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| Version | Date | Description of Revisions |
| 1 | August 30 2006 | Approved final document. |
| 2 | August 11, 2014 | First draft review comments (AV) |
| 3 | June 8, 2015 | Second Draft for Review (AV) |
| **4** | **September 16, 2015** | **Updated, Finalized Specification – Reference eDOCS #5823655-v4 (AV)** |
| **5** | **May 23, 0217** | **Updated references to standards** AWWA C104/A21.4-16, AWWA C606-15, **ASME B16.1-2015,** ANSI B16.21-2016, ASTM D1330-04(2015) (AAM) |
| 6 | August 15, 2017 | Removal of specified products (CPD PMO, OMM) |

NOTE:

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**The on-line copy is the current version of the document.**

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| Item | Description |
| Pipe | 1. Buried Liquid Service Using Push-On, Mechanical, or Proprietary Restrained Joints: AWWA C111/A21.11-12, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings and AWWA C151/A21.51-09, Ductile-Iron Pipe, Centrifugally Cast pressure class conforming to Tables 5 and 7 for Type 4 trench, 1,700 kPa minimum working pressure. Follower glands shall be ductile iron. 2. Buried Fuel Gas or Air Service Using Push-On, Mechanical, or Proprietary Restrained Joints: in accordance with AWWA C151/A21.51-09, Tables 5 and 7 for Type 4 trench, 1,700 kPa minimum working pressure. Follower glands shall be ductile iron. 3. Exposed Pipe Using Grooved End and Flange Joints: AWWA C115/A21.15-11, Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges, thickness Class 53 minimum, 1,700 kPa minimum working pressure. |
| Lining | 1. Asphaltic: AWWA C104/A21.4-16, Cement-Mortar Lining for Ductile-Iron Pipe and Fittings. 2. Cement-Mortar: AWWA C104/A21.4-13. 3. Glass: Completely fused above 760 degrees Celsius, 0.15 to 0.25 mm thick, defects which expose base metal not greater than 0.01 percent of total lined surface, hardness greater than 5 on the Mohs scale, lining bonded sufficiently to withstand a metal strain of 0.025 mm/mm without damage to the glass lining, finished lined pipe not to deviate more than 1.0417 metre per 0.3048 m ([ ]feet) of length from a centreline perpendicular to the flange face or square end of the pipe. |
| Fittings | 1. Lined and coated same as pipe. 2. Push-On: AWWA C110/A21.10-12 and C111/A21.11-12, gray or ductile iron, 1700 kPa minimum working pressure. 3. Mechanical: AWWA C110/A21.10-12, C111/A21.11-12, and C153/A21.53-11 gray or ductile iron, 1700 kPa minimum working pressure. Follower glands shall be ductile iron. 4. Proprietary Restrained: AWWA C111/A21.11-12 and C153/A21.53-11, ductile iron, 1700 kPa minimum working pressure. 5. Grooved End: AWWA C606-15 and C110/A21.10-12, ductile iron, 1700 kPa minimum working pressure. Victaulic. 6. Flange: AWWA C110/A21.10-12 ductile iron, faced and drilled, Class 150 flat face **[or ASME B16.1-2015, Class 250 raised face]**. Gray cast iron will not be allowed. |
| Joints | 1. Push-On: 1700 kg minimum working pressure, AWWA C110/A21.10-12 and C111/A21.11-12. 2. Mechanical: 1,700 kPa minimum working pressure. 3. Proprietary Restrained: 1,050 kPa minimum working pressure. 4. Grooved End: Rigid type radius cut conforming to AWWA C606-11, 1,700 kPa minimum working pressure. Victaulic. 5. Flange: Class 150 flat face, [or Class 250 raised face,] ductile iron, threaded conforming to the requirements of AWWA C115/A21.15-11. Gray cast iron will not be allowed. 6. Branch connections 80 mm and smaller, [except from glass-lined pipe,] shall be made with service saddles as specified in Section 15205 - Process Piping Specialties. [Branch connections, 80 mm and smaller from glass-lined pipe, shall be made with a glass-lined tee with a flanged branch for adapting to the branch piping.] |
| Couplings | 1. Grooved End: 1,700 kPa minimum working pressure, malleable iron in accordance with ASTM A47/A47M-99(2014) or ductile iron in accordance with ASTM A536-84(2014). 2. Grooved End Adapter Flanges: 1,700 kPa minimum working pressure, malleable iron per ASTM A47/A47M-99(2014) or ductile iron in accordance with ASTM A536-84(2014). 3. Acceptable Manufacturers: Victaulic Company couplings or Approved Equivalent. |
| Bolting | 1. Mechanical, Proprietary Restrained, and Grooved End Joints: Manufacturer's standard. 2. Class 150 Flat-Faced Flange: ASTM A307-14, Grade A carbon steel hex head bolts and ASTM A563-07a(2014), Grade A carbon steel hex head nuts. 3. **[Class 250 Raised-Face Flange: ASTM A307-14, Grade B carbon steel hex head bolts and ASTM A563-07a(2014), Grade A carbon steel heavy hex head nuts.]** |
| Gaskets | 1. Push-On, Mechanical, and Proprietary Restrained Joints: Rubber conforming to the requirements of AWWA C111/A21.11-12. 2. Grooved End Joints: Halogenated butyl conforming to the requirements of ASTM D2000-12 and AWWA C606-15. 3. Flanged, Water and Sewage Service: 3 mm, red rubber (SBR), hardness 80 (Shore A), rated to 930 degrees C, conforming to the requirements of ANSI B16.21-2016, AWWA C207-13, and ASTM D1330-04(2015), Grades 1 and 2. 4. Flanged, Hot Air, and Fuel Gas Service: 3 mm thick, homogeneous black rubber (EPDM), hardness 60 (Shore A), rated to 150 degrees Celsius, conforming to the requirements of ANSI B16.21-2016 and ASTM D1330-04(2015) Steam Grade. 5. Full face for Class 150 flat-faced flanges, flat-ring type for Class 250 raised-face flanges. Blind flanges shall be gasketed covering the entire inside face with the gasket cemented to the blind flange. 6. Gasket pressure rating shall equal or exceed the system hydrostatic test pressure. |
| Joint Lubricant | Manufacturer's standard. |

**END OF SECTION**