

1 of 5 **SUBMIT BID TO:**
 PROCUREMENT DEPARTMENT
 UNIVERSITY OF FLORIDA
 971 ELMORE DRIVE/PO BOX 115250
 GAINESVILLE, FL 32611-5250
 Phone: (352) 392-1335 - FAX: (352) 392-8837
 Web Address: <https://procurement.ufl.edu>

UF UNIVERSITY of FLORIDA
INVITATION TO BID
Commodity
Acknowledgment Form

Page 1 of 57 Pages		BID WILL BE OPENED 06/13/2019 at 3:30PM local time and may not be withdrawn within 45 days after such date and time. Questions are due by 05/30/2019 at 5:00PM.		BID NO. ITB19DB-129	
UNIVERSITY MAILING DATE: 05/21/2019		PROCUREMENT AGENT DB / JH		BID TITLE: IFAS Air Cooled Chillers	
VENDOR NAME					
VENDOR MAILING ADDRESS				REASON FOR NOT SUBMITTING BID	
CITY - STATE - ZIP CODE				POSTING OF BID TABULATIONS Bid tabulations with intended award(s) will be posted electronically for review by interested parties at https://procurement.ufl.edu and will remain posted for a period of 72 hours excluding Saturdays, Sundays, or state holidays. Failure to file a protest in accordance with Board of Governors (BOG) Regulation 18.002 or failure to post the bond or other security as required in the BOG regulations 18.002 and 18.003(3), shall constitute a waiver of protest proceedings.	
AREA CODE	TELEPHONE NO.				
	FAX NO.				
	WEB ADDRESS				
	EMAIL ADDRESS				

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm or person submitting a bid for the same materials, supplies, or equipment and is in all respects fair and without collusion or fraud. I agree to abide by all conditions of this bid and certify that I am authorized to sign this bid for the vendor and that the vendor is in compliance with all the requirements of the Invitation to Bid, including but not limited to, certification requirements. In submitting a bid on behalf of the Board of Trustees, hereinafter known as the University, the vendor offers and agrees that if the bid is accepted the vendor will convey, sell, assign, or transfer to the University all rights, title and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the University for price fixing relating to the particular commodities or services purchased or acquired by the University. At the University's discretion, such assignment shall be made and become

effective at the time the purchasing agency tenders final payment to the vendor.

 AUTHORIZED SIGNATURE (MANUAL)

 NAME AND TITLE (TYPED)

GENERAL CONDITIONS

SEALED BIDS: All bid sheets and this form must be executed and submitted in a sealed envelope. (DO NOT INCLUDE MORE THAN ONE BID PER ENVELOPE.) The face of the envelope shall contain, in addition to the above address, the date, and time of the bid opening and the bid number. Bids not submitted on the attached bid form shall be rejected. All bids are subject to the conditions specified herein. Those which do not comply with these conditions are subject to rejection.

1. **EXECUTION OF BID:** Bid must contain an original manual signature of authorized representative in the space provided above. Bid must be typed or printed in ink. Use of erasable ink is not permitted. All corrections to prices made by vendor must be initialed.

2. **NO BID:** If not submitting a bid, respond by returning only this vendor acknowledgment form, marking it "NO BID", and explain the reason in the space provided above. Failure to respond to a procurement solicitation without giving justifiable reason for such failure, nonconformance to contract conditions, or other pertinent factors deemed reasonable and valid shall be cause for removal of the supplier's name from the bid mailing list. NOTE: To qualify as a respondent, vendor must submit a "NO BID", and it must be received no later than the stated bid opening date and hour.

3. **BID OPENING:** Shall be public, on the date, location and the time specified on the bid form. It is the vendor's responsibility to assure that the bid is delivered at the proper time and place of the bid opening. Bids which for any reason are not so delivered will not be considered. A bid may not be altered after opening of the bids. NOTE: Bid tabulations will be posted electronically at <https://procurement.ufl.edu>. Bid tabulations will not be provided by telephone.

4. **PRICES, TERMS AND PAYMENT:** Firm prices shall be bid and will include all packing, handling, shipping charges, and delivery to the destination shown herein.

(a) **TAXES:** The University does not pay Federal Excise and Sales taxes on direct purchases of tangible personal property or services. The Florida Tax Exempt Number is 11-06-024056-57C. This exemption does not apply to purchases of tangible personal property or services made by vendors who use the tangible personal property or services in the performance of contracts for the improvement of University-owned real property as defined in Chapter 192, F.S.

(b) **DISCOUNTS:** Vendors are encouraged to reflect trade discounts in the unit prices quoted; however, vendors may offer a discount for prompt payment. Prompt payment discounts will not be considered in the bid award. However, every effort will be made to take the discount within the time offered.

(c) **MISTAKES:** Vendors are expected to examine the specifications, delivery schedule, bid prices, extensions, and all instructions pertaining to supplies and services. Failure to do so will be at vendor's risk. In case of a mistake in extensions the unit price will govern.

(d) **INVOICING AND PAYMENT:** Payment will be made by the University of Florida after the items awarded to a vendor have been received, inspected, and found to comply with award specifications, free of damage or defect and properly invoiced. All invoices shall bear the purchase order number. Payment for partial shipments shall not be made unless specified. An original invoice shall be submitted. Failure to follow these instructions may result in delay in processing invoices for payment. Payment shall be made in accordance with Section 215.422 (1) (2) F.S. **VENDOR OMBUDSMAN:** The University's vendor ombudsman, whose duties include acting as an advocate for vendors may be experiencing problems in obtaining payment from the University, may be contacted at 352-392-1241.

(e) **ANNUAL APPROPRIATIONS:** The University's performance and obligation to pay under any contract awarded is contingent upon an annual appropriation by the Legislature.

(f) **CONDITION AND PACKAGING:** It is understood and agreed that any item offered or shipped as a result of this bid shall be a new, current standard production model available at the time of this bid. All containers shall be suitable for storage or shipment, and all prices shall include standard commercial packaging.

(g) **SAFETY STANDARDS:** Unless otherwise stipulated in the bid, all manufactured items and fabricated assemblies shall comply with applicable requirements of Occupational Safety and Health Act and any standards hereunder.

5. **CONFLICT OF INTEREST:** The award hereunder is subject to the provisions of Chapter 112, F.S. All vendors must disclose with their bid the name of any officer, director, or agent who is also an employee of the University of Florida. Further, all vendors must disclose the name of any University employee who owns, directly or indirectly, an interest of five percent (5%) or more in the vendor's firm or any of its branches.

6. **AWARDS:** As the best interest of the University may require, the right is reserved to make award(s) by individual item, group of items, all or none or a combination thereof; to reject any and all bids or waive any minor irregularity or technicality in bids received. When it is determined there is no competition to the lowest responsible vendor, evaluation of other bids are not required. Vendors are cautioned to make no assumptions unless their bid has been evaluated as being responsive.

7. INTERPRETATIONS/DISPUTES: Any questions concerning conditions or specifications shall be directed in writing to Procurement Services. Inquiries must reference the date of bid opening and bid number. No interpretations shall be considered binding unless provided in writing by the University in response to requests in full compliance with this provision.

8 NOTICE OF BID PROTEST BONDING REQUIREMENT: Any person or entity who files an action protesting a decision or an intended decision pertaining to a competitive solicitation shall at the time of filing the formal protest, post with the University a bond payable to the University in an amount equal to: 10% of the estimated value of the protestor's bid or proposal; 10% of the estimated expenditure during the contract term; \$10,000.00; or whichever is less. The bond shall be conditioned upon the payment of all costs which may be adjudged against the person or entity filing the protest action. In lieu of a bond, the University may accept a cashier's check, bank official check or money order in the amount of the bond. **FAILURE OF THE PROTESTING PERSON OR ENTITY TO FILE THE REQUIRED BOND, CASHIER'S CHECK, BANK OFFICIAL CHECK OR MONEY ORDER AT THE TIME OF THE FILING THE FORMAL PROTEST SHALL RESULT IN DENIAL OF THE PROTEST.**

9. GOVERNMENTAL RESTRICTIONS: In the event any governmental restrictions may be imposed which would necessitate alteration of the material, quality, workmanship or performance of the items offered in this bid prior to their delivery, it shall be the responsibility of the successful vendor to notify the purchaser at once, indicating in writing the specific regulation which requires an alteration. The University reserves the right to accept any such alteration, including any price adjustments occasioned thereby, or to cancel the contract at no expense to the University.

10. LEGAL REQUIREMENTS: Applicable provision of all Federal, State, county and local laws, and of all ordinances, rules and regulations shall govern development, submittal and evaluation of all bids received in response hereto and shall govern any and all claims and disputes which may arise between person(s) submitting a bid response hereto and the University, by and through its officers, employees and authorized representatives, or any other person, natural or otherwise; and lack of knowledge by any vendor shall not constitute a cognizable defense against the legal effect thereof.

11. LOBBYING: Vendor is prohibited from using funds provided under any contract or purchase order for the purpose of lobbying the Legislature or any official, officer, commission, board, authority, council, committee, or department of the executive branch or the judicial branch of state government.

12. ADVERTISING: In submitting a bid, the vendor agrees not to use the results therefrom as a part of any commercial advertising. Vendor may not use the names, logos, or trademarks of the University, its employees, or affiliates without the prior written consent of the University.

13. ASSIGNMENT: Any contract or purchase order issued pursuant to this Invitation to Bid and the monies which may become due hereunder are not assignable except with the prior written approval of the purchaser.

14. LIABILITY: The vendor agrees to indemnify and save the University of Florida, the State of Florida and the Florida Board of Governors, their officers, agents, and employees harmless from any and all judgments, orders, awards, costs and expenses, including attorney's fees, and also all claims on account of damages to property, including loss of use thereof, or bodily injury (including death) which may be hereafter sustained by the vendor, its employees, its subcontractors, or the University of Florida, the State of Florida and the Florida Board of Governors, their officers, agents, or employees, or third persons, arising out of or in connection with any contract awarded and which are the result of the vendor's breach of contract or of the negligent acts of the vendor, its officers, agents, and employees. This clause does not apply to contracts between government agencies.

15. FACILITIES: The University reserves the right to inspect the vendor's facilities at any time with prior notice.

16. ADDITIONAL QUANTITIES: For a period not exceeding ninety (90) days from the date of acceptance of any offer by the University of Florida, the right is reserved to acquire additional quantities up to but not exceeding those shown on bid or the bid level at the prices bid in this invitation. If additional quantities are not acceptable, the bid sheets must be noted "BID IS FOR SPECIFIED QUANTITY ONLY".

17. SERVICE AND WARRANTY: Unless otherwise specified, the vendor shall define any warranty service and replacements that will be provided during and subsequent to this contract. Vendors must explain on an attached sheet to what extent warranty and service facilities are provided.

18. SAMPLES: Samples of items, when called for, must be furnished free of expense, on or before bid opening time and date, and if not destroyed, may upon request, be returned at the vendor's expense. Each individual sample must be labeled with vendor's name, manufacturer's brand name and number, bid number and item reference. Request for return of samples shall be accompanied by instructions which include shipping authorization and name of carrier and must be received with the bid. If instructions are not received within this time, the commodities shall be disposed of by the University.

19. INSPECTION, ACCEPTANCE AND TITLE: Inspection and acceptance will be at destination unless otherwise provided. Title and risk of loss or damage of all items shall be the responsibility of the contract supplier until accepted by the University, unless loss or damage results from negligence by the University. The contract supplier shall be responsible for filing, processing and collecting all

damage claims. However, to assist him in the expeditious handling of damage claims, the University will:

- (a) Record any evidence of visible damage on all copies of the delivering carrier's Bill of Lading.
- (b) Report damage (Visible or Concealed) to the carrier and contract supplier confirming such reports in writing within 15 days of delivery, requesting that the carrier inspect the damaged merchandise.
- (c) Retain the item and its shipping container, including inner packing material until inspection is performed by the carrier, and disposition given by the contract supplier.
- (d) Provide the contract supplier with a copy of the carrier's Bill of Lading and damage inspection report.

20. PATENTS, COPYRIGHTS, TRADEMARKS, ROYALTIES and other Intellectual Property: The vendor, without exception, shall indemnify and save harmless the University and its employees from liability of any nature or kind, including cost and expenses for or on account of any copyrighted, patented, or unpatented invention, process, or article manufactured or used in the performance of the contract, including its use by the University of Florida. If the vendor uses any design, device, or materials covered by letters, patent or copyright, it is mutually agreed and understood without exception that the bid prices shall include all royalties or costs arising from the use of such design, device, or materials in any way involved in the work.

21. CONFLICT BETWEEN DOCUMENTS: If any terms and conditions contained within the documents that are a part of this ITB or resulting contract are in conflict with any other terms and conditions contained therein, then the various documents comprising this ITB or resulting contract, as applicable, shall govern in the following order of precedence: change order, purchase order, addenda, special conditions, general conditions, specifications, departmental description of work, and bid.

22. MANUFACTURERS' NAMES AND APPROVED EQUIVALENTS: Any manufacturer's names, trade names, brand names, information and/or catalog numbers listed in a specification are for information and not intended to limit competition. If bids are based on equivalent products, indicate on the bid form the manufacturer's name and number. Vendor shall submit with the bid, cuts, sketches, and descriptive literature, and/or complete specifications. Reference to literature submitted with a previous bid will not satisfy this provision. The vendor shall also explain in detail the reasons why the proposed equivalent will meet the specifications and not be considered an exception thereto. The University of Florida reserves the right to determine acceptance of item(s) as an approved equivalent. Bids which do not comply with these requirements are subject to rejection. Bids lacking any written indication of intent to quote an alternate brand will be received and considered in complete compliance with the specifications as listed on the bid form.

23. NONCONFORMANCE TO CONTRACT CONDITIONS: Items may be tested and/or inspected for compliance with specifications by any appropriate testing facilities. Should the items fail, the University may require the vendor to reimburse the University for costs incurred by the University in connection with the examination or testing. The data derived from any tests for compliance with specifications are public records and open to examination thereto in accordance with Chapter 119, F.S. Items delivered not conforming to specifications may be rejected and returned at vendor's expense. These items and items not delivered as per delivery data in bid and/or purchase order may result in vendor being found in default in which event any and all procurement costs may be charged against the defaulting vendor. Any violation of these conditions may also result in the vendor's name being removed from the University of Florida's vendor file.

24. PUBLIC RECORDS: Any material submitted in response to this Invitation to Bid will become a public document pursuant to Section 119.07 F.S. This includes material which the responding vendor might consider to be confidential or a trade secret. Any claim of confidentiality is waived upon submission, effective after opening pursuant to Section 119.07 F.S.

25. DELIVERY: Unless actual date of delivery is specified (or if specified delivery cannot be met), show number of days required to make delivery after receipt of purchase order in space provided. Delivery time may become a basis for making an award (see Special Conditions). Delivery shall be within the normal working hours of the University of Florida, Monday through Friday, unless otherwise specified.

26. PUBLIC PRINTING - PREFERENCE GIVEN PRINTING WITHIN THE STATE: The University of Florida shall give preference to vendors located within the state when awarding contracts to have materials printed, whenever such printing can be done at no greater expense than, and at a level of quality comparable to, that obtainable from a vendor located outside of the state.

(a) **CONTRACTS NOT TO BE SUBLET:** In accordance with Class B Printing Laws and Regulations "Printing shall be awarded only to printing firms. No contract shall be awarded to any broker, agent, or independent contractor offering printing manufactured by other firms or persons."

(b) **DISQUALIFICATION OF VENDOR:** Reasonable grounds for believing that a vendor is involved in more than one bid for the same work will be cause for rejection of all bids in which such vendors are believed to be involved. Any or all bids will be rejected if there is reason to believe that collusion exists between vendors. Bids in which the prices obviously are unbalanced will be subject to rejection.

(c) **TRADE CUSTOMS:** Current trade customs of the printing industry are recognized unless accepted by Special Conditions or Specifications herein.

(d) **COMMUNICATIONS:** It is expected that all materials and proofs will be picked up and delivered by the printer or his representative, unless otherwise specified. Upon request, materials will be forwarded by registered mail.

(e) **RETURN OF MATERIAL:** All copy, photos, artwork, and other materials supplied by the University of Florida must be handled carefully and returned in good condition upon completion of the job. Such return is a condition of the contract and payment will not be made until return is affected.

END OF SECTION

NON-TECHNICAL SPECIFICATIONS

1. **AWARD** - Each lot consists of a base bid and one alternate. Each lot will be looked at independently and it will be at the University's discretion to determine whether the base bid or alternate bid will be awarded to the lowest responsive bidder or if an award will be made at all.
2. **FLORIDA PREFERENCE**—Preference for Florida Based Vendors for Purchases of Personal Property in accordance with §.287.084, Florida Statute; a preference shall be provided to vendors with a principal place of business in Florida. If the lowest responsible and responsive bid for personal property is from a vendor whose principal place of business is outside of Florida and is in a state or political subdivision thereof that grants a preference for the same purchase of personal property to a vendor in such state or political subdivision, as applicable, then the University shall grant the same preference to the Florida based vendor with the lowest responsible and responsive bid received pursuant to this Invitation to Bid.

If the lowest responsible and responsive bid is from a vendor whose principal place of business is in a state that does not grant a preference for the purchase of personal property to a vendor in such state, then the University shall grant a preference in the amount of 5 percent to the lowest and responsive Florida base vendor.

For vendors whose principal place of business is outside of Florida, such vendors must, at the time of submitting its bid, provide a written opinion from a licensed attorney in its state specifying (a) the preference(s) granted by the state or political subdivision and (b) how the preference(s) is/are calculated.

The attached Attestation of Principal Place of Business must be completed and returned with your ITB response.

3. **INQUIRIES** - The University will not give verbal answers to inquiries regarding the specifications, or verbal instructions prior to or after the award of the bid. A verbal statement regarding same by any person shall be non-binding. The University is not liable for any increased costs resulting from the Bidder accepting verbal direction. All changes, if necessary, shall be made by written addendum to the bid.

The University will make a good-faith effort to provide a written response to each question or request for clarification that requires addenda within five (5) University business days. Direct all inquiries to Debbie Berrier, Procurement Agent II, dberrier@ufl.edu.

All addenda will be posted to our web site only:
<https://www.procurement.ufl.edu/vendors/schedule.asp>

Otherwise, it will be the vendor's responsibility to check the web site for any additional information and addenda concerning this ITB.

The University will not respond to any questions/requests for clarification that require addenda, if received by the University after **05/30/2019**.

4. **BID SUBMITTAL** - In order to be considered, all bids should include a complete and signed University of Florida Invitation to Bid Commodity Acknowledgment Form, Chiller Best Value Worksheets (Base Chiller and Alternate #1 Chiller), Attestation of Principal Place of Business, and any Addenda. Submit one (1) complete original bid and one (1) electronic copy on CD/DVD or flash drive in a sealed envelope. Electronic copy must include an Excel copy of the Chiller Bid Tabulation Worksheet. The following information must be included on the outside of the envelope: bid number, date and time of bid opening, and Company name in order to be considered in the award.

BIDS ARE DUE NO LATER THAN 06/13/2019 AT 3:30 PM.

Late bids, emailed bids or faxed bids will not be accepted.

5. **BID DELIVERY** - If this bid will be mailed through the U. S. Postal Service as regular mail, address the bid to the PO Box as shown on the Invitation to Bid Acknowledgment Form.

If a company representative plans to attend the bid opening; if the bid will be hand delivered; or if the bid will be delivered by a service other than the U. S. Postal Service regular mail, i.e., Federal Express, Airborne, United Parcel Service, Courier, U. S. Postal Express Mail, etc., address the bid to the Building and room number as shown on the Invitation to Bid Acknowledgment form.

6. **OPEN COMPETITION** - The University encourages free and open competition among vendors. Whenever possible, specifications and proposal terms and conditions are designed to accomplish the objective, consistent with the necessity to satisfy the University's needs and the accomplishment of a sound economical operation. The vendor's signature on the proposal guarantees that the prices quoted have been established without collusion with other vendors and without effort to preclude the University from obtaining the lowest possible competitive price. The vendor certifies that its officers or employees have not bribed or attempted to bribe or influence in any way on officer, employee or agent of the University.
7. **CONFIDENTIALITY** - From the date of issuance of this ITB, until a proposal is made, the vendor must not make available or discuss his or her proposal, or any part thereof, with any employee or agent of the University, unless permitted by the University Purchasing Authority, in writing, for purposes of clarification only.
8. **CANCELLATION** - Orders or contracts resulting from the bid award will be subject to immediate cancellation if either the product or the service does not comply with the bid specifications.
9. **ERRORS** - The University is not liable for any errors or misinterpretations made by the proposer in responding to this Invitation to Bid.
10. **AVAILABILITY OF FUNDS** - The State of Florida's and the University's performance and obligation to pay under this contract is contingent upon an annual appropriation by the Legislature of the State of Florida.

11. **INVOICING AND PAYMENT TO CONTRACTOR** - All invoices for payment must be submitted in accordance with my UF Payment Solutions procedure found at the following site: <http://www.fa.ufl.edu/departments/university-disbursement-services/vouchers-expenditures-and-payment-processes/myuf-payment-solutions/>
12. **USE OF TERMS** - The terms University of Florida, University, IFAS and Institute of Food and Agricultural Sciences are used synonymously in this Invitation to Bid unless otherwise indicated. The terms vendor, bidder, proposer and contractor are used synonymously in this ITB unless otherwise indicated. The terms bid, response and proposal are used synonymously in this ITB unless otherwise indicated
13. **VENDOR'S EXPENSE** - All proposals submitted in response to the ITB must be submitted at the sole expense of the Vendor, whether or not any agreement is signed as a result of this Invitation to Bid. Proposers will pay all costs associated with the preparation of proposals and necessary visits to campus and other required site visits.
14. **F.O.B. POINT** - The F.O.B. point shall be destination. Exact delivery point will be indicated on the purchase order.
15. **LEAD TIME** - Provide estimated lead time on Chiller Best Value Worksheets.
16. **DELIVERY COSTS** - All costs for delivery, storage, freight, and packing are to be prepaid by the contractor.
17. **PROTECTION OF PROPERTY** - The successful bidder shall at all times guard against damage or loss to the property of the University or of other vendors or contractors and shall be held responsible for replacing or repairing any such loss or damage. The University may withhold payment or make such deductions as deemed necessary to insure reimbursement or replacement for loss or damage to property through negligence of the successful bidder or his agents. The contractor shall provide all barricades and take all necessary precautions to protect buildings and personnel.
18. **DEBRIS** - Successful bidder shall be responsible for the prompt removal of all debris which is a result of delivery, assembly, or installation.
19. **AS SPECIFIED** - A purchase order will be issued to the successful bidder with the understanding that all items delivered must meet the specifications herein. Items delivered not as specified will be returned to the vendor, at no expense to the University, and vendor will be required to deliver items meeting specifications or be held in default in accordance with General Condition #22 of this bid.
20. **WARRANTY** - Bids must include price for 10 year part and labor warranty.
21. **MAINTENANCE AND INSTRUCTION MANUALS** - The successful bidder shall include at least one copy of an instruction manual with each unit supplied. This manual shall include at

least a minimum of operating instructions, maintenance and repair information, including schematic diagrams and a list of available replacement parts.

22. MATERIAL SAFETY DATA SHEET - In accordance with Chapter 442, Florida Statutes, if this purchase order involves the shipping of any item designated as a toxic substance such shipment must be accompanied by a Material Safety Data Sheet (MSDS). A toxic substance is defined as any chemical substance or mixture in gaseous, liquid or solid state, if such substance appears on the "Florida Substance List" promulgated by the Department of Labor and Employment Security; is manufactured, produced, used, applied or stored in the workplace; and causes a significant risk to safety or health during, or as a proximate result of, any customary or reasonable foreseeable handling or use. The MSDS must be maintained by the user agency and must include the following information:

- a. The Chemical name and the common name of the toxic substance.
- b. The hazards or other risks in the use of the toxic substance, including:
 1. The potential for fire, explosion, corrosion, and reactivity.
 2. The known acute and chronic health effects of risks from exposure, including the medical conditions which are generally recognized as being aggravated by exposure to the toxic substance; and
 3. The primary routes of entry and symptoms of overexposure.
- c. The proper precautions, handling practices, necessary personal protective equipment, and other safety precautions in the use of or exposure to the toxic substances, including appropriate emergency treatment in case of overexposure.
- d. The emergency procedure for spills, fire, disposal, and first aid.
- e. A description in lay terms of the known specific potential health risks posed by the toxic substance intended to alert any person reading this information.
- f. The year and month, if available, that the information was compiled and the name, address, and emergency telephone number of the manufacturer responsible for preparing the information.

Any questions regarding this requirement should be directed to: Department of Labor and Employment Security, Bureau of Industrial Safety and Health, Toxic Waste Information Center, 2551 Executive Center Circle West, Tallahassee, Florida 32301-5014, Telephone: 1-800-367-4378.

23. INSURANCE - The Contractor shall purchase from and maintain with a company or companies, lawfully authorized to do business in Florida and acceptable to the University, such insurance as will protect the Contractor from claims arising out of or resulting from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. All insurance policies shall be issued and countersigned by representatives of such companies duly authorized for the State of Florida and shall be written on ISO standard forms or their equivalents. The Contractor shall file with the University Certificates of Insurance prior to the commencement of the work and shall file certificates of insurance evidencing the renewal of such policies at least thirty (30) days prior to the date the each applicable insurance policy is scheduled to expire. Please note that the University of Florida must be named "additional insured" on automobile and general liability policies.

Contractors Liability Insurance - The Contractor shall provide the ISO Commercial General Liability policy for general liability coverage's for limits of not less than of \$500,000 per occurrence. Coverage's shall be maintained without interruption from date of commencement of work until date of final payment.

Worker's Compensation - The Contractor shall secure and maintain for the life of this Agreement, valid Worker's Compensation Insurance as required by Chapter 440, Florida Statutes.

Automobile Liability - The Contractor shall secure and maintain during the life of this Agreement, Automobile Liability insurance on all vehicles against bodily injury and property damage in the amount of at least, \$500,000 per occurrence.

24. **PUBLIC ENTITY CRIME** - A person or affiliate who has been placed on the convicted vendor list by the Department of Management Services, State of Florida, may not submit a proposal on a contract to provide any goods or services, including construction, repairs, or leases and may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant for the University of Florida for a period of 36 months from the date of being placed on the convicted vendor list, a "person" or "affiliate" includes any natural person or any entity, including predecessor or successor entities or any entity under the control of any natural person who is active in its management and who has been convicted of a public entity crime (Rule 6C1-3.020 FAC).
25. **FEDERAL DEBARMENT** - By signing this bid/proposal, the offeror certifies, to the best of its knowledge or belief, that the offeror and its principals are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency; or have not within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them in connection with a public contract or subcontract; or are not criminally or civilly charged by a governmental entity with commission of offenses; or has not within a three year period preceding this offer had a contract terminated for default by any Federal agency. (Federal Acquisition Regulation 52.209-5).
26. **DISCRIMINATION** - An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid on a contract to provide goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not award or perform work as a contractor, supplier, subcontractor or consultant under contract with any public entity, and may not transact business with any public entity.
27. **EQUAL OPPORTUNITY STATEMENT** - The State Universities have established equal opportunity practices which conform to both the spirit and the letter of all laws against discrimination and prohibits discrimination based on race, creed, color, sex, age, national origin, marital status or religion. To be considered for inclusion as a supplier under this agreement, the proposer commits to the following:

- a. The provisions of Executive Order 11246, September 24, 1966, and the rules, regulations and relevant orders of the Secretary of Labor are applicable to each order placed against this agreement regardless of value.
- b. If the proposer expects to receive \$10,000 in orders during the first 12 months of this agreement, a complete certificate of non-segregated facilities shall be attached to the proposal response.
- c. If the proposer expects to receive \$50,000 in orders during the first 12 months of this agreement and employs more than 50 people, standard form 100 (EEOO-1) must be filed prior to March 1 of each year.
- d. If the proposer expects to receive \$50,000 in orders during the first 12 months and employs more than 50 people, a written program for affirmative action compliance must be maintained by the proposer, subject to review upon request by the user agencies of this agreement.

28. SMALL BUSINESS PROGRAM - University is an equal opportunity institution and, as such, encourages the use of small businesses, including women and minority-owned small businesses in the provision of goods and services. Small businesses should have a fair and equal opportunity to compete for dollars spent by the University. Competition ensures that prices are competitive and a broad vendor base is available. Vendor shall use good faith efforts to ensure opportunities are available to small businesses, including women and minority-owned businesses. For questions about the University's Small Business Program contact Kathey Porter, Director of Small Business and Vendor Diversity, 352-392-0380.

29. AMERICANS WITH DISABILITY ACT - If special accommodations are needed in order to attend the bid opening, contact Procurement Services at 352-392-1335 or procurement@ufl.edu, three business days prior to the event.

30. NOTICE TO CONTRACTOR - The University shall consider the employment by any contractor of unauthorized aliens a violation of section 274A(e) of the Immigration and Nationality Act. Such violation shall be cause for unilateral cancellation of this contract.

31. CONTRACTOR SHALL IMPLEMENT - a drug-free workplace program in accordance with the requirements of Section 440.102, Florida Statutes.

32. TOBACCO-FREE CAMPUS POLICY - As of July 1, 2010 the University of Florida campus has been tobacco-free. The use of cigarettes or other tobacco products in UF buildings, parking lots, or in vehicles in these areas is prohibited. The successful vendor is expected to respect this smoke free policy and fully comply with it.

Attestation of Principal Place of Business
University of Florida ITB19DB-129, IFAS Air Cooler Chillers

Name of Bidder: _____ Business Name: _____

Identify the State in which the Bidder has its principal place of business: _____

Bidder's Signature: _____ Title: _____

INSTRUCTIONS: IF your principal place of business above is located within the State of Florida, provide the information as indicated above and return this form with your bid response. No further action is required. IF your principal place of business is outside of the State of Florida, the following must be completed by an attorney and returned with your bid response. Failure to comply may be considered as non-responsive to the terms of this solicitation.

OPINION OF OUT-OF-STATE BIDDER'S ATTORNEY ON BIDDING PREFERENCES
(To be completed by the Attorney for an Out-of-State Bidder)

NOTICE: §287.084(2), Florida Statutes, provides that "a vendor whose principal place of business is outside this state must accompany any written bid, proposal, or reply documents with a written opinion of an attorney at law licensed to practice law in that foreign state, as to the preferences, if any or none, granted by the law of that state [or political subdivision thereof] to its own business entities whose principal places of business are in that foreign state in the letting of any or all public contracts." See also § 287.084(1), Florida Statutes.

LEGAL OPINION ABOUT STATE BIDDING PREFERENCES
(Please Select One)

_____ The Bidder's principal place of business is in the State of _____ and it is my legal opinion that the laws of that state **do not grant a preference** in the letting of any or all public contracts to business entities whose principal places of business are in that state.

_____ The Bidder's principal place of business is in the State of _____ and it is my legal opinion that the laws of that state **grant the following preference(s)** in the letting of any or all public contracts to business entities whose principal places of business are in that State: [Please describe applicable preference(s) and identify applicable state law(s)]:

LEGAL OPINION ABOUT POLITICAL SUBDIVISION BIDDING PREFERENCES
Please Select One)

_____ The Bidder's principal place of business is in the political subdivision of _____ and it is my legal opinion that the laws of that political subdivision **do not grant a preference** in the letting of any or all public contracts to business entities whose principal places of business are in that political subdivision.

_____ The Bidder's principal place of business is in the political subdivision of _____ and it is my legal opinion that the laws of that political subdivision **grant the following preferences(s)** in the letting of any or all public contracts to business entities whose principal places of business are in that political subdivision: [Please describe applicable preference(s) and identify applicable authority granting the preference(s)]:

Signature of out-of-state Bidder's attorney: _____

Printed name of out-of-state Bidder's attorney: _____

Address of out-of-state Bidder's attorney: _____

Telephone number of out-of-state Bidder's attorney: (_____) _____ - _____

Email address of out-of-state Bidder's attorney: _____

Attorney's states of bar admission: _____

Lot 1:
Fort Pierce:
UF IFAS Fort Pierce - Building 7305 Chiller Expansion

Bid must include price for 10 year parts and labor warranty to be considered responsive.

The Base Bid shall include chillers that, based on the Application Specific Part Load Value (ASPLV) calculation below, produce the same or lower ASPLV number than the target ASPLV number.

Bids must meet both the minimum efficiency specified and must not exceed the maximum allowable dimensions to be considered

Base Chiller and Alternate #1 Chiller worksheet must be completed to be considered



Institute of Food & Agricultural Sciences
Chiller Expansion Building 7305
Fort Pierce, Florida

IFAS Project No. 18066
Phase: Early Chiller Package

Issued: April 25, 2019



H2Engineering, Inc.

Tallahassee 850.244.7922 | Gainesville 352.888.5872

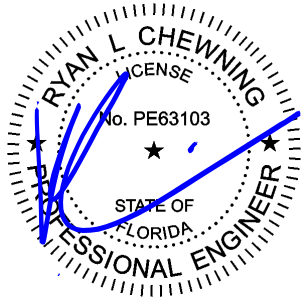
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Early Chiller Package

Ryan L. Chewning, P.E.
#63103



This item has been electronically signed and sealed by **Ryan L. Chewning, P.E.** on the date indicated using a Digital Signature.

2019.05.02 16:44:19-04'00'

Printed copies of this document are not considered signed and sealed, and the signature must be verified on any electronic copies.

Section 1

Chiller Best Value Worksheet



LOT 1**BASE CHILLER****BEST VALUE WORKSHEET**

The Owner intends to direct purchase the chiller specified and scheduled herein with the goal of “Best Value” considering first cost and operating costs. Any award made will be based on the lowest cost/Best Value Cost (A+B):

- A. Chiller Cost: This is your bid, including freight, and all work described herein.

The bid price shall include factory startup per Section 236426.13, and the 10 year parts and labor warranty per Section 236426.13. Do not include sales tax.

This is your traditional bid price.

\$ _____

- B. Operating Cost: Bids not meeting the minimum efficiency specified will be considered non-responsive. However, the Owner will also consider the value of better efficiencies. Submit performance data, including part load performance, with your bid. Use the indicated ambient air temperatures for all calculations. Use 44 °F chilled water supply temperature and scheduled evaporator water flow rates. Calculate your 10 year operating cost as follows:

Capacity	
200T (100%) x _____ kW/ton (@ 95 °F) x 797 hrs x \$0.1375/kWh x 7.024	\$ _____
150T (75%) x _____ kW/ton (@ 80 °F) x 6,082 hrs x \$0.1375/kWh x 7.024	\$ _____
100T (50%) x _____ kW/ton (@ 65 °F) x 1,600 hrs x \$0.1375/kWh x 7.024	\$ _____
50T (25%) x _____ kW/ton (@ 55 °F) x 266 hrs x \$0.1375/kWh x 7.024	\$ _____

Best Value Cost = \$A + \$B = \$ _____

- C. Lead Time: Include estimated lead time for chiller delivery (weeks) _____

LOT 1**ALTERNATE #1 CHILLER****BEST VALUE WORKSHEET**

The Owner intends to direct purchase the chiller specified and scheduled herein with the goal of “Best Value” considering first cost and operating costs. Any award made will be based on the lowest cost/Best Value Cost (A+B):

- A. Chiller Cost: This is your bid, including freight, and all work described herein. The bid price shall include factory startup per Section 236426.13, and the 10 year parts and labor warranty per Section 236426.13. Do not include sales tax. This is your traditional bid price.

\$ _____

- B. Operating Cost: Bids not meeting the minimum efficiency specified will be considered non-responsive. However, the Owner will also consider the value of better efficiencies. Submit performance data, including part load performance, with your bid. Use the indicated ambient air temperatures for all calculations. Use 44 °F chilled water supply temperature and scheduled evaporator water flow rates. Calculate your 10 year operating cost as follows:

Capacity		
200T (100%)	x _____ kW/ton (@ 95 °F) x 797 hrs x \$0.1375/kWh x 7.024	\$ _____
150T (75%)	x _____ kW/ton (@ 80 °F) x 6,082 hrs x \$0.1375/kWh x 7.024	\$ _____
100T (50%)	x _____ kW/ton (@ 65 °F) x 1,600 hrs x \$0.1375/kWh x 7.024	\$ _____
50T (25%)	x _____ kW/ton (@ 55 °F) x 266 hrs x \$0.1375/kWh x 7.024	\$ _____

Best Value Cost = \$A + \$B = \$ _____

- C. Lead Time: Include estimated lead time for chiller delivery (weeks)

Section 2

Technical Specifications



SECTION 230120 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Engineer's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
- C. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., B7124-061000.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Engineer.
 4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Names of subcontractor, manufacturer, and supplier.
 - h. Category and type of submittal.

- i. Submittal purpose and description.
 - j. Specification Section number and title.
 - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - l. Drawing number and detail references, as appropriate.
 - m. Location(s) where product is to be installed, as appropriate.
 - n. Related physical samples submitted directly.
 - o. Indication of full or partial submittal.
 - p. Transmittal number, numbered consecutively.
 - q. Submittal and transmittal distribution record.
 - r. Other necessary identification.
 - s. Remarks.
- 5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- D. Options: Identify options requiring selection by Engineer.
- E. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- F. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- G. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- H. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 1. Post electronic submittals as PDF electronic files directly to Engineer's FTP site specifically established for Project. Electronic submittals shall be small enough (5MB or less) to be emailed for UF IFAS review.
 - a. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm) . Sheets sizes of 11 by 17 inches or 24 by 36 inches are preferred by the Owner.
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineers and owners, and other information specified.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- G. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

- A. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Engineer without action.
- F. Submittals on any particular phase of Work will receive only one review and one re-review (if required). If additional reviews are required beyond these two, the Contractor will be charged \$100.00 per hour for review time. This fee shall be paid to the Engineer prior to Submittal release.

END OF SECTION 230120

SECTION 230150 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 230120 "Submittal Procedures."
 - b. Use product specified if Engineer does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 230120 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 - 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
 - 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 - 4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.

- b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
- 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Selection Specification: Where Specifications include the phrase "as selected by Engineer from manufacturer's full range" or similar phrase, select a product that complies with requirements. Engineer will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners, if requested.
 - 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 230150

SECTION 236426.13 - 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:
 - 1. Packaged, air-cooled chillers.

1.3 DEFINITIONS

- A. BAS: Building automation system.
- B. COP: Coefficient of performance. The ratio of the rate of heat removal to the rate of energy input using consistent units for any given set of rating conditions.
- C. DDC: Direct digital control.
- D. EER: Energy-efficiency ratio. The ratio of the cooling capacity given in terms of Btu/h to the total power input given in terms of watts at any given set of rating conditions.
- E. IPLV: Integrated part-load value. A single-number part-load efficiency figure of merit calculated per the method defined by AHRI 550 / 590 and referenced to AHRI standard rating conditions.
- F. kW/Ton (kW/kW): The ratio of total power input of the chiller in kilowatts to the net refrigerating capacity in tons (kW) at any given set of rating conditions.
- G. NPLV: Nonstandard part-load value. A single-number part-load efficiency figure of merit calculated per the method defined by AHRI 550/590 and intended for operating conditions other than AHRI standard rating conditions.

1.4 PERFORMANCE REQUIREMENTS

- A. Site Altitude: Chiller shall be suitable for altitude in which installed without affecting performance indicated. Make adjustments to affected chiller components to account for site altitude.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include refrigerant, rated capacities, operating characteristics, 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 chiller.
6. Oil capacity of chiller.
7. Fluid capacity of evaporator.
8. Characteristics of safety relief valves.
9. Minimum entering condenser-air temperature.
10. Maximum entering condenser-air temperature.
11. Performance at varying capacities with constant-design, entering condenser-air temperature. Repeat performance at varying capacities for different entering condenser-air temperatures from design to minimum in 10 deg F (6 deg C) increments.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

1.6 INFORMATIONAL SUBMITTALS

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

B. Source quality-control reports.

C. Field Test Reports: Include startup service reports.

D. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each chiller to include in emergency, operation, and maintenance manuals. Provide both electronic copy in PDF and hard copy.

1.8 QUALITY ASSURANCE

A. AHRI Certification: Certify chiller according to AHRI 590 certification program(s).

- B. AHRI Rating: Rate chiller performance according to requirements in AHRI 550/590.
- C. ASHRAE/IES Compliance: Applicable requirements in ASHRAE/IES 90.1.
- D. ASME Compliance: Fabricate and label chiller to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, and include an ASME U-stamp and nameplate certifying compliance.
- E. Comply with NFPA 70.
- F. Comply with requirements of UL and UL Canada and include label by a qualified testing agency showing compliance.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Ship chillers from the factory fully charged with refrigerant.
- B. Ship each oil-lubricated chiller with a full charge of oil.
 - 1. Ship oil factory installed in chiller.
- C. Deliver chiller to Building 7305, Fort Pierce, Florida. Chiller start-up shall be conducted on site at Building 7305, Fort Pierce, Florida. Coordinate chiller delivery with UF IFAS Project Manager, Construction Manager Project Manager, and Mechanical Sub-Contractor.

1.10 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases.
- B. Coordinate sizes, locations, and anchoring attachments of structural-steel support structures.
- C. Coordinate sizes and locations of equipment supports with actual equipment provided.
- D. Coordinate chiller delivery and start-up with UF IFAS Project Manager, Construction Manager Project Manager, and Mechanical Sub-Contractor.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of chillers that fail in materials or workmanship within specified warranty period. Manufacturer shall include a full, no exclusions or exceptions, warranty from date of Substantial Completion.
 - 1. Extended warranty covering entire chiller, including but are not limited to, the following:
 - a. Complete chiller “bumper to bumper” including refrigerant and oil charge (100% coverage; no exclusions or exceptions).
 - b. Condenser coil.

- c. Fans and fan motors.
 - d. Control boards, wiring, etc.
 - e. Variable frequency drives.
 - f. Complete compressor and drive assembly.
 - g. Parts and labor.
 - h. Loss of refrigerant charge for any reason.
2. Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PACKAGED, AIR-COOLED CHILLERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
- 1. Carrier Corporation; a United Technologies company.
 - 2. Trane; a division of American Standard.
 - 3. YORK International Corporation.
- B. Description: Factory-assembled and run-tested chiller complete with base and frame, condenser casing, compressors, compressor motors and motor controllers, evaporator, condenser coils, condenser fans and motors, electrical power, controls, and accessories.
- C. Cabinet:
- 1. Base: Galvanized-steel base extending the perimeter of chiller. Secure frame, compressors, and evaporator to base to provide a single-piece unit.
 - 2. Frame: Rigid galvanized-steel frame secured to base and designed to support cabinet, condenser, control panel, and other chiller components not directly supported by base.
 - 3. Casing: Galvanized steel.
 - 4. Finish: Coat base, frame, and casing with a corrosion-resistant coating capable of withstanding a 500-hour salt-spray test according to ASTM B 117.
 - 5. Sound-reduction package designed to reduce sound level without affecting performance and consisting of the following:
 - a. Acoustic enclosure around compressors.
 - 6. Security Package: Provide removable grilles with fasteners for additional protection of compressors, evaporator, and condenser coils without inhibiting service access. Finish to match cabinet.
- D. Compressors:
- 1. Description: Positive displacement, hermetically sealed.
 - 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 shutoff valves, crankcase oil heater, and suction strainer.
- E. Service: Easily accessible for inspection and service.
- F. Capacity Control: Variable frequency drive to achieve performance indicated.
1. Maintain stable operation throughout range of operation. Configure to achieve most energy-efficient operation possible.
 2. Operating Range: From 100 to 20 percent of design capacity.
 3. Condenser-Air Unloading Requirements over Operating Range: Drop-in, entering condenser-air temperature of 5 deg F (3 deg C) drop for each 10 percent in capacity reduction.
 4. Capacity control shall be both "valveless" and "stepless," requiring no slide valve or capacity-control valve(s) to operate at reduced capacity.
- G. Oil Lubrication System: Consisting of pump if required, filtration, heater, cooler, factory-wired power connection, and controls.
1. Provide lubrication to bearings, gears, and other rotating surfaces at all operating, startup, shutdown, and standby conditions including power failure.
 2. Thermostatically controlled oil heater properly sized to remove refrigerant from oil.
 3. Factory-installed and pressure-tested piping with isolation valves and accessories.
 4. Oil compatible with refrigerant and chiller components.
 5. Positive visual indication of oil level.
 6. Service valve for oil filter.
- H. Vibration Control:
1. Vibration Balance: Balance chiller compressors and drive assemblies to provide a precision balance that is free of noticeable vibration over the entire operating range.
 - a. Over-speed Test: 25 percent above design operating speed.
 2. Isolation: Mount individual compressors on vibration isolators.
- I. Compressor Motors:
1. Hermetically sealed and cooled by refrigerant suction gas.
 2. High-torque, induction type with inherent thermal-overload protection on each phase.
- J. 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. Integral Disconnecting Means: Door-interlocked, UL 489, instantaneous-trip circuit breaker with lockable handle. Minimum withstand rating shall be as required by electrical power distribution system, but not less than 65,000 A.
- e. Technology: Pulse-width-modulated output suitable for constant or variable torque loads.
- f. Motor current at start shall not exceed the rated load amperes, providing no electrical inrush.

K. Refrigerant Circuits:

- 1. Refrigerant Type: R-134a or any HFC. Classified as Safety Group A1 according to ASHRAE 34.
- 2. Refrigerant Compatibility: Chiller parts exposed to refrigerants shall be fully compatible with refrigerants, and pressure components shall be rated for refrigerant pressures.
- 3. Refrigerant Circuit: Each shall include a thermal- or 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.
- 4. Pressure Relief Device:
 - a. Comply with requirements in ASHRAE 15 and in applicable portions of ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
 - b. ASME-rated, spring-loaded pressure relief valve; single- or multiple-reseating type.

L. Evaporator:

- 1. Description: Shell-and-tube design.
 - a. Flooded type with fluid flowing through tubes and refrigerant flowing around 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 flanged end connections for connection to field piping.
- 6. Tube Construction: Individually replaceable copper tubes with enhanced fin design, expanded into tube sheets.
- 7. Heater: Factory-installed and -wired electric heater with integral controls designed to protect the evaporator to minus 20 deg F (minus 29 deg C).

M. Air-Cooled Condenser:

- 1. Plate-fin coil with integral sub-cooling on each circuit, rated at 450 psig (3103 kPa).
 - a. Construct coil casing of galvanized steel.

- b. Condenser coils shall be microchannel type, parallel flow aluminum alloy tubes brazed as one piece. Coils shall be made of single material to avoid galvanic corrosion.
 - c. Coat coils with a factory applied, baked-epoxy electro cathodic dipped corrosion-resistant coating after fabrication.
- 2. Fans: Direct-drive propeller type with statically and dynamically balanced fan blades, arranged for vertical air discharge.
- 3. Fan Motors: Totally enclosed non-ventilating or totally enclosed air over enclosure, with permanently lubricated bearings. Equip each motor with overload protection integral to either the motor or chiller controls.
- 4. Fan Guards: Steel safety guards with corrosion-resistant coating.

N. Electrical Power:

- 1. Factory-installed and -wired switches, motor controllers, transformers, and other electrical devices necessary shall provide a single-point, field-power connection to chiller.
- 2. House in a unit-mounted, NEMA 250, Type 3R enclosure with hinged access door.
- 3. Wiring shall be numbered and color-coded to match wiring diagram.
- 4. Install factory wiring outside of an enclosure in a raceway.
- 5. Field-power interface shall be to NEMA AB 1, instantaneous-trip circuit breaker with lockable handle.
 - a. Disconnect means shall be interlocked with door operation.
 - b. Minimum withstand rating shall be as required by electrical power distribution system, but not less than 65,000 A.
- 6. Provide branch power circuit to each motor and to controls with one of the following disconnecting means:
 - a. NEMA AB 1, motor-circuit protector (circuit breaker) with field-adjustable, short-circuit-trip set point.
- 7. Provide each motor with overcurrent protection.
- 8. Overload relay sized according to UL 1995 or an integral component of chiller control microprocessor.
- 9. Phase-Failure and Under-voltage Relays: Solid-state sensing with adjustable settings.
- 10. Provide power factor correction capacitors to correct power factor to 0.95 at full load.
- 11. Control Transformer: Unit-mounted transformer with primary and secondary fuses and sized with enough capacity to operate electrical load plus spare capacity.
 - a. Power unit-mounted controls where indicated.
- 12. Control Relays: Auxiliary and adjustable time-delay relays.
- 13. For chiller electrical power supply, indicate the following:
 - a. Current and phase to phase for all three phases.
 - b. Voltage, phase to phase, and phase to neutral for all three phases.
 - c. Three-phase real power (kilowatts).

- d. Three-phase reactive power (kilovolt amperes reactive).
- e. Power factor.
- f. Running log of total power versus time (kilowatt-hours).
- g. Fault log, with time and date of each.

O. Controls:

1. Standalone and microprocessor based.
2. Enclosure: Share enclosure with electrical power devices or provide a separate enclosure.
3. Operator Interface: Multiple-character digital or graphic display with dynamic update of information and with keypad or touch-sensitive display located on front of control enclosure. In either imperial or metric units, display the following information:
 - a. Date and time.
 - b. Operating or alarm status.
 - c. Operating hours.
 - d. Outdoor-air temperature if required for chilled-water reset.
 - e. Temperature and pressure of operating set points.
 - f. Entering and leaving temperatures of chilled water.
 - g. Refrigerant pressures in evaporator and condenser.
 - h. Saturation temperature in evaporator and condenser.
 - i. No cooling load condition.
 - j. Elapsed time meter (compressor run status).
 - k. Pump status.
 - l. Anti-recycling timer status.
 - m. Percent of maximum motor amperage.
 - n. Current-limit set point.
 - o. Number of compressor starts.
4. Control Functions:
 - a. Manual or automatic startup and shutdown time schedule.
 - b. Entering and leaving chilled-water temperatures, control set points, and motor load limits. Current limit and demand limit.
 - c. External chiller emergency stop.
 - d. Anti-recycling timer.
 - e. Automatic lead-lag switching.
 - f. Variable evaporator flow.
5. Reset Safety Controls: The following conditions shall shut down chiller and require reset as indicated below:
 - a. Low evaporator pressure or high condenser pressure (three times then lock out).
 - b. Low chilled-water temperature (soft reset).
 - c. Refrigerant high pressure (soft reset).
 - d. High or low oil pressure (reset over time delay).
 - e. High oil temperature (reset over time delay).
 - f. Loss of chilled-water flow (auto reset).
 - g. Control device failure.

6. Trending: Capability to trend analog data of up to five parameters simultaneously over an adjustable period and frequency of polling.
7. Security Access: Provide electronic security access to controls through identification and password with at least three levels of access: view only; view and operate; and view, operate, and service.
8. Control Authority: At least two conditions: Off and automatic control through a remote source.
9. Interface with DDC System for HVAC: Factory-installed hardware and software to enable the DDC system for HVAC to monitor, control, and display chiller status and alarms.
 - a. Hardwired Points:
 - 1) Monitoring: On-off status, common trouble alarm, circuit #1 trouble alarm, circuit #2 trouble alarm.
 - 2) Control: On-off operation, circuit #1 on-off operation, circuit #2 on-off operation, chilled-water, discharge temperature set-point adjustment, electrical power demand limit.
 - b. ASHRAE 135 (BACnet) communication interface with the DDC system for HVAC shall enable the DDC system for HVAC operator to remotely control and monitor the chiller from an operator workstation. Monitoring points displayed locally at chiller control panel shall be available through the DDC system for HVAC.

P. Insulation:

1. Evaporator heat exchanger shall be uninsulated. Insulation will be field applied by Others.
2. All other chiller components shall be insulated as follows:
 - a. Provide closed-cell, flexible, UV protected, thermal insulation complying with ASTM C 534 Type 2 for preformed flexible elastomeric cellular thermal insulation in sheet and tubular form. The thickness shall be 1-1/2".

Q. Accessories:

1. Factory-furnished, chilled-water differential pressure switches for field installation.
2. Individual compressor suction and discharge pressure gages with shutoff valves for each refrigerant circuit.
3. Tool Kit: Chiller manufacturer shall assemble a tool kit specially designed for use in serving the chiller(s) furnished. Include special tools required to service chiller components not readily available to Owner service personnel in performing routine maintenance. Place tools in a lockable case with hinged cover. Provide a list of each tool furnished and attach the list to underside of case cover.
4. Vibration Isolation:
 - a. Chiller manufacturer shall furnish vibration isolation.
 - b. Double-Deflection, Elastomeric Isolation Mounts (York or Mason Industries Inc; Type ND-DS):

- 1) 4-inch Mounting Plates:
 - a) Top Plate: Encapsulated steel load transfer top plates, factory drilled and threaded with threaded studs or bolts.
 - b) Baseplate: Encapsulated steel bottom plates with holes provided for anchoring to support structure.
- 2) Elastomeric Material: Molded, oil-resistant rubber, neoprene, or other elastomeric material

R. Capacities and Characteristics:

1. Low Ambient Operation: Chiller designed for operation to 0 deg F (minus 18 deg C).
2. High Ambient Operation: Chiller designed for operation to 115 deg F (46 deg C).
3. Evaporator:
 - a. Configuration: Integral to chiller.
 - b. Pressure Rating: 150 psig (1034 kPa).
 - c. Fouling Factor: 0.0001 sq. ft. x h x deg F/Btu (0.000018 sq. m x deg C/W).
4. Number of Refrigerant Circuits: Each compressor on an independent circuit.
5. Control Electrical Requirements:
 - a. Power Connection: Fed through integral transformer.
 - b. Power Input: 600 Watts.
 - c. Minimum Circuit Ampacity: 6 Amps.
 - d. Maximum Overcurrent Protection Device: 20 Amps.
 - e. Volts: 120-V ac.
 - f. Phase: Single.
 - g. Hertz: 60.

2.2 SOURCE QUALITY CONTROL

- A. Perform functional tests of chillers before shipping. Provide documentation of functional tests at delivery of unit.
- B. Factory run test each air-cooled chiller with water flowing through evaporator.
- C. Factory test and inspect evaporator according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
- D. For chillers located outdoors, rate sound power level according to AHRI 370.

PART 3 - EXECUTION

3.1 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify that refrigerant charge is sufficient and chiller has been leak tested.
 - 3. Verify that pumps are installed and functional.
 - 4. Verify that thermometers and gages are installed.
 - 5. Operate chiller for run-in period.
 - 6. Check bearing lubrication and oil levels.
 - 7. Verify proper motor rotation.
 - 8. Verify static deflection of vibration isolators, including deflection during chiller startup and shutdown.
 - 9. Verify and record performance of fluid flow and low-temperature interlocks for evaporator and condenser.
 - 10. Verify and record performance of chiller protection devices.
 - 11. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.
 - 12. Verify, adjust as necessary, and record all final chiller internal control settings.
- B. Inspect field-assembled components, equipment installation, and piping and electrical connections for proper assembly, installation, and connection.
- C. Prepare test and inspection startup reports.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain chillers. Video record the training sessions.

END OF SECTION 236426.13

Section 3

Air Cooled Rotary Screw Chiller Schedule



AIR COOLED CHILLER SCHEDULE (OFCI)				
DESIGNATION			CH-2 ALTERNATE #1	CH-2 BASE BID
	MINIMUM NOMINAL CAPACITY	TONS	200	200
	OPERATING CAPACITY	TONS	175	175
	OPERATING TURN DOWN	%	16% - 100%	16% - 100%
	RETURN WATER TEMPERATURE	°F	54	54
	SUPPLY WATER TEMPERATURE	°F	44	44
	EFFICIENCY	EER/IPLV	11.83/20.4	11.49/19.88
	AIR ENTERING CONDENSER	°F	95	95
	OPERATING CHILLED WATER FLOW	GPM	418	418
	WATER PRESSURE DROP	FT.	19.4	19.4
	CHILLER FOULING FACTOR		0.0001	0.0001
UNIT DATA				
	NUMBER OF COMPRESSORS	#	2	2
	NUMBER OF FANS	#	14	12
	UNIT CAPACITY STEPS		VARIABLE	VARIABLE
	COMPRESSOR STARTER TYPE		VFD	VFD
	REFRIGERANT TYPE		R-134A	R-134A
	OPERATING WEIGHT	LBS	18,608	17,763
ELECTRICAL DATA				
	MINIMUM CIRCUIT AMPACITY	AMPS	335	345
	MAX. OVERCURRENT PROTECTION	AMPS	450	450
	ELECTRICAL CHARACTERISTICS	V/PH	460/3	460/3
MAXIMUM TOTAL UNIT KILOWATTS		KW	177.6	182.8
MANUFACTURER			YORK	YORK
MODEL NUMBER			YVAA0218	YVAA0215
NOTES (PROVIDE THE FOLLOWING OPTIONS): 1. PROVIDE VARIABLE SPEED CONTROL FOR EACH COMPRESSOR AND CONDENSER FAN ARRAY VIA VFD. 2. PROVIDE SEACOAST CONSTRUCTION WITH CORROSION RESISTANT BAKED-EPOXY, FACTORY APPLIED ELECTRO CATHODIC DIPPED COATING ON CONDENSER COIL. 3. PROVIDE 120V/1 PHASE POWER CONNECTION FOR EVAPORATOR HEAT TAPE. 4. PROVIDE 4" HIGH DOUBLE DEFLECTION MOLDED DURULINE VIBRATION ISOLATORS. 5. PROVIDE FULL EQUIPMENT WARRANTY WITH NO EXCLUSIONS. SEE SPECIFICATIONS. 6. PROVIDE SINGLE POINT POWER. 7. SUBMIT PERFORMANCE DATA AT 44 DEG F LWT (AS SCHEDULED) AND 49 DEG F LWT.				

**UF IFAS - FORT PIERCE -
CHILLER EXPANSION
BUILDING 7305**

UF | IFAS
UNIVERSITY of FLORIDA

DESCRIPTION

EARLY CHILLER PACKAGE

**DATE: 4-25-19
SCALE: N.T.S.**



ENGINEERING
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TALLAHASSEE, FL 32303
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Lot 2:
Fort Lauderdale:
UF IFAS Fort Lauderdale Recreational Education Center

Bid must include price for 10 year parts and labor warranty to be considered responsive.

The Base Bid shall include chillers that, based on the Application Specific Part Load Value (ASPLV) calculation below, produce the same or lower ASPLV number than the target ASPLV number.

Bids must meet both the minimum efficiency specified and must not exceed the maximum allowable dimensions to be considered

Base Chiller and Alternate #1 Chiller worksheet must be completed to be considered



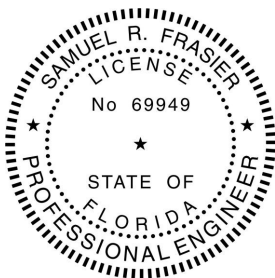
IFAS FLREC Chiller
IFAS Project No. 19034

for

IFAS Facilities Operations
Building 124, Mowry Road
University of Florida
Gainesville, Florida 32611

Project Manual
Chiller Equipment Bid Package
April 30, 2019

Moses Engineering
2209 NW 40th Terrace, Suite A
Gainesville, FL 32605
FL License EB-3097
Moses Project No. 18269



This item has been electronically signed and sealed by Samuel R. Frasier, PE on 05/06/2019 using a Digital Signature.

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TAB 1



DELIVERING INNOVATIVE SOLUTIONS

IFAS FLREC CHILLER
IFAS PROJECT NO. 19034
MOSES PROJECT NO. 18269

LOT 2

BASE CHILLER

BEST VALUE WORKSHEET

The Owner intends to direct purchase the chiller specified and scheduled herein with the goal of "Best Value" considering first cost and operating costs. The award will be made based on the lowest total cost/Best Value Cost (A+B):

A. Chiller Cost: This is your bid, including freight, and all work described herein. The bid price shall include factory startup per Section 23 00 00 and the 10 year parts and labor warranty per Section 23 64 00. Do not include sales tax. This is your traditional bid price. \$ _____

B. Operating Cost: Bids not meeting the minimum efficiency specified will be considered non-responsive. However, the Owner will also consider the value of better efficiencies. Submit performance data, including part load performance, with your bid. Use the indicated ambient air temperatures for all calculations. Use 44F chilled water supply temperature and scheduled nominal evaporator water flow rates. Calculate your 10 year operating cost as follows:

Capacity		
200T (100%) x _____ kW/ton (@ 95F) x 797 hrs x \$0.1375/kWh x 7.024	= \$	
150T (75%) x _____ kW/ton (@ 80F) x 6,082 hrs x \$0.1375/kWh x 7.024	= \$	
100T (50%) x _____ kW/ton (@ 65F) x 1,600 hrs x \$0.1375/kWh x 7.024	= \$	
50T (25%) x _____ kW/ton (@ 55F) x 266 hrs x \$0.1375/kWh x 7.024	= \$	

Best Value Cost = \$A + \$B = \$ _____

C. Lead Time: Include estimated lead time for chiller delivery _____



DELIVERING INNOVATIVE SOLUTIONS

IFAS FLREC CHILLER
IFAS PROJECT NO. 19034
MOSES PROJECT NO. 18269

LOT 2

ALTERNATE 1 CHILLER

BEST VALUE WORKSHEET

The Owner intends to direct purchase the chiller specified and scheduled herein with the goal of "Best Value" considering first cost and operating costs. The award will be made based on the lowest total cost/Best Value Cost (A+B):

- A. Chiller Cost: This is your bid, including freight, and all work described herein. The bid price shall include factory startup per Section 23 00 00 and the 10 year parts and labor warranty per Section 23 64 00. Do not include sales tax. This is your traditional bid price. \$ _____
- B. Operating Cost: Bids not meeting the minimum efficiency specified will be considered non-responsive. However, the Owner will also consider the value of better efficiencies. Submit performance data, including part load performance, with your bid. Use the indicated ambient air temperatures for all calculations. Use 44F chilled water supply temperature and scheduled nominal evaporator water flow rates. Calculate your 10 year operating cost as follows:
- | Capacity | | |
|--|------|----------|
| 200T (100%) x _____ kW/ton (@ 95F) x 797 hrs x \$0.1375/kWh x 7.024 | = \$ | |
| 150T (75%) x _____ kW/ton (@ 80F) x 6,082 hrs x \$0.1375/kWh x 7.024 | = \$ | |
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| 50T (25%) x _____ kW/ton (@ 55F) x 266 hrs x \$0.1375/kWh x 7.024 | = \$ | |
| Best Value Cost = \$A + \$B = | | \$ _____ |
- C. Lead Time: Include estimated lead time for chiller delivery _____

TAB 2

SECTION 23 64 00/PACKAGED AIR-COOLED CHILLERS1 GENERAL

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Specification sections, apply to work of this section.
- 1.2 Codes and Standards:
 - 1.2.1 Chillers shall be UL or ETL listed.
 - 1.2.2 ARI Compliance: Test and rate chillers in accordance with ARI Standards.
 - 1.2.3 NEC Compliance: Comply with applicable NEC requirements pertaining to electrical power and control wiring for construction and installation of reciprocating chillers.
 - 1.2.4 ANSI Compliance: Comply with ANSI B9.1 safety code requirements pertaining to unit construction of reciprocating chillers.
- 1.7 Stamp cooler with ASME mark when cooler has been successfully tested in accordance with ASME Code. Pressure test cooler for refrigerant working side pressure of not less than 235 psig and water side pressure of not less than 150 psig. Leak test condenser coils at 150 psig and pressure test coils at 450 psig.
- 1.3 Approval Submittals:
 - 1.3.1 Product Data: Submit manufacturer's technical product data, including rated capacities for chillers indicated, weights (shipping, installed, and operating), furnished specialties and accessories; and rigging, installation, and start-up instructions.
 - 1.3.2 Shop Drawings: Submit manufacturer's assembly-type shop drawings indicating dimensions, weight loadings, required clearances, methods of assembly of components, and location and size of each field-connection.

- 1.3.3 Provide complete approved submittal with your bid. Submittals that do not comply with specifications will be considered non-responsive.
- 1.4 Test Report and Verification Submittals:
- 1.4.1 Startup Report: Submit startup report by factory-trained representative.
- 1.4.2 Training: Submit letter verifying that Owner training has been received by factory representative.
- 1.5 O&M Data Submittals:
- 1.5.1 Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.
- 1.5.2 Maintenance Data: Submit a copy of approval submittals. Submit maintenance data and parts list for each chiller, control, and accessory; including "trouble-shooting" maintenance guide. Include these data in O&M manual.
- 2 PRODUCTS
- 2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide chillers of one of the following
- Carrier
Trane
York
- 2.2 General: Provide factory-assembled and tested packaged air-cooled liquid chillers as indicated, consisting of compressors, evaporator, condensers, thermal expansion valves, and control panels. Provide capacity and electrical characteristics as scheduled.
- 2.2.1 Warranty: Provide comprehensive 10 year parts and labor warranty for all components; no exclusions. Provide with chiller as part of this specification. Parts and materials to include unit mounted accessories and refrigerant required to charge unit following warranty work.
- 2.2.2 Specified capacity shall be met without overloading compressor motors when operating at a scale factor of 0.0005 at the temperatures scheduled.
- 2.2.3 Maximum water tube velocity shall be 8 fps.
- 2.2.4 Unit shall be capable of operation at 120°F ambient.
- 2.2.5 Chiller EER shall meet the requirements of Florida Energy Efficiency Code.

- 2.3 Refrigerant: Provide full operating charge of refrigerant and oil.
- 2.4 Housing: Provide manufacturer's standard equipment housing construction, corrosion protection coating, and exterior finish. Provide removable panels and/or access doors for inspection and access to internal parts and components. Provide wire guard to protect compressors, coils and other components.
- 2.4.1 Vibration Isolation: Provide engineered 3" neoprene isolation support pads under unit frame from manufacturer.
- 2.5 Evaporator: Provide steel barrel, shell-and-tube design with seamless copper tubes roller expanded into tube sheets. Design, test, and stamp for refrigerant side working pressure of 150 psig minimum, in accordance with ASME Pressure Vessel Code. Provide one water pass with series of internal baffles. Insulate with ¾" minimum flexible unicellular insulation with maximum K-value of 0.28. Protect insulation with galvanized metal enclosure. Provide water drain connection and bulb wells for temperature controller and low-temperature cutout.
- 2.5.1 Heads: Provide removable heads.
- 2.5.2 Heater Tapes: Provide electrical resistance heater tape on evaporator to protect against freezing at -20°F ambient at no-flow condition.
- 2.5.3 Multiple-Compressor Units: Provide multiple independent refrigerant circuits with gasketed evaporator heads.
- 2.6 Condenser: Construct coils with configured aluminum fins mechanically bonded to seamless copper tubing. The fins shall cover the tube and protect against atmospheric corrosion. Provide integral subcooling circuit with liquid accumulators. Provide protective grilles over exposed coil faces. Normal temperature difference between refrigerant condensing temperature and ambient air temperature shall be 20°F. Provide seacoast construction with corrosion resistant coating on coils and with stainless steel fasteners or other elements as required to achieve a 10-year warranty.
- 2.6.1 Multiple-Compressor Units: Provide multiple circuited condenser coils.
- 2.6.2 Condenser Fans: Provide vertical discharge propeller fans, individually direct or belt driven, draw-through design, statically and dynamically balanced. Provide 1750 rpm, permanently lubricated ball-bearing motors with overload protection. Provide protective grille over air discharge. Provide coating for fan blades to protect against corrosion.
- 2.6.3 Low Ambient Control: Provide head pressure control, designed to operate at temperatures down to 40°F.
- 2.7 Compressors: Provide hermetic refrigerant gas cooled, direct drive 1750 rpm scroll compressors with crankcase heater with minimum level of capacity control as scheduled. Mount compressors on vibration isolators within chiller housing.
- 2.7.1 Provide inherent thermal overload protection for all three phases.

- 2.7.2 Provide suction strainer.
- 2.7.3 Lubrication: Provide oil pump, oil filter, oil level sight glass, and oil charging valve.
- 2.7.4 Provide 10 year compressor warranty with entire unit warrantee.
- 2.8 Capacity Modulation: Provide capacity control by means of variable speed operation and/or compressor staging. Refer to schedule for required steps and minimum capacity required.
- 2.9 Refrigerant Circuit: Multiple refrigerant circuits shall be completely independent of each other. Provide for each refrigerant circuit the following:
- Relief valve.
 - Liquid line solenoid valve.
 - Filter dryer.
 - Liquid line sight glass/moisture indicator.
 - Thermal expansion valve.
 - Insulated suction line.
 - Suction and discharge service valves.
 - Purge valve.
 - Liquid line shutoff valve with charging connection.
- 2.10 Control Panels: Provide weathertight control panels, factory-wired for external connection only. Provide key locked panel access doors. Provide dead front panels for personnel protection. All controls, interlock terminals, and field power connections shall be centrally located. Provide the following controls:
- Control power transformer for 120V control voltage with fuses.
 - Terminal strip.
 - Individual factory fusing for each compressor and fan motor.
 - Individual starting contactors for each compressor and fan motor.
 - Compressor lead-lag switch.
 - Fan cycling controls.
 - Phase loss, phase reversal, and low voltage protection.
 - Emergency stop switch.
 - Pumpdown control relay, recycling and manual capability. Recycling pumpdown protection shall operate at all times, including during time clock shutdown periods.
 - Compressor starter relay and solid state start sequence timers.
 - Reset relay.
 - Nonrecycling compressor overload protection on all three phases.
 - High-pressure cutout.
 - Low-pressure cutout.
 - Low-temperature cutout.
 - Chilled water temperature controller.
 - Freeze protection pressure stat.
- 2.11 Accessories: Provide the following accessories:

- 2.11.1 Suction and discharge gauges.
- 2.11.2 Load limit thermostat, if required.
- 2.11.3 Adjustable chilled water differential pressure switch. Vapor-proof chilled water flow switch.
- 2.11.4 Auxiliary control panel for multiple unit sequence control that will control multiple chillers from a single return water sensor and provide chiller lead-lag function.
- 2.12 Microprocessor Chiller Controller: The microprocessor-based control system shall stage unit based on the leaving water temperature. Safeties controlled by the microprocessor include oil differential pressure and motor protection for each compressor, high pressure for each refrigerant circuit, loss of charge, loss of water flow, freeze protection, and low refrigerant pressure. Leaving water temperature sensor shall be factory-installed. Controls shall include auto-stop switch, leaving water temperature setpoint and adjustment, anti-recycle function, digital display, and the ability to accept phase loss, phase reversal, under and over voltage signal. Display readouts include water temperature setpoints, operating temperatures, and diagnostic messages. The microprocessor shall have the ability to display refrigerant pressures and percent unit amp draw. Provide the following control functions:
 - 2.12.1 LCD Display in plain English.
 - 2.12.2 Means of resetting chiller water either by return water temperature or a remote 0-10 DC signal from BAS. Must be enabled upon delivery.
 - 2.12.3 Soft load to prevent compressors from operating at full load during pull down.
 - 2.12.4 Auto restart after power failure without external battery or auxiliary power supply.
 - 2.12.5 Storage of current and previous safety shut downs.
 - 2.12.6 Two short cycle time functions: (1) start-to-start, and (2) stop-to-start. These shall be specially programmed to provide the least amount of time off line while providing the maximum in compressor motor protection.
 - 2.12.7 Capability of controlling the chilled water pumps through the use of factory supplied digital output contacts.
 - 2.12.8 Provide automatic lead-lag based on circuit run hours.
 - 2.12.9 To avert shutdown during critical operation, the microprocessor shall continuously perform diagnostic checks and provide operator with a pre-alarm status indication, allowing time to take corrective action prior to a safety shutdown.
 - 2.12.10 Limit the rate at which the chilled water loop temperature is pulled down. The pulldown rate shall be adjustable.

- 2.12.11 Control head pressure through intelligent cycling of condenser fans.
- 2.12.12 Provide remote monitoring interface capability. Coordinate with BAS in Division 25.
- 2.12.13 Provide current limiting capability, 0 - 10 DC signal from BAS. Must be enabled upon delivery.
- 2.13 Electrical:
- 2.13.1 Provide fused disconnect switch for each chiller.
- 2.13.2 Provide single point connection for each chiller.
- 2.13.3 Short Circuit Withstand: Provide chillers with 65,000 AIC SCCR.
- 3 EXECUTION
- 3.1 Supplier must examine areas and conditions under which chillers are to be installed and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer. The work is to furnish the chiller as described herein. Another contractor will install the chiller.
- 3.2 General: Supplier shall include the cost of disassembling and reassembling the chiller as required for installing the chiller in the existing location. Under a separate Bid Package, another contractor will unload the chiller and rig the chiller, moving it to the existing pad. This same contractor (not the chiller supplier) will perform selective removal/replacement of existing piping and equipment to allow for 8'-0" clear width and 8'-0" clear height. It is the chiller supplier's responsibility to verify that the chiller being provided can be installed thru the available space and to include all chiller disassembly and reassembly cost necessary to accomplish this. Supplier shall visit the site and provide a statement with his bid that confirms the proposed chiller can be installed per these specifications.
- 3.3 Support: Install ground-mounted units on reinforced concrete pad. Furnish anchor bolts which are to be inserted in concrete pad to Concrete Installer.
- 3.3.1 Install on manufacturer provided 3" vibration isolation pads.
- 3.3.2 Provide templates for anchor bolt placement in concrete pad. Deliver templates to concrete installer so work by others is not delayed.
- 3.4 Chilled Water Piping: Refer to other Division-23 sections. Connect inlet to evaporator with controller bulb well, shutoff valve, thermometer, strainer, flow switch, flexible pipe connection, pressure gauge, and union or flange. Connect outlet to evaporator with shutoff valve, balancing cock, thermometer, flexible pipe connection, pressure gauge, and union or flange. Align piping to eliminate strain on chiller heads. Arrange piping to permit removal of chiller heads with minimal pipe removal. Thermometers and gauges shall be located in the equipment room.
- 3.5 Electrical Wiring: Install electrical devices furnished by manufacturer but not specified to be

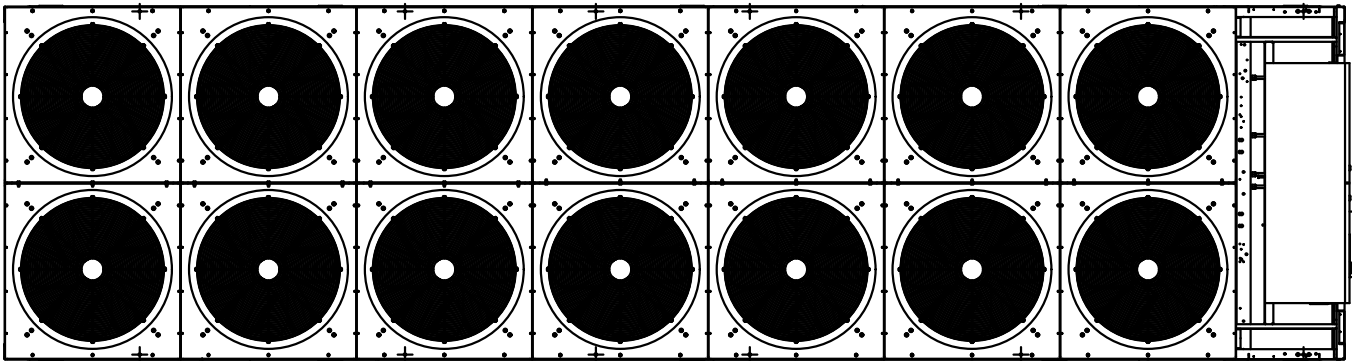
factory-mounted, including electric strip cable for chiller and piping to prevent freezing due to low ambient temperature. Heater cable shall be powered by a separate 120V circuit that may be energized when the unit is not. Furnish copy of manufacturer's wiring diagram submittal to Electrical Installer.

Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-26 sections. Do not proceed with equipment start-up until wiring installation is acceptable to manufacturer and equipment installer.

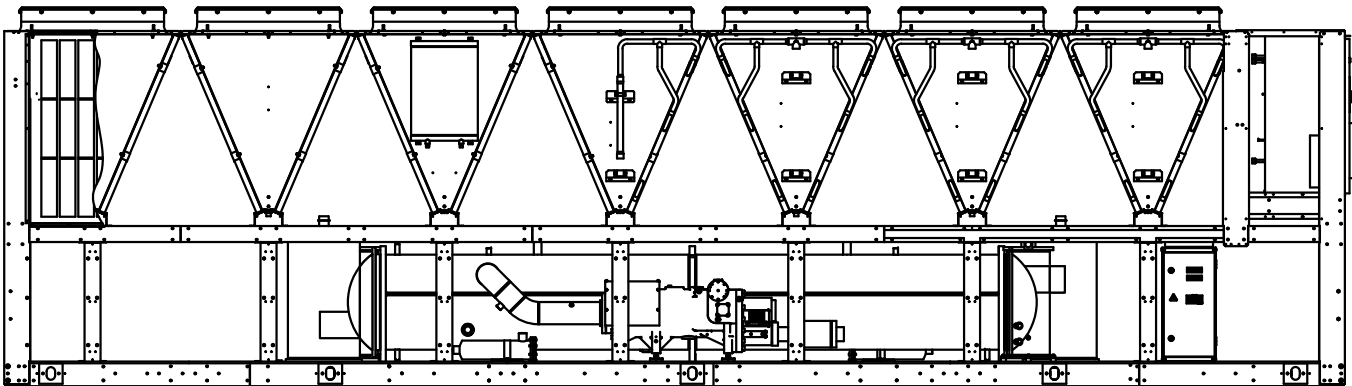
- 3.6 Control: Furnish field-installed automatic temperature control requirements to BAS Installer. Field-installed automatic temperature controls are not work of this section.
- 3.7 Provide services of manufacturer's factory-trained service representative for at least two days to start-up chillers. Include in start-up procedures, testing controls, checking all wiring connections, demonstration of compliance with requirements, demonstration of performance, and replacement of damaged or malfunctioning controls and equipment. Submit complete operating logs and service report following chiller startup.
- 3.8 Provide services of manufacturer's technical representative for two 8-hour days to instruct Owner's personnel in operation and maintenance of chillers. Schedule training with Owner. Provide at least 7-day notice to Contractor and Engineer of training date.
- 3.9 The chiller supplier shall employ servicemen qualified to repair the chillers and shall have an office and stock parts within 100 miles of the project. All service mechanics must be factory trained with a State of Florida Class A license. Servicemen shall maintain 24 hour per day emergency service.

END OF SECTION

TAB 3



① CHILLER PLAN VIEW
SCALE: 3/16" = 1'-0"



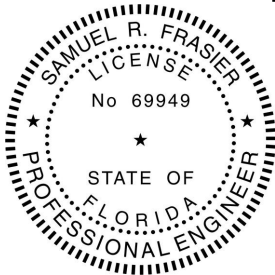
② CHILLER SECTION VIEW
SCALE: 3/16" = 1'-0"

Project Name:
**University of Florida
IFAS FLREC Chiller**

Owner Proj #: 19034

Submittal:
**Chiller Equipment Bid
Package**

Seal: Samuel R Frasier
PE - 0069949



This item has been electronically signed and sealed by Samuel R. Frasier, PE on 05/06/2019 using a Digital Signature.

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Moses Proj #: 18269
Drafted By: G3
Checked By: SRF
Date: 04/30/19
Revisions:

Sheet Title:
CHILLER DETAILS

Sheet #:

M1

Project Name:
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Revisions:

Sheet Title:
CHILLER SCHEDULE

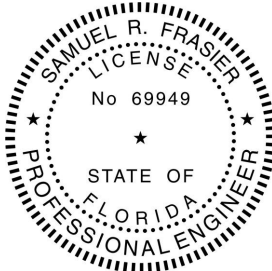
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M2

AIR COOLED CHILLER SCHEDULE

MARK	CH-2 ALTERNATE 1	CH-2 BASE BID
MANUFACTURER	YORK	YORK
MODEL	YVAA0218	YVAA0215
UNIT DATA		
NUMBER OF COMPRESSORS	2	2
NUMBER OF FANS	14	12
UNIT CAPACITY STEPS	VARIABLE	VARIABLE
COMPRESSOR STARTER TYPE	VFD	VFD
REFRIGERANT TYPE	R-134A	R-134A
OPERATING WEIGHT (LBS)	18,608	17,763
DESIGNATION		
MINIMUM CAPACITY (TONS)	200	200
EWI (°F)	54	54
LWI (°F)	44	44
EER/IPLV	11.83/20.4	11.49/19.88
OUTDOOR TEMP (°F)	95	95
CHW FLOW (GPM)	418.8	418.8
WATER PRESSURE DROP (FT)	19.4	19.4
TURN DOWN	10%-100%	10%-100%
CHILLER FOULING FACTOR	0.0001	0.0001
ELECTRICAL DATA		
VOLTS-PHASE	480-3	480-3
MINIMUM CIRCUIT AMPACITY (AMPS)	335	345
MAX OVERCURRENT PROTECTION (AMPS)	450	450
MAX TOTAL UNIT KILOWATTS (KW)	177.6	182.8
SCHEDULE NOTES	(1) (2) (3) (4) (5) (6) (7)	(1) (2) (3) (4) (5) (6) (7)

- SCHEDULE NOTES
- 1) PROVIDE VARIABLE SPEED CONTROL FOR EACH COMPRESSOR AND ARRAY OF CONDENSER FANS VIA VFD
- 2) PROVIDE SEACOAST CONSTRUCTION WITH CORROSION RESISTANT COATING, FACTORY APPLIED TO ACHIEVE A 10-YEAR WARRANTY FOR THE WHOLE MACHINE WITH NO EXCLUSIONS. SEE SPECIFICATIONS
- 3) PROVIDE 4" HIGH DOUBLE DEFLECTION MOLDED DURULINE VIBRATION ISOLATORS PROVIDED BY MANUFACTURER
- 4) PROVIDE SINGLE POINT POWER
- 5) PROVIDE INTERNAL DISCONNECT BREAKER
- 6) SUBMIT PERFORMANCE DATA AT 45°F LWI (AS SCHEDULED) AND 49°F LWI
- 7) ENERGY CONSUMPTION COST IS TO BE ESTIMATED AT \$0.1375/KWH



This item has been electronically signed and sealed by Samuel R. Frasier, PE on 05/06/2019 using a Digital Signature.

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