SECTION 239100 - DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Dampers

B. Flex duct take-offs

C. Flexible duct connections

D. Duct access doors

E. Wall and roof duct terminations

F. Air device duct boots

G. Constant Airflow Regulators

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.

1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:

a. Special fittings.
b. Manual volume damper installations.
c. Control damper installations.
d. Fire-damper and smoke-damper installations, including sleeves; and duct-mounted access doors.
e. Wiring Diagrams: For power, signal, and control wiring.

C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. Comply with AMCA 500-D testing for damper rating.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653.

1. Galvanized Coating Designation: G90.
2. Exposed-Surface Finish: Mill phosphatized.

C. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.

D. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.

E. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

F. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.2 DAMPERS

A. Rectangular Backdraft Dampers: Aluminum construction, parallel action, single thickness blades, felt blade seals, 1 in.w.g. maximum pressure, 2,500 fpm maximum velocity, 200 deg F maximum temperature, vertical mount horizontal airflow, self-lubricating heavy duty nylon bearings, mill finish.

B. Round Backdraft Dampers: Galvanized steel housing, aluminum spring loaded butterfly damper blades, neoprene gasket, 2000 fpm maximum velocity, 180 deg F maximum temperature, requires maximum of 0.08 in.w.g. to open.

C. Round Volume Control Dampers: Galvanized steel housing and 20 gauge damper blade, synthetic bearings, zinc plated steel shaft, locking indicating quadrant regulator, 2,000 fpm maximum velocity, and maximum differential pressure of 2 in.w.g. Mount quadrant regulators on stand-off mounting brackets for insulated ducts. Design Basis: Young Regulator Model 5020R.

D. Rectangular Volume Control Dampers: Aluminum construction, opposed blade manual damper, synthetic blade bushings, stainless steel slide, and a locking indicating quadrant regulator. Where rod lengths exceed 30 inches provide regulator at both ends. Mount

quadrant regulators on stand-off mounting brackets for insulated ducts. Design Basis: Young Regulator Model 820ALN.

E. Round Motorized Outdoor Air Dampers: Galvanized steel construction with 20 gauge galvanized steel damper blade, and EPDM rubber gasket. Actuator shall be powered open with spring return to the closed position. Actuator shall be 120V powered and have a visible blade position indicator. Provide all accessories and relays to control the damper as detailed on the Contract Drawings. Design Basis: Young Regulator Model RDTF.

F. Rectangular Motorized Outdoor Air Dampers: Aluminum frame and blade construction and stainless steel slide. Actuator shall be powered open with spring return to the closed position. Actuator shall be 120V powered and have a visible blade position indicator. Provide all accessories and relays to control the damper as detailed on the Contract Drawings. Design Basis: Young Regulator Model SDTF.

G. Fire Dampers – Multi-Blade: 1-1/2 hour rated, dynamic rated, galvanized steel multiple blade fire damper constructed in accordance with NFPA 90A and UL 555. Dampers shall be constructed with 16 gauge galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings, plated steel axles, plated steel linkage concealed in jamb, and stainless steel closure spring. Closure device shall be a replaceable UL 33 fusible link that will activate at 165 deg F. Provide and install access door and sleeve. Design Basis: Greenheck Model DFD-210.

H. Fire Dampers – Curtain: 1-1/2 hour rated, dynamic rated, curtain type with blades outside of airsteam (Type B), fabricated with roll-formed, 0.034-inch-thick galvanized steel; with mitered and interlocking corners galvanized steel multiple blade fire damper constructed in accordance with NFPA 90A and UL 555. Closure device shall be a replaceable UL 33 fusible link that will activate at 165 deg F. Provide and install access door, retaining angle, and sleeve. Design Basis: Greenheck Model DFD-150.

I. Radiation Dampers: Ceiling radiation damper UL tested and labeled for protection of ceiling openings in fire rated floor/ceiling assemblies with fire resistance ratings of 3 hours or less. Ceiling dampers shall bear the Underwriters' Laboratories (UL) label and be rated for ductless, flexible duct or steel duct air systems. Dampers shall have galvanized steel construction, minimum 22 gauge, butterfly-type shutter, and 165 deg F replaceable fusible link. Design Basis: Metalfab Model MSCD.

1. Provide a boot assembly for radiation dampers located at air devices. Assembly shall be UL listed, minimum 30 gauge galvanized steel box with drywall flange and pre-installed insulation. Provide an "L" boot, an end boot, or a straight boot depending on the application.

2.3 FLEX DUCT TAKE-OFFS

A. Duct Board Take-Offs: Round aluminum snap collar assembled with damper. Damper shall have a locking indicating quadrant regulator. Mount quadrant regulators on stand-off mounting brackets for insulated ducts.

B. Metal Duct Take-Offs: Galvanized steel, rectangular, mitered take-off which transitions to a round collar with balancing damper. Damper shall have a locking indicating quadrant regulator. Mount quadrant regulators on stand-off mounting brackets for insulated ducts.

2.4 FLEXIBLE DUCT CONNECTIONS

A. UL listed fire-retardant, neoprene coated, woven glass fiber fabric manufactured to conform to NFPA 90A. The minimum weight shall be 30 oz per sq yd, fabric shall be approximately 2 inches wide, and the fabric shall be crimped into the metal edging strip of the 24 gauge galvanized steel connectors. Design Basis: Durodyne Model DDFDC.

2.5 DUCT ACCESS DOORS

A. Doors shall be galvanized steel, insulated, and double gasketed with tab type square frame. Access doors shall be hinged with cam fasteners.

2.6 WALL AND ROOF DUCT TERMINATIONS

A. Bathroom Exhaust Duct Terminations: Provide either a wall cap or a roof cap depending on the installation. Wall and roof caps shall be primed and painted to match the color of the wall or roof in which it is installed. Caps shall be constructed of galvanized steel and shall come with a backdraft damper and screen.

B. Dryer Vent Duct Terminations: Provide either a wall cap or a roof cap depending on the installation. Wall and roof caps shall be primed and painted to match the color of the wall or roof in which it is installed. Caps shall be constructed of galvanized steel and shall come with a backdraft damper and no screen.

C. Brick Vents: Heavy gauge extruded aluminum frame and blades with an aluminum mesh insect screen. The blades shall be positioned at a 45 degree angle and the vent shall have a built-in water stop to prevent water intrusion. Vent shall have a mill finish and shall be field-primed and -painted a color approved by the Architect. It is the Contractors responsibility to submit color samples to the Architect for approval. Design Basis: Greenheck BVE.

1. The duct connection to the brick vent shall have an aluminum back draft damper. The back draft damper shall be installed as appropriate for either an intake or exhaust airflow depending on the application.

2. Finish installation for a clean workmanlike installation. Gaps and chips will not be acceptable.

D. Outdoor Air Duct Terminations: Provide either a wall cap or a roof cap depending on the installation. Wall and roof caps shall be primed and painted to match the color of the wall or roof in which it is installed. Caps shall be constructed of galvanized steel and shall come with a screen.

2.7 AIR DEVICE DUCT BOOTS

A. Provide a boot assembly for insulated flexible duct connections to air devices. Assembly shall be minimum 30-gauge galvanized steel box with drywall flange and pre-installed insulation. Provide an “L” boot, an end boot, or a straight boot depending on the application.

2.8 CONSTANT AIRFLOW REGULATOR

A. Constant airflow regulators shall solely operate on duct pressure and require no external power supply. Each regulator shall be pre-set and factory calibrated, requiring no field adjustment to the airflows as indicated on the schedule, and shall be rated for use in air temperatures ranging from -25 deg F to 140 deg F. Constant Airflow Regulators shall be capable of maintaining constant airflow within +/- 10% of scheduled flow rates (15% for units 50 CFM or less), within the operating range of 0.2 to 0.8 in. w.g. differential pressure. Regulators shall be provided as an assembly consisting of a 94V-0 UL ABS plastic body housed within a round sleeve for mounting in round duct. Each round sleeve must be fitted with a lip gasket to ensure perimeter air tightness with the interior surface of the duct. All regulators must be classified per UL 2043 and carry the UL mark indicating compliance. All Constant Airflow Regulators will require no maintenance and must be warranted for a period of no less than five years. Constant Airflow Regulators shall be installed in tight ducting systems in accordance with all applicable codes and manufacturer’s instructions.

B. Design Basis: Model CAR-II Constant Airflow Regulators by American ALDES Ventilation Corporation, Bradenton, Florida.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions.

B. Provide balancing dampers at points on low pressure supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Use splitter dampers only where indicated.

C. Provide fire dampers at locations indicated, where ducts and outlets pass through fire rated components. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

D. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

E. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.

F. Provide duct access doors for inspection and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access.

G. Provide radiation dampers for air devices in rated penetrations and as indicated.

H. Demonstrate re-setting of radiation dampers to the Authority Having Jurisdiction (AHJ) and the Owner's representative.

END OF SECTION 239100