Mesquite Independent School District

Request For Proposal for: **Cooling Tower Replacement Project (Equipment Only)**

Proposal # 2015-014

Proposal Due February 13, 2015 No Later Than**: 2:00** P.M.

Place: **MISD Purchasing Dept.**
800 E. Kearney
Mesquite, Texas 75149

Mesquite Independent School District
Purchasing Department - Rusty Talbot, Administrative Officer
800 E. Kearney, Mesquite, Texas 75149
Phone (972) 882-5542 Fax (972) 882-7740

Instructions to Vendors

Proposal #: 2015-014
Due Date: February 13, 2015
Proposal For: Cooling Tower Replacement Project (Equipment Only)

THIS PROPOSAL WILL NOT BE OPENED OR READ PUBLICLY.

Proposals are solicited for furnishing the merchandise, supplies, services and/or equipment set forth in this proposal. **One (1) original and three (3) copies of the SEALED proposals must be received in the Purchasing Department, 800 E. Kearney, Mesquite, Texas 75149 before 2:00 pm on the above "due date". All envelopes must be clearly marked "Proposal Enclosed" and the Proposal number. Late proposals will be returned to the vendor unopened. Delivery of bid envelope to other Departments within the MISD is NOT considered as delivery to the Purchasing Department. Faxed or emailed proposals will not be accepted.**

Proposals may be withdrawn at any time prior to the official opening. Alterations made before opening time must be initialed by vendor to guarantee authenticity. After the official opening, proposals may not be amended, altered, or withdrawn without the recommendation of the Administrative Officer of Purchasing and the approval of the Mesquite Independent School District Board of Trustees.

All addenda will be issued via the district website at www.mesquiteisd.org/depts/purchasing/. All addenda, if required, will be posted on the aforementioned website at least seven (7) days before proposal opening. It is the vendor's responsibility to check this website for addenda postings prior to submitting responses. Proposers finding errors, requests for additional information, omissions, or corrections that need to be made in the specifications shall contact the Administrative Officer of Purchasing ten (10) days, or as soon as possible before proposal is due. You may submit this information via fax to (972) 882-7740.

The undersigned agrees, if this proposal is accepted, to furnish any and all items upon which prices are offered, at the price(s) and upon the Terms and Conditions contained in the specifications. The period for acceptance of this proposal will be sixty (60) calendar days unless a different period is inserted by vendor.

The Mesquite Independent School District reserves the right to accept or reject in part or in whole any proposals submitted, and to waive any technicalities, and to award proposals in the best interest of the District.

PROPOSAL RESPONSE FORM
PROPOSAL 2015-014
COOLING TOWER REPLACEMENT PROJECT
(EQUIPMENT ONLY)

To: Mesquite Independent School District
Rusty Talbot, Administrative Officer Purchasing
800 East Kearney
Mesquite, Texas 75149

From: _____
Company Name

_____
Address

_____
City/State/Zip

_____
Area Code & Telephone Number

_____
Fax Number

I, the undersigned, as the owner or legally authorized representative of the above named company, by signing the following statement, agree that I have READ and UNDERSTAND all of the Instructions and Specifications contained herein, and that if accepted by the Mesquite Independent School District, all of the provisions are part of a binding contract between the Mesquite Independent School District and our company. I also certify that this proposal is made without previous understanding, agreement, or connection with any person, firm, or corporation making a proposal for the same contract, and is in all ways fair and without collusion or fraud.

_____ _____
Owner or Legally Authorized Representative Title

_____ _____
Signature Date

Mesquite Independent School District
Terms and Conditions
Notice to Responsible Vendors

Items below apply to and become a part of terms and conditions of the proposal unless superseded by attached terms and supplemental conditions or specifications in which case attached conditions will prevail.

1. It is not the policy of Mesquite Independent School District to purchase on the basis of low bids alone, quality and suitability to purpose being the controlling factors; it being understood that the purchaser reserves the right to arrive at such by whatever means he/she may determine.

2. The District reserves the right to **reject any and/all proposals** and to make awards on the individual items as they may appear to be advantageous to theDistrict and to waive all formalities in submitting proposals.

3. Vendors finding errors, omissions, or corrections that need to be made in the Specifications shall contact the Administrative Officer of Purchasing ten (10) days, or as soon as possible before proposal is due.

4. This Request For Proposal and any resulting award(s) shall be interpreted within the laws of the State of Texas and the Uniform Commercial Code (UCC). In case of discrepancies between the laws of the State of Texas and the UCC, the laws of Texas will prevail. Venue for any legal action filed relative to this Request For Proposal or any resulting purchase orders shall be in Dallas County Texas.

5. In the event that any one or more of the provisions contained in the Request For Proposal (or resulting purchase order) shall be held by a court of competent jurisdiction to be invalid, illegal or unenforceable, such provision(s) shall not affect any other provision hereof, and this Request For Proposal (or any resulting purchase order) shall be construed as if the invalid, illegal or unenforceable provision(s) had never been contained herein.

6. To the fullest extent permitted by applicable law, the Vendor and its agents, partners, employees, and consultants (collectively “Indemnitors”) shall and do agree to indemnify, protect, defend with counsel approved by the District, and hold harmless the District and its affiliated enterprises, representatives of the District, and their respective officers, directors, members of the board, partners, employees and agents (collectively “Indemnitees”) from and against all claims, damages, losses, liens, causes of action, suits, judgments and expenses, including attorney fees, of any nature, kind, or description (collectively “Liabilities”) of any person or entity whomsoever arising out of, caused by, or resulting from the performance of services, or provision of goods, by Vendor pursuant to this contract, or any part thereof, or anyone for whose acts it may be liable even if it is caused in part by the negligence or omission of any Idemnitee, so long as it is not caused by the sole negligence or willful misconduct of any Indemnitee.

7. **Non-Appropriation of Funding:** No term Contract or Agreement may exceed a period of one (1) year from the approved contract date without specific authorization of the Mesquite Independent School District. Such contract is a commitment of the District's current revenue only. Should funding for the continuance of this Contract be withdrawn by the Board, the District retains the right to terminate the agreement in accordance with the termination provision stated herein and without pecuniary risk or penalty.

8. Whenever an article or material is defined by describing a proprietary product or by using the name of a manufacturer or brand name, the term “or equal” if not inserted shall be implied. The specified article or material shall be understood as indicating the type, function, minimum standard of design, efficiency and quality desired. It shall not be construed as to exclude other manufactured products of comparable quality, design and efficiency. Specifications received from vendors that are different from the original requirements must meet or exceed original proposal specifications to be considered equivalent. MISD reserves the right to make the final decisions as to comparable items. An article or material, which is shipped and is not **equal,** shall be returned to the supplier transportation charges collect.

9. The term “As Specified” or “A/S” will not be accepted. If bidding on a make or model other than specified, bidder is to list make and model of item being bid and must state any deviations from the item specified. The burden of proof of compliance with this specification will be the responsibility of the vendor. Samples of items which are not as specified must be available to the District within 72 hours after our request.

10. Prices proposed should be F.O.B. Destination, Freight Prepaid. Seller to pay freight charges, bear freight charges, own freight in transit, and file claims, if any.

11. Proposals received after the time and date specified **will not** be considered.

12. When proposal is not returned, the vendor’s name is removed from the vendor’s list.

13. All prices will be guaranteed for sixty (60) days from the date of the proposal opening.

14. It is understood and agreed that MISD reserves the right to increase or decrease quantities or modify condition and specifications by mutual agreement with the selected supplier, both at the time of acceptance of this proposal offer as so modified, and subsequent thereto.

15. Propose unit price on quantity specified, extend and show total. In case of errors in extension, unit prices shall govern.

16. The District is exempt from Federal Excise Tax, State and Local Tax. Do not include tax in your proposal totals. If it is determined that tax was included in the proposal, it will not be included in the tabulation or any awards. Tax exemption certificate will be furnished upon request.

17. Where applicable, samples must be submitted upon request.

18. Cash discounts offered may be considered in determining the successful supplier. Cash discount period shall start from the date of receipt of acceptable invoice or from date of receipt of acceptable material, whichever is the later.

19. Vendor hereby affirmatively states that it has not participated in any act of collusion, favoritism, gratuity, or inside dealings with any member of the staff of Mesquite Independent School District or it's Board of Trustees.

20. Mesquite Independent School District will receive all merchandise at the L. A. Berry Support Complex at 2133 N. Beltline Road, Mesquite, Texas 75150, unless otherwise stated on purchase order. Non-palletized freight shall be unloaded **inside** the Warehouse or School building. Vendor is responsible for providing material handling equipment when delivering to schools or departments. Vendor must advise freight line as to this requirement.

21. <u>Pick up and delivery will be made between the hours of 7:00 A.M. and 2:00 P.M. Monday through Friday excluding school holidays. (Unless arrangements are made otherwise with the Administrative Officer of Purchasing or as otherwise specified on the Proposal form.)</u>

22. <u>Title and Risk of Loss</u>: The title and risk of loss of the goods shall not pass to Mesquite ISD until Mesquite ISD actually receives and takes possession of the goods at the point or points of delivery. Mesquite ISD will not accept responsibility for processing freight damage claims occurring prior to receipt, including concealed damage of goods.

23. Vendor will provide detailed information to the District for <u>each</u> item delivered (model number, serial number, product/equipment description).

24. Invoices shall be sent **<u>directly</u>** to the Mesquite Independent School District, Accounts Payable, 405 East Davis, Mesquite, Texas 75149. Payments are processed after the Business Office has been notified that the items have been received in good condition and no unauthorized substitutions have been made. Invoices must detail the items delivered and reference the Mesquite Independent School District **Purchase Order number**.

25. Vendors are not to unilaterally apply duplicate payments or overpayments against unrelated open invoices without the District's explicit authorization.

26. Upon notification of potential selections for award, the person or entity submitting this proposal must give notice to the district if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in this conviction of a felony. (This requirement does not apply to a publicly held corporation.)

27. The district shall have the right to cancel for default all or any part of the undelivered portions of this order if the contractor breaches any of the terms hereof including warranties of the contractor or if the contractor becomes insolvent or commits acts of bankruptcy. Such right of cancellation is in addition to and not in lieu of any other remedies which the District may have in law or equity.

28. The performance under this order may be terminated in whole or in part by the District in accordance with this provision. Termination hereunder shall be effected by the delivery to the contractor of a "Notice of Termination": specifying the extent to which performance of work under the order is terminated and the date upon which termination becomes effective. Such right of termination is in addition to and not in lieu of any other rights which the District may have in law or equity.

29. The price to be paid by the District shall be that contained in the contractor's proposal which the contractor warrants to be no higher than seller's current prices on orders by others for products of the kind and specification covered by this contract for similar quantities under similar or like conditions and methods of purchase. In the event contractor breaches this warranty, the price of the items shall be reduced to the contractor's current prices on orders by others, or in the alternative, the District may cancel this contract without liability to contractor for breach or contractor's actual expense.

30. The contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for commission, percentage, brokerage, or contingent fee expecting bona fide employees of bona fide established commercial or selling agencies maintained by the contractor for the purpose securing business. For breach or violation of this warranty the District shall have the right in addition to any other right or rights to cancel this contract without liability and to deduct from the contract price, or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee.

31. All contracts and agreements between merchants and Mesquite Independent School District shall strictly adhere to the statutes as set forth in the Uniform Commercial Code as last amended in 1990 by the American Law Institute in the National Conference of Commissioners on Uniform State Laws. Reference: Uniform Commercial Code, 1990 official text.

32. We are unable to send out copies of bid tabulations. There are many factors involved but our current policy is that all opened bids are available for viewing in

the purchasing office but no tabulations are sent out. Thank you in advance for not requesting copies of bid tabulations.

33. Questions in regard to this proposal must be submitted to the Administrative Officer of Purchasing for clarification.

34. No smoking or use of any tobacco products is permitted on school property.

35. Purchase Orders will serve as the award instrument(s) against this request for proposal. Orders will be placed as items are approved for purchase and funds become available.

36. The Purchase Order number <u>must</u> be clearly identified on each carton label and/or delivery ticket. Otherwise, the shipment is subject to being refused and returned to the vendor at the vendor's expense.

37. If problems with quality or workmanship arise on items received, the supplying vendor is responsible for replacing any/or all items at no cost to the Mesquite Independent School District. The supplying vendor will also be responsible for returning to the designated campus to pick up the items in question. Mesquite ISD will not be responsible for shipping items back to vendors.

38. Successful proposer is to remove all packing and packaging material and debris from school property (school dumpster is **not** to be used) and to properly dispose of all discarded materials.

39. Successful Vendor(s) will be required to submit Material Safety Data Sheets for applicable item(s).

40. **<u>Force Majeure:</u>** If by reason of Force Majeure, either party shall be rendered unable wholly or in part to carry out its obligations under this Agreement then such party shall give notice and full particulars of Force Majeure in writing to the other party within a reasonable time after occurrence of the event or cause relied upon, and the obligation of the party giving such notice, so far as it is affected by such Force Majeure, shall be suspended during the continuance of the inability then claimed, except as hereinafter provided, but for no longer period, and such party shall endeavor to remove or overcome such inability with all reasonable dispatch.

    The term "Force Majeure" as employed herein, shall mean acts of God, strikes, lockouts, or other industrial disturbances, act of public enemy, orders of any kind of government of the United States or the State of Texas or any civil or military authority, insurrections, riots, epidemics, landslides, lightning, earthquake, fires, hurricanes, storms, floods, washouts, droughts, arrests, restraint of government and people, civil disturbances, explosions, breakage or accidents to machinery, pipelines or canals, or other causes not reasonably within the control of the party claiming such inability. It is understood and agreed that the settlement of strikes and lockouts shall be entirely within the discretion of the party having the difficulty,

and that the above requirement that any Force Majeure shall be remedied with all reasonable dispatch shall not require the settlement of strikes and lockouts by acceding to the demands of the opposing party or parties when such settlement is unfavorable in the judgment of the party having the difficulty.

41. **RIGHT OF SETOFF** – Mesquite Independent School District may, at any time without prior written notice, set off funds due and owing under this contract and apply same in payment of any obligation, of any nature, due and owing to Mesquite Independent School District by the Contractor.

    a. Do you pay taxes in Mesquite ISD? _____

    b. Are you current on your property tax obligations owed Mesquite ISD?

    _____

42. It is not the policy of the Mesquite Independent School District to award contracts based solely on 'low bid/proposal'. *****The following criteria shall be used by the Mesquite ISD to evaluate the overall 'best value':
    a) The purchase price;
    b) The reputation of the vendor and of the vendor's goods or services;
    c) The quality of the vendor's goods or services;
    d) The extent to which the goods or services meet the district's needs;
    e) The vendor's past relationship with the district;
    f) The impact on the ability of the district to comply with the laws and rules relating to historically under-utilized businesses;
    g) The total long-term cost to the district to acquire the vendor's goods and services;
    h) For a contract for goods and services, other than goods and services related to telecommunications and information services, building construction and manintenance, or instructional materials, whether the vendor or the vendor's ultimate parent company or majority owner:
        (1) Has its principal place of business in this state; or
        (2) Employs at least 500 persons in this state; and
    i) Any other relevant factor specifically listed in this Request For Proposal.
    ***Per Texas Education Code, Subchapter B, Sec. 44.031(b)**

VENDOR PROFILE

Company Name _____

Company Address _____

_____

Website Address _____

Telephone Numbers:

To place orders _____

To check on orders _____

FAX _____

Contacts:

Corporate contact for this proposal:

Name _____

Address _____

City, State, Zip _____

Phone _____ Fax _____

Email _____

Local contact for this proposal:

Name _____

Address _____

City, State, Zip _____

Phone _____ Fax _____

Email _____

Number of years company has been in business under this name _____

Other company names used with dates, from/to:

_____

_____

Remit to Address (if different than above):

Address _____

City, State, Zip_____

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See **Specific Instructions** on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification; check only **one** of the following seven boxes:

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____

Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here	**Signature of U.S. person** ▶	**Date** ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

CERTIFICATE OF RESIDENCY

Texas Government Code Chapter 2252, Subchapter A. Nonresident Bidders makes it necessary for the Mesquite Independent School District to determine the residency of its offerors. In part, this law reads as follows:

Section 2252.001. DEFINITIONS:
(3) "Nonresident bidder" refers to a person who is not a resident.
(4) "Resident bidder" refers to a person whose principal place of business is in this state, including a contractor whose ultimate parent company or majority owner has its principal place of business in this state.

Section 2252.002. AWARD OF CONTRACT TO NONRESIDENT BIDDER:
A governmental entity may not award a governmental contract to a nonresident bidder unless the nonresident underbids the lowest bid submitted by a responsible resident bidder by an amount that is not less than the amount by which a resident bidder would be required to underbid the nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located.

_____
Name of Company

is, under Section 2252.001 (3) and (4), a

_____ Resident Bidder _____ Nonresident Bidder

My principal place of business under Texas Government Gode, Section 2252.001 (3) and (4), is in the city of _____ in the State of _____.

_____
Signature of Authorized Company Representative

_____
Print Name

_____ _____
Title Date

TO BE SIGNED AND RETURNED

DEVIATION OR COMPLIANCE SECTION

DEVIATIONS: In the event the undersigned Proposer intends to deviate from the general terms, conditions, special conditions or specifications contrary to those listed in the "Terms and Conditions" and other information attached hereto, all such deviations must be **listed on this page**. Please reference the line number, provide complete and detailed conditions, and any additional information (attach additional pages as necessary).

Vendors must list all specifications for item(s) proposed that differ from any specifications/brands listed in the RFP. MISD will be the sole judge to determine if deviations are acceptable in meeting the needs of MISD and participating members. Reference on this page the line number and deviation.

NO DEVIATIONS: In the absence of any deviations entry on this form, the Proposer assures MISD of their compliance with the Terms, Conditions, Specifications and information contained in this proposal.

Are there deviations from the specifications? (circle) Yes No

All Proposers MUST COMPLETE this page.

SIGN & RETURN with proposal or proposal may be considered NON-RESPONSIVE.

Our proposal is submitted according to: _____ Deviations listed

above **OR** _____ No Deviations.

Non-Collusion Clause

The undersigned affirms that they are duly authorized to execute this contract, that this company, corporation, firm, partnership or individual has not prepared this proposal in collusion with any other proposer, and that the contents of this proposal as to prices, terms and conditions of proposal have not been communicated by the undersigned nor by any employee or agent to any other person engaged in this type of business prior to the official opening of this proposal.

Vendor: _____

Street Address: _____

City, State, Zip _____

Phone: (____) _____ Fax: (____) _____

Proposer (Signature): _____

Proposer (print name): _____

Company Officer (Signature): _____

Company Officer (print name): _____

Title: _____

Suspension or Debarment Certificate

Non-Federal entities are prohibited from contracting with or making sub-awards under covered transactions to parties that are suspended or debarred or whose principals are suspended or debarred. Covered transactions include procurement for goods or services equal to or in excess of $100,000.00. Contractors receiving individual awards for $100,000.00 or more and all sub-recipients must certify that the organization and its principals are not suspended or debarred.

By submitting this offer and signing this certificate, the proposer:

- Certifies the owner/operator has not been convicted of a felony except as indicated on a separate attachment to this offer, in accordance with Sec. 44.034 Texas Education Code, and
- Certifies that no suspension or disbarment is in place, which would preclude receiving a federally funded contract under the Federal OMB, A-102, Common Rule (Sec. 36)

Vendor Name _____

Authorized Company Official's Name _____

Authorized Company Official's Signature _____

Email Address _____

Date _____

Felony Conviction Notice

Senate Bill 1 passed by the State of Texas Legislators, Section 44.034, Notification of Criminal History, Subsection (a) states "a person or business entity that enters into a contract with a school district must give advance notice to the district if the person or owners or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the felony".

Subsection (b) states "a school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The district must compensate the person or business entity for services performed before the termination of the contract".

This disclosure is not required of a publicly-held corporation (Option A).

I, the undersigned agent for the firm name below, certify that the information concerning notification of felony conviction has been reviewed by me and the following information furnished is true to the best of my knowledge (select one answer).

Vendor Name: _____

Authorized Company Officer's Name (printed): _____

Title: _____

A. My firm is a publicly-held corporation, therefore; this reporting requirement is not applicable.

Signature of Company Officer:_____

B. My firm is not owned nor operated by anyone who has been convicted of a felony.

Signature of Company Officer:_____

C. My firm is owned or operated by the following individual(s) who has/have been convicted of a felony (list names and titles):

_____

_____

Details of Conviction: _____

_____

Signature of Company Officer:_____

FINGERPRINT REQUIREMENTS

If a contractor/vendor's staff will be on a school site where students will be present, then contractor/vendor must comply with Texas Education Code Chapter 22. This is required for all Texas Public Schools. If contractor/vendor's staff will not be on school district property when students are present, then the contractor/vendor may not have covered employees. Mesquite ISD recommends all contractors/vendors consult with their legal counsel for guidance in compliance with this law.

If you have questions on compliance with this section of the Texas Education Code, please contact the Texas Department of Public Safety Non-Criminal Justice Unit, Access and Dissemination Bureau, FAST-FACT at NCJU@txdps.state.tx.us and you should send an email identifying you as a contractor/vendor to a Texas Independent School District. The Texas Department of Public Safety's telephone number is (512) 424-2474.

The Texas Education Code, Chapter 22, Section 22.0834 statutory language may be found at: http://www.statutes.legis.state.tx.us/.

TEXAS EDUCATION CODE CHAPTER 22 CONTRACTOR CERTIFICATION FOR CONTRACTOR EMPLOYEES

Introduction: Texas Eduation Code Chapter 22 requires entities that contract with school districts to provide services to obtain criminal history record information regarding covered employees. Contractors must certify to the district that they have complied. Covered employees with disqualifying criminal histories are prohibited from serving at a school district.

Definitions: ***Covered employees:*** Employees of a contractor or subcontractor who have or will have continuing duties related to the service to be performed at the District and have or will have direct contact with students. The District will be the final arbiter of what constitutes direct contact with students.

Disqualifying criminal history: Any conviction or other criminal history information designated by the District, or one of the following offenses, if at the time of the offense, the victim was under 18 or enrolled at a public school:

(a) a felony offense under Title 5, Texas Penal Code;
(b) an offense for which a defendant is required to register as a sex offender under Chapter 62, Texas Code of Criminal Procedure; or
(c) an equivalent offense under federal law or the laws of another state.

On behalf of _____("Contractor"), I certify that

[ ] None of the employees of Contractor and any subcontractors are *covered employees*, as defined above. If this box is checked, I further certify that Contractor has taken precautions or imposed conditions to ensure that the employees of Contractor and any subcontractor will not become *covered employees*. Contractor will maintain these precautions or conditions throughout the time the contracted services are provided.

Or

[ ] Some or all of the employees of Contractor and any subcontractors are *covered employees*. If this box is checked, I further certify that:

(1) Contractor has obtained all required criminal history record information regarding its *covered employees*. None of the *covered employees* has a disqualifying criminal history.
(2) If Contractor receives information that a *covered employee* subsequently has a reported criminal history, Contractor will immediately remove the *covered employee* from contract duties and notify the District in writing within three (3) business days.
(3) Upon request, Contractor will provide the District with the name and any other requested information of *covered employees* so that the District may obtain criminal history record information on the *covered employees*.
(4) If the District objects to the assignment of a *covered employee* on the basis of the *covered employee's* criminal history record information, Contractor agrees to discontinue using that *covered employee* to provide services for the District.

Noncompliance or misrepresentation regarding this certification may be grounds for contract termination.

Company Name _____

Signature of Authorized Representative _____

Printed Name _____

Date _____

REFERENCES

List below three (3) institutions/companies for whom you have provided goods in the past 12 months.

1. Institution/Company

Name_____

Street Address_____

City/State/Zip_____

Contact's Name_____

Phone Number_____

2. Institution/Company

Name_____

Street Address_____

City/State/Zip_____

Contact's Name_____

Phone Number_____

3. Institution/Company

Name_____

Street Address_____

City/State/Zip_____

Contact's Name_____

Phone Number_____

EDUCATIONAL PURCHASING COOPERATIVE OF NORTH TEXAS

Several governmental entities around the Mesquite Independent School District have indicated an interest in being included in this contract. Should these governmental entities decide to participate in this contract, would you, the vendor, agree that all terms, conditions, specifications, and pricing would apply?

Yes _____ No _____ If you, the vendor, checked yes, the following will apply. Governmental entities utillizing Internal Governmental contracts with the Mesquite Independent School District will be eligible, but not obligated, to purchase materials/services under the contract(s) awarded as a result of this solicitation. All purchases by governmental entity other than Mesquite Independent School District will be billed directly to that governmental entity and paid by that governmental entity. Mesquite Independent School District will not be responsible for another governmental entity's debts. Each governmental entity will order their own material/service as needed. For information regarding the Educational Purchasing Cooperative of North Texas, please visit their website at the following address: http://www.epcnt.com .

CONFLICT OF INTEREST QUESTIONNAIRE — FORM CIQ

For vendor or other person doing business with local government entity

This questionnaire reflects changes made to the law by H.B. 1491, 80 th. Leg., Regular Session.

OFFICE USE ONLY

Date Received

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. *See* Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

1. Name of person who has a business relationship with local governmental entity.

2. ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3. Name of local government officer with whom filer has employment or business relationship.

_____

Name of officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

4.

_____ _____

Signature of person doing business with the governmental entity — Date

Adopted 06/29/07

MESQUITE INDEPENDENT SCHOOL DISTRICT

MARY MOSS ELEMENTARY SCHOOL
CENTRAL PLANT

AND

ENERGY MANAGEMENT SYSTEM UPGRADES
EQUIPMENT PRE-PURCHASE PACKAGE

Prepared by:

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F-2176
RWB Project No. 14109.00
December 8, 2014

SECTION 15010

GENERAL PROVISIONS

PART 1 – GENERAL

1.1 MATERIALS AND EQUIPMENT

A. All materials and equipment purchased shall be new. No used or reconditioned equipment will be allowed.

B. Substitutions: The products of other manufacturers will be acceptable; only, if, in the opinion of the Engineer, the substitute material is of a quality as good or better than the material specified, and will serve with equal efficiency, maintainability, and dependability the purpose for which the items specified were intended.

C. Listed Manufacturers:
   1. Manufacturers listed in a product or system specification are those manufacturers considered capable of manufacturing products conforming to the specification requirements, and are listed therein to establish a standard.
   2. The "listing" of a manufacturer does not imply "acceptance" or "approval" of any standard product of that manufacturer.
   3. Products offered by listed manufacturers shall be equal to, or superior in all respects to, that specified by named products; and shall meet or exceed specification requirements.
   4. The description of specific qualities takes precedence over the reference standards and the description of qualities and reference standards together take precedence over the named product of listed manufacturers.

D. Product Options:
   1. Products specified only by Reference Standards or by Description only means that any product meeting those standards or descriptions, by any manufacturer, will be considered.
   2. Products specified by naming several products or manufacturers means that only the manufacturers named will be considered.
   3. Products specified by naming only one product and manufacturer means that no option exists unless a substitution is accepted. Submit a request for substitution for any product or manufacturer not specifically named.
   4. Products specified by Description, Reference Standard, and naming several products or manufacturers means that any product and manufacturer named meeting those descriptions and standards will be

considered. Submit a request for substitution for any product or manufacturer not specifically named.

E. Limitations or Substitutions:
   1. During Bidding Period, Instructions to Bidders furnished by the Owner will govern times for submitting requests for substitutions under requirements specified in this Section.
   2. No later than ten (10) days prior to the bid date, Proposer shall notify the Engineer in writing of any desired substitutions of products in place of those specified. These requests will be considered; and, if a favorable response is determined, this will be documented in the form of an Addenda.
   3. Substitutions will not be considered when indicated or implied on Shop Drawings or product data submittals without separate formal request, when requested directly by subcontractor or supplier, or when acceptance will require substantial revision of Contract Documents.
   4. Substitute products shall not be ordered or installed without written acceptance.
   5. Only one request for substitution for each product will be considered. If substitution is not accepted, Proposer shall provide specified product.
   6. Engineer will determine acceptability of any and all substitutions.

F. It is fully the Proposer's responsibility to assemble and submit sufficient technical information to fully illustrate that the material or equipment proposed for substitution is equal or superior, as the Engineer is under no obligation to perform the service for the Proposer. The proposal shall be accompanied by manufacturer's engineering data, specification sheet, and a sample, if practical or if requested or specified. In no event shall a proposal for substitution be cause for delay of work. This shall include a detailed comparison to each product specification paragraph.

G. Should a substitution be accepted under the above provisions, and should the substitution prove defective or otherwise unsatisfactory for the intended service, within the warranty period, the Proposer shall replace the substitution with the equipment or material specified, and on which the specifications required him to base his proposal.

H. No substitutions will be considered contingent upon pending certification and rating agency approvals. Such certifications and ratings shall be in effect at the time of bidding.

1.2 EQUIPMENT SIZES AND REQUIREMENTS

A. Space allocations in machinery and mechanical equipment spaces are based on equipment scheduled in each case. Should the Proposer request a substitution for equipment of another make that requires more space in

any critical dimension, the Proposer shall submit, together with other submittal data on the equipment, prints of drawings indicating how the equipment may be installed, indicating room for servicing and revisions in piping or ducting and any other details necessary for the Engineer to form a judgment as to the suitability of the substitute material, as to performance, suitability for the space and other variables.

B. Duties of certain equipment items, horsepower of driving motors and electrical characteristics are scheduled for equipment items of a particular make in each case. Should requests for a substitute material be accepted which has other requirements that would involve allied equipment or other portions of work, the Proposer shall be responsible for all modifications required at no change in contract price. As examples:
   1. If an accepted A/C Unit has a brake horsepower requirement above the motor horsepower scheduled, the Proposer shall be responsible for providing a larger motor and heavier drive and any change in size of the protective device, conduit run and conductors serving that motor. The latter shall be extended through an individual branch protective device and branch circuit on through the panel, feeder, feeder protective device, etc.

C. Structural steel members are indicated to provide supports for certain specific sizes and weights of equipment. Should a substitution request involve other equipment, the spacing of the supports shall be varied to suite the equipment. Should the weight or size of a proposed substituted item of equipment require additional supporting steel members, the Proposer shall include documentation of the additional supports in the request for substitution and install them at no change in contract price if the substitution is accepted.

D. Various large apparatus to be installed may require that the apparatus be installed prior to the installation of portions of structural, walls, or door frames. Coordinate the installation of these items to insure that no demolition of general construction is necessary for equipment installation or that the apparatus does not have to be disassembled for installation.

1.3 EQUIPMENT STANDARDS

A. All basic materials and equipment shall be standard catalog products of a reputable manufacturer and shall essentially duplicate equipment which has been in satisfactory service for at least one (1) year.

B. First of a kind new technology devices will not be considered.

C. Accessory equipment that is required to make a complete and functioning system that is not of the same manufacturer furnishing the basic materials

or equipment shall carry the guarantee of the basic material or equipment manufacturer and repair and replacement parts shall be available through normal trade channels locally.

1.4 GUARANTEE

A. The guarantee provision of this specification requires prompt replacement of all defective workmanship and materials occurring within one year of final job acceptance, Substantial Completion, or as defined by Extended Warranty Contracts. This includes all work required to remove and replace the defective item and to make all necessary adjustments to restore the entire installation to its original specified operating condition and finish at the time of acceptance.

B. The Proposer shall also guarantee that the performance of all equipment furnished and installed under this Division of the Specifications shall be at least equal to the performance as called for in the specifications and as stated in the equipment submittals. Should there be indication that the equipment and installation is not producing the intended conditions, the Proposer shall make further tests as the Owner's Representative may direct to demonstrate that the equipment installed meets the specifications and is delivering the capacity specified or called for on the Drawings.

C. If there is any indication that the equipment does not meet the specified quantities, the Proposer shall, at his expense, institute a program to demonstrate the adequacy of the installation. This program shall include all necessary testing and testing equipment. Should the Proposer not have the equipment or technical skill to perform the tests, it shall be his responsibility to employ recognized experts to perform the tests and shall provide certified laboratory tests, certified factory reports and work sheets, or other certified data to support results of any tests required.

END OF SECTION

SECTION 15150

VARIABLE FREQUENCY MOTOR CONTROLLERS

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

A. Comply with Owner furnished General Requirements and related documents.

B. Comply with all other Division 15 Sections as applicable. Refer to other Divisions for coordination of work with other portions of the work.

1.2 SYSTEM DESCRIPTION

A. Furnish variable frequency motor drives (controllers) to provide motor speed control for pumping and cooling tower systems as indicated on the drawings or as scheduled for equipment with all apparatus, specialties, controls, etc. to make the systems complete.

B. Drives shall all typically be the Pulse-Width-Modulated (PWM) AC type drives. Three phase input power shall be converted to a sine-coded, variable frequency output, used for optimized speed control of induction motors.

1.3 QUALITY ASSURANCE

A. All equipment and materials shall be new and of the best quality.

B. The manufacturer of the variable frequency motor controller shall have a minimum of fifteen (15) years of experience in the design, construction, and application of adjustable frequency controls for heating, ventilating and air conditioning applications.

C. All controllers, with factory mounted options, shall be UL (508C), ETL or CSA certified.

D. All drive manufacturers shall require local supplier representation within 50 miles of the job site, and a suitable service organization capable of repairing equipment within a 24 hour period of notification.

E. All drive manufacturers shall generally have a full line of locally stocked drives with similar features and in sizes consistent with those specified for emergency 24 hour replacement.

F. All VFD's shall have a minimum mean time between failure rating of no less than 150,000 hours.

1.4 SUBMITTALS

A. Shop Drawings: Submit in accordance with Section 15010.

B. Clearly identify all options furnished including detailed wiring diagrams indicating required field connections and wiring to be provided under Division 16 and for Temperature Control System interface.

C. Submittal shall include a list of each specification section paragraph number and notation on each specific feature, function or method of operation in which compliance is intended. Lack of compliance with this requirement will be cause for rejection of submittals.

1.5 PRODUCT HANDLING

A. Storage, handling, and protection of materials shall be in accordance with Section 15010. All drives shall be completely wrapped at the factory with a semi-dust tight enclosure, similar to a heat shrink plastic, to prevent dust and debris from getting into the drive enclosure. Drives shall continue to be protected during construction in a similar fashion and be stored in a dry clean location.

B. The drive shall be wrapped with a low efficiency polyester media filter by the installing contractor when power is supplied to the drive and when operated during the construction period. Filter shall be cleaned or replaced regularly to prevent overheating of the drive and electronics.

C. All materials or equipment damaged during transit, handling, or installation shall be replaced at no cost to the Owner.

D. The installing contractor shall receive this equipment at the site, install them, supervise start-up by the manufacturer's representative, oversee Owner Training and assist in providing close-out documentation to include warranties.

PART 2 - PRODUCTS

2.1 GENERAL

A. The variable frequency controllers furnished shall convert 208 volt (Refer to and verify from Plans and submittals), +10 to -5%, three-phase, 60 Hertz, $\pm$ 3% utility power phase to phase imbalance to adjustable voltage and frequency, $\pm$ 1%, three phase A-C power for stepless motor control from

10% to 110% of base speed under variable torque load.

B. All general options and modifications shall mount within the standard adjustable frequency motor controller enclosure unless otherwise specified or in an integrally mounted expansion module.

C. Variable frequency drive systems shall not cause any radio, television, computer, or other communication system interference within the building in which it is installed. All drives shall meet the requirements of Radio Frequency Interference (RFI) above 7 MHz as specified by FCC regulations, Part 15, Subpart J, Class A devices. All drives shall include EMI/RFI filters.

D. The service voltage distortion shall be limited to 5% peak to peak. All drives shall comply with interference and distortion requirements contained herein. If, after units are installed and distortion or interference is traced back to the VFD Units, equipment manufacturer shall install isolation transformers or input line reactors at no cost to the Owner to eliminate the objectionable interference. All PWM drives shall have a minimum 5% line impedance, via a 3% rated input 3 phase A.C. line reactor combined with a 3% DC bus reactor, or a 50% rated A.C. input line reactor, without exception; D.C. bus reactors only are not a suitable substitute.

E. All drive systems shall be capable of installation in long term operation in a mechanical room environment with a temperature range of 32 degrees F. to 104 degrees F., a humidity level of 0% up to 95% non-condensing relative humidity, and be rated for the altitude applicable to the job site.

F. Enclosures shall have a minimum NEMA 1 rated metal enclosure, unless indicated otherwise elsewhere herein.

G. VFD's shall be capable of withstanding the following conditions without failure or mechanical damage:
   1. Being disconnected under full load.
   2. Single phasing or phase failure on both Input and Output.
   3. Loose wiring on load or line side.
   4. Shorting between terminals and all short circuiting.
   5. Being disconnected and/or make disconnect on a coast down of equipment.
   6. Be able to be energized, pick up a motor load, with a spinning fan wheel, as an example.

H. Variable frequency drives shall be the pulse width modulated (PWM) type as manufactured by Reliance, ABB, Danfoss/Graham, or Yaskawa. All drives shall be of the same manufacturer unless the drive is furnished integral with a factory made piece of equipment.

I. All motors connected to drives shall have individual dedicated drives, Two (2) or more motors shall not be controlled by one (1) drive.

2.2 VARIABLE FREQUENCY DRIVE FEATURES

A. Drives shall include as a minimum the following:
   1. Converter, inverter, regulator with replaceable plug in circuit boards.
   2. Hand-off-auto selector switch or buttons.
   3. Manual speed (frequency) selection.
   4. Independently tuned acceleration and deceleration ramps (0-600 seconds).
   5. 6-66 Hz controlled speed range.
   6. Annunciator for remote indication of fault conditions. Store up to the last 10 faults that have occurred in the drive control panel.
   7. All protective circuits and features as recommended by the manufacturer.
   8. Frequency meter mounted in the door or on the enclosure or displayed on control panel display.
   9. Electronic 4-20ma input signal receiver, with transceiver as required to interface with the temperature control system, adjustable for direct or reverse acting. Provide internal drive limits to prevent drive from exceeding 60 Hertz or dropping below minimum drive speed when the input signal exceeds 20ma or drops below 4ma, respectively.
   10. Output contactor (for positive motor disconnect).
   11. Plug-in tester card and meter unless all trouble shooting can be accomplished via control panel display and keypad.
   12. Recommended replacement modules per operations and maintenance manuals.
   13. Non-resettable elapsed time meter to indicate run time of connected load/motor (not power on to drive).
   14. Input line fuses, Class J.
   15. Automatic shut-off for overload conditions.
   16. Output thermal overloads (one in each phase).
   17. 115 VAC Control Power transformer with fused primary where required for the external control circuit. Coordinate requirement with Section 15901.
   18. Field adjustable input signal offset bias control device.
   19. Auxiliary contacts for connection to an Energy Management System. Provide up to 2 analog outputs, 3 digital inputs and 3 output relays. Refer to Section 15901, Controls and Instrumentation.
   20. Standardized communications interface card suitable for connection to the specified Energy Management System (EMS), an embedded Building Automation System protocol for network communications. Refer to Specification Section 15901 for requirements.

21. Electronic Ground Fault Protection shall be provided for all operating conditions to include initial power applied up to full speed and full load conditions.

B. Provide manual constant speed bypass switch with magnetic across the line starter, to include overload relays, and disconnects to allow the motor to open across the line in the event of VFD shutdown and to allow for a maintenance or service person to safely repair/service the drive while the load is operated by the starter for pumps only. Provide drive output isolation contactors and bypass contactors to accomplish this function. Provide time delay in switch-over circuitry to allow running motor to coast to stop when switched from drive to starter and vice versa. Additionally provide an integral input power supply disconnect on all drives. Bypass features shall include a control safety circuit terminal strip, 115 VAC control transformer, a Drive/Bypass selector switch, Hand-Off-Auto Switch, and indicating LED lights for BYPASS ON, Control Power ON and Drive RUNNING. Either 3 contactor bypasses are acceptable or 2 contactor bypasses with service switch and fast acting fuses (NEC approved disconnect switch to service drive) will be allowed.

C. Variable frequency drives shall be of the pulse width modulation type provided the minimum number of pulses per output cycle is at least 5000 at 30 hertz and below to minimize motor heat and noise.

D. Provide auto restart package on each drive to restart the motor when power resumes after a power interruption. A minimum of five (5) attempts at restart shall occur before the drive goes into a fault condition.

E. Provide a minimum of three (3) critical speed coast troughs for all fan drives.

F. Provide bus capacitors, or equivalent feature, for minimum 500 millisecond power loss ride-through capabilities at a minimum of 50% load.

G. Provide DC bus filter choke for maintaining high input power factor, minimum displacement angle of 0.95, over the entire range of operating speeds and loads.

H. Minimum drive efficiency shall be 95% at 50% speed and 97.5% at 100% speed conditions without exception.

I. Drives shall be rated to withstand 110% of full load amps of connected motor size for up to one (1) minute (60 seconds) and 150% of rated full load amps instantaneously.

J. VFD’s and bypasses shall each have a minimum short circuit rating of 65K

amps RMS where circuit breaker disconnects are employed and 100K amps RMS when drives employ fused disconnects, all without additional input fusing.

K. The starting torque shall be 100% available from 0.5 Hertz up to 60 Hertz output operating frequency.

L. Provide for DC injection braking to prevent fan “wind milling” at a start or stop command, adjustable, with current limited, on all drives serving fans.

M. All programming memory shall be saved when the VFD power source is disconnected. This shall require that all memory for the purpose be non-volatile memory (NV RAM).

N. Provide an automatic energy saving, reduced voltage operation, when the drive has been de-energized, no command to “run”, for a pre-determined time frame, adjustable. This shall be the equivalent to a sleep mode function.

2.3 ELECTRONIC COMPONENTS QUALITY ASSURANCE

A. All electronic components or devices to include transistors, diodes, resistors, integrated circuits, capacitors, etc., shall be 100% inspected and load tested, including temperature cycling (0 Deg.C. to +65 Deg.C.) and ambient high temperature (+65 Deg.C.) load tested according to MIL-STD-8813B.

B. All printed circuit boards shall be tested under a temperature cycling (0 Deg.C. to +65 Deg.C.) load test and then functionally tested via fault finder bench equipment prior to unit installation.

C. All final assemblies shall be tested at full load with application of line-to-line and line-to-ground bolted faults and drive shall trip electronically without device failure.

D. After all tests have been performed, each drive shall undergo a 24 hour burn-in test. The controllers shall be burned in at 100% inductive or motor load for 24 hours without an unscheduled shut down.

E. After the burn-in cycle is complete, each VFD shall be put through a 30-minute cycling motor load test before inspection and shipping.

F. Certification that all of the testing above has been performed shall be provided by the drive manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The motors and drives approved shall be shipped to the job site as scheduled and installed under the supervision of a factory trained manufacturer's superintendent. The manufacturer shall furnish all control and wiring diagrams for inclusion in the temperature control system shop drawings. The electrical wire, wiring and termination work shall be done under Division 16 for power wiring and Section 15901 for temperature control wiring, coordinating all work with and under the supervision or instruction of the drive equipment manufacturer's representative.

B. A variable frequency controller shall be provided as indicated on the schedule for each cooling tower fan and for each individual pump as scheduled.

3.2 SERVICE

A. The manufacturer shall provide the following services performed by a factory authorized and fully trained representative only.
   1. Factory coordinated start-up service.
   2. Training of Owner's personnel in basic trouble-shooting.
   3. Training shall be on site and shall be a minimum of four (4) hour duration and shall be performed in addition to start-up of system on a different day after completion of test and balance work.
   4. Visit the facility two (2) times during the warranty period, once six (6) months after and once twelve (12) months after the warranty period to perform check-out and maintenance of drives, make any required adjustments and replace any components found to be defective. Report to the Owner in writing outlining work performed.

B. Furnish spare parts list as a part of close-out documentation.

3.3 WARRANTIES

A. Provide a three (3) year parts and labor warranty for all drives beginning at Substantial Completion. Warranty shall also include travel and lodging expenses for warranty repair personnel as required. All units shall be installed and checked out to be operating as recommended by the manufacturers authorized and factory trained start-up agent before warranty begins. This includes completion of a factory authorized representative start-up report. Submit completed start-up reports with close-out

documents.

B. All warranty work shall be performed through the installing contractor as if they purchased the equipment directly.

END OF SECTION

SECTION 15540

CENTRIFUGAL PUMPS

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

A. Comply with Owner furnished General Requirements and referenced documents.

B. Comply with all other Division 15 Sections, as applicable. Refer to other Divisions for coordination of work with other portions of work.

1.2 SYSTEM DESCRIPTION

A. Provide water circulating pumps of the type, rotational speed, and arrangement indicated.

B. Each pump shall be rated to deliver the capacity indicated in the tabulation on the Schedule against the head of the system in which it operates.

C. Pumps specified in this section of specifications shall handle chilled and condenser water at no higher than 250 Deg.F. or lower than 10 Deg.F.

D. The equipment specified herein is being pre-purchased by the Owner and will be assigned to the Installing Contractor who shall install the equipment and provide the warranty services.

1.3 QUALITY ASSURANCE

A. All equipment and materials shall be new and of the best quality.

B. All equipment and materials shall be installed in a workmanlike manner by experienced mechanics and as recommended by the pump manufacturer.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's descriptive literature and installation instructions together with pump curves and head calculations. Head calculations required when piping installation and equipment utilized is significantly different from that shown as determined by the Engineer.

B. Shop Drawings: Submit in accordance with Owner furnished General Requirements.

C. Submittals to include pump and motor efficiencies at full load and at 60 Hertz. For variable speed applications submit on the same at 15 Hertz, 30 Hertz and 45 Hertz.

1.5 PRODUCT HANDLING

A. Cover and protect pumps in transit and at site. Pumps not properly protected and stored and which are damaged or defaced during construction shall be rejected.

B. Cover suction and discharge openings to prevent entrance of dirt and debris until final piping connections are made.

C. Storage and protection of materials shall be in accordance with Section 15010.

D. The installing contractor shall receive this equipment at the site, install the pumps, supervise and perform start-up, oversee Owner training, and assist in providing close-out documentation to include furnishing warranties.

PART 2 - PRODUCTS

2.1 GENERAL

A. The head capacities indicated in the schedules are listed for bidding purposes only. Calculate the operating head at each pump, taking into consideration the actual routing of the various lines, pressure drops in heat exchangers and coils, exact lengths of pipe, fittings, etc. Submit these calculations, together with copies of manufacturer's performance curves, as shop drawings on each pump. Clearly mark the curves for each pump to indicate the diameter of the impeller and the selection point.

B. Motors shall be constant speed, open drip proof type and shall be so sized with relation to the pump impeller that the required brake horsepower shall not exceed the rated motor horsepower at any point on the pump curve. Pumps operating in parallel shall not cavitate when operated alone.

C. Provide each pump with a constant speed motor wound for the electrical characteristics indicated on the Drawings. Motors shall be of the nominal starting torque, low starting current, ball bearing, horizontal, 40 Deg.C. ambient, drip-proof squirrel cage induction type. Motors over 1 H.P. shall be high efficiency type equal to G.E. Energy Saver, Baldor Super "E" or A.O. Smith "E" Plus III. All motors on all pumps shall be of the same manufacture.

D. Provide each centrifugal pump with an enclosed impeller whose diameter is 90% or less of the maximum impeller which the manufacturer shows in their published curves for that pump.

E. Provide pump casings and mechanical seals suitable for operation under static and dynamic heads for that pump.

F. Pump baseplates shall be constructed of welded structural steel shapes. Provide with raised lip drip pans with threaded drain connection where handling fluids with operating temperatures below 60 Deg.F., such as chilled water. Furnish baseplates with 1/8" thick steel drain pan of sufficient width to extend under, and a minimum of two inches (2) beyond, and catch any drip from connecting flanges. Removable attachments will not be acceptable. Cover pans with rust inhibitive paint.

G. Coupling shall be of the flexible type, capable of withstanding shock, misalignment and end float as manufactured by "Woods".

H. Motor and pump alignment shall be field adjustable, but shall be factory aligned on a common base plate. Supplier shall furnish adequate shims or other alignment accessories necessary to complete field alignment.

I. Coupling Guard: Coupling guard shall be all metal and fastened to baseplate. Guard shall be removable. All exposed moving parts shall be guarded from all sides.

J. Name Plates: Furnish stainless steel data plates permanently secured to the pump.

K. Bearings shall be the heavy duty ball type on both ends of frame and be regreasable.

L. Provide 1/4 inch gauge tappings, fitted with pipe plugs, at each pump flange.

M. Provide minimum 1/2 inch tappings, fitted with pipe plugs, for a casing air vent and drain on the pump volute.

N. Provide extended lubrication lines with universal grease gun stop check fittings for greasing bearings without requiring disassembly of the pump, guards, or other auxiliary devices.

O. All pumps and materials of construction shall be compatible with ethylene glycol.

2.2 DOUBLE SUCTION PUMPS

A. Double suction pumps shall be bronze fitted, horizontally split case type with flanged inlet and outlet. Flanges shall be rated at 125 PSI. Pumps shall be designed to allow complete removal of the impeller, shaft, and bearings.

B. Each pump and motor shall be mounted on a common baseplate, and shall be connected through a spacer type flexible coupling.

C. The casing bearing bracket, bearing cover and gland shall be of cast iron, ASTM A-48, Class 25A.

D. The shaft shall be of stainless steel construction.

E. The impeller shaft sleeve and casing wearing rings shall all be made of bronze (bronze fitted).

F. Seals shall be John Crane, Type 21, or equivalent, mechanical shaft seals.

G. Bearings shall be grease lubricated ball type, selected to the carry radial and thrust loads required based on the scheduled requirements.

H. Pumps shall be as manufactured by Aurora, PACO, Bell & Gossett, or TACO.

2.3 END SUCTION PUMPS (CENTRIFUGAL PUMPS)

A. End suction pumps shall meet all requirements same as Double Suction Pumps. Pumps shall be frame mounted type.

PART 3 - EXECUTION

3.1 INSTALLATION - BASE MOUNTED PUMPS (INSTALLING CONTRACTOR ONLY)

A. In mounting pumps, level by steel shims or steel wedges on each side of each mounting bolt set beneath the baseplate on top of the foundation.

B. After the baseplate is bolted down, erect forms around the foundation and grout. Exercise care to be sure that the entire space under the baseplate is filled with grout. After grout is thoroughly hardened, remove wedges and fill holes with non-shrinking grout. Tighten bolts.

C. Check levelling and alignment and correct, if necessary, with shims under pump or motor feet.

D. Connect piping and support piping independently of the pump. It is imperative that piping be installed in such manner as not to impose any strain on the pump casing.

E. Connect gauge cocks and gauges to gauge tappings.

F. Connect a gauge cock to the volute air vent connection.

G. Pipe a drain to the drip pan and volute drain and route to the nearest floor drain.

H. Connect power supply and control wiring to disconnect and motor controller.

I. After each unit has been run under actual operating conditions, shut it down and again check its alignment and adjust as necessary.

3.2 WARRANTIES

A. Furnish a full one (1) year parts and labor warranty on all pumps to commence at Substantial Completion.

B. All warranties will be transferred to the Owner as if the equipment were purchased directly by the Contractor. All warranty labor shall be provided by the installing Contractor with parts furnished by the equipment manufacturer.

END OF SECTION

SECTION 15684

ROTARY SCREW WATER COOLED CHILLERS (100 - 450 TONS)

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

A. Comply with Owner furnished - General Requirements and referenced documents.

B. Comply with all other Division 15 Sections as applicable. Refer to other Divisions for coordination of work with other portions of work.

1.2 SYSTEM DESCRIPTION

A. The work shall include the furnishing and installing of rotary screw water cooled chilling units, together with all connecting piping, all required controls, starters, accessories, insulation, hangers, supports, and appurtenances as indicated herein and as shown and scheduled on the Drawings.

B. Chillers shall be completely factory assembled and delivered to the job site for final field installation or to an Owner approved warehouse until the equipment is ready to be accepted on the project site by the Installing Contractor. The Owner will pay for delivery costs from the warehouse to the site to include unloading and setting of equipment onto the structural base on site (assuming it is ready).

C. The equipment specified herein is being pre-purchased by the Owner and will be assigned to the Installing Contractor who shall install the equipment and provide the warranty services.

1.3 QUALITY ASSURANCE

A. All equipment and materials shall be new and of the best quality.

B. All equipment and materials shall be installed in a workmanlike manner by experienced mechanics and as recommended by the equipment manufacturer.

C. Rotary Screw Chillers shall be certified in accordance with the latest edition of ARI Standard 550 to meet the scheduled capacities. Each unit shall bear the ARI Certification Label for Rotary Water-Cooled Chillers as applicable.

D. Conform to ANSI/UL 465 for construction of chillers.

E. Conform to ANSI/ASME Section VIII, Boiler and Pressure Vessel Code, for construction and testing of chillers.

F. Conform to the latest version of ANSI/ASHRAE Standard 15 for construction and operation of chillers.

1.4 SUBMITTALS

A. Product Data: Submit complete manufacturer's descriptive literature and installation instructions to include cut sheets, shipping and operating weights, capacity at all scheduled conditions, electrical requirements, all power and control wiring diagrams, equipment weights, operating weight of refrigerant charge, required service clearances, specified optional accessories, appurtenances, and locations of all field connections.

B. Shop Drawings: Submit in accordance with Owner furnished general requirements.

1.5 PRODUCT HANDLING

A. Cover and protect material in transit and at site, to include all field piping connection points. Material not properly protected and stored and which is damaged or defaced during construction shall be rejected.

B. Storage and protection of materials shall be as stated herein and in accordance with Section 15010.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit three (3) copies of installation, operation, and maintenance data with close-out documentation at "Substantial Completion".

B. Include manuals with information on proper installation, start-up instructions, maintenance data, spare parts lists, controls, wiring diagrams, accessories, and a trouble-shooting guide. Additionally, provide a typewritten copy of the start-up log for each machine indicating operating parameters and conditions which shall be signed by the factory authorized startup technician.

1.7 WARRANTY

A. Provide a one (1) year parts and labor warranty on each chilled water machine as an assembly to begin at "Substantial Completion" as established by the Owner.

B. Provide an extended four (4) year parts only warranty on each chilled water machine as an assembly to begin at the end of the first year warranty.

C. Installing Contractor shall receive chillers, install them, and provide the warranty services as indicated above.

PART 2 - PRODUCTS

2.1 ROTARY SCREW WATER COOLED CHILLERS

A. Compressor and Motor:
1. Compressors shall be of the rotary, twin helical, semi-hermetic, screw type, and shall utilize either R-410a or R-134a refrigerant. Units shall be shipped fully charged.
2. Chillers shall be able to unload to a minimum of 10-15% of design tonnage with a constant entering condenser water temperature of 85 Deg.F., or a hot gas bypass system shall be provided as required to meet this requirement. Refrigeration system control shall result in $\pm$0.5 Deg.F. control of leaving chilled water temperature and allow for infinitely variable (modulated) capacity control.
3. The motor shall be semi-hermetic and either suction or liquid refrigerant cooled. Hot gas motor cooling is not allowed.
4. Motors shall have three RTD's in the motor windings, one per phase, to protect against high motor temperature at start-up.
5. Compressor motors shall be direct drive type with a nominal maximum speed of 3,600 RPM.
6. There shall be a minimum of two (2) compressors and two (2) independent refrigerant circuits with discharge check valves at each compressor.
7. Provide refrigerant isolation valves on the compressor discharge and suction lines, as well as on the liquid lines, three (3) separate valves per system.

B. Evaporator and Condenser:
1. The evaporator and condenser shall be built in accordance with the latest edition of ANSI/ASHRAE Standard 15, Safety Code for Mechanical Refrigeration. Compact water boxes shall be designed for 150 psig maximum working pressure and shall be flanged and gasketed for easy removal and access to the tubes. The water boxes shall have 150 pound ANSI raised face, factory welded, flanged water connections for both chilled and condenser water field piping connections.
2. Evaporator tubes shall be made of copper, and have a minimum 0.025" wall thickness and the condenser tubes shall be made of copper, and have a minimum 0.028" wall thickness.
3. Factory insulation shall be 1/2" thick foam type insulation and shall

cover all low temperature surfaces to include the evaporator, water boxes, suction elbow, refrigerant suction piping, flow chamber.

4. Provide 3/4" drain and vent connections in each evaporator and condenser water box.
5. Provide an evaporator liquid level sensor, sight glasses on the electronic expansion valves and optical oil eye sensor in the oil separators.
6. Ratings shall be with a 0.0001 fouling factor on the water side of the cooler and 0.00025 fouling factor on the water side of condenser tubes. The KW power draw shall not exceed the scheduled KW per ton of cooling capacity at full load with R134a refrigerants. Chiller performance shall be rated in accordance with the latest edition of ARI Standard 550.
7. Provide factory furnished thermal dispersion flow switches for each of the evaporators and condensers for proving flow prior to energizing the chiller.

C. Pump-Out System:

1. Units operating with R-410a or R-134a refrigerants shall have the capability of storing the entire refrigerant charge in the condenser.
2. Pump-out systems will not be allowed as a substitute for this requirement.

D. Controls:

1. Chillers shall be controlled by a local unit mounted microprocessor controller. A dedicated chiller control panel shall be supplied with each chiller by the chiller manufacturer to provide for chiller capacity control in response to the leaving chilled water temperature and by a remote Energy Management Control System.
2. Chiller control panel shall provide control of chiller operation and monitoring of chiller sensors, actuators, relays, and switches. Panel shall include controls to safely and efficiently operate the chiller.
3. Chiller control panel shall monitor safeties for motor starting and running, time between compressor/motor starts, low chilled water temperature, high condenser refrigerant pressure, low evaporator refrigerant pressure and temperature, evaporator and condenser water flows, low oil flow, high motor temperature, and proper operation of unit controls and sensors. Chiller safeties shall allow normal operation down to 40 Deg. F., chilled water supply temperature.
4. Chiller control panel shall be provided with the following dial type pressure gauges, or have microprocessor display of, the following:
   a. Evaporator refrigerant pressure.
   b. Condenser refrigerant pressure.
5. Chiller control panel shall be provided with a starts counter and non-resettable running time meter as manufactured by Cramer. Alternately, this data can be displayed through the microprocessor controller.

6. The front of the chiller control panel shall be capable of displaying the following:
    a. Entering and Leaving Evaporator Water Temperature, Deg.F.
    b. Entering and Leaving Condenser Water Temperature, Deg.F.
    c. Chilled Water Setpoint, Deg.F.
    d. Electrical Current Limit Setpoint, Amps.
    e. Chiller Operating Mode.
    f. Chiller Diagnostic Codes.
    g. Load, % of full load for unit or for each individual compressor motor.
    h. Evaporator refrigerant pressure.
    i. Condenser refrigerant pressure.
7. Chiller control panel shall provide evaporator freeze protection and low limit control. This control shall be used to avoid low evaporator refrigerant temperature trip-outs during critical periods of chiller operation. The control shall take progressively more aggressive load limiting action in response to the severity of the rate of change and the actual value of the evaporator refrigerant temperature. A diagnostic code, reflecting the operating status, shall be automatically displayed at the front panel whenever this control is in effect. Control panel shall effect an automatic restart sequence after a power loss or unsuccessful attempt to start. A minimum of three (3) restarts shall be attempted within a ten (10) minute period.
8. Chiller control panel shall provide a relay output to start the condenser water pump and/or enable the cooling tower temperature controls.
9. Chiller control panel shall provide an alarm relay output that shall energize whenever a fault requiring manual reset is detected by the panel. Output relay shall be compatible with an Owner selected Energy Management System.
10. Unit control panel shall provide leaving chilled water temperature reset based on a 4-20ma or 0-10 VDC signal from a Building Automation System, different than the chiller manufacturer.
11. Unit control panel shall have a minimum of 40, preferably up to 80, characters displayed on the panel display.
12. Provide a LON or BacNET standardized communications protocol chip to communicate directly with the Energy Management System to be provided.

E. Unit Mounted Starters:
1. Motor starter shall be a wye-delta closed transition or solid state factory unit mounted starter. Starter shall be pre-piped and wired, arranged for single point field electrical connection. If starter is not wye-delta, manufacturer must specify the inrush current. If solid state starter is supplied, manufacturer shall provide two (2) additional hours of training specifically on the installation, operation, and maintenance of the starter. Motor starter shall have NEMA 1A gasketed enclosure. Enclosure shall be constructed of minimum 14 gauge steel. Unit

mounted enclosures shall have ventilating louvers. Each door or enclosure more than 48" high shall have three (3) pound vault type latches with padlockable handles.

2. Motor starters shall include incoming line provisions for the number and size cables shown on the Drawings. Incoming line lugs shall be copper mechanical type. Connection directly to the contactors is not permissible.
3. Contactors shall be sized properly for both chiller full load and locked rotor currents. Contactors shall have double break main contacts with weld resistant silver cadmium faces. Auxiliary interlocks that interface with the control panel shall be low resistance having palladium silver contacts.
4. Each motor starter shall include a 1.0 KVA control power transformer with fused primary and 120 volt secondary. Current transformers of the proper size, ratio, and burden capacity shall be provided to provide a signal to the control panel and optional devices. Control relays shall be provided within the motors starter to interface with the control panel.
5. Power wiring within the starter shall be Type MTW stranded copper 90 Deg.C. Power wire bends shall show no evidence of nicking or insulation degradation. Control wire shall be Type MTW stranded copper 90 Deg.C., 14 gauge minimum.
6. Starter shall include an advanced motor protection system incorporating electronic three phase overloads and current transformers. This electronic motor protection system shall monitor and protect against the following conditions:
    a. Three-Phase Overload Protection
    b. Overload Protection During Start-Up
    c. Phase Imbalance
    d. Phase Loss
    e. Phase Reversal
    f. Low Voltage
    g. Distribution fault protection is required by compressor design, consisting of three-phase, current sensing devices that monitor the status of the current. Distribution faults of 1-1/2 electrical cycle durations shall be detected and the compressor motor shall be disconnected within six (6) electrical cycles.
7. Alternately, any, or all portions of, the advanced motor protection system can be furnished in the chiller control panel.
8. The starter and control panel shall be designed to operate in temperatures up to 104 Deg.F. (40 Deg.C.).
9. All field supplied wires, bus bars, and fittings shall be copper only.
10. The following starter options shall be provided:
    a. Ammeters and Voltmeters: Three (3) ammeters shall be provided, one (1) per phase. Ammeters shall be calibrated so the inrush current can be indicated. Three (3) voltmeters shall be provided, each reading a phase-to-phase voltage. Alternately, this may be

furnished in the chiller microprocessor control panel.

b. U.L. Approval.
c. Provide a single point electrical connection such that only one electrical circuit serves this equipment. The control transformer shall be factory wired internal to the wiring enclosure, segregate main wiring from control wiring, and be fed from this single source.
d. A non-fused disconnect switch shall be provided with the chiller.

F. Acoustical Treatment:

1. The maximum “A” weighted sound pressure level acceptable shall be 70.0 (without exception) based on being measured one (1) meter from the side of the unit, 1.5 meters above the floor, in accordance with the most recent version of ARI Standard 575. Compressor sound blankets and/or a complete machine acoustical enclosure, whatever combination is necessitated, will be required to reduce sound levels to within the specified value, if the sound level exceeds that specified without such treatment where required to meet the overall individual net acoustical rating specified herein.
2. Compressors with oil separator and discharge piping shall be individually enclosed by an acoustic sound blanket where required to meet the overall individual unit acoustical rating specified herein. Sound blankets shall be made of one layer of acoustical absorbent textile fiber, minimum 5/8 inch thickness; one layer of anti-vibrating heavy material with a minimum thickness of 1/8"; and both of these layers enclosed with two (2) outer sheets of welded PVC reinforced for exposure to high ambient temperatures and treated for ultra-violet resistance. Enclosure shall be factory mounted.
3. Treat other refrigerant piping and system components with sound reduction materials to limit noise level of machine to the lowest possible with standard, and optional as required, factory installed options. This is required on all units without exception.
4. Provide hot gas discharge mufflers for each compressor that are individually tuned for each specific compressor and operating conditions that optimize acoustical attenuation of compressor noise. This is required on all units without exception.
5. Provide factory furnished, field installed, neoprene isolator pads to minimize noise and vibration transmission from this equipment. This is required on all units without exception.

G. Acceptable Manufacturers:

1. Trane.

2.2 MACHINE ROOM SAFETY SYSTEM

A. A ventilation system and controls shall be furnished under other sections of these specifications to meet the ventilation requirements of the American

Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 15 (most recent edition).

B. For Group A1 refrigerant machines furnish one (1) oxygen deprivation sensor and transmitter to detect oxygen levels below 19.5 percent by volume, adjustable, down to 5%, within the immediate area of the machine. In lieu of this sensor, provide separate refrigerant specific sensors and transmitters for each machine to detect refrigerant concentrations as low as one (1) part per million (PPM), adjustable, within the immediate area of the machine.

C. Both oxygen deprivation and refrigerant specific sensors shall independently transmit a signal to a gas alarm monitor which shall energize the Mechanical Ventilation System and activate audible and visual alarms.

D. Gas alarm monitoring panels shall be designed for refrigerant Machine Room applications and have the following features:
   1. Seven (7) segment, four (4) digit LED Display of each sensor reading to include:
      a. Gas Concentration in percent (%) by volume, or PPM, for each sensor.
      b. Peak Gas Concentration in percent (%) by volume, or PPM, for each sensor.
      c. Each Gas Type Sensor is being monitored, simultaneously, when multiple gas type sensors are utilized.
      d. Two (2) stage alarm level setting for each sensor.
      e. Alarm indication.
      f. Select button to scroll sensor information and to set-up system parameters.
      g. System malfunction indicator.
      h. Auto-Zero self calibration system.
   2. Alarm Panels shall be expandable to add up to three (3) additional sensors.
   3. Provide locking panel cover. Cover shall be a NEMA Type-1 enclosure.
   4. System shall automatically calibrate itself.
   5. System shall be capable of monitoring a minimum of six (6) separate gas sensors, each to as low as 1 PPM.
   6. Provide output alarm relays to:
      a. Energize Ventilation System.
      b. Energize Visual Alarms.
      c. Energize Audible Alarms.
      d. Report alarm condition to Energy Management System.

e. Minimum of two (2) other relays for other alarms and safety controls.

7. Provide fault indication on panel face.
8. Acceptable manufacturers:
   a. General Analysis Corporation SAM-I, or approved equals by:
   b. Yokogawa HGM-300.

E. Audible Alarm Devices

1. Audible Alarm devices shall be heavy-duty, industrial, tone-selectable, stand-alone, signaling devices capable of producing volume controlled, high-decibel tones.
2. Provide up to ten (10) distinctive, field selectable tones, via solid state microprocessor circuitry, for each device.
3. All devices shall be of weatherproof design, fully enclosed, and be made of heavy-duty zinc cast construction with a baked enamel finish.
4. Devices shall be available in 24 Volt DC, 120 VAC, or 240 VAC as required for the specific application. Unless indicated otherwise use 120 VAC devices. Maximum operating current shall not exceed 0.25 amps at 120 VAC.
5. Devices shall be suitable for mounting on a flush wall box utilizing a concealed wiring adaptor kit or for direct wall mounting.
6. Devices shall be UL listed for indoor and outdoor applications.
7. Each device shall deliver up to 110 decibels at ten (10) feet.
8. The speaker portion of the device shall be adjustable to allow directional control of the signal.
9. Provide two (2) audible alarm devices.
10. Devices shall be an Edwards "Adaptatone".

F. Visual Alarm Devices

1. Visual Alarm Devices shall be heavy-duty, industrial, beacons, capable of producing bright flashing lights.
2. All devices shall be of weatherproof design, fully enclosed, and be made of a heavy-duty cast zinc base, suitable as a junction box, with shatter resistant Lexan lenses. Lenses shall have special optics for efficient light dispersal.
3. Lamps shall have bayonet bases on bulbs with yellow or amber lenses.
4. Devices shall be UL listed for indoor and outdoor applications.
5. Devices shall be suitable for surface mounting, pipe mounting or mounting to a four inch (4") octagon box.
6. All flashing lights shall be suitable for 120 VAC and have a maximum operating current of 0.25 amps.
7. Provide two (2) visual alarm devices.
8. Visual Alarm Devices shall be Edwards "Adaptabeacon" flashing lights.

G. Self Contained Breathing Apparatus
   1. Self Contained Breathing Apparatus (SCBA) shall be designed for personnel rescue operations and for emergency work performance in a Machine Room environment.
   2. SCBA shall be NIOSH approved and meet Federal Standard 30-CFR, Part II for open-circuit SCBA's.
   3. Air Cylinders shall be designed for a pressure of 4500 psig, be manufactured of Kevlar and have a rating for a 60 minute supply of air. Cylinders shall have the following accessories:
      a. Comfortable, wide strap, harness.
      b. Remote air pressure gauge.
      c. Low air supply warning.
      d. Low maintenance pneumatics requiring no calibration.
      e. Companion face mask.
      f. Face mask hose and fittings.
      g. Mask mounted demand control valve.
      h. Neoprene, secure seal, face mask.
      i. Shatterproof visor suitable for working in with scratch resistant coating.
      j. Communications option package with voice amplification system(65dB to 100dB)
      k. Provide carrying case, user manual and poster, and a complete maintenance manual.
   4. Provide one (1) SCBA which shall be mounted outside of the Chiller Room where designated by the Owner or where shown on the Drawings.
   5. Acceptable Manufacturer: International Safety Instruments (ISI) "Vanguard".

H. Each refrigeration system shall be provided with an easily legible, permanent sign that is securely attached, easily accessible, and indicates the following:
   1. Name and address of the installer.
   2. Proper name and amount of refrigerant.
   3. Lubricant identify and amount.
   4. Field test pressure applied.

I. Each refrigeration system that contains more than 100 pounds of refrigerant shall be provided with durable signs that have letters not less than 0.5 inch in height and identify the following:
   1. Valves or switches that control refrigerant flow.
   2. Switches that control ventilation.
   3. Switches that control operation of the refrigeration compressor(s).
   4. The kind of refrigerant or secondary coolant contained in the exposed piping outside the machinery room, as applicable.

5. Valves or piping adjacent to valves shall be identified in accordance with ANSI A13.1, "Scheme for Identification of Piping Systems".

J. All of the components specified above will be furnished as a part of the chiller package and will require installation by the firm that installs the chiller, or a subcontractor thereof.

PART 3 - EXECUTION

3.1 DELIVERY AND PROTECTION

A. Deliver all equipment and accessories to on Owner approved warehouse where the chillers shall be stored until the site is ready for them to be delivered. The Owner shall have these items delivered to the site and set in place where designated by the Installing Contractor.

B. All equipment shall be handled carefully to avoid damage and be protected from exposure to the weather and dirt. All equipment shall be examined upon delivery to the site and evidence of abuse, damage, or exposure to weather and dirt shall be grounds for refusal to accept individual pieces of equipment. Rejected items shall be replaced promptly at no cost.

3.2 OPERATING PROCEDURES AND REQUIREMENTS

A. Three (3) copies of the installation, operating, and service (maintenance) instructions in illustrated and bound form shall be furnished by the manufacturer. Include spare parts list with this documentation.

B. At machine start up the manufacturer shall furnish skilled factory trained personnel to supervise, check out performance, make any required adjustments, place the unit in service, and instruct the Owner's personnel for a full period of four (4) hours. Services shall include:
1. Leak Testing.
2. Refrigerant Pressure Testing.
3. System Evacuation (for low pressure machines).
4. System Dehydration (for low pressure machines).
5. Charge Chiller with Operating Charge of Refrigerant and Oil.

All training shall be scheduled with the Owner and documented, start and finish times, list of attendees and information reviewed. This is in addition to the start-up services noted above.

C. The manufacturer of the water chiller shall provide complete wiring diagrams to be supplied to the Electrical and Temperature Controls Systems installers and shall provide drawings indicating all required external wiring and arrangements of wiring connections to include machine room

safety systems.

D. Factory authorized service personnel and routine repair parts shall be locally available within 24 hours of a trouble call.

3.3 INSTALLATION (PROVIDED BY INSTALLING CONTRACTOR)

A. Install in complete accordance with manufacturer's instructions.

B. Provide for single point connection to the electrical service. If oil pump is electric, include the connection of the oil pump to a separately fused circuit.

C. Furnish and install necessary auxiliary water piping for oil cooling units and purge condensers.

D. Arrange piping for easy dismantling to permit tube cleaning.

E. Provide piping from chiller relief valve to the outdoors. Size as recommended by the manufacturer. Install flexible connection at chiller connection.

F. Mount each chiller on four inch (4") thick concrete housekeeping pad as shown with isolation pads as recommended and furnished by the manufacturer.

G. Install one (1) oxygen deprivation sensor, or one (1) refrigerant specific sensor, per machine, along with other specified apparatus per the latest edition of ASHRAE Standard 15.

3.4 MANUFACTURER'S FIELD SERVICES

A. Manufacturer shall furnish a factory trained service technician, at no additional charge, to properly check out and start each unit. Representative shall provide leak testing, evacuation, dehydration, and charging of each unit, as required.

B. A start-up log shall be completed by the field start-up technician to document the chiller's start-up date and operating conditions, which shall then be signed by an Owner’s representative prior to commissioning of the chillers. This document shall be reproduced but with field data typewritten on a new form and be included with the Operations and Maintenance Manuals.

C. The manufacturer shall furnish four (4) hours of chiller training which shall occur separately from chiller start-up.

D. Factory authorized service personnel and routine repair parts shall be locally available within 24 hours of a trouble call.

END OF SECTION

SECTION 15712

INDUCED DRAFT CROSSFLOW COOLING TOWERS
(STAINLESS STEEL)

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

A. Comply with Owner furnished General Requirements and all referenced documents.

B. Comply with all other Sections as applicable. Refer to other Divisions for coordination of this work with other portions of work specified therein.

1.2 SCOPE

A. Furnish induced draft single sided air entry, vertical discharge, factory fabricated and assembled, stainless steel crossflow type cooling towers as specified herein and as indicated on the equipment schedule complete with all specified accessories.

B. Any accessories not factory assembled or installed shall be installed in the field by the installer of the towers under this section of the specifications at no additional cost.

C. The equipment specified herein is being pre-purchased by the Owner and will be assigned to the Contractor for final installation and warranty coverage.

1.3 QUALITY ASSURANCE

A. All equipment and materials shall be new and of the best quality.

B. Provide certification of tower cooling capacity performance in accordance with the Cooling Tower Institute (CTI) Standard STD-201.

1.4 SUBMITTALS

A. Product Data: Submit complete manufacturer's descriptive literature and installation instructions indicating all accessories furnished and capacities of equipment.

B. Shop Drawings:
   1. Submit in accordance with Owner furnished General Requirements.

2. Indicate on shop drawings the projected calendar date for delivery of equipment to the project site.
3. Provide cut sheets on all specified components and accessories.
4. Provide recommended support details of the manufacturer of the towers.
5. Provide wiring diagrams for motors, heaters and other accessories requiring electrical power supply and control.
6. Provide detailed motor performance and efficiency data.

1.5 PRODUCT HANDLING

A. Cover and protect material in transit and at site. Material not properly protected and stored and which is damaged or defaced during transit or storage shall be rejected and replaced at no cost.

B. Storage and protection of materials shall be in accordance with Owner furnished General Requirements.

C. The cooling towers shall be delivered to Crocker Crane from the factory per the Owner's direction (Owner responsibility). The equipment will then be delivered from Crocker Crane (Contractor responsibility) and installed by the contractor to include the cooling tower complete with field installed accessories. The Owner will pay to transport the cooling towers to the site including unloading and setting of the cooling towers onto their final locations.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. The cooling towers shall consist of two (2) factory-assembled, twin-cell, induced draft, stainless steel crossflow type towers with single or double side entry as indicated on the Drawings and vertical air discharge as manufactured by Baltimore Aircoil Company. Each twin cell tower assembly shall consist of two cells and be equal to a Baltimore Model No. XES15E-1285-07FN2, Series 1500, packaged steel tower capable of cooling 610 GPM from 95 Deg.F. to 85 Deg.F. with 78 Deg.F. wet bulb temperature This results in a total cooling effect of 203 tons at 3 GPM per ton. The tower shall be capable of withstanding a wind velocity of 100 MPH without damage.

B. General Construction of all structural steel angles, channels, and all bolts, nuts and washers shall be of all heavy gauge Type 304 stainless steel. All steel panels and surface elements shall be made of heavy gauge Type 304 stainless steel. The casing panels shall all be made of Type 304 stainless

steel.

C. The cold water collection basin floor and sides shall be constructed of heavy gauge Type 304 stainless steel panels and structural members. All seams shall be factory welded to ensure water tight construction and be warranted against leaks for five (5) years. Basin shall be self-cleaning and have a center section with drain, overflow drain and fittings. The basin area under the wet deck surface shall be sloped toward the center section. Provide a Type 304 stainless steel bottom outlet with Type 304 perforated stainless steel strainers for each cell. Additionally provide one (1) brass float operated make-up valve with large diameter plastic float for each tower cell, total of two (2), arranged for easy accessibility and easy adjustment. Additionally, provide a Type 304 stainless steel pipe nipple connection at each cold water basin for a field piped manual quick-fill. Also provide a factory installed side or bottom outlet, as indicated on the Drawings, beveled for welding and suitable for a flanged connection of the bypass valve piping with internal baffling to eliminate turbulence of the operating water level.

D. Hot water distribution basin shall be open gravity type constructed of Type 304 stainless steel. Distribution weirs and plastic metering orifices shall be provided to assure even flow of water over the wet deck surfaces. Provide hinged lift off or sliding warm water distribution basin covers with full size grip handle made of Type 304 stainless steel to prevent debris and algae build-up in the basin. Hinges shall be Type 304 stainless steel.

E. The wet deck (fill) inlet louver and drift eliminators shall consist of waveformed sheets of polyvinylchloride which shall be impervious to rot, decay, fungus, or biological attack. Drift loss shall be limited to less than 0.2% of the total water circulated. Eliminators shall be three pass design. PVC shall be listed by the Factory Mutual Approval Guide.

F. Combined Inlet Shields. The combined inlet shields shall be UV resistant PVC, installed on the air inlet face to minimize air resistance, prevent water splash out, and minimize sunlight exposure to reduce the potential for algae growth in the cold water basin.

G. Fans shall be fixed pitch, axial flow, heavy duty, cast aluminum alloy. The fan cylinder shall have a smoothly contoured inlet ring and have minimum fan tip clearance. Fan guards shall be provided to comply with OSHA Safety Standards and shall be constructed of heavy gauge, Type 304 stainless steel of all welded construction. Fan and shaft shall be supported by heavy duty, self-aligning, grease lubricated ball bearings designed for a minimum L10 life of 40,000 hours with moisture proof seals and integral slinger rings. Provide extended lube lines to permit lubrication from the side of each cell on the exterior of the towers.

H. The fan motor drive assembly shall consist of a cast aluminum fan sheave and a motor sheave in a vented enclosure protected from moist air discharge. Provide a one piece solid backed multi-grooved neoprene/polyester belt. Belt tension shall be adjusted from the motor base support assembly. The fan motors shall be the size scheduled, 3 phase, 60 Hertz, 208 volts, single speed 1800 RPM, single winding, variable torque, totally enclosed, high efficiency (premium efficiency) motors and be Reliance X.E. or Baldor Super-E. Motors shall be invertor duty rated. Motors exposed to the moist air stream shall be the totally enclosed air-over type (TEAO) with special moisture protection on the windings, shafts, and bearings. All tower drives shall include a five (5) year parts only warranty.

I. To maintain the quality of the local environment, the cooling tower shall be furnished with a low sound fan. The thermal performance of the cooling tower when furnished with the low sound fan shall be certified by the Cooling Technology Institute in accordance with paragraph 1.2 of this specification. Maximum sound pressure levels (dB) measured 50 feet (15240 mm) from cooling tower operating at full fan speed shall not exceed the sound levels detailed below.

Location	63	125	250	500	1000	2000	4000	8000	dB(A)
Discharge	54	54	54	51	45	43	46	35	53
Air Inlet	58	57	54	54	48	46	47	43	56
Cased Face	53	50	48	46	39	35	34	24	47

J. Provide, for each tower cell, a single water inlet connection, suitable for a welded pipe flange connection, complete with a pre-strainer assembly and means to balance flow rates to the warm water distribution basins. In lieu of a single connection two (2) warm water basin flange connections with balancing valves is acceptable.

K. Provide one (1) factory installed, 10 Kw each, electrical immersion pan heaters per basin, total of two (2), to maintain +40 Deg. F. pan water temperature at 0 Deg. F. ambient with a low water cut-out switch for each basin. Provide pan heater contactors, one (1) with each tower cell, in a NEMA 3R control panel enclosure, for control of the pan heaters to include a thermostat, adjustable, and overload headers. One thermostat and heater controller will be required per common basin.

L. Access and Safety equipment shall include but not be limited to:
1. Hinged access panels on both end walls for access to the eliminators and fan plenum section. Supports, framing, and handle shall be heavy duty Type 304 stainless steel. Hinges shall be Type 304 stainless steel.
2. Type 304 stainless steel or heavy gauge aluminum fan guard over

each cylinder as specified herein.

3. Type 304 stainless steel or heavy gauge aluminum safety handrail at the fan deck.
4. An OSHA safety cage, Type 304 stainless steel or heavy gauge aluminum, to extend to 8'-0" above finished roof or grade at which access is provided. Tower is supported approximately ten feet (10') above the pavement.
5. An aluminum ladder with access platform to extend from the fan deck to the base of the tower for access to the fan deck.
6. Vibration cutout switches, one (1) for each fan. Provide auxiliary normally open (N.O.) contacts for remote monitoring status.
7. Provide a Type 304 stainless steel internal walkway between access doors for ease of maintenance of all internal tower components.

M. Provide Type 304 stainless steel weir gates for each twin cell tower to isolate individual cold water basins. Further, provide for cooling tower bypass and equalizer connections in the cold water basin as required per the construction documents.

N. Warrant all structural components, fan supports, fans, fan shafts, bearings, sheaves, and fan motors for five (5) years from "Substantial Completion" (parts only). Additionally provide a full one (1) year parts and labor warranty following "Substantial Completion" for the entire unit. (Contractor shall provide all warranties on Owner furnished pre-purchased equipment).

O. All piping and nozzles serving the sweeper piping system that are inside the tower shall be provided and installed under this Section of the Specifications and installed at the factory of the cooling tower manufacturer. Refer to specification section 15723.

PART 3 – EXECUTION

3.1 DELIVERY AND PROTECTION

A. Include delivery of all equipment specified to the site as indicated in Owner furnished General Requirements.

B. All equipment shall be handled carefully to avoid damage and be protected from exposure to the weather and dirt. All equipment shall be examined upon delivery to the site and evidence of abuse, damage, or exposure to weather and dirt shall be grounds for refusal to accept individual pieces of equipment. Rejected items shall be replaced promptly at no cost.

END OF SECTION

SECTION 15723

COOLING TOWER AND CHILLED WATER SEPARATOR SYSTEM

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

A. Comply with Owner furnished General Requirements, and all referenced documents.

B. Comply with all other Sections as applicable.

1.2 SCOPE

A. Furnish series type cooling tower water filtration system as specified herein complete with all specified accessories.

B. Filtration System shall include: Steel Skid; Controls/Valves; Centrifugal Separator Vessel; Pump; Pre-Strainer; raceway; power and control wiring, control panel and all interconnecting piping and automatic accessories as indicated herein.

1.3 QUALITY ASSURANCE

A. All equipment and materials shall be new and of the best quality.

1.4 SUBMITTALS

A. Product Data: Submit complete manufacturer's descriptive literature, installation instructions, piping and wiring diagrams, indicate all accessories furnished, capacities of equipment and pressure drop curves for completed assembly or components.

B. Shop Drawings:
1. Submit in accordance with Owner furnished General Requirements.
2. Indicate on shop drawings the calendar date for projected delivery of all equipment to the project.
3. Clearly indicate components that require field installation of wiring and piping, other than the packaged assembly.

1.5 PRODUCT HANDLING

A. Cover and protect material in transit and at site. Material not properly protected and stored and which is damaged or defaced during transit or storage shall be rejected and replaced at no cost.

B. Storage and protection of materials shall be in accordance with Owner furnished General Requirements.

PART 2 – PRODUCTS

2.1 PREPACKAGED COOLING TOWER WATER PACKAGED SOLIDS SEPARATOR SYSTEM

A. Supply a packaged solids separator with pump and recovery system, completely factory assembled. The packaged system shall include a centrifugal vortex type separator, purge recovery vessel, integral pump with pre-strainer and Schedule 80 PVC interconnecting piping. The complete system shall be mounted on an epoxy coated steel skid.

B. The solids separator system shall be a dumbbell type design with a true tangential entry to ensure proper helical flow. The separator shall be capable of removing separable suspended particulate from the system carrying fluid and have a solids performance rating of greater than 90% efficient at 74 micron (with a specific gravity of 2.6 or greater) on a single pass. The unit shall be equipped with inlet/outlet gauges to monitor pressure drop and a manual air relief valve shall be provided at the top of the vessel.

C. The separator shall be fabricated of carbon steel, rated at 150 psi working pressure. The separator vessel shall be hydro tested at 1.5 times the design pressure and finished with a fusion bonded epoxy coating.

D. The recovery vessel shall be a filter bag type design. The recovery vessel shall be equipped with a fiberfelt bag and stainless steel support basket. The vessel shall incorporate a hinged t-bolt cover and shall be serviceable during system operation via isolation valves. An indicator device, sensing pressure differential, shall identify when unit needs maintenance and a manual air relief valve shall be provided at the top of the vessel.

E. The recovery vessel shall be fabricated of carbon steel, rated at 150 psi working pressure. The vessel shall be hydro tested at 1.5 times the design pressure. The vessel shall be finished with a fusion bonded epoxy exterior coating and internal lining.

F. The system pump shall be a close couple, end suction type, sized for the proper flow rate of the package. The pump shall be of cast iron construction and include a cast iron pre-strainer with a perforated stainless steel 1/8” mesh basket. The pump shall be provided with a premium efficiency TEFC motor.

G. Purging of the accumulation chamber shall be continuous and regulated by

an automatic flow control valve. Purged solids will be captured by the recovery vessel and clean fluid returned to the system inlet, eliminating liquid loss. All interconnection piping shall be Schedule 80 PVC. Schedule is specified for piping internal to skid.

H. The separator shall be equipped with automatic controls consisting of a motor controller with start/stop device with overload and short circuit protection, mounted in a NEMA 4X fiberglass enclosure. The unit shall have a single electrical hook-up point.

2.2 END SUCTION CENTRIFUGAL PUMP

A. Each pump shall be sized for the flow and HP listed on the schedule or as indicated elsewhere herein; manufacturer of sweeper piping system shall determine the required head pressure based on the layout shown on the Drawings.

B. Each pump shall be the close coupled, end-suction type, and be made of cast iron construction, be bronze fitted, have mechanical seals, and have a cast iron pre-strainer. Strainer screen shall be made of stainless steel and have 1/8 inch mesh openings.

C. Motors shall be the premium efficiency, TEFC type, and be rated for 208 Volt V, 60 Hz. Motors shall be a minimum of 5.0 HP in size.

D. Refer to Specification Section 15540 for general pump requirements.

2.3 BASIN SWEEPER PIPING SYSTEM

A. All piping, pipe fittings and nozzles required for the basin sweeper system in the cooling tower shall be factory supplied and installed by tower manufacturer. Piping, unions and valves between the basin connections and the filter packaged solids separator system shall be furnished by the mechanical systems installer.

B. Piping shall be Schedule 80 PVC and shall be equal to sizes shown on drawings.

C. Provide complete piping system with number of nozzles and locations to be similar to that detailed on the Drawings.

D. All piping and nozzles installed inside the cooling towers shall be provided and installed by the tower manufacturer and installed at the factory under Section 15712 of the Specifications.

2.4 ACCEPTABLE MANUFACTURERS

A. Puroflex Corp.

B. Lakos.

PART 3 – EXECUTION

3.1 DELIVERY AND PROTECTION

A. Include delivery of all equipment specified to the site. Equipment shall be delivered by the manufacturer to an Owner approved location where the equipment will be stored until the Contractor is ready to receive the equipment at the project site.

B. All equipment shall be handled carefully to avoid damage and be protected from exposure to the weather and dirt. All equipment shall be examined upon delivery to the site and evidence of abuse, damage, or exposure to weather and dirt shall be grounds for refusal to accept individual pieces of equipment. Rejected items shall be replaced promptly at no cost.

3.2 INSTALLATION (FOR INSTALLING CONTRACTOR ONLY)

A. Install packaged filtration systems level on four inch (4”) thick, with 1” chamfered edges, concrete housekeeping or structural support pads. Fasten base of unit to support pad with corrosion resistant fasteners.

B. Install packaged filtration systems using companion flanges, as required, for the application. Refer to Drawings for installation details.

C. Make all piping connections as indicated and detailed on submittals.

D. Verify that all field power and control wiring has been connected as required.

E. Install all accessories not factory installed to include the pressure gauge kit.

F. Touch-up any factory applied protective coating that was damaged during installation or shipping.

G. Flexible hoses shall not be used for connection between packaged filtration system and remainder of circulating piping system. Use threaded or flanged piping fittings only. Provide unions, as required.

H. Program automatic controls to energize filtration system on a timed cycle

per the manufacturer's recommendations to include backwash timer.

I. Provide a full one (1) year parts and labor warranty following "Substantial Completion" for the entire unit. (Contractor shall provide all warranties on Owner furnished pre-purchased equipment).

END OF SECTION

DRAWINGS

CHILLER SCHEDULE (WATER COOLED)

GENERAL DATA	DESIGNATION	LC-1 & 2
	TYPE	WATER COOLED SCREW
	NOMINAL TONS, EACH	100
EVAPORATOR DATA	GPM	162
	ENTERING WATER TEMP. - DEG. F.	55.0
	LEAVING WATER TEMP. - DEG. F.	40.0
	MAX. WATER PRESS. DROP. FT.	10.0
	FOULING FACTOR	0.00010
CONDENSOR DATA	GPM	305
	ENTERING WATER TEMP. - DEG. F.	94.5
	LEAVING WATER TEMP. - DEG. F.	85.0
	MAX. WATER PRESS. DROP, FT.	20.0
	FOULING FACTOR	0.00025
ELECT. DATA	MAXIMUM KW/TON	0.720
	EER/IPLV	16.7/0.496 KW/TON
	MINIMUM CIRCUIT AMPS (MCA)	284
	MAXIMUM OVERCURRENT PROTECTION	400
	VOLTS/PHASE/HERTZ	208/3/60
	MANUFACTURER/MODEL NO.	TRANE/RTWD-100
	REMARKS	HFC-134A OWNER PRE-PURCHASED

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Consulting Engineers #
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FAX: (972) 788-0002
WWW.RWB.NET

MARY MOSS ELEMENTARY SCHOOL HVAC SYSTEM UPGRADES

PROJECT No.: 14109-00
REVISION: --
REVISED DWG:
DATE: 12/08/2014
DRAWN BY: JMATZEK

SHEET No.:
M1.01

COOLING TOWER SCHEDULE	
DESIGNATION	CT-1, 2
TYPE	INDUCED DRAFT CROSS FLOW
GPM	610 @ 305 PER CELL
E.W.T., DEG. F.	95
L.W.T., DEG. F.	85
AMBIENT W.B., DEG. F.	78
TYPE FAN	Propeller
MOTORS: QUANTITY - MIN. HP.	2 @ 2.0 (ONE PER CELL)
FAN MOTOR RPM	1750
VOLTS/PHASE/HERTZ	208/3/60
STARTER	V.F.D. (ONE PER MOTOR)
MAX. CASING HT.	11'-4"
MANUFACTURER	BALTIMORE AIR COIL
MODEL NO.	XES15E-1285-07FN
BASIN HEATERS	2 @ 10.0 KW. (ONE PER BASIN)
REMARKS	OWNER PRE-PURCHASED W/ WHISPER QUIET FAN

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M1.02

CENTRIFUGAL SEPARATOR SCHEDULE	
DESIGNATION	S-1
SERVES	CONDENSER WATER
MANUFACTURER	PUROFLUX
MODEL	PF-63-025
GPM	160
PRESSURE DROP (PSI)	60
INLET SIZE	3"
OUTLET SIZE	2 1/2"
REMARKS	(1) (2) (3) (4) (5)

(1) WITH CLOSED RECOVERY SYSTEM.

(2) SEPARATOR SYSTEM & PUMP PACKAGE TO BE PRE-PIPED AT FACTORY (SKID MOUNTED).

(3) REFER TO PUMP SCHEDULE FOR PUMP REQUIREMENT FOR THIS PACKAGE.

(4) FULL STREAM SEPARATOR WITH (BASIN SWEEPER PIPING).

(5) OWNER PRE-PURCHASED

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SHEET No.:

M1.03

PUMP SCHEDULE

DESIGNATION	SP-1	PCHP-1 AND 2	CHP-1 AND 2	CWP-1 AND 2
SERVICE	SEPARATOR PUMP	PRIMARY CH. WATER	SECONDARY CH. WATER	CONDENSER WATER
TYPE	END SUCTION	END SUCTION	END SUCTION	END SUCTION
GPM	150	162	275	305
TOTAL HEAD, FT.	60	40	90	45
MIN. PUMP EFFICIENCY, %	51	70	65	74
MIN. MOTOR HP	5.0	3.0	15.0	7.5
PUMP RPM	1750	1750	1750	1750
VOLTS/PHASE/HERTZ	208/3/60	208/3/60	208/3/60	208/3/60
MANUFACTURER/MODEL NO.	ARMSTRONG SERIES 4280 3x1.5x6	PACO/2595-7	PACO/2512-3 (3)	PACO/3095-7
REMARKS	(1) (2) (3)	(3)	V.F.D. (ONE PER PUMP)	(3)

(1) PROVIDED WITH SEPARATOR S-1 AND PRE-PURCHASED BY OWNER.

(2) REFER TO SPEC SECTION 15540

(3) OWNER PRE-PURCHASED

STATE OF TEXAS
KENNETH M. FULK
58555
REGISTERED
PROFESSIONAL ENGINEER
12/8/2014

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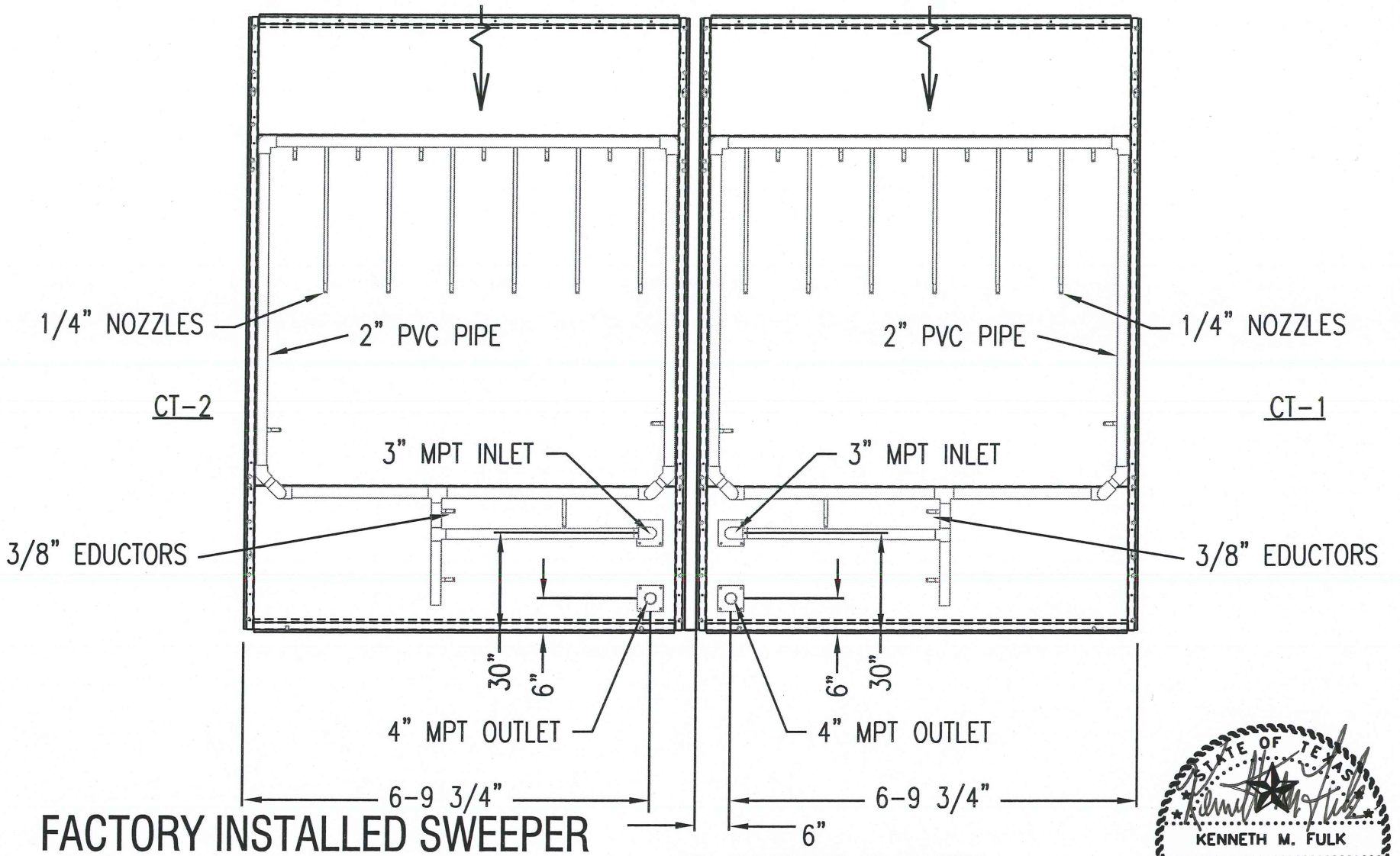
SHEET No.:
M1.04



FACTORY INSTALLED SWEEPER PIPING LAYOUT DETAIL

01

NOT TO SCALE

NOTE: ALL NOZZLES AND EDUCTORS TO BE FACTORY PROVIDED AND INSTALLED. ALL NOZZLES AND EDUCTORS ARE NOT SHOWN ON DETAIL.

STATE OF TEXAS
KENNETH M. FULK
58555
REGISTERED PROFESSIONAL ENGINEER
12/8/2014

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MARY MOSS ELEMENTARY SCHOOL HVAC SYSTEM UPGRADES

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REVISION:	--
REVISED DWG:	
DATE:	12/08/2014
DRAWN BY:	JMATZEK

SHEET No.: M1.05

MARY MOSS ELEMENTARY SCHOOL
1208 NEW MARKET
MESQUITE, TEXAS 75149

ALL COMPONENTS WILL BE INSTALLED BY MISD'S CONTRACTOR.

SECTION 15150 – VARIABLE FREQUENCY MOTOR CONTROLLERS WILL BE DELIVERED TO:

MISD SERVICE CENTER
800 E. KEARNEY
MESQUITE, TX 75149

UNIT COST:_____

SECTION 15540 – CENTRIFUGAL PUMPS WILL BE DELIVERED TO:

MISD SERVICE CENTER
800 E. KEARNEY
MESQUITE, TX 75149

UNIT COST:_____

SECTION 15684 – ROTARY SCREW WATER COOLED CHILLER (100 – 450 TONS) WILL BE DELIVERED TO:

CROCKER CRANE L. P.
2221 E. UNION BOWER ROAD
IRVING, TX 75061

UNIT COST:_____

SECTION 15712 – INDUCED DRAFT CROSSFLOW COOLING TOWERS (STAINLESS STEEL) WILL BE DELIVERED TO:

CROCKER CRANE L. P.
2221 E. UNION BOWER ROAD
IRVING, TX 75061

UNIT COST:_____

SECTION 15723 – COOLING TOWER AND CHILLED WATER SEPARATOR SYSTEM WILL BE DELIVERED TO:

MISD SERVICE CENTER
800 E. KEARNEY
MESQUITE, TX 75149

UNIT COST:_____