COMMONWEALTH OF VIRGINIA
County of Henrico

DEPARTMENT OF FINANCE
Purchasing Division

Addendum No. 1

Date:	September 17, 2025
Invitation to Bid:	25-2866-8JL – Henrico County Animal Shelter Renovation
Receipt Date/Time:	September 23, 2025 at 2:00 PM
Opening Date/Time:	September 23, 2025 at 2:00 PM
Subject:	Questions & Answers Modifications to the Project Manual, and Modifications to the Drawings

Prospective Bidder and Others Concerned,
The following changes, corrections, deletions, clarifications, and/or additions constitute Addendum No. 1:

Questions & Answers:

1. Question: Please reference spec section 115300. 1a. The spec calls for 2 doors, but it only has 1. Please clarify. 1b. The door also calls for a "glass viewing panel", but it is a solid door. Please clarify. 1c. The spec mentions configured for two-level loading. That requires a separate kit. Please clarify if the kit is needed.

   Answer: Specification section 115300 has been revised.

2. Question: FP2.1 note 1 states to add/relocate sprinklers in rooms 120B, 122, 120, 121, and 139. However, FP2.1 note 4 states installing new sprinkler and FP1.0 states to remove the existing sprinkler. The extent of the removal and using existing is not clear. Is the intent to use the existing branch lines or is it a complete demo of all lines to the incoming service? Please clarify.

   Answer: Keynote #1 on sheet FP1.0 states that the removal of sprinklers in these rooms and throughout the entire building because the intent is to remove all ceilings. The intent for the sprinkler system is the same, just remove the sprinklers in the ceilings. Keynote #1 is shown in room 120B, 120 and other areas because there is a wall being added that would cause an obstruction to the spray pattern of the sprinkler and my recommendation was to either add or relocate the sprinklers in this space to accommodate NFPA 13 requirements.

3. Question: The finish plan shows several rooms where the existing floor is to remain and new epoxy is to be installed. There is no clear determination of the amount of the existing flooring that will remain and the extent of the new flooring. Please clarify?

Answer: Refer to revised finish schedule on A3.0.1.

4. Question: The floor plan calls for solar control window film at the Surgical Suite windows. However, there are no elevations to determine the dimensions of these windows. Please clarify?

   Answer: Refer to revised floor plan keynote.

5. Question: A9.1.1 calls out partitions to extend up to the rated horizontal shaft wall, however, drawing A2.1.1 shows partitions type P 1.1. P1.1 is not shown as a fire rated partition per A0.2. Please clarify.

   Answer: Refer to revised partition tags on A2.1.1 revised.

6. Question: Could you clarify the appropriate spec section for the door hardware?

   Answer: Specification section 087100 – Door Hardware has been added.

7. Question: Are the ACT ceilings (Grid and Tile) to be replaced in its entirety? The demo plan sheet A1.2.1 shows the entire ceiling being demolished. Finish Schedule sheet A3.0.1 has numerous rooms listed as existing.

   Answer: Refer to revised finish schedule sheet A3.0.1.

8. Question: There are numerous rooms missing from the finish schedule. If the rooms not listed on the finish schedule do need new ACT I will need to know if I should price ACP-A or ACP-B. (rooms missing from schedule – 101, 102, 103, 104, 105, 113, 117, 123, 126, 127)

   Answer: Refer to revised finish schedule sheet A3.0.1.

9. Question: Section 098430 – Spec 2.01.B.3 Dictates a C-20 Direct mounting required for the sound absorbing wall units. Spec 2.03.A.1 of same section lists accessories for mounting these units with two-part clip system. Please clarify mounting for these associated units.

   Answer: Refer to revised specification section 098430.

10. Question: Section 123553 – Spec 1.06 Requires a full-size mockup cabinet to be provided. Due to the fact this item is noted that it will be located and installed at owner chosen location to be potentially utilized and left in place after mockup approval phase. Please clarify desired configuration of cabinet for mockup cabinet.

    Answer: Refer to revised annotation on A8.1 for location.

11. Question: Section 260544 – Spec 1.3B LEED Submittals are listed. There is no other location that LEED is referenced. Please clarify.

    Answer: Refer to revised specification section 260544.

12. Question: Section 115300 – Spec 2.03.A.1 Specified Basis of Design Dishwasher Hobart Model LXeC. This specific chemical model unit is no longer available from specified manufacturer. Please advise a replacement model desired.

    Answer: Refer to revised specification section 115300.

13. Question: For proper flooring application and adhesion any new Concrete floor patching will require a minimum of 28-day cure before applying Fluid-Applied Flooring materials. This will have some sequencing / schedule implications in Phase 1 & 2 at specified Resinous Flooring locations. Please advise.

    Answer: Refer to General Phasing Note 1 on A1.0.1.

14. Question: Detail 4/A7.1.1 – There is a Wet Sink identified on this detail. This item is not referenced in the Specifications, Schedules or listed in Allowances. Please provide clarification as to whether this item is to be provided by Contractor. If to be provided by Contractor, please provide specifications for unit.

    Answer: Wet Sink annotation on A7.1.1 has been revised.

15. Question: Detail 4/A1.2.1 – There is a note indicating the Existing cages are to be removed and salvaged. The Dual cage gets re-installed per Note 5 on A2.1.1 Are the Quad cages (3ea) being returned to owner or installed elsewhere?

    Answer: Refer to specification section 024100 Demolition for clarification on "Remove and Salvage" terminology.

16. Question: Note 5 on Sheet A2.1.1 indicates the re-installation of the salvaged Dual cage. Please provide framing and dimensional information for the new location. Please provide clarity on the stainless-steel angle closure indicated for complete installation.

    Answer: Refer to additional detail on A2.1.1.

17. Question: Sheet A8.1 - Please provide Elevation for Acoustical Wall Panels for the 7 kennel blocks in room 106.

    Answer: Refer to Typical Acoustical Wall Panels elevation (15/A8.1).

18. Question: Sheet A1.2.1 – Selective Demolition Notes 3,4,7,8, & 11, 17 indicate removing owner items. Are these to be returned to owner or to be disposed?

    Answer: Remove as directed in specification section 024100 Demolition.

19. Question: Sheet A1.2.1 – Selective Demolition Note 17 indicates the removal of existing door with existing frame to remain. Is there any additional work to finish out existing frame (filling / capping existing hardware mounting locations, etc.) for any desired finish?

    Answer: Refer to additional keynote on A2.1.1.

20. Question: Sheet A1.2.1 - Are any of the existing doors that are to be removed per plan to be returned to owner?

    Answer: Remove as directed in specification section 024100 Demolition.

21. Question: Sheet E1.2 – Existing Security panels indicated on plans do not show any associative work. These are shown with a dashed line for associated Selective Demolition scope. Please clarify if these existing security panels are to be relocated, returned to owner, or disposed of.

    Answer: Refer to updated drawings E1.2 & E2.1.3.

22. Question: Sheet P2.2 – Room #109 new plumbing indicates two new DCW hookups for the Dishwasher locations. The Basis of Design Manufacturer and reference note 4 on P6.1 indicate a DHW hookup. Please clarify.

    Answer: Refer to revised drawing P2.2 indicating DHW connection to dishwasher units.

23. Question: Sheet A1.2.1 – Room #109. Is the existing Dishwasher (DW) to remain and be re-utilized?

    Answer: Refer to additional demolition keynote 18.

24. Question: Sheet A3.2.1 – Please clarify any associative materials (any blocking, flashing, weather proofing, steel lintels, etc.) for desired Exterior Door frame installation (Door #160). Current conditions are block along sides and wood framing along head. Also given the current conditions, grout filling header of frame will be improbable. Please advise / Clarify.

    Answer: Refer to revised details on A3.2.1.

25. Question: Sheet A1.2.1 – Room 138 indicates the removal of existing ceiling for above scopes of work. Sheet A9.1.1 appears to indicate new GWB Ceilings to be installed. The Finish Schedule on Sheet A3.0.1 indicates an existing ceiling condition. Please clarify.

    Answer: Refer to revised finish schedule sheet A3.0.1.

26. Question: Sheet A9.1.1 – Room 105 / 102. Does the assumed GWB markings in this lobby / reception area indicate a new or existing bulkhead assembly for this location? Please clarify.

    Answer: Refer to revised annotations on A1.2.1 and A9.1.1.

27. Question: Sheet A9.1.1 – Note 6, Room 121, 139. Please clarify required slotted metal framing above ceiling for suspension of surgical lights.

    Answer: Refer to specification 055000 for slotted metal framing requirements.

28. Question: Sheet P5.1 – Laundry Extractor Trench Drain (TD-2): The location of this LD-2 is not provided in Drawings. Is this an existing installation or condition? If this is intended to be part of the work scope on this renovation, please provide indication of location and necessary sanitary connections. Please clarify.

    Answer: Trench drain detail and TD-2 not applicable, trench for commercial laundry is existing to remain. Detail removed – refer to revised P5.1.

29. Question: Could you please confirm the process for submitting a substitution request for this project? Should it be sent directly to someone, or uploaded here on the bidding platform? Specifically, we are requesting the substitution of the following kennel manufacturers: Midmark, Direct Animal Products, LGL, and Shor-Line.

    Answer: Refer to specification 012500 Substitution Procedures.

Modification to the Project Manual

1. ADD the documents in their entirety, notes as Addendum No.1, dated September 17, 2025.
    a. SECTION 087100 – DOOR HARDWARE
    b. SECTION 230713 – FIRE RATED INSULATION SYSTEMS

2. DELETE the previously issued Documents indicated below in their entirety and SUBSTITUTE the revised Documents in their entirety, noted as Addendum No. 1, dated September 17, 2025.
    a. BID FORM
    b. SECTION 000110 – TABLE OF CONTENTS

c. SECTION 012100 – ALLOWANCES
d. SECTION 072100 – THERMAL INSULATION
e. SECTION 098430 – SOUND-ABSORBING WALL AND CEILING UNITS
f. SECTION 115300 – LABORATORY EQUIPMENT
g. SECTION 224000 – PLUMBING FIXTURES
h. SECTION 237200 – AIR-TO-AIR ENERGY RECOVERY EQUIPMENT
i. SECTION 237413 –PACKAGED OUTDOOR CENTRAL STATION AIR HANDLING UNITS
j. SECTION 238143 – SPLIT-SYSTEM HEAT PUMPS
k. SECTION 260544 – SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

Modification to the Drawings

1. DELETE the previously issued Documents indicated below in their entirety and SUBSTITUTE the revised Documents in their entirety, noted as Addendum No. 1, dated September 17, 2025.
    a. DRAWING LS1.1
    b. DRAWING A0.2
    c. DRAWING A1.2.1
    d. DRAWING A2.1.1
    e. DRAWING A3.0.1
    f. DRAWING A3.2.1
    g. DRAWING A7.1.1
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    r. DRAWING E2.1.1
    s. DRAWING E2.1.2
    t. DRAWING E2.1.3
    u. DRAWING E2.1.4
    v. DRAWING E5.2

All other general terms, conditions and specifications shall remain the same.

Bidders must take due notice and be governed accordingly. Acknowledgement of the receipt of this addendum shall be made on your Bid Form.

Failure to acknowledge this addendum may result in your bid being declared non-responsive.

Sincerely,

Jianchong Luo
Purchasing Manager
Luo001@henrico.gov

REVISED BID FORM (AD-01, 9.17.25)

FIXED PRICE CONTRACT
ITB No. 25-2866-8JL

Date: _____

To: County of Henrico
Department of Finance, Purchasing Office
8600 Staples Mill Road, Henrico, VA 23228-2360
PO Box 90775, Henrico, VA 23273-0775

Project: Henrico County Animal Shelter Renovation

From (full name): _____

(full address) _____

_____

Having carefully examined the site, the drawings, specifications and other documents, and in compliance with your "Invitation to Bid", Instructions to Bidders AIA701-2018 Edition, and this "Bid Form", the undersigned proposes to furnish all labor, materials, supplies and equipment necessary for Henrico County Animal Shelter Renovation. All shall be in accordance with Drawings prepared by Moseley, Inc. dated August 18, 2025 and the Project Manual, dated August 22, 2025.

The Bidder must be a registered contractor in the Commonwealth of Virginia in accordance with Title 54.1, Chapter 11 of the Code of Virginia, as amended, at the time of bid submission, and shall possess a **Virginia Contractor's License Class A.** The Bidder shall have bid and completed projects of comparable nature, size, complexity and construction cost. The Bidder should submit with its bid a completed AIA Document A305, Contractor's Qualifications Statement, which shall document how the applicable projects meet or exceeds the size, complexity, and nature of this project; and includes details of the management staff and self-performed activities associated with the referenced projects. Only those projects which the Bidder performed the work as the General Contractor should be included in the AIA Document A305. Bidders are not required to submit AIA Document A305, Contractor's Qualification Statement if they have submitted one within the last twelve (12) months as of the date of this bid.

The Work consists of the renovation of approximately 8,195 square feet of kennel space, offices, and accessory animal shelter space. Existing walls to remain will be patched as necessary, and new walls shall be constructed of light gauge framing and gypsum board. Existing flooring is to remain and will be patched and new floors shall be resinous flooring in animal areas and vinyl tile in offices. New ceilings shall be provided throughout the building. Mechanical, electrical, and plumbing work, including a new mechanical unit, will be provided in modified areas. The Work shall include installation of new kennels, X-ray equipment, medical equipment, and a centralized oxygen system. The Project address is 10421 Woodman Road, Glen Allen, VA 23060.

It shall be the responsibility of the Contractor to apply for and diligently pursue the applicable Building Permits from the County of Henrico. It shall be the responsibility of the Owner to pay for the Building Permits. However, in a cooperative and expedient effort, the Owner may apply and pay for the Building Permits prior to receipt of bids and should not be included in the bid amount. The Contractor will be responsible for obtaining and bearing the cost of all subcontractors permits.

The Bid Form must be completed in blue or black ink or by typewriter. The bid amounts shall be expressed in figures, only. The unit price of each item on the form, if requested, must be stated in figures. 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 lump sum price is as follows:

PRICES QUOTED SHALL BE FOB DESTINATION

TOTAL BID AMOUNT:

TOTAL BID: The Total Bid includes all Work required by the Bidding Documents for Henrico County Animal Shelter Renovation in strict accordance with the Bidding Documents including the Drawings and Project Manual for the computed price shown in the below Price Schedule:

Price Schedule	
Base Bid Item	
Description	Lump Sum Price
Base Bid includes all Work required by the Bid Documents for this project, with the exception of Allowance Item included below.	*[Enter pricing electronically in ProcureWare]*
Lump Sum Allowance Items	
Description	Lump Sum Price
Lump Sum Allowance No. 1:Include the stipulated sum of $5,000 for interior panel signage, as specified in Division 10 Section "Signage.".	*[An allowance value of* $5,000.00 *is already included electronically in ProcureWare]*
Lump Sum Allowance No. 2: Include the stipulated sum of $60,000 for veterinary X-ray system.	*[An allowance value of* $60,000.00 *is already included electronically in ProcureWare]*
Lump Sum Allowance No. 3: Include the stipulated sum of $9,000 for veterinary hydraulic surgery table.	*[An allowance value of* $9,000.00 *is already included electronically in ProcureWare]*

Lump Sum Allowance No. 4: Include the stipulated sum of $48,584 for Building Automation System (BAS). Work under this allowance shall be provided by Owner-assigned Subcontractor Automated Logic Corporation. Refer to Section 230900 "Building Automation System" and the full scope proposal appended to the end of Section 230900.	*[An allowance value of $48,584.00 is already included electronically in ProcureWare]*
Total Bid Amount (equals the sum of Base Bid + Lump Sum Allowance No. 1 – 4)	*Pricing will automatically calculate in ProcureWare*
Additive Bid Item	
Additive Bid Item No. 1: Provide sound-absorbing wall panels mounted to walls above kennels in rooms indicated on Drawings. Coordinate with Division 9 Section "Sound-Absorbing Wall and Ceiling Units"	*[Enter pricing electronically in ProcureWare]*

BID SECURITY:

Attached hereto is my bid security for five percent (5%) of the Total Bid, made payable to the County of Henrico, Virginia.

GENERAL:

It is the intent of the County of Henrico to recommend the award of this contract to the lowest responsive and responsible bidder based upon the Total Bid Amount plus the amount of Additive Bid Item No. 1, which the Owner in its sole discretion decides to award, provided the bid does not exceed the funds available for the contract.

If a contract is awarded, a separate performance bond and a payment bond **AIA Document A312 (2010),** for 100% of the contract amount, including any additions and/or deductions, shall be provided by the Successful Bidder.

The Successful Bidder agrees to use unit prices to determine changes to the Contract Sum when authorized changes are directed. Unit prices shall include all labor and materials, in place and complete. The source of the unit prices (other than those listed herein) shall be **Means Open Shop Building Construction Cost Data, latest edition, R. S. Means Company, Inc., adjusted for Richmond, Virginia.** The unit prices will be used as maximum limiting charges and minimum credits allowable for any change in the Work.

TIME OF COMPLETION:

The Work shall be Substantially Complete and certified by the Owner within 213 calendar days after the date of the written Notice to Proceed from the Owner to the Contractor. Final Completion of all Work shall be within 30 calendar days after the date of Substantial Completion.

The Owner and the Contractor recognize that time is of the essence and that the Owner will suffer financial loss if the Work is not completed by the deadline for Substantial Completion. Both parties recognize the delays, expense, and damages involved in proving in a legal proceeding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, notwithstanding any other provisions of this

Contract, the Owner and the Contractor agree, stipulate and fix as liquidated damages, but not as a penalty, the sum of Five Hundred Dollars **($500.00)** per day, which the Contractor together with the Contractor's surety shall pay the Owner for each calendar day or part thereof after the Substantial Completion deadline until the Contractor achieves Substantial Completion of the entire Work. The Contractor hereby waives any defense as to the validity of liquidated damages stated in this Agreement on the grounds that such liquidated damages are void as penalties or are not reasonably related to actual damages, and the parties agree that the Owner's entitlement to liquidated damages shall be determined at the time of Substantial Completion.

(BID SIGNATURE SHEET FOLLOWS)

BID SIGNATURE SHEET

My signature certifies that the bid as submitted complies with all requirements specified in this Invitation to Bid ("ITB") No. 25-2866-8JL – Henrico County Animal Shelter Renovation.

My signature also certifies that by submitting a bid in response to this ITB, 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 OF OFFEROR (DO NOT USE TRADE NAME):
ADDRESS:
SIGNATURE: DATE:
NAME OF PERSON SIGNING (print):
TITLE:
TELEPHONE:
FAX:
E-MAIL ADDRESS:
VIRGINIA CONTRACTOR'S REGISTRATION NUMBER: CLASS:
Bidder ___ is or ___ is not located in Henrico County? If so, have you obtained a County license to conduct or engage in this business, trade or occupation in the County? ____Yes. ____No.

RECEIPT OF ADDENDA:

We acknowledge the receipt of the following Addenda:

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

BUSINESS CATEGORY CLASSIFICATION FORM

Company Legal Name: _____

This form completed by: Signature:_____ Title:_____

Date:_____

PLEASE SPECIFY YOUR BUSINESS CATEGORY BY CHECKING THE APPROPRIATE BOX(ES) BELOW.

(Check all that apply.)

- ☐ **SMALL BUSINESS**
- ☐ **WOMEN-OWNED BUSINESS**
- ☐ **MINORITY-OWNED BUSINESS**
- ☐ **SERVICE-DISABLED VETERAN**
- ☐ **EMPLOYMENT SERVICES ORGANIZATION**
- ☐ **NON-SWaM (Not Small, Women-owned or Minority-owned)**

SUPPLIER REGISTRATION – The County of Henrico encourages all suppliers interested in doing business with the County to register with eVA, the Commonwealth of Virginia's electronic procurement portal, http://eva.virginia.gov.

eVA Registered? ☐ **Yes** ☐ **No**

If certified by the Virginia Minority Business Enterprises (DMBE), provide DMBE certification number and expiration date.

_____ **NUMBER** _____ **DATE**

DEFINITIONS

For the purpose of determining the appropriate business category, the following definitions apply:

"Small business" means a business, independently owned and controlled by one or more individuals who are U.S. citizens or legal resident aliens, and together with affiliates, has 250 or fewer employees, or annual gross receipts of $10 million or less averaged over the previous three years. One or more of the individual owners shall control both the management and daily business operations of the small business.

"Women-owned business" means a business that is at least 51 percent owned by one or more women who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51 percent of the equity ownership interest is owned by one or more women who are U.S. citizens or legal resident aliens, and both the management and daily business operations are controlled by one or more women.

"Minority-owned business" means a business that is at least 51 percent owned by one or more minority individuals who are U.S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51 percent of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more minority individuals who are U.S. citizens or legal resident aliens, and both the management and daily business operations are controlled by one or more minority individuals.

"Minority individual" means an individual who is a citizen of the United States or a legal resident alien and who satisfies one or more of the following definitions:

1. "African American" means a person having origins in any of the original peoples of Africa and who is regarded as such by the community of which this person claims to be a part.

2. "Asian American" means a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands, including but not limited to Japan, China, Vietnam, Samoa, Laos, Cambodia, Taiwan, Northern Mariana Islands, the Philippines, a U.S. territory of the Pacific, India, Pakistan, Bangladesh, or Sri Lanka and who is regarded as such by the community of which this person claims to be a part.

3. "Hispanic American" means a person having origins in any of the Spanish-speaking peoples of Mexico, South or Central America, or the Caribbean Islands or other Spanish or Portuguese cultures and who is regarded as such by the community of which this person claims to be a part.

4. "Native American" means a person having origins in any of the original peoples of North America and who is regarded as such by the community of which this person claims to be a part or who is recognized by a tribal organization.

"Service disabled veteran business" means a business that is at least 51 percent owned by one or more service disabled veterans or, in the case of a corporation, partnership, or limited liability company or other entity, at least 51 percent of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more individuals who are service disabled veterans and both the management and daily business operations are controlled by one or more individuals who are service disabled veterans.

"Service disabled veteran" means a veteran who (i) served on active duty in the United States military ground, naval, or air service, (ii) was discharged or released under conditions other than dishonorable, and (iii) has a service-connected disability rating fixed by the United States Department of Veterans Affairs.

"Employment services organization" means an organization that provides community-based employment services to individuals with disabilities that is an approved Commission on Accreditation of Rehabilitation Facilities (CARF) accredited vendor of the Department of Aging and Rehabilitative Services.

VIRGINIA STATE CORPORATION COMMISSION (SCC)
REGISTRATION INFORMATION

The Bidder:

☐ is a corporation or other business entity with the following SCC identification number: _____ **-OR-**

☐ is not a corporation, limited liability company, limited partnership, registered limited liability partnership, or business trust **-OR-**

☐ is an out-of-state business entity that does not regularly and continuously maintain as part of its ordinary and customary business any employees, agents, offices, facilities, or inventories in Virginia (not counting any employees or agents in Virginia who merely solicit orders that require acceptance outside Virginia before they become contracts, and not counting any incidental presence of the Bidder in Virginia that is needed in order to assemble, maintain, and repair goods in accordance with the contracts by which such goods were sold and shipped into Virginia from Bidder's out-of-state location) **-OR-**

☐ is an out-of-state business entity that is including with this bid/proposal an opinion of legal counsel which accurately and completely discloses the undersigned Bidder's current contracts with Virginia and describes why those contracts do not constitute the transaction of business in Virginia within the meaning of §13.1-757 or other similar provisions in Titles 13.1 or 50 of the Code of Virginia.

Please check the following box if you have not checked any of the foregoing options but currently have pending before the SCC an application for authority to transact business in the Commonwealth of Virginia and wish to be considered for a waiver to allow you to submit the SCC identification number after the due date for bids: ☐

RESPONSIBLE BIDDER CERTIFICATION

Name of Bidder: _____

"Responsible bidder" means a person who has the capability, in all respects, to perform fully the contract requirements and the moral and business integrity and reliability that will assure good faith performance, and who has been prequalified, if required.

In determining whether a Bidder is responsible, the County will consider whether the Bidder has defaulted on any government contract in the last five years; whether any government has terminated a contract with the Bidder for cause in the last five years; and whether the Bidder or any of its officers, directors, partners, or owners is currently barred from bidding on contracts by any federal, state, or local government agency.

As part of this submission, the Bidder certifies that:

☐ **It has not defaulted on any government contract in the last five years.**

☐ **No government has terminated a contract with the Bidder for cause in the last five years.**

☐ **Neither it nor any of its officers, directors, partners, or owners are barred from bidding on contracts by any federal, state, or local government agency.**

If the Bidder cannot make <u>any</u> of the certifications required above, the Bidder must indicate the reason by selecting the appropriate box below.

☐ **It has defaulted on one or more government contract(s) in the last five years.**

☐ **A government has terminated a contract with the Bidder for cause in the last five years.**

☐ **It or one or more of its officers, directors, partners, or owners are barred from bidding on contracts by a federal, state, or local government agency.**

If any of the above three boxes are checked, the Bidder must explain all defaults, terminations, and/or bars in reasonable detail and include the contact information for the government agency on whose contract the Bidder has defaulted, been terminated, or been barred from bidding.

_____
Signature of Authorized Representative

_____
Printed Name of Authorized Representative

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SECTION 012100
ALLOWANCES (*AD-01)

PART 1 GENERAL

1.01 SUBMITTALS

A. Allowance Proposal: Submit initial proposal for purchase of products and materials, on Change Order form.

B. Supporting Documentation:

1. Products and Material: Provide invoices and other documents as required, for products and materials indicating quantities, prices, taxes, delivery fees, and other costs.
2. Labor and Installation: Provide time sheets and other documents as required, indicating all on-site Subcontractor costs, including hours worked, quantity or amount of product/material installed, hourly wages, and Subcontractor overhead and profit.

1.02 LUMP-SUM ~~AND QUANTITY~~ ALLOWANCES

A. **Costs Included in Lump-Sum ~~and Quantity~~ Allowances: All Subcontractor's costs: Cost of products and materials, taxes, freight, delivery, receiving and handling, labor and installation, Subcontractor overhead and profit. (*AD-01)**

B. **Costs Not Included in Lump-Sum ~~and Quantity~~ Allowances: All General Contractor's costs: General coordination, GC's overhead and profit. (*AD-01)**

C. Contractor Responsibilities:

1. Assist Architect in selection of products.
2. Obtain proposals from suppliers and installers and offer recommendations.
3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.

D. Contractor shall return unused products and materials that were purchased under allowance to the manufacturer or supplier, and provide credit to the Owner.

E. At closeout of contract, differences in costs for each allowance will be adjusted by Change Order to increase the contract sum or to provide a credit to the Owner, as applicable.

1.03 LUMP SUM ALLOWANCE SCHEDULE

A. Lump Sum Allowance No. 1: Include the stipulated sum of $5,000 for interior panel signage, as specified in Division 10 Section "Signage."

B. Lump Sum Allowance No. 2: Include the stipulated sum of $60,000 for veterinary X-ray system.

C. Lump Sum Allowance No. 3: Include the stipulated sum of $9,000 for veterinary hydraulic surgery table.

D. Lump Sum Allowance No. 4: Include the stipulated sum of $48,584 for Building Automation System (BAS). Work under this allowance shall be provided by Owner-assigned Subcontractor Automated Logic Corporation. Refer to Section 230900 "Building Automation System" and the full scope proposal appended to the end of Section 230900.

1.04 ~~QUANTITY ALLOWANCE SCHEDULE~~ (*AD-01)

A. ~~**Quantity Allowance No. 1: Include 4,000 square feet of removal and replacement of damaged or missing batt insulation. Batt insulation and related accessories are**~~

~~**specified in Division 07 "Thermal Insulation." Coordinate with Division 1 "Unit Prices" for unit price requirements that will be used to determine allowance adjustments.**~~

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 012100

SECTION 072100
THERMAL INSULATION (*AD-01)

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.

B. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

C. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.02 SUBMITTALS

A. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation from physical damage, including chipping, cracking, or soiling. Do not use boards that are damaged due to delivery or handling.

B. Store insulation in a manner that protects from damage or deterioration, including moisture, soiling, or UV exposure.

1.04 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

B. Coordinate with insulation manufacturer for UV exposure requirements and coordinate the schedule of construction to ensure insulation is concealed in a timely manner.

PART 2 PRODUCTS

2.01 MINERAL FIBER BOARD INSULATION MATERIALS

A. Fiber Glass Board Thermal Insulation: Complying with ASTM C612 Type IA or IB; fabricated of inorganic glass fibers factory bonded to an aluminum foil/kraft paper (FSK/FRK) facing.

1. Flame Spread: Flame spread index of 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
3. Board Thickness: 2 inches.
4. Density: 1.6 PCF minimum nominal density.
5. Products:
   a. Basis-of-Design: Knauf; Earthwool Insulation Board.
   b. Johns Manville; Insul-SHIELD.
   c. Owens Corning; Fiberglas 703.

2.02 BLANKET INSULATION MATERIALS

A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
   3. Facing: Unfaced.

2.03 ACCESSORIES

A. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.
   1. Products:
   2. Tape joints of board insulation, and around all penetrations, in accordance with insulation manufacturers' instructions.

B. Board Insulation Fasteners: Wood screws with 2.5 inch square washer retainer. Screws shall be minimum 4 inch long for 1-1/2 inch embedment into wood joists above ceiling; capable of securely and rigidly fastening insulation in place.

C. Insulation Support Wires: Provide 14-gauge steel insulation support wires with mitered tips to dig into wood joist/truss. Length sized for 24 inch joist/truss spacing - verify joist/truss spacing in field. Provide continuous under all above ceiling fiberglass insulation, spaced no further than 16 inches o.c. to prevent insulation sagging.
   1. Basis-of-Design is Simpson Strong-Tie "IS24" Insulation Supports.

D. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 ~~BOARD INSTALLATION AT CAVITY WALLS~~ (*AD-01)

A. ~~**Secure impale fasteners to substrate to manufacturer's required quantity and spacing.**~~

B. ~~**Install boards to fit snugly between wall ties.**~~

C. ~~**Install boards horizontally on walls.**~~
   1. ~~**Install in running bond pattern.**~~
   2. ~~**Butt edges and ends tightly to adjacent boards and protrusions.**~~
   3. ~~**Place impale fastener locking discs.**~~

D. ~~**Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.**~~

3.03 BATT INSTALLATION

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

B. Install in ceiling/attic spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 072100

SECTION 087100 – DOOR HARDWARE (*AD-01)

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.2 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

    a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
    b. Complete (risers, point-to-point) access control system block wiring diagrams.
    c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.3 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check

Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.6 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.
3. Two years for electromechanical door hardware.

1.7 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
b. Hager (HA).
c. Ives (IV).

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:

a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
b. Architectural Builders Hardware (AB).
c. Ives (IV).

C. Pivots: ANSI/BHMA A156.4, Grade 1, certified. Space intermediate pivots equally not less than 25 inches on center apart or not more than 35 inches on center for doors over 121 inches high. Pivot hinges to have oil impregnated bronze bearing in the top pivot and a radial roller and thrust bearing in the bottom pivot with the bottom pivot designed to carry the full weight of the door. Pivots to be UL listed for windstorm where applicable.

1. Manufacturers:

a. Rixson Door Controls (RF).
b. Ives (IV).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide

sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
    a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

    a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – QC-C Series.

2.4 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

5. Manufacturers:

    a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    b. Burns Manufacturing (BU).
    c. Trimco (TC).

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

1. Manufacturers:

    a. Medeco (MC).
    b. No Substitution.

B. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
5. Keyway: Match Facility Standard.

C. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Interchangeable Cores: Core insert, removable by use of a special key; usable with other manufacturers' cylinders.

D. Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified patented cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer’s United States patents. Cylinders are to be factory keyed with owner having the ability for on-site original key cutting.

1. Manufacturers:

a. Medeco (MC) - Keymark Series.
b. No Substitution.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Key locks to Owner's existing system.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Three (3).
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).
4. Construction Control Keys (where required): Two (2).
5. Permanent Control Keys (where required): Two (2).

G. Construction Keying: Provide temporary keyed construction cores.

H. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Manufacturers:

a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) – 8800 Series.
b. Corbin Russwin Hardware (RU) – ML2000 Series.
c. dormakaba Best (BE) – 40H series.

2.7 CYLINDRICAL LOCKS AND LATCHING DEVICES

A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed cylindrical locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide locksets with functions and features as follows:
   a. Meets ANSI/BHMA A156.41 for single motion egress.
   b. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
   c. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
   d. Meets UL Certification Directory ZHLL.R21744 for products used in windstorm rated assemblies.
   e. Exceeds ANSI/BHMA A156.2 requirements by 2.6 times for 3,100 in-lb. abusive locked lever torque with no entry while maintaining egress.
   f. Exceeds ANSI/BHMA A156.2 requirements by 8 times for 1,600 lbs. offset lever pull with no entry for protection against attacks.
   g. Exceeds ANSI/BHMA A156.3 requirements by 2 times for latch retraction with 100 lb. preload while maintaining operation in warped doors.
   h. Exceeds ANSI/BHMA A156.3 requirements by 20 times for no access with minimum 100 vertical impacts for protection against vandalism attempts.
   i. Independent return springs allow lock to exceed ANSI/BHMA A156.2 Grade 1 cycle requirements without lever sag.
   j. Ten-year limited warranty for mechanical functions.
2. Manufacturers:
   a. ASSA ABLOY ACCENTRA, formerly known as Yale (YA) - 4700LN Series.
   b. Corbin Russwin Hardware (RU) - CLX3300 Series.
   c. dormakaba Best (BE) - 9K Series.

2.8 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.9 ELECTRIC STRIKES

A. Standard Electric Strikes: Heavy duty, cylindrical and mortise lock electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Stainless steel construction with dual interlocking plunger design tested to exceed 3000 lbs. of static strength and 350 ft-lbs. of dynamic strength. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified. Provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike where specified.

1. Manufacturers:

a. HES (HS).
b. Security Door Controls (SD).
c. Von Duprin (VD).

B. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) – DC6000 Series.
b. LCN Closers (LC) – 1450 Series.
c. Sargent Manufacturing (SA) – 1431 Series.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:

    a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

    a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    b. Burns Manufacturing (BU).
    c. Trimco (TC).

2.12 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    b. Ives (IV).
    c. Hager (HA).

2.13 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
2. Hager (HA).
3. Zero (ZE).

2.14 ELECTRONIC ACCESSORIES

A. Request-to-Exit Motion Sensor: Request-to-Exit Sensors motion detectors specifically designed for detecting exiting through a door from the secure area to a non-secure area. Include built-in timers (up to 60 second adjustable timing), door monitor with sounder alert, internal vertical pointability coverage, 12VDC or 24VDC power and selectable relay trigger with fail safe/fail secure modes.

1. Manufacturers:

a. Securitron (SU) - XMS Series.

B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

a. Securitron (SU) - DPS Series.

C. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Manufacturers:

a. Securitron (SU) - BPS Series.

2.15 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.16 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. RF - Rixson
4. RO - Rockwood
5. RU - Corbin Russwin
6. MC - Medeco
7. HS - HES
8. NO - Norton
9. SU - Securitron

Hardware Sets

Set: 1.0

Doors: 160

1	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
1	Storeroom Deadbolt Lock	ML2049 ASA LC	630	RU
1	Mortise Cylinder	33702022K (CAM TO SUIT)	26	MC
1	Electric Strike	1600	630	HS
1	SMART Pac Bridge Rectifier	2005M3		HS
1	Surface Closer	DC6210 A4	689	RU
1	Kick Plate	K1050 10" HVBEV CSK	US32D	RO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
1	Gasketing (Head/Jambs)	S773BL		PE
1	Sweep (w/ drip edge)	3452CNB		PE
1	Door Position Switch	DPS2-M/W-BK		SU
1	Request To Exit Sensor	XMS		SU
1	Power Supply	BPS-24-1		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		

Notes:
• Card reader by security integrator.
• Electronic Operation: Valid card releases electric strike or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.

Set: 2.0

Doors: 118, 118B

1	Pivot Set, Lead Lined	L147	626	RX
1	Intermediate Pivot, Lead Lined	ML19	626	RX
1	Storeroom Lock, Lead Wrapped	CLX3357 AZD LC M28	626	RU
1	Mortise Cylinder	33702022K (CAM TO SUIT)	26	MC
1	Electric Strike	1600	630	HS
1	SMART Pac Bridge Rectifier	2005M3		HS
1	Surface Closer	DC6200 A10/A3 M108 (TO SUIT)	689	RU
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
1	Door Position Switch	DPS2-M/W-BK		SU
1	Request To Exit Sensor	XMS		SU
1	Power Supply	BPS-24-1		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		

Notes:
• Card reader by security integrator.
• Electronic Operation: Valid card releases electric strike or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.

Set: 3.0

Doors: 128

3	Hinge	TA714	US26D	MK
1	Office Lock	CLX3351 AZD LC	626	RU
1	Mortise Cylinder	33702022K (CAM TO SUIT)	26	MC
1	Surface Closer	DC6210 A10	689	RU
1	Kick Plate	K1050 10" HVBEV CSK	US32D	RO
3	Silencer	608/609	GRY	RO

Set: 4.0

Doors: 119

3	Hinge	TA714	US26D	MK
1	Storeroom Lock	CLX3357 AZD LC	626	RU
1	Mortise Cylinder	33702022K (CAM TO SUIT)	26	MC
1	Surface Closer	DC6200 A4	689	RU
1	Kick Plate	K1050 10" HVBEV CSK	US32D	RO
1	Gasketing (Head/Jambs)	S88BL		PE

Set: 5.0

Doors: 129, 130, 131

3 Hinge	TA714	US26D	MK
1 Office Lock	CLX3351 AZD LC	626	RU
1 Mortise Cylinder	33702022K (CAM TO SUIT)	26	MC
1 Door Stop	403/441CU (TO SUIT)	US26D	RO
3 Silencer	608/609	GRY	RO

Set: 6.0

Doors: 120B

3 Hinge	TA714	US26D	MK
1 Classroom Lock	CLX3357 AZD LC	626	RU
1 Mortise Cylinder	33702022K (CAM TO SUIT)	26	MC
1 Custom Strike	TO SUIT EXISTING FRAME	626	RO
1 Door Stop	403/441CU (TO SUIT)	US26D	RO
3 Silencer	608/609	GRY	RO

Notes:
• Hardware supplier shall verify existing hinge, lock, and strike preparations in existing opening prior to submittals of hardware schedules.
• Coordinate new hardware with existing frame.

Set: 7.0

Doors: 139

1 Sliding Door Operator	BY OTHERS	OT
2 Push Button	BY OTHERS	OT

Notes:
• Door, frame, balance of hardware by sliding door manufacturer.

END OF SECTION 087100

SECTION 098430
SOUND-ABSORBING WALL AND CEILING UNITS (*AD 01)

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

B. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. ASTM E795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests.

1.02 SUBMITTALS

A. Product Data: Manufacturer's printed data sheets for products specified.

B. Shop Drawings: Fabrication and installation details, panel layout, fabric orientation, and wood grain orientation.

C. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details and mounting hardware.

D. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.

B. Store units flat, in dry, well-ventilated space; do not stand on end.

C. Protect edges from damage.

1.04 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a two-year period for failure of materials or workmanship commencing on the Date of Substantial Completion.

1. Failures include but are not limited to acoustic performance, fabric separation from core or fabric sagging, panel distortion or warping.

PART 2 PRODUCTS

2.01 WOOD FIBER SOUND-ABSORBING UNITS

A. Manufacturers:

1. Armstrong World Industries, Inc; Tectum Direct-Attach.
2. Cardinal Acoustics; Direct Attached Panel.
3. Conwed; Arborcoustic.
4. Troy Acoustics Corporation; Troy Board.
5. Substitutions: See Section 016000 - Product Requirements.

B. Wood Fiber Acoustical Panels for Walls: Cementitious wood fiber.

1. Size: As indicated on Architectural drawings.

2. Thickness: 1 inch.
3. Noise Reduction Coefficient (NRC): 0.80 minimum when tested in accordance with ASTM C423 for Type C-20 mounting, per ASTM E795.
4. Panel Edge: Beveled.
5. Surface Pattern: Coarse.
6. Surface Color: Manufacturer's standard; panels shall be field-painted. **Paint color to be selected by Architect. Multiple color shall be required; 2 colors maximum. (*AD 01)**
7. Installation Method (Wall): Direct-attached over 1 inch depth furring strips and 3 lb rigid/semi-rigid glass fiber acoustic board.
   a. Furring Strips: 1 inch depth wood furring.
   b. Fiberboard Insulation: Rigid/semi-rigid mineral fiber, ASTM C612, unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.

2.02 FABRICATION

A. Fabric Wrapped, General: Fabricate panels to sizes and configurations as indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.

B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

2.03 ~~ACCESSORIES~~

A. ~~Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:~~
   1. ~~Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.~~**(*AD 01)**

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.

B. ~~Install mounting accessories and supports in accordance with shop drawings.~~ **(*AD 01)**

C. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.

D. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
   1. Plumb and level.
   2. Flatness.
   3. Width of joints between panels; where applicable.

3.03 CLEANING

A. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 PROTECTION

A. Provide protection of installed acoustical panels until Date of Substantial Completion.

B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION 098430

SECTION 115300
LABORATORY EQUIPMENT (*AD-01)

PART 1 GENERAL

1.01 PRICE AND PAYMENT PROCEDURES

A. Refer to Section 012100 - Allowances, for lump sum allowances and associated requirements affecting this section. Allowances include indicated laboratory equipment (veterinary X-ray and surgery table) and includes furnish (purchase and delivery) and installation.

1.02 REFERENCE STANDARDS

A. NEMA MG 00001 - Motors and Generators.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate installation of laboratory equipment with laboratory casework and Owner-furnished, Owner-installed laboratory equipment.

B. Preinstallation Meeting: Convene one week before starting work of this section.

1.04 SUBMITTALS

A. Product Data: Provide equipment dimensions and construction; equipment capacities; physical dimensions; utility and service requirements, clearances, and locations; required accessories and optional features; point loads.

B. Shop Drawings: Indicate equipment locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances, installation and servicing clearances required.

C. Operation Data: Include description of equipment operation and required adjusting and testing.

D. Maintenance Data: Identify system maintenance requirements, servicing cycles, lubrication types required and local spare part sources.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package each piece of equipment to ensure protection from damage during shipment and delivery. Legibly indicate on the exterior of each container or crate, the shipping address and a brief description of its contents. Outside of the container, fasten a waterproof envelope containing a packing list and complete instructions for uncrating and setting the equipment in place.

B. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Contractor furnishes and installs equipment noted as CFCI.

B. Each item energized by a single switch.

C. Prewire and prepipe each unit of equipment complete with trim and fittings. Include reduced pressure or atmospheric type backflow preventer fitting to prevent backflow of polluted water or waste into water supply system or equipment. Comply with applicable code requirements.

D. Installation Accessories: Provide all rough-in frames, anchors, supports, accessories and closure trim required for complete installation.

E. Use corrosion-resistant materials for all rivets, bolts, nuts, studs, spacers, and welding metal.

F. Fully assemble equipment in factory, except for those items which cannot be moved to their final locations as single item due to new construction space restrictions.

2.02 STERILIZERS/AUTOCLAVE

A. Sterilizer: (CFCI) Medium scientific sterilizer.
   1. Basis-of-Design: Tuttnauer; T-Edge11.
   2. General: High-performance sterilizer (autoclave) specifically designed for sterilizing or decontaminating laboratory items of many sizes and types, with programmable treatment options.
      a. UL listed and/or approved electrical devices and components, bearing NEMA MG 00001, IEC or other recognized International ratings, as appropriate for the use intended. Low-voltage DC outputs external to the electrical box.
   3. Mounting: Countertop, free-standing.
   4. Chamber Interior Dimensions: 18 inch deep by 11 inch diameter; 27 liter.
   5. Doors: Number, type, and construction indicated.
      a. Number of Doors: One.
      b. Hinged, manual-type.
   6. Operator Controls: Digital type, with touch screen controls and multi-level menus.
   7. Control and Monitoring System: Controller, gauges, and wiring.
      a. Controller: Microcomputer based controller monitoring and controlling all aspects of equipment cycle and process operations. Provide battery backup of microprocessor memory. Controller to ensure fully automatic operation through all equipment cycles.
      b. Jacket and chamber pressure gauges.
      c. Chamber capillary temperature gauge.
   8. Electrical Requirements: 120v, 60Hz.
   9. Include ethernet port, USB ports, and WiFi connectivity.
   10. Verify and coordinate water and drain connections with plumbing subcontractor to ensure proper sizing.
   11. Personnel Safety: Design units to integrate personnel safety features typical to the industry including, but not limited to:
      a. Door operation limiters preventing operator from opening door(s) when unsafe conditions are present.
         1) When chamber is pressurized.
         2) When a liquid load is at an elevated temperature.

2.03 GLASSWARE WASHERS

A. Glassware Washer: (CFCI) Undercounter capacity.
   1. ~~**Basis-of-Design: Hobart; LXeC Chemical Sanitizing Undercounter Dishwashing Machine.**~~ **(*AD-01)**
   2. **Basis-of-Design: Hobart; Centerline CUL Chemical Sanitizing Undercounter Dishwasher. (*AD-01)**
   3. General: High-performance commercial-quality washer specifically designed for cleaning laboratory glassware of many sizes and types, with programmable treatment options and controlled intake of chemicals.

a. UL listed and/or approved electrical devices and components, bearing NEMA MG 00001, IEC or other recognized International ratings, as appropriate for the use intended. Low-voltage DC outputs external to the electrical box.

4. Mounting: On floor, undercounter.
5. **Heating: ~~Steam~~ Electric. (*AD-01)**
6. Doors: Number, type, and construction indicated.
   a. **Number of Doors: ~~Two~~ One. (*AD-01)**
   b. Operation: Front, drop-down, manually-operated, spring counterbalanced; capable of supporting full glassware load and functioning as a loading platform to eliminate the requirement for a loading trolley; double-wall construction; insulated to minimize noise and surface temperature.
   c. **~~Double-pane tempered glass viewing panel.~~ (*AD-01)**
   d. Gaskets: Manufacturer's standard for type door specified, manufactured to withstand temperatures and pressures generated.
7. Interior Illumination: Manufacturer's standard luminaire(s) located on top of the Washer, complete with electronic ballast, gasketed tempered safety glass diffuser, and using fluorescent lamps.
8. **Washing System: Manufacturer's standard~~, configured for two-level loading and washing, and rinse-water source options~~. (*AD-01)**
9. Electrical Requirements: 120v, 60 Hz, 20 A circuit.
10. Operator Controls: Digital type, with touch screen controls and multi-level menus.
11. Personnel Safety: Integrated personnel safety features typical to the industry.

2.04 VETERINARY PASS-THRU CABINET

A. General: Provide 18 gauge, Type 304 stainless steel framed thru-wall wall-mounted cabinet, with tempered glass door infill on both sides.
   1. Size (basis-of-design): 36 inches wide by 36 inches high by 12 inches deep, with two adjustable glass shelves.
   2. Manufacturers:
      a. Basis-of-Design: TriStar Vet; Veterinary Pass-Thru Medical Window Cabinet 700-50.
      b. Continental Metal Products.
      c. Terra Universal.

2.05 NARCOTICS SAFE

A. General: Provide locking, wall-mounted narcotic cabinet. Safe shall include double door system with separate key for each door. DEA-compliant for secure storage of Schedule III, IV, and V controlled substances. Fabricate of heavy duty 20-gauge steel, fully welded construction.
   1. Size (basis-of-design): Minimum 16 inch wide by 24 inch high by 8 inch deep, with minimum two adjustable steel shelves.
   2. Provide full length piano hinges with non-removable pins.
   3. Key Function: Key cannot be removed from door while door is in the unlocked position.
   4. Manufacturers:
      a. Basis-of-Design Product: Graham Field; Model 3008 Narcotic Safe.
      b. OmniMed, Inc.
      c. Midmark.

2.06 EQUIPMENT TO BE PROVIDED VIA ALLOWANCE

A. X-Ray: Furnish and install veterinary X-ray device via lump sum allowance. Refer to Division 1 Section "Allowances."

B. Hydraulic Surgery Table: Furnish and install veterinary hydraulic surgery table via lump sum allowance. Refer to Division 1 Section "Allowances."

END OF SECTION 115300

SECTION 224000 - PLUMBING FIXTURES *AD-01

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. FRP: Fiberglass-reinforced plastic.

C. PMMA: Polymethyl methacrylate (acrylic) plastic.

D. PVC: Polyvinyl chloride plastic.

E. RFI:Request for information.

F. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.

G. Cast Polymer: Cast-filled-polymer-plastic material. This material includes cultured-marble and solid-surface materials.

H. Cultured Marble: Cast-filled-polymer-plastic material with surface coating.

I. Fitting: Device that controls flow of water into or out of plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, showerheads and tub spouts, drains and tailpieces, and traps and waste pipes.

J. Solid Surface: Nonporous, homogeneous, cast-polymer-plastic material with heat-, impact-, scratch-, and stain-resistance qualities.

K. Other Manufacturers: Use one of those listed.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and security anchors for security plumbing fixtures.
2. Include rated capacities, operating characteristics, and furnished specialties and accessories.

B. Performance Submittals:

1. Product Data:
   a. Documentation indicating flow and water consumption requirements.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For security plumbing fixtures and components to include in maintenance manuals.

B. Faucet Cartridges, washers, aerators, and O-Rings: Equal to five percent (5%) of amount of each type and size installed but not less than five (5) of each type and size.

C. Provide Minimum number of key operators (wrenches/tools) for loose key stops, wall hydrants, aerators, security fasteners and any fixture where a key, security fastener, or special tool is required:

1. One (1) for ten percent (10%) of each size or ten (10), whichever is less.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category through one source from a single manufacturer.

1. Exception: If fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for that category.

B. Electrical Components, Devices, and Accessories: Electrical components, devices, and accessories shall be listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities. Comply with requirements in Public Law 102-486, "Energy Policy Act," regarding water flow and consumption rates for plumbing fixtures.

D. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

E. EPA WaterSense: Provide fixtures with WaterSense labeling for all applicable and eligible fixtures and accessories.

F. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

G. Comply with the following standards and other requirements where applicable:

1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
2. Porcelain-Enameled, Formed-Steel Fixtures: ASME A112.19.4M.
3. Slip-Resistant Bathing Surfaces: ASTM F 462.
4. Solid-Surface-Material Lavatories and Sinks: ANSI/ICPA SS-1.
5. Stainless-Steel Commercial, Handwash Sinks: NSF 2 construction.
6. Stainless-Steel Residential Sinks: ASME A112.19.3.
7. Vitreous-China Fixtures: ASME A112.19.2M.
8. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.
9. Water-Closet, Flushometer Tank Trim: ASSE 1037.
10. Whirlpool Bathtub Fittings: ASME A112.19.8M.
11. Backflow Protection Devices for Faucets with Side Spray: ASME A112.18.3M.
12. Backflow Protection Devices for Faucets with Hose-Thread Outlet: ASME A112.18.3M.
13. Diverter Valves for Faucets with Hose Spray: ASSE 1025.

14. Faucets: ASME A112.18.1.
15. Hose-Connection Vacuum Breakers: ASSE 1011.
16. Hose-Coupling Threads: ASME B1.20.7.
17. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
18. NSF Potable-Water Materials: NSF 61.
19. Pipe Threads: ASME B1.20.1.
20. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
21. Supply Fittings: ASME A112.18.1.
22. Brass Waste Fittings: ASME A112.18.2.
23. Backflow Protection Devices for Hand-Held Showers: ASME A112.18.3M.
24. Combination, Pressure-Equalizing and Thermostatic-Control Antiscald Faucets: ASSE 1016.
25. Deck-Mounted Bath/Shower Transfer Valves: ASME 18.7.
26. Faucets: ASME A112.18.1.
27. Hand-Held Showers: ASSE 1014.
28. High-Temperature-Limit Controls for Thermal-Shock-Preventing Devices: ASTM F 445.
29. Hose-Coupling Threads: ASME B1.20.7.
30. Manual-Control Antiscald Faucets: ASTM F 444.
31. Pipe Threads: ASME B1.20.1.
32. Pressure-Equalizing-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.
33. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
34. Thermostatic-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.
35. Atmospheric Vacuum Breakers: ASSE 1001.
36. Brass and Copper Supplies: ASME A112.18.1.
37. Dishwasher Air-Gap Fittings: ASSE 1021.
38. Manual-Operation Flushometers: ASSE 1037.
39. Plastic Tubular Fittings: ASTM F 409.
40. Brass Waste Fittings: ASME A112.18.2.
41. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.
42. Disposers: ASSE 1008 and UL 430.
43. Dishwasher Air-Gap Fittings: ASSE 1021.
44. Flexible Water Connectors: ASME A112.18.6.
45. Floor Drains: ASME A112.6.3.
46. Grab Bars: ASTM F 446.
47. Hose-Coupling Threads: ASME B1.20.7.
48. Hot-Water Dispensers: ASSE 1023 and UL 499.
49. Off-Floor Fixture Supports: ASME A112.6.1M.
50. Pipe Threads: ASME B1.20.1.
51. Plastic Shower Receptors: ANSI Z124.2.
52. Plastic Toilet Seats: ANSI Z124.5.
53. Supply and Drain Protective Shielding Guards: ICC A117.1.
54. Whirlpool Bathtub Equipment: UL 1795.

1.6 COORDINATION

A. Coordinate all accessories. Ensure items fit and work together as an assembly. Provide additional accessories to accommodate final installed field conditions; to include, but not limited to, offsets and other items required for ADA compliance. Provide necessary accessories and components for complete installation.

B. Coordinate roughing-in and final plumbing fixture locations and verify that fixtures can be installed to comply with design.

C. Model numbers are intended to identify families of fixtures and may be incomplete. Refer to other contract documents for hand.

D. Where fixtures or its associated components are installed in rated floors, walls, or ceilings; provide rated fixtures, accessories, and components of equal rating.

E. Where the flush valve assembly height would conflict with the rear grab bar installation (including the minimum 1-1/2" clearance to the bottom of the grab bar), the vacuum breaker flush tube shall be shortened. Shortening of the vacuum breaker flush tube shall not exceed the manufacturer's requirements for maintaining proper operation, including the CL (critical line) markings on the flush tube if provided by the manufacturer to indicate shortening limitations.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Faucet Cartridges, washers, aerators, and O-Rings: Equal to 5 percent of amount of each type and size installed but not less than 5 of each type and size.

PART 2 - PRODUCTS *AD-01

2.1 (EW-1) EYE/FACEWASH STATION (ACCESSIBLE)

A. Manufacturer & Model Number: Haws 7656WCC

1. Barrier-free accessibility.
2. 18-gauge, type 304 stainless steel recessed cabinet.
3. Eye/face wash head with directional laminar flow.
4. Pulldown activation.
5. Stainless steel drain pan within cabinet.
6. 1/2" NPT inlet.
7. 2" NPT drain.
8. 4.20gpm with flow control.

B. (TMV-2) Emergency Thermostatic Mixing Valve: Haws TWBS.EWE

1. Adjustable set point with temperature range.
2. Rough bronze finish.
3. Set for 85°F.
4. ASSE-1071 compliant.
5. NSF-61 compliant.
6. Positive shutoff of hot supply when cold supply is lost.
7. Anti-scald protection with cold water bypass in of hot water failure or tempering valve failure.
8. Equipped with check-stops and strainers.
9. Wall support.
10. ½" – ¾" inlets.

11. ½" – ¾" outlet.

C. Other Manufacturers: Provide products, features, and accessories equal to those specified above.

1. Eye Wash Station:
   a. Haws Corp.
   b. Bradley Corporation
   c. Guardian
   d. Encon

2. Emergency Thermostatic Mixing Valve:
   a. Haws Corp.
   b. Bradley Corporation
   c. Guardian
   d. Encon

2.2 (**SK-1**) KITCHENETTE SINK (ACCESSIBLE) DOUBLE BOWL

A. Manufacturer & Model Number: Elkay LRADQ331955

1. Material: 18 Gauge Stainless Steel
2. Overall Length (Right to Left): 33"
3. Overall Width (Front to Back): 19-1/2"
4. Inside Bowl Depth: 5-1/2"
5. Mounting: Inside hole ratchet system equal to Elkay Quick-Clip® mounting system. Systems requiring access from below shall not be permitted.
6. Number of Bowls: 2
7. Centerline to Centerline of Waste: 15-1/4"
8. Deck Hole drilling configuration: 1 hole, centered on faucet ledge for faucet.

B. Faucet: Elkay Semi-Pro LKAV1061

1. Hole configuration: 1 Hole installation, centered.
2. Spout: 8-1/2" flexible gooseneck swing spout with built-in, hand-held, pull-down, hose spray.
3. Handles: Single side-mounted lever.
4. Aerator: Vandal resistant, pressure compensating, 1.50 gpm
5. Cartridges: Ceramic or compression ¼-turn.
6. Meets ADA requirements: Yes
7. Provide ASSE-1070.
8. Other:
   a. Red & blue temperature indicators. Red = Hot, blue = cold.

C. Basket Strainer & Tail Piece (2 Required): McGuire Part Number 151

1. Material: Forged brass, chrome plated.
2. Tailpiece: 1-1/2" x 4", 20-gauge, seamless brass, chrome plated.
   a. Provide ADA offset to ensure accessible approach clearance.
3. Nuts: Cast brass lock, slip, and coupling, chrome plated

D. Continuous Waste: McGuire Part Number 111C16G17

1. Material: Cast Brass
2. Configuration: End outlet.

3. Finish: Chrome plated
4. Gauge: 17
5. Size: 1½" by 1½"

E. Trap: McGuire Part Number 8912-C-F

1. Size: 1-1/2" x 1-1/2"
2. Material: Polished chrome plated cast brass.
3. Cleanout plug: Yes
4. Nuts: Polished chrome plated brass.
5. Wall bend: 17-gauge seamless tubular chrome plated brass.
6. Wall flange: Chrome plated brass with setscrew. Where pipe protrudes from wall contractor may provide deep flange.

F. Supplies: McGuire Part Number 2167-N3-F

1. Inlet: ½" IPS
2. Outlet: ½" OD compression.
3. Nipple: ½" x 3" chrome plated brass.
4. Wall flange: Heavy brass chrome plated with set-screw.

G. Insulation: Tru-Bro Lav Guard #102

1. Insulate P-trap, angle valves, cold risers, and continuous waste.
2. Notes:
   a. Where piping is covered by casework, insulation is not required.
   b. Insulation for continuous waste is not included in kit and must be provided separately.

H. Other Manufacturers: Provide products, features, and accessories equal to those specified above.

1. Sink:
   a. Acorn-Sinks
   b. Advance Tabco
   c. Kohler
   d. Just
   e. Eagle Group
   f. Elkay

2. Faucet:
   a. Cambridge Bras
   b. Delta
   c. Elkay
   d. Moen
   e. Speakman
   f. T&S Brass

3. Basket Strainer & Tail Piece:
   a. Kohler
   b. Cambridge Brass

4. Trap:
   a. Kohler
   b. Cambridge Brass

5. Supplies:
   a. Cambridge Brass
   b. Kohler

2.3 (**SK-2**) SCRUB SINK WITH FOOT CONTROL

A. Manufacturer & Model Number: Elkay EWS3120FC

1. Material: 14 Gauge Stainless Steel
2. Overall Length (Right to Left): 31"
3. Overall Width (Front to Back): 19-1/2"
4. Inside Bowl Depth: 10-1/2"
5. Mounting: Wall-mounted with wall hanger and wall support brackets.
6. Number of Bowls: 1
7. Backsplash Hole Drilling Configuration: 1 hole, centered on backsplash for faucet.

B. Faucet: Elkay LK395A and Foot Control: LK398C

1. Hole configuration: 1 Hole installation, centered on backsplash.
2. Spout: 3-5/8" fixed gooseneck spout with foot control operation.
3. Handles: Foot control operation anchored to wall with rigid supply extensions concealed in wall.
4. Aerator: Vandal resistant, pressure compensating, 2.20 gpm
5. Cartridges: Ceramic or compression ¼-turn.
6. Meets ADA requirements: Yes
7. Provide ASSE-1070.
8. Other:
   a. Red & blue temperature indicators. Red = Hot, blue = cold.

C. Basket Strainer & Tail Piece: McGuire

1. Material: Forged brass, chrome plated.
2. Tailpiece: 1-1/2" x 4", 20-gauge, seamless brass, chrome plated.
   a. Provide ADA offset to ensure approach clearance.
3. Nuts: Cast brass lock, slip, and coupling, chrome plated

D. Trap: McGuire Part Number 8912-C-F

1. Size: 1-1/2" x 1-1/2"
2. Material: Polished chrome plated cast brass.
3. Cleanout plug: Yes
4. Nuts: Polished chrome plated brass.
5. Wall bend: 17-gauge seamless tubular chrome plated brass.
6. Wall flange: Chrome plated brass with setscrew. Where pipe protrudes from wall contractor may provide deep flange.

E. Supplies: McGuire Part Number 2167-N3-F

1. Inlet: ½" IPS
2. Outlet: ½" OD compression.
3. Nipple: ½" x 3" chrome plated brass.
4. Wall flange: Heavy brass chrome plated with set-screw.

F. Insulation: Tru-Bro Lav Guard #102

1. Insulate P-trap, angle valves, cold risers, and continuous waste.
2. Notes:
   a. Where piping is covered by casework, insulation is not required.
   b. Insulation for continuous waste is not included in kit and must be provided separately.

G. Other Manufacturers: Provide products, features, and accessories equal to those specified above.

1. Sink:
   a. Acorn-Sinks
   b. Advance Tabco
   c. Kohler
   d. Just
   e. Eagle Group
   f. Elkay

2. Faucet and Foot Controls:
   a. Cambridge Bras
   b. Delta
   c. Elkay
   d. Moen
   e. Speakman
   f. T&S Brass

3. Basket Strainer & Tail Piece:
   a. Kohler
   b. Cambridge Brass

4. Trap:
   a. Kohler
   b. Cambridge Brass

5. Supplies:
   a. Cambridge Brass
   b. Kohler

2.4 (**SK-3**) ANIMAL GROOMING SINK WITH TRAP-TYPE HAIR INTERCEPTOR ***AD-01**

A. Manufacturer & Model Number: Shor-Line Elite Grooming 904.0702

1. Material: Stainless Steel
2. Overall Length (left to right): 55”
3. Overall Width (front to back): 24”
4. Mounting: Floor-mounted with adjustable stainless-steel legs.
5. Provide door side based on contract drawings and installation location.
6. Provide slip-resistant tread on integral stairs.
7. Side Panel Hole Drilling Configuration: 2 holes, 8” apart, centered on side panel.

B. Faucet: **T&S Brass B-2278**

1. Hole configuration: 2 Hole installation, 8” centers.

2. Spout: 18" riser with vacuum breaker and 44" flexible stainless-steel hose with heat resistant handle and spray valve assembly and overhead spring return.
3. Handles: Levers.
4. Aerator: Vandal resistant, pressure compensating, 1.15 gpm
5. Cartridges: Ceramic or compression ¼-turn.
6. Integral check stops.
7. Provide ASSE-1070.
8. Other:
   a. Red & blue temperature indicators. Red = Hot, blue = cold.

C. Basket Strainer & Tail Piece: McGuire Part Number 151

1. Material: Forged brass, chrome plated.
2. Tailpiece: 1-1/2" x 4", 20-gauge, seamless brass, chrome plated.
3. Nuts: Cast brass lock, slip, and coupling, chrome plated

D. Hair Trap (Hair Interceptor): **Striem SideKick** or Integral with sink assembly.

1. **Side,** top, or bottom access.
2. Fixture trap-type.
3. 1½" threaded inlet, 1½" threaded side outlet.
4. **Composite housing/body**.
5. Cover with gasket.
6. Removable **basket/screen**.

E. Supplies: McGuire Part Number 2167-N3-F

1. Inlet: ½" IPS
2. Outlet: ½" OD compression.
3. Nipple: ½" x 3" chrome plated brass.
4. Wall flange: Heavy brass chrome plated with set-screw.

F. Other Manufacturers: Provide products, features, and accessories equal to those specified above.

1. Sink:
   a. Acorn-Sinks
   b. Advance Tabco
   c. Kohler
   d. Just
   e. Eagle Group
   f. Elkay

2. Faucet:
   a. Cambridge Bras
   b. Delta
   c. Elkay
   d. Moen
   e. Speakman
   f. T&S Brass

3. Basket Strainer & Tail Piece:
   a. Kohler
   b. Cambridge Brass

4. Hair Trap:
   a. Josam
   b. J.R. Smith
   c. MiFab
   d. Striem
   e. Zurn

5. Supplies:
   a. Cambridge Brass
   b. Kohler

2.5 (**WB-1**) WASHER BOX CONNECTION

A. General: Recessed-mounting, reversible, metal washing machine outlet box with ½" IPS or copper sweat supply fittings complying with ASME A112.18.1M. Include box with faceplate, services indicated for equipment connections, and reinforcement.

B. Manufacturer: GuyGray WB200HA

1. ¼" turn ball valves
2. Long shank adapters
3. 2" drain

C. Available Manufacturers:

1. Acorn Engineering Company.
2. IPS Corporation, Guy Gray
3. Oatey.
4. Symmons Industries, Inc.
5. Zurn Industries, Inc.; Jonespec Div.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for water soil and for waste piping systems and supports to verify actual locations and sizes of piping connections and that locations and types of supports match those indicated, before plumbing fixture installation. Manufacturer's roughing-in data overrides all other indicated data.

B. Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FIXTURE INSTALLATION

A. Assemble fixtures, trim, fittings, and other components according to manufacturers' written instructions.

B. For wall-hanging fixtures, install off-floor supports affixed to building substrate.

C. Install back-outlet, wall hanging fixtures onto waste fitting seals and attach to supports.

D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.

E. Install wall-hanging fixtures with tubular waste piping attached to supports.

F. Install counter-mounted fixtures in and attached to casework.

G. Install fixtures level and plumb according to manufacturers' written instructions and roughing-in drawings.

H. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.

1. Exception: Use ball valve if stops are not specified with fixture. Refer to Section "Valves".

I. Install trap and waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.

J. Install waste piping on drain outlet of each fixture to be indirectly connected to drainage system.

K. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

L. Install water supply, flow-control fittings with specified flow rates in fixture supplies at stop valves.

M. Install faucet, flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

N. Install traps on fixture outlets.

1. Exception: Omit trap on fixtures with integral traps.
2. Exception: Omit trap on indirect wastes, unless otherwise indicated.

O. Install escutcheons at piping wall-ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings. Refer to Division 22 Section "Common Work Results For Plumbing" for escutcheons.

P. Refer to Section "Joint Sealants" for sealant and installation requirements.

Q. Shutoff valves shall be provided and located on each floor, on takeoffs from all vertical risers, branch lines from the mains, and at the branch connections to each fixture.

3.3 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect water supplies from water distribution piping to fixtures.

C. Connect drain piping from fixtures to drainage piping.

D. Supply and Waste Connections to Plumbing Fixtures: Connect fixtures with water supplies, stops, risers, traps, and waste piping. Use sizes required to match fixtures. Connect to plumbing piping.

E. Supply and Waste Connections to Fixtures and Equipment Specified in Other Sections: Connect fixtures and equipment with water supplies, stops, risers, traps, and waste piping. Use size fittings required to match fixtures and equipment. Connect to plumbing piping.

F. Ground equipment: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Verify that installed fixtures are categories and types specified for locations where installed.

B. Check that fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

E. Install fresh batteries in sensor-operated mechanisms.

3.5 ADJUSTING

A. Replace washers and seals or cartridges of leaking and dripping faucets, stops, and valves.

3.6 CLEANING

A. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Do the following:

1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
2. Remove sediment and debris from drains.

3.7 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 224000

SECTION 230713 – FIRE RATED INSULATION SYSTEMS (AD-01)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes insulating the following duct services:
   1. This section specifies material and equipment to provide a 2-hour fire-resistive rated duct enclosure for air distribution systems.

B. Related Sections:

   1. Section 230700 "HVAC Insulation."
   2. Section 233113 "Metal Ducts".

1.3 CODES AND STANDARDS

A. The following published specifications, standards, or tests apply to flexible, fire rated duct wrap systems in this section:
   1. International Organization for Standardization (ISO).
   2. Virginia Uniform Statewide Building Code.
   3. Virginia Mechanical Code.
   4. ASTM E-119 Standard Test Methods for Fire Tests of Building Construction and Materials.
   5. ISO 6944 - 1985 Edition, Fire Resistance Tests for Ventilation Air Ducts.
   6. ASTM E-84, UL/ULC 723 Standard Test Method for Surface Burning Characteristics of Building Materials.
   7. ASTM E-814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
   8. ASTM E-518 Standard Test Method for Thermal Resistance.
   9. ASTM C-411 Standard Test Method for Hot Surface Performance of High-Temperature Thermal Insulation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include a complete copy of the listing report as published by the NRTL.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at elbows, fittings, dampers, specialties and flanges for each type of insulation.
3. Detail application of field-applied jackets.
4. Detail application at linkages of control devices.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Fire-Test Response Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

B. Store in a covered dry environment.

1.8 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with duct Installer for duct insulation application. Before preparing ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.9 SCHEDULING

A. Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Duct Insulation Schedule" articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C795.

2.2 FIRE-RATED INSULATION SYSTEMS – VENTILATION DUCTS

A. Fire-Rated Blanket: High-temperature, flexible, blanket insulation with FSK jacket with equivalent shaft construction that is tested and certified to provide a 2-hour fire rating on an air distribution duct assembly by a nationally recognized testing laboratory acceptable to the authority having jurisdiction.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. 3M.
b. CertainTeed Corporation.
c. Johns Manville; a Berkshire Hathaway company.
d. Nelson Firestop; a brand of Emerson Industrial Automation.
e. Thermal Ceramics.
f. Unifrax Corporation.

B. Performance Requirements:
1. For all General Exhaust and Supply ducts, Ventilation Air Duct Listings:
a. 2-hour fire resistive enclosure assembly tested per ISO 6944 – 1985 Edition.
b. 2 hour ventilation duct system listing 3MU/FRD-120-04 or 3MU/FRD-120-10 for duct type.
c. All ductwork shall be constructed in compliance with duct system listing.
d. Firestop system, tested per ASTM E-814, 2-hour F and T ratings.

2.3 SECUREMENTS

A. Bands:
1. As required to maintain the listing of the system and included in the listing and installation requirements.

B. Insulation Pins and Hangers:

1. As required to maintain the listing of the system and included in the listing and installation requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

B. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

C. Install multiple layers of insulation with longitudinal and end seams staggered in accordance with manufacturer's instructions to maintain fire rating listing.

D. Keep insulation materials dry during application and finishing.

E. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

F. Install insulation with least number of joints practical.

3.4 FIRE-RATED INSULATION SYSTEM INSTALLATION

A. The fire-rated insulation system shall be installed in compliance with the listing. A complete copy of the listing report as published by the NRTL shall be provided for the use of the installers and the authority having jurisdiction.

B. Where fire-rated insulation system is indicated, secure system to ducts and duct hangers and supports to maintain a continuous fire rating.

C. Insulate duct access panels and doors to achieve same fire rating as duct.

D. Install firestopping at penetrations through fire-rated assemblies. Install in accordance with the listing. Fire-stop systems are specified in Section 078413 "Penetration Firestopping."

3.5 DUCT INSULATION SCHEDULE

A. Plenums and Ducts Requiring Insulation:

1. Indoor, concealed supply and general exhaust ducts indicated on the floor plans to have fire-rated wrap: Layers as required to achieve 2-hour fire rating ventilation duct listing.

END OF SECTION 230713

SECTION 237200 - AIR-TO-AIR ENERGY RECOVERY EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, furnished specialties, and accessories.

B. Field quality-control reports.

C. Operation and Maintenance Data: For air-to-air energy recovery equipment to include in maintenance manuals.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. ASHRAE Compliance:

1. Applicable requirements in ASHRAE 62.1-2007, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."
2. Capacity ratings for air-to-air energy recovery equipment shall comply with ASHRAE 84, "Method of Testing Air-to-Air Heat Exchangers."

C. UL Compliance: Packaged heat recovery ventilators shall comply with requirements in UL 1812, "Ducted Heat Recovery Ventilators"; or UL 1815, "Non-Ducted Heat Recovery Ventilators."

1.4 COORDINATION

A. Coordinate layout and installation of air-to-air energy recovery equipment and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of air-to-air energy recovery equipment that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Packaged Energy Recovery Units: Two years.

1.6 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: One set(s) of each type of filter specified.
2. Fan Belts: One set(s) of belts for each belt-driven fan in energy recovery units.
3. Wheel Belts: One set(s) of belts for each heat wheel.

PART 2 - PRODUCTS

2.1 PACKAGED ENERGY RECOVERY UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Aldes.
2. Applied Air; a company of Mestek Technology Inc.
3. Carrier Corporation.
4. Des Champs Technologies.
5. Greenheck Fan Corporation.
6. Lennox Industries Inc.
7. SEMCO Incorporated.
8. Trane; American Standard Inc.
9. Venmar CES Inc.
10. Wing, L. J.; Mestek Technology Inc.
11. RenewAire (AD-01)

B. Housing: Manufacturer's standard construction with corrosion-protection coating and interior finish, gasketed and calked weathertight, hinged access doors with neoprene gaskets for inspection and access to internal parts, minimum 1-inch- thick thermal insulation, knockouts for electrical and piping connections, exterior drain connection, and lifting lugs.
1. Exhaust: Spring-return, two-position, motor-operated damper.
2. Supply: Spring-return, two-position, motor-operated damper.

C. Heat Recovery Device: Enthalpic core heat exchanger.

D. Supply and Exhaust Fans: Forward-curved, centrifugal fan with spring isolators and insulated flexible duct connections.

1. Motor and Drive: Belt driven with adjustable sheaves, motor mounted on adjustable base.
2. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
3. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
4. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in Division 26 Sections.
5. Spring isolators on each fan having 1-inch static deflection.

E. Extended-Surface, Disposable Panel Filters:

1. Comply with NFPA 90A.
2. Provide minimum efficiency reporting value (MERV) according to ASHRAE 52.2.
3. Provide filter holding frames arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lift out from access plenum.
4. Factory-fabricated, dry, extended-surface type.
5. Thickness: 2 inches.
6. Merv (ASHRAE 52.2): 13 (Outside Air), 8 (Return Air).
7. Media: Fibrous material formed into deep-V-shaped pleats and held by self-supporting wire grid.
8. Media-Grid Frame: Nonflammable cardboard.
9. Mounting Frames: Welded, galvanized steel with gaskets and fasteners, suitable for bolting together into built-up filter banks.

F. Piping and Wiring: Fabricate units with space within housing for piping and electrical conduits. Wire motors and controls so only external connections are required during installation.

1. Indoor Enclosure: NEMA 250, Type 12 enclosure contains relays, starters, and terminal strip.
2. Include fused disconnect switches.
3. Variable-speed controller to vary fan capacity from 100 to approximately 50 percent.

G. Controls:
1. The unit shall be constructed so that it can function as a stand-alone heating and cooling system controlled by factory-supplied controllers, thermostats and sensors. This unit shall be controlled by a factory-installed microprocessor programmable controller (DDC) that is connected to various sensors. The unit shall be supplied with a BACnet interface for connection to the building automation system. All points indicated on the controls drawing shall be communicated to the BAS through the BACnet interface.
2. Unit shall incorporate a DDC controller with integral LCD screen that provides text readouts of status, operating settings and alarm conditions. DDC controller shall have a built-in keypad to permit operator to access read-out screens and change settings without the use of ancillary equipment, devices or software. DDC controllers that require the use of equipment or software that is not factory-installed in the unit are not acceptable. Alarm readouts consisting of flashing light codes are not acceptable.
    a. Operating protocol: The DDC shall be factory-programmed for BACnet MSTP for monitoring of the unit's status and control of the unit's functions.

3. Variable Frequency Drive (VFD): The unit shall have factory installed variable frequency drives for modulation of the blower motors. The VFDs shall be factory-programmed for unit-specific requirements and shall not require additional field programming to operate.
4. Sensors:
   a. Dirty Filter Sensors
   b. Temperature Sensors:
      1) Outside Air Intake
      2) Exhaust/Return Air Intake
      3) Outside Air Discharge
      4) Exhaust Air Discharge
   c. Pressure Sensors:
      1) Supply Fan
      2) Exhaust Fan
   d. Current Sensor: Supply Fan, Exhaust Fan

H. Accessories:
1. Rubber-in-shear isolators for ceiling-mounted units.
2. Hinged access doors with quarter-turn latches.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine casing insulation materials and filter media before air-to-air energy recovery equipment installation. Reject insulation materials and filter media that are wet, moisture damaged, or mold damaged.

C. Examine roughing-in for electrical services to verify actual locations of connections before installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Unit Support: Install unit level. Secure air-to-air energy recovery equipment to structural support with anchor bolts.

B. Install units with clearances for service and maintenance.

C. Install new filters at completion of equipment installation and before testing, adjusting, and balancing.

3.3 CONNECTIONS

A. Comply with requirements for ductwork specified in Division 23 Section "Metal Ducts."

B. Install piping adjacent to machine to allow service and maintenance.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
2. Adjust seals and purge.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
4. Set initial temperature and humidity set points.
5. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

D. Air-to-air energy recovery equipment will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain air-to-air energy recovery units.

END OF SECTION 237200

SECTION 237413 - PACKAGED OUTDOOR CENTRAL STATION AIR HANDLING UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 ABBREVIATIONS

A. ABMA American Bearing Manufacturers Association. (www.abma-dc.org)

B. ANSI American National Standards Institute. (www.ansi.org)

C. BAS Building Automation System.

D. CFM Cubic Feet per Minute.

E. DDC Direct-digital controls.

F. ECM Electrically commutated motor.

G. FPM Feet Per Minute.

H. HP Heat pump

I. RTU Rooftop unit. As used in this Section, this abbreviation means packaged, outdoor, central station air handling unit. This abbreviation is used regardless of whether the unit is mounted on the roof or on an equipment pad on the ground.

J. RTU's Rooftop units. As used in this Section, this abbreviation means packaged, outdoor, central station air handling units. This abbreviation is used regardless of whether the units are mounted on the roof or on equipment pads on the ground.

K. SS Stamped Steel

L. VVT Variable-air volume and temperature.

M. WG Water Gauge

1.3 DEFINITIONS

A. Archival Quality: Will last a minimum of 20 years.

B. Head end: Main temperature control computer system storing data accessible to the internet for WEB accessible systems and storing data accessible to the building system backbone for non-WEB accessible systems.

C. HP Outdoor-Air Refrigerant Coil: Refrigerant coil in the outdoor-air stream to reject heat during cooling operations and to absorb heat during heating operations.

D. Modulating: Able to electrically vary and stop in any position.

E. Outdoor air: Air outside the building or taken from outdoors and not previously circulated through the building.

F. Outdoor air measurement: Reporting of the volume of outdoor air taken into the building by RTU and reported to the building operator in CFM.

G. Outdoor-Air Refrigerant Coil: Refrigerant coil in the outdoor-air stream to reject heat during cooling operations.

H. Outdoor-Air Refrigerant-Coil Fan: The outdoor-air refrigerant-coil fan in RTUs. "Outdoor air" is defined as the air outside the building or taken from outdoors and not previously circulated through the system.

I. Record: Maintain in writing on original paper and maintain a copy in electronic format, file type Portable Document Format (*.PDF) is acceptable. Make paper copy available for inspection upon request by Owner, Owner's representative, Architect, or Architect's representative. Email electronic copy to requested email address when request is made by the Owner, Owner's representative, Architect, or Architect's representative. Document shall be "openable" by Owner and Architect's computer.

J. Supply-Air Fan: Fan providing supply air to conditioned space.

K. Supply air: Air entering a space from air-conditioning, heating, or ventilating equipment.

L. Supply-Air Refrigerant Coil: Refrigerant coil in the supply-air stream to absorb heat (provide cooling) during cooling operations and to reject heat (provide heating) during heating operations. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.

M. Two-position: Able to electrically move and stop in only two positions. Usually open or closed.

1.4 PERFORMANCE REQUIREMENTS

A. Support: RTU supports shall comply with required wind and seismic performance requirements, including analysis by a qualified professional engineer.

B. Wind-Restraint Performance shall comply with SEI/ASCE 7 for wind speed and building classification category. Provide minimum 10 lb/sq. ft. multiplied by the maximum area of the mechanical component projected on a vertical plane that is normal to the wind direction, and 45 degrees either side of normal.

1.5 SUBMITTALS

A. Pre-submittal Meeting: A representative of the manufacturer producing equipment being provided under this section of the specifications shall attend a meeting for the purpose of coordinating with the contractor performing work under section "Building Automation System". The meeting shall be held at a location of the Contractor's choosing. The Contractor shall arrange the meeting. Submittals shall be essentially complete at the time of the meeting so detailed coordination items can be discussed.

B. Product Data: Provide manufacturer's technical data for each RTU, including rated capacities, dimensions, required clearances, characteristics, furnished specialties, accessories, and mounting requirements.

C. Exterior Color: Manufacturer's standard color shall be acceptable.

D. Shop Drawings:

1. Detail equipment assemblies, include:
   a. Internal components
   b. Dimensions
   c. Weights
   d. Loads
   e. Supports
   f. Required clearances.
2. Provide method of field assembly.
3. Indicate:
   a. Components
   b. Location
   c. size of each field connection
4. Provide Wiring Diagrams for:
   a. Power
   b. Control
5. For RTU Support comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for support selection.
   a. Calculations: Calculate requirements for selecting vibration isolation, seismic restraint where required**,** and for vibration isolation.
   b. Detail mounting, securing, and flashing of roof curb to roof structure. Indicate coordinating requirements with roof membrane system, curb slope, and curb dimensions.
   c. Restraint: Detail fabrication and attachment of restraints. Indicate anchorage details, quantity, diameter, and connections.

E. Coordination Drawings: Plans and other details, drawn to scale, on which the following items are indicated and coordinated using input from installers:

1. Plan areas containing an RTU indicated at ¼" = 1'- 0" or greater on construction drawings.
2. Areas within 20 feet of section marks indicated on M2 series drawings where such section marks penetrate an RTU.

3. Structural members to which RTUs will be attached.
4. Related roof openings.
5. Related roof curbs, slope, dimensions and flashing.

F. Operation and Maintenance Data: For RTUs to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," Provide the following:

1. After successful completion of testing & balancing, or commissioning provide the following:
   a. Completed Inspection & Testing form.
   b. Record copy of site-specific software on DVD.
   c. Maintenance, Inspection and Testing Records including, may not be limited to, the following:
      1) How to test installed components.
      2) Frequency of testing of installed components.
      3) Frequency of inspection of installed components.
      4) Manufacturer's user training manuals.
2. Manufacturer's required maintenance related to system warranty requirements.
3. Software and Firmware Operational Documentation:
   a. Software operating and upgrade manuals.
   b. Program Software Backup: On magnetic media or compact disk, complete with data files.
   c. Device address list.
   d. Printout of software application and graphic screens.

G. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

A. ARI Compliance:

1. Comply with ARI 210/240 and ARI 340/360 for testing and rating energy efficiencies for RTUs.
2. Comply with ARI 270 for testing and rating sound performance for RTUs.

B. ASHRAE Compliance:

1. Comply with ASHRAE 15 for refrigeration system safety.
2. Comply with ASHRAE 33 for methods of testing cooling and heating coils.
3. Comply with applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

C. System safety. Comply with one of the following:

1. ASHRAE 15 for refrigeration system safety.
2. ASHRAE/IESNA 90.1-2004 applicable requirements in Section 6 - "Heating, Ventilating, and Air-Conditioning."
3. NFPA 90A and NFPA 90B.

4. UL 1995.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to provide labor and materials to remove and replace components of RTU's that fail in materials or workmanship within the following warranty period.

1. Compressors: 5 years from date of Substantial Completion.
2. Gas Furnace(s): 5 years from date of Substantial Completion.
3. Gas Furnace Heat Exchanger(s): 5 years from date of Substantial Completion.
4. VFD: 3 years from date of Substantial Completion.
5. Remainder of unit: 3 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Engineered Air.

B. Trane Custom

C. Venmar

D. Xetex (AD-01)

2.2 GENERAL

Unit designed to sit on existing concrete pad without extension, where extended portions are cantilevered from unit frame.

The gas flue & piping locations, power location, and return duct location match the existing. The supply duct will need to be modified due to the new connection being lower and an inch narrower.

OA/SA filters: (6) side-load, 2" pleated MERV 8 with metal holding frames

RA filters: (6) 20" AmerSeal Cube, Type 8

Clogged filter switches

Supply fan motor: 10 HP, TEFC, 1800 RPM, SF of 1.0. Aluminum extended lube lines to access (door) side.

Exhaust fan motor: 7.5 HP, TEFC, 1800 RPM, SF of 1.0. Aluminum extended lube lines to access (door) side.

O/A Damper: TAMCO 1000 opposed blade (30 x 54), 2-position actuator with end switch.

E/A Damper: TAMCO 8800 opposed blade (23 x 25), 2-position actuator with end switch.

Face/Bypass Damper: EngA standard face & bypass (48 x 58) with 0-10V input (by others)

Airside Access Doors: Deluxe welded with lever handles and tie backs

Service Access Doors: Standard hinged with lever handles and tie backs (compressor access too although the drawing reads "bolt-on")

Unit Construction:

18 GA satin-coated steel casing with two-component epoxy paint and polyurethane topcoat

22 GA solid satin-coated steel liner

18 GA satin-coated steel mid- and main floors

2", 1.5 LB/CU FT fiberglass insulation except for gas HX section

1", 1.5 LB/CU FT fiberglass insulation at gas HX section

8", fully welded, structural steel base frame

DX evaporator face velocity: 512 FPM

Insulated suction lines

18 GA, 304SS drain pan

24" access section between evaporator coil and reheat coil

Modulating HGRH w/ BAS interface

Integrated economizer mode

Gas Heat:

600 MBH input/486 MBH output

409 stainless steel HX

Minimum 15:1 turndown

MUA high limit

Ambient heat lockout

Factory, non-fused, dead front, 400A disconnect

Controls:

Standalone unitary controller w/ BAS BACnet MSTP interface

Unit remote on/off (by others)

2.3 CASINGS

1. General:

   a. Fabrication Requirements: Formed and reinforced double-wall insulated panels, fabricated to allow removal for access to internal parts and components, with joints between sections sealed.
   b. Exterior Material: Manufacturer's standard thickness galvanized steel with factory-painted finish, exterior color shall be manufacturer's standards, with pitched roof panels and knockouts with grommet seals for electrical and piping connections and lifting lugs.
   c. Interior Material: Stainless steel with no finish or factory standard finish, with pitched roof panels and knockouts with grommet seals for electrical and piping connections.

2. Fan Discharge Plenum Interior Material: Stainless steel with no finish or factory standard finish, perforated with 40 percent free area.

3. Insulation and Adhesive:

   a. Comply with NFPA 90A or NFPA 90B.
   b. Materials: ASTM C 1071, Type I.
   c. Thickness: 2".
   d. Materials in contact with air stream shall have air-stream surface coated with an erosion- and temperature-resistant coating or they shall be faced with a plain or coated fibrous mat or fabric.
   e. Liner Adhesive: Comply with ASTM C 916, Type I.

B. Condensate Drain Pans:

1. Formed sections of stainless-steel sheet, a minimum of 2 inches deep, and complying with ASHRAE 62.1-2004.

2. Construction: Provide foam insulation on back. Double wall, foam insulated, moisture tight drain pans are acceptable.
3. Drain Connection(s): Threaded nipple with pan sloped in two directions to drain.

C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004 and UL 181.

2.4 FANS

A. Fans except Condenser Fan(s): Refer to schedule for blade and fan configuration. Provide with permanently lubricated, motor installed on an adjustable fan base resiliently mounted in the casing. Provide aluminum wheel and steel scroll.

B. Fan Shaft Bearings:

1. Prelubricated and Sealed, Ball Bearings: Self-aligning, pillow-block type with a rated life of 120,000 hours according to ANSI/ABMA 9

Or

2. Grease-Lubricated, Tapered-Roller Bearings: Self-aligning, pillow-block type with double-locking collars and 2-piece, cast-iron housing with grease lines extended to outside unit and a rated life of 120,000 hours according to ANSI/ABMA 11.

C. Fan Sound-Power Levels:
1. Fans, except condenser fans, shall meet or create lower sound power levels than those indicated.
2. Fans, except condenser fans, shall comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans shall bear AMCA-certified sound ratings seal.

D. Fan Performance Rating: Except condenser fans factory test fan performance for airflow, pressure, power, air density, rotation speed, and efficiency. Rate performance according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating."

E. Condenser Fan(s): Propeller mounted on shaft of permanently lubricated motor.

F. Fan Motor(s): Refer to section "Common Motor Requirements for HVAC Equipment."

2.5 COILS

A. Indoor Air Refrigerant Coil:

1. Aluminum fins, seamless copper tube with minimum 0.020" wall thickness, and equalizing vertical distributor.
2. Distribution: Interlaced.
3. Circuits: Minimum of one per compressor.
4. Casing: Stainless steel.
5. Split: As indicated. If not indicated none required.

B. Outdoor Air Refrigerant Coil:

1. Aluminum fins, seamless copper tube with minimum 0.020" wall thickness, and equalizing vertical distributor.
2. Distribution: Interlaced.
3. Circuits: Manufacturer's standard.
4. Casing: Galvanized steel.
5. Split: As indicated. If not indicated Manufacturer's standard.

C. Hot Gas Reheat Coil:

1. Aluminum fins, seamless copper tube with minimum 0.020" wall thickness, and equalizing vertical distributor.
2. Distribution: Manufacturer's standard.
3. Circuits: Manufacturer's standard.
4. Casing: Galvanized steel.
5. Split: As indicated. If not indicated Manufacturer's standard.

2.6 COIL SECTION

A. Fabricate coil section to allow removal and replacement of coil(s) for maintenance and to allow in-place access for service and maintenance of coil(s).

B. Coils shall not act as a structural component of the unit.

2.7 REFRIGERANT CIRCUIT COMPONENTS

A. Provide gauge ports with Schrader valves for measuring suction and hot gas pressure.

B. Provide for operation of the unit for heating down to 0° F.

C. Provide for operation of the unit for cooling down to 35° F.

D. Compressor: Hermetic, scroll, mounted on vibration isolators; with internal overcurrent and high-temperature protection, internal pressure relief, and crankcase heater.

E. Refrigeration Specialties:

1. Refrigerant: R-410A.
2. Expansion valve with replaceable thermostatic element.
3. Refrigerant filter/dryer.
4. Manual-reset high-pressure safety switch.
5. Automatic-reset low-pressure safety switch.
6. Minimum off-time relay.
7. Automatic-reset compressor motor thermal overload.
8. Brass service valves and unions installed in compressor suction and discharge lines.
9. Low-ambient kit high-pressure sensor.

F. The following is required for heat pump applications:

1. Four-way reversing valve with a replaceable magnetic coil
2. Thermostatic expansion valve bypass check valves.
3. Suction line accumulator.

G. The following is required for applications with hot gas reheat:

1. Hot-gas reheat solenoid valve with a replaceable magnetic coil.

2.8 GAS FURNACE

A. Description: Factory assembled, piped, and wired; complying with ANSI Z21.47 and NFPA 54.

1. CSA Approval: Designed and certified by and bearing label of CSA.

B. Burners: Stainless steel.

1. Fuel: As indicated.
2. Ignition: Electronically controlled electric spark or hot-surface igniter with flame sensor.

C. Heat-Exchanger and Drain Pan: Stainless steel.

D. Venting: Gravity or power vented.

E. Safety Controls: Manufacturer's standard in accordance with local and state code requirements.

F. Capacity Control: As scheduled. If not scheduled modulating control shall be provided.

1. Cycle: All heat on or off as needed
2. Stage: Provide a minimum of 4 stages, 25%, 50%, 75%, and 100%. Maximum temperature rise at 25% shall be fifteen degrees Fahrenheit (15° F).
3. Modulating: Heat output shall be variable down to 20% of scheduled capacity or a maximum temperature rise of fifteen degrees Fahrenheit (15° F).

2.9 DAMPERS

A. General Requirements for Dampers: Leakage rate, according to AMCA 500, "Laboratory Methods for Testing Dampers for Rating," shall not exceed 2% of air quantity at 2000 FPM face velocity through damper and 4" WG pressure differential.

B. Minimum Outdoor Air Damper(s): Two position parallel or opposed blade galvanized steel motorized mechanically fastened to cadmium plated steel operating rods in reinforced cabinet, with bird screen and intake hood. Provide method of setting minimum outdoor air.

C. Economizer Outdoor Air Damper(s): Modulating opposed blade galvanized steel motorized mechanically fastened to cadmium plated steel operating rods in reinforced cabinet, with bird screen and intake hood. Provide method of setting economizer maximum equal to supply ai.r

D. Return Air Damper(s): Two position (modulating if mechanically interlocked with mixing damper) parallel or opposed blade galvanized steel dampers mechanically fastened to cadmium plated steel operating rod in reinforced cabinet.

E. Mixing Damper(s): Modulating parallel blade galvanized steel dampers mechanically fastened to cadmium plated steel operating rod in reinforced cabinet. Operating rods may be connected with a common linkage and interconnected so return and mixing dampers operate simultaneously. Dampers shall be positioned such that airflows collide to promote mixing.

F. Relief Air Damper(s): Parallel or opposed blade galvanized steel motorized mechanically fastened to cadmium plated steel operating rods in reinforced cabinet, with bird screen and relief hood.

G. Damper Motors:

1. Fail closed.
   a. Exceptions:
      1) Supply air damper shall fail open.
      2) Return air damper shall fail open.
2. Modulating operation unless two-position is indicated.
3. Adjustable minimum position.

2.10 ENERGY RECOVERY DEVICE

A. Air to air aluminum plate heat exchanger.

2.11 ELECTRICAL POWER CONNECTION

A. Provide for single connection of power to unit with unit-mounted disconnect switch accessible from outside unit and control-circuit transformer with built-in overcurrent protection.

2.12 CONTROLS

A. Basic Unit Controls:

1. The manufacturer furnishing units and the contractor installing units under this section shall refer to, among others, Section "Building Automation System", Section "Sequences of Control", and the Seven (7) series control drawings for additional information regarding control of the equipment.

2. Provide control voltage transformer:

   a. Primary Voltage: As required
   b. Secondary Voltage: As required
   c. Load: As required - 100 VA minimum

3. Unit Mounted Control Panel:

a. Furnish under section "Building Automation System" and install under this Section.
b. Interface control panel with BAS.
c. Provide volatile memory backup.
d. Provide software and firmware operational documentation including but not limited to:
   1) Software operating and upgrade manuals.
   2) Backup of Volatile Memory: On archival quality DVD or CD compliant disk, complete with data files.
   3) Device address list.
   4) Printout of software application and graphic

B. Refrigeration system control

1. The manufacturer furnishing equipment under this section shall provide all controls for the compressors and refrigeration system including but not limited to staging and safeties under this section.

C. Operation:

a. Refer to section "Sequences of Operation"

2.13 ACCESSORIES

A. Electric Gas Burner Compartment Heater: When required by unit manufacturer provide electric heater with integral thermostat to maintain minimum 50° F in gas burner compartment.

B. Low Ambient Operation: Provide low-ambient kit for operation down to 35° F.

C. Guards:

1. Where scheduled "SS" or if not scheduled: Provide coil guards of galvanized stamped steel, painted to match casing. Guards shall be on sides of unit. Coils shall not be clearly visible from any direction.
2. Where scheduled "W": Provide coil guards of painted, galvanized-steel wire. Coils are clearly visible from nearly every direction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of RTUs.

B. Examine roughing-in for RTUs to verify actual locations of piping and duct connections before equipment installation.

C. Examine roofs or grade for suitable conditions where RTUs will be installed.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Grade Mounted Unit:

1. Concrete Base:
   a. Anchor grade mounted equipment to concrete base.
   b. Install RTUs on concrete base using elastomeric pads.
   c. Minimum Deflection: ¼".

3.3 FIELD QUALITY CONTROL

A. Whether or not use of equipment is otherwise permitted, startup service, tests, and inspections must be complete prior to running unit. Failure to perform startup service, tests, and inspections prior to running equipment shall grant the owner's representative authority to have the units/equipment removed from the site at the Contractor's expense. This paragraph shall not be construed to grant the Contractor permission to use the unit(s)/equipment specified in this section of the specifications.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Record results.

C. Tests and Inspections:

1. Inspect for and remove shipping bolts, blocks, and tie-down straps.
2. Leak Test: After installation, fill water and steam coils completely with water. Connect gauge and fill valve. Pressurize to 150 PSIG with air. Visually check for water leaks. Pressure shall hold with no visible loss for 120 minutes (2 hours). Fix leaks.
3. Charge refrigerant coils with refrigerant and connect gauges. Use light that will show refrigerant leak and visually check for leaks. Pressure shall hold with no visible loss for 120 minutes (2 hours). Fix leaks.
4. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Replace or repair faulty equipment.
5. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. RTU's or components will be considered defective if unit or components do not pass tests and inspections.

E. Prepare test and inspection reports.

3.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

B. Complete installation and startup checks according to manufacturer's written instructions and do the following:

1. Verify that unit is secure on mountings and supporting devices and connections to piping, ducts, and electrical systems are complete.
2. Verify that proper thermal overload protection is installed in motors, controllers, and switches.
3. Disconnect fan drive system. Verify proper motor rotation direction, free fan wheel rotation, and smooth bearing operation. Reconnect fan drive system, align and adjust belts to proper tension.
4. Verify that bearings, pulleys, belts, and other moving parts are lubricated with factory-recommended lubricants.
5. Verify that dampers fully open and close.
6. Inspect dampers for proper stroke.
7. Inspect damper blades and seals for visible defects.
8. Inspect coil fins. Comb damaged coil fins for parallel orientation.
9. Verify that proper thermal overload protection is installed for electric coils.
10. Install new filters.
11. If not direct drive place new belts on coat hook attached with ¼" long stainless steel sheet metal screws inside unit adjacent to existing belts where no damage will occur. Including but not limited to fans, energy recovery wheels, and enthalpy wheels.
12. Verify that manual and automatic volume control and fire and smoke dampers in connected duct systems are in fully open position.
13. Verify that smoke dampers in connected duct system fully close when unit is deactivated.
14. Inspect for visible damage to unit casing.
15. If included in unit inspect furnace combustion chamber for visible damage.
16. Inspect coils, and fans for visible damage.
17. Inspect internal casing for visible damage.
18. Verify that labels are clearly visible.
19. Verify that clearances have been provided for servicing.
20. Verify that controls are connected and operable.
21. Clean condenser coil and inspect for construction debris.
22. If included in unit, clean furnace flue and inspect for construction debris.
23. If furnace is included in unit purge and connect gas line.
24. Remove packing from vibration isolators.
25. Inspect fan wheel for operation without vibration and binding.
26. Start unit according to manufacturer's written instructions.
    a. Start cooling system.
    b. Do not operate below recommended ambient temperature.
    c. Complete startup sheets and attach 1 paper, and one "universally readable" electronic copy on USB flash drive, with startup report. Maintain a copy in electronic format, file type Portable Document Format (*.TXT, *.DOC, *.RTF, & *.PDF) file formats are acceptable. The file format must be one of those listed or the Owner and Architect must own a computer and software capable of reading the electronic file.
27. Inspect and record performance of interlocks and protective devices.

28. Verify sequence of operation.
29. Operate unit for an initial period as recommended or required by manufacturer.
30. For unit(s)/Equipment equipped with a furnace perform the following operations for minimum and maximum firing. Adjust burner for peak efficiency within operating range.
    a. Measure and record manifold gas pressure.
    b. Confirm proper operation of power vents.
    c. Measure and record combustion air temperature at inlet to combustion chamber.
    d. Measure and record flue gas temperature at furnace discharge.
    e. Perform flue gas analysis. Measure and record flue gas carbon dioxide and oxygen concentration.
    f. Measure and record return air temperature and volume, and supply air temperature and volume when burner is at maximum firing rate. Calculate and record heat input from the burner to the supply air.
31. Calibrate sensors including thermostats.
32. Adjust and inspect high-temperature limits.
33. With unit operating start cooling system, measure, and record the following when the ambient temperature is a minimum of 85° F:
    a. Coil leaving air, dry and wet bulb temperatures.
    b. Coil entering air, dry and wet bulb temperatures.
    c. Return air, dry and wet bulb temperatures.
    d. Outdoor air, dry and wet bulb temperatures.
    e. Outdoor air (condenser) coil, discharge air, dry bulb temperature.
34. Measure and record the following minimum and maximum airflows. Plot fan volumes on fan curve.
    a. Supply air volume.
    b. Return air volume.
    c. Relief/exhaust air volume.
    d. Record relief/exhaust airflow station reading in CFM from BAS head end.
    e. Outdoor air intake volume.
    f. Record outdoor air intake airflow station reading in CFM from BAS head end.
35. Simulate maximum cooling demand by utilizing 100% outdoor air and lowering discharge air temperature. Record the discharge air temperature and outdoor air volume used for the simulation. During simulation operation inspect, measure, and record the following:
    a. Compressor refrigerant suction and hot gas pressures.
    b. Short circuiting of air through condenser coil or from condenser fans to outdoor-air intake.

3.5 CLEANING AND ADJUSTING

A. Occupancy Adjustments: Within 12 months of the date of Substantial Completion, provide up to two (2) on site visits, during normal or other than normal occupancy hours as requested by owner, to assist in adjusting system.

B. After completing testing, adjusting, and balancing clean RTU's internally to remove foreign material and construction dirt and dust. Clean fan wheels, cabinets, dampers, coils, and filter housings, and install new, filters.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units/equipment.

END OF SECTION 237413

SECTION 238143 - SPLIT-SYSTEM HEAT PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Split-system heat-pump units consisting of separate evaporator-fan and compressor-condenser components.

1.3 DEFINITIONS

A. Evaporator-Fan Unit: The part of the split heat pump unit that contains a coil for cooling and a fan to circulate air to conditioned space.

B. Compressor-Condenser Unit: The part of split heat pump unit that contains a refrigerant compressor and a coil for condensing refrigerant.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

B. Field quality-control reports.

C. Operation and Maintenance Data: For split-system heat pump units to include in emergency, operation, and maintenance manuals.

D. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of ductless mini-split units and are based on the specific system indicated. Other manufacturers' systems with equal performance characteristics may be considered.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. All wiring shall be in accordance with the governing version of the National Electrical Code.

D. Units shall be rated in accordance with ARI Standard 210 and bear the ARI Certification label.

E. Ductless split-systems shall be pre-charged with refrigerant for 70 feet of refrigerant tubing.

F. ASHRAE Compliance:

1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2007, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - " Procedures," and Section 7 - "Construction and System Start-Up."

G. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

1.6 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided where condensing units are indicated on grade.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system heat pump units that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. Refrigeration Compressors: 10 years.
b. Evaporator and Condenser Coils: Five years.

1.8 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: One set for each air-handling unit.

PART 2 - PRODUCTS

2.1 INDOOR UNITS – ELECTRIC BACKUP HEAT

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Carrier Corporation; Div. of United Technologies Corp.
2. Johnson Controls (York).
3. Trane.
4. Daikin. (AD-01)

B. Horizontal-Mounted, Evaporator-Fan Components:

1. Cabinet: Enameled steel with removable panels on front and ends in color selected by Architect.
a. Insulation: Faced, glass-fiber duct liner.
b. Drain Pans: Galvanized steel, with connection for drain; insulated.

2. Refrigerant Coil: Copper or Aluminum tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 210/240.

C. Electric Heating Coil:
1. Testing Agency Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Coil Assembly: Comply with UL 1995.
3. Heating Elements: Open-coil resistance wire of 80 percent nickel and 20 percent chromium, supported and insulated by floating ceramic bushings recessed into casing openings, and fastened to supporting brackets.
4. High-Temperature Coil Protection: Disk-type, automatically reset, thermal-cutout, safety device; serviceable through terminal box without removing heater from duct or casing.
a. Secondary Protection: Load-carrying, manually reset or manually replaceable, thermal cutouts; factory wired in series with each heater stage.
5. Control Panel: Unit mounted with disconnecting means and overcurrent protection. Include the following controls:
a. Magnetic contactor.
b. Toggle switches; one per step.
c. Step controller.
d. Time-delay relay.
e. Pilot lights; one per step.
f. Airflow proving switch.

2.2 OUTDOOR UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Carrier Corporation; Div. of United Technologies Corp.
2. ~~Lennox.~~ (AD-01)
3. Johnson Controls (York).

4. Trane.
5. Daikin. (AD-01)

B. Air-Cooled, Compressor-Condenser Components:

1. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.

    a. Compressor Type: Scroll.
    b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
    c. Refrigerant Charge: R-410A.
    d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 210/240.

3. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.
4. Fan: Aluminum-propeller type, directly connected to motor.
5. Motor: Permanently lubricated, with integral thermal-overload protection.
6. Low Ambient Kit: Permits operation down to 45 deg F.
7. Maximum decibel rating: 75 dB.
8. Cover compressors with removable acoustic wrap equal to Dura-coustic by FabSrv.

2.3 ACCESSORIES

A. Basic Unit Controls:

1. Initial Setpoints:
    a. Cooling:
        1) Occupied: 75° F.
        2) Unoccupied: 80° F.
    b. Heating:
        1) Occupied: 70° F.
        2) Unoccupied: 65° F.
2. Terminal strip interface: Provide points listed on seven (7) series drawings for control of the units by the building automation system.

B. Drain Pan Overflow: An overflow cut-off switch shall disable the fan coil unit. This shall stop the fan and close the control valves.

C. Automatic-reset timer to prevent rapid cycling of compressor.

D. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

E. Drain Hose: For condensate.

F. Polyethylene base.

G. Duct mounted Filter Box:
1. Provide filter box for 4" thick Merv-11 rated filters. Filter box shall have have gasketed access doors.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install ground-mounted, compressor-condenser components on concrete equipment pad.

D. Install compressor-condenser components on restrained, spring isolators with a minimum static deflection of 1 inch. See Division 23 Section "Vibration Control for HVAC."

E. Install and connect pre-charged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect condensate drain piping. Unit drain shall be internally trapped.

C. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.

D. Duct Connections: Duct installation requirements are specified in Division 23 Section "Metal Ducts" Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system heat pump units with flexible duct connectors. Flexible duct connectors are specified in Division 23 Section "Air Duct Accessories."

E. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

D. Prepare test and inspection reports.

3.4 STARTUP SERVICE

A. Perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

END OF SECTION 238143

SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. (AD-01)

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Advance Products & Systems, Inc.
b. Metraflex Company (The).
c. Proco Products, Inc.

2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Carbon steel.
4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. HOLDRITE.

2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

    a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."

b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using [**steel**] [**cast-iron**] pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544

EXISTING BUILDING DATA

PRIMARY OCCUPANCY CLASSIFICATION & USE GROUP:	Business: B		
CONSTRUCTION TYPE:	V-B		
FULLY SPRINKLERED | TYPE:	YES	NFPA 13	
MIXED OCCUPANCY:	NO		
NON-SEPARATED MIXED USE:	NO	**DESIGN OCCUPANCY CLASSIFICATION:**	Business: B
SEPARATED MIXED USE:	NO		

OCCUPANCY SCHEDULE

SPACE NUMBER	SPACE NAME	USE CLASSIFICATION	USED TO DETERMINE OCCUPANCY FACTOR ONLY	FLOOR AREA PER OCCUPANT	AREA SF	GROSS	NET	OCCUPANCY LOAD TABULAR	ACTUAL		DESIGN
101	FOYER	B	BUSINESS AREAS	150 SF	102	•		1	2	*	2
102	ENTRY	B	BUSINESS AREAS	150 SF	411	•		3	8	*	8
103	CAT ADOPTIONS	B	BUSINESS AREAS	150 SF	266	•		2	5	*	5
104	INTERVIEW	B	BUSINESS AREAS	150 SF	78	•		1	2	*	2
105	RECEPTION	B	BUSINESS AREAS	150 SF	182	•		2			2
106	ADULT DOG RUNS	B	BUSINESS AREAS	150 SF	2131	•		15			15
107	TOILET	B	TOILETS	0 SF	61	•					0
108	TOILET	B	TOILETS	0 SF	60	•					0
109	FOOD PREP/ISTORAGE	B	BUSINESS AREAS	150 SF	243	•		2	3	*	3
110	PUPPY RUNS	B	BUSINESS AREAS	150 SF	344	•		3	4	*	4
111	QUARANTINE	B	BUSINESS AREAS	150 SF	344	•		3			3
112	WARDENS	B	BUSINESS AREAS	150 SF	163	•		2	4		4
113	CAT ISOLATION	B	BUSINESS AREAS	150 SF	147	•		1	2	*	2
114	LAUNDRY	B	BUSINESS AREAS	150 SF	131	•		1	2	*	2
115	ISOLATION	B	BUSINESS AREAS	150 SF	337	•		3			3
116	CREMATORY	B	BUSINESS AREAS	150 SF	387	•		3	4	*	4
117	FERAL CATS	B	BUSINESS AREAS	150 SF	137	•		1	2	*	2
118	X-RAY	B	BUSINESS AREAS	150 SF	125	•		1	2	*	2
119	SALLYPORT	B	BUSINESS AREAS	150 SF	664	•		5			5
120	DATA CLOSET	B	ACCESSORY STORAGE & MECHANICAL EQUIPMENT ROOM	300 SF	54	•		1			1
120B	CORRIDOR	B	CIRCULATION	0 SF	61	•					0
121	VET	B	BUSINESS AREAS	150 SF	229	•		2			2
122	JANITOR CLOSET	B	ACCESSORY STORAGE & MECHANICAL EQUIPMENT ROOM	300 SF	97	•		1			1
123	LOCKER RM	B	LOCKER ROOM	50 SF	82	•		2			2
124	TOILET	B	TOILETS	0 SF	62	•					0
125	TOILET	B	TOILETS	0 SF	61	•					0
126	LOCKER RM	B	LOCKER ROOM	50 SF	81	•		2			2
127	BREAK ROOM	B	BUSINESS AREAS	150 SF	231	•		2	8	*	8
128	WORKSTATIONS	B	BUSINESS AREAS	150 SF	247	•		2			2
129	OFFICE	B	BUSINESS AREAS	150 SF	97	•		1	3		3
130	OFFICE	B	BUSINESS AREAS	150 SF	97	•		1	3		3
131	OFFICE	B	BUSINESS AREAS	150 SF	98	•		1	3		3
132	CORRIDOR	B	CIRCULATION	0 SF	205	•					0
133	CORRIDOR	B	CIRCULATION	0 SF	396	•					0
134	CORRIDOR	B	CIRCULATION	0 SF	87	•					0
135	CORRIDOR	B	CIRCULATION	0 SF	98	•					0
136	ELECTRICAL	B	ACCESSORY STORAGE & MECHANICAL EQUIPMENT ROOM	300 SF	59	•		1			1
137	OUTDOOR MECHANICAL	B	ACCESSORY STORAGE & MECHANICAL EQUIPMENT ROOM	300 SF	310	•		2			2
138	DOG WASHROOM	B	BUSINESS AREAS	150 SF	53	•		1			1
139	SURGICAL SUITE	B	BUSINESS AREAS	150 SF	84	•		1			1
S1	MED GAS ROOM	B	CIRCULATION	0 SF	34	•					0
											100

OCCUPANCIES DELINEATED WITH * HAVE OCCUPANCY LOAD MODIFICATIONS BASED ON RECORD DRAWINGS DATED MARCH 10, 2006.

N

LIFE SAFETY FLOOR PLAN

1/8" = 1'-0"

LIFE SAFETY SYMBOL LEGEND

APPLIES TO LS SERIES OF DRAWINGS ONLY

DESIGNATOR MATRIX

	WALL	BARRIER	PARTITION	RATED BEARING OR NON-BEARING WALL
4 HR FIRE				
3 HR FIRE				
2 HR FIRE	✖✖✖✖✖			
1 HR FIRE		▶▶▶▶▶		
½ HR FIRE				
SMOKE				
SMOKE-TIGHT				
INCIDENTAL				

SYMBOLS

- 1205 — ROOM NUMBER
- 798 | 1280 — DIRECTION OF EGRESS, EGRESS LOAD CAPACITY, NUMBER OF OCCUPANTS
- DIRECTION OF EGRESS, NUMBER OF OCCUPANTS, EGRESS LOAD CAPACITY — 798 | 1280
- 174'-9" TD — EXIT ACCESS TRAVEL DISTANCE
- 74'-9" CPOT — COMMON PATH OF TRAVEL
- FIRE EXTINGUISHER CABINET
- FIRE EXTINGUISHER BRACKET
- EXTENT OF FLOOR / CEILING AND/OR ROOF / CEILING ASSEMBLY
- EXTENT OF LEVEL 2 ALTERATIONS

NOTES:

1. WALL DESIGNATIONS ON THE LS SERIES OF DRAWINGS ARE FOR GRAPHICAL PURPOSES ONLY AND MAY NOT REPRESENT THE ACTUAL WALL/PARTITION CONSTRUCTION.
2. REFER TO THE CONTRACT DOCUMENTS, INCLUDING THE LIFE SAFETY SYMBOLS LEGEND AND A0, A1 AND, A2 SERIES OF DRAWINGS, FOR ACTUAL WALL/PARTITION TYPES AND CONSTRUCTION REQUIREMENTS.
3. RATING OF BEARING OR NON-BEARING WALLS ARE PER TABLE 601 AND SECTION 602.1 AND DO NOT REQUIRE PROTECTED OPENINGS.

FIRE RATED ASSEMBLIES

REPRESENTED BY Xn

THE ASSEMBLIES REFERENCED ARE BASIS OF DESIGN; EQUIVALENT COMPATIBLE TESTED ASSEMBLIES WILL BE ACCEPTABLE IF APPROVED BY THE LAHJ

MARK	FIRE RATING	APPLIES TO	REFERENCE	REMARKS
X1	1 HR	PARTITION TYPE P6-1	1-HOUR UL DESIGN U419	
X2	1 HR	STAIR CEILING - HORIZONTAL SHAFT WALL SYSTEM	1-HOUR UL DESIGN U415	USE 2 1/2" CH STUDS
X3	1 HR	BEARING AND NON-BEARING MASONRY WALLS	VCC TABLE 721.1(2)	
X4	1 HR	FIRE BARRIER DUCT WRAP	ISO 6944 (1985) DESIGN NUMBER 3MU/FRD 120-04	REFER TO M2.1 FOR LOCATIONS

BUILDING DATA

APPLICABLE CODES, STANDARDS, AND/OR REFERENCES:
VIRGINIA CONSTRUCTION CODE (VCC) 2021
VIRGINIA EXISTING BUILDING CODE (VEBC) 2021
2017 - ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES

LEVEL OF ALTERATIONS
LEVEL 1
LEVEL 2 (1,140 SF) - REFER TO FLOOR PLAN

FLOOR AREA
MAIN FLOOR 10,139 SF (INCLUDING SALLYPORT AND CREMATORY)
MECHANICAL EQUIPMENT LEVEL 503 SF

FIRE RESISTANCE RATING OF EXISTING BUILDING ELEMENTS

CONSTRUCTION TYPE	VB	
BUILDING ELEMENT	CODE REFERENCE	REQUIRED RATING
PRIMARY STRUCTURAL FRAME	Table 601	0 HRS
EXTERIOR BEARING WALLS	Table 601	0 HRS
INTERIOR BEARING WALLS	Table 601	0 HRS
EXTERIOR NONBEARING WALLS AND PARTITIONS	Table 602	0 HRS
INTERIOR NONBEARING WALLS AND PARTITIONS	Table 601	0 HRS
FLOOR CONSTRUCTION & SECONDARY MEMBERS	Table 601	0 HRS
ROOF CONSTRUCTION & SECONDARY MEMBERS	Table 601	0 HRS
SHAFT ENCLOSURES (Less than 4 stories)	713.4	1 HRS
EXIT ENCLOSURES (Less than 4 stories)	1023.2	1 HR
FIRE PARTITIONS	708.3	1 HR
SMOKE BARRIERS	709.3	1 HR
SMOKE PARTITIONS	710.3	0 HRS
CORRIDORS	Table 1020.2	0 HRS

VCC TABLE 721.1(2)

RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS

MATERIAL	ITEM NUMBER	CONSTRUCTION	4 HR	3 HR	2 HR	1 HR
3. CONCRETE MASONRY UNITS	3-1.1	EXPANDED SLAG OR PUMICE	4.7	4.0	3.2	2.1
	3-1.2	EXPANDED CLAY, SHALE OR SLATE	5.1	4.4	3.6	2.6
	3-1.3	LIMESTONE, CINDERS OR AIR COOLED SLAG	5.9	5.0	4.0	2.7
	3-1.4	CALCAREOUS OR SILICEOUS GRAVEL	6.2	5.3	4.2	2.8

VCC TABLE 721.1(2) X3

12" = 1'-0"

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3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-9690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
JOSHUA NATHAN BENNETT
Lic. No. 0401013563
09/17/25
ARCHITECT

HENRICO COUNTY ANIMAL SHELTER RENOVATION

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY

PROJECT NO: 615225
DATE: AUGUST 18, 2025

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DATE	DESCRIPTION
09/17/25	AD-01

LIFE SAFETY INFORMATION

LS1.1

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TERMINATION GENERAL NOTES

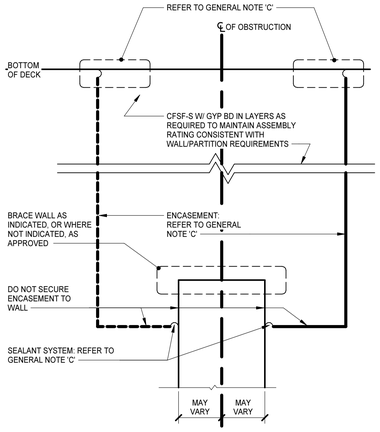
A. AT FIRE-, SMOKE-, AND ACOUSTICALLY RATED WALLS: SEAL ALL NON-OBSTRUCTED HEAD-OF-WALL CONDITIONS IN ACCORDANCE WITH JOINT SYSTEM MANUFACTURER'S RECOMMENDATIONS BASED ON CONDITION ENCOUNTERED (E.G., CMU-TO-DECK (PARALLEL OR PERPENDICULAR TO FLUTES); OR CFSF-TO-DECK (PARALLEL OR PERPENDICULAR TO FLUTES) TO MAINTAIN ASSEMBLY RATING CONSISTENT WITH WALL/PARTITION REQUIREMENTS. BRACE WALL AS INDICATED OR REQUIRED.

B. AT ALL OTHER WALLS INDICATED TO EXTEND TO UNDERSIDE OF FLOOR/ROOF DECK/CAP: SEAL ALL NON-OBSTRUCTED HEAD-OF-WALL CONDITIONS IN ACCORDANCE WITH JOINT SYSTEM MANUFACTURER'S RECOMMENDATIONS BASED ON CONDITION ENCOUNTERED (E.G., CMU-TO-DECK (PARALLEL OR PERPENDICULAR TO FLUTES); OR CFSF-TO-DECK (PARALLEL OR PERPENDICULAR TO FLUTES). BRACE WALL AS INDICATED OR REQUIRED.

C. AT ALL WALLS PREVENTED FROM TERMINATING AT THE UNDERSIDE OF FLOOR/ROOF DECK BY OBSTRUCTIONS, COMPLY WITH THE FOLLOWING:

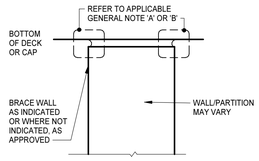
- AT FIRE-, SMOKE-, AND ACOUSTICALLY-RATED WALLS: ENCASE OBSTRUCTION(S) TO MAINTAIN ASSEMBLY RATING CONSISTENT WITH WALL/PARTITION REQUIREMENTS.
- AT SECURITY WALLS: TERMINATE IN ACCORDANCE WITH SECURITY PARTITION REQUIREMENTS.
- AT OTHER WALLS: ENCASE OBSTRUCTION(S) ON ONE SIDE.
- SEAL ENCASEMENT TO WALL AND SEAL ENCASEMENT TO DECK IN ACCORDANCE WITH JOINT SYSTEM MANUFACTURER'S RECOMMENDATIONS AND TO MAINTAIN ASSEMBLY RATING CONSISTENT WITH WALL/PARTITION REQUIREMENTS.

TERMINATIONS



HEAD-OF-WALL TERMINATION @ OBSTRUCTION

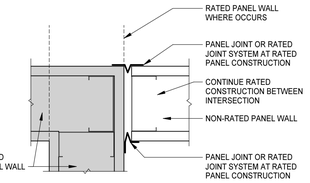
OBSTRUCTION MAY VARY (BEAM, JOIST, GIRDER, CHANNEL, DUCTWORK, PIPING)



HEAD-OF-WALL TERMINATION @ NON-OBSTRUCTION

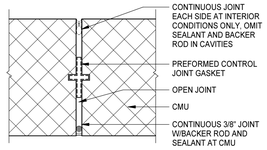
WALL JOINTS

RATED/ NON-RATED CFSF/ PANELS

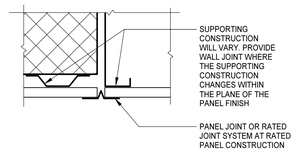


NOTE:
RATED WALL SHADED FOR CLARITY THIS DETAIL

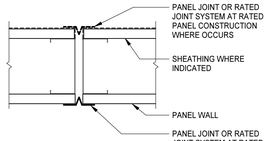
CMU



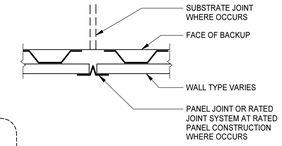
CMU/ CFSF



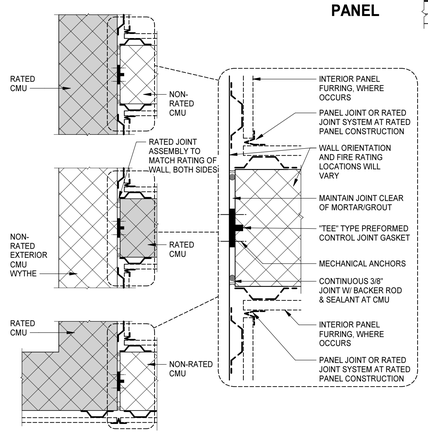
CFSF/ PANELS



PANEL



RATED/ NON-RATED CMU



NOTE:
RATED WALLS SHADED FOR CLARITY THIS DETAIL

WALL/PARTITION TYPE GENERAL NOTES

A. PLAN DIMENSIONS ARE TO FACE OF WALL OR PARTITION. WHERE APPLIED FINISHES OCCUR-SUCH AS CERAMIC TILE-DIMENSIONS ARE TO FACE OF APPLIED FINISH. FOR WAINSCOTS, FLOOR PLAN DIMENSIONS ARE TO FACE OF WAINSCOT MATERIAL. APPLIED FINISHES ARE NOT ALLOWED TO REDUCE CLEAR DIMENSIONS. "APPLIED FINISHES" IN THIS CASE DO NOT INCLUDE TRIM, BASE, AND ACOUSTIC WALL PANELS.

B. EXTEND WALL/PARTITION ASSEMBLY COMPONENTS FULL HEIGHT OF ASSEMBLY.

C. ALL INTERIOR MASONRY UNIT PARTITIONS: M6 UNLESS INDICATED OTHERWISE.

D. ALL INTERIOR CFSF PANEL PARTITIONS: P1 UNLESS INDICATED OTHERWISE.

E. REFER TO STRUCTURAL DRAWINGS AND RELATED SPECIFICATIONS FOR SOLID MASONRY, GROUTING, AND REINFORCEMENT REQUIREMENTS INCLUDING BUT MAY NOT BE LIMITED TO:

- MASONRY WALLS/PARTITIONS
- LINTELS
- LINTEL BEARING CONDITIONS
- BOND BEAMS
- SHELF BEARING CONDITIONS
- STRUCTURAL REINFORCING REQUIREMENTS
- CHANGES IN WYTHE

F. THE TERMS "WALL" AND "PARTITION" MAY BE USED INTERCHANGEABLY THROUGHOUT THE CONTRACT DOCUMENTS.

G. EXTEND ALL FIRE-, SMOKE-, INCIDENTAL USE-, AND ACOUSTICAL-RATED WALLS/PARTITIONS TO UNDERSIDE OF FLOOR DECK, ROOF DECK, STRUCTURAL ELEMENT ENCASEMENT OR SOLID CAP ABOVE.

- SEAL AND TERMINATE IN ACCORDANCE WITH JOINT SYSTEM TESTED ASSEMBLIES FOR RESPECTIVE TYPE OF WALLS/PARTITIONS.

H. PARTITIONS THAT DO NOT EXTEND TO UNDERSIDE OF DECK OR CAP ABOVE:

- EXTEND 4 INCHES MINIMUM ABOVE HIGHEST ADJACENT FINISH CEILING UNLESS INDICATED OTHERWISE.

I. DO NOT CONNECT TIES, ANCHORS, OR REINFORCING TO SINGLE CANTILEVERED FIRE WALL OR BETWEEN DOUBLE FIRE WALLS.

J. SEAL AROUND ALL PENETRATIONS.

K. COMPLY WITH TERMINATION, WALL JOINT, AND MISCELLANEOUS DETAILS FOR THOSE CONDITIONS WHERE APPLICABLE. COMPLY WITH REFERENCED STANDARDS WHERE DETAILS ARE NOT IDENTIFIED IN THE DRAWINGS.

L. WALL/PARTITION TYPES DO NOT ADDRESS WALL FINISHES. REFER TO FINISH SCHEDULE.

M. FINISHED SPACES: PROVIDE CHASES AROUND ALL EXPOSED VERTICAL COMPONENTS, INCLUDING BUT NOT LIMITED TO: DUCTWORK, PIPING, AND CONDUIT, UNLESS COMPONENTS ARE SPECIFICALLY INDICATED TO REMAIN EXPOSED. IF NOT OTHERWISE INDICATED, PROVIDE P2 CHASE CONSTRUCTION.

- HOLD CHASES TIGHT TO COMPONENTS ALLOWING FOR ACCESS, INSULATION, AND TOLERANCES.
- EXTEND CHASES FROM FLOOR TO 4 INCHES MINIMUM ABOVE FINISH CEILING OR IF NO CEILING IS INDICATED, EXTEND CHASES TO UNDERSIDE OF FLOOR DECK, ROOF DECK, OR SOLID CAP ABOVE AND TERMINATE ACCORDINGLY.

N. PROVIDE BACKER BOARD/UNIT OF SAME THICKNESS INDICATED IN LIEU OF GYPSUM BOARD PANEL AT PORTIONS OF WALLS/PARTITIONS TO RECEIVE TILE.

MASONRY UNIT WALL/PARTITION TYPES

REPRESENTED BY Xnn

MARK	FIRE RATED ASSEMBLY (REFER TO LS 1.1 FOR LEGEND)	REMARKS	INFORMATION
M6	--	--	5 5/8" — 6" CMU
M8	--	--	7 5/8" — 8" CMU

PANEL WALL/PARTITION TYPES

REPRESENTED BY Xnn

MARK	FIRE RATED ASSEMBLY (REFER TO LS 1.1 FOR LEGEND)	REMARKS	INFORMATION
P1	--	--	4 7/8" — 5/8" GYPSUM BOARD; 3 5/8" CFSF-NS; 3" SOUND ATTENUATION BATTS
P2	--	--	4 1/4" — 5/8" GYPSUM BOARD; 3 5/8" CFSF-NS; 3" SOUND ATTENUATION BATTS
P3	--	--	4 9/32" — 5/8" LEAD LINED GYPSUM BOARD; 3 5/8" CFSF-NS; 3" SOUND ATTENUATION BATTS
P4	--	--	2 1/8" — 2 LAYERS 5/8" GYPSUM BOARD; 7/8" CFSF
P5	--	--	5/8" GYPSUM BOARD; 4" CFSF-NS
P6-1	X1	--	7 1/4" — 5/8" GYPSUM BOARD; 6" CFSF-NS; SOUND ATTENUATION BATTS

AD-01

MOSELEYARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-9690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
JOSHUA NATHAN BENNETT
Lic. No. 0401013563
08/19/25
ARCHITECT

HENRICO COUNTY ANIMAL SHELTER RENOVATION

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY

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DATE	DESCRIPTION
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WALL/PARTITION TYPES, WALL JOINTS AND TERMINATIONS

A0.2

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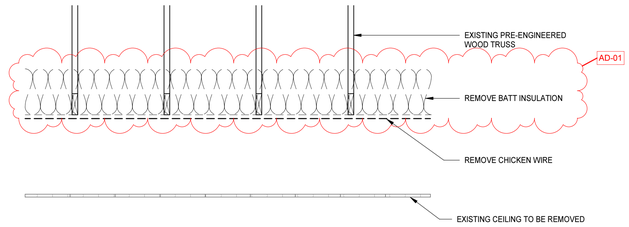
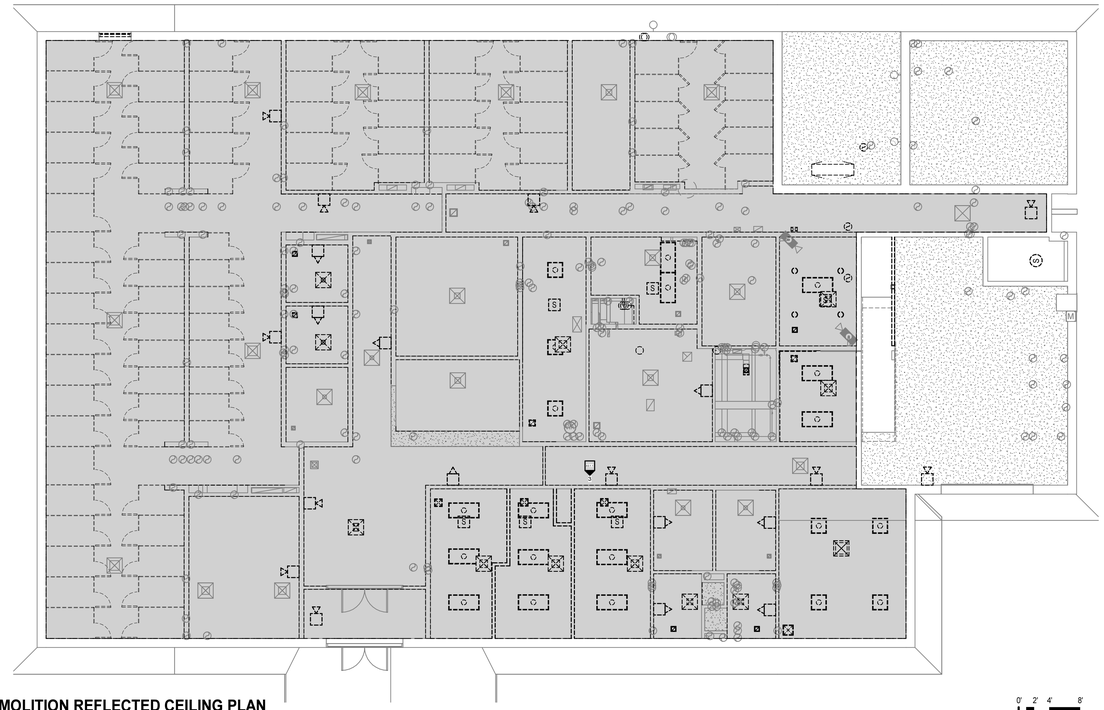


3 INSULATION DEMO DETAIL
A1.2.1 3/4" = 1'-0"



N DEMOLITION REFLECTED CEILING PLAN
1/8" = 1'-0"

0' 2' 4' 8' 16'
1/8" = 1'-0"

DEMOLITION PLAN LEGEND
APPLIES TO DRAWINGS A1.2.1 - A1.2.n

- EXISTING PARTITION/ WALL/ ITEM TO REMAIN
- REMOVE EXISTING PARTITION/WALL/ITEM
- REMOVE EXISTING WINDOW ASSEMBLY AND FRAMING, INCLUDING ANCHORS
- REMOVE EXISTING DOOR AND FRAME ASSEMBLY INCLUDING DOOR HARDWARE, ANCHORS, AND THRESHOLD (WHERE OCCURS).
- REMOVE EXISTING PLUMBING FIXTURE. REFER TO PLUMBING DEMOLITION PLAN FOR ADDITIONAL INFORMATION.
- REMOVE ALL EXISTING FINISH FLOORING, BASE, AND SUSPENDED CEILINGS IN AREA
- AD-01 REMOVE BATT INSULATION IN ATTIC
- REMOVE SUSPENDED CEILING IN AREA

DEMOLITION PLAN GENERAL NOTES

A. REMOVE ALL CONSTRUCTION SHOWN DASHED OR OTHERWISE INDICATED TO BE REMOVED. REFER TO DEMOLITION KEYNOTES FOR ADDITIONAL INFORMATION.

B. REPRESENTATION OF EXISTING ITEMS ARE TO BE CONSIDERED GENERAL IN NATURE AND ARE BASED UPON INFORMATION PROVIDED BY OWNER'S RECORD DRAWINGS AND BY NON-DESTRUCTIVE FIELD INVESTIGATIONS. DEMOLITION PLANS ARE NOT COMPREHENSIVE IN ALL DETAILS OF EXISTING CONSTRUCTION THAT SHALL BE REMOVED TO COMPLETE THE WORK OF THE CONTRACT.

C. NOTIFY THE ARCHITECT OF ANY EXISTING CONDITIONS THAT PREVENT EXECUTION OF THE WORK INDICATED.

D. COORDINATE IN THE FIELD WITH THE OWNER ALL EXISTING ITEMS TO BE SALVAGED PRIOR TO ACTUAL DEMOLITION WORK. SURFACE CLEAN AND STORE SALVAGED ITEMS AS DIRECTED BY THE OWNER. THE OWNER HAS THE FIRST RIGHT OF REFUSAL ON ALL ITEMS REMOVED FROM THE PROJECT.

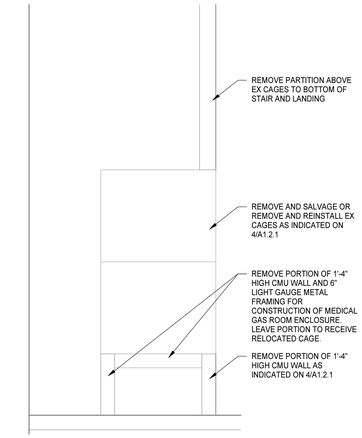
E. REFER TO OTHER DISCIPLINES DEMOLITION DRAWINGS FOR RELATED DEMOLITION WORK. THE ARCHITECTURAL DRAWINGS DO NOT INDICATE ALL THE DEMOLITION WORK REQUIRED IN THIS CONTRACT.

F. PATCH TO MATCH ADJACENT SURFACES ALL EXPOSED SURFACES AFFECTED BY THE DEMOLITION WORK THAT SHALL REMAIN EXPOSED TO VIEW UNLESS SPECIFICALLY INDICATED OTHERWISE.

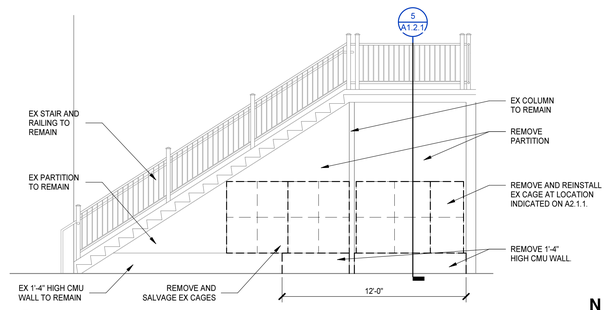
DEMOLITION PLAN KEYNOTES
REPRESENTED BY [n]
APPLIES TO DRAWINGS A1.2.1

1 REMOVE DOG KENNEL
2 REMOVE WINDOW. ENLARGE OPENING IN WALL TO ACCOMODATE DOOR. REFER TO DOOR SCHEDULE FOR DOOR SIZE AND TYPE.
3 REMOVE EYEWASH STATION
4 REMOVE TACK BOARD
5 EXISTING SAFE TO REMAIN
6 REMOVE DOOR, FRAME, AND ASSOCIATED HARDWARE
7 REMOVE PAPER TOWEL DISPENSER
8 REMOVE EYEWASH STATION
9 REMOVE CAGES. REFER TO 4/A1.2.1
10 REMOVE ALL WALL BASE IN KENNEL AREA
11 REMOVE WINDOW SHADES.
12 EXISTING SCALE TO REMAIN
13 CEILING ABOVE SHOWERS TO REMAIN
14 REMOVE COUNTER AND SUPPORTS
15 REMOVE CASEWORK CABINETS AND COUNTER
16 REMOVE PORTION OF WALL
17 REMOVE DOOR. FRAME TO REMAIN
18 REMOVE DISHWASHER
19 EXISTING BULKHEAD TO REMAIN

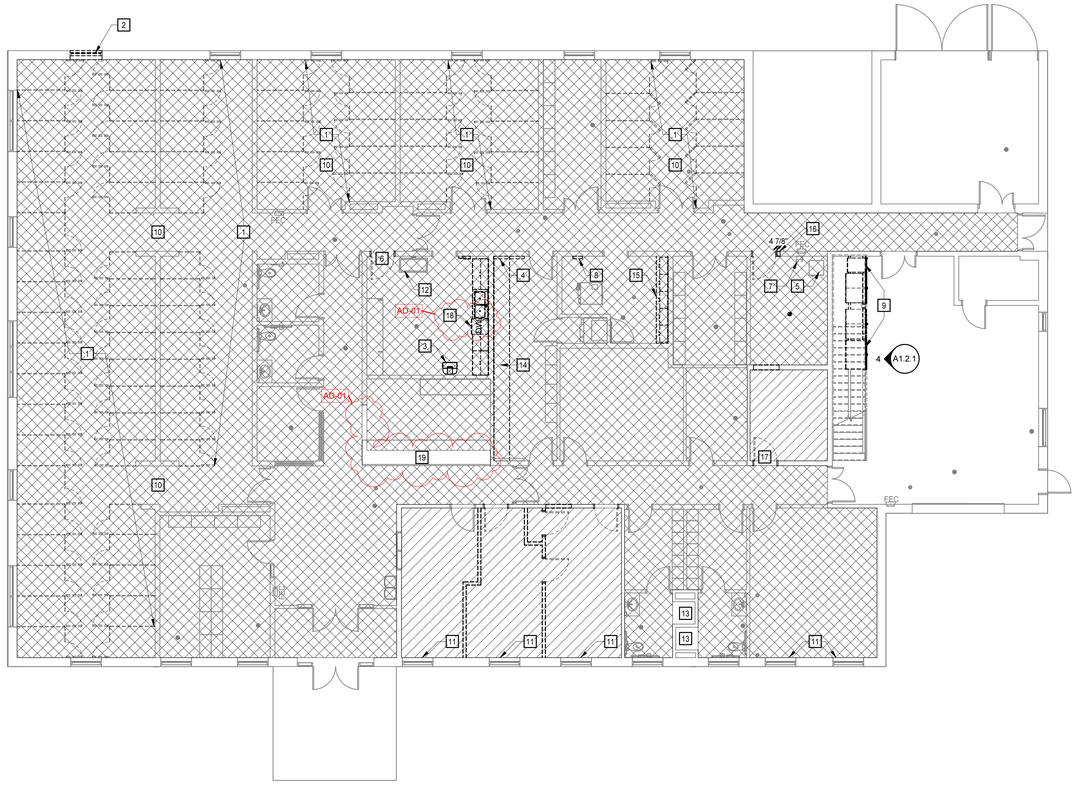
AD-01



5 CAGE SECTION
A1.2.1 A1.2.1 3/4" = 1'-0"



4 SALLYPORT CAGES
A1.2.1 A1.2.1 1/4" = 1'-0"



N DEMOLITION FIRST FLOOR PLAN
1/8" = 1'-0"

0' 2' 4' 8' 16'
1/8" = 1'-0"

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3200 NORFOLK STREET, RICHMOND, VA 23230
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DEMOLITION PLAN - FIRST FLOOR

A1.2.1

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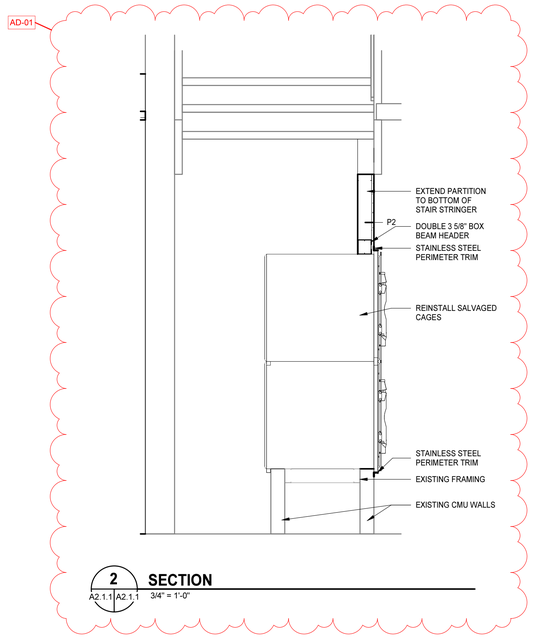


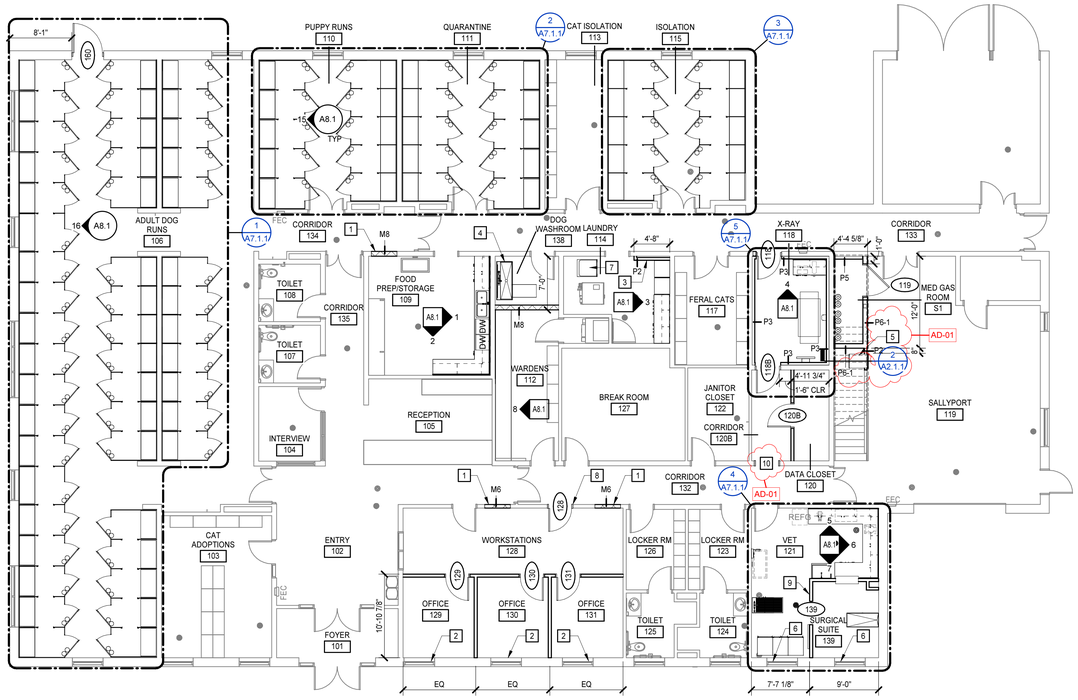
2 A2.1.1 A2.1.1 **SECTION**
3/4" = 1'-0"

FLOOR PLAN KEYNOTES

REPRESENTED BY n

APPLIES TO DRAWINGS A2.1

	1	INFILL OPENING. MATCH ADJACENT CONSTRUCTION.
AD-01	2	HORIZONTAL LOUVER BLINDS FOR EXISTING WINDOWS 4'-2" BY 5'-0" ROUGH OPENING. VIF
	3	RECESSED EYEWASH. INSTALL PANIC BAR AT 48" AFF MAX. TO COMPLY WITH ACCESSIBLE REACH RANGES.
	4	GROOMING TUB WITH LEFT HAND RAMP
AD-01	5	REINSTALL CAGES. PROVIDE STAINLESS STEEL TRIM ON ALL SIDES.
	6	SOLAR CONTROL WINDOW FILM. EXISTING WINDOWS 4'-2" BY 5'-0" ROUGH OPENING. VIF
	7	FRONT-LOAD WASHER
	8	PROVIDE (2)-L3 1/2x2 1/2x5/16 (LONG LEG VERTICAL AND BACK-TO-BACK) BEAR 4" INTO SOUND AND SOLID CMU
	9	PUSH BUTTON DOOR OPERATOR
AD-01	10	CAP OPENINGS IN FRAME



N

FLOOR PLAN
1/8" = 1'-0"

0' 2' 4' 8' 16'
1/8" = 1'-0"

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FLOOR PLAN

A2.1.1

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FINISH SCHEDULE

NUMBER	NAME	FLOOR	BASE	WALLS NORTH	WALLS EAST	WALLS SOUTH	WALLS WEST	WAINSCOT	CEILING	NOTES
101	FOYER	EX	EX	EX	EX	EX	EX		ACP-A	
102	ENTRY	EX	EX	EX	EX	EX	EX		ACP-A	
103	CAT ADOPTIONS	EX	EX	EX	EX	EX	EX		ACP-A	
104	INTERVIEW	EX	EX	EX	EX	EX	EX		ACP-A	
105	RECEPTION	EX	EX	EX	EX	EX	EX		ACP-A/ GB PT	
106	ADULT DOG RUNS	EX/ RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	2
107	TOILET	EX	EX	EX	EX	EX	EX		GB PT	
108	TOILET	EX	EX	EX	EX	EX	EX		GB PT	
109	FOOD PREP/STORAGE	EX/ RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	2
110	PUPPY RUNS	EX/ RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	2
111	QUARANTINE	EX/ RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	2
112	WARDENS	EX/ RES	RES	PT	PT	PT	PT		ACP-A	2
113	CAT ISOLATION	EX	EX	EX	EX	EX	EX		ACP-A	
114	LAUNDRY	EX/ RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	2
115	ISOLATION	EX/ RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	2
116	CREMATORY	EX	EX	EX	EX	EX	EX		EX	
117	FERAL CATS	EX	EX	EX	EX	EX	EX		ACP-A	
118	X-RAY	EX	EX	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	
119	SALLYPORT	EX	EX	EX	EX	EX	EX		EX	
120	DATA CLOSET	SDT	RB	PT	PT	PT	PT		EXPC PT	
120B	CORRIDOR	RES	RES	PT	PT	PT	PT		ACP-A	2
121	VET	RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		ACP-B	1
122	JANITOR CLOSET	EX	EX	EX	EX	EX	EX		GB PT	
123	LOCKER RM	EX	EX	EX	EX	EX	EX		ACP-A	
124	TOILET	EX	EX	EX	EX	EX	EX		GB PT	
125	TOILET	EX	EX	EX	EX	EX	EX		GB PT	
126	LOCKER RM	EX	EX	EX	EX	EX	EX		ACP-A	
127	BREAK ROOM	EX	EX	EX	EX	EX	EX		ACP-A	
128	WORKSTATIONS	VT	RB	PT	PT	PT	PT		ACP-A	
129	OFFICE	VT	RB	PT	PT	PT	PT		ACP-A	
130	OFFICE	VT	RB	PT	PT	PT	PT		ACP-A	
131	OFFICE	VT	RB	PT	PT	PT	PT		ACP-A	
132	CORRIDOR	EX/ RES	RES	PT	PT	PT	PT		ACP-A	2
133	CORRIDOR	EX	EX	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	
134	CORRIDOR	EX	EX	EPX PT	EPX PT	EPX PT	EPX PT		ACP-A	
135	CORRIDOR	EX	EX	EX	EX	EX	EX		ACP-A	
136	ELECTRICAL	EX	EX	EX	EX	EX	EX		EX	
137	OUTDOOR MECHANICAL	EX	EX	EX	EX	EX	EX		EX	
138	DOG WASHROOM	RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		GB PT	
139	SURGICAL SUITE	RES	RES	EPX PT	EPX PT	EPX PT	EPX PT		ACP-B	1
S1	MED GAS ROOM	EX	EX	EX	EX	EX	EX		GB PT	

AD-01

NOTE:

1. PROVIDE INTEGRAL EPOXY RESINOUS COVE WALL BASE 8"H. REFER DETAIL BELOW.

2. PATCH EXISTING FLOORING WITH NEW RESINOUS MATERIAL TO MATCH EXISTING FLUID-APPLIED FLOORING IN COLOR AND COMPOSITION. THE OVERALL QUANTITY OF NEW MATERIAL SHALL BE APPROXIMATELY 30%. REMOVE THE EXISTING BASE AND INSTALL NEW RESINOUS COVE BASE THROUGHOUT, REFER TO DETAIL 2/A3.0.1

FINISH SCHEDULE GENERAL NOTES

A. FINISH SCHEDULE DESCRIBES ONLY THE BASIC OR PREDOMINANT SURFACE FINISH.

B. PROVIDE SAME FINISHES AS THE ADJACENT SPACE IN ALCOVES AND CONTINUOUS SPACES WITHOUT DESIGNATED SPACE NUMBERS.

C. CASEWORK FINISHES ARE NOT NOTED IN THE FINISH SCHEDULE. REFER TO CASEWORK ELEVATIONS AND SPECIFICATIONS FOR MATERIALS AND FINISHES.

D. DIRECTIONAL WALL FINISH INDICATORS (NORTH, EAST, SOUTH, WEST) REFER TO THE "PLAN" NORTH ORIENTATION.

E. BULKHEADS AND SOFFITS MAY NOT BE INDICATED IN FINISH SCHEDULES. REFER TO RCP DETAILS, AND OTHER DOCUMENTS FOR EXTENT.

F. PROVIDE CONTINUOUS SEALANT BETWEEN INTERIOR SLAB-ON-GRADE AND VERTICAL ELEMENT WHERE JOINT IS NOT CONCEALED BY FINISH BASE OR OTHER CONSTRUCTION

G. REFER TO SPECIFICATIONS FOR INFORMATION ON FINISH FIRE CLASSIFICATION RATING.

H. PAINT ALL EXPOSED ELEMENTS (SUCH AS PIPING AND CONDUITS) TO MATCH ADJACENT COLOR (HIDE & BLEND).

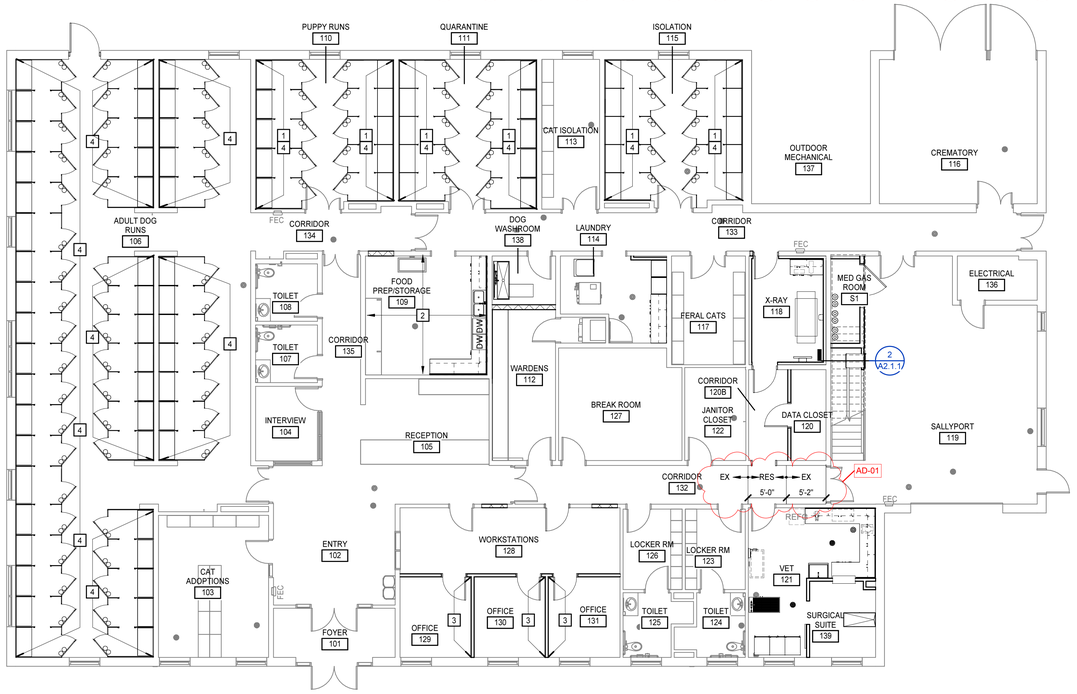
I. WHERE NEW RESINOUS FLOORING IS SPECIFIED, PROVIDE INTEGRAL EPOXY RESINOUS COVE WALL BASE 8"H.

FINISH PLAN KEYNOTES

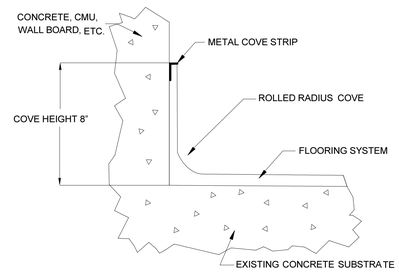
REPRESENTED BY n

APPLIES TO DRAWINGS A3.0.1

1	ACCENT WALL PAINT ABOVE KENNELS
2	ACCENT WALL PAINT AT ALL WALLS ABOVE 7'-4" HIGH
3	ACCENT WALL PAINT THIS WALL, FULL HEIGHT
4	ACOUSTIC WALL PANELS, REFER TO A8.1 FOR TYPICAL LAYOUT AND PANEL SIZE



1 A4.1.x A3.0.1 **INTERIOR FINISH PLAN** 1/8" = 1'-0"



3 TYP A3.0.1 **RES COVE BASE DETAIL** 3" = 1'-0"

NOTE: USE DRY MIXED TROWELABLE MORTAR VERSION OF FLOORING MATERIAL TO BUILD COVE.

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3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
JOSHUA NATHAN BENNETT
Lic. No. 0401013563
08/18/25
ARCHITECT

HENRICO COUNTY ANIMAL SHELTER RENOVATION

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY

PROJECT NO: 615225
DATE: AUGUST 18, 2025

REVISIONS	
DATE	DESCRIPTION
09/17/25	AD-01

FINISH SCHEDULE AND FIINISH PLAN

A3.0.1

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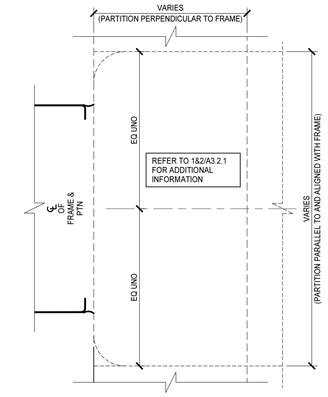
DOOR AND FRAME DETAIL KEYNOTES

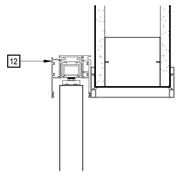
REPRESENTED BY n

APPLIES TO DRAWINGS A3.2.1 - A3.2.n

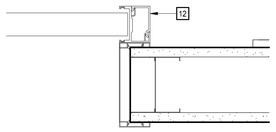
1	ANCHORAGES, REINFORCING, SPECIFIC PARTITION CONSTRUCTION AND/OR LINTELS ARE NOT SHOWN FOR CLARITY.
2	REFER TO FRAME SECTION IN DOOR SCHEDULE FOR TYPE.
3	SEALANT, ALL SIDES - TOOL TO 90°.
4	BACKBEND RETURN @ GB LOCATIONS ONLY.
5	9/16" @ MAS; 1/2" @ GB.
6	1/4" @ JAMBS, UNO; DIMENSION @ HEAD & SILL VARIES.
7	BULLNOSE @ CMU JAMBS & SILLS.
8	0" @ GB LOCATIONS; 1/16" @ MAS LOCATIONS.
9	BACKER ROD AND SEALANT
12	SLIDING DOOR ASSEMBLY
13	STEEL FRAME WITH LEAD SHIELDING
14	LEAD LINED GYP BOARD
15	PROVIDE (2)-L3 1/2x3 1/2x5/16 (BACK-TO-BACK) BEAR 4" INTO SOUND AND SOLID CMU
16	PPT WOOD SHIM AS REQUIRED



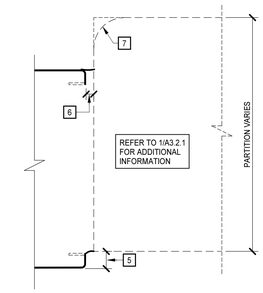
3 INTERIOR BETWEEN THE JAMB - BUTTED HEAD/JAMB/SILL
A3.2.1 — 6" = 1'-0"



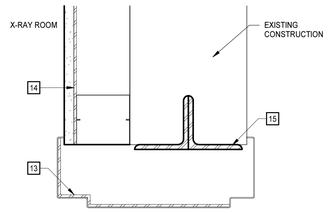
7 HEAD DETAIL
A3.1.1 A3.2.1 — 3" = 1'-0"



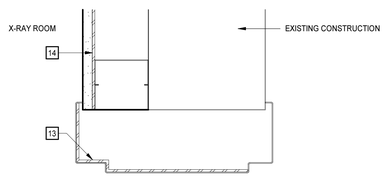
6 JAMB DETAIL
A3.1.1 A3.2.1 — 3" = 1'-0"



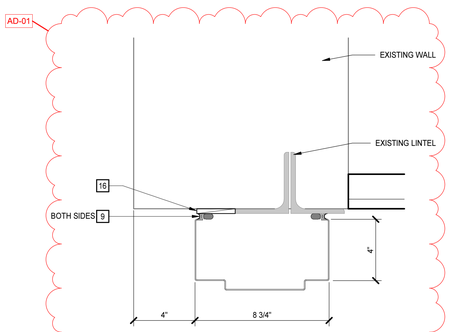
2 INTERIOR BETWEEN THE JAMB - PROJECTED HEAD/JAMB/SILL
A3.2.1 — 6" = 1'-0"



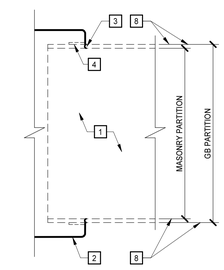
10 HEAD DETAIL
A2.0.x A3.2.1 — 3" = 1'-0"



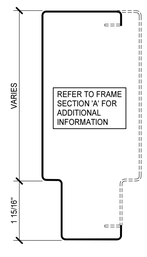
9 HEAD DETAIL
A3.2.1 — 3" = 1'-0"



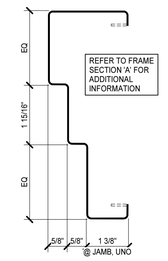
5 HEAD DETAIL
A3.2.1 — 3" = 1'-0"



1 INTERIOR WRAP HEAD/JAMB/SILL
A3.2.1 — 6" = 1'-0"

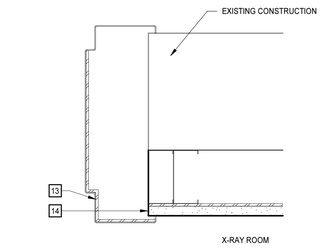


SINGLE RABBET
D

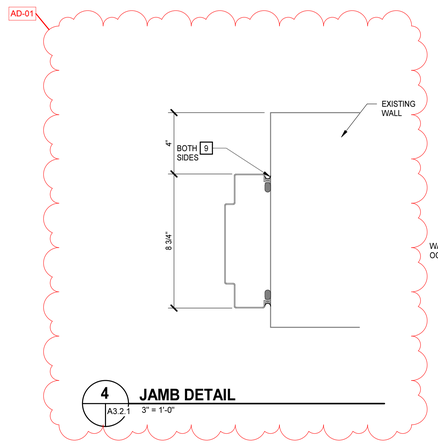


DBL EGRESS @ JAMB ONLY
B

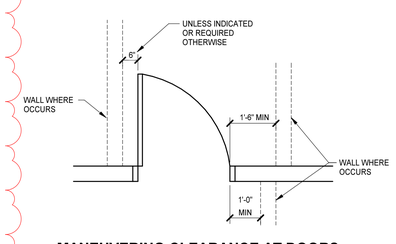
HEAD SECTION SIMILAR



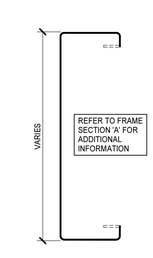
8 JAMB DETAIL
A3.2.1 — 3" = 1'-0"



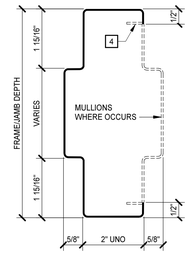
4 JAMB DETAIL
A3.2.1 — 3" = 1'-0"



MANEUVERING CLEARANCE AT DOORS
NO SCALE



CASED OPENING
C



DBL RABBET
A

1. ALL FRAME/JAMB DEPTHS, OTHER THAN WRAP CONDITIONS, SHALL BE 8 3/4", UNO.
2. ALL FRAME/JAMB DEPTHS AT WRAP CONDITIONS SHALL BE SIZED TO SUIT PARTITION.
3. DOORS, PANELS, GLAZING, STOPS, AND OTHER FRAME INFILLS ARE NOT SHOWN IN FRAME SECTIONS AS THEY VARY - PROVIDE SAME WHERE INDICATED.

STEEL FRAME SECTIONS
NO SCALE

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3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-9690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
JOSHUA NATHAN BENNETT
Lic. No. 0401013563
ARCHITECT
09/17/25

HENRICO COUNTY ANIMAL SHELTER RENOVATION

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY

PROJECT NO: 615225
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REVISIONS

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09/17/25	AD-01

DOOR AND FRAME DETAILS

A3.2.1

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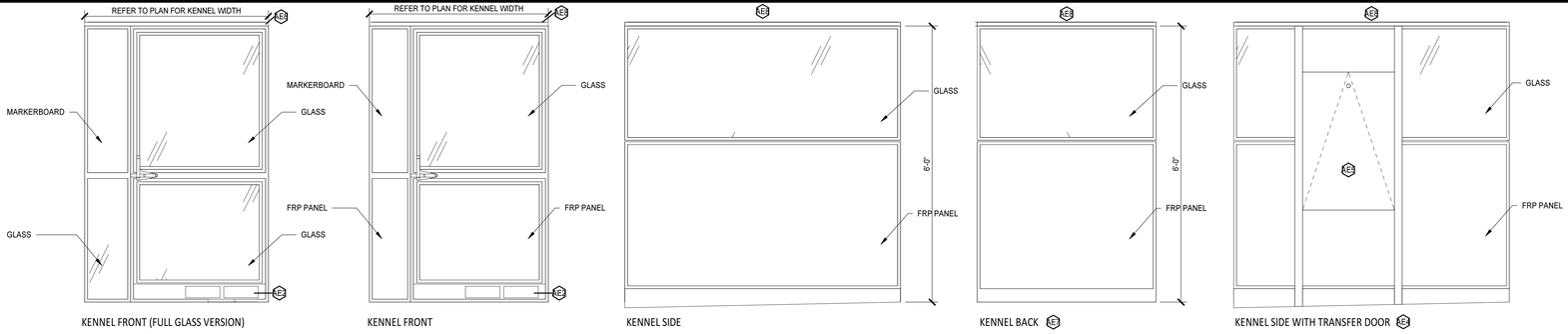


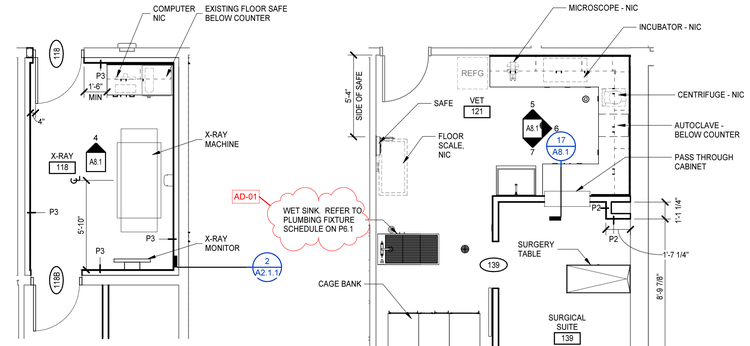
KENNEL FRONT (FULL GLASS VERSION) | KENNEL FRONT | KENNEL SIDE | KENNEL BACK | KENNEL SIDE WITH TRANSFER DOOR

KENNEL ELEVATIONS

3/4" = 1'-0"

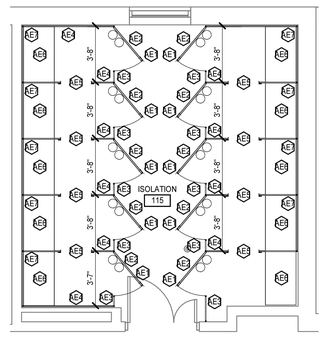
ANIMAL EQUIPMENT SCHEDULE

NO	DESCRIPTION	NOTES
AE1	KENNEL DOOR	
AE2	FOOD AND WATER BOWL FEEDER	
AE3	KENNEL FRONT	
AE3A	KENNEL FRONT - FULL GLASS	
AE4	KENNEL SIDE	
AE5	TRANSFER DOOR	
AE6	FLIP-UP REST BENCH	
AE7	KENNEL BACK	
AE8	KENNEL TOP	PROVIDE KENNEL TOP FOR ALL KENNELS

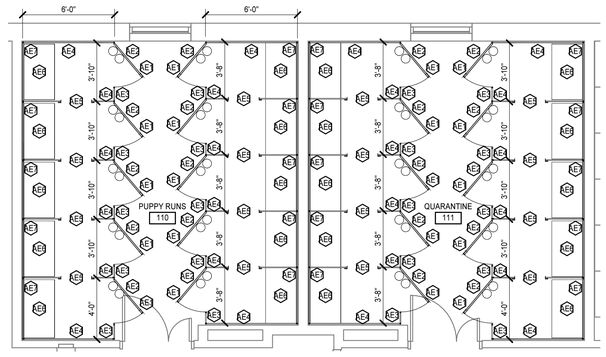


5 A2.1.1 A7.1.1 **ENLARGED PLAN** 1/4" = 1'-0"

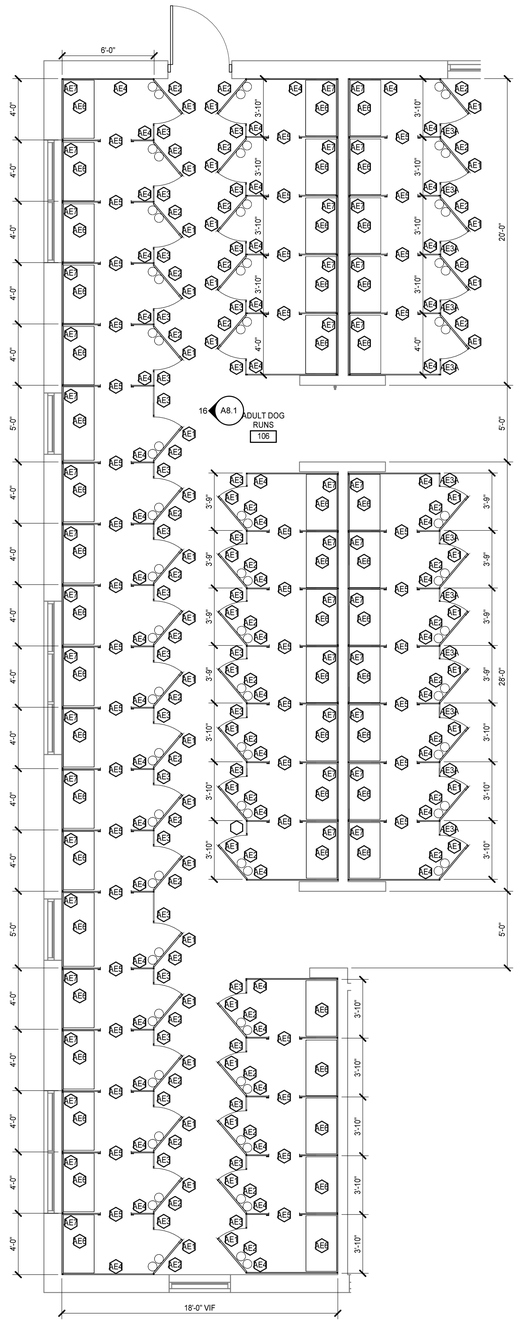
4 A2.1.1 A7.1.1 **ENLARGED PLAN** 1/4" = 1'-0"



3 A2.1.1 A7.1.1 **ENLARGED PLAN** 1/4" = 1'-0"



2 A2.1.1 A7.1.1 **ENLARGED PLAN** 1/4" = 1'-0"



1 A2.1.1 A7.1.1 **ENLARGED PLAN** 1/4" = 1'-0"

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PHONE (804) 794-7555 FAX (804) 355-8690
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09/17/25
ARCHITECT

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ENLARGED PLANS

A7.1.1

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CASEWORK GENERAL NOTES

A. UNLESS INDICATED OTHERWISE, ALL COUNTERTOP(S):
   a. 2'-10" AFF MAX OR 2'-10" MAX TO TOP OF RIM AT DROP-IN SINKS AND LAVATORIES WHERE OCCURS
   b. 2'-1" DEEP
   c. STAINLESS STEEL
   d. BACKSPLASHES: 4" HIGH AT ALL SIDES AND BACK
   e. EXTEND COUNTERTOP 1/2" PAST BASE CABINET AT ALL EXPOSED CASEWORK ENDS
   f. VERIFY SLAB LEVELNESS AT CASEWORK PRIOR TO INSTALL. CONSTRUCTION TOLERANCES DO NOT APPLY TO ACCESSIBLITY DIMENSIONS; MAX DIMENSIONS SHALL BE MAINTAINED.

B. UNLESS INDICATED OTHERWISE, ALL BASE CABINET(S):
   a. 2'-0" DEEP NOMINAL
   b. TOE KICKS: 4" NOMINAL HIGH (REDUCE AS NEEDED FOR TOLERANCES) AND 3" DEEP
   c. SINK LOCATIONS: BASE CABINET WITH ATTACHED TOE KICK FOR BARRIER FREE ACCESS. WIDTH AS INDICATED ON DRAWING.
   d. PHENOLIC CORE

C. UNLESS INDICATED OTHERWISE, ALL WALL CABINET(S):
   a. 1'-0 1/2" DEEP NOMINAL
   b. 2'-6" HIGH
   c. TOP AT 7'-0" AFF
   d. MINIMUM 11" CLEAR INTERIOR DEPTH
   e. PHENOLIC CORE

D. UNLESS INDICATED OTHERWISE, ALL TALL CABINET(S):
   a. 2'-0" DEEP NOMINAL
   b. 7'-0" HIGH
   c. TOE KICKS: 4" HIGH AND 3" DEEP
   d. PHENOLIC CORE

E. BUILT-IN EQUIPMENT: SIZE OPENING (HEIGHT, WIDTH, AND DEPTH) AND ROUGH-IN REQUIREMENTS AS REQUIRED BASED ON APPROVED MANUFACTURER SUBMITTED.

F. ALL SHELVES: ADJUSTABLE UNLESS INDICATED OTHERWISE.

G. PROVIDE FINISH END PANELS AT ALL EXPOSED CASEWORK ENDS.

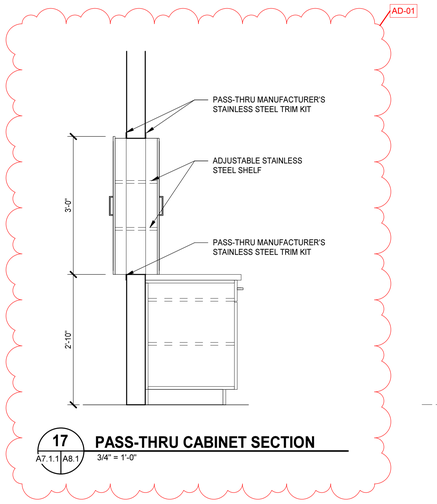
H. LOCKS: ***REQUIRED ONLY IN ROOM 118***

CASEWORK KEYNOTES

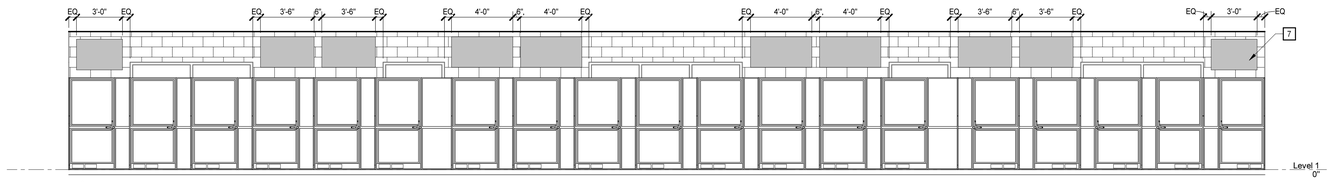
REPRESENTED BY n

APPLIES TO DRAWINGS A8.1 - A8.nn

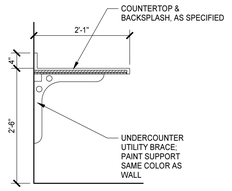
1	EXTEND STAINLESS STEEL BACKSPLASH TO WALL CABINETS
2	ADA CABINET WITH ATTACHED TOE-KICK
3	RECTANGULAR CLOSURE PANEL TO MATCH CABINETS
4	SUPPORT BRACKET
5	SIDE SPLASH
6	SOLID SURFACE COUNTERTOP AND BACKSPLASH
7	ACOUSTIC WALL PANELS, PAINTED IN FIELD
8	RECTANGULAR STAINLESS STEEL CLOSURE PANEL
9	3/4" RECTANGULAR STAINLESS STEEL PANEL
10	BASE CABINET MOCKUP LOCATION



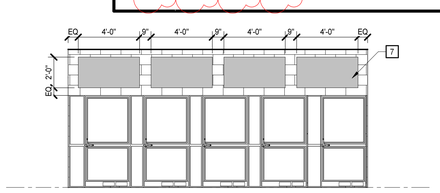
17 A7.1.1 A8.1 **PASS-THRU CABINET SECTION**
3/4" = 1'-0"



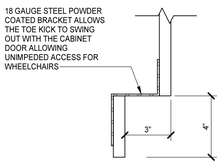
16 A2.1.1 A8.1 **ACOUSTIC WALL PANELS - RM 106 (BID ADDITIVE)**
1/4" = 1'-0"

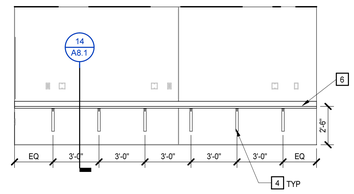


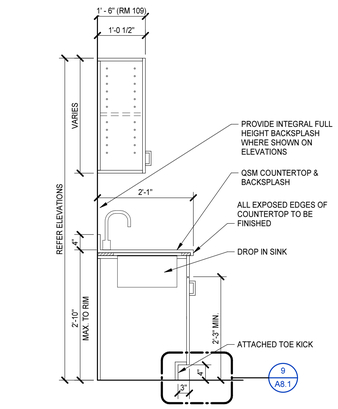
14 TYP A8.1 **COUNTERTOP SECTION**
3/4" = 1'-0"



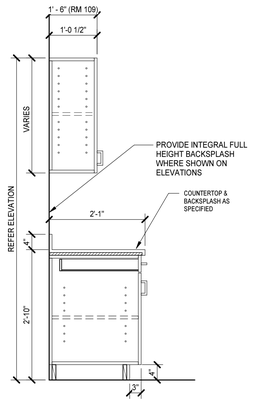
15 A2.1.1 A8.1 **TYPICAL ACOUSTIC WALL PANELS (BID ADDITIVE)**
1/4" = 1'-0"
PANELS SHALL BE INSTALLED BEHIND KENNELS IN ROOMS: 106, 110, 111, 115



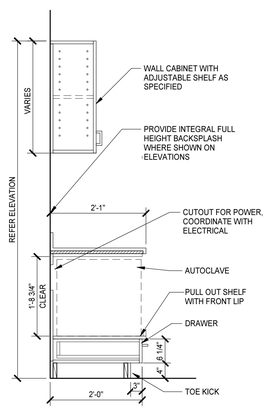




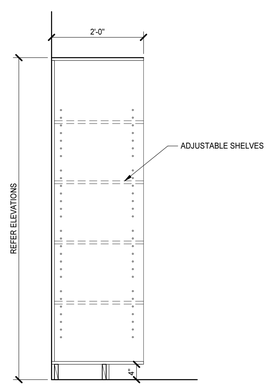
13 A8.1 A8.1 **TYPICAL ADA CABINET SECTION**
3/4" = 1'-0"



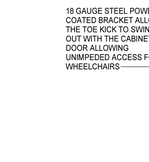
12 A8.1 A8.1 **TYPICAL CABINET SECTION**
3/4" = 1'-0"



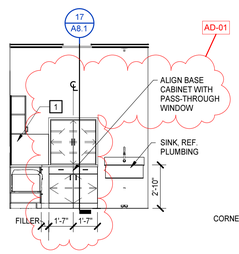
11 A8.1 A8.1 **CABINET SECTION**
3/4" = 1'-0"



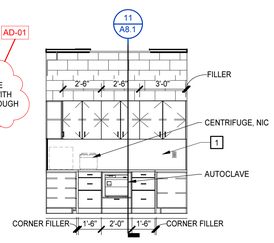
10 A8.1 A8.1 **TYPICAL TALL CABINET SECTION**
3/4" = 1'-0"



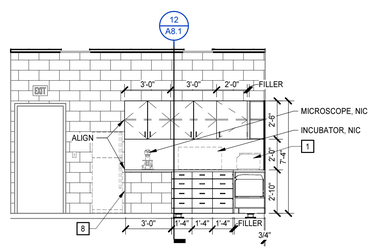
9 TYP A8.1 **DETAIL - ACCESSIBLE TOE KICK**
3" = 1'-0"



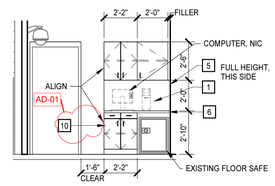
7 **121 VET - SOUTH**
1/4" = 1'-0"



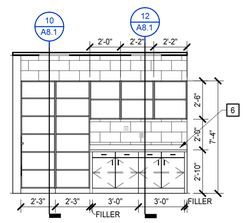
6 **121 VET - EAST**
1/4" = 1'-0"



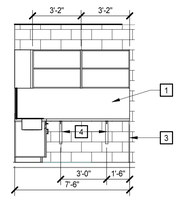
5 **121 VET - NORTH**
1/4" = 1'-0"



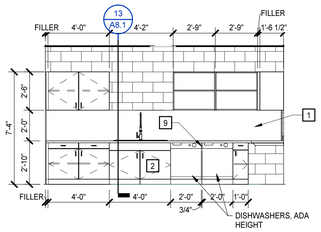
4 **118 X-RAY**
1/4" = 1'-0"



3 **114 LAUNDRY**
1/4" = 1'-0"



2 **109 FOOD PREP/STORAGE (SOUTH)**
1/4" = 1'-0"



1 **109 FOOD PREP/STORAGE (EAST)**
1/4" = 1'-0"

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3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
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COMMONWEALTH OF VIRGINIA
JOSHUA NATHAN BENNETT
Lic. No. 0401013563
09/17/25
ARCHITECT

HENRICO COUNTY ANIMAL SHELTER RENOVATION

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY

PROJECT NO: 615225	
DATE:	AUGUST 18, 2025
REVISIONS	
DATE	DESCRIPTION
09/17/25	AD-01

CASEWORK AND ELEVATIONS

A8.1

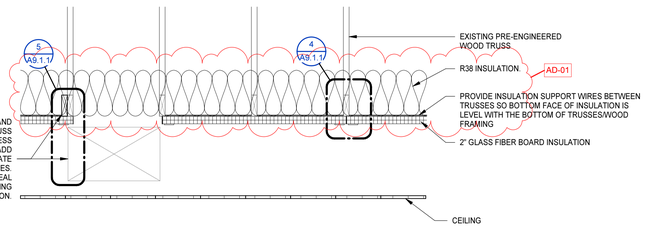
9/17/2025 9:58:46 AM

N

REFLECTED CEILING PLAN - INSULATION WORK
1/8" = 1'-0"

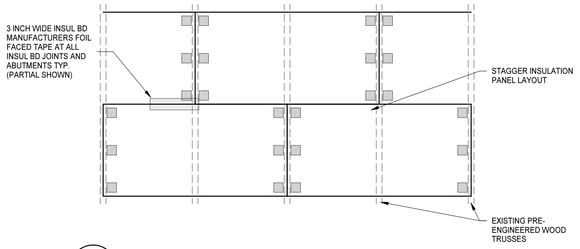
WHERE EXISTING OR CONTRACT ADDED MECHANICAL AND ELECTRICAL EQUIPMENT HANGS BELOW THE TRUSS BOTTOM CORD TOO CLOSE TO ALLOW FULL THICKNESS OF THE INSULATION TO "SLIDE THROUGH," ADD PROVISIONAL 2X WOOD BLOCKING TO ASSURE ADEQUATE SUPPORT ABSENT SAGGING OF UNSUPPORTED EDGES. PROVIDE MANUFACTURERS FOIL FACED TAPE TO SEAL INSULATION DIRECT TO SUCH OFFENDING PIPE/DUCTWORK OR OTHER SIMILAR OBSTRUCTION.

--

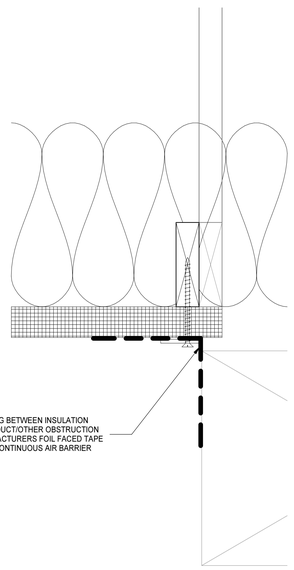


3 DETAIL
A9.1.1 3/4" = 1'-0"

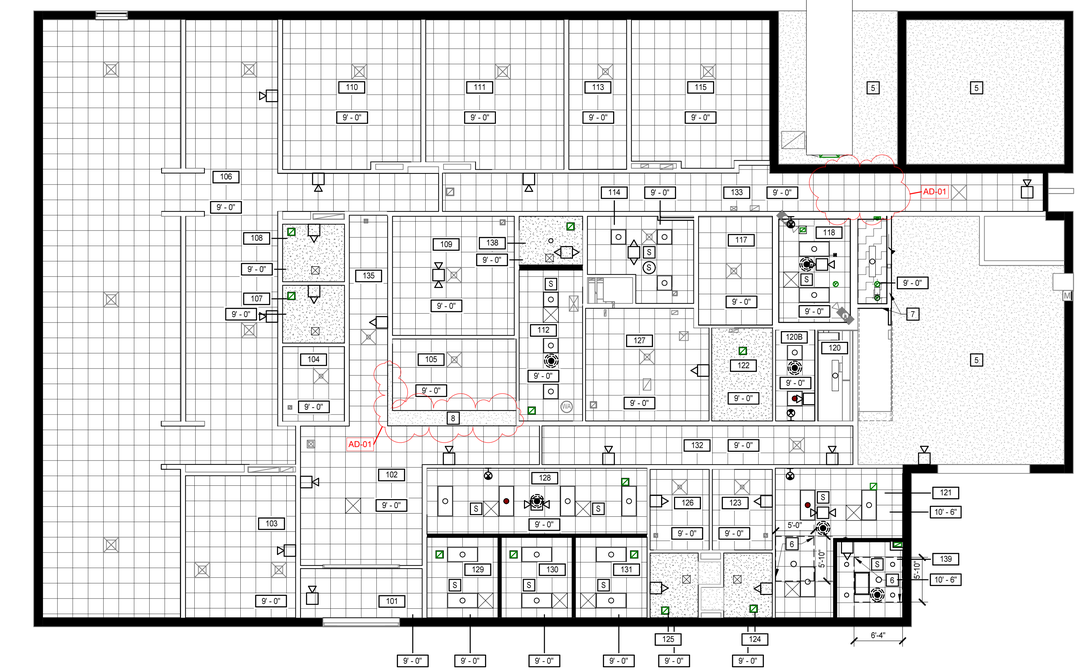
SLIT / CUT INSULATION BOARD AS REQUIRED TO SLIDE INTO PLACE AND FIT TIGHT AROUND THE FOLLOWING BUT NOT LIMITED TO; SUSPENDED CEILING WIRE TIES, DUCT SUPPORT STRAPS, THREADED ROD, UNISTRUT AND OTHER SIMILAR MECHANICAL AND ELECTRICAL EQUIPMENT HANGERS. SEAL CUTS AND RESULTING PENETRATIONS THAT ARE NEEDED IN THE INSULATION WITH INSULATION MANUFACTURERS FOIL FACED TAPE TO CREATE AIR TIGHTNESS.



6 REFLECTED VIEW - PANEL LAYOUT
A9.1.1 3/4" = 1'-0"

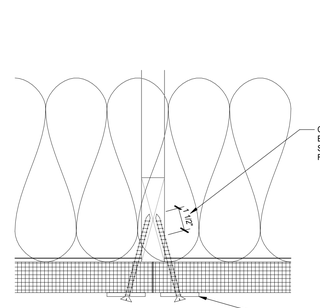


5 DETAIL
A9.1.1 A9.1.1 3" = 1'-0"



N

FIRST FLOOR PLAN
1/8" = 1'-0"



4 DETAIL
A9.1.1 A9.1.1 3" = 1'-0"

REFLECTED CEILING PLAN LEGEND
APPLIES TO DRAWINGS A9.1.1

REFER TO M, E & FP DRAWINGS FOR REFLECTED CEILING PLAN SYMBOLS NOT INDICATED BELOW

- A101 / nn'-nn" — SPACE NUMBER / CEILING HEIGHT, AFF UNO
- INTERIOR APPLICATIONS: GYPSUM BOARD CEILING
- EXTERIOR APPLICATIONS: GYPSUM SOFFIT BOARD OR GYPSUM SHEATHING
- 2'-0" x 2'-0" LAY-IN ACOUSTICAL CEILING PANELS IN SUSPENDED GRID
- 1 HR RATED HORIZONTAL SHAFT WALL (X2)
- INSTALL R38 INSULATION BETWEEN TRUSSES. INSTALL 2" GLASS FIBER INSULATION BOARD AGAINST EXISTING STRUCTURE. REFER TO 3/A9.1.1 — AD-01
- AP — ACCESS PANEL
- WITH OPENING — EXTERIOR WALL
- WITH OPENING — INTERIOR WALL/PARTITION TO UNDERSIDE OF DECK
- WITH OPENING — INTERIOR WALL/PARTITION TO CAP ABOVE OR TERMINATES ADJACENT TO A RATED HORIZONTAL ASSEMBLY
- WITH OPENING — INTERIOR WALL/PARTITION 4" MIN ABOVE HIGHEST ADJACENT CEILING. IF NECESSARY TO ACHIEVE RESULTS DESIRED, EXTEND WALL HEIGHT SO WALL BRACING IS NOT EXPOSED TO VIEW IN FINISHED SPACES
- INTERIOR WALL/PARTITION TO UNDERSIDE OF CEILING
- EXISTING TO REMAIN, VERIFY VERTICAL EXTENTS WHERE THE HEIGHT IMPACTS THE WORK

REFLECTED CEILING PLAN/DETAIL GENERAL NOTES

A. ALL CEILING HEIGHTS SHALL BE 9'-0" AFF UNLESS INDICATED OTHERWISE.

B. DRAWINGS INDICATE GRID LAYOUT DIAGRAMMATICALLY. REFER TO SPECIFICATIONS FOR SPECIFIC GRID LAYOUT CRITERIA AT PERIMETER CONDITIONS THAT MAY DIFFER FROM GRID LAYOUT INDICATED ON DRAWINGS.

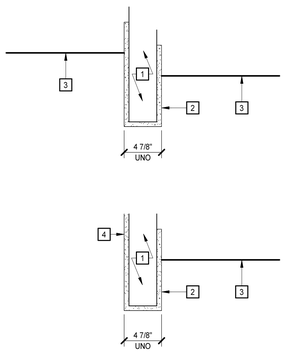
C. CENTER CEILING MOUNTED ITEMS WITHIN CEILING PANELS, UNLESS INDICATED OTHERWISE.

D. REINSTALL ALL CEILING ELEMENTS REMOVED FOR INSULATION INSTALLATION AND CEILING REPLACEMENT.

REFLECTED CEILING PLAN KEYNOTES
REPRESENTED BY n

APPLIES TO DRAWINGS A9.1.1

1	CFSF-S
2	5/8" GYP BD, TERMINATE 4" ABV FIN CLG
3	FIN CLG: FINISH AND/OR HEIGHT AFF VARIES
4	GYP BD: EXTEND FULL HEIGHT, UNLESS INDICATED OTHERWISE
5	EXISTING CEILING TO REMAIN
6	PROVIDE SLOTTED METAL FRAMING ABOVE CEILING FOR SURGICAL LIGHTS
7	EXTEND WALLS UP TO HORIZONTAL SHAFTWALL FOR CONTINUOUS RATING ENCLOSURE
8	EXISTING BULKHEAD TO REMAIN



BULKHEAD DETAILS
NO SCALE

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3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
JOSHUA NATHAN BENNETT
Lic. No. 0401013563
09/17/25
ARCHITECT

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REFLECTED CEILING PLAN - FIRST FLOOR

A9.1.1

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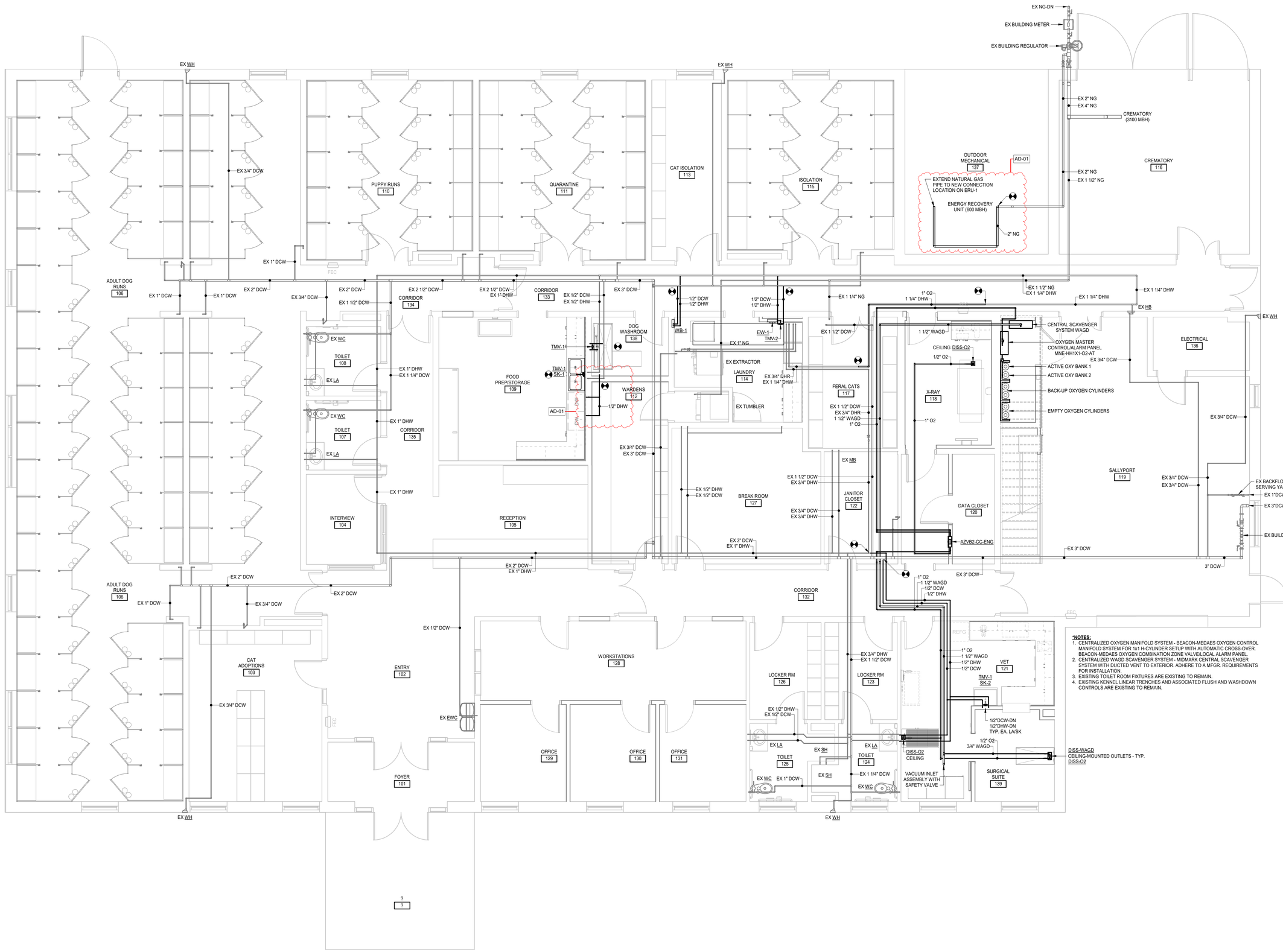

***NOTES:**

1. CENTRALIZED OXYGEN MANIFOLD SYSTEM - BEACON-MEDAES OXYGEN CONTROL MANIFOLD SYSTEM FOR 1x1 H-CYLINDER SETUP WITH AUTOMATIC CROSS-OVER. BEACON-MEDAES OXYGEN COMBINATION ZONE VALVE/LOCAL ALARM PANEL.
2. CENTRALIZED WAGD SCAVENGER SYSTEM - MIDMARK CENTRAL SCAVENGER SYSTEM WITH DUCTED VENT TO EXTERIOR. ADHERE TO A MFGR. REQUIREMENTS FOR INSTALLATION.
3. EXISTING TOILET ROOM FIXTURES ARE EXISTING TO REMAIN.
4. EXISTING KENNEL LINEAR TRENCHES AND ASSOCIATED FLUSH AND WASHDOWN CONTROLS ARE EXISTING TO REMAIN.

FIRST FLOOR PLAN - DOMESTIC

1/4" = 1'-0"

0' 1' 2' 4' 8'

1/4" = 1'-0"

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PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
DAVID T. WHATELY
Lic. No. 052209
08/18/25
PROFESSIONAL ENGINEER

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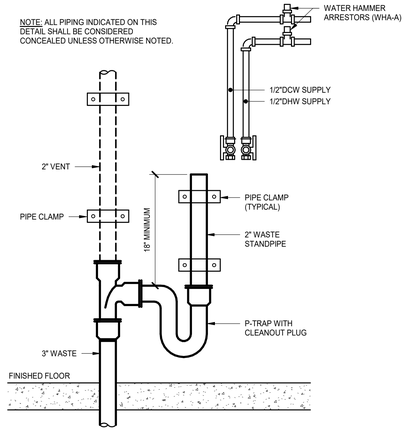
FIRST FLOOR PLAN - DOMESTIC

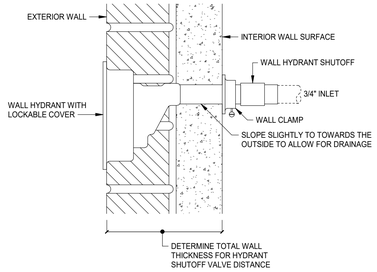
P2.2

9/17/2025 9:12:59 AM



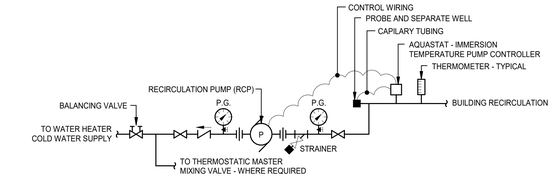
WASHING MACHINE STANDPIPE DRAIN DETAIL

NO SCALE



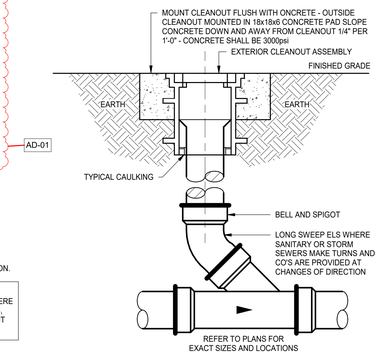
EXTERIOR WALL HYDRANT DETAIL

NO SCALE



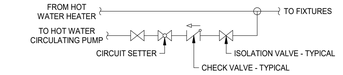
CIRCULATION PUMP DETAIL

NO SCALE



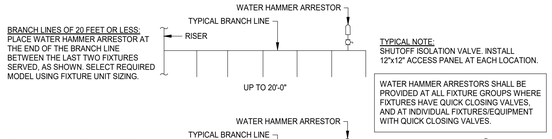
EXTERIOR YARD CLEANOUT DETAIL

NO SCALE



HOT WATER RECIRCULATION BRANCH CONNECTION DETAIL

NO SCALE



P.D.I. WATER HAMMER ARRESTORS

LENGTH OF PIPE	NOMINAL PIPE DIAMETERS					
	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
25'	A	A	B	C	D	E
50'	A	B	C	D	E	F
75'	B	C	D	AE	F	EF
100'	C	D	E	F	CF	FF
125'	C	D	F	AF	EF	EFF
150'	D	E	F	DF	FF	FFF

WHEN LONG RUNS OF PIPING ARE EMPLOYED TO SERVE REMOTE EQUIPMENT, WATER HAMMER ARRESTOR SHOULD BE LOCATED AS CLOSE AS POSSIBLE TO THE POINT OF QUICK CLOSURE OR HAMMER SOURCE.

THE SIZE AND QUANTITY OF WATER HAMMER ARRESTORS TO BE INSTALLED IN BRANCH LINES IS SHOWN IN TABLE. WHEN FLOR PRESSURE OF 65 PSIG TO 85 PSIG ARE USED, THE NEXT LARGER SIZE SHOULD BE SELECTED.

WATER HAMMER ARRESTOR CAPACITIES

CONN. SIZE	PDI SIZE	FIXTURE UNIT CAPACITY	CUBIC INCH VOLUME
1/2"	A	1 TO 11	5
3/4"	B	12 TO 32	7
1"	C	33 TO 60	11
1"	D	61 TO 113	20
1"	E	114 TO 154	29
1"	F	155 TO 330	34

NOTE: MATCH TOTAL FIXTURE UNITS OF BRANCH LINE TO CORRECT SIZE OF WATER HAMMER ARRESTOR.

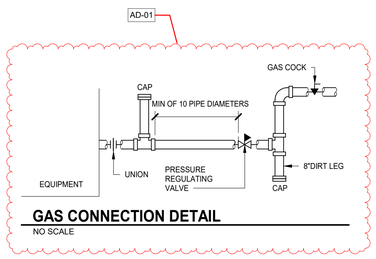
SHOCK ABSORBER SELECTION

CODE	PDI SIZE	FIXTURE UNITS
SA-1	A	1-11
SA-2	B	12-32
SA-3	C	33-60
SA-4	D	61-113
SA-5	E	114-154
SA-6	F	155-330

SHOCK ABSORBER SELECTION TABLE

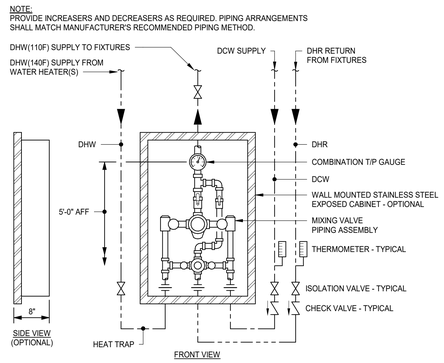
WATER HAMMER ARRESTOR INSTALLATION & SIZING DETAIL

NO SCALE



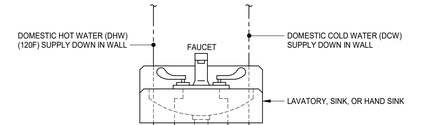
GAS CONNECTION DETAIL

NO SCALE



THERMOSTATIC MIXING VALVE DETAIL

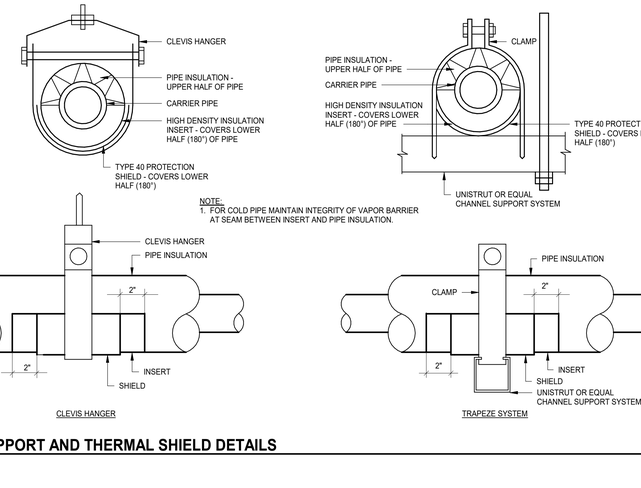
NO SCALE



FINISHED FLOOR

LAVATORY, SINK, OR HAND SINK DETAIL

NO SCALE

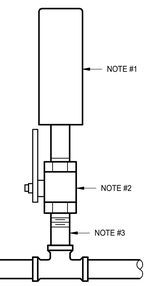


CLEVIS HANGER

TRAPEZE SYSTEM

PIPE SUPPORT AND THERMAL SHIELD DETAILS

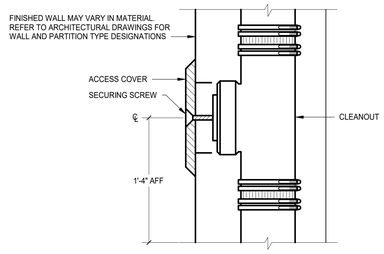
NO SCALE



NOTES:
1. WATER HAMMER ARRESTOR.
2. BALL VALVE. VALVE SIZE SHALL BE EQUAL TO NOMINAL SIZE OF ARRESTOR OUTLET (MINIMUM 1/2").
3. BRANCH PIPE EQUAL TO NOMINAL SIZE OF ARRESTOR OUTLET (MINIMUM 1/2").

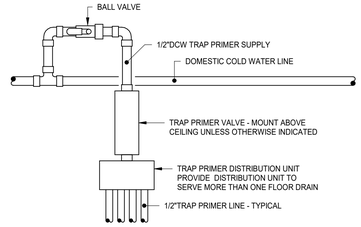
WATER HAMMER ARRESTOR DETAIL

NO SCALE

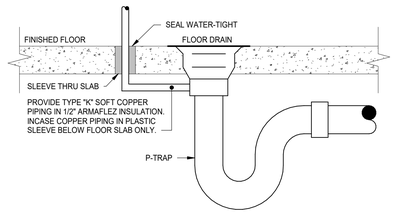


WALL CLEANOUT DETAIL

NO SCALE



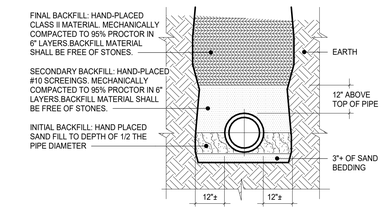
NOTES:
1. PRIMERS, VALVES, AND ASSOCIATED PIPING SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS.
2. PROVIDE DISTRIBUTION UNIT SIZED FOR NUMBER OF DRAINS TO BE SERVED BY EACH INDIVIDUAL PRIMER.
3. DISTRIBUTION UNIT SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.



MECHANICAL PRIMER DETAIL

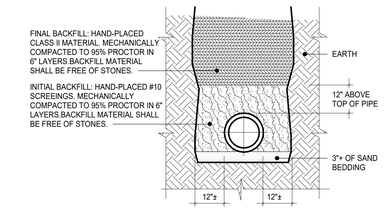
TRAP PRIMER ASSEMBLY DETAILS

NO SCALE



PVC PIPE BEDDING DETAIL

NO SCALE



CAST IRON PIPE BEDDING DETAIL

NO SCALE

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3200 NORFOLK STREET, RICHMOND, VA 23230
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P5.1

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PLUMBING FIXTURE SCHEDULE

TAG	FIXTURE	HEIGHT A.F.F.	BASIS OF DESIGN	PIPE SIZE					LEED USAGE DATA	NOTES
				COLD WATER	TEPID WATER	HOT WATER	VENT	SOIL WASTE		
EW-1	EMERGENCY EYEWASH - RECESSED WALL-MOUNTED	34" TO EYEWASH HEADS	FIXTURE: HAWS 7656WCC		1/2"		1 1/2"	1 1/2"		1, 3
SK-1	KITCHENETTE SINK - DOUBLE BOWL (ACCESSIBLE)	COUNTER MOUNTED REFER TO ARCH DWGS	FIXTURE: ELKAY LRADQ331955 FAUCET: ELKAY LKAV1061	1/2"		1/2"	1 1/2"	1 1/2"	1.80 GPM	1, 2, 4
SK-2	SCRUB SINK WITH FOOT CONTROL	RIM AT 36"	FIXTURE: ELKAY EWS3120FC FAUCET: LK395A FOOT VALVE: LK398C AD-01	1/2"		1/2"	1 1/2"	1 1/2"	2.20 GPM	2
SK-3	ANIMAL GROOMING SINK WITH RAMP AND HAIR TRAP	FLOOR-MOUNTED INTEGRAL SUPPORT LEGS	FIXTURE: SHOR-LINE ELITE 904.0702.45 FAUCET: T&S BRASS B-2278 INTERCEPTOR: STRIEM SIDEKICK	1/2"		1/2"	1 1/2"	2"	1.15 GPM	2, 5
WB-1	WASHER BOX WITH INTEGRAL HAMMER ARRESTORS	CENTER AT 42"	FIXTURE: GUYGRAY WB200HATM	1/2"		1/2"	2"	2"		

1. THIS ACCESSIBLE FIXTURE, ACCESSORIES, AND INSTALLATION SHALL CONFORM TO THE USBC AND ASAD ADA STANDARDS FOR ACCESSIBLE DESIGN.
2. PROVIDE ASSE-1070 CERTIFIED MIXING VALVE BELOW FIXTURE ACCESSIBLE BUT CONCEALED FROM VIEW.
3. PROVIDE ASSE-1071 CERTIFIED EMERGENCY MIXING VALVE IN CEILING CONCEALED FROM VIEW DIRECTLY ABOVE FIXTURE BEING SERVED.
4. PROVIDE DISHWASHER HOOK-UP WHERE DISHWASHER IS PRESENT. CONNECT HW IN SINK BASE AND CONNECT SANITARY THRU HIGH LOOP HOSE DRAIN INTO DISHWASHER TAIL PIECE SINK DRAIN.
5. PROVIDE ANIMAL GROOMING TUB WITH RAMP ACCESS, HAIR TRAP, AND COMPLETE WASH/SPRAY FAUCET ASSEMBLY.

THERMOSTATIC MIXING VALVE SCHEDULE

TAG	BASIS OF DESIGN		DESIGN FLOW (GPM)	FLOW RANGE (GPM)	MAX P.D. AT DESIGN FLOW (PSI)	HW SYSTEM TEMPERATURES		CONNECTION SIZE		NOTES
	MANUFACTURER	MODEL				INLET (°F)	OUTLET (°F)	INLET (IN)	OUTLET (IN)	
TMV-1	MGI CONTROLS	OMEGA ST7017	1.50	0.25 - 9.00	5.00	120	105	1/2"	1/2"	1
TMV-2	HAWS	TWBS-EWE	4.20	1.00 - 7.00	5.00	120	80	1/2"	1/2"	2

1. PROVIDE ASSE-1070 POINT OF USE THERMOSTATIC MIXING VALVE FOR ALL PUBLIC LAVATORIES AND SINKS. UNIT SHALL BE MOUNTED CONCEALED FROM VIEW BELOW FIXTURE.
2. PROVIDE ASSE-1071 EMERGENCY THERMOSTATIC MIXING VALVE LOCATED IN CEILING DIRECTLY ABOVE FIXTURE SERVED.

DRAIN AND CLEANOUT SCHEDULE

TAG	BASIS OF DESIGN		STRAINER/GRATE	NOTES
	MANUFACTURER	MODEL		
FCO	JOSAM	55000	FLOOR CLEANOUT	
FD-1	JOSAM	30000-6A-VP	6" ROUND	1

1. PROVIDE TRAP PRIMER CONNECTION AND EXTENSION, SEE DETAIL.

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3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
DAVID T. WHATELY
Lic. No. 052209
08/18/25
PROFESSIONAL ENGINEER

HENRICO COUNTY ANIMAL SHELTER RENOVATION

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY

PROJECT NO: 615225
DATE: AUGUST 18, 2025

REVISIONS

DATE	DESCRIPTION
09/17/25	AD-01

SCHEDULES

P6.1

9/17/2025 9:13:00 AM

AIR HANDLING UNIT SCHEDULE

TAG	MFR	MODEL NUMBER	SUPPLY FAN						EXHAUST FAN						OUTSIDE AIR DESIGN AIRFLOW (CFM)	ENTHALPY CORE												TOTAL CAPACITY (BTUH)	SENSIBLE CAPACITY (BTUH)	COOLING COIL				INDIRECT GAS BURNER			ELECTRICAL DATA						WEIGHT (LBS)
			DESIGN AIRFLOW (CFM)	ESP (IN WC)	WHEEL DIAMETER (IN)	WHEEL TYPE	FAN SPEED (RPM)	MOTOR SIZE (HP)	DESIGN AIRFLOW (CFM)	ESP (IN WC)	WHEEL DIAMETER (IN)	WHEEL TYPE	FAN SPEED (RPM)	MOTOR SIZE (HP)		SUPPLY AIR SUMMER EAT (°F DB)	SUPPLY AIR SUMMER EAT (°F WB)	SUPPLY AIR SUMMER LAT (°F DB)	SUPPLY AIR SUMMER LAT (°F WB)	SUPPLY AIR WINTER EAT (°F DB)	SUPPLY AIR WINTER EAT (°F WB)	SUPPLY AIR WINTER LAT (°F DB)	SUPPLY AIR WINTER LAT (°F WB)	DESIGN AIRFLOW (CFM)	EXHAUST AIR SUMMER EAT (°F DB)	EXHAUST AIR SUMMER EAT (°F WB)	EXHAUST AIR SUMMER LAT (°F DB)	EXHAUST AIR SUMMER LAT (°F WB)	EXHAUST AIR WINTER EAT (°F DB)	EXHAUST AIR WINTER EAT (°F WB)	EXHAUST AIR WINTER LAT (°F DB)	EXHAUST AIR WINTER LAT (°F WB)			EAT (°F DB)	EAT (°F WB)	LAT (°F DB)	LAT (°F WB)	CAPACITY (BTUH)	EAT (°F)	LAT (°F)	MCA (A)	MOCP (A)	SERVICE (V)	SERVICE (PH)	SERVICE (HZ)	
ERU-1	ENGINEERED AIR	FWX354	7,800	1.00	18.0	AF	2218	10	7,800	1.00	20.0	AF	1020	7.5	7,800	95.0	78.0	80.0	74.0	10.0	8.0	38.5	33.6	7,800	75.0	62.5	90.0	74.9	70.0	52.9	41.5	31.3	439,000	184,000	80.0	74.0	58.1	57.9	600,000	38.5	90.0	196	200	208	3	60	18,000

GENERAL NOTES:
A. DIV 23 FACTORY PROVIDED DISCONNECT SWITCH.

ENERGY RECOVERY VENTILATOR SCHEDULE

AD-01

TAG	MFR	MODEL NUMBER	SERVING	SUPPLY FAN DESIGN AIRFLOW (CFM)	SUPPLY FAN ESP (IN WC)	SUPPLY FAN SPEED (RPM)	SUPPLY FAN MOTOR SIZE (HP)	EXHAUST FAN DESIGN AIRFLOW (CFM)	EXHAUST FAN ESP (IN WC)	EXHAUST FAN SPEED (RPM)	EXHAUST FAN MOTOR SIZE (HP)	ENTHALPY WHEEL OUTDOOR AIR SUMMER EAT (°F DB)	OUTDOOR AIR SUMMER EAT (°F WB)	OUTDOOR AIR SUMMER LAT (°F DB)	OUTDOOR AIR SUMMER LAT (°F WB)	OUTDOOR AIR WINTER EAT (°F DB)	OUTDOOR AIR WINTER EAT (°F WB)	OUTDOOR AIR WINTER LAT (°F DB)	OUTDOOR AIR WINTER LAT (°F WB)	EXHAUST AIR SUMMER EAT (°F DB)	EXHAUST AIR SUMMER EAT (°F WB)	EXHAUST AIR SUMMER LAT (°F DB)	EXHAUST AIR SUMMER LAT (°F WB)	EXHAUST AIR WINTER EAT (°F DB)	EXHAUST AIR WINTER EAT (°F WB)	EXHAUST AIR WINTER LAT (°F DB)	EXHAUST AIR WINTER LAT (°F WB)	ELECTRICAL DATA MCA (A)	MOCP (A)	SERVICE (V)	SERVICE (PH)	SERVICE (HZ)	WEIGHT (LBS)
ERU-2	GREENHECK	ECV-10H-VG-P	HP-3	1,050	0.50	1362	3/4	990	0.50	1397	3/4	1,050	94.0	76.0	82.8	70.1	14.0	11.3	46.5	36.2	990	75.0	62.5	86.8	69.9	70.0	52.8	35.6	32.5	12.2	15	208	1	60	245

GENERAL NOTES:
A. DIV 23 FACTORY PROVIDED DISCONNECT SWITCH.

SPLIT SYSTEM HEAT PUMP INDOOR UNIT WITH ELECTRIC HEAT SCHEDULE

AD-01

TAG	LOCATION	MANUFACTURER	MODEL NUMBER	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	ESP (IN WC)	COOLING TOTAL CAPACITY (BTUH)	COOLING INDOOR EAT (°F) DB	COOLING INDOOR EAT (°F) WB	HEAT PUMP HEATING CAPACITY (BTUH)	HEAT PUMP HEATING INDOOR EAT DB (°F)	ELECTRIC HEAT (kW)	ELECTRICAL DATA MCA (A)	ELECTRICAL DATA MOCP (A)	SERVICE V	SERVICE PH	SERVICE HZ	WEIGHT (LBS)	NOTES
HP-2	MECHANICAL MEZZANINE	TRANE	TWE090	2,250	370	1.0	69,200	80.8	67.0	37,400	59.6	11.25	31.2	40	208	3	60	360	1
HP-3	MECHANICAL MEZZANINE	TRANE	5TEM6D06	1,050	1,050	0.5	36,164	82.8	70.1	29,403	46.5	10.80	22.0	25	208	1	60	175	1, 2
															208		60		

GENERAL NOTES:
A. DIVISION 26 SHALL PROVIDE DISCONNECT SWITCH.

NOTES:
1. PROVIDE AUXILIARY DRAIN PAN UNDERNEATH UNIT WITH CONDENSATE OVERFLOW SENSOR INTERLOCKED WITH UNIT OPERATION.
2. PROVIDE SECOND CIRCUIT AT 52A MCA AND 60A MOCP.

AD-01

SPLIT SYSTEM HEAT PUMP OUTDOOR UNIT SCHEDULE

AD-01

TAG	MANUFACTURER	MODEL NUMBER	AMBIENT AIR TEMPERATURE (°F)	ELECTRICAL DATA MCA (A)	ELECTRICAL DATA MOCP (A)	SERVICE V	SERVICE PH	SERVICE HZ	WEIGHT (LBS)
COND-2	TRANE	TWA072	95.0	30	40	208	3	60	328
COND-3	TRANE	5TWR7036	95.0	29	40	208	1	60	195

GENERAL NOTES:
A. DIV 26 SHALL PROVIDE DISCONNECT SWITCH.

FAN SCHEDULE

AD-01

TAG	MANUFACTURER	MODEL NUMBER	SERVING	TYPE	AIRFLOW (CFM)	ESP (IN WC)	FAN WHEEL (RPM)	DRIVE TYPE	SONES	CONTROL METHOD	MOTOR (HP)	ELECTRICAL DATA (V)	ELECTRICAL DATA (PH)	ELECTRICAL DATA (HZ)	WEIGHT (LBS)	NOTES
EF-1	GREENHECK	SQ-100-VG	GENERAL EXHAUST	INLINE CENTRIFUGAL	650	0.30	1070	DIRECT	9.0	BAS SCHEDULE	1/4	120	1	60	56	1
EF-2	COOK	12CV11D	S1-MED GAS ROOM	MIXED FLOW INLINE	200	0.66	1140	DIRECT	5.7	24/7	1/6	120	1	60	103	2

NOTES:
1. PROVIDE MOTORIZED BACKDRAFT DAMPER.
2. PROVIDE SPARK RESISTANCE TYPE A FAN ASSEMBLY AND EXPLOSION PROOF MOTOR.

DEHUMIDIFIER SCHEDULE

TAG	MANUFACTURER	MODEL NUMBER	SERVING	AIRFLOW (CFM)	ESP (IN WC)	CONTROL METHOD	ELECTRICAL DATA FLA (A)	ELECTRICAL DATA SERVICE (V)	ELECTRICAL DATA SERVICE (PH)	ELECTRICAL DATA SERVICE (HZ)	WEIGHT (LBS)
DH-1	APRILAIRE	E130	HP-1	270	0.20	BAS ENABLE / DISABLE	7.7	120	1	60	98
DH-2A	APRILAIRE	E130	HP-2	270	0.20	BAS ENABLE / DISABLE	7.7	120	1	60	98
DH-2B	APRILAIRE	E130	HP-2	270	0.20	BAS ENABLE / DISABLE	7.7	120	1	60	98
DH-3	APRILAIRE	E130	HP-3	270	0.20	BAS ENABLE / DISABLE	7.7	120	1	60	98

GENERAL NOTES:
A. UNITS TO HAVE SELF-CONTAINED CONTROLS.
B. SET TO 50% RELATIVE HUMIDITY.
C. PROVIDE CONDENSATE OVERFLOW SENSOR IN AUXILIARY DRAIN PAN INTERLOCKED WITH UNIT OPERATION.

GRILLE, REGISTER, & DIFFUSER SCHEDULE

TAG	MANUFACTURER	MODEL NUMBER	MOUNTING STYLE	NECK SIZE	FACE SIZE	MAX NC LEVEL
FFU-1	PRICE	FFU-BTR	LAY-IN	10ø	36x24	
S1	PRICE	ASCD	SURFACE	6ø	12x12	30
S2	PRICE	ASCD	LAY-IN	8ø	24x24	30
S3	PRICE	ASCD	SURFACE	8ø	12x12	30
S4	PRICE	ASCD	LAY-IN	10ø	24x24	30
S6	PRICE	635-F	SURFACE	14x6	16x8	30
R1	PRICE	635-TB	LAY-IN	10x10	12x12	30
R2	PRICE	635-F	SURFACE	10x10	12x12	30
E1	PRICE	635	LAY-IN	10x10	12x12	30

MOSELEYARCHITECTS
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MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
DAVID T. WHATELY
Lic. No. 052209
08/18/2025
PROFESSIONAL ENGINEER

HENRICO ANIMAL SHELTER
10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY, VA
615225

PROJECT NO: 615225
DATE: AUGUST 18, 2025

REVISIONS

DATE	DESCRIPTION
09/17/25	AD-01

SCHEDULES

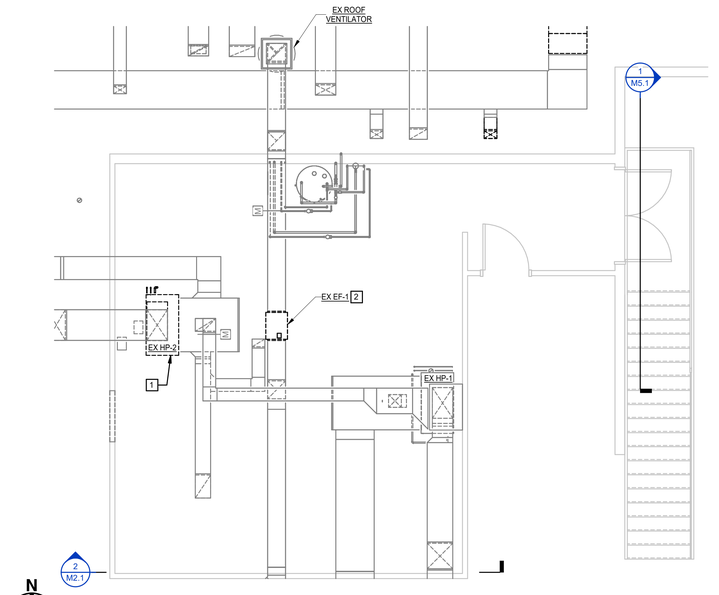
M0.2

9/17/2025 9:59:02 AM

KEYNOTES

APPLIES TO THIS DRAWING

1. REMOVE HP-2 AND ALL ASSOCIATED CONTROLS AND PIPING.
2. REMOVE EF-1 AND ALL ASSOCIATED CONTROLS.
3. REMOVE SUPPLY AND EXHAUST DUCT TO EXTENT REQUIRED TO RECONNECT TO REPLACEMENT ERU-1 UNIT.



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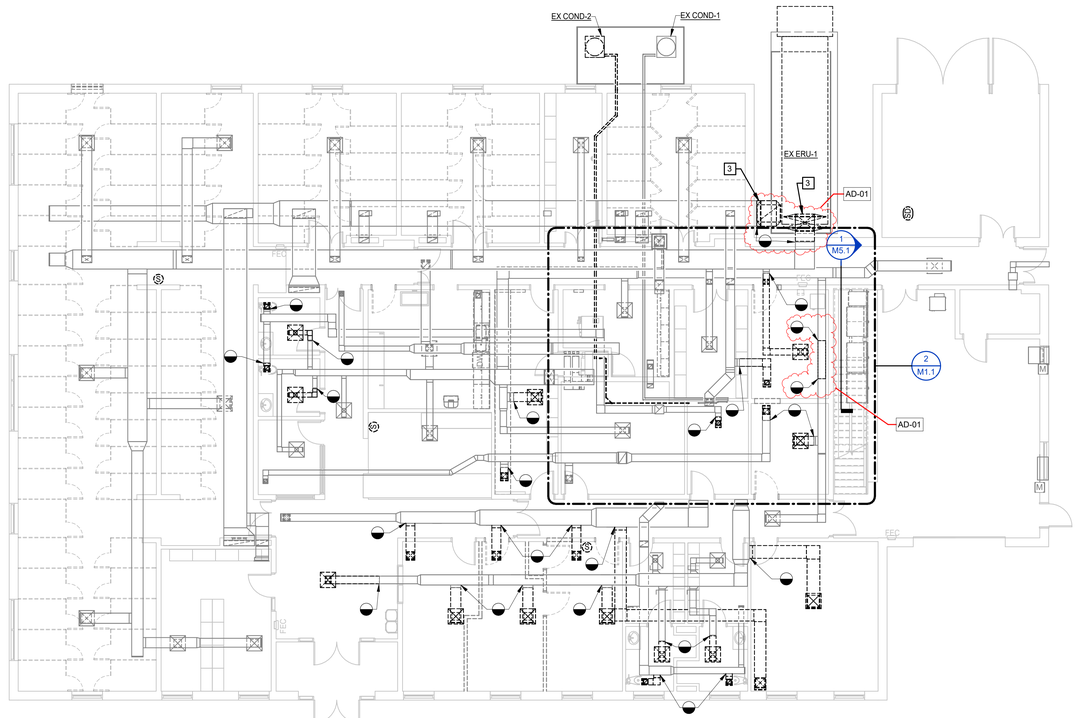
ENLARGED PLAN - MECHANICAL MEZZANINE - DEMOLITION

1/4" = 1'-0"



N

FIRST FLOOR PLAN - DEMOLITION

1/8" = 1'-0"

0' 2' 4' 8' 16'

1/8" = 1'-0"

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PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
DAVID T. WHATELY
Lic. No. 052209
08/18/2025
PROFESSIONAL ENGINEER

HENRICO ANIMAL SHELTER

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
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615225

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DATE	DESCRIPTION
09/17/25	AD-01

FIRST FLOOR PLAN - DEMOLITION

M1.1

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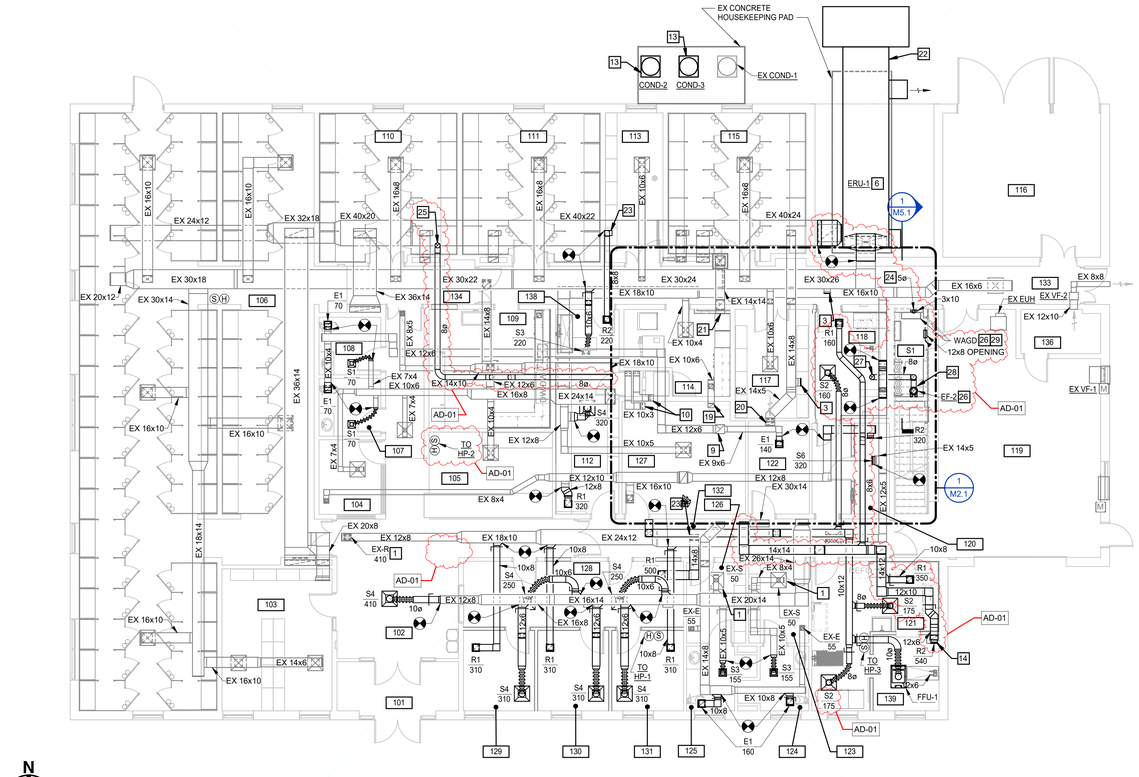


FIRST FLOOR PLAN - DUCTWORK

1/8" = 1'-0"

FIRST FLOOR PLAN - PIPING

1/8" = 1'-0"

2 SECTION

M1.1 M2.1

1/2" = 1'-0"

1 ENLARGED PLAN - MECHANICAL MEZZANINE

M2.1 M2.1

1/4" = 1'-0"

KEYNOTES

APPLIES TO THIS DRAWING

1 REBALANCE AIR TERMINAL TO SPECIFIED CFM.
2 REPLACE ACTUATOR ON EXISTING-TO-REMAIN MOTORIZED DAMPER AND ADJUST MAXIMUM LIMIT STOP TO BALANCE OUTSIDE AIR, WHERE EX HP-1 WILL BE 430 CFM AND HP-2 WILL BE 370 CFM.
3 CAP AND INSULATE DUCT TAP.
4 SET DEHUMIDIFIER / HEAT PUMP ON CMU BLOCKS AND PROVIDE AUXILIARY DRAIN PAN UNDERNEATH UNIT WITH CONDENSATE MOISTURE SENSOR INTERLOCKED WITH UNIT.
5 CONNECT 24X18 EQUIVALENT FREE AREA TO TRIANGULAR PORTION OF EXISTING OUTDOOR AIR LOUVER.
6 REWORK SUPPLY AND EXHAUST DUCT CONNECTIONS AS REQUIRED FOR REPLACEMENT ERU-1 UNIT.
7 EXISTING 10X3 MAKEUP AIR DUCT DOWN TO DRYER ROOM.
8 EXISTING 10X6 DUCT DOWN TO 114-LAUNDRY.
9 EXISTING 14X14 DUCT UP TO MECHANICAL MEZZANINE.
10 EXISTING 10X3 MAKEUP AIR DUCT UP TO MECHANICAL MEZZANINE.
11 EXISTING TABLE EXTENDING OVER DUCTWORK FOR MAINTENANCE ACCESS.
12 REPLACE ACTUATOR ON EXISTING-TO-REMAIN MOTORIZED DAMPER IN THE VERTICAL.
13 PROVIDE RISER UNDERNEATH CONDENSING UNIT TO RAISE BY 2.5 INCHES.
14 MOUNT DIFFUSER CENTERLINE AT ELEVATION 1'-6" AFF.
15 PROVIDE FLUE VENT AND ROUTE THROUGH ROOF LIKE EXISTING. PORTIONS OF FLUE VENT MAY BE REUSED IF SUITABLE BY CUSTOM ERU-1 MANUFACTURER AND ANY NEW FLUE VENT PIECES SHALL MATCH SAME MANUFACTURER AS EXISTING FLUE FOR LISTED ASSEMBLY. COORDINATE FLUE VENTING WITH ERU-1 MANUFACTURER.

AD-01

KEYNOTES

APPLIES TO THIS DRAWING

16 REFRIGERANT PIPING UP TO MECHANICAL MEZZANINE.
17 CONDENSATE PIPING UP TO MECHANICAL MEZZANINE.
18 ROUTE CONDENSATE DRAIN PIPING TO TERMINATE IN MOP SINK IN 122-JANITOR CLOSET.
19 EXISTING 10X6 DUCT UP TO MECHANICAL MEZZANINE.
20 EXISTING 14X5 DUCT DOWN TO EXISTING WALL-MOUNTED RETURN DIFFUSER IN 117-FERAL CATS.
21 EXISTING 14X14 DUCT ROUTED INTO THE MECHANICAL MEZZANINE.
22 ERU-1 SHALL CANTILEVER FROM EXISTING CONCRETE HOUSING PAD.
23 MANUAL BALANCING DAMPER IN THE VERTICAL.
24 TERMINATE TO NO LOSS STACKHEAD DISCHARGE ON ROOF.
25 TERMINATE TO GOOSENECK ON ROOF.
26 PROVIDE FIRE WRAP FOR VENTILATION DUCT SHAFT ASSEMBLY FOR DUCTWORK ASSOCIATED WITH EF-2 / WAGD FROM POINT OF RATED CEILING OR ROOM PENETRATION TO ROOF PENETRATION. ALL DUCTWORK AND FIRE WRAP SHALL MATCH LISTING SPECIFIED AND ALL THROUGH PENETRATIONS SHALL BE COORDINATED AS REQUIRED FOR RATINGS.
27 8ø DUCT UP TO MECHANICAL MEZZANINE.
28 TERMINATE EF-2 INTAKE DUCTWORK AT ELEVATION 1'-0" AFF AND COVER WITH 1/2" WWM.
29 MAXIMUM OF TWO (2) 45-DEGREE ELBOWS AND 30-FEET OF STRAIGHT DUCT RUN FOR EXHAUST DUCTWORK ASSOCIATED WITH WAGD.

AD-01

MOSELEYARCHITECTS

3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-5690

MOSELEYARCHITECTS.COM

DAVID T. WHATELY
Lic. No. 052209
08/18/2025

HENRICO ANIMAL SHELTER

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY, VA
615225

PROJECT NO: 615225
DATE: AUGUST 18, 2025

REVISIONS

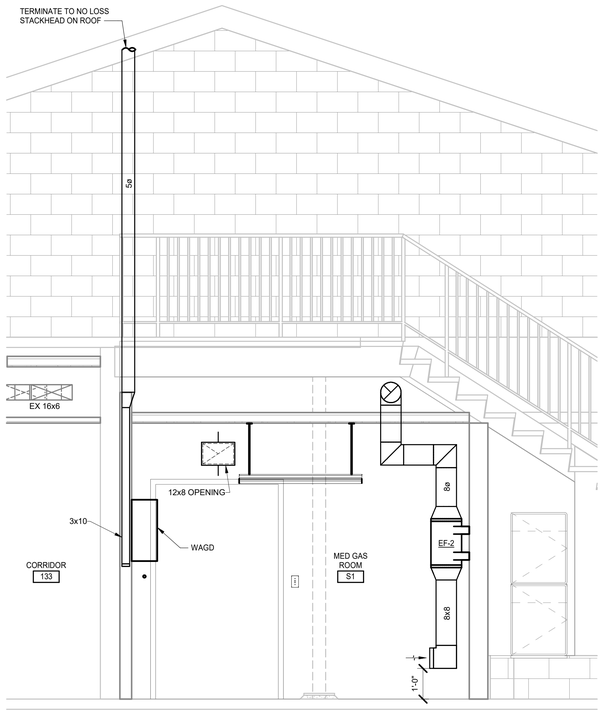
DATE	DESCRIPTION
09/17/25	AD-01

FIRST FLOOR PLAN

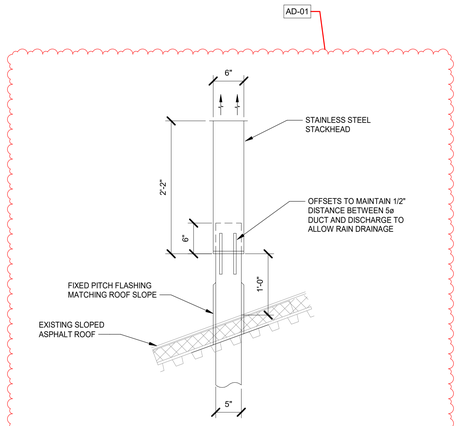
0' 2' 4' 8' 16'
1/8" = 1'-0"

M2.1

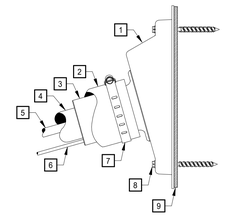
9/17/2025 9:59:12 AM



1 M1.1 M5.1 **SECTION**
1/2" = 1'-0"

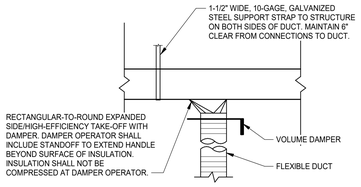


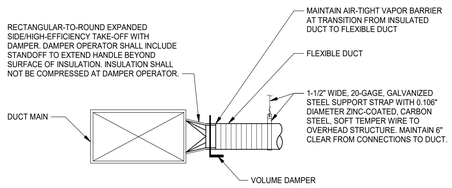
STACKHEAD TERMINATION DETAIL



1. EXTERIOR WALL OR PARAPET WALL, SEAL PENETRATION OUTLET WITH ELASTOMERIC LINE-SET COMPRESSION SLEEVE TYPE "TITAN GS" BY AIREX MANUFACTURING, INC. OR EQUAL. SIZE PER MANUFACTURER'S RECOMMENDATIONS
2. INSULATION PROTECTIVE PVC COVER TYPE "E-FLEX GUARD" BY AIREX MANUFACTURING INC. OR EQUAL.
3. ELASTOMERIC LINE-SET COMPRESSION & ANTI-VIBRATION SLEEVE
4. INSULATION FOR REFRIGERANT SUCTION LINE.
5. REFRIGERANT SUCTION LINE.
6. REFRIGERANT LIQUID LINE.
7. MECHANICAL CONNECTION SECURED WITH STAINLESS STEEL CLAMP.
8. WALL FASTENERS SELF-TAPPING 3/8" HEX HEAD 1/4" DIAMETER ALL MATERIAL ANCHOR SCREWS WITH ELASTOMERIC WASHERS.
9. WALL SURFACE SEAL ELASTOMERIC GASKET.

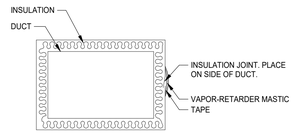
REFRIGERANT PIPE PENETRATION DETAIL - WALL





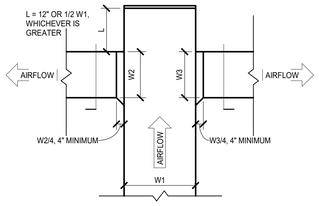
NOTES:
1. FLEXIBLE DUCT SHALL BE INSTALLED OVER METAL DUCT (BEAD/LIP ON METAL DUCT) AND ANCHORED WITH NYLON MECHANICAL BANDS OR PANDUIT STRAP.
2. IN EXPOSED AREAS, PROVIDE RIGID GALVANIZED STEEL BRANCH DUCT TO DIFFUSERS IN LIEU OF FLEXIBLE DUCT UNLESS INDICATED OTHERWISE. SUPPORT IN ACCORDANCE WITH REQUIREMENTS SPECIFIED FOR METAL DUCTS.

BRANCH CONNECTION TO DIFFUSER DETAILS



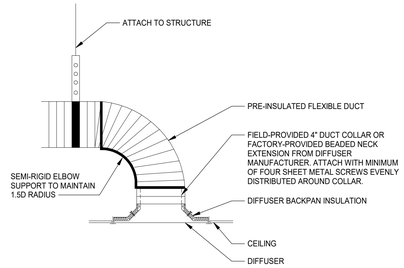
REFER TO SPECIFICATION SECTION 230700 FOR ADDITIONAL INFORMATION.

DUCT INSULATION JOINT DETAIL

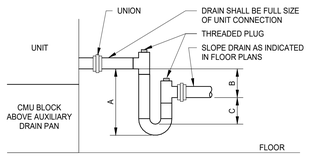


NOTE:
1. REFER TO *BRANCH CONNECTION TO DIFFUSER DETAILS* FOR BRANCH TAKE-OFF REQUIREMENTS.

END OF DUCT MAIN DETAIL



FLEXIBLE DUCT TO DIFFUSER CONNECTION DETAIL

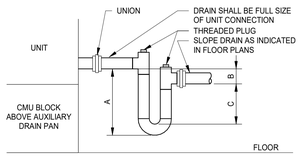


NEGATIVE PRESSURE TRAP

A = B + C + PIPE DIAMETER WHERE:

B = 1" FOR EACH INCH OF NEGATIVE STATIC PRESSURE + 1"

C = 1/2 OF B



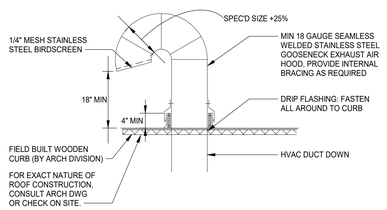
POSITIVE PRESSURE TRAP

A = B + C + PIPE DIAMETER WHERE:

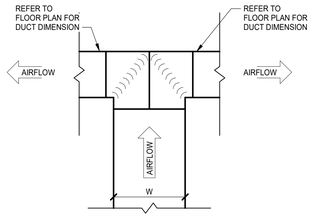
B = 1" MINIMUM

C = 1" + MAXIMUM UNIT POSITIVE STATIC PRESSURE AT COIL DISCHARGE

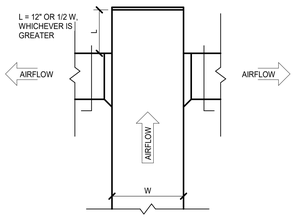
CONDENSATE DRAIN PIPING DETAIL



GOOSENECK DETAIL



NOTES:
1. APPLIES WHERE "W" EXCEEDS 24" OR WHEN AIRFLOW EXCEEDS 1,500 CFM.



NOTES:
1. REFER TO *BRANCH CONNECTION TO DIFFUSER DETAILS* FOR BRANCH TAKE-OFF REQUIREMENTS.
2. APPLIES TO:
   A. WHERE "W" IS LESS THAN 24"
   B. ROUND DUCT BRANCHES TO DIFFUSERS
   C. WHEN AIRFLOW IS EQUAL TO OR LESS THAN 1,500 CFM.

DIVIDED FLOW BRANCH DETAILS

MOSELEYARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
DAVID T. WHATELY
Lic. No. 052209
08/18/2025
PROFESSIONAL ENGINEER

HENRICO ANIMAL SHELTER

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY, VA
615225

PROJECT NO: 615225
DATE: AUGUST 18, 2025

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DETAILS

M5.1

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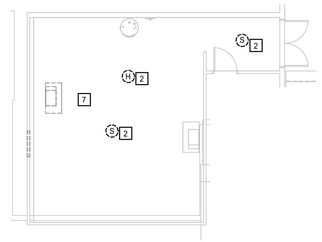

MEZZANINE PLAN - DEMOLITION

1/8" = 1'-0"

GENERAL NOTES

A. ALL EXISTING FIRE ALARM DEVICES SHALL REMAIN UNO AND RECONNECT TO NEW FIRE ALARM SYSTEM.

B. EXISTING INFORMATION INDICATED ON THIS SHEET PER FIELD OBSERVATION AND AS-BUILT DRAWINGS. VERIFY THE INFORMATION IN FIELD.

C. REFER TO ARCHITECTURAL, MECHANICAL, AND PLUMBING PLANS FOR ADDITIONAL INFORMATION.

D. ALL SYMBOLS WITH DASH LINE TO BE REMOVED UNO.

E. ALL SYMBOLS WITH LIGHT LINE TO REMAIN UNO.

F. MAINTAIN ANY CIRCUITS INCLUDING LOW VOLTAGE SYSTEMS TO ANY EQUIPMENT/DEVICES REQUIRED TO SERVE EXISTING-TO-REMAIN SPACES.

G. ALL EXISTING MECHANICAL CIRCUITS SHALL REMAIN AND BE REUSED FOR NEW EQUIPMENT, REWORK AND EXTEND EXISTING FEEDERS AS REQUIRED TO CONNECT TO THE NEW EQUIPMENT. REFER TO DWG E2.1.4 & E2.2 FOR ADDITIONAL INFORMATION.

KEYNOTES

APPLIES TO DRAWINGS E1.2
REPRESENTED BY n

1. ALL EXISTING EQUIPMENT/DEVICES /CONDUITS /CABLES/PLYWOOD ON THE WALL SHALL REMAIN.
2. EXISTING FIRE ALARM DEVICE/EQUIPMENT SHALL BE REPLACED WITH NEW FIRE ALARM DEVICE/EQUIPMENT. REFER TO DWG E2.1.3 FOR ADDITIONAL INFORMATION..
3. EXISTING FIRE ALARM DEVICE SHALL BE REMOVED. THE EXISTING CIRCUIT SHALL BE REUSED. — AD-01
4. EXISTING ANTENNAE SYSTEM SHALL BE RELOCATED PER OWNER'S DIRECTION.
5. EXISTING SPEAKER SHALL BE REMOVED AND RE-INSTALL AFTER CEILING COMPLETE. REFER TO E2.1.3 FOR LOCATION.
6. EXISTING SECURITY PANELS SHALL BE RELOCATED. REFER TO E2.1.3 FOR NEW LOCATIONS. — AD-01
7. ALL EXISTING ELECTRICAL SYSTEMS (INCLUDING ALL LOW VOLTAGE SYSTEMS) IN THE ROOM SHALL REMAIN UNO.
8. REMOVE ALL EXISTING CEILING MOUNTED ELECTRICAL DEVICES INCLUDING LIGHT FIXTURES IN THE ROOM, THEN RE-INSTALL BACK AFTER CEILING COMPLETE.
9. RELOCATE THE EXISTING RECEPTACLE. REFER TO E2.1.2 FOR NEW LOCATION.
10. EXISTING RECEPTACLE AND DATA OUTLET SHALL BE REMOVED AND RE-INSTALL AFTER SHIELDING COMPLETE IN X-RAY ROOM.

FLOOR PLAN - DEMOLITION

1/8" = 1'-0"

MOSELEY ARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
BRIAN C. WELLS
Lic. No. 046269
08-18-25
PROFESSIONAL ENGINEER

HENRICO ANIMAL SHELTER

10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY, VA
615225

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FLOOR PLANS - ELEC DEMOLITION

E1.2

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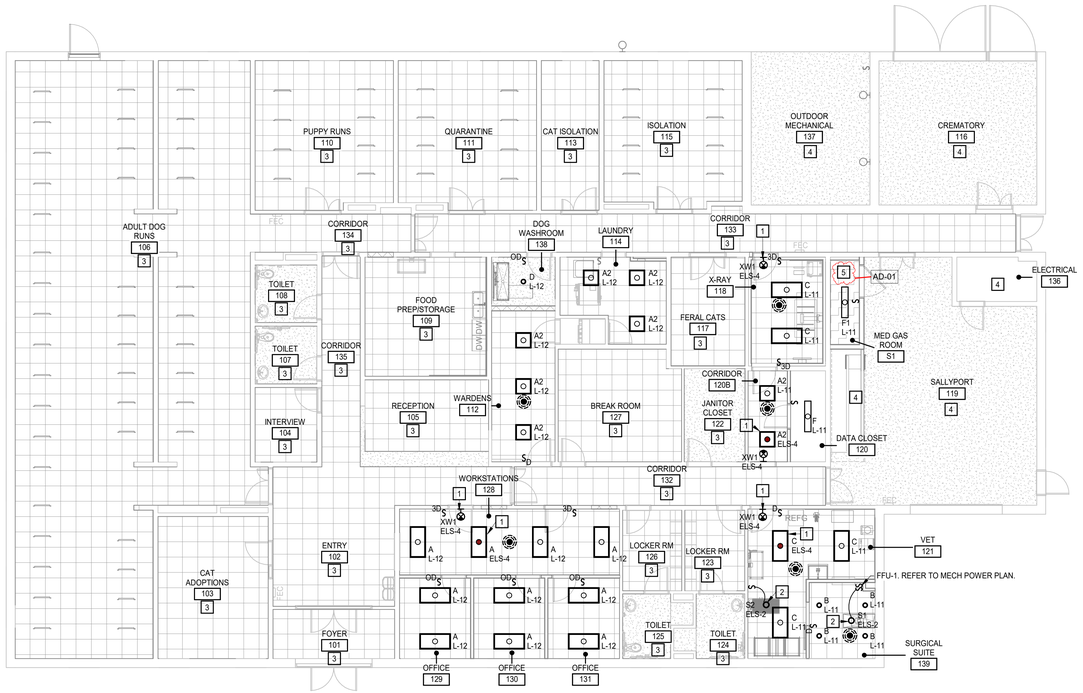
LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	SERIES NO.	WATTAGE	LIGHT SOURCE	LUMENS	CCT	CRI	DIMMING	COMMENTS
A	2X4 RECESSED TROFFER	HE WILLIAMS	50-G-S-24-L59-935-S-AF12125-DIM-UNV	48	LED	6231	3500	90	X	
A2	2X2 RECESSED TROFFER	HE WILLIAMS	50-G-S-22-L43-935-S-AF12125-DIM-UNV	33.7	LED	4363	3500	90	X	
B	CLEANROOM 6" RECESSED CAN LIGHT	HE WILLIAMS	HM6DR-TL-L30-935-ATH-DIM-UNV-LW-OF-WH-AD-N-F1	37.4	LED	3080	3500	90	X	
C	2X4 RECESSED TROFFER CLEANROOM	HE WILLIAMS	LT-24-L52-935-AF-DIM-UNV	37.2	LED	5202	3500	90	X	
D	6" RECESSED CAN LIGHT	HE WILLIAMS	6AR-L30-935-DIM-UNV-OW-OF-CS-MWT-R	31.3	LED	2917	3500	90	X	
F	4' LINEAR PENDANT	HE WILLIAMS	96-4-L62-935-HIAFR-GC2/L/10-DIM-UNV	48	LED	6434	3500	90	X	10' AFF
F1	4' LINEAR SURFACE	HE WILLIAMS	96-4-L62-935-HIAFR-DIM-UNV	48	LED	6434	3500	90	X	SURFACE
S1	SINGLE CEILING MOUNTED EXAM LIGHT	STARTROL	8X4-GS1	81	LED		4500K	95	X	140,000 LUX @ 1 METER
S2	SINGLE CEILING MOUNTED EXAM LIGHT	STARTROL	4X4-GS1	40	LED		4500K	95	X	70,000 LUX @ 1 METER
XW1	WALL EXIT SIGN	HE WILLIAMS	EXIT/EL-SF-R-CP-AN-AC-D	4	LED					

GENERAL NOTES:
A. ALL FIXTURES SHALL BE CAPABLE OF 120V INPUT, UNO.
B. REFER TO LIGHTING PLANS AND SPECIFICATIONS FOR ADDITIONAL FIXTURE INFORMATION.
C. ALL LENS SHALL BE A MINIMUM 0.125" THICKNESS, UNO.
D. PROVIDE NUMBER OF FACES AND DIRECTIONAL CHEVRONS FOR EXIT SIGNS AS INDICATED ON DWGS.



N

FLOOR PLAN - LIGHTING

1/8" = 1'-0"

GENERAL NOTES

A . REFER TO ARCHITECTURAL OR INTERIOR PLANS FOR ADDITIONAL INFORMATION.

KEYNOTES

APPLIES TO DRAWINGS E2.1.1
REPRESENTED BY n

1. EGRESS LIGHTING AND EXIT SIGN SHALL BE UNSWITCHED UNO.
2. SURGICAL LIGHT WILL NOT BE CONTROLLED BY OCCUPANCY SENSOR.
3. REFER TO KEYNOTE#8 ON DEMO DRAWING E1.2.
4. EXITING LIGHTING SYSTEM IN THE ROOM SHALL REMAIN UNO.
5. THE OXYGEN ROOM UNDER THE 119-SALLYPORT STAIRS TO BE CLASS 1, DIV 1. ALL ELECTRICAL EQUIPMENT/DEVICES AND INSTALLATION SHALL MEET REQUIREMENTS OF THE CLASS 1, DIV 1. — AD-01

MOSELEY ARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
BRIAN C. WELLS
Lic. No. 046269
08-18-25
PROFESSIONAL ENGINEER

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HENRICO COUNTY, VA
615225

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FLOOR PLAN - LIGHTING

E2.1.1

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GENERAL NOTES

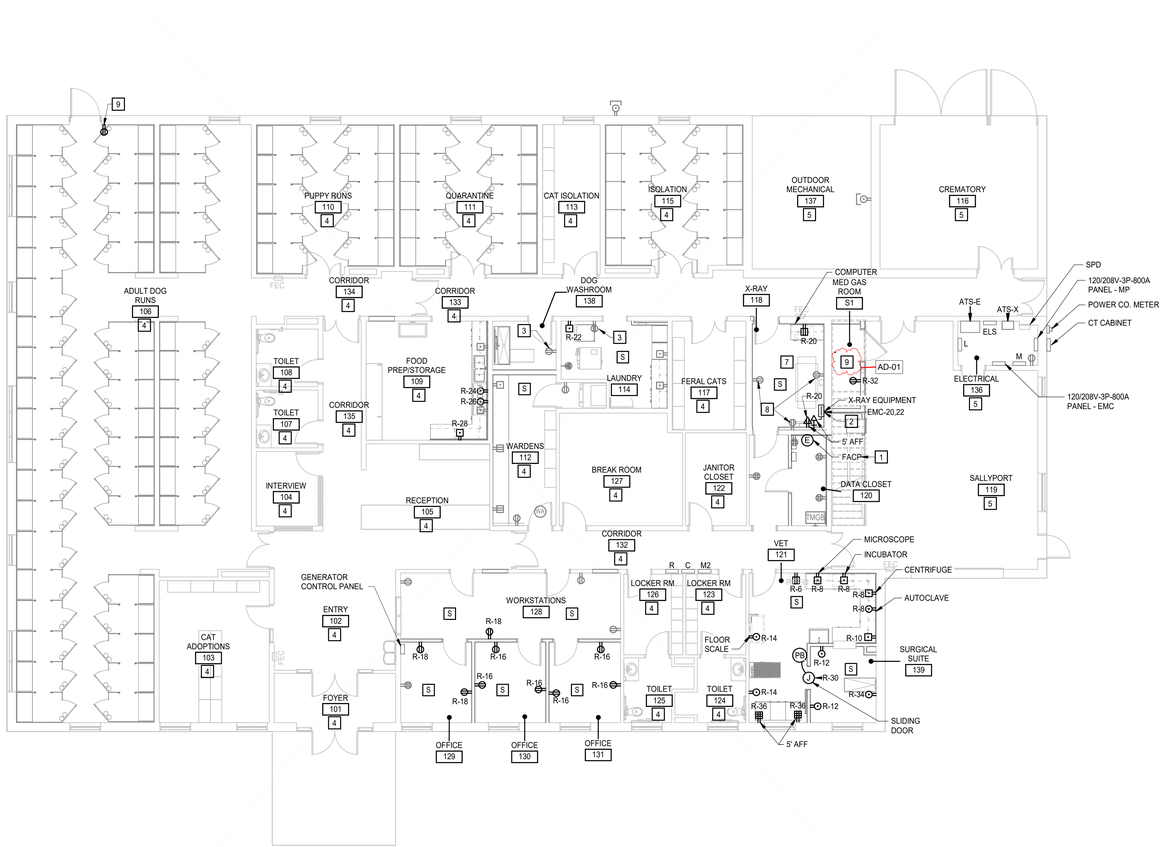
A . REFER TO ARCHITECTURAL OR INTERIOR PLANS FOR ADDITIONAL INFORMATION INCLUDING LOCATIONS AND HEIGHTS OF OUTLETS, JUNCTION BOXES.

B. ALL RECEPTACLE COVERS SHALL BE STAINLESS STEEL.

KEYNOTES

APPLIES TO DRAWINGS E2.1.2
REPRESENTED BY [n]

1. REUSE EXISTING FACP CIRCUIT ELS-13.
2. PROVIDE A NEMA 3R, 208V/1P, 200A 115A-FUSE DISCONNECT. COORDINATE THIS WITH MANUFACTURER. LOCATION CAN BE FIELD ADJUSTED. PROVIDE 3#3/0,#6G,2"C.
3. PROVIDE A GFI RECEPTACLE TO REPLACE THE EXISTING RECEPTACLE.
4. REFER TO KEYNOTE# 7 & #8 ON DEMO DRAWING E1.2.
5. EXISTING POWER SYSTEM IN THE ROOM SHALL REMAIN UNO.
6. REFER TO KEYNOTE# 9 ON DEMO DRAWING E1.2.
7. ALL JUNCTION BOXES AND OTHER PENETRATIONS IN WALLS IN X-RAY ROOM MUST BE LINED WITH EQUIVALENT THICKNESS OF SHIELDING WITH OVERLAPPING EDGES (NO GAPS IN SHIELDING).
8. REFER TO KEYNOTE# 10 ON DEMO DRAWING E1.2.
9. THE OXYGEN ROOM UNDER THE 119-SALLYPORT STAIRS TO BE CLASS 1, DIV 1. ALL ELECTRICAL EQUIPMENT/DEVICES AND INSTALLATION SHALL MEET REQUIREMENTS OF THE CLASS 1, DIV 1. AD-01



N

FLOOR PLAN - POWER
1/8" = 1'-0"

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3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
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FLOOR PLAN - POWER

E2.1.2

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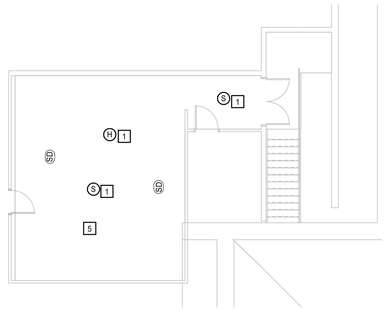
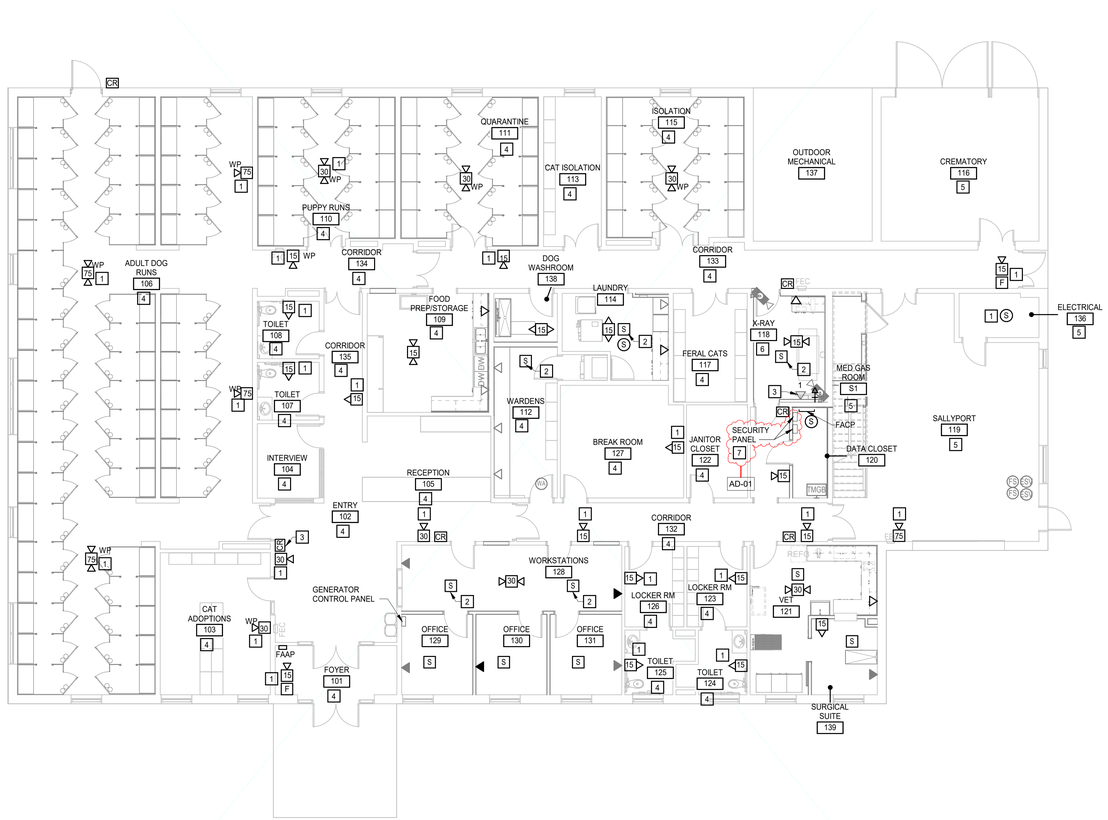


MEZZANINE PLAN - COMMUNICATIONS

1/8" = 1'-0"



FLOOR PLAN - COMMUNICATIONS

1/8" = 1'-0"

GENERAL NOTES

A. SOLID GRAY AREAS ARE NOT IN CONTRACT UNO.

B. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION.

C. ALL EXISTING DEVICES/EQUIPMENT, WHICH WERE CONNECTED TO EXISTING FACP, SHALL BE DISCONNECTED FROM THE EX FACP AND RECONNECTED TO THE FACP LOCATED IN DATA CLOSET/120.

D. ALL DATA/TELE OUTLET COVERS SHALL BE STAINLESS STEEL.

KEYNOTES

APPLIES TO DRAWINGS E2.1.3
REPRESENTED BY: n

1. REFER TO KEYNOTE#2 ON DWG E1.2 FOR ADDITIONAL INFORMATION.
2. REFER TO KEYNOTE#5 ON DWG E1.2 FOR ADDITIONAL INFORMATION.
3. REFER TO KEYNOTE# 10 ON DEMO DRAWING E1.2.
4. REFER TO KEYNOTE# 7 & #8 ON DEMO DRAWING E1.2.
5. EXITING LOW VOLTAGE SYSTEM IN THE ROOM SHALL REMAIN UNO.
6. ALL JUNCTION BOXES AND OTHER PENETRATIONS IN WALLS IN X-RAY ROOM MUST BE LINED WITH EQUIVALENT THICKNESS OF SHIELDING WITH OVERLAPPING EDGES (NO GAPS IN SHIELDING).
7. REFER TO KEYNOTE# 6 ON DEMO DRAWING E1.2. AD-01

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3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
MOSELEYARCHITECTS.COM

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FLOOR PLANS-
COMMUNICATIONS

E2.1.3

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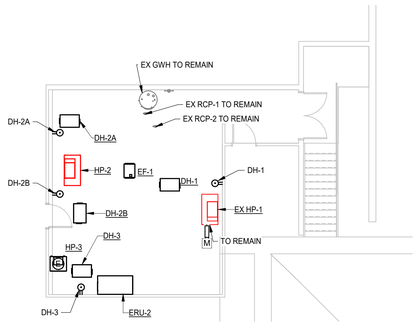


MEZZANINE PLAN - MECH POWER

1/8" = 1'-0"

DIV 23 ELECTRICAL CONNECTION SCHEDULE - E2.1.4

TAG	VOLTAGE	# POLES	PANEL	CCT#	WIRE	DISCONNECTING MEANS	REMARKS
CENTRAL SCAVENGER SYSTEM WAGD	120 V	1	M2	32	2#12,#12G,3/4"C	NOTE 2	
COND-2	208 V	3				NOTE 5	1
COND-3	208 V	2	M2	34,36	3#8,#10G,3/4"C AD-01	NOTE 4	
DH-1	120 V	1	M	17	2#12,#12G,3/4"C	PLUG-IN RECEPTACLE	
DH-2A	120 V	1	M	19	2#12,#12G,3/4"C	PLUG-IN RECEPTACLE	
DH-2B	120 V	1	M	21	2#12,#12G,3/4"C	PLUG-IN RECEPTACLE	
DH-3	120 V	1	M	23	2#12,#12G,3/4"C	PLUG-IN RECEPTACLE	
EF-1	120 V	1				USING EXISTING DISCONNECT	1
EF-2	120 V	1	M	27	2#12,#12G,3/4"C	NOTE 1 AD-01	
ERU-1	208 V	3				NOTE 1	1
ERU-2	208 V	2	M2	26,28	3#12,#12G,3/4"C	NOTE 1	
FFU-1	120 V	1	M2	30	2#12,#12G,3/4"C	NOTE 3	
HP-2	208 V	3				NOTE 5	1
HP-3	208 V	2	M2	38,40	3#4,#10G,1"C	NOTE 4	
HP-3 AD-01	208 V	2	M2	22,24	3#10,#10G,3/4"C	NOTE 6	
OXYGEN MASTER CONTROL/ALARM PANEL	120 V	1	M	25	2#12,#12G,3/4"C	NOTE 2	

DISCONNECT NOTES:
1. PROVIDED BY DIV 23.
2. PROVIDE BY DIV 22.
3. PROVIDE A TOGGLE SWITCH AS INDICATED. REFER TO LIGHTING PLAN FOR LOCATION.
4. PROVIDE NEMA 3R, 208V/1P, 60A NON-FUSE DISCONNECT. MOUNT ON OR ADJACENT TO THE UNIT. LOCATION SHALL BE FIELD DETERMINED.
5. PROVIDE NEMA 3R, 208V/3P, 60A NON-FUSE DISCONNECT. MOUNT ON OR ADJACENT TO THE UNIT. LOCATION SHALL BE FIELD DETERMINED.
6. PROVIDE NEMA 3R, 208V/1P, 30A NON-FUSE DISCONNECT. MOUNT ON OR ADJACENT TO THE UNIT. LOCATION SHALL BE FIELD DETERMINED. AD-01

REMARKS NOTES:
1. REUSE EX CKT OF THE PREVIOUS EQUIPMENT (TO BE REMOVED)

GENERAL NOTES

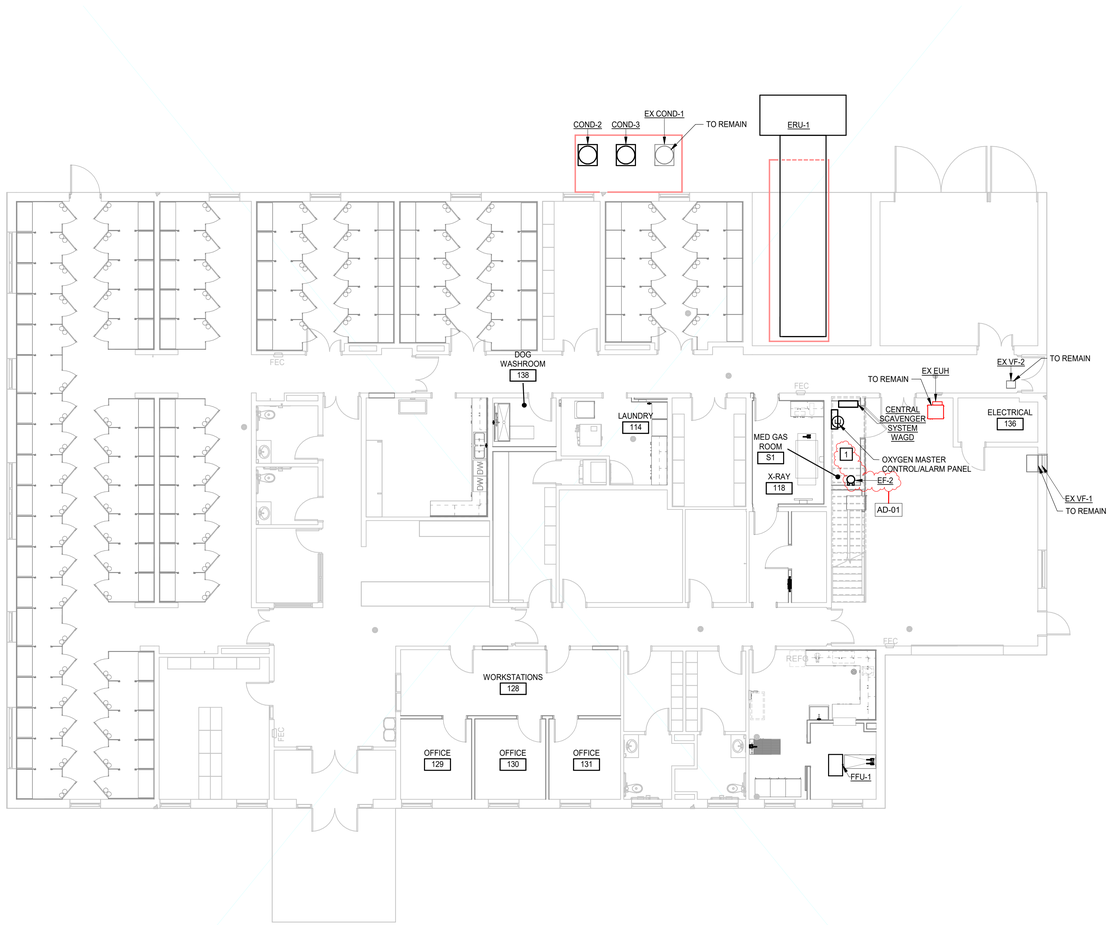
A. COORDINATE LOCATION OF ALL DISCONNECTS, CONTROL PANELS, & ELECTRICAL CONNECTIONS WITH MECHANICAL AND PLUMBING.

B. REFER TO KEYNOTE# 7 & #8 ON DEMO DRAWING E1.2.

KEYNOTES

APPLIES TO DRAWINGS E2.1.4
REPRESENTED BY n

1. THE OXYGEN ROOM UNDER THE 119-SALLYPORT STAIRS TO BE CLASS 1, DIV 1. ALL ELECTRICAL EQUIPMENT/DEVICES AND INSTALLATION SHALL MEET REQUIREMENTS OF THE CLASS 1, DIV 1. AD-01



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FLOOR PLAN - MECH POWER

1/8" = 1'-0"

MOSELEYARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-8690
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BRIAN C. WELLS
Lic. No. 046269
08-18-25
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FLOOR PLANS - MECH POWER

E2.1.4

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EXSITING PANEL SCHEDULE EMC

LOCATION: ELECTRICAL 136 FED FROM: ATS-E
800 AMP MCB 120/208 Wye 3 PH 4 W MOUNT: SURFACE PANEL ASSEMBLY RATED (KAIC): 42 KAIC

CKT	BRKR	POLE	LOAD	A	A	B	B	C	C	LOAD	POLE	BRKR	CKT
1				0.0	0.0								2
3	200 A	3	ERU-1			0.0	0.0			PANEL L	3	225 A	4
5								0.0	1.1				6
7				4.5	2.4								8
9	225 A	3	PANEL M2			8.9	2.8			PANEL R	3	225 A	10
11								5.6	4.1				12
13				0.0	0.0								14
15	225 A	3	PANEL C			0.0	0.0			SPARE	3	100 A	16
17								0.0	0.0				18
19				--	15.0					**X-RAY - RM 118 (PB)**	2	250 A	20
21	--	3	SPACE ONLY			--	15.0						22
23								--	--	SPACE ONLY	1	--	24
25				1.4	--								26
27	350 A	3	PANEL M			1.0	--			N/A	3	--	28
29								1.8	--				30
31				0.0	--								32
33	800 A	3	MAIN			0.0	--			N/A	3	--	34
35								0.0	--				36
37				--	--								38
39	--	3	SPACE ONLY			--	--			SPACE ONLY	3	--	40
41								--	--				42
				23 kVA		28 kVA		13 kVA					
				204 A		243 A		105 A					

(GE) = PROVIDE GFCI BREAKER FOR EQUIPMENT, 6-50mA PER NEC 427.22. PROVIDE DED. NEUTRAL
(GP) = PROVIDE GFCI BREAKER FOR PERSONNEL, 4-6mA PER NEC 210.8. PROVIDE DED. NEUTRAL
(L) = PROVIDE LOCKOUT BREAKER TO PREVENT UNAUTHORIZED SWITCHING.
(LC) = ROUTE TO LOAD VIA LIGHTING CONTACTOR.
(ML) = PROVIDE BREAKER WITH MAINTENANCE LOCKOUT, LOCKABLE.
(EB) = EXISTING BREAKER
(RB) = REPLACE BREAKER WITH SIZE INDICATED
(PB) = PROVIDE BREAKER IN EXISTING SPACE

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
INTERIOR LIGHTING	1094 VA	125.00%	1367 VA	
EXTERIOR LIGHTING	0 VA	0.00%	0 VA	**Total Conn. Load:** 63.0 kVA
RECEPTACLES	4140 VA	100.00%	4140 VA	**Total Est. Demand:** 63.3 kVA
AC / HEAT PUMP	19573 VA	100.00%	19573 VA	**Total Conn. Current:** 175 A
ELECTRIC HEAT	0 VA	0.00%	0 VA	**Total Est. Demand Current:** 176 A
KITCHEN	0 VA	0.00%	0 VA	
MISCELLANEOUS	36710 VA	100.00%	36710 VA	
EXISTING LOAD @ 125%	0 VA	0.00%	0 VA	

EXISTING PANEL SCHEDULE L

LOCATION: ELECTRICAL 136 FED FROM: EMC
225 AMP MCB 120/208 Wye 3 PH 4 W MOUNT: SURFACE PANEL ASSEMBLY RATED (KAIC): 10 KAIC

CKT	BRKR	POLE	LOAD	A	A	B	B	C	C	LOAD	POLE	BRKR	CKT
1	20 A	1	RECEPTION AREA LTS	0.0	0.0					EXT. BUILDING LIGHTS	1	20 A	2
3	20 A	1	ADULT DOG RUNS LTS			0.0	0.0			EXT. SERVICE LIGHTS	1	20 A	4
5	20 A	1	PUPPY/QUARANTINE/ISOLATION LTS					0.0	0.0	PARKING LIGHTS	1	20 A	6
7	20 A	1	FOOD PREP/WARDENS/LAUNDRY/BREAK ROOM LTS	0.0	0.0					PARKING LIGHTS	1	20 A	8
9	20 A	1	OFFICE AREA LTS			0.0	0.0			SIGN LIGHTS	1	20 A	10
11	20 A	1	**LTS RM 118, 120, 120B, 121, 139**					0.4	0.7	**LTS RM 112, 114, 128-131, 133**	1	20 A	12
13	20 A	1	UNKNOWN	0.0	0.0					SPARE	1	20 A	14
15	20 A	1	FERAL/EUTHANASIA/JANITOR LTS			0.0	0.0			SPARE	1	20 A	16
17	20 A	1	SPARE					0.0	0.0	SPARE	1	20 A	18
19	20 A	1	SPARE	0.0	0.0					SPARE	1	20 A	20
21	20 A	1	SPARE			0.0	0.0			SPARE	1	20 A	22
23	20 A	1	SPARE					0.0	0.0	SPARE	1	20 A	24
25	20 A	1	SPARE	0.0	0.0					SPARE	1	20 A	26
27	20 A	1	SPARE			0.0	0.0			SPARE	1	20 A	28
29	20 A	1	SPARE					0.0	--	SPACE ONLY	1	--	30
31	--	1	SPACE ONLY	--	--					SPACE ONLY	1	--	32
33	--	1	SPACE ONLY			--	--			SPACE ONLY	1	--	34
35	--	1	SPACE ONLY					--	--	SPACE ONLY	1	--	36
37	--	1	SPACE ONLY	--	--					SPACE ONLY	1	--	38
39	--	1	SPACE ONLY			--	--			SPACE ONLY	1	--	40
41	--	1	SPACE ONLY					--	--	SPACE ONLY	1	--	42
				0 kVA		0 kVA		1 kVA					
				0 A		0 A		9 A					

(GE) = PROVIDE GFCI BREAKER FOR EQUIPMENT, 6-50mA PER NEC 427.22. PROVIDE DED. NEUTRAL
(GP) = PROVIDE GFCI BREAKER FOR PERSONNEL, 4-6mA PER NEC 210.8. PROVIDE DED. NEUTRAL
(L) = PROVIDE LOCKOUT BREAKER TO PREVENT UNAUTHORIZED SWITCHING.
(LC) = ROUTE TO LOAD VIA LIGHTING CONTACTOR.
(ML) = PROVIDE BREAKER WITH MAINTENANCE LOCKOUT, LOCKABLE.
(EB) = EXISTING BREAKER
(RB) = REPLACE BREAKER WITH SIZE INDICATED
(PB) = PROVIDE BREAKER IN EXISTING SPACE

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
INTERIOR LIGHTING	1094 VA	125.00%	1367 VA	
EXTERIOR LIGHTING	0 VA	0.00%	0 VA	**Total Conn. Load:** 1.1 kVA
RECEPTACLES	0 VA	0.00%	0 VA	**Total Est. Demand:** 1.4 kVA
AC / HEAT PUMP	0 VA	0.00%	0 VA	**Total Conn. Current:** 3 A
ELECTRIC HEAT	0 VA	0.00%	0 VA	**Total Est. Demand Current:** 4 A
KITCHEN	0 VA	0.00%	0 VA	
MISCELLANEOUS	0 VA	0.00%	0 VA	
EXISTING LOAD @ 125%	0 VA	0.00%	0 VA	

EXISTING PANEL SCHEDULE ELS

LOCATION: ELECTRICAL 136 FED FROM: ATS-X
100 AMP MCB 120/208 Wye 3 PH 4 W MOUNT: SURFACE PANEL ASSEMBLY RATED (KAIC): 10 KAIC

CKT	BRKR	POLE	LOAD	A	A	B	B	C	C	LOAD	POLE	BRKR	CKT
1	20 A	1	EXIT SIGN LTS	0.0	0.1					**SURGICAL LTS - RM 121, 139**	1	20 A	2
3	20 A	1	WALK THRU LTS			0.0	0.1			**EGRESS EXIT SIGNAGE**	1	20 A	4
5	20 A	1	CAT ADOPT/BATH/LOCKER LTS					0.0	0.0	SPARE	1	20 A	6
7	20 A	1	EXT EGRESS LTS	0.0	0.0					SPARE	1	20 A	8
9	20 A	1	SALLYPORT/ELEC/DATA/MECH LIGHTS			0.0	0.0			SPARE	1	20 A	10
11	20 A	1	UNKNOWN					0.0	0.0	SPARE	1	20 A	12
13	20 A	1	FIRE ALARM CONTROL PANEL	0.0	0.0					SPARE	1	20 A	14
15	20 A	1	DRY SPRINKLER AIR COMPRESSOR			0.0	0.0			SPARE	1	20 A	16
17	20 A	1	SPARE					0.0	--	SPACE ONLY	1	--	18
19				0.0	--					SPACE ONLY	1	--	20
21	20 A	3	GENERATOR ACCESSORIES			0.0	--			SPACE ONLY	1	--	22
23								0.0	--	SPACE ONLY	1	--	24
25	--	1	SPACE ONLY	--	--					SPACE ONLY	1	--	26
27	--	1	SPACE ONLY			--	--			SPACE ONLY	1	--	28
29	--	1	SPACE ONLY					--	--	SPACE ONLY	1	--	30
31	--	1	SPACE ONLY	--	--					SPACE ONLY	1	--	32
33	--	1	SPACE ONLY			--	--			SPACE ONLY	1	--	34
35	--	1	SPACE ONLY					--	--	SPACE ONLY	1	--	36
37	--	1	SPACE ONLY	--	0.0								38
39	--	1	SPACE ONLY			--	0.0			MAIN	3	100 A	40
41	--	1	SPACE ONLY					--	0.0				42
				0 kVA		0 kVA		0 kVA					
				1 A		1 A		0 A					

(GE) = PROVIDE GFCI BREAKER FOR EQUIPMENT, 6-50mA PER NEC 427.22. PROVIDE DED. NEUTRAL
(GP) = PROVIDE GFCI BREAKER FOR PERSONNEL, 4-6mA PER NEC 210.8. PROVIDE DED. NEUTRAL
(L) = PROVIDE LOCKOUT BREAKER TO PREVENT UNAUTHORIZED SWITCHING.
(LC) = ROUTE TO LOAD VIA LIGHTING CONTACTOR.
(ML) = PROVIDE BREAKER WITH MAINTENANCE LOCKOUT, LOCKABLE.
(EB) = EXISTING BREAKER
(RB) = REPLACE BREAKER WITH SIZE INDICATED
(PB) = PROVIDE BREAKER IN EXISTING SPACE

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
INTERIOR LIGHTING	240 VA	125.00%	300 VA	
EXTERIOR LIGHTING	0 VA	0.00%	0 VA	**Total Conn. Load:** 0.2 kVA
RECEPTACLES	0 VA	0.00%	0 VA	**Total Est. Demand:** 0.3 kVA
AC / HEAT PUMP	0 VA	0.00%	0 VA	**Total Conn. Current:** 1 A
ELECTRIC HEAT	0 VA	0.00%	0 VA	**Total Est. Demand Current:** 1 A
KITCHEN	0 VA	0.00%	0 VA	
MISCELLANEOUS	0 VA	0.00%	0 VA	
EXISTING LOAD @ 125%	0 VA	0.00%	0 VA	

EXISTING PANEL SCHEDULE M2

LOCATION: CORRIDOR 132 FED FROM: EMC
225 AMP MCB 120/208 Wye 3 PH 4 W MOUNT: RECESSED PANEL ASSEMBLY RATED (KAIC): 10 KAIC

CKT	BRKR	POLE	LOAD	A	A	B	B	C	C	LOAD	POLE	BRKR	CKT
1	20 A	1	UNKNOWN	0.0	0.0					UNKNOWN	1	20 A	2
3	15 A	2	UNKNOWN			0.0	0.0			UNKNOWN	1	20 A	4
5								0.0	0.0	UNKNOWN	1	20 A	6
7	15 A	2	UNKNOWN	0.0	0.0					UNKNOWN	1	20 A	8
9						0.0	0.0			SPARE	1	20 A	10
11	20 A	1	EXHAUST FAN					0.0	0.0	SPARE	1	20 A	12
13	20 A	1	EXHAUST FAN	0.0	0.0					SPARE	1	20 A	14
15	20 A	1	EXHAUST FAN			0.0	0.0			SPARE	1	20 A	16
17	20 A	1	EXHAUST FAN					0.0	0.0	SPARE	1	20 A	18
19	50 A	2	UNKNOWN	0.0	0.0					SPARE	1	20 A	20
21						0.0	2.1			**HP-3(RB)**	2	25 A	22
23	40 A	2	UNKNOWN					0.0	2.1				24
25				0.0	0.9					**ERU-2 (RB)**	2	15 A	26
27	20 A	1	UNKNOWN			0.0	0.9						28
29	20 A	1	SPARE					0.0	0.5	**FFU-1**	1	20 A	30
31				0.0	0.5					**CENTRAL SYSTEM WAGD**	1	20 A	32
33	15 A	3	LAUNDRY 114 WATER			0.0	3.0			**COND-3 (PB)**	2	40 A	34
35								0.0	3.0				36
37				0.0	3.3					**HP-3 (PB)**	2	60 A	38
39	20 A	3	UNKNOWN			0.0	3.3						40
41								0.0	--	SPACE ONLY	1	--	42
				5 kVA		9 kVA		6 kVA					
				38 A		75 A		48 A					

AD-01

AD-01

(GE) = PROVIDE GFCI BREAKER FOR EQUIPMENT, 6-50mA PER NEC 427.22. PROVIDE DED. NEUTRAL
(GP) = PROVIDE GFCI BREAKER FOR PERSONNEL, 4-6mA PER NEC 210.8. PROVIDE DED. NEUTRAL
(L) = PROVIDE LOCKOUT BREAKER TO PREVENT UNAUTHORIZED SWITCHING.
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(ML) = PROVIDE BREAKER WITH MAINTENANCE LOCKOUT, LOCKABLE.
(EB) = EXISTING BREAKER
(RB) = REPLACE BREAKER WITH SIZE INDICATED
(PB) = PROVIDE BREAKER IN EXISTING SPACE

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
INTERIOR LIGHTING	0 VA	0.00%	0 VA	
EXTERIOR LIGHTING	0 VA	0.00%	0 VA	**Total Conn. Load:** 18.7 kVA
RECEPTACLES	0 VA	0.00%	0 VA	**Total Est. Demand:** 18.7 kVA
AC / HEAT PUMP	16022 VA	100.00%	16022 VA	**Total Conn. Current:** 52 A
ELECTRIC HEAT	0 VA	0.00%	0 VA	**Total Est. Demand Current:** 52 A
KITCHEN	0 VA	0.00%	0 VA	
MISCELLANEOUS	1000 VA	100.00%	1000 VA	
EXISTING LOAD @ 125%	0 VA	0.00%	0 VA	

EXISTING PANEL SCHEDULE R

LOCATION: CORRIDOR 132 FED FROM: EMC
225 AMP MCB 120/208 Wye 3 PH 4 W MOUNT: RECESSED PANEL ASSEMBLY RATED (KAIC): 10 KAIC

CKT	BRKR	POLE	LOAD	A	A	B	B	LOAD	POLE	BRKR	CKT
1	20 A	1	REC. ADULT DOG 106	0.0	0.0			LIVESTOCK BLDG LIGHTS	1	20 A	2
3	20 A	1	REC. PUPPY ISOL			0.0	0.0	LIVESTOCK BLDG REC.	1	20 A	4
5	20 A	1	REC CAT ADOPT/ENTRY/FOYER	0.0	0.0			**REFRIG- RM 121 (GP)**	1	20 A	6
7	20 A	1	REC SUPPORT TECH/SARG			0.0	0.0	**RECS- RM 121**	1	20 A	8
9	20 A	1	REC. LOCKER ROOM/SINK	0.0	0.0			**REC - RM 121**	1	20 A	10
11	20 A	1	REC. FUTURE VET 121			0.0	0.0	**RECS- RM 139**	1	20 A	12
13	20 A	1	REC TOILETS 107/108	0.0	0.4			**RECS- RM 121**	1	20 A	14
15	20 A	1	REC. FOOD PREP 109			0.0	1.1	**RECS- RM 130, 131**	1	20 A	16
17	20 A	1	REC FOOD PREP 109 COUNTER	0.0	0.0			**RECS- RM 129, 128**	1	20 A	18
19	20 A	1	REC LAUNDRY 114			0.0	0.0	**RECS- RM 118**	1	20 A	20
21	20 A	1	REC BREAKROOM 127	0.0	0.0			**WASHER - RM 114**	1	20 A	22
23	20 A	1	REC. COUNTER BREAKROOM 127			0.0	0.0	**DISHWASHER - RM 109**	1	20 A	24
25	20 A	1	REC TV BREAKROOM 127	0.0	0.8			**DISHWASHER - RM 109**	1	20 A	26
27	20 A	1	REC FERRAL CATS/EUTHAN			0.0	0.2	**REC - RM 109**	1	20 A	28
29	20 A	1	REC. JANITOR/DATA DUPLEX	0.0	0.0			**SLIDING DOOR**	1	20 A	30
31	20 A	1	REC SALLY PORT 119			0.0	0.0	**REC - UNDERSTAIR S1**	1	20 A	32
33	20 A	1	UNKNOWN	0.0	0.0			**SURGERY TABLE - RM 139**	1	20 A	34
35	20 A	1	REC. SALLYPORT/ ELECTRICAL RM			0.0	0.0	**RECS - RM 121 (GP)**	1	20 A	36
37	20 A	1	UNKNOWN	0.0	0.0			SPARE	1	20 A	38
39	20 A	1	REC RECEPTION 105 COPIER			0.0	0.0	SPARE	1	20 A	40
41	20 A	1	REC WARDENS 112	0.0	0.0			SPARE	1	20 A	42
				2 kVA		3 kVA					
				20 A		24 A					

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(RB) = REPLACE BREAKER WITH SIZE INDICATED
(PB) = PROVIDE BREAKER IN EXISTING SPACE

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
INTERIOR LIGHTING	0 VA	0.00%	0 VA	
EXTERIOR LIGHTING	0 VA	0.00%	0 VA	**Total Conn. Load:** 9.4 kVA
RECEPTACLES	4140 VA	100.00%	4140 VA	**Total Est. Demand:** 9.4 kVA
AC / HEAT PUMP	0 VA	0.00%	0 VA	**Total Conn. Current:** 26 A
ELECTRIC HEAT	0 VA	0.00%	0 VA	**Total Est. Demand Current:** 26 A
KITCHEN	0 VA	0.00%	0 VA	
MISCELLANEOUS	5210 VA	100.00%	5210 VA	
EXISTING LOAD @ 125%	0 VA	0.00%	0 VA	

EXISTING PANEL SCHEDULE M

LOCATION: ELECTRICAL 136 FED FROM: EMC
225 AMP MCB 120/208 Wye 3 PH 4 W MOUNT: SURFACE PANEL ASSEMBLY RATED (KAIC): 10 KAIC

CKT	BRKR	POLE	LOAD	A	A	B	B	C	C	LOAD	POLE	BRKR	CKT
1	20 A	1	REC CORR. 132	0.0	0.0					REC CORR. 133, 135	1	20 A	2
3	20 A	1	REC EXT. FRONT & SIDE			0.0	0.0			REC EXT. REAR	1	20 A	4
5	20 A	1	ENTRY 102 EWC					0.0	0.0	UNKNOWN	1	20 A	6
7	20 A	1	WATER HEATER CONTROLS	0.0	0.0					VF-2	1	20 A	8
9	20 A	1	HWCP-1			0.0	0.0			REC SALLYPORT 119 FREEZER	1	20 A	10
11	20 A	1	REC MECH RM 200					0.0	0.0	VF-1	1	20 A	12
13	20 A	1	MOTORIZED GATE	0.0	0.0					EF-1	1	20 A	14
15	20 A	1	HWCP-2			0.0	0.0			UNKNOWN	1	20 A	16
17	20 A	1	**DH-1**					0.9	0.0	UNKNOWN	1	20 A	18
19	20 A	1	**DH-2A**	0.9	0.0					PIT SPRINKLER SUMP PUMP	1	20 A	20
21	20 A	1	**DH-2B**			0.9	0.0			UNIT HEATER SALLYPORT 119	2	50 A	22
23	20 A	1	**DH-3**					0.9	0.0				24
25	20 A	1	**OXYGEN MASTER CONTROL/ALARM PANEL**	0.5	0.0								26
27	20 A	1	**EF-2** AD-01			0.1	0.0			OVERHEAD DOOR SALLYPORT 119	3	20 A	28
29	20 A	1	SPARE					0.0	0.0				30
31				0.0	0.0								32
33	50 A	3	HP-1			0.0	0.0			COND-1	3	50 A	34
35								0.0	0.0				36
37				0.0	0.0								38
39	50 A	3	HP-2			0.0	0.0			COND-2	3	40 A	40
41								0.0	0.0				42
				1 kVA		1 kVA		2 kVA					
				12 A		8 A		15 A					

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(PB) = PROVIDE BREAKER IN EXISTING SPACE

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
INTERIOR LIGHTING	0 VA	0.00%	0 VA	
EXTERIOR LIGHTING	0 VA	0.00%	0 VA	**Total Conn. Load:** 4.1 kVA
RECEPTACLES	0 VA	0.00%	0 VA	**Total Est. Demand:** 4.1 kVA
AC / HEAT PUMP	3644 VA	100.00%	3644 VA	**Total Conn. Current:** 12 A
ELECTRIC HEAT	0 VA	0.00%	0 VA	**Total Est. Demand Current:** 12 A
KITCHEN	0 VA	0.00%	0 VA	
MISCELLANEOUS	500 VA	100.00%	500 VA	
EXISTING LOAD @ 125%	0 VA	0.00%	0 VA	

GENERAL NOTES

A. EXISTING PANELBOARD SCHEDULES PER FIELD OBSERVATION AND THE INFORMATION SHOWN ON EXISTING DRAWINGS.

B. VERIFY INFORMATION SHOWN ON EXISTING PANELBOARD SCHEDULES IN FIELD.

C. CIRCUITS IN BOLD IN EXISTING PANELS ARE NEW OR REUSED OR NO LONGER USED AS SPARE. ALL OTHER CIRCUITS IN NON-BOLD ARE EXISTING CIRCUITS AND TO REMAIN.

D. IDENTIFY ALL UNKOWN LOADS IN EACH PANEL AND UPDATE EACH PANEL SCHEDULE.

MOSELEYARCHITECTS
3200 NORFOLK STREET, RICHMOND, VA 23230
PHONE (804) 794-7555 FAX (804) 355-5690
MOSELEYARCHITECTS.COM

COMMONWEALTH OF VIRGINIA
BRIAN C. WELLS
Lic. No. 046269
08-18-25
PROFESSIONAL ENGINEER

HENRICO ANIMAL SHELTER
10421 WOODMAN ROAD, GLEN ALLEN, VA 23060
HENRICO COUNTY, VA
615225

PROJECT NO: 615225
DATE: AUGUST 18, 2025

REVISIONS	
DATE	DESCRIPTION
09/17/25	AD-01

PANELBOARD SCHEDULES

E5.2

9/17/2025 10:02:50 AM