ADDENDUM NO. 2

PROJECT TITLE:	Courthouse Annex Building Poinsett County Harrisburg, Arkansas
OWNER:	Poinsett County, Arkansas 401 Market St. Harrisburg, AR 72432
OWNER'S REPRESENTATIVE:	J.C. Carter, County Judge (870) 578-0601
ARCHITECT:	Brackett-Krennerich and Associates P.A. 100 East Huntington Avenue, Suite D Post Office Box 1655 Jonesboro, Arkansas 72403-1655 (870) 932-0571 *office* •(870) 932-0975 *fax*
COMMISSION NUMBER:	2237
DATE OF ISSUE:	August 16, 2024
BID DATE/LOCATION:	August 28, 2024 at 2:00 p.m. C.D.S.T Conference Room of the Poinsett County Annex 110 East St. Harrisburg, AR 72432

Contractor shall take note of the following listed revisions and/or additions to the drawings and specifications for the above referenced project and adjust the contract sum accordingly. These revisions are hereby made a part of said documents and subsequent construction as if therein included.

GENERAL

1. Change in bid date:

   August 28, 2024 at 2:00 p.m. C.D.S.T
   Conference Room of the Poinsett County Annex
   110 East St.
   Harrisburg, AR 72432

ARCHITECTURAL

2. Specifications: Section 31 2316 – EXCAVATION – add the following:

3.04 PROTECTION

A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

PLUMBING

3. Specifications: DIVISION 22 - PLUMBING

A. Add Division 22 – Plumbing. Refer to Page 3 – 28 of this addendum.

SECTION 22 0200
PLUMBING GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 CONDITIONS OF THE CONTRACT

A. The conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. This Section is a Division 22 0000 Basic Materials and Methods Section and is a part of each Division Section.

C. The Contractor shall be responsible for construction coordination of all work described in this section with the work specified in other sections of the specifications and shown on the Drawings. In advance of construction, coordinate and work out any minor problems with other trades to avoid conflicts therewith. However, if other minor problems are encountered, bring these problems to the attention of the Architect, who will make the final decisions as to correction.
   1. All references and notations pertaining to coordination by the Contractor shall apply to constructions coordination. The Architect and Engineers have, to the best of their ability, coordinated the drawing and specifications to avoid conflicts between specified equipment and space required for such, and between architectural and engineering disciplines.
   2. If substituted equipment (approved-equal) is to be used, the Contractor shall revise the 1/8” = 1'-0” & 1/4” = 1'-0” scale floor plans shown on the Drawings, indicating to scale, the equipment to be used. The purpose of these revised scale plans is to identify any problems with substituted equipment, and access and clearance requirements are maintained. These revised scale plans are to be submitted with the substituted equipment submittals.

1.02 WORK INCLUDED

A. This section consists of General Requirements and Standard Specifications covering certain parts of work under Division 22 0000 and is supplemented by other Division sections covering additional work, requirements, and materials specifically applicable to the work of each section.

1.03 CODE AND REGULATORY AGENCY COMPLIANCE

A. Provide work and materials in full accordance with the latest rules and regulations of the following:
   1. Occupational Safety and Health Administration.
   2. International Plumbing Code, Current Adopted Edition.
   3. Uniform Plumbing Code, Current Adopted Edition.
   4. International Fuel Gas Code, Current Adopted Edition.
   5. Architectural Barriers Act of 1968: Public Law 90-480.
   6. ICC/ANSI-A117.1.
   7. International Fire Code, Current Adopted Edition.
   8. National Fire Protection Association 101, Life Safety Code.
   9. ADA Code.
   10. Other applicable state and local laws and codes.

1.04 QUALITY ASSURANCE

A. Manufacturers: Only firms regularly engaged in manufacturing of the mechanical services, equipment and specialties of types and sizes required, whose products have been in satisfactory use in similar service shall be used on this project.

B. Installers Qualifications: Only firms with successful installation experience on projects with work similar to that required for this project shall perform work on this project.

1.05 SUBMITTALS

A. Provide six copies of each type of equipment material or information for installation. Comply with division 01.

B. Substitutions and/or systems designed and manufactured by other manufacturers will be considered under the terms described for substitutions with the following exceptions:
   1. Substitutions: See Section 01 6000 - Product Requirements.
   2. Substitution requests will be considered only if received at least 10 days prior to the bid date.
   3. Substitution requests will be considered only if required submittal data is complete; see article SUBMITTALS above.
   4. Contractor (not equipment supplier) shall certify that the use of the substitute system and equipment will not require changes to other work or re-design.
   5. Contractor shall certify that the substitute system will achieve the performance specified.

1.06 SITE EXAMINATION

A. Examine site, verify dimensions and locations against Drawings, and inform self of conditions under which work is to be done before submitting proposal. No allowance will be made for extra expense on account of error.

B. Information shown relative to existing services is based upon available records and data but is approximate only. Make minor deviations found necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation for new piping or its installation. Verify existing conditions, pipe and equipment sizes, elevations and locations within the building prior to commencement of work.

1.07 PLACEMENT OF EQUIPMENT AND WORK

A. The placement of substituted (approved equal) equipment in the locations shown on the drawings shall be the Contractor's responsibility. The Contractor shall verify that all substituted equipment will fit, operate and have clearances and accessibility for maintenance, inspections, and operation within the space shown on the drawings. If the Contractor determines that substituted equipment will not fit and/or operate within the space shown on the Drawings and/or clearances and accessibility cannot be achieved, he shall bring these problems to the attention of the Architect who will make the final decision as to the method of correction. Corrections to work already completed and in-place shall not constitute an increase in the contract amount. The Contractor shall be responsible and incur any cost to allow for 36” clearance on two adjacent sides of equipment or on all sides of electrical access is required.

B. Move equipment and/or work into spaces through openings provided or located in the spaces during constructions, as required.

C. Do disassembling and reassembling of equipment or other work necessary to accomplish this requirement without extra cost to the Owner. Do not disassemble or reassemble any equipment in order to locate it in the space.

1.08 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Incorporate complete operating instructions including starting, stopping, and description of emergency manual operation methods for the following:
   1. Plumbing Systems
   2. Provide charts and diagrams as required.
   3. Provide operating manual for any equipment listed in individual sections of the specifications.

B. Provide maintenance instructions for each item of individual equipment covering pertinent maintenance data, such as lubricants to be used, frequency of lubrications, inspections required, adjustments, belt and pulley sizes, etc.

C. Provide parts bulletins containing manufacturer's bulletins with parts numbers, instructions, etc., for each item of equipment. Strip bulletins so that useless bulk is avoided.

D. Post service telephone numbers and/or addresses in an appropriate place as designated by the Architect.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Mention herein or on Drawings requires that this Contractor provide each item listed of quality noted or acceptable equal. All material shall be new, full weight, standard in all respects, and in first-class condition. Provide materials of the same brand of manufacture throughout for each class of material or equipment where possible. Materials shall be tested within the Continental United States by independent, nationally recognized testing agency and shall be listed in accordance with testing agency requirements.

B. The grade or quality of materials desired is indicated by the trade names or catalog numbers stated herein. The catalog numbers and specification are for bidding purposes only. Actual equipment submitted and ordered shall be verified to be appropriate for indicated use.

C. Dimensions, sizes, and capacities shown are a minimum and shall not be changed without permissions of the Architect/Engineer.

2.02 MATERIALS FURNISHED

A. Identify all materials and equipment by manufacturer's name and model number. Remove unidentified materials and equipment from site.

B. Equipment specified by manufacturer's number shall include all accessories, controls, etc., listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.

C. Equipment or material damaged during transportation, installation, or operation is considered as totally damaged. Replace with new equipment. Variance for this permitted only with written consent.

PART 3 - EXECUTION

3.01 DRAWINGS AND COORDINATION

A. General arrangement and location of piping, ductwork, equipment, etc., are shown on Drawings or herein specified. Carefully examine other work that may conflict with this work. Install this work in harmony with other crafts and at proper time to avoid delay of work.

B. In advance of construction, work out minor changes and relocations to suit actual conditions and work of other trades to avoid conflict therewith. Any change in rerouting ductwork, piping and equipment shall not be cause for additional cost.

C. The Sub-Contractor shall verify that the measurement of constructed rooms, spaces and areas are as shown on the Drawings. Any measurement deviation and/or discrepancies shall be brought to the attention of the Architect who will make the final decision as to the method of correction. Corrections to work already completed and in place shall be done at the Contractor's expense.

D. In addition, obtain all necessary information from the other trades regarding centers of partitions, walls, location of plumbing mains, fire sprinkler mains, and electrical conduits, ducts, pipes, etc., in order that pipes equipment, and ductwork may be placed in their correct positions.

E. Execute any work or apparatus shown on the Drawings and not mentioned in the specifications, or vice versa, the same as if specifically mentioned by both. Omission from Drawings or specifications of any minor details of construction, installation, materials or essential specialties does not relieve this Contractor from furnishing same in place complete.

F. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and workable system.

G. Furnish materials and work at proper time to avoid delay of the work.

3.02 CLOSING IN OF UNINSPECTED WORK

A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected and tested. Should work be enclosed or covered up before it has been inspected and tested, Contractor shall uncover work at own expense. After it has been inspected and tested, make repairs necessary to restore work of other Contractors to condition in which it was found at time of cutting.

3.03 PROJECT MODIFICATIONS

A. During the process of construction, if such conditions arise that require revisions, modifications, or relocations to any mechanical equipment mechanical ductwork, mechanical piping, plumbing piping or materials incorporated in this project, such alterations shall be immediately called to the attention of the Architect. Contractor shall then prepare necessary Drawings showing proposed changes. Submit proposed changes for review to the Architect prior to actual revision of work in the field. There shall be no additional cost incurred for these changes.

B. Two (2) sets of Drawings showing all revisions shall be immediately presented to Architect for his records. Maintain additional copies on the project as necessary to comply with “RECORD DRAWINGS” requirement of the General Requirements.

C. Incorporate all revisions into record Drawings. These drawings shall be up to date at the end of every week and shall be available to Architect or Engineer at any time for inspection.

3.04 GUARANTEE

A. Be responsible for work done and material installed under these plans and specifications. Repair or replace, as may be necessary, any defective work, material, or part which may show itself within one (1) year of filing of Notice of Completion and be responsible for damage to other materials, furnishing, equipment, or premises caused by such defects during this period, if in the opinion of the Architect said defect is due to imperfection of material or workmanship. Provide all such work and materials at no cost to Owner.

B. Be responsible for damage to any part of premises during guarantee period caused by leaks or breaks in work furnished and/or installed under this section.

C. Replace refrigerant, lubricants, or gases lost as result of defects, breaks, or leaks in work.

3.05 RECORD DRAWINGS

A. In addition, furnish one (1) tracing showing all outside utility connections, piping, etc., installed under this contract. Locate and dimension all work with reference to permanent landmarks.

B. Match all symbols and designations used in contract Drawings when preparing “Record” Drawings.

C. Indicate clearly and correctly all work installed differently from that shown, and maintain records up to date as work progresses. Include invert elevations of pipes below grade of floor, the floor lines, plugged wyes, tees, cape, exact locations and sizing or piping, location of valves, and the like. Dimension locations from structural points.

D. Properly identify all stubs for future connections as to locations and use by setting of concrete marker at finished grade in manner suitable to Architect.

3.06 MAINTENANCE DATA

A. Submit maintenance data and parts lists for all mechanical systems materials and products. Include product data, shop drawings, and Record Drawings in the maintenance manual all in allowance with the requirements of Division 01.

3.07 CLEANING UP

A. Comply with Supplementary General Conditions.

END OF SECTION 22 0200

SECTION 22 0519

METERS AND GAUGES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Liquid Meters:

B. Positive displacement meters.

C. Flow meters.

D. Pressure Gauges:
   1. Bourdon tube for liquids and gases.
   2. Diaphragm-actuated for gases.
   3. Manometers.

E. Thermometers.

F. Pressure-Temperature test plugs.

G. Pressure gauges and pressure gauge taps.

H. Thermometers and thermometer wells.

1.02 REFERENCE STANDARDS

A. ASME B40.100 - Pressure Gauges and Gauge Attachments; 2013.

B. ASTM E1 - Standard Specification for ASTM Liquid-in-Glass Thermometers; 2014.

C. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers; 2014, with Editorial Revision (2017).

D. AWWA C700 - Cold-Water Meters -- Displacement Type, Metal Alloy Main Case; 2015.

E. AWWA M6 - Water Meters -- Selection, Installation, Testing, and Maintenance; 2012.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

1.04 FIELD CONDITIONS

A. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

PART 2 PRODUCTS

2.01 LIQUID METERS

A. AWWA C700, positive displacement disc type suitable for fluid with bronze case and cast iron frost-proof, breakaway bottom cap, hermetically sealed register, remote reading to AWWA C706.

B. Meter: Brass body turbine meter with magnetic drive register.

2.02 PRESSURE GAUGES

A. Bourdon Tube for Liquids and Gases:
   1. Accuracy: ASME B40.100, adjustable commercial grade (D) with 5 percent of span.
   2. Process Connection: Lower-back, 1/4 inch NPT male except where noted.

B. Diaphragm Actuated for Gases:
   1. Accuracy: ASME B40.100, adjustable commercial grade (B) with 2 percent at mid-range of span.
   2. Process Connection: Lower-back, 1/4 inch NPT male except where noted.

C. Manometer: Inclined type, red oil on white background with black figures, front recalibration adjustment, 3 percent of full scale accuracy.

D. Accessories:
   1. Gauge Cock: Carbon steel with tee or lever handle for maximum 150 psi.
   2. Needle Valve: Carbon steel, 1/4 inch NPT female for noncorrosive service.

2.03 THERMOMETERS

A. General:
   1. Product Compliance: ASTM E1.
   2. Lens: Clear glass, except where stated.
   3. Accuracy: One percent, when tested in accordance with ASTM E77, except where stated.
   4. Scale: Black markings depicting single scale in degrees F where expected process value falls half-span of standard temperature range.

B. Thermometers - Straight: 5 inch v-shape lead-free brass case with clear glass window scale, 2 inch NPT stem, 3-1/4 inch NPT thermowell, and red or blue non-toxic organic liquid filled glass tube.

C. Thermometers - Adjustable Angle: 7 inch v-shape aluminum case with clear glass window scale, 6 inch NPT stem, red or blue organic non-toxic liquid filled glass tube, and adjustable joint with positive locking device allowing 360 degrees in horizontal plane or 180 degrees in vertical plane adjustments.

D. Thermometers - Dial Type:

2.04 PRESSURE-TEMPERATURE TEST PLUGS:

A. Size: 500 psi capacity; 1/2 inch MPT brass fitting with gasket, cap, and retaining strap for 1/8 inch pressure gauge or temperature probe.

B. Wetted Materials per Temperature Range:
   1. Up to 200 degrees F: Brass probe with neoprene core.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install metering products in accordance with manufacturer's instructions for intended fluid type and service.

B. Install water meters with inlet and outlet isolation valves in compliance with AWWA M6.

C. Install pressure gauges as follows:
   1. At Pumps: Place single gauge before strainer, suction side and discharge side.
   2. Include gauge cock to isolate each gauge and extend nipples for insulation clearance.
   3. Include siphons on high temperature systems and select type according to service rating.
   4. Adjust gauges to selected viewing angle, clean thoroughly, and calibrate to zero.

D. Install thermometers as follows:
   1. Hot Water Heaters: Place upstream and downstream of heater. Add one on the inlet end when using steam as the water heating medium.
   2. Piping: Install thermometers in branch butt weld connection fitting or socket-weld thermowell. Enlarge pipes smaller than 2-1/2 inch to accommodate sockets. Ensure sockets are above insulation clearance.

E. Adjust gauges and thermometers to final angle, clean windows and lenses, and calibrate to zero.

END OF SECTION 22 0519

SECTION 22 0548

VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

REFER TO SECTION 23 0548 VIBRATION AND SEISMIC CONTROLS FOR HVAC DUCTWORK, PIPING, AND EQUIPMENT FOR VIBRATION AND SEISMIC CONTROL REQUIREMENTS RELATED TO THIS SECTION

END OF SECTION 22 0548

SECTION 22 0553

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.

B. Tags.

C. Pipe markers.

D. Ceiling tacks.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturers catalog literature for each product required.

C. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

PART 2 PRODUCTS

2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE

A. Pipe Markers: 3/4 inch diameter and higher.

2.02 IDENTIFICATION APPLICATIONS

A. Major Control Components: Nameplates.

B. Piping: Pipe markers.

C. Pumps: Nameplates.

D. Small-sized Equipment: Tags.

E. Tanks: Nameplates.

F. Valves: Tags and ceiling tacks where located above lay-in ceiling.

G. Water Treatment Devices: Nameplates.

2.03 NAMEPLATES

A. Description: Laminated three-layer plastic with engraved letters.

2.04 TAGS

A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.

B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

2.05 PIPE MARKERS

A. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.

B. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

C. Underground Plastic Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.

D. Color code as follows:

1. Potable, Cooling, Boiler, Feed, Other Water: Green with white letters.
2. Fire Quenching Fluids: Red with white letters.
3. Flammable Fluids: Yellow with black letters.

4. Compressed Air: Blue with white letters.

2.06 CEILING TACKS

A. Description: Steel with 3/4 inch diameter color coded head.

B. Color code as follows:
   1. Plumbing Valves: Green.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

B. Install plastic pipe markers in accordance with manufacturer's instructions.

C. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.

D. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.

E. Use tags on piping 3/4 inch diameter and smaller.
   1. Identify service, flow direction, and pressure.
   2. Install in clear view and align with axis of piping.
   3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

F. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION 22 0553

SECTION 22 0719
PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flexible elastomeric cellular insulation.

B. Piping insulation.

C. Jackets and accessories.

1.02 REFERENCE STANDARDS

A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.

D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2016.

E. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2017.

F. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2013).

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

H. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.06 FIELD CONDITIONS

A. Maintain ambient conditions required by manufacturers of each product.

B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER

A. Manufacturers:
   1. Knauf Insulation: www.knaufusa.com.

2. Johns Manville: www.jm.com.
3. Owens Corning Corp: www.owenscorning.com.
4. CertainTeed Corporation: www.certainteed.com.
5. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Insulation: ASTM C547 and ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
1. K Value: ASTM C177, 0.24 at 75 degrees F.
2. Maximum Service Temperature: 650 degrees F.
3. Maximum Moisture Absorption: 0.2 percent by volume.

C. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.

2.03 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturers:
1. Armacell LLC; AP Armaflex: www.armacell.us/#sle.
2. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
1. Minimum Service Temperature: Minus 40 degrees F.
2. Maximum Service Temperature: 220 degrees F.
3. Connection: Waterproof vapor barrier adhesive.

C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

2.04 JACKETS

A. PVC Plastic.
1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
a. Minimum Service Temperature: 0 degrees F.
b. Maximum Service Temperature: 150 degrees F.
c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
d. Thickness: 10 mil.
e. Connections: Brush on welding adhesive.

B. Canvas Jacket: UL listed 6 oz/sq yd plain weave cotton fabric treated with dilute fire retardant lagging adhesive.

C. Aluminum Jacket: ASTM B209 (ASTM B209M) formed aluminum sheet.
1. Thickness: 0.016 inch sheet.
2. Finish: Smooth.
3. Joining: Longitudinal slip joints and 2 inch laps.
4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that piping has been tested before applying insulation materials.

B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Exposed Piping: Locate insulation and cover seams in least visible locations.

C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.

D. Glass fiber insulated pipes conveying fluids below ambient temperature:
   1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
   2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

E. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.

F. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.

G. Glass fiber insulated pipes conveying fluids above ambient temperature:
   1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
   2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

H. Inserts and Shields:
   1. Application: Piping 1-1/2 inches diameter or larger.
   2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
   3. Insert Location: Between support shield and piping and under the finish jacket.

I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 07 8400.

J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with canvas jacket sized for finish painting.

K. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

L. Buried Piping: Provide factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with one mil thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film.

M. Heat Traced Piping: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.03 SCHEDULES

A. Plumbing Systems:
   1. Domestic Hot Water Supply:
      a. Glass Fiber Insulation:
         1) Minimum Thickness: 1 inch.
      b. Flexible Elastomeric Cellular Foam Insulation:
         1) Minimum Thickness: 1 inch.
   2. Domestic Cold Water:
      a. Glass Fiber Insulation:
         1) Minimum Thickness: 1/2 inch.
      b. Flexible Elastomeric Cellular Foam Insulation:
         1) Minimum Thickness: 1/2 inch.

3. Plumbing Vents Within 10 Feet of the Exterior:
   a. Glass Fiber Insulation:
      1) Minimum Thickness: 1 inch.
   b. Flexible Elastomeric Cellular Foam Insulation:
      1) Minimum Thickness: 1 inch.

END OF SECTION 22 0719

SECTION 22 0719
PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flexible elastomeric cellular insulation.

B. Piping insulation.

C. Jackets and accessories.

1.02 REFERENCE STANDARDS

A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.

D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2016.

E. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2017.

F. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2013).

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

H. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.06 FIELD CONDITIONS

A. Maintain ambient conditions required by manufacturers of each product.

B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER

A. Manufacturers:
   1. Knauf Insulation: www.knaufusa.com.

2. Johns Manville: www.jm.com.
3. Owens Corning Corp: www.owenscorning.com.
4. CertainTeed Corporation: www.certainteed.com.
5. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Insulation: ASTM C547 and ASTM C795; semi-rigid, noncombustible, end grain adhered to jacket.
1. K Value: ASTM C177, 0.24 at 75 degrees F.
2. Maximum Service Temperature: 650 degrees F.
3. Maximum Moisture Absorption: 0.2 percent by volume.

C. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.

2.03 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturers:
1. Armacell LLC; AP Armaflex: www.armacell.us/#sle.
2. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
1. Minimum Service Temperature: Minus 40 degrees F.
2. Maximum Service Temperature: 220 degrees F.
3. Connection: Waterproof vapor barrier adhesive.

C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

2.04 JACKETS

A. PVC Plastic.
1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
a. Minimum Service Temperature: 0 degrees F.
b. Maximum Service Temperature: 150 degrees F.
c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
d. Thickness: 10 mil.
e. Connections: Brush on welding adhesive.

B. Canvas Jacket: UL listed 6 oz/sq yd plain weave cotton fabric treated with dilute fire retardant lagging adhesive.

C. Aluminum Jacket: ASTM B209 (ASTM B209M) formed aluminum sheet.
1. Thickness: 0.016 inch sheet.
2. Finish: Smooth.
3. Joining: Longitudinal slip joints and 2 inch laps.
4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that piping has been tested before applying insulation materials.

B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Exposed Piping: Locate insulation and cover seams in least visible locations.

C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.

D. Glass fiber insulated pipes conveying fluids below ambient temperature:
   1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
   2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

E. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.

F. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.

G. Glass fiber insulated pipes conveying fluids above ambient temperature:
   1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
   2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

H. Inserts and Shields:
   1. Application: Piping 1-1/2 inches diameter or larger.
   2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
   3. Insert Location: Between support shield and piping and under the finish jacket.

I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 07 8400.

J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with canvas jacket sized for finish painting.

K. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

L. Buried Piping: Provide factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with one mil thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film.

M. Heat Traced Piping: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.03 SCHEDULES

A. Plumbing Systems:
   1. Domestic Hot Water Supply:
      a. Glass Fiber Insulation:
         1) Minimum Thickness: 1 inch.
      b. Flexible Elastomeric Cellular Foam Insulation:
         1) Minimum Thickness: 1 inch.
   2. Domestic Cold Water:
      a. Glass Fiber Insulation:
         1) Minimum Thickness: 1/2 inch.
      b. Flexible Elastomeric Cellular Foam Insulation:
         1) Minimum Thickness: 1/2 inch.

3. Plumbing Vents Within 10 Feet of the Exterior:
   a. Glass Fiber Insulation:
      1) Minimum Thickness: 1 inch.
   b. Flexible Elastomeric Cellular Foam Insulation:
      1) Minimum Thickness: 1 inch.

END OF SECTION 22 0719

SECTION 22 1006
PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drains.
B. Cleanouts.
C. Hose bibbs.
D. Hydrants.
E. Washing machine boxes and valves.
F. Refrigerator valve and recessed box.
G. Backflow preventers.
H. Double check valve assemblies.
I. Water hammer arrestors.
J. Sumps and interceptors.
K. Mixing valves.
L. Thermal expansion tanks.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASME A112.6.4 - Roof, Deck, and Balcony Drains; 2008 (Reaffirmed 2012).
B. ASSE 1011 - Performance Requirements for Hose Connection Vacuum Breakers; 2004, with Errata.
C. ASSE 1012 - Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent; 2009.
D. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance; 2011 (Reaffirmed 2016).
E. NSF 61 - Drinking Water System Components - Health Effects; 2014 (Errata 2015).
F. NSF 372 - Drinking Water System Components - Lead Content; 2011.
G. PDI-WH 201 - Water Hammer Arresters; 2010.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. See Section 01 3000 - Administrative Requirements, for submittal procedures.
C. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
D. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.
E. Certificates: Certify that grease interceptors meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept specialties on site in original factory packaging. Inspect for damage.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 DRAINS

A. Manufacturers:
   1. Zurn Industries, LLC: www.zurn.com.
   2. Wade: www.wadedrains.com.
   3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
   4. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Roof Drains:
   1. Assembly: ASME A112.6.4.
   2. Body: Lacquered cast iron with sump.
   3. Strainer: Removable cast iron dome and gravel stop with vandal proof screws.
   4. Accessories: Coordinate with roofing type:
      a. Membrane flange and membrane clamp with integral gravel stop.
      b. Adjustable under deck clamp.
      c. Roof sump receiver.
      d. Waterproofing flange.
      e. Leveling frame.
      f. Adjustable extension sleeve for roof insulation.

C. Roof Overflow Drains:
   1. Lacquered cast iron body and clamp collar and bottom clamp ring; pipe extended to _____ inches above flood elevation.

D. Downspout Nozzles:
   1. Bronze round with straight bottom section, lambs tongue type.

E. Area Drains:
   1. Assembly: ASME A112.6.4.
   2. Body: Lacquered cast iron with sump.
   3. Strainer: Round nickel-bronze.

2.03 CLEANOUTS

A. Manufacturers:
   1. Zurn Industries, LLC: www.zurn.com.
   2. Wade: www.wadedrains.com.
   3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
   4. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Cleanouts at Exterior Surfaced Areas:
   1. Round cast iron tractor-type access frame and non-skid cover.

C. Cleanouts at Exterior Unsurfaced Areas:
   1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.

D. Cleanouts at Interior Finished Floor Areas:
   1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.

E. Cleanouts at Interior Finished Wall Areas:
   1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

F. Cleanouts at Interior Unfinished Accessible Areas:
   1. Threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

2.04 HOSE BIBBS

A. Manufacturers:
   1. Zurn Industries, LLC: www.zurn.com.
   2. Woodford Manufacturing Company: www.wcmind.com.
   3. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Interior Hose Bibbs:
   1. Bronze or brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome-plated where exposed with handwheel, integral vacuum breaker in compliance with ASSE 1011.

2.05 HYDRANTS

A. Manufacturers:
   1. Zurn Industries, LLC: www.zurn.com.
   2. Woodford Manufacturing Company: www.wcmind.com.
   3. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Wall Hydrants:
   1. ASSE 1019; freeze resistant, self-draining type with chrome-plated wall plate hose thread spout, handwheel, and integral vacuum breaker.

2.06 WASHING MACHINE BOXES AND VALVES

A. Box Manufacturers:
   1. IPS Corporation/Guy Gray: www.ipscorp.com.
   2. Oatey Supply Chain Services, Inc: www.oatey.com.
   3. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Valve Manufacturers:
   1. IPS Corporation/Guy Gray: www.ipscorp.com.
   2. Zurn Industries, LLC: www.zurn.com.
   3. Substitutions: See Section 22 0200 - Plumbing General Requirements.

C. Description: Metal preformed rough-in box with brass valves with single lever handle, socket for 2 inch waste, slip in finishing cover.

2.07 REFRIGERATOR / ICE MAKER VALVE AND RECESSED BOX

A. Box Manufacturers:
   1. IPS Corporation/Guy Gray: www.ipscorp.com.
   2. Oatey Supply Chain Services, Inc: www.oatey.com.
   3. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Valve Manufacturers:
   1. IPS Corporation/Guy Gray: www.ipscorp.com.
   2. Zurn Industries, LLC: www.zurn.com.
   3. Substitutions: See Section 22 0200 - Plumbing General Requirements.

C. Description: Metal preformed rough-in box with brass valves with wheel handle, slip in finishing cover.

2.08 BACKFLOW PREVENTERS

A. Manufacturers:
   1. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com.
   2. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Reduced Pressure Backflow Preventer Assembly:

1. ASSE 1013; bronze body with bronze internal parts and stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two gate valves, strainer, and four test cocks, discharge air gap, integral shut-off valves.
2. Size: _____ inch assembly with threaded gate valves.

2.09 DOUBLE CHECK-VALVE ASSEMBLIES

A. Manufacturers:
   1. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com.
   2. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Double Check Valve Assembly:
   1. ASSE 1012; Bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves. Provide intermediate atmospheric vent when indicated on plan.
   2. Size: 3/4 to 2 inch, NPS assembly with threaded full port ball valves.

2.10 WATER HAMMER ARRESTORS

A. Manufacturers:
   1. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com.
   2. Zurn Industries, LLC: www.zurn.com.
   3. Sioux Chief Manufacturing Co.: www.siouxchief.com.
   4. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Water Hammer Arrestors:
   1. Stainless steel construction, piston type sized and located in accordance with PDI-WH 201, precharged suitable for operation in temperature range -100 to 300 degrees F and maximum 250 psi working pressure.

2.11 SUMP AND INTERCEPTORS

A. Manufacturers:
   1. Zurn Industries, LLC: www.zurn.com.
   2. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Grease Interceptors:
   1. Construction:
      a. Material: Epoxy coated fabricated steel.
      b. Accessories: Multi-weir baffle assembly, integral deep seal trap, removable integral flow control, vent connections.
      c. Cover: Steel, epoxy coated, non-skid with gasket, securing handle, and enzyme injection port, recessed for floor finish.

C. Oil Interceptors:
   1. Construction:
      a. Material: Epoxy coated fabricated steel.
      b. Accessories: Integral deep seal trap, removable integral flow control, adjustable draw-off assembly, sediment bucket.
      c. Cover: Steel, epoxy coated, non-skid with gasket, securing handle, and enzyme injection port, recessed for floor finish.

2.12 MIXING VALVES

A. Thermostatic Mixing Valves:
   1. Manufacturers:
      a. Leonard Valve Company: www.leonardvalve.com.
      b. Lawler Manufacturing Company, Inc.: www.lawlervalve.com.
      c. Holby Valve, Inc.: www.holby.com.

d. Substitutions: See Section 22 0200 - Plumbing General Requirements.

2. Valve: Cast brass body, stainless steel or copper alloy bellows, integral temperature adjustment.
3. Accessories:
   a. Check valve on inlets.
   b. Volume control shut-off valve on outlet.
   c. Stem thermometer on outlet.
   d. Strainer stop checks on inlets.

2.13 THERMAL EXPANSION TANKS

A. Manufacturers:
   1. Amtrol, Inc.: www.amtrol.com
   2. Zurn Industries, Inc: www.zurn.com.
   3. Substitutions: See Section 22 0200 - Plumbing General Requirements.

B. Tank:
   1. The outer shell shall be high grade steel with exterior coating. The bladder shall be FDA approved butyl rubber and prevent water from contact with shell interior. The assembly shall incorporate a schrader valve for adjusting air pre-charge and a stainless steel system connection. The tank shall be sized in accordance with the manufacturer's approved sizing criteria for the system served.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.

C. Encase exterior cleanouts in concrete flush with grade.

D. Install floor cleanouts at elevation to accommodate finished floor.

E. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.

F. Pipe relief from backflow preventer to nearest drain.

G. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatories, sinks, washing machine outlets, water closets, urinals, and at all quick closing solenoid valve locations.

H. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures (each washroom) where water hammer arrestors are not required. Fabricate same size as supply pipe or 3/4 inch minimum, and minimum 18 inches long.

END OF SECTION 22 1006