

## 23 31 00 – HVAC Ducts and Casings

### 1. Introduction

- A. Ductwork shall be constructed per latest version of applicable SMACNA duct design guidelines.

### 2. References

- A. SMACNA
- B. ASHRAE Standard 90.1 – latest standard
- C. Duke University Design Guidelines, Section 23 07 16 - HVAC Equipment Insulation

### 3. Design Standards

- A. Reference SMACNA for duct stiffener requirements.
- B. Access doors shall be installed in ductwork upstream of fire/smoke dampers, turning vanes, humidifiers, flow measuring stations, etc. Access doors for humidifiers shall have a window. Access doors shall be sized 2 inch smaller than duct dimension (minimum) up to 24 inch x 24 inch (maximum). Provide mechanical device identification on or adjacent to access door.
- C. Ductwork downstream of humidifiers shall be stainless steel for the length of dispersion. The duct shall be sloped with a drain pan. The drain pan shall have a drain on the bottom.
- D. No interior duct insulation (liner) shall be used without direct approval from FMD.
- E. Exterior, exposed ductwork insulation shall be fiberglass board (welded pins preferred, no stick pins) covered with roofing membrane material, with glued seams to create a vapor barrier.
- F. For moisture laden air (laundry, shower, etc.), exhaust ductwork shall be aluminum or stainless steel, pitched to drain condensate. Dishwasher and kitchen hood exhaust ductwork shall be stainless steel.
- G. All equipment must be supported directly by structural members with adequate load-bearing capacity and material integrity, using appropriate anchoring/connection hardware. Under no circumstances may equipment be supported by connections to finish materials. For example, equipment hung from toggle bolts through plaster-on-lath, gypsum board or ACT ceilings is **not acceptable**.

#### 4. Documentation and Review Requirements

- A. Ductwork sizes, material, routing, insulation type, etc. will be reviewed with HVAC general arrangement layouts, detail drawings and specifications.

#### 5. Installation and Performance Requirements

- A. Volume dampers located on supply and return ducts must be located at branch takeoffs, not at the air outlets. The dampers must be locked or fixed in place and visibly marked after final balance.
- B. Flexible duct may be used only for short runs of 4 feet or less to air outlets. Flexible duct shall be pulled tight, without any kinks and supported with 2 inch wide banding to structure above to prevent any sagging. Turns/bends greater than 45° shall be installed with hard round duct fittings.
- C. Ductwork shall be routed such that large, empty cavities are not created between ductwork and structure above. Mechanical equipment shall be accessible for maintenance.
- D. Ductwork shall be labeled with direction of flow, type of service and from which piece of equipment (e.g. AHU-1 SUPPLY →).
- E. Reference SMACNA for duct leakage standards.
- F. All ductwork of pressure class +/- 2" and greater shall be pressure tested.
- G. Anytime installed ductwork is subject to construction dust, cleanliness must be verified via an independent third party utilizing the last NADCA vacuum test standard and the passing criteria within that standard.

#### 6. As-Built Requirements

- A. Designer must provide drawings showing all as-built ductwork and equipment. Drawings must include final building layout and details of pertinent equipment, details of all system connection points, as well as cross-over/under of other utilities, obstructions, etc.