

SECTION 233100 - HVAC DUCTS AND CASINGS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. **ALL DUCTWORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL LOCAL AND STATE BUILDING CODES.**
- B. **See NSP Green Building Practices Handbook, Section 3.3 – Heating and Cooling Distribution System for further requirements.**
 - 1. **Do not install ductwork in exterior walls and use at least R-6 insulation around ducts in un-conditioned spaces.**
 - 2. **Use mastic compound in lieu of tape at all ductwork connections.**
- C. **See NSP Green Building Practices Handbook, Section 5.2 – Air Exhaust Measures for further requirements.**
 - 1. **Design and install local exhaust systems in all bathrooms (including half baths) and kitchen to meet requirements of Section 5 of ASHRAE standard 62.2-2007.**
 - 2. **Exhaust all air to outdoors.**
- D. **See NSP Green Building Practices Handbook, Section 5.4 - Containment Control.**
 - 1. **During construction seal all permanent ducts and vents to minimize contamination during construction. Remove seals after all phases of construction are complete.**
 - 2. **Flush home after completion and prior to occupancy in accordance with Section 018113.**

1.2 BASIS FOR REPLACEMENT

- A. **If any of the HVAC duct system is crimped, crushed, or punctured patching is not permitted. Developer shall remove and replace to and from the nearest connection.**
- B. **If existing Duct work is greater than 20 years old, the HVAC contractor must locate and repair all leaks and seal all connections with mastic and foil.**

PART 2 - PRODUCTS

2.1 DUCTS

- A. Galvanized-Steel Sheet: ASTM A 653/A 653M, with **G60** hot-dip galvanized coating.
- B. Carbon-Steel Sheets: ASTM A 1008/A 1008M; with oiled, matte finish for exposed ducts.
- C. Stainless Steel: ASTM A 480/A 480M, **Type 316** or **Type 304**, with a No. 2D finish for concealed ducts and No. 4 finish for exposed ducts.

- D. Fibrous-Glass Duct Board: Comply with UL 181, Class 1, **1-inch** thick, fibrous glass with fire-resistant, reinforced foil-scrim-kraft barrier, and having the air-side surface treated to prevent erosion.
- E. Joint and Seam Tape, and Sealant: Comply with UL 181A.
- F. Rectangular Metal Duct Fabrication: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- G. Fibrous-Glass Duct Fabrication: Comply with SMACNA's "Fibrous Glass Duct Construction Standard."
- H. Fibrous-Glass Liner: Comply with NFPA 90A or NFPA 90B and with NAIMA AH124.
 - 1. Thickness: **1 inch**
 - 2. Airstream surface coated with an antimicrobial erosion-resistant coating.
 - 3. Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.
 - 4. Mechanical Fasteners: Galvanized steel suitable for adhesive attachment, mechanical attachment, or welding attachment.

2.2 ACCESSORIES

- A. Volume Dampers and Control Dampers: Single-blade and multiple opposed-blade dampers, standard leakage rating, and suitable for horizontal or vertical applications; factory fabricated and complete with required hardware and accessories.
- B. Fire Dampers: Rated and labeled according to UL 555 by an NRTL; factory fabricated and complete with required hardware and accessories.
- C. Ceiling Fire Dampers: Labeled according to UL 555C by an NRTL and complying with construction details for tested floor- and roof-ceiling assemblies as indicated in UL's "Fire Resistance Directory." Provide factory-fabricated units complete with required hardware and accessories.
- D. Smoke Dampers: Labeled according to UL 555S by an NRTL. Combination fire and smoke dampers shall also be rated and labeled according to UL 555. Provide factory-fabricated units complete with required hardware and accessories.
- E. Flexible Connectors: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.
- F. Flexible Ducts: Factory-fabricated, insulated, round duct, with an outer jacket enclosing **1-inch** thick, glass-fiber insulation around a continuous inner liner

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
 - 1. Outdoor, Supply-Air Ducts: Seal Class A.
 - 2. Outdoor, Exhaust Ducts: Seal Class C.
 - 3. Outdoor, Return-Air Ducts: Seal Class C.
 - 4. Unconditioned Space, Supply-Air Ducts in Pressure Classes **2-Inch wg** and Lower: Seal Class B.
 - 5. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than **2-Inch wg**: Seal Class A.
 - 6. Unconditioned Space, Exhaust Ducts: Seal Class C.
 - 7. Unconditioned Space, Return-Air Ducts: Seal Class B.
 - 8. Conditioned Space, Supply-Air Ducts in Pressure Classes **2-Inch wg** and Lower: Seal Class C.
 - 9. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than **2-Inch wg** Seal Class B.
 - 10. Conditioned Space, Exhaust Ducts: Seal Class B.
 - 11. Conditioned Space, Return-Air Ducts: Seal Class C.
- C. Conceal ducts from view in finished and occupied spaces.
- D. Avoid passing through electrical equipment spaces and enclosures.
- E. Support ducts to comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Ch. 4, "Hangers and Supports."
- F. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- G. Install volume and control dampers in lined duct with methods to avoid damage to liner and to avoid erosion of duct liner.
- H. Where required Install fire and smoke dampers according to UL listing.
- I. Install fusible links in fire dampers.
- J. Clean new and existing duct system(s) before testing, adjusting, and balancing.

3.2 TESTING, ADJUSTING, AND BALANCING

- A. Balance airflow within distribution systems, including sub-mains, branches, and terminals to indicated quantities.

END OF SECTION 233100