project inspector will be tested. Material that fails to meet the above requirements shall be removed and replaced at the contractor's expense. No bedding/shading material shall be placed until replacement material is accepted by the engineer. Contractor shall provide proof of compliance in the form of certification by an independent testing facility at contractor's expense.

(A) Placement of Bedding/Shading Material.

Pipe sizes 12" diameter and smaller shall be installed on a minimum 4-inch thickness of bedding material. Pipe sizes greater than 12" diameter shall be installed on a minimum 6-inch thickness of bedding material.

Bedding/shading material shall be placed under, around, and over the pipe to an elevation of 1-foot above the top of the pipe after compaction. Bedding/shading material shall be place in a manner which will prevent distortion, damage to, or displacement of the pipe from its intended location. Bedding/shading material shall also be placed and water settled so that adequate support will be provided in the haunch areas of the pipe. Bedding thickness shall be measured after installation of pipe.

The bedding/shading material shall be placed in a minimum of three (3) lifts, from the bottom of the trench to 12-inches above the top of the pipe. Each lift shall be compacted to 90% of the dry density, determined in accordance with Arizona Test Methods 225, 226, 230 or 231, and 232. Compaction of the bedding/shading material shall be accomplished in a manner, which will prevent displacement of the pipe and damage to the joint and fittings. Water jetting is <u>not</u> allowed.

(B) Placement of CLSM as bedding material in the pipe zone.

No CLSM material may be used as bedding/shading material unless as specifically called for on the project plans or as approved by the Engineer.

Placement of CLSM as bedding/shading material shall conform to Tucson Water Standard Specification 0209.0310 (B).

0209.0311 Installation.

(A) General.

REMOVE PARAGRAPH FOUR AND FIVE AND REPLACE WITH THE FOLLOWING:

Underground water installations shall have a minimum of 44 inches of cover from final grade except as otherwise noted on the approved construction drawings.

Water mains installed within existing right-of-way shall be installed with a minimum of 60 inches cover from the final grade, or as otherwise noted on the approved construction drawings. All underground water mains shall be located a minimum of 24 inches below any existing or proposed drainage structure, except where Pima County Standard Detail 600 pertains to the proposed work.

ADD THE FOLLOWING AS PARAGRAPH SEVEN:

Design of pipe sizes 12" diameter and larger shall include line and grade profile. Installation of pipe sizes 12" and larger shall be in accordance with line and grade profile as indicated on project plans.

0209.0312 Cutting of Pipe.

REMOVE PARAGRAPH FOUR:

0209.0313 Connections.

ADD THE FOLLOWING TO PARAGRAPH ONE:

Connections or tie-ins between new work and existing piping shall be made using fittings suitable for the conditions encountered. Each connection or tie-in with an existing pipe shall be made at a time and under conditions which will least interfere with service to customers, and as authorized by the Owner. No tie-in between new work and existing piping shall be made before the new work has been disinfected, tested, and accepted by the Owner. Facilities shall be provided by the Contractor for proper dewatering of existing piping prior to making the connection or tie-in and for disposal of all water removed from the dewatered lines without damage to adjacent property or excavations. Special care shall be taken to prevent contamination when dewatering, cutting into and making a connection or tie-in with an existing potable water piping. Trench water, mud or other contaminating substances shall not be permitted to enter the lines. The cost of labor and materials required for connections or tie-ins shall be included in the price bid for installing the water mains.

ADD THE FOLLOWING TO PARAGRAPH TWO:

The Contractor shall bleed off residual pressure in existing waterlines prior to disturbing any restraints. The Contractor shall be responsible for dewatering existing waterlines prior to making connections.

0209.0316 Backfilling.

Materials

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

Pima County/City of Tucson Standard Specifications for Public Improvements (2003 Edition or Current Edition), Section 923, Utility Installations within Public right-of-Way except for the following modifications:

923 – 3.07 Trench Backfill

ADD THE FOLLOWING:

The Contractor must provide evidence that the material meets current compaction requirements. Testing must be in accordance with the following schedule or as directed by the jurisdictional authority.

A minimum of one (1) test is required per 500 feet of trenching length or a portion thereof, per every three (3) feet of trench depth or portion thereof. The Engineer, designated representative, or jurisdictional authority may require additional tests anywhere within the backfill prism.

(C) Utility Locations and Separations.

REMOVE THS SECTION AND REPLACE WITH THE FOLLOWING:

Utilities encountered during construction may cross and/or run parallel to proposed water lines. In general, the locations of existing and proposed relocations of major utilities aboveground and underground are indicated on the Plans. This information has been obtained from utility maps, field survey work and from descriptions provided by the various agencies involved, and represents the best information available. Existing and proposed utility locations are shown on the Plans for design purposes only. It is to be understood that other facilities not shown on the Plans may be encountered during the course of the work.

Under State Law (ARS 40-360-21) the Contractor is required to contact all utilities in order to determine the locations of their respective utilities prior to any excavation. The Contractor is responsible for any damages to existing utilities and will make any necessary repairs at his expense. The Contractor shall brace and/or support existing utilities, including traffic signal poles, as necessary to protect the existing facility from disturbance/damage.

The Contractor shall contact Blue Stake two (2) working days prior to any excavation or construction in the vicinity of existing facilities or utility poles. The Contractor shall contact Tucson Electric Power Company at least ten (10) working days prior to excavation within ten (10) feet of any power pole. Tucson Electric Power Company shall provide relocation or bracing of said pole. Any required utility relocation shall be accomplished in cooperation with and to the satisfaction of the company or agency having jurisdiction over the particular utility. The Contractor is responsible for all costs associated with any utility relocation and/or bracing.

The Contractor shall contact the representative of all utility companies to coordinate any of the Contractor's work that may involve a specific utility and the Contractor shall coordinate his operations with the utility to facilitate the satisfactory completion of the work.

(1) Electric.

REMOVE AND REPLACE PARAGRAPH TWO WITH THE FOLLOWING:

The use of joint trenches is not authorized.

(2) Storm Drain Culvert.

MODIFY THIS SECTION AS FOLLOWS:

The minimum vertical separation between the water main and storm drain culverts shall be per Pima County Standard Detail SD-600.

0209.0317 Testing and Chlorination.

REMOVE THIS SECTION AND REPLACE WITH THE FOLLOWING:

All new waterline installations shall be subject to testing and chlorination in accordance with these specifications. After the installation of all pipe, specified fittings, valves, hydrants, service lines and thrust restraints, the following procedure shall be followed to provide a basis of acceptance of all new work:

1. Preliminary Flushing
2. Disinfection
3. Final Flushing
4. Microbiological Testing
5. Hydrostatic Pressure Test

The above testing and chlorination procedure may be modified as follows if the final connection(s) between the existing and new water system are not yet made and the new water line is capped adjacent to the final connection point:

1. Preliminary Flushing
2. Hydrostatic Pressure Test
3. Disinfection
4. Final Flushing
5. Microbiological Testing
6. New Waterline Pipe Connection to Existing Water System

In the event that the alternative testing and chlorination procedure is followed, all appurtenances required to make the connections(s) to the existing water system shall be swabbed or sprayed internally with a 1 percent calcium hypochlorite and water mixture. The new water line pipe connection(s) to the existing water system shall remain exposed until inspected for leaks.

An explanation of each procedure step follows:

(1) Preliminary Flushing. The new water line shall be slowly filled with potable water and all air shall be vented from the pipeline. The water line, hydrants and appurtenances shall be flushed at a minimum mean main velocity of at least 2.5 fps for a period of 60 seconds per 100 foot length of the section of the work being flushed. In areas where the existing system will not produce the required mean velocity, the minimum mean velocity shall be achieved for a commensurately longer duration as directed by the Engineer. All flushing water shall be disposed of in a manner that meets all local, state and federal requirements.

(2) Disinfection. Disinfection shall be performed in accordance with the provisions of the latest revisions of the Arizona Department of Health Services Engineering Bulletin No. 8, except as modified herein.

(A) Concentrated chlorine solution shall not enter any part of the existing system. All new work, including mains, hydrants and appurtenances shall be disinfected.

(B) The preferred point of application of the concentrated chlorine solution is at a newly installed fitting closest to the fill source or through a corporation stop installed near the fill source specifically for the disinfection purposes. If no existing fitting is present at this location, the Contractor may install a temporary fitting at its own cost, or find another fill source alternative.

(C) The method of chlorination shall be the general continuous feed method. The tablet method of chlorination shall not be accepted. The chlorine concentration shall be maintained at a minimum of 50 mg/l (50 ppm) of available chlorine in all portions of the new work being disinfected during the application period.

(D) The retention period shall be 24 hours. At the end of this 24 hour period, the disinfection solution shall contain not less than 10 mg/l (10 ppm) of available chlorine in all portions of the new work being disinfected.

(3) Final Flushing. At the end of the retention period, as approved by the Engineer, the heavily chlorinated disinfection solution shall be flushed from all parts of the new work. All flushing water shall be disposed of in a manner that meets all local, state, and federal requirements.

(A) Final flushing shall be performed in accordance with the Procedures described in Item (1) Preliminary Flushing, above, except that all main line valves shall be operated throughout their range and be shown to be tight closing during the final flushing.

(B) Final flushing shall continue until chlorine concentration of the flushing water being discharged from all points in the new work is equivalent to the chlorine level of flushing water supply or is less than 1 mg/l (1 ppm).

(C) Service lines shall be thoroughly flushed prior to meter installation.

All flushing shall be disposed of in a manner that meets all local, state and federal requirements.

(4) Microbiological Testing. After final flushing and before the new work is accepted, microbiological test(s) shall be obtained by MDWID and shall show the absence of coliform organisms (no coliform organisms shall be detected in any samples).

Microbiological testing of production facilities as well as pipelines shall be required.

Failure of initial microbiological test(s) will require repeated chlorination, flushing and microbiological testing at the Contractor's sole expense.

(5) Hydrostatic Pressure Testing. Testing shall be performed in accordance with Tucson Water Standard Specification No. 1431, except as modified by the MDWID Modification to the Tucson Water Standard Specification No. 1431, Hydrostatic Pressure Testing of Water Facilities.

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The Contractor shall provide all vents, piping, plugs, bulkheads, valves, bracing, blocking, pump and all other equipment for making the tests. Hydrostatic pressure testing shall not be conducted against existing valves unless authorized by the Engineer. MDWID pressure gages shall be used to conduct the test. The test will be conducted after backfilling, unless the Contractor can provide acceptable means (in addition to restraint requirements specified in the plans) to ensure the integrity of the pipe during the test.

Failure of the hydrostatic pressure test(s) may require repeated chlorination, flushing and microbiological testing at the Contractor's sole expense.