MODIFICATION TO TUCSON WATER STANDARD WATERWORKS SPECIFICATION NO. 1402, CONCRETE CYLINDER PIPE

1402.0201 Materials.

(A) Concrete Cylinder Pipe.

ADD THE FOLLOWING TO PARAGRAPH ONE:

Rubber gaskets shall comply with the requirements of Sections 2.8 and 3.4 of AWWA C303.

(B) Pressure Requirements.

REMOVE PARAGRAPH TWO AND REPLACE WITH THE FOLLOWING:

The design pressure for the concrete cylinder pipe and appurtenances shall be as shown on the approved plans. Hydrostatic pressure testing shall be in accordance with Section 1431, except the test pressure shall equal the design pressure at the lowest point in the section being tested. All pipe and fittings shall be designed to withstand a full vacuum. The Contractor shall pressure test all new work.

(C) External Load Considerations.

REMOVE PARAGRAPH ONE AND REPLACE WITH THE FOLLOWING:

Pipe deflection under the external load shall not exceed $D_2/4000$, where D is the nominal pipe diameter. External loads shall be calculated using a transition width trench plus H-20 traffic loading. The unit weight of the backfill material shall be 120 pounds per cubic foot and the Kμ' soil factor shall be 0.150. The ring deflection shall be calculated from "Spangler's Formula" using a deflection lag factor D_1 of 1.25, a bedding constant K of 0.100, a soil modulus E' of 400 psi, and a settlement projection ratio of 0.3.

ADD THE FOLLOWING AS ITEM (E):

(E) Fittings.

Steel casings for fittings shall conform to the Specifications for Mild-to-Medium-Strength Carbon-Steel Castings for General Application, Grade 70-36, Normalized" (ASTM Designation A27) and AWWA C208.

Dimensions for fabricated steel water pipe fittings shall comply with the requirements of AWWA C208.

SECTION 1402

1402.0301 General.

ADD THE FOLLOWING TO PARAGRAPH ONE:

Flanges shall be AWWA Standard Steel Ring Flanges rated at a pressure class equal to or greater than the pressure class of the pipe and shall conform to AWWA C207. It shall be the Contractor's responsibility to be certain that all flanges used in the pipeline are compatible with flanges used in the valves, particularly relevant to bolt patterns, diameters, drilling patterns, and proper lengths. Bolts and nuts shall be ASTM 325 hex head. Provide special thickness steel cylinder section (12" and 48" long), either side of flanges where bolted to valves.

1402.0302 Installation.

ADD THE FOLLOWING AS ITEM (F):

(F) Joints.

Inside Joint Recess – 24" Diameter and Larger
After the pipe bedding and backfill have been compacted, the inside joint recess of the pipe shall first be moistened, then filled and pointed with a stiff cement mortar, consisting of 1 part cement to 1 ½ parts of sand. The finished joint shall be smooth and flush with the adjacent pipe surfaces. Interior joint pointing operations shall not be conducted within two joints of pipe laying operations.

Exterior Joint Recess
After joining pipe, a plastic or cloth band at least eight inches (8") in width shall be centered and secured over the exterior joint recess. The band shall be bound to the pipe by the use of steel box strapping or by an equivalent method and shall completely and snugly encase the outside joint except for an opening near the top, where mortar grout is to be poured in to the joint recess per AWWA M9. After the band is properly secured, the joint recess shall be moistened with water and then filled with mortar consisting of one part Portland cement and two parts of sand mixed with water to the consistency of thick cream. The mortar grout shall completely fill the outside annular space between the ends of the pipe and around the complete circumference. After the recess has been filled, the opening shall be closed and the mortar allowed to set before bedding and backfill is placed above the bottom of the pipe per AWWA M9.

ADD THE FOLLOWING AS ITEM (G):

(G) Polyethylene Encasement.

All concrete cylinder pipe, including valves and fittings, shall be encased in

polyethylene in accordance with ANSI A21.5 (AWWA C-105, Polyethylene Encasement for Ductile Iron Pipe Systems).

ADD THE FOLLOWING AS ITEM (H):

(H) Inspection.

After the interior joint space of the concrete cylinder pipe (CCP) has been pointed with cement mortar, the interior of the pipeline shall be carefully inspected by closed circuit television (CCTV) and videotaped to determine the condition of the pointed joint and any other potential flaw in the interior of the pipe. The CCTV videotaping shall be reviewed by experienced personnel trained in the workmanship of the completed mortared joint. A submittal verifying the experience level of the camera operator and crew shall be provided to MDWID. Any condition that requires repair shall re-televised and videotaped to document its final condition following any necessary repair. The distance of the camera from a known point shall be continuously displayed on the video. A color videotape and suitable CCTV log shall be submitted to MDWID following final inspection.

The inspection camera shall be specifically designed to provide a close-up view of the pipe walls through the planning and rotation of the camera head from a remote control console. The camera unit shall provide a color picture and shall be capable of operation through a minimum of 1200 lineal feet of pipeline. A transportation skid assembly and adequate lighting shall be utilized to provide the best viewing possible. A television-viewing monitor shall be available on site to allow MDWID personnel to view the interior of the pipe during the television inspection.

Prior to its use, the inspection camera and auxiliary equipment shall be thoroughly sanitized, and written documentation submitted detailing procedures followed.