

SECTION 230520

HVAC SPECIALTIES

PART 1 GENERAL

1.1 STIPULATIONS

- A. The General Conditions, drawings and all other attached documents form a part of this Section and all other Sections by reference thereto and have the same force and effect as if printed herewith in full. The Contractor shall be strictly accountable for the cognizance of carrying out the provisions thereof.

PART 2 PRODUCTS

2.1 INSERTS AND FASTENERS

A. General

1. This section describes methods and materials for various standard types of construction for the guidance and establishment of the minimum requirements. However, if required, provide fasteners in modified form to suit other types of construction and adopt the method most applicable to the problem and with approval of the Professional.
2. Provide all required inserts or fasteners for the various types of construction encountered in the project. Hangers and inserts shall be in accordance with MSS-SP58, ASHRAE or SMACNA.
3. Inserts and fasteners hereinafter described shall be for hangers, supports, anchors, guides, braces, angle clips, brackets, controls, operators, drives, electrical controls, electrical devices, boxes, cabinets and equipment and fixtures. Inserts and fasteners shall be provided by the installing trade.

B. Inserts

1. Inserts shall be accurately located before the concrete is poured. Where loading exceeds the safe allowable limit for any single insert, then multiple inserts shall be installed, spaced no less than 12" on centers. The multiple inserts shall be connected with suitable size steel angles and locking bolts.
2. Inserts in poured concrete slabs shall be iron or fabricated galvanized iron or steel of the type to receive a machine bolt head or nut after installation and shall permit adjustment of this bolt in one horizontal direction.
3. When installed in cured concrete, inserts shall be capable of developing the full strength of bolt. Inserts shall be installed in such a manner that they be flush with the concrete surfaces, permit adjustment of the bolt in one direction and permit removal or insertion of the bolt or nut after the installation of the insert.
4. Where fastenings are required in poured concrete wall construction, inserts of the threaded connection type or galvanized bent end bolts shall be used, accurately set.

C. Fasteners

1. In cases where inserts have been inadvertently omitted or are required in existing construction, the fastening shall be accomplished by means of approved lead sheathed expansion bolts.
 - a. Wood plugs shall not be used in any case.
 - b. Expansion shields in pre-cast concrete slabs shall not be loaded more than 1/2 their maximum design capacity and never more than 200 pounds per bolt.
 - c. Where expansion bolts are spaced closer than one-foot centers, the multiple bolt shall be connected with suitable size steel angles and locking bolts or with single bolts extending through the slab above with a bearing plate.
 - d. Where finished floors occur, the welded plate and rod shall be recessed in the slab, finished in an approved manner.
2. Where roof plank with vegetable fiber admix or gypsum is used and the roofing supported by structural steel members or bar joists, it will be necessary to support piping, conduit, fixtures, ducts, devices, and equipment by suitable structural steel members, or fabricated support system spanning the roof, structural supports or by the use of single bolts extending through the slab above with a bearing plate, provided the plate does not affect the type of guarantee of the roofing and the load of the hanger and plate will not exceed a loading condition more than one-half (1/2) the designed roof loading.
3. Where roofing or floors are supported by structural steel members or bar joists, it will be necessary to support piping, conduit, devices, and equipment by suitable structural steel members, or fabricated supports.
4. Where guides or anchors are noted on the drawings, provision shall be made for the proper inserts or fastenings to structural members, deck or floor material.
5. Where fastenings are needed in masonry walls, bolts shall be galvanized U-bolts accurately set in the construction during erection. In cases where inserts have been inadvertently omitted, fastenings may be secured in the same manner as described for inadvertently omitted inserts.
6. Where fastenings are needed in steel stud, wire lath or other non-masonry construction, a "J" Hook and holding lock washer and nut shall be used and shall fasten to the opposite stud edge to which the item will abut. If the location of the fastening is not a steel stud, then a structural steel shape shall be fastened to the wall with bolt and holding nut with the fastening extension through the wall. The use of toggle bolts will not be permitted.
7. Where fastenings are needed in wood stud, wire lath or other non-masonry construction, backing boards shall be installed. Such backing boards shall be securely fastened and of sufficient size to have the connection near the center of the width. The supporting or fastening devices shall then be lag screwed to the backing boards. Lightweight items and similar items can be fastened by the use of wood screws. Direct fastening to wood studs will not be permitted.

2.2 ACCESS DOORS INTEGRAL WITH BUILDING STRUCTURE

A. General

1. This Contractor shall furnish and install access doors to the General Contractor for installation in ceiling, walls, partitions and floors for access to valves, traps, balancing fittings, devices,

appurtenances, dampers, regulators, controls, and electrical controls or devices for code compliance so that full access for operation, inspection, and maintenance is assured.

2. The doors shall be of sufficient size to permit removal of item or clearance to perform maintenance, but in no case less than 12" x 16".

B. Installation

1. The location of all access doors shall be determined by the Contractor for whose work they are being provided.
2. Access doors shall be arranged so they can be integrated into the surface pattern, e.g. recessed panel with wire lath, security ceiling, masonry, or tile. Bottom of access doors shall not be lower than the top of base, or a minimum of 6" above floor. Tops and/or side of access panels shall be a minimum of 6" from the ceiling or opening or from the edge of a wall return.
3. Access doors are not required where ceilings are of the liftout removable tile type.

C. Product

1. Access doors in fire rated ceiling/floor and ceiling/roof assembly shall be "B-Label" and have a UL 1-1/2 hour (250 deg. F rating) for both door and frame. Maximum size shall be 20" x 20" or 400 square inches in area.
 - a. Frame - 16-gauge minimum steel.
 - b. Panel - 20-gauge minimum steel.
 - c. Paint - Prime coat of baked-on enamel.
 - d. Hinge - Continuous type, one per door.
 - e. Lock - Flush-face, key operated, self-latching cylinder locks.
2. Access doors without UL label
 - a. Frame - 16-gauge minimum steel.
 - b. Panel - 14-gauge minimum steel.
 - c. Paint - Prime coat of baked-on enamel.
 - d. Hinges - Concealed spring hinges. Door to open 175 degrees minimum.
 - e. Lock - Non-Security Areas: Flush-face, key operated, self-latching cylinder locks as specified in Section 08305 - Access Doors; Security Areas. Hardware shall be as specified in Division 11 - Security Access Panels.
3. All access doors shall be keyed alike and provided with casing beads, frame flange, or masonry anchor, as required, for mounting.
4. Identification label shall be attached to each access door as specified herein. Labels shall read FIRE DAMPER, SMOKE DAMPER or as required for each damper installation.

5. Frame and panel access doors in restrooms, kitchens and elsewhere indicated shall be stainless steel.

2.3 MISCELLANEOUS STEEL AND ACCESSORIES

- A. Design, Fabrication and Erection of the Structural and Miscellaneous Steel shall be in accordance with the "Design, Fabrication and Erection of Structural Steel Buildings" of the AISC, latest revision.
- B. All structural and miscellaneous steel shall conform to ASTM A36.
- C. High strength bolts shall conform to ASTM A325, and machine bolts shall conform to ASTM A307.
- D. Bolts shall be 3/4 inch in diameter with 13/16-inch diameter holes unless noted. All field connections shall be made with A325F (Friction-type) bolts unless noted.
- E. Beam connections shall develop the shear value equal to one half of its total uniform load capacity in accordance with the AISC Specifications for Frame Beam Connections, Table II, if shop welded, furnish in accordance with Table III.
- F. Welding shall be in accordance with the AWS D1.1 using E70XX electrodes.
- G. All steel shall receive a shop coat of a lead-free, rust-inhibitive primer.
- H. This Contractor shall provide all materials, equipment, supplies and labor necessary to construct all structural steel work shown on the drawings and as hereinafter specified, and as may be required for the installation of the equipment under this Contract.

2.4 VIBRATION ISOLATORS

A. General

1. Furnish and install vibration isolators as hereinafter specified - all as manufactured by Amber/Booth Company, Vibration Eliminator Company, or Mason Industries, Inc. All model numbers listed below are referenced to Amber/Booth Company.

B. Products

1. Horizontal Pipe Runs

- a. All horizontal pipe runs within the boiler room area shall be isolated from building structure by means of units designed for insertion in rods. A/B Type BSR.
- b. hangers nearest equipment connections shall be of the "Load-transfer" type. A/B type PBSR.

2. Vertical Pipe Risers

- a. The main anchoring point for high pipe risers shall be located at the lowest suitable level of the building capable of supporting the weight of the pipe and water. Locate auxiliary anchors immediately above expansion joints or on intermediate floors as required. The isolators supporting the base of the riser shall be a combination of a steel bearing plate on top of a layer of 1/2" neoprene having a load capacity to 800#/sq. inch and provided with

resilient sleeves and washers around each bolt anchoring the isolator to the structure. A/B type SP-NR-style C.

- b. The isolators supporting auxiliary anchors on upper floors shall be all-directional consisting of steel housed neoprene or combination of elastomer and laminated duct to which the pipe clamps are to be welded. For auxiliary anchors supporting steam and condensate lines, the isolators shall incorporate a 1/4" heat shield to protect the elastomer. A/B type AG.

3. Condensing Units

- a. Provide XL isolators for air-cooled condensing units.

4. Refrigerant Piping

- a. Refrigerant piping connections shall be made with flexible connectors at all equipment to eliminate vibration and noise.

5. Air Handling Units

- a. All ceiling suspended air handling units and fans shall be isolated with properly designed devices conforming to the efficiency requirements recommended by the manufacturer, but no deflection greater than 1-1/2" shall be required. A/B type BSR.
- b. All floor mounted air handling units shall conform to ceiling mounted units and shall be Type A/B Type SW-1.

2.5 FIRE STOPS

- A. Provide silicone or foam fire stopping material at pipe, ductwork, equipment, cable, and tubing penetrations in fire and smoke rated walls and floors. Fire stop material shall be applied to meet 2 hour fire rating. Fire stop material shall be Dow Corning Fire Stop Sealant, Dow Corning Fire Stop Foam, or accepted equal. Fire stop shall be applied in strict accordance with manufacturer's recommendations and instructions.

END OF SECTION