

4/2/2026 12:11:19 PM Autodesk Docs://E3-CY1-A-Core&Shell/43-25-05-00_CV1.1_MEP_2025.rvt

ABBREVIATIONS

Table of abbreviations including (D) DEMOLISHED, (E) EXISTING, (R) RELOCATED, etc.

ABBREVIATIONS

Table of abbreviations including CUH CABINET UNIT HEATER, CWR CHILLED WATER RETURN, CWS CHILLED WATER SUPPLY, etc.

ABBREVIATIONS

Table of abbreviations including D DIFFUSER, DB DECIBEL, DB DRY BULB, etc.

ABBREVIATIONS

Table of abbreviations including F FAHRENHEIT, F FURNACE, FV FIELD VERIFY, etc.

ABBREVIATIONS

Table of abbreviations including HTR HEATER, HTWR HIGH TEMPERATURE HOT WATER RETURN, etc.

Table of abbreviations including IAQ INDOOR AIR QUALITY, ID IN ACCORDANCE WITH, ID INSIDE DIAMETER, etc.

ABBREVIATIONS

Table of abbreviations including N.C. NORMALLY CLOSED, N.O. NORMALLY OPEN, NEC NATIONAL ELECTRIC CODE, etc.

Table of abbreviations including O&M OPERATION AND MAINTENANCE, OA OUTSIDE AIR, OD OUTSIDE DIAMETER, etc.

ABBREVIATIONS

Table of abbreviations including RAD RADIATOR, RAD RADIATED, RCD RECESSED CEILING PLAN, etc.

ABBREVIATIONS

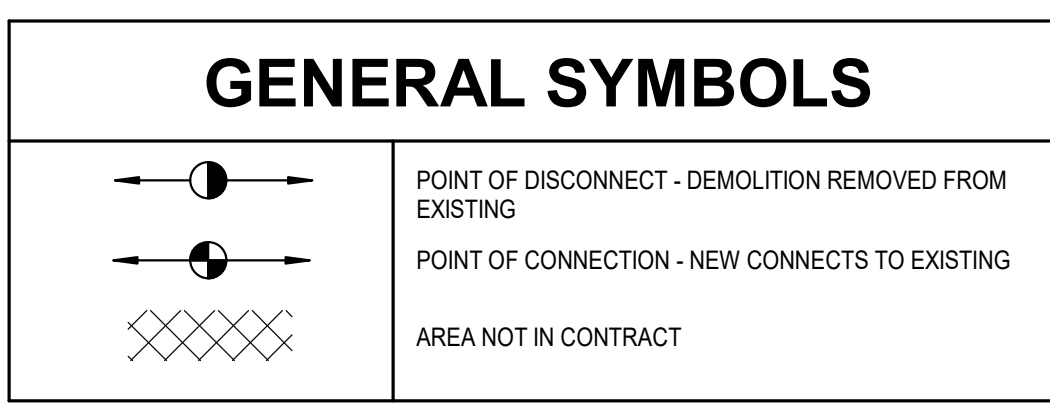
Table of abbreviations including V VOLT, VA VOLT-AMPERE, VA VALVE, etc.

ABBREVIATIONS

Table of abbreviations including W WIDE, W WATT, WB WET BULB, etc.

ABBREVIATIONS

Table of abbreviations including MA MIXED AIR, MAINT MAINTENANCE, MAN MANUAL, etc.



GENERAL NOTES

- 1. WHERE FLOOR DRAINS OCCUR WITHIN THE LIMITS OF CONSTRUCTION... 2. COORDINATE INSTALLATION OF PIPING, DUCTWORK, CONDUIT, LIGHTS, CABLE TRAY, etc.

GENERAL HVAC NOTES

- 1. REFRIGERANT PIPING CONNECTIONS SHALL BE SIZED AS INDICATED BY THE MANUFACTURER... 2. CONTRACTOR SHALL LOCATE THERMOSTATS AND TEMPERATURE SENSORS AT 48" AFF, etc.

SHEET INDEX

Table listing sheet numbers and titles: M0.01 GENERAL NOTES & SYMBOLS & ABBREVIATIONS FOR MECHANICAL, M1.01.0 MECHANICAL OVERALL PLAN (4.0), etc.

HVAC SYMBOLS

Table of HVAC symbols including Schematic, 3D, and Description columns for items like EA GENERAL EXHAUST AIR, GEA GREASE EXHAUST AIR, etc.

PIPING ANNOTATIONS

Table of piping annotations including Schematic, 3D, and Description columns for items like EXISTING TO REMAIN - (E) or EXIST, ITEM TO BE DEMOLISHED - (D) or DEMO, etc.

MECHANICAL PIPING SYSTEMS

Table of mechanical piping systems including Schematic, 3D, and Description columns for items like RD REFRIGERANT DISCHARGE, RHG REFRIGERANT HOT GAS, etc.

PIPING VALVES AND FITTINGS

Table of piping valves and fittings including Schematic, 3D, and Description columns for items like PIPE DROP, PIPE RISE, PIPE TEE DOWN, etc.

NOTE: ALL NOTES ON THIS SHEET ARE APPLICABLE TO ALL OTHER SHEETS IN THIS SET. THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE APPLICABLE IN THIS SET OF DRAWINGS.

HDR, ENGINEERING INC. 1917 SOUTH 67th STREET OMAHA, NEBRASKA 68106 (402) 399-1000 CA-0443

DLR GROUP 6457 FRANCES ST., STE. 200 OMAHA, NE 68106 (402) 742-4200

Kimley-Horn & Assoc. Inc. 1437 S BOULDER AVE. TULSA, OK 74119 (918) 380-8868

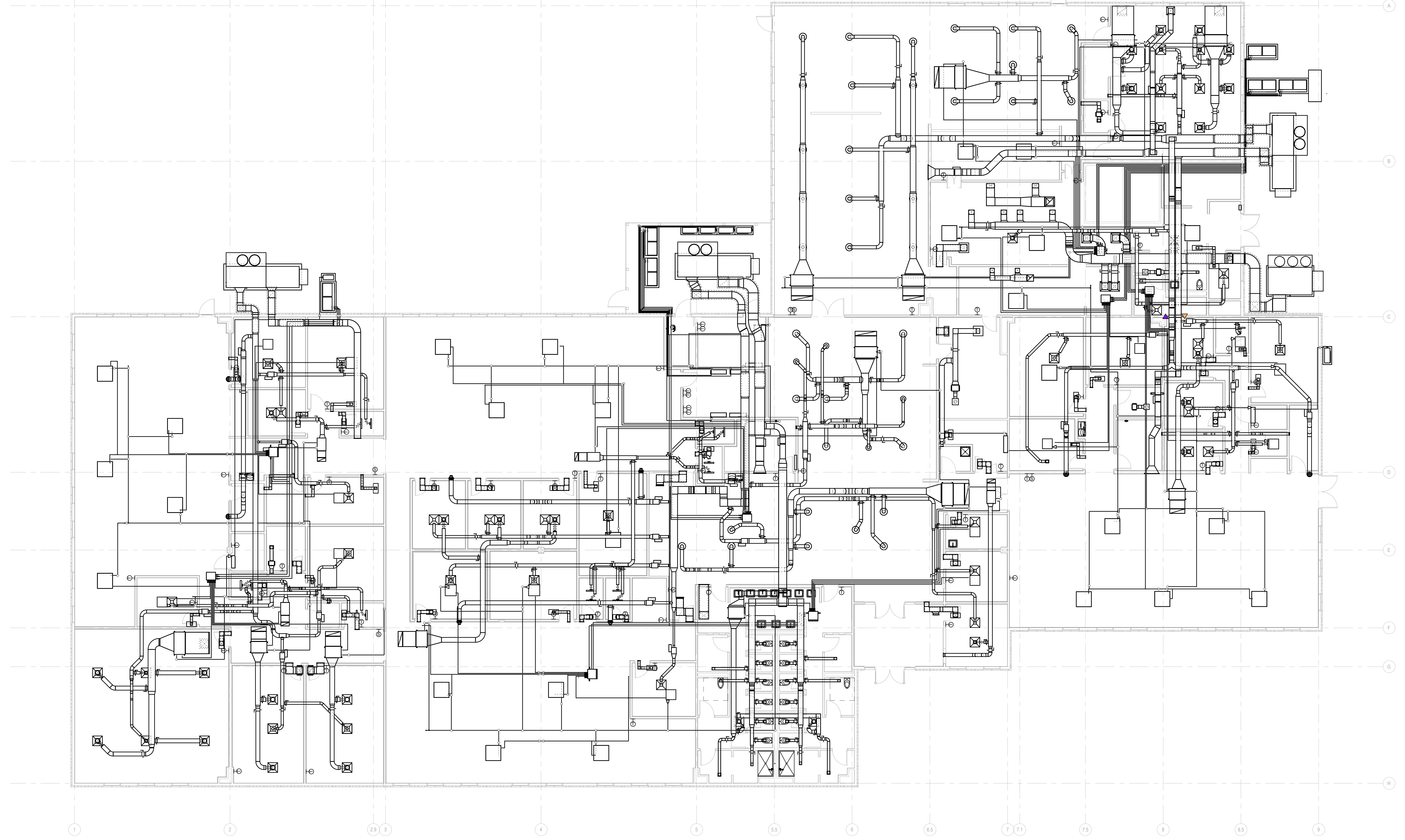
KEY PLAN (AREAS) showing areas C, A, B. REVISIONS table with columns NO., DATE, DESCRIPTION.

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GENERAL NOTES & ABBREVIATIONS FOR MECHANICAL SCALE: 1/8" = 1'-0"

SHEET NUMBER: M0.01 PHASE: ISSUE FOR CONSTRUCTION - HUB

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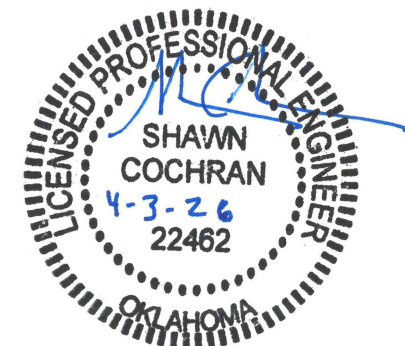
MECHANICAL OVERALL PLAN
SCALE: 1/8" = 1'-0"

- GENERAL NOTES**
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 - B CONTRACTOR SHALL NOT DRILL, NOTCH, OR PENETRATE ANY STRUCTURAL ELEMENT WITHOUT PRIOR WRITTEN CONSENT OF STRUCTURAL ENGINEER. COORDINATE REQUIRED NOTCHES, HOLES, AND PENETRATIONS WITH THE STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION.

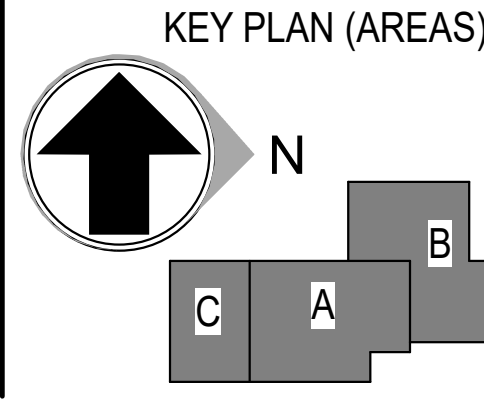


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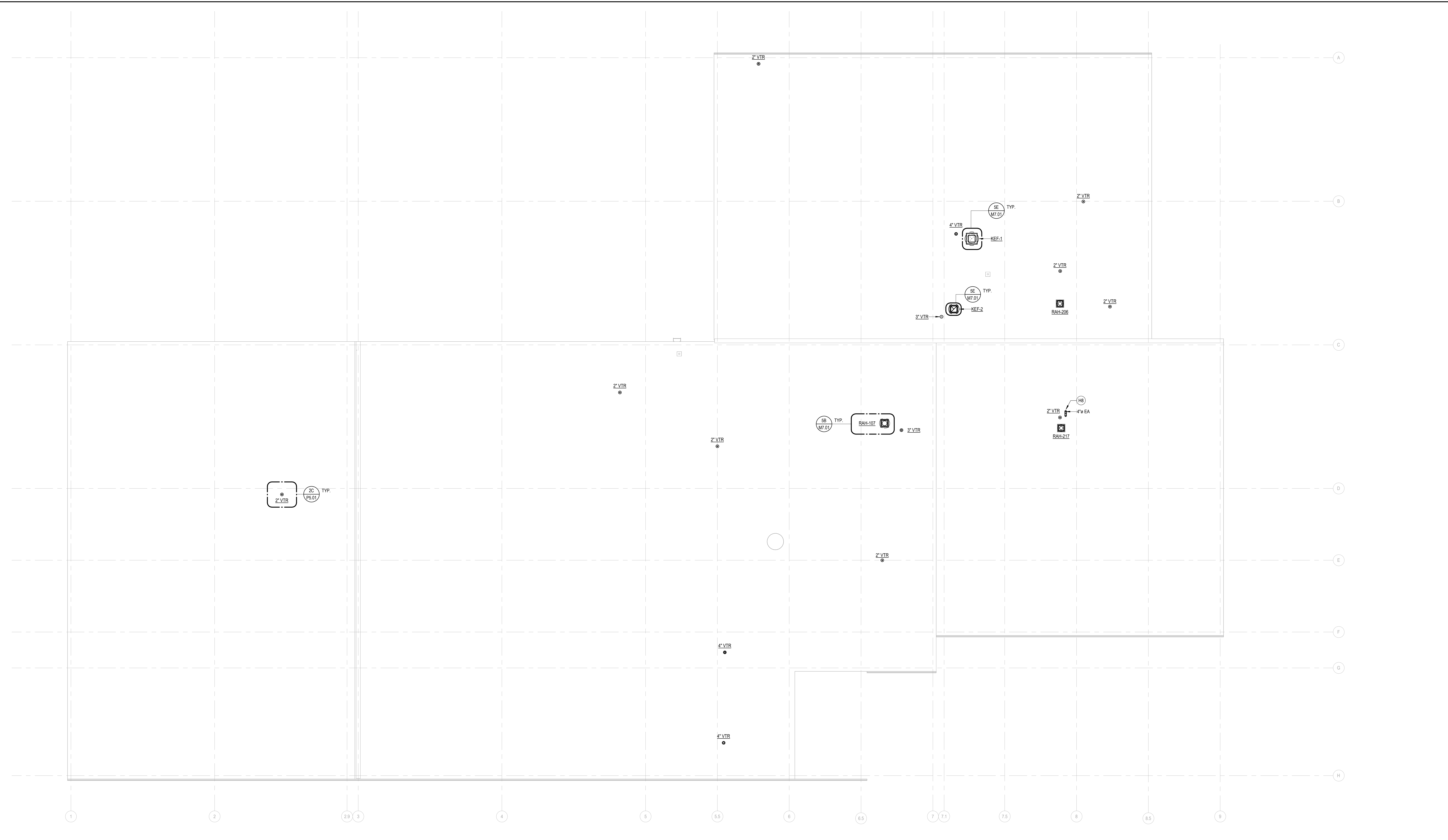
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MECHANICAL OVERALL PLAN (4.0)
SCALE: 1/8" = 1'-0"

SHEET NUMBER:
M1.01.0
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MECHANICAL ROOF PLAN

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

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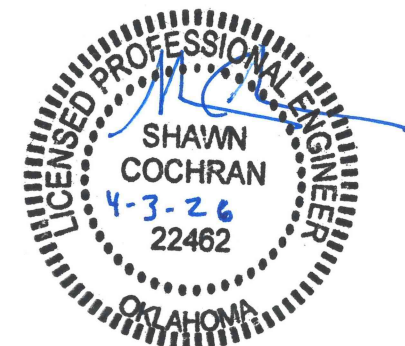
SHEET NOTES

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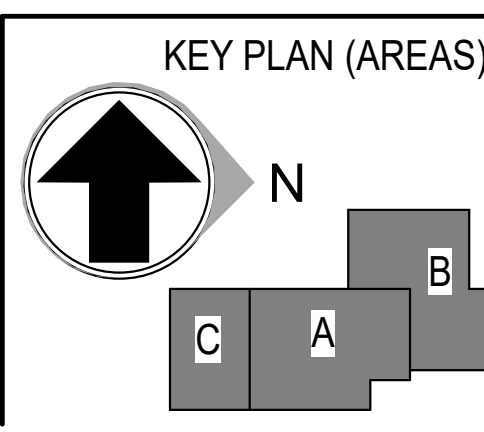


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MECHANICAL OVERALL ROOF PLAN (4.0)
 SCALE: 1/8" = 1'-0"

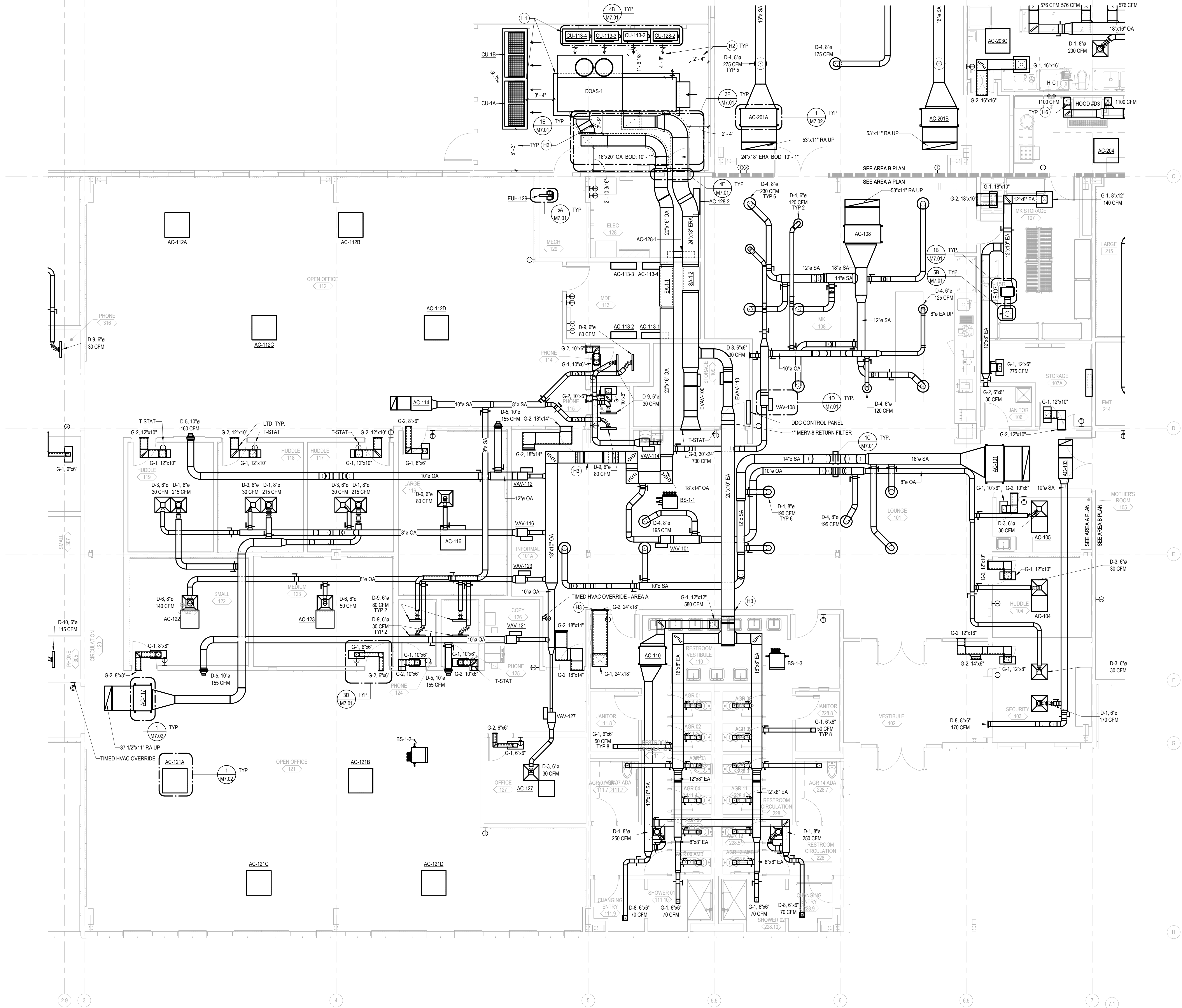
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SHEET NOTES

- H1 4" HOUSEKEEPING PAD BELOW ALL UNITS. TYP. SEE STRUCTURAL FOR CONSTRUCTION. CONTRACTOR TO VERIFY SIZE AND LOCATION WITH UNIT SUPPLIER AND DIMENSIONED CLEARANCES PER PLANS. PROVIDE VIBRATION ISOLATION AT CONNECTIONS TO THE UNIT PER SPECIFICATION 230468.13
- H2 MAINTAIN ALL DIMENSIONED AND MANUFACTURER CLEARANCES BETWEEN EQUIPMENT AND SURROUNDING BARRIERS. VERIFY CLEARANCES WITH UNIT SUPPLIER. TYP.
- H3 INSTALL TIGHT TO STRUCTURE. SEE ARCHITECTURAL INTERIOR ELEVATIONS FOR COORDINATION.
- H6 CONNECT TO HOOD. SEE HOOD DETAILS FROM FOOD SERVICE DRAWINGS. EXHAUST DUCT ONLY, TO BE STAINLESS STEEL, CONFORM TO METAL DUCT SPEC 233113.150. VENTILATION SUPPLY DUCT CONNECTED TO HOODS SHALL NOT BE REQUIRED TO BE STAINLESS STEEL. CONFORM TO METAL DUCT SPEC 233113.10-B.



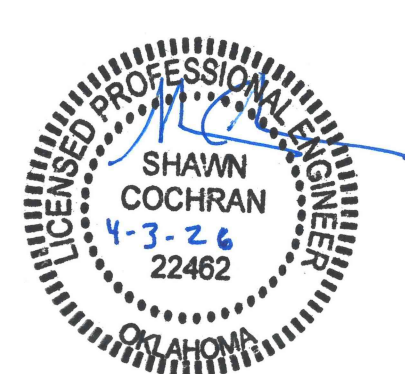
HVAC PLAN - AREA A
SCALE: 3/16" = 1'-0"

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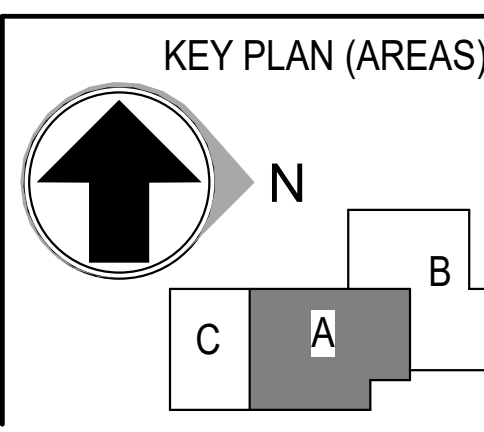


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HVAC PLAN - AREA A
SCALE: 3/16" = 1'-0"

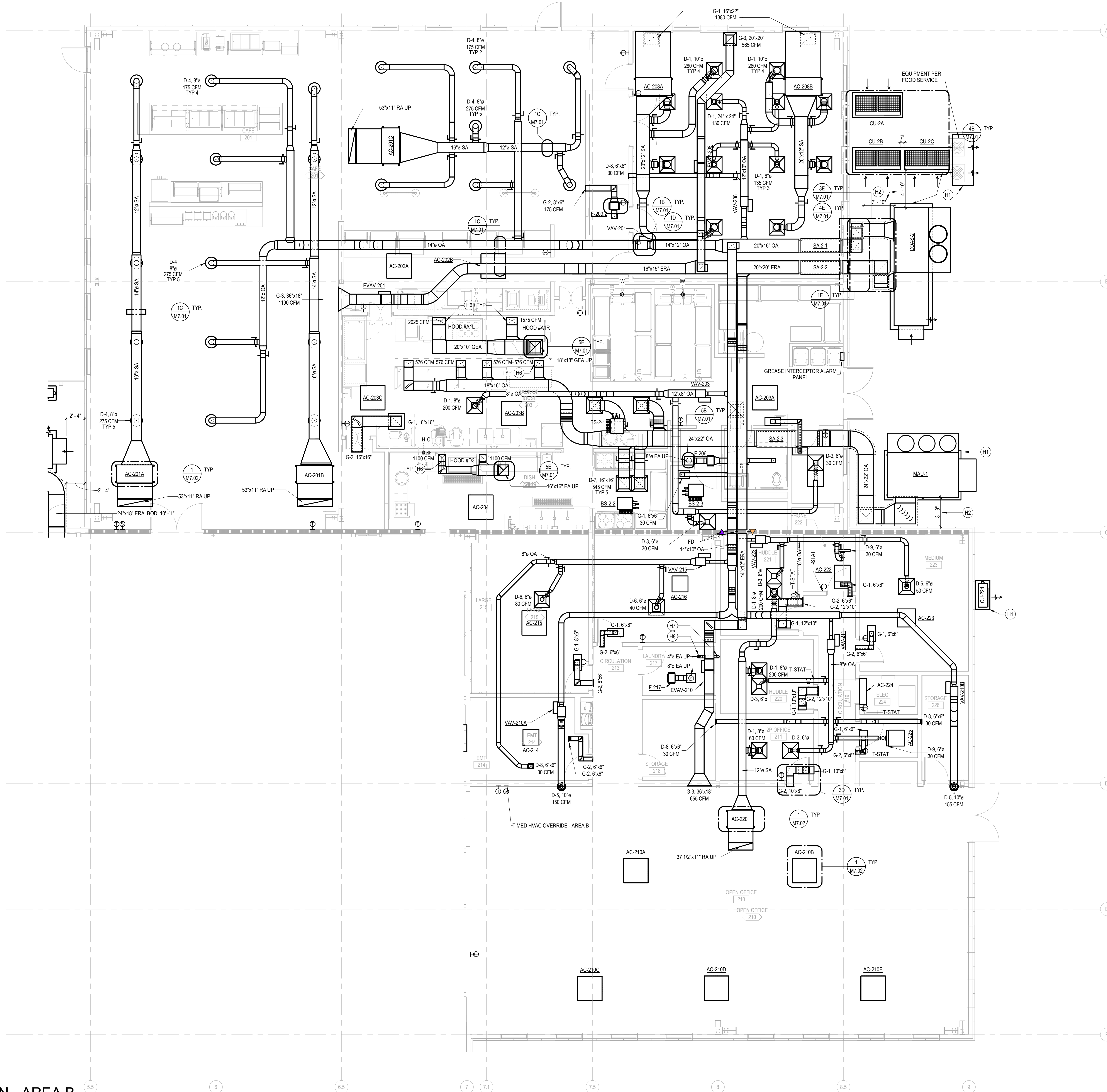
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- H3 CONNECT TO HOOD. SEE HOOD DETAILS FROM FOOD SERVICE DRAWINGS. EXHAUST DUCT ONLY. TO BE STAINLESS STEEL, CONFORM TO METAL DUCT SPEC 233113.3.10-B. VENTILATION SUPPLY DUCT CONNECTED TO HOODS SHALL NOT BE REQUIRED TO BE STAINLESS STEEL, CONFORM TO METAL DUCT SPEC 233113.3.10-B.
- H4 CONNECT DRYER VENT TO RECESSED DRYER CONNECTION BOX WITH VERTICAL EXHAUST CONNECTION. CAP AT DRYER BOX FOR FUTURE CONNECTION.
- H5 4" DRYER VENT TO BE ROLLED ROUND ALUMINUM. TERMINATE WITH GOOSE-NECK AND BIRD SCREEN AT DUCT OPENING.



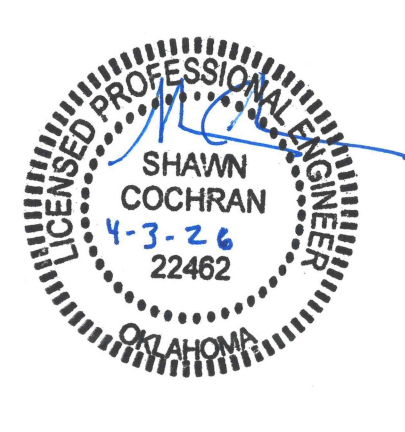
HVAC PLAN - AREA B
SCALE: 3/16" = 1'-0"

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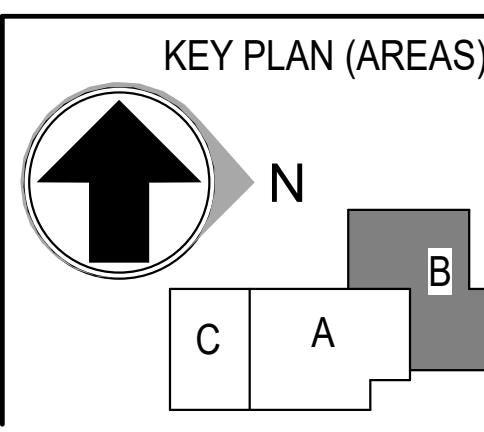


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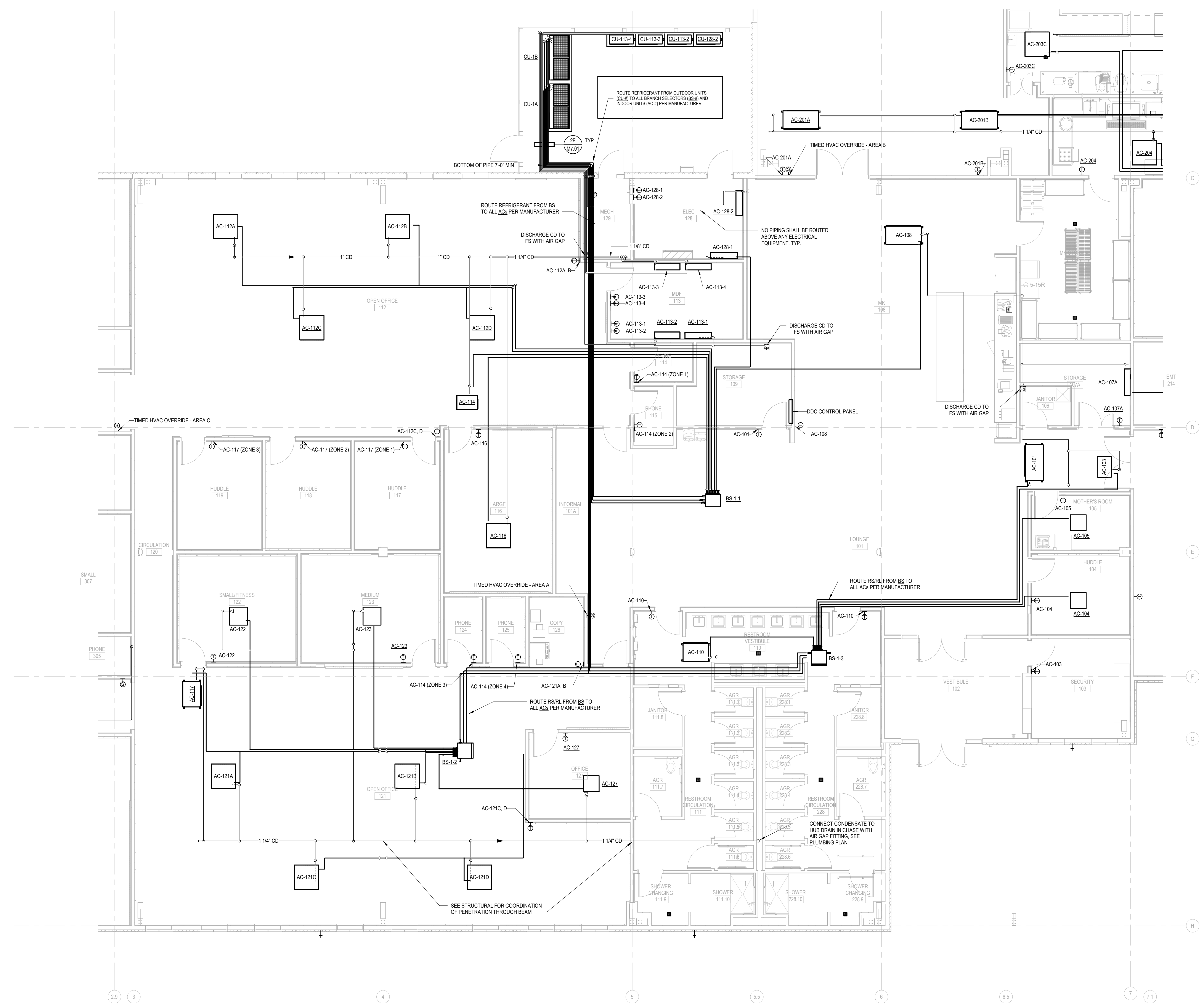
HVAC PLAN - AREA B (4.0)
SCALE: 3/16" = 1'-0"

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M1.21.0
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SHEET NOTES



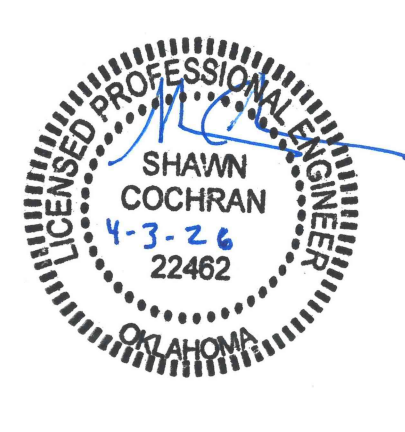
PIPING PLAN - AREA A
SCALE: 3/16" = 1'-0"

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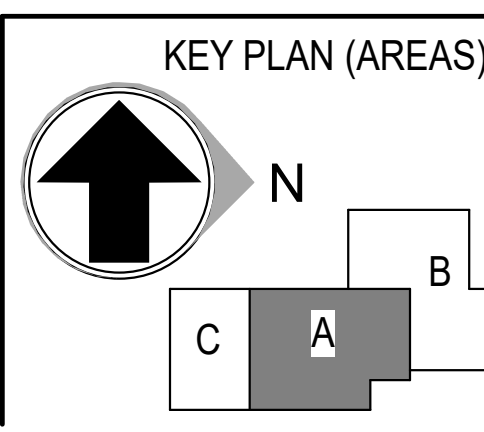


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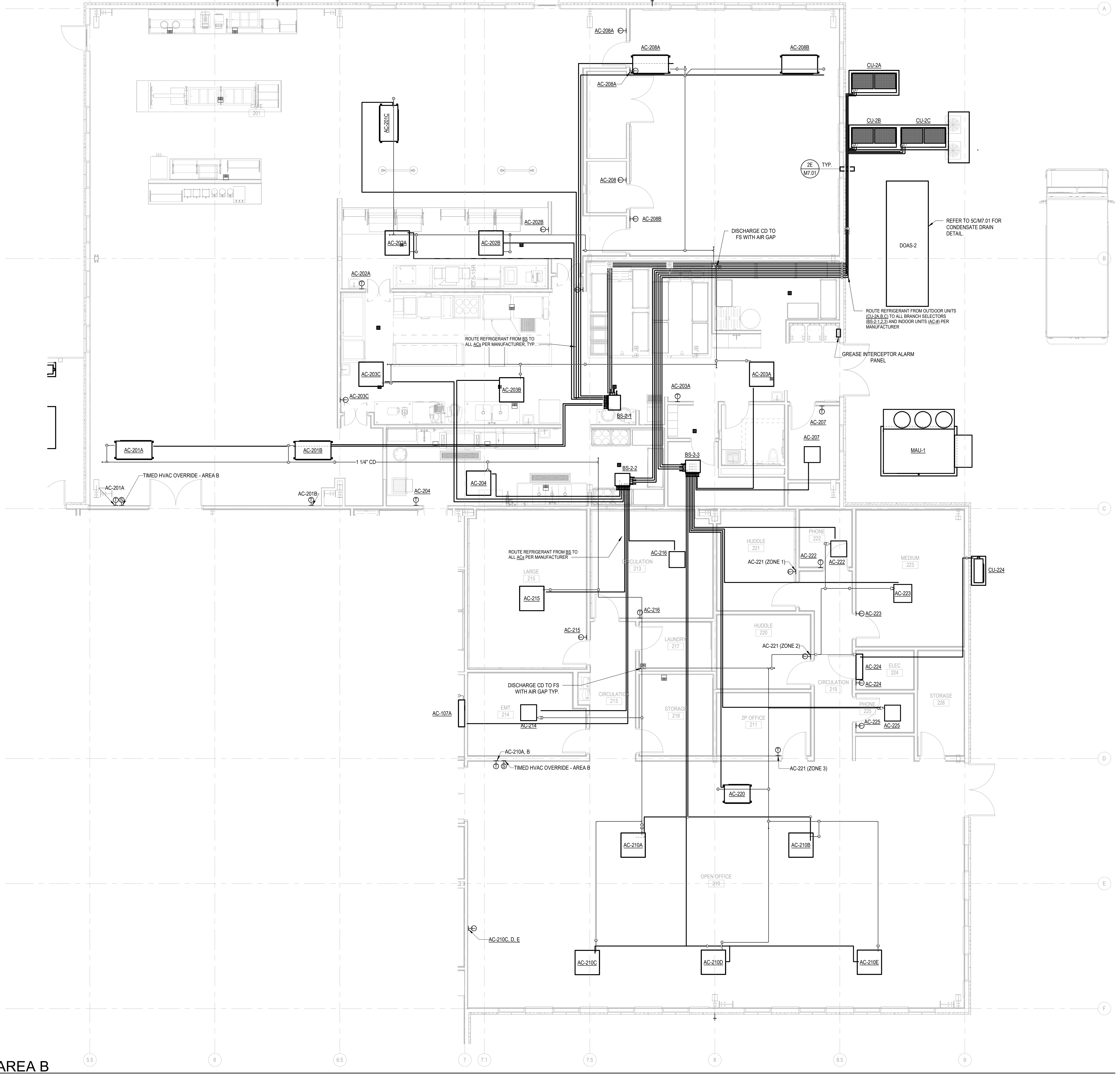
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PIPING PLAN - AREA A
SCALE: 3/16" = 1'-0"

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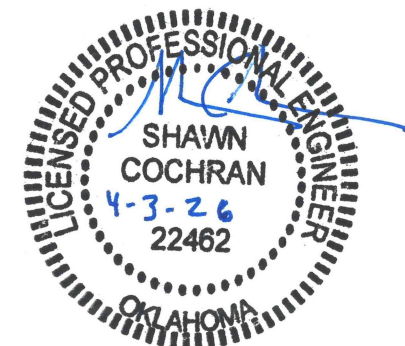
SHEET NOTES

PIPING PLAN - AREA B
SCALE: 3/16" = 1'-0"

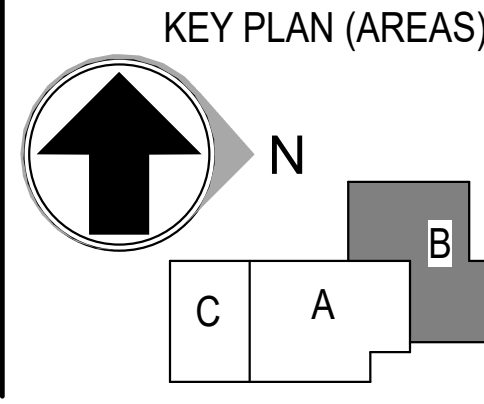
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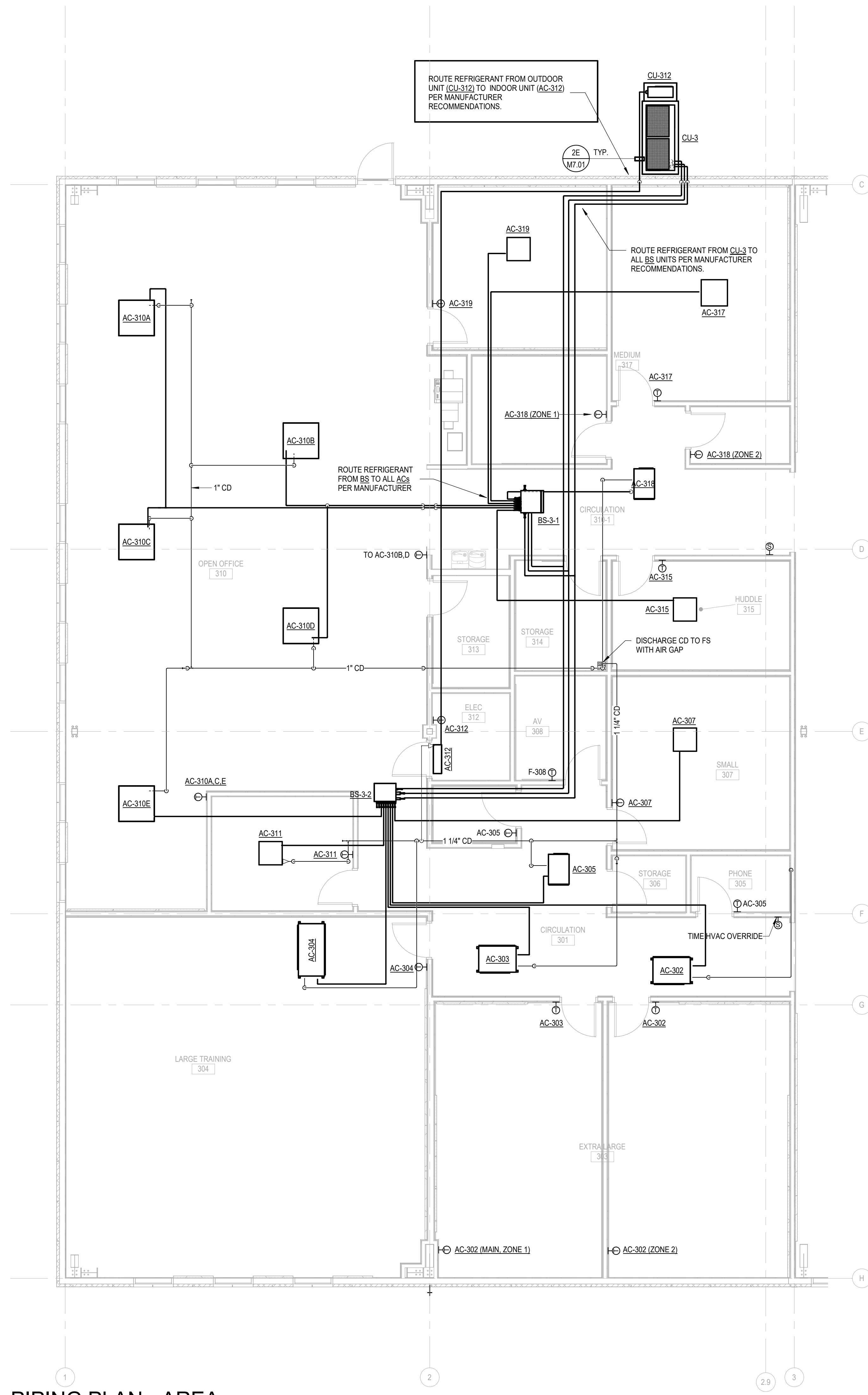
PIPING PLAN - AREA B (4.0)
SCALE: 3/16" = 1'-0"

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SHEET NOTES



PIPING PLAN - AREA
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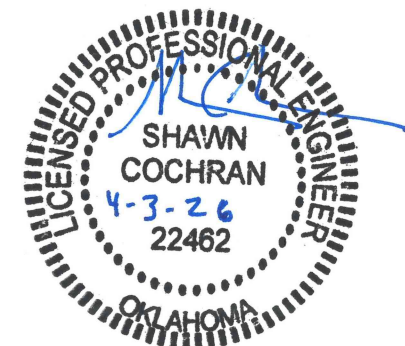
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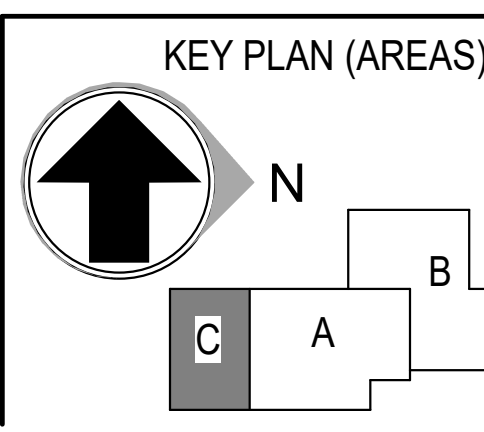
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**CONFIDENTIAL CLIENT
ISSUE FOR CONSTRUCTION**
2026-04-03



REVISIONS		
NO.	DATE	DESCRIPTION
1	2026-04-03	ISSUE FOR CONSTRUCTION - HUB

DRAWN:
Author
APPRVD:
Approver

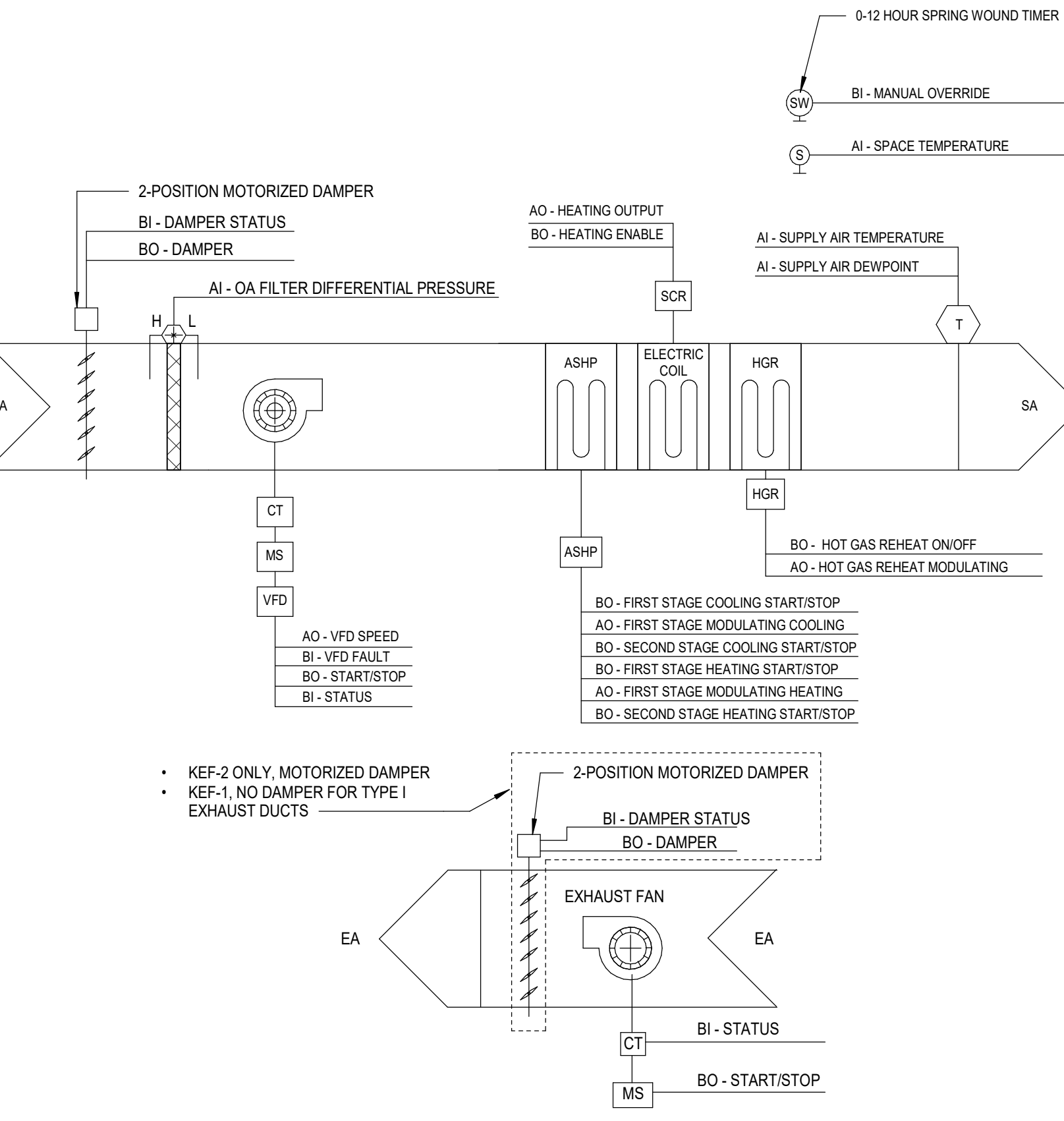
CLY-HUB
PROJECT ADDRESS:
TULSA COUNTY, OK
PROJ. NO. 10438332

PIPING PLAN - AREA C
SCALE: 3/16" = 1'-0"

SHEET NUMBER:
M2.31
PHASE: ISSUE FOR CONSTRUCTION - HUB

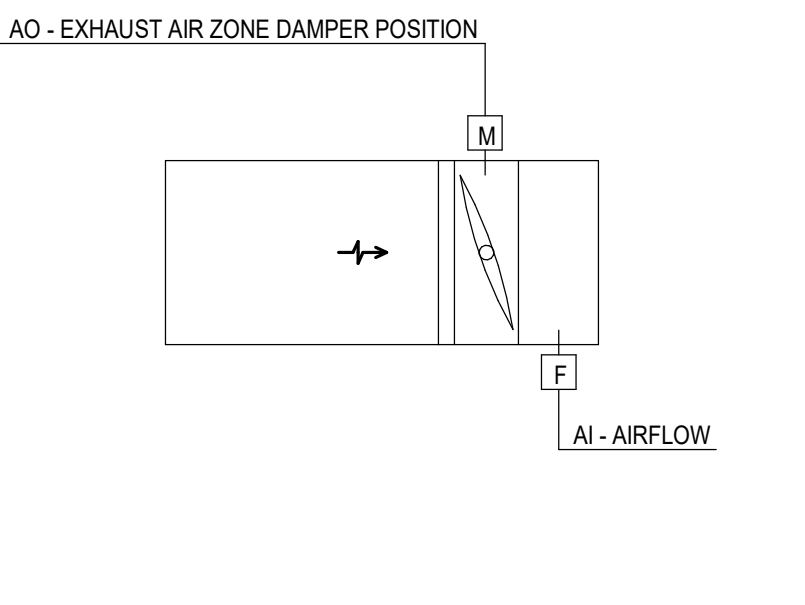
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1 ELECTRIC UNIT HEATER
M5.01 / NO SCALE



6 MAKE-UP AIR UNIT & KITCHEN EXHAUST FANS
M5.01 / NO SCALE

EXHAUST VAV TERMINAL UNIT SEQUENCE OF OPERATIONS... VARIABLE VOLUME TERMINAL UNIT - CONSTANT FLOW CONTROL (EVAV-110)... VARIABLE VOLUME TERMINAL UNIT - VARIABLE FLOW CONTROL (EVAV-100, 201, 208, 210)...



7 EXHAUST VAV TERMINAL UNIT (AREA A)
M5.01 / NO SCALE

2 EXHAUST FAN - SCHEDULED
M5.01 / NO SCALE

MAKEUP AIR UNIT - SUPPLY AIR TEMP (MAU-1) UNIT TO BE CONTROLLED BY CONTROL CONTRACTOR... KITCHEN HOOD EXHAUST FAN (KEF-1 & KEF-2) RUN CONDITIONS - KITCHEN HOOD INTERLOCK... EXHAUST AIR DAMPER...

8 EXHAUST VAV TERMINAL UNIT (AREA B)
M5.01 / NO SCALE

RUN CONDITIONS - CONTINUOUS: THE UNIT SHALL RUN TO MAINTAIN A HEATING SETPOINT OF 45°F (ADJ.)... ALARMS SHALL BE PROVIDED AS FOLLOWS: LOW ZONE TEMP... ZONE SETPOINT ADJUST: THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS...

SEQUENCE: SCHEDULED EXHAUST FAN: THE FAN SHALL RUN ACCORDING TO A USER DEFINABLE SCHEDULE... RUN CONDITIONS - SCHEDULED: THE FAN SHALL RUN ACCORDING TO A USER DEFINABLE SCHEDULE AND EXHAUST DAMPER PROOF OF OPEN... EXHAUST AIR DAMPER...

3 DOMESTIC HOT WATER CONTROLS (DHWG-1)
M5.01 / NO SCALE

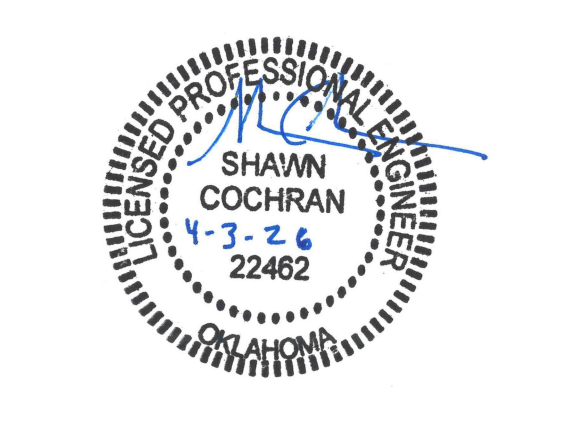
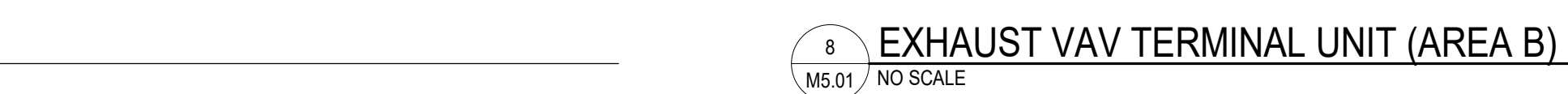
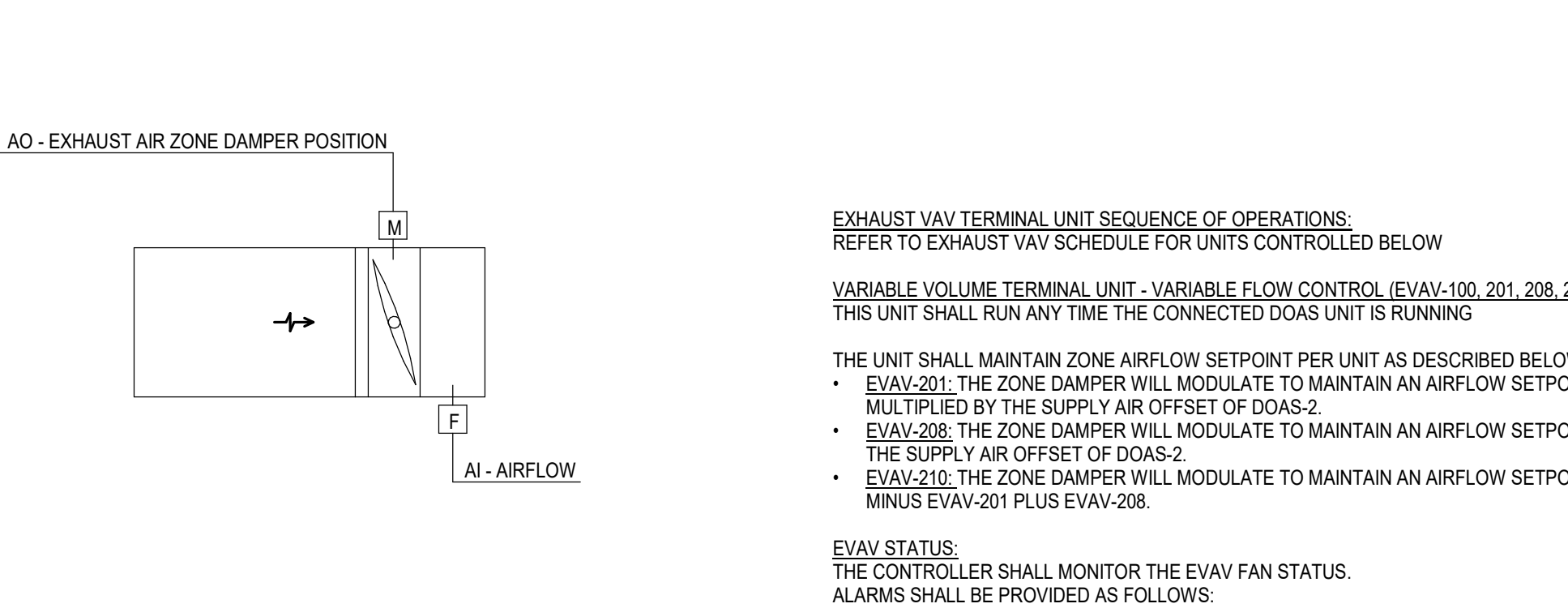
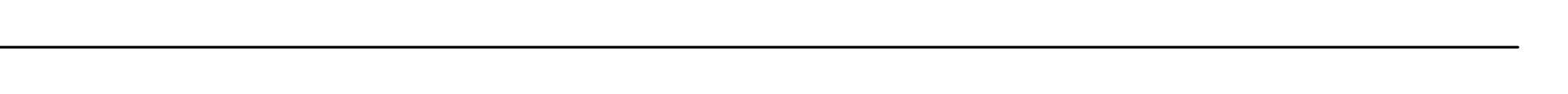
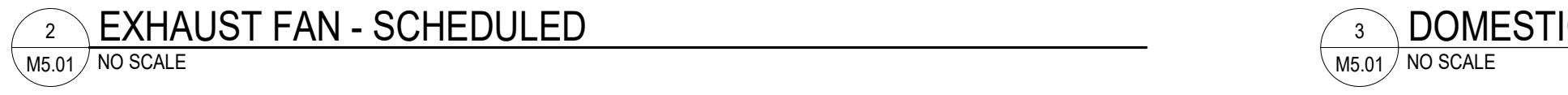
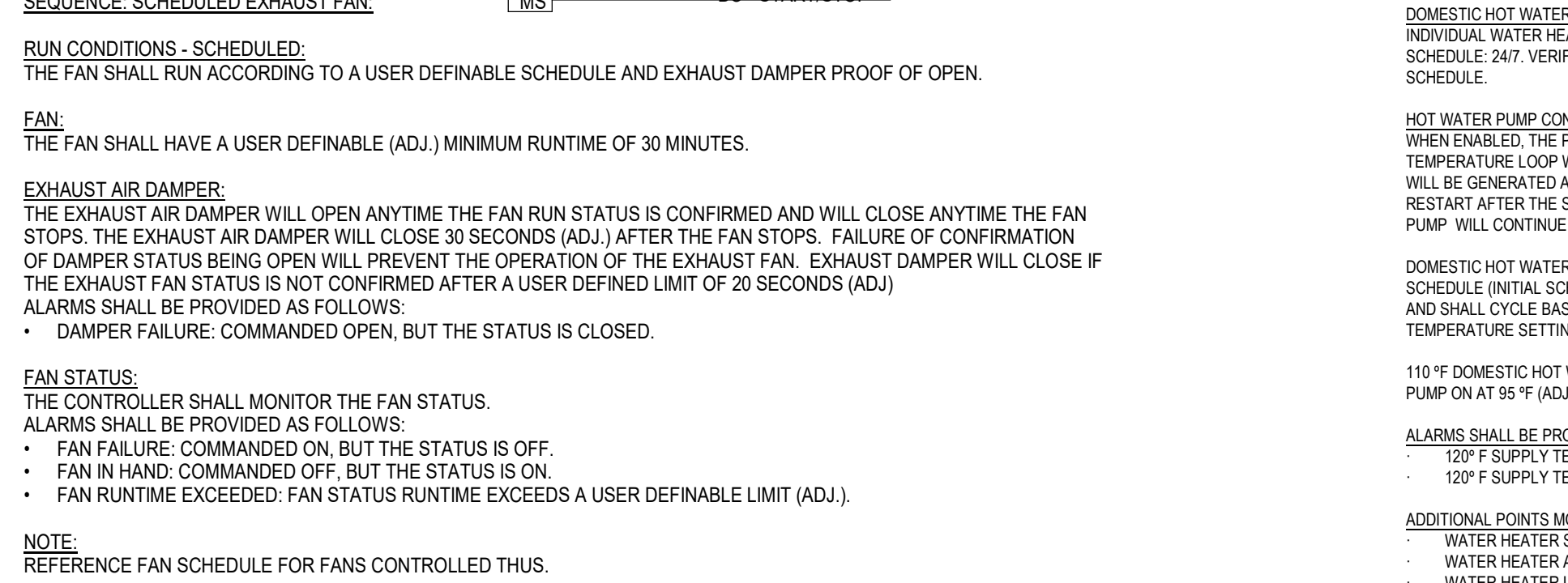
DOMESTIC HOT WATER CONTROL: INDIVIDUAL WATER HEATERS (DHWG-1) SHALL BE ENABLED ON A USER DEFINABLE SCHEDULE... HOT WATER PUMP CONTROL: WHEN ENABLED, THE PUMP (HWRP-1) ASSOCIATED WITH THE WATER HEATER AND SPECIFIC WATER TEMPERATURE LOOP WILL BE STARTED... 110°F DOMESTIC HOT WATER (HWRP-1) PUMP ON AT 85°F (ADJ.) HWC TEMPERATURE...

4 FAN - THERMOSTATIC
M5.01 / NO SCALE

SEQUENCE OF OPERATION: EXHAUST/TRANSFER FAN - THERMOSTATICALLY CONTROLLED: RUN CONDITIONS - CONTINUOUS: THE UNIT SHALL BE CONTINUOUSLY ENABLED TO MAINTAIN A ZONE TEMPERATURE COOLING SETPOINT OF 90°F (ADJ.)... ALARMS SHALL BE PROVIDED AS FOLLOWS: HIGH ZONE TEMP...

5 DOMESTIC HOT WATER CONTROLS (DHWG-2&3)
M5.01 / NO SCALE

DOMESTIC HOT WATER CONTROL - PHASE 2: WATER HEATERS (DHWG-2 & 3) SHALL BE AVAILABLE TO RUN BASED ON A USER DEFINABLE SCHEDULE... HOT WATER PUMP CONTROL: WHEN ENABLED, THE PUMP (HWRP-2) ASSOCIATED WITH THE WATER HEATER AND SPECIFIC WATER TEMPERATURE LOOP WILL BE STARTED...



CONFIDENTIAL CLIENT ISSUE FOR CONSTRUCTION 2026-04-03

Table with 3 columns: NO., DATE, DESCRIPTION. Row 1: 2026-04-03, ISSUE FOR CONSTRUCTION - HUB.

REVISIONS: NO., DATE, DESCRIPTION. DRAWN: Author. APPRVD: Approver.

CLY-HUB PROJECT ADDRESS: TULSA COUNTY, OK. PROJ. NO. 10438332. SCALE: As indicated.

CONTROLS DIAGRAMS SHEET NUMBER: M5.01 PHASE: ISSUE FOR CONSTRUCTION - HUB

SEQUENCE DEDICATED OUTSIDE AIR HEAT PUMP UNIT W/ ELECTRIC SECONDARY HEAT AND HEAT RECOVERY
 UNIT TO BE CONTROLLED BY CONTROLS CONTRACTOR PACKAGE THROUGH TERMINAL STRIP INTERFACING. IT WILL BE THE RESPONSIBILITY OF THE INSTALLING CONTROLS CONTRACTOR TO ENSURE THAT THEIR CONTROLS PACKAGE CAN CONTROL THE UNIT TO PROVIDE A FULLY FUNCTIONAL UNIT WITH SEQUENCE OF OPERATIONS AS DESCRIBED HERE.

UNIT OPERATION
 THE UNIT SHALL RUN WHENEVER:
 • A USER DEFINABLE SCHEDULE DETERMINES THE SYSTEM IS IN THE OCCUPIED MODE.
 INITIAL SCHEDULE 24/7 (ADJ) VERIFY W/OWNER DURING CX.
 • OR ANY ZONE IS OCCUPIED AS DETERMINED BY LOCAL ZONE OVERRIDE BUTTON.

UNIT TERMINAL STRIPS (PROVIDED BY UNIT MANUFACTURER) SHALL BE USED TO ACHIEVE THE FOLLOWING SEQUENCE OF OPERATIONS:
 THE UNIT SHALL SHUT DOWN WHENEVER:
 • A USER DEFINABLE SCHEDULE DETERMINES THE SYSTEM IS IN THE UNOCCUPIED MODE.
 INITIAL SCHEDULE NEVER VERIFY W/OWNER DURING CX.
 • ALL ZONE OCCUPANCY SENSORS ARE INACTIVE.

HIGH STATIC SHUTDOWN
 THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A HIGH STATIC SHUTDOWN SIGNAL. WHEN STATIC PRESSURE OF 2 IN WC OR GREATER (ADJ.) IS REACHED. UNIT SHALL RESTART UPON ACKNOWLEDGEMENT OF ALARM AT USER INTERFACE.

SMOKE DETECTION
 THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A RETURN AIR SMOKE DETECTOR STATUS. UNIT SHALL SHUT DOWN LOCAL MANUAL RESET AT THE SMOKE DETECTOR SHALL BE REQUIRED.

SUPPLY FAN
 THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS IN THE OCCUPIED MODE, UNLESS SHUTDOWN ON SAFETIES. IN THE UNOCCUPIED MODE THE SUPPLY FAN SHALL BE DISABLED.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
 • SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
 • SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
 • SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.) FOR FILTER CHANGE NOTIFICATION.
 • SUPPLY FAN VFD FAULT.

SUPPLY AIR DUCT STATIC PRESSURE CONTROL
 THE CONTROLLER SHALL MEASURE DUCT STATIC PRESSURE AND MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN A DUCT STATIC PRESSURE SETPOINT. THE SUPPLY FAN MINIMUM VFD SPEED SHALL NOT DROP BELOW 30% (ADJ.) THE STATIC PRESSURE SETPOINT SHALL BE RESET BASED ON TERMINAL UNIT DAMPER POSITIONS.
 • THE INITIAL DUCT STATIC PRESSURE SETPOINT SHALL BE ADJUSTABLE DETERMINED BY TAB 2 TO PROVIDE THE DESIGN AIRFLOW.
 • THE BUILDING AUTOMATION SYSTEM SHALL CONTINUOUSLY MONITOR THE DAMPER POSITION ON ALL VAV TERMINAL UNITS. THE DISCHARGE DUCT STATIC PRESSURE SHALL BE SENSED IN A NON-TURBULENT LOCATION 2' OF THE WAY DOWN THE DUCT TEN DUCT WIDTHS FROM ANY ELBOW.
 • WHEN ALL DAMPERS (EXCEPT THOSE AT 0% SHUT OFF) ARE MORE THAN 85% (ADJ.) OPEN, THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET UPWARD BY 5% (ADJ.) OF THE MAXIMUM SYSTEM STATIC PRESSURE SETPOINT AT A FREQUENCY OF 10 MINUTES ADJ. UNTIL ANY DAMPER IS MORE THAN 85% OPEN OR THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET DOWNWARD BY 5% (ADJ.) OF THE MAXIMUM SYSTEM STATIC PRESSURE SETPOINT AT A FREQUENCY OF 10 MINUTES ADJ. UNTIL ANY DAMPER IS MORE THAN 85% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET DOWNWARD TO THE SYSTEM MAXIMUM SETTING OR THE FAN FACTORY ARE AT THEIR MINIMUM SETTING.
 • THE CONTROL BANDS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES AND ADJUSTMENT FREQUENCIES SHALL BE ADJUSTED TO MAINTAIN MAXIMUM STATIC PRESSURE OPTIMIZATION WITH STABLE SYSTEM CONTROL.

SUPPLY FAN MINIMUM AIRFLOW CONTROL
 THE CONTROLLER SHALL MEASURE THE SUPPLY FAN VFD SPEED AND MODULATE VAV DAMPER POSITIONS TO MAINTAIN MINIMUM VFD SPEED AND SUPPLY AIRFLOW.
 • WHEN VFD SPEED DROPS BELOW THE SUPPLY FAN MINIMUM VFD SPEED 30% (ADJ.) THE CONTROLLER SHALL MODULATE ANY VAV DAMPER W/INDE POSITION IS CLOSED 0% TO OPEN 10%. THE CONTROLLER SHALL MODULATE VAV OPEN IN THIS MANNER STARTING WITH VAV 101 AND CONTINUING IN SEQUENTIAL ORDER OR UNTIL SUPPLY FAN MINIMUM VFD SPEED IS MAINTAINED.
 • WHEN VFD SPEED RISES ABOVE 30% (ADJ.) THE SUPPLY FAN DISCHARGE DUCT STATIC PRESSURE SETPOINT SHALL BE RESET UPWARD BY 5% (ADJ.) OF THE MAXIMUM SYSTEM STATIC PRESSURE SETPOINT.
 • VAV DAMPER POSITION MAY BE OVERRIDDEN TO OPEN WHEN COMMANDED BASED ON STANDARD VAV CONTROLS.

EXHAUST FAN
 THE EXHAUST FAN SHALL RUN ANYTIME THE UNIT IS IN THE OCCUPIED MODE, UNLESS SHUTDOWN ON SAFETIES. THE EXHAUST FAN AIRFLOW SETPOINT SHALL MODULATE BETWEEN A MINIMUM AND MAXIMUM SUPPLY AIR OFFSET (BASED ON PERCENTAGE OF EXHAUST AIR TO SUPPLY AIR RATIO DETERMINED DURING TAB) TO MAINTAIN THE BUILDING SPACE PRESSURIZATION SETPOINT. THE SPACE PRESSURIZATION SETPOINT SHALL BE 0.05" WC (ADJ.) RELATIVE TO OUTDOORS. IN A SCENARIO IN WHICH THE BUILDING IS UNABLE TO MAINTAIN THE BUILDING PRESSURE SETPOINT AND THE FAN IS OPERATING AT THE MINIMUM SUPPLY AIR OFFSET SETPOINT, A NOTICE WILL BE GENERATED AT THE BMS AND THE MINIMUM SUPPLY AIR OFFSET SETPOINT WILL BE LOGGED. IN THE UNOCCUPIED MODE THE EXHAUST FAN SHALL BE DISABLED.
 • BUILDING SPACE PRESSURIZATION SETPOINT: 0.05" WC (ADJ.) RELATIVE TO OUTDOORS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
 • EXHAUST FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
 • EXHAUST FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
 • EXHAUST FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.) FOR FILTER CHANGE NOTIFICATION.
 • EXHAUST FAN VFD FAULT.
 • HIGH SPACE PRESSURE: ABOVE 0.07" W.C. (ADJ.)
 • LOW SPACE PRESSURE: BELOW 0.00" W.C. (ADJ.)

SUPPLY TEMPERATURE SETPOINT
 THE CONTROLLER SHALL MONITOR THE OUTDOOR AIR TEMPERATURE, SUPPLY AIR TEMPERATURE, SUPPLY AIR DEWPOINT. THE CONTROLLER SHALL MODULATE THE ASPH COOLING, ASPH HEATING, HOT GAS REHEAT, AND ELECTRIC HEAT TO MAINTAIN THE SUPPLY AIR TEMPERATURE AT 55° F OR BELOW, AND MODULATE THE SUPPLY AIR TEMPERATURE TO MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT OF 75° (ADJ.) IN COOLING AND 70° (ADJ.) IN HEATING.

UNOCCUPIED
 THE UNIT SHALL BE OFF IN THE UNOCCUPIED MODE.
 SUPPLY AIR ENERGY OPTIMIZATION
 • IF DEHUMIDIFICATION IS NOT ENABLED THE SUPPLY AIR TEMP SHALL BE OPTIMIZED BASED ON INDOOR VRF UNIT DEMANDS PER THE BELOW SEQUENCE:
 • A COUNT NUMBER VARIABLE SHALL BE CALCULATED BY THE DDC SYSTEM USING A WEIGHTING FACTOR AND MULTIPLIER. EACH VRF UNIT WEIGHTING FACTOR IS EQUAL TO THE COOLING CAPACITY PER SCHEDULE DIVIDED BY THE TOTAL COOLING CAPACITY OF ALL UNITS. IN COOLING, MULTIPLY BY 100. IN HEATING, MULTIPLY BY 200. IF NEITHER HEATING OR COOLING THEN MULTIPLY BY 150. THE COUNT NUMBER IS EQUAL TO THE SUM OF THIS VALUE CALCULATED FOR ALL VRF UNITS. THE CLOSER THE COUNT NUMBER IS TO 100 THE MORE OF THE LOAD IS IN COOLING AND CLOSER TO 200 THE MORE LOAD IN HEATING.
 • THE MAJORITY OF INDOOR VRF UNIT LOAD IS IN COOLING
 • IF THE COUNT NUMBER IS LESS THAN 150 (ADJ.) FOR 10 MIN (ADJ.)
 • AND OUTSIDE AIR TEMP IS BETWEEN 55-70° F (ADJ.) THE UNIT SHALL BE IN ECONOMIZER MODE
 • OR OUTSIDE AIR TEMP IS LESS THAN 55° F (ADJ.) THE SUPPLY AIR TEMP SETPOINT SHALL BE 65° F (ADJ.)
 • THE MAJORITY OF INDOOR VRF UNIT LOAD IS IN HEATING
 • IF THE COUNT NUMBER IS MORE THAN 150 (ADJ.) FOR 10 MIN (ADJ.)
 • AND OUTSIDE AIR TEMP IS BETWEEN 70-85° F (ADJ.) THE UNIT SHALL BE IN ECONOMIZER MODE
 • OR OUTSIDE AIR TEMP IS GREATER THAN 85° F (ADJ.) THE SUPPLY AIR TEMP SETPOINT SHALL BE 85° F (ADJ.)

ASPH COOLING
 THE ASPH COOLING SHALL BE ENABLED WHENEVER:
 • SUPPLY AIR DEWPOINT IS ABOVE 60% RH (ADJ.)
 • HIGH SUPPLY AIR TEMP: SUPPLY AIR TEMP IS MORE THAN 57° (ADJ.) ABOVE SETPOINT FOR MORE THAN 5 MINUTES (ADJ.)
 • LOW SUPPLY AIR TEMP: SUPPLY AIR TEMP IS MORE THAN 2° F (ADJ.) BELOW SETPOINT FOR MORE THAN 5 MINUTES (ADJ.)
 • AND THE SUPPLY EXHAUST FANS STATUS IS ON.

ASPH HEATING
 THE ASPH HEATING SHALL BE ENABLED WHENEVER:
 • SUPPLY AIR DEWPOINT IS BELOW 55° F (ADJ.)
 • HIGH SUPPLY AIR TEMP: SUPPLY AIR TEMP IS MORE THAN 2° F (ADJ.) ABOVE SETPOINT FOR MORE THAN 5 MINUTES (ADJ.)
 • AND THE SUPPLY EXHAUST FANS STATUS IS ON.

HOT GAS REHEAT
 THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND DEWPOINT AND STAGE THE COOLING AND HOT GAS REHEAT TO MAINTAIN ITS SUPPLY AIR TEMPERATURE AND DEWPOINT SETPOINTS.
 THE HOT GAS REHEAT SHALL BE ENABLED WHENEVER:
 • COOLING (DEHUMIDIFICATION) IS ENABLED
 • AND THE SUPPLY AIR TEMPERATURE IS LESS THAN SUPPLY AIR SETPOINT BY 1° F (ADJ.)
 • AND THE SUPPLY EXHAUST FANS STATUS IS ON.

SECONDARY HEATING
 THE ELECTRIC HEATERS SHALL BE ENABLED WHENEVER:
 • THE HOT GAS REHEAT OR ASPH HEATING IS AT 100%
 • AND THE SUPPLY EXHAUST FANS STATUS IS ON.

HEAT RECOVERY WHEEL, VARIABLE SPEED
 THE CONTROLLER SHALL MODULATE THE HEAT WHEEL FOR ENERGY RECOVERY AS FOLLOWS:
 COOLING MODE - THE ENTHALPY WHEEL SHALL RUN FOR FULL COOL RECOVERY (HOT HUMID DAYS) WHENEVER:
 • THE OUTSIDE AIR ENTHALPY IS GREATER THAN THE RETURN AIR ENTHALPY.
 • AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.
 • AND THE SUPPLY EXHAUST FANS STATUS IS ON.
 PARTIAL COOLING MODE - THE ENTHALPY WHEEL SHALL RUN FOR PARTIAL COOL RECOVERY (HOT DRY DAYS) WHENEVER:
 • THE OUTSIDE AIR HUMIDITY RATIO IS LESS THAN THE RETURN AIR HUMIDITY RATIO
 • AND THE OUTSIDE AIR TEMPERATURE IS GREATER THAN THE RETURN AIR TEMPERATURE
 • AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT
 • AND THE UNIT DISCHARGE AIR DRIVELINE DOES NOT DROP BELOW THE ENTHALPY WHEEL SUPPLY AIR DEWPOINT
 • AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT
 • AND THE SUPPLY EXHAUST FANS STATUS IS ON.

HEATING MODE - THE ENTHALPY WHEEL SHALL RUN FOR FULL HEAT RECOVERY WHENEVER:
 • THE OUTSIDE AIR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY
 • AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE
 • AND THE ZONE TEMPERATURE IS BELOW HEATING SETPOINT.
 • AND THE SUPPLY EXHAUST FANS STATUS IS ON.

ECONOMIZER MODE
 HEAT WHEEL SHALL BE DISABLED WHEN THE OUTSIDE AIR TEMPERATURE IS WITHIN 2° F (ADJ.) OF SUPPLY AIR SETPOINT.
 PERIODIC SELF-CLEANING
 THE HEAT WHEEL SHALL RUN AT 5% SPEED (ADJ.) FOR 25 SEC (ADJ.) EVERY 4HRS (ADJ.) THE UNIT RUNS.
 FROST PROTECTION
 THE HEAT WHEEL SHALL RUN AT 5% SPEED (ADJ.) WHENEVER:
 • OUTSIDE AIR TEMPERATURE DROPS BELOW 32° F (ADJ.)
 • OR WHENEVER EXHAUST AIR TEMPERATURE DROPS BELOW 20° F (ADJ.)

ALARMS SHALL BE PROVIDED AS FOLLOWS:
 • HEAT WHEEL ROTATION FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
 • HEAT WHEEL IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
 • HEAT WHEEL RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)

OUTSIDE AIR AND EXHAUST AIR DAMPER CONTROL
 OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL OPEN WHEN UNIT IS OPERATING IN THE OCCUPIED MODE. DAMPERS SHALL BE CLOSED ALL OTHER TIMES, EXCEPT AS NOTICED.

UNOCCUPIED MODE
 UNIT SHALL GO INTO UNOCCUPIED MODE AS SCHEDULED OR COMMANDED MANUALLY. UNIT SHALL SHUT DOWN AND EXHAUST AIR DAMPERS BE CLOSED.

UNOCCUPIED HUMIDITY CONTROL SHALL BE AVAILABLE TO RUN IF SPACE RELATIVE HUMIDITY IS GREATER THAN 80% CLOSE ON EXHAUST AIR DAMPERS, OVERRIDE EXHAUST AIR DAMPERS TO CLOSED POSITION (RESTROOM EXHAUST), OPEN RECIRCULATION DAMPER AND RUN UNIT IN DEHUMIDIFICATION MODE UNTIL SPACE RH IS LESS THAN 80% FOR 10MIN (ADJ.)

UNOCCUPIED OVERRIDE
 A TIED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

SUPPLY AIR TEMPERATURE
 THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.
 ALARMS SHALL BE PROVIDED AS FOLLOWS:
 • HIGH SUPPLY AIR TEMP: SUPPLY AIR TEMP IS MORE THAN 57° (ADJ.) ABOVE SETPOINT FOR MORE THAN 5 MINUTES (ADJ.)
 • LOW SUPPLY AIR TEMP: SUPPLY AIR TEMP IS MORE THAN 2° F (ADJ.) BELOW SETPOINT FOR MORE THAN 5 MINUTES (ADJ.)

SUPPLY AIR DEWPOINT
 THE CONTROLLER SHALL MONITOR THE SUPPLY AIR DEWPOINT.
 ALARMS SHALL BE PROVIDED AS FOLLOWS:
 • HIGH SUPPLY AIR DEWPOINT: IF THE SUPPLY AIR DEWPOINT IS GREATER THAN 60° F (ADJ.)

FILTER DIFFERENTIAL PRESSURE MONITOR
 THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTERS.
 ALARMS SHALL BE PROVIDED AS FOLLOWS:
 • FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.)

RETURN AIR HUMIDITY
 THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR ECONOMIZER CONTROL.
 ALARMS SHALL BE PROVIDED AS FOLLOWS:
 • HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 70% (ADJ.)

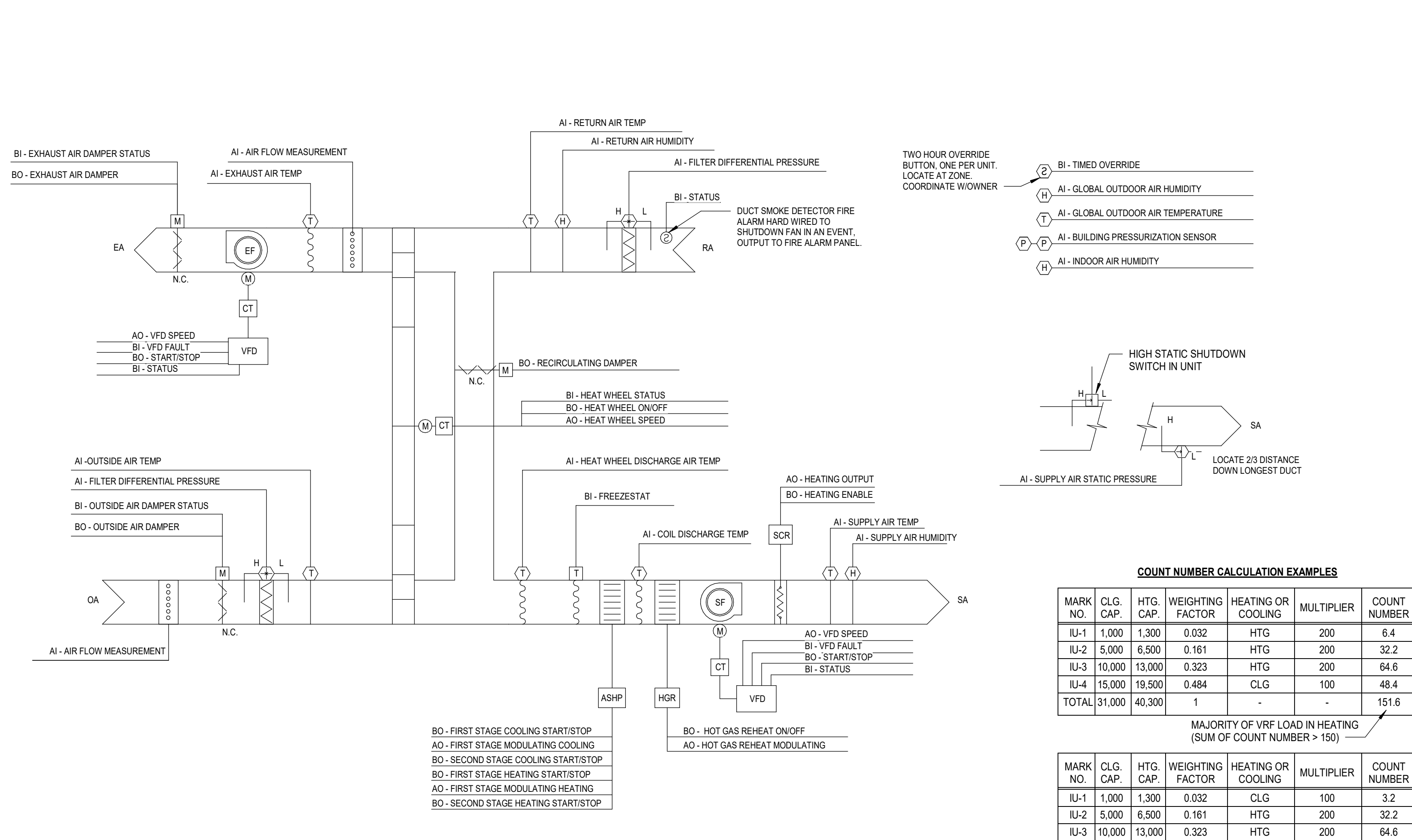
RETURN AIR TEMPERATURE
 THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR SETPOINT CONTROL OR ECONOMIZER CONTROL.
 ALARMS SHALL BE PROVIDED AS FOLLOWS:
 • HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 80° F (ADJ.)
 • LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 50° F (ADJ.)

REFRIGERANT LEAK DETECTION CONTROL
 THIS EQUIPMENT SHALL INCLUDE REFRIGERANT LEAK DETECTION AND FACTORY CONTROLS FOR MITIGATION IN ACCORDANCE WITH U60335-2-40 AND AHJ.

THIS EQUIPMENT SHALL ALSO PROVIDE CONTACTS TO SEND LEAK DETECTION ALARM TO BMS. SEE A2L REFRIGERANT LEAK DETECTION CONTROLS FOR BMS CONTROLS UPON LEAK DETECTION ALARM.

GENERAL NOTES
 1. UNLESS EXPLICITLY INDICATED IN DIVISION 26 CONTRACT DOCUMENTS, ALL ELECTRICAL WIRING, RACEWAY, ENCLOSURES, OVERCURRENT PROTECTION, MISC. COMPONENTS AND CONNECTIONS NECESSARY FOR A COMPLETE AND OPERATING CONTROLS SYSTEM SHALL BE PROVIDED AS PART OF SPECIFICATION SECTION 23000. CONVENIENCE OUTLETS INDICATED IN DIVISION 26 CONTRACT DOCUMENTS SHALL NOT BE USED AS A POWER SOURCE. ALL WORK SHALL BE IN ACCORDANCE WITH DIVISION 26 REQUIREMENTS.
 2. FULL CONTROL FUNCTIONALITY SHALL BE AVAILABLE VIA THE INTERNET WITHOUT NEED FOR ANY SPECIAL SOFTWARE.
 3. ALL DDC INPUT/OUTPUT CONTROL POINTS SHALL BE TRENDALE AND ADJUSTABLE.

COMMISSIONING
 CONTRACTOR SHALL REFER TO COMMISSIONING TEND REQUIREMENTS IN DIV. 23 SPECIFICATION.



COUNT NUMBER CALCULATION EXAMPLES

MARK NO.	CLG. CAP.	HTG. CAP.	WEIGHTING FACTOR	HEATING OR COOLING	MULTIPLIER	COUNT NUMBER
IU-1	1,000	1,300	0.032	HTG	200	6.4
IU-2	5,000	6,500	0.161	HTG	200	32.2
IU-3	10,000	13,000	0.323	HTG	200	64.6
IU-4	15,000	19,500	0.484	CLG	100	48.4
TOTAL	31,000	40,300	1	-	-	151.6

MAJORITY OF VRF LOAD IN HEATING (SUM OF COUNT NUMBER > 150)

MARK NO.	CLG. CAP.	HTG. CAP.	WEIGHTING FACTOR	HEATING OR COOLING	MULTIPLIER	COUNT NUMBER
IU-1	1,000	1,300	0.032	CLG	100	3.2
IU-2	5,000	6,500	0.161	HTG	200	32.2
IU-3	10,000	13,000	0.323	HTG	200	64.6
IU-4	15,000	19,500	0.484	CLG	100	48.4
TOTAL	31,000	40,300	1	-	-	148.4

MAJORITY OF VRF LOAD IN COOLING (SUM OF COUNT NUMBER < 150)

1 DEDICATED OUTSIDE AIR HEAT PUMP WITH HEAT RECOVERY
 M5.02 NO SCALE

VAV TERMINAL UNIT SEQUENCE OF OPERATIONS OCCUPANCY:

ZONE SHALL BE IN OCCUPIED MODE WHEN:
 • ANY SPACE IN A VAV ZONE IS OCCUPIED AS DETERMINED BY OCCUPANCY SENSOR(S). SENSORS PROVIDED AS PART OF DIV. 26. INTERFACE BETWEEN SENSOR AND CONTROLLER BY DIV. 23.

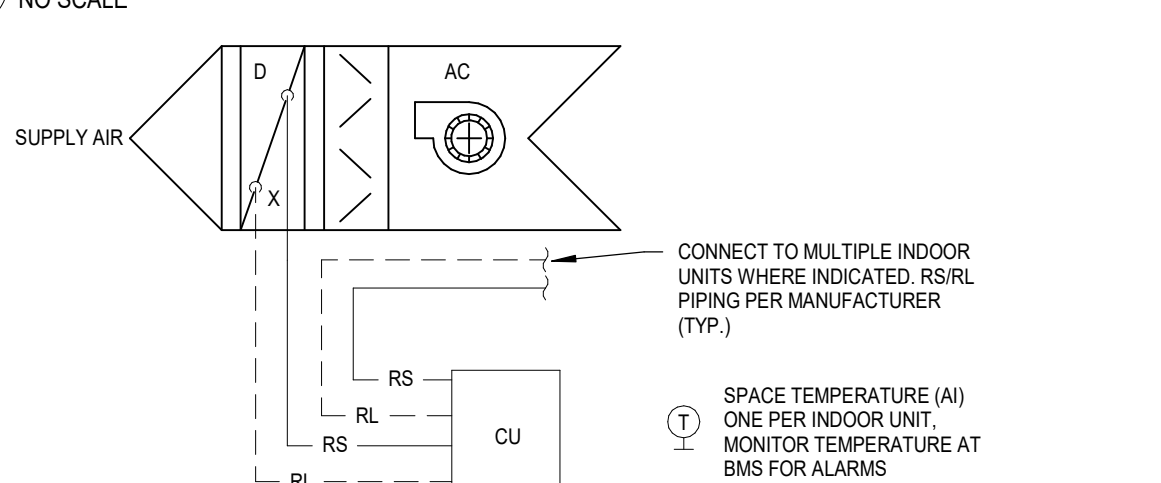
ZONE SHALL BE IN UNOCCUPIED MODE WHEN:
 • ALL SPACES IN A VAV ZONE ARE NOT OCCUPIED AS DETERMINED BY OCCUPANCY SENSOR(S). SENSORS PROVIDED AS PART OF DIV. 26. INTERFACE BETWEEN SENSOR AND CONTROLLER BY DIV. 23.

VARIABLE VOLUME TERMINAL UNIT - FLOW CONTROL:
 THE UNIT SHALL MAINTAIN ZONE AIRFLOW SETPOINTS THROUGH ONE OF THE FOLLOWING:

OCCUPIED:
 • THE ZONE DAMPER WILL MODULATE TO MAINTAIN A CONSTANT OCCUPIED AIRFLOW (ADJ.) DISTRIBUTED INTO THE ZONE.

UNOCCUPIED:
 • WHEN THE ZONE IS UNOCCUPIED, THE ZONE DAMPER WILL MODULATE DOWN TO 0% (ADJ.) OPEN.
 • WHEN IN AN UNOCCUPIED MODE THE DAMPER POSITION MAY BE OVERRIDDEN TO OPEN BY THE DOAS CONTROL TO MAINTAIN DOAS MINIMUM AIRFLOW.

2 VAV TERMINAL WITH NO COIL
 M5.02 NO SCALE



MINI-SPLITS (COOLING ONLY UNITS):
 RUN CONDITIONS - LEAD LAG:
 THE UNIT SHALL BE AVAILABLE TO RUN AT ANY TIME TO MAINTAIN SETPOINT AND OPERATE BASED ON MANUFACTURER CONTROLS:
 • MULTIPLE UNITS IN THE SAME SPACE SHALL BE STAGED SUCH THAT NUMBER OF UNITS RUN ONLY AS NEEDED TO MAINTAIN SETPOINT.
 • AT THE POINT WHERE THE CURRENTLY OPERATING UNITS ARE OPERATING AT 100% CAPACITY AND ZONE TEMPERATURE IS GREATER THAN 1° ABOVE SETPOINT THE NEXT UNIT IN SEQUENCE WILL BEG TO RUN UNTIL ZONE TEMPERATURE IS AT OR BELOW SETPOINT FOR 10 MIN (ADJ.)
 • THE LEAD UNIT SHALL ROTATE EVERY 7 (ADJ.) DAYS

SPACE TEMPERATURE SETPOINT
 • 85° F (ADJ.) COOLING

INFORMATION PROVIDED TO THE BMS:
 PER INDOOR EQUIPMENT (MONITOR)
 • ZONE ENABLE/DISABLE & STATUS
 • ALARM
 • MALFUNCTION CODE
 • FAN MODE (IN, MED, LOW)
 • ZONE TEMPERATURE(S) FOR EACH ZONE CONNECTED TO INDOOR EQUIPMENT
 • ZONE HIGH TEMPERATURE ALARM: ZONE TEMPERATURE IS GREATER THAN 2° F (ADJ.) ABOVE ZONE SETPOINT
 • ZONE SETPOINT

PER INDOOR EQUIPMENT (CONTROL)
 • ZONE SCHEDULING
 • ZONE TEMP SETPOINT

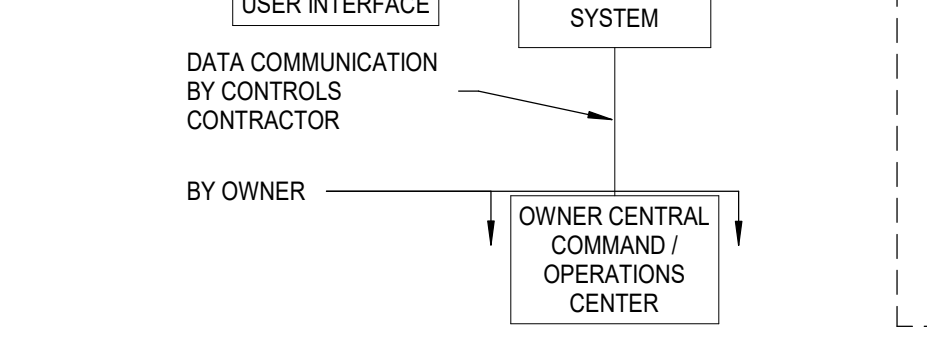
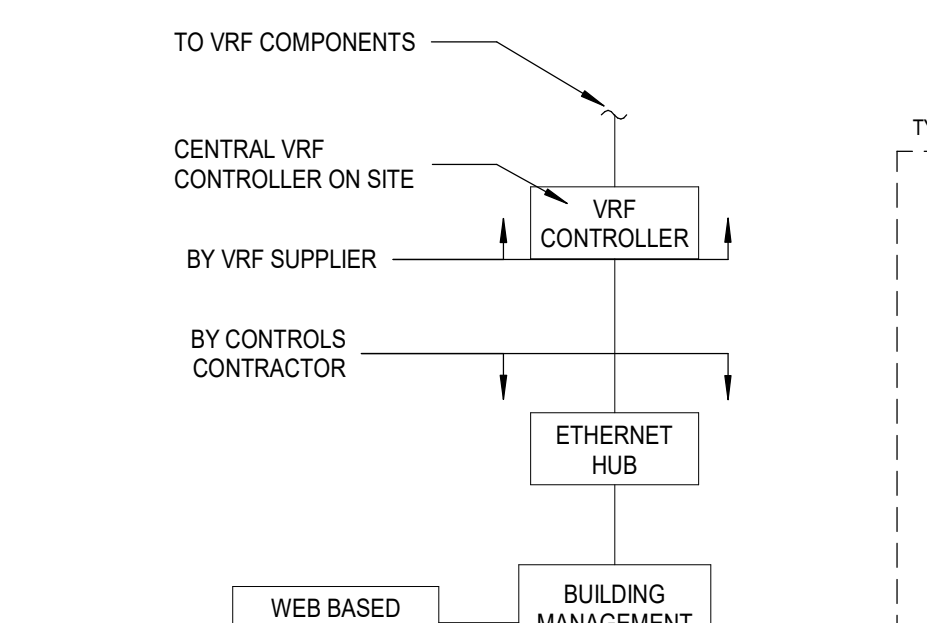
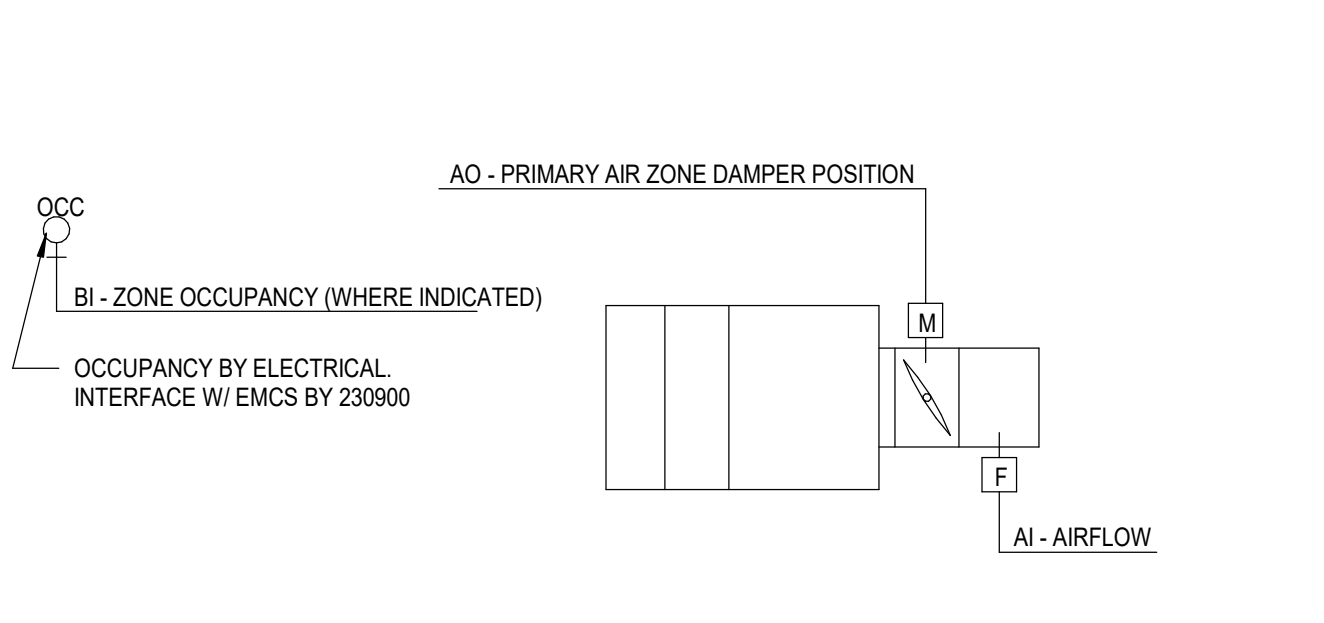
PER OUTDOOR EQUIPMENT (MONITOR)
 • UNIT ENABLE/DISABLE & STATUS
 • ALARM
 • MALFUNCTION CODE
 • DEFROST MODE ENABLED

PER OUTDOOR EQUIPMENT (CONTROL)
 • UNIT ENABLE/DISABLE

REFRIGERANT LEAK DETECTION CONTROL
 THIS EQUIPMENT SHALL INCLUDE REFRIGERANT LEAK DETECTION AND FACTORY CONTROLS FOR MITIGATION IN ACCORDANCE WITH U60335-2-40 AND AHJ.

THIS EQUIPMENT SHALL ALSO PROVIDE CONTACTS TO SEND LEAK DETECTION ALARM TO BMS. SEE A2L REFRIGERANT LEAK DETECTION CONTROLS FOR BMS CONTROLS UPON LEAK DETECTION ALARM.

3 SPLIT SYSTEM COOLING ONLY
 M5.02 NO SCALE



VRF CONTROL SCHEMATIC IS TYPICAL AND APPLIES TO ALL VRF SYSTEMS. REFERENCE VRF OUTDOOR UNIT SCHEDULE, BRANCH SELECTOR SCHEDULE, INDOOR UNIT SCHEDULE AND PLANS FOR SYSTEM LAYOUT, EQUIPMENT QUANTITIES AND ZONING.

RUN CONDITIONS - AUTOMATIC OPERATION:
 THE VRF SYSTEM SHALL RUN BASED ON MANUFACTURER CONTROLS AND BMS SHALL MONITOR AND RECEIVE ALARMS FROM VRF CONTROLLER.

THE UNIT SHALL RUN WHENEVER:
 • A USER DEFINABLE SCHEDULE DETERMINES THE SYSTEM IS IN THE OCCUPIED MODE.
 INITIAL SCHEDULE 24/7 VERIFY W/ OWNER DURING CX.
 • MANUAL OVERRIDE SHALL BE AVAILABLE AT THE ROOM SENSOR TO ENABLE OCCUPIED MODE FOR 1 HR (ADJ.) WHEN AUTOMATIC OPERATION HAS SET THE UNIT TO UNOCCUPIED MODE.

OCCUPIED MODE:
 WHEN THE UNITS ARE CONTROLLED TO THE OCCUPIED MODE, THE FAN WILL RUN SATISFYING HEATING OR COOLING DEMANDS TO MEET THE OCCUPIED SETPOINTS, UNLESS SHUTDOWN ON SAFETIES.

UNOCCUPIED MODE:
 WHEN THE UNITS ARE CONTROLLED TO THE UNOCCUPIED MODE, THE FAN WILL RUN ONLY DURING HEATING OR COOLING TO MEET THE UNOCCUPIED SETPOINTS, UNLESS SHUTDOWN ON SAFETIES.

PER ZONEPIECE OF INDOOR EQUIPMENT (CONTROL)
 • ZONE SCHEDULING
 • ZONE TEMP SETPOINT

PER OUTDOOR EQUIPMENT (MONITOR)
 • UNIT ENABLE/DISABLE & STATUS
 • ALARM
 • MALFUNCTION CODE
 • DEFROST MODE ENABLED

PER OUTDOOR EQUIPMENT (CONTROL)
 • SCHEDULING

NOTES:
 GRAPHICS FOR EACH INDOOR UNIT SHALL INDICATE WHICH OUTDOOR UNIT, BRANCH SELECTOR, AND DOAS UNIT IS ASSOCIATED WITH THAT INDOOR UNIT AND CONTAIN A LINK TO INFO FOR THAT EQUIPMENT.

BMS SHALL INTERFACE WITH THE VARIABLE REFRIGERANT SYSTEM INTERFACE/ ADAPTER TO MONITOR ZONE SETPOINTS AND SCHEDULING TO BE MANAGEABLE THROUGH THE BMS.

ROOM SENSORS ARE TO BE PROVIDED BY THE EQUIPMENT MANUFACTURER WITH THE VRF SYSTEM AND INSTALLED BY THE MECHANICAL CONTRACTOR.

SPACE TEMPERATURE SENSING FOR CONTROL OF THE VRF UNIT SHALL TAKE PLACE AT THE WALL SENSOR AND NOT IN THE RETURN DUCT OR AT THE VRF UNIT.

THIS EQUIPMENT SHALL ALSO PROVIDE CONTACTS TO SEND LEAK DETECTION ALARM TO BMS. SEE A2L REFRIGERANT LEAK DETECTION CONTROLS FOR BMS CONTROLS UPON LEAK DETECTION ALARM.

ALL INDOOR UNITS SHALL HAVE A SHUT DOWN AND ALARM INTERLOCKS WITH UNIT AND ASSOCIATED CONDENSATE PUMP TO STOP UNIT IN THE EVENT OF A

VRF SYSTEM GENERAL NOTES

A. FOR SYMBOLS AND ABBREVIATIONS SEE SHEET M01.
 B. PLANS INDICATE GENERAL ARRANGEMENTS OF EQUIPMENT AND PIPING PER BASIS OF DESIGN MANUFACTURER AND DOES NOT INDICATE ALL REQUIRED COMPONENTS OR PIPE SIZES. CONSULT WITH THE MANUFACTURER FOR ACTUAL LENGTHS, SIZES, QUANTITIES OF PIPING SPECIALTIES, AND VALVES BASED ON UNIT LOCATIONS SHOWN ON PLANS, AND REQUIREMENTS OF SPECIFICATIONS.

C. PROVIDE LEVELING PADS FOR OUTDOOR UNITS AS REQUIRED FOR UNITS TO SIT LEVEL.
 D. MECHANICAL CONTRACTOR TO COORDINATE WITH INSULATING CONTRACTOR FOR LENGTHS AND QUANTITIES OF PIPE PRIOR TO BID.

E. PROVIDE VIBRATION ISOLATION HANGERS FOR ALL INDOOR UNITS. COORDINATE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.

F. COORDINATE WITH MANUFACTURER'S RECOMMENDED REFRIGERANT LINE MAX DISTANCES BETWEEN OUTDOOR UNITS, BRANCH SELECTORS, AND INDOOR UNITS.

G. THE VRF SYSTEM SHALL INCLUDE INTEGRAL LEAK DETECTION CONTROLS AND AUXILIARY CONTACTS FOR LEAK DETECTION SIGNAL TO BMS. LEAK DETECTION ALARM SHALL ACTIVATE AUTOMATIC SHUT OFF VALVES ON OUTDOOR UNITS AND BRANCH BOXES AND COMMAND ALL IMPACTED INDOOR UNITS TO OPERATE IN EMERGENCY FAN MODE AND SHUT DOWN OUTDOOR UNITS.

H. PROVIDE CONDENSATE LINE CLEANOUTS AT THE LAST (HIGHEST) 90° ELBOW ON EACH BRANCH LINE SERVING MULTIPLE INDOOR UNITS.

I. CONTRACTOR SHALL NOT DRILL, NOTCH, OR PENETRATE ANY STRUCTURAL ELEMENT WITHOUT PROPER WRITTEN CONSENT OF STRUCTURAL ENGINEER. COORDINATE REQUIRED NOTCHES, HOLES, AND PENETRATIONS WITH THE STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION.

REFRIGERANT LEAK DETECTION CONTROL
 ALL EQUIPMENT CONTAINING A2L REFRIGERANTS SHALL INCLUDE REFRIGERANT LEAK DETECTION AND FACTORY CONTROLS FOR MITIGATION IN ACCORDANCE WITH U60335-2-40 AND AHJ.
 THIS EQUIPMENT SHALL ALSO PROVIDE CONTACTS TO SEND LEAK DETECTION ALARM TO BMS. SEE A2L REFRIGERANT LEAK DETECTION CONTROLS FOR BMS CONTROLS UPON LEAK DETECTION ALARM.

LEAK DETECTION ALARM
 ALL EQUIPMENT CONTAINING A2L REFRIGERANTS SHALL HAVE THE LEAK DETECTION ALARM SIGNAL MONITORED BY THE BMS. ALARMS SHALL BE PROVIDED AT THE BMS INDICATING REFRIGERANT LEAK DETECTION AND SPECIFIC UNIT IN ALARM.

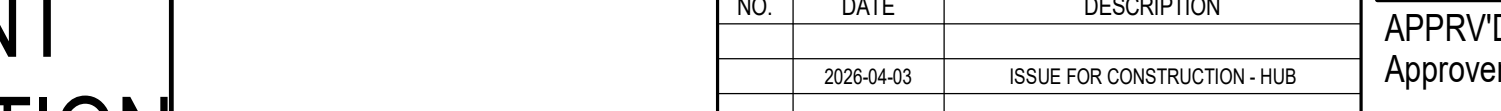
UPON RECEIVING A LEAK DETECTION ALARM FROM ANY EQUIPMENT THE BMS SHALL COMMAND ALL EQUIPMENT LISTED BELOW THAT IS NOT IN ALARM OR SHUT DOWN ON SAFETIES TO DO THE FOLLOWING:
 • VRF SYSTEM (SIGNAL AC4-B54)
 • SYSTEM SHALL MAINTAIN NORMAL OPERATION
 • VENTILATION SYSTEM (DOAS4, VAV4, EDV4#)
 • SYSTEM SHALL BE COMMANDED TO RUN WITH ALL AIRFLOWS SET TO DESIGN MAXIMUM, AND RECIRCULATION DAMPER CLOSED
 • KITCHEN VENTILATION (MAH-1, KEF-#)
 • IF MAH-1 IS CURRENTLY RUNNING, MAINTAIN NORMAL OPERATION WITH INTERLOCK TO KEF-1 & KEF-2 AIRFLOWS.
 • IF MAH-1 IS IN THE OFF COMMAND, BMS SHALL COMMAND KEF-2 TO RUN AT DESIGN AIRFLOW SETPOINT AND COMMAND MAH-1 TO RUN WITH AIRFLOW SETPOINT EQUAL TO KEF-2
 • EXHAUST FANS (F-#) ALL FANS SHALL BE COMMANDED TO RUN AT DESIGN SETPOINTS

AFTER LEAK DETECTION IS CLEARED ALL UNITS WILL RETURN TO NORMAL OPERATION UNLESS IN ALARM OR SHUT DOWN ON SAFETIES.

4 VARIABLE REFRIGERANT FLOW (VRF) SYSTEM CONTROLS
 M5.02 NO SCALE



5 A2L REFRIGERANT LEAK DETECTION CONTROLS
 M5.02 NO SCALE



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HDR HDR, ENGINEERING INC. 1917 SOUTH 67th STREET OMAHA, NEBRASKA 68106 (402) 399-1000 CA-0443

DLR GROUP 6457 FRANCES ST., STE. 200 OMAHA, NE 68106 (402) 742-4200

Kimley Horn KIMLEY-HORN & ASSOC., INC. 1437 S BOULDER AVE. TULSA, OK 74119 (918) 380-8868



CONFIDENTIAL CLIENT ISSUE FOR CONSTRUCTION
 2026-04-03

NO.	DATE	DESCRIPTION
	2026-04-03	ISSUE FOR CONSTRUCTION - HUB

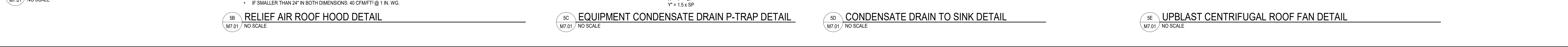
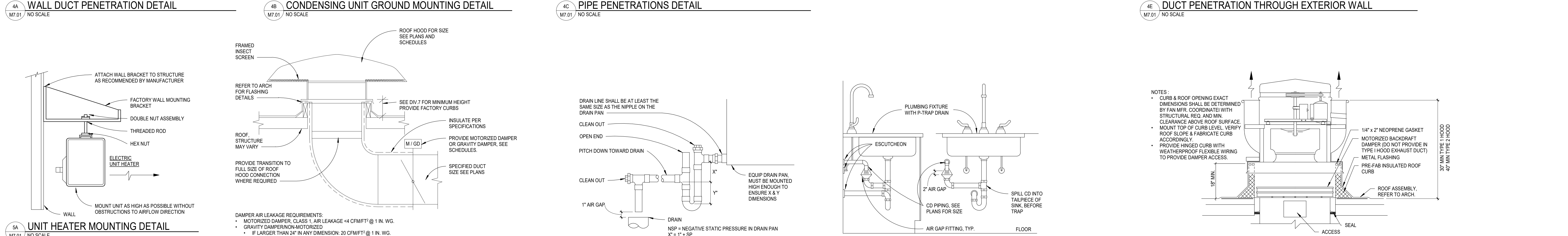
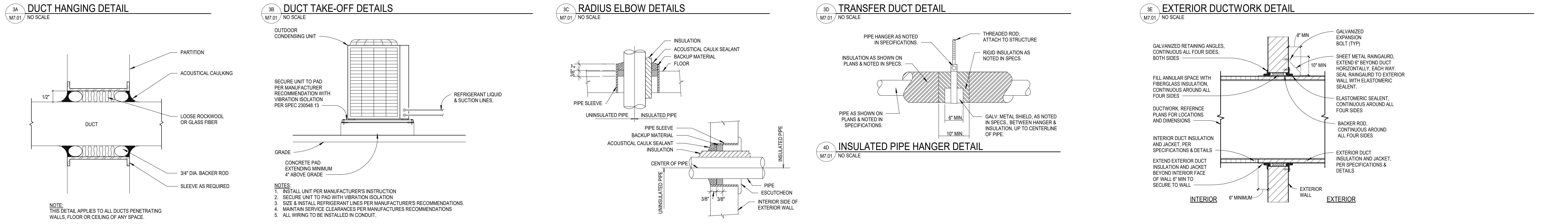
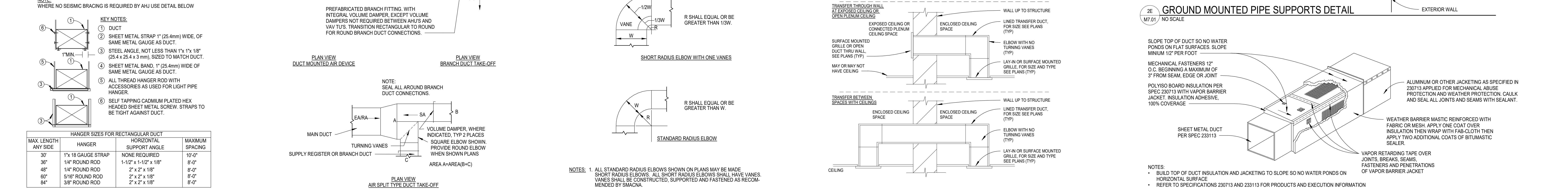
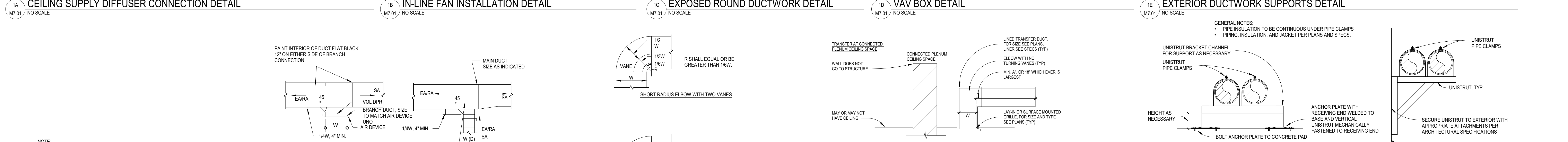
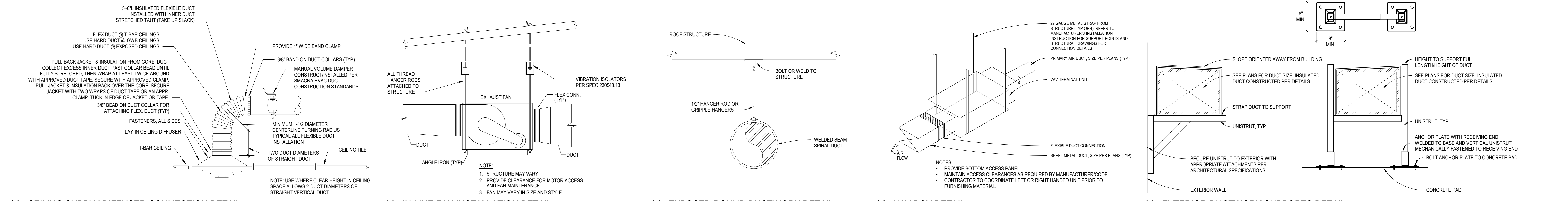
REVISIONS

DRAWN: Author
 APPRVD: Approver

CLY-HUB
 PROJECT ADDRESS: TULSA COUNTY, OK
 PROJ. NO. 10438332

CONTROLS DIAGRAMS
 SCALE: 1/4" = 1'-0"

SHEET NUMBER: **M5.02**
 PHASE: ISSUE FOR CONSTRUCTION - HUB



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**CONFIDENTIAL CLIENT
ISSUE FOR CONSTRUCTION**

KEY PLAN (AREAS)

REVISIONS

NO.	DATE	DESCRIPTION
1	2028-04-03	ISSUE FOR CONSTRUCTION - HUB

DRAWN: Author
APPRVD: Approver

CLY-HUB

PROJECT ADDRESS:
TULSA COUNTY, OK

PROJ. NO. 10438332

MECHANICAL DETAILS

SCALE: As indicated

SHEET NUMBER:
M7.01

PHASE: ISSUE FOR CONSTRUCTION - HUB

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ASHP & ELECTRIC HEAT DEDICATED OUTSIDE AIR UNIT WITH ENERGY RECOVERY WHEEL SCHEDULE

GENERAL NOTES:
 A. MOUNT UNIT ON RAISED CONCRETE PAD MINIMUM 4" ABOVE SURROUNDING GRADE.
 B. INSTALL UNIT WITH VIBRATION ISOLATION BETWEEN UNIT AND CONCRETE PAD PER SPECIFICATIONS.
 C. PROVIDE UNIT WITH INTERNALLY ISOLATED FANS AND COMPRESSORS
 D. PROVIDE WITH GLASS 1" MOTORIZED DAMPERS
 E. PROVIDE WITH MODULATING HOT GAS REHEAT AND HUMIDITY CONTROLLER.
 F. CONTRACTOR TO COORDINATE ACCESS REQUIREMENTS TO ENSURE PROPER MAINTENANCE ACCESS.
 G. HEATING AND COOLING PERFORMANCE SHALL BE CAPABLE OF PROVIDING 75°F LAT IN HEATING AND 75°F LAT IN COOLING AND EVALUATED BASED ON OUTDOOR DESIGN TEMPS. (ADJUSTED TO LOCALIZED SITE) OF 11.1°F DB IN HEATING, AND 93.1°F DB, 74.8°F WB IN COOLING.
 H. DEHUMIDIFICATION COOLING PERFORMANCE SHALL BE CAPABLE OF 55°F LAT OR LESS AT OUTDOOR DESIGN CONDITIONS (ADJUSTED TO LOCALIZED SITE) OF 76°F DEW POINT, 86°F DB.
 J. BIDDING GREENHECK REPRESENTATIVE SHALL CONTACT CHRIS WOODBRIDGE AT CHRISW@DORSE.COM FOR DETAILS.

ID	OUTDOOR AIRFLOW PERCENT (%)	SUPPLY AIRFLOW (CFM)	EXHAUST AIRFLOW (CFM)	FAN DATA				ENERGY RECOVERY WHEEL DATA										HEATING COIL DATA				COOLING COIL DATA				ELECTRICAL DATA										DIMENSIONAL DATA (FT - IN)				BASIS OF DESIGN																
				STATIC PRESS (IN WG)		MOTOR DRIVE TYPE	HORSEPOWER (HP)	STATIC PRESS (IN WG)		MOTOR DRIVE TYPE	HORSEPOWER (HP)	SUMMER					WINTER					TYPE	CAPACITY (MBH)	TEMP DB (°F)	AIR SIDE		HOT GAS REHEAT		TYPE	QTY	ISCOPE	ISMRE	PRE FILTER MERV RATING	FINAL FILTER MERV RATING	FLA (A)	MCA (A)	MOCOP (A)	VOLT (V)	PH	MAX LENGTH	MAX WIDTH	MAX HEIGHT	WEIGHT (LBS)	MANUFACTURER	MODEL											
				EXT	TOTAL			EXT	TOTAL			EAT(db)	EAT(wb)	LAT(db)	LAT(wb)	TOTAL EFFECTIVENESS (%)	EAT(db)	EAT(wb)	LAT(db)	LAT(wb)	TOTAL EFFECTIVENESS (%)				ENT	LVG	INCLUDE HGR	CAPACITY (MBH)																		LVG AIR TEMP DB (°F)										
DOAS-1	100	2,185	1735	2	3.4	DIRECT	3	1.7	2.73	DIRECT	3	100.1 F	75.5 F	83.1 F	67.3 F	77.04	13.6 F	10.6 F	49.8 F	41.3 F	77.86	66.96	ASHP	84.5	49.8	87.2	ELECTRIC-SECONDARY	15	Yes	ASHP	114.7	76.6	83.1	67.3	48.7	48.7	Yes	82.3	85.0	INVERTER SCROLL	1	3.63	8.2	8	13	51.4	61	70	480	3	16'-11"	7'-2"	5'-5"	3.851	GREENHECK	RVE-40-41D-10A-1-02
DOAS-2	100	2,590	2410	2	3.8	DIRECT	3	1.7	2.84	DIRECT	3	100.1 F	75.5 F	82.0 F	66.7 F	70.85	13.6 F	10.6 F	52.6 F	43.1 F	67.8	71.01	ASHP	84.6	52.6	84	ELECTRIC-SECONDARY	15	Yes	ASHP	118.6	82.7	82	66.7	50.8	50.7	Yes	90.6	85.0	INVERTER SCROLL	1	3.63	8.2	8	13	51.4	61	70	480	3	16'-11"	7'-2"	5'-5"	3.826	GREENHECK	RVE-40-41D-10A-1-02
DOAS-3	100	1,120	1120	2	2.06	DIRECT	1.5	0.75	1.45	DIRECT	1	100.1 F	75.5 F	80.5 F	65.9 F	75.5	13.8 F	10.8 F	57.0 F	45.9 F	75.19	76.34	ASHP	49.4	57	99.3	ELECTRIC-SECONDARY	15	Yes	ASHP	59.5	38.9	80.5	65.9	46.6	46.5	Yes	48.9	88.5	INVERTER SCROLL	1	3.91	8.5	8	13	34.7	41.7	45	480	3	16'-11"	7'-2"	5'-5"	3.425	GREENHECK	RVE-40-30D-5A-1-02

DUCT SOUND ATTENUATOR

GENERAL NOTES:
 A. MINIMUM DYNAMIC INSERTION LOSS DETERMINED PER ASTM E477-13 IN A NVLAP-ACCREDITED ACOUSTICAL LABORATORY.
 NOTES:
 1. HTL (HIGH TRANSMISSION LOSS) SILENCER CASING.
 2. NON-BASIS OF DESIGN SILENCER MANUFACTURER SHALL PROVIDE, FOR APPROVAL, PROFESSIONAL ENGINEER STAMPED ACOUSTICAL AND PRESSURE DROP CALCULATIONS FOR ALL SILENCERS OR TEST DATA PERFORMED BY A NVLAP ACCREDITED LAB.
 3. NON-BASIS OF DESIGN PRODUCT SUPPLIED, CONTRACTOR IS FINANCIALLY RESPONSIBLE TO ENSURE NOISE CONTROL SOLUTION IS DELIVERED TO ACHIEVE MINIMUM DYNAMIC INSERTION LOSS PER SCHEDULE.

ID	SERVES	TYPE	ARRANGEMENT	CONNECTION SIZE (IN)			DIMENSIONS (IN)			AIRFLOW (CFM)	PRESSURE DROP (IN WG)	FACE VELOCITY (FPM)	MINIMUM DYNAMIC INSERTION LOSS, dB										BASIS OF DESIGN		
				RECTANGULAR		ATTENUATOR SIZE	LENGTH	RECTANGULAR	HEIGHT				63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	MANUFACTURER	MODEL	NOTES		
SA-1-1	DOAS-1	RECTANGULAR	INLINE	20"	16"	60"	22"	18"	2,185	0.17	747	6	11	20	33	34	28	17	12	VIBRO-ACOUSTICS	RD-MLV-F4	1.2,3			
SA-1-2	DOAS-1	RECTANGULAR	INLINE	24"	18"	36"	26"	20"	1,735	0.07	484	3	6	15	26	29	21	13	9	VIBRO-ACOUSTICS	RD-HV-F7	1.2,3			
SA-2-1	DOAS-2	RECTANGULAR	INLINE	20"	16"	60"	22"	18"	2,590	0.2	824	3	7	16	26	29	20	17	VIBRO-ACOUSTICS	RD-LV-F8	1.2,3				
SA-2-2	DOAS-2	RECTANGULAR	INLINE	20"	20"	60"	22"	22"	2,410	0.2	656	7	10	17	20	22	17	14	12	VIBRO-ACOUSTICS	RD-LV-F2	1.2,3			
SA-2-3	MAU-1	RECTANGULAR	INLINE	24"	22"	60"	26"	24"	6,080	0.2	1,403	6	15	25	30	22	19	18	15	VIBRO-ACOUSTICS	RD-LV-F3	1.2,3			
SA-3-1	DOAS-3	RECTANGULAR	INLINE	14"	14"	36"	16"	16"	1,120	0.2	632	3	6	14	27	38	32	22	15	VIBRO-ACOUSTICS	RD-LV-F9	1.2,3			
SA-3-2	DOAS-3	RECTANGULAR	INLINE	18"	18"	60"	18"	18"	1,120	0.2	499	3	6	13	22	25	21	17	15	VIBRO-ACOUSTICS	RD-MV-F8	1.2,3			

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE

GENERAL NOTES:
 A. ALL PERFORMANCE BASED ON TESTS CONDUCTED IN ACCORDANCE WITH ASHRAE 130-2008 AND AHRI 880-2011.
 B. ALL AIRFLOW, PRESSURE LOSSES AND HEATING PERFORMANCE VALUES HAVE BEEN CORRECTED FOR THE PROJECT SITE ALTITUDE.
 C. COIL AIR PRESSURE DROP SHOWN IS FOR MAX CFM.
 D. ALL NC LEVELS DETERMINED USING AHRI 886-2008 APPENDIX E.
 E. THE MCA AND MOCOP RATINGS WERE CALCULATED IN ACCORDANCE WITH UL STANDARDS BASED ON MOTOR FULL LOAD CURRENT RATINGS.
 F. PROVIDE ACOUSTICAL DUCT LINER FOR 10' DOWNSTREAM OF VAV INCLUDING ALL BRANCHES WITHIN 10'.

ID	LOCATION	NO.	NAME	SERVED BY	TYPE	DUCT CONIS (IN)			AIRFLOW (CFM)	STATIC PRESS (IN WG)		MAX NOISE CRITERIA (NC)		ELECTRICAL DATA				BASIS OF DESIGN		
						INLET (DIAMETER)	OUTLET	HEIGHT		INLET	DOWN	RAD	DISCH	MCA (A)	MOCOP (A)	VOLT (V)	PH	MANUFACTURER	MODEL	NOTES
VAV-101	101	LOUNGE	DOAS-1	SINGLE DUCT	8"	12"	10"	475	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-108	108	MK	DOAS-1	SINGLE DUCT	8"	12"	10"	575	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-112	101A	INFORMAL	DOAS-1	SINGLE DUCT	6"	12"	8"	315	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-114	101	LOUNGE	DOAS-1	SINGLE DUCT	4"	12"	8"	60	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-116	101A	INFORMAL	DOAS-1	SINGLE DUCT	6"	12"	8"	170	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-121	126	COPY	DOAS-1	SINGLE DUCT	8"	12"	8"	310	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-123	101A	INFORMAL	DOAS-1	SINGLE DUCT	6"	12"	8"	250	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-127	121	OPEN OFFICE	DOAS-1	SINGLE DUCT	4"	12"	8"	30	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-201	208	FLEX SPACE	DOAS-2	SINGLE DUCT	10"	14"	12 1/2"	1,050	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-203	203	BACK OF HOUSE	DOAS-2	SINGLE DUCT	6"	12"	8"	260	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-208	208	FLEX SPACE	DOAS-2	SINGLE DUCT	8"	12"	10"	565	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-210A	214	EMT	DOAS-2	SINGLE DUCT	6"	12"	8"	150	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-210B	226	STORAGE	DOAS-2	SINGLE DUCT	6"	12"	8"	155	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-211	219	CIRCULATION	DOAS-2	SINGLE DUCT	4"	12"	8"	150	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-215	213	CIRCULATION	DOAS-2	SINGLE DUCT	4"	12"	8"	150	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-221	221	HIDDLE	DOAS-2	SINGLE DUCT	4"	12"	8"	110	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-302	301	CIRCULATION	DOAS-3	SINGLE DUCT	6"	12"	8"	170	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-304	310	OPEN OFFICE	DOAS-3	SINGLE DUCT	6"	12"	8"	240	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-307	306	STORAGE	DOAS-3	SINGLE DUCT	6"	12"	8"	160	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-310	319	SMALL	DOAS-3	SINGLE DUCT	8"	12"	10"	305	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-315	310-1	CIRCULATION	DOAS-3	SINGLE DUCT	4"	12"	8"	90	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		
VAV-317	319	SMALL	DOAS-3	SINGLE DUCT	6"	12"	8"	155	0.75	0.5	20	20	0.4	15	277	1	PRICE	SDV		

EXHAUST VAV TERMINAL UNIT SCHEDULE

GENERAL NOTES:
 A. EXHAUST TERMINAL UNIT, SIZE AS LISTED, PRESSURE INDEPENDENT, CONTROLS BY OTHERS.
 B. PROVIDE WITH FACTORY AIRFLOW SENSOR.
 C. INSTALLED LOCATION SHALL ALLOW 36" CLEARANCE IN FRONT OF CONTROL PANEL.

ID	LOCATION	NO.	NAME	SERVED BY	TYPE	INLET/OUTLET		AIRFLOW (CFM)	STATIC PRESS (IN WG)		MAX NOISE CRITERIA (NC)		ELECTRICAL DATA				BASIS OF DESIGN			WEIGHT (LB)
						WIDTH	HEIGHT		DESIGN	MAX	INLET	DOWN	RAD	DISCH	MCA (A)	MOCOP (A)	VOLT (V)	PH	MANUFACTURER	
EVAV-100	109	STORAGE	DOAS-1	SINGLE DUCT EXHAUST	20"	17 1/2"	1,245	2,185	0.75	0.5	20	20	0.2	15	277	1	PRICE	SDE-14	100	
EVAV-110	109	STORAGE	DOAS-1	SINGLE DUCT EXHAUST	14"	12 1/2"	940	940	0.75	0.5	20	20	0.2	15	277	1	PRICE	SDE-9	62	
EVAV-201	228.25	FRONT OF HOUSE	DOAS-2	SINGLE DUCT EXHAUST	16"	15"	1,190	1,190	0.75	0.5	20	20	0.2	15	277	1	PRICE	SDE-12	75	
VAV-208	208	FLEX SPACE	DOAS-2	SINGLE DUCT EXHAUST	12"	10"	565	565	0.75	0.5	20	20	0.2	15	277	1	PRICE	SDE-7	53	
EVAV-210	217	LAUNDRY	DOAS-2	SINGLE DUCT EXHAUST	14"	12 1/2"	655	655	0.75	0.5	20	20	0.2	15	277	1	PRICE	SDE-9	62	

ASHP & ELECTRIC HEAT MAKEUP AIR UNIT SCHEDULE

GENERAL NOTES:
 A. MOUNT UNIT ON RAISED CONCRETE PAD MINIMUM 4" ABOVE SURROUNDING GRADE.
 B. INSTALL UNIT WITH VIBRATION ISOLATION BETWEEN UNIT AND CONCRETE PAD PER SPECIFICATIONS.
 C. PROVIDE UNIT WITH INTERNALLY ISOLATED FANS AND COMPRESSORS
 D. PROVIDE WITH GLASS 1" MOTORIZED DAMPERS
 E. PROVIDE WITH MODULATING HOT GAS REHEAT AND HUMIDITY CONTROLLER.
 F. CONTRACTOR TO COORDINATE ACCESS REQUIREMENTS TO ENSURE PROPER MAINTENANCE ACCESS.
 G. HEATING AND COOLING PERFORMANCE SHALL BE CAPABLE OF PROVIDING 75°F LAT IN HEATING AND 75°F LAT IN COOLING AND EVALUATED BASED ON OUTDOOR DESIGN TEMPS. (ADJUSTED TO LOCALIZED SITE) OF 11.1°F DB IN HEATING, AND 93.1°F DB, 74.8°F WB IN COOLING.
 H. DEHUMIDIFICATION COOLING PERFORMANCE SHALL BE CAPABLE OF 55°F LAT OR LESS AT OUTDOOR DESIGN CONDITIONS (ADJUSTED TO LOCALIZED SITE) OF 75°F DEW POINT, 83°F DB.
 J. BIDDING GREENHECK REPRESENTATIVE SHALL CONTACT CHRIS WOODBRIDGE AT CHRISW@DORSE.COM FOR DETAILS.

ID	SERVES	DESIGN AIRFLOW (CFM)	MIN AIR FLOW (CFM)	OUTDOOR AIRFLOW PERCENT (%)	FAN DATA				HEATING COIL DATA				COOLING COIL DATA				ELECTRICAL DATA				DIMENSIONAL DATA (FT - IN)				BASIS OF DESIGN																			
					STATIC PRESS (IN WG)		MOTOR DRIVE TYPE	HORSEPOWER (HP)	TYPE	CAPACITY (MBH)	TEMP DB (°F)	AIR SIDE		HOT GAS REHEAT		TYPE	QTY	ISCOPE	ISMRE	PRE FILTER MERV RATING	FINAL FILTER MERV RATING	FLA (A)	MCA (A)	MOCOP (A)	VOLT (V)	PH	MAX LENGTH	MAX WIDTH	MAX HEIGHT	WEIGHT (LBS)	MANUFACTURER	MODEL												
					EXT	TOTAL						ENT	LVG	INCLUDE HGR	CAPACITY (MBH)																		LVG AIR TEMP DB (°F)											
MAU-1	BACK OF HOUSE	5,065	2,200	100	0.75	1.75	DIRECT	2	2	ASHP	211.2	13.6	55.5	ELECTRIC	100	Yes	ASHP	324.8	222.2	100	1	75.5	55.7	55.6	Yes	224.0	99.4	INVERTER SCROLL	2	3.37	6.8	8	13	189.1	196.1	200	460	3	11'-5"	8'-1"	6'-5"	3,812	GREENHECK	RV-45-30A-1-F2

GRILLES, REGISTERS AND DIFFUSERS SCHEDULE

GENERAL NOTES:
 A. CONTRACTOR SHALL COORDINATE MOUNTING AND SURFACE CONSTRUCTION PRIOR TO FURNISHING MATERIAL.
 B. SEE PLANS FOR LOCATION, QUANTITY, NECK SIZE, FACE SIZE, AND CFM.
 C. SEE PLANS FOR QUANTITIES INSTALLED PER PHASE.

NOTES:
 1. BALANCE ALL DIFFUSERS TO 30 CFM.
 2. PROVIDE 1" MERV-8 FILTER

ID	DESCRIPTION	MATERIAL	FINISH
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SPLIT SYSTEM INDOOR UNIT SCHEDULE

- GENERAL NOTES:**
- CASSETTES SHALL BE RATED AT 37dBa OR LOWER AT DESIGN CONDITIONS.
 - PROVIDE DUCTED UNITS WITH MANUFACTURER'S RETURN AIR FILTER RACK.
 - UNITS TO INCLUDE INTEGRAL CONDENSATE PUMP AND OVERFLOW SENSOR TO SHUTDOWN UNIT ON HIGH LEVEL ALARM.
 - PROVIDE REFRIGERANT PIPING BETWEEN INDOOR UNITS, BRANCH SELECTORS (WHERE APPLICABLE), AND OUTDOOR UNITS PER MANUFACTURER'S PIPING DIAGRAM. PIPING PLANS SHOW GENERAL ARRANGEMENT ONLY. REFRIGERANT IS R-32.
 - REFRIGERANT SHALL BE R-32 OR OTHER REFRIGERANT COMPATIBLE WITH VRF SYSTEM WITH A GLOBAL WARMING POTENTIAL EQUAL TO OR LOWER THAN 700.
 - BIDDING DAIKIN REPRESENTATIVE SHALL CONTACT TIM KULINSKI, TIM@AIRREPS.COM FOR DETAILS.
- NOTES:**
- UNIT IS COOLING ONLY. NO HEATING OR HEATING LOCKED OUT.
 - PROVIDE POWER TO INDOOR UNIT FROM OUTDOOR UNIT.
 - PROVIDE CONDENSATE PAN BELOW UNIT WITH GRAVITY DRAIN TO NEAREST FLOOR DRAIN/SINK.
 - NOT USED
 - PROVIDE RETURN AIR FILTER KIT WITH MERV 13 FILTER. CONNECT TO UPTURNED DUCT ELBOW WITH BIRD SCREEN FIXED TO OPEN END OR DUCT CONNECTION PER PLANS. SIZE TO MATCH UNIT CONNECTION...

ID	LOCATION		TYPE	BRANCH SELECTOR ID	OUTDOOR UNIT ID	FAN DATA		REQUIRED TOTAL COOLING LOAD (BTUH)		REQUIRED HEATING LOAD (BTUH)		ELECTRICAL DATA			WEIGHT (LBS)	BASIS OF DESIGN		NOTES			
	NO.	NAME				DESIGN AIRFLOW (CFM)	MOTOR HP	NOMINAL CAPACITY (TON)	TOTAL CAPACITY (BTUH)	REQUIRED HEATING LOAD (BTUH)	HEATING CAPACITY (BTUH)	FLA (A)	MCA (A)	MOCAP (A)		VOLT (V)	PH		MANUFACTURER	MODEL	
CU-1A																					
AC-108	108	MK	DUCTED UNIT	BS-1-1	CU-1A	1,377	0.5	32,866	4	48,000	4,778	54,000	0.6	3.8	15	208	1	104	DAIKIN	FXMA48	5.6
AC-112A	112	OPEN OFFICE	CEILING CASSETTE	BS-1-1	CU-1A	547	0.06	15,391	1.5	24,000	737	21,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-112B	112	OPEN OFFICE	CEILING CASSETTE	BS-1-1	CU-1A	547	0.06	15,391	1.5	24,000	737	21,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-112C	112	OPEN OFFICE	CEILING CASSETTE	BS-1-1	CU-1A	547	0.06	15,391	1.5	24,000	737	21,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-112D	112	OPEN OFFICE	CEILING CASSETTE	BS-1-1	CU-1A	547	0.06	15,391	1.5	24,000	737	21,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-113-1	113	MDF	HIGH WALL DUCTLESS	BS-1-1	CU-1A	670	0.1	19,779	2	24,000	245	24,000	0.5	0.6	15	208	1	35	DAIKIN	FXAA24	1.3
AC-114	112	OPEN OFFICE	DUCTED UNIT	BS-1-1	CU-1A	318	0.5	6,333	0.8	9,600	758	10,500	0.6	0.8	15	208	1	55	DAIKIN	FXSA09	5.6
AC-116	116	LARGE	CEILING CASSETTE	BS-1-1	CU-1A	441	0.1	11,016	1	12,011	995	13,990	0.5	0.3	15	208	1	42	DAIKIN	FXFA12	
AC-128-1	128	ELEC	HIGH WALL DUCTLESS	BS-1-1	CU-1A	670	0.1	20,460	2	24,000	907	24,000	0.5	0.6	15	208	1	35	DAIKIN	FXAA24	1.3
CU-1B																					
AC-101	101	LOUNGE	DUCTED UNIT	BS-1-3	CU-1B	1,130	0.5	32,965	3	36,000	5,664	40,000	2.3	3.1	15	208	1	101	DAIKIN	FXMA36	5.6
AC-103	101	LOUNGE	DUCTED UNIT	BS-1-3	CU-1B	335	0.5	9,659	1	12,000	6,106	13,500	0.5	0.8	15	208	1	55	DAIKIN	FXSA12	5.6
AC-104	104	HIDDLE	CEILING CASSETTE	BS-1-3	CU-1B	300	0.1	4,386	0.5	6,000	618	6,500	0.2	0.3	15	208	1	35	DAIKIN	FXZA05	
AC-105	105	MOTHER'S ROOM	CEILING CASSETTE	BS-1-3	CU-1B	300	0.1	2,108	0.5	6,000	395	6,500	0.2	0.3	15	208	1	35	DAIKIN	FXZA05	
AC-110	110	RESTROOM VESTIBULE	DUCTED UNIT	BS-1-3	CU-1B	636	0.5	12,519	1.5	18,000	7,594	20,000	0.6	1.9	15	208	1	77	DAIKIN	FXMA18	5.6
AC-117	121	OPEN OFFICE	DUCTED UNIT	BS-1-2	CU-1B	636	0.5	13,557	1.5	18,000	1,603	20,000	0.6	1.9	15	208	1	77	DAIKIN	FXMA18	5.6
AC-121A	121	OPEN OFFICE	CEILING CASSETTE	BS-1-2	CU-1B	547	0.06	14,413	1.5	24,000	858	21,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-121B	121	OPEN OFFICE	CEILING CASSETTE	BS-1-2	CU-1B	547	0.06	14,413	1.5	24,000	858	21,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-121C	121	OPEN OFFICE	CEILING CASSETTE	BS-1-2	CU-1B	547	0.06	14,413	1.5	24,000	858	21,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-121D	121	OPEN OFFICE	CEILING CASSETTE	BS-1-2	CU-1B	547	0.06	14,413	1.5	24,000	858	21,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-122	122	SMALL/FITNESS	CEILING CASSETTE	BS-1-2	CU-1B	353	0.1	10,764	1	12,000	732	13,990	0.2	0.4	15	208	1	36	DAIKIN	FXZA12	
AC-123	123	MEDIUM	CEILING CASSETTE	BS-1-2	CU-1B	353	0.1	8,218	1	12,000	813	13,990	0.2	0.4	15	208	1	36	DAIKIN	FXZA12	
AC-127	127	OFFICE	CEILING CASSETTE	BS-1-2	CU-1B	300	0.1	4,949	0.5	6,000	629	6,500	0.2	0.3	15	208	1	35	DAIKIN	FXZA05	
CU-2A																					
AC-201A	201	CAFE	DUCTED UNIT	BS-2-1	CU-2A	1,377	0.5	36,584	4	48,000	2,358	54,000	2.2	3.6	15	208	1	104	DAIKIN	FXMA48	5.6
AC-201B	201	CAFE	DUCTED UNIT	BS-2-1	CU-2A	1,377	0.5	36,584	4	48,000	2,358	54,000	2.2	3.6	15	208	1	104	DAIKIN	FXMA48	5.6
AC-201C	201	CAFE	DUCTED UNIT	BS-2-1	CU-2A	1,377	0.5	36,584	4	48,000	2,358	54,000	2.2	3.6	15	208	1	104	DAIKIN	FXMA48	5.6
AC-202A	228.25	KITCHEN FRONT OF HOUSE	CEILING CASSETTE	BS-2-1	CU-2A	1,059	0.1	23,651	2.5	18,000	289	20,700	0.5	1	15	208	1	58	DAIKIN	FXFA30	
AC-202B	228.25	KITCHEN FRONT OF HOUSE	CEILING CASSETTE	BS-2-1	CU-2A	1,059	0.1	23,651	2.5	18,000	289	20,700	0.5	1	15	208	1	58	DAIKIN	FXFA30	
AC-208A	208	FLEX SPACE	DUCTED UNIT	BS-2-1	CU-2A	1,130	0.5	33,947	3	36,000	2,345	40,000	2.2	3.1	15	208	1	101	DAIKIN	FXMA36	5.6
AC-208B	208	FLEX SPACE	DUCTED UNIT	BS-2-1	CU-2A	1,130	0.5	33,947	3	36,000	2,345	40,000	2.2	3.1	15	208	1	101	DAIKIN	FXMA36	5.6
CU-2B																					
AC-107A	107A	STORAGE	HIGH WALL DUCTLESS	BS-2-2	CU-2B	670	0.1	19,317	2	24,000	412	24,000	1	0.8	15	208	1	35	DAIKIN	FXAA24	1
AC-203B	203	BACK OF HOUSE	CEILING CASSETTE	BS-2-2	CU-2B	1,253	0.1	25,305	4	30,000	724	34,000	0.5	1.6	15	208	1	58	DAIKIN	FXFA48	
AC-203C	203	BACK OF HOUSE	CEILING CASSETTE	BS-2-2	CU-2B	1,253	0.1	25,305	4	30,000	724	34,000	0.5	1.6	15	208	1	58	DAIKIN	FXFA48	
AC-204	228.29	DISH	CEILING CASSETTE	BS-2-2	CU-2B	1,253	0.1	40,134	4	48,000	1,163	34,000	0.5	1.6	15	208	1	58	DAIKIN	FXFA48	
AC-214	214	EMT	CEILING CASSETTE	BS-2-2	CU-2B	300	0.1	3,658	0.5	6,000	646	6,500	0.2	0.3	15	208	1	35	DAIKIN	FXZA05	
AC-215	215	LARGE	CEILING CASSETTE	BS-2-2	CU-2B	512	0.1	11,966	1.25	18,000	976	20,700	0.5	0.4	15	208	1	42	DAIKIN	FXFA15	
AC-216	213	CIRCULATION	CEILING CASSETTE	BS-2-2	CU-2B	317	0.1	6,783	0.68	8,186	708	10,574	0.2	0.3	15	208	1	35	DAIKIN	FXZA09	
CU-2C																					
AC-203A	203	BACK OF HOUSE	CEILING CASSETTE	BS-2-3	CU-2C	1,253	0.1	25,305	4	30,000	724	34,000	0.5	1.6	15	208	1	58	DAIKIN	FXFA48	
AC-207	207	OFFICE	CEILING CASSETTE	BS-2-3	CU-2C	300	0.1	4,173	0.5	6,000	1,445	6,500	0.2	0.3	15	208	1	35	DAIKIN	FXZA05	
AC-210A	210	OPEN OFFICE	CEILING CASSETTE	BS-2-3	CU-2C	547	0.06	14,302	1.5	24,000	813	27,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-210B	210	OPEN OFFICE	CEILING CASSETTE	BS-2-3	CU-2C	547	0.06	14,302	1.5	24,000	813	27,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-210C	210	OPEN OFFICE	CEILING CASSETTE	BS-2-3	CU-2C	547	0.06	14,302	1.5	24,000	813	27,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-210D	210	OPEN OFFICE	CEILING CASSETTE	BS-2-3	CU-2C	547	0.06	14,302	1.5	24,000	813	27,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-210E	210	OPEN OFFICE	CEILING CASSETTE	BS-2-3	CU-2C	547	0.06	14,302	1.5	24,000	813	27,000	0.5	0.4	15	208	1	42	DAIKIN	FXFA18	
AC-220	210	OPEN OFFICE	DUCTED UNIT	BS-2-3	CU-2C	558	0.5	11,135	1.2	14,400	1,283	17,000	2.2	1.8	15	208	1	77	DAIKIN	FXMA15	5.6
AC-222	222	PHONE	CEILING CASSETTE	BS-2-3	CU-2C	300	0.1	1,844	0.5	6,000	3,771	6,500	0.2	0.3	15	208	1	35	DAIKIN	FXZA05	
AC-223	223	MEDIUM	CEILING CASSETTE	BS-2-3	CU-2C	353	0.1	10,119	1	12,000	2,838	13,990	0.5	0.4	15	208	1	36	DAIKIN	FXZA12	
AC-225	225	PHONE	CEILING CASSETTE	BS-2-3	CU-2C	300	0.1	1,895	0.5	6,000	227	6,500	0.2	0.3	15	208	1	35	DAIKIN	FXZA05	
CU-3																					
AC-302	301	CIRCULATION	DUCTED UNIT	BS-3-2	CU-3	558	0.5	10,903	1.2	14,400	2,237	17,000	2.3	1.8	15	208	1	77	DAIKIN	FXMA15	5.6
AC-303	301	CIRCULATION	DUCTED UNIT	BS-3-2	CU-3	558	0.5	10,903	1.2	14,400	295	17,000	2.3	1.8	15	208	1	77	DAIKIN	FXMA15	5.6
AC-304	304	LARGE TRAINING	DUCTED UNIT	BS-3-2	CU-3	1,377	0.5	32,144	4	48,000	8,367	54,000	2.3	3.6	15	208	1	104	DAIKIN	FXMA48	5.6
AC-305	301	CIRCULATION	DUCTED UNIT	BS-3-2																	