

BID INSTRUCTIONS

One original and two[2] signed copies of the bid must be received in a sealed envelope plainly marked “**11-095 500 Ton Cooling Towers**” with the date and time of the bid opening in the lower left corner of the envelope.

A **mandatory** pre-bid conference will be conducted on **March 23, 2011 at 10:00 AM**. The location of the meeting is the Family Arena 2002 Arena Parkway St. Charles, MO 63303-Gate 1 entrance, south side of the Arena.

An authorized representative of the company/person submitting the bid must sign the bid, in blue ink.

Bids must be submitted to the St. Charles County Finance Department, 201 North Second Street Room 541 St. Charles MO 63301 prior to the bid opening.

Bid opening will be on 3/31/2011 at 10:00 AM , in **Room 523** of the St. Charles County Administration Building, 201 North Second Street, St. Charles, MO 63301.

St. Charles County reserves the right to accept and/or reject any and all bids.

Bid results may be obtained by emailing a request to the St. Charles County Purchasing Manager at purchasing@sccmo.org, **no phone calls please**. Include the name and number of the bid and date of the bid opening when requesting the results. The time it takes for final bid results to be made public depends on the complexity of the project and the cost of the project.

BID INQUIRIES

Any questions or clarifications concerning this Request for Bid must be submitted in writing via E-mail (preferred), mail or fax to:

Rick Hooker, Purchasing Manager
St. Charles County Government
Finance Department
201 North Second St
St. Charles, Missouri 63301
Fax: (636)949-7589
purchasing@sccmo.org

- The bid number and title shall be referenced on all correspondence.
- All questions must be received no later than **5:00 PM** on **03/25/2011**. Any question received after this deadline may not be answered.

Responses to questions/clarifications will be placed on the County's website (<http://www.sccmo.org/Businesses/>). Check this website frequently for updates and any addendum that are issued.

Prohibited Communication

Unauthorized contact with any representative, other than through the procedure outlined in the section titled “Bid Inquiries”, concerning this request is prohibited. Representative shall include, but not be limited to, all elected and appointed officials, and employees of St. Charles County and the Agencies within St. Charles County. Any Offeror engaging in such prohibited communications may be disqualified at the sole discretion of St. Charles County.

TERMS AND CONDITIONS

- St. Charles County reserves the right to reject any and all bids or parts of a bid and waive technicalities, and to adjust quantities.
- All bids will be considered final. No additions, deletions, corrections, or adjustments will be accepted after the time of bid opening.
- All delivery costs or charges must be included in the F.O.B. destination bid price.
- City, County and State of Missouri Sales Tax and Federal Taxes are not applicable to sales made to St. Charles County and must be excluded.
- The contract shall be effective for the approximate twelve (12) month period from the date of the notice of award.
- The electronic version of this bid/RFP is available upon request. The document was entered into WORD for Microsoft Windows. The Purchasing Office does not guarantee the completeness and accuracy of any information provided on the electronic version. Therefore, respondents are cautioned that the hard copy of this bid/RFP on file in the Purchasing Office governs in the event of a discrepancy between the information contained in or on the electronic version and that which is on the hard copy.
- Vendors are required to clearly identify any deviations from the specifications in this document.
- An authorized officer of the company submitting the bid must sign all bids, in blue ink.
- Vendors must submit three [3] signed copies of their bid; one is to be an original and so marked.
- All prices and notations must be in blue ink or typewritten on the attached form. Mistakes must be crossed out, corrections typed adjacent and must be initialed in blue ink by the person signing the bid.
- St. Charles County will not award any bid to an individual or business having any outstanding amounts due from a prior Contract or business relationship with the County or who owes any amount(s) for delinquent taxes, fees or licenses.
- Sealed proposals received after the designated time of the receipt of the sealed proposals will be considered as “No Bid” and “Void” and will not be opened.
- The successful bidder is specifically denied the right of using in any form or medium the names of St. Charles County or any other public entity within the St. Charles County for public advertising unless express written permission is granted.
- All bidders must possess the necessary and appropriate business and/or professional licenses in their field.
- Award will be made to the low responsive, responsible bidder, or to the offeror whose proposal is most advantageous to the County, price and other factors considered. When

payments are to be made to the County, award will be made to the most advantageous offer.

- County reserves the right to accept any item or group of items offered, unless the bidder qualifies his bid by specific limitations. The bid can be on an "all or none" basis if wording in the bid so states and if all items solicited are included in the bid.

- When applicable, provide unit prices and extension prices. Where there is disagreement in the unit and extension prices, the unit price shall govern.

Employment of Unauthorized Aliens Prohibited (Missouri Revised Statutes Section 285.530)

As a condition for the award of any contract or grant in excess of five thousand dollars by St. Charles County to a business entity, the business entity shall, by sworn affidavit and provision of documentation**, affirm its enrollment and participation in a federal work authorization program (**E-Verify**) with respect to the employees working in connection with the contracted services. Every such business entity shall sign an affidavit affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services. [RSMO 285.530 (2)]

An employer may enroll and participate in a federal work authorization program (**E-Verify**) and shall verify the employment eligibility of every employee in the employer's hire whose employment commences after the employer enrolls in a federal work authorization program. The employer shall retain a copy of the dated verification report received from the federal government. Any business entity that participates in such program shall have an affirmative defense that such business entity has not violated subsection 1 of this section. [RSMO 285.530 (4)]

Any entity contracting with St. Charles County shall only be required to provide the referenced affidavit on an annual basis. A copy of the affidavit is included in this bid request. Vendors may choose to send the required documentation using one of the following options:

- Send the notarized affidavit and E-Verify MOU signature page to: St. Charles County, Attn: Purchasing Manager, 201 N Second Street, Room 541, St. Charles, MO 63301 prior to responding to any solicitations; **OR**
- Send the notarized affidavit and E-Verify MOU signature page along with a bid solicitation response.

These documents will be kept on file. The notarized affidavit and E-Verify MOU signature page will remain current for **one year** from the date of the notarized affidavit.

**** PLEASE NOTE:**

Acceptable enrollment and participation documentation consists of a valid copy of the signature page Of the E-Verify Memorandum of Understanding, completed and signed by the Contractor, and the Department of Homeland Security - Verification Division

The online address to enroll in the E-verify program is:

<https://e-verify.uscis.gov/enroll/StartPage.aspx?JS=YES>

Open Records

Any and all information contained in or submitted with the bid becomes a public record subject to the Missouri Sunshine Law when the bids are opened. If the bidder believes that any information contained in or submitted with the bid is protected from disclosure by the Missouri Sunshine Law, the bidder must clearly identify what information the bidder believes is so protected and must also clearly identify the legal basis therefor.

Prevailing Wage

This is a prevailing wage project, therefore, not less than the prevailing hourly rate of wages, as set out in the wage order attached to and made part of the specification for work under the contract, **must** be paid to all workers performing work under the contract. (See section 290.250 RSMo)

The contractor will forfeit a penalty to St. Charles County of \$100.00 per day (or portion of a day) for each worker that is paid less than the prevailing rate for any work done under the contract by the contractor or by any subcontractor. (See section 290.250 RSMo.) For detailed information on rules and occupational titles see 8CSR 30-3.010 through 3.060 (Code of State Regulations-Prevailing Wage rules.)

Safety Training Program

The contractor and all subcontractors to the contract must require all on-site employees to complete the ten hour safety training program required under Section 292.675, RSMo, if they have not previously completed the program and have documentation of having done so.

The contractor will forfeit a penalty to St. Charles County of \$2,500 plus an additional \$100 for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training.

Excessive Unemployment

During periods of excessive unemployment (any month immediately following two consecutive calendar months during which the level of unemployment in the state has exceeded five percent as measured by the United States Bureau of Labor Statistics only Missouri laborers (persons who have resided in Missouri for at least thirty days and intend to become or remain Missouri residents) and laborers from non-restrictive states (persons who are residents of a state which has not enacted state laws restricting Missouri laborers from working on public works projects in that state, as determined by the Labor and Industrial Relations Commission), may be employed under the contract, except that other laborers may be used when Missouri laborers or laborers from non-restrictive states are not available, or are incapable of performing the particular type of work involved, if so certified by the contractor and approved by St. Charles County. (See sections 290.550 through 290.580 RSMo.)

Transient Employer

Every transient employer, as defined in section 285.230, RSMo, must post in a prominent and easily accessible place at the work site a clearly legible copy of the following: (1) The notice of registration for employer withholding issued to such transient employer by the Director of Revenue; (2) Proof of coverage for workers compensation insurance or self-insurance signed by the transient employer and verified by the Department of Revenue through records of the division of workers' compensation; and (3) The notice of registration for unemployment insurance issued to such transient employer by the division of employment security. Any transient employer failing to comply with these requirements shall, under section 285.234, be liable for a penalty of \$500 per day until notices required by this section are posted as required by that statute

Certificate of Authority

All foreign corporations transacting business on a project for St. Charles County must obtain a **Certificate of Authority form Corp-42** from the Missouri Secretary of State. Failure to obtain a certificate shall subject the corporation to a fine of not less than one thousand dollars (see sections 351.572 and 351.574, RSMo).

Labor and Material Bonds

Per Section 107.170 of the Missouri Revised Statutes, in making contracts for public works which are estimated to exceed twenty-five thousand dollars, to be performed for the County, to require every contractor for such work to furnish to the County, a bond with good and sufficient sureties. Such bond, among other conditions, shall be conditioned for the payment of any and all materials, incorporated, consumed or used in connection with the construction of such work, and all insurance premiums, both for compensation, and for all other kinds of insurance, said work, and for all labor performed in such work whether by subcontractor or otherwise.

This bond shall be for the full amount of the contract price with a surety company authorized to do business in the State of Missouri and satisfactory to the County. **These bonds must be filed with the Purchasing Manager prior to the commencement of work.**

Performance Bond

Contractor shall furnish a performance bond in an amount equal to 100% of the contract price to guarantee faithful performance of the contract. The surety on such bond shall be issued by a surety company authorized by the Missouri Department of Insurance to do business in the state of Missouri and be satisfactory to the County.

Insurance

Worker's Compensation and Employer's Liability: The successful contractor and each subcontractor shall maintain a policy of Worker's Compensation insurance, or be a qualified self-insurer, providing Statutory limits and Employer's Liability coverage with limits of no less than \$500,000 during the life of the contract.

Automobile, General Liability (including products and completed operations) and Property Damage: Minimum coverage to be maintained by Contractor and each subcontractor in the amount of \$1,000,000 for bodily injury or death to any one person and \$3,000,000 per occurrence. Coverage for completed operations shall also be included. Property damage coverage of at least \$1,000,000 shall be maintained. In the alternative, a Combined Single Limit Policy in the amount of \$3,000,000 shall be maintained. Automobile coverage must include non-owned vehicles.

All such insurance shall be written through an insurance company licensed to do business in the State of Missouri and acceptable to Saint Charles County. The policy must specifically state that the coverage, as it pertains to the County, shall be primary; that any or all insurance carried by an additional insured is strictly excess and secondary, and will not contribute to the Contractor's policy.

The Contractor and each subcontractor agree to furnish Saint Charles County with a Certificate of Insurance naming them as an Additional Insured on each of their respective policies and include a provision for at least 30 days written notice of any material change or cancellation.

BID SPECIFICATIONS

Main Bid-(2) 500 ton fiberglass chillers

FIBERGLASS COOLING TOWER – FAMILY ARENA

1.1 GENERAL

Furnish and install two (2) induced draft, counter-flow, factory-assembled cooling towers.

The cooling towers shall consist of two (2) body & basin sections, with two (2) fan ducts per section.

1.2 THERMAL PERFORMANCE

The cooling tower shall have the capacity to cool 3200 U.S. GPM of water, from 98°F to 84°F, at a design entering air wet-bulb temperature of 79°F.

Thermal performance shall be certified by the Cooling Tower Institute (CTI) in accordance with CTI Certification Standard STD-201. In addition, the manufacturer guarantees that the cooling tower shall meet the specified performance conditions when installed according to plans and per the guidelines established in the cooling tower manufacturer's Installation, Operation & Maintenance (IOM) Manual.

2.0 CONSTRUCTION

The cooling tower shall be designed and constructed to withstand wind pressure of no less than 30 pounds-force per square foot (psf) on external surfaces. The top of the cooling tower's body shall be designed and constructed to withstand a live load of no less than 40 psf in addition to the concentrated loads of the fan or other equipment mounted thereon.

2.1 BODY & BASIN SECTION

Body & basin sections shall be two (2) seamless, water-tight and leak-proof pieces, constructed of high-performance corrosion-resistant Fiberglass Reinforced Polyester (FRP) with Ultraviolet (UV) resistant resins. Fiberglass Reinforced Polyester (FRP) material shall have a thickness no less than ¼ inch; the cooling tower's structural members, like the body's structure and top cover and basin's walls and bottom, shall be specially reinforced to ensure structural strength. Body & basin sections shall be held together side by side with stainless steel fasteners provided by the Manufacturer.

The following water connections shall be furnished as standard:

- a. Hot water inlet
- b. Cold water outlet
- c. Drain
- d. Overflow
- e. Make-up water
- f. Purge

Fittings of 3 inch and smaller are NPT, and fittings larger than 3 inch are ANSI flange. A standard make-up water mechanical float valve shall be provided per section.

2.2 FAN DUCT

The four (4) fan ducts shall be constructed of high-performance corrosion-resistant Fiberglass Reinforced Polyester (FRP) with Ultraviolet (UV) resistant resins. Fiberglass Reinforced Polyester (FRP) material shall have a thickness no less than ¼ inch; the fan ducts shall be specially reinforced to ensure their structural strength. The fan Ducts shall contain a direct-drive

fan, a motor mounted on an FRP structure, and a corrosion-resistant safety screen mesh (also known as “fan guard”).

MECHANICAL EQUIPMENT

2.3 FANS

The cooling tower shall contain four (4) fans, one per fan duct. Fans shall be direct-drive fans, with axial, propeller type, adjustable-pitch fan blades. Fan blades shall be manufactured of spark and corrosion resistant Fiberglass Reinforced Polyamide (PAG), and shall be suitable for operation on a temperature range of -40° F (-40° C) to 230° F (110° C). Fan hubs shall be manufactured of a pressure die cast aluminum alloy.

2.4 FAN MOTORS

The cooling tower shall contain four (4) fan motors, one per fan duct, rated at 20 HP min and 850 RPM direct drive, for a total installed fan load of 80 HP.

The fan motors shall be single speed, Totally Enclosed Fan Cooled (TEFC), and shall be suitable for 230/460 Volts, 3 phase, 60Hz service. The fan motors shall be rated for continuous operation, 1.15 service factor on sine wave, NEMA Premium efficiency, severe duty – IP54, marine duty, and inverter rated. Fan motor's construction shall be 100% cast iron and shall have Class F Insulation System. The fan motors shall meet NEMA MG1 – 1.26.6, shall have a Division 2 CSA certification nameplate for hazardous locations, Class I Groups A, B, C and D, and shall be Underwriters Laboratories (UL) Recognized CSA Certified.

3.0 FILL MEDIA MODULES

Fill media modules shall be fabricated from rigid, corrugated UV protected Polyvinyl Chloride (PVC) sheets that are conducive to cooling water. Polyvinyl Chloride (PVC) corrugated sheets shall form a cross-corrugated pattern with an angle of 60 degrees from the horizontal between adjacent sheets, to provide a continuous and horizontal redistribution of air and water. Fill media modules shall provide no less than 69 ft²/ft³ of surface area and a void-to-volume ratio of 95%. The manufacturing material, Polyvinyl Chloride (PVC), shall be resistant to rot, fungi, bacteria and organic/inorganic acids and alkalis as commonly found in cooling towers; and shall meet CTI STD-136. Fill media modules' flame spread rating shall be less than 20 according to ASTM E84; and regarding flammability, fill media modules shall be self-extinguishing in less than 5 seconds according to ASTM D635.

4.0 DRIFT ELIMINATORS

Drift eliminators shall be fabricated from rigid, corrugated UV protected Polyvinyl Chloride (PVC) sheets and shall be furnished in lightweight, easily removable sections with 2 changes in air direction to remove entrained water particles from the leaving airstream. Drift losses shall not exceed 0.005% of the design circulating flow. The manufacturing material, Polyvinyl Chloride (PVC), shall be resistant to rot, fungi, bacteria and organic/inorganic acids and alkalis as commonly found in cooling towers, and shall meet CTI STD-136. Drift eliminators' flame spread rating shall be less than 25 according to ASTM E84, and regarding flammability, drift eliminators shall be self-extinguishing.

5.0 AIR INLET LOUVERS

Air inlet louvers shall be cellular type and shall be designed to minimize splash-out of falling water, reduce light transmission into the tower and reduce sound transmission out of the tower at minimal airside pressure loss. Air inlet louvers shall be fabricated from rigid, corrugated UV protected Polyvinyl Chloride (PVC) sheets and shall be easily removable to provide access for cleaning. The manufacturing material, Polyvinyl Chloride (PVC), shall be resistant to rot, fungi,

bacteria and organic/inorganic acids and alkalis as commonly found in cooling towers, and shall meet CTI STD-136. Air Inlet Louvers' flame spread rating shall be less than 20 according to ASTM E84, and regarding flammability, air inlet louvers shall be self-extinguishing in less than 5 seconds according to ASTM D635.

6.0 HOT WATER DISTRIBUTION SYSTEM

Hot water shall enter into the cooling tower through a single inlet per body & basin section. All interior distribution piping shall be Polyvinyl Chloride (PVC) schedule 40 pipe minimum. Water shall be evenly distributed over the fill media by removable 2 ½ inch spray nozzles made of Acrylonitrile Butadiene Styrene copolymer (ABS). Spray nozzles shall contain internal, interchangeable flow devices to provide an optimal spray pattern within the 2 to 10 psig operating pressure range.

7.0 ACCESSORIES (OPTIONAL)

7.1 BASIN HEATERS

The cooling tower shall be provided with two (2) basin heater systems, one per body & basin section. Each basin heater system shall consist of 2 electric immersion basin heater(s) of 16 kW each with 4 control panel(s) and 4 combination level sensor/thermostat well, all installed by others. Immersion basin heaters shall have 334 stainless steel sheaths. The combination level sensor/thermostat wells shall consist of a stainless steel low water probe with a brass and copper thermostat well mounted on 2 inch stainless steel MPT plugs. Basin heaters enclosure shall be furnished with NEMA 4X Glass Reinforced Polyester, stainless steel captive screws, a hinged silicone gasket cover, and shall meet flammability rating 4L94V-O. Basin heater system's contactor shall be a resistive silver-cadmium oxide contactor rated for 40 amperes.

7.2 ELECTRIC WATER LEVEL CONTROL

The cooling tower shall be provided with two (2) electric water level control systems, one per basin section, and shall be installed by others. Each electric water level control system shall consist of one (01) 5-probe water level controller and one (1) stilling chamber. Water level controller's enclosure shall be furnished with NEMA 4X Glass-Filled Polycarbonate, shall have a full gasket cover, and shall meet flammability rating U194V-1. Water level controller's electrodes shall be ¼ inch stainless steel probes and shall sense high water alarm, low water alarm, high water level, and low water level using a common ground. Stilling chamber shall consist of a 2 inch Polyvinyl Chloride (PVC) schedule 80 Body, ½ inch Male Pipe Thread (MPT) Polyvinyl Chloride (PVC) schedule 80 mounting nipples, and ½ inch MPT drain plug.

7.3 VIBRATION SWITCH

The cooling tower shall be provided with four (4) vibration cut-out switches, one per fan duct, for shutdown of fan motor. Vibration switches shall be installed by contractor. Vibration switches' case shall be equal to NEMA 3R. Vibration switches contacts shall be Single Pole Double Throw (SPDT)-double make leaf contacts, for 5 amperes @ 480 VAC.

7.4 LADDER WITH STANDARD SUPPORTS(OPTION-PRICE SEPARATE)

Aluminum ladder to grade shall be welded construction, with standard supports, ready to be installed to the cooling tower by others; stainless steel fasteners shall be provided by manufacturer. Supports' standard material shall be stainless steel, but galvanized steel can be requested instead as option.

7.5 LADDER WITH OSHA SAFETY CAGE(OPTION-PRICE SEPRATE)

Aluminum ladder to grade shall be welded construction, and OSHA safety cage shall be welded construction and assembled to ladder. Ladder with OSHA safety cage shall be ready to be

installed to the cooling tower by others; stainless steel fasteners shall be provided by manufacturer. Cage shall meet OSHA 1910.23 standard. Cage's standard material shall be stainless steel, but galvanized steel can be requested instead as option.

7.6 PERIMETER HANDRAIL(OPTION-PRICE SEPARATE)

Perimeter handrail shall be welded construction in several sections, ready to be assembled by others; stainless steel fasteners shall be provided by manufacturer. Handrail shall meet OSHA 1910.23 standard. Perimeter handrail's standard material shall be stainless steel, but galvanized steel can be requested instead as option.

7.7 CATWALK(OPTION-PRICE SEPARATE)

Catwalk shall be a one-section non-skid welded construction plate, ready to be installed by others; stainless steel fasteners shall be provided by manufacturer. Catwalk shall meet OSHA 1910.23 standard. Catwalk's standard material shall be stainless steel, but galvanized steel can be requested instead as option.

7.8 CATWALK WITH HANDRAIL(OPTION-PRICE SEPARATE)

Catwalk shall be a one-section non-skid welded construction plate, and catwalk's handrail shall be welded construction in several sections. Catwalk and catwalk's handrail shall be ready to be installed by others; stainless steel fasteners shall be provided by manufacturer. Catwalk and catwalk's handrail shall meet OSHA 1910.23 standard. Catwalk and catwalk's handrail standard material shall be stainless steel, but galvanized steel can be requested instead as option.

8.0 REFERENCE STANDARDS AND CODES

ASSOCIATION	STANDARD / CODE	
Cooling Technology Institute (CTI)	CTI STD-201	Standard for the Certification of Water-cooling Tower Thermal Performance.
	CTI STD-136	Polyvinyl Chloride materials used for film fill, splash fill, louvers, and drift eliminators.
American Society for Testing and Materials (ASTM)	ASTM E84	Standard test method for Surface burning characteristics of building materials
	ASTM D635	Standard test method for rate of burning of plastics in a horizontal position.
National Electrical Manufacturers Association (NEMA)	MG1	Motors and generators.
	MG1 – 1.26.6	Waterproof Specification.
Occupational Safety & Health Administration (OSHA)	1910.23	Guarding floor and wall openings and holes.

Alternate bid – (2) all stainless 500 ton chillers

NC Class Stainless Structure Specifications Based on SPEC-SS-NC-10

1.0 Base: Stainless steel tower- Family Arena

1.1 Provide an induced draft, cross flow type, factory assembled, film fill, industrial duty, stainless steel cooling tower situated as shown on the plans. The limiting overall dimensions of each tower shall be 11'10" wide, 12' long, and 15'9" high max. Total operating horsepower of all fans shall not exceed 80 hp, consisting of 4 @ 20 hp motor(s) min. Tower shall be similar and equal in all respects to existing BAC towers.

2.0 Thermal Performance and Efficiency:

2.1 The tower shall be capable of cooling 3200 GPM of water from 98 °F to 84 °F at a design entering air wet-bulb temperature of 79 °F, and its thermal rating shall be certified by the Cooling Technology Institute.

2.2 The tower shall be capable of a minimum 3180 GPM/hp efficiency per ASHRAE Standard 90.1.

2.3 CTI Certification notwithstanding, the cooling tower manufacturer shall guarantee that the tower supplied will meet the specified performance conditions when the tower is installed according to plan. If, because of a suspected thermal performance deficiency, the owner chooses to conduct an on-site thermal performance test under the supervision of a qualified, disinterested third party in accordance with CTI or ASME standards during the first year of operation; and if the tower fails to perform within the limits of test tolerance; then the cooling tower manufacturer will pay for the cost of the test and will make such corrections as are appropriate and agreeable to the owner to compensate for the performance deficiency.

3.0 Warranty:

3.1 The entire tower, including structure, casing, basins, decking, fan(s), motor(s), and all mechanical drive components (including belts, if used) shall be warranted against failure due to defects in materials and workmanship for a period of five (5) years from the date of shipment to the job. Towers not covered by a warranty of this scope will not be accepted.

4.0 Design Loading:

4.1 The tower structure, anchorage and all its components shall be designed by licensed professional engineers per the International Building Code to withstand a wind load of 30 psf, as well as a .3g seismic load. The fan deck, hot water basin covers and, where specified, maintenance platforms shall be designed for 60 psf live load or a 200 lb. concentrated load. Guardrails, where specified, shall be capable of withstanding a 200 lb. concentrated live load in any direction, and shall be designed in accordance with OSHA guidelines.

5.0 Construction:

5.1 Except where otherwise specified, all components of the cooling tower shall be fabricated of heavy-gauge, series 300 stainless steel. The tower shall be capable of withstanding water having a chloride content (NaCl) up to 750 ppm; a sulfate content (SO₄) up to 1200 ppm; a calcium content (CaCO₃) up to 800 ppm; silica (SiO₂) up to 150 ppm; and design hot water temperatures up to 125°F. The circulating water shall contain no oil, grease, fatty acids, or organic solvents.

5.2 The specifications, as written, are intended to indicate those materials that will be capable of withstanding the above water quality in continuing service, as well as the loads described in paragraph 4.1. They are to be regarded as minimum requirements. Where component materials peculiar to individual tower designs are not specified, the manufacturers shall take the above water quality and load carrying capabilities into account in the selection of their materials of manufacture.

5.3* The tower shall include all design and material modifications necessary to meet the fire rating requirements of Factory Mutual. The product proposed shall be listed in the FM Approved guideline, latest edition.

6.0 Mechanical Equipment:

6.1 Fan(s) shall be propeller-type, incorporating wide-chord aluminum alloy blades and galvanized hubs. Blades shall be individually adjustable. Maximum fan tip speed shall be 13,000 ft/min. Fan(s) shall be driven through a right angle, industrial duty, oil lubricated, geared speed reducer that requires no oil changes for the first five (5) years of operation. The gearbox bearings shall be rated at an L_{10A} service life of 100,000 hours or greater.

6.2 Motor(s) shall be 25 hp maximum, TEFC, 1.15 service factor, variable torque, and specially insulated for cooling tower duty. Speed and electrical characteristics shall be 1800 RPM, single-winding, 3 phase, 60 hertz, 480 volts. Motor shall operate in the shaft-horizontal position, and nameplate horsepower shall not be exceeded at design operation.

6.3 The complete mechanical equipment assembly for each cell shall be supported by a rigid steel structural support that resists misalignment between the motor and the gear reducer.

6.4 Gear-Reducer must be suitable for use with a variable speed drive.

7.0 Fill Louvers and Drift Eliminators:

7.1 Fill shall be film type and thermoformed of 15 mil thick PVC **with louvers formed as part**

of each fill sheet. Fill shall be suspended from stainless steel structural tubing supported from the tower structure, and shall be elevated above the floor of the cold water basin to facilitate cleaning. Air inlet faces of the tower shall be free of water splash-out. Fill shall be capable of withstanding a hot water temperature of 125°F.

7.2 Drift eliminators shall be PVC, triple-pass, and shall limit drift losses to 0.005% or less of the design water flow rate.

8.0 Hot Water Distribution System:

8.1 Two stainless steel open basins (one above each bank of fill) shall receive hot water piped to each cell of the tower. These basins shall be installed and sealed at the factory, and shall be equipped with removable, stainless steel covers capable of withstanding the loads described in paragraph 4.1. All components of these basins, with the exception of the nozzles, shall be stainless steel. The water distribution system shall be accessible and maintainable during tower fan and water operation.

8.2 Each basin shall include an inlet hole and bolt circle to accept a 125# flange connection per ANSI B16.1. Removable, interchangeable polypropylene nozzles installed in the floor of these basins shall provide full coverage of the fill by gravity flow.

8.3 The water distribution system shall be accessible and maintainable while tower is operating.

9.0 Casing, Fan Deck and Fan Guard:

9.1 The casing and fan deck shall be heavy-gauge stainless steel, and shall be capable of withstanding the loads described in paragraph 4.1. The top of the fan cylinder shall be equipped with a conical, non-sagging, removable fan guard, fabricated of welded 5/16" and 7 gauge rods, and hot dip galvanized after fabrication. Fan cylinders 5'-0" in height and over shall not be required to have a fan guard.

10.0 Access:

10.1 A large stainless steel, rectangular access door shall be located on both end panels for entry into the cold water basin. Doors shall provide access to the fan plenum area to facilitate inspection and allow maintenance to the fan drive system.

11.0 Cold Water Collection Basin:

11.1 The collection basin shall be heavy-gauge S300 stainless steel, and shall include the number and type of suction connections required to accommodate the outflow piping system shown on the plans. Suction connections shall be equipped with stainless steel debris screens. A factory-installed, float-operated, mechanical make-up valve shall be included. An overflow and drain connection shall be provided in each cell of the cooling tower. The basin floor shall slope toward the drain to allow complete flush out of debris and silt which may accumulate. Towers of more than one cell shall include stainless steel flumes for flow and equalization between cells. The basin shall be accessible and maintainable while water is circulating.

Convenience and Safety Options (bid as separate options)

The top of the tower shall be equipped with a sturdy guardrail, complete with knee rail and toe board, designed according to OSHA guidelines and factory welded into subassemblies for ease of field installation. Posts, top rails and knee rails shall be 1.5 " square tubing. The guardrail assembly shall be hot dipped galvanized after welding and capable of withstanding a 200 pound concentrated live load in any direction. Posts shall be spaced

on centers of 8'-0" or less. A 1'-6" wide aluminum ladder with 3" I-beam side rails and 1.25" diameter rungs shall be permanently attached to the end wall casing of the tower, rising from the base of the tower to the top of the guardrail.

Ladder Safety Cage:

A heavy gauge aluminum safety cage shall surround the ladder, extending from a point approximately 7'-0" above the foot of the ladder to the top of the guardrail.

Plenum Walkway

Provide a factory-installed, stainless steel walkway extending from one end wall access door to the other end wall. This walkway shall be supported by a stainless steel framework, and the top of the walkway shall be at or above the cold water basin overflow level.

Vibration Limit Switch:

A single-pole, double-throw vibration limit switch in a NEMA 4 housing shall be installed on the mechanical equipment support for wiring into the owner's control panel. The purpose of this switch will be to interrupt power to the motor in the event of excessive vibration. It shall be adjustable for sensitivity, and shall require manual reset.

Basin Heater:

Provide a system of electric immersion heaters and controls for each cell of the tower to prevent freezing of water in the collection basin during periods of shutdown. The system shall consist of one or more stainless steel electric immersion heaters installed in threaded couplings provided in the side of the basin. A NEMA 4 enclosure shall house a magnetic contactor to energize heaters; a transformer to provide 24-volt control circuit *power*; and a *solid-state circuit board for temperature and low water cut-off*. A control probe shall be located in the basin to monitor water level and temperature. The system shall be capable of maintaining 40°F water temperature at an ambient air temperature of 0 °F.

Electric Water Level Control:

The collection basin shall be heavy-gauge series 300 stainless steel and shall include the number and type of suction connections required to accommodate the out-flow piping system shown on the plans. Suction connections shall be equipped with stainless steel debris screens. A solid-state water level control system to monitor the water level with a multi-relay control panel pre-wired and mounted in a NEMA 4X nonmetallic enclosure shall be provided. The system shall consist of water level sensing and control units in quantities and locations as indicated on the drawings. An overflow and drain connection shall be provided in each cell of the cooling tower. The basin floor shall slope toward the drain to allow complete flush out of debris and silt which may accumulate. Towers of more than one cell shall include stainless steel flumes for flow and equalization between cells. The basin shall be accessible and maintainable while water is circulating.

Fan Motor Variable Speed Drive: All Weather System

A complete UL listed Variable Speed Drive system in a NEMA 1 indoor; NEMA 12 indoor or NEMA 3R outdoor enclosure shall be provided. The VFD shall use PWM technology with IGBT switching and integrated bypass design. VFD output switching shall not cause mechanical issues with gearbox teeth or drive shafts. The VFD shall catch a fan spinning in the reverse direction without tripping. The panel shall include a main disconnect with

short circuit protection and external operating handle, lockable in the off position for safety. The VFD system shall receive a speed reference signal from the Building Management System monitoring the tower cold-water temperature. As an option to receiving the speed reference signal from a building management system, the drive must have the capability to receive a 4-20 ma temperature signal from an RTD transmitter. The VFD shall have an internal PI regulator to modulate fan speed maintaining set point temperature. The drive's panel display shall be able to display the set-point temperature and cold-water temperature on two separate lines. The bypass shall include a complete magnetic bypass circuit and with capability to isolate the VFD when in the bypass mode. Transfer to the bypass mode shall be manual in the event of VFD failure. Once the motor is transferred to the by-pass circuit the fan motor will run at constant full speed. The bypass circuit will not modulate ON and OFF based on cold-water temperature. The application must be able to handle very cold water while VFD is in a by-pass mode. Operator controls shall be mounted on the front of the enclosure and shall consist of start and stop control, bypass/VFD selection, Auto/Manual selections, manual speed control. To prevent heating problems in the cooling tower fan motor the VFD system shall de-energize the motor once 25% motor speed is reached and cooling is no longer required. The cooling tower manufacturer shall supply VFD start-up assistance. Tower vibration testing throughout the speed range is required to identify and lockout any natural frequency vibration levels which may exceed CTI guidelines. Units must be compatible with energy management system existing.

Project Proposal Submittals

In order for the County to qualify and evaluate the bids received, the Contractor shall include the following information with their submitted proposal.

- Manufacturer's Specification sheets on all major equipment of the (2) 500 Ton Outdoor Air-cooled Chillers and Pump Package System being proposed.
- Isometric schematic of proposed equipment and piping arrangement.
- Three customer references for similar projects that the Contractor has completed within the past two years.
- List of deviations and/or exclusions from the Bid Specifications.
- Equipment / Material delivery and installation timelines for the project.
- Warranties on Labor and Materials

Project Execution Submittals

The Contractor shall submit the following information to the Owner during the execution of the contract. The Owner shall formally approve said submittals before the Contractor makes any major purchases for the project.

- Manufacturer's literature for the proposed 500 Ton Outdoor Air-cooled Chillers and Pump Package System. This information shall include certified dimensions for the equipment being purchased.
- Shop drawings for all mechanical work as planned for the execution and completion of the contract awarded.
- List of deviations / exclusions from the Bid Specifications as required for the Contractor to complete the 500 Ton Outdoor Air-cooled Chiller and Pump System installation as per the Manufacturer's specifications.

Payment Schedule

The Contractor shall apply for the following payments during the execution of the contract.

- 90 % of total contract value payable upon the installation and successful start-up of the (2) 500 Ton Outdoor Air-cooled Chiller and Pump System, near gate #4 of the Family Arena.
- 10 % of total contract value payable upon satisfactory completion of the project. This includes receipt of all appropriate project closeout documents.

Site Access for Execution of Contract

- The site of installation will be available to the Contractor from 7:30 am to 4:30 pm on conventional business days (Monday through Friday) during the execution of the contract. Extended hours will be available upon request.
- The County shall provide an escort as required to give the Contractor adequate access to the Family Arena during the execution of the contract.
- The Contractor shall note that the elevation from the parking lot to the site of installation is at a steep incline and a distance from the parking area which includes a lawn type terrain with varying surface levels. The Contractor shall field verify all clearances that pertain to the execution of the project.

Existing Chilled Water System

- The existing chilled water system located near gate #4, consists of (3) 365 lb modular BAF towers.
- The new 500 Ton Outdoor Air-cooled Chillers and Pump System will be placed in

the existing BAF chillers location.

- The Contractor shall follow all manufacturers' minimum recommended clearances for the placement of the Chiller, Pump system and piping. The Contractor will be responsible for any concrete/rail pad extension that is required to accommodate any component of the new Chiller and Pump System. The contractor will be responsible for delivery of the chiller, pump system and all other components to the point of installation.
- The chiller chilled water system will be piped in with black iron pipe having grooved fittings. Isolation ball valves and a system bypass piping ball valves will be installed just inside the interior wall. The pipe will then be insulated with fiberglass pipe insulation and the outside of the fiberglass covered with a metal jacket secured with banding. Pipes leading to and from the chiller will have inline vibration eliminators installed.
- All Electrical wiring and connections will be done by the contractor. Electric field power supply service will be provided to the project site and connected to the Chiller and pump system as required by the manufacture and shall meet or exceed all building codes. The contractor shall be responsible for all necessary wiring and electrical components including but not limited to electrical panels, disconnects and fuses needed to provide electrical service from an available source within the building to the Chiller, pumps and components.
- The Chillers and Pump System shall be assembled and a test run performed in the manufacturer's facility. The Chiller and Pump system shall be shipped complete and ready for installation at the owner's facility.
- A minimum of one 500 ton chiller shall be fully operational prior to installation of the second unit.
- Each Chiller and Pump system shall have an integrated control system that allows it to operate as a standalone unit. The Chiller and Pump system shall be controlled to maintain required chilled water loop temperature. A switch shall be installed next to the existing thermostat wired to the Chiller and pump system to allow personnel to disable or enable the Chiller and pump system from the thermostat location.

Ancillary Equipment

- The Contractor shall furnish and install full open bore brass ball valves or butterfly style valves at all locations where isolation valves are required.
- The Contractor shall furnish and install all gauges, external sensors, and their associated pipe fitting adaptors required for a proper operating system and monitoring capabilities.
- The Contractor shall furnish and install all additional piping and valves as required to isolate the Chiller and Pumps as necessary to perform maintenance and repair without impacting other building chiller operations.
- All piping shall be done in a way that valves are operable and are accessible by maintenance personnel.
- Any piping requiring draining shall be piped to a floor drain or through an exterior wall to allow draining as required and done in a way that is allowable by all Federal, State and Local laws.

- The Contractor shall be responsible for all changes to the existing chilled water piping as required to install the new Chiller and Pump System.
- Any down time of the current chilled water system in order to modify piping for the new system loop shall be scheduled in advance at a time that is acceptable to Arena personnel.
- The Contractor shall design and fabricate branch piping as required for the Chiller and Pump System.
- The Contractor shall be responsible for making the necessary penetration, for installing the piping from the Chiller and Pump System through the wall of the Family Arena. Once the pipe is in place it shall be secured and insulated in a way that prevents vibration damage and weatherizes the opening from the outside elements.

Project Documentation

- The Contractor shall provide two copies of all manufacturers' literature for each component of the Chiller and Pump System. Manufacturer's literature shall include installation, operation, service, and repair instructions for the equipment.
- The Contractor shall provide an as-built isometric piping schematic for the Chiller and Pump System with all system components clearly labeled on the schematic.

Site Restoration

- The Contractor shall be responsible for any damage done to the Family Arena building or grounds and shall be repaired at the contractors expense to return the area to the same condition as the when the Contractor originally arrived on site.
- The Contractor shall be responsible for removing all construction debris and excess material from the project area of Family Arena. The Contractor shall dispose of all construction debris in a legal and appropriate manner.
- The Contractor shall broom sweep the floor of the entire project area such that is in the same condition as that when the Contractor originally arrived on site.

Exception Sheet

If the item(s) and/or services proposed in the response to this bid is in any way different from that contained in this proposal or bid, the bidder is responsible to clearly identify all such differences in the space provided below. Otherwise, it will be assumed that the bidder's offer is in total compliance with all aspects of the proposal or bid.

Below are the exceptions or differences to the stated specifications (attach additional sheets as needed):

Date: _____

Signature: _____

Title: _____

Company: _____

BID FORM-11-095
For 500 Ton Cooling Towers
BID OPENING DATE: 3/31/2011 at 10:00 AM

(Bidder name)

Submits the following bid for this project:

Quantity-2

Make and Model of Chillers offered _____

Main Bid for two (Fiberglass chillers) \$ _____

Option Pricing:

Ladder	with	Standard	Supports
_____			\$ _____

Ladder with OSHA Safety Cage			\$ _____

Perimeter Handrail			\$ _____

Catwalk			\$ _____

Catwalk with Handrail			\$ _____

Basin Heater			\$ _____

Electric Water Level Control			\$ _____

Vibration Switch			\$ _____

Alternate Bid for two (Stainless chillers) \$ _____

Option Pricing:

Guardrail and Ladder

\$ _____

Ladder Safety Cage

\$ _____

Plenum Walkway

\$ _____

Vibration Limit Switch

\$ _____

Basin Heater

\$ _____

Electric Water Level Control

\$ _____

Fan Motor Variable Speed Drive All Weather System

\$ _____

Authorized signature

Date

THIS FORM MUST BE COMPLETED AND ENCLOSED WITH THE BID

Audit Clause for Contracts

Examination of Records

The Contractor's records must include, but not be limited to, accounting records (hard copy, as well as computer readable data), written policies and procedures, subcontractor files, indirect cost records, overhead allocation records, correspondence, instructions, drawings, receipts, vouchers, memoranda, and any other data relating to this contract shall be open to inspection and subject to audit and/or reproduction by the County Auditor, or a duly authorized representative from the County, at the County's expense. The contractor must preserve all such records for a period of three years, unless permission to destroy them is granted by the County, or for such longer period as may be required by law, after the final payment. Since the Contractor is not subject to the Missouri Sunshine Law (Chapter 610, RSMo), information regarding the Contractor's operations, obtained during audits, will be kept confidential.

The Contractor will require all subcontractors under this contract to comply with the provisions of this article by including the requirements listed above in written contracts with the subcontractors.

Vendor Information

Company Name: _____

Business Address: _____

Business Hours: _____

Phone: _____ Fax: _____

Email address: _____

Contact Person: _____

Authorized Signature: _____

(Indicates acceptance of all bid terms and conditions)

Date: _____