SECTION 23 34 00

HVAC FANS

1.0 GENERAL

1. DESCRIPTION
   1. All work specified in this Section is governed by the Common Work Results for HVAC Section 23 05 00.
   2. This Section 23 34 00 and the accompanying drawings cover the provision of all labor, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the fans as specified herein and as shown. These fans include, but are not limited to the following:
      1. Roof-mounted centrifugal exhaust fans
      2. Roof-mounted upblast exhaust fans
      3. Roof-mounted, propeller-type upblast fans (direct drive)
      4. Roof-mounted, propeller-type upblast fans (belt drive)
      5. Inline fans
      6. Ceiling/cabinet fans
2. INTENT
   1. It is the intent of this Section of the specifications to provide complete, operable, adjusted fans as shown and specified which are free of excessive noise, vibration and airflow fluctuations.
3. BASIS OF DESIGN
   1. The basis of design is as scheduled. Any proposed substitutions shall be proven equal in all aspects to the equipment specified as the basis of design. Particular attention is called to the requirements of Section 23 05 00.
4. ACCEPTABLE SUBSTITUTE MANUFACTURERS
   1. Acceptable substitute manufacturers are Carnes, Cook, Acme, PennBarry, Twin City, Price, and Greenheck. Acceptable manufacturers for kitchen grease exhaust fans are Captive-Aire, Viking, and Greenheck.

2.0 PRODUCTS

1. GENERAL REQUIREMENTS
   1. All non-filtered fans shall be factory tested, rated and certified in accordance with the requirements of AMCA Standard No. 210 and shall be labeled accordingly. Filtered fans may be non-labeled but must be rated in an AMCA approved laboratory in accordance with 210.
   2. All roof-mounted fans shall be constructed such that water cannot enter the building through the fan regardless of whether or not the fan is operating. Fans shall be provided with drain connection and piped to the nearest roof drain as applicable.
   3. Fans installed outside or otherwise subject to weather shall have a weatherproof enclosure over the motor compartment. All components, including VFDs, shall have enclosures and be appropriate for the installation locations.
   4. All roof-mounted fans shall be provided complete with roof curbs. Roof curbs shall be of aluminum construction, insulated, canted and complete with wood nailer strips. Insulation shall meet NFPA 25/50 flame spread/smoke developed ratings.
   5. Fan and curb shall be provided and installed in accordance with manufacturer’s requirements and recommendations for hurricane wind speed at installation location, as required.
   6. All exhaust fans shall be provided complete with gravity-type backdraft dampers.
   7. All belt-drive assemblies shall be mounted on vibration isolators.
   8. All motors on belt-drive assemblies shall be mounted on slide bases to provide adjustment of belt tension.
   9. All belts in belt drives shall be rated for not less than 150% of the connected motor horsepower.
   10. All belt-drives driven by a 5 HP or larger motor shall be multiple belt arrangements.
   11. All belt-drives shall be adjustable to a minimum speed variation of plus or minus 20% of the design RPM.
   12. All centrifugal fan wheels shall be statically and dynamically balanced.
   13. All electric motors and equipment shall be UL labeled.
   14. Refer to Division 26 of these specifications and to the electrical Contract Drawings for electrical characteristics and connections to all equipment. Coordinate all electric motors and other equipment with these electrical documents.
   15. Fans with variable-frequency drives (VFDs) shall have shaft grounding ring and appropriate insulation class.
   16. All exposed motors and belts shall be protected with enclosures or guards in accordance with OSHA requirements.
   17. Life safety fans (i.e. stair pressurization, elevator hoistway pressurization, smoke control, etc. shall have 1.5 times the number of belts necessary for the scheduled performance with no less than two (2) belts.
2. ROOF-MOUNTED CENTRIFUGAL EXHAUST FANS
   1. Roof-mounted centrifugal exhaust fans shall be Greenheck Model G for direct drive fans and Greenheck Model GB for belt-drive fans, or an approved equal, as scheduled.
3. ROOF-MOUNTED, PROPELLER-TYPE UPBLAST FANS
   1. Propellers shall be constructed with die formed galvanized steel blades riveted to a galvanized steel hub. Propellers shall be statically and dynamically balanced for vibration free operation.
   2. Ground and polished steel fan shafts shall be mounted in permanently lubricated, sealed ball bearing pillow blocks.
   3. Propellers shall be attached to fan shafts with a standard square key and set screws for tapered bushings. Bearings shall be selected for a minimum average (L50) life in excess of 200,000 hours at maximum cataloged operating speeds.
   4. Pulleys shall be out of the fully machined cast iron type, keyed and securely attached to the wheel and motor shafts. Motor sheaves shall be adjustable for final system balancing. (Belt drive only).
   5. Drive frame assemblies shall be die formed, galvanized steel construction.
   6. Windbands shall be constructed of heavy gauge galvanized steel with reinforced edges and bolted seams.
   7. Curb caps shall be constructed of galvanized or painted steel. Curb caps shall include an integral venturi inlet and pre-punched mounting holes.
   8. The roof mounted axial upblast exhaust fans shall be Model RBU/RDU as manufactured by Greenheck or an approved substitute.
   9. Fan shall be provided with damper latches.
4. CEILING/CABINET EXHAUST FANS
   1. Ceiling/cabinet exhaust fans shall be Greenheck Model CSP (inline/cabinet) or Greenheck Model SP (ceiling) with integral grille, or an approved equal. Fans shall be provided with speed controller for balancing.

3.0 EXECUTION

1. INSTALLATION
   1. Fans shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.
2. ADJUSTMENT
   1. The fans shall be tested and adjusted after installation to provide the capacities indicated.

END OF SECTION