

ABBREVIATIONS

A.D. ACCESS DOOR	MBH THOUSAND BTUs PER HOUR
AC AIR CURTAIN	MCA MINIMUM CIRCUIT AMPS
AFF ABOVE FINISHED FLOOR	MOCP MAXIMUM OVER CURRENT PROTECTION
AH / AHU AIR HANDLING UNIT	NC NORMALLY CLOSED
AS AIR SEPARATOR	NG NATURAL GAS
B BOILER	NO NORMALLY OPENED
BHP BRAKE HORSE POWER	NTS NOT TO SCALE
B.O.D. BASIS OF DESIGN	OA OUTSIDE AIR
BTU BRITISH THERMAL UNIT	PSI POUNDS PER SQUARE INCH
CF CUBIC FEET	PSIG PSI GAUGE
CFM CUBIC FEET PER MINUTE	PIT PRESSURE / TEMPERATURE (PORT)
CH CHILLER	PVC POLYVINYL CHLORIDE PIPE
CP CIRCULATING PUMP	RA RETURN AIR
CPVC CHLORINATED PVC	RH RELATIVE HUMIDITY
CUH CABINET UNIT HEATER	RHC REHEAT COIL
CV CONSTANT VOLUME	RLA RUNNING LOAD AMPS
CU CONDENSING UNIT	RPM REVOLUTIONS PER MINUTE
(D) TO BE DEMOLISHED	RS/RL REFRIGERANT SUCTION & LIQUID LINES
DB DRY BULB TEMPERATURE (°F)	RTU ROOFTOP AIR HANDLING UNIT
DDC DIRECT DIGITAL CONTROLS	SA SUPPLY AIR
DH DEHUMIDIFIER	SF SUPPLY FAN
DOAS DEDICATED OUTSIDE AIR SYSTEM	SF SQUARE FEET
DN DOWN	SP STATIC PRESSURE
DWV DRAIN WASTE AND VENT	TSP TOTAL STATIC PRESSURE
(E) EXISTING	UH UNIT HEATER
EAT ENTERING AIR TEMPERATURE	UL UNDERWRITERS LABORATORIES
EF EXHAUST FAN	UV / UVGI ULTRAVIOLET / UV GERMICIDAL IRRADIATION
ESP EXTERNAL STATIC PRESSURE	V / VAV VARIABLE AIR VOLUME
EWT ENTERING WATER TEMPERATURE	VRV VARIABLE REFRIGERANT FLOW
FC FLUID COOLER	VFD VARIABLE FREQUENCY DRIVE
FCU FAN COIL UNIT	WB WET BULB TEMPERATURE (°F)
FD FIRE DAMPER	
FLA FULL LOAD AMPS	
FPI FINS PER INCH	
FPM FEET PER MINUTE	
GH GRAVITY HOOD	
GPM GALLONS PER MINUTE	
IV INTAKE VENTILATOR	
KH / KHD KITCHEN HOOD	
KW KILOWATT	
L LOUVER	
LAT LEAVING AIR TEMPERATURE	
LB POUND	
LRA LOOKED ROTOR AMPS	
LWT LEAVING WATER TEMPERATURE	

HVAC DUCTWORK LEGEND

22/14	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
22/14O	OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
22Ø	ROUND DUCT SIZE TAG (DIAMETER)
(E)	EXISTING DUCT TAG
(D)	DUCT BEING DEMOLISHED
S/A	SUPPLY AIR
O/A	OUTSIDE AIR
R/A	RETURN AIR
E/A	EXHAUST AIR

DUCT ACCESSORIES

DROP	RECTANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
DROP	ROUND SUPPLY/OUTSIDE AIR DUCT RISE
DROP	RECTANGULAR RETURN AIR DUCT RISE
DROP	ROUND RETURN AIR DUCT RISE
DROP	RECTANGULAR EXHAUST AIR DUCT RISE
DROP	ROUND EXHAUST AIR DUCT RISE

DUCT ACCESSORIES

FLEXIBLE CONNECTION	
90° ELBOW W/ TURNING VANE	
90° BEND, ROUND DUCT	
45° BEND, ROUND DUCT	
45° BEND, RECTANGULAR DUCT	
30° OR LESS FOR ALL SIMILAR FITTINGS	
RECTANGULAR TRANSITION	
FIRE DAMPER	
SMOKE DAMPER	
COMBINATION FIRE/SMOKE DAMPER	
MANUAL BALANCING DAMPER	
MOTORIZED DAMPER	

HYDRONIC PIPING LEGEND

6"	PIPE SIZE TAG (DIAMETER Ø")
6" CHR	PIPE SIZE AND SYSTEM TAG
(E)	EXISTING PIPE TAG
(D)	DEMOLITION PIPE TAG
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
RS/RL	REFRIGERANT 2-LINE SET

METALLIC PIPE SYMBOLS

PIPE TEE	
PIPE DROP	
PIPE ELBOW	
PIPE CAP	
PIPE RISE	

PIPE ACCESSORIES

2-WAY MOTORIZED VALVE	
3-WAY MOTORIZED VALVE	
3-WAY VALVE	
BALL VALVE	
BUTTERFLY VALVE	
CHECK VALVE	
GATE VALVE	
GLOBE VALVE	
NEEDLE VALVE	
PLUG VALVE	
PRESSURE REDUCING VALVE	
SOLENOID VALVE	
SWING CHECK VALVE	
UNION	

SEISMIC DESIGN CONDITIONS

- SEISMIC DESIGN DATA:
 - A. SEISMIC DESIGN CATEGORY: B
 - B. MECHANICAL COMPONENTS IMPORTANCE FACTOR: 1.0
- SEISMIC RESTRAINTS ARE NOT REQUIRED FOR THE MECHANICAL COMPONENTS AND SYSTEMS PER THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC) AS DEFINED PER ASCE 7-10 SECTION 13.6.
- REFER TO THE SPECIFICATIONS.

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- REFER TO THE SPECIFICATIONS.

HVAC GRILLES/DIFFUSERS

SUPPLY DIFFUSER (SEE PLANS OR SCHEDULE FOR SIZES)	
RETURN GRILLE (SEE PLANS OR SCHEDULE FOR SIZES)	
EXHAUST GRILLE (SEE PLANS OR SCHEDULE FOR SIZES)	

WALL LEGEND

1 HOUR RATED	
2 HOUR RATED	
3 HOUR RATED	

MECHANICAL PHASING

NEW CONSTRUCTION MECHANICAL EQUIPMENT (TYPICAL TAG FOR ALL NEW CONSTRUCTION)	
EXISTING MECHANICAL EQUIPMENT (TYPICAL FOR ALL EXISTING TAGS)	
MECHANICAL EQUIPMENT FOR DEMOLITION (TYPICAL FOR ALL DEMOLITION TAGS)	

MECHANICAL SHEET SET NOTE

* NOTE *

ALL OF GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET. SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THE CONTAINED REFERENCE DRAWINGS.

GENERAL MECHANICAL SYMBOLS

REVISION NUMBER SHOWN ON PLANS	
POINT WHERE NEW CONNECTS TO EXISTING	
DEMOLISH TO POINT INDICATED	
NUMBER OF DETAIL ON SHEET NUMBER OF SHEET WHERE DETAIL APPEARS	
KEYNOTE	
CONTINUATION SYMBOLS:	
PIPE	
ROUND DUCT	
RECTANGULAR DUCT	
SPACE TAG:	
OFFICE — SPACE NAME	
101 — SPACE NUMBER	
100 SF — SPACE AREA	
ITEM TO BE DEMOLISHED	
AREA NOT IN CONTRACT	

HVAC ENERGY DESIGN CONDITIONS

LOCATION:	WINTERVILLE, NC
OUTDOOR SUMMER (0.4% OCCURRANCE):	93.0°F DB / 75.1°F WB
OUTDOOR WINTER (99.0% OCCURRANCE):	24.8°F DB / 68°F WB

MECHANICAL EQUIPMENT TAGS

RTU-XX	EQUIPMENT MARK ID
EVAV-XX	EQUIPMENT MARK ID
200 CFM	EQUIPMENT AIRFLOW
EVAV-XX	EQUIPMENT MARK ID

MECHANICAL DATA DEVICES

SENSOR (GENERIC)	
CARBON DIOXIDE SENSOR	
MANUAL SWITCH	
THERMOSTAT	
LOCKING COVER (OPTIONAL)	
SENSOR INTERLOCK	

GENERAL NOTES

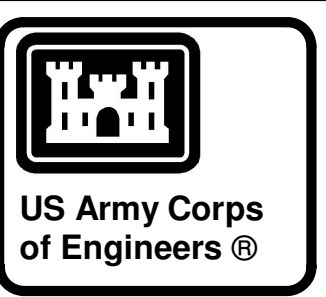
- ALL WORK SHALL COMPLY WITH THE INTERNATIONAL MECHANICAL CODE (IMC), UNIFIED FACILITIES CRITERIA (UFC), ASHRAE STANDARDS, NFPA 90A, AND ALL CITY, STATE, AND LOCAL REQUIREMENTS.
- REFER TO THE PROJECT MANUAL FOR ALL REQUIREMENTS
- REFER TO ARCHITECTURAL PLANS FOR:
 - REFLECTED CEILING PLAN FOR EXACT LOCATION OF AIR DEVICES AND CEILING TYPES.
 - ALL WALL AND ROOF PENETRATIONS AND EQUIPMENT MOUNTING DETAILS.
 - SPECIFIC WALL RATING TYPES AND OTHER INFORMATION.
- ALL DUCTWORK SHALL BE CONSTRUCTED FROM GALVANIZED STEEL IN CONFORMANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS," LATEST EDITION
- U.L. LISTED FLEXIBLE DUCT RUN-OUTS MAY BE USED, BUT SHALL NOT EXCEED 5'-0" IN LENGTH. ALL FLEXIBLE DUCT TO BE PROPERLY SUPPORTED WITH NO KINKS OR HARD BENDS.
- DUCT FITTINGS:
 - SUPPLY TAKE-OFFS TO CEILING SUPPLY DIFFUSERS TO BE CONICAL TAP OR 45° SIDE TAP.
 - ALL DUCT RUN-OUTS TO HAVE LOCKING QUADRANT VOLUME DAMPERS. PROVIDE STAND-OFF BRACKET TO ACCOMMODATE INSULATION THICKNESS.
 - ALL 90° ROUND ELBOWS TO HAVE R/D=1.5 (UNLESS OTHERWISE NOTED).
 - ALL 90° RECTANGULAR ELBOWS TO HAVE TURNING VANES (UNLESS OTHERWISE NOTED).
 - PROVIDE HARD ELBOW WHEN TRANSITIONING FROM RIGID TO FLEXIBLE DUCT WHEN CONNECTING TO AIR DEVICES. REFER TO DETAIL.
- DUCTWORK TO BE COORDINATED WITH STRUCTURAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION, COMPONENTS AND SYSTEMS. ALL DUCTWORK THAT HAS TO BE OFFSET DUE TO AN OBSTRUCTION SHALL BE SLOPED WITH 2-30° ELBOWS UNLESS OTHERWISE NOTED.
- PROVIDE ACCESS PANELS IN CEILINGS OTHER THAN LAY-IN TYPE WHERE NECESSARY:
 - CLOSELY COORDINATE LOCATIONS AND SIZE OF ACCESS PANELS WITH INSTALLED EQUIPMENT TO ACHIEVE GREATEST ACCESSIBILITY FOR MAINTENANCE PURPOSES.
 - PROVIDE ACCESS PANEL AT BALANCING DAMPERS, FIRE DAMPERS, CONTROLS, VALVES, TRAPS, CLEAN OUTS, ETC.
 - PROVIDE ACCESS PANELS FOR GREASE DUCTS, AS REQUIRED BY NFPA 96, FOR CLEANING PURPOSES, AT CHANGES IN DIRECTION, ETC.
- COMPLETELY INSULATE THE TOPS OF ALL CEILING DIFFUSERS. INSULATION TO BE PROVIDED BY THE DIFFUSER MANUFACTURER.
- CLOSELY COORDINATE LOCATIONS OF INSTALLED EQUIPMENT TO ACHIEVE THE GREATEST ACCESSIBILITY.
- MAINTAIN 10'-0" MINIMUM CLEARANCE BETWEEN OUTSIDE AIR INTAKES AND ALL EXHAUST FANS, FLUES, PLUMBING VENTS, ETC.
- ALL ROOF MOUNTED HVAC EQUIPMENT, INCLUDING BUT NOT LIMITED TO EXHAUST FANS, CONDENSING UNITS, AND ROOF-TOP UNITS, SHALL BE A MINIMUM OF 10' FROM THE ROOF'S EDGE, OR PARAPET, UNLESS OTHERWISE NOTED ON PLANS. IN SUCH CASE, CONTRACTOR SHALL COORDINATE WITH ARCHITECT TO PROVIDE SAFETY HANDRAILS AROUND ROOF MOUNTED HVAC EQUIPMENT THAT IS LOCATED LESS THAN 10' FROM ROOF'S EDGE, OR PARAPET.
- PROVIDE FLEXIBLE CONNECTIONS AT INLETS AND OUTLETS OF ALL AIR HANDLING UNITS, MAKE-UP AIR UNITS, FURNACES, AND/OR EXHAUST FANS.
- PROVIDE 4" CONCRETE PADS UNDER ALL GROUND MOUNTED EQUIPMENT. EACH PAD TO EXTEND A MINIMUM OF 6" BEYOND OUTLINE OF UNIT ON ALL SIDES.
- CONDENSATE PIPING SHALL BE COMPRISED OF TYPE "M," DWV COPPER.
- WHERE INDICATED ON THE DRAWINGS, EXTERIOR EXPOSED PIPING SUSCEPTIBLE TO FREEZING SHALL BE INSULATED WITH 1" FIBERGLASS PIPING INSULATION WITH 0.020" ALUMINUM JACKET AND HEAT TRACED AT 5 WATTS/FOOT. SEAL JACKET WATER-TIGHT.
- ALL WALL-MOUNTED, OCCUPANT-CONTROLLED HVAC DEVICES, I.E., THERMOSTATS, HUMIDISTAT, CO2 CONTROLLERS, CONTROL PANELS, ETC., SHALL BE MOUNTED 4'-0" ABOVE FINISHED FLOOR.
- COORDINATE WORK CLOSELY WITH CONTROL CONTRACTOR. PROVIDE ALL NECESSARY DUCT, PIPE TAPS, TEES, WELLS, CONTROL DAMPERS, AIR MEASURING STATIONS, AND OTHER ACCESSORIES REQUIRED BY CONTROL SYSTEM
- SLEEVE AND SEAL ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE RATED AND NON-RATED SLABS AND PARTITIONS.
- UNLESS OTHERWISE NOTED, ALL EXPOSED DUCTWORK SHALL BE EXTERNALLY INSULATED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. DUCTS SHALL BE INSULATED WITH 2" THICK, 4.25 LB/CF DENSITY RIGID POLYPROPYLENE-SCRM-POLYESTER (WHITE) FACED DUCT BOARD. ALL JOINTS SHALL BE SECURELY TAPED WITH APPROVED PRESSURE SENSITIVE TAPE, COVERED WITH MASTIC AND FIBROUS GLASS FABRIC. MASTIC SHALL BE APPLIED CLEANLY; EDGES SHALL BE TAPED OFF PRIOR TO APPLYING THEN REMOVED TO GIVE CLEAN MASTIC EDGES/LINES. METAL TO FIBERGLASS CONNECTIONS TO BE MADE USING 3" WIDE GLASS FABRIC TAPE WITH FLEXIBLE, LOW ODOR, FIRE RESISTIVE, HIGH SOLIDS, VAPOR BARRIER FINISH MASTIC. PAINT DUCT TO MATCH WALLS.
- FIRE RATED WALLS AND PARTITIONS ARE INDICATED ON THE PLANS. PROVIDE FIRE, SMOKE OR FIRE/SMOKE DAMPERS IN DUCT PENETRATIONS OF ALL RATED WALLS AND PARTITIONS AS NECESSARY TO MEET CITY AND STATE REQUIREMENTS.
- INSULATE ALL CONDENSATE DRAINS WITH 1" FLEXIBLE ELASTOMERIC CELLULAR INSULATION PER THE SPECIFICATIONS.
- REFER TO THE PLUMBING PLANS FOR NATURAL GAS PIPING.

DEMOLITION NOTES

- CONTRACTOR SHALL VERIFY EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO:
 - * PIPE SIZES AND ROUTING.
 - * EQUIPMENT CONNECTIONS AND LOCATIONS.
 - * CONTROLS.
- PROVIDE NECESSARY MODIFICATIONS TO NEW AND EXISTING SYSTEMS TO FACILITATE THE INSTALLATION AND INTERFACE OF NEW AND EXISTING SYSTEMS.
- EXISTING SYSTEMS AND INFORMATION SHOWN ON THESE PLANS WERE DEVELOPED USING EXISTING BUILDING DRAWINGS. CONTRACTOR SHALL VERIFY AT SITE ALL EXISTING SYSTEMS. REMOVE ALL PORTIONS OF PIPING SYSTEMS BEING REMOVED OR ABANDONED. TERMINATE EXISTING SYSTEMS ABOVE CEILINGS AND BELOW FLOOR SLABS IN A MANNER THAT WILL NOT CONFLICT WITH NEW WORK. CLOSELY COORDINATE NEW WORK WITH EXISTING SYSTEMS. PROVIDE OFFSETS IN EXISTING AND NEW SYSTEMS AS REQUIRED TO AVOID CONFLICTS.
- COORDINATE AND SCHEDULE ALL CONNECTIONS TO EXISTING SYSTEMS AND SYSTEM SHUT-DOWNS WITH MAINTENANCE PERSONNEL.
- MAINTAIN EXISTING BUILDING SYSTEMS WITH PHASED DEMOLITION AND INSTALLATION OF NEW WORK, PROVIDING TEMPORARY SERVICES AS REQUIRED.
- USE EXISTING PIPING SYSTEM VALVES WHERE POSSIBLE TO ISOLATE SYSTEMS AND TO CAP EXISTING PIPING. REPLACE EXISTING VALVES WHERE NECESSARY WHEN EXISTING VALVES WILL NOT HOLD.
- EXISTING EQUIPMENT BEING REMOVED AND DESIGNATED TO REMAIN THE PROPERTY OF THE OWNER SHALL BE DELIVERED UPON REMOVAL TO LOCATION DESIGNATED BY OWNER. ALL OTHER SYSTEM COMPONENTS REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
- REMOVE AND RELOCATE SMALL CONDUIT, CABLE, PIPE AND DUCT, PIPE AND CEILING HANGERS ETC. AS NECESSARY TO ACHIEVE A COMPLETE INSTALLED MECHANICAL SYSTEM AS SHOWN ON DRAWINGS.
- PATCH ALL WALLS, FLOORS, ROOFS AND CEILINGS TO MATCH EXISTING OR NEW (IF APPLIED) FOR ALL OPENINGS CREATED BY DEMOLITION WORK OF EQUIPMENT AND HVAC SERVICE PENETRATIONS.
- REPLACE AND/OR PATCH TO MATCH EXISTING; ANY EXISTING PIPE AND/OR DUCT INSULATION THAT IS TO REMAIN EXISTING AND IS DAMAGED OR REMOVED DURING CONSTRUCTION.
- REFER TO ELECTRICAL PLANS FOR EXTENT OF DEMOLITION WORK RELATING TO WIRING FOR SUPPORT OF HVAC EQUIPMENT TO BE REMOVED.

EXISTING CONDITION ACTIONS ITEMS

- BEFORE CONNECTING NEW DUCTWORK AND AIR TERMINALS, PRESSURE TEST EXISTING MEDIUM PRESSURE DUCTWORK (DUCTWORK LOCATED BETWEEN AIR HANDLING UNITS AND TERMINAL UNITS) IN ACCORDANCE WITH THE PROCEDURES IN SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL (LATEST EDITION). TEST ROUND AND OVAL TO DUCT LEAK CLASS "3" AND RECTANGULAR DUCT TO DUCT LEAK CLASS "6". WHERE LEAKS ARE FOUND, THE CONTRACTOR SHALL REMOVE INSULATION IN THE AREA OF THE LEAK, PROPERLY SEAL THE LEAKS WITH MASTIC AND FIBROUS TAPE, AND REINSTALL INSULATION TO "LIKE NEW" CONDITION. INSULATION SHALL BE APPLIED IN ACCORDANCE WITH SMACNA AND BE UNIFORM THROUGHOUT. REPORT EXCESSIVE AIR LEAKAGE TO THE CONTRACTING OFFICER ALONG WITH CORRECTIVE ACTION RECOMMENDATIONS.
- CLEAN EXISTING DUCTWORK TO REMAIN IN ACCORDANCE WITH SPECIFICATION SECTION 23 01 30.41.
- BEFORE CONNECTING ANY NEW PIPING OR EQUIPMENT TO EXISTING PIPING, CLEAN AND FLUSH EXISTING PIPING ACCORDING TO THE PROVIDED PROCEDURES. REPORT ANY ISSUES DISCOVERED TO THE CONTRACTING OFFICER ALONG WITH CORRECTIVE ACTION RECOMMENDATIONS.
- INSPECT AND TEST EXISTING ACCESSORIES TO REMAIN, SUCH AS MANUAL DAMPERS, MOTORIZED DAMPERS, FIRE/SMOKE DAMPERS, ETC. FOR PROPER OPERATION. REPORT DEFICIENCIES TO THE CONTRACTING OFFICER ALONG WITH CORRECTIVE ACTION RECOMMENDATIONS.



04-28-2022

DATE	DESCRIPTION

DESIGNED BY: C. Bone	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Bone	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROWWELL AE	
SIZE: ANSI	

US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

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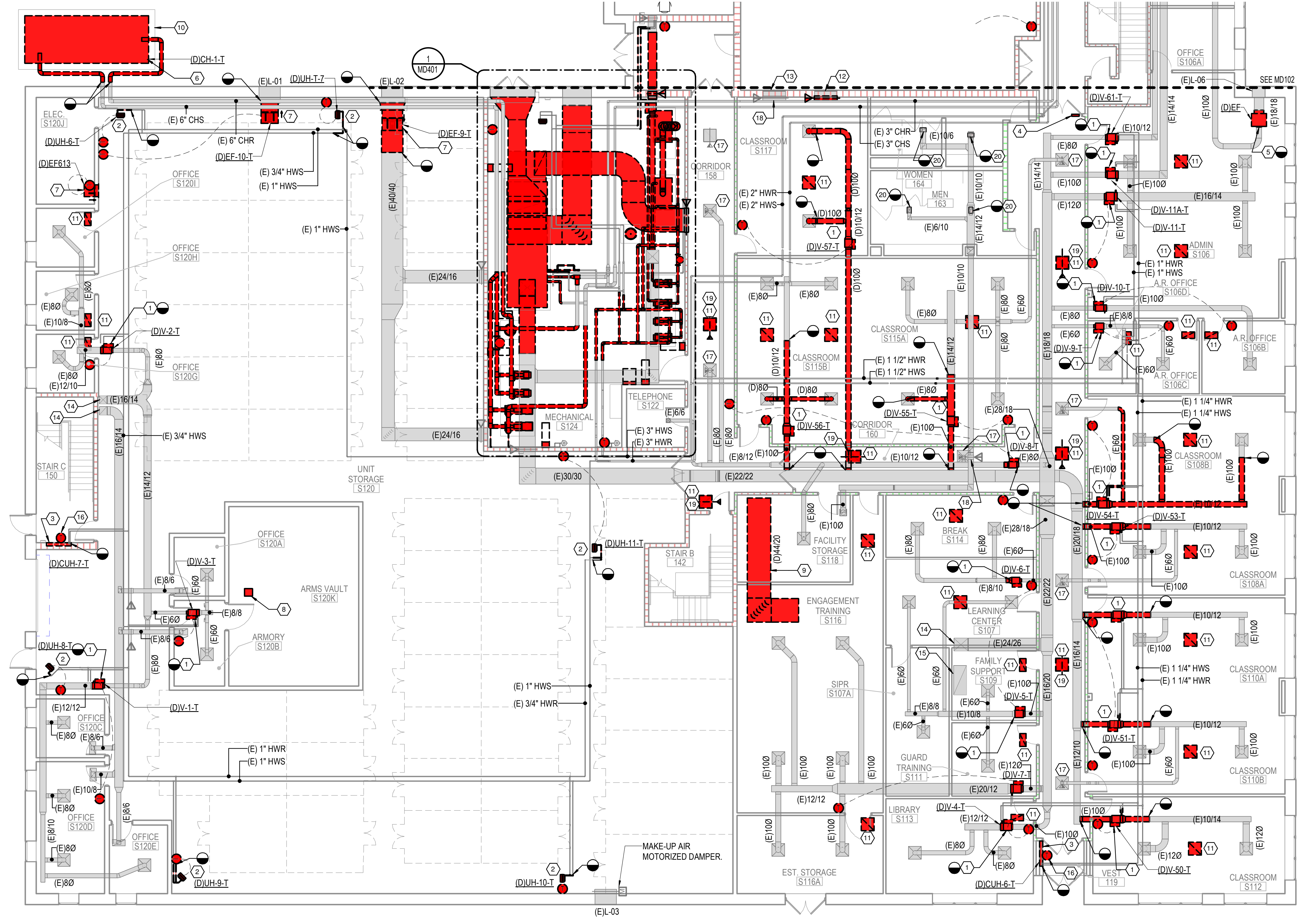
NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC

MECHANICAL LEGEND AND SYMBOLS

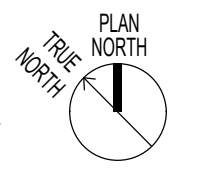
SHEET ID

M-001

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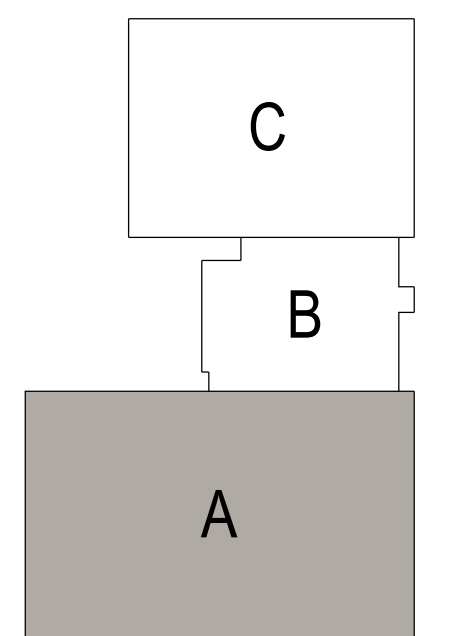


1 FIRST FLOOR MECHANICAL DEMO PLAN - AREA A
1/8" = 1'-0"

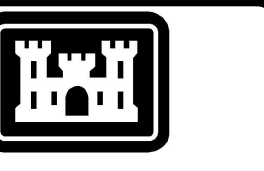


DEMOLITION KEYED NOTES

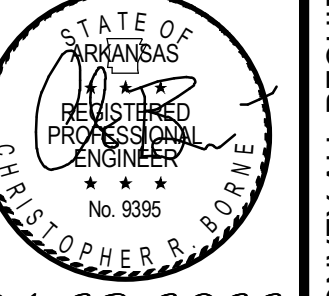
- 1 REMOVE EXISTING VAV BOX INCLUDING CONTROLS, ACTUATOR AND PIPING PACKAGE. EXISTING HANGER AND THERMOSTAT CONDUIT TO REMAIN FOR RE-USE.
- 2 REMOVE EXISTING UNIT HEATER, ASSOCIATED PIPING ACCESSORIES AND CONTROLS. EXISTING HANGER TO REMAIN FOR RE-USE.
- 3 REMOVE EXISTING CABINET UNIT HEATER, ASSOCIATED PIPING ACCESSORIES AND CONTROLS.
- 4 UNPROTECTED RETURN AIR TRANSFER OPENING IN WALL. INFILL WALL OPENING WITH CONSTRUCTION EQUIVALENT TO EXISTING WALL RATING.
- 5 REMOVE EXISTING IN-LINE EXHAUST FAN AND ASSOCIATED CONTROLS, POWER AND HANGERS.
- 6 REMOVE EXISTING AIR-COOLED CHILLER, ASSOCIATED PIPING AS INDICATED, AND ASSOCIATED CONTROLS.
- 7 REMOVE EXISTING AXIAL WALL FAN AND ASSOCIATED CONTROLS AND POWER. HANGERS TO REMAIN FOR RE-USE.
- 8 REMOVE EXISTING PORTABLE DEHUMIDIFIER.
- 9 REMOVE EXISTING DUCTWORK AS INDICATED (TYP.).
- 10 EXISTING EQUIPMENT PAD TO REMAIN.
- 11 REMOVE EXISTING RETURN AIR DEVICE.
- 12 EXISTING TRANSFER GRILLE TO REMAIN. REMOVE EXISTING FIRE/SMOKE DAMPER.
- 13 EXISTING TRANSFER GRILLE AND FIRE/SMOKE DAMPER TO REMAIN.
- 14 EXISTING DUCT TO 2ND FLOOR AND ASSOCIATED FIRE/SMOKE DAMPER AT DECK TO REMAIN.
- 15 EXISTING RETURN AIR OPENING AND ASSOCIATED FIRE/SMOKE DAMPER TO REMAIN.
- 16 REMOVE EXISTING THERMOSTAT. THERMOSTAT FOR EXISTING CABINET UNIT HEATER LOCATED ON THE WALL ABOVE THE HEATER.
- 17 EXISTING AIR DEVICE AND ASSOCIATED FIRE/SMOKE DAMPER TO REMAIN.
- 18 EXISTING FIRE/SMOKE DAMPER TO REMAIN.
- 19 REMOVE EXISTING FIRE/SMOKE DAMPER AND ASSOCIATED WIRING ALONG WITH AIR DEVICE.
- 20 REMOVE EXISTING EXHAUST AIR DEVICE AND ASSOCIATED DUCTWORK AS INDICATED.



KEY PLAN



US Army Corps of Engineers®



04-28-2022

MARK	DESCRIPTION	DATE

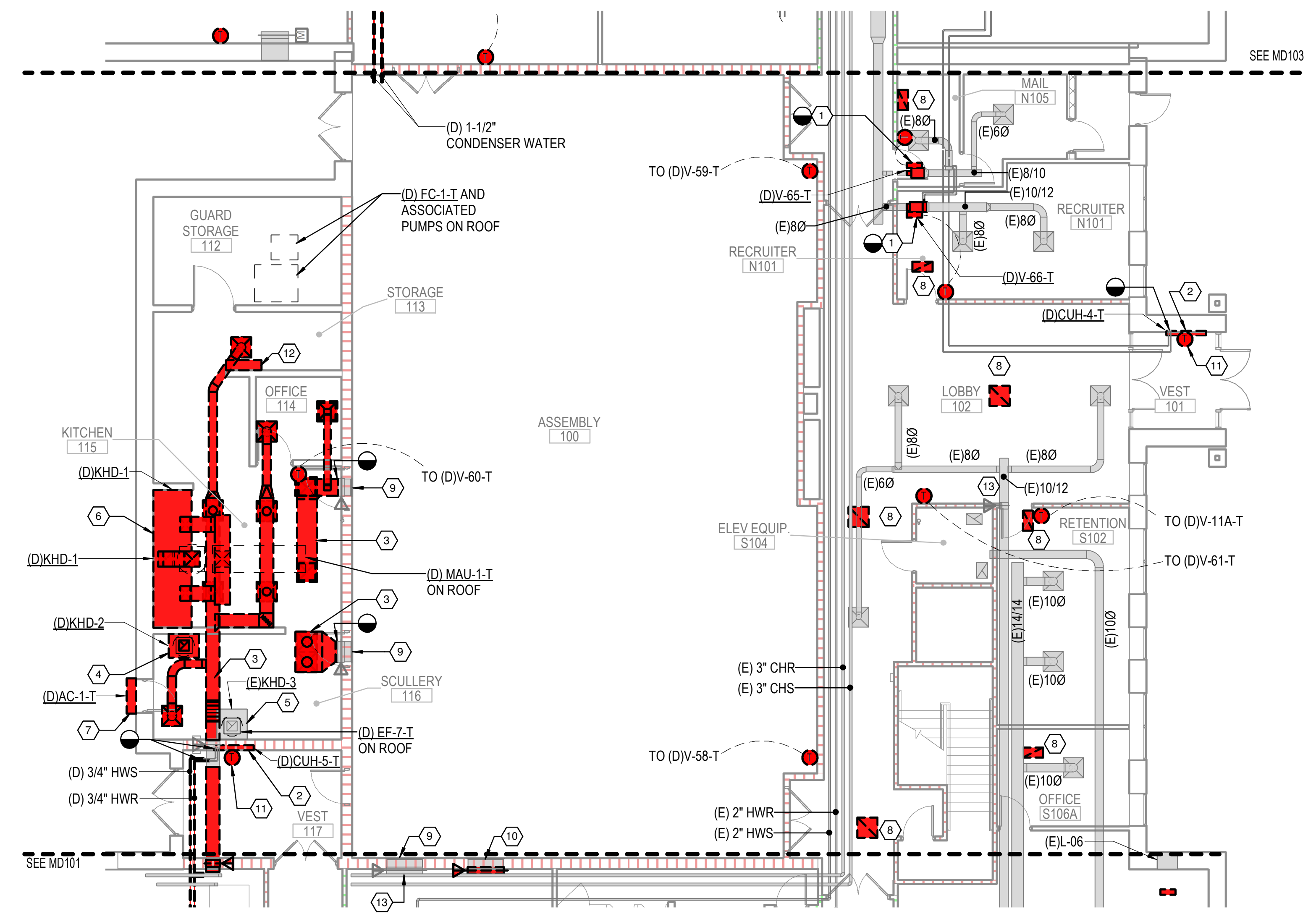
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US ARMY CORPS OF ENGINEERS CHARLESTON DISTRICT CHARLESTON, SOUTH CAROLINA CROMWELL 1300 East 6th Street Little Rock, AR 72202 SIZE: 501.87x2.990 cromwell@con.usace.army.mil			

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
FIRST FLOOR MECHANICAL DEMO PLAN - AREA A

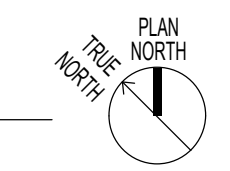
SHEET ID

MD101

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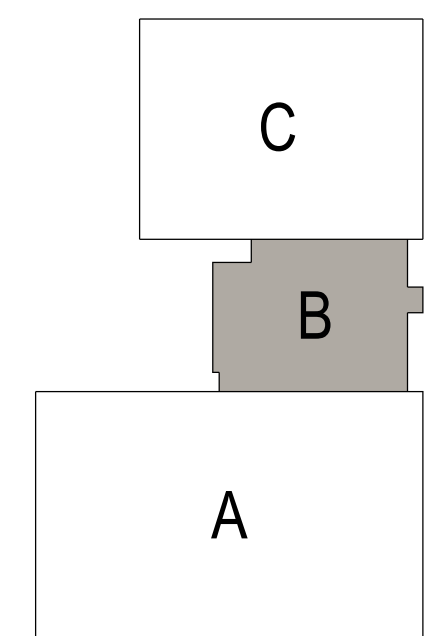


1 FIRST FLOOR MECHANICAL DEMO PLAN - AREA B
1/8" = 1'-0"
0 4 8 16

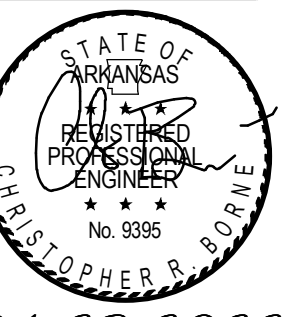
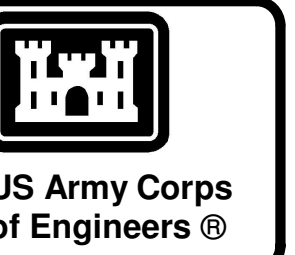


DEMOLITION KEYED NOTES

- 1 REMOVE EXISTING VAV BOX INCLUDING CONTROLS, ACTUATOR AND PIPING PACKAGE. EXISTING HANGER AND THERMOSTAT CONDUIT TO REMAIN FOR RE-USE.
- 2 REMOVE EXISTING CABINET UNIT HEATER, ASSOCIATED PIPING ACCESSORIES AND CONTROLS.
- 3 REMOVE EXISTING DUCT AND ASSOCIATED AIR DEVICE AS INDICATED.
- 4 EXISTING CONDENSATE HOOD, ASSOCIATED EXHAUST DUCTWORK AND CONTROLS TO BE REMOVED.
- 5 EXISTING CONDENSATE HOOD AND ASSOCIATED DUCTWORK TO REMAIN.
- 6 EXISTING GREASE HOOD AND ASSOCIATED EXHAUST DUCT, MAKE-UP AIR DUCT AND CONTROLS TO BE REMOVED.
- 7 REMOVE EXISTING AIR CURTAIN AND ASSOCIATED CONTROLS.
- 8 REMOVE EXISTING RETURN AIR DEVICE.
- 9 EXISTING TRANSFER GRILLE AND FIRE/SMOKE DAMPER TO REMAIN.
- 10 EXISTING TRANSFER GRILL TO REMAIN. REMOVE EXISTING FIRE/SMOKE DAMPER.
- 11 REMOVE EXISTING THERMOSTAT. THERMOSTAT FOR EXISTING CABINET UNIT HEATER LOCATED ON THE WALL ABOVE THE HEATER.
- 12 EXISTING HOOD FIRE SUPPRESSION CABINET TO BE REMOVED.
- 13 EXISTING FIRE/SMOKE DAMPER TO REMAIN.



KEY PLAN



04-28-2022

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501.572.2900	crowellae.com LANSD

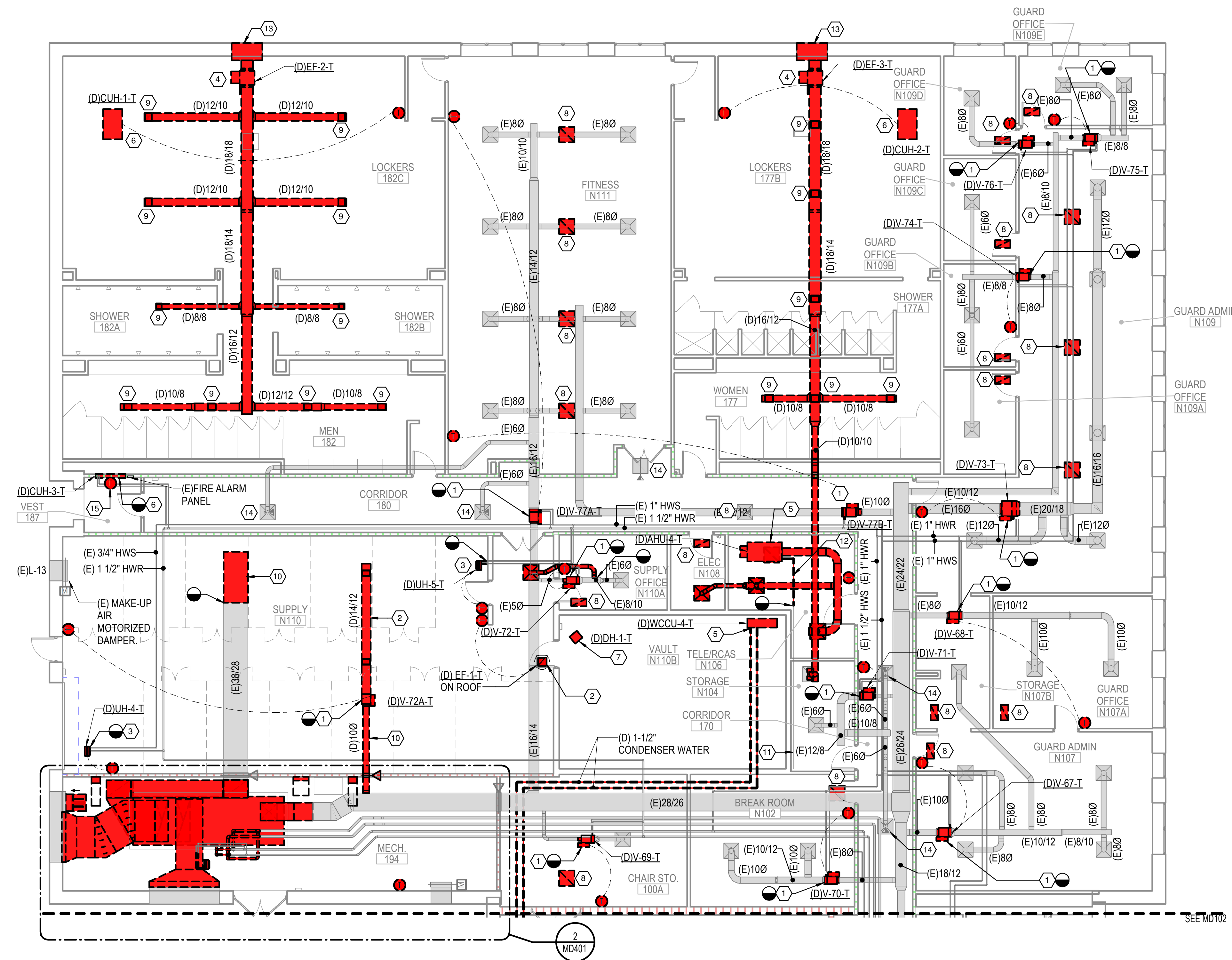
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CHARLESTON DISTRICT
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NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC

FIRST FLOOR MECHANICAL DEMO PLAN - AREA B

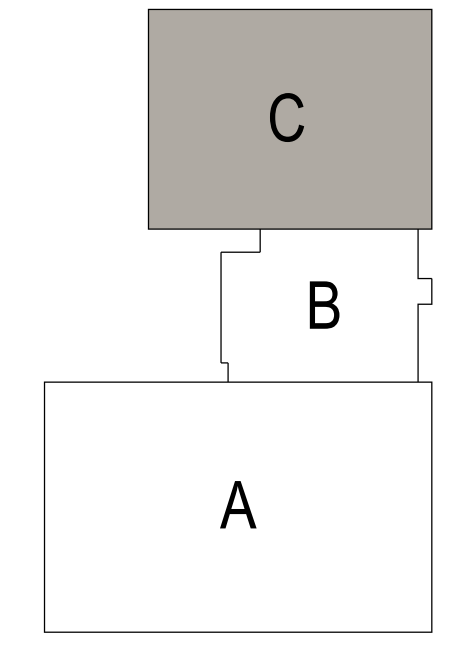
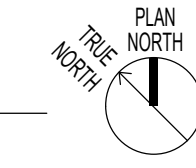
SHEET ID
MD102



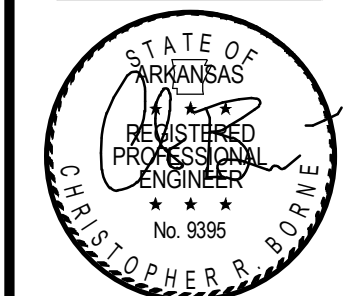
DEMOLITION KEYED NOTES

- 1 REMOVE EXISTING VAV BOX INCLUDING CONTROLS, ACTUATOR AND PIPING PACKAGE. EXISTING HANGER AND THERMOSTAT CONDUIT TO REMAIN FOR RE-USE.
- 2 REMOVE EXISTING DUCT AND ASSOCIATED AIR DEVICE AS INDICATED.
- 3 REMOVE EXISTING UNIT HEATER, ASSOCIATED PIPING ACCESSORIES AND CONTROLS. EXISTING HANGER TO REMAIN FOR RE-USE.
- 4 REMOVE EXISTING IN-LINE EXHAUST FAN AND ASSOCIATED CONTROLS, POWER AND HANGERS.
- 5 REMOVE EXISTING LIEBERT WATER-COOLED CONDENSING UNIT, AIR HANDLING UNIT AND ASSOCIATED DUCTWORK, REFRIGERANT PIPING AND CONTROLS. CONDENSATE PIPING TO REMAIN FOR RE-USE.
- 6 REMOVE EXISTING CABINET UNIT HEATER, ASSOCIATED PIPING ACCESSORIES AND CONTROLS.
- 7 REMOVE EXISTING PORTABLE DEHUMIDIFIER.
- 8 REMOVE EXISTING RETURN AIR DEVICE.
- 9 REMOVE EXISTING EXHAUST AIR DEVICE AND ASSOCIATED DUCTWORK AS INDICATED.
- 10 REMOVE EXISTING DUCTWORK AS INDICATED (TYP.).
- 11 EXISTING 1" CONDENSATE DRAIN TO REMAIN.
- 12 REMOVE PORTION OF EXISTING CONDENSATE DRAIN AS INDICATED.
- 13 REMOVE EXISTING LOUVER. PREPARE REMAINING OPENING FOR RE-USE.
- 14 EXISTING AIR DEVICE AND ASSOCIATED FIRE/SMOKE DAMPER TO REMAIN.
- 15 REMOVE EXISTING THERMOSTAT. THERMOSTAT FOR EXISTING CABINET UNIT HEATER LOCATED ON THE WALL ABOVE THE HEATER.

1 FIRST FLOOR MECHANICAL DEMO PLAN - AREA C
1/8" = 1'-0"



KEY PLAN



04-28-2022

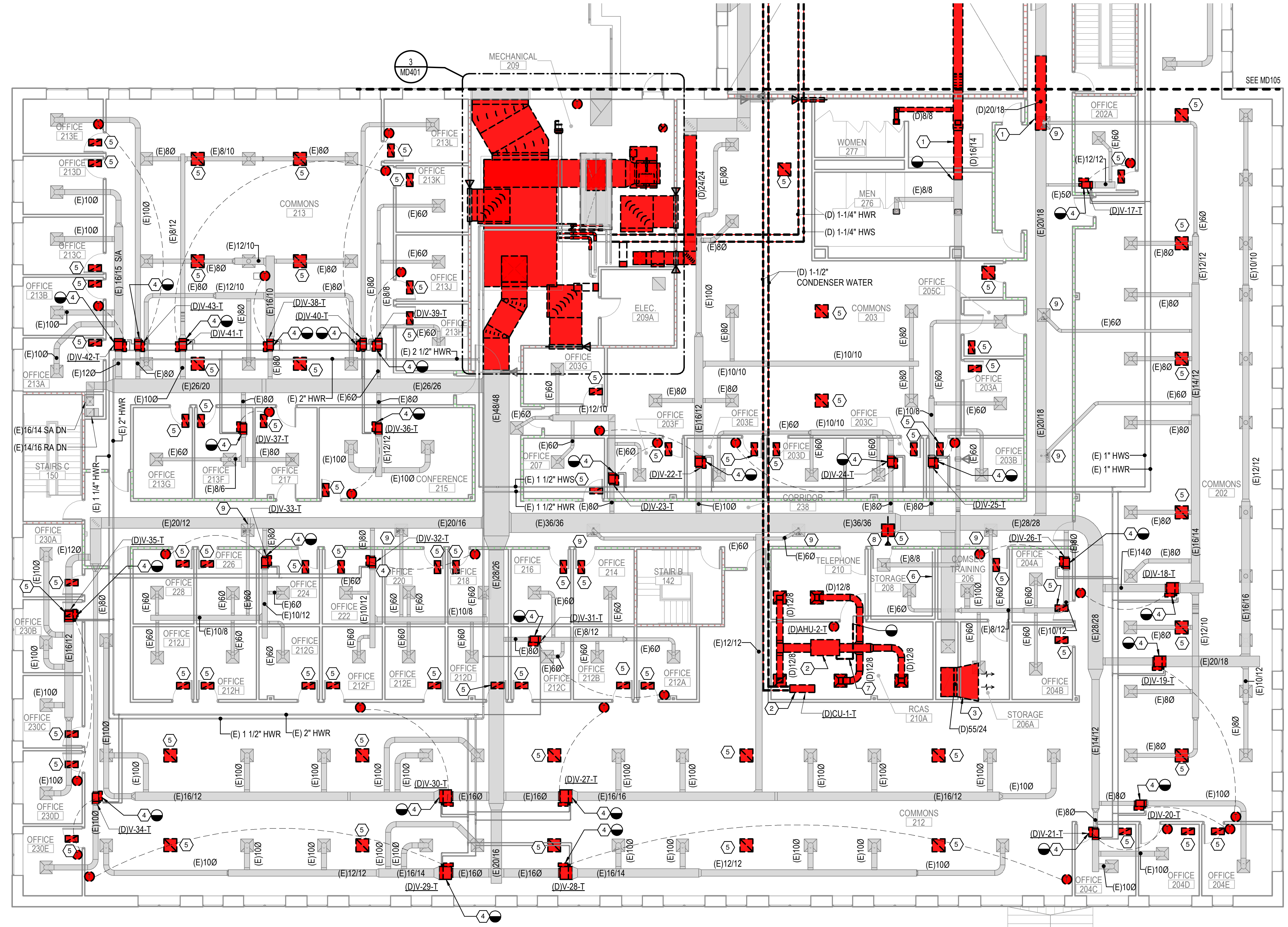
MARK	DESCRIPTION	DATE

ISSUE DATE: 29 APR 2022	SOLICITATION NO.:	CONTRACT NO.:
DESIGNED BY: C. Borne	DRAWN BY: C. Borne	CHECKED BY: R. Seay
US ARMY CORPS OF ENGINEERS CHARLESTON DISTRICT CHARLESTON, SOUTH CAROLINA		SUBMITTED BY: CROMWELL AE
1300 East 6th Street Little Rock, AR 72202 501.372.2900		

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
FIRST FLOOR MECHANICAL DEMO PLANS - AREA C

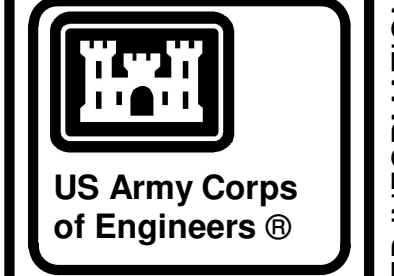
SHEET ID
MD103

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



DEMOLITION KEYED NOTES

- 1 REMOVE EXISTING DUCTWORK AS INDICATED (TYP.).
- 2 REMOVE EXISTING LIEBERT WATER-COOLED CONDENSING UNIT, AIR HANDLING UNIT AND ASSOCIATED DUCTWORK, REFRIGERANT PIPING AND CONTROLS. CONDENSATE PIPING TO REMAIN FOR RE-USE.
- 3 REMOVE INLET AND ELBOW OF 55/24 TRANSFER DUCT TO FIRST FLOOR. THE VERTICAL PORTION OF THE DUCT IS TO REMAIN FOR RE-USE.
- 4 REMOVE EXISTING VAV BOX INCLUDING CONTROLS, ACTUATOR AND PIPING PACKAGE. EXISTING HANGER AND THERMOSTAT CONDUIT TO REMAIN FOR RE-USE.
- 5 REMOVE EXISTING RETURN AIR DEVICE.
- 6 EXISTING 1" CONDENSATE DRAIN TO REMAIN.
- 7 REMOVE PORTION OF EXISTING CONDENSATE DRAIN AS INDICATED.
- 8 REMOVE EXISTING FIRE/SMOKE DAMPER AND ASSOCIATED WIRING ALONG WITH AIR DEVICE.
- 9 EXISTING AIR DEVICE AND ASSOCIATED FIRE/SMOKE DAMPER TO REMAIN.



04-28-2022

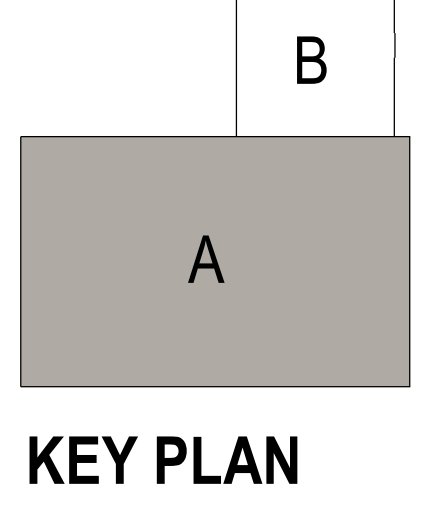
MARK	DESCRIPTION	DATE

US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA
CROMWELL
 1300 East 6th Street Little Rock, AR 72202
 SIZE: 501.87x2.900
 cromwell.com | ansd

DESIGNED BY: C. Bone
 DRAWN BY: C. Bone
 CHECKED BY: R. Sney
 SUBMITTED BY: CHOMWELL AE

ISSUE DATE: 28 APR 2022
 SOLICITATION NO.:
 CONTRACT NO.:

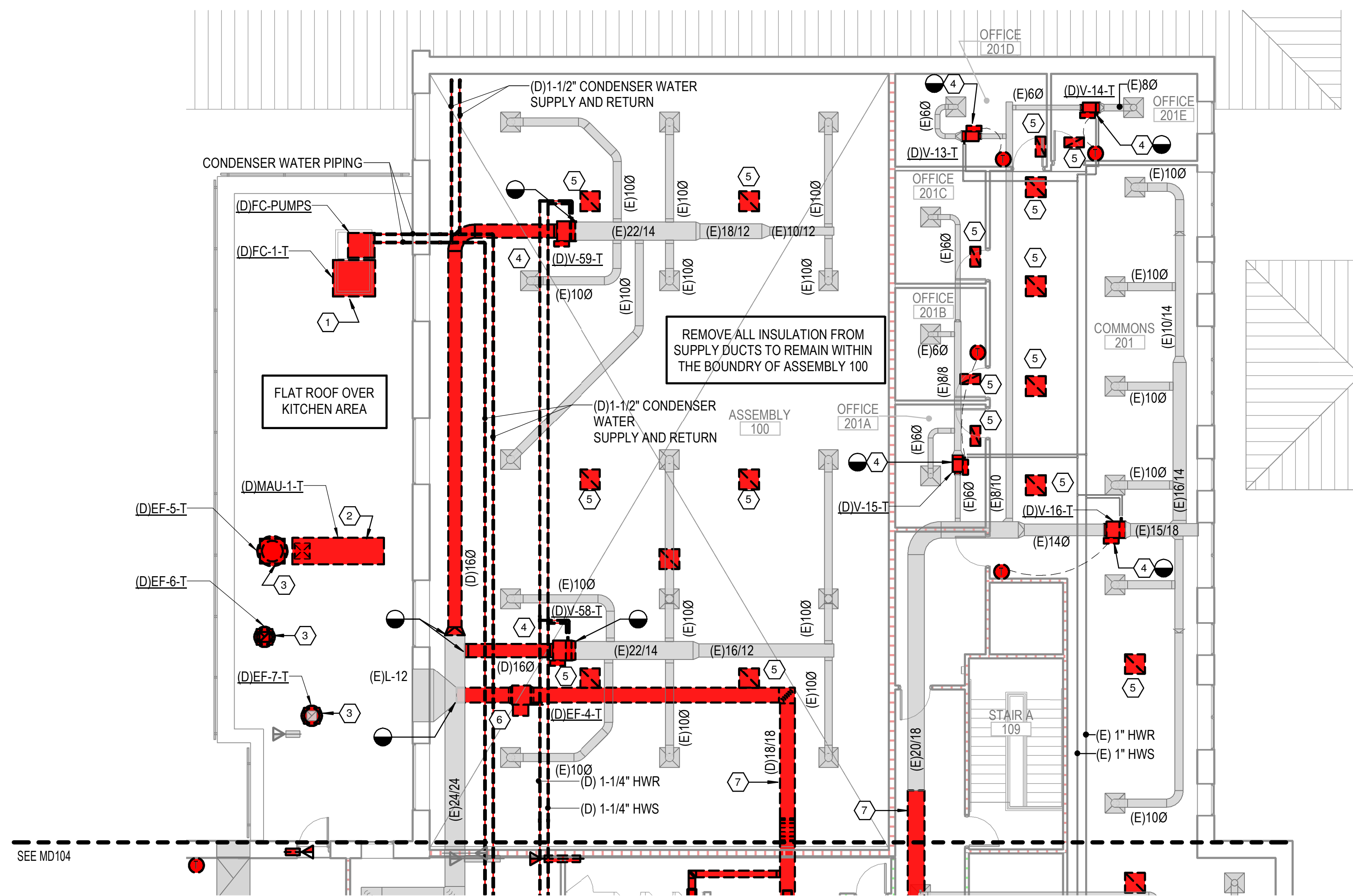
1 SECOND FLOOR MECHANICAL DEMO PLAN - AREA A
 1/8" = 1'-0"
 0 4 8 16



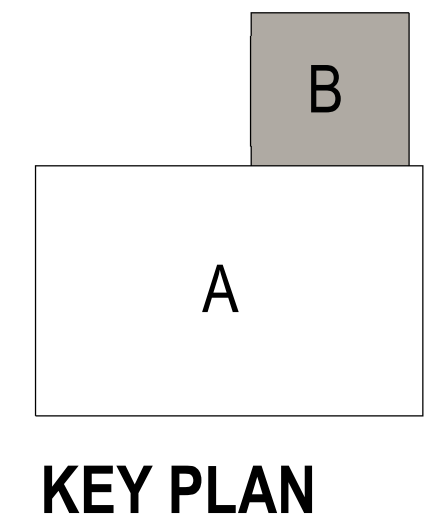
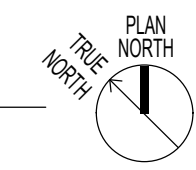
NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC
 SECOND FLOOR MECHANICAL DEMO PLAN - AREA A

SHEET ID
MD104

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

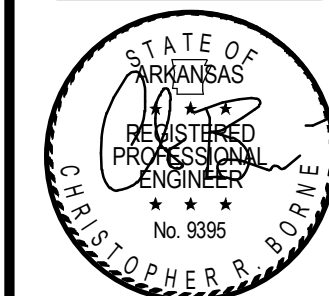
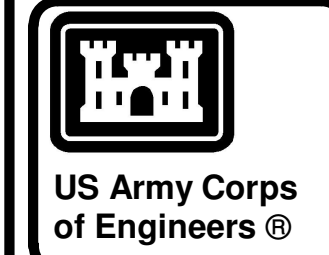


1 SECOND FLOOR MECHANICAL DEMO PLAN - AREA B
1/8" = 1'-0"



KEYED NOTES

- 1 EXISTING FLUID COOLER AND ASSOCIATED PIPING PACKAGE, PIPING AND CONTROLS TO BE REMOVED. EQUIPMENT PLATFORM TO REMAIN.
- 2 REMOVE EXISTING MAKE-UP AIR UNIT AND ASSOCIATED DUCTWORK, GAS PIPING AND CONTROLS. CURB TO REMAIN.
- 3 REMOVE EXISTING ROOF-MOUNTED EXHAUST FAN AND ASSOCIATED CONTROLS AND POWER. CURB TO REMAIN.
- 4 REMOVE EXISTING VAV BOX INCLUDING CONTROLS, ACTUATOR AND PIPING PACKAGE. EXISTING HANGER AND THERMOSTAT CONDUIT TO REMAIN FOR RE-USE.
- 5 REMOVE EXISTING RETURN AIR DEVICE.
- 6 REMOVE EXISTING IN-LINE EXHAUST FAN AND ASSOCIATED CONTROLS, POWER AND HANGERS.
- 7 REMOVE EXISTING DUCTWORK AS INDICATED (TYP.).



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
1300 East 6th Street Little Rock, AR 72202	
501.872.2900	

CROMWELL
US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

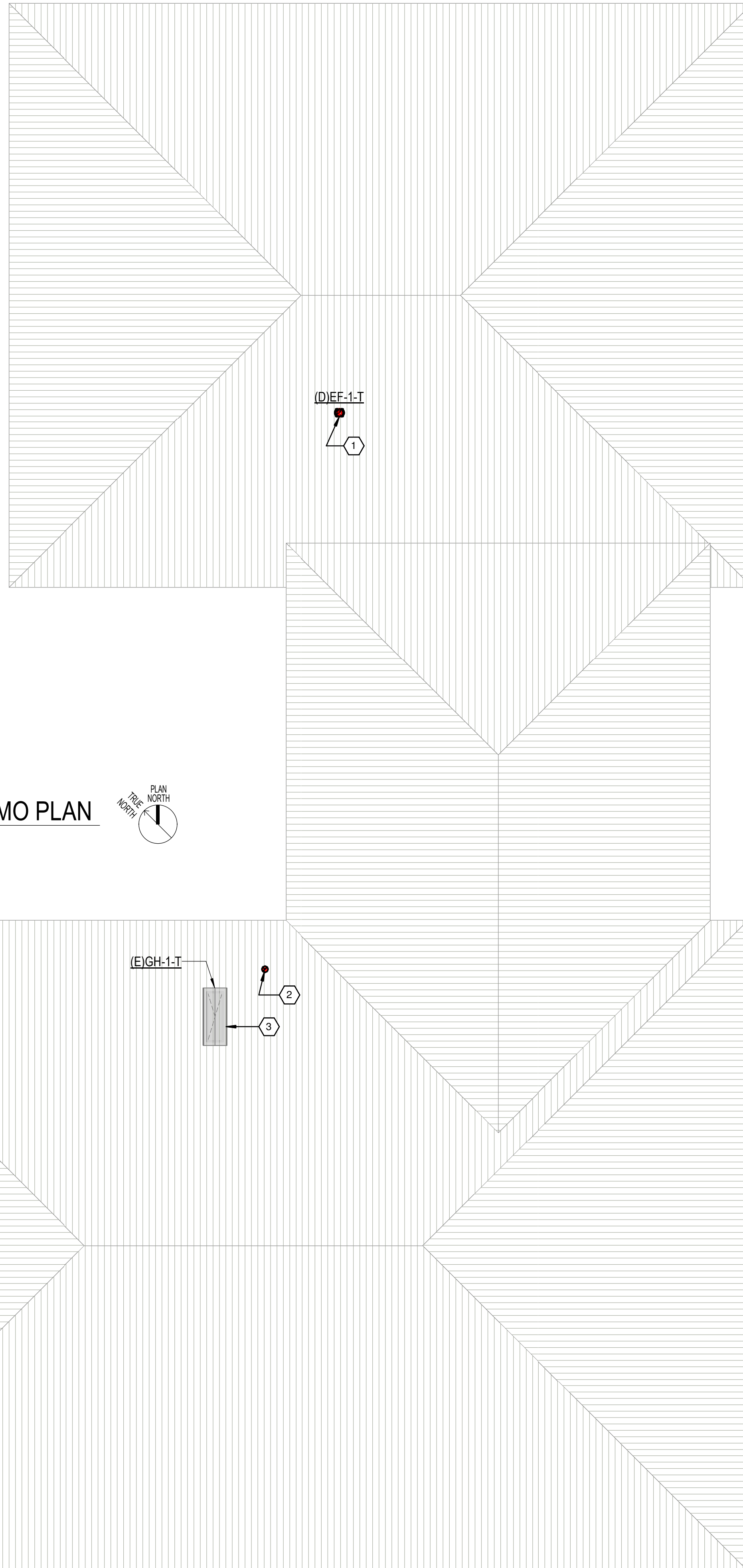
NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
SECOND FLOOR MECHANICAL DEMO PLAN -
AREA B

SHEET ID
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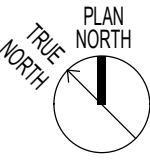
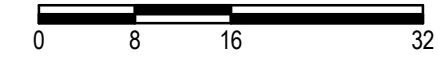
WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

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1 OVERALL ROOF MECHANICAL DEMO PLAN
 1/16" = 1'-0"

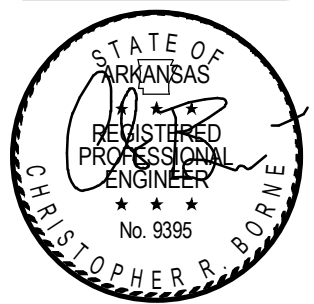


DEMOLITION KEYED NOTES

- 1 REMOVE EXISTING ROOF-MOUNTED EXHAUST FAN AND ASSOCIATED CONTROLS AND POWER. CURB TO REMAIN.
- 2 EXISTING 16" DIA. FLUE THROUGH ROOF TO BE REMOVED.
- 3 EXISTING ROOF-MOUNTED GRAVITY HOOD AND THROAT-SIZE RELIEF DUCT TO REMAIN. ALL OTHER RELIEF DUCT AND ASSOCIATED CONTROL DAMPER TO BE REMOVED.



US Army Corps of Engineers®



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL A/E	
SIZE: 901.87x2.900	

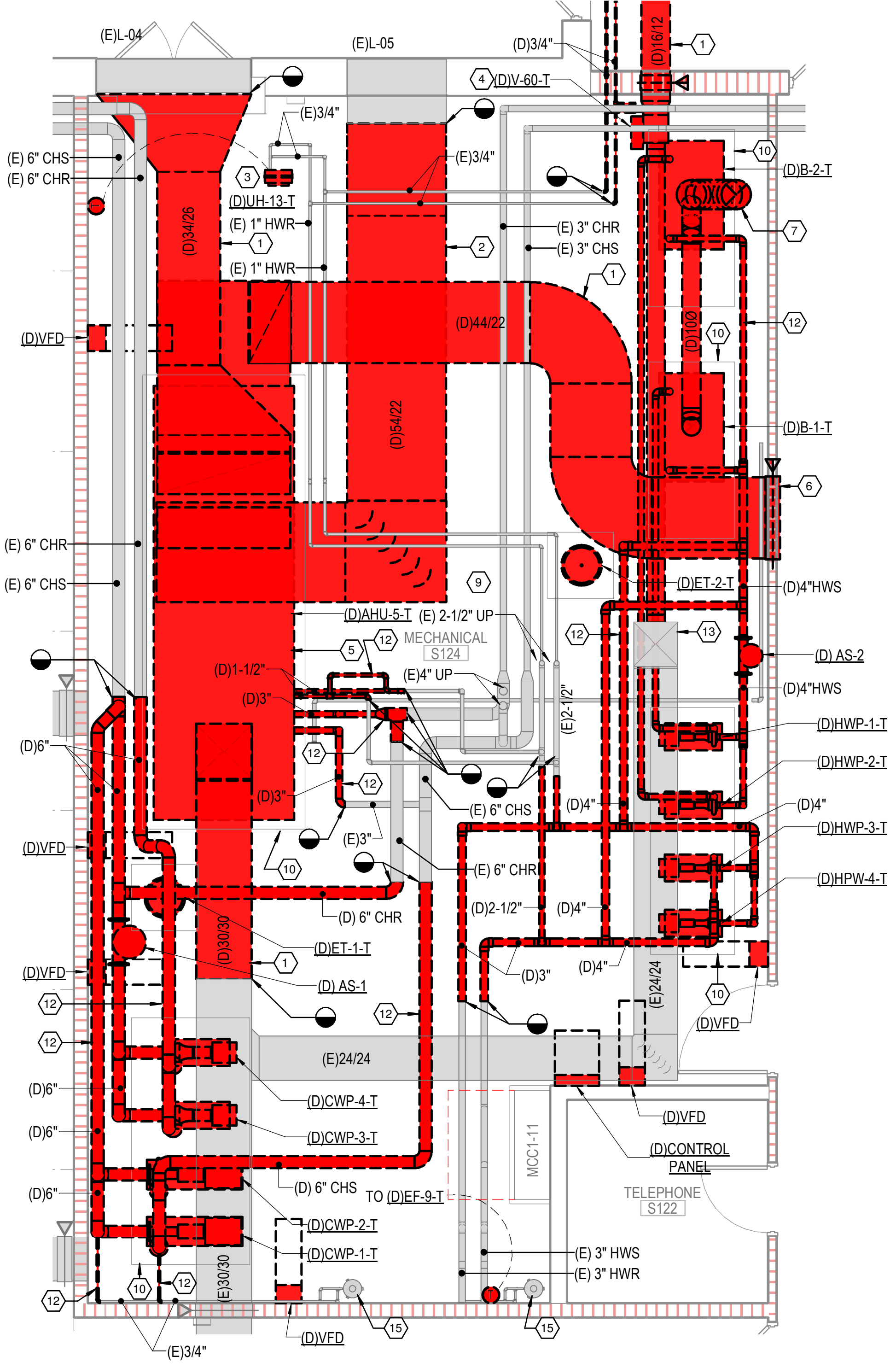
US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA

CROMWELL
 1300 East 6th Street Little Rock, AR 72202
 501.872.2900
 cromwell.com | ANS1D

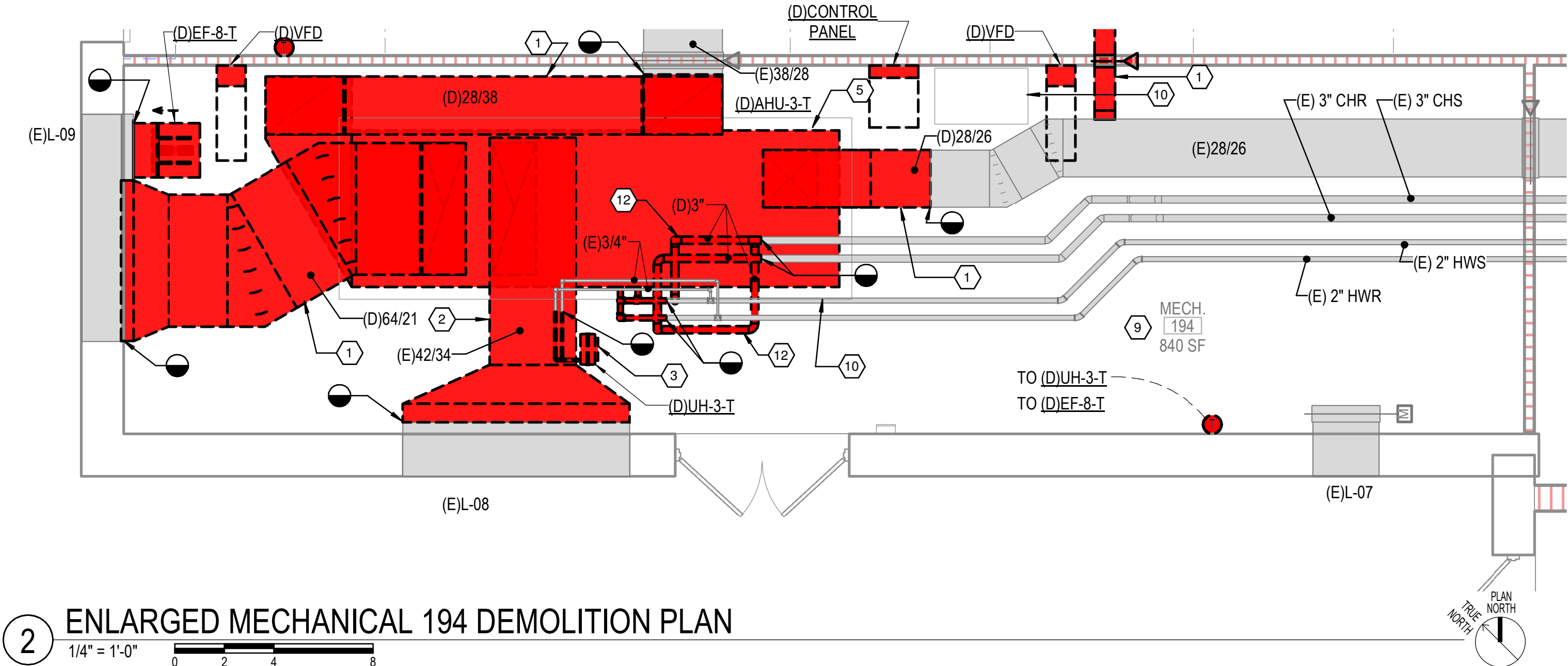
NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC
 OVERALL ROOF MECHANICAL DEMO PLAN

SHEET ID
MD106

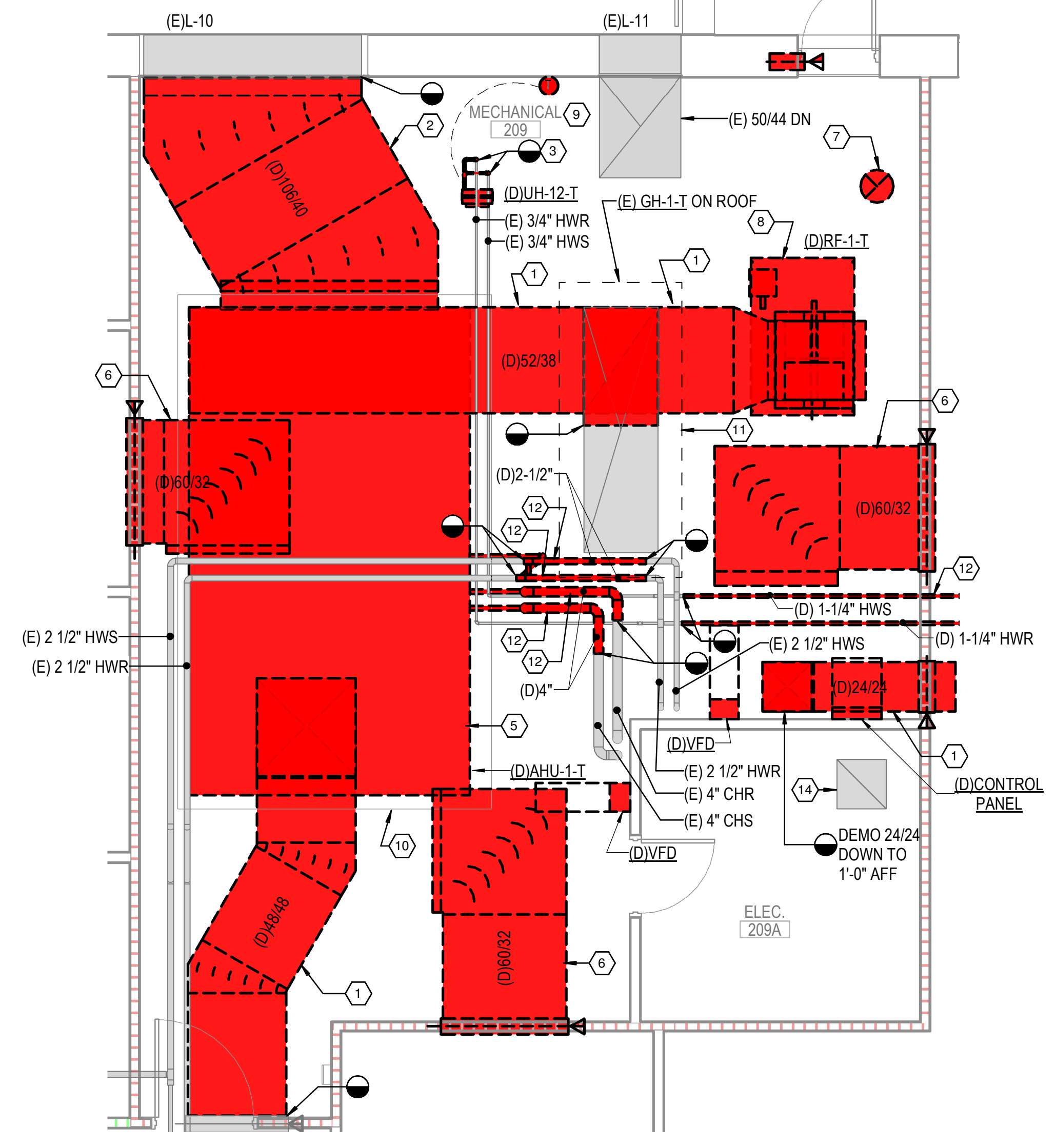
WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



1 ENLARGED MECHANICAL S124 DEMOLITION PLAN
 1/4" = 1'-0" 0 2 4 8
 PLAN NORTH



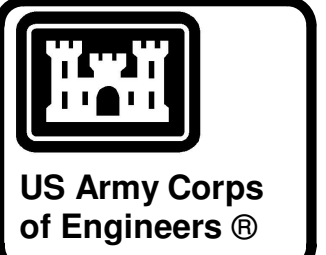
2 ENLARGED MECHANICAL 194 DEMOLITION PLAN
 1/4" = 1'-0" 0 2 4 8
 PLAN NORTH



3 ENLARGED MECHANICAL 209 DEMOLITION PLAN
 1/4" = 1'-0" 0 2 4 8
 PLAN NORTH

DEMOLITION KEYED NOTES

- 1 REMOVE EXISTING DUCTWORK AS INDICATED (TYP.).
- 2 REMOVE EXISTING OUTSIDE AIR DUCT.
- 3 REMOVE EXISTING UNIT HEATER, ASSOCIATED PIPING ACCESSORIES AND CONTROLS. EXISTING HANGER TO REMAIN FOR RE-USE.
- 4 REMOVE EXISTING VAV BOX INCLUDING CONTROLS, ACTUATOR AND PIPING PACKAGE. EXISTING HANGER AND THERMOSTAT CONDUIT TO REMAIN FOR RE-USE.
- 5 REMOVE EXISTING AIR HANDLING UNIT
- 6 REMOVE RETURN TRANSFER DUCT AND ASSOCIATED FIRE/SMOKE DAMPER.
- 7 EXISTING 16" DIA. FLUE THROUGH ROOF TO BE REMOVED.
- 8 REMOVE EXISTING RETURN FAN AND ASSOCIATED DUCTWORK, CONTROLS AND ROOF-SUPPORTED EQUIPMENT RAILS.
- 9 HAZARDOUS MATERIAL SURVEY INDICATES ASBESTOS CONTAINING MATERIAL (ACM) IN THE GASKETING FOR THE MECHANICAL PIPING TO BE REMOVED IN THIS SPACE. CONDUCT ABATEMENT OF THE ACM PER THE HAZARDOUS MATERIALS REPORT INCLUDED IN THE SPECIFICATIONS AND SPECIFICATIONS SECTION 02 82 00 ASBESTOS REMEDIATION.
- 10 EXISTING EQUIPMENT PAD TO REMAIN.
- 11 EXISTING ROOF-MOUNTED GRAVITY HOOD AND THROAT-SIZE RELIEF DUCT TO REMAIN. ALL OTHER RELIEF DUCT AND ASSOCIATED CONTROL DAMPER TO BE REMOVED.
- 12 REMOVE EXISTING PIPING AS INDICATED (TYP.).
- 13 EXISTING DUCT TO 2ND FLOOR AND ASSOCIATED FIRE/SMOKE DAMPER AT DECK TO REMAIN.
- 14 EXISTING TRANSFER GRILLE IN ELECTRICAL ROOM CEILING/LID TO REMAIN.
- 15 EXISTING BYPASS FEEDER AND ASSOCIATED PIPING TO REMAIN AS INDICATED.



04-28-2022

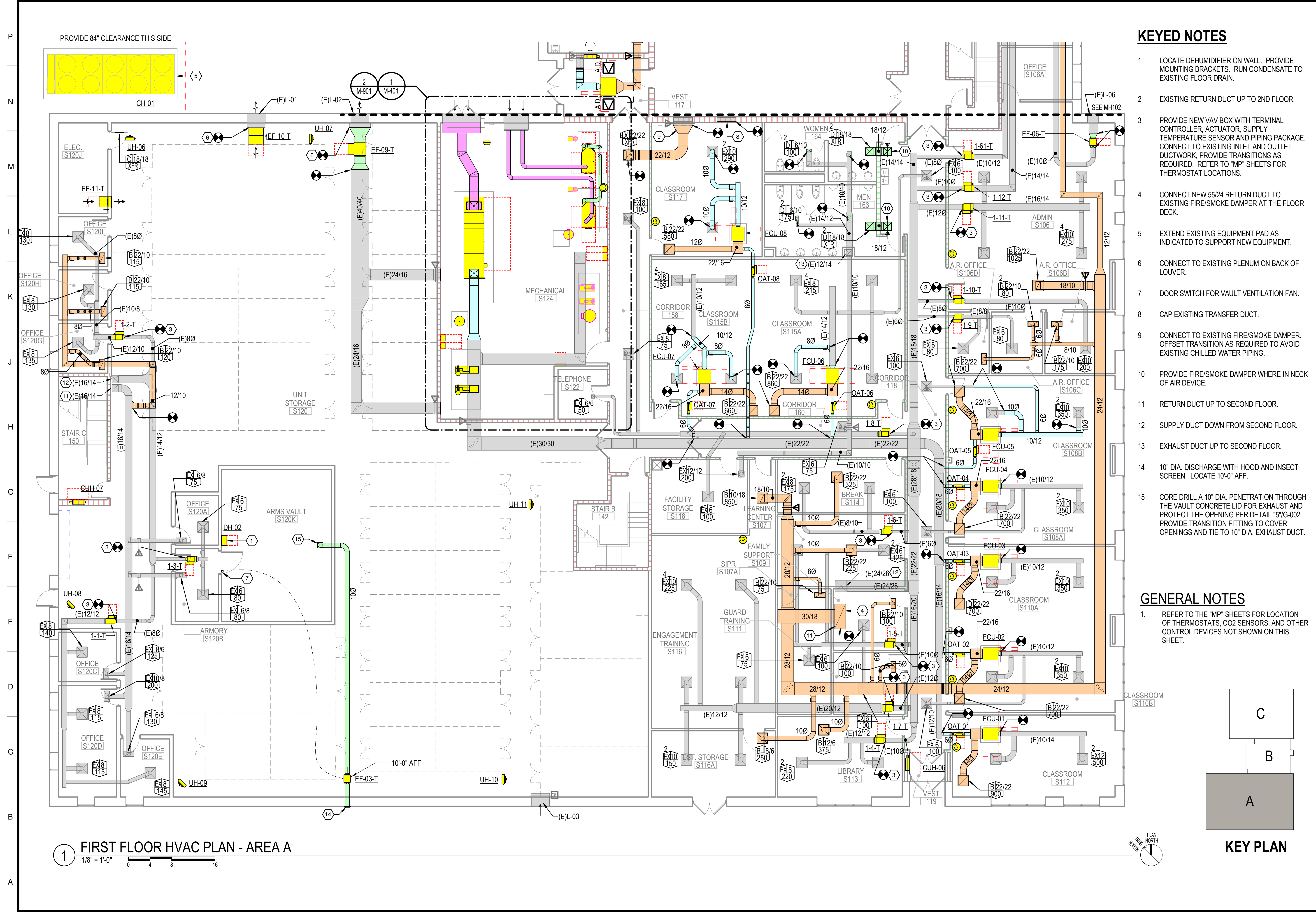
MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022	SOLICITATION NO.:	CONTRACT NO.:
DRAWN BY: C. Borne	CHECKED BY: R. Seay	SUBMITTED BY: CROMWELL AE	
US ARMY CORPS OF ENGINEERS CHARLESTON DISTRICT CHARLESTON, SOUTH CAROLINA			
1300 East 6th Street Little Rock, AR 72202 501.372.2900 cromwell@icm.lansid			

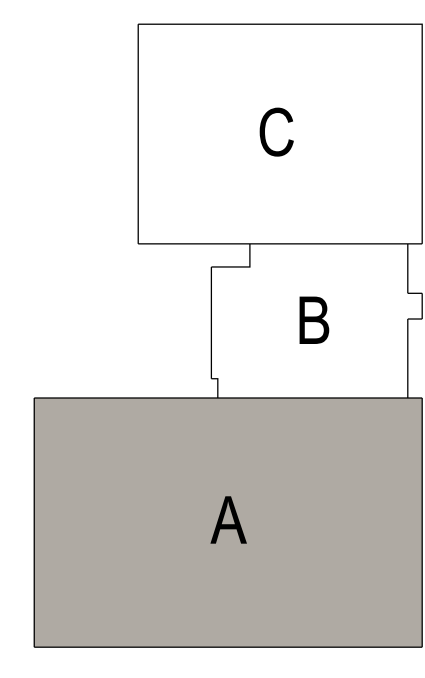
NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC
 ENLARGED MECHANICAL DEMO PLANS

SHEET ID
 MD401

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



1 FIRST FLOOR HVAC PLAN - AREA A
 1/8" = 1'-0"
 0 4 8 16



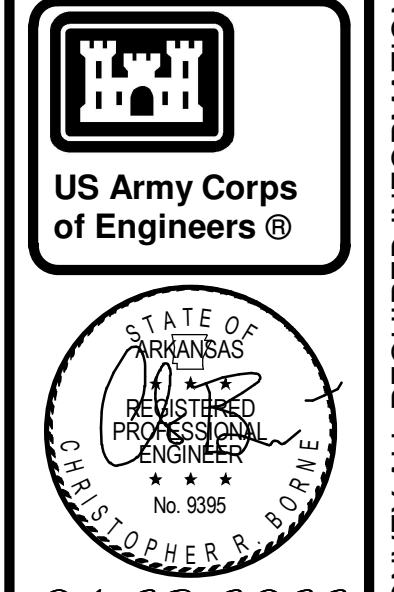
KEY PLAN

KEYED NOTES

- 1 LOCATE DEHUMIDIFIER ON WALL. PROVIDE MOUNTING BRACKETS. RUN CONDENSATE TO EXISTING FLOOR DRAIN.
- 2 EXISTING RETURN DUCT UP TO 2ND FLOOR.
- 3 PROVIDE NEW VAV BOX WITH TERMINAL CONTROLLER, ACTUATOR, SUPPLY TEMPERATURE SENSOR AND PIPING PACKAGE. CONNECT TO EXISTING INLET AND OUTLET DUCTWORK, PROVIDE TRANSITIONS AS REQUIRED. REFER TO "MP" SHEETS FOR THERMOSTAT LOCATIONS.
- 4 CONNECT NEW 55/24 RETURN DUCT TO EXISTING FIRE/SMOKE DAMPER AT THE FLOOR DECK.
- 5 EXTEND EXISTING EQUIPMENT PAD AS INDICATED TO SUPPORT NEW EQUIPMENT.
- 6 CONNECT TO EXISTING PLENUM ON BACK OF LOUVER.
- 7 DOOR SWITCH FOR VAULT VENTILATION FAN.
- 8 CAP EXISTING TRANSFER DUCT.
- 9 CONNECT TO EXISTING FIRE/SMOKE DAMPER. OFFSET TRANSITION AS REQUIRED TO AVOID EXISTING CHILLED WATER PIPING.
- 10 PROVIDE FIRE/SMOKE DAMPER WHERE IN NECK OF AIR DEVICE.
- 11 RETURN DUCT UP TO SECOND FLOOR.
- 12 SUPPLY DUCT DOWN FROM SECOND FLOOR.
- 13 EXHAUST DUCT UP TO SECOND FLOOR.
- 14 10" DIA. DISCHARGE WITH HOOD AND INSECT SCREEN. LOCATE 10'-0" AFF.
- 15 CORE DRILL A 10" DIA. PENETRATION THROUGH THE VAULT CONCRETE LID FOR EXHAUST AND PROTECT THE OPENING PER DETAIL "5"/G-002. PROVIDE TRANSITION FITTING TO COVER OPENINGS AND TIE TO 10" DIA. EXHAUST DUCT.

GENERAL NOTES

1. REFER TO THE "MP" SHEETS FOR LOCATION OF THERMOSTATS, CO2 SENSORS, AND OTHER CONTROL DEVICES NOT SHOWN ON THIS SHEET.



MARK	DESCRIPTION	DATE

US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA

CROMWELL

1300 East 6th Street Little Rock, AR 72202
 501.372.2500
 cromwell@com.lansid

DESIGNED BY: C. Bone
 DRAWN BY: C. Bone
 CHECKED BY: R. Shay
 SUBMITTED BY: CROMWELL AE
 SIZE: 11x17

ISSUE DATE: 28 APR 2022
 SOLICITATION NO.:
 CONTRACT NO.:

NC026 HVAC-ELEC-PLUMB RESET
 WINTERTVILLE, NC

FIRST FLOOR HVAC PLAN - AREA A

SHEET ID
MH101

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

MAIL ROOM SEQUENCE

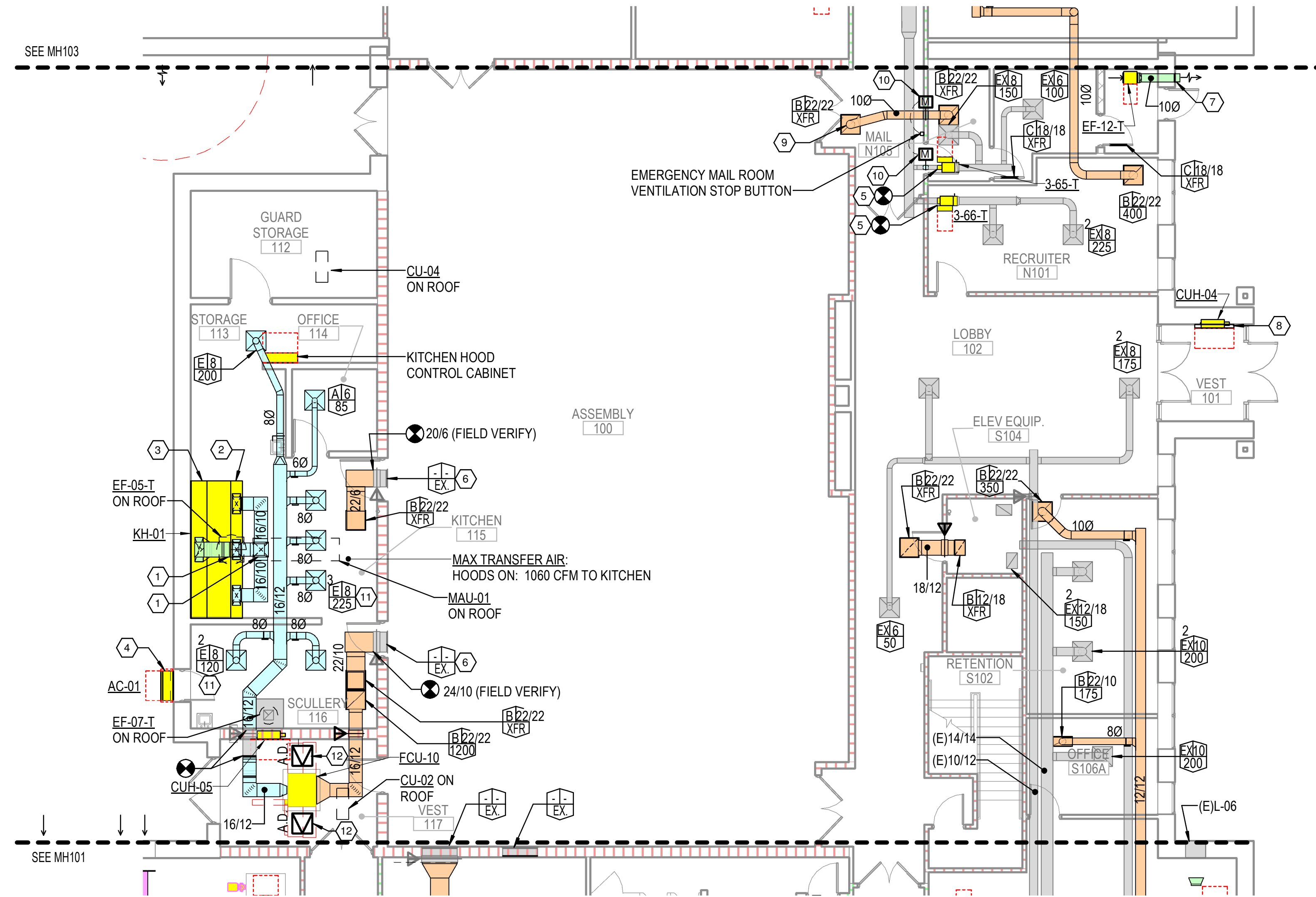
- EXHAUST FAN EF-12-T SHALL RUN CONTINUOUSLY TO MAINTAIN NEGATIVE PRESSURE IN THE MAIL AREA.
- UPON ACTIVATION OF THE MAIL ROOM VENTILATION STOP BUTTON, THE LOW-LEAK DAMPERS IN THE VAV 3-65-T INLET DUCT AND IN THE TRANSFER DUCT SHALL BE CLOSED. AN ALARM SHALL BE REPORTED THROUGH THE BAS.

KEYED NOTES

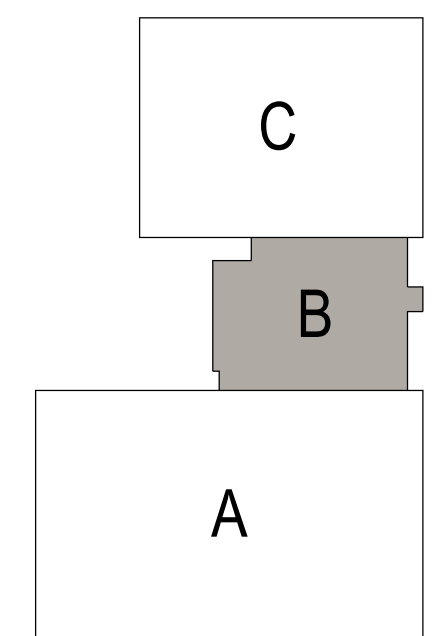
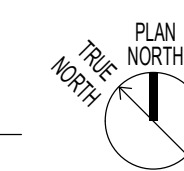
- RE-USE EXISTING ROOF OPENING.
- DOWNFLOW PERFORATED FACE MAKE-UP AIR PLENUM.
- PROVIDE GREASE HOOD FIRE SUPPRESSION SYSTEM.
- LOCATE NEW AIR CURTAIN OVER KITCHEN ACCESS DOOR. PROVIDE AUTOMATIC DOOR SWITCH.
- PROVIDE NEW VAV BOX WITH TERMINAL CONTROLLER, ACTUATOR, SUPPLY TEMPERATURE SENSOR AND PIPING PACKAGE. CONNECT TO EXISTING INLET AND OUTLET DUCTWORK. PROVIDE TRANSITIONS AS REQUIRED. REFER TO "MP" SHEETS FOR THERMOSTAT LOCATIONS.
- CONNECT TO EXISTING TRANSFER GRILLE.
- 10" DIA. DISCHARGE WITH HOOD AND INSECT SCREEN. LOCATE 10'-0" AFF.
- CABINET UNIT HEATER ENCLOSURE PANEL FOR OUT OF WALL MOUNTING.
- PROVIDE FIRE/SMOKE DAMPER WHERE DUCT PENETRATES RATED "LID".
- PROVIDE LOW-LEAK MOTORIZED DAMPER IN DUCT.
- ADJUST BLADE PATTERN TO AVOID SUPPLY AIRFLOW INTERFERENCE WITH KITCHEN HOOD EXHAUST CAPTURE.
- PROVIDE A MINIMUM 24/24 ACCESS DOOR. ACCESS DOOR RATING TO MATCH CEILING.

GENERAL NOTES

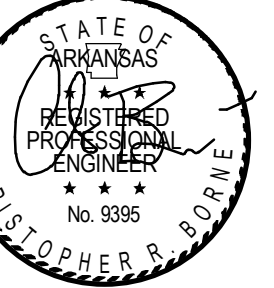
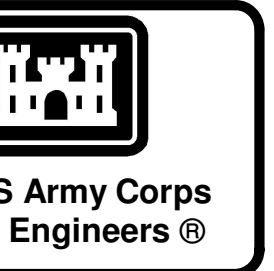
- REFER TO THE "MP" SHEETS FOR LOCATION OF THERMOSTATS, CO2 SENSORS, AND OTHER CONTROL DEVICES NOT SHOWN ON THIS SHEET.



1 FIRST FLOOR HVAC PLAN - AREA B
1/8" = 1'-0"
0 4 8 16



KEY PLAN



04-28-2022

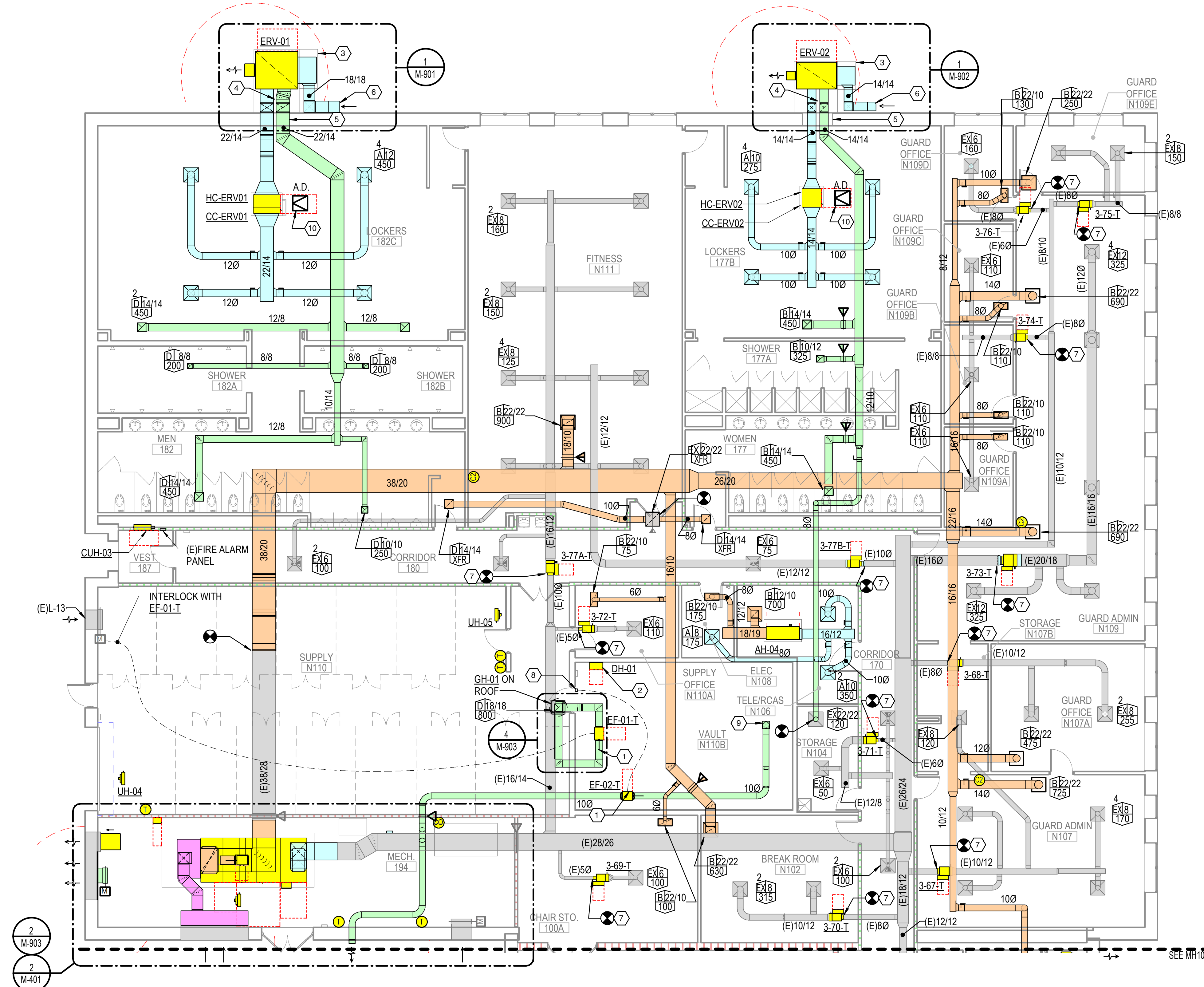
MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	

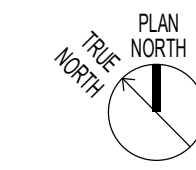
US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA
CROMWELL
1300 East 6th Street Little Rock, AR 72202
501.872.2900
cromwell@con.usace.army.mil

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
FIRST FLOOR HVAC PLAN - AREA B
SHEET ID
MH102

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



1 FIRST FLOOR HVAC PLAN - AREA C
1/8" = 1'-0"
0 4 8 16

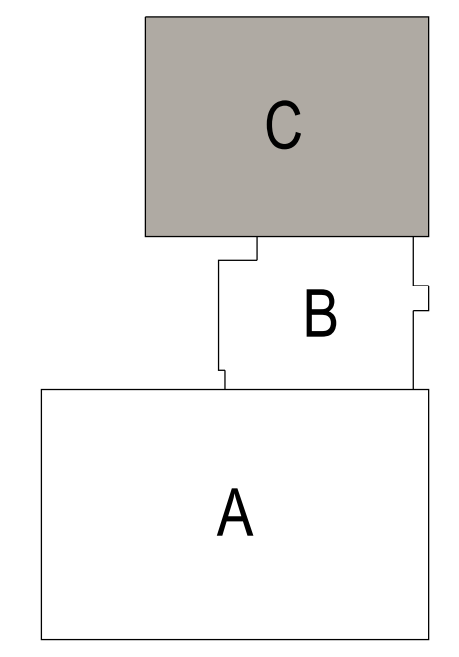


KEYED NOTES

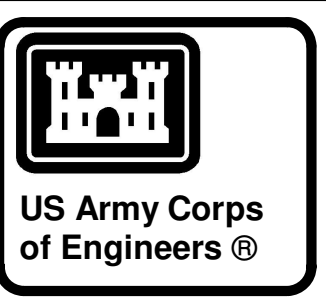
- LOCATE NEW EXHAUST FAN ON TOP OF VAULT FOR ACCESSIBILITY.
- LOCATE DEHUMIDIFIER ON WALL. PROVIDE MOUNTING BRACKETS. RUN CONDENSATE TO EXISTING FLOOR DRAIN.
- NEW CONCRETE EQUIPMENT PAD.
- SUPPLY AND EXHAUST DUCTS SERVING ENERGY RECOVERY UNITS SHALL BE DOUBLE WALL INSULATED WHILE EXTERNAL TO THE BUILDING. TRANSITION TO SINGLE WALL EXTERNALLY INSULATED DUCT WHERE THE DUCTS ENTER THE BUILDING.
- IN-FILL UNSEEN PORTION OF EXISTING LOUVER OPENING. REFERENCE ARCHITECTURAL DETAIL 2/G-004 FOR MORE INFORMATION.
- EXTEND OUTSIDE AIR INTAKE TO A MINIMUM 10'-0" ABOVE GRADE AND TURN HORIZONTAL. PROVIDE 45-DEGREE CUT AND INSECT SCREEN OVER OPENING.
- PROVIDE NEW VAV BOX WITH TERMINAL CONTROLLER, ACTUATOR, SUPPLY TEMPERATURE SENSOR AND PIPING PACKAGE. CONNECT TO EXISTING INLET AND OUTLET DUCTWORK. PROVIDE TRANSITIONS AS REQUIRED. REFER TO "MP" SHEETS FOR THERMOSTAT LOCATIONS.
- DOOR SWITCH FOR VAULT VENTILATION FAN.
- CORE DRILL A 10" DIA. PENETRATION THROUGH THE VAULT CONCRETE LID FOR EXHAUST AND PROTECT THE OPENING PER DETAIL "5/G-002. PROVIDE TRANSITION FITTING TO COVER OPENINGS AND TIE TO 10" DIA. EXHAUST DUCT.
- PROVIDE A MINIMUM 24/24 ACCESS DOOR. ACCESS DOOR RATING TO MATCH CEILING.

GENERAL NOTES

- REFER TO THE "MP" SHEETS FOR LOCATION OF THERMOSTATS, CO2 SENSORS, AND OTHER CONTROL DEVICES NOT SHOWN ON THIS SHEET.



KEY PLAN



04-28-2022

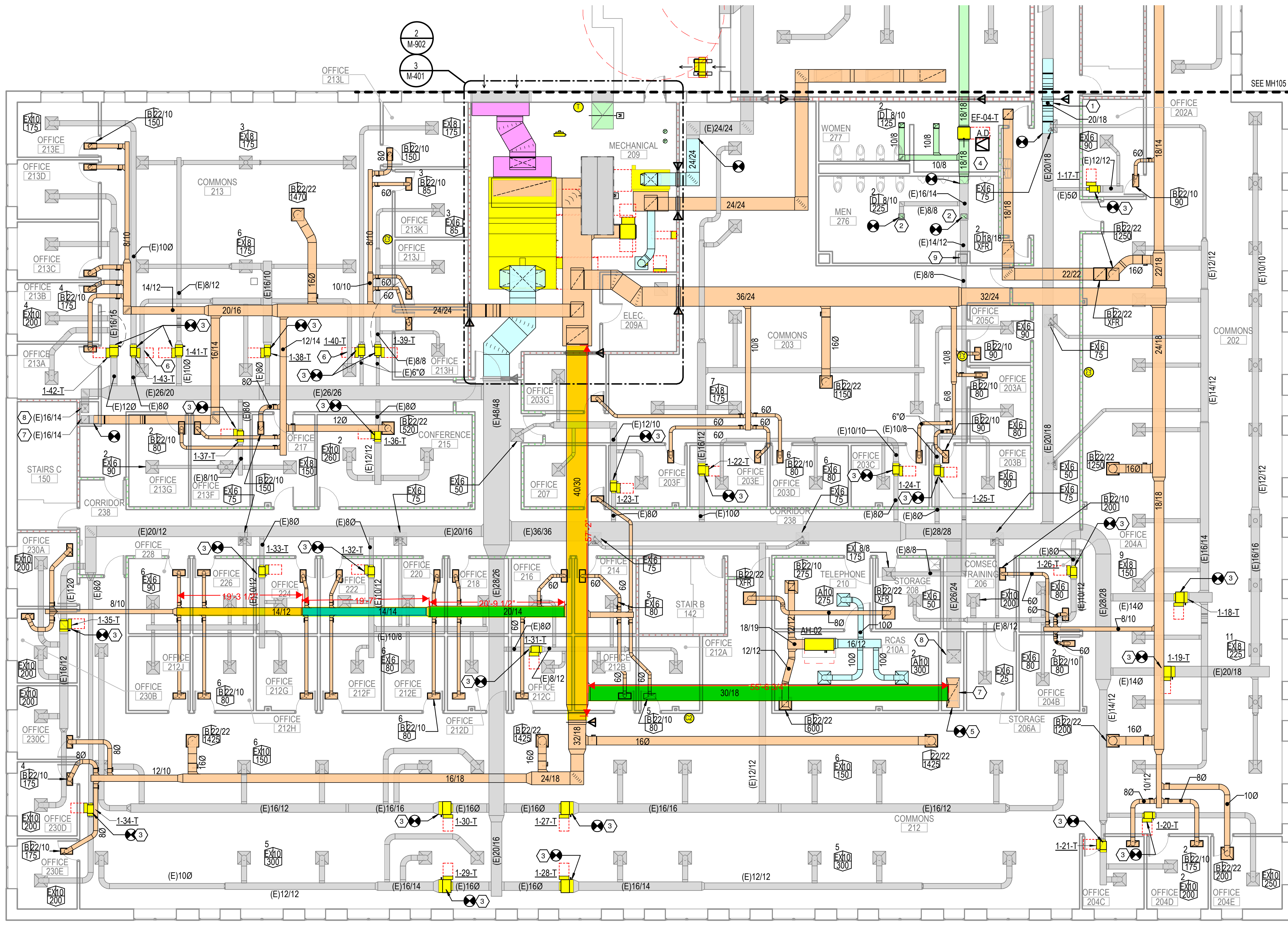
MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
1300 East 6th Street Little Rock, AR 72202	
501.872.2500	

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
FIRST FLOOR HVAC PLAN - AREA C

SHEET ID
MH103

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

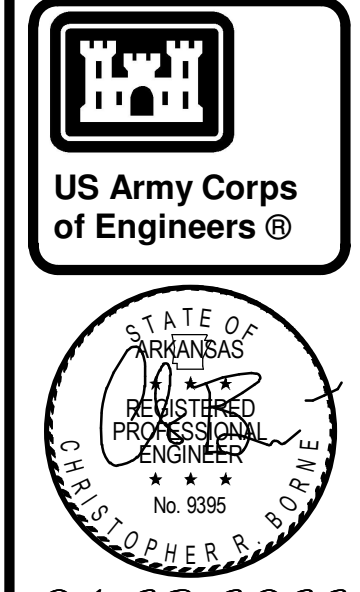


KEYED NOTES

- 1 ROUTE DUCT OVER CORRIDOR "LID" THROUGH SMOKE PARTITION.
- 2 NEW EXHAUST AIR DEVICE.
- 3 PROVIDE NEW VAV BOX WITH TERMINAL CONTROLLER, ACTUATOR, SUPPLY TEMPERATURE SENSOR AND PIPING PACKAGE. CONNECT TO EXISTING INLET AND OUTLET DUCTWORK. PROVIDE TRANSITIONS AS REQUIRED. REFER TO "MP" SHEETS FOR THERMOSTAT LOCATIONS.
- 4 PROVIDE MINIMUM 24/24 ACCESS DOOR FOR NEW IN-LINE EXHAUST FAN. LOCATE ON SERVICE SIDE OF FAN.
- 5 TRANSITION AND CONNECT TO EXISTING 55/24 RETURN AIR DUCT IN VERTICAL.
- 6 OFFSET EXISTING DUCT AS REQUIRED TO ALLOW ACCESS TO VAV BOX.
- 7 RETURN DUCT UP FROM FIRST FLOOR.
- 8 SUPPLY DUCT DOWN TO FIRST FLOOR.
- 9 EXHAUST DUCT UP FROM FIRST FLOOR.

GENERAL NOTES

1. REFER TO THE "MP" SHEETS FOR LOCATION OF THERMOSTATS, CO2 SENSORS, AND OTHER CONTROL DEVICES NOT SHOWN ON THIS SHEET.



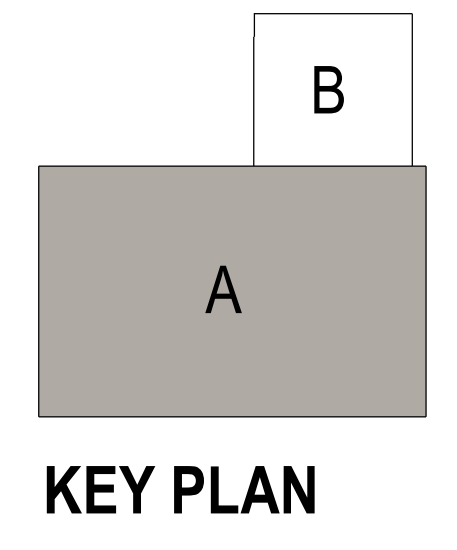
MARK	DESCRIPTION	DATE

US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA
CROMWELL
 1300 East 6th Street Little Rock, AR 72202
 501.372.2500
 cromwell.com LANSD

DESIGNED BY: C. Bone
 DRAWN BY: C. Bone
 CHECKED BY: R. Seay
 SUBMITTED BY: CROMWELL AE
 SIZE: 11x17

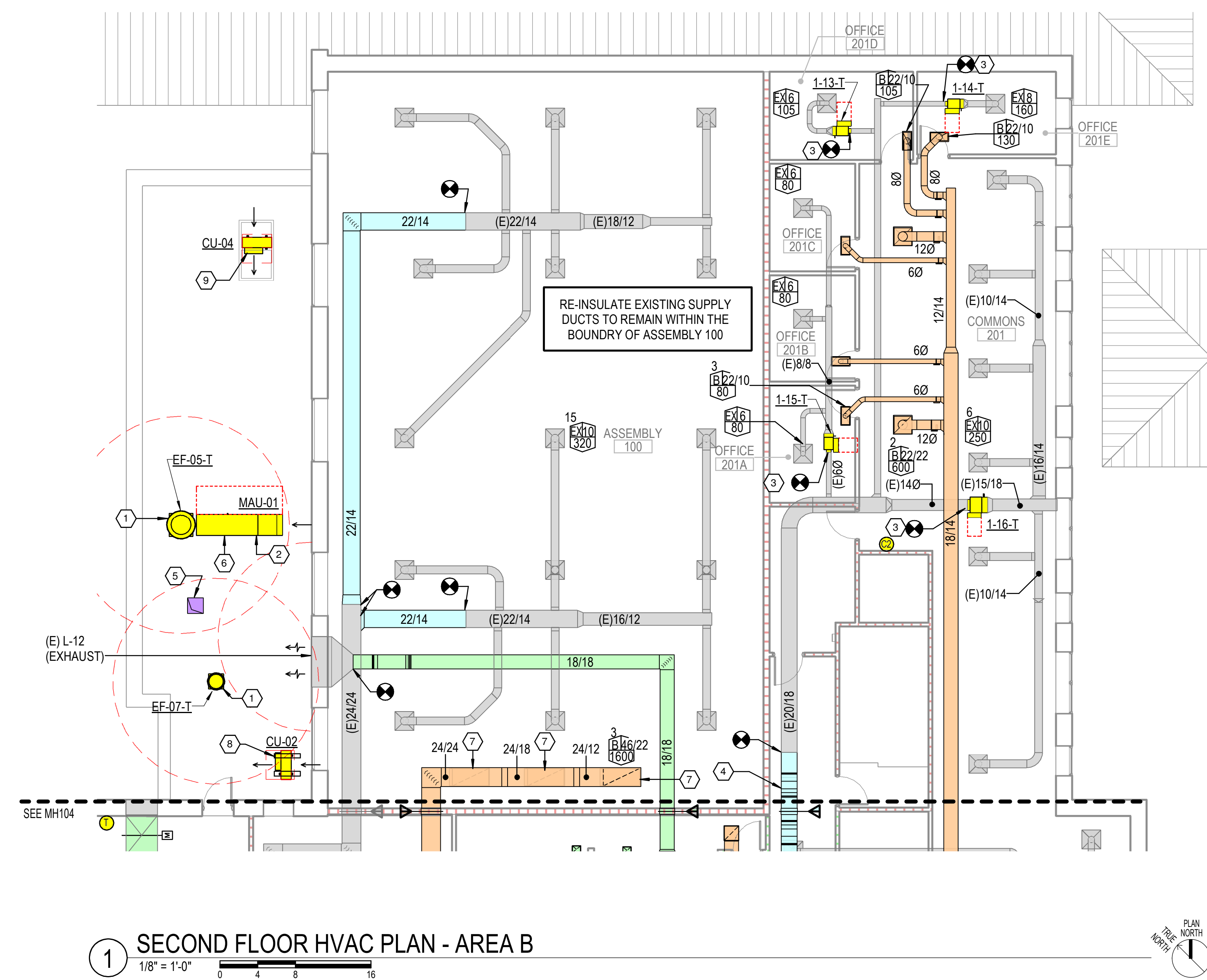
ISSUE DATE: 28 APR 2022
 SOLICITATION NO.:
 CONTRACT NO.:

1 SECOND FLOOR HVAC PLAN - AREA A
 1/8" = 1'-0"
 0 4 8 16



NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC
 SECOND FLOOR HVAC PLAN - AREA A
 SHEET ID
MH104

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL CONVEY ALL REQUIRED INFORMATION.



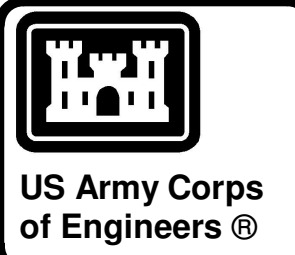
1 SECOND FLOOR HVAC PLAN - AREA B
1/8" = 1'-0"

KEYED NOTES

- 1 LOCATE NEW EXHAUST FAN ON EXISTING CURB.
- 2 LOCATE NEW MAKE-UP AIR UNIT ON EXISTING CURB.
- 3 PROVIDE NEW VAV BOX WITH TERMINAL CONTROLLER, ACTUATOR, SUPPLY TEMPERATURE SENSOR AND PIPING PACKAGE. CONNECT TO EXISTING INLET AND OUTLET DUCTWORK. PROVIDE TRANSITIONS AS REQUIRED. REFER TO "MP" SHEETS FOR THERMOSTAT LOCATIONS.
- 4 ROUTE DUCT OVER CORRIDOR "LID" THROUGH SMOKE PARTITION.
- 5 PROVIDE PAINTED GALVANIZED INSULATED COVER OVER EXISTING CURB. CREASE CAP TO PREVENT WATER PONDING.
- 6 REFER TO PLUMBING DRAWINGS FOR NATURAL GAS PIPING.
- 7 PROVIDE OPPOSED BLADE DAMPER WITH QUADRANT LOCKING OPERATOR IN DUCTS SERVING RETURN GRILLES.
- 8 PROVIDE ROOF SUPPORT FOR CONDENSING UNIT.
- 9 LOCATE CONDENSING UNIT ON EXISTING EQUIPMENT PLATFORM.

GENERAL NOTES

1. REFER TO THE "MP" SHEETS FOR LOCATION OF THERMOSTATS, CO2 SENSORS, AND OTHER CONTROL DEVICES NOT SHOWN ON THIS SHEET.



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
1300 East 6th Street Little Rock, AR 72202 501.872.2900 cromwell@com.lanlisd	

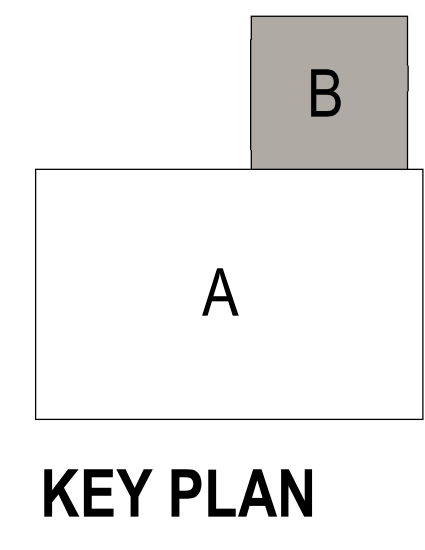
US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

CROMWELL

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC

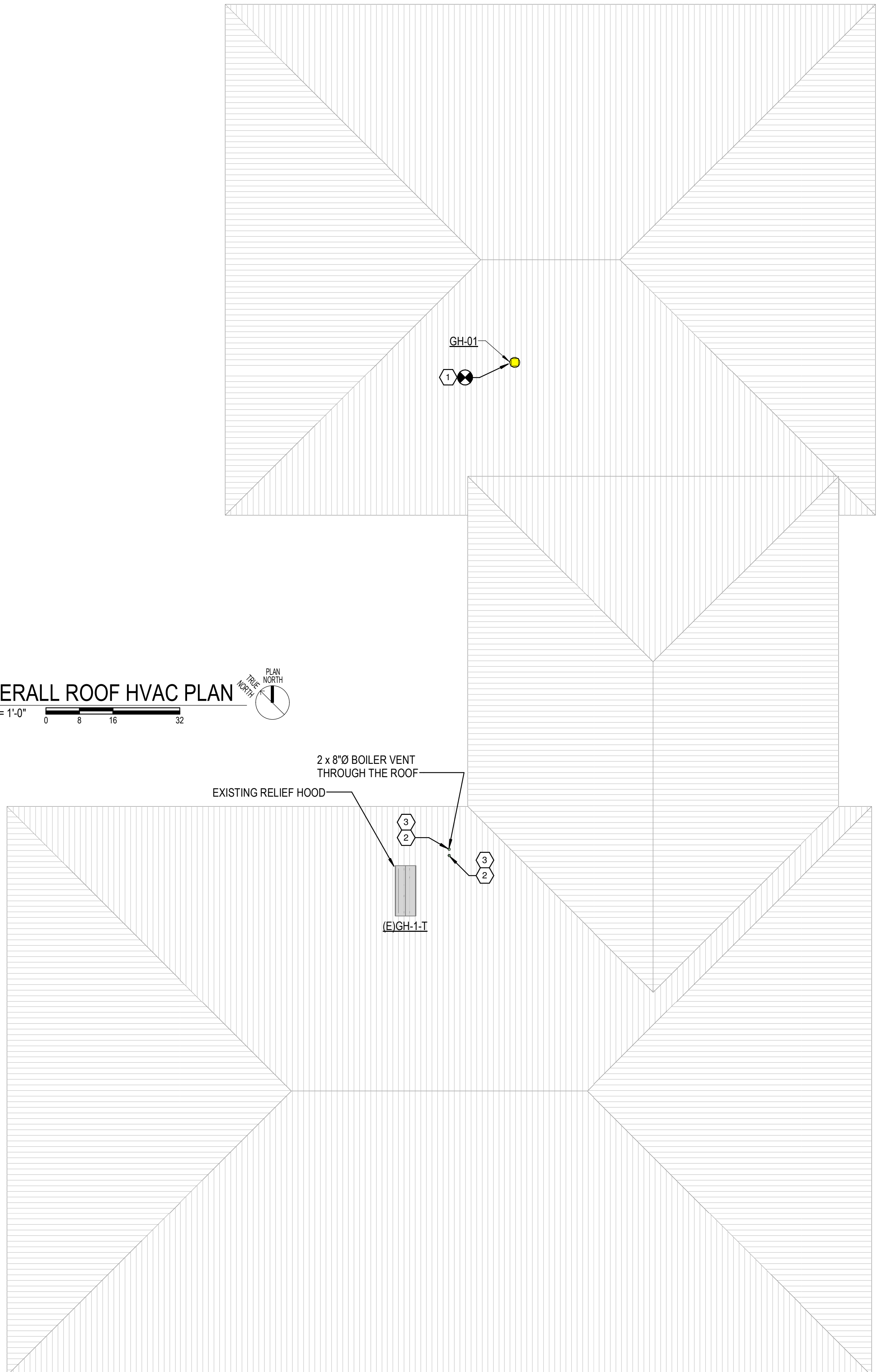
SECOND FLOOR HVAC PLAN - AREA B

SHEET ID
MH105



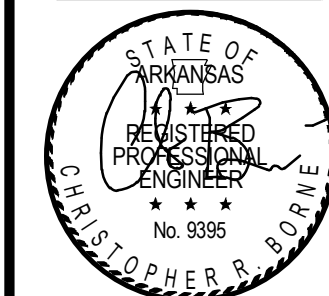
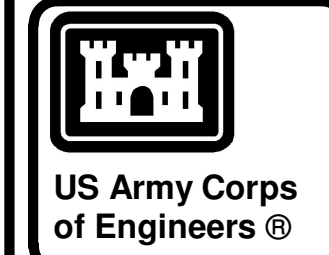
WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

1 OVERALL ROOF HVAC PLAN
 1/16" = 1'-0"
 0 8 16 32
 PLAN NORTH



KEYED NOTES

- 1 NEW GRAVITY RELIEF VENTILATOR ON EXISTING CURB.
- 2 REFERENCE DETAIL 3/A-105 FOR DETAIL AT ROOF PENETRATION.
- 3 PROVIDE CPVC COUPLING AT TERMINATION OF CPVC FLUE VENT. TERMINATE A MINIMUM OF 3 FEET ABOVE WHERE THE VENT PENETRATES THE ROOF AND AT LEAST 2 FEET ABOVE ANY PORTION OF THE BUILDING WITHIN 10 FT.



04-28-2022

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SUBMITTED BY: CROMWELL A/E	
1300 East 6th Street Little Rock, AR 72202 501.572.2900 cromwell@aecom.lansid	

CROMWELL

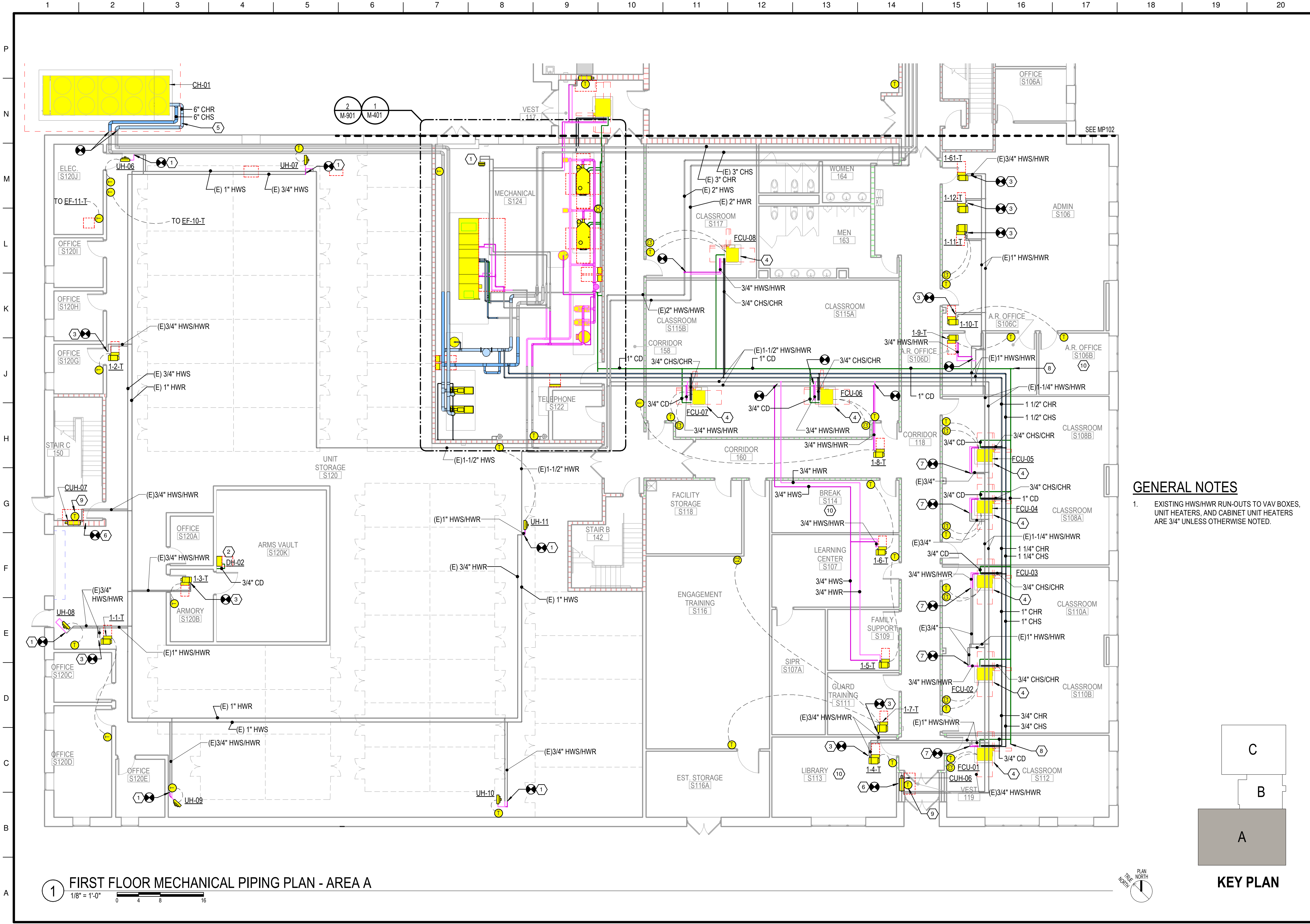
US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA

CROMWELL

WINTERVILLE, NC
 OVERALL ROOF HVAC PLAN

SHEET ID
MH106

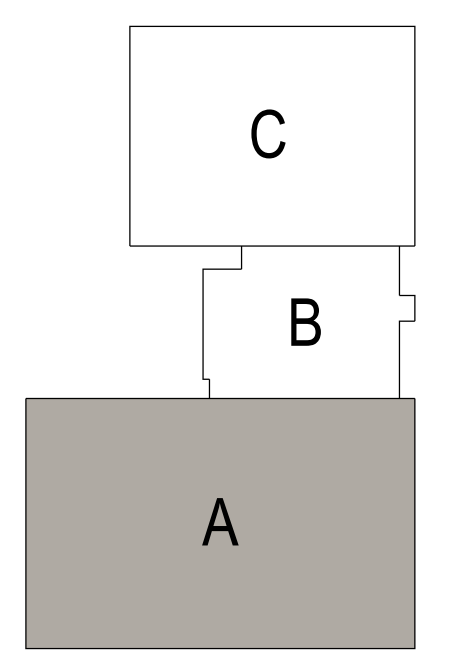
WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



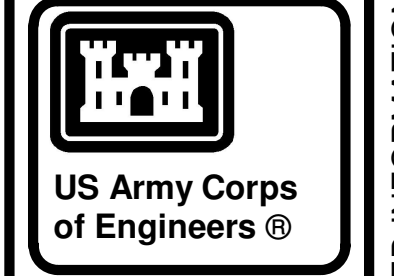
1 FIRST FLOOR MECHANICAL PIPING PLAN - AREA A
 1/8" = 1'-0"

GENERAL NOTES

- EXISTING HWS/HWR RUN-OUTS TO VAV BOXES, UNIT HEATERS, AND CABINET UNIT HEATERS ARE 3/4" UNLESS OTHERWISE NOTED.



KEY PLAN



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	

US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA

CROMWELL
 1300 East 6th Street Little Rock, AR 72202
 501.372.2900
 cromwell@conlanisd.com

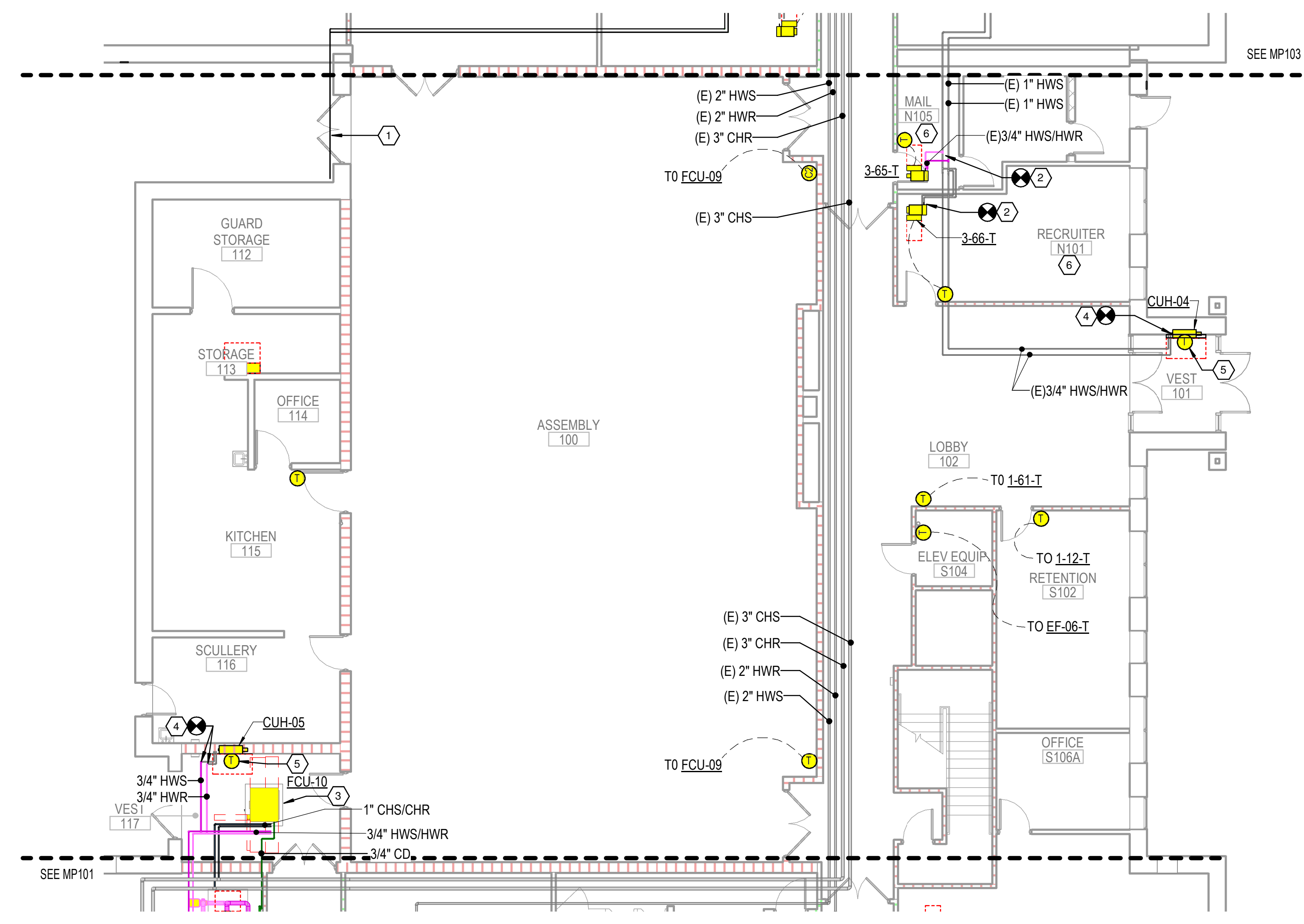
NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC

FIRST FLOOR MECHANICAL PIPING PLAN - AREA A

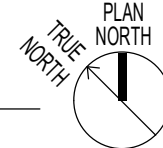
SHEET ID
MP101

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

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MECHANICAL S125
1
1/8" = 1'-0"
0 4 8 16
FIRST FLOOR MECHANICAL PIPING PLAN - AREA B

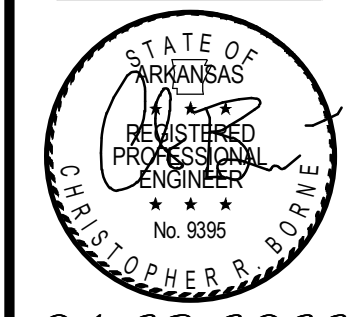
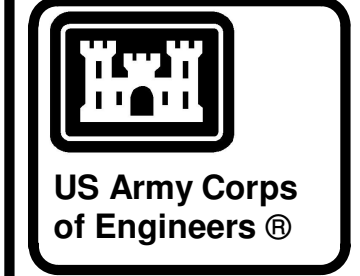
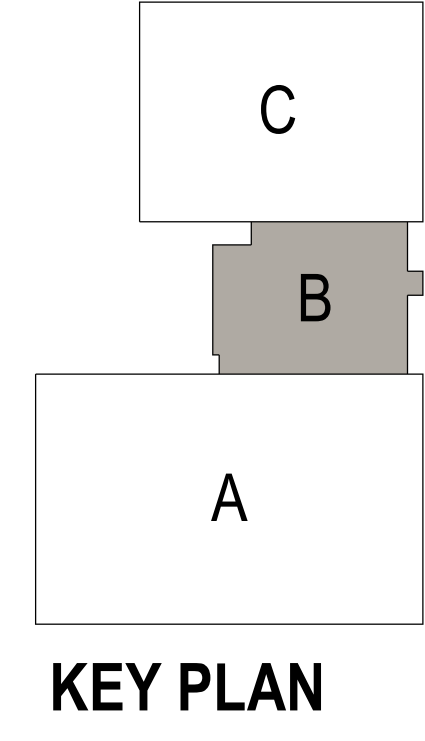


KEYED NOTES

- 1 CONCEAL EXPOSED REFRIGERANT PIPING INSIDE LINE COVER KIT. PAINT TO MATCH BRICK WITH UV RESISTANT PAINT. ANY OPENINGS SHALL BE SEALED WEATHER TIGHT AND RODENT PROOF. SPRAY FOAM IS NOT ACCEPTABLE.
- 2 PROVIDE PIPING PACKAGE FOR VAV BOX. CONNECT TO EXISTING HWS/HWR.
- 3 PROVIDE AUXILIARY DRAIN PAN UNDER AIR HANDLING UNITS, FAN COIL UNITS AND COOLING COILS. PAN SHALL ENCOMPASS THE FULL PERIMETER OF THE EQUIPMENT AND BE CONSTRUCTED OF NON-CORROSIVE MATERIAL. PROVIDE FLOAT SWITCH TO DISABLE THE EQUIPMENT AND ALERT THE BUILDING AUTOMATION SYSTEM.
- 4 CONNECT NEW CABINET UNIT HEATER TO EXISTING HEATING WATER PIPING.
- 5 THERMOSTAT FOR CABINET UNIT HEATER LOCATED ON THE WALL ABOVE THE HEATER.
- 6 UTILIZE AUXILIARY CONTACT ON LIGHTING CONTROL OCCUPANCY SENSOR TO DETERMINE ROOM OCCUPANCY FOR VENTILATION CALCULATIONS.

GENERAL NOTES

1. EXISTING HWS/HWR RUN-OUTS TO VAV BOXES, UNIT HEATERS, AND CABINET UNIT HEATERS ARE 3/4" UNLESS OTHERWISE NOTED.



04-28-2022

MARK	DESCRIPTION	DATE

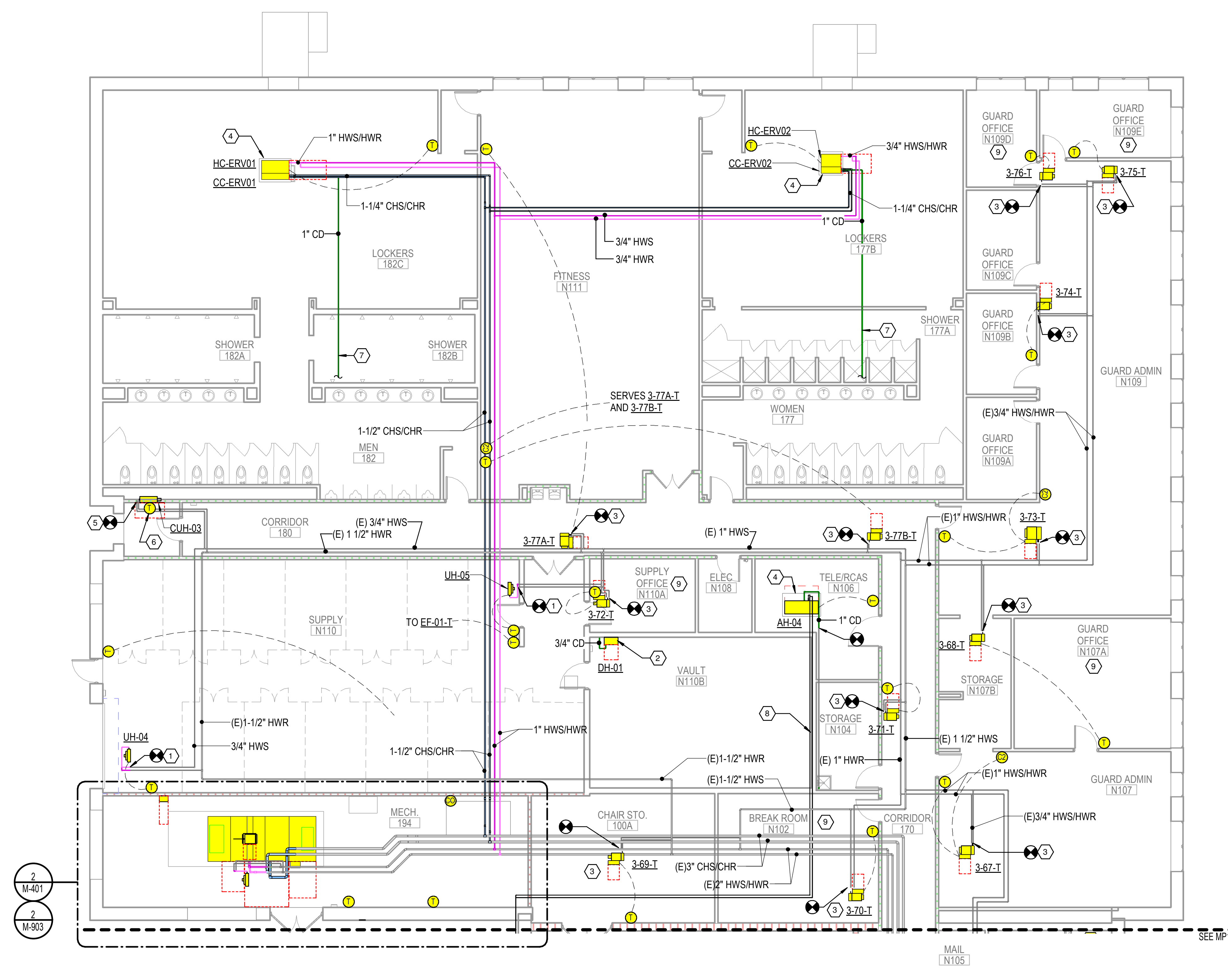
DESIGNED BY: C. Borne	ISSUE DATE: 29 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
1300 East 6th Street Little Rock, AR 72202 501.572.2900 cromwell@com.lansid	

CROMWELL

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
FIRST FLOOR MECHANICAL PIPING PLAN - AREA B

SHEET ID
MP102

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



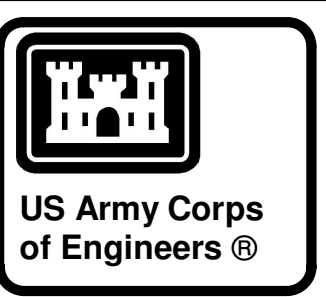
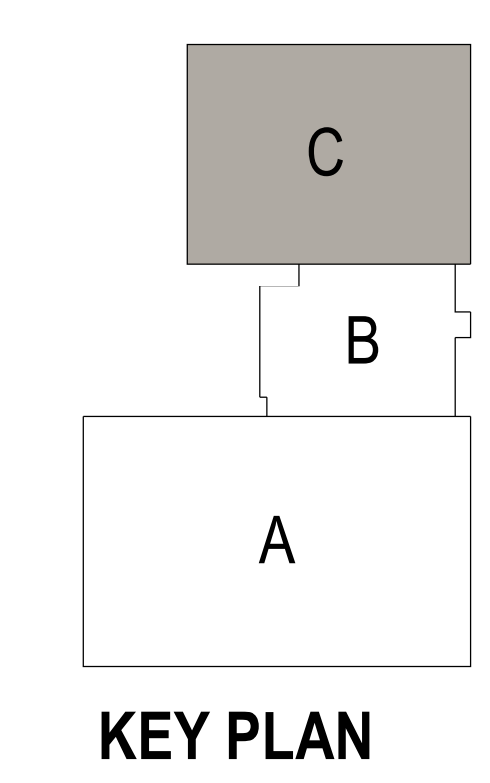
1 FIRST FLOOR MECHANICAL PIPING PLAN - AREA C
1/8" = 1'-0"
0 4 8 16

KEYED NOTES

- CONNECT NEW UNIT HEATER TO EXISTING HEATING WATER PIPING.
- RUN DRAIN LINE FROM DEHUMIDIFIER TO EXISTING FLOOR DRAIN.
- PROVIDE PIPING PACKAGE FOR VAV BOX. CONNECT TO EXISTING HWS/HWR.
- PROVIDE AUXILIARY DRAIN PAN UNDER AIR HANDLING UNITS, FAN COIL UNITS AND COOLING COILS. PAN SHALL ENCOMPASS THE FULL PERIMETER OF THE EQUIPMENT AND BE CONSTRUCTED OF NON-CORROSIVE MATERIAL. PROVIDE FLOAT SWITCH TO DISABLE THE EQUIPMENT AND ALERT THE BUILDING AUTOMATION SYSTEM.
- CONNECT NEW CABINET UNIT HEATER TO EXISTING HEATING WATER PIPING.
- THERMOSTAT FOR CABINET UNIT HEATER LOCATED ON THE WALL ABOVE THE HEATER.
- RUN CONDENSATE TO EXISTING PLUMBING VENT. PROVIDE AN OPEN-SITE DRAIN WITH A P-TRAP AND TRAP SEAL.
- SIZE REFRIGERANT PIPING PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- UTILIZE AUXILIARY CONTACT ON LIGHTING CONTROL OCCUPANCY SENSOR TO DETERMINE ROOM OCCUPANCY FOR VENTILATION CALCULATIONS.

GENERAL NOTES

- EXISTING HWS/HWR RUN-OUTS TO VAV BOXES, UNIT HEATERS, AND CABINET UNIT HEATERS ARE 3/4" UNLESS OTHERWISE NOTED.



04-28-2022

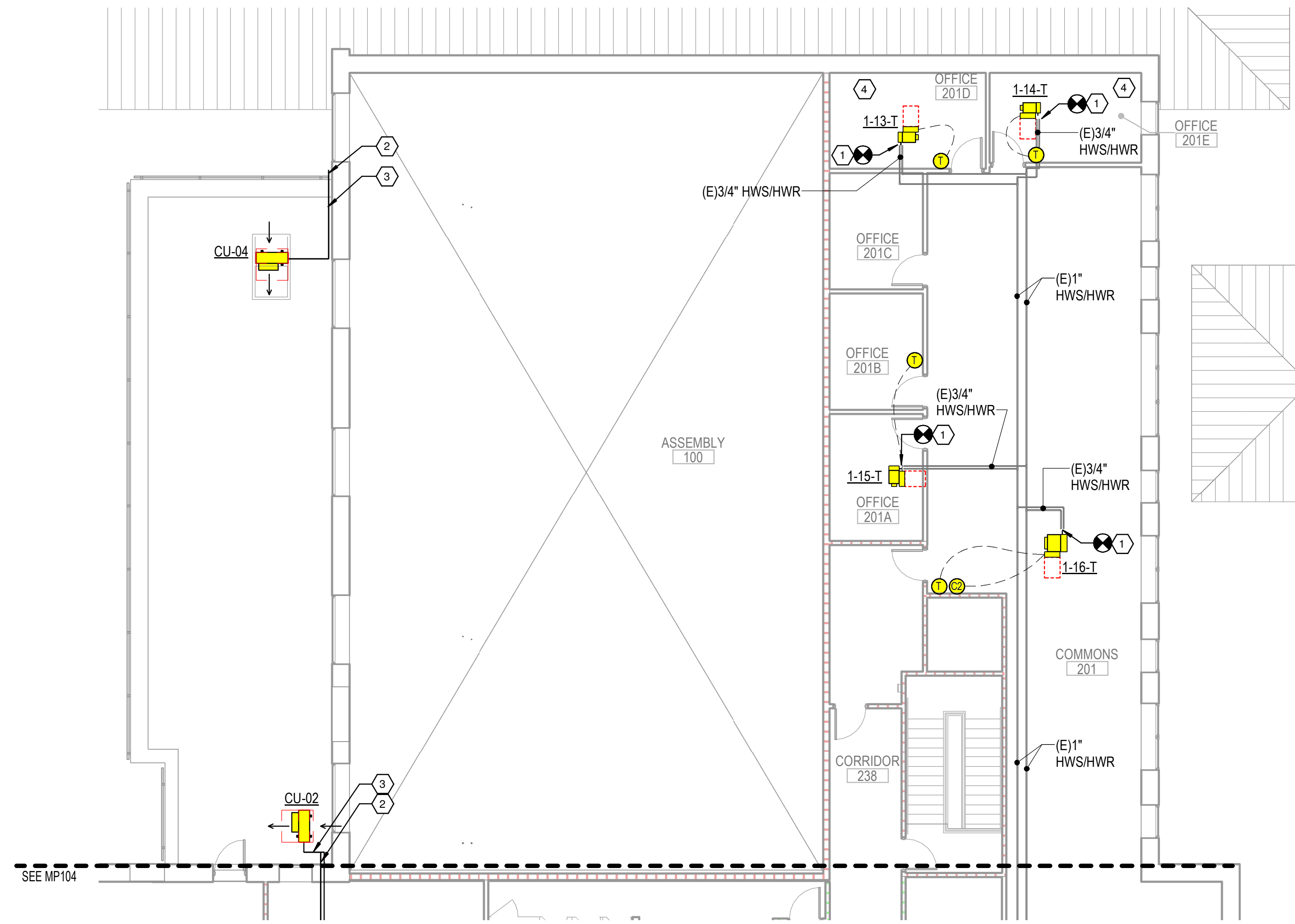
MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	

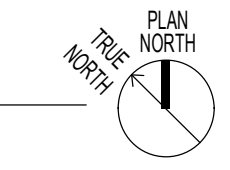
US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA
CROMWELL
1300 East 6th Street Little Rock, AR 72202
501.372.2900
cromwell@con.usace.army.mil

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
FIRST FLOOR MECHANICAL PIPING PLAN - AREA C
SHEET ID
MP103

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



1 SECOND FLOOR MECHANICAL PIPING PLAN - AREA B
1/8" = 1'-0"
0 4 8 16

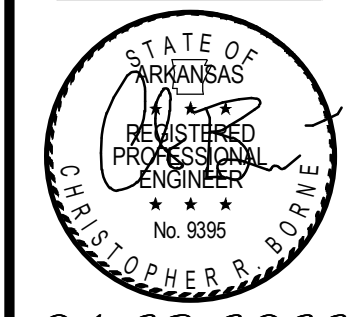
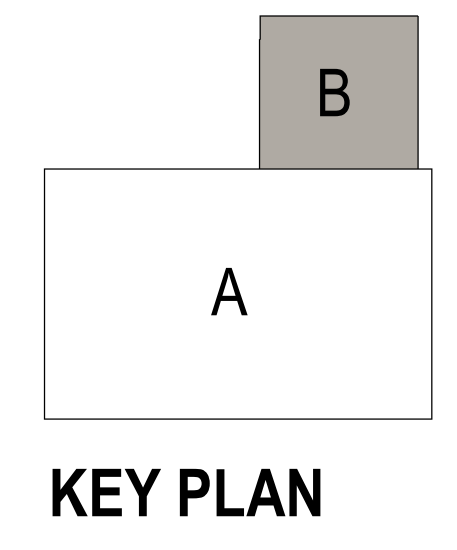


KEYED NOTES

- 1 PROVIDE PIPING PACKAGE FOR VAV BOX. CONNECT TO EXISTING HWS/HWR.
- 2 CONCEAL EXPOSED REFRIGERANT PIPING INSIDE LINE COVER KIT. PAINT TO MATCH BRICK WITH UV RESISTANT PAINT. ANY OPENINGS SHALL BE SEALED WEATHER TIGHT AND RODENT PROOF. SPRAY FOAM IS NOT ACCEPTABLE.
- 3 SIZE REFRIGERANT PIPING PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- 4 UTILIZE AUXILIARY CONTACT ON LIGHTING CONTROL OCCUPANCY SENSOR TO DETERMINE ROOM OCCUPANCY FOR VENTILATION CALCULATIONS.

GENERAL NOTES

1. EXISTING HWS/HWR RUN-OUTS TO VAV BOXES, UNIT HEATERS, AND CABINET UNIT HEATERS ARE 3/4" UNLESS OTHERWISE NOTED.



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SUBMITTED BY: CROMWELL AE	
SIZE: 501.372.2500	

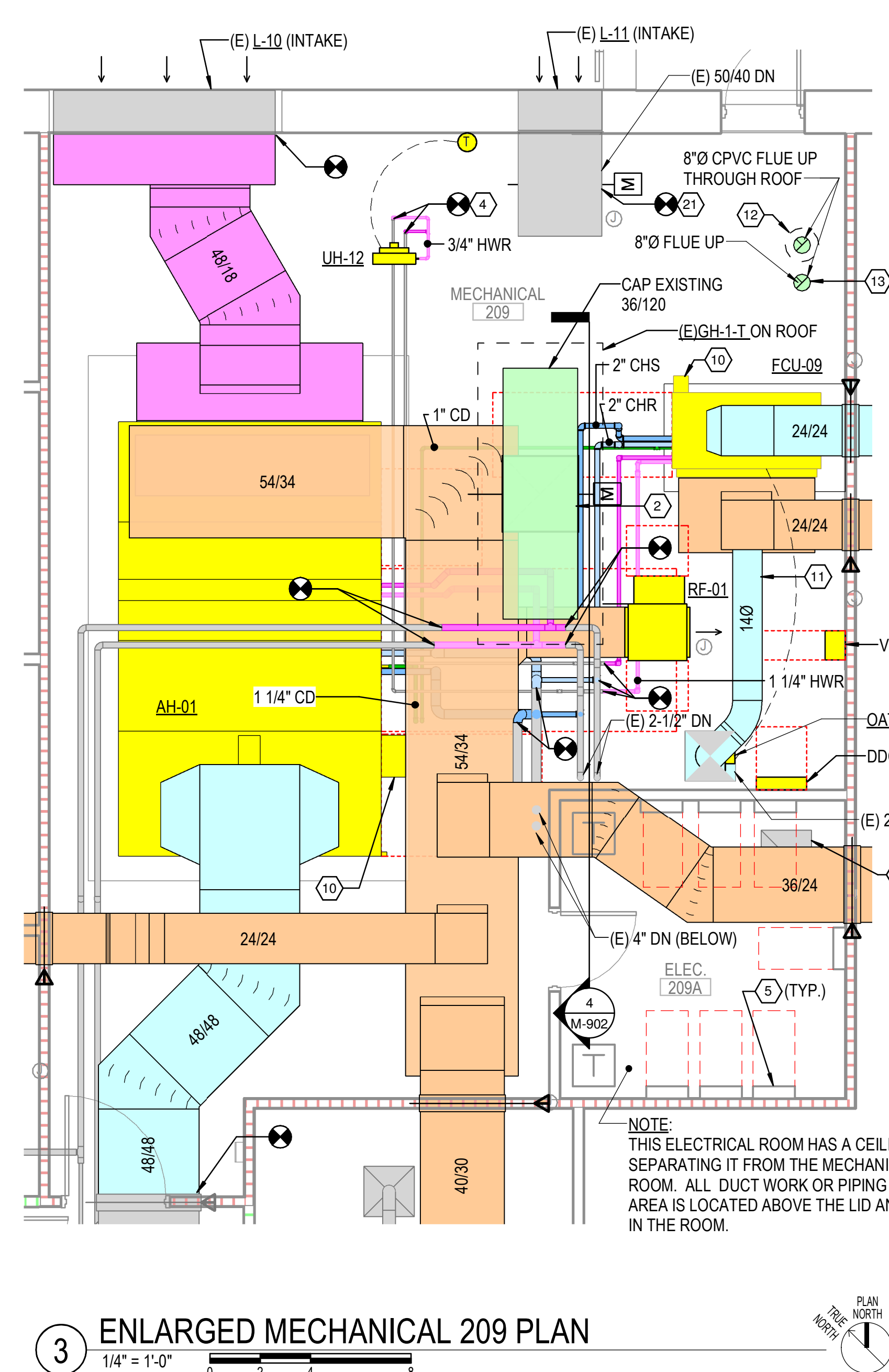
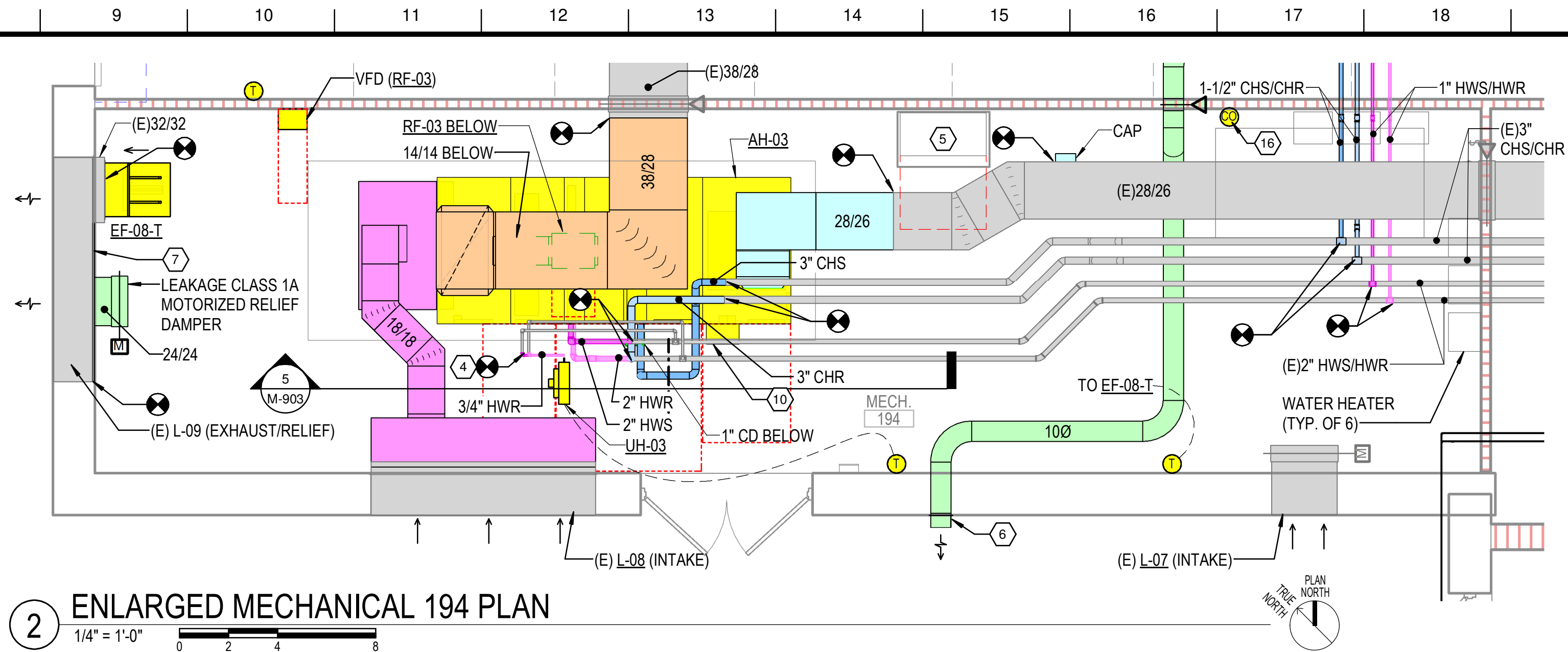
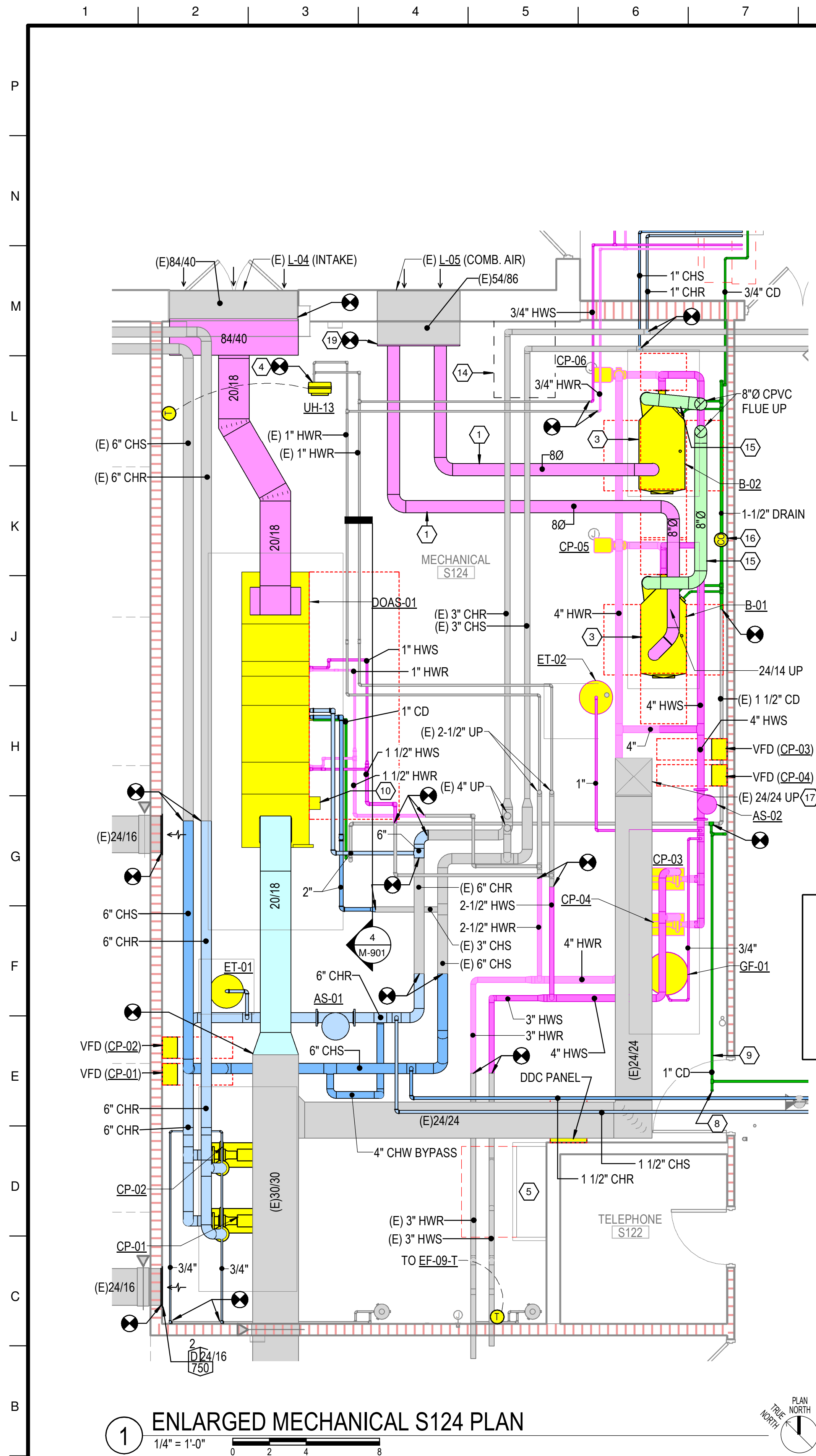
US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

CROMWELL
1300 East 6th Street Little Rock, AR 72202
cromwell.com LANSID

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
SECOND FLOOR MECHANICAL PIPING PLAN -
AREA B

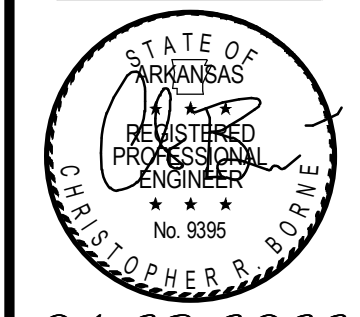
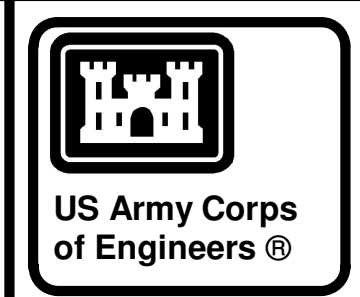
SHEET ID
MP105

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



KEYED NOTES

- PVC COMBUSTION AIR DUCT.
- PROVIDE NEW 36/36 LEAKAGE CLASS 1A MOTORIZED RELIEF DAMPER IN NECK OF EXISTING RELIEF HOOD.
- REFER TO PLUMBING DRAWINGS FOR NATURAL GAS PIPING.
- CONNECT NEW UNIT HEATER TO EXISTING HEATING WATER PIPING.
- ELECTRICAL PANEL.
- 10" DIA. DISCHARGE WITH HOOD AND INSECT SCREEN. LOCATE 10'-0" AFF.
- PROVIDE INSULATED BLANK-OFF OVER UNUSED PORTIONS OF LOUVER.
- PROVIDE A REMOVABLE CAP AT CHANGES IN DIRECTION FOR CLEANING OF CONDENSATE PIPING.
- RUN TO NEAREST FLOOR DRAIN.
- AIR HANDLER MOUNTED VFD OR MOTOR CONTROLLER.
- TRANSITION FROM (E) 24/24 TO 14" DIAMETER IN VERTICAL AND INSTALL OAT-09 3'-0" AFF. CONNECT OUTSIDE AIR DUCT TO THE 24/24 RETURN SERVING FCU-09 AT 8'-0" AFF.
- IN-FILL UNUSED PORTION OF (E) 16" DIAMETER FLOOR OPENING.
- NEW OPENING IN FLOOR FOR 8" DIAMETER FLUE.
- MAKE-UP AIR OPENING AT 2ND FLOOR LEVEL.
- CPVC FLUE VENT.
- CARBON MONOXIDE DETECTOR.
- SUPPLY DUCT UP TO SECOND FLOOR.
- SUPPLY DUCT DOWN TO FIRST FLOOR.
- CAP EXISTING 54/86 PLENUM FOR USE AS INLET FOR DUCTED BOILER COMBUSTION AIR.
- EXISTING TRANSFER GRILLE IN ELECTRICAL ROOM CEILING/LID TO REMAIN.
- PROVIDE NEW MOTORIZED DAMPER IN EXISTING MAKE-UP AIR DUCT.



04-28-2022

MARK	DESCRIPTION	DATE

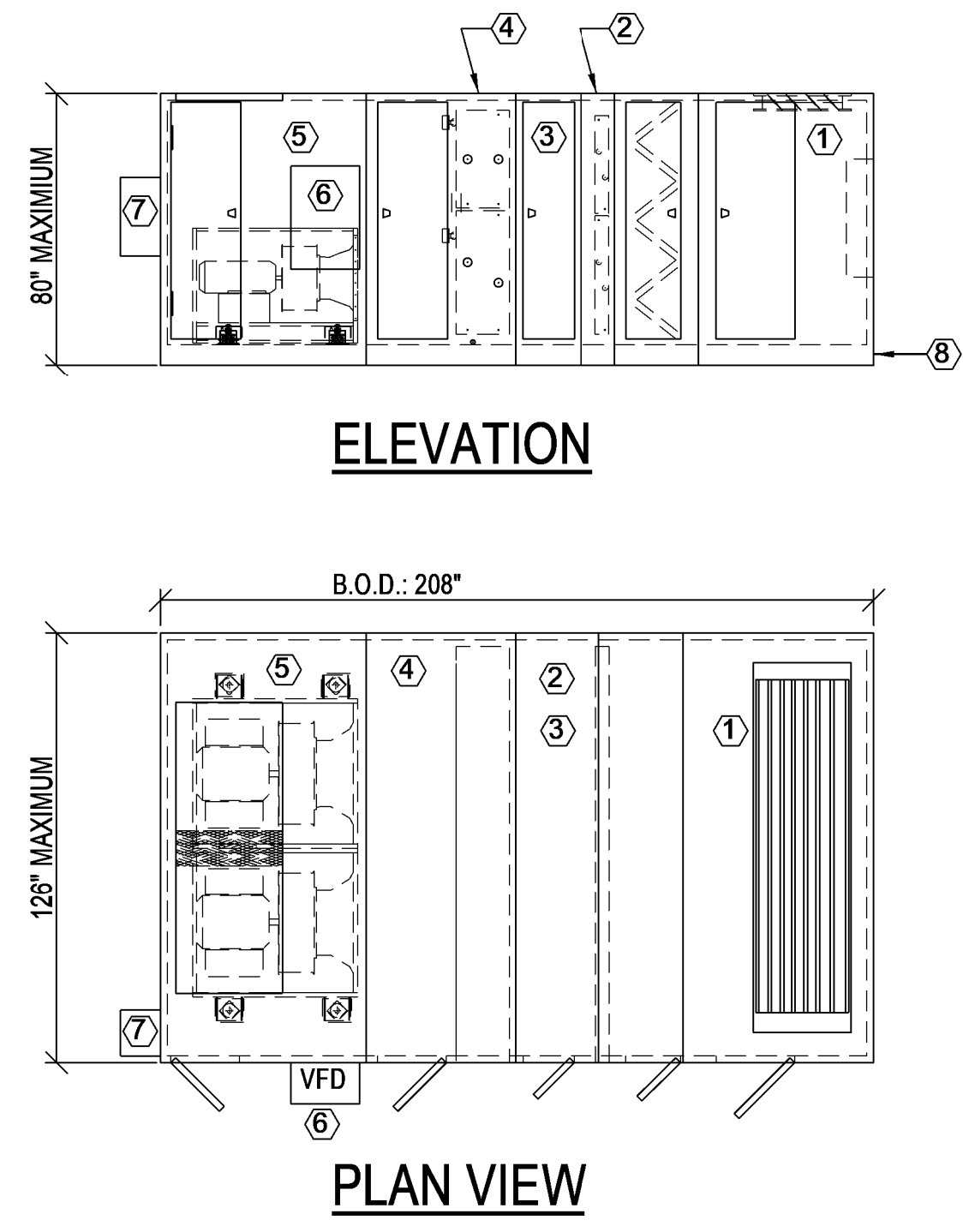
DESIGNED BY: C. Bone	ISSUE DATE: 28 APR 2022	SOLICITATION NO.:	CONTRACT NO.:
DRAWN BY: C. Bone	CHECKED BY: R. Seay	SUBMITTED BY: CROWWELL AE	
US ARMY CORPS OF ENGINEERS CHARLESTON DISTRICT CHARLESTON, SOUTH CAROLINA		1300 East 6th Street Little Rock, AR 72202 501.872.2900 crowwell@com.lansid	

CROWWELL
WINTERVILLE, NC
ENLARGED MECHANICAL PLANS

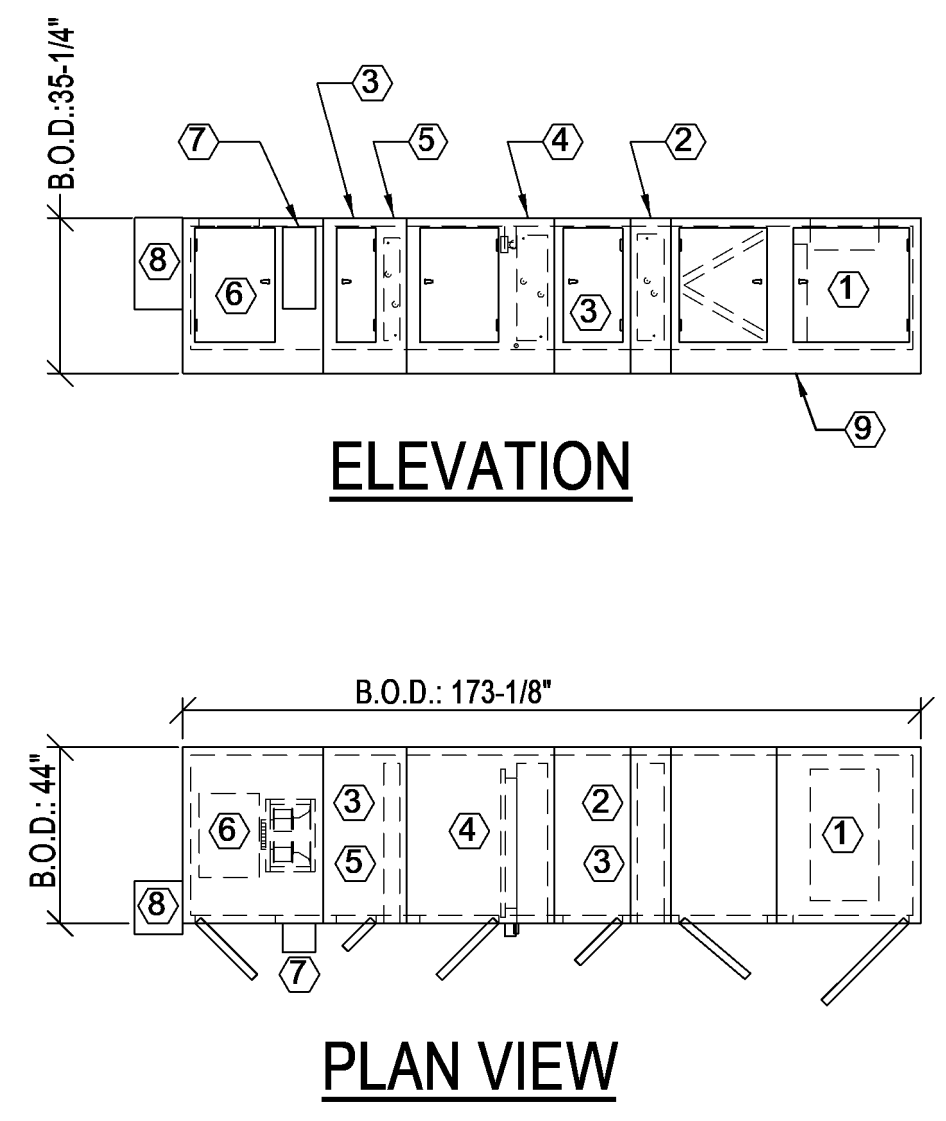
NC026 HVAC-ELEC-PLUMB RESET WINTERVILLE, NC
ENLARGED MECHANICAL PLANS

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL CONVEY ALL REQUIRED INFORMATION.

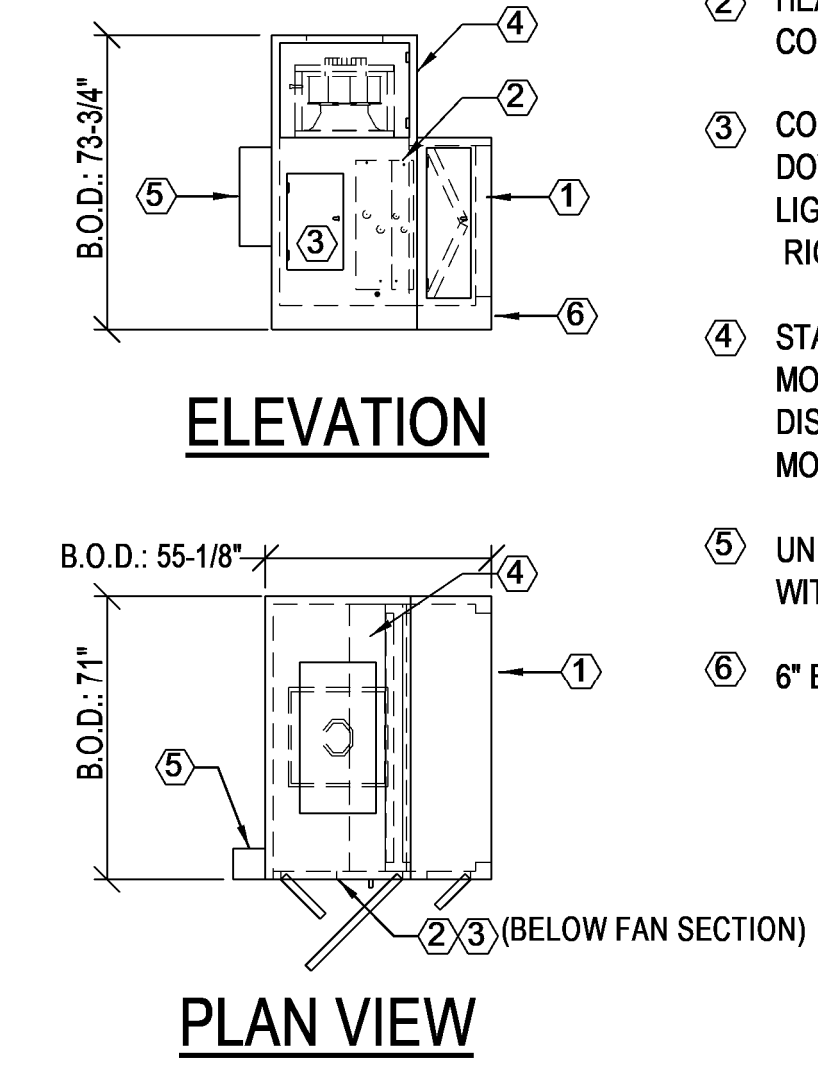
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- AH-01 KEYED NOTES:**
- ① FILTER MIXING BOX SECTION WITH ANGLED MERV 13 FILTERS AND TOP OUTSIDE AIR AIRFLOW MEASURING STATION. HINGED ACCESS DOOR. LEAKAGE CLASS 1A DAMPERS.
 - ② HEATING COIL SECTION. RIGHT HAND COIL CONNECTIONS.
 - ③ ACCESS SECTION WITH HINGED ACCESS DOOR.
 - ④ COOLING COIL SECTION WITH DOWNSTREAM ACCESS WITH HINGED ACCESS DOOR AND UV LIGHTS. RIGHT HAND COIL CONNECTIONS.
 - ⑤ SUPPLY FAN SECTION WITH DUAL DIRECT DRIVE PLENUM FANS AND TOP DISCHARGE. PREMIUM EFFICIENCY MOTORS, HINGED ACCESS DOOR.
 - ⑥ UNIT MOUNTED VFD WITH NEMA 1 ENCLOSURE AND MANUAL BYPASS.
 - ⑦ UNIT MOUNTED CONTROL ENCLOSURE.
 - ⑧ 6" BASE RAIL.

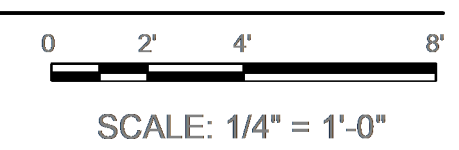


- DOAS-01 KEYED NOTES:**
- ① FILTER SECTION WITH ANGLED MERV 13 FILTERS AND TOP OUTSIDE AIR AIRFLOW MEASURING STATION. HINGED ACCESS DOOR. LEAKAGE CLASS 1A DAMPERS.
 - ② PRE - HEATING COIL SECTION. RIGHT HAND COIL CONNECTIONS.
 - ③ ACCESS SECTION WITH HINGED ACCESS DOOR.
 - ④ COOLING COIL SECTION WITH DOWNSTREAM ACCESS WITH HINGED ACCESS DOOR AND UV LIGHTS. RIGHT HAND COIL CONNECTIONS.
 - ⑤ RE - HEATING COIL SECTION. RIGHT HAND COIL CONNECTIONS.
 - ⑥ SUPPLY FAN SECTION WITH MOTORIZED IMPELLER PLENUM FAN AND TOP DISCHARGE. PREMIUM EFFICIENCY MOTOR. HINGED ACCESS DOOR.
 - ⑦ UNIT MOUNTED MOTOR CONTROLLER WITH NEMA 1 ENCLOSURE.
 - ⑧ UNIT MOUNTED CONTROL ENCLOSURE.
 - ⑨ 6" BASE RAIL.

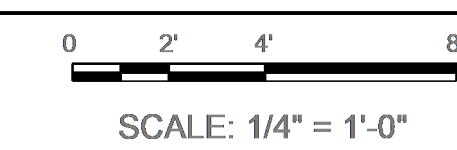


- FCU-09 KEYED NOTES:**
- ① HORIZONTAL RETURN SECTION WITH HINGED ACCESS DOOR AND ANGLED FILTERS. MERV 13 FILTERS.
 - ② HEATING COIL SECTION. RIGHT HAND COIL CONNECTIONS.
 - ③ COOLING COIL SECTION WITH DOWNSTREAM TURNING SECTION, UVGI LIGHTS AND HINGED ACCESS DOOR. RIGHT HAND COIL CONNECTIONS.
 - ④ STACKED SUPPLY FAN SECTION WITH MOTORIZED IMPELLER AND TOP DISCHARGE. PREMIUM EFFICIENCY MOTOR. HINGED ACCESS DOOR.
 - ⑤ UNIT MOUNTED MOTOR CONTROLLER WITH NEMA 1 ENCLOSURE.
 - ⑥ 6" BASE RAIL.

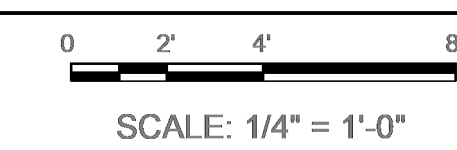
① AH-01
1/4"=1'-0"



② DOAS-01
1/4"=1'-0"

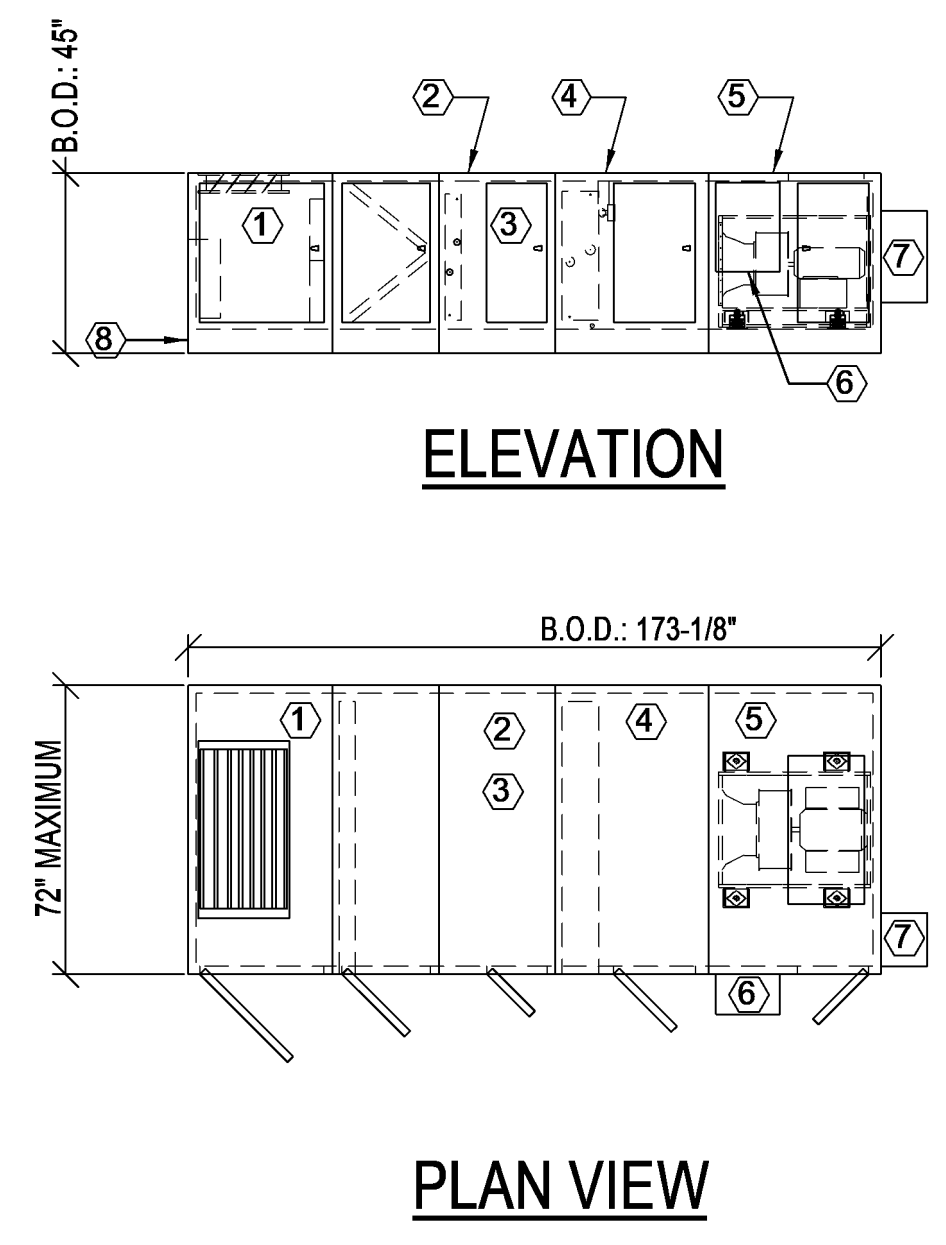


③ FCU-09
1/4"=1'-0"



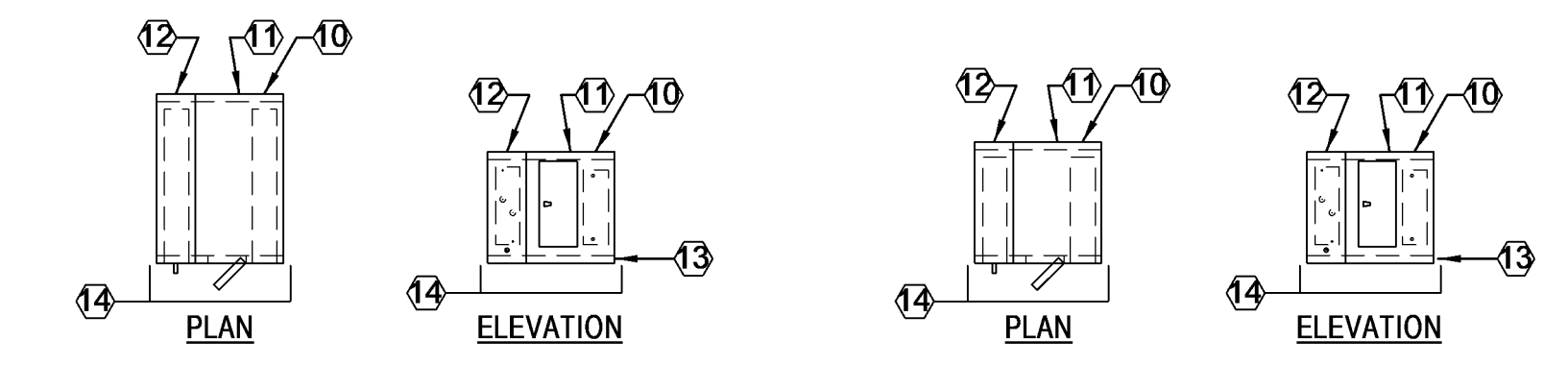
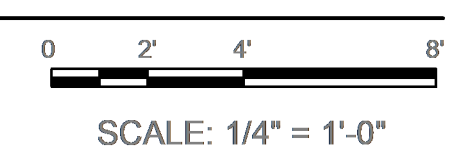
NOTE:
(ALL DETAILS)

BASIS OF DESIGN (B.O.D.) DIMENSIONS PROVIDED FOR REFERENCE ONLY. MAXIMUM DIMENSIONS ARE PROVIDED TO PREVENT INTERFERENCE ISSUES. COORDINATE NEW EQUIPMENT WITH EXISTING CONDITIONS.

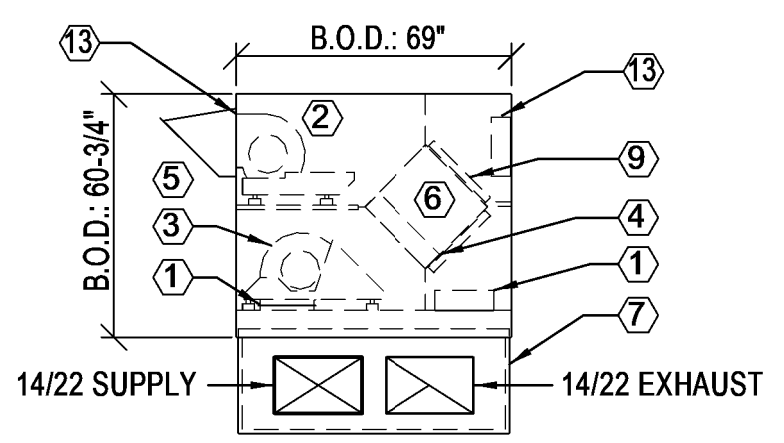


- AH-03 KEYED NOTES:**
- ① FILTER MIXING BOX SECTION WITH ANGLED MERV 13 FILTERS AND TOP OUTSIDE AIR AIRFLOW MEASURING STATION. HINGED ACCESS DOOR. LEAKAGE CLASS 1A DAMPERS.
 - ② HEATING COIL SECTION. LEFT HAND COIL CONNECTIONS.
 - ③ ACCESS SECTION WITH HINGED ACCESS DOOR.
 - ④ COOLING COIL SECTION WITH DOWNSTREAM ACCESS WITH HINGED ACCESS DOOR AND UV LIGHTS. LEFT HAND COIL CONNECTIONS.
 - ⑤ SUPPLY FAN SECTION WITH DIRECT DRIVE PLENUM FAN AND TOP DISCHARGE. PREMIUM EFFICIENCY MOTORS. HINGED ACCESS DOOR.
 - ⑥ UNIT MOUNTED VFD WITH NEMA 1 ENCLOSURE AND MANUAL BYPASS.
 - ⑦ UNIT MOUNTED CONTROL ENCLOSURE.
 - ⑧ 6" BASE RAIL.

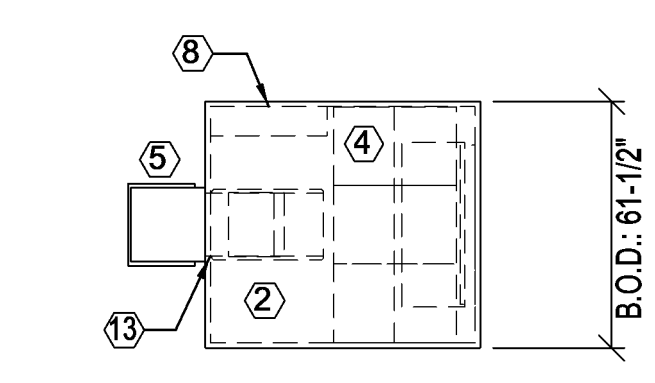
④ AH-03
1/4"=1'-0"



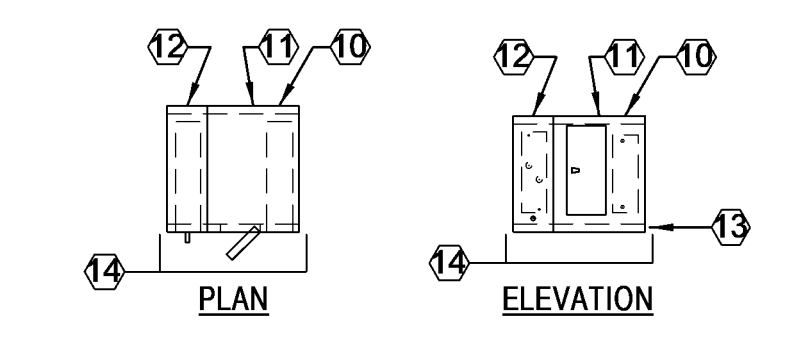
CC-ERV01 / HC-ERV01



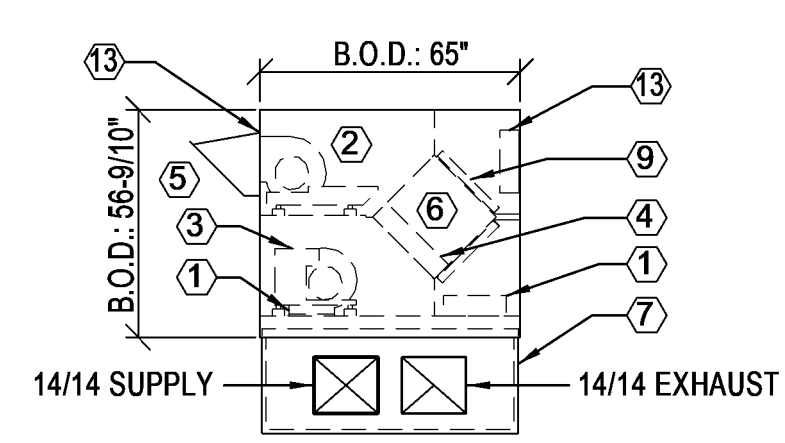
ERV-01: ELEVATION



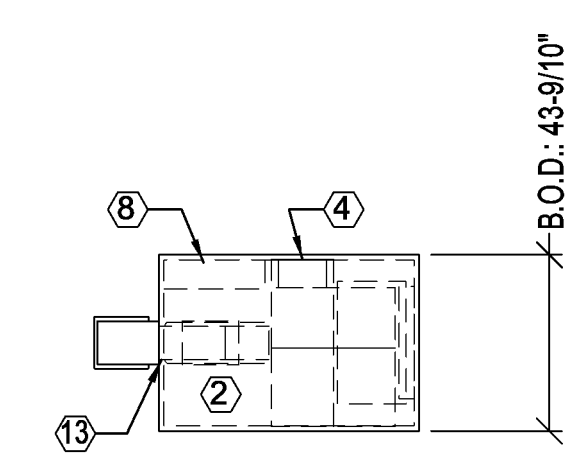
ERV-01: PLAN VIEW



CC-ERV02 / HC-ERV02

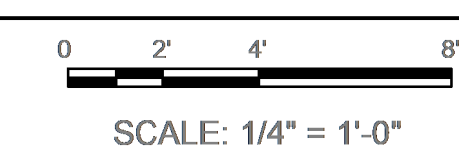


ERV-02: ELEVATION

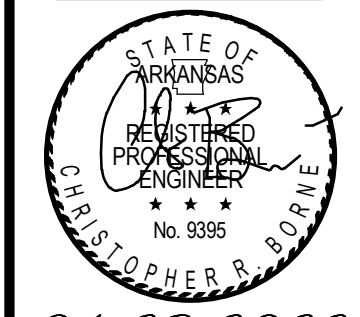
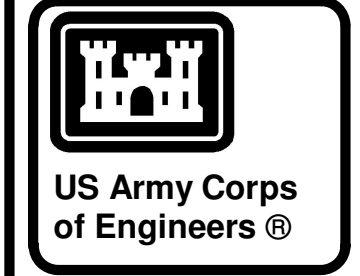


ERV-02: PLAN VIEW

⑤ ERV-01 AND ERV-02
1/4"=1'-0"



- KEYED NOTES:**
- ① BOTTOM SUPPLY DISCHARGE AND EXHAUST INTAKE TO/FROM HORIZONTAL DISCHARGE CURB.
 - ② EXHAUST FAN.
 - ③ SUPPLY FAN.
 - ④ BYPASS DAMPER.
 - ⑤ DISCHARGE HOOD.
 - ⑥ HEAT EXCHANGER.
 - ⑦ INSULATED HORIZONTAL FLOW ADAPTER CURB FOR GROUND MOUNTING.
 - ⑧ CONTROL PANEL.
 - ⑨ MERV 13 FILTERS.
 - ⑩ HEATING COIL SECTION WITH RIGHT HAND COIL CONNECTIONS.
 - ⑪ ACCESS SECTION WITH HINGED ACCESS DOOR.
 - ⑫ COOLING COIL SECTION WITH STAINLESS STEEL DRAIN PAN. RIGHT HAND COIL CONNECTIONS.
 - ⑬ CLASS 1A INLET AND DISCHARGE ISOLATION DAMPER.
 - ⑭ COILS AND ACCESS SECTIONS SHALL BE DOUBLE WALL MODULAR AIR HANDLING UNIT SECTIONS OF THE SAME MANUFACTURER. CONSTRUCTION TO MEET THE REQUIREMENTS OF AIR HANDLING UNITS IN SPECIFICATION SECTION SPECIFICATION 23 30 00.



04-28-2022

MARK	DESCRIPTION	DATE

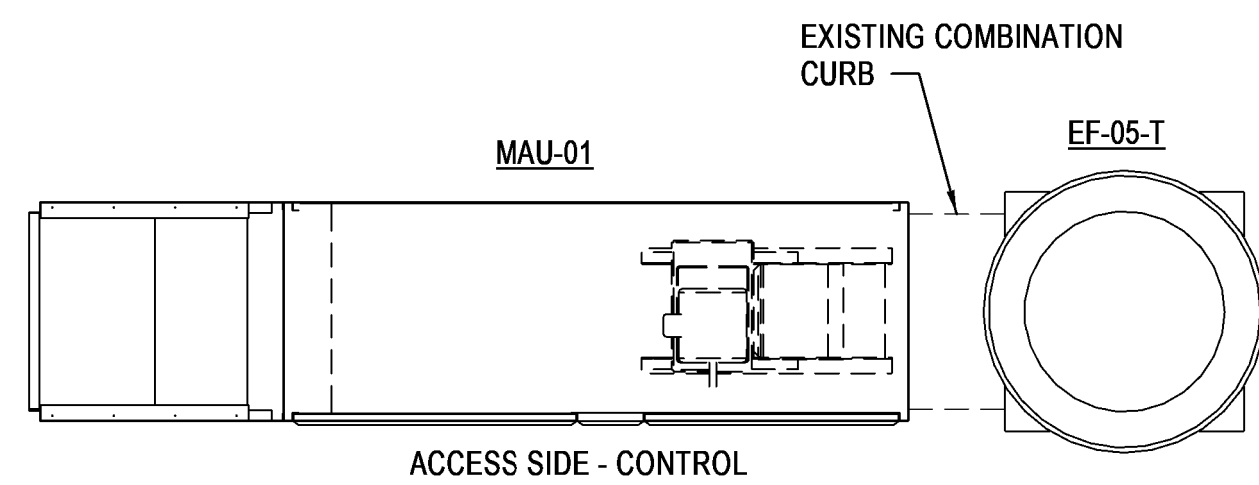
DESIGNED BY: C. Bone	ISSUE DATE: 29 APR 2022
DRAWN BY: C. Bone	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
1300 East 6th Street Winterville, NC 28787-2900	Little Rock, AR 72202

CROMWELL
MECHANICAL DETAILS
NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC

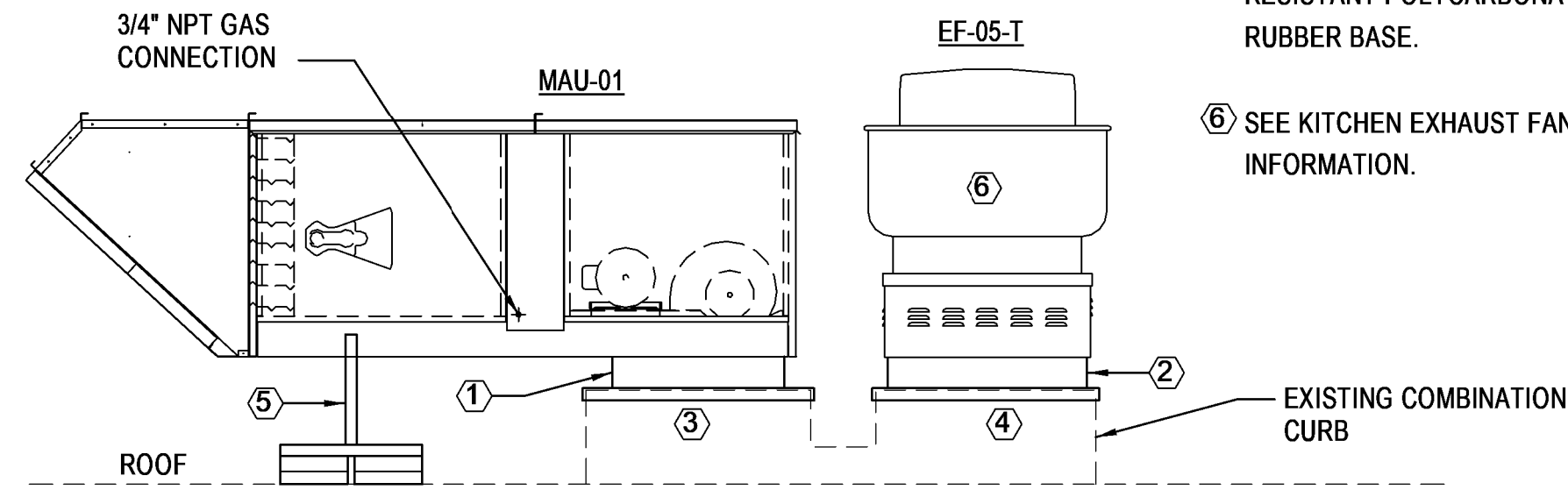
SHEET ID
M-501

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

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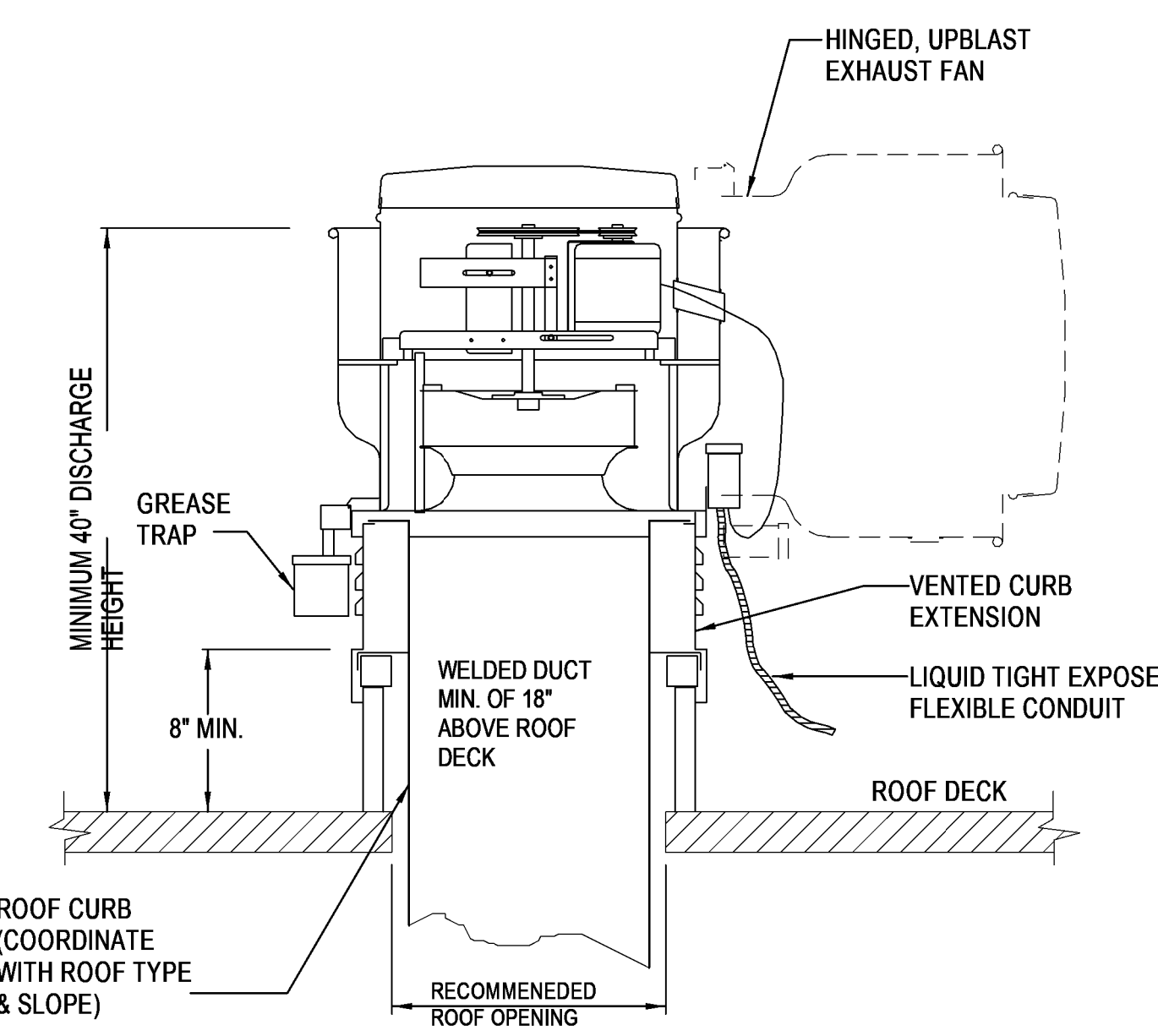
PLAN VIEW



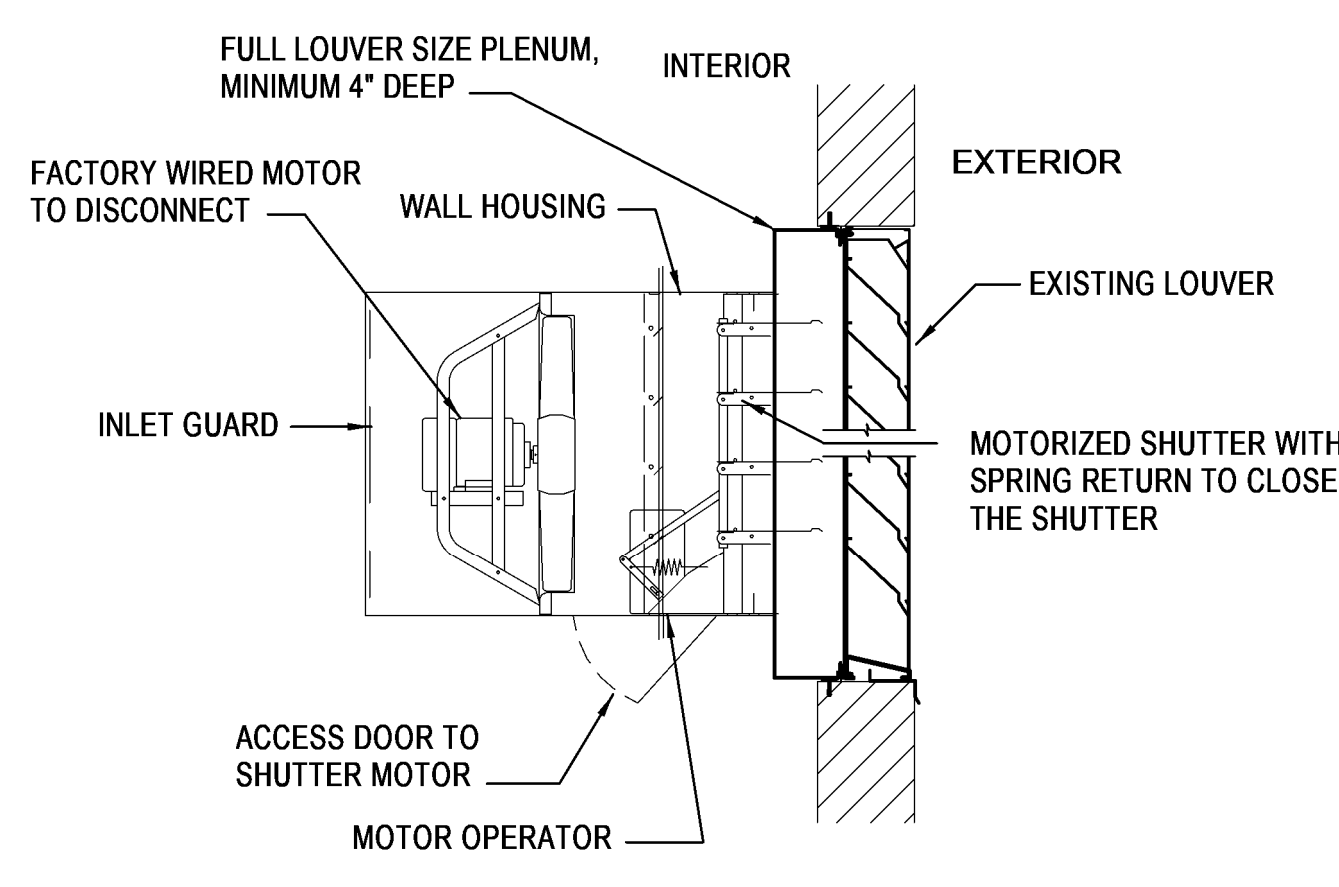
ELEVATION VIEW

- KEYED NOTES:**
- 1 MAKE-UP AIR UNIT MANUFACTURER'S ADAPTER CURB
 - 2 EXHAUST FAN MANUFACTURER'S ADAPTER CURB
 - 3 EXISTING MAKE-UP CURB IS 32" x 31.5" (FIELD VERIFY).
 - 4 EXISTING EXHAUST FAN CURB IS 31.5" x 31.5" (FIELD VERIFY)
 - 5 STRUT CHANNEL EQUIPMENT SUPPORT WITH UV RESISTANT POLYCARBONATE OR 100% RECYCLED RUBBER BASE.
 - 6 SEE KITCHEN EXHAUST FAN DETAIL FOR MORE INFORMATION.

1 KITCHEN HOOD MAKE-UP AIR UNIT AND EXHAUST FAN
NO SCALE

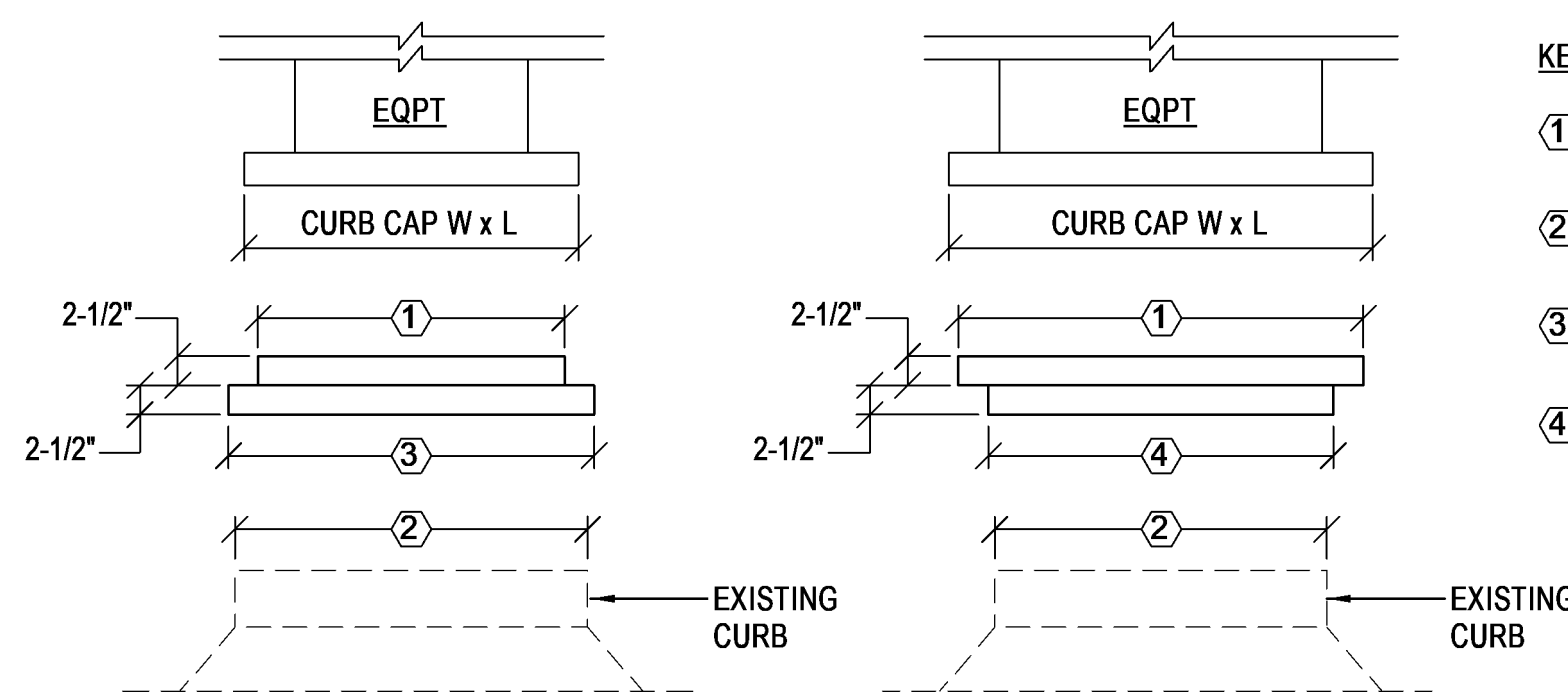


2 KITCHEN EXHAUST FAN
NO SCALE



NOTE: SUPPORT FAN FROM STRUCTURE.

3 WALL MOUNTED PROPELLER EXHAUST FAN
NO SCALE



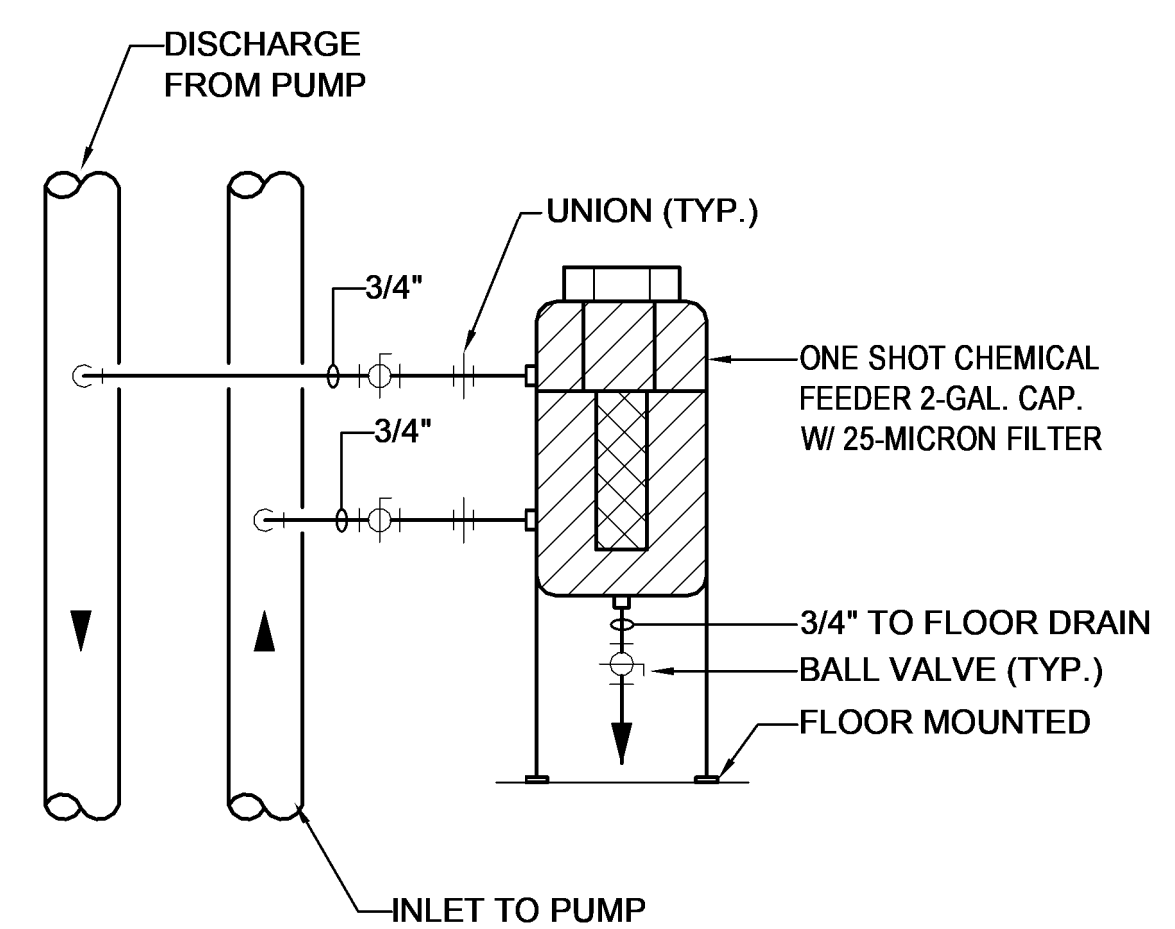
CURB ENLARGER CURB REDUCER

- KEYED NOTES:**
- 1 CURB CAP W x L LESS 1/2".
 - 2 EXISTING CURB (E)W x (E)L.
 - 3 ACTUAL ADAPTED CURB CAP W x L.
 - 4 ACTUAL REDUCED CURB CAP W x L.

ADAPTER DIMENSION NOTES:

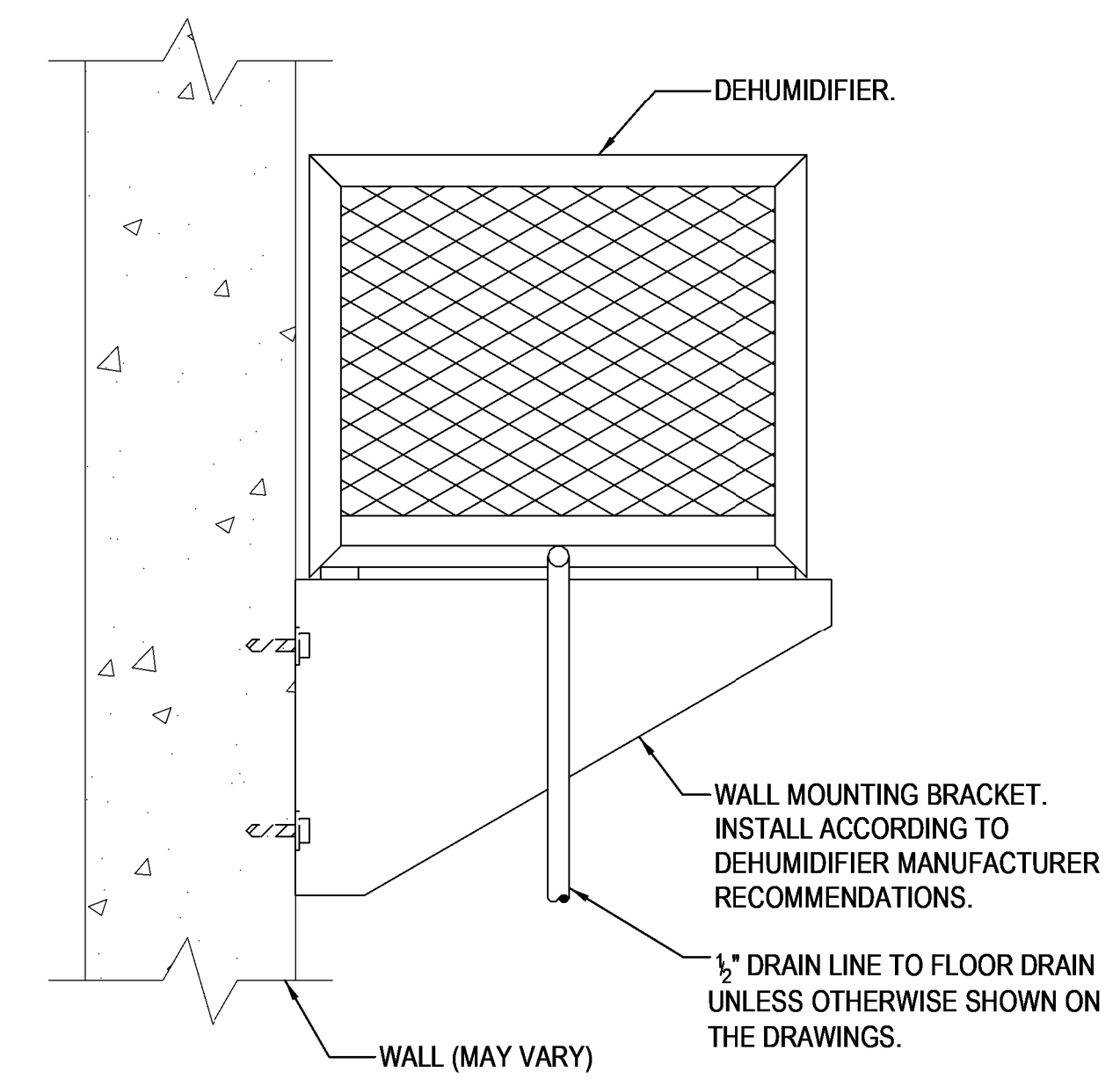
1. ADAPTERS FOR EXISTING CURBS WITHOUT WOOD NAILERS: PLAN W x L SHALL BE 1/2" LARGER THAN THE EXISTING CURB (E)W x (E)L.
2. ADAPTERS FOR EXISTING CURBS WITH WOOD NAILERS: PLAN W x L SHALL BE 1-1/2" LARGER THAN THE EXISTING CURB (E)W x (E)L.

4 CURB ADAPTER
NO SCALE

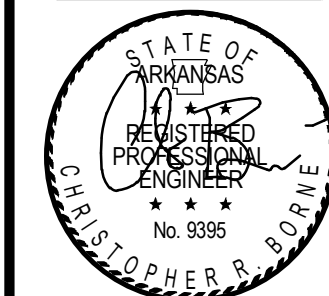
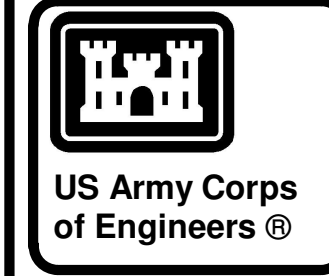


INSTALL ON HYDRONIC WATER SYSTEMS. LOCATE UNIT IN MECH. RM. ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

5 CHEMICAL FEEDER PIPING
NO SCALE



6 DEHUMIDIFIER
NO SCALE



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	

US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

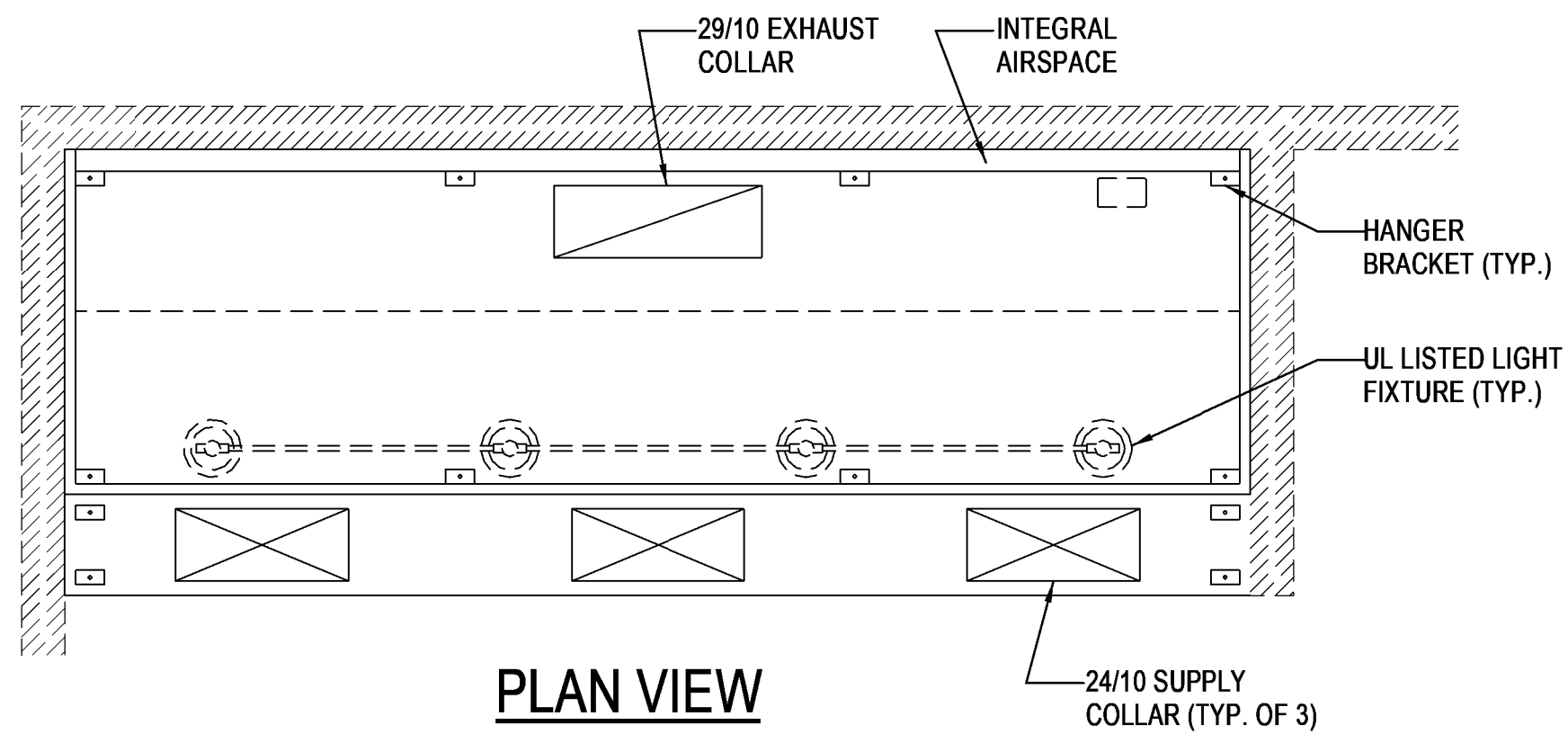
CROMWELL
1300 East 6th Street Little Rock, AR 72202
501.872.2900
cromwell@con.usace.army.mil

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
MECHANICAL DETAILS

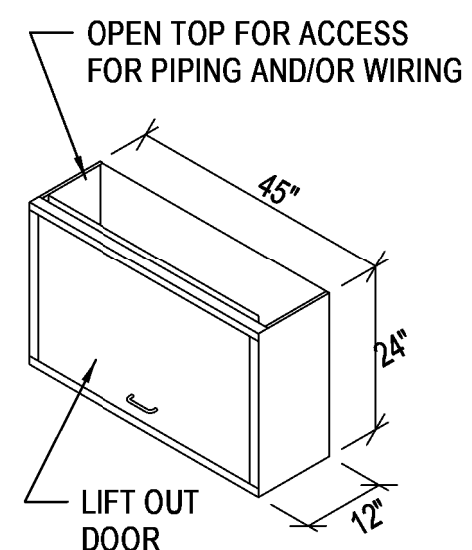
SHEET ID
M-502

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

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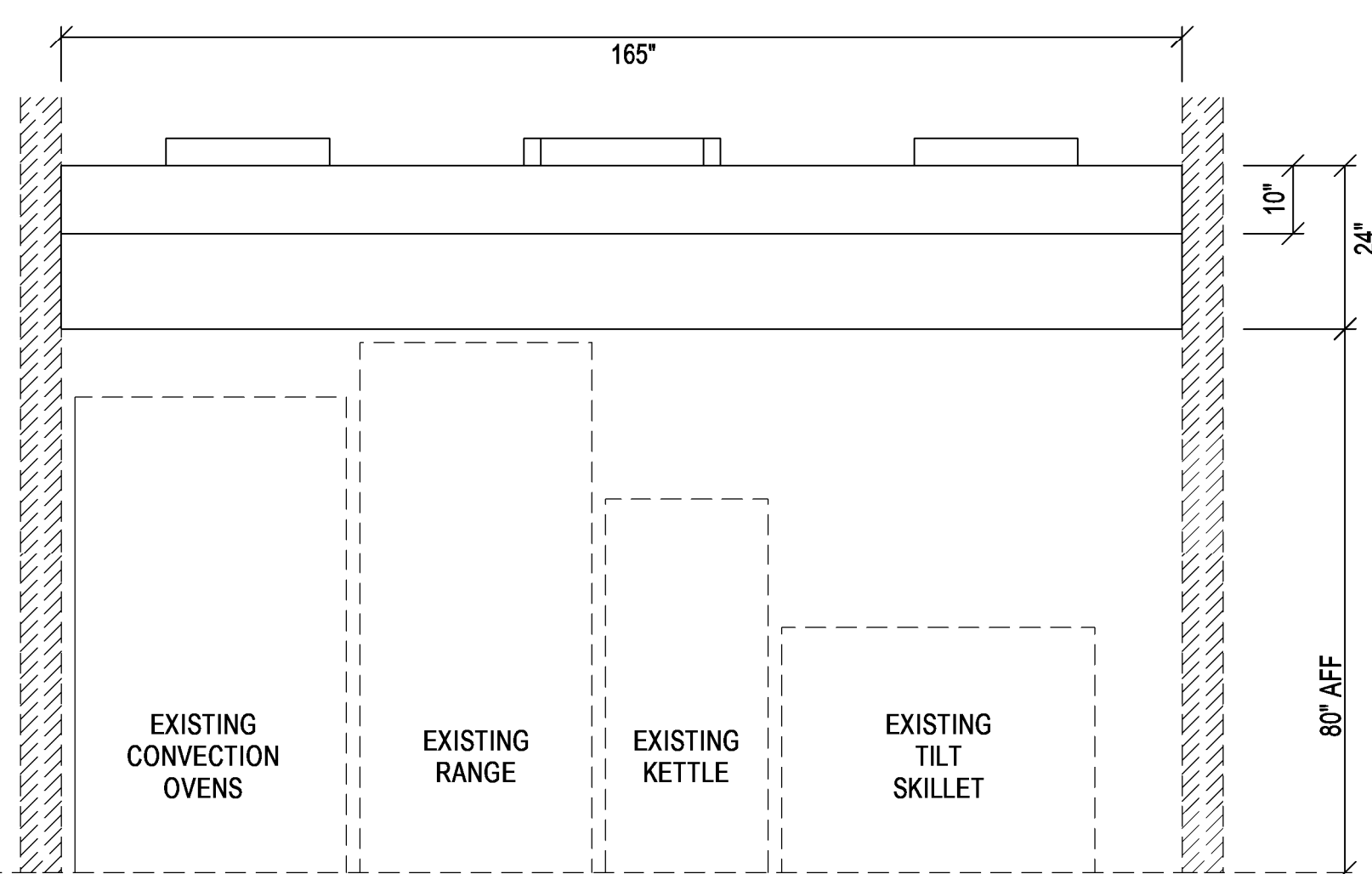


PLAN VIEW

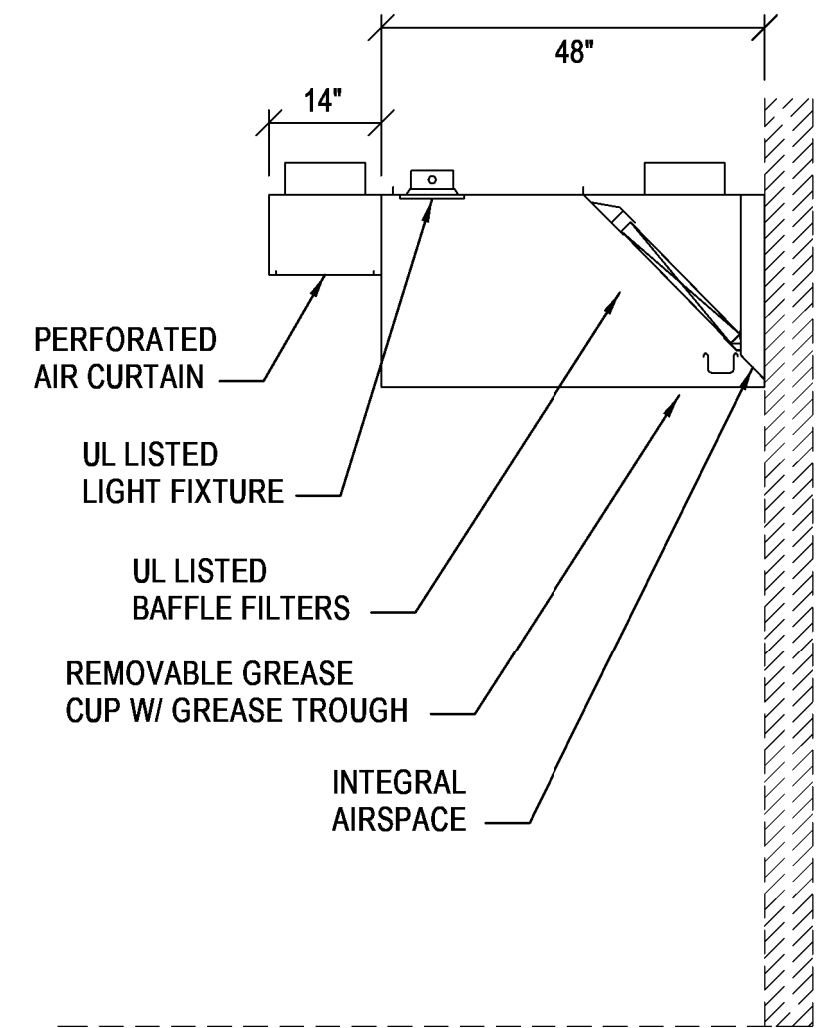


UTILITY CABINET DETAIL

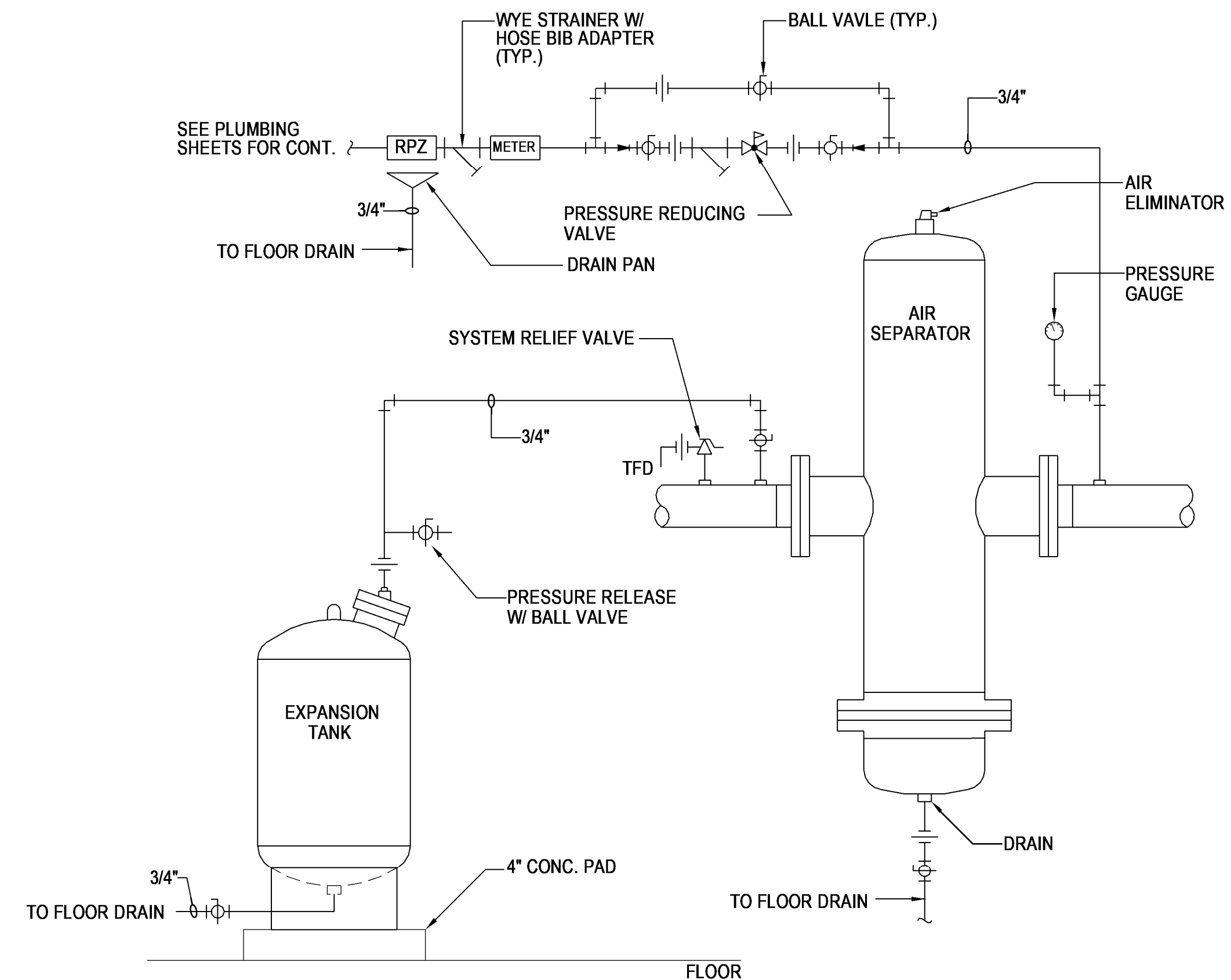
- UTILITY CABINET NOTES :**
- REFERENCE EQUIPMENT SCHEDULE FOR CABINET LOCATION
 - 24" REQUIRED FROM CABINET DOOR TO ALLOW ACCESS TO UTILITY CABINET COMPONENTS.
 - UTILITY CABINET TOP IS OPEN FOR ACCESSABILITY TO POWERSOURCE / COMPONENT CONNECTIONS FROM THE CEILING



FRONT ELEVATION VIEW

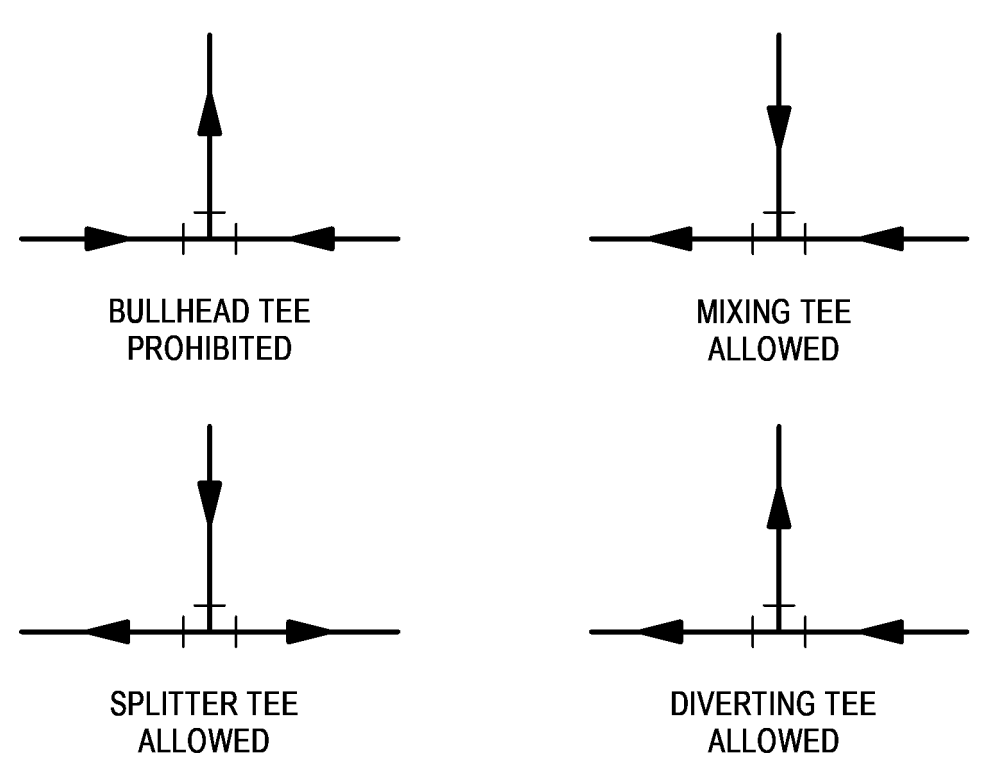


SIDE ELEVATION VIEW



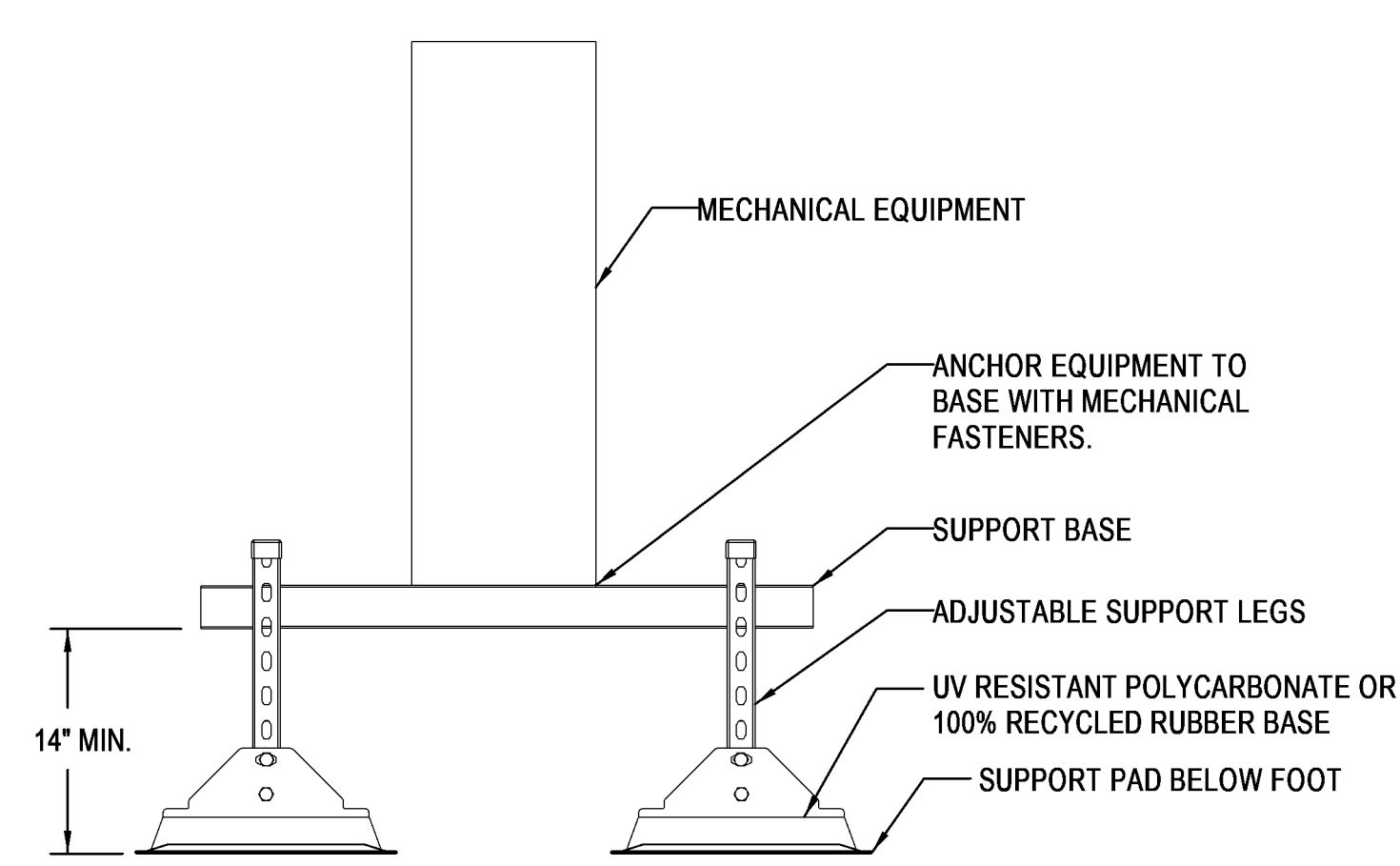
2 AIR SEPARATOR & EXP. TANK
NO SCALE

1 KITCHEN HOOD
NO SCALE

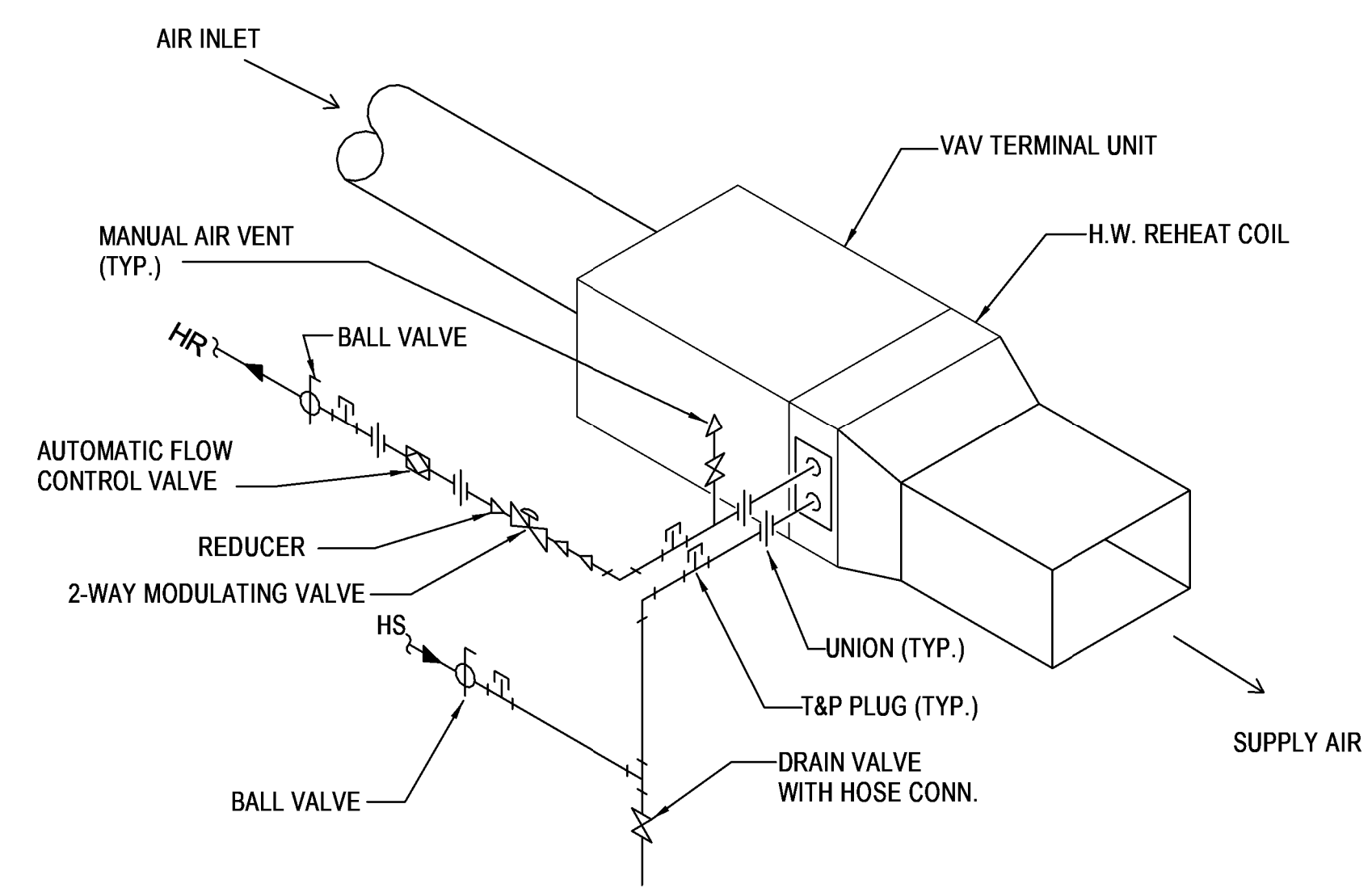


TEES SHOWN ON PIPING PLANS ARE SCHEMATIC. DO NOT PIPE A BULLHEAD TEE ARRANGEMENT.

3 PIPING TEE FLOW ARRANGEMENT
NO SCALE

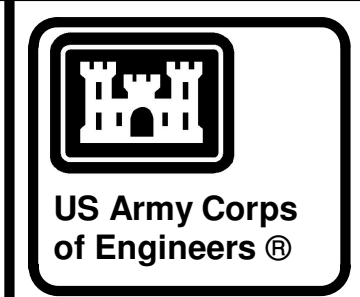


4 ROOFTOP EQUIPMENT SUPPORT
NO SCALE



NOTE: PROVIDE FLEXIBLE CONNECTIONS AT INLET OF VAV TERMINAL.

5 VAV TERMINAL WITH HOT WATER COIL (2-WAY VALVE)
NO SCALE



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne
 DRAWN BY: C. Borne
 CHECKED BY: R. Seay
 SUBMITTED BY: CROMWELL AE

ISSUE DATE: 28 APR 2022
 SOLICITATION NO.:
 CONTRACT NO.:

US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA

CROMWELL
 1300 East 6th Street
 Little Rock, AR 72202
 501.872.2900
 cromwell.com | ANSI D

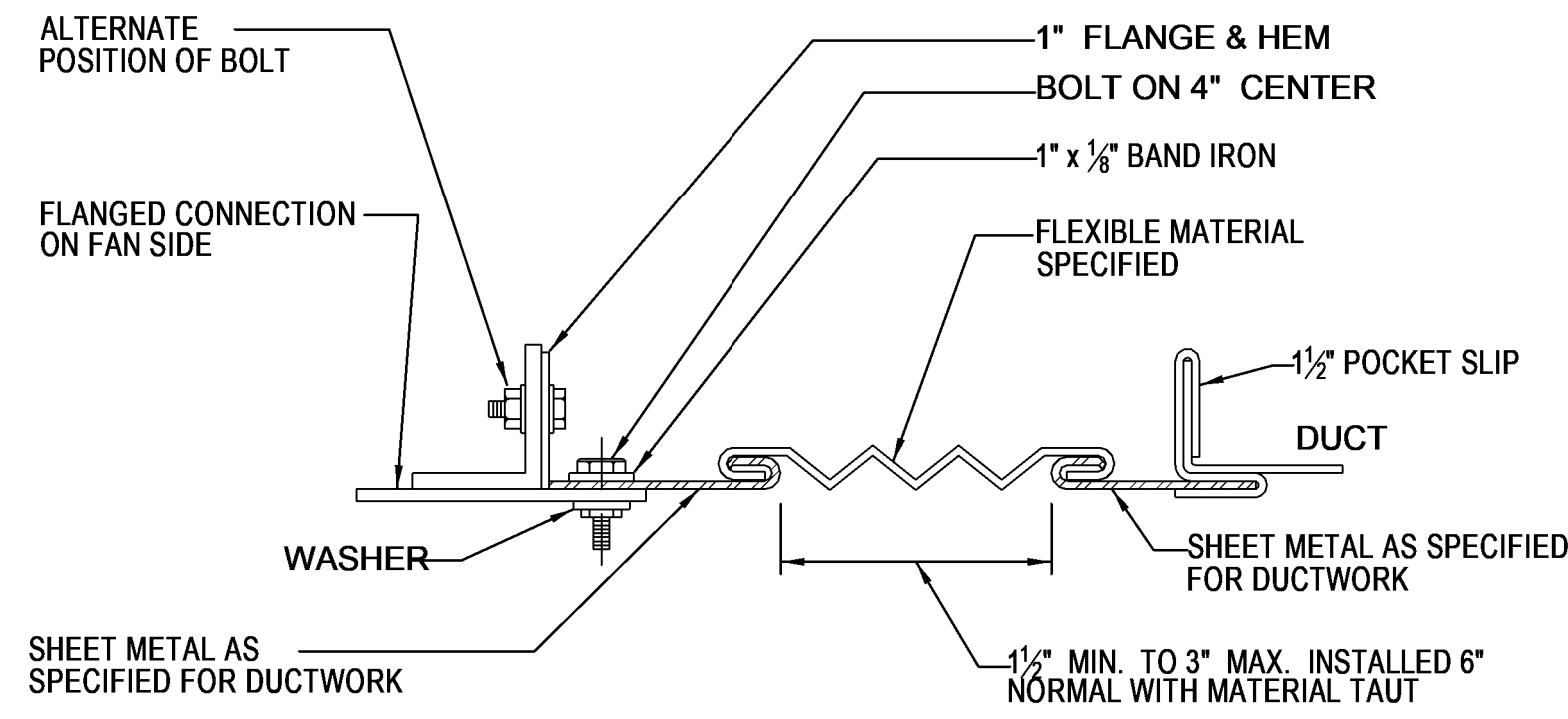
NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC

MECHANICAL DETAILS

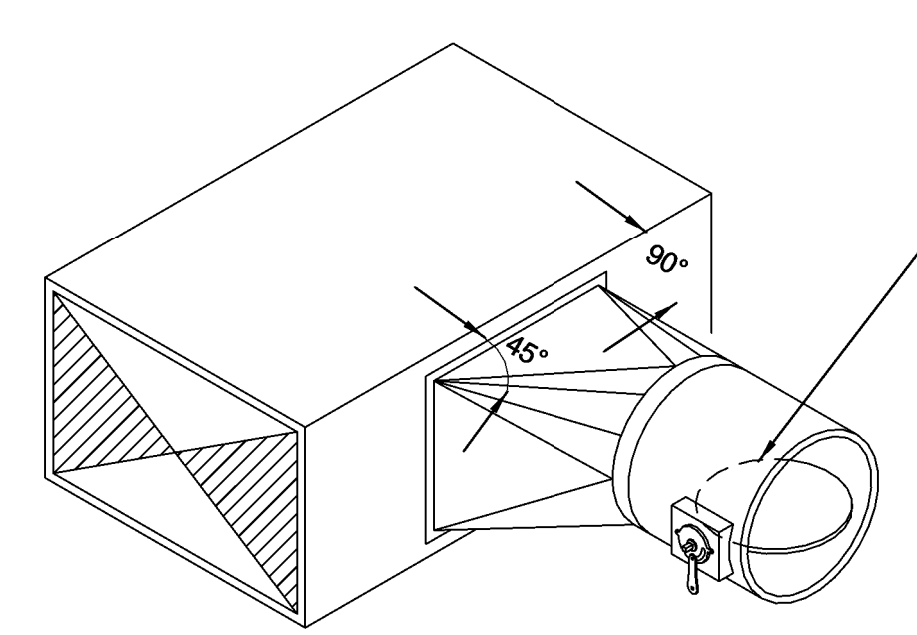
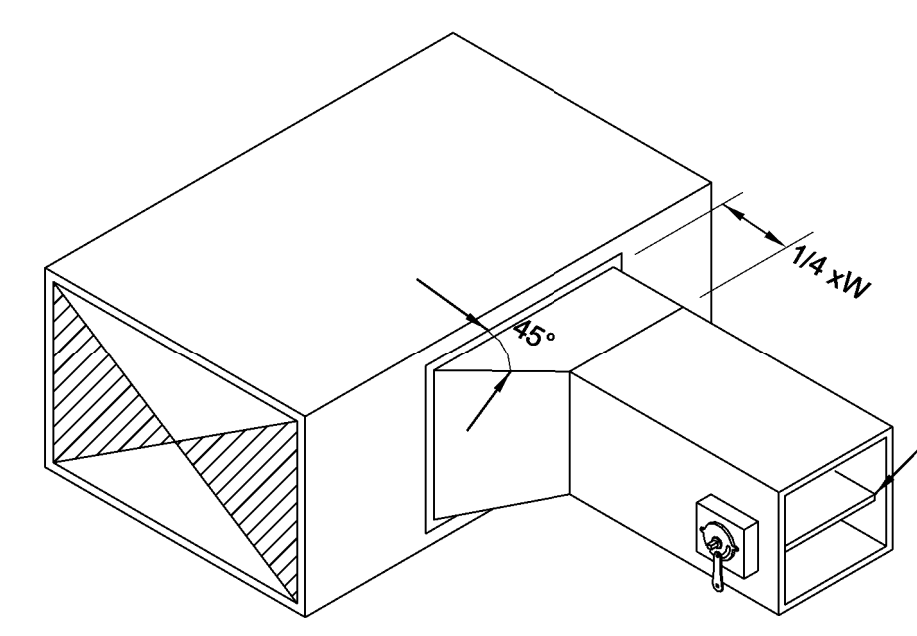
SHEET ID
M-503

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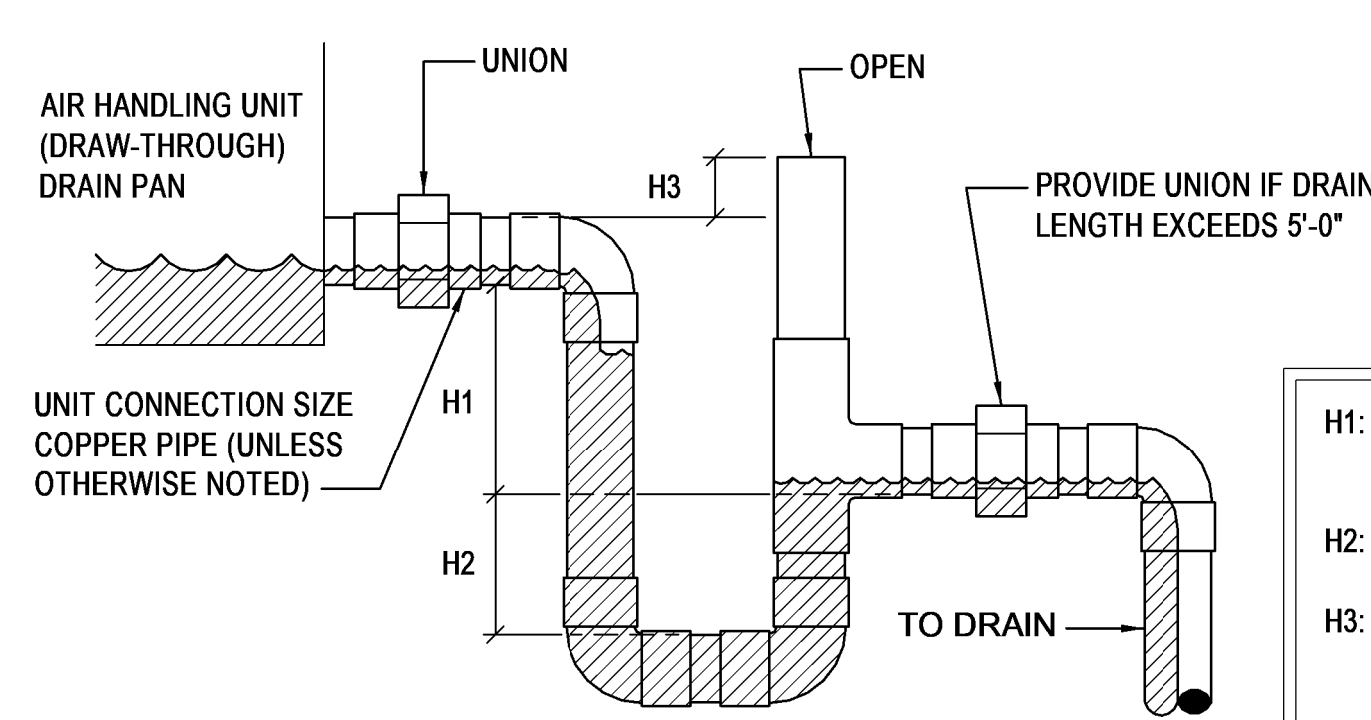
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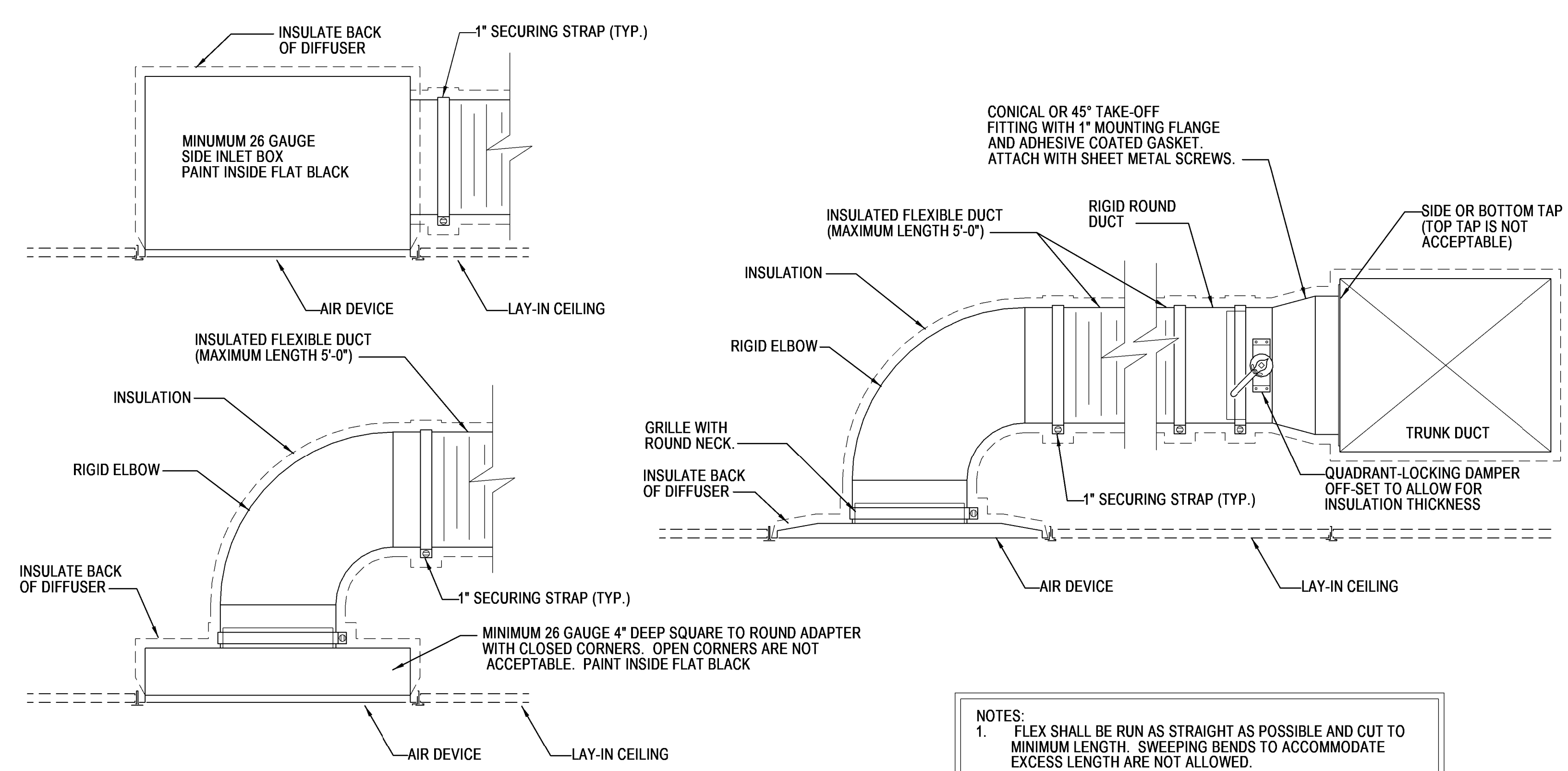
1 DUCTWORK FLEX CONNECTION
NO SCALE



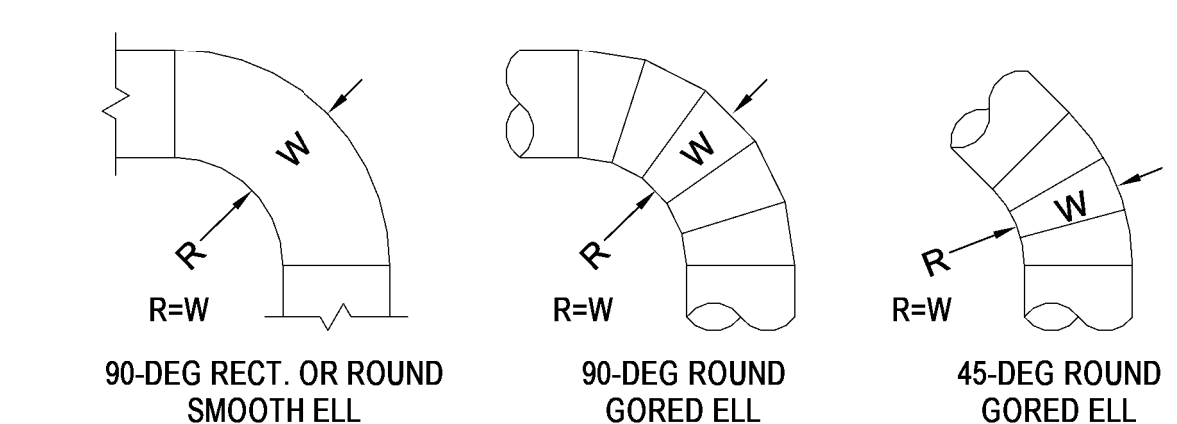
2 DUCT TAKE-OFF
NO SCALE



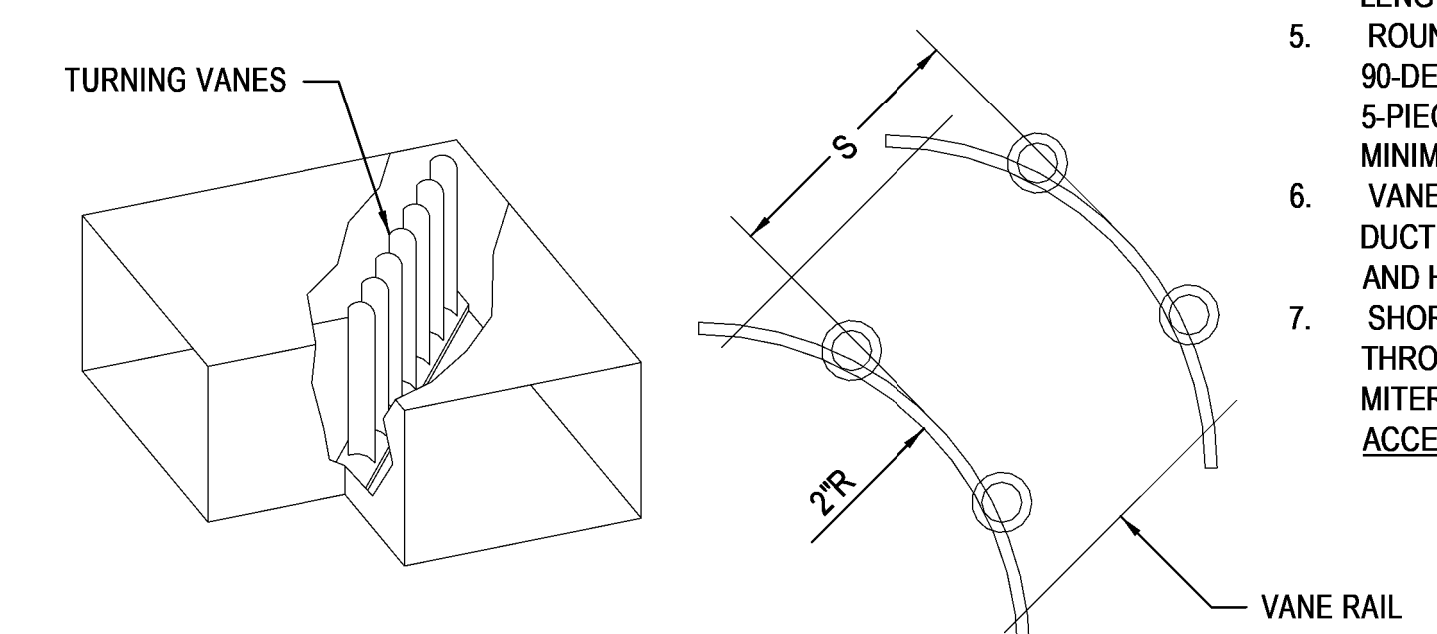
3 CONDENSATE DRAIN TRAP
NO SCALE



4 ROUND TAKE-OFF DUCT CONNECTION
NO SCALE



STANDARD RADIUS ELL



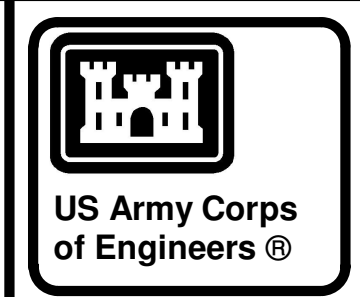
S=1.5\" SGL THICKNESS VANES
S=2.125\" DBL THICKNESS VANES

MITERED ELL

5 RECTANGULAR AND ROUND DUCT ELBOWS
NO SCALE

NOTES:
1. FLEX SHALL BE RUN AS STRAIGHT AS POSSIBLE AND CUT TO MINIMUM LENGTH. SWEEPING BENDS TO ACCOMMODATE EXCESS LENGTH ARE NOT ALLOWED.
2. FLEXIBLE DUCT SHALL NOT BE PERMITTED ON NEGATIVE PRESSURE DUCTWORK (I.E. RETURN AND EXHAUST).

- NOTES:**
- WHERE FULL RADIUS TURNS ARE NOT POSSIBLE, MITERED ELL'S WITH TURNING VANES SHALL BE PROVIDED FOR ALL CHANGES IN HORIZONTAL AND VERTICAL DUCT DIRECTION 45-DEGREE OR GREATER.
 - CONSTRUCT ELBOWS IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE.
 - TURNING VANE ELBOW SHALL BE ASHRAE FITTING CR3-9 WITH SINGLE WIDTH VANES FOR VANE LENGTHS UP TO 24\".
 - TURNING VANE ELBOW SHALL BE ASHRAE FITTING CR3-15 WITH DOUBLE WIDTH VANES FOR VANE LENGTHS OVER 24\".
 - ROUND ELBOWS SHALL BE SMOOTH OR GORED. 90-DEGREE GORED ELL'S SHALL BE MINIMUM 5-PIECE AND 45-DEGREE GORED ELL'S SHALL BE MINIMUM 3-PIECE.
 - VANES SHALL BE WELDED TO THE VANE RAIL IN DUCT SYSTEMS WITH AIR VELOCITIES 3000 FPM AND HIGHER.
 - SHORT RADIUS ELBOWS, ELBOWS WITH MITERED THROATS/RADIUS HEELS, AND ELBOWS WITH MITERED THROATS/CHAMFERED HEELS ARE NOT ACCEPTABLE.



04-28-2022

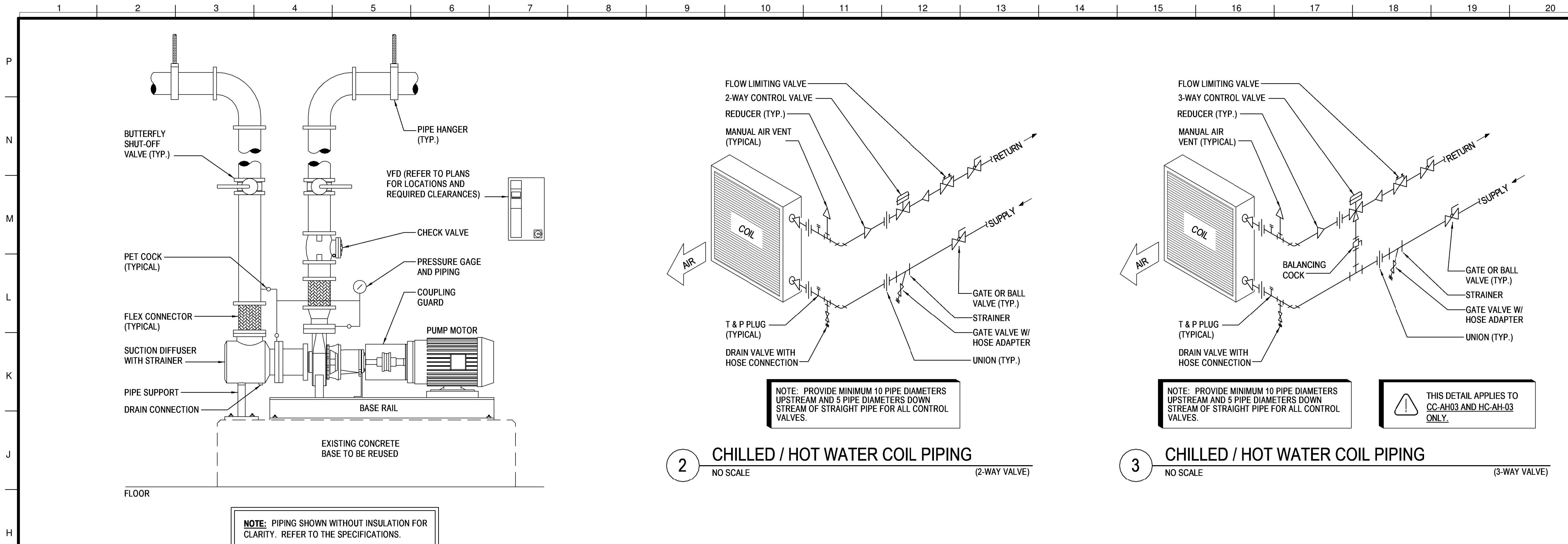
MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
1300 East 6th Street Little Rock, AR 72202 501.872.2900 cromwell@com.lansid	

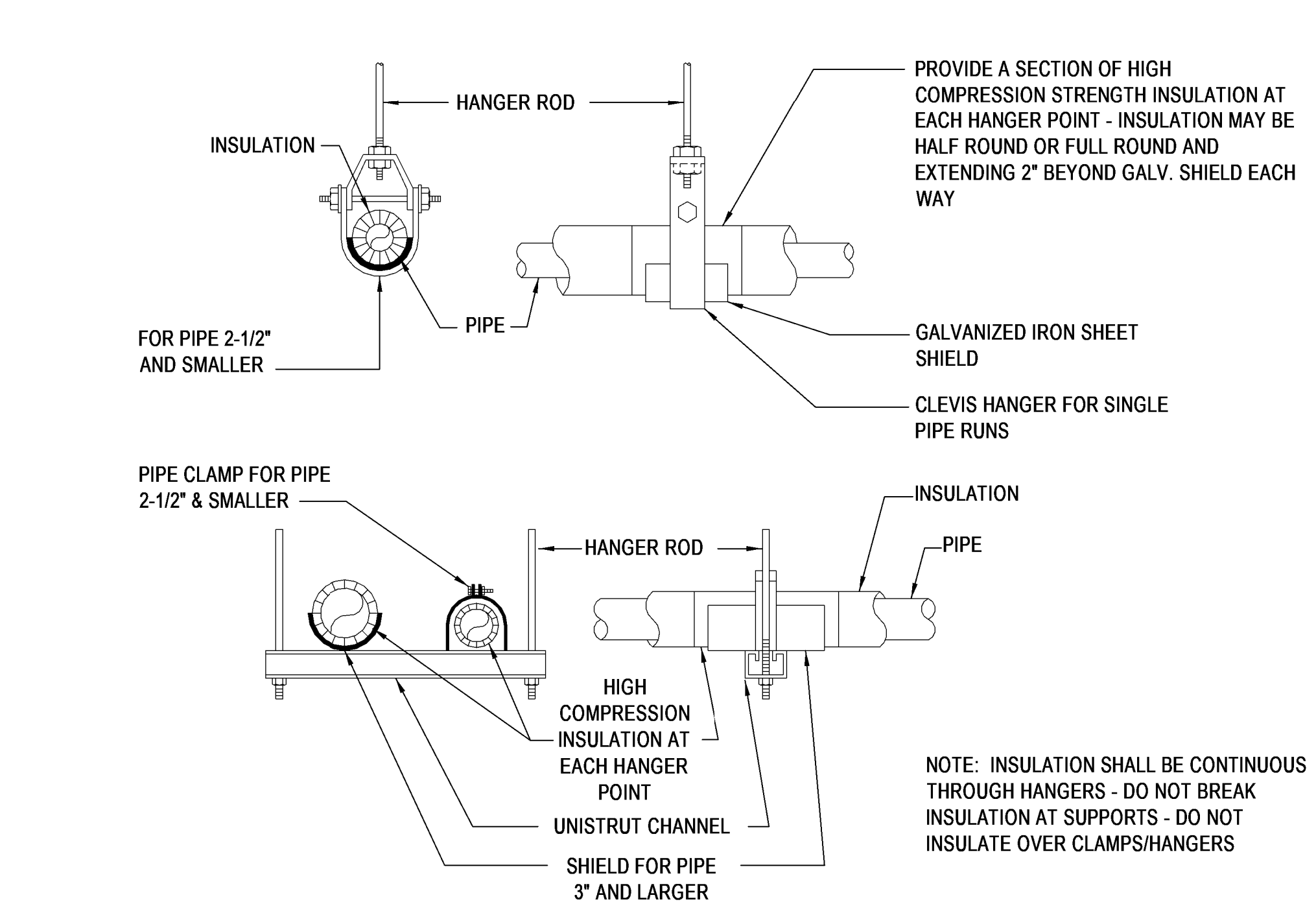
US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA
CROMWELL
MECHANICAL DETAILS
NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC

SHEET ID
M-504

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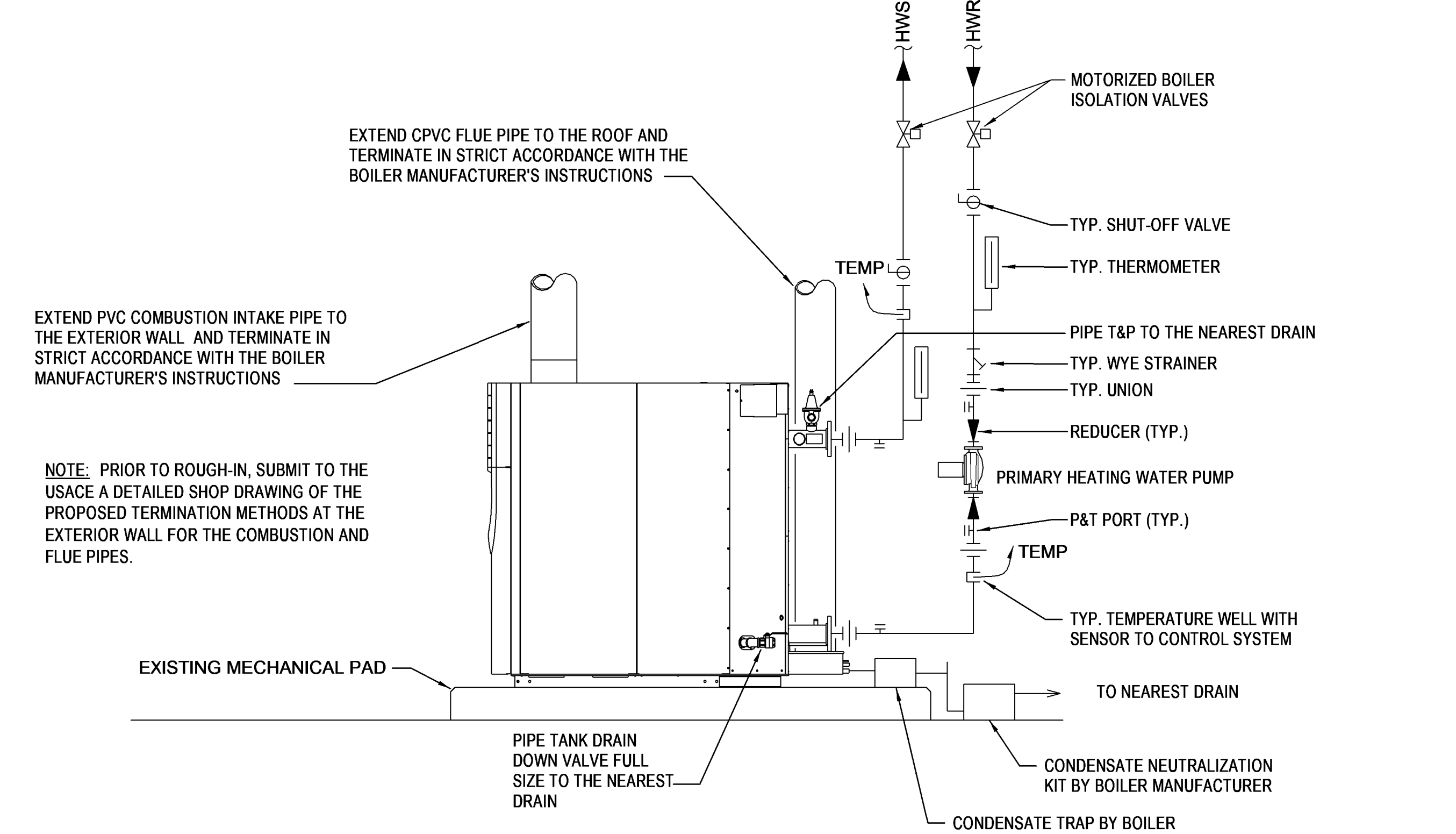


1 BASE MOUNTED END-SUCTION PUMP
NONE



4 MECHANICAL PIPE HANGER
NONE

5 CONDENSING BOILER
NONE



US Army Corps of Engineers®

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER BORNE No. 9396

04-28-2022

MARK	DESCRIPTION	DATE

ISSUE DATE: 29 APR 2022
SOLICITATION NO.:
DESIGNED BY: C. Borne
DRAWN BY: C. Borne
CHECKED BY: R. Seay
SUBMITTED BY: CHOMWELL AE
DATE: 04/28/2022
SIZE: 11x17

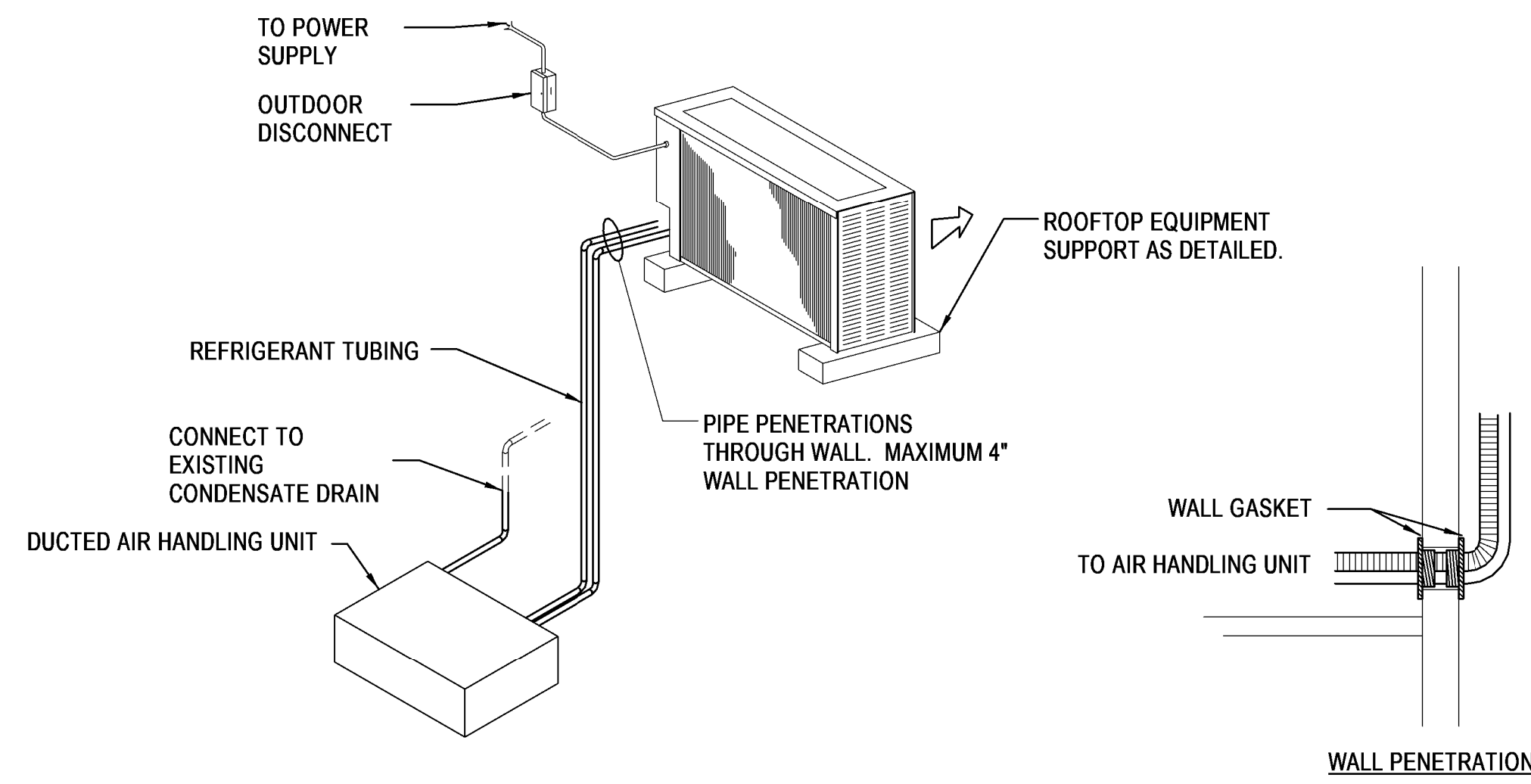
US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

CROMWELL
1300 East 6th Street Little Rock, AR 72202
501.372.2900
cromwell.com LANSI D

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
MECHANICAL DETAILS

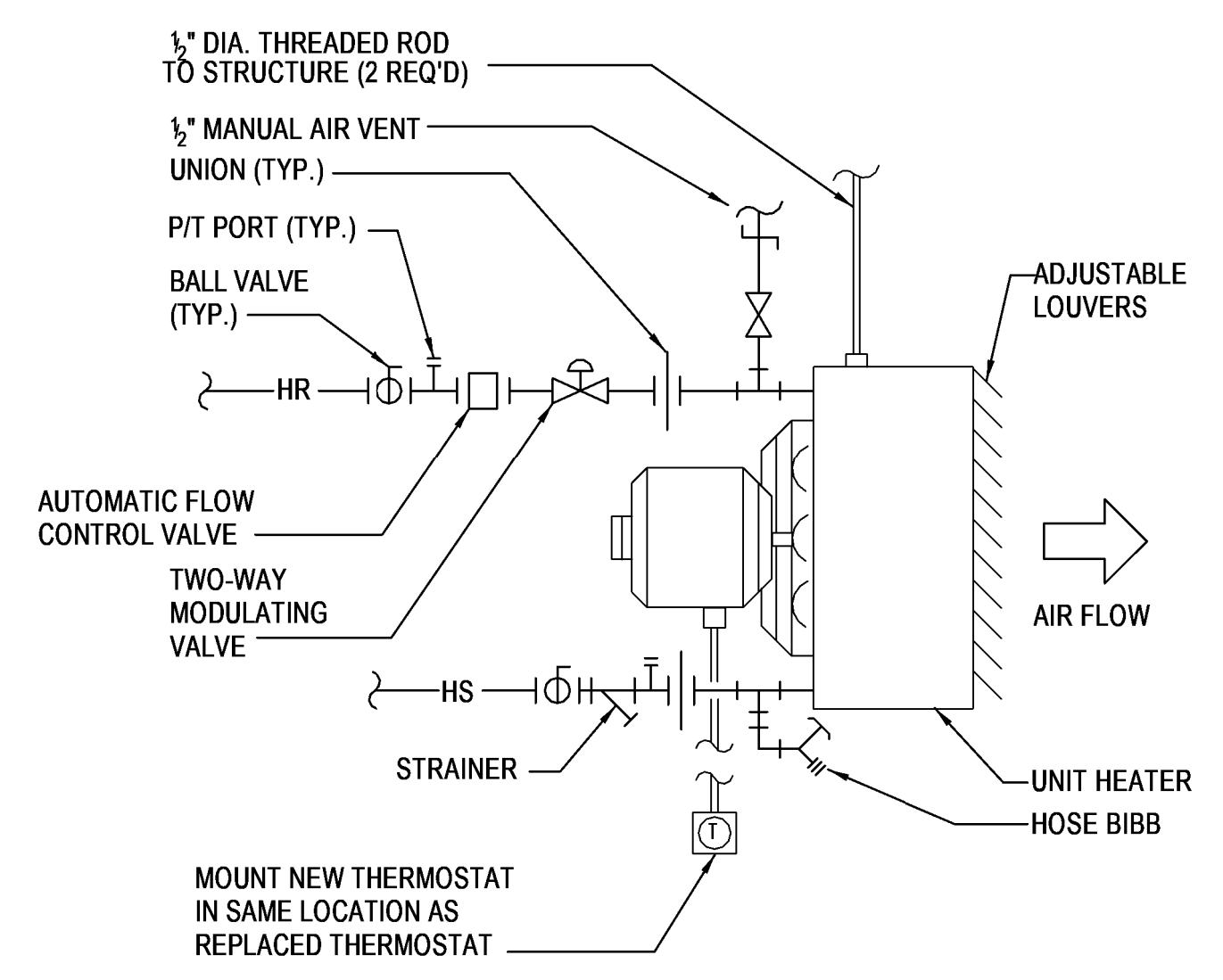
SHEET ID
M-505

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

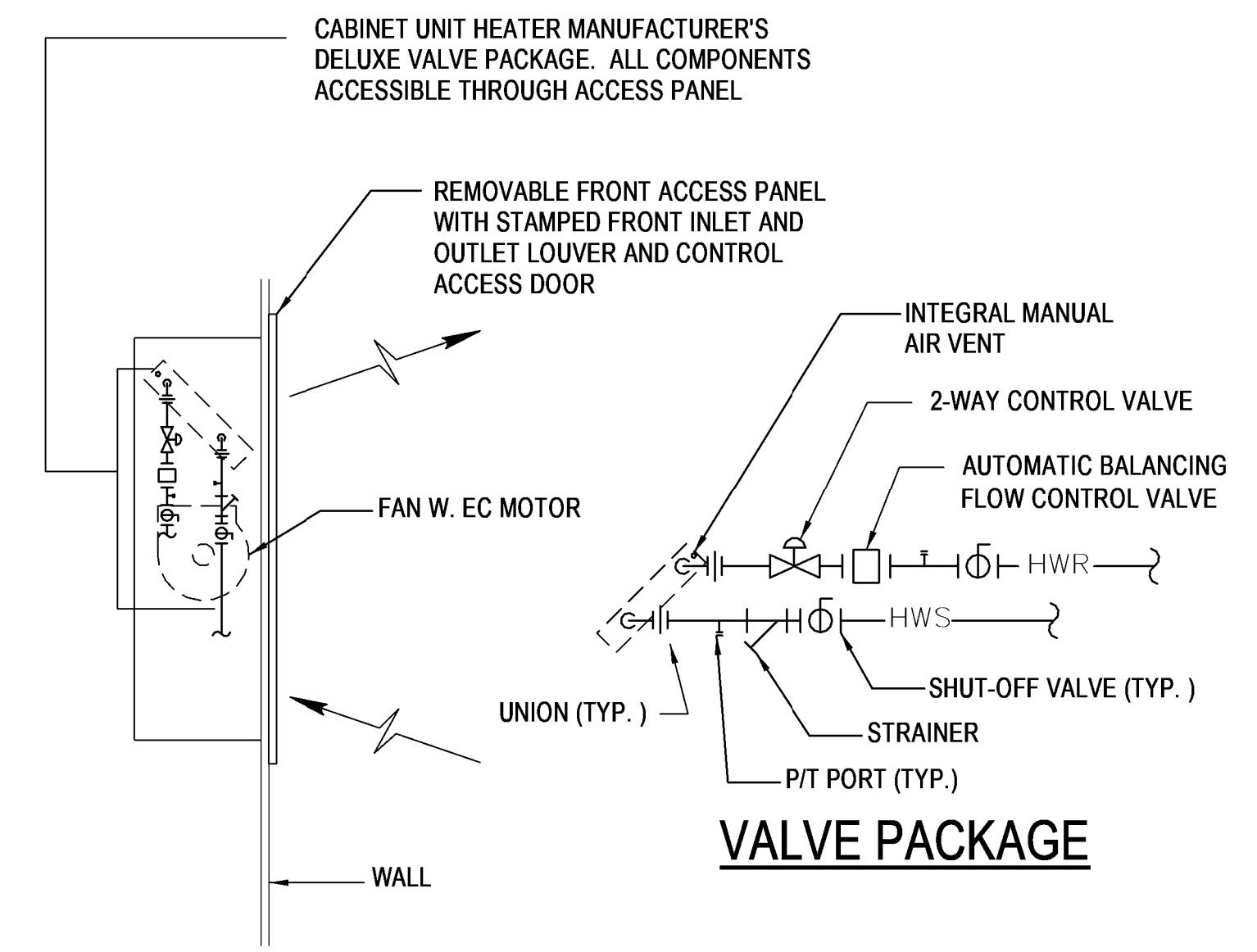


NOTES:
 1. REFRIGERANT LIQUID AND SUCTION LINES INSULATED WITH 1" CLOSED CELL FOAM AND COVERED WITH 0.016" ALUMINUM JACKETING. CONDENSATE LINES INSULATED INDOOR, UN-INSULATED OUTDOOR.
 2. PROVIDE MANUFACTURER'S RECOMMENDED UNIT CLEARANCES FOR BOTH THE INDOOR AND OUTDOOR UNIT.

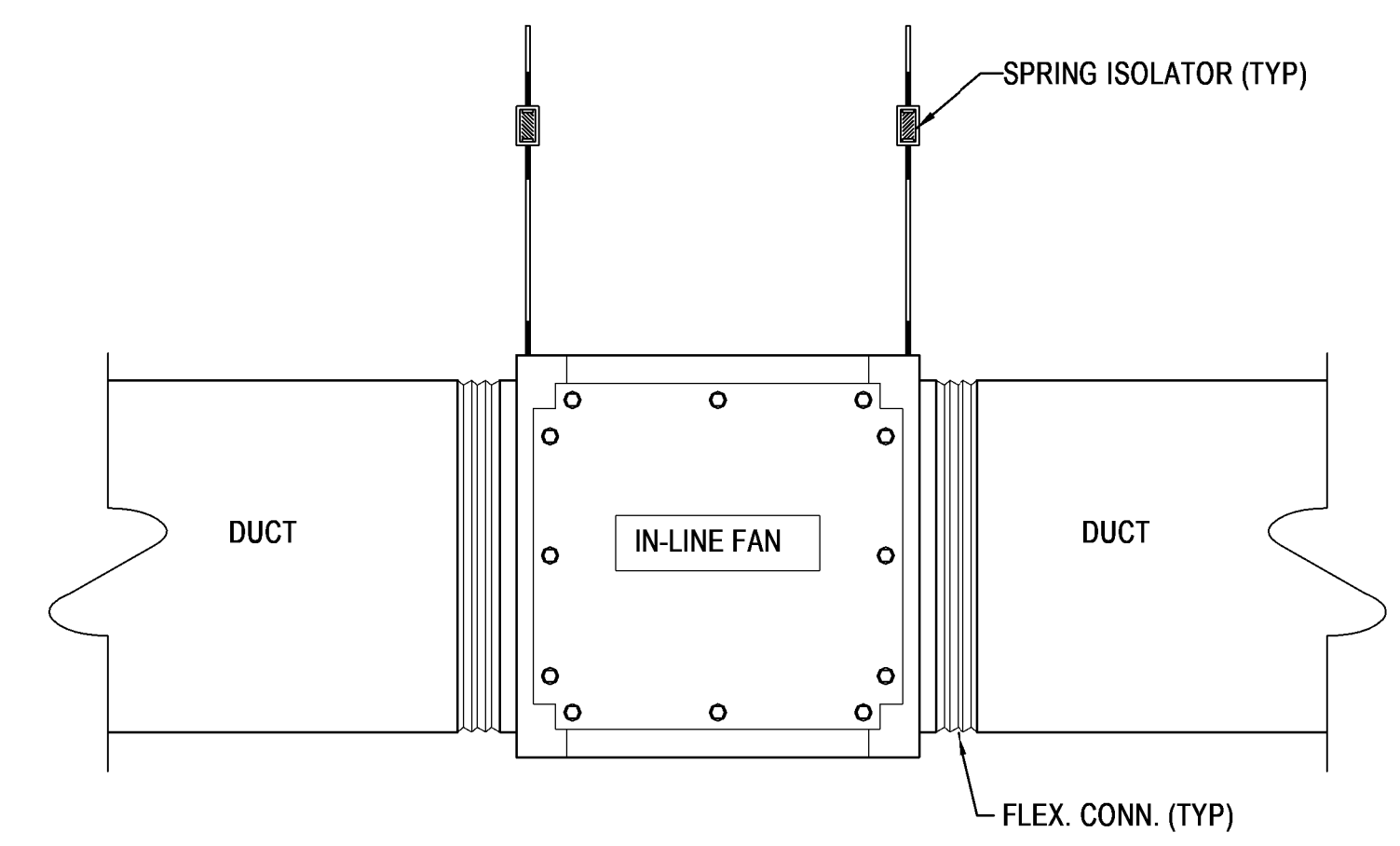
1 MINI-SPLIT SYSTEM A/C UNIT (DUCTED)
NO SCALE



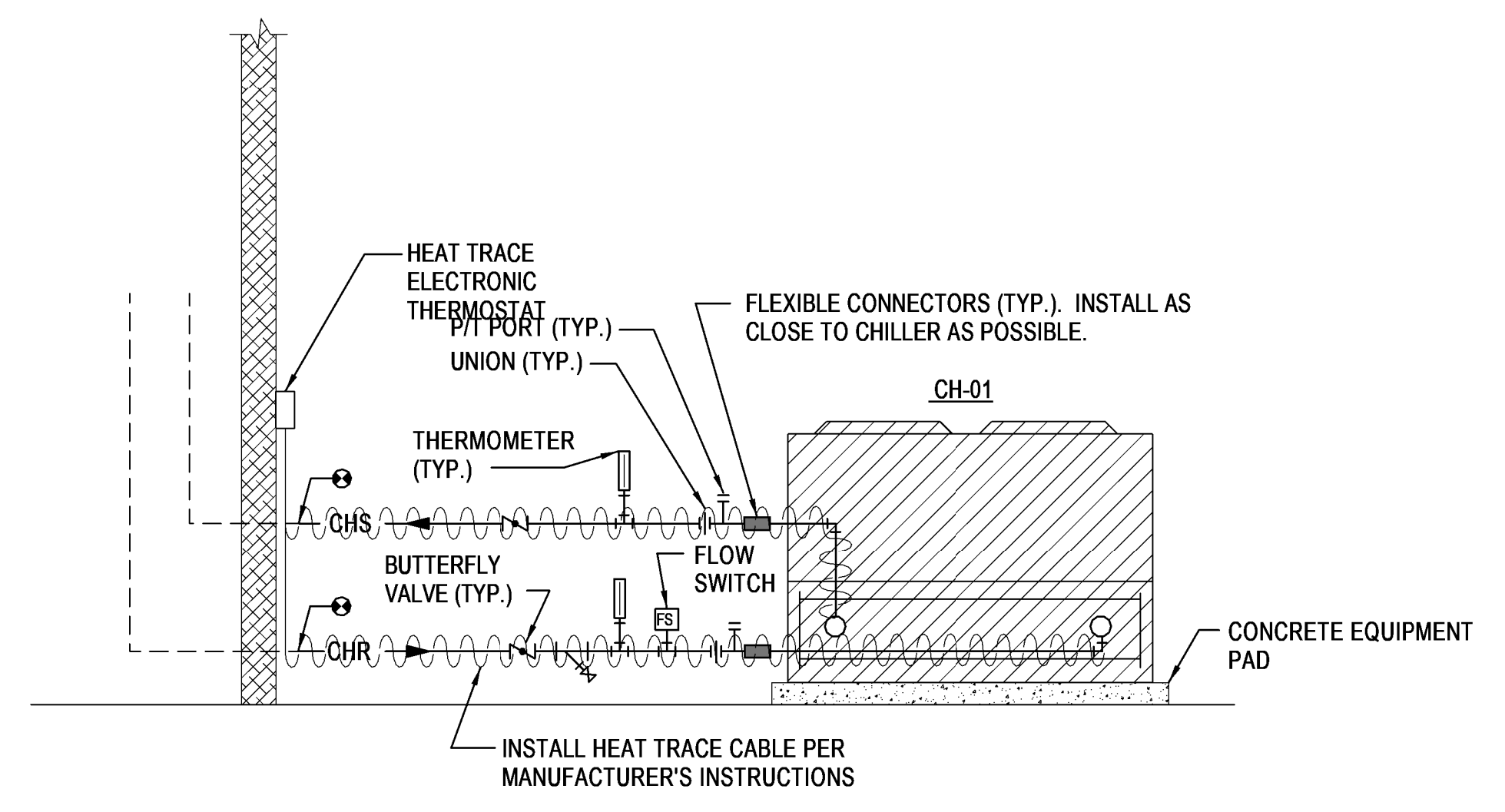
2 UNIT HEATER - HOT WATER
NO SCALE (2-WAY VALVE)



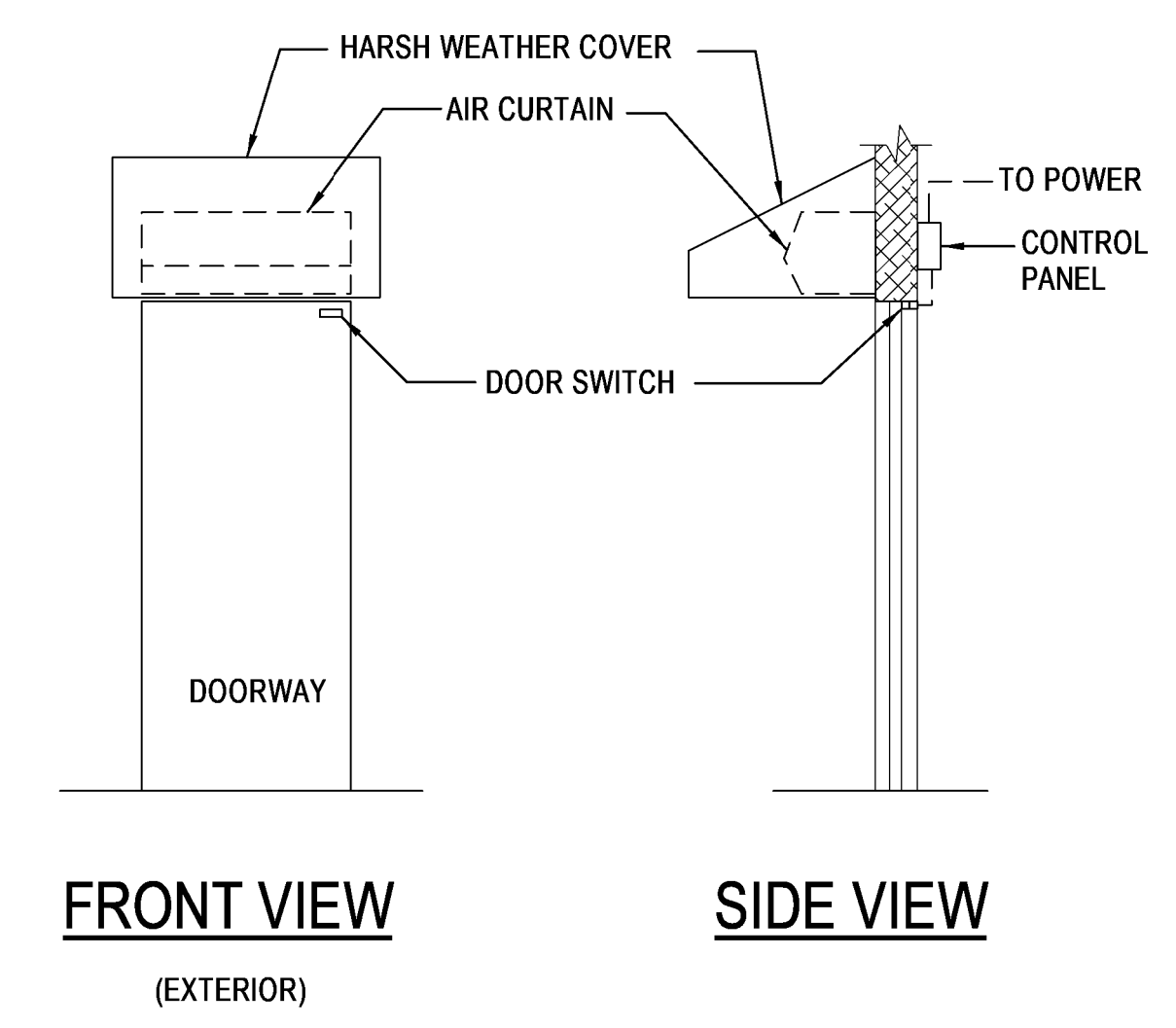
3 VERTICAL HOT WATER CABINET UNIT HEATER
NO SCALE



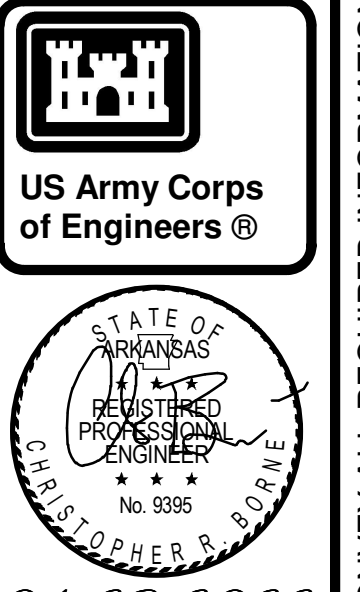
4 IN-LINE EXHAUST FAN
NO SCALE



5 AIR-COOLED CHILLER PIPING DIAGRAM
NO SCALE



6 AIR CURTAIN
NO SCALE



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
SIZE: 501.87x2.900	

US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA

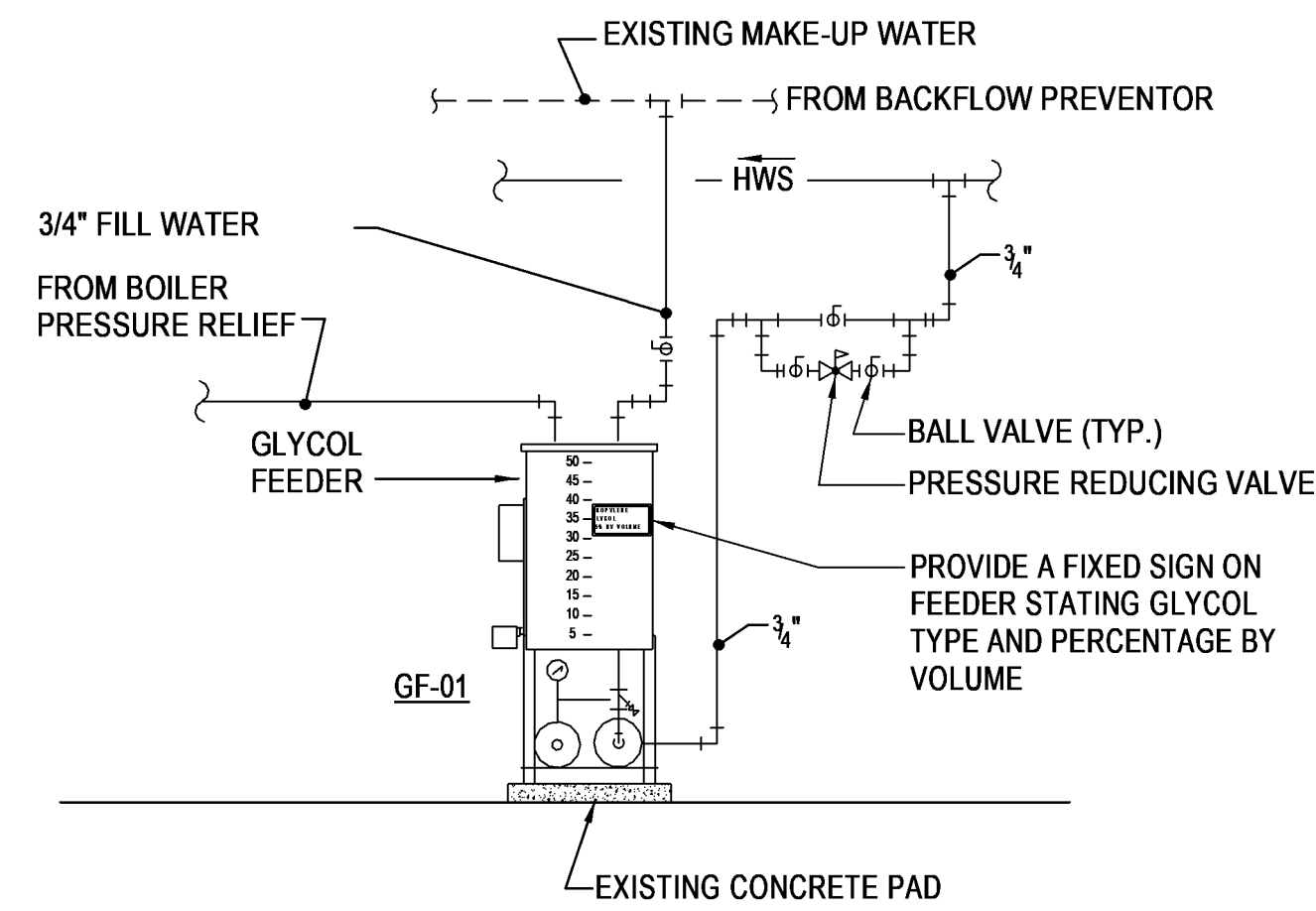
CROMWELL
 1300 East 6th Street Little Rock, AR 72202
 cromwell@com.lansid

NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC
 MECHANICAL DETAILS

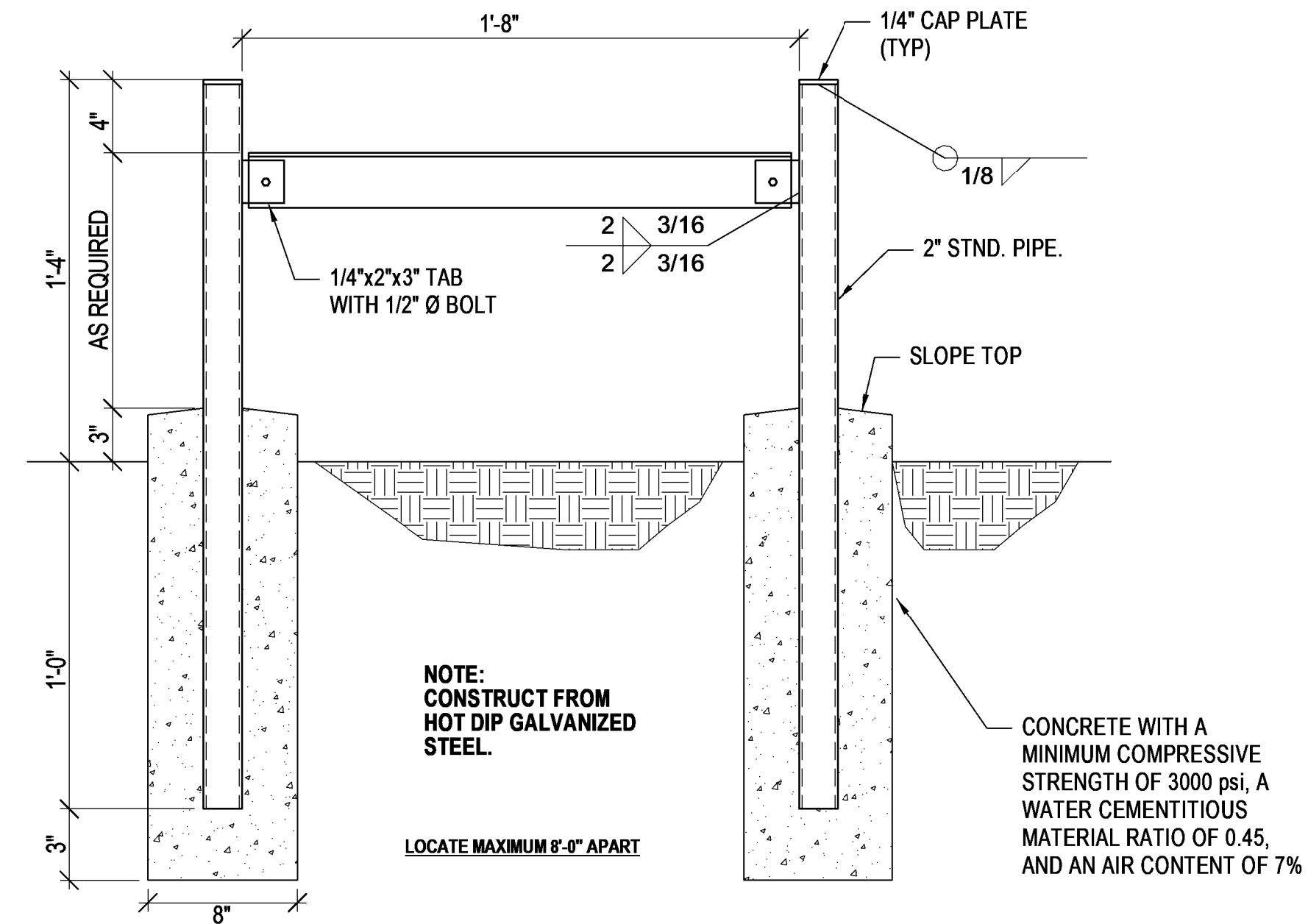
SHEET ID
M-506

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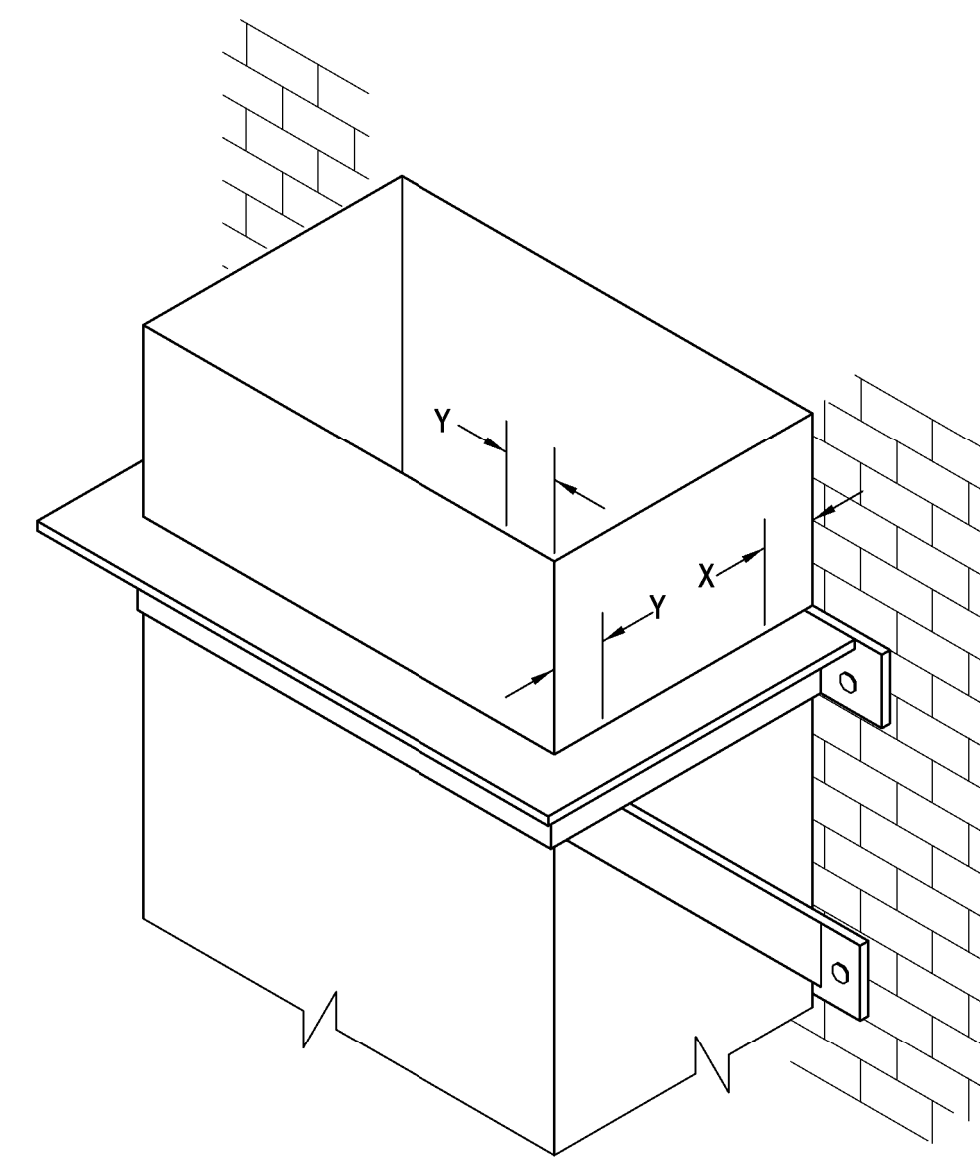
P
N
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1 GLYCOL FEEDER
NONE



2 PIPING STAND FOR EXTERIOR APPLICATION
NO SCALE

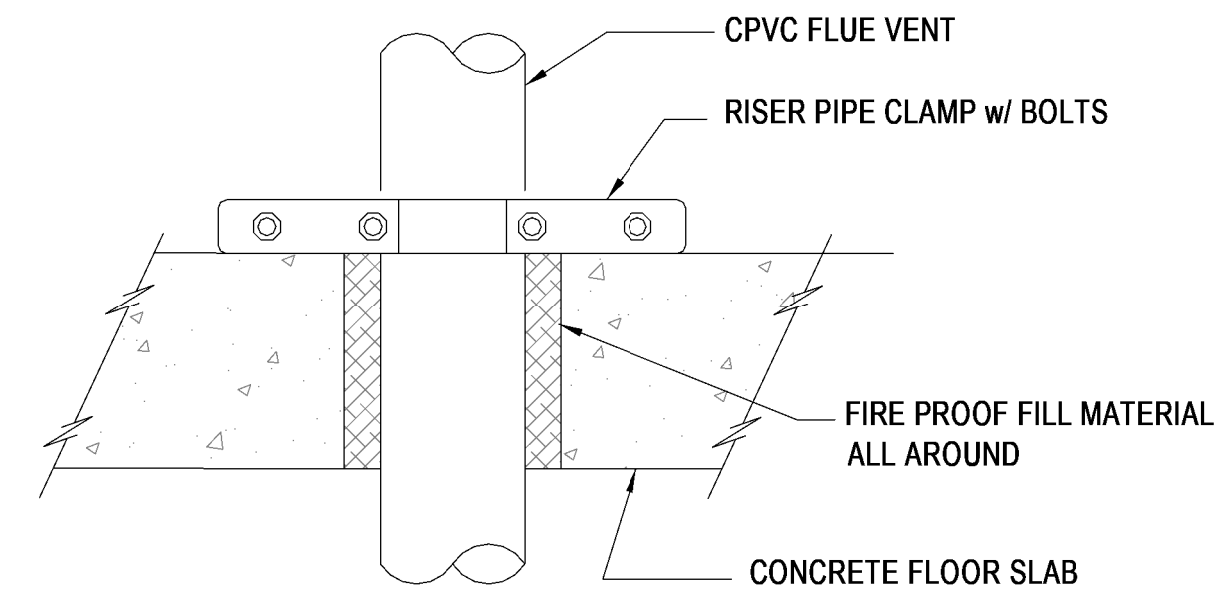


3 DUCT SUPPORT FROM WALL
NONE

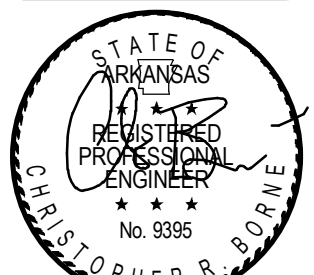
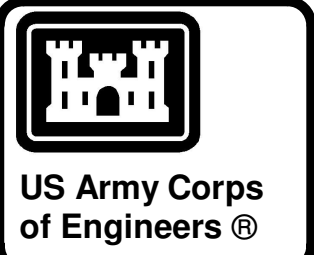
NOTES:

- BRACKETS ARE SIZED FOR 12 FEET OF DUCT, MAXIMUM.
- LOCATE DUCTS AGAINST WALL OR MAXIMUM OF 2" AWAY FROM WALL.
- EACH WALL ANCHOR SHALL SATISFY THE FOLLOWING CRITERIA UNLESS OTHER ANALYSIS IS MADE:
 - A. TENSILE LOAD = 3/8 x DUCT WEIGHT; SAFETY FACTOR 4.
 - B. SHEAR LOAD = 1/2 x DUCT WEIGHT; SAFETY FACTOR 4.
- WELD, BOLT OR NO. 8 SCREW (MIN.); DEVIATION PERMITTED BY OTHER ANALYSIS. X = 1", Y = 2". ADD OTHERS TO ACCOMMODATE LOAD. MINIMUM OF 3 ON 24" WIDTH AND UP. ADD ALONG SIDES NEAREST ANCHORS.
- SUGGESTED ANGLE SIZING:
 - A. 30/12 DUCT OR EQUIV.: 1" x 1" x 1/8" ANGLE
 - B. 36/18 DUCT OR EQUIV.: 1" x 1" x 1/8" ANGLE
 - C. 42/24 DUCT OR EQUIV.: 1-1/4" x 1-1/4" x 1/8" ANGLE
 - D. 48/30 DUCT OR EQUIV.: 1-1/4" x 1-1/4" x 1/8" ANGLE

DETAIL SOURCE:
SMACNA HVAC DUCT CONSTRUCTION STANDARDS, THIRD EDITION
FIGURE 5-9 "SUPPORTS FROM WALL"



4 FLOOR SUPPORT FOR VERTICAL CPVC FLUE VENT
NO SCALE



04-28-2022

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SIZE: 501.87x2.2500	

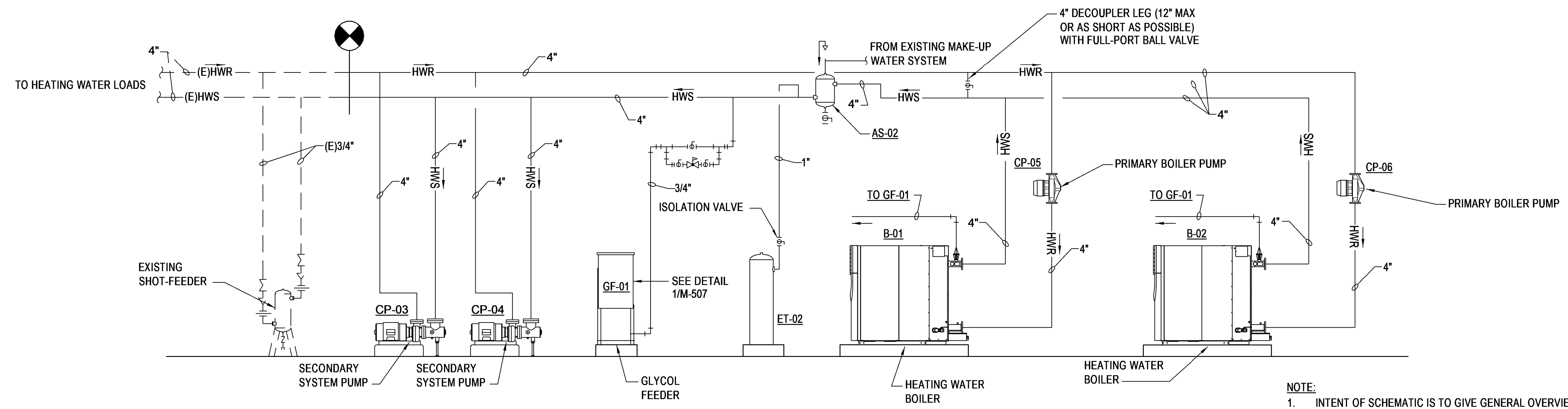
US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

CROMWELL
1300 East 6th Street Little Rock, AR 72202
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NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
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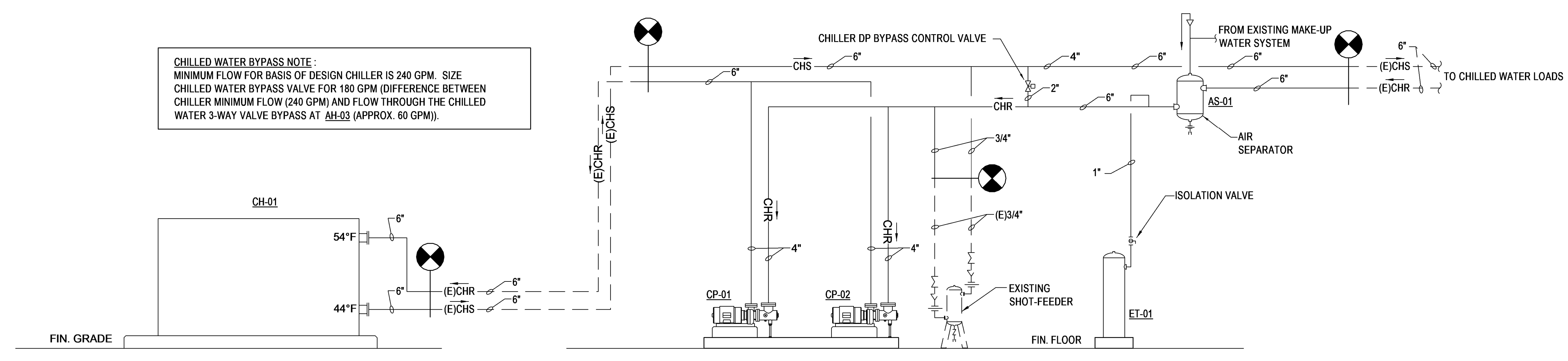
SHEET ID
M-507

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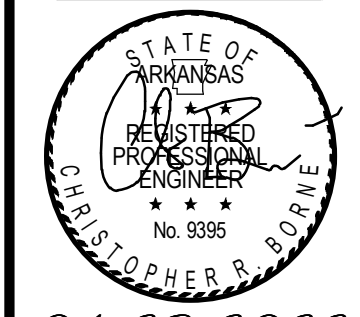
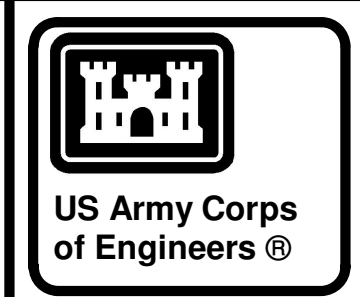
NOTE:
1. INTENT OF SCHEMATIC IS TO GIVE GENERAL OVERVIEW OF PIPING SYSTEM. NOT ALL PIPE FITTINGS AND CONTROL DEVICES ARE SHOWN. ALSO REFER TO DETAILS AND CONTROL DIAGRAMS.

1 HEATING WATER SYSTEM PIPING DIAGRAM
NONE



NOTE:
1. INTENT OF SCHEMATIC IS TO GIVE GENERAL OVERVIEW OF PIPING SYSTEM. NOT ALL PIPE FITTINGS AND CONTROL DEVICES ARE SHOWN. ALSO REFER TO DETAILS AND CONTROL DIAGRAMS.

2 CHILLED WATER SYSTEM PIPING DIAGRAM
NONE



04-28-2022

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CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL A/E	
1300 East 6th Street Little Rock, AR 72202 501.572.2900 cromwell@aecom.lansid	

US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

CROMWELL

MECHANICAL DETAILS

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC

SHEET ID
M-508

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

AIR HANDLING UNITS

MARK	SERVES	LOCATION	FAN									COOLING COIL	PRE-HEATING COIL	RE-HEATING COIL	ELECTRICAL	FILTER(S)	REMARKS
			CFM	OSA MIN / MAX CFM	ESP	TYPE	NO.	RPM	HP EA.	COMBINED BHP	VOLTS/Ø						
AH-01	SEE PLANS	MECH 194	24000	3200 / 7000	3.5	(1)	2	1909	20	32.83	CC-AH01	HC-AH01	N/A	460/3	MERV 13	(3) (4)	
AH-03	SEE PLANS	MECH 209	7300	1230 / 2300	2.5	(1)	1	2176	10	9.42	CC-AH03	HC-AH03	N/A	460/3	MERV 13	(4)	
DOAS-01	SEE PLANS	MECH S124	2600	800 / 2600	1.0	(2)	1	1929	6.03	(2)	CC-DOAS01	HC-DOAS01A	HC-DOAS01B	460/3	MERV 13	(4)	

- (1) DIRECT-DRIVE AIRFOIL PLENUM FAN VARIABLE FREQUENCY DRIVE.
- (2) MOTORIZED IMPELLER PLENUM FAN WITH MOTOR CONTROLLER. INPUT POWER 1.61 kW.
- (3) LARGEST SECTION SHALL FIT THROUGH EXISTING LOUVER OPENING.
- (4) ULTRA LOW LEAKAGE RETURN AIR AND OUTSIDE AIR DAMPERS PANELS AND ACCESS DOORS SHALL BE CONSTRUCTED AS A 2-INCH NOMINAL THICK; THERMAL BROKE DOUBLE WALL ASSEMBLY, INJECTED WITH FOAM INSULATION WITH AN R-VALUE OF NOT LESS THAN R-13.

(4) (CONT.)

- THE CASING LEAKAGE RATE SHALL NOT EXCEED 1% OF SUPPLY AIR VOLUME AT DESIGN STATIC PRESSURE UP TO A MAXIMUM OF +8" W.C. IN POSITIVE PRESSURE SECTIONS AND -8" W.C. (1.99 KPA) IN NEGATIVE PRESSURE SECTIONS.
- A 10-GAUGE, 6-INCH FORMED G60 GALVANIZED STEEL BASE RAIL SHALL BE PROVIDED BY THE UNIT MANUFACTURER FOR STRUCTURAL RIGIDITY AND CONDENSATE TRAPPING.
- FAN AND MOTOR SHALL BE MOUNTED INTERNALLY ON A STEEL BASE WITH SPRING ISOLATORS. FACTORY MOUNT MOTOR ON SLIDE BASE THAT CAN BE SLID OUT THE SIDE OF THE UNIT IF REMOVAL IS REQUIRED. PROVIDE ACCESS TO MOTOR, DRIVE, AND BEARINGS THROUGH HINGED ACCESS DOOR.
- WATER COOLING COILS SHALL BE CERTIFIED IN ACCORDANCE WITH AHRI STANDARD 410 AND BEAR THE AHRI LABEL.
- COIL HEADERS SHALL CONSIST OF SEAMLESS COPPER TUBING. FINNS SHALL HAVE A MINIMUM THICKNESS OF 0.0075 INCH ALUMINUM PLATE CONSTRUCTION. COIL TUBES SHALL BE 5/8 INCH OD SEAMLESS COPPER, 0.020 INCH NOMINAL TUBE WALL THICKNESS, EXPANDED INTO FINNS, BRAZED AT JOINTS.
- FILTER MEDIA SHALL BE UL 900 LISTED, CLASS I OR CLASS II.

SEE SHEET M-501 FOR ADDITIONAL CONSTRUCTION AND ACCESSORY DETAILS.

CHILLER - AIR COOLED

MARK	SERVES	NOMINAL TONS	COOLING STAGES	MIN. TURN DOWN	EVAPORATOR				EVAPORATOR MINIMUM FLOW - GPM	CONDENSER FANS		COMPRESSORS			ELECTRICAL - SINGLE POINT			EFFICIENCY	REFRIG. TYPE	REMARKS	
					EWT °F	LWT °F	GPM	MAX. P.D.		NO.	FAN FLA - AMPS (EACH)	NO.	COMPRESSOR RLA - AMPS (EACH)	TYPE	MCA	MOCQ	VOLTS/Ø				EER
CH-01	BUILDING	200	6	15%	54	42	348	11.32	240	10	5.8	6	4 @ 54 / 2 @ 69	SCROLL	403	450	460/3	9.863	16.561	R-410A	(1)

- (1) PROVIDE HIGH EFFICIENCY CONDENSER COIL FINNS, LOW AMBIENT, FACTORY INLET STRAINER, UNIT MOUNTED DISCONNECT SWITCH WITH CIRCUIT PROTECTION, UNIT-MOUNTED STARTER, HINGED ACCESS PANELS, EVAPORATOR HEAT TRACE, CONVENIENCE OUTLET, BAS COMMUNICATION VIA BACNET PROTOCOL, AND LOUVERED COVERS/HAIL GUARDS. UNIT SHALL HAVE A MINIMUM OF TWO REFRIGERATION CIRCUITS.

AIR AND SEDIMENT SEPARATOR

MARK	SERVES	SIZE	MAX. WPD	GPM	REMARKS
AS-01	CHILLED WATER	6"	0.6 FT H2O	362	(1)
AS-02	HEATING WATER	4"	0.6 FT H2O	192	(1)

- (1) COMBINATION AIR AND SEDIMENT SEPARATOR UTILIZING STAINLESS STEEL COALESCING MEDIA TO REMOVE IMPURITIES FROM HIGH VELOCITY HVAC SYSTEMS. PROVIDE 1/2" HIGH CAPACITY AUTOMATIC AIR VENT, 1/2" BLOW DOWN VALVE AND 1/2" SKIM VALVE. COALESCING MEDIA SHALL BE MINIMUM 58% OPEN AREA. ACCESSIBLE THROUGH REMOVABLE END COVER. UNIT SHALL BE DESIGNED, CONSTRUCTED, INSPECTED AND STAMPED PER ASME SECTION VIII, DIVISION 1.

CHILLED WATER COOLING COILS

MARK	SERVES	CFM	MAX FACE VELOCITY (FPM)	WIDTH	LENGTH	MAX FPF	MIN. TOTAL (MBH)	MIN. SENSIBLE (MBH)	ENTERING AIR TEMP.		MAX LEAVING AIR TEMP.		MAX APD	EWT (°F)	LWT (°F)	GPM	MAX WPD FT W.C.	REMARKS
									DB (°F)	WB (°F)	DB (°F)	WB (°F)						
CC-AH01	AH-01	24000	500	AS REQ'D	AS REQ'D	144	1252.9	831.6	83.7	68.9	52.3	52.0	0.81	42	54	208.0	6.4	(1) (4)
CC-AH03	AH-03	7300	550	AS REQ'D	AS REQ'D	144	373.5	249.8	83.9	69.2	52.9	52.8	1.22	42	54	62.1	5.1	(1) (4)
CC-DOAS01	DOAS-01	2600	500	AS REQ'D	AS REQ'D	144	182.4	109.6	93.0	75.1	55.0	54.5	0.60	42	54	30.3	7.1	(1) (4)
CC-ERV01	ERV-01 (LOOSE)	1800	-	AS REQ'D	AS REQ'D	144	64.3	44.0	83.4	69.6	61.3	58.9	0.29	42	54	10.7	3.6	(2) (4)
CC-ERV02	ERV-02 (LOOSE)	1100	-	AS REQ'D	AS REQ'D	144	33.8	29.8	82.1	69.0	63.8	62.1	0.27	42	54	4.2	0.5	(3) (4)

- (1) PROVIDED WITH ASSOCIATED AIR HANDLING UNIT.
- (2) MODULAR AIR HANDLING UNIT SECTIONS FOR NOMINAL 4 SF AREA COILS. SEE DETAIL *5"/M-501.
- (3) MODULAR AIR HANDLING UNIT SECTIONS FOR NOMINAL 3 SF AREA COILS. SEE DETAIL *5"/M-501.
- (4) STAINLESS STEEL DRAIN PAN.

EXPANSION TANK

MARK	SERVES	LOCATION	TYPE	TANK VOLUME (GALLONS)	TANK ACCEPTANCE (GALLONS)	MIN. TEMP. °F	MAX. TEMP. °F	MIN. PRESS. (PSIG)	MAX. PRESS. (PSIG)	REMARKS
ET-01	CHILLED WATER	MECHANICAL S124	(1)	53	53	42	80	35	80	(1)
ET-02	HOT WATER	MECHANICAL S124	(1)	80	80	68	160	35	80	(1)

- (1) ASME RATED, PRE-CHARGED BLADDER-TYPE PRESSURE VESSEL DESIGNED TO ABSORB THE EXPANSION FORCES OF HEATING/ COOLING SYSTEM WATER WHILE MAINTAINING PROPER SYSTEM PRESSURIZATION UNDER VARYING OPERATING CONDITIONS. 125 PSI MAXIMUM OPERATING PRESSURE, 240 DEG. F MAXIMUM OPERATING TEMPERATURE. FORGED STEEL SYSTEM CONNECTION, CARBON STEEL SHELL, AND HEAVY DUTY BUTYL RUBBER REPLACEABLE BLADDER. UNIT DESIGNED AND CONSTRUCTED PER ASME SECTION VIII, DIVISION 1.

HOT WATER HEATING COILS

MARK	SERVES	CFM	MAX FACE VELOCITY (FPM)	WIDTH	LENGTH	MAX FPF	MIN. TOTAL (MBH)	ENTERING AIR TEMP.		MIN. LEAVING AIR TEMP.		MAX APD (1)	EWT (°F)	LWT (°F)	GPM	MAX WPD FT W.C.	REMARKS
								DB (°F)	WB (°F)	DB (°F)	WB (°F)						
HC-AH01	AH-01	10000	510	AS REQ'D	AS REQ'D	144	321.1	25.6	55	0.07	140	110	22.36	0.7		(2)	
HC-AH03	AH-03	2300	600	AS REQ'D	AS REQ'D	144	85.2	24.8	55	0.17	140	110	5.93	0.2		(2)	
HC-DOAS01A	DOAS-01	2600	450	AS REQ'D	AS REQ'D	144	85.2	24.8	55	0.14	140	104.4	5.00	0.3		(2)	
HC-DOAS01B	DOAS-01	2600	500	AS REQ'D	AS REQ'D	144	42.3	55	70	0.08	140	110	2.83	0.4		(2)	
HC-ERV01	ERV-01 (LOOSE)	1800	450	AS REQ'D	AS REQ'D	144	54.3	52.2	80	0.1	140	110	3.8	2.8		(3)	
HC-ERV02	ERV-02 (LOOSE)	1100	450	AS REQ'D	AS REQ'D	144	32.7	55.8	80	0.1	140	110	2.3	2.3		(4)	

- (1) APD AT FULL COOLING AIRFLOW
- (2) PERFORMANCE WITH 25% PROPYLENE GLYCOL.
- (3) MODULAR AIR HANDLING UNIT SECTIONS FOR NOMINAL 4 SF AREA COILS. SEE DETAIL *5"/M-501.
- (4) MODULAR AIR HANDLING UNIT SECTIONS FOR NOMINAL 3 SF AREA COILS. SEE DETAIL *5"/M-501.

PUMPS

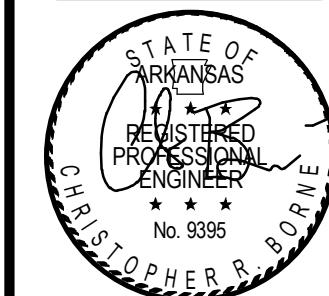
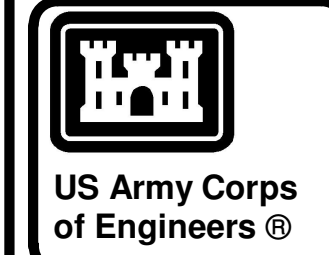
MARK	SERVES	LOCATION	FLUID	TYPE	GPM	TDH FT.	IMPELLER DIA.	RPM	HP	VOLTS/Ø	DUTY POINT EFF.	REMARKS
CP-01	CHILLED WATER	MECHANICAL S124	WATER	(A)	348	80	10.25	1800	15.0	460/3PH	76.9	(1)
CP-02	CHILLED WATER	MECHANICAL S124	WATER	(A)	348	80	10.25	1800	15.0	460/3PH	76.9	(1)
CP-03	HEATING WATER	MECHANICAL S124	(3)	(A)	120	85	9.5	1800	7.5	460/3PH	66.6	(1)
CP-04	HEATING WATER	MECHANICAL S124	(3)	(A)	120	85	9.5	1800	7.5	460/3PH	66.6	(1)
CP-05	B-01	MECHANICAL S124	(3)	(B)	92	25	5.25	1800	1.0	460/3PH	71.1	(2)
CP-06	B-02	MECHANICAL S124	(3)	(B)	92	25	5.25	1800	1.0	460/3PH	71.1	(2)

- (A) BASE-MOUNTED, FLEXIBLY-COUPLED END-SUCTION PUMP.
- (B) INLINE, DIRECT DRIVE.
- (1) PROVIDE MANUFACTURER'S SUCTION DIFFUSER WITH STRAINER AND VFD-RATED NON-OVERLOADING PREMIUM EFFICIENCY MOTOR.
- (2) CONSTANT VOLUME BOILER CIRCULATION PUMPS.
- (3) 25% PROPYLENE GLYCOL.

ENERGY RECOVERY VENTILATOR

MARK	SERVES	OUTDOOR DESIGN CONDITIONS	INDOOR RETURN CONDITIONS	AIR PERFORMANCE - OUTSIDE AIR								AIR PERFORMANCE - EXHAUST AIR								CAPACITY		CORE EFFECTIVENESS %	FILTERS	UNIT ELECTRICAL			WEIGHT	REMARKS
				VOLUME CFM	SUMMER LAT DB/WB	WINTER LAT DB/WB	ESP IN W.C.	TSP IN W.C.	RPM	MOTOR HP	VOLUME CFM	SUMMER LAT DB/WB	WINTER LAT DB/WB	ESP IN W.C.	TSP IN W.C.	RPM	MOTOR HP	MBH REDUCTION SUMMER / WINTER	MCA	MOCQ	VOLTS/Ø							
ERV-01	MEN'S LOCKER	(1)	(2)	1800	83.4 F / 69.6 F	52.2 F / 41.0 F	1.0	1.167	1125	1.0	2000	87.6 F / 70.6 F	40.1 F / 35.5 F	0.5	0.615	1180	1.5	32.4 / 61.1	58.7	MERV 13	12.9	15.0	208/3(1)	1200 LB	(3) (4) (5) (6)			
ERV-02	WOMEN'S LOCKER	(1)	(2)	1100	82.1 F / 69.0 F	55.8 F / 43.5 F	1.0	1.151	1258	0.75	1345	87.7 F / 70.7 F	39.7 F / 35.1 F	0.5	0.772	1180	3/4	22.3 / 41.7	66.4	MERV 13	7.9	15.0	208/3(1)	800 LB	(3) (4) (5) (6)			

- (1) SUMMER DB (F): 94.0 WINTER DB (F): 21.0 SUMMER WB (F): 74.0 WINTER WB (F): 17.4
- (2) PROVIDE FACTORY WIRED DISCONNECT, PREMIUM EFFICIENCY MOTORS, SINGLE-POINT POWER CONNECTION, DOUBLE-WALL CONSTRUCTION, HINGED ACCESS DOORS, LEAKAGE CLASS 1A SOLUTION DAMPERS, HEAT EXCHANGER BYPASS DAMPER AND ADAPTER CURB FOR GROUND MOUNTING WITH HORIZONTAL DISCHARGE AND INLET. MERV 13 OUTSIDE AIR FILTERS. ADAPTER CURB SHALL BE FACTORY FABRICATED AND INSULATED WITH AN INTERNAL RADIUS ELBOW OR TURNING VANES TO DIRECT HORIZONTAL FLOW. SUBMIT CURB FOR APPROVAL WITH EQUIPMENT.
- (3) PROVIDE BMS INTERFACE WITH MONITORING AND CONTROL. COORDINATE NETWORK PROTOCOL WITH THE RMCS PROVIDER. REQUIRED POINTS:
 - FAN PROVE STATUS (DI)
 - DIRTY FILTER STATUS (DI)
 - WHEEL ROTATION SENSOR (DIAI)
 - SUPPLY DISCHARGE TEMP (AI)
 - OUTDOOR AIR INLET TEMP (AI)
 - RETURN INLET TEMP (AI)
 - UNIT ENABLE (DO)
- (4) UNIT SHALL BE FULLY ASSEMBLED AT THE FACTORY AND CONSIST OF AN INSULATED METAL CABINET, OUTDOOR AIR INTAKE WEATHERHOOD WITH METAL MESH FILTERS, ENERGY CORE, MOTORIZED INTAKE DAMPER, MOTORIZED EXHAUST DAMPER, BYPASS DAMPER, FILTER ASSEMBLY FOR INTAKE AND EXHAUST AIR, SUPPLY AIR BLOWER ASSEMBLY, EXHAUST AIR BLOWER ASSEMBLY AND AN ELECTRICAL CONTROL CENTER TESTED AND PREPARED FOR SINGLE-POINT HIGH VOLTAGE CONNECTION.
- (5) ENERGY CORE SHALL BE OF TOTAL ENTHALPY AND SHALL BE REMOVABLE FROM THE CABINET. THE CORE MEDIA SHALL BE A CORRUGATED POLYMER MEMBRANE REMOVABLE FOR SERVICE FROM A GALVANIZED STEEL FRAMEWORK AND CAN BE REMOVABLE FOR SERVICING. CORE SHALL HAVE A MINIMUM FIVE-YEAR WARRANTY. PERFORMANCE CRITERIA ARE TO BE AS SPECIFIED IN AHRI STANDARD 1060.



04-28-2022

DATE	DESCRIPTION

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 DRAWN BY: C. Bone
 CHECKED BY: R. Seay
 SUBMITTED BY: CROMWELL AE
 ISSUE DATE: 28 APR 2022
 SOLICITATION NO.:
 CONTRACT NO.:
 US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA
CROMWELL
 1300 East 6th Street Little Rock, AR 72202
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NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC
 MECHANICAL SCHEDULES

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VAV TERMINAL BOXES (W/ HOT WATER HEAT)

MARK	SERVES	TYPE	INLET SIZE	MAX. CFM	MIN. CFM	HEATING CFM	OSA CFM @ MAX. OCCUPANCY ①	INLET S.P.	A.P.D.	MAX. N.C.	HOT WATER REHEAT						REMARKS
											EAT	MIN LAT	EWI	MIN MBH	GPM	MAX WPD	
1-01-T	SEE PLANS	SINGLE DUCT	08	515	200	200	120	1.0	0.22	30	55	95.4	140	8.88	1.00	0.5	②③
1-02-T	SEE PLANS	SINGLE DUCT	08	395	145	145	90	1.0	0.15	30	55	90.9	140	5.72	0.50	0.5	②③
1-03-T	SEE PLANS	SINGLE DUCT	06	155	80	80	40	1.0	0.04	30	55	75.7	140	1.82	0.25	0.5	②③
1-04-T	SEE PLANS	SINGLE DUCT	08	440	145	145	110 ④	1.0	0.17	30	55	95.2	140	6.41	0.75	0.5	②③
1-05-T	SEE PLANS	SINGLE DUCT	08	525	155	155	150 ④	1.0	0.12	30	55	83.9	140	4.93	0.33	0.5	②③
1-06-T	SEE PLANS	SINGLE DUCT	06	350	105	105	90	1.0	0.19	30	55	87.4	140	3.74	0.33	0.5	②③
1-07-T	SEE PLANS	SINGLE DUCT	12	1300	390	390	285 ⑤	1.0	0.31	30	55	80.4	140	10.92	0.75	0.5	②③
1-08-T	SEE PLANS	SINGLE DUCT	08	400	200	200	110	1.0	0.15	30	55	84.7	140	6.53	1.00	0.5	②③
1-09-T	SEE PLANS	SINGLE DUCT	06	160	80	80	45	1.0	0.04	30	55	77.3	140	1.96	0.25	0.5	②③
1-10-T	SEE PLANS	SINGLE DUCT	06	200	80	80	45 ④	1.0	0.09	30	55	90.5	140	3.12	0.50	0.5	②③
1-11-T	SEE PLANS	SINGLE DUCT	12	1100	330	330	270 ⑤	1.0	0.24	30	55	92.5	140	13.61	1.00	0.5	②③
1-12-T	SEE PLANS	SINGLE DUCT	08	600	200	200	150	1.0	0.29	30	55	94.8	140	8.76	1.00	0.5	②③
1-13-T	SEE PLANS	SINGLE DUCT	05	105	65	65	30 ④	1.0	0.02	30	55	87.0	140	2.29	0.33	0.5	②③
1-14-T	SEE PLANS	SINGLE DUCT	06	160	80	80	40 ④	1.0	0.07	30	55	93.9	140	3.42	0.33	0.5	②③
1-15-T	SEE PLANS	SINGLE DUCT	06	240	80	80	65	1.0	0.10	30	55	80.2	140	2.21	0.33	0.5	②③
1-16-T	SEE PLANS	SINGLE DUCT	12	1500	450	450	380	1.0	0.39	30	55	97.1	140	20.83	2.00	0.5	②③
1-17-T	SEE PLANS	SINGLE DUCT	05	90	65	65	25 ④	1.0	0.02	30	55	75.5	140	1.47	0.25	0.5	②③
1-18-T	SEE PLANS	SINGLE DUCT	12	1325	395	395	340 ⑤	1.0	0.32	30	55	85.3	140	13.17	1.00	0.5	②③
1-19-T	SEE PLANS	SINGLE DUCT	14	2475	740	740	610 ⑤	1.0	0.51	30	55	95.8	140	33.23	3.00	0.5	②③
1-20-T	SEE PLANS	SINGLE DUCT	06	250	100	100	60 ④	1.0	0.16	30	55	96.1	140	4.52	0.50	0.5	②③
1-21-T	SEE PLANS	SINGLE DUCT	08	400	155	155	90	1.0	0.15	30	55	89.7	140	5.92	0.50	0.5	②③
1-22-T	SEE PLANS	SINGLE DUCT	10	1225	365	365	350 ⑤	1.0	0.47	30	55	86.0	140	12.43	1.00	0.5	②③
1-23-T	SEE PLANS	SINGLE DUCT	06	290	85	85	85	1.0	0.13	30	55	85.5	140	2.85	0.50	0.5	②③
1-24-T	SEE PLANS	SINGLE DUCT	06	240	80	80	70	1.0	0.10	30	55	80.8	140	2.27	0.33	0.5	②③
1-25-T	SEE PLANS	SINGLE DUCT	06	260	80	80	70	1.0	0.10	30	55	80.8	140	2.27	0.33	0.5	②③
1-26-T	SEE PLANS	SINGLE DUCT	08	510	150	150	210	1.0	0.12	30	55	85.2	140	4.98	0.75	0.5	②③
1-27-T	SEE PLANS	SINGLE DUCT	10	1050	315	315	295 ⑤	1.0	0.37	30	55	86.2	140	10.82	1.00	0.5	②③
1-28-T	SEE PLANS	SINGLE DUCT	12	1500	500	500	385 ⑤	1.0	0.39	30	55	94.7	140	21.82	2.00	0.5	②③
1-29-T	SEE PLANS	SINGLE DUCT	12	1500	500	500	360 ⑤	1.0	0.39	30	55	93.7	140	21.30	2.00	0.5	②③
1-30-T	SEE PLANS	SINGLE DUCT	10	900	270	270	260 ⑤	1.0	0.29	30	55	84.2	140	8.68	0.75	0.5	②③
1-31-T	SEE PLANS	SINGLE DUCT	08	400	145	145	110	1.0	0.08	30	55	79.5	140	3.91	0.33	0.5	②③
1-32-T	SEE PLANS	SINGLE DUCT	08	555	165	165	155	1.0	0.14	30	55	83.8	140	5.23	0.75	0.5	②③
1-33-T	SEE PLANS	SINGLE DUCT	08	555	165	165	160	1.0	0.14	30	55	84.6	140	5.38	0.75	0.5	②③
1-34-T	SEE PLANS	SINGLE DUCT	06	200	80	80	45 ④	1.0	0.10	30	55	95.5	140	3.56	0.33	0.5	②③
1-35-T	SEE PLANS	SINGLE DUCT	10	800	240	240	160	1.0	0.24	30	55	97.0	140	11.09	1.25	0.5	②③
1-36-T	SEE PLANS	SINGLE DUCT	08	520	155	155	130	1.0	0.12	30	55	75.6	140	3.51	1.25	0.5	②③
1-37-T	SEE PLANS	SINGLE DUCT	08	330	145	145	85	1.0	0.06	30	55	77.0	140	3.51	0.33	0.5	②③
1-38-T	SEE PLANS	SINGLE DUCT	10	1050	315	315	310 ⑤	1.0	0.37	30	55	84.3	140	10.15	0.75	0.5	②③
1-39-T	SEE PLANS	SINGLE DUCT	06	255	80	80	70	1.0	0.10	30	55	81.2	140	2.31	0.33	0.5	②③
1-40-T	SEE PLANS	SINGLE DUCT	06	175	80	80	40 ④	1.0	0.08	30	55	92.1	140	3.27	0.33	0.5	②③
1-41-T	SEE PLANS	SINGLE DUCT	08	525	225	225	140 ⑤	1.0	0.23	30	55	98.8	140	10.83	1.50	0.5	②③
1-42-T	SEE PLANS	SINGLE DUCT	10	800	240	240	180	1.0	0.24	30	55	95.2	140	10.63	1.00	0.5	②③
1-43-T	SEE PLANS	SINGLE DUCT	06	175	80	80	40 ④	1.0	0.08	30	55	96.1	140	3.62	0.33	0.5	②③
1-61-T	SEE PLANS	SINGLE DUCT	08	400	175	175	120	1.0	0.15	30	55	97.8	140	8.24	1.00	0.5	②③
3-65-T	SEE PLANS	SINGLE DUCT	05	250	75	75	45 ④	1.0	0.08	30	55	83.1	140	2.32	0.33	0.5	②③
3-66-T	SEE PLANS	SINGLE DUCT	08	450	145	145	125 ④	1.0	0.18	30	55	89.3	140	5.47	0.50	0.5	②③
3-67-T	SEE PLANS	SINGLE DUCT	10	800	240	240	235 ⑤	1.0	0.24	30	55	87.7	140	8.63	0.75	0.5	②③
3-68-T	SEE PLANS	SINGLE DUCT	08	510	150	150	150 ④	1.0	0.22	30	55	92.3	140	6.15	0.75	0.5	②③
3-69-T	SEE PLANS	SINGLE DUCT	05	100	65	65	45	1.0	0.02	30	55	86.3	140	2.24	0.33	0.5	②③
3-70-T	SEE PLANS	SINGLE DUCT	08	630	185	185	185 ④	1.0	0.18	30	55	75.0	140	4.08	0.50	0.5	②③
3-71-T	SEE PLANS	SINGLE DUCT	06	250	75	75	65	1.0	0.10	30	55	90.4	140	2.92	0.33	0.5	②③
3-72-T	SEE PLANS	SINGLE DUCT	05	110	65	65	270 ④	1.0	0.02	30	55	73.6	140	1.33	0.25	0.5	②③
3-73-T	SEE PLANS	SINGLE DUCT	14	1625	485	485	475 ⑤	1.0	0.26	30	55	91.6	140	19.55	1.50	0.5	②③
3-74-T	SEE PLANS	SINGLE DUCT	08	330	120	120	95	1.0	0.06	30	55	78.0	140	3.03	0.33	0.5	②③
3-75-T	SEE PLANS	SINGLE DUCT	08	300	145	145	90 ④	1.0	0.10	30	55	95.4	140	6.44	0.75	0.5	②③
3-76-T	SEE PLANS	SINGLE DUCT	06	160	80	80	45 ④	1.0	0.07	30	55	89.6	140	3.04	0.33	0.5	②③
3-77A-T	SEE PLANS	SINGLE DUCT	10	820	290	290	260 ⑤	1.0	0.25	30	55	99.0	140	14.04	2.00	0.5	②③
3-77B-T	SEE PLANS	SINGLE DUCT	08	575	150	150	140 ⑤	1.0	0.11	30	55	83.0	140	4.62	0.75	0.5	②③

- ① *MIN. OSA CFM* PROVIDED TO ALLOW THE BUILDING AUTOMATION SYSTEM TO PERFORM ASHRAE 62 VENTILATION CALCULATIONS.
- ② VAV BOXES SHALL HAVE RIGHT OR LEFT HAND CONTROL ENCLOSURE AND PIPING CONNECTIONS AS INDICATED ON THE DRAWINGS. SUBMITTALS SHALL REFLECT THESE CONDITIONS.
- ③ PROVIDE CLEANABLE STERILE LINER (FIBERGLASS IS NOT ACCEPTABLE), HANGER BRACKETS AND HINGED ACCESS CONTROLS ENCLOSURE. HEATING COILS SHALL BE HIGH CAPACITY (12 FIN PER INCH).
- ④ OCCUPANCY DETERMINED BY LIGHT CONTROLS OCCUPANCY SENSOR.
- ⑤ CO2 VENTILATION CONTROL.

OUTSIDE AIR TERMINALS

MARK	SERVES	INLET SIZE DIAMETER	MAXIMUM CFM	MINIMUM CFM OCCUPIED / UNOCCUPIED	MAXIMUM A.P.D.	MAXIMUM N.C. @ 0.5"	REMARKS
OAT-01	FCU-01	5"	120	50 / 0	< 0.07	< 10	①
OAT-02	FCU-02	5"	150	50 / 0	0.07	< 10	①
OAT-03	FCU-03	5"	125	50 / 0	< 0.07	< 10	①
OAT-04	FCU-04	5"	150	50 / 0	0.07	< 10	①
OAT-05	FCU-05	5"	150	50 / 0	0.07	< 10	①
OAT-06	FCU-06	6"	220	50 / 0	< 0.09	< 10	①
OAT-07	FCU-07	5"	150	50 / 0	0.07	< 10	①
OAT-08	FCU-08	5"	135	50 / 0	< 0.07	< 10	①
OAT-09	FCU-09	14"	1400	400 / 0 ②	0.07	< 12	①

- ① ROUND UNLET AND DISCHARGE VARIABLE AIR VOLUME, PRESSURE INDEPENDENT TERMINAL WITH TIGHT CLOSE-OFF DAMPER (LESS THAN 3% LEAKAGE AT 6-IN W.G.). MULTI-POINT INLET VELOCITY SENSOR WITH CENTER AVERAGING, GAUGE TEES FOR CFM MEASUREMENT, HEAVY GAUGE UN-INSULATED STEEL CASING FOR FIELD INSULATING, AND HANGING BRACKETS. TERMINALS SHALL HAVE RIGHT OR LEFT HAND CONTROL ENCLOSURE AS INDICATED ON THE DRAWINGS. SUBMITTALS SHALL REFLECT THESE CONDITIONS.
- ② SEE MINIMUM CFM OVERRIDE NOTES ON SHEET M-705.
- ③ PROVIDE HANGER BRACKETS AND HINGED ACCESS CONTROLS ENCLOSURE.

DEHUMIDIFIER

MARK	SERVES	CFM	EXTRACTION @ 65° / 60% RH PPD	ELECTRICAL			REMARKS
				VOLTS/Ø	MCA	POWER	
DH-01	VAULT N110B	170	15	120 / 1	15A	0.51 KW	①②
DH-02	VAULT S120K	170	15	120 / 1	15A	0.51 KW	①②

- ① HEAVY-DUTY, PORTABLE DEHUMIDIFIER SUITABLE FOR PERMANENT INSTALLATION WITH THE FOLLOWING FEATURES: DRAIN POINT FOR CONDENSATE COLLECTION OF HOSE ATTACHMENT, "HOT GAS" DEFROSTING, STURDY MILITARY-TYPE CARRYING HANDLES, AND TOTALLY ENCLOSED COILS IN AN EPOXY COATED, HEAVY GAUGE STEEL CASE. PROVIDE ADJUSTABLE ALARM HUMIDISTAT, "VOLTAGE FREE" CONNECTOR, POWER ON INDICATOR, HOURS RUN METER, AND W ALL MOUNTING BRACKET.
- ② MOUNT UNIT HIGH ON WALL WHERE INDICATED ON THE PLANS.

AIR CURTAIN

MARK	FAN			ELECTRICAL			REMARKS
	CFM @ NOZZLE	NO.	HP (EACH)	FLA	MOCPP	VOLTS/Ø	
AC-01	6000	1	1.0	9.0	15	120/1	①

- ① AIR CURTAIN WITH CONTINUOUS DUTY TEAO MOTOR, SELF-CONTAINED ONE-PIECE HEAVY GAUGE CORROSION PROOF PAINT LOCK METAL DESIGN, ETL CERTIFIED TO ANSI/NSF 37 STANDARDS, ETL CERTIFIED TO CONFORM TO UL 507 (INDOOR/ OUTDOOR USE), CERTIFIED TO AMCA 211 STANDARDS, ADJUSTABLE AIR DIRECTIONAL VANES WITH 40" SWEEP FRONT TO BACK, RUST PREVENTATIVE ELECTROSTATIC POLYURETHANE POWDER COATING, MECHANICAL DOOR LIMIT SWITCH, ADJUSTABLE MOUNTING BRACKET SET, AND MANUFACTURER'S HARSH WEATHER COVER HOOD.

LOUVERS (EXISTING)

MARK	SERVES	TYPE	APPROX. SIZE (W / H) INCHES	CFM	EST. FREE AREA SQ. FT.	EST. VELOCITY FPM	EST. MAX. PD IN. W.C.	REMARKS
(E) L-01	EF-10-T	EXHAUST	40 / 40	2200	5.8	380	< 0.03	①
(E) L-02	EF-09-T	EXHAUST	40 / 40	3200	5.8	552	< 0.06	①
(E) L-03	EF-10-T	INTAKE	40 / 40	2200	5.8	380	< 0.03	①
(E) L-04	DOAS-01	INTAKE	84 / 42	2600	12.6	207	< 0.02	①
(E) L-05	B-01 / B-02	INTAKE	54 / 86	-	17.9	-		

FAN COIL UNITS

Table with columns: MARK, SERVES, COOLING (CAPACITY MBH, EAT °F, LAT °F, EWT °F, GPM, WPD FT., ROWS), HEATING (TOTAL MBH, EAT °F, LAT °F, EWT °F, GPM, WPD FT., ROWS), FAN (CFM, ESP IN, POWER HP, RPM), ELECTRICAL (VOLTS/Ø, MCA, MOC), DESIGN DIMENSIONS, REMARKS.

AIR CONDITIONING DATA

Table with columns: DESIGN AREA, WINTER (99% DRY BULB) OUTSIDE, WINTER (99% DRY BULB) OUTSIDE DB °F, WINTER (99% DRY BULB) OUTSIDE WB °F.

① PITT / GREENVILLE, NC (WMO#: 723065)

- ① BLOWER COIL FAN COIL UNIT. PROVIDE MANUFACTURER'S BACNET COMPATIBLE UNIT CONTROLLER, ELECTRICAL DISCONNECT, MERV13 FILTER, MANUFACTURER'S HIGH STATIC EC MOTOR, AND EXTERNAL AUXILIARY DRAIN PAN. OTHER FEATURES: 1) 1" 1.5 LB/CU. FT DENSITY FOIL FACED INSULATION. 2) LARGE MOTOR ACCESS PANELS ON BOTH SIDES OF THE UNIT, 18-GAUGE GALVANIZED CASING, 3) DWDI DYNAMICALLY BALANCED FC FANS, AND DOUBLE-SLOPE DRAIN PAN.
② 1.81 TOTAL BRAKE HORSEPOWER. MOTORIZED IMPELLER PLENUM FAN.
③ PROVIDE MANUFACTURER'S 2-WAY COOLING VALVE AND HEATING VALVE PACKAGES.
④ CAPACITY WITH 25% PROPYLENE GLYCOL.

- ⑥ MODULAR AIR HANDLING UNIT. ARRANGEMENT BY SECTION: HORIZONTAL INLET FILTER, HEATING COIL, COOLING COIL WITH TURNING SECTION, STACKED VERTICAL DISCHARGE FAN SECTION WITH DUAL MOTORIZED IMPELLER FANS. PROVIDE MANUFACTURER'S BACNET COMPATIBLE UNIT CONTROLLER, ELECTRICAL DISCONNECT, MERV13 FILTER, MANUFACTURER'S ECM, AND AUXILIARY VALVE DRAIN PAN. ADDITIONAL FEATURES 1) PANELS AND ACCESS DOORS SHALL BE CONSTRUCTED AS A 2-INCH NOMINAL THICK; THERMAL BROKE DOUBLE WALL ASSEMBLY, INJECTED WITH FOAM INSULATION WITH AN R-VALUE OF NOT LESS THAN R-13, 2) THE CASING LEAKAGE RATE SHALL NOT EXCEED 1% OF SUPPLY AIR VOLUME AT DESIGN STATIC PRESSURE UP TO A MAXIMUM OF +8" W.C. IN POSITIVE PRESSURE SECTIONS AND -8" W.C. (1.99 KPA) IN NEGATIVE PRESSURE SECTIONS, 3) A 10-GAUGE, 6-INCH FORMED G60 GALVANIZED STEEL BASE RAIL SHALL BE PROVIDED BY THE UNIT MANUFACTURER FOR STRUCTURAL RIGIDITY AND CONDENSATE TRAPPING.
SEE SHEET M-501 FOR ADDITIONAL CONSTRUCTION AND ACCESSORY DETAILS.

MAKE-UP AIR UNIT w/ GAS HEATING

Table with columns: MARK, SERVES, MIN. INPUT / OUTPUT MBH, FUEL, CFM, ESP, HP, RPM, VOLTS/Ø, REMARKS.

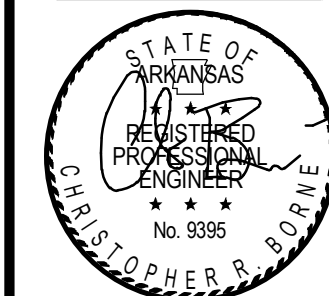
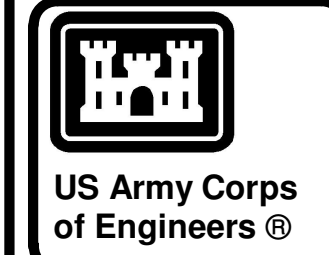
- ① DIRECT-FIRED BURNER. PROVIDE CUSTOM CURB SHARED WITH EF-05-T (COORDINATE WITH EXISTING CURB), STAINLESS STEEL BURNER WITH 25:1 MODULATING FIRE, DISCHARGE AIR TEMPERATURE CONTROL, VARIABLE SPEED SUPPLY FAN WITH FACTORY MOUNTED VFD, MOTORIZED INLET DAMPER, WASHABLE FILTERS, AND DISCONNECT. ADDITIONAL FEATURES: 1) WEATHER HOOD, 2) DOUBLE WALL FROM BURNER SECTION THROUGH END OF UNIT, 3) 18-GAUGE GALVANIZED G90 OUTSIDE CASING, 4) 12-GUAGE G90 BASE RAIL, 5) INSULATED, REMOVABLE ACCESS PANELS, 6) BURNER CONTROLS WITH: MANUAL RESET HIGH LIMIT SWITCH, DUAL SAFETY SHUT OFF VALVES, FM GLOBAL REQUIREMENTS INCLUDING HIGH AND LOW GAS PRESSURE SWITCHES AND VISUAL INDICATION OF GAS VALVES, 6) NEMA PREMIUM MOTOR EFFICIENCY.
② UNIT SHALL BE CONTROLLED BY KH-01 VARIABLE VOLUME CONTROLS.

PIPE FLUSHING AND CLEANING SPECIFICATION

- 1. Flushing & Cleaning of Steel Piping Systems
a. Submit a detailed plan for Government review and approval describing in full detail the individual steps associated with this process before any piping is installed.
b. Provide a complete water flushing and cleaning of the existing closed loop chilled and hot water systems as specified herein.
c. All existing chilled and hot water piping shall be thoroughly flushed out with pre-cleaning chemicals designed to remove deposits such as pipe dope, oils, loose rust, mill scale and other extraneous materials. Recommended dosages of pre-cleaner chemical products shall be furnished by water treatment supplier, added and circulated throughout the water systems. The water system shall then be diluted and final flushed thoroughly until no foreign matter is observed and total alkalinity of the water is equal to or better that that of the make-up water.
d. All temporary connections required for flushing, cleaning, purging, and circulating shall be included.
e. Provide suitable pipe bypasses at each coil and heat exchanger during the flushing and cleaning operation.
f. Self-contained flush unit requirements will contain a pump or pumps connected that will meet or exceed the volume required to flush and purge the system at the required velocity rate through the largest pipe. Pump curve will be submitted along with other important documentation for the related equipment on the unit. This will include, at minimum, filtration, flow meter(s), pressure gauges, and unit description or picture. All operators will comply with all safety regulations of the project site. The flushing operation will be manned continuously during the flushing process.
2. Flushing Procedure Guidelines
a. Pre-Flush - Bypass loops should be installed in front of any strainers and control valves at all equipment components. Coordinate with System Flushing Contractor for proper sizing and placement of bypasses and flush ports.
b. Install temporary strainer elements in front of pumps, tanks, solenoid valves, control valves, and other equipment where permanent strainers are not indicated that are not bypassed. Keep these strainers in service until the equipment has been tested, then remove either entire strainer or straining element only. Fit strainers with a line size blow-off valve. Strainers should be removed when a self-contained flush unit is used in conjunction with on board filtration.
c. Flush ports should be identified along with the type of high pressure hose or piping that will be used to connect to the system. The water source should be identified and must be adequate to fill and make up water in a timely manner to the system during the flush process. A water dump location should be identified which is usually the sanitary.
d. Clear Water Flush - Fill the piping system with clean potable water. The first flush is a clear- water flush intended to circulate water through the system and force loose debris to low point drains and flush cart filtration system. This flush should be at minimum velocity throughout the system of 5 -7 ft./sec throughout. Filtration should be at minimum, 50 microns. This flush shall continue until the system water is comparable to the make-up water. Iron content should be under 2.0 ppm.
e. Cleaning & Passivation - The second flush cycle is a combined flushing cycle where cleaning and passivation chemicals are introduced into the system to clean the oils and treat the inside wall of the piping system. This process will be monitored by the chemical treatment company to meet the chemical specifications of the water. The cleaning velocity should be between 3 to 5 ft./sec throughout, and the circulation time will be based on the chemical testing, but will be at minimum, 24 hours.
f. Final Clear Water Flush - The system will be continuously flushed while discharging chemicals into the sanitary system as approved locally. As the existing treated water is being discharged, a fresh water make-up source will be utilized to ensure air is not introduced into the system. Continue to drain the system while adding domestic water to dilute the treated water. The chemical treatment company will monitor the outgoing water composition and compare the composition with the incoming water. Flush with fresh water until the conductivity is reduced to that of the make-up water and iron meets specifications. The final system water should be approved by the chemical treatment company. Filtration should be 5 microns.
g. Final Chemical Fill - Once the chemical treatment company has determined the system has been brought back to the correct composition, the chemical treatment company will inject the final chemicals into the system. Once the system is filled with the final chemicals it is important the water not be left stagnant.
i. Verify satisfactory completion of clean piping and a final flushing and chemical treatment report should be submitted by field personnel. The report should include at minimum, project name, date, location, parties involved, type of pipes treated, scope summary, flows, durations, and other relevant information.
ii. Cleaning chemicals, procedure, water testing, reporting, and consultation must be provided by a qualified water treatment company specializing in this type of work.

TYPE 1 KITCHEN HOOD

Table with columns: HOOD NO., STYLE / CONFIGURATION, HOOD DIMENSIONS (SECTION LENGTH, WIDTH, HEIGHT), GREASE CUP OR DRAIN, HOOD TEMP. RATING, TOTAL WEIGHT, SECTION LOCATION, ILLUMINATION DETAILS (FIXTURE TYPE, QTY, INTENSITY), GREASE FILTRATION DETAILS (TYPE / MODEL MATERIAL, QTY, LENGTH, HEIGHT), HOOD SECTION # COLLAR #, EXHAUST PLENUM COLLARS (DISTANCE TO END, WIDTH, DEPTH, DIAMETER, VOLUME, S.P., VELOCITY).



04-28-2022

Table with columns: MARK, DESCRIPTION, DATE

US ARMY CORPS OF ENGINEERS CHARLESTON DISTRICT CHARLESTON, SOUTH CAROLINA CROMWELL logo and contact information.

NC026 HVAC-ELEC-PLUMB RESET WINTERVILLE, NC MECHANICAL SCHEDULES

SHEET ID M-604

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

CONTROL ABBREVIATIONS

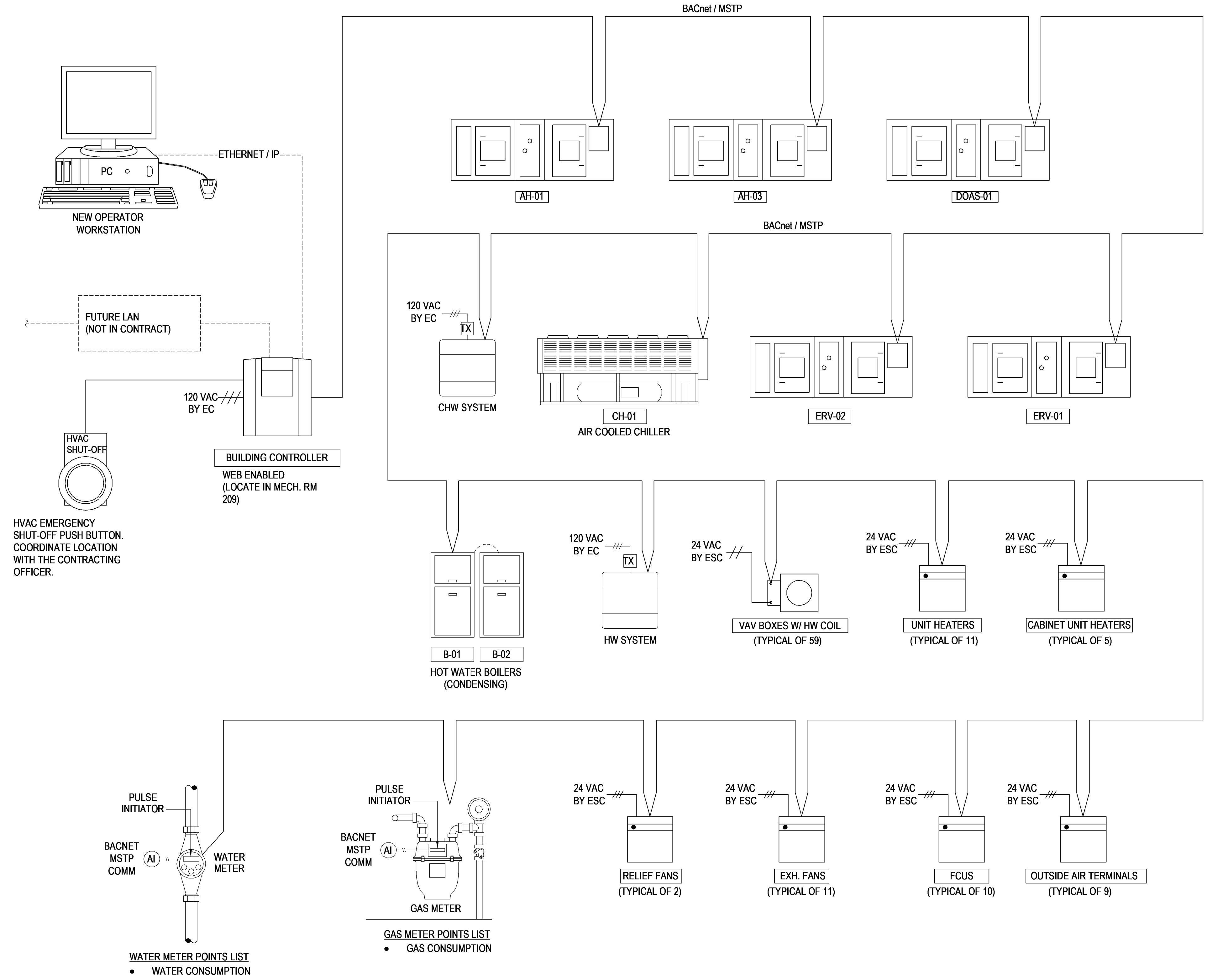
ADJ	ADJUSTABLE	OA / OAT / OAH	OUTSIDE AIR / OA TEMP. / OA HUMIDITY
AFMS	AIRFLOW MEASURING STATION	PC	PERSONAL COMPUTER
ARNET	ARMY RESERVE NETWORK	PPM	PARTS PER MILLION
BAS	BUILDING AUTOMATION SYSTEM	RA / RAT / RAH	RETURN AIR / RA TEMP. / RA HUMIDITY
CT	CURRENT TRANSDUCER	SA / SAT / SAH	SUPPLY AIR / SA TEMP. / SA HUMIDITY
DD	DIRECT DRIVE	SD	SMOKE DETECTOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	STG	STAGE
DSP	DUCT STATIC PRESSURE	TLL	TEMPERATURE LOW LIMIT
EC / ESC	ELECTRICAL SUBCONTRACTOR	UV / UVGI	ULTRAVIOLET GERMICIDAL IRRADIATION
ECM	ELECTRONICALLY COMMUTATED MOTOR	VAC	VOLTS OF ALTERNATING CURRENT
F	FAHRENHEIT	VFD	VARIABLE FREQUENCY DRIVE
FSL	HIGH STATIC LIMIT		
HERTZ	HERTZ	(AI)	ANALOG INPUT
IP	INTERNET PROTOCOL	(AO)	ANALOG OUTPUT
JACE	JAVA APPLICATIONS CONTROL ENGINE (TRIDIUM)	(DI)	DIGITAL INPUT
MSTP	BUILDING AUTOMATION CONTROL MASTER SLAVE TOKEN PASSING	(DO)	DIGITAL OUTPUT
NC	NORMALLY CLOSED		
NO	NORMALLY OPEN		

DDC CONTROL SYSTEM NOTES

1. PROVIDE A COMPLETE NEW NETWORKED DDC SYSTEM FOR STAND-ALONE CONTROL IN COMPLIANCE WITH THE LATEST REVISION OF THE ASHRAE 135 BACNET STANDARD.
2. THE NEW DDC SYSTEM SHALL BE A SINGLE, COMPLETE, NON-PROPRIETARY DDC SYSTEM AND SHALL BE BASED ON AN OPEN IMPLEMENTATION OF THE BACnet PROTOCOL PER ASHRAE STANDARD 135.
3. THE CONTROL SYSTEM SHALL BE CAPABLE OF A FUTURE UPGRADE ENABLING ACCESS VIA ARNET (BY OTHERS) VIA A SECOND JACE, WHICH WILL BE BROUGHT IN AND CONNECTED TO THE INITIAL JACE OF THE CONTROL SYSTEM. THE CONTROLS CONTRACTOR SHALL ADD LEVELS OF ACCESS TO LIMIT A USER'S ABILITY TO CHANGE THE SET POINTS BASED OFF OF THE USER'S PERMISSIONS. THE 81ST RFOS SHALL BE RESPONSIBLE FOR DICTATING USER ACCESS LEVEL.
4. THE CONTROL SYSTEM SHALL CONSIST OF A HIGH-SPEED, PEER-TO-PEER NETWORK OF DDC CONTROLLERS, A CONTROL SYSTEM SERVER, AND A WEB-BASED OPERATOR INTERFACE. SYSTEM SOFTWARE SHALL BE BASED ON A SERVER/THIN CLIENT ARCHITECTURE, DESIGNED AROUND THE OPEN STANDARDS OF WEB TECHNOLOGY. THE CONTROL SYSTEM SERVER SHALL BE ACCESSED USING A WEB BROWSER OVER THE CONTROL SYSTEM NETWORK, THE OWNER'S LOCAL AREA NETWORK, AND FUTURE ACCESS OVER THE INTERNET. THE INTENT OF THE THIN-CLIENT ARCHITECTURE IS TO PROVIDE OPERATORS COMPLETE ACCESS TO THE CONTROL SYSTEM VIA A WEB BROWSER. NO SPECIAL SOFTWARE OTHER THAN A WEB BROWSER SHALL BE REQUIRED TO ACCESS GRAPHICS, POINT DISPLAYS, ALARMS, AND TRENDS AS WELL AS CONFIGURE TRENDS, SCHEDULING, POINTS, AND CONTROLLERS, OR TO DOWNLOAD PROGRAMMING INTO THE CONTROLLERS. PROVIDE NOT LESS THAN 2 LEVELS OF PASSWORD-PROTECTED ACCESS TO THE SYSTEM.
5. THE SYSTEM SHALL USE THE BACnet PROTOCOL FOR COMMUNICATION TO THE OPERATOR WORKSTATION OR WEB SERVER AND FOR COMMUNICATION BETWEEN CONTROL MODULES. I/O POINTS, SCHEDULES, SETPOINTS, TRENDS AND ALARMS SHALL BE BACnet OBJECTS. INCLUDE ALL PROGRAMMING, OBJECTS, AND SERVICES REQUIRED TO MEET THE SEQUENCE OF CONTROL.
6. PROVIDE BACnet COMMUNICATIONS BETWEEN THE DDC SYSTEM AND NATIVE BACnet DEVICES FURNISHED WITH ALL HVAC EQUIPMENT INCLUDING BUT NOT LIMITED TO AIR CONDITIONING UNITS, BOILERS, CHILLERS, AND VARIABLE FREQUENCY DRIVES. PROVIDE ALL NEW ACTUATORS, SENSORS, CONTROL WIRING, AND ANY OTHER COMPONENTS NECESSARY TO PROVIDE A COMPLETE AND FUNCTIONAL DDC SYSTEM.
7. PROVIDE AN OPERATOR WORKSTATION WITH COMPLETE INTERFACE SOFTWARE CAPABLE OF PROGRAMMING, CONFIGURING, AND MONITORING THE DIGITAL CONTROLLERS.
8. PROVIDE SURGE PROTECTION AND A 72 HOUR UPS AT THE BUILDING CONTROLLER.
9. UNLESS OTHERWISE NOTED, VARIABLE FREQUENCY DRIVES NOT PROVIDED WITH EQUIPMENT SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR. VFD'S SHALL PROVIDE FOR INTEGRAL EQUIPMENT DISCONNECTING MEANS. VFD'S SHALL HAVE A BYPASS FUNCTION. VFD ENCLOSURES SHALL HAVE A NEMA RATING AS SPECIFIED.

GENERAL CONTROL NOTES

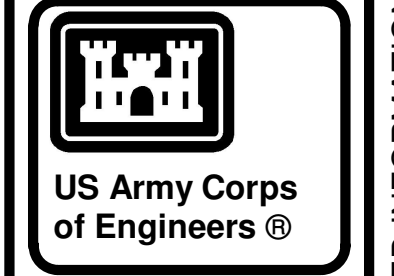
1. INSTALL THE ELECTRICAL EQUIPMENT, CONDUCTORS, AND ALL OTHER RELATED ITEMS ACCORDANCE WITH NFPA 70.
2. INSTALL ANY FIRE ALARM DEVICES AND RELATED EQUIPMENT IN ACCORDANCE WITH NFPA 72, NFPA 90A, NFPA 101, SBCCI, AND ANY APPLICABLE ANSI STANDARDS.
3. HOUSE ALL WIRE SPLICES NOT CONNECTED TO A DEVICE WITHIN A 4"x4"x2-1/8" JUNCTION BOX.
4. PROVIDE ALL NECESSARY: CONTROL POWER, CONTROL POWER WIRING, VALVES, ACTUATORS, CONDUIT, WIRING, CONTROLLERS, INTERFACE, SWITCHES, CIRCUIT BOARDS, THERMOSTATS, LABOR, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM. MAKE FINAL CONNECTION TO BAS DRY CONTACTS AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
5. PROVIDE AN EMERGENCY SHUTOFF SWITCH THAT WILL POWER OFF ALL AIR MOVING EQUIPMENT. MOUNT SWITCH IN THE CORRIDOR OUTSIDE THE MECHANICAL ROOM. LABEL SWITCH AND PROVIDE PROTECTIVE BREAK GLASS TYPE COVER.



WATER METER POINTS LIST
 • WATER CONSUMPTION

GAS METER POINTS LIST
 • GAS CONSUMPTION

1 CONTROL RISER DIAGRAM
 NO SCALE



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Bone	ISSUE DATE: 29 APR 2022
DRAWN BY: C. Bone	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
SIZE: ANSI	

US ARMY CORPS OF ENGINEERS
 CHARLESTON DISTRICT
 CHARLESTON, SOUTH CAROLINA

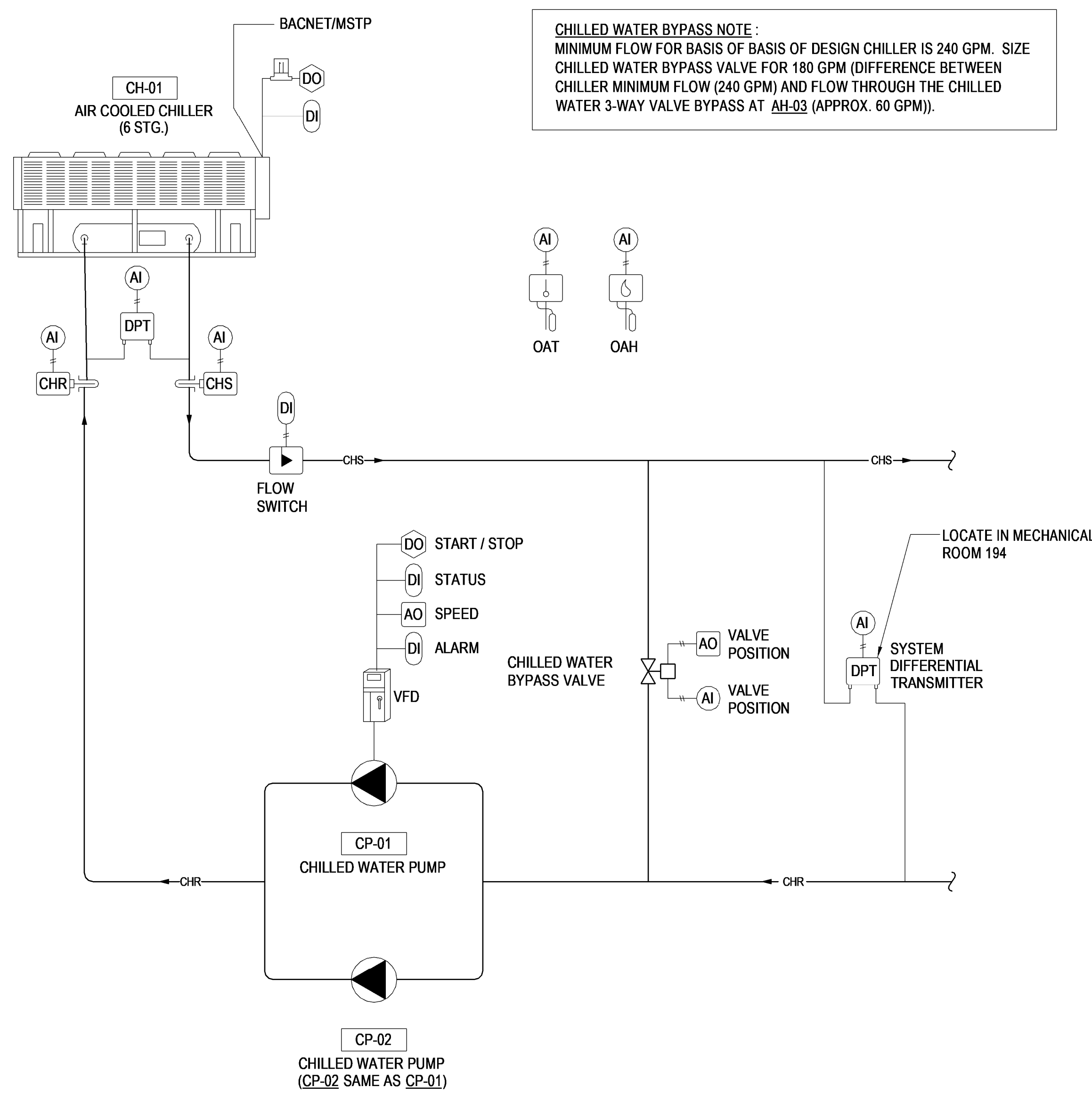
CROMWELL
 1300 East 6th Street Little Rock, AR 72202
 501.372.2900 cromwell@com.lansid

NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC
MECHANICAL CONTROLS

SHEET ID
M-701

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1 CHILLED WATER SYSTEM - CONTROL DIAGRAM
 NO SCALE

SEQUENCE OF OPERATION: AIR COOLED CHILLER

SYSTEM GENERAL DESCRIPTION:

THE COOLING PLANT CONTROL SYSTEM SHALL MONITOR AND CONTROL THE SYSTEM'S CHILLER(S), PUMP(S), AND CONTROL VALVES AS SHOWN ON THE COOLING PLANT FLOW DIAGRAM AND AS DETAILED IN THE SEQUENCE OF OPERATION LISTED BELOW.

THE COOLING PLANT SYSTEM CONSISTS OF AN AIR-COOLED CHILLER WITH ITS PIPING CONFIGURATION ARRANGED AS A VARIABLE PRIMARY LOOP SUPPLYING CHILLED WATER TO THE FACILITY.

THE MANIFOLD CHILLED WATER PUMPS ARE CONFIGURED AS DUTY / STAND-BY CONTROL.

COOLING PLANT SYSTEM ENABLE/DISABLE:

THE COOLING PLANT SYSTEM SHALL BE ENABLED/DISABLED BY THE COOLING PLANT CONTROLLER AS REQUESTED BY THE BUILDING AUTOMATION SYSTEM (BAS) HUMAN-INTERFACE PANEL OR AS COMMANDED BY THE BAS. THE SYSTEM WILL START AND STOP THE CHILLER AND CHILLED WATER PUMPS BASED UPON SYSTEM LOAD.

WHEN THE COOLING PLANT SYSTEM IS ENABLED THE SYSTEM SHALL SEND AN ENABLE SIGNAL TO THE CHILLER AND ENABLE THE DUTY PUMP OF THE CHILLED WATER PUMPING SEQUENCE.

ONCE THE CHILLER IS ENABLED AND FLOW IS PROVEN, THE CHILLER CONTROLLER WILL STAGE COMPRESSORS TO MEET THE SYSTEM LOAD.

THE COOLING PLANT IS DISABLED WHEN ALL CHILLERS ARE DISABLED AND THERE IS NOT AN ACTIVE CHILLED WATER PUMP REQUEST. WHEN THE PLANT IS DISABLED THE CHILLED WATER PUMP SHALL BE COMMANDED OFF.

CHILLED WATER PUMP COMMANDS:

WHEN THE COOLING PLANT SYSTEM IS ENABLED, THE SYSTEM SHALL RESPOND TO A CHILLED WATER PUMP REQUEST FROM THE CHILLER, THE SYSTEM SHALL START THE LEAD CHILLED WATER PUMP THROUGH A CONTACT CLOSURE OF THE PUMPS VARIABLE SPEED DRIVE RUN-ENABLE CONTACTS. THE SYSTEM SHALL DETECT THE CHILLED WATER PUMP RUN STATUS BY A VARIABLE SPEED DRIVE CURRENT SWITCH. THE MANIFOLD CHILLED WATER PUMPS WILL OPERATE IN A DUTY/STAND-BY SEQUENCE THAT SHALL BE ROTATED ON A WEEKLY SCHEDULE (ADJ.). THE ROTATION SEQUENCE SHALL BE BASED ON CALCULATED RUN TIME WITH THE PUMP HAVING THE LEAST RUN TIME DESIGNATED AS LEAD, THE PUMP WITH THE NEXT LOWEST RUN TIME WILL BE THE STAND-BY IN THE SEQUENCE. FROM THE SYSTEM HUMAN-INTERFACE PANEL OR A BAS OPERATOR INTERFACE, AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE THE DUTY/STAND-BY SEQUENCE OR REQUEST ANY PUMP TO BE UNAVAILABLE WHICH WOULD REMOVE IT FROM THE ROTATION SEQUENCE.

CHILLED WATER PUMP SPEED:

THE SYSTEM SHALL MONITOR THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. WHEN THE PUMP VARIABLE SPEED DRIVE IS ENABLED, THE SYSTEM SHALL CONTROL THE ANALOG SPEED SIGNAL THAT IS SENT TO THE PUMP VARIABLE SPEED DRIVE TO MAINTAIN THE CHILLED WATER DIFFERENTIAL PRESSURE SET POINT AS DETERMINED THROUGH PRESSURE OPTIMIZATION.

CHILLED WATER PUMP FAILURE:

IF THE LEAD START/STOP RELAY IS ENABLED AND THE PUMP'S RUNNING STATUS IS OFF FOR MORE THAN 30 SECONDS (ADJ.), THE SYSTEM SHALL ANNUNCIATE A CHILLED WATER PUMP FAILURE ALARM TO THE BAS AND START THE NEXT PUMP IN THE SEQUENCE. ONCE THE PROBLEM HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS OPERATOR INTERFACE OR BY MANUALLY OVERRIDING THE PUMP ON. THIS SHALL RE-ENABLE THE DUTY/STAND-BY SEQUENCE.

CHILLED WATER MINIMUM FLOW BYPASS VALVE:

THE SYSTEM SHALL MONITOR THE EVAPORATOR DIFFERENTIAL PRESSURE OF THE CHILLER. WHEN THE PRESSURE OF THE OPERATING CHILLER INDICATES A LOW PRESSURE (FLOW), THE SYSTEM SHALL CONTROL THE ANALOG SIGNAL THAT IS SENT TO THE CHILLED WATER BYPASS VALVE TO MAINTAIN THE MINIMUM PRESSURE (FLOW) FOR ALL OPERATING CHILLERS.

OPTIMIZED DISTRIBUTION PUMP DIFFERENTIAL PRESSURE CONTROL:

THE SYSTEM SHALL MONITOR THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. THE SYSTEM SHALL CONTROL THE CHILLED WATER PUMP(S) VARIABLE SPEED DRIVE TO MAINTAIN THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE TO ITS SET POINT. THE BAS SHALL MONITOR THE POSITION OF ALL CHILLED WATER CONTROL VALVES SERVED BY THE COOLING PLANT. AT CHILLED WATER SYSTEM STARTUP, THE CHILLED WATER SYSTEM PRESSURE SET POINT WILL BE SET TO THE SYSTEM DESIGN VALUE OF 15 PSI (ADJ.). IN ALL CASES THE DISTRIBUTION PUMP(S) DIFFERENTIAL PRESSURE SET POINT SHALL BE BOUND BETWEEN A MINIMUM OF 30 PSI (ADJ.) AND A MAXIMUM OF THE SYSTEM DESIGN VALUE.

WHEN ALL CHILLED WATER VALVES ARE LESS THAN 85% OPEN, THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SET POINT WILL BE LOWERED BY 0.1 PSIG (ADJ.) OF THE CURRENT CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SET POINT. THIS OCCURS EVERY 5 MINUTES UNTIL AT LEAST ONE VALVE IS MORE THAN 85% OPEN, OR IF THE SET POINT IS EQUAL TO THE MINIMUM CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SET POINT, OR IF THE PUMP VARIABLE SPEED DRIVE(S) ARE AT A MINIMUM SPEED SETTING (22 HZ).

WHEN ANY CHILLED WATER VALVE IS MORE THAN 95% OPEN, THE CHILLED WATER SYSTEM PRESSURE SET POINT WILL INCREASE BY 0.1 PSIG (ADJ.) OF THE CURRENT CHILLED WATER SYSTEM DIFFERENTIAL SET POINT. THIS OCCURS EVERY 5 MINUTES UNTIL NO VALVE IS MORE THAN 95% OPEN, OR IF THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SET POINT HAS RISEN TO THE SYSTEMS MAXIMUM SETTING, OR IF THE PUMP VARIABLE SPEED DRIVE(S) ARE AT THE MAXIMUM SETTING (60 HZ).

SAFETIES AND ALARMS

CHILLED WATER FREEZE PROTECTION: WHEN THE OUTDOOR AIR TEMPERATURE FALLS BELOW 32°F (ADJ.) AND THE CHILLED WATER PLANT IS DISABLED, THE DUTY CHILLED WATER PUMP SHALL BE ENABLED TO RUN AT 15% (ADJ.) OPERATION. WHEN THE OUTDOOR AIR TEMPERATURE RISES ABOVE 32°F (ADJ.), NORMAL SEQUENCE SHALL RESUME.

CHILLED WATER PUMP FAILURE: IF THE DUTY START/STOP RELAY IS ENABLED AND THE PUMP'S RUNNING STATUS IS OFF FOR MORE THAN 30 SECONDS (ADJ.), THE SYSTEM SHALL ANNUNCIATE A CHILLED WATER PUMP FAILURE ALARM TO THE BAS AND START THE STANDBY PUMP IN THE SEQUENCE. ONCE THE PROBLEM HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS OPERATOR INTERFACE OR BY MANUALLY OVERRIDING THE PUMP ON. THIS SHALL RE-ENABLE THE DUTY / STAND-BY SEQUENCE

ALARMS: SHALL INCLUDE (BUT NOT BE LIMITED TO) THE FOLLOWING

- VFD ALARM
- MOTOR FAILURE
- SENSOR FAILURE (TEMPERATURE, PRESSURE, ETC..)
- VALVE FAILURE
- CHILLER ALARM
- PUMP FAILURE

ALL ALARMS SHALL REPORT THROUGH THE BAS AND MUST BE MANUALLY RESET.

US Army Corps of Engineers

04-28-2022

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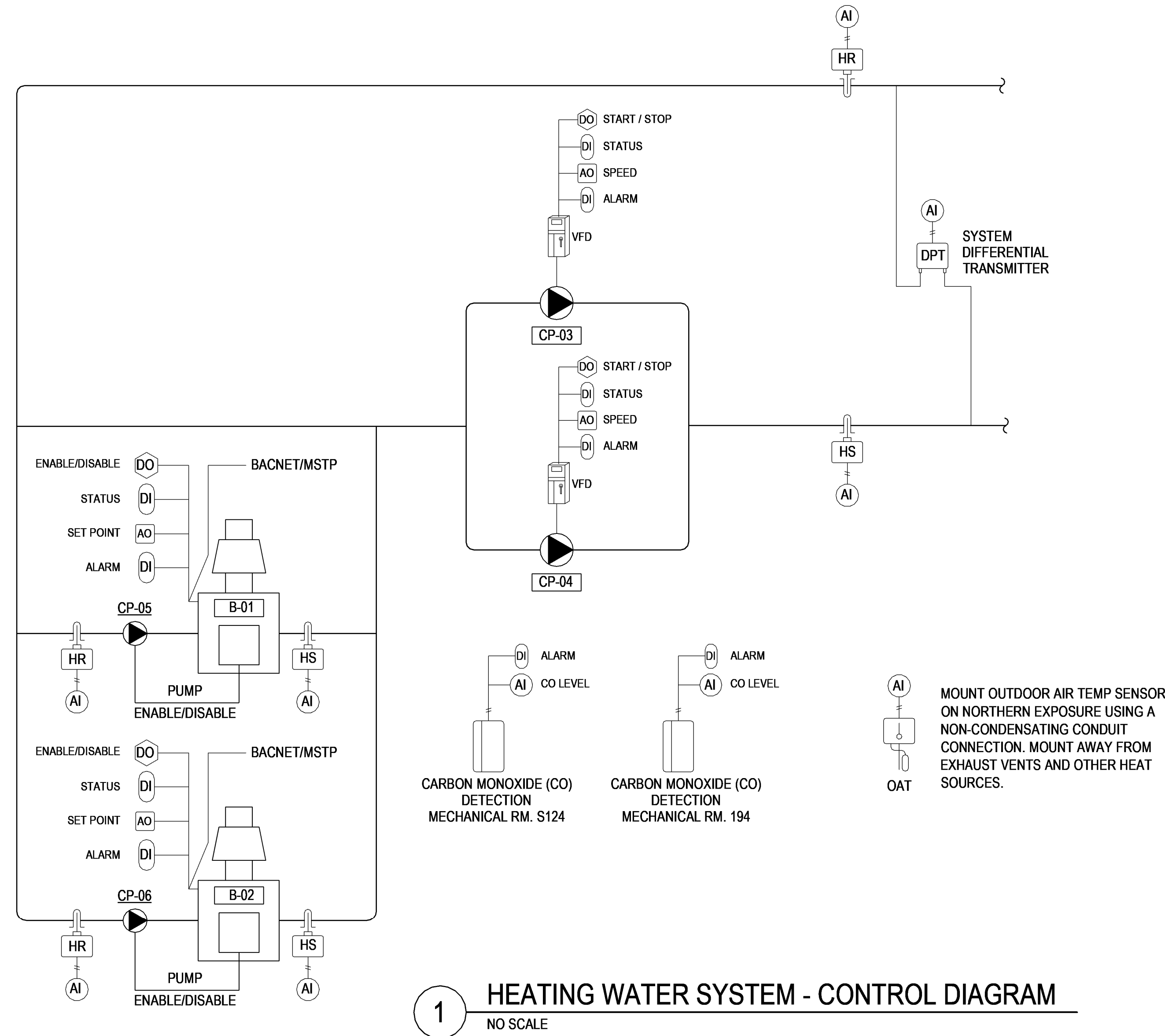
DESIGNED BY: C. Bone	ISSUE DATE: 29 APR 2022	SOLICITATION NO.:	CONTRACT NO.:
DRAWN BY: C. Bone	CHARLESTON DISTRICT CHARLESTON, SOUTH CAROLINA		
CHECKED BY: R. Seay	 CROMWELL		
SUBMITTED BY: CROMWELL AE			
1300 East 6th Street Little Rock, AR 72202 SIZE: 501.87x2.900 cromwell.com ANSI D			

NC026 HVAC-ELEC-PLUMB RESET
 WINTERVILLE, NC
 MECHANICAL CONTROLS

SHEET ID
M-702

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1 HEATING WATER SYSTEM - CONTROL DIAGRAM
NO SCALE

SAFETIES:

SECONDARY HEATING WATER DISTRIBUTION PUMP FAILURE: IF THE LEAD START/STOP RELAY IS ENABLED AND THE CURRENT SWITCH STATUS IS OFF FOR MORE THAN 30 SECONDS (ADJ.), THE BAS CONTROLLER SHALL ANNUNCIATE A HEATING WATER PUMP FAILURE ALARM TO THE BAS WORKSTATION AND START THE STAND-BY PUMP. WHEN A PUMP FAILURE EXISTS THE CURRENTLY RUNNING PUMP BECOMES THE LEAD PUMP. ONCE THE PROBLEM HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS CONTROLLER OR BAS WORKSTATION. THIS ACTION SHALL RE-ENABLE THE DUTY / STAND-BY SEQUENCE.

FREEZE PROTECTION: WHEN THE OUTDOOR AIR TEMPERATURE FALLS BELOW 35.0 DEG. F (ADJ.), THE HOT WATER DISTRIBUTION PUMP SHALL OPERATE CONTINUOUSLY TO PROVIDE HOT WATER CIRCULATION TO ALL ASSOCIATED HOT WATER COILS. IF THE HOT WATER SUPPLY TEMPERATURE FALLS BELOW 130.0 DEG. F (ADJ.) DURING UNOCCUPIED PERIODS, THE BOILER SEQUENCE SHALL BE ENABLED TO SAFEGUARD AGAINST LOW WATER TEMPERATURE AND BOILER CONDENSATION.

CARBON MONOXIDE (CO) DETECTION: IF CO LEVELS EXCEED 9 PPM AS DETECTED BY THE SPACE CO DETECTOR, THE BOILERS SHALL BE DISABLED AND THE BAS SHALL NOTIFY THE FIRE ALARM SYSTEM AND AN ALARM WILL BE SENT TO THE BAS. A MANUAL RESET IS REQUIRED TO RESTART THE SYSTEM.

ALARMS: SHALL INCLUDE (BUT NOT BE LIMITED TO) THE FOLLOWING

- VFD ALARM
- MOTOR FAILURE
- SENSOR FAILURE (TEMPERATURE, PRESSURE, ETC...)
- VALVE FAILURE
- BOILER ALARM
- PUMP FAILURE

ALL ALARMS SHALL REPORT THROUGH THE BAS AND MUST BE MANUALLY RESET.

SEQUENCE OF OPERATION: HEATING WATER BOILERS

GENERAL DESCRIPTION:

THE HEATING WATER SYSTEM CONSISTS OF TWO BOILERS AND ASSOCIATED PUMPS. THE BUILDING AUTOMATION SYSTEM (BAS) CONTROLLER SHALL PROVIDE STAND-ALONE CONTROL OR BAS WORKSTATION CONTROL OF THE SUPPLY HEATING WATER TEMPERATURE SET POINT (ADJ.) BY CONTROLLING THE BOILER'S ENABLE/DISABLE BOILER SIGNAL.

HEATING SYSTEM ENABLE/DISABLE:

THE HEATING SYSTEM SHALL BE ENABLED SHALL BE ENABLED/DISABLED AS REQUESTED BY THE BUILDING AUTOMATION SYSTEM (BAS) HUMAN-INTERFACE PANEL OR AS COMMANDED BY THE BAS WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW 60.0 DEG. F (ADJ.), ON A COMMAND FOR DEHUMIDIFICATION OR REHEAT THROUGH THE BAS. THE BAS WILL START AND STOP THE THE BOILERS AND SECONDARY HEATING WATER PUMPS BASED UPON SYSTEM LOAD.

WHEN THE HEATING SYSTEM IS ENABLED, THE BOILER FACTORY CONTROLLER SHALL OPERATE THE BOILERS AND ASSOCIATED PRIMARY BOILER CIRCULATION PUMPS TO MAINTAIN ITS LOCAL SUPPLY SET POINT AS DETERMINED BY THE BAS.

HEATING SHALL BE DISABLED WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 65.0 DEG. F (ADJ.) AND THERE IS NO COMMAND FOR DEHUMIDIFICATION OR REHEAT. WHEN HEATING IS DISABLED, THE HOT WATER PUMPS AND BOILERS SHALL BE COMMANDED TO OFF.

BOILER CONTROL:

THE BOILER DUTY / STANDBY SEQUENCE SHALL BE BASED ON A WEEKLY SCHEDULE. AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE THE LEAD / LAG SEQUENCE FROM THE BAS CONTROLLER OR A BAS WORKSTATION.

IF THE HOT WATER DISTRIBUTION SYSTEM SUPPLY TEMPERATURE FALLS MORE THAN 25.0 DEG. F (ADJ.) BELOW SET POINT FOR A PERIOD LONGER THAN 15 MINUTES (ADJ.), OR IF AN ACTIVE BOILER SIGNALS A FAILURE ALARM, THE BAS CONTROLLER SHALL ENABLE THE STANDBY BOILER. IN ADDITION, THE BAS CONTROLLER SHALL SEND AN ALARM TO THE BAS WORKSTATION. WHEN A BOILER FAILURE EXISTS, LEAD/LAG AUTOMATION SHALL BE DISABLED AND THE CURRENTLY RUNNING BOILER SHALL BECOME THE LEAD BOILER. ONCE THE PROBLEM IS CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS CONTROLLER OR BAS WORKSTATION. THIS SHALL RE-ENABLE THE LEAD/LAG SEQUENCE.

ONCE THE LEAD BOILER IS ENABLED, THE ADD SEQUENCE OF ADDITIONAL BOILERS SHALL BE DISABLED FOR A PERIOD OF 30 MINUTES (ADJ.). ADDITIONAL BOILERS ARE ADDED IF THE HOT WATER DISTRIBUTION SYSTEM SUPPLY TEMPERATURE FALLS 5.0 DEG. F (ADJ.) BELOW THE HOT WATER SETPOINT FOR A PERIOD OF 10 MINUTES (ADJ.) OR MORE.

THE LAST BOILER ENABLED SHALL BE DISABLED WHEN THE HOT WATER TEMPERATURE RISES 5.0 DEG. F (ADJ.) ABOVE THE HOT WATER SETPOINT FOR A PERIOD OF 10 MINUTES (ADJ.) OR MORE. ADDITIONAL BOILERS SHALL BE DISABLED FOLLOWING THE SAME SUBTRACTION SEQUENCE IF THE HOT WATER TEMPERATURE REMAINS 5.0 DEG. F (ADJ.) ABOVE THE HOT WATER SETPOINT FOR A PERIOD OF 10 MINUTES (ADJ.) OR MORE.

HOT WATER RESET:

THE HOT WATER SUPPLY TEMPERATURE SETPOINT SHALL BE LINEARLY RESET FROM 110.0 DEG. F (ADJ.) TO 140.0 DEG. F (ADJ.) AS THE OUTSIDE AIR TEMPERATURE FALLS FROM 60.0 DEG. F (ADJ.) TO 20.0 DEG. F (ADJ.)

HOT WATER DISTRIBUTION PUMP START/STOP:

THE BAS CONTROLLER SHALL START A HOT WATER PUMP THROUGH A CONTACT CLOSURE OF THE PUMP'S VARIABLE FREQUENCY DRIVE (VFD) RUN-ENABLE CONTACTS.

SECONDARY HEATING WATER DISTRIBUTION PUMP STATUS:

THE BAS CONTROLLER SHALL DETECT HOT WATER PUMP RUN STATUS BY A VFD CURRENT SWITCH.

SECONDARY HEATING WATER DISTRIBUTION PUMP DUTY / STAND-BY:

THE SECONDARY HEATING WATER PUMP DUTY / STAND-BY SEQUENCE SHALL BE BASED ON A WEEKLY SCHEDULE. FROM THE BAS CONTROLLER OR A BAS WORKSTATION, AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE THE DUTY / STAND-BY SEQUENCE.

SECONDARY HEATING WATER DISTRIBUTION PUMP SPEED:

THE BAS CONTROLLER SHALL MONITOR THE HEATING WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. WHEN THE PUMP VFD IS ENABLED, THE BAS CONTROLLER SHALL CONTROL THE ANALOG SPEED SIGNAL SENT TO THE PUMP VFD TO MAINTAIN A HOT WATER DIFFERENTIAL PRESSURE SET POINT OF 50.0 PSIG (ADJ.).

SECONDARY PUMP OPTIMIZATION:

THE BAS SHALL CONTINUALLY MONITOR THE HEATING WATER CONTROL VALVE POSITION OF ALL AHU'S IN THE HOT WATER SYSTEM.

AT HOT WATER SYSTEM STARTUP, THE HOT WATER PRESSURE SET POINT IS 100% OF THE MAXIMUM PRESSURE SET POINT. WHEN ALL HOT WATER VALVES ARE LESS THAN 85% OPEN, THE HOT WATER DIFFERENTIAL PRESSURE SET POINT SHALL BE LOWERED BY 0.1 PSIG (ADJ.) OF THE CURRENT HOT WATER DIFFERENTIAL PRESSURE SET POINT. THIS OCCURS EVERY 5 MINUTES UNTIL AT LEAST ONE VALVE IS MORE THAN 85% OPEN, OR IF THE SET POINT IS EQUAL TO THE MINIMUM HOT WATER DIFFERENTIAL PRESSURE SET POINT, OR IF THE PUMP VFD'S ARE AT A MINIMUM SPEED SETTING (22 HZ).

WHEN ANY HEATING WATER VALVE IS MORE THAN 95% OPEN, THE HEATING WATER PRESSURE SET POINT SHALL INCREASES BY 0.1 PSIG (ADJ.) OF THE CURRENT HEATING WATER DIFFERENTIAL SET POINT. THIS OCCURS EVERY 5 MINUTES UNTIL NO VALVE IS MORE THAN 95% OPEN, OR IF THE HEATING WATER DIFFERENTIAL PRESSURE SET POINT HAS RISEN TO THE SYSTEM'S MAXIMUM SETTING, OR IF THE PUMP VFD'S ARE AT THE MAXIMUM SETTING (60 HZ).



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DESIGNED BY: C. Bone	ISSUE DATE: 28 APR 2022
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CHECKED BY: R. Seay	CONTRACT NO.:
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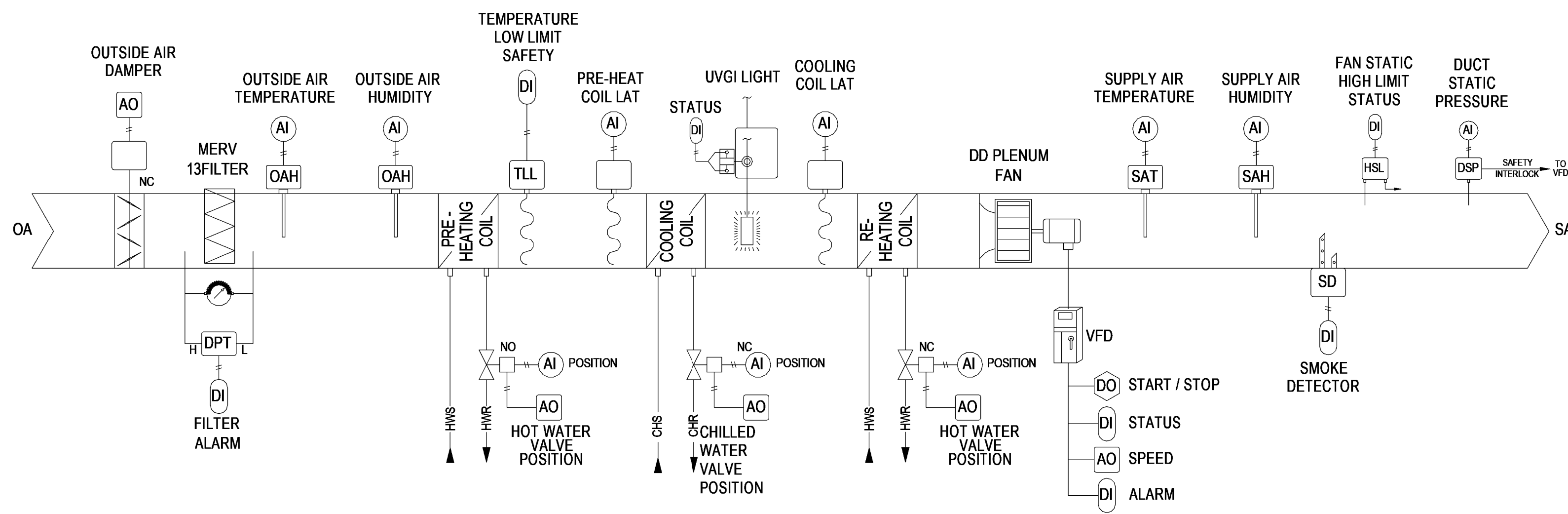
US ARMY CORPS OF ENGINEERS
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NOTE:
ANY CONTROL DEVICES NOT PROVIDED WITH THE EQUIPMENT BY THE EQUIPMENT MANUFACTURER ARE TO BE PROVIDED BY THE CONTROLS CONTRACTORS. COORDINATE WITH THE EQUIPMENT PROVIDER.



1 DOAS - CONTROL DIAGRAM
NO SCALE

SEQUENCE OF OPERATION: DOAS

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER AN OCCUPIED OR UNOCCUPIED COMMAND. THE BAS SHALL ALSO SEND TEMPERATURES, SET POINTS AND OTHER APPLICABLE INFORMATION TO THE CONTROLLER. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS, THE CONTROLLER SHALL OPERATE IN THE OCCUPIED MODE USING ITS DEFAULT SETPOINTS.

OCCUPIED:

DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE OUTDOOR AIR DAMPER SHALL OPEN FULLY BEFORE THE FAN STARTS. THE PRE-HEAT, CHILLED WATER, AND REHEAT VALVES SHALL MODULATE TO MAINTAIN THE FOLLOWING CONDITIONS:

- PRE-HEAT VALVE: 55°F DB (ADJ.)
- CHILLED WATER VALVE: 55°F DB (ADJ.)
- RE-HEAT VALVE: 65°F DB (ADJ.), 65% RH (ADJ.)

IF THE OUTSIDE AIR DEW POINT IS BELOW 54°F (ADJ.), THE CHILLED WATER LAT SHALL BE OVERRIDDEN AND THE CHILLED WATER CONTROL VALVE SHALL BE CLOSED.

UNOCCUPIED:

DURING UNOCCUPIED PERIODS THE SUPPLY FAN SHALL BE DISABLED, THE OUTSIDE AIR DAMPER SHALL BE CLOSED, AND THE PRE-HEAT, CHILLED WATER AND RE-HEAT CONTROL VALVES SHALL CLOSE.

MORNING WARM-UP / MORNING COOL-DOWN:

THE SUPPLY FAN WILL BE OFF AND THE OUTSIDE AIR DAMPER CLOSED WHEN THE FAN COIL UNITS SERVED BY THE DOAS ARE IN MORNING WARM-UP OR MORNING COOL-DOWN MODE.

VAV SUPPLY FAN:

THE FAN WILL BE OFF IN THE UNOCCUPIED MODE. WHEN THE CONTROLLER IS IN THE OCCUPIED MODE, THE SUPPLY FAN WILL OPERATE CONTINUOUSLY AND ITS SPEED WILL BE MODULATED TO MAINTAIN THE DUCT STATIC PRESSURE SET POINT. THE DUCT STATIC PRESSURE SET POINT IS SENT BY THE BAS AND IS RESET BETWEEN THE MINIMUM AND MAXIMUM STATIC PRESSURE LIMITS TO MAINTAIN THE "CRITICAL ZONE" VAV AIR DAMPER IN A POSITION BETWEEN 65% AND 75% OPEN.

IF THE SUPPLY FAN FAILS TO PROVE STATUS FOR 30 SECONDS (ADJ.), THE FAN WILL BE COMMANDED OFF, THE OUTSIDE AIR DAMPER AND ALL VALVES WILL CLOSE AND AN ALARM WILL BE ANNUNCIATED. A MANUAL RESET IS REQUIRED TO RESTART THE FAN. A HARDWIRED, HIGH STATIC PRESSURE CUT-OFF SWITCH IS ELECTRICALLY INTERLOCKED WITH THE VARIABLE SPEED DRIVE. IF THE HIGH STATIC PRESSURE CUT-OFF SWITCH IS TRIPPED THE FAN WILL STOP, THE OUTSIDE AIR DAMPER AND ALL VALVES WILL CLOSE AND AN ALARM WILL BE ANNUNCIATED. A MANUAL RESET OF THE HIGH STATIC PRESSURE CUT-OFF SWITCH WILL BE REQUIRED TO RESTART THE FAN.

INDOOR AIR QUALITY AIR CLEANING:

WHEN THE SUPPLY FAN IS ON, THE ULTRA VIOLET GERMICIDAL IRRADIATION AIR CLEANING LAMPS SHALL BE ENABLED. WHEN THE AIR CLEANING ACCESS DOOR IS OPENED, THE DOOR INTERLOCK SAFETY CUT-OFF SWITCH SHALL OPEN AND DISABLE THE UV LAMPS.

FILTER STATUS:

A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S) WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSURES DURING NORMAL OPERATION A DIRTY FILTER ALARM SHALL ANNUNCIATE AT THE BAS.

SAFETIES:

AIR TEMPERATURE SENSOR FAILURES: THE FOLLOWING ACTIONS SHALL TAKE PLACE UPON AIR TEMPERATURE SENSOR FAILURES:

- PRE-HEAT COIL LAT FAILURE: THE PRE-HEAT CONTROL VALVE SHALL OPEN TO 10% (ADJ.)
- CHILLED WATER COIL LAT FAILURE: THE CHILLED WATER CONTROL VALVE SHALL OPEN TO 50% (ADJ.)
- RE-HEAT CONTROL VALVE LAT FAILURE: THE RE-HEAT CONTROL VALVE SHALL CLOSE

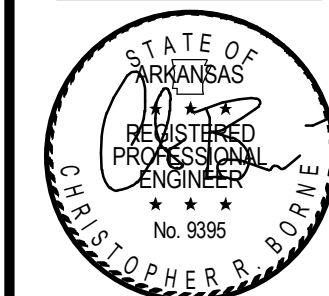
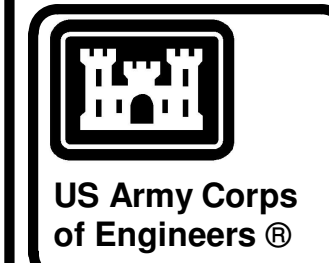
AN ALARM WILL BE ANNUNCIATED UPON FAILURE OF ANY AIR TEMPERATURE SENSOR. THE FAN WILL CONTINUE TO FOLLOW THE SCHEDULE AND THE ALARM WILL AUTOMATICALLY RESET EVERY 15 MINUTES.

SUPPLY FAN: IF THE SUPPLY FAN FAILS TO PROVE STATUS FOR 30 SECONDS (ADJ.), THE FAN WILL BE COMMANDED OFF, THE OUTSIDE AIR DAMPER WILL CLOSE AND AN ALARM WILL BE SENT TO THE BAS. A MANUAL RESET IS REQUIRED TO RESTART THE FAN. A HARDWIRED, HIGH STATIC PRESSURE CUT-OFF SWITCH IS ELECTRICALLY INTERLOCKED WITH THE VARIABLE SPEED DRIVE. IF THE HIGH STATIC PRESSURE CUT-OFF SWITCH IS TRIPPED THE FAN WILL STOP, THE OUTSIDE AIR DAMPER WILL CLOSE AND AN ALARM WILL BE SENT TO THE BAS. A MANUAL RESET OF THE HIGH STATIC PRESSURE CUT-OFF SWITCH WILL BE REQUIRED TO RESTART THE FAN.

FREEZE PROTECTION: A HARDWIRED, LOW LIMIT TEMPERATURE SWITCH SHALL BE ELECTRICALLY INTERLOCKED WITH THE MOTOR STARTER. IF THE LOW LIMIT TEMPERATURE SWITCH IS TRIPPED 38.0 DEG. F (ADJ.), THE FAN SHALL BE COMMANDED OFF AND THE OUTSIDE AIR DAMPER SHALL CLOSE. ALL HOT WATER VALVES SHALL BE COMMANDED OPEN TO 100% (ADJ.). AN ALARM SHALL ANNUNCIATE AT THE BAS AND MANUAL RESET OF THE LOW LIMIT TEMPERATURE SWITCH SHALL BE REQUIRED TO RESTART THE FAN.

SMOKE DETECTION: THE SYSTEM SHALL SHUT DOWN UPON DETECTION OF SMOKE BY SMOKE DETECTORS LOCATED IN THE SUPPLY AIRSTREAM AND NOTIFY THE FIRE ALARM SYSTEM. THE SYSTEM SHALL SHUT DOWN UPON ALARM FROM FIRE ALARM SYSTEM. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO THE UNIT THROUGH THE DRY CONTACTS OF THE SMOKE DETECTOR. A MANUAL RESET OF THE SMOKE DETECTOR SHALL BE REQUIRED TO RESTART THE UNIT.

ALL ALARMS SHALL REPORT THROUGH THE BAS AND MUST BE MANUALLY RESET.



04-28-2022

DATE	DESCRIPTION	MARK

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
1300 East 6th Street Winterville, NC 28786-2900	

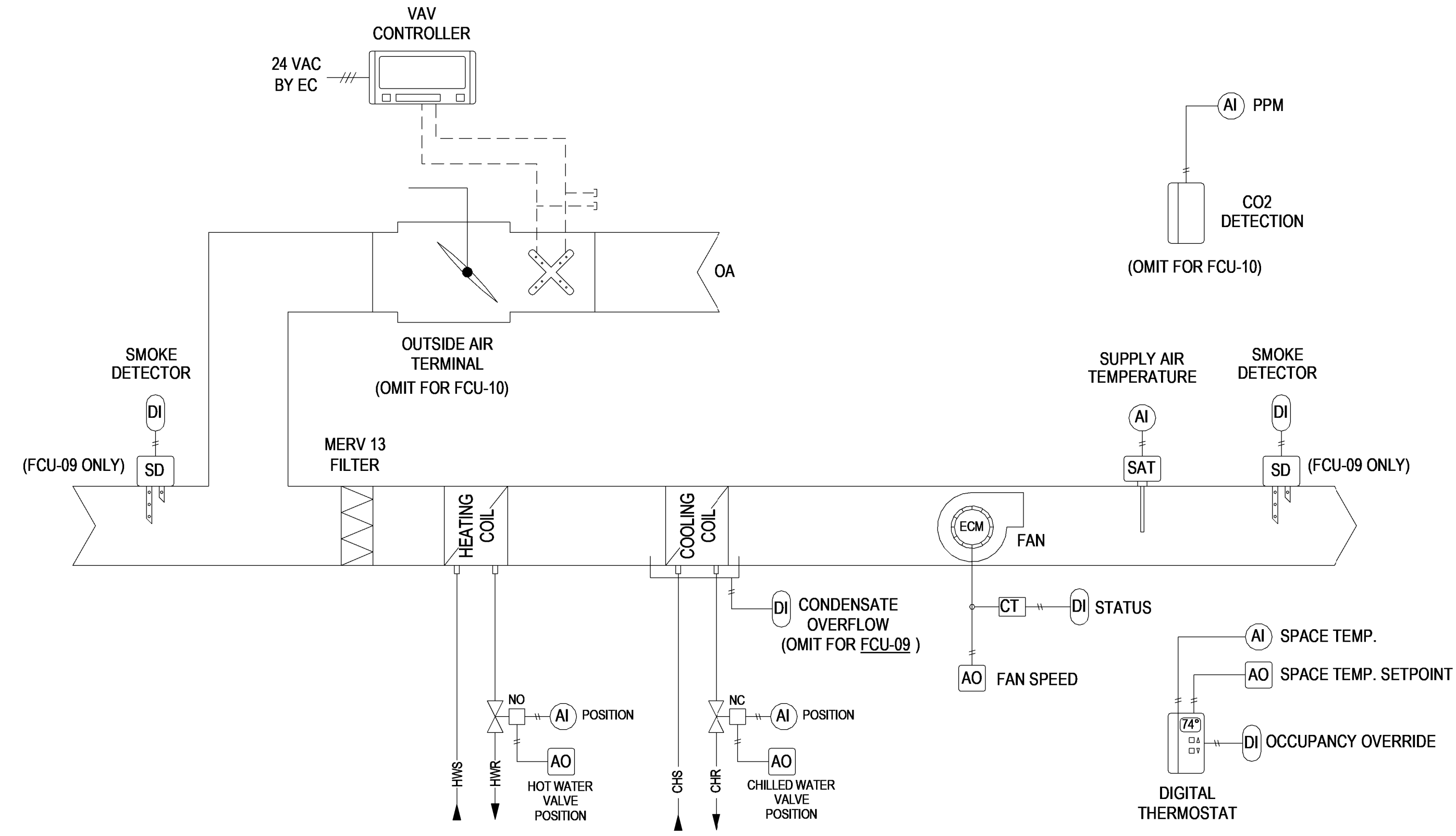
NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
MECHANICAL CONTROLS

SHEET ID
M-704

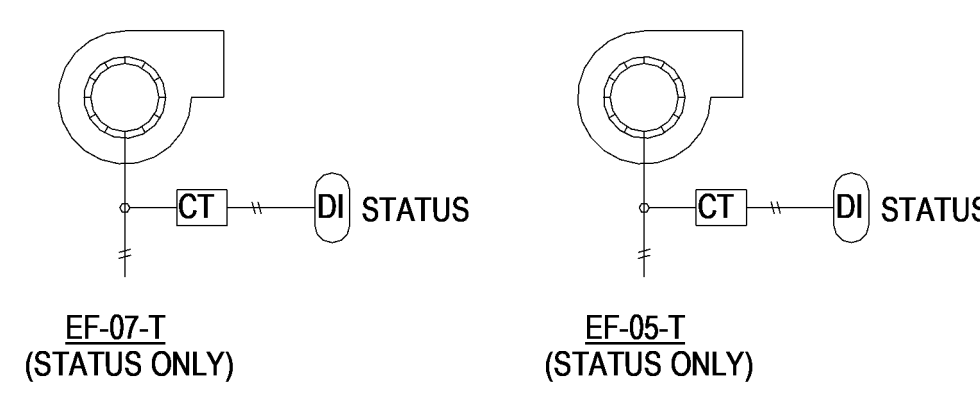
WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

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NOTE:
ANY CONTROL DEVICES NOT PROVIDED WITH THE EQUIPMENT BY THE EQUIPMENT MANUFACTURER ARE TO BE PROVIDED BY THE CONTROLS CONTRACTORS. COORDINATE WITH THE EQUIPMENT PROVIDER.



1 FAN COIL UNIT - CONTROL DIAGRAM
NO SCALE



2 FCU-09 / OAT-09 ADDITIONAL SEQUENCE INFORMATION
NO SCALE

ADDITIONAL SEQUENCE OF OPERATION: OAT-09/FCU-09

OAT-09 MINIMUM CFM OVERRIDE:

THE BAS SHALL MONITOR THE STATUS OF EF-05-T AND EF-07-T. WHEN A MONITORED FAN IS ENABLED, THE MINIMUM CFM FOR OAT-09 SHALL BE OVERRIDDEN AS FOLLOWS:

- NO EXHAUST FAN ENABLED: SCHEDULED MINIMUM CFM (NO OVERRIDE)
- EF-05-T ONLY: 625 CFM (ADJ.)
- EF-07-T ONLY: 775 CFM (ADJ.)
- EF-05-T AND EF-07-T: 1400 CFM (ADJ.)

MAXIMUM CFM SHALL REMAIN AS SCHEDULED.

SEQUENCE OF OPERATION: FAN COIL

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARM-UP/PRE-COOL, OCCUPIED/UNOCCUPIED AND HEAT/COOL MODES. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.

OCCUPIED:

- THE SUPPLY FAN SHALL RUN CONTINUOUSLY DURING THE OCCUPIED TIME. THE CONTROLLER SHALL MODULATE THE FAN SPEED BETWEEN MINIMUM AND MAXIMUM SPEEDS (30% - 100%, ADJ.) TO MAINTAIN SPACE TEMPERATURE.
- COOLING MODE: THE CONTROLLER SHALL MODULATE THE COOLING COIL CONTROL VALVE TO MAINTAIN 55 DEG. F (ADJ.) SAT UNTIL THE SUPPLY FAN REACHES MINIMUM SPEED, AT WHICH POINT THE VALVE WILL MODULATE TO MAINTAIN A SPACE TEMPERATURE OF 76°F (ADJ.). THE HEATING CONTROL VALVE SHALL BE CLOSED.
- HEATING MODE: THE CONTROLLER SHALL MODULATE THE HEATING COIL CONTROL VALVE TO MAINTAIN 80 DEG. F (ADJ.) SAT UNTIL THE SUPPLY FAN REACHES MINIMUM SPEED, AT WHICH POINT THE VALVE WILL MODULATE TO MAINTAIN A SPACE TEMPERATURE OF 68 DEG. F (ADJ.). THE COOLING CONTROL VALVE SHALL BE CLOSED.
- THE OUTSIDE AIR TERMINAL SHALL MODULATE BETWEEN ITS SCHEDULED MINIMUM AND MAXIMUM AIR FLOWS TO MAINTAIN SPACE CO2 LEVELS BELOW 500 PPM (ADJ.)

UNOCCUPIED:

- THE SUPPLY FAN SHALL RUN INTERMITTENTLY ON A CALL FOR COOLING OR HEATING DURING THE UN OCCUPIED TIME. THE CONTROLLER SHALL OPERATE THE FAN AT MAXIMUM SPEED (100%, ADJ.).
- COOLING MODE: THE CONTROLLER SHALL MODULATE THE COOLING COIL CONTROL VALVE TO MAINTAIN A SPACE TEMPERATURE OF 80 DEG F (ADJ.). THE HEATING CONTROL VALVE SHALL BE CLOSED.
- HEATING MODE: THE CONTROLLER SHALL MODULATE THE HEATING COIL CONTROL VALVE TO MAINTAIN A SPACE TEMPERATURE OF 64 DEG F (ADJ.). THE COOLING CONTROL VALVE SHALL BE CLOSED.
- THE OUTSIDE AIR TERMINAL SHALL BE CLOSED.

UNOCCUPIED MANUAL OVERRIDE: IF THE OCCUPANCY OVERRIDE BUTTON ON THE SPACE THERMOSTAT IS ENABLED, THEY UNIT SHALL ENTER OCCUPIED MODE FOR A PERIOD OF 1 HOUR (ADJ.).

OPTIMAL START:

THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SET POINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS.

MORNING WARM-UP MODE AND PRE-COOL MODES :

DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SET POINT A MORNING WARM-UP MODE SHALL BE ACTIVATED. WHEN MORNING WARM-UP IS INITIATED THE UNIT SHALL ENABLE THE HEATING AND SUPPLY FAN. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SET POINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SET POINT, PRE-COOL MODE SHALL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SET POINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

OPTIMAL STOP:

THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SET POINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP OCCURS. WHEN THE OPTIMAL STOP MODE IS ACTIVE THE UNIT CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SET POINT.

OCCUPIED BYPASS:

THE BAS SHALL MONITOR THE STATUS OF THE ON AND CANCEL BUTTONS OF THE SPACE TEMPERATURE SENSOR. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM A SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.).

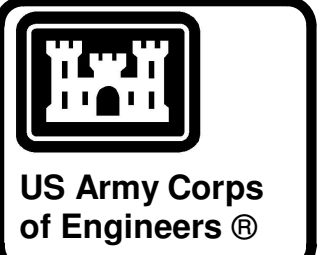
SAFETIES:

(FCU-10 ONLY) THE SYSTEM SHALL SHUT DOWN UPON DETECTION OF SMOKE BY SMOKE DETECTORS LOCATED IN THE SUPPLY OR RETURN AIRSTREAMS AND NOTIFY THE FIRE ALARM SYSTEM. THE SYSTEM SHALL SHUT DOWN UPON ALARM FROM FIRE ALARM SYSTEM.

IF THE SUPPLY FAN FAILS TO PROVE STATUS FOR 30 SECONDS (ADJ.) AS SENSED THROUGH THE CURRENT TRANSDUCER, THE FAN WILL BE COMMANDED OFF, THE OUTSIDE AIR TERMINAL WILL CLOSE AND AN ALARM WILL BE SENT TO THE BAS. A MANUAL RESET IS REQUIRED TO RESTART THE FAN.

CONDENSATE OVERFLOW MONITORING: IF THE CONDENSATE LEVEL REACHES THE TRIP POINT AS DETECTED BY THE FLOAT SWITCH IN THE AUXILIARY DRAIN PAN, A CONDENSATE OVERFLOW DIAGNOSTIC SHALL ANNUNCIATE AT THE BAS. TO PREVENT THE CONDENSATE DRAIN PAN FROM OVERFLOWING AND CAUSING WATER DAMAGE TO THE BUILDING. THE FAN SHALL BE DISABLED AND THE CHILLED WATER VALVE SHALL CLOSE.

ALL ALARMS SHALL REPORT THROUGH THE BAS AND MUST BE MANUALLY RESET.



04-28-2022

MARK	DESCRIPTION	DATE

US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

CROMWELL

DESIGNED BY: C. Borne
DRAWN BY: C. Borne
CHECKED BY: R. Seay
SUBMITTED BY: CROMWELL AE

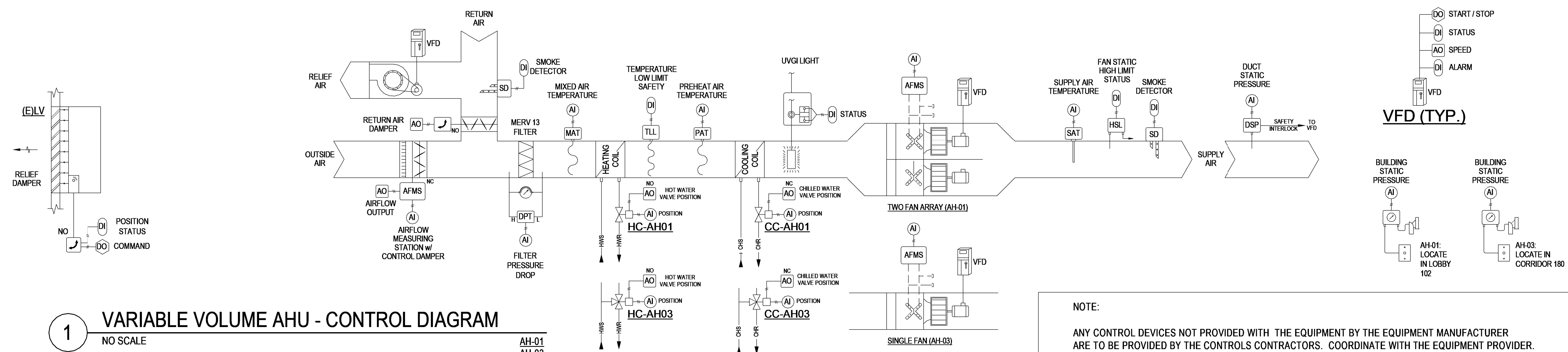
ISSUE DATE: 28 APR 2022
SOLICITATION NO.:
CONTRACT NO.:
1300 East 6th Street Little Rock, AR 72202
501.872.2900
cromwell@con.ansld

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
MECHANICAL CONTROLS

SHEET ID
M-705

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

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1 VARIABLE VOLUME AHU - CONTROL DIAGRAM
NO SCALE

AH-01
AH-03
RF-01
RF-03

NOTE:
ANY CONTROL DEVICES NOT PROVIDED WITH THE EQUIPMENT BY THE EQUIPMENT MANUFACTURER ARE TO BE PROVIDED BY THE CONTROLS CONTRACTORS. COORDINATE WITH THE EQUIPMENT PROVIDER.

SEQUENCE OF OPERATION: VARIABLE VOLUME AIR HANDLING UNIT

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) WILL SEND THE CONTROLLER OCCUPIED, UNOCCUPIED, OPTIMAL START, NIGHT HEAT / COOL AND TIMED OVERRIDE COMMANDS. THE BAS WILL ALSO SEND A DISCHARGE AIR TEMPERATURE SET POINT AND A DUCT STATIC PRESSURE SET POINT. IF COMMUNICATION IS LOST WITH THE BAS, THE CONTROLLER WILL OPERATE IN THE OCCUPIED COOLING MODE USING ITS DEFAULT SET POINTS.

OCCUPIED (TEMPERATURE CONTROL):

DURING OCCUPIED PERIODS THE SUPPLY FAN WILL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER WILL OPEN TO MAINTAIN PRESSURIZATION AND/OR VENTILATION REQUIREMENTS, WHICHEVER IS GREATER.

PRE-HEAT COIL CONTROL: THE PRE-HEAT COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN A LEAVING PRE-HEAT TEMPERATURE OF 55°F (ADJ.). IF THE PRE-HEAT TEMPERATURE SENSOR FAILS AND THE MIXED AIR TEMPERATURE IS BELOW 45°F (ADJ.) THE PRE-HEAT VALVE SHALL BE 10% OPEN. IF THE PRE-HEAT TEMPERATURE SENSOR FAILS AND THE MIXED AIR TEMPERATURE IS ABOVE 50°F (ADJ.) THE PRE-HEAT VALVE SHALL BE COMMANDED CLOSED. AN ALARM SHALL ANNUNCIATE AT THE BAS IF THE LEAVING PRE-HEAT TEMPERATURE SENSOR, THE MIXED AIR TEMPERATURE SENSOR OR THE OUTSIDE AIR TEMPERATURE SENSOR ARE FAILED.

COOLING COIL CONTROL: THE COOLING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN A SUPPLY AIR TEMPERATURE OF 55°F (ADJ.). IF THE SUPPLY AIR TEMPERATURE SENSOR FAILS THE COOLING COIL CONTROL VALVE SHALL BE COMMANDED CLOSED AND AN ALARM SHALL ANNUNCIATE AT THE BAS.

UNOCCUPIED (NIGHT SETBACK):

ON A CALL FOR COOLING OR HEATING AT THE ZONE LEVEL, THE SUPPLY FAN WILL START, THE OUTSIDE AIR DAMPER WILL REMAIN CLOSED, AND THE PRE-HEAT AND COOLING CONTROL VALVES WILL MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT OF 55°F (ADJ.). WHEN THE ZONE LEVEL THERMOSTATS ARE SATISFIED, THE SUPPLY FAN WILL STOP, THE CHILLED WATER CONTROL VALVE WILL CLOSE, THE PRE-HEAT CONTROL VALVE WILL OPEN, AND THE OUTSIDE AIR DAMPER WILL REMAIN CLOSED.

MORNING WARM-UP:

DURING OPTIMAL START, IF THE AVERAGE ZONE TEMPERATURE IS 1.5 DEG. F (ADJ.) OR MORE BELOW THE OCCUPIED HEATING SET POINT, A MORNING WARM-UP SEQUENCE WILL BE ACTIVATED. THE SUPPLY FAN WILL START, THE OUTSIDE AIR DAMPER WILL REMAIN CLOSED, AND THE PRE-HEAT VALVE WILL MODULATE ON TO MAINTAIN A HEATING SET POINT OF 80°F (ADJ.). AND THE ZONE REHEAT COILS WILL BE IN HEATING MODE. THIS MODE WILL TERMINATE WHEN THE AVERAGE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SET POINT OR THE OCCUPIED TIME PERIOD HAS STARTED.

MORNING COOL-DOWN:

DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SET POINT, A MORNING COOL-DOWN SEQUENCE WILL BE ACTIVATED. THE SUPPLY FAN WILL START AND THE UNIT WILL MODULATE THE COOLING COIL CONTROL VALVE ON TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT A COOLING SET POINT OF 55° F (ADJ.). THE OUTSIDE AIR DAMPER WILL REMAIN CLOSED. MODE WILL TERMINATE WHEN THE AVERAGE SPACE TEMPERATURE REACHES THE OCCUPIED COOLING SET POINT OR THE OCCUPIED TIME PERIOD HAS STARTED.

VARIABLE AIR VOLUME (VAV) SUPPLY FAN:

THE FAN WILL BE OFF IN THE UNOCCUPIED MODE. WHEN THE CONTROLLER IS IN THE OCCUPIED MODE, THE SUPPLY FAN (AH-03) OR FANS (AH-01) WILL OPERATE CONTINUOUSLY AND VFD(S) WILL MODULATE FAN SPEED D TO MAINTAIN THE DUCT STATIC PRESSURE SET POINT. THE DUCT STATIC PRESSURE SET POINT IS SENT BY THE BAS AND IS RESET BETWEEN THE MINIMUM AND MAXIMUM STATIC PRESSURE LIMITS TO MAINTAIN THE "CRITICAL ZONE" VAV AIR DAMPER IN A POSITION BETWEEN 65% AND 75% OPEN.

IF THE SUPPLY FAN FAILS TO PROVE STATUS FOR 30 SECONDS (ADJ.), THE FAN WILL BE COMMANDED OFF, THE OUTSIDE AIR DAMPER AND ALL VALVES WILL CLOSE AND AN ALARM WILL BE ANNUNCIATED. A MANUAL RESET IS REQUIRED TO RESTART THE FAN. A HARDWIRED, HIGH STATIC PRESSURE CUT-OFF SWITCH IS ELECTRICALLY INTERLOCKED WITH THE VARIABLE SPEED DRIVE. IF THE HIGH STATIC PRESSURE CUT-OFF SWITCH IS TRIPPED THE FAN WILL STOP, THE OUTSIDE AIR DAMPER AND ALL VALVES WILL CLOSE AND AN ALARM WILL BE ANNUNCIATED. A MANUAL RESET OF THE HIGH STATIC PRESSURE CUT-OFF SWITCH WILL BE REQUIRED TO RESTART THE FAN.

OUTSIDE AIRFLOW CONTROL:

DURING ALL OCCUPIED MODES THE OUTSIDE AIRFLOW SHALL BE MEASURED AT THE INTAKE AND MAINTAINED AT THE EITHER THE MINIMUM SCHEDULED AIRFLOW FOR BUILDING PRESSURIZATION OR THE REQUIRED OUTDOOR AIRFLOW (Vot) AT ALL LOAD CONDITIONS, WHICHEVER IS GREATER. REQUIRED Vot SET POINT FOR THE AIR HANDLER SHALL BE DETERMINED USING ASHRAE STANDARD 62.1-2010 (EQUATION 6-8 AND APPENDIX A).

OUTSIDE AIRFLOW CONTROL (CONTINUED):

THE BUILDING AUTOMATION SYSTEM SHALL DYNAMICALLY CALCULATE EQUATION 6-8 TAKING INTO ACCOUNT ALL CONNECTED ZONES TO DETERMINE THE MINIMUM OUTDOOR AIRFLOW SET POINT (REFERENCE "3"/M-709). DAMPER SHALL BE CONTROLLED TO THE MINIMUM OUTSIDE AIRFLOW. THE OUTSIDE AIR DAMPER SHALL BE CLOSED DURING THE UNOCCUPIED MODE, MORNING WARM-UP AND PRE-COOL MODES.

RELIEF AIR AND BUILDING PRESSURE CONTROL:

A DIFFERENTIAL PRESSURE TRANSDUCER SHALL ACTIVELY MONITOR THE DIFFERENCE IN PRESSURE BETWEEN THE BUILDING (INDOORS) AND OUTDOORS. IF THE BUILDING PRESSURE INCREASES ABOVE THE DIFFERENTIAL PRESSURE SETPOINT OF 0.02" (ADJ.), THE UNIT CONTROLLER SHALL OPEN THE RELIEF AIR DAMPER, TURN ON THE RELIEF AIR FAN AND MODULATE THE RELIEF AIR FAN VARIABLE SPEED DRIVE TO CONTROL BUILDING PRESSURE TO THE DIFFERENTIAL PRESSURE SET POINT. IF THE BUILDING PRESSURE DECREASES BELOW THE DIFFERENTIAL PRESSURE SET POINT, THE ASSOCIATED CONTROLLER SHALL DEACTIVATE THE RELIEF AIR FAN VARIABLE SPEED DRIVE.

A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE RELIEF AIR FAN. IF THE SWITCH IS DETECTED TO BE OPEN FOR 40 CONSECUTIVE SECONDS AFTER A REQUEST FOR RELIEF FAN OPERATION A FAN FAILURE ALARM SHALL ANNUNCIATE AT THE BAS AND THE RELIEF FAN SHALL STOP. A MANUAL RESET SHALL BE REQUIRED.

INDOOR AIR QUALITY AIR CLEANING:

WHEN THE SUPPLY FAN IS ON, THE ULTRA VIOLET GERMICIDAL IRRADIATION AIR CLEANING LAMPS SHALL BE ENABLED. WHEN THE AIR CLEANING ACCESS DOOR IS OPENED, THE DOOR INTERLOCK SAFETY CUT-OFF SWITCH SHALL OPEN AND DISABLE THE UV LAMPS.

FILTER STATUS:

A DIFFERENTIAL PRESSURE SWITCH WILL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES DURING NORMAL OPERATION A DIRTY FILTER ALARM WILL BE ANNUNCIATED.

SAFETIES:

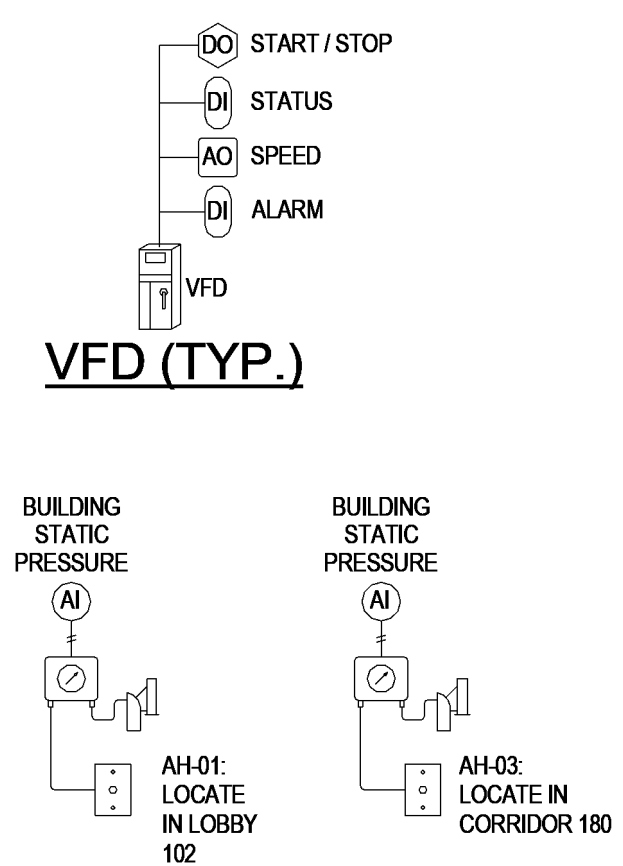
DISCHARGE AIR TEMPERATURE: IF THE DISCHARGE AIR TEMPERATURE SENSOR FAILS DURING NORMAL OPERATION; THE COOLING COIL WILL BE DISABLED AND AN ALARM WILL BE ANNUNCIATED. THE FAN WILL CONTINUE TO FOLLOW THE SCHEDULE AND THE ALARM WILL AUTOMATICALLY RESET EVERY 15 MINUTES.

SUPPLY FAN(S): IF THE SUPPLY FAN(S) FAIL TO PROVE STATUS FOR 30 SECONDS (ADJ.), THE FAN(S) WILL BE COMMANDED OFF, THE OUTSIDE AIR DAMPER WILL CLOSE AND AN ALARM WILL BE SENT TO THE BAS. A MANUAL RESET IS REQUIRED TO RESTART THE FAN(S). A HARDWIRED, HIGH STATIC PRESSURE CUT-OFF SWITCH IS ELECTRICALLY INTERLOCKED WITH THE VARIABLE SPEED DRIVE. IF THE HIGH STATIC PRESSURE CUT-OFF SWITCH IS TRIPPED THE FAN(S) WILL STOP, THE OUTSIDE AIR DAMPER WILL CLOSE AND AN ALARM WILL BE SENT TO THE BAS. A MANUAL RESET OF THE HIGH STATIC PRESSURE CUT-OFF SWITCH WILL BE REQUIRED TO RESTART THE FAN(S).

FREEZE PROTECTION: A HARDWIRED, LOW LIMIT TEMPERATURE SWITCH SHALL BE ELECTRICALLY INTERLOCKED WITH THE VFD. IF THE LOW LIMIT TEMPERATURE SWITCH IS TRIPPED 32°F (ADJ.), THE FAN(S) SHALL BE COMMANDED OFF AND THE OUTSIDE AIR DAMPER SHALL CLOSE. ALL HOT WATER VALVES SHALL BE COMMANDED OPEN TO 100% (ADJ.). AN ALARM SHALL ANNUNCIATE AT THE BAS AND MANUAL RESET OF THE LOW LIMIT TEMPERATURE SWITCH SHALL BE REQUIRED TO RESTART THE FAN.

SMOKE DETECTION: THE SYSTEM SHALL SHUT DOWN UPON DETECTION OF SMOKE BY SMOKE DETECTORS LOCATED IN THE SUPPLY OR RETURN AIRSTREAMS AND NOTIFY THE FIRE ALARM SYSTEM. THE SYSTEM SHALL SHUT DOWN UPON ALARM FROM FIRE ALARM SYSTEM. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO THE UNIT THROUGH THE DRY CONTACTS OF THE SMOKE DETECTOR. A MANUAL RESET OF THE SMOKE DETECTOR SHALL BE REQUIRED TO RESTART THE UNIT.

ALL ALARMS SHALL REPORT THROUGH THE BAS AND MUST BE MANUALLY RESET.



04-28-2022

MARK	DESCRIPTION	DATE

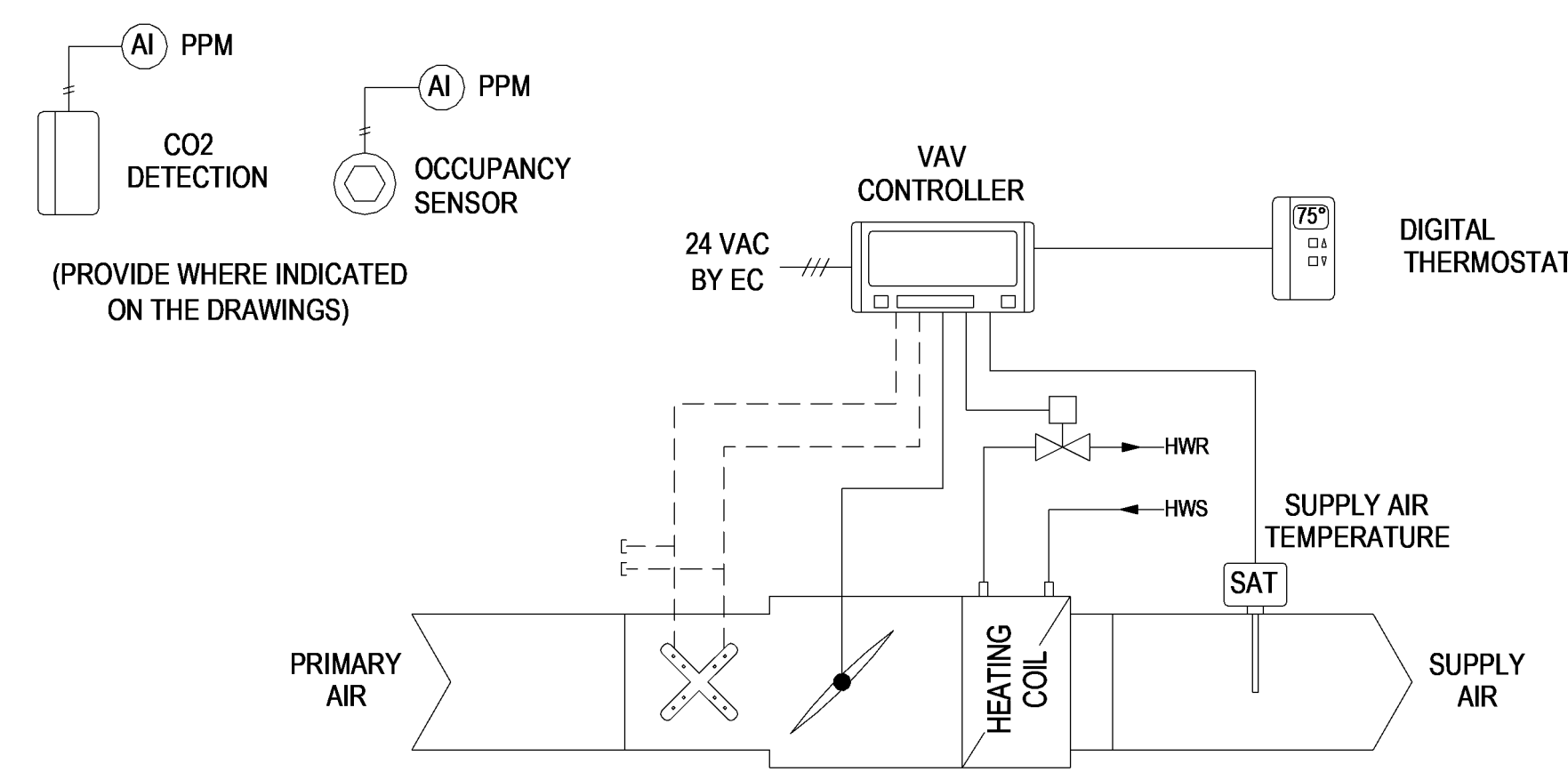
DESIGNED BY: C. Borne	ISSUE DATE: 29 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AR	
1300 East 6th Street Little Rock, AR 72202 501.572.2500 cromwell@com.lansid	

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
CROMWELL
MECHANICAL CONTROLS

SHEET ID
M-706

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

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SEQUENCE OF OPERATION: VAV TERMINAL UNIT WITH HOT WATER RE-HEAT

THE AIR TERMINAL MODE OF OPERATION IS EITHER "OCCUPIED" OR "UNOCCUPIED" BASED UPON A COMMAND SENT BY THE BUILDING AUTOMATION SYSTEM (BAS). IF COMMUNICATION IS LOST WITH THE BAS, THE VAV CONTROLLER WILL OPERATE USING ITS LOCAL SET POINTS.

OCCUPIED MODE:

DURING THE OCCUPIED MODE OF OPERATION, THE SPACE TEMPERATURE SET POINT SHALL BE OCCUPANT ADJUSTABLE AT THE THERMOSTAT. LIMITS SHALL BE SET FOR MINIMUM AND MAXIMUM SPACE TEMPERATURE. HEATING MIN. / MAX.: 66 / 70 DEG. F (ADJ.). COOLING MIN. / MAX.: 74 / 78 DEG. F.

COOLING MODE: THE COOLING SET POINT SHALL BE EQUAL TO THE SPACE TEMPERATURE SETPOINT PLUS 1.0°F (ADJ.). ON A CALL FOR COOLING, THE TERMINAL DAMPER SHALL BE MODULATED BETWEEN THE SCHEDULED COOLING MINIMUM AND THE COOLING MAXIMUM AIR FLOWS AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE AT THE COOLING SET POINT. IF THE COOLING AIR FLOW IS AT MINIMUM AND THE SPACE DROPS BELOW THE COOLING SET POINT, THE HEATING WATER CONTROL VALVE WILL MODULATE TO MAINTAIN SPACE TEMPERATURE SET POINT.

HEATING MODE: ON A CALL FOR HEATING, THE TERMINAL DAMPER SHALL BE MODULATED TO THE SCHEDULED HEATING AIR FLOW AND THE HEATING WATER CONTROL VALVE SHALL MODULATE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET POINT.

UNOCCUPIED (NIGHT SETBACK) MODE:

DURING THE UNOCCUPIED MODE, THE COOLING SET POINT SHALL BE 82 DEG. F (ADJ.) AND THE HEATING SET POINT SHALL BE 64 DEG. F (ADJ.).

ON A CALL FOR COOLING, THE TERMINAL DAMPER SHALL BE MODULATED FROM FULLY CLOSED (0 CFM) TO THE MAXIMUM COOLING AIR FLOW SET POINT AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE AT THE COOLING SET POINT. ON A CALL FOR HEATING, THE TERMINAL DAMPER SHALL BE MODULATED BETWEEN THE SCHEDULED HEATING AIR FLOW SET POINT AND THE THE HEATING WATER CONTROL VALVE SHALL BE MODULATED OPEN AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE AT THE HEATING SET POINT.

MORNING WARM-UP:

DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT A MORNING WARM-UP MODE SHALL BE ACTIVATED. WITH MORNING WARM-UP INITIATED, THE UNIT SHALL ENABLE HEATING WATER VALVE AND SUPPLY FAN. THE HEATING WATER CONTROL VALVE SHALL BE MODULATED AS REQUIRED TO ACHIEVE THE MORNING WARM-UP SETPOINT AND THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES THE MORNING WARMUP SETPOINT (ADJ.) OR 60 MINUTES HAVE ELAPSED, THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

SAFETIES AND ALARMS:

SPACE SENSOR FAILURE: IF THERE IS A FAULT WITH THE OPERATION OF THE SPACE SENSOR (THERMOSTAT) AN ALARM WILL BE ANNUNCIATED AT THE BAS. SPACE SENSOR FAILURE WILL CAUSE THE VAV TO DRIVE THE DAMPER TO MINIMUM AIR FLOW IF THE VAV IS IN THE OCCUPIED MODE, OR DRIVE IT CLOSED IF THE VAV IS IN THE UNOCCUPIED MODE.

SAFETIES AND ALARMS (CONT.):

THE BAS SHALL PROVIDE ALARM MESSAGES FOR THE FOLLOWING:

- SA TEMPERATURE FAILURE
- SPACE TEMPERATURE FAILURE
- LOW AIR FLOW
- LOCAL SET POINT FAILURE
- PRIMARY AIR TEMPERATURE FAILURE
- FLOW SENSOR FAILURE

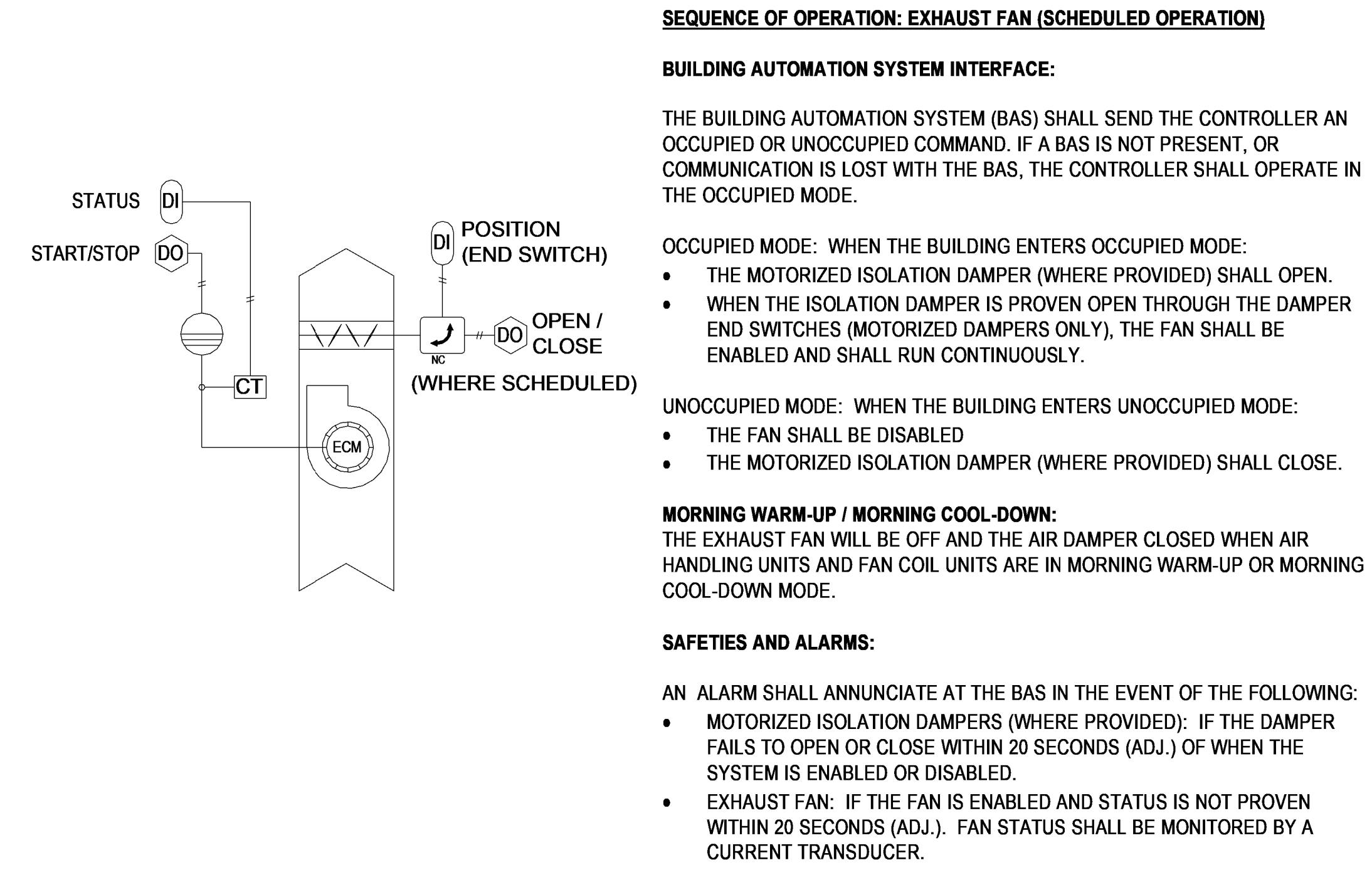
ZONE OCCUPANCY DETECTION:

ZONE OCCUPANCY SHALL BE REPORTED TO THE BAS THROUGH TIME OF DAY SCHEDULING, OCCUPANCY SENSOR OR CO2 SENSING. REFERENCE "3"/M-709 FOR DETAILS.

CRITICAL ZONE RESET AND PRESSURE OPTIMIZATION

THE CONTROLLER SHALL PROVIDE AIRFLOW, ACTUAL DAMPER POSITION AND ACTUAL VALVE POSITION TO THE BAS FOR SYSTEM FOR CRITICAL ZONE RESET AND PRESSURE OPTIMIZATION CALCULATIONS.

1 VAV TERMINAL UNIT - CONTROL DIAGRAM
NO SCALE



SEQUENCE OF OPERATION: EXHAUST FAN (SCHEDULED OPERATION)

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER AN OCCUPIED OR UNOCCUPIED COMMAND. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS, THE CONTROLLER SHALL OPERATE IN THE OCCUPIED MODE.

OCCUPIED MODE: WHEN THE BUILDING ENTERS OCCUPIED MODE:

- THE MOTORIZED ISOLATION DAMPER (WHERE PROVIDED) SHALL OPEN.
- WHEN THE ISOLATION DAMPER IS PROVEN OPEN THROUGH THE DAMPER END SWITCHES (MOTORIZED DAMPERS ONLY), THE FAN SHALL BE ENABLED AND SHALL RUN CONTINUOUSLY.

UNOCCUPIED MODE: WHEN THE BUILDING ENTERS UNOCCUPIED MODE:

- THE FAN SHALL BE DISABLED
- THE MOTORIZED ISOLATION DAMPER (WHERE PROVIDED) SHALL CLOSE.

MORNING WARM-UP / MORNING COOL-DOWN:

THE EXHAUST FAN WILL BE OFF AND THE AIR DAMPER CLOSED WHEN AIR HANDLING UNITS AND FAN COIL UNITS ARE IN MORNING WARM-UP OR MORNING COOL-DOWN MODE.

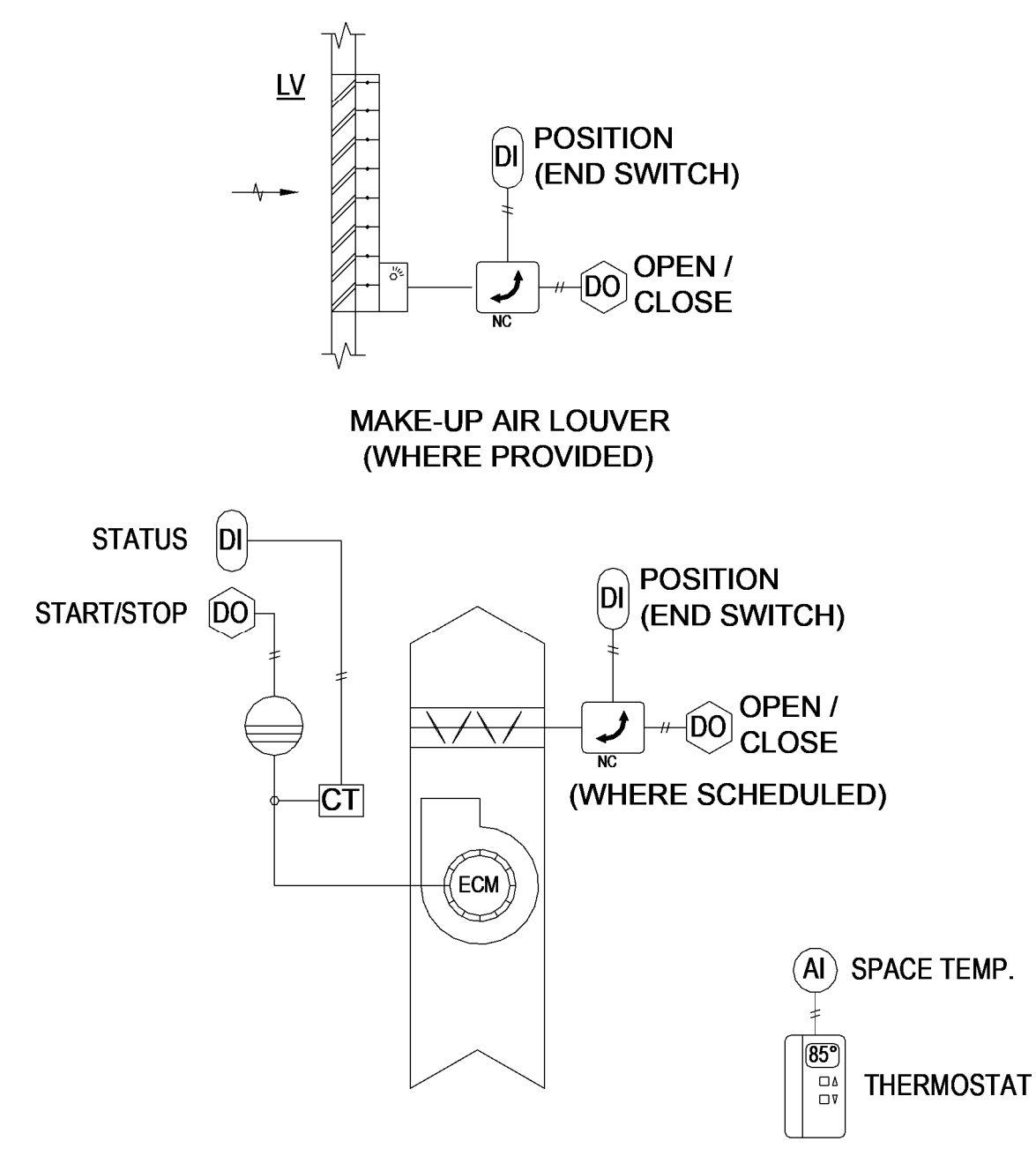
SAFETIES AND ALARMS:

AN ALARM SHALL ANNUNCIATE AT THE BAS IN THE EVENT OF THE FOLLOWING:

- MOTORIZED ISOLATION DAMPERS (WHERE PROVIDED): IF THE DAMPER FAILS TO OPEN OR CLOSE WITHIN 20 SECONDS (ADJ.) OF WHEN THE SYSTEM IS ENABLED OR DISABLED.
- EXHAUST FAN: IF THE FAN IS ENABLED AND STATUS IS NOT PROVEN WITHIN 20 SECONDS (ADJ.). FAN STATUS SHALL BE MONITORED BY A CURRENT TRANSDUCER.

2 EXHAUST FAN (SCHEDULED) - CONTROL DIAGRAM
NO SCALE

EF-04-T



SEQUENCE OF OPERATION: EXHAUST FAN (THERMOSTAT CONTROLLED)

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND TEMPERATURE SET POINTS AND OTHER APPLICABLE INFORMATION TO THE CONTROLLER. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS, THE CONTROLLER SHALL OPERATE USING ITS DEFAULT SET POINTS.

OPERATION:

ON A CALL FOR VENTILATION COOLING AS SENSED BY THE SPACE THERMOSTAT:

- THE VENTILATION SYSTEM SHALL BE ENABLED.
- THE MOTORIZED FAN ISOLATION DAMPER (WHERE PROVIDED) SHALL OPEN.
- THE MAKE-UP AIR DAMPER (WHERE PROVIDED) SHALL OPEN.
- WHEN THE ISOLATION DAMPERS ARE PROVEN OPEN THROUGH THE DAMPER END SWITCHES (MOTORIZED DAMPERS ONLY), THE FAN SHALL BE ENABLED AND SHALL OPERATE TO MAINTAIN THE SPACE TEMPERATURE SET POINT OF 80 DEG. F (ADJ.).

WHEN SPACE TEMPERATURE IS SATISFIED:

- THE FAN SHALL BE DISABLED
- THE MOTORIZED DAMPERS (WHERE PROVIDED) SHALL CLOSE.

SAFETIES AND ALARMS:

AN ALARM SHALL ANNUNCIATE AT THE BAS IN THE EVENT OF THE FOLLOWING:

- MOTORIZED ISOLATION DAMPERS (WHERE PROVIDED): IF A DAMPER FAILS TO OPEN OR CLOSE WITHIN 20 SECONDS (ADJ.) OF WHEN THE SYSTEM IS ENABLED OR DISABLED.
- EXHAUST FAN: IF THE FAN IS ENABLED AND STATUS IS NOT PROVEN WITHIN 20 SECONDS (ADJ.). FAN STATUS SHALL BE MONITORED BY A CURRENT TRANSDUCER.

3 EXHAUST FAN (THERMOSTAT) - CONTROL DIAGRAM
NO SCALE

EF-01-T EF-09-T
EF-06-T EF-10-T
EF-08-T EF-11-T

US Army Corps of Engineers®

04-28-2022

DATE	MARK	DESCRIPTION

DESIGNED BY: C. Borne	ISSUE DATE: 29 APR 2022	SOLICITATION NO.:	CONTRACT NO.:
DRAWN BY: C. Borne	CHECKED BY: R. Seay	SUBMITTED BY: CROMWELL AE	
CROMWELL			
US ARMY CORPS OF ENGINEERS CHARLESTON DISTRICT CHARLESTON, SOUTH CAROLINA 1300 East 6th Street Little Rock, AR 72202 501.372.2900 cromwell@con.usace.army.mil			

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC

MECHANICAL CONTROLS

SHEET ID

M-707

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

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SEQUENCE OF OPERATION: EXHAUST FAN (DOOR SENSOR CONTROLLED)

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL MONITOR THE FAN STATUS.

OCCUPIED MODE:

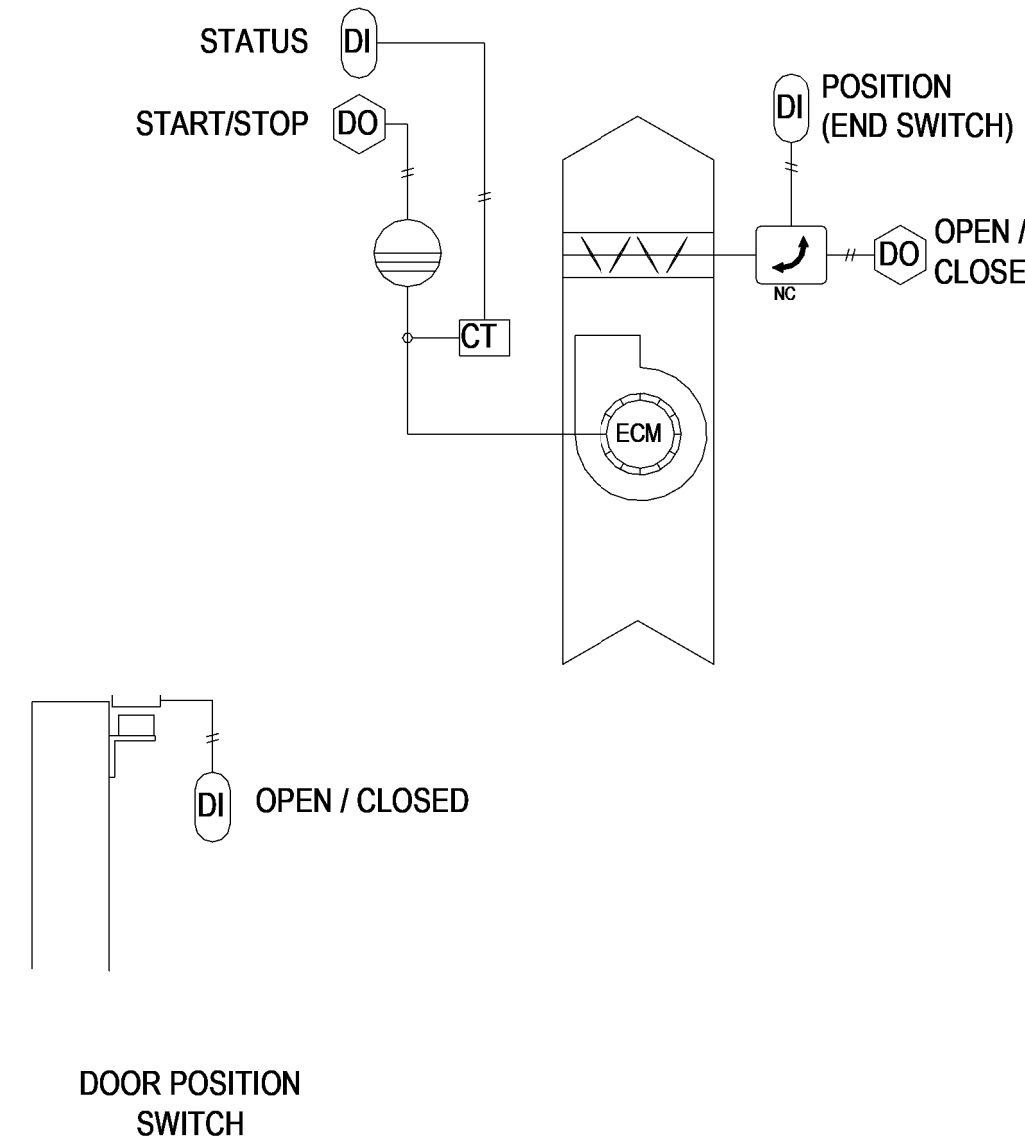
- WHEN THE SPACE IS OCCUPIED AS SENSED BY THE DOOR POSITION SENSOR:
- THE VENTILATION SYSTEM SHALL BE ENABLED.
 - THE MOTORIZED FAN ISOLATION DAMPER SHALL OPEN.
 - WHEN THE ISOLATION DAMPERS ARE PROVEN OPEN THROUGH THE DAMPER END SWITCHES, THE FAN SHALL BE ENABLED AND SHALL RUN CONTINUOUSLY.

OCCUPIED MODE:

- WHEN THE SPACE IS UNOCCUPIED AS SENSED BY THE DOOR POSITION SENSOR:
- THE FAN SHALL BE DISABLED
 - THE MOTORIZED DAMPERS (WHERE PROVIDED) SHALL CLOSE.

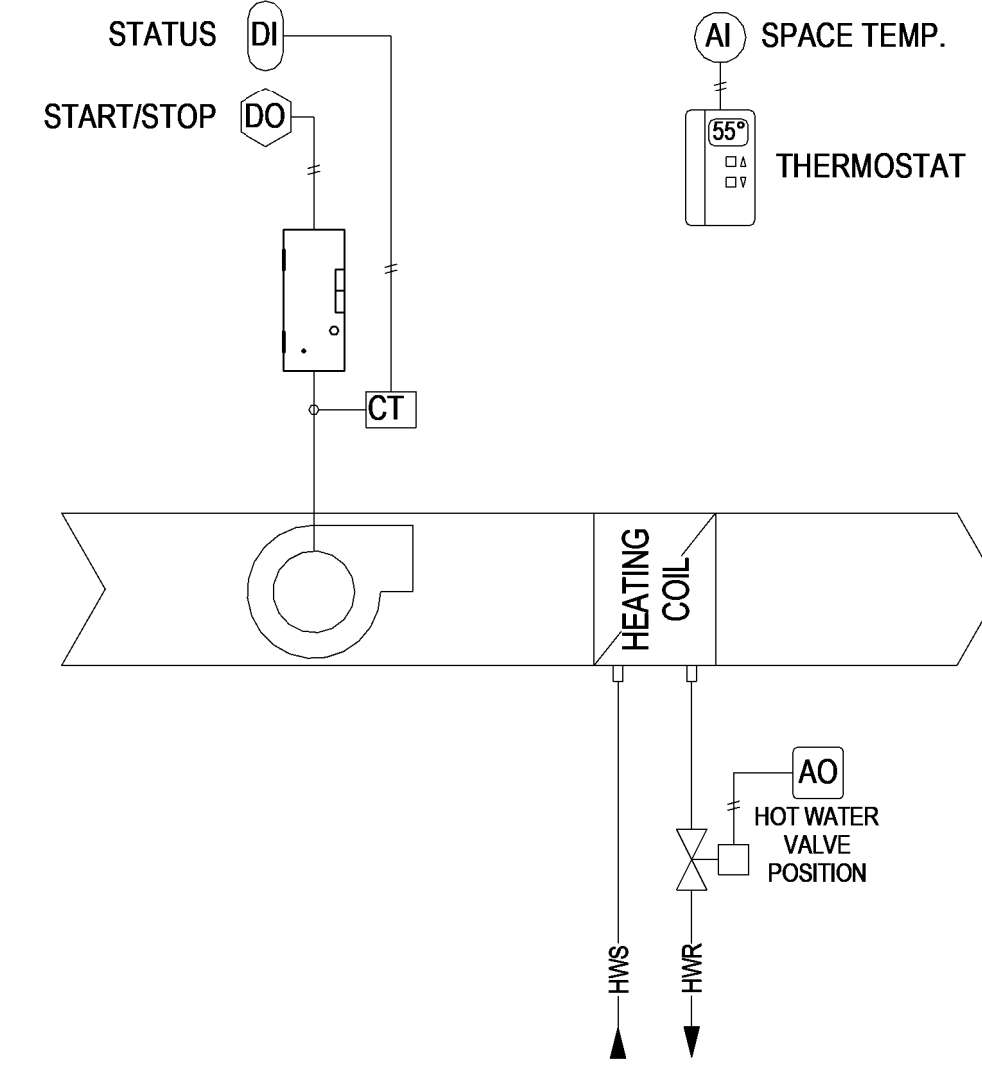
SAFETIES AND ALARMS:

- AN ALARM SHALL ANNUNCIATE AT THE BAS IN THE EVENT OF THE FOLLOWING:
- MOTORIZED ISOLATION DAMPERS (WHERE PROVIDED): IF A DAMPER FAILS TO OPEN OR CLOSE WITHIN 20 SECONDS (ADJ.) OF WHEN THE SYSTEM IS ENABLED OR DISABLED.
 - EXHAUST FAN: IF THE FAN IS ENABLED AND STATUS IS NOT PROVEN WITHIN 20 SECONDS (ADJ.). FAN STATUS SHALL BE MONITORED BY A CURRENT TRANSDUCER.



1 EXHAUST FAN (DOOR SWITCH) - CONTROL DIAGRAM
NO SCALE

EF-02-T
EF-03-T



SEQUENCE OF OPERATION: HOT WATER CABINET AND UNIT HEATERS

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARM-UP, OCCUPIED/UNOCCUPIED AND HEAT/COOL MODES. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS

SPACE TEMPERATURE SHALL BE CONTROLLED BY A SPACE THERMOSTAT

HEATING MODE:

ON A RISE BELOW SPACE TEMPERATURE SETPOINT THE UNIT HEATER FAN SHALL CYCLE ON AND THE HOT WATER VALVE WILL MODULATE TO MAINTAIN SPACE TEMPERATURE TO SETPOINT. WHEN THE SETPOINT IS REACHED, THE HOT WATER VALVE WILL CLOSE AND THE UNIT HEATER FAN SHALL CYCLE OFF.

SPACE HEATING SETPOINT: 55°F (ADJ.)

IF THE SPACE TEMPERATURE DROPS BELOW 50°F (ADJ.), A LOW TEMPERATURE ALARM WILL BE SENT TO THE BAS.

2 HOT WATER CABINET AND UNIT HEATER - CONTROL DIAGRAM
NO SCALE

SEQUENCE OF OPERATION: ENERGY RECOVERY VENTILATOR

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER AN OCCUPIED OR UNOCCUPIED COMMAND. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS, THE CONTROLLER SHALL OPERATE IN THE OCCUPIED MODE.

OCCUPIED:

DURING OCCUPIED PERIODS:

- THE EXHAUST FAN AND THE SUPPLY FANS SHALL RUN CONTINUOUSLY.
- THE CHILLED WATER CONTROL VALVE AND THE HEATING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN OCCUPIED SPACE TEMPERATURE OF 78 DEG. F (ADJ.) COOLING AND 68 DEG. F HEATING (ADJ.).

UNOCCUPIED:

DURING UNOCCUPIED PERIODS:

- THE EXHAUST AIR BYPASS DAMPER WILL BE OPEN.
- THE EXHAUST FAN AND THE SUPPLY FAN SHALL CYCLE ON A CALL FOR HEATING OR COOLING.
- THE CHILLED WATER CONTROL VALVE AND THE HEATING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN UN OCCUPIED SPACE TEMPERATURE OF 84-DEG F COOLING AND 60-DEG F HEATING (ADJUSTABLE).

MORNING WARM-UP:

DURING OPTIMAL START, IF THE AVERAGE ZONE TEMPERATURE IS 1.5 DEG. F (ADJ.) OR MORE BELOW THE OCCUPIED HEATING SET POINT, A MORNING WARM-UP SEQUENCE WILL BE ACTIVATED. THE SUPPLY FAN WILL START AND THE PRE-HEAT VALVE WILL MODULATE TO RETURN THE SPACE TO OCCUPIED HEATING SET POINT.

MORNING COOL-DOWN:

DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SET POINT, A MORNING COOL-DOWN SEQUENCE WILL BE ACTIVATED. THE SUPPLY FAN WILL START AND THE COOLING COIL VALVE WILL MODULATE TO RETURN THE SPACE TO OCCUPIED COOLING SET POINT.

UNOCCUPIED OVERRIDE: IF THE SPACE IS DETERMINED TO BE OCCUPIED BY

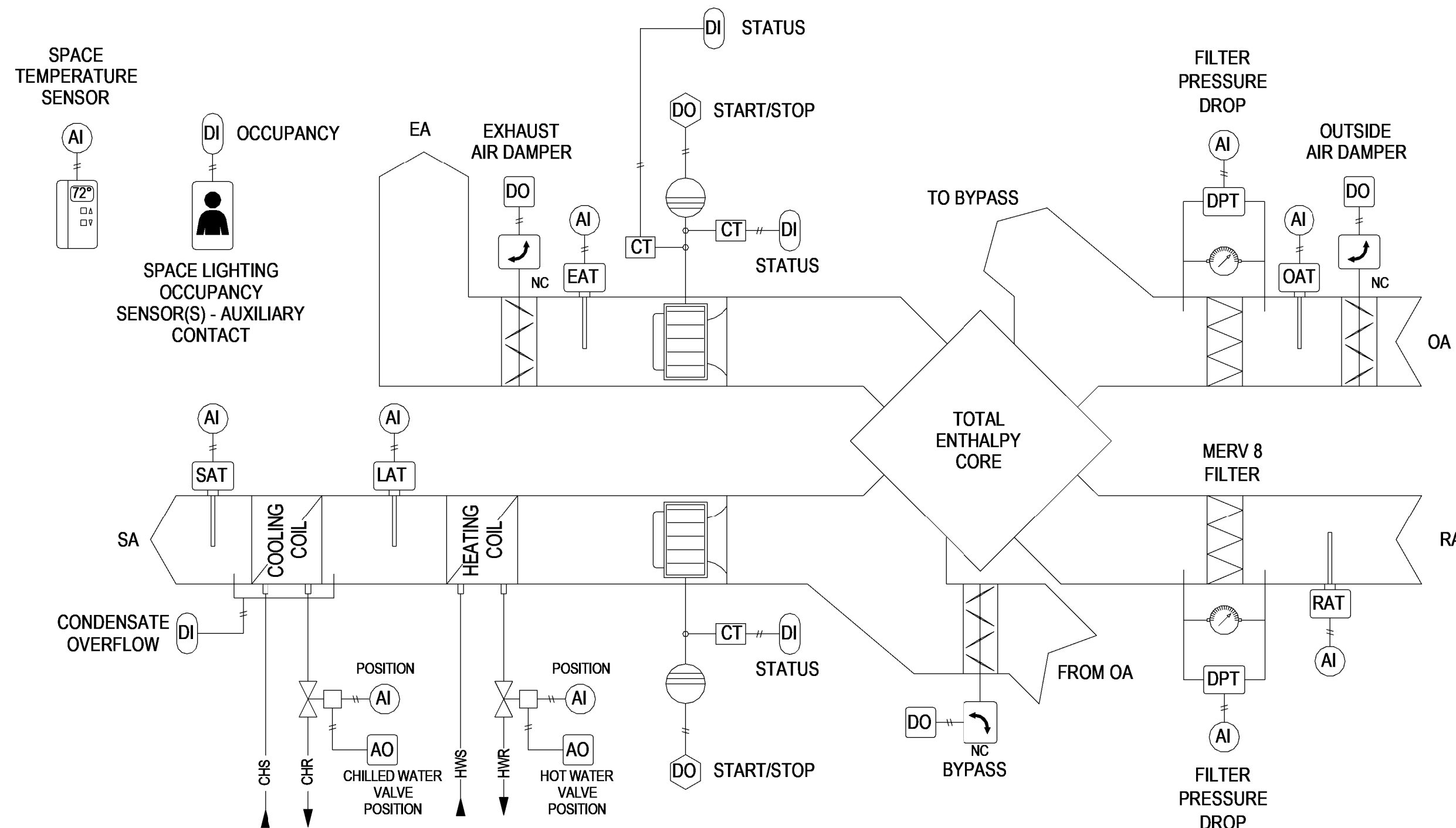
THE AUXILIARY CONTACT ON THE SPACE LIGHTING OCCUPANCY SENSORS, THE SYSTEM SHALL TEMPORARILY OVERRIDE INTO OCCUPIED MODE. THE SYSTEM SHALL REMAIN ON FOR 15 MINUTES (ADJ.) AFTER THE SPACE IS DETERMINED TO BE UNOCCUPIED BY THE OCCUPANCY SENSOR.

SAFETIES:

FAN STATUS: IF ANY FAN FAILS TO PROVE STATUS FOR 30 SECONDS (ADJ.) AS SENSED THROUGH THE CURRENT TRANSDUCER, THE FANS WILL BE COMMANDED OFF AN ALARM WILL BE SENT TO THE BAS. A MANUAL RESET IS REQUIRED TO RESTART THE FANS.

CONDENSATE OVERFLOW MONITORING: IF THE CONDENSATE LEVEL REACHES THE TRIP POINT AS DETECTED BY THE FLOAT SWITCH IN THE AUXILIARY DRAIN PAN, A CONDENSATE OVERFLOW DIAGNOSTIC SHALL ANNUNCIATE AT THE BAS. TO PREVENT THE CONDENSATE DRAIN PAN FROM OVERFLOWING AND CAUSING WATER DAMAGE TO THE BUILDING. THE FAN SHALL BE DISABLED AND THE CHILLED WATER VALVE SHALL CLOSE.

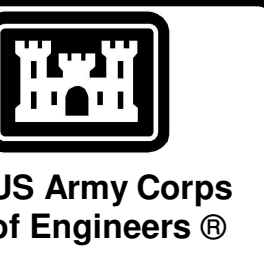
ALL ALARMS SHALL REPORT THROUGH THE BAS AND MUST BE MANUALLY RESET.



NOTE:
ANY CONTROL DEVICES NOT PROVIDED WITH THE EQUIPMENT BY THE EQUIPMENT MANUFACTURER ARE TO BE PROVIDED BY THE CONTROLS CONTRACTORS. COORDINATE WITH THE EQUIPMENT PROVIDER.

3 ERV SEQUENCE OF OPERATION
NO SCALE

ERV-01 / CC-ERV01 / HC-ERV01
ERV-02 / CC-ERV-02 / HC-ERV02



US Army Corps of Engineers®



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 29 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
SIZE: 1/8" x 1/4" x 1/8"	

US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

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NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
MECHANICAL CONTROLS

SHEET ID
M-708

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

MINI-SPLIT SYSTEMS (AH-02/CU-02, AH-04/CU-04):

EACH DUCTLESS SPLIT SYSTEM SHALL OPERATE BY A STAND-ALONE, WIRED ROOM THERMOSTAT.

CONDENSATE OVERFLOW MONITORING: IF THE CONDENSATE LEVEL REACHES THE TRIP POINT AS DETECTED BY THE FLOAT SWITCH IN THE AUXILIARY DRAIN PAN, A CONDENSATE OVERFLOW DIAGNOSTIC SHALL ANNUNCIATE AT THE BAS. TO PREVENT THE CONDENSATE DRAIN PAN FROM OVERFLOWING AND CAUSING WATER DAMAGE TO THE BUILDING. THE SYSTEM SHALL BE DISABLED.

KITCHEN GREASE HOOD VENTILATION SYSTEMS (KH-01/EF-05-T/MAU-01)

KITCHEN VENTILATION SYSTEM CONTROL SHALL BE STAND-ALONE AND NOT CONNECTED TO THE BAS. EXHAUST FAN AND MAKE-UP AIR FAN NORMAL OPERATION SHALL BE INTERLOCKED TO AND OPERATE AND VARY SPEED SIMULTANEOUSLY. THE FANS SHALL BE STARTED BY THE HOOD CONTROLLER. SEE "VARIABLE VOLUME KITCHEN HOOD CONTROL SYSTEMS" THIS SHEET FOR MORE INFORMATION REGARDING VARIABLE SPEED CONTROLS.

ON A DETECTION OF FIRE BY THE HOOD CONTROLS, THE EXHAUST FAN SHALL RUN. THE GAS SOLENOID SHUT-OFF VALVE FOR KITCHEN EQUIPMENT UNDER THE HOOD SHALL BE ACTIVATED.

MAIL ROOM:

SEE "MAIL ROOM SEQUENCE" ON SHEET MH102.

1 SEQUENCE OF OPERATION: STAND-ALONE SYSTEMS

NO SCALE

THE KITCHEN CONTROL SYSTEM

THE KITCHEN CONTROL SYSTEM SHALL BE A UL LISTED OUTLET CENTER WHICH SHALL CONSIST OF A NEMA-1 STAINLESS STEEL ENCLOSURE WITHIN A STAINLESS STEEL ENCLOSURE PANEL, PRINTED CIRCUIT BOARD (PCB), USER INTERFACE, HOOD, AUDIBLE ALARM, SENSOR(S) AND VARIABLE FREQUENCY DRIVE(S) (VFD) OR MOTOR STARTERS, WITH ROOM TEMPERATURE SENSORS AND FAN CONTROL THROUGH RELAYS OR 0-10 VDC SIGNALS. THE PCB SHALL BE CAPABLE OF CONTROLLING MULTIPLE EXHAUST AND SUPPLY FANS VIA VFDS OR ANALOG SIGNALS. THE CONTROL SYSTEM SHALL UTILIZE A COMBINED CONTROL PANEL AND HOOD LIGHT POWER CONNECTION WITH OPTIONS FOR 110-120V / 50-60HZ / 1PH INPUT VOLTAGE OR 220-240V / 50-60HZ / 1PH INPUT VOLTAGE, TO BE PROTECTED BY A 15 AMP BREAKER. THE CONTROL SYSTEM SHALL BE EQUIPPED WITH EITHER MODBUS OR BACNET MSTP BUILDING MANAGEMENT INTERFACING, AND ALSO BE ABLE TO CONTROL UP TO 8 DIFFERENT ECM FANS, ALONGSIDE A 3-PHASE MAKEUP AIR UNIT, WITHOUT THE NEED FOR ADDED EXPANSION BOARDS OR CONTROLLERS. STANDARD KITCHEN CONTROL ENCLOSURE FITTED WITH HANDLED, QUARTER-TURN, SLOTTED LATCHED DOORS, OR OPTIONAL PRISON PACKAGE CONFIGURATION WITH HANDLED, TAMPER-PROOF QUARTER TURN LATCHED DOORS.

THE USER INTERFACE SHALL BE A FULL COLOR TOUCH SCREEN WITH FAN AND LIGHT CONTROL, GAS VALVE RESET (OPTIONAL), AND BALANCING INTERFACING FOR PROPER KITCHEN FAN BALANCING. THE TOUCHSCREEN SHALL HAVE THE CAPABILITY TO SIMULTANEOUSLY CONTROL ALL FANS AND LIGHTS CONNECTED TO THE CONTROL PANEL WITH A SINGLE BUTTON. THE TOUCH SCREEN SHALL BE CONFIGURED TO PUSH FIT INTO A JUNCTION BOX, WITH NO VISIBLE/EXPOSED SCREWS.

IN THE EVENT OF THE FAILURE CONSISTING OF, BUT NOT LIMITED TO TEMPERATURE SENSOR(S), VFD(S) AND FIRE, THE TOUCH SCREEN WILL AUTOMATICALLY GO TO A FAULT PAGE, WHICH WILL DESCRIBE THE CURRENT FAULT. THE FAULT WILL REMAIN UNTIL THE FAILURE IS CORRECTED.

THE TOUCHSCREEN SHALL BE LIGHTED, FULL COLOR, AND UTILIZE SIMPLE PLUG AND PLAY CONNECTIONS. TOUCHSCREEN SHALL BE MOUNTED ON THE EXHAUST HOOD, A UTILITY CABINET ON THE HOOD OR WALL, OR SHIPPED LOOSE FOR REMOTE MOUNTING. IF TOUCHSCREEN IS SHIPPED LOOSE FOR REMOTE MOUNTING, IT SHALL BE PROVIDED ALONGSIDE OPTIONAL 50FT OR 100FT PLUG AND PLAY CAT5E CABLE FOR CONNECTION TO MAIN CONTROL PCB. ALL TOUCHSCREEN MOUNTING OPTIONS WILL SET THE FULL COLOR TOUCHSCREEN CENTERED ON A STAINLESS-STEEL FACEPLATE, WITH NO VISIBLE SCREWS OR FASTENERS ON THE FACEPLATE.

VARIABLE VOLUME SYSTEM OPERATION

THE VARIABLE VOLUME KITCHEN CONTROLS SHALL UTILIZE RESISTIVE TYPE TEMPERATURE SENSORS THAT ARE MOUNTED IN THE CAPTURE TANK OF THE HOOD TO MONITOR EXHAUST AIR TEMPERATURES, AND AN OPTIONAL ROOM TEMPERATURE SENSOR, SHIPPED LOOSE, TO BE INSTALLED TO DETECT AMBIENT AIR TEMPERATURES IN THE KITCHEN SPACE. TEMPERATURE SENSORS SHALL BE MADE OF STAINLESS STEEL AND SHALL BE INSTALLED IN A UL APPROVED COUPLING.

THE SYSTEM SHALL BE CAPABLE OF SERVING AS A CODE COMPLIANT AUTO START-UP CONTROL TO AUTOMATICALLY START THE FANS DURING COOKING OPERATIONS. AUTO START-UP OPERATION IS CONTROLLED BY THE MEASUREMENT OF AN EXCESS OFFSET TEMPERATURE BETWEEN THE EXHAUST TEMPERATURE CAUSED BY COOKING AND THE AMBIENT ROOM TEMPERATURE IN THE KITCHEN (DEFAULT OFFSET TEMPERATURE: 10°F, ADJUSTABLE). IF NOT EQUIPPED WITH A ROOM TEMPERATURE SENSOR, AUTO START-UP OPERATION SHALL BE CONTROLLED BY THE MEASUREMENT OF AN EXCESS OFFSET TEMPERATURE BETWEEN THE EXHAUST TEMPERATURE CAUSED BY COOKING AND THE CONSTANT, PRESET ROOM TEMPERATURE (DEFAULT PRESET ROOM TEMPERATURE SET POINT: 75°F, ADJUSTABLE. DEFAULT OFFSET TEMPERATURE: 10°F, ADJUSTABLE. DEFAULT AUTO START-UP INITIATES AT 85°F AS MEASURED BY THE HOOD TEMPERATURE SENSOR(S)). IF ANY FAN(S) ARE ACTIVATED THROUGH THE AUTO START-UP OPERATION, THE FAN(S) WILL NOT SHUT OFF AUTOMATICALLY UNTIL THE MEASURED HOOD TEMPERATURE(S) REMAIN 5° F (ADJUSTABLE) BELOW THE ROOM TEMPERATURE (PRESET OR ACTUAL) FOR THE LENGTH OF THE HYSTERESIS TIMER OF 5 MINUTES (ADJUSTABLE).

AFTER FAN INITIATION IS TRIGGERED, EITHER MANUALLY, THROUGH THE TOUCHSCREEN, OR THROUGH THE AUTO START-UP OPERATION, THE CONTROLLER SHALL MODULATE THE SPEED OF THE FANS VIA VFD(S) OR ANALOG SIGNAL(S), FROM MAXIMUM SPEED DOWN TO A MINIMUM SPEED PERCENTAGE (MINIMUM SPEED TO BE DETERMINED BY BUILDING TEST AND BALANCE, MINIMUM SPEED IS FACTORY DEFAULTED TO 50%). AFTER FAN INITIATION IS TRIGGERED, THE INITIAL ACTIVATION TEMPERATURE IS RECORDED AS THE ROOM TEMPERATURE AT ACTIVATION PLUS THE OFFSET TEMPERATURE OF 10°F (ADJUSTABLE). IF NOT EQUIPPED WITH A ROOM TEMPERATURE SENSOR, THE ACTIVATION TEMPERATURE SHALL BE RECORDED AS THE PRESET ROOM TEMPERATURE PLUS THE OFFSET TEMPERATURE (DEFAULT PRESET ROOM TEMPERATURE SET POINT: 75°F (ADJUSTABLE), DEFAULT ACTIVATION TEMPERATURE SHALL BE 85°F AS MEASURED BY THE HOOD TEMPERATURE SENSOR(S)). SPEED MODULATION OF THE FANS SHALL BE CONTROLLED THROUGH THE DIFFERENCE BETWEEN ACTIVATION TEMPERATURE AND THE HIGHEST CURRENT TEMPERATURE RECORDED AT THE HOOD TEMPERATURE SENSOR(S), MINIMUM FAN SPEED SHALL OCCUR WHEN THE CURRENT HOOD TEMPERATURE EQUALS THE ACTIVATION TEMPERATURE, AND MAXIMUM FAN SPEED SHALL OCCUR WHEN THE CURRENT HOOD TEMPERATURE IS EQUAL TO OR EXCEEDS THE ACTIVATION TEMPERATURE PLUS THE MODULATION TEMP RANGE (MODULATION TEMP RANGE DEFAULT: 30°F, ADJUSTABLE). SPEED CONTROL SHALL BE CONTROLLED THROUGH VFD(S) OR ANALOG SIGNAL(S) SHALL ALLOW MODULATION OF THE FAN SPEEDS. THE CONTROLLER MUST BE COMPATIBLE WITH MODULATING TURNDOWN OF UP TO 50% OF MAXIMUM FAN SPEED. UPON PRESSING THE "MAX FAN" BUTTON, EXHAUST FAN SPEEDS SHALL GO TO MAXIMUM SPEED FOR 10 MINUTES (ADJUSTABLE), OR UNTIL THE "MAX FAN" BUTTON IS PRESSED AGAIN, WHICH SHALL RETURN THE SYSTEM TO FULL TEMPERATURE CONTROL.

VARIABLE FREQUENCY DRIVES SHALL BE MOUNTED IN THE CONTROL ENCLOSURE, A UTILITY CABINET, OR AT THE EXHAUST/SUPPLY FAN ITSELF. IF VARIABLE FREQUENCY DRIVES ARE MOUNTED WITHIN THE CONTROL ENCLOSURE, ENCLOSURE SHALL BE EQUIPPED WITH A COOLING FAN AND LOUVER TO FACILITATE VENTILATION FOR THE VARIABLE FREQUENCY DRIVES. VARIABLE DRIVES SHALL PROVIDE THERMAL OVERLOAD PROTECTION TO FANS AND ELIMINATE THE NEED FOR MAGNETIC STARTERS FOR 3 PHASE MOTORS. TO ENSURE PROPER BUILDING PRESSURIZATION, THE SUPPLY FANS SHALL RESPOND TO CHANGES IN THE EXHAUST FANS SPEEDS. THE SPEED OF THE ASSOCIATED SUPPLY FAN(S) IS EITHER DETERMINED BY THE WEIGHTED AVERAGE PERCENT SPEED OF THAT SUPPLY FAN(S) ASSOCIATED EXHAUST FAN(S) (DEFAULT) OR IS CONTROLLED BY MAINTAINING THE ORIGINAL DESIGN EXHAUST/SUPPLY CFM DIFFERENTIAL.

2 VARIABLE VOLUME KITCHEN HOOD CONTROL SYSTEM

NO SCALE

DEMAND CONTROL VENTILATION - ZONE LEVEL VENTILATION REQUIREMENTS

Zone ventilation requirements shall be determined using one of the following methods:
- Time of Day Scheduling
- Occupancy Sensor
- CO2 Sensor

TIME OF DAY SCHEDULING

The BAS shall include a time-of-day schedule to indicate whether a zone is normally occupied or unoccupied. When the schedule indicates that the zone is normally unoccupied, the required outdoor airflow for the zone (Voz) shall be zero. When the schedule indicates that the zone is normally occupied, the required outdoor airflow for the zone shall equal the design outdoor airflow (Voz-design, based on design occupancy), unless the zone is equipped with an occupancy sensor and/or a carbon dioxide (CO) sensor.

OCCUPANCY SENSOR

For those zones equipped with an occupancy sensor, the required outdoor airflow for the zone (Voz) shall be continuously determined based on whether people are present or not. When the occupancy sensor indicates that people are present in the zone, the required outdoor airflow shall equal the design outdoor airflow (Voz-design). When the occupancy sensor indicates that no people are present in the zone, the required outdoor airflow shall equal the "occupied standby" outdoor airflow (Voz-standby).

CO2 SENSOR

For those zones equipped with a CO2 sensor, the required outdoor airflow for the zone (Voz) shall be continuously calculated using the measured CO2 concentration in the zone using:

$$V_{OZ} = \left(\frac{C_{s-actual} - C_{s-min}}{C_{s-design} - C_{s-min}} \right) \times (V_{oz-design} - V_{oz-min}) + V_{oz-min}$$

where,
Voz = current required outdoor airflow for the zone
Voz-design = zone outdoor airflow at design population
Voz-min = minimum required zone outdoor airflow
Cs-actual = current CO2 concentration in the zone
Cs-design = zone CO2 concentration that corresponds to Voz-design
Cs-min = zone CO2 concentration that corresponds to Voz-min

The required zone outdoor-air fraction (Zpz) shall be continuously calculated for each VAV terminal zone by dividing the current (calculated) required outdoor airflow by the current (measured) primary airflow being delivered to the zone using:

$$Z_{pz} = V_{oz} / V_{pz}$$

where,
Voz = current required outdoor airflow for the zone
Vpz = current primary airflow for the zone

The BAS shall communicate the maximum allowable zone outdoor-air fraction (Max Z) to the VAV controllers. If the calculated Zpz for a zone is greater than Max Z, the VAV controller shall increase the primary airflow (Vpz) delivered to the zone, which will have the result of decreasing Zpz for that zone. Max Z shall be equal to 1.0 whenever the airside economizer is disabled and the OA damper is wide open; otherwise, Max Z shall be equal to 0.70 (adj.).

The BAS shall regularly determine the highest zone outdoor-air fraction (Zpz), sum the outdoor airflow requirements (Voz) for all VAV terminal zones, and sum the current primary airflows (Vpz) for all VAV zones to determine the total system primary airflow (Vps). This information shall be used in Equation 6-8 and the equations from Appendix A of ASHRAE Standard 62.1-2010 to calculate the minimum required outdoor airflow for the system (Vot) using the following:

$$X_s = V_{ou} / V_{ps}$$

where,
Vou = sum of zone outdoor airflows (Voz)
Vps = sum of zone primary airflows (Vpz)

$$E_v = 1 + X_s - \max Z_{pz}$$

where,
max Zpz = highest zone outdoor-air fraction (Zpz)

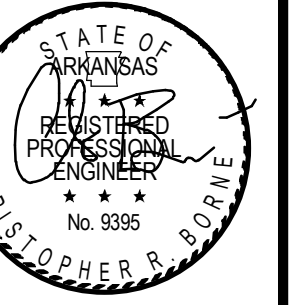
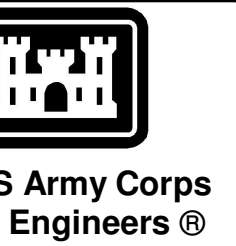
$$V_{ot} = V_{ou} / E_v$$

The minimum outdoor airflow (Vot) setpoint shall be recalculated every 30 minutes (adj), and communicated to the air-handling unit controller.

Prior to final system acceptance, a trend log of actual system operation will be provided to the engineer and owner. Logged operating conditions will include: highest zone outdoor-air fraction (Zpz), total system primary airflow (Vps), calculated outdoor airflow setpoint (Vot), and the actual measured outdoor airflow. These conditions will be logged at 30-minute intervals over a typical 48-hour period.

3 ZONE LEVEL MINIMUM VENTILATION REQUIREMENTS

NO SCALE



04-28-2022

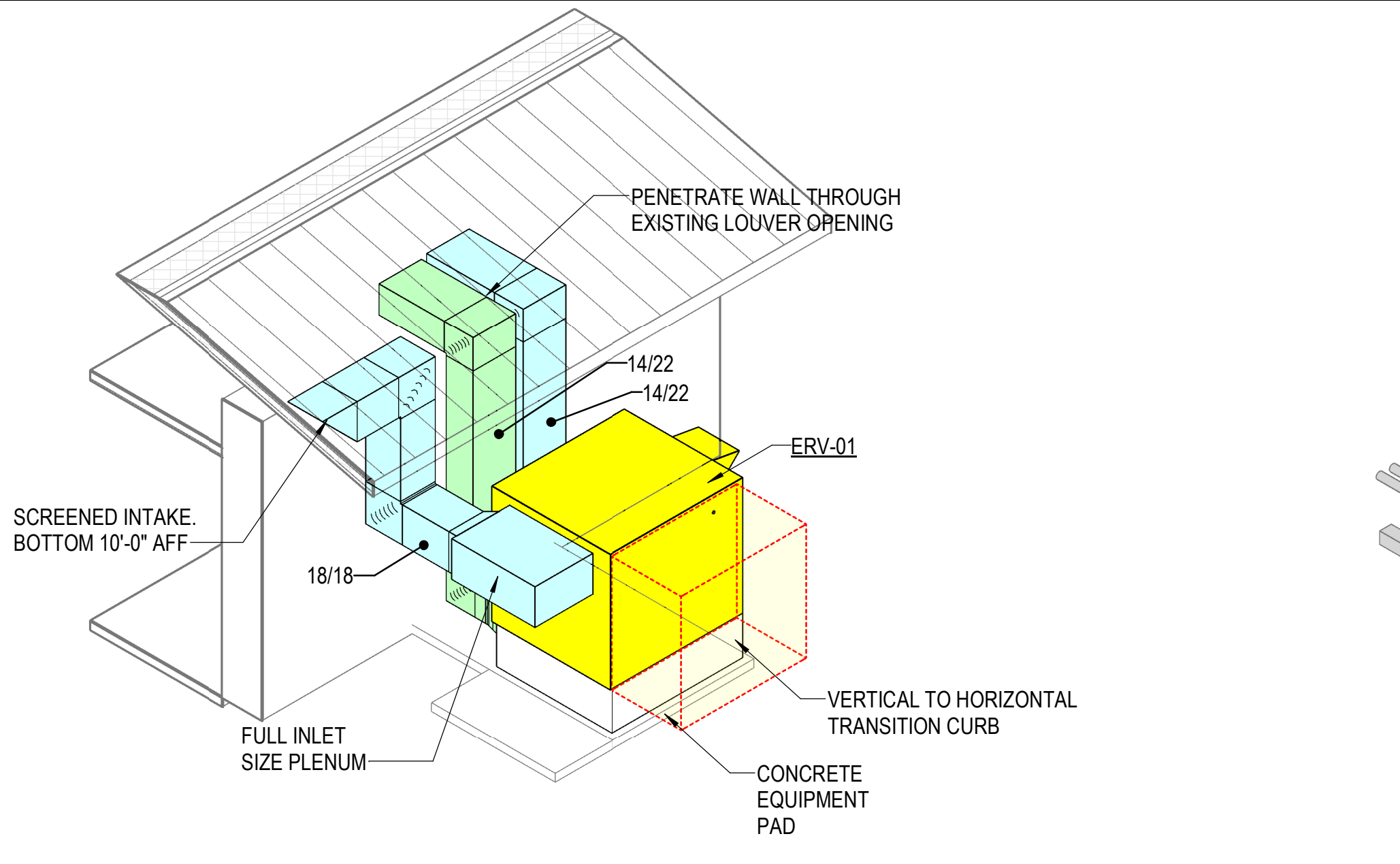
DATE	DESCRIPTION	MARK

DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022	SOLICITATION NO.:
DRAWN BY: C. Borne	CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE		DATE:
1300 East 6th Street Little Rock, AR 72202 501.372.2900 cromwellae.com		SIZE:

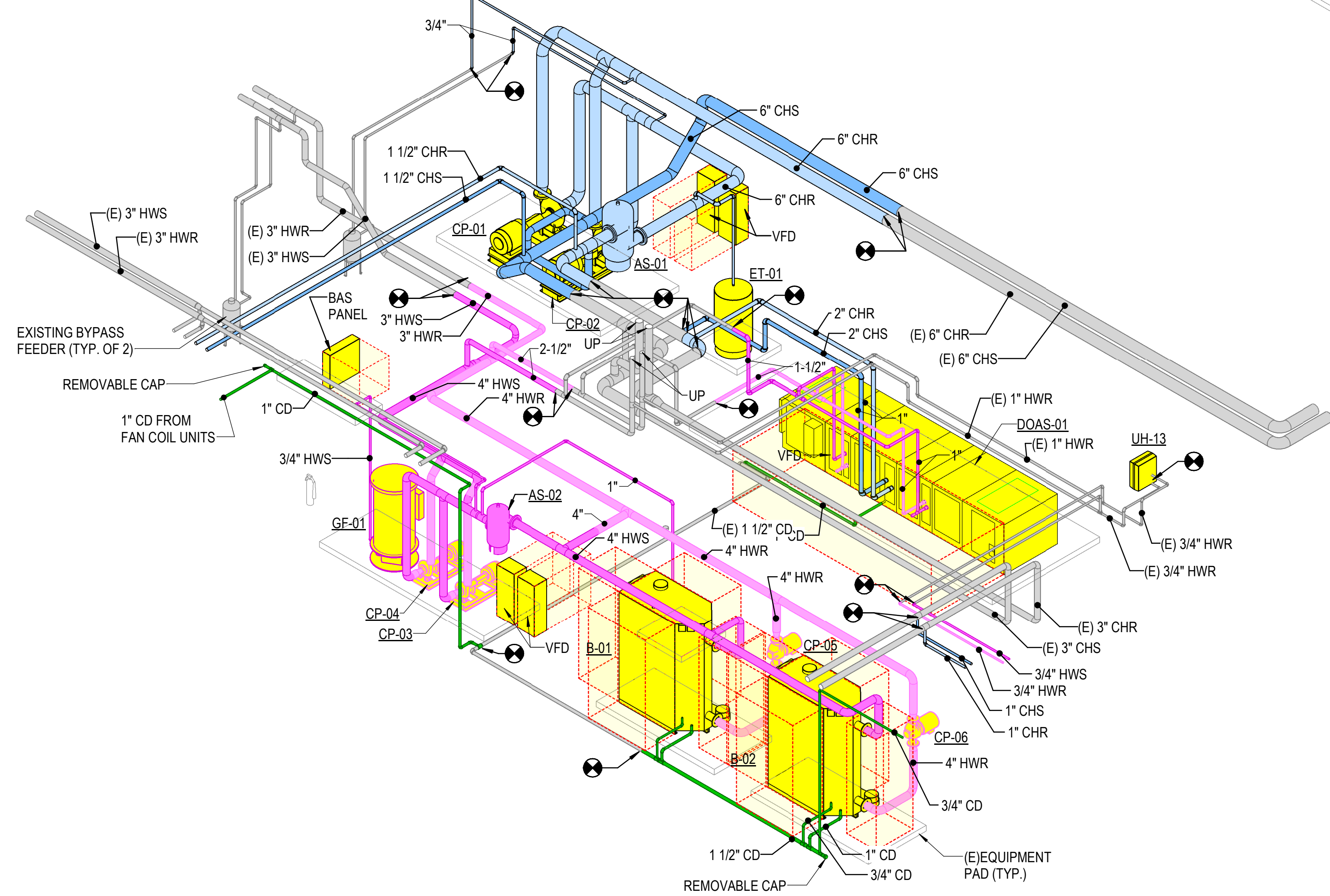
CROMWELL
MECHANICAL CONTROLS
WINTERVILLE, NC
NC026 HVAC-ELEC-PLUMB RESET

SHEET ID
M-709

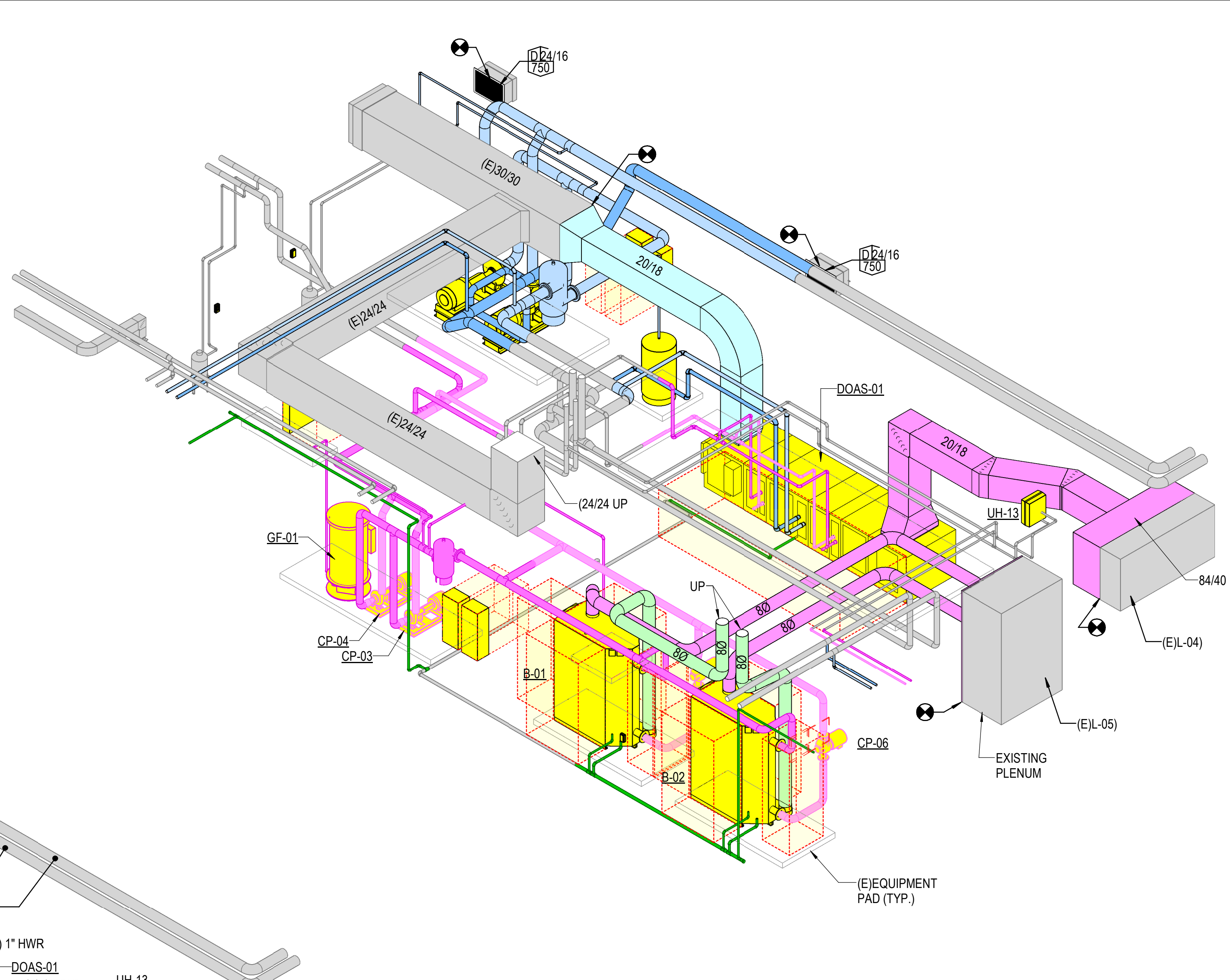
WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.



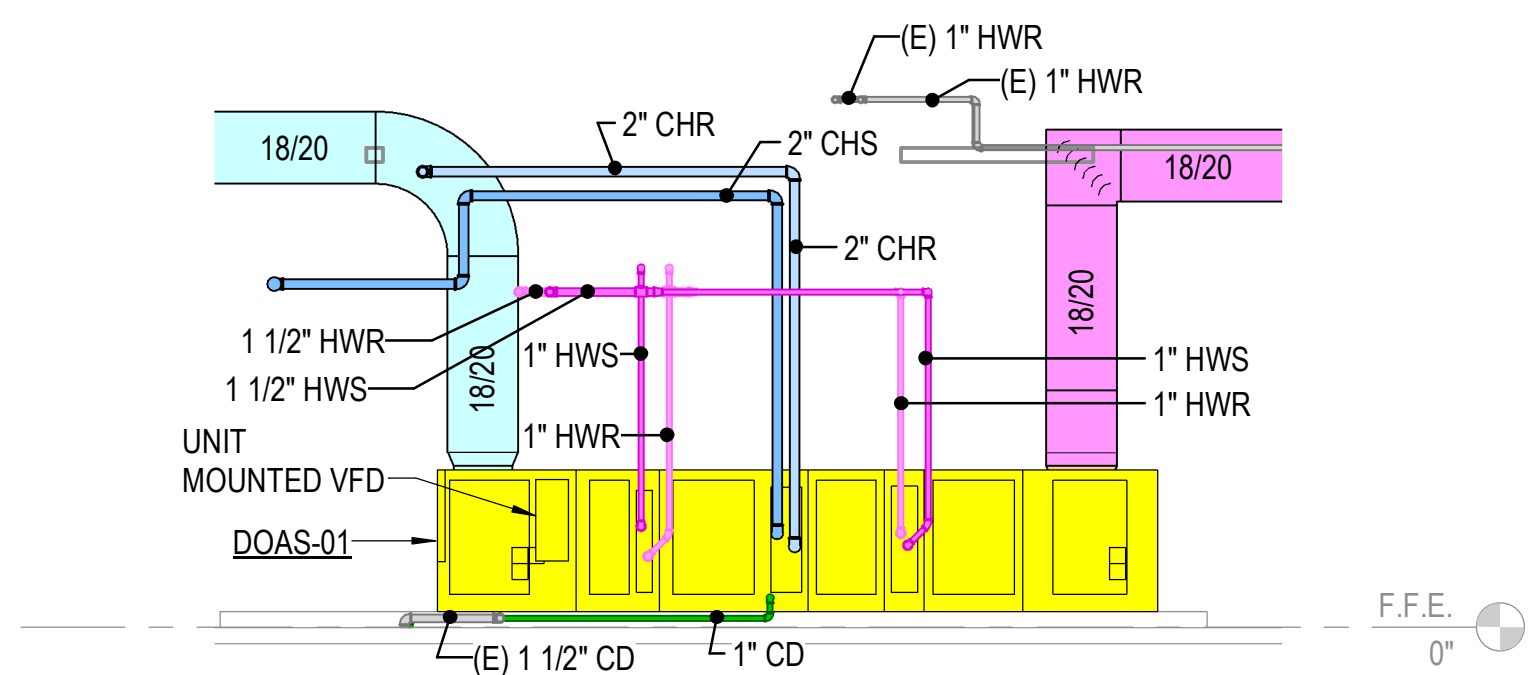
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NOT TO SCALE



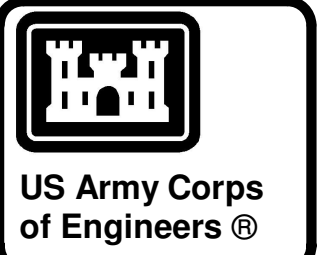
3 ISOMETRIC AT MECH ROOM S124 (PIPING ONLY)
NOT TO SCALE



2 ISOMETRIC AT MECH ROOM S124 (DUCT AND PIPING)
NOT TO SCALE



4 SECTION AT DOAS-01
1/4" = 1'-0"



04-28-2022

MARK	DESCRIPTION	DATE

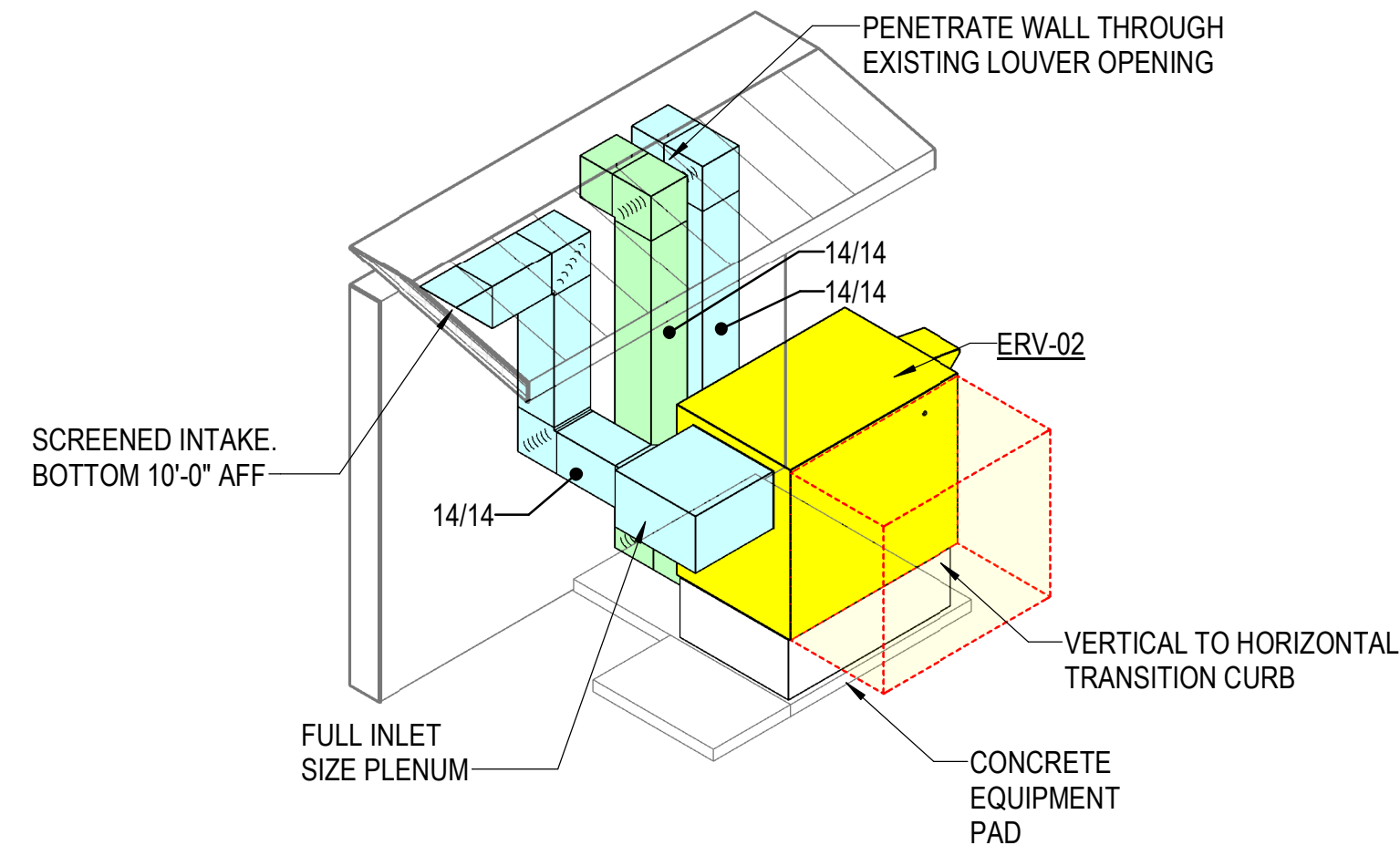
DESIGNED BY: C. Borne	ISSUE DATE: 28 APR 2022	DESIGNED BY: C. Borne	SOLICITATION NO.:
DRAWN BY: C. Borne	CHECKED BY: R. Seay	DRAWN BY: C. Borne	CONTRACT NO.:
SUBMITTED BY: CROMWELL A.E.	DATE:	SUBMITTED BY: CROMWELL A.E.	DATE:
1300 East 6th Street Little Rock, AR 72202 501.372.2900 cromwell.com ANSI D			

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
MECHANICAL SECTIONS AND ISOMETRICS

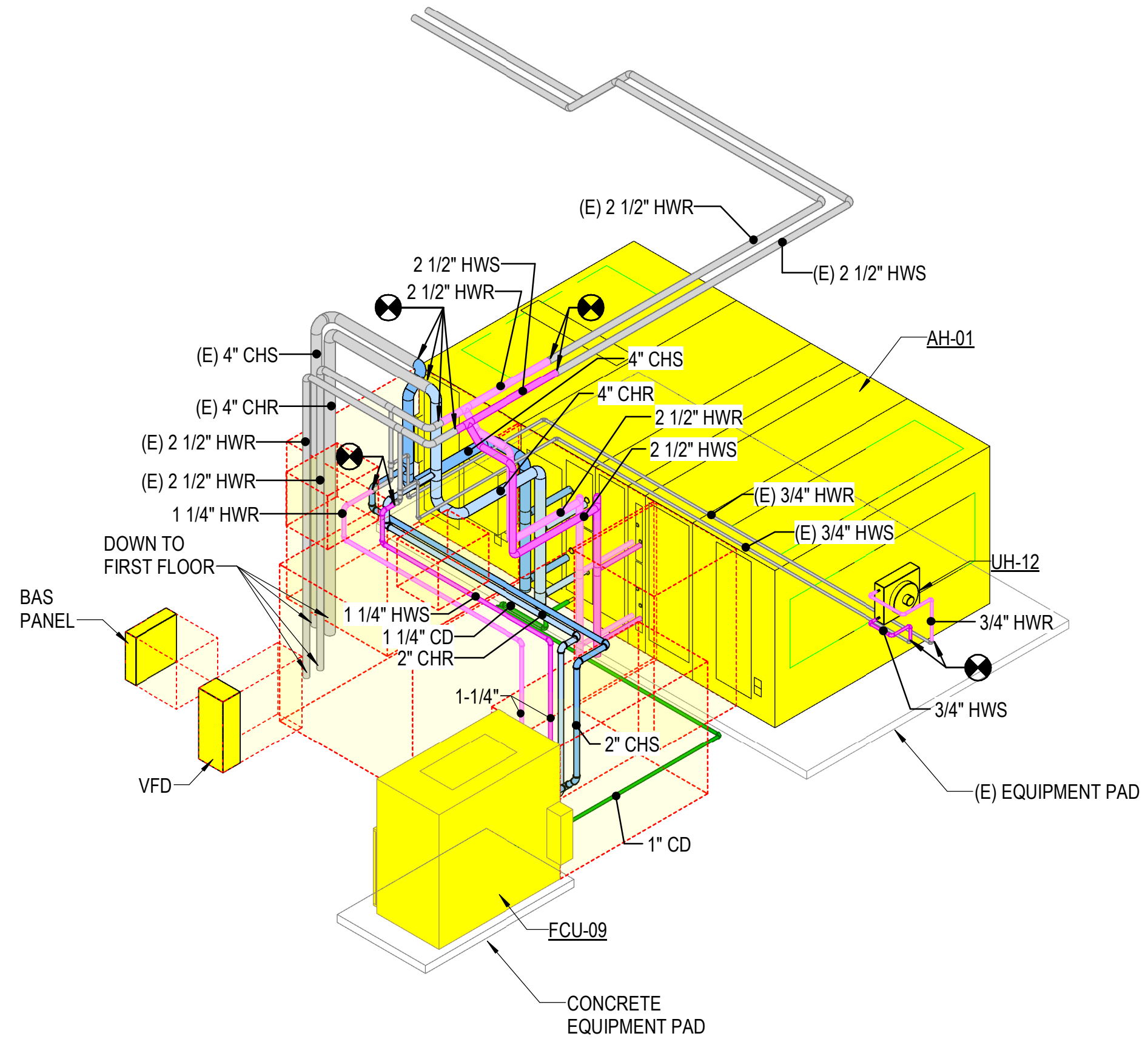
SHEET ID
M-901

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

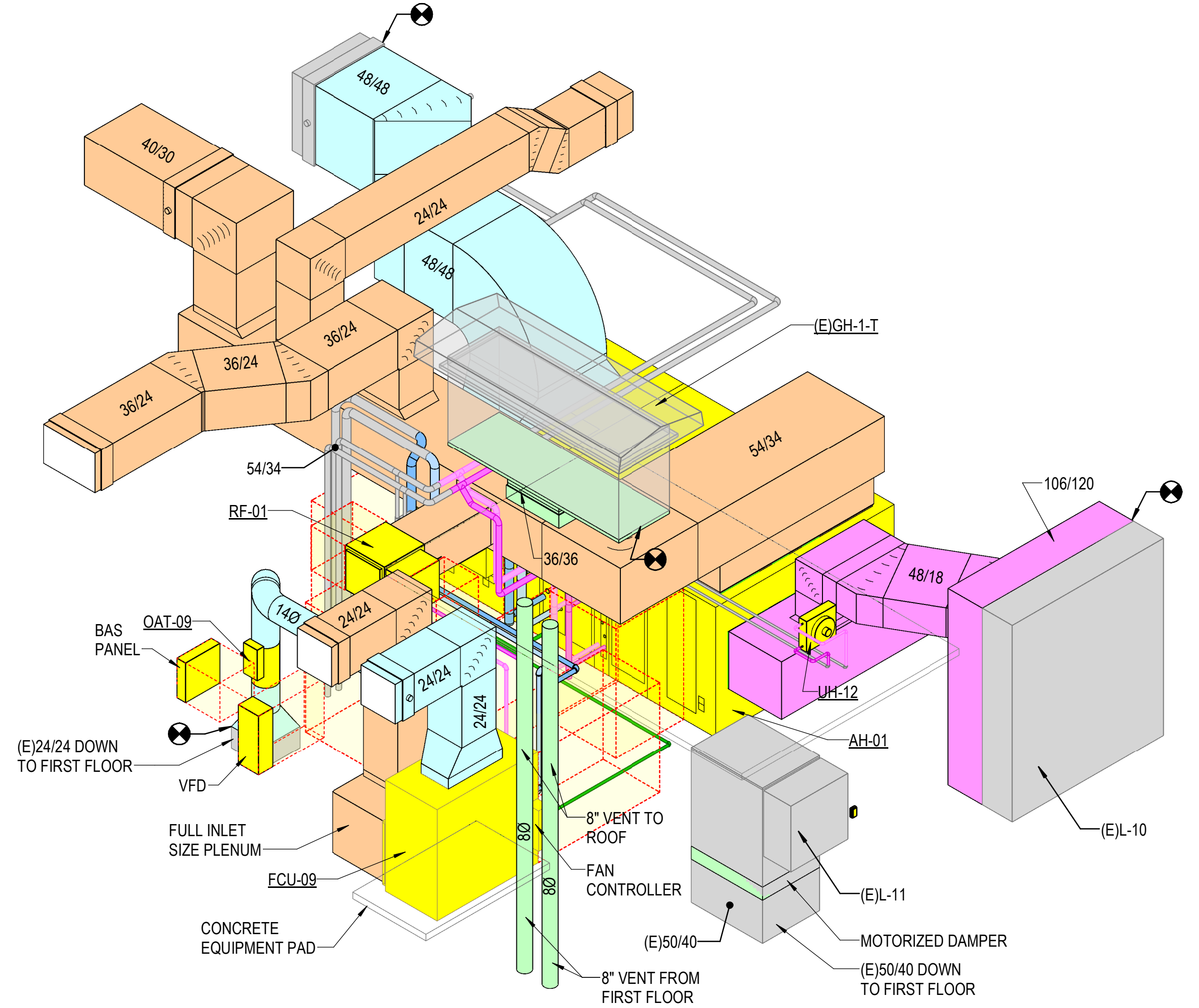
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M
L
K
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F
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D
C
B
A



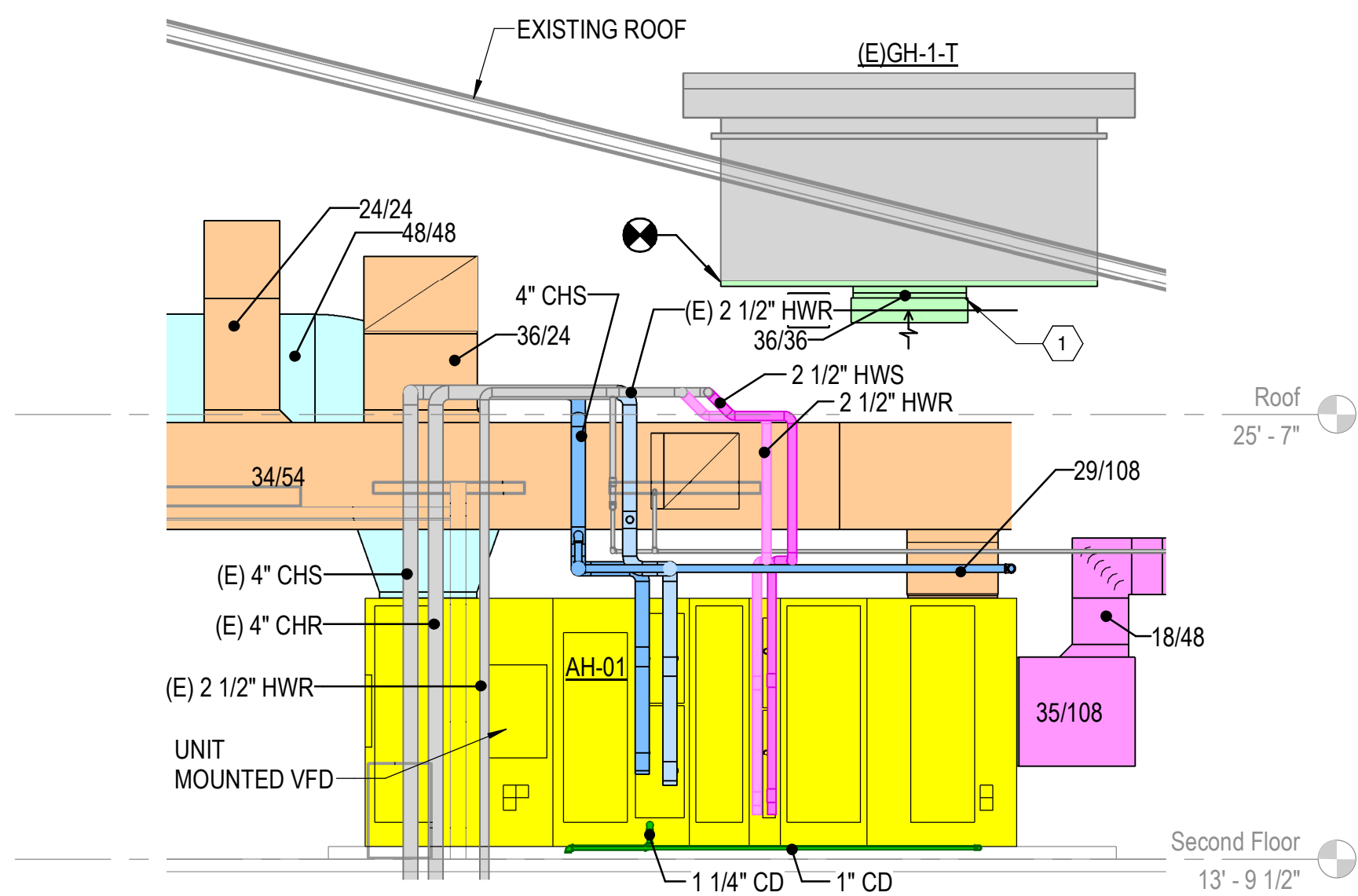
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NOT TO SCALE



3 ISOMETRIC AT MECH ROOM 209 (PIPING ONLY)
NOT TO SCALE



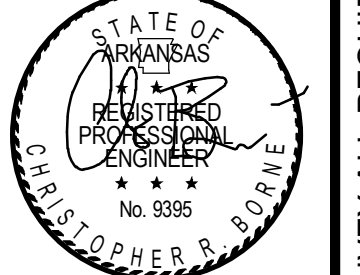
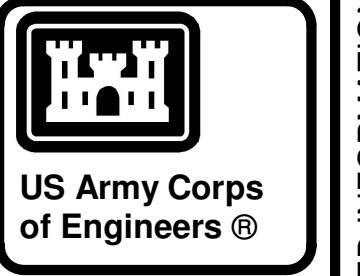
2 ISOMETRIC AT MECH ROOM 209 (DUCT AND PIPING)
NOT TO SCALE



4 SECTION AT AH-01
1/4" = 1'-0"

KEYED NOTES

- PROVIDE NEW 36/36 LEAKAGE CLASS 1A MOTORIZED RELIEF DAMPER IN NECK OF EXISTING RELIEF HOOD.



04-28-2022

MARK	DESCRIPTION	DATE

US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA

CROMWELL

1300 East 6th Street Little Rock, AR 72202
501.372.2900
cromwell@com.lanlisd

DESIGNED BY: C. Borne
DRAWN BY: C. Borne
CHECKED BY: R. Seay
SUBMITTED BY: CROMWELL AE

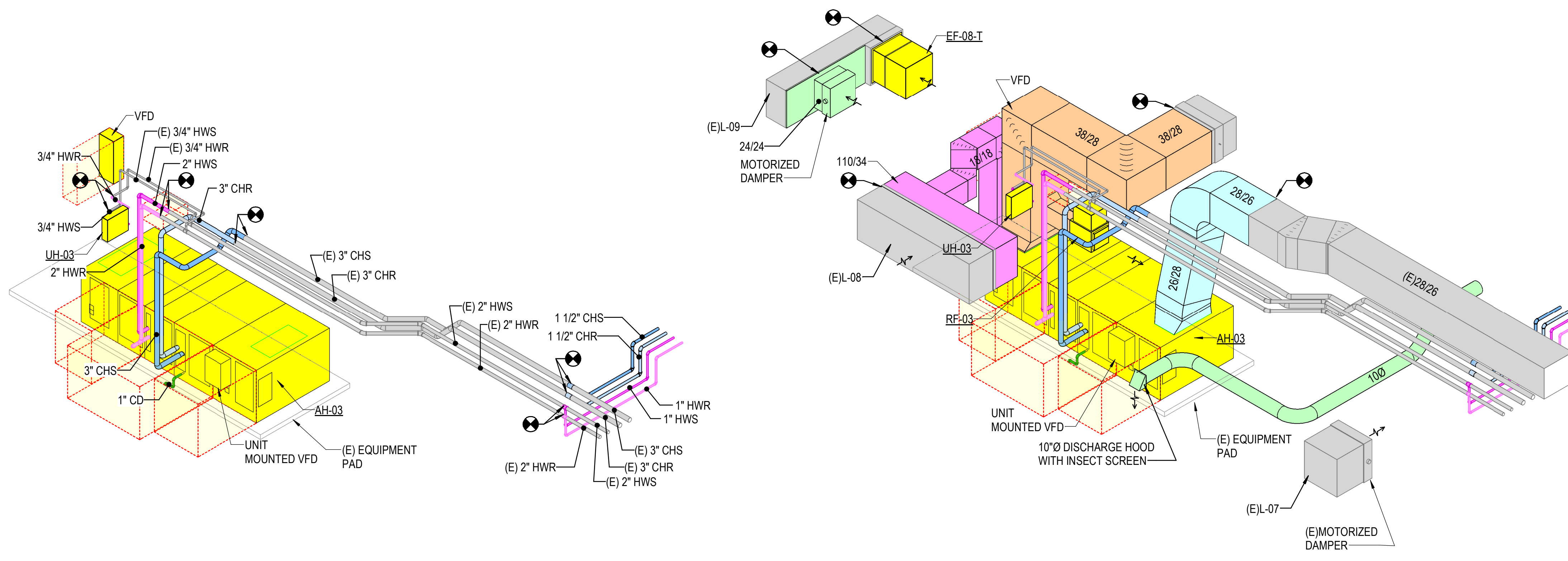
ISSUE DATE: 28 APR 2022
SOLICITATION NO.:
CONTRACT NO.:

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC

MECHANICAL SECTIONS AND ISOMETRICS

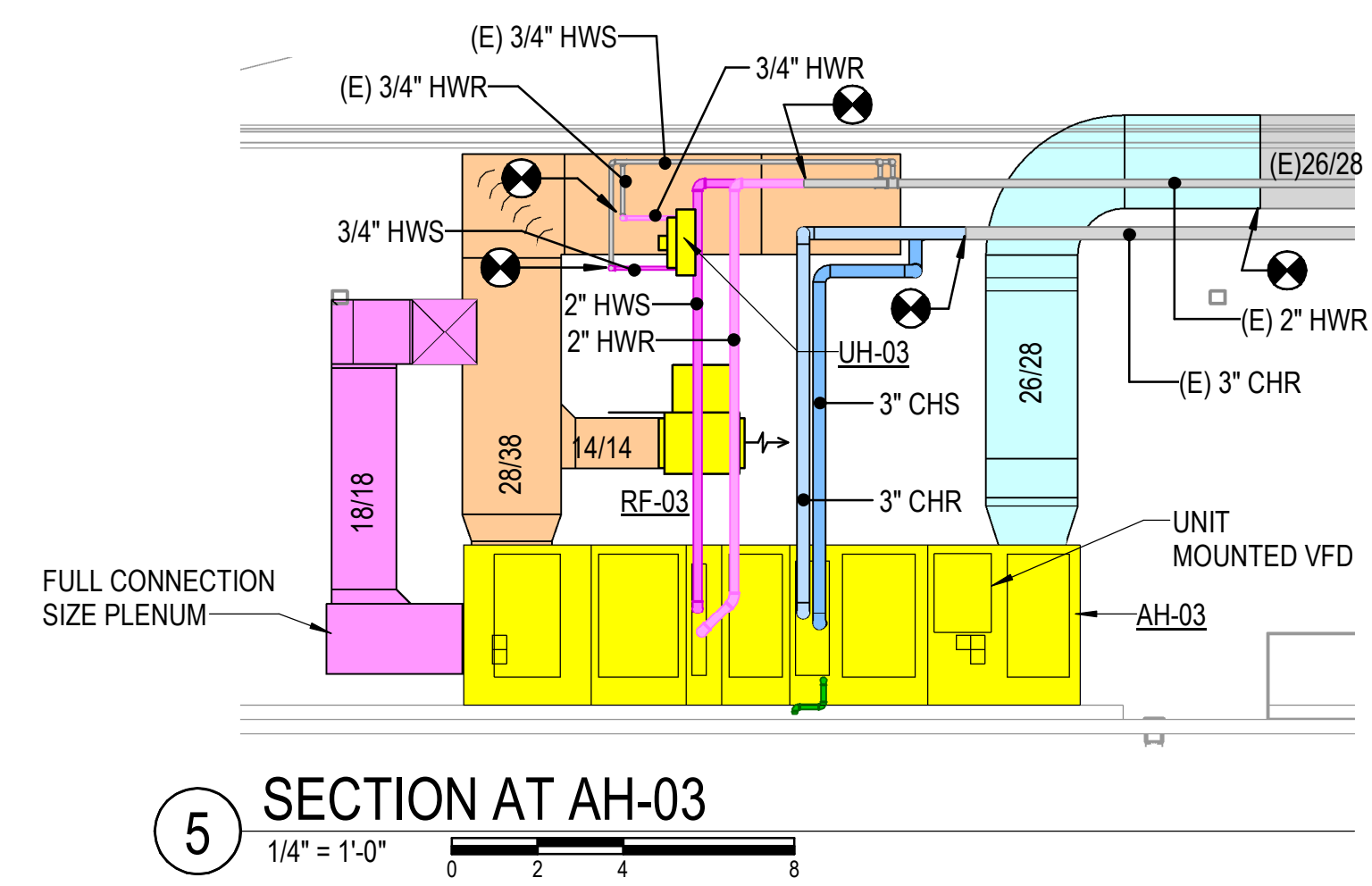
SHEET ID
M-902

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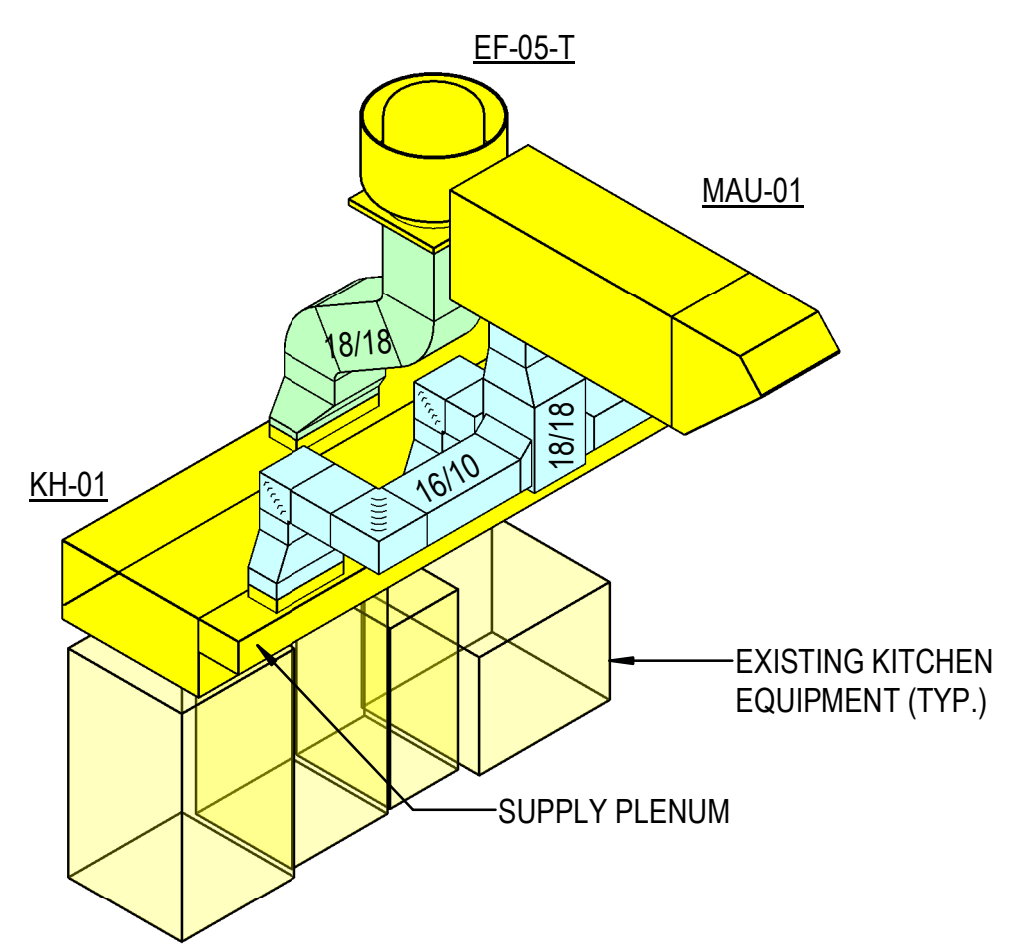


1 ISOMETRIC AT MECH ROOM 194 (PIPING ONLY)
NOT TO SCALE

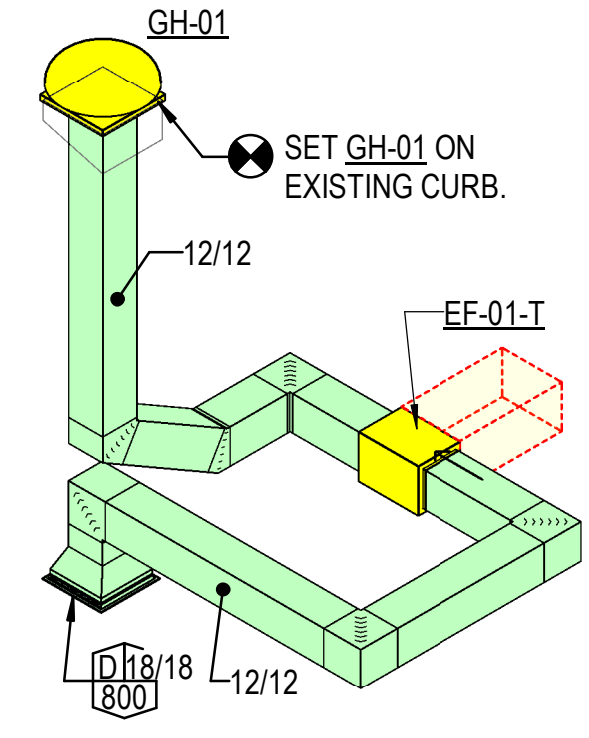
2 ISOMETRIC AT MECH ROOM 194 (DUCT AND PIPING)
NOT TO SCALE



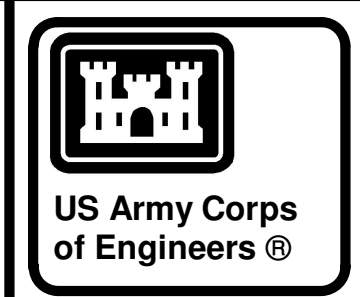
5 SECTION AT AH-03
1/4" = 1'-0"



3 ISOMETRIC AT KITCHEN HOOD AND MAKE-UP AIR
NOT TO SCALE



4 ISOMETRIC AT EF-01-T
NOT TO SCALE



04-28-2022

MARK	DESCRIPTION	DATE

DESIGNED BY: C. Borne	ISSUE DATE: 29 APR 2022
DRAWN BY: C. Borne	SOLICITATION NO.:
CHECKED BY: R. Seay	CONTRACT NO.:
SUBMITTED BY: CROMWELL AE	
SIZE: 501.872.2900	

US ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT
CHARLESTON, SOUTH CAROLINA
CROMWELL
1300 East 6th Street Little Rock, AR 72202
501.872.2900
cromwell.com | ANSI D

NC026 HVAC-ELEC-PLUMB RESET
WINTERVILLE, NC
MECHANICAL SECTIONS AND ISOMETRICS

SHEET ID
M-903

WHILE THESE DRAWINGS ARE BEST VIEWED AND PRINTED IN FULL COLOR, A BLACK AND WHITE/GRAY SCALE PRINT WILL STILL CONVEY ALL REQUIRED INFORMATION.

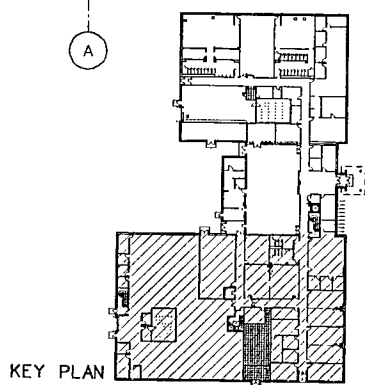
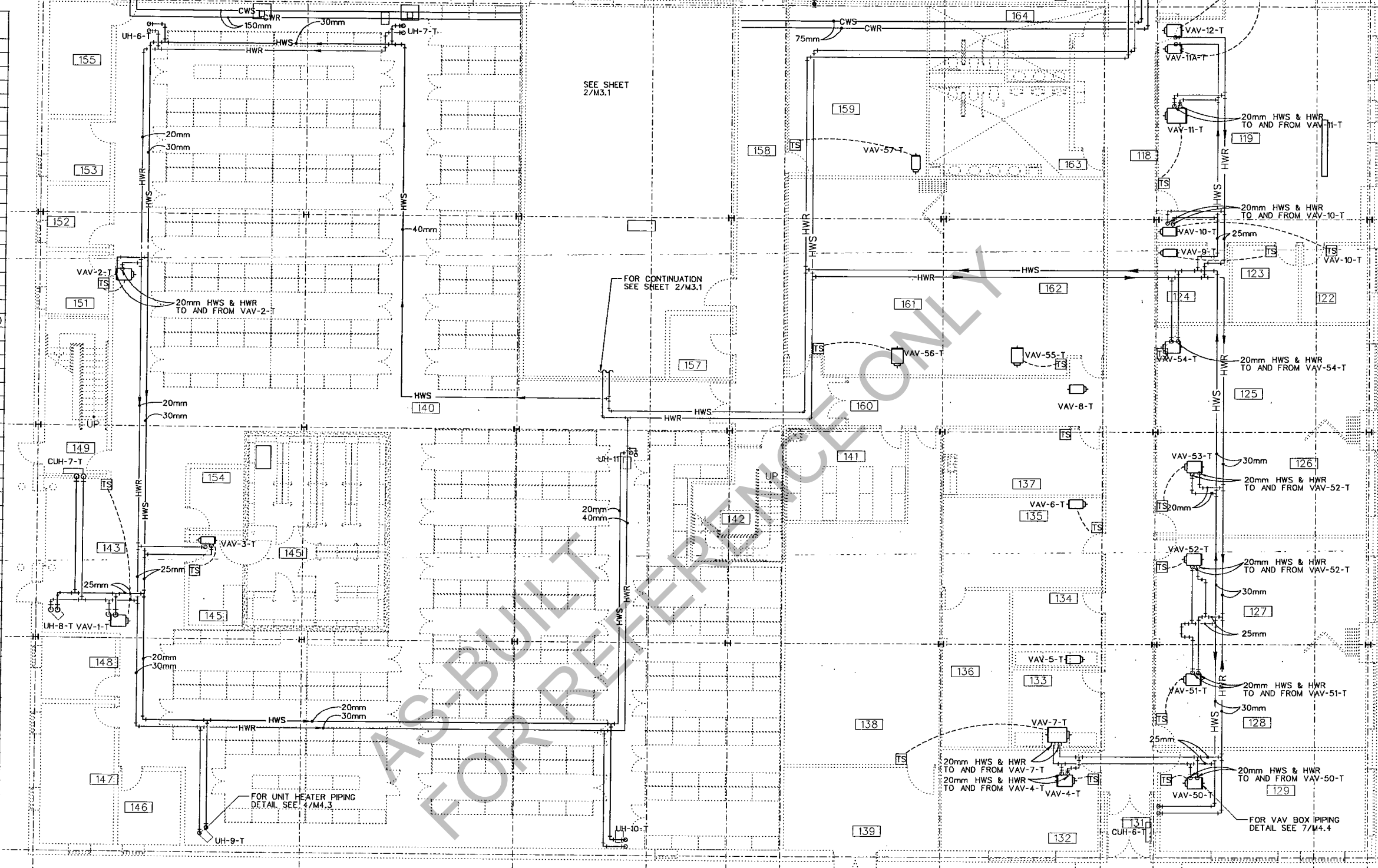
ROOM NUMB	ROOM NAME
101	UNIT STO
103	UNIT STO
105	PR OFF
107	PR OFF
112	UNIT STO
114	ELEC
115	ARMORY
117	STAIR
118	PR OFF
119	PR OFF
120	UNIT STO
121	UNIT STO
122	VAULT
123	TELE
133	MECH
134	UNIT STO
141	EST
144	STAIR
146	UNIT STO
147	VAULT
148	FAC MNTN STO
151	MECH
152	KITCHEN
154	M. LOCKER
156	ELEC
157	ARMORY
158	PR OFF
159	UNIT STO
160	LIBR
161	TRNG AID STO
162	LIBR STO
163	TRN AID S
164	EST
166	LRNG CTR
169	CORR
170	CLASSRM
171	CLASSRM
172	VEND
175	M. SHWR
177	M. TLT
180	F. LOCKER
187	CORR
189	BREAK
191	CLASSRM
193	CORR
195	ASSEMBLY
196	CLASSRM
197	CLASSRM
198	CLASSRM
199	CLASSRM
200	CLASSRM
201	UEPR OFF
201	UEPR OFF
202	UEPR OFF
202	FTPR OFF
203	ADMN COMMON

FOR CHILLER PIPING
DETAIL SEE 6/M4.3

SEE SHEET
2/M3.1

SEE SHEET M1.1.4
FOR CONTINUATION

REFER TO
SHEET M1.1.2
MATCH LINE



1 TRAINING CENTER- FIRST FLOOR PIPING PLAN
M1.1 SCALE = 1:100
GRAPHIC SCALE 1:100

10

11

12

13

14

15

Rev.	Date	Description
1	11 JULY 2001	Design file no. 808025
2		Design code
3		File name: M1.MS
4		Plot scale: 1/8" = 1'-0"

RSP Architects, Ltd.
1401 West Avenue
Madison, WI 53703
608.261.1400

TRNG CENTER SOUTH
FIRST FLOOR SOUTH
PIPING

PROJECT :
GREENVILLE, NORTH CAROLINA
AFRC/OMS/AMSA/UNH STORAGE
DRAWING NO. :
M1-CAR01-11131
FY 2000

M1
Sheet



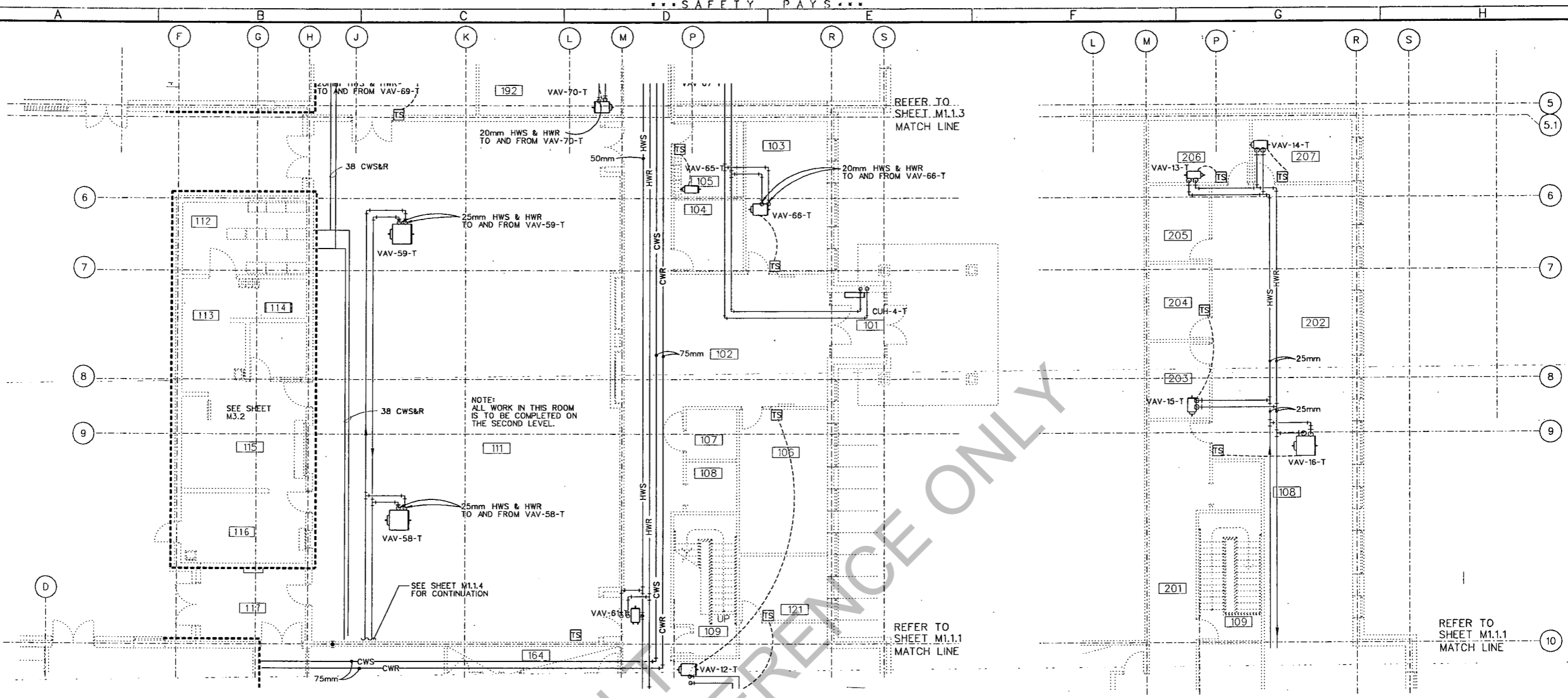
Rev.	Date	Description

Designed by:	R. WICKLIFF	Checked by:	C. JOHNSON	Reviewed by:	D. LINDALE	Submitted by:	
Date:	11 JULY 2001	Design file no.:	6066025	Drawing code:	MT12.M05	File name:	MT12.M05

RSP Architects, Ltd.
 100 First Avenue North
 Birmingham, AL 35203
 205-382-2025
TRAINING CENTER 1ST FLOOR & 2ND FLOOR NORTH PIPING

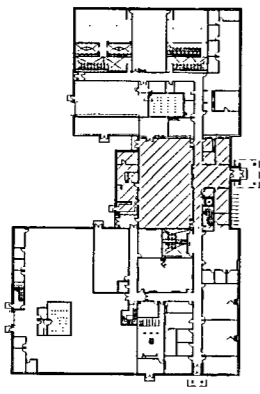
PROJECT :
 GREENVILLE, NORTH CAROLINA
 AFRC/OMS/AMSA/UNH STORAGE
 PN:CAR01-1131
 FY2000

M1.1.2
 Sheet of

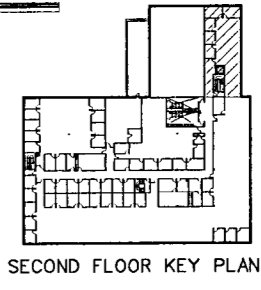


1 TRAINING CENTER - FIRST FLOOR PIPING PLAN
 ML12 SCALE 1:100
 2000 1000 0 2000 4000 6000 8000 10000
 GRAPHIC SCALE 1:100

2 TRAINING CENTER - SECOND FLOOR PIPING PLAN
 ML12 SCALE 1:100
 2000 1000 0 2000 4000 6000 8000 10000
 GRAPHIC SCALE 1:100



ROOM NUMB	ROOM NAME
101	UNIT STO
103	UNIT STO
105	PR OFF
107	PR OFF
112	UNIT STO
114	ELEC
115	ARMORY
117	STAIR

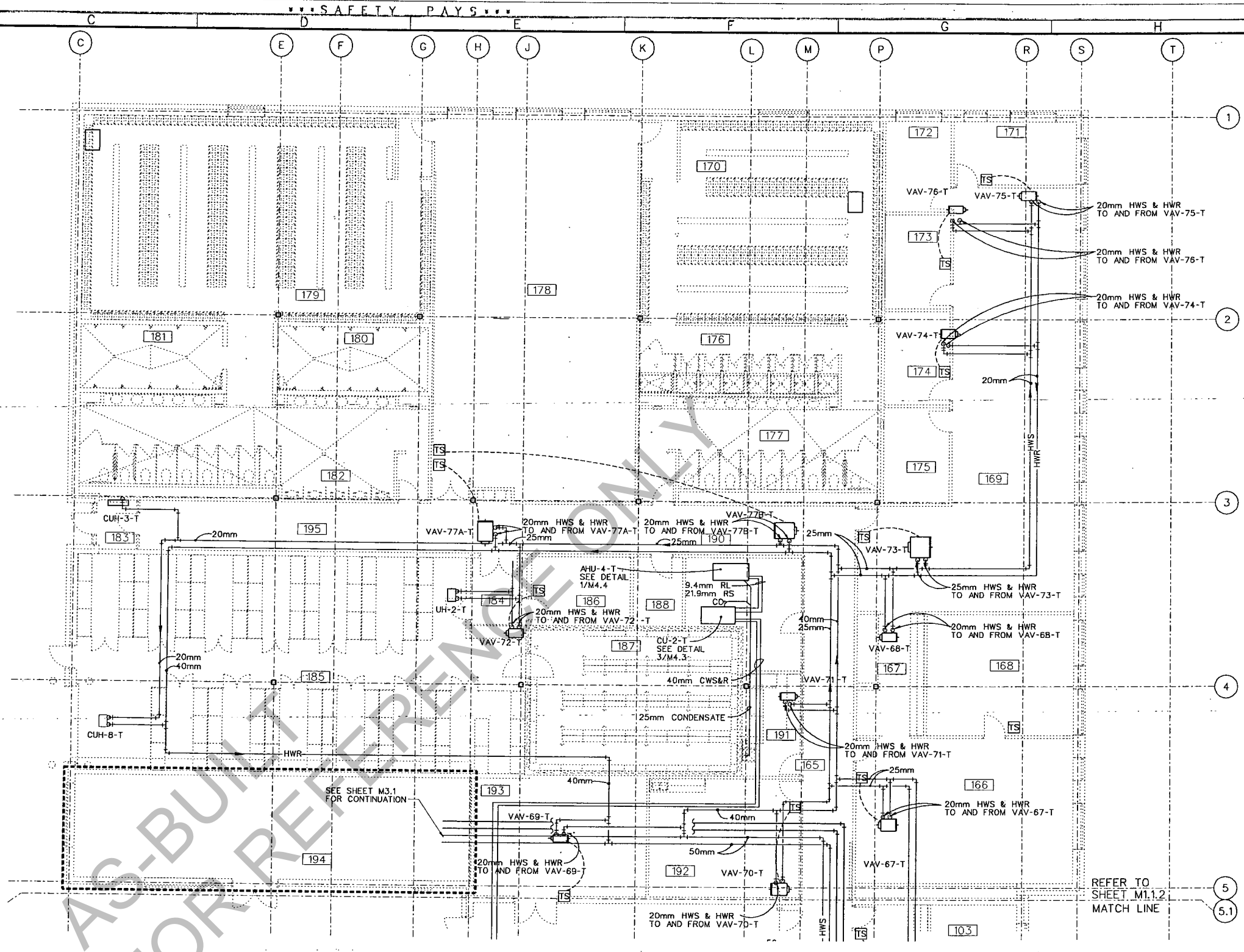


ROOM NUMB	ROOM NAME
203	UEPR OFF
204	FTPR OFF
205	FTPR OFF
205	TLT
206	CORR
206	TLT
207	FTPR OFF

SECOND FLOOR KEY PLAN

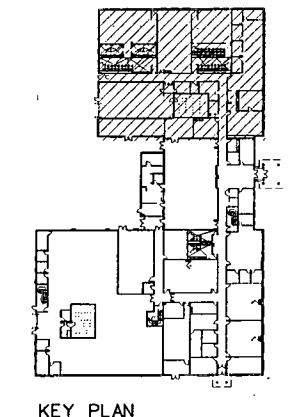
AS-BUILT FOR REFERENCE ONLY

ROOM NUMB	ROOM NAME
165	CORRIDOR
166	GUARD ADMIN COMM
167	ADMIN SUPPORT
168	GUARD OFFICE
169	UESH OFFICE
170	WOMENS LOCKER
171	GUARD OFFICE
172	GUARD OFFICE
173	GUARD OFFICE
174	GUARD OFFICE
175	GUARD OFFICE
176	WOMENS SHOWER
177	WOMENS TOILET
178	PHYS FITNESS
179	MENS LOCKER
180	MENS SHOWER
181	MENS SHOWER
182	MENS TOILET
183	VESTIBULE
184	STORAGE VEST
185	UNIT STORAGE
186	PR OFFICE
187	VAULT
188	ELEC
189	NOT USED
190	TELEPHONE/RCAS
191	FAC MAINT STORAGE
192	BREAK
193	CHAIR STORAGE
194	MECH
195	CORRIDOR



AS-BUILT FOR REFERENCE ONLY

1 TRAINING CENTER- FIRST FLOOR PIPING PLAN
 M1.3 SCALE - 1:100
 2000 1000 0 2000 4000 6000 8000 10000
 GRAPHIC SCALE 1:100



Rev.	Date	Description

Designed by: R. WICKLIND	Checked by: C. JOHNSON, ALEXANDER	Drawn by: D. LINDAHL	Submitted by:
Date: JULY 2001	Design file no: 606025	Drawing code:	File name: M13.MXD Plot code: 1100

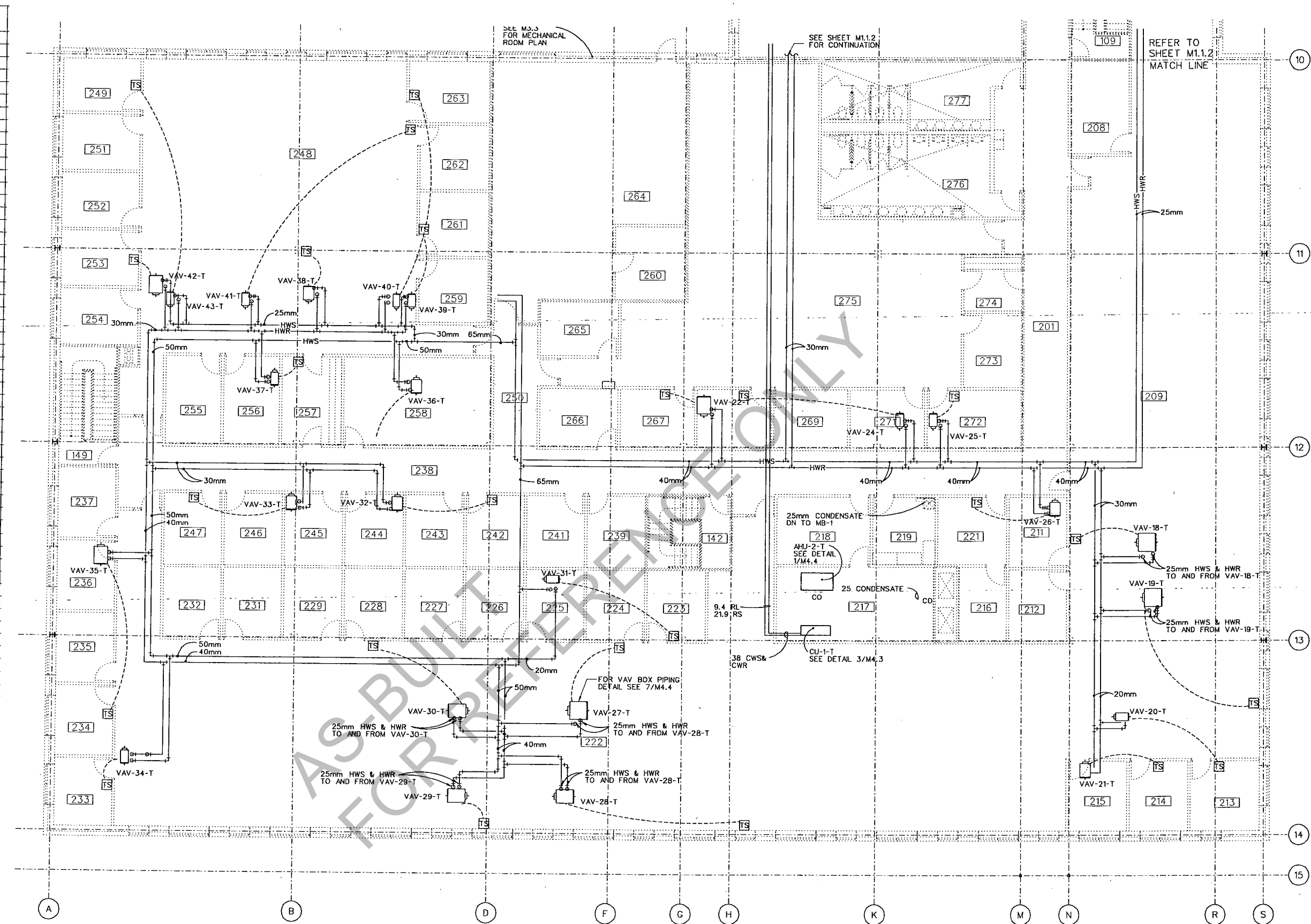
ESP Architects, Ltd.
 1400 N. 1st St.
 1400 N. 1st St.
 1400 N. 1st St.
 1400 N. 1st St.

**TRAINING CENTER
 FIRST FLOOR PLAN
 PIPING**

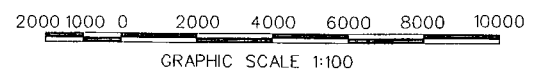
PROJECT:
 GREENVILLE, NORTH CAROLINA
 AFRC/OMS/AMSA/UNH STORAGE
 PNCAR01-11131
 FY2000

M1.3
 Sheet of

ROOM NUMB	ROOM NAME
201	CORRIDOR
202	ADMIN COMMON
203	DET 2 OFFICE
204	DET 2 OFFICE
205	DET 2 OFFICE
206	DET 2 OFFICE
207	DET 2 OFFICE
208	DET 3 OFFICE
209	ADMIN COMMON
210	NOT USED
211	DET 3 OFFICE
212	DET 3 OFFICE
213	DET 1 OFFICE
214	DET 1 OFFICE
215	DET 1 OFFICE
216	COMSEC STORAGE
217	RCAS
218	TELEPHONE
219	FACILITY MAINT STOR.
220	NOT USED
221	COMSEC TRAINING
222	ADMIN COMMON
223	362ND OFFICE
224	362ND OFFICE
225	362ND OFFICE
226	362ND OFFICE
227	362ND OFFICE
228	362ND OFFICE
229	362ND OFFICE
230	NOT USED
231	362ND OFFICE
232	362ND OFFICE
233	362ND OFFICE
234	362ND OFFICE
235	362ND OFFICE
236	362ND OFFICE
237	362ND OFFICE
238	CORRIDOR
239	362ND OFFICE
240	NOT USED
241	362ND OFFICE
242	362ND OFFICE
243	362ND OFFICE
244	362ND OFFICE
245	362ND OFFICE
246	362ND OFFICE
247	362ND OFFICE
248	ADMIN COMMON
249	HHD OFFICE
250	CORRIDOR
251	HHD OFFICE
252	HHD OFFICE
253	HHD OFFICE
254	HHD OFFICE
255	HHD OFFICE
256	HHD OFFICE
257	ADMIN SUPPORT
258	CONFERENCE
259	HHD OFFICE
260	ELECTRICAL ROOM
261	HHD OFFICE
262	HHD OFFICE
263	HHD OFFICE
264	MECHANICAL
265	398TH OFFICE
266	362ND OFFICE
267	398TH OFFICE
268	398TH OFFICE
269	398TH OFFICE
270	NOT USED
271	398TH OFFICE



1 TRAINING CENTER- SECOND FLOOR PIPING PLAN
M1.14 SCALE - 1/100



Revision	Description

Designed by: R. WICKLUND	Checked by: C. JOHNSON	Design file no: 080825	Drawn code: M14.MOS
Reviewed by: D. LINDALL	Submitted by: 		Plot scale: 1/100

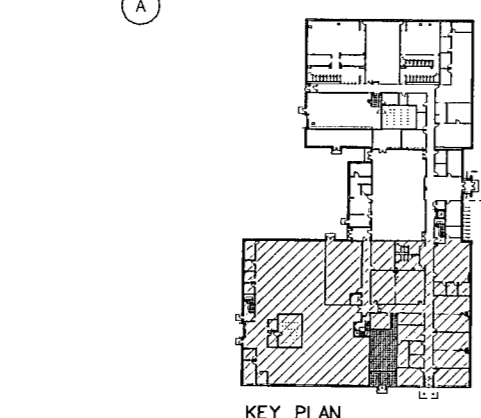
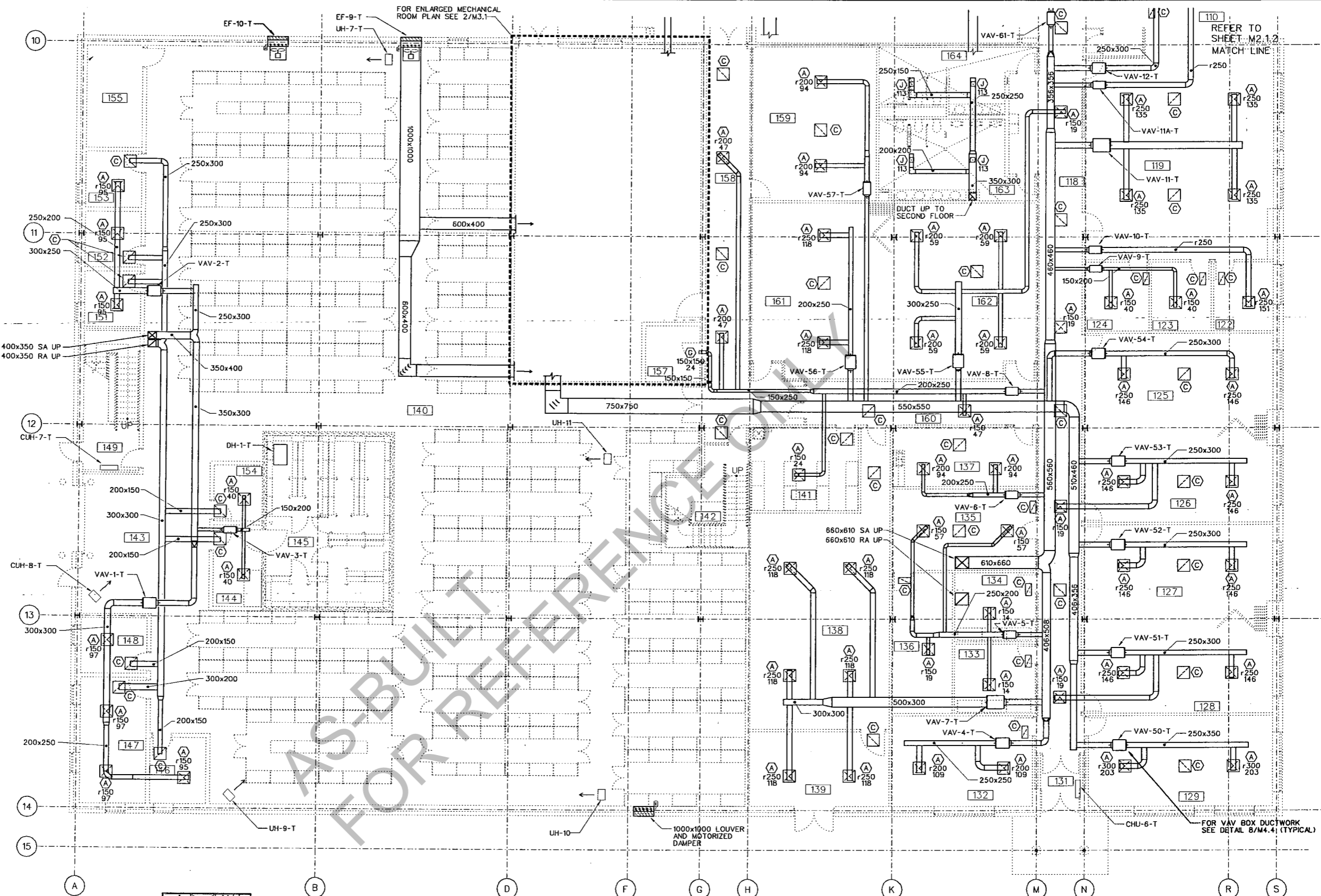
RJP
RJP Architects, Ltd.
140-1000
Mississauga, ON L4W 1M7
Canada

TRAINING CENTER
SECOND FLOOR SOUTH
PIPING

PROJECT:
GREENVILLE, NORTH CAROLINA
AFRC/OMS/AMSA/UNH STORAGE
PN:CAR01-11131
FY2000

M1.1.4
Sheet of

118	CORRIDOR
119	ADMIN COMMON
120	NOT USED
121	NOT USED
122	665TH OFFICE
123	665TH OFFICE
124	665TH OFFICE
125	CLASSROOM
126	CLASSROOM
127	CLASSROOM
128	CLASSROOM
129	CLASSROOM
130	NOT USED
131	VESTIBULE
132	LIBRARY
133	TRAINING AID STORAGE
134	TRAINING AID STORAGE
135	LEARNING CENTER
136	LIBRARY STORAGE
137	BREAK ROOM
138	EST
139	EST STORAGE
140	UNIT STORAGE
141	FAC MAINT STORAGE
142	STAIR
143	STAGING
144	ARMORER
145	VAULT
146	398TH OFFICE
147	362ND OFFICE
148	HHD OFFICE
149	STAIR
150	NOT USED
151	DET-1 OFFICE
152	DET-3 OFFICE
153	DET-2 OFFICE
154	665TH OFFICE
155	ELEC
156	MECHANICAL
157	TELEPHONE
158	CORRIDOR
159	CLASSROOM
160	CORRIDOR
161	CLASSROOM
162	CLASSROOM
163	MEN TLT
164	WOMEN TLT



1 TRAINING CENTER- FIRST FLOOR HVAC PLAN
 M2.1.1 SCALE - 1:100
 2000 1000 0 2000 4000 6000 8000 10000
 GRAPHIC SCALE 1:100



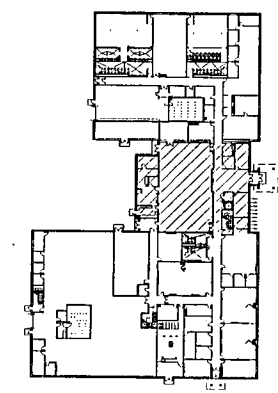
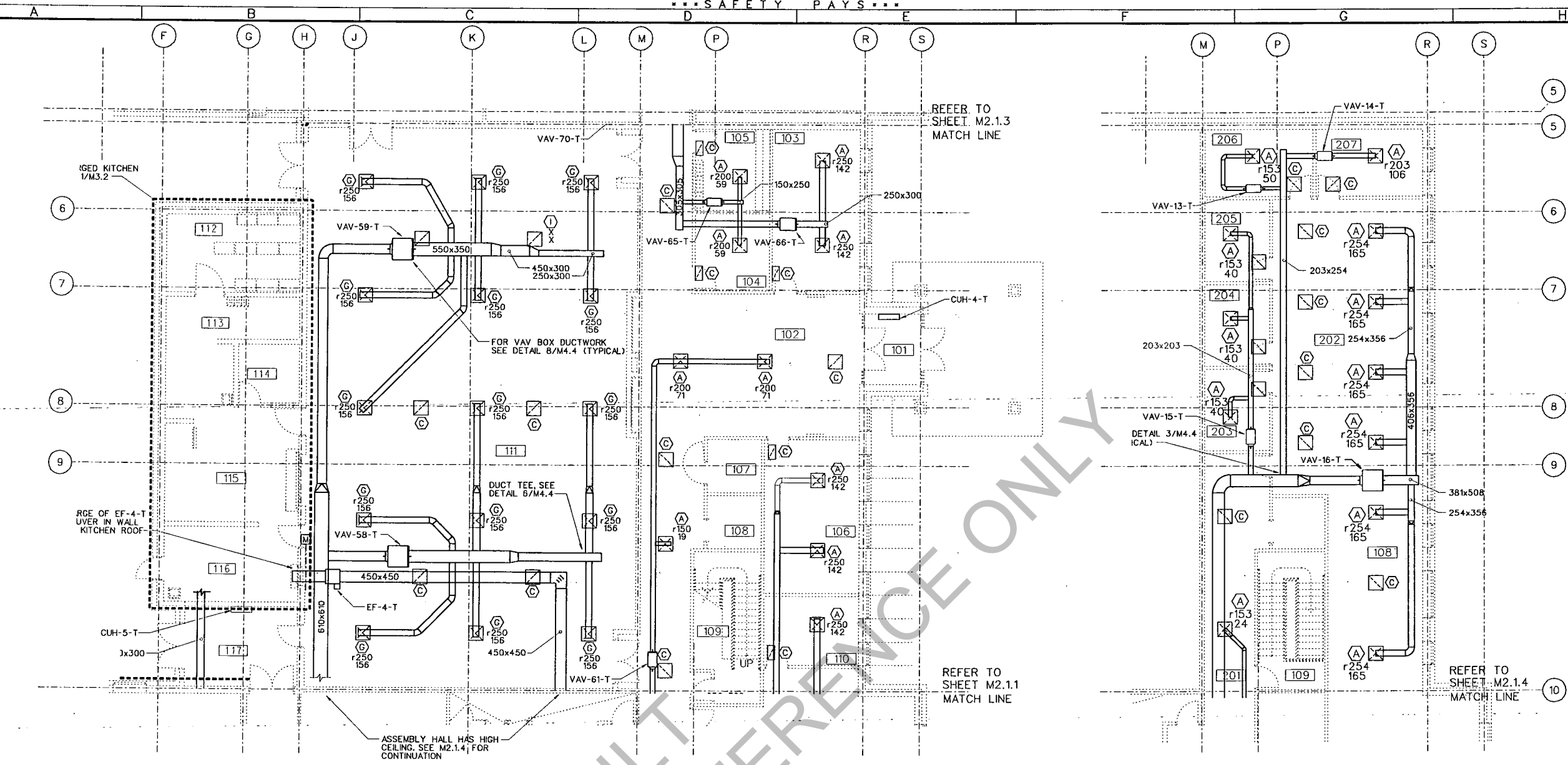
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Date	
Revision	
Description	
Symbol	

Rev.	
Date	JULY 2001
Design file no.	006025
Designed by	R. WICKLUND
Drawn by	C. JOHNSON, ALEXANDER
Reviewed by	D. LINDHOLM
Submitted by	
File name	M2.1.MOS
Plot scale	1:100

RF Architects, Ltd.
 1400-3300
 1400-3300
 MINNESOTA, MN 55009
**TRAINING CENTER
 FIRST FLOOR SOUTH
 HVAC**

PROJECT :
 GREENVILLE, NORTH CAROLINA
 AFRC/OMS/AMSA/UNH STORAGE
 PN:CAR01-1131
 FY2000

M2.1.1
 Sheet of

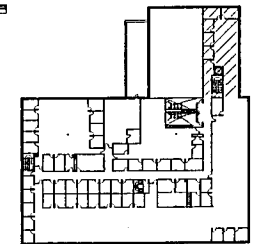
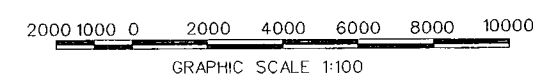


FIRST FLOOR KEY PLAN

1 TRAINING CENTER FIRST FLOOR HVAC PLAN
M2.1.2 SCALE 1:100



2 TRAINING CENTER SECOND FLOOR HVAC PLAN
M2.1.2 SCALE 1:100



SECOND FLOOR KEY PLAN

ROOM NUMB	ROOM NAME
101	VESTIBULE
102	LOBBY
103	GUARD/RET OFFICE
104	FAC MANAGER
105	MAIL
106	USAR/RET OFFICE
107	ELEV EQUIPMENT
108	ELEVATOR
109	STAIR
110	665TH OFFICE
111	ASSEMBLY
112	STORAGE
113	STORAGE
114	OFFICE
115	KITCHEN
116	SCULLERY
117	VESTIBULE

ROOM NUMB	ROOM NAME
201	CORRIDOR
202	ADMIN COMMON
203	DET 2 OFFICE
204	DET 2 OFFICE
205	DET 2 OFFICE
206	DET 2 OFFICE
207	DET 2 OFFICE

Revision	Date	Appr.

Rev.	Date	Design file no.	Design code	File name	Plot scale

DESIGNED BY: R. WICKLUND
 DRAWN BY: C. JOHNSON
 CHECKED BY: N. ALEXANDER
 REVISIONS BY: D. LINDALL
 SUBMITTED BY: M2.1.2/JDS
 NONE

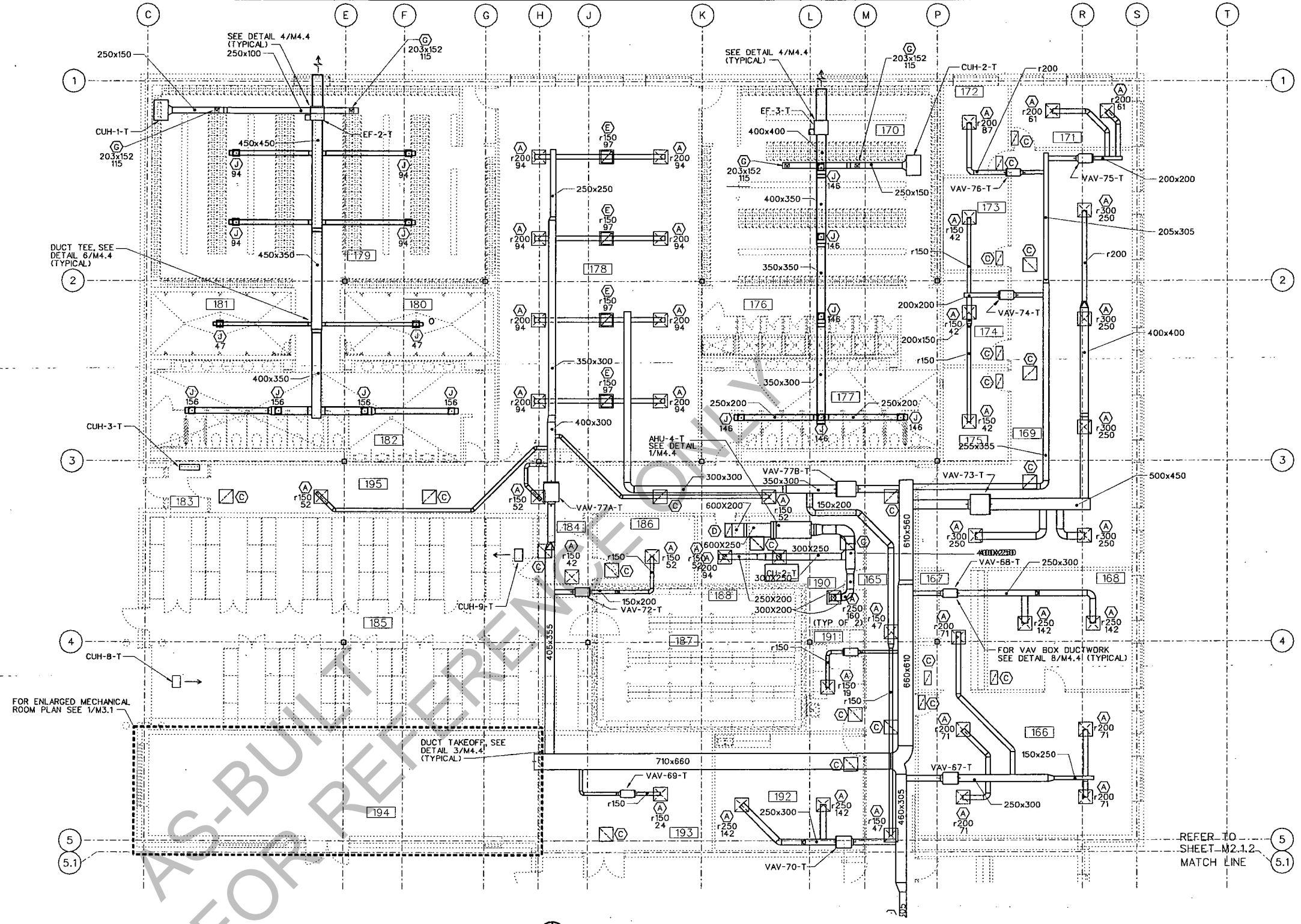
ESP Architects, Ltd.
 100 West Avenue South
 Memphis, TN 38101
 901.525.1111

TRAINING CENTER 1ST FLOOR ASSEMBLY & 2ND FLOOR NORTH HVAC

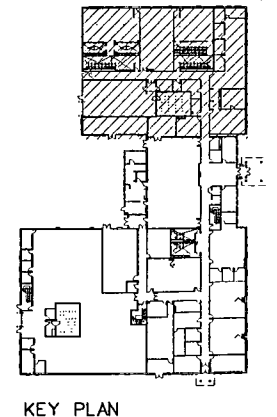
PROJECT: GREENVILLE, NORTH CAROLINA
 AFRC/OMS/AMSA/JNH STORAGE
 PN:CAR01-1131
 FY2000

M2.1.2
 Sheet of

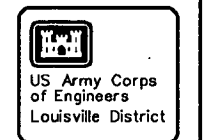
ROOM NUMB	ROOM NAME
165	CORRIDOR
166	GUARD ADMIN COMM
167	ADMIN SUPPORT
168	GUARD OFFICE
169	WESH OFFICE
170	WOMENS LOCKER
171	GUARD OFFICE
172	GUARD OFFICE
173	GUARD OFFICE
174	GUARD OFFICE
175	GUARD OFFICE
176	WOMENS SHOWER
177	WOMENS TOILET
178	PHYS FITNESS
179	MENS LOCKER
180	MENS SHOWER
181	MENS SHOWER
182	MENS TOILET
183	VESTIBULE
184	STORAGE VEST
185	UNIT STORAGE
186	PR OFFICE
187	VAULT
188	ELEC
189	NOT USED
190	TELEPHONE/RCAS
191	FAC MAINT STORAGE
192	BREAK
193	CHAIR STORAGE
194	MECH
195	CORRIDOR



1 TRAINING CENTER- FIRST FLOOR HVAC PLAN
 M2.1.3 SCALE - 1:100
 GRAPHIC SCALE 1:100



KEY PLAN



Rev.	Date	Description

Designed by: R. WICKLUND	Checked by: C. JOHNSON	Design file no: 608025	Drawing code: M2.1.3
Reviewed by: D. LINDALE	Submitted by:	File name: M2.1.3.MXD	Plot scale: 1:100

RSP Architects, Ltd.
 1400 W. 10th St.
 Winnipeg, MB R2M 2K8
 CANADA
 TRAINING CENTER
 FIRST FLOOR PLAN
 HVAC

PROJECT :
 GREENVILLE, NORTH CAROLINA
 AFRC/OMS/AMSA/JNH STORAGE
 PN:CAR01-1131
 FY2000

Sheet of
M2.1.3



Rev.	Date	Description

Symbol	Description

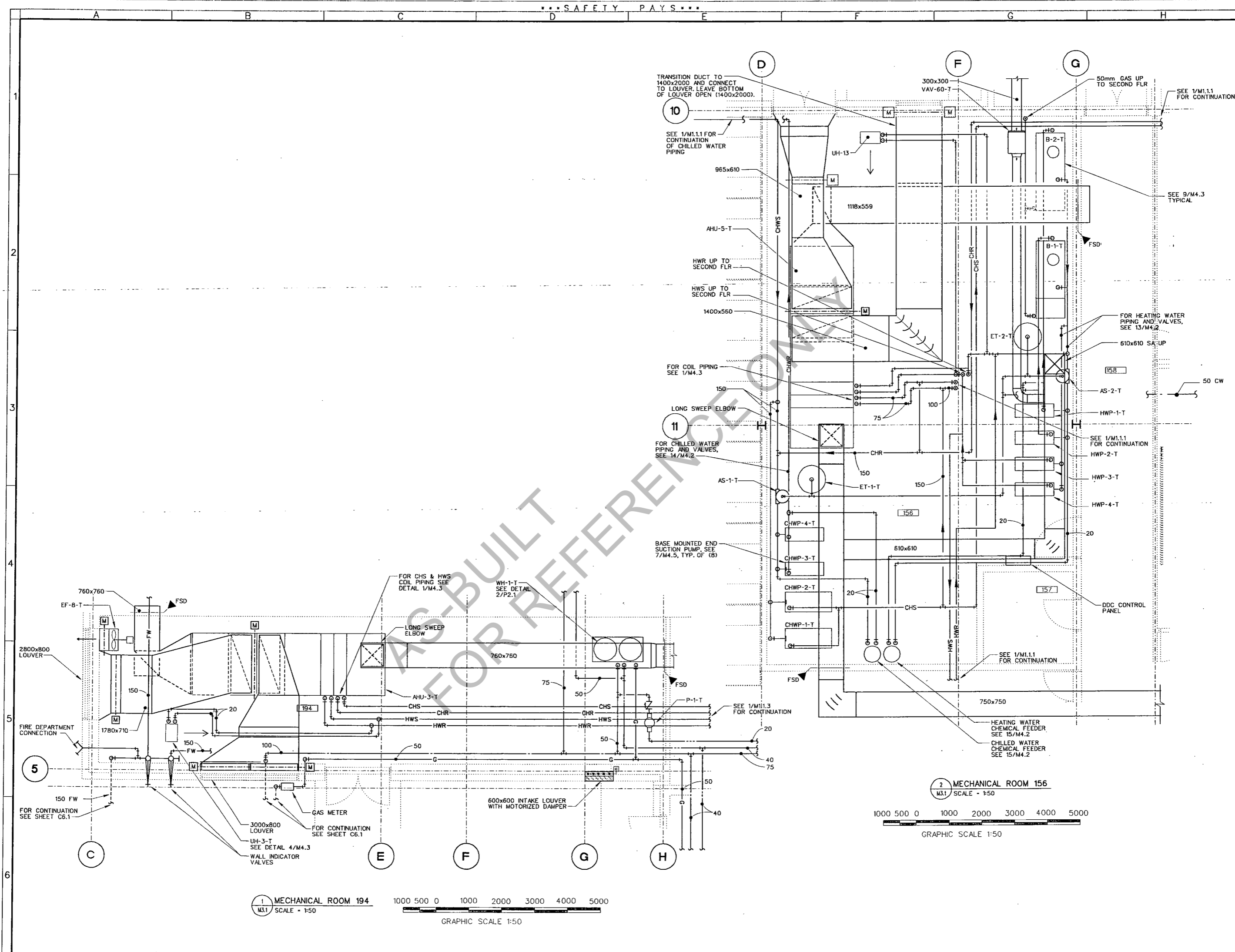
Rev.	Date	Design file no.	Drawing code	File name	Plot scale

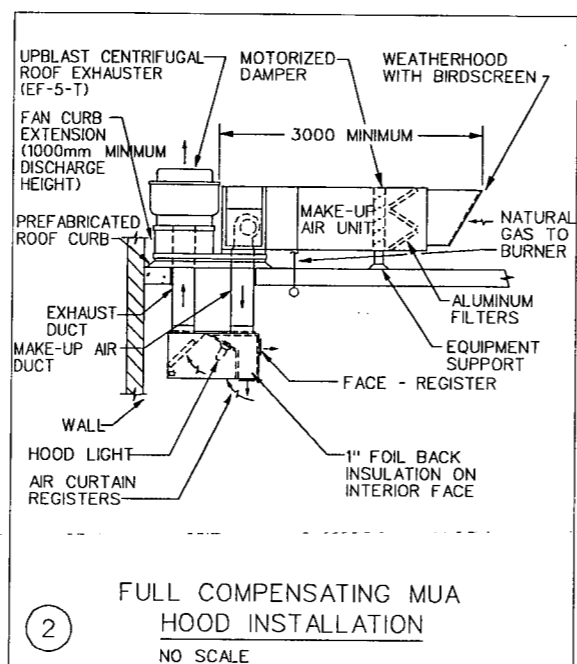
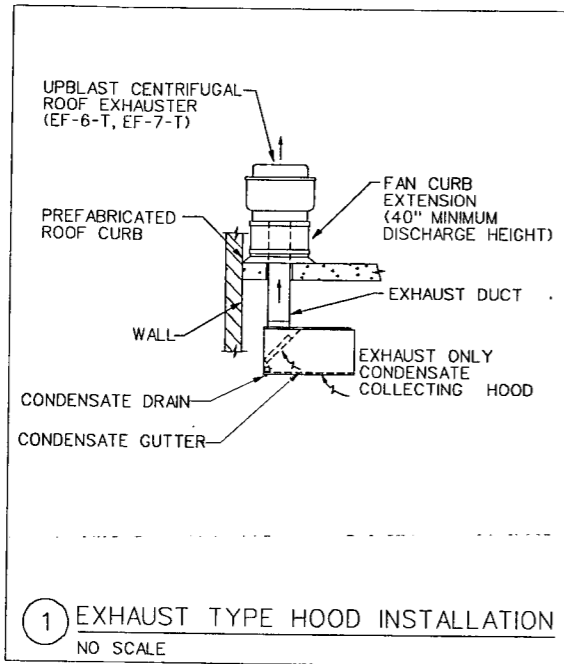
REF Architects, Ltd.
 200 West Avenue
 Alexandria, VA 22304
 (703) 544-4400
 www.refarch.com

**TRAINING CENTER
 FIRST FLOOR
 MECHANICAL ROOM**

PROJECT :
**GREENVILLE, NORTH CAROLINA
 AFRC/OMS/AMSA/JNH STORAGE
 PN:CAR01-1131**
 FY2000

M3.1
 Sheet of





1 EXHAUST TYPE HOOD INSTALLATION
NO SCALE

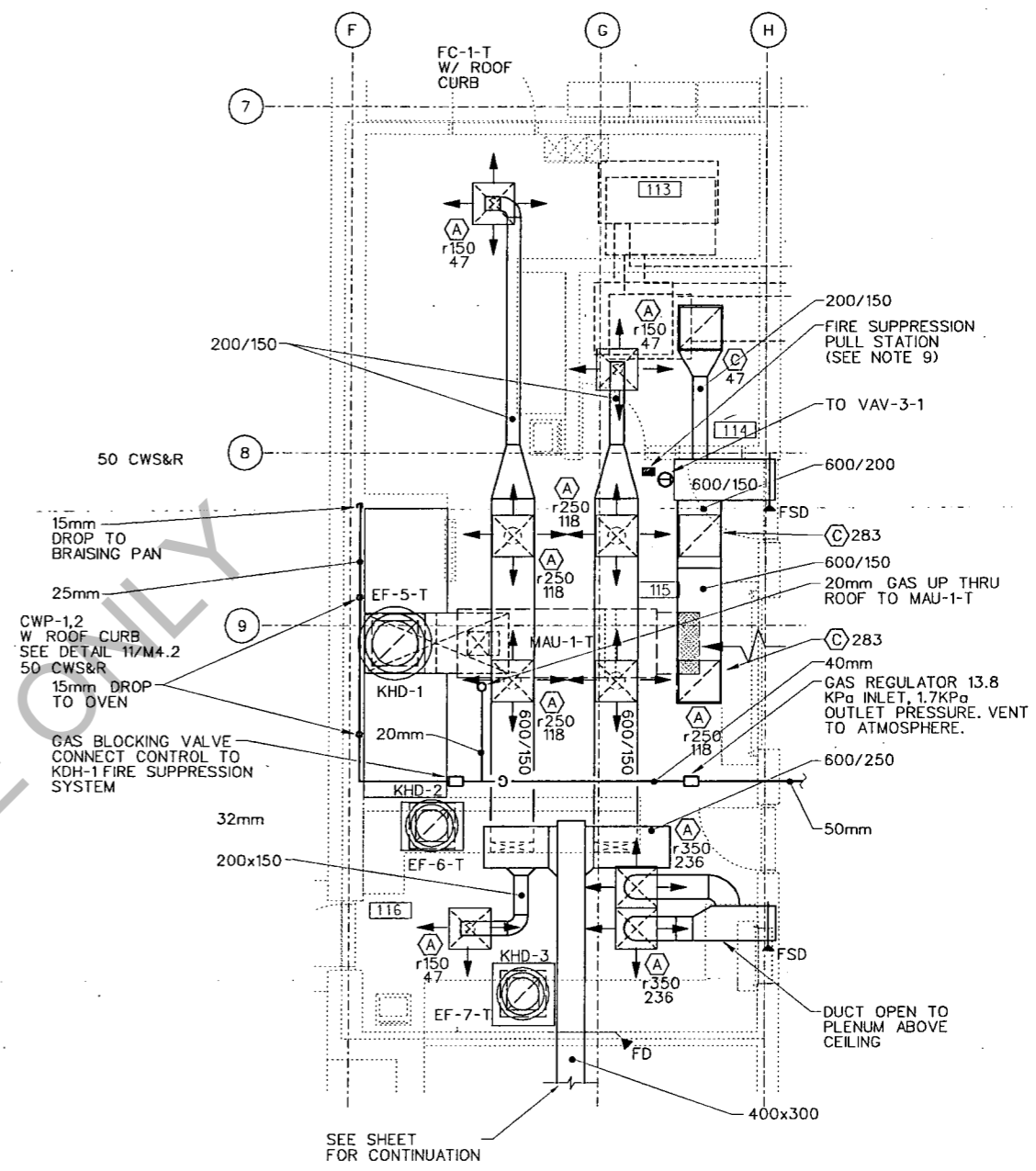
2 FULL COMPENSATING MUA HOOD INSTALLATION
NO SCALE

KITCHEN HOOD SCHEDULE							
HOOD						REMARKS	
MARK	HOOD STYLE	HOOD DIMENSIONS LENGTH x WIDTH (1)	CONSTRUCTION MATERIAL (2)	NUMBER OF LIGHTS	HOOD TYPE	MODEL No. OR EQUAL	
KHD-1	WALL MOUNT	4300 x 1200 mm (CAPTURE AREA)	1.3 mm THICK TYPE 304SS	4	COMPENSATING	GREENHECK GHCV-15.00-S	NOTES (1) THRU (11), (13)
KHD-2	WALL MOUNT	900 x 700 mm (CAPTURE AREA)	1.3 mm THICK TYPE 304SS	0	EXHAUST	GREENHECK GC-4.00-S	NOTES (1) THRU (6), (12)
KHD-3	WALL MOUNT	900 x 900 mm (CAPTURE AREA)	1.3 mm THICK TYPE 304SS	0	EXHAUST	GREENHECK GC-3.50-S	NOTES (1) THRU (6), (12)

KITCHEN FAN SCHEDULE							
MARK	AIR L/S	S.P. KPa	MODEL No. OR EQUAL	W (MIN)	DIRECT FIRE GAS HEAT (KW)	VOLTS/ PHASE/ HERTZ	REMARKS
MAU-1	1982	.187	GREENHECK KSU-115-A-2-15	1119	68	460/3/60	NOTE 11.

NOTES:

- MAXIMUM MOUNTING HEIGHT IS 1950 mm AFF.. PROVIDE MATCHING STAINLESS STEEL SKIRTS TO EXTEND TO CEILING AS REQUIRED.
- EXTEND MINIMUM 1.3 mm EXHAUST DUCT FROM HOOD COLLAR TO EXHAUST FAN CONNECTION. TRANSITION EXHAUST DUCT TO HOOD COLLAR AS REQUIRED.
- EXTEND EXHAUST FAN CURB AS NECESSARY, TO PROVIDE 1000 mm CLEAR FROM OUTLET TO THE ROOF SURFACE. SEE DETAILS FOR MOUNTING REQUIREMENTS.
- NOT USED.
- NOT USED.
- SEE DETAILS FOR MOUNTING REQUIREMENTS.
- PROVIDE HOOD WITH COMPLETE FIRE SUPPRESSION SYSTEM, SEPARATELY OR INTEGRALLY MOUNTED. INTERLOCK ALL GAS EQUIPMENT UNDER THE HOOD TO SHUT DOWN WHENEVER THE FIRE SUPPRESSION SYSTEM IS ACTIVATED.
- PROVIDE FIVE FUNCTION HOOD MOUNTED CONTROL PANEL WITH LIGHT SWITCH COMBINED EXHAUST AND SUPPLY FAN SWITCH AND SUPPLY AND EXHAUST INDICATING LIGHTS FOR KHD-1.
- PROVIDE MANUAL WALL MOUNTED CONTROL AT LEAST 600mm AWAY FROM COOKING SURFACE FOR ACTIVATION OF THE FIRE SUPPRESSION SYSTEM.
- ALL CONTROLS, FIRE SUPPRESSION SYSTEM, AND ACCESSORIES SHALL BE SUPPLIED AS REQUIRED TO MEET LOCAL CODES.
- MAKE UP AIR UNIT TO TEMPER MAKE UP AIR, WITH DIRECT FIRED NATURAL GAS BURNER EAT -9°C, LAT 18°C.
- HOOD TO HAVE FULL LENGTH REMOVABLE CONDENSATE BAFFLES CONSTRUCTED OF 18 GAUGE TYPE 304 SS PITCHED TO FULL PERIMETER WELDED GUTTER WITH 15mm N.P.T. STAINLESS STEEL DRAIN FITTING.
- PROVIDE PRE WIRED FAN CONTROL CENTERS CONTAINING MAGNETIC MOTOR STARTERS, CONTROL TRANSFORMERS, INTEGRAL DISCONNECT SWITCH AND OTHER COMPONENTS REQUIRED FOR A POWER CONNECTION.



KITCHEN HVAC PLAN
SCALE: 1:50

US Army Corps of Engineers
Louisville District

Rev. Description

Symbol

Rev. Date

11 JUL 2001

Designed by: R. WICKLUND
Checked by: C. JOHNSON, ALEXANDER
Reviewed by: D. LINDALE
Submitted by:

File name: M3.2.MDS
Plot scale: 50:1

RSP Architects, Ltd.
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416-276-8888

PROJECT :
GREENVILLE, NORTH CAROLINA
AFRC/OMSA/AMSA/UNH STORAGE
PNCAR01-11131

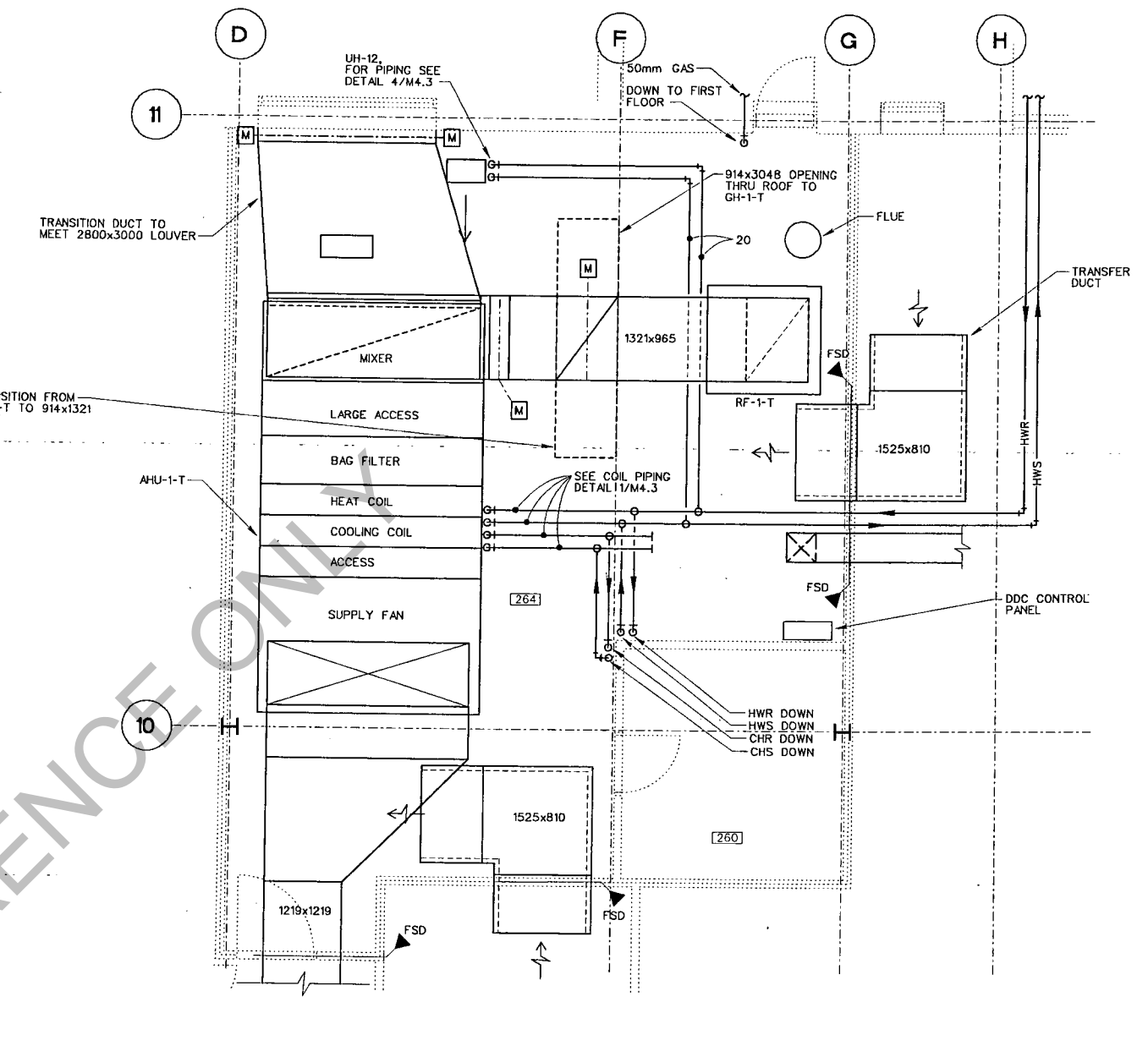
FY2000

M3.2
Sheet of

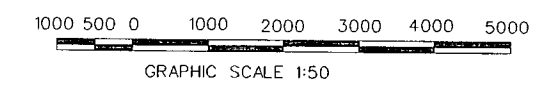
FINAL DESIGN SUBMITTAL

1
2
3
4
5
6

A B C D E F G H



1 MECHANICAL ROOM 156
M3.3 SCALE - 1:50



AS-BUILT
FOR REFERENCE ONLY

US Army Corps
of Engineers
Louisville District

Symbol	Revisions	Date	Appr.

Revisions	Description

Designed by: R. WICKLUND	Date: 11 JULY 2001	Rev.
Drawn by: C. JOHNSON, ALEXANDER	Design file no.	
Reviewed by: D. LINDAHL	Drawing code:	
Submitted by:	File name: M3.3.DGN	
	Plot scale:	

RSP Architects, Ltd.
2000 West 10th Street
Columbus, Indiana 47312
46202

TRAINING CENTER
SECOND FLOOR
MECHANICAL ROOM

PROJECT:
GREENVILLE, NORTH CAROLINA
AFRC/OMS/AMSA/UNH STORAGE
PN:CAR01-11131
FY2000

M3.3
Sheet of