SOUTH WINDSOR PUBLIC SCHOOLS

1737 Main Street
South Windsor, CT 06074

Bidding Manual for

TIMOTHY EDWARDS MIDDLE SCHOOL AIR CONDITIONING FOR (4) CLASSROOMS

RFP # 2023-007

BID OPENING

January 13, 2023 11:00 A.M.

Ms. Chris M. Chemerka
Director of Finance & Operations

Mr. Darrell Crowley Director of Facility Operations

LEGAL NOTICE

SOUTH WINDSOR PUBLIC SCHOOLS

REQUEST FOR PROPOSALS FOR TIMOTHY EDWARDS MIDDLE SCHOOL AIR CONDITIONING FOR (4) CLASSROOMS RFP # 2023-007

Documents for TEMS Air Conditioning for (4) Classrooms for the South Windsor Public Schools, RFP# 2023-007 may be obtained online at www.southwindsorschools.org on or after 8:00 a.m., December 9, 2022.

Sealed proposals must be received at the following address on or before 10:50 a.m., Eastern Standard Time, on Friday, January 13, 2023. Thereafter, the name of the firms that have submitted proposals will be publicly read aloud.

Mr. Darrell Crowley, Director of Facility Operations South Windsor Public Schools 1737 Main Street South Windsor, CT, 06074

A mandatory pre-bid walk through will be conducted on Wednesday, December 28, 2022 at 9:00 am. Bidders should meet at the Timothy Edwards Middle School, 100 Arnold Way, SW. Bids will not be accepted from any firm that does not attend.

The South Windsor Public Schools reserve the rights to: amend or terminate this Request for Proposal; accept all or any part of a proposal; reject any or all proposals, in whole or in part; waive any technical defects, informalities or non-material deficiencies in a proposal; and award the proposal, in whole or in part, including accepting a proposal or part of a proposal, that, in its judgment, will be in the South Windsor Public School's best interests.

PURPOSE OF REQUEST FOR PROPOSAL (RFP)

The South Windsor Public Schools is seeking Proposals for qualified Mechanical Contractors to provide air conditioning to four internal classrooms.

ISSUING OFFICE/ADMINISTRATIVE GUIDANCE

The SWPS is the issuing office for this document and all subsequent addenda relating to it.

The information provided herein is intended to assist interested bidders in the preparation of proposals necessary to properly respond to this RFP. The RFP is designed to provide interested bidders with sufficient basic information to submit proposals meeting minimum requirements, but is not intended to limit a proposal's content or to exclude any relevant or essential data therefrom. Bidders are at liberty and are encouraged to expand upon the specifications to evidence service capability under any agreement.

Please note, however, that all forms provided must be completed and become part of the submitted proposal in order for the proposal to be considered complete.

QUESTIONS AND AMENDMENTS

Any questions regarding the bid, including the process and procedures and specifications, are to be submitted in writing (e-mail acceptable) to:

Darrell Crowley, Director of Facility Operations dcrowley@swindsor.k12.ct.us

And:

Karen Dallaire, Administrative Secretary kdallaire@swindsor.k12.ct.us

The representatives listed about must receive any questions no later than January 6, 2023 by 2:00 p.m. The SWPS will answer all pertinent written questions by issuing an addendum, which shall become a part of the Invitation to Bid, containing all pertinent questions received as provided about and decision regarding same. Such addenda will be posted on the SWPS's website (www.southwindsorschools.org) by January 9, 2023 by 4:00 p.m. Each bidder is responsible for confirming with the SWPS whether any addenda have been issued, and if so, obtaining a copy of such addenda and completing its Bid in accordance with the Bid Documents modified by such addenda.

No oral statement of the SWPS, including oral statements by the representative listed above, shall be effective to waive, change, or otherwise modify any provision of the Bid Documents, and no bidder or prospective bidder shall rely on any alleged oral statement.

RESPONSE DATE

Two paper copies and one digital copy of your proposal must be received at the SWPS Facility Operations Office, Room 100, 1737 Main Street, South Windsor, CT 06074, prior to 10:50 a.m. on Friday, January 13, 2023. Proposals received after the above time will be rejected.

- a. Sealed bids will be received at the Office of the Director of Facility Operations, SWPS, 1737 Main Street, Room 100, South Windsor, CT 06074, until 10:50 a.m., Eastern Standard Time, on January 13, 2023.
- b. Bids received after that time will not be considered and will be returned unopened to the bidder.
- c. All bids must be submitted in sealed envelopes, bearing on the outside, the name of the proposal for which the bid is submitted: TEMS Air Conditioning for (4) Classrooms, Bid # 2023-007 and the name and address of the bidder.
- d. If forwarded by US Postal mail, the sealed envelope containing the bid and marked as directed above, must be enclosed in another envelope, address as specified.
- e. The bid forms must be completed with a bid price for any or all of the options presented therein, except as otherwise expressly provided herein.

TERM OF CONTRACT

The contract cannot be assigned, sublet, sold, transferred, or otherwise disposed of by either party without the written consent of the other.

CONSIDERATION OF PROPOSALS

The submission of a bid will serve as conclusive evidence that the bidder has satisfied itself as to all requirements outlined in the bid documents and to all conditions concerning the work of the contract and the execution of any contract which may ensue. Each proposal should be submitted with the most favorable price and services standpoint. The SWPS reserves the right to reject any and/or all proposals or any parts thereof for any reason whatsoever, to waive any informality in any proposal or in any provision in the request for proposals, to require a modification of the contract terms at any time, and to select the bidder who, in the opinion of the SWPS, will best meet the interests of the SWPS, provided nothing herein, shall be deemed to waive any requirement of federal, state, or local law. Under no circumstances will the SWPS be responsible for the cost of preparing any proposal.

Proposers are advised to provide information detailed sufficiently to enable evaluation of their capabilities, experience, and approach to the services outlined in the proposal. Each proposal should provide a straight forward, concise description of the proposer's capabilities to satisfy the requirements of this Request for Proposals.

OTHER INFORMATION

The contractor at all times shall observe and comply with all federal, state, and local laws and by-laws, ordinances and regulations in any manner affecting the conduct of the work.

All contractors or other persons providing services for the South Windsor Public Schools shall conform to the provisions of the Connecticut Occupational Safety & Health Act (OSHA) of the State of Connecticut.

Bidders are to address all aspects of the Bid Documents as they will be incorporated into the contract that the SWPS enters into with the selected vendor.

The SWPS reserves the right, either before or after the opening of bids, to ask any bidder to clarify its bids or submit additional information that the SWPS in its sole discretion deems desirable.

Costs for preparing bid

Each bidder's cost incurred in developing its bid are solely its responsibility, and the SWPS shall have no liability for such costs.

Ownership of bids

All bids submitted become the property of the SWPS and will not be returned to bidders.

Freedom of Information Act

All information submitted in a bid or in response to a request for additional information is subject to disclosure under the Connecticut Freedom of Information Act as amended and judicially interpreted. A bidder's responses may contain financial, trade secret or other data that it claims should not be public (the "Confidential Information"). A bidder must identify specifically the pages and portions of its proposal that contain the claimed Confidential Information by visibly marking all such pages and portions. Provided that the bidder cooperates with the SWPS, the SWPS shall, to the extent permitted by law, protect from unauthorized use and disclosure such Confidential Information.

Non-Collusion

By submitting a bid, each bidder, and each person signing on behalf of any bidder, certifies under penalty of perjury that, to the best of his/her knowledge and belief, the prices in this bid have been arrived at independently, without collusion, consultation, communication, or agreement with any other bidder or competitor, and further, that the prices which have been quoted in this bid have not been knowingly disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or competitor.

CONTRACT AWARD/EXECUTION

All bids will be publicly opened and names of companies submitting bids will be read aloud, on the date, time, and at the place identified in the Invitation to Bid. Bidders may be present at the opening.

The SWPS may elect to award the contract to other than the lowest bidder if it is judged to be in the best interest of the SWPS. Criteria which could be applied in the determination would include, but not be limited to, financial responsibility, service, performance on contracts, and experience. During the evaluation of the bids, the SWPS may request bidders to make oral presentations.

The SWPS reserves the following rights: (a) to reject any and all bids, in whole or in part, (b) to waive any irregularity, (c) to award or reject a bid on the basis of pervious performance, reputation or experience, (d) to accept the one that will be in the best interest of the district.

No bid will be accepted, nor contract awarded, to any contractor whose performance on any previous contract with this or any other school district has been determined to be unsatisfactory. The SWPS reserves the right to be the sole judge in this decision.

No contract will exist unless and until a written contract is executed by both the SWPS and the contractor. No bidder can claim any contract rights by virtue of submitting a bid, including the lowest bid.

Bidders will not include federal excise taxes nor state sales taxes from which SWPS are exempt.

INDEMINFICATION

The contractor agrees to indemnify, defend, and hold harmless the SWPS, its respective officers, employees and agents from any and all claims and losses accruing or resulting to any person, firm or corporation who may be injured or damaged by the contractor in the performance of this contract.

INSURANCE

The successful contractor shall provide a certificate of insurance naming the SWPS and the Town of South Windsor as "additional insured" in the minimum amounts as specified herein. Said insurance shall be provided at the sole expense of the bidder with an insurance company which is licensed to do business in the State of Connecticut.

- A. General Liability (including completed operations coverage) \$1,000,000 (combined single limit) and \$2,000,000 aggregate coverage
 Bodily Injury Property Damage Coverage/occurrence and \$2,000,000 aggregate coverage.
- B. Worker's Compensation per state statute
- C. Comprehensive Automobile Liability:

 Bodily Injury Property Damage Coverage/occurrence and \$2,000,000 aggregate coverage.
- D. Excess/Umbrella Liability (with all liability coverages as underlyers): \$5,000,000
- E. Workers' Compensation & Employers Liability-\$1,000,000 in Employers Liability limits

PREVAILING WAGE REQUIREMENTS

Prevailing wage rates set forth by the State of Connecticut pursuant to section 31-53/31-54/31-55 of the Connecticut General Statutes as amended and as referenced in the Specifications must be paid on this project.

EQUAL OPPORTUNITY – AFFIRMATIVE ACTION

The South Windsor Public Schools is an Equal Opportunity Employer. The Board of Education transacts business with firms which are in compliance with all Federal and State Statutes and Executive Orders pertaining to non-discrimination. By submitting a bid you are indicating your firm does not make employment decisions (including decisions related to hiring, assignment, compensation, promotion, demotion, disciplinary action and termination) on the basis of race, color, religion, age, sex, marital status, sexual orientation, national origin, alienage, ancestry, disability, pregnancy, veteran status, or gender identify or expression, except in the case of a bona fide occupational qualification.

-- END SECTION --

Detailed Specifications

Description of Services

The scope of the services requested is as follows:

The South Windsor Public Schools is seeking Proposals for qualified Mechanical Contractors to provide air conditioning to four interior classrooms. The proposal shall include ceiling mounted VRF cassettes with roof mounted condensing unit, new construction work identified and shall comply with Terms and Conditions provided by the Town of South Windsor and the South Windsor Public Schools.

This Request for Proposal (RFP) seeks to provide new air conditioning equipment as follows:

- Provide (8) 1 ½-ton ceiling mounted VRF cassette units with (1) one 12-ton roof mounted condensing unit.
- Each classroom shall have (2) two 1 ½-ton ceiling mounted VRF cassette units with dedicated wall mounted thermostat.
- Provide insulated refrigerant piping between indoor & outside units.
- Provide condensate piping.
- Provide new accessories and features as specified.
- Provide electrical work as required.
- The School has an existing Invensys / SNE Energy Management and Controls System (EMCS) in place. The Owner will engage SNE Building Systems (Controls Contractor) separate from the Construction Contract to wire and commission the unit controls. The temperature control and staging control of the units shall be controlled by the packaged controller. The scheduling and energy management functions shall be controlled by the Invensys EMCS. Coordinate work with SNE Building Systems. Contact Jeff Hammick at SNE 860-653-5095 to provide the controls wiring, programming and commissioning.
- Controls shall be factory furnished and wiring to include all operating and safety controls for fan, compressor and reversing valve operation. Controller shall have a BACNet MS/TP communications interface or shall be a native BACNet controller. Include a new room temperature sensor with each unit that is compatible with the HP Unit's factory supplied controller.
- Start of work must occur after the close of the current school year, approximately June 16, 2023 and be completed prior to August 11, 2023.

Additional specific scope of work information and specifications follow below on Drawing Set M0-M4.

The Contractor will enter into an agreement with the South Windsor Public Schools for all work including mechanical HVAC work, supporting electrical work, and any general trades work identified in the Scope of Work. The Contractor will be responsible for the complete execution of all work indicated in this RFP and in accordance with the Specifications. All subcontractors (insulators, electricians, etc.) shall be under the control of the Contractor.

Within this RFP and other Contract Documents, where the term "Contractor" is used, it shall mean the Contractor submitting the Proposal and providing the overall execution, coordination and management of the Project.

Within this RFP and other Contract Documents, where the term "Owner's Engineering Consultant" is used, it shall mean the Owner's consultants preparing this RFP and the Specifications and providing consultation and review services throughout the Project to completion.

Within this RFP where the term "Owner" is used, it shall mean the agents and staff of South Windsor Public Schools and/or their separately contracted vendors, subcontractors or agents.

Contractor Qualifications

All Contractors bidding on this RFP shall be Mechanical Contractor Firms regularly engaged in the construction, installation and servicing of HVAC and Refrigeration systems.

Proposal Criteria

Include in the Proposal a description of the Systems, Manufacturers and Equipment intended to be provided under the Contract. Construction permits shall be taken for all trades.

Proposals received after the due date and time will not be accepted, nor will proposals be accepted from bidders who have not attended a Pre-Bid Walkthrough.

Owner's Engineering Consultant

The Owner has retained the services of an Engineer (Owner's Engineering Consultant) for the purpose of establishing the project RFP and Specifications and to review the proposals and the work of the mechanical contractors. The Contractor's proposals and the performance and quality of work shall remain the responsibility of the Contractor.

The Contractor shall agree to the review comments and terms of the Owner's Engineering Consultant in all matters relative to the equipment and material specifications and the Consultant's review of equipment and materials submittals and review of work in progress.

Design Criteria - General

The Codes and Standards listed below shall apply to all mechanical and electrical work.

Connecticut State Building Code:

Connecticut Fire Safety Code 2022

The International Building Code 2021

The International Existing Building Code 2021

The International Plumbing Code 2021

The International Mechanical Code 2021

International Energy Conservation Code 2021

NFPA-70 The National Electrical Code 2020

ICC A117.1 Accessible and Usable Buildings & Facilities

The International Fire Code 2021

NOTE: The codes and standards listed above are subject to change as the State of Connecticut assigns from time to time. Those listed above are applicable on the date of this RFP. The Contractor shall at all times, work in accordance with the most current applicable versions and editions as may be in effect at the time of permit application and procurement.

The Contractor shall clean up the project site daily, recognizing that the school may have nearby activities during construction. No materials, equipment tools or demolition debris shall be left in the open or outside.

The Contractor shall provide their own dumpsters as required, located where acceptable to the Building Department and Fire Marshal's Office.

The Contractor shall take precautions to prevent damage to the existing building, furnishings and site and make reparations whenever damage occurs at no cost to the Owner.

Form of Contract

The Contractor shall enter into an Agreement with the South Windsor Public Schools using the AIA Document A101 – Standard Form of Agreement Between Owner and Contractor. (Sample Copy Attached.)

Payment requisitions shall be submitted to the Owner periodically using the AIA Form G702/A – Application and Certificate for Payment including Schedule of Values and appropriate Supplemental Continuation Sheets. (Sample Copy Attached.) Payment requests are to be sent to the Engineer for signature and verification of the payment request. SWPS will review payment paperwork and when appropriate, submit for payment.

Bonding

Bid Bonds and Performance & Payment Bonds will not be required.

Vendor References:

The organization/company must have successfully provided similar services in Connecticut. Please list four other Connecticut client(s) including contact names, addresses, phone numbers and email addresses.

Selection Criteria:

Selection will be based on the candidate's ability to offer a complete range of services at a competitive price. Candidate responses will be evaluated based on:

- Responsiveness of the proposal in developing a comprehensive work plan and processes
- Qualifications, experience in and credentials of the professionals assigned to the client
- Ability to communicate effectively
- Cost

-- END SECTION --

REQUEST FOR PROPOSALS FOR SOUTH WINDSOR PUBLIC SCHOOLS PROPOSAL FORM

The company identified below agrees to all of the conditions, specifications and instructions contained in the attached specifications and will provide the services designated therein as specified.

TOTAL BASE BID:		
\$		
Acknowledgement of Addendum #1		(if issued)
Acknowledgement of Addendum #2	(Please Sign)	(if issued)
	(Please Sign)	(* ********************************

List of References:

<u>Name</u>	<u>Address</u>	<u>E-mail</u>	<u>Phone</u>

In addition to the above, please provide, on a separate sheet under letterhead, a brief description of the proposed schedule, project management and coordination procedures and any other supporting information relative to means and methods to be employed on this project.

The undersigned is submitting this bid w	vithout collusion with	any other individual or
corporation.		

SUBMITTED BY:

Firm:	Signature
Address:	Name
	Title:
	Telephone:
E-mail Address	

AFFIRMATIVE ACTION STATEMENT

Date	
The employment policies and practices of	
Are to recruit and employ qualified job applicar	(Vendor) nts without discrimination based on race, creed
color, religion, age, sex, national origin or hand	dicap and to treat all employees equally withou
discrimination because of race, creed, color, re	eligion, age, sex, national origin or handicap.
_	(Signature)

MUST BE ENCLOSED WITH BID



Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year (In words, indicate day, month and year.)

BETWEEN the Owner:

(Name, legal status, address and other information)

and the Contractor: (Name, legal status, address and other information)

for the following Project: (Name, location and detailed description)

The Architect:
(Name, legal status, address and other information)

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

TABLE OF ARTICLES

- THE CONTRACT DOCUMENTS
- THE WORK OF THIS CONTRACT
- DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- **CONTRACT SUM**
- **PAYMENTS**
- **DISPUTE RESOLUTION**
- **TERMINATION OR SUSPENSION**
- **MISCELLANEOUS PROVISIONS**
- **ENUMERATION OF CONTRACT DOCUMENTS**

EXHIBIT A INSURANCE AND BONDS – (See insurance limits of coverage in Specification Section "SUPPLEMENTAL GENERAL CONDITIONS," ARTICLE 34 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE).

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be: (Check one of the following boxes.)

[]	The date of this Agreement.	

A date set forth in a notice to proceed issued by the Owner.

•	-	,
[]	Established as follows: (Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

AlA Document A101™ - 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017 by The American Institute of Architects, All rights reserved, WARNING: This AIA® Document is protected by U.S. Copyright Law and International Trea Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 10:48:49 ET on 02/14/2020 under Order No.9636396353 which expires on 04/01/2020, and is not for resale. **User Notes:**

	Not later than	() calendar days fr	om the date of commencer	nent of the Work.
[]	By the following	ng date:		
to be compl	eted prior to Subs		the entire Work, the Contra	Documents, if portions of the Work are ctor shall achieve Substantial
Po	rtion of Work		Substantial Completion D	ate
		o achieve Substantial (orth in Section 4.5.	Completion as provided in t	his Section 3.3, liquidated damages, if
§ 4.1 The O	he Contract Sum s			the Contractor's performance of the ns as provided in the Contract
§ 4.2 Alterna § 4.2.1 Alter		uded in the Contract St	um: Form of Proposal as se	t forth in Exhibit B
Ite	m		Price	
execution o	f this Agreement.	Upon acceptance, the	llowing alternates may be a Owner shall issue a Modifi must be met for the Owner	
Ite	m		Price	Conditions for Acceptance
	ances, if any, inclu ch allowance.)	ided in the Contract Si	ım: Form of Proposal as se	t forth in Exhibit B.
Ite	m		Price	
		of Proposal as set for e unit price and quant		ich the unit price will be applicable.)
lte	m		Units and Limitation	s Price per Unit (\$0.00)
	ated damages, if a s and conditions f	nny: îor liquidated damages	, if any.)	
§ 4.6 Other:		r other incentives, if a	ny, that might result in a ch	nange to the Contract Sum.)

Init.

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ARTICLE 5 PAYMENTS

NOTE: ALL PAYMENTS TO BE PROCESSED -PAID WITHIN 30 DAYS AFTER WINDSOR PUBLIC BUILDING COMMISSION APPROVAL. THE PUBLIC BUILDING COMMISSION MEETS EVERY MONTH, ALWAYS ON THE SECOND TUESDAY AND FOR EIGHT MONTHS ON THE FOURTH TUESDAY. FOR THE MONTHS OF JULY, AUGUST, NOVEMBER AND DECEMBER THEY MEET ONCE A MONTH.

§ 5.1 Progress Payments

- § 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.
- § 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:
- § 5.1.3 Provided that an Application for Payment is received by the Architect not later than the First day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the Thirtieth day of the Same month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Thirty (30) days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

- § 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.
- § 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.
- § 5.1.6 In accordance with AIA Document A201TM—2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
- § 5.1.6.1 The amount of each progress payment shall first include:
 - .1 That portion of the Contract Sum properly allocable to completed Work;
 - .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
 - .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.
- § 5.1.6.2 The amount of each progress payment shall then be reduced by:
 - .1 The aggregate of any amounts previously paid by the Owner;
 - .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
 - Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
 - 4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
 - **.5** Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

Five Percent (5.00%)

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as

(Insert any other conditions for release of retainage upon Substantial Completion.)

- § 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.
- § 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

- § 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when
 - the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
 - a final Certificate for Payment has been issued by the Architect.
- § 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located. (Insert rate of interest agreed upon, if anv.)

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ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker. (If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

8	6.2	Binding	Dispute	Reso	lution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows: (Check the appropriate box.)

- [] Arbitration pursuant to Section 15.4 of AIA Document A201–2017
- [X] Litigation in a court of competent jurisdiction
- [] Other (Specify: Refer to Section 15.3 Mediation of AIA Document A201-2017

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner as provided in Article 14 of AIA Document A201–2017.

(Paragraphs deleted)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:

(Name, address, email address, and other information)

§ 8.3 The Contractor's representative:

(Name, address, email address, and other information)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101TM—2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance (See insurance limits of coverage in Specification Section "SUPPLEMENTAL GENERAL CONDITIONS," ARTICLE 34 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE) and elsewhere in the Contract Documents.

- § 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101TM—2017 Exhibit A (See insurance limits of coverage in Specification Section "SUPPLEMENTAL GENERAL CONDITIONS," ARTICLE 34 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE) and elsewhere in the Contract Documents.
- § 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203[™]–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101TM—2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101TM_2017, Exhibit A, Insurance and Bonds

(Paragraphs deleted)

(See insurance limits of coverage in Specification Section "SUPPLEMENTAL GENERAL CONDITIONS," ARTICLE 34 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE)

.5	Drawings - As set for	th in Exhibit D		
	Number	Title	Date	
.6	Specifications – As se	et forth in Exhibit C		
	Section	Title	Date	Pages
.7	Addenda, if any:			
	Number	Date	Pages	
	Destina of Adda. de	nalatina ta hiddina an managanl maasin		41 C44

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:

,	Sheck equire		that apply and i	iclude approp	riate informati	on identifying th	ie exhibit whei	re		
[]		cument E204 TM - he date of the E2		•		indicated belo	ow:		
[1	The Sus	tainability Plan:							
	Title			Date		Pages				
[1	Supplem	nentary and other	r Conditions o	of the Contract:					
	Doc	ument		Title		Date	Paç	jes		
AII Si C C B A	ocumoumple equire ropose ocume A Dopecific ontenid Pro	ent A201 ^T forms, the ments, and als, are no cunts should cument A cation Sec RACTOR ts – contain posal -subcuments E	ditional document M_2017 provides to Contractor's bit of other informated the part of the Conditional distribution of the Cond	s that the adverse that the adverse to the firm of the	ertisement or in the portions of Act by the Owner in the ents unless enund to be part of the the and Bonds - the ENERAL CO TO INSURANCE THE TOTAL TOTAL THE ENERAL CO THE TOTAL THE ENERAL CO THE ENER	vitation to bid, Idenda relating in anticipation of merated in this Ashe Contract Do (See insurance NDITIONS," ACE)— enumerated ibit C s set forth in Ex	Instructions to to bidding or freceiving bid Agreement. An cuments.) limits of cove ARTICLE 34 I in the Table hibit B	Bidders, proposal is or y such rage in		
P E	erforn	nance, Lat	 contained in the contained in the contained	Payment Bon				in Exhibit		
	IA Do		A701 and the Inv		- contained in t			in Exhibit		
L ir L	ist of Exhi	all Major bit I Personnel	edule (including Subcontractors f on the Job (nam	or (Site, Roof	ing, Plumbing,	HVAC, Electric	cal, Security) a			

This Agreement entered into as of the day and year first written above.

OWNER (Signature)	CONTRACTOR (Signature)	
(Printed name and title)	(Printed name and title)	

Application and Certificate for Payment

TO OWNER:	PROJECT:		APPLICATION NO: 001 PERIOD TO: CONTRACT FOR: General Construction Distribution to OWNER:
FROM	VIA		CONTRACT DATE:
CONTRACTOR:	ARCHITECT:		PROJECT NOS: / / CONTRACTOR:
			FIELD:
			OTHER:
			omen.
CONTRACTOR'S APPLICATION FOR	PAYMENT		The undersigned Contractor certifies that to the best of the Contractor's knowledge
Application is made for payment, as shown below, in co- Continuation Sheet, AIA Document G703, is attached.	onnection with the Cor	ntract,	information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and
1. ORIGINAL CONTRACT SUM	***************************************	\$0.00	payments received from the Owner, and that current payment shown herein is now due.
2. NET CHANGE BY CHANGE ORDERS		\$0.00	CONTRACTOR:
3. CONTRACT SUM TO DATE (Line 1 ± 2)	·	\$0.00	By: Date:
4. TOTAL COMPLETED & STORED TO DATE (Column G	on G703)		State of:
5. RETAINAGE:			County of:
a. 0 % of Completed Work			Subscribed and sworn to before
(Column D + E on G703)	-	\$0.00	me this day of
b. 0 % of Stored Material		CO.OO	Note: D.I.P.
(Column F on G703)		\$0.00	Notary Public: My Commission expires:
Total Retainage (Lines 5a + 5b or Total in Column I	of G703)		
6. TOTAL EARNED LESS RETAINAGE		\$0.00	ARCHITECT'S CERTIFICATE FOR PAYMENT
(Line 4 Less Line 5 Total)			In accordance with the Contract Documents, based on on-site observations and the data
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT	1,4,54,000,000,000,000,000,000,000,000	\$0.00	comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the
(Line 6 from prior Certificate)			quality of the Work is in accordance with the Contract Documents, and the Contractor is
8. CURRENT PAYMENT DUE		\$0.00	entitled to payment of the AMOLINIT CERTIFIED
9. BALANCE TO FINISH, INCLUDING RETAINAGE		\$0.00	AMOUNT CERTIFIED\$0.00
(Line 3 less Line 6)		\$0.00	(Attach explanation if amount certified differs from the amount applied. Initial all figures on this
(Zine 5 1655 Zine 6)	-	\$0.00	Application and on the Continuation Sheet that are changed to conform with the amount certified.)
CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS	ARCHITECT:
Total changes approved in previous months by Owner	\$0.00	\$0.00	By: Date:
Total approved this Month	\$0.00	\$0.00	
TOTALS	\$0.00	\$0.00	This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of
NET CHANGES by Change Order		\$0.00	the Owner or Contractor under this Contract.



Continuation Sheet

AIA Document, G702TM—1992, Application and Certification for Payment, or G736TM—2009, Project Application and Project Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.

In tabulations below, amounts are in US dollars.

Use Column I on Contracts where variable retainage for line items may apply.

		_
APPLICATION NO:	001	
APPLICATION DATE:		
PERIOD TO:		
ARCHITECT'S PROJECT NO:		_

A	В	С	D	E	F	G		Н	I
ITEM	DESCRIPTION OF	SCHEDULED	WORK COMPLETED		MATERIALS PRESENTLY	TOTAL COMPLETED AND	%	BALANCE TO	RETAINAGE
NO.	WORK	VALUE	FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD	STORED (NOT IN D OR E)	STORED TO DATE	(G ÷C)	FINISH (C - G)	(IF VARIABLE RATE)
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	
		0.00	0.00	0.00			0.00%		
		0.00	0.00	0.00	0.00		0.00%		
		0.00	0.00	0.00	0.00		0.00%		
		0.00	0.00	0.00	0.00	0.00	0.00%		
		0.00	0.00	0.00	0.00	0.00	0.00%		
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%		
		0.00	0.00	0.00	0.00	0.00	0.00%		0.00
		0.00	0.00	0.00	0.00	0.00	0.00%		0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%		
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%		0.00
		0.00	0.00	0.00	0.00	0.00	0.00%		
		0.00	0.00	0.00	0.00	0.00	0.00%		0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
	GRAND TOTAL	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0.00%	\$0.00	\$0.00

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ABBREVIATIONS

а	48" ABOVE FINISHED FLOOR	FCU	FAN COIL UNIT	PIV	POST INDICATOR VALVE
Α	AMPS	FD	FIRE DAMPER	PLEF	PLENUM FAN
AC ACD	AIR COMPRESSOR AUTOMATIC COOLING CONDENSATE PUMP	FD/SB FD	FIRE DAMPER WITH INTEGRAL SECURITY BARS FLOOR DRAIN	PLUF PRESS	PLUG FAN PRESSURE
ACF	AIRFLOW CENTRIFUGAL FAN	FDC	FIRE DEPARTMENT CONNECTION	PRV	PRESSURE REDUCING VALVE
ACU	AIR CONDITIONING UNIT(S)	FDV	FIRE DEPARTMENT VALVE	PSI	POUNDS PER SQUARE INCH
AD AD	ACCESS DOOR AREA DRAIN	FHC FM	FIRE HOSE CABINET FLOW METER	PVC RA	POLYVINYL CHLORIDE RETURN AIR
AFF	ABOVE FINISHED FLOOR	FOB	FLAT ON BOTTOM	RAF	RETURN AIR FAN
AFG	ABOVE FINISHED GRADE AIR HANDLING UNIT	FOF FOR	FUEL OIL FILL FUEL OIL RETURN	RD REF	ROOF DRAIN REFRIGERANT PIPING (MULTIPLE PIPES)
AHU AMB	AMBIENT	FOS	FUEL OIL RETURN FUEL OIL SUPPLY	REF	ROOF EXHAUST FAN
ANN	ANNUNCIATOR	FOT	FLAT ON TOP	REG	REGISTER
APD APPROX	AIR PRESSURE DROP APPROXIMATE	FOV FP	FUEL OIL VENT FIRE PUMP	RF RH	RELIEF FAN RELATIVE HUMIDITY
ARV	AXIAL ROOF VENTILATOR	FPM	FEET PER MINUTE	RHC	REHEAT COIL
AS	AIR SEPARATOR	FPS	FEET PER SECOND	RHG	REFRIGERANT HOT GAS
ATC AVG	AUTOMATIC TEMPERATURE CONTROL AVERAGE	FS FT	FLOOR SINK FOOT OR FEET	RL RM	RELOCATED ROOM
AWT	AVERAGE WATER TEMPERATURE	FVC	FIRE VALVE CABINET	RMS	ROOT MEAN SQUARED
b BDD	42" ABOVE FINISHED FLOOR BACK DRAFT DAMPER	G GA	GROUND GAUGE	RPD RPM	REDUCED PRESSURE DEVICE REVOLUTIONS PER MINUTE
BFW	BOILER FEED WATER	GAL	GALLONS	RTU	ROOF TOP UNIT
BHP	BRAKE HORSEPOWER	GPH	GALLONS PER MINUTE	RV RWL	RADON VENT
BICF BSMT	BACKWARD INCLINED CENTRIFUGAL FAN BASEMENT	GPM GR	GALLONS PER MINUTE GRAINS	S	RAIN WATER LEADER SOIL
BTUH	BRITISH THERMAL UNITS/HOUR	GWH	GAS WATER HEATER	S&R	SUPPLY AND RETURN
C CV	CONDUIT COEFFICIENT, VALVE FLOW	H HC	HEIGHT HEATING COIL	SA SAC	SUPPLY AIR SHOP AIR COMPRESSOR
CC	COOLING COIL	H/C	HEATING/COOLING	SCC	SPRINKLER CONTROL CABINET
CD	CONDENSATE	HD	HEAD	SD	SMOKE DAMPER
CER/CEG CFM	CEILING EXHAUST REG./GRILLE CUBIC FEET PER MINUTE	HDCP HP	HANDICAP HORSEPOWER	SP SP	STANDPIPE STATIC PRESSURE
CHWR	CHILLED WATER RETURN	HPG	HIGH PRESSURE GAS	SP	SUMP PUMP
CHWS CHP	CHILLED WATER SUPPLY CONSOLE HEAT PUMP	HR HT	HOUR(S) HEAT	SPEC SPK	SPECIFICATION SPRINKLER
CI	CAST IRON	HTR	HEATER	SPK/SP	COMBINED SPRINKLER/ STANDPIPE
CLGWTR	COOLING WATER	HUM	HUMIDIFIER	SPST	SINGLE POLE SINGLE THROW
CLG CMV	CEILING CEILING MOUNTED VENTILATOR	HV HW	HEATING/VENTILATION UNIT HOT WATER	SQ SS	SQUARE STAINLESS STEEL
CO	CLEANOUT	HWR	HOT WATER RETURN	ST	STORM
CO2	CARBON DIOXIDE	HWRP	HOT WATER RETURN PUMP	STD	STANDARD
COMP COND	COMPRESSOR CONDENSER	HWRR HWS	HOT WATER REVERSE RETURN HOT WATER SUPPLY	SUCT SWBD	SUCTION SWITCHBOARD
CONV	CONVECTOR	HX	HEAT EXCHANGER	SW	SWITCH
CP CRU	CONDENSATE PUMP COMPUTER ROOM UNIT	ICF ID	IN-LINE CENTRIFUGAL FAN INSIDE DIAMETER	TAF TAG	TUBEAXIAL FAN IDENTIFICATION OF EQUIPMENT
CRV	CENTRIFUGAL ROOF VENTILATOR	IEF	IN-LINE EXHAUST FAN	TD	TEMPERATURE DIFFERENCE
CWR	CONDENSER WATER RETURN	IN IN WG	INCHES	TEMP TMV	TEMPERATURE
CWS CWV	CONDENSER WATER SUPPLY CENTRIFUGAL WALL VENTILATOR	IW WG IW	INCHES OF WATER, GAUGE (PRESS.) INDIRECT WASTE	TP	THERMOSTATIC MIXING VALVE TAMPERPROOF
CT	COOLING TOWER	JP	JOCKEY PUMP	TP	TRAP PRIMER
CU CU FT	CONDENSING UNIT CUBIC FEET	KEF KHWST	KITCHEN EXHAUST FAN KITCHEN HOT WATER STORAGE TANK	TSP T'STAT	TOTAL STATIC PRESSURE THERMOSTAT
CUH	CABINET UNIT HEATER	KWH	KITCHEN WATER HEATER	TW	TEMPERED WATER
CV	CONSTANT VOLUME	L	LENGTH	TWR TYP	TEMPERED WATER RETURN
CW dB	COLD WATER DECIBEL	LAT LAV	LEAVING AIR TEMPERATURE LAVATORY	UH	TYPICAL UNIT HEATER
D	DEPTH	LBS/HR	POUNDS PER HOUR	UPF	UPBLAST PROPELLER ROOF EXHAUST FAN
DB DCV	DRY BULB TEMPERATURE DOUBLE CHECK VALVE	LF LIQ	LINEAR FEET LIQUID	UR USF	URINAL UTILITY SET FAN
DEG or °	DEGREE	LV	LABORATORY VACUUM	V	VENT
DIA or Ø	DIAMETER	LWT	LEAVING WATER TEMPERATURE	V VAF	VOLTAGE VANEAXIAL FAN
DN DP	DOWN DIFFERENTIAL PRESSURE	MA MAX	MIXED AIR MAXIMUM	VAF VAV	VARIABLE AIR VOLUME
DSA	DUCT SOUND ATTENUATORS	MBH	BTU PER HOUR (THOUSAND)	VD	VOLUME DAMPER
DWG DX	DRAWING DIRECT EXPANSION	MD MECH	MOTORIZED DAMPER MECHANICAL	VEL VFC	VELOCITY VARIABLE FREQUENCY CONTROLLER
EA	EXHAUST AIR	MFF	MIXED FLOW FAN	VIF	VERIFY IN FIELD
EAT	ENTERING AIR TEMPERATURE	MFR	MANUFACTURER	VOL	VOLUME
EBR EDR	ELECTRIC BASEBOARD RADIATION EQUIVALENT DIRECT RADIATION	MIN MUAU	MINIMUM MAKE UP AIR UNIT	VTR W	VENT THRU ROOF WATT
EF	EXHAUST FAN	N/A	NOT APPLICABLE	W	WIRE
EFF	EFFICIENCY	N.C.	NORMALLY CLOSED NATIONAL ELECTRICAL CODE	WB WC	WET BULB TEMPERATURE WATER CLOSET
ELEC ESP	ELECTRICAL EXTERNAL STATIC PRESSURE	NEC NIC	NOT IN CONTRACT	WEF	WATER CLOSET WALL EXHAUST FAN
ET	EXPANSION TANK (HVAC)	N.O.	NORMALLY OPEN	WH	WALL HYDRANT (HOSE BIBB)
ETR	EXISTING TO REMAIN ELECTRIC TRAP PRIMER	NTS OA	NOT TO SCALE OUTSIDE AIR	WHA WI	WATER HAMMER ARRESTER WIDTH
ETP EUH	ELECTRIC TRAP PRIMER ELECTRIC UNIT HEATER	OD	OUTSIDE AIR OUTSIDE DIAMETER	WP	WEATHERPROOF
EVAP	EVAPORATOR	ORD	OVERFLOW ROOF DRAIN	WPD	WATER PRESSURE DROP
EWB EWT	ENTERING WET BULB TEMPERATURE ENTERING WATER TEMPERATURE	ORWL P	OVERFLOW RAIN WATER LEADER PHASE	WTG WTR	WALL TRANSFER GRILLE WATER
EXH	EXHAUST	PCD	PUMPED CONDENSATE DRAIN (COOLING)	WV	WASTE AND VENT COMBINATION
EXP	EXPANSION	PD	PRESSURE DROP	WWM	WELDED WIRE MESH
F FCCF	FAHRENHEIT FORWARD CURVE CENTRIFLIGAL FAN	PF PH / Ø	PROPELLER FAN PHASE		

FORWARD CURVE CENTRIFUGAL FAN

PH/Ø

PHASE

	HVAC SYMBOLS
	RECTANGULAR, FLAT OVAL OR ROUND AIR DUCT
	AIR DUCT WITH ACOUSTICAL LINING
	SUPPLY AIR DUCT UP
	SUPPLY AIR DUCT DOWN
	RETURN AIR DUCT UP
	RETURN AIR DUCT DOWN
	EXHAUST AIR DUCT UP
	EXHAUST AIR DUCT DOWN
	TURNING VANES
$\triangle AD$	ACCESS DOOR
vvv	FLEXIBLE DUCT CONNECTION
	CEILING SUPPLY DIFFUSERS
	CEILING RETURN / EXHAUST GRILLE
	HARD DUCTED DIFFUSER OR GRILLE WITH FULL SIZE BOTTOM TAKE-OFF
	DIRECTION OF SUPPLY OR OUTDOOR AIRFLOW
- \-	DIRECTION OF RETURN OR EXHAUST AIRFLOW
\wedge	DOOR UNDERCUT
BDD	BACK DRAFT DAMPER
VD	VOLUME DAMPER
FD	FIRE DAMPER
M	MOTORIZED DAMPER
DS	DUCT SMOKE DETECTOR WITH REMOTE INDICATING LIGHT AND TEST SWITCH
(SP)	DUCT STATIC PRESSURE SENSOR
(DP)	DIFFERENTIAL PRESSURE SENSOR
VFC	VARIABLE FREQUENCY CONTROLLER
T	ROOM THERMOSTAT
Tc	ROOM TEMPERATURE WITH CARBON DIOXIDE SENSOR
CO	CARBON MONOXIDE SENSOR
C02	CARBON DIOXIDE SENSOR
	DUCT SIZING
20x12	RECTANGULAR DUCT
20/12	FLAT OVAL DUCT
20"ø	ROUND DUCT

GENERAL SYMBOLS

	LIVERAL STRIBULS
	THICK, DARK SOLID LINES INDICATE NEW OR RELOCATED ITEMS OR NEW RACEWAY AND WIRING
	THIN, LIGHT LINES INDICATE EXISTING ITEMS OR RACEWAY TO REMAIN IN PLACE AND BE REUSED
	THICK, DASHED LINES INDICATE EXISTING ITEMS TO BE REMOVED
—●	POINT OF NEW TO EXISTING CONNECTION, INCLUDING TRANSITIONS

GENERAL PROCEDURES NOTES

- PROJECT INCLUDES ACCESS TO AND COORDINATION WITH
 POSSIBLE OCCUPIED SPACES ADJACENT TO THE WORK AREA AND
 WITHIN OTHER PARTS OF THE BUILDING.
- 2. NOTICE OF WORK TO BE PERFORMED OUTSIDE THE WORK AREA, IS TO BE GIVEN AT LEAST 48 HOURS PRIOR TO SCHEDULED WORK TO ALL PARTIES.
- 3. THE CONTRACTOR IS TO INCLUDE IN HIS BID, OR MAKE PROVISIONS FOR, THE FOLLOWING SPECIAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
- A. PERFORMANCE OF WORK AFTER HOURS, OR PREMIUM TIME, SUCH AS CORE DRILLING, HAMMER DRILLING, ETC.
- B. "HOT WORKS PERMIT" FOR SOLDERING, BRAZING OR TORCHING.
- C. PROTECTION OF THE ADJACENT OCCUPIED AREAS AND ITEMS IN THESE AREAS FROM DAMAGE.
- D. RESTORATION OF ANY DISTURBED OCCUPIED SPACES TO CONDITION ACCEPTABLE TO BUILDING OWNER PRIOR TO THE START OF NEXT DAY'S NORMAL BUSINESS HOURS.
- E. CONTRACTOR TO SUBMIT A PROPOSED SCHEDULE TO OWNER INDICATING ANTICIPATED AFTER HOURS WORK FOR REVIEW PRIOR TO COMMENCING WORK.

GENERAL NOTES

- ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH CURRENT APPLICABLE CODES, ORDINANCES, REGULATORY AGENCIES HAVING JURISDICTION, AND SPECIFICATIONS. SPECIFICATIONS MAY EXCEED REQUIREMENTS OF THE CODE, IN WHICH CASE, THE SPECIFICATION MUST BE FOLLOWED.
- 2. THE INTENT OF THESE DOCUMENTS IS FOR THE MEP TRADES TO FURNISH AND INSTALL COMPLETE MECHANICAL, AND ELECTRICAL SYSTEMS. THE SPECIFIED HVAC SYSTEM SHALL BE COMPLETE IN ALL RESPECTS; OPERATIONAL, TESTED, ADJUSTED, APPROVED BY AUTHORITIES HAVING JURISDICTION AND READY FOR BENEFICIAL USE BY THE OWNER.
- 3. THE TRADES SHALL OBTAIN AND REVIEW ALL CONTRACT DOCUMENTS BEFORE SUBMITTING THEIR BID. INFORMATION IS PROVIDED ON THE VARIOUS DRAWINGS, SCHEDULES, SPECIFICATIONS, AND ALL OF THE VARIOUS DOCUMENTS IN THE BIDDING PACKAGE. THE CONTRACT DOCUMENTS ARE COMPLEMENTARY AND FORM A TOTAL PROJECT DESIGN AND INFORMATION SOURCE FOR CONSTRUCTION PURPOSES.
- 4. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN THE CONTRACT. COORDINATE LOCATIONS OF EQUIPMENT WITH OTHER TRADES BEFORE AND DURING CONSTRUCTION. ANY MODIFICATION TO THE EQUIPMENT LAYOUT, REQUIRED FOR INSTALLATION, IS TO BE PERFORMED UNDER THE CONTRACT AGREEMENT, AT NO ADDITIONAL COST. REFER TOP DETAILS, SCHEDULES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- 5. THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT DOCUMENTS OF ALL TRADES. DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND PIPING. CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF EQUIPMENT AND PIPING INSTALLATION WITH ALL TRADES BEFORE COMMENCING WORK.
- 6. EQUIPMENT SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS, WHEN EQUIPMENT MUST BE LOCATED ABOVE AN INACCESSIBLE CEILING (GYP BOARD OR EQUIVALENT), OR BEHIND A WALL, AN APPROPRIATE ACCESS DOOR SHALL BE PROVIDED. IF AN ACCESS DOOR IS REQUIRED, IT SHALL BE OF A RATING APPROPRIATE FOR THE WALL/CEILING IN WHICH IT IS TO BE INSTALLED. CONTRACTOR SHALL COORDINATE LOCATIONS OF ACCESS PANELS FOR ALL VALVES AND DEVICES, REQUIRING ACCESS, WITH THE ARCHITECT, PRIOR TO INSTALLATION OF SUCH DEVICES OR OTHER APPURTENANCES.
- 7. REFER TO THE ARCHITECTURAL DRAWINGS FOR THE EXACT LOCATION AND MOUNTING HEIGHTS OF VARIOUS EQUIPMENT. ALL SUCH EQUIPMENT AND EQUIPMENT COLORS AND FINISHES SHALL BE COORDINATED WITH THE ARCHITECT: MOUNTING HEIGHTS SHALL BE APPROVED BY THE ARCHITECT.
- 8. WHERE A CONFLICT OCCURS BETWEEN THE DOCUMENTS, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. CARRY AS PART OF THE BID THE LARGER QUANTITY AND/OR MORE EXPENSIVE ITEM(S)
- 9. PROVIDE THE REQUIRED/SPECIFIED SLEEVES AND SEALS FOR PIPES OR CONDUIT PENETRATING INTERIOR, AND EXTERIOR WALLS AND FLOOR SLABS.
- 10. THIS CONTRACT SHALL INCLUDE ALL THE NECESSARY PIPING, FITTINGS, TRANSITIONS ETC. AS REQUIRED TO INSTALL PIPING AND EQUIPMENT, AND TO AVOID ANY CONFLICTS WITH OTHER TRADES AND THE BUILDING STRUCTURE. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY ASSUMPTIONS, OMISSIONS OR ERRORS HE MAKES AS A RESULT OF HIS FAILURE TO COORDINATE WITH OTHER TRADES OR BECOME FULLY FAMILIAR WITH THE PROJECT DOCUMENTS OF ALL TRADES.
- 11. DO NOT INSTALL ANY PIPING OVER ELECTRICAL PANELS, TRANSFORMERS, SPECIAL EQUIPMENT, OR THROUGH ELECTRICAL ROOMS, DATA ROOMS, ELEVATOR MACHINE ROOM, STAIRWELL OR STAIRWELL WALLS THAT ARE NOT ASSOCIATED WITH OR SERVE THE RESPECTIVE ROOMS. COORDINATE THE LOCATION OF ELECTRICAL EQUIPMENT IN THE FIELD AND ADJUST AS NECESSARY.
- 20. TEST AND BALANCE BOTH AIR SYSTEMS, PROVIDE BALANCING REPORT TO ARCHITECT AND ENGINEER
- 21. PIPING SHALL BE SUPPORTED FROM STRUCTURE ABOVE. TO MAXIMIZE HEAD ROOM, INSTALL PIPING TIGHT TO BOTTOM OF BEAMS WHEN RUNNING PERPENDICULAR TO BEAM; INSTALL PIPING TIGHT TO FLOOR SLAB WHEN RUNNING PARALLEL TO BEAM; PROVIDE ALL NECESSARY FITTINGS AND TRANSITIONS.
- 22. PROVIDE THROTTLING VALVES AND SHUT-OFF VALVES AS INDICATED IN SPECIFICATIONS IN ADDITION TO THOSE INDICATED ON THE DOCUMENTS.
- 23. INSTALL ALL EQUIPMENT VALVES AS REQUIRED BY MANUFACTURERS INSTRUCTIONS AND RECOMMENDATIONS AND AS DETAILED.
- 24. ALL SUPPLY RECTANGULAR 90° ELBOWS SHALL HAVE TURNING VANES.
- 25. PROVIDE DUCT TAKE-OFF TYPES AND VOLUME DAMPERS PER THE SPECIFICATIONS AND DUCT TAKE-OFF DETAILS ON DRAWINGS. TAKE-OFFS SHOWN ON FLOOR PLANS DO NOT REPRESENT THE SPECIFIC TYPE OF TAKE-OFF REQUIRED; CONSULT THE DETAILS AND SPECIFICATIONS.
- 26. PROVIDE VOLUME DAMPERS ON ALL SUPPLY, EXHAUST, AND RETURN BRANCH DUCTS.
- 27. COORDINATE AND VERIFY LOCATIONS OF ALL ITEMS REQUIRING ACCESS WITH ARCHITECT IN FIELD., INCLUDING VALVES, VOLUME DAMPERS, FIRE DAMPERS, ETC.
- 28. ALL EQUIPMENT LOCATED ON THE ROOF THAT REQUIRES SERVICING SHALL BE LOCATED A MINIMUM 10'-0" FROM EDGE OF THE ROOF.
- 29. ALL THERMOSTATS LOCATED ON OUTSIDE WALL SHALL HAVE INSULATED PAD BEHIND.
- 30. ALL MOTORIZED DAMPERS SHALL BE WIRED BY ATC CONTRACTOR, COORDINATE VOLTAGE REQUIREMENTS WITH EQUIPMENT.

RENOVATION

- 1. THIS PROJECT INVOLVES THE RENOVATION OF AN EXISTING FACILITY; BEFORE SUBMITTING THE BID, CONTRACTORS SHALL VISIT THE SITE AND BECOME THOROUGHLY FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH THE PROJECT IS TO BE COMPLETED.
- 2. CONTRACTORS SHALL BE HELD RESPONSIBLE FOR ASSUMPTIONS, OMISSIONS OR ERRORS MADE AS A RESULT OF FAILURE TO BECOME FULLY FAMILIAR WITH THE EXISTING CONDITIONS.
- 3. IT IS NOT THE INTENT OF THESE DOCUMENTS TO SHOW EVERY DEVICE, APPURTENANCE, PIPE, WIRE OR CONDUIT TO BE REMOVED. MEP EQUIPMENT, UNITS, AND SYSTEMS NOT BEING REUSED, SHALL BE REMOVED IN THEIR ENTIRETY INCLUDING ASSOCIATED HANGERS, SUPPORTS, BASES, PADS, PIPES, DUCTS, CONDUITS, WIRES, INSULATION, AND CONTROLS BACK TO THE POINT OF ORIGIN.
- 4. PROPERLY DISPOSE OF DEMOLISHED EQUIPMENT IN COMPLIANCE WITH CODES, REGULATIONS, AND DEP STANDARDS; TURN OVER TO THE OWNER, EQUIPMENT SO INDICATED.
- 5. RELOCATE EXISTING EQUIPMENT, DEVICES, PIPING, WIRING, AND RELATED SYSTEMS AS REQUIRED FOR CONSTRUCTION PURPOSES. ALL EXISTING SYSTEMS SHALL BE FULLY OPERATIONAL, INCLUDING RECONNECTION TO SERVICES AND UPGRADED SYSTEMS. ALL RELOCATED EQUIPMENT SHALL BE PROTECTED DURING CONSTRUCTION.
- 6. PROVIDE TEMPORARY CONNECTIONS AND SYSTEM MODIFICATIONS AS REQUIRED FOR CONSTRUCTION AND PHASING PURPOSES.
- INCLUDE ALL WORK REQUIRED TO ALLOW PHASED CONSTRUCTION WHEN NECESSARY. COORDINATE WITH GENERAL CONTRACTOR/CONSTRUCTION MANAGER FOR PHASING REQUIREMENTS.
- 8. SYSTEMS REQUIRING TO REMAIN IN OPERATION DURING DEMOLITION AND RENOVATION SHALL BE CAREFULLY PROTECTED FROM DAMAGE AND CONTAMINATION BY THE CONSTRUCTION PROCESS.

MECHANICAL

- 1. ALL NEW EQUIPMENT SHALL BE TIED INTO EXISTING BUILDING MANAGEMENT SYSTEM (BMS)
- 2. PIPING SHALL BE SUPPORTED FROM STRUCTURE ABOVE. TO MAXIMIZE HEAD ROOM, INSTALL PIPING TIGHT TO BOTTOM OF BEAMS WHEN RUNNING PERPENDICULAR TO BEAM; INSTALL PIPING TIGHT TO FLOOR SLAB WHEN RUNNING PARALLEL TO BEAM; PROVIDE ALL NECESSARY FITTINGS AND TRANSITIONS.
- 3. ALL CONDENSATE PIPING SHALL BE PVC OR CPVC SCHEDULE 40.



	ROCKY HILL, CT 06067 P: (860) 436-4336 F: (860) 436-4450 www.rzdesignassociates.com
SEAL	
CONSULTANTS	

SUBMISSION HISTORY
SOUMISSION THETOKT

Timothy Edwards Middle School A/C

100 Arnold Way, South Windsor, CT 06074

DWG	DATA

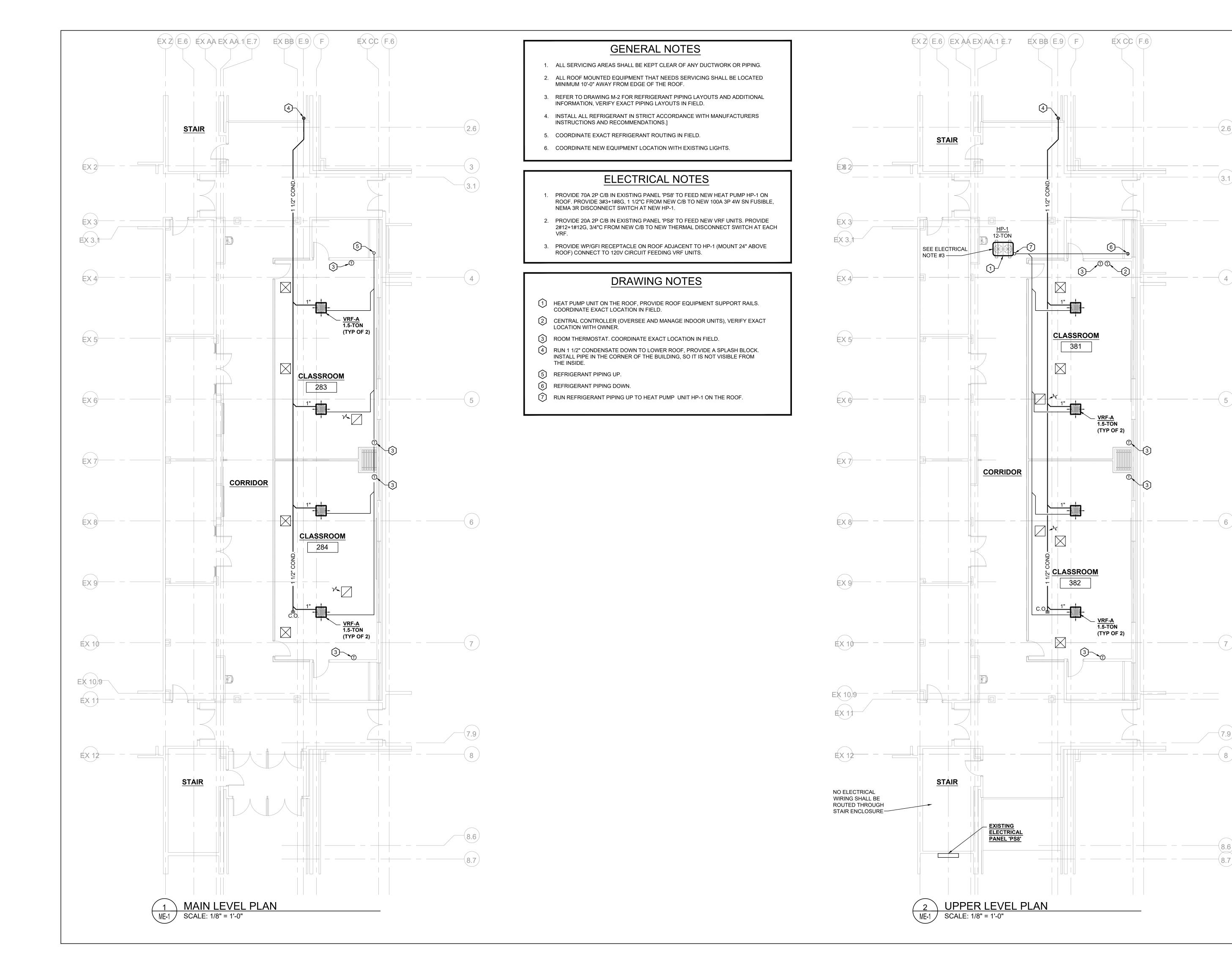
JOB INFO

PROJECT NUMBER: 22-347
SUBMISSION DATE: 11/30/2021
DRAWN: DS
REVIEWED: BJZ
SCALE: AS NOTED

DWG TITLE

MECHANICAL GENERAL INFORMATION

DWG #





CONSULTANTS

SUBMISSION HISTORY

Timothy Edwards
Middle School

A/C

100 Arnold Way, South Windsor, CT 06074

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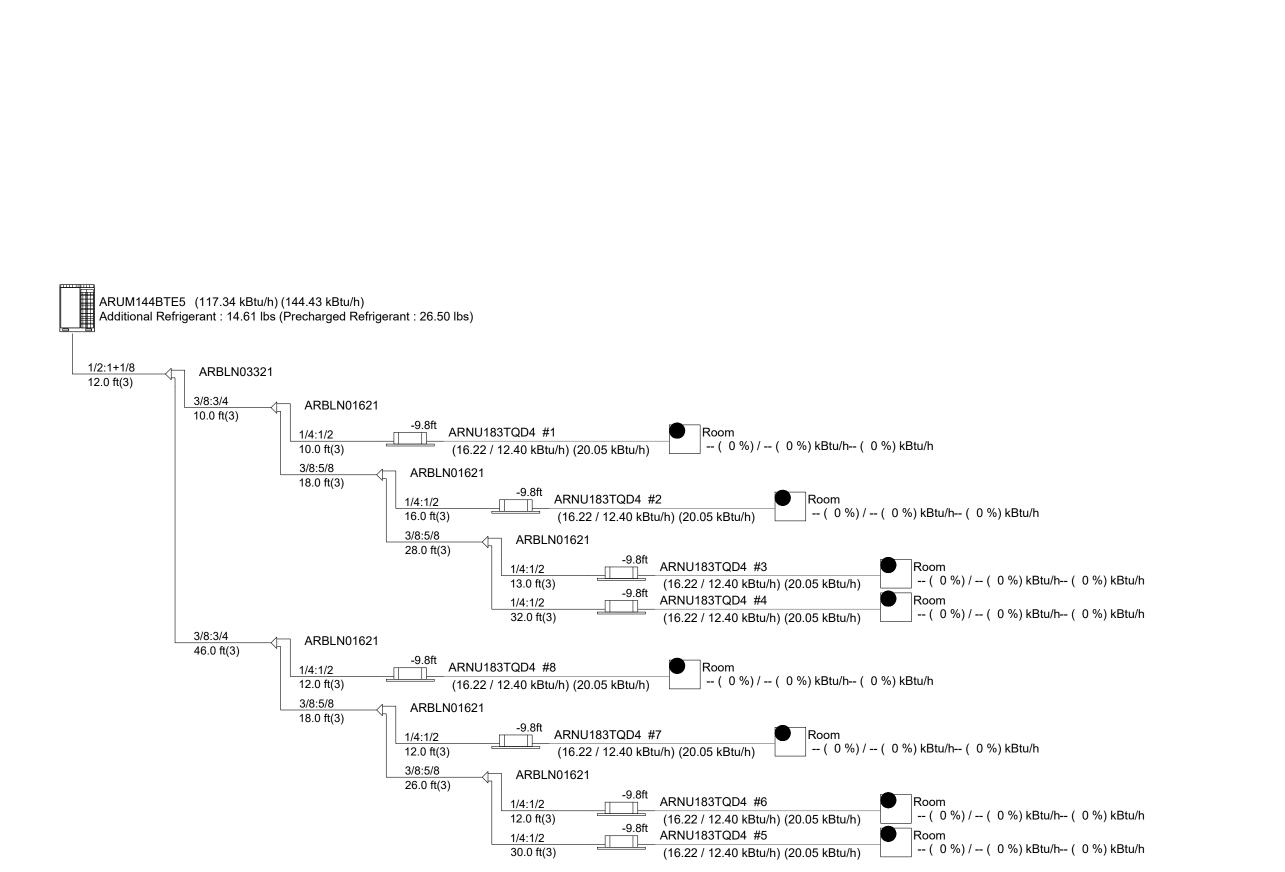
MECHANICAL ELECTRICAL PART PLANS

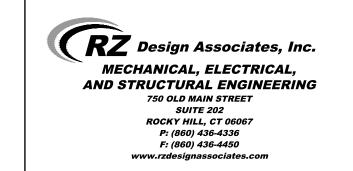
22-347

11/30/2021

AS NOTED

DWG #





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Power wiring, breaker size, and disconnects should follow local code and NEC. Multi-frame outdoor units require a separate power connection for each frame. Refer to the most up-to-date submittal sheets for applicable electrical data.

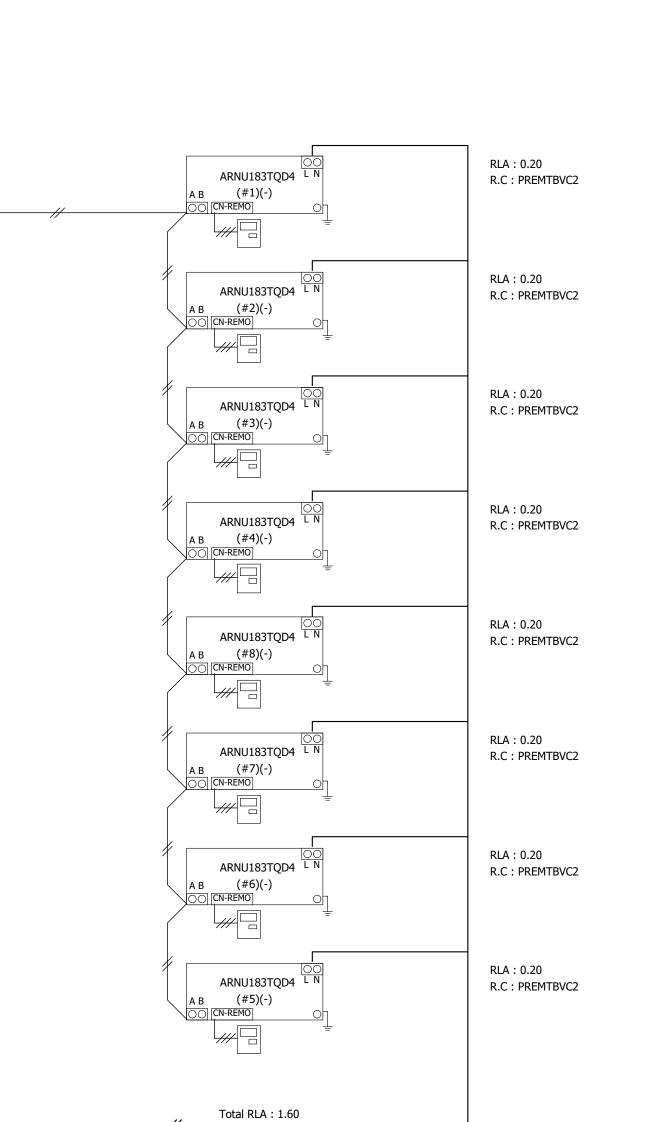
Power line(Outdoor unit)
Power line(Indoor unit / HR unit)
Communication line (ODU-IDU / ODU-ODU): Twisted, Stranded and shielded AWG 18 x 2C
Communication line (ODU-CEN): Twisted, Stranded and shielded AWG 18 x 2C
Communication line(Remote controller): Twisted and stranded AWG 22 x 3C
Ground shield wire at ODU only
Note: Polarity matters: Always connect 'A' to 'A' and 'B' to 'B'

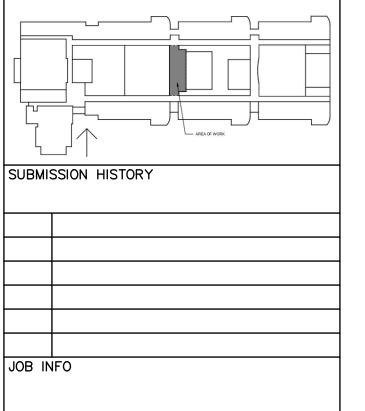
ARUM144BTE5

ODU IDU CEN
R S T B A B A B A
OOO OOOOOOO

V,Hz: 3Phase/208~230V/60Hz

MCA: 51.1 MOP: 70





Timothy Edwards Middle School A/C

100 Arnold Way, South Windsor, CT 06074

DWG DATA

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SCALE: AS NOTED

DWG TITLE

MECHANICAL AND ELECTRICAL RISER DIAGRAMS

DWG ;

						AN COIL UNI EVAPORATOR			
TAG	MF	-R	MODEL		TONS	COOLING CAPACITY (BTUH)	HEATING CAPACITY (BTUH)	CFM	MAX SOUND LEVI dB(a)
VRF-A	L	G	ARNU183T	QD4	1.5	19,100	21,500	396/388/353	37/35/34
		•			EVA	PORATOR ELEC	TRICAL		
TAG	AMPS	VOLTS/ PHASE	WEIGHT (LBS)	REMARKS					
VRF-A	0.20	208/1	35	FITS INTO 2'x2' CEILING GRID					

<u>GENERAL NOTES/ACCESSORIES:</u>

1. ACCEPTABLE MANUFACTURERS BY: MITSUBISHI & DAIKIN. 2. CEILING MOUNTED CASSETTE 4-WAY BLOW.

3. PROVIDE MASTER CONTROLLER

4. PROVIDE WALL MOUNTED THERMOSTATS. 5. PROVIDE DRAIN PAN UL LISTED CONDENSATE LEVEL SENSOR.

6. INTEGRAL CONDENSATE PUMP WITH UP TO 27" OF LIFT

		OUT	DOO	R HE	AT PUMI	P UNIT	SCHEDU	JLE			
TAG	MFR	MODEL			AMBIENT TEMP (°F)	TONS	COOLING (BTUH)	HEATI (BTUI		COP	SHE
HP-1	LG	ARUM144BTE55			95	12	144,000	162,0	00	3.57	25.90
					ELECTRIC	CAL					
TAG	COMPRESSOR TYPE	REFRIGERANT	МСА	мсв	VOLTS/ PHASE	WEIGHT (LBS)	EER	IEER		REMARI	<s< td=""></s<>
HP-1	INVERTER	R410A	51	70	208/1	639	12.10	23.00			

GENERAL NOTES/ACCESSORIES: ACCEPTABLE MANUFACTURERS BY: MITSUBISHI.

1. PROVIDE HAIL GUARD KIT.

2. PROVIDE ROOF EQUIPMENT SUPPORTS EQUIVALENT TO CONN-FAB OR MIRO INDUSTRIES INC..

3. PROVIDE BACNET INTERFACE CARD

4. HEAT PUMPS MUST HAVE FULLY MODULATING INVERTER COMPRESSORS
5. INSTALL ALL REFRIGERANT PIPING IN STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND RECOMMENDATIONS.

SECURE UNIT TO ISOLATORS

ROOFING / FLASHING OF RAILS BY OTHERS—

ROOF INSULATION —

ROOF DECK-

(4 LOCATIONS) —



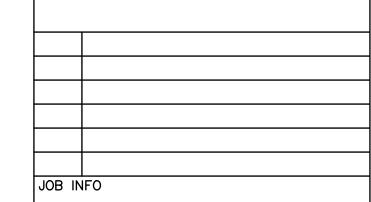
RZ Design Associates, Inc.

MECHANICAL, ELECTRICAL, AND STRUCTURAL ENGINEERING 750 OLD MAIN STREET

SUITE 202 ROCKY HILL, CT 06067 P: (860) 436-4336 F: (860) 436-4450 www.rzdesignassociates.com

SUBMISSION HISTORY

CONSULTANTS



Timothy Edwards Middle School A/C

100 Arnold Way, South Windsor, CT 06074

DWG DATA

- CONDENSING UNIT

- NEOPRENE ISOLATORS

(TYP. OF 4 PER UNIT)

— PRE-FABRICATED EQUIPMENT SUPPORTS W/ INTEGRAL WOOD NAILER & FLASHING CAP.

- SECURE RAILS TO ROOF STRUCTURE

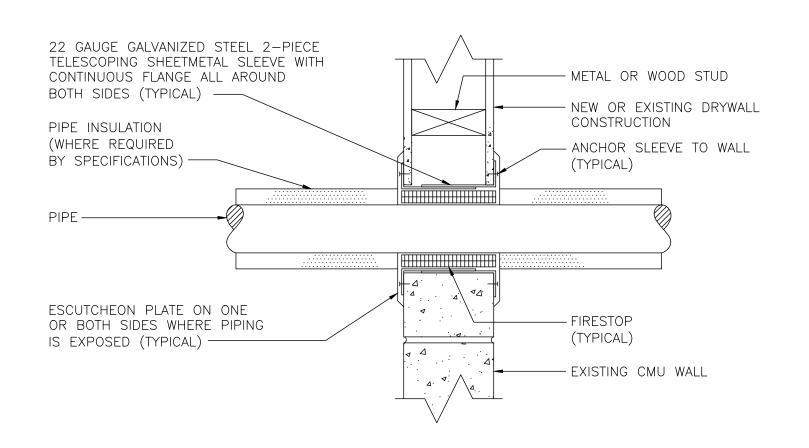
PROJECT NUMBER: 22-347 SUBMISSION DATE: 11/30/2021 DRAWN: REVIEWED: AS NOTED SCALE:

DWG TITLE

MECHANICAL **DETAILS AND** SCHEDULES

DWG #

ME-3



DETAIL - PIPE SLEEVE NOT TO SCALE

ROOF MOUNTED CONDENSING UNIT DETAIL NOT TO SCALE

ACCEPTABLE.

MECHANICAL SPECIFICATIONS

GENERAL

- WHEN A CONFLICT BETWEEN THE DRAWINGS, NOTES AND/OR SPECIFICATIONS OCCUR, THE MORE STRINGENT, AND/OR LARGER QUANTITY AND/OR MORE EXPENSIVE SHALL APPLY. THE REQUIREMENTS LISTED WITHIN NOTES OR SPECIFICATIONS SHALL BE REQUIRED, PROVIDED AND INSTALLED WHETHER SPECIFICALLY INDICATED ON THE DRAWINGS OR NOT.
- 2. IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO PROVIDE FOR FINISHED WORK, TESTED AND READY FOR OPERATION.
- 3. ITEMS AND SERVICES NOT SHOWN ON DRAWINGS OR SPECIFICATIONS BUT REQUIRED TO RENDER THE WORK COMPLETE AND READY FOR OPERATION, SHALL BE PROVIDED WITHOUT ADDITIONAL COST.
- 4. WORK OF THIS SECTION SHALL BE GOVERNED BY THE CONTRACT DOCUMENTS. PROVIDE MATERIALS, LABOR, EQUIPMENT AND SERVICES NECESSARY TO FURNISH, DELIVER AND INSTALL ALL WORK AS REQUIRED BY JOB CONDITIONS. WHERE A CONFLICT EXISTS BETWEEN THESE NOTES, THE DRAWINGS AND THE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL APPLY.
- 5. DRAWINGS ARE DIAGRAMMATIC AND INDICATE A GENERAL ARRANGEMENT OF WORK AND ARE NOT TO BE CONSIDERED SUB-CONTRACTOR DOCUMENTS. IT IS THE INTENT OF THESE DOCUMENTS TO INCLUDE THE PROVISION AND INSTALLATION OF ALL NECESSARY WORK AND MATERIALS FOR COMPLETE, OPERATIONAL AND CODE COMPLIANT SYSTEMS BY THE CONTRACTOR. GENERAL DESIGN CONCEPTS INDICATED MUST BE FOLLOWED OR BETTERED. THE BID SHALL INCLUDE OFFSETS, ADDITIONAL PIPING, VALVES AND EQUIPMENT AND COMPONENTS AS REQUIRED TO MEET CONSTRUCTION CONDITIONS FOR PROPER OPERATION. DO NOT SCALE DRAWINGS. CONSULT ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR SPACE CONDITIONS AND ADDITIONAL REQUIREMENTS. DO NOT SCALE THE DRAWINGS.
- 6. PERFORM THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT GENERAL CONDITIONS AND IN COORDINATION WITH ALL OTHER TRADES. ALL WORK SHALL BE DONE IN CONFORMANCE AND PROVISIONS OF ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES AND LAWS.

CODES AND STANDARDS:

- CONNECTICUT BUILDING CODE AND ALL SUPPLEMENTS
 IBC 2015 INTERNATIONAL BUILDING CODE
 IEBC 2015 INTERNATIONAL EXISTING BUILDING CODE
 IMC 2015 INTERNATIONAL MECHANICAL CODE
 IMP 2015 INTERNATIONAL PLUMBING CODE
 IECC 2015 INTERNATIONAL ENERGY CONSERVATION CODE
 NEC 2017 NATIONAL ELECTRICAL CODE / NFPA 70
- NFPA NFPA-101 FIRE SAFETY CODE ICC/ANSI A117.1-2003 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
- 7. WORK SHALL INCLUDE ALL INCIDENTALS, LABOR, MATERIALS, EQUIPMENT, APPLIANCES, SERVICES, HOISTING, SCAFFOLDING, SUPPORTS, TOOLS, CONSUMABLE ITEMS, FEES, LICENSES, AND ADMINISTRATIVE TASKS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
- 8. STORE MATERIALS INSIDE AND PROTECTED FROM DEBRIS, WEATHER AND MOISTURE.
- 9. THE CONTRACTOR SHALL EXAMINE THE DRAWINGS AND SPECIFICATIONS RELATING TO THE WORK OF ALL DIVISIONS AND TRADES AND BECOME FULLY FAMILIAR AND INFORMED AS TO THE EXTENT AND CHARACTER OF WORK REQUIRED, AND ITS RELATIONSHIP TO THE REQUIREMENTS OF THIS DIVISION. INCLUDE ALL SUCH REQUIREMENTS AS PART OF THIS MECHANICAL WORK.
- 10. BEFORE SUBMITTING A BID, THE CONTRACTOR SHALL VISIT THE SITE, AND SHALL BECOME THOROUGHLY FAMILIAR WITH ALL CONDITIONS UNDER WHICH THE WORK WILL BE INSTALLED. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY ASSUMPTIONS, OMISSIONS OR ERRORS MADE AS A RESULT OF FAILURE TO BECOME FAMILIAR WITH THE SITE AND EXISTING BUILDING AND THE CONTRACT DOCUMENTS.

PERMITS AND FEE

1. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS; AND PAY ALL GOVERNMENT AND STATE SALES TAXES AND FEES WHERE APPLICABLE, AND OTHER COSTS, INCLUDING UTILITY CONNECTIONS OR EXTENSIONS IN CONNECTION WITH THE WORK, FILE ALL NECESSARY DRAWINGS, PREPARE ALL DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS OF ALL GOVERNMENTAL AND STATE DEPARTMENTS HAVING JURISDICTION, OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTIONS FOR HIS WORK, AND DELIVER A COPY TO THE OWNER'S REPRESENTATIVE BEFORE REQUEST FOR ACCEPTANCE AND FINAL PAYMENT FOR THE WORK. REFER TO THE SUPPLEMENTARY GENERAL CONDITIONS FOR INFORMATION ON WAIVING OF PERMIT FEES.

ALTERATION WORK AND DEMOLITION

- 1. ALL EQUIPMENT, DUCTWORK, PIPING, CONTROL DEVICES ETC... TO BE REMOVED, SHALL BE DISPOSED OF, TURNED OVER TO THE OWNER, OR SALVAGED AS DIRECTED BY THE OWNER. EQUIPMENT, DUCTWORK, PIPING, CONTROL DEVICES, ETC. SHALL NOT BE REMOVED FROM THE PREMISES WITHOUT THE OWNERS APPROVAL. REMOVE ALL EXISTING COMPONENTS REQUIRED TO MEET THE FUNCTIONAL INTENT OF THE DESIGN DRAWINGS.
- 2. NO DEAD ENDS SHALL BE LEFT ON ANY DUCTWORK AND PIPING SYSTEMS UPON COMPLETION OF WORK. ALL DUCTWORK AND PIPING BEING REMOVED SHALL BE PROPERLY VALVED AND CAPPED AT THE MAINS.
- 3. ALL SYSTEMS SHALL BE LEFT IN WORKING ORDER TO THE SATISFACTION OF THE OWNER UPON COMPLETION OF ALL NEW WORK.
- 4. CONDUCT SELECTIVE DEMOLITION WORK IN A MANNER THAT WILL MINIMIZE NEED FOR DISRUPTION OF NORMAL OPERATIONS IN OTHER AREAS OF THE BUILDING. PROVIDE MINIMUM OF 48 HOURS ADVANCE NOTICE TO OWNER OF DEMOLITION OR SYSTEM SHUTDOWN ACTIVITIES THAT WILL AFFECT NORMAL OPERATIONS IN THE BUILDING OR REQUIRE THE INTERRUPTION OF UTILITY SERVICES.
- 5. DRAINING OF PIPING SYSTEMS: WHERE EXISTING PIPING SYSTEMS REQUIRE DRAINING OF FLUIDS FROM EQUIPMENT AND PIPING, ALL DRAINAGE SHALL BE DIRECTED BY HOSE OR PIPE TO SUITABLE, FREE FLOWING DRAINS OR SUITABLE CONTAINERS. DO NOT ALLOW EXCESSIVE FLUID/WATER BUILDUP ON FLOORS OR SITE AREA. ENSURE THAT EXISTING DRAINS ARE KEPT CLEAR OF DEBRIS TO PREVENT BLOCKAGES.
- 6. CERTAIN ITEMS OF EXISTING EQUIPMENT AND PIPING OR DUCTWORK MAY BE INDICATED FOR REMOVAL, RELOCATION OR ABANDONMENT. ITEMS NOTED FOR REMOVAL SHALL BE DISCONNECTED AND DISPOSED OF BY THE CONTRACTOR OR TURNED OVER TO THE OWNER IF THE OWNER SO REQUESTS. IF INSTRUCTED TO DISPOSE OF ITEMS, THE CONTRACTOR SHALL REMOVE THE ITEMS FROM THE PREMISES AND DISPOSE OF THEM IN A SAFE, LEGAL AND RESPONSIBLE MANNER AND LOCATION. ITEMS NOTED FOR RELOCATION ARE INTENDED FOR REUSE IN ANOTHER LOCATION AS DESIGNATED ON THE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE THE MATERIAL FROM ITS PRESENT LOCATION, STORE THE MATERIAL IN A SAFE PLACE, AND REINSTALL THE MATERIAL IN ITS NEW LOCATION. QUESTIONS REGARDING THE SUITABILITY OF THE MATERIAL OR EQUIPMENT SHALL BE BROUGHT, IN WRITTEN FORM, TO THE ATTENTION OF THE OWNER/ENGINEER. ABANDONMENT SHALL BE DEFINED AS LEAVING IN PLACE ANY ITEM SO DESIGNATED AND SHALL INCLUDE PROPER PIPING OR DUCTWORK TERMINATION WITHIN ANY OCCUPIED OR OPEN AREA. ALL ABANDONED PIPES AND DUCTS SHALL BE DISCONNECTED AND CAPPED AT THEIR MAINS.

COORDINATION WITH OTHER DIVISIONS

1. ALL WORK SHALL BE CARRIED OUT IN CONJUNCTION WITH OTHER TRADES AND FULL COOPERATION SHALL BE GIVEN IN ORDER THAT ALL WORK MAY PROCEED WITH A MINIMUM OF DELAY AND INTERFERENCE. PARTICULAR EMPHASIS IS PLACED ON TIMELY INSTALLATION OF MAJOR APPARATUS AND FURNISHING

- OTHER CONTRACTORS, ESPECIALLY THE CONSTRUCTION MANAGER, WITH INFORMATION AS TO OPENINGS, CHASES, SLEEVES, BASES, INSERTS, EQUIPMENT LOCATIONS, PANELS, ETC., REQUIRED BY OTHER TRADES.
- 2. THE CONTRACTORS ARE REQUIRED TO EXAMINE ALL OF THE PROJECT DRAWINGS, INCLUDING THE SITE, ARCHITECTURAL, STRUCTURAL AND THOSE OF OTHER MECHANICAL AND ELECTRICAL TRADES AND MUTUALLY ARRANGE WORK SO AS TO AVOID INTERFERENCE WITH THE WORK OF OTHER TRADES AND / OR EXISTING SYSTEMS AND EQUIPMENT. IN GENERAL, DUCTWORK, HEATING PIPING, SPRINKLER PIPING AND DRAINAGE LINES TAKE PRECEDENCE OVER WATER, GAS AND ELECTRICAL CONDUITS. THE ENGINEER SHALL MAKE FINAL DECISIONS REGARDING THE ARRANGEMENT OF WORK WHICH CANNOT BE AGREED UPON BY THE CONTRACTORS.
- 3. WHERE THE WORK OF THE CONTRACTOR WILL BE INSTALLED IN CLOSE PROXIMITY TO OR WILL INTERFERE WITH WORK OF OTHER TRADES, THE CONTRACTORS WILL COOPERATE IN WORKING OUT SPACE CONDITIONS TO MAKE A SATISFACTORY ADJUSTMENT.
- 4. IF THE WORK UNDER A SECTION IS INSTALLED BEFORE COORDINATING WITH OTHER DIVISIONS OR SECTIONS OR SO AS TO CAUSE INTERFERENCE WITH WORK OF OTHER SECTIONS, THE NECESSARY CHANGES TO CORRECT THE CONDITION SHALL BE MADE BY THE CONTRACTOR CAUSING THE INTERFERENCE WITHOUT EXTRA CHARGE TO THE OWNER.

SHUT DOWNS

- 1. WHEN INSTALLATION OF A NEW SYSTEM REQUIRES THE TEMPORARY SHUTDOWN OF AN EXISTING OPERATING SYSTEM, THE CONNECTION OF THE NEW SYSTEM SHALL BE PERFORMED AT SUCH TIME AS DESIGNATED BY THE ENGINEER OR THE OWNER'S REPRESENTATIVE.
- 2. THE ENGINEER AND THE OWNER SHALL BE NOTIFIED OF THE ESTIMATED DURATION OF THE SHUTDOWN PERIOD AT LEAST THREE (3) DAYS IN ADVANCE OF THE DATE THE WORK IS TO BE PERFORMED.
- 3. WORK SHALL BE ARRANGED FOR CONTINUOUS PERFORMANCE WHENEVER POSSIBLE. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR, INCLUDING OVERTIME IF REQUIRED, TO ASSURE THAT EXISTING OPERATING SERVICES WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE NECESSARY CONNECTIONS.

ELECTRICAL CONNECTIONS

- 1. UNLESS OTHERWISE SPECIFIED, ALL WIRING SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH DIVISION 26.
- 2. ALL POWER WIRING SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 26 COMPLETE FROM POWER SOURCE TO MOTOR OR EQUIPMENT JUNCTION BOX INCLUDING POWER WIRING THROUGH THE STARTERS. ALL STARTERS NOT FACTORY MOUNTED ON EQUIPMENT SHALL BE MOUNTED UNDER THE SPECIFICATION SECTION FURNISHING THE STARTER.
- 3. THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL TEMPERATURE CONTROL WIRING, INTERLOCK WIRING AND EQUIPMENT CONTROL WIRING FOR THE EQUIPMENT FURNISHED UNDER THIS DIVISION.
- 4. THE MECHANICAL CONTRACTOR SHALL FURNISH STARTERS AND/OR DISCONNECTS TO THE ELECTRICAL CONTRACTOR FOR EQUIPMENT PROVIDED. THE MECHANICAL CONTRACTOR SHALL PROVIDE AND BE RESPONSIBLE FOR THE PROPERLY SIZED OVERLOAD HEATERS IN ALL STARTERS THAT HE FURNISHES.

SHOP DRAWINGS

- 1. PRIOR TO DELIVERY TO THE JOBSITE AND SUFFICIENTLY IN ADVANCE TO ALLOW THOROUGH REVIEW, THE CONTRACTOR SHALL SUBMIT, FOR REVIEW, DETAILED SHOP DRAWINGS OF ALL EQUIPMENT AND MATERIAL SPECIFIED IN EACH SECTION AND COORDINATED DUCTWORK LAYOUTS. ALL DUCTWORK SHOP DRAWINGS, AUTOMATIC TEMPERATURE CONTROLS AND ALL DIAGRAMS AND RISERS SHALL BE SUBMITTED IN HARD COPY FORMAT. NO MATERIAL OR EQUIPMENT MAY BE DELIVERED TO THE JOB SITE OR INSTALLED UNTIL THE CONTRACTOR HAS RECEIVED SHOP DRAWINGS FOR THE PARTICULAR MATERIAL OR EQUIPMENT WHICH HAVE BEEN PROPERLY REVIEWED.
- 2. SHOP DRAWINGS SHALL BE SUBMITTED WITHIN 30 DAYS AFTER AWARD OF CONTRACT BEFORE ANY MATERIAL OR EQUIPMENT IS PURCHASED. THE CONTRACTOR SHALL SUBMIT FOR REVIEW COPIES OF ALL SHOP DRAWINGS TO BE INCORPORATED IN THE MECHANICAL CONTRACT. REFER TO THE GENERAL CONDITIONS AND SUPPLEMENTARY GENERAL CONDITIONS FOR THE QUANTITY OF COPIES REQUIRED FOR SUBMISSION. WHERE QUANTITIES ARE NOT SPECIFIED, PROVIDE SEVEN (7) COPIES FOR REVIEW.
- 3. PROVIDE SHOP DRAWINGS FOR ALL DEVICES SPECIFIED ON DRAWINGS IN EQUIPMENT SCHEDULES AND FOR ALL SYSTEMS INCLUDING DUCTWORK, PIPING, CONTROLS, ETC., OR WHERE CALLED FOR ELSEWHERE IN THE SPECIFICATIONS. SHOP DRAWINGS SHALL INCLUDE MANUFACTURERS' NAMES, CATALOG NUMBERS, CUTS, WIRING AND PIPING DIAGRAMS AND OTHER SUCH DESCRIPTIVE DATA AS MAY BE REQUIRED TO IDENTIFY AND ACCEPT THE EQUIPMENT, CERTIFIED DIMENSIONAL DRAWINGS, ACCURATE LAYOUT AND ARRANGEMENT DRAWINGS, LOCATIONS AND SIZES OF ALL CONNECTIONS, AND EQUIPMENT WEIGHTS. ALL PERFORMANCE DATA REQUIRED TO VERIFY THE EQUIPMENT'S SUITABILITY SHALL BE CLEARLY PRESENTED. A COMPLETE LIST IN EACH CATEGORY (EXAMPLE: ALL DIFFUSERS) OF ALL SHOP DRAWINGS, CATALOG CUTS, MATERIAL LISTS, ETC., SHALL BE SUBMITTED TO THE ENGINEER AT ONE TIME. NO CONSIDERATION WILL BE GIVEN TO A PARTIAL SHOP DRAWING SUBMITTAL.
- A. EQUIPMENT SHOP DRAWINGS SHALL CONTAIN FULL RANGE PERFORMANCE CURVES, GRAPHS, TABLES OR OTHER PERTINENT DATA WHICH CLEARLY INDICATES OPERATIONAL RANGE OF A GIVEN UNIT SIZE. COMPUTER GENERATED/PLOTTED CURVES OR INFORMATION, BASED SOLELY ON THE DESIGN PERFORMANCE, WILL NOT BE ACCEPTED.
- B. ALL SUBMITTALS OF EQUIPMENT FURNISHED WITH MOTORS SHALL CONTAIN A COMPLETE DESCRIPTION OF THE MOTOR'S OPERATING CHARACTERISTICS (HORSEPOWER, VOLTAGE, PHASE, SERVICE FACTOR) AND THE NAMEPLATE MOTOR EFFICIENCY.
- C. SHOP DRAWING SUBMITTAL SHEETS WHICH MAY SHOW ITEMS THAT ARE NOT BEING FURNISHED SHALL HAVE THOSE ITEMS CROSSED OFF IN INK TO CLEARLY INDICATE WHICH ITEMS WILL BE FURNISHED AND WHICH WILL NOT BE FURNISHED.
- 4. ACCEPTANCE RENDERED ON SHOP DRAWINGS SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR BUILDING CONDITIONS. WHERE DRAWINGS ARE REVIEWED, REVIEW DOES NOT MEAN THAT DRAWINGS HAVE BEEN CHECKED IN DETAIL; SAID APPROVAL DOES NOT IN ANY WAY RELIEVE THE CONTRACTOR FROM HIS RESPONSIBILITY OR NECESSITY OF FURNISHING MATERIAL OR PERFORMING WORK AS REQUIRED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS. VERIFY AVAILABLE SPACE PRIOR TO SUBMITTING SHOP DRAWINGS. ACCEPTANCE OF SHOP DRAWINGS SHALL NOT APPLY TO QUANTITY NOR RELIEVE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLY WITH INTENT OF DRAWINGS AND SPECIFICATIONS.

AS-BUILT DRAWINGS

1. PROVIDE A COMPLETE SET OF AS -BUILT DRAWINGS REFLECTING AS INSTALLED CONDITIONS. AS-BUILT DRAWINGS SHALL INDICATE ALL INSTALLED CONDITIONS OF SYSTEMS WITHIN THIS DISCIPLINE. DRAWINGS SHALL BE OF SIMILAR SCALE AS THE CONSTRUCTION DOCUMENTS AND INCLUDE DETAILS AS NECESSARY TO CLEARLY REFLECT THE INSTALLED CONDITION. DRAWINGS SHALL BE BOUND IN A COMPLETE AND CONSECUTIVE SET. SUPPLEMENTAL SKETCHES AND LOOSE PAPERWORK WILL NOT BE ACCEPTABLE AND WILL BE RETURNED FOR REVISION. THE CONTRACTOR SHALL COMPLY WITH THE ENGINEERS COMMENTS TO PRODUCE A CLEAR AND CONCISE SET OF DRAWINGS. DRAWINGS SHALL BE SUBMITTED IN BOTH HARD COPY AND ELECTRONIC (AUTO-CAD VERSION AS REQUIRED BY THE OWNER) VERSION. NUMBER OF COPIES OF EACH AS REQUESTED BY THE OWNER.

- 2. PROVIDE "AS-BUILT DRAWINGS" INDICATING IN A NEAT AND ACCURATE MANNER A COMPLETE RECORD OF ALL REVISIONS OF THE ORIGINAL DESIGN OF THE WORK. INDICATE THE FOLLOWING INSTALLED CONDITIONS:
- A. INCLUDE ALL CHANGES AND AN ACCURATE RECORD, ON REPRODUCTIONS OF THE CONTRACT DRAWINGS OR APPROPRIATE SHOP DRAWINGS, OF ALL DEVIATIONS, BETWEEN THE WORK SHOWN AND THE WORK INSTALLED.
- B. MAINS AND BRANCHES OF PIPING SYSTEMS, WITH VALVES AND CONTROL DEVICES LOCATED AND NUMBERED, CONCEALED UNIONS LOCATED, AND WITH ITEMS REQUIRING MAINTENANCE LOCATED (I.E. TRAPS, STRAINERS, EXPANSION COMPENSATORS, TANKS, ETC.) VALVE LOCATION DIAGRAMS, COMPLETE WITH VALVE TAG CHART.
- C. EQUIPMENT LOCATIONS (EXPOSEED AND CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES.
- D. APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
- E. CONTRACT MODIFICATIONS, ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
- 3. SUBMIT FOR REVIEW BOUND SETS OF THE REQUIRED DRAWINGS, MANUALS AND OPERATING INSTRUCTIONS.
- 4. SUBMIT A COMPLETE MAINTENANCE MANUAL OF ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT.

HANGERS AND SUPPORT

- 1. SEISMIC RESTRAINT: PROVIDE SEISMIC RESTRAINT AND EXPANSION OF ALL MECHANICAL EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH STATE AND LOCAL BUILDING CODE REQUIREMENTS. SUBMIT SHOP DRAWINGS SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT INDICATING ALL NECESSARY COMPONENT CUTS, PLAN LOCATIONS AND CALCULATIONS FOR A COMPLETE SYSTEM.
- 2. PROVIDE ALL NECESSARY STRUCTURAL MEMBERS INCLUDING ADDITIONAL STRUCTURAL SUPPORT TO SUPPORT PIPING AND EQUIPMENT. HANGERS AND SUPPORTS SHALL BE OF AN APPROVED DESIGN NECESSARY TO SUPPORT DUCTWORK, PIPING EQUIPMENT AND TO KEEP IN PROPER ALIGNMENT AND PREVENT TRANSMISSION OF INJURIOUS THRUSTS AND VIBRATIONS. IN ALL CASES WHERE HANGERS, BRACKETS, ETC. ARE SUPPORTED FROM CONCRETE CONSTRUCTION, DO NOT WEAKEN CONCRETE OR PENETRATE WATERPROOFING. ALL HANGERS AND SUPPORTS SHALL BE CAPABLE OF SCREW ADJUSTMENT AFTER PIPING IS ERECTED. HANGERS SUPPORTING PIPING EXPANDING INTO LOOPS, BENDS, AND OFFSETS SHALL BE SECURED TO THE BUILDING STRUCTURE IN SUCH A MANNER THAT HORIZONTAL ADJUSTMENT PERPENDICULAR TO THE RUN OF PIPING SUPPORTED MAY BE MADE TO ACCOMMODATE DISPLACEMENT DUE TO EXPANSION. ALL SUCH HANGERS SHALL BE FINALLY ADJUSTED BOTH IN THE VERTICAL AND HORIZONTAL DIRECTION, AS REQUIRED. HANGERS IN CONTACT WITH COPPER OR BRASS PIPE SHALL BE DIELECTRIC, COMPATIBLE WITH COPPER AND BRASS ALLOY OR PROVIDED WITH FELT SLEEVE.
- 3. PROVIDE ADDITIONAL SUPPORT FOR DUCTWORK, PIPING AND EQUIPMENT WHEN DECK IS NOT CAPABLE OF SUPPORT.
- 4. BEAM CLAMPS HANGERS SUPPORTED FROM STEEL SHALL BE CENTER LOADING BEAM CLAMPS FOR HANGERS SUPPORTING PIPING 2 INCHES FOR 2-1/2 INCHES AND LARGER, I BEAM CLAMPS SHALL BE FORGED STEEL. "C" CLAMPS ARE NOT TO BE USED.
- 5. PROVIDE AND INSTALL EXPANSION COMPENSATION FOR ALL PIPING. SUBMIT PLANS, CALCULATIONS AND EQUIPMENT DATA.

DUCTWORK

- 1. DUCTWORK SHALL BE FABRICATED FROM HOT-DIPPED GALVANIZED STEEL SHEET CONFORMING TO ASTM A653, WITH G60 COATING. EXHAUST DUCTWORK SERVING TOILET/SHOWER SPACES SHALL BE ALUMINUM SHEET ALLOY 3003-H14, ASTM B 209, ALUMINUM CONNECTORS AND BAR STOCK: ALLOY 6061-T6 OR OF EQUIVALENT STRENGTH.
- 2. MANUFACTURED METAL DUCTWORK AND FITTINGS SHALL BE BY LINDAB, SEMCO OR UNITED McGILL CORP. FLAT OVAL AND ROUND DUCTS: MACHINE MADE FROM SPIRAL LOCKSEAM DUCT WITH LIGHT REINFORCING CORRUGATIONS; FITTINGS MANUFACTURED OF AT LEAST TWO GAGES HEAVER THAN METAL DUCT.
- 3. FABRICATE, SUPPORT, INSTALL AND SEAL IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE, AND AS INDICATED. PROVIDE DUCT MATERIAL, GAUGES, REINFORCING AND SEALING FOR OPERATING PRESSURES INDICATED.
- 4. INSULATED FLEXIBLE DUCTS SHALL BE FABRICATED FROM MULTIPLE LAYERS OF ALUMINUM LAMINATE SUPPORTED BY HELICALLY WOUND SPRING STEEL WIRE WITH FIBERGLASS INSULATION AND POLYETHYLENE VAPOR BARRIER. PRESSURE RATING SHALL BE 10 INCH W.G. POSITIVE AND 1.0 INCH W.G. NEGATIVE. FLEXIBLE DUCTS SHALL NOT PASS THROUGH WALLS NOR EXCEED 8 FEET IN LENGTH. SECURE TO DUCT TAP WITH CLAMP OR DRAWBAND. PROPERLY SUPPORT SO AS NOT TO SAG OR KINK.
- 5. JOINT SEALERS AND SEALANTS SHALL BE NON-HARDENING, WATER, MILDEW AND MOLD RESISTANT. MAXIMUM FLAME SPREAD OF 25, SMOKE DEVELOPED OF 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- 6. PROVIDE AIR FOIL TURNING VANES WHEN RECTANGULAR ELBOWS MUST BE USED.
- ACCESS DOORS SHALL BE PROVIDED UNDER THIS SECTION AS REQUIRED TO PROVIDE ACCESS TO FIRE AND SMOKE DAMPERS, CONTROLS, HUMIDIFIERS, COILS VALVES, ETC., WHICH ARE LOCATED IN DUCTS.
- 8. ON ALL AIR HANDLING EQUIPMENT INCLUDING AIR HANDLERS, ERV UNITS, UTILITY AND CABINET FANS, FURNISH AND INSTALL FLEXIBLE DUCT CONNECTORS TO ISOLATE FAN VIBRATION FROM THE DUCT SYSTEM. (EXCEPTION: AIR HANDLING UNITS WITH INTERNAL FAN VIBRATION ISOLATORS AND FLEXIBLE CONNECTORS INSTALLED BETWEEN FAN AND HOUSING.)
- 9. ACCESSORY DUCTWORK MATERIALS SUCH AS TAPES, SEALANTS, FASTENERS, ETC., SHALL COMPLY WITH NFPA 90A WITH A MAXIMUM FLAME SPREAD RATING OF 25 AND A MAXIMUM SMOKE DEVELOPED RATING OF 50, AND SHALL BE SMACNA AND UL APPROVED.

DUCTWORK INSULATION

- 1. FACED FIBERGLASS DUCT WRAP SHALL BE APPLIED EXTERNALLY TO ALL CONCEALED DUCTS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. DUCT WRAP TO BE 1.5 PCF DENSITY WITH K VALUE OF 0.27 AT 75 DEG F, EQUAL TO OWENS CORNING TYPE 100 OR EQUIVALENT.
- 2. APPLY RIGID BOARD INSULATION TO ALL EXPOSED DUCTWORK AND PLENUMS, ETC., BY USING MECHANICAL, WELD-TYPE PIN FASTENERS. FASTENERS SHALL BE SPOTTED NOT LESS THAN 3 INCHES FROM THE EDGE OF THE DUCT AND ON 12-INCH CENTERS THROUGHOUT THE AREA OF THE DUCT. RIGID BOARD INSULATION SHALL BE 6.0 PCF DENSITY WITH K VALUE OF 0.22 AT 75 DEG F, EQUAL TO OWENS CORNING TYPE 705 OR EQUIVALENT.
- 3. APPLY 1" ACOUSTICAL DUCT LINER AND LINER BOARD TO THE INSIDE OF DUCTS AND PLENUMS AS SPECIFIED AND AS CALLED FOR ON DRAWINGS. ACOUSTICAL LINER SHALL BE 2.0 PCF DENSITY WITH K VALUE OF 0.26 AT 75 DEG F, EQUAL TO MANVILLE PERMACOTE LINACOUSTIC-HP OR EQUIVALENT.
- 4. THE FOLLOWING DUCTS SHALL BE INSULATED WITH KRAFT FOIL FACED DUCT WRAP INSULATION IN SUFFICIENT THICKNESS TO MEET THE REQUIREMENTS OF THE 2015 INTERNATIONAL ENERGY CODE:
- A. ALL CONCEALED SUPPLY AIR AND RETURN AIR DUCTWORK ABOVE CEILINGS WHETHER LINED OR UNLINED.

- B. ALL OUTDOOR AIR DUCTWORK.
- C. ALL EXHAUST DUCTWORK ON COLD SIDE OF BACKDRAFT OR MOTORIZED DAMPERS.
- 5. PROVIDE 1" ACOUSTICAL DUCT LINER ON FIRST 10' OF SUPPLY AIR DISCHARGE AND RETURN AIR INLET DUCTS OF ALL AIR HANDLING UNITS.
- 6. EXTERIOR DUCTWORK EXPOSED TO THE WEATHER SHALL BE INSULATED WITH MINIMUM R-12 INSULATION, IT SHALL BE COVERED WITH AN ALUMINUM JACKET; ASTM B 209; 0.016" SHEET; SMOOTH FINISH; LONGITUDINAL SLIP JOINTS AND 2" LAPS; DIE SHAPED FITTING COVERS AND 3/8" WIDE, 0.015" THICK ALUMINUM METALJACKET BANDS. ALUMINUM JACKET SHALL BE PITCHED FROM INSIDE OUT 1/2" PER FOOT TO PREVENT ANY WATER POOLING ON TOP OF THE DUCT INSULATION.

REGISTERS, GRILLES AND DIFFUSERS

- 4. REGISTERS, GRILLES AND DIFFUSERS SHALL BE AS SCHEDULED ON THE DRAWINGS. FINISH SHALL BE AS SELECTED BY THE ARCHITECT.
- 5. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 6. CHECK LOCATIONS OF OUTLETS AND INLETS AND MAKE NECESSARY ADJUSTMENTS IN POSITION TO CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY AND LIGHTING ARRANGEMENT. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR LOCATIONS OF REGISTERS, GRILLS AND DIFFUSERS.
- 7. INSTALL DIFFUSERS TO DUCTWORK WITH AIR TIGHT CONNECTION.PAINT INSIDE OF DUCT CONNECTION TO REGISTERS AND DIFFUSERS BLACK FOR A DISTANCE OF 18" WHEREVER SHINY SHEETMETAL IS VISIBLE FORM THE OCCUPIED SPACE.
- 8. PROVIDE BALANCING DAMPERS ON DUCT TAKE-OFFS TO DIFFUSERS, GRILLES AND REGISTERS, DESPITE WHETHER DAMPERS ARE SPECIFIED AS PART OF THE DIFFUSER, GRILLE OR REGISTER ASSEMBLY.

REFRIGERANT PIPING

- 1. DRAWN (RIGID) COPPER TUBE SHALL BE TYPE ACR, R410 RATED, ASTM B280, H58 TEMPER, CLEAN, DRY AND CAPPED. FITTINGS SHALL BE ASME B16.22 WROUGHT COPPER. JOINTS SHALL BE BRAZED WITH AWS A5.8 BCUP SILVER / PHOSPHORUS / COPPER ALLOY.
- 2. ANNEALED (SOFT) COPPER TUBE SHALL BE TYPE ACR, R410 RATED, ASTM B280, O60 TEMPER, CLEAN, DRY AND CAPPED. FITTINGS SHALL BE ASME 16.22 WROUGHT COPPER. JOINTS SHALL BE FLARED OR BRAZED WITH AWS A5.8 BCUP SILVER / PHOSPHORUS / COPPER ALLOY.
- 3. INSULATION SHALL BE FLEXIBLE ELASTOMERIC. INSULATION THICKNESS SHALL BE IN CONFORMANCE WITH THE 2015 INTERNATIONAL ENERGY CODE.
- 4. PIPING INSTALLATION
- A. INSTALL REFRIGERATION PIPING IN ACCORDANCE WITH VRF SYSTEM MANUFACTURER'S INSTRUCTIONS AND ASME B31.5.
- B. ROUTE PIPING IN AN ORDERLY MANNER, PARALLEL TO BUILDING STRUCTURE, AND MAINTAIN GRADIENT. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS. SLEEVE PIPING PASSING THROUGH PARTITIONS, WALLS AND FLOORS. SLOPE PIPING AND ARRANGE TO DRAIN AT LOW POINTS.

COOLING COIL CONDENSATE PIPING

1. ALL CONDENSATE DRAIN PIPING SHALL BE CPVC OR TYPE DWV COPPER WITH WROUGHT COPPER FITTINGS SOLDERED WITH 95-5 WIRE SOLDER. PITCH PIPING A MINIMUM 1" PER 10 FT. OF RUN. PROVIDE CLEANOUTS AT CHANGES IN DIRECTION AND PROVIDE 4"DEEP TRAP AT AIR HANDLING UNIT(S). CONDENSATE PIPING AND ALL FITTINGS SHALL BE INSULATED WITH 1" FIBERGLASS INSULATION COVERED WITH A KRAFT PAPER AND ALUMINUM FOIL ALL PURPOSE JACKET.

HVAC INSTRUMENTATION AND DDC CONTROLS

CONTROLS SHALL BE BY: SNE CONTROLS CONTACT PERSON: MIKE GIRARD 860-653-5095

1. ALL NEW EQUIPMENT SHALL BE TIED INTO EXISTING SNE BUILDING MANAGEMENT SYSTEM (BMS)

2. GENERAL

- A. FURNISH AND INSTALL COMPLETE TEMPERATURE CONTROL FOR ALL
- HVAC SYSTEMS.

 B. PROVIDE NEW CONTROL DEVICES INCLUDING THERMOSTATS, STAGING RELAYS AND OTHER RELATED DEVICES FOR A COMPLETE OPERATIONAL SYSTEM PER THE OPERATING SEQUENCE AND INDUSTRY STANDARDS.
- C. MOUNT ALL CONTROLS FURNISHED AS ACCESSORIES TO EQUIPMENT AND PROVIDE ALL CONTROL WIRING REQUIRED FOR PROPER OPERATION. ALL WIRING SHALL BE IN CONDUIT PER NEC AND LOCAL CODE REQUIREMENTS.

 D. REFER TO THE CONTROL POINTS LIST AND SEQUENCE OF OPERATIONS

VRF SYSTEM

FOR DDC CONTROL SYSTEM REQUIREMENTS.

- A. THE VRF SYSTEM WILL BE USED FOR HEATING AND COOLING. THE VRF MODES WILL BE CONTROLLED BY THE BMS SYSTEM THROUGH A BACNET INTERFACE.
- B. IF THE ZONE REQUIRES COOLING, AS SENSED BY THE BAS PROVIDED TEMPERATURE SENSOR, THE BAS WILL REQUEST THE VRF SYSTEM TO BE IN COOLING MODE. THE VRF CONTROLLER WILL COMPARE THE BAS SETPOINT TO THE VRF SUPPLIED TEMPERATURE SENSOR REFERENCE AND CONTROL TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.
- C. IF THE ZONE REQUIRES HEATING, AS SENSED BY THE BAS PROVIDED TEMPERATURE SENSOR, AND THE OUTDOOR AIR TEMPERATURE IS ABOVE 40 DEGREES (ADJ.) THE BAS WILL REQUEST THE VRF SYSTEM TO BE IN HEATING MODE. THE VRF CONTROLLER WILL COMPARE THE BAS SETPOINT TO THE VRF SUPPLIED TEMPERATURE SENSOR REFERENCE AND CONTROL TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.
- D. IF THE ZONE REQUIRES HEATING, AS SENSED BY THE BAS PROVIDED TEMPERATURE SENSOR, AND THE OUTDOOR AIR TEMPERATURE IS BELOW 4 DEGREES (ADJ.) THE BAS WILL REQUEST THE VRF SYSTEM TO BE OFF. THE HEATING WILL BE PROVIDED BY THE HOT WATER SYSTEM.
- E. THE BAS WILL COMMUNICATE TO THE VRF SYSTEM GLOBAL CONTROLLER VIA BACNET.1. SYSTEM MODES, ZONE TEMPERATURE SETPOINTS, SYSTEM ALARMS, SYSTEM SCHEDULING WILL BE INTERFACED.
- ALL COMMUNICATIONS CONTROL WIRING WILL BE PROVIDED BY THE ATC.
 REFERENCE SENSOR (PROVIDED BY THE VRF SYSTEM MANUFACTURER) WILL BE WIRED BY THE ATC.

ADA ACCESSIBILITY

- 1. INSTALL THERMOSTATS & DDC TEMPERATURE SENSORS AT MOUNTING HEIGHT AS REQUIRED BY ICCC/ANSI A117.1-2003 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES.
- 2. COORDINATE LOCATION AND ELEVATION WITH LIGHT SWITCHES, ETC.



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SEAL								

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DWG DATA

JOB INFO

PROJECT NUMBER: 22-347
SUBMISSION DATE: 11/30/2021
DRAWN: DS
REVIEWED: BJZ

AS NOTED

DWG TITLE

SCALE:

MECHANICAL SPECIFICATIONS