



Raleigh-Durham Airport Authority
1000 Trade Drive
PO Box 80001
RDU Airport, NC 27623
www.RDU.com

INVITATION FOR BID (“IFB”)

RALEIGH-DURHAM AIRPORT AUTHORITY Procurement Department 1000 Trade Dr., PO Box 80001 RDU Airport, NC 27623	INVITATION FOR BIDS (IFB) NO.: 554-2023-0049
	IFB Title: CEP Burner Boiler & Expansion Tank Replacement
	Type of Commodity/Good: Burner boiler and expansion tank
Refer <u>ALL</u> Inquiries to: Authority Contact: Jamel Alston and Dale Poole E-Mail: jamel.alston@rdu.com dale.poole@rdu.com	IFB Advertise Date: December 6, 2023 Pre Bid Meeting: N/A Deadline for Submitting Questions: December 20, 2023, at 2pm EST IFB Due Date and Time: January 10, 2024 at 2 pm EST

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SECTION I

BID INSTRUCTIONS

1. Notice

Raleigh-Durham Airport Authority (the “Authority”) invites bids from qualified contractors or individuals (the “Contractor”) interested in providing the Authority with ONE EXISTING BOILER BURNER, MOUNTING PLATE, AND ALL ACCESSORIES DEMOLISHED AND A NEW BOILER BURNER TO BE INSTALLED IN THE SAME PLACE. SEVEN EXISTING EXPANSION TANKS SHALL BE REMOVED AND REPLACED WITH SEVEN NEW EXPANSION TANKS. Tanks (“Goods”).

This IFB is available electronically as of the date of issuance on the following websites:

[Business Opportunities - Raleigh-Durham International Airport \(rdu.com\)](http://BusinessOpportunities-Raleigh-DurhamInternationalAirport.rdu.com)
[Government Contract Bids, RFPs & Procurement | DemandStar](http://GovernmentContractBids,RFPs&Procurement|DemandStar) (DemandStar.com)

For questions related to this IFB, contact the person indicated on the cover sheet. All questions in regard to this IFB shall be directed in writing to the Authority Contact by e-mail. Only inquiries in writing will be accepted by the Authority, and only written responses will be binding upon the Authority. There shall be no communication with the Authority regarding this IFB unless otherwise directed by the Authority’s Point of Contact identified above. **** NO PHONE CALLS ****

All answers to inquiries will be posted on the websites referenced above. It is the responsibility of all Contractors interested in submitting responses to this IFB to routinely check the specified websites for any revisions to this IFB, responses to questions, change of schedule, addenda, announcements and other procurement information.

Written questions concerning this IFB will be received via e-mail only until the Due Date for Questions specified in the schedule above by the Authority’s Point of Contact. Please insert “**Questions - IFB # 554-2023-0049**” as the subject for the email. The Authority will prepare responses to all written questions properly submitted and post the responses as an Addendum on the primary website referenced herein. Oral responses are not binding upon the Authority. Questions received after the deadline for the submission of written questions may not receive a response

This procurement shall be conducted in accordance with all applicable federal and state laws and regulations, and the policies and procedures of the Authority, as those may be amended. All future amendments to any such laws, regulations and applicable Authority policies and procedures shall be applicable to this procurement.

2. Solicitation Schedule and Deadlines

Issuance of IFB:	December 6, 2023
Pre-Bid Meeting:	N/A <input type="checkbox"/> Mandatory Attendance
Due Date for Written Questions:	December 20, 2023 by 2:00pm EST
Response to Questions:	December 27, 2023 Estimated
DUE DATE AND TIME FOR BIDS	January 10 at 2 pm EST at which time bids will be publicly opened and read aloud

The Authority reserves the right to revise the schedule in its sole discretion.



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Attendance at the Pre-Bid Meeting may not be mandatory, unless directed otherwise, but Contractors are strongly encouraged to attend. Attendance at the Pre-Bid Meeting will be documented and all, must sign in at the Pre-Bid Meeting.

Written questions concerning this IFB will be received until **December 20, 2023** at 2:00 pm EST by the Authority Contact. Questions must be submitted to the Authority Contact in writing via email. Please insert “Questions – 554-2023-0049” as the subject for the email. The Authority will prepare responses to written questions submitted as appropriate and post the responses on the website referenced herein. Oral responses are not binding upon the Authority.

3. Submittal of Bid, Modifications, and Withdrawal

Bids from Contractors must be received by the Due Date and Time specified above and delivered to the following location:

<p>If Delivered by United Parcel Service (UPS):</p> <p>Raleigh-Durham Airport Authority Attn: Jamel Alston RDU Center 1000 Trade Drive Morrisville, NC 27560 Raleigh-Durham Airport Authority</p>	<p>If Delivered by FedEx:</p> <p>Raleigh-Durham Airport Authority Attn: Jamel Alston RDU Center 1000 Trade Drive RDU Airport, NC 27623 Raleigh-Durham Airport Authority</p>
<p>If Delivered by United States Postal Service (USPS):</p> <p>Raleigh-Durham Airport Authority Attn: Jamel Alston RDU Center PO Box 80001 RDU Airport, NC 27623 Raleigh-Durham Airport Authority</p>	<p>If Hand Delivered to RDU Authority Building:</p> <p>Raleigh-Durham Airport Authority RDU Authority Building-Cell Phone Lot Attn: Jamel Alston RDU Center 1000 Trade Drive RDU Airport, NC 27623</p>

Bids shall be enclosed in a securely sealed envelope or package. The envelope/package must be addressed to the Authority as specified above. The name and address of the prospective Contractor and the IFB # and title shall be placed on the outside of the package. Bids shall not be accepted by electronic means. All items required to be included with the bid submission must be included, or the bid may be subject to rejection. It is the responsibility of the Contractor to ensure that the bid package is complete and received by the Authority at the proper time. The Authority will in no way be responsible for delays caused by the United States mail delivery, common carrier, or by any other occurrence. If Contractor wishes to submit multiple bids, each must be in a separate sealed envelope as described herein.

Failure to execute/sign a bid prior to the submittal deadline shall render the bid invalid. Regardless of cause, late bids will not be accepted and will be automatically disqualified from further consideration.

The Authority will permit modifications to a bid after submittal until the specified due date and time for accepting bids. The bid may be picked up by a representative of the bidding Contractor provided that the request to modify is in writing, is executed by the bidding Contractor or the bidding Contractor’s duly authorized representative, and is filed with the Authority. It is the bidding Contractor’s responsibility to resubmit before the deadline. All bid modifications shall be hand-delivered to the Authority Contact.

A bidding Contractor may withdraw a bid without prejudice prior to the submittal deadline, provided that the request is in writing, is executed by the bidding Contractor or his/her duly authorized representative, and is filed with the Authority.

From the date that this IFB is issued until the selection and the announcement, **Contractors shall only contact the Authority Contact with respect to any facet of this procurement.** Bidding Contractors shall not be permitted to contact any Authority



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Board Member, Officer, employee, agent or selection committee member with respect to this procurement. Violation of this provision shall result in the disqualification of the bidding Contractor's bid.

All costs incurred by any Contractor in responding to this IFB shall be borne by such Contractor. The Authority shall have no responsibility whatsoever for any associated direct or indirect costs.

By submitting a bid to the Authority the bidding Contractor agrees that the Contractor's bid shall remain effective for 180 days after the deadline for submitting the bid.

4. Bid Process, Notification of Award, Right to Reject, Bonding

All bids shall be opened in public and read aloud at the Raleigh-Durham Airport Authority Building if required by law, and if an award is made, the Authority will award the contract to the lowest responsible and responsive bidding Contractor, taking into consideration quality, performance and the time specified in the IFB for the performance of the contract.

The Authority will notify the successful Contractor of the award by email. If the successful Contractor defaults or otherwise is unable to enter into a contract with the Authority, then the Authority reserves the right to award a contract to the next lowest responsible and responsive bidding Contractor. The successful proposing Contractor will have fourteen (14) calendar days after receipt of the notification of award to furnish any performance and payment bonds required herein.

The Authority reserves the right to reject any and all bids, in whole or in part: by deeming the offer unsatisfactory as to quality or quantity, delivery, or price offered; for non-compliance with the requirements or intent of this solicitation; for lack of competitiveness; for error(s) in specifications or indications that revision would be advantageous to the Authority; as a result of the cancellation of, or other changes in, the intended project; as a result of a determination that the proposed requirement is no longer needed; for lack of available funds; because of circumstances that prevent determination of the best offer; or by any other determination that rejection would be in the best interest of the Authority. The Authority reserves the right to reject any bid as non-responsive if the bid fails to include any of the required information on the required forms in the specified order. If all bids are rejected, the Authority Contact will send an email or letter to all bidding Contractors informing them that all bids were rejected.

The Authority reserves the right to cancel this IFB if it is determined to be in the best interest of the Authority to do so.

5. Addenda, Clarifications, Amendments, Modifications, Waivers

The Authority reserves the right to amend, insert, or delete any item in this IFB if it is determined to be in the best interest of Authority. If it becomes necessary to revise any part of this IFB, a written addendum to this IFB will be posted on the websites referenced herein. The Authority will not be bound by, and the Contractor shall not rely on, any oral or written communication or representation regarding this IFB except to the extent that it is contained in an addendum to this IFB or the Questions and Answers as posted on the IFB websites, and is not superseded by a later addendum to this IFB.

The Authority may request written clarifications to bids. Bidding Contractors shall provide the requested information in writing by the date and time indicated in the written request. If the requested information is not timely received, the bidding Contractor's ratings may be adversely affected and/or the bid may be declared non-responsive and not eligible for award.

The Authority will not be bound by oral explanations or instructions given by anyone at any time during the bid process or after award. The Authority will not consider Contractor information indicated by reference as part of the IFB response. However, the Authority may consider other sources in the evaluation of bids, such as references, for example.

The Authority may waive minor informalities or irregularities in bids received where such is merely a matter of form and not substance, and the correction or waiver of which is not prejudicial to other bidding Contractors. Minor irregularities are defined as those that will not have an adverse effect on the Authority's interest and will not affect the price of the bids by giving a bidding Contractor an advantage or benefit not enjoyed by other bidding Contractors.



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6. Bid Format and Content

Interested Contractors shall submit one (1) original bid package and one (1) copy, including all required forms, and one (1) digital-media copy of the complete bid package in PDF format. The Authority retains the right to reject any bid submitted that does not conform to any of the requirements detailed herein, including but not limited bid formatting.

Contractors are to submit their information addressing qualifications, expertise, competence and capability. The bid submission shall be limited to no more than twenty-five (25) pages maximum, not including the required Forms (see Section IV below). Bids should use a minimum of size 12 pt. font on 8 ½" by 11" paper. The Forms may be provided as additional pages. The submittal must address and include:

- 1) A minimum of three (3) current and verifiable client references that are able to comment on the Contractor's relevant experience, at least two of which are active clients and one former client (include company name, contact name and telephone number, email address, nature of company's business, and a description of the services/goods provided);
- 2) Provide detail of all warranties as listed in the specifications and shown on Item 35 on Form K - Specification Verification Form. Include details of any warranty exclusions and disclaimers.
- 3) Details of vehicle pre-production, production, delivery and training schedules.
- 4) Copy of manufacturer equipment brochure and detailed vehicle specification listing.
- 5) Required Forms.

The bid must also include all required forms as provided in Section IV.

Contractor is to furnish all information requested in the spaces provided in this document. Further, if required elsewhere in this solicitation, each bidding Contractor shall submit with their bid sketches, descriptive literature and/or complete specifications covering the products offered. Reference to literature submitted with a previous offer will not satisfy this provision. Bids that do not comply with these requirements will be subject to rejection.

Responses to this solicitation become the exclusive property of the Authority. All submittals received may become a matter of public record subject to the provisions of Chapter 132 of the North Carolina General Statutes. A Contractor's business and trade secrets that are plainly marked as "Confidential" or "Trade Secret" will be protected from disclosure as a public record to the extent permitted by North Carolina General Statutes § 132-1.2. The Authority shall not in any way be liable or responsible for the disclosure of any response or portions thereof if they are not plainly marked as "Confidential" or "Trade Secret" or if disclosure is required under the Public Records Act. Any submittal which contains language purporting to render all or significant portions of the response "Confidential" or "Trade Secret" may be regarded as non-responsive.

The bidding Contractor shall treat all work product and any other information or knowledge of the Authority related to the specifications, in any form whatsoever, as confidential information of the Authority and shall not disclose or make same available to any third party without the Authority's advance written consent. Third party means any person or entity other than the Authority or the Contractor and includes without limitation any governmental unit, private enterprise or individual.

The Authority is exempt from Federal Taxes, such as excise and transportation. Exemption is claimed under Registry No. 56-70-0047K as provided by Chapter 23 of the Internal Revenue Code. Prices offered shall not include any applicable North Carolina and county sales and use taxes, which shall be shown as separate items if applicable.

7. Ethics & Objectivity



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It is inappropriate for Offerors competing for this contract, including their agents and potential sub-consultants, to lobby Authority Board members or staff during the entire selection process, from the date the solicitation is issued through the date on which the Authority acts on the staff recommendation regarding the selected firm. Accordingly, potential respondents (including sub-contractors) interested in this engagement are instructed not to conduct activities of any nature that may be perceived as attempts to promote themselves or influence the outcome of the selection process.

The Authority is interested in maximizing the opportunities for firms to compete for roles in the subject contract and to submit bids offering the highest qualified teams. Accordingly, the Authority discourages firms interested in being selected for this engagement from entering into formal or informal contracts that limit subcontracting opportunities by other firms or result in exclusive subcontracting arrangements with other firms.

From the date that this RFP is issued until the selection and the announcement, Offerors shall contact ONLY the Authority's Point of Contact with respect to any facet of this procurement. Proposing Offerors shall not contact any Authority Board Member, Officer, employee, agent or selection committee member with respect to this procurement. Violation of this provision may result in the disqualification of the Offeror's Bid.

CERTIFICATION REGARDING LOBBYING

The Bidder or Offeror certifies by signing and submitting this bid or bid, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative contract, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative contract.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative contract, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative contracts) and that all sub-recipients shall certify and disclose accordingly.

8. Appropriations

Contractor agrees and understands that payment as specified in the resulting contract for the period set forth herein, or any extensions or renewal thereof is dependent upon and subject to the appropriation, allocation or availability of funds for this purpose and the contract shall automatically terminate upon depletion of such funds.

9. Non-Exclusiveness of Contract

At any point during the term of the contract the Authority reserves the right to enter into other contracts with this or other contractors to obtain the same or similar goods and services when it is deemed to be in the best interest of the Authority.

10. Terms and Conditions

The Services will be governed by an contract (the "Contract"), which is available as separate downloadable document Contract and attached hereto this IFB.

Each Offeror shall provide any other applicable contract terms and conditions that Offeror will ask the Authority to agree upon. Any such other proposed terms and conditions should either be built into or be incorporated by reference into the Contract. The Authority will entertain exceptions and additional provisions, but Offerors are cautioned that the Authority has a limited ability and willingness to agree to modifications to the standard Authority Contract. The Authority will compare and contrast the terms and conditions bids submitted by qualified Offerors at the same time it evaluates the cost bids of



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qualified Offerors. At the conclusion of this evaluation, the Authority may elect to award the contract to the Offeror whose aggregate bid the Authority determines to be most advantageous to the Authority. The Authority may enter into contract negotiations with one or more qualified Offerors in an effort to reach mutually agreeable contract terms and conditions if the Authority is not satisfied with the terms and conditions proposed by the applicable Offeror(s). The Authority is not obligated to negotiate with all qualified Offerors. The Authority reserves the right to eliminate from further consideration any Offeror that submits a cost bid or a terms and conditions bid that is not advantageous to the Authority.

CONTRACTORS ARE REQUIRED TO REVIEW THE ATTACHED CONTRACT(S). ANY REQUESTED CHANGES OR COMMENTS TO THE CONTRACT(S) PLEASE SUBMITTED WITH THE BID. IF THE CONTRACTOR FAILS TO PROVIDE REQUESTED CHANGES OR COMMENTS TO THE TERMS AND CONDITIONS, THE AUTHORITY WILL ASSUME THE CONTRACTOR AGREES TO THE CONTRACT(S) AS WRITTEN. THE AUTHORITY HAS LIMITED ABILITY TO CHANGE THE CONTRACT. ANY REQUESTED CHANGES MAY BE REJECTED BY THE AUTHORITY. THE AUTHORITY RETAINS THE RIGHT TO AWARD TO THE NEXT LOWEST RESPONSIVE AND RESPONSIBLE CONTRACTOR.

11. Fixed Pricing

Pricing, fees, and percentage discounts are to be fixed for the term of the Contract.

12. Buy American

The Contractor agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all steel and manufactured goods used in AIP funded projects are produced in the United States, unless the Federal Aviation Administration has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

A bidder or offeror must complete and submit the Buy America certification included as Form F with their bid or offer. The Authority will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

13. NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY

The Offeror’s or Bidder’s attention is called to the “Equal Opportunity Clause” and the “Standard Federal Equal Employment Opportunity Construction Contract Specifications” set forth herein.

The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor’s aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables

Goals for minority participation for each trade: [sponsor must insert established goal]

Goals for female participation in each trade: 6.9%

These goals are applicable to all of the Contractor’s construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor’s compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a) and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and



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the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP) within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

As used in this notice and in the contract resulting from this solicitation, the "covered area" is [sponsor must insert state, county, and city].

14. CIVIL RIGHTS – TITLE VI ASSURANCE NOTE – CONTRACTOR must also include provisions in its subcontracts

Title VI Solicitation Notice:

The Authority, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 USC §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders or offerors that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

Compliance with Nondiscrimination Requirements:

During the performance of this contract, Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor"), agrees as follows:

1. **Compliance with Regulations:** Contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this Contract.
2. **Nondiscrimination:** Contractor, with regard to the work performed by it during the Contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. Contractor will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the Contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21.
3. **Solicitations for Subcontracts, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding or negotiation made by Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by Contractor of the contractor's obligations under this Contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.
4. **Information and Reports:** Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information,



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and its facilities as may be determined by the Authority or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, Contractor will so certify to the sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance: In the event of a Contractor's noncompliance with the non-discrimination provisions of this Contract, the Authority will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:

- a. Withholding payments to Contractor under the Contract until Contractor complies; and/or
- b. Cancelling, terminating, or suspending a contract, in whole or in part.

6. Incorporation of Provisions: Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. Contractor will take action with respect to any subcontract or procurement as the Authority or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, Contractor may request the Authority to enter into any litigation to protect the interests of the Authority. In addition, Contractor may request the United States to enter into the litigation to protect the interests of the United States.

Title VI List of Pertinent Nondiscrimination Acts and Authorities

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 USC § 2000d et seq., 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination in Federally-assisted programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 USC § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973 (29 USC § 794 et seq.), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended (42 USC § 6101 et seq.) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (49 USC § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);



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- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 USC §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration’s Nondiscrimination statute (49 USC § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 USC 1681 et seq).

15. OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. Contractor must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. Contractor retains full responsibility to monitor its compliance and their subcontractor’s compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR Part 1910). Contractor must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.



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SECTION II

The Authority is seeking a licensed contractor to replace the Boiler Burner and Expansion Tanks unit at the RDU Central Energy Plant located at 727 Departure Drive Morrisville, NC. The Contractor shall provide all materials, tools, equipment, and labor required for to make the repairs. Work performed shall stay within local codes and state codes. The Contractor will be responsible for any permits required such as electrical and mechanical.

See Attachment for Specifications and detailed scope of work.

SECTION III

MINORITY AND WOMEN OWNED SMALL BUSINESS (MWSB)

(MWSB) PROGRAM

It is the policy of the Authority that neither the Authority, its contractors, service providers, subcontractors nor vendors, shall discriminate on the basis of race, color, religion, national origin, or gender in the award and performance of contracts, subcontracts and purchases. The Authority awards contracts without regard to race, religion, color, creed, national origin, gender, age or handicapping condition.

The Authority has established a Minority and Women-Owned Small Business Program (“MWSB Program”) to encourage equal opportunity for MWSBs to compete for employment as contractors, subcontractors, suppliers and service providers. It is also the Authority’s policy to remove barriers which may exist for MWSBs to compete for contracts, subcontracts and procurement awarded by the Authority. Additional information concerning the Authority’s MWSB Program may be found on the internet at <https://www.rdu.com/do-business-with-rdu/small-businesses/>.

A. Minority and Women-Owned Small Business Program

A Minority or Women-Owned Small Business (MWSB) is a firm which has been certified by an approved agency to meet the following criteria: A small business, as defined by the Small Business Administration size standards, that is at least fifty-one percent (51%) owned, and controlled by one or more socially and economically disadvantaged individuals. The following individuals are presumed to be socially and economically disadvantaged: Black Americans; Hispanic Americans; Asian Americans; Native Americans; and Women. Contractors which are not owned by members of these groups may not be utilized to achieve MWSB Goals in Authority contracts.



INVITATION FOR BID (IFB NO. 554-2023-0049)

B. MWSB Goals

The MWSB Goals for MWSB participation on this IFB represent the total dollars that will be spent with MWSBs as a percentage of the total contract amount, including any amendments, change orders, and/or contingency. The MWSB Goals are as follows:

- MB Goal: The goal for minority-owned business (MB) participation is 5%
- WB Goal: The goal for woman-owned business (WB) participation is 5%

MWSB firms and small businesses are encouraged to respond to this solicitation.

C. MWSB Program Provisions

All Contractors shall agree by the submission of this IFB that MWSBs have the maximum opportunity to participate in the performance of contracts and subcontracts. All Contractors are hereby notified that failure to carry out the obligations of the MWSB Program may constitute a breach of contract, and the Authority will take any and all actions permitted by law to ensure compliance by all Contractors engaged by it.

The Authority maintains a list of registered MWSBs at www.rdu.com/mwsbdirectory. Links to the NCDOT and HUB directories are available on the Authority's Small Business Program website (<https://www.rdu.com/do-business-with-rdu/small-businesses/>). Prospective proposers are encouraged to inspect these databases to assist in locating firms for MWSB participation. Proof of certification must be included in the response when submitted to the Authority.



INVITATION FOR BID (IFB NO. 554-2023-0049)

SECTION IV REQUIRED FORMS

1. Form A attached hereto – Bid Form (Price of Goods)
2. Form B attached hereto – Execution of Bid and Debarment Certification
3. Form C – Bidder References and Work History
4. Form D – E-Verify Certification
5. Form E – Iran Divestment Act Certification of Eligibility
6. Form F –Buy American Certification
7. Form G - Tax Delinquency and Felony Convictions Certifications
8. Form I- Supplier Survey and W-9 forms
9. Form J- Sample Contract (Terms and Conditions)
10. Form K- MWSB FORMS

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INVITATION FOR BID (IFB NO. 554-2023-0049)

1. Form A – Bid Form for CEP Burner Boiler & Expansion Tank Replacement

Contractor Name:			Date:		
PRICING					
#	Product Description	Qty	Unit of Measure	Unit Cost	Total
1	Boiler Burner	1	Each		
2	Expansion Tank	7	Each		
3	Removal of Old Boiler Burner and Expansion Tanks				
4	Installation of new Boiler Burner and Expansion Tanks				
	TOTAL, including shipping costs:				

Lead-Time (in weeks): _____

Offer valid for one hundred eighty (180) calendar days from Bid due date.



INVITATION FOR BID (IFB NO. 554-2023-0049)

2. Form B – Execution of Bid Document and Debarment Certification

IFB NAME: CEP Burner Boiler & Expansion Tank Replacement

IFB NUMBER: 554-2023-0049

FULL LEGAL NAME OF CONTRACTOR: (enter Full Legal Name of Contractor)

COMPANY ADDRESS: (enter Company Address)

TELEPHONE NUMBER: (enter Telephone Number)

FAX NUMBER: (enter Fax Number)

EMAIL: (enter Email Address)

OFFER AND ACCEPTANCE: This solicitation advertises the Authority’s needs for the services and/or goods described herein. The Authority seeks bids comprising competitive bids offering to sell the services and/or goods described in the IFB. All bids and responses received by the Authority shall be treated as offers to contract by the Contractor and must be consistent with the attached form of Contract. The Authority’s acceptance of any bid must be demonstrated by the Authority’s execution of such Contract or the issuance of a purchase order, if issued. Acceptance shall create a contract having an order of precedence among terms as follows: (1) the Contract; (2) Purchase Order; (2) Specifications of this IFB, and (3) the awarded Contractor’s bid.

In compliance with this IFB, and subject to all the conditions herein, the undersigned offers and agrees to furnish any or all services or goods upon which prices are submitted, at the prices offered herein, within the time specified herein subject to the Terms and Conditions or purchase order.

The person executing the Bid, on behalf of the Contractor, being duly sworn, solemnly swears (or affirms) that:

- (1) he/she is fully informed regarding the preparation, contents and circumstances of the bid,
- (2) that neither he/she, nor any official, agent or employee of the Contractor has entered into any contract, participated in any collusion, or otherwise taken any action which is in restraint of free competition in connection with any bid, bid, or contract,
- (3) that the Contractor has not been convicted of violating North Carolina General Statute §133-24 within the last three years, and
- (4) that the Contractor intends to do the work with its own bona fide employees or subcontractors and is not submitting a bid for the benefit of another Contractor.

In addition, execution of this bid in the proper manner also constitutes the Contractor’s certification of status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached hereto and incorporated herein, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

This bid is valid for one-hundred-eighty (180) days from the IFB due date.

The Contractor hereby acknowledges receipt of Addenda as indicated below. Failure to do so does not relieve the Contractor from compliance with modifications provided in all Addenda issued by the Authority pertaining to this IFB.

Addenda Number(s): _____ Initial: _____

DEBARMENT CERTIFICATION

- 1. Contractor certifies that to the best of its knowledge and belief that it and its principals:



INVITATION FOR BID (IFB NO. 554-2023-0049)

- a. Are not presently debarred, suspended, proposed for disbarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal, State, City or County department or agency;
 - b. Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
 - d. Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.
2. Where the Contractor is unable to certify to any of the statements in this certification, it shall attach an explanation to this certification.

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[SIGNATURE ON FOLLOWING PAGE]



INVITATION FOR BID (IFB NO. 554-2023-0049)

Execution of Bid Document and Debarment Certification

I certify that I have the authority to bind the Contractor:

NAME of Authorized Official	
TITLE of Authorized Official	
SIGNATURE of Authorized Official	
DATE of Submission	



INVITATION FOR BID (IFB NO. 554-2023-0049)

3. Form C – Bidder References and Work History

All statements contained herein must be true and correct. Any omissions or inaccuracies may result in the rejection of this Bid by the Authority. Bidders should note that some responses require separate sheet(s) for response. Those responses should be appropriately marked corresponding to the question. Bidders should use as many additional sheets of paper as necessary to completely answer the question.

All of the information requirements in this are required for Bidders and all subcontractors identified in the Bid. Therefore, the use of the term “Contractor” in this form applies to Contractors and all subcontractors of the Contractor that will be involved in the performance of the Work pursuant to the Contract.

A. REFERENCES

Offeror must show the following:

- They currently and have been providing similar good/services within the past five (5) years;

Information may be provided in the chart below or on a separate sheet of paper as needed.

Client Name Contact Name Contact Phone/ E-Mail / Physical Address	Start Date	End Date	Project Description

B. BIDDER HISTORY

1. Has Bidder ever been subject to claims, actions, demands, suits or other litigation (collectively litigation) brought by any airport owner/operator or others over non-payment of rent or fees, or non-performance of similar Work as that requested under this IFB ? Yes () No ().

If the answer is “Yes,” attach a detailed explanation of the nature and result of such litigation.

2. Does the Bidder have any past due arrearages or is in breach of contract with any previous or existing contract with the Authority?
Yes () No ().



INVITATION FOR BID (IFB NO. 554-2023-0049)

3. Has Bidder declared bankruptcy in the past ten (10) years? Yes () No ().

If the answer is "Yes," attach a detailed explanation including the date of filing, the jurisdiction (state and court), the amounts of assets and liabilities and the disposition of that action



INVITATION FOR BID (IFB NO. 554-2023-0049)

4. Form D – E-Verify Certification

This E-Verify Certification is provided to the Authority by the company signing below (“Company”) as a prerequisite to the Authority considering Company for award of the Contract.

1. Company understands that:
 - a. E-Verify is the Federal program operated by the United States Department of Homeland Security and other Federal agencies to enable employers to verify the work authorization of employees pursuant to Federal law, as modified from time to time.
 - b. Article 2 of Chapter 64 of the North Carolina General Statutes requires employers that transact business in this state and employ 25 or more employees in this state to: (i) verify the work authorization of employees who will be performing work in North Carolina through E-Verify; and (ii) maintain records of such verification (the “**E-Verify Requirements**”).
 - c. North Carolina General Statute 160A-201(b) prohibits the Authority from entering into contracts unless the contractor and all subcontractors comply with the E-Verify Requirements.
2. As a condition of being considered for the Contract, Company certifies that:
 - a. If Company has 25 or more employees working in North Carolina (whether now or at any time during the term of the Contract), Company will comply with the E-Verify Requirements in verifying the work authorization of Company employees working in North Carolina; and
 - b. Regardless of how many employees Company has working in North Carolina, Company will take appropriate steps to ensure that each subcontractor performing work on the Contract that has 25 or more employees in North Carolina will comply with the E-Verify Requirements.
 - c. Company acknowledges that the Authority will be relying on this Certification in entering into the Contract, and that the Authority may incur expenses and damages if the Authority enters into the Contract with Company and Company or any subcontractor fails to comply with the E-Verify Requirements. Company agrees to indemnify and save the Authority harmless from and against all losses, damages, costs, expenses (including reasonable attorneys’ fees), obligations, duties, fines and penalties (collectively “**Losses**”) arising directly or indirectly from violation of the E-Verify Requirements by Company or any of its subcontractors, including without limitation any Losses incurred as a result of the Contract being deemed void.

Company Name

Signature of Company’s Authorized Representative

Date

Print Name:

Title:



INVITATION FOR BID (IFB NO. 554-2023-0049)

5. Form E – Iran Divestment Act Certification of Eligibility

As provided in G.S. 147-86.59, any person identified as engaging in investment activities in Iran, determined by appearing on the Final Divestment List created by the State Treasurer pursuant to G.S. 147-86.58, is ineligible to contract with the State of North Carolina or any political subdivision of the State. The Iran Divestment Act of 2015, G.S. 147-86.55 et seq.* requires that each Contractor, prior to contracting certify, and the undersigned on behalf of the Contractor does hereby certify, to the following:

1. that the Contractor is not identified on the Final Divestment List of entities that the State Treasurer has determined engages in investment activities in Iran;
2. that the Contractor shall not utilize on any contract with the agency any subcontractor that is identified on the Final Divestment List; and
3. that the undersigned is authorized by the Contractor to make this Certification.

Company Name

Signature of Company's Authorized Representative

Date

Print Name:

Title:

The State Treasurer's Final Divestment List can be found on the State Treasurer's website at the address <https://www.nctreasurer.com/inside-the-department/OpenGovernment/Pages/Iran-Divestment-Act-Resources.aspx>, which will be updated every 180 days.

Note: Enacted by Session Law 2015-118 as G.S. 143C-55 et seq., but renumbered for codification at the direction of the Revisor of Statutes



INVITATION FOR BID (IFB NO. 554-2023-0049)

6. Form F – Buy American Certification

Certificate of Buy American Compliance for Manufactured Products

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their bid. The bidder or offeror must indicate how they intend to comply with 49 USC § 50101 by selecting one on the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter “X”.

- Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:
- Only installing steel and manufactured products produced in the United States;
 - Installing manufactured products for which the Federal Aviation Administration (FAA) has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
 - Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

- To provide to the Authority evidence that documents the source and origin of the steel and manufactured product.
 - To faithfully comply with providing U.S. domestic product.
 - To furnish U.S. domestic product for any waiver request that the FAA rejects
 - To refrain from seeking a waiver request after establishment of the Contract, unless extenuating circumstances emerge that the FAA determines justified.
- The bidder or offeror hereby certifies it cannot comply with the 100 percent Buy American Preferences of 49 USC § 50101(a), but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:
- To the submit to the Authority within 15 calendar days of the bid opening, a formal waiver request and required documentation that supports the type of waiver being requested.
 - That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the bid.
 - To faithfully comply with providing U.S. domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
 - To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver – The cost of the item components and subcomponents produced in the United States is more than 60 percent of the cost of all components and subcomponents of the “item”. The required documentation for a Type 3 waiver is:

- Listing of all product components and subcomponents that are not comprised of 100 percent U.S. domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
- Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.
- Percentage of non-domestic component and subcomponent cost as compared to total “item” component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.



INVITATION FOR BID (IFB NO. 554-2023-0049)

Type 4 Waiver – Total cost of project using U.S. domestic source product exceeds the total project cost using non-domestic product by 25 percent. The required documentation for a Type 4 of waiver is:

- a) Detailed cost information for total project using U.S. domestic product
- b) Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date

Signature

Company Name

Title



INVITATION FOR BID (IFB NO. 554-2023-0049)

7. Form G – Tax Delinquency and Felony Convictions Certifications

CERTIFICATION OF OFFERER/BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications

- 1) The applicant represents that it is () is not () a corporation (or other business entity or individual) that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to a contract with the authority responsible for collecting the tax liability.
- 1) The applicant represents that it is () is not () is not a corporation (or other business entity or individual) that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the Authority has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore must provide information about its tax liability or conviction to the Authority, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twenty-four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to a contract with the authority responsible for collecting the tax liability.



INVITATION FOR BID (IFB NO. 554-2023-0049)

8. Form I – Supplier Survey and W-9 forms

Offeror must complete, and insert the Authority's Supplier Survey and W-9 Form found by accessing the following link:

<https://rdu.diversitycompliance.com/?TN=rdu>



INVITATION FOR BID (IFB NO. 554-2023-0049)

9. **Form J – Sample Contract (Terms and Conditions)**

Separate downloadable document.



INVITATION FOR BID (IFB NO. 554-2023-0049)

10. Form K - MWSB Required Forms

- 1. Instructions to MWSB Bidding Forms**
- 2. Appendix 1A – Schedule of MWSB Subcontractors**
- 3. Appendix 1 B – MWSB Certification Status**
- 4. Appendix 2 Good Faith Effort Checklist**
- 5. Appendix 3 Self Performance Form**
- 6. Appendix 4 Intent to Preform – Subcontractor**
- 7. Appendix 5 – Intent to Preform – Supplier**
- 8. Trucking Utilization Form**

Full Scope

OWNER:

RALEIGH-DURHAM AIRPORT AUTHORITY
2400 JOHN BRANTLEY BLVD.
MORRISVILLE, NORTH CAROLINA 27650

CONTACT:
XXX
XXX
XXX

ARCHITECT:

ANDRE JOHNSON ARCHITECTS
172 MINE LAKE COURT, SUITE 200
RALEIGH, NORTH CAROLINA 27620

CONTACT:
ANDRE L. JOHNSON, AIA
T. 919.661.6935
andre@andrejohnsonarchitect.com

MEP ENGINEERS:

LORING CONSULTING ENGINEERS
1007 SLATER RD
DURHAM, NORTH CAROLINA 27703

CONTACT:
JOSEPH CHARITY, III
T. 919.355.5503
jcharity@loringengineers.com

CLIENT AND PROJECT



RALEIGH - DURHAM
AIRPORT AUTHORITY

CEP EQUIPMENT REPLACEMENT

TASK ORDER AJA 10.2023

2400 JOHN BRANTLEY BLVD.
MORRISVILLE, NC 27650

DESIGNER



Andre Johnson Architects

172 MINE LAKE COURT, SUITE 200
RALEIGH, NORTH CAROLINA 27615
TELEPHONE: 919.661.6935
MAIL: andre@andrejohnsonarchitect.com

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CONSULTANT



New York City • Washington, DC • Pinalden • Durham
Toronto • Philadelphia • Gainesburg

REGISTRATION



10/30/2023

ISSUE

No. Date Description

CEP EQUIPMENT REPLACEMENT TASK ORDER AJA 10.2023

2400 JOHN BRANTLEY BLVD. MORRISVILLE, NC 27650

SHEET INFO

COVER
SHEET

G-000

10/30/2023

PROJECT NO: 13540

DATE: OCT 30, 2023

100% CD

MECHANICAL SYMBOL LIST

Table with 2 columns: PIPING and ABBREVIATIONS. Lists symbols for chilled water supply, return, condenser water supply, return, hot water supply, return, dual temperature supply, return, fuel oil supply, return, fill, vent, low pressure steam, condensate return, pump, preheat hot water return, supply, steam trap, drain line, cold water make up line, air line, vent line, pipe anchor, flow direction, pitched down, guide, union, reducer, riser support, double line pipe symbol, capped pipe, strainer, elbow, tee connections, etc.

Table with 2 columns: ABBREVIATIONS and DESCRIPTIONS. Lists abbreviations for air conditioning, access door, finished floor, flow measuring station, hung ceiling, handling unit, acoustic lined duct, separator, temperature controls, air vent, draft damper, boiler pump, airflow regulator, coil, diffuser, feet of air per minute, grille, chiller, chilled water return, supply, manager, pump, damper, register, cooling tower, volume, heater, condenser water return, supply, drain, pressure sensor, smoke detector, dual temperature return, supply, existing, exhaust fan, duct heater, energy recovery ventilator, electric unit heater, static pressure, expansion tank, flexible connection, fan coil unit, fire damper with access door, flow meter, fuel oil fill, pump, return, supply, vent, switch, fire/smoke damper with access door, fin tube radiators, contractor, hot water return, supply, exchanger, low pressure steam return, low pressure steam supply, maximum, BTU's per hour, motorized damper with access door, manufacturer, minimum, manual vent, not in this contract, not to scale, normally closed/open, outside air intake, pump, discharge, preheat hot water return, supply, return air, fan, grill, revolution per minute, sound attenuator, stand alone controller, smoke damper with access door, spill air fan, static pressure, toilet exhaust, unit heater, volume damper, variable frequency drive, verify in field, wire mesh screen, point of disconnection, new connection, patch.

Table with 2 columns: VALVES AND GAUGES and DESCRIPTIONS. Lists symbols for shut-off valve/isolation valve, check valve, automatic two-way control valve, balancing valve, relief valve, thermometer, pressure gauge, manual air vent, automatic air vent, pressure gauge/cock, carbon dioxide sensor, speed switch, ceiling mounted occupancy sensor, electric control valve, control valve station, venturi flow meter, firestat, freeze stat, existing pipe to remain, existing pipe to be removed, supply and return piping riser symbol, drain piping riser symbol.

- GENERAL NOTES: 1. MECHANICAL WORK SHALL CONFORM TO ALL REQUIREMENTS OF THE LATEST CONSTRUCTION CODE OF NORTH CAROLINA LOCAL CODES RULES AND REGULATIONS... 2. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING THE BID AND BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS... 3. DESIGN DRAWINGS ARE TO BE CONSIDERED DIAGRAMMATIC. OFFSETS MAY BE REQUIRED TO AVOID EXISTING SERVICES, OTHER TRADES, ETC. COORDINATE WORK WITH ALL TRADES AND FIELD CONDITIONS... 4. LOCATIONS OF NEW UTILITIES, INCLUDING PIPE RISERS, ARE GENERALLY SCHEMATIC. CONTRACTOR SHALL COORDINATE ALL NEW UTILITIES, SERVICES, ETC. WITH EXISTING STRUCTURAL AND ARCHITECTURAL DRAWINGS AND PROVIDE ALL OFFSETS AS REQUIRED... 5. PROVIDE FIRE STOPPING FOR ALL NEW AND EXISTING DUCTS, PIPE, AND CONDUIT PENETRATIONS THROUGH EXISTING AND NEW FIRE RATED WALLS, PARTITIONS, AND SLABS... 6. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY... 7. COORDINATE SCHEDULE FOR HOOK-UPS TO EXISTING SYSTEMS AND EQUIPMENT, AND REMOVAL OR RELOCATIONS WITH THE OWNER AND PERFORM THIS WORK AT SUCH TIMES TO ENSURE THAT PERIODS OF SHUTDOWN WILL BE ACCEPTABLE TO THE OWNER. ALL SYSTEM SHUTDOWNS SHALL BE KEPT TO A MINIMUM... 8. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND RESTORING THE CONTINUITY OF ALL EXISTING SYSTEMS AFFECTED. INCLUDING BUT NOT LIMITED TO: INSULATION, VAPOR BARRIER, VALVES, CAPS, PUMPS, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR THE WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF SAME WHICH MAY BE DAMAGED, LOST OR STOLEN WITHOUT ADDITIONAL COST TO OWNER... 9. PRIOR TO COMMENCEMENT OF ANY WORK, EXISTING SYSTEMS ASSOCIATED WITH THIS WORK SHALL BE TESTED IN THE PRESENCE OF BUILDING PERSONNEL. PRE-CONSTRUCTION/DEMOLITION BALANCING REPORTS SHALL BE SUBMITTED TO ENGINEER AND BUILDING MANAGEMENT FOR REVIEW... 10. ALL SYSTEMS AND SERVICES THAT SERVE ADJACENT SPACES SHALL BE MAINTAINED THROUGHOUT WORK... 11. SUBMIT SHOP DRAWINGS OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES OR ITEMS ORDERED... 12. COORDINATE ALL DUCT AND PIPING SYSTEM ELEVATIONS WITH ALL OTHER TRADES AND PROVIDE NECESSARY OFFSETS TO AVOID CONFLICTS... 13. COORDINATE ALL EQUIPMENT REQUIREMENTS WITH APPROPRIATE TRADES (IE-CONDENSATE PUMPS COORDINATED WITH ELECTRICAL, PLUMBING, ATC, ETC.)... 14. VERIFY AND COORDINATE ALL EQUIPMENT ACCESS AND CLEARANCES WITH THE ARCHITECT, GENERAL CONTRACTOR AND/OR CONSTRUCTION MANAGER... 15. ALL PIPING SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE. DO NOT SUPPORT PIPE FROM DUCT SUPPORT AND VICE VERSA... 16. THE MECHANICAL CONTRACTOR SHALL PROVIDE CONTROL WIRING AND TRANSFORMERS FOR ALL THERMOSTATS, ACTUATORS AND CONTROLLERS. TRANSFORMERS SHALL BE ADEQUATELY SIZED TO SUPPORT THE EQUIPMENT COORDINATE WITH ELECTRICAL CONTRACTOR FOR LOCATIONS OF DISCONNECT, JUNCTION BOX/SOURCE AND EXTEND WIRING... 17. ALL THERMOSTATS SHALL BE PER THE BUILDING AND OWNER STANDARD... 18. PROVIDE TEMPORARY WORK DUCT WITH DAMPERS, CAPS, EQUIPMENT, VALVES, CAPPED PIPE CONNECTIONS, SUPPORTS, ACCESSORIES TO KEEP EXISTING BUILDING, SYSTEM IN OPERATION AND MAINTAIN SERVICES, HEATING, AIR CONDITIONING, VENTILATION... 19. PROTECT ALL EXISTING AND NEW WORK FROM DUST, DIRT, DEBRIS. SEAL AND PROTECT ALL OPEN ENDS OF WORK, DUCT, PIPES FROM DUST, DIRT. CONTRACTOR SHALL PERFORM ALL WORK IN A SAFE MANNER. PROTECT WORK, PROPERTY, SURROUNDINGS FROM DAMAGE, INJURY... 20. GUARANTEE ALL WORK AGAINST FAULTY AND IMPROPER MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER, EXCEPT THAT WHERE GUARANTEES OR WARRANTIES FOR LONGER TERMS ARE SPECIFIED HEREIN, SUCH LONGER TERM SHALL APPLY. AT NO ADDITIONAL COST TO OWNER, WITHIN 24 HOURS AFTER NOTIFICATION, CORRECT ANY DEFICIENCIES WHICH OCCUR DURING THE GUARANTEE PERIOD. ALL TO THE SATISFACTION OF THE OWNER AND ARCHITECT... 21. PROVIDE 5 YEAR EQUIPMENT MANUFACTURERS WARRANTY FOR COMPRESSOR FROM DATE OF SHIPMENT... 22. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL RIGGING, HOISTING TO BRING EQUIPMENT AND INSTALL IN LOCATIONS INDICATED... 23.1. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIAL, LABOR, TOOLS ACCESSORIES TO RIG UNITS, WORK IN SPACE. PROVIDE PROTECTION FOR WALLS, ROOF, FLOOR AND EXTERIOR OF BUILDING. PROPERTY CONTRACTOR SHALL PROVIDE ALL PREPARATION, TEMPORARY WORK... 23.2. SUBMIT RIGGING AND HOISTING PLAN FOR REVIEW COORDINATED WITH ALL EQUIPMENT. WORK TO BE BROUGHT IN AND RIGGED INTO SPACE... 23.3. CONTRACTOR SHALL PREPARE DOCUMENTS, FILE, PROCURE ALL PERMITS, APPROVALS FOR RIGGING HOISTING... 23.4. CONTRACTOR SHALL FIELD VERIFY EXISTING CONSTRAINTS AND DETERMINE LARGEST SECTION OF UNIT. WORK THAT CAN BE RIGGED INTO SPACE WITHOUT DAMAGE TO EXISTING SPACE OR WORK. CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE ALL PARTITIONS, DOORS, FRAMES, AND OTHER ITEMS AS REQUIRED TO RIG UNITS, WORK INTO SPACE AND REINSTALL ALL ITEMS. ANY DAMAGED ITEMS SHALL BE REPLACED OR NEW ITEMS SHALL BE PROVIDED AS DIRECTED BY ARCHITECT. CONTRACTOR SHALL REMOVE, RELOCATE TEMPORARILY, RECONNECT. CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF RIGGING FOR THIS PROJECT. PROVIDE ALL RELATED WORK TO KEEP EXISTING SYSTEMS IN OPERATION... 24. PROVIDE TEMPORARY WORK, VALVED PIPING CONNECTIONS TO KEEP EXISTING SYSTEM IN OPERATION, SPACES FUNCTIONAL. MAINTAIN CONTINUITY OF SYSTEM... 25. ANY ACTIVITIES, DEMOLITION, CONSTRUCTION WORK THAT GENERATES NOISE, FUME, ODOR SHALL BE PERFORMED DURING AFTER NORMAL WORK HOURS PRIOR APPROVAL BY OWNER DURING TIME PERIOD ALLOWED BY OWNER. PROVIDE ALL RELATED PREPARATIONS, WORK TO MINIMIZE INCONVENIENCE TO OCCUPANTS AND ANY DISRUPTION OF SPACE AND ADJACENT OCCUPANTS... 26. INTERIOR AND EXTERIOR MECHANICAL EQUIPMENT AND SYSTEMS SHALL COMPLY WITH THE PROVISION OF NOISE CONTROL REQUIREMENTS AS PER MC 928... 27. ADEQUATELY BRACE AND PROTECT ALL WORK DURING CONSTRUCTION AGAINST DAMAGE. BREAKAGE, COLLAPSE, DISTORTIONS, AND ALL ALIGNMENTS ACCORDING TO CODES AND STANDARDS OF GOOD PRACTICE... 28. WHERE MANUFACTURER'S NAMES AND PRODUCT NUMBERS ARE INDICATED ON THE DRAWINGS IT SHALL BE CONSTRUED TO MEAN THE ESTABLISHING OF QUALITY AND PERFORMANCE STANDARDS OF SUCH ITEMS... 29. WHERE DUCTWORK OR PIPING CROSSES EXPANSION JOINTS APPROPRIATE FITTINGS SHALL BE PROVIDED.

MECHANICAL SUMMARY table containing: MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT; THERMAL ZONE (Winter Dry Bulb: 3A, 23.6°F, Summer Dry Bulb: 92.6°F); INTERIOR DESIGN CONDITIONS (Winter Dry Bulb: 72°F, Summer Dry Bulb: 75°F, Relative Humidity: 50%); BUILDING HEATING LOAD: EXISTING TO REMAIN; BUILDING COOLING LOAD: EXISTING TO REMAIN; MECHANICAL SPACING CONDITIONING SYSTEM (UNITARY); LIST EQUIPMENT EFFICIENCIES: SEE SCHEDULES.

- GENERAL DEMOLITION NOTES: 1. ALL HVAC SYSTEMS SERVING OCCUPIED PORTIONS OF THE SITE SHALL REMAIN AND BE KEPT OPERATIONAL THROUGHOUT CONSTRUCTION UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR DIRECTED BY THE CONSTRUCTION MANAGER... 2. THE DEMOLITION SPECIFICATION SHALL BE CONSIDERED ONLY AS A GUIDE AND IS NOT INTENDED TO SHOW EVERY SINGLE ITEM OF WORK. ACTUAL FIELD CONDITIONS WILL DETERMINE THE PRECISE WORK TO BE DONE. SHOULD ANY QUESTION ARISE AS TO WHETHER OR NOT ANY PIPING, EQUIPMENT OR OTHER ITEM SHOULD BE REMOVED, OR REMAIN AS PRESENTLY INSTALLED, THIS CONTRACTOR SHALL REQUEST, IN WRITING, CLARIFICATION FROM THE ARCHITECT. BECAUSE THE MECHANICAL DRAWINGS INDICATE THE INTENT OF THE SCOPE OF WORK, NO EXTRA CHARGES WILL BE ALLOWED FOR ANY REMOVALS NECESSARY FOR THE COMPLETION OF THE WORK UNDER THIS PROJECT... 3. ALL WORK REQUIRED TO REMAIN IN SERVICE BUT INTERFERING WITH THE ALTERATIONS SHALL BE RELOCATED AND RECONNECTED USING MATERIALS AND STANDARDS OF THIS CONTRACT... 4. COORDINATE PHASING OF HVAC REMOVALS WITH THE OWNER AND CONSTRUCTION MANAGER... 5. EQUIPMENT INDICATED TO BE REMOVED SHALL BE TAKEN FROM THE SITE AND DISPOSED OF IN ACCORDANCE WITH APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS. EQUIPMENT REQUIRED TO BE TURNED OVER TO THE OWNER SHALL BE PLACED IN A MUTUALLY ACCEPTABLE LOCATION... 6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL FROM THE PREMISES ALL DEBRIS RESULTING FROM REMOVAL OF MECHANICAL WORK... 7. PATCH ALL OPENINGS TO OUTSIDE, CREATED BY REMOVAL OF EQUIPMENT, DUCTWORK, PIPING, ETC., AIRTIGHT... 8. NOTES AND GRAPHIC REPRESENTATIONS SHALL NOT LIMIT THE EXTENT OF DEMOLITION REQUIRED. CONTRACTOR SHALL VISIT THE SITE, CAREFULLY EXAMINE EXISTING CONDITIONS AND SHALL PERFORM ALL DEMOLITION REQUIRED TO ACHIEVE THE FINAL DESIGN INTENT AS REQUIRED BY THE CONTRACT DOCUMENTS. EXTENT OF ALL DEMOLITION WORK SHALL BE COORDINATED WITH THE ARCHITECT, OWNER AND CONSTRUCTION MANAGER... 9. COORDINATE WITH OWNER WHAT EQUIPMENT, IF ANY, ARE TO BE REMOVED, KEPT INTACT AND RETURNED TO THE OWNER. IN GENERAL ALL EQUIPMENT AND OTHER APPURTENANCES WHICH ARE TO BE REMOVED SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OFF.

CLIENT AND PROJECT



RALEIGH - DURHAM AIRPORT AUTHORITY

CEP EQUIPMENT REPLACEMENT

TASK ORDER AJA 10.2023

2400 JOHN BRANTLEY BLVD. MORRISVILLE, NC 27650

DESIGNER



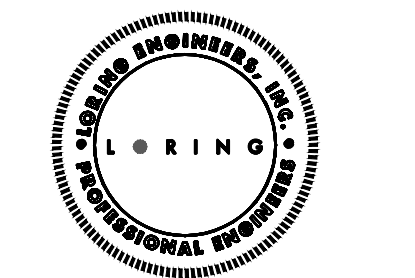
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CONSULTANT



REGISTRATION



10/30/2023

ISSUE

No. Date Description

SHEET INFO

MECHANICAL SYMBOL LIST, ABBREVIATIONS AND NOTES

M-001

PROJECT NO: 13540

DATE: OCT 30, 2023

100% CD

1. **HVAC SPECIFICATIONS**
2. **CODES AND STANDARDS**
 - A. DESIGN AND PERFORMANCE OF COMPONENTS AND METHODS SPECIFIED HEREIN SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE CODES, STANDARDS, AND MANUFACTURER'S RECOMMENDATIONS OF THE ENTITIES LISTED BELOW.
 1. BUILDING BUILDING MANAGEMENT COMPANY STANDARDS FOR ALTERATIONS AND CONSTRUCTION
 2. BC 2018 NORTH CAROLINA BUILDING CODE
 3. MC 2018 NORTH CAROLINA MECHANICAL CODE
 4. ECC 2018 NORTH CAROLINA ENERGY CONSERVATION CODE
 5. ASHRAE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
 6. ASTM AMERICAN SOCIETY FOR TESTING MATERIALS
 7. ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
 8. UL UNDERWRITER'S LABORATORIES, INC
 9. FM FACTORY MUTUAL
 10. NFPA NATIONAL FIRE PROTECTION ASSOCIATION.
 11. SMACNA SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION.
 12. ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS
 13. AMCA AIR MOVING AND CONDITIONING ASSOCIATION.
 14. ARI AMERICAN REFRIGERATION INSTITUTE.
 15. MSS MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY.
3. **SCOPE OF WORK**
 - A. THE PROJECT INCLUDES ONE EXISTING BOILER BURNER, MOUNTING PLATE, AND ALL ACCESSORIES DEMOLISHED AND A NEW BOILER BURNER TO BE INSTALLED IN THE SAME PLACE. SEVEN EXISTING EXPANSION TANKS SHALL BE REMOVED AND REPLACED WITH SEVEN NEW EXPANSION TANKS. PIPE SHALL BE RECONNECTED FROM CUT OFF TO TIE BACK INTO THE EXISTING PIPING SYSTEM.
 - B. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, TOOLS, APPLIANCES, SERVICES, HOISTING, SCAFFOLDING, RIGGING, SUPERVISION AND OVERHEAD FOR THE FURNISHING AND INSTALLING OF ALL THE HEATING, VENTILATING AND AIR CONDITIONING, EXHAUST AND RELATED WORK COMPLETE, IN ACCORDANCE WITH THE DRAWINGS, SCHEDULES AND SPECIFICATIONS. ANY LISTING OR INDICATION OF THE ITEMS FURNISHED OR WORK PERFORMED SHALL NOT LIMIT THE GENERAL REQUIREMENTS TO FURNISH, INSTALL, TEST AND PLACE IN OPERATION ALL WORK, INCLUDING ACCESSORIES REQUIRED.
 - C. ALL MECHANICAL AND ELECTRICAL WORK SHALL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL MEET ALL LOCAL CODES AS STATED BELOW. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING MANAGER AT NO ADDITIONAL COST. UPON COMPLETION OF THE WORK UNDER THIS CONTRACT THE CONTRACTOR SHALL REMOVE ALL TOOLS, APPLIANCES, SURPLUS MATERIAL AND SCRAP LEAVING THIS WORK IN PERFECT CONDITION.
 - D. FINAL PATCHING AND PAINTING SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. CUTTING, CORE DRILLING, ROUGH PATCHING SHALL BE BY THE CONTRACTOR.
 - E. FINAL PATCHING AND PAINTING SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. CONTRACTOR SHALL COORDINATE WITH THE OWNER TO MATCH THE PAINT COLOR OF THE INSULATION ON THE NEW EXPANSION TANKS WITH THE EXISTING PAINT COLOR OF THE INSULATION FOR THE HOT WATER SYSTEM. CUTTING, CORE DRILLING, AND ROUGH PATCHING SHALL BE BY THE CONTRACTOR.
4. **GENERAL SPECIFICATIONS NOTES**
 - A. BUILDING MANAGEMENT COMPANY STANDARDS FOR BUILDING ALTERATIONS AND CONSTRUCTION ARE PART OF THE SECTION AND CONTRACT. ALL WORK PERFORMED HEREUNDER SHALL BE SUBJECT THERETO.
 - B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THE WORK ARE HEREBY INCORPORATED INTO AND MADE PART OF THESE SPECIFICATIONS. THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING THE PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE LOCAL CODES AND REGULATIONS. THE CONTRACTOR, AT NO ADDITIONAL COST TO THE OWNER, SHALL CORRECT ANY WORK DONE CAUSING SUCH VIOLATION.
 - C. INVESTIGATE EACH SPACE THROUGH WHICH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM THE MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM BUILDING OWNER AND TENANT AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
 - D. THE CONTRACT DRAWINGS ARE GENERALLY DIAGRAMMATIC AND DO NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS FOR DUCTS. THE CONTRACTOR SHALL ALLOW IN THE PRICE FOR ROUTING OF DUCTS TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL BY THE ARCHITECT/ENGINEER. THE CONTRACTOR SHALL COORDINATE ALL THE WORK WITH EXISTING FIELD CONDITIONS AND WITH THE WORK OF ALL OTHER TRADES INVOLVED IN THE PROJECT.
 - E. IT IS THE INTENTION OF THESE DRAWINGS AND SPECIFICATIONS TO CALL FOR FINISHED WORK, TESTED AND READY FOR OPERATION. ALL MATERIALS, WORK, INCIDENTAL ACCESSORIES OR OTHER DETAILS NOT SHOWN BUT NECESSARY TO MAKE THE WORK COMPLETE AND PERFECT IN ALL RESPECTS AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SPECIFIED, SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST

- TO THE OWNER.
- F. SUBMISSION OF THE PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH EFFECT THE WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTS (SIZES, CLEARANCES, ETC.) AND CONDITIONS.
 - G. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THE CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
 - H. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE NEW WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL.
 - I. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.
 - J. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND AN APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY THE ARCHITECT.
 - K. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK, AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF THE NEW SYSTEM.
 - L. ALL MATERIALS AND EQUIPMENT ARE TO BE NEW AND FIRST CLASS QUALITY, UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
 - M. ALL DEFECTS, WHICH DEVELOP OR ARE DISCOVERED WITHIN THE PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COSTS.
 - N. EXISTING DUCTS, PIPES, INSULATION, INDUCTION UNITS AND ENCLOSURES, ETC., THAT ARE DAMAGED DURING CONSTRUCTION PERIOD, WHETHER OR NOT DUE TO THE CONTRACTOR'S NEGLIGENCE, SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AND LEFT IN A CONDITION SATISFACTORY TO THE BUILDING MANAGEMENT.
 - O. ALL PRESENT MATERIALS, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THE CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
 - P. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
 - Q. THE CONTRACTOR'S PROPOSAL FOR ALL WORK PERFORMANCE IS REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
 - R. ALL WORK SHALL MEET OR EXCEED THE LATEST REQUIREMENT OF THE BUILDING CODE, ENERGY CODES, ELECTRICAL CODE AND THE FIRE PREVENTION CODE AND OTHER AUTHORITIES EXERCISING JURISDICTION OF THE WORK OF THE PROJECT.
 - S. COMPLY WITH APPLICABLE UTILITY COMPANY RULES AND REGULATIONS.
 - T. COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.
 - U. CONTRACTOR SHALL PREPARE FILING DOCUMENTS, FILE, SECURE ALL REQUIRED PERMITS AND INSPECTION CERTIFICATES AND TRANSMIT SAME TO THE OWNER AT THE COMPLETION OF THE WORK.
 - V. UNLESS OTHERWISE NOTED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO A CONDITION SATISFACTORY TO THE ARCHITECT.
 - W. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED THE EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
 - X. THE CONTRACTOR SHALL REQUEST BUILDING SYSTEMS SHUTDOWN 48 HOURS IN ADVANCE BY NOTIFYING THE BUILDING MANAGEMENT WHO WILL COORDINATE THE SHUTDOWN THE CONTRACTOR SHALL INSURE THAT DRAINAGE WILL BE DISCHARGED TO AN APPROVED LOCATION OR RECEPTACLE WITHOUT CAUSING DAMAGE TO OTHER WORK AND PROPERTY. SHUT-DOWN TIME SHALL BE KEPT TO A MINIMUM. WHERE WORK MUST BE DONE AFTER HOURS OR REQUIRES AN EQUIPMENT SHUTDOWN SUCH AS FOR THE INSTALLATION OF NEW DUCTWORK AND PIPING, OR REMOVAL OF EXISTING DUCTWORK AND PIPING, THE CONTRACTOR SHALL PROVIDE THE BUILDING ENGINEER AND OWNER WITH 72 HOURS NOTICE.
 - Y. CHANGES IN THE CROSS-SECTIONAL DIMENSIONS OF A DUCT ARE PERMISSIBLE WHEN REQUIRED TO MEET JOB CONDITIONS. MAINTAIN AT LEAST THE SAME EQUIVALENT CROSS-SECTIONAL DUCT AREA IN ACCORDANCE WITH THE LATEST EDITION OF THE ASHRAE GUIDE.
 - Z. CEILING HEIGHTS INDICATED ON DRAWINGS MUST BE MAINTAINED. THE CONTRACTOR MUST RISE AND DROP DUCTWORK/PIPING BETWEEN EXISTING FRAMING AND UTILITIES AS REQUIRED.
 - AA. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND SHALL COMPLY WITH THE BUILDING CODE AND THE REGULATIONS OF OTHER AUTHORITIES HAVING JURISDICTION.
 - BB. DIMENSIONAL LAYOUT PLANS OF EQUIPMENT ROOMS SHALL BE MADE SHOWING ALL BASES, PADS AND INERTIA BLOCKS REQUIRED FOR MECHANICAL EQUIPMENT. INCLUDE DIMENSIONS OF BASES, BOLT LAYOUTS, DETAILS, ETC.
 - CC. CONTRACTOR SHALL FURNISH ALL NECESSARY TEMPLATES, PATTERNS, ETC., FOR INSTALLING WORK AND FOR PURPOSE OF MAKING ADJOINING WORK CONFORM, FURNISH SETTING PLANS AND SHOP DETAILS TO OTHER TRADES AS REQUIRED.
 - DD. ALL MECHANICAL AND ELECTRICAL WORK SHALL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL MEET ALL LOCAL CODES AS STATED BELOW. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THE PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR OWNER AT NO ADDITIONAL COST. UPON COMPLETION OF THE WORK UNDER THE CONTRACT, THE CONTRACTOR SHALL REMOVE ALL TOOLS, APPLIANCES, SURPLUS MATERIAL AND SCRAP, LEAVING THE WORK IN PERFECT CONDITION.

- EE. THE CONTRACTOR SHALL PREPARE A LIST OF ALL ACCESS DOORS REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT, VALVES, DAMPERS, CONTROLS, AND OTHER SIMILAR DEVICES, WHICH SHALL BE SUPPLIED TO THE GENERAL CONTRACTOR WHO SHALL FURNISH AND INSTALL SAME. ACCESS DOOR SHALL BE OF AMPLE SIZE AND MINIMUM OF 16" X 16".
- FF. THE CONTRACTOR SHALL SUITABLY FIELD TAG AND IDENTIFY ALL CONCEALED EQUIPMENT, VALVES, DAMPERS, ETC. WHICH REQUIRE ACCESS DOOR PROVISIONS IN ADVANCE OF CEILING INSTALLATIONS. IN CONCEALED SPLINE CEILINGS ACCESS PANELS SHALL BE INSTALLED.
5. **NOTICE TO BIDDERS**
 - A. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS UPON WHICH THE CONTRACTOR SHALL SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR PROVISIONS.
 - B. WHEN CONFLICTS OCCUR IN THE SPECIFICATIONS OR ON THE DRAWINGS, OR BETWEEN EITHER, THE ITEMS IN GREATER QUANTITY OR HIGHER COST SHALL BE PROVIDED.
 - C. THE CONTRACTOR SHALL PROVIDE ALL ITEMS OF LABOR OR MATERIALS THAT ARE SPECIFICALLY INDICATED OR ARE REQUIRED TO COMPLETE THE INTENDED INSTALLATIONS.
 - D. THE CONTRACTOR SHALL COORDINATE THE WORK WITH ALL TRADES IN ORDER THAT CONFLICTS IN SPACE LOCATIONS DO NOT OCCUR.
 - E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN, WITHOUT ADDITIONAL COSTS TO THE OWNER.
 - F. ALL WORK IN OCCUPIED AREAS SHALL BE PERFORMED ON OTHER THAN NORMAL WORKING HOURS OR SCHEDULED AS DIRECTED BY THE BUILDING MANAGEMENT.
 - G. THE CONTRACTOR SHALL PRICE THE WORK BASED ON ANY NECESSARY MODIFICATIONS OF THE EXISTING SYSTEMS. CONTRACTOR SHALL INCLUDE ALL NECESSARY OVERTIME WORK.
 - H. THE CONTRACTOR WILL BE HELD TO HAVE VISITED THE SITE AND EXAMINED THE DRAWINGS AND SPECIFICATIONS OF OTHER TRADES AND OF GENERAL CONSTRUCTION TRADES TO SATISFY ALL CONDITIONS INVOLVED. THE CONTRACTOR SHALL VERIFY ALL MEASUREMENTS GIVEN ON THE DRAWINGS AND THOROUGHLY BE ACQUAINTED WITH ALL EXISTING CONDITIONS AFFECTING THE PROPER INSTALLATION OF THE WORK.
6. **SUBMITTALS**
 - A. SHOP DRAWINGS OF DUCTWORK, PIPING LAYOUTS AND ELEVATIONS SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO ERECTION OR PURCHASE. SUBMIT CATALOG CUTS FOR AIR CONDITIONING UNITS, PIPE HANGERS, INSULATION, DIFFUSERS, PUMPS, VALVES, MISCELLANEOUS ACCESSORIES, ETC. INCLUDING CERTIFIED EQUIPMENT MANUFACTURER'S PERFORMANCE DATA.
 - B. BALANCING AND TESTING: SUBMIT AGENT'S QUALIFICATIONS AND REPORT AS SPECIFIED PRIOR TO PROCEEDING WITH THE WORK.
 - C. SHOP DRAWINGS SHALL BE 3/8"=1'-0" SCALE.
 - D. SUBMIT HANGING DETAILS WITH LOADING FOR ALL NEW EQUIPMENT TO STRUCTURAL ENGINEER FOR REVIEW.
 - E. CONTRACTOR SHALL PREPARE PRELIMINARY SHOP DRAWINGS SUITABLE FOR USE IN COORDINATING THE WORK WITH THE WORK OF OTHER TRADES. CONTRACTOR SHALL PREPARE AND FURNISH DUCTWORK LAYOUTS AT 3/8" = 1'-0" SCALE FOR USE BY AND COORDINATION WITH OTHER TRADES. COORDINATION MEETINGS SHALL BE HELD UNDER THE SUPERVISION OF THE CONSTRUCTION MANAGER (CM) OR GENERAL CONTRACTOR (GC). EACH TRADE SHALL HAVE PROPER REPRESENTATION AT ALL COORDINATION MEETINGS FOR THE PURPOSE OF DETAILING, ON THE DRAWINGS MENTIONED ABOVE, THE EXACT LOCATION AND ROUTING OF THEIR WORK. AFTER THE CONCLUSION OF THE COORDINATION MEETINGS, EACH TRADE SHALL SIGN THE COORDINATED DRAWINGS AND COPIES SHALL BE DISTRIBUTED BY THE CM/GC TO ALL PARTIES CONCERNED, INCLUDING THE OWNER. FINAL SHOP DRAWINGS OF ALL TRADES SHALL BE IN ACCORDANCE WITH THE COORDINATED DRAWING, WHICH FINAL SHOP DRAWINGS SHALL BE SUBMITTED FOR FINAL APPROVAL.
 - F. IF THE TRADE CONTRACTOR INSTALLS WORK SO AS TO CAUSE INTERFERENCE WITH WORK OF OTHER TRADES, HE SHALL MAKE NECESSARY CHANGES IN WORK TO CORRECT THE CONDITION WITHOUT EXTRA CHARGE.
 - G. CONTRACTOR SHALL FURNISH ALL NECESSARY TEMPLATES, PATTERNS, ETC., FOR INSTALLING WORK AND FOR THE PURPOSE OF MAKING ADJOINING WORK CONFORM, SUCH AS ACCESS PANELS IN GYPSUM BOARD CEILINGS, ETC. FURNISH SETTING PLANS AND SHOP DETAILS TO OTHER TRADES AS REQUIRED.
7. **AS-BUILT DRAWINGS**
 - A. CONTRACTOR SHALL KEEP RECORD OF ALL CHANGES, FIELD CONDITIONS, AND SHALL PREPARE AND PROVIDE AS-BUILT DRAWINGS INDICATING ANY DEVIATION FROM THE ORIGINAL MECHANICAL DESIGN. THE DRAWING SHALL BE STAMPED "AS-BUILT" WITH THE DATE AND CONTRACTOR'S SIGNATURE. TWO (2) SET OF PRINTS AND AN ELECTRONIC COPY CONTAINING AUTOCAD/REVIT FILES SHALL BE DELIVERED TO THE ENGINEER BEFORE FINAL PAYMENT IS MADE. AFTER REVIEW AND APPROVAL OF AS-BUILT DRAWINGS, CONTRACTOR SHALL PROVIDE THREE (3) SETS OF PRINTS AND AN ELECTRONIC COPY OF THE AS-BUILT DRAWINGS TO THE OWNER AND BUILDING MANAGEMENT UPON COMPLETION OF WORK.
 - B. FURNISH TO THE ARCHITECT THREE (3) BOUND AND INDEXED COPIES OF OPERATIONS, MAINTENANCE AND TESTING, ADJUSTING AND BALANCING DATA MANUALS FOR THE INSTALLATION. ALSO PROVIDE ONE (1) ELECTRONIC COPY OF THE ABOVE BOUND COPY.
 - C. THE MANUAL SHALL PROVIDE COMPREHENSIVE DETAILED INFORMATION ON THE APPROVED INSTALLATION, OPERATION AND USE, MAINTENANCE AND PARTS LIST.
8. **CUTTING AND PATCHING**
 - A. REFER TO THE ARCHITECTURAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND INFORMATION BEYOND THAT COVERED BELOW.
 - B. CUTTING - REMOVAL OF PORTIONS OR SECTIONS OF STRUCTURAL MEMBERS (AS APPROVED BY A STRUCTURAL ENGINEER), WALLS, FLOORS, CEILINGS, AND THE LIKE, AS REQUIRED TO PERMIT INSTALLATION OF NEW MECHANICAL OR ELECTRICAL MATERIALS OR EQUIPMENT.

- C. PATCHING - REPAIR OF SUCH CUT MATERIALS, RESTORING TO AS CLOSE TO ORIGINAL CONDITION AS POSSIBLE, OR AS DIRECTED BY THE ENGINEER UNLESS NOTED OTHERWISE ON DRAWINGS OR IN "EXCEPTIONS" BELOW.
- D. CUTTING AND PATCHING OF EXISTING MATERIALS (I.E. EXISTING PRIOR TO THE AWARD OF THE CONTRACT) SHALL BE PERFORMED BY THE RESPECTIVE CONTRACTOR OR SUBCONTRACTOR REQUIRING SAME.
- E. CUTTING AND PATCHING OF NEW WORK (I.E. EXISTING MATERIALS INSTALLED AFTER THE AWARD OF THE CONTRACT) SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. THIS IS NOT INTENDED TO ELIMINATE FINANCIAL RESPONSIBILITY.
- F. PATCHING OF EXISTING MATERIALS IN SITUATIONS WHERE NEW SURFACE FINISHES ARE TO BE APPLIED AS PART OF THE CONTRACTOR'S WORK SHALL BE PERFORMED BY THE GENERAL CONTRACTOR. IN CASES WHERE UNNECESSARILY EXCESSIVE CUTTING HAS BEEN PERFORMED, THE REQUIRED PATCHING SHALL BE PERFORMED BY THE RESPECTIVE CONTRACTOR WHO PERFORMED THE CUTTING, EXCEPT FOR THE FINAL SURFACE FINISH.
9. **HVAC INSULATION**
 - A. GENERAL
 1. DESIGN AND PERFORMANCE OF COMPONENTS AND METHODS SPECIFIED HEREIN SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE CODES, STANDARDS, AND RECOMMENDATIONS OF THE ENTITIES LISTED BELOW:
 - a. STATE ENERGY CONSERVATION CODE (SECC)
 - b. BUILDING CODE (BC)
 - c. MECHANICAL CODE (MC)
 - d. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
 - e. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
 - f. UNDERWRITERS LABORATORIES INC. (UL)
 2. INSULATION SHALL BE APPLIED TO PIPING, DUCT AND EQUIPMENT OF MATERIALS AS SPECIFIED HEREIN AND FOR APPLICABLE SYSTEMS OF THIS PROJECT.
 3. ALL INSULATION, INCLUDING JACKETS OR FACINGS, ADHESIVES, MASTICS, CEMENTS, TAPES AND GLASS CLOTH FOR FITTINGS SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS AS TESTED BY ASTM E 84, NFPA 225, AND UL 723 PROCEDURES, NOT EXCEEDING A "FLAME SPREAD" OF 25 AND "SMOKE DEVELOPED" OF 50.
 4. NOTE THAT EQUIPMENT CASINGS WHICH HAVE INTERNAL AND ACOUSTICAL INSULATION NEED NOT BE INSULATED AT THE EXTERIOR SURFACE.
 5. WHERE INTERNAL DUCT INSULATION IS REQUIRED, THE EXTERIOR DUCT INSULATION MAY BE OMITTED, PROVIDED THAT THE EQUIVALENT "R" FACTOR FOR THE INTERNAL DUCT INSULATION IS THE SAME AS THE EXTERNAL DUCT INSULATION REQUIREMENTS.
 6. ALL NEW DUCTWORK WITHIN 15'-0" DOWNSTREAM FROM MECHANICAL EQUIPMENT INCLUDING BUT NOT LIMITED TO A/C UNITS, EXHAUST FANS, AND VAV TERMINALS SHALL BE PROVIDED WITH ACOUSTICAL LINING. SEE SPECIFICATIONS FOR DETAILS.
 7. VALVES, FITTINGS, STRAINERS, AND OTHER PIPING APPURTENANCES SHALL BE INSULATED TO MATCH THOSE OF THE SYSTEMS TO WHICH THEY ARE CONNECTED.
 8. ALL NEW AND EXISTING INSULATION AND EXTERIOR JACKETS THAT ARE DAMAGED SHALL BE REPLACED WITH NEW MATERIAL AS SPECIFIED, TO THE SATISFACTION OF THE ENGINEER.
 9. INSULATION MATERIALS SHALL BE PRODUCTS OF ONE OF THE FOLLOWING MANUFACTURERS:
 - a. MANVILLE CORP.
 - b. CERTAIN TEED CORP./INSULATION GROUP
 - c. OWENS - CORNING FIBERGLASS CORP.
 - B. INSULATION OF PIPES
 1. INSULATION FOR ALL PIPING, INCLUDING CONDENSATE DRAIN PIPING, CONDENSER WATER SUPPLY/RETURN, CHILLED WATER SUPPLY/RETURN, HOT WATER SUPPLY/RETURUO, AND REFRIGERANT PIPING:
 - a. FIBERGLASS INSULATION SIMILAR TO TMC MICRO-LOCK A, #4 DENSITY WITH VAPOR BARRIER LAPPED AND SEALED USING B-F 81-99. PROVIDE THICKNESS AS FOLLOWS: INSULATE CONDENSATE DRAIN PIPES WITH 1" THICK INSULATION; HOT WATER, CONDENSER WATER, AND CHILLED WATER PIPES WITH 2" THICK INSULATION.
 - b. INSULATE ALL REFRIGERANT PIPING WITH 1-1/2" THICK ARMAFLEX INSULATION SIMILAR TO ARMACELL AP ARMAFLEX. ALL OUTDOOR PIPING SHALL ALSO BE PROVIDED WITH PROTECTIVE JACKETING.
 - c. INSULATION TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATION.
 - d. AT PIPE SUPPORT POINTS BELOW HANGERS INSTALL SECTION OF RIGID TYPE.
 - e. ALL FITTINGS, FLANGES AND VALVES TO BE COVERED WITH ONE PIECE J-M ZESTON COVERS.
 - f. FLAME SPREAD RATING AND SMOKE DEVELOPED RATING SHALL NOT TO EXCEED 25/50 RESPECTIVELY PER U.L. REQUIREMENTS.
 2. ALL ADHESIVES' VOLATILE ORGANIC COMPOUND (VOC) CONTENT SHALL CONFORM TO THE LIMITS SET BY THE CURRENT SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQM) RULE #1168 AND SHALL BE NO MORE THAN 250 GRAMS PER LITER.
10. **PIPING AND ACCESSORIES**
 - A. PIPE:
 1. PIPE SHALL BE NEW, FREE FROM SCALE OR RUST, AND OF MATERIAL AND WEIGHT SPECIFIED. EACH LENGTH OF PIPE SHALL BE PROPERLY MARKED AT THE MILL FOR

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10/30/2023

ISSUE

No.	Date	Description
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SHEET INFO

MECHANICAL SPECIFICATIONS

M-002

PROJECT NO: 13540
DATE: OCT 30, 2023
100% CD

	PROPER IDENTIFICATION WITH NAME OR SYMBOL OF MANUFACTURER.	
2.	PIPING SHALL BE SEAMLESS STEEL ASTM A-53B AS SPECIFIED OR COPPER PIPING SHALL BE HARD TEMPERED K TYPE WITH WROUGHT COPPER BRAZING FITTINGS, FOR PARTICULAR SERVICE SPECIFIED BELOW, CONFORMING TO ASTM B-88 ANSI/ASME B16.22 AS MANUFACTURED BY CHASE-ANACONDA.	
3.	PIPING MATERIALS AND FITTINGS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:	
PIPING		
SYSTEM	SCHEDULE	FITTINGS
HW	TYPE K COPPER PIPE	
VALVES		
TYPE	SIZE	PRESSURE
BALL	2 1/2" & DOWN	350 PSI
GATE	2 1/2" & DOWN	350 PSI
B.	VENT PIPING AT ALL HIGH POINTS.	
C.	ISOLATE EQUIPMENT, CONTROLS INSTRUMENTS AND VALVES FORM THE PIPING SYSTEM DURING HYDROSTATIC TESTS.	
D.	THERMOMETERS:	
1.	PROVIDE RED READING MERCURY THERMOMETERS IN THE SUPPLY AND RETURN PIPING AS SHOWN ON THE DRAWINGS HAVING A 9" SCALE. ALUMINUM CASE AND SEPARABLE SOCKETS, MOUNTED AS SHOWN ON THE DRAWINGS, SO LOCATED AS TO BE READILY READ FROM THE FLOOR.	
E.	PRESSURE GAUGES:	
1.	GAUGES SHALL HAVE BLACK ALUMINUM CASES WITH BLACK NUMBERS ON WHITE BACKGROUND. THE GAUGES SHALL BE AS MANUFACTURED BY WEKSLER INSTRUMENT CO., ASHCROFT OR APPROVED EQUAL.	
F.	STRAINER:	
1.	THE SCREENS FOR THE STRAINERS SHALL BE STAINLESS STEEL.	
2.	STRAINER SHALL BE PROVIDED WITH CAPPED BLOWDOWN VALVES.	
G.	ARRANGE PIPING TO EQUIPMENT TO PERMIT SERVICING OR REMOVAL WITHOUT DISMANTLING PIPE BRANCHES.	
H.	NEW PIPING IS TO BE INTERNALLY CLEANED PRIOR TO CONNECTION TO WATER SYSTEM.	
I.	WHERE CHANGES OF SIZE OCCUR IN HORIZONTAL PIPING, PROVIDE ECCENTRIC TYPE REDUCING FITTINGS TO ATTAIN PROPER DRAINAGE AND VENTING OF PIPELINE.	
J.	PROVIDE FOR THE EXPANSION AND CONTRACTION OF PIPING SYSTEMS.	
K.	PIPE SUPPORTS AND HANGERS	
1.	ALL SUPPORTS AND PARTS SHALL CONFORM TO THE LATEST REQUIREMENTS OF ANSI B 31.9 AS APPLICABLE FOR PRESSURE PIPING AND MSS STANDARD PRACTICE SP-58 SP-69.	
2.	DO NOT HANG PIPING FROM OTHER PIPING. IN NO CASE SHALL HANGERS BE SUPPORTED BY MEANS OF VERTICAL EXPANSION BOLTS.	
3.	IF REMOVAL OF EXISTING FIREPROOFING IS REQUIRED FOR INSTALLATION PURPOSES, SUCH REMOVAL SHALL BE PERFORMED BY THE CONTRACTOR AND SHALL BE KEPT TO A MINIMUM. THE CONTRACTOR SHALL REPLACE ALL REMOVED FIREPROOFING WITH NEW FIREPROOFING TO THE SATISFACTION OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE AUTHORITY.	
4.	SUPPORT HANGERS FROM BUILDING STEEL FRAMING WITH AN APPROVED TYPE CLAMP INSERT. PROVIDE ANY ADDITIONAL STEEL SUPPORTS BETWEEN EXISTING FRAMING MEMBERS AS MAY BE REQUIRED. NO HANGERS SHALL BE SUPPORTED FROM METAL DECK FLOOR. WELDING TO THE BUILDING STRUCTURE MEMBERS WILL NOT BE PERMITTED UNLESS APPROVED BY THE BUILDING MANAGEMENT.	
5.	PIPE HANGERS RODS, INSERTS AND CLAMPS SHALL BE UL APPROVED FOR THEIR RESPECTIVE USES.	
6.	UNLESS OTHERWISE SPECIFICALLY APPROVED, HANGER SIZE AND SPACING SHALL BE AS FOLLOWS:	
	PIPE SIZE	MAX. HANGER SPACING
	MIN. ROD	
SIZE		
1/2" TO 1-1/4"	6 FT. O.C.	3/8"
1-1/4" TO 2-1/2"	6 FT. O.C.	1/2"
2-1/2" TO 4"	6 FT. O.C.	3/4"
7.	THE ABOVE HANGER SPACINGS APPLY TO STRAIGHT RUNS OF PIPE ONLY.	
8.	AT POINTS WHERE VALVES, SPECIALTIES OR BRANCH CONNECTIONS ARE LOCATED, ADDITIONAL HANGERS, OR SUPPORTS SHALL BE USED TO PROPERLY SUPPORT THE LOAD.	
9.	HANGERS AND SUPPORTS SHALL BE MANUFACTURED BY GRINNELL CORP, CARPENTER & PATTERSON INC., MICHIGAN HANGER CO. INC., OR AN APPROVED EQUAL.	
11.	<u>INSTALLATION OF PIPING</u>	
A.	INSTALL ALL PIPING AS SHOWN ON PLANS.	
B.	ARRANGE PIPING TO EQUIPMENT TO PERMIT SERVICING OR REMOVAL WITHOUT DISMANTLING PIPE BRANCHES.	
C.	FURNISH AND INSTALL PIPING HANGERS, SUPPORTS, ANCHORS AND GUIDES HAVING	

A BUILT-IN SERVICE FACTOR OF FIVE (5) IN CONFORMANCE TO THE LATEST ASME CODE FOR PRESSURE PIPING. ALL HANGER SPECIALTIES SHALL BE FURNISHED WITH ZINC CHROMATE PRIME PAINT FINISH.
D. PIPE AND VALVE IDENTIFICATION
1. PROVIDE AND AFFIX A SET OF APPROVED ADHESIVE BANDS IDENTIFYING THE SYSTEM AND DIRECTION OF FLOW.
2. PROVIDE BANDS EVERY 15'-0", AT EVERY CHANGE IN DIRECTION AND AT EVERY BRANCH TEE.
3. EACH SET SHALL CONSIST OF ONE BAND ON WHICH THE NAME OF THE SERVICE AND THE PIPE SIZE ARE PRINTED IN LETTERS NOT LESS THAN ONE (1) INCH HIGH.
4. ADHESIVE BANDS SHALL BE W.H. BRADY CO. "QUICK-LABEL", OR AN APPROVED EQUAL.
12. SLEEVES AND ESCUTCHEONS FOR PIPING
A. PROVIDE SLEEVES FOR PIPES PASSING THROUGH WALL PARTITIONS. PIPE SLEEVES THROUGH INTERIOR WALLS AND PARTITIONS #18 GAGE GALVANIZED STEEL.
B. SPACE BETWEEN PIPE SHALL AND SLEEVE SHALL BE CAULKED WITH INCOMBUSTIBLE ROPE OR MINERAL WOOL TO WITHIN 1/2" OF WALL FACES AND FILLED WITH CAULKING COMPOUND TO WALL FACES.
C. FURNISH AND INSTALL ESCUTCHEON PLATES ON ALL EXPOSED PIPING THROUGH WALLS OR FLOORS AND HELD IN PLACE WITH SCREWS OR BE INTERNAL SPRING TENSION.
D. SLEEVES SHALL HAVE AN INTERNAL DIAMETER OF AT LEAST 1" LARGER THAN THE OUTSIDE PIPE SIZE DIAMETER.
E. WHERE PIPES PASS THROUGH CONSTRUCTION REQUIRED TO HAVE A FIRE RESISTANCE RATING, THE SPACE BETWEEN THE PIPE AND ITS SLEEVE SHALL NOT EXCEED 1/2 INCH AND SHALL BE COMPLETELY PACKED WITH MINERAL WOOL OR EQUIVALENT NON-COMBUSTIBLE MATERIAL AND SHALL BE CLOSED OFF BY CLOSE FITTING 16 GAUGE BLACK METAL ESCUTCHEONS ON BOTH SIDES OF THE CONSTRUCTION.
13. BLADDER-TYPE EXPANSION TANKS
A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH THE REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE SUITABLE FOR USE ON THIS PROJECT INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING OR APPROVED EQUAL:
1. BELL & GOSSET
2. TACO
B. CONSTRUCTION: WELDED STEEL, TESTED AND STAMPED IN ACCORDANCE WITH ASME SECTION VIII; SUPPLIED WITH NATIONAL BOARD FORM U-1, RATED FOR WORKING PRESSURE, WITH FLEXIBLE BUTYL BLADDER SEALED INTO TANK, AND STEEL SUPPORT STAND.
C. ACCESSORIES: PRESSURE GAGE AND AIR-CHARGING FITTING, TANK DRAIN; PRE-CHARGE TO MINIMUM PRESSURE REQUIRED TO FLOOD HIGHEST POINT IN PIPING SYSTEM PLUS 5 PSIG.
D. AUTOMATIC COLD WATER FILL ASSEMBLY: PRESSURE REDUCING VALVE, REDUCED PRESSURE DOUBLE CHECK BACK FLOW PREVENTION DEVICE, TEST COCKS, STRAINER, VACUUM BREAKER, AND BY-PASS VALVES TO MEET LOCAL CODE.
E. PROVIDE CLOSED EXPANSION TANKS FOR THE CLOSED WATER SYSTEMS WHERE LOCATED AND OF SIZES AND CAPACITIES AS INDICATED ON DRAWINGS. DRAIN LINES SHALL TERMINATE AT NEAREST FLOOR DRAIN. TANKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASME CODE FOR UNFIRED VESSELS.
F. PROVIDE CONCRETE PAD FOR FLOOR-MOUNTED TANKS AND PROPER SUPPORT FROM STRUCTURE FOR SUSPENDED TANKS.
G. INSTALL ALL ACCESSORIES AND TRIM AS SHOWN ON TYPICAL DETAILS FOR EXPANSION TANKS INCLUDING PRESSURE GAUGES AND PRESSURE REDUCING VALVES.
14. COMBINATION GAS/LIGHT OIL BURNERS
A. GENERAL
1. FURNISH AND INSTALL UNDERWRITERS LABELED COMBINATION GAS/LIGHT OIL BURNERS. THE BURNER DESIGN, CONSTRUCTION, COMPONENTS AND INSTALLATION SHALL MEET ALL APPLICABLE CODE REQUIREMENTS.
2. THE NEW BURNER SYSTEM SHALL BE INSTALLED IN A SCOTCH MARINE TYPE BOILER. THE BOILER MODEL NUMBER W7-5-3000-W160 MANUFACTURED BY SUPERIOR BOILER.
3. THE BURNER SHALL BE MOUNTED TO FIRE ON THE CENTERLINE OF THE BOILER FURNACE. A NEW STEEL BOILER/BURNER MOUNTING PLATE WILL BE SUPPLIED. A NEW REFRACTORY FRONT PLATE SHAPED AND INSTALLED IN ACCORDANCE WITH THE BURNER MANUFACTURER'S INSTRUCTIONS WILL BE PROVIDED.
4. CONTRACTOR AND BOILER BURNER VENDOR SHALL VISIT THE SITE PRIOR TO CREATING THE SUBMITTAL FOR THE NEW BURNER. EXISTING BURNER MODEL IS OBSOLETE. NEW BURNER MANUFACTURER SHALL DETERMINE WHAT FIELD MODIFICATIONS (IF ANY) WILL BE REQUIRED IN ORDER TO CONFIRM NEW BURNER IS COMPATIBLE WITH EXISTING BOILER OPERATION AND SEQUENCE.
B. GENERAL BURNER DESCRIPTION
1. THE BURNER SHALL BE POWER FLAME FORCED DRAFT FLAME RETENTION MODEL CM10C-GO-30. EACH BURNER SHALL BE CAPABLE OF BURNING 23,910 CFH OF 1,050 BTU/CU FT. NATURAL GAS, WITH A SPECIFIC GRAVITY OF .55 - .87. GAS PRESSURE APPLIED TO THE BURNER GAS TRAIN SUPPLY CONNECTION SHALL BE A MINIMUM OF 5 PSIG AT FULL HIGH RATE AND A MAXIMUM OF 4 PSIG AT STATIC CONDITIONS. EACH BURNER SHALL BE CAPABLE OF BURNING 180 GPH OF NO. 2 FUEL OIL
C. APPROVAL CODES

1. EACH BURNER SHALL BE LISTED BY UNDERWRITERS LABORATORIES AND SHALL BEAR THE APPROPRIATE U.L. LABEL (IN ADDITION TO THE U.L. REQUIREMENTS, ALL EQUIPMENT AND INSTALLATION PROCEDURES WILL MEET THE REQUIREMENTS OF IRI, FM, ASME CSD-1, AND NORTH CAROLINA BUILDING CODES). EACH BURNER SHALL BE DESIGNED AND CONSTRUCTED AS AN INTEGRATED COMBUSTION SYSTEM PACKAGE AND SHALL BE FACTORY FIRE TESTED.
D. COMBUSTION HEAD DESIGN
1. EACH BURNER SHALL BE OF WELDED STEEL CONSTRUCTION AND HAVE A BAKED ON POWDER COAT FINISH. THE COMBUSTION HEAD SHALL INCORPORATE A MULTI BLADE, STAINLESS STEEL, FLAME RETENTION DIFFUSER. THE GAS FIRING HEAD SHALL INCLUDE A SERIES OF GAS INJECTION SPUDS THAT DISTRIBUTE THE FUEL EVENLY AROUND THE PERIPHERY OF THE DIFFUSER ASSEMBLY. A GAS ANNULUS SHALL PROVIDE A SECONDARY LAYER OF FUEL TO CREATE A STAGING EFFECT TO ACHIEVE MAXIMUM FUEL/AIR MIXING AND MINIMAL EMISSIONS. BURNERS WITH CAST ALLOY BLOWER HOUSINGS WILL NOT BE ACCEPTED. THE BURNER COMBUSTION HEAD WILL CARRY FULL FIVE (5) YEAR REPLACEMENT WARRANTY.
2. THE DESIGN SHALL ALSO INCLUDE AN ADJUSTABLE SLEEVE FOR SETTING THE SECONDARY GAS AND VARYING THE PRIMARY AIR/GAS MIX WITHIN THE COMBUSTION ZONE. THE BURNER COMBUSTION HEAD COMPONENTS WILL BE EASILY ACCESSIBLE THROUGH AN ACCESS DOOR LOCATED ON THE SIDE OF THE BURNER BLAST TUBE. THE BURNER COMBUSTION HEAD COMPONENTS SHALL BE EASILY ADJUSTED OR REPLACED, AND THE OIL GUN ASSEMBLY MAINTAINED WITHOUT HAVING TO DISCONNECT FUEL SUPPLY PIPING OR ELECTRICAL CONNECTIONS TO THE BURNER ASSEMBLY.
3. ALL AIR REQUIRED FOR COMBUSTION SHALL BE SUPPLIED BY A BLOWER MOUNTED INTEGRAL TO THE BURNER. THE BLOWER WHEEL SHALL BE OF THE BACKWARD INCLINED CENTRIFUGAL DESIGN AND SHALL BE DIRECTLY DRIVEN BY A 20 HP 3450 RPM 480 VOLT, 60 HERTZ 3 PHASE MOTOR. A MULTIPLE BLADE DAMPER ASSEMBLY LOCATED ON THE INLET SIDE OF THE BLOWER WHEEL SHALL METER THE COMBUSTION AIR FLOW.
E. IGNITION SYSTEM
1. THE BURNER IGNITION SYSTEM, WHICH WILL LIGHT EITHER THE MAIN GAS OR OIL FLAME, SHALL UTILIZE NATURAL GAS AS THE FUEL SOURCE. THE GAS PILOT SYSTEM COMPONENTS SHALL INCLUDE SPARK IGNITED PILOT ASSEMBLY, 6000 VOLT IGNITION TRANSFORMER, PILOT SOLENOID VALVE, PILOT GAS PRESSURE REGULATOR AND MANUAL GAS SHUTOFF COCK. THE FLAME PROVING SYSTEM SHALL INCORPORATE AN ULTRA-VIOLET FLAME DETECTOR, WHICH WILL MONITOR BOTH THE PILOT AND MAIN FLAMES. THE PILOT ASSEMBLY SHALL FIT WITHIN THE CONFINES OF THE BLAST TUBE - AVOIDING SPECIAL BURNER FRONT PLATE PILOT CUT OUTS.
F. FUEL/AIR CONTROL SYSTEM
1. MODULATION
THE MAIN ON-OFF GAS SUPPLY SHALL BE CONTROLLED BY A MOTORIZED GAS VALVE. THE MAIN ON-OFF OIL SUPPLY SHALL BE CONTROLLED BY A SOLENOID OIL VALVE. A MODULATING MOTOR SHALL CONTROL THE MODULATED POSITIONING OF THE AIR INLET DAMPERS, BUTTERFLY TYPE GAS PROPORTIONING VALVE AND A METERING TYPE OIL VALVE, TO BEST MEET VARYING SYSTEM LOAD CONDITIONS.
PROVIDE A CAM ACTUATED CHARACTERIZED FUEL METERING DEVICE, WHICH WILL BE AN INTEGRAL PART OF THE BURNER FUEL METERING SYSTEM. THE SYSTEM SHALL BE U.L. LISTED AND CAPABLE OF PROVIDING AN ADJUSTABLE AND ACCURATELY REPEATABLE FUEL/AIR RATIO THROUGHOUT THE BURNER'S FULL FIRING RANGE. THE SYSTEM SHALL BE CAPABLE OF PROVIDING A CONSTANT FUEL/AIR RATIO, OR A LINEARLY ADJUSTED FUEL/AIR RATIO, IN ORDER TO SATISFY INDIVIDUAL BURNER APPLICATION REQUIREMENTS. EACH SYSTEM SHALL BE COMPLETE WITH FOURTEEN (14) SEPARATELY ADJUSTABLE CAM DEVELOPMENT SET-POINTS. EACH SET-POINT SHALL BE COMPLETE WITH LOCKING SET SCREW. THE CAM FOLLOWER SHALL BE EQUIPPED WITH A DOUBLE SPRING SET, IN ORDER TO INSURE MAXIMUM RELIABILITY. ALL BEARING POINTS SHALL BE PROVIDED WITH OIL IMPREGNATED BRONZE BUSHINGS, REQUIRING NO FIELD LUBRICATION.
THE POSITIONING OF THE MODULATING MOTOR SHALL BE CONTROLLED BY A 135 OHM, OR 4-20 MILLIAMP, OR 0-10 VDC, MODULATING TYPE (TEMPERATURE) (PRESSURE) CONTROLLER. WHEN THE OPERATING CONTROL IS SATISFIED THE BURNER SHALL SHUTOFF AND RETURN TO THE LOW FIRE START POSITION. THE MODULATING MOTOR SHALL PROVIDE AN ELECTRICAL INTERLOCK TO INSURE A GUARANTEED LOW FIRE START POSITION PRIOR TO THE PILOT TRIAL FOR IGNITION SEQUENCE.
G. GAS CONTROL TRAIN
1. U.L. REQUIREMENTS: THE GAS VALVE TRAIN SHALL CONTAIN THE FOLLOWING:
a. MANUAL SHUTOFF COCK
b. MAIN GAS PRESSURE REGULATOR
c. AUTOMATICALLY OPERATED MAIN GAS VALVE
d. AUTOMATICALLY OPERATED MAIN MOTORIZED GAS VALVE WITH PROOF OF CLOSURE INTERLOCK SWITCH.
e. AUTOMATICALLY OPERATED AUXILIARY GAS VALVE.
f. MANUAL RESET LOW AND HIGH GAS PRESSURE
g. MANUAL LEAK TEST COCK
h. BURNER MANIFOLD GAS PRESSURE GAUGE AND GAUGE COCK.
i. AUTOMATICALLY OPERATED NORMALLY OPEN VENT VALVE (SPECIFY AS STANDARD ABOVE 12,500 MBH FOR FUEL GASES WITH A SPECIFIC GRAVITY OF LESS THAN 1.0 - OPTIONAL AT 12,500 AND BELOW AND/OR SPECIFIC GRAVITIES OF 1.0 OR ABOVE).
2. FM REQUIREMENTS:
a. U.L. LISTED LEAK TEST COCK
b. AUTOMATICALLY OPERATED MAIN MOTORIZED GAS VALVE WITH PROOF OF CLOSURE FEATURE AND CARRY A FM LABEL.

c. AUTOMATICALLY OPERATED AUXILIARY GAS VALVE SHALL BE MOTORIZED TYPE, INCORPORATE PROOF OF CLOSURE FEATURE AND CARRY A FM LABEL.
d. BOTH AUTOMATICALLY OPERATED MOTORIZED GAS VALVES SHALL BE EQUIPPED WITH 13 SECOND TIMING MOTORIZED OPERATORS.
e. BOTH AUTOMATICALLY OPERATED MOTORIZED GAS VALVES SHALL INCORPORATE THE PROOF OF CLOSURE FEATURE.
3. IRI REQUIREMENTS:
a. U.L. LISTED LEAK TEST COCK
b. BOTH AUTOMATICALLY OPERATED GAS VALVES (MAIN AND AUXILIARY) SHALL HAVE MOTORIZED OPERATORS.
c. AUTOMATICALLY OPERATED MAIN GAS VALVE SHALL HAVE PROOF OF CLOSURE FEATURE.
d. ONE (1) NORMALLY OPEN VENT VALVE SIZED ACCORDING TO IRI REQUIREMENTS.
e. MANUAL RESET LOW AND HIGH GAS PRESSURE SWITCHES.
H. OIL CONTROL TRAIN
1. GENERAL
THE OIL TRAIN SHALL INCORPORATE U.L. APPROVED COMPONENTS AS SUPPLIED BY THE BURNER MANUFACTURER TO PROVIDE SPECIFIED FUEL/AIR CONTROL SYSTEM OPERATION CAPABLE OF AN 8:1 TURNDOWN.
2. FUEL FLOW TO THE AIR OR STEAM ATOMIZING NOZZLE SHALL BE DELIVERED BY A SINGLE OR TWO STAGE GEAR TYPE PUMP CAPABLE OF PRODUCING 100 PSIG DISCHARGE PRESSURE AND 15 IN. HG. VACUUM. IT SHALL BE A SEPARATE UNIT MOUNTED ON ITS OWN SUPPORT BASE WITH DIRECT DRIVE MOTOR. THE UNIT SHALL BE COMPLETE WITH SUCTION LINE MANUAL GATE VALVE, REMOVABLE MESH TYPE OIL STRAINER, 0-30" HG. 0-30 PSIG VACUUM/PRESSURE GAUGE WITH GAUGE DAMPENING ORIFICE, 0-100 PSIG OIL NOZZLE PRESSURE GAUGE WITH GAUGE DAMPENING ORIFICE AND NOZZLE LINE SOLENOID SAFETY SHUTOFF OIL VALVE.
3. ADDITIONAL OIL COMPONENTS SHALL BE PROVIDED AS FOLLOWS:
a. OIL NOZZLE LINE AUXILIARY SOLENOID SAFETY SHUTOFF OIL VALVE
b. LOW OIL PRESSURE SWITCH WHEN REMOTE BURNER PUMP IS FURNISHED
4. BURNER MOUNTED AIR OR STEAM ATOMIZING PIPING TRAIN SHALL CONSIST OF SOLENOID SHUTOFF VALVE, LOW ATOMIZING AIR OR STEAM PRESSURE SWITCH AND PRESSURE GAUGE.
5. A SEPARATE PISTON TYPE AIR COMPRESSOR SET WITH PRESSURE INDICATING GAUGE SHALL BE PROVIDED. ROTARY BANE AIR COMPRESSORS WILL NOT BE ACCEPTED.
6. FURNISH AND INSTALL OIL CIRCULATING PUMP SET WHICH WILL SUPPLY NO. 2 FUEL AT 3 PSIG TO INLET OF THE BURNER HIGH PRESSURE OIL PUMPS. THE PUMP SET SHALL BE COMPLETELY FACTORY PRE-PIPED, WIRED AND ASSEMBLED. THE OIL PUMP SHALL BE ROTARY GEAR TYPE.
7. FOR BURNERS UP O AND INCLUDING 12,500 MBH USE TWO (2) FM LABELED VALVES, OR ONE (1) VALVE WITH PROOF OF CLOSURE AND FM LABEL.
8. FOR BURNERS ABOVE 12,500 MBH, BOTH VALVES SHALL HAVE PROOF OF CLOSURE AND FM LABEL.
I. INTERLOCKS
1. FOR FOR U.L. MODULATION. THE MODULATING MOTOR SHALL BE SEQUENCED TO ALLOW FOR FOUR (4) COMPLETE AIR CHANGES OF THE COMBUSTION CHAMBER AND BREACHING, AND THROUGH AN INTEGRAL END SWITCH BE ELECTRICALLY INTERLOCKED WITH THE CONTROL BURNER CIRCUIT TO INSURE THE FUEL/AIR LINKAGE IS IN THE LOW FIRE START POSITION BEFORE BURNER IGNITION SEQUENCE CAN BEGIN.
2. A FRESH AIR LOUVER END SWITCH ELECTRICAL INTERLOCK SHALL BE PROVIDED IN THE BURNER OPERATING CIRCUIT WHICH WILL INSURE THAT THE FRESH AIR LOUVERS ARE OPEN BEFORE THE BURNER CAN OPERATE. BOILER ROOM FREEZE PROTECTION CIRCUIT SHALL BE PROVIDED TO CLOSE THE FRESH AIR INTAKE IN THE EVENT OF A FLAME FAILURE.
3. THE INDUCED DRAFT FAN OPERATION WILL BE ELECTRICALLY INTERLOCKED WITH THE BURNER OPERATING CIRCUIT TO INSURE THAT THE BURNER WILL NOT OPERATE IF THE DRAFT FAN IS NOT OPERATING OR IF THE DRAFT IS BELOW A PRESET LEVEL.
4. THE OVERFIRE DRAFT SYSTEM CIRCUITRY SHALL BE INTERLOCKED WITH THE BURNER CIRCUITRY TO INSURE CORRECT SEQUENCING OF ALL COMBUSTION SYSTEM COMPONENTS.
J. FLAME SAFEGUARD CONTROL
1. U.L. REQUIREMENT:
a. THE FLAME SAFEGUARD CONTROL SYSTEM SHALL INCLUDE ULTRAVIOLET SENSOR FOR FLAME DETECTION AND PROVIDE FULLY AUTOMATIC SEQUENCING OF PRE-PURGE AND POST-PURGE, BLOWER MOTOR, INTERRUPTED IGNITION SYSTEM, AND FUEL/AIR FLOW COMPONENTS. BURNER SHALL PURGE WITH FULL OPEN-AIR LOUVER AT NOT LESS THAN 60% OF HIGH FIRE AIRFLOW RATE FOR A MINIMUM OF FOUR (4) AIR CHANGES AND NOT LESS THAN 60 SECONDS. FLAME SAFEGUARD SHALL PROVIDE SAFETY SHUTDOWN WITH MANUAL RESET ON AIR FLOW FAILURE. THE FLAME SAFEGUARD CONTROL SHALL BE HONEYWELL MODEL RM7840L OR EQUAL AS MANUFACTURED BY FIREYE.

CLIENT AND PROJECT



RALEIGH - DURHAM AIRPORT AUTHORITY

CEP EQUIPMENT REPLACEMENT

TASK ORDER AJA 10.2023

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REGISTRATION




10/30/2023

ISSUE

No.	Date	Description
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SHEET INFO

MECHANICAL SPECIFICATIONS II

M-003

PROJECT NO: 13540
DATE: OCT 30, 2023
100% CD

2. FM REQUIREMENTS:
- FM FLAME SAFEGUARD REQUIREMENTS ARE THE SAME AS THOSE IMPOSED BY U.L.
3. IRI REQUIREMENTS:
- THE FLAME SAFEGUARD CONTROL SYSTEM SHALL INCLUDE ULTRAVIOLET SENSOR FOR FLAME DETECTION AND PROVIDE FULLY AUTOMATIC SEQUENCING OF PRE-PURGE AND POST-PURGE, BLOWER MOTOR, INTERRUPTED IGNITION SYSTEM, AND FUEL/AIR FLOW COMPONENTS. THE FLAME SAFEGUARD CONTROL SHALL BE THE HONEYWELL MODEL RM7840L OR EQUAL AS MANUFACTURED BY FIREYE.
- K. CONTROL PANEL - WITH HONEYWELL CONTROLS
- EACH BURNER SHALL BE COMPLETE WITH AN INTEGRAL BURNER MOUNTED CONTROL PANEL, WHICH SHALL HOUSE ALL REQUIRED OPERATING ELECTRICAL COMPONENTS.
 - APPROPRIATE ELECTRICAL KNOCKOUTS SHALL BE PROVIDED ON BOTH SIDES AND BOTTOM OF THE PANEL TO ALLOW FOR NECESSARY POWER AND LIMIT CONTROL WIRING. THE CONTROL PANEL SHALL BE CONSTRUCTED OF 16-GAUGE STEEL AND SHALL BE COMPLETE WITH A TOP MOUNTED SWITCH AND CONTROL SECTION WHICH SHALL BE HINGED TO ALLOW FOR FULL ACCESS TO ALL PANEL MOUNTED COMPONENTS. THE CONTROL PANEL SHALL BE PAINTED IN A COLOR AND FINISH IDENTICAL TO THE BURNER BEING SUPPLIED.
 - THE CONTROL PANEL SHALL INCLUDE (IF 208, 230 OR 460 VOLTS) A DIN RAIL MOUNTED CONTROL CIRCUIT TRANSFORMER WITH INTEGRAL FUSES ON BOTH THE PRIMARY AND SECONDARY WINDINGS. FLAME SAFEGUARD CONTROL AS SPECIFIED ABOVE. DIN RAIL MOUNTED MOTOR STARTERS, RELAYS, TERMINAL BLOCKS, AND OTHER ELECTRICAL DEVICES AS REQUIRED.
- L. POWER FLAME DIRECTOR © SCS SUPERVISORY CONTROL SYSTEM
- DESIGN AND PERFORMANCE OF COMPONENTS AND METHODS SPECIFIED HEREIN SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE CODES, STANDARDS, AND RECOMMENDATIONS OF THE ENTITIES LISTED BELOW:
 - EACH BURNER SHALL BE COMPLETE WITH A (REMOTE MOUNTED) (BURNER MOUNTED) CONTROL PANEL WHICH SHALL HOUSE ALL REQUIRED OPERATING ELECTRICAL COMPONENTS. THE POWER FLAME DIRECTOR® SCS-S SUPERVISION CONTROL SYSTEM AND INTEGRATED COMBUSTION MANAGEMENT SYSTEM SHALL COMBINE CONFIGURABLE SAFETY AND PROGRAMMABLE LOGIC, ANCILLARY CONTROLS INTO A SINGULAR CONTROL PLATFORM IN A MODULAR FORMAT. EACH BOILER/BURNER CONTROL SYSTEM SHALL BE FACTORY EQUIPPED WITH A PRE-CONFIGURED COMBUSTION MANAGEMENT SYSTEM AND HUMAN MACHINE INTERFACE (HMI)
 - DESCRIPTION: THE BOILER/BURNER INTEGRATED COMBUSTION MANAGEMENT SYSTEM SHALL PROVIDE AUTOMATIC BURNER SEQUENCING, FAN CONTROL, ELECTRONIC IGNITION, FLAME SUPERVISION, CRITICAL SAFETY LOAD CONTROL (PILOT VALVE(S), MAIN FUEL VALVE(S)), SYSTEM STATUS INDICATION, FIRING RATE CONTROL, LIMIT CONTROL, LOAD CONTROL, MULTIPLE CONTROL LOOPS (E.G., CENTRAL HEATING LOW TEMP WATER, CENTRAL HEATING HIGH TEMP WATER, CENTRAL HEATING STEAM, DOMESTIC HOT WATER CONTROL, ETC.), CIRCULATION PUMP CONTROL, SYSTEM OR SELF-DIAGNOSTICS, AND COMMUNICATIONS FOR A DISPLAY, OTHER DEVICES, BUILDING AUTOMATION SYSTEM, OR INDUSTRIAL CONTROL SYSTEM.
 - BURNER MANAGEMENT OPERATION INCLUDING; AUTOMATIC SEQUENCING OF THE BURNER THROUGH STANDBY, SAFE START CHECK, PRE-PURGE, FLAME IGNITION TRIALS (PILOT FLAME ESTABLISHING PERIOD, MAIN FLAME ESTABLISHING PERIOD), RUN AND POST PURGE, FLAME PROVING AND LOCKOUT ON FLAME FAILURE DURING PILOT FLAME PROVING, MAIN FAILURE PROVING, OR RUN. PURGE DAMPER/VALVE POSITION FOR PRE-PURGE, LIGHT-OFF DAMPER/VALVE POSITION FOR FLAME IGNITION TRIALS. FULL MODULATING CONTROL OF FUEL AND COMBUSTION AIR.
- THE COMBUSTION MANAGEMENT SYSTEM SHALL MEET THE REQUIREMENTS AND BE CERTIFIED TO: CUL, UL508A, CE, FM, ISO 23552-1, UL353 AND SIL 3 CAPABLE.
- THE INTEGRATED COMBUSTION MANAGEMENT SYSTEM AND THE ASSOCIATED CONTROL PANEL SHALL BE FACTORY PRE-WIRED SUPPLIED WITH EACH BOILER/BURNER UNIT. THE SYSTEM SHALL CONSIST OF AN ARRAY OF MODULES IMPLEMENTING A SINGULAR CONTROLLER; INTEGRATED COMBUSTION MANAGEMENT SYSTEM, PROGRAMMED AT THE OEM PRODUCTION FACILITY. THE CONTROL PANEL SHALL BE MOUNTED ON THE BOILER/BURNER OR REMOTELY WALL MOUNTED, BASE MODULE WITH LIGHT SENSOR BACKLIT LCD SCREEN LOCAL OPERATOR INTERFACE FOR MONITORING THE INDIVIDUAL BOILER.
 - THE INTEGRATED COMBUSTION MANAGEMENT SYSTEM SHALL PROVIDE ADVANCED SYSTEM FUNCTIONS, CONFIGURABLE SAFETY AND PROGRAMMABLE LOGIC USING NIAGARA AX WIRE SHEET EDITOR, THAT ALLOW STANDARD AND CUSTOMIZABLE CONTROL SOLUTIONS INCLUDING TAMPER RESISTANT CONTROL LOGIC AND PASSWORD PROTECTION. THE WIRE SHEET EDITOR SHALL BE COMMON FOR HMI AND CONTROL LOGIC DEVELOPMENT AND SHALL PROVIDE A MEANS FOR BACKWARDS COMPATIBILITY ENABLING FUTURE SYSTEM CHANGES, MODULE EXPANSION, AND EXTERNAL SYSTEM INTEGRATION. THE INTEGRATED COMBUSTION MANAGEMENT SYSTEM SHALL PROVIDE A FLEXIBLE DIN RAIL MOUNTING CONFIGURATION FOR OPTIMIZING CONTROL PANEL SPACE. THE DIN RAIL MOUNTING SYSTEM MUST BE CAPABLE OF CONTIGUOUS MODULE CONNECTIONS OR DETACHED MODULE CONNECTIONS WITH PRE-ASSEMBLED WIRING HARNESSSES. THE SYSTEM ARCHITECTURE MUST BE CAPABLE OF SHARING SYSTEM POWER AND MODULE INTER-COMMUNICATION WITHOUT REQUIRING EXTERNAL WIRING. THE SYSTEM SHALL BE HONEYWELL SLATE, PROGRAMMED AND CONFIGURED BY POWER FLAME INC.
 - EACH MODULE IN THE SYSTEM MUST EMPLOY MISS-WIRING PROTECTIONS AND ALLOW FOR REPLACEMENT WITHOUT REQUIRING REPROGRAMMING OR REWIRING. (ACCOMPLISHES THIS WITH BACKUP/RESTORE FUNCTIONS, USB MEMORY STICKS, AND SD CARDS). THE INTEGRATED COMBUSTION MANAGEMENT SYSTEM SHALL
- PROVIDE UNIVERSAL VOLTAGE OPERATION OF 24VDC OR 24VAC TO 240VAC POWERED SYSTEMS WITH ONLY WIRING CHANGES. SYSTEM PROGRAMMING OR EXTERNAL VOLTAGE LEVEL SHIFTING IS REQUIRED TO CHANGE BETWEEN DIFFERENT VOLTAGE LEVELS. DIFFERENT VOLTAGE LEVELS MAY ALSO BE EMPLOYED ON EACH OF THE MODULES.
8. INTEGRATED COMBUSTION MANAGEMENT SYSTEM MODULES: BASE MODULE SHALL PROVIDE:
- STORAGE OF DATA FOR DEVICE CONFIGURATION AND CONTROL PROGRAM INITIALIZATION.
 - BACKLIT LCD SCREEN WITH LIGHT SENSOR, LOCAL OPERATOR INTERFACE FOR MONITORING THE INDIVIDUAL BOILER THROUGH MENU DRIVEN MESSAGING
 - POWER SUPPLY FOR ALL MODULES WITH MULTIPLE VOLTAGE OPTIONS.
 - REAL TIME CLOCK.
 - EVENT LOG STORAGE FOR LOCK-OUTS, FAULT HISTORY, AND OEM REQUESTED EVENTS.
 - TREND LOGGING FOR OEM SPECIFIED DATA.
 - NETWORK IDENTIFICATION OF THE SYSTEM AS SINGULAR DEVICE.
 - EXTERNAL COMMUNICATION 10BASE-T FOR ETHERNET AND /OR RS485.
 - WEB SERVICES FOR DIRECT BROWSER ACCESS TO THE SYSTEM, BOTH HONEYWELL PROVIDED AND DESIGNER CUSTOMIZED PAGES, BASED ON JAVASCRIPT, SUCH AS IMPLEMENTED AND SUPPORTS HTML5.
 - 3 LEVEL PASSWORD PROTECTION OF CONFIGURABLE PROGRAMMABLE LOGIC AND FUEL AIR RATIO CONTROL.
 - ALARM ANNUNCIATION.
 - HISTORICAL FAULT AND ALARM INDICATION VIA HMI.
 - TEXT READABLE SYSTEM FAULT AND TROUBLESHOOTING.
 - MODULE AUTO ADDRESSING VIA PLATFORM COMMUNICATION BUS.
 - SAFETY AND PROGRAMMABLE LOGIC INTEGRATION SYSTEM.
 - 24 VDC OR 24 VAC TO 240 VAC POWER.
9. BURNER CONTROL MODULE SHALL PROVIDE:
- CONFIGURABLE SAFETY.
 - FLAME SAFEGUARD CONTROL, 24 VDC OR 24 TO 240 VAC, PRIMARY OR PROGRAMMER, SEMI-AUTOMATIC OR FULLY AUTOMATIC.
 - VALVE PROVING.
 - DUAL FUELS CAPABILITY.
 - EXAMINE ALL LOAD TERMINALS TO ASSURE IT IS CAPABLE OF RECOGNIZING THE TRUE STATUS OF THE EXTERNAL CONTROLS, LIMITS, AND INTERLOCKS. IF ANY INPUT FAILS THIS TEST, THE BURNER CONTROL MODULE AND COMBUSTION MANAGEMENT SYSTEM SHALL LOCKOUT ON SAFETY SHUTDOWN.
 - CLOSED LOOP LOGIC TEST VERIFIES INTEGRITY OF SAFETY CRITICAL LOADS AND MUST BE ABLE TO LOCKOUT ON SAFETY SHUTDOWN.
 - PRE-IGNITION INTERLOCKS (FUEL VALVE PROOF OF CLOSURE, ETC.) AND FLAME SIGNAL CHECKED DURING STANDBY, PURGE, AND OFF CYCLES.
 - LIGHT-OFF AND PURGE POSITION PROVING.
 - TAMPER PROOF TIMING AND SAFETY LOGIC.
 - INTERNALLY CROSS-LIMITED TO FUEL AIR MODULE TO ENSURE FLAME SAFETY AND COMBUSTION CONTROL WORK AS ONE.
10. FLAME AMPLIFIER MODULE SHALL PROVIDE:
- SIGNAL FROM FLAME DETECTOR TO INDICATE PRESENCE OF FLAME, OPERATED BY BURNER
 - CONTROL "PARENT" SAFETY MODULE.
 - DISPLAY FOR FLAME SIGNAL STRENGTH.
 - DIN RAIL OR REMOTE MOUNTING.
 - DYNAMIC CHECKING OF THE FLAME AMPLIFIER MODULE.
 - THE INTEGRATED COMBUSTION MANAGEMENT SYSTEM FLAME AMPLIFIER MODULE MUST
 - BE ABLE TO RECOGNIZE A NO FLAME SIGNAL DURING THIS DYNAMIC AMPLIFIER CHECK.
 - UV WITH DYNAMIC AMPLI-CHECK AND DYNAMIC SELF-CHECK.
 - LOW VOLTAGE IR WITH DYNAMIC AMPLI-CHECK.
 - LOW VOLTAGE UV/VISIBLE WITH DYNAMIC AMPLI-CHECK.
 - RECTIFICATION WITH DYNAMIC AMPLI-CHECK AND DYNAMIC SELF-CHECK.
 - DAISY CHAIN OPTION TO INTERFACE WITH MULTIPLE DETECTORS.
11. FUEL AIR RATIO CONTROL MODULE SHALL BE CAPABLE OF PROVIDING THE BELOW FUNCTION:
- RELATIONAL CONTROL BETWEEN FUEL, AIRFLOW, AND FLUE GAS RECIRCULATION FOR THE POWER BURNER.
 - PARALLEL-POSITIONING CONTROL OF UP TO FOUR ACTUATORS AND /OR TWO VARIABLE FREQUENCY DRIVES, UP TO (24) POINT CURVE WITH NO SLOPE CONSTRAINTS THAT WOULD LIMIT
- THE STEEPNESS OF THE CURVE.
- CONTROL OF THE ACTUATORS AND RECEIVE FEEDBACK WITH COMPONENT ANTI-SWAP PROTECTION.
 - CURVE VERIFICATION AND OFF CURVE CHECKING ALGORITHMS.
 - DUAL FUELS CAPABILITY. INTEGRATED COMBUSTION MANAGEMENT SYSTEM
 - O2 TRIM CONTROL, OR OTHER FLUE GAS CONSTITUENTS OR TEMPERATURES.
 - COMBUSTION CONTROL WITH PROGRAMMABLE DISPLAY.
 - CONTROL OF THE ACTUATORS; 50, 150, 300, OR 900 INCH POUND TORQUE
 - NEMA 1 OR NEMA 4 ACTUATORS.
 - INTERNAL ACTUATOR TESTS INCLUDING TEMPERATURE AND HEALTH DIAGNOSTICS.
 - CONTROL OF 3RD PARTY ACTUATORS USING APPROPRIATE SHAFT LOCATION FEEDBACK
12. ANALOG I/O MODULE SHALL PROVIDE:
- ANALOG INPUT AND OUTPUT CAPABILITY FOR ALL COMBUSTION AND ANCILLARY CONTROL APPLICATIONS.
 - MULTIPLE COMBINATION OF ANALOG FUNCTIONALITY FOR EACH CELL.
 - FOUR ANALOG CELLS, WITH UP TO (12) SIGNAL INPUTS AND OUTPUTS.
 - THE CAPABILITY TO SUPPORT VOLTAGE, RESISTANCE, CURRENT, PWM, TACHOMETER, THERMOCOUPLES, RTD, BRIDGE AND NTC SENSORS.
 - THE CAPABILITY TO CONFIGURE INPUTS AND OUTPUTS AS VOLTAGE, CURRENT, OR PWM SIGNALS.
 - UNIVERSAL ANALOG CELL LOGIC.
 - UTILIZE SOLID STATE CONTROLS AND SENSORS TO PROVIDE CONTROL FUNCTIONS SUCH AS:
 - MODULATING CONTROL ALGORITHM BY PROPORTIONAL INTEGRAL DERIVATIVE (PID) LOGIC.
 - TEMPERATURE; WATER, AIR, AND STACK
 - HYDRONIC BOILER SYSTEM OUTDOOR COMPENSATION AND RESET
 - REMOTE SET POINT CONTROL
 - ASSURED LOW FIRE CUT OFF LOGIC
 - OPERATING AND MODULATING CONTROL
 - STEAM PRESSURE TRANSMITTER INTERFACE FOR STEAM PRESSURE INDICATION AND ON/OFF AND MODULATING CONTROL
 - WATER TEMPERATURE TRANSMITTER FOR BOILER WATER TEMPERATURE INDICATION, THERMAL SHOCK PROTECTION, ON/OFF AND MODULATING CONTROL
 - CALCULATION OF BOILER EFFICIENCY
 - ECONOMIZER OPERATION
 - ANALOG MONITORING INCLUDING; STEAM FLOW, FUEL FLOW, WATER FLOW, FLUE GAS INLET AND OUTLET TEMPERATURE, FEED WATER TEMPERATURE, OIL TEMPERATURE, AND GAS AND OIL PRESSURE
13. DIGITAL I/O MODULE SHALL PROVIDE:
- DIGITAL INPUT AND OUTPUT CAPABILITY FOR ALL COMBUSTION AND ANCILLARY CONTROL APPLICATIONS.
 - UNIVERSAL I/O CONFIGURABLE IN MULTIPLE COMBINATION UP TO (14) OPTICAL INPUTS OR (6) RELAY OUTPUTS.
 - AUTOMATIC ADAPTATION TO 24VDC OR 24VAC TO 240VAC.
 - PROVIDES DISCRETE POWER AND OR ISOLATED RELAY SIGNALS.
14. ANNUNCIATOR MODULE SHALL PROVIDE:) STATUS MONITORING OF A SERIES STRING OF LIMIT, CONTROL, AND /OR INTERLOCK CONTACTS FOR DIAGNOSTIC OF A COMMERCIAL OR INDUSTRIAL BURNER.
- ONE RELAY OUTPUT.
 - AUTOMATIC ADAPTATION TO 24VDC OR 24VAC TO 240VAC.
 - 14 OPTO - INPUTS
 - PROGRAMMABLE TAGGING AND INTERLOCK/LIMIT STRING CONFIGURATION.
15. THE PLATFORM SHALL BE IDENTIFIED AS A SINGLE NETWORK DEVICE, SUPPORTING COMMUNICATIONS PROTOCOLS:
- BACNET /IP - VIA 802.3i 10BASE-T.
 - BACNET /MSTP - VIA RS-485.
 - MODBUS RTU /TCP - VIA 802.3i 10BASE-T
 - MODBUS RTU /485 - VIA RS-485
 - ETHERNET AND WEB BROWSER - VIA 802.3i 10BASE-T ACCESS (HTTPD)
16. THE PLATFORM SHALL PROVIDE A WEB-BASED USER INTERFACE FOR VIEWING SYSTEM STATUS, AND VIEWING, CREATING, OR MODIFYING CONFIGURATIONS. (WHERE SHOWN ON DRAWINGS). THE TOUCH SCREEN GRAPHICAL OPERATOR
- INTERFACE PROVIDES OVERVIEW INTERFACE WITH COMBUSTION SYSTEM PARAMETERS AND CONFIGURATION, BURNER MANAGEMENT SYSTEM, ALARMS, DIAGNOSTICS, TROUBLESHOOTING, ALARM HISTORY, SYSTEM FIRING RATE, LIMIT OPERATION, ANALOG - DIGITAL - FIRST OUT ANNUNCIATION, FLAME SIGNAL, FUEL AIR RATIO, AND MONITORING:
- MANUAL CONTROL OF BURNER FIRING RATE INCREMENT AND DECREMENT THE FIRING RATE.
 - INDICATION OF COMBUSTION MANAGEMENT SYSTEM STATUS AND DIAGNOSTICS
 - DISPLAY OF OPERATING PARAMETERS
 - TROUBLESHOOTING INFORMATION AND DIAGNOSTICS
17. THE COLOR TOUCH SCREEN GRAPHICAL OPERATOR INTERFACE & MONITORING: PROVIDES USER INTERFACE TO THE CONTROL SYSTEM, BOILER OVERVIEW SCREEN WITH CONNECTED BOILER PARAMETER READOUTS, BURNER MANAGEMENT CONTROL STATUS SCREEN, ALARM BANNERS, DIAGNOSTIC SCREENS FOR FAULT TROUBLESHOOTING, ALARM HISTORY SCREEN, (PARAMETER TRENDING FOR REAL-TIME AND HISTORICAL TRENDS), SYSTEM FIRING RATE SCREEN AND SYSTEM CONFIGURATION SCREENS, IN ADDITION TO:
- MANUAL CONTROL OF THE BOILER-FIRING RATE UTILIZING CONTROL SCREENS ON THE HMI TO INCREASE AND DECREASE THE FIRING RATE.
 - ON SCREEN INDICATION OF BURNER MANAGEMENT CONTROLLER STATUS AND DIAGNOSTICS
 - ON SCREEN REAL-TIME DISPLAY OF ALL CONNECTED PROCESS PARAMETERS
 - ON SCREEN RECOMMENDATION FOR TROUBLESHOOTING FAULT CONDITIONS
 - ON SCREEN WATER LEVEL INDICATING ALARM(S) AND SET-POINT FEATURE
 - ON SCREEN REAL TIME TRENDING DISPLAY OF SELECTABLE PROCESS FUNCTIONS
 - ON SCREEN HISTORICAL TRENDING DISPLAY OF SELECTABLE PROCESS FUNCTIONS
 - DISPLAY ALARM/FAULT HISTORY
 - BOILER EFFICIENCY CALCULATION: FOR EACH BURNER
18. ANNUNCIATION & DIAGNOSTICS:
- ACTIVE ALARM ANNUNCIATION
 - PROVIDE HISTORICAL ALARM INFORMATION ACCESSED FROM DISPLAY
 - DETECTS AND ISOLATES AN ALARM, AND REPORTS INTERNAL CIRCUIT FAULTS
 - CAPABILITY OF DISPLAYING ALARM HISTORY OF DATE, TIME, CYCLE OF OCCURRENCE AND DATE AND TIME OF UP TO THE MOST RECENT 21 FAULTS
 - ENGLISH TEXT DESCRIPTION OF THE SYSTEM FAULT
 - SELF-CHECKING FLAME SCANNER CAPABLE
 - WATER LEVEL INDICATION AND LOW WATER SHUTDOWN ALARM
19. LED DISPLAY & INTERFACE MONITORING:
- MANUAL CONTROL OF THE BOILER FIRING RATE UTILIZING CONTROL PUSHBUTTONS TO INCREMENT AND DECREMENT THE FIRING RATE.
 - INDICATION OF BURNER STATUS AND DIAGNOSTICS
 - INDICATION OF CONNECTED PRESSURE OR TEMPERATURE SENSOR READINGS
 - ON SCREEN DISPLAY OF SYSTEM ALARMS AND FAULTS
 - ON SCREEN HISTORY OF ALARMS AND FAULTS
20. MULTIPLE BOILER MANAGEMENT:
- THE OEM SHALL FACTORY CONFIGURE THE INTEGRATED COMBUSTION MANAGEMENT SYSTEM FOR LEAD /LAG MASTER PANEL OPERATION OF A MULTIPLE BOILER HEATING PLANT. THE SYSTEM SHALL BE CONFIGURED WITH ALL COMPONENTS OF THE SYSTEM LISTED AS PRODUCTS OF A SINGLE MANUFACTURER UNDER THE APPROPRIATE CATEGORY BY THE UNDERWRITER'S LABORATORIES, INC. AND IN ACCORDANCE WITH THE APPROPRIATE CSD-1/NFPA 85 SECTIONS. SYSTEM SHALL BE COMMISSIONED BY A FACTORY AUTHORIZED REPRESENTATIVE OR SUPPLIER INSTALLER WITH FACTORY TRAINED PERSONNEL. USE HMI TOUCH SCREEN MENU DRIVEN SETUP AND CONTROL. MONITOR SETPOINTS AND ALL SELECTABLE PARAMETERS. AUTOMATICALLY CONTROL HEADER WATER TEMPERATURE, DISPLAY ALL UNITS ONLINE, CURRENT FIRING RATE, SETPOINT AND ACTUAL HEADER (TEMPERATURE OR PRESSURE).
- SELECT LEAD BOILER POSITION. OPTIMIZE SYSTEM PERFORMANCE WITH THE FOLLOWING FEATURES :
 - PID CONTROLLED SERIES OR PARALLEL MODULATION MODES.
 - 4-20MA MODULATION SIGNAL OUTPUT
 - ADJUSTABLE ON AND OFF DELAY TIMERS
 - MANUAL/AUTO FIRING RATE ADJUSTMENTS
 - INSTANT CUT IN AN CUTOUT VALVES
 - SCREEN ADJUSTABLE SETPOINT



RALEIGH - DURHAM AIRPORT AUTHORITY

CEP EQUIPMENT REPLACEMENT

TASK ORDER AJA 10.2023

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MECHANICAL SPECIFICATIONS III

M-004

PROJECT NO: 13540
DATE: OCT 30, 2023
100% CD

- 7) BOILER CYCLE COUNTER
- 8) BOILER HOUR COUNTERS.
- 9) TIME EQUALIZE FUNCTION
- 10) TIME ALTERNATE FUNCTION
- 11) CYCLE EQUALIZE FUNCTION
- 12) CYCLE ALTERNATE FUNCTION
- 13) BASE LOADING FOR LAG BOILERS
- 14) MANUAL LEAD SELECT

b. FAILURE TRANSFER FEATURE TO AUTOMATICALLY TRANSFER LEAD BOILER TO NEXT AVAILABLE BOILER IF LEAD BOILER FAILS.

c. NIGHT/ WEEKEND SETBACK FEATURE - ABILITY TO SET NIGHT SETBACK AND WEEKEND SETBACK TEMPERATURE SETTINGS.

d. PROVIDE MODBUS COMMUNICATIONS FIELD SELECTABLE 9600,19200 OR 38400 BAUD RATE FOR BMS SYSTEM

e. PUMP CONTROL / ISOLATION VALVE

f. BOILER PUMP OR ISOLATION VALVE COMES ON DURING THE CALL FOR HEAT. PUMP OR VALVE TURNS OFF AFTER A TIME DELAY AFTER THE CALL FOR HEAT HAS BEEN REMOVED (USER DEFINED). LEAD BURNER PUMP OR VALVE STAYS ON REGARDLESS IF IT IS FIRING OR NOT. BOILER PUMPS OR VALVES COME ON AND STAY ON IF LEAD LAG / BYPASS SWITCH IS PLACED IN BYPASS.

g. OUTLET MONITORING (THIS FEATURE IS AN OPTION FOR HOT WATER SYSTEMS ONLY.)

h. REDUCES A BOILER TO LOW FIRE IF IT IS DETERMINED THAT THE OUTLET VALVE IS CLOSED BASED ON THE RATE OF CHANGE OF THE OUTLET OF THE BOILER VS THE RATE OF CHANGE OF THE HEADER.

i. SYSTEM INTEGRATION: EACH SYSTEM SHALL FUNCTION AS A SINGLE NETWORK DEVICE RESPONDING TO A SINGLE ADDRESS, MULTIPLE SYSTEMS MAY COMMUNICATE "PEER TO PEER" VIA BACNET/MSTP AND/OR BACNET/IP COMMUNICATION PROTOCOLS.

j. BUILDING AUTOMATION SYSTEM INTERFACE: THE SYSTEM SHALL FUNCTION AS A SINGLE NETWORK DEVICE RESPONDING TO A SINGLE ADDRESS OR BE COMPRISED OF MULTIPLE CONTROLLERS, COMMUNICATING VIA MODBUS/RS485 OR BACNET/MSTP AND/OR MODBUS/TCP, BACNET/IP AND/OR HTTP COMMUNICATION PROTOCOLS:

k. ALL WIRING WITHIN THE COMBUSTION CONTROL SYSTEM SHALL BE FACTORY PRE-WIRED UTILIZING A UL LISTED COMPONENTS AND HAVE ALL OPTIONAL CONTROLS WILL BE WIRED TO A DIN RAIL MOUNTED TERMINAL STRIP WITHIN THE CONTROL PANEL. ALL WIRING WILL BE NUMBERED, AND COLOR CODED TO FACILITATE FIELD WIRING CONNECTIONS. ALL DEVICES ON THE FACE OF THE CONTROL PANEL WILL HAVE ENGRAVED LAMINATED LABELS NAME PLATES. ALL RELAYS, CONTROL DEVICES AND ITEMS MOUNTED INSIDE THE PANEL WILL BE IDENTIFIED WITH LAMINATED OR ENGRAVED NAME PLATES. BLOWER MOTOR WILL BE CONTROLLED VIA VARIABLE SPEED DRIVE WITH DISPLAY. THE VFD WILL BE MOUNTED ON THE BURNER ASSEMBLY OR REMOTELY CLOSE TO THE BLOWER MOTOR.

21. APPROPRIATE ELECTRICAL KNOCKOUTS SHALL BE PROVIDED ON BOTH SIDES AND BOTTOM OF THE PANEL TO ALLOW FOR NECESSARY POWER AND LIMIT CONTROL WIRING. THE CONTROL PANEL SHALL BE CONSTRUCTED OF STAINLESS STEEL NEMA 4X AND SHALL BE COMPLETE WITH A FRONT MOUNTED ON-OFF CONTROL SWITCH AND CONTROL SECTION WHICH SHALL BE HINGED TO ALLOW FOR FULL ACCESS TO ALL PANEL MOUNTED COMPONENTS. ALL WIRING SHALL BE COLOR CODED AND NUMBER.

22. THE CONTROL PANEL SHALL INCLUDE A DIN RAIL MOUNTED CONTROL CIRCUIT TRANSFORMER WITH INTEGRAL FUSES ON BOTH THE PRIMARY AND SECONDARY WINDINGS. FLAMES SAFEGUARD CONTROL AS SPECIFIED ABOVE DIN RAIL MOUNTED MOTOR STARTERS, RELAYS, TERMINAL BLOCKS AND OTHER ELECTRICAL DEVICES AS REQUIRED. ALL ELECTRICAL DEVICES SHALL BE U.L. LISTED AND MAINTAIN THE NEMA 4X ENCLOSURE RATING. PROVIDE INDICATOR LIGHTS OR LEDS FOR "POWER ON", "DEMAND", "MAIN FUEL", "FLAME FAILURE", AND "LOW WATER. ENGRAVED LABEL INDICATING THE FUNCTION OF EACH LIGHT AND SWITCH SHALL BE PROVIDED. ALL LOCKOUT CONDITIONS WILL SOUND AN ALARM, PANEL MOUNT AN AUTO-REST ALARM SILENCING SWITCH AND ALARM BUZZER. PANEL MOUNTED FUSED DISCONNECT FOR SINGLE POINT FIELD ELECTRICAL CONNECTION. PROVIDE EMERGENCY STOP ON THE ENCLOSURE AND PROVIDE TERMINALS FOR FIELD CONNECTIONS TO EMERGENCY STOP STATION.

23. ADDITIONAL AUXILIARY LIGHTS WILL BE MOUNTED IN THE FRONT INDICATION SECTION OF THE PANEL AND INCLUDE AN ENGRAVED LABEL INDICATING THE FUNCTION OF EACH LIGHT. THE FOLLOWING INDICATION LIGHTS WILL BE SUPPLIED ALONG WITH NECESSARY ISOLATION CIRCUITS AS REQUIRED.

"HIGH TEMPERATURE" (R), "LOW GAS PRESSURE" (R), "HIGH GAS PRESSURE" (R), "PILOT FAILURE" (R), "IGNITION ON" (A), "AIR FLOW FAILURE" (B), "LOW OIL PRESSURE" (R), "HIGH LIMIT" (R)

a. MAJOR FUNCTIONS:

- 1) PARALLEL POSITIONING CONTROL FOR PRECISE CONTROL OF FUEL/AIR RATIO
- 2) SERVO MOTORS FOR MAIN GAS & OIL, COMBUSTION AIR AND IFGR
- 3) VARIABLE SPEED DRIVE (VFD) FOR BURNER COMBUSTION AIR FAN TO MINIMIZE ENERGY COSTS
- 4) LINKAGE-LESS FULL MODULATION FOR CONTROL (PID

ALGORITHM)

- 5) OXYGEN TRIM TO OPTIMIZE FUEL/AIR RATIO AND CALCULATE EFFICIENCY
- 6) BURNER SEQUENCING: LIGHT OFF/SHUTDOWN, PRE AND POST PURGE (TO MEET FM/IRI/UL)
- 7) FULL FLAME SAFE GUARD FUNCTIONS (TO MEET IRI/FM/UL)
- 8) ANNUNCIATION & DIAGNOSTICS
- 9) TOUCH SCREEN, GRAPHIC OPERATOR INTERFACE & MONITORING
- 10) LCD DISPLAY INTERFACE & MONITORING
- 11) BMS INTERFACE
- 12) INTEGRATED DRAFT CONTROL TO INCLUDE DRAFT DAMPER MOTOR, LINKAGE, END SWITCHES
- 13) INTEGRATED LEAD/LAG CAPABILITIES; TO WORK WITH STAND-ALONE MASTER PANEL
- 14) OPTIONAL FUEL FLOWS, STEAM FLOW, WATER FLOW, TEMPERATURES AND PRESSURES

b. BOILER EFFICIENCY CALCULATION: FOR EACH BURNER, TO INCLUDE O2, AMBIENT AIR TEMP, FLUE GAS TEMP. CALCULATIONS TO FOLLOW THE ANSIA/HRI STANDARD 1500-2015

c. ANNUNCIATION & DIAGNOSTICS:

- 1) ACTIVE ALARM ANNUNCIATION
- 2) PROVIDE HISTORICAL ALARM INFORMATION ACCESSED FROM DISPLAY
- 3) DETECTS AND ISOLATES AN ALARM, AND REPORTS INTERNAL CIRCUIT FAULTS
- 4) CAPABILITY OF DISPLAYING ALARM HISTORY OF DATE, TIME, CYCLE OF OCCURRENCE AND DATE AND TIME OF UP TO THE MOST RECENT 21 FAULTS
- 5) ENGLISH TEXT DESCRIPTION OF THE SYSTEM FAULT
- 6) SELF CHECKING
- 7) WATER LEVEL INDICATION AND LOW WATER SHUTDOWN ALARM

d. LED DISPLAY & INTERFACE MONITORING:

- 1) MANUAL CONTROL OF THE BOILER FIRING RATE UTILIZING CONTROL PUSHBUTTONS TO INCREMENT AND DECREMENT THE FIRING RATE.
- 2) INDICATION OF BURNER STATUS AND DIAGNOSTICS
- 3) INDICATION OF CONNECTED PRESSURE OR TEMPERATURE SENSOR READINGS
- 4) ON SCREEN DISPLAY OF SYSTEM ALARMS AND FAULTS
- 5) ON SCREEN HISTORY OF ALARMS AND FAULTS

e. INTEGRATED BOILER CONTROLS:

- 1) OPERATING AND MODULATING CONTROL
- 2) PRIMARY LOW WATER CUT-OFF
- 3) VARIABLE SPEED DRIVE FAULT SHUTDOWN
- 4) PASSWORD PROTECTION OF PROGRAMMABLE CONTROLLER LOGIC
- 5) PASSWORD PROTECTION OF PARALLEL POSITIONING CONTROL

f. TRANSMITTERS AND SENSORS:

- 1) VARIABLE SPEED DRIVE SENSOR
- 2) O2 ANALYZER
- 3) COMBUSTION AIR TEMPERATURE TRANSMITTER
- 4) STACK TEMPERATURE TRANSMITTER
- 5) STEAM PRESSURE TRANSMITTER
- 6) STEAM FLOW METER
- 7) GAS FLOW METER
- 8) OIL FLOW METER
- 9) FEEDWATER FLOW METER
- 10) COMBUSTION AIR FLOW METER
- 11) FEEDWATER INLET/OUTLET TEMPERATURE TRANSMITTERS (STACK ECONOMIZER)

g. FIELD END DEVICE:

- 1) VARIABLE FREQUENCY DRIVE
- 2) SERVO MOTORS AS REQUIRED
- 3) FIELD INSTALLED END SWITCHES

M. DRAFT CONTROL

- 1. A DOUBLE ACTING TYPE OF BAROMETRIC DRAFT DAMPER SHALL BE SUPPLIED AND INSTALLED ON THE BOILER BREECHING. AN ELECTRICAL INTERLOCK WILL SHUT THE GAS SUPPLY OFF IN THE EVENT THAT FLUE GASES ESCAPE FROM THE DAMPER OPENING FOR A PERIOD OF 60 SECONDS.
- 2. AUTOMATIC SEQUENCE OVERFIRE DRAFT CONTROL SYSTEM.

THE CONTRACTOR SHALL FURNISH AND INSTALL A UL APPROVED POWER FLAME MODEL DC-3 SEQUENCE OVERFIRE DRAFT CONTROL SYSTEM. THE CONTROLLER SHALL BE INSTALLED IN THE BURNER PANEL AND MUST HAVE A TWO LINE VACUUM FLORESCENT DISPLAY FOR ALL TUNING AND SCALING OPERATIONS AND FOR DISPLAY OF VARIABLES SUCH AS DRAFT PRESSURE. THE OPERATOR

INTERFACE MUST BE HAVE FOUR PUSHBUTTONS ON THE FRONT PANEL FOR ALL OPERATOR FUNCTIONS SUCH AS ALARM ACKNOWLEDGEMENT, SELECTION OF DISPLAYS AND CONTROL FUNCTIONS. THE DISPLAY MUST INCLUDE SET POINTS AND TUNING PARAMETERS AND OPERATIONAL VALUES SUCH AS FLUE GAS TEMPERATURE, DRAFT PRESSURE AND ALARMS.

THE CONTROLLER MUST SENSE THE DRAFT PRESSURE BY DIRECT CONNECTION TO THE FURNACE TAP WITHOUT THE NEED FOR AN EXTERNAL TRANSMITTER. THE CONTROLLER MUST HAVE A PIEZORESISTIVE SILICON SENSING ELEMENT THAT IS CAPABLE OF MEASURING POSITIVE OR NEGATIVE PRESSURES WITHIN THE RANGE OF 0 TO + OR - 2" W.C.. THIS ELEMENT MUST BE TEMPERATURE COMPENSATED AND MUST PRODUCE A SIGNAL THAT IS DIRECTLY PROPORTIONAL TO THE DIFFERENTIAL PRESSURE BETWEEN ATMOSPHERIC AND THE FURNACE PRESSURE.

THE CONTROLLER MUST BE FIELD CONFIGURABLE FOR SELECTING THE SEQUENCE MODE FROM NON-SEQUENCING TO SEQUENCING WITH POST AND PRE-PURGE CAPABILITY AND FOR POSITIVE OR NEGATIVE SET POINT CONTROL APPLICATIONS. POST AND PRE-PURGE CAPABILITY MUST HAVE ADJUSTABLE TIME DELAYS OF 20 TO 120 SECONDS SELECTABLE FROM THE FRONT PANEL. THE CONTROLLER MUST RETRANSMIT THE DRAFT PRESSURE AS 4-20 MADC SIGNAL FOR RECORDING OR REMOTE DISPLAY AND MUST HAVE MODBUS (SELECTABLE AS 9600 OR 19200 BAUD RATE) COMMUNICATIONS AS STANDARD.

THE CONTROLLER MUST HAVE AN ELECTRONIC DRAFT INDICATOR. THE DRAFT PRESSURE MUST BE INDICATED ON THE TWO LINE VACUUM FLORESCENT DISPLAY FOR THE RANGE.

THE CONTROLLER MUST INCLUDE A CLOSED/AUTO/OPEN SELECTOR SWITCH AND ALL NECESSARY RELAYS FOR FULL PROGRAMMING AND CONTROL ACTIONS. THE CLOSED POSITION WILL BYPASS ALL AUTOMATIC FUNCTIONS AND CLOSES THE DAMPER. THE OPEN POSITION WILL OPEN THE DAMPER AND THE BOILER CAN BE OPERATED IN THE CASE OF CONTROLLER MALFUNCTION OR BOILER MAINTENANCE. IN THE AUTOMATIC POSITION THE CONTROLLER WILL MAINTAIN THE DESIRED SETTING TO WITHIN ONE-HUNDRETH (0.01) INCH WATER COLUMN BY VARYING THE POSITION OF THE DRAFT DAMPER. THE CONTROLLER WILL INCLUDE PROPORTIONING BAND ADJUSTMENT AND WILL FILTER OUT THE FURNACE PULSATION WITHOUT LOSS OF SENSITIVITY.

THE CONTROLLER CIRCUIT SHALL INTERCONNECT WITH THE COMBUSTION SAFEGUARD AND LIMIT CONTROL CIRCUITS GOVERNING BURNER OPERATION, TO PROVIDE FIXED DAMPER OPENING FOR PRE-PURGE AND STABLE IGNITION, FULL MODULATION OF DAMPER DURING FIRING, AND CLOSE DAMPER AFTER BOILER SHUT DOWN. HOWEVER, BURNER SHALL SHUT DOWN WHEN SWITCH IS MOVED FROM AUTOMATIC. THE OPEN DAMPER SWITCH SHALL PROVIDE MEANS TO FULLY OPEN DAMPER WITHOUT INTERRUPTING FIRING.

THE CONTROLLER MUST HAVE A UL APPROVED DRAFT CUTOFF SWITCH, MODEL AFS-952, THAT WILL SHUT DOWN THE SYSTEM IN THE EVENT OF AN UNSAFE DRAFT CONDITION IN THE FURNACE EXTENDING OVER 8 SECONDS. THE SWITCH MUST BE MOUNTED INSIDE THE CONTROLLER CABINET. AFTER SAFE DRAFT IS REESTABLISHED, THE COMBUSTION SYSTEM MUST RECYCLE FROM THE ORIGINAL STARTING POSITION. THE CUTOFF POINT OF THE MINIMUM DRAFT SWITCH SHALL BE ADJUSTABLE FROM ZERO TO WITHIN TWO-HUNDRETHS (0.02) INCH OF THE OPERATING DRAFT. THE RELAY PANEL AND SOLID-STATE CONTROL SECTION SHALL EACH BE OF THE MODULAR TYPE, PERMITTING EASY REPLACEMENT. THE CONTROLLER SHALL ALSO INDICATE ALARM VALUES ON THE DISPLAY.

THE CONTROLLER OUTPUT SHALL DRIVE A 150 INCH-POUND TORQUE ROTARY ACTUATOR. UNIT MUST BE EQUIPPED WITH AN ADJUSTABLE "START POSITION" SWITCH. A PURGE POSITION SIGNAL SWITCH MUST BE AN INTEGRAL PART OF THE OPERATOR. THE OPERATOR MUST BE EQUIPPED WITH A MECHANISM PERMITTING SELECTION OF ANY PARTIALLY OPEN SETTING OF THE DAMPER FOR THE PURGE POSITION (MINIMUM 20 PERCENT). THIS FEATURE MUST ALLOW THE FULL RANGE OF THE DAMPER OPENING TO BE UTILIZED DURING THE FIRING CYCLE, AND ALSO PERMIT ADJUSTMENT OF THE PURGE POSITION TO PROVIDE MAXIMUM OPENING OF THE DAMPER WITHOUT ADVERSE EFFECT ON PILOT OPERATION.

ALL NECESSARY LINKAGE, INCLUDING ADJUSTABLE CLEVISSES, PIPE ADAPTERS, AND DAMPER LEVER ARMS MUST BE DESIGNED FOR THE PARTICULAR USE OF THE EQUIPMENT TO BE INSTALLED, TO PROVIDE FREE, SMOOTH AND RIGID OPERATION, BUT ELIMINATE UNNECESSARY PLAY AND LOST MOTION.

THE CONTROLLER MUST HAVE AN INTERNAL FLUE GAS TEMPERATURE INDICATOR AND TRANSMITTER AND MEET ISA SEQUENCE M ALARM FUNCTIONS. A TYPE J THERMOCOUPLE SHALL BE PROVIDED AND REMOTE MOUNTED BY THE CONTRACTOR.

THE CONTROLLER SHALL ACCEPT THE INPUT FROM THE THERMOCOUPLE DIRECTLY AND SHALL DISPLAY THE TEMPERATURE ON THE FRONT PANEL VACUUM FLORESCENT DISPLAY. THE CONTROLLER MUST HAVE THE CAPABILITY OF SETTING THE ALARM TEMPERATURE, PROVIDE A FLASHING DISPLAY OF TEMPERATURE ALARMS AND HAVE TWO ALARM CONTACT OUTPUTS. THE CONTROLLER MUST HAVE LOCAL RESET; REMOTE RESET OR AUTOMATIC ALARM RESET CAPABILITY. THE CONTROLLER MUST HAVE DUAL FAIL-SAFE SPDT CONTACTS FOR REMOTE ALARMING OR INDICATION. THIS TEMPERATURE MUST RE-TRANSMITTER AS A 4-20 MADC SIGNAL FOR THE RANGE OF 32 DEG F TO 1000 DEG F. THE CONTROLLER MUST HAVE THE CAPABILITY OF TEMPERATURE DISPLAY IN DEGREE CELSIUS VIA FRONT PANEL OPERATION. THERMOCOUPLE FAILURE MUST RESULT IN A FAIL-SAFE RESPONSE BY IMMEDIATELY GOING TO THE MAXIMUM OUTPUT OF 20 MADC.

CLIENT AND PROJECT



RALEIGH - DURHAM AIRPORT AUTHORITY

CEP EQUIPMENT REPLACEMENT

TASK ORDER AJA 10.2023

2400 JOHN BRANTLEY BLVD. MORRISVILLE, NC 27650

DESIGNER



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10/30/2023

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No. Date Description

SHEET INFO

MECHANICAL SPECIFICATIONS IV

M-005

PROJECT NO: 13540

DATE: OCT 30, 2023

100% CD

GENERAL NOTES

1. THE DEMOLITION SPECIFICATION SHALL BE CONSIDERED ONLY AS A GUIDE AND IS NOT INTENDED TO SHOW EVERY SINGLE ITEM OF WORK. ACTUAL FIELD CONDITIONS WILL DETERMINE THE PRECISE WORK TO BE DONE. SHOULD ANY QUESTION ARISE AS TO WHETHER OR NOT ANY PIPING, EQUIPMENT OR OTHER ITEM SHOULD BE REMOVED, OR REMAIN AS PRESENTLY INSTALLED, THIS CONTRACTOR SHALL REQUEST, IN WRITING, CLARIFICATION FROM THE ARCHITECT. BECAUSE THE MECHANICAL DRAWINGS INDICATE THE INTENT OF THE SCOPE OF WORK, NO EXTRA CHARGES WILL BE ALLOWED FOR ANY REMOVALS NECESSARY FOR THE COMPLETION OF THE WORK UNDER THIS PROJECT.
2. REMOVAL SHALL INCLUDE TAKING FROM THE PREMISES AND DISPOSAL OF REMOVED ITEMS UNLESS OTHERWISE NOTED. ALL REMOVALS SHALL BE COORDINATED AND APPROVED BY BUILDING MANAGER.
3. EXTREME CARE SHALL BE EXERCISED IN DEMOLITION PHASE TO AVOID THE DISTURBANCE OF ANY BASE BUILDING SYSTEM THAT SHALL REMAIN AND IT IS NOT INCLUDED IN THE SCOPE OF THE WORK.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
5. BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR AREAS IN USE, THE CONTRACTOR SHALL REQUEST FROM THE OWNER PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR SHALL PERFORM THE WORK ONLY AT THE TIME OR TIMES DESIGNATED BY THE OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.
6. DEMOLITION AND OTHER WORK WHICH CREATES DIRT AND/OR DISTURBING NOISE, MUST BE PERFORMED AFTER NORMAL WORKING HOURS OR ON WEEKENDS. THE DELIVERY, HANDLING, AND INSTALLING OF MATERIALS, EQUIPMENT AND DEBRIS MUST BE ARRANGED TO AVOID ANY INCONVENIENCE AND ANNOYANCE TO OTHER TENANTS. CLEANING MUST BE CONTROLLED TO PREVENT DIRT AND DUST FROM INFILTRATING INTO ADJACENT AREAS. WELDING OR BURNING MUST BE PERFORMED ONLY DURING TIMES SPECIFICALLY APPROVED BY THE BUILDING MANAGER.

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**CEP
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REPLACEMENT**

TASK ORDER AJA 10.2023

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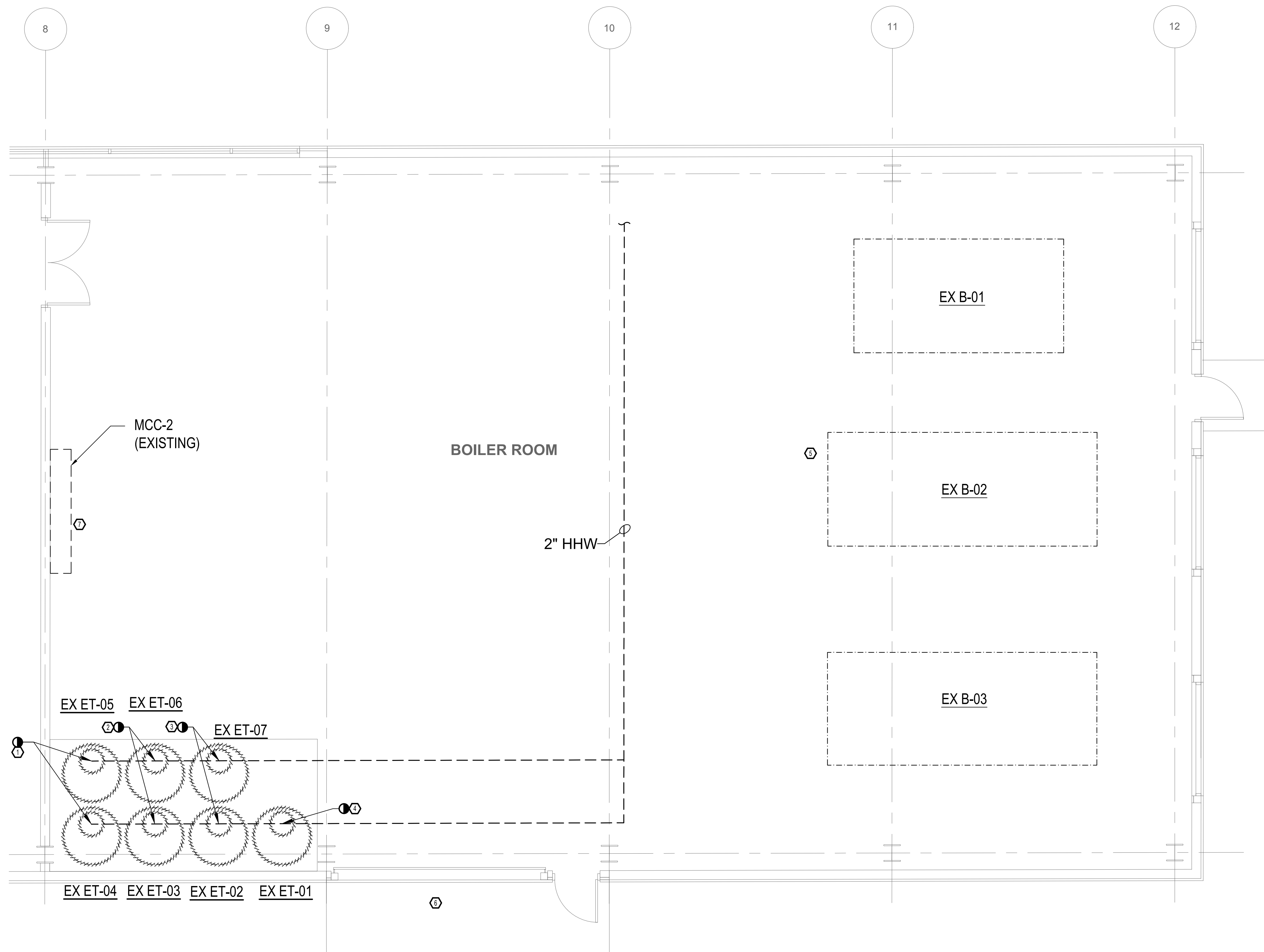
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SHEET INFO

**MECHANICAL
DEMOLITION
PLAN**

M-101

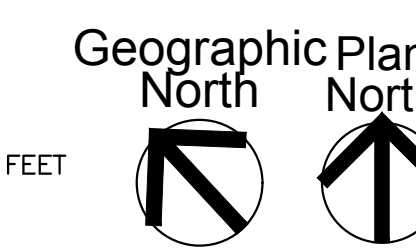
PROJECT NO: 13540
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SHEET KEYNOTES

1. EXISTING EXPANSION TANKS ET-04 AND ET-05 SHALL BE REMOVED IN PHASE 1. DISCONNECT FROM EXISTING PIPING AND PREPARE FOR NEW CONNECTION. ENSURE VALVES AND PIPING ARE IN GOOD CONDITION PRIOR TO CONNECTION TO NEW EQUIPMENT.
2. EXISTING EXPANSION TANKS ET-03 AND ET-06 SHALL BE REMOVED IN PHASE 2. DISCONNECT FROM EXISTING PIPING AND PREPARE FOR NEW CONNECTION. ENSURE VALVES AND PIPING ARE IN GOOD CONDITION PRIOR TO CONNECTION TO NEW EQUIPMENT.
3. EXISTING EXPANSION TANKS ET-02 AND ET-07 SHALL BE REMOVED IN PHASE 3. DISCONNECT FROM EXISTING PIPING AND PREPARE FOR NEW CONNECTION. ENSURE VALVES AND PIPING ARE IN GOOD CONDITION PRIOR TO CONNECTION TO NEW EQUIPMENT.
4. EXISTING EXPANSION TANK ET-01 SHALL BE REMOVED IN PHASE 4. DISCONNECT FROM EXISTING PIPING AND PREPARE FOR NEW CONNECTION. ENSURE VALVES AND PIPING ARE IN GOOD CONDITION PRIOR TO CONNECTION TO NEW EQUIPMENT.
5. EXISTING BOILER BURNER TO BE REMOVED AND REPLACED.
6. CONTRACTOR SHALL USE EXISTING ROLL UP DOOR FOR REMOVAL OF EXISTING EQUIPMENT FROM THE CEP.
7. CONTRACTOR SHALL REMOVE EXISTING 100A 3-POLE CIRCUIT BREAKER SERVING THE B-2 BLOWER. SEE M-201 FOR ADDITIONAL INFORMATION.

MECHANICAL DEMOLITION PLAN
SCALE: 1/4"=1'-0"



GENERAL NOTES

CLIENT AND PROJECT



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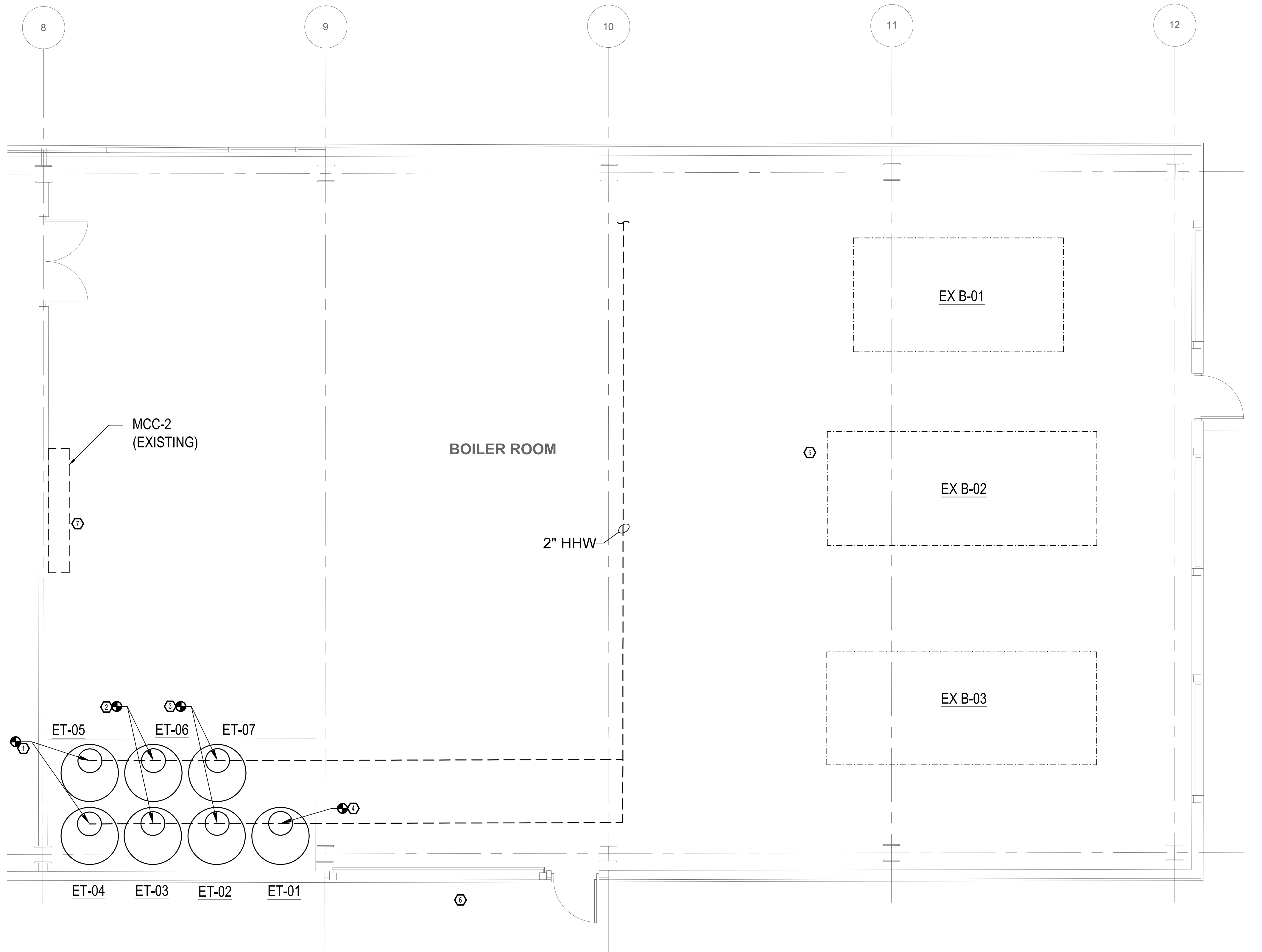
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SHEET KEYNOTES

- ① CONTRACTOR SHALL INSTALL NEW EXPANSION TANKS ET-04 AND ET-05 IN PHASE 1. AFTER INSTALLATION IS COMPLETE, CONTRACTOR SHALL CONFIRM PROPER CONNECTION TO NEW EQUIPMENT AND CONFIRM PRESSURE IS HOLDING AT THE SAME PIPING HEADER VIA PRESSURE GAUGES AT EACH TANK.
- ② CONTRACTOR SHALL INSTALL NEW EXPANSION TANKS ET-03 AND ET-06 IN PHASE 2. AFTER INSTALLATION IS COMPLETE, CONTRACTOR SHALL CONFIRM PROPER CONNECTION TO NEW EQUIPMENT AND CONFIRM PRESSURE IS HOLDING AT THE SAME PRESSURE AS THE OTHER EXPANSION TANKS CONNECTED TO THE SAME PIPING HEADER VIA PRESSURE GAUGES AT EACH TANK.
- ③ CONTRACTOR SHALL INSTALL NEW EXPANSION TANKS ET-02 AND ET-07 IN PHASE 3. AFTER INSTALLATION IS COMPLETE, CONTRACTOR SHALL CONFIRM PROPER CONNECTION TO NEW EQUIPMENT AND CONFIRM PRESSURE IS HOLDING AT THE SAME PRESSURE AS THE OTHER EXPANSION TANKS CONNECTED TO THE SAME PIPING HEADER VIA PRESSURE GAUGES AT EACH TANK.
- ④ CONTRACTOR SHALL INSTALL NEW EXPANSION TANKS ET-01 IN PHASE 4. AFTER INSTALLATION IS COMPLETE, CONTRACTOR SHALL CONFIRM PROPER CONNECTION TO NEW EQUIPMENT AND CONFIRM PRESSURE IS HOLDING AT THE SAME PRESSURE AS THE OTHER EXPANSION TANKS CONNECTED TO THE SAME PIPING HEADER VIA PRESSURE GAUGES AT EACH TANK.
- ⑤ NEW BOILER BURNER TO BE INSTALLED AND TESTED TO CONFIRM PROPER INSTALLATION. REFER TO DRAWING SCHEDULE AND MANUFACTURER'S OPERATING SPECIFICATION.
- ⑥ CONTRACTOR SHALL USE EXISTING ROLL UP DOOR FOR BRINGING NEW EQUIPMENT INTO THE CEP.
- ⑦ CONTRACTOR SHALL PROVIDE A 60A 3-POLE CIRCUIT BREAKER TO SERVE THE B-2 BLOWER WHICH SHALL BE COMPATIBLE WITH THE SQUARE D MODEL 6 MOTOR CONTROL CENTER. COORDINATE ALL REQUIREMENTS WITH THE BURNER MANUFACTURER.

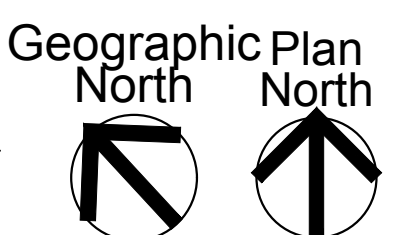
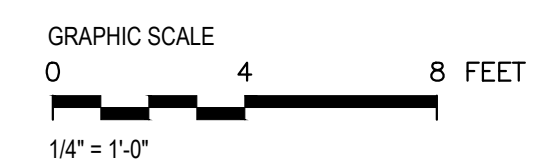


MECHANICAL PLAN
SCALE: 1/4"=1'-0"

SHEET INFO

**MECHANICAL
PLAN**

M-201



PROJECT NO: 13540
DATE: OCT 30, 2023
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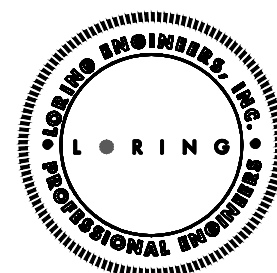
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No. Date Description

SHEET INFO

**MECHANICAL
SCHEDULES**

M-401

PROJECT NO: 13540

DATE: OCT 30, 2023

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ET ASME EXPANSION TANK SCHEDULE BASIS OF DESIGN: BELL & GOSSETT										
TANK NO.	LOCATION	SYSTEM SERVED	TANK TYPE	TANK VOLUME (GAL.)	SIZE		OPER. TEMP. (°F)	INITIAL FILL PRESS. (PSIG)	A.S.M.E. WORK PRESS. (PSIG)	MODEL NUMBER/NOTES
					DIA. (IN.)	LENGTH HEIGHT (IN.)				
ET-1	CENTRAL ENERGY PLANT	HEATING HOT WATER	BLADDER	528	48	86	40-200	45	125	B-2000
ET-2	CENTRAL ENERGY PLANT	HEATING HOT WATER	BLADDER	528	48	86	40-200	45	125	B-2000
ET-3	CENTRAL ENERGY PLANT	HEATING HOT WATER	BLADDER	528	48	86	40-200	45	125	B-2000
ET-4	CENTRAL ENERGY PLANT	HEATING HOT WATER	BLADDER	528	48	86	40-200	45	125	B-2000
ET-5	CENTRAL ENERGY PLANT	HEATING HOT WATER	BLADDER	528	48	86	40-200	45	125	B-2000
ET-6	CENTRAL ENERGY PLANT	HEATING HOT WATER	BLADDER	528	48	86	40-200	45	125	B-2000
ET-7	CENTRAL ENERGY PLANT	HEATING HOT WATER	BLADDER	528	48	86	40-200	45	125	B-2000

B BOILER BURNER SCHEDULE						
DESIG.	NATURAL GAS (MBH)	MINIMUM PRESSURE (IN)	FUEL OIL (GPH)	BLOWER MOTOR (HP)	BASIS OF DESIGN	REMARKS
B-2	36,000	128	257	20	POWERFLAME CM10C-G(O)-30	1,2,3

NOTES:

- BOILER BURNER REPLACEMENT SHALL INCLUDE NEW GAS TRIN, OIL PIPING VALVE RIG, BURNER MOUNTING PLATE, AND BOILER BURNER CONTROL PANEL. REFER TO SPECIFICATIONS FOR DETAILS.
- NEW CONTROL PANEL SHALL COMMUNICATE VIA MODBUS INTERFACE TO THE PLANT CONTROL SYSTEM.
- BOILER BURNER CONTROL SEQUENCE SHALL MATCH THE EXISTING CONTROL SEQUENCE, IN COORDINATION WITH THE OTHER TWO EXISTING BOILERS.