SECTION 23 05 10

HVAC BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - DESIGN DIRECTIVES

1.1 SUMMARY

A. This Section includes limited scope general construction materials and methods for application with mechanical installations as follows:

1. Selective demolition including:

   a. Nondestructive removal of materials and equipment for reuse or salvage as indicated.
   b. Dismantling mechanical materials and equipment made obsolete by these installations.

2. Miscellaneous metals for support of mechanical materials and equipment.
3. Wood grounds, nailers, blocking, fasteners, and anchorage for support of mechanical materials and equipment.
4. Joint sealers for sealing around mechanical materials and equipment; and for sealing penetrations in fire and smoke barriers, floors, and foundation walls.

1.2 QUALITY ASSURANCE

A. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel."

B. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved.

C. Fire caulk: Fire caulk must bear the UL label and UL test number. A copy of the test as well as the installation instructions must be included in the submittal.

1.3 DESIGN CRITERIA

A. The consultants shall coordinate this section so as not to have duplicate or contradictory information. Determine who supplies and installs the various components specified herein.

B. Architectural access doors are specified in Division 8.

C. Larger projects may need to have coordination of the type of fire caulk used on the project. This requirement is stated in section seven of the specifications and shall be dictated by the construction manager / general contractor.

PART 2 - PRODUCTS

2.1 WALL AND FLOOR SLEEVES:

A. Sheet Metal Sleeves (light): 20 gage galvanized sheet metal with pipe or Pittsburgh lock longitudinal joint.

B. Sheet Metal Sleeves (heavy): 16 gage galvanized sheet metal with pipe or Pittsburgh lock longitudinal joint.

C. Steel Sleeves: Minimum schedule 10, steel pipe, ASTM A53, Grade A.

D. Mechanical sleeve seals shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation. Manufacturer shall be Link Seal by Thunderline Corp.

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2.2 MISCELLANEOUS METALS

A. Steel plates, shapes, bars, and bar grating: ASTM A 36.

2.3 MISCELLANEOUS LUMBER

A. Light framing size lumber of any species, number 2 common boards complying with WCLIB or AWPA rules.

B. Plywood panels; APA ACX; thickness not less than 23/32 inches.

2.4 FIRE CAULK

A. Fire caulk, joint fillers, and other related materials compatible with each other and with joint substrates under conditions of service and application. All products shall be installed in the manner determined by the manufacturer as tested by an independent testing laboratory.

2.5 MOTOR SHEAVES

A. The mechanical contractor shall be responsible for furnishing and installing sheaves on motors and/or fans as required to achieve design performance.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

3.2 PROJECT CONDITIONS

A. Conditions Affecting Selective Demolition: The following project conditions apply:

1. Protect adjacent materials indicated to remain. Install and maintain dust and noise barriers to keep dirt, dust, and noise from being transmitted to adjacent areas. Remove protection and barriers after demolition operations are complete.
2. Locate, identify, and protect mechanical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, contact FO&M to install temporary services for affected areas. Do not shut off or disconnect services without contacting FO&M.

B. Environmental Conditions: Apply joint sealers under temperature and humidity conditions within the limits permitted by the joint sealer manufacturer. Do not apply joint sealers to wet substrates.

3.3 SEQUENCE AND SCHEDULING

A. Coordinate the shut-off and disconnection of utility services with FO&M at least two business days in advance.

B. The contractors are not allowed to open or close existing building valves.

C. The contractor shall comply with the lock out / tag out procedures in accordance with the Dartmouth College policy. These procedures are intended to prevent injury to individuals and are strictly enforced.

D. When working in occupied buildings, the contractor shall coordinate with the building occupants to schedule noisy operations. Coordination shall take place via the DC Project Manager.

E. Perform demolition in phases as indicated.

3.4 INSTALLATION OF SLEEVES

A. Applications:

1. Install light sheet metal sleeves for all pipes passing through non fire rated dry wall partitions and walls.
2. Install heavy sheet metal sleeves for all ducts passing through floors and smoke rated walls and in walls constructed of concrete or masonry.
3. Install steel pipe sleeves for all pipes passing through fire and/or smoke rated walls, and in walls constructed of masonry or concrete.
4. Sleeves may be eliminated in walls when holes are cleanly cored or saw cut through solid concrete or masonry.
5. Penetrations through exterior walls shall be heavy sheet metal or steel pipe.
6. Mechanical Sleeve Seals: Install per manufacturer's recommended practices. Ensure the structure penetration is properly sleeved, refer to Section 2.1 D. for requirements.

B. The interstitial space between the sleeve and the (insulated) pipe/duct passing through the sleeve shall be ≥1/2" and ≤1".

C. Sleeves poured in place shall have anchors welded to the outside of the sleeve to insure embedment in the concrete. All steel shall be painted one coat of a rust inhibitive paint.

D. Sleeves shall be installed flush with the face of finished walls and ceilings; extend one inch above the level of finished floors.

E. Sleeves may be eliminated where pipes and ducts pass through fire separations providing the UL tested assembly requires the elimination of a sleeve. Refer to DC Standards 07841, Through-Penetration Firestop Systems.

3.5 SELECTIVE DEMOLITION

A. Demolish, remove, and disconnect abandoned mechanical materials and equipment indicated to be removed and not salvaged.

B. Remove and disconnect existing mechanical materials and equipment indicated to be removed and salvaged and deliver materials and equipment to the location designated for storage by the Owner.

C. Remove from the site and legally dispose of demolished materials and equipment not indicated to be salvaged, such as inactive and obsolete piping, fittings and specialties, hangers, equipment, ductwork, controls, fixtures, and insulation. Do not abandon inactive pipe & duct in place.

3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGE

A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Field Welding: Comply with AWS "Structural Welding Code."

3.7 ERECTION OF WOOD SUPPORTS AND ANCHORAGE

A. Cut, fit, and place wood grounds, nailers, blocking, and anchorage accurately in location, alignment, and elevation to support and anchor mechanical materials and equipment.

B. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials.

C. Attach to substrates as required to support applied loads.

3.8 APPLICATION OF FIRE CAULK AND JOINT SEALERS

A. Refer to DC Standards 07841, Through-Penetration Firestop Systems.

3.9 INSTALLATION OF FILTERS

A. All air equipment with filters shall be supplied with two sets of filters with the exception of terminal units only requiring pre-filters

1. Pre filter (MERV 8 or greater)
2. Active carbon filters (where required).
3. Final filters. (MERV 13 or greater)

B. Contractor shall install the first set of filters in air moving equipment to protect the air handler from the construction environment.

   1. Units with provisions for both pre-filters and final filters shall initially have the same quality filter installed in the final filter location as the pre-filter.

C. Coordinate with the FO&M representative regarding the timing for installing active carbon filters.

D. The contractor shall install the second set, the owner's set, of filters just prior to the balancing contractor starting their work.

END OF SECTION 23 05 10