Part 1 General

1.1 General

.1 For additional information, refer to Section 15010 – Mechanical General Requirements and Division 1 - General Conditions of the Contract.

.2 For a list of applicable codes and standards, refer to Section 15010 – Mechanical General Requirements.

.3 The mechanical contractor shall be responsible for coordinating all aspects of this work.

.4 The positions indicated on the drawings are approximate only. Check the location of the outlets and make any necessary adjustments in positions to conform with the architectural features, symmetry and lighting arrangement.

1.2 Separate, Alternate Units Prices

.1 Provide the following separate, alternate and unit prices.

1.3 Scope of Work

.1 The scope of work for this section includes, but is not limited to, the following:

.1 Provision of all grilles, registers, diffusers and door grilles specified in this Section and shown on the Drawings.

.2 Provision of all exterior louvres, roof mounted hoods and gooseneck hoods specified in this Section and shown on the Drawings.

1.4 Shop Drawings

.1 Shop drawings shall be submitted for the following items:

.1 Grilles, registers, diffusers and door grilles.

.2 Exterior louvres, roof mounted hoods and gooseneck hoods.

.2 Shop drawings shall indicate the following:

.1 Size and free area.

.2 Noise level and throw characteristics at the specified air volumes.

.3 Mounting methods.

.4 Finish.

.5 Accessories such as volume control dampers and equalizing grids.

Part 2 Products

2.1 General

.1 Air outlets shall be based on a noise level of NC30 maximum unless otherwise specified.

.2 Provide plaster frames for diffusers located in plaster surfaces.

.3 Provide anti-smudge frames or plaques on diffusers located in rough textured surfaces, such as acoustical plaster.

.4 Refer to Diffuser, Grille, Register and Louvre Schedule for Manufacturer's accessories.

2.2 Rectangular Ceiling Diffusers

.1 Air Pattern: 360^{o}, fixed.

.2 Construction: steel, multi-core, stamped with sectorizing baffles where indicated on drawings.

.3 Accessories: frame suitable for ceiling type scheduled.

.4 Volume Control: radial opposed blade damper, adjustable from diffuser face, equalizing grid.

.5 Acceptable material: Price, Nailor, Titus.

2.3 Round Ceiling Diffusers

.1 Air Pattern: 360^{o}, fixed.

.2 Construction: steel, multi-core, stamped or spun with sectorizing baffles where indicated on drawings.

.3 Accessories: 25 mm (1") duct collar and duct ring, plaster ring in plaster ceilings, suitable for ceiling type scheduled.

.4 Volume Control: radial opposed blade damper, adjustable from diffuser face, equalizing grid.

.5 Acceptable material: Price, Nailor, Titus.

2.4 Sidewall Supply Grilles

.1 Air Pattern: adjustable pattern with two way deflection.

.2 Construction: streamlined and adjustable 20 mm (3/4") deep curved blades on 20 mm (3/4") centres, constructed of extruded aluminum with mitred corners.

.3 Volume Control: integral, gang operated, opposed blade dampers with removable key operator, operable from face.

.4 Mounting: 30 mm (1-1/4") wide margin border frame with mitred corners and concealed clips.

.5 Acceptable material: Price, Nailor, Titus.

.6 Condensing Units

2.5 Linear Bar Grilles (Sidewall/Sill Floor Mount)

.1 Air Pattern: 0^{o} deflection.

.2 Construction: fixed bar type louvers parallel to long dimensions with 3 mm (1/8") thick x 13 mm (1/2") deep bars on 12 mm (1/2") centres with 25 mm (1") border, extruded aluminum.

.1 Floor mounted grilles shall feature heavy duty construction suitable for pedestrian traffic areas.

.3 Accessories: Provide blank off strips on inactive sessions.

.4 Volume Control: opposed blade damper, operable from face of grille.

.5 Mounting: concealed clips or screws where noted.

.6 Acceptable material: Price, Nailor, Titus.

2.6 Ceiling Eggcrate Return/Exhaust Grilles

.1 Construction: aluminum fixed grid of 13 x 13 x 13 mm (½" x ½" x ½").

.2 Mounting: 30 mm (1-1/4") frame with countersunk oval head screws, lay in frame for suspended grid ceilings, suitable for ceiling scheduled.

.3 Volume Control: integral, gang operated opposed blade damper with removable key operator, operable from face.

.4 Acceptable material: Price, Nailor, Titus.

2.7 Sidewall Exhaust/Return Grilles

.1 Construction: extruded aluminum or 0.9 mm thick (20 gauge) steel with 0.8 mm thick (22 gauge) x 20 mm (3/4") deep blades, 0^{o} deflection with horizontal blades spaced 20 mm (3/4") on centre.

.2 Volume Control: integral, gang operated, opposed blade dampers with removable key operator, operable from face.

.3 Mounting: 30 mm (1-1/4") wide margin border frame with mitred corners and countersunk oval head screws.

.4 Acceptable material: Price, Nailor, Titus.

2.8 Door Grilles

.1 Construction: V-shaped louvers constructed of 1.0 mm thick (20 gauge) steel, 25 mm (1") deep, 13 mm (1/2") on centre with 1.0 mm thick (20 gauge) steel frame with auxiliary frame to give finished appearance on both sides of door.

.2 Mounting: countersunk, oval head screws.

.3 Acceptable material: Price, Nailor, Titus.

2.9 Air Intake/Exhaust Louvers

.1 Construction:

.1 Aluminum: 2 mm thick (14 gauge) extruded aluminum blades and frame, welded construction.

.2 Steel: 1.6 mm thick (16 gauge) steel frames and blade, welded construction with exposed joints ground flush and smooth.

.2 Louver Depth: 100 mm (4").

.3 Blade Configuration: storm-proof blades on 30° slope with 20 mm (3/4") vertical/horizontal top and bottom margins, horizontal middle "ridge" over entire length on each blade for water protection, blades spaced on 125 mm (5") centre, maximum blade length 1,500 mm (60").

.4 Mounting: countersunk screws in frame to fasten into jamb.

.5 Accessories: 13 mm (1/2") square exhaust, 25 mm (1") square, 2 mm thick (14 gauge) intake birdscreen in frames; middle mullions at maximum 1,500 mm (60") on centre, folded extruded aluminum.

.6 Finish:

.1 Steel: baked enamel, colour selected by Contract Administrator from manufacturer's standard colour range.

.2 Aluminum: baked enamel, colour selected by Contract Administrator from manufacturer's standard colour range.

.7 Louver Free Area: as specified in the attached schedule on the drawings.

.8 Air Intake Louver Water Penetration: not to exceed 43 g/m^2 (0.14 oz/ft^2) of free area when tested to AMCA Standard 500.

.9 Pressure Loss: as specified in the Air Outlet Schedule on the drawings.

.10 Acceptable material: Airolite.

2.10 Goosenecks

.1 Construction: fabricate to SMACNA Low Pressure Duct Construction Standards, minimum thickness of 1.2 mm (18 gauge) galvanized steel.

.2 Accessories: 13 mm (1/2") square mesh by 2 mm thick (14 gauge) birdscreen.

.3 Roof Clearance: minimum 900 mm (36") above roof.

2.11 Variable Air Volume Terminals (VAV-7.1 to VAV-7.6, VAV-9.1, VAV-10.1 to VAV-10.4, VAV-11.1 to VAV-11.6)

.1 Provide as shown on the drawings and as detailed in the equipment schedules, normally closed pressure independent variable volume terminals.

.2 Factory mounted terminal unit controllers and damper actuators are specified in Division 15900.

.3 Mounting responsibility: terminal unit manufacturer to take delivery of and install components supplied by Division 15900.

.4 Provide control arrangement such that field adjustment of maximum and minimum air flow and field selection of normally closed or normally open mode is easily achieved.

.5 Provide sound data (NC levels) for both transmitted and radiated noise for pressures ranging up to 1000 Pa (4" w.g.). Discharge and radiated sound ratings not to exceed room noise rating as listed.

.6 Provide sound attenuators on all VAV Terminals.

.7 Interior lining is to be constructed of impermeable, cleanable, closed –cell liner materials products for any portion of ventilation systems including VAV boxes and attenuators.

.8 Acceptable material: E.H. Price, Nailor, Titus.

2.12 Fan Powered Terminals (FPB-11.1)

.1 Provide normally open direct acting pressure independent constant volume, parallel fan powered terminals with variable primary air volume.

.2 All required mounting and wiring of terminal unit components supplied by Division 15900 to be provided by terminal unit manufacturer. Terminal unit manufacturer to provide fan relay and power transformer.

.3 Provide sound data (NC levels) for both transmitted and radiated noise for pressures ranging up to 1000 Pa (4" w.g.) All terminal units to be selected and attenuated for NC30 or less.

.4 The assembly casing to be constructed as follows:

.1 22 ga. casing (zinc coated steel construction) with integral turned-in flanges to capture exposed edges of insulation on return air plenum inlet;

.2 Removable bottom access panels to access the interior of the unit for motor servicing and removal, cleaning and inspection.

.3 Casing: fully lined with 20mm (3/4") dual density insulation (which complies with UL181 and NFPA90A) and faced with aluminum foil/reinforced Kraft vapour and air barrier.

.4 Metal filter frames: on plenum opening to fan compartment. Filters to be 25mm (1") thick disposable media in permanent reusable metal frames.

.5 Airflow sensor: provided by terminal unit manufacturer, of a multi-point, multi-axis flow ring or cross sensor having a minimum of twelve pickup points designed to average the airflow across the inlet of the assembly. Single point or flow bar sensors are not acceptable. Sensor, mounted at 1.5 duct diameters straight duct upstream of unit, to maintain airflow to within ± 5% of rated unit airflow setpoint

.6 Controller to operate the electric damper actuator through full-catalogued air volume range without changing orifices or other parts.

.7 Air distribution assembly to be designed, installed and field adjusted, if necessary, to maintain controlled pressure independent airflow. For optimum performance, installed units to be provided with a minimum of four duct diameters of straight inlet duct, same size as the inlet, between the inlet and any takeoff, transition or fitting. Also to be provided:

.1 External taps for air balancing instruments.

.2 Adjustable flow settings at the controller.

.8 Terminal units to be factory set to 50% minimum air flow position unless noted otherwise on drawings. This percentage to be field adjustable.

.9 All primary control components to be mounted inside a protective metal shroud.

.10 Damper to be 18 gauge metal minimum, with peripheral gasket, pivoted in self-lubricating bearings. In fully closed position, air leakage past the closed damper not to exceed 2% of the nominal catalogue rating at 750 Pa (3"w.g.) inlet static pressure, as rated by Air Diffusion Council test procedures.

.11 Fans to be forward curved centrifugal type, with direct drive 110V split capacitor type motors. Unit to be provided with a manual solid state speed controller for adjustment of fan speed. Fan and motor assembly to be internally suspended and isolated from the casing on rubber-in-shear isolators. All motors to be permanently lubricated. Access to be provided through a removable access panel in the bottom panel of the fan terminal assembly.

.12 All fan controls to be enclosed in a single control box with an access panel mounted on the side of assembly. All controls to be sealed from primary airflow.

.13 Unit to be CSA certified. Unit Manufacturer to provide unit mounted electrical disconnect switch.

.14 Acceptable material: E.H. Price, Nailor, Titus

Part 3 Execution

3.1 Installation

.1 Make airtight connections between diffusers and ductwork.

.2 Provide balancing damper on duct take-off to each diffuser at main branch take-off, even when volume dampers are specified as part of grille assembly. For details of balancing dampers, refer to Section 15800, Ductwork Accessories.

.3 Sizes indicated are nominal. Provide the correct standard product nearest to nominal, which delivers the capacity listed without an increase in noise level or pressure drop.

.4 Arrange to paint any ductwork which is visible behind air outlets-matte black.

.5 Confirm all air outlet/inlet and louver dimensions. Coordinate mounting details, finish and colours with ceiling and wall construction prior to submitting shop drawings.

.6 Adjust supply outlets to deliver patterns defined on drawings or as directed by Contract Administrator.

.7 Provide factory finish on each air inlet/outlet, louver and intake hood as indicated on the Air Outlet Schedule on the drawings.

.8 Mount roof hoods and goosenecks on a 300 mm (12”) high curb base.

3.2 Variable Air Volume Terminals (VAV-7.1, to VAV-11.6)/Fan Powered Terminals (FPB-11.1)

.1 Support independently of ductwork. Do not install inlet ductwork in lengths less than that required by the Manufacturer.

.2 Do not provide inlet sized ductwork more than 1200 mm (4 ft.) long.

END OF SECTION