STANDARD SPECIFICATION
SECTION 15050 GENERAL PIPING REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes the general requirements for selecting bolts, nuts, washers, and gaskets for flanges used in the various piping services in the Standard Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Standard Drawings.

B. Record Drawings and Submittals: STD SPEC 01300.

C. Painting and Coating: STD SPEC 09900.

D. Cold Applied Wax Tape Coating: STD SPEC 09952.

E. Polyethylene Sheet or Tube Encasement: STD SPEC 09954

1.03 SUBMITTALS

A. Submit submittal packages in accordance with Standard Specification Section 01300.

B. Submit affidavit of compliance with referenced standards (e.g., AWWA, ANSI, ASTM, etc.).

C. Submit certified copies of mill test reports for bolts and nuts, including coatings if specified. Provide recertification by an independent domestic testing laboratory for materials originating outside of the United States.

D. Submit manufacturer's data sheet for gaskets supplied showing dimensions and bolting recommendations.

PART 2 - MATERIALS

2.01 THREAD FORMING FOR STAINLESS STEEL BOLTS

Form threads by means of rolling, not cutting or grinding.

2.02 BOLTS AND NUTS FOR STEEL OR DUCTILE IRON FLANGES

A. Bolts and nuts for Class 150 flanges (including AWWA C207, Class E) located indoors; outdoors above ground; in vaults and structures; or where buried and wrapped with polyethylene material shall be carbon steel, ASTM A 307, Grade B.

B. Bolts and nuts for AWWA C207 Class F flanges and ANSI B16.5 and B16.47 Class 300 flanges located indoors; outdoors above ground; in vaults and structures; or where buried

and wrapped with polyethylene material shall conform to ASTM A 193, Grade B7, with nuts conforming to ASTM A 194, Grade 2H.

C. Bolts and nuts for Class 150 flanges and Class E flanges exposed to water or in direct contact with earth shall be Type 316 stainless steel conforming to ASTM A 193, Grade B8M, for bolts and ASTM A 194, Grade 8M, for nuts.

D. Bolts and nuts for Class 300 flanges and class F flanges exposed to water or in direct contact with earth shall be Type 316 stainless steel conforming to ASTM A 193, Grade B8M, Class 2, for bolts and ASTM A 194, Grade 8M, for nuts.

E. Bolts used in flange insulation kits shall conform to ASTM A 193, Grade B7. Nuts shall conform to ASTM A 194, Grade 2H.

F. Provide washers for each nut. Washers shall be of the same material as the nuts.

2.03 BOLTS AND NUTS FOR FLANGES USED IN COPPER PIPE OR TUBE

A. When both aboveground or buried adjoining flanges are bronze, use bronze bolts and nuts. Bolts shall conform to ASTM F 468, Grade C65100 or C63000. Nuts shall conform to ASTM F 467, Grade C65100 or C63000.

B. When only one of the aboveground adjoining flanges is bronze, use Type 316 stainless steel bolts and nuts conforming to ASTM A 193, Grade B8M for bolts and ASTM A 194, Grade 8M for nuts.

C. Connect to buried ferrous flanges with flange insulation kits. Bolts used in flange insulation kits shall conform to ASTM B 193, Grade B7. Nuts shall comply with ASTM A 194, Grade 2H. If the adjoining buried flange is bronze, use bronze bolts and nuts as described above, without a flange insulation kit.

D. Provide washers for each nut. Washers shall be of the same material as the nuts.

2.04 LUBRICANT FOR STAINLESS STEEL BOLTS AND NUTS

Lubricant shall be chloride free and shall be TRX-Synlube by Ramco, Anti-Seize by Ramco, Husk-It Husky Lube O'Seal, or District approved equal.

2.05 GASKETS FOR FLANGES USED IN STEEL PIPING FOR WATER SERVICE

Gaskets for flat face and raised face flanges shall be 1/8-inch thick and shall be one of the following nonasbestos materials:

A. Cloth-inserted rubber with a Shore "A" hardness of 75 to 85. Gaskets shall be suitable for a working pressure of 200 psi at a temperature of 180°F. Products: Garlock Style 19 or District approved equal.

B. Acrylic or aramid fiber bound with nitrile. Products: Garlock "Bluegard," Klinger "Klingersil C4400," or District approved equal. Gaskets shall be suitable for a pressure of 500 psi at a temperature of 400°F.

2.06 GASKETS FOR FLANGES USED IN STEEL PIPING FOR SEWAGE SERVICE

Gaskets shall be full face, 1/8-inch thick, and shall be one of the following nonasbestos materials:

A. Buna-N having a hardness of 55 to 65 durometer. Gaskets shall be suitable for a working pressure of 200 psi at a temperature of 180°F. Products: Garlock Style 9122 or District approved equal.

B. Acrylic or aramid fiber bound with nitrile. Products: Garlock "Bluegard," Klinger "Klingersil C4400," or District approved equal. Gaskets shall be suitable for a water pressure of 500 psi at a temperature of 400°F.

2.07 GASKETS FOR FLANGES USED IN DUCTILE-IRON PIPING AND FITTINGS FOR WATER SERVICE

Gaskets shall be full face, 1/8-inch thick, cloth-inserted rubber, with a Shore "A" hardness of 75 to 85. Gaskets shall be suitable for a working pressure of 200 psi at a temperature of 180°F. Gaskets shall have "nominal" pipe size inside diameters not the inside diameters per ANSI B16.21. Products: Garlock Style 19 or District approved equal.

2.08 GASKETS FOR FLANGES USED IN DUCTILE-IRON PIPING AND FITTINGS FOR SEWAGE SERVICE

Gaskets shall be full face, 1/8-inch thick, Buna-N having a hardness of 55 to 65 durometer. Gaskets shall be suitable for a working pressure of 200 psi at a temperature of 250°F. Gaskets shall have "nominal" pipe size inside diameters not the inside diameters per ANSI B16.21. Provide Garlock Style 9122 or District approved equal.

2.09 GASKETS FOR FLANGES USED IN COPPER PIPE OR TUBE

Gaskets shall be full face, 1/8-inch thick, and shall be one of the following nonasbestos materials:

A. Cloth-inserted rubber with a Shore "A" hardness of 75 to 85. Gaskets shall be suitable for a working pressure of 200 psi at a temperature of 180°F. Products: Garlock Style 19 or District approved equal.

B. Acrylic or aramid fiber bound with nitrile. Products: Garlock "Bluegard," Klinger "Klingersil C4400," or District approved equal. Gaskets shall be suitable for a pressure of 500 psi at a temperature of 400°F.

PART 3 - EXECUTION

3.01 RAISED FACE AND FLAT FACE FLANGES

Where a raised face flange connects to a flat-faced flange, remove the raised face of the flange.

3.02 INSTALLING ABOVEGROUND OR EXPOSED PIPING

A. Provide pipe hangers and supports as detailed in the Drawings and the Standard Specifications.

B. Install pipe without springing, forcing, or stressing the pipe or any adjacent connecting valves or equipment.

3.03 INSTALLING FLANGED PIPING

A. Set pipe with the flange bolt holes straddling the pipe horizontal and vertical centerline. Install pipe without springing, forcing, or stressing the pipe or any adjacent connecting valves or equipment. Before bolting up, align flange faces to the design plane within 1/16-inch per foot measured across any diameter. Align flange bolt holes within 1/8-inch maximum offset.

B. Clean bolts, nuts, washers and flange faces by wire brushing before installing gasket and adjoining flange. Inspect gasket seating surfaces, gasket, each bolt, nut, washer, and facing on which the nuts will rotate. Replace any damaged item.

C. Lubricate threads of carbon steel bolts and nuts with oil and graphite prior to installation. Assemble all bolts, nuts, and washers in the flange, then tighten nuts in a progressive diametrically opposite sequence, and torque with a calibrated torque wrench. All clamping torque shall be applied to the nuts only.

D. Bolt lengths shall extend completely through their nuts. Any which fail to do so shall not be considered acceptably engaged.

E. Do not use more than one gasket between contact faces in assembling a flanged joint.

F. Place washers under all nuts. Place washers under bolt heads where the flanges have been fusion bonded epoxy coated. Do not damage coated surfaces during installation.

G. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reset or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight. Replace galled, cracked, or distorted bolts and nuts.

H. After testing, coat exposed surfaces of bolts, nuts, and washers to be buried with primer for wax tape coating per Standard Specification Section 09952.

I. Wrap flanges which connect to buried valves or other buried equipment with polyethylene sheet per Standard Specification Section 09954. Extend the polyethylene material over the flanges and bolts, and secure it around the adjacent pipe circumference with plastic adhesive tape.

3.04 INSTALLING BLIND FLANGES

A. At outlets not indicated to be connected to valves or to other pipes and to complete the installed pipeline hydrostatic test, provide blind flanges with bolts, nuts, washers, and gaskets.

B. Coat the inside face of blind flanges per Standard Specification Section 09900, System No. 5.

3.05 INSTALLATION OF STAINLESS STEEL BOLTS AND NUTS

Prior to assembly, coat threaded portions of stainless steel bolts and nuts with lubricant.

END OF SECTION