A1 SPRINKLER PLAN - 1ST FLOOR

1/4" = 1'-0"

0 2' 4' 8'

LEGEND

——F—— NEW FIRE SPRINKLER SUPPLY PIPING

– – F – – F – – FIRE PROTECTION UNDERGROUND LINE

FDC FIRE DEPARTMENT CONNECTION

GENERAL NOTES

1. AUTOMATIC SPRINKLER SYSTEMS SHALL BE DESIGNED IN ACCORDANCE WITH 2016 NFPA 13, "STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS" CONTRACTOR SHALL PROVIDE DESIGN CALCULATIONS, DRAWINGS, AND COPIES OF ALL FLOW TEST DATA TO ENGINEER OF RECORD AND LOCAL FIRE MARSHAL FOR REVIEW AND APPROVAL IN WRITING PRIOR TO PURCHASE AND INSTALLATION OF EQUIPMENT AND MATERIALS. CONTRACTOR SHALL SUBMIT HYDRAULIC CALCULATIONS IF REQUIRED BY LOCAL CODES.
2. SEE FIRE PROTECTION SPRINKLER SYSTEM SPECIFICATION SHEET FOR ADDITIONAL REQUIREMENTS.

DRAWING NOTES

1 SEE CIVIL DRAWINGS FOR CONTINUATION OF FIRE SPRINKLER PIPE UNDERGROUND.

Fire Protection Sprinkler System Specification Sheet
(Per §40-10-250)

Project Data				
Project name: North Cedar Office Building				
Location in South Carolina:	Address (street # & street name): 208 North Cedar Street			State project: ☐ Yes ☒ No
	City: Summerville, SC	County: Berkeley		State project #: N/A

Water Supply Information (flow test data must be less than 1 year old per §40-10-250(A)(1))				
Date test conducted: TBD	Static pressure (psi): TBD	Residual pressure (psi): TBD	Flow (gpm): TBD	
Distances of test gauges relative to the base of the riser:	Horizontal (ft): 250'	Vertical (elevation difference in ft): 0'-0"		
Source of water supply:	☒ Municipal dead-end ☐ Municipal circulation ☐ Other:		Pipe Size (in.): 8"	
Test data by/from:	Name: TBD	Title: Testers		
	Organization: TBD		Telephone #: (xxx) xxx-xxxx	
Fire pump:	☐ Yes ☒ No	Pump Capacity (gpm): N/A	Churn Pressure (psi): N/A	
	New Existing	Rated Pressure (psi):	Pressure @ 150% flow (psi):	
On-site storage tank:	☐ Yes ☒ No	☐ New ☐ Existing	Tank capacity (gallons): N/A	

NFPA Hazard Classification (attach continuation page when necessary)

Area #	Class or Code Reference	Description of Hazard Protected (commodity description, storage height, and arrangement as applicable.)
1	Light Hazard	Business Offices

Design Parameters (attach continuation page when necessary)

Area #	System Type	Density (gpm/ft²) / Area (ft²) or Other (reference code section)	Inside Hose (gpm)	Outside Hose (gpm)
1	Wet Pipe	0.10 gpm / 1500 sq ft	-0-	100

Seismic Design Data: S_s= 1.87 g

Codes and Standards (attach continuation page when necessary)

Applicable Codes, Standards & Editions (i.e. "2006 IBC", "2007 NFPA 13", etc.) **for the Scope of Work on the Sprinkler System**

NFPA 13 – 2016 Edition, SCBC – 2018 Edition, SCFC – 2018 Edition

Scope of Work:
Interior fire sprinkler work starts at 12" above finished floor and includes a wet pipe riser and distribution system inside the building.

Specifier's Information

Name: Christopher J. Constantine
Engineering services provided through a firm: ☒ Yes ☐ No
Firm name: Constantine Engineering Associates, LLC
Address: 1643B Savannah Hwy #181
City: Charleston
State: South Carolina Zip: 29407
Phone #: 843-628-7878 Fax #: 843-628-7881
E-mail: cconstantine@constantineengineering.com

SOUTH CAROLINA CONSTANTINE ENGINEERING ASSOCIATES, LLC C-04361 CERTIFICATE OF AUTHORIZATION
Certificate of Authorization

SOUTH CAROLINA PROFESSIONAL ENGINEER SEAL 16540 CHRISTOPHER J. CONSTANTINE
Professional Engineer's Seal

Revision No.: 0 Page 1 of 1 Signature: Christopher J. Constantine
Date: 04/06/2022

CONSTANTINE ENGINEERING ASSOCIATES, LLC
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SOUTH CAROLINA PROFESSIONAL ENGINEER SEAL 16540 CHRISTOPHER J. CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

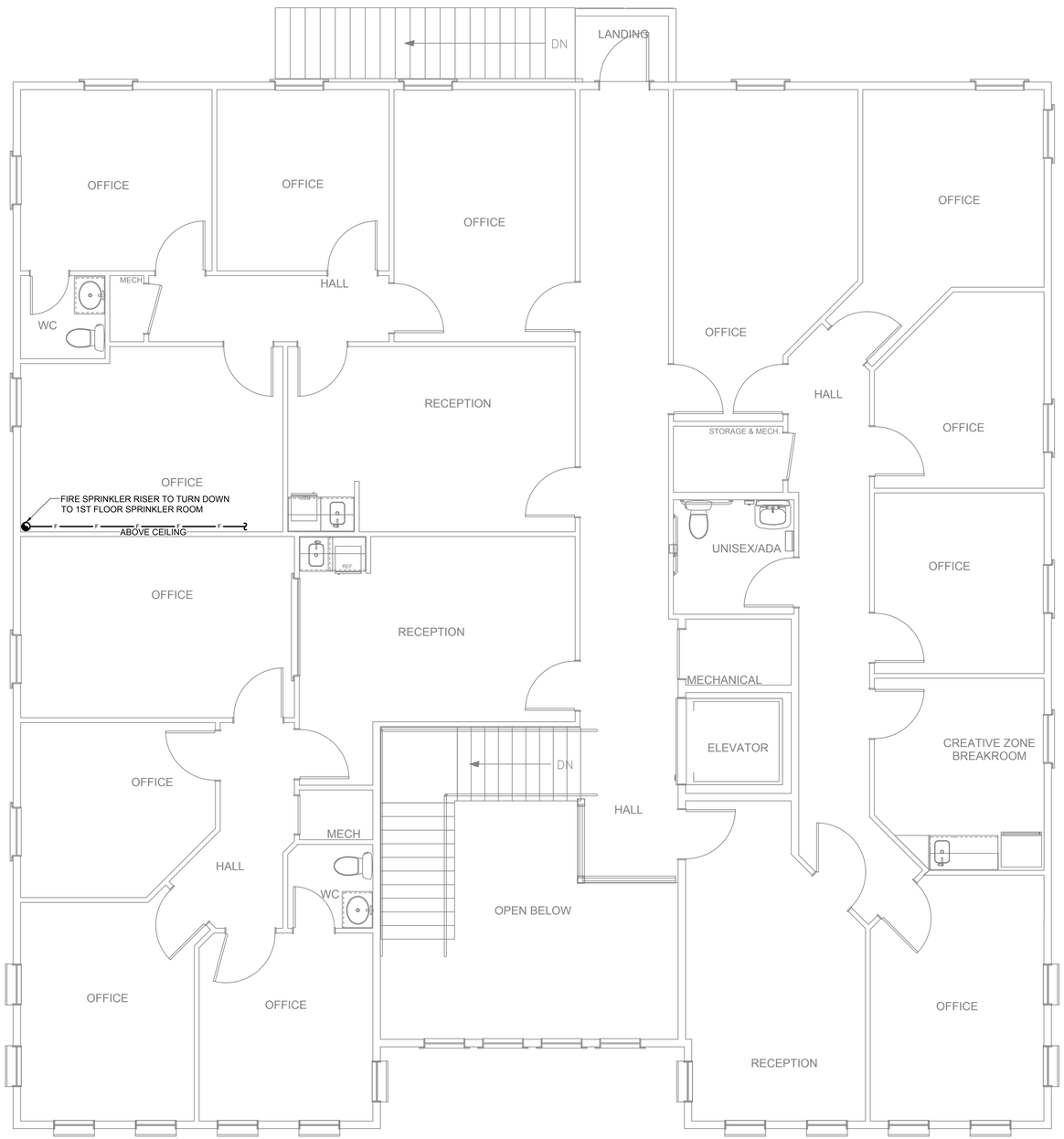
FIRE PROTECTION PLAN - SPRINKLER - 1ST FLOOR

REVISIONS:

DESIGNED BY:	MBV
DRAWN BY:	MBV
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER **22-031**

SHEET NUMBER **F1**



A1 SPRINKLER PLAN - 2ND FLOOR

1/4" = 1'-0"

0 2' 4' 8'

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SEAL
16540
ENGINEER

NORTH CEDAR OFFICE BUILDING

208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

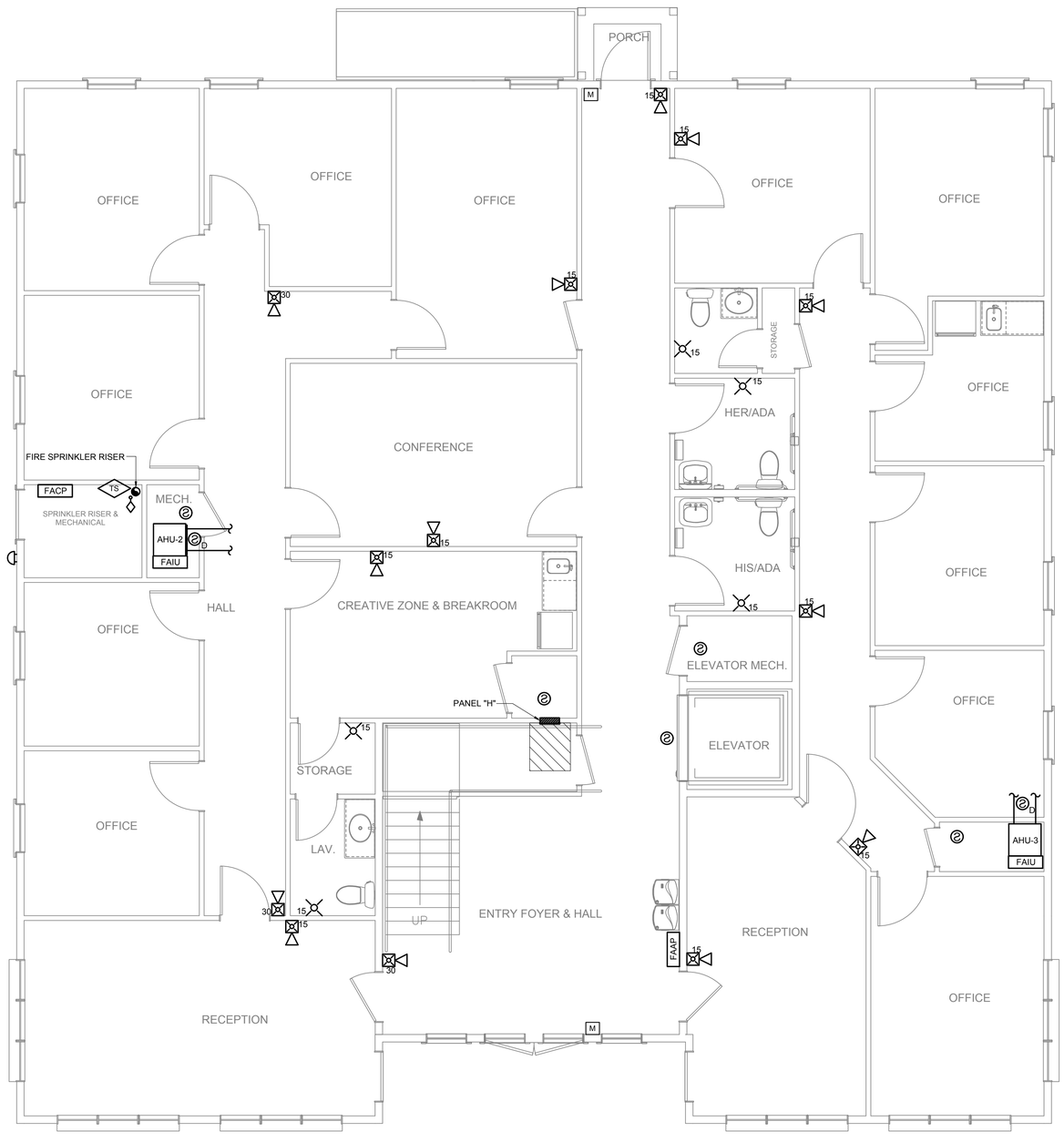
FIRE PROTECTION PLAN - SPRINKLER - 2ND FLOOR

REVISIONS:

DESIGNED BY:	MBV
DRAWN BY:	MBV
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
F2



A1 ALARM PLAN - 1ST FLOOR

1/4" = 1'-0"

0 2' 4' 8'

FIRE ALARM LEGEND

	FIRE HORN/STROBE ALARM DEVICE (CANDELA NOTED BY NUMBER VALUE), WALL MOUNT WITH ENTIRE LENS NOT LESS THAN 80" AFF AND NOT GREATER THAN 96" AFF.
SP	FIRE HORN/SPEAKER STROBE ALARM DEVICE, WALL MOUNT WITH ENTIRE LENS NOT LESS THAN 80" AFF AND NOT GREATER THAN 96" AFF.
	STROBE ALARM (CANDELA NOTED BY NUMBER VALUE), WALL MOUNT WITH ENTIRE LENS NOT LESS THAN 80" AFF AND NOT GREATER THAN 96" AFF.
M	HAND PULL, MOUNT AT 48" AFF
FACP	FIRE ALARM CONTROL PANEL
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FAIU	FIRE ALARM INTERFACE UNIT (FOR MECHANICAL EQUIPMENT)
	FIRE ALARM BELL
	SMOKE DETECTOR
D	DUCT DETECTOR (TWO RELAY)
HD	HEAT DETECTOR
TS	TAMPER SWITCH
	FLOW SWITCH

GENERAL NOTES

1. FURNISH ALL MATERIALS AND LABOR NECESSARY TO PROVIDE COMPLETE AND PROPERLY OPERATING FIRE ALARM SYSTEMS. FURNISH ALL MATERIALS AND LABOR NECESSARY TO DEMONSTRATE TO THE OWNER AND TO THE ENGINEER THAT ALL SYSTEMS ARE OPERATING PROPERLY AND AS SPECIFIED. WARRANTY ALL WORK AND ALL MATERIALS, EQUIPMENT AND DEVICES FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE.

2. ENSURE THAT ALL WORK CONFORMS TO:
   - 2.1. 2018 SOUTH CAROLINA FIRE CODE
   - 2.2. 2016 NATIONAL FIRE ALARM AND SIGNALING CODE (NFPA 72)
   - 2.3. 2018 SOUTH CAROLINA BUILDING CODE
   - 2.4. 2016 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS (NFPA 13)
   - 2.5. ALL FEDERAL, STATE AND LOCAL CODES AND ORDINANCES
   - 2.6. LOCAL UTILITY COMPANY REGULATIONS

3. ALL MATERIALS, EQUIPMENT AND DEVICES AS A MINIMUM SHALL MEET THE REQUIREMENTS OF U.L. (WHERE U.L. STANDARDS ARE ESTABLISHED FOR THOSE ITEMS) AND THE REQUIREMENTS OF THE NFPA 70. ALL ITEMS SHALL BE CLASSIFIED BY U.L. AS SUITABLE FOR THE PURPOSE USED.

4. COORDINATE LOCATION OF FIRE PROTECTION DEVICES AND FIRE PROTECTION WORK WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. NUMBERS ADJACENT TO DEVICES ARE NOMINAL MOUNTING HEIGHTS.

5. PROVIDE ALL THE INTERCONNECTING POWER WIRING AND CONDUIT FOR ALL FIRE PROTECTION

6. COORDINATE WITH AND OBTAIN PERMITS AND INSPECTIONS FROM THE AUTHORITY HAVING JURISDICTION. INCLUDE ALL FEES IN BID.

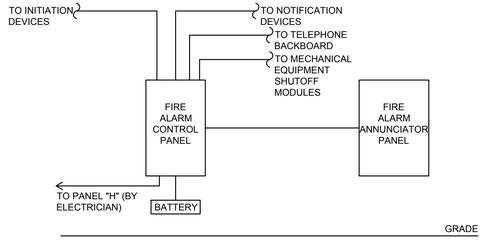
7. PROVIDE MINIMUM SIZE OF #16 CONDUCTOR FOR FIRE PROTECTION CIRCUITS LESS THAN 75'-0" IN LENGTH. OTHERWISE, PROVIDE MINIMUM CONDUCTOR SIZE OF #14. INSTALL ALL WIRING IN CONDUIT UNLESS NOTED OTHERWISE.

8. SUPPORT ALL CONDUIT ABOVE CEILING FROM BUILDING STRUCTURAL MEMBERS OR CONCRETE DECKING, NOT FROM CEILING GRID OR GRID HANGER WIRES.

9. PROVIDE ALL MOUNTING BRACKETS, HANGERS, CLIPS, ETC. AS NECESSARY TO MOUNT AND SECURE FIRE PROTECTION DEVICES IN LOCATIONS SHOWN AND AS RECOMMENDED BY THE MANUFACTURER FOR THE APPLICATION INTENDED.

10. WHERE CONDUIT PENETRATES FIRE RATED BARRIERS (WALLS, FLOORS AND CEILINGS), SEAL THE OPENING AROUND THE CONDUIT TO MAINTAIN THE FIRE RATING OF THE BARRIER WITH U.L. LISTED FIRE STOPPING MATERIAL.

11. PROVIDE TYPEWRITTEN DIRECTORY FOR ALL CIRCUITS. DIRECTORY SHALL IDENTIFY PANELBOARD AND INDICATE EACH CIRCUIT NUMBER, DESCRIPTION AND LOCATION.



A4 FIRE ALARM RISER

NO SCALE

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SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 16540 JOHN CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

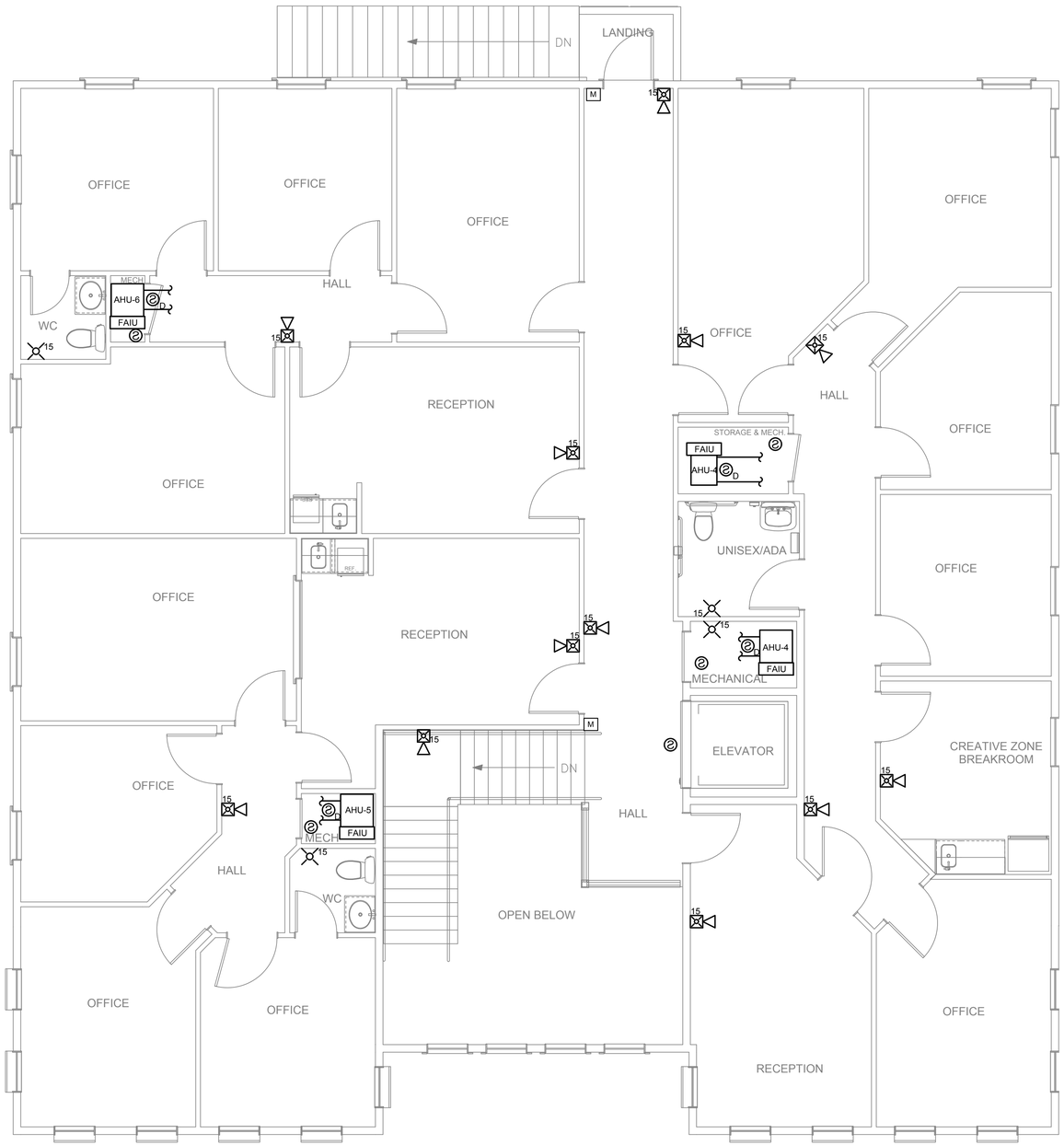
FIRE ALARM PLAN - 1ST FLOOR

REVISIONS:

DESIGNED BY:	JCM
DRAWN BY:	JCM
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
F3



A1 ALARM PLAN - 2ND FLOOR

1/4" = 1'-0"

0 2' 4' 8'

FIRE ALARM SPECIFICATIONS

1.1 ACTION SUBMITTALS

A. Product Data: For each type of product, including furnished options and accessories.

B. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
2. Include plans, elevations, sections, details, and attachments to other work.
3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
11. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
    a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
    b. Show field wiring required for HVAC unit shutdown on alarm.
    c. Locate detectors according to manufacturer's written recommendations.
12. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

C. General Submittal Requirements:

1. Shop Drawings shall be prepared by persons with the following qualifications:
    a. Trained and certified by manufacturer in fire-alarm system design.
    b. NICET-certified, fire-alarm technician; Level III minimum.
    c. Licensed or certified by authorities having jurisdiction.

1.2 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.

1. Include the following and deliver copies to authorities having jurisdiction:
    a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
    b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
    c. Complete wiring diagrams showing connections between all devices and equipment.
    d. Riser diagram.
    e. Record copy of site-specific software.
    f. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
        1) Equipment tested.
        2) Frequency of testing of installed components.
        3) Frequency of inspection of installed components.
        4) Requirements and recommendations related to results of maintenance.
        5) Manufacturer's user training manuals.
    g. Manufacturer's required maintenance related to system warranty requirements.
    h. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

1.4 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

1.5 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances.
2. Identify alarm and specific initiating device at fire-alarm control unit and remote annunciators.
3. Transmit an alarm signal to the remote alarm receiving station.
4. Unlock electric door locks in designated egress paths.
5. Release fire and smoke doors held open by magnetic door holders.
6. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
7. Close smoke dampers in air ducts of designated air-conditioning duct systems.
8. Activate emergency lighting control.
9. Activate emergency shutoffs for gas and fuel supplies.
10. Record events in the system memory.

B. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. Loss of communication with any panel on the network.

C. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of communication with any addressable sensor, input module, relay, control module, or remote annunciator.
4. Loss of primary power at fire-alarm control unit.
5. Ground or a single break in internal circuits of fire-alarm control unit.
6. Abnormal ac voltage at fire-alarm control unit.
7. Break in standby battery circuitry.
8. Failure of battery charging.
9. Abnormal position of any switch at fire-alarm control unit or annunciator.

1.6 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.7 PATHWAYS

A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.

1. Exposed pathways located less than 96 inches above the floor shall be installed in EMT.

B. Pathways shall be installed in EMT.

C. Exposed EMT shall be painted red enamel.

1.8 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, connect hardware and devices to fire-alarm system.

B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

1. Smoke dampers in air ducts of designated HVAC duct systems.
2. Magnetically held-open doors.
3. Electronically locked doors and access gates.
4. Alarm-initiating connection to elevator recall system and components.
5. Alarm-initiating connection to activate emergency lighting control.
6. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
7. Supervisory connections at valve supervisory switches.
8. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
9. Supervisory connections at fire-extinguisher locations.

1.9 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

B. Ground shielded cables at the control panel location only. Insulate shield at device location.

1.10 FIELD QUALITY CONTROL

A. Field tests shall be witnessed by authorities having jurisdiction.

B. Perform the following tests and inspections:

1. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72..

C. Prepare test and inspection reports.

1.11 SOFTWARE SERVICE AGREEMENT.

A. Comply with UL 864.

B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

1.12 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

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CONSTANTINE ENGINEERING ASSOCIATES, LLC
C-04361

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
SEAL
16540

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

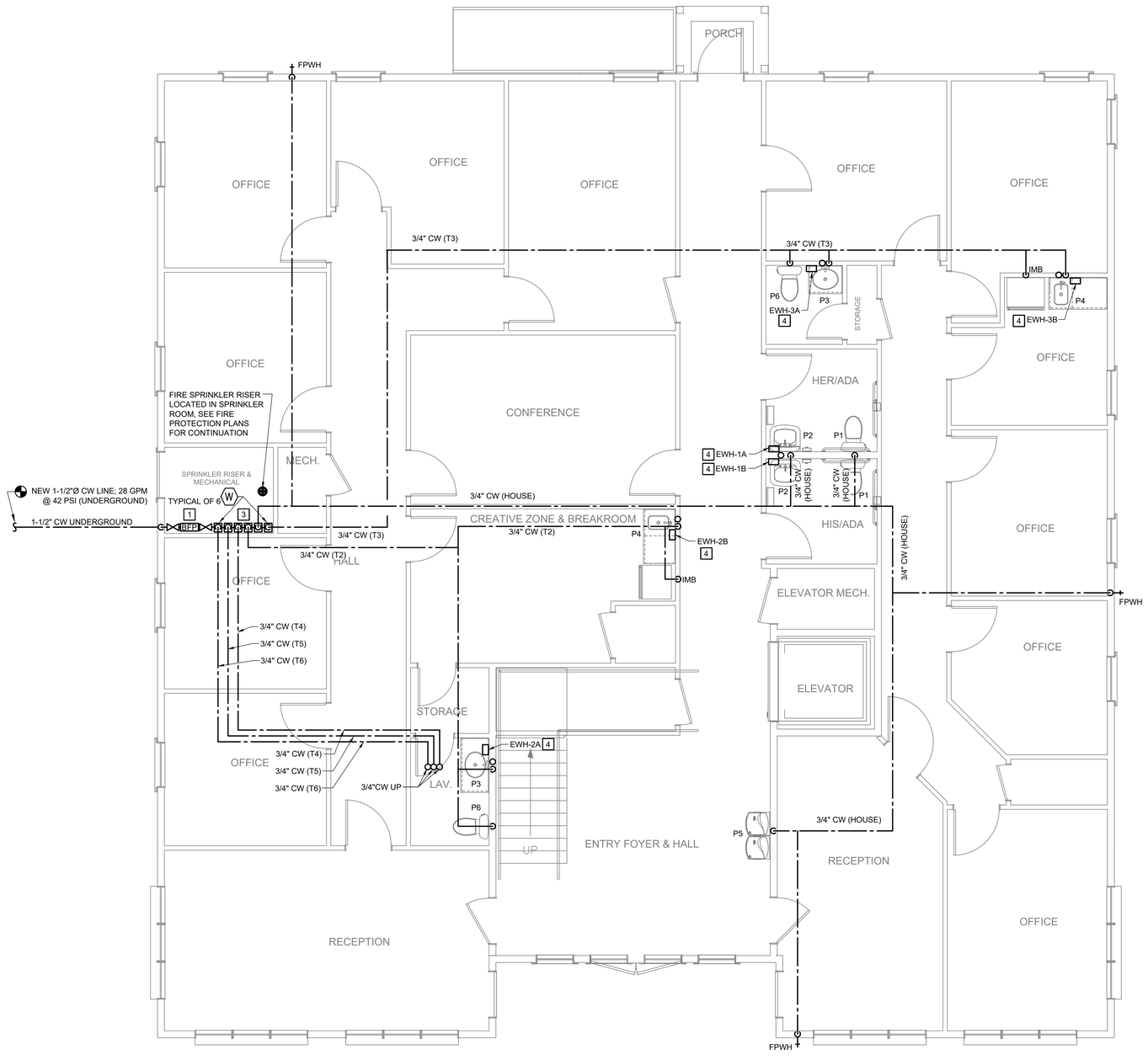
FIRE ALARM PLAN - 2ND FLOOR

REVISIONS:

DESIGNED BY:	JCM
DRAWN BY:	JCM
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
F4



A1 **SUPPLY PLAN - 1ST FLOOR**

1/4" = 1'-0"

0 2' 4' 8'

LEGEND

	COLD WATER LINE, CW
	HOT WATER LINE, HW
	SANITARY DRAIN LINE, S
	VENT LINE, V
VTR	VENT THRU ROOF
	CONNECTION TO EXISTING
	BRANCH ISOLATION VALVE
WCO	WALL CLEANOUT
FCO	FLOOR CLEANOUT
GCO	GRADE CLEANOUT
FD	FLOOR DRAIN
FPWH	WALL HYDRANT (FREEZE PROOF)
BFP	BACKFLOW PREVENTER
EWH	ELECTRIC WATER HEATER
T#	TENANT NUMBER

GENERAL NOTES

1. PROVIDE LABOR, EQUIPMENT AND MATERIALS TO COMPLETE THE PLUMBING WORK INDICATED ON THESE DRAWINGS AS REQUIRED BY LOCAL CODE AND ORDINANCES.
2. INCLUDE WASTE, VENT, DOMESTIC COLD & HOT WATER PIPING, AS INDICATED ON THESE DRAWINGS, AS WELL AS HOOKUP OF FIXTURES AND INSULATION OF PIPING.
3. INCLUDE ITEMS, SUCH AS FITTINGS, ETC. NOT MENTIONED BUT UNDERSTOOD TO BE NECESSARY TO COMPLETE THE PLUMBING SYSTEM.
4. SOIL, WASTE, VENT AND WATER PIPING MATERIALS MUST MEET OR EXCEED LOCAL CODES.
5. PROVIDE CLEANOUTS FOR SOIL AND WASTE LINES THAT MEET OR EXCEED LOCAL CODES.
6. CAP STUBS FOR THE DRAINAGE SYSTEM UNTIL FINISHED WORK IS INSTALLED.
7. PROVIDE WATER HAMMER ARRESTERS IN ACCORDANCE WITH THE SOUTH CAROLINA PLUMBING CODE AND LOCAL ORDINANCES.
8. LOCATE PLUMBING FIXTURES PER ARCHITECTURAL DRAWINGS. PIPING IS SHOWN IN GENERAL LOCATION. EXACT LOCATION WILL BE DETERMINED BY JOB CONDITIONS.
9. COMPLETE WORK IN ACCORDANCE WITH THE 2018 SOUTH CAROLINA PLUMBING CODE AND LOCAL ORDINANCES. SEE SPECIFICATIONS FOR PRODUCT AND INSTALLATION REQUIREMENTS.
10. GUARANTEE WORK UNDER THIS CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP, MATERIALS AND EQUIPMENT FOR ONE YEAR AFTER ACCEPTANCE OF THE BUILDING BY THE OWNER. SHOULD SUCH DEFECTS OCCUR DURING THE ONE YEAR PERIOD, REPAIR AND/OR REPLACE DEFECTIVE ITEMS AND DAMAGE RESULTING FROM THE FAILURE OF THESE ITEMS AT NO EXPENSE WHATSOEVER TO THE OWNER.

DRAWING NOTES

1. 1-1/2" RPZ BFP, SEE TO CIVIL DRAWINGS FOR BFP MODEL NUMBER. RPZ SHALL BE MOUNTED MIN. 36" A.F.F. ABOVE FLOOR. DRAIN TO HUB DRAIN AND PIPE TO EXTERIOR.
2. CONNECT 1-1/2" DOMESTIC WATER LINE ONSITE FOR 28 GPM AT 42 PSI; SEE CIVIL DRAWINGS FOR CONTINUATION.
3. PROVIDE SHUT-OFF VALVE(s) BEFORE AND AFTER WATER METER(s) MOUNTED VERTICALLY ON WALL, TYPICAL OF 6.
4. FIELD VERIFY AND MOUNT ELECTRIC (TANKLESS) WATER HEATER (EWH) UNDERNEATH SINK. PROVIDE WITH SHUT-OFF VALVES.

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SUMMERVILLE, SOUTH CAROLINA 29483

PLUMBING SUPPLY PLAN - 1ST FLOOR

REVISIONS:

DESIGNED BY:	DDF
DRAWN BY:	DDF
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DATE:	04/01/2022

JOB NUMBER
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DRAWING NOTES

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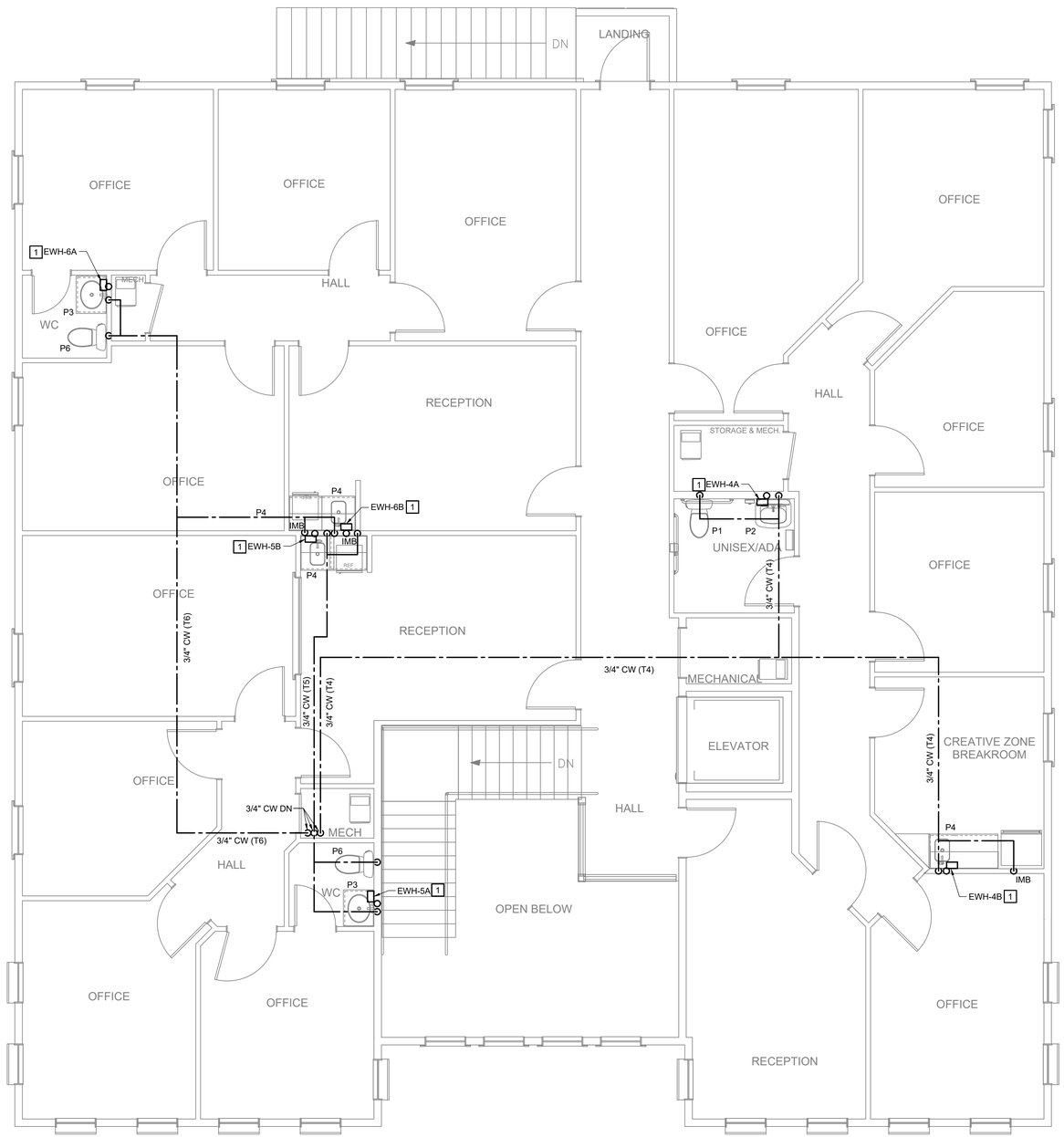

A1 **SUPPLY PLAN - 2ND FLOOR**

1/4" = 1'-0"

0 2' 4' 8'

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CHRISTOPHER J. CONSTANTINE

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208 NORTH CEDAR STREET
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PLUMBING SUPPLY PLAN - 2ND FLOOR

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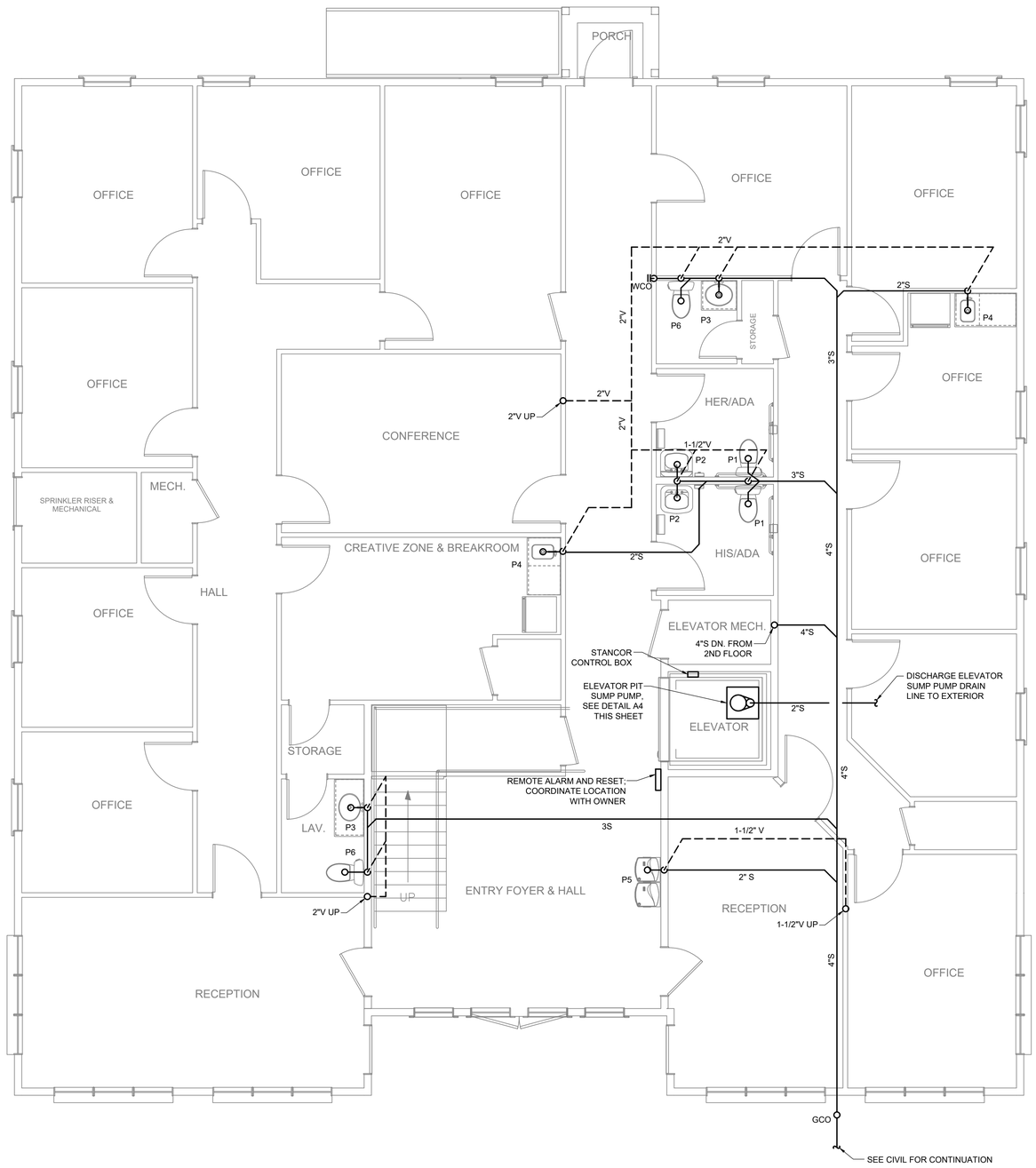
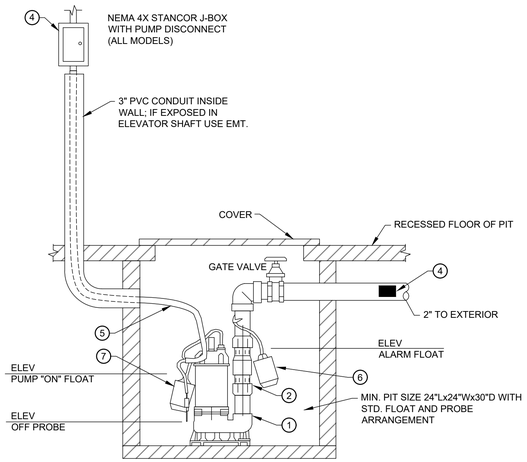


A1 **DRAIN, WASTE & VENT PLAN - 1ST FLOOR**

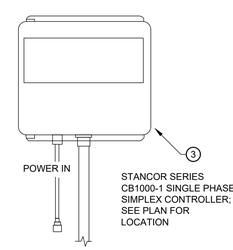
1/4" = 1'-0"

0 2' 4' 8'



NOTES:

1. STANCOR MODEL SE-50 SUBMERSIBLE EFFLUENT PUMP 0.50 HP, 115 VOLT, 3450 RPM, 2" DISCHARGE CONNECTION.
2. STANCOR CHECK VALVE.
3. STANCOR SERIES CB1000-1 SINGLE PHASE SIMPLEX CONTROLLER. INCLUDE HIGH WATER ALARM, RED LED LIGHT, BUZZER, TEST-SILENCE SWITCH OPTIONS AND REMOTE ALARM SIGNAL.
4. ALL BURIED PUMP PRESSURE DISCHARGE PIPING SHALL BE PROTECTED WITH TAPECOAT CT CORROSION PROTECTION TAPE.
5. POWER CABLE, PROBE CABLE AND HIGH LIQUID ALARM CABLE.
6. HIGH LIQUID ALARM FLOAT WITH CLAMP DEVICE TO MOUNT TO PUMP DISCHARGE PIPING.
7. PUMP "ON" FLOAT.



A4 **SUMP PUMP DETAIL**

NO SCALE

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CONSTANTINE ENGINEERING ASSOCIATES, LLC C-04361 CERTIFICATE OF AUTHORIZATION

SEAL 16540

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

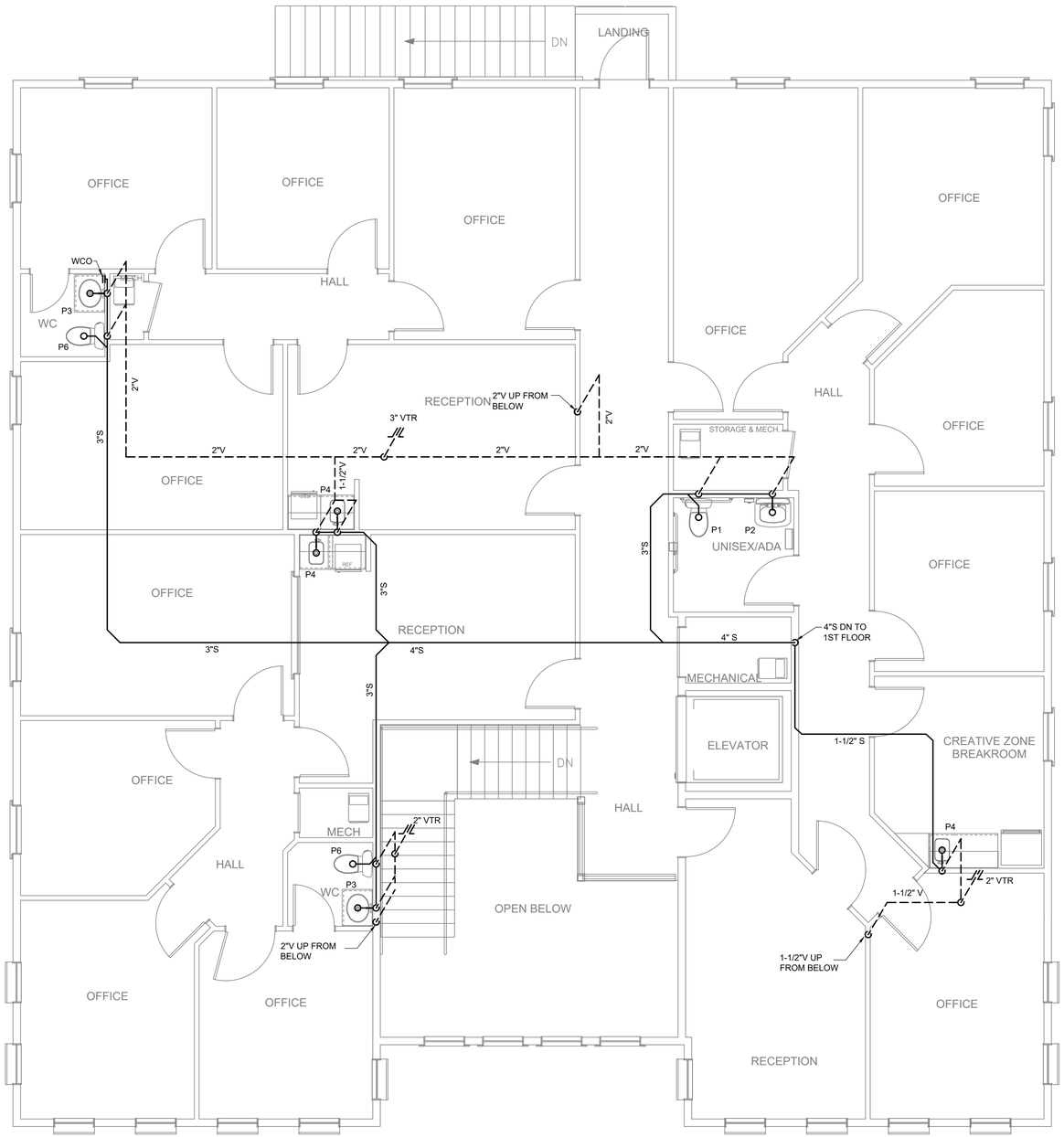
PLUMBING DRAIN, WASTE, AND VENT PLAN - 1ST FLOOR

REVISIONS:

DESIGNED BY:	DDF
DRAWN BY:	DDF
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
P3



A1 DRAIN, WASTE & VENT PLAN - 2ND FLOOR

1/4" = 1'-0"

0 2' 4' 8'

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SOUTH CAROLINA — CONSTANTINE ENGINEERING ASSOCIATES, LLC C-04361 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — SEAL 16540 — CHRISTOPHER J. CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

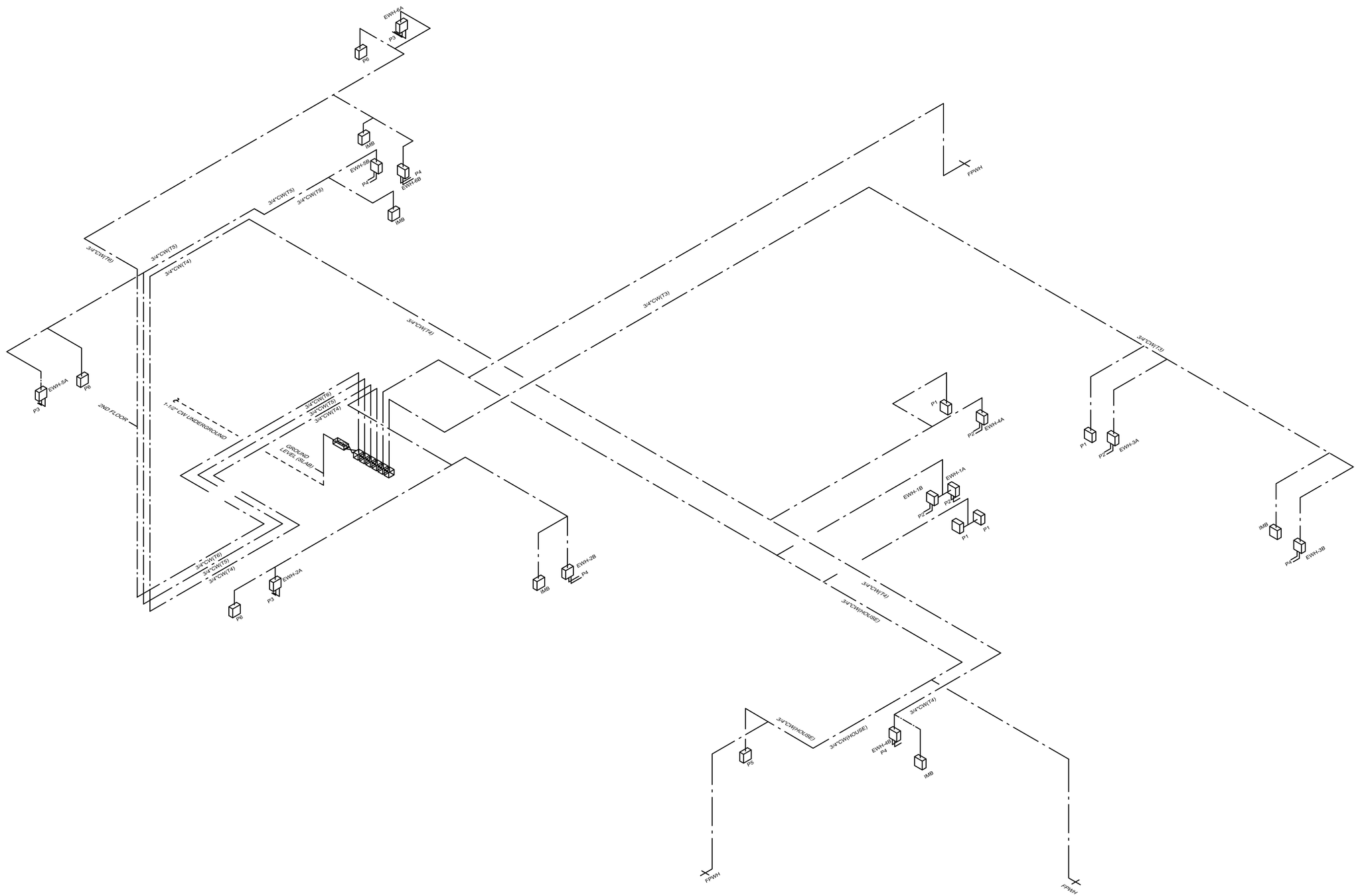
PLUMBING DRAIN, WASTE, AND VENT PLAN - 2ND FLOOR

REVISIONS:

DESIGNED BY:	DDF
DRAWN BY:	DDF
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
P4



A1 PLUMBING ISOMETRIC - SUPPLY

NO SCALE

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SOUTH CAROLINA — CONSTANTINE ENGINEERING ASSOCIATES, LLC C-04361 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — SEAL 16540 — CONSTANTINE

NORTH CEDAR OFFICE BUILDING

208 NORTH CEDAR STREET

SUMMERVILLE, SOUTH CAROLINA 29483

PLUMBING SUPPLY PLAN - ISOMETRIC VIEW

REVISIONS:

DESIGNED BY:	MBV
DRAWN BY:	MBV
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER

22-031

SHEET NUMBER

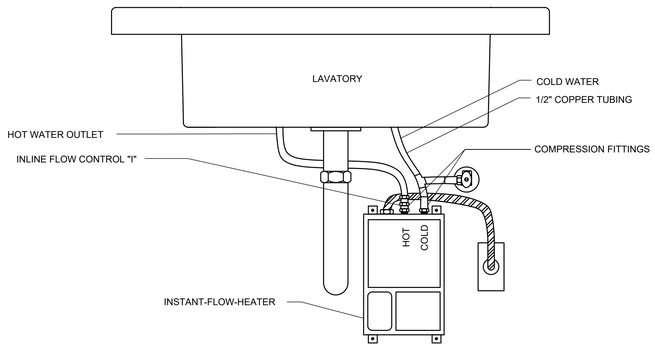
P5

PLUMBING FIXTURE SCHEDULE

MARK	DESCRIPTION	MFR	MODEL	USE				NOTES
				CW	HW	WASTE	VENT	
P1	ADA WATER CLOSET TANK TYPE	KOHLER	HIGHLINE CLASS 5 K-3999	1/2"	-	3"	2"	COMFORT HEIGHT COMBINATION ELONGATED TOILET, VITREOUS CHINA, 1.28 GPF WITH K-4650 LUSTRA SEAT AND COVER
P2	ADA LAVATORY WALL HUNG	KOHLER	PINOIR K-2028-4	1/2"	1/2"	1 1/2"	1 1/2"	INCLUDE KOHLER CORALAIS K-15583-4RA FAUCET AND DRAIN; INCLUDE REMOVABLE TRAP WITH SLIP JOINT
P3	ADA LAVATORY COUNTERTOP	KOHLER	PENNINGTON K-2196-4-0	1/2"	1/2"	1 1/2"	1 1/2"	INCLUDE KOHLER CORALAIS K-15583-4RA FAUCET AND DRAIN; INCLUDE REMOVABLE TRAP WITH SLIP JOINT
P4	KITCHEN SINK	SEE OWNER/ARCHITECT FOR FIXTURE SELECTION AND MODEL NUMBER		1/2"	1/2"	1 1/2"	1 1/2"	
P5	WATER COOLER, BARRIER FREE	ELKAY	EZSTL8C	1/2"	-	1-1/2"	1-1/2"	TWO STATION WALL MOUNT WATER COOLER, ADA COMPLIANT
P6	WATER CLOSET TANK TYPE	KOHLER	WELLWORTH CLASS 5 K-3998	1/2"	-	3"	2"	STANDARD HEIGHT COMBINATION ELONGATED TOILET, VITREOUS CHINA, 1.28 GPF WITH K-4650 LUSTRA SEAT AND COVER
FCO	FLOOR CLEANOUT	ZURN	CO-2450	-	-	3"	-	
GCO	GRADE CLEANOUT	ZURN	Z1400-NL	-	-	3"	-	
IMB	ICEMAKER OUTLET BOX	OATEY	POLYSTYRENE	1/2"	-	-	-	6"X6" HIGH IMPACT POLYSTYRENE WITH QUARTER-TURN BALL VALVE
WCO	WALL CLEANOUT	ZURN	Z1440	-	-	3"	-	
FPWH	FREEZE PROOF WALL HYDRANT	ZURN	Z1305	3/4"	-	-	-	

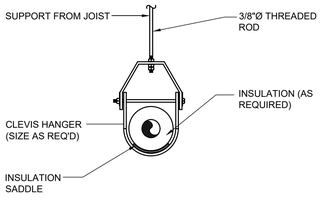
ELECTRIC WATER HEATER SCHEDULE (TANKLESS)

MARK	MFR	MODEL	VOLTS	PHASE	WATTS	RECOVERY @ 100°F RISE	NOTES
EWH-1A,2A,1B, 2B,3A,3B,4A,4B, 5A,5B,6A,6B	EEMAX	EX3012	120	1	3000	N/A TANKLESS	1. ELEMENT SHALL BE REPLACEMENT CARTRIDGE INSERT TYPE 2. REPLACEABLE FILTER IN INLET CONNECTION 3. FLOW REGULATOR IN OUTLET CONNECTION 4. COORDINATE WITH ELECTRICIAN FOR POWER REQUIREMENTS



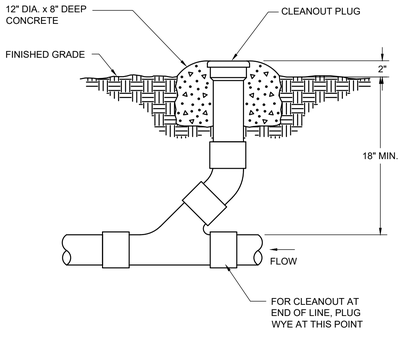
B1 TANKLESS WATER HEATER DETAIL

NO SCALE



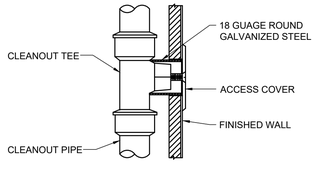
B2 PIPE SUPPORT DETAIL

NO SCALE



A1 GRADE CLEANOUT DETAIL

NO SCALE



A2 WALL CLEANOUT DETAIL

NO SCALE

SEISMIC DESIGN CATEGORY D

GENERAL NOTES

A. PER THE 2018 SOUTH CAROLINA BUILDING CODE, MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT AND COMPONENTS, INCLUDING THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED FOR SEISMIC FORCES IN ACCORDANCE WITH CHAPTER 13 OF ASCE 7-16.
B. EXTERIOR EQUIPMENT (INCLUDING ROOF CURBS, RAILS, SUPPORTS) EXPOSED TO WIND SHALL BE DESIGNED AND INSTALLED TO RESIST THE WIND PRESSURES DETERMINED IN ACCORDANCE WITH CHAPTERS 26 TO 29 OF ASCE 7-16.
C. WHERE DESIGN FOR SEISMIC AND WIND LOADS IS REQUIRED, THE MORE DEMANDING FORCE MUST BE USED.
D. REFERENCE THE STRUCTURAL DRAWINGS FOR SITE SPECIFIC INFORMATION ON SEISMIC DESIGN CATEGORY, WIND SPEEDS, ETC.
E. SEE DESIGN LOAD CRITERIA TABLE, THIS SHEET, FOR SPECIFIC COMPONENT IMPORTANCE FACTOR DESIGNATIONS.
F. USE TABLE BELOW TO DETERMINE SEISMIC RESTRAINT REQUIREMENTS FOR EACH COMPONENT.
G. FOR ALL COMPONENTS REQUIRING SEISMIC RESTRAINT, THE COMPONENT SUPPORTS AND ATTACHMENTS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL.
H. WHERE SEISMIC RESTRAINT IS REQUIRED, HOUSEKEEPING PADS NEEDED FOR THE INSTALLATION OF EQUIPMENT UNDER THIS CONTRACT MUST BE DESIGNED BY THE SEISMIC ENGINEER. DO NOT POUR ANY HOUSEKEEPING PADS PRIOR TO THE THE RECEIPT OF THE APPROVED SEISMIC SUBMITTAL.
I. SEISMIC RESTRAINTS FOR DUCTWORK AND PIPING MUST BE SHOWN ON LAYOUT DRAWINGS SHOWING SPECIFIC RESTRAINT LOCATIONS ALONG WITH ACCOMPANYING DETAILS AND CALCULATIONS.

COMPONENT IDENTIFICATION		COMPONENT IMPORTANCE FACTOR (Ip) 1.0 SEISMIC RESTRAINT REQUIREMENT	1.0 ASCE 7-16 REFERENCE	1.5 SEISMIC RESTRAINT REQUIREMENT	1.5 ASCE 7-16 REFERENCE
ROOF MOUNTED		RESTRAIN ALL (SEE NOTE 1)	13.1.4.6	RESTRAIN ALL	13.1.4.6
FLOOR MOUNTED		RESTRAIN ALL (SEE NOTES 1,2)	13.1.4.6	RESTRAIN ALL	13.1.4.6
WALL MOUNTED		RESTRAIN ALL (SEE NOTE 1,2)	13.1.4.6	RESTRAIN ALL	13.1.4.6
COMPONENT SUPPORTS		RESTRAIN ALL (SEE NOTE 1)	13.6.5	RESTRAIN ALL	13.6.5
SUSPENDED EQUIPMENT	INLINE W/ DUCT/PIPE	RESTRAIN IF >75 LBS PROVIDE FLEX. CONN. (SEE NOTE 3)	13.6.7	RESTRAIN IF >75 LBS PROVIDE FLEX. CONN. (SEE NOTE 3)	13.6.7
	NOT INLINE W/ DUCT/PIPE	RESTRAIN ALL (SEE NOTE 1)	13.1.4.6	RESTRAIN ALL	13.1.4.6
SUSPENDED DUCTILE PIPING (STEEL, ALUMINUM, COPPER, ETC.)		RESTRAIN IF > 3" (SEE NOTE 4)	13.6.8.3.c	RESTRAIN IF > 1" (SEE NOTE 4)	13.6.8.3.b
SUSPENDED NON DUCTILE PIPING (CAST IRON, PLASTIC, CERAMIC)		RESTRAIN ALL (SEE NOTE 4)	13.6.8.3.3	RESTRAIN ALL (SEE NOTE 4)	13.6.8.3.3
SUSPENDED PIPE ON TRAPEZE		RESTRAIN IF ANY PIPE ON TRAPEZE > 2" RESTRAIN IF TOTAL WEIGHT OF PIPES ON TRAPEZE > 10 LBS/FT (SEE NOTE 4)	13.6.8.3.1	RESTRAIN IF ANY PIPE ON TRAPEZE > 1" RESTRAIN IF TOTAL WEIGHT OF PIPES ON TRAPEZE > 10 LBS/FT (SEE NOTE 4)	13.6.8.3.1
DUCTWORK		RESTRAIN IF > 6 SQ.FT. AND > 17 LBS/FT (SEE NOTE 4,5)	13.6.7	RESTRAIN IF > 6 SQ.FT. AND > 17 LBS/FT (SEE NOTE 4,5)	13.6.7
MULTIPLE DUCTS ON TRAPEZE		RESTRAIN IF TOTAL WEIGHT OF DUCTS ON TRAPEZE > 10 LBS/FT (SEE NOTE 4,5)	13.6.7	RESTRAIN IF TOTAL WEIGHT OF DUCTS ON TRAPEZE > 10 LBS/FT (SEE NOTE 4,5)	13.6.7

TABLE NOTES:
1. EQUIPMENT 20 LBS. OR LESS IS EXEMPT IF THE COMPONENT IS POSITIVELY ATTACHED TO THE STRUCTURE, AND FLEXIBLE CONNECTIONS ARE PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.
2. RESTRAINTS ARE NOT REQUIRED IF THE COMPONENT WEIGHTS 400 LBS. OR LESS, IS MOUNTED WITH THE CENTER OF MASS AT 4 FT. OR LESS ABOVE A FLOOR, IS POSITIVELY ATTACHED TO THE STRUCTURE, AND HAS FLEXIBLE CONNECTIONS BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.
3. FLEXIBLE CONNECTIONS REQUIRED FOR PIPE CONNECTIONS ONLY.
4. RESTRAINT IS NOT REQUIRED IF THE PIPING / DUCTWORK / CONDUIT IS SUPPORTED BY HANGERS AND EACH HANGER IN THE PIPING RUN IS 12 IN. OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE. WHERE PIPES ARE SUPPORTED ON A TRAPEZE, THE TRAPEZE SHALL BE SUPPORTED BY HANGERS HAVING A LENGTH OF 12 IN. OR LESS. WHERE ROD HANGERS ARE USED, THEY SHALL BE EQUIPPED WITH SWIVELS, EYE NUTS OR OTHER DEVICES TO PREVENT BENDING IN THE ROD.
5. ALL DUCTWORK, REGARDLESS OF SIZE, DESIGNED TO CARRY TOXIC, HIGHLY TOXIC, OR EXPLOSIVE GASES OR USED FOR SMOKE CONTROL MUST BE RESTRAINED.

PLUMBING SPECIFICATIONS

COMMON PIPING REQUIREMENTS
1. SUPPORTING DEVICES
   1.A. Hanger and Pipe Attachments: Factory fabricated with galvanized coatings; nonmetallic coated for hangers in direct contact with copper tubing.
2. INSTALLATION
   2.A. Install piping free of sags and bends.
   2.B. Install fittings for changes in direction and branch connections.
   2.C. Install sleeves pipes passing through walls, gypsum-board partitions and concrete floor.
   2.D. Exterior Wall, Pipe Penetrations: Mechanical sleeve seals installed in steel or cast-iron pipes for wall sleeves.
   2.E. Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals in waster piping.
3. HANGERS AND SUPPORTS
   3.A. Install building attachments within concrete or to structure. Install additional attachments at concentrated loads, and at changes in direction of piping.
   3.B. Load Distribution: Install hangers and supports so piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

DOMESTIC WATER PIPING
1. PIPES AND TUBES
   1.A. Hard Copper Tube: ASTM B 88, Type L, water tube, drawn temper.
   1.B. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.
   1.C. Cross Linked Polyethylene: PEX Type-A.
2. FITTINGS
   2.A. Wrought- Copper, Solder-Joint Pressure Fittings: ASME B16.22.
   2.B. Cast-Copper-Alloy, Solder-Joing Pressure Fittings: ASME b16.18.
   2.C. Copper Unions: ASME B16.18, cast-copper-alloy body, hexagonal stock, with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends. Threads complying with ASME B1.20.1.
   2.D. Ductile- and Gray-Iron Gasketed Fittings: AWWA C110 standard pattern or ductile-iron AWWA C153 compact pattern, 250-psig minimum pressure rating, with AWWA C104 cement-mortar lining and AWWA C111 rubber gaskets.
3. JOINING MATERIALS
   3.A. Solder Filler Metal: ASTM B 32, alloys to suit system requirements.
   3.B. Brazing Filler Metals: AWS A5.8, alloys to suit system requirements.
4. PIPING APPLICATIONS
   4.A. Install listed pipe materials and joint methods below in the following applications:
      4.A.1. Underground, Service Entrance Piping: soft copper tube, Type K, seamless.
      4.A.2. Aboveground: hard copper tube, Type L; wrought-copper or cast-copper-alloy pressure fittings; copper unions; bronze flanges; and solder joints with Alloy Sn95, Sn94, or E solder.
5. VALVE APPLICATIONS
   5.A. Install gate valves close to main on each branch and riser serving 2 or more plumbing fixtures or equipment connections and where indicated.
   5.B. Install gate or ball valves on inlet to each plumbing equipment item, on each supply to each plumbing fixture not having stops on supplies, and elsewhere as indicated.
   5.C. Install drain valve at base of each riser, at low points of horizontal runs, and where required to drain water distribution piping system.
6. PIPING INSTALLATIONS
   6.A. Install hangers and supports at intervals indicated in the applicable Plumbing Code and as recommended by pipe manufacturer.
   6.B. Install water hammer arresters at location indicated and elsewhere as required for acceptable control of water shock.
7. INSPECTING AND CLEANING
   7.A. Inspect and test piping systems following procedures of authorities having jurisdiction.
   7.B. Clean and disinfect water distribution piping following procedures of authorities having jurisdiction.
8. PIPE INSULATION
   8.A. Cold water: 1/2-inch elastomeric, closed cell type (copper only).
   8.B. Hot water: 3/4-inch elastomeric, closed cell type (copper throughout, PEX within 8-ft of water heater).

SANITARY WASTE AND VENT PIPING
1. PIPES AND TUBES
   1.A. PVC Plastic, DWV Pipe: ASTM D 2665, Schedule 40, plain ends.
2. FITTINGS
   2.A. PVC Plastic, DWV Pipe Fittings: ASTM D 2665, made to ASTM D 3311; socket-type; drain, waste, and vent pipe patterns.
3. PIPE APPLICATIONS
   3.A. PVC Plastic, DWV Pipe; PVC socket-type drain, waste, and vent pipe pattern fittings; and solvent-cemented joints.
4. PIPING INSTALLATION
   4.A. Install cleanout and extension to grade at connection of building sanitary drain and building sanitary sewer.
   4.B. Locate drainage piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.
   4.C. ALL Buried plastic pipe and fittings shall be installed per ASTM D 2321.
5. INSPECTION
   5.A. Inspect and test piping systems following procedures of authorities having jurisdiction.

PLUMBING FIXTURES
1. SECTION REQUIREMENTS
   1.A. Submit Product Data for each type of plumbing fixture.
   1.B. Comply with requirements of Public Law 102-486, "Energy Policy Act," regarding water flow rate and water consumption of plumbing fixtures.
2. See schedule, this Sheet.
3. INSTALLATIONS
   3.A. Install fitting insulation kits on handicap-accessible fixtures.
   3.B. Install fixtures with flanges and gasket seals.
   3.C. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.
   3.D. Fasten wall-hanging plumbing fixtures securely to supports attached to building substrate when supports are specified, and to building wall construction where no support is indicated.
   3.E. Fasten floor-mounted fixtures to substrate. Fasten fixtures having holes for securing fixture to wall construction, to reinforcement built into walls.
   3.F. Fasten wall-mounted fittings to reinforcement built into walls.
   3.G. Fasten counter-mounting plumbing fixtures to casework.
   3.H. Secure supplies to supports or substrate within pipe space behind fixture.
   3.I. Install individual supply inlets, supply stops, supply risers, and tubular brass traps with cleanouts at fixture.
   3.J. Install water-supply stop valves in accessible locations.
   3.K. Install traps on fixture outlets. Omit traps on fixtures having integral traps. Omit traps on indirect wastes, unless otherwise indicated.
   3.L. Install escutcheons at wall, floor, and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-patter escutcheons where required to conceal protruding pipe fittings.
   3.M. Seal joints between fixtures and walls, floors, and counters using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color.
   3.N. Install piping connections between plumbing fixtures and piping systems and plumbing equipment. Install insulation on supplies and drains of handicap-accessible fixtures.
   3.O. Ground equipment. Tighten electrical connectors and terminals according to UL 486A and UL486B.

DOMESTIC WATER HEATERS.
1. SECTION REQUIREMENTS
   1.A. Submit Product Data.
   1.B. Comply with performance efficiencies prescribed in ASHRAE 90.
2. ELECTRIC WATER HEATERS
   2.A. See schedule, this Sheet.
3. INSTALLATION
   3.A. Install temperature and pressure-relief valves and extend to exterior, or mop sink.
   3.B. Install vacuum-relief valves in cold-water-inlet piping.
   3.C. Install shutoff valves and unions at hot- and cold-water piping connections.
   3.D. Make piping connections with dielectric fittings where dissimilar piping materials are joined.
   3.E. Electrically ground units according to authorities having jurisdiction.

DESIGN LOAD CRITERIA

WIND RESTRAINT LOADING		SEISMIC RESTRAINT LOADING						
BASIC WIND SPEED	BUILDING CLASSIFICATION CATEGORY	SITE CLASS	BUILDING CATEGORY	IMPORTANCE FACTOR	RESPONSE MODIFICATION FACTOR	AMPLIFICATION FACTOR	SPECTRAL RESPONSE ACCELERATION (SHORT PERIODS) S_{DS}	SPECTRAL RESPONSE ACCELERATION (1-SEC PERIODS) S_{D1}
SEE STRUCTURAL		D	B	1.0	SEE STRUCTURAL		0.876G	0.297G

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SOUTH CAROLINA CONSTANTINE ENGINEERING ASSOCIATES, LLC C-04361 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 16540 CHRISTOPHER J. CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

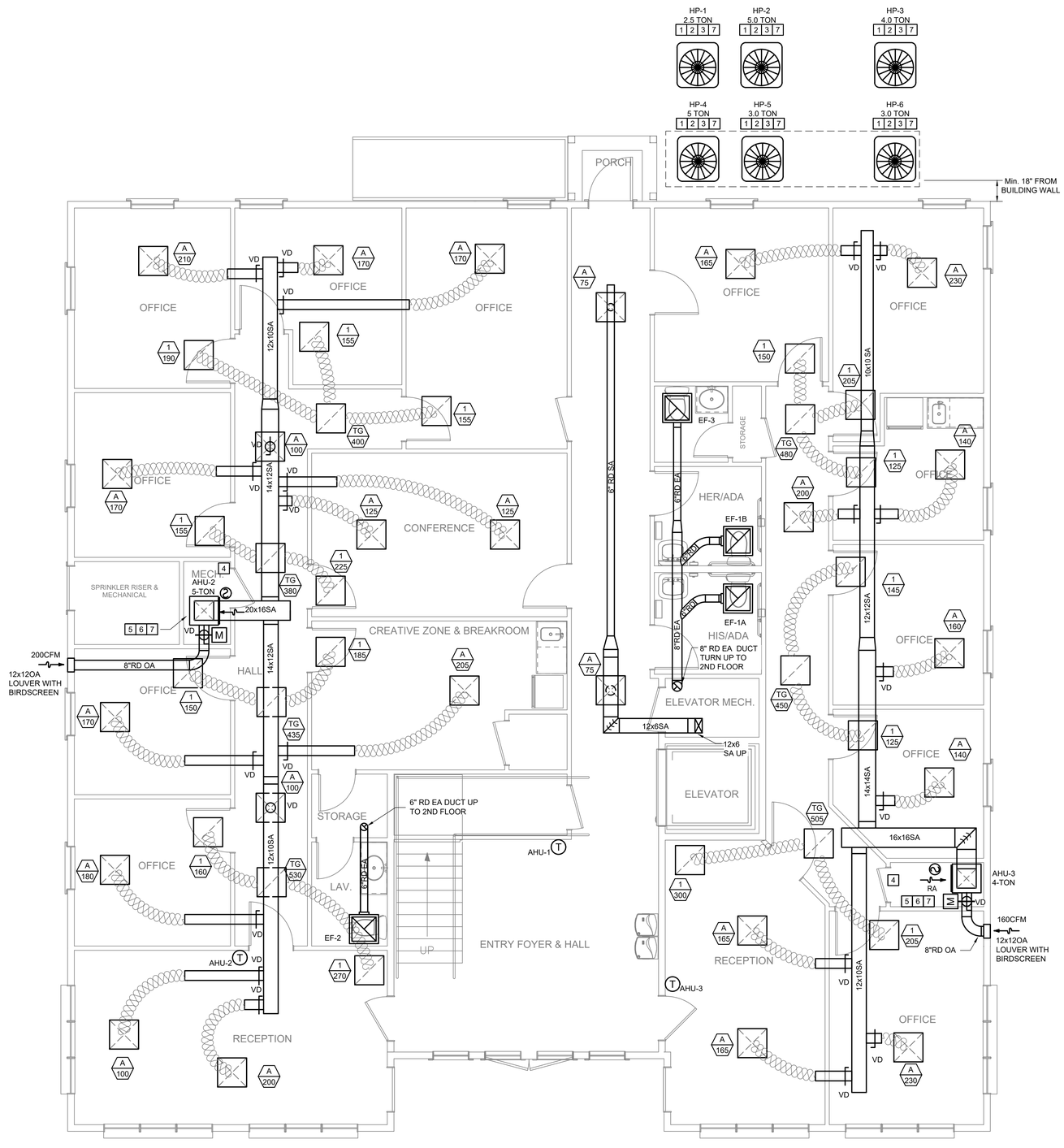
SEISMIC DESIGN, DETAILS AND SPECIFICATIONS

REVISIONS:

DESIGNED BY:	DDF
DRAWN BY:	DDF
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
P7



LEGEND

	CEILING SUPPLY DIFFUSER
	CEILING RETURN GRILLE
	EXHAUST FAN, EF
	SIDEWALL SPIN-IN W/DAMPER
	FLEXIBLE DUCT-MAX. 8' LONG SEE SCHEDULE FOR SIZES
VD	MANUAL VOLUME DAMPER
M	MOTORIZED VOLUME DAMPER
OBBD	OPPOSED BLADE BALANCING DAMPER
SA	SUPPLY AIR
OA	OUTDOOR AIR
EA	EXHAUST AIR
HP	HEAT PUMP
AHU	AIR HANDLING UNIT
EF	EXHAUST FAN
CFM	CUBIC FEET PER MINUTE
RA	RETURN AIR
RD	ROUND DUCT
T N	THERMOSTAT, N DENOTES UNIT NUMBER
7 / 150	TOP: DIFFUSER TAG (SEE SCHEDULE) BOTTOM: AIRFLOW (CFM)
	DUCT SMOKE DETECTOR WIRED BACK TO F.A.C.P. (SEE ELECTRICAL)

GENERAL NOTES

1. PROVIDE LABOR, MATERIALS AND EQUIPMENT TO COMPLETE THE HVAC WORK INDICATED ON THE DRAWINGS AND AS REQUIRED BY LOCAL CODES AND ORDINANCES.
2. FURNISH AND INSTALL HEATING AND COOLING UNITS AS INDICATED ON THE DRAWINGS.
3. FABRICATE AND INSTALL DUCTWORK IN ACCORDANCE WITH SMACNA STANDARDS.
4. INSTALL CONTROL SYSTEM COMPLETE WITH WIRING, COMPONENTS, ETC., TO PERFORM CONTROL SEQUENCE AS PER FACTORY RECOMMENDATIONS.
5. INSTALL AND CONNECT THE HVAC SYSTEM IN STRICT ACCORDANCE WITH LOCAL CODES, ORDINANCES AND THE 2018 SOUTH CAROLINA MECHANICAL CODE.
6. ADJUST CONTROLS AND EQUIPMENT FOR PROPER OPERATION. LUBRICATE AND CLEAN EQUIPMENT PRIOR TO ACCEPTANCE OF BUILDING BY OWNER.
7. COORDINATE WORK WITH THE ELECTRICAL INSTALLER.
8. FURNISH THE OWNER WITH OPERATING MANUALS AND MAINTENANCE INSTRUCTIONS FOR EQUIPMENT INSTALLED.
9. GUARANTEE WORK INSTALLED UNDER THE CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS, USUAL WEAR EXPECTED. SHOULD SUCH DEFECTS DEVELOP WITHIN A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF THE BUILDING BY THE OWNER, REPAIR AND/OR REPLACE DEFECTIVE ITEMS AND DAMAGE, RESULTING FROM FAILURE OF THESE ITEMS, AT NO EXPENSE WHATSOEVER TO THE OWNER. PROVIDE FIVE (5) YEAR COMPRESSOR WARRANTY.

DRAWING NOTES

1. FIELD VERIFY EQUIPMENT LOCATION TO ENSURE REQUIRED MANUFACTURERS CLEARANCES ARE MAINTAINED.
2. PROVIDE LOCKING REFRIGERANT CAPS PER SCMC 110.10, (TYPICAL).
3. THE CONDENSING UNITS SHALL BE MOUNTED ABOVE GRADE ON A 4" THICK CONCRETE PAD, EXTEND 6" PAST ON ALL SIDES.
4. PROVIDE LOUVERED DOOR (LOW) FOR RETURN AIR BACK TO AHUs.
5. PROVIDE DUCT MOUNTED SMOKE DETECTOR IN THE RETURN DUCT OF ALL AIR HANDLING UNITS (AHU's) TO DE-ENERGIZE THE SUPPLY FAN SHOULD SMOKE BE DETECTED. DUCT MOUNTED SMOKE DETECTORS ARE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
6. ROUTE CONDENSATE TUBING TO THE OUTSIDE. PROVIDE WITH 3/4" ELASTOMETRIC INSULATION AND SPLASH BLOCK ON GRADE.
7. FIELD VERIFY AND ROUTE REFRIGERANT LINES UP IN WALL, ABOVE CEILINGS AND TO AHU(s).

A1 **MECHANICAL PLAN - 1ST FLOOR**

1/4" = 1'-0"

0 2' 4' 8'

CONSTANTINE ENGINEERING ASSOCIATES, LLC
1643B Savannah Hwy. #181, Charleston, SC 29407
Phone: 843.628-7878, Fax: 843.628-7881

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
CONSTANTINE ENGINEERING ASSOCIATES, LLC
C-04361

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
SEAL 16540

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

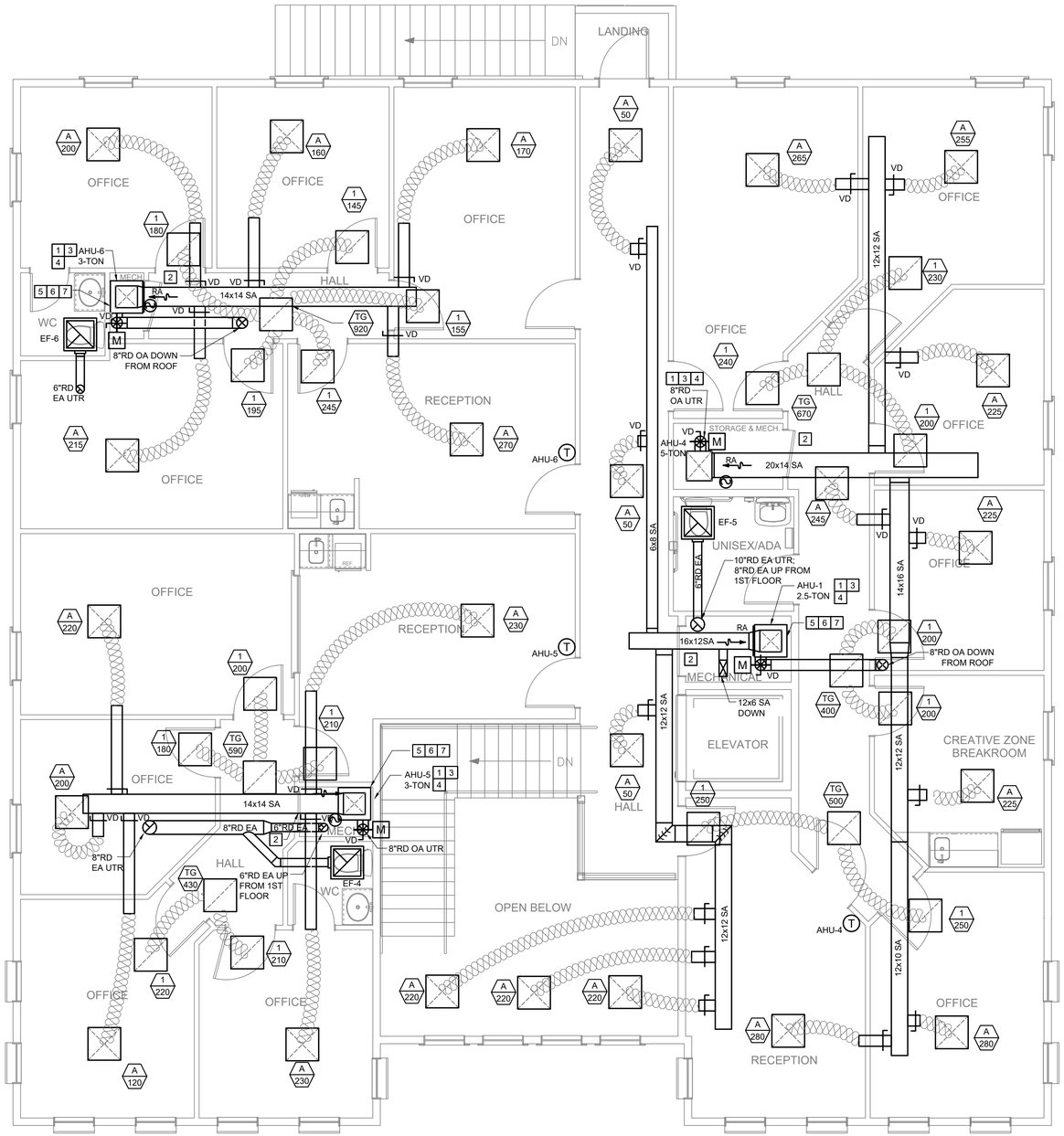
MECHANICAL PLAN - 1ST FLOOR

REVISIONS:

DESIGNED BY:	MBV
DRAWN BY:	MBV
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
M1



DRAWING NOTES

1. PROVIDE LOUVERED DOOR (LOW) FOR RETURN AIR BACK TO AHUs.
2. PROVIDE DUCT MOUNTED SMOKE DETECTOR IN THE RETURN DUCT OF ALL AIR HANDLING UNITS (AHU's) TO DE-ENERGIZE THE SUPPLY FAN SHOULD SMOKE BE DETECTED. DUCT MOUNTED SMOKE DETECTORS ARE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
3. ROUTE CONDENSATE TUBING TO THE OUTSIDE. PROVIDE WITH 3/4" ELASTOMETRIC INSULATION AND SPLASH BLOCK ON GRADE.
4. FIELD VERIFY AND ROUTE REFRIGERANT LINES UP IN WALL, ABOVE CEILINGS AND TO AHU(s).

A1 MECHANICAL PLAN - 2ND FLOOR

1/4" = 1'-0"

0 2' 4' 8'

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SOUTH CAROLINA — CONSTANTINE ENGINEERING ASSOCIATES, LLC C-04361 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — SEAL 16540 — CHRISTOPHER J. CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

MECHANICAL PLAN- 2ND FLOOR

REVISIONS:

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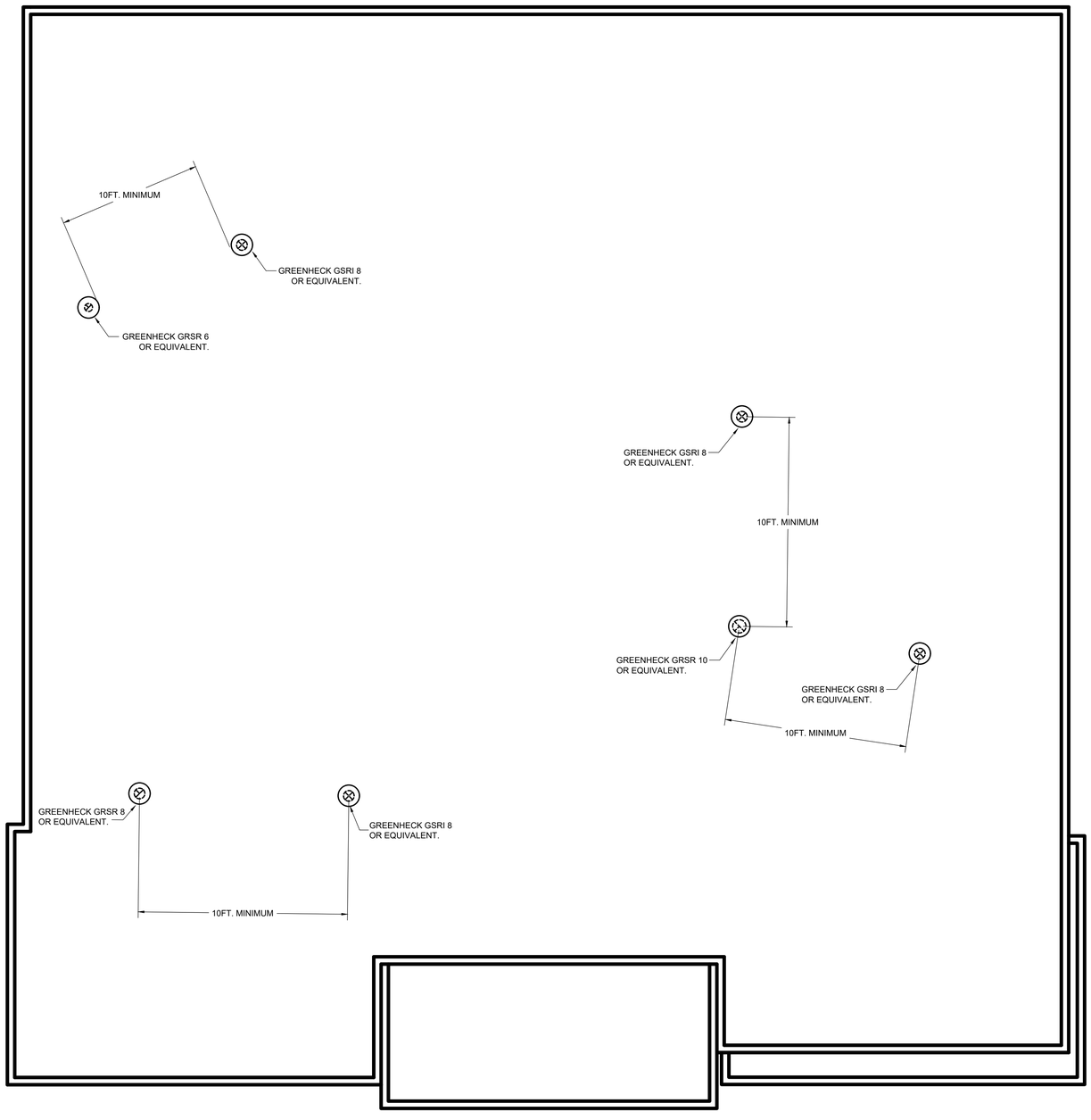
M2



A1 **MECHANICAL PLAN - ROOF**

1/4" = 1'-0"

0 2' 4' 8'

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208 NORTH CEDAR STREET

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MECHANICAL PLAN - ROOF

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SPLIT SYSTEM HEAT PUMP SCHEDULE

SYMBOL	INDOOR SECTION				COOLING CAPACITY @95°F (MBTUH)			HEATING SECTION			ELECTRICAL			FILTER	DESIGN BASIS
	TOTAL CFM	O.A. CFM	AIR ENTR.	E.S.P. I.W.G.	TOTAL	SENS.	(S)EER	TYPE	CAP.	STAGES	SYS. VOLTS	MCA	MOCP		
AHU-1	1000	100	80°F db/67°F WB	0.50	-	-	-	AUX ELEC	3.60 KW	-	240/1/60	29	30	MERV-11	TRANE TEM6A0B30H21
HP-1	-	-	95°F db/80°F WB	-	29.2	21.8	(14.50)	R410A	27.8 MBH	-	240/1/60	17	25	-	TRANE 4TWR4030G1
AHU-5,6	1200	120	80°F db/67°F WB	0.50	-	-	-	AUX ELEC	7.68 KW	-	240/1/60	45	45	MERV-11	TRANE TEM6A0C36H31
HP-5,6	-	-	95°F db/80°F WB	-	36.7	27.3	(14.50)	R410A	32.6 MBH	-	240/1/60	19	30	-	TRANE 4TWR4036G1
AHU-3	1600	160	80°F db/67°F WB	0.50	-	-	-	AUX ELEC	9.6 KW	-	240/1/60	59	60	MERV-11	TRANE TEM6A0D48H41
HP-3	-	-	95°F db/80°F WB	-	48.5	35.8	(14.50)	R410A	44.0 MBH	-	240/1/60	26	45	-	TRANE 4TWR4048G1
AHU-2,4	2000	200	80°F db/67°F WB	0.50	-	-	-	AUX ELEC	10.80 KW	-	240/1/60	60	60	MERV-11	TRANE GAM5B0C60M51SB
HP-2,4	-	-	95°F db/80°F WB	-	57.0	41.8	(14.00)	R410A	54.0 MBH	-	240/1/60	32	50	-	TRANE 4TWR4060G1000A

NOTES:

1. PROVIDE WITH SINGLE POINT POWER CONNECTION.
2. SEER REQUIREMENTS ARE MINIMUM ARI STANDARDS AND SHALL INCLUDE FAN MOTOR HEAT ADDITION.
3. FAN SECTIONS SHALL BE FACTORY PROVIDED WITH INTERNAL VIBRATION ISOLATION.
4. INSTALL INSULATED PVC DRIP PAN LINES FROM AHU PIPED TO EXTERIOR AS INDICATED ON PLANS.
5. PROVIDE ACCUMULATORS AND OTHER EQUIPMENT AS RECOMMENDED BY MANUFACTURER FOR EXTENDED REFRIGERANT LINE LENGTHS.
6. PROVIDE DUCT MOUNTED SMOKE DETECTOR IN THE RETURN DUCT OF ALL AIR HANDLER UNITS TO DE-ENERGIZE THE SUPPLY FAN SHOULD SMOKE BE DETECTED. DUCT MOUNTED SMOKE DETECTORS ARE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
7. PROVIDE WIRED, 7-DAY PROGRAMMABLE, WALL MOUNTED THERMOSTATS FOR AHUs.

DIFFUSER, REGISTER, AND GRILLE SCHEDULE

MARK	MFR	MODEL	TYPE	USE			MTG	PANEL SIZE	NECK SIZE	DAMPER	FINISH	PATTERN	NOTES
				SPLY	RET	EXH							
A	NAILOR	6250	CEILING DIFFUSER	X			LAY-IN	24X24	SEE CHART	VD IN DUCT	WHITE	4-WAY	
1	NAILOR	4260AA	CEILING GRILLE		X		LAY-IN	24X24	SEE CHART	N/A	WHITE	N/A	
TG	NAILOR	4260AA	CEILING GRILLE		X		LAY-IN	24X24	SEE CHART	N/A	WHITE	N/A	PLENUM BOX MOUNTED TO TOP OF TG GRILLE

EXHAUST FAN SCHEDULE

SYMBOL	MFR	MODEL	CFM	ST PR (IWG)	DRIVE	FAN RPM	MOTOR W	SYS. VOLTS	CONTROL
EF-3,4,6	GREENHECK	SP-A50-90-VG	75	0.359	DIRECT	887	12	120/1/60	LIGHT SWITCH, SEE ELECTRICAL
EF-1A,1B,2,5	LIGHT/EXHAUST FAN COMBINATION TO BE SELECTED BY ARCHITECT		75	0.359	DIRECT	887	12	120/1/60	LIGHT SWITCH, SEE ELECTRICAL

DESIGN LOAD CRITERIA

WIND RESTRAINT LOADING		SEISMIC RESTRAINT LOADING						
BASIC WIND SPEED	BUILDING CLASSIFICATION CATEGORY	SITE CLASS	BUILDING CATEGORY	IMPORTANCE FACTOR	RESPONSE MODIFICATION FACTOR	AMPLIFICATION FACTOR	SPECTRAL RESPONSE ACCELERATION (SHORT PERIODS) S_{DS}	SPECTRAL RESPONSE ACCELERATION (1-SEC PERIODS) S_{D1}
SEE STRUCTURAL		D	B	1.0	SEE STRUCTURAL		1.496	NULL

CHART OF NECK SIZES (FOR DIFFUSERS & GRILLES)

CFM	DIA
0-34	4"
35-97	6"
98-209	8"
210-374	10"
375-605	12"
606-904	14"
905-1300	16"

SEISMIC DESIGN CATEGORY D

GENERAL NOTES

A. PER THE 2018 SOUTH CAROLINA BUILDING CODE, MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT AND COMPONENTS, INCLUDING THEIR SUPPORTS AND ATTACHMENTS, SHALL BE DESIGNED FOR SEISMIC FORCES IN ACCORDANCE WITH CHAPTER 13 OF ASCE 7-16.
B. EXTERIOR EQUIPMENT (INCLUDING ROOF CURBS, RAILS, SUPPORTS) EXPOSED TO WIND SHALL BE DESIGNED AND INSTALLED TO RESIST THE WIND PRESSURES DETERMINED IN ACCORDANCE WITH CHAPTERS 26 TO 29 OF ASCE 7-16.
C. WHERE DESIGN FOR SEISMIC AND WIND LOADS IS REQUIRED, THE MORE DEMANDING FORCE MUST BE USED.
D. REFERENCE THE STRUCTURAL DRAWINGS FOR SITE SPECIFIC INFORMATION ON SEISMIC DESIGN CATEGORY, WIND SPEEDS, ETC.
E. SEE DESIGN LOAD CRITERIA TABLE, THIS SHEET, FOR SPECIFIC COMPONENT IMPORTANCE FACTOR DESIGNATIONS.
F. USE TABLE BELOW TO DETERMINE SEISMIC RESTRAINT REQUIREMENTS FOR EACH COMPONENT.
G. FOR ALL COMPONENTS REQUIRING SEISMIC RESTRAINT, THE COMPONENT SUPPORTS AND ATTACHMENTS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL.
H. WHERE SEISMIC RESTRAINT IS REQUIRED, HOUSEKEEPING PADS NEEDED FOR THE INSTALLATION OF EQUIPMENT UNDER THIS CONTRACT MUST BE DESIGNED BY THE SEISMIC ENGINEER. DO NOT POUR ANY HOUSEKEEPING PADS PRIOR TO THE THE RECEIPT OF THE APPROVED SEISMIC SUBMITTAL.
I. SEISMIC RESTRAINTS FOR DUCTWORK AND PIPING MUST BE SHOWN ON LAYOUT DRAWINGS SHOWING SPECIFIC RESTRAINT LOCATIONS ALONG WITH ACCOMPANYING DETAILS AND CALCULATIONS.

COMPONENT IDENTIFICATION		COMPONENT IMPORTANCE FACTOR (Ip) 1.0 SEISMIC RESTRAINT REQUIREMENT	1.0 ASCE 7-16 REFERENCE	1.5 SEISMIC RESTRAINT REQUIREMENT	1.5 ASCE 7-16 REFERENCE
ROOF MOUNTED		RESTRAIN ALL (SEE NOTE 1)	13.1.4.6	RESTRAIN ALL	13.1.4.6
FLOOR MOUNTED		RESTRAIN ALL (SEE NOTES 1,2)	13.1.4.6	RESTRAIN ALL	13.1.4.6
WALL MOUNTED		RESTRAIN ALL (SEE NOTE 1,2)	13.1.4.6	RESTRAIN ALL	13.1.4.6
COMPONENT SUPPORTS		RESTRAIN ALL (SEE NOTE 1)	13.6.5	RESTRAIN ALL	13.6.5
SUSPENDED EQUIPMENT	INLINE W/ DUCT/PIPE	RESTRAIN IF >75 LBS PROVIDE FLEX. CONN. (SEE NOTE 3)	13.6.7	RESTRAIN IF >75 LBS PROVIDE FLEX. CONN. (SEE NOTE 3)	13.6.7
	NOT INLINE W/ DUCT/PIPE	RESTRAIN ALL (SEE NOTE 1)	13.1.4.6	RESTRAIN ALL	13.1.4.6
SUSPENDED DUCTILE PIPING (STEEL, ALUMINUM, COPPER, ETC.)		RESTRAIN IF > 3" (SEE NOTE 4)	13.6.8.3.3.c	RESTRAINT IF > 1" (SEE NOTE 4)	13.6.8.3.3.b
SUSPENDED NON DUCTILE PIPING (CAST IRON, PLASTIC, CERAMIC)		RESTRAIN ALL (SEE NOTE 4)	13.6.8.3.3	RESTRAIN ALL (SEE NOTE 4)	13.6.8.3.3
SUSPENDED PIPE ON TRAPEZE		RESTRAIN IF ANY PIPE ON TRAPEZE > 3" RESTRAIN IF TOTAL WEIGHT OF PIPES ON TRAPEZE > 10 LBS/FT (SEE NOTE 4)	13.6.8.3.1	RESTRAIN IF ANY PIPE ON TRAPEZE > 1" RESTRAIN IF TOTAL WEIGHT OF PIPES ON TRAPEZE > 1 LBS/FT (SEE NOTE 4)	13.6.8.3.1
DUCTWORK		RESTRAIN IF > 6 SQ.FT. AND > 17 LBS/FT (SEE NOTE 4,5)	13.6.7	RESTRAIN IF > 6 SQ.FT. AND > 17 LBS/FT (SEE NOTE 4,5)	13.6.7
MULTIPLE DUCTS ON TRAPEZE		RESTRAIN IF TOTAL WEIGHT OF DUCTS ON TRAPEZE > 10 LBS/FT (SEE NOTE 4,5)	13.6.7	RESTRAIN IF TOTAL WEIGHT OF DUCTS ON TRAPEZE > 10 LBS/FT (SEE NOTE 4,5)	13.6.7

TABLE NOTES:

1. EQUIPMENT 20 LBS. OR LESS IS EXEMPT IF THE COMPONENT IS POSITIVELY ATTACHED TO THE STRUCTURE, AND FLEXIBLE CONNECTIONS ARE PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.
2. RESTRAINTS ARE NOT REQUIRED IF THE COMPONENT WEIGHTS 400 LBS. OR LESS, IS MOUNTED WITH THE CENTER OF MASS AT 4 FT. OR LESS ABOVE A FLOOR, IS POSITIVELY ATTACHED TO THE STRUCTURE, AND HAS FLEXIBLE CONNECTIONS BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.
3. FLEXIBLE CONNECTIONS REQUIRED FOR PIPE CONNECTIONS ONLY.
4. RESTRAINT IS NOT REQUIRED IF THE PIPING / DUCTWORK / CONDUIT IS SUPPORTED BY HANGERS AND EACH HANGER IN THE PIPING RUN IS 12 IN. OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE. WHERE PIPES ARE SUPPORTED ON A TRAPEZE, THE TRAPEZE SHALL BE SUPPORTED BY HANGERS HAVING A LENGTH OF 12 IN. OR LESS. WHERE ROD HANGERS ARE USED, THEY SHALL BE EQUIPPED WITH SWIVELS, EYE NUTS OR OTHER DEVICES TO PREVENT BENDING IN THE ROD.
5. ALL DUCTWORK, REGARDLESS OF SIZE, DESIGNED TO CARRY TOXIC, HIGHLY TOXIC, OR EXPLOSIVE GASES OR USED FOR SMOKE CONTROL MUST BE RESTRAINED.

MECHANICAL SPECIFICATIONS

MECHANICAL INSULATION
1. SECTION REQUIREMENTS
   1.A. Summary: Mechanical insulation includes duct insulation for indoor applications.
   1.B. Submit Product Data for each type of mechanical insulation
   1.C. Quality Assurance: UL labeled with maximum flame-spread rating of 25 and maximum smoke- developed rating of 50 according to ASTM E 84.
2. DUCT AND EQUIPMENT INSULATION
   2.A. Glass-Fiber-Blanket Insulation: ASTM C 553, Type II, Class F1, jacketed blankets with a k-value of 0.31 at 75 deg F mean temperature.
3. INSTALLATION
   3.A. Seal vapor-barrier penetrations for hangers, supports, anchors, and other projections.
   3.B. Interior Walls and Partitions Penetrations: Apply insulation continuously through walls and partitions.
   3.C. Interior Piping System Applications: Insulate the following piping systems:
      3.C.1. Refrigerant suction piping.
   3.D. Install duct insulation as follows:
      3.D.1. Install insulation continuously on ducts. Maintain insulation vapor retarder on supply duct.
      3.D.2. Install removable or segmented insulation on access panel and doors.
      3.D.3. Install vapor barriers on insulated ducts and plenums with surface operating temperatures below 60 deg F. Seal joints and seams to maintain vapor barrier on insulation requiring a vapor barrier.
      3.D.4. Seal penetrations for hangers, supports, anchors, and other projections in insulation requiring a vapor barrier.
      3.D.5. Blanket Insulation Installation: Bond ducts having long sides or diameters smaller than 24 inches with bonding adhesive applied in 6-inch- wide transverse strips on 12-inch centers. Bond ducts having long sides or diameters 24 inches and larger with anchor pins spaced 12 inches apart each way. Apply bonding adhesive to prevent sagging of insulation. Overlap joints 3 inches. Seal joints, breaks, and punctures with vapor-barrier compound.
   3.E. Do not apply insulation to the following systems, materials, and equipment:
      3.E.1. Factory-insulated flexible ducts.
      3.E.2 Factory-insulated plenums, casings, terminal boxes, and filter boxes and sections.
      3.E.3. Flexible connectors.
      3.E.4. Vibration-control devices.
      3.E.5. Testing laboratory labels and stamps.
      3.E.6. Nameplates and data plates.
   3.F. Duct Insulation Thickness and Application Schedule: Insulate ducts with the following material and thickness:
      3.F.1. Concealed Applications: Fiberglass blanket, 3 inches thick.

REFRIGERANT PIPING
1. PIPES AND TUBES
   1.A. Hard Copper Tube: ASTM B 280, Type ACR, drawn temper.
   1.B. Soft Copper Tube: ASTM B 280, Type ACR, annealed temper.
2. FITTINGS
   2.A. Copper Fittings: ASME B16.22, wrought-copper streamlined pattern.
3. JOINING MATERIALS
   3.A. Brazing Filler Metals: AWS A5.8, Classification BAg-1 (Silver).
4. INSTALLATION
   4.A. Install refrigerant piping according to ASHRAE 15.
   4.B. Below ground, install copper tubing in conduit. Vent conduit outdoors.
   4.C. Insulate suction lines and liquid lines, but insulate them together if adjacent.
   4.D. Install unions to allow removal of solenoid valves, pressure-regulating valves, expansion valves, and at connections to compressors and evaporators.
   4.E. Charge and purge systems, after testing, and dispose of refrigerant by following ASHRAE 15 procedures.
   4.F. Provide locking refrigerant caps at heat pumps per IMC 1101.10.

CONDENSATE DRAIN PIPING
1. PIPES AND TUBES
   1.A. PVC Plastic, Schedule 40, plain ends.
2. FITTINGS
   2.A. PVC Plastic, solvent cement joints.
3. INSTALLATION
   3.A. Support pipe as indicated and per manufacturer's recommendations.
   3.B. Apply manufacturer's recommended coating for protection from sun where exposed. Insulate entire length with 3/4" elastomeric.

CONDENSING UNITS
1. SECTION REQUIREMENTS
   1.A. Submit Product Data
2. MECHANICAL-DRAFT, AIR-COOLED REFRIGERANT HEAT PUMP CONDENSING UNITS
   2.A. See Schedule on this Sheet.
3. ACCESSORIES
   3.A. Precharged and insulated refrigerant suction and liquid tubing.
   3.B. Head-pressure control to modulate condenser-fan motor speed for low ambient conditions.
   3.C. Low-voltage control transformer.
4. INSTALLATION
   4.A. Install units level and plumb, and maintain recommended clearances.
   4.B. Install ground-mounted units on 4-inch- thick reinforced-concrete base or 6-inch reinforced base as indicated. Anchor unit to pad using inserts or anchor bolts.
   4.C. Install electrical devices.

AIR HANDLING UNITS
1. SECTION REQUIREMENTS
   1.A. Submit Product Data.
2. FACTORY-ASSEMBLED UNITS
   2.A. See Schedule on this Sheet.
   2.B. Assembled and tested units with electric-resistance heating coil, refrigerant cooling coil, disposable filters, direct-drive centrifugal fans, galvanized steel condensate drain pan and furniture-grade steel cabinet.
   2.C. Arrangement: suspended above ceiling from roof structure - see detail..
   2.D. Cabinet Finish: Bonderized, phosphatized, baked-enamel finish in manufacturer's standard color selected by Architect.
3. INSTALLATION
   3.A. Install units level and plumb and firmly anchored.
   3.B. Connect units to wiring systems and to ground.

DUCTS AND ACCESSORIES
1. SECTION REQUIREMENTS
   1.A. Summary: Metal and nonmetal ducts and accessories in pressure classes 2 inch wg (500 Pa) or less.
   1.B. Comply with 90A.
2. DUCTS
   2.A. Galvanized Sheet Steel: Lock-forming quality, ASTM A 653, G90 (ASTM A 653M, Z275).
   2.B. Joint and Seam Tape: Comply with UL 181A.
   2.C. Joint and Seam Sealant: Comply with UL 181A.
   2.D. Rectangular Metal Duct Fabrication: Comply with SMACNA's "HVAC Duct Construction Standard for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.
3. ACCESSORIES
   3.A. Volume-Control Dampers: Factory-fabricated volume-control dampers, complete with required hardware and accessories. Single-blade and multiple opposed-blade, standard leakage rating, and suitable for horizontal or vertical applications.
   3.B. Flexible Connectors: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL 181, class 1.
4. INSTALLATION
   4.A. Duct System Pressure Class: Construct and install each duct system for low pressure duct classification.
   4.B. Conceal ducts from view in finished and occupied spaces, unless noted otherwise on the drawings.
   4.C. Avoid passing through electrical equipment spaces and enclosures.
   4.D. Support and connect metal ducts according to SMACNA's "HVAC Duct Construction Standard".
   4.E. Install duct accessories according to applicable portions of details of construction as shown in SMACNA standards.
5. TESTING, ADJUSTING, AND BALANCING
   5.A. Balance airflow within distribution systems, including submains, branches, and terminals to indicated quantities
   5.B. Provide reports to Engineer which are prepared by AABC or NEBB certified testing and balancing company.

DIFFUSERS, REGISTERS, AND GRILLES
1. SECTION REQUIREMENTS
   1.A. Submit Product Data, including color charts for factory finishes.
2. OUTLETS AND INLETS
   2.A. See Diffuser Schedule on this Sheet.
3. INSTALLATION
   3.A. Coordinate location and installation with duct installation and installation of other ceiling- and wall-mounted items.
   3.B. Locate ceiling diffusers as indicated on Sheet M1 & M2 and coordinate diffuser placement with lighting. Provide plaster frame on diffusers as necessary.
   3.C. Architect to select color. Submittals must be approved in writing prior to purchase of diffusers and grilles.

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MECHANICAL SCHEDULES AND SPECIFICATIONS

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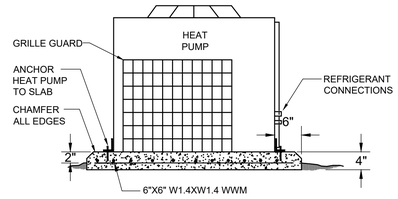

C3 OUTDOOR HEAT PUMP

D5 CONDENSATE DRAIN

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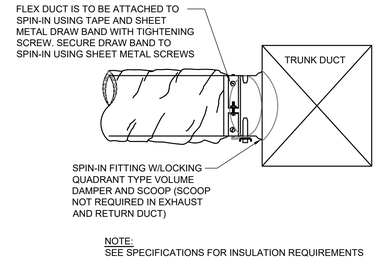
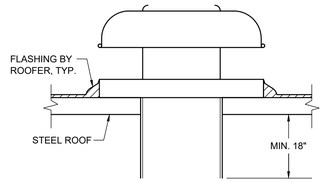


NOTE:
SEE SPECIFICATIONS FOR INSULATION REQUIREMENTS

C5 FLEXIBLE DUCT CONNECTION



B3 TYPICAL RELIEF HOOD

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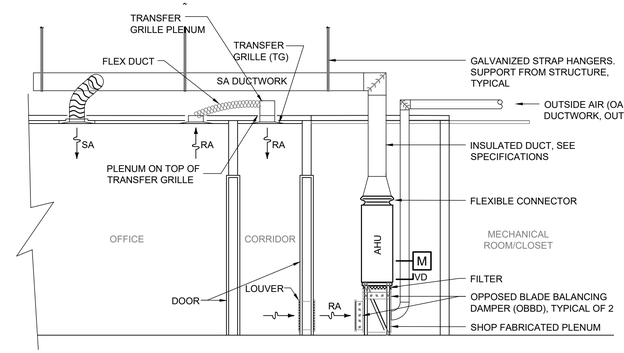

B5 VERTICAL UPFLOW AHU DETAIL

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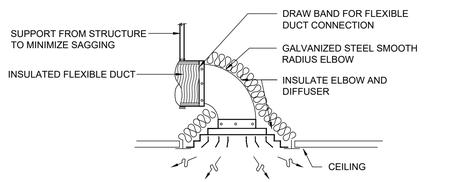
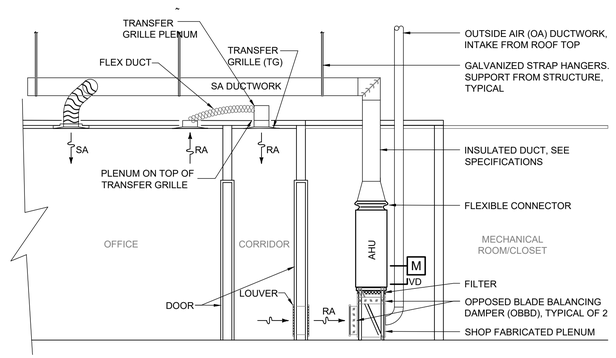


A3 TYPICAL DIFFUSER DETAIL

NO SCALE



A5 VERTICAL UPFLOW AHU DETAIL

NO SCALE

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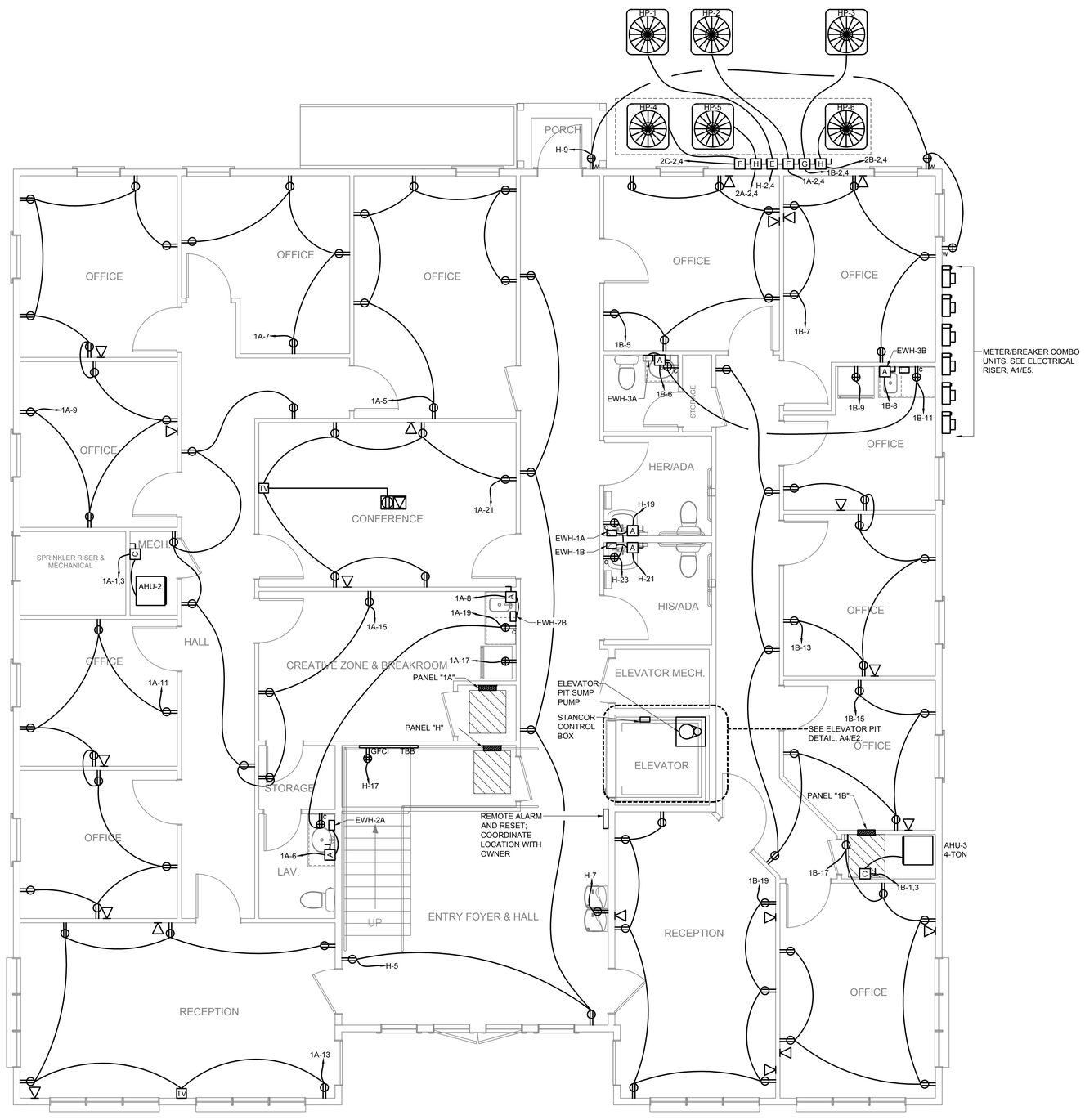
SHEET NUMBER
M5



LEGEND

A-1,3	HOMERUN OF CIRCUIT TO PANEL - CIRCUIT NUMBERS INDICATED.
	125V, 20A DUPLEX RECEPTACLE AT 18" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED "c" INDICATES 42" AFF MOUNTING HEIGHT "w" INDICATES WEATHERPROOF "TL" INDICATES TWISTLOCK
	125V, 20A DUPLEX RECEPTACLE WITH GFI
	125V, 20A QUADRUPLEX RECEPTACLE AT 18" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED
	125V, 20A FLUSH FLOOR BOX RECEPTACLE
#	DISCONNECT SWITCH - SEE DISCONNECT SCHEDULE
	EXHAUST FAN
	COMMUNICATIONS OUTLET WITH 3/4" CONDUIT TO ABOVE CEILING
	FLOOR BOX COMMUNICATIONS OUTLET WITH 3/4" CONDUIT BELOW FLOOR BACK TO NEAREST WALL, TO ABOVE CEILING
TBB	4'x8'x3/4" PT PLYWOOD TELEPHONE BACKBOARD, PAINTED WHITE WITH FIRE RETARDING PAINT, 2" CONDUIT TO TELEPHONE SERVICE POINT AND #6G TO BUILDING SERVICE GROUND
#"	INDICATES AFF MOUNTING HEIGHT
S	SMOKE DETECTOR
	LOAD CENTER, FLUSH MOUNTED. HATCHING INDICATES CLEAR SPACE IN FRONT.
	ELECTRICAL EARTH GROUND
$D	DIMMER SWITCH, 20A, 125V
$O	OCCUPANCY SENSOR WITH ADJUSTABLE TIME DELAY, 20A,125V
$DO	OCCUPANCY SWITCH WITH MANUAL OVERRIDE AND DIMMING FUNCTIONS, 20A, 125V
$3D	DIMMER SWITCH, 3-WAY, 125V, 20A
TV	LEGRAND PASS & SEYMOUR TV2MW 2-GANG TV BOX
EWH	ELECTRIC WATER HEATER
AHU	AIR HANDLING UNIT
HP	HEAT PUMP
BOD	BASIS OF DESIGN
AFF	ABOVE FINISHED FLOOR
H	HEAT DETECTOR

GENERAL NOTES

1. FURNISH ALL MATERIALS AND LABOR NECESSARY TO PROVIDE COMPLETE AND PROPERLY OPERATING ELECTRICAL SYSTEMS. FURNISH ALL MATERIALS AND LABOR NECESSARY TO DEMONSTRATE TO THE OWNER AND TO THE ENGINEER THAT ALL SYSTEMS ARE OPERATING PROPERLY AND AS SPECIFIED. WARRANTY ALL WORK AND ALL MATERIALS, EQUIPMENT AND DEVICES FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE.

2. ENSURE THAT ALL WORK CONFORMS TO:
   - 2.1. 2017 A117.1 ANSI
   - 2.2. 2017 NATIONAL ELECTRICAL CODE (NFPA 70) WITH SC MODIFICATIONS
   - 2.3. 2018 SOUTH CAROLINA BUILDING CODE
   - 2.3. 2009 SOUTH CAROLINA ENERGY CONSERVATION CODE
   - 2.4. NECA STANDARD OF INSTALLATION
   - 2.5. ALL FEDERAL, STATE AND LOCAL CODES AND ORDINANCES
   - 2.6. LOCAL UTILITY COMPANY REGULATIONS

3. ALL MATERIALS, EQUIPMENT AND DEVICES AS A MINIMUM SHALL MEET THE REQUIREMENTS OF U.L. (WHERE U.L. STANDARDS ARE ESTABLISHED FOR THOSE ITEMS) AND THE REQUIREMENTS OF THE NFPA 70. ALL ITEMS SHALL BE CLASSIFIED BY U.L. AS SUITABLE FOR THE PURPOSE USED.

4. COORDINATE LOCATION OF ELECTRICAL DEVICES AND ELECTRICAL WORK WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. NUMBERS ADJACENT TO DEVICES ARE NOMINAL MOUNTING HEIGHTS.

5. PROVIDE ALL THE INTERCONNECTING POWER WIRING AND CONDUIT, CONTROL WIRING (RATED 120 VOLTS (NOMINAL)) AND CONDUIT, AND THE ELECTRICAL POWER CIRCUITS FOR ALL EQUIPMENT PROVIDED BY OTHER TRADES.

6. COORDINATE WITH AND OBTAIN PERMITS AND INSPECTIONS FROM THE AUTHORITY HAVING JURISDICTION. INCLUDE ALL FEES IN BID.

7. PROVIDE A LAMINATED PLASTIC NAMEPLATE FOR EACH MAJOR ITEM OF ELECTRICAL EQUIPMENT (E.G. PANELBOARDS, DISCONNECT SWITCHES, TRANSFORMERS, ETC.). ATTACH WITH SCREWS, BOLTS OR RIVETS. LABEL ALL SERVICE METERS AND DISCONNECTS WITH NAME AND IDENTIFY SPACE/AREA SERVED.

8. BOND THE NEUTRAL AND GROUND BUS TOGETHER AT THE SERVICE EQUIPMENT ONLY. BOND THE GROUNDING CONDUCTOR TO THE GROUNDING ELECTRODE SYSTEM (WHICH IS COMPRISED OF A 3/4"x10' DRIVEN GROUND ROD AND CONNECTIONS TO METALLIC PIPING, BUILDING STEEL, ETC.). PROVIDE INSULATED NEUTRALS FOR ALL SUBPANELS PER N.E.C. ARTICLE 250.

9. PROVIDE MINIMUM SIZE OF #12 CONDUCTOR FOR 20A POWER CIRCUITS LESS THAN 75'-0" IN LENGTH. OTHERWISE, PROVIDE MINIMUM CONDUCTOR SIZE OF #10. PROVIDE MINIMUM SIZE OF #12 AWG FOR LIGHTING CIRCUITS AND #16 FOR CONTROL CIRCUITS UNLESS NOTED OTHERWISE. INSTALL ALL WIRING IN CONDUIT UNLESS NOTED OTHERWISE.

10. SUPPORT ALL CONDUIT ABOVE CEILING FROM BUILDING STRUCTURAL MEMBERS OR CONCRETE DECKING, NOT FROM CEILING GRID OR GRID HANGER WIRES.

11. PROVIDE ALL MOUNTING BRACKETS, HANGERS, CLIPS, ETC. AS NECESSARY TO MOUNT AND SECURE LIGHT FIXTURES IN LOCATIONS SHOWN AND AS RECOMMENDED BY THE MANUFACTURER FOR THE APPLICATION INTENDED.

12. WHERE CONDUIT PENETRATES FIRE RATED BARRIERS (WALLS, FLOORS AND CEILINGS), SEAL THE OPENING AROUND THE CONDUIT TO MAINTAIN THE FIRE RATING OF THE BARRIER WITH U.L. LISTED FIRE STOPPING MATERIAL.

13. PROVIDE TYPEWRITTEN DIRECTORY FOR ALL CIRCUITS. DIRECTORY SHALL IDENTIFY PANELBOARD AND INDICATE EACH CIRCUIT NUMBER, DESCRIPTION AND LOCATION.

14. THE CLEARANCE AROUND PANELS SHALL COMPLY WITH NEC AND SCFC 605.3 WORKING SPACE AND CLEARANCE. A WORKING SPACE OF NOT LESS THAN 30 INCHES (762 MM) IN WIDTH, 36 INCHES (914 MM) IN DEPTH AND 78 INCHES (1981 MM) IN HEIGHT SHALL BE PROVIDED IN FRONT OF ELECTRICAL SERVICE EQUIPMENT. WHERE THE ELECTRICAL SERVICE EQUIPMENT IS WIDER THAN 30 INCHES (762 MM), THE WORKING SPACE SHALL NOT BE LESS THAN THE WIDTH OF THE EQUIPMENT. NO STORAGE OF ANY MATERIALS SHALL BE LOCATED WITHIN THE DESIGNATED WORKING SPACE. PROVIDE STRIPING ON THE FLOOR AROUND ELECTRICAL PANELS TO CLEARLY IDENTIFY/INDICATE CLEARANCE AREA/NO STORAGE AREA.

15. MAKE ARRANGEMENTS WITH THE POWER COMPANY TO OBTAIN PERMANENT POWER AND PROVIDE TEMPORARY ELECTRICAL SERVICE TO THE PROJECT FOR CONSTRUCTION POWER. PROVIDE SERVICE ENTRANCE AND PROVISION FOR METERING IN ACCORDANCE WITH THE POWER COMPANY'S REQUIREMENTS. INCLUDE ALL FEES IN BID.

16. MECHANICAL EQUIPMENT SHOWN FOR REFERENCE PURPOSES ONLY. COORDINATE EXACT LOCATION OF HVAC EQUIPMENT WITH MECHANICAL DRAWINGS.

A1 **POWER PLAN - 1ST FLOOR**

1/4" = 1'-0"

0 2' 4' 8'

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SOUTH CAROLINA CONSTANTINE ENGINEERING ASSOCIATES, LLC C-04361 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 16540 CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

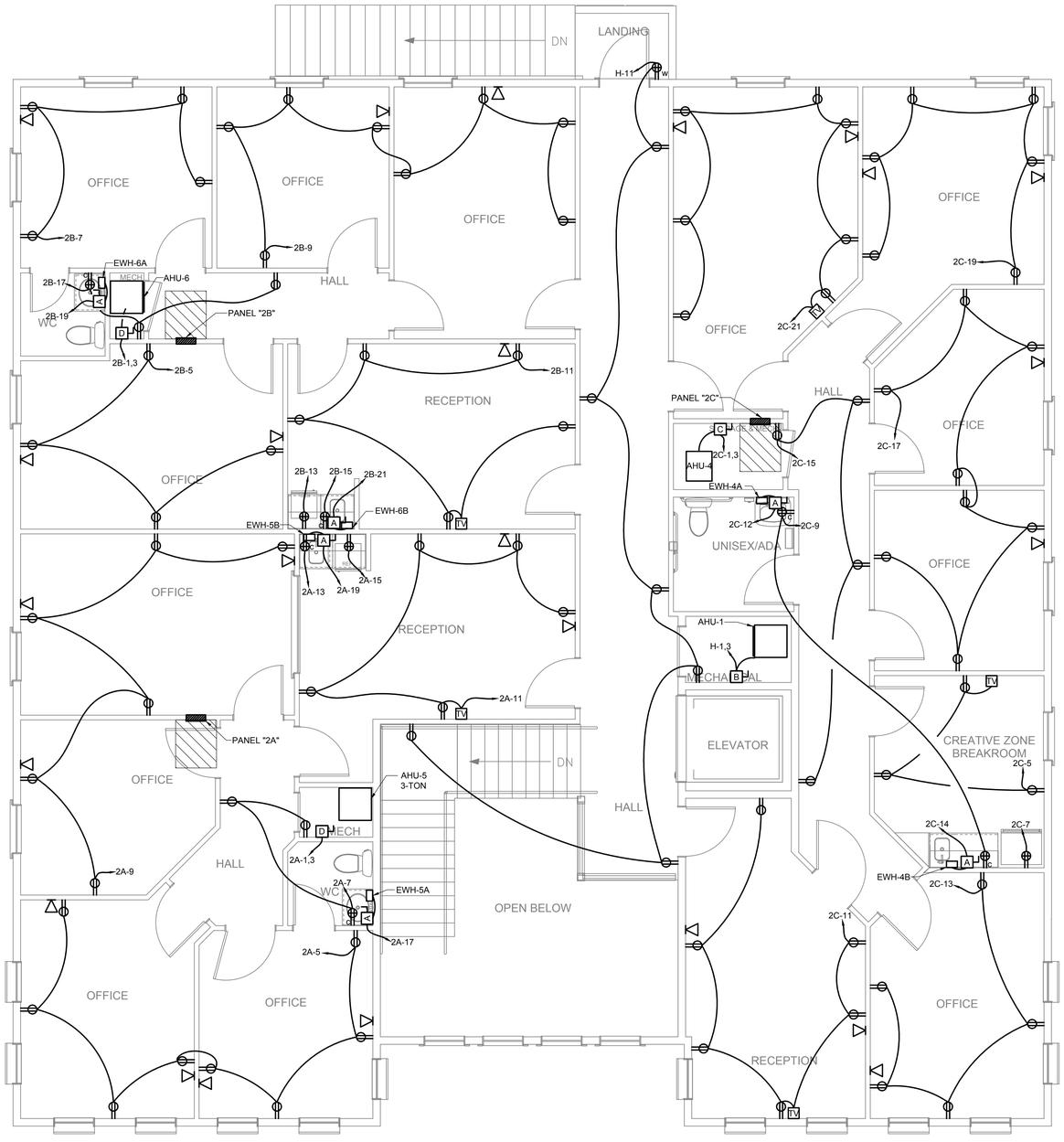
ELECTRICAL PLAN - POWER - 1ST FLOOR

REVISIONS:

DESIGNED BY:	JCM
DRAWN BY:	JCM
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

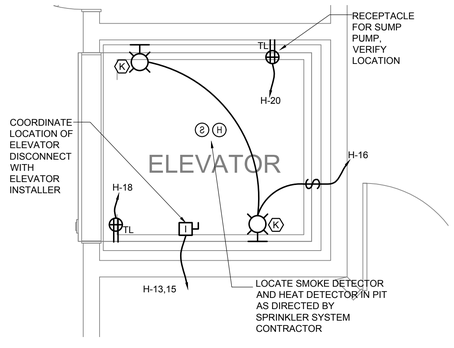
SHEET NUMBER
E1



A1 POWER PLAN - 2ND FLOOR

1/4" = 1'-0"

0 2' 4' 8'



A4 POWER PLAN - ELEVATOR PIT

1/2" = 1'-0"

0 1' 2' 4'

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SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — SEAL 16540 — CONSTANTINE — CERTIFICATE OF AUTHORIZATION

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

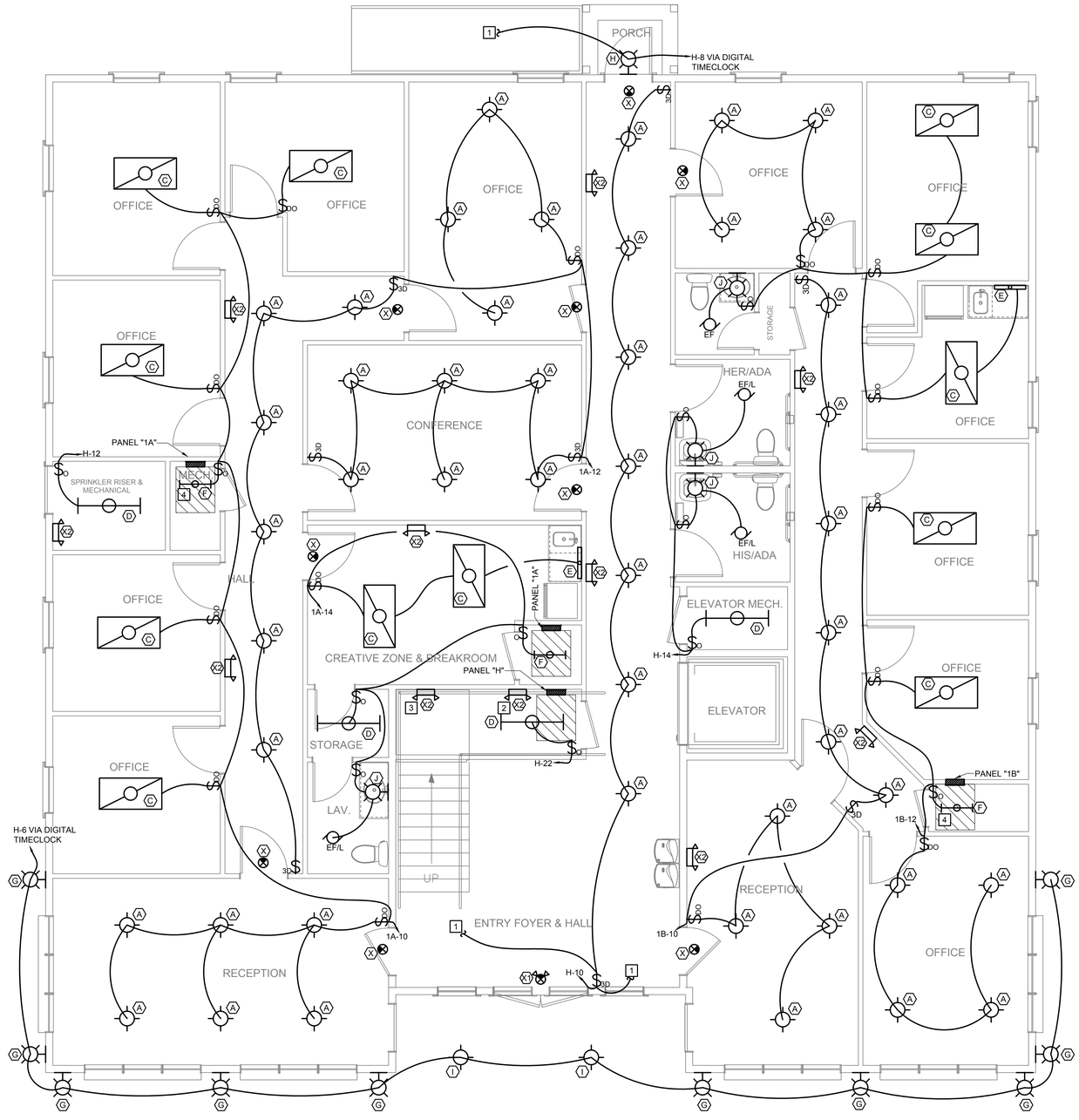
ELECTRICAL PLAN - POWER - 2ND FLOOR

REVISIONS:

DESIGNED BY:	JCM
DRAWN BY:	JCM
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
E2



LUMINAIRE SCHEDULE

MARK	SYMBOL	DESCRIPTION	VOLTAGE	LUMENS	CCT	WATTS	NOTES
A		RECESSED CAN, LED	120	2000	3000K	32	
B		HIGH BAY RECESSED CAN, LED	120	3000	3000K	40	
C		2' X 4' SURFACE MOUNT, LED	120	3000	3000K	40	
D		4' STRIP LIGHT, LED	120	1200	3000K	22	
E		2' LED UNDERCABINET LIGHT	120	900	3000K	18	
F		2' STRIP LIGHT, LED	120	900	3000K	18	
EF		RESTROOM EXHAUST FAN	120	NA	NA	75	
EF/L		RESTROOM EXHAUST FAN WITH LIGHT COMBO	120	2000	3000K	120	
G		EXTERIOR SCONCE, LED	120	4000	3000K	40	
H		EXTERIOR SCONCE WITH BATTERY BACKUP FOR EMERGENCY EGRESS, LED	120	4000	3000K	40	
I		EXTERIOR CAN LIGHT WITH BATTERY BACKUP FOR EMERGENCY EGRESS, LED	120	2000	3000K	32	
J		VANITY SCONCE, LED	120	1000	3000K	20	
K		ENCLOSED AND GASKETED WALL LIGHT, LED	120	3000	4000K	30	
X		EXIT SIGN, DIRECTIONAL ARROWS AS INDICATED ON PLANS	120	-	-	5	CONNECT TO LOCAL LIGHTING BRANCH CIRCUIT AHEAD OF CONTROLS
X1		EXIT SIGN WITH INTEGRAL BATTERY BACKUP LIGHT & WITH H-6 VIA DIGITAL TIMELOCK	120	-	-	12	CONNECT TO LOCAL LIGHTING BRANCH CIRCUIT AHEAD OF CONTROLS
X2		INTERIOR EGRESS EMERGENCY LIGHT FIXTURE	120	-	-	12	CONNECT TO LOCAL LIGHTING BRANCH CIRCUIT AHEAD OF CONTROLS

LIGHT SELECTIONS BY OWNER/ARCHITECT; COORDINATE PRIOR TO PURCHASE. FIXTURES SHOWN ARE USED FOR DESIGN PURPOSES AND PERFORMANCE ONLY.

DRAWING NOTES

1. TIE INTO COMMON AREA LIGHTS AT SECOND FLOOR, SEE LIGHTING PLAN - 2ND FLOOR, A1/E4.
2. THIS FIXTURE SHALL BE LOCATED IN ELECTRICAL CLOSET UNDER STAIRS.
3. THIS FIXTURE SHALL BE LOCATED ON WALL ABOVE STAIR INTERMEDIATE LANDING.
4. THIS FIXTURE SHALL BE PROVIDED WITH 90 MIN. MINIMUM EMERGENCY BATTERY BACKUP.

A1 **LIGHTING PLAN - 1ST FLOOR**

1/4" = 1'-0"

0 2' 4' 8'

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SEAL 16540 SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER J. CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

ELECTRICAL PLAN - LIGHTING - 1ST FLOOR

REVISIONS:

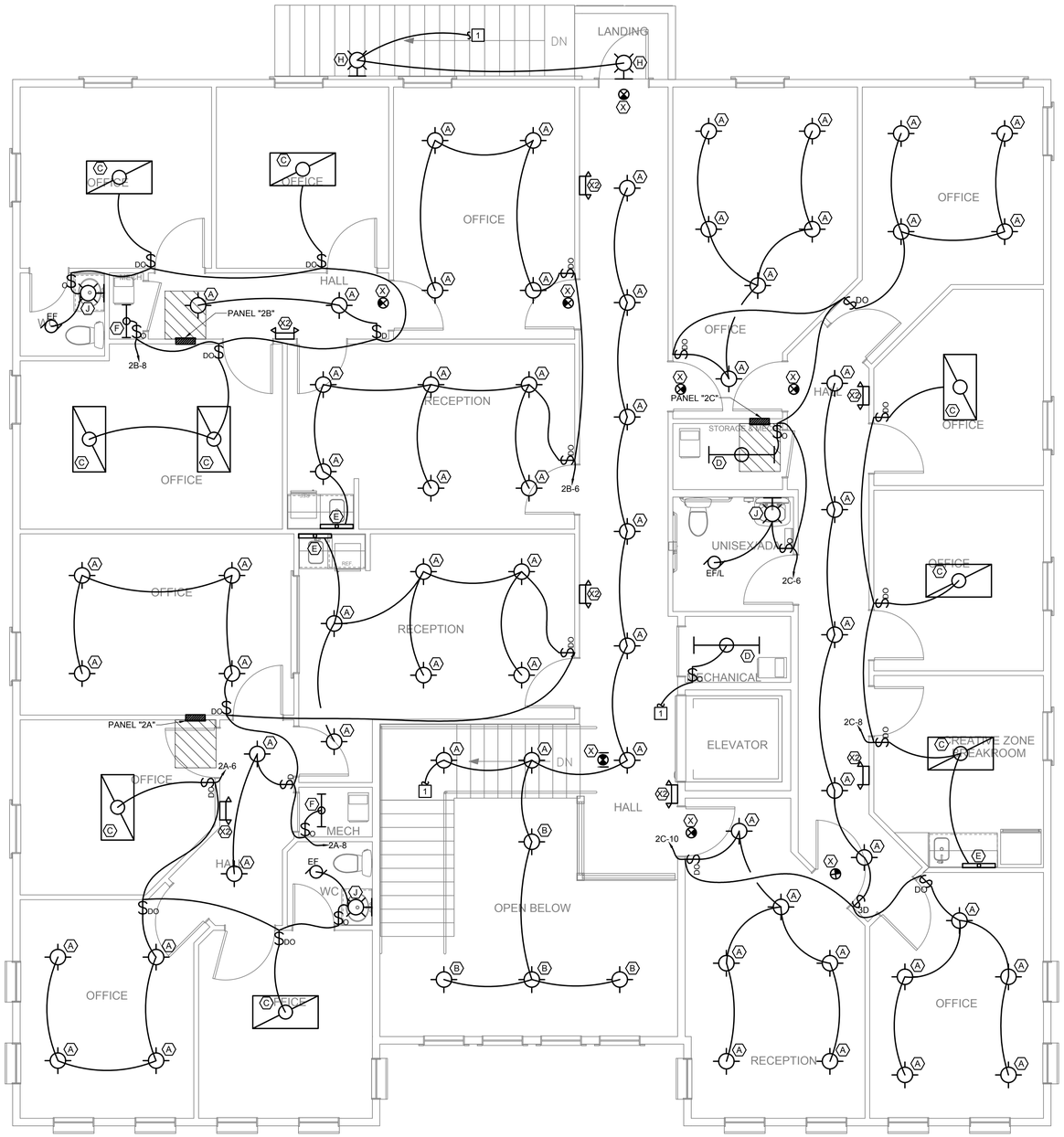
DESIGNED BY:	JCM
DRAWN BY:	JCM
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
E3

DRAWING NOTES

1 TIE INTO COMMON AREA LIGHTS AT FIRST FLOOR, SEE LIGHTING PLAN - 1ST FLOOR, A1/E3.



A1 LIGHTING PLAN - 2ND FLOOR

1/4" = 1'-0"

0 2' 4' 8'

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CONSTANTINE ENGINEERING ASSOCIATES, LLC
SOUTH CAROLINA
CERTIFICATE OF AUTHORIZATION
C-04361

SEAL
16540
REGISTERED PROFESSIONAL ENGINEER
SOUTH CAROLINA
CHRISTOPHER J. CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

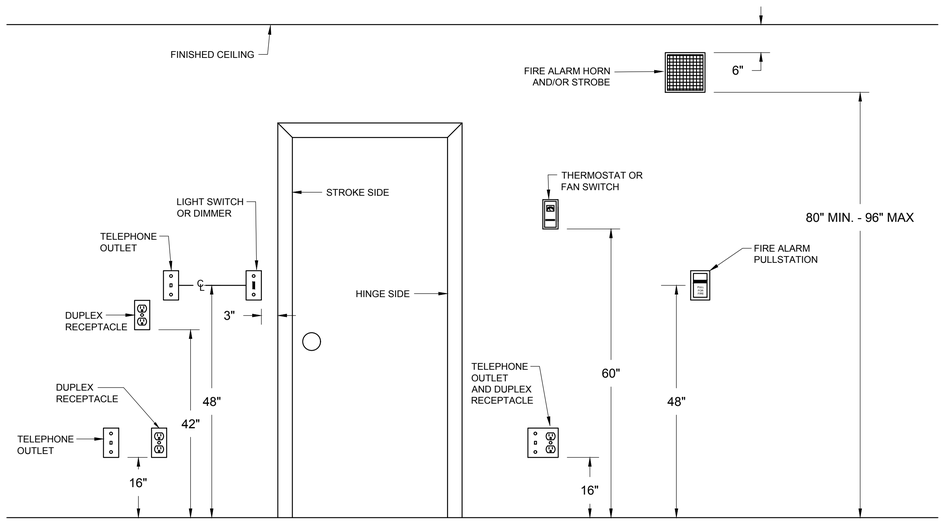
ELECTRICAL PLAN - LIGHTING - 2ND FLOOR

REVISIONS:

DESIGNED BY:	JCM
DRAWN BY:	JCM
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

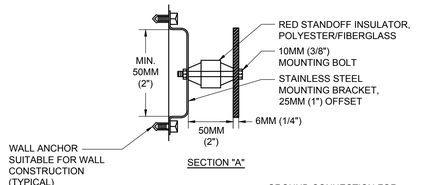
SHEET NUMBER
E4



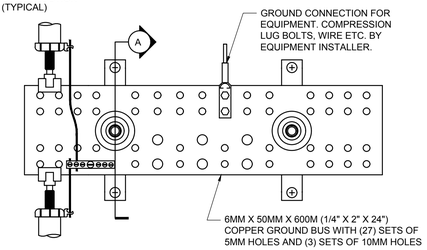
NOTE: MOUNTING HEIGHTS TYPICAL UNLESS OTHERWISE SPECIFIED ON DRAWING.

C1 TYPICAL DEVICE MOUNTING HEIGHTS

NO SCALE



SECTION "A"

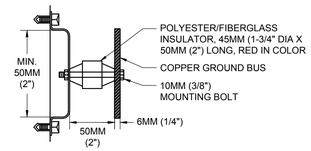


FRONT ELEVATION

NOTE:
ADDITIONAL GROUND CONNECTIONS SHALL BE BY TELECOMMUNICATIONS EQUIPMENT INSTALLER.

C3 BUILDING TELECOMMUNICATION SYSTEM GROUND BUS

NO SCALE



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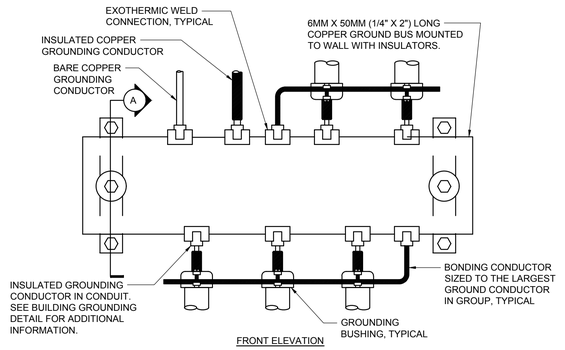
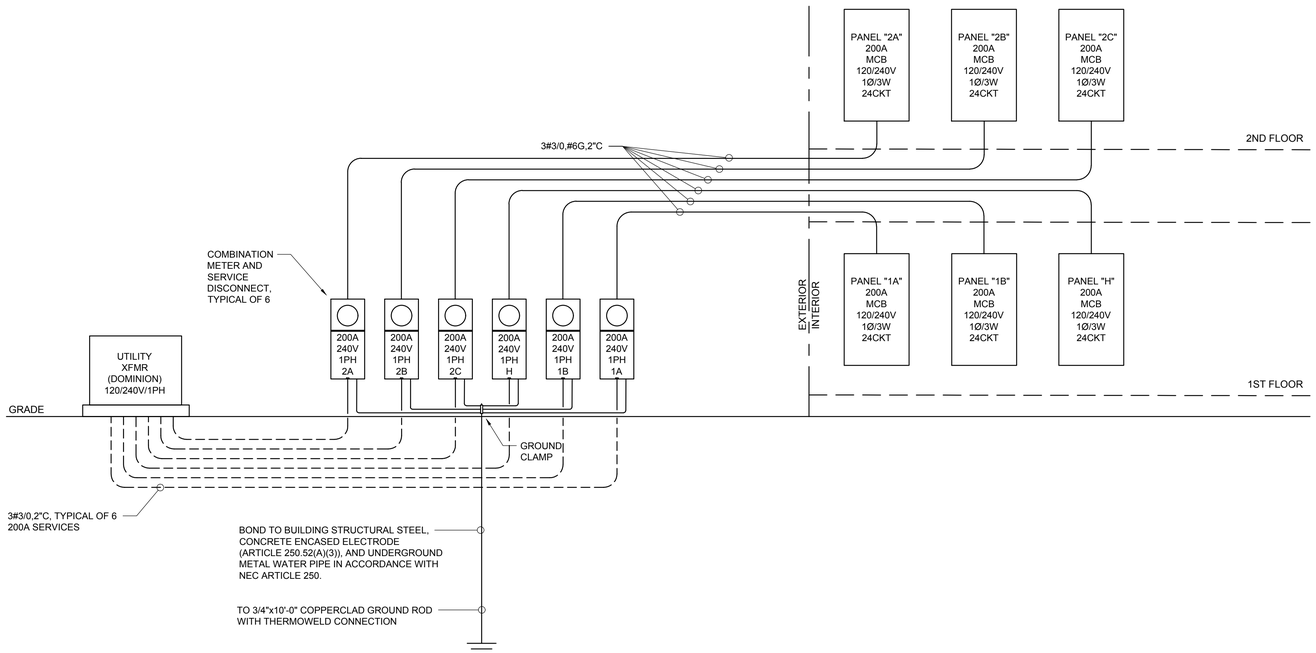


FRONT ELEVATION

NOTE:
REFER TO BUILDING GROUNDING ELECTRODE SYSTEM DETAIL FOR EXACT CONFIGURATION.

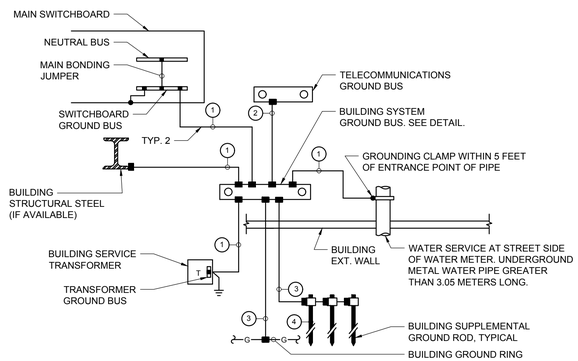
C4 BUILDING ELECTRICAL SYSTEM GROUND BUS

NO SCALE



A1 ELECTRICAL RISER DIAGRAM

NO SCALE



LEGEND:

- ● INDICATES BOLTED CONNECTION.
- ■ INDICATES EXOTHERMIC WELD CONNECTION, COMPATIBLE WITH MATERIALS BEING JOINED.
- (1) 4/0 AWG INSULATED COPPER GROUND CONDUCTOR IN 30mm CONDUIT.
- (2) 2/0 AWG INSULATED COPPER GROUND CONDUCTOR IN 30mm CONDUIT.
- (3) 4/0 AWG BARE COPPER GROUND CONDUCTOR.
- (4) 19mm x 3050mm 3 (3/4" x 10'-0" EACH) LONG COPPER-CLAD GROUND ROD DRIVEN IN TRIAD CONFIGURATION WITH TOP 300mm (12") BELOW GRADE. PER NEC SECTION 250.

A4 BUILDING GROUNDING ELECTRODE SYSTEM

NO SCALE

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SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 16540 CONSTANTINE

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

ELECTRICAL DETAILS

REVISIONS:

DESIGNED BY:	JCM
DRAWN BY:	JCM
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
E5

ELECTRICAL PANEL "H" SCHEDULE

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE & TYPE:	CABINET:	MIN SCC:	FED FROM:	NOTES:
120-240/1/3	200A	200A MCB	SURFACE	22 KAIC	METER	

NO	TRIP	AREA SERVED	A	B	A	B	AREA SERVED	TRIP	NO
1	30	AHU-1	2880		2040		HP-1	25	2
3				2880		2040			4
5	20	RECEPTACLES - 1ST FLOOR INTERIOR	900		464		LIGHTS - EXTERIOR SCONCES	20	6
7	20	RECEPTACLES - DRINKING FOUNTAIN		400		120	LIGHTS - REAR EXTERIOR SCONCES	20	8
9	20	RECEPTACLES - 1ST FLOOR EXTERIOR	540		400		LIGHTS - CORRIDORS	20	10
11	20	RECEPTACLES - 2ND FLOOR		1260		22	SPRINKLER RISER ROOM LIGHTS	20	12
13	40	ELEVATOR DISCONNECT	2520		172		LIGHTS - 1ST FLR RR'S/ELEV. MACHINE ROOM	20	14
15				2520		80	LIGHTS - ELEVATOR PIT	20	16
17	20	TBB GFCI QUAD RECEPTACLE	360		360		RECEPTACLE - ELEVATOR PIT	20	18
19	35	EWH-1A		3000		570	RECEPTACLE - ELEVATOR SUMP PUMP	20	20
21	35	EWH-1B	3000		22		LIGHTS - HOUSE ELEC. CLOSET	20	22
23	20	RECEPTACLES - 1ST FLOOR RESTROOMS		360		X	SPARE	20	24

TOTAL CONNECTED LOAD =	26910	VA	TOTAL DEMAND =	26910	VA	TOTAL DEMAND =	112	AMPS

ELECTRICAL PANEL "1A" SCHEDULE

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE & TYPE:	CABINET:	MIN SCC:	FED FROM:	NOTES:
120-240/1/3	200A NEMA 1	200A MCB	SURFACE	22 KAIC	METER	

NO	TRIP	AREA SERVED	A	B	A	B	AREA SERVED	TRIP	NO
1	60	AHU-2	5760		3840		HP-2	50	2
3				5760		3840			4
5	20	RECEPTACLES - OFFICE	1080		3000		EWH-2A	35	6
7	20	RECEPTACLES - OFFICE		720		3000	EWH-2B	35	8
9	20	RECEPTACLES - OFFICES	1620		450		LIGHTS - RECEPTION/OFFICES	20	10
11	20	RECEPTACLES - OFFICES		1440		512	LIGHTS - OFFICES/CONF. ROOM/CORRIDOR	20	12
13	20	RECEPTACLES - RECEPTION	1400		147		LIGHTS - BREAKROOM/STOR/RESTROOM	20	14
15	20	RECEPTACLES - MECH/HALL/BREAK		1440		X	SPARE	20	16
17	20	BREAKROOM REFRIGERATOR	1000		X		SPARE	20	18
19	20	BREAKROOM COUNTER/RR'S GFCI		360		X	SPARE	20	20
21	20	RECEPTACLES - CONFERENCE ROOM	1580		X		SPARE	20	22
23	20	SPARE		X		X	SPARE	20	24

TOTAL CONNECTED LOAD =	36949	VA	TOTAL DEMAND =	36949	VA	TOTAL DEMAND =	154	AMPS

ELECTRICAL PANEL "1B" SCHEDULE

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE & TYPE:	CABINET:	MIN SCC:	FED FROM:	NOTES:
120-240/1/3	200A NEMA 1	200A MCB	FLUSH	22 KAIC	METER	

NO	TRIP	AREA SERVED	A	B	A	B	AREA SERVED	TRIP	NO
1	60	AHU-3	5760		3120		HP-3	45	2
3				5760		3120			4
5	20	RECEPTACLES - OFFICES	1080		3000		EWH-3A	35	6
7	20	RECEPTACLES - OFFICES		900		3000	EWH-3B	35	8
9	20	BREAKROOM REFRIGERATOR	1000		344		LIGHTS - RECEPTION/CORRIDOR	20	10
11	20	RECEPTACLES - RR/BREARKROOM GFCI		360		519	LIGHTS - OFFICES/RESTROOM	20	12
13	20	RECEPTACLES - OFFICES	1080		X		SPARE	20	14
15	20	RECEPTACLES - OFFICE/HALL		1440		X	SPARE	20	16
17	20	RECEPTACLES - OFFICE/MECH	1080		X		SPARE	20	18
19	20	RECEPTACLES - RECEPTION		1620		X	SPARE	20	20
21	20	SPARE	X		X		SPARE	20	22
23	20	SPARE		X		X	SPARE	20	24

TOTAL CONNECTED LOAD =	33183	VA	TOTAL DEMAND =	33183	VA	TOTAL DEMAND =	138	AMPS

ELECTRICAL PANEL "2A" SCHEDULE

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE & TYPE:	CABINET:	MIN SCC:	FED FROM:	NOTES:
120-240/1/3	200A NEMA 1	200A MCB	FLUSH	22 KAIC	METER	

NO	TRIP	AREA SERVED	A	B	A	B	AREA SERVED	TRIP	NO
1	45	AHU-5	4320		2280		HP-5	30	2
3				4320		2280			4
5	20	RECEPTACLES - OFFICE	720		420		LIGHTS - OFFICES	20	6
7	20	RECEPTACLES - HALL/MECH		360		301	LIGHTS - RECEPTION/HALL/MECH/OFFICE	20	8
9	20	RECEPTACLES - OFFICES	1080		X		SPARE	20	10
11	20	RECEPTACLES - RECEPTION		1400		X	SPARE	20	12
13	20	RECEPTACLES - BREAK ROOM COUNTER	180		X		SPARE	20	14
15	20	RECEPTACLES - BREAK ROOM REFRIG.		1000		X	SPARE	20	16
17	35	EWH-5A	3000		X		SPARE	20	18
19	35	EWH-5B		3000		X	SPARE	20	20
21	20	SPARE	X		X		SPARE	20	22
23	20	SPARE		X		X	SPARE	20	24

TOTAL CONNECTED LOAD =	24661	VA	TOTAL DEMAND =	24661	VA	TOTAL DEMAND =	103	AMPS

ELECTRICAL PANEL "2B" SCHEDULE

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE & TYPE:	CABINET:	MIN SCC:	FED FROM:	NOTES:
120-240/1/3	200A NEMA 1	200A MCB	FLUSH	22 KAIC	METER	

NO	TRIP	AREA SERVED	A	B	A	B	AREA SERVED	TRIP	NO
1	45	AHU-6	4320		2280		HP-6	30	2
3				4320		2280			4
5	20	RECEPTACLES - OFFICE	720		338		LIGHTS - OFFICE/RECEPTION	20	6
7	20	RECEPTACLES - OFFICE		720		335	LIGHTS - OFFICES/RESTROOM/MECH	20	8
9	20	RECEPTACLES - OFFICES	1440		X		SPARE	20	10
11	20	RECEPTACLES - RECEPTION		1400		X	SPARE	20	12
13	20	RECEPTACLES - BREAK ROOM REFRIG.	1000		X		SPARE	20	14
15	20	RECEPTACLES - BREAK ROOM COUNTER		180		X	SPARE	20	16
17	20	RECEPTACLES - MECH/HALL	360		X		SPARE	20	18
19	35	EWH-6A		3000		X	SPARE	20	20
21	35	EWH-6B	3000		X		SPARE	20	22
23	20	SPARE		X		X	SPARE	20	24

TOTAL CONNECTED LOAD =	25693	VA	TOTAL DEMAND =	25693	VA	TOTAL DEMAND =	107	AMPS

ELECTRICAL PANEL "2C" SCHEDULE

VOLTS/PHASE/WIRE:	PANEL SIZE & TYPE:	MAIN SIZE & TYPE:	CABINET:	MIN SCC:	FED FROM:	NOTES:
120-240/1/3	200A NEMA 1	200A MCB	FLUSH	22 KAIC	METER	

NO	TRIP	AREA SERVED	A	B	A	B	AREA SERVED	TRIP	NO
1	60	AHU-4	5760		3840		HP-4	50	2
3				5760		3840			4
5	20	RECEPTACLES - BREAK ROOM	1040		435		LIGHTS - OFFICES/MECH/RESTROOM	20	6
7	20	RECEPTACLES - BREAK ROOM REFRIG.		1000		138	LIGHTS - OFFICES	20	8
9	20	RECEPTACLES - BREAK RM COUNTER/RR'S	360		512		LIGHTS - OFFICES/RECEPTION	20	10
11	20	RECEPTACLES - RECEPTION		1260		3000	EWH-4A	35	12
13	20	RECEPTACLES - OFFICE	900		3000		EWH-4B	35	14
15	20	RECEPTACLES - CORRIDOR REST ROOM		720		X	SPARE	20	16
17	20	RECEPTACLES - OFFICES	1440		X		SPARE	20	18
19	20	RECEPTACLES - OFFICE		1080		X	SPARE	20	20
21	20	RECEPTACLES - OFFICE	1760		X		SPARE	20	22
23	20	SPARE		X		X	SPARE	20	24

TOTAL CONNECTED LOAD =	35845	VA	TOTAL DEMAND =	35845	VA	TOTAL DEMAND =	149	AMPS

DISCONNECT SCHEDULE

SYM.	POLE	NEMA RATING	SIZE (AMPS)	FUSE (AMPS)	FEEDER SIZE:	NOTES:
A	1	1	60	35	2#8,1#10G,3/4"C	TIME DELAY FUSE
B	2	1	30	30	3#10,1#10G,3/4"C	TIME DELAY FUSE
C	2	1	60	60	3#6,1#10G,1"C	TIME DELAY FUSE
D	2	1	60	45	3#8,1#10G,3/4"C	TIME DELAY FUSE
E	2	3R	30	25	3#10,1#10G,3/4"C	TIME DELAY FUSE
F	2	3R	60	50	3#8,1#10G,3/4"C	TIME DELAY FUSE
G	2	3R	60	45	3#8,1#10G,3/4"C	TIME DELAY FUSE
H	2	3R	30	30	3#10,1#10G,3/4"C	TIME DELAY FUSE

ELECTRICAL SPECIFICATIONS

WIRING METHODS

1. SECTION REQUIREMENTS
   1.A. Summary: Building wires and cables and associated splices, connectors, and terminations for wiring systems rated 600 V and less, and twisted-pair cable; and raceways and boxes.
2. WIRES AND CABLES
   2.A. Building Wires and Cables: Type THHN/XHHW copper conductor rated for operation at 90° C.
   2.B. Connectors and Splices: Wiring connectors of size, ampacity rating, material, and type and class for application and for service indicated. Terminals to be rated for operation at 75°C.
   2.C. Use of type MC Cable is permitted in accordance with NEC.
3. RACEWAYS
   3.A. Conduit: Comply with the following:
      3.A.1. Rigid Steel Conduit: ANSI C80.1.
      3.A.2. Intermediate Metal Conduit: ANSI C80.6.
      3.A.3. Electrical Metallic Tubing: ANSI C80.3.
      3.A.4. Rigid Nonmetallic Conduit: NEMA TC 2, Schedule 40.
   3.B. Wireways: Hinged type, with manufacturer's standard finish.
   3.C. Outlet and Device Boxes: UL Listed and labeled sheet metal boxes.
   3.D. Pull and Junction Boxes: Small sheet metal boxes.
4. INSTALLATION
   4.A. Install wires and cables according to the NECA's "Standard of Installation."
   4.B. Wiring at Outlets: Install with at least 12 inches of slack conductor at each outlet.
   4.C. Outdoors Wiring Methods: As follows:
      4.C.1. Exposed: Rigid or intermediate metal conduit.
      4.C.2. Concealed: Rigid or intermediate metal conduit.
      4.C.3. Underground, Single Run: Rigid nonmetallic conduit.
      4.C.4. Underground, Grouped: Rigid nonmetallic conduit.
   4.D. Connection to Vibrating Equipment (Including Electric Solenoid or Motor-Driven Equipment): Liquid tight flexible metal conduit.
   4.E. Indoors Wiring Methods: As follows:
      4.E.1. Connection to vibrating Equipment (Including Electric Solenoid or Motor-Driven Equipment): Flexible metal conduit, except in wet or damp locations use liquid tight flexible metal conduit.
      4.E.2. Damp or Wet Locations: Rigid steel conduit.
      4.E.3. Exposed: Electrical metallic tubing.
      4.E.4. Concealed: Electrical metallic tubing.
      4.E.5. Boxes and Enclosures: NEMA 250, Type 1, except in damp or wet locations use NEMA 250, Type 4, stainless steel.
      4.E.6. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.
      4.E.7. Conceal conduit and electrical metallic tubing, unless otherwise indicated, within finished walls, ceilings, and floors.
      4.E.8. Cabled electrical conductors may be utilized where permitted by NEC and local jurisdiction ordinances, except on medical facility patient area receptacles.
   4.F. Use Raceway fittings compatible with raceway and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, unless otherwise indicated.
   4.G. Raceways Embedded in Slabs: Install in middle third of the slab thickness where practical, and leave at least 1-inch concrete cover.
   4.H. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow the surface contours as much as practical.
   4.I. Join raceways with fittings designed and approved for the purpose and make joints tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight. Use insulating bushings to protect conductors.
   4.J. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line having not less than 200-lb tensile strength. Leave not less than 12 inches of c slack at each end of the pull wire.
   4.K. Stub-up Connections: Extend conductors to equipment with rigid steel conduit; flexible metal conduit may be used 6 inches above the floor.
   4.L. Flexible Connections: Use maximum of 72 inches of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use liquid tight flexible conduit in wet or damp locations. Install separate ground conductor across flexible connections.
   4.M. Install a separate green ground conductor in all raceways.

WIRING DEVICES

1. SECTION REQUIREMENTS
   1.A. Submit Product Data
2. DEVICES
   2.A. General Purpose Wiring Devices: Comply with NEMA WD1.
   2.B. Color: White.
   2.C. Receptacles: UL 498, general-use grade except as indicated otherwise.
   2.D. Ground-Fault Circuit Interrupter Receptacles: UL 943, feed-through type, with integral NEMA 5-20R duplex receptacle; for installation in a 2-3/4 inch deep outlet box without an adapter.
   2.E. Snap Switches: Quiet-type ac switches, 120/277V, 20A, complying with UL 20.
   2.F. Wall Plates, Finished Areas: Smooth plastic, fastened with metal screws having heads matching plate color.
   2.G. Wall Plates, Unfinished Areas: Galvanized steel with metal screws.
   2.H. In cases where receptacles intended to supply power to water coolers cannot be concealed due to water cooler design, Ground-Fault Circuit Interrupter Receptacles shall be used. Ground-Fault Circuit Interruption to be provided upstream of concealed receptacles.
3. INSTALLATION
   3.A. Install devices and assemblies plumb and secure.
   3.B. Mount devices flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
   3.C. Protect devices and assemblies during painting.
   3.D. Install wall plates when painting is complete.

SAFETY SWITCHES AND CIRCUIT BREAKERS

1. SWITCHES
   1.A. Enclosed, Nonfusible Switch: NEMA KS 1, Type HD, with lockable handle.
   1.B. Enclosed, Fusible Switch, 800A and Smaller: NEMA KS 1, Type HD, clips to accommodate specified fuses, enclosure consistent with environment where located, handle lockable with 2 padlocks, and interlocked with cover in closed position.

PANELBOARDS

1. SECTION REQUIREMENTS
   1.A. Submit Product Data.
2. PANELBOARDS AND LOAD CENTERS
   2.A. Flush-mounted, NEMA PB 1, Type 1.
      2.A.1. Front: Secured to box with concealed trim clamps.
      2.A.2. Bus: Hard drawn copper of 98 percent conductivity.
   2.B. Molded-Case Circuit Breaker: NEMA AB 1; no tandem circuit breakers; single handle for multiple circuit breakers.
3. INSTALLATION
   3.A. Install panelboards and accessory items according to NEMA PB 1.1. Indicate installed circuit loads on a typed circuit directory, after balancing panelboard loads, showing as-built conditions.
   3.B. Wiring in Panelboard Gutters: Arrange conductors into groups, bundle and wrap with wire ties.

LIGHTING

1. SECTION REQUIREMENTS
   1.A. Submit Product Data for each luminaire, including lamps.
   1.B. Coordinate ceiling-mounted luminaires with ceiling construction.
2. LUMINAIRES
   2.A. As shown on contract drawings.
3. INSTALLATION
   3.A. Set units plumb, square, and level with ceiling and walls, and secure.
   3.B. Disconnecting Means. In indoor locations, other than dwellings and associated accessory structures, luminaires that contain ballast(s) that can be serviced in place shall have a disconnecting means either internal or external to each luminaire, to disconnect simultaneously from source of supply all conductors of ballast, including grounded conductor if any. Line side terminals of the disconnecting means shall be guarded. The disconnecting means shall be located so as to be accessible to qualified persons before servicing or maintaining the ballast.
   3.C. Support for Recessed and Semirecessed Grid-Type Fluorescent Fixtures: Install ceiling support system rods or wires at a minimum of 4 rods or wires for each fixture, located not set more than 6 inches from fixture corners.
   3.D. Lamping: Where specific lamp designations are not indicated, lamp units according to manufacturer's written instructions.

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SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION
CONSTANTINE ENGINEERING ASSOCIATES, LLC
C-04361

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
SEAL 16540

NORTH CEDAR OFFICE BUILDING
208 NORTH CEDAR STREET
SUMMERVILLE, SOUTH CAROLINA 29483

ELECTRICAL SCHEDULES, SPECIFICATIONS

REVISIONS:

DESIGNED BY:	JCM
DRAWN BY:	JCM
CHECKED BY:	CJC
DATE:	04/01/2022

JOB NUMBER
22-031

SHEET NUMBER
E6