VRV REFRIGERANT PIPING – R-32:

1. **JOINT CONSTRUCTION:** ALL JOINTS SHALL BE MECHANICALLY ATTACHED OR BRAZED PER MANUFACTURER'S RECOMMENDATION. FLARED JOINTS ARE PERMITTED ONLY AT INDOOR UNITS. USE METAL-TO-METAL SEALS; O-RINGS ARE NOT PERMITTED.

2. **PIPING COMPLIANCE:** ALL PIPING SHALL FOLLOW THE MECHANICAL DESIGN. DEVIATIONS MUST BE SUBMITTED FOR PRIOR APPROVAL. COPPER TUBING MUST MEET ASTM B280 AND BE SUITABLE FOR A2L REFRIGERANTS WITH A MINIMUM PRESSURE RATING OF 700 PSIG.

3. **FLARING:** USE DEDICATED FLARE TOOLS RATED FOR R-32. APPLY POE OIL ONLY. ENSURE FLARES ARE SMOOTH, ROUND, AND DO NOT PROTRUDE INTO THREADS. USE PLASTIC FLARE SIZE GAUGES FOR ACCURACY.

4. **PIPE MATERIAL:**
   A. EXTERIOR: TYPE "L" ACR-RATED STRAIGHT COPPER PIPE.
   B. INTERIOR: TYPE "L" ACR-RATED STRAIGHT COPPER PIPE.
   C. ALL PIPING MUST WITHSTAND 600 PSI CONTINUOUS PRESSURE AND BE COMPLIANT WITH ASHRAE 15-2024 ADDENDUM A.

5. **BRAZING WITH NITROGEN:** USE DRY NITROGEN AT 3 PSI DURING BRAZING TO PREVENT OXIDATION AND COPPER PLATING.

6. **PRESSURE TESTING: FOLLOW A THREE-STEP LEAK TEST:**
   A. STEP 1: 150 PSI FOR 3 MINUTES
   B. STEP 2: 325 PSI FOR 5 MINUTES
   C. STEP 3: 600 PSI FOR 24 HOURS
   D. USE HYDROGEN LEAK DETECTORS OR BUBBLE SOLUTION (NO DISH SOAP). DOCUMENT RESULTS.

7. **EPA & ASHRAE COMPLIANCE:** LEAK TESTING AND EVACUATION MUST COMPLY WITH EPA GREENCHILL AND ASHRAE 15-2024 ADDENDUM A, WHICH ALLOWS SHAFT ALTERNATIVES FOR VERTICAL PIPING.

8. **EVACUATION PROCEDURES:**
   A. EVACUATE TO 4000 MICRONS, BREAK WITH NITROGEN, HOLD 15 MIN
   B. EVACUATE TO 1500 MICRONS, HOLD 20 MIN
   C. EVACUATE TO <500 MICRONS, HOLD 60 MIN
   D. FINAL EVACUATION TO <300 MICRONS, HOLD 24 HOURS
   E. USE CHECK VALVES TO PREVENT OIL BACKFLOW.

9. **REFRIGERANT CHARGING:** CHARGE R-32 IN LIQUID STATE USING DIGITAL SCALES. CALCULATE CHARGE BASED ON LINE LENGTH AND DIAMETER. USE TOOLS RATED FOR R-32 TO PREVENT CONTAMINATION.

10. **EXTERIOR INSULATION PROTECTION:**
    A. USE ALUMINUM JACKETING OVER INSULATION:
    B. .016" THICK, STUCCO EMBOSSED FINISH
    C. POLYSURLYN MOISTURE BARRIER
    D. ½" ALUMINUM BAND CLAMPS EVERY 10–12"

11. **INSULATION TECHNIQUES:** USE CLOSED-CELL EPDM INSULATION RATED TO 257°F, UV-RESISTANT, AND COMPLIANT WITH ASTM E84, UL 723, CAN/ULC-S102. INSULATE ALL PIPING INCLUDING LIQUID, GAS, EQUALIZER, AND FLARE NUTS.

12. **CONDENSATION PREVENTION:** COVER ALL JOINTS AND FLARE NUTS. UNINSULATED JOINTS WILL CAUSE MOISTURE AND LEAKS.

13. **LINE COMPONENTS:** DO NOT INSTALL DRIERS, OIL TRAPS, OR SIGHT GLASSES. THESE AFFECT PERFORMANCE AND VOID WARRANTIES.

14. **CODE COMPLIANCE:** INSTALL PER ASHRAE 15-2024, ASHRAE 90.1, AND IMC 2024 WITH REGIONAL AMENDMENTS FOR R-32.

15. **INSTALLER CERTIFICATION:** INSTALLERS MUST BE MANUFACTURER-CERTIFIED FOR R-32 VRV SYSTEMS. PROVIDE DOCUMENTATION OF TRAINING AND COMMISSIONING. INCLUDE SPECIAL TOOL KIT:
    A. R-32 GAUGE SET
    B. TORQUE WRENCH
    C. FLARE TOOL
    D. FLARE GAUGE

16. **FIRE-RATED APPLICATIONS:** WHERE REFRIGERANT PIPING OR DUCTWORK IS ROUTED WITHIN OR THROUGH FIRE-RESISTANCE-RATED WALLS, FLOORS, OR CEILINGS, PROVIDE A LISTED FIRE-RESISTIVE SHAFT ENCLOSURE, FIRE-RATED CHASE, OR LISTED FIRE-RATED INSULATION SYSTEM IN ACCORDANCE WITH THE 2021 VIRGINIA CONSTRUCTION CODE AND THE APPLICABLE UL OR INTERTEK LISTING. FINAL SELECTION OF THE FIRE-RESISTIVE METHOD SHALL BE COORDINATED WITH THE ARCHITECTURAL LIFE SAFETY AND WALL TYPE DRAWINGS AND SHALL BE SUBJECT TO APPROVAL BY THE AUTHORITY HAVING JURISDICTION. FACTORY-PROVIDED INSULATION SHALL BE REMOVED ONLY WHERE REQUIRED TO ACHIEVE A LISTED UL FIRE-RESISTIVE ASSEMBLY OR LISTED UL FIRESTOP SYSTEM; INSULATION SHALL OTHERWISE REMAIN CONTINUOUS.

GENERAL NOTES:

1. INSTRUCT THE OWNER IN THE PROPER OPERATION AND MAINTENANCE OF THE MECHANICAL SYSTEMS UNTIL THE OWNER IS FULLY PREPARED TO OPERATE AND MAINTAIN THE MECHANICAL SYSTEM. HOWEVER, LENGTH OF INSTRUCTION TIME SHALL BE LIMITED TO ONE DAY.

2. EQUIPMENT, MATERIALS AND LABOR REQUIRED BY THESE CONTRACT DRAWINGS SHALL BE GUARANTEED TO BE FREE FROM DEFECTIVE MATERIALS OR WORKMANSHIP FOR ONE YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT UNLESS SPECIFIED OTHERWISE. DEFECTIVE MATERIALS OR WORKMANSHIP OCCURRING DURING THIS PERIOD SHALL BE CORRECTED AT NO ADDITIONAL COST.

3. GENERAL CONTRACTOR TO VERIFY THE FINAL LOCATION OF ALL THERMOSTATS, TEMPERATURE SENSORS, PANELS AND CONTROL INSTRUMENTS WITH THE ARCHITECT AND OWNER PRIOR TO ROUGH-IN.

4. GENERAL CONTRACTOR TO VERIFY WALL OPENINGS WITH STRUCTURE, LOCATIONS OF NEW AND EXISTING EQUIPMENT AND ROUTE OF DUCTWORK WITH EXISTING CONDITIONS PRIOR TO ROUGH-IN.

5. REFER TO ARCHITECTURAL, STRUCTURAL AND ELECTRICAL DRAWINGS TO COORDINATE THE EXACT LOCATIONS OF DIFFUSERS, REGISTERS, GRILLES, PIPING AND OTHER MECHANICAL EQUIPMENT WITH CEILING GRID, LIGHTS, BEAMS AND OTHER BUILDING COMPONENTS.

6. CEILING GRID AND OTHER ITEMS SHALL NOT BE SUPPORTED FROM OR IN CONTACT WITH MECHANICAL EQUIPMENT. CONDUIT, WIRING, PIPING AND SUPPORTS SHALL NOT BE LOCATED IN FRONT OF FAN COIL ACCESS PANELS.

7. DUCTWORK AND PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL PANELS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING WITH ELECTRICAL PANELS WHEN SHOWN NEAR PANELS OR OVER ELECTRICAL ROOMS.

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

9. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL SUPPORTS REQUIRED TO MOUNT MECHANICAL EQUIPMENT, PIPING AND DUCTWORK. EQUIPMENT SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

10. ALL DUCTWORK TRANSITIONS AND PIPING INCREASERS/REDUCERS SHALL BE PROVIDED AS REQUIRED FOR EQUIPMENT CONNECTIONS. SEE MANUFACTURERS DATA FOR ACTUAL DUCTWORK AND PIPING CONNECTION SIZES AND LOCATIONS.

11. PROVIDE AIR DEFLECTORS IN ALL SUPPLY AIR DUCTWORK SQUARE ELBOWS.

12. DUCTWORK AND PIPING LAYOUTS ARE FOR DIAGRAMMATICAL PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEASURING AND COORDINATING ALL DUCTWORK AND PIPING PRIOR TO INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY AND ALL OFFSETS AS REQUIRED TO MEET THE INTENT OF THE DESIGN DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER.

13. ALL MECHANICAL DUCTWORK, REFRIGERANT PIPING, AND CONDUITS PENETRATING FIRE-RESISTANCE-RATED WALLS, FLOORS, OR CEILINGS SHALL BE PROTECTED WITH A LISTED FIRESTOP SYSTEM ASSEMBLY TESTED IN ACCORDANCE WITH ASTM E814 OR UL 1479 AND INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S LISTING AND THE 2021 VIRGINIA CONSTRUCTION CODE (VCC), INCLUDING BUT NOT LIMITED TO SECTIONS 705, 706, 707, 708, AND 711. FIRESTOP SYSTEMS SHALL MAINTAIN THE REQUIRED FIRE-RESISTANCE RATING OF THE PENETRATED ASSEMBLY. FIRE-RESISTANCE RATINGS AND LOCATIONS SHALL BE AS INDICATED ON THE ARCHITECTURAL LIFE SAFETY AND WALL TYPE DRAWINGS.

14. ALL CUTTING AND PATCHING FOR THE INSTALLATION OF NEW WORK IN EXISTING BUILDING SHALL BE DONE BY THE GENERAL CONTRACTOR.

15. PROVIDE FLEXIBLE DUCT CONNECTIONS BETWEEN THE SUPPLY AND RETURN DUCTS FROM ALL AIR UNITS AND AT BUILDING EXPANSION JOINTS. FLEXIBLE CONNECTIONS SHALL BE WEATHERTIGHT WHEN EXPOSED.

SYMBOL LEGEND

SYMBOL	DESCRIPTION (DISREGARD ITEMS NOT SHOWN ON PLANS)
GENERAL	
(#)	KEY NOTE TAG
(#)	REVISION TAG
	NEW EQUIPMENT
DUCTWORK	
	SUPPLY AIR DUCTWORK
	RETURN AIR AND OUTSIDE AIR DUCTWORK
	EXHAUST AIR DUCTWORK
	FLEXIBLE DUCTWORK
	SUPPLY AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	RETURN AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	EXHAUST AIR DUCTWORK THROUGH HORIZONTAL PARTITION
	MANUAL BALANCING DAMPER
	MOTORIZED DAMPER
SENSORS	
T	THERMOSTAT AND TEMPERATURE SENSOR
H	HUMIDISTAT
SD	SMOKE DETECTOR
AIR DEVICES	
-	GRILLE SIZE TAG (REFER TO GRILLE SIZE LEGEND)
	SUPPLY AIR DIFFUSER
	RETURN AIR GRILLE
	EXHAUST AIR GRILLE
	SUPPLY AIR SIDEWALL GRILLE
	RETURN AIR SIDEWALL GRILLE
20X12	RETURN AIR OPENING ABOVE CEILING
PIPING	
—D—	CONDENSATE DRAIN LINE
—R—	REFRIGERANT LINES
	ELBOW UP
	ELBOW DOWN
	90° ELBOW
	45° ELBOW
	CONTINUATION

SUBSCRIPTS AND ABBREVIATIONS	
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
ATM	ATMOSPHERE
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
CO	CARBON MONOXIDE
D	CONDENSATE DRAIN
DB	DRY BULB (TEMPERATURE)
DIA	DIAMETER
DMS	DUCTLESS MINI-SPLIT
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRICAL UNIT HEATER
F	FAHRENHEIT
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
G	GAS
HP	HORSEPOWER
HRU	HEAT RECOVERY UNIT
HZ	HERTZ (CYCLES PER SECOND)
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
MCA	MINIMUM CIRCUIT AMPS
MD	MANUAL DAMPER
MOD	MOTORIZED OPERATED DAMPER
NC	NOISE CRITERIA
OA	OUTSIDE AIR
PH	PHASE
R	RADIUS
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF-TOP UNIT
SA	SUPPLY AIR
SD	SMOKE DETECTOR OR SMOKE DAMPER
FSD	COMBINATION FIRE / SMOKE DAMPER
TYP	TYPICAL
UC	1" UNDERCUT (DOOR)
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
WB	WET BULB TEMPERATURE

APPLICABLE CODES

2021 VIRGINIA CONSTRUCTION CODE (VCC)

2021 VIRGINIA MECHANICAL CODE (VMC)

2021 VIRGINIA ENERGY CONSERVATION CODE (VECC)

2021 VIRGINIA PLUMBING CODE (VPC)

2021 VIRGINIA FUEL GAS CODE (VFGC)

ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES

NFPA 99 – HEALTH CARE FACILITIES CODE

NFPA 13 – INSTALLATION OF SPRINKLER SYSTEMS

BASIS OF DESIGN

THE MANUFACTURER AND MODEL NUMBER LISTED IN THE DRAWINGS OR SPECIFICATIONS ARE THE BASIS OF DESIGN. WHEN PROVIDING EQUIPMENT THAT IS NOT THE BASIS OF DESIGN, THE CONTRACTOR SHALL PROVIDE AN ITEMIZED LIST OF ALL DEVIATIONS FROM THE INFORMATION DETAILED IN BOTH THE SPECIFICATION SECTION AND SCHEDULE. ADDITIONALLY, THE EQUIPMENT MUST MEET THE PHYSICAL CONSTRAINTS OF ROOM INCLUDING COORDINATION WITH OTHER TRADES AND ALL EQUIPMENT CLEARANCES, INCLUDING OTHER TRADES. FINALLY, THE CONTRACTOR SHALL PROVIDE AT THE CONTRACTOR'S COST ANY SCOPE INCREASE AND DEDUCTIONS BASED ON THE NON-BASIS OF DESIGN EQUIPMENT FOR THE FOLLOWING MINIMUM ITEMS:

- ELECTRICAL MODIFICATIONS, INCLUDING WIRING, CONDUIT, DISCONNECTS, OVERCURRENT PROTECTION, PANELS, ETC.
- STRUCTURAL MODIFICATIONS.
- CIVIL MODIFICATIONS.
- PLUMBING MODIFICATIONS.
- DUCT AND PIPE CONNECTIONS OR ARRANGEMENTS.
- SPACE HEATING AND COOLING REQUIREMENTS.
- EXHAUST OR VENTILATION MODIFICATIONS.
- VIBRATION ISOLATION REQUIREMENTS.
- **CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE EQUIPMENT MANUFACTURER FOR ANY CHANGES TO THE REFRIGERANTS REQUIRED PER NEW EPA GUIDELINES. CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES FOR CHANGES IN EQUIPMENT SIZE OR ELECTRICAL REQUIREMENTS.**

HVAC EQUIPMENT SIZES ARE BASED UPON ASHRAE 2021 WEATHER DATA AS LISTED BELOW.
HEATING AND COOLING DESIGN CONDITION LOCATION: ***VIRGINIA TECH MONTGOMERY, VIRGINIA***
SUMMER:
- OUTDOOR CONDITIONS: ***88.8°F DB, 72.3 WB***
- INDOOR SETPOINTS: ***75°F DB 50% RH***

WINTER:
- OUTDOOR CONDITIONS: ***10.3°F DB***
- INDOOR SETPOINTS: ***72°F DB 35% RH***

Salas O'Brien
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Project No: 2450-70746-00

Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

DATE: December 8, 2025

Revisions

No.	Date	Description

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New Facility For
Community Health Center
of the New River Valley
145 Akers Farm Road Town of Christiansburg, Virginia

DRAWN BY: BMG
CHECKED BY: SSL

MECHANICAL GENERAL NOTES AND SYMBOLS LEGEND

COMMONWEALTH OF VIRGINIA
12/08/2025
SAMUEL S. LOTT
Lic. No. 061900
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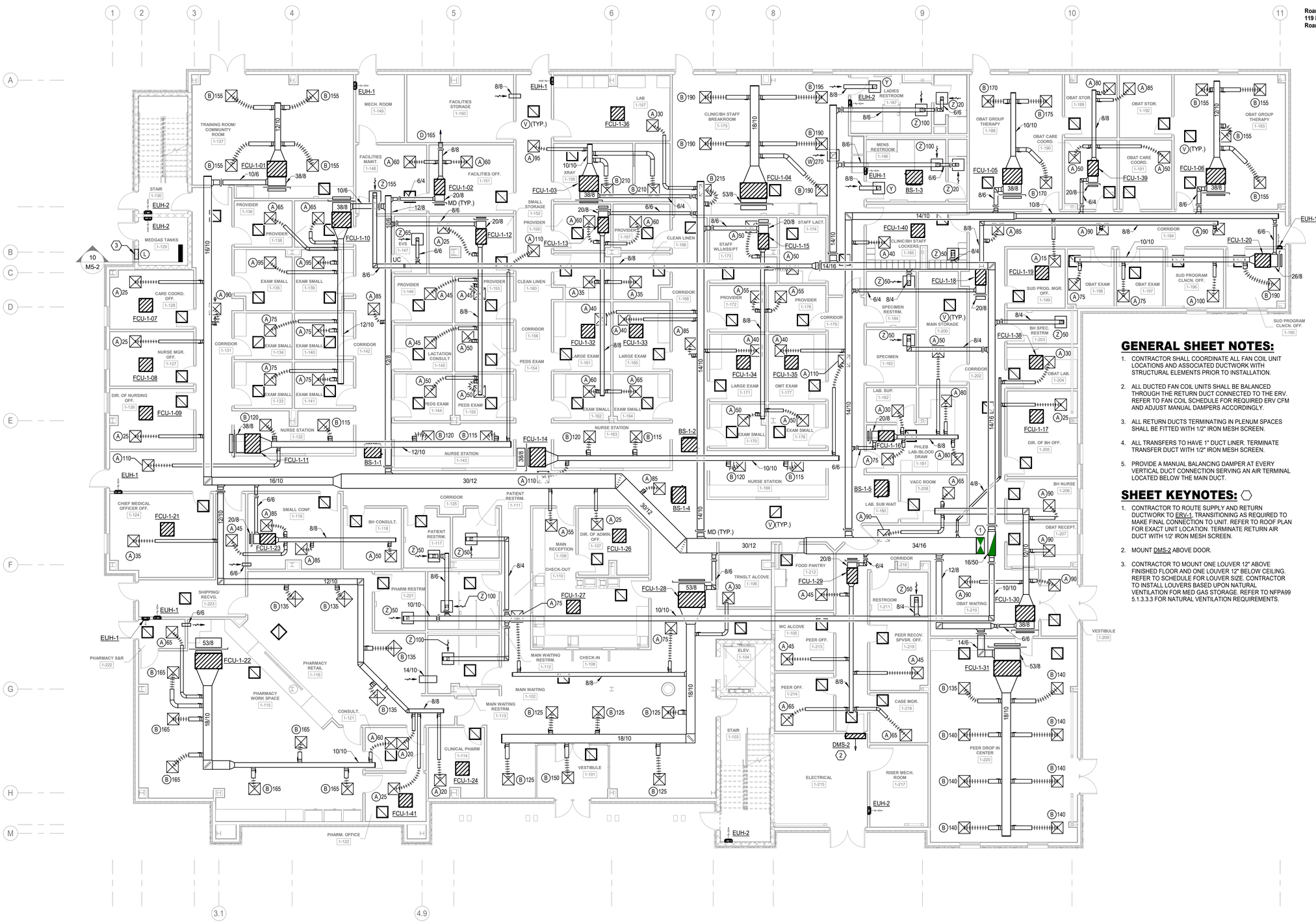


GENERAL SHEET NOTES:

1. CONTRACTOR SHALL COORDINATE ALL FAN COIL UNIT LOCATIONS AND ASSOCIATED DUCTWORK WITH STRUCTURAL ELEMENTS PRIOR TO INSTALLATION.
2. ALL DUCTED FAN COIL UNITS SHALL BE BALANCED THROUGH THE RETURN DUCT CONNECTED TO THE ERV. REFER TO FAN COIL SCHEDULE FOR REQUIRED ERV CFM AND ADJUST MANUAL DAMPERS ACCORDINGLY.
3. ALL RETURN DUCTS TERMINATING IN PLENUM SPACES SHALL BE FITTED WITH 1/2" IRON MESH SCREEN.
4. ALL TRANSFERS TO HAVE 1" DUCT LINER. TERMINATE TRANSFER DUCT WITH 1/2" IRON MESH SCREEN.
5. PROVIDE A MANUAL BALANCING DAMPER AT EVERY VERTICAL DUCT CONNECTION SERVING AN AIR TERMINAL LOCATED BELOW THE MAIN DUCT.

SHEET KEYNOTES: ⬡

1. CONTRACTOR TO ROUTE SUPPLY AND RETURN DUCTWORK TO ERV-1, TRANSITIONING AS REQUIRED TO MAKE FINAL CONNECTION TO UNIT. REFER TO ROOF PLAN FOR EXACT UNIT LOCATION. TERMINATE RETURN AIR DUCT WITH 1/2" IRON MESH SCREEN.
2. MOUNT DMS-2 ABOVE DOOR.
3. CONTRACTOR TO MOUNT ONE LOUVER 12" ABOVE FINISHED FLOOR AND ONE LOUVER 12" BELOW CEILING. REFER TO SCHEDULE FOR LOUVER SIZE. CONTRACTOR TO INSTALL LOUVERS BASED UPON NATURAL VENTILATION FOR MED GAS STORAGE. REFER TO NFPA99 5.1.3.3.3 FOR NATURAL VENTILATION REQUIREMENTS.

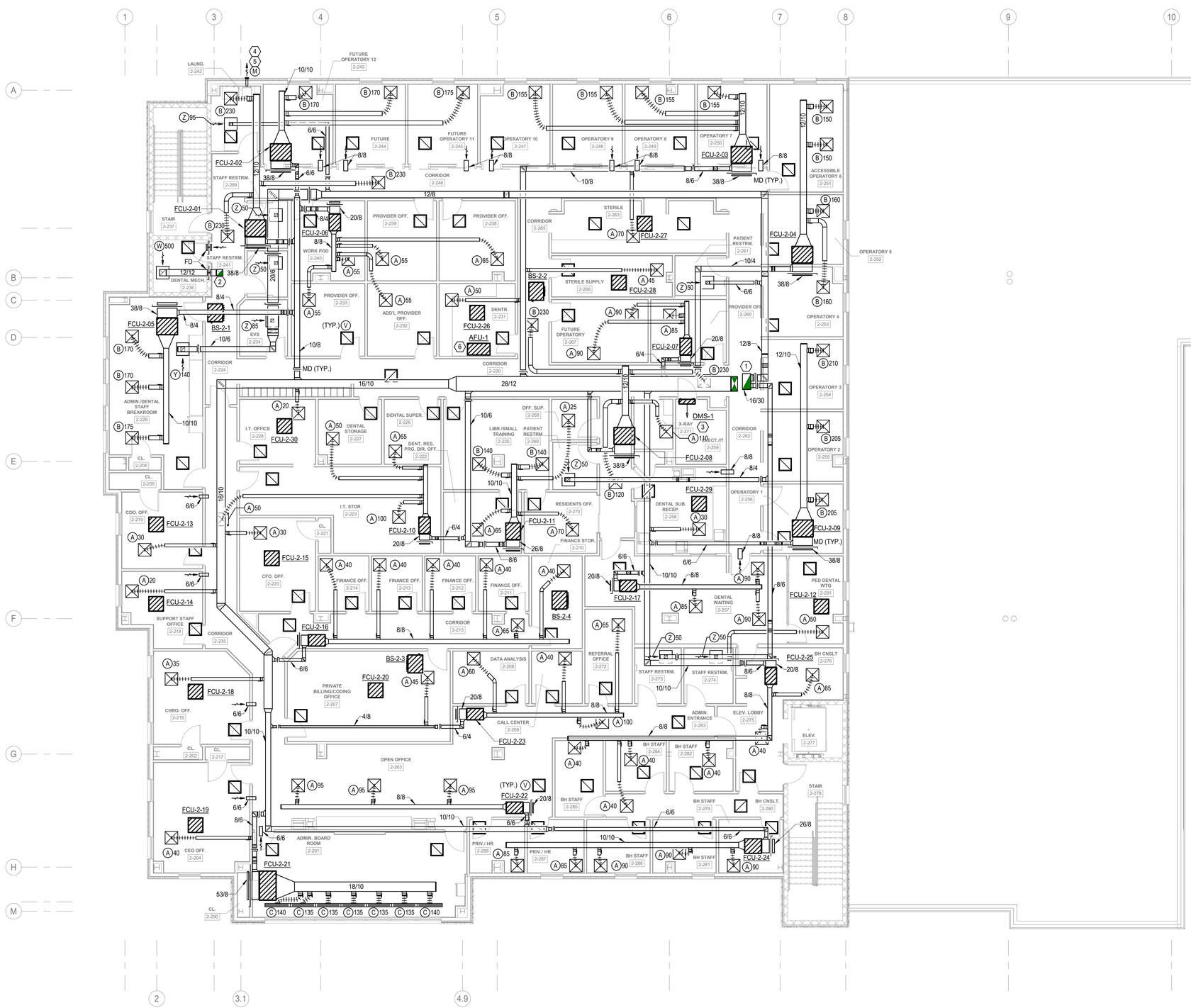
DRAWN BY: BMG
CHECKED BY: SSL

FIRST FLOOR PLAN - DUCTWORK

COMMONWEALTH OF VIRGINIA
12/08/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

COMMISSION No.
24069
SHEET
MH1-1

1 **FIRST FLOOR PLAN - DUCTWORK**
Scale: 1/8" = 1'-0"



1 **SECOND FLOOR PLAN - DUCTWORK**
Scale: 1/8" = 1'-0"

GENERAL SHEET NOTES:

1. CONTRACTOR SHALL COORDINATE ALL FAN COIL UNIT LOCATIONS AND ASSOCIATED DUCTWORK WITH STRUCTURAL ELEMENTS PRIOR TO INSTALLATION.
2. ALL DUCTED FAN COIL UNITS SHALL BE BALANCED THROUGH THE RETURN DUCT CONNECTED TO THE ERV. REFER TO FAN COIL SCHEDULE FOR REQUIRED ERV CFM AND ADJUST MANUAL DAMPERS ACCORDINGLY.
3. ALL RETURN DUCTS TERMINATING IN PLENUM SPACES SHALL BE FITTED WITH 1/2" IRON MESH SCREEN.
4. ALL TRANSFERS TO HAVE 1" DUCT LINER. TERMINATE TRANSFER DUCT WITH 1/2" IRON MESH SCREEN.
5. PROVIDE A MANUAL BALANCING DAMPER AT EVERY VERTICAL DUCT CONNECTION SERVING AN AIR TERMINAL LOCATED BELOW THE MAIN DUCT.
6. REFER TO MH1-3 FOR ALL ROOF MOUNTED EQUIPMENT.

SHEET KEYNOTES: ⬡

1. CONTRACTOR TO ROUTE SUPPLY AND RETURN DUCTWORK TO ERV-2. TRANSITIONING AS REQUIRED TO MAKE FINAL CONNECTION TO UNIT. REFER TO ROOF PLAN FOR EXACT UNIT LOCATION. TERMINATE RETURN AIR DUCT WITH 1/2" IRON MESH SCREEN.
2. ROUTE 12" X 12" EXHAUST DUCT UP TO REF-2. CONTRACTOR SHALL TRANSITION DUCTWORK AS NECESSARY TO MAKE CONNECTION TO EXHAUST FAN.
3. MOUNT DMS-1 ABOVE DOOR.
4. CONNECT DRYER VENT IN WALL TO DRYER BOX MODEL # 480 BY IN-O-VATE TECHNOLOGIES INC. COORDINATE WITH DRYER OUTLET PRIOR TO INSTALLATION. PROVIDE AND INSTALL EQUIVALENT LENGTH PLACARD ADJACENT TO DRYER WALL INLET PER IMC 2021 SECTION 504.8.4.1 AND FIGURE 504.8.4.1.
5. ROUTE DRYER DUCT TO MINIMIZE CHANGES IN DIRECTION THRU WALL AND CONNECT TO DRYER WALL VENT.
6. CONTRACTOR TO PROVIDE AIR FILTRATION UNIT (AFU-1) COMPLETE WITH SOURCE CAPTURE ARM, HIGH-EFFICIENCY CARTRIDGE FILTER, AND ALL REQUIRED ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM. PROVIDE AQC MODEL MINIROLL OR APPROVED EQUAL.

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New Facility For
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of the New River Valley
145 Akers Farm Road Town of Christiansburg, Virginia

DRAWN BY: BMG
CHECKED BY: SSL

SECOND FLOOR PLAN - DUCTWORK

COMMONWEALTH OF VIRGINIA
12/08/2025
SAMUEL S. LOTT
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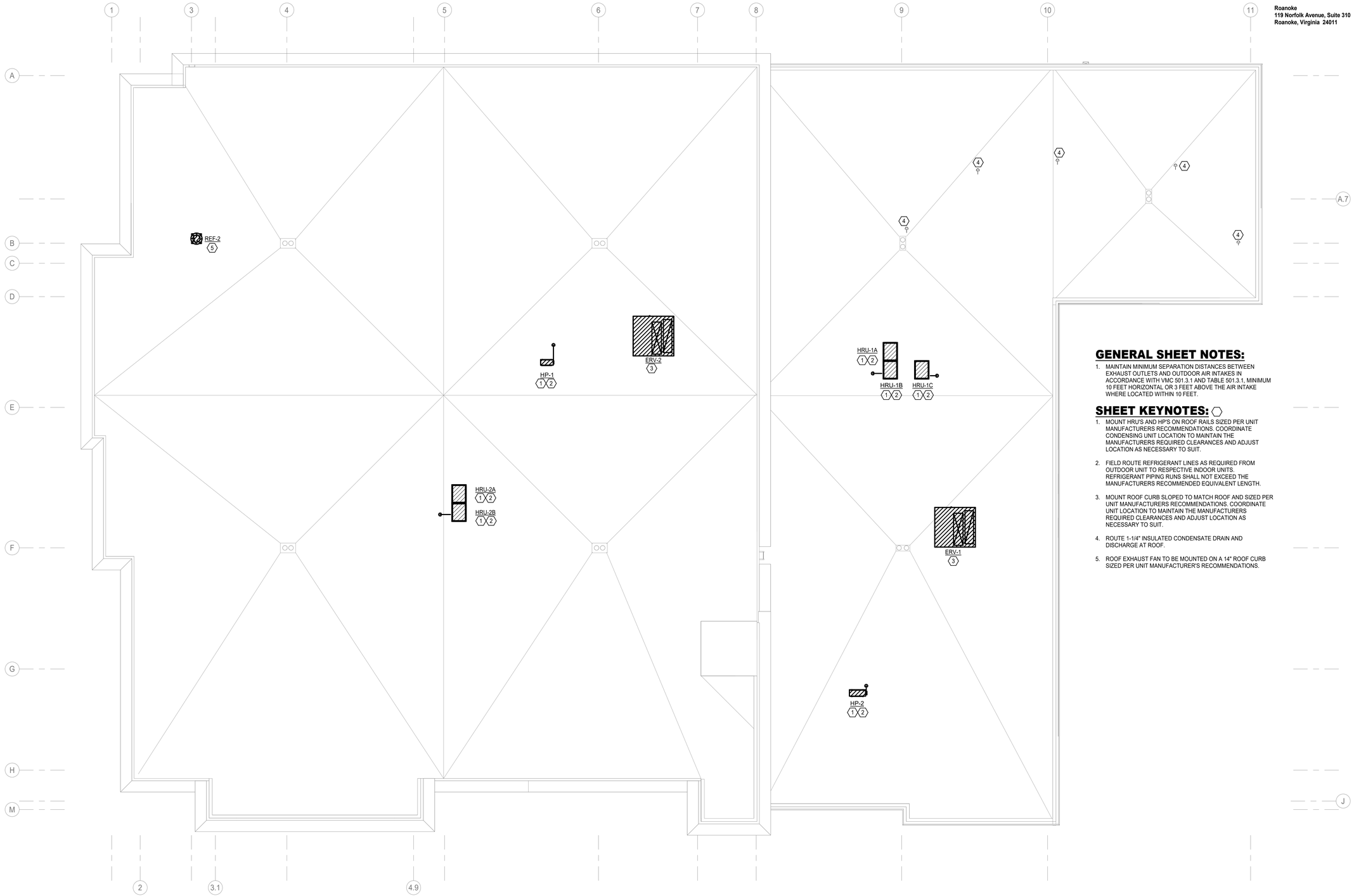

1 **ROOF PLAN - MECHANICAL**
Scale: 1/8" = 1'-0"

GENERAL SHEET NOTES:

1. MAINTAIN MINIMUM SEPARATION DISTANCES BETWEEN EXHAUST OUTLETS AND OUTDOOR AIR INTAKES IN ACCORDANCE WITH VMC 501.3.1 AND TABLE 501.3.1, MINIMUM 10 FEET HORIZONTAL OR 3 FEET ABOVE THE AIR INTAKE WHERE LOCATED WITHIN 10 FEET.

SHEET KEYNOTES: ⬡

1. MOUNT HRU'S AND HP'S ON ROOF RAILS SIZED PER UNIT MANUFACTURERS RECOMMENDATIONS. COORDINATE CONDENSING UNIT LOCATION TO MAINTAIN THE MANUFACTURERS REQUIRED CLEARANCES AND ADJUST LOCATION AS NECESSARY TO SUIT.
2. FIELD ROUTE REFRIGERANT LINES AS REQUIRED FROM OUTDOOR UNIT TO RESPECTIVE INDOOR UNITS. REFRIGERANT PIPING RUNS SHALL NOT EXCEED THE MANUFACTURERS RECOMMENDED EQUIVALENT LENGTH.
3. MOUNT ROOF CURB SLOPED TO MATCH ROOF AND SIZED PER UNIT MANUFACTURERS RECOMMENDATIONS. COORDINATE UNIT LOCATION TO MAINTAIN THE MANUFACTURERS REQUIRED CLEARANCES AND ADJUST LOCATION AS NECESSARY TO SUIT.
4. ROUTE 1-1/4" INSULATED CONDENSATE DRAIN AND DISCHARGE AT ROOF.
5. ROOF EXHAUST FAN TO BE MOUNTED ON A 14" ROOF CURB SIZED PER UNIT MANUFACTURER'S RECOMMENDATIONS.

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ROOF LEVEL - MECHANICAL

COMMONWEALTH OF VIRGINIA
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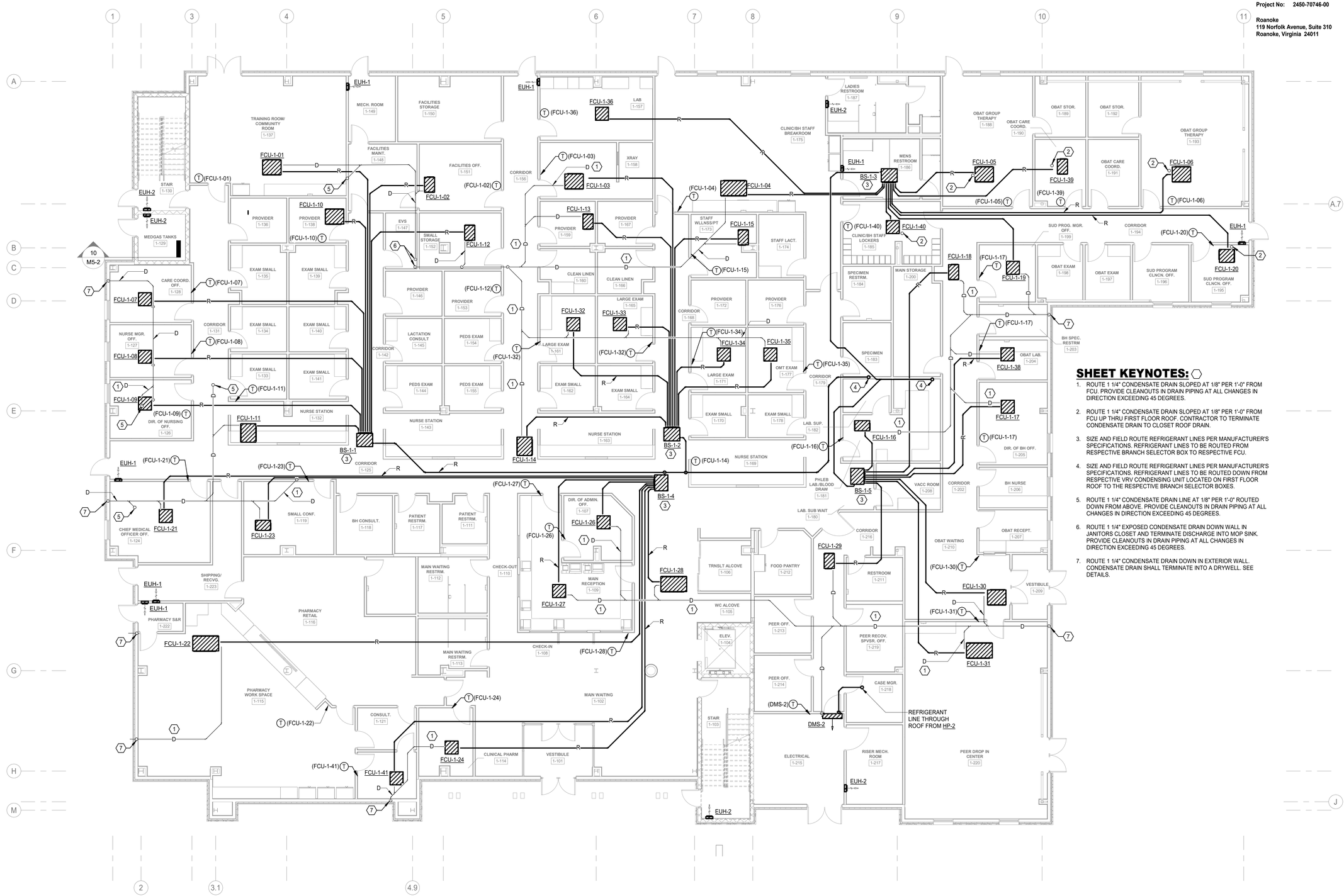

SHEET KEYNOTES:

1. ROUTE 1 1/4" CONDENSATE DRAIN SLOPED AT 1/8" PER 1'-0" FROM FCU. PROVIDE CLEANOUTS IN DRAIN PIPING AT ALL CHANGES IN DIRECTION EXCEEDING 45 DEGREES.
2. ROUTE 1 1/4" CONDENSATE DRAIN SLOPED AT 1/8" PER 1'-0" FROM FCU UP THRU FIRST FLOOR ROOF. CONTRACTOR TO TERMINATE CONDENSATE DRAIN TO CLOSET ROOF DRAIN.
3. SIZE AND FIELD ROUTE REFRIGERANT LINES PER MANUFACTURER'S SPECIFICATIONS. REFRIGERANT LINES TO BE ROUTED FROM RESPECTIVE BRANCH SELECTOR BOX TO RESPECTIVE FCU.
4. SIZE AND FIELD ROUTE REFRIGERANT LINES PER MANUFACTURER'S SPECIFICATIONS. REFRIGERANT LINES TO BE ROUTED DOWN FROM RESPECTIVE VRV CONDENSING UNIT LOCATED ON FIRST FLOOR ROOF TO THE RESPECTIVE BRANCH SELECTOR BOXES.
5. ROUTE 1 1/4" CONDENSATE DRAIN LINE AT 1/8" PER 1'-0" ROUTED DOWN FROM ABOVE. PROVIDE CLEANOUTS IN DRAIN PIPING AT ALL CHANGES IN DIRECTION EXCEEDING 45 DEGREES.
6. ROUTE 1 1/4" EXPOSED CONDENSATE DRAIN DOWN WALL IN JANITORS CLOSET AND TERMINATE DISCHARGE INTO MOP SINK. PROVIDE CLEANOUTS IN DRAIN PIPING AT ALL CHANGES IN DIRECTION EXCEEDING 45 DEGREES.
7. ROUTE 1 1/4" CONDENSATE DRAIN DOWN IN EXTERIOR WALL. CONDENSATE DRAIN SHALL TERMINATE INTO A DRYWELL. SEE DETAILS.

1 FIRST FLOOR PLAN - PIPING
Scale: 1/8" = 1'-0"

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FIRST FLOOR PLAN - PIPING

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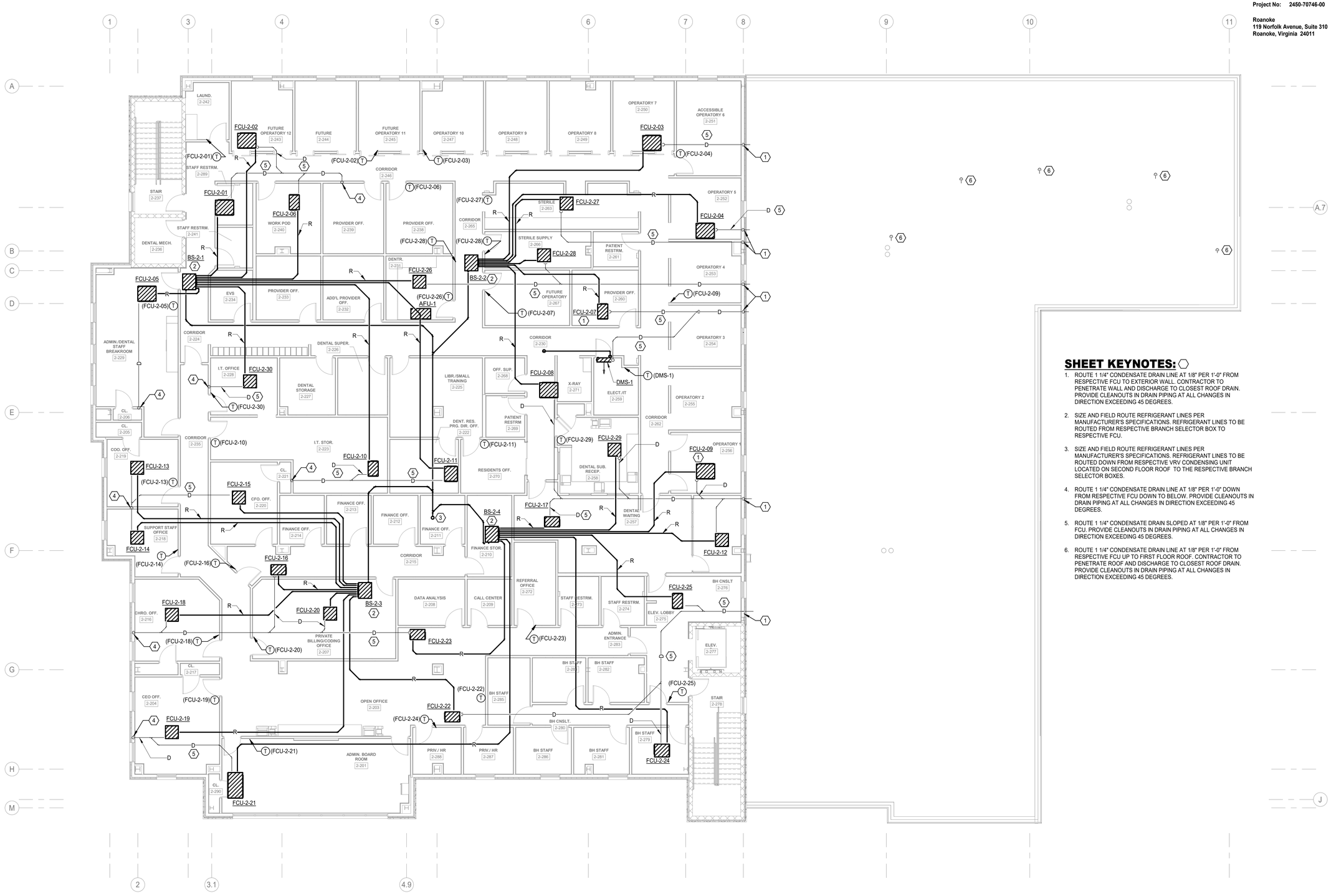
12/08/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

COMMISSION No.
24069
SHEET
MP1-1



1 **SECOND FLOOR PLAN - PIPING**
Scale: 1/8" = 1'-0"

SHEET KEYNOTES:

1. ROUTE 1 1/4" CONDENSATE DRAIN LINE AT 1/8" PER 1'-0" FROM RESPECTIVE FCU TO EXTERIOR WALL. CONTRACTOR TO PENETRATE WALL AND DISCHARGE TO CLOSEST ROOF DRAIN. PROVIDE CLEANOUTS IN DRAIN PIPING AT ALL CHANGES IN DIRECTION EXCEEDING 45 DEGREES.
2. SIZE AND FIELD ROUTE REFRIGERANT LINES PER MANUFACTURER'S SPECIFICATIONS. REFRIGERANT LINES TO BE ROUTED FROM RESPECTIVE BRANCH SELECTOR BOX TO RESPECTIVE FCU.
3. SIZE AND FIELD ROUTE REFRIGERANT LINES PER MANUFACTURER'S SPECIFICATIONS. REFRIGERANT LINES TO BE ROUTED DOWN FROM RESPECTIVE VRV CONDENSING UNIT LOCATED ON SECOND FLOOR ROOF TO THE RESPECTIVE BRANCH SELECTOR BOXES.
4. ROUTE 1 1/4" CONDENSATE DRAIN LINE AT 1/8" PER 1'-0" DOWN FROM RESPECTIVE FCU DOWN TO BELOW. PROVIDE CLEANOUTS IN DRAIN PIPING AT ALL CHANGES IN DIRECTION EXCEEDING 45 DEGREES.
5. ROUTE 1 1/4" CONDENSATE DRAIN SLOPED AT 1/8" PER 1'-0" FROM FCU. PROVIDE CLEANOUTS IN DRAIN PIPING AT ALL CHANGES IN DIRECTION EXCEEDING 45 DEGREES.
6. ROUTE 1 1/4" CONDENSATE DRAIN LINE AT 1/8" PER 1'-0" FROM RESPECTIVE FCU UP TO FIRST FLOOR ROOF. CONTRACTOR TO PENETRATE ROOF AND DISCHARGE TO CLOSEST ROOF DRAIN. PROVIDE CLEANOUTS IN DRAIN PIPING AT ALL CHANGES IN DIRECTION EXCEEDING 45 DEGREES.

Salas O'Brien
salasobrien.com 540-952-9651
Project No: 2450-70746-00
Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

DATE: December 8, 2025

Revisions

No.	Date	Description

HUGHES ASSOCIATES
ARCHITECTS & ENGINEERS
3800 ELECTRIC ROAD, SUITE 300 | ROANOKE, VIRGINIA 24018
540.342.4002
www.HughesAE.com

New Facility For
Community Health Center
of the New River Valley
145 Akers Farm Road
Town of Christiansburg, Virginia

DRAWN BY: BMG
CHECKED BY: SSL

SECOND FLOOR PLAN - PIPING

COMMONWEALTH OF VIRGINIA
12/08/2025
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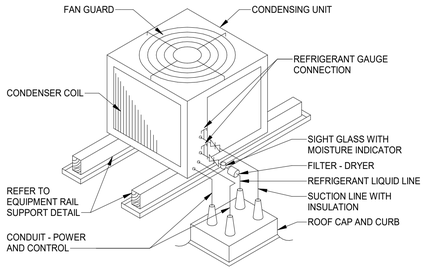
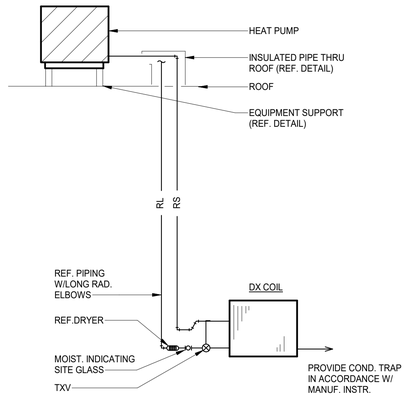
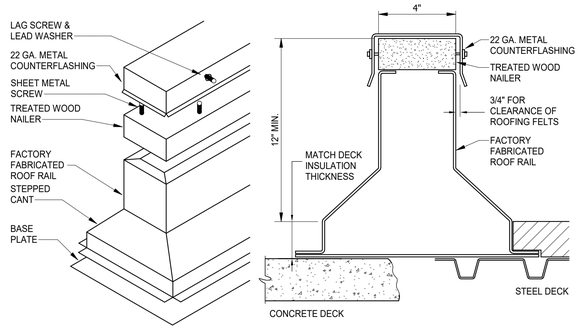


1 HEAT PUMP
Scale: NONE

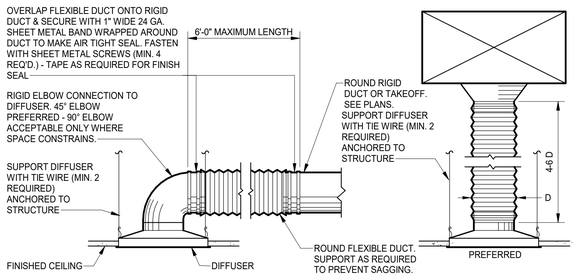


2 REFRIGERANT PIPING DIAGRAM
Scale: NONE

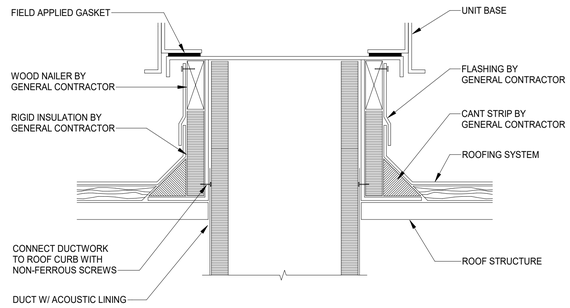


NOTE:
PROVIDE 8" WIDE DRAIN OPENING ("RAIN SCUPPER") AT 60" O.C. IF RAILING EXCEEDS 10'-0" IN LENGTH.

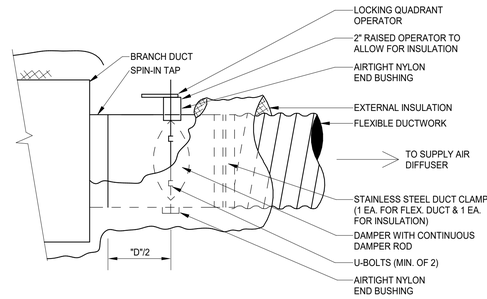
3 ROOF RAIL EQUIPMENT SUPPORT
Scale: NONE



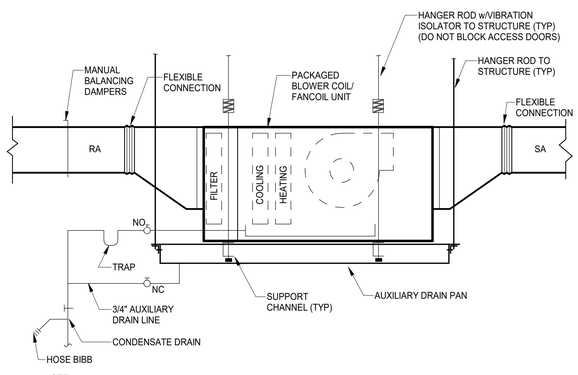
4 CEILING DIFFUSER INSTALLATION
Scale: NONE



5 EQUIPMENT ROOF CURB
Scale: NONE

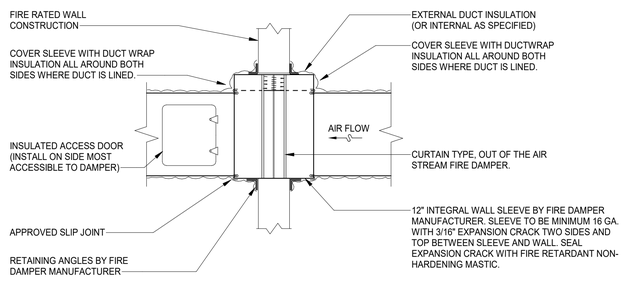


6 FLEXIBLE DUCT TAP - SPIN-IN
Scale: NONE



NOTE:
PROVIDE CONDENSATE OVERFLOW SENSOR AND SWITCH IN PRIMARY [AUXILARY] DRAIN PAN.

7 HORIZONTAL PACKAGED INDOOR FCU
Scale: NONE



NOTES:
1. THIS DETAIL IS FOR REFERENCE ONLY. INSTALLATION SHALL BE IN STRICT COMPLIANCE WITH U.L. LISTING AND MANUFACTURER'S INSTRUCTIONS.

8 FIRE DAMPER
Scale: NONE

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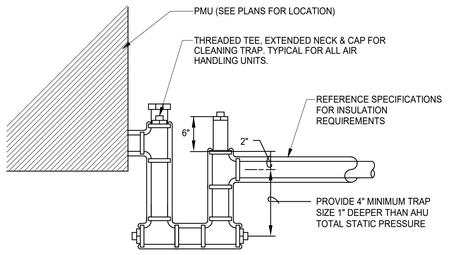
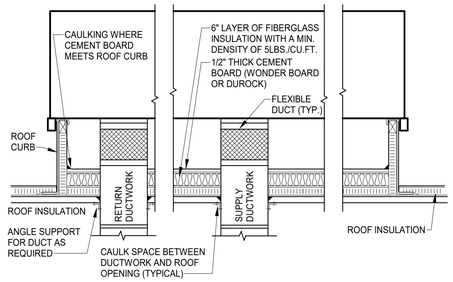
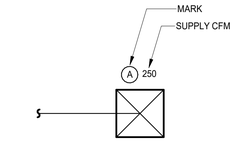


1 CONDENSATE DRAIN PIPING AT RTU/ERV
Scale: NONE

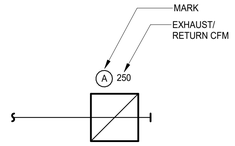


NOTES:
1. CUT ROOF OPENING JUST LARGE ENOUGH TO ACCOMMODATE SUPPLY AND RETURN DUCTWORK. CAULK AIR TIGHT THE SPACE BETWEEN DUCTWORK AND ROOF OPENINGS.
2. PROVIDE 5# DENSITY INSULATION UNDER UNIT ON TOP OF ROOF AND INSIDE ROOF CURB. COVER INSULATION WITH 1/2" CEMENT BOARD AND CAULK BETWEEN CEMENT BOARD AND ROOF CURB.
3. ROOF INSULATION SHALL EXTEND UNDER UNIT.
4. PROVIDE ISOLATION RAILS.
5. COORDINATE EXACT UNIT LOCATION AND SUPPORT WITH EXISTING STRUCATURAL SYSTEM.

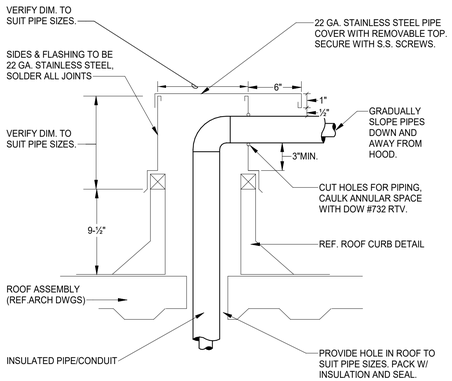
2 ERV MOUNTING
Scale: NONE



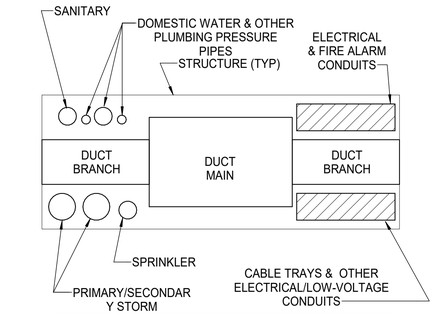
3 DIFFUSER SIZING
Scale: NONE



4 REGISTER SIZING
Scale: NONE

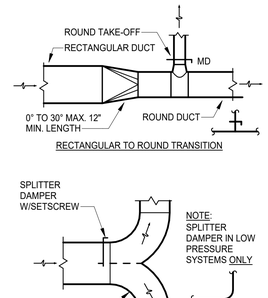


5 INSULATED PIPE THRU ROOF
Scale: NONE



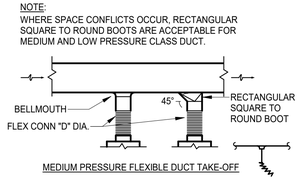
NOTE: AT THE CONTRACTOR'S DISCRETION, SYSTEMS SHOWN IN THIS DETAIL MAY BE REARRANGED TO FACILITATE CONSTRUCTION. SYSTEMS NOT SHOWN SHALL BE COORDINATED IN THE FIELD BETWEEN TRADES. ABOVE CEILING COORDINATION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND ANY CONFLICTS SHALL BE COORDINATED IN THE FILED BETWEEN TRADES. FOR EXISTING CONDITIONS, CONTRACTOR SHALL VERIFY AND COORDINATE WITH EXISTING STRUCTURE PRIOR TO FABRICATION OF DUCTWORK.

6 MEP CEILING COORDINATION
Scale: NONE

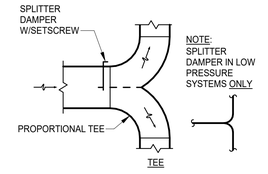


RECTANGULAR TO ROUND TRANSITION

NOTE:
WHERE SPACE CONFLICTS OCCUR, RECTANGULAR SQUARE TO ROUND BOOTS ARE ACCEPTABLE FOR MEDIUM AND LOW PRESSURE CLASS DUCT.

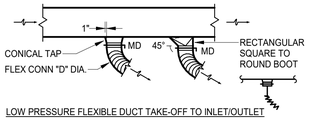


MEDIUM PRESSURE FLEXIBLE DUCT TAKE-OFF

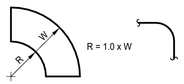


TEE

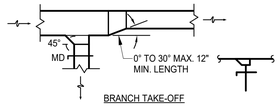
NOTE:
SPLITTER DAMPER IN LOW PRESSURE SYSTEMS ONLY



LOW PRESSURE FLEXIBLE DUCT TAKE-OFF TO INLET/OUTLET



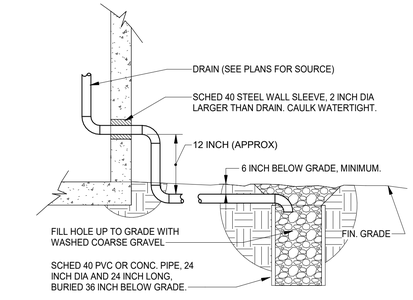
FULL RADIUS ELBOW



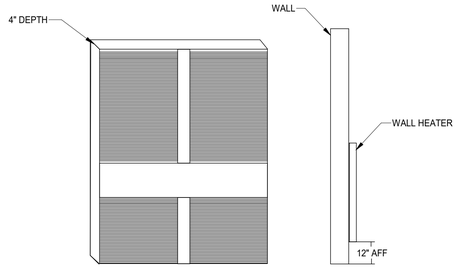
BRANCH TAKE-OFF

NOTE:
UNLESS NOTED OTHERWISE ALL MITERED 90 DEGREE ELBOWS SHALL HAVE TURNING VANES. 45 DEGREE ELBOWS SHALL NOT HAVE TURNING VANES.

7 STANDARD DUCT CONSTRUCTION
Scale: NONE

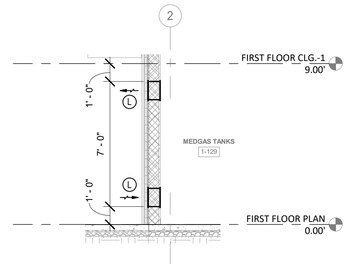


8 CONDENSATE DISCHARGE INTO DRYWELL
Scale: NONE



NOTES:
1. INTEGRAL THERMOSTAT. SETPOINT AT 45 DEGREES (ADJUSTABLE).
2. SURFACE MOUNTED FOR ALL RATED WALLS.
3. RECESSED MOUNTED FOR NON-RATED WALLS.
4. OPTIONAL ACCESSORIES: SURFACE MOUNTED ADAPTER OR SEMI-RECESSED MOUNTED ADAPTER.
5. CONFIRM ROUGH IN DIMENSIONS (FOR RECESSED APPLICATION) WITH MANUFACTURER SPECIFICATIONS.

9 ELECTRIC WALL HEATER
Scale: NONE



10 MEDGAS TANKS STORAGE ROOM ELEVATION
Scale: 1/4" = 1'-0"

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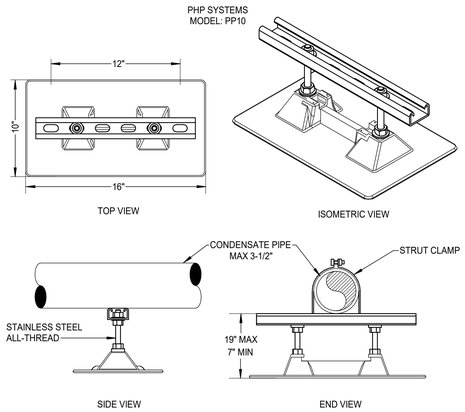
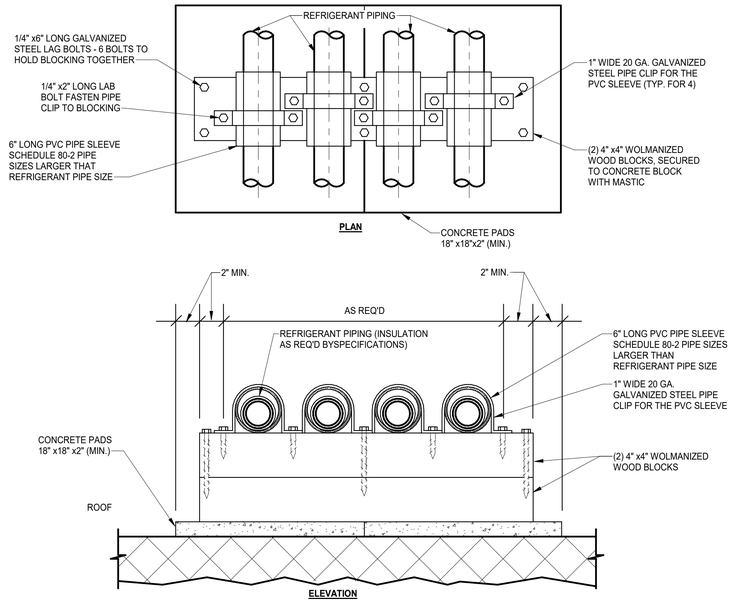


1 CONDENSATE PIPE SUPPORT ON ROOF
Scale: NONE



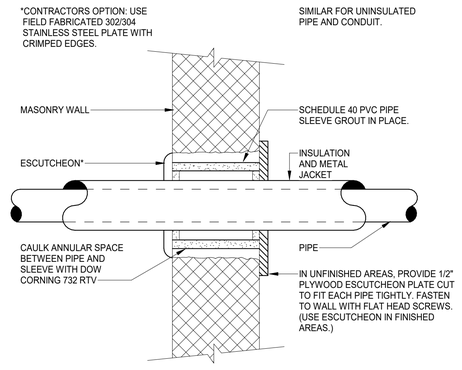
NOTE:
1. SUPPORT REQUIRED AT ALL CHANGES IN DIRECTION & AS SHOWN ON DRAWINGS.
2. INCREASE HEIGHT AS REQUIRED FOR ROUTING ABOVE ROOF MOUNTED ACCESSORIES SUCH AS EXPANSION JOINTS.

2 REFRIGERANT PIPING ROOF SUPPORT
Scale: NONE

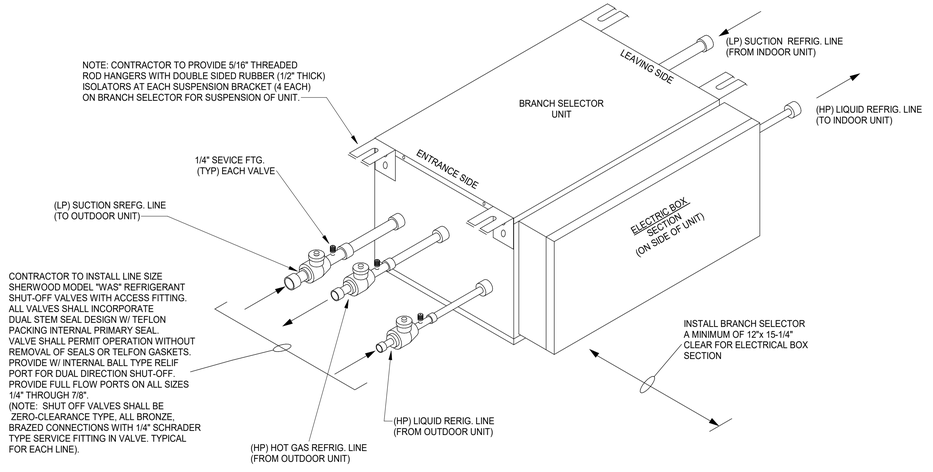
PIPING SUPPORT/HANGER SPACING

CONDENSATE AND REFRIGERANT PIPING		
PIPE MATERIAL	MAXIMUM HORIZONTAL SPACING	MAXIMUM VERTICAL SPACING
CPVC, 1" AND SMALLER	3'-0"	10'-0"
CPVC, 1-1/4" AND LARGER	4'-0"	10'-0"
COPPER / COPPER ALLOY TUBING 1-1/4" AND SMALLER	6'-0"	10'-0"
COPPER / COPPER ALLOY TUBING 1-1/2" AND LARGER	10'-0"	10'-0"

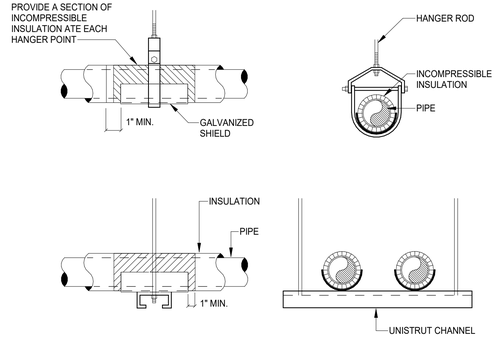
3 PIPING SUPPORT/HANGER SPACING
Scale: NONE



4 PIPE THROUGH EXTERIOR WALL
Scale: NONE



5 TYPICAL BRANCH SELECTOR PIPING
Scale: NONE



6 PIPE HANGERS
Scale: 12" = 1'-0"

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ENERGY RECOVERY UNIT

MARK	OUTSIDE AIR SUPPLY FAN			EXHAUST FAN			ELECTRICAL CONNECTION					ENERGY WHEEL RECOVERY												COILING COIL						HOT GAS REHEAT		GAS HEATING SECTION				MANUFACTURER	MODEL	REMARKS
												SUMMER PERFORMANCE								WINTER PERFORMANCE																		
												OUTSIDE AIR				EXHAUST AIR				OUTSIDE AIR		EXHAUST AIR		TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	ENT. AIR TEMP, DB	ENT. AIR TEMP, WB	LEAVING COIL		LEAVING UNIT								
	AIRFLOW CFM	EXT. SP (IN.W.C.)	HORSE POWER	AIRFLOW CFM	EXT. SP (IN.W.C.)	HORSE POWER	V	PH	F	MCA	MOCP	EAT DB	EAT WB	LAT DB	LAT WB	EAT DB	EAT WB	LAT DB	LAT WB	EAT DB	LAT DB	EAT DB	LAT DB					LEAV. AIR TEMP, DB	LEAV. AIR TEMP, WB	LEAV. AIR TEMP, DB	LEAV. AIR TEMP, WB	LEAV. AIR TEMP, DB	LEAV. AIR TEMP, WB	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	ENT. AIR TEMP, DB	LEAV. AIR TEMP, DB			
ERV-1	4,350	2.0	5.0	3,915	0.5	3.0	460	3	60	64.7	70.0	88.8	72.3	80.3	67.1	75.0	63.0	84.0	69.0	10.3	44.5	72.0	29.0	192.0	124.1	80.3	67.1	51.6	51.6	77.8	61.5	75.5	60.1	350	272.2	10.8	73.3	TEMPMASTER	DROA180C2L	ALL
ERV-2	2,650	2.0	3.0	2,385	0.5	1.5	460	3	60	51.5	60.0	88.8	72.3	79.9	67.0	75.0	63.0	84.5	69.1	10.3	45.6	72.0	27.7	120.2	76.5	79.9	67.0	50.9	50.9	76.0	60.5	74.2	59.8	250	194.4	10.3	83.5	TEMPMASTER	DROA120C2	ALL

GENERAL NOTES:

1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES, DAMPERS, AND DUCT MOUNTED HOT WATER COILS WHERE APPLICABLE. DIRTY FILTER AND UNIT CASING MUST BE ADDED TO EXTERNAL STATIC PRESSURE TO OBTAIN TOTAL PRESSURE LOSS. INCREASE HORSEPOWER AS REQUIRED TO MEET YOUR TOTAL PRESSURE LOSS. COORDINATE WITH ELECTRICIAN.
2. MAINTAIN MINIMUM CLEARANCE FOR COIL PULL AS RECOMMENDED BY UNIT MANUFACTURER. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.

REMARKS:

1. PROVIDE VARIABLE FREQUENCY DRIVE FOR SUPPLY AND EXHAUST FAN.
2. PROVIDE UNIT WITH 10:1 MODULATION NATURAL GAS HEAT.
3. PROVIDE UNIT WITH DUAL CIRCUIT HOT GAS REHEAT.
4. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH, AND FACTORY MOUNTED GFI OUTLET TO BE FIELD WIRED.
5. PROVIDE UNIT WITH FACTORY MOUNTED CONTROLS WITH TEMPERATURE AND HUMIDITY SENSOR.
6. UNIT TO BE CURB MOUNTED ON 14" ROOF CURB AND SLOPED TO MATCH ROOF PITCH. CONTRACTOR SHALL COORDINATE WITH UNIT MANUFACTURER TO VERIFY THAT THE CURB SHALL BE SIZED FOR DUCTWORK PENETRATIONS AS SHOWN ON THE DRAWINGS.
7. PROVIDE A WATER LEVEL SENSING DEVICE (FLOW SWITCH) IN THE PRIMARY DRAIN PAN. THIS DEVICE SHALL SHUT OFF THE APPLIANCE IN THE EVENT THE PRIMARY DRAIN LINE BECOMES RESTRICTED.
8. PROVIDE UNIT WITH CLOGGED FILTER INDICATOR.
9. PROVIDE MERV 13 FILTERS.
10. PROVIDE UNIT CONTROLLER CAPABLE OF BACNET IP COMMUNICATION WITH THE ABILITY TO INTEGRATE THE ERV INTO THE VRV ITOUCH MANAGER THROUGH THE BACNET CLIENT OPTION.
11. PROVIDE UNIT WITH DUCT SMOKE DETECTORS.

VRV FAN COIL UNIT

MARK	ERV SUPPLY CFM	FAN			ELECTRICAL CONNECTION					NOMINAL COOLING CAPACITY (BTU/H)	NOMINAL HEATING CAPACITY (BTU/H)	MANUFACTURER	MODEL	REMARKS
		SUPPLY AIR CFM	EXT.STATIC PRESSURE (IN. W.C.)	POWER (W)	V	P	F	MCA	MOCP					
FCU-1-01	240	620	0.20	163	208	1	60	1.80	15.0	24,000	27,000	DAIKIN	FXSA24AAVJU	ALL
FCU-1-02	70	285	0.20	59	208	1	60	0.90	15.0	12,000	13,500	DAIKIN	FXSA12AAVJU	ALL
FCU-1-03	75	515	0.20	163	208	1	60	1.60	15.0	18,000	20,000	DAIKIN	FXSA18AAVJU	ALL
FCU-1-04	---	955	0.20	390	208	1	60	2.50	15.0	36,000	40,000	DAIKIN	FXSA36AAVJU	ALL
FCU-1-05	155	515	0.20	163	208	1	60	1.60	15.0	18,000	20,000	DAIKIN	FXSA18AAVJU	ALL
FCU-1-06	195	620	0.20	163	208	1	60	1.80	15.0	24,000	27,000	DAIKIN	FXSA24AAVJU	ALL
FCU-1-07	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-08	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-09	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-10	240	620	0.20	163	208	1	60	1.80	15.0	24,000	27,000	DAIKIN	FXSA24AAVJU	ALL
FCU-1-11	---	690	0.20	163	208	1	60	1.90	15.0	30,000	34,000	DAIKIN	FXSA30AAVJU	ALL
FCU-1-12	165	315	0.20	59	208	1	60	0.80	15.0	9,500	10,500	DAIKIN	FXSA09AAVJU	ALL
FCU-1-13	150	315	0.20	59	208	1	60	0.80	15.0	7,200	8,500	DAIKIN	FXSA07AAVJU	ALL
FCU-1-14	---	690	0.20	163	208	1	60	1.90	15.0	30,000	34,000	DAIKIN	FXSA30AAVJU	ALL
FCU-1-15	155	315	0.20	59	208	1	60	0.80	15.0	9,500	10,500	DAIKIN	FXSA09AAVJU	ALL
FCU-1-16	110	315	0.20	59	208	1	60	0.80	15.0	9,500	10,500	DAIKIN	FXSA09AAVJU	ALL
FCU-1-17	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-18	50	265	0.20	59	208	1	60	0.80	15.0	5,800	6,500	DAIKIN	FXSA05AAVJU	ALL
FCU-1-19	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-20	95	440	0.20	111	208	1	60	1.50	15.0	15,000	17,000	DAIKIN	FXSA15AAVJU	ALL
FCU-1-21	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-22	---	1,115	0.20	390	208	1	60	2.80	15.0	48,000	54,000	DAIKIN	FXSA48AAVJU	ALL
FCU-1-23	120	265	0.20	59	208	1	60	0.80	15.0	9,500	10,500	DAIKIN	FXSA09AAVJU	ALL
FCU-1-24	20	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-26	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-27	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-28	210	955	0.20	390	208	1	60	2.50	15.0	36,000	40,000	DAIKIN	FXSA36AAVJU	ALL
FCU-1-29	85	265	0.20	59	208	1	60	0.80	15.0	7,200	8,500	DAIKIN	FXSA07AAVJU	ALL
FCU-1-30	135	515	0.20	163	208	1	60	1.60	15.0	18,000	20,000	DAIKIN	FXSA18AAVJU	ALL
FCU-1-31	365	1,115	0.20	390	208	1	60	2.80	15.0	48,000	54,000	DAIKIN	FXSA48AAVJU	ALL
FCU-1-32	---	410	0.00	53	208	1	60	0.30	15.0	9,500	10,500	DAIKIN	FXFA09AAVJU	ALL
FCU-1-33	---	410	0.00	53	208	1	60	0.30	15.0	9,500	10,500	DAIKIN	FXFA09AAVJU	ALL
FCU-1-34	---	410	0.00	53	208	1	60	0.30	15.0	9,500	10,500	DAIKIN	FXFA09AAVJU	ALL
FCU-1-35	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-36	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-38	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-39	80	265	0.20	59	208	1	60	0.80	15.0	5,800	6,500	DAIKIN	FXSA05AAVJU	ALL
FCU-1-40	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-1-41	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-01	100	690	0.20	163	208	1	60	1.90	15.0	30,000	34,000	DAIKIN	FXSA30AAVJU	ALL
FCU-2-02	135	515	0.20	163	208	1	60	1.60	15.0	18,000	20,000	DAIKIN	FXSA18AAVJU	ALL
FCU-2-03	180	620	0.20	163	208	1	60	1.80	15.0	24,000	27,000	DAIKIN	FXSA24AAVJU	ALL
FCU-2-04	155	620	0.20	163	208	1	60	1.80	15.0	24,000	27,000	DAIKIN	FXSA24AAVJU	ALL
FCU-2-05	110	515	0.20	163	208	1	60	1.60	15.0	18,000	20,000	DAIKIN	FXSA18AAVJU	ALL
FCU-2-06	115	285	0.20	59	208	1	60	0.90	15.0	12,000	13,500	DAIKIN	FXSA12AAVJU	ALL
FCU-2-07	70	265	0.20	59	208	1	60	0.80	15.0	5,800	6,500	DAIKIN	FXSA05AAVJU	ALL
FCU-2-08	95	690	0.20	163	208	1	60	1.90	15.0	30,000	34,000	DAIKIN	FXSA30AAVJU	ALL
FCU-2-09	135	620	0.20	163	208	1	60	1.80	15.0	24,000	27,000	DAIKIN	FXSA24AAVJU	ALL
FCU-2-10	90	265	0.20	59	208	1	60	0.80	15.0	7,200	8,500	DAIKIN	FXSA07AAVJU	ALL
FCU-2-11	160	440	0.20	111	208	1	60	1.50	15.0	15,000	17,000	DAIKIN	FXSA15AAVJU	ALL
FCU-2-12	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-13	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-14	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-15	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-16	100	265	0.20	59	208	1	60	0.80	15.0	7,200	8,500	DAIKIN	FXSA07AAVJU	ALL
FCU-2-17	155	265	0.20	59	208	1	60	0.80	15.0	7,200	8,500	DAIKIN	FXSA07AAVJU	ALL
FCU-2-18	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-19	---	410	0.00	53	208	1	60	0.30	15.0	9,500	10,500	DAIKIN	FXFA09AAVJU	ALL
FCU-2-20	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-21	195	955	0.20	390	208	1	60	2.50	15.0	36,000	40,000	DAIKIN	FXSA36AAVJU	ALL
FCU-2-22	95	285	0.20	59	208	1	60	0.90	15.0	12,000	13,500	DAIKIN	FXSA12AAVJU	ALL
FCU-2-23	65	265	0.20	59	208	1	60	0.80	15.0	7,200	8,500	DAIKIN	FXSA07AAVJU	ALL
FCU-2-24	75	440	0.20	111	208	1	60	1.50	15.0	15,000	17,000	DAIKIN	FXSA15AAVJU	ALL
FCU-2-25	155	285	0.20	59	208	1	60	0.90	15.0	12,000	13,500	DAIKIN	FXSA12AAVJU	ALL
FCU-2-26	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-27	---	410	0.00	53	208	1	60	0.30	15.0	9,500	10,500	DAIKIN	FXFA09AAVJU	ALL
FCU-2-28	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-29	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL
FCU-2-30	---	410	0.00	53	208	1	60	0.30	15.0	7,200	8,500	DAIKIN	FXFA07AAVJU	ALL

GENERAL NOTES:

1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES, DAMPERS, AND DUCT MOUNTED HOT WATER COILS WHERE APPLICABLE. DIRTY FILTER AND UNIT CASING MUST BE ADDED TO EXTERNAL STATIC PRESSURE TO OBTAIN TOTAL PRESSURE LOSS. INCREASE HORSEPOWER AS REQUIRED TO MEET YOUR TOTAL PRESSURE LOSS. COORDINATE WITH ELECTRICIAN.
2. MAINTAIN MINIMUM CLEARANCE FOR COIL PULL AS RECOMMENDED BY UNIT MANUFACTURER. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.

REMARKS:

1. UNIT TO BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. CONTROLLED BY PROGRAMMABLE WIRED THERMOSTAT.
3. REFRIGERANT LINES TO BE SIZED PER MANUFACTURER'S REQUIREMENTS.
4. PROVIDE UNIT WITH CONDENSATE PUMP SIZED TO PROVIDE ENOUGH LIFT TO GRAVITY DRAIN TO ASSOCIATED TERMINATION AS SHOWN ON DRAWINGS.
5. PROVIDE DUCTED UNITS WITH FILTER RACK AND RETURN DUCT SMOKE DETECTORS.

VRV HEAT RECOVERY UNIT

MARK	RATED COOLING CAPACITY (BTU/H)	RATED HEATING CAPACITY (BTU/H)	ELECTRICAL CONNECTION					MANUFACTURER	MODEL	REMARKS
			V	PH	F	MCA	MOCP			
HRU-1A	138,000	138,000	460	3	60	23.3	30.0	DAIKIN	REYA144AAYDA	ALL
HRU-1B	138,000	138,000	460	3	60	23.3	30.0	DAIKIN	REYA144AAYDA	ALL
HRU-1C	184,000	184,000	460	3	60	30.7	35.0	DAIKIN	REYA192AAYDA	ALL
HRU-2A	156,000	156,000	460	3	60	27.1	30.0	DAIKIN	REYA168AAYDA	ALL
HRU-2B	138,000	138,000	460	3	60	23.3	30.0	DAIKIN	REYA144AAYDA	ALL

GENERAL NOTES:

1. MINIMUM RECOMMENDED CLEARANCE AROUND UNIT IS 12 INCHES ON NON-SERVICE SIDES AND 30 INCHES ON SERVICE SIDES. MAINTAIN MINIMUM CLEARANCE FOR CONDENSER AIR FLOW AS RECOMMENDED BY UNIT MANUFACTURER.
2. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.
3. HRU-1A AND HRU-1B ARE TWINNED UNITS MODEL REYA288AAYDA.
4. HRU-2A AND HRU-2B ARE TWINNED UNITS MODEL REYA312AAYDA.

REMARKS:

1. PROVIDE UNIT WITH LOW AMBIENT CONTROL DOWN TO -4°F.
2. PROVIDE UNIT WITH DISCONNECT SWITCH.
3. REFRIGERANT LINES TO BE SIZED PER MANUFACTURER'S REQUIREMENTS.
4. PROVIDE UNIT WITH COIL GUARD.
5. PROVIDE UNIT WITH ITOUCH MANAGER CENTRALIZED CONTROLLER WITH BACNET CLIENT OPTION.

VRV BRANCH SELECTOR

MARK	ELECTRICAL CONNECTION					NUM. OF BRANCHES	DIMENSIONS (IN)			WEIGHT (LBS)	MODEL	REMARKS
	V	PH	F	MCA	MOCP		W	H	D			
BS-1-1	208	1	60	1.9	15	8	33.4	9.5	27.7	110.2	BSF8A54AAVJ	ALL
BS-1-2	208	1	60	1.9	15	8	33.4	9.5	27.7	110.2	BSF8A54AAVJ	ALL
BS-1-3	208	1	60	1.9	15	8	33.4	9.5	27.7	110.2	BSF8A54AAVJ	ALL
BS-1-4	208	1	60	1.9	15	8	33.4	9.5	27.7	110.2	BSF8A54AAVJ	ALL
BS-1-5	208	1	60	1.9	15	8	33.4	9.5	27.7	110.2	BSF8A54AAVJ	ALL
BS-2-1	208	1	60	1.9	15	8	33.4	9.5	27.7	110.2	BSF8A54AAVJ	ALL
BS-2-2	208	1	60	1.9	15	6	33.4	9.5	27.7	99.2	BSF8A54AAVJ	ALL
BS-2-3	208	1	60	1.9	15	8	33.4	9.5	27.7	110.2	BSF8A54AAVJ	ALL
BS-2-4	208	1	60	1.9	15	8	33.4	9.5	27.7	110.2	BSF8A54AAVJ	ALL

GENERAL NOTES:

1. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.

REMARKS:

1. REFRIGERANT LINES TO BE SIZED PER MANUFACTURER'S REQUIREMENTS.

FAN

MARK	CFM	EXT. STATIC PRESSURE (IN. W.C.)	HORSE POWER	FAN RPM	ELECTRICAL CONNECTION					INTERLOCKED WITH	FAN TYPE	BASIS OF DESIGN		REMARKS
					V	PH	F	MCA	MOCP			MANUFACTURER	MODEL	
REF-2	500	1.00	0.274	1,774	460	3	60	2.60	15	ERV-2	DIRECT	COOK	120R17D OR81	ALL

GENERAL NOTES:

1. EXTERNAL STATIC PRESSURE INCLUDES LOSSES DUE TO DUCTWORK, AIR DEVICES AND DAMPERS. UNIT CASING MUST BE ADDED TO EXTERNAL STATIC PRESSURE TO OBTAIN TOTAL PRESSURE LOSS. INCREASE HORSEPOWER AS REQUIRED TO MEET YOUR TOTAL PRESSURE LOSS. COORDINATE WITH ELECTRICIAN.
2. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.

REMARKS:

1. COORDINATE WITH THE ELECTRICAL DRAWINGS AND ELECTRICAL CONTRACTOR FOR WIRING EXHAUST FANS TO BE INTERLOCKED WITH ERV-2.
2. PROVIDE WITH DISCONNECT.
3. PROVIDE WITH AUTOMATIC BACKDRAFT DAMPER.
4. PROVIDE UNIT WITH VFD.

GRILLES, REGISTERS AND DIFFUSERS

MARK	DESCRIPTION	MOUNTING TYPE	FACE WIDTH	FACE LENGTH	NECK SIZE	MAX AIRFLOW (CFM)	MAX AIR P.D., IN. H2O	MAX N.C.	MANUFACTURER	MODEL	REMARKS
A	ALUMINUM SQUARE CONE DIFFUSER	LAY-IN DIFFUSER	24.0	24.0	6"ø	110	0.1	25	PRICE	ASCD	1, 2
B	ALUMINUM SQUARE CONE DIFFUSER	LAY-IN DIFFUSER	24.0	24.0	8"ø	230	0.1	25	PRICE	ASCD	1, 2
C	LINEAR 3-SLOT DIFFUSER W/ PLENUM	T-BAR LAY-IN	8.5	48.0	8"ø	280	0.1	25	PRICE	SDS50	1, 2
D	45° DOUBLE DEFLECTION BLADES W/ 3/4" SPACING	SURFACE MOUNTED	8.0	8.0	8/8	320	0.1	25	PRICE	620	1, 2
L	LOUVER	---	20.0	12.0	20/12	200	0.05	---	RUSKIN	ELF445DX	---
M	DRYER EXHAUST	SURFACE MOUNTED	6.5	6.5	4"ø	200	---	---	INOVATE	DWV4	---
V	ALUMINUM PERFORATED RETURN DIFFUSER	LAY-IN DIFFUSER	24.0	24.0	22/22	1700	0.05	20	PRICE	PDDR	3
W	ALUMINUM PERFORATED RETURN DIFFUSER	LAY-IN DIFFUSER	24.0	24.0	12/12	500	0.05	20	PRICE	PDDR	4
Y	ALUMINUM PERFORATED RETURN DIFFUSER	LAY-IN DIFFUSER	24.0	24.0	8/8	225	0.05	20	PRICE	PDDR	4
Z	ALUMINUM PERFORATED RETURN DIFFUSER	LAY-IN DIFFUSER	24.0	24.0	6/6	100	0.05	20	PRICE	PDDR	4

GENERAL NOTES:

1. COORDINATE EXACT GRILLE AND DIFFUSER LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS.
2. WHERE MULTIPLE WALL MOUNTED REGISTERS ARE INSTALLED IN A ROOM, THE REGISTERS SHALL BE ALIGNED ON THE CENTER POINT OF EACH REGISTER.
3. ALL CEILING DIFFUSERS SHALL BE 4-WAY THROW TYPE UNLESS NOTED OTHERWISE.

REMARKS:

1. DUCT MOUNTED BALANCING DAMPERS SHALL BE FURNISHED AND INSTALLED WHERE RUNOUT IS ABOVE AN ACCESSIBLE CEILING.
2. THE HARD DUCT TAP FITTING AND FLEXIBLE DUCT CONNECTION SHALL BE SIZED TO EQUAL THE DIAMETER FOR THE DIFFUSER CONNECTION.
3. PROVIDE LIGHT SHIELD AND RETURN AIR SILENCER.
4. PROVIDE OPPOSED BLADE DAMPER MODEL VCS3.

DUCTLESS MINI-SPLIT - INDOOR UNIT

MARK	SUPPLY AIR CFM	ELECTRICAL CONNECTION					COOLING		RATED HEATING CAPACITY (BTU/H)	MANUFACTURER	MODEL	REMARKS
		V	P	F	MCA	MOCP	RATED CAPACITY (BTU/H)	MIN. EER2 / SEER2				
DMS-1	395	208	1	60	12.3	15	12,000	13.2 / 25.2	13,600	DAIKIN	FTXM12WVJU9	ALL
DMS-2	583	208	1	60	18.8	20	18,000	12.5 / 22.7	21,600	DAIKIN	FTXM18WVJU9	ALL

REMARKS:

1. UNIT TO BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. CONTROLLED BY 7-DAY PROGRAMMABLE WIRED THERMOSTAT COORDINATE LOCATION WITH OWNER.
3. REFRIGERANT LINES TO BE SIZED PER MANUFACTURER'S REQUIREMENTS.
4. COOLING CAPACITY BASED ON AHRI CONDITIONS.
5. PROVIDE UNIT WITH CONDENSATE OVER FLOW SWITCH.
6. PROVIDE UNIT WITH INTEGRAL CONDENSATE PUMP.

A2L REFRIGERANT CALCULATIONS		EDVC = Veff * LFL * CF * Focc					
	Floor Area (ft^2)	Ceiling Height with Plenum (ft)	Veff	CF	LFL (lb/1000ft^3)	Focc	EDVC (lbs)	Mrel (lbs)
Level 1	22,015	13.5	297202.5	0.5	19.1	1	2838.3	193.1
Level 2	14,525	11.9	172847.5	0.5	19.1	1	1650.7	113.2

EDVC	=	effective dispersal volume charge	lb
Veff	=	effective dispersal volume	ft^3
LFL	=	lower flammability limit	lb/ft^3
CF	=	concentration factor	value of 0.5
Focc	=	occupancy adjustment factor	value of 1

A2L REFRIGERANT CALCULATIONS		EDVC = RCL * Veff * Focc					
	Floor Area (ft^2)	Ceiling Height with Plenum (ft)	Veff	RCL (lb/1000ft^3)	Focc	EDVC (lbs)	Mrel (lbs)
Level 1	22,015	13.5	297202.5	4.8	1	1426.6	193.1
Level 2	14,525	11.9	172847.5	4.8	1	829.7	113.2

EDVC	=	effective dispersal volume charge	lb
Veff	=	effective dispersal volume	ft^3
RCL	=	refrigerant concentration limit	lb/ft^3
Focc	=	occupancy adjustment factor	value of 1

HEAT PUMP

MARK	RATED COOLING CAPACITY (BTU/H)	RATED HEATING CAPACITY (BTU/H)	MINIMUM EER2 / SEER2	ELECTRICAL CONNECTION					RELATED UNIT MARK	MANUFACTURER	MODEL	REMARKS
				V	PH	F	MCA	MOCP				
HP-1	12,000	13,600	13.2 / 25.2	208	1	60	12.3	15.0	DMS-1	DAIKIN	RXM12WVJU9	ALL
HP-2	18,000	21,600	12.5 / 22.7	208	1	60	18.8	20.0	DMS-2	DAIKIN	RXM18WVJU9	ALL

GENERAL NOTES:

1. MINIMUM RECOMMENDED CLEARANCE AROUND ROOFTOP UNIT IS 12 INCHES ON NON-SERVICE SIDES AND 30 INCHES ON SERVICE SIDES. MAINTAIN MINIMUM CLEARANCE FOR CONDENSER AIR FLOW AS RECOMMENDED BY UNIT MANUFACTURER. MAINTAIN MINIMUM CLEARANCE AS REQUIRED TO OPEN ACCESS AND CONTROL DOORS ON UNIT FOR SERVICE, MAINTENANCE, AND INSPECTION. MAINTAIN MINIMUM ELECTRICAL CLEARANCE AS REQUIRED BY NEC.

REMARKS:

1. PROVIDE WITH LOW AMBIENT CONTROL DOWN TO 20°F.
2. REFRIGERANT LINES TO BE SIZED PER MANUFACTURER'S REQUIREMENTS.
3. PROVIDE WITH COIL GUARD.
4. DISABLE HEAT PUMP DURING INSTALLATION. UNIT SHALL OPERATE IN COOLING MODE ONLY.

ELECTRIC UNIT HEATER

MARK	CFM	KW	ELECTRICAL CONNECTION					MANUFACTURER	MODEL	REMARKS
			V	PH	F	MCA	MO

ROOM NUMBER	ROOM NAME	CODE REQUIRED OUTSIDE AIR (CFM)	ACTUAL OUTSIDE AIR (CFM)	CODE REQUIRED EXHAUST AIR (CFM)	ACTUAL EXHAUST AIR (CFM)
1-101	VESTIBULE	10	10	0	0
1-102/1-108	MAIN WAITING / CHECK-IN	135	135	0	0
1-103	STAIR	0	0	0	0
1-104	ELEVATOR	0	0	0	0
1-105	WC ALCOVE	5	5	0	0
1-106	TRNSLT ALCOVE	10	10	0	0
1-107	DIR. OF ADMIN OFFICE	20	25	0	0
1-109	MAIN RECEPTION	50	55	0	0
1-110	CHECK-OUT	25	25	0	0
1-111	PATIENT RESTROOM	0	0	50	50
1-112	MAIN WAITING RESTROOM	0	0	100	100
1-113	MAIN WAITING RESTROOM	0	0	100	100
1-114	CLINICAL PHARM	15	25	0	0
1-115/1-116	PHARMACY	485	500	0	0
1-117	PATIENT RESTROOM	0	0	50	50
1-118	BH CONSULT	15	25	0	0
1-119	SMALL CONFERENCE	85	95	0	0
1-121	CONSULT	15	25	0	0
1-122	PHARM OFFICE	15	25	0	0
1-123/1-222	SHIPPING/RECIEVING	25	25	0	0
1-124	CHIEF MEDICAL OFFICER OFFICE	35	35	0	0
1-125/131/142/168/179/216	CORRIDOR	190	190	50	50
1-126	DIR. OF NURSING OFFICE	20	25	0	0
1-127	NURSE MGR. OFFICE	20	25	0	0
1-128	CARE COORD. OFFICE	20	25	0	0
1-129	MEDGAS TANKS	0	0	0	0
1-130	STAIR	0	0	258	260
1-132	NURSE STATION	20	25	0	0
1-133	EXAM SMALL	25	25	0	0
1-134	EXAM SMALL	25	30	0	0
1-135	EXAM SMALL	35	35	0	0
1-136	PROVIDER	25	30	0	0
1-137	TRAINING ROOM / COMMUNITY ROOM	225	225	0	0
1-138	PROVIDER	25	25	0	0
1-139	EXAM SMALL	35	35	0	0
1-140	EXAM SMALL	25	30	0	0
1-141	EXAM SMALL	25	30	0	0
1-143	NURSE STATION	20	30	0	0
1-144	PEDS EXAM	25	25	0	0
1-145	LACTATION CONSULT	15	25	0	0
1-145	PROVIDER	15	25	0	0
1-147	EVS	0	0	0	0
1-148	FACILITIES MAINT.	20	25	147	150
1-149	MECH ROOM	0	0	100	100
1-150	FACILITIES STORAGE	25	25	0	0
1-151	FACILITIES OFFICE	20	25	0	0
1-152	SMALL STORAGE	25	25	0	0
1-153	PROVIDER	25	25	0	0
1-154	PEDS EXAM	25	25	0	0
1-155	PEDS EXAM	25	25	0	0
1-157	MAIN STORAGE	70	70	0	0
1-158	X-RAY	65	65	0	0
1-159	PROVIDER	25	25	0	0
1-160	CLEAN LINEN	25	25	0	0
1-161	LARGE EXAM	40	40	0	0
1-162	EXAM SMALL	25	25	0	0
1-163	NURSE STATION	20	25	0	0
1-164	EXAM SMALL	25	25	0	0
1-165	LARGE EXAM	40	40	0	0
1-166	CLEAN LINEN	25	25	0	0
1-167	PROVIDER	25	25	0	0
1-169	NURSE STATION	20	25	0	0
1-170	PROVIDER	25	35	0	0
1-171	LARGE EXAM	35	35	0	0
1-172	EXAM SMALL	25	25	0	0
1-173	STAFF WLLNSS/PT	40	40	0	0
1-174	STAFF LACT	15	25	0	0
1-175	CLINIC/BH STAFF BREAKROOM	205	205	0	0
1-176	PROVIDER	25	25	24	25
1-177	OMT EXAM	40	40	0	0
1-178	PROVIDER	25	25	0	0
1-180	LAB SUB WAIT	10	25	0	0
1-181	PHLEB LAB / BLOOD DRAW	60	60	0	0
1-182	LAB SUP.	20	25	0	0
1-183	SPECIMEN RESTROOM	0	0	0	0
1-184	SPECIMEN RESTROOM	0	0	50	50
1-185	CLINIC/BH STAFF LOCKERS	25	25	50	50
1-186	MENS RESTROOM	0	0	37	40
1-187	LADIES RESTROOM	0	0	210	210
1-188	OBAT GROUP THERAPY	150	150	210	210
1-189	OBAT STORAGE	15	15	0	0
1-190	OBAT CARE COORD.	15	25	0	0
1-191	OBAT CARE COORD.	15	25	0	0
1-192	OBAT STORAGE	15	15	0	0
1-193	OBAT GROUP THERAPY	180	180	0	0
1-194/1-202	CORRIDOR	50	50	0	0
1-195	SUD PROGRAM CLNCN OFFICE	15	25	0	0
1-196	SUD PROGRAM CLNCN OFFICE	15	25	0	0
1-197	OBAT EXAM	30	30	0	0
1-198	OBAT EXAM	25	25	0	0
1-199	SUD PROGRAM MGR. OFFICE	15	25	0	0
1-200	MAIN STORAGE	25	25	0	0
1-203	BH SPEC.	0	0	0	0
1-204	OBAT LAB	30	30	0	0
1-205	DIR. OF BH OFFICE	20	25	0	0
1-206	BH NURSE	30	30	0	0
1-207	OBAT RECEPT.	15	15	0	0
1-208	VACC ROOM	30	30	0	0
1-209	VESTIBULE	10	10	0	0
1-210	OBAT WAITING	50	50	0	0
1-211	RESTROOM	0	0	0	0
1-212	FOOD PANTRY	15	15	50	50
1-213	PEER OFFICE	15	25	0	0
1-214	PEER OFFICE	15	25	0	0
1-215	ELECTRICAL	0	0	0	0
1-216	CORRIDOR	20	20	0	0
1-217	MECH	0	0	0	0
1-218	CASE MGR.	15	25	0	0
1-219	PEER RECOV. SPVSR. OFFICE	20	25	0	0
1-220	PEER DROP IN CENTER	350	350	0	0
1-221	PHARM RESTROOM	0	0	0	0
TOTAL	**LEVEL 1**	**4055**	**4350**	**1486**	**1495**

ROOM NUMBER	ROOM NAME	CODE REQUIRED OUTSIDE AIR (CFM)	ACTUAL OUTSIDE AIR (CFM)	CODE REQUIRED EXHAUST AIR (CFM)	ACTUAL EXHAUST AIR (CFM)
2-201	ADMIN BOARD ROOM	195	195	0	0
2-203	OPEN OFFICE	80	80	0	0
2-204	CEO OFFICE	35	40	0	0
2-207	PRIVATE BILLING/CODING OFFICE	45	45	0	0
2-208	DATA ANALYSIS	15	15	0	0
2-209	CALL CENTER	15	15	0	0
2-210	FINANCE STORAGE	20	20	0	0
2-211	FINANCE OFFICE	15	15	0	0
2-212	FINANCE OFFICE	15	15	0	0
2-213	FINANCE OFFICE	15	15	0	0
2-214	FINANCE OFFICE	15	15	0	0
2-215	CORRIDOR	20	20	0	0
2-216	CHRO. OFFICE	35	35	0	0
2-218	SUPPORT STAFF OFFICE	20	20	0	0
2-219	COO OFFICE	20	30	0	0
2-220	CFO OFFICE	25	30	0	0
2-222	DENT. RES. PRG. DIR. OFFICE	20	25	0	0
2-223	IT STORAGE	35	35	0	0
2-224	CORRIDOR	15	15	0	0
2-225	LIBR/SMALL TRAINING	95	95	0	0
2-226	DENTAL SUPER	15	15	0	0
2-227	DENTAL STORAGE	20	20	0	0
2-228	IT OFFICE	20	20	0	0
2-229	ADMIN/DENTAL STAFF BREAKROOM	100	100	120	125
2-230/235/246/262/265	CORRIDOR	135	175	0	0
2-231	DENTR.	45	45	0	0
2-232	ADDITIONAL PROVIDER OFFICE	20	25	0	0
2-233	PROVIDER OFFICE	20	20	0	0
2-234	EVS	0	0	69	70
2-236	DENTAL MECH	0	0	0	500
2-237	STAIR	0	0	0	0
2-238	PROVIDER OFFICE	20	20	0	0
2-239	PROVIDER OFFICE	20	20	0	0
2-240	WORK POD	20	25	0	0
2-241	STAFF RESTROOM	0	0	50	50
2-242	LAUNDRY	25	30	80	80
2-243	FUTURE OPERATORY 12	45	45	0	0
2-244	FUTURE	45	45	0	0
2-245	FUTURE OPERATORY 11	45	45	0	0
2-247	OPERATORY 10	45	45	0	0
2-248	OPERATORY 9	45	45	0	0
2-249	OPERATORY 8	45	45	0	0
2-250	OPERATORY 7	45	45	0	0
2-251	ACCESSIBLE OPERATORY 6	65	65	0	0
2-252	OPERATORY 5	45	45	0	0
2-253	OPERATORY 4	45	45	0	0
2-254	OPERATORY 3	45	45	0	0
2-255	OPERATORY 2	45	45	0	0
2-256	OPERATORY 1	45	45	0	0
2-257	DENTAL WAITING	155	155	0	0
2-258	DENTAL SUB. RECEP.	25	30	0	0
2-259	ELECT./IT	15	15	0	0
2-260	PROVIDER OFFICE	20	20	0	0
2-261	PATIENT RESTROOM	0	0	50	50
2-263	STERILE	75	75	0	0
2-266	STERILE SUPPLY	40	45	0	0
2-267	FUTURE OPERATORY	50	50	0	0
2-268	OFFICE SUPPLY	10	10	0	0
2-269	PATIENT RESTROOM	0	0	0	0
2-270	RESIDENTS OFFICE	15	20	0	0
2-271	X-RAY	20	20	0	0
2-272	REFERRAL OFFICE	15	20	0	0
2-273	STAFF RESTROOM	0	0	50	50
2-274	STAFF RESTROOM	0	0	50	50
2-275	ELEVATOR LOBBY	75	75	0	0
2-276	BH CNSLT	35	35	0	0
2-277	ELEVATOR	0	0	0	0
2-278	STAIR	0	0	0	0
2-279	BH STAFF	15	15	0	0
2-280	BH CNSLT.	0	0	0	0
2-281	BH STAFF	15	15	0	0
2-282	BH STAFF	15	15	0	0
2-283	ADMIN ENTRANCE	10	15	0	0
2-284	BH STAFF	15	15	0	0
2-285	BH STAFF	15	15	0	0
2-286	BH STAFF	15	15	0	0
2-287	PRIV./HR	15	15	0	0
2-288	PRIV./HR	15	15	0	0
2-289	STAFF RESTROOM	0	0	50	50
2-291	PED DENTAL WTG	50	50	0	0
TOTAL	**LEVEL 2**	**2545**	**2650**	**519**	**1025**

Salas O'Brien
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Project No: 2450-70746-00

Roanoke
119 Norfolk Avenue, Suite 310
Roanoke, Virginia 24011

DATE: December 8, 2025

Revisions

No.	Date	Description

HUGHES ASSOCIATES ARCHITECTS & ENGINEERS
3800 ELECTRIC ROAD, SUITE 300 | ROANOKE, VIRGINIA 24018
540.342.4002 www.HughesAE.com

New Facility For

Community Health Center of the New River Valley

145 Akers Farm Road Town of Christiansburg, Virginia

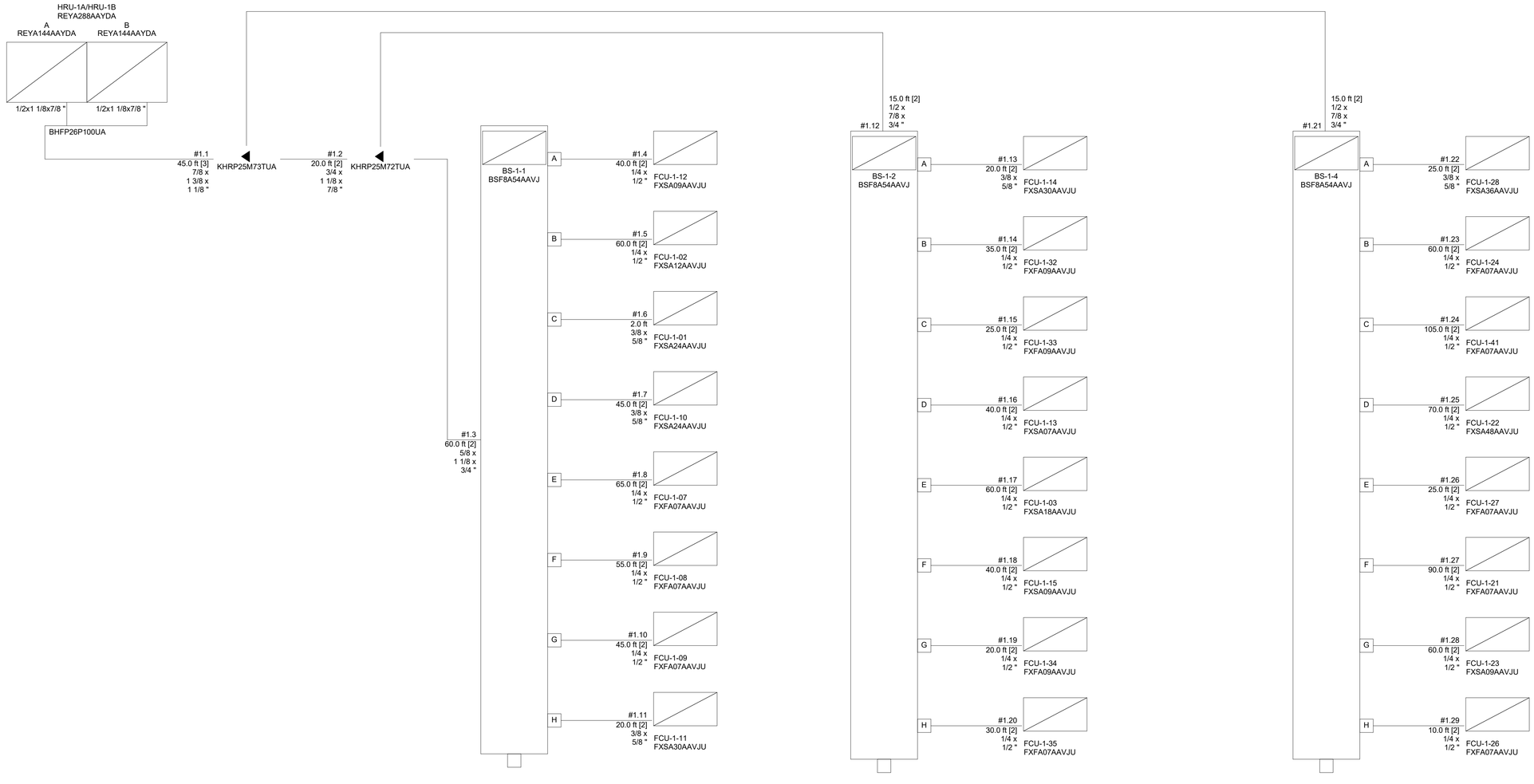
DRAWN BY: BMG
CHECKED BY: SSL

MECHANICAL VENTILATION CALCULATIONS

COMMONWEALTH OF VIRGINIA
12/08/2025
SAMUEL S. LOTT
Lic. No. 061900
PROFESSIONAL ENGINEER

COMMISSION No.
24069

SHEET
M6-2



1 **HRU-1A/HRU-1B PIPING DIAGRAM**
Scale: NONE

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Project No: 2450-70746-00

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145 Akers Farm Road Town of Christiansburg, Virginia

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MECHANICAL
PIPING
DIAGRAMS

COMMONWEALTH OF VIRGINIA
12/08/2025
SAMUEL S.
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PROFESSIONAL ENGINEER

COMMISSION No.
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SHEET
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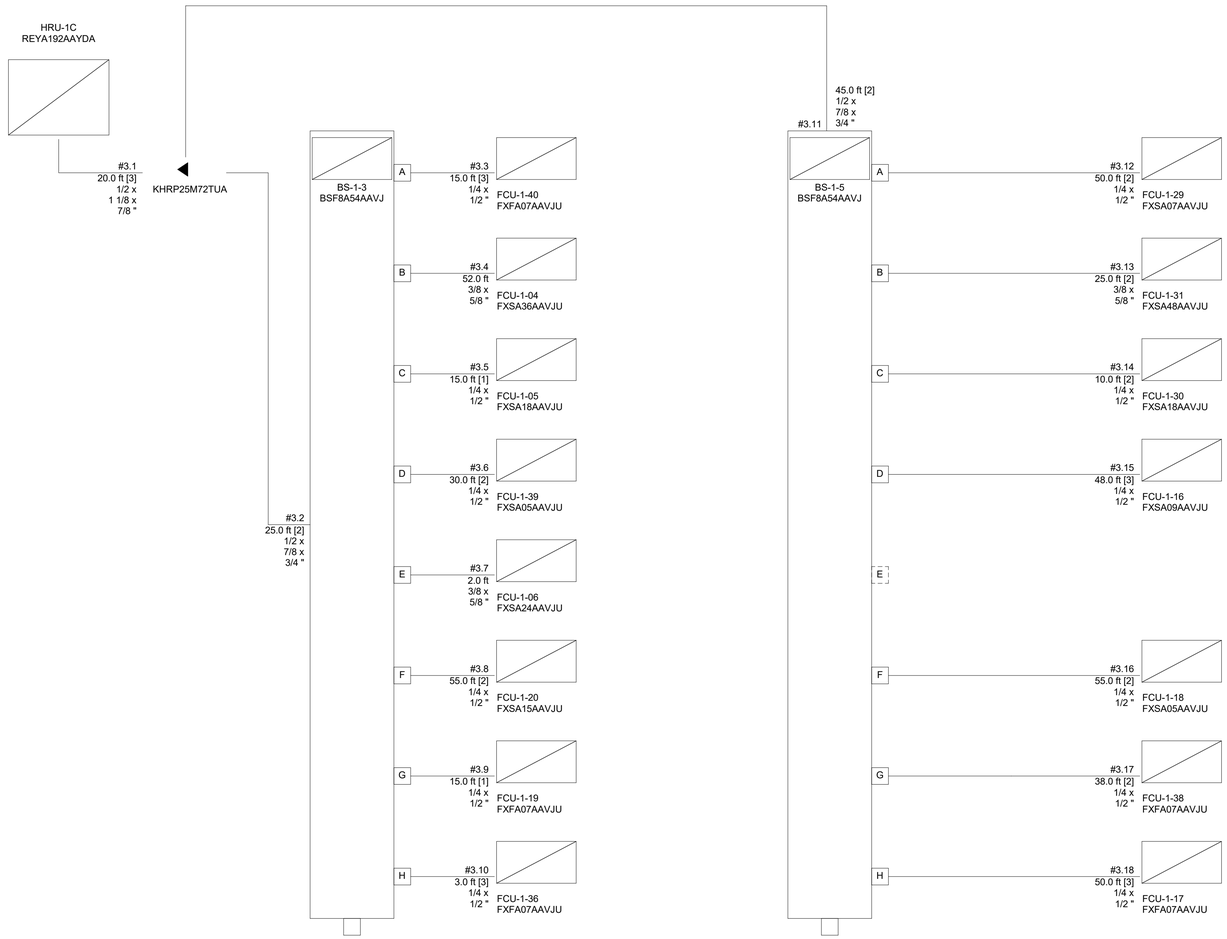

1 HRU-1C PIPING DIAGRAM

Scale: 12" = 1'-0"

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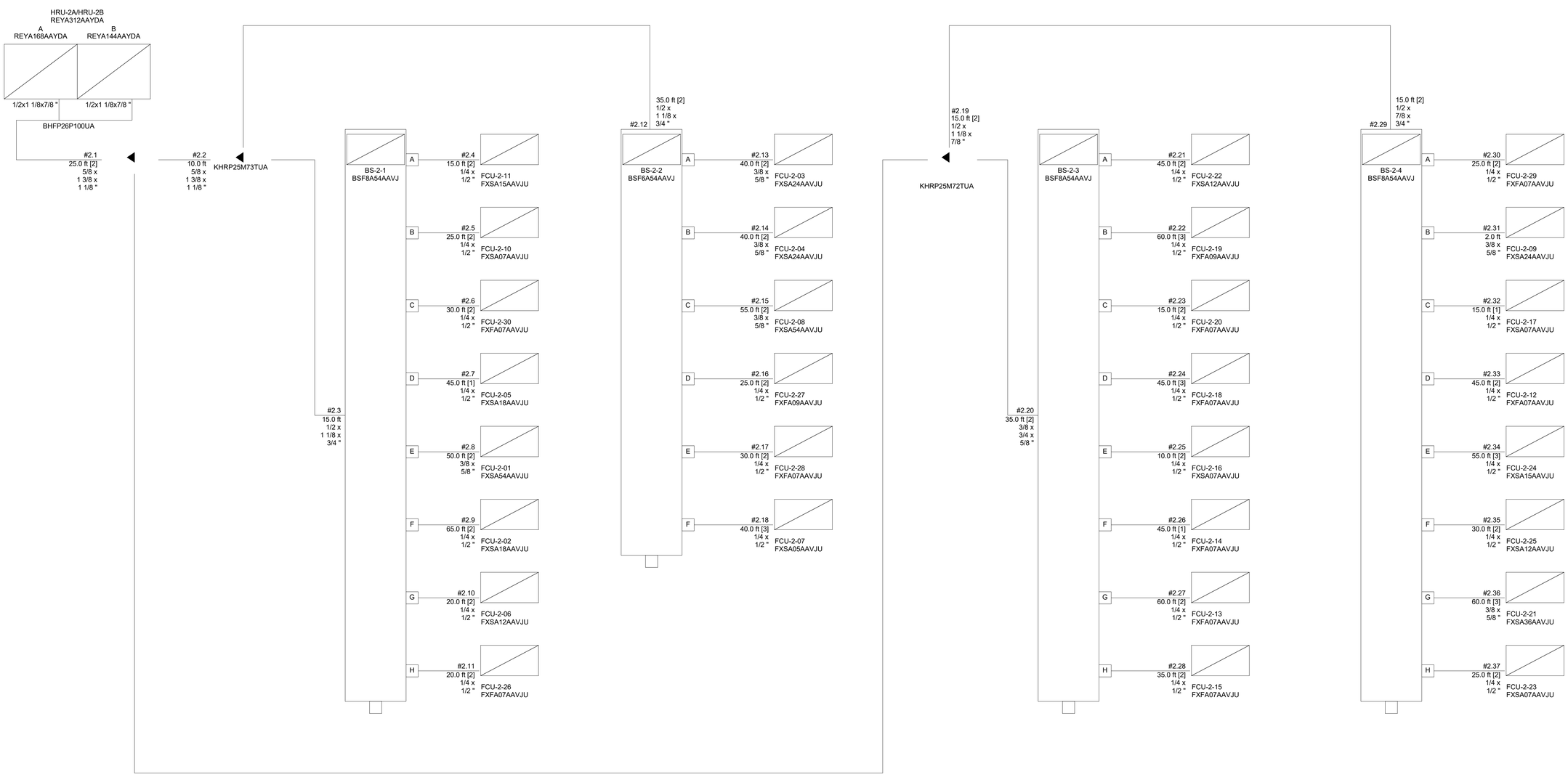

1 HRU-2A/HRU-2B PIPING DIAGRAM

Scale: NONE

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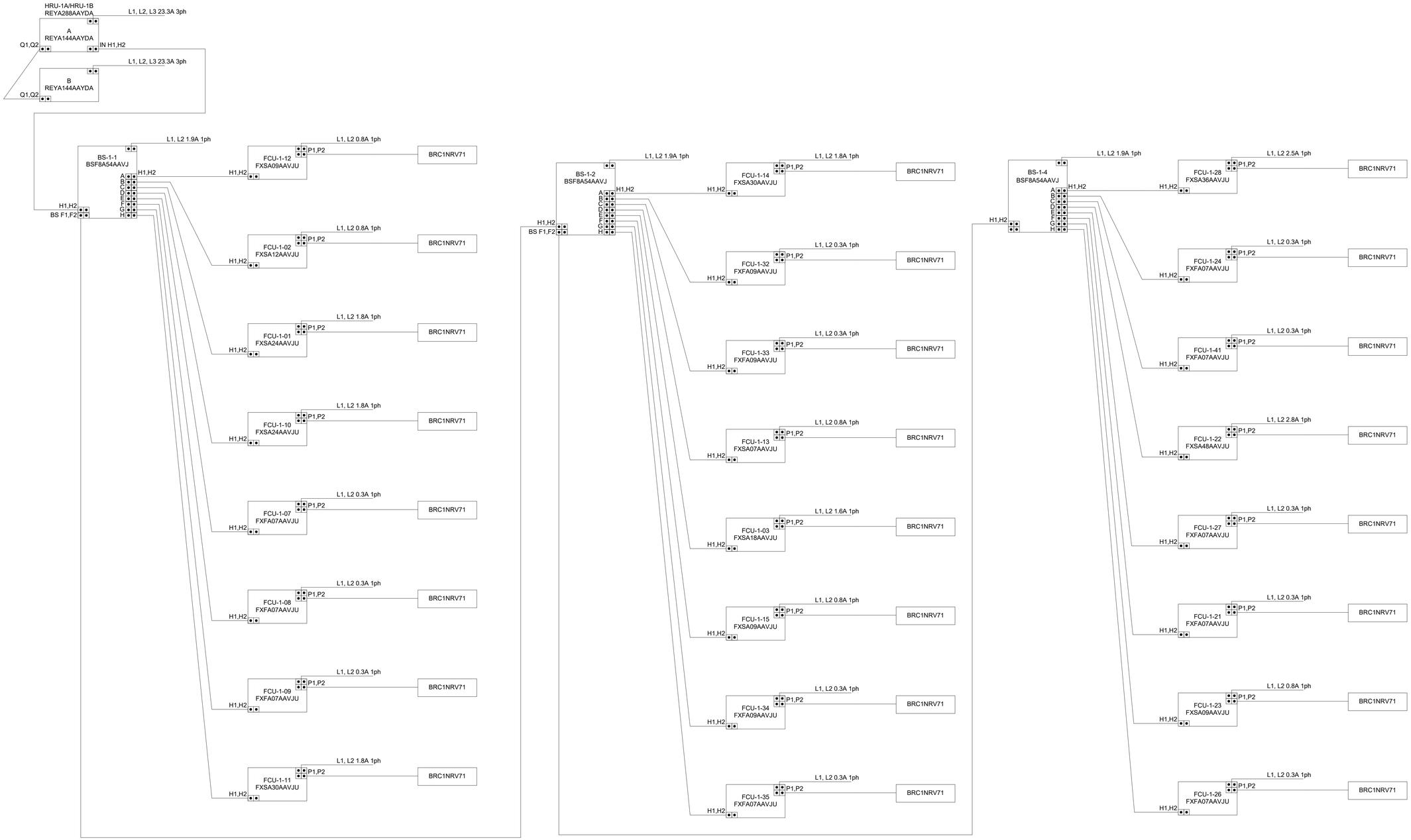
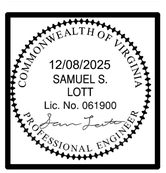
MECHANICAL WIRING DIAGRAMS



1 **HRU-1A/HRU-1B WIRING DIAGRAM**
Scale: 12" = 1'-0"



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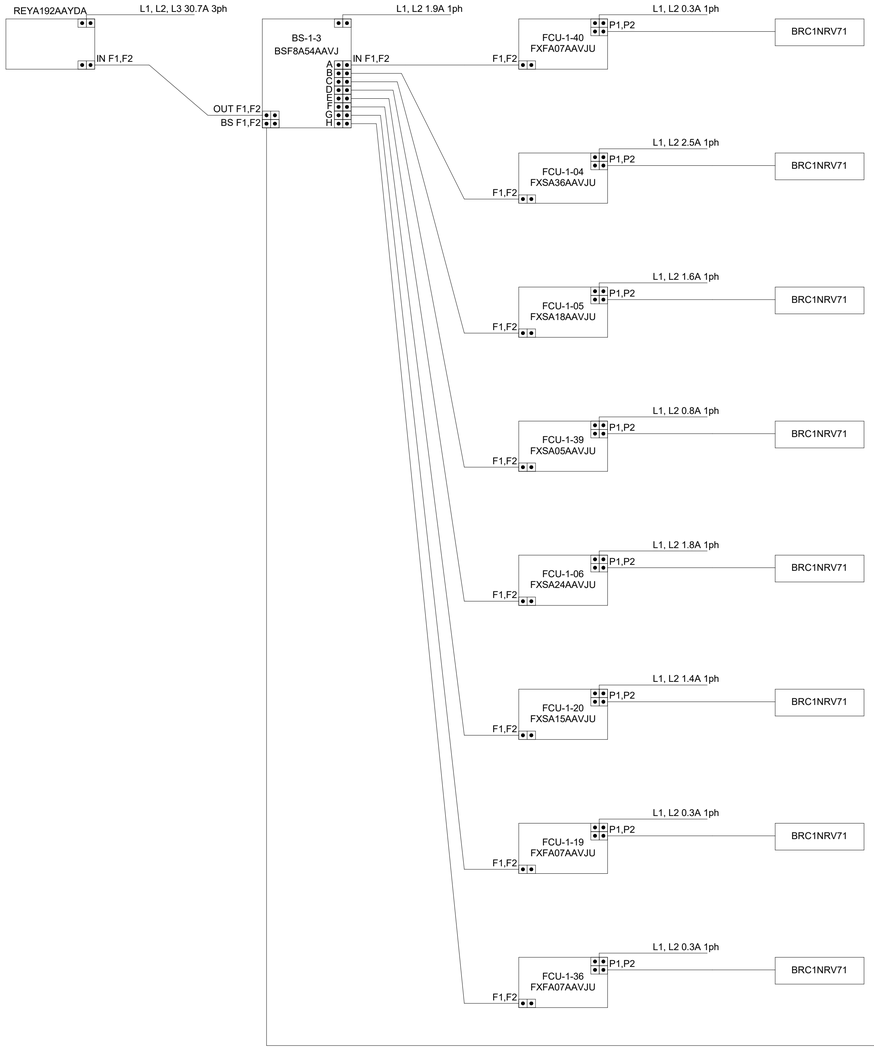

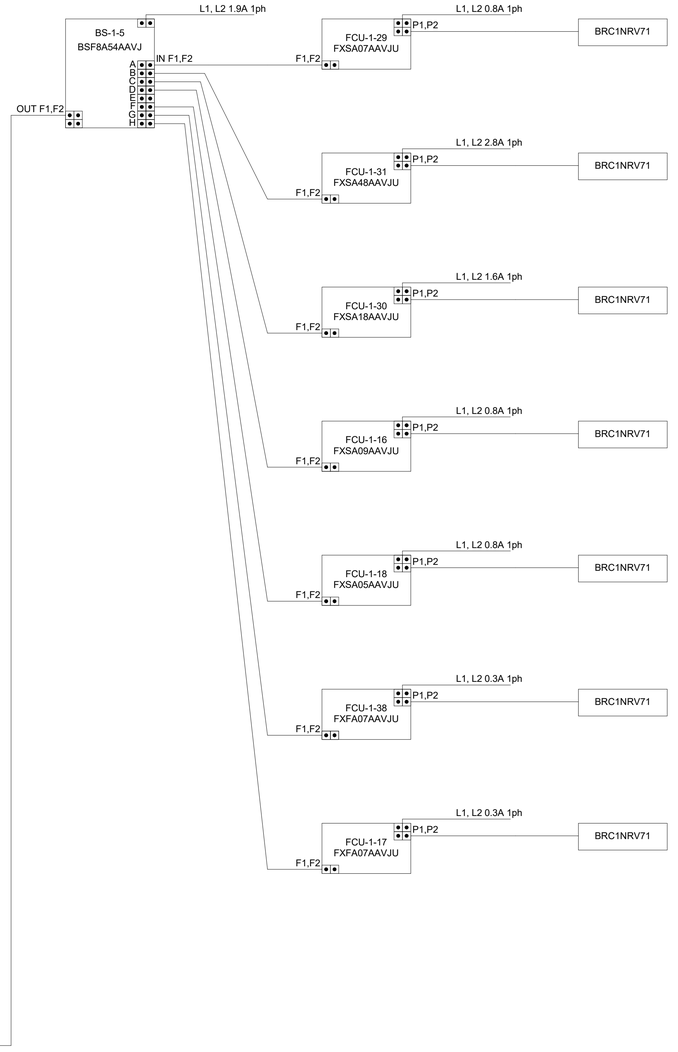

1 HRU-1C WIRING DIAGRAM

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MECHANICAL WIRING DIAGRAMS

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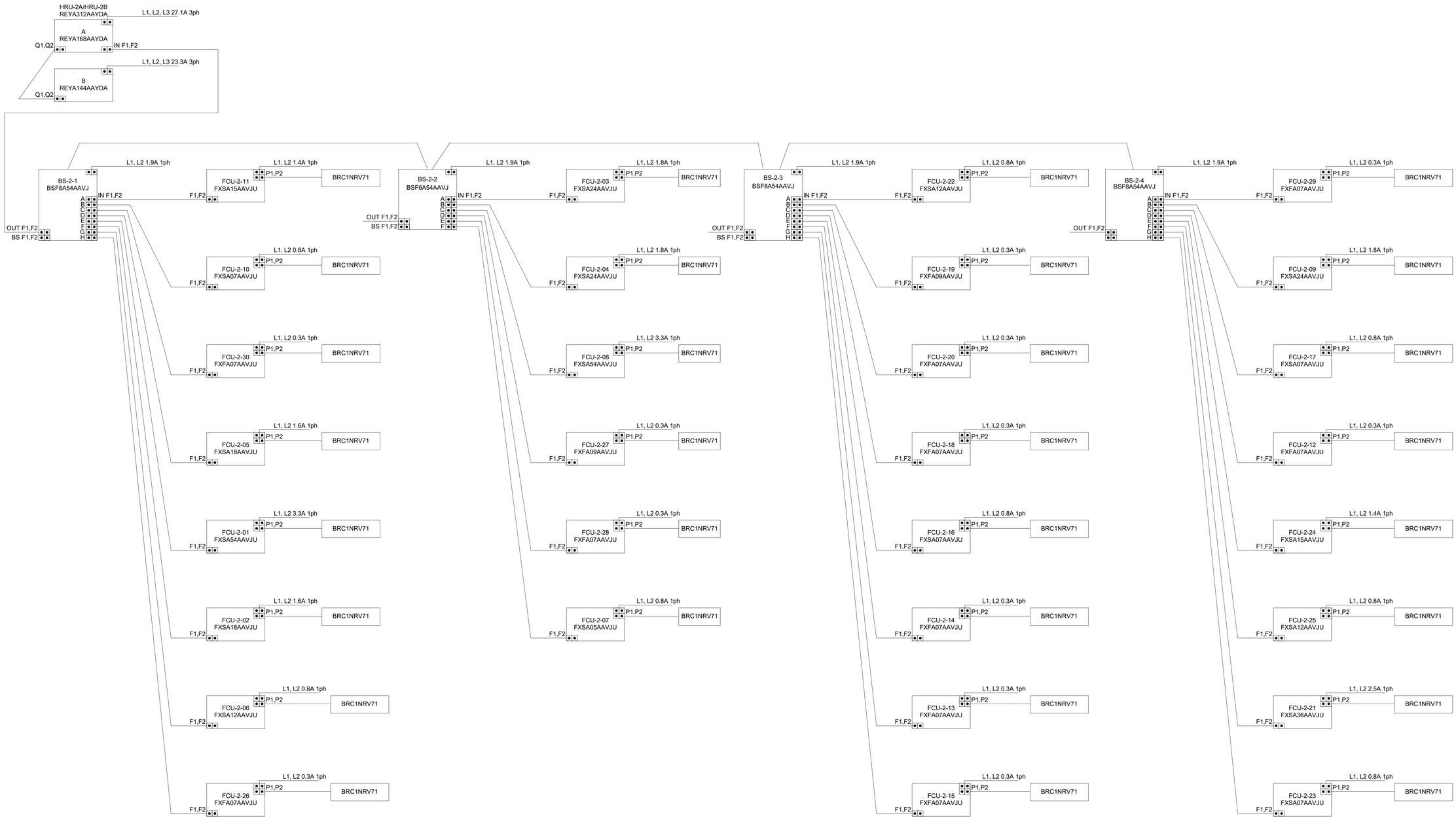

1 **HRU-2A/HRU-2B WIRING DIAGRAM**
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MECHANICAL WIRING DIAGRAMS

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