SECTION 233423

HVAC POWER VENTILATORS

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 1 Specification with completely editable text; therefore, any portion of the text can be modified by the A/E preparing the Solicitation Package to suit the project.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. GENERAL
   1. SUMMARY
2. This Section includes the following:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**NOTE TO SPECIFIER**

Adjust list below to suit Project.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

* + - 1. Centrifugal roof ventilators.
      2. Centrifugal wall ventilators.
      3. Ceiling-mounting ventilators.
      4. In-line centrifugal fans.

1. Related Sections:
   * + 1. Sections 075213 through 076207 (depending on roof type used)
       2. Section 230500 – Common Work Results for HVAC
       3. Section 233100 – HVAC Ducts and Casings
       4. Section 260500 – Common Work Results for Electrical
       5. Section 260519 – Low-Voltage Electrical Power Conductors and Cables
   1. SUBMITTALS
      1. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:
      2. Operation and maintenance data.
   2. QUALITY ASSURANCE
      1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
      2. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.
      3. UL Standard: Power ventilators shall comply with UL 705.
2. PRODUCTS

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**NOTE TO SPECIFIER**

Verify manufacturer information, Product numbers, and availability at time of Project Manual preparation for Project.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

* 1. CENTRIFUGAL ROOF VENTILATORS
     1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1. Carnes Company HVAC.
        2. Central Blower Co.
        3. Greenheck.
        4. Loren Cook Company.
        5. Penn Ventilation.
     2. Description: Direct- or belt-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, curb base, and accessories.
     3. Painted galvanized-steel and fiberglass housings are also available from some manufacturers.
     4. Fan Wheels: Aluminum hub and wheel with backward-inclined blades.
     5. Drive Assembly: Belt drive or direct drive, as required.
        1. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
        2. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
        3. Pulleys: Cast-iron, adjustable-pitch motor pulley.
        4. Fan and motor isolated from exhaust airstream.
     6. Accessories:
        1. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted [**inside**] [**outside**] fan housing, factory wired through an internal aluminum conduit.
        2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
        3. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in curb base; factory set to close when fan stops.
        4. Motorized Dampers: Parallel-blade dampers mounted in curb base with electric actuator; wired to close when fan stops.
     7. Roof Curbs: Galvanized steel; mitered and welded corners; 1-1/2-inch-thick, rigid, fiberglass insulation adhered to inside walls; and 1-1/2-inch wood nailer. Size as required to suit roof opening and fan base.
        1. Overall Height: High enough to allow proper roof flashing to prevent leaks.
        2. Pitch Mounting: Manufacture curb for roof slope.
        3. Burglar Bars: Provide where required for security.
  2. CENTRIFUGAL WALL VENTILATORS
     1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1. Carnes Company HVAC.
        2. Central Blower Co.
        3. Greenheck.
        4. Loren Cook Company.
        5. Penn Ventilation.
     2. Description: Direct- or belt-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, and accessories.
     3. Housing: Heavy-gage, removable, spun-aluminum, dome top and outlet baffle; venturi inlet cone.
     4. Fan Wheel: Aluminum hub and wheel with backward-inclined blades.
     5. Belt-Driven Drive Assembly: Resiliently mounted to housing, with the following features:
        1. Fan Shaft: Turned, ground, and polished steel; keyed to wheel hub.
        2. Shaft Bearings: Permanently lubricated, permanently sealed, self-aligning ball bearings.
        3. Pulleys: Cast-iron, adjustable-pitch motor pulley.
        4. Fan and motor isolated from exhaust airstream.
     6. Accessories:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**NOTE TO SPECIFIER**

Edit list of accessories below that may be required for Project.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

* + - 1. Disconnect Switch: Nonfusible type, with thermal-overload protection mounted inside fan housing, factory wired through internal aluminum conduit.
      2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
      3. Wall Grille: Ring type for flush mounting.
      4. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in wall sleeve; factory set to close when fan stops.
      5. Motorized Dampers: Parallel-blade dampers mounted in curb base with electric actuator; wired to close when fan stops.
  1. CEILING-MOUNTING VENTILATORS
     1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1. Broan Mfg. Co., Inc.
        2. Carnes Company HVAC.
        3. Greenheck.
        4. Loren Cook Company.
        5. NuTone Inc.
        6. Penn Ventilation.
     2. Description: Centrifugal fans designed for installing in ceiling or wall or for concealed in-line applications.
     3. Housing: Steel, lined with acoustical insulation.
     4. Fan Wheel: Centrifugal wheels directly mounted on motor shaft. Fan shrouds, motor, and fan wheel shall be removable for service.
     5. Grille: Louvered grille with flange on intake and thumbscrew attachment to fan housing.
     6. Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.
  2. IN-LINE CENTRIFUGAL FANS
     1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1. Carnes Company HVAC.
        2. Central Blower Co.
        3. Greenheck.
        4. Loren Cook Company.
        5. Penn Ventilation.
     2. Description: In-line, centrifugal fans consisting of housing, wheel, outlet guide vanes, fan shaft, bearings, motor and disconnect switch, drive assembly, mounting brackets, and accessories.
     3. Housing: Split, spun aluminum with aluminum straightening vanes, inlet and outlet flanges, and support bracket adaptable to floor, side wall, or ceiling mounting.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**NOTE TO SPECIFIER**

Adjust two subparagraphs below to suit Project.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

* + 1. Direct-Driven Units: Motor mounted in airstream, factory wired to disconnect switch located on outside of fan housing.
    2. Belt-Driven Units: Motor mounted on adjustable base, with adjustable sheaves, enclosure around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.
    3. Fan Wheels: Aluminum, airfoil blades welded to aluminum hub.
  1. MOTORS
     1. Comply with requirements in Section 230500, Article 2.2 – “Motors”.

1. EXECUTION
   1. INSTALLATION
      1. Install power ventilators level and plumb.
      2. Support units using elastomeric mounts or spring isolators based upon size.

Secure vibration and seismic controls to concrete bases using anchor bolts cast in concrete base.

* + 1. Secure roof-mounting fans to roof curbs with cadmium-plated hardware. Refer to Section [070000] for installation of roof curbs.
    2. Ceiling Units: Suspend units from structure; use metal straps.
    3. Support suspended units from structure using threaded steel rods and elastomeric hangers or spring hangers.
    4. Install units with clearances for service and maintenance.
    5. Label units according to requirements specified in Section 230500, Article 2.3 – “Mechanical Identification”.
    6. Coordinate duct installation and specialty arrangements with schematics on Drawings and with requirements specified in duct systems. If Drawings are explicit enough, these requirements may be reduced or omitted.
    7. Duct installation and connection requirements are specified in Section 233100, “HVAC Ducts and Casings”. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Section 233100, Article 2.6 – “Flexible Duct Connections”.
    8. Install ducts adjacent to power ventilators to allow service and maintenance.
    9. Ground equipment according to Section 260500, Article 2.1 - "Grounding and Bonding."
    10. Connect wiring according to Section 260519 "Low Voltage Electrical Power Conductors and Cables."
    11. Mechanical equipment, appliances, and supports that are exposed to wind shall be designed and installed to resist the wind pressures determined in accordance with the local Building Code.
    12. For High-Velocity Hurricane Zones, all rooftop equipment and supports shall be secured to the structure in compliance with the loading requirements of the local Building Code.
  1. FIELD QUALITY CONTROL
     1. Perform the following field tests and inspections and prepare test reports:
        1. Verify that shipping, blocking, and bracing are removed.
        2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
        3. Verify that cleaning and adjusting are complete.
        4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
        5. Adjust belt tension.
        6. Adjust damper linkages for proper damper operation.
        7. Verify lubrication for bearings and other moving parts.
        8. Remove and replace malfunctioning units and retest as specified above.
     2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION

USPS MPF Specification Last Revised: 10/1/2022