

## PART 1 - GENERAL

## 1.01 SUMMARY

## A. Section Includes:

1. Diffusers.
2. Registers
3. Grilles.
4. Louvers.
5. Louvered penthouses.
6. Roof hoods.
7. Goosenecks.

## B. Related Sections:

1. Division 08 - Louvers: Wall Louvers.
2. Division 09 - Painting and Coating: Execution and product requirements for Painting of ductwork visible behind outlets and inlets specified by this section.
3. Section 23 33 00 - Air Duct Accessories: Volume dampers for inlets and outlets.

## 1.02 REFERENCES

## A. Air Movement and Control Association International, Inc.:

1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

## B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:

1. ASHRAE 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets.

## C. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

## 1.03 SUBMITTALS

## A. Division 01 - Submittal Procedures: Submittal procedures.

- B. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, throw, and noise level.
- C. Samples: Submit one (1) of each required air outlet and inlet type.
- D. Test Reports: Rating of air outlet and inlet performance.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

#### 1.04 CLOSEOUT SUBMITTALS

- A. Division 01 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of air outlets and inlets.

#### 1.05 QUALITY ASSURANCE

- A. Test and rate diffuser, register, and grille performance in accordance with ANSI/ASHRAE 70.
- B. Test and rate louver performance in accordance with AMCA 500.
- C. Perform Work in accordance with IBC-NJ.

#### 1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project.

#### 1.07 MOCK-UP

- A. Division 01 - Quality Requirements: Mock-up requirements.
- B. Construct typical interior ceiling module with supply and return air outlets.
- C. Locate where directed by Architect/Engineer.
- D. Incorporate accepted mock-up as part of Work.
- E. Remove mock-up when directed by Architect.

#### 1.08 EXTRA MATERIALS

- A. Division 01 - Execution and Closeout Requirements: Spare parts and maintenance products.

## 1.09 ACCEPTABLE MANUFACTURES

- A. Manufacturer: Subject to requirements of the specification, provide the following manufacturer's products by one of the following or approved equal:
1. Anemostat Air Products
  2. E. H Price Company
  3. Nailor Industries, Inc.
  4. Titus
  5. Substitutions: Division 01 - Product Requirements.

## PART 2 - PRODUCTS

### 2.01 ROUND CEILING DIFFUSERS

- A. Product Description: Type: Round, stamped or spun, multi-core diffuser made of 18 gauge steel, with sector baffles where indicated. Diffuser collar not more than 1 inch (25 mm) above ceiling. In plaster ceilings, furnish plaster ring and ceiling plaque.
- B. Fabrication: Steel with baked enamel. Custom color selected by Architect.
- C. Accessories: Butterfly damper and multi-louvered equalizing grid with damper adjustable from diffuser face. Provide retainer cable for diffuser with neck of 12" or larger.

### 2.02 RECTANGULAR CEILING DIFFUSERS

- A. Type: Square stamped, multi-core or plaque panel construction diffuser to discharge air in required pattern with sector baffles where indicated.
- B. Frame: To match ceiling construction.
- C. Fabrication: 24 gauge steel with baked enamel. Custom color selected by Architect.
- D. Accessories: Butterfly damper and multi-louvered equalizing grid with damper adjustable from diffuser face. Molded and foil-baked insulation blankets.

### 2.03 CEILING PLENUM SLOT DIFFUSERS

- A. Type: Continuous 1-1/2 inch (38 mm) wide slot. Number slots as indicated on drawings with adjustable vanes for left, right or vertical discharge.
- B. Fabrication: 18 gauge steel with factory finish. Custom color selected by Architect.

- C. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting and gasket mitered end border.
- D. Plenum: Integral, 24 gauge galvanized steel, internally insulated with black coatings. Plenum mounted pattern controller can be field adjusted thru face of diffuser.

#### 2.04 CEILING SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, two-way deflection.
- B. Frame: 1-1/4 inch (32 mm) margin with [countersunk screw] [concealed] mounting and gasket made of 20 gauge steel welded.
- C. Fabrication: Aluminum extrusions with factory finish. Custom color selected by Architect.
- D. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.

#### 2.05 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with blades set at 45 degrees, along long face.
- B. Frame: 1-1/4 inch (32 mm) margin with concealed mounting.
- C. Fabrication: Steel with 20 gage (0.90 mm) minimum frames and 22 gage (0.80 mm) minimum blades, steel and aluminum with 20 gage (0.90 mm) minimum frame, or aluminum extrusions, with factory finish. Custom color selected by Architect.
- D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.
- E. Gymnasiums: Furnish front pivoted or welded in place blades, securely fastened to be immobile.

#### 2.06 FIXED LINEAR SUPPLY AND RETURN BAR GRILLES

- A. Type: Extruded aluminum with 1/8" or 1/4" bars on 1/4" or 1/2" centers with 0° or 15° deflection. Deflection bars shall be fixed and parallel to the long dimension.
- B. Frame: 1 inch (25 mm) margin. Provide end caps, mitered corners, and blank-offs for a continuous appearance made of heavy gauge extruded aluminum and mitered corners.
- C. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

## 2.07 WALL SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing with spring or other device to set blades, along long face, double deflection.
- B. Frame: 1 inch (25 mm) margin with concealed mounting and gasket made of 20 gauge steel welded.
- C. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face.
- D. Gymnasiums: Furnish front pivoted or welded in place blades, securely fastened to be immobile.

## 2.08 LINEAR MODULAR SLOT

- A. Type: Extruded aluminum, continuous linear slot with extruded aluminum pattern controller.
- B. Frame: To match ceiling construction.
- C. Fabrication: Aluminum extrusions .062 inch thick with end-caps, mitered corner and blank-offs for a continuous appearance.
- D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

## 2.09 ARCHITECTURAL LINEAR DIFFUSERS

- A. Type: Continuous slot at diffuser with anodized aluminum finish and black pattern controller.
- B. Frame-to-match ceiling construction.
- C. Provide mitered corners and end caps.

## 2.10 WALL EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with spring or other device to set blades, horizontal face.
- B. Frame: 1-1/4 inch (32 mm) margin with concealed mounting.
- C. Fabrication: Steel with 20 gage (0.90 mm) minimum frames and 22 gage (0.80 mm) minimum blades finish. Custom color selected by Architect.

- D. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.
- E. Gymnasiums: Furnish front pivoted or welded in place blades, securely fastened to be immobile.

#### 2.11 LINEAR FLOOR SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined blades with 0 or 30 degree deflection, 7/32 x 3/4 inch (6 x 19 mm) on 7/16 (6 mm) centers, assembled on expanded tubes mandrel construction.
- B. Frame: 1-1/4 inch (32 mm) heavy margin frame with concealed mounting and gasket, and mounting frame, less than 3/16 inch thick.
- C. Fabrication: Aluminum extrusions with factory finish. Custom color selected by Architect.
- D. Damper: Integral gang-operated opposed blade damper with removable key operator, operable from face.
- E. Support for core spacings shall not exceed 6 inches on center.
- F. Provide carpet clamp flange for installing in carpeted area.

#### 2.12 LABORATORY SUPPLY AIR DIFFUSERS

- A. Air diffusers for Laboratories shall be Titus model TriTec. Diffusers shall be constructed using a 6" tall, maximum, back pan which is designed for optimum performance with the diffuser. The back pan shall be divided into two chambers: upper and lower. The back pan shall have integral hanger tabs for securing the unit to the overhead structure. The upper velocity dampening chamber shall be separated from the lower air dampening chamber by a pressure induction plate. All pattern controllers shall be internal to the unit and shall be located in the lower air dampening chamber.
- B. The face of the diffuser shall be 51% free area perforated steel with 3/16" diameter holes on 1/4" staggered centers, and shall match, in appearance, industry standard perforated diffusers. The face shall not hang below the ceiling more than 5/8" and shall have 6 clips securing it in place. 1/4-turn fasteners on the face are not acceptable. The face, lower air chamber, directional blades, and the pressure induction plate shall be one assembly that can be removed from the face of the unit for sanitizing in an autoclave. The face shall be provided with two retainer cables. The back pan shall be manufactured of 22 gauge steel, minimum. The diffuser must be available for full radial air diffusion (2-way) and/or 1/2 radial air diffusion (1-way).

#### 2.13 LOUVERED PENTHOUSE

- A. Manufacturers: Subject to the requirement of the specification, the following manufacturer's products that may be incorporated into the project:

1. Construction Specialties Inc.
  2. Greenheck Corp.
  3. Industrial Louvers Inc.
  4. Substitutions: Division 01 - Product Requirements.
- B. Louvers: Type as specified above.
- C. Fabrication: Completely welded assembly. Fabricate with mitered corners. Structural supports rated for 20 psf (0.96 kPa) wind and snow loading. Furnish sill water catch with 2 inch (50 mm) high water stop and depth to enclose structural supports.
- D. Roof: Aluminum construction, standing seam type with formed water baffle plates open at corners for drainage. Furnish with 1 inch (25 mm) glass fiber insulation.
- E. Bird Screen: Interwoven wire mesh of aluminum, 1/2 inch (13 mm) open weave, diagonal design.
- F. Insect Screen: Aluminum mesh, set in aluminum frame.
- G. Extruded aluminum louvers.
- H. Roof Curb: 24 inch high aluminum construction with continuously welded seams, built-in cant strips, 1 inch (25 mm) insulation and curb bottom, hinged curb adapter, and factory installed nailer strip.
- I. Subject to approval by Architect.

## 2.14 ROOF HOODS

- A. Fabricate air inlet or exhaust hoods in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Fabricate of reinforced galvanized steel, minimum 16 gage (1.50 mm) base and 20 gage (0.90 mm) hood, or aluminum, minimum 16 gage (1.50 mm) base and 18 gage (1.20 mm) hood. Furnish removable hood; bird screen with 1/2 inch (13 mm) square mesh for exhaust and 3/4 inch (19 mm) for intake, and factory-baked enamel finish.
- C. Fabricate hood outlet area minimum of twice throat area.
- D. Roof Curb: 24 inch (600 mm) high self-flashing, aluminum construction with continuously welded seams, built-in cant strips, 1 inch (25 mm) insulation and curb bottom, interior baffle with acoustic insulation, curb bottom, ventilated double wall, hinged curb adapter, and factory installed nailer strip.

## 2.15 GOOSENECKS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, of minimum 18 gage (1.20 mm) galvanized steel or stainless steel with bird screens.

- B. Roof Curb: 24 inch (600 mm) high self-flashing, aluminum construction with continuously welded seams, built-in cant strips, 1 inch (25 mm) insulation and curb bottom, interior baffle with acoustic insulation, curb bottom, ventilated double wall, hinged curb adapter, and factory installed nailer strip.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify inlet and outlet locations.
- C. Verify ceiling and wall systems are ready for installation.

### 3.02 INSTALLATION

- A. Install diffusers to ductwork with airtight connection.
- B. Install balancing dampers on duct take-off to diffusers, grilles, and registers, whether or not dampers are furnished as part of diffuser, grille, and register assembly. Refer to Section 23 33 00.
- C. Paint visible portion of ductwork behind air outlets and inlets matte black. Refer to Division 09.
- D. Provide mounting frame/border to match ceiling construction for each type of outlet.
- E. Install insulation blanket on diffusers and taped to duct collar insulation and edges of diffuser to make air tight.
- F. Install or secure the retainer cable for diffusers having removable cores.
- G. Interior of duct collar, duct connection and plenum shall be painted black where the same is visible or as directed by the architect.
- H. Provide blank-off for linear diffusers above ceiling, heavy gauge, painted black sheet metal, for inactive portions of linear diffusers. Install in approved manner.

### 3.03 INTERFACE WITH OTHER PRODUCTS

- A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

END OF SECTION