SECTION 23 37 00
AIR OUTLETS AND INLETS

SPEC WRITER NOTES:
1. Use this section only for NCA projects.
2. Delete between //----// if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.
3. References to pressure in this section are gage pressure unless otherwise noted.

PART 1 - GENERAL

1.1 DESCRIPTION
A. Air outlets and inlets, including the following: Grilles, registers and diffusers.

1.2 RELATED WORK
A. Outdoor and Exhaust Louvers: Section 08 90 00, LOUVERS AND VENTS.
B. //Seismic Reinforcing: Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS.//
C. General Mechanical Requirements: Section 23 05 11, COMMON WORK RESULTS FOR HVAC.
D. Noise Level Requirements: Section 23 05 41, NOISE AND VIBRATION CONTROL FOR HVAC PIPING AND EQUIPMENT.
E. Testing and Balancing of Air Flows: Section 23 05 93, TESTING, ADJUSTING, AND BALANCING FOR HVAC.

1.3 QUALITY ASSURANCE
A. Refer to article, QUALITY ASSURANCE, in Section 23 05 11, COMMON WORK RESULTS FOR HVAC.
B. Fire Safety Code: Comply with NFPA 90A.

1.4 SUBMITTALS
A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
B. Manufacturer's Literature and Data:
   1. Air intake/exhaust hoods.
   2. Grilles, registers, diffusers and accessories.
C. Coordination Drawings: Refer to article, SUBMITTALS, in Section 23 05 11, COMMON WORK RESULTS FOR HVAC.

1.5 APPLICABLE PUBLICATIONS
A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
B. American Society of Civil Engineers (ASCE):
C. American Society for Testing and Materials (ASTM):
A653/A653M-08 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy coated (Galvannealed) by the Hot-Dip process
B209-07 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
E84-09 Standard Test Method for Surface Burning Characteristics of Building Materials

D. National Fire Protection Association (NFPA):
90A-09 Standard for the Installation of Air Conditioning and Ventilating Systems

E. Underwriters Laboratories, Inc. (UL):
UL 33 Heat Responsive Links for Fire-Protection Service

PART 2 - PRODUCTS

2.1 GRAVITY TYPE AIR INTAKE/EXHAUST HOODS

A. Aluminum, ASTM B209, spun, or fabricated using panel sections with roll-formed edges, 13 mm (1/2 inch) mesh aluminum or galvanized welded wire bird screen, with motorized dampers where shown on the drawings, accessible interior, designed for wind velocity specified in Paragraph 3.2.

B. See hood schedule on the drawings. Sizes shown on the drawings designate throat size. Area of hood perimeter opening shall be not less than the throat area.

C. Dampers: Construct damper of the same material as the ventilator and of the design to completely close opening or remain wide open.

//D. See paragraph 3.2 for Intake/Exhaust exposed to high wind velocities. //</br>

2.2 PREFABRICATED ROOF CURBS

A. Galvanized steel or extruded aluminum 300 mm (12 inches) above finish roof service, continuous welded corner seams, treated wood nailer, 40 mm (1-1/2 inch) thick, 48 kg/cubic meter (3 pound/cubic feet) density rigid mineral fiberboard insulation with metal liner, built-in cant strip (except for gypsum or tectum decks). For surface insulated roof deck, provide raised cant strip (recessed mounting flange) to start at the upper surface of the insulation. Curbs shall be constructed for pitched roof or ridge mounting as required to keep top of curb level.

2.3 EQUIPMENT SUPPORTS

A. Refer to Section 23 05 11, COMMON WORK RESULTS FOR HVAC.

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2.4 AIR OUTLETS AND INLETS

A. Materials:
1. Steel or aluminum: Provide manufacturer's standard gasket.
2. Exposed Fastenings: The same material as the respective inlet or outlet. Fasteners for aluminum may be stainless steel.
3. Contractor shall review all ceiling drawings and details and provide all ceiling mounted devices with appropriate dimensions and trim for the specific locations.

B. Performance Test Data: In accordance with ANSI/ASHRAE Standard 70-2006. Refer to Section 23 05 41, NOISE AND VIBRATION CONTROL FOR HVAC PIPING AND EQUIPMENT for NC criteria.

C. Air Supply Outlets:
1. Ceiling Diffusers: Suitable for surface mounting, exposed T-bar //or special tile// ceilings, white finish, square or round neck connection as shown on the drawings.
   a. Louver face, 360 degree pattern: Round neck, surface mounting unless shown otherwise on the drawings.
   b. Modular core type: Square, removable core for 1, 2, 3, or 4 way directional pattern.
   c. Perforated face type: Manual adjustment for one-, two-, three-, or four-way horizontal air distribution pattern without change of air volume or pressure. Perforated face diffusers shall have the pattern controller on the inner face, rather than in the neck and designed to discharge air horizontally at the ceiling maintaining a Coanda effect.
   d. Slot diffuser/plenum:
      1) Galvanized steel boot lined with 13 mm (1/2 inch) thick fiberglass conforming to NFPA 90A and complying with UL 181 for erosion. Form slots or use adjustable pattern controllers, to provide stable, horizontal air flow pattern over a wide range of operating conditions.
      2) Provide inlet connection diameter equal to duct diameter shown on drawings.
      3) Maximum pressure drop at design flow rate: 37 Pa (0.15 inch) W.G.
2. Supply Grilles and Registers: Extruded aluminum, white finish, and individually adjustable blades. Front bars parallel to the short dimension.
   a. Border: Flat, 30 mm (1-1/4 inch) wide.
   b. Bar spacing: 20 mm (3/4 inch) maximum.
   c. Provide opposed blade damper where shown.
   a. Border: Flat, 30 mm (1-1/4 inches) wide.
   b. Bar spacing: 20 mm (3/4 inch) maximum.
   c. Provide opposed blade damper where shown.
4. Grilles: Same as registers but without the opposed blade damper.
D. Return and Exhaust Registers and Grilles: Provide opposed blade damper for registers.
   1. Finish: white baked enamel.
   2. Standard Type: Fixed horizontal face bars set at 35 degrees, 30 mm (1-1/4 inch) margin.
   3. //Perforated Face Type: To match supply units.//
   4. //Grid Core Type: 13 mm by 13 mm (1/2 inch by 1/2 inch) core with 30 mm (1-1/4 inch) margin.//
   5. //Linear Type: To match supply units.//
   6. //Door Grilles: Are furnished with the doors.//
   7. //Filter Grilles: Standard face hinged to a mounting frame with space for a 25 mm (one inch) throwaway filter. Hold face closed by a locking screw. Provide retaining clips to hold filter in place. Provide one inch thick fiberglass throwaway filter.//

2.5 WIRE MESH GRILLE
   A. Fabricate grille with 2 x 2 mesh 13 mm (1/2 inch) galvanized steel or aluminum hardware cloth in a spot welded galvanized steel frame with approximately 40 mm (1-1/2 inch) margin.
   B. Use grilles where shown in unfinished areas such as mechanical rooms.

PART 3 - EXECUTION

3.1 INSTALLATION
   A. Comply with provisions of Section 23 05 11, COMMON WORK RESULTS FOR HVAC, particularly regarding coordination with other trades and work in existing buildings.
   B. Protection and Cleaning: Adequately protect equipment and materials against physical damage. Place equipment in first class operating condition, or return to source of supply for repair or replacement, as determined by RE/COTR. Protect equipment during construction against entry of foreign matter to the inside and clean both inside and outside before operation and painting.
SPEC WRITER NOTES:
Specify wind velocity as per Fig. 1 in Handbook ASCE 7 where wind velocity exceeds 90 mph in coastal areas.

// 3.2 INTAKE/EXHAUST HOODS EXPOSED TO WIND VELOCITY
A. Provide additional support and bracing to all exposed ductwork installed on the roof or outside the building to withstand wind velocity of ____ km/h (___mph). //

3.3 TESTING, ADJUSTING AND BALANCING (TAB)
A. Refer to Section 23 05 93, TESTING, ADJUSTING, AND BALANCING FOR HVAC.

3.4 OPERATING AND PERFORMANCE TESTS
A. Refer to Section 23 05 11, COMMON WORK RESULTS FOR HVAC

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