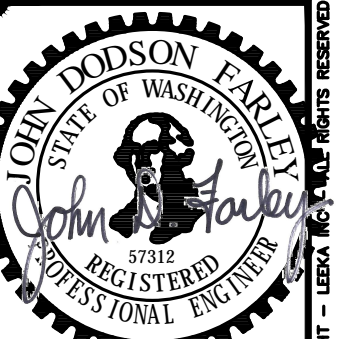


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4:12 pm, Oct 06, 2023



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Creating Positive Impressions in the Built Environment  
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Portland, Oregon 97214

Tenant Improvement  
ESD112  
Mental Health Facility Phase II  
2400 NE 65th Ave., Vancouver, WA.

**SECTION 210000  
FIRE PROTECTION SPECIFICATIONS INDEX**

**DIVISION 21: FIRE PROTECTION**

210000 Water Based Fire Suppression Systems

**SECTION 21 00 00  
WATER BASED FIRE SUPPRESSION SYSTEMS**

**1 PART 1 GENERAL**

**1.01 SUMMARY**

A. Work Included: Providing complete design and installation of automatic wet and dry fire sprinkler system modifications for the building project areas in accordance with the latest edition of NFPA 13.

B. Scope:

1. Obtain water supply from existing building piping.

2. Provide 100% fire sprinkler protection for the areas of work noted on the architectural and mechanical drawings per NFPA and local fire bureau requirements.

**1.02 SUBMITTALS**

A. Include and pay for all required engineering of fire sprinkler system.

B. 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. Submittal items larger than 8 1/2" x 11 shall be a reproducible tracing.

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.

F. Submittals shall include:

1. Manufacturer's catalog or technical data showing performance, dimensions, materials of construction and recommended methods of installation.
2. Submit locations of all inspector test stations, building drains, alarm bells and other visible appurtenances to the architect for review.
3. Specifically note locations of exposed piping on the shop drawings for Architect review.
4. Provide information and coordinate with electrical contractor as to locations and power requirements for all alarms, tamper switches, flow switches etc.
5. After Architect's review, prepare fire protection system shop drawings as required by code showing location piping, alarm valves, piping sizes, test tees and valves, drain valves and other related items. Submit drawings to the governing fire bureau and appropriate insurance services for review per owner's requirements. After changes by the reviews are made, submit three sets of approved drawings to the Architect.
6. Final submittals are to include the governing fire bureau stamp of design acceptance.

**1.03 OPERATION AND MAINTENANCE DATA**

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

B. O&M data shall include:

1. Manufacturer's literature for all equipment and materials.

**2. MAINTENANCE INSTRUCTIONS.**

**2 PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

A. System Components: Star, Grinnell, Viking, Gem, Central or approved equal.

**2.02 DESCRIPTION**

A. Piping Material: Schedule 40 black steel or steel tubing with flanged, screwed or mechanical joint fittings.

B. Sprinkler Heads: Tyco, Viking, Gem, Central, Reliable or approved equal.

1. Sprinkler Heads:
  - a. General building - Match existing styles and finishes in the building

C. IT Data Center - Fully recessed with tamper-resistant cover plates, white cover plate finish.

2. Provide hard wire sprinkler head guards in:
  - a. Storage Rooms.
  - b. Mechanical Rooms.
  - c. Data hub rooms and closets.
  - d. Janitor rooms.

C. Provide miscellaneous valves, signaling and appurtenances as required.

**3 PART 3 EXECUTION**

**3.01 INSTALLATION**

A. General: Provide only U.L., Inc. listed components.

B. System Types:

1. General Building Areas - Provide complete hydraulically designed system(s) as required by the Uniform Building Code, NFPA Standard 13 and the governing fire bureau per the scope noted above. Provide all piping, heads and appurtenances as required.
2. IT Data Center - Provide a complete double interlock pre-action sprinkler system, and associated equipment, ready for operation.
  - a. The activation of any pre-action system detector will cause the system to fill the piping network with water, initiate an alarm through the building fire alarm system, and will activate alarm and water flow contacts for auxiliary functions
  - b. The opening of an automatic sprinkler or damper to system piping will initiate the sounding of a warning alarm through the building fire alarm system but will not cause the system to fill.
  - c. The activation of at least one pre-action system detector and the opening of an automatic sprinkler will cause the sounding of a warning alarm through the building fire alarm system, water to discharge and operation of an auxiliary contact indicating alarm and discharge.

D. Minimize piping extent in the ceiling areas above the spaces noted - All drains lines to be located outside the areas of IT Data Center (1002B), Frame Room (1002C).

C. The contractor is to provide as part of a design build scope all materials and labor required for a complete operating system in accordance with applicable NFPA codes, governing fire bureau and code jurisdictions and the system requirements of these specifications.

D. Provide hangers, brackets, supports, anchors and related appurtenances, as required, to support all piping and equipment provided under this section. Piping and equipment supports shall conform to NFPA Standard 13.

E. Provide seismic bracing and support as required.

F. Sprinkler Head Installations:

1. Ceiling Tie Finishes: Heads are to be installed in the middle of a square panel and the half panel of a 2'x4' ceiling tile.
2. Heads are to be coordinated with speakers, smoke detectors, ceiling grids and other ceiling mounted appurtenances.
3. Spaces with multiple heads are to have the heads spaced symmetrically within the space. If more than the minimum head number is required for a symmetrical pattern within the space coordinated with other ceiling appurtenances, the symmetrical and coordinated appearance will govern the final layout and design.
4. Corners and similar elongated spaces are to have the heads installed in the middle of the space ceiling, not to one side in an asymmetrical pattern.

G. Piping Installation: Fire protection piping systems to be installed in conformance with NFPA Standard 13. Install all piping in a true and even manner with lines plucked for drainage and system arranged so it can be entirely emptied of water.

H. Coordinate electrical connections for all flow and tamper switches, alarms and other fire protection system electrical connections required and include the cost of those connections in the bid price. Include the bid price provisions to bring power to all points of connection related to the sprinkler fire protection system.

I. Ceiling Areas:

1. Piping shall be concealed in all areas except those that have no ceilings and then it shall be coordinated with the Architect.
2. Review the architectural demolition plans to note points of ceiling access for piping installation.
3. Review the ceiling and other site conditions prior to bid.
4. Areas that are deemed to not have access for piping installation will be required to have new openings cut into existing ceiling areas for piping and head installation. Coordinate these openings with the architect and general contractor.
5. Include all required cutting and patching costs in the initial bid costs.

J. Non-Ceiling Areas: Piping locations shall be exposed and coordinated with lights, ducts and other equipment. Review all exposed sprinkler head locations with the architect prior to installation.

K. Perform all tests and arrange for required inspections of installed system as required by NFPA Standard 13. Submit certificates of inspection and tests to Architect.

L. The exact number of heads and design required will be determined by the contractor based upon drawings approved by the local fire bureau. The contractor is to provide fully designed and functional sprinkler systems meeting the requirements of NFPA and the local fire bureau. Provide all design, heads and equipment required for the complete functional systems.

M. Coordinate sprinkler mains with drain fixtures and verify adequate drain receptors are available for the system. Inspectors test, etc.

N. Coordinate pipe routing with other trades requiring ceiling space for the installation of their equipment. Locate valves, controls and accessories in the locations approved and coordinated with the architect. Coordinate with other trades and specialty drawings to determine exact floor location in room.

**3.02 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES**

A. Contractors shall provide proper sizing when providing sleeves or core-drilled holes to accommodate their 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.

**SECTION 230000  
MECHANICAL SPECIFICATIONS INDEX**

**DIVISION 23: MECHANICAL**

230000 Basic HVAC Requirements

230513 230520 Hangers and Supports for HVAC Piping and Equipment

230553 Identification for HVAC Piping and Equipment

230565 Testing, Adjusting and Balancing For HVAC

230700 HVAC Insulation

230800 General Commissioning Requirements

232000 HVAC Piping

233100 HVAC Ducts and Casings

233300 Air Duct Accessories

233400 Fans

233700 Air Outlets and Inlets

237000 Variable Flow Refrigerant Systems

237200 Air to Air Energy Recovery Air Handler

238126 Split System Air Conditioning

238239 Electric Heating Devices

**2 PART 1 GENERAL**

**2.01 OTHER REQUIREMENTS**

A. The Bidding, General and Supplementary of this project manual and specific sections as noted apply to the work specified in Mechanical Division 23 which encompasses Sections 23 00 00 through 23 81 23. This Section 23 00 00 applies to all sections of Mechanical Division 23.

**2.02 GENERAL SCOPE**

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

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

1. Include all incidental items and work not specifically shown or specified but required by good practice in a complete system.
2. The drawings and specifications are complementary. What is called for in one shall be called for in both.
3. 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 ductwork fittings required for coordination with structure and other construction trades.

**2.03 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.

C. Where terms such as "shown," "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.

D. 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.

**SECTION 23 00 00  
BASIC HVAC REQUIREMENTS**

**2 PART 1 GENERAL**

**2.01 OTHER REQUIREMENTS**

A. The Bidding, General and Supplementary of this project manual and specific sections as noted apply to the work specified in Mechanical Division 23 which encompasses Sections 23 00 00 through 23 81 23. This Section 23 00 00 applies to all sections of Mechanical Division 23.

**2.02 GENERAL SCOPE**

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

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1. Include all incidental items and work not specifically shown or specified but required by good practice in a complete system.
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3. 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 ductwork fittings required for coordination with structure and other construction trades.

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

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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.

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D. 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.

**2.04 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. Air Diffusion Council ADC
2. American Gas Association AGA
3. Air Movement and Control Association AMCA
4. American National Standards Institute ANSI
5. Air Conditioning and Refrigeration Institute ARI
6. Acoustical Society of America ASA
7. American Society of Heating, Refrigerating and Air Conditioning ASHRAE
8. American Society of Mechanical Engineers ASME
9. American Society for Testing and Materials ASTM
10. City of Hillsboro, Oregon
11. Washington County, Oregon
12. National Environmental Balancing Bureau NEBB
13. National Electrical Manufacturers Association NEMA
14. National Fire Protection Association NFPA
15. Sheet Metal and Air Conditioning Contractors' National Association SMACNA
16. Underwriters Laboratories UL
17. Oregon Structural Specialty Code - 2014 edition OSSC
18. Oregon Mechanical Specialty Code - 2014 edition OMSC
19. Oregon State Energy Efficiency Specialty Code - 2014 edition OSSEC
20. Oregon Plumbing Specialty Code - 2014 edition OPSC

**2.05 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.

**2.06 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.

**2.07 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.

**3 PART 2 PRODUCTS**

Not Used

**4 PART 3 EXECUTION**

**4.01 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 all piping and ductwork by volume and phase of mechanical equipment.

**4.02 PERMITS, FEES AND INSPECTIONS**

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

B. Schedule any required inspections.

**4.03 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.

**4.04 MEASUREMENTS**

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

**4.05 DELIVERY, HANDLING AND STORAGE**

A. Install 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.

**4.06 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 particular equipment in accordance with the manufacturer's recommendations and to provide the system results required. Provide all work necessary in the drawings to install the 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. Anchorages to Floors, Roofs, Etc.: Sway Bracing and Seismic Restraints:

The contractor is responsible to determine the means and methods of equipment installation and support.

2. Provide supports for all apparatus as specified and 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.

3. Provide seismic restraints on all mechanical equipment as specified herein.

4. Provide deflected supports directly to the governing code jurisdiction for anchorage to floors, roofs, etc., sway bracing and seismic restraints. Submittals to show locations and sufficient support details as required by the governing code jurisdiction.

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

6. Mechanical seismic criteria is as follows:

|    |   |   |     |
|----|---|---|-----|
| a. | Occupancy Classification                      |   | II  |
| b. | Seismic Design Category                       | D |     |
| c. | Component Importance Factor (I <sub>p</sub> ) |   | 1.0 |
|    | 1) General mechanical components              |   | 1.5 |

2) Natural gas piping / equipment / systems: 1.5

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

F. The presence of above ceiling equipment items shall be marked using label tape markers affixed to the ceiling grid. The markers shall indicate equipment category and equipment number. Coordinate color-coding and labeling requirements with the owner's representative.

**4.07 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 un-insulated 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.

C. Seal space between pipe and sleeve with Dow Corning Fire Stop System, 3M Brand CP25 or approved equal where piping penetrates fire-rated 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.

**4.08 FLOOR, WALL AND CEILING PLATES**

A. Provide escutcheon plates where all exposed piping and ductwork 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. Seal plates to sufficiently cover pipe sleeves and openings in fresh materials.

**4.09 ACCESS DOORS AND PANELS NOT SPECIFIED IN THE ARCHITECTURAL DOCUMENTATION**

A. Manufacturers: Cecoco, Mitcor, Emdor. Cecoco used as basis of selection.

B. Non-rated panels: Style W, SR, 1, SR, 2, P, PX as required for wall or ceiling construction, 12 inch x 12 inch or larger as required for ease of access.

C. Fire-rated panels: Style FB, UL listed for 1-1/2 hr fire rated stud and masonry wall systems.

D. Provide access panels where shown on the drawings or as required for proper access to mechanical appurtenances. Coordinate the installation of access panels in with the specific building construction penetrated. Coordinate access panel installation with Manufacturer's instructions.

**SECTION 23 00 00  
BASIC HVAC REQUIREMENTS**

18. Oregon Mechanical Specialty Code - 2014 edition OMSC

19. Oregon State Energy Efficiency Specialty Code - 2014 edition OSSEC

20. Oregon Plumbing Specialty Code - 2014 edition OPSC

**2.05 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.

**2.06 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.

**2.07 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.

**3 PART 2 PRODUCTS**

Not Used

**4 PART 3 EXECUTION**

**4.01 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 all piping and ductwork by volume and phase of mechanical equipment.

**4.02 PERMITS, FEES AND INSPECTIONS**

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

B. Schedule any required inspections.

**4.03 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.

**4.04 MEASUREMENTS**

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

**4.05 DELIVERY, HANDLING AND STORAGE**

A. Install 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.

**4.06 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 particular equipment in accordance with the manufacturer's recommendations and to provide the system results required. Provide all work necessary in the drawings to install the 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. Anchorages to Floors, Roofs, Etc.: Sway Bracing and Seismic Restraints:

The contractor is responsible to determine the means and methods of equipment installation and support.

2. Provide supports for all apparatus as specified and 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.

3. Provide seismic restraints on all mechanical equipment as specified herein.

4. Provide deflected supports directly to the governing code jurisdiction for anchorage to floors, roofs, etc., sway bracing and seismic restraints. Submittals to show locations and sufficient support details as required by the governing code jurisdiction.

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

6. Mechanical seismic criteria is as follows:

|    |   |   |     |
|----|---|---|-----|
| a. | Occupancy Classification                      |   | II  |
| b. | Seismic Design Category                       | D |     |
| c. | Component Importance Factor (I <sub>p</sub> ) |   | 1.0 |
|    | 1) General mechanical components              |   | 1.5 |

2) Natural gas piping / equipment / systems: 1.5

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

F. The presence of above ceiling equipment items shall be marked using label tape markers affixed to the ceiling grid. The markers shall indicate equipment category and equipment number. Coordinate color-coding and labeling requirements with the owner's representative.

**4.07 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 un-insulated 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.

C. Seal space between pipe and sleeve with Dow Corning Fire Stop System, 3M Brand CP25 or approved equal where piping penetrates fire-rated 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.

**4.08 FLOOR, WALL AND CEILING PLATES**

A. Provide escutcheon plates where all exposed piping and ductwork 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. Seal plates to sufficiently cover pipe sleeves and openings in fresh materials.

**4.09 ACCESS DOORS AND PANELS NOT SPECIFIED IN THE ARCHITECTURAL DOCUMENTATION**

A. Manufacturers: Cecoco, Mitcor, Emdor. Cecoco used as basis of selection.

B. Non-rated panels: Style W, SR, 1, SR, 2, P, PX as required for wall or ceiling construction, 12 inch x 12 inch or larger as required for ease of access.

C. Fire-rated panels: Style FB, UL listed for 1-1/2 hr fire rated stud and masonry wall systems.

D. Provide access panels where shown on the drawings or as required for proper access to mechanical appurtenances. Coordinate the installation of access panels in with the specific building construction penetrated. Coordinate access panel installation with Manufacturer's instructions.

**4.10 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 ducts and piping that may temporarily be left unconnected.

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

**4.11 ACCESSIBILITY**

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

**4.12 ELECTRICAL WORK**

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

**4.13 RELATED WORK**

A. The following work and materials are specified elsewhere:

1. Pipe chases, equipment pads and foundations, trenches, painting, air louvers, louvered penthouse and access panels except as otherwise specified in this division.

B. Framed openings, wood grounds and nailing strips, masonry, concrete and other architectural and structural elements.

**4.14 CLEANING**

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

B. Clean all mechanical 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.

**4.15 RECORD DRAWINGS**

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

B. Record all piping and ductwork 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.

**4.16 OPERATION AND MAINTENANCE MANUALS:**

A. Submit three 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 equipment installed such as fans, air supply units, pumps, heating and cooling equipment, 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.

**4.17 HVAC SYSTEMS TRAINING**

A. Training must be on fully operational system, or the training must be repeated when the system is fully operational at no additional cost to the Owner. Training must be scheduled through the Washington County project representative at a time that is convenient to county personnel. The Washington County representative must be notified of any changes, re-scheduling or modifications to the training schedule.

1. Maintain a start-up log notebook in the job trailer containing signed copies of the manufacturer's start-up sheets for all equipment.

2. Training walk-throughs to be performed by a contractor field project manager or technician who is fully knowledgeable with the project specifics and has had continuous involvement during the course of the project. The individual is to be knowledgeable in the specific installation details and maintenance of the project equipment.

B. Maintenance training will take place in two separate sessions. One session to occur within 30 days after substantial completion. This session to include a detailed review of the HVAC system record drawings and equipment installation instructions. The instructor shall then walk through the building identifying the location of the equipment installed and specific function(s) related to the overall mechanical systems. The training shall include answering maintenance personnel questions, troubleshooting and diagnostic procedures, repair instructions and preventive maintenance. This training will include all maintenance staff per Washington County.

C. Provide a written agenda to the attendees outlining the general scope of the training session and the building equipment involved.

D. The second session is to occur 10-months after substantial completion. The session shall be used to address observed operational issues. This training will include all maintenance staff per Washington County.

**4.18 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 grind in place in a neat manner. Leave good surface to match existing finish.

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

**4.19 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 manufacturer's of the products used.

**4.20 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.

**4.21 VERIFICATION OF EXISTING CONDITIONS**

A. Verify field conditions and measurements prior to the manufacture of shop fabricated materials and equipment.

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

**4.22 SYSTEMS WRITING**

|          |                 |                     |                     |                      |                     |
|----------|-----------------|---------------------|---------------------|----------------------|---------------------|
| Revised: | PCR/UT          | DATE: AUG. 10, 2023 | DATE: AUG. 17, 2023 | DATE: SEPT. 26, 2023 | DATE: OCT. 03, 2023 |
|          | APPLICANT EDITS |                     | APPLICANT EDITS     | APPLICANT EDITS      |                     |

Job No: 2246  
Date: February 18, 2023  
File Size: 24x36  
Progress set  
DRAWN: JDF  
CHECKED:  
Sheet Title  
MECHANICAL SPECIFICATIONS  
Sheet Number  
M9.00



REVISED 4:12 pm, Oct 06, 2023

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