Regional School District 8 RHAM HIGH SCHOOL

BID DOCUMENTS

FOR HEATING, VENTILATION, AND AIR CONDITIONING UPGRADES FOR MEDIA CENTER AND WEIGHT ROOM AND CLASSROOMS

HVAC BID # 2019 - 101



Patricia Law, Ed.D.

Superintendent of Schools

Eva Gallupe

Business Manager

Michael J. Schlehofer

Director of Facilities

Regional School District No. 8 is an Affirmative Action/Equal Opportunity Employer.

INVITATION TO BID HVAC Bid # 2019 - 101

Regional School District 8 is seeking bids for HVAC upgrades at RHAM High School for the Media Center, Weight Room and Classrooms, 85 Wall Street, Hebron, CT. The Information for Bidders, Proposal Form, Plans, Specifications and other Contract Documents, as prepared by RZ Design Associates, Inc. 750 Old Main Street Suite 202 Rocky Hill, CT 06067; will be available via Regional School District 8 Website **Monday September 16, 2019**. The website address is www.rhamschools.org

A Pre-Bid Conference (not mandatory) will be held on **Monday September 23, 2019 at 11:00AM**, at RHAM High School, 85 Wall Street, Hebron, CT, in the Principal's Main Conference Room.

Sealed bids may be mailed to Regional School District 8 85 Wall Street, Hebron, CT 06248 or delivered in person to the Central Office, Regional School District No. 8, 85 Wall Street, Hebron, CT 06248. Bids will be accepted until **Friday, October 4, 2019 no later than 1:45PM** local time on Friday October 4, 2019 at which time they will be opened. Bids must be clearly marked with the bid number and title on the exterior of the sealed envelope. No responsibility shall be attached to any person or persons for the premature opening of bids not properly marked.

Facsimile Transmissions- Submission of this bid or any portion of this bid and/or any documents relating to this bid by means of Facsimile Transmission (fax machine) is unacceptable and will not be considered in the bid process.

As security, each Bid must be accompanied by a Certified Check or Cashiers Check drawn upon either a State Bank and Trust Company or a National Banking Association, to the order of the Regional School District No. 8, or the Bid must be accompanied by a Bid Bond having as surety thereto, such Surety Company or Companies as are authorized to do business in the State of Connecticut, of an amount not less than 10% of the Bid.

The successful Bidder shall furnish Performance, Labor and Material Payment Bonds, each for 100% of the Contract Sum.

Eva Gallupe, Business Manager Regional School District 8 85 Wall Street Hebron, CT 06248

Regional School District 8

BID TERMS AND CONDITIONS

1. INTRODUCTION

Regional School District 8 is seeking bids for HVAC upgrades at RHAM High School for the Media Center, Weight Room and Classrooms, 85 Wall Street, Hebron, CT.

The Information for Bidders, Proposal Form, Plans, Specifications and other Contract Documents, as prepared by RZ Design Associates, Inc. 750 Old Main Street Suite 202 Rocky Hill, CT 06067; will be available via Regional School District 8 Website after **Monday September 16, 2019**. The website address is www.rhamschools.org

It is the intention of Regional School District 8 to select a Contractor to provide these services based on factors that include the comprehensiveness and quality of the bid, the experience of the Contractor, the costs submitted by the Contractor, and factors which, in the opinion of Regional School District 8, will lead to efficient, cost effective, and well maintained facilities. Price in and of itself will not necessarily be the deciding factor in awarding the contract.

This invitation to Bid will be publicly advertised.

2. PROPOSALS AND DUE DATE with PRE-BID CONFERENCE

- 2.1 Pre-Bid Conference (not mandatory) **Monday, September 23, 2019 at 11:00AM** RHAM High School, 85 Wall Street, Hebron, CT 06248.
- 2.2 Sealed bids marked "HVAC BID # 2019 101" must be received in the Business Office by 1:45PM on FRIDAY, October 4, 2019. Bids shall be opened at that time.
- 2.3 It is the intention of Regional School District 8 to select a Vendor to provide these services based on factors which include the comprehensiveness and quality of the proposal, the experience of the Vendor, the costs submitted by the Vendor, and factors which, in the opinion of Regional School District 8, will lead to efficient, cost effective, and well maintained facilities. Price in and of itself will not necessarily be the deciding factor in awarding the contract. Not with-standing the forgoing, the District may award the contract to the lowest responsible bidder, but reserves the right to reject any and all bids, or parts thereof, or to waive irregularities as deemed to be in the best interest of the District.
- 2.4 Bid proposals and signed specifications shall be submitted to:Eva Gallupe, Business ManagerRegional School District 885 Wall Street

3. INSTRUCTION TO BIDDERS

- 3.1 All bids submitted must be in SEALED ENVELOPES and must be notated with "HVAC Bid # 2019 101" on the face of the envelope to be considered. Bidders not marking the envelopes will have no recourse against any Board member and/or its employees for the failure of the bid to be considered. Amendments to or withdrawal of any section of the submitted bid received later than the time and date set for the bid opening will not be considered. Bids received later than the time and date specified will not be considered.
- 3.2 Facsimile Transmissions- Submission of this bid or any portion of this bid and/or any documents relating to this bid by means of Facsimile Transmission (fax machine) is unacceptable and will not be considered in the bid process.
- 3.3 No oral agreement made by a bidder or contractor with any agency or employee of the Board or the District will be binding upon the Board or the District and such oral agreement will be disregarded.
- 3.4 Request for interpretation of any portion of the bid may be made by email to the Board's <u>Director of Facilities</u>. All replies will be given via email with an emailed copy of such inquiry and reply provided to each prospective bidder. Request for interpretation due by September 25. 2019.
- 3.5 Interested bidders are encouraged to visit and inspect the school sites before submitting a bid in order to familiarize themselves with work requirements. Additional information, if required, can be obtained from the Facilities Director at 860-228-5311. Failure to visit the school will not relieve the contractor of its obligation to confirm its ability to perform the work indicated in the specifications.
- 3.6 The Board is exempt from the payment of taxes imposed by the Federal Government and/or the State of Connecticut. Such taxes should not be included in the bid price.
- 3.7 In the event of receipt of identical bids as to offerings, delivery, service, content, price, etc. from two or more different lowest responsible qualified bidders, the contract will be awarded in accordance with the information contained in the bid documents, based on Board Policy No. 3330 Subsection 6 Requirements Governing Bid Awards found on page 2 and Subsection 3 of the Competitive Proposal Process for Special or Professional Services on page 5 of the Policy.
- 3.8 For bids to be considered, the attached Non Collusive Bid Statement must be completed and submitted with the bid.
- 3.9 Once bids are opened, the bid shall stand firm for ninety (90) days after the bid opening.
- 3.10 To be considered, all bids must contain -
 - Completed Bid Form.

- Name, address, phone number, and email address of firm/person(s) responsible for the project, if different from the Bid Form signatory.
- At least three (3) references and contact information for which you have performed this type of work.
- Proposed project schedule.
- Bid security payable to the Regional School District 8 in the form of a certified check or Bid Bond is required for five (5) percent of the bid amount, issued by an acceptable surety on AIA documents A311 or comparable legal form and must accompany bid.

4. SCOPE OF WORK -

4.1 See attached Specifications and other Contract Documents, as prepared by RZ Design Associates, Inc.

5. SERVICE CONTRACTOR REQUIREMENTS -

- 5.1 If the contractor is a corporation, limited liability company or limited liability partnership, the contractor must be authorized to do business in the State of Connecticut as evidenced on the records of the Connecticut Secretary of the State.
- 5.2 Employees of the contractor providing services under the contract must have a minimum of 2 years' experience in the type of work to be performed and be properly licensed. Bidder must submit at least three (3) current references where similar work was performed by the bidder.

The Contractor represents, warrants and guarantees:

- 5.3 That Contractor is financially solvent and the Contractor is experienced in and competent to perform the type of work and to furnish the materials, supplies, and equipment to be performed or furnished by it.
- 5.4 That Contractor shall procure and maintain solely at its own expense Workers Compensation, Connecticut Disability Insurance, and Connecticut Unemployment Insurance in amounts as required by law for all of its employees engaged in the performance of the Contract. That it shall procure and maintain, solely at its own expense, such insurance coverages in the amounts and under the conditions set forth in Section 8 of the Contract. Certificates of Insurance, where applicable, will be submitted to the designated Districts' Offices no later than 30 days prior to the initiation of each Contract year.
- 5.5 That it will comply with Federal and State Fair Labor Standards Act minimum wage standards set by law as to all of its employees while they are engaged in work under any Contract between Contractor and the Districts.
- 5.6 Complete and complies with State of Connecticut educational employment verification form. (Act-16-67)

- 5.7 That it will comply with the Occupational Safety and Health Act ("OSHA") and the "Toxic Substances Act" ("Right to Know Act") with respect to all operations or activities on School Districts' premises, and all other federal, state or local laws, rules or regulations concerning the handling and disposal of toxic or hazardous substances and wastes.
- 5.8 The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, religion, national origin, ancestry, sex, sexual orientation, marital status, age, military or veteran status, genetic information, gender identity or expression or disability or any other reason prohibited by federal or state law. Such action shall be taken with reference but not limited to: recruitment, hiring, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on-the-job training. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth provisions of this nondiscrimination clause.
- 5.9 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to of race, creed, color, national origin, sex, sexual orientation, marital status, age, or disability or any other reason prohibited by federal or state law.
- 5.10 The Contractor will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Contract so that such provisions will be binding upon each subcontractor, provided that the foregoing provisions shall not apply to contracts or subcontracts for standard commercial supplies.
- 5.11 The Contractor will comply with all federal and state provisions for drug and alcohol testing and be responsible for any and all fines related thereto.
- 5.12 The Contractor will comply with any and all other applicable Federal, State, and/or Local laws, rules, and regulations, and the policies and procedures of each District.

6. WORK CONTRACT PROVISIONS -

The paragraphs listed below are informational only; bidders are advised that any bidder awarded a contract shall be subject to these conditions. This list is not meant to be comprehensive or all-inclusive. The District reserves its rights to add to or otherwise alter these conditions at its sole discretion.

- 6.1. **Proof of Insurance** Original, completed Certificates of Insurance shall be presented to Regional School District 8 prior to contract issuance. Provider agrees to provide replacement/renewal certificates at least 60 days prior to the expiration date of the policies.
- 6.2 **Insurance Requirements** Provider shall agree to maintain in force at all times during the contract the following minimum coverage and shall name Regional School District 8 as an Additional Insured on a primary and non-contributory basis to all policies except Workers

Compensation. All policies should also include a Waiver of Subrogation. Insurance shall be written with Carriers approved in the State of Connecticut and with a minimum AM Best's Rating of "A-" VIII. In addition, all Carriers are subject to approval by the Regional School District 8.

		(Minimum Limits)
General Liability	Each Occurrence	\$1,000,000
General Aggregate		\$2,000,000
Products/Completed	Operations Aggregate	\$2,000,000
Auto Liability Each Accident	Combined Single Limit	\$1,000,000
Umbrella (Excess Liability)	Each Occurrence Aggregate	\$1,000,000 \$1,000,000

If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of this contract. If the policy is replaced and/or the retroactive date is changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

- 6.3 **Workers' Compensation Insurance** for all the employees employed on said Work shall be maintained in accordance with Connecticut's Workers' Compensation Act. In case any class of employees engaged in hazardous Work under the contract at the site of the Work is not protected under the Workers' Compensation Act, the contractor shall provide Workers' Compensation Insurance for the protection of its employees not otherwise protected.
- 6.4 **Occupational Safety and Health Act of 1970-** Contractor shall warrant that the machinery, equipment or other materials used in the performance of the services under the contract shall be in compliance with the standards required by the Occupational Safety and Health Act of 1970 (and all amendments thereto) as well as the standards required by comparable State and local laws, if any, for such machinery, equipment or other materials in effect at the time of such use.
- 6.5 **Machines and/or Equipment Lockout/Tagout-** In an effort to comply with OSHA's final rule on control of hazardous energy sources, contractors must warrant that any and all machines and/or equipment as is offered under this bid will be supplied and/or installed and/or equipped with lockout/tag out devices as prescribed by OSHA.
- 6.6 **Hazardous Materials** Any materials required by this bid and subsequent purchase orders that are hazardous under federal, state or local statute, ordinance, regulation or agency order will be packaged, labeled, marked and shipped by the contractor to comply with all federal, state and local regulations then in effect including but not limited to the provisions of the Hazardous Materials Transportation Act and Regulations promulgated there under and will

further comply with any special requirements and any policies and procedures of the Board relating to the purchase of hazardous materials as might be noted on subsequent purchase orders or otherwise communicated to contractor in writing.

6.7 **Material Safety Data Sheets ("MSDS")** - MSDS shall be provided by the contractor upon delivery to Board for any goods having carcinogens listed in the following references: OSHA 1910 Subpart Z

ACHIG Current Threshold Values

DOT HazMat Table 49

IARC Carcinogen List

National Toxicology Program Carcinogen List

Radioactive Materials

These Material Safety Data Sheets must be consistent with and include information required by the OSHA Hazard Communication Standard published as 29 CFR 1910.1200, as the same may be amended or supplemented from time to time. Where possible, these MSDS sheets should comply with GHS (Globally Harmonized System) standards.

68 Permits -

Awarded bidders are responsible for obtaining all necessary permits as required by OSHA, Federal, State and/or Town regulations. Town permit fee applies to Regional School District 8.

6.9 Wage Rates -

The wages paid on an hourly basis to any mechanic, laborer or workman employed upon the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such employee to any employee welfare fund, as defined in subsection (h) of section 31-53 of the general statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such employees to any such employee welfare fund shall pay to each employee as part of his wages the amount of payment or contribution for his classification on each pay day. The schedule of prevailing wage and welfare payments for this project as supplied by the State of Connecticut, Labor Department is attached. The Contractor shall comply with the provisions of Section 1 of Public Act 85-355 of the June 16, 1985 session of the General Assembly.

6.10 **Invoicing and Payment -**

A. At a frequency not to exceed once a month, the Contractor may submit to the Engineer for review the Application for Payment filled out and signed by the Contractor covering the Work completed as of the date of the Application and supported by such data as the Engineer may reasonably require. Only under certain conditions, and if approved by the Owner, if payment is requested on the basis of materials and equipment not incorporated

- in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application or Payment shall also be accompanied by such supporting data, satisfactory to the Owner, as will establish the title to the material and equipment and protect his interest therein, including applicable insurance.
- B. The Contractor warrants and guarantees that title to all Work, materials and equipment covered by an Application for Payment, whether incorporated in the Project or not, will have passed to the Owner prior to the making of the Application for Payment, free and clear of all liens, claims, security interests and encumbrances; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor or by any other person performing the Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.
- C. The Engineer will, within fourteen days after receipt of each Application for Payment, either indicate in writing his approval of payment and present the Application to the Owner or return the Application to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the Application.
- D. The amount paid the Contractor shall be the amount due less 5% retainage. The retainage shall be held by the Owner until completion of the Work.
- E. The Owner will, within fourteen days of presentation to him of an approved Application for Payment, pay the Contractor the amount approved by the Engineer.

6.11 Certificates of Completion and Final Payment -

- A. Upon written notice from the Contractor that the Project is complete, the Engineer will make a final inspection with the Contractor and will notify the Contractor in writing of any particulars in which this Inspection reveals that the Work is defective. The Contractor shall immediately make such corrections as are necessary to remedy such defects.
- B. After the Contractor has completed any such corrections to the satisfaction of the Engineer and delivered all maintenance and operating instructions, schedules, guarantees, bonds certificates of inspection and other documents all as required by the Contract Documents, the Owner will issue a certificate of completion and Contractor may make application for final payment following the procedure for progress payments.

The final Application for Payment shall be accompanied by such supporting data as the Engineer may require, together with complete and legally effective releases or waivers (satisfactory to the Owner) of all Liens arising out of the Contract Documents and the Labor and services performed and the material and equipment furnished thereunder.

In lieu there of and as approved by the Owner, the Contractor may furnish receipts or releases in full; an affidavit of the Contractor that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which the owner or its property might in any way be responsible have been paid or otherwise satisfied; and the consent of the surety, if any, to final payment. If any Subcontractor or supplier fails to furnish a release or receipt in full, the Contractor may furnish a bond satisfactory to the Owner to indemnify it against any Lien.

- C. If, on the basis of his observation and review of the Work during construction, his final inspection and his review of the final Application for Payment all as required by the Contract documents, the Engineer is satisfied that the Work has been completed and the Contractor has fulfilled all of his obligations under the Contract Documents, he will, within fourteen days after receipt of the final Application for Payment, indicate in writing his approval of payment and present the Application to the Owner for payment. Otherwise, he will return the Application to the Contractor, indicating in writing his reasons for refusing to approve final payment, in which case the Contractor will make the necessary corrections and resubmit the Application.
- D. Final payment shall constitute 95% of the final Contract amount. The remaining 5% will be payable in accordance with "Warranty and Guarantee: Removal or Acceptance of Defective Work". The Owner will, within fourteen days of presentation to him of an approved final Application for Payment, pay the Contractor the amount approved by the Engineer.

6.12 Owners Right to Stop or Suspend -

- A. If the Work is defective, or the Contractor fails to supply sufficient skilled workmen or suitable materials or equipment, or if the Contractor fails to make prompt payments to Subcontractors or for labor, materials or equipment, the Owner may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.
- B. The Owner may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to the Contractor which shall fix the date on which Work shall be resumed. The Contractor will resume the Work on the date so fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time directly attributable to any suspension if he makes a claim therefore as provided in the General Conditions.

6.13 Liquidated Damages -

- A. If the Contractor fails to complete the work within the time specified in the contract, or any extension, as specified in the clause entitled Default of this contract, the Contractor shall pay to the Owner as liquidated damages, the sum of \$1,000.00 for each day of delay. If different completion dates are specified in the contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this contract, liquidated damages shall not be due the Owner. The Contractor remains liable for damages caused other than by delay.
- B. If the Owner terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final.

6.14 Time for Completion -

It is hereby understood and mutually agreed by and between the Contractor and the Owner that the date of beginning and the time for completion as specified in the Contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this Contract; and it is further mutually understood and agreed that the work embraced in this Contract shall be commenced on a date to be specified in the notice to proceed. The Contractor agrees that said work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will insure full completion thereof within 210 calendar days from the notice to proceed. Furthermore, major construction activities (i.e. Rigging of equipment, ductwork modifications, etc.) shall occur between April 10, 2020 and April 17, 2020 when school is closed for vacation. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

- 6.15 **Default-** It shall be understood that a contractor supplying equipment and/or supplies will be considered to be in default if/when he/she has not delivered the item(s) within the time constraints set forth in the contract. Contractors providing a service and/or construction will be considered to be in default if/when they have failed to meet the completion date(s) and/or times set forth in the contract and/or, in the case of construction, contractor has ceased on the project for a period of fifteen (15) days cumulative or consecutive.
- 6.16 **Indemnification** The contractor agrees to indemnify and hold harmless the District and its employees from any and all liability arising out of the contractor's performance of services under the contract, its operations and functions and/or supplied items.

6 17 Warranties -

Work delivered shall be guaranteed against faulty material and workmanship for a period of one (1) year from owner's acceptance. If during this period such faults develop, the unit or part affected shall be replaced at no cost to the owner for materials and labor.

The terms and contents of these general bid terms and conditions are made a part of this bid.

7. STIPULATIONS -

- 7.1 A contract issued as a result of a bid shall not be considered exclusive. The District reserves the right to contract with other vendors for similar services when deemed appropriate.
- 7.2 The District maintains the right to withhold payment for unsatisfactory materials and/or workmanship until such time that the defect is corrected. If the defect is not satisfactorily remediated within 60 days, the District may elect to have the remediation done by an alternate vendor and subtract the cost from the contractor's invoice. The District also reserves the right to deduct from the contractor's billing any costs incurred as a result of inferior or unsatisfactory materials and/or workmanship.
- 7.3 The District reserves the right to cancel the contract at any time, for any or no reason, with no cost to the District. If the cancellation is for inadequate performance, then the cancellation shall be immediate. If the cancellation is for budgetary considerations or is based upon the discretionary right of the District then the cancellation shall be upon thirty (30) days written notice.
- 7.4 The District reserves the right not to award the continuation of a multiple year bid. The award of each year's contract is contingent upon adoption and approval of budgetary funds for this purpose.

8. **DISPUTE RESOLUTION**

Any controversy or disputes arising under this contract shall be litigated in a court of competent jurisdiction in the State of Connecticut or, as determined by the District, be first subject to mediation. The District will have the option to choose the forum. If the matter is brought in a court of competent jurisdiction, the prevailing party shall be entitled to court costs and reasonable attorney's fees. The District specifically **does not agree to be a party to any arbitration proceedings**.

9. CHOICE OF LAW

If any controversy between the parties arise Connecticut law will apply and the contract will be interpreted and governed by the laws of the State of Connecticut (excluding its choice of law rules).

EXHIBIT A

REGIONAL SCHOOL DISTRICT 8

OFFICIAL BID FORM HVAC 2019 - 101

Name of Company:		
	;	
Phone Number of Primary	y Contact:	
Email Address of Primary	Contact:	
The undersigned	, doing business in t	the Regional School
District 8 submits herewith,	in conformity with the general terms, conditions,	and specifications
for the above-mentioned pul	blic bid, the following proposal for: HVAC 2019) - 101 – Regional
School District 8		
The Undersigned agrees to	o perform all Construction Work as indicated	on the Drawings
and described in the Speci	fications, and Addenda thereto, for the lump s	um price of:
).
(Written)		
Date	Signature of Bidder	

EXHIBIT B

REGIONAL SCHOOL DISTRICT 8

Business and Financial References

Reference Name Contact Information	<u>Contract Site</u>	<u>Dates</u>

EXHIBIT C

Legal Name of Business:

REGIONAL SCHOOL DISTRICT 8

NON-COLLUSIVE BID STATEMENT

The undersigned bidder, having fully informed himself regarding the accuracy of the statements made herein, certifies that:

- 1. The bid has been arrived at by the bidder independently and has been submitted without collusion with and without any agreement, understanding or planned common course of action with any other vendor of materials, supplies, equipment or services described in the invitation to bid, designed to limit independent bidding or competition, and
- 2. The contents of the bid have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder or its surety on any bond furnished with the bid and will not be communicated to any such person prior to the official opening of the bid.

The undersigned bidder further certifies that this statement is executed for the purpose of inducing the Board to consider the bid and make an award in accordance therewith.

Person Authorized to Sign for Cor	npany:	
Signature of Authorized Person:		
Date:		

EXHIBIT C

REGIONAL SCHOOL DISTRICT 8

CONTRACT

If notified of the acceptance of this Bid within sixty (60) calendar days of the time set for opening of bids, the Undersigned agrees to execute the "Standard Form of Agreement Between the Owner and Contractor where the basis of payment is a Stipulated Sum", AIA Document A101, as issued by The American Institute of Architects, current edition, within thirty (30) calendar days of the receipt of such notification and in accordance with this Bid and the Contract Documents.

CONTRACT SECURITY

The Undersigned agrees if awarded the Contract, to execute and deliver to the owner at the time of Contract signing, Performance Bond and Labor and Materials Payment Bond (Form A311 as issued by the American Institute of Architects) in amounts equal to 100 percent of the Contract Sum, as set form in the Instructions to Bidders of the Project Specifications.

TIME OF COMPLETION

The Undersigned further agrees, if awarded the Contract, to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and upon issuance of a Purchase Order; and to complete the entire project within 210 consecutive calendar days from the notice to proceed.

DECLARATION

The Undersigned hereby declares that he or she has carefully examined the Invitation to Bid, the Instruction to Bidders, the Drawings and Specification, has visited the actual location of the Work, has consulted his sources of supply, has satisfied himself as to all quantities and conditions, and understands that in signing this Bid, he waives all right to plead any misunderstanding regarding the same. The Undersigned understands that his or her competence and responsibility and that of his proposed subcontractors, time of completion, as well as any other factors of interest to the Owner, will be a consideration in making the award. The Owner reserves the right to reject any or all bids, to accept or reject alternate bids and unit prices and to waive any informality or irregularity concerning the bids received as it may be in his or her interest to do.

(Legal Name of Bidder)	
(Legal Name of Blader)	[Seal, if bid is by a
	corporation
(Address of Bidder)	
By	(Authorized Officer)

Insert Spec drawings from RZ Design, 10 Pages

GENERAL NOTES

RENOVATION

- 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
- 4. EQUIPMENT, PIPING, OR CONDUIT SHALL NOT BE ABANDONED IN-PLACE UNLESS SPECIFICALLY SO
- PROPERLY DISPOSE OF DEMOLISHED EQUIPMENT IN COMPLIANCE WITH CODES, REGULATIONS, AND DEP STANDARDS; TURN OVER TO THE OWNER, EQUIPMENT SO INDICATED.
- 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.
- 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 FOR PHASING REQUIREMENTS.
- 9. ALL EXISTING EQUIPMENT, FIXTURES, AND DEVICES TO BE REMOVED AND RELOCATED SHALL BE FIELD VERIFIED FOR EXACT QUANTITY AND CONDITION; KEEP AN ACCURATE RECORD OF STORED EQUIPMENT AND ITS CONDITION.
- 10. REBALANCE NEW AND EXISTING MECHANICAL AND ELECTRICAL SYSTEMS ASSOCIATED WITH THE RENOVATION, INCLUDING RENOVATED AREAS AND AREAS AFFECTED BY SYSTEM MODIFICATIONS.
- 11. SYSTEMS REQUIRING TO REMAIN IN OPERATION DURING DEMOLITION AND RENOVATION SHALL BE CAREFULLY PROTECTED FROM DAMAGE AND CONTAMINATION BY THE CONSTRUCTION PROCESS.

ARREVIATIONS

ANN

ATC

AVG

BFW

BTUH

CHWR

CHWS

CLGWTR

CLG

COND

CONV

CRU

CRV

CWR

CWS

CWV

CU FT

CW

DCV

DEG or °

DWG

EDR

EUH

EVAP

EWB

FCCF

DIA or Ø

	ABB	<u>REVIATIONS</u>		
48" ABOVE FINISHED FLOOR	FCU	FAN COIL UNIT	PIV	POST INDICATOR VALVE
GENERAL SERVICE COMPRESSED AIR	FD	FIRE DAMPER	PLEF	PLENUM FAN
AIR COMPRESSOR	FD/SB	FIRE DAMPER WITH INTEGRAL SECURITY BARS	PLUF	PLUG FAN
AUTOMATIC COOLING CONDENSATE PUMP	FD	FLOOR DRAIN	PRESS	PRESSURE
AIRFLOW CENTRIFUGAL FAN	FDC	FIRE DEPARTMENT CONNECTION	PRV	PRESSURE REDUCING VALVE
AIR CONDITIONING UNIT(S)	FDV	FIRE DEPARTMENT VALVE	PSI	POUNDS PER SQUARE INCH
ACCESS DOOR AREA DRAIN	FHC FM	FIRE HOSE CABINET FLOW METER	PVC RA	POLYVINYL CHLORIDE RETURN AIR
ABOVE FINISHED FLOOR	FOB	FLAT ON BOTTOM	RAF	RETURN AIR RETURN AIR FAN
ABOVE FINISHED FRADE	FOF	FUEL OIL FILL	RD	ROOF DRAIN
AIR HANDLING UNIT	FOR	FUEL OIL RETURN	REF	REFRIGERANT PIPING (MULTIPLE PIPES)
AMBIENT	FOS	FUEL OIL SUPPLY	REF	ROOF EXHAUST FAN `
ANNUNCIATOR	FOT	FLAT ON TOP	REG	REGISTER
AIR PRESSURE DROP	FOV	FUEL OIL VENT	RF	RELIEF FAN
APPROXIMATE	FP FDM	FIRE PUMP	RH	RELATIVE HUMIDITY
AXIAL ROOF VENTILATOR	FPM FPS	FEET PER MINUTE FEET PER SECOND	RHC RHG	REHEAT COIL REFRIGERANT HOT GAS
AIR SEPARATOR AUTOMATIC TEMPERATURE CONTROL	FS	FLOOR SINK	RL	RELOCATED
AVERAGE	FT	FOOT OR FEET	RM	ROOM
AVERAGE WATER TEMPERATURE	FVC	FIRE VALVE CABINET	RMS	ROOT MEAN SQUARED
42" ABOVE FINISHED FLOOR	G	GAS	RPD	REDUCED PRESSURE DEVICE
BACK DRAFT DAMPER	GA	GAUGE	RPM	REVOLUTIONS PER MINUTE
BOILER FEED WATER	GAL	GALLONS	RTU	ROOF TOP UNIT
BRAKE HORSEPOWER	GPH	GALLONS PER HOUR	RV	RADON VENT
BACKWARD INCLINED CENTRIFUGAL FAN	GPM	GALLONS PER MINUTE	RWL	RAIN WATER LEADER
BASEMENT	GR	GRAINS	S	SOIL
BRITISH THERMAL UNITS/HOUR	GWH	GAS WATER HEATER	S&R	SUPPLY AND RETURN
COEFFICIENT, VALVE FLOW COOLING COIL	H HC	HEIGHT HEATING COIL	SA SAC	SUPPLY AIR SHOP AIR COMPRESSOR
CONDENSATE	H/C	HEATING COIL HEATING/COOLING	SCC	SPRINKLER CONTROL CABINET
CEILING EXHAUST REG./GRILLE	HD	HEAD	SD	SMOKE DAMPER
CUBIC FEET PER MINUTE	HDCP	HANDICAP	SP	STANDPIPE
CHILLED WATER RETURN	HP	HORSEPOWER	SP	STATIC PRESSURE
CHILLED WATER SUPPLY	HPG	HIGH PRESSURE GAS	SP	SUMP PUMP
CONSOLE HEAT PUMP	HR	HOUR(S)	SPEC	SPECIFICATION
CAST IRON	HT	HEAT	SPK	SPRINKLER
COOLING WATER	HTR	HEATER	SPK/SP	COMBINED SPRINKLER/ STANDPIPE
CEILING	HUM HV	HUMIDIFIER	SPST	SINGLE POLE SINGLE THROW
CEILING MOUNTED VENTILATOR CLEANOUT	⊓v HW	HEATING/VENTILATION UNIT HOT WATER	SQ SS	SQUARE STAINLESS STEEL
CARBON DIOXIDE	HWR	HOT WATER HOT WATER RETURN	ST	STORM
COMPRESSOR	HWRP	HOT WATER RETURN PUMP	STD	STANDARD
CONDENSER	HWRR	HOT WATER REVERSE RETURN	SUCT	SUCTION
CONVECTOR	HWS	HOT WATER SUPPLY	SWBD	SWITCHBOARD
CONDENSATE PUMP	HX	HEAT EXCHANGER	SW	SWITCH
COMPUTER ROOM UNIT	ICF	IN-LINE CENTRIFUGAL FAN	TAF	TUBEAXIAL FAN
CENTRIFUGAL ROOF VENTILATOR	ID	INSIDE DIAMETER	TAG	IDENTIFICATION OF EQUIPMENT
CONDENSER WATER SUPPLY	IEF IN	IN-LINE EXHAUST FAN	TD TEMP	TEMPERATURE DIFFERENCE
CONDENSER WATER SUPPLY CENTRIFUGAL WALL VENTILATOR	IN WG	INCHES INCHES OF WATER, GAUGE (PRESS.)	TMV	TEMPERATURE THERMOSTATIC MIXING VALVE
COOLING TOWER	IW	INDIRECT WASTE	TP	TAMPERPROOF
CONDENSING UNIT	JP	JOCKEY PUMP	TP	TRAP PRIMER
CUBIC FEET	KEF	KITCHEN EXHAUST FAN	TSP	TOTAL STATIC PRESSURE
CABINET UNIT HEATER	KHWST	KITCHEN HOT WATER STORAGE TANK	T'STAT	THERMOSTAT
CONSTANT VOLUME	KWH	KITCHEN WATER HEATER	TW	TEMPERED WATER
COLD WATER	L	LENGTH	TWR	TEMPERED WATER RETURN
DECIBEL	LAT	LEAVING AIR TEMPERATURE	TYP	TYPICAL
DEPTH DEPTH DEPTH DE	LAV LBS/HR	LAVATORY	UH UPF	UNIT HEATER UPBLAST PROPELLER ROOF EXHAUST FAN
DRY BULB TEMPERATURE DOUBLE CHECK VALVE	LB5/HR LF	POUNDS PER HOUR LINEAR FEET	UR	URINAL
DEGREE	LIQ	LIQUID	USF	UTILITY SET FAN
DIAMETER	LV	LABORATORY VACUUM	V	VENT
DOWN	LWT	LEAVING WATER TEMPERATURE	V	VOLTAGE
DIFFERENTIAL PRESSURE	MA	MIXED AIR	VAF	VANEAXIAL FAN
DUCT SOUND ATTENUATORS	MAX	MAXIMUM	VAV	VARIABLE AIR VOLUME
DRAWING	MBH	BTU PER HOUR (THOUSAND)	VD	VOLUME DAMPER
DIRECT EXPANSION	MD	MOTORIZED DAMPER	VEL	VELOCITY
EXHAUST AIR	MECH MFF	MECHANICAL MIXED FLOW FAN	VFC VIF	VARIABLE FREQUENCY CONTROLLER VERIFY IN FIELD
ENTERING AIR TEMPERATURE	MFR	MANUFACTURER	VOL	VOLUME
ELECTRIC BASEBOARD RADIATION EQUIVALENT DIRECT RADIATION	MIN	MINIMUM	VTR	VENT THRU ROOF
EXHAUST FAN	MUAU	MAKE UP AIR UNIT	W	WASTE
EFFICIENCY	N/A	NOT APPLICABLE	W	WATT
ELECTRICAL	N.C.	NORMALLY CLOSED	WB	WET BULB TEMPERATURE
EXTERNAL STATIC PRESSURE	NEC	NATIONAL ELECTRICAL CODE	WC	WATER CLOSET
EXPANSION TANK (HVAC)	NIC	NOT IN CONTRACT	WEF	WALL EXHAUST FAN
EXISTING TO REMAIN	N.O.	NORMALLY OPEN	WH	WALL HYDRANT (HOSE BIBB)
ELECTRIC TRAP PRIMER	NTS	NOT TO SCALE	WHA WI	WATER HAMMER ARRESTER WIDTH
ELECTRIC UNIT HEATER	OA OD	OUTSIDE AIR OUTSIDE DIAMETER	WP	WEATHERPROOF
EVAPORATOR ENTERING WET BULB TEMPERATURE	ORD	OVERFLOW ROOF DRAIN	WPD	WATTER ROOF WATER PRESSURE DROP
ENTERING WET BOLD TEMPERATURE ENTERING WATER TEMPERATURE	ORWL	OVERFLOW RAIN WATER LEADER	WTG	WALL TRANSFER GRILLE
EXHAUST	PCD	PUMPED CONDENSATE DRAIN (COOLING)	WTR	WATER
EXPANSION	PD	PRESSURE DROP	WV	WASTE AND VENT COMBINATION
FAHRENHEIT	PF	PROPELLER FAN	WWM	WELDED WIRE MESH
FORWARD CURVE CENTRIFUGAL FAN	PH/Ø	PHASE		

FI	TTINGS AND VALVES
	PIPE ANCHOR
Ø	BACKFLOW PREVENTOR STRAINER OR STRAINER WITH BLOW-DOWN
	VALVE HOSE END, CAP AND CHAIN
 1	WALL CLEANOUT OR BLIND FLANGE
	"P" TRAP
- 	PIPE TEE DOWN
	IN-LINE EXPANSION COMPENSATOR FLOOR CLEANOUT
	STEAM TRAP ASSEMBLY
	STEEL PENETRATION/PIPE SLEEVE
	PIPE ELBOW UP OR PIPE TEE UP
	PIPE ELBOW DOWN
	COMPANION FLANGE
	PIPE CAP OR CAPPED END OF PIPE
	UNION
	PIPE GUIDES
	PUMP
	WATER HAMMER ARRESTOR
	TAKEOFF FROM TOP OF MAIN PIPE TAKEOFF FROM BOTTOM OF MAIN PIPE
	DIRECTION OF FLUID FLOW
	VALVE ON RISER
<u> </u>	VALVE ON DROP
•	METERING ORIFICE
	AIR VENT
•	FLOW SENSOR
— С	PIPE DROP WITH VALVE 2-WAY CONTROL VALVE
X	
	3-WAY CONTROL VALVE
	BALL VALVE CALIBRATED BALANCING VALVE
——————————————————————————————————————	SHUT-OFF VALVE (SEE SPECIFICATIONS FOR APPLICATION TYPE)
	BUTTERFLY VALVE
	CHECK VALVE
——————————————————————————————————————	THERMOSTATIC MIXING VALVE
	GLOBE VALVE
	GATE VALVE
	PRESSURE REDUCING VALVE
*	GAS COCK
	TRIPLE DUTY VALVE
<u> </u>	OS&Y VALVE
	FUSOMATIC VALVE (FIREMATIC)
	DRAIN VALVE WITH HOSE END, CAP & CHAIN OR WALL HYDRANT / HOSE BIBB
<u> </u>	MOTORIZED BUTTERFLY VALVE
<u></u>	PRESSURE RELIEF SAFETY VALVE
——————————————————————————————————————	AQUASTAT
	SOLENOID VALVE
	TEMPERATURE SENSOR WITH SEPARABLE SOCKET IN IMMERSIBLE WELL
<u></u>	TEMPERATURE GAUGE WITH SEPARABLE SOCKET IN IMMERSIBLE WELL
	THERMOMETER WITH SEPARABLE SOCKET IN IMMERSIBLE WELL
 	PRESSURE GAUGE
(P) 	PRESSURE SENSOR WITH SYPHON (STEAM)
	FLEXIBLE CONNECTOR

GENERAL SYMBOLS THICK, DARK SOLID LINES INDICATE NEW OR RELOCATED ITEMS OR NEW RACEWAY THIN, LIGHT LINES INDICATE EXISTING ITEMS

OR RACEWAY TO REMAIN IN PLACE AND BE REUSED ITEMS TO BE REMOVED

THICK, DASHED LINES INDICATE EXISTING POINT OF NEW TO EXISTING CONNECTION, INCLUDING TRANSITIONS

	HVAC SYMBOLS	RZ Design
	RECTANGULAR, FLAT OVAL OR ROUND AIR DUCT	MECHANICA AND STRUCTU
		750 OLD SU ROCKY I
	AIR DUCT WITH ACOUSTICAL LINING	P: (86 F: (86 www.rzdesi
	SUPPLY AIR DUCT UP	www.rzaesi
	SUPPLY AIR DUCT DOWN	_
	RETURN AIR DUCT UP	_
	RETURN AIR DUCT DOWN	-
	EXHAUST AIR DUCT UP	_
	EXHAUST AIR DUCT DOWN TURNING VANES	
	ACCESS DOOR	
□ AD □ M	FLEXIBLE DUCT CONNECTION	
	CEILING SUPPLY DIFFUSERS	
	CEILING RETURN / EXHAUST GRILLE	
	HARD DUCTED DIFFUSER OR GRILLE WITH FULL SIZE BOTTOM TAKE-OFF	SEAL
	DIRECTION OF SUPPLY OR OUTDOOR AIRFLOW	
- √ →	DIRECTION OF RETURN OR EXHAUST AIRFLOW	
√	DOOR UNDERCUT	
BDD	BACK DRAFT DAMPER	_
VD VD	VOLUME DAMPER	
FD	FIRE DAMPER	
FD/SB	FIRE DAMPER WITH INTEGRAL SECURITY BARS	
	VAV BOX w/ UNIT TYPE	
	FAN POWERED VAV BOX	
xxx	SUPPLY PIPING. REFER TO ABBREVIATION LIST FOR DESIGNATION (XXX)	
XXX $$	RETURN PIPING. REFER TO ABBREVIATION LIST FOR DESIGNATION (XXX)	
✓ XXX ✓✓	ELECTRICAL HEATING CABLE. REFER TO ABBREVIATION LIST FOR DESIGNATION (XXX)	SUBMISSION HISTORY
SD	SMOKE DAMPER SYSTEM AND ASSOCIATED DEVICES PER SPECIFICATIONS AND MEP DETAILS	
FS	COMBINATION FIRE AND SMOKE DAMPER	1
M——	MOTORIZED DAMPER	1
	HUMIDIFIER TUBE/PANEL	
DS	DUCT SMOKE DETECTOR WITH REMOTE INDICATING LIGHT AND TEST SWITCH	JOB INFO R'
(SP)	DUCT STATIC PRESSURE SENSOR	
(P)	DIFFERENTIAL PRESSURE SENSOR	REPLAC
VFC	VARIABLE FREQUENCY CONTROLLER	fo
AFS	AIR FLOW STATION	
DSA	DUCT SOUND ATTENUATOR	RH
	ROOM TEMPERATURE WITH	
Tc	ROOM TEMPERATURE WITH CARBON DIOXIDE SENSOR	High S
CO	CARBON MONOXIDE SENSOR	Wall
CO2	CARBON DIOXIDE SENSOR	Hebro
\bigoplus	HUMIDISTAT	062
	FINNED TUBE RADIATION	
MV	DANFOSS CONTROL VALVE	DWG DATA
FM	FLOW METER	- · · · · · · · · · · · · · · · · ·
$\frac{?}{??}$	FIN TUBE TAG	PROJECT NUMBER:
	Γ SIZING	SUBMISSION DATE:
	PECTANCIII AP DIICT	- IDRAWN:

RECTANGULAR DUCT

FLAT OVAL DUCT

ROUND DUCT

20x12

20/12

20"ø

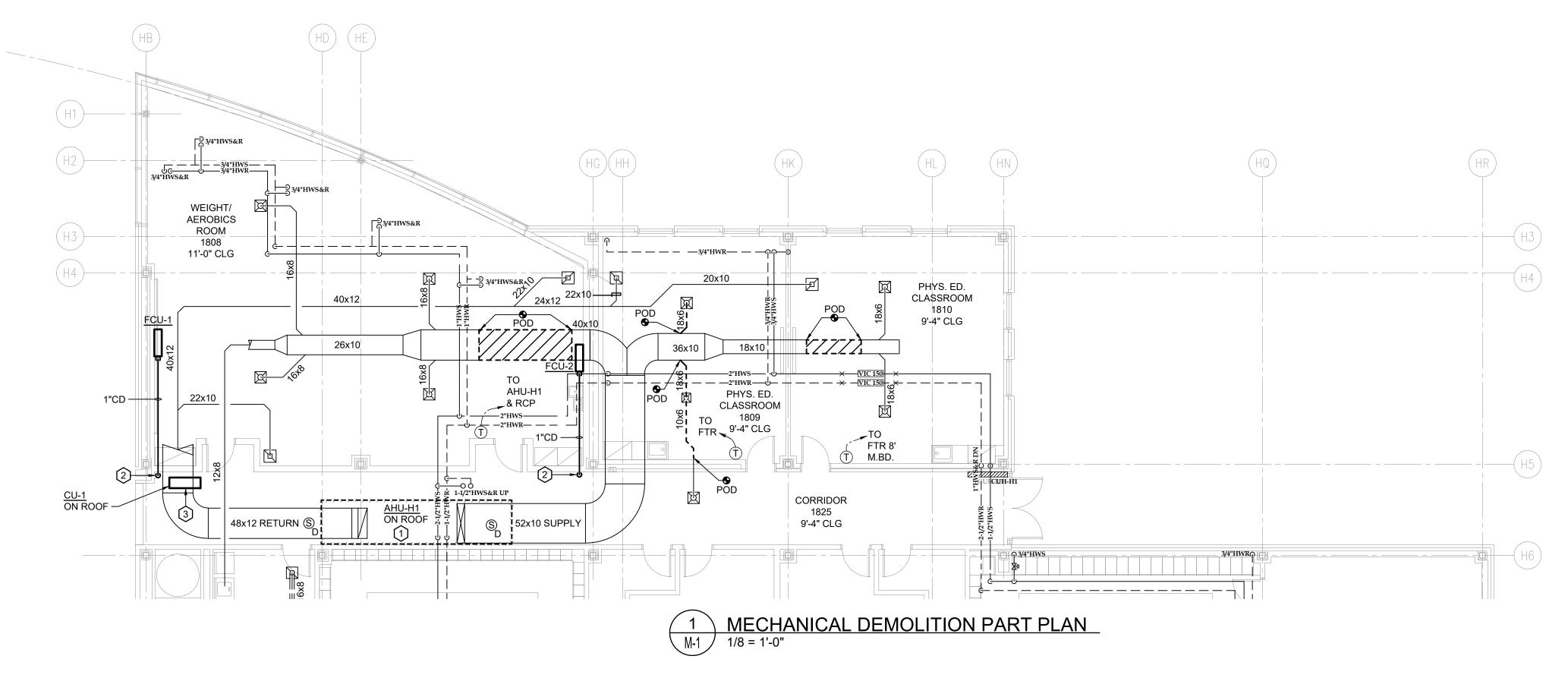
RZ Design Associates, Inc. MECHANICAL, ELECTRICAL, AND STRUCTURAL ENGINEERING 750 OLD MAIN STREET ROCKY HILL, CT 06067 P: (860) 436-4336 F: (860) 436-4450 www.rzdesignassociates.com

RTU **REPLACEMENT** for

RHAM High School Wall Street Hebron, CT 06248

PROJECT NUMBER: 19-338 SUBMISSION DATE: 09/13/19 DRAWN: REVIEWED: SCALE: AS NOTED

MECHANICAL LEGEND, **ABBREVIATIONS** AND NOTES



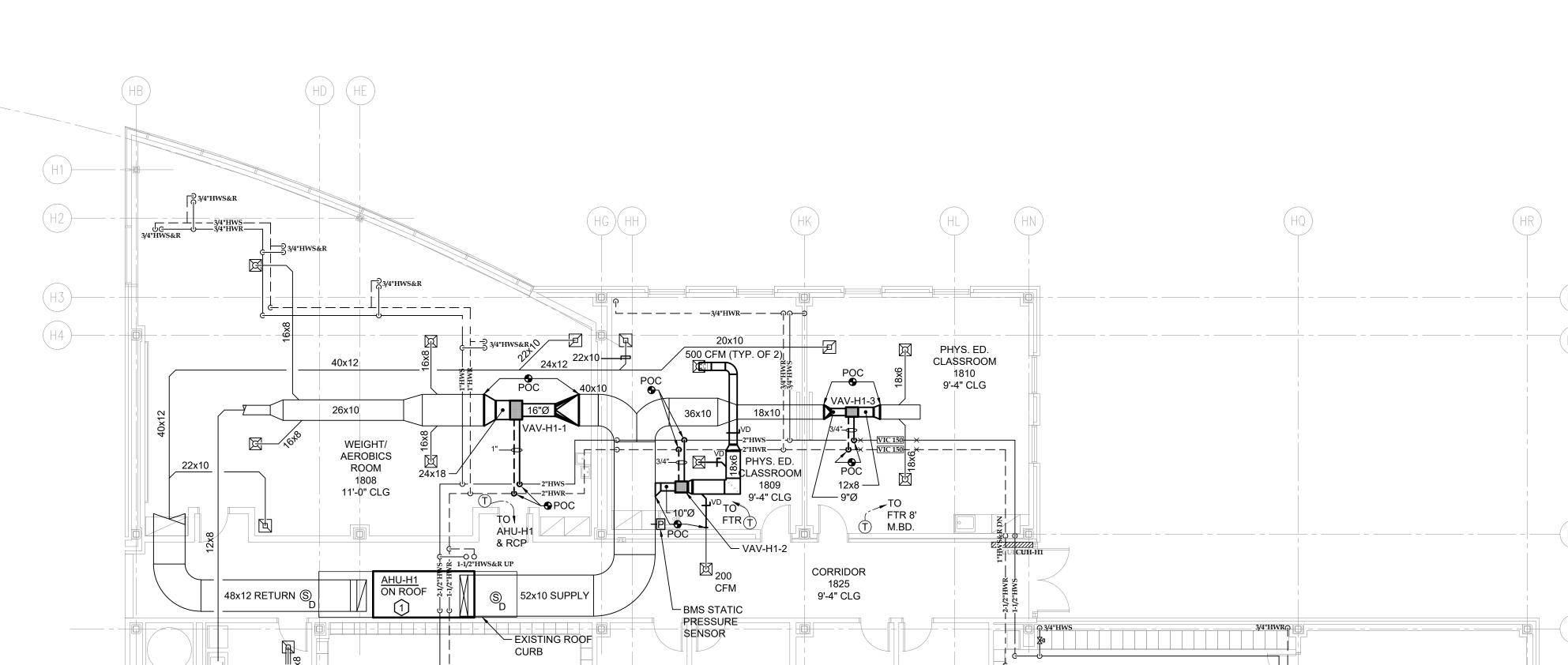
HVAC GENERAL NOTES:

1. UNLESS OTHERWISE NOTED, ALL HVAC EQUIPMENT SHALL BE EXISTING TO REMAIN.

2. BALANCE AHU-H1 TO FLOW RATES INDICATED WITHIN THE RTU SCHEDULE. BALANCE REGISTERS ASSOCIATED WITH VAV-H1-2 TO THE FLOW RATES INDICATED ON THE DRAWINGS.

HVAC KEY NOTES:

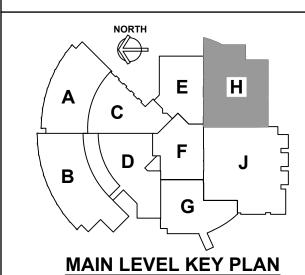
- REMOVE EXISTING AHU-H1 ON ROOF. PROVIDE REPLACEMENT AHU-H1 AND CURB ADAPTER TO ALLOW INSTALLATION ON THE EXISTING CURB AND CONNECT TO EXISTING DUCTWORK. REMOVE EXISTING HWS&R PIPING TO BELOW ROOF AND EXTEND 1 1/4" PIPING TO NEW HOT WATER COIL. VERIFY ALL DIMENSIONS IN FIELD.
- TERMINATE 1" CONDENSATE WITH 90° ELBOW DOWN ABOVE LOWER ROOF.
- MOUNT CU-1 TO EXISTING MASONRY WALL UTILIZING MANUFACTURERS WALL BRACKET.



MECHANICAL NEW WORK PART PLAN

1/8 = 1'-0"





SUBMISSION HISTORY

IOD INE

RTU REPLACEMENT for

RHAM
High School
Wall Street
Hebron, CT
06248

DWG DATA

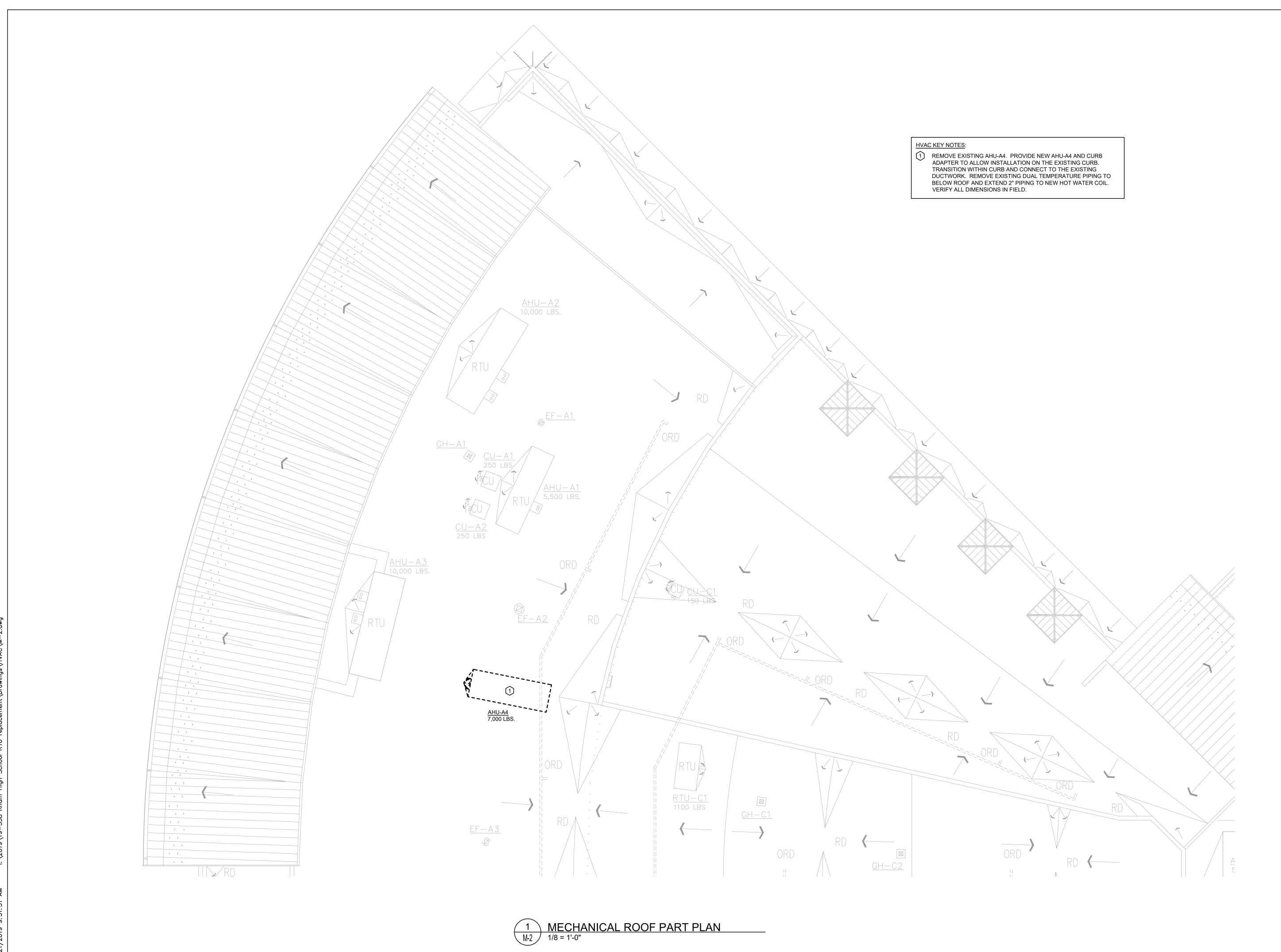
PROJECT NUMBER: 19–338
SUBMISSION DATE: 09/13/19
DRAWN: PA
REVIEWED: KH
SCALE: 1/8" = 1'-0"

DWG TITLE

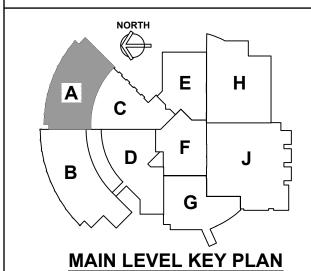
MECHANICAL PLAN

DW0

M-1







SUBMISSION HISTORY

JOB INFO

RTU REPLACEMENT for

RHAM
High School
Wall Street
Hebron, CT
06248

DWG DATA

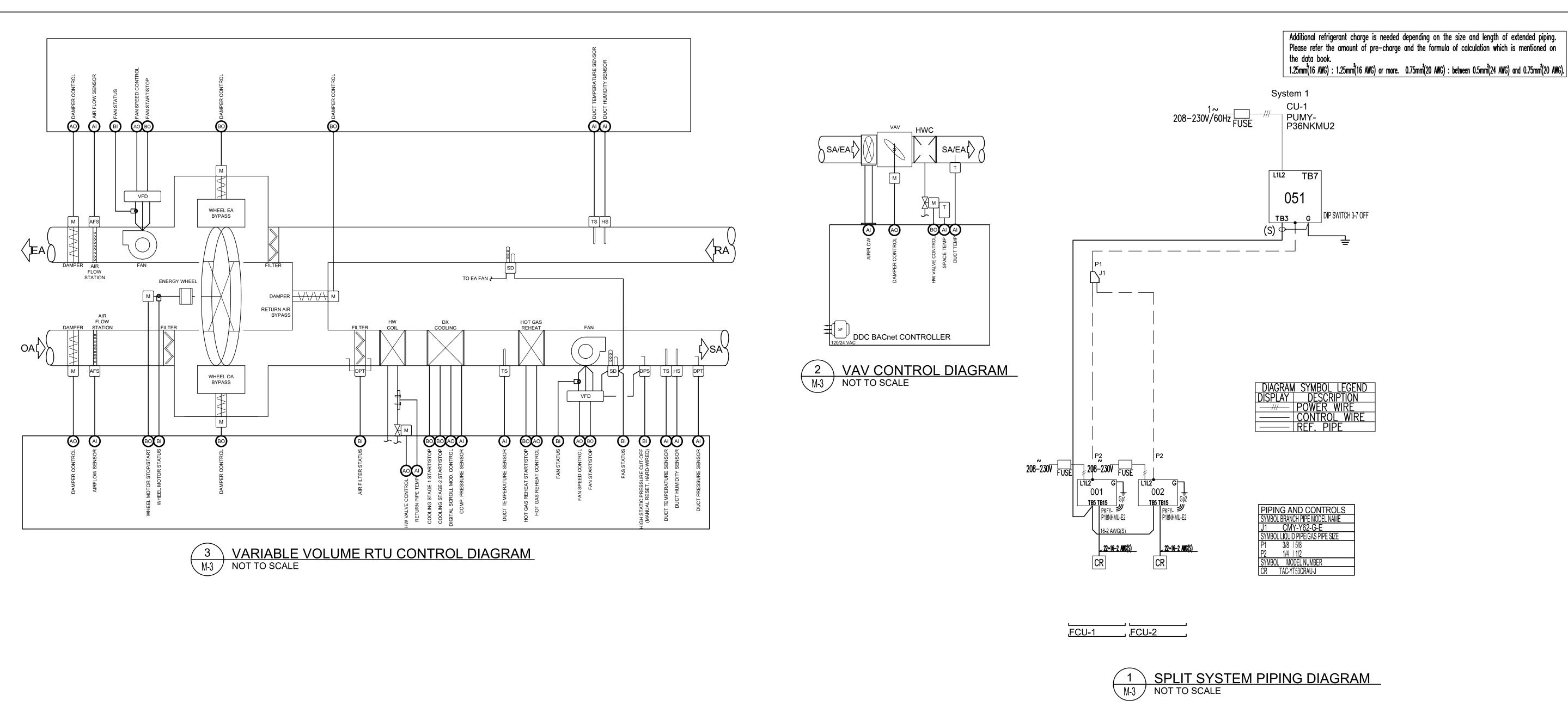
PROJECT NUMBER: 19-338 SUBMISSION DATE: 09/13/19 DRAWN: PA REVIEWED: KH SCALE: 3/32" = 1'-0"

DWG TITLE

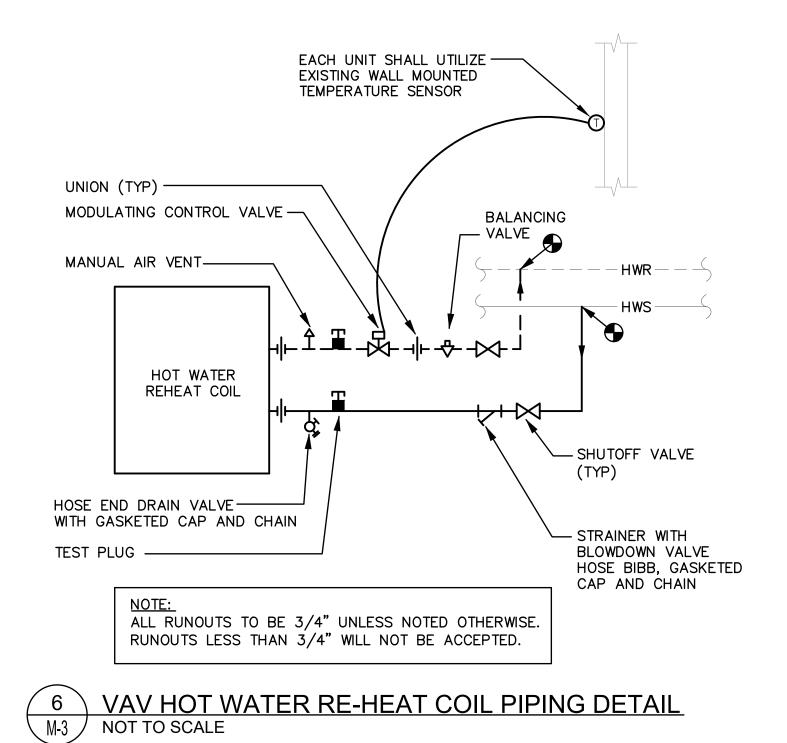
MECHANICAL ROOF PLAN

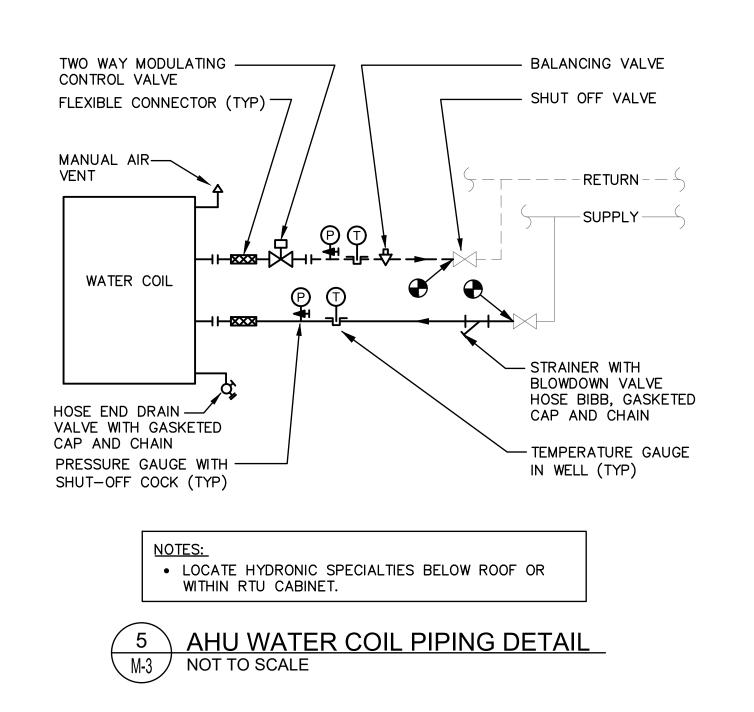
DWG ;

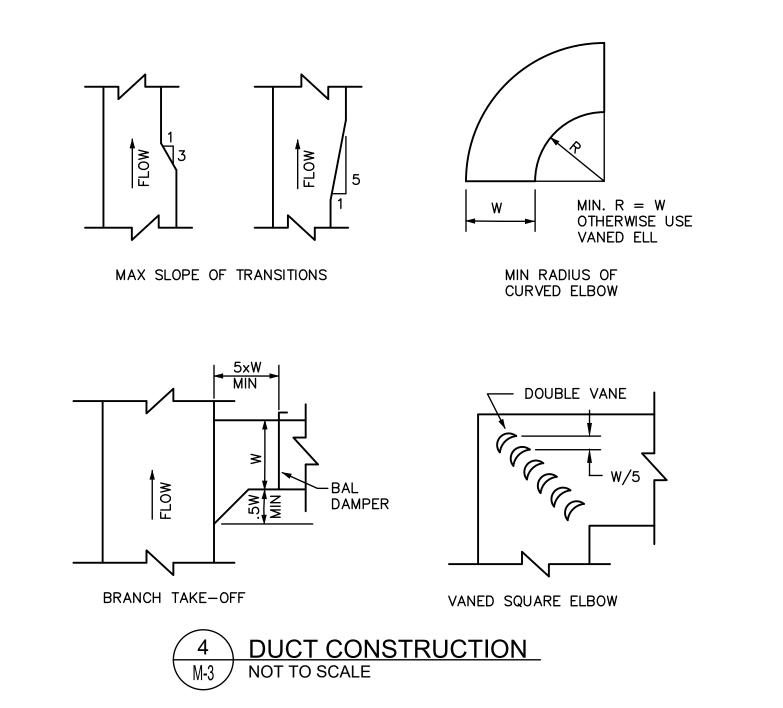
M-2



SPLIT SYSTEM PIPING DIAGRAM









SUBMISSION HISTORY

JOB INFO

RTU **REPLACEMENT** for

> **RHAM** High School Wall Street Hebron, CT 06248

DWG DATA

PROJECT NUMBER: 19-338 SUBMISSION DATE: 09/13/19 DRAWN: REVIEWED: SCALE: AS NOTED

DWG TITLE

MECHANICAL DETAILS

DWG #

PROVIDE OPTIONAL CONDENSATE PUMP SI3100-230 FOR EACH INDOOR UNIT. MOUNT CONDENSATE PUMP ABOVE CEILING.

PROVIDE MODEL DPSL1 UL LISTED DRAIN PAN LEVEL SENSOR FOR EACH INDOOR UNIT (FIELD INSTALLED.)

*COOLING PERFORMANCE BASED ON 80°F IDB, 67°F IWB AND 95°F ODB. HEATING PERFORMANCE BASED ON 70°F IDB, 45°F ODB AND 43°F OWB.

PROVIDE MANUFACTURER'S CONDENSING UNIT WALL SUPPORT BRACKET.

4. INSTALL REFRIGERANT PIPING IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

5. PROVIDE PAC-UKPRC001-CU-1 COMMUNICATION ADAPTER FOR EACH INDOOR UNIT FOR BMS COMMUNICATION. 6. PROVIDE LINE-HIDE COVER SYSTEM TO CONCEAL ALL EXPOSED REFRIGERANT AND CONDENSATE PIPING.

		SHU	JT OFF TYF	PE VAV BO	X SCHI	EDULE .	- HYDRC	NIC			
		PRIMARY AIR	RFLOW (CFM)		HEATING COIL PERFORMANCE						NC
TAG	INLET SIZE	MAXIMUM	MINIMUM	FLOW (CFM)	ROWS	LAT	GPM	LWT	PD (FT)	MAX. DISCH.	MAX. RAD.
VAV H-1 1	16	2,950	885	2,950	2	90	5.0	140.2	0.41	22	24
VAV H-1 2	10	1,200	360	1,200	2	90	2.2	142.8	0.31	18	20
VAV H-1 3	9	1,000	300	1,000	2	90	1.6	137.0	0.21	18	19

BOXES ARE BASED ON KRUEGER (MODEL# LMHS)

2. ACCEPTABLE MANUFACTURERS BY: NAILOR INDÚSTRIES INC., PRICE & TRANE.

3. 0.5" MAXIMUM ALLOWABLE STATIC PRESSURE DROP FOR BOX AND REHEAT COIL

4. HEATING COIL PERFORMANCE BASED ON NOMINAL CFM LISTED IN THE SCHEDULE @ 60° DEGREE F. ENTERING AIR TEMPERATURE, 180° DEGREE F. ENTERING WATER TEMPERATURE.

				AIR	HAN	IDLIN	IG UI	NIT :	SCHEE	DUL	E.						
TAG		MFR		N	MODEL			М	MINIMUM OA		AREA SERVED		ED	WEIGHT			
AHU-A4		AAON		RN-040			3,420		MED	A CENT	ER	7,14	7				
AHU-H1		AAON		F	RN-015	,			1,875		WEI	SHT RO	OM	2,54	.3		
						S	UPPLY	FAN									
TAG		CFM		ESP N WG)			SP WG)		RPM		I	НP		ВНР	VFD		
AHU-A4	1	3,400		3.00		4.	69		1372		(2	2)15		10.12	YES		
AHU-H1		4,600		2.75		4.	28		1858			7.5		4.57	YES		
					•	НОТ	WATE	R COIL	-				•				
TAG	EA ⁻ (°F		LAT (°F)	МВ	Н	EV (°F			LWT (°F)	,	GPM VELOCIT (FPM)		GPM VE		CITY	MAXIMUM WPD (FT)	ROW
AHU-A4	65.0	6	101.4	522	.8	180	0.0		146.4		32.0	714.7		714.7		1.0	2
AHU-H1	60.	7	98.0	188.	188.6 180		0.0		147.7		12.0		788.6 3.0		2		
		'		1		E	LECTRI	CAL							-		
TAG	N	1CA	МОС	NOCP VOLTS/ PHASE			IEEF	٦		F	REMARK	S					
AHU-A4	1	137	150		460/3			11.7	1.7				ALL				
AHU-H1		48	60		460/3		13.0)				ALL					
		1					DX CO	IL									
TAG	EAT DB/WB	LAT DB/\	WB TOTA	L MBH				RIG.	MAXIMUM VELOCITY		ROWS		N PIPE	HOT GAS REHEAT			
	(°F)	(°F)			M	ВН	TY	PE	(FPM)			SIZE (IN)		CAPACITY (MBH)	LAT (db (°F)		
AHU-A4	76.4 / 63.1	56.5 / 53		21		39	R-4		420		4		1"	250	70.0		
AHU-H1	77.9 / 64.2	53.4 / 51	.4 1	177 132		R-4		315 4			1" 95		70.0				
							KHAUST	FAN									
TAG	CFN	1		ESP (IN WG)			TSP (IN. WG)		RPM		HP		E	BHP	VFD		
AHU-A4	13,40	00	1.	00	1.63			968		(2) 5		2.95		YES			
AHU-H1	4,60	0	0.	75		1.65			1538		3		2	2.00	YES		
	ı				E	ENERGY	RECOV	ERY W	/HEEL								
	WHEEL PERFORMANCE (SUMMER)										WHEEL PE	RFORM	IANCE (WINTER)			

						_				
		•	EN	IERGY RECOVER	Y WHEEL			·		
	\	WHEEL PERFORM	ANCE (SUMMER	2)	WHEEL PERFORMANCE (WINTER)					
TAG	O.A. DB / WB (°F)	LEAVING S.A. R DB / WB (°F)		RETURN AIR DB / WB (°F)		LEAVING DB (°F)	S.A.	RETURN AIR DB (°F)		
AHU-A4	95 / 75	80.6 / 66.	2	75 / 62	0	52.7		70		
AHU-H1	95 / 75	82.1 / 67.	82.1 / 67.1		0	47.2		70		
			SOUND PC	WER DISCHARGI	E/RETURN LW(dB)		·			
TAG	1ST OCTAVE	2ND OCTAVE	3RD OCTAVE	4TH OCTAVE	5TH OCTAVE	6TH OCTAVE	7TH OCTAVE	8TH OCTAVE		
AHU-A4	96 / 88	95 / 87	94 / 84	96 / 79	94 / 79	93 / 78	86 / 77	80 / 76		
AHU-H1	94 / 90	93 / 88	99 / 90	91 / 80	83 / 77	81 / 75	78 / 71	73 / 65		

GENERAL NOTES/ACCESSORIES:

1. ACCEPTABLE MANUFACTURERS BY: VALENT, TRANE. PROVIDE UNITS WITHOUT CONTROLS FOR FIELD INSTALLATION OF CONTROLS BY THE CONTROLS CONTRACTOR.

2. AHU SHALL BE PREWIRED FOR SINGLE POINT POWER CONNECTION, INCLUDING FAN CIRCUITRY AND 120V

LIGHT/RECEPTACLE CIRCUIT WITH TRANSFORMER. 3. ALTERNATE MANUFACTURER OF EQUAL PERFORMANCE AND CAPACITY MUST HAVE SIMILAR PHYSICAL DIMENSIONS, OTHERWISE BASE MANUFACTURER MUST BE SUPPLIED. CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING DIMENSIONS IN FIELD. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL STRUCTURAL AND MECHANICAL MODIFICATIONS AT NO COST TO OWNER.

4. ROOFTOP VFD'S SHALL BE MOUNTED IN WEATHER PROOF ENCLOSURE INSTALLED BY UNIT'S MANUFACTURER.

5. PROVIDE MERV-13 FILTERS.

6. PROVIDE DUCT TRANSITION AT THE UNIT, COORDINATE STEEL FRAMING WITH AIR HANDLING SUBMITTALS AND ADJUST STEEL AS NECESSARY AT NO COST TO OWNER V.I.F.

7. PROVIDE O.A. INTAKE HOODS.

8. PROVIDE CURB ADAPTER TO ALLOW INSTALLATION ON EXISTING CURB. THE CONTRACTOR SHALL FIELD MEASURE THE EXISTING CURB AND SUBMIT SHOP DRAWINGS FOR THE ADAPTA CURB. 9. PROVIDE NON-FUSED DISCONNECT SWITCH.

10. PROVIDE 100% MODULATING OUTSIDE AIR ECONOMIZER. 11. PROVIDE HINGED SERVICE ACCESS AND STAINLESS STEEL

DRAIN PANS. 12. PROVIDE VARIABLE CAPACITY COMPRESSORS. RZ Design Associates, Inc. MECHANICAL, ELECTRICAL, AND STRUCTURAL ENGINEERING 750 OLD MAIN STREET ROCKY HILL, CT 06067 P: (860) 436-4336 F: (860) 436-4450

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SUBMISSION HISTORY

JOB INFO

RTU REPLACEMENT for

RHAM High School Wall Street Hebron, CT 06248

DWG DATA

PROJECT NUMBER: 19-338 SUBMISSION DATE: 09/13/19 DRAWN: REVIEWED:

AS NOTED

SCALE:

MECHANICAL SCHEDULES

GENERAL

- 1. 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 FEES

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.
- 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.
- 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.
- 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.

5. PROGRESS SCHEDULE

- A. THE CONTRACTOR SHALL PREPARE A CONSTRUCTION SCHEDULE IN A FORM ACCEPTABLE TO THE ENGINEER AND OWNER WITHIN TWO (2) WEEKS FROM THE EXECUTION DATE OF THE CONTRACT FOR THE ENGINEER'S AND OWNER'S APPROVAL.
- B. THE PROGRESS SCHEDULE SHALL BE IN THE FORM OF A NETWORK SCHEDULE CHART.
- C. THE PROGRESS SCHEDULE SHALL BE UPDATED AT LEAST ONCE A MONTH OR MORE FREQUENTLY, IF NECESSARY, SHOULD THE PROJECT BE FACED WITH THE THREAT OF DELAY FOR ANY REASON. SHOULD CHANGES THAT HAVE OCCURRED SINCE THE PREVIOUS SUBMISSION OF THE SCHEDULE, INDICATE PROGRESS OF ACTIVITY AND COMPLETION DATES.
- D. FURNISH THE ENGINEER AND OWNER WITH SUFFICIENT COPIES OF THE ORIGINAL SCHEDULES AND ALL UPDATED SCHEDULES AS THE OWNER OR ENGINEER MAY REQUIRE.

E. AFTER APPROVAL OF THE SCHEDULE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT IT IS ADHERED TO, AND FOR ASCERTAINING THAT PROPER COORDINATION IS MAINTAINED BETWEEN ALL OF OF THE CONTRACT.

6. SCHEDULE OF VALUES

- A. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER AND OWNER A SCHEDULE OF VALUES AT LEAST TEN (10) DAYS PRIOR TO SUBMITTING THE FIRST APPLICATION FOR PAYMENT.
- B. THE SCHEDULE OF VALUES SHALL LIST THE BREAKDOWN OF THE WORK WITH IDENTIFICATION OF PROJECT, ISSUE DATE, CONTRACTOR'S NAME AND ADDRESS.
- C. EACH ITEM SHALL BE ACCOMPANIED BY A DOLLAR VALUE ROUNDED OFF TO THE NEAREST TEN DOLLARS. AS REQUESTED BY THE ENGINEER, SUPPORT VALUES GIVEN WITH DATA THAT WILL SUBSTANTIATE THEIR CORRECTNESS.
- D. THE USE OF THE SCHEDULE OF VALUES SHALL BE ONLY AS A BASES FOR CONTRACTOR'S APPLICATION FOR PAYMENT.
- E. SUM TOTAL OF ALL COST OF ITEMS LISTED IN THE SCHEDULE SHALL BE EQUAL TO THE TOTAL CONTRACT SUM.
- F. THE SCHEDULE OF VALUES SHALL BE SUBMITTED EACH MONTH ALONG WITH THE APPLICATION FOR THE PAYMENT.

AS-BIJII T 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.
- 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 5 FEET IN LENGTH. SECURE TO DUCT TAP WITH CLAMP OR DRAWBAND. PROPERLY SUPPORT SO AS NOT TO SAG OR KINK.
- AND MOLD RESISTANT. MAXIMUM FLAME SPREAD OF 25, SMOKE DEVELOPED OF 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

5. JOINT SEALERS AND SEALANTS SHALL BE NON-HARDENING, WATER, MILDEW

- 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.)
- 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 1.0 PCF DENSITY WITH K VALUE OF 0.27 AT 75 DEG F, EQUAL TO OWENS CORNING TYPE 100 OR EQUIVALENT.
- 2. THE FOLLOWING DUCTS SHALL BE INSULATED WITH KRAFT FOIL FACED DUCT WRAP INSULATION IN 1" THICKNESS:
- A. ALL NEW CONCEALED SUPPLY AIR AND RETURN AIR DUCTWORK ABOVE CEILINGS WHETHER LINED OR UNLINED.

IPING

- 1. HOT WATER SUPPLY AND RETURN & CHILLED WATER SUPPLY AND RETURN
- A. PIPE: SCHEDULE 40 BLACK STEEL PIPE CONFORMING TO ASTM A53, WITH WELDED, THREADED OR GROOVED JOINTS.
- B. FITTINGS: ASTM A234 WROUGHT STEEL WELDING TYPE FITTINGS, ASTM B16.3 MALLEABLE IRON THREADED FITTINGS, OR GROOVED FITTINGS AND MECHANICAL COUPLINGS.
- C. FITTINGS 2" AND UNDER SHALL BE THREADED, FITTINGS 2-1/2" AND OVER SHALL BE WELDED OR GROOVED.
- D. PIPING 2" AND SMALLER MAY BE ASTM B88 TYPE K DRAWN COPPER WITH SOLDERED FITTINGS OR COPPER PRESS FITTINGS.
- 2. CONDENSATE PIPING:
- A. ASTM D1785, SCHEDULE 40 PVC PIPING WITH ASTM D2466 FITTINGS WITH SOLVENT WELDED JOINTS IN ACCORDANCE WITH ASTM D2855.
- 3. PIPING INSULATION:
- A. PROVIDE RIGID MOLDED, NONCOMBUSTIBLE FIBERGLASS PIPE INSULATION WITH WHITE KRAFT PAPER VAPOR BARRIER JACKET AND SELF-SEALING LAP JOINT AND BUTT STRIPS. INSULATION SHALL BE 1.5 PCF DENSITY WITH K VALUE OF 0.24 AT 75 DEG F. INSULATION SHALL BE RATED FOR OPERATING TEMPERATURES FROM 0 DEG F TO 850 DEG F AND BE EQUIVALENT TO OWENS CORNING ASJ-SSL II OR EQUIVALENT.
- B. FITTINGS SHALL BE COVERED WITH FLEXIBLE FIBERGLASS INSULATION AND ZESTON PVC FITTING COVERS.
- C. ALL INSULATION MATERIALS, INCLUDING JACKETS AND ADHESIVES, SHALL MEET THE REQUIREMENTS OF NFPA 90A, ACCORDING TO ASTM TEST E-84, NFPA 255 AND UL 723, HAVING A FLAME-SPREAD RATING OF NOT OVER 25, A SMOKE-DEVELOPED RATING OF NOT OVER 50 AND A FUEL-CONTRIBUTED RATING OF NOT OVER 50.
- D. PROVIDE 1 1/2" INSULATION ON PIPING LESS THAN 1 1/2" DIAMETER AND 2" INSULATION ON PIPING 1 1/2" DIAMETER AND HIGHER.
- 4. PIPING INSTALLATION
- A. ALL PIPE CONNECTIONS SHALL BE INSTALLED TO ALLOW FOR FREEDOM OF MOVEMENT OF THE PIPING DURING EXPANSION AND CONTRACTION WITHOUT SPRINGING. SWING JOINTS, EXPANSION LOOPS AND EXPANSION JOINTS WITH PROPER ANCHORS AND GUIDES SHALL BE PROVIDED BY THE CONTRACTOR WHERE NECESSARY AND/OR WHERE SHOWN ON THE DRAWINGS. ANCHORS AND GUIDES SHALL BE SUBJECT TO THE REVIEW OF THE ENGINEER. PAY PARTICULAR ATTENTION TO PLASTIC PIPING WITH HIGH COEFFICIENTS OF EXPANSION.
- B. REMOVE SCALE AND DIRT ON INSIDE AND OUTSIDE OF PIPE BEFORE
- C. AFTER COMPLETION, FILL, CLEAN AND TREAT SYSTEM. VENT AIR FROM
- D. INSTALL HOT WATER AND CHILLED WATER PIPING TO ASME B31.9 REQUIREMENTS.
- E. 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.
- F. PIPING SYSTEMS SHALL BE PERMANENTLY LABELED TO IDENTIFY FLUID INSIDE PIPES, DIRECTION OF FLUID FLOW AND APPROXIMATE WORKING PRESSURE. LABELING SYSTEM SHALL BE "OPTI-CODE" WITH "ARROWS ON A ROLL TAPE" PERMANENTLY AFFIXED TO PIPING AS MANUFACTURED BY SETON NAME PLATE CORP., OR AN ACCEPTED EQUIVALENT.
- G. UNIONS ARE TO BE USED AT CONNECTIONS TO FIXTURES AND OTHER APPARATUS TO ALLOW EASY REMOVAL. PROVIDE ACCEPTABLE DIELECTRIC UNIONS OR ADAPTERS AT ALL CONNECTIONS BETWEEN FERROUS AND NON-FERROUS PIPING.
- H. ANY EXPOSED, UNINSULATED PIPING LOCATED IN FINISHED AREAS WHERE PIPING PASSES THROUGH WALLS, FLOOR OR CEILING, SHALL BE CHROME-PLATED WITH CHROME-PLATED ESCUTCHEONS.
- I. PROVIDE HOSE BIB DRAINS WITH BRASS CAPS AT LOW POINTS OF PIPING RISERS FOR DRAINAGE.

5. PIPE HANGERS AND SUPPORTS

- A. ALL HANGER, SUPPORT AND ANCHOR TYPES OR MODEL NUMBERS SPECIFIED HEREIN ARE BASED ON GRINNELL OR ACCEPTABLE EQUIVALENT SUPPORTS SHALL CONFORM TO MSS-SP-69 AND ANSI B31.1. WIRE AND/OR STRAP HANGERS WILL NOT BE ACCEPTABLE.
- B. ALTERNATE PIPING SUPPORT SYSTEMS MAY BE ACCEPTABLE BASED ON TYPE AND SIZE OF PIPING INSTALLED AND SUPPORT SYSTEM EMPLOYED. STRUT SYSTEMS SUCH AS B-LINE, UNI-STRUT, SUPER STRUT, ETC. WITH INTEGRAL PIPE CLAMPING AND SUPPORTING HARDWARE OR INNOVATIVE SUPPORT PRODUCTS MAY BE ACCEPTED. SUBMIT A DRAFT SUBMITTAL TO ENGINEER PRIOR TO OFFICIAL SUBMITTAL FOR APPROVAL TO DETERMINE ACCEPTABILITY OF ALTERNATIVE SUPPORT SYSTEMS.
- C. IN NO CASE SHALL PIPING BE BOTTOM OR FLOOR SUPPORTED ON THREADED ROD ONLY. A MANUFACTURED SUPPORT / BASE SHALL BE EMPLOYED WHICH IS DURABLE AND SUITABLE RESISTANT TO THE EFFECTS OF CORROSION AND MINOR IMPACT.
- D. HANGERS FOR PIPE SIZES TWO (2") INCHES AND SMALLER SHALL BE LIGHT-DUTY, CLEVIS-TYPE HANGERS, #65. FOR COPPER PIPES TWO (2") INCHES AND SMALLER, USE CT-69 COPPER BAND HANGERS OR CT-65 COPPER PLATED CLEVIS.
- E. HANGERS FOR PIPING OVER 2-1/2 INCHES SHALL BE GENERAL-DUTY, CLEVIS-TYPE HANGERS, #260. FOR COPPER SIZES 2-1/2 INCHES THROUGH 4 INCHES, USE CT-65. THESE HANGERS MAY BE USED FOR LARGER SIZES IN PLASTIC DRAINAGE PIPING. USE SADDLES OR INSULATION PROTECTORS FOR PLASTIC PIPE OR USE FEE & MASON FIGURE 108.
- F. FOR INSULATED COLD AND/OR CHILLED WATER PIPING SYSTEMS, HANGERS SHALL BE SIZED FOR THE SPECIFIED INSULATION THICKNESS. PROVIDE

NON-COMPRESSIBLE, FOAM-TYPE PIPE COVERING SADDLES OF THE REQUIRED THICKNESS AND A SHEET METAL HANGER SADDLE TO PREVENT CRUSHING OF INSULATION BY THE HANGER. INSULATED HOT WATER PIPING MAY BE INSTALLED WITH LINE- SIZE HANGERS. INSULATE AROUND HANGER.

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.
- 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 SPLIT 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.

TESTING, ADJUSTING AND BALANCING

- AFTER COMPLETION OF THE WORK, BUT BEFORE SUBSTANTIAL COMPLETION, TEST, ADJUST AND BALANCE ALL AIR AND WATER SYSTEMS IN ACCORDANCE WITH EITHER AABC, NEBB, OR TABB STANDARDS.
- 2. TESTING AND BALANCING CONTRACTORS SHALL BE CERTIFIED BY EITHER AABC, NEBB OR TABB.
- 3. AIR HANDLING SYSTEMS SHALL BE BALANCED TO WITHIN PLUS OR MINUS 5 PERCENT OF DESIGN FOR SUPPLY SYSTEMS AND PLUS OR MINUS 10 PERCENT FOR RETURN AND EXHAUST SYSTEMS.
- 4. AIR OUTLETS AND INLETS SHALL BE BALANCED TO WITHIN PLUS 10 PERCENT AND MINUS 5 PERCENT OF DESIGN TO SPACE. ADJUST OUTLETS AND INLETS IN SPACE TO WITHIN PLUS OR MINUS 10 PERCENT OF DESIGN.
- 5. ADJUST HYDRONIC SYSTEMS TO WITHIN PLUS OR MINUS 10 PERCENT OF
- 6. PERMANENTLY MARK SETTINGS OF VALVES, DAMPERS, AND OTHER ADJUSTMENT DEVICES ALLOWING SETTINGS TO BE RESTORED. SET AND LOCK MEMORY STOPS
- 7. SUBMIT FINAL REPORT INDICATING DESIGN VERSUS FINAL PERFORMANCE; NOTABLE CHARACTERISTICS OF THE SYSTEM; DESCRIPTION OF SYSTEMS OPERATION SEQUENCE; TEST CONDITIONS; AND A LIST OF INSTRUMENTS USED. FINAL REPORT SHALL BE SUBMITTED PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT.

HVAC INSTRUMENTATION AND CONTROLS

- THE HVAC CONTRACTOR SHALL ENGAGE AUTOMATED BUILDING SYSTEMS, INC AS THE CONTROL CONTRACTOR.
- 2. FURNISH AND INSTALL COMPLETE TEMPERATURE CONTROL FOR ALL NEW HVAC SYSTEMS CONNECTED TO THE EXISTING ABS BUILDING MANAGEMENT SYSTEM.
- OTHER RELATED DEVICES FOR A COMPLETE OPERATIONAL SYSTEM PER THE SEQUENCE OF OPERATION AND INDUSTRY STANDARDS.

3. PROVIDE NEW CONTROL DEVICES INCLUDING TEMPERATURE SENSORS AND

4. MOUNT ALL CONTROLS FURNISHED AS ACCESSORIES TO EQUIPMENT AND PROVIDE ALL CONTROL WIRING REQUIRED FOR PROPER OPERATION.

SEQUENCE OF OPERATION A. AHU-A4, MEDIA CENTER

- THE EXISTING CONTROL SEQUENCE FOR AHU-A4 SHALL BE UTILIZED TO CONTROL THE NEW AHU-A4 WITH THE FOLLOWING REVISIONS:
- a. WHEN THE DUAL TEMPERATURE SYSTEM IS OPERATING IN CHILLED WATER MODE, THE COIL CONTROL VALVE SHALL BE CLOSED AND THE COMPRESSORS SHALL BE MODULATED TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.
- b. THE AHU-A4 DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE 55 °F. IN THE EVENT A SPACE IS OVERCOOLED WITH THE ASSOCIATED AIR TERMINAL UNIT AT THE MINIMUM POSITION, THE AIR TERMINAL UNIT REHEAT COIL HOT WATER VALVE SHALL BE UTILIZED TO MAINTAIN SPACE TEMPERATURE IF THE DUAL TEMPERATURE SYSTEM IS OPERATING IN HEATING MODE. IN THE EVENT THE DUAL TEMPERATURE SYSTEM IS OPERATING IN COOLING MODE, THE AHU-A4 DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE RESET UPWARD TO MAINTAIN SPACE TEMPERATURE. SHOULD THE OUTSIDE AIR DEW POINT BE GREATER THAN 55 °F OR THE AHU-A4 RETURN AIR HUMIDITY BE GREATER THAN 55%, THE AHU-A4 COOLING COIL DISCHARGE AIR TEMPERATURE SHALL BE 55 °F AND TEMPERATURE RESET SHALL BE ACCOMPLISHED UTILIZING THE HOT GAS REHEAT.
- c. DURING NON-ECONOMIZER OPERATION, THE AHU-A4 EXHAUST FAN SPEED SHALL TRACK THE OUTSIDE AIR DAMPER POSITION AND THE ENERGY RECOVERY WHEEL SHALL BE BYPASSED AND THE ENERGY RECOVERY WHEEL SHALL BE DISABLED. DURING ECONOMIZER OPERATION, THE AHU-A4 EXHAUST FAN SPEED SHALL TRACK THE SUPPLY FAN SPEED AND THE OUTSIDE AIR AND EXHAUST AIR STREAMS SHALL BE ALIGNED TO THE ENERGY RECOVERY WHEEL AND

B. AHU-H1, WEIGHT ROOM

1. THE REVISED AHU-A4 SEQUENCE OF OPERATION ABOVE SHALL BE

THE ENERGY RECOVERY WHEEL SHALL BE OPERATING.

UTILIZED FOR AHU-H1.

SETPOINT.

- C. WEIGHT ROOM SPLIT SYSTEMS

 1. THE ATC CONTRACTOR SHALL INTEGRATE THE HEAT PUMPS INTO THE BMS VIA BACNET MSTP. THE BMS SHALL BE ABLE TO ADJUST THE HEAT PUMP SET POINT AND OPERATING MODE. THE HEAT PUMPS SHALL OPERATE ON THEIR RETURN AIR SENSORS TO MAINTAIN TEMPERATURE
- 2. SHOULD THE WEIGHT ROOM SPACE TEMPERATURE EXCEED THE SPACE TEMPERATURE SETPOINT BY 2 °F, THE BMS SHALL ENABLE THE SPLIT SYSTEMS. SHOULD THE WEIGHT ROOM AIR TERMINAL UNIT BEGIN TO MODULATE CLOSED, THE BMS SHALL DISABLE THE SPLIT SYSTEMS.
- D. THE ATC CONTRACTOR SHALL UPDATE THE BMS GRAPHICS TO REFLECT THE NEW HVAC CONFIGURATION.

RZ Design Associates, Inc.

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SEAL

SUBMISSION HISTORY

JOB INFO

RTU REPLACEMENT

RHAM
High School
Wall Street
Hebron, CT

DWG DATA

PROJECT NUMBER: 19-338
SUBMISSION DATE: 09/13/19
DRAWN: PA
REVIEWED: KH

AS NOTED

DWG TITLE

SCALE:

MECHANICAL SPECIFICATIONS

200 "

M-5

ELECTRICAL GENERAL NOTES

- 1. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH CURRENT APPLICABLE CODES, ORDINANCES, THE REGULATORY AGENCIES HAVING JURISDICTION AND THE SPECIFICATIONS. THE SPECIFICATIONS MAY EXCEED THE 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 ELECTRICAL SYSTEM SHALL BE COMPLETE IN ALL RESPECTS; OPERATIONAL, TESTED, ADJUSTED, APPROVED BY THE AUTHORITIES HAVING JURISDICTION AND READY FOR BENEFICIAL USE BY THE OWNER.
- THE TRADES SHALL OBTAIN AND REVIEW ALL CONTRACT DOCUMENTS BEFORE SUBMITTING A 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.
- 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 TO DETAILS, SCHEDULES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- 5. THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT DOCUMENTS OF ALL TRADES. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND CONDUITS. THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF EQUIPMENT AND CONDUITS INSTALLATION WITH ALL THE TRADES BEFORE COMMENCING WORK.
- 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. THE CONTRACTOR SHALL COORDINATE LOCATIONS OF ACCESS PANELS FOR ALL DEVICES, REQUIRING ACCESS, WITH THE ARCHITECT, PRIOR TO INSTALLATION OF SUCH DEVICES OR OTHER APPURTENANCES.
- 7. 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).
- THIS CONTRACT SHALL INCLUDE ALL THE NECESSARY CONDUITS, FITTINGS, TRANSITIONS ETC. AS REQUIRED TO INSTALL CONDUITS 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.
- 9. DO NOT INSTALL ANY ELECTRICAL PANELS, TRANSFORMERS, SPECIAL EQUIPMENT, BELOW PIPING OR THROUGH MECHANICAL ROOMS, THAT ARE NOT ASSOCIATED WITH OR SERVE THE RESPECTIVE ROOMS. COORDINATE THE LOCATION OF MECHANICAL EQUIPMENT IN THE FIELD AND ADJUST AS NECESSARY.
- 10. ALL HOMERUNS SHALL BE 2#12, 1#12G., 3/4"C TO 20A-1P CIRCUIT BREAKER IN PANEL DESIGNATED UNLESS OTHERWISE
- 11. ALL 120 VAC (277 VAC) CIRCUITS EXCEEDING 150' IN LENGTH SHALL BE INCREASED TO 2#10, 1#10G, 3/4" CONDUIT UNLESS OTHERWISE NOTED.
- 12. ALL BRANCH CIRCUITS SHALL BE PROVIDED WITH SEPARATE NEUTRALS. USE OF COMMON NEUTRALS WILL NOT BE ALLOWED.
- 13. FIELD VERIFY WITH MANUFACTURER'S PROVIDED EXACT ELECTRICAL CHARACTERISTICS AND CONNECTION REQUIREMENTS OF ALL OPERATIONAL EQUIPMENT PRIOR TO MAKING ELECTRICAL POWER CONNECTION. FURNISH AND
- 14. RECEPTACLES LOCATED WITHIN 6' OF A WATER SOURCE, OR OUTSIDE, AND WHERE REQUIRED BY CODE SHALL BE PROVIDED WITH GFCI PROTECTION, WHETHER INDICATED OR NOT.
- 15. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL REQUIRED SLEEVES AND FIRE STOP FOR CONDUITS AND CABLES
- 16. ELECTRICAL CONTRACTOR SHALL SEAL ALL CONDUITS PENETRATING EXTERIOR WALLS.

INSTALL SAFETY DISCONNECT AS REQUIRED BY NEC.

PENETRATING FIRE RATED WALLS AND FLOORS.

- 17. ALL WIRING SHALL BE IN CONDUIT, UNLESS OTHERWISE INDICATED. CONDUITS SHALL BE RUN CONCEALED IN NEW WALLS AND ABOVE CEILINGS.
- 18. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL LOCATIONS OF EQUIPMENT WITH DIV. 21, 22 AND 23 PRIOR TO ROUGHING OR INSTALLING OUTLETS.
- 19. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER, ALL LOCATIONS OF EQUIPMENT BEING FURNISHED BY THE OWNER PRIOR TO ROUGHING OR INSTALLING OUTLETS.
- 20. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATIONS AND EXACT LOCATION OF DEVICES PRIOR TO ROUGHING OR
- 21. CONDUITS AND/OR WIRING SHALL NOT PENETRATE STAIR ENCLOSURES UNLESS SPECIFICALLY SERVING EQUIPMENT OR
- DEVICES LOCATED WITHIN STAIR ENCLOSURE.

 22. WHERE INDICATED, PROVIDE FIXTURES WITH EMERGENCY BATTERY TO OPERATE LAMPS FOR 1 1/2 HOURS UPON LOSS
- OF NORMAL POWER. WIRE EMERGENCY BATTERY AND EXIT LIGHTS TO LINE SIDE OF AREA LIGHTING CIRCUIT.

 23. DIRECTIONAL CHEVRONS SHALL CONFORM TO NFPA 5-10.4.1.2 AND SHALL BE IDENTIFIABLE AS A DIRECTIONAL
- 23. DIRECTIONAL CHEVRONS SHALL CONFORM TO NEPA 5-10.4.1.2 AND SHALL BE IDENTIFIABLE AS A DIRECTIONAL INDICATOR AT A MINIMUM OF 40 FT. UNDER ALL SPACE CONDITIONS. PROVIDE DIRECTIONAL CHEVRONS AS INDICATED ON PLAN.
- 24. BRANCH CIRCUIT WIRING IS SHOWN ON THE FLOOR PLANS. NUMERALS ADJACENT TO THE HOMERUN SYMBOLS FOR LIGHTING, RECEPTACLES, MOTORS, APPLIANCES, ETC. INDICATE THE CIRCUIT NUMBER TO WHICH THE ITEMS ARE TO BE CONNECTED. PROVIDE BRANCH CIRCUIT WIRING FOR ALL ITEMS SHOWN IN ACCORDANCE WITH THESE GENERAL NOTES AND THE ELECTRICAL SPECIFICATIONS.
- 25. ALL 1 POLE, 15 AND 20 AMPERE BRANCH CIRCUITS SERVING RECEPTACLE OR LIGHTING SHALL BE 2 WIRE CIRCUITS PROVIDING AN INDIVIDUAL NEUTRAL CONDUCTOR FOR EACH UNGROUNDED (HOT) CIRCUIT CONDUCTOR. DO NOT SHARE NEUTRAL CONDUCTORS.
- 26. REFER TO ARCHITECTS REFLECTED CEILING PLAN FOR EXACT LOCATIONS OF CEILING MOUNTED DEVICES.
- 27. ALL EXPOSED CABLES OF ANY TYPE IN PLENUM CEILING SPACE SHALL BE PLENUM RATED.
- 28. CONTRACTOR SHALL PROVIDE ALL NECESSARY MISCELLANEOUS STEEL FOR THE SUPPORT OF ALL EQUIPMENT, PIPING, CONDUIT AND DUCTWORK. SUSPENDED FROM SLAB, STEEL, WALL OR TRUSSWORK.
- 29. ALL PENETRATIONS OF FLOORS AND WALLS (WHETHER OR NOT FIRE RESISTANCE RATED) SHALL BE PROVIDED WITH A THROUGH PENETRATION PROTECTION SYSTEM (FIRESTOPPING). EACH THROUGH PENETRATION PROTECTION SYSTEM SHALL BE TESTED IN ACCORDANCE WITH ASTM E814 AND BE LISTED FOR THE TYPE OF FLOOR OR WALL ASSEMBLY PENETRATED AND THE TYPE OF PROTECTION SYSTEM.
- 30. IT IS NOT THE INTENTION TO SHOW EVERY FITTING, HANGER, WIRE OR DEVICE, ALL SUCH ITEMS SHALL BE FURNISHED AND INSTALLED AS NECESSARY FOR A COMPLETE SYSTEM.
- 31. SEE SPECIFICATION SECTION "ELECTRICAL IDENTIFICATION" FOR PROPERLY LABELING EQUIPMENT WIRING, BOXES, ETC.
- SWITCHING SCHEMES.

32. CONTRACTOR SHALL DETERMINE THE QUANTITY OF CONDUCTORS REQUIRED FOR PROPER OPERATION OF ALL

LOCAL AUTHORITY HAVING JURISDICTION.

33. PROVIDE ALL BONDING AND GROUNDING REQUIRED BY THE NATIONAL ELECTRIC CODE, NFPA 70 AND AS REQUIRED BY

- 34. ALL REQUIRED BONDING CONDUCTORS SHALL BE MINIMUM #8 SOLID INSULATED COPPER, PROVIDE ALL NECESSARY FITTINGS, JUNCTION BOXES, END FITTINGS, ETC., FOR A COMPLETE, CONTINUOUS INSTALLATIONS.
- 35. ALL BONDING/GROUNDING CONNECTIONS SHALL BE MADE BY LISTED CLAMP OR CONNECTORS AS REQUIRED BY ARTICLE 250 OF NFPA 70, THE NATIONAL ELECTRIC CODE (CURRENT ADOPTED EDITION).
- 36. SEISMICALLY SUPPORT THE EQUIPMENT AS REQUIRED BY CODE, THE AUTHORITY HAVING JURISDICTION, AND/OR AS SPECIFIED. SUBMIT ENGINEERED INSTALLATION DETAILS PER THE SPECIFICATIONS. THE CONTRACTOR'S SEISMIC ENGINEER SHALL REVIEW THE INSTALLATION AND PROVIDE A DETAILED REPORT FOR THE RECORD.

ELECTRICAL DEMOLITION NOTES

- BEFORE SUBMITTING BID, THE CONTRACTORS SHALL VISIT THE JOB SITE AND BECOME FULLY FAMILIAR WITH THE EXISTING CONDITIONS AND THE DOCUMENTS OF OTHER TRADES UNDER WHICH THEIR WORK WILL BE ACCOMPLISHED. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY ASSUMPTIONS, OMISSIONS OR ERRORS MADE AS A RESULT OF FAILURE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS.
- 2. THE CONTRACTOR SHALL COORDINATE AND SCHEDULE ANY DAILY INTERRUPTIONS OR SHUTDOWNS OF THE EXISTING SYSTEMS IN ADVANCE WITH OWNER'S DESIGNATED REPRESENTATIVE. THIS SHALL INCLUDE SERVICES INTERRUPTIONS AND CONNECTIONS, MECHANICAL AND ELECTRICAL DISRUPTIONS EFFECTING OTHER TRADES. INCLUDE ALL WORK REQUIRED TO ALLOW PHASED CONSTRUCTION WHERE NECESSARY.
- 3. DEMOLITION DRAWINGS ARE STRICTLY DIAGRAMMATIC AND SHOW GENERAL ARRANGEMENT AND APPROXIMATE LOCATION OF EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT. IT IS NOT THE INTENT OF THESE DRAWINGS TO SHOW ALL EQUIPMENT, PIPING OR CONDUIT TO BE REMOVED. EQUIPMENT NOT BEING REUSED SHALL BE REMOVED, INCLUDING ALL ASSOCIATED HANGERS, SUPPORTS, PIPES, CONDUITS, WIRES, AND CONTROLS BACK TO THE POINT OF ORIGIN.
- 4. REFER TO THE ARCHITECTURAL DEMOLITION DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS. THE FULL EXTENT OF THE DEMOLITION AND RECONSTRUCTION SCOPE OF WORK SHALL BE DETERMINED BY THE ENTIRE SET OF BID DOCUMENTS.
- 5. THE CONTRACTORS SHALL COORDINATE THE DEMOLITION SCOPE OF WORK WITH THE GENERAL CONTRACTOR'S OR CONSTRUCTION MANAGER'S PHASING SCHEDULE PRIOR TO COMMENCEMENT OF WORK. CARE MUST BE TAKEN SO AS NOT TO DESTROY, REMOVE OR DEMOLISH ANY EQUIPMENT, APPURTENANCES OR DEVICES INTENDED TO REMAIN. PROVIDE TEMPORARY SERVICES AND SYSTEM MODIFICATIONS TO ACCOMMODATE CONTINUOUS OPERATION OF ACTIVE SYSTEM.
- 6. THE LOCATION OF EXISTING ELECTRICAL SYSTEM SHOWN ON FLOOR PLANS, IS BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL FIELD VERIFY PRIOR TO COMMENCEMENT OF CONSTRUCTION, EXACT QUANTITY AND LOCATION(S) OF EXISTING EQUIPMENT, PANELS, CONDUITS, LIGHTING, ETC. TO BE REMOVED AND ADJUST AS NECESSARY
- 7. ALL EQUIPMENT, AND ASSOCIATED WIRING, CONDUITS INDICATED TO BE REMOVED OR RELOCATED, SHALL BE DISCONNECTED AND REMOVED, INCLUDING HANGERS AND OTHER COMPONENTS. NO EQUIPMENT, WIRING OR CONDUITS SHALL BE ABANDONED IN PLACE. UNLESS SPECIFICALLY NOTED.
- 8. ALL SYSTEMS TO BE REMOVED SHALL BE REMOVED BACK TO THE POINT OF SOURCE. THE CONTRACTOR SHALL VERIFY WHICH SYSTEMS MUST REMAIN ACTIVE TO SERVE ADJACENT SPACES DURING CONSTRUCTION. SHOULD THE CONTRACTOR ENCOUNTER, DURING DEMOLITION OF EXISTING WALLS OR CHASES, ANY WIRING OR CONDUIT WHICH MUST REMAIN ACTIVE, IMMEDIATELY GIVE NOTICE TO THE ENGINEER, GENERAL CONTRACTOR OR CONSTRUCTION MANAGER.
- 9. ALL SALVAGEABLE MATERIALS OR EQUIPMENT TO BE REMOVED SHALL BE TURNED OVER TO THE OWNER AT THE END OF EACH DAY. ITEMS REMOVED AND NOT REUSED OR CLAIMED BY THE OWNER SHALL BECOME PROPERTY OF THE TRADE CONTRACTOR AND SHALL BE TRANSPORTED FROM THE SITE. SITE STORAGE OF REMOVED ITEMS WILL NOT BE PERMITTED.
- 10. PROPERLY DISPOSE OF ALL DEMOLISHED EQUIPMENT IN COMPLIANCE WITH CODES AND REGULATIONS; THIS APPLIES TO HAZARDOUS MATERIALS AND CONTAMINATED ITEMS TO BE DEMOLISHED.
- 11. THE CONTRACTOR SHALL OBTAIN EXISTING ELECTRICAL DRAWINGS FROM THE OWNER IF AVAILABLE TO HELP DETERMINE FULL SCOPE OF WORK.

ELECTRICAL LEGEND

N O T E : ALL MOUNTING HEIGHTS GIVEN ARE TO CENTERLINE OF DEVICE UNLESS OTHERWISE NOTED.

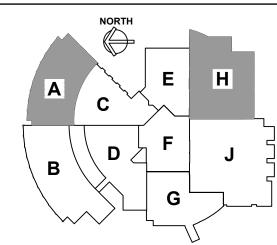
SYMBOL	DESCRIPTION
	CEILING RECESSED MOUNTED LIGHT FIXTURE — SUBLETTER INDICATES TYPE
0	PENDANT (OR CABLE) MOUNTED LIGHT FIXTURE — SUBLETTER INDICATES TYPE
	LIGHT FIXTURE CONNECTED TO EMERGENCY LIGHTING CIRCUIT — SUBLETTER INDICATES TYPE
	TRACK LIGHT FIXTURE - INCLUDES ALL TRACK, CONNECTORS, POWER FEEDS, ETC - SUBLETTER INDICATES TYPE
<u> </u>	CEILING RECESSED WALL WASH LIGHT FIXTURE — SUBLETTER INDICATES TYPE
→	EMERGENCY BATTERY UNIT WITH TWO DIRECTIONAL HEADS — COORDINATE LOCATION AND MOUNTING WITH OWNER/ARCHITECT
⊠ ▼	SINGLE/DOUBLE FACE EXIT SIGN WITH BATTERY AND DIRECTIONAL ARROWS AS SHOWN — CEILING MOUNTED
S	SINGLE POLE TOGGLE SWITCH - MOUNT AT 48" A.F.F.
	DIMMER SWITCH - MOUNT AT 48" A.F.F.
S _D	
S _{oc}	WALL MOUNTED OCCUPANCY SENSOR SWITCH WITH MANUAL OVERRIDE — MOUNT AT 48" A.F.F.
<u></u>	CEILING MOUNTED OCCUPANCY SENSOR SWITCH
SA	EMERGENCY "CALL-FOR-AID" SWITCH - MOUNT AT 48" A.F.F. WITH PULL CORD TO 6" A.F.F.
B	EMERGENCY "CALL-FOR-AID" BUZZER/LIGHT - MOUNT ABOVE DOOR
€	GROUNDED DUPLEX RECEPTACLE - MOUNT AT 18" A.F.F. U.N.O.
⇒ A	GROUNDED DUPLEX RECEPTACLE - MOUNT ABOVE COUNTER BACKSPLASH OR 42" A.F.F.
- ⊕GFI	GROUNDED DUPLEX RECEPTACLE — GFI TYPE — SEE NOTE BELOW
Ю	SPECIAL PURPOSE RECEPTACLE - MATCH NEMA CONFIGURATION OF EQUIPMENT SERVED - MOUNT AT 18" A.F.F. U.N.O.
•	GROUNDED DOUBLE DUPLEX RECEPTACLE - MOUNT AT 18" A.F.F. U.N.O.
₩7	FLOOR MOUNTED RECEPTACLE/TELEDATA DEVICE. PROVIDE WIREMOLD EVOLUTION SERIES FLOOR BOX FOR ON GRADE APPLICATION.
4	TECHNOLOGIES OUTLET — MOUNT AT 18" AFF UNLESS OTHERWISE NOTED:
9 ●	POWER AND TEL/DATA CONNECTION POINT FOR SYSTEMS FURNITURE FEED
J	JUNCTION BOX
<i>\O</i> '	MOTOR
S _T	THERMAL OVERLOAD SWITCH - MOUNT AT FRACTIONAL HP MOTORS
占	DISCONNECT SWITCH
궙	FUSED DISCONNECT SWITCH
E	MANUAL FIRE ALARM PULL STATION — MOUNT AT 48" A.F.F.
	FIRE ALARM VISUAL ONLY INDICATING UNIT — MOUNT AT 6'-8" AFF
	FIRE ALARM HORN AND VISUAL INDICATING UNIT — MOUNT AT 6'—8" A.F.F.
	SMOKE DETECTOR
\$	
\$ 	DUCT SMOKE DETECTOR - LOCATE TEST SWITCHES IN CEILING BELOW
FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM ANNUCIATOR
<i></i>	ELECTRIC PANEL — SEE PANEL SCHEDULES FOR VOLTAGE, RATING AND FEEDER SIZE.
TC	TIMECLOCK
DL	ELECTRIFIED DOOR LOCK - COORDINATE REQUIREMENTS WITH HARDWARE PROVIDED.
K	ACCESS CONTROL CARD READER DEVICE - COORDINATE REQUIREMENTS, INCLUDING PROGRAMMING WITH OWNER.
Α	AMPERE
A.F.F.	ABOVE FINISHED FLOOR
C	CONDUIT
C/B	CIRCUIT BREAKER
CIR	CIRCUIT
CUH	CABINET UNIT HEATER
EBU	EMERGENCY BATTERY UNIT
EF	EXHAUST FAN
EM	ITEM PROVIDED WITH OR CONNECTED TO EMERGENCY POWER
EMT	ELECTRICAL METALLIC TUBING
EWH	ELECTRIC WATER HEATER
FA	FIRE ALARM
GFI	GROUND FAULT INTERRUPTER
IEF	IN-LINE EXHAUST FAN
IG	IN-LINE EXHAUST FAIN ISOLATED GROUND
JB	JUNCTION BOX
MAU	MAKE-UP AIR UNIT
Р	POLE
PVC	POLYVINYL CHLORIDE CONDUIT
RAP	REMOTE ANNUNCIATOR PANEL
REF	ROOF EXHAUST FAN
RGS	RIGID GALVANIZED STEEL CONDUIT
RTU	ROOFTOP UNIT
TV	TELEVISION
TX	TRANSFORMER
U.N.O.	UNLESS NOTED OTHERWISE
<u> </u>	WEATHER PROOF
WP	
WP	BRANCH CIRCUIT WRING
WP	BRANCH CIRCUIT WRING BRANCH CIRCUIT FEEDER
WP	

NOIES:

- 1. RECEPTACLES LOCATED WITHIN 6' OF A WATER SOURCE, LOCATED OUTSIDE AND WHERE REQUIRED BY CODE SHALL BE PROVIDED WITH A GFI TYPE RECEPTACLE WHETHER INDICATED OR NOT. ADDITIONALLY, THOSE EXTERIOR RECEPTACLES SHALL BE PROVIDED WITH COVERS RATED "WEATHER PROOF WHILE IN USE"
- 2. ALL BRANCH CIRCUITS TO BE PROVIDED WITH INDIVIDUAL DEDICATED NEUTRAL. MULTI-CIRCUIT FEEDERS UTILIZING COMMON NEUTRALS WILL NOT BE ACCEPTED.
- 3. ALL SYMBOLS MAY NOT BE USED.



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MAIN LEVEL KEY PLAN

SUBMISSION HISTORY

JOB INFO

RTU REPLACEMENT for

RHAM
High School
Wall Street
Hebron, CT
06248

DWG DATA

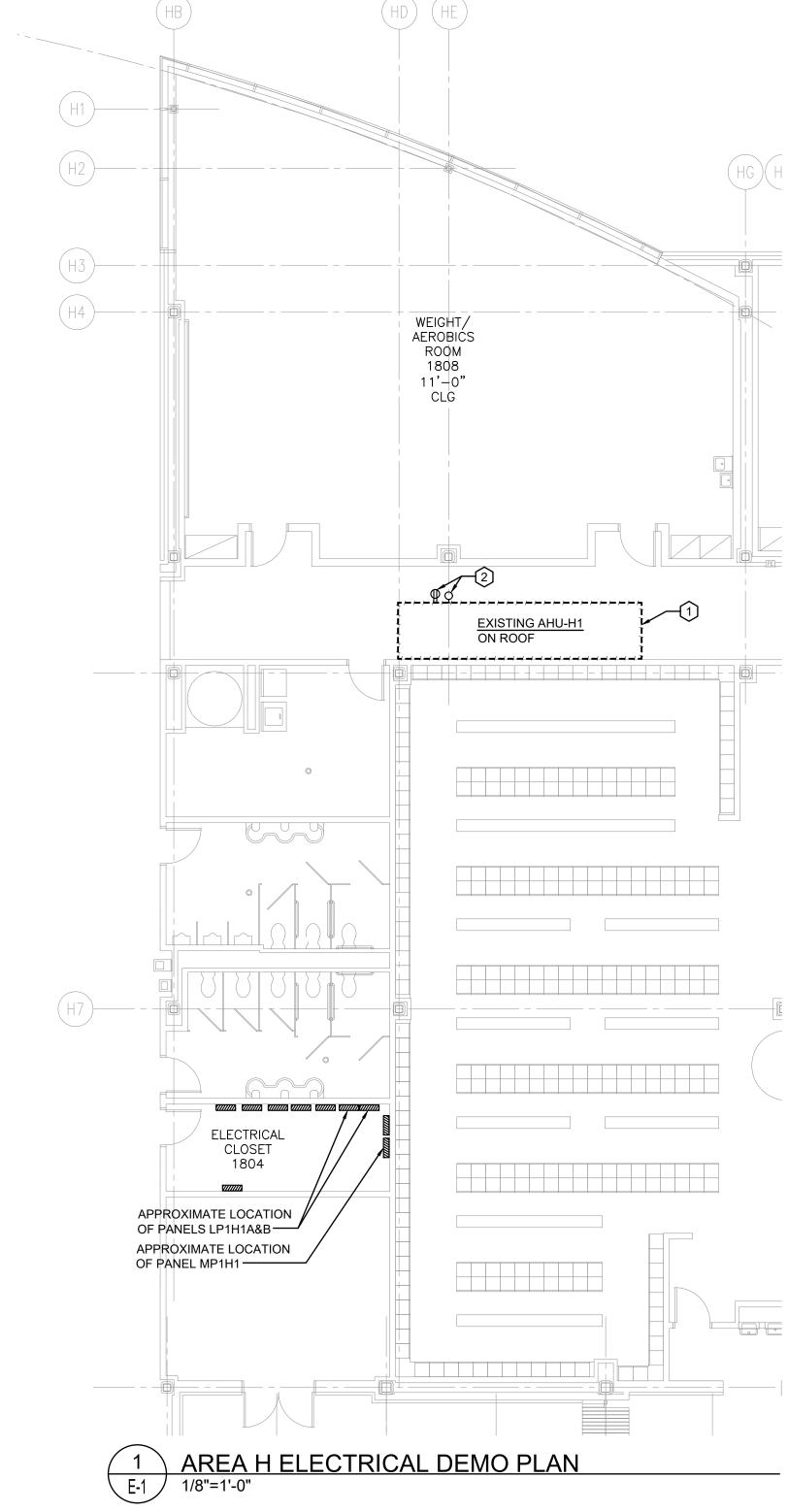
PROJECT NUMBER: 19-338
SUBMISSION DATE: 09/13/19
DRAWN: JJZ
REVIEWED: BJZ
SCALE: NONE

DWG TITLE

ELECTRICAL NOTES & LEGEND

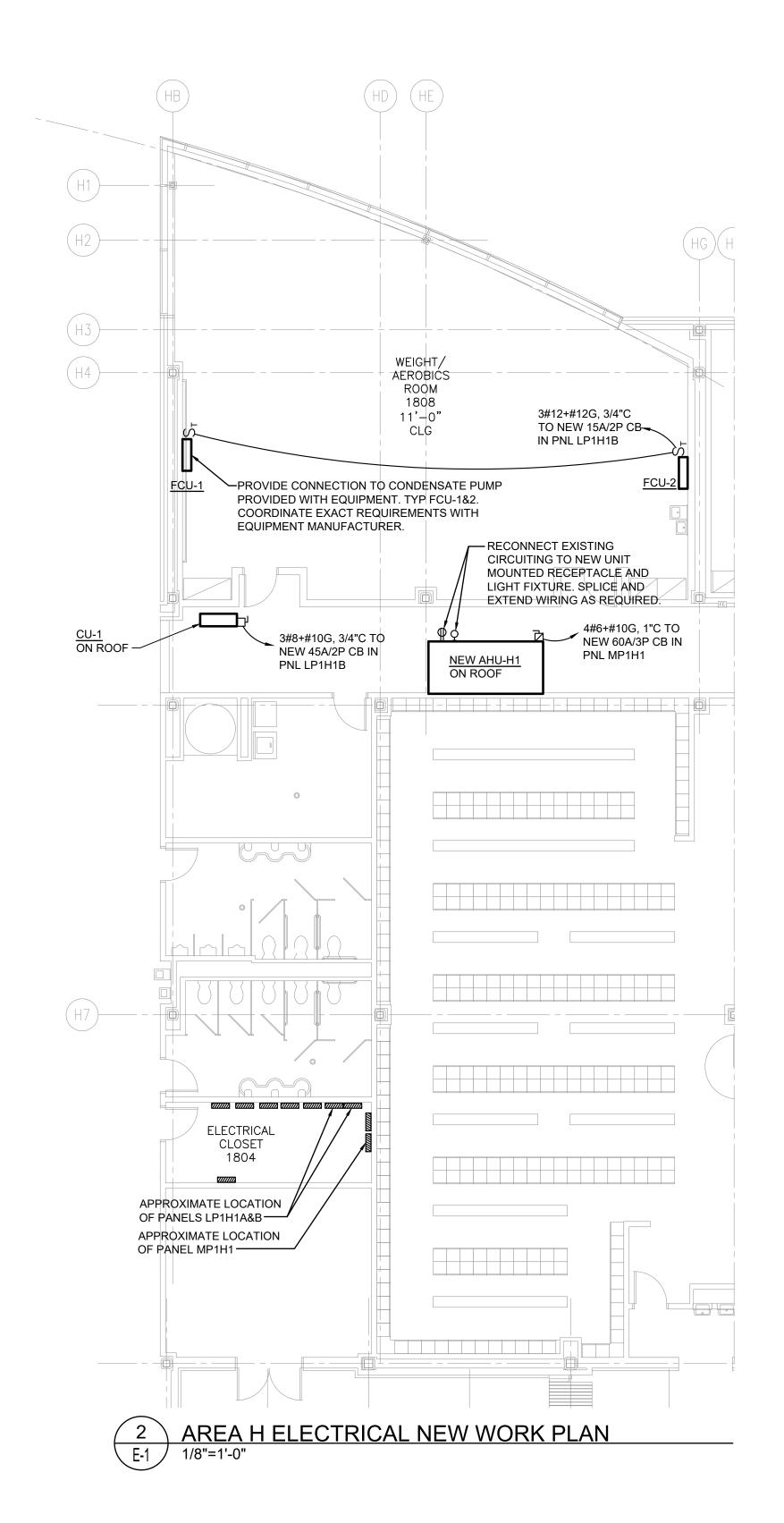
DWG #

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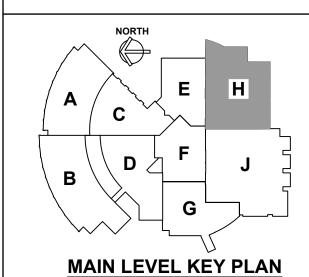


DEMO KEYNOTES

- DISCONNECT EXISTING AIR HANDLING UNIT AHU-H1 (SUPPLY AND RETURN FANS) AND REMOVE ALL WIRING BACK TO SOURCE. EXISTING CIRCUIT BREAKERS IN PANEL MP1H1 SERVING EXISTING AHU-H1 TO REMAIN AND BE LABELED SPARE IN THE CIRCUIT DIRECTORY.
- 2 EXISTING UNIT MOUNTED RECEPTACLE AND LIGHT FIXTURE TO BE DISCONNECTED AND REMOVED. MAINTAIN EXISTING CIRCUIT FOR RECONNECTION TO NEW RECEPTACLE AND LIGHT FIXTURE PROVIDED WITH NEW UNIT. SPLICE AND EXTEND WIRING AS REQUIRED.







SUBMISSION HISTORY

JOB INFO

RTU REPLACEMENT for

RHAM
High School
Wall Street
Hebron, CT
06248

DWG DATA

PROJECT NUMBER:
SUBMISSION DATE:
DRAWN:
REVIEWED:

O9/13/19

JJZ
D:

BJZ

1/8"=1'-0"

19-338

DWG TITLE

SCALE:

AREA H ELECTRICAL PLAN

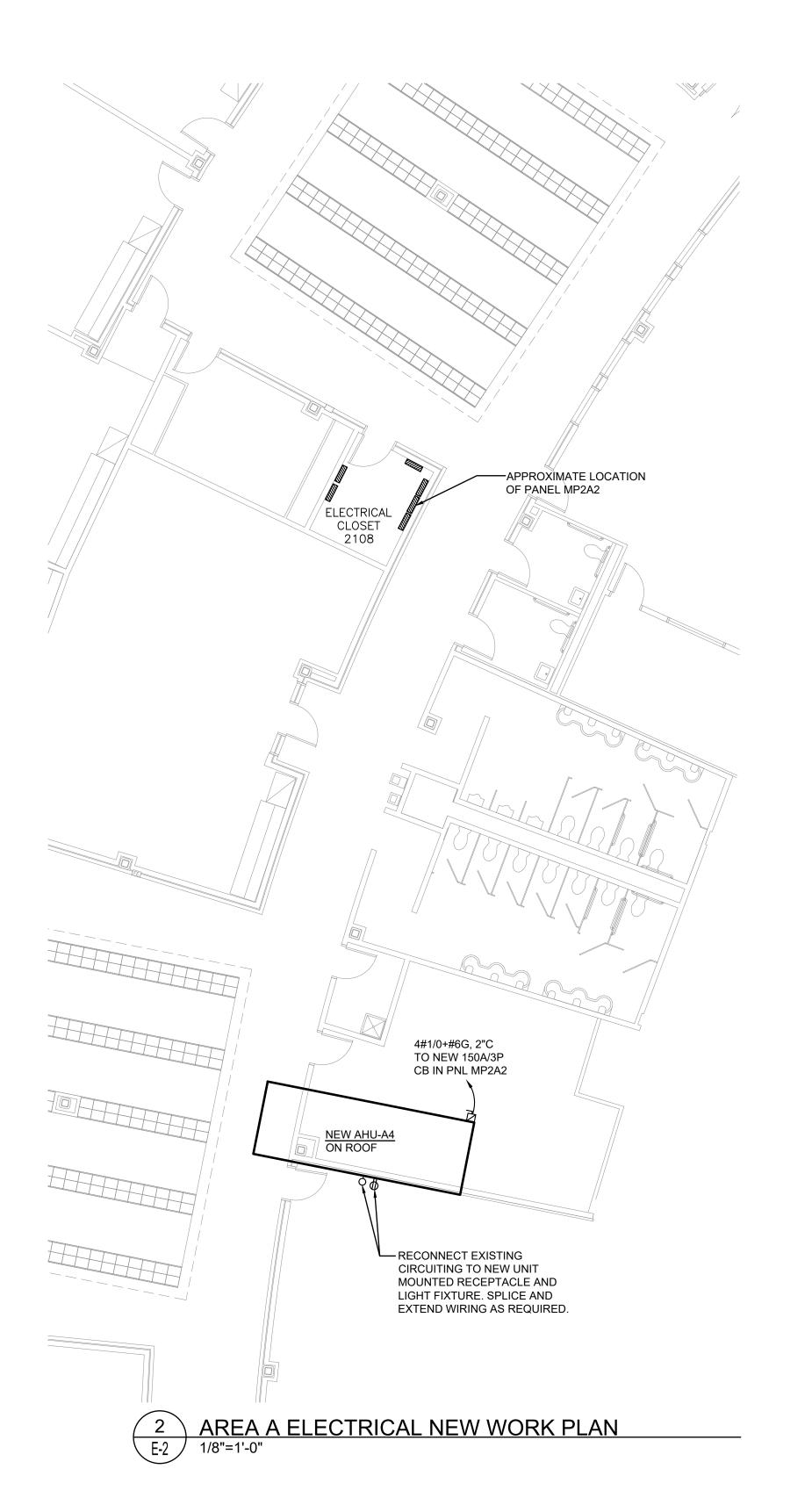
DWG

E-1

/2019 9:31:51 AM

DEMO KEYNOTES:

- DISCONNECT EXISTING AIR HANDLING UNIT AHU-A4 (SUPPLY AND RETURN FANS) AND REMOVE ALL WIRING BACK TO SOURCE. EXISTING CIRCUIT BREAKERS IN PANEL MP2A2 SERVING EXISTING AHU-A4 TO REMAIN AND BE LABELED SPARE IN THE CIRCUIT DIRECTORY.
- EXISTING UNIT MOUNTED RECEPTACLE AND LIGHT FIXTURE TO BE DISCONNECTED AND REMOVED. MAINTAIN EXISTING CIRCUIT FOR RECONNECTION TO NEW RECEPTACLE AND LIGHT FIXTURE PROVIDED WITH NEW UNIT. SPLICE AND EXTEND WIRING AS REQUIRED.



RZ Design Associates, Inc.

MECHANICAL, ELECTRICAL,

AND STRUCTURAL ENGINEERING

750 OLD MAIN STREET

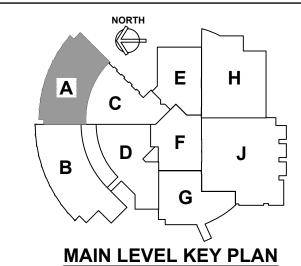
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MAIN LEVEL KET FE

SEAL

SUBMISSION HISTORY

B INFO

RTU REPLACEMENT for

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High School
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Hebron, CT
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DWG DATA

PROJECT NUMBER:
SUBMISSION DATE:
DRAWN:
REVIEWED:

SION DATE: 09/13/19JJZ

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DWG TITL

SCALE:

AREA A
ELECTRICAL PLAN

DWG

E-2

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- 1. REQUIREMENTS SPECIFIED ON COVER SHEET, ALONG WITH ELECTRICAL SPECIFICATIONS AND ALL ITS SECTIONS, COMPRISE THE CONTRACT DOCUMENTS FOR THE ELECTRICAL CONTRACT. DRAWINGS AND ALL THEIR REVISIONS UP TO THE BID SUBMITTAL DATE BECOME A BINDING PART OF THE CONTRACT, ALONG WITH THESE SPECIFICATIONS AS THOUGH THEY WERE ONE, AND ANYTHING IMPLIED BY THE SPECIFICATIONS SHALL BE INTERPRETED AS ALSO IMPLIED BY THE DRAWINGS AND VICE VERSA. PROVIDE NECESSARY ITEMS FOR A COMPLETE INSTALLATION OF ALL ELECTRICALLY OPERATED EQUIPMENT LISTED IN THE SPECIFICATIONS OR SHOWN ON THE CONTRACT DRAWINGS.
- 2. THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND EQUIPMENT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED INTO, AND BECOME A PART OF THIS DIVISION. THIS CONTRACTOR SHALL EXAMINE ALL SUCH DRAWINGS AND SPECIFICATIONS AND BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS CONTAINED THEREIN. THE SUBMISSION OF HIS BID SHALL INDICATE SUCH KNOWLEDGE
- 3. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC. THEY ARE INTENDED TO SHOW THE APPROXIMATE LOCATIONS OF EQUIPMENT AND CONDUIT. DIMENSIONS GIVEN ON THE PLANS, IN FIGURES, SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS AND SHALL BE VERIFIED IN THE FIELD. THE ELECTRICAL CONTRACTOR SHALL LAYOUT ALL EQUIPMENT ROOMS TO MAKE SURE THE EQUIPMENT, AS PURCHASED, FITS IN THE ROOM OR SPACE SHOWN. EXACT LOCATION OF ALL EQUIPMENT SHALL BE VERIFIED IN THE FIELD AND ROUTING OF CONDUITS SHALL SUIT FIELD CONDITIONS.
- 4. UNTIL THE TIME OF INSTALLATION, THE ARCHITECT RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF CONDUIT AND EQUIPMENT WITHOUT ADDITIONAL COST TO THE
- 5. THE ELECTRICAL DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER. MATERIAL AND LABOR NECESSARY TO THE PROJECT SHALL BE FURNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. LABOR AND/OR MATERIALS NEITHER SHOWN NOR SPECIFIED, BUT OBVIOUSLY NECESSARY FOR THE COMPLETION AND PROPER FUNCTIONING OF THE SYSTEM, SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST.
- 6. ARRANGE ALL EQUIPMENT SUBSTANTIALLY AS SHOWN ON THE DRAWINGS. MAKE DEVIATIONS ONLY WHERE NECESSARY TO AVOID INTERFERENCE. CHECK ALL EQUIPMENT SIZES AGAINST AVAILABLE SPACE PRIOR TO SHIPMENT TO AVOID INTERFERENCE.
- 7. EXAMINE THE WORK OF OTHER TRADES INSOFAR AS THEIR WORK COMES IN CONTACT WITH OR IS COVERED BY THIS WORK. IN NO CASE ATTACH TO, OR FINISH AGAINST ANY DEFECTIVE WORK OR INSTALL WORK IN A MANNER WHICH WILL PREVENT PROPER INSTALLATION OF THE WORK OF OTHER TRADES.
- 8. ELECTRICAL CONTRACTOR SHALL VERIFY WITH OTHER TRADES ALL ELECTRICAL CHARACTERISTICS OF EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS. CONTRACTOR SHALL VERIFY VOLTAGE, PHASE AND HORSEPOWER AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO START OF WORK. ELECTRICAL CONTRACTOR SHALL PROVIDE DISCONNECTING MEANS AND OVERLOAD PROTECTION FOR ALL EQUIPMENT, UNLESS FURNISHED INTEGRAL WITH EQUIPMENT PACKAGE.
- 9. IT IS THE INTENT OF THESE DRAWINGS THAT THIS BE A COMPLETE ELECTRICAL JOB. ANY ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO BIDDING THE JOB. B. VISIT TO THE SITE
- 1. THE CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING HIS WORK. THE SUBMISSION OF HIS PROPOSAL SHALL INDICATE SUCH KNOWLEDGE. NO ADDITIONAL PAYMENT SHALL BE MADE ON CLAIMS THAT ARISE FROM A LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS. C. CODE AND PERMITS
- 1. INSTALLATION SHALL BE IN FULL ACCORDANCE WITH ALL CODES, RULES AND REGULATIONS OF MUNICIPAL, CITY, COUNTY, STATE AND PUBLIC UTILITIES AND ALL OTHER AUTHORITIES HAVING JURISDICTION OVER THE PREMISES.
- 2. COMPLY WITH ANY SPECIFICATION REQUIREMENTS THAT ARE IN EXCESS BUT NOT IN CONFLICT WITH CODE REQUIREMENTS.
- 3. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, PLAN REVIEWS AND CERTIFICATES OF INSPECTION IN CONNECTION WITH HIS WORK, REQUIRED BY THE FOREGOING AUTHORITIES. BEFORE FINAL PAYMENT OF THE CONTRACT IS ALLOWED, ALL CERTIFICATES SHALL BE DELIVERED TO THE ARCHITECT IN DUPLICATE.
- 4. ELECTRICAL MATERIAL AND EQUIPMENT SHALL BEAR THE UL LABEL EXCEPT WHERE UL DOES NOT LABEL SUCH TYPES OF MATERIAL AND EQUIPMENT. D. SHOP DRAWINGS SUBMITTALS
- 1. THE ELECTRICAL CONTRACTOR SHALL SUBMIT FIVE (5) SETS OF SHOP DRAWINGS. THE SHOP DRAWINGS OF THE FOLLOWING EQUIPMENT USING THE INDICATED NUMBERING SYSTEM AND TITLES, SHALL BE SUBMITTED THROUGH THE ARCHITECT TO THE ENGINEER AND THEN RESUBMITTED FOR FINAL APPROVAL, IF NECESSARY. SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS:
- b. PANELBOARDS AND SAFETY SWITCHES INCLUDING FAULT CURRENT STUDY BASED ON
- EQUIPMENT BEING SUPPLIED. c. CONTACTORS, TIME SWITCHES AND PHOTOCELL
- d. LIGHTING FIXTURES e. SUPERVISORY ALARM SYSTEM
- 2. ALL SUBMITTED SHOP DRAWINGS (MANUFACTURERS "EQUIPMENT DESCRIPTIVE SHEETS OR VENDORS" PREPARED DRAWINGS) SHALL HAVE THE GENERAL CONTRACTOR'S OR SUBCONTRACTOR'S "STAMP OF APPROVAL" INDICATING THAT THE ITEM SUBMITTED IS AS CALLED FOR ON THE PLANS AND SPECIFICATIONS, IS APPROVED BY THE GENERAL CONTRACTOR OR SUBCONTRACTOR, THE DATE OF APPROVAL AND INITIALED BY THE PERSON APPROVING THE SUBMITTAL AND THE NAME OF THE COMPANY SUBMITTING SAID EQUIPMENT FOR APPROVAL.
- 3. SUBMIT BOUND BROCHURES COMPLETE WITH A TABLE OF CONTENTS. LOOSE OR STAPLED TOGETHER SHEETS ARE NOT ACCEPTABLE. ANY SUBMITTALS NOT IN BROCHURE FORM OR NOT AS SPECIFIED SHALL BE RETURNED AT THE CONTRACTOR'S EXPENSE FOR RESUBMITTAL. 4. ALL DESCRIPTIVE LITERATURE SHALL BE SUBMITTED IN A THREE (3) HOLE BROCHURE WITH A COVER IDENTIFYING THE FOLLOWING:
- a. NAME OF THE JOB. b. LOCATION OF THE JOB, ADDRESS, CITY AND STATE.
- c. NAME AND ADDRESS OF THE COMPANY SUBMITTING THE BROCHURES. d. DATE OF THE SUBMITTAL
- 5. EVERY EFFORT SHALL BE MADE, IN CHECKING THE SHOP DRAWINGS, TO DETECT AND CORRECT ALL ERRORS, OMISSIONS AND INACCURACIES. FAILURE TO DO THIS WILL NOT RELIEVE THE ELECTRICAL CONTRACTOR OF THE RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- E. RECORD DRAWINGS 1. SUBMIT TO THE ARCHITECT ONE SET OF REPRODUCIBLE (MYLARS) ELECTRICAL DRAWINGS SHOWING THE RECORD CONDITIONS. F. STANDARDS AND SUBSTITUTIONS
- 1. WHEREVER THE WORDS "APPROVED BY", "APPROVED EQUAL", "AS DIRECTED" OR SIMILAR PHRASES ARE USED IN THE FOLLOWING SPECIFICATIONS, THEY SHALL BE UNDERSTOOD TO REFER TO THE OWNER AS THE APPROVING AGENCY. THE NAME OR MAKE OF ANY EQUIPMENT OR MATERIALS NAMED IN THIS SPECIFICATION (WHETHER OR NOT THE WORDS "OR APPROVED
- EQUAL" ARE USED) SHALL BE KNOWN AS THE "STANDARD". 2. THESE SPECIFICATIONS ESTABLISH QUALITY STANDARD OF MATERIALS AND EQUIPMENT TO BE PROVIDED. SPECIFIC ITEMS ARE IDENTIFIED BY MANUFACTURER, TRADE NAME OR CATALOG DESIGNATION. THIS CONTRACTOR SHALL SUBMIT HIS BASE BID PRICE BASED UPON STANDARD SPECIFIED EQUIPMENT DESCRIBED HEREIN AND AS DETAILED ON DRAWINGS AND ASSOCIATED CONTRACT DOCUMENTS. THESE SPECIFICATIONS ARE NOT TO BE CONSIDERED PROPRIETARY THE CONTRACTOR MAY SUBMIT INFORMATION ON MATERIALS AND MANUFACTURERS (OTHER THAN THOSE LISTED) FOR REVIEW BY THE ARCHITECT AND ENGINEER NO LATER THAN TEN (10) DAYS BEFORE BIDS ARE SUBMITTED. IN ADDITION, SAMPLES OF PROPOSED EQUIPMENT MAY BE REQUIRED TO BE SUBMITTED TO THE ENGINEER FOR REVIEW NO LATER THAN TEN (10) DAYS BEFORE BIDS ARE SUBMITTED. MANUFACTURERS OF PRODUCTS ACCEPTED BY THE ARCHITECT AND ENGINEER WILL BE LISTED IN AN ADDENDUM TO THE SPECIFICATIONS AS AN ACCEPTABLE SUBSTITUTION EQUIPMENT ACCEPTED AS DETAILED BELOW AND SHALL BE SHOWN AS A SEPARATE ADD OR DEDUCT PRICE TO BE FACTORED INTO THE BASE BID PRICE BY THE ARCHITECT AND OWNER IF ACCEPTED.
- 3. SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS AND EQUIPMENT OTHER THAN HOSE SPECIFIED OR APPROVED BY ADDENDUM, SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS TO THE ARCHITECT AT THE BID OPENING. THE REQUEST SHALL BE AN
- ALTERNATE TO THE ORIGINAL BID; BE ACCOMPANIED WITH COMPLETE DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ALL ITEMS. FAILURE BY THIS CONTRACTOR TO SUBMIT THE REQUISITE DOCUMENTATION DETAILED ABOVE SHALL BE UNDERSTOOD BY THE ARCHITECT AND ENGINEER TO INDICATE THAT SUBSTITUTE EQUIPMENT WILL NOT BE PRESENTED BY THE CONTRACTOR FOR CONSIDERATION. SUCH SUBSTITUTIONS WILL NOT BE CONSIDERED AFTER THE BID OPENING DATE AND DELAY OF PROJECT WILL NOT BE PERMITTED FOR FURTHER INSPECTION AND EVALUATION AFTER THIS
- 4. WHERE SUCH SUBSTITUTIONS ALTER THE DESIGN OR SPACE REQUIREMENTS INDICATED ON THE DRAWINGS, INCLUDE ALL ITEMS OF COST FOR THE REVISED DESIGN AND CONSTRUCTION INCLUDING COST OF ALL ALLIED TRADES INVOLVED.

- 5. ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO APPROVAL OF THE ARCHITECT AND ENGINEER. IF REQUESTED, THE CONTRACTOR SHALL SUBMIT (AT HIS COST) INSPECTION SAMPLES OF BOTH THE SPECIFIED AND PROPOSED
- SUBSTITUTE ITEMS. 6. IN ALL CASES WHERE SUBSTITUTIONS ARE PERMITTED, THE CONTRACTOR SHALL BEAR ANY EXTRA COST OF EVALUATING THE QUALITY OF THE MATERIAL AND EQUIPMENT TO BE PROVIDED, INCLUDING ALL ARCH/ENGINEER FEES ASSOCIATED WITH CHANGE.
- G. TESTING AND PLACING IN SERVICE 1. ANY MATERIAL OR EQUIPMENT FAILING A TEST SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- 2. TESTS SHALL INCLUDE THE FOLLOWING: a. MEASURE THE LOAD ON EACH PHASE OF THE MAIN SERVICE AND EACH PHASE OF EVERY
- FEEDER UNDER FULL LOAD CONDITIONS. b. MEASURE THE NO-LOAD AND FULL-LOAD VOLTAGES (PHASE TO PHASE, PHASE TO NEUTRAL AND PHASE TO GROUND FOR EACH PHASE OF EACH SERVICE, OF EACH SEPARATELY DERIVED SYSTEM, AND AT EACH PANELBOARD OR TRANSFORMER).
- c. MEASURE THE GROUND RESISTANCE OF THE MAIN SERVICE GROUNDING ELECTRODE AND THE GROUND RESISTANCE OF EACH SEPARATELY DERIVED SYSTEM'S GROUNDING
- ELECTRODE. d. MAKE INSULATION RESISTANCE TESTS ON ALL DRY TYPE TRANSFORMERS AND MOTORS.
- H. INTERFERENCES 1. BEFORE THE INSTALLATION OF ANY ITEM BEGINS, THE ELECTRICAL CONTRACTOR SHALL CAREFULLY ASCERTAIN THAT IT DOES NOT INTERFERE WITH CLEARANCES FOR THE ERECTION OF FINISH BEAMS, COLUMNS, PILASTERS, WALLS OR OTHER STRUCTURAL OR ARCHITECTURAL MEMBERS AS SHOWN ON THE ARCHITECTURAL DRAWINGS. IF ANY WORK IS INSTALLED AND THE ARCHITECTURAL DESIGN CANNOT BE FOLLOWED, THIS CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAKE CHANGES IN HIS WORK AS DIRECTED BY THE ARCHITECT TO PERMIT THE COMPLETION OF THE ARCHITECTURAL WORK IN ACCORDANCE WITH DRAWINGS AND
- 2. IT SHALL BE THE DUTY OF THIS CONTRACTOR TO REPORT ANY INTERFERENCES BETWEEN HIS WORK AND THAT OF ANY OF THE OTHER CONTRACTORS AS SOON AS THEY ARE DISCOVERED. THE ARCHITECT SHALL DETERMINE WHICH EQUIPMENT WILL BE RELOCATED, REGARDLESS OF
- WHICH WAS INSTALLED FIRST. HIS DECISION WILL BE FINAL. I. QUALITY ASSURANCE ALL PRODUCTS SHALL BE NEW AND OF THE TYPE AND QUALITY SPECIFIED. WHERE
- MATERIALS, EQUIPMENT, APPARATUS OR OTHER PRODUCTS ARE SPECIFIED BY MANUFACTURER. BRAND NAME, TYPE OF CATALOG NUMBER, SUCH DESIGNATION SHALL ESTABLISH THE STANDARDS OF THE DESIRED QUALITY AND STYLE. IT IS THE INTENT OF THESE SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY OF MATERIALS AND EQUIPMENT INSTALLED.

BASIC ELECTRICAL MATERIALS AND METHODS

- 1. GENERAL: FURNISH AND MOUNT ON EACH PANELBOARD, SWITCHBOARD (INCLUDING BRANCH SWITCHES), LARGE JUNCTION BOX, SAFETY SWITCH, STARTER, REMOTE CONTROL, PUSH BUTTON STATION, AND ALL SIMILAR CONTROLS, A NAMEPLATE DESCRIPTIVE OF THE EQUIPMENT OR EQUIPMENT CONTROLLED.
- 2. PROVIDE BLACK AND WHITE NAMEPLATES CONSTRUCTED FROM LAMINATED PHENOLIC WITH A WHITE CENTER CORE. LETTERS SHALL BE ENGRAVED IN THE PHENOLIC TO FORM WHITE LETTERS 3/8" HIGH. FASTEN THE NAMEPLATES WITH SCREWS AND AN ADHESIVE TYPE FASTENER.

3. MEET THE REQUIREMENTS OF NEC 110.16 AND 110.21(B) B. MOUNTING ACCESSORIES

- 1. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL ANGLE IRON, CHANNEL IRON, RODS, SUPPORTS, HANGERS, CONCRETE OR PLYWOOD REQUIRED TO INSTALL, MOUNT AND SUPPORT ANY ELECTRICAL EQUIPMENT OR DEVICE CALLED FOR ON THE PLANS
- 2. SUPPORTING MATERIAL SHALL BE COMPLETE WITH HANGERS, CONNECTORS, BOLTS, CLAMPS AND NECESSARY ACCESSORIES TO MAKE A COMPLETE INSTALLATION. SUPPORTING MATERIAL SHALL BE GALVANIZED, PAINTED OR OTHERWISE SUITABLY FINISHED. PRODUCTS BY BRINKLEY, STEEL CITY OR RACO WILL BE ACCEPTABLE.
- 3. ALL SURFACE-MOUNTED EQUIPMENT ON BLOCK WALLS SHALL BE MOUNTED ON 3/4" PLYWOOD BACKBOARD. ALL FLOOR-MOUNTED EQUIPMENT SHALL BE INSTALLED ON A 4" HIGH CONCRETE HOUSEKEEPING PAD.
- 1. THE ELECTRICAL WORK FOR CONSTRUCTION PROPOSED SHALL CONFORM TO ALL FEDERAL (OSHA), STATE, ALL SPECIFIC SAFETY REQUIREMENTS AND THE REQUIREMENTS OF THE CURRENT EDITION OF THE NEC.
- 2. CHECK THE HVAC AND PLUMBING SPECIFICATIONS FOR ELECTRICAL REQUIREMENTS AND INCLUDE THE SAME IN THE CONTRACT COST.
- 3. EQUIPMENT CONNECTIONS, STARTERS, DISCONNECT SWITCHES, CONTROL TRANSFORMERS AND PUSHBUTTON STATIONS FOR THE EQUIPMENT FURNISHED BY THE OWNER OR UNDER A SEPARATE CONTRACT SHALL BE INSTALLED AND CONNECTED UNDER THIS DIVISION, AS INDICATED ON THE CONTRACT DRAWINGS.
- 4. ALL CUTTING, PATCHING, EXCAVATING, BACKFILLING AND CONCRETE WORK RELATED TO THIS CONTRACT WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. THIS CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF PROVIDING THE SLEEVES, CHASES AND OPENINGS NECESSARY FOR THE ELECTRICAL INSTALLATION AND FOR THEIR REPAIR IN AN ACCEPTABLE MANNER, AS DETERMINED BY THE ARCHITECT. ALL HOLES SHALL BE CORE-DRILLED. PROVIDE FIRE STOP IN ALL OPENINGS CREATED THROUGH FIRE-RATED WALLS,
- FLOORS OR CEILINGS. 5. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED ACCESS PANELS NECESSARY FOR HIS WORK, COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION. D. MATERIALS AND WORKMANSHIP
- 1. ALL WORK SHALL BE INSTALLED IN A PRACTICAL AND WORKMANLIKE MANNER, BY MECHANICS SKILLED IN THE SEVERAL TRADES NECESSARY.
- 2. ALL MATERIALS SHALL BE NEW AND FREE FROM DEFECTS AND SHALL BE THE BEST OF THEIR SEVERAL KINDS UNLESS SPECIFIED OR INDICATED ON THE DRAWINGS TO THE CONTRARY.
- 3. DURING EACH PHASE AND AT THE COMPLETION OF THE CONSTRUCTION, THIS CONTRACTOR SHALL REMOVE ALL DEBRIS AND EXCESS MATERIALS CAUSED BY HIS WORK. HE SHALL LEAVE THE AREA OF OPERATION BROOM CLEAN.
- 4. ALL ELECTRICAL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OR ETL
- 5. THIS CONTRACTOR SHALL GUARANTEE HIS WORKMANSHIP AND MATERIAL (LAMPS EXCEPTED) FOR A PERIOD OF ONE YEAR FROM THE DATE OF BUILDING OPENING AND LEAVE HIS WORK IN PERFECT ORDER AT THE COMPLETION. SHOULD DEFECTS DEVELOP WITHIN THE GUARANTEE PERIOD, THE CONTRACTOR SHALL, UPON NOTICE OF THE SAME, REMEDY THE DEFECTS AND HAVE ALL DAMAGES TO OTHER WORK OR FURNISHINGS CAUSED BY THE REPAIRS CORRECTED AT HIS EXPENSE TO THE CONDITION BEFORE SUCH DAMAGE.
- E. SCOPE OF WORK 1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIAL, STORAGE, UNPACKING AND PLACEMENT; TO INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING ITEMS:
- a. COMPLETE POWER AND LIGHTING DISTRIBUTION SYSTEM INCLUDING ALL PANELS AND FEEDERS. b. COMPLETE BRANCH CIRCUIT WIRING SYSTEM.
- c. COMPLETE POWER WIRING FOR ALL AIR CONDITIONING EQUIPMENT, PLUMBING SYSTEM, HEATING EQUIPMENT, VENTILATING AND EXHAUST EQUIPMENT
- d. LIGHTING FIXTURE INSTALLATION, INCLUDING ALL FLUORESCENT LAMPS e. COMPLETE TELEPHONE AND COMMUNICATION CONDUIT SYSTEM INCLUDING PULL BOXES,
- OUTLET BOXES, AND CONDUIT AS SPECIFIED, SHOWN ON THE DRAWINGS AND REQUIRED BY THE LOCAL TELEPHONE COMPANY AND/OR OWNER. FROM EACH OUTLET PROVIDE A 1" EMPTY EMT CONDUIT ROUTED INTO THE CEILING CAVITY OR TO THE CLOSEST TELECOMMUNICATIONS CLOSET. PROVIDE A DRAG LINE IN EACH RUN AND TERMINATE IN A BUSED ELBOW.
- f. TEMPORARY ELECTRICAL POWER AND LIGHTING AS REQUIRED FOR CONSTRUCTION.
- g. TESTING OF ALL CABLES AND CIRCUIT WIRING AFTER INSTALLATION. h. EXIT LIGHT SYSTEM.
- i. WIRING DEVICES. j. LIGHTING CONTROLS.
- k. GROUNDING OF THE ELECTRICAL SYSTEM.
- I. IDENTIFY RACEWAYS AND CABLES WITH COLOR BANDING AS FOLLOWS: 2. COLORS:
 - a).FIRE ALARM SYSTEM: RED b).SECURITY SYSTEM: BLUE AND YELLOW. c).TELECOMMUNICATION SYSTEM: GREEN AND YELLOW.

- A. GROUND ALL EQUIPMENT PER N.E.C. B. ALL CONDUITS SHALL CONTAIN A CODE-SIZED GROUND WIRE SIZED PER N.E.C. IN ADDITION TO THE CONDUCTORS SHOWN ON THE PLANS. WHERE CIRCUIT CONDUCTORS ARE INCREASED IN
- SIZE FOR VOLTAGE DROP. THE GROUND WIRE SIZE SHALL BE INCREASED PROPORTIONATELY. C. AFTER INSTALLING GROUNDING SYSTEM BUT BEFORE PERMANENT ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, TEST FOR COMPLIANCE WITH REQUIREMENTS.

- A. COLOR CODE CONDUCTORS (EXCEPT CONTROL AND INSTRUMENTATION CONDUCTORS) AS FOLLOWS:
- 208/120V SYSTEM=PHASE A BLACK; PHASE B RED; PHASE C BLUE; NEUTRAL WHITE; GROUND
- 1. #12 AND #10 CONDUCTORS SHALL HAVE CONTINUOUS INSULATION COLOR, AS LISTED ABOVE. 2. COLOR CODE CONDUCTORS LARGER THAN ABOVE, WHICH DO NOT HAVE CONTINUOUS INSULATION COLOR BY APPLICATION OF AT LEAST TWO LAPS OF COLORED TAPE ON EACH CONDUCTOR AT ALL POINTS OF ACCESS INCLUDING JUNCTION BOXES. COLOR TAPE SHALL BE THE EQUAL OF 3M PRODUCTS SCOTCH #35.
- 3. CONDUCTORS SHALL BE SOFT ANNEALED COPPER INSULATED FOR 600 VOLTS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALUMINUM CONDUCTORS ARE NOT ALLOWED ON THIS
- B. INSULATION TYPE SHALL BE TYPE THWN FOR WIRE SIZES #8 AWG AND LARGER AND THHN OR THWN FOR #10AWG AND SMALLER. THHN SHALL NOT BE USED IN WET OR DAMP LOCATIONS. C. FLEXIBLE CORD SHALL BE HEAVY DUTY TYPE SO WITH AN EQUIPMENT GROUND CONDUCTOR IN
- ADDITION TO THE CURRENT CARRYING CONDUCTORS. D. PROVIDE #12 CONDUCTORS, UNLESS OTHERWISE INDICATED. 1. CONTROL CONDUCTORS SHALL BE #14 MINIMUM FOR NEC CLASS I AND #16 FOR NEC CLASS II.
- E. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED. F. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID.
- G.INSTALL WIRING IN CONDUIT. CONCEALED WIRING IN WALLS OR ABOVE CEILINGS, OR EXPOSED IN UNFINISHED AREAS (WHERE NOT SUBJECT TO PHYSICAL DAMAGE) MAY BE RUN IN MC OR AC
- CABLE. H. CONNECT #10 AND SMALLER WIRES WITH CONSTANT PRESSURE EXPANDABLE SPRING TYPE
- CONNECTORS, "SCOTCHLOK" BY 3M OR B-CAP BY BUCHANAN. I. CONNECT #8 AND LARGER WIRES WITH COMPRESSION CONNECTORS OR SPLICES AS MANUFACTURED BY BURNDY OR T&B.
- J. INSULATE SPLICING CONNECTORS TO AT LEAST 200% OF THE WIRE INSULATION. USE PRE-STRETCHED TUBING CONNECTOR INSULATORS, 3M PST FOR #2 AND LARGER CONDUCTORS. K. PULL CONDUCTORS USING RECOGNIZED METHODS AND EQUIPMENT LEAVING AT LEAST 6" WIRE
- AT ALL JUNCTION BOXES FOR CONNECTIONS. 1. CLEANOUT EACH CONDUIT SYSTEM BEFORE PULLING WIRE.
- L. FORM AND TIE ALL WIRING IN PANELBOARDS. M.THERE SHALL BE NO WIRENUT JOINTS OR SPLICES MADE INSIDE SWITCHBOARDS/PANELBOARDS. N. BRANCH CIRCUIT WIRE SIZES (AND CONDUITS) SHALL BE INCREASED FROM THOSE INDICATED ON THE PLANS TO PREVENT EXCESSIVE VOLTAGE DROP. BRANCH CIRCUITS SHALL BE INSTALLED WITH WIRES OF SUFFICIENT SIZE SO THAT VOLTAGE DROP BETWEEN THE PANEL AND THE LOADS
- DOES NOT EXCEED LIMIT OF 3%. O. WIRE SIZES SHALL BE BASED ON THE 60 DEGREES C. AMPACITIES FOR WIRE SIZES NO. 14-1
- A.W.G., AND 75 DEGREES C. AMPACITIES FOR WIRE SIZES #1/0 A.W.G. AND LARGER. P. CIRCUITS MAY BE MULTI-PLEXED IN CONDUIT PROVIDED WIRE IS PROPERLY DERATED AND CONDUIT SIZED PER CODE. UNDER NO CIRCUMSTANCE SHALL MORE THAN (8) CURRENT CARRYING CONDUCTORS BE RUN IN A SINGLE CONDUIT.

RACEWAYS AND BOXES

- 1. ALL WIRE SHALL BE RUN IN ACCORDANCE WITH CODE IN CORROSION RESISTANT, RIGID, THREADED, METAL CONDUIT OR ELECTRICAL METALLIC TUBING (E.M.T.) UNLESS OTHERWISE
- SPECIFICALLY STATED HEREIN. a. CONDUIT IN EXTERIOR WALLS, BELOW FLOOR SLAB, OR UNDERGROUND SHALL BE RIGID, THREADED, GALVANIZED, HEAVY WALL TYPE.
- b. CARLON PVC TYPE 40 HEAVY WALL CONDUIT WITH GROUND WIRE MAY BE USED BELOW FLOOR SLAB OR UNDERGROUND IN LIEU OF RIGID, THREADED, GALVANIZED CONDUIT. PVC 40 CONDUIT SHALL NOT BE RUN IN OR ABOVE FLOOR SLAB. PVC CONDUIT SHALL TERMINATE BELOW FLOOR SLAB WITH RIGID, THREADED METAL CONDUIT ADAPTER. CONDUIT ABOVE SLAB SHALL BE METAL.
- c. CONDUIT RUN EXPOSED TO THE WEATHER SHALL BE HEAVY WALL, METAL THREADED TYPE. d. PROVIDE BRANCH CIRCUIT CONDUCTORS THAT ARE TYPE THHN OR THWN AS REQUIRED. MC CABLE CAN BE USED FOR LIGHT FIXTURE TO LIGHT FIXTURE. 2. CONDUIT SIZE SHALL BE 3/4" MINIMUM.
- 3. CONDUIT SHALL BE SECURELY FASTENED IN PLACE. 4. ALL CONDUIT SHALL BE CONCEALED IN WALLS, FLOOR AND CEILINGS WHEREVER POSSIBLE. EXPOSED CONDUIT IN FINISHED AREAS WILL NOT BE PERMITTED. EXPOSED CONDUIT WILL BE PERMITTED IN UNFINISHED AREAS WITH THE SPECIFIC APPROVAL OF THE ARCHITECT. 5. USE FLEXIBLE CONDUIT FOR THE CONNECTION TO RECESSED OR SEMI-RECESSED LIGHTING FIXTURES (6' LENGTH MAXIMUM). USE LIQUID TIGHT METAL CONDUIT FOR ALL CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION AND IN AREAS SUBJECT TO
- MOISTURE. 6. USE WATERTIGHT JOINTS WITH BURIED AND CONCRETE ENCASED CONDUIT. ALL BURIED CONDUITS OUTSIDE OF BUILDINGS SHALL HAVE A MINIMUM OF 24" OF COVER. METAL CONDUITS
- BURIED IN EARTH SHALL BE PAINTED (TWO COATS) WITH HEAVY ASPHALTUM PAINT. 7. SUPPORT RUNS OF CONDUIT AS DETAILED IN THE APPROPRIATE TABLE OF THE NATIONAL ELECTRICAL CODE (NEC).
- 8. INSTALL EXPOSED RUNS OF CONDUIT AND CONDUIT ABOVE LAY-IN CEILINGS PARALLEL OR PERPENDICULAR TO THE WALLS, STRUCTURAL MEMBERS OF INTERSECTIONS OF VERTICAL PLANES AND CEILINGS. PROVIDE RIGHT ANGLE TURNS USING FITTINGS OR SYMMETRICAL BENDS. SUPPORT CONDUITS WITHIN 1" OF ALL CHANGES IN DIRECTION. 9. IF A CONDUIT IS SUSPENDED, IT SHALL BE SUPPORTED ON TRAPEZE HANGERS WHICH USE
- "ALL-THREAD" RODS FROM THE STRUCTURAL STEEL. THE USE OF CEILING SUPPORT WIRE OR SIMILAR MATERIAL WILL NOT BE ACCEPTED. 10.INSTALL EMPTY CONDUIT FOR FUTURE USE AS INDICATED ON THE DRAWINGS. CONDUIT SHALL
- BE COMPLETE WITH JETLINE OR PULL ROPE, JUNCTION/OUTLET BOXES, TILE RINGS AND APPROPRIATE COVER PLATES.
- 11.PROVIDE PITCHPOCKETS WHERE CONDUITS PENETRATE THE ROOF. 12.THREAD LUBRICATION/SEALANT IS REQUIRED ON OUTDOOR AND UNDERGROUND THREADED METAL JOINTS.
- 13.INSTALL FIRE SEAL FITTINGS WHERE CONDUITS PENETRATE CONCRETE FLOOR SLABS OR MASONRY WALLS REQUIRED TO BE FIRE RATED. 14.HORIZONTAL PORTION OF CONDUIT EXPOSED ON THE ROOF AND FEEDING EQUIPMENT SHALL
- NOT BE MORE THAN 5'-0" UNLESS THE WRITTEN APPROVAL FROM ARCHITECT OR ENGINEER IS OBTAINED. B. PULL AND JUNCTION BOXES 1. INSTALL PULL AND JUNCTION BOXES WHERE SHOWN ON THE DRAWINGS, AND WHERE
- REQUIRED FOR CHANGES IN DIRECTION, AT JUNCTION POINTS, AND TO FACILITATE WIRE PULLING. FURNISH BOX SIZES IN ACCORDANCE WITH NEC UNLESS LARGER BOXES ARE INDICATED.
- 2. PROVIDE STEEL BOXES AND REMOVABLE COVERS OF CODE GAGE, HOT ROLLED SHEET STEEL, HOT DIPPED GALVANIZED INSIDE AND OUTSIDE, FOR ABOVE GROUND WORK. FURNISH WEATHERPROOF BOXES WHEN INSTALLED ABOVE GROUND OUTSIDE. 3. PROVIDE CAST IRON BOXES, HOT DIPPED GALVANIZED INSIDE AND OUTSIDE WHERE SHOWN ON
- THE DRAWINGS. FURNISH REMOVABLE COVERS WITH GASKETS AND STAINLESS STEEL, BRASS OR BRONZE SCREWS. 4. PROVIDE CONCRETE BOXES FOR UNDERGROUND WORK UNLESS OTHERWISE INDICATED ON THE DRAWINGS. FURNISH STEEL FRAMES AND COVERS WITH THE COVER ATTACHED TO THE FRAME WITH HEXAGON HEAD, BRASS OR BRONZE CAP SCREWS, 3/8" DIAMETER. PROVIDE A
- TWO COATS OF HEAVY ASPHALTUM. C. OUTLET BOXES 1. USE SHEET STEEL BOXES, ZINC COATED OR CADMIUM PLATED, FOR CONCEALED INTERIOR
- 2. USE CAST BOXES, ZINC-CADMIUM FINISH MALLEABLE IRON, FOR EXPOSED INTERIOR WORK, AND FOR EXPOSED OR CONCEALED WORK IN WET, DAMP OR EXTERIOR LOCATIONS. 3. WALL BOX SIZES (MINIMUM) SHALL BE 4" SQUARE x 2-1/2" DEEP WHERE WALL CONSTRUCTION PERMITS. WHERE WALL CONSTRUCTION DICTATES, THE WIDTH MAY BE REDUCED TO 2-1/8" OR
- 1-1/2" UNDER SPECIAL CONDITIONS. 4. FIXTURE OUTLETS IN CEILINGS (MINIMUM) SHALL BE 4" OCTAGONAL x 1-1/2" DEEP (4-11/16" OCTAGONAL x 2-1/2" DEEP WHERE REQUIRED TO ACCOMMODATE LARGER CONDUIT OR LARGER NUMBER OF WIRES).
- 5. GANG BOXES SHALL BE ONE PIECE (MINIMUM), 2-1/8" DEEP. 6. PROVIDE CONCRETE-TIGHT FLOOR BOXES WITH ADJUSTABLE COVERS SET FLUSH AND LEVEL WITH THE FINISHED FLOOR, WITH OUTLETS AS INDICATED ON THE DRAWINGS. PROVIDE WIREMOLD #EFB6S SERIES BOXES WITH LEVELING SCREWS FOR ABOVE GRADE APPLICATIONS, AND WIREMOLD #EFB6S-OG FOR ON-GRADE APPLICATIONS. FLUSH TYPE COVERS AND OPENINGS TO SERVE OUTLETS USED. FURNISH FLUSH CAPS FOR CLOSING OFF BOX WHEN NOT

NOTED:

- 7. PROVIDE WIREMOLD EVOLUTION SERIES WALL BOX BEHIND ALL WALL MOUNTED FLAT SCREEN
- MONITORS. COORDINATE HEIGHT WITH ARCHITECT. 8. FLUSH MOUNT BOXES IN ALL FINISHED WALLS. INSTALL THE PLASTER RINGS IN DRYWALLED PLASTERED WALLS AND RAISED COVERS AS REQUIRED IN WALLS WITH OTHER FINISHES SO THAT THE COVER PLATES FIT TIGHTLY AGAINST BOXES OR RINGS, 3/16" MAXIMUM GAPS ARE
- ALLOWED FOR NONCOMBUSTIBLE WALLS. 9. ADJUST LOCATION OF OUTLETS IN MASONRY OR TILE CONSTRUCTION TO OCCUR IN THE NEAREST JOINT TO THE HEIGHT SPECIFIED. HEIGHTS SHALL MEET A.D.A. REQUIREMENTS.
- 10. SUPPORT ALL BOXES TO MAINTAIN PROPER ALIGNMENT AND RIGIDITY. 10.CLEAN BOXES OF ALL FOREIGN MATTER PRIOR TO THE INSTALLATION OR WIRING OF DEVICES. 11.MOUNTING HEIGHTS ON THE DRAWINGS ARE TO THE CENTERLINE OF THE BOX UNLESS OTHERWISE NOTED.

A. WIRING DEVICE COLOR SHALL BE WHITE, UNLESS OTHERWISE INDICATED.

- B. OCCUPANCY SENSOR SWITCHES SHALL BE 120/277 VOLT, DUAL TECHNOLOGY 0-10V DIMMING WALL SWITCH OCCUPANCY SENSORS, WATTSTOPPER #DW-311. C. DIMMER SWITCHES SHALL BE WIDE SLIDE 0-10V PRESET DIMMER WITH INTEGRATED POWER PACK
- EQUAL TO PASS & SEYMOUR WS4FBL3PW. D. GENERAL SWITCHES SHALL BE SPECIFICATION GRADE AS MANUFACTURED BY PASS & SEYMOUR.
- E. CEILING MOUNTED OCCUPANCY SENSORS SHALL BE LOW VOLTAGE DUAL TECHNOLOGY, WATTSTOPPER #DT-300.
- F. PROVIDE NEMA CONFIGURATION 5-20R DUPLEX 125 VOLT GROUNDING TYPE RECEPTACLES RATED FOR 20 AMPERES UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- G.RECEPTACLES SHALL BE SPECIFICATION GRADE AS MANUFACTURED BY PASS & SEYMOUR. H. RECEPTACLES REQUIRING AMPERAGES, VOLTAGES OR CONFIGURATIONS DIFFERENT FROM THE DUPLEX CONVENIENCE RECEPTACLES ABOVE SHALL BE AS INDICATED ON THE DRAWINGS.
- I. PROVIDE OTHER RECEPTACLES OF A QUALITY, MATERIAL AND WORKMANSHIP EQUAL TO THAT SPECIFIED FOR DUPLEX CONVENIENCE RECEPTACLES. J. PROVIDE COVER OR DEVICE PLATES FOR OUTLET BOXES AS FOLLOWS UNLESS OTHERWISE
- 1. FINISHED AREAS: STAINLESS STEEL. 2. UNFINISHED AREAS: ZINC COATED SHEET METAL, ALUMINUM, OR CAST METAL, AS
- APPROPRIATE FOR THE TYPE OF BOX. 3. EXTERIOR AREAS: COPPER FREE ALUMINUM WITH GRAY, POWDER EPOXY FINISH, GASKET,
- WEATHERPROOF. 4. TELEPHONE, COMMUNICATION, AND SIGNAL OUTLET PLATES, SHALL MATCH THOSE USED FOR RECEPTACLES AND SWITCHES. ALL OUTLET AND/OR JUNCTION BOXES SHALL BE COMPLETE
- WITH A COVER PLATE BY THIS CONTRACTOR. 5. WHERE DEVICES ARE GANGED, THEY SHALL BE INSTALLED UNDER A COMMON COVERPLATE. I. LOCATE THE SWITCHES APPROXIMATELY 4'-0" ABOVE THE FINISHED FLOOR ELEVATION OR
- NEAREST BLOCK COURSE (WITHIN A.D.A. REQUIREMENTS), UNLESS OTHERWISE INDICATED. THE LONG DIMENSION OF THE SWITCHES SHALL BE VERTICAL. J. LOCATE RECEPTACLES APPROXIMATELY 1"-6" ABOVE THE FINISHED FLOOR ELEVATION OR

NEAREST BLOCK COURSE (WITHIN A.D.A. REQUIREMENTS), UNLESS NOTED OTHERWISE. THE

LONG DIMENSION OF RECEPTACLES SHALL BE VERTICAL

- A. SAFETY SWITCHES SHALL BE THE ENCLOSED HEAVY-DUTY TYPE (TYPE HD) WITH QUICK-MAKE, QUICK-BREAK MECHANISM AND EXTERNAL PAD LOCKABLE OPERATING HANDLE. B. SAFETY SWITCHES SHALL BE RATED FOR 240 OR 600 VOLTS AS APPLICABLE. THEY SHALL BE
- HORSEPOWER RATED WHEN USED IN MOTOR CIRCUITS. C. SAFETY SWITCHES SHALL BE FUSIBLE OR NON-FUSIBLE, 2, 3, OR 4 POLE AS INDICATED ON THE DRAWINGS. D. SAFETY SWITCHES SHALL BE SINGLE THROW UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- E. ENCLOSURES SHALL BE NEMA 1 INDOORS AND NEMA 3R OUTDOORS UNLESS OTHERWISE INDICATED ON DRAWINGS. F. MANUFACTURER SHALL BE SQUARE D, SIEMENS, OR CUTLER-HAMMER. ALL SAFETY SWITCHES
- SHALL BE BY ONE MANUFACTURER. G.MOUNT THE SAFETY SWITCHES SECURELY BETWEEN 3' & 6' LEVELS ABOVE THE FLOOR UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

H. SWITCHES ON BLOCK WALLS SHALL BE MOUNTED ON A 3/4" PLYWOOD BACKBOARD, WHERE LOCATED INDOORS.

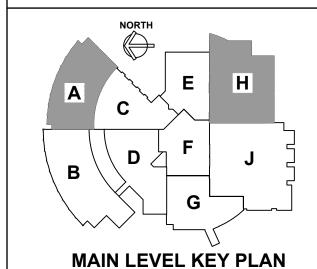
- **DISTRIBUTION AND PANELBOARDS**
- 1. PANELBOARDS SHALL BE FULLY RATED TO INTERRUPT SYMMETRICAL SHORT CIRCUIT AT THE TERMINALS. 2. PANELBOARDS SHALL BE LABELED WITH PHENOLIC NAMEPLATES INSCRIBED AS INDICATED ON THE DRAWINGS. PROVIDE LABELS AFFIXED TO PANELBOARDS AS REQUIRED BY NFPA 70E.
- 3. PANELBOARDS SHALL BE ENCLOSED DEAD FRONT SAFETY TYPE WITH FEATURES AND RATINGS
- AS SCHEDULED ON THE DRAWINGS. 4. MOLDED CASE CIRCUIT BREAKERS SHALL BE AS SCHEDULED ON THE DRAWINGS AND
- SPECIFIED IN THIS DIVISION. 5. ALL BUS BARS SHALL BE RECTANGULAR TIN PLATED ALUMINUM.
- 6. SPACE, WHERE SHOWN IN PANEL SCHEDULES, DESIGNATES SPACE FOR FUTURE PROTECTIVE DEVICES AND SHALL INCLUDE BUS AND SUPPORT.
- 7. INSTALL CABINETS SO THAT CENTER OF THE TOP BREAKER DOES NOT EXCEED 6'-6" ABOVE THE FINISHED FLOOR.
- 8. ENTRIES ON DIRECTORY CARDS SHALL BE TYPED, COMPLETE AND ACCURATE. 9. ALL BOLTED CONNECTIONS SHALL BE TORQUED IN ACCORDANCE WITH MANUFACTURER'S STANDARDS.
- 10. ELECTRICAL CONTRACTOR SHALL ARRANGE CIRCUITS AS NEAR AS POSSIBLE TO CIRCUIT NUMBERS ON THE DRAWINGS. AT COMPLETION OF JOB, ELECTRICAL CONTRACTOR SHALL TAKE CURRENT READING CHECKS OF RESPECTIVE PHASES. A MINIMUM OF CIRCUIT CONNECTIONS SHALL BE REARRANGED TO BALANCE, AS CLOSELY AS POSSIBLE, THE LOAD IN
- THE PANEL

11. ALL BREAKERS SHALL BE BOLT-ON TYPE. 12. MANUFACTURE SHALL BE SQUARE D AS THE PREFERRED SWITCHGEAR.

- A. NEW LIGHT FIXTURES SHALL BE AS LISTED IN THE LIGHTING FIXTURE SCHEDULE. B. ALL LIGHTING FIXTURES SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR AS INDICATED ON THE LIGHTING FIXTURE SCHEDULE, INCLUDING LAMPS. LAMPS SHALL BE OF SAME
- MANUFACTURER FOR ALL TYPES. C. ALL FIXTURES SHALL BEAR THE UNDERWRITER'S LABORATORIES LABEL AND SHALL BE INSTALLED
- ACCORDING TO MANUFACTURER'S INSTRUCTIONS. D. BALLASTS FOR LINEAR FLUORESCENT LAMPS SHALL BE AS LISTED IN THE LIGHTING FIXTURE
- E. HIGH INTENSITY DISCHARGE BALLASTS SHALL BE CONSTANT WATTAGE TYPE. F. THIS CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY SUPPORT MEDIA FOR ALL LIGHTING FIXTURES INCLUDING STRUCTURAL STEEL, ANGLE, RODS, ETC. IN GENERAL,
- FLUORESCENT AND HIGH INTENSITY DISCHARGE FIXTURES SHALL BE SUPPORTED IN A MANNER ACCEPTABLE TO THE LOCAL INSPECTION AUTHORITIES. ALL FIXTURES SHALL BE FIRMLY SUPPORTED FROM BEAMS OR JOISTS. 1. PROVIDE ALL NECESSARY BACKING, BLOCKING AND SUPPORTS FOR WALL MOUNTED FIXTURES.
- RUBBER GASKET FOR SEALING BETWEEN THE COVER AND THE FRAME. PAINT THE COVER WITH 2. FIXTURES SHALL NOT BE SUPPORTED FROM ROOF DECK. G. ALL FIXTURES SHALL BE U.L. LISTED AND APPROVED FOR THE PURPOSE INTENDED. H. RECESSED FIXTURES IN FIRE RATED CEILING OR SUPPLY AIR PLENUMS SHALL BE APPROVED FOR THE FIRE RATING OF THE CEILING. PROVIDE AIR-TIGHT GASKETS TO SEAL AROUND OPENINGS.

MECHANICAL, ELECTRICAL, AND STRUCTURAL ENGINEERING 750 OLD MAIN STREET ROCKY HILL, CT 06067 P: (860) 436-4336 F: (860) 436-4450 www.rzdesignassociates.com

RZ Design Associates, Inc.



JOB INFO RTU **REPLACEMENT**

for

SUBMISSION HISTORY

RHAM **High School Wall Street** Hebron, CT

06248

DWG DATA

PROJECT NUMBER: 19-338 SUBMISSION DATE: 09/13/19 DRAWN: **REVIEWED:**

NONE

ELECTRICAL SPECIFICATIONS

SCALE: I. ALL ADJUSTABLE FIXTURES SHALL BE AIMED AND ADJUSTED DURING EVENING HOURS TO THE SATISFACTION OF THE ARCHITECT.

STATE OF CONNECTICUT Educational Employer Verification (in accordance with Public Act 16-67)

<u>Directions for School District/Entity Considering Applicant for Employment</u>: Each local or regional board of education, governing council of a state or local charter school or an interdistrict magnet school operator is required to obtain the information listed on this form from ALL current or former employer(s) of the applicant if such employer was a local or regional board of education, a governing council of a state or local charter school, an interdistrict magnet school operator or if the employment caused the applicant to have contact with children. Applicants are required under the law to provide a prospective employer with the name, address and telephone number of all current or former employers that meet the above criteria. Information may be collected either through a written communication or telephonically.

<u>Directions for Current/Previous Employer</u>: The applicant listed below is under consideration for a position with the school/district listed below in Section 2. The individual identified below has reported current/previous employment with your organization or contractual services with your organization in a position in which he/she had contact with children. As required by Connecticut General Statutes Section 10-222c, as amended by Public Act 16-67, please provide the information requested in Section 3. In accordance with the provisions of Public Act 16-67, you are required to respond to this request within five business days.

Section 1 – To be completed by the Applicant

Name of applicant					
Former name(s) (if applicable)					
Street address					
City, State, Zip Code					
Approximate dates of employment with employer listed in Section 3 of this form					
Position held with employer listed in Section 3 of this form					
Section 2 – To be completed by the Prospective Employer					
Name of prospective employer					
Street address of prospective employer					
City, State, Zip Code					
Contact person					
Telephone number/email address					
Section 3 – To be completed by the Current/Former Employer					
Name of employer					
Date of receipt of this notice					
Date of employment of above named applicant					
Contact person					
Telephone number/email address					

To your knowledge,	, has the A	Applicant	ever
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Yes	No	Been the subject of an allegation of abuse or neglect or sexual misconduct for which there is an investigation currently
		pending with any current or prior employer, state agency or municipal police department or which has been
		substantiated?

- **Yes** No Been disciplined or asked to resign from employment or resigned from or otherwise separated from any employment while an allegation of abuse or neglect or sexual misconduct was pending or under investigation, or due to a substantiation of abuse or neglect or sexual misconduct?
- Yes No Had a professional or occupational license, certificate, authorization or permit suspended or revoked or ever surrendered such a license, certificate, authorization or permit while an allegation of abuse or neglect or sexual misconduct was pending or under investigation, or due to a substantiation of abuse or neglect or sexual misconduct?

Signature of Superintendent or HR Director	Date	

Return all completed information to the Prospective Employer listed in Section 2 of this form.

NOTES:

The terms provided below are currently defined in state law as follows. Please note that statutes may be amended from time to time.

Sexual Misconduct – "any verbal, nonverbal, written or electronic communication, or any other act directed toward or with a student that is designed to establish a sexual relationship with the student, including a sexual invitation, dating or soliciting a date, engaging in sexual dialog, making sexually suggestive comments, self-disclosure or physical exposure of a sexual or erotic nature and any other sexual, indecent or erotic contact with a student." Connecticut General Statutes § 10-222c(k).

Abuse or neglect – "abuse or neglect as described in Section 46b-120, and includes any violation of Sections 53a-70, 53a-70a, 53a-71, 53a-72a, 53a-72b or 53a-73a." Connecticut General Statutes § 10-222c(k).