

SPECIAL SPECIFICATION

SECTION 15641S

INDUCED DRAFT COOLING TOWER

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Cooling tower.
- B. Accessories.
- C. Ladder and handrails.
- D. Tower structure, basins, supports, and walls.
- E. Foundations, footings, and piers.
- F. Filtration system.

1.02 RELATED SECTIONS

- A. Section 13085S- Seismic Protection
- B. Section 15051S- Piping Systems.**
- C. Section 15060S - Hangers and Supports.
- D. Section 15070S - Vibration Isolation.
- E. Section 15185S - Chemical Water Treatment.
- F. Section 15622S - Water-Cooled Centrifugal Chillers.
- G. Section 15950S - Testing, Adjusting and Balancing.

1.03 REFERENCES

- A. AFBMA 9 - Load Rating and Fatigue Life for Ball Bearings.

- B. AFBMA 11 - Load Rating and Fatigue Life for Roller Bearings.
- C. ASTM A 48 - Gray Iron Castings.
- D. ASTM D 1784 - Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
- E. ASTM E 84 - Surface Burning Characteristics of Building Materials.

1.04 SUBMITTALS

- A. Include product data indicating all rated capacities, dimensions, weights and point loadings, accessories, required clearances, electrical requirements, wiring diagrams and location and size of field connections.
- B. Certify performance based on CTI Standard 201, and submit performance curve plotting leaving water temperature against wet bulb temperature. Test tower in accordance with CTI Test Code ATC-105, latest edition.
- C. Indicate on shop drawings all construction for foundations, piers, wall construction, basins, structural steel supports, including dimensions, sizes and locations for mounting bolt holes. Provide elevations to indicate how final construction will appear on site and relationship to adjacent exterior walls and footings.
- D. Provide operation and maintenance manual.

1.05 QUALITY ASSURANCE

- A. Provide A/E with manufacturer's certification that materials meet or exceed minimum requirements as specified.
- B. Provide documented installation list for verification indicating that tower manufacturer has been in business and building the type tower and fill for this project for at least five years.

1.06 WARRANTY

- A. Provide manufacturer's five-year warranty against failure of mechanical equipment components of fan driven system and supports, with exception of motor. Include repair or replacement of defective material in warranty. Include motor manufacturer's standard one-year beneficial service warranty for motor.
- B. Warrantee fans, gear reducers and drive shafts for five years with repairs or replacement free of charge within the warranty period.

- C. Provide manufacturer's standard one year beneficial service warranty for motors and other components.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Baltimore Air Coil, Inc. **No substitutions allowed.**

2.02 MANUFACTURED UNIT

- A. Provide complete unit for outdoor use, field assembled, multi-cell, counterflow, vertical discharge, induced draft type with sump, water basin, fan, speed reducers, water distribution system, fill, fill support lintels, drift eliminators and motor, drive shafts, shaft guards with number of cells as shown or scheduled on Drawings.
- B. Cooling tower shall consist of inner workings, structural support, and concrete walls complete and in place.

2.03 COMPONENTS

- A. Louvers: Not required.
- B. Fan: Multi-blade, fiberglass, adjustable pitch, propeller type with **belt drive**.
- C. Motor: **High efficiency VFC rated**, 1,800 rotations per minute totally enclosed fan cooled (TEFC) type with special moisture protection, mounted on galvanized steel base plates, bolted to **adjustable motor base**. **Provide eyes on structure for attaching lifting device for servicing motor.**
- D. **Provide ladder and platform for servicing motor and fan.**
- E. Access: **aluminum** ladder for access to tower internals for each cell.
- F. Safety: Safety railings and ladder, with safety cage from grade to fan deck.
- G. Low Pressure Distribution System: Centrally located header with side laterals, fittings, and nozzles. Provide fiberglass or PVC piping, depending on size. Nozzles shall be ABS material.
- H. Fill: **PVC** fill packing with low water absorption.

I. Drift Eliminators:

1. Three pass zig-zag type polyvinyl chloride plastic to limit drift loss to .0005 percent of total water circulated. Provide a stainless steel access door for access to distribution system.
2. PVC resin, ASTM D 1784, Type 1, Grade 2, with minimum 9 percent titanium dioxide to protect against ultraviolet rays. Provide minimum flame spread rating of 25 or less in accordance with ASTM E 84.

J. Hot and cold basins: 304 stainless steel.

K. Nuts, Bolts and Washers: Stainless steel.

L. Finish: Provide steel components of G-235 hot dipped galvanized steel with edges protected with zinc rich compound. Cut all holes and hot dip galvanize after fabrication of steel components. Provide panels for exterior wall of cooling tower to match panels of exterior wall of building. Match color, construction material and height.

2.04 ACCESSORIES

A. Vibration Cut-Out Switch with Remote Vibration Switch Motor Control:

1. De-energize fan motors upon excessive vibration.
2. Vibration switch, control module **to contain 2 contacts, one wired** with motor starter, **the other wired to FCS.**

PART 3 - EXECUTION

3.01 INSTALLATION

A. Construct cooling tower complete including structure, basins, supports, walls, and components as follows:

1. Tile fill and lintel supports.
2. Distribution system.
3. Mist eliminators.
4. Motors.
5. Drive shafts and guards.

6. Fans.
 7. Motor and gear base plates.
 8. Tower structure, basins, and supports.
 9. Concrete walls, foundations, and piers.
- B. Connect condenser water piping with flanged connections to tower at tower **inlet** shown on Drawings. Pitch condenser water supply to tower and condenser water suction away from tower. Supply pitot tube and thermal well taps as recommended by CTI testing procedures.
- C. Connect overflow, and drain to storm sewer.
- D. Provide service and control valves as shown on Drawings.

3.02 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services:
1. Provide job site supervision by representative of tower manufacturer for complete construction of cooling tower and start-up instruction.
 2. Inspect tower after installation and submit report prior to start-up, verifying installation is in accordance with specified requirements and manufacturer's recommendations.
 3. Allow two 8-hour days for start-up and instruction of Owner's operating personnel.

END OF SECTION