REQUEST FOR QUOTATION
(RFQ) 17-1174OV
Wastewater Division, Utilities Department, Laboratory Exhaust Fans Replacement, 4751 66th Street West, Bradenton, FL 34210

Manatee County, a political subdivision of the State of Florida, (hereinafter "County") invites your participation in the following Request for Quotation. All quotes submitted must be in accordance with the Request for Quotation documents provided herein.

NON-MANDATORY INFORMATION CONFERENCE AND SITE INSPECTION

In order to ensure all prospective quoters have sufficient information and understanding of County's needs, an **Information Conference** will be held in the at **10:00 AM July 12, 2017 at the Wastewater Division Laboratory, Utilities Department located at 4751 66th Street West, Bradenton, FL 34210.**

Site Inspection of the Work shall take place immediately following the Information Conference. Additional site inspection schedules may be found on page A-2 of this Request for Quotation.

DEADLINE FOR CLARIFICATION REQUESTS: 5:00 PM on July 27, 2017.

This solicitation is not a sealed bid process. Replies may be submitted via email, fax or U.S. Mail. Address for US Mail submittal provided on page A- 1.

Replies are due 3:00 PM on August 16, 2017.

FOR INFORMATION CONTACT:
Olga Valcich, CPPB – Contract Specialist
PHONE (941) 749-3055
olga.valcich@mymanatee.org
Manatee County Financial Management Department
Procurement Division

AUTHORIZED FOR RELEASE_____

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SECTION A
INFORMATION TO QUOTERS

PURPOSE
It is the intent of the County of Manatee to procure the expertise of a Mechanical Contractor to provide all necessary labor, material, equipment, testing and incidentals required to remove, furnish and install two (2) Exhaust Fans at the Manatee County Water Treatment Laboratory located in Bradenton, FL,

Work shall be performed by one (1) Prime Contractor.

QUOTE FORM DELIVERY REQUIREMENTS
Any quotes received after the stated time and date will not be considered. Acceptable methods of delivery of quotes are as follows:

Email Address: olga.valcich@mymanatee.org
Fax No.: (941)749-3034
US MAIL to: 1112 Manatee Avenue West, Suite 803, Bradenton FL 34205

Replies are due at 3:00 PM on August 16, 2017.

MODIFICATION OF RFQ DOCUMENTS
If a Quoter wishes to recommend changes to the RFQ documents, the Quoter shall furnish, in writing, data and information necessary to aid County in evaluating the request to modify the Specifications. County is not obligated to make any changes to the RFQ documents. Unless an Addendum is issued, the RFQ documents shall remain unaltered. **Quoters must fully comply with the RFQ documents in their entirety.**

DEADLINE FOR CLARIFICATION REQUESTS
July 27, 2017 a 5:00PM. shall be the deadline to submit all inquiries, suggestions, or requests concerning interpretation, clarification or additional information pertaining to this Request for Quotes to the Manatee County Procurement Division.

COSTS INCURRED IN RESPONDING
This solicitation does not commit the County to pay any costs incurred in the submission of quotes or make necessary studies or designs for the preparation thereof, nor to procure or contract for the equipment.

SECURING QUOTE DOCUMENTS
RFQs and related documents are available on http://www.mymanatee.org/purchasing for download in a portable document format (.PDF) file by clicking on "Quotes and Proposals" from the Procurement Division's web page. You may view and print these files using Adobe Reader software. If necessary, you may download a free copy of Adobe Reader from the link provided on the "Quotes and Proposals" page.

Additionally, Manatee County collaborates with the Manatee Chamber of Commerce by announcing solicitation opportunities to the Chamber which are then passed to its members.

Complete copies of the RFQ and all related documents are available for public inspection at the Manatee County Procurement Division, 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205, or by calling (941) 749-3014. Appointments are encouraged. Documents are available between the hours of 9:00 AM and 4:00 PM Monday through Friday, with the exception of holidays. A complete set of the RFQ documents must be used in preparing quotes. County assumes no responsibility for errors and misinterpretations resulting from the use of incomplete sets of quote documents.

EXAMINATION OF QUOTE DOCUMENTS AND SITE(S)
It is the responsibility of each quoter before submitting a quote, to

(a) Examine the RFQ documents thoroughly;

(b) Visit the Project Site to inspect and become familiar with local conditions that may affect cost, progress, performance, or furnishing of the Work.

Site Inspections shall be held on:

July 20, 2017 at 10:00 AM

and

August 8, 2017at 10:00 AM

Location: Wastewater Division Laboratory, Utilities Department, 4751 66th Street West Bradenton, FL 34210

Jeff Koch (941) 792-8811, Ext 5178) shall coordinate the site inspection.

(c) Consider federal, state, and local codes, laws, and regulations that may affect costs, progress, performance, or furnishing of the Work;

(d) Study and carefully correlate quoter's observations with the RFQ documents; and

(e) Notify County of all conflicts, errors, or discrepancies in the RFQ documents.

Each quoter may, at quoter's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies, and obtain any additional information and data which pertain to the physical conditions at or contiguous to the Project Site(s) or otherwise which may affect cost, progress, performance or furnishing of the Work and which quoter deems necessary to determine his quote for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the RFQ documents. County will provide each quoter access to the site(s) to conduct such explorations and tests.

Quoter shall fill all holes, clean up and restore the Project Site(s) to its former condition upon completion of such explorations. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by successful quoter in performing the Work are identified in the RFQ documents.

All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by successful quoter. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by County unless otherwise provided in the RFQ documents.

Inspection of the Project Site(s) is **a requirement** to be considered for award of this quote. Prior to submitting a quote, each quoter shall examine the Project Site(s) and all conditions thereon fully familiarizing themselves with the full scope of the Work. Failure to become familiar with Project Site conditions will in no way relieve the successful quoter from the necessity of furnishing any materials or performing any Work that is required to complete the Project in accordance with the Project Plans and Specifications. Quoter shall acknowledge inspection of the Project Site(s) on his/her signed, submitted Quote Form.

MODIFICATION OF QUOTE DOCUMENTS

If a quoter wishes to recommend changes to the RFQ documents, the quoter shall furnish, in writing, data and information necessary to aid County in evaluating the request to modify the RFQ documents. County is not obligated to make any changes to the RFQ documents. Unless an addendum is issued, the RFQ documents shall remain unaltered. **Quoters must fully comply with the RFQ documents in their entirety.**

CLARIFICATION & ADDENDA

Each quoter shall examine all RFQ documents and shall judge all matters relating to their adequacy and accuracy. Any inquiries, suggestions or requests concerning interpretation, clarification or additional information pertaining to this RFQ shall be made through the Manatee County Procurement Division. County shall not be responsible for oral interpretations given by any County employee, representative, or others.

July 27, 2017 at 5:00 PM shall be the deadline to submit to the Procurement Division, in writing, all inquiries, suggestions, or requests concerning interpretation, clarification or additional information pertaining to this RFQ.

This deadline has been established to maintain fair treatment of all potential quoters, while maintaining progression of the Work.

If any addenda are issued to this RFQ, County will post the documents on the Procurement Division's web page at http://www.mymanatee.org/purchasing, and then by clicking on "Quotes and Proposals".

The issuance of a written addendum is the only official method whereby interpretation, clarification or additional information can be given.

It shall be the **responsibility of each quoter, prior to submitting a quote**, to contact the Procurement Division (see contact information on the cover page) to **determine if any addenda were issued** and to make such addenda a part of their quote.

CONFIDENTIALITY OF SECURITY RELATED RECORDS

(a) Pursuant to Florida Statutes § 119.071(3), the following records (hereinafter referred to collectively as "the Confidential Security Records") are confidential and exempt from the disclosure requirements of Florida Statutes § 119.07(1):

1. A Security System Plan or portion thereof for any property owned by or leased to the County or any privately owned or leased property held by the County.

2. Building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility, or other structure owned or operated by the County.

3. Building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout or structural elements of an attractions and recreation facility, entertainment or resort complex, industrial complex, retail and service development, office development, or hotel or motel development in the possession of, submitted to the County.

(b) Contractor/Vendor agrees that it shall not, as a result of a public records request or for any other reason disclose the contents of, or release or provide copies of the Confidential Security Records to any other party absent the express written authorization of the County's Property Management Director or to comply with a court order requiring such release or disclosure. To the extent Contractor/Vendor receives a request for such records, it shall immediately contact the County's designated Contract Manager who shall coordinate the County's response to the request. Notwithstanding the foregoing, the Contractor/Vendor may

1. Disclose or release Security System Plans to:

(A) The property County or leaseholder; or

(B) Another state or federal agency to prevent, detect, guard against, respond to, investigate, or manage the consequences of any attempted or actual act of terrorism, or to prosecute those persons who are responsible for such attempts or acts.

2. Disclose or release building plans, blueprints, schematic drawings, and diagrams, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, arena, stadium, water treatment facility, or other structure owned or operated by the County:

(A) To another governmental entity if disclosure is necessary for the

receiving entity to perform its duties and responsibilities;
(B) To a licensed architect, engineer, or contractor who is performing work on or related to the building, arena, stadium, water treatment facility, or other structure owned or operated by the County and is contractually bound by the Contractor/Vendor to comply with this Article/Section; or
(C) Upon a showing of good cause before a court of competent jurisdiction.

(c) For purposes of this Section, the term "Security System Plan" includes all:

1. Records, information, photographs, audio and visual presentations, schematic diagrams, surveys, recommendations, or consultations or portions thereof relating directly to the physical security of the facility or revealing security systems;
2. Threat assessments conducted by any agency or any private entity;
3. Threat response plans;
4. Emergency evacuation plans;
5. Sheltering arrangements; or
6. Manuals for security personnel, emergency equipment, or security training.

LOBBYING

After the issuance of any RFQ, prospective quoters or their agents, representatives or persons acting at the request of such quoter shall not contact, communicate with or discuss any matter relating to the RFQ with any officer, agent or employee of Manatee County other than the Purchasing Official or the contact identified in this RFQ, pursuant to the Manatee County Code of Laws. This prohibition includes copying such persons on all written communication, including email correspondence. This requirement begins with the issuance of an RFQ and ends upon execution of the final Agreement or when the RFQ has been cancelled. Violators of this prohibition shall be subject to sanctions as provided in the Manatee County Code of Laws.

UNBALANCED QUOTING PROHIBITED

County recognizes that large and/or complex projects will often result in a variety of methods, sources, and prices. However, where in the opinion of County such variation does not appear to be justified, given quoter requirements and industry and market conditions, the quote will be presumed to be unbalanced. Examples of unbalanced quotes will include:

a. Quotes showing omissions, alterations of form, additions not specified, or required conditional or unauthorized alternate quotes.

   quoting prices that substantially deviate, either higher or lower, from those quotes included in the of competitive quoters for the same line item unit costs.

b. Quotes where the unit costs offered are in excess of or below reasonable cost analysis values.

In the event County determines that a quote is presumed unbalanced, it will request the opportunity to and reserves the right to, review all source quotes, price lists, letters of intent, etc., which the quoter obtained and upon which the quoter relied upon to develop its quote. County reserves the right to reject as nonresponsive any presumptive unbalanced quotes where the quoter is unable to demonstrate the validity and/or necessity of the unbalanced unit costs.

FRONT LOADING OF QUOTE PRICING PROHIBITED

Prices offered for performance and/or acquisition activities which occur early in the Project Schedule, such as mobilization; clearing and grubbing; or maintenance of traffic; that are substantially higher than pricing of competitive quoters within the same portion of the Project Schedule, will be presumed to be front loaded. Front loaded quotes could reasonably appear to be an attempt to obtain unjustified early payments creating a risk of insufficient incentive for the quoter to complete the Work or otherwise creating an appearance of an undercapitalized quoter.

In the event County determines that a quote is presumed to be front loaded, it will request the opportunity to, and reserves the right to, review all source quotes, quotes, price lists, letters of intent, etc., which the quoter obtained and upon which the quoter relied upon to develop the pricing or acquisition timing for these quote items. County reserves the right to reject as nonresponsive any presumptive front loaded quotes where the quoter is unable to demonstrate the validity and/or necessity of the front loaded costs.

COSTS INCURRED IN RESPONDING

This solicitation does not commit the County to pay any costs incurred in the submission of quotes or make necessary studies or designs for the preparation thereof, nor to procure or contract for the equipment.

RESERVED RIGHTS

County reserves the right to accept or reject any and/or all quotes, to waive irregularities and technicalities, and to request resubmission. Also, County reserves the right to accept all or any part of the quote and to increase or decrease quantities to meet additional or reduced requirements of County. Any sole response received by the first submission date may or may not be rejected by County depending on available competition and current needs of County. For all items combined, the quote of the lowest, responsive, responsible quoter will be accepted, unless all quotes are rejected.

The lowest, responsible quoter shall mean that quoter who makes the lowest quote to sell goods and/or services of a quality which meets or exceeds the quality of goods and/or services set forth in the RFQ documents or otherwise required by County.

To be responsive, a quoter shall submit a quote which conforms in all material respects to the requirements set forth in the RFQ.

To be a responsible quoter, the quoter shall have the capability in all respects to perform fully the quote requirements, and the tenacity, perseverance, experience, integrity, reliability, capacity, facilities, equipment, and credit which will assure good faith performance.

Also, County reserves the right to make such investigation as it deems necessary to determine the ability of any quoter to furnish the service requested. Information County deems necessary to make this determination shall be provided by the quoter. Such information may include, but shall not be limited to current financial statements, verification of availability of equipment and personnel, and past performance records.

APPLICABLE LAWS

Quoter must be authorized to transact business in the State of Florida. All applicable laws and regulations of the State of Florida and ordinances and regulations of Manatee County will apply to any resulting Agreement. Any involvement with the Manatee County Procurement Division shall be in accordance with the Manatee County Purchasing Ordinance as amended.

COLLUSION

By submitting a quote to this RFQ, quoter certifies that it has not divulged, discussed or compared its quote with any other quoter, and has not colluded with any other quoter or parties to this quote whatsoever. Also, quoter certifies, and in the case of a joint quote each party thereto certifies as to their own organization, that in connection with this quote:

a. any prices and/or cost data submitted have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices and/or cost data, with any other quoter or with any competitor;

b. any prices and/or cost data quoted for this quote have not been knowingly disclosed by the quoter and will not knowingly be disclosed by the quoter, prior to the scheduled opening, directly or indirectly to any other quoter or to any competitor;

c. no attempt has been made or will be made by the quoter to induce any other person or firm to submit or not to submit a quote for the purpose of restricting competition;

d. the only person or persons interested in this quote, principal or principals is/are named therein and that no person other than therein mentioned has any interest in this quote or in the resulting Agreement to be entered into; and

e. no person or agency has been employed or retained to solicit or secure the resulting Agreement upon an agreement or understanding or a commission, percentage, brokerage, or contingent fee except bona fide employees or established commercial agencies maintained by quoter for purpose of doing business.

CODE OF ETHICS

With respect to this quote, if any quoter violates, directly or indirectly, the ethics provisions of the Manatee County Procurement Ordinance and/or Florida criminal or civil laws related to public procurement, including but not limited to Chapter 112, Part III, Code of Ethics for Public Officers and Employees, Florida Statutes, such quoter will be disqualified from eligibility to perform the Work described in this RFQ, and may also be disqualified from furnishing future goods or services to, and from submitting any future quotes to supply goods or services to, Manatee County.

By submitting a quote, the quoter represents to County that all statements made and materials submitted are truthful, with no relevant facts withheld. If a quoter is determined to have been untruthful in their quote or any related presentation, such quoter will be disqualified from eligibility to perform the Work described in this RFQ, and may also be disqualified from furnishing future goods or services to, and from submitting any future quotes to supply goods or services to, Manatee County.

PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime, as that term is defined in Section 287.133, Florida Statutes, may not submit a quote to provide any goods or services to a public entity; may not submit a quote with a public entity for the construction or repair of a public building or public work; may not submit quotes on leases of real property to a public entity; may not be awarded or perform Work as a contractor, supplier, Subcontractor, or consultant under an agreement with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for CATEGORY TWO for a period of thirty-six (36) months following the date of being placed on the convicted list.

In addition, the Manatee County Code of Laws prohibits the award of any quote to any person or entity who/which has, within the past five (5) years, been convicted of, or admitted to in court or sworn to under oath, a public entity crime or of any environmental law that, in the reasonable opinion of the Purchasing Official, establishes reasonable grounds to believe the person or business entity will not conduct business in a responsible matter.

To ensure compliance with the foregoing, the Code requires all persons or entities desiring to do business with County to execute and file with the Purchasing Official an affidavit, executed under the pain and penalties of perjury, confirming that person, entity and any person(s) affiliated with the entity, does not have such a record and is therefore eligible to seek and be awarded business with County. In the case of a business entity other than a partnership or a corporation, such affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, such affidavit shall be executed by the general partner(s). A Public Contracting and Environmental Crimes Certification form is attached herein for this purpose.

QUOTE FORMS

Quotes must be submitted on the provided forms, although additional pages may be attached. **Quoters must fully complete all pages of the Quote Forms. Quote Forms must be executed by an authorized signatory who has the legal authority to make the quote and bind the company. Quoters must fully comply with all requirements of this RFQ in its entirety.** Failure to comply shall result in quoter being deemed nonresponsive.

CONTRACT FORMS

The Contract resulting from the acceptance of a Quote shall be in the form of a two party agreement.

LEGAL NAME

Quotes shall clearly indicate the legal name, address and telephone number of the quoter on the Quote Form. Quote Forms shall be signed above the typed or printed name and title of the signer. The signer must have the authority to bind the quoter to the submitted quote.

When quoter is a partnership, the Quote Form shall be signed in the name of the firm and by all partners required under the terms of the partnership agreement. When a corporation is a quoter, the authorized corporate officers shall sign.

Quoters who are corporations or limited partnerships shall provide a certified copy of their permit to transact business in the State of Florida, preferably along with the Quote Form, or within forty-eight (48) hours after request by County.

When submitting a quote as a joint venture, it must have filed paper documents with the Division of Profession's Construction Industry Licensing Board prior to submitting a quote.

DISCOUNTS

Any and all discounts must be incorporated in the prices contained in the quote and not shown separately. The prices indicated on the Quote Form shall be the prices used in determining award.

TAXES

Manatee County is exempt from Federal Excise and State Sales Taxes. (F.E.T. Cert. No. 59-78-0089K; Florida Sales Tax Exempt Cert. No. 85-8012622206C-6); therefore, the quoter is prohibited from delineating a separate line item in his quote for any sales or service taxes. Nothing herein shall affect the quoter's normal tax liability.

The Contractor shall be responsible for the payment of taxes of any kind and character, including, but not limited to sales, consumer, use, and other similar taxes payable on account of the work performed and materials furnished under the award in accordance with the laws and Regulations of the place of the project which are applicable during the performance of the work. Nothing herein shall affect the quoter's normal tax liability.

DESCRIPTIVE INFORMATION

Unless otherwise specifically provided in the RFQ documents, all equipment, materials and articles provided shall be new and of the most suitable grade for the purpose intended. Unless otherwise specifically provided in the RFQ documents, reference to any equipment, material, article or patented process, by trade name, brand name, make or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition.

AUTHORIZED PRODUCT REPRESENTATION

The quoter, by virtue of submitting the name and specifications of a manufacturer's product, will be required to furnish the named manufacturer's product. Failure to perform accordingly may, in County's sole discretion, be deemed a material breach of the resulting Agreement, and shall constitute grounds for County's immediate termination of the resulting Agreement.

ROYALTIES AND PATENTS

The successful quoter shall pay all royalties and license fees for equipment or processes in conjunction with the equipment and/or services being furnished. Successful quoter shall defend all suits or claims for infringement of any patent, trademark or copyright, and shall save County harmless from loss on account thereof, including costs and attorney's fees.

AMERICANS WITH DISABILITIES ACT

County does not discriminate upon the basis of any individual's disability status. This non-discrimination policy involves every aspect of County's functions including one's access to, participation, employment, or treatment in its programs or activities. Anyone requiring **reasonable accommodation** for an Information Conference or Quote Opening should contact the person named on the cover page of this RFQ document at least twenty-four (24) hours in advance of either activity.

EQUAL EMPLOYMENT OPPORTUNITY

In accordance with the provisions of Title VI of the Civil Rights Act of 1964 and Title 15, Part 8 of the Code of Federal Regulations, County hereby notifies all quoters that they will affirmatively ensure minority business enterprises will be afforded full opportunity to participate in response to this advertisement and will not be discriminated against on the grounds of race, color or national origin in consideration for quote award.

MBE/DBE

The State of Florida Office of Supplier Diversity provides the certification process and the database for identifying certified MBE/DBE firms. This service may be directly accessed at: http://www.osd.dms.state.fl.us/iframe.htm. If you have any questions regarding this State service, please contact their office at (850) 487-0915.

MATHEMATICAL ERRORS

Quote Forms without mathematical formulas:
In the event of multiplication/extension error(s), the unit price shall prevail. In the event of addition error(s) the extension totals will prevail. In the event the dollar amount for contract contingency is omitted, it will be added to the total price of the quote.
Quote Forms with mathematical formulas:
Interactive Quote Forms that contain mathematical formulas may be used for automating lengthy and complex quote forms.

In the event these forms are used and a multiplication/extension error(s) is discovered, the unit price entered by the vendor shall prevail. The vendor shall assume the responsibility and accuracy of the information input in the quote form and therefore shall verify that the calculations are correct before submitting their quote.

Regardless of which type of quote form is used, all quotes shall be reviewed mathematically and corrected, if necessary, using these standards, prior to additional evaluation.

SUBCONTRACTORS

The successful quoter will obtain prior written approval from the County for any subcontractor(s) and the work they will perform. A subcontractor is defined as any entity performing work within the scope of the project who is not an employee of the successful quoter.

Quoters subcontracting any portion of the work shall include a list of subcontractors along with their quote. The list shall include: name and address of subcontractor, type of work to be performed and the percent of the contract amount to be subcontracted.

Prior to the employment of any person under this contract, the successful quoter shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of (a) all persons employed during the contract term by the successful quoter to perform employment duties within Florida and (b) all persons, including subcontractors, assigned by the successful quoter to perform work pursuant to the contract with Manatee County. For more information on this process, please refer to United States Citizenship and Immigration Service site at: http://www.uscis.gov/.

Only those individuals determined eligible to work within the United States shall be employed under this contract.

By submission of a quote in response to this RFQ, the successful quoter commits that all employees and subcontractors will undergo e-verification before placement on this contract.

If County has reasonable objection to any subcontractor, the County may request the successful quoter to submit an acceptable substitute without an increase in contract sum or contract time.

If successful quoter declines to make any such substitution, the County may award the resulting agreement to the next lowest qualified quoter that proposes to use acceptable subcontractors, who County does not make written objection to. In the event the successful quoter declines to make any such substitution post award, the County may exercise its right to terminate the agreement.

The successful quoter shall maintain sole responsibility for the actions of its employees and subcontractors. New employees brought in after contract award shall follow the same requirement stated above for the life of the contract.

DISCLOSURE

Upon receipt, all inquiries and responses to inquiries related to this RFQ become "Public Records", and shall be subject to public disclosure consistent with Florida Statues, Chapter 119.

Quotes become subject to disclosure thirty (30) days after the opening or if a notice of intent to award decision is made earlier than this time as provided by Florida Statutes § 119.071(1)(b). No announcement or review of the quote shall be conducted at the public quote opening.

Based on the above, County will receive quotes at the time and date stated and will make public at the opening the names of the business entities of all that submitted a quote and any amount presented as a total offer without any verification of the mathematics or the completeness of the quote.

If County rejects all quotes and concurrently notices its intent to reissue the solicitation, the rejected quotes are exempt from public disclosure until such time as County provides notice of an intended decision concerning the reissued solicitation or until County withdraws the reissued solicitation. A quote is not exempt for longer than twelve (12) months after the initial notice rejecting all quotes.

Pursuant to Florida Statutes 119.0701, to the extent CONTRACTOR is performing services on behalf of the COUNTY, contractor must:

a. Keep and maintain public records required by public agency to perform the service.

b. Upon request from the public agency's custodian of public records, provide the public agency with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Florida Statutes, Chapter 119, or as otherwise provided by law.

c. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the contractor does not transfer the records to the public agency.

d. Upon completion of the contract, transfer, at no cost, to the public agency all public records in possession of contractor or keep and maintain public records required by

the public agency to perform the service. If the contractor transfers all public records to the public agency upon completion of the contract, the contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the contractor keeps and maintains public records upon completion of the contract, the contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the public agency, upon request from public agency's custodian of public records, in a format that is compatible with the information technology systems of the public agency.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT COUNTY'S CUSTODIAN OF PUBLIC RECORDS AT: (941) 742-5845, debbie.scaccianoce@mymanatee.org, Attn: Records Manager, 1112 Manatee Ave W., Bradenton, FL 34205.

LOCAL PREFERENCE

Local business is defined as a business legally authorized to engage in the sale of the goods and/or services to be procured, and which certifies within its quote that for at least six (6) months prior to the announcement of the solicitation of quotes it has maintained a physical place of business in Manatee, Desoto, Hardee, Hillsborough, Pinellas or Sarasota County with at least one full-time employee at that location.

Local preference shall not apply to the following categories of Agreements:

1. Purchases or Agreements which are funded, in whole or in part, by a governmental or other funding entity, where the terms and conditions of receipt of the funds prohibit the preference.

2. Any quote announcement which specifically provides that the general local preference policies set forth in this section are suspended due to the unique nature of the goods or services sought, the existence of an emergency as found by either the County Commission or County Administrator, or where such suspension is, in the opinion of the County Attorney, required by law.

To qualify for local preference under this section, **a local business must certify to County** by completing an **"Affidavit as to Local Business Form"**, which is available for download at www.mymanatee.org/vendor. Click on "Affidavit for Local Business" to access and print the form. Complete, notarize, and mail the notarized original to the following address: Manatee County Procurement Division , 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205.

It is the responsibility of the quoter to ensure accuracy of the Affidavit as to Local Business and notify County of any changes affecting same.

VENDOR REGISTRATION

Registering your business with Manatee County will enhance our opportunities to identify sources for goods and services, plus identify local businesses. This information is used for soliciting quotations up to $250,000.00 and for competitive solicitations of larger purchases. Our staff can assist you with your registration as needed.
Our office hours are 8:00 A.M. to 5:00 P.M., Monday through Friday on regular business days. Please call (941) 749-3014 if you wish to have a Purchasing staff member assist you.

Quick steps to registration: **www.mymanatee.org/purchasing**

A link to Vendor Registration is listed on the Procurement Division's web page under "Register as a Vendor". Click on "Vendor Registration Form" for on-line input. Registration is not mandatory; however, by taking the time to register, you are helping County to provide timely notification of quotation, quote and proposal opportunities to your business.

ENVIRONMENTAL SUSTAINABILITY

All quoters are encouraged to use as many environmentally preferable "green" products, materials, supplies, etc. as possible in order to promote a safe and healthy environment. Environmentally preferable are products or services that have a reduced adverse effect on the environment.

Quoters shall acknowledge whether or not their organization has an environmental sustainability initiative by checking the appropriate box on the quote form. In addition, the quoter shall submit a summary of their environmental sustainability initiative along with their quote. This information will be used as a determining factor in the award decision when all other evaluative factors, including local preference policies are otherwise equal.

ePAYABLES

Manatee County and Clerk of the Circuit Court have partnered to offer the ePayables program, which allows payments to be made to vendors via credit cards. The Clerk will issue a unique credit card number to each vendor; the card has a zero balance until payments have been authorized.

After goods are delivered or services rendered, vendors submit invoices to the remit to address on the purchase order according to the current process. When payments are authorized, an email notification is sent to the vendor. The email notification includes the invoice number(s), invoice date(s), and amount of payment. There is no cost for vendors to participate in this program; however, there may be a charge by the company that processes your credit card transactions.

If you are interested in participating in this program, please complete the ePayables Application attached herein and return the completed form via email to Ms. Lori Bryan, Supervisor at lori.bryan@manateeclerk.com.

NOTE: ANY OR ALL STATEMENTS CONTAINED IN THE FOLLOWING SECTIONS: SCOPE OF WORK, QUOTE SUMMARY, CONSTRUCTION AGREEMENT FOR STIPULATED SUM, AND GENERAL CONDITIONS OF THE CONSTRUCTION AGREEMENT, WHICH VARY FROM THE INFORMATION TO QUOTERS, SHALL HAVE PRECEDENCE.

END OF SECTION A

SECTION B
SCOPE OF WORK

B.01 SCOPE OF WORK

Work shall be performed in accordance with the following Scope of Work for the removal and replacement of two (2) laboratory exhaust fans. **Outage shall be over a weekend, coordinated with the County and shall last no more than two (2) consecutive days).**

Successful contractor shall remove the two (2) existing roof mounted exhaust fans set on a single curb, sharing an intake plenum. The entire assembly is to be removed and scrapped, including fans, discharge nozzles, intake plenums, and dampers.

The following items are to remain, to be reused: Roof curb, electrical service, 120 volt convenience outlet above roof, two (2) variable frequency drives in mechanical room, all ductwork and sensors below roof.

A new exhaust fan assembly is to be installed onto existing roof curb. This includes two (2) fans with discharge nozzles, fan assembly with three (3) motorized dampers. Due to the highly corrosive environment, the basis of design for the fan assembly has been selected which offers plastic construction that will not rust with stainless steel hardware. The mechanical contractor and fan manufacturer shall be responsible for field verifying existing conditions including dimensions of curb.

Structural engineering and wind load calculations and documentation for fan assembly and attachment to curb shall be provided by manufacturer of the fan assembly to the Engineer and County Project Manager

Also included under the Scope of Work:

Testing, Adjusting and Balancing shall be in accordance with Section 15990 of the Specification. The test and balance report shall be submitted to the Project Architect/Engineer and to the Owner and shall be signed, "sealed" and certified by a certified balancing agent in the State of Florida whose specialty is HVAC together with a signed statement that this balancer's specialty is HVAC.

It shall be the responsibility of the Successful Quoter to provide a Testing and Balancing Contractor to perform all work in accordance with Section 15990 who has a minimum of five (5) years' experience in balancing Labs with Fume Hoods.

Question 13 of the Quoter's Questionnaire shall be completed to ensure required experience of Testing and Balancing Contractor.

Controls: Wire sensors and motorized dampers are specified on plans, confirm sequence of operation as specified and / or make required modifications. **Boyd Brothers Service, Inc., Punta Gorda, FL (1-941-627-8881) shall be subcontracted by the successful quoter for programming and instrumentation.**

Roof Mounted Service Platform and Stair: A full perimeter equipment platform shall be provided per FMC306.5.1. Guard rails shall be a minimum of 42" above surface. Per NEC, Platform shall provide 42" horizontal service clearance to any serviceable high voltage equipment. Manufacturer of platform shall provide engineered shop drawings for platform and attachment methods.

Structure, handrails of platform and stair shall be stainless steel. Walking surfaces shall be aluminum grate with bi-metallic separation. Paint assemblies to match roof.

For basis of design, contact "Pitched Roof Service Platforms, Inc." at 877-455-7577. Prior to ordering platform and stair assemblies, the Mechanical Contractor shall coordinate all measurements with manufacturer, including roof slope, distance, locations of roof standing seams and roof structure, etc… REF: Plant Sheet M2.0.

Electrical Scope: Successful contractor shall disconnect service of existing fans to be removed and reconnect to new fans. Disconnect switches to be furnished by fan manufacturer. Coordinate with the contractor to remove and reinstall lighting protection.

Scope is to essentially disconnect service of existing fans to be removed, and reconnect to new fans. Disconnect switches to be furnished by fan manufacturer. Coordinate with mechanical contractor to remove and reinstall lighting protection.

All work shall be completed in accordance with Mechanical Specifications:
Sheet No. M1.0, Mechanical Renovation Plan
Sheet No. M2.0, Mechanical Schedules & Details

Electrical Specifications:
Sheet No. E0.0, Electrical Legend, Specifications and General Project Notes
Sheet No. E1.0, Electrical Plans
Sheet No. E2.0, Electrical Riser Diagram and Schedules

Additional Specifications include:
Section 15010, Basic Mechanical Requirements (Section 15010-1 through Section 15010-18

Section 15140, Supports and Anchors (Section 15140-1 through15140-4)

Section 15190, Mechanical Identification (Section 15190-1 through 15190-3)

Section 15290, Ductwork Insulation (Section 15290-1- through 15290-4)

Section 15890, Ductwork (Section 15890-1 through 15890-8)

Section 15910, Ductwork Accessories (Section 15910-1 through 15910-4

Section 15936, Air Devices (Section 15936-1 through 15936-3)

Section 15990, Testing, Adjusting and Balancing (Section 15990-1 through 15590-5

Location of Work:
Wastewater Division, Utilities Department, Laboratory Exhaust Fan Replacement, 4751 66th Street West, Bradenton, FL 34210.

The Contractor shall furnish all shop drawings, working drawings, labor, materials, equipment, tools, services and incidentals necessary to complete all work required by these Specifications.

The Contractor shall perform the work complete, in place and ready for continuous service and shall include any repairs, replacement, and /or restoration required as a result of damages caused prior to acceptance by the County.

The Contractor shall furnish and install all materials, equipment and labor which is reasonably and properly inferable and necessary for the proper completion of the work, whether specifically indicated in the Contract Documents or not.

B.02 COMPLETION OF WORK

The Work will be completed and ready for final inspection within the specified calendar day from the date the Contract Time commences to run. Only one quote shall be considered, based on a completion time period of 120 calendar days.

ALL WORK SHALL BE PERFORMED BY ONE (1) PRIME CONTRACTOR.

B.03 LIQUIDATED DAMAGES

If the successful quoter fails to achieve Substantial Completion of the Work within the Contract Time and as otherwise required by the Contract Documents, the Owner shall be entitled to retain or recover from the successful quoter, as liquidated damages and not as a penalty, the sum of **$100.00 per calendar day**, commencing upon the first day following expiration of the Contract Time and continuing until the actual date of Substantial Completion. Such liquidated damages are hereby agreed to be a reasonable estimate of damages the Owner will incur as a result of delayed completion of the Work. The Owner may deduct liquidated damages as described in this paragraph from any unpaid amounts then or thereafter due the successful quoter under this Agreement. Any liquidated damages not so deducted from any unpaid amounts due the successful quoter shall be payable to the Owner at the demand of the Owner, together with interest from the date of the demand at the maximum allowable rate.

B.04 CONTRACT CONTINGENCY WORK

Contract contingency is a monetary allowance used solely at Owner's discretion to handle unexpected conditions as required to satisfactorily complete the Work in accordance with the RFQ documents. A Field Directive must be issued by an authorized Owner representative to authorize use of contract contingency funds.

The percentage for contract contingency is listed on the Quote Form. Quoter shall enter the dollar amount for contract contingency based on the percentage of the total base quote. The total contract award will include contract contingency.

Appropriate uses of contract contingency include increases to existing quote item quantities that do not change the initial scope of Work, which may be directed by staff; modification items not originally Quote which were unforeseen yet necessary during the Work to provide a safe, complete Project and that do not change the initial scope of Work; and unanticipated conflicts and/or design changes required during construction which are necessary to provide a safe, complete Project and that do not change the initial scope of Work.

Inappropriate uses of contract contingency include anything that changes the initial scope of Work, including the Contract Sum and Contract Time, and adding Quote items not previously contemplated that change the initial scope of Work.

END OF SECTION B

SECTION C
QUOTE SUMMARY

C.01 MINIMUM QUALIFICATIONS OF QUOTERS

No person who is not certified or registered as a Mechanical Contractor pursuant to Chapter 489, Florida Statutes, on the day the quote is submitted, and who has continuously held that certification or registration for a period of at least three (3) consecutive years immediately prior to the day the quote is submitted, may be qualified to quote on this Work. In the event that a quoter is a business organization, including a partnership, corporation, business trust or other legal entity as set forth in Section 489.119(2), Florida Statutes, then the quoter shall only be qualified to quote on this Work if: 1) the quoter (the business organization) is on the day the quote is submitted, and for at least three (3) consecutive years immediately prior to the day the quote is submitted has been, in continuous existence, properly licensed and registered as required by Florida law; and 2) the quoter, on the day the quote is submitted, has a certified or registered Qualifying Agent, as required by Section 489.119, Florida Statutes, and that Qualifying Agent has been the same Qualifying Agent of the quoter for a period of at least three (3) consecutive years immediately prior to the day the quote is submitted.

C.02 PERMITTING

Contractor shall be responsible to pull and pay for any permitting required to perform a successful project. Manatee County personnel shall be available to the Contractor should any assistance be required in obtaining the permit.

C.03 WORKING HOURS

Successful Contractor shall coordinate the construction schedule with County representative.

Removal and replacement of exhaust fans shall be done anytime over a two (2) day weekend and shall be fully operational after the outage.

If the proper and efficient prosecution of the work requires operations during the night or weekends, the written permission of the County shall be obtained prior to starting such items of work.

Such permission, however, may be revoked at any time by the County if the contractor fails to maintain adequate equipment and supervision for the proper execution and control of the work at night.

C.04 CLEAN UP

The Contractor shall keep the construction site free of rubbish and waste materials and restore to their original condition those portions not designated for alteration by the scope of work. Clean up and restoration shall be accomplished on a continuing basis through the contract period and in such a manner as to maintain a minimum of nuisance and interference to the County.

It is the intent of this specification that any work areas and those other areas not designated for alteration by the scope of work be restored to their original condition or as nearly as possible.

C.05 REGULATIONS

It shall be the responsibility of the quoter to assure compliance with any OSHA, EPA and / or other federal or state of Florida rules, regulations or other requirements, as each may apply.

C.06 DEMONSTRATION

After all adjustments, lubrications and clean up, the contractor shall demonstrate and instruct the proper operation, function of the exhaust fan(s)

C.07 WARRANTIES, MAINTENANCE MANUALS AND BONDS

After final approval of work, the contractor shall deliver to the County the following:

A. Service and Maintenance manuals 4 (four) sets.
B. Submit Warranties, Bonds

C.08 MEASUREMENT AND PAYMENT – LUMP SUM ITEMS

When payment for items is shown to be paid for on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum items. Lump sum contracts shall be complete, tested and fully operable prior to request for final payment. Contractor may be required to provide a break-down of the lump sum totals.

Item No. 1: Mobilization/Demobilization

Measurement and payment for this Quote Item shall include full compensation for the required 100 percent (100%) Performance Bond, 100 Percent (100%) Payment Bond, all required insurance for the project and the Contractor's mobilization and demobilizations costs as shown on the Quote Form. Mobilization includes, but is not limited to: preparation and movement of personnel, contractor's equipment required for product installation, supplies and incidentals such as safety and sanitary supplies/ facilities.

Payment for mobilization shall not exceed 10 percent (10%) of the total Contract cost, but shall exclude the material cost of any emergency equipment, unless the Contractor can prove to the County that his actual mobilization costs exceeds 10 percent (10%).

Partial payments for this Quote Item will be made in accordance with the following schedule:

Percent of Original Contract Amount	Percent Allowable Payment of Mobilization/Demobilization Quote Item Price:
5	25
10	35
25	45
50	50
75	75
100	100

Item 2: Remove and scrap two (2) existing roof mounted exhaust fans, and install two (2) New Exhaust Fans Assembly as detailed in the quote form. Partial payment may be made for the removal and installation of the new Exhaust Fans per Contractor's Schedule of Values.

Item 3: Roof Mounted Service Platform and Stair: Partial payment shall be made for fabricated sections and for installation of sections per the Contractor's Schedule of Values.

Item 4: Testing, Adjusting and Balance: Full payment shall be made in accordance with the Test and Balance report submitted and approved by the Owner.

Item 5: Programming and Instrumentation: Full payment shall be made upon completion, and verification by the Owner of the Disconnect/Reconnect of the Strobic Exhaust Fans. Work shall be performed by Boyd Brothers Service, Inc., Punta Gorda, FL.

C.09 BASIS OF AWARD

County may not make award to a quoter who is delinquent in payment of any taxes, fees, fines, contractual debts, judgments, or any other debts due and owed to the County, or is in default on any contractual or regulatory obligation to the County. By submitting this solicitation response, quoter attests that it is not delinquent in payment of any such debts due and owed to the County, nor is it in default on any contractual or regulatory obligation to the County. In the event the quoter's statement is discovered to be false, quoter will be subject to suspension and/or debarment and the County may terminate any award it has with quoter.

Award shall be to the lowest, responsive, responsible quoter meeting specifications and having the lowest total offer for the Work as set forth in this RFQ. Quote prices shall include costs for furnishing all labor, equipment and/or materials for the completion of the Work in accordance with and in the manner set forth and described in the RFQ documents to Owner's satisfaction within the prescribed time.

NOTE: Inspection of the site is a pre-requisite to be considered for award of this quote.

In evaluating quotes, Owner shall consider the qualifications of the quoter; and if required, may also consider the qualifications of the Subcontractors, suppliers, and other persons and organizations proposed. Owner may also consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work.

Whenever two or more quotes are equal with respect to price, the quote received from a local business shall be given preference in award.

Whenever two or more quotes are equal with respect to price, and all other evaluative factors are otherwise equal, including local preference policies, if the company provides documented environmentally preferable "green" products, materials, or supplies, they shall be given preference in award.

Whenever two or more quotes which are equal with respect to price are received, and neither of these quotes are from a local business, and neither of these quotes provides documented "green" products, the award shall be determined by a chance drawing, coin toss, or similar tie-breaking method conducted by the Procurement Division and open to the public.

END OF SECTION C

SECTION D/ RFQ17-1174OV / Water Treatment Laboratory Exhaust Fan Replacement
INSURANCE AND BOND REQUIREMENTS

The Successful Bidder will not commence work under the resulting Agreement until all insurance coverages indicated herein have been obtained. The Successful Bidder shall obtain and submit to the Procurement Division within ten (10) calendar days from the date of notice of intent to award, at his expense, the following minimum amounts of insurance (inclusive of any amounts provided by an umbrella or excess policy):

Insurance / Bond Type	Required Limits
1. ☒ Automobile Liability:	Coverage must be afforded under a per occurrence policy form including coverage for all owned, hired and non-owned vehicles. $ 1,000,000 combined single limit, or $_____ bodily injury and $_____ property damage. Coverage must also include $10,000 Personal Injury Protection (No Fault), $_____ Hired-Non Owned Liability and $10,000 Medical Payments. *This policy shall contain severability of interests' provisions.*
2. ☒ Commercial General Liability: (Occurrence Form - patterned after the current ISO form)	Coverage shall be afforded under a per occurrence policy form. $1,000,000 single limit per occurrence; $1,000,000 aggregate $_____ Products/Completed Operations Aggregate $1,000,000 Personal and Advertising Injury Liability $100,000 Fire Damage Liability $10,000 Medical Expense, and $_____ Third Party Property Damage. $_____ Project Specific Aggregate (Required on projects valued at over $10,000,000) *This policy shall contain severability of interests' provisions.*
3. ☒ Employer's Liability:	$100,000 each accident $_____ disease each employee $_____ disease policy limit
4. ☒ Worker's Compensation:	Statutory Limits of Chapter 440, Florida Statutes, and all Federal Government Statutory Limits & Requirements. If any operations are to be undertaken on or about navigable waters, coverage must be included for the US Longshoremen & Harbor Workers Act and Jones Act. Note: Should "leased employees" be retained for any part of the project or service, the employee leasing agency shall provide evidence of workers' compensation coverage and employee liability coverage for all personnel on the worksite and in compliance with the above requirements.

Insurance / Bond Type	Required Limits
	Note: Workers' compensation coverage is a firm requirement. Elective exemptions are considered on a case-by-case basis and are approved in a very limited number of instances.
5. ☐ Other Insurance, as noted:	a. ☐ Aircraft Liability $ _____ per occurrence Coverage shall be carried in limits of not less than $5,000,000 each occurrence if applicable to the completion of the services under this Agreement. b. ☒ Installation Floater If the resulting Agreement **does not** include construction of or additions to above ground building or structures, but does involve the installation of machinery or equipment, Successful Bidder shall provide an **"Installation Floater"** with the minimum amount of insurance to be 100% of the value of such addition(s), building(s), or structure(s). c. ☐ Pollution $ _____ per occurrence d. ☐ Professional Liability and/or Errors and Omissions (E&O) Liability Professional (E&O) Liability shall be afforded for the Bodily Injury and Property Damage for not less than $_____ Each Claim, $1,000,000 Policy Aggregate. e. ☒ Builder's Risk Insurance When this contract or agreement includes the construction of roadways and/or the addition of a permanent structure or building, including the installation of machinery and/or equipment, the following insurance coverage must be afforded: Coverage Form: Completed Value, All Risk (Roadways/Buildings and Machinery/Equipment) in an amount equal to 100% of the value upon completion or the value of the equipment to be installed. Coverage should include, but not be limited to, storage and transport of materials, equipment, supplies of any kind whatsoever to be used on or incidental to the project, theft coverage, and Waiver of Occupancy Clause Endorsement, where applicable. The policy shall not carry a self-insured retention/deductible greater than $10,000.

Insurance / Bond Type	Required Limits
	f. ☐ Cyber Liability Coverage must comply with Florida Statute 501.171 and must be afforded under a per occurrence policy form for limits not less than $_____ Security Breach Liability, $_____ Security Breach Expense (each occurrence), $_____ Security Breach Expense (aggregate), $_____ Replacement or Restoration of Electronic Data, $_____ Extortion Threats, $_____ Business Income and Extra Expense, and $_____ Public Relations Expense. The policy must not carry a self-insured retention/deductible greater than $_____. g. ☐ Hazardous Materials Insurance Hazardous materials includes all materials and substances that are now designated or defined as hazardous by Florida or Federal law or by the rules of regulations of Florida or any Federal Agency. *Pollution Liability* Coverage must be afforded under a per occurrence policy form for limits not less than the value of the contract, subject to a $_____ minimum, for Bodily Injury and Property Damage to include sudden and gradual release, each claim and aggregate. *Asbestos Liability (If handling within scope of Contract)* Coverage must be afforded under a per occurrence policy form for limits not less than the value of the contract, subject to a $_____ minimum, for Bodily Injury and Property Damage to include sudden and gradual release, each claim and aggregate. *Disposal* Coverage must be afforded under a per occurrence policy form for limits not less than the value of the contract, subject to a $_____ minimum, for Liability for Sudden and Accidental Occurrences, each claim and an aggregate and not less than the value of the contract, subject to a $_____ minimum, for Liability for Non-Sudden Occurrences, each claim and aggregate. *Hazardous Waste Transportation Insurance* Coverage must be afforded under a per occurrence policy form for limits not less than the value of the contract, subject to a $_____ minimum, per accident. The Successful Bidder shall designate the hauler and have the hauler furnish a Certificate of Insurance for Automobile Liability Insurance with Endorsement MCS-90 for liability arising out of the transportation of

Insurance / Bond Type	Required Limits
	hazardous materials. The Successful Bidder must also provide the EPA Identification Number. h. ☐ Liquor Liability Coverage must be afforded under a per occurrence policy form for limits not less than $_____ Each Occurrence and Aggregate. i. ☐ Garage Keeper's Liability Coverage shall be required if the maintenance, servicing, cleaning or repairing of any County motor vehicles is inherent or implied within the provision of the contract. Coverage must be afforded under a per occurrence policy form for limits not less than equal to the full replacement value of the lot or garage. j. ☐ Bailee's Customer Coverage must be afforded under a per occurrence policy form for limits not less than equal to the full replacement value of the lot or garage. k. ☐ Watercraft $_____ per occurrence
6. ☒ Bid Bond:	A construction project over $100,000 requires a Bid Bond in the amount of 5% of the total bid offer. Bid bond shall be submitted with the sealed bid and shall include project name, location, and / or address and project number. In lieu of the bond, the bidder may file an alternative form of security in the amount of 5% of the total offer, in the form of a money order, a certified check, a cashier's check, or an irrevocable letter of credit issued to Manatee County.
7. ☒ Payment and Performance Bond:	A construction project over $100,000 requires a Payment and Performance Bond be submitted by Successful Bidder for 100% of the award amount and shall be presented to Manatee County within ten (10) calendar days of issuance of the notice of intent to award.

Reviewed___WLK

INSURANCE REQUIREMENTS

I. THE POLICIES ARE TO CONTAIN, OR BE ENDORSED TO CONTAIN, THE FOLLOWING PROVISIONS:

Commercial General Liability and Automobile Liability Coverages

a. **"Manatee County, a Political Subdivision of the State of Florida," is to be named as an Additional Insured in respect to:** Liability arising out of activities performed by or on behalf of the Successful Bidder, his agents, representatives, and employees; products and completed operations of the Successful Bidder; or automobiles owned, leased, hired or borrowed by the Successful Bidder. The coverage shall contain no special limitation(s) on the scope of protection afforded to the County, its officials, employees or volunteers.

In addition to furnishing a Certificate of Insurance, the Successful Bidder shall provide the endorsement that evidences Manatee County being listed as an Additional Insured. This can be done in one of two ways: (1) an endorsement can be issued that specifically lists "Manatee County, a Political Subdivision of the State of Florida," as Additional Insured; or, (2) an endorsement can be issued that states that all Certificate Holders are Additional Insured with respect to the policy.

b. The Successful Bidder's insurance coverage shall be primary insurance with respect to the County, its officials, employees and volunteers. Any insurance or self-insurance maintained by the County, its officials, employees or volunteers shall be excess of Successful Bidder's insurance and shall be non-contributory.

c. The insurance policies must be on an occurrence form.

Workers' Compensation and Employers' Liability Coverages

The insurer shall agree to waive all rights of subrogation against the County, its officials, employees and volunteers for losses arising from work performed by the Successful Bidder for the County.

II. GENERAL INSURANCE PROVISIONS APPLICABLE TO ALL POLICIES:

a. Prior to the execution of contract or issuance of a Purchase Order, and then annually upon the anniversary date(s) of the insurance policy's renewal date(s) for as long as this contract remains in effect, Successful Bidder shall furnish the County with a Certificate(s) of Insurance (using an industry accepted certificate form, signed by the Issuer, with applicable endorsements, and containing the solicitation or contract number, and title or description) evidencing the coverage set forth above and naming "Manatee County, a Political Subdivision of the State of Florida" as an Additional Insured on the applicable coverage(s) set forth above.

b. If the policy contains an aggregate limit, confirmation is needed in writing (letter, email, etc.) that the aggregate limit has not been eroded to procurement representative when supplying Certificate of Insurance.

In addition, when requested in writing from the County, Successful Bidder will provide the County with a certified copy of all applicable policies. The address where such certificates and certified policies shall be sent or delivered is as follows:

Manatee County, a Political Subdivision of the State of Florida
Attn: Risk Management Division
1112 Manatee Avenue West, Suite 969
Bradenton, FL 34205

c. The project's solicitation number and title shall be listed on each certificate.

d. Successful Bidder shall provide thirty (30) days written notice to the Risk Manager of any cancellation, non-renewal, termination, material change, or reduction in coverage of any insurance policies to procurement representative including solicitation number and title with all notices.

e. Successful Bidder agrees that should at any time Successful Bidder fail to meet or maintain the required insurance coverage(s) as set forth herein, the County may terminate this contract.

f. The Successful Bidder waives all subrogation rights against Manatee County, a Political Subdivision of the State of Florida, for all losses or damages which occur during the contract and for any events occurring during the contract period, whether the suit is brought during the contract period or not.

g. The Successful Bidder has sole responsibility for all insurance premiums and policy deductibles.

h. It is the Successful Bidder's responsibility to ensure that his agents, representatives and subcontractors comply with the insurance requirements set forth herein. Successful Bidder shall include his agents, representatives, and subcontractors working on the project or at the worksite as insured under its policies, or Successful Bidder shall furnish separate certificates and endorsements for each agent, representative, and subcontractor working on the project or at the worksite. All coverages for agents, representatives, and subcontractors shall be subject to all of the requirements set forth to the procurement representative.

i. All required insurance policies must be written with a carrier having a minimum A.M. Best rating of A- FSC VII or better. In addition, the County has the right to review the Successful Bidder's deductible or self-insured retention and to require that it be reduced or eliminated.

III. Successful Bidder understands and agrees that the stipulated limits of coverage listed herein in this insurance section shall not be construed as a limitation of any potential liability to the County, or to others, and the County's failure to request evidence of this insurance coverage shall not be construed as a waiver of Successful Bidder's obligation to provide and maintain the insurance coverage specified.

IV. The enclosed Hold Harmless Agreement shall be signed by the Successful Bidder and shall become a part of the contract.

V. Successful Bidder understands and agrees that the County does not waive its immunity and nothing herein shall be interpreted as a waiver of the County's rights, including the limitation of waiver of immunity, as set forth in Florida Statutes 768.28, or any other statutes, and the County expressly reserves these rights to the full extent allowed by law.

VI. No award shall be made until the Procurement Division has received the Certificate of Insurance and Hold Harmless Agreement in accordance with this section.

VII. BONDING REQUIREMENTS

Bid Bond/Certified Check. By submitting a bid, the bidder agrees should its bid be accepted, **to execute the form of Agreement and present the same to Manatee County for approval within ten (10) calendar days after notice of intent to award**. The bidder further agrees that failure to execute and deliver said form of Agreement **within ten (10) calendar days** will result in damages to Manatee County and as guarantee of payment of same a bid bond/certified check shall be enclosed within the submitted sealed bid in the amount of five (5%) percent of the total amount of the bid. The bidder further agrees that in case the bidder fails to enter into an Agreement, as prescribed by Manatee County, the bid bond/certified check accompanying the bid shall be forfeited to Manatee County as agreed liquidated damages. If County enters into an agreement with a bidder, or if County rejects any and/or all bids, accompanying bond will be promptly returned.

Payment and Performance Bonds. Prior to commencing work, the Successful Bidder shall obtain, for the benefit of and directed to County, a Payment and Performance Bond satisfying the requirements of Section 255.05, Florida Statutes, covering the faithful performance by the Successful Bidder of its obligation under the Contract Documents, including but not limited to the construction of the project on the project site and the payment and obligations arising thereunder, including all payments to Subcontractors, laborers, and materialmen. The surety selected by the Successful Bidder to provide the Payment and Performance Bond shall be approved by County prior to issuance of such Bond, which approval shall not be unreasonably withheld or delayed provided that surety is rated A- or better by Best's Key Guide, latest edition.

Failure to provide the required bonds on the prescribed form may result in Successful Bidder being deemed nonresponsive. Bonds must be in the form prescribed in Section 255.05, Florida Statutes, and must not contain notice, demand or other terms and conditions, including informal pre-claim meetings, not provided for in Section 255.05, Florida Statutes.

Bonds shall be in an amount equal to 100% of the contract price issued by a duly authorized and nationally recognized surety company, authorized to do business in the State of Florida, satisfactory to County. Surety shall be rated as "A-" or better by Best's Key Guide, latest edition. The attorney-in-fact who signs the bonds must file with the bonds, a certificate and effective dated copy of power-of-attorney. Payment and Performance Bonds shall be issued to Manatee County, a political subdivision of the State of Florida, **within ten (10) calendar days after issuance of notice of intent to award**.

In addition, pursuant to Section 255.05(1)(b), Florida Statutes, prior to commencing work, the Successful Bidder shall be responsible and bear all costs associated to record the Payment and Performance Bond with the Manatee County Clerk of the Circuit Court. A certified copy of said recording shall be furnished to the Procurement Division upon filing. Pursuant to Section 255.05(1)(b), Florida Statutes, County will make no payment to the Successful Bidder until the Successful Bidder has complied with this paragraph.

Furnishing Payment and Performance Bonds shall be requisite to execution of an Agreement with County. Said Payment and Performance Bonds will remain in force for the duration of the Agreement with the premiums paid by the Successful Bidder. Failure of the Successful Bidder to execute such Agreement and to supply the required bonds shall be just cause for cancellation of the award. County may then contract with the next lowest, responsive and responsible bidder or re-advertise this IFB.

Failure of County at any time to require performance by the Successful Bidder of any provisions set out in the resulting Agreement will in no way affect the right of County, thereafter, to enforce those provisions.

BIDDER'S INSURANCE STATEMENT

THE UNDERSIGNED has read and understands the aforementioned insurance and bond requirements of this IFB and shall provide the insurance and bonds required by this section within ten (10) days from the date of notice of intent to award.

Bidder Name: _____ Date: _____

Authorized Bidder's Signature: _____

Print Name: _____

Insurance Agency: _____

Agent Name: _____ Agent Phone: _____

Surety Agency: _____

Surety Name: _____ Surety Phone: _____

Please return this completed and signed statement with your bid.

Manatee County, a Political Subdivision of the State of Florida
Indemnity and Hold Harmless
RFQ 17-1174OV – Exhaust Fans

Respondent shall defend, indemnify and hold harmless the County and all of the County's officers, agents, employees, and volunteers from and against all claims, liability, loss and expense, including reasonable costs, collection expenses, attorneys' fees, and court costs which may arise because of the negligence (whether active or passive), misconduct, or other fault, in whole or in part (whether joint, concurrent, or contributing), of Respondent, its officers, employees, representatives and agents in performance or non-performance of its obligations under the Contract/Agreement. Respondent recognizes the broad nature of this indemnification and hold harmless clause, as well as the provision of a legal defense to the County when necessary, and voluntarily makes this covenant and expressly acknowledges the receipt of such good and valuable consideration provided by the County in support of these indemnification, legal defense and hold harmless contractual obligations in accordance with the laws of the State of Florida. This clause shall survive the termination of this Contract/Agreement. Compliance with any insurance requirements required elsewhere within this Contract/Agreement shall not relieve Respondent of its liability and obligation to defend, hold harmless and indemnify the County as set forth in this article of the Contract/Agreement.

Nothing herein shall be construed to extend the County's liability beyond that provided in section 768.28, Florida Statutes.

PROJECT NUMBER AND/OR NAME	
INSURANCE AGENT	
RESPONDENT SIGNATURE	DATE

Acknowledgement:

STATE OF _____ COUNTY OF _____

The foregoing instrument was acknowledged before me this _____ day of _____,

20____ by _____ [YOUR FULL LEGAL NAME], who is

personally known to me or who has produced _____ as

identification.

Notary Signature _____

Print Name: _____

(seal)

QUOTE FORM

For: RFQ 17-1174OV
Wastewater Division, Utilities Department, Laboratory Exhaust Fans Replacement
4751 66th Street West
Bradenton, FL 34210

Total Offer _____
Based on a completion time of 150 calendar days

We, the undersigned, hereby declare that we have carefully reviewed the RFQ Documents in their entirety and with full knowledge and understanding of the aforementioned herewith submit this quote, completely meeting each and every specification, term, and condition contained therein.

One schedule for completion of the Work shall be considered. Each quote for completion by the specified stated time shall be offered as a separate "total offer". County has the sole authority to select the quote based on the completion time which is in the best interest of County. Only one award shall be made.

As quoter, we understand that the RFQ documents, in its entirety, including but not limited to, all specifications, terms, and conditions shall be made a part of any resulting Agreement between Manatee County and the successful quoter. Failure to comply shall result in Agreement default, whereupon, the defaulting successful quoter shall be required to pay for any and all re-procurement costs, damages, and attorney fees as incurred by County, and agrees to forfeit his/her quote bond.

Communications concerning this quote shall be addressed as follows: **(Complete all fields)**

Quoter's Name: _____

Mailing Address: _____

Telephone: ( ) _____ Fax: ( ) _____

Email Address: _____

A quote bond, certified check, or cashier's check in the amount of 5% of the total quote offer is attached herein.

I, _____ on [date(s)] **_____ attest that I have visited the project site(s) to familiarize myself with the full scope of work required for the quote.**

Acknowledge Addendum No.____ Dated: _____ Acknowledge Addendum No._____ Dated: _____
Acknowledge Addendum No.____ Dated: _____ Acknowledge Addendum No._____ Dated: _____
Acknowledge Addendum No.____ Dated: _____ Acknowledge Addendum No._____ Dated: _____

Authorized Signature(s): _____

Name and Title of Above Signer(s): _____

Date: _____

	QUOTE FORM		
	RFQ17-1174OV, Wastewater Division, Utilities Department, Laboratory Exhaust Fans Replacement, 4751 66th Street West, Bradenton, FL 34210		
ITEM NO.	**DESCRIPTION**	**QTY/U/M**	**EXTENDED TOTAL**
1	Mobilization /Demobilization	1 LS	$
	Reuse: Roof Curb, Electrical Service, 120 convenience outlet above roof, two(2) variable frequency drives in mechanical room, all ductwork and sensors below roof:		
2	Remove and scrap two(2) existing roof mounted exhaust fans set on a single curb, sharing an intake plenum, including fans, discharge nozzles, intake plenums and dampers. Install two (2) New Exhaust Fans Assembly (**MK Plastics AXCL 2225 2 Fan Plenum)** onto existing roof curb. This includes two (2) fans with discharge nozzles, fan assembly with three (3) motorized dampers. New disconnect switches to be furnished by fan manufacturer.(Structural Engineering and Wind load calculations and documentation for fan assembly and attachment to curb to be provided by the fan manufacturer).	1 LS	$
3	Roof Mounted Service Platform and Stair In accordance with Florida Mechanical Code 306.5.1.	1 LS	$
4	Test, Adjusting and Balance - In accordance with Section 15990 of the Specifications	1 LS	$
5	Programming and Instrumentation (Boyd Brothers Service, Inc., Punta Gorda, FL)		$3,000.00
	TOTAL BASE QUOTE: (Based on a completion time of 150 calendar day).		$
	Contract Contingency (Used only with County Approval (5%)		$
	TOTAL QUOTE OFFER WITH CONTRACT CONTINGENCY ((Based on a completion time of 150 CALENDAR DAYS		$

QUOTER:_____

AUTHORIZED SIGNATURE:_____-

ATTACHMENT A

QUOTER'S QUESTIONNAIRE

(RFQ 17-1174OV

(Submit in Duplicate)

The bidder warrants the truth and accuracy of all statements and answers herein contained. (Attach additional pages if necessary.)

THIS QUESTIONNAIRE MUST BE COMPLETED AND SUBMITTED WITH YOUR BID

1. Contact Information:

   FEIN #: _____

   License #: _____
   License Issued to: _____
   Date License Issued (MM/DD/YR): _____
   Company Name: _____
   Physical Address: _____
   City: _____ State of Incorporation: _____ Zip Code: _____
   Phone Number: ( ) _____ Fax Number: ( ) _____
   Email address: _____

2. Bidding as: an individual __; a partnership __; a corporation __; a joint venture __

3. If a partnership, list names and addresses of partners; if a corporation, list names of officers, directors, shareholders, and state of incorporation; if joint venture, list names and address of ventures' and the same if any venture are a corporation for each such corporation, partnership, or joint venture:

   _____
   _____
   _____
   _____

4. Bidder is authorized to do business in the State of Florida: ☐ Yes ☐ No

   For how many years? _____

5. Your organization has been in business (under this firm's name) as a

   _____

   Is this firm in bankruptcy? _____

6. Attach a list of projects where this specific type of Work was performed.

QUOTER: _____

AUTHORIZED SIGNATURE: _____

Is this firm currently contemplating or in litigation? Provide summary details.

_____

_____

_____

7. Have you ever been assessed liquidated damages under a contract during the past five (5) years? If so, state when, where (contact name, address and phone number) and why.

_____

_____

_____

8. Have you ever failed to complete Work awarded to you? Or failed to complete projects within contract time? If so, state when, where (contact name, address, phone number) and why.

_____

_____

_____

9. Have you ever been debarred or prohibited from providing a bid to a governmental entity? If yes, name the entity and describe the circumstances.

_____

_____

_____

10. Will you subcontract any part of this Work? If so, describe which portion(s) and to whom.

_____

_____

_____

QUOTER: _____

AUTHORIZED SIGNATURE:_____

If any, list MBE/DBE (with Agreement amount) to be utilized:

_____

_____

_____

11. What equipment do you own to accomplish this Work? (A listing may be attached)

_____

_____

_____

12. What equipment will you purchase/rent for the Work? (Specify which)

_____

_____

_____

13. Testing and Balancing Contractor shall have a minimum of five (5) years' experience in balancing Labs with Fume Hoods. List a minimum of five (5) references and provide contact name, telephone number and location when and where work was performed.

_____

_____

_____

_____

14. List the following in connection with the surety which is providing the bond(s):

Surety's Name: _____

Address: _____

_____

QUOTER: _____

AUTHORIZED SIGNATURE: _____

Name, address, phone number and email of surety's resident agent for service of process in Florida:

Agent's Name: _____

Address: _____

_____

Phone: _____

Email: _____

QUOTER: _____

AUTHORIZED SIGNATURE:_____

ATTACHMENT B / RFQ17-1174OV

PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES CERTIFICATION

SWORN STATEMENT PURSUANT TO ARTICLE V,
MANATEE COUNTY PROCUREMENT CODE

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

This sworn statement is submitted to the Manatee County Board of County Commissioners by

_____

[Print individual's name and title]

____ for _____[Print name of entity submitting sworn statement]

whose business address is _____

and (if applicable) its Federal Employer Identification Number (FEIN) is _____. If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement: _____.

I understand that no person or entity shall be awarded or receive an Owner's Agreement for public improvements, procurement of goods or services (including professional services) or an Owner's lease, franchise, concession or management agreement, or shall receive a grant of Owner's monies unless such person or entity has submitted a written certification to Owner that it has not:

(1) been convicted of bribery or attempting to bribe a public officer or employee of Manatee County, the State of Florida, or any other public entity, including, but not limited to the Government of the United States, any state, or any local government authority in the United States, in that officer's or employee's official capacity; or

(2) been convicted of an agreement or collusion among bidders or prospective bidders in restraint of freedom of competition, by agreement to bid a fixed price, or otherwise; or

(3) been convicted of a violation of an environmental law that, in the sole opinion of Owner's Purchasing Official, reflects negatively upon the ability of the person or entity to conduct business in a responsible manner; or

(4) made an admission of guilt of such conduct described in items (1), (2) or (3) above, which is a matter of record, but has not been prosecuted for such conduct, or has made an admission of guilt of such conduct, which is a matter of record, pursuant to formal prosecution. An admission of guilt shall be construed to include a plea of nolo contendere; or

(5) where an officer, official, agent or employee of a business entity has been convicted of or has admitted guilt to any of the crimes set forth above on behalf of such an entity and pursuant to the direction or authorization of an official thereof (including the person committing the offense, if he is an official of the business entity), the business shall be chargeable with the conduct herein above set forth. A business entity shall be chargeable with the conduct of an affiliated entity, whether wholly owned, partially owned, or one which has common ownership or a common Board of Directors. For purposes of this Form, business entities are affiliated if, directly or indirectly, one business entity controls or has the power to control another business entity, or if an individual or group of individuals controls or has the power to control both entities. Indicia of control shall include, without limitation, interlocking management or ownership, identity of interests among family members, shared organization of a business entity following the ineligibility of a business entity under this Article, or using substantially the same management, ownership or principles as the ineligible entity.

(Continued)

Any person or entity who claims that this Article is inapplicable to him/her/it because a conviction or judgment has been reversed by a court of competent jurisdiction shall prove the same with documentation satisfactory to Owner's Purchasing Official. Upon presentation of such satisfactory proof, the person or entity shall be allowed to contract with Owner.

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR MANATEE COUNTY IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT ANY AGREEMENT OR BUSINESS TRANSACTION SHALL PROVIDE FOR SUSPENSION OF PAYMENTS, OR TERMINATION, OR BOTH, IF THE CONTRACTING OFFICER OR COUNTY ADMINISTRATOR DETERMINES THAT **SUCH PERSON OR ENTITY HAS MADE FALSE CERTIFICATION.**

_____
[Signature]

STATE OF FLORIDA
COUNTY OF _____

Sworn to and subscribed before me this ____ day of _____, 20_____ by _____

Personally known _____ OR Produced identification _____
[Type of identification]

_____ My commission expires _____
Notary Public Signature

_____
[Print, type or stamp Commissioned name of Notary Public]

Signatory Requirement - In the case of a business entity other than a partnership or a corporation, this affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, this affidavit shall be executed by the general partner(s). In the case of a corporation, this affidavit shall be executed by the corporate president.

ATTACHMENT C

SWORN STATEMENT

THE FLORIDA TRENCH SAFETY ACT

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR BY AN OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This Sworn Statement is submitted with **RFQ NO.17-1174OV**
2. This Sworn Statement is submitted by_____ whose business address is_____ and, if applicable, its Federal Employer Identification Number (FEIN) is_____. If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement _____.
3. Name of individual signing this Sworn Statement is: _____, Whose relationship to the above entity is: _____.
4. The Trench Safety Standards that will be in effect during the construction of this project shall include, but are not limited to: Laws of Florida, Chapters 90-96, TRENCH SAFETY ACT, and OSHA RULES AND REGULATIONS 29 CFR 1926.650 Subpart P, effective October 1, 1990.
5. The undersigned assures that the entity will comply with the applicable Trench Safety Standards and agrees to indemnify and hold harmless Owner and Engineer, and any of their agents or employees from any claims arising from the failure to comply with said standard.
6. The undersigned has appropriated the following costs for compliance with the applicable standards:

Trench Safety Measure (Description)	Units of Measure (LF, SY)	Unit Quantity	Unit Cost	Extended Cost
a. _____	_____	_____	$_____	_____
b. _____	_____	_____	$_____	_____
c. _____	_____	_____	$_____	_____
d. _____	_____	_____	$_____	_____

7. The undersigned intends to comply with these standards by instituting the following procedures:

_____

_____

_____

THE UNDERSIGNED, in submitting this bid, represents that they have reviewed and considered all available geotechnical information and made such other investigations and tests as they may deem necessary to adequately design the trench safety system(s) to be utilized on this project.

_____

(AUTHORIZED SIGNATURE / TITLE)

SWORN to and subscribed before me this _____ day of _____, 20_____.

(Impress official seal)

Notary Public, State of Florida: _____

My commission expires: _____

Angelina M. Colonneso

CLERK OF THE CIRCUIT COURT AND COMPTROLLER OF MANATEE COUNTY

1115 Manatee Avenue West, Bradenton, Florida 34205 - Phone (941) 749-1800 – Fax (941) 741-4082
P.O. Box 25400, Bradenton, Florida 34206 - www.manateeclerk.com

ATTACHMENT D: E PAYABLES APPLICATION

Company name_____

Contact person_____

Phone number_____

Email Address_____

FINANCE USE ONLY

Open orders: YES or NO

PEID _____

CREATE DATE _____

CONFIRMED WITH _____
Name and phone number

IFAS _____

BANK _____

INITIALS_____

Return completed form to:

Via email to: lori.bryan@manateeclerk.com

Via fax to: (941) 741-4011

Via mail:

PO Box 1000

Bradenton, Fl 34206

Revised: September 30, 2015

Attachment E

VENDOR CERTIFICATION REGARDING
SCRUTINIZED COMPANIES LISTS

I am an agent authorized by the company responding to this solicitation to make the following certification: I hereby certify that the company has reviewed Florida Statutes § 287.135, and that after such review, the company is not prohibited by the terms of that statute from entering into an agreement with Manatee County for the commodities and/or services which are the subject of this solicitation. I further acknowledge that my submission of a false certification may subject me and/or my company to civil penalties, attorney's fees, and/or costs.

Vendor Name:_____

Vendor FEIN:_____

Address:_____

City:_____ State:_____ Zip:_____

Certified by:_____

Who is authorized to sign on behalf of the company listed above.

Authorized Signature:_____

Print
Name:_____

Title:_____

Date:_____

MASTER MECHANICAL SPECIFICATIONS

Division 15 - Index 10

SECTION 15010
BASIC MECHANICAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basic Mechanical Requirements specifically applicable to Division 15 Sections, in addition to Division 1 - General Requirements, General Conditions and Supplementary General Conditions.

B. This Division of the specifications includes Mechanical:

1. Heating, Ventilating, Air Conditioning (HVAC).

2. Plumbing, and that Mechanical which applies to HVAC and plumbing.

1.02 INTENT

A. It is the intention of these specifications and drawings to call for finished work, tested, and ready for operation. Wherever the word "provide" is used, it shall mean "furnish and install complete and ready for use."

B. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.

1.03 SURVEYS AND MEASUREMENTS

A. Base all measurements, both horizontal and vertical from established benchmarks. All work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as related to the work. All material take-offs for the site shall be field measured prior to bids.

1.04 DRAWINGS

A. Drawings are diagrammatic and indicate the general arrangement of systems and work included in the contract. Drawings are not to be scaled. The architectural drawings and details shall be examined for exact location of fixtures and equipment. Where they are not definitely located, this information shall be obtained from the Architect.

B. If directed by the Engineer, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.

C. At the time of each shop drawing submission, the Contractor shall call the Engineer's attention (in writing) to, and plainly mark on shop drawings, any deviations from the Contract Documents. (See paragraph 1.06, B.)

D. Samples, drawings, specifications, catalogs, submitted for approval, shall be properly labeled indicating specific service for which material or equipment is to be used, location, section and article number of specifications governing, Contractor's name, and name of job. All equipment shall be labeled to match labeling on contract documents.

E. Control systems: Submit description of operation and schematic drawings of the entire control system. Include bulletins describing each item of control equipment or component.

F. Catalogs, pamphlets, or other documents submitted to describe items on which approval is being requested, shall be specific and identification in catalog, pamphlet, etc. of item submitted shall be clearly made in ink. Data of a general nature will not be accepted.

G. Approval rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are approved, said approval does not mean that drawings have been checked in detail; said approval does not in any way relieve the Contractor from their responsibility or necessity of furnishing material or performing work as required by the contract drawings and specifications.

H. All shop drawings shall be submitted to the Engineer by the Contractor no later than 30 days from the day of contract award.

I. Failure of the Contractor to submit shop drawings in ample time for checking shall not entitle him to an extension of contract time, and no claim for extension by reason of such default will be allowed.

J. Submit all Division 15 submittals at one (1) time in one (1) integral group. Piece-by-piece submission of individual items will not be acceptable. Engineer may check contents of each submittal set upon initial delivery; if not complete as set forth herein, submittal sets may be returned to Contractor without review and approval and will not be accepted until made complete.

K. Routing and methods of support of piping shall be shown on shop drawings and shall have the review of the Engineer prior to fabrication and installation. Spacing of supports shall be as specified in Section 15140, or if not specified, shall not exceed the suggested maximum spacing recommended in ANSI B31.1 for each type of line. Supports shall be fabricated as detailed on reviewed shop drawings. Provide supports so located that temporary supports are not required during removal of valves or equipment. Insofar as possible, support lines directly from the building structure.

L. At the close of the job, prior to final review, five (5) bound copies of the following shall be submitted by transmittal letter to the Engineer for review and acceptance.

1. Equipment warranties
2. Contractor's warranty
3. Parts list and manuals for all equipment
4. Test and Balance readings
5. Written operating instructions
6. Written maintenance instructions on care of the system

1.05 SUBMITTALS

A. Submit Manufacturer's published technical data, catalog cuts, wiring diagrams, shop drawings, samples and testing and balancing logs for all elements of the HVAC work. Submit under provisions of General Conditions and Supplementary General Conditions.

B. No equipment, piping, ductwork or components shall be fabricated, delivered, erected, or connected other than from shop drawings reviewed and approved by the Engineer.

C. It shall be understood that review of shop drawings by the Engineer does not supersede the requirement to provide a complete and functioning system in compliance with the Contract Documents.

D. Equipment Supports: Submit detailed shop drawings indicating equipment weight and dimensions, support material, connections, anchoring, and vibration isolation.

E. Submittals shall include, but not be limited to the following:

1. All equipment (i.e. cooling, heating, plumbing, electrical motors, starters, controls, etc.)

2. Electrical Requirements (Voltage, phase, and amperage) of each electrical item, such as motors, etc.

3. All auxiliary equipment.

4. Pipe, ductwork, valves, insulation, etc.

1.06 SUBSTITUTIONS

A. Materials and equipment are specified herein by a single or by multiple Manufacturers to indicate quality and performance required. The drawings are based upon equipment scheduled on drawings and specified. If another Manufacturer is considered for substitution during the bidding process, the Mechanical Contractor shall be responsible for coordinating all electrical, mechanical, structural, or architectural changes. Comparable equipment Manufacturers that are listed as equals shall be considered as substitutes. Manufacturers other than the basis of design shall submit cut sheets showing dimensional data, a 1/4" scale plan and a section drawings showing proper fit and all clearances for maintenance items.

B. Substitutions of other Manufacturer's will be considered for use if, in the Engineers opinion, the item requested for substitution is equal to that specified. The Contractor shall provide to the Engineer a typed comparative list of the basis of design and the proposed substitute. The comparative shall list capacities, pressure drops, horsepower, electrical requirements, etc., (refer to paragraph 1.04, C and 1.06. C).

Request for approval of substitutions or equals prior to bid must be made in writing. The approval of any substitutions or equals prior to bid shall not be construed as a shop drawing approval. The substitute or equal must be submitted as described in the specifications and meet all the requirements of the specifications and drawings.

C. All requests for substitutions shall be submitted as described in paragraph 1.06, B., and specifically indicate any and all differences or omissions between the product specified as basis of design and the product proposed for substitution. Differences shall include but shall not be limited to data as follows for both the specified and substituted products.

1. Principle of operation
2. Materials of construction or finishes
3. Thickness or gauge of materials
4. Weight of item
5. Deleted features or items

6. Added features or items
7. Changes in other Contractor's work caused by the substitution
8. Physical dimensions
9. Electrical requirements

D. If the Contractor proposes to use equipment other than that specified or detailed on the drawing, which requires any redesign of the structure, partitions, foundations, piping, wiring, or any other part of the mechanical or electrical, then all such redesign, and all new drawings and detailing required therefore, shall be prepared by the Subcontractor at his own expense and submitted to the Engineer for approval.

E. If such approved deviation requires quantity and arrangement of ductwork, piping, wiring, conduit, and equipment from that specified or indicated on the drawings, then the Contractor shall furnish and install any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.07 COOPERATION WITH OTHER TRADES

A. Give full cooperation to other trades and furnish in writing to the General Contractor, with copies to the Architect, any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.

B. When work installed under this Division will be in close proximity to, or will interfere with work of other trades, assist in working out space conditions to make a satisfactory adjustment. If so directed by the Engineer, prepare composite working drawings and sections at a suitable scale not less than 1/4" = 1'0", clearly showing how work is to be installed in relation to the work of other trades. If the work is installed before coordinating with other trades, or so as to cause any interference with work of other trades, make all the necessary changes in work to correct the condition without extra charge.

C. Furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

1.08 PROTECTION

A. Protect all work and material provided under this Division from damage. All damaged equipment work or material provided under this Division shall be replaced with new. Re-builds are not acceptable.

B. Protect all work and equipment until inspected, tested, and accepted. Protect work against theft, injury, or damage; and carefully store material and equipment received on site, which are not immediately installed. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of obstructing material.

1.09 SCAFFOLDING, RIGGING, HOISTING

A. Provide all scaffolding, rigging, hoisting, and services necessary for erection and delivery into the premises of any equipment and apparatus furnished. Remove it from premises when no longer required.

1.10 REMOVAL OF RUBBISH

A. This Contractor shall at all time keep premises free from accumulations of waste materials or rubbish caused by his employees or work. At completion of work he shall remove all his tools, scaffolding, materials, and rubbish from the building and site. He shall leave the premises and his work in a clean, orderly, and acceptable condition.

B. All plaster, concrete, cement, etc. shall be removed from all pipe, hangers, and equipment prior to painting and/or concealment.

1.11 SAFETY

A. This Contractor shall comply with Section 107 of the Contract work hours and safety standards act (40 U.S.C.333), Title 29 - Labor, Chapter XIII, Bureau of Standards, Department of Labor, Part 1518 - Safety and Health Regulations for construction; and that his housekeeping and equipment be maintained in such a manner that they comply with the Florida industrial commission safety code and regulations of the Federal Williams - Steiger Occupational Safety and Health Act of 1970 (OSHA), wherein it states that the Contractor shall not require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety.

1.12 SUPERVISION

A. This Contractor shall provide a competent, experienced, full time superintendent who is acceptable to the Architect/Engineer and Owner, and who is authorized to make decisions on behalf of the Contractor.

1.13 LUBRICATION

A. Where necessary, provide means for lubricating all bearings and other machine parts. If a part requiring lubrication is concealed or inaccessible, extend a lubrication tube with suitable fitting to an accessible location and suitably identify it.

B. After installation, properly lubricate all parts requiring lubrication and keep them adequately lubricated until final acceptance by the Owner.

1.14 VALVE CHARTS, TAGS, AND NAME PLATES

A. Provide at a location designated by the Engineer and the Owner, a valve chart laminated on wood or enclosed in a sturdy aluminum frame with a clear plastic shield. Chart shall show the designated number of each valve, its location and service. Valve numbers shall be same as those shown on the "As-Built" drawings.

B. Each valve shown on the chart shall have a 1-1/2" diameter, 18 gauge brass tag with clearly visible stamped numbers, securely fastened to the valve stem or handle with a heavy brass hook or chain.

C. Each panel mounted switch, thermometer, gauge, or controller for fans, pumps, or other electrically operated equipment shall be clearly designated by a black plastic nameplate of size approved by the Engineer securely fastened with metal pins or screws to the panel directly under the item designated.

D. Refer to Section 15190 for additional information.

1.15 WIRING DIAGRAMS

A. Furnish for use under Division 16 all wiring diagrams as may be required for the installation of the wiring to insure proper operation and control of the equipment provided under this Division. Provide the diagrams in time to avoid delays.

1.16 MATERIAL AND WORKMANSHIP

A. All materials and apparatus required for the work, except as specifically specified otherwise, shall be new, of first-class quality, and shall be furnished, delivered, erected, connected and finished in every detail, and shall be so selected and arranged as to fit properly into the building spaces. Where no specific kind or quality of material is given, a first-class standard article as approved by the Engineer shall be furnished. Refer to substitution requirements as outlined in this Section.

B. Unless otherwise specifically indicated on the plans or specifications, all equipment and materials shall be installed with the approval of the Architect and Engineer in accordance with the recommendations of the Manufacturer. This includes the performance of such tests as the Manufacturer recommends.

1.17 QUIET OPERATION AND VIBRATION

A. All work shall operate under all conditions of load without any sound or vibration that is objectionable in the opinion of the Engineer and the Owner. In case of moving machinery, sound, or vibration noticeable outside of room in which it is installed, or annoyingly noticeable inside its own room, will be considered objectionable. Sound or vibration conditions considered objectionable by the Engineer and the Owner shall be corrected in an approved manner at no additional expense to the Owner. Vibration control shall be by means of approved vibration eliminators in a manner as specified in Section 15242.

1.18 ACCESSIBILITY

A. This Contractor shall be responsible for the sufficiency of the size of shafts and chases, the adequate clearance in double partitions and hung ceilings for the proper installation of his work. He shall cooperate with all other Contractors whose work is in the same space, and shall advise them of his requirements. Such spaces and clearances shall, however, be kept to the minimum size required.

B. This Contractor shall locate all equipment that must be serviced, operated, or maintained in fully accessible positions. Equipment shall include but not be limited to, valves, traps, clean-outs, motors, controllers, switchgear, and drain points. If required for better accessibility, furnish access doors for this purpose. Minor deviations from drawings may be made to allow for better accessibility.

C. This Contractor shall provide the access panels for concealed mechanical equipment, valves, controls, dampers, or other device requiring service. (Refer to Paragraph 1.20 of this section.)

1.19 FOUNDATIONS, SUPPORTS, PIERS, ATTACHMENTS

A. This Contractor shall furnish and install all necessary foundations, supports, pads, bases and piers required for all air conditioning equipment, piping, pumps, tanks, compressors, and for all other equipment furnished under this Division, and shall submit drawings to the Architect and Engineer for approval before purchase, fabrication or construction of same.

B. Provide concrete pads for pumps, compressors, and other rotating machinery, and for all equipment where foundations are indicated. All pads shall be extended six inches (6") beyond machine base in all directions with top edge chamfered. Inset six inches (6") steel dowel rods into floors to anchor pads. Provide 3000 psi concrete. All pads shall have a minimum of 6x6 - W2.9/W2.9 welded wire mesh unless otherwise noted. For chillers provide thickened edge minimum 8" wide into the ground. The thickened edge shall be reinforced with continuous #5 reinforcing bar (Grade 60) top and bottom. The wire mesh should be installed to drop into thickened edge. Shop drawings of all foundations and pads shall be submitted to the Architect and Engineer for approval.

C. Construction of foundations, supports, pads, bases, and piers where mounted on the floor, shall be the same materials and same quality of finish as the adjacent and surrounding flooring material.

D. All equipment, unless shown otherwise, shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the Architect and the Engineer, not strong enough shall be replaced as directed.

1.20 ACCESS DOORS FOR WALLS AND CEILINGS

A. Provide flush panel access doors with a 16 gauge steel frame and a 14-gauge steel door panel.

B. Finish is to be primed painted steel.

C. Provide concealed hinges that allow the door to open 175 degrees and have a removable pin.

D. Provide access doors with a locked flush mounted vandal proof spanner head operated steel cams.

E. Provide 1-1/2 hour "B" label door for rated chase walls.

F. Furnish masonry anchors for installation in masonry walls and metal lath wings with casing bead for plaster installation.

G. Provide a minimum 2'-0" by 2'-0" access doors unless shown or noted otherwise on the drawings.

H. Access doors for chase walls shall be mounted 16" off the finish floor.

I. Access doors for mechanical equipment shall be a minimum of 12" larger than equipment all around.

1.21 VALVE BOXES

A. All exterior underground valves shall be provided with exterior valve boxes equipped with removable covers appropriately labeled.

B. Valve boxes shall be manufactured of reinforced fiberglass plastic or heavy duty PVC as approved by the Architect/Engineer.

1.22 WELDING

A. Welded pipe joints shall be made by the oxyacetylene or electric process in accordance with the Code of Pressure Piping ASA B31.1.

B. Welding shall be done with good quality modern welding equipment, by competent operators, and in thorough, first class manner, conforming to AWS Standards.

C. The Contractor shall be required to furnish proof of the competency of each welding operator for both field and shop welds and shall at the request of the Architect/Engineer have all or any of such welding operators pass a standard qualification test such as ASME, AWS, or Hartford Insurance Company procedure and tests.

D. Filler-metal for the welding process shall conform to ASTM A233 "Specification for Mild Steel Arc-Welding Electrodes". Classification of electrodes shall be one of the following: E6010, E6015, E7016, E7018.

E. When welding is to be performed, precautionary measures must be taken to prevent fire. Remove flammable materials and debris from the area. Provide an appropriate extinguisher nearby.

F. Pipes shall be cut short and cold sprung into place before welding or fabricating to compensate for expansion of lines when hot.

G. Welds shall be of the single vee butt type. Pipe end shall be shop beveled to 45 degrees to within 1/16 inch of the inside wall surface.

H. The abutting ends of the joints shall be separated before welding to permit complete fusion, tacked in two or more points to maintain alignment, and welded. Welding shall be continuous around the pipe.

I. Welds shall be of sound weld metal, thoroughly fused into the ends of the pipe and to the bottom of the vee, and shall be built up in excess of the pipe wall to give a reinforcement of one-quarter (1/4) the pipe wall thickness and in such a manner that one weld metal will present a gradual increase in thickness from the surface of the pipe to the center of the weld. The minimum width of the weld shall be 2-1/2 times the pipe wall thickness.

J. The fillet welds from the flanges of fittings shall be fused into the pipe and plate for minimum distance of 1-1/2 times the pipe wall thickness and shall be built up to present a minimum throat thickness of depth of weld of 1-1/4 times the pipe wall thickness.

K. Branch connections shall be fabricated by welding. Openings cut into pipe for welded connections shall be accurately made to give carefully matched intersections and welding fittings shall be carefully welded into the pipe system.

L. Welding ells shall be used at all turns in welded pipelines; no mitred ells will be approved.

M. Where branch piping is three times smaller than the main, branch connections shall be made up with the appropriate manufactured weld-on fitting. Welded tees shall be used for all other branch connections, unless otherwise approved by the Architect/Engineer for a specific case.

1. Approved Manufacturers

a. Allied Piping Products.
b. Bonney Forge.
c. Branch Connections.
d. Branchlets.
e. Tube Turn.
f. Thread-O-Lets.

N. Welds in piping shall be annealed after welding to remove the welding strains. The temperature need not exceed that causing a dull red, and shall be uniform around the pipe. Welds made in place shall be annealed, but the pipe shall be free to expand and shall be properly supported so as to avoid stresses. Slow cooling shall always follow annealing.

1.23 REGULATORY REQUIREMENTS

A. Conform to applicable Codes and Standards as follows:

(1) STANDARD

(a) Certain standard materials and installation requirements are described by reference to standard specifications. These standards are as follows:

ADA Americans with Disabilities Accessibility Implementation Act

ASA American Standards Association.

ASTM American Society for Testing Materials.

ASME American Society of Mechanical Engineers Code of Unfired Pressure Vessels.

NEMA National Electrical Manufacturers Association.

UL Underwriters Laboratories.

ANSI American National Standards Institute.

ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineers.

SMACNA Sheet Metal and Air Conditioning Contractor's National Association.

AMCA Air Moving and Conditioning Association.

ARI Air Conditioning and Refrigeration Institute.

AMA Acoustical Materials Association.

For additional standards and requirements see other sections of the specifications.

Whenever a reference is made to a standard, installation and materials shall comply with the latest published edition at the time project is bid unless otherwise specified herein.

(2) CODES AND RULES

(a) All material furnished and all work installed shall comply with the following codes as they apply to this project:

National Electric Code.

Regulations of the Florida Industrial Commission Concerning Safety.

Applicable County, State and Local Building Codes.

Local and State Fire Marshal Rules and Regulations and applicable NFPA Standards.

NFPA 10-2007, Standard for Portable Fire Extinguishers

NFPA 11-2005, Standard for Low Expansion Foam

NFPA 11-2005, Standard for Medium and High Expansion Foam System

NFPA 12-2008, Standard on Carbon Dioxide Extinguishing System

NFPA 12-A-2009, Standard on Halon 1301
Fire Extinguishing System

NFPA 13-2007, Standard for the Installation of Sprinkler Systems

NFPA 13D-2007, Standard for the Installation of Sprinkler Systems in One and Two- Family Dwellings and Manufactured Homes

NFPA 13R-2007, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and including Four Stories in Height

NFPA 14-2007, Standard for the Installation of Standpipe and Hose Systems, except 2-7 shall be omitted

NFPA 15-2007, Standard for Water Spray Fixed Systems for Fire Protection

NFPA 16-2007, Standard on Deluge Foam-Water Sprinkler and Foam-Water System

NFPA 17-2009, Standard for Dry Chemical Extinguishing Systems

NFPA 17A-2009, Standard on Wet Chemical Extinguishing Systems

NFPA 20-2007, Standard for the Installation of Stationary Pumps for Fire Protection

NFPA 22-2008, Standard for Water Tanks for Private Fire Protection

NFPA 24-2007, Standards for the Installation of Private Fire Service Mains and Their Appurtenances

NFPA 25-2008, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, except that quarterly flow tests shall be required for those systems supplied by a municipal water supply.

NFPA 30-2008, Flammable and Combustible Liquids Code

NFPA 30A-2008, Automotive and Marine Service Station Code

NFPA 30B-2007, Code for the Manufacture and Storage of Aerosol Products

NFPA 31-2006, Standard for the Installation of Oil Burning Equipment

NFPA 32-2007, Standards for Drycleaning Plants

NFPA 33-2007, Standard for Spray Application Using Flammable and Combustible Materials

NFPA 34-2007, Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids

NFPA 35-2005, Standard for the Manufacture of Organic Coatings

NFPA 36-2004, Standard for Solvent Extraction Plants

NFPA 37-2006, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines

NFPA 40-2007, Standard for the Storage and Handling of Cellulose Nitrate Motion Picture Film

NFPA 45-2004, Standard on Fire Protection for Laboratories Using Chemicals

NFPA 50-2001, Standard for Bulk Oxygen Systems at Consumer Sites

NFPA 50B-2003, Standard for Liquid Hydrogen Systems at Consumer Sites

NFPA 51-2007, Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting and Allied Processes

NFPA 51A-2006, Standard for Acetylene Cylinder Charging Plants

NFPA 51B-2009, Standard for Fire Prevention During Welding, Cutting and Other Hot Work

NFPA 52-2006, Vehicular Fuel Systems Code

NFPA 54-2009, National Fuel Gas Code

NFPA 55-2005, Standard for the Storage, Use, and Handling of Compressed Gasses and Cryogenic Fluids in Portable and Stationary Containers, Cylinders and Tanks

NFPA 57-2002, Liquefied Natural Gas Vehicular Fuel Systems Code

NFPA 58-2008, Liquefied Petroleum Gas Code

NFPA 59-2008, Standard for Storage and Handling of Liquefied Petroleum Gases at Utility Gas Plants

NFPA 59A-2009, Standard for the Production, Storage and Handling of Liquefied Natural Gas

NFPA 61-2008, Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Products Facilities

NFPA 69-2008, Standard on Explosion Prevention Systems

NFPA 70-2008, National Electrical Code

NFPA 72-2007, National Fire Alarm Code

NFPA 75-2009, Standard for the Protection of Electronic Computer/Data Processing Equipment

NFPA 80-2007, Standard for Fire Doors and Fire Windows

NFPA80A-2007, Recommended Practice for Protection of Building from Exterior Fire Exposires

NFPA 82-2004, Standard on Incinerators and Waste and Linen Handling Systems and Equipment

NFPA 85-2007, Boiler and Combustion Systems Hazards Code

NFPA 86-2007, Standard for Ovens and Furnaces

NFPA 88A-2007, Standard for Parking Structures

NFPA 88B-1997, Standard for Repair Garages

NFPA 90A-2009, Standard for the Installation of Air Conditioning and Ventilating Systems

NFPA 90B-2009, Standard for the Installation of Warm Air Heating and Air Conditioning Systems

NFPA 91-2004, Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids

NFPA 92A-2009, Recommended Practice for Smoke-Control Systems

NFPA 92B-2009, Guide for Smoke Management Systems in Malls, Atria, and Large Area

NFPA 96-2008, Standard for Ventilation Control and Fire Prevention of Commercial Cooking Operations. Subdivision 7-2.2 of NFPA 96 applies prospectively only. Existing installations are permitted to remain in place subject to the approval of the authority having jurisdiction.

NFPA 99-2005, Standard for Health Care Facilities

NFPA 101A-2007, Guide, on Alternative Approaches to Life Safety

NFPA 102-2006, Standard for Grandstands, Folding and Telescoping Seating, Tents and Membrane Structures

NFPA 105-2007, Recommended Practice for the Installation of Smoke-Control Door Assemblies

NFPA 110-2005, Standard for Emergency and Standby Power Systems

NFPA 111-2005, Standard on Stored Electrical Energy Emergency and Standby Power Systems

NFPA 120-2004, Standard for Coal Preparation Plants

NFPA 140-2008, Standard for Motion Picture and Television Production Studio Soundstages and Approved Production Facilities

NFPA 150-2007, Standard on Fire safety in Racetrack Stables

NFPA 160-2006, Standard for Flame Effects Before an Audience

NFPA 211-2006, Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances

NFPA 214-2011, Standard on Water-Cooling Towers

NFPA 220-1999, Standard on Types of Building Construction

NFPA 221-2009, Standard on Fire Walls and Fire Barrier Walls

NFPA 230-2003, Standard for the Fire Protection of Storage

NFPA 231D-1998, Standard for Storage of Rubber Tires

NFPA 232-2007, Standard for the Protection of Records

NFPA 232-2007, Standard for Fire Protection for Archives and Record Centers

NFPA 241-2004, Standard for Safeguarding Construction, Alteration and Demolition Operations

NFPA 251-2006, Standard Methods of Tests of Fire Endurance of Building Construction and Materials

NFPA 252-2008, Standard Methods of Fire Tests of Door Assemblies

NFPA 253-2006, Standard Method of Test for Critical Flux of Floor Covering Systems Using a Radiant Heat Energy Source

NFPA 255-2006, Standard Method of Test of Surface Burning Characteristics of Building Materials

NFPA 256-2003, Standard Methods of Fire Tests of Roof Coverings

NFPA 257-2007, Standard on Fire Tests for Window and Glass Block Assemblies

NFPA 259-2008, Standard Test Method for Potential Heat of Building Materials

NFPA 260-2009, Standard Method of Test and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture

NFPA 261-2009, Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes

NFPA 265-2007, Standard Method of Test for Evaluating Room Fire Growth Contribution of Textile Wall Coverings

NFPA 266-2001, Standard Method of Test for Characteristics of Upholstered Furniture Exposed to Flaming Ignition Sources

NFPA 267-1998, Standard Method of Test for Fire Characteristics of Mattresses and Bedding Assemblies Exposed to Flaming Ignition Sources

NFPA 286-2006, Standard Method of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth

NFPA 303-2006, Fire Protection Standards for Marinas and Boatyards

NFPA 418-2006 edition, Standard for Heliports

NFPA 1561-2008, Standard on Emergency Services Incident Management System

NFPA 1962-2008, Standard for the Care, Use, and Service Testing of Fire Hose Including Couplings and Nozzles

NFPA 1963-2003, Standards for Fire Hose Connections

NFPA 2001-2008, Standard on Clean Agent Fire Extinguishing Systems

NFPA 8501-1997, Standard for Single Burner Operation

NFPA 8502-1999, Standard for the Prevention of Furnace Explosions/Implosions in Multiple Burner Boilers

NFPA 8503-1997, Standard for Pulverized Fuel Systems

Florida Building Code 2010

Florida Existing Building Code 2010

Florida Building Code Mechanical Code 2010

Florida Building Code Plumbing Code 2010

Florida Building Code Gas Code 2010

Florida Building Code Test Protocols for High Velocity Hurricane Zones, 2010

Florida Fire Prevention Code 2010

Applicable codes shall be those adopted by the authority having jurisdiction at the time project is bid.

(3) PERMITS, FEES AND INSPECTIONS

(a) The Contractor shall give all necessary notices, obtain all permits and pay all government fees, sales taxes and other costs, including utility connections or extensions, in connection with this work; file all necessary approvals of all governmental departments having jurisdiction.

(b) Obtain all required certificates of inspection for his work and deliver to the Owner/Engineer the same certificates before request for acceptance and final payment for the work.

(c) The Contractor shall include in the work, without extra cost to the Owner, any labor, materials, services, apparatus and drawings required to comply with all applicable laws, ordinances, rules and regulations.

(d) The Contractor shall inform the Engineer of any work or materials which conflict with any of the applicable codes, standards, laws and regulations before submitting his bid.

1.24 SCOPE OF WORK

A. The scope of the work included under this Division of the Specifications shall include complete mechanical Medical Gas, Fire Protection and plumbing systems as shown on the plans and as specified herein. The General Conditions and Special Conditions of these specifications shall form a part and be included under this Section of the Specifications. Provide all supervision, labor, material, equipment, machinery, plant, and any and all other items necessary to complete the mechanical systems. All items of equipment are specified in the singular; however, provide and install the number of items of equipment as indicated on the drawings, and as required for complete systems.

B. Systems shall include all appurtenances as required to achieve the operating conditions as shown and specified and shall result in a superior installation.

C. Scope of work shall include, but not be limited to, the following:

1. Demolition

a. Remove air handling units, fan coil units and exhaust fans in the renovated areas and their respective chilled water piping valves, controls, supports, pads, ductwork, etc... Heating hot water pipes, valves, etc... shall be removed and modified to accommodate new equipment ductwork, new chilled water pipes, etc...

b. Remove all existing supply, return and exhaust ductwork within renovated areas. (Refer to drawing for extent of renovated areas.)

c. Remove existing control system as directed in renovated areas.

2. New Work

a. Provide one (1) new 40 ton waste heat recovery (water to water) chiller and one (1) new 175 ton air cooled chiller, complete with starter, disconnect, piping controls, supports, pumps, etc.

b. Provide air handling systems and split system DX units, complete with coils, filters, variable volume boxes with heating coils, ductwork, controls, etc.

c. Provide a new building management and automatic temperature control system.

d. Insulate all new chilled water, heating and domestic hot water piping. Replace all insulation on existing piping system where it has been

removed or damaged. Insulate all new and existing equipment with exposed hot and cold surfaces.

e. Provide a new primary-secondary pumping system.

f. Provide rough balancing of air and water systems.

g. Provide sanitary and roof drainage systems as shown on drawings.

h. Modify existing gas, domestic hot and cold water system as shown on drawings. Provide new water heaters where indicated on drawings. Provide Fire Protection System and Equipment as indicated on the drawings.

i. Provide new plumbing fixtures as indicated on drawings.

j. Provide Medical Gas Piping System and Equipment as indicated on the drawings.

k. Provide fume hood supply and exhaust air systems complete with ductwork, supply and exhaust fans, controls, etc.

l. Final connections of ductwork, piping (domestic, chilled, make-up, and hot) to equipment and plumbing fixtures.

m. Complete water chemical treatment systems.

D. All electrical work required to support mechanical equipment or is otherwise necessary to operate mechanical equipment, shall be the responsibility of the Mechanical Contractor (including, but not limited to) electrical motors for all motor-operated equipment required under this Division, motor controllers, all starters not provided by the electrical Contractor (coordinate with Electrical Contractor), pilot lights and relays, line and low voltage control wiring, raceways, connections to switches, and other electrical devices furnished with temperature control systems except as otherwise provided for in other Divisions of this Specification.

E. All starters furnished by the Mechanical Contractor shall meet all requirements specified in Section 16480.

F. Any equipment submitted for prior approval shall be submitted with the following written information specifically for the submitted project application: Specific model numbers, dimensional data, performance data and other data as requested by the Engineer. General or ambiguous submittals will not be considered for prior approval.

1.25 REMOVALS, RELOCATIONS, RECONNECTIONS, AND RESTORATIONS

A. Demolition of existing piping, equipment, etc., shall be done as indicated on the Drawings. Existing piping and/or equipment to be removed shall be offered to the Owner. If the Owner wishes to utilize the existing equipment elsewhere, this Contractor shall move the equipment to a site designated by the Owner. All material to be removed shall be discarded by the Contractor and they shall not be used again.

B. All demolition work shall be completely coordinated with the Owner. Demolition and reconnections requiring shut-down of existing systems shall be scheduled with the Owner/Engineer. If shutdown can only be accommodated on the weekend, or after normal working hours, such work shall be done at no additional cost to the Owner.

C. Location, capacity, size, etc. of existing equipment, piping, etc., was obtained from field survey and as built drawings. Verify all conditions at site prior to commencing with work. Notify Engineer of any discrepancies prior to starting work or ordering material.

D. Survey existing facilities and utilities as necessary to determine location of shut-off or disconnect devices, drains, vents, etc. Drain, refill, and purge existing water piping circuits to make new piping connections.

E. Temporarily store all items to be relocated, if required. Contractor shall be responsible for safe storage of all such items and shall replace any items lost or damaged during storage removal or reinstallation.

1.26 PROJECT/SITE CONDITION

A. Install Work in locations shown on Drawings, unless prevented by Project conditions.

B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other sections. Obtain permission of Owner/Engineer before proceeding.

1.27 AS BUILT DRAWINGS

A. This Contractor shall provide as built drawings (SEPIAS) and AutoCAD files before final payment will be issued.

END OF SECTION

SECTION 15140
SUPPORTS AND ANCHORS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Pipe, duct, and equipment hangers, supports, and associated anchors.

B. Equipment bases and supports.

C. Sleeves and seals.

D. Flashing and sealing equipment and pipe stacks.

1.02 RELATED WORK

A. Section 15010 - Basic Mechanical Requirements.

B. Section 15260 - Piping Insulation.

C. Section 15410 - Plumbing Piping.

D. Section 15415 - Gas Piping.

E. Section 15450 - Plumbing Equipment.

F. Section 15510 - Hydronic Piping.

G. Section 15535 - Refrigerant Piping and Specialties.

H. Section 15540 - HVAC Pumps.

I. Section 15671 - Air Cooled Condensing Unit.

J. Section 15682 - Air Cooled Packaged Water Chiller.

K. Section 15685 - Water Cooled Heat Recovery Chiller.

L. Section 15836 - Split System Air Handler.

M. Section 15855 - Air Handling Units with Coils.

N. Section 15870 - Power Ventilators.

H. Section 15875 - Power Roof Ventilators.

P. Section 15890 - Ductwork.

Q. Section 15930 - Air Terminal Units (VAV).

1.03 SPECIAL REQUIREMENTS

A. Contractor shall submit shop drawings on products and methods of pipe supports.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. B-Line Systems.

B. Grinnel.

C. F and S.

2.03 HANGER RODS

A. Hanger Rods: Threaded both ends, threaded one end, and continuous threaded. Hanger rods shall be zinc-plated steel.

2.04 INSERTS

A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.05 FLASHING

A. Metal Flashing: 22 gage galvanized steel.

B. Lead Flashing: 5 lb/sq ft sheet lead for waterproofing; one lb/sq ft sheet lead for soundproofing.

C. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.

2.07 FABRICATION

A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

B. Design hangers without disengagement of supported pipe.

C. Provide copper plated hangers and supports for copper piping.

2.08 FINISH

A. Steel pipe hangers, steel supports, miscellaneous steel supports, bolts, screws, etc., not specified to be plated or coated shall be hot dipped galvanized with a minimum of 1.50 oz/ft 2 on all sides and all field cuts shall be zinc coated.

PART 3 EXECUTION

3.01 INSERTS

A. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

B. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.

C. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.

3.02 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

	MAX. HANGER SPACING	HANGER ROD DIAMETER
1/2 to 1-1/4 inch	6'-6"	3/8"
1-1/2 to 2 inch	10'-0"	3/8"
2-1/2 to 3 inch	10'-0"	1/2"
4 to 6 inch	10'-0"	5/8"
8 to 12 inch	14'-0"	7/8"
14 inch and Over	20'-0"	1"
PVC (All Sizes)	4'-0"	3/8"

B. Install hangers to provide minimum 1/2-inch space between finished covering and adjacent work.

C. Place a hanger within 12 inches of each horizontal elbow.

D. Use hangers with 1-1/2 inch minimum vertical adjustment.

E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

H. Support riser piping independently of connected horizontal piping.

I. All auxiliary steel required for pipe supports shall be furnished and installed by this Contractor. Where building structure is not usable for pipe supports, provide steel members, channels, angles, or "UNISTRUT" components for piping support. All auxiliary steel exposed to weather shall be galvanized.

J. Provide all steel required for support of pipes other than steel shown on structural Engineer's drawings.

3.03 EQUIPMENT BASES AND SUPPORTS

A. Provide equipment bases and supports of concrete type under all mechanical equipment and as shown on drawings.

B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct support of steel members. Brace and fasten with flanges bolted to structure.

D. Provide rigid anchors for pipes after vibration isolation components are installed.

E. Refer to Section 15010, Article 1.19, Foundations, Supports, Piers, Attachments, for additional requirements.

3.04 FLASHING

A. Provide flexible flashing and metal counter flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

B. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked one-inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter flash and seal.

C. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms, installed in accordance with Manufacturer's instructions for sound control.

3.05 SLEEVES

A. Set sleeves in position in formwork. Provide reinforcing around sleeves.

B. Extend sleeves through floors one inch above finished floor level. Caulk sleeves full depth and provide floor plate.

C. Where piping penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with fire stopping insulation and caulk seal. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

D. Install chrome plated steel escutcheons at finished surfaces.

END OF SECTION 15140

SECTION 15190
MECHANICAL IDENTIFICATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Identification of mechanical products installed under Division 15.

1.02 RELATED WORK

A. Section 15010 - Basic Mechanical Requirements.

B. Section 15260 - Piping Insulation.

C. Section 15280 – Equipment Insulation.

D. Section 15290 – Ductwork Insulation.

E. Section 15410 – Plumbing Piping

F. Section 15415 – Gas Piping.

G. Section 15450 – Plumbing Equipment.

H Section 15510 - Hydronic Piping.

I Section 15515 - Hydronic Specialties.

J. Section 15540 – HVAC Pumps.

K. Section 15671 – Air Cooled Condensing Unit.

L. Section 15682 – Air Cooled Packaged Water Chiller.

M. Section 15685 – Water Cooled Heat Recovery Chiller.

N. Section 15836 – Split System Air Handler.

O. Section 15855 – Air Handling Units with Coils.

P. Section 15870 – Power Ventilators.

Q. Section 15875 – Power Roof Ventilators.

R. Section 15930 – Air Terminal Units (VAV).

1.03 REFERENCES

A. ANSI/ASME A13.1 - Scheme for the Identification of Piping Systems.

1.04 SUBMITTALS

A. Submit product data under provisions of Section 15010.

B. Submit list of wording, symbols, letter size, and color-coding for mechanical identification.

C. Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number. Refer to Section 15010, Paragraph 1.14.

D. Submit manufacturer's installation instructions under provisions of Section 15010 and Division 1.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Brady, Seton or approved equal.

2.02 MATERIALS

A. Color: Unless specified otherwise, conform to ANSI/ASME A13.1

B. Metal Tags: 18-gauge brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

C. Stencils: With clean-cut symbols and letters of following size:

OUTSIDE DIAMETER OF INSULATION OR PIPE	LENGTH OF COLOR FIELD	SIZE OF LETTERS
3/4" - 1-1/4"	8"	1/2"
1-1/2" - 2"	8"	3/4"
2-1/2" - 6"	12"	1-1/4"
8" - 10"	24"	2-1/2"
Over 10"	32"	3-1/2"
Ductwork and Equipment	2-1/2"	

D. Stencil Paint: In accordance with Section 09900, semi-gloss enamel.

E. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and fluid being conveyed.

F. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09900 for stencil painting.

3.02 INSTALLATION

A. Metal Tags: Install with heavy brass hook or chain.

B. Stencil Painting: Apply in accordance with Section 09900.

C. Plastic Pipe Markers: Install in accordance with manufacturer's instructions.

D. Plastic Tape Pipe Markers: Install complete around pipe in accordance with manufacturer's instructions.

E. Equipment: Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with stencil painting. Small devices, such as in-line pumps, may be identified with metal tags

F. Controls: Identify control panels and major control components outside panels with plastic nameplates.

G. Valves: Identify valves in main and branch piping with tags.

H. Piping: Identify piping, concealed or exposed, with plastic pipe markers or stenciled painting. Tags may be used on small diameter piping. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and "T", at each side of penetration of structure or enclosure, and at each obstruction.

I. Ductwork: Identify ductwork with stenciled painting. Identify as to air handling unit number. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.

J. Provide signage for gas vent where located on drawings to indicate the following: "Warning: Flammable Gas Vent".

K. Identify locations of equipment above ceiling such as valves, VAV boxes, fans, filter etc… Provide a color coded label with the equipment tag number at the ceiling.

3.03 VALVE CHART AND SCHEDULE

A. Provide valve chart and schedule in aluminum frame with clear plastic shield. Install at location as directed.

END OF SECTION 15190

SECTION 15290
DUCTWORK INSULATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Ductwork insulation.

1.02 RELATED WORK

A. Section 15010 - Basic Mechanical Requirements.

B. Section 15190 - Mechanical Identification.

C. Section 15855 - Air Handling Units with Coils.

D. Section 15890 - Ductwork.

E. Section 15910 - Ductwork Accessories.

F. Section 15930 - Air Terminal Units (VAV).

G. Section 15936 - Air Outlets and Inlets.

1.03 REFERENCES

A. ANSI/ASTM C553 - Mineral Fiber Blanket and Felt Insulation.

B. ANSI/ASTM C612 - Mineral Fiber Block and Board Thermal Insulation.

1.04 QUALITY ASSURANCE

A. Applicator: Company specializing in ductwork insulation application with two years minimum experience.

B. Materials: UL listed; flame spread/smoke developed rating of 25/50 in accordance with NFPA 90A.

1.05 SUBMITTALS

A. Submit product data under provisions of Section 15010, General Conditions, and Supplementary General Conditions.

B. Include product description, list of materials and thickness for each service, and locations.

C. Submit manufacturer's installation instructions.

D. Submit product description and manufacturer's instructions for all adhesives, mechanical fasteners, joint tape, etc., prior to starting work.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Knauf Fiberglass.

B. Owens Corning Fiberglass.

C. Mansville.

D. Pre-approved Equal.

2.02 MATERIALS

A. Type A: Flexible glass fiber; ANSI/ASTM C553; commercial grade; 1.5 PCF, 6.0 installed `R' value (minimum) at 75 degrees F, .002 foil scrim facing for air conditioning ducts (2" thick).

B. Type B: Glass fiber; UL Class 1; `k' value of 0.24 at 75 degrees F 3 lb/cu ft minimum density; black pigmented, fire resistant coated air side for maximum 6,000 ft/min air velocity. Insulation shall be Owens-Corning Fiberglas Aeroflex Duct Liner.

C. Adhesives: Waterproof fire-retardant type and conform to adhesive and sealant council standards; ASC-A7001A-1971.

D. Lagging Adhesive: Fire resistive to ASTM E84. NFPA 255. UL 723.

E. Mechanical Fasteners: Galvanized steel, 12 gages, and self- adhesive pad. Fasteners shall conform to mechanical fastener standard MF-1-1971 (available from SMACNA).

F. Joint Tape: Glass fiber cloth, open mesh.

G. Tie Wire: Annealed steel, 16 gages.

PART 3 EXECUTION

3.01 PREPARATION

A. Install materials after ductwork has been tested and approved.

B. Clean surfaces for adhesives.

C. Extend shafts for handles on equipment/devices, which are insulated so that insulation is applied at the intended thickness (not compressed). Insulation shall be installed in a manner to eliminate sweating on handles and shafts. Handles shall remain accessible, visible, and operable.

3.02 INSTALLATION

A. Type A:

1. Apply insulation tightly and smoothly to duct.

2. Secure insulation on the bottom of ducts and plenums and on the sides of plenums and other places where the insulation will sag.

3. Install all materials in accordance with Manufacturer's installation instructions.

4. Butt all insulation joints firmly.

5. Install duct wrap to obtain specified `R' value using a maximum of 25% compression.

6. All penetrations and damage to the facing shall be repaired with tape or mastic prior to system start-up.

7. Provide 3" wide (minimum) pressure sensitive tape applied with moving pressure using an appropriate sealing tool at all seams and joints. Apply vapor seal mastic over all taped seams and joints.

8. Longitudinal seam of the vapor retarder shall be overlapped a minimum of 2 inches. A 2-inch tab shall be provided for the circumferential seam.

9. Closure systems shall have a 25/50-flame spread/smoke developed rating per UL 723.

10. For rectangular ducts over 18 inches wide, the duct wrap shall be secured to the bottom side of the duct with mechanical fasteners spaced on 18-inch centers to reduce sag. Fasteners shall be installed in a manner to avoid over compressing the insulation with the retaining washer.

B. Type B

1. All portions of duct designated to receive duct liner shall be completely covered with Duct Liner. Transverse joints shall be neatly butted and there shall be no interruptions or gaps. Board shall be cut to assure tight, overlapped corner joints. Top pieces shall be supported by the sidepieces.

2. The black-coated surface of Duct Liner shall face the air stream.

3. Duct Liner shall be adhered to the sheet metal duct with 100% coverage of adhesive, all exposed leading edges and transverse joints shall also be coated with adhesive. In addition to the above, mechanical fasteners shall be used to secure the Duct Liner to the duct. All edges of duct liner shall be coated with adhesive during the fabrication of ductwork and all exposed edges shall be coated with adhesive prior to field installation of sections.

4. For horizontal runs when the duct width exceeds 12" or the duct height exceeds 16", the Duct Liner Board shall be additionally secured with mechanical fasteners starting within 3" of upstream transverse edges of the Liner and spaced at a

maximum of 15" o.c. and 15" from longitudinal joints. On vertical runs, the fasteners shall be used when either dimension exceeds 12".

C. Install all materials in accordance with Manufacturer's installation.

D. Refer to Section 15890 for weather proofing of outdoor ductwork.

E. Continue insulation with vapor barrier through penetrations.

3.03 SCHEDULE

A. Supply and Return Ductwork - Type A (2" thick).

B. Flex Connections at Air Handling Units and Other Transitions - Type A (2" thick).

C. All Equipment and Ductwork Operating Below Ambient Dew Point - Type A (2" thick).

D. Supply and Return Ductwork - First fifteen (15) feet before and after air handler - Type B (1" thick).

E. Air Transfer Ductwork - Type B (1" thick).

F. Tops of All Supply Diffusers - Type A (2" thick).

G. Air Monitor - Type A (3/4" thick).

H. Outside Air Duct - Type A (2" thick).

I. Duct Mounted Coils - Type B (1-1/2" thick).

J. Air Terminal Units (VAV) - Type B (1-1/2" thick).

K. Outside Air Duct and Exhaust Duct - First 10 Feet Before _and After Fan - Type B (1" thick).

END OF SECTION 15290

SECTION 15890
DUCTWORK

PART 1 GENERAL

1.01 WORK INCLUDED

A. Low pressure ducts.

B. Duct cleaning

1.02 RELATED WORK

A. Section 09900 - Painting.

B. Section 15010 - Basic Mechanical Requirements.

C. Section 15140 - Supports and Anchors.

D. Section 15290 - Duct Insulation.

E. Section 15855 - Air Handling Units with coils.

F. Section 15870 - Power Ventilators.

G. Section 15875 - Power Roof Ventilators.

H. Section 15910 - Ductwork Accessories.

I. Section 15936 - Air Outlets and Inlets.

J. Section 15975 - Building Management and Automatic Temperature Control System.

1.03 REFERENCES

A. ASHRAE - Handbook 2001 Fundamentals; Chapter 34 - Duct Design.

B. ASHRAE - Handbook 2000 HVAC Systems and Equipment; Chapter 16 - Duct Construction.

C. ASTM A 90 - Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.

D. ASTM A 167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

E. ASTM A 525 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.

F. ASTM A 527 - Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process, Lock Forming Quality.

G. ASTM B209 - Aluminum and Aluminum Alloy Sheet and Plate.

H. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

I. SMACNA - Low Pressure Duct Construction Standards.

J. UL 181 - Factory-Made Air Ducts and Connectors.

K. NFPA 96 - Removal of smoke and grease - Laden vapors from Commercial Cooking Equipment.

1.04 DEFINITIONS

A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain sizes inside lining.

B. Low Pressure: Three pressure classifications:

1. 1/2 inch WG positive or negative static pressure and velocities less than 2,000 fpm;

2. 1 inch WG positive or negative static pressure and velocities less than 2,500 fpm; and

3. 2 inch WG positive or negative static pressure and velocities less than 2,500 fpm.

C. Medium Pressure: Two pressure classifications:

1. 3 inch WG positive or negative static pressure and velocities less than 4,000 fpm; and

2. 4 inch WG positive static pressure and velocities less than 4,000 fpm.

Schedule of Duct Construction Requirements:

1. All Air Handlers (first 40 feet on supply side of unit connection): 4-inch WG positive static pressure and velocities less than 4,000 fpm.

2. All Air Handlers (first 40 feet on return side of unit connection): 3-inch WG negative static pressure and velocities less than 4,000 fpm;

3. Return Ductwork: 1-inch negative static pressure and velocities less than 2,500 fpm.

4. Exhaust Ductwork and Outside Air Ductwork: 1-inch positive or negative static pressure and velocities less than 2,500 fpm.

5. Transfer Ductwork: 1/2-inch positive or negative static pressure and velocities less than 2,000 fpm.

6. All Others: Refer to SMACNA HVAC Duct Construction Standards, 1985, Table 1-1.

1.05 REGULATORY REQUIREMENTS

A. Construct ductwork to NFPA 90A standards.

1.06 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 15010 and Supplementary General Conditions.

B. Submit ductwork shop drawings including plans and sections at a scale of 3/8" to a foot. Indicate duct pressure class, fittings, turning vanes, ductwork accessories, particulars such as gages, sizes, welds, duct reinforcement and configuration prior to start of work. Reproduction of the contract documents will not suffice. Shop drawings shall be submitted forty-five (45) days from the date of contract award.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 15010 and Supplementary General Conditions.

B. Store and protect products under provisions of Section 15010 and Supplementary General Conditions.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Non-combustible or conforming to requirements for Class 1 air duct materials, or UL 181.

B. Steel Ducts: Galvanized steel sheet, lock-forming quality, having zinc coating of 1.25 oz per sq ft for each side in conformance with ASTM A90.

C. Fibrous Glass Ducts: Not to be used.

D. Fasteners: Rivets, bolts, or sheet metal screws.

E. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic.

F. Hanger Rod: Steel, galvanized; threaded both ends, threaded one end, or continuously threaded. Hang duct in trapeze fashion in accordance with SMACNA Standards.

G. Straps: Straps may be used on ducts 24" wide and smaller, ducts larger than 24" shall be supported on trapeze with hanger rods.

2.02 LOW PRESSURE DUCTWORK

A. Fabricate and support in accordance with SMACNA Low Pressure Duct Construction Standards and ASHRAE handbooks, except as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated

B. All ductwork constructed to meet static pressure construction class 2" W.G. and up shall meet SMACNA duct sealing class "B". Ductwork construction class below 2" W.G. shall meet duct-sealing class "C".

C. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission.

D. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Provide turning vanes on all T's, bends, and elbows (including long radius elbows and short radius elbows).

E. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.

F. Coordinate low-pressure ductwork with piping structure to avoid routing conflicts.

G. Use double nuts and lock washers on threaded rod supports.

2.03 MEDIUM PRESSURE DUCTWORK

A. All ductwork from static pressures greater than 2 inches w.g. and/or velocity equal to or greater than 2,500 fpm shall be considered as "medium pressure" construction.

B. All gauges of sheet metal, transverse joints, and bracing shall be as set forth in the latest edition of SMACNA "HVAC Duct Construction Standards" and the SMACNA "Industrial Duct Construction Standards" with Class 1 construction. Ductwork shall be Seal Class A construction.

C. The first forty feet (or length as shown on drawings) of ductwork from the air handler shall be double wall duct. The inner wall shall be galvanized perforated sheet metal for sound attenuation. A mylar film shall separate the inner wall from the layer of insulation. Refer to specification 15290 for insulation requirements. The outer wall shall be galvanized sheet metal.

D. All longitudinal and transverse joints shall be carefully sealed with sealing compound. Compound shall be applied both when forming joints, and when pulling joints together. When transverse joints are flanged, provide gaskets of neoprene or other suitable material between flanges.

E. Rectangular Ductwork within 40 feet of airhandling units (including access doors) shall be double-wall; duct and fittings shall be of Pittsburgh-lock longitudinal seam construction with transverse duct connectors. Duct shall be provided in lengths as required to meet the installation requirements of routing the ducts through the existing structure. Standard construction shall conform with the 1985 SMACNA HVAC Duct Construction Standards and TDC Lockformer Addendum to SMACNA. Duct and fittings shall be shipped fully assembled. The liner perforations shall be 3/32 inch diameter with an overall open area of 23%.

F. Flat oval and round medium pressure ductwork shall be constructed of zinc coated steel of spiral lock seam construction. Conduit shall be cut to length on the job and assembled with matched dimension fittings. Conduit and fittings shall be as manufactured by United McGill, United Sheet Metal Company, or approved equal by Semco, Gowco or SSM industries. Make-up connections with sealing compound and mechanically fasten with drive or twist screws. Tape joints with pressure sensitive plastic tape or "hard cast" jointing compound.

G. All fittings for oval and round ductwork shall be factory fabricated by United McGill, United Steel Metal Company, Semco or Dowco and shall be one gauge heavier than the duct run in which it is installed. All joints shall be made with an approved type adhesive and taped.

2.04 EXPOSED SPIRAL ROUND SUPPLY DUCT, BRANCH DUCT AND FITTINGS

A. Double Wall Round Ducts (Supply): Galvanized steel meeting ASTM A653 standards (paint-grip finish), one inch (1") thick fiberglass insulation, spiral outer shell and perforated liner. A UL approved mylar film and taped joints shall separate the internal fiberglass lining and airstream. Duct shall be United McGill Corporation ACOUSTI-K27 2-10 inch W.G. standard (KRHSD), Eastern Sheet Metal, or approved equal by Semco, Gowco or SSM industries.

B. The Duct shall be constructed of perforated liner, a 1 inch layer of 1 inch fiberglass insulation conforming to the specification for Type A insulation in Section 15290 with a UL approved mylar film and taped joint separation between the insulation and inner liner/airstream and an outer pressure shell. Duct shall be spiral lockseam construction, provided in standard lengths of 10, 12, and 20 feet. The liner perforations shall be 3/32 inch diameter with an overall open area of 23 percent, insulated duct shall have a maximum thermal conductivity (k) factor of 0.27 Btu per hour per square foot degree F per inch thickness at 75°F ambient. Fabricate duct from galvanized steel meeting ASTM A653 standards, and as listed in the following table:

Inner Liner Diameter (Inches)	Outer Shell Gauge	Inner Liner Gauge	Inner Liner Construction
3 – 8	26	28	Standard Spiral
9 – 12	26	28	Ribbed Spiral
13 – 24	24	28	Ribbed Spiral
25 – 34	22	28	Ribbed Spiral
35 – 42	20	28	Ribbed Spiral
44 – 48	20	26	Ribbed Spiral
50 – 60	18	26	Ribbed Spiral
62 – 82	18	22	Standard Spiral

C. Fittings shall be constructed of a perforated 1 inch layer of fiberglass insulation, and an outer pressure shell. Fittings shall be constructed of galvanized steel meeting ASTM A653 standards and as listed in the following table:

Inner Liner Diameter (Inches)	Outer Shell Gauge	Inner Liner Gauge
3 – 12	24*	24
13 – 24	22	24
25 – 34	20	24
35 – 48	20	22
50 – 58	18	22
60 – 82	16	20
* Pleated elbows shall be 26 gauge minimum		

Standing seam joints shall be used wherever possible on fittings. All standing seam joints shall be sealed with a UL Classified zero flame spread and zero smoke developed cement specially formulated for bonding metal-to-metal joints. In lieu of standing seam construction, joints shall be solid welded or spot welded and bonded. All welded joints shall be coated with a protective paint, inside and out, to prevent damage to the galvanized surface. Spot-welded fittings shall have all joints sealed with a UL Classified zero flame spread and zero smoke developed cement specially formulated for bonding metal-to-metal joints.

Elbow shells shall be of die-stamped, gored, pleated, or mitered construction as specified in the contract documents or in United McGill's construction standards. Elbow liners shall be gored unless 2-piece mitered construction is specified. Diverging flow fittings shall be constructed with a radiused entrance to all branch taps and with no excess material projecting from the body into the branch tap entrance.

Perforations shall be 3/32 inch in diameter with an overall open area of 23 percent. Insulted fittings shall have a maximum thermal conductivity (k) of 0.27 Btu per hour per square foot per degree Fahrenheit per inch thickness at 75°F ambient temperature.

Connections: All double wall duct and fittings shall be provided with both an inner liner coupling and an outer pressure shell coupling. Outer shell connections can be by slip joint or flanged joint; however, flanged joints are recommended in sizes greater than 36 inches in diameter. In either case, a slip coupling shall be used to join inner liner sections at duct/duct joints. Fitting liners shall be extended 2 inches beyond the outer shell cut-off to provide an inner liner coupling at duct/fitting joints.

D. Ductwork Shop Drawings/Field Coordination: All double wall ductwork shall be factory pre-manufactured (all ductwork including straight runs and fittings). As a basic part of this manufacturer's contractual requirements, they shall provide a minimum ¼" per foot, scaled, coordinated, ductwork shop drawings (coordination drawings). The coordination drawings shall be field verified by a certified manufacturer's representative and the installing contractor(s). The coordination drawings shall represent the actual routing, mounting locations, transitions, etc., as necessary to achieve the design intent while optimizing the use of the designated installation space as it relates to equipment and materials of other trades in that space (i.e., piping, air handlers, starters, building structure, electrical panels, etc). These coordination drawings shall be submitted to the engineer for review and approval prior to ordering materials. The coordination drawings provided shall be submitted to the engineer prior to the ordering of sheet metal duct.

2.05 FLEXIBLE DUCT

A. The duct shall be made from dead soft aluminum sheet, spiral wound into a tube and spiral corrugated. The duct shall be fabricated with a triple mechanical lock to form a continuous secure airtight joint. No adhesives may be used in the manufacture. Duct shall have a factory applied fiberglass insulation blanket with a "C" factor not more than .23. This blanket shall be protected by an outdoor vapor barrier composed of fiberglass reinforced aluminum foil and Mylar laminate. Ducting shall be cut to size and hand formed to suite job conditions in accordance with the manufacturer's recommendations. The duct shall conform to NFPA 90A and be listed by Underwriters Laboratories as 181 Class I Air Duct.

B. Flexible duct shall be Triple Lock Type TL-M as manufactured by Flex master or approved equal by Clevaflex or Flexible Tubing Corporation.

C. Maximum length of duct shall be 6'-0" on diffuser connections and 4'-0" on VAV box inlet connections.

D. Install with maximum bend radius of 1-1/2 diameters.

PART 3 EXECUTION

3.01 INSTALLATION

A. Chemical, Flammable, and Fume Hood Exhaust Systems:

1. Ductwork shall be fabricated and installed as indicated on drawings.

2. Duct system shall be tested at twice its operating pressure and have "zero" leakage.

B. Provide openings in ductwork where required to accommodate smoke detectors and sensors. Provide Pitot tube openings where required for testing of systems, complete with metal cap with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

C. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

D. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

E. Install motorized control dampers, duct mounted temperature pressure sensors and air monitors in ductwork; dampers, sensors and air monitors supplied under Section 15975, installed by the Mechanical Contractor.

F. All ductwork connected to motor driven equipment shall be provided with flexible duct connections.

G. Install 18" x 18" duct access doors within 6-8 feet of each air handler for both the return and supply.

H. Aluminum ductwork serving wet areas shall be pitched for drainage toward registers. Bottom of ductwork shall be welded or soldered watertight.

I. Install duct smoke detectors in ductwork furnished by others as shown on the drawings.

3.02 ADJUSTING, TESTING, AND CLEANING

A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment, which may be harmed by excessive dirt with temporary filters, or bypass during cleaning.

B. All ducts of all pressures shall be leak-tested as per SMACNA, HVAC Air Duct Leakage Test Manual, in the presence of the A/E and Owner's representative. The tabulated test results shall be submitted to the A/E. Duct shall be tested in accordance with the applicable leakage class as defined and scheduled herein. Reference Figure 4-1, Duct Leakage Classification, and Table 4-1, Applicable Leakage Classes, of SMACNA Manual. If the leakage constant determined from the tests is lower than or equal to the specified leakage class, the duct is in compliance. If the duct is not in compliance, the duct shall be resealed and retested until the duct is tested and found to be in compliance.

END OF SECTION 15890

SECTION 15910
DUCTWORK ACCESSORIES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Volume control dampers.

B. Air turning devices.

C. Flexible duct connections.

D. Duct test holes.

E. Motor operated dampers.

F. Access doors.

G. Fire dampers.

H. Air extractors.

I. Equalizing grids.

J. Stationary louvers.

1.02 RELATED WORK

A. Section 15010 - Basic Mechanical Requirements.

B. Section 15855 - Air Handling Units with Coils.

C. Section 15890 - Ductwork.

D. Section 15975 - Building Management and Automatic Temperature Control System.

1.03 REFERENCES

A. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

B. SMACNA - Low Pressure Duct Construction Standards.

1.04 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 15010, General Conditions, and Supplementary General Conditions.

PART 2 PRODUCTS

2.01 VOLUME CONTROL DAMPERS - (BALANCING)

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

B. Fabricate multi-blade damper of opposed blade pattern for ducts more than 12" in height and single blade dampers for ducts 12" in height or less with maximum blade length of □ □48 inches. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.

C. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where rod lengths exceed 30 inches provide regulator at both ends.

2.02 AIR TURNING VANES

A. Turning Vanes Over 36 Inches:

Multi-blade device with double thickness airfoil blades with long trailing edge vanes aligned in short dimension, steel or aluminum construction, with individually adjustable blades, mounting straps. Refer to SMACNA HVAC Duct Construction Standards, First Edition, for spacing, reinforcing, and other construction quality details.

B. Turning Vanes up to 36 Inches:

Single blade device with long trailing edge vanes, aligned, steel or aluminum construction, with individually adjustable blades, mounting straps. Refer to SMACNA HVAC Duct Construction Standards, First Edition, for spacing, reinforcing, and other construction quality details.

2.03 DUCT CONNECTIONS

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards, and as indicated.

2.04 DUCT TEST HOLES

A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent test holes shall be factory fabricated, airtight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.05 MOTOR OPERATED DAMPERS

A. Dampers shall be furnished by automatic controls contractor and installed by the mechanical contractor.

2.06 ACCESS DOORS

A. Access doors shall be provided at all main volume dampers, automatic dampers, before and after booster heaters, air flow measuring stations, thermostats in fan discharges, control devices, fire dampers and other locations where duct access is required.

B. Doors shall be constructed of #22 gauge metal minimum or at least two (2) gauges heavier than duct. Door material shall be same as duct system.

C. Doors shall be provided with a flat iron or angle iron stiffening frame and so constructed that they can be operated without twisting or distortion. Doors on insulated ductwork shall be of double panel construction, provided with an approved type insulated filler not less than 1" thick. The duct opening at each door shall be provided with a continuous reinforcing galvanized bar or angle against which the door will close, this being provided with a latex foam gasket. Gasket shall be held to bar or angle by applying a flameproof adhesive. All access doors shall be hinged, minimum two (2) hinges.

D. Door frames on insulated ductwork shall be placed on an extended metal collar flush with the face of the finished insulation.

E. Doors shall be gasketed airtight.

F. Access door and hardware shall be submitted for approval before fabrication.

G. Access door on air handling unit shall open out on draw-through unit and open in on blow through units.

2.07 FIRE DAMPERS

A. Provide UL labeled fire dampers for horizontal and vertical openings in shaft walls, fire rated partitions and floors as shown on the Drawings. Dampers shall provide 100% of the duct-free area. Dampers shall be built and tested in accordance with NFPA 90A, latest edition. Damper shall be continuous stainless spring steel curtain, guided on a center rod and shall close by it's own inertia from any position. Damper shall lock in closed position. Frame shall be 18-gauge cold-rolled steel. Dampers shall be installed in duct extension sleeves and with perimeter angles and breakaway fittings in accordance with the Manufacturer's instructions and SMACNA details.

B. Fire dampers shall be as manufactured by Green Heck, by Air Balance Inc. or Ruskin or pre-approved equal (per Section 15010).

PART 3 EXECUTION

3.01 INSTALLATION

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

B. Provide balancing dampers at points on low pressure supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing.

C. Provide back draft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

D. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.

E. Provide duct test holes where required for testing and balancing purposes.

F. Motorized dampers are furnished under Section 15975, installed by the Mechanical Contractor.

G. Provide 18" x 18" access doors in ductwork within 6-8 feet of each air handler for both the return and supply.

END OF SECTION 15910

SECTION 15936
AIR DEVICES

PART 1 GENERAL

1.01 WORK INCLUDED

A. Registers/grilles.

B. Louvers

1.02 RELATED WORK

A. Section 09900 - Painting.

B. Section 15010 - Basic Mechanical Requirements.

C. Section 15890 - Ductwork

1.03 REFERENCES

A. ADC 1062 - Certification, Rating and Test Manual.

B. AMCA 500 - Test Method for Louvers, Dampers and Shutters.

C. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

D. ARI 650 - Air Outlets and Inlets.

E. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.

F. SMACNA - Low Pressure Duct Construction Standard.

1.04 QUALITY ASSURANCE

A. Test and rate performance of air outlets and inlets in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.

B. Test and rate performance of louvers in accordance with AMCA 500.

1.05 REGULATORY REQUIREMENTS

A. Conform to ANSI/NFPA 90A.

1.06 SUBMITTALS

A. Submit product data under provisions of Section 15010, General Conditions, and Supplementary General Conditions.

B. Provide product data for items required for this project.

C. Submit schedule of outlets and inlets indicating type, size, location, application, and noise level.

D. Review requirements of outlets and inlets as to size, finish, and type of mounting prior to submitting product data and schedules of outlets and inlets.

E. Submit engineering data in a manner to facilitate convenient review of aspiration ability, including temperature and velocity traverses, throw and drop, noise criteria ratings sizes, free area and quality of construction. Outlets shall be selected for maximum noise criteria level as scheduled on drawings.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - CEILING DIFFUSERS AND REGISTERS

A. Metalaire.

B. Titus.

C. Kruger.

D. Price.

E. Substitutions: Upon prior approval.

2.02 CEILING DIFFUSERS, REGISTERS, AND GRILLES

A. Fabricate aluminum and baked enamel white finish. (Refer to schedule on drawings.)

B. Provide opposed blade damper and multi-louvered equalizing grid with damper adjustable from diffusers and registers faces.

C. Coordinate frame type with latest architectural reflected ceiling plan.

D. Refer to schedule on drawings for type and model number.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install items in accordance with manufacturers' instructions.

B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement. Refer to Section 09900.

C. Install diffusers registers and grilles to ductwork with air tight connection.

D. Provide balancing dampers in diffusers and registers.

E. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09900.

END OF SECTION 15936

SECTION 15990
TESTING, ADJUSTING, AND BALANCING

PART 1 GENERAL

1.01 SUMMARY STATEMENT

A. Test and balance of HVAC systems supply, return, and exhaust systems shall be performed by an independent test and balance agency certified by AABC or NEBB. The cost of the TAB services are a part of the base bid for this Contract. The TAB services provided herein shall be completed and the written report submitted to the Engineer a minimum of 15 days prior to Substantial Completion of each project phase. The Owner will then perform a verification TAB. If discrepancies are found, they will be corrected by this Contractor and the Contractor will be responsible to pay for additional trips for the Owner's TAB representatives to verify.

1.02 RELATED DOCUMENTS

A. The requirements set forth in the Bidding Requirements and the Contractual Conditions of Division One shall apply to this Section.

B. The requirements of Section 15010, Basic Mechanical Requirements, shall be adhered to in the test and balance work which shall include Section 15260, Piping Insulation; Section 15515, Hydronic Specialties; Section 15890, Ductwork; and Section 15975, Building Management and Automatic Temperature Control System.

1.03 GENERAL

A. Scope

1. Description

a. The Contractor shall, at the Contractor's expense, procure the services of an independent testing and balance firm which specializes in the balancing and testing of heating, ventilating and air conditioning systems. This specialty services firm shall balance, adjust and test water circulation, air moving equipment, air distribution and/or exhaust systems as herein specified.

b. Test and balance work shall not begin until all systems have been completed and are in full working order to the satisfaction of the Project Architect/Engineer and the Owner. This Contractor shall make all preliminary tests and adjustments before advising in writing that test and balance work is ready to begin and shall place all systems and equipment into full operation during each working day of testing and balancing.

2. Replacement pulleys (adjustable and non-adjustable), additional balancing dampers, pressure taps, balancing valves, cocks and fittings, etc., required to effect proper air and water balance shall be furnished and installed by this Contractor at no additional cost to the Owner. This Contractor shall do this work as soon as possible so as not to delay the completion of the test and balance work.

3. Air filters shall be replaced and strainers shall be cleaned by this Contractor before proceeding with test and balance and thereafter as required by the test and balance firm.

4. Systems shall be placed into service using approved start up procedures. This (mechanical) contractor shall be responsible for proper initial setting and adjustment of HVAC equipment, air handlers, VAV boxes, exhaust fans, etc. furnished and installed by him.

5. This Contractor shall provide test openings as required; shall operate HVAC equipment and provide trades persons to assist and make adjustments for test and balance during the process.

6. When the Owner's verification test and balance firm is ready to test according to the established schedule, but is prevented from testing and balancing, making adjustments or taking measurements due to incompleteness of the work, all extra charges for test and balance attributable to the delay may be back charged to this Contractor. The Project Architect/Engineer shall be the judge as to whether a delay has occurred and back charges due the Owner, and which, if judged proper, shall be effected through a Change Order reducing the Contract Sum.

7. The Contractor's test and balance firm shall periodically visit the site during construction of the HVAC system. No less than two visits per phase will be made. Should methods, materials or workmanship being used adversely affect balancing and adjusting work, the test and balance agency shall report its findings in writing to the Contractor with recommendations for correction.

8. The Contractor's test and balance firm has agreed or shall agree to carry out the test and balance in accordance with the AABC National Standards for Total Systems Balance, 1982 or the NEBB Procedural Standards for Testing, Adjusting and Balancing or Environmental Systems, Fourth edition, and in conformance with ASHRAE Handbook, 1991, Chapter 34, Testing, Adjusting and Balancing and as outlined in this Specification Section.

9. This Contractor shall furnish to the testing and balancing agency a complete set of plans and specifications, addenda, shop drawings, schedules and change orders as may be required.

B. Quality Assurance

1. The final result of balancing shall be to provide uniform air temperatures within a two (2) degree F spread in the conditioned space at peak load conditions.

2. All instruments used shall be accurately calibrated within six months of testing and balancing and shall be maintained in good working order.

3. In the event of dispute, the Owner or Contractor or Project Architect/Engineer may choose to provide verification of test and balance reports, and such verification shall be by a third independent agency selected by the Engineer. Reports found to be inaccurate will be disallowed, and the Contractor's test and balance firm will be required to repeat operations under the supervision of the third independent agency until accurate reports are completed and

agreed upon, provided the Contractor's TAB firm is found to be at fault in the judgment of the Engineer. The cost of disputed test and balance work shall be borne by the Owner or Contractor (whichever is found to be at fault).

C. Submittals

1. The test and balance firm will submit two (2) copies of data for the testing and balancing for the approval of the Project Architect/Engineer and three (3) file copies to the Owner and two (2) copies to this Contractor.

2. All data and information shall be compiled in a neat, orderly format on 8-1/2" x 11" test forms and shall be signed and sealed by the certified individual as previously described.

2.01 EXECUTION

A. Air Balance

1. This Contractor shall prepare the air systems for balancing and verify same for test and balance firm as follows:

a. Mechanically check fans, blowers and air handling equipment and make such available to operate under design conditions.

b. Set volume dampers, air dampers and vanes in their normal position.

c. Set grilles, diffusers, etc. installed with vanes, blades in their normal position.

d. Mechanically check controls, whether they are electronic, electric or pneumatic or a combination thereof, and make available to operate under design conditions.

e. Mark damper shafts and locking devices to accurately represent the position of their respective dampers when in optimum position.

2. The Contractor's test and balance firm shall perform the following tests and balance system in accordance with these requirements:

a. Test and adjust fan RPM to design requirements.

b. Test and record motor full load amperes. Verify the sizing and settings of overloads as well as document same on reports. Coordinate with Division 16 to install and size overloads to NEC and manufacturers requirements.

c. Make pitot tube traverse of main supply and return ducts and obtain design CFM at fans.

d. Test and record system total pressures, suction and discharge.

e. Test and adjust system for design CFM recirculated air.

f. Test and adjust system for design CFM outside air.

g. Test and record coil entering air temperatures (D.B. heating and cooling).

h. Test and record coil entering air temperatures (W.B. cooling).

i. Test and record coil leaving air temperatures. (D.B. heating and cooling).

j. Test and record coil leaving air temperatures (W.B. cooling).

k. Adjust all main supply and return air ducts to proper design CFM.

l. Adjust all zones to proper design CFM (±10%), supply and return. Show all DDC readings at time of measured readings. Coordinate with Controls Contractor to resolve differences.

m. Test and adjust each diffuser, grille, and register to within ±10% of design requirements.

n. Each grille, diffuser and register shall be identified as to location, area and system.

o. Test and record all room temperatures, D.B. and W.B. Test shall be made near room thermostat where installed at four feet above floor.

3. Size, type and manufacturer of diffusers, grilles, registers, and all tested equipment shall be identified and listed. Manufacturer's ratings on all equipment shall be used to make required calculations.

4. Readings and tests of diffusers, grilles and registers, shall include test resultant velocity, required CFM and test resultant CFM after adjustments.

5. In cooperation with the control manufacturer's representative, the test and balance firm shall set adjustments of automatically operated dampers to operate as specified, indicated, and/or noted.

6. Testing and balance firm shall check all controls for proper calibrations and list all controls requiring adjustment by control installers.

7. Diffusers, grilles and registers shall be adjusted by the test and balance firm to minimize drafts in all areas.

8. The test and balance firm shall verify duct work leakage tests. Data from duct work leakage tests shall be tabulated and included with the test and balance report. Leakage tests per SMACNA requirements shall be performed.

9. Tested section of duct work shall be marked by this Contractor and verified by the test and balance firm. All tests and repairs shall be made before duct sections are concealed or insulated.

D. Equipment

1. The test and balance agency shall submit, as part of its report, complete identification and operating data on the following:

a. Air handling units.

b. New and existing air devices (grilles, registers, diffusers).

c. VAV boxes.

d. Chillers, pumps, etc.

2. Pump Impeller Size Requirements

a. Test and balance agency shall measure pump characteristics and select the pump impeller diameter required to achieve the design flow conditions of the particular system while optimizing the motor work and balancing valve position in order to alleviate noise caused by turbulence in the valve. Turn these dimensions, along with the installed pump curves with the new pump and system curves, for review by the Engineer. Upon approval by the Engineer, the impeller dimensions shall be turned over to the installing contractor for impeller shaving.

E. Certification

1. The test and balance report to the Project Architect/Engineer and to the Owner shall be signed, "sealed" and certified by a certified balancing agent in the State of Florida whose specialty discipline is HVAC, together with a signed statement that this balancer's specialty is HVAC.

END OF SECTION

MECHANICAL SPECIFICATIONS

MECHANICAL SPECIFICATIONS

1. GENERAL RESPONSIBILITIES OF THE CONTRACTORS

PRIOR TO STARTING THE PROJECT, THE MECHANICAL CONTRACTOR SHALL PROVIDE THE SERVICES OF A STRUCTURAL PROFESSIONAL ENGINEER WHO SHALL CERTIFY THE INSTALLATION AND ATTACHMENT OF ALL ITEMS REQUIRING STRUCTURAL SUPPORT OR WIND LOADING ARE ACCEPTABLE AND MEET THE CODE REQUIREMENTS. ALL DETAILS SHOWN ARE ONLY INTENDED TO BE USED BUDGETING PURPOSES. THE MECHANICAL CONTRACTOR SHALL PROVIDE A SIGNED AND SEAL LETTER FROM THE STRUCTURAL ENGINEER STATING THAT THE ENTIRE MECHANICAL INSTALLATION MEETS FLORIDA WIND LOAD AND STRUCTURAL SUPPORT REQUIREMENTS.

THE GENERAL CONTRACTORS SHALL PROVIDE THE LABOR, MATERIALS, AND EQUIPMENT REQUIRED FOR THE HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM(S) AS DESCRIBED IN THE COMPLETE SET OF CONSTRUCTION DOCUMENTS. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2014 FLORIDA BUILDING CODE AND 2014 FLORIDA ENERGY CODE, 2011 NATIONAL ELECTRIC CODE, NFPA NATIONAL FIRE CODES, AND ALL OTHER STATE AND LOCAL CODES.

THE OWNER SHALL NOT BE RESPONSIBLE FOR ANY PORTION OF THE SCOPE OF WORK UNLESS SPECIFICALLY NOTED IN THE CONSTRUCTION DOCUMENTS.

THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION SCHEDULES OF ALL TRADES. FIXED WORK SUCH AS DUCTWORK AND SANITARY AND STORM PIPING SHALL BE INSTALLED PRIOR TO ANY TRADE WORK THAT CAN BE EASILY RELOCATED OR OFFSET SUCH AS ELECTRICAL CONDUIT AND FIRE PROTECTION AND WATER PIPING. ALL ELECTRICAL CONDUIT AND WATER PIPING SHALL BE INSTALLED AS CLOSE TO WALLS AND AS CLOSE TOGETHER AS POSSIBLE TO ALLOW FOR MAXIMUM DUCT ACCESSIBILITY.

ALL CONTRACTORS SHALL COORDINATE THE SCOPE OF THEIR WORK AND THEIR CONSTRUCTION SCHEDULES WITH THE OWNER TO PREVENT ANY INTERRUPTIONS UNACCEPTABLE TO THE OWNER. THIS MAY REQUIRE WORK AFTER NORMAL OPERATING HOURS AND/OR ON WEEKENDS.

2. BIDS, SHOP DRAWINGS, EQUIPMENT SUBMITTALS, AND CHANGE ORDERS

EACH PROSPECTIVE CONTRACTOR SHALL EVALUATE THE SCOPE OF WORK THOROUGHLY PRIOR TO SUBMITTING A BID. SOME CONDUIT, PIPING, AND OTHER OBSTACLES MAY NEED TO BE RELOCATED AND SUCH RELOCATION SHOULD BE INCLUDED IN EACH PROSPECTIVE MECHANICAL CONTRACTOR'S BID.

EACH PROSPECTIVE MECHANICAL CONTRACTOR SHALL PROVIDE A DETAILED COST BREAKDOWN FOR EACH TASK IN THE SCOPE OF WORK AS SHOWN ON THE CONSTRUCTION DOCUMENTS, INCLUDING EQUIPMENT, MATERIALS, AND LABOR. ANY PROPOSED VALUE-ENGINEERING, INCLUDING SUBSTITUTIONS FOR SCHEDULED EQUIPMENT, SHALL BE PRESENTED SEPARATELY AS AN ALTERNATE WITH A SIMILAR COST BREAKDOWN. THE SCOPE OF WORK SHALL BE BID WITH THE SCHEDULED EQUIPMENT AND ANY PROPOSED VALUE-ENGINEERING OR EQUIPMENT SUBSTITUTIONS SHALL BE IDENTIFIED AS ALTERNATE DEDUCTIONS FROM THE CONTRACTOR'S BASE BID. ANY CHANGE ORDERS MUST BE SUBMITTED WITH BOTH THE ORIGINAL COST BREAKDOWN AND THE NEW COST BREAKDOWN FOR COMPARISON.

EACH PROSPECTIVE MECHANICAL CONTRACTOR SHALL PROVIDE A CONSTRUCTION SCHEDULE DETAILING THE START DATE, DURATION, ASSIGNED MAN-HOURS, AND FINISH DATE OF EACH TASK IN THE SCOPE OF WORK AS SHOWN ON THE CONSTRUCTION DOCUMENTS. IF ANY PROPOSED VALUE-ENGINEERING OR EQUIPMENT SUBSTITUTIONS AFFECT THIS SCHEDULE, THEN THOSE IMPACTS SHALL BE IDENTIFIED SEPARATELY.

PRIOR TO STARTING THE PROJECT, THE MECHANICAL CONTRACTOR SHALL STUDY THE COMPLETE SET OF CONSTRUCTION DOCUMENTS AND COORDINATE WITH THE OTHER TRADES AS REQUIRED TO PROVIDE SHOP DRAWINGS TO SUBMIT TO THE MECHANICAL ENGINEER FOR APPROVAL. THE SHOP DRAWINGS MAY BE SUBMITTED AS HAND-DRAWN NOTES UPON A COPY OF THE CONSTRUCTION DOCUMENTS IF PERMISSION IS OBTAINED FROM THE MECHANICAL ENGINEER. THE CONSTRUCTION DOCUMENTS ARE DIAGRAMMATIC IN NATURE AND INTENDED SOLELY TO CLARIFY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. THE CONSTRUCTION DOCUMENTS ARE NOT INTENDED TO ALERT THE CONTRACTOR(S) OF ALL OBSTACLES. THE SHOP DRAWINGS SHALL SHOW THE COORDINATION OF DUCTWORK AND MECHANICAL EQUIPMENT INSTALLATION WITH EXISTING AND NEW OBSTACLES INCLUDING, BUT NOT LIMITED TO, ELECTRICAL CONDUITS, FIRE PROTECTION PIPING, RAIN LEADERS, SANITARY DRAINS, STRUCTURAL MEMBERS, AND WATER PIPING, AS WELL AS THE MECHANICAL EQUIPMENT MANUFACTURER'S' RECOMMENDED CLEARANCES AND THE STRUCTURAL ENGINEER'S RECOMMENDATIONS REGARDING THE INSTALLATION AND ATTACHMENT OF ALL ITEMS REQUIRING STRUCTURAL SUPPORT OR WIND LOADING. THE MECHANICAL CONTRACTOR SHALL ALSO SHOW THE EXISTING CONDITIONS ON THE SHOP DRAWINGS WHERE THE EXISTING CONDITIONS ARE DIFFERENT FROM THOSE SHOWN ON THE CONSTRUCTION DOCUMENTS.

PRIOR TO STARTING THE PROJECT, THE MECHANICAL CONTRACTOR SHALL STUDY THE COMPLETE SET OF CONSTRUCTION DOCUMENTS AND COORDINATE WITH THE MANUFACTURER(S) AS REQUIRED TO PROVIDE EQUIPMENT SUBMITTALS TO SUBMIT TO THE MECHANICAL ENGINEER FOR APPROVAL. THE EQUIPMENT SUBMITTALS SHALL INCLUDE DIMENSIONS, WEIGHTS, SPECIFIED ACCESSORIES AND REQUIRED CLEARANCES, AS WELL AS FAN CURVES, SOUND LEVELS, CONSTRUCTION DETAILS, WARRANTY INFORMATION, AND ALL OTHER RELEVANT DATA PRESENTED IN THE SAME FORMAT AS THE EQUIPMENT SCHEDULES ON THE CONSTRUCTION DOCUMENTS.

THE BASE PRICE SHALL USE ALL EQUIPMENT AS SPECIFIED. ALL VALUE ENGINEERING ALTERNATES SHALL BE LISTED AS ALTERNATES FOR THE OWNERS CONSIDERATION. IF ALTERNATE PRICING IS NOT ACCEPTED BY THE OWNER AND ENGINEER, THEN THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AS SPECIFIED. THE OWNER WILL CONSIDER A CHEAPER PIECE OF EQUIPMENT IF THE DEDUCT IS ENOUGH AND THE PERFORMANCE IS STILL ACCEPTABLE. THE OWNER WILL CONSIDER A MORE EXPENSIVE PIECE OF EQUIPMENT IF BETTER PERFORMANCE WOULD JUSTIFY THE ADDITIONAL UPFRONT COST. PLEASE PROVIDE ALL ALTERNATES THAT WOULD BE USEFUL FOR THE OWNER TO CONSIDER TO SAVE MONEY OR IMPROVE PERFORMANCE. ALTERNATES MUST MEET THE SPECIFICATION REQUIREMENTS AND THE CONTRACTOR ASSUMES FULL RESPONSIBILITY OF COORDINATING WITH OTHER TRADES FOR ALL CHANGES AND COST REQUIRED.

ALTERNATIVES TO THE SCHEDULED EQUIPMENT AND MATERIALS MUST BE EQUAL TO OR EXCEED THOSE SCHEDULED. IF SUBSTITUTIONS FOR SCHEDULED EQUIPMENT AND MATERIALS ARE TO BE MADE, THEN THE MECHANICAL CONTRACTOR SHALL FIRST SUBMIT TO THE MECHANICAL ENGINEER COMPARATIVE LITERATURE CLEARLY SHOWING THE EQUIVALENT OPERATING CAPABILITIES AND OTHER PROPERTIES OF THE SUBSTITUTIONS. ALL DEVIATIONS MUST BE CLEARLY IDENTIFIED AND A REQUEST MUST BE MADE SPECIFIC FOR ALL DEVIATIONS. WHEN SUBSTITUTIONS ARE MADE, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY OF COORDINATING WITH OTHER TRADES ON ANY CHANGES REQUIRED FOR THE SUBSTITUTION, INCLUDING COSTS, ASSOCIATED WITH DUCTWORK, PIPING, ELECTRICAL AND STRUCTURAL TO IMPLEMENT THE SUBSTITUTED ITEM(S).

ANY CHANGE ORDER SUBMITTED BY THE GENERAL, MECHANICAL, OR ELECTRICAL CONTRACTORS FOR WORK WITHIN THE SCOPE OF THIS PROJECT SHALL NOT EXCEED THE VALUES LISTED IN THE MOST CURRENT VERSIONS OF THE MEANS COST DATA BOOKS FOR THE APPLICABLE TRADES. EVERY CHANGE ORDER SHALL BE ACCOMPANIED BY A DETAILED COST BREAKDOWN FOR EACH TASK, INCLUDING EQUIPMENT, MATERIALS, AND LABOR. THE MECHANICAL ENGINEER MAY, AT HIS DISCRETION, REQUIRE THE CONTRACTOR(S) TO PROVIDE A FINAL, VERIFIABLE ACCOUNTING OF EQUIPMENT, MATERIALS, AND LABOR AFTER THE WORK IS COMPLETE AND PRIOR TO THE MECHANICAL ENGINEERS APPROVAL OF THE CONTRACTOR'S' FINAL PAY APPLICATION(S). LABOR RATES FOR CHANGE ORDERS SHALL NOT EXCEED $50/HOUR ($75/HR OVERTIME) FOR ANY CHANGE ORDERS INCLUDING ALL OVERHEAD AND PROFIT UNLESS APPROVED BY THE ENGINEER OF RECORD. MATERIALRATES FOR PIPING SHALL NOT EXCEED A 0.35 MULTIPLER FOR NIBCO MATERIALS UNLESS APPROVED BY ENGINEER OF RECORD.

3. MECHANICAL EQUIPMENT INSTALLATION

ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED AS REQUIRED BY THE MANUFACTURER'S' INSTALLATION AND MAINTENANCE MANUALS. THOSE MANUALS WILL TYPICALLY PROVIDE MORE DETAIL THAN THE CONSTRUCTION DOCUMENTS. IF THERE IS A CONFLICT BETWEEN THE INSTALLATION AND MAINTENANCE MANUALS AND THE CONSTRUCTION DOCUMENTS, THEN THE MECHANICAL CONTRACTOR SHALL SUBMIT A REQUEST-FOR-INFORMATION TO THE MECHANICAL ENGINEER.

ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED SUCH THAT SUFFICIENT CLEARANCES ARE PROVIDED FOR MAINTENANCE. ALL MECHANICAL EQUIPMENT AT A HEIGHT GREATER THAN SIXTEEN (16) FEET SHALL HAVE A PERMANENT MEANS OF ACCESS.

EXHAUST FANS SHALL HAVE A FLORIDA PRODUCT APPROVAL, MIAMI-DADE NOA AND BE RATED FOR HIGH WIND PER THE FLORIDA BUILDING CODE.

THE MECHANICAL CONTRACTOR SHALL PROVIDE VIBRATION ISOLATION AS RECOMMENDED BY THE MANUFACTURER(S) AND/OR REQUIRED BY THE MECHANICAL ENGINEER TO ENSURE QUIET OPERATION OF THE MECHANICAL EQUIPMENT. NO UNDUE VIBRATION OR SOUND SHALL BE TRANSMITTED TO THE STRUCTURE OR ANY OCCUPIED SPACES WITHIN THE STRUCTURE.

THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL STARTERS, CONTACTORS, RELAYS, CONTROLS, AND ACCESSORIES NECESSARY TO PROVIDE A COMPLETE AND WORKING POWER AND CONTROL SYSTEM FOR THE MECHANICAL EQUIPMENT WITHIN THE SCOPE OF WORK. THE ELECTRICAL CONTRACTOR WILL PROVIDE ALL DISCONNECT SWITCHES, CONDUIT, AND WIRING FOR THE MECHANICAL EQUIPMENT WITHIN THE SCOPE OF WORK. ALL ELECTRICAL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER OPERATION OF THE COMPLETE SYSTEM AND SHALL ENSURE THAT WIRING DIAGRAMS ARE PROVIDED TO THE OWNER. NO WIRING OF ANY KIND SHALL BE EXPOSED IN FINISHED AREAS.

THE MECHANICAL CONTRACTOR SHALL ENSURE THAT ALL MECHANICAL EQUIPMENT IS STARTED, TESTED, ADJUSTED, AND PLACED IN SATISFACTORY OPERATING CONDITION PRIOR TO SUBSTANTIAL COMPLETION. THE MECHANICAL CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP, MATERIALS, AND MECHANICAL EQUIPMENT TO BE FREE OF DEFECTS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER AND SHALL REPAIR ANY DEFECTS OCCURRING WITHIN THAT TIME WITHOUT COST TO THE OWNER. ALL MECHANICAL EQUIPMENT IN THE SCOPE OF WORK SHALL BE COVERED FOR THE DURATION OF THE MANUFACTURER'S WARRANTIES AND THE CONTRACTOR SHALL PROVIDE THE OWNER WITH ORIGINALS OF ALL MANUFACTURER'S GUARANTEES AND WARRANTIES. THE CONTRACTOR SHALL PROVIDE THE COST OF ALL WARRANTIES TO THE OWNER AND GIVE THE OWNER THE OPTION TO DEDUCT THIS COST FROM THE CONTRACTOR PRICE AND PURCHASE THE WARRANTIES DIRECTLY.

THE MECHANICAL CONTRACTOR SHALL COORDINATE ALL MECHANICAL EQUIPMENT VOLTAGE REQUIREMENTS WITH THE VOLTAGE AVAILABLE AT THE PROJECT SITE PRIOR TO ORDERING ANY MECHANICAL EQUIPMENT.

4. CONTROLS

THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CONTRACTING WITH THE EXISTING CONTROLS CONTRACTOR AND DETERMINING WHAT IS REQUIRED TO INCORPORATE NEW MECHANICAL EQUIPMENT AND CONTROLS INTO THE EXISTING CONTROL SYSTEM(S) AND INCLUDING ALL COSTS ASSOCIATED WITH INCORPORATING NEW MECHANICAL EQUIPMENT AND CONTROLS INTO THE EXISTING CONTROL SYSTEM(S) IN HIS/HER BID. THE CONTROLS CONTRACTOR SHALL PROVIDE A COMPLETE DESCRIPTION OF THE ENTIRE CONTROL SYSTEM, INCLUDING SCHEMATIC DRAWINGS. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROLS AND SUB-CONTRACT TO THE ELECTRICAL CONTRACTOR ALL CONTROL POWER AND TRANSFORMERS NOT IDENTIFIED IN THE ELECTRICAL PORTION OF THE CONSTRUCTION DOCUMENTS.

5. TESTING AND BALANCING THE HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM

THE GENERAL CONTRACTOR SHALL PROVIDE THE SERVICES OF AN INDEPENDENT TEST AND BALANCE AGENCY TO TEST, BALANCE, AND CERTIFY THE PERFORMANCE OF THE COMPLETE EXHAUST AIR SYSTEMS. THE TEST AND BALANCE CONTRACTOR SHALL PERFORM ALL TESTING, ADJUSTING, BALANCING, AND DATA RECORDING NECESSARY TO ESTABLISH THE CAPACITY AND QUALITY OF THE SYSTEMS AND CONFIRM THE SATISFACTORY COMPLETION OF ALL ASPECTS OF THE SCOPE OF WORK. THIS WILL INCLUDE NOT ONLY THE NEW SYSTEMS, BUT ALSO ALL OF THE EXISTING SYSTEMS THAT HAVE BEEN MODIFIED.

THE TEST AND BALANCE CONTRACTOR SHALL BE AN APPROVED MEMBER OF THE AABC OR NEBB AND SHALL SPECIALIZE IN THE TESTING AND BALANCING OF HEATING, VENTILATION, AND AIR CONDITIONING SYSTEMS. THE FOLLOWING TEST AND BALANCE CONTRACTORS ARE PRE-APPROVED: THE PHOENIX AGENCY, SITA, TEST AND BALANCE CORPORATION AND SPEC TECH CONSULTANTS. THE CONTRACTOR SHALL SUBMIT ANY NON-PRE-APPROVED TEST AND BALANCE CONTRACTOR TO THE MECHANICAL ENGINEER FOR APPROVAL PRIOR TO SUBMITTING A BID.

THE TEST AND BALANCE CONTRACTOR SHALL ENSURE THAT THE BUILDING IS UNDER POSITIVE PRESSURE AT THE CONCLUSION OF THE TEST AND BALANCE PROCESS. IF THE BUILDING IS NOT UNDER POSITIVE PRESSURE AT THE CONCLUSION OF THE TEST AND BALANCE PROCESS, THEN THE TEST AND BALANCE AND MECHANICAL CONTRACTORS SHALL IMMEDIATELY AND WITHOUT DELAY NOTIFY THE ARCHITECT AND MECHANICAL ENGINEER. THE TEST AND BALANCE CONTRACTOR SHALL WORK WITH THE ENGINEER TO COMFORT BALANCE AS REQUIRED TO SATISFY THE CLIENT.

CONTROLS CONTRACTOR SHALL PROVIDE REQUIRED BAS HARDWARE, SOFTWARE, PERSONNEL AND ASSISTANCE TO TAB AGENCY AS REQUIRED TO BALANCE THE SYSTEMS. CONTROLS CONTRACTOR SHALL ALSO PROVIDE TRENDING REPORT TO DEMONSTRATE THAT SYSTEMS ARE COMPLETE. MECHANICAL CONTRACTOR SHALL PROVIDE TAB AGENCY ONE COMPLETE SET OF CONTRACT DOCUMENTS, CHANGE ORDERS, AND APPROVED SUBMITTALS. MECHANICAL CONTRACTOR SHALL COORDINATE MEETINGS AND ASSISTANCE FROM SUPPLIERS AND CONTRACTORS AS REQUIRED BY TAB AGENCY. MECHANICAL CONTRACTOR SHALL PROVIDE ADDITIONAL VALVES, DAMPERS, SHEAVES AND BELTS AS REQUIRED BY TAB AGENCY. MECHANICAL CONTRACTOR SHALL FLAG ALL MANUAL VOLUME DAMPERS WITH FLUORESCENT OR OTHER HIGH-VISIBILITY TAPE. MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS TO ALL DAMPERS, VALVES, TEST PORTS, NAMEPLATES AND OTHER APPURTENANCES AS REQUIRED BY TAB AGENCY. MECHANICAL CONTRACTOR SHALL REPLACE OR REPAIR INSULATION AS REQUIRED BY TAB AGENCY.

THE TEST AND BALANCE CONTRACTOR SHALL, UPON COMPLETION OF ALL NECESSARY TESTING AND BALANCING AND AT LEAST ONE (1) WEEK PRIOR TO SUBSTANTIAL COMPLETION, SUBMIT THREE (3) BOUND COPIES OF THE TEST AND BALANCE REPORT TO THE MECHANICAL ENGINEER.

THE TEST AND BALANCE CONTRACTOR SHALL BALANCE THE SCOPE OF WORK AS SHOWN ON THE CONSTRUCTION DOCUMENTS AND RETURN AREAS OUTSIDE OF THE SCOPE OF WORK AND SERVED BY EXISTING SYSTEMS WITHIN THE SCOPE OF WORK TO THE ORIGINAL DESIGN AIRFLOWS OR RE-BALANCE THE ORIGINAL DESIGN AIRFLOWS IN LOCATIONS WHERE THE EXISTING SYSTEM MAY NOT BE BALANCED PROPERLY.

6. SUBSTANTIAL AND FINAL COMPLETION

THE MECHANICAL CONTRACTOR SHALL MAINTAIN A SET OF CONTINUOUSLY UPDATED, REPRODUCIBLE AS-BUILT DRAWINGS DURING CONSTRUCTION AND PROVIDE A COMPLETE SET OF THOSE DRAWINGS IN BOTH ELECTRONIC AND HARDCOPY FORMATS TO THE OWNER UPON FINAL COMPLETION.

THE MECHANICAL AND ELECTRICAL CONTRACTORS SHALL PROVIDE FIVE (5) BOUND COPIES OF ALL MECHANICAL AND ELECTRICAL CONTRACTOR WARRANTIES, MANUFACTURER'S' WARRANTIES, PARTS LISTS, AND INSTALLATION AND MAINTENANCE MANUALS FOR ALL MECHANICAL EQUIPMENT, AS WELL AS INSTRUCTIONS FOR OPERATING AND MAINTAINING ALL MECHANICAL EQUIPMENT TO THE OWNER UPON FINAL COMPLETION.

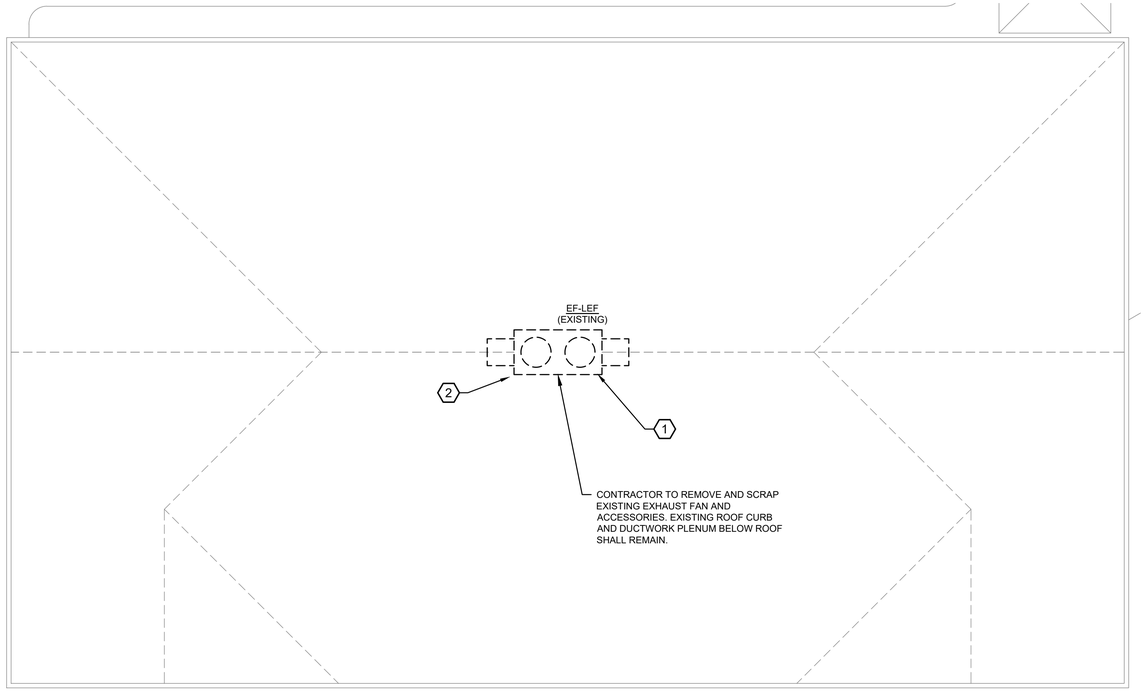
7. ROOF WORK

CONTRACTOR SHALL SUBCONTRACT WITH OWNERS ROOFING CONTRACTOR TO PROVIDE ALL WORK REQUIRED TO MAINTAIN ROOF INTEGRITY AND WARRANTY.

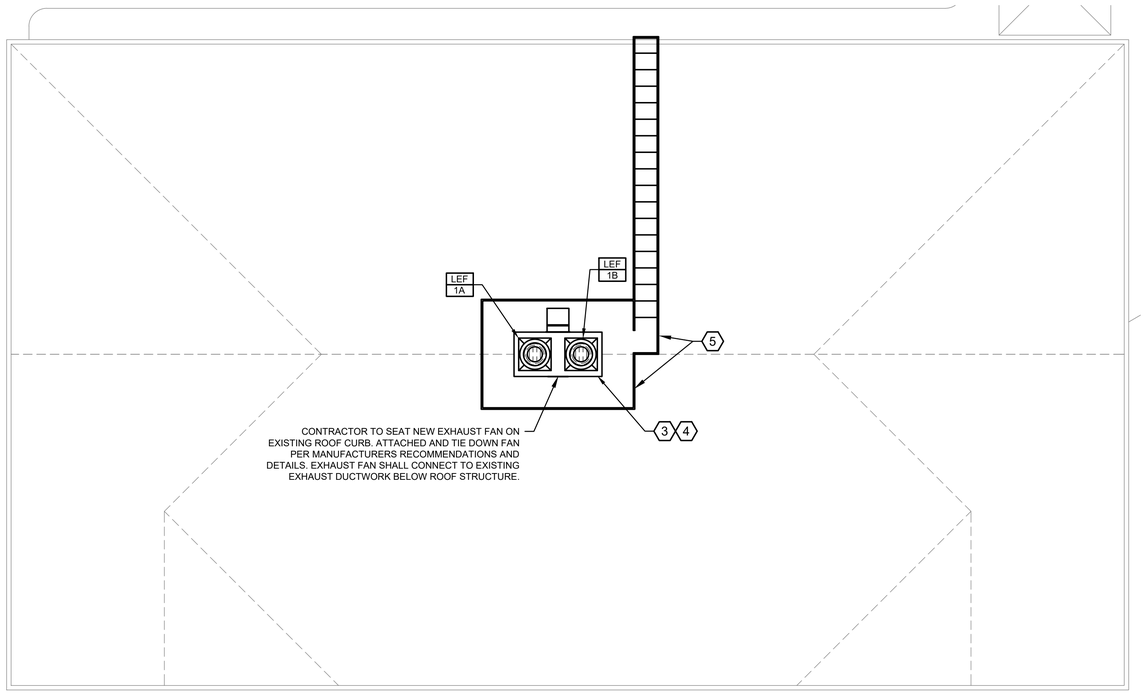
(#) MECHANICAL NOTES

1. CONTRACTOR TO RETAIN EXISTING LIGHTING PROTECTION, AND SHALL BE REINSTALLED ON NEW EXHAUST FAN.
2. EXISTING CONVENIENCE OUTLET TO REMAIN. (SEE ELECTRICAL PLANS.)
3. CONTRACTOR TO INSTALL FAN PER MANUFACTURES LITERATURE AND DETAILS ON MECHANICAL SHEET M2. THE MANUFACTURER OF THE FAN ASSEMBLY SHALL PROVIDE STRUCTURAL ENGINEERING SERVICES AND DOCUMENTATION, SIGNED AND SEALED BY A FLORIDA LICENSED PROFESSIONAL ENGINEER. THIS SHALL INCLUDE WIND LOAD CALCULATIONS PER FLORIDA CODE AND DETAILS TO SECURE FAN ASSEMBLY TO EXISTING CURB, AND FAN COMPONENTS TO EACH OTHER.
4. REINSTALL EXISTING LIGHTING PROTECTION ONTO NEW EXHAUST FAN PER MANUFACTURES LITERATURE.
5. THE MECHANICAL CONTRACTOR SHALL PROVIDE SERVICE PLATFORM AND STAIR COMPLIANT WITH FLORIDA MECHANICAL CODE 306.5.1. PROVIDE STAIR, WITH HANDRAILS, UP SLOPE OF ROOF TO REAR OF BUILDING. STAIR AND PLATFORM SHALL BE SECURED TO ROOF STRUCTURE, PER ENGINEERED DRAWINGS BY MANUFACTURER. SEE DETAIL.

CONSTRUCTION SCHEDULE:
THE CONTRACTORS SHALL COORDINATE THE CONSTRUCTION SCHEDULE WITH MANATEE COUNTY TO MINIMIZE DISRUPTION OF LABORATORY OPERATIONS. THE REPLACEMENT OF THE EXHAUST FAN AND STARTUP SHALL PREFERABLY OCCUR OVER A WEEKEND. FURTHER WORK, INCLUDING THE PLATFORM AND STAIR MAY OCCUR AFTERWARD.
PRIOR TO ORDERING THE EQUIPMENT (FAN ASSEMBLY, PLATFORM, STAIR), THE MECHANICAL CONTRACTOR SHALL FIELD VERIFY AND COORDINATE ALL PERTINENT MEASUREMENTS AND / OR CONDITIONS WITH THE MANUFACTURES OF THE EQUIPMENT. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW.



1 MECHANICAL DEMOLITION PLAN: ROOF
SCALE: 1/8"=1'-0"



2 MECHANICAL RENOVATION PLAN: ROOF
SCALE: 1/8"=1'-0"

REVISIONS

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MECHANICAL RENOVATION PLAN

MANATEE COUNTY - WATER TREATMENT LAB

EXHAUST FAN REPLACEMENT

4751 65th STREET WEST
BRADENTON, FL 34210

JOB NO: 14079.06E
PROJ. MNGR: JRW
DRAWN BY: DCD
ISSUE DATE: 06.27.2017

SHEET NUMBER
M1.0
BID SET

CONTROLS SEQUENCE OF OPERATION

FUME HOOD EXHAUST FANS

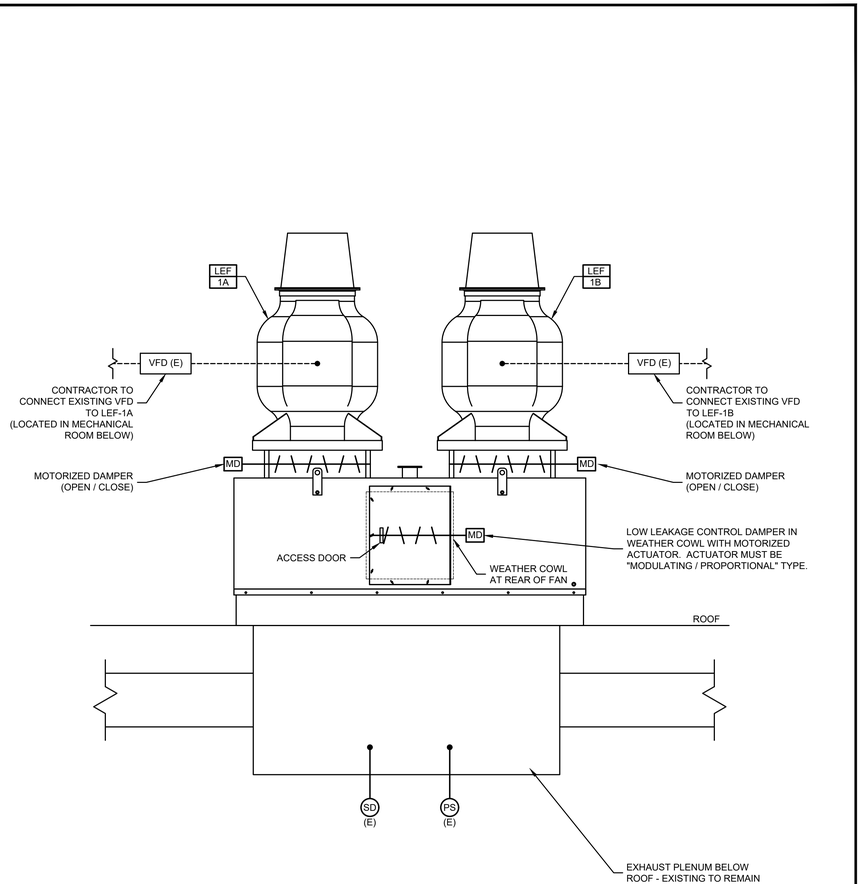
- Only one fan, LEF-1A or LEF-1B shall run at one time. Two fans are designed for redundancy.
- Exhaust shall operate at all times regardless of occupancy.
- Lead fan shall be alternated periodically, such as weekly. Switching of lead fan shall be scheduled during un-occupied hours.
- Switching of fans shall provide continuous exhaust flow. During switch, the VFD of one fan shall ramp down to zero while the VFD of the other fan simultaneously ramps up to setpoint.
- When the lead fan is energized, its motorized isolation damper shall open 100%. The motorized damper of the redundant fan shall close shut.
- If a run fault is found in one of the fans, an alert shall be sent through the BMS.
- The other fan shall operate as lead until repair has been made, and fault reset.
- Occupied hours:
  - The VFD of the lead fan shall ramp up to balanced setpoint to provide balanced exhaust flow. This is a constant flow exhaust system.
  - The bypass damper shall be closed shut, so that the full balanced exhaust the fan is drawn through the exhaust duct system.
  - The VFD of AHU-2 shall ramp up to the balanced setpoint to provide balanced supply flow. This is a constant flow supply system.
  - AHU-2 shall provide a constant leaving coil temperature of 50˚F. Zone heaters shall modulate to maintain room temperature.
- All hours:
  - AHU-2 shall modulate chilled water supply valve to provide a constant leaving coil temperature of 50˚F.
  - Zone heaters shall modulate to maintain room temperature. Default setpoints are 65˚F in metals analysis and 68˚F in all other spaces of lab.
  - Monitor pressure differential from inside of lobby to the exterior to verify that the building is maintained at a slight positive pressure.
  - Send alarm if a negative pressure persists for over one hour.
- AHU-2 fault: If AHU airflow fault is detected or AHU-2 is shut down, an alarm shall sound indicating to evacuate building.
- Exhaust flow shall modulate down to a lower, but safe airflow to prevent a door closure hazard.
- The controls contractor, the mechanical contractor, the T&B contractor and ASE shall work together to determine the proper airflow setpoint.
- Upon detection of smoke from the exhaust system smoke detector, the fire alarm system shall sound an alarm indicating to evacuate the building. AHU-2 shall shut down and outside air damper shall close. The exhaust fan shall continue to operate at reduced airflow.
- EF fault: If exhaust flow cannot be achieved with either exhaust fan or the exhaust fans are shut down, an alarm shall sound indicating to evacuate building. AHU-2 shall shut down and outside air damper shall close.
- Un-occupied hours mode (optional line item alternate): Energy saving measure
- The controls contractor shall write progamming to enable a low-flow operation during un-occupied hours.
- This shall include an adjustable time of day schedule; unoccupied from 8pm to 4 am, and 4 occupancy sensors located throughout laboratory area.
- The un-occupied mode will occur if and only if the schedule indicates un-occupied and none of the occupancy sensors detect people.
- Provide adjustable Setpoints for both exhaust and supply (AHU-2) VFD as a percentage of the occupied mode VFD setting.
- Set original low-flow airflow for both supply and exhaust to 100% of occupied airflow. Owner may initialize programming by adusting this setting.
- When this mode is intitialized, the controls contractor, the mechanical contractor, the T&B contractor and ASE shall work together to commission and determine the proper airflow setpoints.
- The owner should have the controls commissioned every 5 years.
- All setpoints shall be adjustable.

MECHANICAL LEGEND

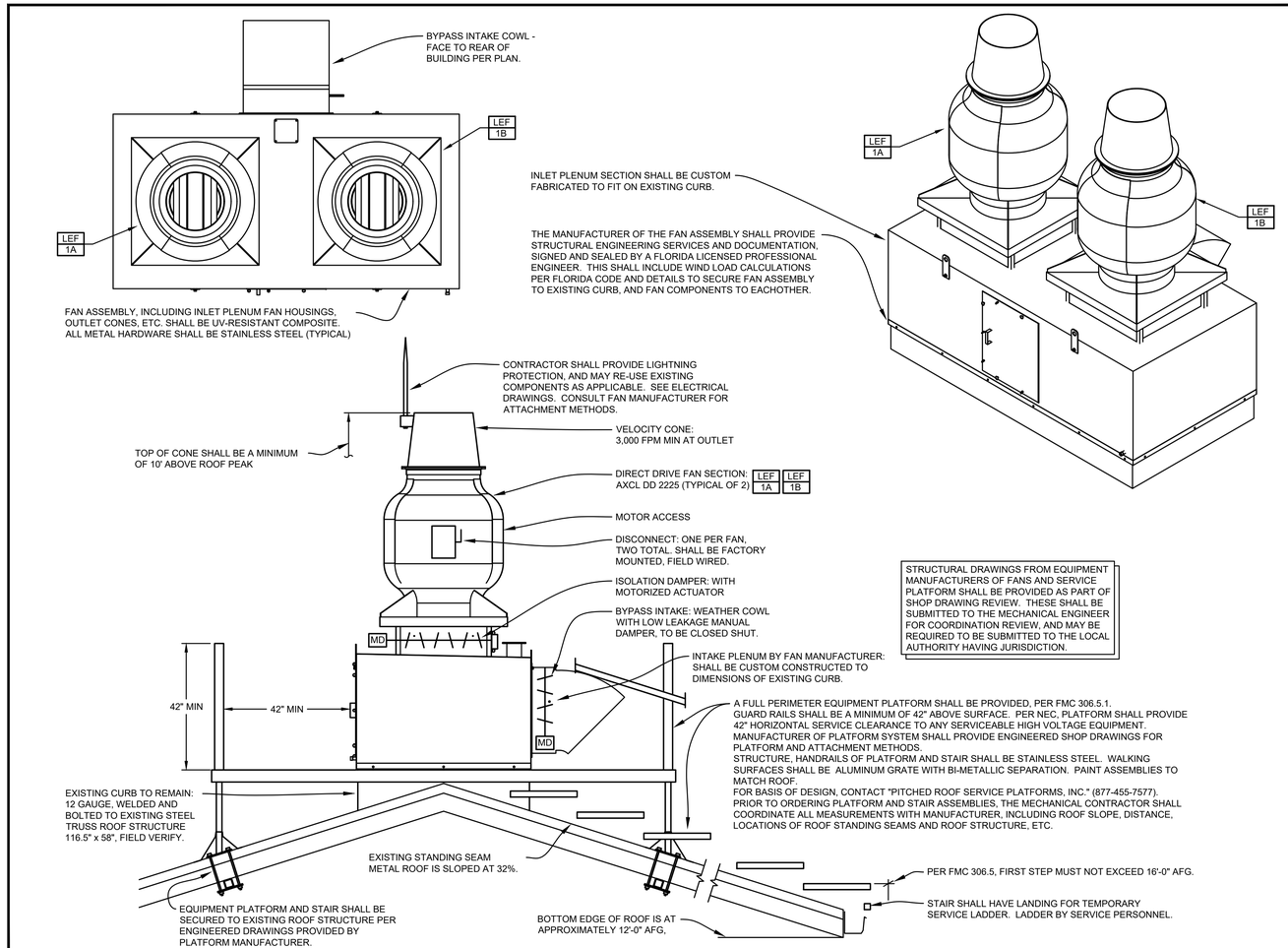
	NEW POINT OF CONNECTION
EQ NO	EQUIPMENT TAG
HS	HUMIDISTAT
PS	PRESSURE SENSOR
RS	REMOTE TEMPERATURE SENSOR
SD	SMOKE DETECTOR
T	THERMOSTAT
TC	TIME CLOCK
BD	BACKDRAFT DAMPER (WITH ACCESS DOOR ON ACCESSIBLE SIDE)
MD	MOTORIZED DAMPER (WITH ACCESS DOOR ON ACCESSIBLE SIDE)
M	MANUAL DAMPER

FAN SCHEDULE - ROOF MOUNTED

	MARK	LEF-1A	LEF-1B
FAN DATA	MANUFACTURER - BASIS OF DESIGN	MK PLASTICS	MK PLASTICS
	MODEL NUMBER	AXCL - 2225	AXCL - 2225
	CFM	8,680	8,680
	EXTERNAL STATIC PRESSURE (IWG)	2.5"	2.5"
	DRIVE	DIRECT	DIRECT
	CONE VELOCITY (FPM)	3,979	3,979
	FAN RPM	1,911	1,911
	ELECTRICAL SERVICE	460/3/60	460/3/60
	MOTOR (HP)	10	10
	MOTOR RPM	1,800	1,800
	OPERATING WEIGHT	534	534
NOTES	1. LEF-1A & LEF-1B SHALL SHARE A FIELD FABRICATED PLENUM		
	2. FOR MK PLASTICS BASIS OF DESIGN CONTACT TOM BARROW CO, CYRIL JOHN, 813-990-9010.		
	3. SHALL BE MIAMI-DADE NOA HIGH WIND LOAD CERTIFIED.		



1 CONTROLS SCHEMATIC: EXHAUST SYSTEM
NOT TO SCALE



STRUCTURAL DRAWINGS FROM EQUIPMENT MANUFACTURERS OF FANS AND SERVICE PLATFORM SHALL BE PROVIDED AS PART OF SHOP DRAWING REVIEW. THESE SHALL BE SUBMITTED TO THE MECHANICAL ENGINEER FOR COORDINATION REVIEW, AND MAY BE REQUIRED TO BE SUBMITTED TO THE LOCAL AUTHORITY HAVING JURISDICTION.

2 MK PLASTICS EXHAUST FAN DETAIL
NOT TO SCALE

REVISIONS

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MECHANICAL SCHEDULES & DETAILS

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DIVISION 16000 ELECTRICAL SPECIFICATIONS

SECTION 16010
GENERAL PROVISIONS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, and equipment as required by the plans and specifications to provide a complete and operable electrical system. This specification describes the types of materials, methods, and management to be utilized. This includes the work listed in this division as well as equipment furnished under other divisions not specifically mentioned herein.

1.02 CODES AND STANDARDS

A. All equipment, materials, and methods of design and installation are to comply with the 2011 National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and the requirements of applicable local codes. Codes and standards of the following organizations may be referred to in this section and shall be considered as the minimum acceptable. A reference herein to any portion of the standard or code is not to be considered as negating any other portion of the standard or code.

1. American Society for Testing & Materials (ASTM)
2. Institute of Electrical & Electronic Engineers (IEEE)
3. National Electrical Code (NEC), 2011 ed.
4. National Electric Manufacturers Association (NEMA)
5. Underwriters Laboratories, Inc. (UL)
6. Florida Building Code (FBC), 2014, 5th ed.
7. Florida Fire Prevention Code (Florida Specific edition of NFPA 101), 2010 ed.

1.03 EQUIPMENT, MATERIAL AND WORKMANSHIP

A. All equipment and material shall be new, free from defects, of current manufacture, and listed by Underwriters Laboratories, Inc., (UL) where UL requirements apply. All materials are to be products of reputable and experienced manufacturers. Similar items in the project are to be of the same manufacturer. Use only equipment and materials of commercial quality and durability, and capable of long, reliable, trouble free service.

B. Provide protection for materials and equipment against loss or damage throughout the contract. Provide protection from the effect of weather prior to installation, store items to be installed in indoor weather protected location.

C. Following installation, protect materials and equipment from corrosion, physical damage and effects of moisture on insulation.

D. Layout work carefully in advance.

E. Do not cut or notch any structural member or building surface without specific approval of the Structural Engineer. Carefully carry out any cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, paving, or other surfaces required for the installation, support, or anchorage of conduit, raceways, or other electrical equipment. Following such work, restore surfaces neatly to new conditions using skilled craftsmen of the trades involved at no additional cost to the Owner.

F. All work will be performed by accomplished, qualified and experienced personnel working under continuous competent supervision.

G. Contractor shall restore fire ratings of all rated assemblies penetrated with the appropriate assembly: WL-1001, CAJ-1045, WL-1049, WL-3214, WJ-1055, or WJ-3094 or equivalent.

1.04 PERMITS

A. Obtain and pay for all permits and inspections pertinent to the electrical installation.

1.05 SITE INSPECTION

A. Prior to submitting a bid, visit the project site and ascertain conditions affecting the proposed work and all existing electrical facilities.

B. Furnish all labor associated with accompanying Engineer during observations of construction.

1.06 SHOP DRAWINGS

A. Submit 6 copies of all project submittal data and shop drawings.

B. Submit complete shop drawings for review prior to purchase of the following:

1. Safety switches, and fuses.

1.07 RECORD DRAWINGS

A. Maintain a neatly marked set of record drawings showing installation location, and/or routing of conduits, depth of buried cables, pull boxes, junction boxes, and outlets. Mark this set to show current job progress and any deviation from the contract drawings. These drawings shall available upon request of the Engineer. After final inspection, transfer all record information to the Owner as required in the contract.

PART 2 - EXECUTION

2.01 INSTALLATION

A. The electrical plans show general arrangements and locations for equipment conduit, outlets, etc. Unless detailed or dimensioned, exact locations of conduit, routing of cables and placement of equipment will be governed by structural conditions, physical interference, and locations of electrical termination on equipment. Examine architectural, structural, and mechanical plans and shop drawings for the various equipment in order to determine exact routing and placement of all raceways, cables, and equipment, to assure a workable installation in accordance with NEC.

2.02 CLEAN-UP

A. Continuously remove debris, cuttings, crates, cartons, etc.

B. Before acceptance, carefully clean all cabinets, panels, boxes, wiring devices, cover plates, etc. Replace all damaged or blemished fixtures.

END OF SECTION

SECTION 16070
ELECTRICAL CONNECTIONS FOR EQUIPMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide all labor, materials and equipment as required furnishing connections to all electrical equipment, lights, etc.

PART 2 - PRODUCTS

2.01 GENERAL

A. For each electrical connection indicated, provide complete assembly of materials, including but not necessarily limited to, raceways, conductors, cords caps, wiring devices, pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, cable ties, solderless wire nuts, and other items and accessories as needed to complete splices, terminations, and connections as required.

B. See Section 16111, Conduit Raceways; and Section 16120 Wire and Cables for additional requirements. Provide final connections for equipment consistent with the following:

1. Permanently installed fixed equipment - flexible seal-tite conduit from branch circuit terminal equipment, or raceway; to equipment, control cabinet, terminal junction box, or wiring terminals. Totally enclose all wiring in raceway.
2. Movable and/or portable equipment - wiring device, cord cap, and multi-conductor cord suitable for the equipment and in accordance with NEC requirements (Article 400).
3. Other methods as required by the National Electrical Code and/or as required by special equipment or field conditions.

PART 3 - EXECUTION

3.01 INSTALLATION OF ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with connector manufacturer's written instructions and with recognized industry practices, and complying with requirements of NEC and NECA's "Standard of Installation" to ensure that products fulfill requirements.

B. Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams.

C. Coordinate installation of electrical connections for equipment with equipment installer.

D. Verify all electrical loads (voltage, phase, full load amperes, number and point of connections, minimum circuit ampacity, etc.) for equipment furnished under other Sections of this specification, by reviewing respective shop drawings furnished under each section. Meet with each subcontractor who is responsible for furnishing equipment that requiring electrical service connection and review equipment electrical characteristics. Report any variances from electrical characteristics noted on the electrical drawings to the Engineer before proceeding with rough-in work.

E. Obtain and review the equipment shop drawings to determine particular final connection requirements before rough in begins for each equipment item.

F. Refer to basic materials and methods Section 16120, Conductors, for identification of electrical power supply conductor terminations.

END OF SECTION

SECTION 16111
CONDUIT RACEWAYS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials and equipment as required to install all flexible or rigid conduit, couplings, supports and nonmetallic ducts, as shown on the Plans.

PART 2 - PRODUCTS

2.01 MATERIALS

A. GENERAL: Provide conduit, and fittings of types, grades, sizes, and weights (wall thicknesses) as indicated; with minimum trade size of 1/2" above grade and 3/4" below grade.

B. Electrical Metallic Tubing (EMT) with zinc die cast or steel set screw fittings for dry and damp locations, compression fittings for wet locations.

C. RIGID METAL CONDUIT (RMC) with threaded fittings.

D. RIGID NON-METALLIC CONDUIT (RNC): Schedule 40, with matching glue on socket fittings.

E. FLEXIBLE METALLIC CONDUIT (FMC): Galvanized interlocked steel strip with cadmium plated steel or malleable iron fittings.

F. LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LT): Provide liquid-tight, flexible metal conduit; constructed of single strip, flexible continuous, interlocked, and double-wrapped steel; galvanized inside and outside; coated with liquid-tight jacket of flexible polyvinyl chloride (PVC) with cadmium plated steel or malleable iron fittings and compression type steel ferrule and neoprene gasket sealing rings.

G. EXPANSION FITTINGS: OZ Type AX, or equivalent to suit application.

2.02 SCHEDULE OF LOCATIONS

A. RMC in all areas subject to physical damage to an elevation of 48" AFF/AFG.

B. EMT for all above grade areas in the building unless noted otherwise.

C. RNC for all areas below grade.

D. Make connections to motors and equipment with FMC and LT as environmental conditions dictate.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install conduit concealed in all areas where possible.

B. Coordinate installation of conduit in masonry work.

C. Do not install conduit larger than 2-1/2" in concrete slabs. Provide a minimum concrete cover over conduits of two inches, but not less than required to maintain any established fire ratings.

D. Plug ends of conduits to prevent entry of dirt or moisture.

E. Clean out conduit before installation of conductors.

F. Route all exposed conduits parallel or perpendicular to building lines.

G. Do not exceed number of bends in conduit beyond that allowed by the NEC.

H. Cut conduit with hacksaw or other approved pipe cutting tool and ream ends to clean out all burrs before connecting.

I. Keep conduits at least 12" away from gas lines and hot water pipes, and in no case permit conductors to reach higher than rated temperatures.

J. Fasten raceways securely in place. Firmly fasten conduit within three feet of each outlet, junction box, cabinet, or fitting. Support metallic conduit in accordance with the NEC. Use raceway fasteners designed for the purpose.

K. Provide pull boxes as shown on the plans, plus any such items required to assemble conduits and other raceways. Provide pull boxes as dictated by wire pulling requirements. Unless shown otherwise, face into secondary or unfinished rooms.

END OF SECTION

SECTION 16120
BUILDING WIRE AND CABLE

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, and equipment as required to install all wires and cables as n the Plans, and as required to connect all electrical services and equipment.

1.02 RELATED WORK

A. Section 16000 - Electrical General Requirements

B. Section 16111 - Conduit

PART 2 - PRODUCTS

2.01 MATERIALS

A. All wiring shall be copper unless specifically noted otherwise on plans.

B. Minimum size conductors:

1. Branch circuits, # 12 AWG THHN/THWN.
2. Control circuits, # 14 AWG THHN/THWN.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Color coding shall be as follows:

Voltage	Phase A	Phase B	Phase C	Neutral
277/480	Brown	Orange	Yellow	Gray

B. Provide a green grounding conductor in all raceways except service entrance.

C. Provide conductors with identification tags as manufactured by Brady or approved equal.

D. Install wires and cables continuous without splices from source of supply to distribution equipment and from source of supply to motors, lighting, or power outlets. Do not use pull boxes for making splices. Do not install splices in conduits or trench.

E. Install all wiring in accordance with NEC.

END OF SECTION

SECTION 16130
PULL AND JUNCTION BOXES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Construct junction or pull boxes less than 100 cubic inches as "standard outlet boxes".

B. Provide all covers of same gauge metal and include screws.

PART 2 - PRODUCTS

2.01 STANDARD OUTLET BOXES

A. Make of material resistant to corrosion or suitably protected, both internally and externally by galvanizing.

B. Boxes installed in damp or wet locations shall be U.L. approved for the purpose.

C. Comply with U.L. Standard 50.

D. Metal boxes to meet NEC construction specifications.

E. Boxes exposed or surface mounted shall be die-cast or permanent-mold cast aluminum body with threaded external hub and cast cover.

F. Interior metal boxes shall be labeled with the circuits contained within. Labeling shall be by permanent black magic marker.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install junction boxes so that covers are readily accessible after the completion of the installation.

B. Mount rigidly in place with front of box level and plumb.

C. Secure flush covers with corrosion resistant screws or bolts.

D. Provide each pull box with sufficient clamps to which cables shall be secured in neat and orderly fashion permitting ready identification.

E. Mount pull boxes connected to concealed conduits with covers flush with the finished wall.

END OF SECTION

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION	MOUNTING
	DISCONNECT SWITCH. NEMA/AMPERAGE/POLE/FUSE/VOLTAGE. PROVIDE NEMA 1, 600V UON.	AS NOTED.
	MOTOR CONNECTION OR EXHAUST FAN.	BY OTHERS.
J J	JUNCTION BOX OR OUTLET BOX.	AS NOTED.
	DRIVEN GROUND ROD.	AS NOTED.
	CONDUIT CONCEALED IN WALL OR CEILING.	SEE SPECIFICATIONS.
	CONDUIT CONCEALED IN SLAB OR UNDERGROUND.	SEE SPECIFICATIONS.
	CONDUIT EXPOSED ON WALL OR CEILING.	SEE SPECIFICATIONS.
#2	PHASE,NEUTRAL,EQUIPMENT GROUND, AND ISOLATED GROUND. ALL HOMERUNS SHALL BE 1/2" WITH 3 #12 UON.	
	480Y/277V PANELBOARD.	78" AFF TO TOP.
	208Y/120V OR 240/120V PANELBOARD.	78" AFF TO TOP.
	REFER TO KEYED NOTES.	
FACP	FIRE ALARM CONTROL PANEL.	78" AFF TO TOP.
FAA	FIRE ALARM ANNUNCIATOR PANEL.	66" AFF TO TOP.
P	FIRE ALARM SYSTEM SMOKE DETECTOR.	CEILING UON.
	FIRE ALARM SYSTEM DUCT TYPE SMOKE DETECTOR.	IN RETURN DUCT UON.
P	FIRE ALARM SYSTEM PULL STATION.	48" AFF TO CENTERLINE UON.
	FIRE ALARM SYSTEM STROBE.	80" AFF TO BOTTOM OR 6" BELOW CEILING.
	FIRE ALARM SYSTEM HORN/STROBE.	80" AFF TO BOTTOM OR 6" BELOW CEILING.
G	FIRE ALARM SYSTEM BELL.	96" AFF TO TOP UON.
T	TAMPER SWITCH.	FIELD COORDINATE.
F	FLOW SWITCH.	FIELD COORDINATE.
M	FIRE ALARM MONITORING MODULE	FIELD COORDINATE.
R	FAN SHUTDOWN RELAY.	FIELD COORDINATE.

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	HID	HIGH INTENSITY DISCHARGE
AFG	ABOVE FINISHED GRADE	HP	HORSEPOWER
C	CONDUIT	N	NEW
CLG	CEILING MOUNTED	NF	NON-FUSED
D	DEMOLISHED	NL	NIGHT LIGHT
E	EXISTING	NP	NAMEPLATE
EC	ELECTRICAL CONTRACTOR	PNL	PANEL
EG	EQUIPMENT GROUND	R	RELOCATED
EWC	ELECTRIC WATER COOLER	TTB/C	TELEPHONE TERMINAL BOARD/CABINET
EWH	ELECTRIC WATER HEATER	UON	UNLESS OTHERWISE NOTED
GEC	GROUNDING ELECTRODE CONDUCTOR	WP	WEATHERPROOF
GFI	GROUND FAULT INTERRUPTER	WPI	WEATHERPROOF WHILE IN USE

GENERAL PROJECT NOTES

1. CONTRACTOR SHALL PERFORM A SITE VISIT TO VERIFY EXISTING SYSTEMS AND CONDITIONS PRIOR TO SUBMITTING BID.
2. THE EXISTING CIRCUITRY ON THE PLANS IS SHOWN FOR REFERENCE ONLY AND WAS TAKEN FROM THE ORIGINAL CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL PROVIDE ALL CIRCUITRY WITHIN THE AREA UNDER CONSTRUCTION AS REQUIRED TO PROVIDE A FULLY FUNCTIONAL ELECTRICAL SYSTEM MEETING THE INTENTION OF THE PLANS AND SPECIFICATIONS. CONTRACTOR SHALL VERIFY THE ACCURACY OF EXISTING CONDITIONS, INCLUDING THE ACCURACY OF THE AS-BUILT CIRCUITRY INDICATED ON THE PLANS PRIOR TO SUBMITTING BID. NO ADDITIONAL COSTS FOR INACCURATE OR UNCONFIRMED EXISTING CONDITIONS WILL BE ACCEPTED.
3. CONTRACTOR MAY RE-USE EXISTING PANELBOARDS, CIRCUIT BREAKERS, TRANSFORMERS, SAFETY SWITCHES, ETC. ONLY WHERE INDICATED TO BE REUSED ON THE PLANS.
4. CONTRACTOR MAY RE-USE EXISTING CONDUIT, CONDUCTORS, FITTINGS, SUPPORTS, ETC. WHERE THESE ITEMS COMPLY WITH CURRENT CODE AND THE REQUIREMENTS OF THE SPECIFICATIONS.
5. CONTRACTOR SHALL VERIFY THE PRESCENCE OF EXISTING SPARES AND SPACES IN THE PANELBOARDS UNDER THIS SCOPE OF WORK. CONTRACTOR SHALL PROVIDE ALL NECESSARY NEW BREAKERS TO FACILITATE THE ELECTRICAL INSTALLATION WHETHER SHOWN ON THE PLANS OR NOT. ANY CONFLICTS BETWEEN THE ELECTRICAL PLANS AND SITE CONDITIONS SHALL BE DOCUMENTED ON THE AS-BUILT PLANS.
6. ITEMS TO BE DEMOLISHED, SUCH AS DISCONNECTS, TRANSFORMERS, ETC. SHALL BE HANDED OVER TO THE OWNER TO BE KEPT AS SPARE INVENTORY OR REMOVED FROM SITE AT THE SOLE DISCRETION OF THE OWNER.
7. ANY MECHANICAL EQUIPMENT TO BE DEMOLISHED OR RELOCATED SHALL BE COORDINATED WITH THE MECHANICAL PLANS AND MECHANICAL CONTRACTOR PRIOR TO REMOVAL.
8. CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE MECHANICAL PLANS. ADDITIONAL WORK NOT SHOWN ON THE ELECTRICAL PLANS MAY BE REQUIRED BY THE CONTRACTOR IN ORDER TO ASSIST THE WORK OF OTHER TRADES. ANY SUCH WORK SHALL BE COMPLETED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
9. CONTRACTOR SHALL MAINTAIN EXISTING DOWNSTREAM CIRCUITRY FOR DEVICES AND EQUIPMENT TO REMAIN. WHERE DEMOLITION WORK IS BEING PERFORMED THAT WOULD DISRUPT SERVICE, THE CONTRACTOR SHALL EXTEND OR REPLACE FEEDERS OR BRANCH CIRCUITS AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.
10. ALL FIRE ALARM DEVICES SHALL CONFORM TO BUILDING STANDARDS. NEW NOTIFICATION DEVICES ARE TO BE INTEGRATEDINTO THE EXISTING FIRE ALARM SYSTEM. PROVIDE SIGNAL EXPANDER IF REQUIRED TO ACCOMMODATE NEW DEVICES. UPON COMPLETION OF WORK, THE FIRE ALARM SYSTEM SHALL BE CERTIFIED BY MANUFACTURER. CONTRACTOR SHALL OBTAIN A SEPARATE PERMIT FOR ALL WORK ASSOCIATED WITH THE FIRE ALARM SYSTEM.

REVISIONS

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ELECTRICAL LEGEND, SPECIFICATIONS & GEN. PROJECT NOTES

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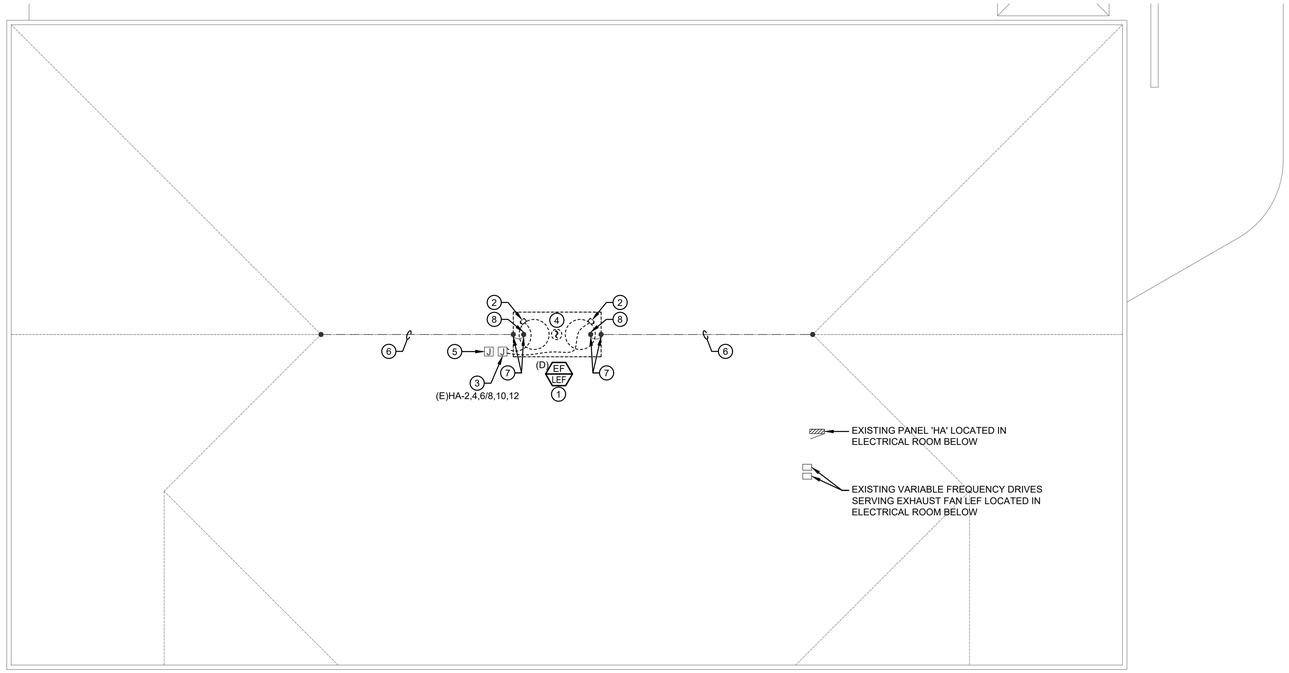
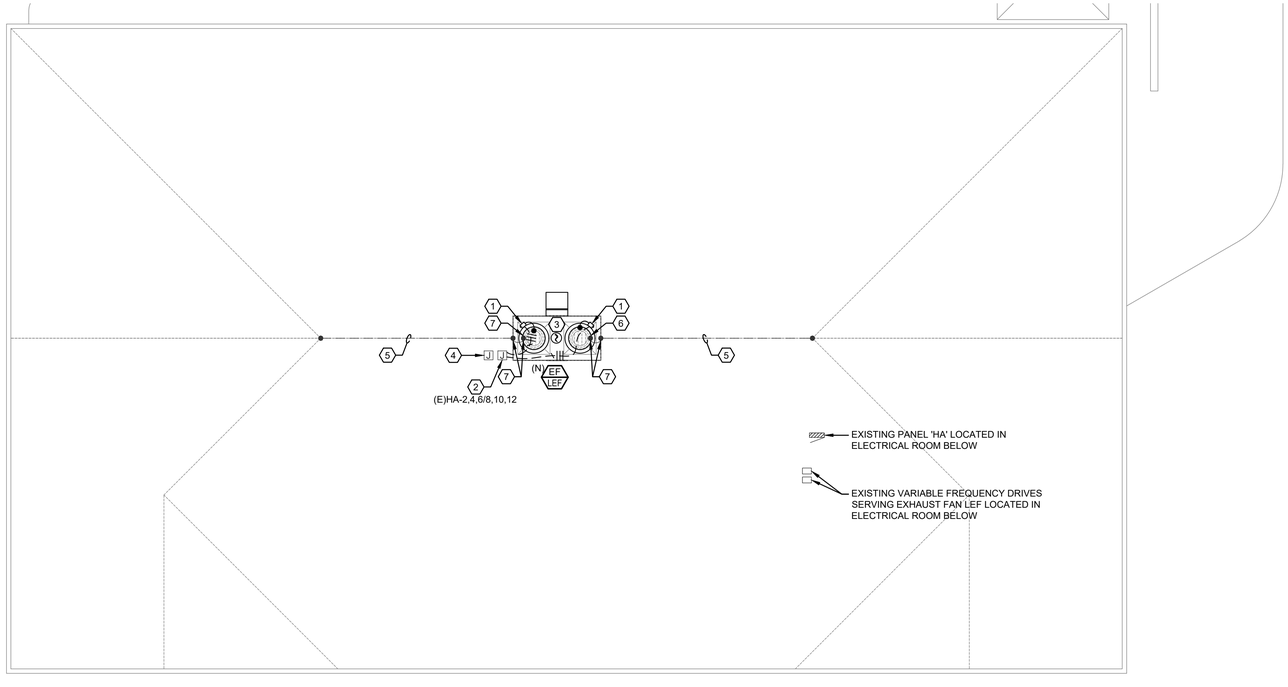


1 ELECTRICAL DEMOLITION PLAN
SCALE: 1/8"=1'-0"



1 ELECTRICAL RENOVATION PLAN
SCALE: 1/8"=1'-0"

ELECTRICAL DEMOLITION NOTES

1. EXISTING MECHANICAL EQUIPMENT TO BE REMOVED IN ITS ENTIRETY BY MECHANICAL CONTRACTOR AND REPLACED IN PLACE WITH SAME SIZE UNIT. ELECTRICAL CONTRACTOR SHALL DISCONNECT ALL LINE AND LOW VOLTAGE CONNECTIONS TO FACILITATE THE REMOVAL OF MECHANICAL EQUIPMENT. LOW VOLTAGE CONNECTIONS TO BE REMOVED SHALL INCLUDE BUILDING MANAGEMENT SYSTEM, FIRE ALARM, ETC.
2. REMOVE EXISTING DISCONNECT SERVING EXISTING MECHANICAL EQUIPMENT TO BE REMOVED IN ITS ENTIRETY. REMOVE ALL EXISTING SURFACE MOUNTED WEATHERPROOF POWER CONNECTIONS IN THEIR ENTIRETY BACK TO SOURCE JUNCTION BOX.
3. EXISTING NEMA 3R JUNCTION BOX FOR POWER TO REMAIN.
4. REMOVE EXISTING FIRE ALARM SMOKE DETECTOR TO FACILITATE THE REMOVAL OF MECHANICAL EQUIPMENT. ELECTRICAL CONTRACTOR SHALL TEMPORARILY SUSPEND/SUPPORT EXISTING FIRE ALARM DEVICE AS REQUIRED UNTIL NEW EXHAUST FAN IS INSTALLED.
5. EXISTING NEMA 3R JUNCTION BOX FOR CONTROLS TO REMAIN.
6. EXISTING LIGHTNING PROTECTION CABLE TO REMAIN. CONTRACTOR TO TAKE CARE TO NOT DAMAGE CABLE DURING REMOVAL OF MECHANICAL EQUIPMENT.
7. EXISTING LIGHTNING PROTECTION CABLE CONNECTED TO EXISTING MECHANICAL EQUIPMENT TO BE REMOVED TO FACILITATE THE EQUIPMENTS REMOVAL. REMOVE LIGHTNING PROTECTION CABLE TO NEAREST SPLICE POINT. CONTRACTOR TO RETAIN EXISTING LIGHTNING PROTECTION CABLE FOR RE-USE ON NEW MECHANICAL EQUIPMENT. REFER TO RENOVATION PLAN ON THIS SHEET FOR NEW WORK.
8. EXISTING LIGHTNING PROTECTION ARIEL ROD CONNECTED TO EXISTING MECHANICAL EQUIPMENT TO BE REMOVED TO FACILITATE THE EQUIPMENTS REMOVAL. CONTRACTOR TO RETAIN EXISTING ARIEL RODS FOR RE-USE ON NEW MECHANICAL EQUIPMENT. REFER TO RENOVATION PLAN ON THIS SHEET FOR NEW WORK.

ELECTRICAL RENOVATION NOTES

1. NEW DISCONNECT TO BE FURNISHED WITH MECHANICAL EQUIPMENT. ELECTRICAL SHALL MOUNT AND PROVIDE ALL NEW WIRING TO DISCONNECT AND MAKE FINAL CONNECTIONS TO NEW MECHANICAL EQUIPMENT. PROVIDE 3 #12 CU AND 1 #12 CU E.G. IN 1/2" C. ALL NEW WIRING TO BE IN WEATHER PROOF FLEXIBLE CONDUIT. CONTRACTOR SHALL PROVIDE LABELING ON DISCONNECT THAT STATES "CAUTION-DAMAGE TO DRIVE MAY OCCUR IF CIRCUIT IS OPENED WHILE IN USE". LABELING TO BE BLACK LETTERS ON YELLOW BACKGROUND.
2. EXISTING NEMA 3R JUNCTION BOX FOR POWER. EXTEND EXISTING CIRCUITRY TO NEW DISCONNECTS AS REQUIRED.
3. REINSTALL EXISTING FIRE ALARM SMOKE DETECTOR IN NEW MECHANICAL EQUIPMENT. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR.
4. EXISTING NEMA 3R JUNCTION BOX FOR CONTROLS. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NEW CONDUIT FOR CONTROLS AS REQUIRED. ALL NEW CONTROL CONDUIT SHALL BE IN WEATHER PROOF FLEXIBLE CONDUIT. ALL LOW VOLTAGE WIRE/CABLE TO BE PROVIDED AND TERMINATED BY MECHANICAL CONTRACTOR. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL CONTRACTOR.
5. EXISTING LIGHTNING PROTECTION SYSTEM MAIN CABLE.
6. LOCATION OF RELOCATED LIGHTNING PROTECTION ARIEL ROD. MOUNT TO NEW ROOF MOUNTED MECHANICAL EQUIPMENT AS REQUIRED. CONTRACTOR SHALL PROVIDE ALL NECESSARY HARDWARE NEEDED TO MOUNT EXISTING ROD TO NEW MECHANICAL EQUIPMENT.
7. BOND NEW MECHANICAL EQUIPMENT TO EXISTING LIGHTNING PROTECTION SYSTEM UTILIZING EXISTING LIGHTNING PROTECTION SYSTEM CABLING MADE AVAILABLE BY DEMOLITION. PROVIDE NEW LIGHTNING PROTECTION CONNECTION POINTS TO MATCH EXISTING MAIN LIGHTNING PROTECTION SYSTEM. BOND AT CLOSEST POINT TO EXISTING LIGHTNING PROTECTION SYSTEM.

GENERAL NOTES

1. CONTRACTOR SHALL PERFORM A SITE VISIT TO VERIFY EXISTING SYSTEMS AND CONDITIONS PRIOR TO SUBMITTING BID.
2. THE EXISTING CIRCUITRY ON THE PLANS IS SHOWN FOR REFERENCE ONLY AND WAS TAKEN FROM THE ORIGINAL CONSTRUCTION DOCUMENTS AND WHAT COULD BE DETERMINED FROM A SITE SURVEY. THE CONTRACTOR SHALL PROVIDE ALL CIRCUITRY WITHIN THE AREA UNDER CONSTRUCTION AS REQUIRED TO PROVIDE A FULLY FUNCTIONAL ELECTRICAL SYSTEM MEETING THE INTENTION OF THE PLANS. CONTRACTOR SHALL VERIFY THE ACCURACY OF EXISTING CONDITIONS, INCLUDING THE ACCURACY OF THE AS-BUILT CIRCUITRY INDICATED ON THE PLANS PRIOR TO SUBMITTING BID. NO ADDITIONAL COSTS FOR INACCURATE OR UNCONFIRMED EXISTING CONDITIONS WILL BE ACCEPTED.
3. CONTRACTOR MAY RE-USE EXISTING PANELBOARDS, CIRCUIT BREAKERS, TRANSFORMERS, SAFETY SWITCHES, ETC. ONLY WHERE INDICATED TO BE REUSED ON THE PLANS.
4. CONTRACTOR MAY RE-USE EXISTING CONDUIT, CONDUCTORS, FITTINGS, AND SUPPORTS, ETC. WHERE THESE ITEMS ARE SUPPORTED AND SECURED WITH STRAPS COMPLY WITH CURRENT NEC CODE AND THE REQUIREMENTS OF THE SPECIFICATIONS.
5. ITEMS TO BE DEMOLISHED, SUCH AS DISCONNECTS, JUNCTION BOXES, ETC. SHALL BE HANDED OVER TO THE OWNER TO BE KEPT AS SPARE INVENTORY OR REMOVED FROM SITE AT THE SOLE DISCRETION OF THE OWNER.
6. ALL NEW JUNCTION BOXES SHALL CONTAIN A GROUND PIGTAIL TO BE GROUNDED TO THE JUNCTION BOX BY A THREADED CONNECTION.
7. DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN AN UPDATED SET OF CONSTRUCTION PLANS INDICATING DISCREPANCIES IN EXISTING CONDITIONS AND MODIFICATIONS MADE DURING THE CONSTRUCTION PROCESS. AT PROJECT COMPLETION THE INSTALLER SHALL PROVIDE THESE RED LINE DRAWINGS DOCUMENTING ACTUAL INSTALLED "AS-BUILT" CONDITIONS TO THE ENGINEER.
8. NO LOAD WAS ADDED TO THE EXISTING SERVICE, BRANCH CIRCUITRY OR PANELBOARD 'HA' AS PART OF THIS PROJECT. PROJECT SCOPE IS REPLACING EXISTING EXHAUST FAN WITH ONE OF SAME SIZE AND HORSE POWER.

REVISIONS
1 _____
2 _____
3 _____
4 _____
5 _____
6 _____

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Job No. 14079.06E
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CADD: KCW
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Project Engineer
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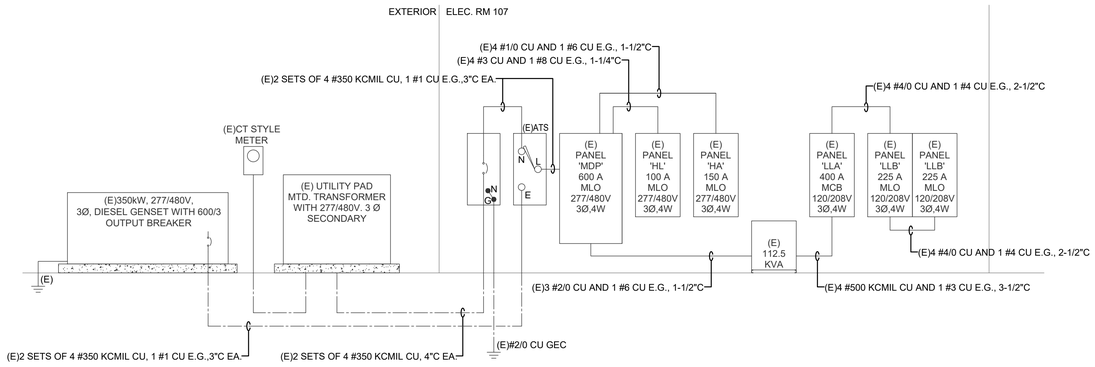
ELECTRICAL PLANS

MANATEE COUNTY - WATER TREATMENT LAB
EXHAUST FAN REPLACEMENT
4751 65th STREET WEST
BRADENTON, FL 34210

JOB NO: 14079.06E
PROJ. MNGR: KCW
DRAWN BY: KCW
ISSUE DATE: 06.27.2017

SHEET NUMBER
E1.0
BID SET



1 PARTIAL ELECTRICAL RISER DIAGRAM

SCALE: NO SCALE

NOTE: RISER DIAGRAM SHOWN FOR REFERENCE ONLY. NO WORK TO EXISTING ELECTRICAL SERVICE IS PART OF THIS SCOPE OF WORK.

PANEL: 'HA' (EXISTING) — ACCESSORIES: EXISTING SQUARE D NF PNLBRD

VOLTAGE: 480 /Y277 | PHASE: 3 | MOUNTING: SURFACE
AMPS: 150 AMP MLO | WIRE: 4 | NEMA 1 | AIC: 35,000

LOAD (KVA) LTG	REC	MISC	COOL	HEAT	MTR	AMPS	POLE	LOAD DESCRIPTION	CKT	A	B	C	CKT	LOAD DESCRIPTION	AMPS	POLE	LOAD (KVA) LTG	REC	MISC	COOL	HEAT	MTR
		4.0				20	3	WATER HEATER (1)	1				2	LEF-1 (1)	30	3						3.9
		4.0				--	-	----------	3				4	----------	--	-						3.9
		4.0				--	-	----------	5				6	----------	--	-						3.9
					3.9	30	3	CWP-1 (1)	7				8	LEF-2 (1)	30	3						3.9
					3.9	--	-	----------	9				10	----------	--	-						3.9
					3.9	--	-	----------	11				12	----------	--	-						3.9
					0.9	15	3	HWP-1 (1)	13				14	AHU-1 (1)	15	3				0.7		
					0.9	--	-	----------	15				16	----------	--	-				0.7		
					0.9	--	-	----------	17				18	----------	--	-				0.7		
						20	3	TVSS (1)	19				20	AHU-2 (1)	40	3				5.8		
						--	-	----------	21				22	----------	--	-				5.8		
						--	-	----------	23				24	----------	--	-				5.8		
					2.1	30	3	LIFT STATION (1)	25				26	SPACE								
					2.1	--	-	----------	27				28	SPACE								
					2.1	--	-	----------	29				30	SPACE								
								SPACE	31				32	SPACE								
								SPACE	33				34	SPACE								
								SPACE	35				36	SPACE								
								SPACE	37				38	SPACE								
								SPACE	39				40	SPACE								
								SPACE	41				42	SPACE								

CONNECTED LOAD SUMMARY (KVA)

	A	B	C	TOTALS	D.F.
LTG	0.0	0.0	0.0	0.0	
REC	0.0	0.0	0.0	0.0	
MISC	4.0	4.0	4.0	12.0	1.00
COOL	6.5	6.5	6.5	19.6	1.00
HEAT	0.0	0.0	0.0	0.0	
MTR	14.7	14.7	14.7	44.1	1.07

CONNECTED LOAD PER PHASE

PHASE A 25.2 KVA **91.1 AMPS**
PHASE B 25.2 KVA **91.1 AMPS**
PHASE C 25.2 KVA **91.1 AMPS**

DEMAND LOAD SUMMARY

COMMENTS	LOAD	
	0.0	KVA
	0.0	KVA
	12.0	KVA
	19.6	KVA
	0.0	KVA
125% OF LARGEST MOTOR PLUS 100% OF REMAINDER	47.0	KVA

Breaker Notes ( ):
1.
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DEMAND LOAD: 78.6 KVA

DEMAND CURRENT: **94.6 AMPS**

REVISIONS

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ELECTRICAL RISER DIAGRAM & SCHEDULES

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