## ADDENDUM

**Date Issued:** February 17, 2020  
**Project:** Intermountain Healthcare  
**Tooele Valley Dialysis Clinic Remodel**  
2356 North 400 East, Suite #102  
Tooele, Utah 84074  

**Addendum Number:** 1

The Contractors submitting proposals on the above-captioned project shall be governed by the following addendum, changes and explanations to the drawings and specifications and shall submit their bids in accordance therewith.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>General Items Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>As indicated in the Notice to Contractors, all bids shall need to be Emailed to AnnaLisa Silcox with Intermountain Healthcare Corporate Office at <a href="mailto:AnnaLisa.Silcox@imail.org">AnnaLisa.Silcox@imail.org</a> by <strong>February 20, 2020- 2:00 p.m.</strong></td>
</tr>
<tr>
<td>2</td>
<td>All permit fees shall be paid by the Owner. Do not include in the bid.</td>
</tr>
<tr>
<td>3</td>
<td>Owner prefers daytime work. The building shall remain occupied during the construction and some work may need to be coordinated and scheduled with the Owner if required to happen off hour. Contractor shall coordinate with the Owner regarding noise control, working hours and utility shutdowns. Contact North Pointe medical Park facility Managing Director Michael Burnham for more information during construction.</td>
</tr>
<tr>
<td>4</td>
<td>Coordinate all roof, fire wall penetrations and saw cutting of concrete flooring with Mechanical, Plumbing and Electrical drawings. Field verify existing conditions before proceeding with the work. Patch &amp; repair to match with adjacent existing or as noted in the construction documents.</td>
</tr>
<tr>
<td>5</td>
<td>As indicated in the construction documents and during pre-bid walkthrough- one layer of type-X gypsum board is required to be attached to the underside of floor joist above for a UL listed floor assembly rating of one hour. Re-route existing MC cable, J-boxes, electrical items etc., intertwined in the joist spaces or bring below new sheetrock in some areas as required. Contractor shall field verify existing conditions before proceeding with the work. Med gas lines shown in the revised mechanical demolition plan PD101 anchored to joist with Unistrut support is required to be re-installed as required, see attached mechanical addendum #1 for more information. Sheetrock around existing refrigerant lines serving upper floors where occurs. Contractor shall put back all existing insulation at the floor joist above before installing the gypsum board.</td>
</tr>
<tr>
<td>6</td>
<td>Contractor to note that AWI Premium grade millwork is required as indicated in the project specifications manual. However, AWI inspection and certification are <strong>NOT</strong> required for this project.</td>
</tr>
<tr>
<td>7</td>
<td>Impact resistant gypsum board is required at all corridors up to the height of 48'' from floor.</td>
</tr>
<tr>
<td>8</td>
<td>As noted in the construction documents, drawings and specifications, provide cost for Future exam/ training room as Bid Additive Alternate #1 and include in the bid form.</td>
</tr>
<tr>
<td>Item Number</td>
<td>General Items Description</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td>provided in the project manual. See construction documents for scope of work in the future room noted.</td>
</tr>
<tr>
<td>9</td>
<td>Contractor shall provide list of subs and breakdown of the bid to the Owner within 24 hours of the bid submittal.</td>
</tr>
<tr>
<td>10</td>
<td>As noted during the walkthrough- Vendor serving the existing building for Fire Alarm system and security system is BEST (Building Electronic Systems Technology) and are required to be contacted for bidding the portions managed by them in the building. Contact “Stephen Pullan” of BEST at 801-360-9310 for more information.</td>
</tr>
<tr>
<td>11</td>
<td>Asbestos inspection and any required abatement shall be performed by the Owner and report shall be provided to the contractor before the start of construction work.</td>
</tr>
<tr>
<td>12</td>
<td>As discussed during pre-bid walkthrough- all existing walls and gypsum ceiling of the existing X-ray room have lead shielding. Contractor shall provide and include abatement of lead from this room in the bid by adopting AHJ approved methods and procedures for safe handling and clearing of lead from the site.</td>
</tr>
<tr>
<td>13</td>
<td>As noted by Michael Burnham- Owner shall remove two existing Aluminum storefront system located at the building corridor along with the ceiling grid lights, exam room cabinets &amp; millwork from the remodel area. Do not include in the demolition bid.</td>
</tr>
<tr>
<td>14</td>
<td>As noted by Michael Burnham- Owner shall provide and install the required temporary dust barrier wall outside the two removed Aluminum storefront systems at the building hallway, do not include in the bid. Contractor shall only provide and include in the bid temporary dust barrier outside the new door A143 that is required to be cut into the existing wall and continue dust barrier on each side of the door to cover the walls where sheet rock is being removed.</td>
</tr>
<tr>
<td>15</td>
<td>See attached Mechanical &amp; Plumbing Addendum #1 from VBFA Engineers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sheet Number</th>
<th>Drawings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Mechanical &amp; Plumbing</strong></td>
</tr>
<tr>
<td>MH101</td>
<td>See attached revised- Level 1 Mechanical Plan.</td>
</tr>
<tr>
<td>MH502</td>
<td>See attached revised- Mechanical Details.</td>
</tr>
<tr>
<td>PD101</td>
<td>See attached revised- Level 1 Plumbing Demolition Plan</td>
</tr>
<tr>
<td>PP100</td>
<td>See attached revised- Below Grade Plumbing Plan.</td>
</tr>
<tr>
<td>PP101</td>
<td>See attached revised- Level 1 Plumbing Plan.</td>
</tr>
<tr>
<td>PP601</td>
<td>See attached revised- Plumbing Schedules.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specification Section</th>
<th>Project Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Architectural Sections</strong></td>
<td></td>
</tr>
<tr>
<td>08 71 00</td>
<td>Door Hardware: Hardware Group 8 on page 18 has been revised in this section to include lock at door A133. Refer to attached revised sheet (partial spec) for more information.</td>
</tr>
</tbody>
</table>
**Specification Section** | **Project Manual**
--- | ---
**Plumbing Sections**
22 11 16 | **Domestic Water Piping**: Specifications section has been revised to include PEX piping. See attached revised specifications section for more information.

**Attachments:**
Mechanical Addendum #1, Revised Partial Spec section 08 71 00 (revised page), Revised Spec Section 22 11 16, Revised Sheet MH101, MH502, PD101, PP100, PP101 & PP601.
The following revision, additions, deletions, and/or items of clarification shall hereby be included as an integral part of the Contract Documents for the above-listed project and shall be fully binding. All other requirements of the original plans and specification shall remain in effect in their respective order.

DIVISION – 22 & 23

DRAWINGS

SHEET - MH101 – LEVEL 1 MECHANICAL PLAN
1. Ductwork transitions added to avoid going up into the beam pockets.

SHEET - MH502 – MECHANICAL DETAILS
1. "Rectangular Duct Depressed to Avoid an Obstruction Detail" added to sheet.

SHEET - PD101 – LEVEL 1 PLUMBING DEMOLITION PLAN
1. Keyed 6 added.

SHEET - PP100 – BELOW GRADE PLUMBING PLAN
1. Waste and vent added for CS-1.
2. 1-1/2” Vent line to WC-1 changed to 2” Vent.

SHEET - PP101 – LEVEL 1 PLUMBING PLAN
1. CS-1 added in Soiled (A128)
2. DCW main line resized for CS-1.

SHEET - PP601 – PLUMBING SCHEDULES
1. CS-1 added to plumbing fixture schedule

SPECIFICATIONS

SECTION - 22 11 16 – Domestic Water Piping
1. PEX added to the specification.
PRIOR APPROVALS

The following manufacturers, trade names and products are allowed to bid on a name brand only basis with the provision that they completely satisfy all and every requirement of the drawings, specifications and all addenda shall conform to the design, quality and standards specified, established and required for the complete and satisfactory installation and performance of the building and all its respective parts.

<table>
<thead>
<tr>
<th>Item</th>
<th>Manufacturer</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust Fans</td>
<td>ACME</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Exhaust Fans</td>
<td>S&amp;P</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Louver</td>
<td>Nailor</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Louver</td>
<td>Air Rite Mfg.</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Louver</td>
<td>United Enertech</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Duct Mounted Access Doors</td>
<td>Nailor</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Split System</td>
<td>LG</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Split System</td>
<td>Samsung</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Diffusers, Registers, Grilles</td>
<td>Hart &amp; Cooley</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Flexible Ducts</td>
<td>JPL</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Gas Fired Furnace</td>
<td>American Standard</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Condensing Units</td>
<td>American Standard</td>
<td>APPROVED</td>
</tr>
<tr>
<td>Set</td>
<td>Doors</td>
<td>Hardware Description</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td><strong>6.0</strong></td>
<td>A132A</td>
<td>Gasketing S773D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power Supply BPS-24-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Battery Backup B-24-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Card Reader BY SECURITY CONTRACTOR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continuous Hinge FM300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cylindrical Lock (storeroom) CL3357 NZD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Closer (surface) DC6210</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kickplate K1050 10&quot; X 2&quot;LDW 3BE CSK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wall Stop 409</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gasketing S773D</td>
</tr>
<tr>
<td><strong>7.0</strong></td>
<td>A124, A126, A143</td>
<td>Hinge TA2714 4-1/2&quot; x 4-1/2&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cylindrical Lock (storeroom) CL3357 NZD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electric Strike 1006-12/24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Closer (surface) DC6210</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kickplate K1050 10&quot; X 2&quot;LDW 3BE CSK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wall Stop 409</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gasketing S773D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power Supply BPS-24-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Battery Backup B-24-5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Card Reader BY SECURITY CONTRACTOR</td>
</tr>
<tr>
<td><strong>8.0</strong></td>
<td>A133</td>
<td>Hinge TA2714 4-1/2&quot; x 4-1/2&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cylindrical Lock (storeroom) CL3357 NZD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flush Bolt 555</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dust Proof Strike 570</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kickplate K1050 10&quot; X 2&quot;LDW 3BE CSK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wall Stop 409</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gasketing S773D</td>
</tr>
<tr>
<td><strong>9.0</strong></td>
<td>A135, A139, A140</td>
<td>Hinge TA2714 4-1/2&quot; x 4-1/2&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cylindrical Lock (storeroom) CL3357 NZD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flush Bolt 555</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dust Proof Strike 570</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kickplate K1050 10&quot; X 2&quot;LDW 3BE CSK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wall Stop 409</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gasketing S773D</td>
</tr>
</tbody>
</table>
SECTION 221116 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Under-building-slab and aboveground domestic water pipes, tubes, and fittings inside buildings.

1.3 ACTION SUBMITTALS

A. Product Data: For transition fittings and dielectric fittings.

B. Delegated-Design Submittal:

1. Seismic calculations and detailed analysis: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacing. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices. Project specific design documentation and calculations shall be prepared and stamped by a registered professional engineer who is responsible for the seismic restraint design and who is licensed in the state where the project is being constructed (ASCE 7, 13.2.1.1).

1.4 INFORMATIONAL SUBMITTALS

A. System purging and disinfecting activities report.

B. Field quality-control reports.

1.5 FIELD CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Construction Manager or owner no fewer than two days in advance of proposed interruption of water service.
PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

B. Potable-water piping and components shall comply with NSF 14 and NSF 61. Plastic piping components shall be marked with "NSF-pw."

C. All piping shall be American made and tested; no import pipe will be permitted.

D. All exposed water supply piping in toilet rooms, custodial rooms and kitchens shall be chromium plated.

E. All piping installed in or passing through a plenum must be plenum rated, fire wrapped, or installed in a metal conduit.

2.2 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type K and ASTM B 88, Type L water tube, drawn temper.

B. Soft Copper Tube: ASTM B 88, Type K and ASTM B 88, Type L water tube, annealed temper.

C. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.


E. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.

F. Copper Unions:
   1. MSS SP-123.
   4. Solder-joint or threaded ends.

G. Copper Pressure-Seal-Joint Fittings:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Elkhart Products Corporation.
      b. NIBCO Inc.
      c. Viega.
   2. Fittings for NPS 2 and Smaller: Wrought-copper fitting with EPDM-rubber, O-ring seal in each end.
3. **Fittings for NPS 2-1/2 to NPS 4:** Cast-bronze or wrought-copper fitting with EPDM-rubber, O-ring seal in each end.

**H. Copper Push-on-Joint Fittings:**

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
   a. Victaulic Company.

2. **Description:**
   a. Cast-copper fitting complying with ASME B16.18 or wrought-copper fitting complying with ASME B 16.22.
   b. Stainless-steel teeth and EPDM-rubber, O-ring seal in each end instead of solder-joint ends.

### 2.3 DUCTILE-IRON PIPE AND FITTINGS

**A. Mechanical-Joint, Ductile-Iron Pipe:**

1. AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

**B. Standard-Pattern, Mechanical-Joint Fittings:**

1. AWWA C110/A21.10, ductile or gray iron.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

**C. Compact-Pattern, Mechanical-Joint Fittings:**

1. AWWA C153/A21.53, ductile iron.
2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

**D. Plain-End, Ductile-Iron Pipe:** AWWA C151/A21.51.

### 2.4 PEX TUBE AND FITTINGS

**A. PEX Distribution System:** ASTM F 877, SDR 9 tubing.

**B. Fittings for PEX Tube:** ASTM F 1807, metal-insert type with copper or stainless-steel crimp rings and matching PEX tube dimensions.

### 2.5 PIPING JOINING MATERIALS

**A. Pipe-Flange Gasket Materials:**
1. AWWA C110/A21.10, rubber, flat face, 1/8 inch thick or ASME B16.21, nonmetallic and asbestos free unless otherwise indicated.
2. Full-face or ring type unless otherwise indicated.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

C. Solder Filler Metals: ASTM B 32, lead-free alloys.

D. Flux: ASTM B 813, water flushable.

E. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.6 TRANSITION FITTINGS

A. General Requirements:
   1. Same size as pipes to be joined.
   2. Pressure rating at least equal to pipes to be joined.
   3. End connections compatible with pipes to be joined.

B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

C. Sleeve-Type Transition Coupling: AWWA C219.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Cascade Waterworks Manufacturing.
      b. Dresser, Inc.; Piping Specialties Products.
      c. Ford Meter Box Company, Inc. (The).
      d. JCM Industries.
      e. Romac Industries, Inc.
      f. Smith-Blair, Inc.; a Sensus company.
      g. Viking Johnson.

D. Plastic-to-Metal Transition Fittings:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      b. Harvel Plastics, Inc.
      c. Spears Manufacturing Company.

   2. Description:
      a. CPVC or PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions.
      b. One end with threaded brass insert and one solvent-cement-socket or threaded end.
E. PP-to-Metal Transition Fittings:

1. Description:
   a. PP one-piece fitting with manufacturer’s Schedule 80 equivalent dimensions.
   b. One end with threaded brass insert and one fusion-socket end.

2.7 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.

B. Dielectric Nipples and Waterways:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Elster Perfection Corporation.
      b. Grinnell Mechanical Products; Tyco Fire Products LP.
      c. Matco-Norca.
      d. Clearflow/Perfection Corp.
      e. Precision Plumbing Products, Inc.
      f. Victaulic Company.

   3. Electroplated steel nipple or waterway complying with ASTM F 1545 or ANSI/NSF-61 Compliant.
   4. Pressure Rating and Temperature: **300 psig at 225 deg F.**
   5. End Connections: Male threaded or grooved.
   6. Lining: Inert and noncorrosive, propylene or LTHS.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Polypropylene pipe in or passing through plenums must be fire wrapped or installed in a metal conduit.
C. Install copper tubing under building slab according to CDA’s “Copper Tube Handbook.”

D. Install underground copper tube in PE encasement according to ASTM A 674 or AWWA C105/A21.5.

E. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve inside the building at each domestic water-service entrance. Comply with requirements for pressure gages in Division 22 Section “Meters and Gages for Plumbing Piping” and with requirements for drain valves and strainers in Division 22 Section “Domestic Water Piping Specialties.”

F. Install shutoff valve immediately upstream of each dielectric fitting.

G. Install water-pressure-reducing valves downstream from shutoff valves. Comply with requirements for pressure-reducing valves in Division 22 Section “Domestic Water Piping Specialties.”

H. Install domestic water piping level with 0.25 percent slope downward toward drain and plumb.
   1. Piping will be drained seasonally for freeze protection.

I. Rough-in domestic water piping for water-meter installation according to utility company’s requirements.

J. Install seismic restraints on piping. Comply with SEI/ASCE 7 and with requirements for seismic-restraint devices in Division 22 Section “Vibration and Seismic Controls for Plumbing Piping and Equipment.”

K. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.

L. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

M. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

N. Install piping to permit valve servicing.

O. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.

P. Install piping free of sags and bends.

Q. Install fittings for changes in direction and branch connections.

R. Install PEX piping with loop at each change of direction of more than 90 degrees.

S. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
T. Install pressure gages on suction and discharge piping for each plumbing pump and packaged booster pump. Comply with requirements for pressure gages in Division 22 Section "Meters and Gages for Plumbing Piping."

U. Install thermostats in hot-water circulation piping. Comply with requirements for thermostats in Division 22 Section "Domestic Water Pumps."

V. Install thermometers on inlet and outlet piping from each water heater. Comply with requirements for thermometers in Division 22 Section "Meters and Gages for Plumbing Piping."

W. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."

X. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."

Y. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 22 Section "Escutcheons for Plumbing Piping."

3.3 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Brazed Joints for Copper Tubing: Comply with CDA's "Copper Tube Handbook," "Brazed Joints" chapter.

E. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

F. Pressure-Sealed Joints for Copper Tubing: Join copper tube and pressure-seal fittings with tools recommended by fitting manufacturer.

G. Push-on Joints for Copper Tubing: Clean end of tube. Measure insertion depth with manufacturer's depth gage. Join copper tube and push-on-joint fittings by inserting tube to measured depth.
H. Joint Construction for Grooved-End Copper Tubing: Make joints according to AWWA C606. Roll groove ends of tubes. Lubricate and install gasket over ends of tubes or tube and fitting. Install coupling housing sections over gasket with keys seated in tubing grooves. Install and tighten housing bolts.

I. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.

J. Joints for PEX Piping: Join according to ASTM F1807.

K. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

3.4 TRANSITION FITTING INSTALLATION

A. Install transition couplings at joints of dissimilar piping.

B. Transition Fittings in Underground Domestic Water Piping:
   1. Fittings for NPS 1-1/2 and Smaller: Fitting-type coupling.
   2. Fittings for NPS 2 and Larger: Sleeve-type coupling.

C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition fittings.

3.5 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples/waterways.

C. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric nipples/waterways.

D. Dielectric Fittings for NPS 5 and Larger: Use dielectric nipples/waterways.

3.6 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for seismic-restraint devices in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment."

B. Comply with requirements for pipe hanger, support products, and installation in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."

   1. Vertical Piping: MSS Type 8 or 42, clamps.
   2. Individual, Straight, Horizontal Piping Runs:
      a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
      b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
      c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
4. Base of Vertical Piping: MSS Type 52, spring hangers.

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.

E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
4. NPS 2-1/2: 108 inches with 1/2-inch rod.
5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
6. NPS 6: 10 feet with 5/8-inch rod.
7. NPS 8: 10 feet with 3/4-inch rod.

F. Install supports for vertical copper tubing every 10 feet.

G. Install vinyl-coated hangers for PP piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1 and Smaller: 36 inches with 3/8-inch rod.
2. NPS 1-1/4 to NPS 2: 48 inches with 3/8-inch rod.
3. NPS 2-1/2 to NPS 3-1/2: 48 inches with 1/2-inch rod.
4. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
5. NPS 6: 48 inches with 3/4-inch rod.
6. NPS 8: 48 inches with 7/8-inch rod.

H. Install supports for vertical PP piping every 60 inches for NPS 1 and smaller, and every 72 inches for NPS 1-1/4 and larger.

I. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer’s written instructions.

3.7 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.

C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.

D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
1. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
2. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code. Comply with requirements for connection sizes in Division 22 plumbing fixture Sections.

3. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.8 IDENTIFICATION

A. Identify system components. Comply with requirements for identification materials and installation in Division 22 Section "Identification for Plumbing Piping and Equipment."

B. Label pressure piping with system operating pressure.

3.9 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Piping Inspections:
   a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
   b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
      1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
      2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
   c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
   d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

2. Piping Tests:
   a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
   b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
   c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
   d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials.
Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.

e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.

f. Prepare reports for tests and for corrective action required.

B. Domestic water piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.10 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
   
   a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
   
   b. Adjust calibrated balancing valves to flows indicated.

5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.11 CLEANING

A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
   
   a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
   
   b. Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.

   1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.

c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.

d. Repeat procedures if biological examination shows contamination.

e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Clean non-potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.

2. Use purging procedures prescribed by authorities having jurisdiction or; if methods are not prescribed, follow procedures described below:

a. Flush piping system with clean, potable water until dirty water does not appear at outlets.

b. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

C. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.

D. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.12 PIPING SCHEDULE

A. Some piping types and sizes mentioned in this section may not be used on this project.

B. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

C. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.

D. All exposed water supply piping in toilet rooms, custodial rooms and kitchens shall be chromium plated.

E. Under-building-slab, domestic water, building-service piping, shall be one of the following:

1. Soft copper tube, ASTM B 88, Type K wrought-copper, solder-joint fittings; and brazed joints.

F. Aboveground domestic water piping, NPS 2 and smaller, shall be one of the following:

1. Hard copper tube, ASTM B 88, Type L; cast-copper, solder-joint fittings; and soldered joints.

2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.

3. Hard copper tube, ASTM B 88, Type L; copper push-on-joint fittings; and push-on joints.
4. PEX tube, NPS 1 and smaller; fittings for PEX tube; and crimped joints.

G. Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be one of the following:
   1. Hard copper tube, ASTM B 88, Type L; cast-copper, solder-joint fittings; and soldered joints.
   2. Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
   3. Hard copper tube, ASTM B 88, Type L; grooved-joint, copper-tube appurtenances; and grooved joints.

3.13 VALVE SCHEDULE

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
   1. Shutoff Duty: Use ball for piping NPS 3 and smaller. Use butterfly, with flanged ends for piping NPS 4 and larger.
   2. Throttling Duty: Use ball valves for piping NPS 2 and smaller. Use butterfly valves with flanged ends for piping NPS 2-1/2 and larger.

B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

END OF SECTION 221116
1. ROUND DUCT ELBOW DETAILS

2. SUPPLY DIFFUSER W/ FLEX DUCT DETAIL

3. RECTANGULAR DUCT DEPRESSED TO AVOID AN OBSTRUCTION DETAIL
1. Existing elements shown dark and indicated with an "X" to be demolished, typical.
2. Demolish all domestic water lines back to main.
3. Demolish all vent lines.
5. Demolish all fire sprinkler piping back to riser.
6. Disassemble all gas lines. Reassemble gas lines after sheetrock has been installed to joists. Coordinate all shutdowns with affected tenants. Pipes shall be disassembled and reinstalled over weekend to mitigate operational downtime. Provide temporary heat as necessary.
KEYED NOTES

1. EXISTING ELEMENTS SHOWN LIGHT, TYPICAL.
2. CONTRACTOR RESPONSIBLE FOR COORDINATING AND LOCATING CLEANOUTS TO INCLUDE COORDINATION OF ALL CLEANOUTS PER CODE IN ADDITION TO CLEANOUTS CALLED OUT ON PLANS, TYPICAL.
3. WALLS SHOWN FROM ABOVE, TYPICAL.

SCALE: 1/4" = 1'-0"
<table>
<thead>
<tr>
<th><strong>ID</strong></th>
<th><strong>Type</strong></th>
<th><strong>Location</strong></th>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP-1</td>
<td>B&amp;G PR 3/4</td>
<td>MECH A140</td>
<td>Domestic</td>
<td>0.5 WATER - LEAD-FREE BRONZE - 1/6 1725 115/1/60 Notes: 1,2,3,4</td>
</tr>
<tr>
<td>WH-1</td>
<td>AO SMITH BTH-199</td>
<td>(A140)</td>
<td>Gas</td>
<td>97 N. GAS 235 100 4 77/28 120/1 1 Notes: 1,2,3,4</td>
</tr>
</tbody>
</table>

**PLUMBING FIXTURE SCHEDULE**

<table>
<thead>
<tr>
<th><strong>ID</strong></th>
<th><strong>Type</strong></th>
<th><strong>Location</strong></th>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CS-1</td>
<td>CLINIC SINK</td>
<td></td>
<td></td>
<td>KOHLER K6710, WHITBY, 28 X 28-INCH, ENAMELED CAST IRON FLOOR-MOUNTED</td>
</tr>
<tr>
<td>SS-1</td>
<td>CORNER MOUNTED</td>
<td></td>
<td></td>
<td>KOHLER K6626-VBCP, 7-3/8” SPOUT WITH PAIL HOOK, CAST BRASS P-TRAP WITH CLEANOUT</td>
</tr>
<tr>
<td>SB-1</td>
<td>SUPPLY BOX</td>
<td></td>
<td></td>
<td>KOHLER K6010, MONTREAL, 30” X 18” X 10” ENAMELED CAST IRON</td>
</tr>
<tr>
<td>WD-1</td>
<td>TYPICAL SINK</td>
<td></td>
<td></td>
<td>KOHLER K-6676, TYRELL, 28 X 28-INCH, ENAMELED CAST IRON FLOOR-MOUNTED</td>
</tr>
<tr>
<td>WD-2</td>
<td>TYPICAL SINK</td>
<td></td>
<td></td>
<td>KOHLER K-6676, TYRELL, 28 X 28-INCH, ENAMELED CAST IRON FLOOR-MOUNTED</td>
</tr>
</tbody>
</table>

**PLUMBING SCHEDULES**

**DOMESTIC EXPANSION TANK SCHEDULE**

<table>
<thead>
<tr>
<th><strong>ID</strong></th>
<th><strong>Type</strong></th>
<th><strong>Location</strong></th>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP-1</td>
<td>B&amp;G PR 3/4</td>
<td>MECH A140</td>
<td>Domestic</td>
<td>0.5 WATER - LEAD-FREE BRONZE - 1/6 1725 115/1/60 Notes: 1,2,3,4</td>
</tr>
<tr>
<td>WH-1</td>
<td>AO SMITH BTH-199</td>
<td>(A140)</td>
<td>Gas</td>
<td>97 N. GAS 235 100 4 77/28 120/1 1 Notes: 1,2,3,4</td>
</tr>
</tbody>
</table>

**DOMESTIC WATER HEATER SCHEDULE**

<table>
<thead>
<tr>
<th><strong>ID</strong></th>
<th><strong>Type</strong></th>
<th><strong>Location</strong></th>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP-1</td>
<td>B&amp;G PR 3/4</td>
<td>MECH A140</td>
<td>Domestic</td>
<td>0.5 WATER - LEAD-FREE BRONZE - 1/6 1725 115/1/60 Notes: 1,2,3,4</td>
</tr>
<tr>
<td>WH-1</td>
<td>AO SMITH BTH-199</td>
<td>(A140)</td>
<td>Gas</td>
<td>97 N. GAS 235 100 4 77/28 120/1 1 Notes: 1,2,3,4</td>
</tr>
</tbody>
</table>

**RECIRCULATION PUMP SCHEDULE**

<table>
<thead>
<tr>
<th><strong>ID</strong></th>
<th><strong>Type</strong></th>
<th><strong>Location</strong></th>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP-1</td>
<td>B&amp;G PR 3/4</td>
<td>MECH A140</td>
<td>Domestic</td>
<td>0.5 WATER - LEAD-FREE BRONZE - 1/6 1725 115/1/60 Notes: 1,2,3,4</td>
</tr>
<tr>
<td>WH-1</td>
<td>AO SMITH BTH-199</td>
<td>(A140)</td>
<td>Gas</td>
<td>97 N. GAS 235 100 4 77/28 120/1 1 Notes: 1,2,3,4</td>
</tr>
</tbody>
</table>

**RELATIONSHIP FOR TANK SCHEDULE**

<table>
<thead>
<tr>
<th><strong>ID</strong></th>
<th><strong>Type</strong></th>
<th><strong>Location</strong></th>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP-1</td>
<td>B&amp;G PR 3/4</td>
<td>MECH A140</td>
<td>Domestic</td>
<td>0.5 WATER - LEAD-FREE BRONZE - 1/6 1725 115/1/60 Notes: 1,2,3,4</td>
</tr>
<tr>
<td>WH-1</td>
<td>AO SMITH BTH-199</td>
<td>(A140)</td>
<td>Gas</td>
<td>97 N. GAS 235 100 4 77/28 120/1 1 Notes: 1,2,3,4</td>
</tr>
</tbody>
</table>

**PIPE WORK/INSULATION THICKNESSES**

<table>
<thead>
<tr>
<th><strong>ID</strong></th>
<th><strong>Type</strong></th>
<th><strong>Location</strong></th>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP-1</td>
<td>B&amp;G PR 3/4</td>
<td>MECH A140</td>
<td>Domestic</td>
<td>0.5 WATER - LEAD-FREE BRONZE - 1/6 1725 115/1/60 Notes: 1,2,3,4</td>
</tr>
<tr>
<td>WH-1</td>
<td>AO SMITH BTH-199</td>
<td>(A140)</td>
<td>Gas</td>
<td>97 N. GAS 235 100 4 77/28 120/1 1 Notes: 1,2,3,4</td>
</tr>
</tbody>
</table>