SECTION 23 34 00 - HVAC FANS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Centrifugal fans.
2. Propeller fans.
3. Downblast centrifugal roof fans.
4. Upblast centrifugal roof fans.
5. Ceiling fans.
6. Inline ceiling fans.
7. Duct blowers or cabinet fans.
8. Centrifugal square inline fans.

1.2 REFERENCES

A. American Bearing Manufacturers Association:
1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

B. Air Movement and Control Association International, Inc.:
1. AMCA 99 - Standards Handbook.
2. AMCA 204 - Balance Quality and Vibration Levels for Fans.
3. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
4. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
5. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.

C. ASTM International:
1. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

D. National Electrical Manufacturers Association:
1. NEMA MG 1 - Motors and Generators.
2. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

E. Underwriters Laboratories Inc.:
1. UL 705 - Power Ventilators.

1.3 SUBMITTALS

A. Product Data: Submit data on each type of fan and include accessories, fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.

PART 2 - PRODUCTS

2.1 CENTRIFUGAL FANS

A. Manufacturers:
   1. **Twin City Fan Co.**
   2. **Greenheck.**
   3. **Cook.**

B. Wheel and Inlet:
   1. Backward Inclined: Steel construction with smooth curved inlet flange, back plate, backward curved blades welded or riveted to flange and back plate; cast iron or cast steel hub riveted to back plate and keyed to shaft with set screws.
   2. Forward Curved: Galvanized steel construction with inlet flange, back plate, shallow blades with inlet and tip curved forward in direction of airflow, mechanically secured to flange and back plate; steel hub swaged to back plate and keyed to shaft with set screw.
   3. Airfoil Wheel: Steel construction with smooth curved inlet flange, back plate die formed hollow airfoil shaped blades continuously welded at tip flange, and back plate; cast iron or cast steel hub riveted to back plate and keyed to shaft with set screws.

C. Housing:
   1. Steel, spot welded for AMCA 99 Class I and II fans, and continuously welded for Class III, braced, designed to minimize turbulence with spun inlet bell and shaped cut-off.
   2. Factory finish before assembly to manufacturer's standard.
   3. Fabricate plug fans without volute housing, in lined steel cabinet.

D. Bearings and Sleeves:
   1. Bearings: Pillow block type, self-aligning, grease-lubricated ball bearings, with ABMA 9 L-10 life at 50,000 hours roller bearings, ABMA 11, L-10 life at 120,000 hours.
   2. Shafts: Hot rolled steel, ground and polished, with key way, protectively coated with lubricating oil, and shaft guard.
   3. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, keyed. Variable and adjustable pitch sheaves for motors 15 hp and under, selected so required rpm is obtained with sheaves set at mid-position. Fixed sheave for 20 hp and

over, matched belts, and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of motor.

2.2 PROPELLER FANS

A. Manufacturers:
   1. **Twin City Fan Co.**
   2. **Greenheck.**
   3. **Cook.**

2.3 DOWNBLAST CENTRIFUGAL ROOF FANS

A. Manufacturers:
   1. **Twin City Fan Co.**
   2. **Greenheck.**
   3. **Cook.**

2.4 UPBLAST CENTRIFUGAL ROOF FANS

A. Manufacturers:
   1. **Twin City Fan Co.**
   2. **Greenheck.**
   3. **Cook.**

B. Fan Unit: Upblast type. V-belt or direct drive, spun aluminum housing with grease tray; resilient mounted motor; aluminum wire bird screen; square base to suit roof curb with continuous curb gaskets.

C. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

D. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor.

2.5 CEILING FANS AND INLINE CEILING FANS

A. Manufacturers:
   1. **Twin City Fan Co.**
   2. **Greenheck.**
   3. **Cook.**

B. Centrifugal Fan Unit: Direct driven with galvanized steel housing lined with 1/2 inch acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge opening, integral outlet duct collar. Discharge position convertible by moving interchangeable panels.

C. Disconnect Switch: Fan mounted toggle switch for thermal overload protected motor.

D. Motor: Open drip proof type with permanently lubricated sealed bearings and thermal overload protection.

2.6 DUCT BLOWER OR CABINET FANS

A. Manufacturers:
   1. **Twin City Fan Co.**
   2. **Greenheck.**
   3. **Cook.**

B. Product Description: V-belt drive with galvanized steel housing lined with 1/2 or 1 inch acoustic glass fiber insulation as scheduled, removable side panel for access, inlet and outlet duct collar, gravity backdraft damper in discharge, horizontal hanging brackets.

C. Fan Wheel: Double width-double inlet backward inclined forward curved centrifugal type.

D. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

2.7 CENTRIFUGAL SQUARE INLINE FANS

A. Manufacturers:
   1. **Twin City Fan Co.**
   2. **Greenheck.**
   3. **Cook.**

B. Product Description: V-belt or Direct drive with galvanized steel housing lined with 1/2 or 1 inch acoustic glass fiber insulation, integral inlet cone, removable access doors on 3 sides, inlet and outlet duct collar, gravity backdraft damper in discharge, horizontal hanging brackets.

C. Fan Wheel: Backward inclined centrifugal type, aluminum construction.

D. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

E. Motor and Drive Mounting: Out of air stream.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install per manufacturer’s instructions.

B. Install backdraft dampers where required by code.

C. Install safety screen where inlet or outlet is exposed.

3.2 TRAINING

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain centrifugal fans.

B. Train LAWA Maintenance personnel to adjust, operate, and maintain centrifugal fans.

C. Provide minimum of 12 hours each (3 shifts) of classroom and hands on training to LAWA Maintenance personnel.

END OF SECTION 23 34 00