PART 1 - GENERAL REQUIREMENTS

1.01 SUMMARY

A. This Section only applies to Mechanically Joined Plumbing Piping Systems for joining piping for Plumbing applications as defined in Division Section 22 “Water Distribution Piping and Specialties”.

B. The Division 22 contractor may provide mechanically joined, couplings, fittings, valves and related components as an option in lieu of, in whole or in part, copper sweat, brazing, threaded or flanged piping methods.

C. Mechanically joined couplings, fittings, valves and related components specified in this section shall not be provided for natural gas piping in lieu of welded, threaded or flanged piping methods.

1.02 DEFINITIONS

A. Lead Free: Refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content ≤0.25% per Safe Drinking Water Act as amended January 4th, 2011 Section 1417.

B. CWP: Cold working pressure in psi.

C. CTS: Copper tube size.

1.03 RELATED SECTIONS INCLUDE THE FOLLOWING:

A. Division 22 section “Basic Plumbing Piping Materials and Methods” for materials for dielectric waterway fittings and flange kits.

B. Division 22 Section “Water Distribution Piping and Specialties” for related sections.

1.04 SUBMITTALS

A. Product Data: Submit data for each type of coupling, fitting and special-duty valve indicated. Include flow and pressure drop curves based on manufacturer's testing.

B. Shop Drawings: Detail fabrication of pipe anchors, hangers, special pipe support assemblies, alignment guides, expansion joints and loops, and their attachment to the building structure.

1. If an assembly of flexible couplings are used for seismic vibration, thermal expansion, or noise and vibration reduction, submit shop drawings indicating location of assembly, including anchors and guides. Include movement analysis of the assembly, and performance data of the assembly.

C. Maintenance Data: Include for each piping specialty and valve in Maintenance Manual specified in Division 01 and Division 22 Section "General Plumbing Requirements."

D. Field Test Reports: Written reports of tests specified in Part 3 of this Section. Include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Failed test results and corrective action taken to achieve requirements.

E. Submit a schedule of dissimilar metal joints and adaptor flanges and flange kits. Include joint type material, connection method and proposed flange kits to isolate dissimilar metals. Include minimum and maximum torque requirements for flange connections to valves. Dielectric flange kits are specified in Division 22 section “Basic Plumbing Piping Materials and Methods”.

F. Submit certification that valves and fittings for domestic water distribution comply with NSF 61 Annex G and / or NSF 372.

G. Submit certification that pipe, pipe fittings, pipe specialties, and valves and fittings are manufactured in plants located in the United States or certified that they comply with applicable ANSI, ASTM and MSS standards.

H. Submit contractor certificates indicating completion of installation training course from manufacturer of piping to be used.

1.05 QUALITY ASSURANCE

A. All grooved and press to connect components shall be of one manufacturer, be date and origin stamped for quality assurance and traceability.

B. Grooved mechanical piping shall conform to local code approval and/or as listed by ANSI-B-31.1, B-31.3, B-39.1, ASME, UL/ULC, FM, IAPMO or ICC.

1. Components shall be capable of providing system rigidity to accommodate hanging and support in accordance with ANSI B31.1 and ANSI B31.9.

C. Grooved and press to connect end product manufacturer shall be ISO certified.

D. Grooved couplings shall meet the requirements of ASTM F-1476.

E. Grooving tools shall be of an approved manufacturer by the grooved fittings manufacturer. Verify tolerances of and maintain grooving tool components for duration of grooving processes. Replace grooving tool components that are found out of tolerance with new as required.

F. Obtain training from the grooved and press to connect manufacturer for all workers that will be installing or handling the grooved or press to connect piping systems.

G. Comply with NSF 61 Annex G and / or NSF 372 for wetted surfaces of valves and fittings containing no more than 0.25% lead by weight for domestic water distribution.

H. Pipe, fittings, specialties, and valves shall be manufactured in plants located in the United States or certified to meet the specified ASTM, ANSI, and MSS standards.

1.06 COORDINATION

A. Reference Division 22 Section "Water Distribution Piping and Specialties" for coordination.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Refer to manufacturer's current literature for comparable products and pressure ratings of couplings and standard fittings for various pipe sizes and pipe schedules. Products identified by model number are based on available size ranges from that manufacturer. Products offered by manufacturers with extended ranges are acceptable provided they meet the specified requirements.

B. Copper Grooved Copper Tubing System

1. ASC Engineered Solutions "Gruvlok".
2. Shurjoint Piping Products.
3. Victaulic Company of America.

C. Press to Connect Copper Tubing System

1. Apollo "Xpress"
2. GRINNELL Mechanical Products "G-Press"
3. NIBCO Inc., Press System.
4. Viega ProPress

2.02 COPPER GROOVED TUBING SYSTEM

A. Pipe:

1. 2 inch through 8 inch: CTS, ASTM B88 Type K or L, hard drawn.
2. Ends: Roll grooved only in accordance to manufacturer's current listed standards. Flaring of tube ends to IPS dimensions or to accommodate alternate sized couplings is not allowed.

B. General requirements for couplings, adapters, and standard fittings:

1. Full-flow type, compatible with ASTM B75 or B88 CTS grooved joints.
2. Flaring of tube ends to IPS dimensions or to accommodate alternate sized couplings is not allowed.

C. Couplings:

1. Material: Cast of ductile iron conforming to ASTM A536, Grade 65-45-12 or ASTM A395 Grade 65-45-15, coated with suitable enamel or epoxy.
2. Constructed of two-piece housing attached with bolts and nuts with pressure responsive elastomeric gasket, with pressure rating of 300 PSI at 180F. Provide washers where required by the manufacturer.
3. Rigid Type:
    a) ASC Engineered Solutions Gruvlok Series # 6402.
    b) Shurjoint Piping Products Styles #305, #306, and #307.
    c) Victaulic Style # 607.
4. Bolts, nuts, and washers:
    a) Track-head bolts of heat treated carbon or manganese steel conforming to ASTM A183 or A449 with a minimum tensile strength of 110,000 psi.
    b) Heavy-duty hexagonal nuts conforming to ASTM A563, Grade B.
    c) Plated carbon steel flat washers conforming to ASTM F436.
    d) Zinc-electroplated conforming to ASTM B633.
    e) Type 304 or 316 stainless steel bolts and nuts conforming to ASTM A193, Grade B8/B8M, Class 2 or ASTM F593 and F594, Group 2, Condition CW.
    f) Type 304 or 316 stainless steel washers.

D. Flange Adapters:

1. For connection to ANSI class components according to ANSI B16.1 (steel) or ANSI B16.24 (copper).
2. Material: Cast of ductile iron conforming to ASTM A536, Grade 65-45-12 or ASTM A395 Grade 65-45-15, coated with suitable enamel or epoxy.
3. 2 inch-6 inch (ANSI class 125/150):
    a) ASC Engineered Solutions Gruvlok Series # 6084.
    b) Shurjoint Piping Products Styles # C341.
    c) Victaulic Style # 641.

E. Fittings:

1. Materials:
    a) Wrought copper conforming to ASTM B75 alloy C12200 or ASTM B152 alloy C1100.
    b) Lead free bronze sand cast conforming to ASTM B584 alloy UNS C89836.

F. Gaskets:

1. EPDM Gaskets:

a) Grade “E”, “EHP” or “EHT” EPDM compound (green or red/green color coded, respectively) conforming to ASTM D2000 designation 2CA615A25B24F17Z.
b) Temperature operating range: -30 degrees F to +230 degrees F.
c) Style suitable for the application.

2. Fluoroelastomer Gaskets

a) Fluoroelastomer compound specifically formulated for compatibility with potable water systems resistant to chlorine and chloramine disinfectants (red and blue stripe color code).
b) Temperature operating range: 0 degrees F to +180 degrees F.
c) Style suitable for the application.

G. Valves:

1. Provide valves as specified in Division 22 section “General Duty Valves for Plumbing Piping.”

2. 2 Inch through 6 Inch Butterfly Valve:

a) 300 psig CWP, CTS grooved ends, MSS SP-68, suitable for bidirectional and dead-end service at full rated pressure. Conform to Class IV leakage requirements per FCI/ANSI 70-2.
b) Body: Lead free, cast brass to UNS C87850, C90500, or cast bronze per ASTM B584.
c) Disc: Aluminum bronze disc or elastomer encapsulated ductile iron disc per ASTM A536 Grade 65-45-12.
d) Stem: Stainless steel.
e) Seat: Pressure responsive and of a grade suitable for the intended service.
f) Operator: Lever operators (10 position minimum) with locks and stops. Provide chain wheel for valves installed 72 inches or higher above finished floor elevation in mechanical rooms. Extend chains to an elevation of 5’-0” above finished floor elevation.

a. ASC Engineered Solutions Gruvlok Series # 6700
g) Shurjoint Piping Products Style # SJ-C300
h) ASC Engineered Solutions Gruvlok Series #B6700Victaulic # 608N

H. Adapters – Grooved X Plain Copper

1. Wrought copper conforming to ASTM B75 alloy C12200 or ASTM B152 alloy C1100. CTS grooved end x plain end for press or sweat connection.

a) ASC Engineered Solutions Gruvlok Series #652
b) Shurjoint #C52

2.03 PRESS TO CONNECT COPPER TUBING SYSTEM

A. Copper Tube:

1. CTS ½ inch through 4 inch: ASTM B-88 Type K or L.

B. General requirements for couplings, adapters, and standard fittings:

1. Acceptable body materials:

a) Wrought copper conforming to ASTM B75 alloy C12200 or ASTM B152 alloy C1100.

b) Cast copper conforming to ASTM B584 alloy C87600 or C84400.

2. Coupling and fitting housings with soldered ends shall conform to ASME B16.18 and B16.22.

3. Coupling and fitting housings with flared ends shall conform to ASME B16.26.

4. Coupling and fitting housings with threaded ends shall conform to ASME B1.20.1.

5. Coupling and fitting housings for press ends shall have self-contained O-ring seals in the coupling/fitting ends.

6. Rated for 200 psi CWP up to 250 degrees F maximum.

C. O-Ring Seals: EPDM compound conforming to ASME B16.51, style suitable for the application.

D. Flange Adapters:

1. For connection to ANSI class components according to ANSI B16.1 (steel) or ANSI B16.24 (copper).

2. 2-1/2 inch through 4 inch (ANSI class 125/150):

a) Steel flange with NSF 14 compliant fused epoxy coating, copper or brass press to connect joint with copper face ring and plastic or rubber dielectric isolating ring separating the flange from the press to connect joint.

3. Rated for 200 psi CWP up to 250 degrees F maximum.

E. Valves:

1. Provide 2 inch and smaller press to connect valves listed in this section or lead free cast bronze valves 2 inch and smaller listed in Division 22 section "Water Distribution Piping and Specialties" may be used with sweat connections or sweat X press adapters.

2. Ball Valve:

a) Rated for 200 psi CWP up to 250 degrees F maximum, conforming to MSS SP-110.

b) Body and trim: Lead free cast bronze conforming to ASTM B62 or B584.

c) Ends: Female press to connect ends of copper material.

d) Ball: Full port, chrome-plated brass ball.

e) Stem: Blow-out proof, of material silicon bronze conforming to ASTM B371 or ASTM B99, or stainless steel.
f) Seat: PTFE or TFE, suitable for intended service.
g) Operator: Lever handle with non-thermal conductive material for insulated piping. Provide with 2 inch extended sleeve to allow valve operation without disturbing the insulation and with memory stop for throttling, metering or balancing service.

1) Apollo # 77WLF
2) NIBCO # PC-585-LF
3) Milwaukee # UPBA-450-12

3. Ball Valve:

a) Rated for 200 psi CWP up to 250 degrees F maximum, conforming to MSS SP-110.
b) Body and trim: Lead free cast bronze conforming to ASTM B62 or B584.
c) Ends: Female press to connect ends of copper material.
d) Ball: Full port, stainless steel ball.
e) Stem: Blow-out proof, of material silicon bronze conforming to ASTM B371 or ASTM B99, or stainless steel.
f) Seat: PTFE or TFE, suitable for intended service.
g) Operator: Lever handle with non-thermal conductive material for insulated piping. Provide with 2 inch extended sleeve to allow valve operation without disturbing the insulation and with memory stop for throttling, metering or balancing service.
h) 2 inch and smaller:

1) Apollo # 77WLF-140
2) NIBCO # PC-585-66-LF
3) Milwaukee # UPBA-450S-12
4) Viega # 2971.1 ZL

4. Gate Valves

a) Rated for 200 psig CWP up to 250 degrees F maximum, conforming to MSS SP-80.
b) Body and trim: Lead free cast bronze body conforming to ASTM B62 or B584 with threaded bonnet and solid wedge.
c) Ends: Female press to connect ends of copper or brass material.
d) Stem: Silicon bronze conforming to ASTM B371 or ASTM B99, or stainless steel, rising type with brass packing gland and non-asbestos packing.
e) Operator: Malleable or ductile iron hand-wheel.
f) 2 inch and smaller:

1) Apollo # 101T-PRLF
2) Hammond # UP645 P2
3) Milwaukee UP105 P2

4) NIBCO # PC-113-LF

5. Globe Valves

a) Rated for 200 psig CWP up to 250 degrees F maximum, conforming to MSS SP-80.
b) Body and trim: Lead free cast bronze conforming to ASTM B62 or B584 with threaded bonnet.
c) Disc: PTFE renewable seat and disc.
d) Ends: Female press to connect ends of copper or brass material.
e) Stem: Silicon bronze conforming to ASTM B 99, or stainless steel, rising type with brass packing gland and non-asbestos composition packing.
f) Operator: Malleable or ductile iron hand-wheel.
g) 2 inch and smaller:

1) Apollo # 120T-PRLF
2) Hammond # UP440 P2
3) Milwaukee # UP502 P2

6. Check Valves (Y pattern, swing type or in-line)

a) Rated for 200 psig CWP up to 250 degrees F maximum, conforming to MSS SP-80.
b) Body and trim: Cast bronze conforming to ASTM B62.
c) Disc: PTFE renewable seat and disc.
d) Ends: Female press to connect ends of copper or brass material.
e) 2 inch and smaller:

1) Apollo # 163T-PRLF
2) Hammond # UP904 P2
3) NIBCO # PF-413-Y-LF
4) Milwaukee # UP509 P2

7. Check Valves (lift type, in-line)

a) Rated for 250 psig CWP up to 250 degrees F maximum, conforming to MSS SP-80.
b) Body: Cast bronze conforming to ASTM B584.
c) Spring: 316 stainless steel.
d) Ends: Female press to connect ends of copper or brass material.
e) 2 inch and smaller:

1) Apollo # 61LF
2) Milwaukee # UP548T P2

8. Gate Valves -2-1/2 inch and Larger

a) MSS SP-70; Class 125, 200-psi CWP, iron body, bronze mounted, with body and bonnet conforming to ASTM A 126 Class B; with flanged ends, non-asbestos composition packing, and two-piece

packing gland assembly. Provide with factory installed press to connect flange adapters, as described herein, with bolts, nuts and washers.

1) NIBCO

9. Butterfly Valves – 2-1/2 inch and Larger

a) MSS SP-67; 200-psi CWP; lug-type body constructed of ductile iron conforming to ASTM A 126, Class B or ductile iron conforming to ASTM A 536. Provide valves with field replaceable EPDM sleeve/seat, aluminum-bronze disc, 416 stainless steel stem, and EPDM O-ring stem seals. Provide lever operators, (10 position minimum), with lock and stops with locks. Drill and tap valves on dead-end service or requiring additional body strength. Valves must be rated for dead end service at 150 psi with no downstream flange required. Provide with factory installed press to connect flange adapters, as described herein, with bolts, nuts and washers.

1) NIBCO # PFD2000

1) NIBCO # PFD2022

2) Viega # 2873.81

F. Strainers:

1. Provide 2 inch and smaller press to connect strainers listed in this section or lead free cast bronze strainers 2 inch and smaller listed in Division 22 section "Basic Piping Materials and Methods" may be used with sweat connections or sweat X press adapters.
2. Strainers (Y pattern)

a) Rated for 250 psig CWP up to 250 degrees F maximum.
b) Body: Cast bronze conforming to ASTM B584.
c) Screen: Stainless steel mesh with 0.062" perforations.
d) Ends: Female press to connect ends of copper or brass material.
e) 2 inch and smaller:

1) Apollo # 59LF

PART 3 - EXECUTION

3.01 PIPING INSTALLATIONS

A. Install pipe, fittings, valves and specialties in accordance with manufacturer's installation instructions.

B. Water distribution piping installations shall be installed subject to Division 22 Section "Water Distribution Systems and Specialties" in addition to those requirements specified in this Section.

C. Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of piping systems. Locations and arrangements of piping take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated.

3.02 PIPE APPLICATIONS ABOVE GRADE

A. Water piping in sizes 2-1/2 to 8 inches shall be Type L drawn copper tube with roll-grooved ends and copper tube dimensioned mechanical couplings and fittings or water piping sizes 2-1/2 inch to 4 inch shall be Type L drawn copper tube with plain ends and copper tube dimensioned press to connect fittings.

B. Water piping in sizes 4 inches and smaller shall be Type L drawn copper tube with plain ends and copper tube dimensioned press to connect copper couplings and fittings.

3.03 HANGERS AND SUPPORTS

A. Support of piping must account for expansion and contraction, vibration, and the dead load of the piping and its contents.

B. General: Hanger supports, and anchors devices are specified in Division 22 Section "Hangers and Supports for Plumbing Piping." Reference Division 22 Section “Water Distribution Systems and Specialties” for pipe spacing limitations.

3.04 PIPE JOINT CONSTRUCTION

A. Copper Grooved tubing System

1. Pipe ends shall be clean and free from oils, indentations, projections and roll marks in the area from pipe end to groove for proper gasket sealing.
2. Roll and cut groove ends in accordance to manufacturer’s current listed standards. Use rolls sets designed and intended for use on the appropriate pipe material when grooving pipe.
3. Flaring of CTS tube ends to IPS dimensions or to accommodate alternate sized couplings is not allowed.
4. Verify the gasket style and elastomeric material (grade) is suitable for the intended service as specified and in combination with any system chemical additive.
5. Reference latest published manufacturer’s product data for additional pressure ratings and application information.
6. Reference latest published manufacturer’s field installation instructions or other included installation instruction prior to attempting assembly.
7. Ream, deburr and clean tube ends and verify they are free from indentations, projections and roll marks in the area from tube end to groove for proper gasket sealing.

8. All grooved components (couplings, fittings, valves, gaskets, bolts and nuts) shall be of one manufacturer. All grooving tools shall be of one manufacturer, though not necessarily the same as the grooved component manufacturer.
9. Install gaskets with lubricant suitable for all piping services. Lubricant shall be by one manufacturer.

B. Press to connect Copper Tubing System

1. Ream, deburr and clean tube ends and verify they are free from indentations, projections, burrs and foreign matter.
2. Install permanent inspection mark on tube.
3. Clean tube and fittings of all dirt and oil. Verify O-ring is in place and free of oil, grease or dirt.
4. Push copper tube into fittings with twisting action to all the way to the fitting stop or shoulder.
5. Mark tube with permanent marker to indicate proper tube insertion depth.
6. Verify press tool has correct size jaw set for tube size used.
7. Complete one tool cycle with empty jaw to calibrate tool for each time new jaw is inserted into tool.
8. Squeeze jaw arms to open tool jaws and place jaws around the contour of the fitting. Verify tool is perpendicular to the fitting and depress tool switch.
9. Squeeze jaw open to remove the tool and observe witness mark.
10. Verify crimped fitting connection for misalignment of the copper tube, misalignment of the tool or improper insertion of the tube. If any of these conditions are found cut out the joint and provide a new joint.
11. Maintain minimum distance between joints per the manufacturer's published installation instructions.

C. Dielectric Isolation Requirements for Copper Grooved Connections: Provide dielectric grooved waterway fittings or couplings at grooved galvanized steel, stainless steel or ductile iron to grooved copper joints. Dielectric waterway fittings are specified in Section "Basic Piping Materials and Methods".

D. Dielectric Isolation Requirements for Press to Connect Adapter Flange Connections: Provide dielectric flanges or flange kits for the following joint types:

1. Adapter Flanges to Iron, Ductile Iron or Steel Body Valves and Fittings (Except Butterfly Valves with EPDM Sleeve/Seats): Provide full face gaskets between flanges and adapter flanges. At each bolt provide, steel washers, thermoplastic washers and bolt isolation sleeves or thermoplastic combination washers and bolt sleeves on valve and adapter flanges.
2. Adapter Flanges to Butterfly Valves with EPDM Sleeve/Seats in Series with Iron, Ductile Iron or Steel Body Valves and Fittings: At each bolt provide, steel washers, thermoplastic washers and bolt isolation sleeves or thermoplastic combination washers and bolt sleeves on adapter flange. Provide steel bolts on butterfly valve flange.

3. Adapter Flanges to Butterfly Valves in Copper Tubing: Install flat washers at each bolt on adapter flange. Provide full face gasket only for butterfly valves without integral liner acting as a gasket.
4. Full face gaskets, thermoplastic washers and bolt isolation sleeves or thermoplastic combination washers and bolt sleeves are specified in Section "Basic Piping Materials and Methods".

E. Flange Adapters:

1. Install flange adapter washers when flange adapters are used against the following surfaces:

a) Rubber.
b) Adapting to ANSI/AWWA cast flanges.
c) Rubber faced lug valves.
d) Serrated flanged surfaces.

2. Do not install flange adapters for applications that incorporate tie rods for anchoring or on standard grooved-end fittings within 90 degrees of each other.

3.05 VALVE APPLICATIONS

A. Reference Division 22 Section "Water Distribution Piping and Specialties" for valve applications.

3.06 EQUIPMENT CONNECTIONS

A. Grooved flexible style couplings may be used at equipment connections where specified for vibration isolation control only.

B. Press to connect joints shall not be provided for equipment connections. Provide flanges, unions, di-electric unions or waterway fittings. Flanges, unions, di-electric unions and waterway fittings are specified in Division 22 specification section "Basic Piping Materials and Methods"

3.07 EXPANSION JOINTS:

A. Provide expansion joints where indicated. Expansion joints and their installation requirements are specified in Division 22 specification section "Expansion Fittings and Loops for Plumbing Piping".

1. Provide with copper press to connect ends or copper press to connect X screwed NPT adapters for 2 inches and smaller.
2. Provide with copper press to connect ends or press to connect adapter flanges for 2-1/2 inches to 4 inches.
3. Provide copper grooved adapter flanges for 2-1/2 inches to 8 inches.

B. Where field conditions allow and as a contractor's option, provide expansion joints consisting of an assembly of flexible couplings: Fabricated from a combination of

couplings and nipples with rolled groove short type “K” or “L” copper tube nipples and flexible CTS couplings. Install with removable ties to hold joint compressed or expanded during piping fabrication. Provide the same gaskets as specified above for rigid couplings. Provide expansion joints of an assembly of flexible couplings with displacement identical expansion joints as indicated.

3.08 STRAINERS

A. Provide strainers as specified in part 2 of this specification section or Division 22 specification section “Basic Piping Materials and Methods”.

1. Provide manufacturer strainer with press to connect ends for 2 inches and smaller.
2. Provide copper press to connect X screwed NPT adapters for 2 inches and smaller.
3. Provide press to connect adapter flanges for 2-1/2 inches to 4 inches.
4. Provide copper grooved adapter flanges for 2-1/2 inches to 8 inches.

3.09 WATER DISTRIBUTION SPECIALTIES INSTALLATION

A. Reference Division 22 Section “Water Distribution Systems and Specialties” for water distribution specialties and installation requirements.

3.010 FIELD QUALITY CONTROL

A. The following procedures are paraphrased from the ASME B-31.9, code for pressure piping, building services piping.

B. Installing contractor shall schedule training session with the grooved or press to connect manufacturer for all workers that will be installing or handling the grooved or press to connect piping systems. Submit certification letter along with list of attendees to engineer of record within 30-days of mobilization. Include copy of certification letter with closeout documents.

C. Grooved and Press to connect fitting manufacturer shall provide certification training to contractor without cost and without additional cost to Owner.

D. Provide testing procedures as defined in Division 22 Section “Water Distribution Systems and Specialties” and as specified in grooved mechanical piping manufacturer’s installation instructions.

E. Installing contractor shall visually inspect couplings and repair or replace any misaligned couplings and couplings with gaps prior to calling for inspection as defined in Division 22 Section “General Plumbing Requirements.”

F. Grooved and Press to connect fitting manufacturer’s representative shall make periodic visits to the jobsite during construction to ensure the installing contractor is

following the latest published manufacturer's field installation instructions and best practice procedures provided during the training session.

3.011 STARTUP

A. Refer to Division 22 Section "Water Distribution Piping and Specialties" for startup procedures.

END OF SECTION