

# OWNER FURNISHED EQUIPMENT PACKAGE

for

## NEPTUNE MIDDLE SCHOOL EVAPORATIVE COOLER REPLACEMENT



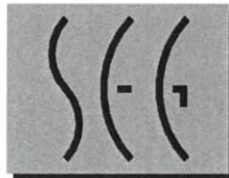
### OSCEOLA COUNTY SCHOOL DISTRICT FACILITIES DEPARTMENT

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SEG Project #06018

## SECTION 15660

## LIQUID COOLERS AND EVAPORATIVE CONDENSERS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section includes liquid cooler with fans, controls, inside sump, circulating pump, sound attenuation and discharge hood.

## 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. American Society of Mechanical Engineers:
  - 1. ASME PTC 23 - Atmospheric Water Cooling Equipment.

## 1.3 SUBMITTALS

- A. Shop Drawings: Indicate proposed structural steel supports including dimensions, sizes, and locations for mounting bolt holes.
- B. Product Data: Submit rated capacities, dimensions, weights and point loads, accessories, required clearances, electrical requirements and wiring diagrams, and location and size of field connections. Submit schematic indicating capacity controls. Submit performance curve plotting leaving water temperature against wet bulb temperature
- C. Manufacturer's Installation Instructions: Submit rigging, water and electric connections.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements based on ASME PTC 23.
- E. Manufacturer's Field Reports: Submit start-up report.

## 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.5 EXTRA MATERIALS

- A. Furnish two sets of matched fan belts.
- B. Furnish twelve spray nozzles.
- C. Furnish one valve seat for each make-up valve, one strainer screen, one float.

PART 2 PRODUCTS

2.1 CLOSED CIRCUIT EVAPORATIVE COOLERS

- A. **Manufacturers:**
  - 1. Baltimore Aircoil Company
  - 2. Evapco
  - 3. Substitutions: Section 15010 – Basic Mechanical Procedures:  
Substitutions
- B. **Product Description:** Factory assembled, outdoor units, sectional, counter flow, vertical discharge, induced or forced draft design, with fan assemblies built into pan and casing. Overall dimensions and operating weight shall not exceed the basis of design.
- C. **Thermal Performance:** The closed circuit cooling tower shall be warranted by the manufacturer to meet or exceed the capacity indicated in the Equipment Schedule at the temperature conditions specified. Coil pressure drop shall not exceed the scheduled drop.
- D. **Construction Details**
  - 1. **Corrosion Resistant Construction:** All steel panels and structural members shall be G-235 hot-dip galvanized steel with an electrostatically sprayed, thermosetting, hybrid polymer fuse-bonded to the substrate. Coatings other than the basis of design must be submitted to the engineer for pre-approval. Coating shall have the following minimum characteristics
    - a. When X-scribed to the steel substrate it shall be able to withstand 6000 hours of 5% salt spray per ASTM B117 without blistering, chipping, or loss of adhesion and 6000 hours of exposure to acidic (pH=4.0) and alkaline (pH=11.0) water solutions at 95°F (35°C) without signs of chemical attack;
    - b. Shall withstand impact of 160 in-lbs per ASTM D2794 without fracture or delamination of the polymer layer;
    - c. Shall withstand 6000 hours of ultraviolet radiation equivalent to 120,000 hours of noontime sun exposure without loss of functional properties;
    - d. Shall withstand 6000 hours of exposure to 60 psi water jet without signs of wear or erosion.



- E. **Coil Section:** The heat transfer section shall be encased with removable heavy-gauge galvanized steel panels. The coil shall be constructed of continuous serpentine all prime surface steel, be pneumatically tested at 375 psig, and be hot-dip galvanized after fabrication. The coil shall be designed for free drainage of fluid and shall be ASME B31.5 compliant.
- F. **Cold Water Basin – Stainless Steel:** The cold water basin shall be constructed of Series 300 stainless steel. All factory seams in the cold water basin shall be welded, leak tested at the factory to ensure watertight assembly and shall be warranted against leaks for 5 years. The basin shall include a depressed section with drain/ clean-out connection. Standard accessories shall include large area, lift-out steel strainers with perforated openings sized smaller than water distribution nozzle orifices, an integral anti-vortexing hood to prevent air entrainment, waste water bleed line, and brass make-up valve with large diameter plastic float arranged for easy adjustment.
- G. **Casing Panels:** Casing panels shall be constructed of steel matching the structure.
- H. **Spray Water System**
1. **Spray Water Pump(s):** The tower shall include an appropriate number of close coupled, bronze-fitted centrifugal pump and motor assemblies equipped with mechanical seal, mounted in the basin and piped from the suction connection to the water distribution system. The pump motor(s) shall be the totally enclosed fan cooled (TEFC) type. The system shall include a metering valve and bleed line to control the bleed rate from the pump discharge to the overflow connection.
  2. **Water Distribution System:** Water shall be distributed evenly over the coil at a flow rate sufficient to ensure complete wetting of the coil at all times. Large diameter, non-clog, 360° plastic distribution nozzles shall provide overlapping, umbrella spray patterns that create multiple intersection points with adjacent nozzles. The branches and spray nozzles shall be held in place by snap-in rubber grommets, allowing quick removal of individual nozzles or complete branches for cleaning or flushing.
- I. **Fill and Drift Eliminators**
1. **Fill and Drift Eliminators:** The fill and integral drift eliminators shall be formed from self-extinguishing (per ASTM-568) polyvinyl chloride (PVC) having a flame spread rating of 5 per ASTM E84 and shall be impervious to rot, decay, fungus and biological attack. The fill shall be manufactured and performance tested by the tower manufacturer. A separate set of drift eliminators shall be removable in easily handled sections for quick access to the coil. Eliminators shall have a minimum of three changes in air direction.
- J. **Air Inlet Louvers**

1. **Air Inlet Louvers:** Air inlet louvers shall be wave-formed, fiberglass-reinforced polyester (FRP) spaced to minimize air resistance and prevent water splash-out.

K. **Mechanical Equipment**

1. **Fan(s):** Fan(s) shall be heavy-duty, axial flow, with aluminum alloy blades. Air shall discharge through a fan cylinder designed for streamlined air entry and minimum fan blade tip clearance for maximum fan efficiency. Fan(s) and shaft(s) shall be supported by heavy-duty, self-aligning, grease-packed ball bearings with moisture-proof seals and integral slinger rings, designed for minimum L-10 life of 40,000 hours. Fan(s) shall be drive by a one-piece, multi-groove neoprene/polyester belt designed specifically for evaporative cooling service. Fan and motor sheave(s) shall be fabricated from cast aluminum.
2. **Fan Motor:** Fan motor(s) shall be totally enclosed air over (TEAO), reversible, squirrel cage, ball bearing type designed specifically for evaporative cooling duty. The motor shall be furnished with special moisture protection on windings, shafts, and bearings. Fan motors shall be inverter duty type designed per NEMA Standard MG1, Section IV, Part 31.
3. **Mechanical Equipment Warranty:** The fan(s), fan shaft(s), sheaves, bearings, mechanical equipment support and fan motor shall be warranted against defects in materials and workmanship for a period of five (5) years from date of shipment.

L. **Access**

1. **Plenum Access:** A large, hinged access door shall be provided on each end wall for access to the coil, drift eliminators, and fan plenum section. The water make-up valve, float ball, and suction strainer shall be easily accessible. On single side air inlet units, the access door shall open to an internal walkway.

M. **Accessories**

1. **Vibration Cutout Switch:** Provide mechanical local reset vibration switch. The mechanical vibration cutout switch will be guaranteed to trip at a point so as not to cause damage to the cooling tower. To ensure this, the trip point will be a frequency range of 0 to 3,600 RPM and a trip point of 0.2 to 2.0 g's.
2. **Platform with ladder:** A galvanized steel platform and aluminum ladder to grade shall be provided at all access doors to access the plenum section of the cooling tower. All working surfaces shall be able to withstand 50 psf live load or 200 pound concentrated load

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- A. Verify required utilities are available, in proper location, and ready to use.
- B. Verify anchor locations.

**3.2 INSTALLATION**

- A. Install cooler on structural steel beams per structural drawings.
- B. Install cooler water from sump to sprays with flanged or union connections.
- C. Install make-up water piping with flanged or union connections to cooler. Pitch to cooler. Pipe drain, overflow drain, and bleed lint as shown on drawings.

**3.3 ADJUSTING**

- A. Adjust water level float valves and float controls for proper operating level.
- B. Adjust bleed valve for proportion of circulated water.
- C. Adjust temperature controls and verify operation.

**3.4 DEMONSTRATION AND TRAINING**

- A. Demonstrate operation in accordance with specified requirements.

**END OF SECTION**

**Evaporative Cooler Schedule**

Mark	Basis of Design		Cells	Coil Performance				Ambient Wet Bulb (Deg F)		
	Manuf.	Model		Flowrate (GPM)	Fluid	Pd (PSI)	Heat Rej (MBH)		EWT (Deg F)	LWT (Deg F)
EC-1	BAC	1500FXV-444	1	285	Water	5.83	1,709	97	85	80

**Remarks:**

1. Provide stainless steel basin
2. Provide Ballbond on upper structure.
3. Provide internal ladder.
4. Provide dual fan motor system.



No. Motors	Fans		Spray Pump		Dimensions (LxWxH) (In.)	Operating Weight (Lbs.)
	HP (Each)	V/Ph/Hz.	HP	V/Ph/Hz.		
2	10	460/3/60	3	460/3/60	145x101x159	17,100