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WESTSIDE
COMMUNITY SCHOOLS

Westside Community Schools
Westside High School Fluid Cooler Procurement

Project Manual

August 22nd, 2025

MEI PROJECT NO.: 25352

4940 North 118th Street
Omaha, NE 68164
P: 402.491.4144
www.morrisseyengineering.com

Specifications for:
Westside Community Schools
Westside High School Fluid Cooler Procurement
Omaha, NE

Owner Representative
Project Advocates
1313 Cuming Street, Suite 201
Omaha, NE 68102
Contact: Chris Bilau
Phone: (402) 507-0844
Email: chrisb@project-advocates.com

Mechanical / Electrical Engineers
Morrissey Engineering
4940 North 118th Street
Omaha, NE 68164
Phone: (402) 491-4144
Fax: (402) 491-4146

Mechanical Contact: Andy Gilliam, P.E.
Email: agilliam@morrisseyengineering.com

WESTSIDE COMMUNITY SCHOOLS

Date: August 22, 2025

Westside Community Schools (hereinafter referred to as "the District" or "WCS") invites bids on:

Westside Community Schools
Westside High School Fluid Cooler Procurement
Omaha, NE

Bids are to be made on the bid form enclosed. One completed electronic copy of the bid form is to be returned via email to agilliam@morrisseyengineering.com.

Any questions concerning clarification of this bid should be directed to:

Andy Gilliam
Morrissey Engineering
4940 North 118th Street
Omaha, Nebraska 68164
Phone: (402) 491-4144
agilliam@morrisseyengineering.com

The School District reserves the right to accept or reject any or all bids or any part thereof and to waive any and all technicalities and irregularities should it deem to be in the best interest of the District to do so.

BIDS ARE DUE: 1:00 P.M. (CST), FRIDAY, SEPTEMBER 5, 2025

Submit bids via email to:

agilliam@morrisseyengineering.com

Bidding documents may be examined at the office of the Engineer,

Morrissey Engineering
4940 North 118th Street
Omaha, Nebraska 68164

and at the following exchanges after August 26, 2025:

F.W. DODGE CORPORATION, 11422 Miracle Hills Dr., Suite 206, Omaha, NE 68154
OMAHA BUILDERS EXCHANGE, 4159 So. 94th Street, Omaha, NE 68127
Lincoln Builder's Bureau, 5910 South 58th Street, Suite C, Lincoln, NE 68516
A & D's Virtual Plan Room, http://www.adtechplans.com/

Bidders may obtain Bidding Documents at the office of the printer,

A & D Technical Supply
4320 S 89th Street
Omaha, NE, 68127
(402) 592-4950

Documents will be available between the hours of 8:00 a.m. and 12:00 noon and 1:00 p.m. and 5:00 p.m., Monday through Friday. All bidders who require hard copies of bid documents shall place an order directly with A & D Technical Supply and shall pay all costs associated with printing and if applicable, all shipping costs. Only full and complete sets will be printed - partial set orders are not allowed. Hard copy bid documents do not need to be returned as no refund will be issued.

PART 1 - BIDDING INFORMATION

1.1 SCOPE OF THE PROJECT

Westside Community Schools wishes to purchase the material for future installation for (1) new fluid cooler unit to be installed at Westside High School.

1.2 INFORMATION TO BIDDERS

Bids must be prepared on the attached bid form, with all required information provided, and submitted via email. Time.gov shall be the official clock for purposes determining when the deadline for bid submission has been reached.

1.3 SCHOOL DISTRICT'S RIGHT

The School District reserves the right to accept or reject any or all bids or any part thereof and to waive any and all technicalities and irregularities should it deem to be in the best interest of the District to do so.

Qualification of Bidders: The District may make such investigations as it deems necessary to determine the ability of the bidder to provide the material, and the bidder shall furnish to the District all such information and data for this purpose as the District may request. The District reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the District that such bidder is properly qualified to carry out the obligations of the plans or specifications and to complete the work contemplated therein. Conditional bids shall not be accepted.

1.4 BID PROPOSAL

Each sheet of the bid proposal must be signed and dated as indicated.

1.5 BID TABULATIONS

Bid tabs may be requested via email to agilliam@morrisseyengineering.com.

1.6 MODIFICATION OR WITHDRAWAL OF BIDS

Prior to the opening of bids, any bidders may modify or withdraw their bids by written email notification to Andrew Wane at the Support Center of Westside Community Schools. Such notice shall be submitted in writing, over signature of the bidder. After opening of bids, the bids shall remain open and subject to acceptance by the School District for one hundred twenty (120) days and may not be withdrawn or modified prior to the expiration of such one hundred twenty (120) day period.

1.7 ADDITIONAL INFORMATION

No oral interpretations will be made to any bidder as to the meaning of drawings and specifications or other contract documents. Every request for an interpretation shall be made in writing and addressed to:

Andy Gilliam
Morrissey Engineering
4940 North 118th Street
Omaha, Nebraska 68164
Phone: (402) 491-4144
agilliam@morrisseyengineering.com

PART 2 - GENERAL CONDITIONS

2.1 SHOP DRAWINGS

Unless otherwise noted, submit a PDF of shop drawing and product data for review to agilliam@morrisseyengineering.com for approval before fabrication or ordering equipment. The Engineer will not be responsible for or accept any material that is not constructed in conformity with the approved shop drawings and specifications. In order to expedite the shop drawing process apparent low bidder should consider working on shop drawings immediately after bid opening. The Engineer will review shop drawings as soon as reasonably practical after they are submitted.

2.2 COMPLIANCE WITH LAWS

The Contractor, in performance of the work called for in the Contract documents, will comply with all applicable government laws, ordinances, regulations, and codes.

2.3 INDEMNIFICATION

Bidder shall indemnify and save Westside harmless from and against any loss, damage, liability and expenses occasioned by, arising out of, any negligent or intentional act by bidder or any of bidder's agents, employees, and subcontractors.

2.4 NO ASSIGNMENT

Contractor shall not assign or transfer the Contract between School District and Contractor, nor any right arising thereunder, nor shall this Contract or any such right be transferred by operation of law.

2.5 AIA CONTRACT

Successful Contractor shall enter AIA contract with District. See example on following page.

ABC Building
909 South 76th Street
Omaha, Nebraska 68114

Proposal Form
for
Westside Community Schools
Westside High School Fluid Cooler Unit Procurement

Bidder agrees to furnish all labor, materials, tools, equipment, services, transportation, supervision and miscellaneous expense required to deliver the equipment specified in PROJECT MANUAL as prepared by Morrissey Engineering, Inc, 4940 North 118th St., Omaha, NE 68164, dated August 22, 2025 for the sum set forth below, subject to all addenda officially issued prior to bidding for the sum of:

Total Lump Sum Base Bid:

$ _____.00

_____Dollars
(Amount shown in both figures and words. In case of discrepancy, words shall govern)

Equipment Performance:

Bidder shall meet all criteria of equipment performance per sheet M0.01 and specification section 236500.
Bidders may include additional information for consideration.

Lead Time:

Lead time shall be based on equipment order date of September 19, 2025.

_____ Weeks from order to arrival on site.

Addenda

Acknowledge receipt of Addenda No. _____, _____, _____, _____,

Date _____, _____, _____, _____,

And have included the provisions of these Addenda in my bid. Initials _____

For: _____
(*Company)*

By: _____
(Printed Name)

By: _____
(Signature)

Date: _____

DRAFT

AIA® Document A152™ – 2019

Purchase Order

PURCHASER: *(name and address)* Douglas County School District 28-0066 a/k/a Westside Community Schools, 909 South 76th Street Omaha, NE 68114-4599	**VENDOR:** *(name and address)*	**ARCHITECT:** *(name and address)* TACK Architects 2922 N. 61st St Studio 1 Omaha, NE 68104
PURCHASE ORDER INFORMATION: Number: WCSHS - 001 Date: August 22, 2025	**DELIVER TO:** *(name and address)* Westside Service Center C/O - Chris Bilau - 402-507-0844	**PROJECT:** *(name and address)* Westside High School Fluid Cooler 8701 Pacific Street Omaha, NE 68114

IDENTIFICATION OF GOODS

The Vendor agrees to provide the following goods to the Purchaser:
(Insert a list of goods to be provided by the Vendor, including details for identification and quantities for each, or identify a separate exhibit that includes such information.)

PRICE

The Purchaser shall pay the Vendor the following amount for the goods provided under this Purchase Order:
(Insert the price the Purchaser is to pay the Vendor, including amounts for taxes, duties, tariffs, handling charges, delivery, and incidental services. Identify unit prices, if applicable.)

PAYMENTS

The Purchaser shall pay the Vendor according to the following payment terms:
(Insert payment terms, such as payment due dates, deposit requirements, and discounts, if any.)
Net balance paid in 30 days of invoice receipt. Items to be billed upon shipment from the factory

DELIVERY

The Vendor shall deliver the goods to the "Deliver To" address above. The Vendor's additional delivery requirements are:
(Insert additional delivery requirements, such as delivery date or range of dates, hours of delivery, split delivery, inside delivery, unpackaging requirements, or receiving instructions.)
Chris Bilau at 402-507-0844

OTHER REQUIREMENTS OR TERMS

CONTRACT DOCUMENTS

The Contract Documents consist of:

- **.1** This Purchase Order and all documents or exhibits referenced herein
- **.2** AIA Document A152™-2019, Exhibit A - Terms and Conditions
- **.3** Other:

SIGNATURE of the Purchaser's Authorized Representative	**SIGNATURE of the Vendor's Authorized Representative**
Purchaser's Authorized Representative ***(Print Name and Title)***	**Vendor's Authorized Representative** ***(Print Name and Title)***
DATE	**DATE**

SECTION 23 65 00 - CLOSED-CIRCUIT, INDUCED-DRAFT, COUNTERFLOW COOLING TOWERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. The Owner will select and employ the Commissioning Authority (CxA) for this project. All Contractors shall cooperate with the CxA to complete all required commissioning. Specification Section 01 91 13 defines the Contractor's responsibilities with respect to the process. The Contractor shall review this section and shall include in their bids the work associated with the commissioning effort described.

1.2 SUMMARY

A. Section includes factory-assembled, closed-circuit, induced-draft, counterflow cooling towers.

1.3 DEFINITIONS

A. SCCR: Short-circuit current rating.

1.4 SUBMITTALS

A. Product Data: For each type of product.

1. Include rated capacities, pressure drop, fan performance data, rating at selected points indicated, and furnished specialties and accessories.
2. Maximum flow rate.
3. Minimum flow rate.
4. Pressure required at cooling tower supply piping connections.
5. Drift loss as percent of design flow rate.
6. Sound:

    a. Sound pressure levels for operation with fan off, fan at minimum speed, and design speed. If sound requirements are indicated at a specific distance, submit performance using same distance for comparative analysis.
    b. Sound power levels in eight octave bands for operation with fans off, fans at minimum speed, and design speed.

7. Fan airflow at design conditions, brake horsepower, and drive losses (indicated in horsepower and percent of brake horsepower).
8. Fan motor electrical characteristics including, but not limited to, speed, voltage, phase, hertz, amperage, efficiency, and power factor at 100, 75, 50, and 25 percent of nameplate horsepower.
9. Pump flow rate, head, brake horsepower, and efficiency.
10. Pump motor electrical characteristics including, but not limited to, speed, voltage, phase hertz, amperage, efficiency, and power factor at 100, 75, 50, and 25 percent of nameplate horsepower.
11. Electrical power requirements for each cooling tower component requiring power.

B. Shop Drawings:

1. Manufacturer's drawings of assembled cooling towers, control panels, sections, and elevations.
2. Assembled unit dimensions.
3. Diagram showing each separate piece requiring field assembly.
4. Shipped sub-assembly dimensions and weights for field assembly.
5. Assembled unit weight without water.
6. Operating weight and load distribution.
7. Unit vibration isolation.
8. Required clearances for maintenance and operation.
9. Sizes and dimensioned locations of piping and wiring connections.
10. Diagrams for power, signal, and control wiring.

C. Coordination Drawings:

1. Drawings on which the following items are shown and coordinated with each other, using input from installers of the items involved:

    a. Structural supports.
    b. Piping roughing-in requirements.
    c. Conduit and wiring roughing-in requirements for controls and electrical power, including spaces reserved for controls and electrical equipment.
    d. Access requirements, including working clearances for controls and electrical equipment, and service clearances. Mark and label clearances.

2. Drawings showing plans, sections, and elevation views, drawn to scale of at least ¼" = 1'-0".
3. Each view to show screened background with the following:

    a. Structural grids.
    b. Adjacent walls, floors, and roofs.
    c. Equipment and products of other trades that are located in vicinity of cooling towers and are part of final installation, such as controls, power, lighting, fire-suppression systems, and plumbing systems.

D. Product Certificates: For certification required in "Quality Assurance" Article.

E. Field Test Reports: Include startup service reports.

F. Source quality-control reports.

G. Field quality-control reports.

H. Sample Warranty: For special warranty.

I. Operation and Maintenance Data: For each cooling tower to include in emergency, operation, and maintenance manuals.

J. Belts:

1. Furnish one set of matching belts for each unique belt configuration and size furnished.

K. Tool Kit:

1. A tool kit specially designed by cooling tower manufacturer for use in servicing cooling tower furnished.
2. Special tools required to service components not readily available to Owner service personnel in performing routine maintenance.

3. Lockable case with hinged cover, marked with large and permanent text to indicate the special purpose of tool kit, such as "Fluid Cooler Tool Kit." Text size shall be at least 1 inch high.
4. A list of each tool furnished. Permanently attach the list to underside of case cover. Text size shall be at least 1/2 inch high.

L. Touchup Coating: 32-oz. container of paint coating used. Label outside of container with detailed description of coating to allow for procurement of a matching coating in the future.

1.5 QUALITY ASSURANCE

A. ASME Compliance: Fabricate and label heat-exchanger coils to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

B. CTI Certification: Cooling tower thermal performance according to CTI STD 201RS.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Coordinate requirements for multi-piece assembly for shipment. Limit the number of separate pieces for field installation to as few as possible.

B. If factory assembly of multiple pieces is required for testing or other reasons, disassemble cooling tower into major assemblies as required by installation before packaging for shipment.

1. Clearly label each separate package with a unique designation and include with assembly instructions for each complete cooling tower.
2. Install seals on gear-drive assemblies to eliminate oil leakage during shipment if shipped with oil.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace the following components of cooling towers that fail in materials or workmanship within specified warranty period:

1. Fan Motor/Drive System: Warranty Period shall be Five (5) years from date of unit shipment from Factory (fan motor(s), fan(s), bearings, mechanical support, sheaves, bushings and belt(s)).
2. The Entire Unit shall have a comprehensive one (1) year warranty against defects in materials and workmanship from startup, not to exceed eighteen (18) months from shipment of the unit.
3. Heat Transfer Coil: Warranty Period shall be One (1) year from date of unit shipment from Factory.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. 1 extra set of belts for each unit.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Baltimore Aircoil Company.
2. EVAPCO, Inc.
3. SPX Cooling Technology
4. Approved Substitute

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Cooling tower and support structure shall withstand the effects of loads and stresses within limits and under conditions indicated according to governing code.

B. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Vibration:

1. Rotating assemblies shall be dynamically balanced to achieve a balance level of "good" while complying with industry standard requirements for cooling towers.
2. Critical speed shall be at least 115 percent of design speed.

2.3 DESIGN ARRANGEMENT

A. Counterflow design with airflow from all sides and induced-draft, top-mounted axial fan and pressurized pipe distribution.

2.4 CASING AND FRAME

A. Casing Material: Galvanized steel, ASTM A653/A653M, G235 coating.

B. Frame Material: Galvanized steel, ASTM A653/A653M, G235 coating.

C. Hardware: Galvanized steel.

D. Joints and Seams: Sealed watertight.

E. Welded Connections: Sealed watertight by continuous welds.

2.5 COLLECTION BASIN

A. Factory-Assembled Collection Basin:

1. Material: Stainless steel, Grade 304.
2. Hardware: Stainless steel.

3. Joints and Seams: Sealed watertight.
4. Welded Connections: Sealed watertight by continuous welds.
5. Removable stainless-steel strainer with openings smaller than nozzle orifices.
6. Overflow and drain connections.
7. Makeup-water connection.
8. Outlet Connection: Configured to mate to ASME B16.5, Class 150 flange.
9. Water Silencer: The unit shall be provided with water silencers located in the falling water area of the cold-water basin. The water silencers shall be constructed of lightweight PVC in easily handled sections for ease of removal and access to the basin area.

2.6 COLLECTION BASIN MAKEUP-WATER ASSEMBLY

A. Make up float assembly shall be a mechanical brass valve with an adjustable plastic float.

2.7 COLLECTION BASIN HEATER

A. Electric Heater:

1. Stainless-Steel Electric Immersion Heaters: Installed in a threaded coupling on the side of the collection basin.
2. Heater Control Panel: Mounted on the side of each cooling tower cell.
3. Enclosure: NEMA 250, Type 4.
4. Magnetic contactors controlled by a temperature sensor/controller to maintain collection basin water-temperature set point. Water-level probe shall monitor cooling tower water level and de-energize the heater when the water reaches low-level set point.
5. Control-circuit transformer with primary and secondary side fuses.
6. Terminal blocks with numbered and color-coded wiring to match wiring diagram.
7. Single-point, field-power connection to a disconnect (provided by Electrical) and heater branch circuiting complying with NFPA 70.
8. Factory Wiring Method: Metal raceway for factory-installed wiring outside of enclosures, except make connections to each electric basin heater with liquidtight conduit.

    a. Raceway shall be corrosion-resistant stainless steel.

2.8 PRESSURIZED DISTRIBUTION NETWORK

A. Main header and lateral branch piping designed for even distribution over heat-exchanger coils throughout the entire flow range without the need for balancing valves and for connecting individual, easily removable, nonclogging spray nozzles.

B. Pipe Material: Schedule 40 PVC.

C. Spray Nozzle Material: ABS Plastic or PVC.

D. Piping Supports: Corrosion-resistant hangers and supports to resist movement during operation and shipment.

2.9 HEAT-EXCHANGER COILS

A. Tube and Tube Sheet Materials: Carbon-steel tube and sheet with outer surface of tube and sheet hot-dip galvanized after fabrication.

B. Heat-Exchanger Arrangement:

1. Serpentine tubes; sloped for complete drainage of fluid by gravity.
2. Tubes with extended surface fins if required to achieve performance indicated.

C. ASME Compliance: Designed, manufactured, and tested according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, and bearing ASME "U" stamp; sloped for complete drainage of fluid by gravity.

D. Field Piping Connections: Vent, supply, and return suitable for mating to ASME B16.5, Class 150 flange.

2.10 DRIFT ELIMINATORS

A. Material: PVC; with maximum flame-spread index of 5 according to ASTM E84.

B. UV Treatment: Inhibitors to protect against damage caused by UV radiation.

C. Arrangement: Multiple, easily removable sections.

D. Configuration: Multipass, designed and tested to reduce water carryover to 0.001 percent of design flow rate indicated.

E. Hardware: Galvanized steel.

2.11 AIR INLET

A. Air-Intake Louvers:

1. Material: PVC.
2. UV Treatment: Inhibitors to protect against damage caused by UV radiation.
3. Multiple, easily removable sections arranged to uniformly direct air into cooling tower, to minimize air resistance, to block direct sunlight, and to prevent water from splashing out of tower during all modes of operation including operation with fans off.

B. Hardware: Galvanized steel.

2.12 FAN AND DRIVE ASSEMBLY

A. Axial Fan: Balanced at the factory after assembly.

1. Fan shall be low sound design with wide chord blades.
2. Blade Material: Aluminum.
3. Hub Material: Aluminum.
4. Fan Shaft: Corrosion resistant.
5. Fan Shaft Bearings: Self-aligning ball or roller bearings with moisture-proof seals and premium, moisture-resistant grease suitable for temperatures between minus 20 and plus 300 deg F. Bearings designed for an L-10 life of 80,000 hours.
6. Bearings Grease Fittings: Extended lubrication lines to an easily accessible location.
7. Automatic Bearing Greasing System:

    a. Manufacturer designed system to provide an as needed supply of new grease to bearings while reducing the need for periodic bearing maintenance and associated greasing problems.

b. Easily replaceable storage container filled with recommended grease and located in an easily accessible location on cooling tower exterior. Container capacity of sufficient size to provide grease for one year.

B. Belt Drive:

1. Service Factor: 1.5 based on motor nameplate horsepower.
2. Sheaves: Fan and motor shafts shall have taper-lock sheaves fabricated from corrosion-resistant materials.
3. Belt: Multiple V-belt design with a matched set of cogged belts.
4. Belt Material: Oil resistant, nonstatic conducting, and constructed of neoprene polyester cord.
5. Belt-Drive Guard: Comply with OSHA regulations.

C. Fan Motor:

1. Comply with NEMA MG 1 unless otherwise indicated.
2. Description: NEMA MG 1, Design B, as required to comply with capacity and torque characteristics; medium induction motor.
3. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
4. Motor Enclosure: Totally enclosed, totally enclosed air-over (TEAO) or totally enclosed fan-cooled (TEFC).
5. Rotor: Random-wound, squirrel cage.
6. Energy Efficiency: Comply with ASHRAE/IES 90.1.
7. Service Factor: 1.15.
8. Temperature Rise: Match insulation rating.
9. Insulation: Class F.
10. Variable-Speed Motors: Inverter-duty rated per NEMA MG 1, Section IV, "Performance Standard Applying to All Machines," Part 31, "Definite-Purpose, Inverter-Fed, Polyphase Motors."
11. Motor Base: Adjustable, or other suitable provision for adjusting belt tension.
12. Motor Shaft Grounding: Motors shall be controlled through variable-frequency controllers with shaft grounding system to protect motor bearings from induced voltage. Drag on motor shaft due to shaft ground system shall be less than 0.5 percent of motor nameplate horsepower.

D. Hardware: Galvanized steel.

2.13 AIR DISCHARGE

A. Fan Discharge Stack:

1. Manufacturer's standard low-profile design.
2. Material: Material to match casing.
3. Stack Termination: Wire-mesh, galvanized-steel screens; segmented into multiple removable pie sections and complying with OSHA regulations.

2.14 RECIRCULATING WATER DISTRIBUTION SYSTEM

A. Pump: Close-coupled, single-stage, bronze-fitted centrifugal pump; with mechanical seal and suitable for outdoor service. Factory install pump with following:

1. Flanges at pump connections to piping.
2. Strainer, with blowdown isolation valve, installed in piping on suction side of pump.
3. Flow balancing valve in piping on discharge side of pump.

B. Pump Motor:

1. Comply with NEMA MG 1 unless otherwise indicated.
2. Description: NEMA MG 1, Design B, as required to comply with capacity and torque characteristics; medium induction motor.
3. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
4. Motor Enclosure: Totally enclosed.
5. Rotor: Random-wound, squirrel cage.
6. Energy Efficiency: Comply with ASHRAE/IES 90.1.
7. Service Factor: 1.15.
8. Temperature Rise: Match insulation rating.
9. Insulation: Class F.

C. Piping: Interconnecting collection basin to pump and pressurization distribution system.

1. Design delegated to manufacturer.
2. External to and supported from cooling tower casing and frame.
3. Material: PVC.
4. Install flanges at connections to collection basin and pressurized distribution system.
5. Drain connection with isolation valve at piping low point if piping does not drain directly into collection basin.

2.15 CONTROLS

A. Vibration Switch: For each fan drive.

1. Enclosure: NEMA 250, Type 4.
2. Vibration Detection: Sensor with a field-adjustable, acceleration-sensitivity set point in a range of 0 to 1 g and frequency range of 0 to 3000 cycles per minute. Cooling tower manufacturer shall recommend switch set point for proper operation and protection.
3. Switch shall have manual-reset button hardwired connection to fan motor electrical circuit.
4. Switch shall have field connection to a control system hardwired connection to fan motor electrical circuit.
5. Switch shall, on sensing excessive vibration, signal an alarm for connection to control system and shut down the fan.

B. Comply with requirements on plans and in Section 23 09 93.

2.16 SERVICE ACCESS

A. Doors:

1. Large enough for personnel to access cooling tower internal components.
2. Doors shall be hinged with handles operable from both sides of the door.
3. Door materials shall match casing.
4. Hinges and handles shall be corrosion resistant.

B. External Platforms with Handrails: Galvanized-steel bar grating at cooling tower access doors when cooling towers are elevated and not accessible from grade.

C. Fan Deck Floor between Cooling Tower Cells:

1. Factory furnish reinforced fan deck floor panels between cooling tower cells for field installation.

2. Floor materials shall match adjacent cooling tower cell fan deck.
3. Fan deck floor shall fasten to and be supported by framing that is attached to cooling tower cells.
4. Frame shall be constructed of same materials as cooling tower frame.

D. Handrail: Galvanized steel complete with kneerail and toeboard, around external platforms and top of cooling tower. Comply with 29 CFR 1910.23.

E. Internal Platforms: Galvanized-steel bar grating.

1. Spanning the collection basin from one end of cooling tower to the other and positioned to form a path between. Platform shall be elevated so that all parts are above the high water level of the collection basin.
2. Elevated internal platforms with handrails accessible from fixed vertical ladders to access the fan drive assembly when out of reach.

F. Hardware: Galvanized steel when connecting galvanized-steel components; stainless steel when connecting other materials.

2.17 EVAPORATIVE COOLING WATER TREATMENT SYSTEM

A. GENERAL

1. DESCRIPTION

a. Work Includes:

1) Furnish all labor, materials, tools, equipment and services for condenser water treatment system as indicated, in accordance with provisions of the contract documents.
2) Completely coordinate with work of all other trades.
3) See Division 1 for General Requirements.
4) Manufacturer's representative company will provide automatically controlled water treatment program and equipment as specified herein.
5) Provide monthly service for the condenser water treatment program, including the necessary chemicals designed to minimize corrosion, scale formation and biological growth in the following mechanical systems:

a) Condenser Water Piping System

b. Description of System:

1) Riser mounted solid-chemistry inhibitor feeder by equipment manufacturer.
2) Unit mounted bio-control feeder(s) (by equipment manufacturer) capable of feeding granular biocide without supplemental makedown water.
3) Solid, controlled release chemicals as specified below.
4) Factory mounted (by equipment manufacturer) conductivity controller and bleed valve as specified below. System shall be self-draining.

2. SUBMITTALS (See Division 1)

a. Submit per the requirements Division 1.
b. Shop drawings: Show all water treatment equipment, including the following:

1) Piping diagrams of all factory mounted components (show all field piping required, if any).

2) Conductivity control panel and wiring diagrams (show all field wiring required). Include bill of materials showing model number, manufacturer, physical layout drawings, panel and equipment catalog cuts.

c. Operation and maintenance manuals: Include testing procedures for each of the treated systems.
d. List of chemicals and methods to be used for each system: Use generic names. Provide Material Safety Data Sheets (MSDS) for each chemical used.
e. Laboratory analysis of project site make-up water: Submit a copy of a laboratory analysis documenting the quality of the project's make-up water. Make-up water analysis to include the following analytes as a minimum:

1) *Calcium Hardness (as ppm $CaCO_3$)*
2) *Total Hardness (as ppm $CaCO_3$)*
3) *Total Alkalinity or m-Alkalinity (as ppm $CaCO_3$)*
4) *pH*
5) *Silica (as SiO_2)*
6) *Specific Conductivity (micro S/cm)*
7) *Sulfate (as SO_4)*
8) *Chloride (as Cl-)*
9) *Phosphate (as PO_4)*

3. QUALITY ASSURANCE

a. The water treatment supplier shall:

1) Obtain water samples from the site and furnish a laboratory analysis of the water supply with submittal.
2) Review the make-up water analysis to ensure compatibility with the water treatment program.
3) Propose water treatment methods and appropriate chemicals required to minimize scale, corrosion and biological growth. Submit all of the above with shop drawings and other required submittals.

b. Methods and chemicals selected shall comply with all the requirements of the American Public Health Association (APHA), the Environmental Protection Agency (EPA) and local environmental agencies.

4. PERFORMANCE CRITERIA

a. Maintain the conditions listed below in the water system(s):

1) Conductivity range of 300 to 5,000 micro S/cm.
2) pH range of 7.0 to 8.8
3) Local environmental regulations may dictate the highest pH permitted for blowdown. The conductivity setting can be adjusted up or down to change the pH by the balancing of fresh make-up water.
4) Total bacteria count (TBC) of less than 10,000 CFU/ml.
5) Keep condenser water system scale free and corrosion to levels acceptable by AWT guidelines.

B. PRODUCTS

1. WATER TREATMENT SYSTEM

a. Acceptable Products:

1) Chemical Feed & Control Equipment

a) Factory mounted inhibitor feeder
b) Factory mounted biocide feeder
c) Factory mounted conductivity controller, piping manifold with conductivity probe and sampling port

b. Chemicals

1) Chromates, zinc, or any liquid chemicals shall not be used.
2) Scale and corrosion inhibitor shall be non-toxic to humans and animals for its intended use.
3) Phosphates are allowed as permitted by EPA and local authorities.
4) Scale and corrosion inhibitor chemistry shall be provided in a solid form with controlled released polymer coating for safe handling and easy reloading.
5) The chemical feed equipment shall operate and feed chemicals into the condenser water system only when the systems recirculating pumps are in operation.
6) The granular biocide shall be packaged such that handling of the chemistry directly is minimized.

c. Condenser Water System:

1) Chemical feed and control equipment - condenser system: Provide the following components (including all factory piping and wiring).

d. Factory mounted assembly for controlling conductivity and providing automatic solid chemical treatment to the condenser water system(s). The assembly system shall have the following features and capabilities:
Conductivity controller: Shall provide linear, temperature compensated measurements directly in micromhos over full range. Conductivity measurement will be displayed on an LED display. Controller will have a USB port and shall be capable of retrieving operational frequency of bleed valve, output contact, make-up/bleed metering over a 60 day period.

1) Inhibitor feed: Inhibitor chemical shall be fed directly from the unit riser pipe. A solid chemistry inhibitor shall be used with time released control mechanism. No pumps, timers or liquids shall be accepted.
2) Biocide feed: Biocide chemical feeds will be controlled by a factory mounted feeder. Solid biocide will be fed directly into the recirculating stream. No pumps, timers or liquids shall be accepted.
3) Basis of design - EVAPCO Smart Shield®

e. The conductivity controller, chemical feeders and sample stream piping assembly shall be factory mounted on the closed circuit cooler or evaporative condenser. All components of the system shall be pre-plumbed and pre-wired to minimize field connections required to provide an operational treatment system. The packaged system shall consist of the following:

1) One (1) sample stream piping assembly consisting of:

a) Two (2) 1 inch inlet/outlet shut-off valves.
b) One (1) conductivity probe of PVC construction, with a temperature compensating toroidal probe mounted in the sample stream.

2) One (1) pre-piped bleed-off piping assembly consisting of inlet shut-off valve, sample valve, throttling valve and motorized ball valve. Bleed-off piping assembly shall be sized to provide the proper bleed-off rate of the system. Bleed piping and controller should prevent the feed of biocide during the bleed cycle.

3) Factory mounted solid chemical inhibitor feeder(s) shall be provided for feed of the scale and corrosion inhibitor. Feed rate shall be adjustable based on a multiple chamber feeder arrangement.
4) Factory mounted solid biocide chemical feeder(s) shall be provided for feed of the biocide. Feeder shall be completely factory mounted for easy commissioning and refill.
5) Water treatment chemicals: Calculate and furnish 1-year supply of the recommended product for control of scale and corrosion in the open recirculating system. Additionally, calculate and furnish a 1- year supply of biocide for control of microbiological growth in the same system. The one year supply of chemistry shall be calculated based on the most efficient cycles of concentration the make-up water quality will allow. Biocide product recommended shall be properly registered with the Environmental Protection Agency and EPA registration number shall be clearly shown on all product literature and package labels. To ensure operator safety, all chemical products shall be provided in solid or granular form for reduced material handling.

f. Testing equipment: Provide water test kits and equipment necessary to control the condenser water systems treatment program. Test kits to include the following as a minimum:

1) Reagents and apparatus for determination of corrosion inhibitor level in the condenser water systems.
2) Reagents and apparatus for determination of pH, total alkalinity, free and total chlorine, and calcium hardness.
3) Apparatus for determination of microbiological colony population and biocide effectiveness.

C. EXECUTION

1. INSTALLATION AND SERVICES

a. Installation of water system will include:

1) All components shall be mounted by the evaporative equipment manufacturer during unit construction and prior to shipment from the factory.
2) Supply all components (coils, transformers, conductivity meters, blow down valves etc) necessary for a completely automated stand-alone system. Blow down valves shall be motorized ball valves power open, spring return factory mounted during unit construction.
3) Immediately after hydrostatic testing of piping is completed the mechanical contractor shall drain, flush, clean and passivate all systems. Subsequent to the cleaning process, each system shall be re-filled with clean water prior to the system being placed into operation. Once filled the condenser water pump and cooling tower fans shall be operated until conductivity set point is achieved.
4) Mechanical contractor shall pipe all bleed and drain lines to sanitary sewer.
5) If the working height of the water treatment system will be elevated, there shall be a safe way to service the system provided.

b. Provide all consulting services, for a period of 1-year from start-up of the cooling system, which will include:

1) Installation and system start-up procedure recommendations.
2) Pre-operation system clean-out procedure supervision.
3) Initial water analysis and recommendations.
4) Training of operating personnel on proper feeding and control techniques.
5) Monthly field service visits during wet operation.
6) Any necessary log sheets and record forms.

c. All services will be provided by a factory authorized service provider of the evaporative condenser or closed circuit cooler manufacturer.

2.18 SOURCE QUALITY CONTROL

A. Performance Test: Factory test and certify cooling tower performance according to CTI STD 201RS, "Standard for the Certification of Water-Cooling Tower Thermal Performance."

1. Prepare test report indicating test procedures, instrumentation, test conditions, and results. Submit copy of results within one week of test date.

B. Factory Functional Tests:

1. Test collection and distribution basins after assembly, and prove free of leaks.
2. Test factory-installed electric/electronic water-level controls for proper operation.
3. Test factory-installed electric basin heaters for proper operation.
4. Test factory-installed fan and drive assemblies for proper operation.
5. Test factory-installed control package for proper operation.
6. Test access doors to ensure smooth operation and proper fit.
7. Submit report documenting tests performed and results within one week of test date.

C. Heat-Exchanger Factory Pressure and Leak Tests:

1. Pneumatically test heat-exchanger assembly while submerged underwater and prove to be free of leaks.
2. Test pressure equal to 1.5 times rated pressured, but not less than 375 psig.
3. Submit report documenting test and results.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine cooling towers before installation. Reject cooling towers that are damaged.

B. Before cooling tower installation, examine roughing-in for tower support, anchor-bolt sizes and locations, piping, controls, and electrical connections to verify actual locations, sizes, and other conditions affecting cooling tower performance, maintenance, and operation.

1. Cooling tower locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping, controls, and electrical connections.
2. Verify sizes and locations of concrete bases and support structure with actual equipment.
3. Verify sizes, locations, and anchoring attachments of structural-steel support structures.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install cooling towers on structural rails. See structural plans for details.

B. Install anchor bolts to elevations required for proper attachment to supported equipment.

C. Maintain manufacturer's recommended clearances for service and maintenance.

D. Maintain clearances required by governing code.

E. Loose Components: Install components, devices, and accessories furnished by manufacturer with cooling tower, that are not factory mounted.

1. Loose components shall be installed by manufacturer's factory-trained service personnel.

3.3 PIPING CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where installing piping adjacent to cooling towers, allow space for service and maintenance.

C. Install drain piping with valve at cooling tower drain connections and at low points in piping.

D. Connect cooling tower overflows and drains, and piping drains to sanitary sewage system.

E. Makeup-Water Piping:

1. Comply with applicable requirements in Section 22 11 16 "Domestic Water Piping."
2. Connect to makeup-water connections with shutoff valve, plugged tee with pressure gage, and drain connection with valve and union.

F. Supply and Return Piping:

1. Comply with applicable requirements in Section 23 21 13 "Hydronic Piping."
2. Connect to entering cooling tower connections with shutoff valve, strainer, balancing valve, thermometer, plugged tee with pressure gage, and drain connection with valve.
3. Connect to leaving cooling tower connection with shutoff valve thermometer, plugged tee with full port ball valve for portable field instruments, and drain connection with valve.
4. Make connections to cooling tower with a flange.

3.4 ELECTRICAL POWER CONNECTIONS

A. Connect field electrical power source to each separate electrical device requiring field electrical power. Coordinate termination point and connection type with Installer.

B. Comply with requirements in Division 26.

C. Comply with requirements in Division 26.

D. Install nameplate for each electrical connection indicating electrical equipment designation and circuit number feeding connection. Nameplate shall be laminated phenolic layers of black with engraved white letters at least 1/2 inch high. Locate nameplate where easily visible.

3.5 CONTROLS CONNECTIONS

A. Install control and electrical power wiring to field-mounted control devices.

B. Connect control wiring between cooling towers and other equipment to interlock operation as required to achieve a complete and functioning system.

C. Connect control wiring between cooling tower control interface and DDC system for remote monitoring and control of cooling towers. Comply with requirements in Section 23 09 00 and 230933.

D. Install label at each termination indicating control equipment designation serving cooling tower and the I/O point designation for each control connection. Comply with requirements in Division 26 for labeling and identification products and installations.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Tests and Inspections: Comply with ASME PTC 23 or CTI ATC 105.

C. Cooling towers will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.7 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

B. Inspect field-assembled components, equipment installation, and piping; controls; and electrical connections for proper assemblies, installations, and connections.

C. Obtain performance data from manufacturer.

1. Complete installation and startup checks according to manufacturer's written instructions and perform the following:

    a. Clean entire unit including basins.
    b. Verify that accessories are properly installed.
    c. Verify clearances for airflow and for cooling tower servicing.
    d. Check for vibration isolation and structural support.
    e. Lubricate bearings.
    f. Verify fan rotation for correct direction and for vibration or binding and correct problems.
    g. Verify pump rotation for correct direction, vibration, cavitation, and flow and correct problems.
    h. Adjust belts to proper alignment and tension.
    i. Operate variable-speed fans through entire operating range and check for harmonic vibration imbalance. Set motor controller to skip speeds resulting in abnormal vibration.
    j. Check vibration switch setting. Verify operation.
    k. Verify water level in tower basin. Fill to proper startup level. Check makeup-water-level control and valve.
    l. Verify operation of basin heater and control.
    m. Verify that cooling tower air discharge is not recirculating air into tower or HVAC air intakes. Recommend corrective action.
    n. Replace defective and malfunctioning units.

D. Start cooling tower and associated water pumps. Follow manufacturer's written starting procedures.

E. Prepare a written startup report that records the results of tests and inspections.

3.8 ADJUSTING

A. Set and balance water flow to each tower inlet.

B. Adjust water-level control for proper operating level.

C. Adjust basin heater control for proper operating set point.

3.9 DEMONSTRATION

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

1. Video record the training sessions.
2. Instructor shall be factory trained and certified.
3. Perform not less than 4 hours of training.
4. Train personnel in operation and maintenance and to obtain maximum efficiency in plant operation.
5. Perform instructional videos showing general operation and maintenance that are coordinated with operation and maintenance manuals.
6. Obtain Owner sign-off that training is complete.
7. Owner training shall be held at Project site.

END OF SECTION 23 65 00

FLUID COOLER SCHEDULE

REMARKS:
1. INDUCED DRAFT, COUNTERFLOW, LOW PROFILE, BELT DRIVEN PROPELLAR FAN, CLOSED CIRCUIT COOLING TOWER WITH TWO CELLS CAPABLE OF INDEPENDENT OPERATION.
2. PROVIDE WITH INVERTER DUTY MOTORS FOR VARIABLE FREQUENCY DRIVE OPERATION.
3. PROVIDE WITH WELDED 304L STAINLESS STEEL WATER BASIN, VIBRATION SWITCH, MECHANICAL MAKEUP FLOAT VALVE. EACH FLUID COOLER CELL SHALL INCLUDE DUAL 4" IN/OUT PIPE CONNECTIONS, PVC NON-CORROSIVE SPRAY SYSTEM, 3" OVERFLOW CONNECTION, 2" DRAIN CONNECTION, 2" MAKEUP CONNECTION, AND GLAVANIZED STEEL COIL.
4. PROVIDE WITH STAINLESS STEEL FAN GUARD, ACCESS DOOR PLATFORM WITH ALUMINIMUM LADDER, WALKWAY, LADDER, AND SERVICE PLATFORM. PROVIDE PERIMETER HANDRAILS, SELF CLOSING GATE, AND ACCESS LADDER WITH CAGE.
5. FAN MOTORS TO BE OPERATED BY VFDS CONTROLLED THROUGH THE BAS.
6. PROVIDE UNIT WITH ONE SPRAY PUMP PER CELL (TWO TOTAL). PUMPS SHALL BE 480V/3Ø, 10 HP EACH.
7. TOWER SHALL BE CAPABLE OF 1,950 GPM CONDENSER WATER FLOW WITH EWT: 95°F; LWT: 85°F AT 49.2°F AMBIENT TEMPERATURE WITHOUT SPRAY WATER OPERATION.
8. PUMPS SHALL BE ENABLED THROUGH THE BAS.
9. DIMENSIONS EXCLUDE SPRAY PUMP, PIPING ACCESSORIES, OR ADDITIONAL ACCESSORY CLEARANCES.
10. ELECTRICAL DISCONNECTS AND MOTOR STARTERS BY ELECTRICAL CONTRACTOR. SEE ELECTRICAL DRAWINGS. TOTAL OF (8) ELECTRICAL CONNECTIONS: (2) FANS, (2) FAN MOTOR HEATERS, (2) SPRAY PUMPS, (2) CONDUCTIVITY CONTROLLER.
11. PROVIDE WITH LOW SOUND FAN AND WATER SILENCERS.
12. PROVIDE EACH CELL WITH FACTORY MOUNTED WATER TREATMENT PACKAGE WITH INCLUDING CONDUCTIVITY CONTROLLER, FEEDER, AND BLOWDOWN VALVE (SMART SHIELD PACKAGE FMF-10-6, BCF-10)

GENERAL					PHYSICAL SIZE (9)		FAN MOTOR					COOLING			CONDENSER FANS (7)			CONDENSER WATER							SOUND DATA								
												CAPACITY		AMBIENT AIR							TEMPERATURE (°F)	CONN. SIZES (QTY 4 EA)				UNIT SOUND POWER								
PLAN TAG	MANUFACTURER	MODEL	CONFIG.	ACC.	DIMENSIONS (D x W x H)	WEIGHT (lbs.)	DESIGN AIRFLOW (CFM)	HP (EACH)	VOLTAGE / PHASE	TYPE	CONTROL DEVICE	TONS	BTU/H	TEMP. (DB / WB)	TYPE	QTY	HP (EACH)	FLOW (GPM)	FLUID	MAX P.D. (FT HEAD)	EWT/LWT	INLET	OUTLET	EVAPORATED WATER RATE (GPM)	SPRAY PUMP FLOW RATE (PER PUMP) (GPM)	63hz	125hz	250hz	500hz	1000hz	2000hz	4000hz	8000hz	REMARKS
FC-1	EVAPCO	eco-ATWB 24-5N20	(1)	(2) (3) (4) (12)	240" x 290" x 215"	109,300	272,800	40	480 V / 3	O.D.P.	(5)	606	9,100,000	95°F / 78°F	PROPELLAR	2	40	1950	40% PROPYLENE GLYCOL	35	95 / 85	4	4	14.6	1400	110	114	114	108	99	96	94	91	(6) (8) (10) (11)

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OMAHA, NE 68164
402-493-4144

STRUCTURAL: THOMPSON, DREESSEN & DORNER, INC.
10836 OLD MILL RD
OMAHA, NE 68154
402-330-8860

COIL: LAMP RYNEARSON
14710 W DODGE RD #100
OMAHA, NE 68154
402-496-2498

Construction Documents

WESTSIDE HIGH SCHOOL
COOLING TOWER
8701 PACIFIC ST
OMAHA, NE 68114

Construction Documents

AGENCY APPROVAL(S):

NO.	REVISION	DATE

PROFESSIONAL MECHANICAL ENGINEER
ANDREW L. GILLIAM
E-16619
08.22.2025
STATE OF NEBRASKA

SHEET NAME:

FLUID COOLER EQUIPMENT PACKAGE

DATE: 08/22/2025

PROJECT NO.: 2025.016.00

SHEET NO.:

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