



SEQUENCE OF OPERATION FOR CONSTANT VOLUME MAKE-UP AIR HANDLING UNIT  
(1-MAU-29)

1. GENERAL

1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1 SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-1 SHALL BE FULLY OPEN. A DAMPER END SWITCH SHALL PREVENT SUPPLY FAN FROM STARTING UNTIL DAMPER IS 50% OPEN.

2. TEMPERATURE CONTROL

2.1 THE PREHEAT VALVE V-2 SHALL CONSIST OF TWO VALVES (A & B) SIZED FOR 1/3 AND 2/3 (RESPECTIVELY) OF THE TOTAL CAPACITY. THE PAIR SHALL OPERATE IN SEQUENCE WITH THE SMALLER VALVE OPENING FIRST. PROVIDE ANALOG FEEDBACK SIGNAL FOR EACH VALVE TO MONITOR VALVE POSITION.

2.2 PREHEAT COIL IF THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) IS BELOW 35°F [1.7°C]. STEAM VALVE V-2 SHALL GO TO FULL OPEN AND THE PREHEAT COIL FACE-AND-BYPASS DAMPER (D-2) SHALL MODULATE TO MAINTAIN A TEMPERATURE SETPOINT OF 70°F (AS MEASURED BY TT-5) WHICH IS ADJUSTABLE.

2.3 PREHEAT COIL IF THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) IS GREATER THAN 70°F. STEAM VALVE V-2 SHALL GO TO FULL CLOSED AND THE PREHEAT COIL FACE-AND-BYPASS DAMPER (D-2) SHALL GO TO FULL BYPASS.

2.4 PREHEAT COIL IF THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) IS BETWEEN 35°F AND 70°F. THE PREHEAT COIL FACE-AND-BYPASS DAMPER (D-2) SHALL GO OPEN TO FULL AIRFLOW ACROSS THE FACE OF THE COIL AND STEAM VALVE V-2 SHALL MODULATE TO MAINTAIN A TEMPERATURE SETPOINT OF 70°F (AS MEASURED BY TT-5) WHICH IS ADJUSTABLE. DEHUMIDIFICATION, IF REQUIRED, WILL OVERRIDE THIS SETPOINT AS DESCRIBED IN PARAGRAPH 4.2.

2.5 COOLING COIL: IF THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) RISES ABOVE 70°F (ADJUSTABLE), THE DX COOLING STAGES WILL BE ACTIVATED TO MAINTAIN DISCHARGE AIR (AS MEASURED BY TT-5) AT 70°F (ADJUSTABLE). THE FOUR DX COOLING STAGES WILL BE ACTIVATED SEQUENTIALLY AND ALLOW FOR A CONFIGURABLE TIME DELAY BETWEEN EACH STAGE. ONCE ACTIVATED, EACH STAGE WILL NOT BE DEACTIVATED UNTIL THE CONTROL ALGORITHM HAS CALCULATED A DECREMENT OF A FULL STAGE. COOLING WILL BE LOCKED OUT WHEN OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) FALLS BELOW THE COOLING LOCKOUT SETPOINT OF 50°F (ADJUSTABLE).

3. AIR FLOW CONTROL

3.1 THE MAKE-UP AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN'S VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 8,000 CFM (FIELD ADJUSTABLE), SENSED BY FT-1.

3.2 HIGH PRESSURE SWITCH SPS-1 LOCATED AT THE SUPPLY FAN DISCHARGE SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 2" (75mm) OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-1 DOES EXCEED 2" (75mm) THE SUPPLY AIR FAN SHALL STOP. SPS-1 SHALL BE HARDWIRED TO THE SUPPLY FAN'S VARIABLE SPEED MOTOR CONTROLLER (STARTING DEVICE) AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. SPS-1 WILL REQUIRE MANUAL RESET AT THE DEVICE.

4. DEHUMIDIFICATION

4.1 ON A RISE OF THE DISCHARGE AIR HUMIDITY (AS MEASURED BY SENSOR H-1) ABOVE 50% RELATIVE HUMIDITY (ADJUSTABLE), THE DX COOLING STAGES SHALL BE ACTIVATED AS DETERMINED BY ITS PID LOOP TO DEHUMIDIFY THE DISCHARGE AIR. DURING DEHUMIDIFICATION, IF THE DISCHARGE AIR TEMPERATURE DROPS BELOW 70°F (ADJUSTABLE), THE HOT GAS REHEAT V-1 SHALL MODULATE TO REHEAT THE DISCHARGE AIR AS REQUIRED TO MAINTAIN DISCHARGE AIR SETPOINT. PROVIDE ANALOG FEEDBACK FOR THE HOT GAS REHEAT FUNCTION.

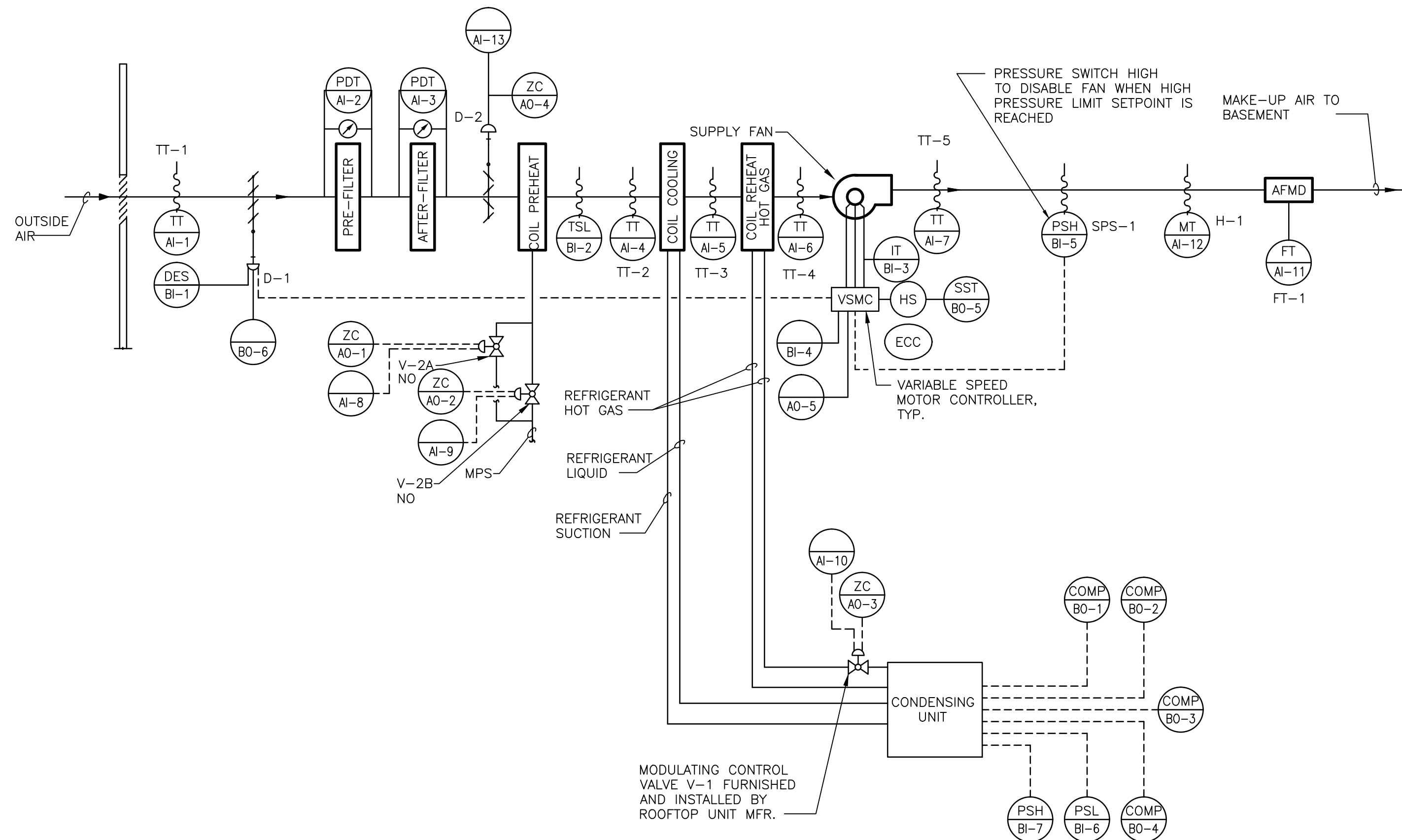
4.2 DURING DEHUMIDIFICATION, THE PREHEAT COIL DISCHARGE TEMPERATURE SETPOINT SHALL BE LOWERED TO 55°F. AFTER COMPLETION OF DEHUMIDIFICATION, PREHEAT COIL DISCHARGE TEMPERATURE SETPOINT SHALL RETURN TO THE VALUE GIVEN IN PARAGRAPH 2.

5. FREEZE PROTECTION

5.1 IF THE AIR TEMPERATURE AS SENSED BY TT-2 FALLS BELOW 45°F [7°C], AN ALARM SIGNAL SHALL INDICATE AT THE DDC PANEL AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F [4.4°C], AS SENSED BY THE TSL, THE SUPPLY FAN SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIRECT DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN VFD AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO, OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.

6. EMERGENCY CONSTANT SPEED OPERATION

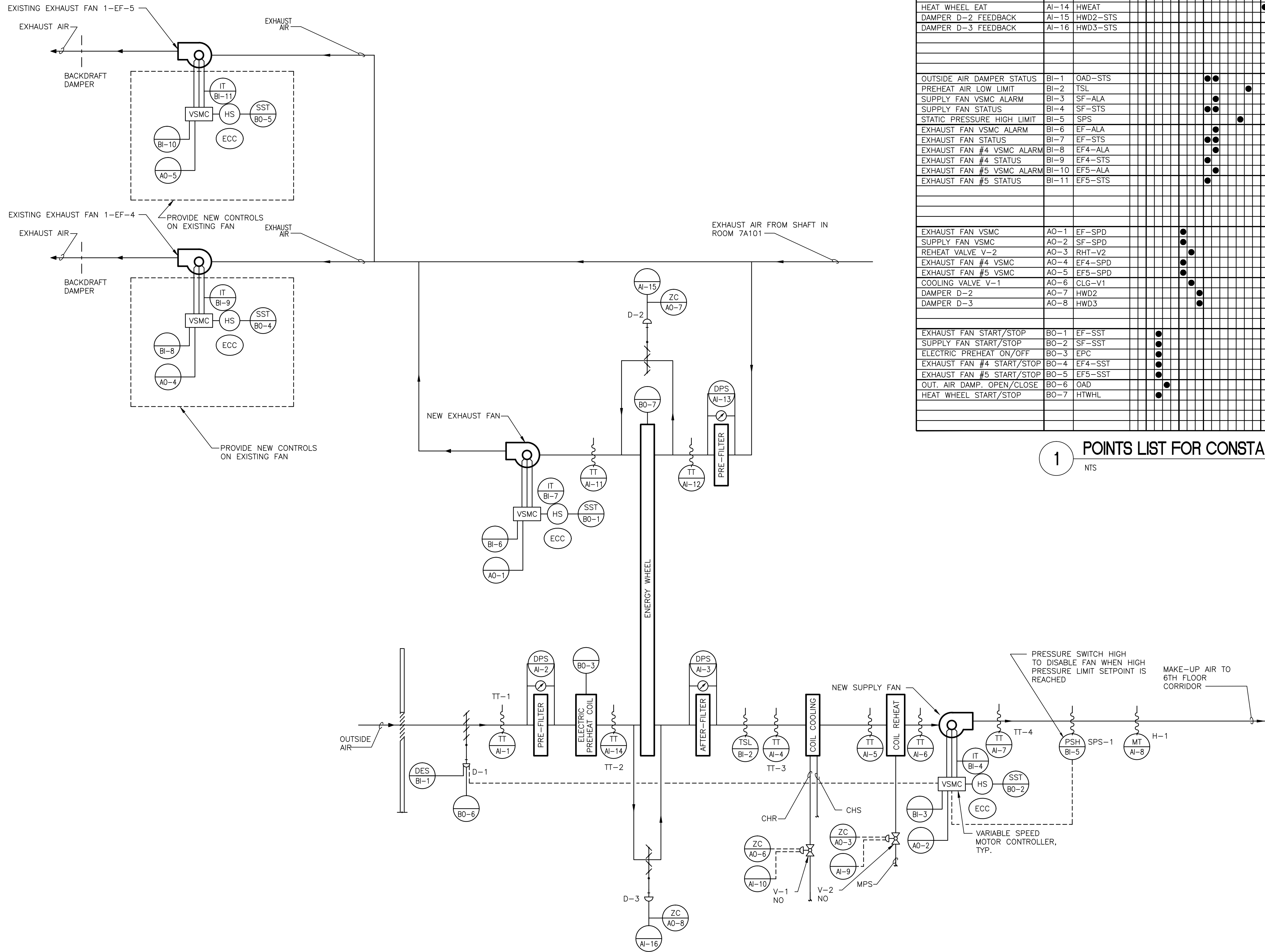
6.1 UPON FAILURE OF THE VFD, THE SUPPLY FAN SHALL BE STARTED/STOPPED MANUALLY AT THE DIRECT DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER. FAN SHALL THEN BE OPERATED AT CONSTANT SPEED.





# SEQUENCE OF OPERATION FOR MAKE-UP AIR UNIT (1-MAU-30)

- GENERAL
  - UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1 SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-1 SHALL BE FULLY OPEN. A DAMPER END SWITCH SHALL PREVENT SUPPLY FAN FROM STARTING UNTIL DAMPER IS 50% OPEN.
  - THE EXHAUST FAN AND ENERGY WHEEL SHALL RUN WHEN THE SUPPLY FAN IS RUNNING.
- TEMPERATURE CONTROL
  - WHEN THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) FALLS BELOW 15°F (ADJUSTABLE), THE ELECTRIC PREHEAT COIL SHALL BE ENERGIZED. WHEN THE OUTSIDE AIR TEMPERATURE RISES ABOVE 17°F (ADJUSTABLE), THE ELECTRIC PREHEAT COIL SHALL BE DEENERGIZED. THE PREHEAT COIL IS USED TO PREVENT FROST FORMATION ON THE HEAT WHEEL.
  - COOLING MODE (WHEN OUTSIDE AIR TEMPERATURE IS GREATER THAN OR EQUAL TO THE DISCHARGE AIR SETPOINT): MODULATE HEAT WHEEL BYPASS DAMPERS D-2 & D-3 AND CHILLED WATER VALVE V-1 OPEN IN SEQUENCE TO MAINTAIN A TEMPERATURE SETPOINT OF 70°F (AS MEASURED BY TT-4) WHICH IS ADJUSTABLE. PROVIDE ANALOG FEEDBACK SIGNAL FOR V-1 TO MONITOR VALVE POSITION AND D-2/D-3 TO MONITOR DAMPER POSITION.
  - HEATING MODE (WHEN OUTSIDE AIR TEMPERATURE IS LESS THAN THE DISCHARGE AIR SETPOINT): MODULATE HEAT WHEEL BYPASS DAMPERS D-2 & D-3 AND REHEAT STEAM VALVE V-2 OPEN IN SEQUENCE TO MAINTAIN A TEMPERATURE SETPOINT OF 70°F (AS MEASURED BY TT-4) WHICH IS ADJUSTABLE. PROVIDE ANALOG FEEDBACK SIGNAL FOR V-2 TO MONITOR VALVE POSITION AND D-2/D-3 TO MONITOR DAMPER POSITION.
  - DISCHARGE AIR SETPOINT SHALL BE 70°F (ADJUSTABLE) AS MEASURED BY TT-4.
- AIR FLOW CONTROL
  - THE SUPPLY FAN AND EXHAUST FAN SHALL BE OPERATED AT CONSTANT SPEED. THE AIR BALANCE CONTRACTOR SHALL SET THE VFD SPEED FOR 1400 CFM OF SUPPLY AIR AND 1350 CFM OF EXHAUST AIR.
  - HIGH PRESSURE SWITCH SPS-1 LOCATED AT THE SUPPLY FAN DISCHARGE SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 2" (75mm) OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-1 DOES EXCEED 2" (75mm) THE SUPPLY AIR FAN SHALL STOP. SPS-1 SHALL BE HARDWIRED TO THE SUPPLY FAN'S VARIABLE SPEED MOTOR CONTROLLER (STARTING DEVICE) AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. SPS-1 WILL REQUIRE MANUAL RESET AT THE DEVICE.
- DEHUMIDIFICATION
  - ON A RISE OF THE DISCHARGE AIR HUMIDITY (AS MEASURED BY H-1) ABOVE 50% RELATIVE HUMIDITY (ADJUSTABLE), THE COOLING CONTROL VALVE SHALL MODULATE OPEN AS DETERMINED BY ITS PID LOOP AS REQUIRED TO DEHUMIDIFY THE DISCHARGE AIR. DURING DEHUMIDIFICATION, IF THE DISCHARGE AIR TEMPERATURE DROPS BELOW 70°F (ADJUSTABLE), THE STEAM REHEAT VALVE V-2 SHALL MODULATE OPEN TO REHEAT THE DISCHARGE AIR AS REQUIRED TO MAINTAIN DISCHARGE AIR SETPOINT.
- FREEZE PROTECTION
  - IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45°F (7°C), AN ALARM SIGNAL SHALL INDICATE AT THE DDC PANEL AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F (4.4°C), AS SENSED BY THE TSL THE SUPPLY FAN SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIRECT DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN VFD AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO, OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.
- EMERGENCY CONSTANT SPEED OPERATION
  - UPON FAILURE OF A VFD, THE SUPPLY FAN OR EXHAUST FAN SHALL BE STARTED/STOPPED MANUALLY AT THE DIRECT DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER.



1. **AIR FLOW CONTROL**

1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE FCC. H-0-0 SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "STOP" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1 SHALL BE FULLY CLOSED, WHEN THE UNIT IS "ON" D-1 SHALL BE FULLY OPEN. A DAMPER END SWITCH SHALL PREVENT SUPPLY FAN FROM STARTING UNTIL DAMPER IS 50% OPEN.

1.2 THE EXHAUST FAN AND ENERGY WHEEL SHALL RUN WHEN THE SUPPLY FAN IS RUNNING.

2. **TEMPERATURE CONTROL**

2.1 WHEN THE OUTSIDE AIR TEMPERATURE (AS MEASURED BY TT-1) FALLS BELOW 15°F (ADJUSTABLE), THE ELECTRIC PREHEAT COIL SHALL BE ENERGIZED. WHEN THE OUTSIDE AIR TEMPERATURE RISES ABOVE 17°F (ADJUSTABLE), THE ELECTRIC PREHEAT COIL SHALL BE DEENERGIZED. THE PREHEAT COIL IS USED TO PREVENT FROST FORMATION ON THE HEAT WHEEL.

2.2 COOLING MODE (WHEN OUTSIDE AIR TEMPERATURE IS GREATER THAN OR EQUAL TO THE DISCHARGE AIR SETPOINT): MODULATE HEAT WHEEL BYPASS DAMPERS D-2 & D-3 AND CHILLED WATER VALVE V-1 IN SEQUENCE TO MAINTAIN A TEMPERATURE SETPOINT OF 70°F (AS MEASURED BY TT-4) WHICH IS ADJUSTABLE. PROVIDE ANALOG FEEDBACK SIGNAL FOR V-1 TO MONITOR VALVE POSITION AND D-2/D-3 TO MONITOR DAMPER POSITION.

2.3 HEATING MODE (WHEN OUTSIDE AIR TEMPERATURE IS LESS THAN THE DISCHARGE AIR SETPOINT): MODULATE HEAT WHEEL BYPASS DAMPERS D-2 & D-3 AND REHEAT STEAM VALVE V-2 OPEN IN SEQUENCE TO MAINTAIN A TEMPERATURE SETPOINT OF 70°F (AS MEASURED BY TT-4) WHICH IS ADJUSTABLE. PROVIDE ANALOG FEEDBACK SIGNAL FOR V-2 TO MONITOR VALVE POSITION AND D-2/D-3 TO MONITOR DAMPER POSITION.

2.4 DISCHARGE AIR SETPOINT SHALL BE 70°F (ADJUSTABLE) AS MEASURED BY TT-4.

3. **AIR FLOW CONTROL**

3.1 THE SUPPLY FAN AND EXHAUST FAN SHALL BE OPERATED AT CONSTANT SPEED. THE AIR BALANCE CONTRACTOR SHALL SET THE VFD SPEED FOR 1400 CFM OF SUPPLY AIR AND 1350 CFM OF EXHAUST AIR.

3.2 HIGH PRESSURE SWITCH SP5-1 LOCATED AT THE SUPPLY FAN DISCHARGE SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 72" [75mm] OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SP5-1 DOES EXCEED 72" [75mm] THE SUPPLY AIR FAN SHALL STOP. SP5-1 SHALL BE HARDWIRED TO THE SUPPLY FAN'S VARIABLE SPEED MOTOR CONTROLLER (STARTING DEVICE) AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. SP5-1 WILL REQUIRE MANUAL RESET AT THE DEVICE.

—4.1 ON A RISE OF THE DISCHARGE AIR HUMIDITY (AS MEASURED BY H-1) ABOVE 50% RELATIVE HUMIDITY (ADJUSTABLE), THE COOLING CONTROL VALVE SHALL MODULATE OPEN AS DETERMINED BY ITS PID LOOP AS REQUIRED TO DEHUMIDIFY THE DISCHARGE AIR. DURING DEHUMIDIFICATION, IF THE DISCHARGE AIR TEMPERATURE DROPS BELOW 70°F (ADJUSTABLE), THE STEAM REHEAT VALVE V-2 SHALL MODULATE OPEN TO REHEAT THE DISCHARGE AIR AS REQUIRED TO MAINTAIN DISCHARGE AIR SETPOINT.

5.1 IF THE AIR TEMPERATURE AS SENSED BY TT-3 FALLS BELOW 45°F [7°C], AN ALARM SIGNAL SHALL INDICATE AT THE DDC PANEL AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F [4.4°C], AS SENSED BY THE TSL THE SUPPLY FAN SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIRECT DIGITAL CONTROL PANEL AND ECC. TSL SHALL BE HARDWIRED TO THE SUPPLY FAN VFD AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO, OR BYPASS MODE. TSL WILL REQUIRE MANUAL RESET AT THE DEVICE.

6.1 UPON FAILURE OF A VFD, THE SUPPLY FAN OR EXHAUST FAN SHALL BE STARTED/STOPPED MANUALLY AT THE DIRECT DIGITAL CONTROL PANEL OR THE ECC THROUGH THE BY-PASS STARTER.

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







1 POINTS LIST FOR CONSTANT VOLUME MAKE-UP AIR UNIT (1-MAU-31)

three inches = one foot  
one and one-half inch = one foot  
one-half inch = one foot  
three-quarters inch = one foot  
three-eighths inch = one foot  
one-quarter inch = one foot  
one-eighth inch = one foot

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E  
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11007

ELECTRICAL SYMBOL LIST

-  PANELBOARD CABINET, FLUSH MOUNTED
-  PANELBOARD CABINET, SURFACE MOUNTED
-  BRANCH CIRCUIT HOMERUN. LINES INDICATE NUMBER OF CIRCUITS, NEUTRAL, AND SWITCH LEG CONDUCTORS. ONE SEPARATE GREEN GROUNDING CONDUCTOR SHALL BE PROVIDED FOR EACH HOMERUN; NOT SHOWN
-  JUNCTION BOX
-  DISCONNECT SWITCH, UNFUSED
-  STARTER, COMBINATION WITH DISCONNECT SWITCH
-  CONDUIT RUN CONCEALED IN GROUND OR FLOOR. #12 WIRES IN 3/4" CONDUIT. OTHER SIZES AS NOTED.
-  FLEXIBLE CONDUIT – FINAL CONNECTION TO EQUIPMENT.
-  USED FOR IDENTIFICATION OF ASSOCIATED PLAN NOTES.
-  RECEPTACLE, DUPLEX
-  RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER  
WP = WEATHERPROOF.
-  FIRE ALARM DUCT TYPE SMOKE DETECTOR.

ELECTRICAL GENERAL DEMOLITION NOTES

1. THE DEMOLITION ITEMS ON THE DRAWINGS ARE APPROXIMATE AND WERE COMPILED BY OBSERVATIONS MADE DURING A WALK THROUGH TOUR AT THE SITE. THE INTENT IS TO GENERALLY INDICATE DEMOLITION ITEMS AND AREAS AND IS NOT INTENDED TO COMPLETELY INDICATE ALL THE WORK REQUIRED.
2. IN GENERAL, DISCONNECT AND REMOVE ELECTRICAL ITEMS IN THE DEMOLITION AREAS INCLUDING, BUT NOT LIMITED TO CONDUIT AND WIRING, ETC. ALL AS REQUIRED TO ACCOMMODATE REMODELING AND CONSTRUCTION AS SHOWN ON THE DRAWINGS. REMOVE ALL UNUSED CONDUIT AND WIRING COMPLETE BACK TO SOURCE. ELECTRICAL CONTRACTOR SHALL INCLUDE TIME TO INVESTIGATE, TRACE AND IDENTIFY ALL CIRCUITS, FEEDERS AND OTHER SYSTEM WIRING PRIOR TO REMOVALS AND INSTALLATIONS. MAINTAIN SERVICES TO AREAS NOT BEING REMODELED. REUSE EXISTING WHERE REQUIRED. UNUSED BREAKERS AND SWITCHES TO REMAIN AS SPARE. SEE PLAN NOTES FOR ITEMS TO BE RETAINED AND REUSED OR RELOCATED. MAINTAIN ANY THROUGH WIRING TO SYSTEMS IN AREAS NOT BEING REMODELED.
3. SEE PLUMBING AND HVAC DRAWINGS FOR ALL DEMOLISHED EQUIPMENT.
4. PROVIDE NEW BLANK MATCHING COVERPLATES FOR ALL EXISTING BOXES WHERE THE DEVICE IS REMOVED AND NOT REPLACED WITH A NEW DEVICE.
5. WORK INVOLVING A POWER OUTAGE SHALL BE PERFORMED ON WEEKENDS AND NIGHTS AND MUST BE COORDINATED WITH THE OWNER WITH A MINIMUM OF 14 DAYS NOTICE. OTHER WORK IN OCCUPIED AREAS OF THE HOSPITAL MAY ALSO REQUIRE NIGHT AND WEEKEND HOURS, COORDINATE SCHEDULE WITH COTR PRIOR TO THE START OF ANY WORK. THE SCHEDULING AND COORDINATION OF OUTAGES ARE TO BE DONE IN ADVANCE WITH THE COTR BY WRITTEN REQUEST STATING WORK TO BE PERFORMED, TIME REQUESTED TO PERFORM WORK, TOTAL DURATION OF INTERRUPTION AND AREAS TO BE AFFECTED.

ELECTRICAL GENERAL NOTES

1. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ANY NEW WORK RELATED TO REPLACING EXISTING CONDUIT AND WIRING PRIOR TO ASSOCIATED DEMOLITION. IN GENERAL, DISCONNECT ELECTRICAL EQUIPMENT, FURNISH AND INSTALL NEW WORK, MAKE ALL CONNECTIONS, AND REMOVE EXISTING WORK TO BE DEMOLISHED. THIS WORK IS TO BE SEQUENCED SO AS TO MINIMIZE THE AMOUNT AND DURATION OF OUTAGES.
2. FOR ANY UNUSED EMPTY BOXES, FURNISH AND INSTALL A BLANK COVER PLATE.
3. FOR ALL EXISTING PANELBOARDS AFFECTED BY CIRCUITING CHANGES AS SHOWN ON THE DRAWINGS, PROVIDE A NEW UPDATED TYPEWRITTEN PANEL DIRECTORY PER SPECIFICATIONS.
4. ALL NEW VARIABLE SPEED DRIVES ARE FURNISHED BY THE TEMPERATURE CONTROLS SUBCONTRACTOR, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. LOW VOLTAGE WIRING BY TEMPERATURE CONTROLS SUBCONTRACTOR.

ELECTRICAL ABBREVIATIONS

A	AMPERES
AFF	ABOVE FINISHED FLOOR
E.C.	ELECTRICAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GRD.	GROUND
MCA	MINIMUM CIRCUIT AMPACITY
MFR.	MANUFACTURER
N.C.	NORMALLY OPEN CONTACT
N.O.	NORMALLY CLOSED CONTACT
N.T.S.	NOT TO SCALE
S.F.	SUBFEED TO PANEL
W (AT EQUIPMENT)	WATTS
W (AT DISTRIBUTION)	WIRE
V	VOLTS
VA	VOLT AMPERES
Z	IMPEDANCE
ø	PHASE
TYP.	TYPICAL
AHJ	AUTHORITY HAVING JURISDICTION
A.C.	ABOVE COUNTER

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APPROVED: SAFETY MANAGER  
JUSTIN GREENE  
APPROVED: INFECTION CONTROL  
SHAWN M. MILLS  
APPROVED:

APPROVED: CHIEF, FACILITIES MANAGEMENT SERVICE LINE  
CLAYTON HELMS, CHFM  
APPROVED: ASSOCIATE DIRECTOR for PATIENT CARE SERVICES/EXECUTIVE NURSE  
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KARIN L. McGRAW, MSN, FACHE  
APPROVED: ASSOCIATE DIRECTOR  
J. BRIAN NIMMO, MS  
APPROVED: CHIEF OF STAFF  
JOHN D. BERRYMAN, M. D.

DRAWING TITLE:  
ELECTRICAL SYMBOLS, ABBREV.  
& GENERAL NOTES

PROJECT TITLE:  
HVAC NEGATIVE AIR CORRECTIONS

DATE  
07/06/2012

REV.

SCALE

DRAWING No.  
EP001

PROJECT No.  
517-11-105

DRAWN BY:  
TMS

CHECKED BY:  
JPA

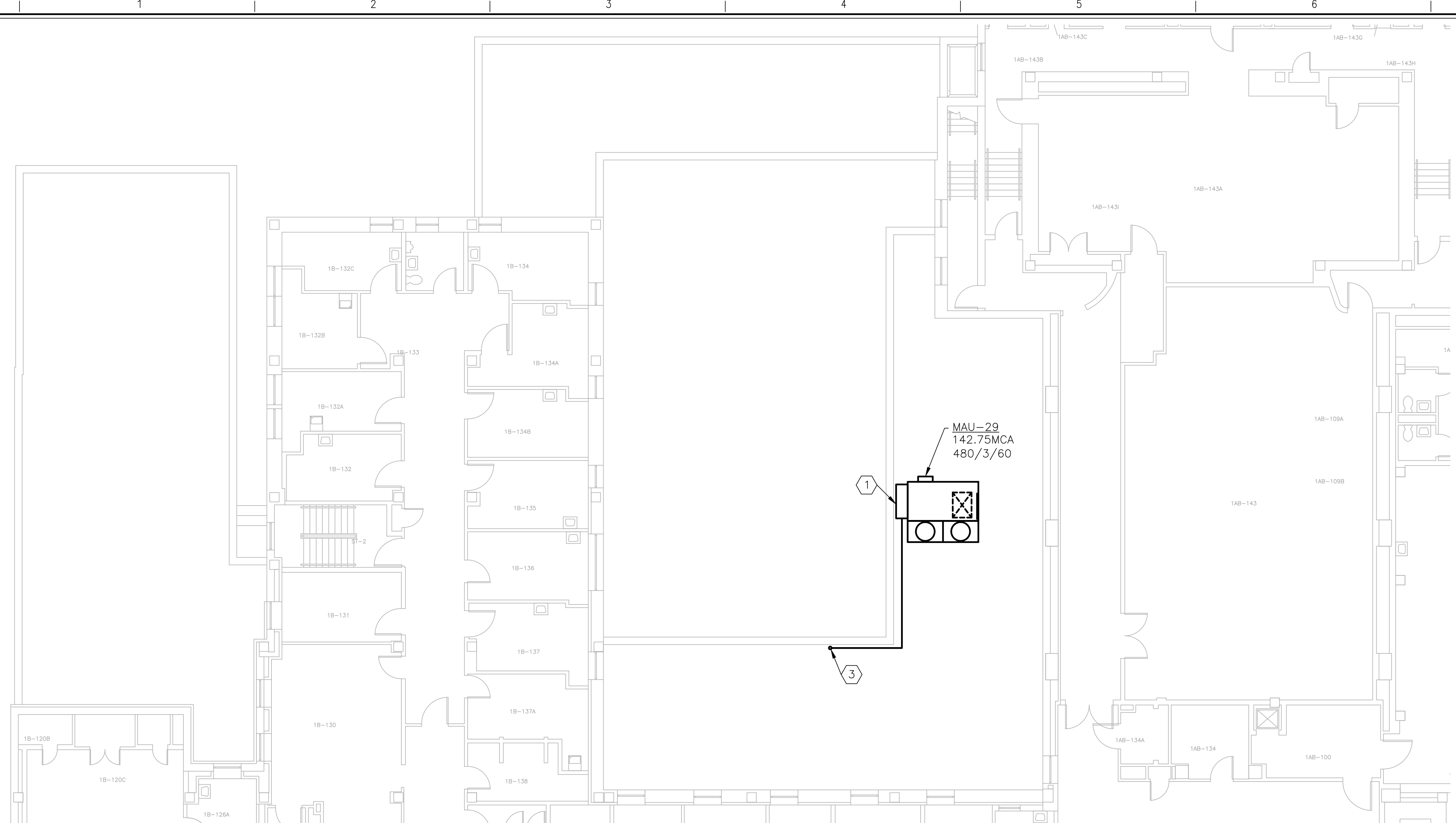
Veterans Affairs  
Medical Center  
200 Veterans Av  
Beckley, WV.  
25801





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three-eighths inch = one foot  
one-quarter inch = one foot  
one-eighth inch = one foot  
one-sixteenth inch = one foot

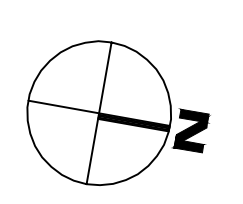
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ELECTRICAL PARTIAL FIRST FLOOR PLAN

1/8" = 1'-0"

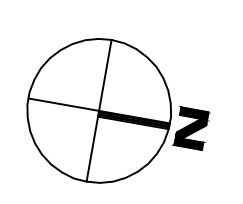
NEW WORK



ELECTRICAL PARTIAL BASEMENT ROOF PLAN

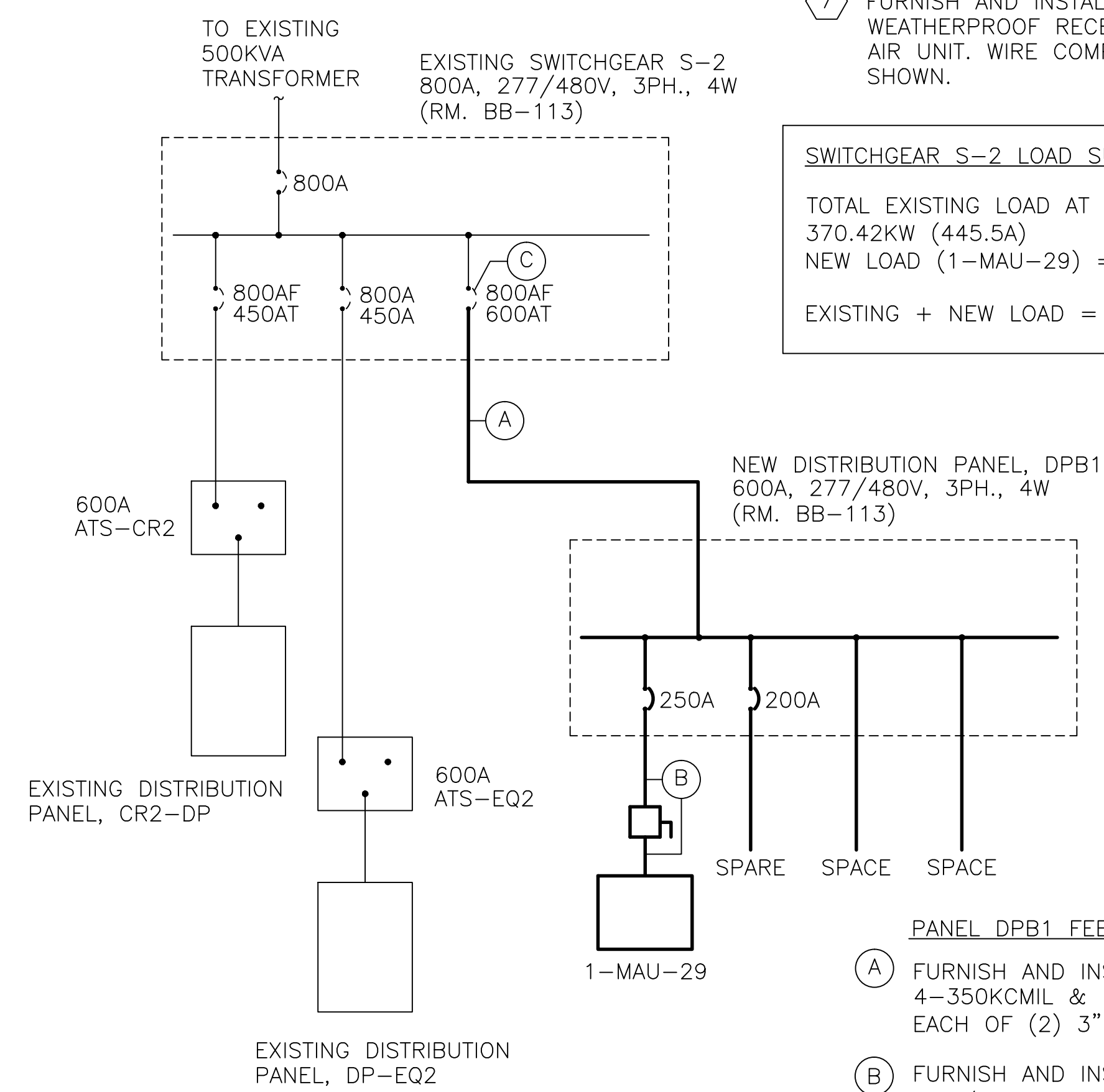
1/8" = 1'-0"

NEW WORK



CODED NOTES

- 1 WIRE NEW MAU UNIT AND UNIT-MOUNTED VFD COMPLETE TO NEW DISTRIBUTION PANEL DPB1 IN BASEMENT RM BB-113. COORDINATE EXACT ROUTE OF FEEDER WITH EXISTING BUILDING CONDITIONS.
- 2 EXISTING SUBSTATION, S-2, 800A, 277/480V, 3PH., 4W LOCATED IN BASEMENT, BB-113. LOCATE EXISTING SPARE 800A-3P BREAKER AND ADJUST TRIP SETTING TO 600AT. WIRE COMPLETE TO NEW DISTRIBUTION PANEL DPB.
- 3 APPROXIMATE FEEDER ROUTE FROM NEW 1-MAU-29. FEEDER TO BE ROUTED FROM 1ST FLOOR ROOF TO RM BB-123D BELOW AND CONTINUE ABOVE BASEMENT FLOOR CEILING TO NEW DISTRIBUTION PANEL DPB1 IN RM BB-113. PROVIDE JUNCTION BOX AS REQUIRED TO MEET NEC REQUIREMENTS FOR ALLOWED NUMBER OF CONDUIT BENDS. COORDINATE EXACT ROUTE OF FEEDER PRIOR TO INSTALLATION.
- 4 FURNISH AND INSTALL A NEW DISTRIBUTION, BREAKER, PANELBOARD, 600A, 277/480V, 3PH., 4W, MINIMUM 30KA SCCR RATING, DPB1. PANEL TO BE SQUARE D, TYPE HCP PANELBOARD, OR EQUAL. NEW PANEL TO BE FED FROM EXISTING SWITCHGEAR S-2. SEE NOTE 2 AND ONE-LINE DIAGRAM ON THIS SHEET FOR RELATED WORK.
- 5 AT EXISTING PANEL EMBK-3, 200A, 120/208V, 3PH., 4W PANELBOARD, FURNISH AND INSTALL (1) 20A-1P BREAKER AND (1) 20A-1P, GFCI, 30mA BREAKER IN AVAILABLE SPACE. BREAKERS TO MATCH EXISTING BREAKERS IN PANEL WITH RESPECT TO MANUFACTURER, TYPE, AND SCCR RATING. WIRE (1) GFCI BREAKER COMPLETE TO NEW JUNCTION BOX AND HEAT TRACE AT NOTE 6 ON THIS SHEET. WIRE OTHER BREAKER COMPLETE TO NEW RECEPTACLE AT MAKE-UP AIR UNIT, 1-MAU-29.
- 6 NEW JUNCTION BOX AND 120V CIRCUIT FOR NEW HEAT TRACE. WIRE COMPLETE TO NEW GFCI BREAKER IN PANEL EMBK-3. WIRE COMPLETE PER MANUFACTURER'S INSTRUCTIONS.
- 7 FURNISH AND INSTALL A 20A-1P, GFCI, WEATHERPROOF RECEPTACLE AT MAKE-UP AIR UNIT. WIRE COMPLETE TO CIRCUIT AS SHOWN.



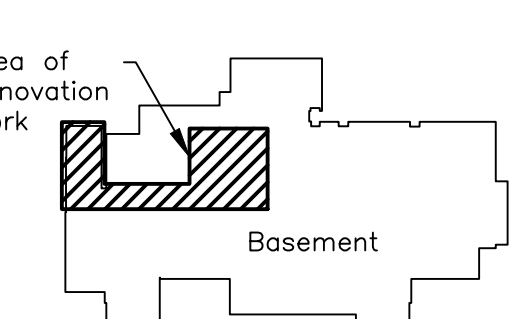
SWITCHGEAR S-2 LOAD SUMMARY

TOTAL EXISTING LOAD AT SWITCHGEAR S-2 =
370.42KW (445.5A)
NEW LOAD (1-MAU-29) = 95KW
EXISTING + NEW LOAD = 465.4KW (560A)

- PANEL DPB1 FEEDER SCHEDULE
- FURNISH AND INSTALL NEW 4-350KCMIL & 1-1 GRD. IN EACH OF (2) 3" CONDUITS.
  - FURNISH AND INSTALL NEW 3-4/0 & 1-4 IN 2" CONDUIT.
  - ADJUST EXISTING 800A/800AT BREAKER TRIP RATING TO 600AT.

PARTIAL SWITCHGEAR, S-2 ELECTRICAL ONLINE DIAGRAM

NTS



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Project Number: 11025

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JOHN D. BERRYMAN, M. D.

DRAWING TITLE:  
PARTIAL BSMT & 1st FLOOR PLAN  
ELECTRICAL NEW WORK  
PROJECT TITLE:  
HVAC NEGATIVE AIR CORRECTIONS  
DATE  
07/06/2012  
REV.  
SCALE

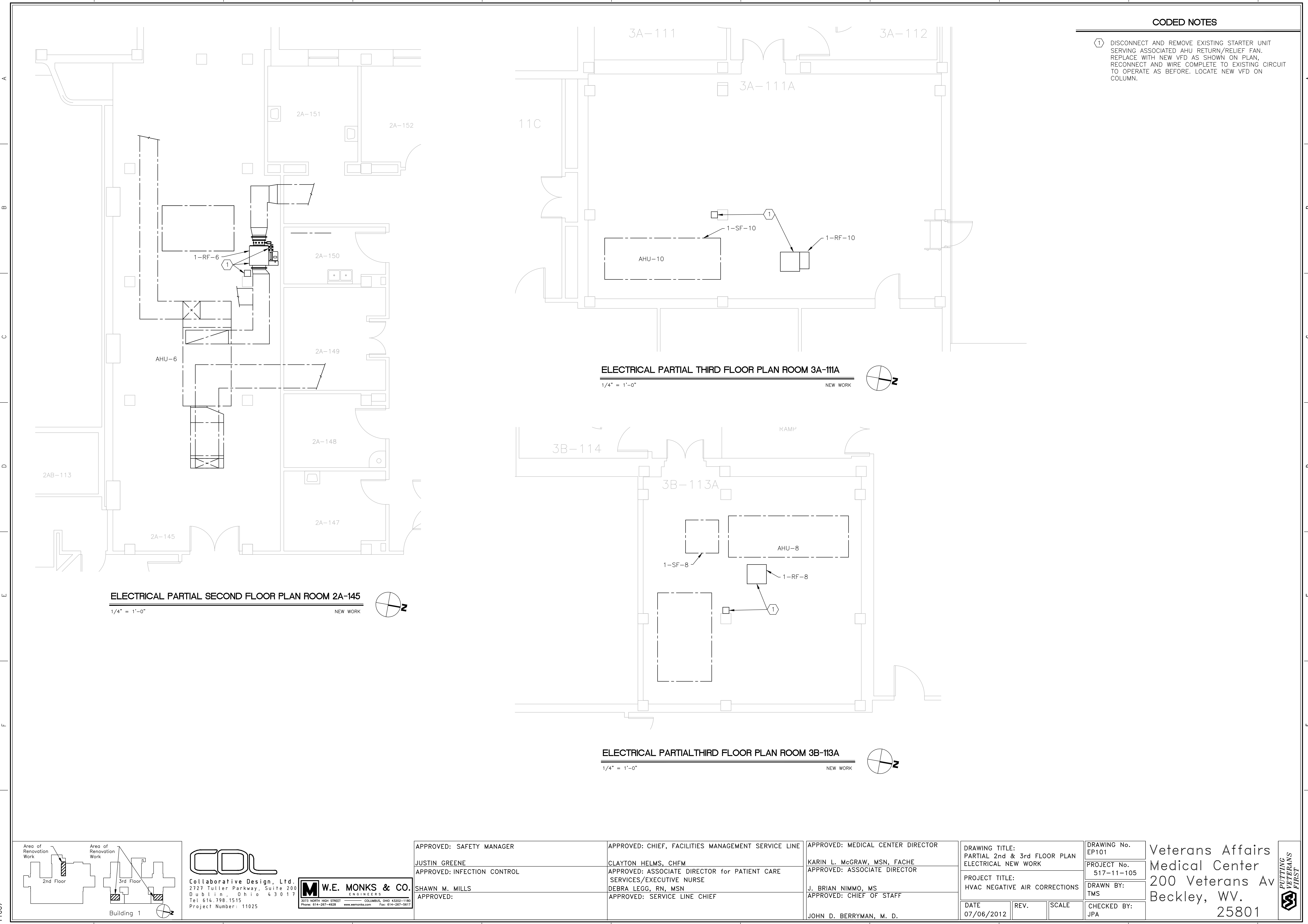
DRAWING No.  
EP100  
PROJECT No.  
517-11-105  
DRAWN BY:  
TMS  
CHECKED BY:  
JPA

Veterans Affairs  
Medical Center  
200 Veterans Av  
Beckley, WV.  
25801



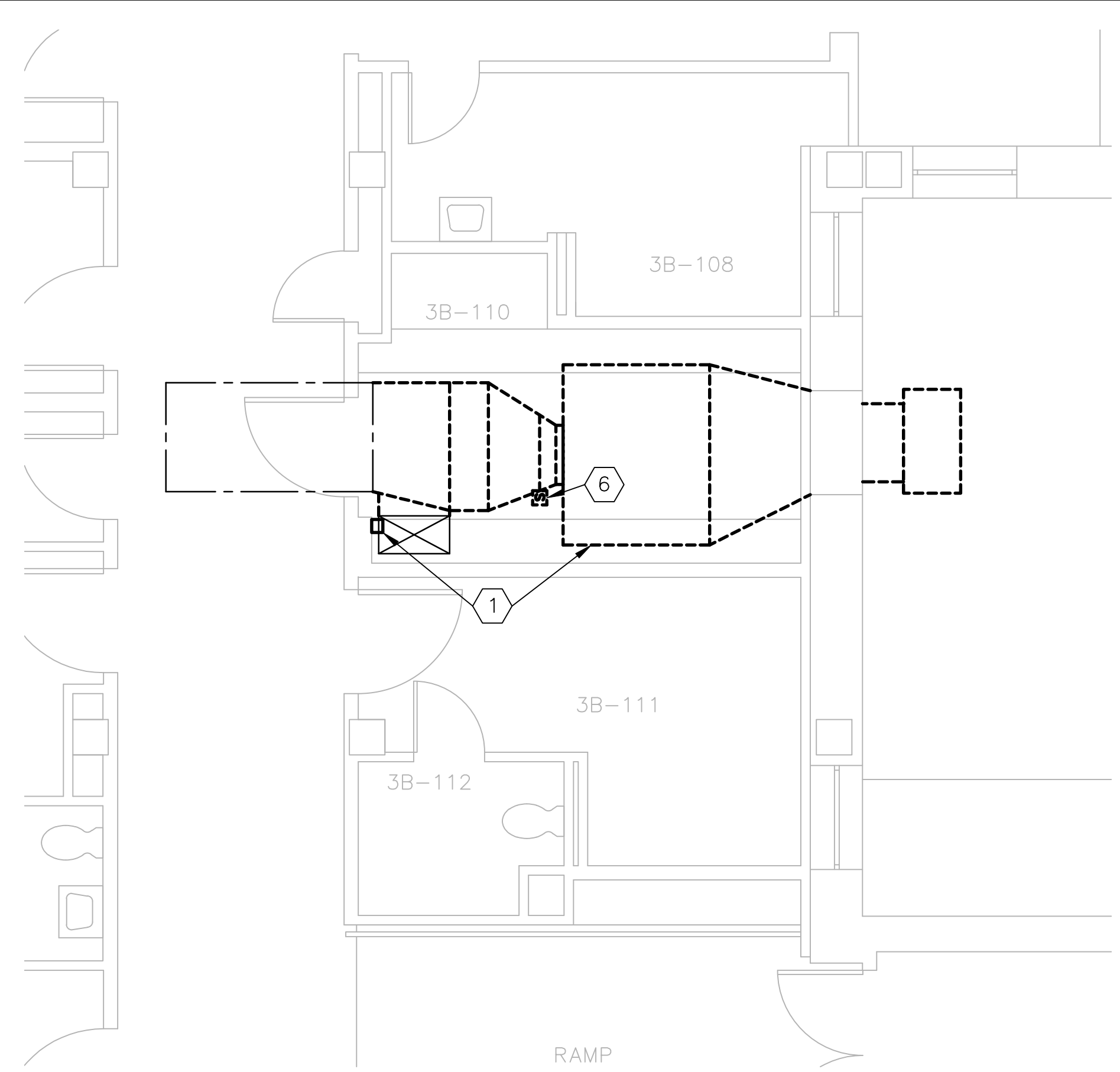
three inches = one foot  
one and one-half inch = one foot  
one-half inch = one foot  
three-quarters inch = one foot  
one-half inch = one foot  
three-eighths inch = one foot  
one-quarter inch = one foot  
one-eighth inch = one foot

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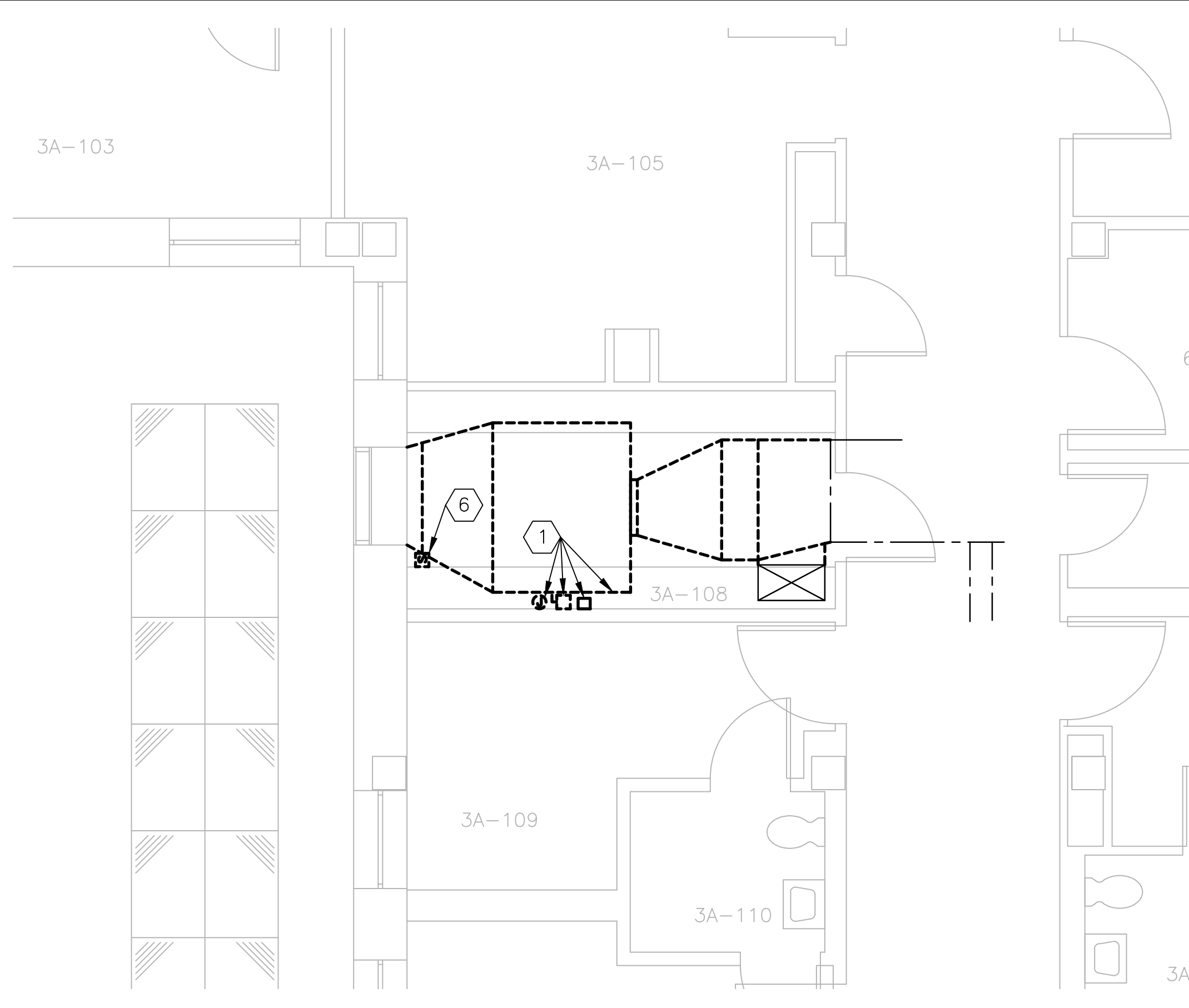


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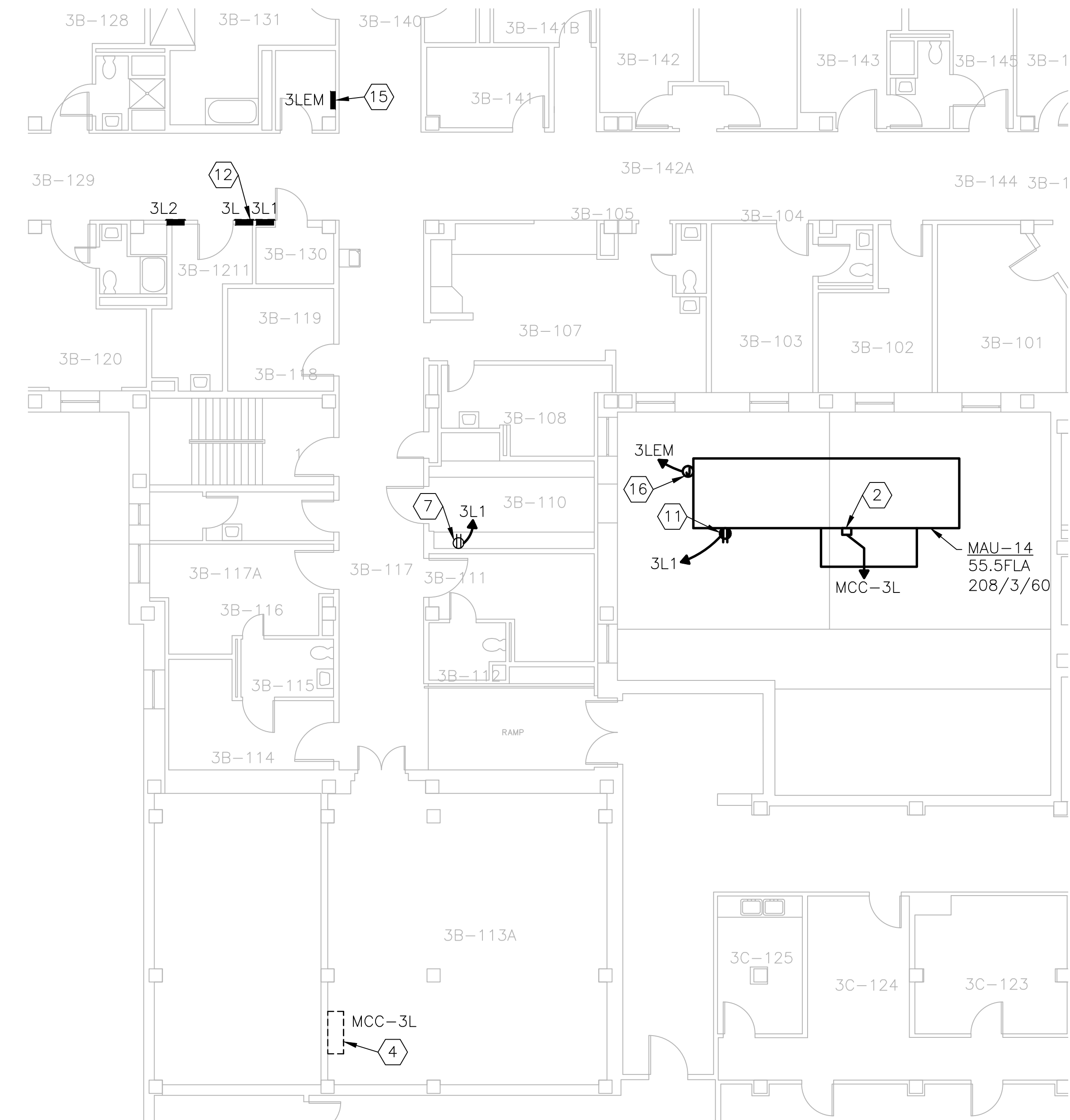
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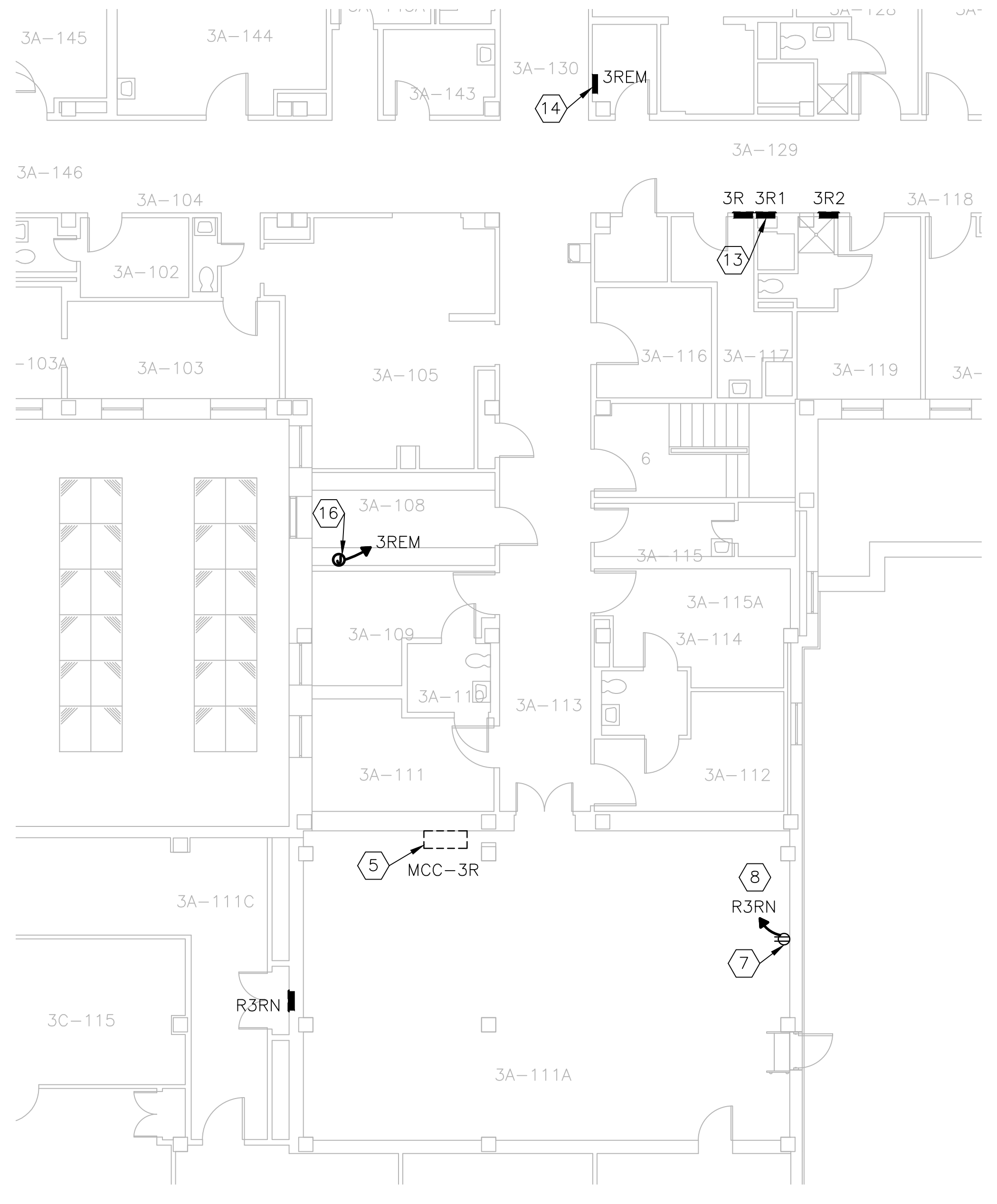
ELECTRICAL PARTIAL THIRD FLOOR PLAN ROOM 3B-111  
1/4" = 1'-0" DEMOLITION



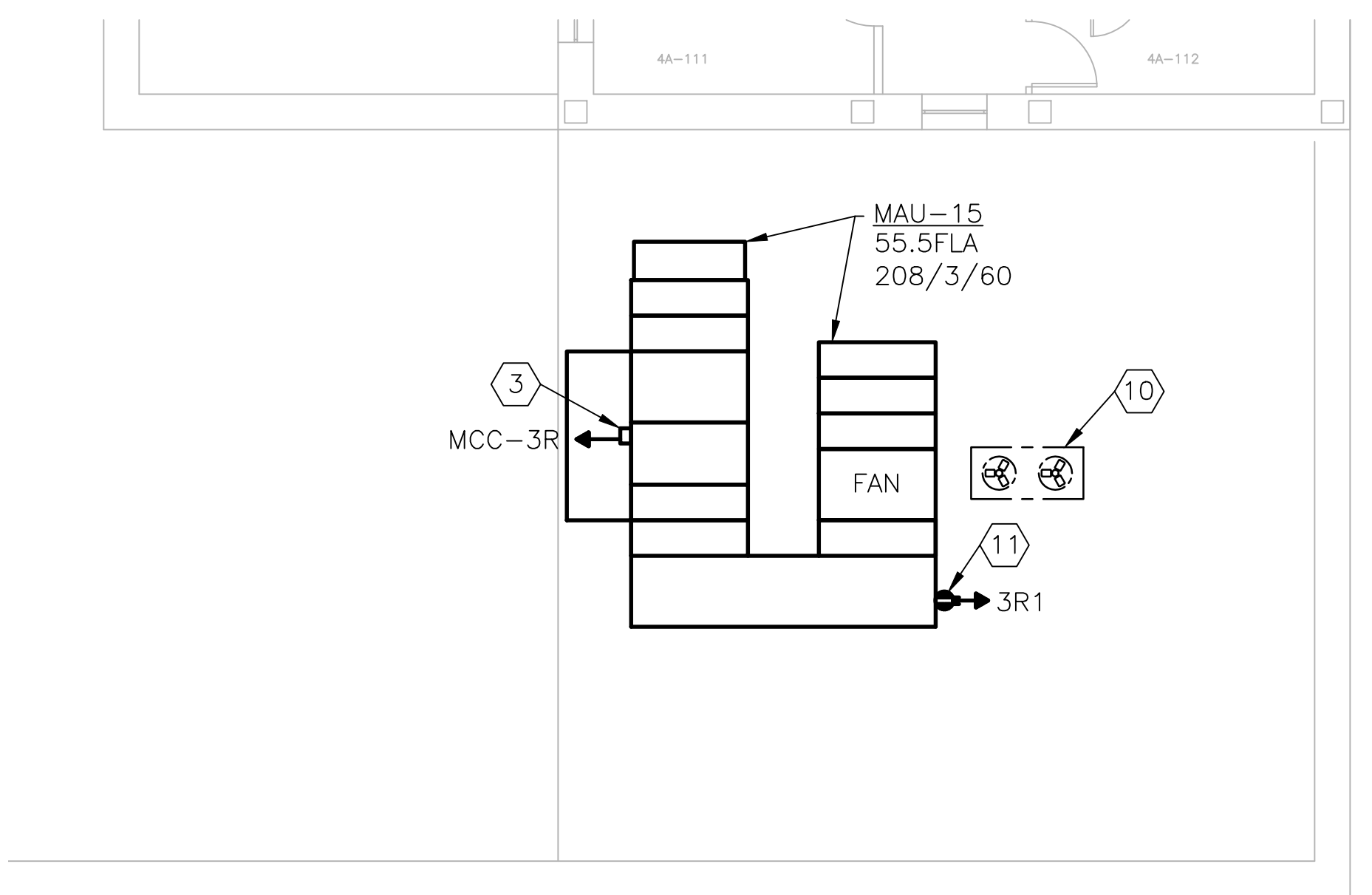
ELECTRICAL PARTIAL THIRD FLOOR PLAN ROOM 3A-108  
1/4" = 1'-0" DEMOLITION



ELECTRICAL PARTIAL THIRD FLOOR PLAN ROOM 3B-111  
1/8" = 1'-0" NEW WORK



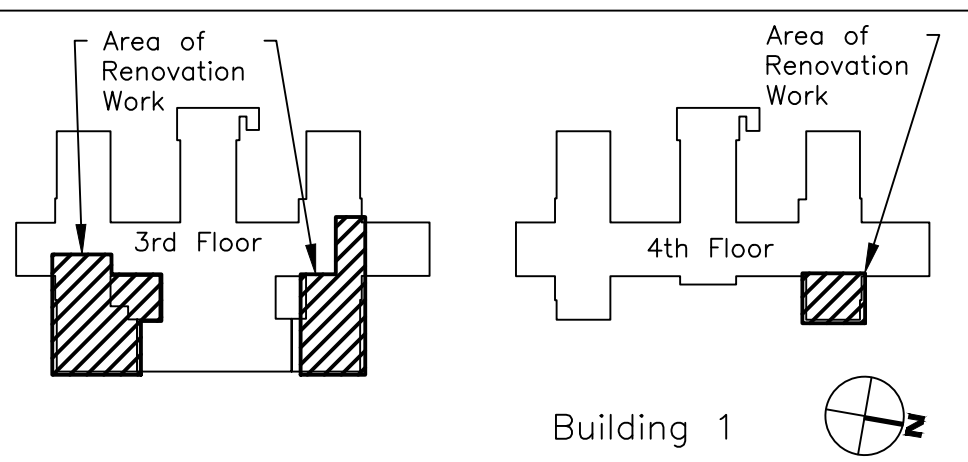
ELECTRICAL PARTIAL THIRD FLOOR PLAN ROOM 3A-11A  
1/8" = 1'-0" NEW WORK



ELECTRICAL PARTIAL FOURTH FLOOR PLAN ROOM 3A-11A  
1/8" = 1'-0" NEW WORK

- 14 AT EXISTING PANEL 3REM, 125A, 120/208V, 3PH., 4W, FURNISH AND INSTALL A NEW 20A-1P, GFCI 30mA BREAKER IN AVAILABLE SPACE. NEW BREAKER TO MATCH EXISTING BREAKERS IN PANEL WITH RESPECT TO MANUFACTURER, TYPE, AND SCCR RATING. WIRE COMPLETE TO NEW HEAT TRACE AT NOTE 16, IN RM 3A-108.
- 15 AT EXISTING PANEL 3LEM, 125A, 120/208V, 3PH., 4W, FURNISH AND INSTALL A NEW 20A-1P, GFCI 30mA BREAKER IN AVAILABLE SPACE. NEW BREAKER TO MATCH EXISTING BREAKERS IN PANEL WITH RESPECT TO MANUFACTURER, TYPE, AND SCCR RATING. WIRE COMPLETE TO NEW HEAT TRACE AT MAU-14.
- 16 NEW JUNCTION BOX AND 120V CIRCUIT FOR NEW HEAT TRACE. COORDINATE EXACT LOCATION OF JUNCTION BOX AND CIRCUIT WITH COTR PRIOR TO INSTALLATION. WIRE COMPLETE TO NEW GFCI BREAKER AT ASSOCIATED PANEL. WIRE COMPLETE PER MANUFACTURER'S INSTRUCTIONS.

- 1 DISCONNECT AND REMOVE EXISTING VFD AND ASSOCIATED CIRCUIT COMPLETE BACK TO SOURCE FOR ASSOCIATED EXISTING AHU UNIT SO THAT AHU CAN BE REMOVED.
- 2 FURNISH AND INSTALL NEW 3-1 & 1-8 GRD. IN 1-1/4" CONDUIT TO MAU-14. WIRE CIRCUIT COMPLETE FROM UNIT-MOUNTED VFD TO EXISTING MCC-3L.
- 3 FURNISH AND INSTALL NEW 3-1 & 1-8 GRD. IN 1-1/4" CONDUIT TO MAU-15. WIRE CIRCUIT COMPLETE FROM UNIT-MOUNTED VFD TO EXISTING MCC-3R.
- 4 AT EXISTING MCC-3L, FURNISH AND INSTALL A NEW BUCKET WITH NEW 100A-3P BREAKER WITH H-O-A SWITCH, PILOT LIGHT, RESET SWITCH, AND CONTROL TRANSFORMER. BUCKET TO MATCH EXISTING SWITCHES IN MCC WITH RESPECT TO TYPE, SCCR RATING, AND ALL ACCESSORIES. WIRE COMPLETE TO NEW MAU-14. EXISTING MCC IS GE CR8000, 600A, 208V, 3PH., 3W, 25KA.
- 5 AT EXISTING MCC-3R, FURNISH AND INSTALL A NEW BUCKET WITH NEW 100A-3P BREAKER WITH H-O-A SWITCH, PILOT LIGHT, RESET SWITCH, AND CONTROL TRANSFORMER. BUCKET TO MATCH EXISTING SWITCHES IN MCC WITH RESPECT TO TYPE, SCCR RATING, AND ALL ACCESSORIES. WIRE COMPLETE TO NEW MAU-15. EXISTING MCC IS GE CR8000, 600A, 208V, 3PH., 3W, 25KA.
- 6 DISCONNECT AND REMOVE EXISTING DUCT TYPE SMOKE DETECTOR AND ASSOCIATED CONDUIT AND WIRING BACK TO NEAREST FIRE ALARM DEVICE ON SAME CIRCUIT. RELOCATE EXISTING FIRE ALARM SMOKE DETECTOR TO NEW SUPPLY DUCT SERVING MAKE-UP AIR UNIT 1-MAU-14. EXTEND EXISTING CIRCUIT, RECONNECT AND WIRE COMPLETE TO OPERATE AS BEFORE. COORDINATE WORK WITH COTR.
- 7 FURNISH AND INSTALL DEDICATED 20A-1P, 120V RECEPTACLE FOR PLUG-IN CONNECTION TO R.O. WATER SYSTEM. WIRE COMPLETE.
- 8 WIRE NEW RECEPTACLE COMPLETE TO SPARE 20A-1P BREAKER IN EXISTING PANEL AT INDICATED CIRCUIT.
- 9 NOT USED.
- 10 EXISTING CONDENSING UNIT IS TO BE RELOCATED TO CLEAR CONCRETE BEAM BELOW TO ALLOW INSTALLATION OF I-BEAM TO ACCOMMODATE THE PENETRATION FOR THE NEW SUPPLY AIR DUCT FROM MAU-15. ELECTRICAL CONTRACTOR TO REWORK, DISCONNECT AND CONNECT WIRING TO THE DISCONNECT SWITCH TO OPERATE AS BEFORE.
- 11 FURNISH AND INSTALL A 20A-1P, GFCI, WEATHERPROOF RECEPTACLE AT MAKE-UP AIR UNIT. WIRE COMPLETE TO CIRCUIT AS SHOWN.
- 12 AT EXISTING PANEL 3L1, 225A, 120/208V, 3PH., 4W, FURNISH AND INSTALL (2) 20A-1P BREAKERS IN AVAILABLE SPACE. NEW BREAKERS TO MATCH EXISTING BREAKERS IN PANEL WITH RESPECT TO MANUFACTURER, TYPE, AND SCCR RATING. WIRE (1) BREAKER COMPLETE TO NEW RECEPTACLE AT MAKE-UP AIR UNIT 1-MAU-14. WIRE OTHER BREAKER COMPLETE TO RECEPTACLE FOR R.O. SYSTEM AT NOTE 7 IN ROOM 3B-110 ON THIS SHEET.
- 13 AT EXISTING PANEL 3R1, 225A, 120/208V, 3PH., 4W, FURNISH AND INSTALL A 20A-1P BREAKER IN AVAILABLE SPACE. NEW BREAKER TO MATCH EXISTING BREAKERS IN PANEL WITH RESPECT TO MANUFACTURER, TYPE, AND SCCR RATING. WIRE COMPLETE TO NEW RECEPTACLE AT MAKE-UP AIR UNIT 1-MAU-15.



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DRAWING TITLE: PARTIAL 3rd & 4th FLOOR PLAN ELECTRICAL DEMO & NEW WORK			DRAWING No. EP102	
PROJECT TITLE: HVAC NEGATIVE AIR CORRECTIONS			PROJECT No. 517-11-105	
DATE 07/06/2012	REV.	SCALE	DRAWN BY: TMS	
			CHECKED BY: JPA	

Veterans Affairs  
Medical Center  
200 Veterans Av  
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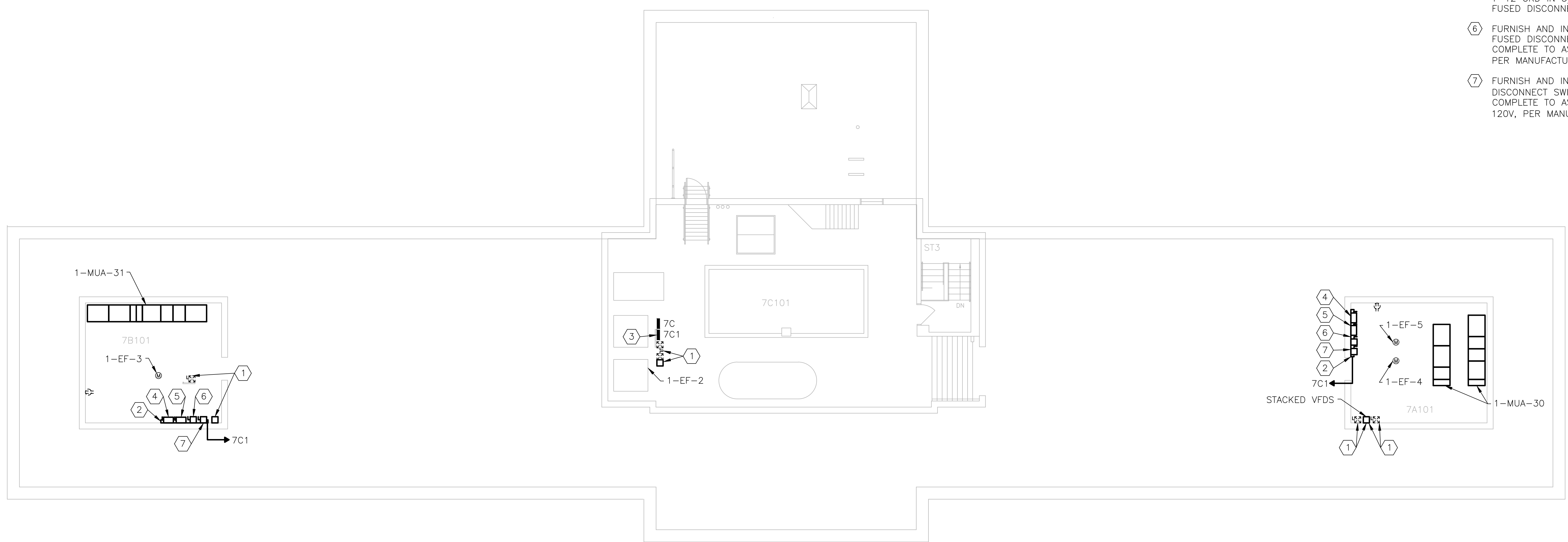


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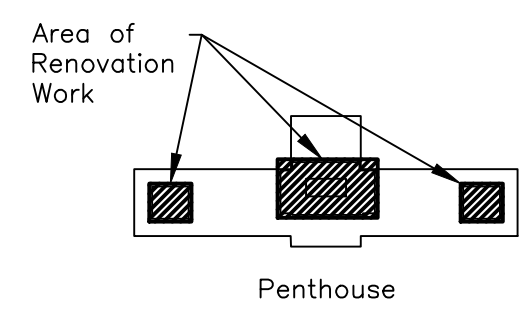
A  
B  
C  
D  
E  
F

CODED NOTES

- 1 DISCONNECT AND REMOVE EXISTING STARTER UNIT SERVING ASSOCIATED EXHAUST FAN IN ROOM. REPLACE WITH NEW VFD, RECONNECT AND WIRE COMPLETE TO EXISTING CIRCUIT TO OPERATE AS BEFORE.
- 2 WIREWAY BELOW STARTER AND VFDS AND TAP FEEDER FOR EACH VFD, DISCONNECT SWITCH, AND TOGGLE DISCONNECT SWITCH. WIRE ALL COMPLETE.
- 3 IN EXISTING PANEL 7C1, 225A, 120/208V, 3PH, 4W, FURNISH AND INSTALL (2) NEW 40A-3P BREAKERS AT AVAILABLE SPACE. NEW CIRCUIT BREAKER TO MATCH EXISTING BRAND, TYPE, AND SCCR RATING. WIRE (1) NEW BREAKER TO WIREWAY IN RM 7A101 AND (1) BREAKER TO WIREWAY IN RM 7B101. WIRE TO BE 3-#8 & 1-#10 GRD. IN 3/4" CONDUIT. PROVIDE NEW UPDATED TYPE-WRITTEN PANEL DIRECTORY AT PANEL.
- 4 INSTALL AND WIRE NEW VFD COMPLETE TO ASSOCIATED NEW MAU SUPPLY FAN IN ROOM, WITH 3-#12 & 1-12 GRD IN 3/4" CONDUIT. VFD TO BE COMBINATION FUSED DISCONNECT TYPE FUSED AT 15A.
- 5 INSTALL AND WIRE NEW VFD COMPLETE TO ASSOCIATED NEW MAU EXHAUST FAN IN ROOM, WITH 3-#12 & 1-12 GRD IN 3/4" CONDUIT. VFD TO BE COMBINATION FUSED DISCONNECT TYPE FUSED AT 10A.
- 6 FURNISH AND INSTALL A NEW 30A-3P, 208V, NEMA 1, FUSED DISCONNECT SWITCH WITH 15A FUSES. WIRE COMPLETE TO ASSOCIATED MAU ELECTRIC HEAT SECTION PER MANUFACTURER'S INSTRUCTIONS.
- 7 FURNISH AND INSTALL A NEW 30A-3P, NEMA 1, FUSED DISCONNECT SWITCH WITH (1) 20A FUSE. WIRE COMPLETE TO ASSOCIATED MAU ELECTRIC HEAT WHEEL, 120V, PER MANUFACTURER'S INSTRUCTIONS.



ELECTRICAL PENTHOUSE FLOOR PLAN  
1/8" = 1'-0"  
NEW WORK



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