



# Addendum 01

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**PROJECT:**

West Hills Coalinga Chiller  
Replacement  
Coalinga, CA

Date : February 16, 2024  
TETER Project No.: 22-12358

**CLIENT:**

West Hills Community  
College District  
275 Phelps Ave.  
Coalinga, CA

DSA File No.: 10-C1  
DSA Appl. No.: 02-120711

*The following additions, deletions and revisions to the plans, specifications and Addenda shall become a part of the plans and specifications. It is the responsibility of the General Contractor to submit the information contained in this addendum to all subcontractors and suppliers. The Bidder shall acknowledge receipt of the Addendum in the Bid Proposal. (Addendum number of pages: 2 pages + 63 attachments = 65 total pages).*

**PROJECT MANUAL:**

**1 – 01: PROJECT MANUAL, SPECIFICATION SECTION 00 – “CONTRACT REQUIREMENTS”**, revise as follows:

- A. Add Supplemental Contract Documents, see attachment **AD1-01**.
  - a. Bid Form
  - b. Substitution Listing
  - c. List of Subcontractors
  - d. Bid Bond
  - e. Non Collusion Declaration
  - f. Exclusion of Lead Asbestos Products
  - g. Construction Agreement
  - h. Payment Bond
  - i. Performance Bond
  - j. Workers Comp-Certificate
  - k. Guarantee
  - l. Escrow Agreement
  - m. Shop Drawing Transmittal
  - n. Drug Free Workplace Cert.
  - o. Cert. of Attendance at Mandatory Job Walk
  - p. Contractor Qualifications Questionnaire

**Bid RFIs:**

**1-02: Is the owner purchased Chiller equipment specification available?**

A. RESPONSE: The chiller purchase package with equipment schedule and specification is attached, see attachment **AD1-02**.

**1-03: Who is responsible for constructing EMS Panel Support on detail 18/M800?**

A. RESPONSE: Mechanical contractor is responsible for providing the Unistrut support; controls contractor shall provide EMS panel.

**1-04: Is it acceptable to remove entire walkway for new pipe trench and repave instead of sawcut and patch?**

A. RESPONSE: No exception is taken to removing and repaving the walkway.

**END OF ADDENDUM NO. 1**



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**Aya Shitanishi**  
Architect

**BID FORM**

**Name of Bidder:**

**Project: West Hills Coalinga Chiller Replacement Bldg. H**

**Project #: 22-12358**

**To: West Hills Community College District, referred to as "OWNER."**

A. In compliance with your Notice to Contractors Calling for Bids and related documents, the undersigned bidder, having familiarized itself with the terms of the contract, the local conditions affecting the performance of the contract, the cost of the work at the place where the work is to be done, and the drawings and specifications and other contract documents, proposes and agrees to perform the contract within the time stipulated, including all of its component parts and everything required to be performed, and to provide and furnish any and all of the labor, materials, tools, expendable equipment, and all applicable taxes, utility, and transportation services necessary to perform the contract and complete in a workmanlike manner all of the work required in connection with the above-referenced project, including sheeting, shoring, and bracing, or equivalent method for protection of life and limb in trenches and open excavation in conformance with applicable safety orders, within the time limits set for completion of all work, all in strict conformity with the drawings and specifications and other contract documents, including Addenda Nos. \_\_\_\_\_ on file at the office of OWNER for the Base Bid sum of:

\_\_\_\_\_ dollars.  
*[written in words]*

\$ \_\_\_\_\_  
*[written in numbers]*

B. The Bidder agrees that upon written notice of acceptance of this bid, he will execute the contract and provide all bonds and other required documents within ten (10) working days after contract award.

C. Attached is bid security not less than 10 percent of the bid, in the amount of \$ \_\_\_\_\_, in the form of  (cash)  (bid bond)  (certified check)  (cashier's check).  
*[check one]*

D. The Bidder acknowledges that OWNER reserves the right to accept or reject any and/or all Base Bids and alternate bids. This entire bid shall remain open and active for sixty (60) days after bid opening, and any alternate bids not initially awarded shall remain active, as an irrevocable offer by the Bidder to enter into either a change order or separate contract, for up to six months after award of the contract.

E. It is understood and agreed that if written notice of the acceptance of this bid is mailed, telegraphed, or delivered to the Bidder after the opening of the bid, and within the time this bid is required to remain open, or at any time after that before this bid is withdrawn, the Bidder will execute and deliver to OWNER the Agreement and will also furnish and deliver to OWNER the Performance Bond and a separate Payment Bond as specified, certificates of insurance, and other required documents.

F. It is understood and agreed that should the Bidder fail or refuse to return executed copies of the Construction Agreement, bonds, insurance certificates, and other required documents to OWNER within the time specified, the bid security shall be forfeited to OWNER.

G. In submitting this bid, the Bidder offers and agrees that if the bid is accepted it will assign to OWNER all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Business & Professions Code Section 16700 and following sections) arising from purchases of goods, materials, or services by the Bidder for sale to OWNER pursuant to the bid. Such assignment shall be made and become effective at the time OWNER tenders final payment under the contract. (Public Contract Code Section 7103.5; Government Code Section 4552.)

H. The Bidder hereby certifies that it is, and at all times during the performance of work under the Contract Documents shall be, in full compliance with the provisions of the Immigration Reform and Control Act of 1986 ("IRCA") in the hiring of its employees, and the Bidder shall indemnify, hold harmless, and defend OWNER against any and all actions, proceedings, penalties, or claims arising out of the Bidder's failure to comply



Date: Telephone:

Names of Other Partners:

**CORPORATION**

Corporation Name: \_\_\_\_\_, a Corporation.  
(State of Incorporation)

Business Address:

Date: Telephone:

\*By: \_\_\_\_\_ [Required] [Seal]  
(President/Chief Executive Officer/Vice President) [Circle One]

Print Name:

\*By: \_\_\_\_\_ [Required]  
(Secretary/Treasurer/Chief Financial Officer/Assistant Treasurer) [Circle One]

Print Name:

**JOINT VENTURE**

Joint Venturer Name:

\*Signed by: \_\_\_\_\_ (Joint Venturer)

Print Name:

Business Address:

Date: Telephone:

Other Parties to Joint Venture:

If an individual joint venturer:

\*By: \_\_\_\_\_ (Signature)

Print Name:

If a DBA joint venturer:

\*By: \_\_\_\_\_ (Signature)

Print Name:

If a partnership joint venturer:

\*By: \_\_\_\_\_ (Signature)

Print Name:

If a Corporation joint venturer:

**[Seal]**

(Name)

a \_\_\_\_\_ Corporation.  
(State of Incorporation)

\*By: \_\_\_\_\_

Print Name:

Title:

**\*Important Notice:** Labor Code § 1771.1(a) provides that “A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.” Please go to <http://www.dir.ca.gov/Public-Works/PublicWorks.html> for more information and to register. This project is subject to monitoring by the Department of Industrial Relations.

# SUBSTITUTION LISTING

**\*\*TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID\*\***

**TO: West Hills Community College District ("OWNER")**

1. Pursuant to bidding and contract requirements for the work titled:  
**Project Title/Bid #: West Hills Coalinga Chiller Replacement Bldg. H**

The contract sum, proposed by the undersigned on the Bid Form, is for the work as shown on the drawings, described in the specifications, and otherwise defined in the Contract Documents. However, the undersigned proposes the following substitutions for the Owner's consideration. Should the Owner accept any or all of the proposed substitutions, the Bidder agrees to reduce the contract sum by the amount shown. Proposed substitutions must be submitted not later than 10 working days prior to the date of bid opening in order for such request to be reviewed before bidding. All substitutions must be listed on this form and submitted prior to or with the bid or they will not be reviewed.

2. Please complete, attaching additional sheets as necessary:

Bidder proposes [check one]:     no substitutions.  
 the following substitutions:

Specified Product or Material	Drawing Number or Specification Section	Proposed Substitution	Proposed Price Reduction



3. All bids should be calculated and submitted on the assumption that substitution requests will not be approved.

4. Bidder hereby certifies that the requested substitutions are equal or better in all respects to what is specified, unless otherwise noted.

**SIGNATURE MUST BE IDENTICAL  
TO THAT PROVIDED ON BID FORM**

BIDDER:

By: \_\_\_\_\_

Print Name:

# LIST OF SUBCONTRACTORS

## TO BE SUBMITTED WITH BID

**PROJECT TITLE: BID #: West Hills Coalinga Chiller Replacement Bldg. H**

**OWNER: West Hills Community College District**

A. In compliance with the Subletting and Subcontracting Fair Practices Act (Public Contract Code Section 4100 and following sections) and any amendments to the Act, each Bidder shall set forth below:

1. The name, location of the place of business California contractor license number and DIR registration number of:

a. Each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the work or improvement to be performed under the Construction Agreement;

b. Each subcontractor licensed by the State of California who, under subcontract to the Bidder, specially fabricates and/or installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent of the Bidder's total bid or Ten Thousand Dollars ( \$10,000), whichever is greater;

2. The portion of the work which will be done by each subcontractor.

B. The Bidder shall list only one subcontractor for each such portion as is defined by the Bidder in this bid.

C. If the Bidder fails to specify a subcontractor, or if the Bidder specifies more than one subcontractor for the same portion of work to be performed under the contract in excess of one-half of one percent of the Bidder's total bid, the Bidder shall be deemed to have agreed that the Bidder is fully qualified to perform that portion, and that the Bidder alone shall perform that portion.

D. No Bidder whose bid is accepted shall (i) substitute any subcontractor, (ii) permit any subcontractor to be voluntarily assigned or transferred, or allow it to be performed by anyone other than the original subcontractor listed in the original bid, or (c) sublet or subcontract any portion of the work in excess of one-half of one percent of the Bidder's total bid as to which the original bid did not designate a subcontractor, except as authorized in the Subletting and Subcontracting Fair Practices Act.

E. Violations of any provision of the Subletting and Subcontracting Fair Practices Act may be deemed by the OWNER to make the bid non-responsive and/or the Bidder non-responsible.

F. Attach additional sheets, as necessary.

<b>SUBCONTRACTOR'S NAME &amp; LOCATION</b>	<b>DESCRIPTION OF PORTION TO BE SUBCONTRACTED</b>	<b>CALIFORNIA CONTRACTOR LICENSE NO.</b>	<b>DIR REGISTRATION NUMBER</b>

Firm Name:

By: \_\_\_\_\_  
*[Signature must match that on bid]*

Print Name:

# BID BOND

**IF USED BY BIDDER, MUST BE COMPLETED AND SUBMITTED WITH BID**

**PROJECT TITLE/BID #:** West Hills Coalinga Chiller Replacement Bldg. H  
**OWNER:** West Hills Community College District

KNOW ALL MEN BY THESE PRESENTS, that we, \_\_\_\_\_ as Principal, and \_\_\_\_\_ as Surety, are held and firmly bound unto the \_\_\_\_\_ (referred to as Owner) in the sum of \_\_\_\_\_ percent of the total amount of the bid and bid additive alternates of the Principal submitted to the Owner for the work and obligations described below for the payment of which sum in lawful money of the United States, well and truly to be made, we jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

The condition of this obligation is such that whereas the Principal has submitted the accompanying bid dated \_\_\_\_\_, 20\_\_.

NOW, THEREFORE, if the Principal shall not withdraw said bid within the period specified therein after the opening of the same, or if no period be specified, within 60 days after said opening; and if the Principal is awarded the contract, and shall within the specified period, or if no period is specified, within five working days after the award of the contract, enter into a written contract with the Owner in accordance with the bid as accepted and give bonds with good and sufficient surety or sureties as may be required for the faithful performance and proper fulfillment of such contract and for the payment of labor and materials used for the performance of the contract, provide certificates evidencing the required insurance is in effect (in the amounts required in the contract documents), and provide any other documents required under the contract documents to be submitted at the time the contract is executed, then the above obligation shall be void and of no effect, otherwise to remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or the call for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of said contract or the call for bids, or to the work, or to the specifications.

In the event suit is brought upon this bond by the Owner and judgment is recovered, the Surety shall pay all costs incurred by the Owner in such suit, including a reasonable attorney's fee to be fixed by the court.

IN WITNESS WHEREOF, the parties have executed this instrument under their several seals this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, the name and corporate party being hereto affixed and duly signed by its undersigned authorized representative.

DATED:

PRINCIPAL

By: \_\_\_\_\_

Title:

DATED:

SURETY

By: \_\_\_\_\_

Title:

Note: Signatures of those executing for the Surety must be properly acknowledged.

**NONCOLLUSION DECLARATION  
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID**

**PROJECT TITLE/BID #: West Hills Coalinga Chiller Replacement Bldg. H**

**OWNER: West Hills Community College District**

The undersigned declares:

I am the \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing bid. The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on \_\_\_\_\_ [date], at \_\_\_\_\_ [city], \_\_\_\_\_ [state].

Contractor:

By \_\_\_\_\_

Title:

Signature: \_\_\_\_\_

# EXCLUSION OF LEAD AND ASBESTOS PRODUCTS

## TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

**PROJECT TITLE/BID #: West Hills Coalinga Chiller Replacement Bldg. H**  
**OWNER: West Hills Community College District**

Pursuant to the provisions of the California Education Code for construction, modernization, or renovation of school facilities, lead based paint, lead plumbing, and solders, or other potential sources of lead contamination shall not be utilized in the construction of any new school facility or the modernization or renovation of any existing school facility.

The Contractor agrees that sources and potential sources of lead contamination, whether in products or materials, will not be used in performing work under the Agreement.

In addition, the Contractor agrees that asbestos containing products or materials will not be used in performing work under the Agreement.

At completion of work under the Agreement, the Contractor will warrant and represent to the Owner the following:

1. That no asbestos containing products or materials, or sources or potential sources of lead contamination, were used in performing work under the Agreement.
2. That should any asbestos containing products, or sources or potential sources of lead contamination, be found to have been used by the Contractor or any subcontractor, supplier, or vendor on the Project, the Contractor will replace them, together with all related materials, at no cost to the Owner.
3. That should the replacement require any interruption in the normal operation of the school, the Contractor will pay all costs necessarily incurred to keep the school functioning with the least possible disruption to its day-to-day operations.

Executed at \_\_\_\_\_, California, on \_\_\_\_\_, 20 .

Firm Name:

By:

Title:

Signed: \_\_\_\_\_

*[Signature must match that on bid]*

## PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the \_\_\_\_\_, (referred to as "Owner"), has awarded to \_\_\_\_\_ (referred to as the "Contractor/ Principal") a contract for the work described as follows:

WHEREAS, Contractor/Principal is required by Division 4, Part 6, Title 3, Chapter 5 (commencing at Section 9550) of the California Civil Code to furnish a bond in connection with the contract;

NOW, THEREFORE, we, the Contractor/Principal and \_\_\_\_\_ as Surety, are held firmly bound unto Owner in the penal sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_), lawful money of the United States of America for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Contractor/Principal, his/her or its heirs, executors, administrators, successors, or assigns, or a subcontractor, shall fail to pay any person or persons named in Civil Code Section 9100 or fail to pay for any materials or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code with respect to work or labor thereon of any kind, or shall fail to deduct, withhold, and pay over to the Employment Development Department any amounts required to be deducted, withheld, and paid over by Section 13020 of the Unemployment Insurance Code with respect to work and labor thereon of any kind, then said Surety will pay for the same, in or to an amount not exceeding the amount set forth above, and in case suit is brought upon this bond Surety will also pay such reasonable attorney's fees as shall be fixed by the court, awarded and taxed as provided in Division 4, Part 6, Title 3, Chapter 5 (commencing at Section 9550) of the California Civil Code.

This bond shall inure to the benefit of any of the persons named in Section 9100 of the California Civil Code so as to give a right of action to such person or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration, or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement described above or pertaining or relating to the furnishing of labor, materials, or equipment therefor, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement described above, nor by any rescission or attempted rescission of the contract, agreement, or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond, and



that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Owner and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 8400 and 8402 of the California Civil Code and has not been paid the full amount of his/her or its claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration, or modification.

Any claims under this bond may be addressed to:

Name & address of Surety

Name & address of agent or representative in California, if different than above

Telephone # of Surety, or agent or representative in California

IN WITNESS WHEREOF, we have hereto set our hands and seals on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_ .

**[SEAL]**

Contractor/Principal

By: \_\_\_\_\_  
Signature

Print Name Above

Print Title Above

Surety:

By: \_\_\_\_\_  
Signature

Print Name Above

Print Title Above

***[SEAL AND NOTARIAL ACKNOWLEDGMENT OF SURETY]***

## PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the \_\_\_\_\_ (referred to as "Owner"), has awarded to \_\_\_\_\_ (referred to as "Contractor/Principal") a contract for the work described as follows: \_\_\_\_\_.

NOW, THEREFORE, we, the Contractor/Principal and \_\_\_\_\_, as Surety, are held firmly bound unto Owner in the penal sum of \$\_\_\_\_\_ Dollars (\$\_\_\_\_\_), lawful money of the United States of America for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION IS SUCH THAT, if the hereby bonded Contractor/Principal, its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by and well and truly keep and perform all the undertakings, terms, covenants, conditions, and agreements in the said contract and any alteration thereof, made as therein provided, including but not limited to the provisions regarding contract duration, indemnification, and liquidated damages, all within the time and in the manner therein designated in all respects according to their true intent and meaning, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

As a condition precedent to the satisfactory completion of the contract, the above obligation shall hold good for a period of \_\_\_\_ year(s) after the acceptance of the work by the Owner, during which time if Contractor/Principal shall fail to make full, complete, and satisfactory repair and replacements and totally protect the Owner from loss or damage made evident during the period of \_\_\_\_ year(s) from the date of completion of the work, and resulting from or caused by defective materials or faulty workmanship, the above obligation in penal sum thereof shall remain in full force and effect. The obligation of Surety under this bond shall continue so long as any obligation of Contractor/Principal remains.

Whenever Contractor/Principal shall be, and is declared by the Owner to be, in default under the contract, the Owner having performed the Owner's obligations under the contract, the Surety shall promptly remedy the default, or shall promptly:

1. Complete the contract in accordance with its terms and conditions; or
2. Obtain a bid or bids for completing the contract in accordance with its terms and conditions, an upon determination by Surety of the lowest responsive and responsible bidder, arrange for a contract between such bidder and the Owner, and make available as work progresses sufficient funds to pay the cost of completion less the balance of the contract price, but not exceeding, including other costs and damages for which Surety may be liable under this Performance Bond, the amount set forth above. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor/Principal by the Owner under the

contract and any modifications to it, less the amount previously paid by the Owner to the Contractor/Principal.

Surety expressly agrees that the Owner may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor/Principal.

Surety shall not utilize Contractor/Principal in completing the contract nor shall Surety accept a bid from Contractor/Principal for completion of the work if the Owner, when declaring the Contractor/Principal in default, notifies Surety of the Owner's objection to Contractor/Principal's further participation in the completion of the work.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the successors or assigns of the Owner. Any suit under this bond must be instituted within the applicable statute of limitations period.

FURTHER, for value received, the Surety hereby stipulates and agrees that no change, extension of time, alternation, or modification of the Contract Documents, or of the work to be performed under them, shall in any way affect its obligations on this bond; and it does hereby waive notice of any change, extension of time, alteration, or modification of the Contract Documents or of work to be performed under them.

Contractor/Principal and Surety agree that if the Owner is required to engage the services of an attorney in connection with the enforcement of this bond, each shall pay Owner's reasonable attorney's fees incurred, with or without suit, in addition to the above amount.

Any claims under this bond may be addressed to:

Name and address of Surety:

\_\_\_\_\_

Name and address of agent or representative in California, if different than above:

\_\_\_\_\_

Telephone number of Surety, or agent or representative in California:

\_\_\_\_\_

IN WITNESS WHEREOF, we have hereto set our hands and seals on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

[SEAL]

CONTRACTOR/PRINCIPAL

By \_\_\_\_\_  
Signature

\_\_\_\_\_  
Type or Print Name Above

\_\_\_\_\_  
Type of Print Title Above

SURETY

By \_\_\_\_\_  
Signature

\_\_\_\_\_  
Type or Print Name Above

\_\_\_\_\_  
Type of Print Title Above

*[SEAL AND NOTARIAL ACKNOWLEDGMENT OF SURETY]*

# WORKERS' COMPENSATION CERTIFICATE

**PROJECT TITLE: BID #: West Hills Coalinga Chiller Replacement Bldg. H**  
**OWNER: West Hills Community College District**

Labor Code Section 3700 provides:

"Every employer except the state shall secure the payment of compensation in one or more of the following ways:

"(a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this state.

"(b) By securing from the Director of Industrial Relations a certificate of consent to self-insure either as an individual employer, or as one employer in a group of employers, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees.

"(c) For any county, city, city and county, municipal corporation, public district, public agency, or any political subdivision of the state, including each member of a pooling arrangement under a joint exercise of powers agreement (but not the state itself), by securing from the Director of Industrial Relations a certificate of consent to self-insure against workers' compensation claims, which certificate may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to administer workers' compensation claims properly, and to pay workers' compensation claims that may become due to its employees. On or before March 31, 1979, a political subdivision of the state which on December 31, 1978, was uninsured for its liability to pay compensation, shall file a properly completed and executed application for a certificate of consent to self-insure against workers' compensation claims. The certificate shall be issued and be subject to the provisions of Section 3702."

I am aware of the provisions of Labor Code Section 3700 which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing and during the performance of the work on this Project.

Print Name of Contractor Above

By: \_\_\_\_\_

Date:

Print Name Above

Title:

[In accordance with Article 5 (commencing at Section 1860), Chapter 1, Part 7, Division 2 of the Labor Code, the above certificate must be signed and filed with the awarding body prior to performing any work under the contract.]

## GUARANTEE

**PROJECT TITLE: BID #: West Hills Coalinga Chiller Replacement Bldg. H**  
**OWNER: West Hills Community College District**

We guarantee that the construction work described above has been performed in accordance with, and complies with, the Contract Documents. We agree to repair or replace any or all of the work, together with any other adjacent work which may be required in connection with it, that may prove to be defective in workmanship or material within a period of one year from the date of acceptance of the project by Owner and the filing of the final verified report with the Division of State Architect (DSA), ordinary wear and tear excepted.

In the event of our failure to comply with these conditions within the applicable time frame as determined by Owner pursuant to the Contract Documents, in no event later than one week after being notified in writing by Owner, we authorize Owner to proceed to have the defects repaired at our expense, for which we will pay the costs and charges upon demand.

Date:

Name of Contractor

By: \_\_\_\_\_

Signature

Print Name:

Title:

Representative of Contractor  
to be Contacted for Service:

Name:

Address:

Telephone number of Contact:

**ESCROW AGREEMENT FOR  
SECURITY DEPOSITS IN LIEU OF RETENTION**

This Escrow Agreement is made and entered into by and between Owner \_\_\_\_\_, whose address is \_\_\_\_\_, and Contractor \_\_\_\_\_, whose address is \_\_\_\_\_, and Escrow Agent \_\_\_\_\_, whose address is \_\_\_\_\_.

For the consideration set forth in this Agreement, the Owner, Contractor, and Escrow Agent agree as follows:

1. Pursuant to Section 22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by Owner pursuant to the Construction Agreement entered into between the Owner and Contractor for \_\_\_\_\_ in the amount of \$ \_\_\_\_\_, dated \_\_\_\_\_ (referred to as the "Construction Agreement"). Alternatively, on written request of Contractor, Owner shall make payments of the retention earnings directly to the Escrow Agent. When Contractor deposits the securities as a substitute for retention earnings, the Escrow Agent shall notify the Owner within 10 days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Construction Agreement between the Owner and Contractor. Securities shall be held in the name of \_\_\_\_\_ and shall designate the Contractor as the beneficial owner.
2. Owner shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments under the provisions of the Construction Agreement, provided the Escrow Agent holds securities in the form and amount specified above.
3. When Owner makes payments of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of Contractor until the time the escrow created under this Escrow Agreement is terminated. Contractor may direct investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when Owner pays the Escrow Agent directly.
4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of Owner. These expenses and payment terms shall be determined by Owner, Contractor, and Escrow Agent.



5. The interest earned on the securities or the money market accounts held in escrow, and all interest earned on that interest, shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the Owner.

6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from Owner to Escrow Agent that Owner consents to withdrawal of the amount sought to be withdrawn by Contractor.

7. Owner shall have a right to draw upon the securities in the event of default by Contractor. Upon seven days' written notice of the default to the Escrow Agent from Owner, Escrow Agent shall immediately convert the securities to cash and distribute the cash as instructed by Owner.

8. Upon receipt of written notification from Owner certifying that the work under the Construction Agreement is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Construction Agreement, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payment of fees and charges.

9. Escrow Agent shall rely on the written notifications from Owner and Contractor pursuant to Sections 6 to 8, inclusive, of this Escrow Agreement and Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

10. The names of the persons who are authorized to give written notice or to receive written notice on behalf of Owner and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures, are as follows:

On behalf of Owner:

On behalf of Contractor:

Title

Title

Name Above [typed or printed]

Name Above [typed or printed]

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

Address:

Address:

On behalf of Escrow Agent:

Title

\_\_\_\_\_  
Name Above [typed or printed]

\_\_\_\_\_  
Signature

Address:

At the time the Escrow Account is opened, the Owner and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Escrow Agreement.

IN WITNESS WHEREOF, the parties have executed this Escrow Agreement by their proper officers on the date first set forth above.

Owner

Contractor

Title Above

Title Above

Name Above [typed or printed]

Name Above [typed or printed]

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

Escrow Agent

Title Above

Name Above [typed or printed]

\_\_\_\_\_  
Signature

## SHOP DRAWING TRANSMITTAL

**PROJECT TITLE/ BID #:** West Hills Coalinga Chiller Replacement Bldg. H  
**OWNER:** West Hills Community College District

The procedure governing shop drawing submittals is contained in the Contract Documents. All requirements must be followed by the Contractor. Failure to comply with all requirements will constitute grounds for return of the shop drawing for proper resubmittal. The Contractor shall sequentially number each submittal, using this form.

Date: \_\_\_\_\_ Submittal No. \_\_\_\_\_  
From: \_\_\_\_\_ To: \_\_\_\_\_

This is:      an original submittal        
                 a 2nd submittal              
                 a [         ] submittal       

---

Subject of Submittal:

Material or Equipment Designation:

Specification Section(s):

Check either (a) or (b)

- (a) We have verified that the material or equipment contained in this submittal meets all the requirements specified or shown (no exceptions).
- (b) We have verified that the material or equipment contained in this submittal meets all the requirements specified or shown, except for the following deviations (List deviations on attached sheet).

The Contractor has reviewed and approved not only the field dimensions but the construction criteria and has also made written notation regarding any information in the shop drawings that does not conform to the Contract Documents. This shop drawing has been coordinated with all other shop drawings received to date by Contractor and this duty of coordination has not been delegated to subcontractors, material suppliers, the architect, or the engineers on this project.

\_\_\_\_\_  
Signature of Contractor or Supplier

## **DRUG-FREE WORKPLACE CERTIFICATION**

**PROJECT TITLE/BID #: West Hills Coalinga Chiller Replacement Bldg. H**  
**OWNER: West Hills Community College District**

This Drug-Free Workplace Certification is required pursuant to Government Code Section 8350 and following sections, and the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract for the procurement of any property or services from any state agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract awarded by a state agency may be subject to suspension of payments or termination of the contract and the contractor may be subject to debarment from future contracting, if the state agency determines that specified acts have occurred.

Pursuant to Government Code Section 8355, every person or organization awarded a contract from a state agency shall certify that it will provide a drug-free workplace by doing all of the following:

- A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the person's or organization's workplace, and specifying actions which will be taken against employees for violations of the prohibition;
- B. Establishing a drug-free awareness program to inform employees about all of the following:
  - 1. The dangers of drug abuse in the workplace;
  - 2. The person's or organization's policy of maintaining a drug-free workplace;
  - 3. The availability of drug counseling, rehabilitation, and employee-assistance programs;
  - 4. The penalties that may be imposed upon employees for drug abuse violations;
- C. Requiring that each employee engaged in the performance of work on the Project be given a copy of the statement required by subdivision (a), and that as a condition of employment on the Contract the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of Government Code Section 8355 listed above and will publish a statement notifying employees concerning (a) the prohibition of controlled substances at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by Section 8355(a) and requiring that the employee agree to abide by the terms of that statement.

I also understand that if the Owner determines that I have either (a) made a false certification or (b) violated this certification by failing to carry out the requirements of Section 8355, the contract awarded is subject to suspension of payments, termination, or both. I further understand that should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of Section 8350 and following sections.

I acknowledge that I am aware of the provisions of Government Code Section 8350 and following sections, and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

Name of Contractor

\_\_\_\_\_  
Signature

Print Name Above

Print Title Above

Date:

## CERTIFICATE OF ATTENDANCE AT MANDATORY JOB WALK

*On projects including a mandatory job walk, this form must be submitted with the bid or bidder will be declared "non-responsive"*

**PROJECT TITLE/ BID #: West Hills Coalinga Chiller Replacement Bldg. H**  
**OWNER: West Hills Community College District**

It is the Owner's intention to provide all contractors with equal access to information regarding this project. Further, the Owner has issued plans and specifications to bidders and has allowed bidders the opportunity to inspect the site with knowledgeable personnel at the job walk. Therefore it is understood that the Owner may declare the bid non-responsive for any of the following conditions:

1. If a bidder attends the entire mandatory job walk but fails to complete this form;
2. If a bidder fails to attend the entire mandatory job walk;
3. If a bidder fails to attend the entire mandatory job walk but certifies that he was in attendance. *[NOTE: This may also lead to a determination that the bidder is non-responsive.]*

Please check one of the following:

- I attended the entire mandatory job walk  
**-OR-**  
 I did not attend the entire mandatory job walk.

I hereby certify under penalty of the perjury laws of the State of California that the foregoing is true and correct.

Executed at \_\_\_\_\_, California, on \_\_\_\_\_, 20 .

Firm Name:

By:  
Print Name Above

Signed \_\_\_\_\_

Print Title:

# CONTRACTOR'S QUALIFICATIONS QUESTIONNAIRE

## TO BE SUBMITTED WITH THE BID WHEN THERE HAS BEEN NO PREQUALIFICATION PROCESS

**PROJECT TITLE/BID #:** West Hills Coalinga Chiller Replacement Bldg. H  
**OWNER:** West Hills Community College District

The prospective Bidder shall furnish all the following information accurately and completely. Failure to fully and completely comply with this requirement may result in rejection of any bid submitted. Additional sheets may be attached if necessary. "You" or "your" as used in this questionnaire refers to the Bidder's firm and any of its owners, officers, directors, shareholders, parties, or principals. Owner has discretion to request additional information depending on the project.

### —WARNING—

Certain information may lead to a determination of non-responsibility and rejection of the bid.

**(1) Firm name and address:**

**(2) Telephone:**

**(3) Type of firm:** (check one) Individual  Partnership  Corp.

**(4) License No.:**

Class:

DIR Registration No.

Name of license holder:

**(5) Have you or any of your principals ever been licensed under a different name or different license number?** Response must include information pertaining to principals' association outside of the firm bidding this Project. If yes, give name and license number:

**(6) Names and titles of all principals of the firm:**

**(7) Number of years as contractor.** Include only years in this type of construction and only the years with the current entity in its current form:                      Years

**(8) Person who inspected work site for your firm:**

Name:

Title:

Date of Inspection:

**(9) Years of experience your firm has in public school construction work:**

As general contractor:                      Years

As subcontractor:                      Years

**(10) In the last five years has your firm or any of its principals defaulted so as to cause a loss to a surety?** Response must include information pertaining to principals' associations outside of the firm bidding this Project. If the answer is yes, give date, name, and address of surety and details:

**(11) In the last five years have you or any of your principals been assessed liquidated damages for any project?** Response must include information pertaining to principals' associations outside of the firm bidding this Project. If yes, explain:

**(12) In the last five years have you or any of your principals been in litigation or arbitration or a dispute of any kind on a question or questions relating to a public construction project?** Response must include information pertaining to principals' association outside of the firm bidding this Project. If yes, provide name of public agency and details of the dispute. Attach additional pages as necessary.

**(13) In the last five years have you or any of your principals ever failed to complete a project?** Response must include information pertaining to principals' association outside of the firm bidding this Project. If yes, provide owner's name and details. Attach additional pages as necessary.



**(14) In the last five years have you or any of your principals been assessed back-charges on any public works construction project?** If so, explain, including the identity of the public entity, the basis for their claims, and the final result. Attach additional pages as necessary.

**(15) In the last five years have you or any of your principals ever failed to complete a project within the time frame originally set for completion, plus any extension of time granted for weather delays?** An extension of time for any reason other than weather delays requires an explanation. Response must include information pertaining to principals' association outside of the firm bidding this Project. If yes, provide owner's name and details. Attach additional pages as necessary.

**(16) List names, addresses, and telephone numbers of three architects or engineers with whom you have worked on a public works project in the last five years:**

Project One:

Project Two:

Project Three:

**(17) Conflicts of Interest:** Do you now or have you in the last five years had any direct or indirect business, financial, or other connection with any official, employee, or consultant of the OWNER or architect? If yes, describe. Attach additional pages as necessary.

**(18) In the last five years have you or any of your principals filed a claim for additional compensation from a public entity on a construction project?** If yes,

explain and include the identity of the public entity, the basis for the claim, the response by the public entity, and the final result. Attach additional pages as necessary.

**(19) In the last five years have you or any of your principals ever failed to pre-qualify, or been deemed unqualified, on any public works construction project?** If yes, explain and include the identity of the public entity, the basis for their claims, and the final result. Attach additional pages as necessary.

**(20) In the last five years have you or any of your principals ever been declared a “non-responsible” bidder on any public works construction project?** If yes, explain and include the identity of the public entity, the basis for their claims, and the final result. Attach additional pages as necessary.

**(21) Staff/Roster Functions:** List all members of your staff who will be assigned or responsible for work as a team member on this Project (except clerical) and show job titles, functions, years with firm, and projects completed for company. Include company officers, responsible managing employee (RME), project manager, and superintendent. Provide the following information for each individual (copy this page as many times as required).

**Name and Title:**

**Function:**

**Years with firm:**

**Has the individual had prior exposure as a team member on one of your projects?**

Yes  No

**List of all school projects this person has completed for you:**

**Provide an organizational chart reflecting your proposed project team for the Project, including all persons on your project team.**

**(22) Surety:** Indicate the names of all surety companies utilized by you in the last 10 years. Attach additional pages as necessary.

Surety Name & Address Period Covered

Surety Name & Address Period Covered

Surety Name & Address Period Covered

Surety Name & Address Period Covered

**(23)** Attach a notarized statement from surety company(ies) proposed to be utilized on this Project, indicating your total bonding capacity and certifying that:

A. Currently available bonding capacity exceeds the value of your contract, as estimated by the OWNER, and;

B. Surety(ies) will provide bonding of the project in the event you are awarded Project.

**(24) Insurance:** Provide a notarized statement from your workers' compensation carrier specifying your current "Experience Modification Rate" for workers' compensation for the State of California. Provide a list of above-referenced ratings and corresponding companies for the last five years.

**(25) Safety:**

A. Does your firm have a written Safety Program:

Yes  No  (If yes, attach copy.)

B. Does your firm have personnel permanently assigned to safety?

Yes  No  (If yes, provide names and duties.)

**(26) Give the public entity's name, telephone number, and the name of the contact person for the three largest public works projects performed for a public entity, other than a school/college/university, that you have completed in the last five years:** Attach additional sheets as necessary.

**(27) List of References:** Provide information on the three largest projects performed for a public school, college, or university in the last five years.

**Contract 1:**

Name:

Address:

Telephone:

Contact Person:

Type of construction project:

Dates of commencement and completion of construction project:

Contract amount:

Architect:

Architect's address:

Telephone:

DSA or public agency inspector:

Address:

Telephone:

**Contract 2:**

Name:

Address:

Telephone:

Contact Person:

Type of construction project:

Dates of commencement and completion of construction project:

Contract amount:

Architect:

Architect's address:

Telephone:

DSA or public agency inspector:

Address:

Telephone:

**Contract 3:**

Name:

Address:

Telephone:

Contact Person:

Type of construction project:

Dates of commencement and completion of construction project:

Contract amount:

Architect:

Architect's address:

Telephone:

DSA or public agency inspector:

Address:

Telephone:

I certify and declare under penalty of perjury under the laws of the State of California that the foregoing information is true, correct, and complete.

Executed this \_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, at \_\_\_\_\_ (City, County), State of \_\_\_\_\_.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name Above

\_\_\_\_\_  
Print Title Above

<b>WATER CHILLER SCHEDULE (AIR COOLED)</b>		
<b>DESIGNATION</b>	<b>CH-1</b>	
<b>CAPACITY (TONS)</b>	156.1	
<b>FLA</b>	351	
<b>VOLTS / PHASE</b>	460 / 3	
<b>MCA / MOCP</b>	369 / 500	
<b>EER / IPLV</b>	8.5 / 16.8	
<b>COMP. MOTOR</b>	<b>QUANTITY</b>	6
	<b>RLA (EACH)</b>	54
	<b>OPER. KW (EACH)</b>	34.9
<b>EVAPORATOR</b>	<b>GPM</b>	305
	<b>PRESSURE DROP (FT.)</b>	8.6
	<b>EWT / LWT (°F)</b>	54 / 42
	<b>SCALE FACTOR</b>	0.0001
<b>AMBIENT AIR (°F)</b>	105	
<b>MANUFACTURER</b>	TRANE	
<b>TYPE</b>	SCROLL	
<b>MODEL NUMBER</b>	ACSA1802EUA*Q	
<b>LOCATION</b>	MECHANICAL YARD	
<b>OPER. WT (LBS)</b>	9,577	
<b>ACCESSORIES</b>	1	

1. SUPERIOR SOUND PACKAGE WITH NOISE REDUCTION.



## TETER, LLP

7535 N. PALM AVE. 201  
FRESNO, CA 93711 | 559.437.0887  
125 S. BRIDGE ST. 150  
VISALIA, CA 93291 | 559.625.5246  
1200 DISCOVERY DR. 160  
BAKERSFIELD, CA 93309 | 661.843.8400

## WHCCD COALINGA CHILLER REPLACEMENT

300 CHERRY LANE  
COALINGA, CA

JOB NUMBER:  
**22-12358**

DWG. DATE:  
**9/8/22**

**M1**

SECTION 236423  
SCROLL WATER CHILLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Packaged, air-cooled, electric-motor-driven, scroll water chillers.

1.3 DEFINITIONS

- A. 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.
- B. 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.
- C. IPLV: Integrated part-load value. A single number part-load efficiency figure of merit calculated per the method defined by ARI 550/590 and referenced to ARI standard rating conditions.
- D. kW/Ton: The ratio of total power input of the chiller in kilowatts to the net refrigerating capacity in tons at any given set of rating conditions.
- E. NPLV: Nonstandard part-load value. A single number part-load efficiency figure of merit calculated per the method defined by ARI 550/590 and intended for operating conditions other than the ARI standard rating conditions.

1.4 SUBMITTALS

- A. Product Data: Include refrigerant, rated capacities, operating characteristics, furnished specialties, and accessories.
  - 1. Performance at ARI standard conditions and at conditions indicated.
  - 2. Performance at ARI standard unloading conditions.
  - 3. Minimum evaporator flow rate.
  - 4. Refrigerant capacity of water chiller.
  - 5. Oil capacity of water chiller.
  - 6. Fluid capacity of evaporator.



7. Characteristics of safety relief valves.
  8. Minimum entering condenser-air temperature
  9. Performance at varying capacity with constant design entering condenser-air temperature. Repeat performance at varying capacity for different entering condenser-air temperatures from design to minimum in 10 deg F increments.
- B. Shop Drawings: Complete set of manufacturer's prints of water chiller assemblies, control panels, sections and elevations, and unit isolation. Include the following:
1. Assembled unit dimensions.
  2. Weight and load distribution.
  3. Required clearances for maintenance and operation.
  4. Size and location of piping and wiring connections.
  5. Wiring Diagrams: For power, signal, and control wiring.
- C. Startup service reports.
- D. Operation and Maintenance Data: For each water chiller to include in emergency, operation, and maintenance manuals.
- E. Warranty: Sample of special warranty.

#### 1.5 QUALITY ASSURANCE

- A. ARI Certification: Certify chiller according to ARI 590 certification program.
- B. ARI Rating: Rate water chiller performance according to requirements in ARI 550/590, "Water Chilling Packages Using the Vapor Compression Cycle."
- C. ASHRAE Compliance: ASHRAE 15 for safety code for mechanical refrigeration.
- D. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."
- E. ASME Compliance: Fabricate and stamp water chiller heat exchangers to comply with ASME Boiler and Pressure Vessel Code.
- F. Comply with NFPA 70.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

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

#### 1.7 COORDINATION

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

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of water chillers that fail in materials or workmanship within specified period.
1. Compressor Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PACKAGED AIR-COOLED WATER CHILLERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Trane.
- B. Description: Factory-assembled and run-tested water 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 water 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 from 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 consisting of the following:
    - a. Acoustic enclosure around compressors.
    - b. Reduced-speed fans with acoustic treatment.
    - c. Designed to reduce sound level without affecting performance.
- D. Compressors:
1. Description: Positive-displacement direct drive with hermetically sealed casing.
  2. Each compressor provided with suction and discharge service valves, crankcase oil heater, and suction strainer.
  3. Operating Speed: Nominal 3600 rpm for 60-Hz applications.
  4. Capacity Control: On-off compressor cycling.
  5. Oil Lubrication System: Automatic pump with strainer, sight glass, filling connection, filter with magnetic plug, and initial oil charge.
  6. Vibration Isolation: Mount individual compressors on vibration isolators.

E. Compressor Motors:

1. Hermetically sealed and cooled by refrigerant suction gas.
2. High-torque, two-pole induction type with inherent thermal-overload protection on each phase.

F. Compressor Motor Controllers:

1. Across the Line: NEMA ICS 2, Class A, full voltage, nonreversing.

G. Refrigeration:

1. Refrigerant: R-410a. Classified as Safety Group A1 according to ASHRAE 34.
2. Refrigerant Compatibility: Parts exposed to refrigerants shall be fully compatible with refrigerants, and pressure components shall be rated for refrigerant pressures.
3. Refrigerant Circuit: Each circuit shall include a thermal-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. Refrigerant Isolation: Factory install positive shutoff isolation valves in the compressor discharge line and the refrigerant liquid-line to allow the isolation and storage of the refrigerant charge in the chiller condenser.

H. Evaporator:

1. Brazed Plate:
  - a. Direct-expansion, single-pass, brazed-plate design.
  - b. Type 316 stainless-steel construction.
  - c. Code Compliance: Tested and stamped according to ASME Boiler and Pressure Vessel Code.
  - d. Fluid Nozzles: Terminate with mechanical-coupling end connections for connection to field piping.
2. Heater: Factory-installed, field-wired electric heater with integral controls designed to protect the evaporator to minus 20 deg F.

I. Air-Cooled Condenser:

1. Plate-fin coil with integral subcooling on each circuit, rated at 650 psig.
  - a. Aluminum microchannel condenser coils.
2. Fans: Direct-drive propeller type with statically and dynamically balanced fan blades, arranged for vertical air discharge.
3. Fan Motors: Totally enclosed nonventilating (TENV) or totally enclosed air over (TEAO) enclosure, with permanently lubricated bearings, and having built-in overcurrent- and thermal-overload protection.
4. Fan Guards: Steel safety guards with corrosion-resistant coating.

J. 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 water chiller.
2. House in a unit-mounted, NEMA 250, Type 3R enclosure with hinged access door with lock and key or padlock and key.
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 wire lugs.
6. Provide branch power circuit to each motor and to controls with one of the following disconnecting means:
  - a. NEMA KS 1, heavy-duty, fusible switch with rejection-type fuse clips rated for fuses. Select and size fuses to provide Type 2 protection according to IEC 60947-4-1.
  - b. NEMA KS 1, heavy-duty, nonfusible switch.
  - c. NEMA AB 1, motor-circuit protector (circuit breaker) with field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.
7. Provide each motor with overcurrent protection.
8. Overload relay sized according to UL 1995, or an integral component of water chiller control microprocessor.
9. Phase-Failure and Undervoltage: Solid-state sensing with adjustable settings.
10. 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.
  - b. Power unit-mounted, ground fault interrupt (GFI) duplex receptacle.
11. Control Relays: Auxiliary and adjustable time-delay relays.
12. Indicate the following for water chiller electrical power supply:
  - a. Current, 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.

K. Controls:

1. Stand-alone, microprocessor based.
2. Enclosure: Share enclosure with electrical power devices or provide a separate enclosure of matching construction.
3. Operator Interface: Keypad or pressure-sensitive touch screen. Multiple-character, backlit, liquid-crystal display or light-emitting diodes. Display the following:
  - a. Date and time.

- b. Operating or alarm status.
  - c. Operating hours.
  - d. Outside-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. Antirecycling 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 limit. Chilled-water leaving temperature shall be reset based on return-water temperature.
  - c. Current limit and demand limit.
  - d. External water chiller emergency stop.
  - e. Antirecycling timer.
  - f. Automatic lead-lag switching.
5. Manual-Reset Safety Controls: The following conditions shall shut down water chiller and require manual reset:
- a. Low evaporator pressure or high condenser pressure.
  - b. Low chilled-water temperature.
  - c. Refrigerant high pressure.
  - d. High or low oil pressure.
  - e. High oil temperature.
  - f. Loss of chilled-water flow.
  - g. Control device failure.
6. Building Automation System Interface: Factory-installed hardware and software to enable building automation system to monitor, control, and display water chiller status and alarms.
- a. Hardwired Points:
    - 1) Monitoring: On/off status, common trouble alarm.
    - 2) Control: On/off operation, chilled-water discharge temperature set-point adjustment.

- b. ASHRAE 135 (BACnet) communication interface with building automation system shall enable building automation system operator to remotely control and monitor the water chiller from an operator workstation. Control features and monitoring points displayed locally at water chiller control panel shall be available through building automation system.

L. Insulation:

- 1. Material: Closed-cell, flexible elastomeric, thermal insulation complying with ASTM C 534, Type I, for tubular materials and Type II, for sheet materials.
- 2. Thickness: 3/4 inch.
- 3. Factory-applied insulation over cold surfaces of water chiller components.
  - a. Adhesive: As recommended by insulation manufacturer and applied to 100 percent of insulation contact surface. Seal seams and joints.
- 4. Apply protective coating to exposed surfaces of insulation.

M. Accessories:

- 1. Factory-furnished, chilled-water flow switches for field installation.
- 2. Individual compressor suction and discharge pressure gages with shutoff valves for each refrigeration circuit.
- 3. Factory-furnished neoprene isolators for field installation.

## 2.2 SOURCE QUALITY CONTROL

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

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 WATER CHILLER INSTALLATION

- A. Install water chillers on support structure indicated.
- B. Equipment Mounting: Install water chiller on concrete bases using elastomeric pads.
  - 1. Minimum Deflection: 1/4 inch.
  - 2. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 3. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Maintain manufacturer's recommended clearances for service and maintenance.
- D. Charge water chiller with refrigerant if not factory charged and fill with oil if not factory installed.
- E. Install separate devices furnished by manufacturer and not factory installed.

### 3.3 CONNECTIONS

- A. Comply with requirements in Division 23 Section "Hydronic Piping" Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to chiller to allow service and maintenance.
- C. Evaporator Fluid Connections: Connect to evaporator inlet with shutoff valve, strainer, flexible connector, thermometer, and plugged tee with pressure gage. Connect to evaporator outlet with shutoff valve, balancing valve, flexible connector, flow switch, thermometer, plugged tee with pressure gage, and drain connection with valve. Make connections to water chiller with a flange.
- D. Connect each drain connection with a union and drain pipe and extend pipe, full size of connection, to floor drain. Provide a shutoff valve at each connection if required.

### 3.4 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. Inspect field-assembled components, equipment installation, and piping and electrical connections for proper assemblies, installations, and connections.
- C. Complete installation and startup checks according to manufacturer's written instructions and perform the following:
  - 1. Verify that refrigerant charge is sufficient and water chiller has been leak tested.
  - 2. Verify that pumps are installed and functional.
  - 3. Verify that thermometers and gages are installed.
  - 4. Operate water chiller for run-in period.
  - 5. Check bearing lubrication and oil levels.

6. Verify that refrigerant pressure relief device for chillers installed indoors is vented outside.
  7. Verify proper motor rotation.
  8. Verify and record performance of chilled-water flow and low-temperature interlocks.
  9. Verify and record performance of water chiller protection devices.
  10. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.
- D. Prepare a written startup report that records results of tests and inspections.

### 3.5 DEMONSTRATION

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

END OF SECTION





### Unit Overview

<b>Chiller Model</b>	Ascend (TM) Air-Cooled Chiller Model ACS
<b>Unit Nominal Tonnage</b>	180 Nominal Tons
<b>Refrigeration Capacity</b>	156.07 tons
<b>Cooling Efficiency</b>	8.491 EER (Btu/W-h)
<b>IPLV.IP</b>	16.844 EER (Btu/W-h)
<b>NPLV.IP</b>	15.213 EER (Btu/W-h)
<b>Voltage</b>	460V/60Hz/3Phase
<b>Refrigerant</b>	Refrigerant Charge R-410A
<b>Elevation</b>	0.00 ft
<b>Agency Listing</b>	UL listed to US & Canadian safety std
<b>Model Number</b>	ACSA1802EUA*QUXAXNB2XLNX SMEX1TAXBXXAXXXXXXONX



### Evaporator Information

<b>Evaporator Application</b>	Standard Cooling (Above 40 Deg F)	<b>Fluid Properties</b>	
<b>Fouling Factor</b>	0.000100 hr-sq ft-deg F/ Btu	<b>Fluid Type</b>	Water
<b>Flow Sense Set Point</b>	Flow Switch Set Point 60	<b>Fluid Freeze Point</b>	32.00 F
<b>Design Flow</b>	304.95 gpm	<b>Entering Temperature</b>	54.00 F
<b>Evaporator Head Loss</b>	8.12 ft	<b>Leaving Temperature</b>	42.00 F
<b>Strainer Head Loss</b>	0.51 ft		
<b>VPF Min Flow</b>	239.79 gpm		

### Condenser Information

<b>Unit Application</b>	Standard Ambient	<b>Temperatures</b>	
<b>Condenser Fin Options</b>	Aluminum Micro Channel	<b>Ambient Air Temp.</b>	105.00 F
<b>Number of Fans</b>	10	<b>Saturated Cond - ckt 1</b>	128.58 F
		<b>Saturated Cond - ckt 2</b>	128.58 F

### Electrical Information

<b>Unit Voltage</b>	460V/60Hz/3Phase	<b>RLA</b>		
<b>Total Power</b>	220.57 kW	<b>Compressor 1A</b>	54.00 A	
<b>Compressor Starter</b>	Across-The-Line-Starter	<b>Compressor 1B</b>	54.00 A	
<b>Incoming Line Connection</b>	Single Point Unit Power Connection	<b>Compressor 1C</b>	54.00 A	
<b>Incoming Line Connection Type</b>	Terminal Block	<b>Compressor 2A</b>	54.00 A	
<b>Short Circuit Current Rating</b>	Default Short Circuit Rating	<b>Compressor 2B</b>	54.00 A	
<b>FLA - Condenser Fan (each)</b>	2.70 A	<b>Compressor 2C</b>	54.00 A	
<b>MCA</b>		<b>LRA</b>		
<b>Single Point Power</b>	369 A	<b>Compressor 1A X-L LRA</b>	294.00 A	
<b>MOP</b>		<b>Compressor 1B X-L LRA</b>	294.00 A	
<b>Single Point Power</b>	500 A	<b>Compressor 1C X-L LRA</b>	294.00 A	
		<b>Compressor 2A X-L LRA</b>	294.00 A	
		<b>Compressor 2B X-L LRA</b>	294.00 A	
		<b>Compressor 2C X-L LRA</b>	294.00 A	

### Physical Information

<b>Dimensions</b>		<b>Weights</b>		<b>Charge</b>	<b>Circuit 1</b>	<b>Circuit 2</b>
<b>Length</b>	282 in	<b>Operating</b>	9577 lb	<b>Refrigerant</b>	73.0 lb	73.0 lb
<b>Width</b>	88 in	<b>Shipping</b>	9434 lb	<b>Oil</b>	4.60 gal	4.60 gal
<b>Height</b>	98 in					



## Acoustical Performance

Unit Sound Level		Superior With Noise Reduction Request							
Sound Power Levels (Lw, in dB, ref1 pW)									
Percent Load	Octave Band Center Frequency (Hz)								Overall A-Wtd
	63	125	250	500	1000	2000	4000	8000	
100	99 dB	96 dB	92 dB	93 dB	89 dB	83 dB	74 dB	67 dB	94 dBA

Standard full and part-load rating conditions per AHRI 550/590

Noise Reduction Request Sound Power Levels (Lw, in dB, ref1 pW)									
Percent Load	Octave Band Center Frequency (Hz)								Overall A-Wtd
	63	125	250	500	1000	2000	4000	8000	
100	99 dB	96 dB	92 dB	93 dB	89 dB	83 dB	74 dB	67 dB	94 dBA

Levels are with low noise package, 80% of full speed noise reduction request fan speed, and 70°F ambient air temperature.

Sound Pressure Levels (Lw, in dB, ref1 pW) 10m from center of broad sides of chiller									
Percent Load	Octave Band Center Frequency (Hz)								Overall A-Wtd
	63	125	250	500	1000	2000	4000	8000	
100	72 dB	69 dB	65 dB	66 dB	62 dB	56 dB	47 dB	40 dB	67 dBA

Standard full and part-load rating conditions per AHRI 550/590

Noise Reduction Request Sound Pressure Levels (Lw, in dB, ref1 pW) 10m from center of broad sides of chiller									
Percent Load	Octave Band Center Frequency (Hz)								Overall A-Wtd
	63	125	250	500	1000	2000	4000	8000	
100	69 dB	65 dB	66 dB	72 dB	62 dB	56 dB	47 dB	40 dB	67 dBA

Levels are with low noise package, 80% of full speed noise reduction request fan speed, and 70°F ambient air temperature.

## Standard Rating Performance and Information for LEED Rating

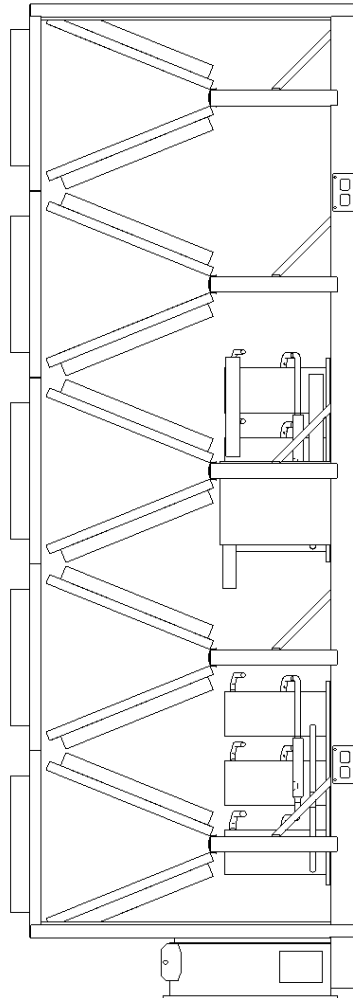
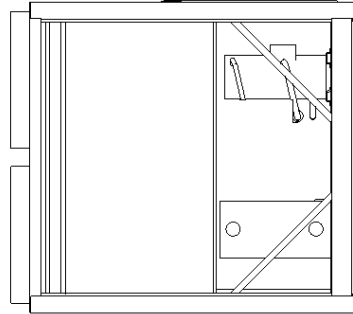
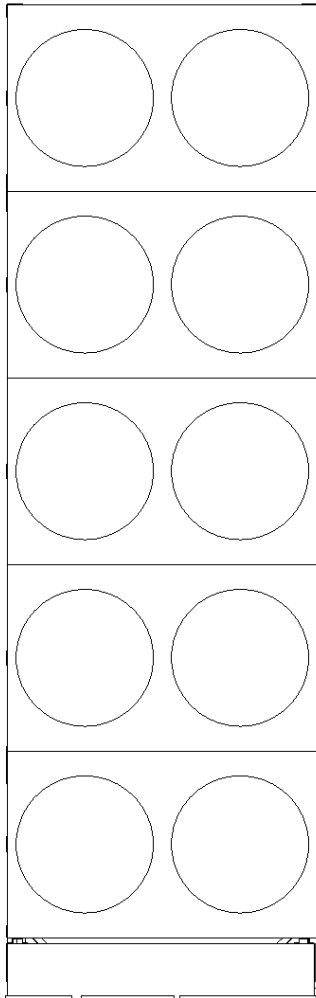
<b>Refrigerant Charge - ckt 1</b>	73.0 lb	This product meets the minimum efficiency requirements of ASHRAE Standard 90.1 and CANS/CSA C743 for all versions (which are based on AHRI standard rating conditions with water) and, therefore, also meets the LEED "Minimum Energy Performance" prerequisite in the Energy and Atmosphere section.  The LEED Green Building Rating System™, developed by the U.S. Green Building Council, provides independent, third-party verification that a building project meets green building and performance measures
<b>Refrigerant Charge - ckt 2</b>	73.0 lb	
<b>Rated Refrigerating Capacity</b>	172.54 tons	
<b>Rated Cooling Efficiency</b>	10.096 EER (Btu/W-h)	
<b>Rated IPLV</b>	16.844 EER (Btu/W-h)	
<b>Refrigerating Capacity</b>	156.07 tons	
<b>Cooling Efficiency</b>	8.491 EER (Btu/W-h)	
<b>Compressor Power</b>	209.58 kW	
<b>Fan Motor Power</b>	10.95 kW	

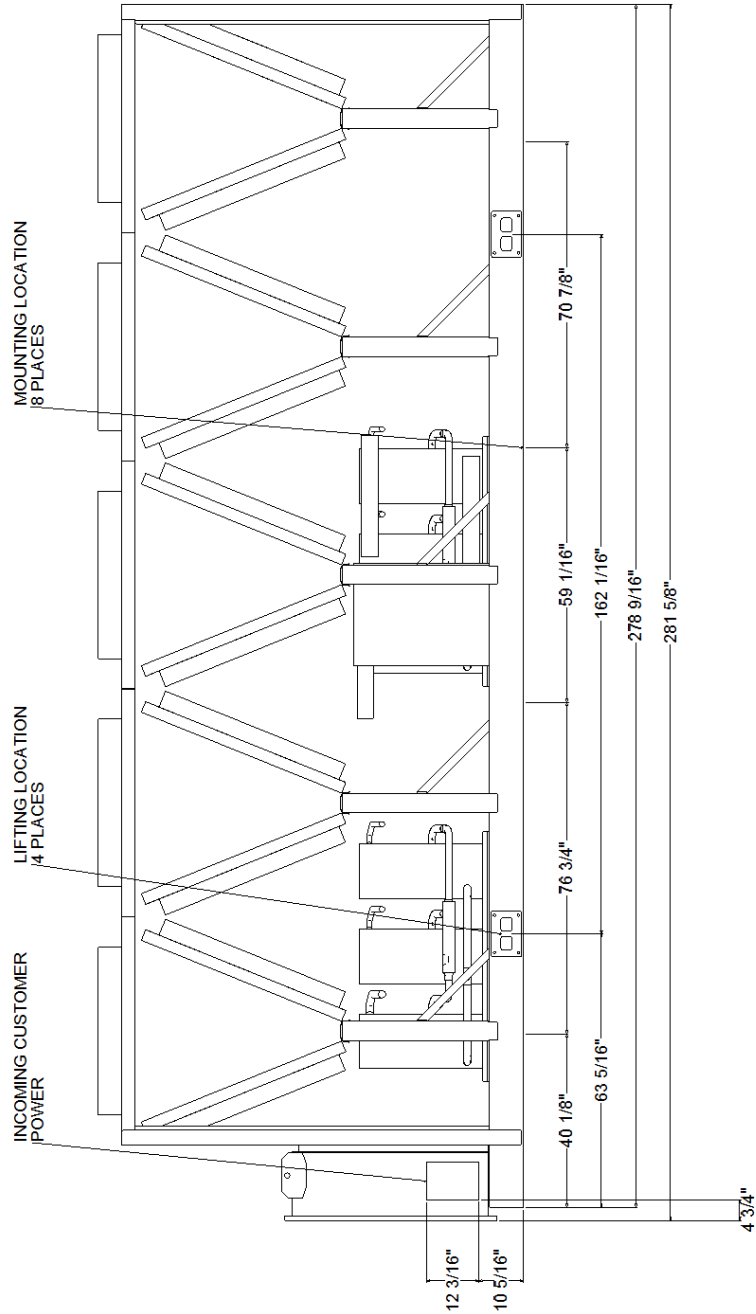
Certified in accordance with the AHRI Air-Cooled Water-Chilling Packages Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Certified units may be found in the AHRI Directory at [www.ahridirectory.org](http://www.ahridirectory.org).

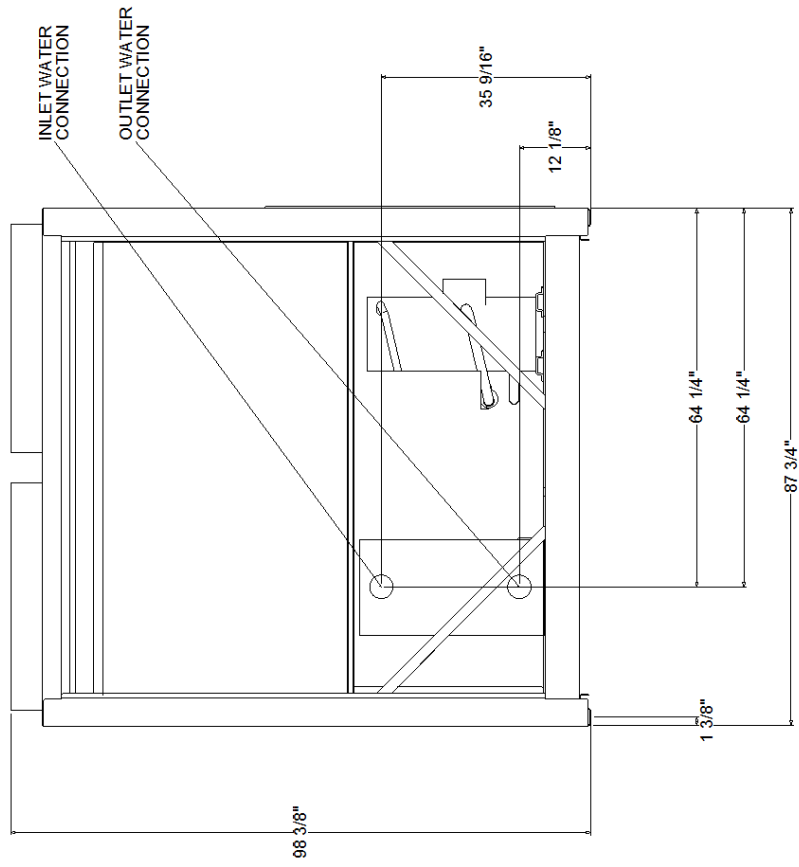


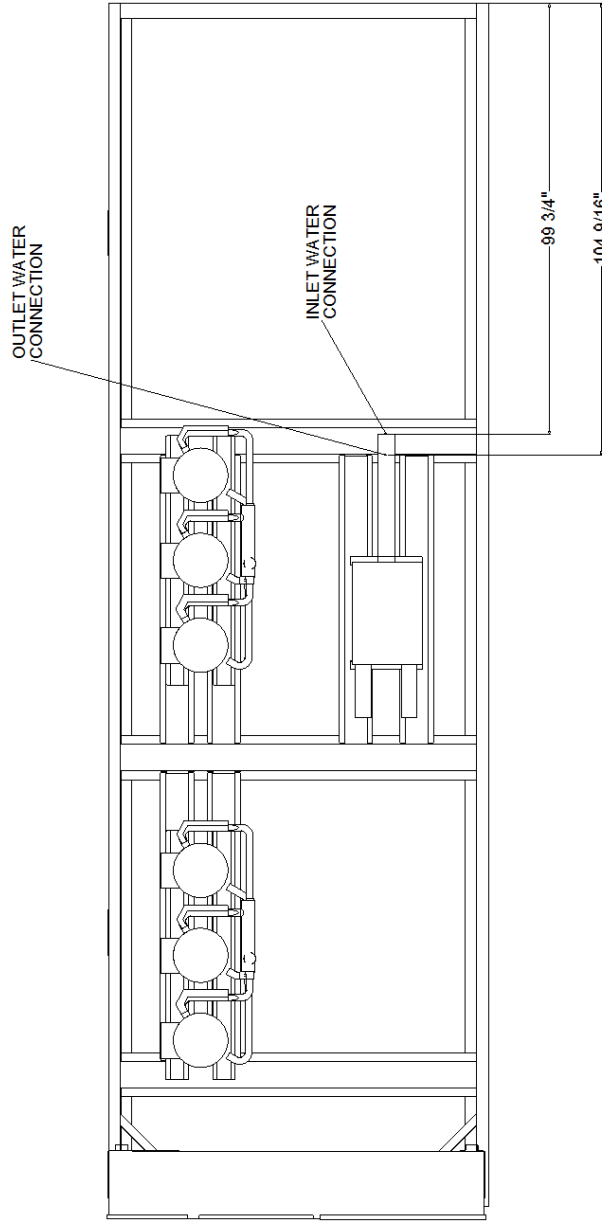
Trane Select Assist Version Number: 262  
 Data Generation Date: 8/25/2022

NOMINAL TONNAGE 180  
 WATER CONNECTION 4" (100mm)  
 WATER VOLUME 19.4 gallons  
 NOTE: WIRING AND MOST PIPING IS  
 NOT SHOWN FOR CLARITY. ONLY MAJOR  
 COMPONENTS ARE SHOWN.





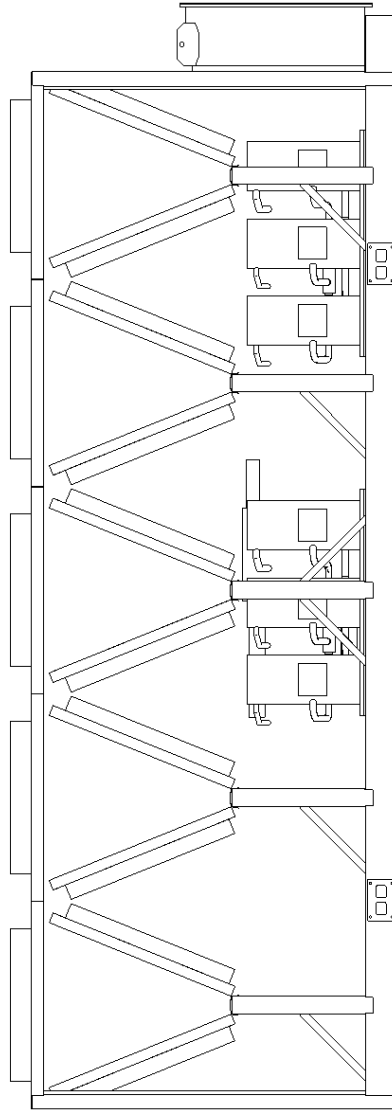




CONDENSER REMOVED FOR CLARITY



The left side view of the unit is displayed for units with partial heat recovery. If no heat recovery option is selected, no dimensions will be displayed.



- NOTES:
1. DO NOT FORK LIFT UNIT.
  2. KEEP UNIT LEVEL WHEN LIFTING.
  3. TOTAL WEIGHT IS TYPICAL FOR UNITS WITH R-410A AND WITHOUT LOUVER PANELS.
  4. DIAGRAM IS A GENERIC REPRESENTATION OF THE UNIT.
  5. THE MAXIMUM RIGGING ANGLE AT EACH CHILLER LIFT POINT IS 30 DEGREES FROM VERTICAL.
  6. DO NOT ALLOW LIFTING STRAPS/CHAINS TO CONTACT UNIT DURING LIFT.

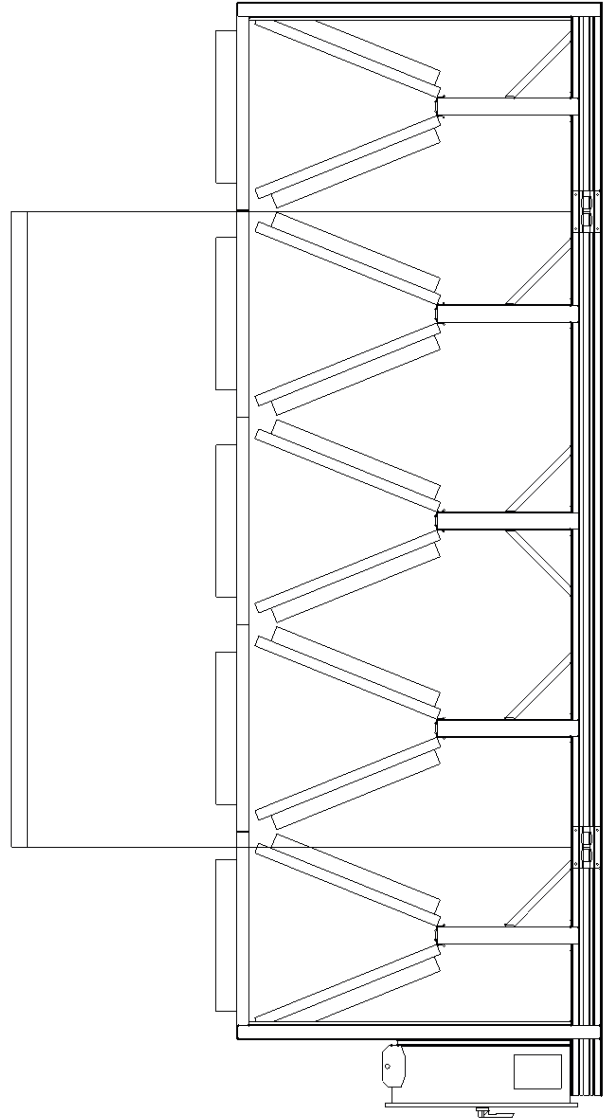
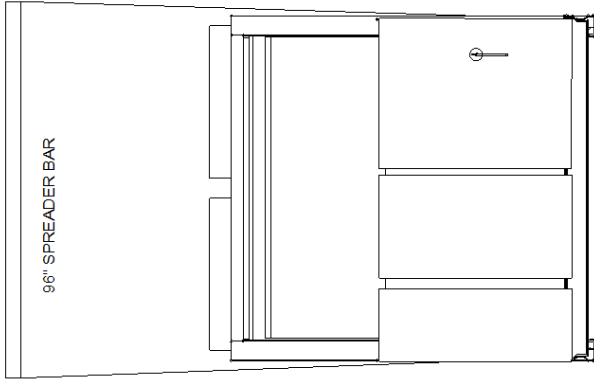
TOTAL SHIPPING/LIFTING WEIGHT 9,434 lb

**WARNING**  
**LIFTING AND RIGGING**

Use the spreader bar as shown in the diagram. Refer to installation instructions located inside control panel for further rigging information.

Other lifting arrangements could result in death, serious injury or equipment damage.

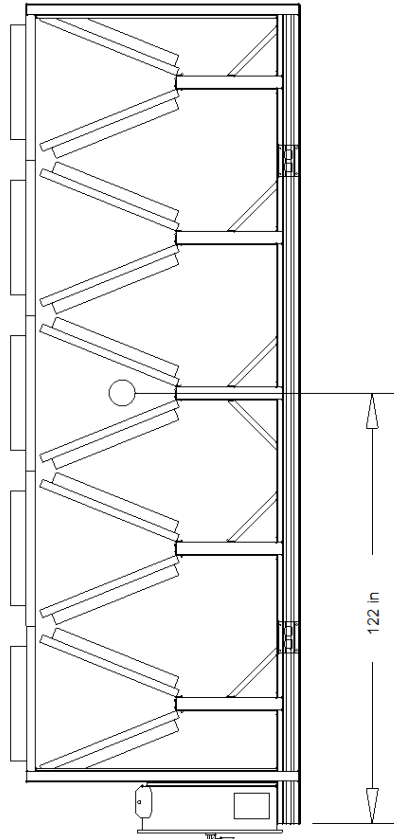
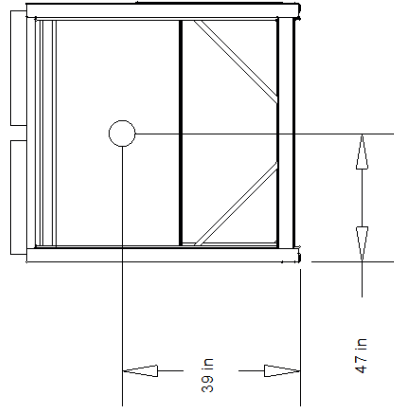
**DO NOT ALL LIFTING STRAPS TO CONTACT UNIT DURING LIFT.**



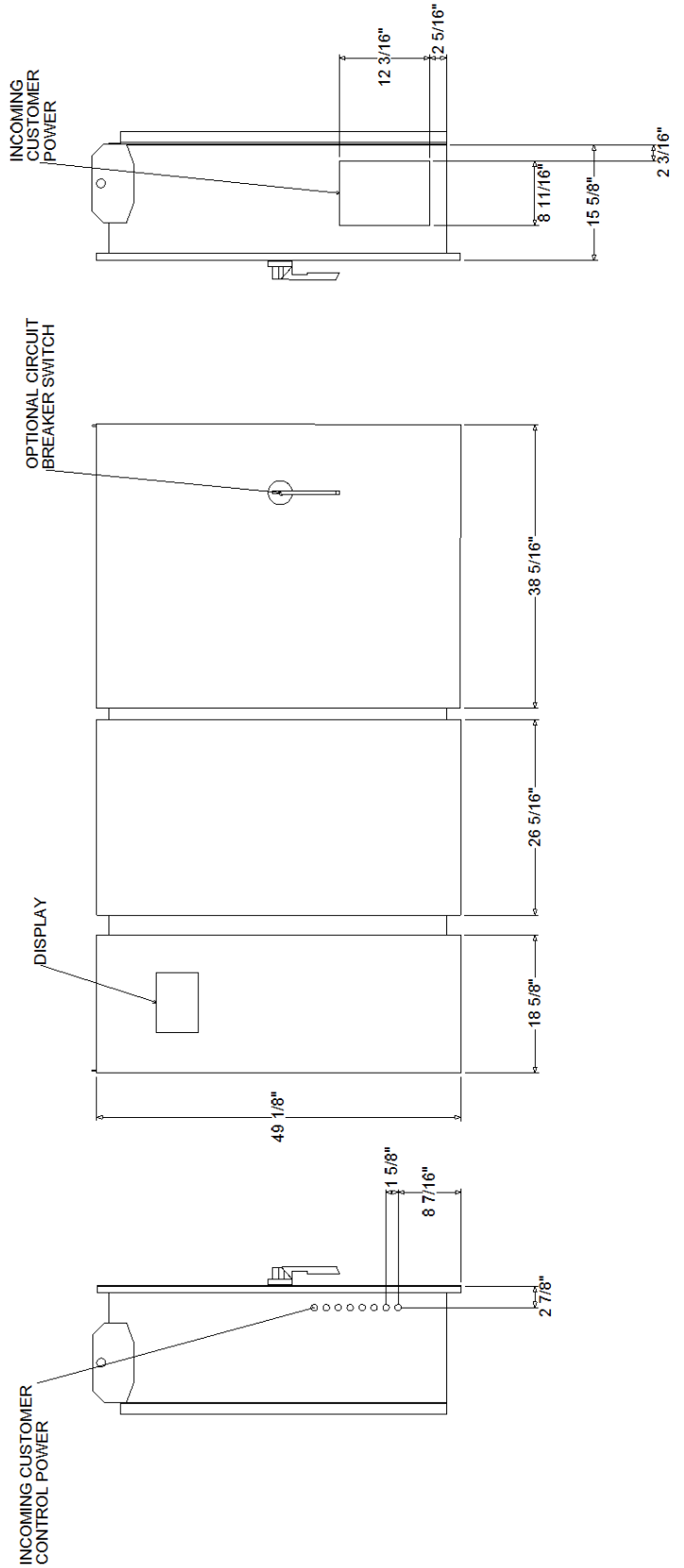
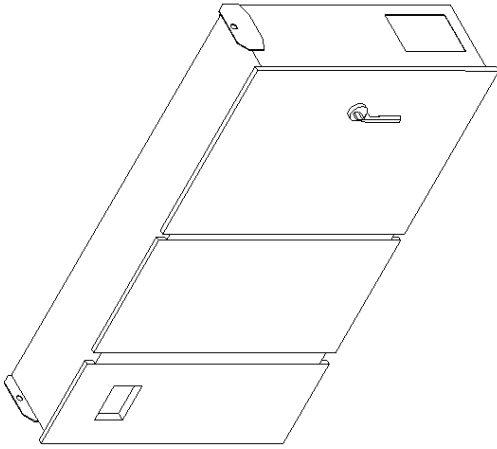


## CENTER OF GRAVITY

Different unit configurations and options may cause a variation in the center of gravity from what is listed. Refer to the Installation, Operating and Maintenance manual for specific lifting instructions.

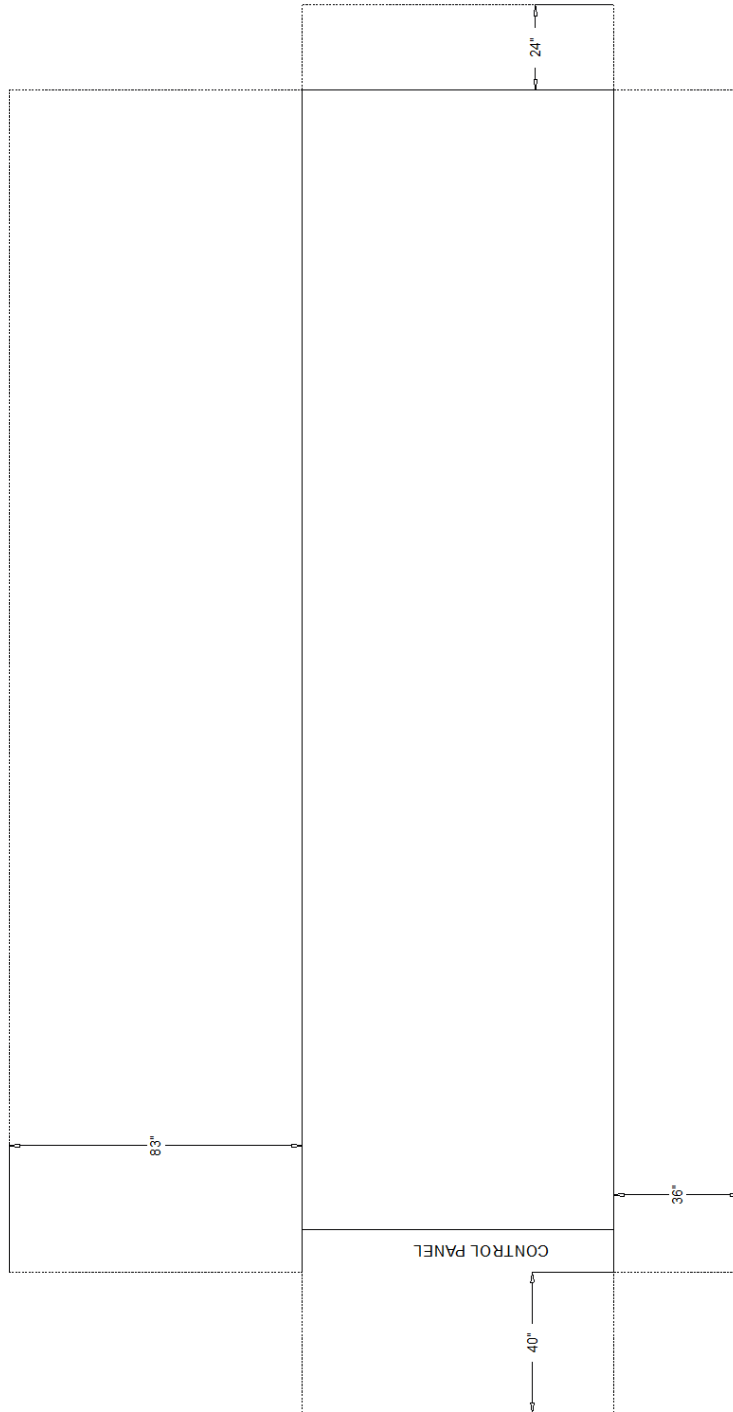


CUSTOMER WIRE SELECTION TABLE	
POWER WIRE CONNECTION TO TERMINAL BLOCK	
CIRCUIT 1 & 2 (SINGLE POINT POWER) LUG WIRE SIZE RANGE (PER PHASE)	(2) #4 - 500 MCM
SHORT CIRCUIT RATING	10,000 A





UNIT CLEARANCE  
NO OBSTRUCTIONS ABOVE UNIT

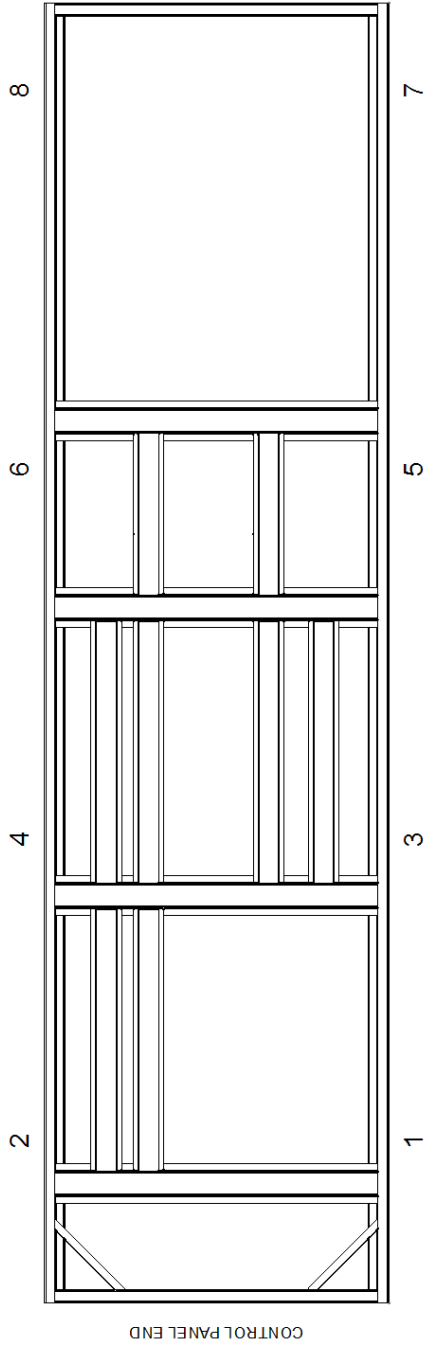




POINT LOAD WEIGHTS AND ISOLATOR SELECTIONS

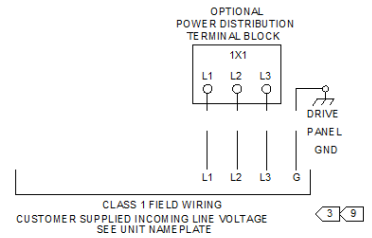
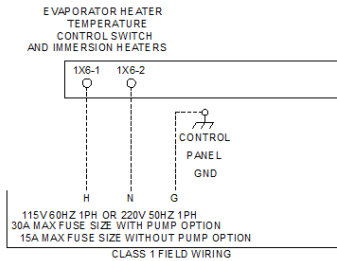
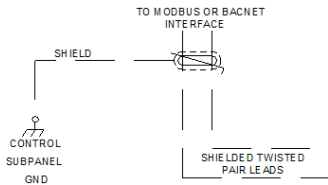
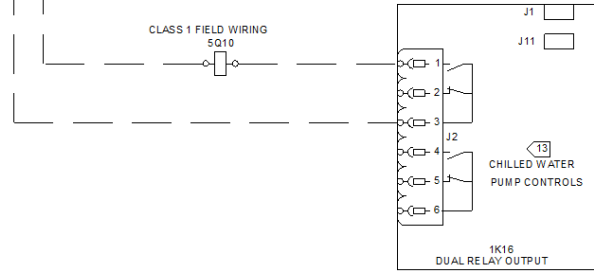
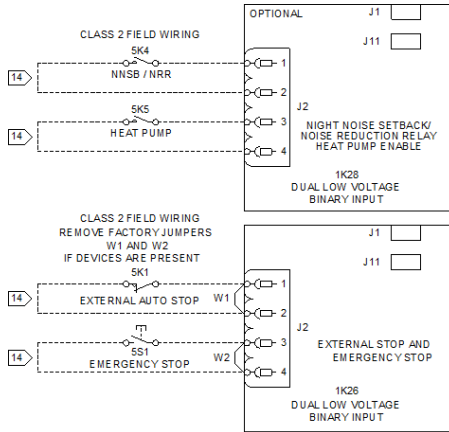
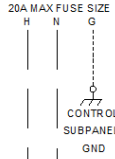
Mounting Hole Diameter: 9/16"

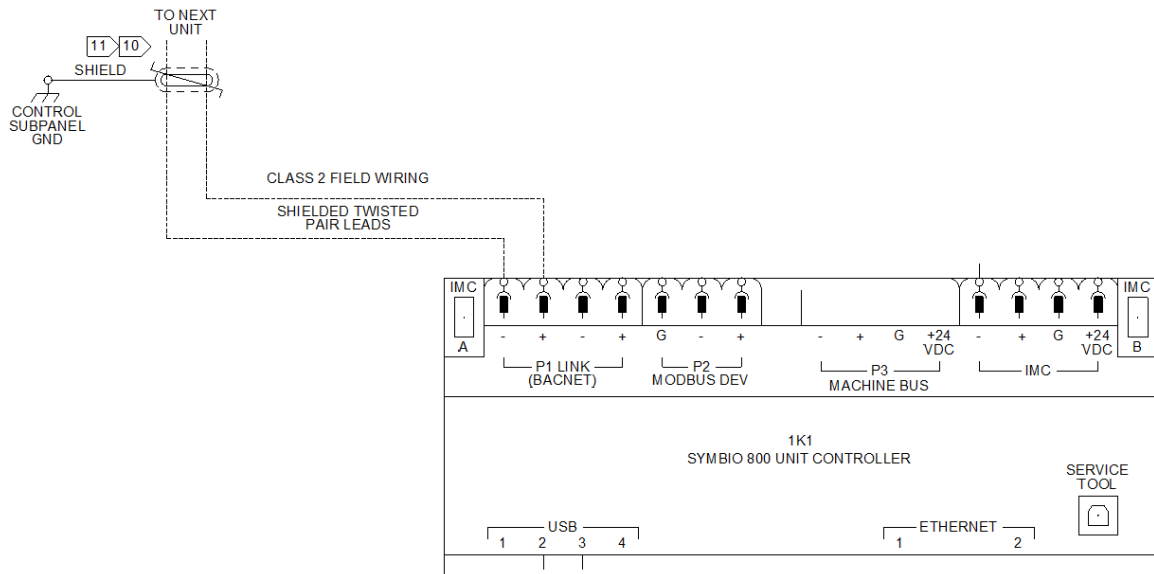
1	1,645 lb
2	1,832 lb
3	1,365 lb
4	1,717 lb
5	798 lb
6	812 lb
7	663 lb
8	745 lb



115VAC 60HZ  
 1PH  
 OR  
 220VAC 50HZ  
 1PH

12







### GENERAL NOTES:

1. WIRE REPRESENTED BY DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS.
2. ALL STANDARD AND OPTIONAL COMPONENTS SHOWN.
- 3 SINGLE SOURCE POWER IS PROVIDED AS STANDARD ON THIS PRODUCT. FIELD CONNECTIONS ARE MADE TO DEVICES 1Q1 OR 1X1.
4. ALL MOTORS ARE PROTECTED FROM PRIMARY SINGLE PHASE FAILURES.
5. CAUTION - TRANE PUMP CONTROL MUST BE USED TO PROVIDE PUMP CONTROL. EVAPORATOR CHILLED WATER PUMP MUST BE CONTROLLED BY THE CHILLER OUTPUT. FAILURE TO COMPLY WITH THIS REQUIREMENT MAY RESULT IN DAMAGE TO THE UNIT.
6. CAUTION - DO NOT ENERGIZE THE UNIT UNTIL CHECK OUT AND STARTUP PROCEDURES HAVE BEEN COMPLETED.

### WIRING REQUIREMENTS:

7. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL CODES.
8. DO NOT RUN LOW VOLTAGE CONTROL WIRING (30V OR LESS) IN CONDUIT WITH 110V OR HIGHER WIRING. DO NOT EXCEED THE FOLLOWING MAXIMUM RUN LENGTH FOR A GIVEN SIZE: 14 AWG OF 5000 FT, 16 AWG OF 2000 FT OR 18 AWG OF 1000 FT.
- 9 ALL UNIT POWER WIRING MUST BE 600V COPPER CONDUCTORS ONLY AND HAVE A MINIMUM TEMPERATURE INSULATION RATING OF 90 C. REFER TO UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION DEVICE. PROVIDE AN EQUIPMENT GROUNDING IN ACCORDANCE WITH APPLICABLE ELECTRIC CODES. REFER TO WIRE RANGE TABLE FOR LUG SIZES.
- 10 SHIELDED, TWISTED PAIR LEADS ARE REQUIRED FOR CONNECTIONS TO THE COMMUNICATIONS INTERFACE MODULES (1K1 OR OPTIONAL 1K6). THE SHIELD SHOULD BE GROUNDED AT THE UNIT CONTROL PANEL END.
- 11 22 AWG SHIELDED COMMUNICATION WIRE EQUIVALENT TO HELIX LF22P0014216 IS RECOMMENDED FOR WIRING TO NEXT UNIT. THE SUM TOTAL OF ALL INTERCONNECTED CABLE SEGMENTS ARE NOT TO EXCEED 4500 FT. CONNECTION TOPOLOGY SHOULD BE DAISY CHAIN. REFER TO BUILDING AUTOMATION SYSTEM (BAS) COMMUNICATION INSTALLATION LITERATURE FOR END OF LINE TERMINATION RESISTOR REQUIREMENTS.
- 12 ALL CUSTOMER SUPPLIED CONTROL CIRCUIT WIRING MUST BE COPPER CONDUCTORS ONLY AND HAVE A MINIMUM INSULATION RATING OF 300V. EXCEPT AS NOTED, ALL CUSTOMER WIRING CONNECTIONS ARE MADE TO CIRCUIT BOARD MOUNTED BOX LUGS WITH A WIRE RANGE OF 14 TO 18 AWG OR TO DIN RAIL MOUNTED SPRING FORCE TERMINALS.

### CONTACT RATINGS AND REQUIREMENTS:

- 13 UNIT PROVIDED DRY CONTACTS FOR THE CONDENSER / CHILLED WATER PUMP CONTROL. RELAY CONTACT RATINGS AT 120VAC: 7.2A RESISTIVE, 2.88A PILOT DUTY, OR 1/3 HP, 7.2 FLA. CONTACTS ARE RATED FOR 240VAC, 5A GENERAL PURPOSE DUTY. 1K16 IS NOT PRESENT WITH PUMP PACKAGE OPTION.
- 14 CUSTOMER SUPPLIED CONTACTS FOR ALL LOW VOLTAGE CONNECTIONS MUST BE COMPATIBLE WITH DRY CIRCUIT 24VDC FOR A 12mA RESISTIVE LOAD. SILVER OR GOLD PLATED CONTACTS ARE RECOMMENDED.
- 18 WHEN ICE MAKING OPTION SELECTED, DEFAULT RELAY SETTING WILL BE REPLACED WITH "ICE MAKING COMPLETE" OUTPUT FUNCTION.



## Foundation

Provide rigid, non-warping mounting pads or a concrete foundation of sufficient strength and mass to support the applicable operating weight (i.e. including completed piping, and full operating charges of refrigerant, oil and water). The expectation of Trane equipment is that piping is fully supported by an independent structure/system, without being connected to the waterbox. Once in place, the unit must be level within 1/2" across the length and width of the unit. The Trane Company is not responsible for equipment problems resulting from an improperly designed or constructed foundation.

## Center of Gravity

Different unit configurations and options may cause a variation in the center of gravity from what is listed in the submittal. Refer to the Installation, Operating and Maintenance manual for specific lifting instructions.

## General

Units are leak and pressure tested at 650 psig high side, 495 psig low side, then evacuated and charged. All Air-cooled chillers are factory tested to confirm operation prior to shipment.

Standard power connections include main three phase power to the compressors, condenser fans and control power transformer.

Note: A separate field supplied low voltage power source is required to power the evaporator freeze protection.

Unit panels, structural elements and control boxes are constructed of galvanized steel and mounted on a bolted galvanized steel base. Unit panels, control boxes and the structural base are finished with a baked on powder paint.

Anytime water only is present in the evaporator, the Trane Symbio (TM) 800 controller must have flow control of the chilled water system. Flow control can be done either directly or through an input to a building automation system to conduct an action resulting in minimum flow through the chiller evaporator barrel to avoid potentially catastrophic damage to the evaporator due to freezing. If the system has sufficient glycol to protect down to the lowest expected ambient, flow control is optional.

## Factory Refrigerant Charge (R410A)

Packaged units ship with a full operating charge of oil and R410A refrigerant.

## Compressor and Motor

The unit is equipped with three hermetic, direct-drive, 3600 rpm 60 Hz suction gas-cooled scroll compressors per circuit. The simple design has only three major moving parts and a completely enclosed compression chamber which leads to increased efficiency. Overload protection is internal to the compressors. The compressor includes: centrifugal oil pump, oil level sight glass and oil charging valve. Each compressor will have compressor heaters installed and properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

## Unit-Mounted Starter

The control panel is designed per UL 1995. The starter is an across-the-line configuration, factory-mounted and fully pre-wired to the compressor motor and control panel. A factory-installed, factory-wired control power transformer provides all unit power.

Power line connection type is standard with a terminal block.

## Short Circuit Current Rating (SCCR)

A short circuit current rating offers a measure of safety for what the starter panel enclosure is able to withstand in the event of an explosion caused by a short circuit.

Short circuit current rating of 10kA is provided.



## Evaporator

Braze plate heat exchanger is made of stainless steel with copper as the braze material. It is designed to withstand a refrigerant side working pressure of 650 psig (44.8 bars) and a waterside working pressure of 150 psig (10.5 bars). Evaporator is tested at 1.1 times maximum allowable refrigerant side working pressure and 1.5 times maximum allowable water side working pressure. It has one water pass. A water strainer and a flow switch are factory installed. Immersion heaters protect the evaporator to an ambient of -4.0 F. All evaporators have grooved pipe connections.

The evaporator is covered with factory-installed 0.75 inch (19.05 mm) Armaflex II or equal ( $k=0.28$ ) insulation. Foam insulation is used on the suction line.

Unit is designed for operation in standard leaving evaporator temperature greater than or equal to 40.0 F.

## Condenser

Air-cooled microchannel condenser coils use all Long Life Alloy aluminum brazed fin constructions. Each slab is split horizontally into separate condensing and sub-cooling coils that are connected by either a copper tube or received tank. The maximum allowable working pressure of the condenser is 650 psig (44.8 bars). Condensers are factory proof and leak tested at 650 psig (44.8 bars).

Direct-drive vertical discharge condenser fans are balanced and individually protected. Three-phase condenser fan motors with permanently lubricated ball bearings and external thermal overload protection are provided.

Units start and operate from 32.0 F to 115.0 F.

## Refrigerant Circuits and Capacity Modulation

The unit has dual refrigerant circuits. Each refrigerant circuit has Trane scroll compressors piped in parallel with a passive oil management system. A passive oil management system maintains proper oil levels within compressors and has no moving parts. Each refrigerant circuit includes filter drier, electronic expansion valve, liquid line and discharge service valves.

Capacity modulation is achieved by turning compressors on and off. The unit has six capacity stages.

## Unit Controls

All unit controls are housed in an outdoor rated weather tight enclosure with removable plates to allow for customer connection of power wiring and remote interlocks. All controls, including sensors, are factory mounted and tested prior to shipment. Microcomputer controls provide all control functions including startup and shut down, leaving chilled/hot water temperature control, evaporator flow proving, compressor staging and speed control, electronic expansion valve modulation, condenser fan sequencing and speed control, anti-recycle logic, automatic lead/lag compressor starting and load limiting.

The Symbio (TM) 800 unit control module, utilizing Adaptive Control microprocessor, automatically takes action to avoid unit shut-down due to abnormal operating conditions associated with low refrigerant pressure, high condensing pressure. Should the abnormal operating condition continue until a protective limit is violated, the unit will be shut down. Unit protective functions of the Symbio (TM) 800, include loss of chilled water flow, evaporator freezing, loss of refrigerant, low refrigerant pressure, high refrigerant pressure, high compressor motor temperature, and loss of oil to the compressor.

The display is outdoor capable including an UV resistant touchscreen with removable cover.

## Remote Communications - BACnet Interface (MS/TP)

BACnet Interface allows the user to easily interface with using BACnet MS/TP via a single twisted-pair wiring to a factory-installed and tested communication board. Provides support for BACnet defined MS/TP protocol as defined by ASHRAE standard 135-2004.