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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | August 12, 2014 | First draft review (AV) |
| 3 | June 8, 2015 | Second Draft for Review (AV) |
| 4 | **September 16, 2015** | **Updated, Finalized Specification – Reference eDOCS #5823658-v4 (AV)** |
| 5 | May 23, 2017 | Updated references to standards ANSI/ASME B16.1-2015, ANSI/ASME B16.3-2016, ASME B16.21-2016, ASTM A106/A106M-15, ASTM A197/A197M-00(2015), ASTM A563-15, ASTM D1330-04(2015)e1, AWWA C606-15 (AAM) |
| 6 | July 4, 2017 | Updated references to standards ASTM A234/A234M-16, ASTM A307-14e1 (AAM) |

NOTE:

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| **Item** | **Size** | **Description** |
| Pipe | All | Black carbon steel, ASTM A106/A106M-15, Grade B seamless or ASTM A53/A53M-12, Grade B seamless or by Electric Resistance Welding. Threaded, butt-welded, grooved end, and flanged joints: |
|  | Screwed: |  |
|  | 50 mm & smaller | Schedule 80. |
|  | Welded: |  |
|  | 60 mm thru 250 mm | Schedule 40. |
|  | 300 mm thru 400 mm | Schedule 30. |
|  | 450 mm thru 600 mm | Schedule 20. |
| Grooved: |  |
|  | 60 mm thru 150 mm | Schedule 40. |
|  | 200 mm thru 300 mm | Schedule 30. |
|  | 350 mm | Standard weight. |
| Joints | 50 mm & smaller | Threaded or flanged at valves and equipment or grooved end meeting the requirements of AWWA C606-15. |
|  | 60 mm & larger | Butt-welded or flanged at valves and equipment, or grooved end meeting the requirements of AWWA C606-15. |
| Fittings | 50 mm & smaller | Threaded: 68- or 2070kpag malleable iron, ASTM A197/A197M-00(2015) or ASTM A47/A47M-99(2014), dimensions in accordance with ANSI/ASME B16.3-2016. Fire sprinkler fittings to be UL/ULC listed. |
| Grooved End: Malleable iron ASTM A47/A47M-99(2014) or ductile iron ASTM A536-84(2014), grooved ends to accept couplings without field preparation.  Approved product:   1. Victaulic Company 2. Tyco International; Grinnell 3. Approved Equivalent. |
| Fittings | 60 mm & larger | Butt Welded: Wrought carbon steel butt- welding, ASTM A234/A234M-16, Grade WPB meeting the requirements of ANSI/ASME B16.9-2012; fitting wall thickness to match adjoining pipe; long radius  elbows unless shown otherwise on the Drawings. |
| Grooved End: Malleable iron ASTM A47/A47M-99(2014) or ductile iron ASTM A536-84(2014), grooved ends to accept couplings without field preparation.  Approved products:   1. Victaulic Company 2. Tyco International; Grinnell 3. Approved Equivalent |
| Branch Connections | 50 mm & smaller | Threaded, straight, or reducing tees in conformance with Fittings specified above. |
|  | 60 mm & larger | Butt-welding or grooved end tee in conformance with Fittings specified above. |
| Flanges | 50 mm & smaller | Forged carbon steel, ASTM A105/A105M-14, Grade II, ANSI/ASME B16.5-2013 Class 150 or Class 300 socket-weld or threaded, 1.5 mm raised face. |
|  | 60 mm & larger | Butt-Welded Systems: Forged carbon steel, ASTM A105/A105M-14, ANSI/ASME B16.5-2013 Class 150 or Class 300 slip-on or welding neck, 1.5 mm raised face; weld neck bore to match pipe internal diameter. Use weld neck flanges when abutting butt-weld fittings. |
| Grooved End Adapter Flange: Malleable iron ASTM A47/A47M-99(2014) or ductile iron ASTM A536-84(2014). Approved products:   1. Victaulic Company 2. Tyco International, Grinnell 3. Approved Equivalent. |
| Cast Iron Mating Flange: AWWA C207-13, Class D or E, hub or ring type, ANSI/ASME B16.1-2015, 862kpag drilling, AWWA C207-13 Class F hub type or ASTM A105/A105M-14, ANSI B16.5-2013 Class 2,070 kPag, drilling. |
| Unions | 50 mm & smaller | Threaded malleable iron, ASTM A197/A197M-00(2015) or ASTM A47/A47M-99(2014), 1,035 or 2,070 kPag WOG, meeting the requirements of ASME B16.3-2016. |
| Couplings | 60 mm & larger | Grooved End: Rigid joint malleable iron, ASTM A47 or ductile iron, ASTM A536-84(2014). Approved products:  1. Victaulic Company  2. Tyco International, Grinnell  3. Approved Equivalent. |
| Screwed End: Malleable iron, ASTM A197/A197M-  00(2015) or ASTM A47/A47M-99(2014). |
| Bolting | All | Flanges: Carbon steel ASTM A307-14e1, Grade A hex head bolts and ASTM A563-15 Grade A hex head nuts. Use 3mm undersize bolting material for insulating flanges. |
| Grooved End Couplings: Carbon steel, ASTM A183-14 bolts and nuts, 758,620 kPa minimum tensile strength. |
| Gaskets | All flanges | Water, Steam, and Air Services: 1.5 mm thick, compressed inorganic fiber with nitrile binder, rated to 371 degrees Celsius and 6900 kPa. |
| Fuel Gas Service: 3 mm thick, homogeneous black rubber (EPDM), hardness 60 (Shore A), rated to 150 degrees C, conforming to ASME B16.21-2016 and ASTM D1330-04(2015)e1, Steam Grade. |
| Blind flanges shall be gasketed covering the entire inside face with the gasket cemented to the blind flange. |
| Grooved Couplings: EPDM in accordance with ASTM D2000-12 for water and air to 110 degrees Celsius, nitrile for oil service to 82 degrees Celsius. |
| Thread Lubricant | 50 mm & smaller | General Service: Teflon tape. |

**END OF SECTION**