



Invitation for Bid # 251-26-061

1551 Rock Quarry Rd – Bldg. F

Raleigh, NC 27610

Refer ALL Inquiries to: Clarence Rogers
Telephone No: 919-588-3546

E-Mail: bids-crogers7@wcpss.net

Proposals will be publicly opened: September 26, 2025 @ 1:00 PM

Contract Type: Open Market

Commodity: Equipment, Chiller, Replacement
Commodity Code: 401017

Using Agency Name: WAKE COUNTY PUBLIC SCHOOL SYSTEM

NOTICE TO BIDDERS

Bids are subject to rejection unless submitted on this form. Failure to submit a bid in accordance with the instructions throughout this document shall constitute just cause to reject bid. See below for bid/proposal submitting instructions. Bids submitted via facsimile (FAX) machine or email in response to this Invitation for Bids will not be acceptable.

EXECUTION

In compliance with this Invitation for Bid, and subject to all the conditions herein, the undersigned offers and agrees to furnish and deliver any or all items upon which prices are quoted, at the prices set opposite each item within the time specified herein. Vendors are subject to immediate disqualification at any stage of the selection process for any of the following:

- The submission of false or misleading information in the vendor's proposal.
- Any efforts to dissuade or discourage other vendors from submitting proposals.
- Any efforts to influence, dictate, or change the terms of another vendor's proposal.
- Any form of bid collusion or bid rigging.

Failure to execute/sign this page prior to submittal shall render bid invalid. Late bids are not acceptable.

BIDDER:		FEDERAL ID OR SOCIAL SECURITY NO.	
STREET ADDRESS:		P.O. BOX:	ZIP:
CITY & STATE & ZIP:		TELEPHONE NUMBER:	TOLL FREE TEL. NO (800)
PRINCIPAL PLACE OF BUSINESS ADDRESS IF DIFFERENT FROM ABOVE			
TYPE OR PRINT NAME & TITLE OF PERSON SIGNING:		FAX NUMBER:	
AUTHORIZED SIGNATURE:	DATE:	E-MAIL:	

Offer valid for 45 days from date of bid opening unless otherwise stated here: ____ days Prompt Payment Discount: _____ % _____ days.

IFB SCHEDULE

The table below shows the *intended* schedule for this IFB. WCPSS will make every effort to adhere to this schedule.

Event	Responsibility	Date and Time (ET.)
Issue IFB	WCPSS	September 12, 2025
Submit Written Questions	Vendor	September 16, 2025, by 2:00 pm
Provide Response to Questions	WCPSS	September 18, 2025, 2025, by End of Business
Submit Proposals	Vendor	September 26, 2025, by 1:00 pm

PROPOSAL QUESTIONS

Upon review of the IFB documents, Vendors may have questions to clarify or interpret the IFB in order to submit the best proposal possible. To accommodate the Proposal Questions process, Vendors shall submit any such questions by the above due date.

Written questions shall be emailed to bids-crogers7@wcpss.net by the date and time specified above. Vendors should enter "IFB 251-26-061 Questions" as the subject for the email. Question's submittals should include a reference to the applicable IFB section and be submitted in a format shown below:

Reference	Vendor Question
IFB Section, Page Number	Vendor question ...?

Questions received prior to the submission deadline date, WCPSS' response, and any additional terms deemed necessary by WCPSS will be posted in the form of an addendum and shall become an Addendum to this IFB. No information, instruction or advice provided orally or informally by any WCPSS personnel, whether made in response to a question or otherwise in connection with this IFB, shall be considered authoritative or binding. Vendors shall rely *only* on written material contained in an Addendum to this IFB. **Addendum's associated with the Invitation for Bid will be posted to the following links and it will be the vendor's responsibility to adhere to and check these addendums prior to bid submittal:**

(<http://wcpss.net/domain/101>)

(<http://www.evp.nc.gov/solicitations>)

PROPOSAL SUBMITTAL

Proposals, subject to the conditions made a part hereof and the receipt requirements described below, shall be received at the address indicated in the table below, for furnishing and delivering those items or services as described herein.

Mailing address for delivery of proposal

PROPOSAL NUMBER: IFB: 251-26-061
Wake County Public Schools
ATTN: Clarence Rogers
1551 Rock Quarry Rd. Building F
Raleigh, NC 27610

IMPORTANT NOTE: All responses shall be physically delivered to the office address listed above on or before the response deadline in order to be considered timely, regardless of the method of delivery. **This is an absolute requirement.** All risk of late arrival due to unanticipated delay—whether delivered by hand, U.S. Postal Service, courier, or other delivery service is entirely on the Vendor. It is the sole responsibility of the Vendor to have the proposal physically in this Office by the specified time and date of opening. The time of delivery will be marked on each proposal when received, and any proposal received after the proposal submission deadline will be rejected. Sealed proposals, subject to the conditions made a part

hereof, will be received at the address indicated in the table in this Section, for furnishing and delivering the commodity as described herein.

- a) **Submit one (1) signed, original executed proposal response and one (1) electronic copy on a flash drive simultaneously to the address identified in the table above.**
- b) **Clearly mark each package with: (1) Vendor name; (2) the IFB number; and (3) the due date. Address the package(s) for delivery as shown in the table above.** If Vendor is submitting more than one (1) proposal, each proposal shall be submitted in separate envelopes and marked accordingly. For delivery purposes, separate envelopes from a single Vendor may be included in the same outer package. Proposals are subject to rejection unless submitted with the information above included on the outside of the proposal package.

PURPOSE

The purpose of this Invitation for Bids (IFB) is to obtain pricing for and select qualified vendor to furnish, deliver, and startup **Carrier, 448 Ton Air Cooled Screw Chiller and 179 Ton Air Cooled Scroll Chiller** to Wake County Public School System (WCPSS).

BACKGROUND

For background purposes, The Wake County Public School System is currently the largest school district in North Carolina and the 15th largest in the United States. There are currently 203 schools serving a student population of approximately 161,000, with approximately 20,000 staff. Wake County covers 854 square miles. Additional information about the school system can be accessed via the internet site (www.wcpss.net).

AWARD OF CONTRACT

It is WCPSS intent to award this contract to a single overall Vendor. WSPSS reserves the right to amend quantities or cancel bid due to changes in availability of funds.

DESCRIPTIVE LITERATURE/SPECIFICATION SHEET

Each bid must be accompanied by complete descriptive literature, specification sheet and all other pertinent data necessary for thorough evaluation of the item(s) bid and sufficient to determine compliance of the item(s) with the specifications. Failure to include such information may be a sufficient basis for rejection of the bid.

AWARD CRITERIA

All qualified bids will be evaluated and an award made based on the most responsive/responsible low bid meeting the requirements specified in the "SPECIFICATIONS" section below which includes criteria considered to be in the best interest of the district.

SCOPE: See attachments

DELIVERY

The Vendor shall deliver Free-On-Board (FOB) Destination to the following location:

**Wake County Public School System
Central Receiving, Building F
1551 Rock Quarry Road**

Raleigh, NC 27610

Successful Vendor shall complete delivery within thirty (30) consecutive calendar days after receipt of purchase order.

For completion by Vendor: Delivery will be made from _____ (city, state) within _____ consecutive calendar days after receipt of purchase order. Promptness of delivery may be used as a factor in the award.

BRAND SPECIFIC

Manufacturer(s) name and product descriptions used in this solicitation are product specific. The items offered in response to this solicitation must be the manufacturer and type specified. These specific products are needed due to compatibility and continuity of support. Failure to comply with this requirement shall be a sufficient basis from disqualifying a bid from further consideration.

AUTHORIZED RESELLER

The Vendor shall be authorized by the manufacturer to distribute or resell the products and/or equipment offered in this IFB. The Vendor shall provide a signed statement from the manufacturer confirming authorization with its bid response. Failure to provide this statement may constitute sufficient grounds for rejection of Vendor's offer, at the discretion of the WCPSS.

PRICING FORM:

FURNISH AND DELIVER:

QTY.	DESCRIPTION
1	448 Ton Air Cooled Screw Chiller, as per SPECIFICATIONS.

VENDOR OFFERING	TO BE COMPLETED BY VENDOR (NOTE: "As Specified" should not be given. Please state the Manufacturer and Model Number being offered.)
MFR.:	
BRAND/MODEL#:	
TOTAL:	

SPECIFICATIONS:

REQUIREMENTS	VENDOR RESPONSE
Carrier 30XV450S	YES OR NO
Required Delivery Information	ARO _____
Price includes freight/shipping charges	YES OR NO
Price includes weekend startup	YES OR NO
Authorized Dealer/Distributor of Carrier equipment	YES OR NO

FURNISH AND DELIVER:

QTY.	DESCRIPTION
2	179 Ton Air Cooled Scroll Chiller, as per SPECIFICATIONS.

VENDOR OFFERING	TO BE COMPLETED BY VENDOR (NOTE: "As Specified" should not be given. Please state the Manufacturer and Model Number being offered.)
MFR.:	
BRAND/MODEL#:	
UNIT PRICE:	
TOTAL:	

SPECIFICATIONS:

REQUIREMENTS	VENDOR RESPONSE
Carrier 30RC-1826S	YES OR NO
Required Delivery Information	ARO _____
Price includes freight/shipping charges	YES OR NO
Price includes weekend startup	YES OR NO
Authorized Dealer/Distributor of Carrier equipment	YES OR NO

CONFIDENTIALITY AND PROHIBITED COMMUNICATIONS DURING EVALUATION

During the evaluation period—from the date bids are opened through the date the contract is awarded—each Vendor submitting a bid (including its representatives, sub-contractors and/or suppliers) is prohibited from having any communications with any person inside or outside of WCPSS, other government agency office, WCPSS body or private entity, if the communication refers to the content of Vendor's bid or qualifications, the contents of another Vendor's bid, another Vendor's qualifications or ability to perform the contract, and/or the transmittal of any other communication of information that could be reasonably considered to have the effect of directly or indirectly influencing the evaluation of bids and/or the award of the contract. A Vendor not in compliance with this provision shall be disqualified from contract award, unless it is determined in WCPSS' discretion that the communication was harmless, that it was made without intent to influence and that the best interest of WCPSS would not be served by the disqualification. A Vendor's bid may be disqualified if its sub-contractor and supplier engage in any of the foregoing communications during the time that the procurement is active (i.e., the issuance date of the procurement to the date of contract award). Please contact bids-crogers7@wcpss.net.

PRODUCT SAFETY LISTING:

Note that the complete product offered herein, and not merely its component parts or subsystems, must comply with the safety listing. For the statutory basis for the requirement for product safety listing, Vendor is encouraged to review NCGS Chapter 66, Article 4, especially paragraph 66-26

https://www.ncleg.gov/EnactedLegislation/Statutes/pdf/ByArticle/Chapter_66/Article_4.pdf

In the event such evaluation determines that any item delivered does not meet applicable safety standards, WCPSS, at its unfettered option and discretion, may either (a) require the Vendor to bear all costs of modifications that the third-party determines are necessary for compliance with applicable safety standards, including the cost of re-evaluation, or (b) reject such item(s) as defective and return it to Vendor at Vendor's expense.

DEVIATIONS

Any deviations from specifications and requirements herein by bidder may subject proposal to disqualification.

FIRM BID

Prices and any other entry made hereon by the bidder shall be considered firm and not subject to change or withdrawal.

TAXES

Please do not include Sales Tax in your quote. The Wake County Public School System is **NOT tax-exempt**. N.C. sales tax will be added automatically on the awarded purchase order.

NC ELECTRONIC VENDOR PORTAL

The North Carolina electronic Vendor Portal (eVP) is the State of North Carolina's system to connect vendors with state government organizations that purchase goods and services. eVP provides a self-service portal where vendors can register and participate in electronic procurement activities. Please register here: <https://evp.nc.gov/> to receive bid notification and electronic procurement opportunities from Wake County Public Schools.

TERMS AND CONDITIONS

1. **READ, REVIEW AND COMPLY:** It shall be the bidder's responsibility to read this entire document, review all enclosures and attachments, and comply with all requirements specified herein.
2. **NOTICE TO BIDDERS:** All bids are subject to the provisions of special terms and conditions specific to this Invitation for Bids, the specifications. Wake County Public School System (WCPSS) objects to and will not evaluate or consider any additional terms and conditions submitted with a bidder response. This applies to any language appearing in or attached to the document as part of the bidder's response. **DO NOT ATTACH ANY ADDITIONAL TERMS AND CONDITIONS.**
By execution and delivery of this document, the bidder agrees that any additional terms and conditions, whether submitted purposely or inadvertently, shall have no force or effect.
3. **DEFINITIONS:**
 - **BIDDER:** Company, firm, corporation, partnership, individual, etc., submitting a response to an Invitation for Bids.
 - **TERM CONTRACT:** A contract generally intended to cover all normal requirements for a commodity for a specified period of time based on estimated quantities only.
 - **OPEN MARKET CONTRACT:** A contract for the purchase of a commodity not covered by a term contract.
4. **EXECUTION:** Failure to sign under EXECUTION section will render bid invalid.
5. **ORDER OF PRECEDENCE:** In cases of conflict between specific provisions in this bid, the order of precedence shall be (1) special terms and conditions specific to this bid, (2) specifications, and (3) Instructions to Bidders.
6. **TIME FOR CONSIDERATION:** Unless otherwise indicated on the first page of this document, bidder's offer shall be valid for 45 days from the date of bid opening. Preference may be given to bids allowing not less than 45 days for consideration and acceptance.
7. **SPECIFICATIONS:** Any deviation from specifications indicated herein must be clearly pointed out; otherwise, it will be considered that items offered are in strict compliance with these specifications, and bidder will be held responsible, therefore. Deviations shall be explained in detail. **The bidder shall not construe this paragraph as inviting deviation or implying that any deviation will be acceptable.**
8. **INFORMATION AND DESCRIPTIVE LITERATURE:** Bidder is to furnish all information requested and, in the spaces, provided in this document. Further, if required elsewhere in this bid, each bidder must submit with their bid sketches, descriptive literature and/or complete specifications covering the products offered. Reference to literature submitted with a previous bid will not satisfy this provision. Bids which do not comply with these requirements will be subject to rejection.
9. **RECYCLING AND SOURCE REDUCTION:** It is the policy of WCPSS to encourage and promote the purchase of products with recycled content to the extent economically practicable, and to purchase items which are reusable, refillable, repairable, more durable, and less toxic to the extent that the purchase or use is practicable and cost-effective.
We also encourage and promote using minimal packaging and the use of recycled/recyclable products in the packaging of commodities purchased. However, no sacrifice in quality of packaging will be acceptable. The company remains responsible for providing packaging that will protect the commodity and contain it for its intended use.
Companies are strongly urged to bring to the attention of WCPSS which issued the solicitation document, those products or packaging they offer which have recycled content and that are recyclable.
10. **CLARIFICATIONS/INTERPRETATIONS:** Any and all questions regarding this document must be addressed to the purchaser named on the cover sheet of this document. Do not contact the school or department directly. Any and all revisions to this document shall be made only by written addendum from WCPSS Purchasing Department. The bidder is cautioned that the requirements of this bid can be altered only by written addendum and that verbal communications from whatever source are of no effect.
11. **ACCEPTANCE AND REJECTION:** WCPSS reserves the right to reject any and all bids, to waive any informality in bids and, unless otherwise specified by the bidder, to accept any item in the bid. If either a unit price or extended price is obviously in error and the other is obviously correct, the incorrect price will be disregarded.
12. **REFERENCES:** WCPSS reserves the right to require a list of users of the exact item offered. WCPSS may contact these users to determine acceptability of the bid. Such information may be considered in the evaluation of the bid.
13. **AWARD OF CONTRACT:** As directed by statute, qualified bids will be evaluated and acceptance may be made of the lowest and best bid most advantageous to WCPSS as determined upon consideration of such factors as: prices offered; the quality of the articles offered; the general reputation and performance capabilities of the bidders; the substantial conformity with the specifications and other conditions set forth in the bid; the suitability of the articles for the intended use; the related services needed; the date or dates of delivery and performance; and such other factors deemed by WCPSS to be pertinent or peculiar to the purchase in question. Unless otherwise specified by WCPSS or the bidder, WCPSS reserves the right to accept any item or group of items on a multi-item bid. WCPSS also reserves the right to reject any and all bids. In addition, on TERM CONTRACTS, WCPSS reserves the right to make partial, progressive, or multiple awards: where it is advantageous to award separately by items;

or where more than one supplier is needed to provide the contemplated requirements as to quantity, quality, delivery, service, geographical areas; other factors deemed by WCPSS to be pertinent or peculiar to the purchase in question.

14. **HISTORICALLY UNDERUTILIZED BUSINESSES:** Pursuant to General Statute 143-48 and Executive Order #150, WCPSS invites and encourages participation in this procurement process by businesses owned by minorities, women, disabled, disabled business enterprises and non-profit work centers for the blind and severely disabled.
15. **CONFIDENTIAL INFORMATION:** As provided by statute and rule, WCPSS will consider keeping trade secrets which the bidder does not wish disclosed confidential. Each page shall be identified in boldface at the top and bottom as "CONFIDENTIAL" by the bidder. Cost information shall not be deemed confidential. In spite of what is labeled as a trade secret, the determination whether it is or not will be determined by North Carolina law.
16. **SAMPLES:** Sample of items, when required, must be furnished as stipulated herein, free of expense, and if not destroyed will, upon request be returned at the bidder's expense. Request for the return of samples must be made within 10 days following date of bid opening. Otherwise, the samples will become WCPSS property. Each individual sample must be labeled with the bidder's name, bid number, and item number. A sample on which an award is made, will be retained until the contract is completed, and then returned, if requested, as specified above.
17. **AWARD PROCEDURES:** Contract award notice shall be posted on WCPSS website. Contract award notices are sent **only** to those actually awarded contracts, and not to every person or firm responding to this solicitation.
18. **RECIPROCAL PREFERENCE:** G.S. 143-59 establishes a reciprocal preference law to discourage other states from applying in-state preferences against North Carolina's resident bidders. The "Principal Place of Business" is defined as the principal place from which the trade or business of the bidder is directed or managed.
19. **DEFAULT AND PERFORMANCE BOND:** In case of default by the contractor, WCPSS may procure the articles or services from other sources and hold the contractor responsible for any excess cost occasioned thereby. WCPSS reserves the right to require performance bond or other acceptable alternative guarantees from successful bidder without expense to WCPSS.
20. **GOVERNMENTAL RESTRICTIONS:** In the event any Governmental restrictions are imposed which necessitate alteration of the material, quality, workmanship, or performance of the items offered prior to their delivery, it shall be the responsibility of the contractor to notify in writing WCPSS, indicating the specific regulation which required such alterations. WCPSS reserves the right to accept any such alterations, including any price adjustments occasioned thereby, or to cancel the contract.
21. **TAXES:** Any applicable taxes shall be invoiced as a separate item.
G.S. 143-59.1 bars the WCPSS from entering into contracts with vendors if the vendor or its affiliates meet one of the conditions of G. S. 105-164.8(b) and refuse to collect use tax on sales of tangible personal property to purchasers in North Carolina. Conditions under G. S. 105-164.8(b) include: (1) Maintenance of a retail establishment or office, (2) Presence of representatives in the State that solicit sales or transact business on behalf of the vendor and (3) Systematic exploitation of the market by media-assisted, media-facilitated, or media-solicited means. By execution of the bid document the vendor certifies that it and all of its affiliates (if it has affiliates) collect(s) the appropriate taxes.
22. **SITUS:** The place of this contract, its situs and forum, shall be Wake County, North Carolina, where all matters, whether sounding in contract or tort, relating to its validity, construction, interpretation, and enforcement shall be determined.
23. **GOVERNING LAWS:** This contract is made under and shall be governed and construed in accordance with the laws of the State of North Carolina.
24. **INSPECTION AT CONTRACTOR'S SITE:** WCPSS reserves the right to inspect, at a reasonable time, the equipment/item, plant or other facilities of a prospective contractor prior to contract award, and during the contract term as necessary for WCPSS determination that such equipment/item, plant or other facilities conform with the specifications/requirements and are adequate and suitable for the proper and effective performance of the contract.
25. **PAYMENT TERMS:** Payment terms are Net not later than 30 days after receipt of correct invoice or acceptance of goods, whichever is later. Payment may be made by procurement card, and it shall be accepted by the contractor for payment if the contractor accepts that card (Visa, MasterCard, etc.) from other customers.
26. **CONDITION AND PACKAGING:** Unless otherwise provided by special terms and conditions or specifications, it is understood and agreed that any item offered or shipped has not been sold or used for any purpose and shall be in first class condition. All containers/packaging shall be suitable for handling, storage, or shipment.
27. **STANDARDS:** All manufactured items and/or fabricated assemblies subject to operation under pressure, operation by connection to an electric source, or operation involving a connection to a manufactured, natural, or LP gas source shall be constructed and approved in a manner acceptable to the appropriate state inspector which customarily requires the label or re-examination listing or identification marking of the appropriate safety standard organization; such as the American Society of Mechanical Engineers for pressure vessels; the Underwriters Laboratories and /or National Electrical Manufacturers' Association for electrically operated assemblies; or the American Gas Association for gas operated assemblies, where such approvals of listings have been established for the type of device offered and furnished. Further, all items furnished shall meet all requirements of the Occupational Safety and Health Act (OSHA), and state and federal requirements relating to clean air and water pollution.

28. **PATENT:** The contractor shall hold and save WCPSS, its officers, agents, and employees, harmless from liability of any kind, including costs and expenses, on account of any confidential information, copyrighted material, patented or unpatented invention, articles, device or appliance manufactured or used in the performance of this contract, including use by WCPSS or disclosure of any information pursuant to the NC Public Records Act.
29. **ASSIGNMENT:** No assignment of the contractor's obligations nor the contractor's right to receive payment hereunder shall be permitted.
However, upon written request approved by the purchasing department and solely as a convenience to the contractor, WCPSS may:
a. Forward the contractor's payment check directly to any person or entity designated by the contractor, and
b. Include any person or entity designated by contractor as a joint payee on the contractor's payment check.
In no event shall such approval and action obligate WCPSS to anyone other than the contractor and the contractor shall remain responsible for fulfillment of all contract obligations.
30. **INSURANCE:**
Certificates of Insurance acceptable to WCPSS shall be filed with WCPSS prior to commencement of the Work. These Certificates shall contain a provision that coverage afforded under the policies will not be canceled until at least thirty (30) days' prior written notice has been given to WCPSS, and that the Wake County Board of Education is listed as additional insured on general liability and automobile liability. **Provider agrees to maintain the appropriate insurance outlined in Exhibit B.** Other types of appropriate insurance may be required depending upon scope of services provided. Examples are aviation liability, pollution liability, crime, employee dishonesty/directors and officers.
The successful vendor agrees to hold harmless and indemnify the Wake County Board of Education (WCBOE) for any liability that may arise from the negligent or illegal acts of the vendor's employees or agents.
31. **GENERAL INDEMNITY:** The provider shall hold and save WCPSS, its officers, agents, and employees, harmless from liability of any kind, including all claims and losses, accruing or resulting to any other person, firm, or corporation furnishing or supplying work, services, materials, or supplies in connection with the performance of this contract, and from any and all claims and losses accruing or resulting to any person, firm, or corporation that may be injured or damaged by the provider in the performance of this contract and that are attributable to the negligence or intentionally tortious acts of the provider. The provider represents and warrants that it shall make no claim of any kind or nature against WCPSS agents who are involved in the delivery or processing of contractor goods to WCPSS. The representation and warranty in the preceding sentence shall survive the termination or expiration of this contract.
32. **CANCELLATION (TERM CONTRACTS ONLY):** All contract obligations shall prevail for at least 180 days after the effective date of the contract. After that period, in addition to the provisions of the paragraph entitled Price Adjustments, for the protection of both parties, this contract may be canceled in whole or in part by either party by giving 30 days prior notice in writing to the other party.
33. **QUANTITIES (TERM CONTRACTS ONLY):** The award of a term contract neither implies nor guarantees any minimum or maximum purchases there under.
34. **PRICE ADJUSTMENTS (TERM CONTRACTS ONLY):** Any price changes, downward or upward, which might be permitted during the contract period must be general, either by reason of market change or on the part of the contractor to other customers.
a. **Notification:** Must be given to WCPSS, in writing, concerning any proposed price adjustments. Such notification shall be accompanied by copy of manufacturer's official notice or other acceptable evidence that the change is general in nature.
b. **Decreases:** WCPSS shall receive full proportionate benefit immediately at any time during the contract period.
Increases: All prices shall be firm against any increase for 180 days from the effective date of the contract. After this period, a request for increase may be submitted with WCPSS reserving the right to accept or reject the increase or cancel the contract. Such action by WCPSS shall occur not later than 15 days after the receipt by WCPSS of a properly documented request for price increase. Any increases accepted shall become effective not later than 30 days after the expiration of the original 15 days reserved to evaluate the request for increase.
35. **Invoices:** It is understood and agreed that orders will be shipped at the established contract prices in effect on dates orders are placed. Invoicing at variance with this provision will subject the contract to cancellation. Applicable North Carolina sales tax shall be invoiced as a separate item.
36. **LUNSFORD ACT/CRIMINAL BACKGROUND CHECKS:** The Provider shall conduct at its own expense sexual offender registry checks on each of its employees, agents, ownership personnel, or contractors ("contractual personnel") who will engage in any service on or delivery of goods to school system property or at a school-system sponsored event. The checks shall include at a minimum check of the State Sex Offender and Public Protection Registration Program, the State Sexually Violent Predator Registration Program, and the National Sex Offender Registry ("the Registries"). For the Provider's convenience only, all of the required registry checks may be completed at no cost by accessing the North Carolina Sex Offender Registry website at <http://sexoffender.ncdoj.gov/>. The Provider shall provide certification on Sexual Offender Registry Check Certification Form that the registry checks were conducted on each of its contractual personnel providing services or delivering goods under this Agreement prior to the commencement of such services or the delivery of such goods. The Provider shall conduct a current initial check of the registries (a check done more than 30 days prior to the date of this Agreement shall not satisfy this contractual obligation). In addition, Provider agrees to conduct the registry checks and provide a supplemental certification form before any additional contractual personnel are used to deliver goods or provide services pursuant to this Agreement. Provider further agrees to conduct

annual registry checks of all contractual personnel and provide annual certifications at each anniversary date of this Agreement. Provider shall not assign any individual to deliver goods or provide services pursuant to this Agreement if said individual appears on any of the listed registries. Provider agrees that it will maintain all records and documents necessary to demonstrate that it has conducted a thorough check of the registries as to each contractual personnel and agrees to provide such records and documents to the school system upon request. Provider specifically acknowledges that the school system retains the right to audit these records to ensure compliance with this section at any time in the school system's sole discretion. Failure to comply with the terms of this provision shall be grounds for immediate termination of the Agreement. In addition, the school system may conduct additional criminal records checks at Provider's expense. If the school system exercises this right to conduct additional criminal records checks, Provider agrees to provide within seven (7) days of request the full name, date of birth, state of residency for the past ten years, and any additional information requested by the school system for all contractual personnel who may deliver goods or perform services under this Agreement. Provider further agrees that it has an ongoing obligation to provide the school system with the name of any new contractual personnel who may deliver goods or provide services under the Agreement. WCPSS reserves the right to prohibit any contractual personnel of Provider from delivering goods or providing services under this Agreement if WCPSS determines, in its sole discretion, that such contractual personnel may pose a threat to the safety or well-being of students, school personnel or others.

37. **ACCESS TO PERSONS AND RECORDS:** The State Auditor and the WCPSS internal auditors shall have access to persons and records as a result of all contracts or grants entered into by WCPSS in accordance with General Statute 147-64.7 and Session Law 2010-194, Section 21 (i.e., the State Auditors and WCPSS may audit the records of the contractor during the term of the contract to verify accounts and data affecting fees or performance).
38. **COMPLIANCE WITH E-VERIFY:** Provider shall comply with all applicable laws and regulations in providing services under this Contract. In particular, Provider shall not employ any individuals to provide services to the School System who are not authorized by federal law to work in the United States. Provider represents and warrants that it is aware of and in compliance with the Immigration Reform and Control Act and North Carolina law (Article 2 of Chapter 64 of the North Carolina General Statutes) requiring use of the E-Verify system for employers who employ twenty-five (25) or more employees and that it is and will remain in compliance with these laws at all times while providing services pursuant to this Contract. Provider shall also ensure that any of its subcontractors (of any tier) will remain in compliance with these laws at all times while providing subcontracted services in connection with this Contract.
39. **COMPLIANCE WITH AFFORDABLE CARE ACT:** Provider is responsible for providing affordable health care coverage to all of its full-time employees providing services to the School System. The definitions of "affordable coverage" and "full-time employee" are governed by the Affordable Care Act and accompanying IRS and Treasury Department regulations.
40. **RESTRICTED COMPANIES LIST:** Bidder represents that as of the date of this bid, Bidder is not included on the Final Divestment List created by the North Carolina State Treasurer pursuant to N.C. Gen. Stat. § 147-86.58. Bidder also represents that as of the date of this bid, Bidder is not included on the list of restricted companies determined to be engaged in a boycott of Israel created by the North Carolina State Treasurer pursuant to N.C. Gen. Stat. § 147-86.81.
41. **BUSINESS AUTHORIZATION:** Bidder is duly qualified to do business in North Carolina. If Bidder is a business entity that is not registered in North Carolina, prior to providing any products or beginning any services described by this bid, Bidder shall either (i) obtain a certificate of authority from the Secretary of State for North Carolina, pursuant to N. C. Gen. Stat. § 55-15-03, or (ii) provide a letter from an attorney indicating that the attorney has reviewed N. C. Gen. Stat. § 55-15-01 and determined that Bidder is not required to obtain a certificate of authority pursuant to N. C. Gen. Stat. § 55-15-01(b).
42. **GIFT PROHIBITION.** Provider acknowledges that it is subject to N.C.G.S. §§ 14-234 and 133-32, which prohibit contractors from providing items of value to school system officials and employees under various circumstances. N.C.G.S. § 14-234, in pertinent part, prohibits contractors from providing to specific school system officers/employees a gift, favor, reward, service, or promise of reward in exchange for recommending influencing or attempting to influence the award of a contract. N.C.G.S. § 133-32, in pertinent part, bars provision of gifts or favors to specific school system officers/employees by a contractor who has a contract, has performed under a contract in the last year, or anticipates bidding on a contract in the future. Provider covenants that no director, employee or agent of Provider, or any other person connected with Provider, has made, offered or given, either directly or indirectly, to any School System Board member, employee, or agent, or to any person connected with the School System, any gift, favor, or item of value in violation of either N.C.G.S. §§ 14-234 or 133-32. Provider agrees that a breach of this provision as identified by the school system may result in the School System's termination of this Contract without liability and/or at the School System's discretion, the recovery of any and all funds paid to Provider pursuant to this Contract. Provider further agrees that to the extent there exists any doubt as to whether its actions have violated, or could violate, this provision, Provider will promptly notify the school system so it can make a determination as to the propriety of the Provider's past or proposed future conduct.

ETHICS AND THE PURCHASING FUNCTION *Policy Code: 6401/9100*

The Wake County Board of Education is committed to conducting the purchasing function in an ethical manner and in compliance with state and federal laws and regulations. The Board expects all employees who are directly or indirectly involved in any aspect of the purchasing function to be aware of and comply with all current state and federal laws and regulations as these standards apply to the school system's purchasing activities. The Board's purchasing goals and principles will not be compromised by individuals motivated by personal gain.

Employees directly or indirectly involved in any aspect of the school system's procurement, purchasing, and/or contracting process for apparatus, materials, equipment, supplies, services, real property, or construction or repair projects, regardless of source of funds, must adhere to the following standards of conduct and those established in any policies regarding employee conflict of interest and 8305: Federal Grant Administration.

1. Employees are expected to make all purchasing-related decisions in a neutral and objective way based on what is in the best interest of the school system and not in consideration of actual or potential personal benefit.
2. Employees shall not participate, directly or indirectly, in making or administering any contract from which they will obtain a direct benefit, unless an exception is allowed pursuant to law.

An employee obtains a direct benefit when the employee or his or her spouse will receive income, commission, or property under the contract, or the employee or spouse has more than a 10 percent interest in an entity that is a party to the contract. See G.S. 14-234 and any policies regarding employee conflict of interest.

Participation in making or administering a contract includes, but is not limited to, participating in the development of specifications or contract terms; obtaining or reviewing bids; preparation or award of the contract; and having the authority to make decisions about, interpret, or oversee the contract.

3. Employees shall not participate, directly or indirectly, in the selection, award, or administration of a contract supported in whole or part by a federal grant or award if the employee has a real or apparent conflict of interest. See 2 C.F.R. 200.318 and policy 8305: Federal Grant Administration.

A real or apparent conflict exists when the employee, his or her immediate family member or partner, or an organization which employs or is about to employ any of those individuals, has a financial or other interest in or receives a tangible personal benefit from a firm considered for a contract. For purposes of this subsection, a "financial interest" means a financial interest which comprises more than five percent of the equity of the firm or business or more than five percent of the assets of the economic interest in indebtedness. It does not include an ownership interest held through a fiduciary, such as *Policy Code: 6401/9100* a mutual fund or blind trust, where the individual or individual's employer has no control over the selection of holdings.

4. Employees shall not influence or attempt to influence any person involved in making or administering a contract from which the employee will obtain a direct benefit as described in paragraph 2, above.
5. Employees shall not solicit or receive any gift, favor, reward, service, or promise of reward, including a promise of future employment, in exchange for recommending, influencing, or attempting to influence the award of a contract by the school system.
6. Employees shall notify the superintendent or designee in writing if they have an actual or potential conflict of interest under this policy or applicable state or federal law that would disqualify them from performing any aspect of their job responsibilities.
7. Employees shall not solicit or accept trips, meals, gratuities, gifts, favors, or anything of monetary value from current or recent (within the past year) contractors, subcontractors, or suppliers, or any persons or entities that foreseeably may bid on a contract in the future, unless the item is an unsolicited gift of nominal value (\$50 or less), and is one of the following: an advertising item or souvenir that is widely distributed; an honorarium for participating in a meeting; a meal provided at a banquet; or other item that is clearly permitted by state and federal law. Multiple permitted items from a single contractor may not exceed an aggregate value of \$100 in a twelve-month period.

Employees shall inform existing and potential contractors, subcontractors, and suppliers about these restrictions.

8. Employees shall not solicit or accept any gift from a current or potential provider of E-rate services or products in violation of applicable federal E-rate program gifting rules.
9. Employees shall not divulge confidential information to any unauthorized person. Confidential information includes but is not limited to (1) the school system's cost estimate for any public contract, prior to bidding or completion of other competitive purchasing processes; and (2) the identity of contractors who have obtained proposals for bid purposes for a public contract, until the bids are opened in public and recorded in the Board minutes.
10. An employee shall not misuse information in violation of G.S. 14-234.1. Specifically, an employee shall not, in contemplation of the

employee's own official action or that of the Board or others acting on behalf of the school system, or in reliance on information known to the employee in his or her official capacity and not made public, to: a. acquire a financial interest in any property, transaction, or enterprise; b. gain a financial benefit that may be affected by the information or contemplated action; or c. intentionally aid another to acquire a financial interest or gain a financial benefit from the information or contemplated action.

The superintendent or designee shall ensure that all affected personnel are aware of Board policy requirements and applicable laws. Any individual aware of any violation of this policy, policy 2121: Board Member Conflict of Interest, any policies regarding employee conflict of interest, the conflict-of-interest provisions of policy 8305: Federal Grant Administration, or applicable conflict of interest laws shall report such violation in accordance with policy 1760/7280: Prohibition Against Retaliation. Employees who violate this policy, policy 2121, any policies regarding employee conflict of interest, or the conflict-of-interest provisions of policy 8305, will be subject to disciplinary action.

Legal References: 2 C.F.R. 200.318(c); 47 C.F.R. 54.503; FCC Sixth Report and Order 10-175; G.S. 14-234, -234.1; 133-32, -33; Attorney General Opinion requested by L.W. Lamar regarding G.S. 133-32, the Applicability to Attorneys and Law Firms Providing Professional Services to Local Boards of Education, dated May 13, 1993

Exhibit B - Insurance Requirements

COMMERCIAL GENERAL LIABILITY, COMMERCIAL AUTOMOBILE LIABILITY, AND WORKERS COMPENSATION ARE STANDARD LINES OF COVERAGE REQUIRED FOR ALL WAKE COUNTY BOARD OF EDUCATION (WCBOE) AGREEMENTS

Type of Insurance	Type of Service	Minimum Insurance Limits
Commercial General Liability (CGL)_ for direct operations, contractual liability and completed operations with limits not less than those stated	All Services	\$1,000,000 each occurrence Including Personal & Advertising Injury \$1,000,000 each occurrence with \$2,000,000 General Aggregate, and \$2,000,000 Products/Completed Operations Aggregate and Medical Expense \$5,000 (any one person)
Commercial Automobile Liability (CAL) including coverage for owned, hired, and non-owned vehicles: Enhanced Limits Automobile Liability	All Services operating vehicles on WCPSS sites or transporting goods. Contact WCPSS Risk Management For services that transport Students or Staff Contact WCPSS Risk Management for Charter/Motorcoach Transportation	\$1,000,000 per occurrence Combined Single Limit each accident. \$2,000,000 per occurrence Combined Single Limit (for Hired Transportation example EC Transportation, Special Events) \$5,000,000 per occurrence/Combined Single Limit required for Charter/Motorcoach Transportation Services
Workers Compensation (WC) including Occupational Disease and Employer's Liability Insurance.	All Services Required for any contractor with three or more W2 employees. Contractors not required by law to carry Workers Compensation may be required to provide proof of or attest the personal health insurance	Part A: Worker's Compensation Coverage – Statutory Limits as required by state of North Carolina Worker's Compensation laws. Part B: Employer's Liability Bodily Injury by Accident: \$500,000 each accident Bodily Injury by Disease: \$500,000 each employee Bodily Injury by Disease: \$500,000 Policy Limit

OTHER INDUSTRY TYPES OF APPROPRIATE INSURANCE BELOW OR LIMITS ARE REQUIRED BY WCPSS RISK MANAGEMENT DEPENDING UPON THE SCOPE OF SERVICES

Professional Liability Insurance (PL) Errors and Omissions (E&O)	Required for any services involving professional services such as architectural and or engineering and design services. May include malpractice insurance if medical or mental health services are provided.	Minimum \$1,000,000.
Sexual Misconduct Liability (SML) /Sexual Abuse/Molestation (SAM)	Required for any provider services when alone with students, including online services involving live chat. For allegations of sexual abuse by policyholders and those employed by them, whether founded or unfounded.	Minimum \$1,000,000.
Cyber Liability (CL)	Required for any service with access to or exchange involving personally identifiable information or software applications.	Minimum Limit requirements \$1,000,000 up to \$5,000,000
Aircraft/Aviation General Liability (AGL)	Required for any services or presentations involving manned or unmanned flight. Most commercial general liability policies will not cover aviation-related exposures.	Minimum \$1,000,000 for each occurrence + WCBOE Policy must be followed and WCPSS Risk Management must approve the flying pre-flight.
Pollution Liability	Required if hazardous waste / harmful substances are being utilized or disturbed.	Minimum \$1,000,000. Each wrongful act with \$2,000,000 aggregate
Commercial Crime Insurance (Included extension to third parties)	Required for contracted services that have access to WCPSS sites while unsupervised example Custodial, Security	Minimum \$1,000,000. Each wrongful act with \$2,000,000 aggregate

VENDOR INFORMATION SHEET

Company Name (include dba): _____
Phone number: _____ Fax: _____ E-mail: _____
Contact: _____
Corporate Office Address: _____

Wake County Office Address (if different from Corporate): _____

Web Address: _____

Length of time in business: _____ Number of permanent employees: _____

DOT #: _____ (if applicable) MC License #: _____ (if applicable)

Insurance Contact: _____ Phone: _____

The Wake County Public School System reserves the right to reject or disqualify any and all vendors, waive informalities and irregularities in the bid process, and to accept vendors, which are considered to be in the best interest of the School System.

MINORITY, WOMEN, SMALL BUSINESS ENTERPRISE INFORMATION

Pursuant to WCPSS Board of Education policy and NC General Statutes, WCPSS invites and encourages participation in this procurement process by businesses owned by minorities, women, small business enterprise, disabled business enterprises and non-profit work centers for the blind and severely disabled.

Parties are required to complete the following information when submitting their response to this request:

Check all that apply:

- Minority Owned Business
- Woman Owned Business
- Small Business Enterprise

____ Yes, I certify that that my company has been certified by the North Carolina Department of Administration (HUB Office) as a Historically Underutilized Business.

____ No, my company has not yet received HUB or MWBE certification but meet the above criteria.

____ No, my company is not a minority, woman, or small business enterprise.

Vendor Signature: _____

Date: _____

Print Name: _____

SECTION 236423 - AIR-COOLED, SCROLL WATER CHILLERS

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.

1.2 SUMMARY

- A. Section includes packaged, air-cooled, electric-motor-driven, scroll water chillers.
- B. **Chillers are being purchased by WCPSS including delivery of chiller to site, warranty, and startup, with installation by a mechanical contractor under separate bid**

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include refrigerant, rated capacities, operating characteristics, and furnished specialties and accessories.
 - 2. Performance at AHRI standard conditions and at conditions indicated.
 - 3. Performance at AHRI standard unloading conditions.
 - 4. Minimum evaporator flow rate.
 - 5. Refrigerant capacity of water chiller.
 - 6. Oil capacity of water chiller.
 - 7. Fluid capacity of evaporator.
 - 8. Characteristics of safety relief valves.
- B. Shop Drawings: Complete set of manufacturer's prints of water chiller assemblies, control panels, sections and elevations, and unit isolation. Include the following:
 - 1. Assembled unit dimensions.
 - 2. Weight and load distribution.
 - 3. Required clearances for maintenance and operation.
 - 4. Size and location of piping and wiring connections.
 - 5. Diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Installation instructions.
- B. Startup service reports.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each water chiller to include in emergency, operation, and maintenance manuals.

- B. Spare Parts List: Recommended spare parts list with quantity for each.
- C. Touchup Paint Description: Detailed description of paint used in application of finish coat to allow for procurement of a matching paint.

1.6 QUALITY ASSURANCE

- A. AHRI Certification: Certify chiller according to AHRI 590 certification program.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Ship water chillers from the factory fully charged with refrigerant and filled with oil.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of water chillers that fail in materials or workmanship within specified warranty period.
 - 1. Extended warranties include, but are not limited to, the following:
 - a. Complete compressor and drive assembly including refrigerant and oil charge.
 - 2. Extended Warranty Period: Five years from date of Substantial Completion.

1.9 STARTUP SERVICE

- A. Include the engagement of a factory-authorized service representative to perform startup service.

1.10 DEMONSTRATION

- A. Include the engagement of a factory-authorized service representative to perform demonstration service to the Owner.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AHRI Rating: Rate water chiller performance according to requirements in AHRI 550/590.
- B. ASHRAE Compliance: ASHRAE 15 for safety code for mechanical refrigeration.
- C. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."
- D. ASME Compliance: Fabricate and stamp water chiller heat exchangers to comply with ASME Boiler and Pressure Vessel Code.
- E. Comply with NFPA 70.
- F. Comply with requirements of UL 1995, "Heating and Cooling Equipment," and include label by a qualified testing agency showing compliance.

2.2 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by the following: Carrier, Dunham Bush, or JCI/York.

2.3 MANUFACTURED UNITS

- A. Description: Factory-assembled and run-tested water chiller complete with compressor(s), compressor motors and motor controllers, evaporator, condenser with fans, electrical power, controls, and indicated accessories.
- B. Acoustic-reduction package shall have the following:
1. Acoustic enclosure around compressors.
 2. Constant-speed fans with acoustic treatment.
 3. Designed to reduce sound level without affecting performance.
- C. Security Package: Security grilles with fasteners for additional protection of compressors, evaporator, condenser coil trim panels, and hail guards for condenser coils. Grilles, panels, and guards shall be non-corroding material or coated steel for corrosion resistance and shall be removable for service access.

2.4 CABINET

- A. Base: Galvanized-steel base extending the perimeter of water chiller. Secure frame, compressors, and evaporator to base to provide a single-piece unit.
- B. Frame: Rigid galvanized-steel frame secured to base and designed to support cabinet, condenser, control panel, and other chiller components not directly supported from base.
- C. Casing: Galvanized steel.
- D. Finish: Coat base, frame, and casing with a corrosion-resistant coating capable of withstanding a 10500-hour salt-spray test according to ASTM B 117.

2.5 COMPRESSOR-DRIVE ASSEMBLIES

- A. Scroll Compressors:
1. Description: Positive-displacement direct drive with hermetically sealed casing.
 2. Each compressor provided with suction and discharge service valves, crankcase oil heater, and suction strainer.
 - a. For multiple compressor assemblies, it is acceptable to isolate each refrigeration circuit in lieu of each compressor.
 3. Operating Speed: Nominal 3600 rpm for 60-Hz applications.
 4. Capacity Control: On-off compressor cycling. Provide four capacity steps minimum.
 5. Oil Lubrication System: Automatic pump with strainer, sight glass, filling connection, filter with magnetic plug or removable magnet in sump, and initial oil charge.
 - a. Manufacturer's other standard methods of providing positive lubrication are acceptable in lieu of an automatic pump.
 6. Vibration Isolation: Mount individual compressors on vibration isolators.
 - a. For multiple compressor assemblies, it is acceptable to isolate each compressor assembly in lieu of each compressor.

- B. Compressor Motors:
 - 1. Hermetically sealed and cooled by refrigerant suction gas.
 - 2. High-torque, two-pole induction type with inherent thermal-overload protection on each phase.
- C. Compressor Motor Controllers:
 - 1. Across the Line: NEMA ICS 2, Class A, full voltage, nonreversing.

2.6 REFRIGERATION

- A. Refrigerant: R-32, or as per manufacturer's standard.
- B. Refrigerant Compatibility: Parts exposed to refrigerants shall be fully compatible with refrigerants, and pressure components shall be rated for refrigerant pressures.
- C. Refrigerant Circuit: Each circuit shall include an electronic-expansion valve, refrigerant charging connections, a hot-gas muffler, compressor suction and discharge shutoff valves, a liquid-line shutoff valve, a replaceable-core filter-dryer, a sight glass with moisture indicator, a liquid-line solenoid valve, and an insulated suction line.
- D. Refrigerant Isolation: Factory install positive shutoff isolation valves in the compressor discharge line and the refrigerant liquid-line to allow the isolation and storage of the refrigerant charge in the chiller condenser.
 - 1. For multiple compressor assemblies, it is acceptable to isolate each refrigeration circuit in lieu of each compressor.

2.7 EVAPORATOR

- A. Brazed plate or shell and tube design as indicated in the Chiller Schedule.
- B. Brazed Plate:
 - 1. Direct-expansion, single-pass, brazed-plate design.
 - 2. Stainless-steel construction.
 - 3. Code Compliance: Tested according to ASME Boiler and Pressure Vessel Code.
 - 4. Fluid Nozzles: Terminate with mechanical-coupling end connections for connection to field piping.
 - 5. Inlet Strainer: Factory-furnished, mesh strainer for field installation in supply piping to evaporator. Manufacturer has option to factory install strainer.
- C. Shell and Tube:
 - 1. Description: Direct-expansion, shell-and-tube design with fluid flowing through the shell and refrigerant flowing through the tubes within the shell.
 - 2. Code Compliance: Tested and stamped according to ASME Boiler and Pressure Vessel Code.
 - 3. Shell Material: Carbon steel.
 - 4. Shell Heads: Removable carbon-steel heads with multipass baffles designed to ensure positive oil return and located at each end of the tube bundle.
 - 5. Shell Nozzles: Fluid nozzles located along the side of the shell and terminated with mechanical-coupling end connections for connection to field piping.
 - 6. Tube Construction: Individually replaceable copper tubes with enhanced fin design, expanded into tube sheets.

- D. Flow Switch: Factory-furnished and -installed, thermal-type flow switch wired to chiller operating controls.
- E. Heater: Factory-installed and -wired electric heater with integral controls designed to protect the evaporator to minus 20 deg F. If required by manufacturer, heater power circuit may be separate from the power circuit for the chiller.

2.8 AIR-COOLED CONDENSER

- A. Coil(s) with integral subcooling on each circuit.
- B. Copper Tube with Plate Fin Coils:
 - 1. Construct coils of copper tubes mechanically bonded to aluminum fins.
- C. **Aluminum Microchannel Coils are Not Acceptable.**
- D. Hail Protection: Provide condenser coils with louvers, baffles, or hoods to protect against hail damage.
- E. Fans: Direct-drive propeller type with statically and dynamically balanced fan blades, arranged for vertical air discharge.
- F. Fan Motors: TENV or TEAO enclosure, with sealed and permanently lubricated bearings, and having built-in overcurrent- and thermal-overload protection.
 - 1. Overcurrent- and thermal-overload protection not integral to motor is acceptable if provided with chiller electrical power package.
- G. Fan Guards: Removable steel safety guards with corrosion-resistant coating.
- H. Ambient temperature operating range of 0 deg F to 115 deg F.

2.9 INSULATION

- A. Closed-cell, flexible, elastomeric thermal insulation complying with ASTM C 534/C 534M, Type I for tubular materials and Type II for sheet materials.
 - 1. Thickness: 1-1/2 inches.
- B. Adhesive: As recommended by insulation manufacturer.
- C. Factory-applied insulation over all cold surfaces of chiller capable of forming condensation. Components shall include, but not be limited to, evaporator, evaporator water boxes including nozzles, refrigerant suction pipe from evaporator to compressor, cold surfaces of compressor, refrigerant-cooled motor, and auxiliary piping.
 - 1. Apply adhesive to 100 percent of insulation contact surface.
 - 2. Before insulating steel surfaces, prepare surfaces for paint, and prime and paint as indicated for other painted components. Do not insulate unpainted steel surfaces.
 - 3. Seal seams and joints to provide a vapor barrier.
 - 4. After adhesive has fully cured, paint exposed surfaces of insulation to match other painted parts.
 - 5. Manufacturer has option to factory or field insulate chiller components to reduce potential for damage during installation.
 - 6. Field-Applied Insulation:

- a. Components that are not factory insulated shall be field insulated to comply with requirements indicated.
- b. Manufacturer shall be responsible for chiller insulation whether factory or field installed to ensure that manufacturer is the single point of responsibility for chillers.
- c. Manufacturer's factory-authorized service representative shall instruct and supervise installation of field-applied insulation.
- d. After field-applied insulation is complete, paint insulation to match factory-applied finish.

2.10 ELECTRICAL

- A. Factory installed and wired, and functionally tested at factory before shipment.
- B. Factory-installed and -wired switches, motor controllers, transformers, and other electrical devices necessary shall provide a single-point field power connection to water chiller.
- C. House in a unit-mounted, NEMA 250, Type 3R enclosure with hinged access door with lock and key or padlock and key.
- D. Wiring shall be numbered and color-coded to match wiring diagram.
- E. Factory wiring located outside of enclosure shall be in raceway. Terminal connections shall be made with not more than a 24-inch length of liquidtight or flexible metallic conduit.
- F. Field power interface shall be to circuit breaker. Minimum SCCR according to UL 508 shall be as required by electrical power distribution system and as indicated in the Chiller Schedule.
- G. Each motor shall have branch power circuit and controls with one of the following disconnecting means having SCCR to match main disconnecting means:
 1. NEMA KS 1, heavy-duty, non-fused switch.
- H. Each motor shall have overcurrent protection.
- I. Overload relay sized according to UL 1995, or an integral component of water chiller control microprocessor.
- J. Phase-Failure and Undervoltage: Solid-state sensing with adjustable settings.
- K. Controls Transformer: Unit-mounted transformer with primary and secondary fuses and sized with enough capacity to operate electrical load plus spare capacity.
- L. Control Relays: Auxiliary and adjustable time-delay relays, or an integral to water chiller microprocessor.
- M. Indicate the following on the Operator Display the following for water chiller electrical power supply:
 1. Current, phase to phase, for all three phases.
 2. Voltage, phase to phase and phase to neutral for all three phases.
 3. Three-phase real power (kilowatts).
 4. Three-phase reactive power (kilovolt amperes reactive).
 5. Power factor.
 6. Running log of total power versus time (kilowatt hours).
 7. Fault log, with time and date of each.

2.11 CONTROLS

- A. Factory installed and wired, and functionally tested at factory before shipment.
- B. Standalone, microprocessor based, with all memory stored in nonvolatile memory so that reprogramming is not required on loss of electrical power.
- C. Enclosure: Share enclosure with electrical power devices or provide a separate enclosure of matching construction.
- D. Operator Interface: Keypad or pressure-sensitive touch screen. Multiple-character, 7” color digital display. Display the following:
 - 1. Date and time.
 - 2. Operating or alarm status.
 - 3. Operating hours.
 - 4. Outside-air temperature if required for chilled-water reset.
 - 5. Temperature and pressure of operating set points.
 - 6. Chilled-water entering and leaving temperatures.
 - 7. Refrigerant pressures in evaporator and condenser.
 - 8. Saturation temperature in evaporator and condenser.
 - 9. No cooling load condition.
 - 10. Elapsed time meter (compressor run status).
 - 11. Pump status.
 - 12. Antirecycling timer status.
 - 13. Percent of maximum motor amperage.
 - 14. Current-limit set point.
 - 15. Number of compressor starts.
 - 16. Alarm history with retention of operational data before unit shutdown.
 - 17. Superheat.
- E. Control Functions:
 - 1. Manual or automatic startup and shutdown time schedule.
 - 2. Capacity control based on evaporator leaving-fluid temperature.
 - 3. Capacity control compensated by rate of change of evaporator entering-fluid temperature.
 - 4. Chilled-water entering and leaving temperatures, control set points, and motor load limit. Chilled-water leaving temperature shall be reset based on return-water temperature.
 - 5. Current limit and demand limit.
 - 6. Condenser-water temperature.
 - 7. External water chiller emergency stop.
 - 8. Antirecycling timer.
 - 9. Automatic lead-lag switching.
- F. Manual-Reset Safety Controls: The following conditions shall shut down water chiller and require manual reset:
 - 1. Low evaporator pressure or high condenser pressure.
 - 2. Low chilled-water temperature.
 - 3. Refrigerant high pressure.
 - 4. High or low oil pressure.
 - 5. High oil temperature.
 - 6. Loss of chilled-water flow.
 - 7. Loss of condenser-water flow.
 - 8. Control device failure.

- G. BAS System Interface: Factory-install hardware and software to enable system to monitor, control, and display chiller status and alarms.
 - 1. Hardwired I/O Points:
 - a. Monitoring: On/off status, common trouble alarm.
 - b. Control: On/off operation, chilled-water discharge temperature set-point adjustment.
 - c. Chiller Pump Output Relay.
 - 2. Communication Interface: ASHRAE 135 BACnet or LonTalk communication interface, as indicated in the Chiller Schedule and as coordinated with the BAS system being provided, shall enable control system operator to remotely control and monitor the water chiller from an operator workstation. Control features and monitoring points displayed locally at water chiller control panel shall be available through DDC system for HVAC.
- H. Factory-installed wiring outside of enclosures shall be in NFPA 70-complaint raceway. Make terminal connections with liquidtight or flexible metallic conduit.

2.12 ACCESSORIES

- A. Factory-furnished neoprene isolators for field installation.

2.13 SOURCE QUALITY CONTROL

- A. Perform functional test of water chillers before shipping.
- B. Factory test and inspect evaporator according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1. Stamp with ASME label.
- C. For water chillers located outdoors, rate sound power level according to AHRI 370 procedure.

PART 3 - EXECUTION

- 3.1 **This specification Section is for Equipment Procurement Package for the project. Requirements for Execution and Installation of chillers are included for reference only. Installation of chillers is part of subsequent specifications and bid package for the project.**

3.2 EXAMINATION

- A. Examine chillers upon receipt and prior to installation. Reject chillers that are damaged.
- B. Before water chiller installation, examine roughing-in for equipment support, anchor-bolt sizes and locations, piping, controls, and electrical connections to verify actual locations, sizes, and other conditions affecting water chiller performance, maintenance, and operations.
 - 1. Water chiller locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping, controls, and electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 WATER CHILLER INSTALLATION

- A. Coordinate sizes and locations of bases with actual equipment provided.

- B. Equipment Mounting:
 - 1. Install water chillers on existing, new, or extended concrete equipment bases.
 - 2. For new or extended concrete bases, comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
 - 3. Mount on factory-furnished neoprene isolators.
- C. Maintain manufacturer's recommended clearances for service and maintenance.
- D. Maintain clearances required by governing code.
- E. Chiller manufacturer's factory-trained service personnel shall charge water chiller with refrigerant if not factory charged and fill with oil if not factory installed.
- F. Install separate devices furnished by manufacturer and not factory installed.
 - 1. Chillers shipped in multiple major assemblies shall be field assembled by chiller manufacturer's factory-trained service personnel.

3.4 PIPING CONNECTIONS

- A. Comply with requirements in Section 232113 "Hydronic Piping" and Section 232116 "Hydronic Piping Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where installing piping adjacent to chillers, allow space for service and maintenance.
- C. Evaporator Fluid Connections:
 - 1. Make connections to water chiller with a mechanical coupling.
- D. Connect each drain connection with a drain valve, full size of drain connection.
- E. Connect each chiller vent connection with an automatic vent, full size of vent connection.

3.5 ELECTRICAL POWER CONNECTIONS

- A. Connect wiring according to Section 260519 "Conductors and Cables."
- B. Ground equipment according to Section 260526 "Grounding and Bonding."
- C. Provide 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.

3.6 CONTROLS CONNECTIONS

- A. Install control and electrical power wiring to field-mounted control devices.
- B. Connect control wiring between chillers and other equipment to interlock operation as required to provide a complete and functioning system.
- C. Connect control wiring between chiller control interface and BAS system for remote monitoring and control of chillers. Comply with requirements in Section 230900 "Building Automation System."

- D. Provide nameplate on face of chiller control panel indicating control equipment designation serving chiller and the I/O point designation for each control connection. Nameplate shall be laminated phenolic layers of black with engraved white letters at least 1/2 inch high.

3.7 STARTUP SERVICE

- A. Included with chillers as part of Equipment Procurement, a factory-authorized service representative shall perform startup service.
- B. Inspect field-assembled components, equipment installation, and piping and electrical connections for proper assemblies, installations, and connections.
- C. Complete installation and startup checks shall include the following:
 - 1. Verify that refrigerant charge is sufficient and water chiller has been leak tested.
 - 2. Verify that pumps are installed and functional.
 - 3. Verify that thermometers and gages are installed.
 - 4. Operate water chiller for run-in period.
 - 5. Check bearing lubrication and oil levels.
 - 6. Verify that refrigerant pressure relief device for chillers installed indoors is vented outside.
 - 7. Verify proper motor rotation.
 - 8. Verify static deflection of vibration isolators, including deflection during water chiller startup and shutdown.
 - 9. Verify and record performance of water chiller protection devices.
 - 10. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.
- D. Visually inspect chiller for damage before starting. Repair or replace damaged components, including insulation. Do not start chiller until damage that is detrimental to operation has been corrected.
- E. Prepare a written startup report that records results of tests and inspections.

3.8 DEMONSTRATION

- A. Included with chillers as part of Equipment Procurement, a factory-authorized service representative shall train Owner's maintenance personnel to adjust, operate, and maintain water chillers.
 - 1. Instructor shall be factory trained and certified.
 - 2. Train personnel in operation and maintenance and to obtain maximum efficiency in plant operation.
 - 3. Provide instructional videos showing general operation and maintenance that are coordinated with operation and maintenance manuals.
 - 4. Obtain Owner sign-off that training is complete.
 - 5. Owner training shall be held at Project site.

END OF SECTION 236423

SECTION 236426 - AIR-COOLED, ROTARY-SCREW WATER CHILLERS

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.

1.2 SUMMARY

- A. Section includes packaged, air-cooled, electric-motor-driven, rotary-screw water chillers.
- B. **Chillers are being purchased by WCPSS including delivery of chiller to site, warranty, and startup, with installation by a mechanical contractor under separate bid**

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include refrigerant, rated capacities, operating characteristics, and furnished specialties and accessories.
 - 2. Performance at AHRI standard conditions and at conditions indicated.
 - 3. Performance at AHRI standard unloading conditions.
 - 4. Minimum evaporator flow rate.
 - 5. Refrigerant capacity of water chiller.
 - 6. Oil capacity of water chiller.
 - 7. Fluid capacity of evaporator.
 - 8. Characteristics of safety relief valves.
- B. Shop Drawings: Complete set of manufacturer's prints of water chiller assemblies, control panels, sections and elevations, and unit isolation. Include the following:
 - 1. Assembled unit dimensions.
 - 2. Weight and load distribution.
 - 3. Required clearances for maintenance and operation.
 - 4. Size and location of piping and wiring connections.
 - 5. Diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Installation instructions.
- B. Startup service reports.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each water chiller to include in emergency, operation, and maintenance manuals.

- B. Spare Parts List: Recommended spare parts list with quantity for each.
- C. Touchup Paint Description: Detailed description of paint used in application of finish coat to allow for procurement of a matching paint.

1.6 QUALITY ASSURANCE

- A. AHRI Certification: Certify chiller according to AHRI 590 certification program.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Ship water chillers from the factory fully charged with refrigerant and filled with oil.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of water chillers that fail in materials or workmanship within specified warranty period.
 - 1. Extended warranties include, but are not limited to, the following:
 - a. Complete compressor and drive assembly including refrigerant and oil charge.
 - 2. Extended Warranty Period: Five years from date of Substantial Completion.

1.9 STARTUP SERVICE

- A. Include the engagement of a factory-authorized service representative to perform startup service.

1.10 DEMONSTRATION

- A. Include the engagement of a factory-authorized service representative to perform demonstration service to the Owner.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AHRI Rating: Rate water chiller performance according to requirements in AHRI 550/590.
- B. ASHRAE Compliance: ASHRAE 15 for safety code for mechanical refrigeration.
- C. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."
- D. ASME Compliance: Fabricate and stamp water chiller heat exchangers to comply with ASME Boiler and Pressure Vessel Code.
- E. Comply with NFPA 70.
- F. Comply with requirements of UL and include label by a qualified testing agency showing compliance.

2.2 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by the following: Carrier, Dunham Bush, or JCI/York.

2.3 MANUFACTURED UNITS

- A. Description: Factory-assembled and run-tested water chiller complete with compressor(s), compressor motors and motor controllers, evaporator, condenser with fans, electrical power, controls, and indicated accessories.
- B. Acoustic-reduction package shall have the following:
 - 1. Acoustic enclosure around compressors.
 - 2. Variable-speed fans with acoustic treatment.
 - 3. Designed to reduce sound level without affecting performance.
- C. Security Package: Security grilles with fasteners for additional protection of compressors, evaporator, condenser coil trim panels, and hail guards for condenser coils. Grilles, panels, and guards shall be non-corroding material or coated steel for corrosion resistance and shall be removable for service access.

2.4 CABINET

- A. Base: Galvanized-steel base extending the perimeter of water chiller. Secure frame, compressors, and evaporator to base to provide a single-piece unit.
- B. Frame: Rigid galvanized-steel frame secured to base and designed to support cabinet, condenser, control panel, and other chiller components not directly supported from base.
- C. Casing: Galvanized steel.
- D. Finish: Coat base, frame, and casing with a corrosion-resistant coating capable of withstanding a 10500-hour salt-spray test according to ASTM B 117.

2.5 COMPRESSOR-DRIVE ASSEMBLIES

- A. Screw Compressors:
 - 1. Description: Positive-displacement direct drive with hermetically sealed casing.
 - 2. Casing: Cast iron, precision machined for minimum clearance about periphery of rotors.
 - 3. Rotors: Manufacturer's standard one- or two-rotor design.
 - 4. Each compressor provided with suction and discharge service valves, crankcase oil heater, and suction strainer.
 - a. For multiple compressor assemblies, it is acceptable to isolate each refrigeration circuit in lieu of each compressor.
 - 5. Capacity Control: On-off compressor cycling and modulating slide-valve assembly or port unloaders combined with hot-gas bypass, if necessary, to achieve performance indicated.
 - a. Maintain stable operation throughout range of operation. Configure to achieve most energy-efficient operation possible.
 - b. Operating Range: From 100 to 20 percent of design capacity.
 - c. Condenser-Air Unloading over Operating Range.

6. Oil Lubrication System: Consisting of pump if required, filtration, heater, cooler, factory-wired power connection, and controls.
 - a. Provide lubrication to bearings, gears, and other rotating surfaces at all operating, startup, shutdown, and standby conditions including power failure.
 - b. Thermostatically controlled oil heater properly sized to remove refrigerant from oil.
 - c. Factory-installed and pressure-tested piping with isolation valves and accessories.
 - d. Oil compatible with refrigerant and chiller components.
 - e. Positive visual indication of oil level.
 7. Vibration Isolation: Mount individual compressors on vibration isolators.
 - a. For multiple compressor assemblies, it is acceptable to isolate each compressor assembly in lieu of each compressor.
- B. Compressor Motors:
1. Hermetically sealed and cooled by refrigerant suction gas.
 2. High-torque, induction type with inherent thermal-overload protection on each phase.
- C. Compressor Motor Controllers:
1. Variable-Frequency Controller:
 - a. Motor controller shall be factory mounted and wired on the chiller to provide a single-point, field-power termination to the chiller and its auxiliaries.
 - b. Description: NEMA ICS 2; listed and labeled as a complete unit and arranged to provide variable speed by adjusting output voltage and frequency.
 - c. Enclosure: Unit mounted, NEMA 250, Type 3R, with hinged full-front access door with lock and key.
 - d. Technology: Pulse-width-modulated output suitable for constant or variable torque loads.
 - e. Motor current at start shall not exceed the rated load amperes, providing no electrical inrush.
- 2.6 REFRIGERATION
- A. Refrigerant: R-513A, or as per manufacturer's standard.
- B. Refrigerant Compatibility: Parts exposed to refrigerants shall be fully compatible with refrigerants, and pressure components shall be rated for refrigerant pressures.
- C. Refrigerant Circuit: Each circuit shall include an electronic-expansion valve, refrigerant charging connections, a hot-gas muffler, compressor suction and discharge shutoff valves, a liquid-line shutoff valve, a replaceable-core filter-dryer, a sight glass with moisture indicator, a liquid-line solenoid valve, and an insulated suction line.
- D. Refrigerant Isolation: Factory install positive shutoff isolation valves in the compressor discharge line and the refrigerant liquid-line to allow the isolation and storage of the refrigerant charge in the chiller condenser.
 1. For multiple compressor assemblies, it is acceptable to isolate each refrigeration circuit in lieu of each compressor.
- E. Pressure Relief Device:
1. Comply with requirements in ASHRAE 15 and in applicable portions of ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
 2. ASME-rated, spring-loaded pressure relief valve; single- or multiple-reseating type.

2.7 EVAPORATOR

A. Shell and Tube design:

1. Description: Direct-expansion, shell-and-tube flooded type with fluid flowing through the tubes and refrigerant flowing around the tubes within the shell.
2. Code Compliance: Tested and stamped according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
3. Shell Material: Carbon steel.
4. Shell Heads: Removable carbon-steel heads located at each end of the tube bundle.
5. Fluid Nozzles: Terminated with mechanical-coupling end connections for connection to field piping.

B. Tube Construction: Individually replaceable copper tubes with enhanced fin design, expanded into tube sheets.

C. Flow Switch: Factory-furnished and -installed, thermal-type flow switch wired to chiller operating controls.

D. Heater: Factory-installed and -wired electric heater with integral controls designed to protect the evaporator to minus 20 deg F. If required by manufacturer, heater power circuit may be separate from the power circuit for the chiller.

2.8 AIR-COOLED CONDENSER

A. Coil(s) with integral subcooling on each circuit.

B. Copper Tube with Plate Fin Coils:

1. Construct coils of copper tubes mechanically bonded to aluminum fins.

C. **Aluminum Microchannel Coils are Not Acceptable.**

D. Hail Protection: Provide condenser coils with louvers, baffles, or hoods to protect against hail damage.

E. Fans: Direct-drive propeller type with statically and dynamically balanced fan blades, arranged for vertical air discharge.

F. Fan Motors: TENV or TEAO enclosure, with sealed and permanently lubricated bearings, and having built-in overcurrent- and thermal-overload protection.

1. Overcurrent- and thermal-overload protection not integral to motor is acceptable if provided with chiller electrical power package.
2. With variable-frequency drives for variable airflow.

G. Fan Guards: Removable steel safety guards with corrosion-resistant coating.

H. Ambient temperature operating range of 0 deg F to 115 deg F.

2.9 INSULATION

A. Closed-cell, flexible, elastomeric thermal insulation complying with ASTM C 534/C 534M, Type I for tubular materials and Type II for sheet materials.

1. Thickness: 1-1/2 inches.

- B. Adhesive: As recommended by insulation manufacturer.
- C. Factory-applied insulation over all cold surfaces of chiller capable of forming condensation. Components shall include, but not be limited to, evaporator, evaporator water boxes including nozzles, refrigerant suction pipe from evaporator to compressor, cold surfaces of compressor, refrigerant-cooled motor, and auxiliary piping.
 - 1. Apply adhesive to 100 percent of insulation contact surface.
 - 2. Before insulating steel surfaces, prepare surfaces for paint, and prime and paint as indicated for other painted components. Do not insulate unpainted steel surfaces.
 - 3. Seal seams and joints to provide a vapor barrier.
 - 4. After adhesive has fully cured, paint exposed surfaces of insulation to match other painted parts.
 - 5. Manufacturer has option to factory or field insulate chiller components to reduce potential for damage during installation.
 - 6. Field-Applied Insulation:
 - a. Components that are not factory insulated shall be field insulated to comply with requirements indicated.
 - b. Manufacturer shall be responsible for chiller insulation whether factory or field installed to ensure that manufacturer is the single point of responsibility for chillers.
 - c. Manufacturer's factory-authorized service representative shall instruct and supervise installation of field-applied insulation.
 - d. After field-applied insulation is complete, paint insulation to match factory-applied finish.

2.10 ELECTRICAL

- A. Factory installed and wired, and functionally tested at factory before shipment.
- B. Factory-installed and -wired switches, motor controllers, transformers, and other electrical devices necessary shall provide a single-point field power connection to water chiller.
- C. House in a unit-mounted, NEMA 250, Type 3R enclosure with hinged access door with lock and key or padlock and key.
- D. Wiring shall be numbered and color-coded to match wiring diagram.
- E. Factory wiring located outside of enclosure shall be in raceway. Terminal connections shall be made with not more than a 24-inch length of liquidtight or flexible metallic conduit.
- F. Field power interface shall be to circuit breaker. Minimum SCCR according to UL 508 shall be as required by electrical power distribution system and as indicated in the Chiller Schedule.
- G. Each motor shall have branch power circuit and controls with one of the following disconnecting means having SCCR to match main disconnecting means:
 - 1. NEMA KS 1, heavy-duty, non-fused switch.
- H. Each motor shall have overcurrent protection.
- I. Overload relay sized according to UL 1995, or an integral component of water chiller control microprocessor.
- J. Phase-Failure and Undervoltage: Solid-state sensing with adjustable settings.
- K. Controls Transformer: Unit-mounted transformer with primary and secondary fuses and sized with enough capacity to operate electrical load plus spare capacity.

- L. Control Relays: Auxiliary and adjustable time-delay relays, or an integral to water chiller microprocessor.
- M. Indicate the following on the Operator Display the following for water chiller electrical power supply:
 - 1. Current, phase to phase, for all three phases.
 - 2. Voltage, phase to phase and phase to neutral for all three phases.
 - 3. Three-phase real power (kilowatts).
 - 4. Three-phase reactive power (kilovolt amperes reactive).
 - 5. Power factor.
 - 6. Running log of total power versus time (kilowatt hours).
 - 7. Fault log, with time and date of each.

2.11 CONTROLS

- A. Factory installed and wired, and functionally tested at factory before shipment.
- B. Standalone, microprocessor based, with all memory stored in nonvolatile memory so that reprogramming is not required on loss of electrical power.
- C. Enclosure: Share enclosure with electrical power devices or provide a separate enclosure of matching construction.
- D. Operator Interface: Keypad or pressure-sensitive touch screen. Multiple-character, 7" color digital display. Display the following:
 - 1. Date and time.
 - 2. Operating or alarm status.
 - 3. Operating hours.
 - 4. Outside-air temperature if required for chilled-water reset.
 - 5. Temperature and pressure of operating set points.
 - 6. Chilled-water entering and leaving temperatures.
 - 7. Refrigerant pressures in evaporator and condenser.
 - 8. Saturation temperature in evaporator and condenser.
 - 9. No cooling load condition.
 - 10. Elapsed time meter (compressor run status).
 - 11. Pump status.
 - 12. Antirecycling timer status.
 - 13. Percent of maximum motor amperage.
 - 14. Current-limit set point.
 - 15. Number of compressor starts.
 - 16. Alarm history with retention of operational data before unit shutdown.
 - 17. Superheat.
- E. Control Functions:
 - 1. Manual or automatic startup and shutdown time schedule.
 - 2. Capacity control based on evaporator leaving-fluid temperature.
 - 3. Capacity control compensated by rate of change of evaporator entering-fluid temperature.
 - 4. Chilled-water entering and leaving temperatures, control set points, and motor load limit. Chilled-water leaving temperature shall be reset based on return-water temperature.
 - 5. Current limit and demand limit.
 - 6. Condenser-water temperature.
 - 7. External water chiller emergency stop.
 - 8. Antirecycling timer.
 - 9. Automatic lead-lag switching.

- F. Manual-Reset Safety Controls: The following conditions shall shut down water chiller and require manual reset:
 - 1. Low evaporator pressure or high condenser pressure.
 - 2. Low chilled-water temperature.
 - 3. Refrigerant high pressure.
 - 4. High or low oil pressure.
 - 5. High oil temperature.
 - 6. Loss of chilled-water flow.
 - 7. Loss of condenser-water flow.
 - 8. Control device failure.

- G. BAS System Interface: Factory-install hardware and software to enable system to monitor, control, and display chiller status and alarms.
 - 1. Hardwired I/O Points:
 - a. Monitoring: On/off status, common trouble alarm.
 - b. Control: On/off operation, chilled-water discharge temperature set-point adjustment.
 - c. Chiller Pump Output Relay.
 - 2. Communication Interface: ASHRAE 135 BACnet or LonTalk communication interface, as indicated in the Chiller Schedule and as coordinated with the BAS system being provided, shall enable control system operator to remotely control and monitor the water chiller from an operator workstation. Control features and monitoring points displayed locally at water chiller control panel shall be available through DDC system for HVAC.

- H. Factory-installed wiring outside of enclosures shall be in NFPA 70-complaint raceway. Make terminal connections with liquidtight or flexible metallic conduit.

2.12 ACCESSORIES

- A. Factory-furnished neoprene isolators for field installation.

2.13 SOURCE QUALITY CONTROL

- A. Perform functional test of water chillers before shipping.
- B. Factory test and inspect evaporator according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1. Stamp with ASME label.
- C. For water chillers located outdoors, rate sound power level according to AHRI 370 procedure.

PART 3 - EXECUTION

- 3.1 **This specification Section is for Equipment Procurement Package for the project. Requirements for Execution and Installation of chillers are included for reference only. Installation of chillers is part of subsequent specifications and bid package for the project.**

3.2 EXAMINATION

- A. Examine chillers upon receipt and prior to installation. Reject chillers that are damaged.

- B. Before water chiller installation, examine roughing-in for equipment support, anchor-bolt sizes and locations, piping, controls, and electrical connections to verify actual locations, sizes, and other conditions affecting water chiller performance, maintenance, and operations.
 - 1. Water chiller locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping, controls, and electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 WATER CHILLER INSTALLATION

- A. Coordinate sizes and locations of bases with actual equipment provided.
- B. Equipment Mounting:
 - 1. Install water chillers on existing, new, or extended concrete equipment bases.
 - 2. For new or extended concrete bases, comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
 - 3. Mount on factory-furnished neoprene isolators.
- C. Maintain manufacturer's recommended clearances for service and maintenance.
- D. Maintain clearances required by governing code.
- E. Chiller manufacturer's factory-trained service personnel shall charge water chiller with refrigerant if not factory charged and fill with oil if not factory installed.
- F. Install separate devices furnished by manufacturer and not factory installed.
 - 1. Chillers shipped in multiple major assemblies shall be field assembled by chiller manufacturer's factory-trained service personnel.

3.4 PIPING CONNECTIONS

- A. Comply with requirements in Section 232113 "Hydronic Piping" and Section 232116 "Hydronic Piping Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Where installing piping adjacent to chillers, allow space for service and maintenance.
- C. Evaporator Fluid Connections:
 - 1. Make connections to water chiller with a mechanical coupling.
- D. Connect each drain connection with a drain valve, full size of drain connection.
- E. Connect each chiller vent connection with an automatic vent, full size of vent connection.

3.5 ELECTRICAL POWER CONNECTIONS

- A. Connect wiring according to Section 260519 "Conductors and Cables."
- B. Ground equipment according to Section 260526 "Grounding and Bonding."

- C. Provide 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.

3.6 CONTROLS CONNECTIONS

- A. Install control and electrical power wiring to field-mounted control devices.
- B. Connect control wiring between chillers and other equipment to interlock operation as required to provide a complete and functioning system.
- C. Connect control wiring between chiller control interface and BAS system for remote monitoring and control of chillers. Comply with requirements in Section 230900 "Building Automation System."
- D. Provide nameplate on face of chiller control panel indicating control equipment designation serving chiller and the I/O point designation for each control connection. Nameplate shall be laminated phenolic layers of black with engraved white letters at least 1/2 inch high.

3.7 STARTUP SERVICE

- A. Included with chillers as part of Equipment Procurement, a factory-authorized service representative shall perform startup service.
- B. Inspect field-assembled components, equipment installation, and piping and electrical connections for proper assemblies, installations, and connections.
- C. Complete installation and startup checks shall include the following:
 - 1. Verify that refrigerant charge is sufficient and water chiller has been leak tested.
 - 2. Verify that pumps are installed and functional.
 - 3. Verify that thermometers and gages are installed.
 - 4. Operate water chiller for run-in period.
 - 5. Check bearing lubrication and oil levels.
 - 6. Verify that refrigerant pressure relief device for chillers installed indoors is vented outside.
 - 7. Verify proper motor rotation.
 - 8. Verify static deflection of vibration isolators, including deflection during water chiller startup and shutdown.
 - 9. Verify and record performance of water chiller protection devices.
 - 10. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.
- D. Visually inspect chiller for damage before starting. Repair or replace damaged components, including insulation. Do not start chiller until damage that is detrimental to operation has been corrected.
- E. Prepare a written startup report that records results of tests and inspections.

3.8 DEMONSTRATION

- A. Included with chillers as part of Equipment Procurement, a factory-authorized service representative shall train Owner's maintenance personnel to adjust, operate, and maintain water chillers.
 - 1. Instructor shall be factory trained and certified.
 - 2. Train personnel in operation and maintenance and to obtain maximum efficiency in plant operation.

3. Provide instructional videos showing general operation and maintenance that are coordinated with operation and maintenance manuals.
4. Obtain Owner sign-off that training is complete.
5. Owner training shall be held at Project site.

END OF SECTION 236426

AIR-COOLED CHILLER SCHEDULE

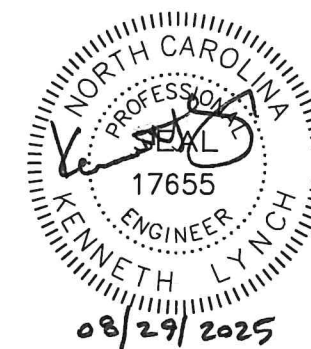
SYMBOL	CAPACITY TONS REFR. ①	EVAPORATOR				AIR COOLED COND. EAT 'F	ELECTRICAL					MIN. EFFICIENCY ③		BASIS OF DESIGN	BUILDING	REMARKS
		EW'T 'F	FLWT 'F	GPM	MAX. PD		VOLTAGE/PHASE	MCA ②	MOCP	REC FUSE SIZE	MIN. SHORT CIRCUIT/AIC RATING	FULL LOAD EER	IPLV			
CHILLER 05-1	448 ⑮	55	45	1080	27 FT ⑬	95	460V-3φ	880.9	1,200	1,000	65,000	9.2	18.1	CARRIER 30XV450S	BUILDING 5 ⑥	④⑦⑧⑨⑩⑪⑫
CHILLER 07-1	179 ⑭	55	45	425	13 FT ⑬	95	460V-3φ	371.3	400.0	400	65,000	10.2	16.0	CARRIER 30RC-1826S	BUILDING 7 ⑥	④⑦⑧⑨⑩⑪⑫
CHILLER 07-2	179 ⑭	55	45	425	13 FT ⑬	95	460V-3φ	371.3	400.0	400	65,000	10.2	16.0	CARRIER 30RC-1826S	BUILDING 7 ⑥	④⑦⑧⑨⑩⑪⑫

- ① BASED ON 0.0001 EVAPORATOR FOULING FACTOR.
- ② MINIMUM CIRCUIT AMPACITY WITH SINGLE POINT POWER CONNECTION. IF REQUIRED, PROVIDE SEPARATE 115V-1φ POWER CONNECTION FOR HEATER CIRCUITS.
- ③ PER AHRI 550/590.
- ④ SEE SECTION 236423 AND 236426 FOR CHILLER SPECIFICATION AND WARRANTY.
- ⑤ FACTORY FURNISHED WITH LON COMM CARD; CONTRACTOR TO ROUTE NEW COMM AND CONDUIT FROM CHILLER TO BUILDING DDC BAS CONTROLLER. COORDINATE WITH AND CONNECT TO EXISTING HONEYWELL INVENSYS I/A SYSTEM AND JACE.
- ⑥ FACTORY FURNISHED WITH LON COMM CARD; CONTRACTOR TO ROUTE NEW COMM AND CONDUIT FROM CHILLER TO BUILDING DDC BAS CONTROLLER. COORDINATE WITH AND CONNECT TO EXISTING INVENSYS I/A CONTROLLER.
- ⑦ ANALOG CHILLED WATER SETPOINT RESET.
- ⑧ FACTORY FURNISHED LOW SOUND OPTION INCLUDING COMPRESSOR BLANKETS.
- ⑨ SINGLE POINT POWER WITH CONTROL POWER TRANSFORMER.
- ⑩ FACTORY FURNISHED WITH SECURITY GRILLES OVER COMPRESSOR ACCESS AREA, HAIL GUARDS OVER CONDENSER COILS, AND NEOPRENE VIBRATION PADS.
- ⑪ FACTORY FURNISHED WITH REFRIGERANT CIRCUIT SUCTION AND DISCHARGE SERVICE VALVES AND SUCTION LINE INSULATION.
- ⑫ WITH ALUMINUM FIN & COPPER TUBE CONDENSER COILS, MICROCHANNEL COILS ARE NOT ACCEPTABLE.
- ⑬ WITH SHELL AND TUBE EVAPORATOR.
- ⑭ SCROLL COMPRESSORS.
- ⑮ SCREW COMPRESSORS.

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PACKAGE 9 - CHILLER REPLACEMENT
ENLOE MAGNET HIGH SCHOOL
WAKE COUNTY PUBLIC SCHOOL SYSTEM
RALEIGH, NORTH CAROLINA 27610
WCPSS PROJECT #: 862-0710/0412



DESIGNED BY	KL
DRAWN BY	KCL
CHECKED BY	KL
JOB NUMBER	25043
SHEET	M-1
OF	1
DATE	AUGUST 29, 2025