



ROANOKE COUNTY

FINANCE & MANAGEMENT SERVICES DEPARTMENT PURCHASING DIVISION

INVITATION FOR BID

IFB # 2021-117 Northside High School Makeup Air Unit Addition

OPENING DATE: July 15, 2021
OPENING TIME: 2:00 P.M.

The Invitation to Bid and related documents may be obtained during normal business hours from the Purchasing Division, at the Roanoke County Administration Building, 5204 Bernard Drive, Suite 300F, Roanoke, VA 24018. This document may be viewed and/or downloaded from the County of Roanoke Purchasing Division's website at <https://www.roanokecountyva.gov/bids.aspx>. If you have any problems accessing the documents, you may contact Purchasing at (540) 772-2061.

A mandatory pre-bid conference will be held at 9:30 AM on July 7, 2021 at Northside High School (6758 Northside High School Road, Roanoke VA 24019).

**THIS PUBLIC BODY DOES NOT DISCRIMINATE
AGAINST FAITH-BASED ORGANIZATIONS**

DATE of IFB: June 29, 2021

INVITATION FOR BID (IFB)

IFB No. 2021-117

Issue Date: June 29, 2021

Title: Northside High School Makeup Air Unit Addition

Issued By: **County of Roanoke**
Roanoke County Administration Building
Purchasing Division
5204 Bernard Drive, SW, Suite 300-F
Roanoke, VA 24018-0798
Phone (540) 772-2061
Email: KHoyt@roanokecountyva.gov

Sealed Bids will be received on or before **2:00 P.M., July 15, 2021** for furnishing the services and/or items described herein. The time of receipt shall be determined by the time clock stamp in the Purchasing office.

All questions must be submitted before 5:00 p.m., **July 9, 2021**. If necessary, an addendum will be issued and posted to the County website on the Current Bids/RFP Requests tab at <https://www.roanokecountyva.gov/bids.aspx>.

If proposals are hand delivered or mailed, send directly to the Purchasing Division at the address listed above. If the Roanoke County Administration Building is closed for business at the time scheduled for the proposal opening, the sealed proposal will be accepted and opened on the next business day of the County, at the originally scheduled hour.

THIS PUBLIC BODY DOES NOT DISCRIMINATE AGAINST FAITH-BASED ORGANIZATIONS.

The County reserves the right to cancel this IFB and/or reject any or all proposals and to waive any informalities in any proposal.

This section is to be completed by the Offeror and this page must be returned with the bid. In compliance with this Invitation For Bid and subject to all terms and conditions imposed herein, which are hereby incorporated herein by reference, the undersigned offers and agrees to furnish the services and/or items requested in this solicitation if the undersigned is selected as the successful Bidder. No Bid may be withdrawn within a period of sixty (60) days after Bid opening except for clerical errors, as set forth in part (1) of Section 2.2-4330(B), Virginia Code, 1950, as amended. Notices of bid withdrawal must be submitted in writing to the Purchasing Division.

My signature certifies that the bid as submitted complies with all requirements specified in this Invitation for Bid ("IFB"). If this Bid is accepted by the County, to provide the services and/or items in accordance with this Invitation for Bid and to execute a Contract/Purchase Order substantially similar to the attached Contract/Purchase Order Terms and Conditions for such services and/or items. My signature also certifies that by submitting a bid in response to this IFB, the Bidder represents that in the preparation and submission of this bid, the Bidder did not, either directly or indirectly, enter into any combination or arrangement with any person or business entity, or enter into any agreement, participate in any collusion, or otherwise take any action in the restraining of free, competitive bidding in violation of the Sherman Act (15 U.S.C. Section 1) or Sections 59.1-9.1 through 59.1-9.17 or Sections 59.1-68.6 through 59.1-68.8 of the Code of Virginia.

I hereby certify that I am authorized to sign as a legal representative for the business entity submitting this bid.

Legal Name and Address of Firm:

_____ Date: _____

_____ By: _____
(Signature in Ink)

_____ Name: _____
(Please Print)

_____ Zip: _____ Title: _____

Phone: _____ FAX: _____

Email: _____ Business License# _____

Virginia State Corporation Commission Identification Number: _____

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COUNTY OF ROANOKE, VIRGINIA
INVITATION FOR BID NO. 2021-117
Northside High School Makeup Air Unit Addition

SECTION 1. PURPOSE

The purpose of this Invitation for Bid (IFB) is the procurement and installation of two (2) ERV units at Northside High School, per the project plans provided as Attachment F to this IFB.

The County of Roanoke, on behalf of Roanoke County Public Schools, invites any qualified Bidder to respond to this IFB by submitting a Bid for such work, service, and/or items consistent with the terms and conditions herein set forth.

SECTION 2. BACKGROUND

Not Used.

SECTION 3. SERVICES AND/OR ITEMS REQUIRED

A description and/or listing of the services and/or items that the Successful will be required to provide to the County under this IFB are those that are set forth below and/or referred to in any way in the sample contract, any terms and conditions, and/or any attachments referred to in this IFB. Each Bidder should carefully read and review all such documents.

The following are the services and/or items that the Successful Bidder shall provide to the County of Roanoke:

- A. Install New ERV to front office with curb and structural reinforcements being the responsibility of the winning bidder.
- B. Install ERV on E wing roof with custom side discharge curb, and structural reinforcements.
- C. Remove and replace ductwork on rooftop as shown on plans.
- D. Remove and replace Existing exhaust fan EF-1 as shown on plans.
- E. A (7) page set of plans prepared by Lawrence Perry Associates dated 1/25/21 are to be utilized for all specifications and requirements (**Attachment F to this IFB**).
- F. Plans have been submitted to Roanoke County Engineering and should be approved prior to bid day.
- G. Contractor is responsible for all permits required by state and local jurisdictions.
- H. Work may not interrupt students or faculty, and must be done on non-school days.
- I. No Bid Bond is required.
- J. Work is to be completed on or before December 28, 2021.

It is not the intent of the specifications to be proprietary, nor to exclude any manufacturer or dealer. Deviations will be given consideration if they are considered suitable and acceptable for comparison. Any deviations must be submitted in writing with the bid response. It is the responsibility of the Bidder to prove a deviation equal to the product/service specified.

SECTION 4. REQUIRED QUALIFICATIONS FOR BIDDERS

Not Used.

SECTION 5. TERM OF CONTRACT OR TIME OF PERFORMANCE OR NOT USED

- A. The Successful Bidder shall start the performance of any resultant Contract as fixed by a notice to proceed given by the County to the Successful Bidder and fully and completely perform the Contract on or before December 28, 2021, all in accordance with the Contract provisions.
- B. All terms and conditions shall remain in force for the term of the Contract and for any renewal period unless modified by mutual agreement of both parties. Prices shall not be increased during the initial term of the Contract. Prices for any renewal periods will be subject to the mutual agreement of both parties.

SECTION 6. PAYMENT FOR SERVICES

Payment(s) to the Successful Bidder shall be made in accordance with the provisions of the resultant Contract or Purchase Order, subject to final approval by the County/RCPS.

SECTION 7. GENERAL INSTRUCTIONS TO BIDDERS

- A. Bids, to be considered, must be received by the County of Roanoke Purchasing Division, at the Roanoke County Administration Building, 5204 Bernard Drive, Suite 300F, Roanoke, VA 24018, at or before 2:00 p.m., local time, on **July 15, 2021**, at which time all Bids received will be publicly opened and read. **Bids received after 2:00 p.m. will NOT be accepted or considered.** The time of receipt shall be determined by the time clock stamp in the Purchasing Office, or if it is not working, such time shall be determined by the Purchasing official who is to open the bids.

Each Bid, one (1) **original, marked as such** and **three (3) complete copies, marked as such**, must be appropriately signed by an authorized representative of the Offeror, and must be submitted in a **SEALED** envelope or package. A removable media storage device containing two (2) digital copies of the proposal, one as submitted, and one **redacted to remove all confidential and proprietary material**, must be included in the proposal packet. The notation "**Northside High School Makeup Air Unit Addition**", **IFB No. 2021-117**, and the specified opening time and date must be clearly marked on the front of that sealed envelope or package.

FAXED OR E-MAILED BIDS ARE NOT ACCEPTABLE.

The Invitation for Bid and related documents may be obtained during normal business hours from the Purchasing Division, at the Roanoke County Administration Building, 5204 Bernard Drive, Suite 300F, Roanoke, VA 24018. This document may be viewed and/or downloaded from the County of Roanoke Purchasing Division's website at <https://www.roanokecountyva.gov/bids.aspx>.

If you have any problems accessing the documents, you may contact Purchasing at (540) 772-2061.

If proposals are hand delivered or mailed, send directly to the Purchasing Division at the address listed above. If the Roanoke County Administration Building is closed for business at the time scheduled for the Bid opening, the sealed bid will be accepted and opened on the next business day of the County, at the originally scheduled hour.

All questions must be submitted before 5:00 P.M. on July 9, 2021. If necessary, an addendum will be issued and posted to the County website on the Current Bids/RFP Requests tab at <https://www.roanokecountyva.gov/bids.aspx>.

A mandatory pre-bid conference will be held at 9:30 AM on July 7, 2021, at 6758 Northside High School Rd, Roanoke, VA 24019.

- B. If you download this IFB from the County website and intend to submit a proposal, you should notify Purchasing that you have done so. However, each Bidder is solely responsible for ensuring that such Bidder has the current, complete version of the IFB documents, including any addenda, before submitting a bid. Receipt by the bidder of such addendum should be acknowledged on the Bid Form and/or addendum. The County Purchasing Division or its designee will issue Addenda that will be posted to the County website on the Current Bid Opportunities tab at <https://www.roanokecountyva.gov/bids.aspx>.

C. **IMPORTANT NOTICE - ADDENDUMS AND NOTICES OF AWARD**

Vendors may visit <http://roanokecountyva.gov/list.aspx> to sign up to receive emails or text message notices about bids, proposals, addendums, bid tabulation and awards. Vendors can sign up to receive notification in selected commodity/service categories. It is the vendor's responsibility to keep information current in the system in order to receive the notifications. The sign up only requires an email address and/or a cell phone number for receiving text messages (if your phone is capable) and your choice of categories.

Although '**Notify Me**' will be the only way to receive automatic notification, all BIDS/RFP Information will continue to be posted on our website, and can be picked up at the Purchasing Division, 5204 Bernard Drive, Suite 300F, Roanoke, VA 24018. Phone # (540) 772-2061.

The County is not responsible for any IFB obtained from any source other than the County. Contact Kate Hoyt, by phone at 540-283-8149, or by email at KHoyt@roanokecountyva.gov.

- D. Payment terms and delivery date(s) must be shown on the submitted Bid, if applicable.
- E. All Bids are to be submitted in accordance with all terms, conditions, rules, regulations, requirements and specifications identified in and by this IFB.

- F. Bids are to be on the Form as provided with **OR** as **otherwise specified** in this IFB. If a Bid Form is provided, **no changes are to be made to the Bid Form**. Any changes to Bid amounts must be initialed.
- G. All Bids shall be signed by a person on behalf of the responding Bidder who is appropriately authorized to do so. The printed name of that authorized person should be shown as well. Any Bid submitted should be in the complete legal name of the Bidder responding. No Bid will be considered from any Bidder not properly licensed as may be required by law.
- H. Except in cases of emergency, all bids for construction contracts shall be accompanied by a bid bond from a surety company selected by the bidder, which is legally authorized to do business in Virginia.
- (1) A bid, payment or performance bond for contracts for goods or services other than construction may be required if provided in the Invitation for Bid.
 - (2) The amount of the bid bond shall not exceed five percent (5%) of the total amount of the bid.
 - (3) In lieu of a bid bond, a bidder may furnish a certified check or cash escrow in the face amount required for the bond.
 - (4) Upon award of any public construction contract exceeding \$100,000 awarded to any prime contractor, such contractor shall furnish:
 - i. Performance bond in the sum of the contract amount.
 - ii. Payment bond in the sum of the contract amount.
 - (5) Performance and/or payment bonds may be required for construction contracts below \$100,000 at the discretion of the County.
 - (6) In cases of emergency performance bonds/payment bonds are required within ten (10) calendar days of notice to proceed or project commencement.
- I. Bids that have been appropriately opened cannot be changed, adjusted, corrected or modified in any way other than complete withdrawal. The County's procedures for withdrawal of bids (whether construction or other than construction) is that set forth in Code of Virginia, §2.2-4330(A)&(B)(1), which allows withdrawal of a Bid due to an error such as an unintentional arithmetic error or an unintentional omission of a quantity of work, labor or material made directly in the compilation of a Bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used in the preparation of the Bid. Withdrawal must be requested within two days of the Bid opening by delivering to the County original work papers, documents, and materials used in preparation of the Bid.
- J. All Bids, appropriately received, will be evaluated by considering the requirements set forth in the IFB, the quality, workmanship, economy of operation, suitability for intended purpose, delivery, payment terms and price of product or service being requested in this Bid.
- K. Bids are to be submitted on the type, brand, make, and/or kind of product and/or service requested or its approved equal, to be solely determined by the County, unless otherwise specified. Should a Bid be for a product and/or service as an equal, the name, make, model and type of that which is being Bid must be clearly stated. The Bid must also be accompanied by descriptive literature of the product or service Bid to allow for

evaluation. Failure to provide this information may result in the Bid being considered non-responsive and may not be considered.

It is not the intent of the specifications to be proprietary, nor to exclude any manufacturer or dealer. Deviations will be given consideration if they are considered to be suitable and acceptable for comparison. Any deviations must be submitted, in writing, with your bid. Deviations discovered after bid award or material receipt, not stated in your bid, shall be grounds for disqualification and nullification of order. It is the responsibility of the Offeror to prove that the deviation is equal to the product/service specified. The County of Roanoke will make the final determination as to whether the product is equivalent.

- L. If an award is made for the item(s) and/or services requested, a notice of award will be made which will be posted for public review on the County of Roanoke Purchasing Division's website under Current Bid Opportunities at <https://www.roanokecountyva.gov/bids.aspx> or you may contact Purchasing directly at (540) 772-2061 to request a copy of the award notification.

Upon completion of the Contract, payment will be made only to the Successful Bidder at the address as shown on the Contract. If the remittance address is other than the address on the Bid, it must be clearly noted and explained in the Bid. Contract/Purchase Order(s) will be paid only when the items and/or services have been supplied to and approved by the County.

- M. All items, identified in this IFB, are to be quoted and provided **F.O.B. DESTINATION-INSIDE DELIVERY**, unless otherwise stated in this IFB. All furniture items, if any, are to be put together and set in place.
- N. The County reserves the right to cancel this IFB or reject any or all Bids, to waive any informalities in any Bid and to purchase any whole or part of the items and/ or services listed in the IFB.
- M. Each Bidder is to notify in writing the Purchasing Division if any of Bidder's owners, officers, employees, or agents, or their immediate family members, is currently or has been in the past year, an employee of the County of Roanoke or has any responsibility or authority with the County that might affect the procurement transaction or any claim resulting therefrom. If so, please provide the Purchasing Division with the complete name and address of each such person and their connection to the County of Roanoke. Each Bidder is advised that the Ethics in Public Contracting and Conflicts of Interests Act of the Code of Virginia, as set forth in this IFB, apply to this IFB. Such information should be provided in writing before the Bid opening date or may also be provided with the Bid response.
- N. **The attention of each Bidder is directed to VA Code Sections 54.1-1100 et seq. which requires certain licenses for contractors, tradesmen and others. Each Bidder is required to determine which license, if any, it is required to have under such sections. Each Bidder shall so state on the Bid Form, or in its response, if no Bid Form is provided, whether it has a VA license under such sections and, if so, the type of license and/or license number. Failure to include this information may result in the Bid being rejected as non-responsive.**

O. **Bid Submittals shall include:**

1. **Invitation for Bid Signature Page** (p. 2-3)
2. **Bid Form**, p. 17 (Unit Price shall include all labor, material, delivery costs, overhead and profit.)
3. **Signed copies of any addenda issued.**

Failure to do so may result in the Bid being determined as non-responsive.

Questions or concerns may be addressed by contacting Kate Hoyt by email at KHoyt@roanokecountyva.gov.

- P. Ethics in Public Contracting. The provisions, requirements, and prohibitions as contained in Sections 2.2-4367 through 2.2-4377, of the Virginia Code, pertaining to bidders, offerors, contractors, and subcontractors are applicable to this IFB.
- Q. Conflict of Interests Act. The provisions, requirements, and prohibitions as contained in Sections 2.2-3100, et seq., of the Virginia Code are applicable to this IFB.
- R. The procurement provisions of the Virginia Public Procurement Act as well as the County Procurement Manual, apply to this RFP, unless specifically modified herein. The County's Procurement Manual can be reviewed on the County's electronic procurement website.
- S. The County may request clarification from any of the Bidders after review of the Bids received.
- T. The County is not liable for any costs incurred by any Bidder in connection with this IFB or any response by any Bidder to this IFB. The expenses incurred by a Bidder in the preparation, submission, and presentation of the Bid are the sole responsibility of the Bidder and may not be charged to the County.
- U. General and/or technical questions regarding the Scope of Services and/or items required, or procurement questions under this IFB may be directed to Kate Hoyt, Buyer, by phone at 540-283-8149, or by email at KHoyt@roanokecountyva.gov.
- V. Each Bidder is required to state if it has ever been debarred, fined, had a contract terminated, or found not be a responsible bidder or Offer or by any federal, state, or local government and/or private entity. If so, please give the details of each such matter and include this information with Bidder's response.
- W. **Data on Convictions for Certain Crimes and Child Abuse and Neglect Certification of Contractor:** The Consultant certifies that none of the persons who will provide services requiring direct contact with students on school property during school hours or during school-sponsored activities has been convicted of any of the following felony or misdemeanor offenses: felony sex or violence offenses, other felony offenses or misdemeanor sex offenses within the past ten years.

The Consultant further understands and acknowledges (1) that if he makes a materially false statement regarding any of the above offenses, he will be guilty of a Class 1 misdemeanor and may forfeit profits derived from the contract. Further, the Consultant understands and acknowledges that before any person is permitted to provide such

services subsequent to this certification, he must complete a new certification regarding such person in a form satisfactory to Roanoke County and the Roanoke County School Board. **Data and Convictions information will be requested before the County of Roanoke/Schools enters into a contract when required.**

- X. Each Bidder who is a stock or Nonstock Corporation, Limited Liability Company, business trust, or a limited partnership or other business entity shall be authorized to transact business in the Commonwealth of Virginia as a domestic or foreign business entity if required by law. Each such Bidder shall include in its bid response the Identification Number issued to it by the Virginia State Corporation Commission (SCC) and should list its business entity name as it is listed with the SCC. Any Bidder that is not required to be authorized to transact business in the Commonwealth as a domestic or foreign business entity as required by law shall include in its bid response a statement describing why the Bidder is not required to be so authorized. (See Va. Code Section 2.2-4311.2).
- Y. Direct contact with any Roanoke County or RCPS employee without the permission of the Purchasing Manager or her designated representative, on the subject of this bid, is strictly forbidden. Violation of this Instruction may result in disqualification of Bid.

SECTION 8. MISCELLANEOUS

- A. Ownership of all data, materials, and documentation originated and prepared for the County pursuant to the IFB shall belong exclusively to the County and be subject to public inspection in accordance with the *Virginia Freedom of Information Act*. The trade secrets or proprietary information submitted by the Bidder shall not be subject to public disclosure under the *Freedom of Information Act*, unless otherwise required by law or a court. **However, the Bidder must invoke the protection of Section 2.2-4342(F) of the Code of Virginia, in writing, either before or at the time the data or other material is submitted.** The written notice must SPECIFICALLY identify the data or materials to be protected and state the reason why protection is necessary. The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. The classification of an entire proposal document, line item prices, and/or total proposal prices as proprietary, or trade secrets, is NOT ACCEPTABLE and may result in REJECTION of the Bid.
- B. All Bidders shall be solely responsible for making sure that they have the most current and complete version of this IFB and all addenda that may have been issued for this IFB and that such Bidder has examined all such documents and data. Any interpretation, correction, or change of the IFB will be made by an addendum. Interpretations, corrections or changes of this IFB made in any other manner will not be binding and Bidders must not rely upon such interpretations, corrections, or changes. The County Purchasing Division or its designee will issue Addenda that will be posted to the County website on the Current Bid Opportunities tab at <https://www.roanokecountyva.gov/bids.aspx>.
- C. No Bidder shall confer on any public employee having official responsibility for a purchasing transaction any payment, loan, subscription, advance, deposit or money, service, or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value is exchanged.
- D. The County may make investigations to determine the ability of the Bidder to perform the

work and/or provide the services and/or items as described in this IFB. The County of Roanoke reserves the right to reject any Bid if the Bidder fails to satisfy the County of Roanoke that it is qualified to carry out the obligations and requirements requested in this IFB.

- E. The Successful Bidder must comply with the nondiscrimination provisions of Virginia Code Section 2.2-4311, which are incorporated herein by reference.
- F. The Successful Bidder must comply with the drug-free workplace provisions of Virginia Code Section 2.2-4312, which are incorporated herein by reference.
- G. It is the policy of the County of Roanoke to maximize participation whenever possible by minority and women owned business enterprises in all aspects of County contracting opportunities.
- H. The Successful Bidder shall comply with all applicable County, State, and Federal laws, codes, provisions, and regulations. The successful Bidder shall not during the performance of any resultant contract knowingly employ an unauthorized alien as defined in the federal Immigration Reform and Control Act of 1986.
- I. Providers of any outside services and/or items shall be subject to the same conditions and requirements as the Successful Bidder in regards to law, code, or regulation compliance. The County reserves the right of approval for any subcontract work, including the costs thereof.

SECTION 9. EVALUATION FOR LOWEST RESPONSIVE AND RESPONSIBLE BIDDER

To determine the lowest responsive and responsible Bidder with respect to this Bid, the following factors, among such others as will protect and preserve the interest of the County may be considered:

- A. Total extended Bid price as set forth on the Bid Form;
- B. The specified terms and discounts, if any, of the Bid;
- C. The ability, capacity and skill of the Bidder to perform the Contract and/or provide the services and/or items required;
- D. Whether the Bidder can perform the Contract and/or perform the services and/or provide the items promptly, or within the time specified, without delay or interference;
- E. The character, integrity, reputation, judgment, experience and efficiency of the Bidder;
- F. The quality of performance on previous contracts or services;
- G. The previous and existing compliance by the Bidder with laws and ordinances relating to other contracts, purchase orders, items and/or services provided by Bidder in other matters;

- H. The equipment and facilities available to the Bidder to perform the Contract and/or provide the services and/or items requested in the IFB;
- I. The sufficiency of the financial resources and ability of the Bidder to perform the Contract and/or provide the services and/or items requested in the IFB;
- J. The quality, availability, and adaptability of the supplies, materials, equipment and/or services the Bidder can provide for the particular use and/or work requested in the IFB; and
- K. The ability of the Bidder to provide future maintenance, parts, and service for the items requested in the IFB.

SECTION 10. CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

Successful Bidder, and any of its subcontractors, shall, at its sole expense, obtain and maintain during the life of the resulting Contract the insurance policies and/or bonds required. Any required insurance policies and/or bonds shall be effective prior to the beginning of any work or other performance by Successful Bidder, or any of its subcontractors, under any resultant Contract. All such insurance shall be primary and noncontributory to any insurance or self-insurance the County may have. The policies and coverages required are those as may be referred to in the sample Contract attached to this IFB, but shall include workers' compensation coverage regardless of the number of employees, unless otherwise approved by the County's Risk Manager.

SECTION 11. NEGOTIATIONS WITH LOWEST RESPONSIVE AND RESPONSIBLE BIDDER

If the bid by the lowest responsive and responsible bidder exceeds available funds, the County reserves the right to negotiate with the apparent lowest responsible bidder pursuant to County Code Chapter 17 (Ord. No. 3350, S2-30,12-14-82). State Code 2.2.4318. The conditions and procedures under which such negotiation may be undertaken are that the appropriate County officials shall determine that the lowest responsive and responsible bid exceeds available funds and notify such bidder in writing of its desire to negotiate. Thereafter, negotiations with the apparent low bidder may be held to obtain a Contract within available funds involving discussions of reduction of quantity, quality, or other cost saving mechanisms. Any such negotiated Contract shall be subject to final approval of the County, in the sole discretion of the County.

SECTION 12. BID AWARD

If an award of a Contract/Purchase Order is made, it will be awarded to the lowest responsive and responsible bidder. If an award of a contract is made, notification of such award will be posted for public review on the County of Roanoke Purchasing Division's website under Current Bid Opportunities at <https://www.roanokecountyva.gov/bids.aspx> or you may contact Purchasing directly at (540) 772-2061 to request a copy of the award notification.

SECTION 13. FAITH BASED ORGANIZATIONS

Pursuant to Virginia Code Section 2.2-4343.1, be advised that the County does not discriminate against faith-based organizations.

SECTION 14. HOLD HARMLESS AND INDEMNITY

Successful Bidder shall indemnify and hold harmless the County and its officers, agents, and employees against any and all liability, losses, damages, claims, causes of action, suits of any nature, costs, and expenses, including reasonable attorney's fees, resulting from or arising out of Successful Bidder's or its employees, agents, or subcontractors actions, activities, or omissions, negligent or otherwise, on or near County's property or arising in any way out of or resulting from any of the work or items to be provided under the Contract, and this includes, without limitation, any fines or penalties, violations of federal, state, or local laws or regulations, personal injury, wrongful death, or property damage claims or suits. Successful Bidder agrees to and shall protect, indemnify, and hold harmless all the parties referred to above from any and all demands for fees, claims, suits, actions, causes of action, settlement or judgments based on the alleged or actual infringement or violation of any copyright, trademark, patent, invention, article, arrangement, or other apparatus that may be used in the performance of the Contract.

SECTION 15. PROTESTS

Any Bidder who wishes to protest or object to any award made or other decisions Pursuant to this IFB may do so only in accordance with the provisions of Sections 2.2-4357, 4358, 4359, 4360, 4363, and 4364 of the Code of Virginia, and only if such is provided for in such Code section. Any such protest or objection must be in writing signed by a representative of the entity making the protest or objection and contain the information required by the applicable Code Sections set forth above. Such writing must be delivered to the County Manager within the required time period.

SECTION 16. COOPERATIVE PROCUREMENT

The procurement of goods and/or services provided for in this procurement is being conducted in accordance with Virginia Code Section 2.2-4304 and on behalf of other public bodies in Virginia. Unless specifically prohibited by the Successful Bidder, any resultant contract may be used by other public bodies in Virginia as allowed by Section 2.2-4304. The Successful Bidder shall deal directly with each public agency or body seeking to obtain any goods and/or services pursuant to this procurement or from this procurement and in accordance with Virginia Code Section 2.2-4304. The County of Roanoke shall not be responsible or liable for any costs, expenses, or any other matters of any type to either the Bidder or the public agency or body seeking to obtain any goods and/or services pursuant to this cooperative procurement provision.

SECTION 17. INFORMATION ON CONTRACT/PURCHASE ORDER TO BE AWARDED

The **Sample Contract** marked as Attachment E to IFB No. 2021-117 contains terms and conditions that the County will include in any Contract/Purchase Order that may be awarded, but such terms and conditions may be added to, deleted, or modified as may be agreed to between the County and the Successful Bidder. However, if a Bidder has any objections to any of the terms or conditions set forth in the Sample or any changes or additions thereto that the Bidder wants to discuss before submitting a bid, the Bidder should set forth such objections, changes, or additions in written correspondence to the Purchasing Division at least five (5) days before the bid opening date for this IFB. Otherwise, submission of a bid by a Bidder will obligate such Bidder, if it is the Successful Bidder, to enter into a Contract containing the same or substantially similar terms and conditions as contained in such Attachment, and to comply with such terms and conditions. Also, such terms and conditions, together with the requirements of this IFB, shall be deemed to be a part of any resultant Contract/Purchase Order that may be issued by the County to the Successful Bidder.

END.

IFB # 2021-117
ATTACHMENT A: BID FORM/SPECIFICATIONS

County of Roanoke
Purchasing Division
5204 Bernard Drive, SW, Suite 300-F
Roanoke, VA 24018-0798

The County/RCPS reserves the right to add, delete, or adjust quantities as deemed necessary by the County.

Bids containing any conditions, omissions, unexplained erasures, alterations or items not called for in the bid, or irregularities of any kind, may be rejected by the County as being nonresponsive. No changes are to be made to the Bid Form. Any changes to a Bid Amount must be initialed by the person signing the Bid Form.

I/We hereby propose to furnish and install two ERV units at Northside High School, in accordance with the enclosed general terms, conditions and specifications contained in IFB No. **2021-117**. The Bid Form must be completed in blue or black ink. Discrepancies in the multiplication of units of work and the unit prices will be resolved in favor of the correct multiplication of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. My/Our prices are as follows:

PRICES QUOTED SHALL BE FOB DESTINATION. Freight charges shall be included in the bid price.

Lump Sum/Turnkey Project cost: _____

(total cost to include all products and services, and any relevant fees or charges, per the plans provided as Attachment F to this IFB 2021-117.)

_____ (Initial) **I/We can furnish and deliver all items on or before December 28, 2021.**

Payment terms are: net 30. If Bidder offers a cash discount for prompt payment, it will only be considered in determining the lowest responsible Bidder if the Bidder allows at least twenty (20) days for the prompt payment after the goods or services are received or after the invoice is rendered, whichever is later.

To aid in the evaluation of bids, bidders must submit the original Bid Form and one copy of the Bid Form, Attachments, and detailed specification sheets, if applicable. If you fail to do so, your bid may be considered non-responsive and rejected.

Have you complied with this requirement? ☐ Yes / ☐ No.

Indicate whether your business _____ IS or _____ IS NOT located in Roanoke County. If it is, please include a copy of your Roanoke County business license with your bid.

I/We acknowledge the receipt of:

Addendum No. _____ Dated _____.

IFB#: 2021-117

Revised 4/2019

Addendum No. _____ Dated _____.

Addendum No. _____ Dated _____.

Addendum No. _____ Dated _____.

ATTACHMENT B: Virginia State Corporation Commission (SCC) Registration Information

The attention of each Bidder is directed to VA Code sections 54.1-1100, et seq. which requires certain licenses for contractors, tradesmen, and others. Each Bidder is required to determine which license, if any, it is required to have under such sections. Complete the following:

Bidder ___ does have or ___ does not have a Virginia Contractor's License. (Check appropriate block)

If Bidder has a Virginia Contractor's License, circle the class Bidder has and list the number.

Licensed "Class A", "Class B", or "Class C" Virginia Contractor Number: _____

If Bidder has another type of Virginia License, please list the type and number:

Type of license: _____ and number: _____.

Bidder is a ___ resident or ___ nonresident of Virginia. (Check appropriate blank.) See VA Code Sections 54.1-1100, et seq.

The attention of each Bidder is directed to Virginia Code Section 2.2-4311.2 which requires a bidder organized or authorized to transact business in the Commonwealth of Virginia pursuant to Title 13.1 or Title 50 of the Code of Virginia, as amended, or as otherwise required by law, shall include in its bid the Identification Number issued to such bidder by the Virginia State Corporation Commission (SCC). Furthermore, any bidder that is not required to be authorized to transact business in the Commonwealth of Virginia as a domestic or foreign business entity under Title 13.1 or Title 50 or as otherwise required by law shall include in its bid a statement describing why the bidder is not required to be so authorized. Please complete the following by checking the appropriate line that applies and providing the requested information:

- A. _____ Bidder is a Virginia business entity organized and authorized to transact business in Virginia by the SCC and such bidder's/offeror's Identification Number issued to it by the SCC is: _____.
- B. _____ Bidder is an out-of-state (foreign) business entity that is authorized to transact business in Virginia by the SCC and such bidder's Identification Number issued to it by the SCC is: _____.
- C. _____ Bidder does not have an Identification Number issued to it by the SCC and such bidder is not required to be authorized to transact business in Virginia by the SCC for the following reason(s):

Please attach additional sheets of paper if you need more space to explain why such bidder is not required to be authorized to transact business in Virginia.

Signature page required with submittal of bid

IFB # 2021-117
ATTACHMENT C: Direct Contact with Students Form

Name of Bidder: _____

Pursuant to Va. Code § [22.1-296.1](#), as a condition of awarding a contract for the provision of services that require the contractor, his employees or subcontractors to have **direct contact with students** on school property during regular school hours or during school-sponsored activities, the school board shall require the contractor to provide certification that all persons who will provide such services have not been convicted of a felony or any offense involving the sexual molestation or physical or sexual abuse or rape of a child.

Any person making a materially false statement regarding any such offense shall be guilty of a Class 1 misdemeanor and, upon conviction, the fact of such conviction shall be grounds for the revocation of the contract to provide such services and, when relevant, the revocation of any license required to provide such services.

I further understand and acknowledge (1) that if I make a materially false statement regarding any of the above offenses, I will be guilty of a Class 1 misdemeanor and (2) that before any person is permitted to provide such services subsequent to this certification, I must complete a new certification regarding such person.

As part of this submission, I certify that the employees of, or subcontractors to, the above mentioned contractor that will be providing services that require direct contact with students to the School Board under the resulting contract will have not been convicted of a felony or any offense involving the sexual molestation or physical or sexual abuse or rape of a child. Furthermore, I understand that the duty to certify is ongoing and extends to future employees and employees of subcontractors for the duration of the contract.

Signature of Authorized Representative

Printed Name of Authorized Representative

*Printed Name of Vendor
(If different than Representative)*

Date

ATTACHMENT D: NOTICE OF PROPRIETARY INFORMATION FORM

Confidentiality References Protection in Accordance with the Code of Virginia, Section 2.2-4342

Section Title	Page #	Reason(s) for Withholding from Disclosure

INSTRUCTIONS: Identify the data or other materials to be protected and state the reasons by using the codes listed below. Indicate the specific words, figures, or paragraphs that constitute trade secrets or proprietary materials. The classification of an entire bid or proposal document, line item prices, and/or total bid or proposal prices as proprietary or trade secret is not acceptable and will result in rejection of the bid or proposal.

- A) This page contains information relating to "trade secrets", and "proprietary information" including processes. Operations, style of work, or apparatus. Identify confidential statistical data. Amount or source of any income...of any person (or) partnership. See Virginia Public Procurement Act. Section 2.2-4342. Unauthorized disclosure of such information would violate the Trade Secrets Act 18 U.S.C. 1905.
- B) This page contains proprietary information including confidential, commercial or financial information, which was provided to the Government on a voluntary basis and is of the type that would not customarily release to the public. See Virginia Public Procurement Act, Section 2.2-4342; 5 U.S.C. 552 (b) (4); 12 C.F.R. 309.5(c) (4).
- C) This page contains proprietary information including confidential, commercial or financial information. The disclosure of such information would cause substantial harm to competitive position and impair the Government's ability to obtain necessary information from contractors in the future. 5 U.S.C. See Virginia Public Procurement Act. Section 2.2-4342; 552 (b) (4)12 C.F.R. 309.5(c) (4).

ATTACHMENT E: SAMPLE CONTRACT and TERMS AND CONDITIONS



**COUNTY OF ROANOKE, VIRGINIA
SAMPLE CONTRACT BETWEEN COUNTY OF ROANOKE AND**

FOR _____

This Contract # 2021-117 is dated _____, between the County of Roanoke, Virginia, hereinafter referred to as the "County" or "Owner", and legal name/address of contractor, hereinafter referred to as the "Contractor," Choose an item. .

WITNESSETH:

WHEREAS, Contractor has been awarded this nonexclusive Contract by the County for furnishing all equipment, materials, goods, labor, and services necessary for purchase and installation of ERV units at Northside High School, and associated work in accordance with this Contract and the documents referred to herein, all such items or services also being referred to hereinafter as the Work or Project.

NOW, THEREFORE, THE COUNTY AND THE CONTRACTOR AGREE AS FOLLOWS:

SECTION 1. WORK/ SERVICES TO BE PROVIDED AND DOCUMENTS.

For and in consideration of the money hereinafter specified to be paid by the County to the Contractor for the Work provided for in this Contract to be performed by the Contractor, the Contractor hereby covenants and agrees with the County to fully perform the services, provide any materials called for to construct, and complete the Work called for by this Contract in a good and workmanlike manner in accordance with this Contract and the documents referred to herein in order to fully and properly complete this Contract within the time stipulated, time being made of the essence for this Contract. It is also agreed by the parties hereto that the documents to this Contract consist of this Contract and the following documents listed below (Contract Documents), all of which are and constitute a part of this Contract as if attached hereto or set out in full herein, viz:

1. Insurance Requirements (Exhibit 1).
2. Scope of Work/Fee Schedule (Exhibit 2).
3. Bid Form Completed by Contractor and dated _____ (Exhibit 3). **(To be provided after selection of Successful Bidder.)**
4. Invitation for Bid No. 2021-117, which is incorporated herein by reference.

The parties agree that if there are any differences between the provisions of the above referenced documents, the provisions of the County documents and this Contract will control over any Contractor supplied documents or information.

SECTION 2. CONTRACT AMOUNT.

The County agrees to pay the Contractor for the Contractor's complete and satisfactory performance of the Work/ Service, in the manner and at the time set out in this Contract, but the total amount for all such requests will not exceed \$ _____, as provided for in this Contract and that this Contract amount may be increased or decreased by additions and/or reductions in the Work as may be authorized and approved by the County, and the Contract amount may be decreased by the County's assessment of any damages against the Contractor, as may be provided for in this Contractor or by law, and the County retains the right of setoff as to any amounts of money the Contractor may owe the County. However, Contractor further acknowledges and agrees that any request for Contractor to perform Work under this Contract is in the sole discretion of the County and that there is no guarantee of any minimum amount of Work that may be requested by the County and that no Work may be requested.

SECTION 3. TERM OF CONTRACT.

Not Used.

SECTION 4. TIME OF PERFORMANCE.

The Contractor shall commence the Work to be performed under this Contract on such date as is established and fixed for such commencement by written notice (which may be initially given verbally in an emergency situation) to proceed given by the County representative to the Contractor, and the Contractor covenants and agrees to fully construct, perform, and complete the Work and/or provide the goods called for by this Contract established by such notice. The Contractor further agrees that the Work shall be started promptly upon receipt of such notice and shall be prosecuted regularly, diligently, and uninterruptedly at a rate of progress that will ensure full completion thereof in the shortest length of time consistent with the Contract Documents and that Contractor will cooperate and coordinate with the other County contractors or employees doing other work or using the area where Contractor is working.

SECTION 5. PAYMENT.

- A. The County agrees to pay Contractor for the Contractor's complete and satisfactory performance of the Work, in the manner and at the time set out in this Contract. The County/RCPS retains the right to setoff as to any amounts of money Contractor may owe the County/RCPS. A written progress report may be requested by the County/RCPS to accompany payment request and, if so, such progress report shall detail the work completed. Also, sufficient documentation of all costs, expenses, materials supplies, and/or hours worked may be requested by the County/RCPS and, if so, may be required prior to the processing of any such request for payment. Payment will only be made for work actually performed, services actually supplied, and/or materials or goods furnished to the County/RCPS, all of which need to be approved and accepted by the County prior to such payment, unless otherwise provided for in the Contract documents. Once a payment request has been received the County/RCPS, the County/RCPS will process such payment request. If there are any objections or problems with the payment request, the County will notify

the Contractor of such matters. If the payment request is approved and accepted by the County, payment will be made by the County/RCPS to the Contractor not more than 30 days after such request has been approved.

- B. The services the Contractor may be requested to provide the County are those items set forth in Exhibit 2 (Scope of Work) and/or Exhibit 3 (Bid Form), which list of services may be amended by the mutual agreement of the parties. The prices to be paid to the Contractor for such services provided to and accepted by the County under the provisions of this Contract shall be the current price(s) as set forth in Exhibit 3 (Bid Form). Unless otherwise stated in this Contract, the price(s) shall include all applicable charges such as pick up, delivery, printing, packaging, shipping, and other charges.

SECTION 6. SALES TAX EXEMPTION.

The County is exempt from payment of State Sales and Use Tax on all tangible personal property purchased or leased for the County's use or consumption. The Virginia Sales and Use Tax Certificate of Exemption number is 217-074292-9. The County's tax-exempt status shall not inure to the benefit of Vendor. Vendor shall be liable for all applicable local, state and federal taxes that may arise or be due under this Agreement.

SECTION 7. FREE ON BOARD, RISK OF LOSS, AND TITLE.

All prices include F.O.B Destination, inside delivery, unless otherwise noted in this Contract. The risk of loss from any casualty, regardless of cause, shall be on the Contractor until the items have been delivered to County personnel making the request and accepted by the County. The risk of loss shall also be on the Contractor during the return of any items to the Contractor. Title to the items shall pass to the County upon receipt and acceptance of such items by the County.

SECTION 8. INSPECTION.

The County shall have a reasonable time after receipt of items / services provided and before payment to inspect all items for conformity to this Contract. If all or some of the items delivered to the County do not fully conform to the provisions hereof, the County shall have the right to reject and return such nonconforming items, at the sole cost of the Contractor.

SECTION 9. WARRANTY OF MATERIAL AND WORKMANSHIP.

Contractor agrees that all items provided to the County will be new, or if an item is refurbished or remanufactured, such item will meet the industry standards for such item and the item shall be clearly labeled as refurbished or remanufactured, and that all such items include such warranties as may be provided by Virginia law together with any warranties provided by the manufacturer of the item. Contractor shall use reasonable commercial efforts to assist the County in processing warranty claims against a manufacturer. Contractor also agrees that the services provided under this Contract shall be completed in a professional, good and workmanlike manner, with the degree of skill and care that is required by like contractors in Virginia. Further, Contractor warrants that such services shall be completed in accordance with the applicable requirements of this Contract

and shall be correct and appropriate for the purposes contemplated in this Contract. Contractor agrees that Contractor shall repair or replace, at Contractor's sole expense, and to the satisfaction of the County, any items, material, equipment, or part of the item that is found by the County to be defective or not in accordance with the terms of this Contract.

SECTION 10. PAYMENTS TO OTHERS BY CONTRACTOR.

The Contractor agrees that Contractor will comply with the requirements of Section 2.2-4354 of the Virginia Code regarding Contractor's payment to other entities and the Contractor will take one of the two actions permitted therein within 7 days after receipt of amounts paid to Contractor by the County. Contractor further agrees that the Contractor shall indemnify and hold the County harmless for any lawful claims resulting from the failure of the Contractor to make prompt payments to all persons supplying the Contractor equipment, labor, tools, or material in connection with the work provided for in the Contract. In the event of such claims, the County may, in the County's sole discretion, after providing written notice to the Contractor, withhold from any payment request or final payment the unpaid sum of money deemed sufficient to pay all appropriate claims and associated costs in connection with the Contract and make such payment, if the County determines it to be appropriate to do so.

SECTION 11. HOLD HARMLESS AND INDEMNITY.

Contractor shall indemnify and hold harmless the County and its officers, agents, and employees against any and all liability, losses, damages, claims, causes of action, suits of any nature, costs, and expenses, including reasonable attorney's fees, resulting from or arising out of Contractor's or its employees, agents, or subcontractors actions, activities, or omissions, negligent or otherwise, on or near County's property or arising in any way out of or resulting from any of the work or items to be provided under this Contract, and this includes, without limitation, any fines or penalties, violations of federal, state, or local laws or regulations, personal injury, wrongful death, or property damage claims or suits. Contractor agrees to and shall protect, indemnify, and hold harmless all the parties referred to above from any and all demands for fees, claims, suits, actions, causes of action, settlement or judgments based on the alleged or actual infringement or violation of any copyright, trademark, patent, invention, article, arrangement, or other apparatus that may be used in the performance of this Contract.

SECTION 12. COMPLIANCE WITH LAWS AND REGULATIONS, AND IMMIGRATION LAW.

Contractor agrees to and will comply with all applicable federal, state, and local laws, ordinances, and regulations, including, but not limited to all applicable licensing requirements, environmental regulations, and OSHA regulations. Contractor further agrees that Contractor does not and shall not during the performance of its Contract; knowingly employ an unauthorized alien as defined in the Federal Immigration Reform & Control Act of 1986.

SECTION 13. INDEPENDENT CONTRACTOR.

The relationship between Contractor and the County is a contractual relationship. It is not intended in any way to create a legal agency or employment relationship. Contractor shall, at all times, maintain its status as an independent contractor and both parties acknowledge that neither is an agent, partner or employee of the other for any purpose. Contractor shall be responsible for causing all required insurance, workers' compensation (regardless of number of employees) and unemployment insurance to be provided for all of its employees and subcontractors. Contractor will be responsible for all actions of any of its subcontractors, and that they are properly licensed.

SECTION 14. REPORTS, RECORDS, AND AUDIT.

Contractor agrees to maintain all books, records, electronic data, and other documents relating to this Contract for a period of five (5) years after the end of each fiscal year covered by this Contract. The County, its authorized employees, agents, representatives, and/or state auditors shall have full access to and the right to request, examine, copy, and/or audit any such materials during the term of the Contract and such retention period, upon prior written notice to Contractor. This includes the County's right to audit and/or examine any of the Contractor's documents and/or data as the County deems appropriate to protect the County's interests.

SECTION 15. INSURANCE REQUIREMENTS.

Contractor and any of its subcontractors involved in this Contract shall maintain the insurance coverage's set forth in Exhibit 1 to this Contract and provide the proof of such insurance coverage as called for in Exhibit 1, including workers' compensation coverage regardless of the number of Contractor's employees. Such insurance coverage shall be obtained at the Contractor's sole expense and maintained during the life of the Contract and shall be effective prior to the beginning of any work or other performance by the Contractor under this Contract. Additional insured endorsements, if required, must be received by the County within 30 days of the execution of this Contract or as otherwise required by the County's Risk Manager.

SECTION 16. DEFAULT.

If Contractor fails or refuses to perform any of the terms of this Contract, including poor services, work or materials, the County may, by written notice to Contractor, terminate this Contract in whole or in part. In addition to any right to terminate, the County may enforce any remedy available at law or in equity in connection with such default, and Contractor shall be liable for any damages to the County resulting from Contractor's default. The County further reserves the right to immediately obtain such work or services from other entities in the event of Contractor's default.

SECTION 17. NONWAIVER.

Contractor agrees that the County's waiver or failure to enforce or require performance of any term or condition of this Contract or the County's waiver of any particular breach of this Contract by the Contractor extends to that instance only. Such waiver or failure is not and shall not be a waiver of any of the terms or conditions of this Contract or a waiver of any other breaches of the

Contract by the Contractor and does not bar the County from requiring the Contractor to comply with all the terms and conditions of the Contract and does not bar the County from asserting any and all rights and/or remedies it has or might have against the Contractor under this Contract or by law.

SECTION 18. FORUM SELECTION AND CHOICE OF LAW.

This Contract shall be governed by, and construed in accordance with, the laws of the Commonwealth of Virginia, without application of Virginia's conflict of law provisions. Venue for any litigation, suits, and claims arising from or connected with this Contract shall only be proper in the Roanoke County Circuit Court, or in the Roanoke County General District Court if the amount in controversy is within the jurisdictional limit of such court, and all parties to this Contract voluntarily submit themselves to the jurisdiction and venue of such courts, regardless of the actual location of such parties. The provisions of this Contract shall not be construed in favor of or against either party, but shall be construed according to their fair and customary meaning as if both parties jointly prepared this Contract.

SECTION 19. SEVERABILITY.

If any provision of this Contract, or the application of any provision hereof to a particular entity or circumstance, shall be held to be invalid or unenforceable by a court of competent jurisdiction, the remaining provisions of this Contract shall not be affected and all other terms and conditions of this Contract shall be valid and enforceable to the fullest extent permitted by law.

SECTION 20. NONDISCRIMINATION.

- A. During the performance of this Contract, Contractor agrees as follows:
- i. Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state or federal law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 - ii. Contractor in all solicitations or advertisements for employees placed by or on behalf of Contractor will state that Contractor is an equal opportunity employer.
 - iii. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.
- B. Contractor will include the provisions of the foregoing Section A (i, ii, and iii) in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

SECTION 21. DRUG-FREE WORKPLACE.

- A. During the performance of this Contract, Contractor agrees to (i) provide a drug-free workplace for Contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of Contractor that Contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.
- B. For the purposes of this section, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a contractor, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

SECTION 22. FAITH BASED ORGANIZATIONS.

Pursuant to Virginia Code Section 2.2-4343.1, be advised that the County does not discriminate against faith-based organizations.

SECTION 23. DATA ON CONVICTIONS FOR CERTAIN CRIMES

The Vendor certifies that none of the persons who will provide services requiring direct contact with students on school property during school hours or during school-sponsored activities has been convicted of any of the following felony or misdemeanor offenses: felony sex or violence offenses, other felony offenses or misdemeanor sex offenses within the past ten years. Upon request by the Schools, Vendor shall provide specific documentation to verify that it has conducted requisite criminal conviction checks on its employees, agents, sub-contractors, and assigns. Schools reserve the right to remove or deny entrance to any employee, agent, sub-contractor, or assign of Vendor when School determines, in its sole discretion, that such person poses a risk to health or safety of others on School property.

The Consultant further understands and acknowledges (1) that if he makes a materially false statement regarding any of the above offenses, he will be guilty of a Class 1 misdemeanor and may forfeit profits derived from the contract. Further, the Consultant understands and acknowledges that before any person is permitted to provide such services subsequent to this certification, he must complete a new certification regarding such person in a form satisfactory to Roanoke County and the Roanoke County School Board. Data and Convictions information will be requested before the County of Roanoke/Schools enters into a contract / when required.

SECTION 24. ASSIGNMENT.

Contractor may not assign or transfer this Contract in whole or in part except with the prior written consent of the County, which consent shall not be unreasonably withheld. If consent to assign is given, no such assignment shall in any way release or relieve the Contractor from any of the covenants or undertakings contained in this Contract and the Contractor shall remain liable for the Contract during the entire term thereof.

SECTION 25. CONTRACTUAL DISPUTES.

Contractual claims, whether for money or for other relief, including any disputes as to change orders or extra work, shall be submitted, in writing, no later than sixty (60) calendar days after final payment or payment designated as a final payment; however, written notice of the Contractor's intention to file such claim must be given at the time of the occurrence or beginning of the work upon which the claim is based. Such notice is a condition precedent to the assertion of any such claim by the Contractor. A written decision upon any such claims will be made by Board of Supervisors or designee (hereafter BOS) within thirty (30) calendar days after submittal of the claim and any practically available additional supporting evidence required by the BOS. The Contractor may not institute legal action prior to receipt of the County's decision on the claim unless the BOS fails to render such decision within one hundred twenty (120) calendar days from submittal of its claim. The decision of the BOS shall be final and conclusive unless the Contractor within six (6) months of the date of the final decision on a claim or from expiration of the 120 day time limit, whichever occurs first, initiates legal action as provided in Section 2.2 -4364, of the Code of Virginia. Failure of the County to render a decision within said one hundred twenty (120) calendar days shall not result in the Contractor being awarded the relief claimed nor shall it result in any other relief or penalty. The sole result of the County's failure to render a decision within said one hundred twenty (120) calendar days shall be Contractor's right to immediately institute legal action. No administrative appeals procedure pursuant to Section 2.2 -4365, of the Code of Virginia, has been established for contractual claims under this Contract.

SECTION 26. SUCCESSORS AND ASSIGNS.

The terms, conditions, provisions, and undertakings of this Contract shall be binding upon and inure to the benefit of each of the parties hereto and their respective successors and assigns.

SECTION 27. HEADINGS.

The captions and headings in this Contract are for convenience and reference purposes only and shall not affect in any way the meaning and interpretation of this Contract.

SECTION 28. COUNTERPART COPIES.

This Contract may be executed in any number of counterpart copies, each of which shall be deemed an original, but all of which together shall constitute a single instrument.

SECTION 29. AUTHORITY TO SIGN.

The persons who have executed this Contract represent and warrant that they are duly authorized to execute this Contract on behalf of the party for whom they are signing.

SECTION 30. NOTICES.

All notices must be given in writing and shall be validly given if sent by certified mail, return receipt requested, or by a nationally recognized overnight courier, with a receipt, addressed as follows (or any other address that the party to be notified may have designated to the sender by like notice):

To RCPS:	Roanoke County Public Schools Attn: Chris Lowe 5937 Cove Road Roanoke, Virginia 24019
Email:	@rcps.us
Copy to:	County of Roanoke Purchasing Division Attn: Kate Hoyt, Buyer 5204 Bernard Drive, SW, Suite 300-F Roanoke, Virginia 24018
Email:	KHoyt@ronaokecountyva.gov
If to Contractor:	_____ Attn: _____, President/CEO _____ _____
Email Address:	_____
Phone:	_____

Notices shall be deemed to be effective one day after sending if sent by overnight courier or three (3) days after sending it by certified mail, return receipt requested.

SECTION 31. PROTECTING PERSONS AND PROPERTY.

The Contractor expressly undertakes both directly and through its subcontractors, to take every reasonable precaution at all times for the protection of all persons and property at the location of the Work or in the vicinity of the Work or that may be affected by the Contractor's operation in connection with the Work. The Contractor will maintain adequate protection of all Contractor's Work to prevent damage to it and shall protect the County's property from any injury or loss arising in connection with this Contract and to protect adjacent property to prevent any damage to it or loss of use and enjoyment by its owners. Contractor agrees to be responsible for the entire Work and will be liable for all damages to the Work, including, but not limited to, damages to any

property of the County or to any property in the vicinity or adjacent to the Work. All damage with respect to the Work caused by vandalism, weather, or any other cause, other than resulting from the sole negligence of the County shall be the responsibility of the Contractor. Contractor shall also be responsible for any inventory shortages and discrepancies of any type.

SECTION 32. CONTRACT SUBJECT TO FUNDING.

This Contract is subject to funding and/or appropriations from federal, state, and/or local governments and/or agencies. If any such funding is not provided, withdrawn, or otherwise not made available for this Contract, the Contractor agrees that the County may terminate this Contract on seven (7) days written notice to Contractor, without any penalty or damages being incurred by the County. Contractor further agrees to comply with any applicable requirements of any grants and/or agreements providing such funding.

SECTION 33. SUSPENSION OR TERMINATION OF CONTRACT BY COUNTY.

The County, at any time, may order Contractor to immediately stop work on this Contract, and/or by seven days (7) written notice may terminate this Contract, with or without cause, in whole or in part, at any time. Upon receipt of such notice, the Contractor shall immediately discontinue all services affected (unless the notice directs otherwise), and deliver to the County all data (including electronic data), drawings, specifications, reports, project deliverables, estimates, summaries, and such other information and materials as may have been accumulated by the Contractor in performing this Contract whether completed or in process (unless otherwise directed by the notice).

1. If the termination or stop work order is due to the failure of the Contractor to fulfill any of its Contract obligations, the County may take over the Work and prosecute the same to completion by contract or otherwise. In such case, the Contractor shall be liable to the County for any damages allowed by law, and upon demand of County shall promptly pay the same to County.
2. Should the Contract be terminated or work is stopped not due in any way to the fault of the Contractor, the Contractor shall only be entitled to compensation for services actually performed and materials actually supplied prior to notice of termination or to stop work and which are approved by the County and any applicable federal or state approving agency. No profit, overhead, or any other costs of any type are allowed after the date of such notice of termination or stop work order.
3. The rights and remedies of the County provided in this Section are in addition to any other rights and remedies provided by law or under this Contract and County may pursue any and all such rights and remedies against Contractor as it deems appropriate.

SECTION 34. ETHICS IN PUBLIC CONTRACTING.

The provisions, requirements, and prohibitions as contained in Sections 2.2-4367 through 2.2-4377, of the Va. Code, pertaining to bidders, offerors, contractors, and subcontractors are applicable to this Contract.

SECTION 35. COMPLIANCE WITH STATE LAW; FOREIGN AND DOMESTIC BUSINESSES AUTHORIZED TO TRANSACT BUSINESS IN THE COMMONWEALTH OF VIRGINIA.

Contractor shall comply with the provisions of Virginia Code Section 2.2-4311.2, as amended, which provides that a contractor organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 or as otherwise required by law. Contractor shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50, to be revoked or cancelled at any time during the term of the Contract. The County may void the Contract if the Contractor fails to remain in compliance with the provisions of this section.

SECTION 36. OWNERSHIP OF REPORTS AND DOCUMENTS.

Contractor agrees that all reports and any other documents (including electronic data) prepared for, obtained in connection with, and/or required to be produced in connection with this Contract shall be delivered by the Contractor to the County and all such items shall become the sole property of the County. The Contractor agrees that the County shall own all rights of any type in and to all such items, including but not limited to copyrights and trademarks, and the County may reproduce, copy, and use all such items as the County deems appropriate, without any restriction or limitation on their use and without any cost or charges to the County from Contractor. Contractor hereby transfers and assigns all such rights and items to the County. Contractor further agrees Contractor will take any action and execute any documents necessary to accomplish the provisions of this Section. The Contractor also warrants that Contractor has good title to all materials, equipment, documents, and supplies which it uses in the Work or for which it accepts payment in whole or in part.

SECTION 37. ENTIRE CONTRACT.

This Contract, including any attachments, exhibits, and referenced documents, constitutes the complete understanding between the parties. This Contract may be modified only by written agreement properly executed by the parties.

SIGNATURE PAGE TO FOLLOW.

THIS AGREEMENT may be modified in writing by mutual agreement of both parties.

IN WITNESS WHEREOF, the parties hereto have signed this Contract by their authorized representatives.

(Full Legal Name of Vendor)

By_____

Printed Name and Title

COUNTY OF ROANOKE, VIRGINIA

By_____

Printed Name and Title

Approved as to execution:

County Attorney/Assistant County Attorney

**CONTRACT 2021-117
BETWEEN COUNTY OF ROANOKE AND [VENDOR NAME]
FOR**

EXHIBIT 1: SAMPLE CONTRACTOR'S INSURANCE AND BOND REQUIREMENTS

REFERENCE: IFB # 2021-117

INSURANCE REQUIREMENTS SECTION

The Contractor shall comply with the insurance requirements set forth in the Contract, including the items set forth below:

- A. Neither the Contractor nor any subcontractor shall commence work under this Contract until the Contractor has obtained and provided proof of the required insurance coverages to the County, and such proof has been approved by the County. The Contractor confirms to the County that all subcontractors have provided Contractor with proof of such insurance, or will do so prior to commencing any work under this Contract.
- B. Contractor, including all subcontractors, shall, at its and/or their sole expense, obtain and maintain during the life of this Contract the insurance policies and/or coverages required by this section. The County and its officers, employees, agents, assigns, and volunteers shall be added as an additional insureds, by endorsement, to the general liability and automobile coverages of any such policies and such insurance coverages shall be primary and noncontributory to any insurance and/or self-insurance such additional insureds may have. The Contractor shall immediately notify in writing the County of any changes, modifications, and/or termination of any insurance coverages and/or policies required by this Contract. The Contractor shall provide to the County with the signed Contract an Acord certificate of insurance which states in the description of operations section one of the two paragraphs below:
 - (1) The County and its officers, employees, agents, assigns, and volunteers are additional insureds by endorsement as coverage under this policy includes ISO endorsement CG 20 33 which provides that the insured status of such entities is automatic if required by a contract or a written agreement. (If additional insured status is automatic under a different coverage form, Contractor must attach a copy of the coverage form to its certificate. Any required insurance policies shall be effective prior to the beginning of any work or other performance by Contractor and any subcontractors under this Contract).

OR

- (2) ISO endorsement CG 20 10 will be issued, prior to the beginning of any work or other performance by Contractor under this Contract, to the County and its officers, employees, agents, assigns, and volunteers naming them as an additional insured under the general liability coverage. (A copy of the binder confirming the issuance

must be attached to the certificate. Any required insurance policies shall be effective prior to the beginning of any work or other performance by Contractor and any subcontractors under this Contract).

However, if B (1) or (2) cannot be provided, the County's Risk Manager, in such Manager's sole discretion, may approve such other certificate of insurance or insurance document(s) that the Risk Manager deems acceptable. The County of Roanoke shall also be named as the Certificate Holder.

C. The following insurance coverages and limits are required in order to provide services or materials to Roanoke County general government agencies and the Roanoke County Public Schools. These limits may be adjusted depending on the type of service or materials being provided and the exposure to risk.

The Successful Offeror shall carry Liability Insurance in the amount specified below, including contractual liability assumed by the Successful Offeror, and shall deliver a Certificate of Insurance from carriers acceptable to the owner specifying such limits. The Certificate shall show the County of Roanoke and Roanoke County Public Schools, their supervisory boards and members thereof, officers, agents, employees and volunteers as additional insureds by endorsement, on the Commercial General Liability, Automobile Liability and Excess/Umbrella Liability coverage. The additional insured status shall be endorsed to the coverage with the provision that this coverage "is primary to all other coverage the County of Roanoke and/or Roanoke County Public Schools may possess." A Certificate of Insurance evidencing the additional insured status must be presented to the County of Roanoke and/or Roanoke County Public Schools along with a copy of the Endorsement prior to work or services beginning.

The coverage shall be provided by a carrier(s) rated "Excellent" by A.M. Best. In addition, the insurer shall agree to give the County 30 days' notice of its decision to cancel coverage.

(1) Workers' Compensation

Statutory Virginia Limits

Employers' Liability Insurance

- \$100,000 for each Accident by employee
- \$100,000 for each Disease by employee
- \$500,000 policy limit by Disease

(2) Commercial General Liability - Combined Single Limit

- \$1,000,000 each occurrence including contractual liability for specified agreement
- \$2,000,000 General Aggregate (other than Products/Completed Operations)
- \$2,000,000 General Liability-Products/Completed Operations
- \$1,000,000 Personal and Advertising injury
- \$ 100,000 Fire Damage Legal Liability

Coverage must include Broad Form property damage and (XCU) Explosion, Collapse and Underground Coverage

- (3) **Business Automobile Liability** – including owned, non-owned and hired car coverage
- Combined Single Limit - \$1,000,000 each accident

Compliance by the Contractor with the foregoing requirements as to carrying insurance shall not relieve the Contractor of their liabilities provisions of the Contract

- D. Contractual Liability covers the following indemnity agreement: “The Successful Offeror agrees to indemnify, defend and hold harmless the County of Roanoke and Roanoke County Public Schools, their supervisory boards and members thereof, officers, agents, employees and volunteers from any claims, damages, suits, actions, liabilities and costs of any kind or nature, including attorneys’ fees, arising from or caused by the provision of any services, the failure to provide any services or the use of any services or materials furnished (or made available) by the Successful Offeror, provided that such liability is not attributable to the County or School Division’s sole negligence.”
- E. The continued maintenance of the insurance policies and coverages required by the Agreement is a continuing obligation, and the lapse and/or termination of any such policies or coverages without approved replacement policies and/or coverages being obtained shall be grounds for termination of the Consultant/Contractor for default.
- F. Nothing contained in the insurance requirements is to be construed as limiting the liability of the Consultant/Contractor, and/or its subcontractors, or their insurance carriers. The County does not in any way represent that the coverages or the limits of insurance specified are sufficient or adequate to protect the Consultant/Contractor’s interest or liabilities, but are merely minimums. The obligation of the Consultant/Contractor, and its subcontractors, to purchase insurance shall not in any way limit the obligations of the Consultant/Contractor in the event that the County or any of those named above should suffer any injury or loss in excess of the amount actually recoverable through insurance.
- G. The classification code numbers appearing on the Commercial General Liability coverage parts shall not exclude the symbols "X-C-U".
- H. The intent of this insurance specification is to provide the coverage required and the limits expected for each type of coverage. With regard to the Business Automobile Liability and Commercial General Liability, the total amount of coverage can be accomplished through any combination of primary and excess/umbrella insurance. However, the total insurance protection provided for Commercial General Liability or for Business Automobile Liability, either individually or in combination with the Excess/Umbrella Liability, must total \$1,000,000 per occurrence. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded the County of Roanoke and Roanoke County Public Schools. This policy shall be endorsed to be primary with respect to the additional insured.

I. The certificate holders on the Accord form Certificates of Insurance shall be:

Roanoke County School Board
5937 Cove Road,
Roanoke, VA 24019
Attn: Purchasing Dept.

J. **Claims Made Policies**

If the liability insurance has been issued on a "claims made" basis, the Successful Offeror must either:

- (1) Agree to provide certificates of insurance evidencing the above coverage for a period of three (3) years after final payment under the Agreement for General Liability policies. This certificate shall evidence a "retroactive date" no later than the beginning of the Offeror's work; or
- (2) Purchase the extended reporting period endorsement for the policies and provide certificates of insurance and a copy of the endorsement.

BOND REQUIREMENTS SECTION

The Contractor shall comply with the bond requirements set forth in the Contract, including the items set forth below:

- A. Except in cases of emergency, all bids for construction contracts shall be accompanied by a bid bond from a surety company selected by the bidder, which is legally authorized to do business in Virginia.
- (1) A bid, payment or performance bond for contracts for goods or services other than construction may be required if provided in the Invitation for Bid.
 - (2) The amount of the bid bond shall not exceed five percent (5%) of the total amount of the bid.
 - (3) In lieu of a bid bond, a bidder may furnish a certified check or cash escrow in the face amount required for the bond.
 - (4) Upon award of any public construction contract exceeding \$100,000 awarded to any prime contractor, such contractor shall furnish:
 - i. Performance bond in the sum of the contract amount.
 - ii. Payment bond in the sum of the contract amount.
 - (5) Performance and/or payment bonds may be required for construction contracts below \$100,000 at the discretion of the County.

- (6) In cases of emergency performance bonds/payment bonds are required within ten (10) calendar days of notice to proceed/project commencement.

END

**CONTRACT 2021-117
BETWEEN COUNTY OF ROANOKE AND VENDOR NAME
FOR**

EXHIBIT 2: SCOPE OF WORK/FEE SCHEDULE

REFERENCE: IFB# 2021-117

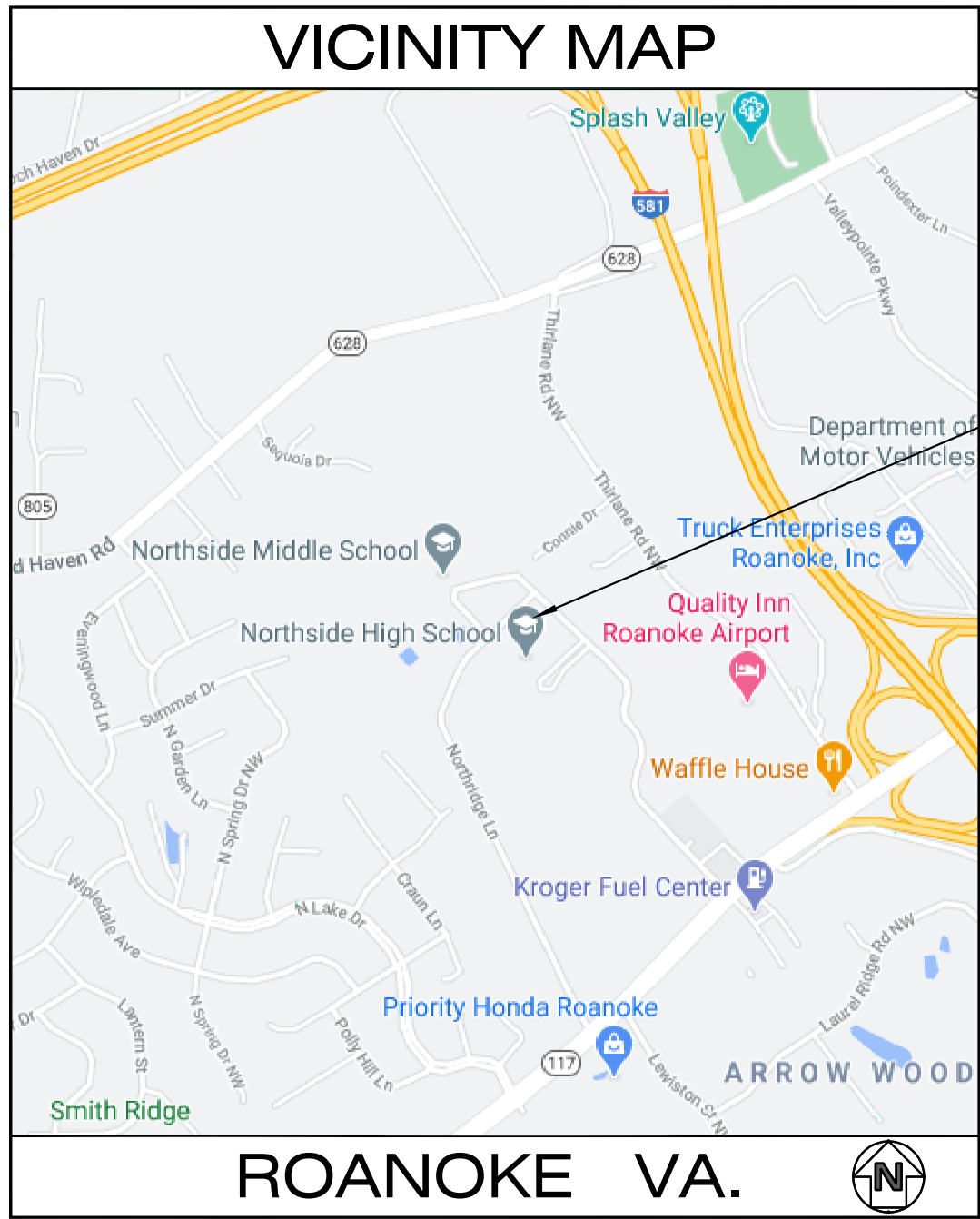
The services, work, and/or items that the Contractor shall provide in a timely and proper manner in accordance with the Contract include, but are not necessarily limited to, the following:

Reference IFB 2021-117 Specifications.

ATTACHMENT F: PROJECT PLANS

NORTHSIDE HIGH SCHOOL MAKEUP AIR UNIT ADDITION

6758 NORTHSIDE HIGH SCHOOL RD.
ROANOKE, VA 24019

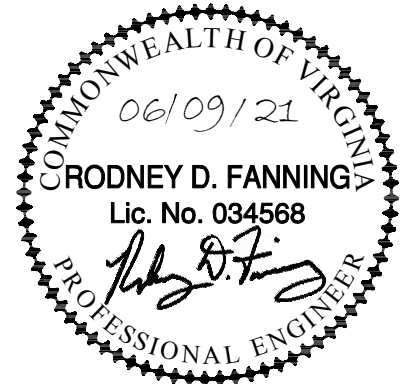
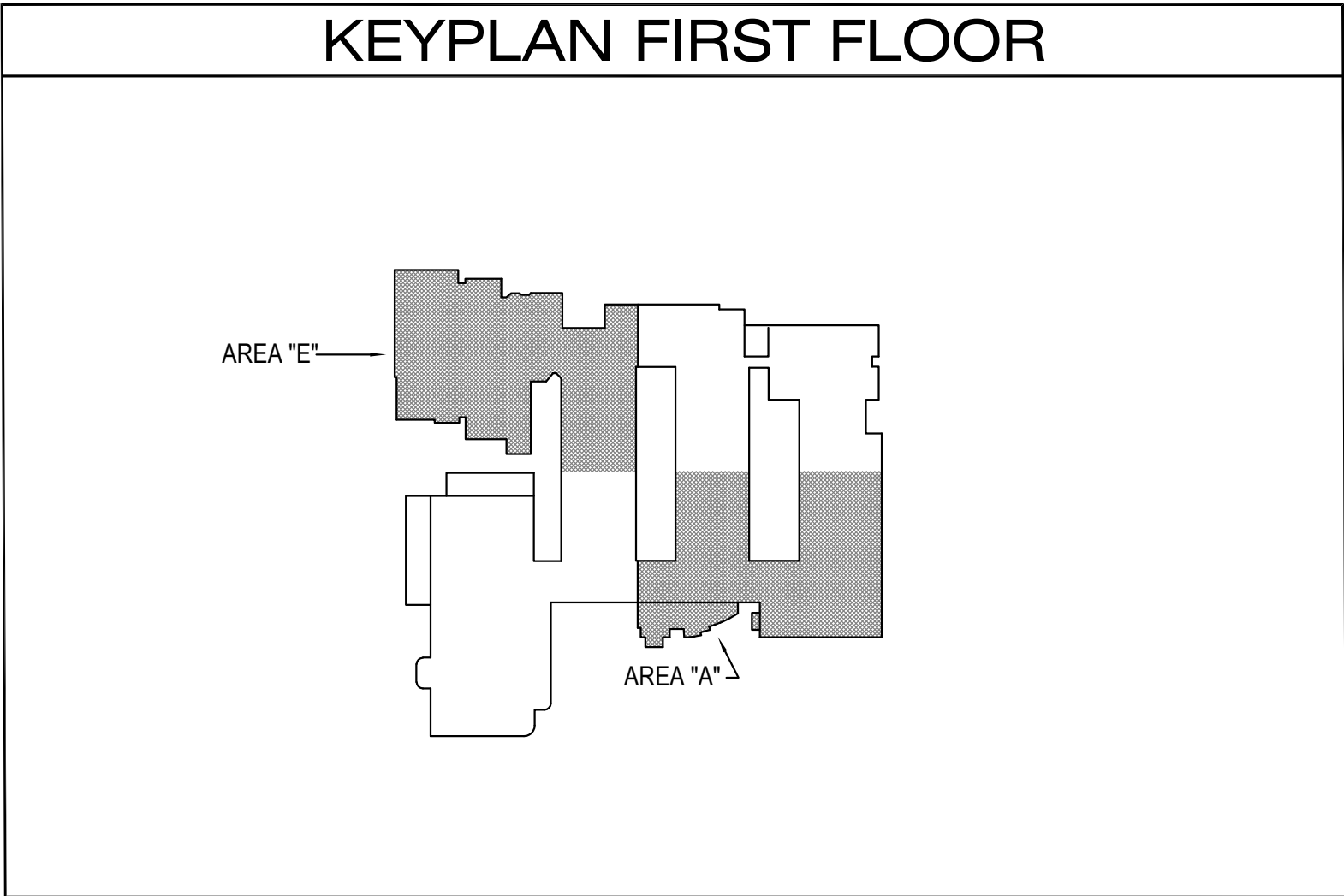


NORTHSIDE
HIGH
SCHOOL

INDEX OF DRAWINGS	
T1	TITLE SHEET
M1	HVAC LEGEND, GENERAL NOTES, SCHEDULE AND DETAILS
M2	FLOOR PLAN - HVAC
M3	HVAC SPECIFICATIONS
M4	HVAC SPECIFICATIONS
E1	ELECTRICAL LEGEND, ABBREVIATIONS, SPECIFICATIONS, NOTES AND PARTIAL ONE-LINE DIAGRAM
E2	PARTIAL FIRST FLOOR PLANS - AREA A AND AREA E - POWER

REFERENCE INFORMATION	
TOTAL BUILDING AREA:	146,815 SF
RENOVATION AREA:	7,310 SF
CONSTRUCTION TYPE:	II-B
OCCUPANT USE GROUP:	E,B,A-3
FIRE SUPPRESSION:	EXISTING
FIRE ALARM:	EXISTING

CODE DATA
CODE GOVERNING NEW WORK: 2015 VIRGINIA EXISTING BUILDING CODE (VEBC)
CODE GOVERNING ORIGINAL WORK: 2003 VIRGINIA UNIFORM STATE BUILDING CODE
CODE MODIFICATIONS FOR EXISTING WORK: NONE KNOWN

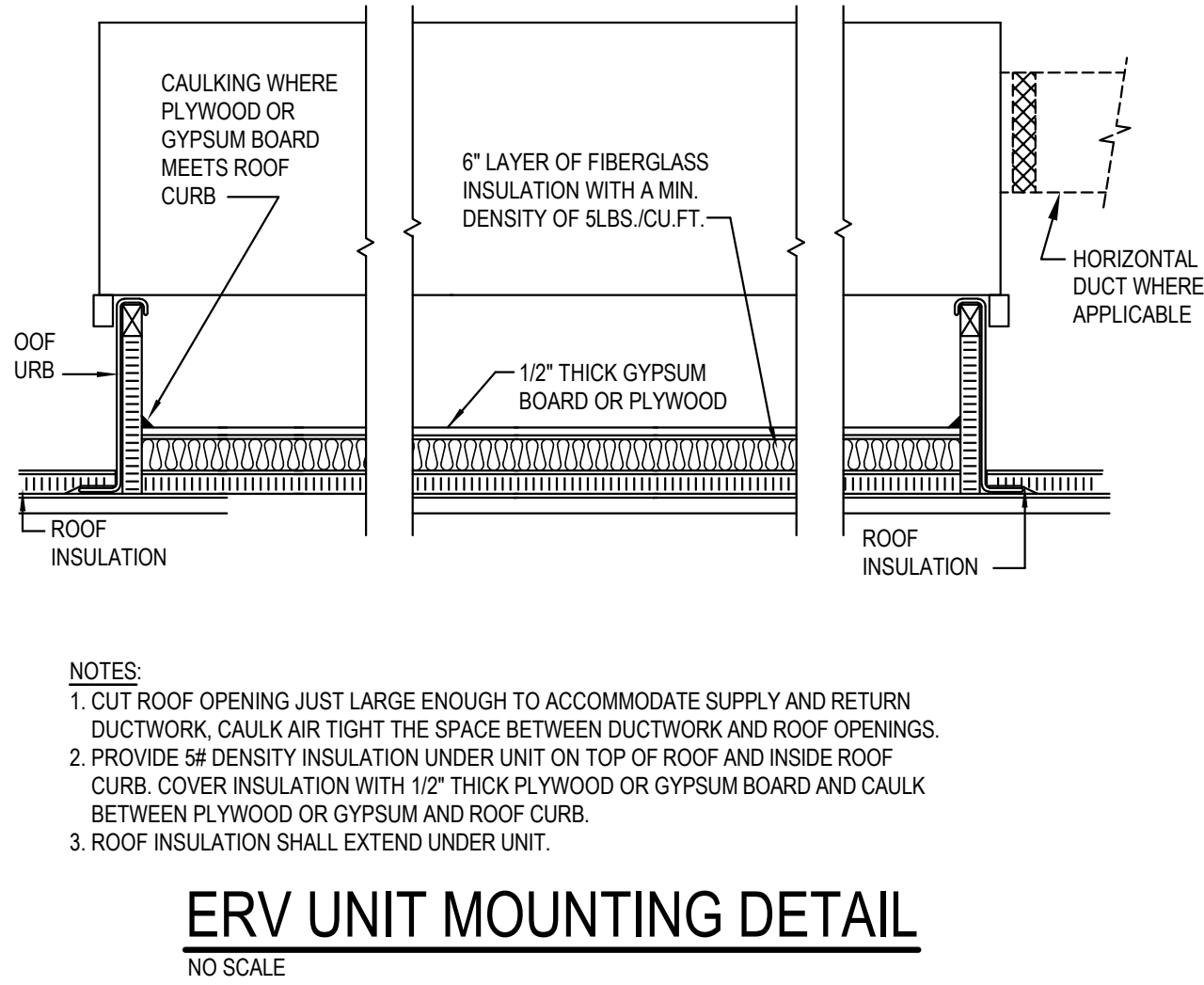
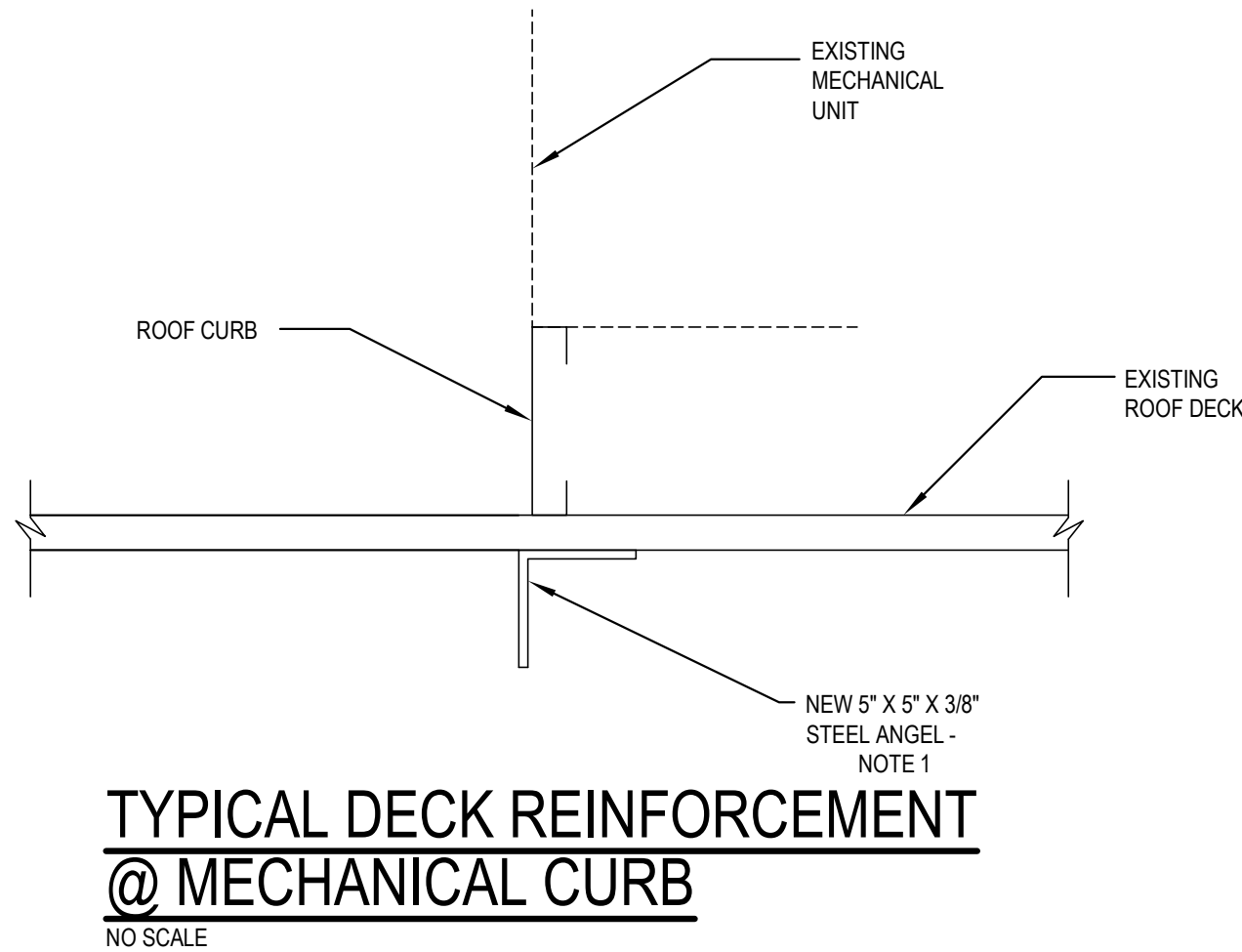
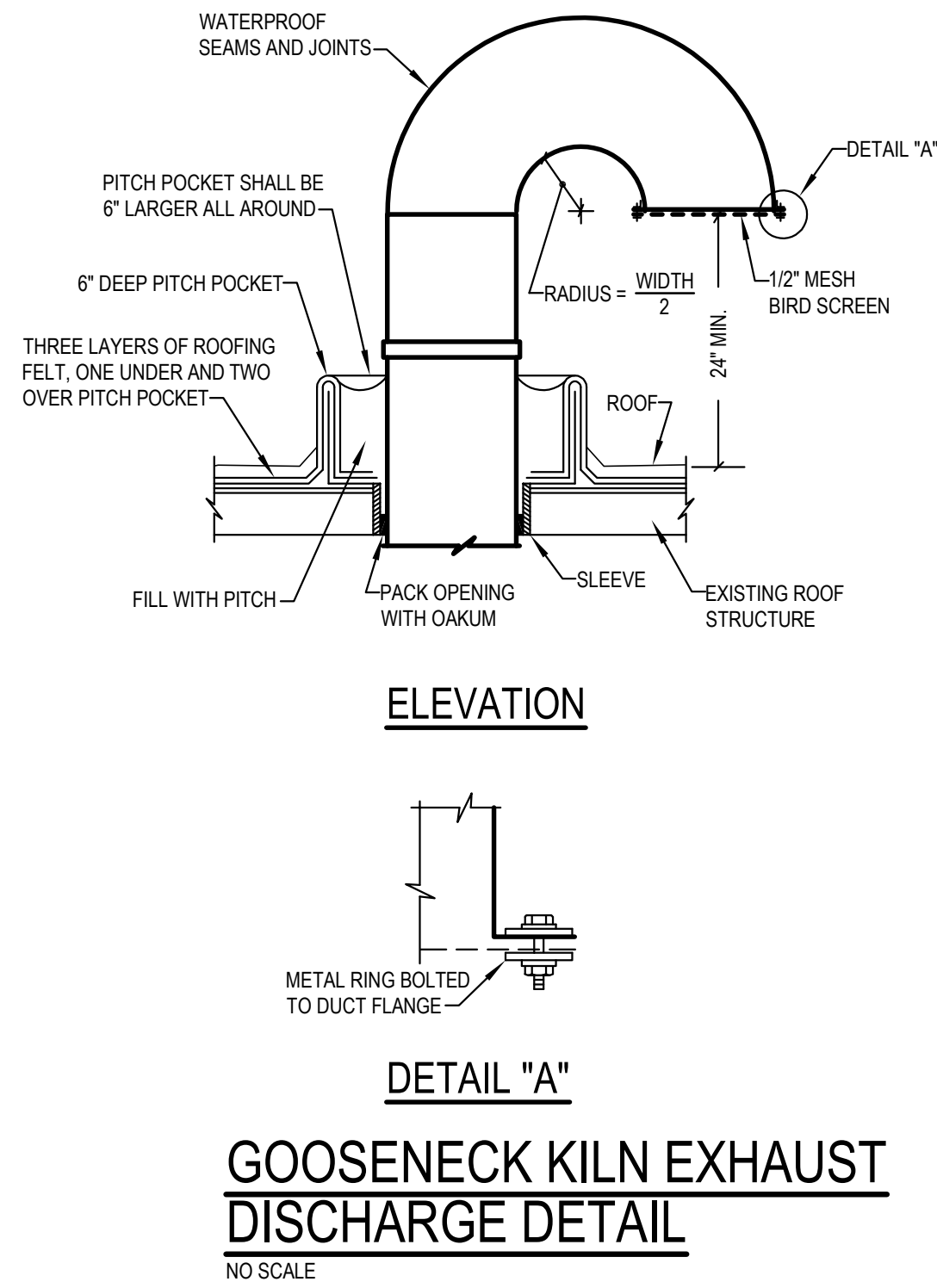
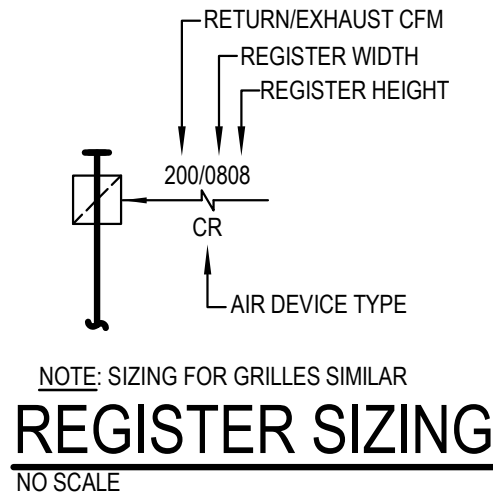


REVISION	DATE

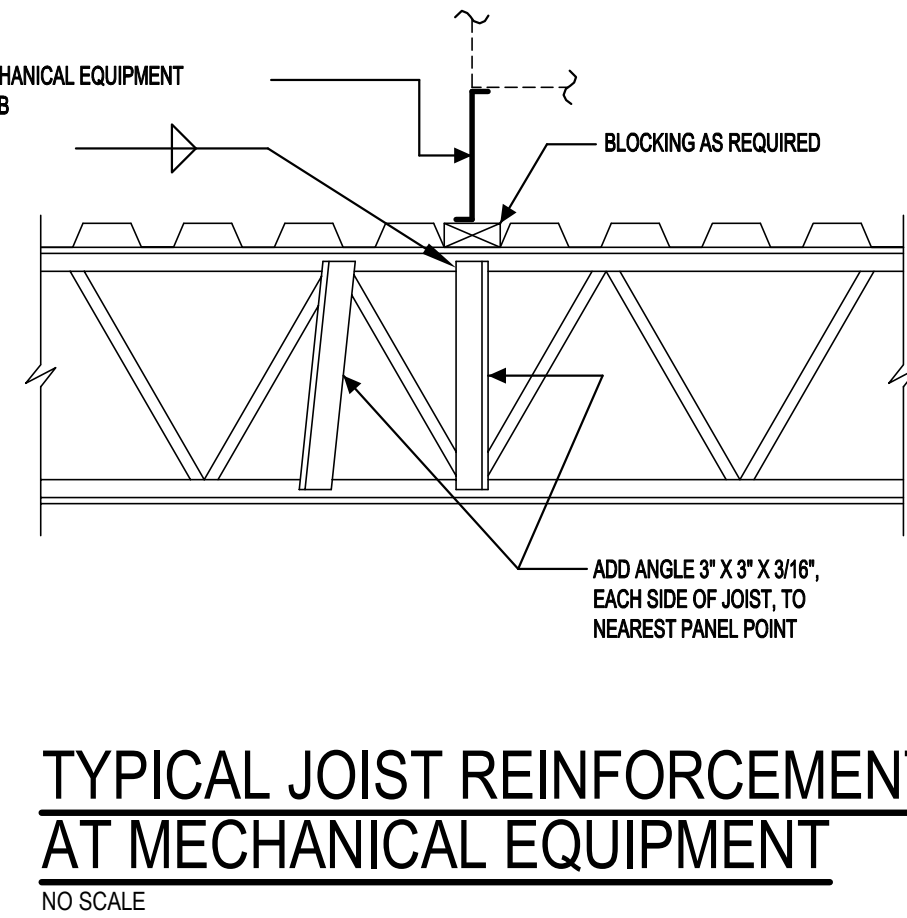
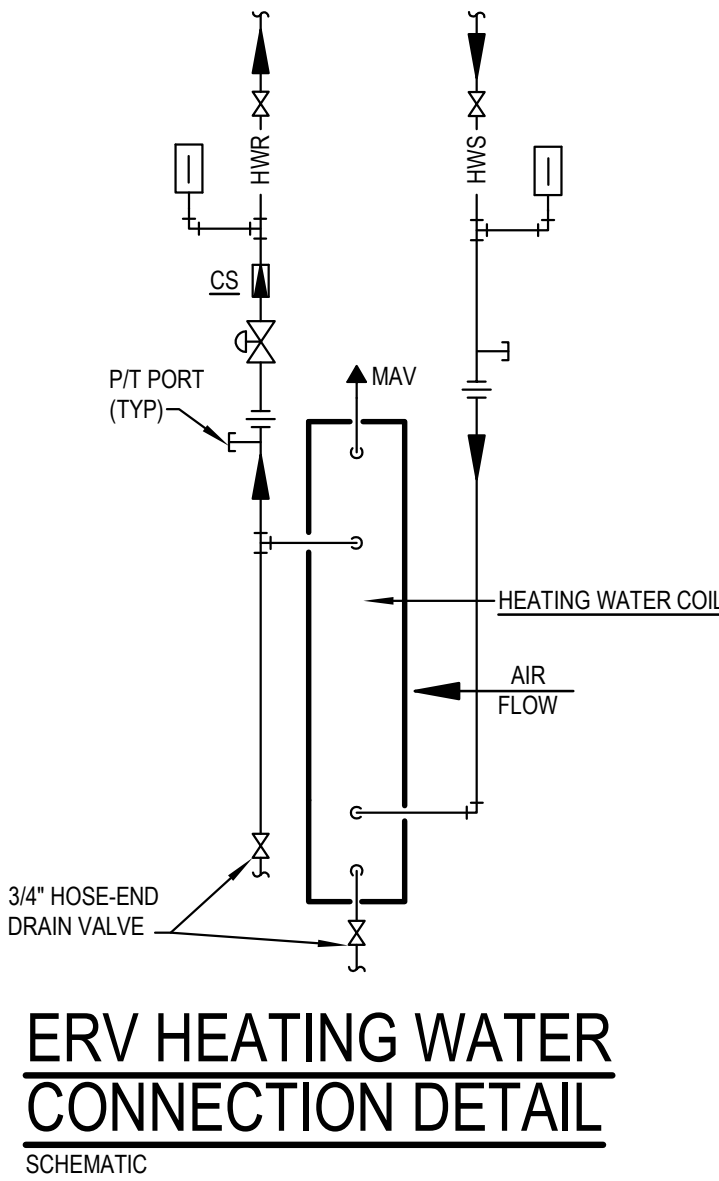
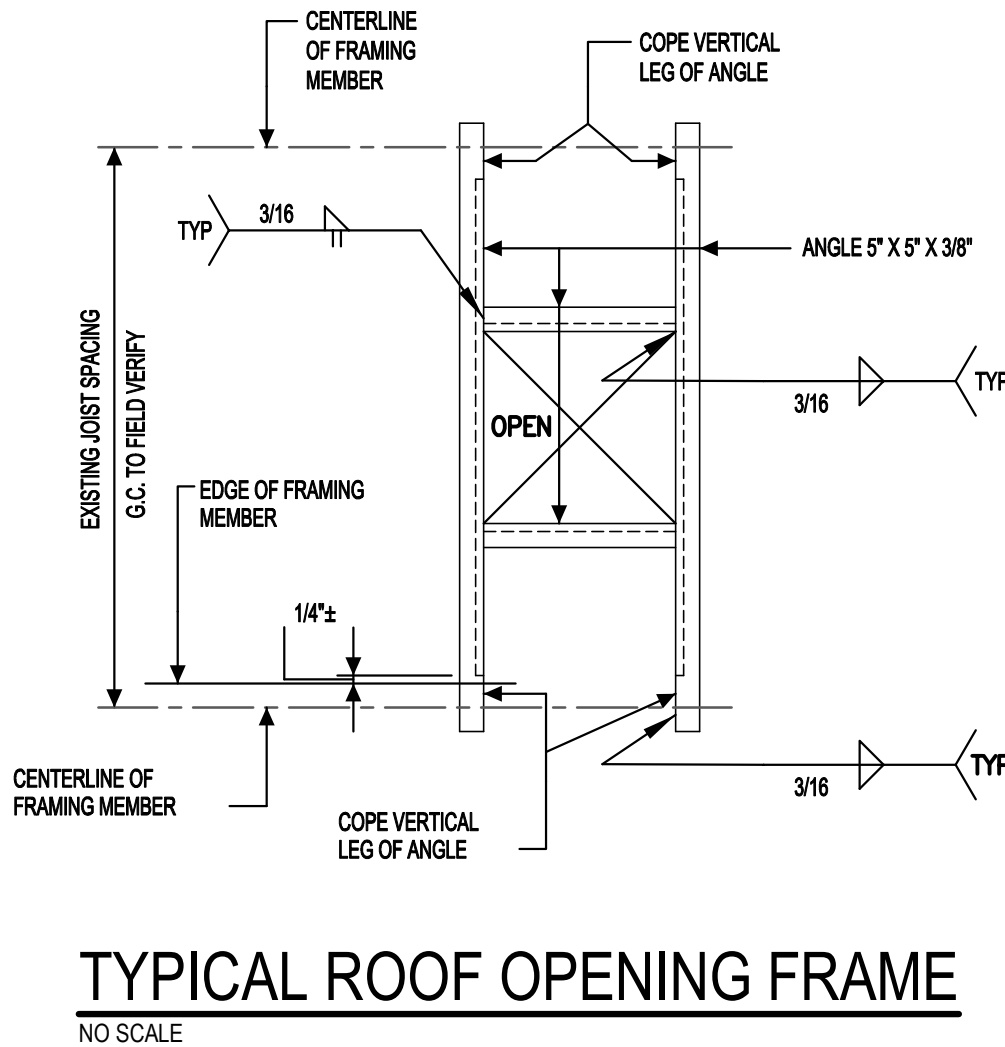
NORTHSIDE HIGH SCHOOL
MAKEUP AIR UNIT ADDITION
ROANOKE, VIRGINIA

TITLE SHEET

DESIGNED JTO/RWR	DRAWN JTO/RWR
CHECKED WAM/RDF	APPROVED LPA
COMM. NO. 21101.12	DATE 06-09-21
SHEET T1	



- NOTES:
1. CUT ROOF OPENING JUST LARGE ENOUGH TO ACCOMMODATE SUPPLY AND RETURN DUCTWORK, CAULK AIR TIGHT THE SPACE BETWEEN DUCTWORK AND ROOF OPENINGS.
 2. PROVIDE 5# DENSITY INSULATION UNDER UNIT ON TOP OF ROOF AND INSIDE ROOF CURB. COVER INSULATION WITH 1/2" THICK PLYWOOD OR GYPSUM BOARD AND CAULK BETWEEN PLYWOOD OR GYPSUM AND ROOF CURB.
 3. ROOF INSULATION SHALL EXTEND UNDER UNIT.



FANS: GREENHECK								
MARK	FAN TYPE	CFM	ESP	MAX SONES	MOTOR HP	ELECTRICAL		MODEL
						FLA	V / PH	
EF-1	ROOF MOUNTED EXHAUST	1,140	0.25	8.4	1/6	~	115 / 60	G-120
REMARKS:								
1. PROVIDE SPEED CONTROLLER FOR AIR BALANCE OF FAN.								
2. PROVIDE CURB ADAPTER.								

ROOFTOP 100% OA ENERGY RECOVERY VENTILATION UNITS: GREENHECK		
UNIT MARK	ERV-E WING	ERV-FRONT OFFICE
CV OR VAV	CV	CV
OUTSIDE AIR, CFM	1,880	1,155
ESP, IN. W.C.	1.00	0.30
MOTOR HP	1	1
EXHAUST AIRFLOW, CFM	1,690	1,060
ESP, IN. W.C.	0.50	0.30
MOTOR HP	1	1
ENERGY RECOVERY WHEEL		
OUTSIDE AIRFLOW, CFM	1,880	1,155
EXHAUST AIRFLOW, CFM	1,690	1,060
SUMMER PERFORMANCE		
OA EAT, °F DB / WB	91 / 74	91 / 74
SA LAT, °F DB / WB	80 / 67	80 / 67
RA EAT, °F DB / WB	75 / 62	75 / 62
RA LAT, °F DB / WB	87 / 71	88 / 71
TOTAL ENERGY RECOVERED (MBH)	53.5	36.0
WINTER PERFORMANCE		
OA EAT, °F DB / WB	12 / 9	12 / 9
SA LAT, °F DB / WB	52 / 48	54 / 44
RA EAT, °F DB / WB	72 / 56	72 / 56
RA LAT, °F DB / WB	25 / 24	25 / 23
TOTAL ENERGY RECOVERED (MBH)	79.8	52.4
COOLING COIL		
TOTAL CAPACITY, MBH	73.0	65.0
SENSIBLE CAPACITY, MBH	50.8	41.0
EAT, °F DB / WB	80 / 67	80 / 66
LAT, °F DB / WB	54 / 54	47 / 47
NO. OF COMPRESSORS	1	1
HOT WATER COIL		
TOTAL CAPACITY, MBH	35.3	--
GPM	2.0	--
EWT / LWT, °F DB	180 / 144	--
WPD, FT. H2O	1	--
LAT, °F DB	70	--
ELECTRIC HEATING COIL		
TOTAL CAPACITY, KW	--	10.0
EAT, °F DB	--	54
LAT, °F DB	--	81
STAGES OF HEATING	--	SCR MODULATING
HOT GAS REHEAT COIL		
CAPACITY, MBH	44.0	38.0
LAT, °F DB	76.8	78.0
UNIT ELECTRICAL (V / PH)	460 / 3	460 / 3
MCA, A	16	31
MOP, A	20	35
ESTIMATED UNIT WEIGHT, LBS	3,190	3,690
UNIT MODEL	RVE-36	RVE-40-30
REMARKS	1, 2, 3	1, 2, 4
1. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH AND FACTORY WIRED GFI OUTLET.		
2. FURNISH WITH VFD		
3. PROVIDE CUSTOM CURB FOR SIDE DISCHARGE.		
4. PROVIDE CURB ADAPTER.		

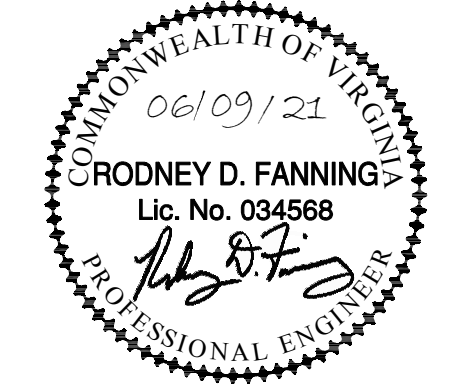
HVAC LEGEND	
ABOVE BALANCING VALVE	ABV
BELOW	BEL
CEILING GRILLE	CG
CHILLED WATER RETURN PIPE	CWR
CHILLED WATER SUPPLY PIPE	CWS
CIRCUIT SETTER	CWS
CUBIC FEET PER MINUTE	CFM
DEGREES FAHRENHEIT	°F
DUCTWORK (NEW)	DB
RETURN & EXHAUST	
SUPPLY	
DUCTWORK (EXISTING TO REMAIN)	EX
DUCTWORK (EXISTING TO BE REMOVED)	
EXISTING, REMOVE FROM THIS POINT	
FIRE DAMPER	FD
GALLONS PER MINUTE	GPM
HEATING WATER RETURN PIPE	HWR
HEATING WATER SUPPLY PIPE	HWS
HORSEPOWER	HP
KILOWATT	KW
LEAVING AIR TEMPERATURE	LAT
LEAVING WATER TEMPERATURE	LWT
MANUAL AIR VENT	MAV
MANUAL DAMPER	MD
MOTOR OPERATED DAMPER	MOD
NEW CONNECTED TO EXISTING	
OUTDOOR AIR	OA
BOTTOM TAKEOFF	
SIDE CONNECTION	
TOP TAKEOFF	
TURN DOWN OR FROM BELOW	
TURN UP OR FROM ABOVE	
POUNDS	LBS
SERVICE VALVE	
STRAINER	
THERMOMETER	
THOUSAND BTU PER HOUR	MBH
TWO-WAY CONTROL VALVE	
WET BULB	WB

GENERAL NOTES:

1. ALL DUCTWORK AND PIPES SHALL BE COORDINATED WITH EXISTING DUCTS, PIPES, LIGHTS, STRUCTURAL SYSTEM, CEILING SUPPORTS AND FRAMING BEFORE INSTALLATION. MINOR DUCT AND PIPE OFFSETS AND MINOR DUCT TRANSITIONS SHALL BE PROVIDED AS REQUIRED. WHERE TRANSITIONS ARE REQUIRED, CROSS SECTIONAL AREA OF DUCT SHALL NOT BE REDUCED. MEASUREMENTS FOR VERTICAL CLEARANCES OF DUCTWORK SHALL BE TAKEN AT THE JOB SITE BEFORE FABRICATION OF ANY DUCTWORK.
2. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTRUCTIONS.
3. MATERIALS AND INSTALLATION SHALL COMPLY WITH LOCAL CODES, APPLICABLE PROVISIONS OF LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION, LOCAL UTILITY REGULATIONS AND GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.
4. VERIFY ROOF OPENINGS WITH STRUCTURE.
5. VERIFY LOCATIONS OF NEW AND EXISTING EQUIPMENT AND ROUTE OF DUCTWORK WITH EXISTING CONDITIONS.
6. CONTRACTOR SHALL PROVIDE ALL SUPPORTS REQUIRED FOR MOUNTING MECHANICAL EQUIPMENT AND DUCTWORK.
7. WHERE PIPE AND DUCT CONNECTIONS ARE SHOWN CONNECTING TO EXISTING, CONTRACTOR SHALL VERIFY ARRANGEMENTS, DETERMINE EXACT LOCATIONS AND CONNECTION SIZES PRIOR TO INSTALLATION.
8. EXPOSED DUCTWORK SHALL BE INSTALLED IN PRACTICAL ALIGNMENT WITH THE BUILDING AND SHALL BE ADEQUATELY SECURED TO THE BUILDING STRUCTURE.

DEMOLITION NOTES:

1. SCOPE: THE DEMOLITION SCOPE IS THE REMOVAL OF ONE (1) EXISTING ENERGY RECOVERY VENTILATOR (ER-2) AND ONE (1) EXISTING EXHAUST FAN (EF-1). THE EXISTING ENERGY RECOVERY VENTILATOR BEING DEMOLISHED WILL BE REPLACED WITH A NEW ENERGY RECOVERY VENTILATOR IN THE SAME LOCATION. ALSO TO BE DEMOLISHED IS A SECTION OF EXHAUST DUCTWORK AND OUTSIDE AIR INTAKE.

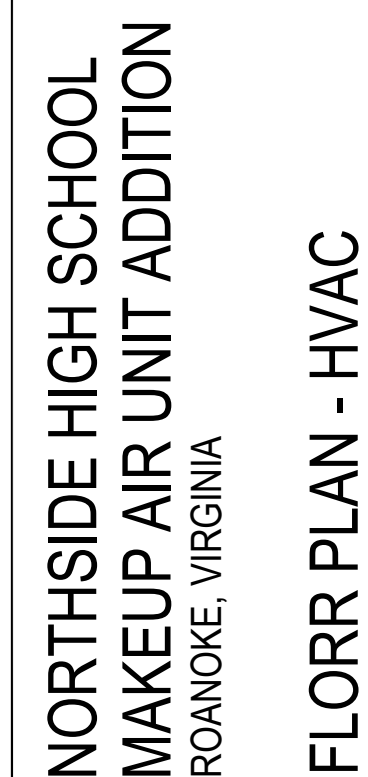


REVISION	DATE

DESIGNED	DRAWN
RWR	RWR
CHECKED	APPROVED
RDF	LPA
COMM. NO.	DATE
21101.12	06-09-21



REVISION	DATE



FLORR PLAN - HVAC

M2

SPECIFICATIONS FOR HVAC WORK

1.

SCOPE OF THE WORK: WORK SHALL INCLUDE COMPLETE HVAC SYSTEMS. PROVIDE SUPERVISION, LABOR, MATERIAL, EQUIPMENT, MACHINERY, PLANT AND ITEMS NECESSARY FOR COMPLETE SYSTEMS TESTED AND READY FOR OPERATION.
2.

REGULATIONS: MATERIALS AND INSTALLATION SHALL COMPLY WITH LOCAL CODES, APPLICABLE PROVISIONS OF LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION, LOCAL UTILITY REGULATIONS AND GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.
3.

DRAWINGS: THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED. WHERE VARIANCES OCCUR INCLUDE THE ITEMS OF BETTER QUALITY, GREATER QUANTITY OR HIGHER COST.
4.

COORDINATION OF WORK: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION AND PROPER RELATION OF HIS WORK TO THE BUILDING STRUCTURE AND TO THE WORK OF OTHER TRADES. CONTRACTOR SHALL PROVIDE DIMENSIONS AND LOCATIONS OF ALL OPENINGS, SHAFTS AND SIMILAR ITEMS TO THE PROPER TRADES AND SHALL INSTALL, WORK AS REQUIRED SO AS NOT TO DELAY THE BUILDING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY HIS WORK OR WORKMEN. REPAIRING OF DAMAGED WORK SHALL BE DONE BY THE CONTRACTOR AT NO ADDITIONAL COST.
5.

VISITING THE SITE: EACH CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE BEFORE PRICING THE JOB TO FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS TO BE MET IN THE EXECUTION OF THE WORK UNDER THIS CONTRACT. NO ADDITIONAL COMPENSATION WILL BE ALLOWED RELATING TO SITE CONDITIONS.
6.

INTERRUPTION OF SERVICES: INTERRUPTIONS OF SERVICE TO EXISTING SYSTEMS SHALL BE COORDINATED WITH THE OWNER AS TO TIME AND DURATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY INTERRUPTIONS TO SERVICE AND SHALL REPAIR ANY DAMAGES TO EXISTING SYSTEMS CAUSED BY HIS OPERATIONS.
7.

WORK IN OCCUPIED AREAS: WORK IN OCCUPIED AREAS SHALL BE COORDINATED WITH THE OCCUPANT AND OWNER AS TO TIME AND DURATION. THE CONTRACTOR SHALL PROTECT THE OCCUPIED AREA AND SHALL BE RESPONSIBLE FOR CLEANING AND REPAIRING ANY DAMAGES CAUSED BY HIS WORK. SAFETY OF BUILDING OCCUPANTS SHALL BE ASSURED AT ALL TIMES. TOOLS, MATERIAL, DIRT AND DEBRIS SHALL BE REMOVED FROM OCCUPIED AREAS WHENEVER WORK AREAS ARE LEFT UNATTENDED.
8.

ACCESSIBILITY: LOCATE EQUIPMENT WHICH MUST BE SERVICED OR MAINTAINED IN FULLY ACCESSIBLE POSITIONS WHERE POSSIBLE. OTHERWISE, FURNISH ACCESS PANELS OF SUFFICIENT SIZE AND LOCATED SO THAT THE CONCEALED EQUIPMENT CAN BE SERVICED.
9.

ROUGH-IN: ROUGH-IN OPENINGS SHALL ALIGN VERTICALLY AND HORIZONTALLY WITH BUILDING STRUCTURE. WALL-MOUNTED THERMOSTATS SHALL BE MOUNTED 48" ABOVE FINISHED FLOOR TO THE TOP OF THE THERMOSTAT.
10.

SLEEVES: LOCATE SLEEVES DURING NORMAL COURSE OF WORK. PROVIDE SLEEVES FOR PIPING PASSING THROUGH CONCRETE FLOOR SLABS AND CONCRETE, MASONRY, TILE AND GYPSUM WALL CONSTRUCTION. SLEEVES SHALL NOT BE REQUIRED FOR PIPING EMBEDDED IN CONCRETE OR SLAB ON GRADE, EXCEPT THAT COPPER PIPING SHALL REQUIRE SLEEVES THROUGH SLABS ON GRADE. SLEEVES PLACED IN EXTERIOR WALLS BELOW GRADE SHALL BE WATERTIGHT. WHERE SLEEVES ARE LOCATED THROUGH FIRE-RATED WALLS OR FLOORS, THE SLEEVE ASSEMBLIES SHALL MAINTAIN THE FIRE RATING OF THE WALL OR FLOOR. SLEEVES SHALL BE CONSTRUCTED OF 20 GAUGE GALVANIZED STEEL WITH LOCK SEAM JOINTS FOR ALL SLEEVES SET IN CONCRETE FLOOR SLABS. ALL OTHER SLEEVES SHALL BE CONSTRUCTED OF GALVANIZED STEEL PIPE.
11.

CUTTING AND PATCHING: THE CONTRACTOR SHALL PROVIDE ALL CUTTING AND PATCHING NECESSARY TO INSTALL HIS WORK. PATCHING SHALL MATCH ADJACENT SURFACES. NO STRUCTURAL MEMBERS SHALL BE CUT WITHOUT THE APPROVAL OF THE ARCHITECT.
12.

CLEANING: EQUIPMENT AND PIPING SHALL BE CLEANED TO REMOVE FOREIGN MATERIALS. PROVIDE TEMPORARY FILTERS FOR AIR UNITS THAT ARE OPERATED DURING CONSTRUCTION. PLUG OR CAP OPENINGS IN EQUIPMENT, DUCTWORK, PIPING AND MATERIALS UNTIL CONNECTION IS MADE TO THE SYSTEM. REMOVE FROM THE PREMISES ALL UNUSED MATERIAL AND DEBRIS RESULTING FROM THE PERFORMANCE OF HVAC WORK.
13.

WIRING: STARTERS THAT ARE SPECIFIED TO BE FURNISHED AS AN INTEGRAL PART OF THE MECHANICAL EQUIPMENT SHALL BE COMPLETE WITH PROPERLY SIZED OVERLOAD HEATERS. TEMPERATURE CONTROL WIRING, EQUIPMENT CONTROL WIRING AND CONTROL INTERLOCK WIRING FOR MECHANICAL EQUIPMENT SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR. CONTROL WIRING SHALL NOT INCLUDE ANY WIRING WHICH CARRIES MOTOR CURRENT. ALL WIRING SHALL BE IN METAL CONDUIT AND SHALL COMPLY WITH THE ELECTRICAL SPECIFICATIONS.
14.

QUIET OPERATION: SYSTEMS SHALL OPERATE UNDER CONDITIONS OF LOAD WITHOUT UNUSUAL OR EXCESSIVE NOISE OR VIBRATION. UNUSUAL OR EXCESSIVE NOISE OR VIBRATION SHALL BE CORRECTED.
15.

TESTING AND BALANCING: HVAC CONTRACTOR SHALL TEST ALL HVAC EQUIPMENT TO ASSURE THAT THE PROPER SEQUENCE OF CONTROL IS ESTABLISHED AND OPERATING IN A SAFE MANNER. THE AIR QUANTITIES FOR EQUIPMENT, DIFFUSERS AND REGISTERS SHALL BE BALANCED FOR THE CFM AS INDICATED ON THE DRAWING.
16.

INSTRUCTIONS TO OWNER: INSTRUCT THE OWNER IN THE PROPER OPERATION AND MAINTENANCE OF THE MECHANICAL SYSTEMS UNTIL THE OWNER IS FULLY PREPARED TO OPERATE AND MAINTAIN THE SYSTEMS. HOWEVER, LENGTH OF INSTRUCTION TIME SHALL BE LIMITED TO ONE HALF (1/2) DAY.
17.

OPERATING AND MAINTENANCE: PROVIDE THE OWNER WITH TWO (2) BOUND SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL HVAC EQUIPMENT AND CONTROLS.
18.

GUARANTEE: EQUIPMENT, MATERIALS AND LABOR REQUIRED BY THESE CONTRACT DRAWINGS SHALL BE GUARANTEED TO BE FREE FROM DEFECTIVE MATERIALS OR WORKMANSHIP FOR ONE (1) YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT UNLESS SPECIFIED FOR A LONGER PERIOD IN OTHER PORTIONS OF THE SPECIFICATIONS. DEFECTIVE MATERIALS OR WORKMANSHIP OCCURRING DURING THIS PERIOD SHALL BE CORRECTED AT NO ADDITIONAL COST.
19.

PAINTING: GENERAL - PAINT MECHANICAL EQUIPMENT AND MATERIALS WHERE NOT CONCEALED. PAINTING (IN CONCEALED SPACES) SHALL BE LIMITED TO EQUIPMENT AND MATERIALS NOT OTHERWISE PROTECTED FROM RUSTING SUCH AS HANGERS AND SUPPORTS. PAINT SHALL BE PRODUCTS OF SHERWIN-WILLIAMS, PITTSBURGH, PRATT-LAMBERT OR EQUAL. SURFACE PREPARATION, PRIMING AND PAINT APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. GALVANIZED SURFACES SHALL BE PRETREATED WITH A PHOSPHORIC ACID CLEANING SOLUTION AND PRIMED. AFTER PREPARATION EACH ITEM SHALL BE PAINTED, EXCEPT COLOR OF PAINT FOR EQUIPMENT AND MATERIAL WHERE NOT CONCEALED SHALL BE AS SELECTED BY THE ARCHITECT. ITEMS NOT CONCEALED IN ROOMS SHALL BE PAINTED OF THE SAME COLOR TO MATCH ADJACENT WALLS OR CEILINGS. PAINTING IS NOT REQUIRED OF ITEMS WITH A FACTORY-FINISH COAT. PATCH PAINTING IS REQUIRED OF ANY DAMAGED AREAS TO MATCH FACTORY-FINISH COAT. NAMEPLATES ON EQUIPMENT SHALL NOT BE PAINTED.
20.

IDENTIFICATION OF PIPES AND EQUIPMENT: EACH AIR MAJOR PIECE OF EQUIPMENT, SUCH AS AIR HANDLING UNITS AND PIPING SHALL BE IDENTIFIED BY MARKING THAT WILL READ THE SAME AS THE IDENTIFICATION SHOWN ON THE DRAWINGS. STENCIL LETTERS SHALL BE 2 INCHES HIGH UPPER CASE PAINTED WITH WHITE ENAMEL ON EQUIPMENT AND BLACK ENAMEL ON PIPING AND CONDUIT. IDENTIFICATION SHALL BE PAINTED ON EACH PIPE OR CONDUIT WHERE EXPOSED OR ACCESSIBLE AND SHALL BE PLACED EVERY 15 FEET ALONG THE PIPE OR CONDUIT.
21.

AIR DEVICES
- A.

DIFFUSERS, REGISTERS AND GRILLES SHALL BE PRICE OR EQUAL UNLESS NOTED OTHERWISE. CEILING DEVICES SHALL HAVE WHITE BAKED ENAMEL FINISH. ALL OTHER DEVICES SHALL HAVE PRIME FINISH.
- B.

RETURN AND EXHAUST REGISTERS AND GRILLES SHALL BE MODEL 630 ALUMINUM CONSTRUCTION WITH 45 DEGREE DEFLECTING VANES AND SHALL HAVE FREE AREA NOT LESS THAN 75%. REGISTER DAMPERS SHALL BE OPPOSED-BLADE FACE-OPERATED TYPE WITH REMOVABLE KEY.
22.

DUCTWORK
- A.

GENERAL: DUCTWORK SHALL BE ZINC-COATED SHEET STEEL OR ALUMINUM, CONSTRUCTED AND INSTALLED AS RECOMMENDED BY THE LATEST EDITION OF SMACNA.
- B.

DUCT CLEARANCE SHALL BE ESTABLISHED AT THE JOB SITE BEFORE ANY DUCTS ARE FABRICATED. THE CONTRACTOR WILL NOT BE ALLOWED ANY EXTRA COSTS FOR DUCTS FABRICATED AND THEN FOUND NOT TO FIT.
- C.

MANUAL VOLUME CONTROL DAMPERS SHALL HAVE ACCESSIBLE OPERATING MECHANISM. BLADE HEIGHT SHALL NOT EXCEED 8 INCHES.
- D.

PROVIDE FLEXIBLE DUCT CONNECTIONS TO AIR HANDLING EQUIPMENT.
- E.

DUCT SUPPORTS SHALL CONSIST OF NOT LESS THAN 1" X 16-GAUGE GALVANIZED STRAP IRON HANGERS SPACED NOT OVER 4'-0" ON CENTER.
- F.

WATERTIGHT DUCTS SHALL BE FABRICATED FROM STAINLESS STEEL SHEETS WITH BRAZED SEAMS.
23.

PIPING
- A.

HEATED WATER LINES: PIPE 4" AND SMALLER SHALL BE ALL TYPE 1" HARD DRAWN COPPER TUBING OR ALL ASTM A53 SCHEDULE 40 STANDARD WEIGHT BLACK STEEL.
- B.

COOLING COIL CONDENSATE DRAIN LINES SHALL BE PVC. PROVIDE WATER SEAL FROM EACH AIR HANDLING UNIT OF SUFFICIENT DEPTH TO PREVENT BLOW OUT OR SIPHONING OF WATER. EXTEND ROOFTOP CONDENSATE LINES TO NEAREST ROOF DRAIN.
- C.

SERVICE VALVES: UP TO AND INCLUDING 2" SHALL BE ALL BRASS, RISING STEM, SOLID WEDGE DISC GATE VALVES.
- D.

GLOBE VALVES SHALL BE ALL BRASS WITH BRASS DISC, EXCEPT GLOBE VALVES OVER 2" SIZE MAY BE BUTTERFLY TYPE.
- E.

BALANCING COCKS SHALL BE ALL BRASS, SQUARE HEAD OR SCREWDRIVER HEAD WITH CHECK. BALANCING COCKS OVER 2" SIZE MAY BE IRON BODY.
- F.

STRAINERS SHALL BE Y TYPE WITH BRONZE BASKET SUITABLE FOR 125 PSI SERVICE.
- G.

MANUAL AIR VENTS SHALL BE CHROMIUM-PLATED BRASS 1/8" NPT COIN-OPERATED TYPE.
24.

THERMAL COVERING
- A.

INSULATION SHALL BE, JOHNS MANVILLE, OWENS CORNING, ARMSTRONG OR EQUAL. INSULATION SHALL NOT BE APPLIED UNTIL AFTER THE EQUIPMENT, PIPES OR DUCTS TO BE INSULATED HAVE PROVEN SATISFACTORY UNDER TESTS. ALL MATERIALS USED SHALL HAVE COMPOSITE FLAME-SPREAD RATINGS NOT EXCEEDING 25 AND A SMOKE-DEVELOPED RATING NOT EXCEEDING 50.
- B.

PIPING: INSULATION SHALL BE INSTALLED IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- C.

FIBERGLASS PIPE INSULATION SHALL HAVE A WHITE KRAFT BONDED TO ALUMINUM FOIL, REINFORCED WITH FIBERGLASS YARN JACKET. ELASTOMERIC INSULATION SHALL BE CONSTRUCTED OF A CLOSED CELL STRUCTURE TO EFFECTIVELY RETARD THE FLOW OF MOISTURE VAPOR AND SERVE AS A VAPOR BARRIER. INSULATION THICKNESS AND TYPE FOR VARIOUS PIPING SYSTEMS SHALL BE AS INDICATED IN THE FOLLOWING TABLE (PIPE SIZE/INSULATION THICKNESS).

PIPE SIZE/INSULATION THICKNESS							
SYSTEM	TEMP. RANGE (°F)	LESS THAN 1"	1" TO 1-1/4"	1-1/2" TO 3"	4" TO 6"	8" & UP	INS. TYPE
HEATING WATER	140-200	1.5	1.5	2.0	2.0	2.0	A
NOTES:							
MINIMUM THICKNESS FOR INSULATION LISTED IN PRECEDING TABLE IS BASED ON THERMAL CONDUCTIVITY, 'K' NOT EXCEEDING 0.27 BTU PER INCH·HR. X SQ. FT. X DEG. F. BASED ON MEAN TEMPERATURE OF 75 DEG. F. INSULATION WITH GREATER THERMAL CONDUCTIVITY SHALL HAVE INCREASED THICKNESS TO PROVIDE SAME PERFORMANCE CHARACTERISTICS AS SPECIFIED.							
A. FIBERGLASS TYPE INSULATION; B. ELASTOMERIC TYPE INSULATION. RUNOUTS TO INDIVIDUAL TERMINAL UNITS (NOT EXCEEDING 12 FT. IN LENGTH).							

FIBERGLASS PIPE INSULATION FITTINGS SHALL BE COVERED WITH PREMOULDED PVC FITTING COVERS. JACKETS ON FIBERGLASS PIPE INSULATION BELOW 80 DEG. F. SHALL BE VAPOR SEALED USING SELF-SEALING LAP, LAP SEAL GUN OR ADHESIVE. ALL INSULATION JOINTS, LAPS, VOIDS, PUNCTURES AND END TAPERS SHALL BE SEALED WITH 1/32" THICKNESS OF VAPOR ADHESIVE. A 12" LONG, 1/2 SECTION OF HYDROUS CALCIUM SILICATE OR FOAMGLAS INSULATION SHALL BE USED BETWEEN HANGERS AND PIPING. ON PIPE, SIZES 1-1/2" AND BELOW, HYDROUS CALCIUM SILICATE OR FOAMGLAS WILL NOT BE REQUIRED. ALL PIPING SHALL HAVE LOAD-DISTRIBUTING GALVANIZED 16 GAUGE METAL SHIELDS INSTALLED AROUND THE LOWER HALF OF THE INSULATION.

D.

ELASTOMERIC PIPE INSULATION SEAMS, VOIDS AND BUTT JOINTS SHALL BE SEALED WITH A VAPOR BARRIER ADHESIVE OR TAPED WITH 1-1/2 INCH WIDE 3M #471 TAPE. FLEXIBLE ELASTOMERIC INSULATION EXPOSED TO WEATHER SHALL BE COVERED WITH TWO COATS OF ARMSTRONG ARMAFLEX FINISH (VINYL LACQUER).

E.

DUCTWORK: INSULATE RETURN DUCTS IN ATTIC SPACES, CRAWL SPACES AND EQUIPMENT ROOMS. ALL SUPPLY DUCTS AND ALL OUTDOOR AIR DUCTS SHALL BE INSULATED. EXHAUST DUCTWORK SHALL BE INSULATED IN ATTIC SPACES AND CRAWL SPACES AND WITHIN 10 FEET OF CONNECTIONS TO OUTDOORS. INSULATION WHERE DUCTS ARE NOT CONCEALED SHALL BE RIGID DUCT INSULATION MEETING ASTM C 612. ALL OTHER INSULATION SHALL BE FLEXIBLE DUCT INSULATION MEETING ASTM C 533. INSULATION SHALL HAVE A FACTORY-APPLIED FACING OF FOIL-SCRIM-KRAFT PAPER JACKET REINFORCED WITH FIBERGLASS YARN MESH. INSULATION SHALL BE SECURED TO RECTANGULAR DUCTS BY IMPALING OVER METAL STICK CLIPS SPACED 12" CENTER EACH WAY. WHERE INSULATION JOINTS OCCUR, FACING TABS SHALL BE LAPPED NOT LESS THAN 2"; ALL JOINTS, VOIDS AND PUNCTURES IN FACING SHALL BE EFFECTIVELY VAPOR SEALED WITH FOSTER VAPOR-SAFE OR VAPOR-FAS ADHESIVE. INSULATION FOR ALL OUTDOOR AIR DUCTWORK AND INSULATION FOR SUPPLY AND RETURN DUCTWORK WHERE INSTALLED IN ATTIC SPACES AND CRAWL SPACES SHALL BE 2" THICK AND SHALL HAVE A MINIMUM TOTAL THERMAL RESISTANCE (R) OF 7.4 AT A MEAN TEMPERATURE OF 75 DEG. F. INSULATION FOR ALL OTHER DUCTWORK SHALL BE 1-1/2" THICK AND SHALL HAVE A MINIMUM TOTAL THERMAL RESISTANCE (R) OF 5.6 AT A MEAN TEMPERATURE OF 75 DEG. F.

25.

EXHAUST FAN (EF-1): FAN SHALL BE GREENHECK CENTRIFUGAL, DOWNBLAST MODEL AS SCHEDULED OR EQUAL BY PENN OR COOK. CONSTRUCTION SHALL INCLUDE ALUMINUM HOUSING COMPLETELY WEATHERPROOF AND REMOVABLE FOR SERVICING. MOTOR SHALL BE IN FULLY ENCLOSED AIR-COOLED MOTOR COMPARTMENT OUTSIDE OF EXHAUST AIR STREAM. MOTOR SHALL BE FACTORY WIRED TO TERMINAL STRIP MOUNTED IN JUNCTION BOX INSIDE MOTOR HOUSING. FAN SHALL INCLUDE BIRD SCREEN AND MOTORIZED DAMPER. PROVIDE CURB ADAPTER AS REQUIRED. ROOF CURB SHALL BE 14" HIGH, GALVANIZED STEEL OR ALUMINUM CONSTRUCTION WITH CONTINUOUS WELDED AND MITERED CORNER SEAMS. CURB SHALL HAVE 2 INCH WALL THICKNESS, TREATED WOOD NALER, 3 LB DENSITY RIGID MINERAL FIBERBOARD INSULATION WITH METAL LINER, AND BUILT-IN CANT STRIP.

26.

PACKAGED ROOFTOP ENERGY RECOVERY VENTILATOR UNIT (ERV-FRONT OFFICES AND ERV-E WING)

A.

GENERAL: ROOFTOP ENERGY RECOVERY VENTILATOR UNITS SHALL BE GREENHECK, AAO, TRANE, OR JCI. GREENHECK EQUIPMENT IS USED AS THE BASIS OF DESIGN. UNITS SHALL BE CERTIFIED IN ACCORDANCE WITH ANSIUL 99.05, HEATING AND COOLING EQUIPMENT.

1.

UNITS SHALL INCLUDE COMPRESSORS, EVAPORATOR COILS, FILTERS, SUPPLY FANS, DAMPERS, AIR-COOLED CONDENSER COILS, CONDENSER FANS, HOT-GAS REHEAT, AIR SOURCE HEAT PUMP, SECONDARY ELECTRIC HEATER, EXHAUST FANS, OUTSIDE AIR/ECONOMIZER, ENERGY RECOVERY WHEELS, VARIABLE FREQUENCY DRIVES (VFD) AND UNIT CONTROLS.

2.

UNITS SHALL BE FACTORY ASSEMBLED AND TESTED INCLUDING LEAK TESTING OF THE DX COILS, PRESSURE TESTING OF THE REFRIGERATION CIRCUIT, AND RUN TESTING OF THE COMPLETED UNIT. TAG TO TEST REPORT SHALL BE SUPPLIED WITH THE UNIT IN THE SERVICE COMPARTMENTS LITERATURE POCKET.

3.

UNITS SHALL HAVE DECALS AND RAGS TO INDICATE LIFTING AND RIGGING, SERVICE AREAS AND CAUTION AREAS FOR SAFETY AND TO ASSIST SERVICE PERSONNEL.

4.

UNIT COMPONENTS SHALL BE LABELED, INCLUDING REFRIGERATION SYSTEM COMPONENTS AND ELECTRICAL AND CONTROLS COMPONENTS.

5.

LAMINATED COLOR-CODED WIRING DIAGRAM SHALL MATCH FACTORY INSTALLED WIRING AND SHALL BE AFFIXED TO THE INTERIOR OF THE CONTROL COMPARTMENT'S HINGED ACCESS DOOR.

6.

UNIT NAMEPLATE SHALL BE PROVIDED IN TWO LOCATIONS ON THE UNIT, AFFIXED TO THE EXTERIOR OF THE UNIT AND AFFIXED TO THE INTERIOR OF THE CONTROL COMPARTMENT'S HINGED ACCESS DOOR.

B.

CONSTRUCTION:

1.

ALL CABINET WALLS, ACCESS DOORS, AND ROOF SHALL BE FABRICATED OF DOUBLE WALL, IMPACT RESISTANT, RIGID POLYURETHANE FOAM PANELS.

2.

UNIT INSULATION SHALL HAVE A MINIMUM THERMAL RESISTANCE R-VALUE OF 13. FOAM INSULATION SHALL HAVE A MINIMUM DENSITY OF 2 POUNDS/CUBIC FOOT AND SHALL BE TESTED IN ACCORDANCE WITH ASTM D1929-11 FOR A MINIMUM FLAME IGNITION TEMPERATURE OF 610°F.

3.

UNIT CONSTRUCTION SHALL BE DOUBLE WALL WITH G90 GALVANIZED STEEL ON BOTH SIDES AND A THERMAL BREAK. DOUBLE WALL CONSTRUCTION WITH A THERMAL BREAK SHALL PREVENT MOISTURE ACCUMULATION ON THE INSULATION, PROVIDE A CLEANABLE INTERIOR, PREVENT HEAT TRANSFER THROUGH THE PANEL, AND PREVENT EXTERIOR CONDENSATION ON THE PANEL.

4.

UNITS SHALL BE DESIGNED TO REDUCE AIR LEAKAGE AND INFILTRATION THROUGH THE CABINET. CABINET LEAKAGE SHALL NOT EXCEED 1% OF TOTAL AIRFLOW WHEN TESTED AT 1/3 TIMES THE MINIMUM EXTERNAL STATIC PRESSURE PROVIDED IN AHRI STANDARD 340/360. PANEL DEFLECTION SHALL NOT EXCEED L240 RATIO AT 125% OF DESIGN STATIC PRESSURE. AT A MAXIMUM 8 INCHES OF POSITIVE OR NEGATIVE STATIC PRESSURE, TO REDUCE AIR LEAKAGE, DEFLECTION SHALL BE MEASURED AT THE MIDPOINT OF THE PANEL HEIGHT AND WIDTH. CONTINUOUS SEALING SHALL BE INCLUDED BETWEEN PANELS AND BETWEEN ACCESS DOORS AND OPENINGS TO REDUCE AIR LEAKAGE. PIPING AND ELECTRICAL CONDUIT THROUGH CABINET PANELS SHALL INCLUDE SEALING TO REDUCE AIR LEAKAGE.

5.

ROOF OF THE AIR TUNNEL SHALL BE SLOPED TO PROVIDE COMPLETE DRAINAGE. CABINET SHALL HAVE RAIN BREAK OVERHANGS ABOVE ACCESS DOORS.

6.

ACCESS TO FILTERS, DAMPERS, COOLING COILS, REHEAT COIL, ELECTRIC HEATER, EXHAUST FANS, ENERGY RECOVERY WHEELS, COMPRESSORS, AND ELECTRICAL AND CONTROLS COMPONENTS SHALL BE THROUGH HINGED ACCESS DOORS WITH QUARTER TURN, ZINC CAST, LOCKABLE HANDLES. FULL LENGTH STAINLESS STEEL PIANO HINGES SHALL BE INCLUDED ON THE DOORS.

7.

EXTERIOR PAINT FINISH SHALL BE CAPABLE OF WITHSTANDING AT LEAST 2,500 HOURS, WITH NO VISIBLE CORROSIVE EFFECTS, WHEN TESTED IN A SALT SPRAY AND FOG ATMOSPHERE IN ACCORDANCE WITH ASTM B 117-95 TEST PROCEDURE.

8.

UNITS SHALL INCLUDE DOUBLE SLOPED 304 STAINLESS STEEL DRAIN PAN.

9.

UNITS SHALL BE PROVIDED WITH BASE DISCHARGE AND RETURN AIR OPENINGS. ALL OPENINGS THROUGH THE BASE PAN OF THE UNIT SHALL HAVE UPTURNED FLANGES OF AT LEAST 1/2 INCH IN HEIGHT AROUND THE OPENING.

10.

UNITS SHALL INCLUDE LIFTING LUGS ON THE TOP OF THE UNIT.

11.

UNIT BASE PAN SHALL BE PROVIDED WITH 1/2 INCH THICK FOAM INSULATION.

C.

ELECTRICAL:

1.

UNITS SHALL BE PROVIDED WITH FACTORY INSTALLED AND FACTORY WIRED, NON-FUSED DISCONNECT SWITCH.

2.

UNITS SHALL BE PROVIDED WITH A FACTORY INSTALLED AND FACTORY WIRED 115V, 13 AMP GFI OUTLET DISCONNECT SWITCH IN THE UNIT CONTROL PANEL.

3.

UNITS SHALL BE PROVIDED WITH PHASE AND BROWN OUT PROTECTION WHICH SHUTS DOWN ALL MOTORS IN THE UNIT IF THE ELECTRICAL PHASES ARE MORE THAN 10% OUT OF BALANCE ON VOLTAGE, THE VOLTAGE IS MORE THAN 10% UNDER DESIGN VOLTAGE OR ON PHASE REVERSAL.

D.

SUPPLY FANS:

1.

UNITS SHALL INCLUDE DIRECT DRIVE, UNHOUSED, BACKWARD CURVED, PLENUM SUPPLY FANS.

2.

BLOWERS AND MOTORS SHALL BE DYNAMICALLY BALANCED AND MOUNTED ON RUBBER ISOLATORS.

3.

MOTORS SHALL BE INVERTER DUTY PREMIUM EFFICIENCY ODP WITH BALL BEARINGS RATED FOR 200,000 HOURS SERVICE WITH EXTERNAL LUBRICATION POINTS.

4.

VARIABLE FREQUENCY DRIVES (VFD) SHALL BE FACTORY WIRED AND MOUNTED IN THE UNIT. FAN MOTORS SHALL BE INVERTER DUTY PREMIUM EFFICIENCY.

E.

EXHAUST FANS:

1.

EXHAUST DAMPERS SHALL BE SIZED FOR 100% RELIEF.

2.

FANS AND MOTORS SHALL BE DYNAMICALLY BALANCED.

3.

MOTORS SHALL BE INVERTER DUTY PREMIUM EFFICIENCY ODP WITH BALL BEARINGS RATED FOR 200,000 HOURS SERVICE WITH EXTERNAL LUBRICATION POINTS.

4.

ACCESS TO EXHAUST FANS SHALL BE THROUGH DOUBLE WALL, HINGED ACCESS DOORS WITH QUARTER TURN LOCKABLE HANDLES.

5.

UNITS SHALL INCLUDE BELT DRIVEN, UNHOUSED, BACKWARD CURVED, PLENUM EXHAUST FANS.

6.

VARIABLE FREQUENCY DRIVES (VFD) SHALL BE FACTORY WIRED AND MOUNTED IN THE UNIT. FAN MOTORS SHALL BE INVERTER DUTY PREMIUM EFFICIENCY TYPE.

F.

COOLING COILS:

1.

EVAPORATOR COILS:

a.

COILS SHALL BE DESIGNED FOR USE WITH R-410A REFRIGERANT AND CONSTRUCTED OF COPPER TUBES WITH ALUMINUM FINS MECHANICALLY BONDED TO THE TUBES AND GALVANIZED STEEL END CASINGS. FIN DESIGN SHALL BE SINE WAVE RIPLED.

b.

COILS SHALL HAVE INTERLACED CIRCUITRY AND SHALL BE STANDARD CAPACITY.

c.

COILS SHALL BE HYDROGEN OR HELIUM LEAK TESTED.

d.

COILS SHALL BE FURNISHED WITH FACTORY INSTALLED EXPANSION VALVES.

G.

REFRIGERATION SYSTEM:

1.

UNITS SHALL BE FACTORY CHARGED WITH R-410A REFRIGERANT.

2.

COMPRESSORS SHALL BE SCROLL TYPE WITH THERMAL OVERLOAD PROTECTION AND CARRY A 5-YEAR NON-PRORATED WARRANTY, FROM THE DATE OF ORIGINAL EQUIPMENT SHIPMENT FROM THE FACTORY.

3.

COMPRESSORS SHALL BE MOUNTED IN AN ISOLATED SERVICE COMPARTMENT WHICH CAN BE ACCESSSED WITHOUT AFFECTING UNIT OPERATION. LOCKABLE HINGED COMPRESSOR ACCESS DOORS SHALL BE FABRICATED OF DOUBLE WALL, RIGID POLYURETHANE FOAM INJECTED PANELS TO PREVENT THE TRANSMISSION OF NOISE OUTSIDE THE CABINET.

4.

COMPRESSORS SHALL BE ISOLATED FROM THE BASE PAN WITH THE COMPRESSOR MANUFACTURER'S RECOMMENDED RUBBER VIBRATION ISOLATORS, TO REDUCE ANY TRANSMISSION OF NOISE FROM THE COMPRESSORS INTO THE BUILDING AREA.

5.

EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH EXPANSION VALVE TYPE REFRIGERANT FLOW CONTROL.

6.

EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH AUTOMATIC RESET LOW PRESSURE AND MANUAL RESET HIGH PRESSURE REFRIGERANT SAFETY CONTROLS. SCHRADER TYPE SERVICE FITTINGS ON BOTH THE HIGH PRESSURE AND LOW PRESSURE SIDES AND A FACTORY INSTALLED REPLACEABLE CORE LIQUID LINE FILTER DRIERS.

7.

UNITS SHALL INCLUDE A VARIABLE CAPACITY SCROLL COMPRESSOR ON THE LEAD REFRIGERATION CIRCUIT WHICH SHALL BE CAPABLE OF MODULATION FROM

- 10-100% OF ITS CAPACITY.

LEAD REFRIGERATION CIRCUIT SHALL BE PROVIDED WITH HOT GAS REHEAT COIL, MODULATING VALVES, ELECTRONIC CONTROLLER, SUPPLY AIR TEMPERATURE SENSOR AND A CONTROL SIGNAL TERMINAL WHICH ALLOW THE UNIT TO HAVE A DEHUMIDIFICATION MODE OF OPERATION, WHICH INCLUDES SUPPLY AIR TEMPERATURE CONTROL TO PREVENT SUPPLY AIR TEMPERATURE SWINGS AND OVERCOOLING OF THE SPACE.

EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH A LIQUID LINE SIGHT GLASS.

EACH REFRIGERATION CIRCUIT SHALL BE EQUIPPED WITH SUCTION AND DISCHARGE COMPRESSOR ISOLATION VALVES.

FIRST CAPACITY STAGE SHALL BE PROVIDED WITH ON/OFF CONDENSER FAN CYCLING AND ADJUSTABLE COMPRESSOR LOCKOUT TO ALLOW COOLING OPERATION DOWN TO 35°F.

EACH REFRIGERATION CIRCUIT SHALL BE PROVIDED WITH AN ADJUSTABLE TEMPERATURE SENSOR FREEZE STAT WHICH SHUTS DOWN THE COOLING CIRCUITS WHEN THE EVAPORATOR COIL TUBING FALLS BELOW THE SETPOINT.

H.

AIR-COOLED CONDENSERS:

1.

CONDENSER FANS SHALL BE A VERTICAL DISCHARGE, AXIAL FLOW, DIRECT DRIVE FANS.

2.

COILS SHALL BE DESIGNED FOR USE WITH R-410A REFRIGERANT. COILS SHALL BE MULTI-PASS AND FABRICATED FROM ALUMINUM MICROCHANNEL TUBES.

3.

COILS SHALL BE DESIGNED FOR A MINIMUM OF 10°F OF REFRIGERANT SUB-COOLING.

4.

COILS SHALL BE HYDROGEN OR HELIUM LEAK TESTED.

I.

HOT GAS REHEAT COIL: HOT GAS REHEAT COIL SHALL BE FACTORY INSTALLED AND SHALL INCLUDE FULLY MODULATING HOT GAS REHEAT VALVE.

J.

HEATING SECTION

1.

ELECTRIC HEAT COIL (ERV-FRONT OFFICES)

a.

ELECTRIC HEAT SHALL BE MODULATING SCR TYPE. HEATING COILS SHALL BE CONSTRUCTED OF A LOW WATT DENSITY, HIGH NICKEL CHROMIUM ALLOY RESISTANCE WIRE, MECHANICALLY STACKED AND HELI-ARC WELDED TO CORROSION RESISTANT TERMINALS. A CORROSION RESISTANT HEAVY GAUGE RACK SHALL SUPPORT THE ELEMENTS. SAFETY CONTROLS SHALL INCLUDE AUTOMATIC RESET HIGH LIMIT CONTROL WITH MANUAL RESET BACKUP LINE BREAK PROTECTION. HEATING ELEMENT BRANCH CIRCUITS SHALL BE FUSED TO MAXIMUM OF 48 AMPS PER NEC REQUIREMENTS. THE ELECTRIC HEAT SECTION SHALL BE POSITIONED DOWNSTREAM OF THE SUPPLY AIR FAN. PROOF OF AIRFLOW MUST BE ESTABLISHED ANY TIME THE ELECTRIC HEAT ELEMENT IS ENERGIZED.

b.

THE ELECTRIC HEAT ELEMENTS SHALL BE CONTROLLED BY THE FACTORY INSTALLED MAIN UNIT DDC CONTROL SYSTEM. THE CONTROL SYSTEM WILL HAVE FOUR DISTINCT STAGES OF HEATING ON ANY UNIT OVER 25 TONS. EACH STAGE CONTROL CONTACTOR SHALL BE A THREE POLE CONTACTOR. WHEN THE STAGE CONTROL CONTACTOR IS NOT ENERGIZED, IT MUST BREAK ALL THREE PHASES OF POWER INPUT TO THE ELECTRIC HEATER.

c.

THE ELECTRICAL POWER SUPPLY FOR THE ELECTRIC HEATER SHALL BE FROM THE ROOFTOP UNIT CONTROL PANEL. UNIT SHALL HAVE A SINGLE POINT POWER SUPPLY CONNECTION. INDEPENDENT SUPPLY POWER CONNECTION TO THE ELECTRIC HEATER WILL NOT BE ACCEPTED. ALL DISCONNECTS MUST BE THREE POLE TO REMOVE POWER FROM ALL INCOMING LESS.

2.

HOT WATER COIL (ERV-E WING)

a.

HEATING COILS SHALL BE FIN AND TUBE TYPE SUITABLE FOR WATER SERVICE, CONSTRUCTED OF SEAMLESS COPPER TUBES MECHANICALLY EXPANDED INTO ALUMINUM FINS. FINS SHALL HAVE A MINIMUM THICKNESS OF 0.006". CASING SHALL BE CONSTRUCTED OF INSULATED, DOUBLE-WALL, GALVANIZED STEEL PANELS WITH AN NON-ABSORPTING SOLID ADHESIVENT LAYER PRIOR TO BEING FORMED INTO THE HONEYCOMB MEDIA STRUCTURE TO INSURE THAT ALL SURFACES ARE COATED AND THAT ADEQUATE LATENT CAPACITY IS PROVIDED. THE MEDIA SHALL HAVE A FLAME SPREAD OF LESS THAN 25 AND A SMOKE DEVELOPED OF LESS THAN 50 WHEN RATED IN ACCORDANCE WITH ASTM E84.

1.

UNITS SHALL INCLUDE 2 INCH THICK, PLEATED PANEL FILTERS WITH AN ASHRAE EFFICIENCY OF 30% AND MERV RATING OF 8, UPSTREAM OF THE COOLING COIL.

2.

UNITS SHALL INCLUDE A CLOGGED FILTER SWITCH.

K.

OUTSIDE AIR/ECONOMIZERS: UNITS SHALL INCLUDE 0-100% ECONOMIZER CONSISTING OF A MOTOR OPERATED OUTSIDE AIR DAMPER AND RETURN AIR DAMPER ASSEMBLY CONSTRUCTED OF EXTRUDED ALUMINUM, HOLLOW CORE, AIRFOIL BLADES WITH RUBBER EDGE SEALS AND ALUMINUM END SEALS. DAMPER BLADES SHALL BE GEAR DRIVEN AND DESIGNED TO HAVE NO MORE THAN 20 CFM OF LEAKAGE PER SQ. FT. AT 4 IN. W.G. AIR PRESSURE DIFFERENTIAL ACROSS THE DAMPER. LOW LEAKAGE DAMPERS SHALL BE CLASS 2 AMCA CERTIFIED, IN ACCORDANCE WITH AMCA STANDARD 511. DAMPER ASSEMBLY SHALL BE CONTROLLED BY SPRING RETURN ENTHALPY ACTIVATED FULLY MODULATING ACTUATOR. UNIT SHALL INCLUDE OUTSIDE AIR OPENING BIRD SCREEN, OUTSIDE AIR HOOD, AND BAROMETRIC RELIEF DAMPERS.

L.

ENERGY RECOVERY:

1.

ENERGY RECOVERY WHEELS SHALL BE SEMCO STANDARD 'TE3' SERIES WITH COMPONENTS AS FOLLOWS:

1.

TOTAL ENERGY RECOVERY WHEEL UNIT: THE ROTOR MEDIA SHALL BE MADE OF ALUMINUM, WHICH IS COATED TO PROHIBIT CORROSION. ALL MEDIA SURFACES SHALL BE COATED WITH A NON-ABSORPTING SOLID ADHESIVENT LAYER PRIOR TO BEING FORMED INTO THE HONEYCOMB MEDIA STRUCTURE TO INSURE THAT ALL SURFACES ARE COATED AND THAT ADEQUATE LATENT CAPACITY IS PROVIDED. THE MEDIA SHALL HAVE A FLAME SPREAD OF LESS THAN 25 AND A SMOKE DEVELOPED OF LESS THAN 50 WHEN RATED IN ACCORDANCE WITH ASTM E84.

2.

THE FACES OF THE TOTAL ENERGY RECOVERY WHEEL SHALL BE SEALED WITH A TWO-PART POLYMER ACID RESISTANT COATING TO LIMIT SURFACE OXIDATION. THE MEDIA FACE COATING SHALL ALSO INCLUDE A PROPRIETARY TEFLON-BASED ANTI-STICK ADDITIVE SHOWN, BY INDEPENDENT TESTING, TO EFFECTIVELY LIMIT THE COLLECTION OF DUST OR SMOKE PARTICULATE AND TO AID IN THE SURFACE CLEANING PROCESS SHOULD CLEANING BE REQUIRED.

3.

THE ENTIRE RECOVERY WHEEL MEDIA FACE SHALL BE TREATED WITH AVIRON46, AND SHALL EXHIBIT EFFECTIVE ANTIMICROBIAL ACTION, SUPPORTED BY INDEPENDENT TEST DATA. ANY ANTIMICROBIAL AGENT USED MUST, BY LAW, CARRY AN EPA REGISTRATION FOR USE IN DUCT SYSTEMS. ALL DESCANT SURFACES WITHIN THE TRANSFER MEDIA SHALL ALSO EXHIBIT BACTERIA-STATIC PROPERTIES AS SUPPORTED BY INDEPENDENT TESTING.

4.

THE DESCICANT SHALL BE INORGANIC AND SPECIFICALLY DEVELOPED FOR THE SELECTIVE ADSORPTION OF WATER VAPOR. THE DESCICANT SHALL UTILIZE A 3A MOLECULAR SIEVE CERTIFIED BY THE MANUFACTURER TO HAVE AN INTERNAL PORE DIAMETER DISTRIBUTION WHICH LIMITS ADSORPTION TO MATERIALS NOT LARGER THAN THE CRITICAL DIAMETER OF A WATER MOLECULE (2.8 ANGSTROMS).

5.

SUBMIT CERTIFICATION BY A QUALIFIED INDEPENDENT ORGANIZATION DOCUMENTING EQUIVALENT SENSIBLE AND LATENT RECOVERY EFFICIENCIES CONDUCTED IN ACCORDANCE WITH ASHRAE 84-78P AND THE RESULTS PRESENTED IN ACCORDANCE WITH AHRI 109-93.

6.

AN INDEPENDENT WHEEL TEST FROM A CREDIBLE TEST LABORATORY SHALL DOCUMENT THAT THE DESCICANT MATERIAL UTILIZED DOES NOT TRANSFER POLLUTANTS TYPICALLY ENCOUNTERED IN THE INDOOR AIR ENVIRONMENT. THE CROSS-CONTAMINATION AND PERFORMANCE CERTIFICATION REPORTS SHALL BE PROVIDED UPON WRITTEN REQUEST FOR ENGINEERING REVIEW.

7.

PURGE SECTOR: THE UNIT SHALL BE PROVIDED WITH A FACTORY SET, FIELD ADJUSTABLE, PURGE SECTOR DESIGNED TO LIMIT CROSS CONTAMINATION TO LESS THAN 34 PERCENT OF THAT OF THE EXHAUST AIRSTREAM CONCENTRATION WHEN OPERATED UNDER APPROPRIATE CONDITIONS.

8.

ROTOR SEALS: THE ROTOR SHALL BE SUPPLIED WITH LABYRINTH SEALS ONLY, WHICH AT NO TIME SHALL MAKE CONTACT WITH ANY ROTATING SURFACE OF THE EXCHANGER ROTOR FACE. THESE MULTI-PASS SEALS SHALL UTILIZE FOUR LABYRINTH STAGES FOR OPTIMUM PERFORMANCE.

9.

ROTOR SUPPORT SYSTEM: THE ROTOR MEDIA SHALL BE PROVIDED IN SEGMENTED FASHION TO ALLOW FOR FIELD ERECTION OR REPLACEMENT OF ONE SECTION AT A TIME WITHOUT REQUIRING SIDE ACCESS. THE MEDIA SHALL BE RIGIDLY HELD IN PLACE BY A STRUCTURAL SPOKE SYSTEM MADE OF EXTRUDED ALUMINUM.

10.

ROTOR HOUSING: THE ROTOR HOUSING SHALL BE A STRUCTURAL FRAMEWORK WHICH LIMITS THE DEFLECTION OF THE ROTOR DUE TO AIR PRESSURE LOSS TO LESS THAN 1/32". THE HOUSING IS MADE OF GALVANIZED STEEL TO PREVENT CORROSION. THE ROTOR IS SUPPORTED BY TWO PILLOW BLOCK BEARINGS WHICH CAN BE MAINTAINED OR REPLACED WITHOUT THE REMOVAL OF THE ROTOR FROM ITS CASING OR THE MEDIA FROM ITS SPOKE SYSTEM.

12.

TEMPERATURE CONTROL PANEL: VARIABLE SPEED CONTROL SHALL BE ACCOMPLISHED BY THE USE OF AN A/C INVERTER. THE ROTOR SHALL INCLUDE ALL DIGITAL PROGRAMMING WITH A MANUAL SPEED ADJUSTMENT ON THE FRONT OF THE INVERTER. THE DRIVE SYSTEM SHALL ALLOW FOR A TURNDOWN RATIO OF 80:1 (20 RPM TO 1/4 RPM). THE CONTROL SYSTEM SHALL INCLUDE FOUR LINEARIZED THERMISTOR SENSORS AS FOLLOWS:

a.

PROPORTIONAL TEMPERATURE CONTROLLER MOUNTED IN THE SUPPLY AIR STREAM.

b.

DIFFERENTIAL SUMMER/WINTER CHANGEOVER SENSORS MOUNTED IN THE OUTDOOR AND RETURN AIR STREAMS.

c.

FROST PREVENTION SENSOR LOCATED IN THE EXHAUST AIRSTREAM.

d.

DIGITAL READOUT OF THE TEMPERATURE READINGS RECORDED BY THESE SENSORS AND CONTROL SET-POINTS IS DISPLAYED BY THE CONTROL PANEL.

13.

DIGITAL PERFORMANCE DISPLAY MODULE: DIGITAL READ OUT CONFIRMING THE EFFECTIVENESS OF THE ENERGY WHEEL VIA TEMPERATURE READINGS RECORDED BY THESE SENSORS AND CONTROL SET-POINTS SHALL BE DISPLAYED BY THE CONTROL PANEL.

14.

WARRANTY: THE UNIT MANUFACTURER SHALL WARRANT TO THE BUYER THAT FOR A PERIOD OF 5 YEARS FROM THE DATE OF SHIPMENT THE GOODS TO BE DELIVERED TO THE BUYER SHALL IN ALL MATERIAL RESPECTS BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP WHEN USED IN A PROPER AND NORMAL MANNER. SHOULD ANY FAILURE TO CONFORM TO THE ABOVE APPEAR WITHIN 5 YEARS AFTER THE DATE OF SHIPMENT, THE UNIT MANUFACTURER SHALL UPON PROMPT NOTIFICATION THEREOF DURING THE WARRANTY PERIOD AND CONFIRMATION TO THE UNIT MANUFACTURER'S SATISFACTION THAT THE GOODS HAVE BEEN STORED, INSTALLED, OPERATED AND MAINTAINED PROPERLY AND IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICE, CORRECT THE NON-CONFORMITY AT THE UNIT MANUFACTURER'S OPTION EITHER BY REPAIRING ANY DEFECTIVE PART OR PARTS OR BY MAKING AVAILABLE AT THE UNIT MANUFACTURER'S PLANT A REPAIRED OR REPLACEMENT PART.

N.

CONTROLS:

1.

FACTORY INSTALLED AND FACTORY PROVIDED CONTROLLERS

a.

UNIT CONTROLLERS SHALL BE CAPABLE OF CONTROLLING ALL FEATURES AND OPTIONS OF THE UNIT. CONTROLLER SHALL BE FACTORY INSTALLED IN THE UNIT CONTROLS COMPARTMENT AND FACTORY TESTED. CONTROLLERS SHALL BE CAPABLE OF STAND ALONE OPERATION WITH UNIT CONFIGURATION, SETPOINT ADJUSTMENT, SENSOR STATUS VIEWING, UNIT ALARMS VIEWING, AND OCCUPANCY SCHEDULING AVAILABLE WITHOUT ACCESS TO A BUILDING MANAGEMENT SYSTEM. THE CONTROLLER SHALL COME WITH A WEB USER INTERFACE AND A REMOTE DISPLAY THAT ALLOWS FOR REMOTE MONITORING AND ADJUSTMENT OF PARAMETERS OF THE UNIT MOUNTED CONTROLLER.

b.

CONTROLLER SHALL HAVE AN ONBOARD CLOCK AND CALENDAR FUNCTIONS THAT ALLOW FOR OCCUPANCY SCHEDULING.

c.

CONTROLLER SHALL INCLUDE NON-VOLATILE MEMORY TO RETAIN ALL PROGRAMMED VALUES WITHOUT THE USE OF A BATTERY, IN THE EVENT OF A POWER FAILURE.

d.

MAKEUP AIR CONTROLLER:

(1)

UNIT SHALL MODULATE COOLING WITH CONSTANT AIRFLOW TO MEET VENTILATION OUTSIDE AIR LOADS. COOLING CAPACITY SHALL MODULATE BASED ON SUPPLY AIR TEMPERATURE.

(2)

WITH MODULATING HOT GAS REHEAT, UNIT SHALL MODULATE COOLING AND HOT GAS REHEAT AS EFFICIENTLY AS POSSIBLE, TO MEET OUTSIDE AIR HUMIDITY LOADS AND PREVENT SUPPLY AIR TEMPERATURE SWINGS AND OVERCOOLING OF THE SPACE.

(3)

UNIT SHALL MODULATE HEATING WITH CONSTANT AIRFLOW TO MEET VENTILATION OUTSIDE AIR LOADS. HEATING CAPACITY SHALL MODULATE BASED ON SUPPLY AIR TEMPERATURE.

O.

WEATHERHOODS: UNIT SHALL HAVE FACTORY FURNISHED OUTDOOR AND EXHAUST AIR WEATHERHOODS. OUTDOOR AIR WEATHERHOOD SHALL INCORPORATE A LOUVERED DESIGN AND MOISTURE ELIMINATOR. WEATHERHOODS SHALL BE TESTED IN ACCORDANCE WITH AMCA STANDARD 500L AND ACHIEVE AN 'A' WATER PENETRATION CLASSIFICATION RATING UP TO 8 INHR RAINFALL AT 50 MPH.

P.

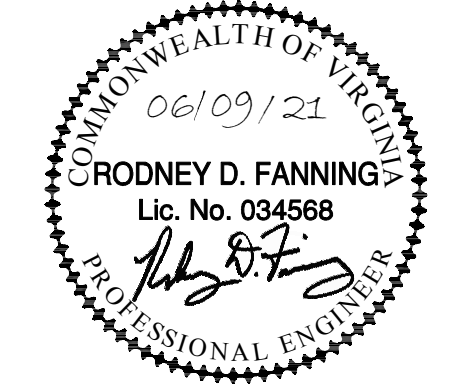
CURBS TO BE FULLY GASKETED BETWEEN THE CURB TOP AND UNIT BOTTOM WITH THE CURB PROVIDING FULL PERIMETER SUPPORT, CROSS STRUCTURE SUPPORT AND AIR SEAL FOR THE UNIT. CURB GASKET SHALL BE FURNISHED WITHIN THE CONTROL COMPARTMENT OF THE ROOFTOP UNIT TO BE MOUNTED ON THE CURB IMMEDIATELY BEFORE MOUNTING OF THE ROOFTOP UNIT. CURBS SHALL BE FULLY LINED WITH 1 INCH NEOPRENE COATED FIBERGLASS INSULATION.

L | P | A

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REVISION	DATE

NORTHSIDE HIGH SCHOOL
MAKEUP AIR UNIT ADDITION
ROANOKE, VIRGINIA

HVAC SPECIFICATIONS

DESIGNED	DRAWN
RWR	RWR
CHECKED	APPROVED
RFJ	LPA
COMM. NO.	DATE
21101.12	06-09-21
SHEET	
M3	

SPECIFICATIONS FOR HVAC WORK

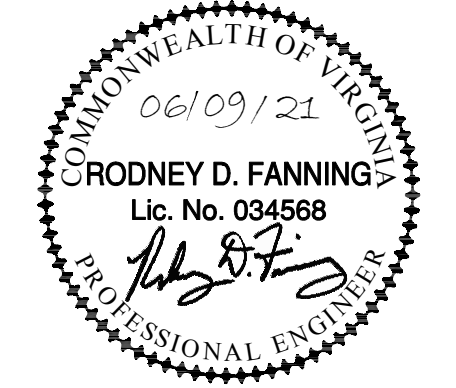
28. TEMPERATURE CONTROL SYSTEM:
- A. GENERAL - CONTROLS FOR ERV-FRONT OFFICE, ERV-E WING, AND EF-1 SHALL BE PROVIDED AND INTEGRATED WITH THE EXISTING TRANE TRACER BUILDING AUTOMATION SYSTEM (BAS). COMPONENT PARTS OF THE SYSTEM SHALL BE MANUFACTURED BY ONE CONTROL MANUFACTURER AND/OR BY THE PARTICULAR HVAC EQUIPMENT MANUFACTURER. IN EITHER CASE, THE TEMPERATURE CONTROL CONTRACTOR SHALL BE RESPONSIBLE FOR ACHIEVING THE "SEQUENCE OF CONTROL." THE SYSTEM SHALL BE INSTALLED BY COMPETENT, TRAINED MECHANICS. PROVIDE ALL EQUIPMENT AND MATERIALS AS REQUIRED TO ACCOMPLISH THE SEQUENCE OF CONTROL.
- B. COORDINATION OF WORK: ALL WIRING IN CONNECTION WITH THE TEMPERATURE CONTROL SYSTEM SHALL BE FURNISHED AND INSTALLED BY THE CONTROLS SYSTEM CONTRACTOR. WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATION. WIRING WITHOUT CONDUIT ABOVE CEILINGS SHALL BE PROPERLY SUPPORTED WITHOUT SAGS. LOOSE WIRES LAYING ON CEILINGS, LIGHTS, OR PIPES WILL NOT BE ACCEPTABLE AT ANY LOCATION.
- C. SERVICE AND GUARANTEE - THE ENTIRE CONTROL SYSTEM SHALL BE SERVICED AND MAINTAINED IN FIRST-CLASS CONDITION BY THE CONTROL MANUFACTURER FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE AT NO EXTRA COST TO THE OWNER.
- D. SEQUENCE OF CONTROL:
1. EF-1: RETAIN EXISTING EF-1 CONTROLS SEQUENCE.
2. ERV-FRONT OFFICES AND ERV-E WING: UNIT TO OPERATE DURING OCCUPIED HOURS AS DESCRIBED IN SECTION 26.N.1.d.

LPA

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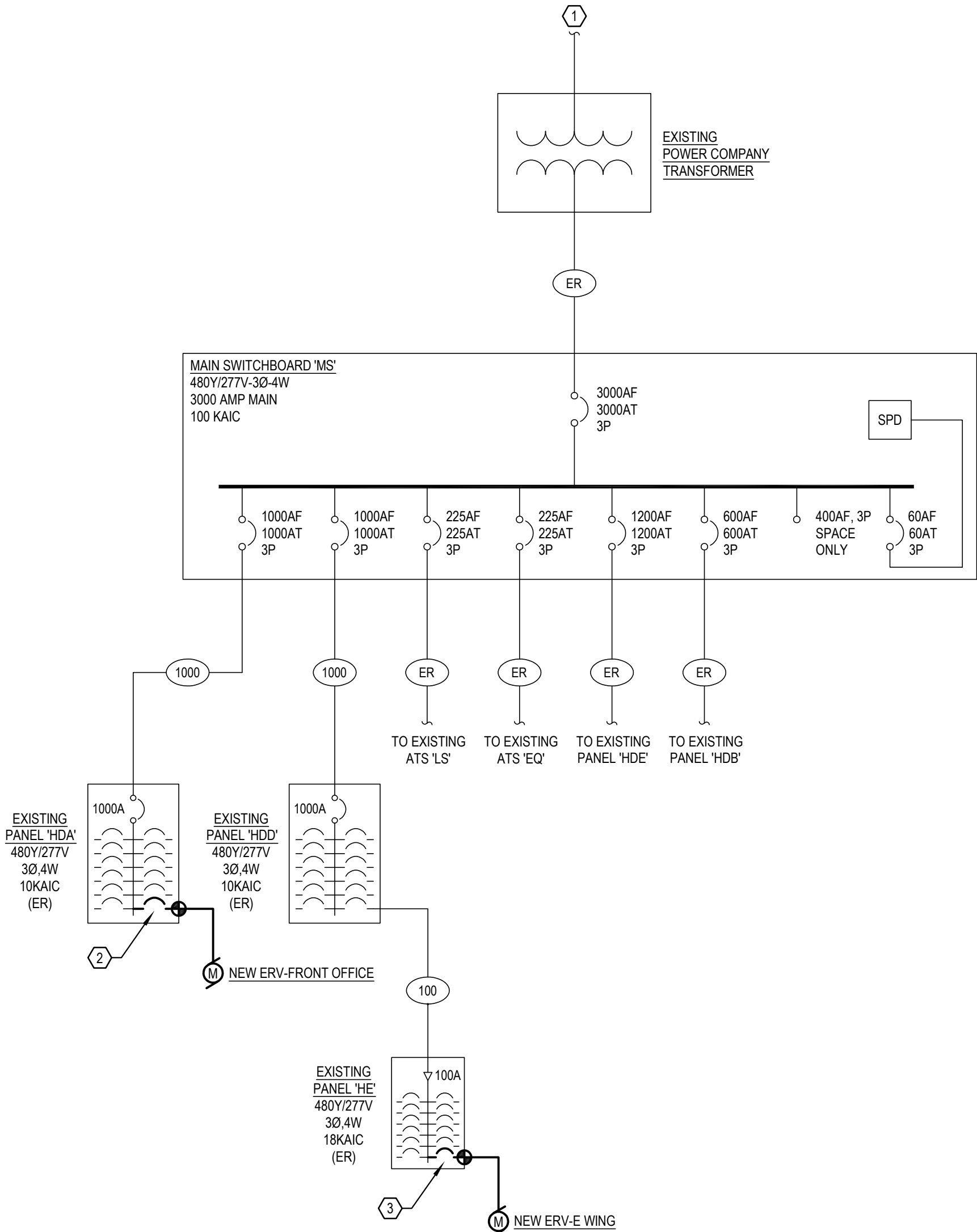
NORTHSIDE HIGH SCHOOL
MAKEUP AIR UNIT ADDITION
ROANOKE, VIRGINIA

HVAC SPECIFICATIONS

DESIGNED RWR	DRAWN RWR
CHECKED RDF	APPROVED LPA
COMM. NO. 21101.12	DATE 06-09-21
SHEET M4	

ELECTRICAL SPECIFICATIONS:

1. **SCOPE OF WORK:** PROVIDE SUPERVISION, LABOR, MATERIAL, EQUIPMENT, MACHINERY, PLANT AND OTHER ITEMS NECESSARY FOR A COMPLETE AND OPERABLE ELECTRICAL SYSTEM.
- WHERE VARIANCES OCCUR BETWEEN DRAWINGS AND SPECIFICATIONS OR WITHIN EITHER DOCUMENT ITSELF, INCLUDE IN THE CONTRACT PRICE THE ITEM OR ARRANGEMENT OF BETTER QUALITY, GREATER QUANTITY, OR HIGHER COST.
2. **STANDARDS AND CODES:** THE MATERIALS AND EQUIPMENT SHALL BE NEW AND LISTED BY UNDERWRITERS LABORATORIES, INC. THE INSTALLATION SHALL BE IN ACCORDANCE WITH THE 2015 VIRGINIA UNIFORM STATEWIDE BUILDING CODE (USBC); THE 2015 INTERNATIONAL BUILDING CODE (IBC) AS ADOPTED AND MODIFIED BY THE 2015 VIRGINIA CONSTRUCTION CODE (VCC); THE 2014 NFPA-70 (NATIONAL ELECTRICAL CODE, OR NEC); AND OTHER RELATED CODES AND STANDARDS. THE COMPLETED INSTALLATION SHALL COMPLY WITH THE ADAAG "AMERICAN WITH DISABILITIES ACT GUIDELINES FOR BUILDINGS AND FACILITIES". WORKMANSHIP SHALL MEET THE "STANDARDS OF INSTALLATION" AS PUBLISHED BY THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA).
3. **PERMITS AND FEES:** OBTAIN PERMITS, BONDS, LICENSES AND INSPECTION CERTIFICATES. PAY INSPECTION FEES AND TAXES. FILE PLANS AND PREPARE DOCUMENTS REQUIRED TO OBTAIN APPROVALS OF GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.
4. **CONDUIT:** PROVIDE RIGID GALVANIZED STEEL CONDUIT (RGS) OR IMC WHERE EXTERIOR ABOVE-GRADE. WHERE NOT EXTERIOR, PROVIDE ELECTRICAL METALLIC TUBING (EMT) FOR BRANCH CIRCUITS. PROVIDE GALVANIZED SINGLE STRIP FLEXIBLE CONDUIT, MINIMUM 18" LONG, FOR MOTOR CONNECTIONS. USE PVC JACKETED FLEXIBLE LIQUID-TIGHT CONDUIT TYPE UA FOR MOTOR CONNECTIONS IN WET LOCATIONS. CONDUIT SHALL BE MINIMUM 3/4". SUPPORT CONDUIT AS REQUIRED BY THE NEC. FOR ROOF DECKING APPLICATIONS, FOLLOW REQUIREMENTS OF NEC 300.4(E). EXPANSION/DEFLECTION FITTINGS SHALL BE PROVIDED WHERE REQUIRED PER NEC 300.4(H). FITTINGS SHALL NOT BE CAST POT METAL.
- ALL CONDUITS PASSING THROUGH RATED WALLS OR CEILINGS SHALL BE SLEEVED AND PACKED WITH U.L. LISTED SEALANT TO MAINTAIN RATING.
- TYPE AC, MC AND NMC CABLE ARE NOT ALLOWED.
5. **JUNCTION, OUTLET AND PULL BOXES:** PROVIDE JUNCTION, OUTLET AND PULL BOXES FOR WIRING DEVICES, FIXTURES, CONNECTIONS TO EQUIPMENT AND AS REQUIRED BY THE NEC. BOXES SHALL BE STEEL UNLESS REQUIRED OTHERWISE BY ENVIRONMENT.
6. **HANGERS AND SUPPORTS:** PROVIDE ALL HANGERS, SUPPORTS, ANCHORS, SLEEVES AND SEALS AS REQUIRED BY THE NEC.
7. **WIRING:** PROVIDE COPPER CONDUCTORS, XHHW OR XHHW-2 OR THHN OR THWN-2, 600 VOLT, 90 DEGREE C RATED. WIRING SHALL BE COLOR-CODED TO IDENTIFY PHASES, NEUTRAL AND GROUND. MATCH EXISTING BUILDING WIRING COLOR-CODING. NUMBER 12 AWG SHALL BE THE SMALLEST SIZE WIRE USED FOR POWER AND LIGHTING. FOR 120-VOLT 15 AMP AND 20 AMP BRANCH CIRCUITS, USE MINIMUM 12 AWG UP TO 60 FEET, 10 AWG FOR 61-95 FEET, 8 AWG FOR 96-155 FEET AND 6 AWG FOR BRANCH CIRCUITS LONGER THAN 155 FEET. CONDUCTORS SHALL BE SAME SIZE FOR ENTIRE LENGTH OF RUN. FOR 277-VOLT 15 AMP AND 20 AMP BRANCH CIRCUITS, USE MINIMUM 12 AWG UP TO 140 FEET, 10 AWG FOR 141-220 FEET AND 8 AWG FOR BRANCH CIRCUITS LONGER THAN 220 FEET; CONDUCTORS SHALL BE SAME SIZE FOR ENTIRE LENGTH OF RUN. CONDUCTORS 8 AWG AND LARGER SHALL BE STRANDED; CONDUCTORS 10 AWG AND SMALLER SHALL BE SOLID. WIRING SHALL BE RUN CONCEALED, EXCEPT WHERE INDICATED OTHERWISE ON THE DRAWINGS. DO NOT INSTALL A SHARED NEUTRAL ON ANY CIRCUIT. ALL TERMINATIONS SHALL BE 75 DEGREES C.
8. **GROUNDING AND BONDING:** PROVIDE AN EQUIPMENT GROUNDING SYSTEM INSTALLED TO METALLIC STRUCTURES, ENCLOSURES, RACEWAYS, JUNCTION BOXES, OUTLET BOXES, PULL BOXES, CABINETS, MACHINE FRAMES, PORTABLE EQUIPMENT AND OTHER CONDUCTIVE ITEMS IN CLOSE PROXIMITY TO ELECTRICAL CIRCUITS. ALL BRANCH AND FEEDER CIRCUITS SHALL INCLUDE A GREEN GROUNDING CONDUCTOR.
9. **IDENTIFICATION:** WHEREVER REASONABLY REQUIRED FOR SAFETY, MAINTENANCE AND/OR OPERATIONAL PURPOSES, PROVIDE SELF-ADHESIVE PLASTIC SIGNS FOR IDENTIFICATION, INSTRUCTION OR WARNING ON SWITCHES AND OUTLETS, AS WELL AS OTHER CONTROLS, DEVICES AND ENCLOSURE COVERS. PROVIDE A DANGER SIGN WHEREVER IT IS POSSIBLE FOR PERSONS TO COME INTO CONTACT WITH A VOLTAGE HIGHER THAN 120 VOLTS, AS WELL AS ON CRITICAL SWITCHES AND CONTROLS WHERE UNTIMELY OPERATION COULD BE A SAFETY HAZARD. PROVIDE AN ENGRAVED PLASTIC-LAMINATE LABEL ON EACH MAJOR UNIT OF ELECTRICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO: CABINETS, ENCLOSURES, VFD'S, STARTERS, AND DISCONNECT SWITCHES. EQUIPMENT LABELS SHALL INCLUDE WHAT IS REQUIRED IN NEC 408.4(B).
10. **CONNECTIONS TO EQUIPMENT:** MAKE FINAL ELECTRICAL POWER CONNECTIONS TO MECHANICAL EQUIPMENT. PROVIDE CONDUITS, OUTLET BOXES AND POWER WIRING FROM THE POWER SOURCE TO THE MOTOR OR EQUIPMENT JUNCTION BOX, INCLUDING WIRING THROUGH STARTERS OR SAFETY SWITCHES, IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.



PARTIAL ONE-LINE DIAGRAM

SCALE: NONE

ONE-LINE DIAGRAM NOTES:

1. EXISTING PRIMARY FEED FROM UTILITY TO REMAIN.
2. PROVIDE AND INSTALL ONE (1) 3-POLE 35 AMP CIRCUIT BREAKER OF MATCHING FRAME, AIC RATING AND TYPE IN EXISTING PANEL 'HDA' TO SERVE NEW ERV-FRONT OFFICE. REFER TO SHEET E2 FOR MORE INFORMATION.
3. PROVIDE AND INSTALL ONE (1) 3-POLE 20 AMP CIRCUIT BREAKER OF MATCHING FRAME, AIC RATING AND TYPE IN EXISTING PANEL 'HE' TO SERVE NEW ERV-E WING. REFER TO SHEET E2 FOR MORE INFORMATION.

ELECTRICAL ABBREVIATIONS

A OR AMP	AMPERE	INC	INCANDESCENT
ABD	ABANDONED	INIT	INITIAL
ABV	ABOVE	JB	JUNCTION BOX
AC	ALTERNATING CURRENT	KCMIL	THOUSAND CIRCULAR MILS
ACB	ABOVE COUNTER BACKSPLASH	KO	KNOCKOUT
AF OR AFI	ARC FAULT INTERRUPTER	KV	KILOVOLT
AFD	ADJUSTABLE FREQUENCY DRIVE	KVA	KILOVOLT-AMPERE
AFF	ABOVE FINISHED FLOOR	KVAR	KILOVOLT-AMPERE REACTIVE
AIC	AMPERES INTERRUPTING CAPACITY	KW	KILOWATT
AIP	ABANDONED IN PLACE	KWH	KILOWATT-HOUR
AL	ALUMINUM	LA	LIGHTNING ARRESTER
AM	AMMETER	LED	LIGHT EMITTING DIODE
AMPL	AMPLIFIER	LPS	LOW PRESSURE SODIUM
ASYM	ASYMMETRICAL	LRP	LIGHTING RELAY PANEL
ATS	AUTOMATIC TRANSFER SWITCH	LTG	LIGHTING
AWG	AMERICAN WIRE GAGE	LUM	LUMENS OR LUMINAIRE
BAS	BUILDING AUTOMATION SYSTEM	MAG	MAGNETIC
BEL	BELOW	MAN	MANUAL
BD	BUS DUCT	MATV	MASTER ANTENNA TELEVISION
BOT	BOTTOM	MCA	MINIMUM CIRCUIT CAPACITY
BRKR	BREAKER	MCB	MAIN CIRCUIT BREAKER
C	COUNTERTOP	MCC	MOTOR CONTROL CENTER
CAB	CABINET	MCM	THOUSAND CIRCULAR MILS
CATV	CABLE TV	MDF	MAIN DISTRIBUTION FRAME
CB	CIRCUIT BREAKER	MIG	MOTOR/GENERATOR
CC	CLOSED CIRCUIT TELEVISION	MH	METAL HALIDE OR MOUNTING HEIGHT
CF	COMPACT FLUORESCENT	MIN	MINIMUM
CKT	CIRCUIT	MLO	MAIN LUGS ONLY
CLG	CEILING	MMS	MANUAL MOTOR STARTER
CND	CONDUIT	MNS	MASS NOTIFICATION SYSTEM
CNTR	CENTER	MOPP	MAXIMUM OVER CURRENT PROTECTION
COMB	COMBINATION	MOD	MOTOR OPERATED DAMPER
COND	CONDUCTOR	MOT	MOTOR
CONN	CONNECTION	MS	MAGNETIC STARTER
CONT	CONTACTOR	MTG	MOUNTED OR MOUNTING
CR	CORROSION RESISTANT	MTR	METER
CT	CURRENT TRANSFORMER	N	NORM
CTRL	CONTROL	N OR NORM	NATIONAL ELECTRICAL CODE
CUL	COPPER	NEC	NEUTRAL
CW	COLD WATER	NFSS	NON-FUSIBLE SAFETY SWITCH
DB	DOOR BELL	NL	NIGHT LIGHT
DC	DIRECT CURRENT	NO	NUMBER
DIM	DIMENSION	OH	OVERHEAD
DISC	DISCONNECT	P	POLE
DR	DOOR RELEASE SERVICE	PB	PULL BOX OR PUSHBUTTON
DS	DOOR SWITCH	PBS	PUSHBUTTON STATION
DWG	DRAWING	PH	PHASE
E OR EMER	EMERGENCY	PNL	PANEL OR PANELBOARD
EC	EMPTY CONDUIT	PNLBRD	PANELBOARD
ECNC	EXIST CND AND NEW CONDS	PRM	PRIMARY
EGC	EQUIPMENT GROUNDING CONDUCTOR	PT	POTENTIAL TRANSFORMER
EL	EXIST RELOCATED TO THIS LOCATION	PVC	POLYVINYL CHLORIDE
ELEC	ELECTRIC OR ELECTRICAL	PWR	POWER
ELEV	ELEVATOR	QTY	QUANTITY
EM	EXIST REMOVED	RB	RELAY BASE
EML	EXIST REMOVED AND RELOCATED	REC	RECEPTACLE
EMN	EXIST REMOVED AND NEW INSTALLED	REFRIG	REFRIGERATOR
EMT	ELECTRICAL METALLIC TUBING	RGS	RIGID GALVANIZED STEEL CONDUIT
ENCL	ENCLOSURE	S/O	SPACE ONLY
ENG	ENGINE	SB	SOUNDER BASE
EP	EXPLOSIONPROOF	SCCR	SHORT CIRCUIT CURRENT RATING
EQUIP	EQUIPMENT	SEC	SECONDARY
ER	EXIST TO REMAIN	SL	SINGLE STATION
ERC	ELEVATOR RECALL	SMD	MOTOR OPERATED SMOKE DAMPER
EW	ELECTRIC WATER COOLER	SMR	SURFACE METAL RACEWAY
EXIST	EXISTING	SN	SOLID NEUTRAL
EXT	EXTERIOR	SP	SPECIAL PURPOSE
FACD	FIRE ALARM CONTROL PANEL	SPD	SURGE PROTECTIVE DEVICE
FACU	FIRE ALARM CONTROL UNIT	SPKR	SPEAKER
FDR	FEEDER	SR	SURFACE RACEWAY
FC	FOOTCANDLE	SS	SURGE SUPPRESSOR
FLUOR	FLUORESCENT	STR	STARTER
FSD	FIRE/SMOKE DAMPER	SW	SWITCH
FSS	FUSIBLE SAFETY SWITCH	SWBD	SWITCHBOARD
FXTR	FIXTURE	SWGR	SWITCHGEAR
G	RECEPTACLE GUARD	SYM	SYMMETRICAL
GD	GARAGE DOOR	T	TAMPER RESISTANT
GEC	GROUNDING ELECTRODE CONDUCTOR	TC	TIME CLOCK
GEN	GENERATOR	TEL	TELEPHONE
GF, GFI, GFCI	GROUND FAULT CIRCUIT INTERRUPTER	TV	TELEVISION
GFP	GROUND FAULT PROTECTION/PROTECTED	TYP	TYPICAL
GND	GROUND	U	USB CHARGER
GTD	GENERATOR TRANSFER DEVICE	UC	UNDERCOUNTER
H OR HOR	HORIZONTAL	UF	UNDERFLOOR
HG	HOSPITAL GRADE	UG	UNDERGROUND
HGT	HEIGHT	UL	UNDERWRITERS' LABORATORIES
HD	HIGH INTENSITY DISCHARGE	UNO	UNLESS NOTED OTHERWISE
HDA	HAND-OFF-AUTOMATIC	V	VOLT
HP	HORSEPOWER OR HEAT PUMP	VA	VOLT-AMPERE
HPF	HIGH POWER FACTOR	VAR	VOLT-AMPERE REACTIVE
HPS	HIGH PRESSURE SODIUM	VERT	VERTICAL
HTR	HEATER	VFD	VARIABLE FREQUENCY DRIVE
HW	HOT WATER	VM	VOLTMETER
HZ	HERTZ	W	WATT OR WIRE
IC	INTERCOM OR INTERRUPTING CAPACITY	WG	WIRE GUARD
IDF	INTERMEDIATE DISTRIBUTION FRAME	WP	WEATHERPROOF
IG	ISOLATED GROUND	XFER	TRANSFER
IMC	INTERMEDIATE METAL CONDUIT	XFMR	TRANSFORMER

NOTE (ELECTRICAL ABBREVIATIONS):

1. ALL ABBREVIATIONS LISTED MAY NOT APPLY TO THIS PROJECT. REFER TO OTHER ABBREVIATION LISTS ELSEWHERE IN THESE DOCUMENTS FOR ABBREVIATIONS NOT LISTED HERE.

ELECTRICAL DEMAND SUMMARY:

CAPACITY OF PANEL 'HDA': 1000A @ 480V-3PH
EXISTING LOAD ON PANEL 'HDA'**: 862.3A @ 480V-3PH
NEW LOAD CONNECTED TO PANEL 'HDA': 24.9A @ 480V-3PH
NEW TOTAL LOAD CONNECTED TO PANEL 'HDA': 907.2A @ 480V-3PH

CAPACITY OF PANEL 'HE': 100A @ 480V-3PH
EXISTING LOAD ON PANEL 'HE'**: 29.5A @ 480V-3PH
NEW LOAD CONNECTED TO PANEL 'HE': 12.9A @ 480V-3PH
NEW TOTAL LOAD CONNECTED TO PANEL 'HE': 42.4A @ 480V-3PH

CAPACITY OF PANEL 'HDD': 1000A @ 480V-3PH
EXISTING LOAD ON PANEL 'HDD'**: 728.8A @ 480V-3PH
NEW LOAD CONNECTED TO PANEL 'HDD': 12.9A @ 480V-3PH
NEW TOTAL LOAD CONNECTED TO PANEL 'HDD': 741.7A @ 480V-3PH

CAPACITY OF MAIN SWITCHBOARD 'MS': 3000A @ 480V-3PH
12-MONTH PEAK DEMAND READINGS FOR SWITCHBOARD 'MS'**: 466.7A @ 480V-3PH
PEAK DEMAND X 125% (PER NEC 220.87): 583.3A @ 480V-3PH
NEW LOAD ADDED TO SWITCHBOARD 'MS': 37.8A @ 480V-3PH
NEW CALCULATED PEAK DEMAND ON SWITCHBOARD 'MS': 621.1A @ 480V-3PH

** EXISTING LOADS DETERMINED FROM THE EXISTING NORTHSIDE HIGH SCHOOL ADDITIONS AND RENOVATIONS DRAWINGS DATED APRIL 15, 2007.

*** PEAK DEMAND METER READINGS OBTAINED FROM ROANOKE COUNTY PUBLIC SCHOOLS ON 05-13-2021.

ELECTRICAL LEGEND

MTG. HGT.	SYMBOL	DESCRIPTION
		PLAN NOTE DESIGNATION.
		NEW CONNECTED TO EXISTING AT THIS POINT.
1'-4" TO BOT		RECEPTACLE, DUPLEX GFCI, WALL.
6'-0"		208/120 VOLT PANELBOARD.
6'-0"		480/277 VOLT PANELBOARD.
		ELECTRIC MOTOR CONNECTION.
		CIRCUIT DESIGNATION. DESIGNATION SHOWN INDICATES PANEL, HDA AND CIRCUIT NUMBER 24.
5'-0"		TOGGLE SWITCH, HORSEPOWER RATED, WALL OR EQUIPMENT MOUNTED, SINGLE POLE, FUSED AS INDICATED ON THE FLOOR PLANS.

NOTES (ELECTRICAL LEGEND):

1. THESE ARE STANDARD ELECTRICAL SYMBOLS AND MAY NOT ALL APPEAR ON THE PROJECT DRAWINGS. HOWEVER, WHEREVER AN ELECTRICAL SYMBOL APPEARS ON THE PROJECT DRAWINGS, THE ITEM SHALL BE FURNISHED AND INSTALLED.
2. MOUNTING HEIGHTS ARE FROM FINISHED FLOOR TO TOP OF OUTLET OR EQUIPMENT, UNO, WHERE THE MOUNTING HEIGHT INDICATED ON THE DRAWINGS IS DIFFERENT FROM THE LEGEND, THE DRAWING TAKES PRECEDENT. SEE DRAWINGS FOR MOUNTING HEIGHTS NOT INDICATED IN THE LEGEND.
3. SEE ELECTRICAL ABBREVIATIONS FOR ALPHABETIC SUBSCRIPT WITH SYMBOL, UNO.

GENERAL NOTES:

1. ALL VFD'S WILL BE FURNISHED BY THE MECHANICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL MOUNT THE VFD'S (UNLESS THEY ARE INTEGRAL TO THE EQUIPMENT SERVED). CONNECT THE LINE SIDE POWER WIRING AND THE LOAD SIDE POWER WIRING FROM THE VFD'S TO THE EQUIPMENT. ALL CONTROL AND INTERLOCK WIRING FOR THE VFD'S SHALL BE BY THE CONTROL SYSTEM CONTRACTOR.
2. LOAD SIDE CONDUCTOR AND CONDUIT SIZES FROM DISCONNECT SWITCHES, STARTERS AND VFD'S TO EQUIPMENT SHALL BE THE SAME AS LINE SIDE CONDUCTORS AND CONDUIT.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ALL PANELBOARD CONDUIT ENTRANCE LOCATIONS IN THE FIELD (TOP, BOTTOM, SIDE).
4. WHERE RE-USE OF EXISTING CONDUIT, WIRING AND/OR OUTLET BOXES IS INDICATED, ALSO PROVIDE NEW MATERIALS IF NECESSARY.
5. PROVIDE NECESSARY FIRE RATED DEVICES AND FIRE SEALANT TO MATCH EXISTING INSTALLATION CONDITIONS FOR ALL NEW PENETRATIONS THROUGH EXISTING WALLS AND FLOORS. VERIFY TYPE OF FIRE SEALANTS AND DEVICES REQUIRED WITH EXISTING CONDITIONS.
6. "HOMERUN" CONDUITS SHALL BE RUN DOWN CORRIDORS FROM THE RESPECTIVE ELECTRICAL ROOM (NOT THROUGH CLASSROOMS OR OFFICES OR OTHER SIMILAR SPACES).
7. MODIFY EXISTING PANEL SCHEDULES TO ACCURATELY REFLECT ALL CHANGES MADE AS PART OF THIS CONTRACT. ALL NEW BREAKERS IN EXISTING PANELS SHALL MATCH EXISTING AIC. PROVIDE NEW "TYPED" AS-BUILT PANEL SCHEDULES, HANDWRITTEN PANEL SCHEDULES WILL NOT BE ACCEPTED.
8. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID IN ORDER TO VERIFY ALL EXISTING CONDITIONS, TO DETERMINE THE FULL EXTENT OF DEMOLITION WORK REQUIRED, AND TO DETERMINE THE FULL EXTENT OF RELOCATION AND MODIFICATION WORK REQUIRED FOR ELECTRICAL WORK DUE TO OTHER DISCIPLINES INTERFERING OR ANY OTHER REASON. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE TO COORDINATE ALL ELECTRICAL WORK WITH BOTH NEW AND EXISTING PIPING, DUCTWORK, CONDUIT, ETC. NO CHANGE ORDERS WILL BE APPROVED FOR ADDITIONAL WORK DUE TO THE CONTRACTOR NEGLECTING TO VISIT THE SITE AND GATHER ALL NECESSARY INFORMATION.
9. PROVIDE SEALANT AROUND ALL NEW ROOF PENETRATIONS FOR WEATHERPROOFING AND PEST CONTROL.

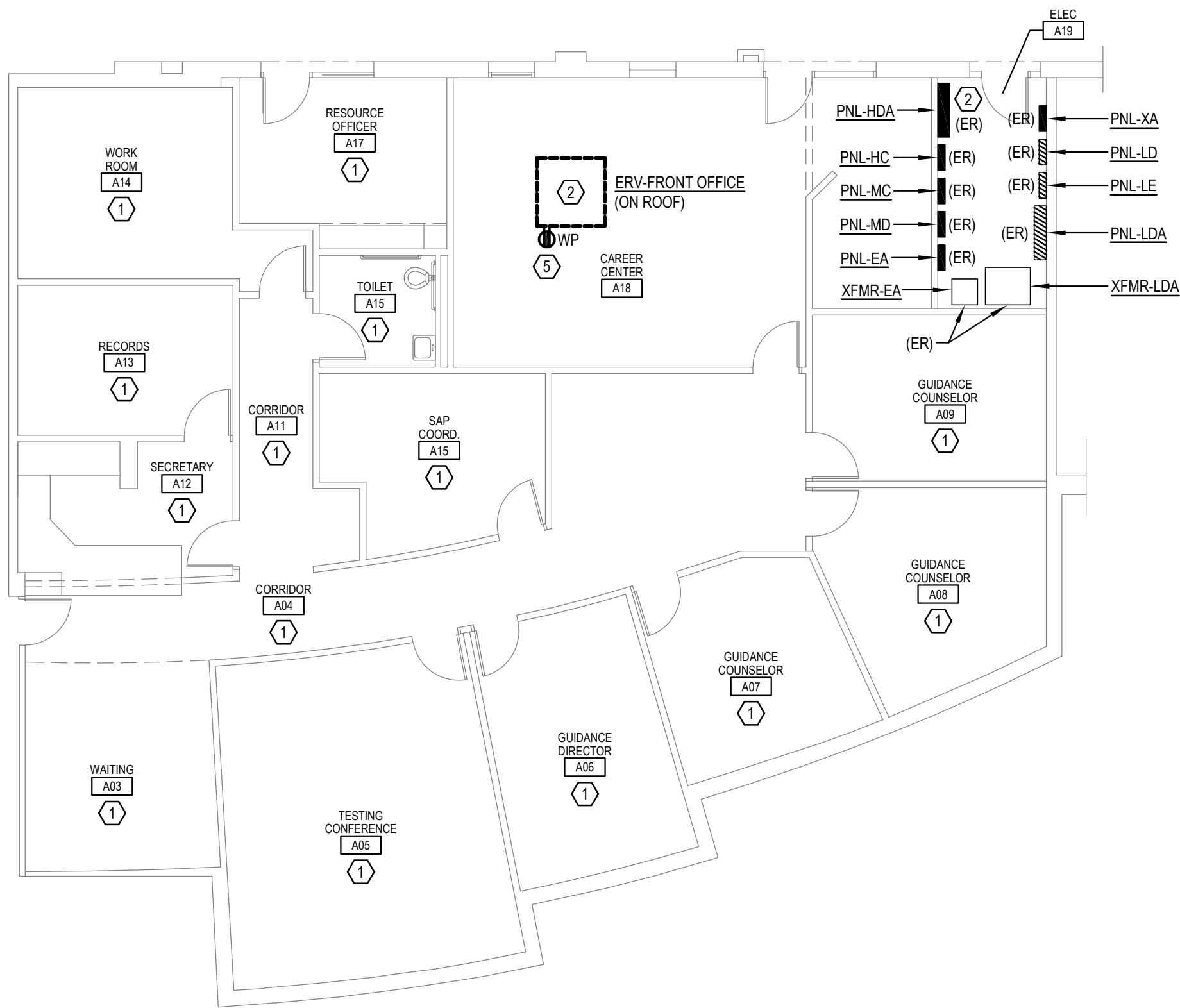
ELECTRICAL DEMOLITION NOTES:

1. **SCOPE:** THE SCOPE OF ELECTRICAL DEMOLITION IS DEFINED IN THE FOLLOWING NOTES. IN GENERAL, THE DEMOLITION SCOPE IS THE REMOVAL OF ONE (1) EXISTING ENERGY RECOVERY VENTILATOR (ER-2) AND ONE (1) EXISTING EXHAUST FAN (EF-1). THE EXISTING ENERGY RECOVERY VENTILATOR BEING DEMOLISHED WILL BE REPLACED WITH A NEW ENERGY RECOVERY VENTILATOR IN THE SAME LOCATION. THE EXISTING FEEDER CONDUIT AND CONDUCTORS SERVING THE EXISTING ENERGY RECOVERY VENTILATOR SHALL BE DISCONNECTED AND REMOVED (A NEW CIRCUIT SHALL BE PROVIDED). THE EXISTING EXHAUST FAN BEING DEMOLISHED WILL BE REPLACED WITH A NEW SMALLER EXHAUST FAN IN THE SAME LOCATION. THE EXISTING FEEDER CONDUIT AND CONDUCTORS SERVING THIS FAN SHALL BE DISCONNECTED AND RETAINED FOR RECONNECTION TO THE NEW EXHAUST FAN.
2. **MECHANICAL EQUIPMENT:** DISCONNECT EXISTING MECHANICAL EQUIPMENT THAT IS BEING REMOVED, AND REMOVE ALL ASSOCIATED STARTERS, DISCONNECTS, ETC. ABANDON CONDUITS AND CONDUCTORS CONCEALED IN EXISTING WALLS TO REMAIN. WHERE CONDUIT COMES UP FROM FLOOR, CUT CONDUIT FLUSH WITH FLOOR, FILL IT WITH GROUT, AND FINISH TO MATCH FLOOR SURFACE. REMOVE CONDUITS AND CONDUCTORS EXPOSED, CONCEALED ABOVE CEILING, AND EXTERIOR EXPOSED. CONDUIT AND CONDUCTORS TO REMOVED MECHANICAL EQUIPMENT SHALL BE REUSED ONLY WHERE SPECIFICALLY INDICATED. SEE MECHANICAL DRAWINGS FOR MORE INFORMATION. UNLESS SPECIFICALLY INDICATED OTHERWISE, EXISTING WIRING TO EXISTING TO REMAIN EQUIPMENT SHALL REMAIN. NOTE THAT SOME EXISTING CONDUITS AND CONDUCTORS SERVING EXISTING MECHANICAL EQUIPMENT WILL BE RE-USED. REFER TO THE DEMOLITION SCOPE OF WORK ABOVE FOR MORE INFORMATION.
3. **ELECTRICAL SERVICE:** THE EXISTING ELECTRICAL SERVICE SHALL REMAIN AS INSTALLED. SOME DOWNTIME WILL LIKELY BE REQUIRED FOR SELECT PANELBOARDS IN THE SYSTEM. ALL ELECTRICAL SERVICE DOWNTIME REQUIRED SHALL BE COORDINATED WITH OWNER AND SHALL BE AT THE OWNER'S CONVENIENCE. DOWNTIME SHALL BE KEPT TO THE MINIMUM. ALL EXTENDED DOWNTIME REQUIRED SHALL BE COORDINATED WITH OWNER.
4. **PANELBOARDS:** ALL EXISTING PANELBOARDS SHALL REMAIN. WHERE EXISTING PANELBOARDS ARE TO REMAIN, UPDATE THE CIRCUIT DIRECTORIES TO REFLECT ALL AS-BUILT/EXISTING CIRCUIT CHANGES. PROVIDE NEW TYPED CIRCUIT DIRECTORIES FOR ALL EXISTING AND NEW CIRCUITS IN MODIFIED PANELS. CIRCUIT CHANGES INCLUDE, BUT ARE NOT LIMITED TO, MOVING EXISTING LOADS IN EXISTING PANELS, REMOVING EXISTING LOADS FROM EXISTING PANELS, ADDING NEW LOADS TO EXISTING PANELS, CHANGING BREAKERS IN EXISTING PANELS, ETC. EXISTING CIRCUITS NO LONGER BEING USED AFTER DEMOLITION WORK SHALL BE MADE "SPARE" AND SHALL BE PLACED IN THE "OFF" POSITION.
5. **CONDUIT:** ALL ACCESSIBLE UNUSED CONDUIT SHALL BE REMOVED; ALL INACCESSIBLE UNUSED CONDUIT SHALL BE ABANDONED. ALL CONDUIT TO NEW DEVICES AND EQUIPMENT SHALL BE NEW, UNLESS NOTED OTHERWISE.
6. **WIRING:** ALL WIRING TO DEMOLISHED DEVICES AND EQUIPMENT SHALL BE REMOVED, UNLESS NOTED OTHERWISE. ALL EXISTING WIRING TO EXISTING-TO-REMAIN DEVICES AND EQUIPMENT SHALL REMAIN, UNLESS NOTED OTHERWISE. ALL ACCESSIBLE UNUSED WIRING SHALL BE REMOVED; ALL INACCESSIBLE UNUSED WIRING SHALL BE ABANDONED. ALL WIRING TO NEW DEVICES AND EQUIPMENT SHALL BE NEW, UNLESS NOTED OTHERWISE.
7. MAINTAIN CIRCUIT CONTINUITY AS NECESSARY IN ALL DEMOLITION WORK.
8. THE CONTRACTOR SHALL INFORM THE OWNER'S REPRESENTATIVE OF ELECTRICAL EQUIPMENT REMOVED FROM THE BUILDING. IF THE OWNER DESIRES TO RETAIN EQUIPMENT, HE WILL REMOVE IT FROM THE SITE. ALL EQUIPMENT NOT RETAINED BY THE OWNER SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE. DISPOSAL OF ALL EQUIPMENT CONTAINING HAZARDOUS MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND THE COST OF DISPOSAL SHALL BE INCLUDED.
9. REFER TO THE MECHANICAL DRAWINGS FOR ADDITIONAL DEMOLITION AND SCOPE OF WORK INFORMATION.
10. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID AND SHALL VERIFY ALL DEMOLITION REQUIRED. ADDITIONAL COMPENSATION WILL NOT BE ALLOWED FOR DEMOLITION DUE TO CONTRACTOR NOT VISITING SITE AND DETERMINING FULL SCOPE OF DEMOLITION REQUIRED.



REVISION	DATE

DESIGNED	JTO	DRAWN	JTO
CHECKED	WAM	APPROVED	LPA
COMM. NO.	21101.12	DATE	06-09-21
SHEET	E1		

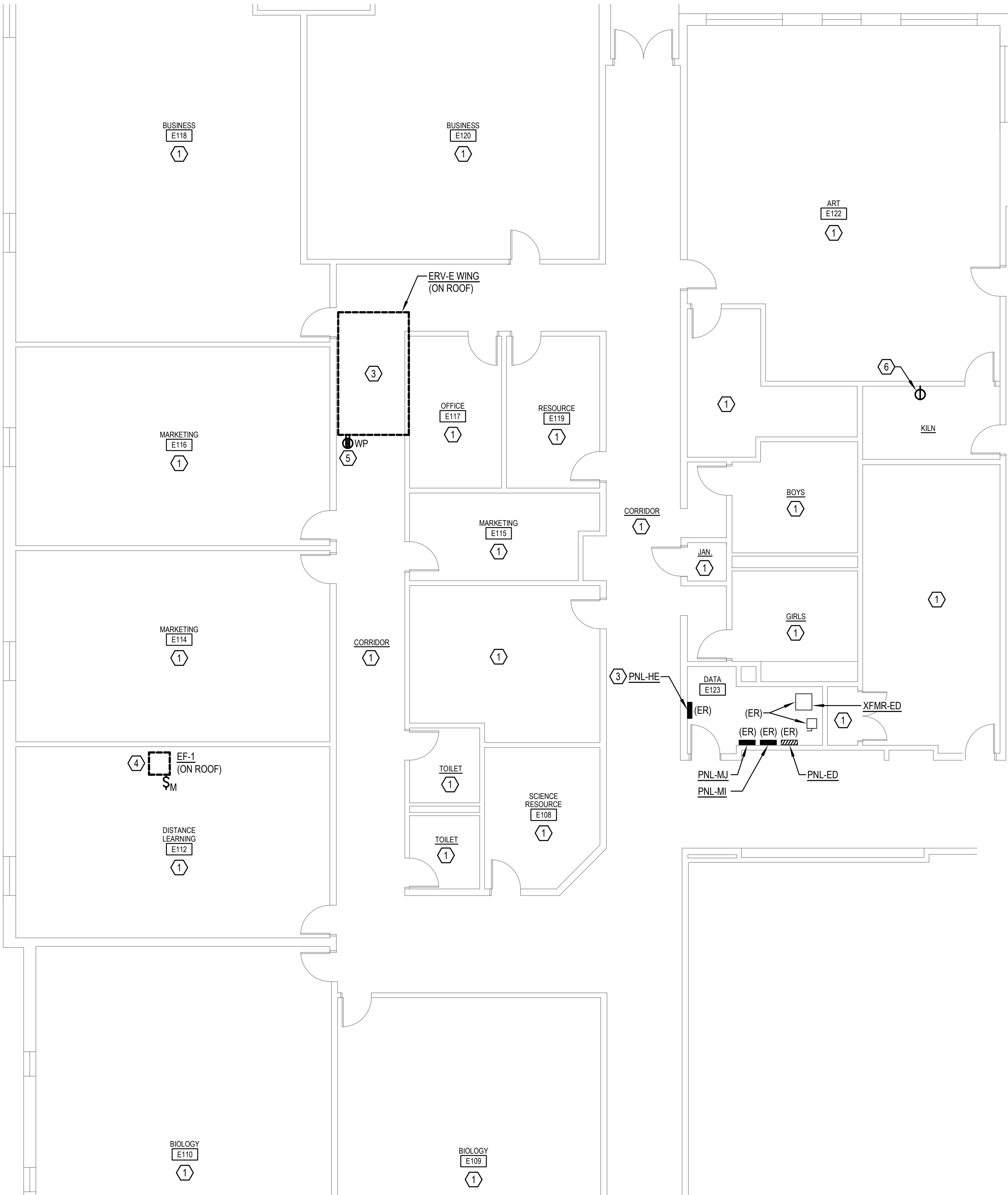


PARTIAL FIRST FLOOR PLAN - AREA A - POWER

SCALE: 1/8" = 1'-0"

PLAN NOTES:

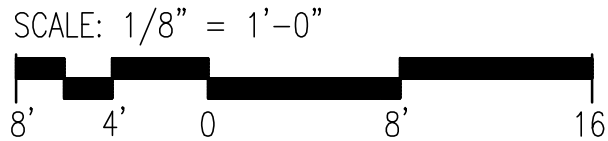
- NO NEW ELECTRICAL WORK TO BE PERFORMED IN THIS SPACE.
- PROVIDE AND INSTALL ONE (1) 3-POLE 35 AMP CIRCUIT BREAKER OF MATCHING FRAME, AIC RATING AND TYPE IN EXISTING PANEL 'HDA' TO SERVE NEW ERV-FRONT OFFICE. PROVIDE 3-#8 (COPPER) AND 1-#10 (COPPER) GROUND IN 1" CONDUIT FOR THE NEW CIRCUIT AND CONNECT TO THE NEW ERV UNIT VIA THE INTEGRAL NON-FUSED DISCONNECT SWITCH. THE NEW CIRCUIT SHALL BE RUN CONCEALED IN ALL FINISHED SPACES. UPDATE THE PANEL INDEX WITH THE NEW CIRCUIT INFORMATION AS INDICATED IN THE GENERAL NOTES ON SHEET E1.
- PROVIDE AND INSTALL ONE (1) 3-POLE 20 AMP CIRCUIT BREAKER OF MATCHING FRAME, AIC RATING AND TYPE IN EXISTING PANEL 'HE' TO SERVE NEW ERV-E WING. PROVIDE 3-#12 (COPPER) AND 1-#12 (COPPER) GROUND IN 3/4" CONDUIT FOR THE NEW CIRCUIT AND CONNECT TO THE NEW ERV UNIT VIA THE INTEGRAL NON-FUSED DISCONNECT SWITCH. THE NEW CIRCUIT SHALL BE RUN CONCEALED IN ALL FINISHED SPACES. UPDATE THE PANEL INDEX WITH THE NEW CIRCUIT INFORMATION AS INDICATED IN THE GENERAL NOTES ON SHEET E1.
- RECONNECT THE NEW EXHAUST FAN TO THE EXISTING CIRCUIT RETAINED DURING DEMOLITION VIA A NEW 1-POLE FUSED DISCONNECT SWITCH WITH 15 AMP FUSES (BUSSMAN 'SSU' OR EQUAL). PROVIDE NEW MATERIALS MATCHING EXISTING AS REQUIRED TO CONNECT THE NEW EXHAUST FAN TO THE EXISTING CIRCUIT. REFER TO THE ELECTRICAL DEMOLITION NOTES ON SHEET E1 FOR MORE INFORMATION.
- FACTORY WIRED SERVICE RECEPTACLE PROVIDED WITH THE NEW MECHANICAL EQUIPMENT.
- PROVIDE AND INSTALL ONE (1) SPECIFICATION GRADE SIMPLEX RECEPTACLE IN A SURFACE MOUNTED OUTLET BOX IN THIS SPACE FOR POWER TO THE NEW KILN BLOWER MOTOR. COORDINATE THE EXACT LOCATION OF THIS RECEPTACLE WITH THE LOCATION OF THE KILN BLOWER MOTOR PRIOR TO ROUGH-IN. THE COLOR OF THE NEW RECEPTACLE AND WALL PLATE SHALL MATCH THE EXISTING DEVICES IN THIS SPACE. CONNECT THE NEW RECEPTACLE TO THE NEAREST EXISTING 120V 20 AMP RECEPTACLE CIRCUIT WITH SUFFICIENT SPARE CAPACITY UTILIZING 2-#12 (COPPER) AND 1-#12 (COPPER) GROUND IN 3/4" CONDUIT.



PARTIAL FIRST FLOOR PLAN - AREA E - POWER

SCALE: 1/8" = 1'-0"

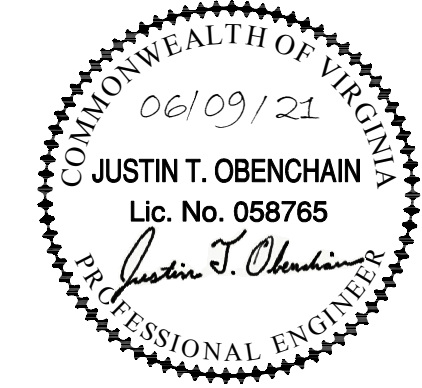
GRAPHIC SCALE



NORTHSIDE HIGH SCHOOL
MAKEUP AIR UNIT ADDITION
ROANOKE, VIRGINIA

PARTIAL FIRST FLOOR PLANS - AREA A AND AREA E - POWER

DESIGNED	JTO	DRAWN	JTO
CHECKED	WAM	APPROVED	LPA
COMM. NO.	21101.12	DATE	06-09-21
SHEET	E2		



REVISION	DATE