

## REQUEST FOR PROPOSAL

The Board of Education for Montague Area Public Schools will be receiving sealed bids for:

### **RRO Elementary – Unit Ventilator Upgrades**

4859 Knudsen St.  
Montague, MI 49437

### **PROJECT INFORMATION**

The purpose of this project is to upgrade the existing (6) unit ventilators. The details are addressed in the bid set located in pages 7-14 of this document.

All bids must be for the entire project. All major subcontractors shall be named by the bidder. The bidder shall specify its full name, address, contact person and telephone number, state whether it is a corporation, partnership, or individual, and include certificates evidencing current contractor's liability, commercial general liability, and vehicle liability insurance for the project amount specified in the bid documents.

Work shall commence after June 7, 2024 and be completed no later than August 2, 2024. The successful bidder shall work with Tom Cederquist, Director of Operations, regarding the project's schedule.

### **BID PROPOSAL**

Sealed bids, in duplicate, will be received until **2:30 pm local time on Tuesday, May 7<sup>th</sup>, 2024** at the Montague Area Public Schools District Office, 4882 Stanton Blvd., Montague, MI 49437. Bids will be publicly opened and read aloud immediately after the closing of bids at the Central Office Conference Room located at the same address. Interested parties are invited to attend. Bids received after this time will neither be considered nor accepted.

All proposals shall be accompanied by a sworn and notarized Familial Disclosure Statement as well as Iran Economic Sanctions Act, both of which forms are included in the Bid Form.

All Bids may not be modified, withdrawn, or canceled for a period of sixty (60) days from the time and date of Bid receipt.

Proposals shall be in sealed opaque envelopes identifying the legal name and address of the submitting contractor's company, plainly labeled as follows:

**Montague Area Public Schools  
Sealed Bid Proposal – Unit Ventilator Upgrades  
Attn: Jeff Johnson  
4882 Stanton Blvd.  
Montague, MI 49437**

### **BID SECURITY / PERFORMANCE BONDS**

Each bid shall be accompanied by a bid bond in an amount equal to five percent (5%) of the bid. Bid security shall be in the form of a Bid Bond, Cashier's Check, or Certified Check. This shall secure the Owner from loss or damage by reason of the withdrawal of the bid by a Bidder or by failure of the

successful Bidder to enter into a contract with the Owner if his bid is accepted by the Owner. Such checks shall be made payable to Montague Area Public Schools.

Once selected, the successful Bidder will be required to furnish performance and payment bonds in the amounts equal to 100% of the contract amount.

**PRE-BID SITE INQUIRIES**

Interested bidders are to contact Tom Cederquist, Director of Operations, with questions and requests to examine the construction site. Mr. Cederquist may be reached at 231-730-5228, Monday – Friday, 8:00 a.m. – 4:00 p.m.

**BID AWARD**

All bids received will be presented and considered by the Board of Education at 6:00 p.m. on Monday, May 13, 2024. The Board of Education reserves the right to waive irregularities and/or reject any and all bids, and also reserves the right to exercise the full discretion afforded to it by the law in the selection of the bidder and the awarding of the contract.

**PREVAILING WAGES DO NOT APPLY TO THIS PROJECT**

# BID FORM

**SUBMIT IN DUPLICATE**

**BID TO:** Montague Area Public Schools  
ATTN: Jeffrey Johnson, *Superintendent*  
4882 Stanton Blvd.  
Montague, MI 49437

**BID FROM:** \_\_\_\_\_  
(Bidder Name)  
\_\_\_\_\_  
(Address)  
\_\_\_\_\_  
(City, State, Zip)

**PROJECT:** Montague Area Public Schools, Unit Ventilator Upgrades, Project #5143

Ladies and Gentlemen:

The undersigned, having familiarized themselves with the local conditions affecting the cost of the work and having examined the site and the Bidding Documents prepared by Rhoades Engineering Corporation, 4801 Henry Street, Muskegon, MI 49441 hereby propose to furnish all labor, material, equipment, taxes, and services required for the proper completion for this project, including all addenda issued thereto, for the sum of:

**BASE BID AMOUNT:** \_\_\_\_\_ Dollars ( \$ \_\_\_\_\_ ),  
(use words) (use figures)

**TAXES:** Bid sum includes all applicable taxes, including Michigan Sales Tax.

**COST OF BONDS:** Bid sum includes cost of furnishing a Performance Bond and a Material Payment Bond, each in the amount of 100% of the Base Bid for all bids exceeding \$50,000.00.

Price of performance, labor and material bond (included in Base Bid). . . . Dollars ( \$ \_\_\_\_\_ )

**ACKNOWLEDGEMENT OF ADDENDA:**

The following addenda have been received, are hereby acknowledged, and their execution is included in the above Base Bid:

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_ Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_

**VOLUNTARY ALTERNATES:**

Identify in detail on appropriate attachment any Voluntary Alternates shown here:

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

**BID SECURITY:**

Accompanying this Bid, as required by the Instructions to Bidders, is a Bid Security in the form of (Certified Check / Cashier's Check / Bid Bond) in the amount of:

\_\_\_\_\_ Dollars ( \$ \_\_\_\_\_ )

Payable to the Owner, which is it agreed, shall be retained as liquidated damages, not as a penalty, by the Owner, if the undersigned fails to execute the Contract in conformity with the form of Contract incorporated in the Contract Documents and fails to furnish specified bonds within ten (10) days after date of issuance of Letter of Intent to Award to the undersigned.

**CONSTRUCTION PROGRESS SCHEDULE:**

If awarded the Contract, the undersigned agrees to commence the Work after June 7, 2024 and complete the Work in accordance with the Construction Schedule set forth in the RFP.

Endorses the Construction Schedule: \_\_\_\_\_  
(Bidder Initials)

Amends the Construction Schedule as follows: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CONTRACTOR LABOR RATES:**

In the event of a contract change during the course of the project, that will add or decrease from the Contract amount, we will apply the following hourly labor rates (total labor rate includes hourly wage rate plus all insurances, taxes, health and welfare contributions and other benefits - before overhead and profit mark-up) for each employee's job title:

Job Title	Labor Rate	Job Title	Labor Rate
_____	\$ _____/hr	_____	\$ _____/hr
_____	\$ _____/hr	_____	\$ _____/hr

**CHANGE ORDER WORK:**

For revisions to the contract, whether deleted or added, the contractor agrees to the following mark-ups for overhead and profit:

- |                              |         |
|------------------------------|---------|
| 1. Direct (own forces) Labor | _____ % |
| 2. Direct Material           | _____ % |
| 3. Subcontracted Work        | _____ % |
| 4. Equipment Rental          | _____ % |

**CREDIT FOR WORK DELETED:**

Should any work be deleted from the Contract by order of the Owner, full cost savings realized thereby will be credited to the Owner.

**FAMILIAL DISCLOSURE:**

See Page 4 of this Bid Form for required Familial Disclosure Statement.

**IRAN ECONOMIC SANCTIONS ACT:**

See Page 5 of this Bid Form for required Iran Economic Sanctions Act.

**AGREEMENT:**

The undersigned agree(s) to provide the post-bid information required within ten (10) days after receipt of the Notice of Intent to Award and to execute an agreement for work covered by this Proposal on a Subcontract Agreement.

In submitting this bid, it is understood that the Owner reserves the right to reject any or all bids. It is further agreed that this bid is binding for a period of sixty (60) days from the opening thereof.

Respectfully submitted,

(If a Corporation, affix seal)

Date \_\_\_\_\_, 2024

Firm Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

By \_\_\_\_\_

Signed \_\_\_\_\_

Title \_\_\_\_\_

Telephone No. ( \_\_\_\_\_ ) \_\_\_\_\_

Email Address \_\_\_\_\_

### FAMILIAL DISCLOSURE STATEMENT

This form is required by State Law for the construction, addition, repair, or renovation of school buildings when that project cost exceeds the calculated threshold. For the 2023-24 year, that threshold is \$29,572 and it is adjusted annually by the Consumer Price Index. The law does not preclude bidders from submitting bids or a Board of Education from approving a bid with a familial relationship. The law requires the notification to allow Board members and the Superintendent to avoid recommending or voting on a conflict of interest.

*“The legislation requires bidders to provide “a sworn and notarized statement disclosing any familial relationship that exists between the owner or any employee of the bidder and any member of the Board [of Education]...or Superintendent of the School District...A Board [of Education]...shall not accept [i.e. “approve”] a bid that does not include this sworn and notarized statement.”* MCL 380.1267(3)(d)

The following are members of the Board for Montague Area Public Schools:

<b>Brent Raeth</b>	<b>Cindy Francis</b>	<b>Scott Beishuizen</b>	<b>Joel Smith</b>
<b>Tom Johnson</b>	<b>Amanda Dahl</b>	<b>Karen Neubauer</b>	

The bidder must check one of the following:

\_\_\_\_\_ No, there is not a familial relationship between the Owner or any employee of the Bidder and any member of the Montague Area Public Schools Board.

\_\_\_\_\_ Yes, there is a familial relationship between the Owner or an employee of the Bidder and a member of the Montague Area Public Schools Board.

	<u>Owner/Employee</u>	<u>Board Member</u>	<u>Relationship</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____

If additional, please list on the reverse or another sheet.

**Sworn Statement:** I swear that I have prepared the above information to the best of my knowledge.

_____	_____	_____	_____
<i>Signature</i>	<i>Printed Name</i>	<i>Title</i>	<i>Date</i>

<b>Notary:</b>	Subscribed and sworn this _____ day	Notary Public, State of _____
	of _____, 2024.	County of _____
		My Commission expires: _____

\_\_\_\_\_  
*Signature of Notary*

**IRAN ECONOMIC SANCTIONS ACT**  
*Michigan Public Act No. 517 of 2012*

The undersigned, the owner or authorized officer of \_\_\_\_\_ (the "Bidder"), pursuant to the compliance certification requirement provided in the Montague Area Public Schools (the "School District") Request for Proposals for the Unit Ventilator Upgrades (the "RFP"), hereby certifies, represents and warrants that the Bidder (including officers, directors and employees) is not an "Iran linked business" within the meaning of the Iran Economic Sanctions Act, Michigan Public Act No. 517 of 2012 (the "Act"), and that in the event Bidder is awarded a contract/purchase order as a result of the aforementioned RFP, the Bidder will not become an "Iran linked business" at any time during the course of performing the Work or any services under the contract.

The Bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the contract/purchase order or proposed contract for which false certification was made, whichever is greater, the cost of the School District's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a request for proposal three (3) years from the date it is determined that the person has submitted the false certification.

**BIDDER:**

\_\_\_\_\_  
*Name of Company*

\_\_\_\_\_  
*Name and Title of Authorized Representative*

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Date*

**NOTARY:**

Subscribed and sworn this \_\_\_\_\_ day of  
\_\_\_\_\_, 2024.

\_\_\_\_\_  
*Signature of Notary*

Notary Public, State of \_\_\_\_\_

County of \_\_\_\_\_

My Commission expires: \_\_\_\_\_

# UNIT VENTILATOR UPGRADES

FOR

# MONTAGUE AREA PUBLIC SCHOOLS

4859 KNUDSEN ST.

MONTAGUE, MICHIGAN

PREPARED BY

# RHOADES ENGINEERING CORPORATION

4801 HENRY STREET  
TELEPHONE: 231-798-4328



NORTON SHORES, MICHIGAN

49441

REC FILE No. 5143A

## SHEET INDEX

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SHEET	E-2:	FIRST AND SECOND FLOOR ELECTRICAL PLAN
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SHEET	M-1:	SECOND FLOOR MECHANICAL PLANS
SHEET	M-2:	MECHANICAL SCHEDULES AND DETAILS

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Verify existing conditions. Any discrepancies, non-compliance, or unclear items shall be reported to Rhoades Engineering Corporation, in writing, and shall be resolved before the commencement of work.

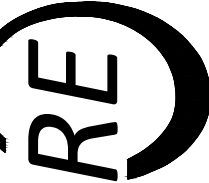
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Do Not Scale Drawings!

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Consulting Engineers  
Mechanical - Electrical  
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PROJECT TITLE:  
**MONTAGUE AREA PUBLIC SCHOOLS  
RENOVATION TO R.R. OEHRLI ELEMENTARY  
4859 KNUDSEN ST., MONTAGUE, MI**

SEAL & SIGNATURE

DATE: 4/22/24  
ISSUED FOR: PERMITS, BIDS & CONSTRUCTION

PROJECT No. 5143

DRAWING TITLE: COVER PAGE

SHEET No.

C1

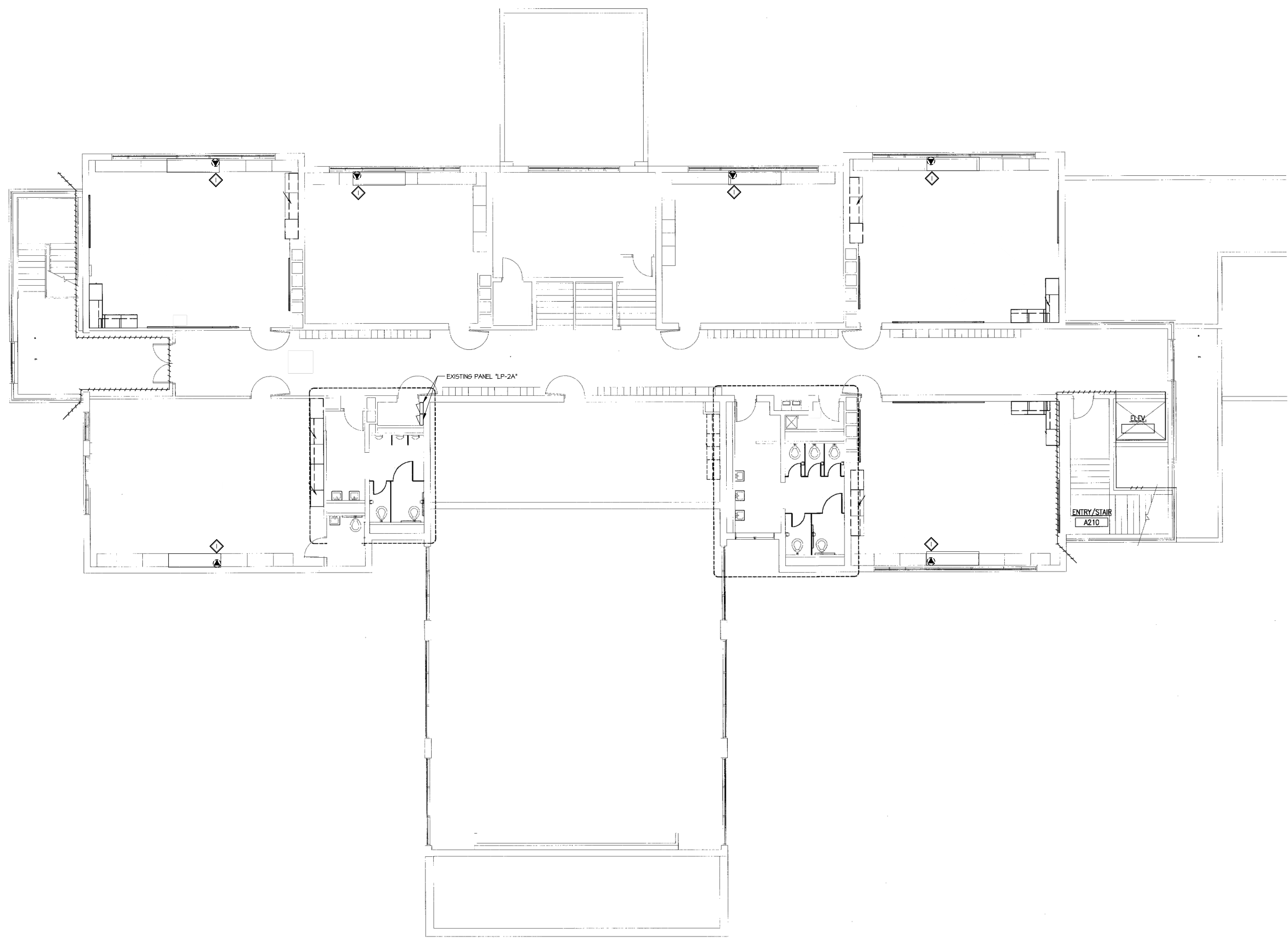


**ELECTRICAL DEMOLITION NOTE**

◇ E.C. SHALL DISCONNECT EXISTING CIRCUIT SERVING UNIT VENTILATOR BEING REMOVED. E.C. SHALL REMOVE CONDUIT AND WIRE BACK TO THE SOURCE.

**GENERAL DEMOLITION NOTES**

1. E.C. SHALL VERIFY ALL CIRCUITING PRIOR TO STARTING DEMOLITION.
2. E.C. SHALL REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE, EXCEPT AS NOTED TO BE RE-USED FOR NEW LOADS.
3. E.C. SHALL DISCONNECT, REMOVE AND DISPOSE OF ALL ELECTRICAL ITEMS SHOWN DASHED.



**SECOND FLOOR ELECTRICAL DEMOLITION PLAN**  
SCALE: 1/8" = 1'-0"

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**RE**

PROJECT TITLE:  
**MONTAGUE AREA PUBLIC SCHOOLS  
RENOVATION TO R.R. OEHRLI ELEMENTARY  
4859 KNUDSEN ST. MONTAGUE, MI**

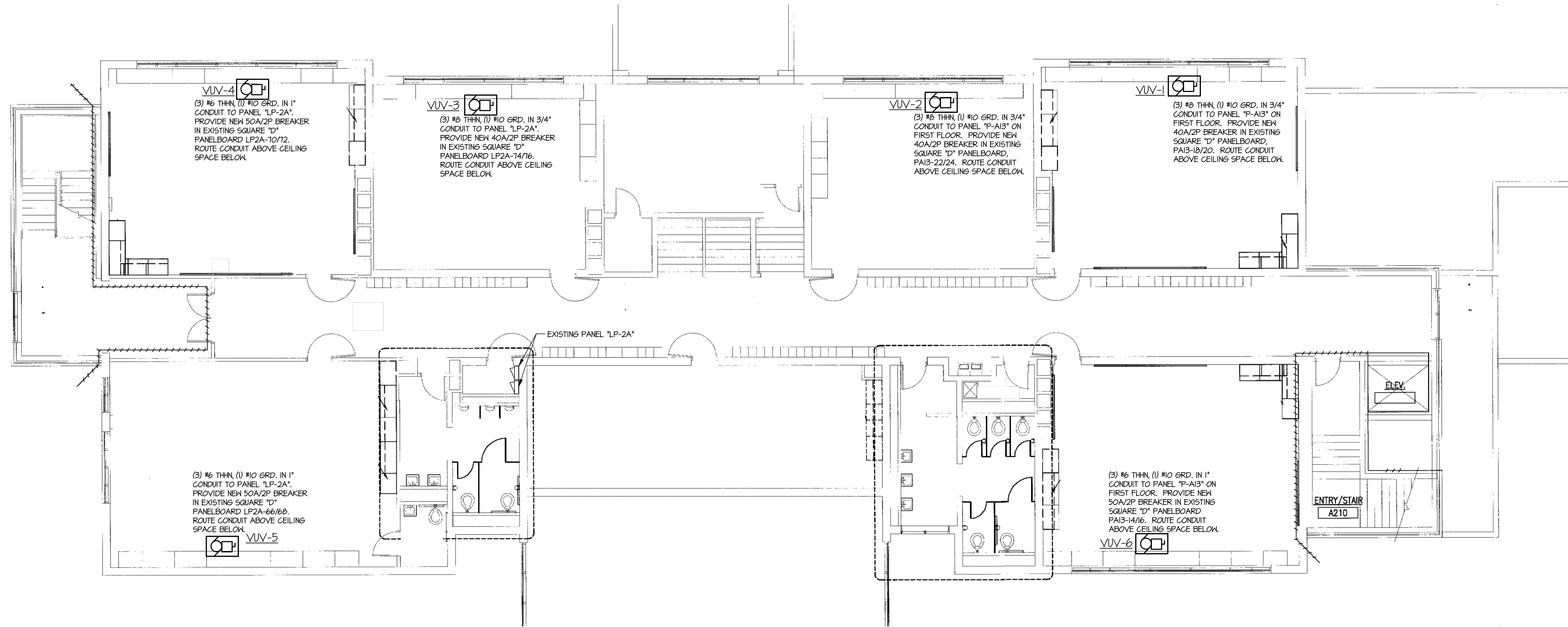
SEAL & SIGNATURE

DATE: 4/22/24 ISSUED FOR: PERMITS, BIDS & CONSTRUCTION

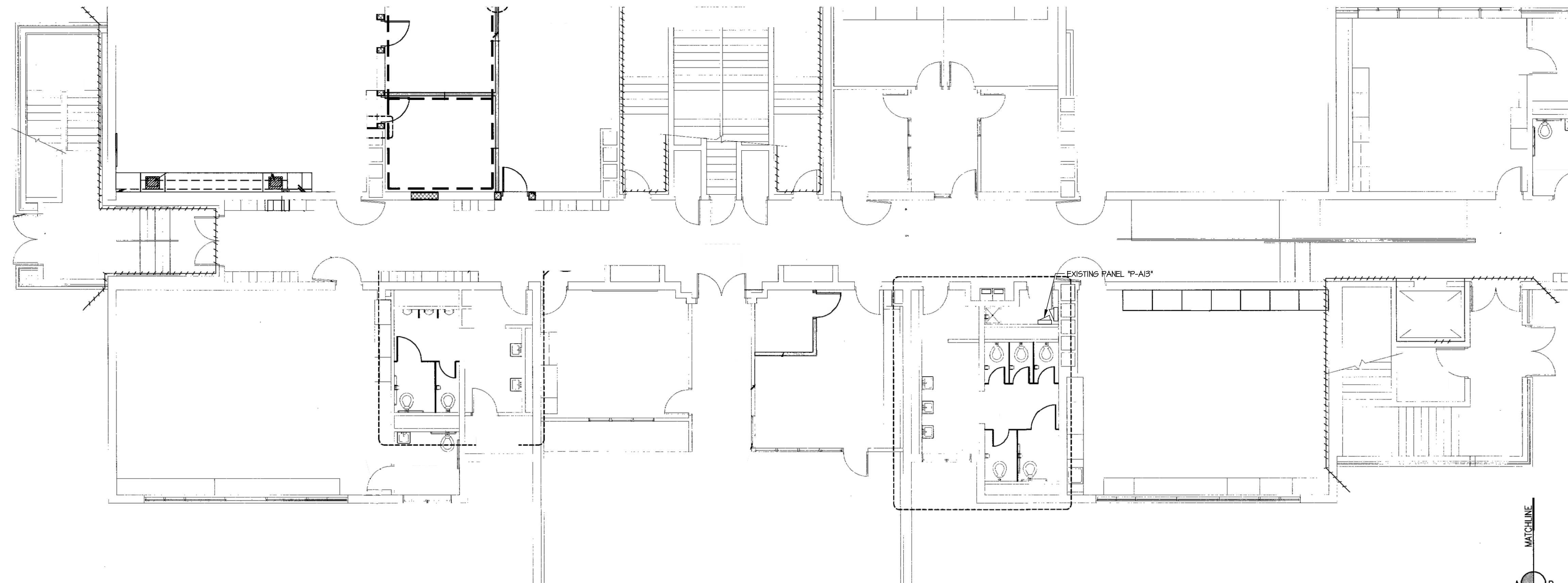
PROJECT No. 5143

DRAWING TITLE:  
SECOND FLOOR ELECTRICAL DEMOLITION PLAN

SHEET No. E-1



**SECOND FLOOR ELECTRICAL PLAN**  
 SCALE: 1/8" = 1'-0"



**FIRST FLOOR ELECTRICAL PLAN**  
 SCALE: 1/8" = 1'-0"

Tuesday, April 22, 2025 at 10:27am E:\143\143\143\Elementary School\Electrical\143\electrical.dwg C:\hs

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PROJECT TITLE:  
**MONTAGUE AREA PUBLIC SCHOOLS  
 RENOVATION TO R.R. OEHRLI ELEMENTARY**  
 4859 KNUDSEN ST. MONTAGUE, MI

SEAL & SIGNATURE

DATE: 4/22/24  
 ISSUED FOR: PERMITS, BIDS & CONSTRUCTION

PROJECT No.  
 5143

DRAWING TITLE:  
 FIRST AND SECOND FLOOR ELECTRICAL PLAN

SHEET No.  
**E-2**

DIVISION 16 - ELECTRICAL

SECTION 16000 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 Related Documents

Drawings and general provisions of Contract, including General and Supplemental Conditions and Division I Specifications sections, apply to the work of all Division 16 Sections.

1.2 General

A. The work in this division consists of furnishing all labor and materials, accessories, equipment, transportation, supervision, startup services, instructions, permits and incidentals, and related items necessary to complete installation and successfully test, startup and operate, in a practical and efficient manner, all electrical work and systems indicated on the drawings and described in each Section of this Division.

B. The work shall also include any items which, while not specifically included in these specifications or drawings, are reasonable and properly inferable therefrom or are accepted trade practice or necessary for the proper completion of this System.

C. All materials used shall be new, in good condition and shall bear the U.L. label or listing.

D. Electrical Drawings and Specifications are intended to supplement each other and all work specified or indicated in either shall be provided. Should the drawings disagree in themselves or with the specifications, the better quality or greater quantity shall be provided.

1.3 Codes, ordinances, permits, fees or assessments

A. All work and materials shall be installed in accordance with the standards as described by all applicable federal, state and local codes and ordinances including the Michigan Electric Code, the Michigan Building Code, MIOSHA and ADA. The Electrical Trades shall be responsible for obtaining all necessary permits and inspections and shall include the cost of all such in his proposal. After completion of the work, the Electrical Trades shall furnish to the Owner a certificate of final inspection and approval from the Inspection Bureau having jurisdiction.

1.4 Warranty

A. All labor, materials and equipment shall be guaranteed by the Contractor and/or warranted by the manufacturer for one (1) calendar year after date of final acceptance, except where specific, longer periods are specified. Make all necessary alterations, repairs, adjustments and replacements during guarantee period as directed by Engineer to comply with drawings and specifications. Such work shall be at no cost to the owner.

1.5 Operating and Maintenance Instructions

A. Refer to division I.

B. Before Owner acceptance of the work, provide detailed verbal instructions, for a period of two (2) day at four (4) hours per day, to the Owner's operating personnel regarding the installed systems.

C. Furnish to the Owner (3) sets of neatly bound and indexed operating and maintenance manuals for electrical work consisting of the following:

1. Complete instruction manuals, including a description of operation for each piece of equipment.
2. Complete maintenance information.
3. Wiring diagrams.
4. Parts lists.
6. Manufacturer's literature on all equipment and systems.
7. Shop drawings for each piece of equipment.
8. As-built drawings (two sets).
9. Narratives

1.6 Record Drawings

A. Refer to Division I Specifications

SECTION 16010 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 Quality Assurance

A. All Work shall be performed by persons who are experienced in the appropriate Trade.

B. Materials shall be new, of first-class quality and shall be furnished complete including delivery, erection, finish and connections.

C. Where a product is not named to establish quality or kind, the Contractor shall obtain approval of the Engineer prior to use of a product.

D. Where products are named by make and model number, these products are the basis of the System design. Where products by other approved manufacturers are used, the contractor shall include in his bid all additional work required for installation of that product, including work of other trades. Contractor shall also be responsible for verifying that equipment will fit into space provided and shall pay all additional costs associated with all such equipment that will not fit into the space provided.

E. When two or more items of the same equipment are required (lighting fixtures, wiring devices, panel-boards, transformers, etc.) they shall be of the same manufacturer.

F. Provide products which are compatible within systems and with other connected items.

G. All Work shall be coordinated and Scheduled with the Owners Representative / Project Manager.

H. Coordination with Mechanical Work: Coordinate motor control wiring with Division 15 Contractor. Refer to Division 15. The following division of work between the Mechanical Contractor's Temperature Controls Installer and the Electrical Contractor:

PART 2 - PRODUCTS

2.1 WIRING MATERIALS

A. Feeders: Stranded copper conductor, 600 Volt Insulation, rated a minimum 90° C, Minimum Size #12 AWG, Type THHN or XHHN in minimum 3/4" EMT type conduit unless otherwise approved.

B. Branch Circuits for lighting, receptacles and power loads with Minimum Circuit Ampacity of 20 Amperes or less. Home runs shall be stranded copper conductor, rated a minimum 90° C, Minimum Size #12 AWG, Type THHN or THHN in minimum 3/4" EMT type conduit unless otherwise approved. Type "AC" cable may be used for whips.

C. Use the color coded conductors as follows:

- 208Y/120V Phases: Black, Red and Blue
- Neutral: White
- Ground: Green

2.2 ELECTRICAL SUPPORTING MEANS

A. Use galvanized steel or nonmetallic supports in wet and damp locations.

B. Strength of supports: Adequate to carry all present and known future loads times a safety factor of at least 2.

PART 3 - EXECUTION

3.1 General

A. All equipment installations shall be according to the product manufacturer's written installation instructions.

B. Coordinate Electrical equipment and materials installations with all new and existing building components. Route all conduits in spaces indicated and as job conditions warrant, arranged for most convenient servicing access and with due consideration given to other installers' work. If final locations of Electrical Equipment vary from those shown on the plans, Electrical Installer shall coordinate with all affected trades at no added cost to the owner.

C. Arrange for chases, slots and openings in other building components to allow for electrical installations.

D. Phase and schedule in accordance with the construction phases as indicated in Division I.

E. Rough-in: Verify final locations for rough-ins by field measurements. Refer to construction documents and equipment submittals for rough-in requirements.

F. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components as they are constructed.

G. Sequence, coordinate and integrate the installations of Electrical materials and equipment for efficient flow of work. Give particular attention to large equipment requiring positioning prior to closing-in the building.

H. Where mounting heights are not detailed or dimensioned, install electrical services and overhead equipment to provide the maximum headroom possible.

I. Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting with minimum of interference with other installations.

J. Coordinate connection of mechanical systems with exterior utilities and services. Comply with requirements of governing regulations, franchised service companies and controlling agencies. Provide required connection for each service.

K. Install items level, plumb and parallel to other building systems and components except where otherwise indicated.

L. Give right of way to raceways and piping systems installed at a required slope.

3.4 Delivery, Storage and Handling

A. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels and similar information needed for distinct identification; adequately packaged and protected to prevent damage during shipment, storage and handling.

B. Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage.

C. Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

3.5 Protection

- A. Protect all fixtures, equipment and materials at all times, whether new or existing to remain.
- B. Make good all damages caused, whether directly or indirectly, by Electrical Installer's personnel.
- C. Close all pipe openings with caps and plugs during installation.
- D. Tightly cover and protect all fixtures and equipment against dirt, water, chemical and mechanical injury.
- E. Deliver all work in a thoroughly clean, perfect, unblemished condition at completion.
- F. Protect new and existing footings from undermining created by excavations.

3.6 WIRING INSTALLATION REQUIREMENTS

A. Receptacle and lighting circuits shall be installed in separate raceways

B. Wiring at outlets: Install at least 6" of slack conductor at each outlet.

C. Wiring at lighting fixtures: Provide adequate (maximum 10'-0") flexible conduit to allow lighting fixtures to be relocated one ceiling grid tile dimension in any direction. Hospital grade AC cable may be used.

D. At least one ground wire sized per the National Electric Code shall be installed in each branch circuit and feeder conduit.

E. All circuit conductors must be talled at devices so that circuit integrity is not dependent on device screws.

F. Junction boxes located above ceilings shall be 4" square x 2 1/8" deep with 1/2" x 3/4" knockouts.

3.7 IDENTIFICATION

A. Panelboard numbers shall comply with the owners standard numbering system.

B. Each panelboard, motor starter, disconnect switch, etc. shall be identified with an engraved nameplate. Nameplates shall be 1", 5-ply lamacoid with 1/2" high white letters. Black background shall be used for panelboards, etc. supplied by the Normal Power System and Red background shall be used for panelboards, etc. supplied by the Emergency Power System. "Dymo" or tape markers will not be accepted.

C. Each panelboard shall be equipped with a typewritten circuit schedule indicating rooms and / or equipment served.

D. Each junction box cover shall be labeled with panel and circuit numbers.

E. Each outlet and switch cover shall be labeled with panel and circuit number. Labels shall be tape type with clear background and black lettering.

F. Provide permanent operational dated nameplate on each item of power operated mechanical equipment, indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Affix nameplates in accessible locations.

3.8 Fire stopping

A. Fire stop all penetrations of rated walls and floors with U.L. listed material. Each fire stopping material shall be installed according to it's U.L. listing.

3.9 Access Doors

A. Furnish for installation by general contractor wall and ceiling access doors for each junction box or wiring device where these items are located above ceilings (except lay-in) or behind walls.

C. Wall and ceiling access doors shall be Larsen, Milcor or Karp of style and rating to fit construction.

SECTION 16416 - DISCONNECT SWITCHES, CIRCUIT BREAKERS AND MOTOR STARTERS

PART 1 - PRODUCTS

1.1 MANUFACTURERS

- A. Square D
- B. Other Approved

1.2 DISCONNECT SWITCHES

- A. Heavy-Duty (HD), Rated 240 Volt or 600 Volt as required.
- B. Fused or non-fused as indicated on drawings.
- C. Enclosure: NEMA 1 for indoor use and NEMA 3R for outdoor use.

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PROJECT TITLE:  
**MONTAGUE AREA PUBLIC SCHOOLS  
RENOVATION TO R.R. OEHRLI ELEMENTARY  
4859 KNUDSEN ST. MONTAGUE, MI**

SEAL & SIGNATURE

DATE: 4/22/24  
ISSUED FOR: PERMITS, BIDS & CONSTRUCTION

PROJECT No. 5143

DRAWING TITLE: SPECIFICATIONS

SHEET No.

**E-3**

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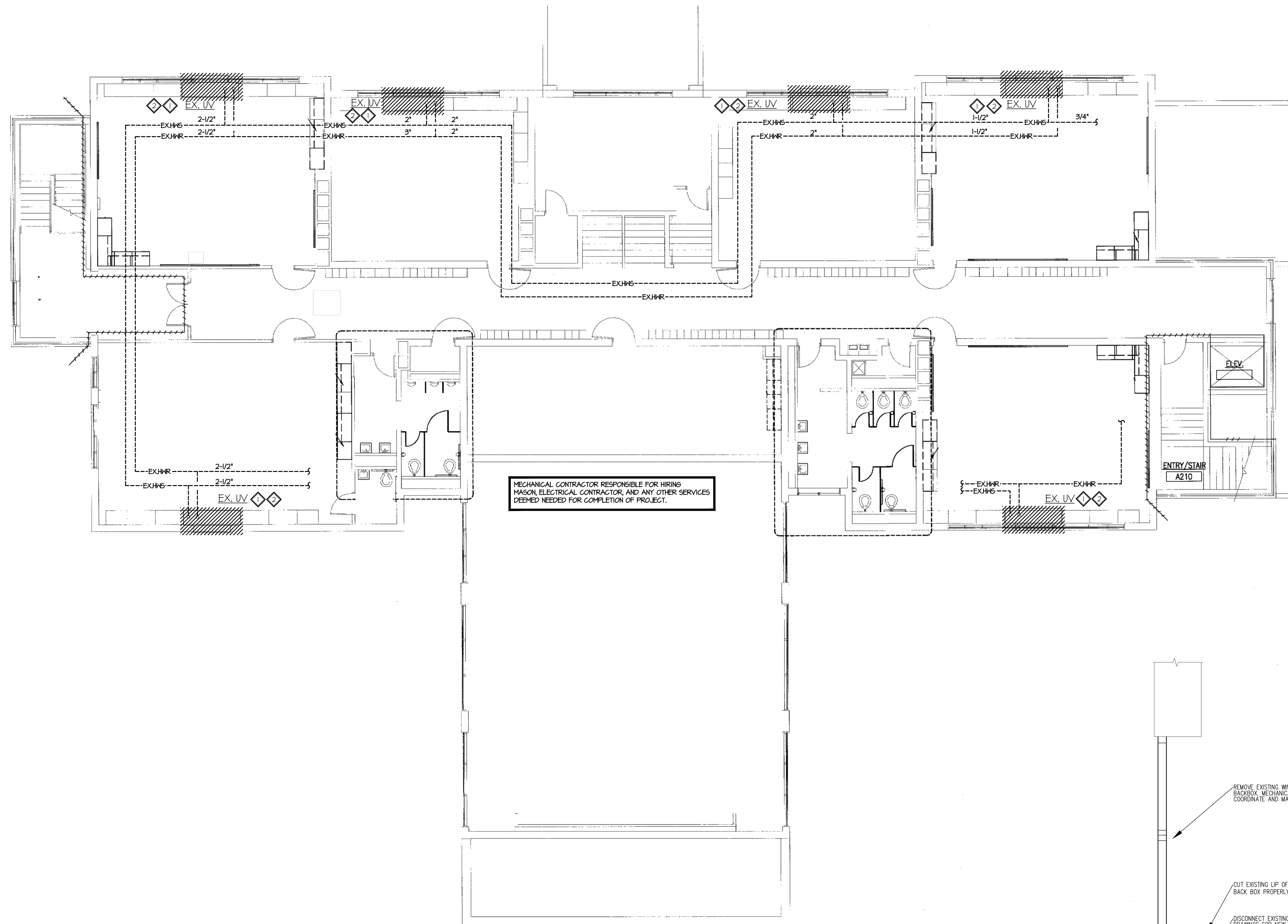
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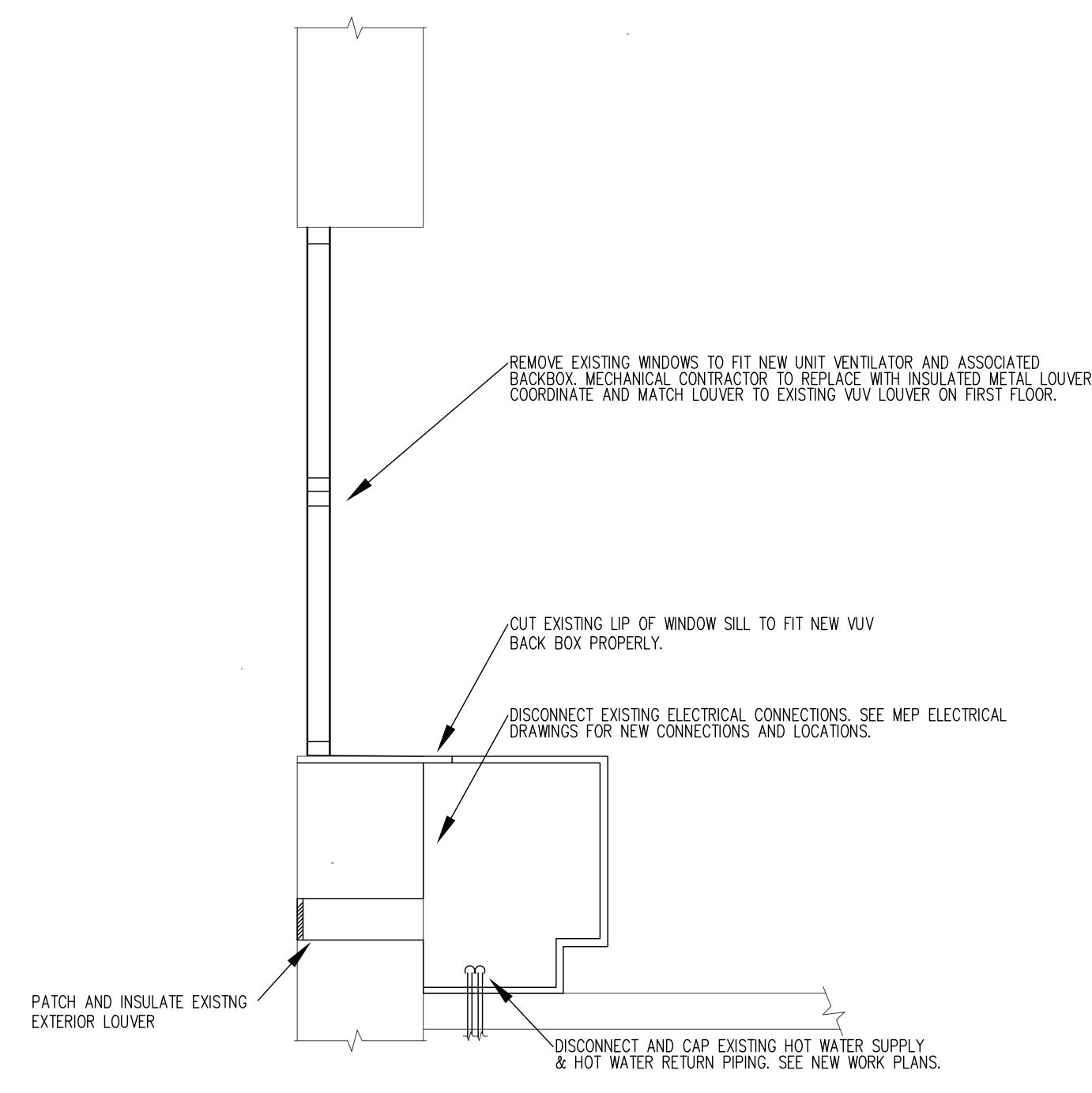
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- ### GENERAL DEMOLITION NOTES
- REFER TO WRITTEN SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
  - MECHANICAL TRADES TO COORDINATE ALL WORK WITH OTHER TRADES.
  - MECHANICAL TRADES TO MAINTAIN WORK AREA IN A NEAT AND ORDERLY STATE. DISPOSE OF CONSTRUCTION DEBRIS ON A DAILY BASIS.
  - ALL CUTTING, PATCHING AND ASSOCIATED COSTS SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR OR SUBCONTRACTOR. ACTUAL PATCHING AND FINISHING OF SURFACES SHALL BE PERFORMED BY TRADESMEN QUALIFIED AND LICENSED FOR THE SPECIFIC WORK TO BE PERFORMED. THIS CONTRACTOR SHALL COORDINATE THIS WORK WITH THE OWNER AND GENERAL TRADES.
  - EXISTING CONDITIONS SHOWN ON THESE DRAWINGS ARE NOT ALL CONCLUSIVE AND SHOW GENERAL ARRANGEMENT OF DUCTWORK, PIPING AND EQUIPMENT WHICH HAVE BEEN OBTAINED FROM EXISTING DRAWINGS AND FIELD INSPECTIONS. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND QUANTITY PRIOR TO PRICING AND CONSTRUCTION.
  - DEMOLITION WORK IS IDENTIFIED ON FLOOR PLAN BY NOTES AND/OR ITEMS SHOWN WITHIN HATCH TYPE LINE PATTERN. DISCONNECT AND REMOVE ALL MECHANICAL EQUIPMENT, DUCTWORK, PIPING AND ACCESSORIES NOTED FOR DEMOLITION IN A NEAT, PROFESSIONAL, AND LEGAL MANNER. NOT ALL OF THE MECHANICAL WORK IS NECESSARILY SHOWN OR NOTED ON THESE DRAWINGS. THOSE ITEMS NOT SHOWN OR NOTED, BUT ARE DEEMED NECESSARY FOR THIS PROJECT SHALL BE PART OF THIS CONTRACT. ALL MECHANICAL EQUIPMENT AND ACCESSORIES NOT BEING REUSED SHALL BE REMOVED AND DISPOSED OF.
  - CONSULT WITH OWNER PRIOR TO DEMOLITION OF EQUIPMENT ITEMS. AT OWNER'S REQUEST, EQUIPMENT TO BE REMOVED SHALL BE CAREFULLY TURNED OVER TO OWNER, MAINTAINING ITS EXISTING CONDITION.
  - ROOF PATCHING SHALL BE PERFORMED BY EXISTING ROOF WARRANTY HOLDER, SUCH THAT EXISTING ROOF WARRANTY IS MAINTAINED, COORDINATE WITH CONSTRUCTION MANAGER.
  - UTILITIES SHOWN ARE APPROXIMATE LOCATIONS FROM AVAILABLE INFORMATION. THEIR LOCATIONS SHOULD NOT BE CONSIDERED EXACT LOCATIONS NOR SHOULD THEY BE CONSIDERED AS THE ONLY UTILITIES IN THE AREA AND TO CALL TEXAS 811 PRIOR TO START OF WORK.

- ### DEMOLITION PLAN NOTES
- ◇ CAP EXISTING HOT WATER AND HOT WATER RETURN PIPES ABOVE FINISHED FLOOR. SEE NEW WORK PLAN FOR NEW CONNECTIONS.
  - ◇ REMOVE EXISTING UNIT VENTILATOR. MECHANICAL CONTRACTOR TO CAP EXISTING LOUVER, INSULATE TO R-20, THEN PATCH WALL AND PAINT TO MATCH EXISTING.

MECHANICAL CONTRACTOR RESPONSIBLE FOR HIRING MASON, ELECTRICAL CONTRACTOR, AND ANY OTHER SERVICES DEEMED NEEDED FOR COMPLETION OF PROJECT.



**SECOND FLOOR MECHANICAL DEMOLITION PLAN**  
SCALE: 1/8" = 1'-0"

**1 MD1 UV DEMOLITION DETAIL**  
SCALE: NA

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**GENERAL DEMOLITION NOTES**

**DEMOLITION PLAN NOTES**

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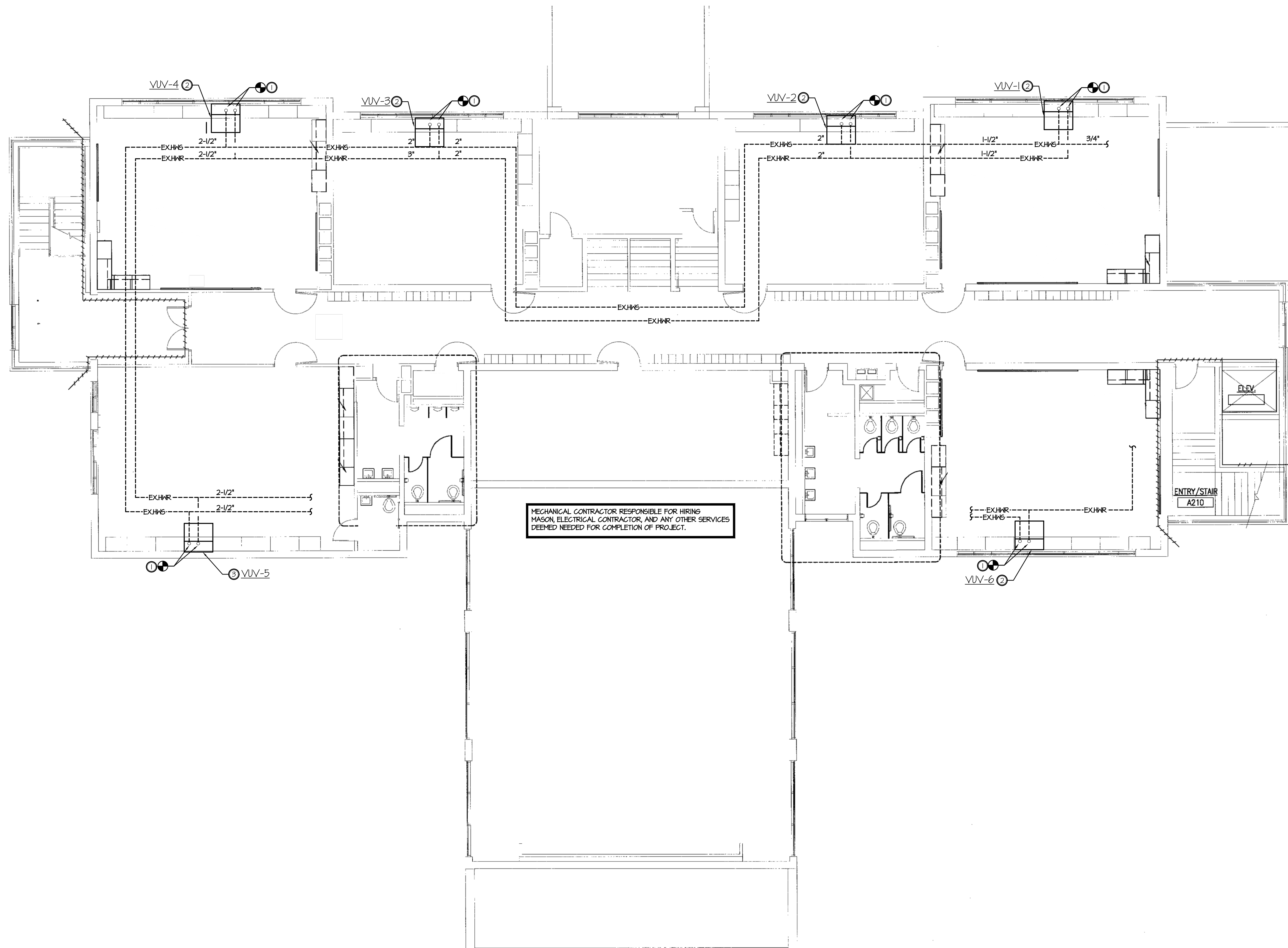
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PROJECT No. 5143

DRAWING TITLE: SECOND FLOOR MECHANICAL DEMOLITION PLAN

SHEET No. MD1





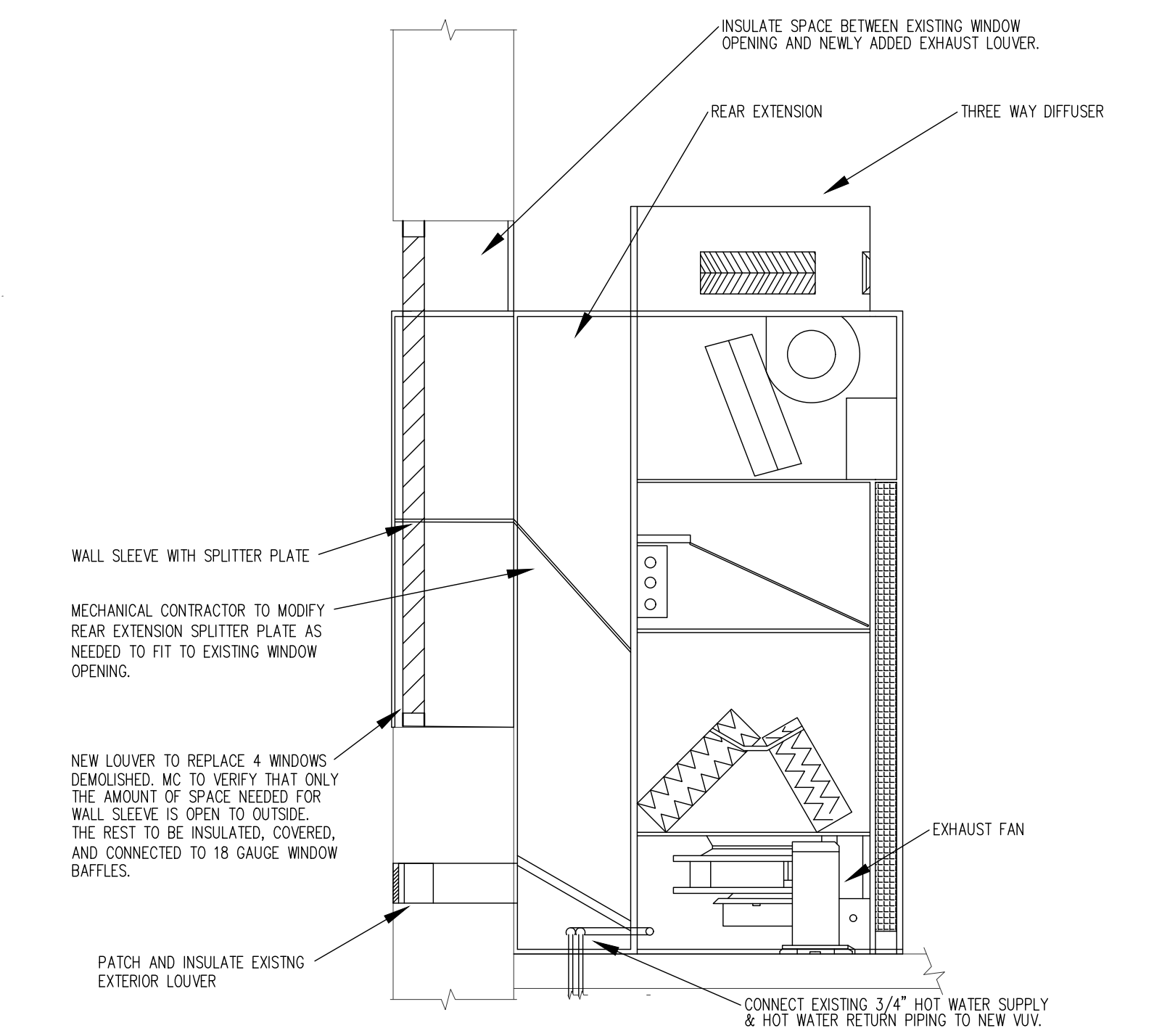
**SECOND FLOOR MECHANICAL PLAN**  
SCALE: 1/8" = 1'-0"

**MECHANICAL GENERAL NOTES**

- ALL WORK SHALL BE INSTALLED PER LOCAL, STATE, & FEDERAL CODES, RULES, ORDINANCES, AND REGULATIONS.
- REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- ALL DUCT AND EQUIPMENT ELEVATIONS NOTED ON PLANS MEASURED FROM F.F. TO BOTTOM OF DUCT/EQUIPMENT UNLESS OTHERWISE NOTED.
- ALL DUCTWORK SHALL BE INSULATED ACCORDING TO WRITTEN SPECIFICATIONS UNLESS OTHERWISE NOTED. ALL CONCEALED SUPPLY DUCTWORK SHALL HAVE BLANKET DUCT WRAP INSULATION. ALL EXPOSED SUPPLY DUCTWORK IN CONDITIONED SPACES AND ALL EXHAUST DUCTWORK DO NOT REQUIRE INSULATION. ALL RECTANGULAR RETURN DUCTWORK SHALL HAVE 1" INTERNAL ACOUSTICAL LINER INSULATION.
- ALL DUCTWORK BEHIND GRILLES AND DIFFUSERS CONNECTIONS SHALL BE PAINTED FLAT BLACK. PAINT INSIDE OF DUCT CONNECTIONS 2'-0" UP STREAM OF FIRST 90 DEGREE ELBOW.
- ALL WORK SHOWN ON THIS PLAN TO BE COORDINATED WITH ALL OTHER TRADES PRIOR TO FABRICATION AND INSTALLATION.
- FIELD VERIFY THERMOSTAT AND SENSOR LOCATIONS WITH OWNER. INSTALL SENSORS AT A HEIGHT OF 4'0" A.F.F. COORDINATE MECHANICAL SENSOR LOCATIONS WITH OTHER TRADES.
- ALL DUCT DIMENSIONS ARE INSIDE DIMENSIONS.
- INSTALLING CONTRACTOR SHALL USE EXTREME CAUTION TO COORDINATE THE EXACT ROUTING AND ELEVATION OF DUCTING SYSTEMS. THIS CONTRACTOR SHALL INSTALL ALL DUCTING SO AS TO NOT INTERFERE WITH THE REMOVAL AND/OR SERVICING OF SYSTEMS.
- ALL RECTANGULAR RETURN DUCTWORK SHALL HAVE 1" INTERNAL LINER, REFER TO SPECIFICATIONS.
- ALL SUPPLY, RETURN AND EXHAUST BRANCH DUCTS SHALL HAVE A BALANCING DAMPER NEAR MAIN.
- ALL SUPPLY, RETURN AND EXHAUST DUCT ELBOWS SHALL BE SMOOTH RADIUS ELBOWS WITH THE INSIDE RADIUS SAME AS WIDTH OF DUCT UNLESS OTHERWISE NOTED OR APPROVED BY THE ENGINEER. ALL 90° MITERED ELBOWS SHALL HAVE TURNING VANES.
- EXHAUST TERMINATIONS, PLUMBING VENTS, ETC. TO BE A MINIMUM OF 3FT. VERTICAL CLEARANCE ABOVE OR MINIMUM OF 10FT. HORIZONTAL CLEARANCE FROM FENESTRATION OR EQUIPMENT OUTDOOR AIR INTAKES.
- ALL SERVICEABLE MECHANICAL EQUIPMENT INSTALLED ON ROOF SHALL BE INSTALLED A MINIMUM OF 10FT FROM ROOF EDGE OR HAVE GUARD RAIL AS REQUIRED BY CODE. MAINTAIN MANUFACTURER RECOMMENDED CLEARANCES.
- PAINT ALL VISIBLE GAS PIPING TO MATCH ADJACENT SURFACE. ALL GAS PIPING ROUTED ON ROOF SHALL BE PAINTED YELLOW.
- DIFFUSERS/GRILLES TO BE ORDERED WITH FINISH SPECIFIED IN ASSOCIATED SCHEDULE. MECHANICAL CONTRACTOR SHALL THOROUGHLY CLEAN ALL HVAC SPECIFIED TO BE PAINTED FOR PREPARATION OF PAINTING BY PAINTING CONTRACTOR. ALL OILS, DUST AND DEBRIS SHALL BE REMOVED FROM SURFACES REQUIRING PAINTING.
- ALL ROOF PENETRATIONS SHALL BE PERFORMED IN ACCORDANCE WITH ROOF WARRANTY.
- ALL MECHANICAL DUCTS AND PIPING PENETRATING RATED ASSEMBLIES SHALL BE SEALED AND FIRE-STOPPED TO COMPLY WITH LOCAL REGULATIONS.
- ALL EXPOSED HVAC INSTALLED AS HIGH AS POSSIBLE TO BOTTOM OF DECK/JOIST UNLESS NOTED OTHERWISE. FIELD COORDINATE EXACT HVAC ROUTING WITH STRUCTURAL ELEMENTS, EXISTING SYSTEMS, AND OTHER TRADES.

**MECHANICAL KEY NOTES**

- ① MECHANICAL CONTRACTOR TO CONNECT EXISTING HOT WATER SUPPLY AND RETURN PIPING TO NEW VAV.
- ② REMOVE EXISTING WINDOWS BEHIND NEW VAV UNIT. MECHANICAL CONTRACTOR TO COVER WINDOW OPENING WITH INSULATED METAL LOUVER. MECHANICAL CONTRACTOR TO COVER VAV BACKBOX INTAKE/OUTPUT TO NEW INSULATED METAL LOUVER. COVER AND BLOCK OFF ANY PART OF NEW LOUVER NOT CONNECTED TO NEW BACK BOX WITH INSULATING AND THEN PAINT TO MATCH EXISTING INTERIOR.
- ③ MECHANICAL CONTRACTOR TO COORDINATE NEW OUTSIDE INTAKE/EXHAUST LOUVER FROM NEW VAV WITH BRICK MASON. REMOVE APPROPRIATE AMOUNT OF BRICK FROM WALL FOR BACKBOX INTAKE/EXHAUST.



**VAV INSTALLATION DETAIL**  
SCALE: NA

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SEAL & SIGNATURE

DATE: 4/22/24 ISSUED FOR: PERMITS, BIDS & CONSTRUCTION

PROJECT No. 5143

DRAWING TITLE: SECOND FLOOR MECHANICAL PLAN

SHEET No.

**M1**

UNIT VENTILATOR SCHEDULE												
SYMBOL	CFM	E.S.P.	% O.A.	E.A.T.	L.A.T.	MBH	E.I.T.	L.H.T.	GPM	V/ø	NOTE	REMARKS
VUV-1	1100	0.5	24%	80/67	60.7/51.9	24.2	50	NA	6 GPM	20ø-60-1	1,2	EQUAL TO AIREDALE MODEL #CMD36BMACANNH2NI
VUV-2	1100	0.5	24%	80/67	60.7/51.9	24.2	50	NA	6 GPM	20ø-60-1	1,2	EQUAL TO AIREDALE MODEL #CMD36BMACANNH2NI
VUV-3	1100	0.5	24%	80/67	60.7/51.9	24.2	50	NA	6 GPM	20ø-60-1	1,2	EQUAL TO AIREDALE MODEL #CMD36BMACANNH2NI
VUV-4	1500	0.5	24%	80/67	59.6/51.5	33.9	50	NA	6 GPM	20ø-60-1	1,2	EQUAL TO AIREDALE MODEL #CMD48BMACANNH2NI
VUV-5	1500	0.5	24%	80/67	59.6/51.5	33.9	50	NA	6 GPM	20ø-60-1	1,2	EQUAL TO AIREDALE MODEL #CMD48BMACANNH2NI
VUV-6	1500	0.5	24%	80/67	59.6/51.5	33.9	50	NA	6 GPM	20ø-60-1	1,2	EQUAL TO AIREDALE MODEL #CMD48BMACANNH2NI

NOTES: 1. PROVIDE MANUFACTURER MADE BACKBOX, MODIFY AS NEEDED TO FIT TO SPACE.  
2. PROVIDE MANUFACTURER MADE 3 WAY TOP MOUNTED DIFFUSER.  
3. PROVIDE MANUFACTURER SHUT OFF SWITCH.

HVAC PIPING	
—HPS—	HIGH PRESSURE STEAM
—MPS—	MEDIUM PRESSURE STEAM
—LPS—	LOW PRESSURE STEAM
—HPC—	HIGH PRESSURE CONDENSATE
—MPC—	MEDIUM PRESSURE CONDENSATE
—PC—	PUMPED CONDENSATE
—R—	REFRIGERANT
—RD—	REFRIGERANT DISCHARGE
—RS—	REFRIGERANT SUCTION
—C—	CONDENSER WATER SUPPLY
—CR—	CONDENSER WATER RETURN
—CWS—	CHILLED WATER SUPPLY
—CWR—	CHILLED WATER RETURN
—HWS—	HOT WATER SUPPLY
—HWR—	HOT WATER RETURN
—HPWS—	HEAT PUMP WATER SUPPLY
—HPWR—	HEAT PUMP WATER RETURN

BASIC PLUMBING PIPING			
—FOD—	FUEL OIL DISCHARGE		AIR LINE VALVE
—FOG—	FUEL OIL GAGE		BACK FLOW PREVENTOR
—FOS—	FUEL OIL SUCTION		BALANCING VALVE
—FOR—	FUEL OIL RETURN		BALL VALVE
—FOV—	FUEL OIL TANK VENT		BUTTERFLY VALVE
—A—	COMPRESSED AIR		CHECK VALVE
—VAC—	VACUUM (AIR)		CIRCUIT SETTER
—S—	SAN DRAIN ABOVE FLOOR		GAS COCK
—S—	SAN DRAIN BELOW FLOOR		GATE VALVE
—ST—	STORM DRAIN ABOVE FLOOR		GLOBE VALVE
—ST—	STORM DRAIN BELOW FLOOR		PRESSURE REDUCING VALVE
—ESD—	EMERGENCY STORM DRAINAGE		RELIEF VALVE
—ESD—	EMERGENCY STORM BELOW FLOOR		RISE AND DROP VALVE
—V—	VENT		SOLENOID VALVE
—	COLD WATER		THREE WAY VALVE
—	HOT WATER		TWO WAY VALVE
—	HOT WATER RECIRC.		ALIGNMENT GUIDE
—G—	GAS		ANCHOR, INTERMEDIATE
—ACID—	ACID WASTE		
—O—	OXYGEN		
—N—	NITROGEN		
—NO—	NITROUS OXIDE		
—FP—	FIRE PROTECTION		
	EXPANSION JOINT		EXPANSION LOOP
	FLOW ARROW		FLOW-METER, ORIFICE
	P.S.		PIPING CAP
	PIPING CONTINUATION		WALL CLEAN OUT (WCO)
	PIPE DROP, BOTTOM		PIPE DROP
	PIPE DROP		PIPE RISE
	PITCH OF PIPE, RISE (R) DROP (D)		PRESSURE GAUGE AND COCK
	PRESSURE SWITCH		PUMP
	REDUCER, CONCENTRIC		SILL COCK
	STRAINER		STRAINER, BLOW OFF
	THERMOMETER		THERMOMETER WELL
	TRAP, STEAM		UNION
	NEW UPRIGHT SPRINKLER HEAD		EXIST. UPRIGHT SPRINKLER HEAD
	NEW PENDENT SPRINKLER HEAD		EXIST. PENDENT SPRINKLER HEAD
	FLOOR DRAIN (SEE SPECS)		FLOOR SINK (SEE SPECS)
	FLOOR CLEAN OUT		ROOF DRAIN

GENERAL HYDRONICS NOTES:	
1.	THE INSTALLATION OF ALL PIPING SHALL BE CLOSELY COORDINATED WITH SHEET METAL, ELECTRICAL, AND STRUCTURAL CONDITIONS. NOT ALL REQUIRED OFFSETS AND FITTINGS ARE INDICATED ON DRAWINGS, BUT SHALL BE PROVIDED. REFER TO EXISTING ARCHITECTURAL AND STRUCTURAL PLANS FOR CLEARANCES.
2.	ALL PIPING SHALL BE INSTALLED TO FACILITATE COIL REMOVAL, FILTER REPLACEMENT AND OPENING OF ACCESS PANELS.
3.	INSTALL MAINS AS HIGH AS POSSIBLE. MANUAL AIR VENTS SHALL BE PROVIDED AT ALL PIPING HIGH POINTS AND END OF PIPING LOOPS. PROVIDE REMOVABLE INSULATION PLUG.
4.	PIPE ANCHORS, EXPANSION LOOPS, AND GUIDES SHALL BE PROVIDED AS REQUIRED. REFER TO SPECIFICATIONS.
5.	SLEEVE AND SEAL EXTERIOR WALL AND ROOF PENETRATIONS TO A WEATHER TIGHT CONDITION.
6.	PROVIDE MINIMUM OF 3/4" PIPE FOR ALL PIPING UNLESS SHOWN OTHERWISE.
7.	ALL VALVES ARE TO BE FULL LINE SIZE EXCEPT CONTROL AND BALANCING VALVES. PROVIDE 1/2" DRAIN VALVES WITH HOSE-END CAPS AT ALL LOW POINTS IN PIPING.
8.	PROVIDE MINIMUM PITCH SUFFICIENT TO INSURE ADEQUATE DRAINING. PROVIDE REMOVABLE INSULATION PLUG.
9.	UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD AND AS HIGH AS POSSIBLE TO THE UNDERSIDE OF THE STRUCTURE OR SLAB, WITH SPACE FOR INSULATION WHERE REQUIRED.
10.	PIPING AND ASSOCIATED APPURTENANCES SHALL NOT INTERFERE WITH DOORS AND WINDOWS.
11.	ALL PIPING WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. PROVIDE OFFSETS IN PIPING AROUND OBSTRUCTIONS ENCOUNTERED IN FIELD.
12.	PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO, AND WITHIN 50 FEET OF ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS) THROUGHOUT MECHANICAL EQUIPMENT ROOMS.
13.	FOR BALANCING 3-WAY VALVES, BALANCE BY-PASS WITH VALVE AT 50% POSITION SUCH THAT TOTAL FLOW DOES NOT EXCEED 100%.
14.	CONDENSATE WATER PIPING SHALL BE A MINIMUM OF 3/4". SEE THE DETAILS SHOWN IN THE DRAWINGS OR MANUFACTURER'S LITERATURE FOR CONDENSATE PIPING ARRANGEMENT. PITCH DOWN IN DIRECTION OF FLOW. MINIMUM 1/8" PER 10 FEET.
15.	INSTALL PIPING SO ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
16.	PROVIDE PRESSURE/TEMPERATURE (P/T) PLUGS, WITH CAPS UP AND DOWNSTREAM OF ALL EQUIPMENT, AT THE SUPPLY AND RETURN TAPS OF ALL PIPING BRANCHES AND/OR WHERE INDICATED. PROVIDE EXTENDED PLUGS AND LABELS WHERE PIPING IS INSULATED.
17.	PROVIDE FLUSHING VALVES AND TEES AT BOTH ENDS OF ALL EQUIPMENT. TAPS SHALL MATCH EQUIPMENT PIPING UP TO IT. FOR LARGER EQUIPMENT AND PIPE LOOPS, PROVIDE 1-1/2" TAPS AND VALVES.
18.	ALL HYDRONIC PIPING BRANCH TAKEOFFS FROM MAINS SHALL BE MADE WITH SWING JOINTS.
19.	NEW PIPING PASSING THRU EXISTING WALLS AND / OR FLOORS SHALL BE CORE DRILLED FOR SLEEVE.
20.	MECHANICAL CONTRACTOR SHALL CONFIRM THAT ALL EXISTING VALVES WITHIN THE SERVICE OF WORK ARE OPERATIONAL AT TIME OF INSPECTION IF VALVE FAILS PROVIDE A PRICE FOR REPAIRS OR REPLACEMENT OF THE VALVE.
21.	MECHANICAL CONTRACTOR SHALL FLUSH AND CLEAN ALL STRAINERS IN THE VICINITY OF THEIR WORK.
22.	OFFSET PIPING TO ACCOMMODATE LARGE DUCTWORK. COORDINATE IN FIELD.
23.	PIPING PASSING THROUGH RATED FLOORS 4 WALLS SHALL BE SLEEVED AND FIRE STOPPED IN COMPLIANCE WITH THE LATEST CODE. ACCEPTABLE INSTALLATION METHODS. MATERIALS SHALL BE AS MANUFACTURED BY "HLTI".
24.	NEW PIPING PASSING THRU EXISTING WALLS AND / OR FLOORS SHALL BE CORE DRILLED FOR SLEEVE.
25.	PROVIDE ALL MISCELLANEOUS STEEL AND ITEMS REQUIRED FOR THE PROPER INSTALLATION OF ALL PIPE, SHEET METAL AND EQUIPMENT.
26.	DO NOT INSTALL EQUIPMENT, PIPING OR DUCTWORK OVER ANY ELECTRICAL EQUIPMENT OR COMMUNICATION ROOMS. DO NOT RUN ANY PIPING OR DUCTWORK INTO THE ELECTRICAL ROOM UNLESS DEDICATED TO SERVE THAT ROOM.
27.	ALL BOILER CONDENSATE DRAIN PIPING TO TERMINATE TO DRAIN VIA AIR GAP.

HVAC DUCTWORK	
	SLOT DIFFUSER
	SUPPLY AIR DIFFUSER
	RETURN AIR DIFFUSER
	SUPPLY AIR DUCT SECTION, FIRST FIGURE IS TOP
	RETURN AIR DUCT SECTION, FIRST FIGURE IS TOP
	EXHAUST FAN
	VERTICAL FIRE DAMPER
	VERTICAL FIRE/SMOKE DAMPER
	HORIZONTAL FIRE DAMPER
	HORIZONTAL FIRE/SMOKE DAMPER
	SMOKE DAMPER
	MANUAL VOLUME DAMPER
	MANUAL SPLITTER
	DUCT SIZE, FIRST FIGURE IS SIDE SHOWN
	ACOUSTICAL LINING (INSULATION)
	CHANGE IN ELEVATION, RISE (R) DROP (D)
	STANDARD BRANCH, NO SPLITTER
	FLEX CONNECTION
	THERMOSTAT
	THERMOSTAT WITH GUARD
	TEMPERATURE SENSOR
	HUMIDISTAT
	DEMOLITION NOTES TAG
	REVISED NOTES TAG
	APPENDIX TAG
	EQUIPMENT NOTES TAG

ABBREVIATIONS					
AFF	ABOVE FINISHED FLOOR	EC	ELECTRICAL CONTRACTOR	M.C.	MECHANICAL CONTRACTOR
AHU	AIR HANDLING UNIT	EF	EXHAUST FAN	OA	OUTSIDE AIR
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	EW	ELECTRIC WATER COOLER	RA	RETURN AIR
BF	BARRIER FREE	EWT	ENTERING WATER TEMPERATURE	SA	SUPPLY AIR
BTUH	BRITISH THERMAL UNITS PER HOUR	EXIST.	EXISTING	SAN	SANITARY SEWER
CA	COMBUSTION AIR	FCO	FLOOR CLEAN OUT	SC	SITE CONTRACTOR
CFM	CUBIC FEET PER MINUTE	FD	FLOOR DRAIN	SP	STATIC PRESSURE
CO	CLEAN OUT	FT	FIN-TUBE RADIATION	SS	SERVICE SINK
COND	CONDENSATE	GPM	GALLONS PER MINUTE	ST	STORM SEWER
CSEV	CIRCUIT SETTER BALANCING VALVE	HP	HORSE POWER	UH	UNIT HEATER
CU	CONDENSING UNIT	HWR	HOT WATER RETURN	UR	URINAL
GH	GABINET UNIT HEATER	HWS	HOT WATER SUPPLY	V	VENT
GJL	COLD WATER	I.E.	INVERT ELEVATION	VTR	VENT THRU ROOF
EAT	ENTERING AIR TEMPERATURE	LAT	LEAVING AIR TEMPERATURE	WC	WALL CLOSET
		LAV	LAVATORY	WCO	WALL CLEAN OUT
		LWT	LEAVING WATER TEMPERATURE	WH	WATER HEATER
				WS	WORK SINK
				YCO	YARD CLEAN OUT

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