PLUMBING SPECIFICATIONS

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SECTION 22 00 00
BASIC PLUMBING REQUIREMENTS

1 PART 1 GENERAL

1.1 OTHER REQUIREMENTS

A. The Bidding, General and Supplementary of this project manual and specific sections as noted apply to the work specified in Plumbing Division 22 which encompasses Sections 22 00 00 through 22 47 00. This Section 22 00 00 applies to all sections of Division 22 Plumbing.

1.2 SCOPE

A. It is the intent of these specifications and the accompanying drawings to describe complete plumbing systems installations for all building areas, new and renovation.

B. Furnish and install all material, labor and equipment in accordance with these documents.

C. Include all incidental items and work not specifically shown or specified but required by good practice in a complete system.

D. The drawings and specifications are complementary. What is called for in one shall be called for in both.

E. The drawings are diagrammatic but should be followed as closely as possible. Where required by jobsite conditions, relocate and provide fittings, etc., as required. Provide an allowance in the contract bid to furnish additional pipe and fittings required for coordination with structure and other construction trades.

1.3 DEFINITIONS

A. Or approved equal: Requires approval prior to bid date.

B. Indicated:
1. The term "indicated" is a cross reference to details, notes, or schedules on the drawings, other paragraphs or schedules in the specifications, and similar means of recording requirements in the Contract Documents.
2. Where terms such as "shown," "noted," "scheduled," and "specified" are used instead of "indicated," it is for the purpose of helping the reader locate the cross reference, and no limitation of location is intended except as specifically noted.

C. Directed, Requested, Etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by the Engineer," "requested by the Engineer," etc. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

D. Site or Project Site: The space available to the Contractor for the performance of the work, either exclusively or in conjunction with others performing the work as part of the project. The extent of the project site is shown on the plumbing drawings and is not identical with the description of the land upon which the project is to be built.

E. Approved:
1. Where used in conjunction with the Architect's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the meaning of the term "approved" will be held to the limitations of the Architect's responsibilities and duties as specified in the General and Supplementary Conditions.
2. In no case will "approval" by the Architect be interpreted as a release of the Contractor from responsibilities to fulfill requirements of the Contract Documents.

F. Provide: The term "provide" means to furnish and install, complete and ready for the intended use.

1.4 STANDARDS AND CODES

A. Provide all equipment and material and perform all work in accordance with all local, state and national codes and regulations.

B. For work on this project, comply with appropriate standards published by the following:
1. American National Standards Institute.
2. Acoustical Society of America.
3. American Society of Mechanical Engineers.
4. American Society of Plumbing Engineers.
5. American Society for Testing and Materials.
6. Institute of Boiler and Radiator Manufacturers.
7. National Electrical Manufacturers Association.
8. National Fire Protection Association.
9. Underwriters' Laboratories.

1.5 APPROVAL OF EQUIPMENT AND MATERIALS

A. Manufacturer's trade names, catalog numbers and material specifications used in this specification are intended to establish the quality of equipment or materials expected. Materials and manufacturers not listed require approval prior to the bid date.

B. Approval of substitute equipment or materials will be based upon performance, quality and other factors deemed important by the Architect. The Contractor will be responsible for making all changes in this and other associated work required as a result of the substitution. Additional or modified structural calculations and roof penetrations required to accommodate the substitution will be the responsibility of the contractor.

1.6 SUBMITTALS

A. Transmit five sets of submittals to the Architect for review. The submittals shall be bound in three_ring binders, have major topic tabs and an index. In order to expedite approval of certain items, it is not necessary to transmit complete submittals initially. The initial transmittal will include the binder, expected tabs and an index indicating which items are included, the date each is transmitted, and which items are yet to be transmitted. Future transmittals shall include a revised index.

B. Furnish performance data and technical information on all materials and equipment to be used on the project.

C. Include shop drawings with the submittals where necessary to determine clearance, where the Contractor proposes alternate equipment or material arrangements, and when requested by the Architect.

D. Items transmitted for approval must be received in the Architect's office within 45 days of contract award. The Architect prior to installation must approve all material and equipment.

E. Review of submittals or shop drawings by the Architect does not relieve the Contractor from the requirements of the Contract Documents unless specific approval has been requested for a given deviation.

1.7 QUALITY ASSURANCE

A. Maintain the highest standards of workmanship throughout the project.

B. Use the latest editions of applicable and specifically referenced standards.

C. Inspect all material and equipment upon arrival at the site and return any which is not in new condition.

2 PART 2 PRODUCTS

Not Used

3 PART 3 EXECUTION

3.1 COORDINATION

A. Cooperate with other trades to assure that construction proceeds in an orderly and timely manner. Contract cost increases due to improperly sequenced work with other trades will not be allowed.

B. Study the new and existing architectural, structural, electrical, shop and any specialty drawings as appropriate and specifications to determine required coordination.

C. Prepare detailed shop drawings where necessary to assure proper fit and necessary clearance.

D. Refer to electrical drawings to verify voltage and phase of plumbing equipment.

3.2 PERMITS, FEES AND INSPECTIONS

A. Obtain all required permits and pay for all fees and connection charges.

B. Schedule any required inspections.

3.3 MATERIALS AND WORKMANSHIP

A. Furnish all materials and equipment in new condition, free from defects and of size, make, type and quality specified. Installation shall be in a neat and workmanlike manner.

B. When two or more items of the same kind, type or class are required, use items of a single manufacturer.

3.4 MEASUREMENTS

A. Take all measurements from reference datums established by the plumbing contractor.

3.5 DELIVERY, HANDLING AND STORAGE

A. Receive all material and equipment at the jobsite or shop.

B. Use proper and sufficient equipment to handle all products employed in the project.

C. Where storage of material or equipment is necessary, it shall be a clean and weatherproof area. Seal any openings and cover the product to assure that there will be no corrosion or foreign matter introduced. Assure that it will be in new condition when placed in service.

3.6 EQUIPMENT INSTALLATION, BRACING AND SUPPORT

A. Install all equipment in strict accordance with the manufacturer's instructions unless otherwise indicated.

B. The drawings in general are based upon one of the specific manufacturers listed for a particular equipment item. The other specified manufacturers and additional approved manufacturers of equipment may require deviations from the drawings to properly install the equipment in accordance with the manufacturer's recommendations and to provide the system results required. Provide all work necessary in the base bid price to install this equipment.

C. Where the installation shown or specified is contrary to the manufacturer's instructions, advise the Architect in writing of the differences before proceeding with the installation.

D. Provide supports for all apparatus as specified, detailed, as required by the manufacturers of specific equipment and the project governing code authorities. Anchor all roof and base/floor mounted equipment with size and spacing of anchor bolts or other attachment means as recommended by the respective equipment manufacturer. Provide seismic restraints on all mechanical equipment in conformance with the 2007 Oregon Structural Specialty Code, Section 1613 "Earthquake Loads". Costs for seismic calculations are to be included in the bid price.

E. Maintain a copy of the manufacturer's installation instructions at the jobsite for all equipment.

3.7 SLEEVES AND INSERTS

A. Provide sleeves at all locations where piping and ductwork passes through building construction.

B. Sleeves for interior walls and floors shall be 22-gauge galvanized or heavier as required. Sleeves for exterior walls shall be cast iron, wall thickness as required.
1. Wall sleeves shall be installed in all exterior walls and all interior masonry or fire-rated walls in a manner that preserves the fire-rated or watertight integrity of the wall.
2. Interior wall sleeves for uninsulated pipe shall allow minimum 1/4-inch clearance all around pipe for pipe movement. Allow 1-inch clearance around pipe at building expansion joints.
3. Interior wall sleeves for insulated piping shall be selected to encompass the pipe and insulation and allow minimum 1/4-inch clearance around insulation for pipe movement. Allow 1-inch clearance around pipe and insulation at building expansion joints.
4. Floor sleeves shall extend 1/2-inch above the floor and shall be sealed watertight.
5. Floor sleeves shall be oversized to allow 1/2-inch minimum space all around pipe or pipe and insulation where applicable. Seal space between pipe and sleeve with Dow Corning Fire Stop System, 3M brand CP25 or approved equal. Sealant must be between pipe and sleeve. Sealant between insulation and sleeve is not acceptable. Install firestop materials in complete accordance with the manufacturer's instructions and in compliance to applicable UL listings.

C. Seal space between pipe and sleeve with Dow Corning Fire Stop System, 3M Brand CP25 or approved equal where piping penetrates firewall or floors. Sealant must be between pipe and sleeve; sealant between insulation and sleeve is not acceptable. Install firestop materials in complete accordance with the manufacturer's instructions and in compliance to applicable UL listings.

3.8 FLOOR, WALL AND CEILING PLATES

A. Provide escutcheon plates where all exposed piping passes through finished walls, floors and ceilings, including accessible cabinet spaces.

B. Floor plates: deep recessed, cast brass, chrome plated.

C. Wall and ceiling plates: spun aluminum, chrome plated.

D. Secure plates to pipe or structure. Plates shall not penetrate insulation vapor barriers. Size plates to sufficiently cover pipe sleeves and openings in finish materials.

3.9 ACCESS DOORS AND PANESL

A. Provide access doors or panels where indicated on the drawings or required to provide access to valves, equipment, water hammer arrestors, trap primers and other appurtenances requiring periodic attention and as specified.

B. Provide doors or panels as manufactured by Cesco, Milcor, Elmdor or approved equal. Cesco used as basis of design.

C. In non-fire rated ceiling and wall access panels provide Cesco style W, SR-1, P, PX as required for wall or ceiling construction, 12" x 12" or larger as required for ease of access.

D. In fire-rated ceiling and wall access panels provide Cesco style FB, U.L. listed for 1-1/2 hour fire rated stud and masonary wall system.

3.10 PROTECTION

A. Protect all work, material and equipment from loss or damage until the Owner accepts the project.

B. As the work progresses, keep all equipment covered and cap all piping that may temporarily be left unconnected.

C. Notify all other trades of any required precautions necessary to protect the work.

3.11 ACCESSIBILITY

A. Provide convenient access by location or access panel to all equipment requiring periodic service.

3.12 ELECTRICAL WORK

A. Materials and work to be provided as a part of this Plumbing Division 22 are:
1. Equipment control wiring.
2. Interlock wiring.
3. Motor starters.

B. Wherever possible, provide all interconnect wiring within or on a piece of equipment with the equipment unless shown or specified otherwise. An electrician licensed to perform this type of work shall perform all field wiring.

3.13 RELATED WORK

A. The following work and materials are specified elsewhere:

B. Pipe chases, equipment pads and foundations, trenches, painting, louvered and access panels except as otherwise specified in this division.
1. Framed openings, wood grounds and nailing strips, masonry, concrete and other architectural and structural elements.

C. The following work and materials are specified in Electrical Division:
1. Power wiring.
2. Disconnect switches.
3. Furnishing and installation of disconnect switches.
4. Installation of magnetic starters.

3.14 CLEANING

A. Maintain premises and public properties free from accumulations of waste, debris and rubbish during construction.

B. Clean all plumbing equipment of dust, grease, iron cuttings, unnecessary stamps or shipping labels, etc.

C. Touch up factory_painted surfaces, as necessary, with paint of matching color.

3.15 RECORD DRAWINGS

A. Maintain one set of construction drawings at the jobsite for the sole purpose of recording work of the plumbing contract, as actually installed. Upon request, the Architect will make the original tracings available to the plumbing contractor for printing the drawings. The Contractor shall pay the reproduction costs.

B. Record all piping by dimensions from gridlines, below grade, above floor, etc. Show location of all access panels, cleanouts, rough_in for future, etc.

C. Make record drawings available to the Architect for review or reproduction during construction. The Architect will pay any printing costs.

D. Deliver record drawings to the Architect promptly upon completion of the project.

3.16 OPERATION AND MAINTENANCE MANUALS:

A. Submit five copies of the Operation and Maintenance Manuals to the Architect for approval before project completion. Bind the instruction books with three_ring 8-1/2" x 11" side binders with plastic covers. Include an index and tabs for major systems and equipment. Operation and Maintenance Manuals shall include the following:

B. Directories:
1. Supplier Directory: Alphabetical list of principal subcontractors and suppliers of equipment giving names, addresses and telephone numbers.
2. Equipment Directory: List of plumbing equipment installed such as, pumps, water heaters, plumbing fixtures, etc., giving drawing reference numbers, location, area served, manufacturer with model number and supplier.

C. Manufacturer's Literature:
1. Show name, address and phone number of the nearest service facility authorized by the manufacturer.
2. Include illustrations, diagrams, and instructions for installation, startup, operation, inspections, maintenance, parts list, data sheets and other necessary materials.
3. Include complete electrical, schematic and connection diagrams for each equipment item.
4. Include the name, address and phone number of contractor(s) who furnished and who installed equipment and systems.
5. Where the literature covers more than one model, check off neatly in ink correct model number and data for the model number including all specified options.
6. In those instances where the equipment, its mode of control, or both, is job assembled for special functions, then provide written operating and maintenance instructions prepared by the assembler on 8-1/2" x 11" sheets.

D. Maintenance Instructions:
1. Where instructions for maintenance are not included in the manufacturer's literature, provide supplemental data to enable proper maintenance of the equipment installed.
2. Include specific lubrication methods and recommended frequencies along with procedures and precautions for inspection and routine service.

E. Copy of Written Guarantee.

F. Recommended Spare Parts Stock.

3.17 OWNER MEETING

A. Schedule a meeting between the Contractor's representative and the Owner for the purpose of reviewing operation and maintenance of the building mechanical systems. The Contractor's representative shall be well qualified and knowledgeable of the systems in this facility.

B. The meeting shall be scheduled to allow the Owner and appropriate subcontractors and equipment suppliers to attend.

C. The meeting shall be scheduled promptly upon completion of the project and approval of the Operation and Maintenance Manuals.

D. The Contractor shall review the Operation and Maintenance Manuals and record drawings in detail with the Owner.

3.18 CUTTING AND PATCHING

A. Cut work as required for installation and patch to match original conditions as directed and approved by Architect. Do not cut structural portion without Architect's approval.

B. When masonry construction must be penetrated, provide a steel pipe sleeve in opening and grout in place in a neat manner. Leave grout surface to match existing finish.

C. Prior to cutting any existing work, locate all concealed utilities to eliminate any possible service interruption or damage.

3.19 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

A. Contractors shall provide proper sizing when providing sleeves or core-drilled holes to accommodate the through penetrating items. All voids between sleeve or core-drilled hole and pipe passing through, shall be firestopped to meet the requirements of ASTM E-814.

B. Fire stop penetrations in accordance with the U.L. listed assemblies provided by the manufacturers of the products used.

3.20 CONTRACT COST DATA

A. Furnish to the Architect a cost breakdown of the Plumbing Contract with major systems and equipment broken out with itemized costs.

3.21 CHANGE ORDERS

A. All supplemental cost proposals by the Contractor shall be accompanied with a complete itemized breakdown of labor and materials cost without exception.

B. Contractor's estimating sheets for the supplemental cost proposals shall be made available to the Architect. Labor must be separated and allocated for each item of work.

3.22 VERIFICATION OF EXISTING CONDITIONS

A. Verify field conditions and measurements prior to the manufacture or order of materials and equipment.

B. Produce shop drawings with details as required to verify proper installation of materials & equipment in conformance with applicable codes and the manufacturer's requirements.

3.23 SYSTEMS WIRING

ITEMFURNISHED BY
INSTALL BYPOWER WIRING
CONTROL WIRING1.Division 23
Equipment MotorsDiv. 22Div. 22Div. 26Div. 222.Motor Starters, Contactors and Overload Heaters - IntegralDiv. 22Div. 26Div. 26Div.
223.Motor Control CentersDiv. 26Div. 26Div. 26Div. 224.Fused & Unfused Disconnect SwitchesDiv. 26Div. 26Div. 26------5.Manual
Operation SwitchesDiv. 26Div. 26Div. 26Div. 266.Control Relays & TransformersDiv. 22Div. 22Div. 22Div. 227.Energy Management Control
PanelsDiv. 22Div. 22Div. 22Div. 228.Motorized Solenoid ValvesDiv. 23Div. 23Div. 23Div. 22

END OF SECTION

SECTION 22 05 19

METERS AND GAUGES FOR PLUMBING PIPING

4 PART 1 GENERAL

4.1 DESCRIPTION

A. This section prescribes the requirements for materials and methods of installation of gauges and instruments specified, shown on the drawings or required by good practice.

4.2 RELATED WORK

A. Basic Mechanical Requirements, Section 22-00-00.

4.3 SUBMITTALS

A. Manufacturer's catalog or technical data substantiating

5 PART 2 PRODUCTS

5.1 PRESSURE GAUGES

A. Manufacturers: Marshalltown, Ashcroft, Marsh or approved equal. Marshalltown used as basis for selection.

B. Type: Figure 224WF with 4 1/2" dial, bottom stem connection, midrange reading during system operation and Figure 123 cock.

5.2 THERMOMETERS

A. Manufacturers: Marshalltown, Ashcroft, Marsh, Palmer, Tel_Tru or approved equal. Marshalltown used as basis for selection.

B. Type: Model V_3 adjustable model with 3 1/2 inch dial, 50 to 250 F. range for hot water.

6 PART 3 EXECUTION

6.1 INSTALLATION

A. Install all gauges and thermometers where shown on the drawings and in accordance with manufacturer's recommendations.

B. Pressure gauge and thermometers shall be installed or located to be easily read from the floor.

END OF SECTION

SECTION 22 05 23

GENERAL DUTY VALVES FOR PLUMBING

7 PART 1 GENERAL

7.1 SUMMARY

A. Work included: Providing of all required valves, cocks and faucets.

7.2 SUBMITTALS

A. Provide submittals in accordance with Section 22-00-00.

B. Submittals shall include manufacturer's catalog or technical data showing performance, dimensions, materials of construction and recommended methods of installation.

7.3 OPERATION AND MAINTENANCE DATA

A. Provide O&M data in accordance with Section 22-00-00.

B. O&M data will include manufacturer's literature and Maintenance instructions.

8 PART 2 PRODUCTS

8.1 MANUFACTURERS

A. Gate Valves, Ball Valves and Drain Valves: Hammond, Stockham, Nibco, Milwaukee or approved equal. Hammond used as basis of selection.

8.2 DESCRIPTION

A. Bronze Gate Valve (Domestic Water Service): Figure IB 647, Class 125, 200 PSI non-shock cold water rated solder type bronze body gate valve with solid wedge disc, integral seat, threaded bonnet, non-rising stem, iron handwheel.

B. Ball Valves (Domestic Water Service): Ball valves for domestic water service shall be Figure 8511, 150 WSP / 600 WOG, 400 PSI non-shock cold water rated solder type 2-piece bronze body ball valve with full port / large port, solder ends, blow out proof stem, RTFE seats and PTFE packing, free floating chrome plated brass ball.

C. Drain Valves: Figure 710 or 712 brass hose end valve, 150 WWP, brass body, adjustable packing nut and stuffing box, Buna-N seats, iron handwheel. Provide cap & chain.

9 PART 3 EXECUTION

9.1 INSTALLATION

A. Provide valves at connections to equipment, where shown on the drawings or as required.

B. Install all valves with stem horizontal or above, accessible and same size as connected piping.

C. Provide separate support for valves where necessary.

END OF SECTION

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

10 PART 1 GENERAL

10.1 SUMMARY

A. Work included: Providing of all required hangers and supports for piping, and equipment.

10.2 SUBMITTALS

A. Provide submittals in accordance with Section 22-00-00.

B. Submittals shall include:
1. Manufacturer's technical literature for all products used indicating service for each type of hanger.
2. Include proposed pre-manufactured piping and duct vibration isolation products.
3. Submit literature or describe duct-supporting method.

11 PART 2 PRODUCTS

11.1 MANUFACTURERS

A. M-CO, Grinnell, Super Strut. M-CO used for selection.

B. Vibration Isolators:
1. Type of isolator, base, and minimum static deflection shall be as required for each specific equipment application as recommended by isolator or equipment manufacturer but subject to minimum requirements indicated herein.
2. Uniform Loading: Select and locate isolators to produce uniform loading and deflection even when equipment weight is not evenly distributed.
3. Mason Industries products used as basis of selection.

11.2 DESCRIPTION

A. Pipe Attachments:
1. Non_insulated ferrous pipe (1/2 to 1-1/2 inch): Figure 100.
2. Non_insulated ferrous pipe (2 inch and larger): Figure 400.
3. Non_insulated copper pipe: Figure 101.
4. Insulated pipe: Figures 1031 and 4031.
5. Riser clamp, ferrous pipe: Figure 510.
6. Riser clamp, plastic DWV: Figure 515.

B. Upper Attachments: Attachment to wood structures where weights permit shall be Figure 325 or 328.

C. Structural Attachments: Provide all necessary structural attachments such as concrete anchors, beam clamps, hanger flanges and brackets. Hangers shall not be suspended from other piping, equipment, etc.

D. Miscellaneous items such as hanger rod, rod couplings, turnbuckles, etc. shall be standard figure numbers of the same manufacturer as the attachments.

12 PART 3 EXECUTION

12.1 INSTALLATION

A. Provide hangers and supports in accordance with the instructions furnished by the manufacturers of these devices.

B. For horizontal pipe lines install pipe hangers with maximum hanger spacing and maximum hanger rods as recommended in Table 6 of the 2000 edition of the ASHRAE Guide and Data Book, Systems and Equipment Chapter 41: Where concentrated loads of valves, fittings, etc. occur, closer spacing will be necessary and shall be based on the weight to be supported and the maximum recommended loads for the hanger components. Cast iron soil pipe shall be supported at every joint.

C. Horizontal banks of piping for plumbing piping only, i.e. domestic hot and cold water, may be supported on a common steel channel strut member spaced not more than the shortest allowable span required on the individual pipe. Piping to be maintained at these relative lateral positions using clamps, slips or free to roll axially or slide using a Figure 125 insulated protector at all points of support for insulated lines.

D. Provide additional structural members where required to support piping or ductwork.

E. Provide hangers and support devices in accordance with the equipment manufacturer's instructions for all equipment.

F. Provide seismic bracing and supports per SMACNA Seismic Restraint Manual Guidelines and as required by the governing jurisdiction for all Mechanical Systems. Provide seismic restraints on all mechanical equipment in accordance with Zone 3 seismic requirements. Provide seismic restraint details and calculations as required by the governing code jurisdiction. Cost for all seismic detail development and calculations are to be included in the base bid price.

G. Provide supplementary drawings and calculations as required by governing code jurisdictions noting seismic support data/calculations as required for permit purposes.

H. All piping and duct supports within 30-feet of air handling units is to be isolated from the building support structure by pre-manufactured spring and/or resilient vibration isolators.

END OF SECTION

SECTION 22 05 48

VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

13 PART 1 GENERAL

13.1 DESCRIPTION

A. Work included: Providing of all seismic restraints and vibration isolation for plumbing equipment.

13.2 QUALITY ASSURANCE

A. Equipment: All plumbing equipment mounted on vibration isolators shall be provided with seismic restraints capable of resisting a horizontal force of 100 percent of the weight of the equipment furnished.

B. Piping: Refer to specification section 22 05 29, Hangers and Supports for Plumbing Piping and Equipment.

13.3 SUBMITTALS

A. Provide submittals in accordance with Section 22 00 00.

B. Submittals shall include:
1. Manufacturer's technical literature for all products used including weights, dimensions and standard connections.
2. Indicate service for each type of hanger.

14 PART 2 PRODUCTS

14.1 GENERAL REQUIREMENTS

A. Type of isolator, base, and minimum static deflection shall be as required for each specific equipment application as recommended by isolator or equipment manufacturer but subject to minimum requirements indicated herein.

B. Uniform Loading: Select and locate isolators to produce uniform loading and deflection even when equipment weight is not evenly distributed.

C. Mason Industries products used as basis of selection.

14.2 VIBRATION ISOLATORS

A. Piping Systems:
1. Provide isolation by either floor mount or hangers with 3/4-inch deflection.
2. Provide oversized wall penetrations, line with neoprene and seal with resilient caulk or firestop material as appropriate.
3. Isolate domestic water piping from structure with Holdrite. Attach to one side of double stud wall.

15 PART 3 EXECUTION

15.1 INSTALLATION

A. Provide vibration isolation above for the noted plumbing systems. Install all vibration isolation devices in accordance with manufacturer's installation instructions. Provide additional support members, Unistrut bracing, etc as required for proper installation of isolation devices.

B. Inspection and Adjustments: Check for vibration and noise transmission through connections and floor. Adjust, repair, or replace isolators as required to reduce vibration and noise transmissions to specified levels.

C. On all sides of suspended equipment, provide bracing for rigid supports and provide restraints for resiliently supported equipment. The slack cable restraint method, Mason Industries, or equal, is acceptable.

15.2 ADJUSTING

A. Adjust vibration isolators after equipment is at operating weight.

B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

C. Adjust active height of spring isolators.

D. Adjust seismic restraints to permit free movement of equipment within normal mode of operation.

E. Torque anchor bolts according to equipment manufacturer's recommendations to resist seismic forces.

END OF SECTION

SECTION 22 05 53

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

16 PART 1 GENERAL

16.1 SUMMARY

A. Work included: Providing of all required identification systems for equipment and piping.

16.2 SUBMITTALS

A. Provide submittals in accordance with Section 22 01 00.

B. Submittals shall include:
1. List of proposed equipment and valve tags.
2. Product information on piping markers.

17 PART 2 PRODUCTS

17.1 MANUFACTURERS

A. W. H. Brady Co. or Seton.

17.2 DESCRIPTION

A. Equipment Identification: Equipment identification tags shall be three_ply, white center, black face plastic plates with 1/2" high letters for major and 1/4" high letters for minor equipment.

B. Piping Markers:
1. All vinyl self_sticking labels.
2. Markers shall comply with ANSI A 13.1 for width, size of letters, background colors, etc.

18 PART 3 EXECUTION

18.1 INSTALLATION

A. Provide each piece of roof equipment with a manufacturer's standard nameplate indicating manufacturer's name, model number, capacities and characteristics.

B. In addition, provide each piece of equipment with a plastic tag indicating its designation on this project. Mount this tag with screws, where possible, in a clearly visible location.

C. Affix piping markers to pipe or insulation in locations that make them clearly visible. Secure markers with two wraps of "Scotch Reinforced Tape" at each end.

D. Locate markers at intervals of 15 to no more than 50 feet allowing visual identification of a line from any point along that line and as follows: At each valve, where a pipe passes through a wall, direction of flow on each leg of a "T" and on lower quarters of the line on horizontal runs where view is not obstructed.

E. Provide arrow markers to indicate direction of flow away from each pipe identification marker.

END OF SECTION

SECTION 22 05 93

REVISED
4:08 pm, Oct 06, 2023

JOHN DODSON FARLEY
STATE OF WASHINGTON
57312
REGISTERED
PROFESSIONAL ENGINEER
10/6/2023

LEEKA Architecture and Planning
Creating Positive Impressions in the Built Environment
1001 SE Water Avenue Suite 175
Portland, Oregon 97214
503.644.4222 tel
succeed@leekainc.com e-mail
www.leekainc.com web

Tenant Improvement
ESD112
Mental Health Facility Phase II
2400 NE 66th Ave. Vancouver WA.

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SYSTEM DESIGN CONSULTANTS INC.
333 SE SECOND AVE, SUITE 100
PORTLAND OREGON 97214
503-248-0227
CONTACT: NEIL BOYER