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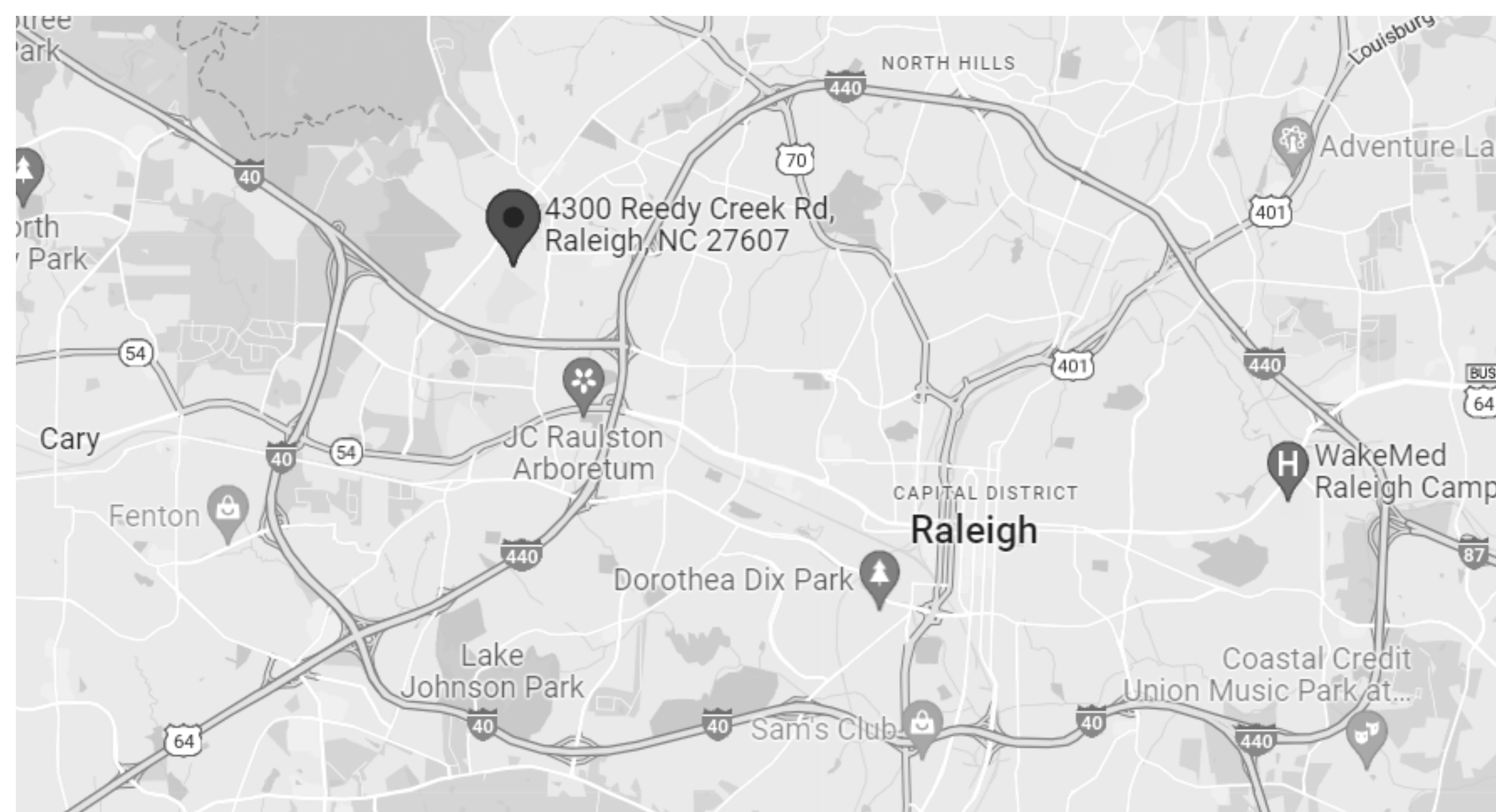
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs

North Carolina Department of Agriculture and Consumer Services

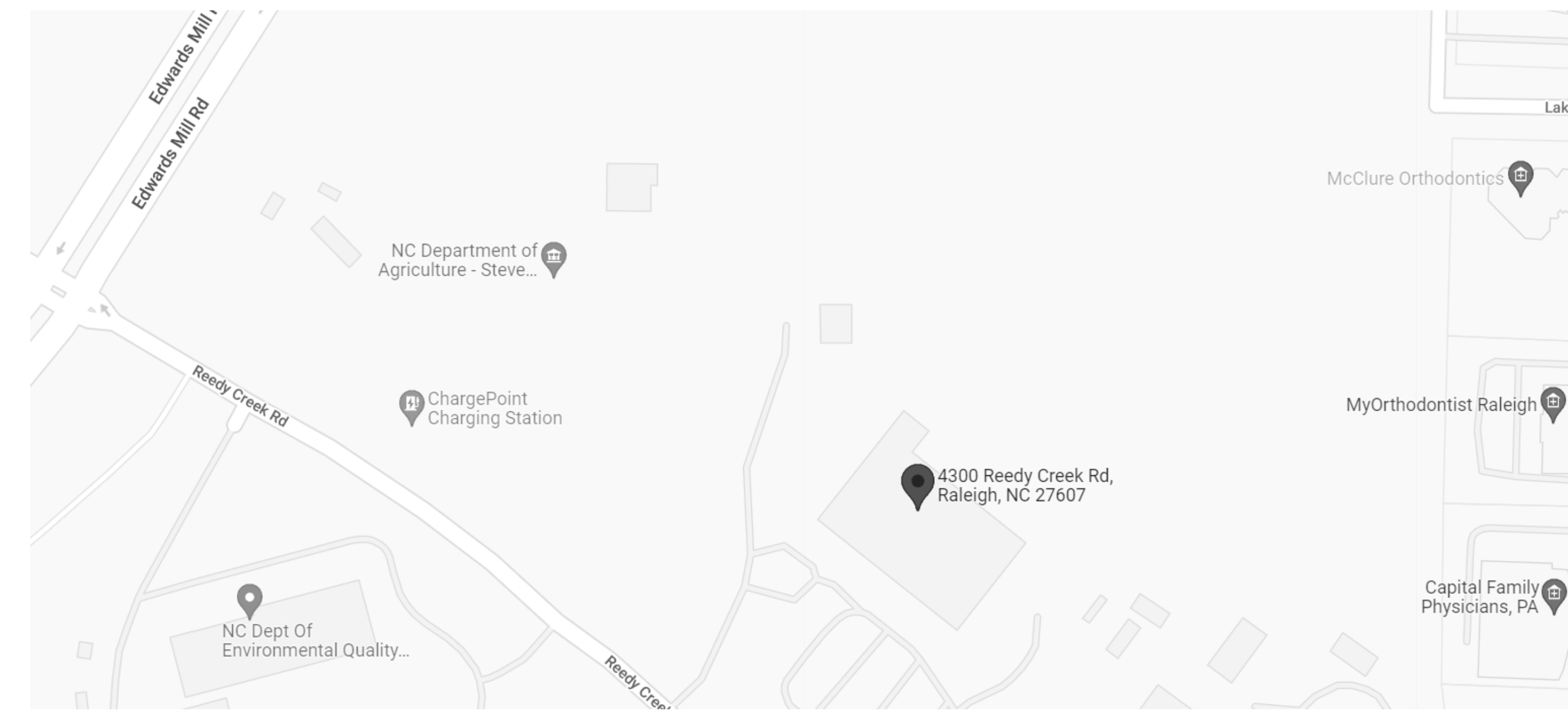
SCO ID# 22-24510-01A
Code: 42017; Item 4404
RMF Project No. : 02220164.A0

BID DOCUMENTS

07/11/2023

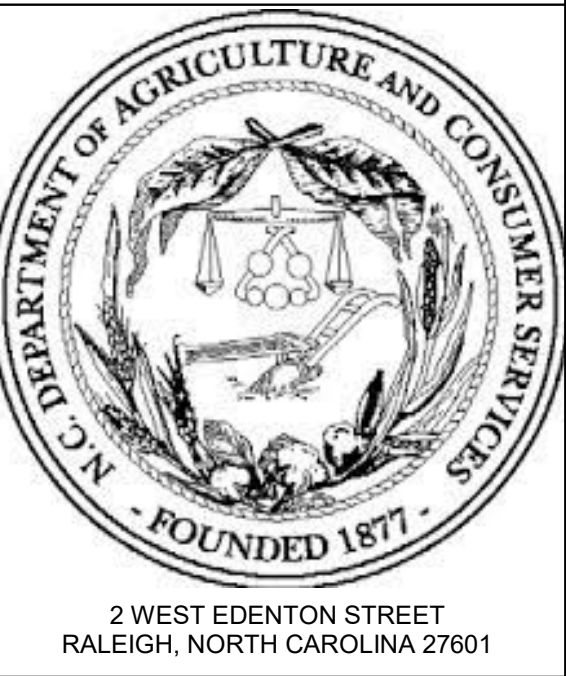


1 VICINITY MAP
SCALE: N.T.S.



2 SITE MAP
SCALE: N.T.S.

REV	DESCRIPTION	DATE
REVISIONS		
SUBMISSION TITLE: BID DOCUMENTS		
SEAL: 		
DRAWN BY:	JA	DATE: 07/11/2023
DESIGNED BY:	FLT	SCALE: NONE
CHECKED BY:	KAN	RMF JOB NO.: 02220164.A0
PROJ. MGR.:	KAN	CLIENT JOB #:
PROJECT NAME: Eddy Building HVAC & Lab Exhaust Upgrades & Repairs		
SCO ID: #22-24510-01A		
PROJECT ADDRESS: 4300 REEDY CREEK, EDDY BUILDING, RALEIGH, NC 27607		
DRAWING TITLE: COVER SHEET		
DRAWING NUMBER: G-001		



NO CHANGES TO BUILDING ENVELOPE INCLUDED IN THIS PROJECT
ENERGY SUMMARY
ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the North Carolina Energy Conservation Code shall also be provided.

NO CHANGES TO BUILDING STRUCTURE INCLUDED IN THIS PROJECT
2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
STRUCTURAL DESIGN
DESIGN LOADS:
Importance Factors: Snow (Is) _____
Seismic (Ic) _____

NO CHANGES TO BUILDING MECHANICAL DESIGN INCLUDED IN THIS PROJECT
2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
MECHANICAL DESIGN
MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT
Thermal Zone
winter dry bulb: _____
summer dry bulb: _____

NO CHANGES TO BUILDING LIGHTING DESIGN INCLUDED IN THIS PROJECT
2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
ELECTRICAL DESIGN
ELECTRICAL SYSTEM AND EQUIPMENT
Method of Compliance: Energy Code: _____
ASHRAE 90.1: _____

Table with 3 columns: REV, DESCRIPTION, DATE

SUBMISSION TITLE:
BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
DESIGNED BY: FLT SCALE: NONE
CHECKED BY: KAN RMF JOB NO.: 02220164.A0
PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eaddy Building HVAC & Lab Exhaust Upgrades & Repairs
SCO ID: #22-24510-01A
PROJECT ADDRESS:
4300 REEDY CREEK,
EADDY BUILDING,
RALEIGH, NC 27607

DRAWING TITLE:
BUILDING CODE SUMMARY
DRAWING NUMBER:
CS-002

1. NOTIFY THE OWNER, IN WRITING, AT LEAST FIFTEEN (15) DAYS IN ADVANCE OF ALL REQUIRED SHUTDOWNS OF WATER, FIRE, GAS, ELECTRICAL SERVICE, OR OTHER UTILITIES. UPON RECEIPT OF APPROVAL FROM OWNER, SHUTDOWNS SHALL BE PERFORMED AS DIRECTED OTHERWISE BY THE OWNER AND SHALL BE ACCOMPLISHED AT NO ADDITIONAL CONTRACT COST. AT THE END OF EACH SHUTDOWN ALL SERVICES SHALL BE RESTORED SO THAT NORMAL USE OF THE UTILITIES CAN CONTINUE.

Table with columns: SYMBOL, EQUIPMENT DESIGNATIONS, DESCRIPTION, SYMBOL, PIPING COMPONENTS AND SPECIATIES, DESCRIPTION, SYMBOL, DUCTWORK SYMBOLS, DESCRIPTION. Includes symbols for air compressor, air chiller, air conditioning unit, etc.

Table with columns: SYMBOL, PIPING SYMBOLS, DESCRIPTION. Includes symbols for boiler blowdown, bearing cooling water return, blow off, etc.

Table with columns: #, NUMBER, POUND, HZR, HOT WATER RECIRCULATION, etc. Includes abbreviations for DOLLAR, PERCENT, AND, PLUS, MINUS, etc.

MECHANICAL GENERAL NOTES

1. COMPLY WITH 2018 NC MECHANICAL CODE AND ALL OTHER APPLICABLE BUILDING CODES FOR ALL WORK UNDER THIS CONTRACT.

FIRE RATED PARTITION LINETYPES

Table with columns: SYMBOL, DESCRIPTION. Includes symbols for 1/2 HOUR FIRE PARTITION, 1 HOUR FIRE PARTITION, 2 HOUR FIRE PARTITION, etc.

SCOPE OF WORK

THE SCOPE OF WORK SHALL INCLUDE THE FOLLOWING:
BASE BID:
CHILLER
REPLACEMENT OF THE AIR-COOLED CHILLER WITH AUTOMATIC CONTROLS.

MECHANICAL GENERAL NOTES

1. COMPLY WITH 2018 NC MECHANICAL CODE AND ALL OTHER APPLICABLE BUILDING CODES FOR ALL WORK UNDER THIS CONTRACT.

Table with columns: #, NUMBER, POUND, HZR, HOT WATER RECIRCULATION, etc. Includes abbreviations for DOLLAR, PERCENT, AND, PLUS, MINUS, etc.

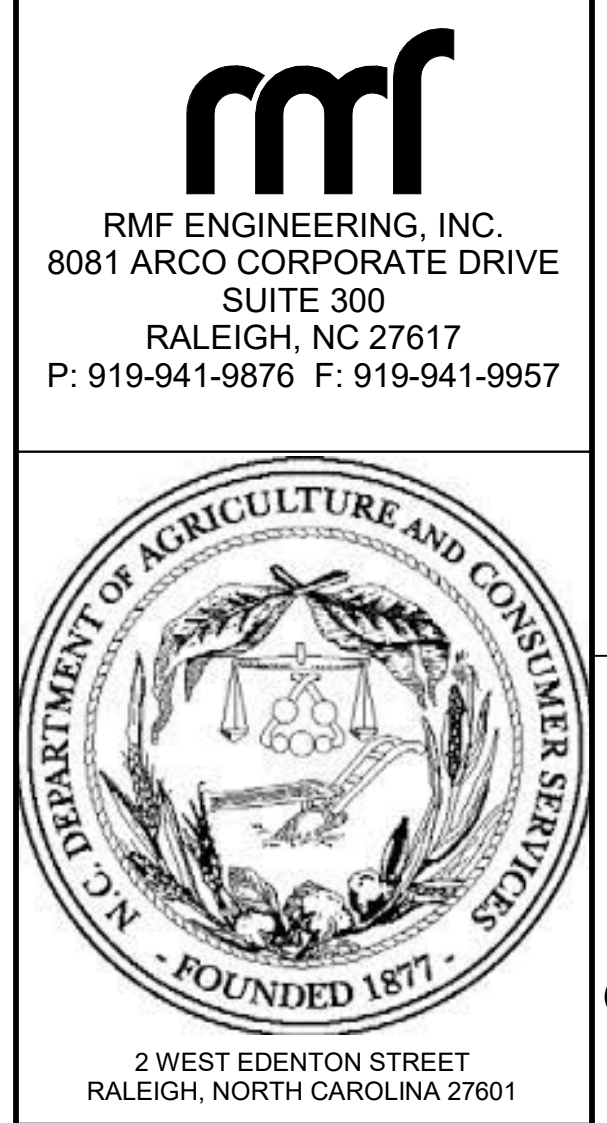


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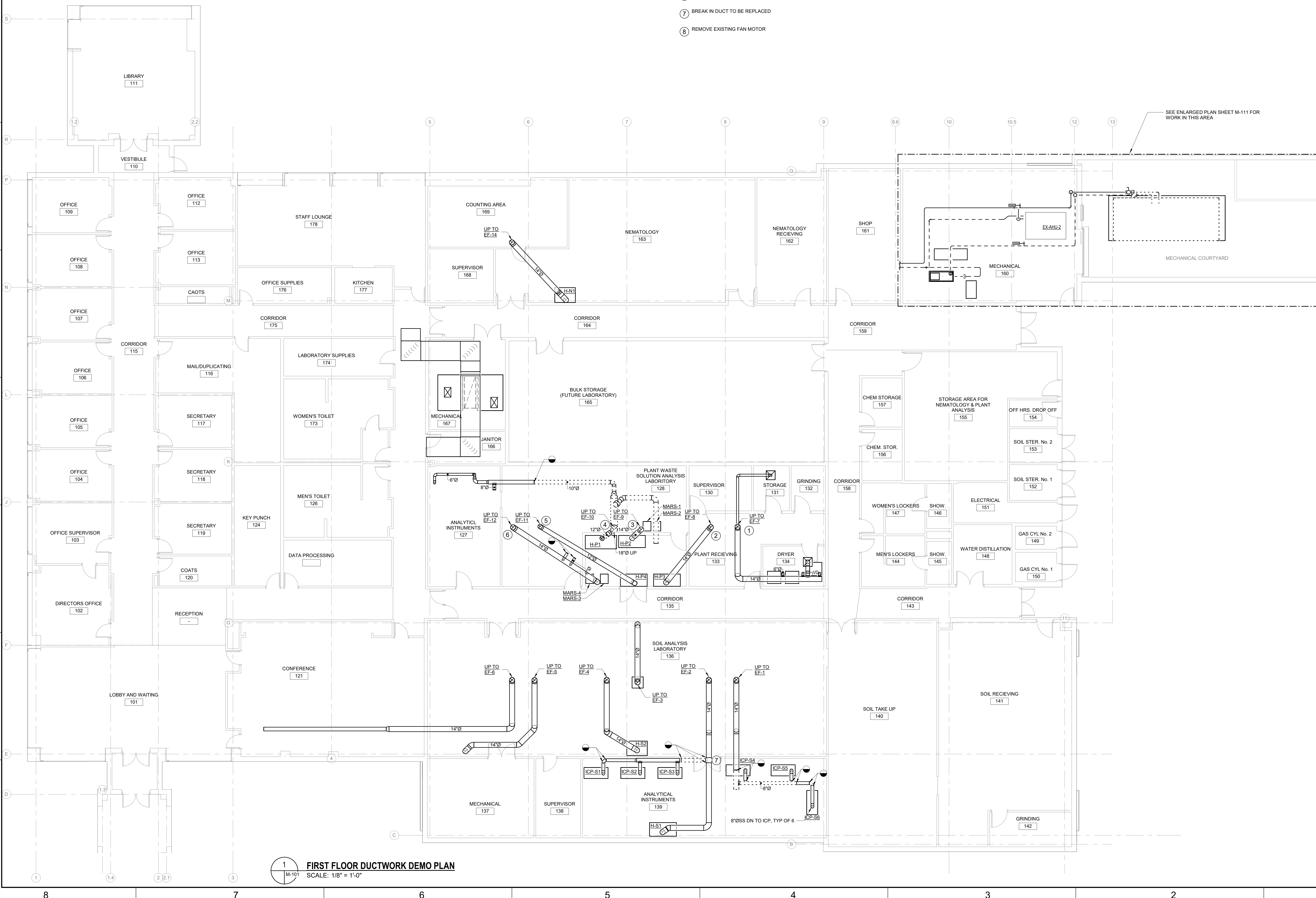
PROJECT NAME: Eaddy Building HVAC & Lab Exhaust Upgrades & Repairs
SCO ID: #22-24510-01A
PROJECT ADDRESS: 4300 REEDY CREEK, EADDY BUILDING, RALEIGH, NC 27607
MECHANICAL NOTES, SYMBOLS, AND ABBREVIATIONS
DRAWING NUMBER: M-001

DRAWING NOTES

- ① 140 UP TO EF-7(E) TO REMAIN
- ② 140 UP TO EF-8(E) TO REMAIN
- ③ 140 UP TO EF-9(E) TO REMAIN
- ④ REMOVE 180 UP TO EF-10(E)
- ⑤ 120 UP TO EF-11(E) TO REMAIN
- ⑥ 140 UP TO EF-12(E) TO REMAIN
- ⑦ BREAK IN DUCT TO BE REPLACED
- ⑧ REMOVE EXISTING FAN MOTOR

GENERAL NOTES

1. REFER TO GENERAL DEMOLITION NOTES ON DRAWING M-001



SEE ENLARGED PLAN SHEET M-111 FOR WORK IN THIS AREA

1 FIRST FLOOR DUCTWORK DEMO PLAN
SCALE: 1/8" = 1'-0"

REV	DESCRIPTION	DATE

SUBMISSION TITLE: **BID DOCUMENTS**

SEAL:
7/11/2023

DRAWN BY: JAA DATE: 07/11/2023
 DESIGNED BY: FLT SCALE: 1/8" = 1'-0"
 CHECKED BY: KAN RME JOB NO.: 02220164.A0
 PROJ. MGR.: KAN CLIENT JOB #:
 PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs
 SCO ID: #22-24510-01A
 PROJECT ADDRESS:
 4300 REEDY CREEK,
 EDDY BUILDING,
 RALEIGH, NC 27607
 DRAWING TITLE:
MECHANICAL DEMOLITION FLOOR PLAN
 DRAWING NUMBER:
M-101

DRAWING NOTES

- ① REMOVE EXISTING EXHAUST FAN AND CAP CURB. REFER TO DETAILS FOR CURB CAPPING REQUIREMENTS.
- ② REMOVE EXISTING EXHAUST FAN IN PREPARATION FOR INSTALLATION OF NEW FAN.

GENERAL NOTES

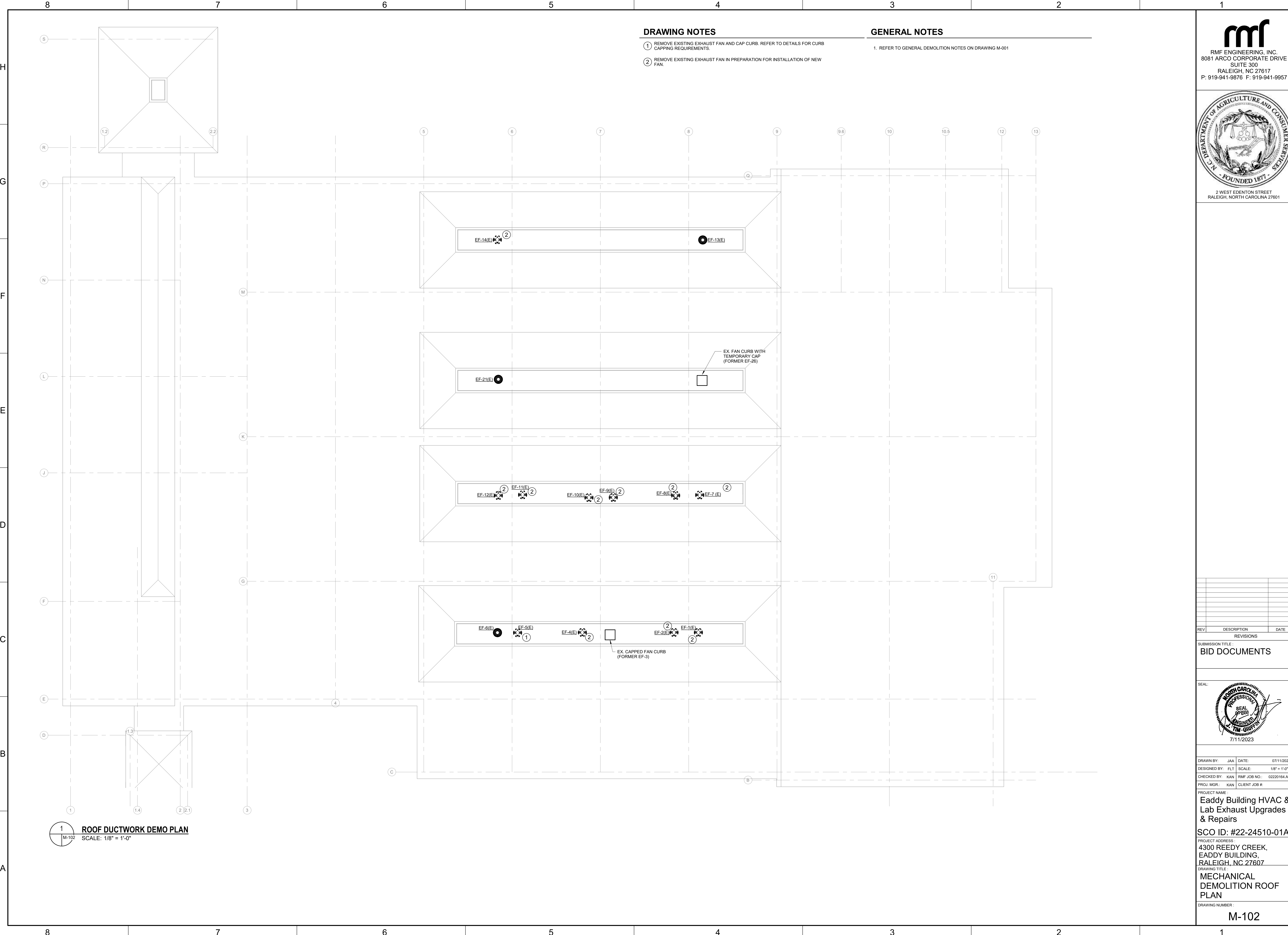
- 1. REFER TO GENERAL DEMOLITION NOTES ON DRAWING M-001



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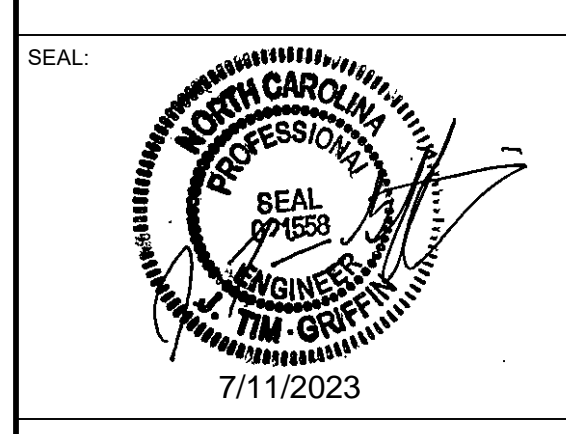
2 WEST EDENTON STREET
RALEIGH, NORTH CAROLINA 27601



1 ROOF DUCTWORK DEMO PLAN
M-102 SCALE: 1/8" = 1'-0"

REV	DESCRIPTION	DATE

SUBMISSION TITLE:
BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
DESIGNED BY: FLT SCALE: 1/8" = 1'-0"
CHECKED BY: KAN RMF JOB NO.: 02220164.A0
PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs
SCO ID: #22-24510-01A
PROJECT ADDRESS:
4300 REEDY CREEK,
EDDY BUILDING,
RALEIGH, NC 27607
DRAWING TITLE:
MECHANICAL DEMOLITION ROOF PLAN

DRAWING NUMBER:
M-102

DRAWING NOTES

- ① REMOVE EXISTING AIR-COOLED CHILLER, REFRIGERANT IS TO BE RECOVERED AND TURNED OVER TO AN EPA CERTIFIED REFRIGERANT RECLAIMING FACILITY PER 1102.2 OF THE NC MECHANICAL CODE.
- ② REMOVE CHW PIPING FROM CHILLER TO ISOLATION VALVES.

GENERAL NOTES

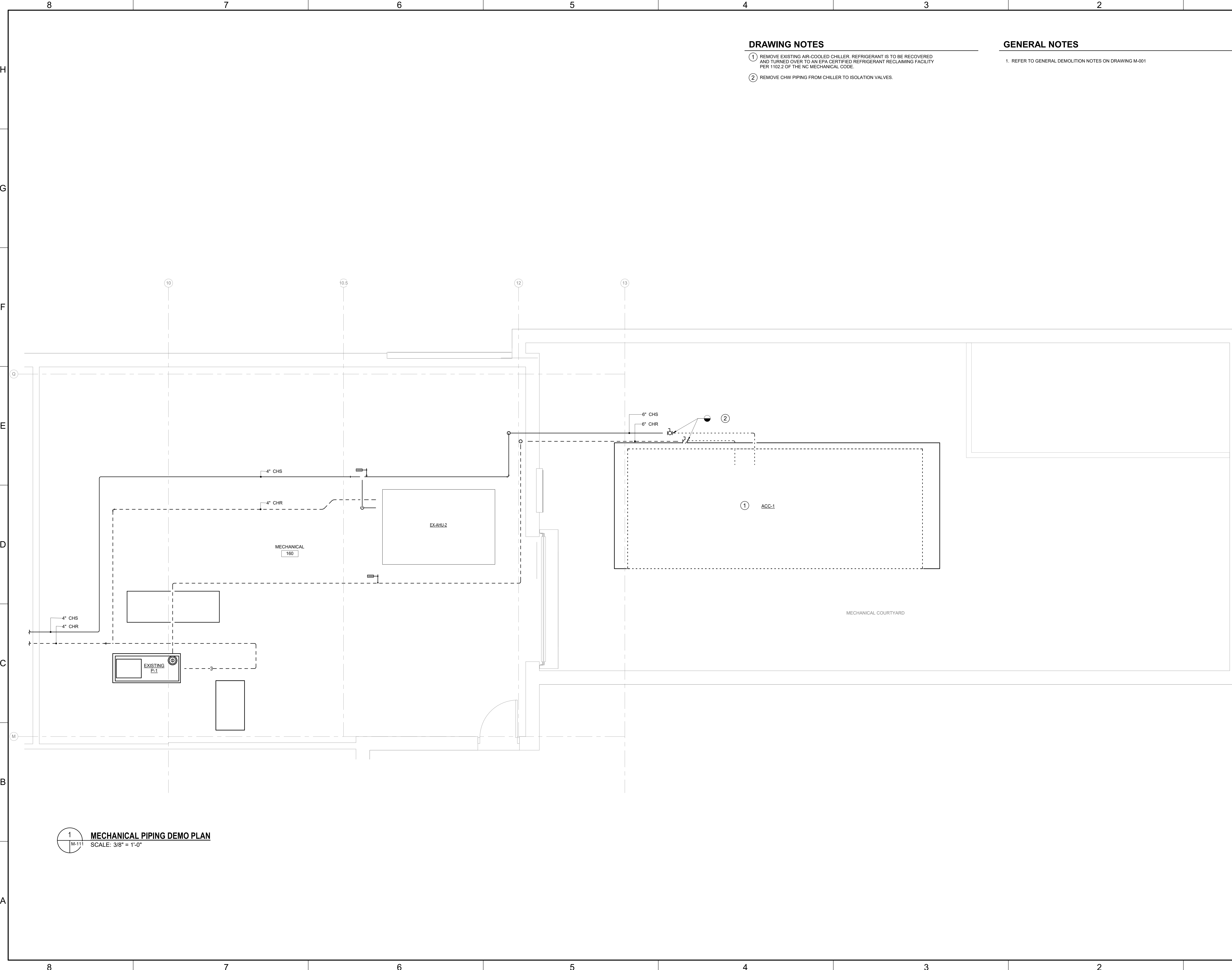
- 1. REFER TO GENERAL DEMOLITION NOTES ON DRAWING M-001



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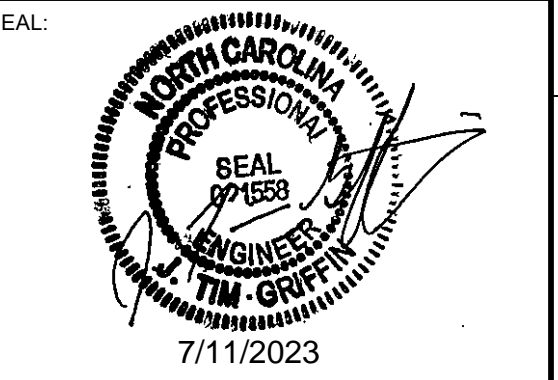
2 WEST EDENTON STREET
RALEIGH, NORTH CAROLINA 27601



1 MECHANICAL PIPING DEMO PLAN
SCALE: 3/8" = 1'-0"

REV	DESCRIPTION	DATE

BID DOCUMENTS



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CHECKED BY: KAN RMF JOB NO.: 02220164.A0
PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs
SCO ID: #22-24510-01A
PROJECT ADDRESS:
4300 REEDY CREEK,
EDDY BUILDING,
RALEIGH, NC 27607
DRAWING TITLE:
MECHANICAL PIPING DEMOLITION PLAN


DRAWING NUMBER:
M-111

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P: 919-941-9876 F: 919-941-9957



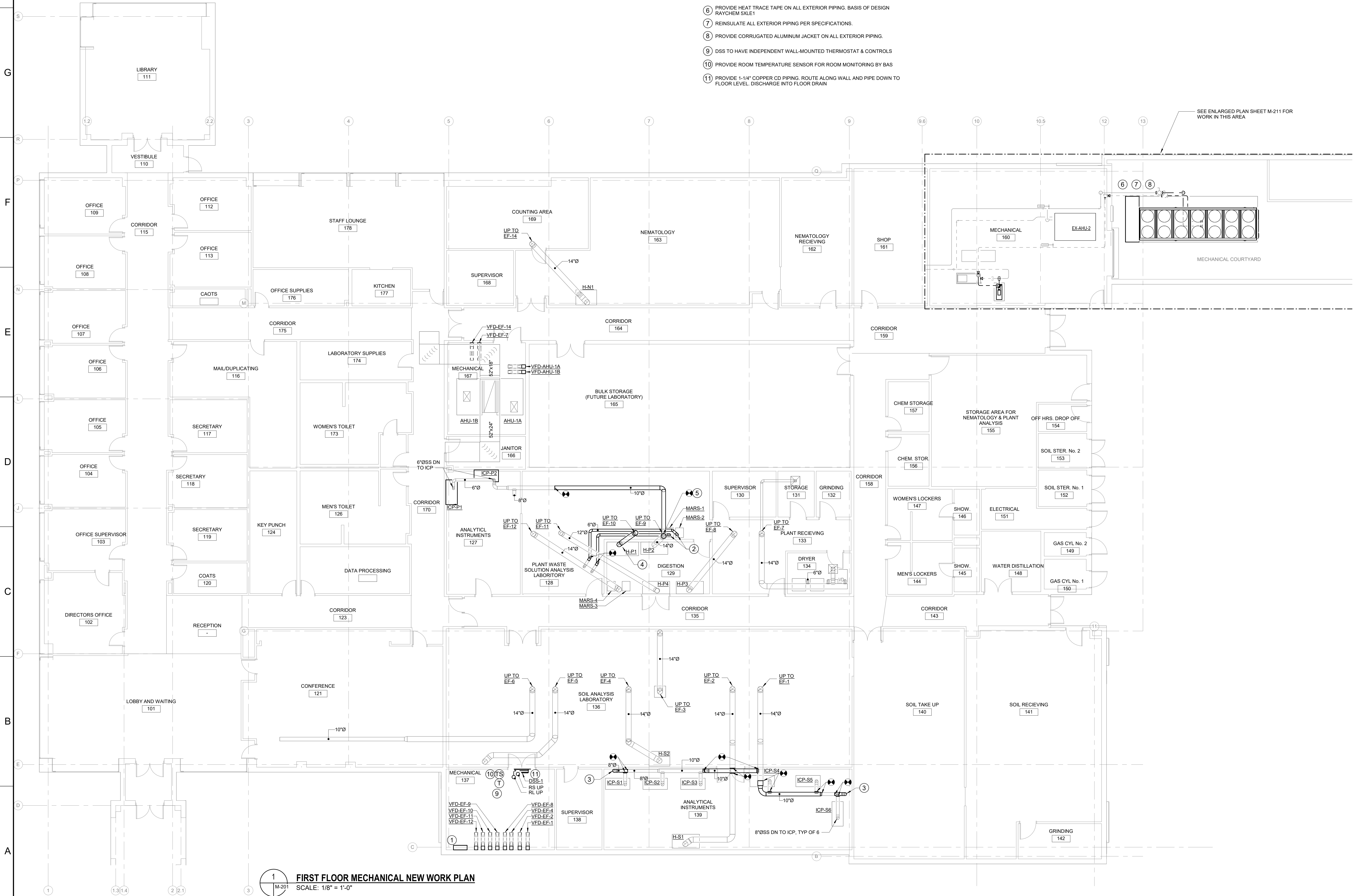
2 WEST EDENTON STREET
RALEIGH, NORTH CAROLINA 27601

DRAWING NOTES

- NEW BAS CONTROL PANEL LOCATION. COORDINATE 120V POWER SERVICE TO PANEL W/E.C.
- ROUTE 6"Ø DN TO 6 FT AFF AND CONNECT TO EXISTING MARS6 DIGESTOR EXHAUST DISCHARGE FLEX HOSE. PROVIDE MANUAL BALANCING DAMPER IN 6"Ø VERTICAL DUCT.
- 6"Ø SS DN TO LOW POINT DRAIN RE: LOW POINT DRAIN DETAIL ON M-501
- NEW 12"Ø CPVC EXHAUST RISER DOWN THROUGH CEILING. CONNECT TO EXISTING FUME HOOD EXHAUST COLLAR. PROVIDE CPVC ESCUTCHEON PLATE AT CEILING PENETRATION.
- CONNECT NEW 10"Ø CPVC INTO EXISTING 14"Ø VERTICAL EXHAUST RISER. TIE INTO RISER AT 45° ANGLE WITH WYE BRANCH FITTING.
- PROVIDE HEAT TRACE TAPE ON ALL EXTERIOR PIPING. BASIS OF DESIGN RAYCHEM 5XL1
- REINSULATE ALL EXTERIOR PIPING PER SPECIFICATIONS.
- PROVIDE CORRUGATED ALUMINUM JACKET ON ALL EXTERIOR PIPING.
- DSS TO HAVE INDEPENDENT WALL-MOUNTED THERMOSTAT & CONTROLS
- PROVIDE ROOM TEMPERATURE SENSOR FOR ROOM MONITORING BY BAS
- PROVIDE 1-1/4" COPPER CD PIPING. ROUTE ALONG WALL AND PIPE DOWN TO FLOOR LEVEL. DISCHARGE INTO FLOOR DRAIN

GENERAL NOTES

- REFER TO GENERAL MECHANICAL NOTES ON DRAWING M-001.
- REFER TO LABORATORY EQUIPMENT SCHEDULE FOR EQUIPMENT AIRFLOW AND BALANCING REQUIREMENTS.




1
M-201
FIRST FLOOR MECHANICAL NEW WORK PLAN
SCALE: 1/8" = 1'-0"

REV	DESCRIPTION	DATE

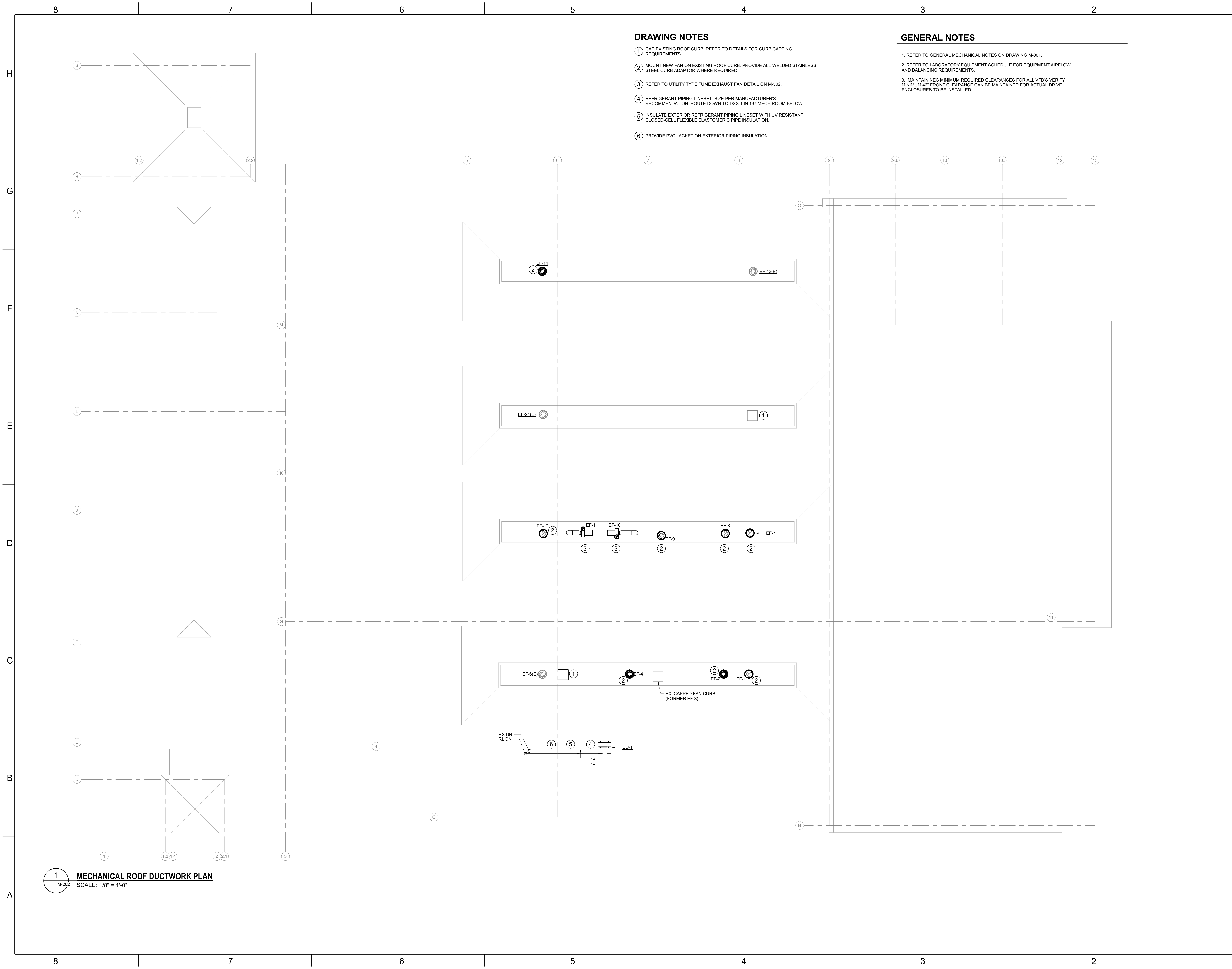
REVISIONS

SUBMISSION TITLE:
BID DOCUMENTS

SEAL:

 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL #1958
 7/11/2023

DRAWN BY: JAA DATE: 07/11/2023
 DESIGNED BY: FLT SCALE: 1/8" = 1'-0"
 CHECKED BY: KAN RFM JOB NO.: 02220164.A0
 PROJ. MGR.: KAN CLIENT JOB #:
 PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs
 SCO ID: #22-24510-01A
 PROJECT ADDRESS:
 4300 REEDY CREEK,
 EDDY BUILDING,
 RALEIGH, NC 27607
 DRAWING TITLE:
MECHANICAL NEW WORK FLOOR PLAN
 DRAWING NUMBER:
M-201

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DRAWING NOTES

- 1 CAP EXISTING ROOF CURB. REFER TO DETAILS FOR CURB CAPPING REQUIREMENTS.
- 2 MOUNT NEW FAN ON EXISTING ROOF CURB. PROVIDE ALL-WELDED STAINLESS STEEL CURB ADAPTOR WHERE REQUIRED.
- 3 REFER TO UTILITY TYPE FUME EXHAUST FAN DETAIL ON M-502.
- 4 REFRIGERANT PIPING LINESET. SIZE PER MANUFACTURER'S RECOMMENDATION. ROUTE DOWN TO DSS-1 IN 137 MECH ROOM BELOW
- 5 INSULATE EXTERIOR REFRIGERANT PIPING LINESET WITH UV RESISTANT CLOSED-CELL FLEXIBLE ELASTOMERIC PIPE INSULATION.
- 6 PROVIDE PVC JACKET ON EXTERIOR PIPING INSULATION.

GENERAL NOTES

1. REFER TO GENERAL MECHANICAL NOTES ON DRAWING M-001.
2. REFER TO LABORATORY EQUIPMENT SCHEDULE FOR EQUIPMENT AIRFLOW AND BALANCING REQUIREMENTS.
3. MAINTAIN NEC MINIMUM REQUIRED CLEARANCES FOR ALL VFD'S VERIFY MINIMUM 42" FRONT CLEARANCE CAN BE MAINTAINED FOR ACTUAL DRIVE ENCLOSURES TO BE INSTALLED.

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2 WEST EDENTON STREET
RALEIGH, NORTH CAROLINA 27601

REV	DESCRIPTION	DATE
REVISIONS		

SUBMISSION TITLE:
BID DOCUMENTS

DRAWN BY: JAA	DATE: 07/11/2023
DESIGNED BY: FLT	SCALE: 1/8" = 1'-0"
CHECKED BY: KAN	RFM JOB NO.: 02220164A0
PROJ. MGR.: KAN	CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs

SCO ID: #22-24510-01A

PROJECT ADDRESS:
4300 REEDY CREEK,
EDDY BUILDING,
RALEIGH, NC 27607

DRAWING TITLE:
MECHANICAL NEW WORK ROOF PLAN

DRAWING NUMBER:
M-202

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DRAWING NOTES

- ① ADD NEW CONCRETE PAD EXTENSION. LENGTHEN EXISTING EQUIPMENT PAD BY 3'-0". DRILL INTO THE SIDE OF THE EXISTING PAD AND USE EPOXY TO SET DOWEL REBAR BEFORE POURING PAD EXTENSION. VERTICAL AND HORIZONTAL SPACING OF DOWEL REBAR TO BE PER MANUFACTURERS RECOMMENDATION.
- ② PROVIDE HEAT TRACE TAPE ON ALL EXTERIOR PIPING. BASIS OF DESIGN RAYCHEM SXLE1
- ③ REINSULATE ALL EXTERIOR PIPING USING POLYISOCYANURATE INSULATION.
- ④ PROVIDE CORRUGATED ALUMINUM JACKET ON ALL EXTERIOR PIPING.

GENERAL NOTES

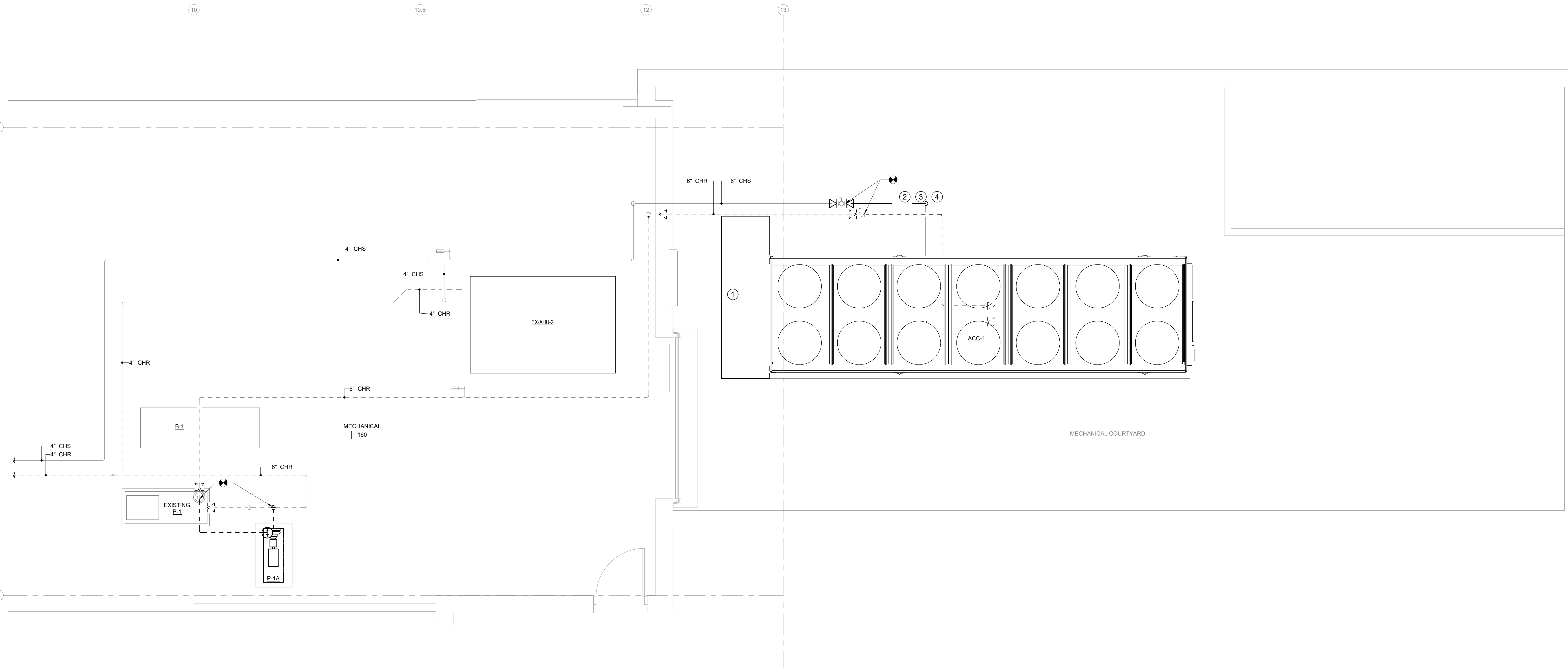
- 1. REFER TO GENERAL MECHANICAL NOTES ON DRAIN M-001



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2 WEST EDENTON STREET
RALEIGH, NORTH CAROLINA 27601



1
M-211
Mechanical Piping Plan
SCALE: 3/8" = 1'-0"

REV	DESCRIPTION	DATE

BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
DESIGNED BY: FLT SCALE: 3/8" = 1'-0"
CHECKED BY: KAN RMF JOB NO.: 02220164.A0
PROJ. MGR: KAN CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs
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4300 REEDY CREEK,
EDDY BUILDING,
RALEIGH, NC 27607

MECHANICAL PIPING PLAN

DRAWING NUMBER:
M-211

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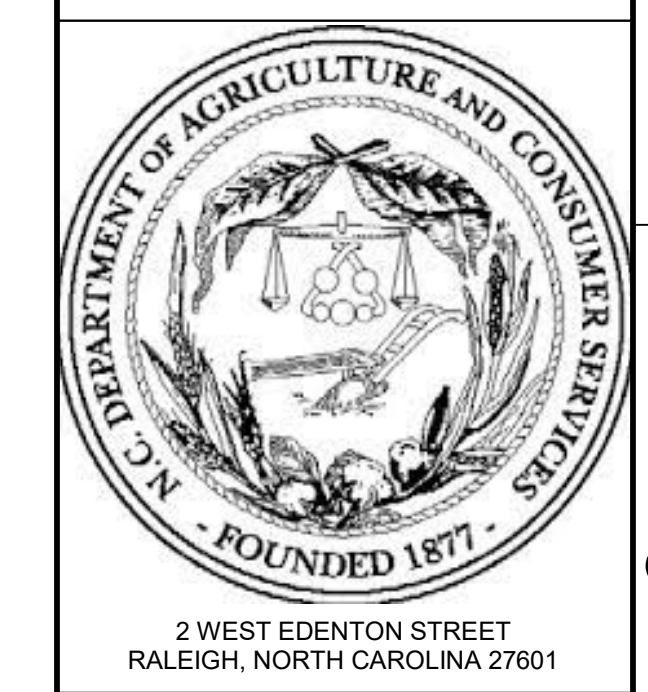
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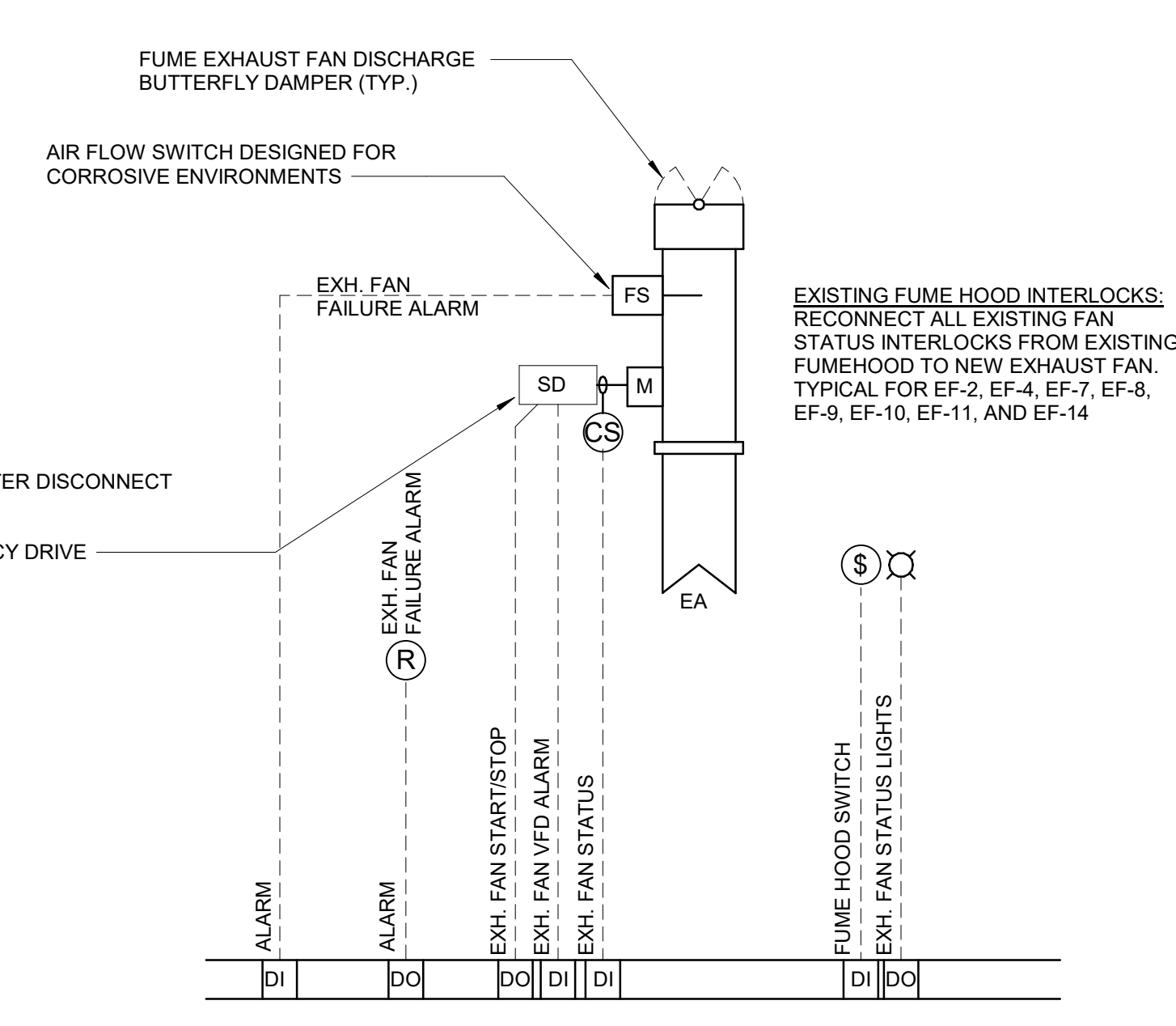
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2 WEST EDENTON STREET
 RALEIGH, NORTH CAROLINA 27601



FUME EXHAUST FAN CONTROL

FAN CONTROL:
 BAS SHALL START/STOP EXHAUST FAN BASED ON BUILDING OCCUPIED/UNOCCUPIED SCHEDULE. FAN SHALL OPERATE WHENEVER BUILDING IS OCCUPIED.

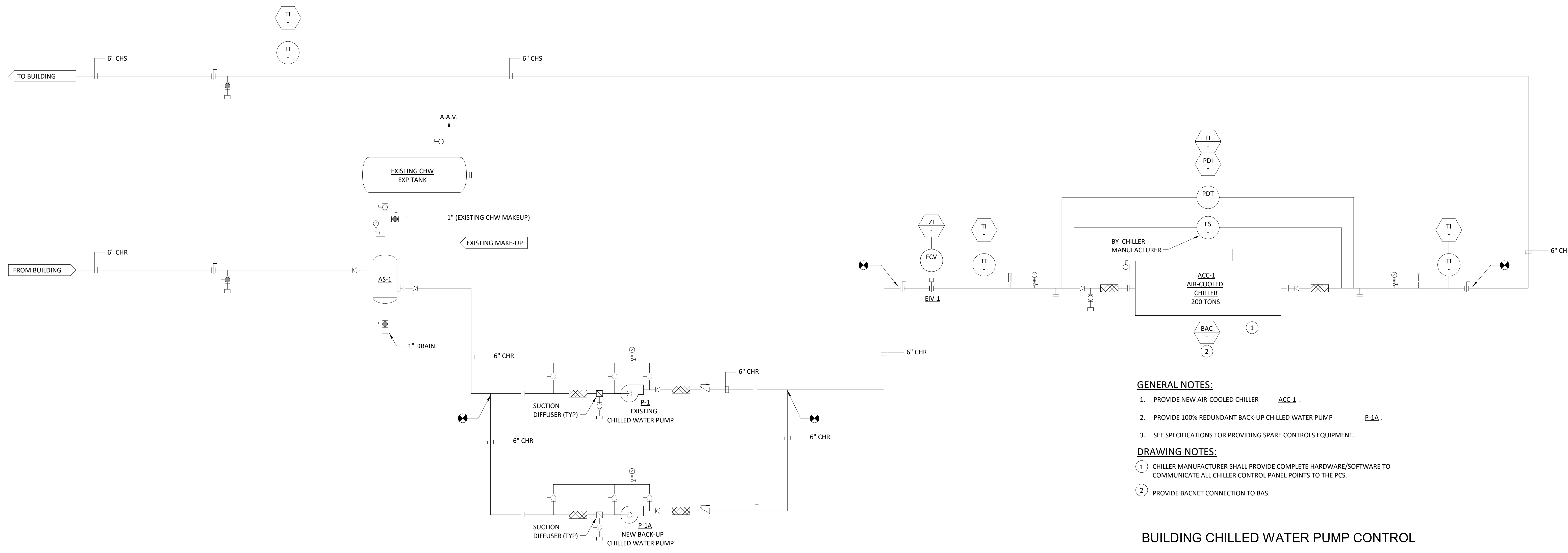
FANS SERVING FUME HOODS ONLY: SWITCH ON CONSTANT GREEN LIGHT WHEN HOOD EXHAUST FAN IS OPERATING BASED ON FAN STATUS SENSOR. SWITCH OFF LIGHT WHEN HOOD EXHAUST FAN IS NOT OPERATING.

PROVIDE AIRFLOW SWITCH TO PROVE FAN STATUS. AIRFLOW SWITCH MUST BE DESIGNED FOR CORROSIVE ENVIRONMENTS AND IS TO BE MOUNTED IN READILY ACCESSIBLE LOCATION

MONITOR AND TREND:
 EXHAUST FAN STATUS CHANGES (BY AIR FLOW SENSOR)
 EXHAUST FAN RUN TIMES

ALARMS:
 FAN FAILURES
 LOW FLOW HOOD ALARMS

1 FUME EXHAUST FAN CONTROLS DIAGRAM
 SCALE: N.T.S.



GENERAL NOTES:

1. PROVIDE NEW AIR-COOLED CHILLER ACC-1.
2. PROVIDE 100% REDUNDANT BACK-UP CHILLED WATER PUMP P-1A.
3. SEE SPECIFICATIONS FOR PROVIDING SPARE CONTROLS EQUIPMENT.

DRAWING NOTES:

- 1 CHILLER MANUFACTURER SHALL PROVIDE COMPLETE HARDWARE/SOFTWARE TO COMMUNICATE ALL CHILLER CONTROL PANEL POINTS TO THE PCS.
- 2 PROVIDE BACNET CONNECTION TO BAS.

BUILDING CHILLED WATER PUMP CONTROL

CHILLED WATER PUMP CONTROL SEQUENCE (P-1 & P-1A)

1. EACH BUILDING CHILLED WATER PUMP IS SIZED FOR 100% OF THE TOTAL LOAD AND SHALL OPERATE IN A LEADSTANDBY CONFIGURATION. PUMP LEADSTANDBY DESIGNATION SHALL BE CYCLED BY A LEADSTANDBY PROGRAM. THE PUMP LEADSTANDBY PROGRAM SHALL BE WRITTEN BY THE BAS CONTROLS CONTRACTOR TO EQUALIZE THE RUN TIMES ON THE EQUIPMENT (ADJUSTABLE).
2. START/STOP SETTINGS SHALL BE PERFORMED MANUALLY THROUGH A HAND-OFF-AUTO (H-O-A) SWITCH OR PROVIDED BY THE BAS. IN AUTO, THE BAS SHALL START AND STOP THE PUMPS. ONCE STARTED THE PUMPS SHALL RUN CONTINUOUSLY.

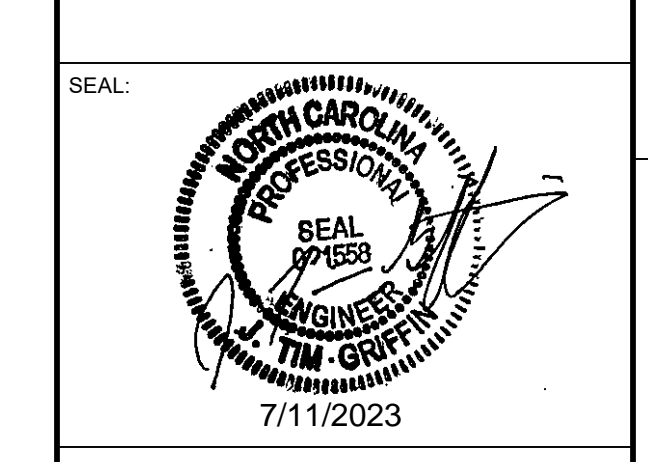
CHILLED WATER PUMP MONITORING AND ALARM

1. CHILLED WATER PUMP RUN STATUS SHALL BE MONITORED BY ITS CURRENT SENSING RELAY. WHENEVER A PUMP IS COMMANDED TO RUN AND AFTER A 15 SECOND (ADJUSTABLE) TIME DELAY, IF CURRENT SENSING RELAY DOES NOT CONFIRM PUMP IS RUNNING, THE PUMP SHALL BE COMMANDED OFF. AN ALARM (MANUAL RESET) SHALL BE GENERATED AT THE BAS AND THE SYSTEM SHALL AUTOMATICALLY STAGE UP THE STANDBY PUMP.

2 CHILLED WATER SYSTEM CONTROLS DIAGRAM
 SCALE: N.T.S.

REV	DESCRIPTION	DATE
REVISIONS		

BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
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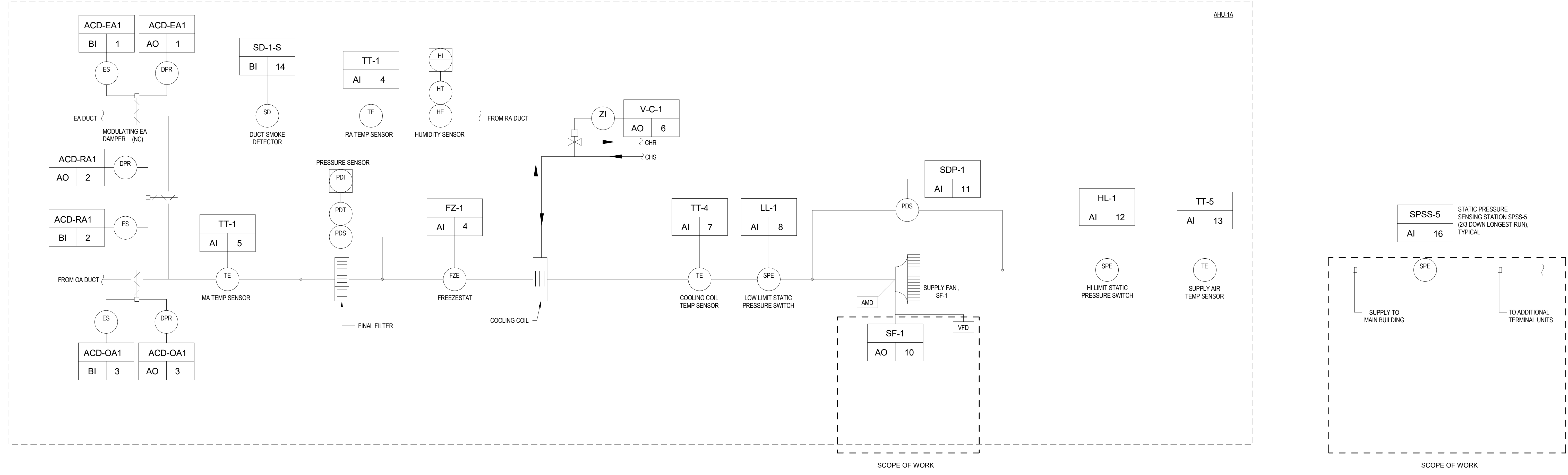
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SCO ID: #22-24510-01A

PROJECT ADDRESS:
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 RALEIGH, NC 27607

MECHANICAL CONTROLS

DRAWING NUMBER:
M-401



AHU-1A & AHU-1B SEQUENCE OF OPERATION

AHU-1A & 1B SEQUENCE OF OPERATION

RUN CONDITIONS - SCHEDULED:
 THE UNIT SHALL RUN BASED UPON AN OPERATOR ADJUSTABLE SCHEDULE.

EMERGENCY SHUTDOWN:
 THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL FROM THE FIRE ALARM SYSTEM OR OTHER ALARMS NOTED BELOW.

FREEZE PROTECTION:
 THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A FREEZE/STAT STATUS.

HIGH STATIC SHUTDOWN:
 THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A HIGH STATIC SHUTDOWN SIGNAL. UNIT SHALL AUTOMATICALLY RESET AFTER FIRST INSTANCE. UNIT SHALL REQUIRE A MANUAL RESET AFTER RECEIVING A SECOND HIGH STATIC SHUTDOWN SIGNAL.

AHU OPTIMAL START:
 THE UNIT SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONES TO REACH THEIR OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES.

SUPPLY FANS:
 THE SUPPLY AIR FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

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

SUPPLY AIR DUCT STATIC PRESSURE CONTROL:
 THE CONTROLLER SHALL MEASURE DUCT STATIC PRESSURE AND SHALL MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT (ADJ.) - THE SUPPLY FANS SPEED SHALL NOT DROP BELOW 30% (ADJ.) OR THE SPEED REQUIRED TO PROVIDE MINIMUM REQUIRED AIRFLOW TO THE ZONES AS PART OF A STATIC PRESSURE RESET CONTROL STRATEGY.

- STATIC PRESSURE RESET: THE SYSTEM STATIC PRESSURE SET POINT SHALL BE RESET WITH TRIM AND RESPOND DEMAND BASED LOGIC IN ACCORDANCE WITH ASHRAE STANDARD 90.1 WITH A LOW LIMIT OF 0.33" WC, AND A HIGH LIMIT OF 2.0" WC, AS DETERMINED BY THE TEST, ADJUST AND BALANCING (TAB) CONTRACTOR.
 - WHEN THE FAN IS OFF, THE STATIC PRESSURE SETPOINT SHALL BE FROZEN AT THE INITIAL SETPOINT DETERMINED BY TAB.
 - WHEN THE FAN IS PROVEN ON, EVERY 5 MINUTES, DECREASE THE SETPOINT BY 0.05 INCHES IF THERE IS ONE OR FEWER PRESSURE REQUESTS. IF THERE IS TWO OR MORE PRESSURE REQUESTS, INCREASE THE SETPOINT BY 0.05 INCHES.
 - WHERE VAV TERMINAL UNIT DAMPER POSITION IS KNOWN, A PRESSURE REQUEST IS GENERATED WHEN ANY DAMPER SERVED BY THE SYSTEM IS MORE THAN 90% OPEN. WHERE VAV TERMINAL UNIT DAMPER POSITION IS UNKNOWN, A PRESSURE REQUEST IS MADE WHEN THE BAS/O AS THE TERMINAL UNITS ACTUAL SUPPLY AIRFLOW TO SUPPLY AIRFLOW SETPOINT IS LESS THAN 90% UNTIL IT RISES TO 100%.
 - IF A DAMPER POSITION IS AT 100% OPEN FOR MORE THAN 30 MINUTES THE TERMINAL UNIT SHALL BE LOCKED OUT OF THE POLLING AND AN ALARM SHALL BE GENERATED AT THE BAS. THIS LOCK OUT SHALL REMAIN UNTIL THE TERMINAL UNIT IS REVIEWED TO DETERMINE THE CAUSE OF THE READING AND THE LOCKOUT IS MANUALLY RELEASED. THIS TERMINAL UNIT SHALL BE TERMED A ROGUE ZONE BOX UNTIL RELEASED.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
 HIGH SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (ADJ.) GREATER THAN SETPOINT.
 LOW SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (ADJ.) LESS THAN SETPOINT.
 SUPPLY FAN VFD FAULT.

UNOCCUPIED MODE:
 AHU-1A SUPPLY FAN VFD SHALL MODULATE DOWN TO MAINTAIN THE LAB NEGATIVE TO THE CORRIDOR.

SUPPLY AIR TEMPERATURE SETPOINT:
 - THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL RESET BETWEEN 55°F (ADJ.) TO 65°F (ADJ.). THE UNIT SHALL START WITH 65°F (ADJ.) DISCHARGE AIR TEMPERATURE SETPOINT.
 - THE CONTROLLER SHALL CONTINUOUSLY MONITOR THE VAV ZONE COOLING DEMAND BY COMPARING THE INDIVIDUAL ZONE TEMPERATURE WITH ITS INDIVIDUAL COOLING SETPOINT. IF 4 (ADJ.) OR MORE BOXES ZONE COOLING DEMAND IS GREATER THAN 50% (ADJ.) OR ZONE HUMIDITY IS GREATER THAN 50% RH, THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL DROP BY 0.5°F (ADJ.) EVERY 5 MINUTES UNTIL IT REACHES THE DISCHARGE AIR SETPOINT. RESET LOW LIMIT OR ALL THE ZONES ARE SATISFIED.
 - IF ALL THE BOXES ZONE COOLING DEMAND ARE SATISFIED OR BELOW 20% (ADJ.), THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL RISE BY 0.5°F (ADJ.) EVERY 5 MINUTES UNTIL IT REACHES THE DISCHARGE AIR SETPOINT. RESET HIGH LIMIT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
 HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.).
 LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

COOLING COIL VALVE:
 THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE COOLING COIL VALVE TO MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT.

THE COOLING SHALL BE ENABLED WHENEVER:
 - THE SUPPLY AIR TEMPERATURE IS MORE THAN THE SUPPLY AIR TEMPERATURE SETPOINT.
 - AND AS REQUIRED DURING ECONOMIZER MODE.
 - AND THE SUPPLY FANS STATUS IS ON.
 - AND THE HEATING (IF PRESENT) IS NOT ACTIVE.

THE COOLING COIL VALVE SHALL OPEN THE 50% (ADJ.) WHENEVER THE FREEZE/STAT (IF PRESENT) IS ON.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
 HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) GREATER THAN SETPOINT.

FILTER DIFFERENTIAL PRESSURE MONITOR:
 THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTERS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
 FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

RETURN AIR HUMIDITY:
 THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR SUPPLY TEMPERATURE CONTROL.

RETURN AIR TEMPERATURE:
 THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR SUPPLY TEMPERATURE CONTROL.

NO. POINT	SYSTEM APPARATUS OR AREA POINT DESCRIPTION	INPUTS																OUTPUTS				SYSTEM FEATURES				GENERAL																				
		ANALOG								CALC.								BINARY		ANALOG		ALARMS		PROGRAMS		GENERAL																				
		SPEED (FREQ) V/F	AMPS	RW	VALVE/DAMPER POSITION	CO2	TEMPERATURE	STATIC PRESSURE	DIFFERENTIAL PRESSURE	INLET TEMPERATURE	AIR FLOW (CFM)	OUTLET TEMPERATURE	BTU/H	RUN TIME	CFM	ENTHALPY	STATUS (DIFF. PRESS)	COOLING COIL STATUS	LOW TEMP LIMIT	HIGH HUM. LIMIT	END SWITCH (ES) POSITION	ENABLE/DISABLE	DAMPER POSITION	DIFFERENTIAL PRESSURE	DIFFERENTIAL PRESSURE	VALVE POSITION	DAMPER POSITION	LOW TEMP LIMIT	LOW CON. LIMIT	HUMIDITY LIMIT	HIGH LOW PRESSURE LIMIT	HIGH CO2 DIFFERENTIAL	FAULT	FIRE ALARM	TIME SCHEDULING	PROGRAMS	SCHEDULE	ALARMS	TREND INTERVAL (MIN)	RUN TIME TOTAL	SPANNING OF OPERATIONS	OVERSEER OR GRAPHIC				
10	SUPPLY FAN	X	X	X	X								X		X	X																						X	X	5	X	X	X			
12,3	MODULATING CONTROL DAMPERS				X											X	X			X	X	X														X	X	5	X	X	X					
11	FAN DIFFERENTIAL PRESSURE						X																																	X	X					
4, 5, 13	TEMPERATURE SENSORS					X						X																											X	5	X	X				
12	HIGH STATIC PRESSURE																																							X	X					
16	SYSTEM STATIC PRESSURE						X																																X	5	X	X	X			
4	FREEZE-STAT					X																																			X	X				
14	DUCT SMOKE DETECTOR																X																								X	X				
6	AUTOMATIC COIL CONTROL VALVES				X																																			X	5	X	X	X		

1 AHU-1A & 1B CONTROLS DIAGRAM
 SCALE: N.T.S.

REV. DESCRIPTION DATE

SUBMISSION TITLE:
BID DOCUMENTS

SEAL:

DRAWN BY: JAA DATE: 07/11/2023
 DESIGNED BY: FLT SCALE: NONE
 CHECKED BY: KAN RMF JOB NO.: 02220164.0
 PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eaddy Building HVAC & Lab Exhaust Upgrades & Repairs

SCO ID: #22-24510-01A

PROJECT ADDRESS:
 4300 REEDY CREEK,
 EADDY BUILDING,
 RALEIGH, NC 27607

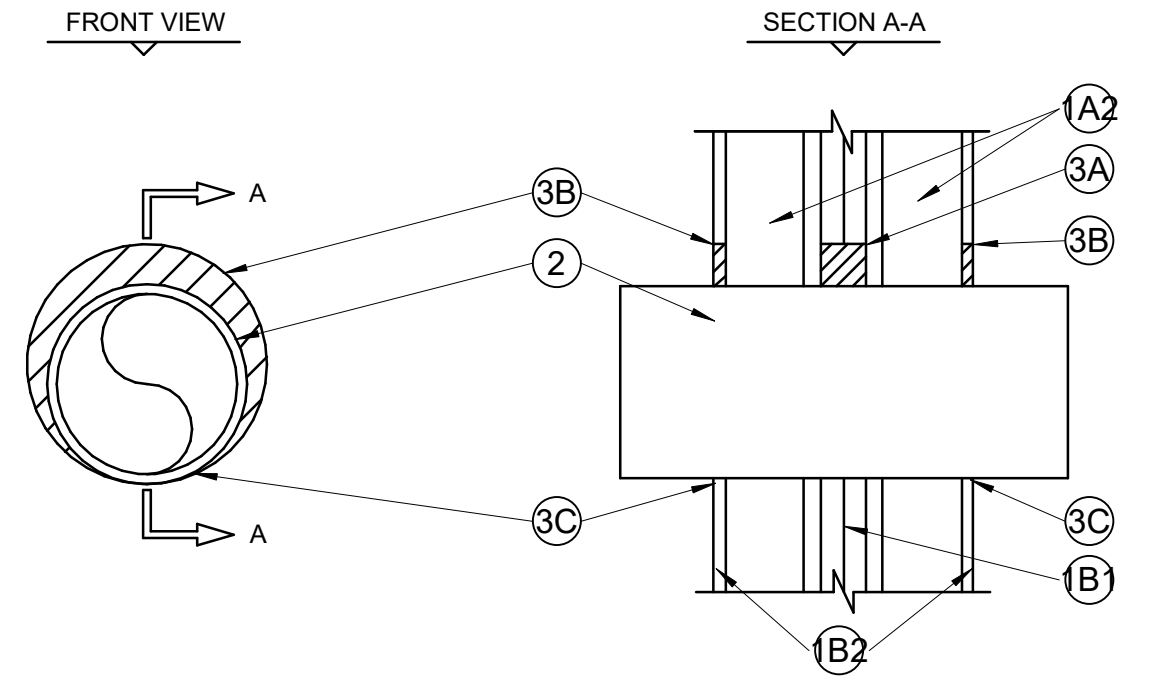
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MECHANICAL CONTROLS

DRAWING NUMBER:
M-402

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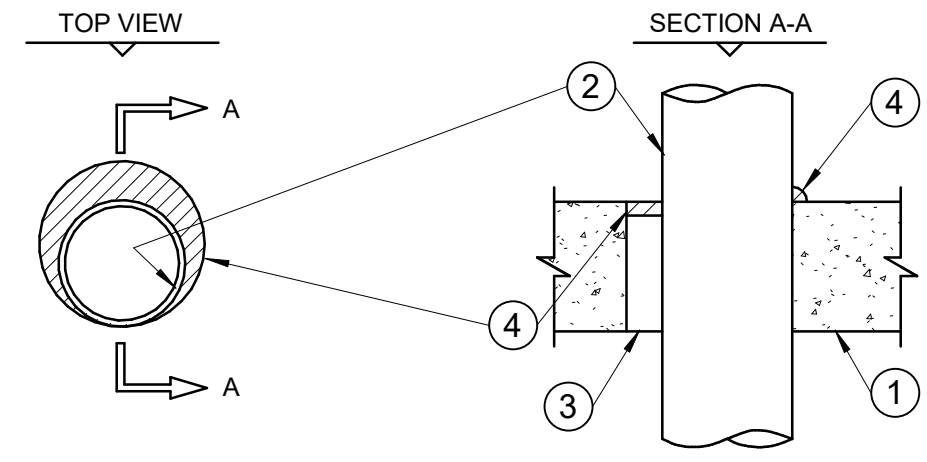
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ULcUL SYSTEM NO. W-L-1406 - JANUARY 26, 2015
 METAL PIPE THROUGH GYPSUM WALL ASSEMBLY
 F-RATING = 2-HR
 T-RATING = 0-HR
 L-RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
 L-RATING AT 400°F = LESS THAN 4 CFM/SQ. FT.

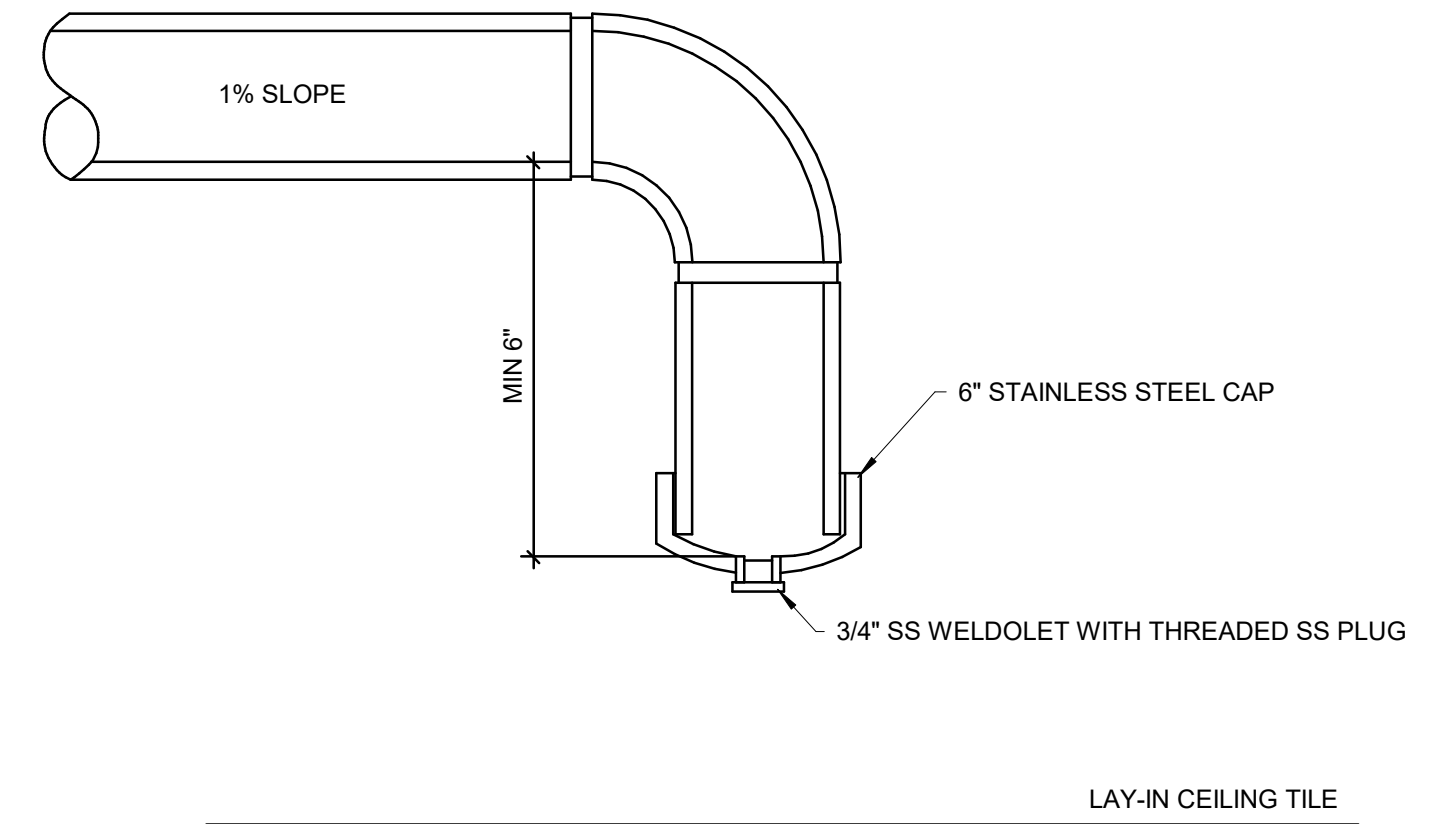


- WALL ASSEMBLY - THE 2 HR FIRE-RATED GYPSUM BOARD, STEEL AND WOOD STUD WALL ASSEMBLY SHALL BE CONSTRUCTED AS DESCRIBED IN THE U300 DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING FEATURES:
 - STUDS
 - FRAMING SHALL CONSIST OF STEEL MEMBERS FORMED DROM NO. 25 MSG GALV STEEL HAVING "H" SHAPED FLANGED SPACED 24 IN OC.
 - FRAMING SHALL CONSIST OF NOM 2 BY 4 IN LUMBER SPACED MAX 24 IN. OC. STUDS CROSS BRACED AT MID-HEIGHT WHERE NECESSARY FOR CLIP ATTACHMENT.
 - GYPSUM BOARD -
 - GYPSUM BOARD SHALL CONSIST OF TWO LAYERS OF 1 IN. THICK GYPSUM BOARD LINER PANELS, SUPPLIED IN NOM 24 IN. WIDTHS.
 - GYPSUM BOARD SHALL CONSIST OF CLASSIFIED OR UNCLASSIFIED - MIN 1/2 IN. THICK, 4 FT. WIDE, APPLIED EITHER HORIZONTALLY OR VERTICALLY.
- MAX DIAMETER OF OPENING IS 10-1/2 IN.
- THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT, OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-7/8 IN. PIPE, CONDUIT, OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDERS OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS, OR TUBING MAY BE USED:
 - STEEL PIPE - NOM 8 IN. DIAMETER (OR SMALLER) SCHEDULE 5 (OR HEAVIER) STEEL PIPE.
 - IRON PIPE - NOM 8 IN. DIAMETER (OR SMALLER) CAST OR DUCTILE IRON PIPE.
 - COPPER TUBING - NOM 4 IN. DIAMETER (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
 - COPPER PIPE - NOM 4 IN. DIAMETER (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
 - CONDUIT - NOM 4" DIAMETER (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR 6 IN. DIAM STEEL CONDUIT.
- FIRESTOP SYSTEM - THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
 - FILL, VOID, OR CAVITY MATERIAL - SEALANT - MIN 2 IN. DEPTH OF FILL MATERIAL APPLIED WITHIN ANNULUS ON OUTER GYPSUM LINER SIDES FLUSH WITH OUTER LAYERS OF GYPSUM LINER
 - FILL, VOID, OR CAVITY MATERIAL - SEALANT - MIN 1/2 IN. DEPTH OF FILL MATERIAL APPLIED WITHIN ANNULUS FLUSH WITH OUTER SURFACES OF GYPSUM BOARD.
 - FILL, VOID, OR CAVITY MATERIAL - SEALANT - MIN 1/4 IN. BEAD OF FILL MATERIAL APPLIED AT INTERFACE OF OUTER LAYERS OF GYPSUM BOARD AND PENETRANT (POINT CONTACT).

ULcUL SYSTEM NO. C-AJ-1149 - JUNE 23, 2016
 METAL PIPE THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL ASSEMBLY
 F-RATING = 2-HR
 T-RATING = 0-HR
 L-RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
 L-RATING AT 400°F = 4 CFM/SQ. FT.
 W-RATING = CLASS 1 (SEE NOTE NO. 4 BELOW)



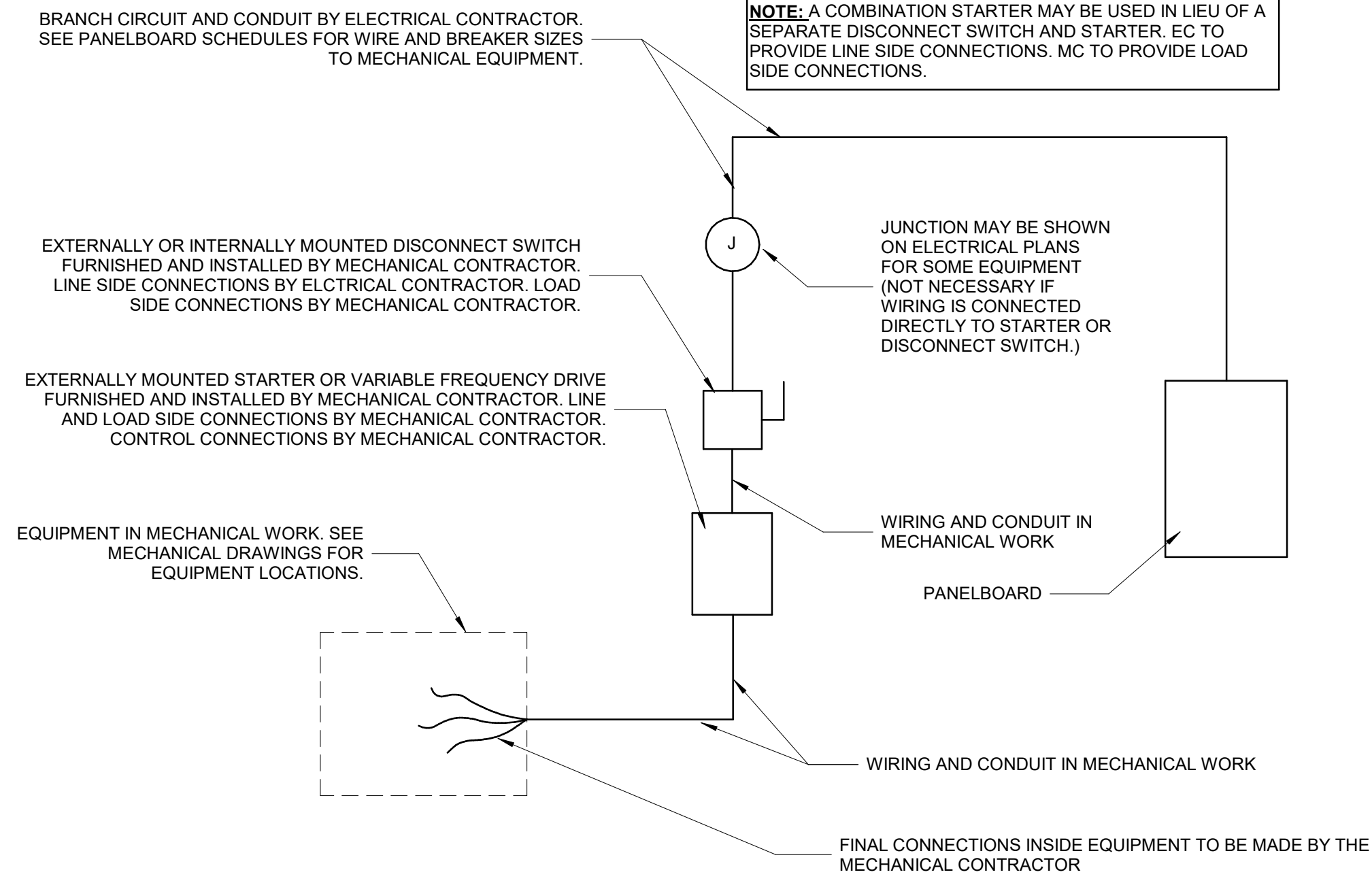
- FLOOR OR WALL ASSEMBLY - MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS. MAX DIAM. OF OPENING IS 12 IN.
 SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
- THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT, OR TUBING TO BE INSTALLED WITHIN THE FIRESTOP SYSTEM. PIPE, CONDUIT, OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDERS OF FLOOR OR WALL ASSEMBLY. THE ANNULAR SPACE SHALL BE 0 IN. (POINT CONTACT) TO MAX 1-1/4 IN. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS, OR TUBING MAY BE USED:
 - STEEL PIPE - NOM 10 IN. DIAMETER (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
 - IRON PIPE - NOM 10 IN. DIAMETER (OR SMALLER) CAST OR DUCTILE IRON PIPE.
 - COPPER TUBING - NOM 4 IN. DIAMETER (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
 - COPPER PIPE - NOM 4 IN. DIAMETER (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
 - CONDUIT - NOM 4" DIAMETER (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR STEEL CONDUIT.
- PACKING MATERIAL - MINIMUM 3 IN. THICKNESS OF MIN. 4 PCF MINERAL WOOL BATT INSULATION FOR NOM. 4 IN. DIAMETER (AND SMALLER) PIPES, CONDUIT, OR TUBINGS AND MIN. 4 IN. THICKNESS OF MIN. 4 PCF MINERAL WOOL BATT INSULATION FOR PIPE GREATER THAN NOM. 4 IN. DIAMETER FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
- FILL VOID OR CAVITY MATERIAL - SEALANT - MIN 1/2 IN. THICKNESS OF FILL MATEIAL APPLIED WITHIN THE ANNULUS. FLUSH WITH THE TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL AT THE POINT OF CONTACT LOCATION BETWEEN PIPE AND CONCRETE. A MIN. 1/2 IN. DIAM. OF BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/PIPE INTERFACE ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL. W RATING APPLIES ONLY WHEN CFS-S SIL GG, CFS-S SIL SL (FLOOR ONLY), CFS01S SEALANT OR FS-ONE MAX IS USED. PACKING MATERIAL TO BE A MIN. 4 IN. THICKNESS OF MIN. 4 PCF MINERAL WOOL BATT INSULATION.
 HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - CFS01S, CFS-S SIL GG, CFS-S-S SIL SL (FLOORS ONLY), CP606 OR FS-ONE SEALANT OR FS-ONE MAX INTUMESCENT SEALANT.



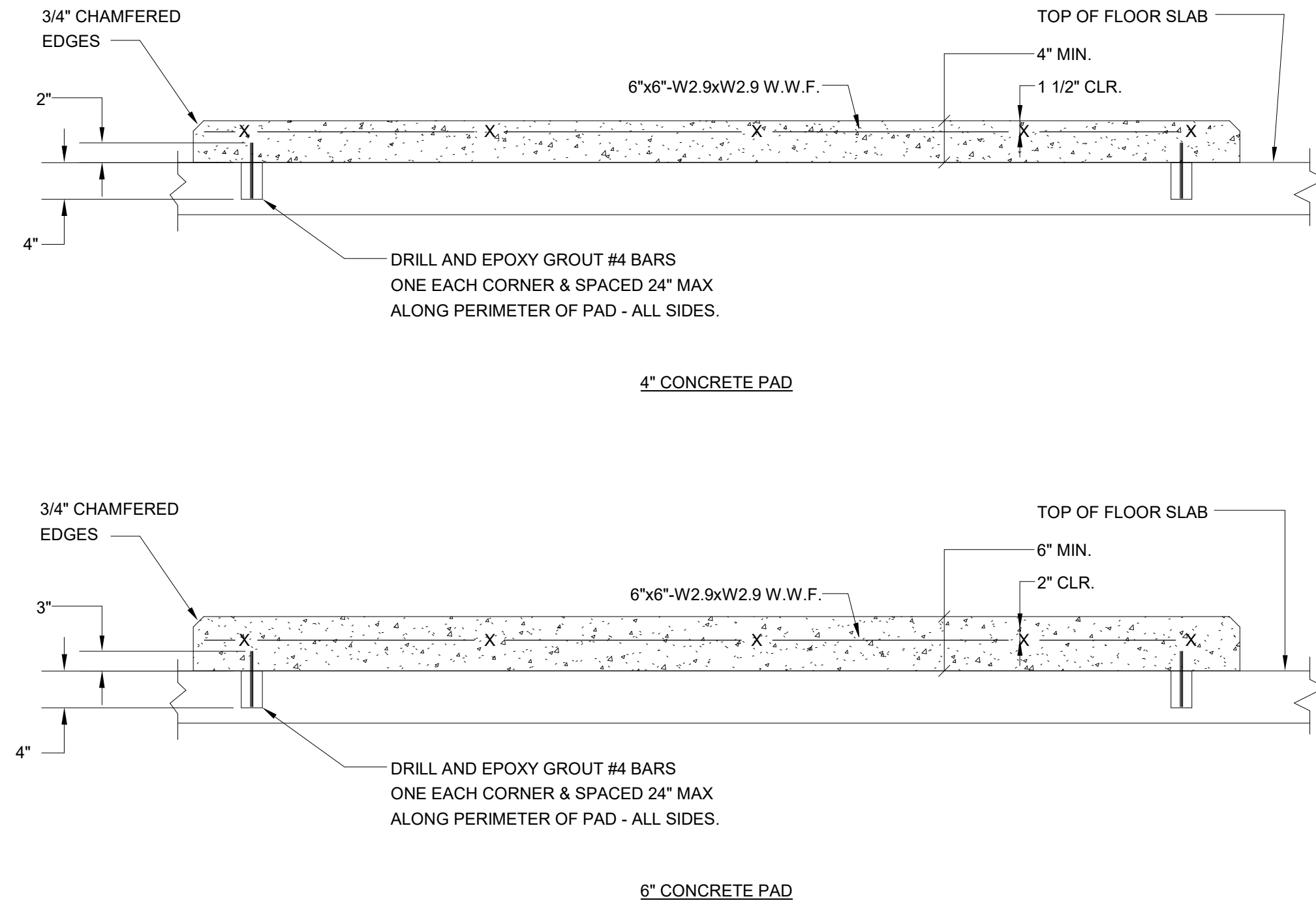
3 **DETAIL - STAINLESS STEEL DUCT LOW POINT DRAIN**
 SCALE: N.T.S.

1 **UL PENETRATION DETAIL - METAL CONDUIT THROUGH GYPSUM WALL ASSEMBLY**
 SCALE: N.T.S.

2 **UL PENETRATION DETAIL - METAL CONDUIT THROUGH CONCRETE WALL OR FLOOR**
 SCALE: N.T.S.

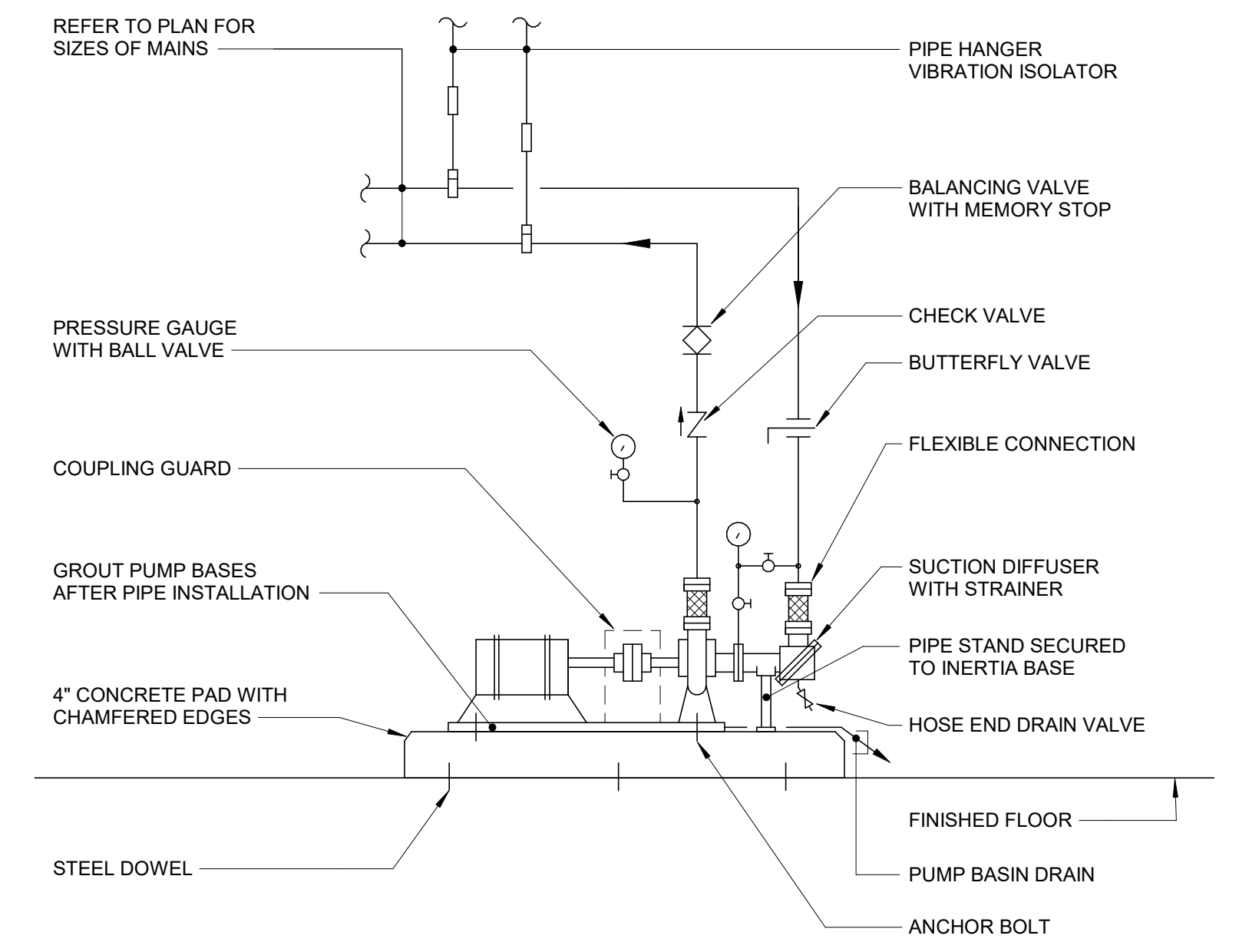


5 **DETAIL - ELEC. CONNECTIONS TO MECHANICAL EQUIPMENT**
 SCALE: N.T.S.



NOTE:
 1. SIZE PAD 6" LARGER ALL AROUND TO SUIT EQUIPMENT FURNISHED

6 **DETAIL - CONCRETE PAD**
 SCALE: N.T.S.



4 **M - DETAIL - END SUCTION PUMP WITH SUCTION DIFFUSER SCHEMATIC**
 SCALE: 12" = 1'-0"

RMF ENGINEERING, INC.
 8081 ARCO CORPORATE DRIVE
 SUITE 300
 RALEIGH, NC 27617
 P: 919-941-9876 F: 919-941-9957

2 WEST EDENTON STREET
 RALEIGH, NORTH CAROLINA 27601

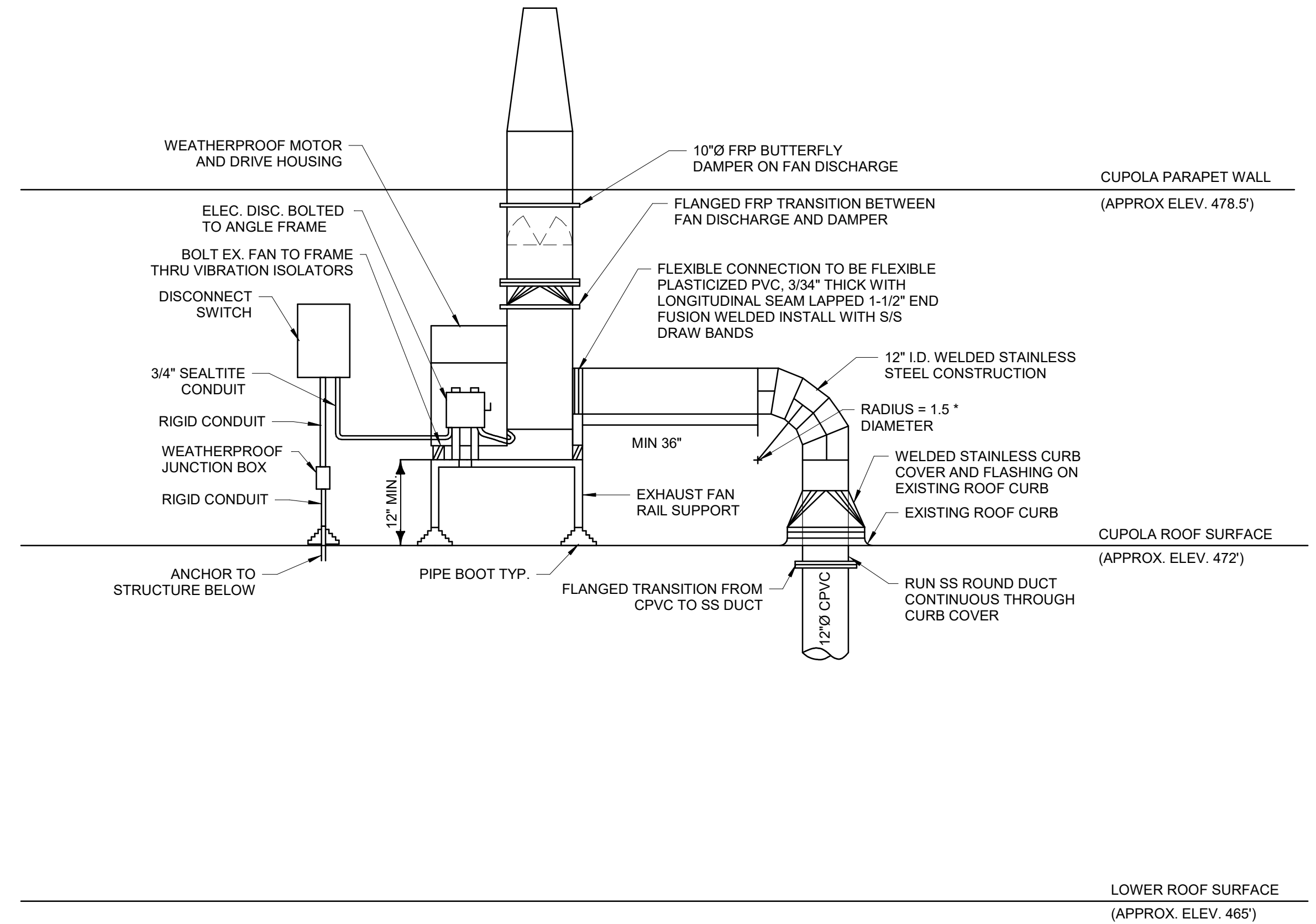
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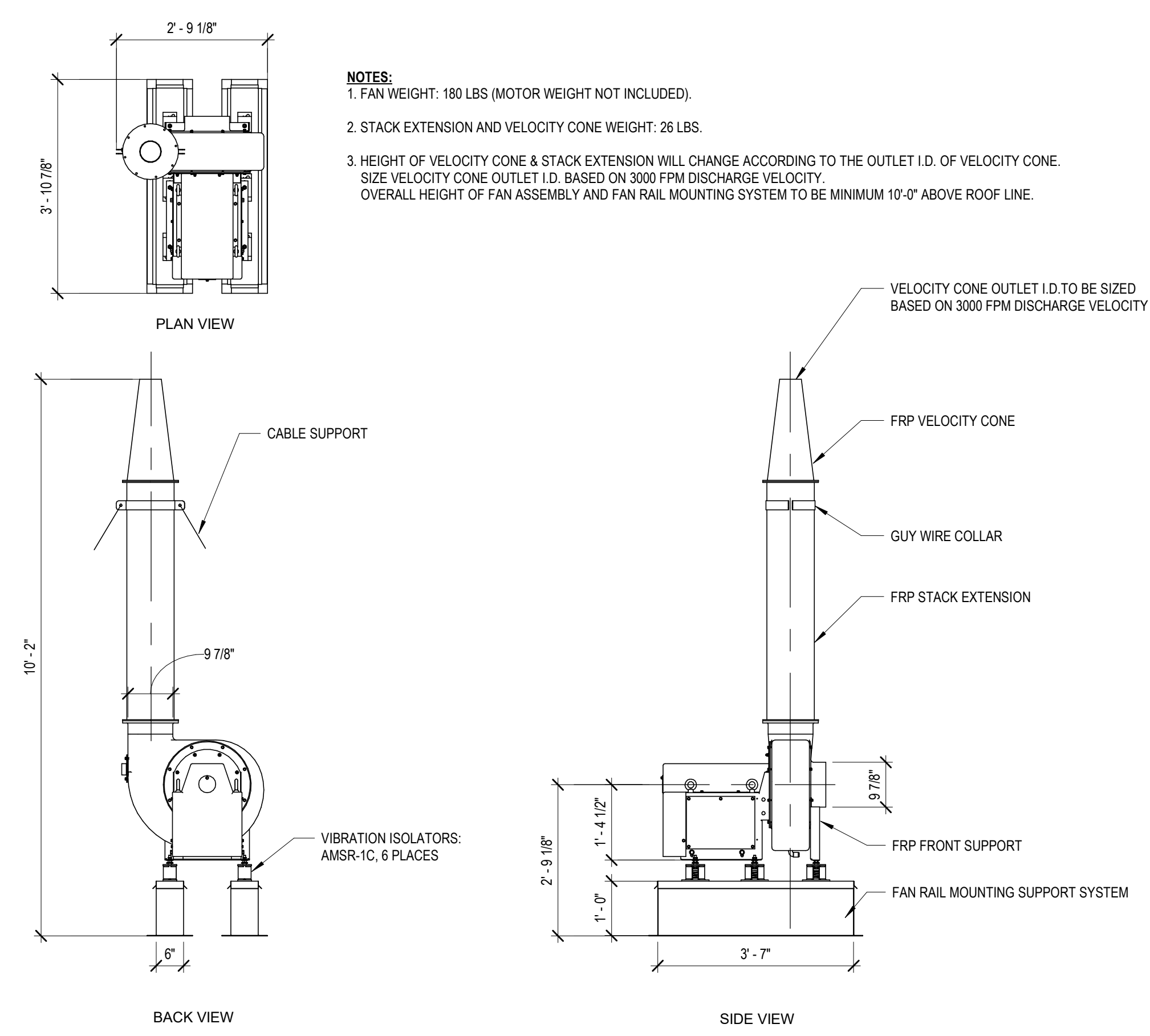
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 DESIGNED BY: FLT SCALE: AS SHOWN
 CHECKED BY: KAN RMF JOB NO.: 02220164.0
 PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eaddy Building HVAC & Lab Exhaust Upgrades & Repairs
 SCO ID: #22-24510-01A
 PROJECT ADDRESS:
 4300 REEDY CREEK,
 EADDY BUILDING,
 RALEIGH, NC 27607
 DRAWING TITLE:
MECHANICAL DETAILS

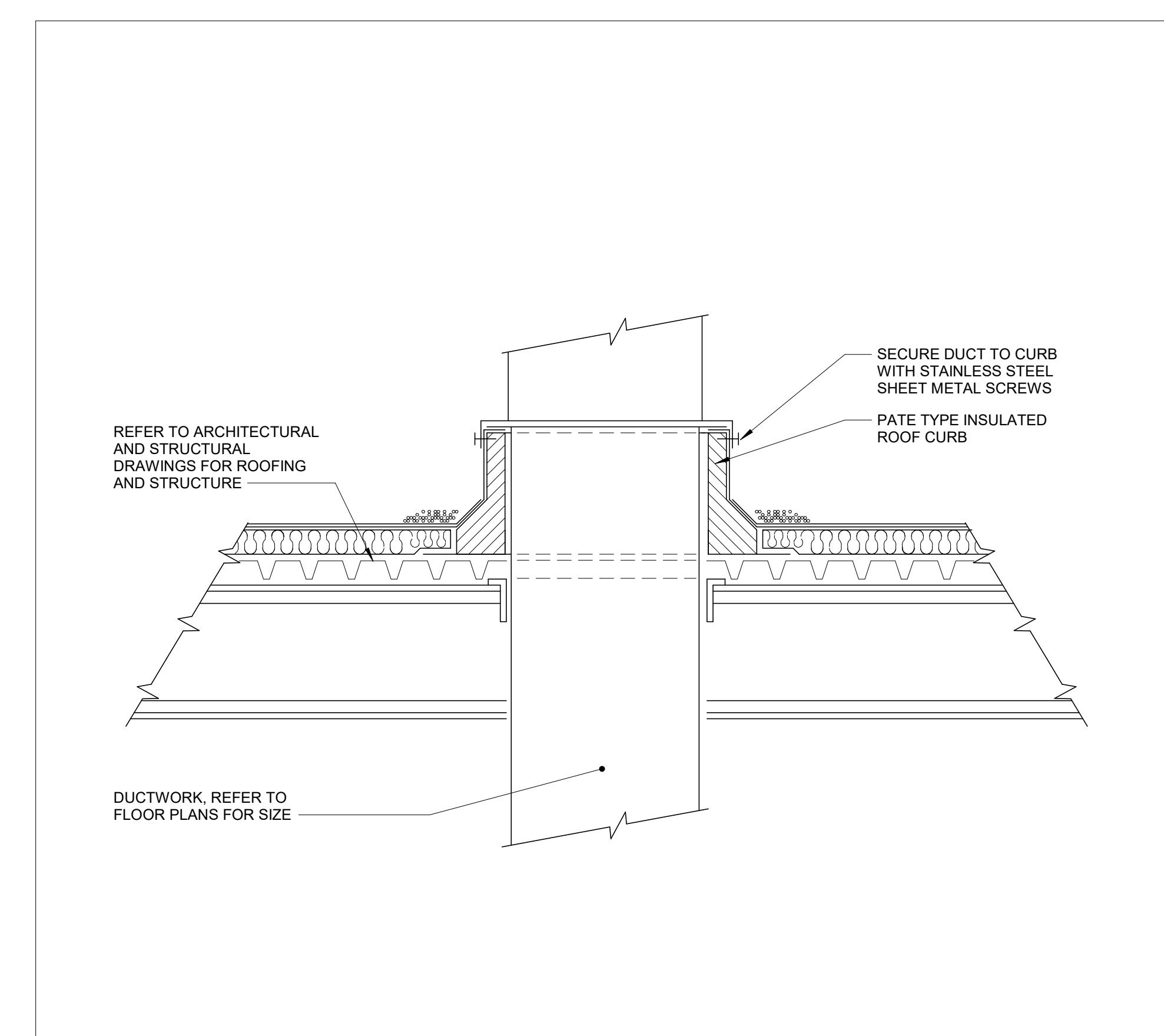
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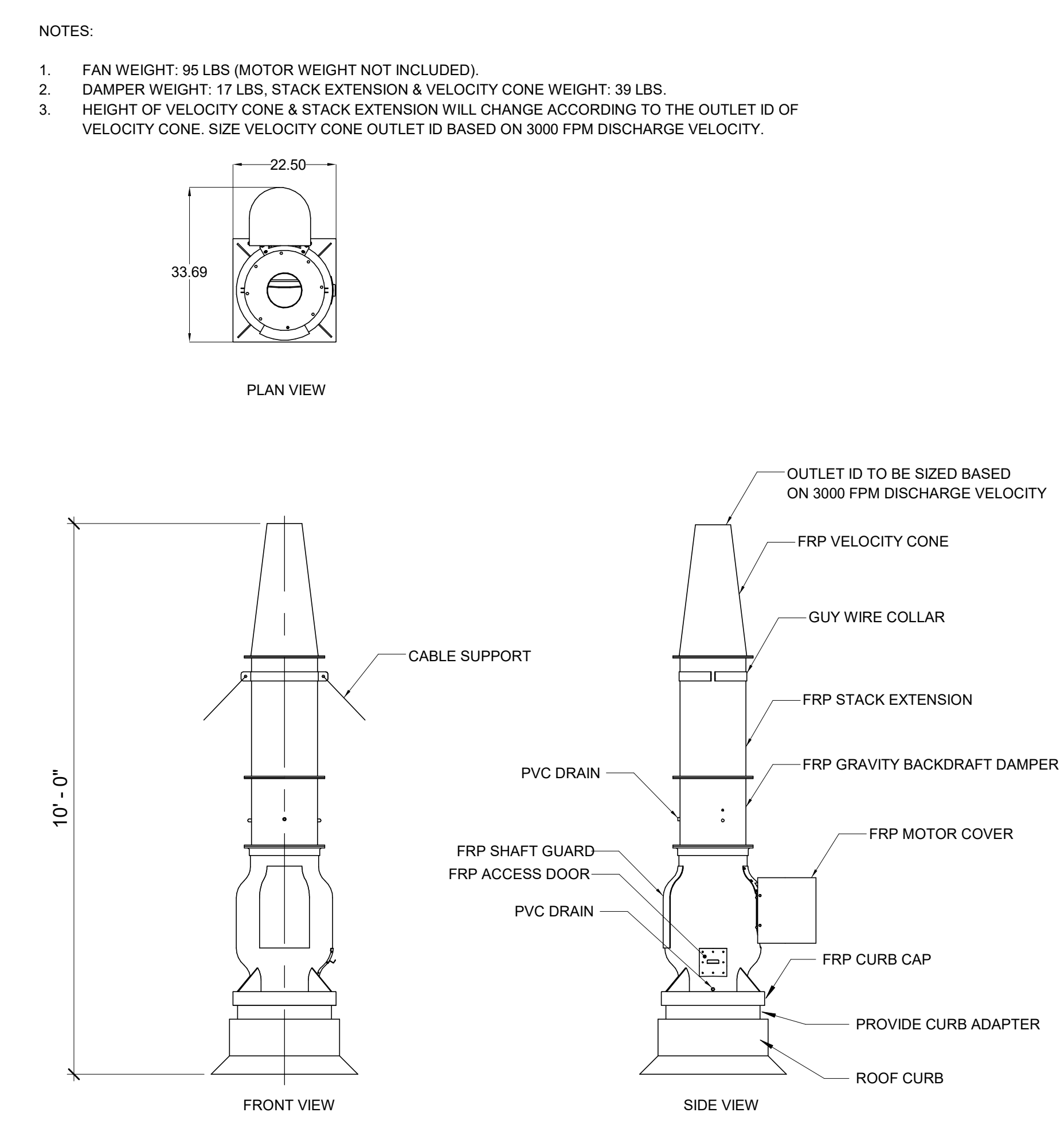
2 **DETAIL - UTILITY TYPE FUME EXHAUST FAN DETAIL**
SCALE: 12" = 1'-0"



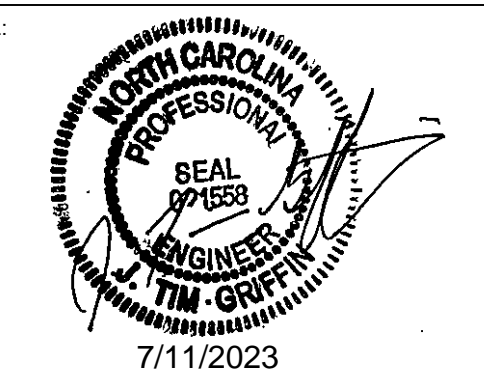
1 **DETAIL - FRP UTILITY SET FAN**
SCALE: 1/2" = 1'-0"



4 **M - DETAIL - DUCT ROOF PENETRATION**
SCALE: 12" = 1'-0"



3 **DETAIL - BIFURCATED EXHAUST FAN DETAIL**
SCALE: 1/2" = 1'-0"

REV	DESCRIPTION	DATE
REVISIONS		
SUBMISSION TITLE:		
BID DOCUMENTS		
SEAL:		
		
DRAWN BY:	JAA	DATE: 07/11/2023
DESIGNED BY:	FLT	SCALE: As indicated
CHECKED BY:	KAN	RMF JOB NO.: 02220164.A0
PROJ. MGR.:	KAN	CLIENT JOB #:
PROJECT NAME:		
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs		
SCO ID: #22-24510-01A		
PROJECT ADDRESS:		
4300 REEDY CREEK, EDDY BUILDING, RALEIGH, NC 27607		
DRAWING TITLE:		
MECHANICAL DETAILS		
DRAWING NUMBER:		
M-502		

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BASE BID AIR-COOLED CHILLER SCHEDULE

Table with columns: DESIGNATION, MANUFACTURER, MODEL, TYPE, REFRIGERANT, NOMINAL TONS, CAPACITY TONS, NUMBER OF COMPRESSORS, FLUID, GPM, EWT, LWT, MAX PD, CONFIG, FOULING FACTOR, FAN TYPE, NO. OF FANS, AMBIENT TEMP, TOTAL UNIT POWER, COMPRESSOR POWER, FAN POWER, MCA, MOP, VOLT/PHHZ, COOLING EFFICIENCY, IPLV/IP, NPLV/IP, REMARKS

- REMARKS: 1. BASIS OF DESIGN: TRANE. APPROVED EQUALS BY YORK OR CARRIER. 2. CONFIRM SIEMENS BAS COMMUNICATION REQUIREMENTS. PROVIDE BAGNET COMMUNICATIONS INTERFACE. 3. EXTEND LENGTH OF EXISTING CONCRETE EQUIPMENT PAD BY 3'-0". SEE DETAIL. 4. PROVIDE HEAT TRACE TAPE ON ALL EXTERIOR PIPING. BASIS OF DESIGN RAYCHEM 5XL. 5. REINSULATE ALL EXTERIOR PIPING PER SPECIFICATIONS. 6. PROVIDE CORRUGATED ALUMINUM JACKET ON ALL EXTERIOR PIPING.

BASE BID EXHAUST FAN SCHEDULE

Table with columns: MARK, SERVICE (SPACE/EQUIPMENT), TYPE, MANUFACTURER/MODEL, AIR FLOW (CFM), TSP (IN WG), DRIVE TYPE, SPEED (RPM), BRAKE MOTOR (HP), NOMINAL MOTOR (HP), MAX SOUND (SONES), DAMPER TYPE, VOLTAGE/PHASE, STARTER / DISCONNECT MEANS, REMARKS

- REMARKS: 1. REFER TO SECTION 233423. 2. BASIS OF DESIGN: M.K. PLASTICS. APPROVED EQUALS BY LOREN COOK OR GREENECK. 3. PROVIDE STARTING AND DISCONNECTING MEANS AS SCHEDULED. 4. PROVIDE EXTERNAL DISCONNECT. 5. PROVIDE BELT GUARD/WEATHER COVER, ACCESS DOOR, AND DRAIN. 6. PROVIDE WITH CURB CAP AND INLET CONNECTION FLANGE. 7. PROVIDE FRP BUTTERFLY DISCHARGE DAMPER. 8. PROVIDE BASE SUPPORT RAILS AND SPRING VIBRATION ISOLATION. 9. UPPLAST CONFIGURATION ARRANGEMENT 10 WITH SUPPLEMENTAL FRONT SUPPORT. 10. PROVIDE FRP OUTLET TRANSITION AND DISCHARGE STACK - REFER TO DETAILS. 11. SCHEDULED AIRFLOWS ARE NOMINAL DESIGN AIRFLOW RATES. ACTUAL VALUES USED IN FINAL TAB PROCESS SHALL BE BASED ON AIRFLOW RATES PRE-READ BY TAB CONTRACTOR PRIOR TO START OF WORK.

OWNER PROVIDED LABORATORY EQUIPMENT SCHEDULE

Table with columns: TAG NO. ON DWGS., EQUIPMENT DESCRIPTION, EQUIPMENT MANUFACTURER / MODEL (LAB- ID #), LAB AREA, ROOM NO., ROOM NAME, EXISTING EXH. FAN TAG, NEW EXH. FAN TAG, NOMINAL DESIGN CFM, MAX EXH. AIR TEMP DEG. C, NOTES

- NOTES: 1. AIRFLOWS SCHEDULED ARE NOMINAL DESIGN AIRFLOWS. ACTUAL AIRFLOWS SHALL BE PRE-READ BY TAB CONTRACTOR PRIOR TO START OF WORK. EQUIPMENT SHALL BE RE-BALANCED TO SAME, PRE-READ AIRFLOWS UPON COMPLETION OF WORK. 2. RECENTLY RELOCATED FROM SOIL ANALYSIS LABORATORY 136 (WAS SERVED BY EF-5) 3. ALL NEW EXHAUST SYSTEM DUCTWORK AND COMPONENTS SHALL BE OF WELDED STAINLESS STEEL CONSTRUCTION TO MATCH EXISTING DUCTWORK, FOR MIN 20 FT FROM EQUIPMENT CONNECTION. 4. ALL NEW EXHAUST SYSTEM DUCTWORK AND COMPONENTS SHALL BE OF WELDED STAINLESS STEEL CONSTRUCTION TO MATCH EXISTING. 5. ALL NEW EXHAUST SYSTEM DUCTWORK AND COMPONENTS SHALL BE OF CPVC CONSTRUCTION TO MATCH EXISTING.

ALTERNATE BID 1 - DUCTLESS SPLIT SYSTEM SCHEDULE

Table with columns: DESIGNATION, SERVICE, Manufacturer, Model, INDOOR UNIT (NOMINAL CFM RANGE, ESP, EAT °F, COOLING CAPACITY, SENS, TOTAL), MOUNTING, OUTDOOR CONDENSING UNIT (DESIGNATION, AMBIENT AIR TEMP °F, CAPACITY (TONS), V/DB/Hz), ELECTRICAL (MCA, MOPC), REMARKS

- REMARKS: 1. BASIS OF DESIGN: MITSUBISHI. APPROVED EQUALS BY TRANE OR CARRIER. 2. ROUTE REFRIGERANT PIPING LINESET BETWEEN INDOOR AND OUTDOOR UNITS. 3. SIZE REFRIGERANT PIPING LINESET PER MANUFACTURER'S GUIDELINES. 4. DSS-1 SHALL HAVE INDEPENDENT CONTROLS. 5. PROVIDE ROOM TEMPERATURE AND HUMIDITY SENSOR TO BE MONITORED BY SIEMENS BAS. 6. PROVIDE INVERTER-DUTY MOTOR. 7. PROVIDE BLUE DIAMOND MAXIBLUE CONDENSATE PUMP MODEL X87-721. 8. CONDENSATE PUMP TO HAVE RESERVOIR AND SENSOR. 9. MOUNT CONDENSATE PUMP WITHIN 6'-0" OF RESERVOIR. 10. ROUTE TUBING FROM PUMP AND CONNECT INTO COPPER CD LINE. 11. ROUTE COPPER CD LINE TO DISCHARGE POINT AS SHOWN ON DRAWINGS. 12. PROVIDE BAGNET INTERFACE. 13. PROVIDE DELUXE WIRED MA CONTROLLER FOR WALL MOUNTING. 14. PROVIDE FRONT AND REAR WIND BAFFLE KIT. 15. PROVIDE SIDE ADVANCED WIND BAFFLE KIT.

ALTERNATE BID 2 - PUMP SCHEDULE

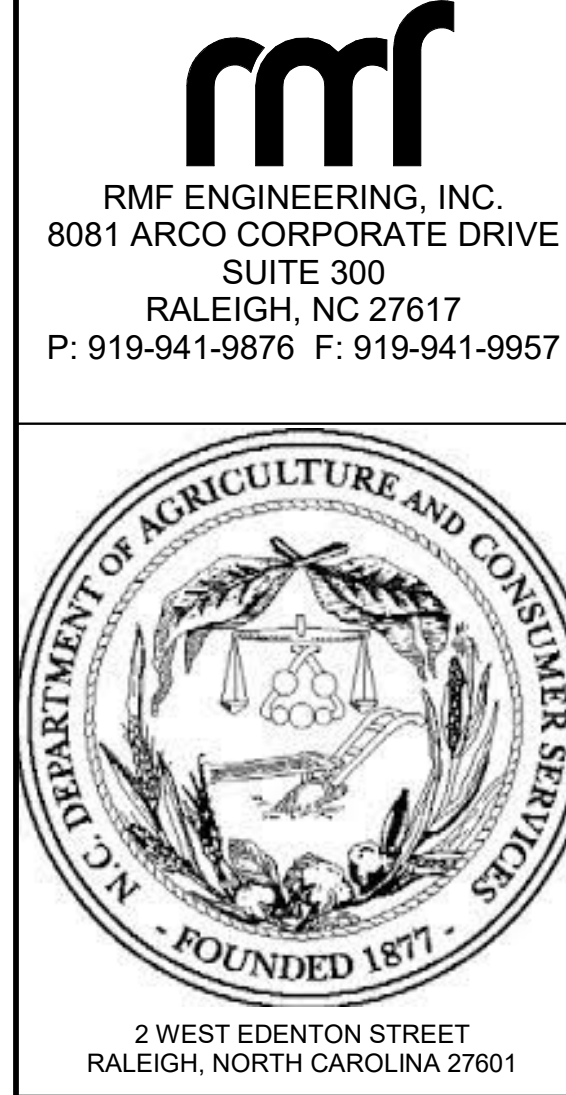
Table with columns: TAG, MANUFACTURER, MODEL, SERVICE, FLUID, FLOW (GPM), HEAD (FEET), RPM, EFFICIENCY (%), BHP, MOTOR HP, POWER, IMPELLER DIA. (IN), MAX FT. MP5H, SUCTION X DISCHARGE, TYPE, REMARKS

- REMARKS: 1. BASIS OF DESIGN: BELL & GOSSETT. APPROVED EQUALS BY TACO OR ARMSTRONG. 2. PROVIDE 6" THICK CONCRETE EQUIPMENT PAD. SEE DETAIL. 3. PROVIDE SUCTION DIFFUSER. 4. PROVIDE INVERTER-DUTY MOTOR. 5. PUMP IS TO OPERATE AS 100% REDUNDANT BACK-UP UNIT.

ALTERNATE BID 4 - EXISTING AIR HANDLING UNIT FAN MOTOR SCHEDULE

Table with columns: TAG, MANUFACTURER, MODEL NUMBER, SERIAL NO., AREA SERVED, TYPE, SUPPLY AIR (CFM), TSP (IN WG), MAX RPM, MAX BHP, HP, RPM, FRAME, SERVICE FACTOR, FLA, VOLTS/PHHZ, ACCESSORIES, REMARKS

- REMARKS: 1. DATA PROVIDED IS FOR INFORMATIONAL PURPOSES ONLY. 2. CONTRACTOR TO FIELD VERIFY ALL MOTOR REQUIREMENTS BEFORE ORDERING REPLACEMENT MOTOR. 3. REMOVE INLET GUIDE VANES FROM FAN HOUSING. 4. DO NOT REMOVE INLET CONE FROM FAN HOUSING. 5. PROVIDE INVERTER-DUTY REPLACEMENT MOTOR. 6. PROVIDE VFD SIZED FOR REPLACEMENT MOTOR. 7. BAS TO CONTROL VFD BASED ON DUCT STATIC PRESSURE SENSOR.



2 WEST EDENTON STREET RALEIGH, NORTH CAROLINA 27601

Table with columns: REV, DESCRIPTION, DATE

SUBMISSION TITLE: BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023 DESIGNED BY: FLT SCALE: NONE CHECKED BY: KAN RMF JOB NO.: 02220164A0 PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME: Eaddy Building HVAC & Lab Exhaust Upgrades & Repairs SCO ID: #22-24510-01A PROJECT ADDRESS: 4300 REEDY CREEK, EADDY BUILDING, RALEIGH, NC 27607 DRAWING TITLE: MECHANICAL SCHEDULES

DRAWING NUMBER: M-701

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ELECTRICAL SYMBOLS

LIGHTING SYMBOLS

Table of lighting symbols including single pole toggle switch, double pole toggle switch, three-way toggle switch, four-way toggle switch, key operated switch, manual starter w/overloads, switch w/pilot light, dimmer switch, 4 button dimmer switch, low voltage control switch, manual time switch, momentary contact switch, switch with weatherproof enclosure, occupancy sensor, vacancy sensor, time clock, relay, lighting contactor, photocell or pushplate switch, emergency shunt relay, lighting fixture (recessed, surface, or pendant mounted), lighting fixture (2 ballast), lighting fixture (industrial), lighting fixture (wall mounted - type as specified), lighting fixture (recessed, surface, or pendant mounted), lighting fixture (wall mounted - type as specified), wall washer, adjustable wall washer, lighting fixture on emergency or night light circuit (NL), emergency battery pack, emergency battery pack w/remote heads, remote emergency head, emergency battery pack semi recessed, ceiling mount, exit sign (ceiling or pendant mounted), exit sign (wall mounted - end, back), exit sign (directional arrows), pole mounted lighting fixture (single head, double head), pole mounted lighting fixture (single, pole top), lighting pole (sports).

SPECIAL SYSTEMS SYMBOLS

Table of special systems symbols including fire alarm horn type speaker, fire alarm flashing strobe light, fire alarm horn, combination fire alarm horn and flashing strobe light, ceiling speaker, fire alarm speaker w/ strobe, horn type speaker, magnetic door holder, digital alarm communicator transmitter, fire alarm annunciator panel, fire alarm control panel, rescue assistance master control panel, rescue assistance remote station, fire alarm transponder, door solenoid, electric strike - locking device connection point, fire alarm pull station, heat detector, smoke detector, smoke detector (ionization), fire alarm duct detector with relay, carbon monoxide detector, fire alarm system addressable relay - control, fire alarm system addressable relay - monitor, fire alarm system remote alarm light, flow switch connection, tamper switch connection, fire alarm linear beam smoke detector transmitter, fire fighter's telephone jack, monitor system junction box, amplifier, keypad, card reader, door alarm contact, rough-in junction box for CCTV camera, push button plate, television antenna outlet, cable TV outlet, television system splitter, AV credenza location, AV input plate, AV in-wall rack, AV monitor TV, AV screen control, AV scheduling panel, AV signage TV, AV touch panel, data/telephone outlet, ceiling mounted, telephone outlet, data outlet, telephone outlet wall mounted, telephone outlet emergency, data/telephone outlet, unshaded area = data, shaded area = voice, numerals indicate quantity of wired jacks, telephone outlet floor mounted, data outlet floor mounted, data/telephone outlet floor mounted, unshaded area = data, shaded area = voice, numerals indicate quantity of wired jacks, combination power & telephone outlet, floor mounted, combination power & data/telephone outlet, floor mounted, wireless access point.

POWER SYMBOLS

Table of power symbols including combination switch and simplex receptacle, combination switch and duplex receptacle, simplex receptacle, duplex receptacle, duplex receptacle pedestal type, duplex receptacle mounted 6" above backsplash or counter, duplex receptacle ground fault interrupter type, duplex receptacle GFI mounted 6" above backsplash or counter, duplex receptacle mounted high, duplex receptacle isolated ground, duplex receptacle at 54" A.F.F., double duplex receptacle, double duplex receptacle isolated ground, simplex receptacle cart recharge, duplex receptacle cart recharge, duplex receptacle pay phone, special receptacle NEMA 6-20R, special receptacle NEMA 6-30R, special receptacle NEMA 14-20R, special receptacle NEMA 15-30R, special receptacle floor mounted, special receptacle pedestal type, television receptacle, television receptacle, clock hanger outlet, program clock outlet, emergency power off switch, junction box, junction box wall mounted, equipment connection as noted, equipment connection as noted wall mounted, heater connection, heater fan, enclosed circuit breaker, non-fused disconnect switch, fused disconnect switch, magnetic motor starter, combination magnetic motor starter, variable frequency controller w/ fused disconnect switch, variable frequency drive w/ disconnect switch, motor, generator, manual motor starter w/ thermal overloads, motor switch, mechanical equipment connection with motor, mechanical equipment connection no motor, control panel type as indicated, momentary contact start-stop pushbutton station, maintained contact start-stop pushbutton station, maintained contact emergency stop pushbutton station, branch panelboard, distribution panelboard, transformer concrete pad mounted.

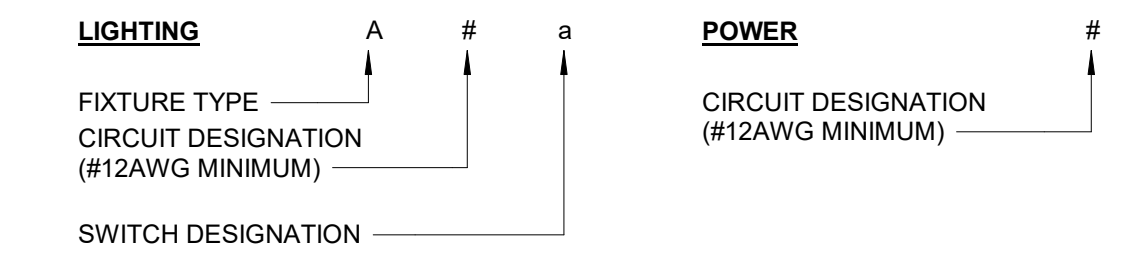
ELECTRICAL ABBREVIATIONS

Table of electrical abbreviations including 2S1W, 2S2W, A, AMP, A/C, AC, AFCI, AFF, AFG, AHU, AIC, ALT, ANN, APPROX, ARCH, ATC, ATS, AV, AWG, BAS, BFC, BFG, BLDG, BOD, C, CND, CATV, CB, CCTV, CKT, CCT, CL, CLG, CONN, CPT, CURT, CTR, CU, CO, CX, DC, DISC, DN, DP, DPST, DPST, DT, DWG, E, EMERG, EA, EC, EF, EH, ELEC, ELEV, ETR, EWC, EXP, FA, FAAP, FAACP, FBO, FC, FDR, FLA, FLR, FR, FU, FUSS, FVNR, FVR, GEN, GF, GF, GF, GFR, GRD, GRS, HID, HOA, HP, HPS, HTR, HV, HZ, IG, JB, KCMIL, KV, KVA, KVAR, KW, 2S1W, 2S2W, A, AMP, A/C, AC, AFCI, AFF, AFG, AHU, AIC, ALT, ANN, APPROX, ARCH, ATC, ATS, AV, AWG, BAS, BLDG AUTOMATION SYSTEM, BELOW FINISHED CEILING, BELOW FINISHED GRADE, BUILDING, BOTTOM OF DEVICE, C, CND, CONDUIT, CABLE TELEVISION, CABLE TELEVISION CIRCUIT BREAKER, CLOSED CIRCUIT TELEVISION, CIRCUIT, CURRENT LIMITING, CEILING, CONNECT, CONTROL POWER TRANSFORMER, CURRENT TRANSFORMER, CENTER, COPPER, CONNECT TO EXISTING, DIRECT CURRENT, DISCONNECT, DOWN, DISTRIBUTION PANEL, DOUBLE POLE DOUBLE THROW, DOUBLE POLE SINGLE THROW, DOUBLE THROW, DRAWING, E, EMERG, EMERGENCY, EACH, EMPTY CONDUIT, EXHAUST FAN, ELECTRIC HEATER, ELECTRIC, ELEVATION, ELEVATOR, EXISTING TO REMAIN, ELECTRIC WATER COOLER, EXISTING, EXPOSED, FIRE ALARM, FIRE ALARM ANNUNCIATOR PANEL, FIRE ALARM CONTROL PANEL, FURNISHED BY OTHERS, FAN COIL, FEEDER, FULL LOAD AMPERES, FLOOR, FRAME, FUSED, FUSIBLE, FUSED SAFETY SWITCH, FULL VOLTAGE NON-REVERSING, FULL VOLTAGE REVERSING, GENERATOR, GENERAL, GROUND FAULT CIRCUIT INTERRUPTER, GROUND FAULT INTERRUPTER, GROUND FAULT PROTECTED, GROUND FAULT RELAY, GROUND, GALVANIZED RIGID STEEL, HIGH INTENSITY DISCHARGE, HAND-OFF-AUTOMATIC, HEAT PUMP, HORSEPOWER, HIGH PRESSURE SODIUM, HEATER, HIGH VOLTAGE, HERTZ, ISOLATED GROUND, JUNCTION BOX, THOUSAND CIRCULAR MILS, KILOVOLTS, KILOVOLT AMPERES, KILOVOLT AMPERES REACTIVE, KILOWATTS.

NURSE CALL DEVICE SYMBOLS

Table of nurse call device symbols including nurse call station - patient and emergency, nurse call annunciator panel, nurse call master station, nurse call staff station, nurse call duty station, nurse call code blue station, code blue annunciator, nurse call dome light - ceiling mounted, nurse call dome light - wall mounted, nurse call zone light - ceiling mounted, nurse call zone light - wall mounted, nurse call equipment cabinet, intercom station.

CIRCUIT DESIGNATIONS



ELECTRICAL SYMBOLS NOTES

- 1. THIS IS A STANDARD SYMBOL LIST. SOME SYMBOLS MAY NOT APPEAR ON THE ACCOMPANYING DRAWINGS.
2. REFER TO SPECIFICATIONS FOR DETAILED REQUIREMENTS.
3. PLAN AND SECTION SYMBOLS MAY ALSO BE USED ON RISER DIAGRAMS.
4. ON SINGLE LINE DIAGRAMS FOR 3 PHASE SYSTEMS, DEVICE QUANTITY = 3, UNLESS OTHERWISE NOTED.
5. DEVICE SHALL BE MOUNTED A MINIMUM OF 90" AFF TO BOTTOM OF DEVICE OR BELOW THE FINISHED CEILING OF NOT LESS THAN 6" TO TOP OF DEVICE, WHICHEVER IS LOWER.
6. UNLESS OTHERWISE NOTED, ALL INTERIOR CONDUITS AND BOXES SHALL BE CONCEALED.

ELECTRICAL DRAWING PRESENTATION

Table of electrical drawing presentation symbols including revision number, drawing note number, section/elevation identification, part plan and detail identification, existing line type, new electrical work line type, future electrical work line type, demolition line type on demolition drawings.

Logo for RMF Engineering, Inc. with address: 8081 ARCO CORPORATE DRIVE SUITE 300 RALEIGH, NC 27617. Phone: 919-941-9876. Fax: 919-941-9957. Seal of the Department of Agriculture and Consumer Services, Raleigh, North Carolina, 1871.

Table with columns: REV, DESCRIPTION, DATE. Includes submission title: BID DOCUMENTS.

Project information including project name: Eaddy Building HVAC & Lab Exhaust Upgrades & Repairs. SCO ID: #22-24510-01A. Project address: 4300 REEDY CREEK, EADDY BUILDING, RALEIGH, NC 27607. Electrical notes, symbols and abbreviations. Drawing number: E-001.

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GENERAL ELECTRICAL NOTES

- 1. NOTIFY THE OWNER, IN WRITING, AT LEAST SEVEN (7) DAYS IN ADVANCE OF ALL REQUIRED SHUTDOWNS OF WATER, FIRE, SEWER, GAS, ELECTRICAL SERVICE, OR OTHER UTILITIES. UPON WRITTEN RECEIPT OF APPROVAL FROM OWNER, SHUTDOWN SHALL BE PERFORMED BETWEEN THE HOURS OF SIX (6) P.M. AND SIX (6) A.M. OR AS DIRECTED OTHERWISE BY THE OWNER AND SHALL BE ACCOMPLISHED AT NO ADDITIONAL CONTRACT COST. AT THE END OF EACH SHUTDOWN ALL SERVICES SHALL BE RESTORED SO THAT NORMAL USE OF THE UTILITIES CAN CONTINUE.
2. ALL WORK SHALL BE PERFORMED IN A SEQUENCE AND DURING HOURS TO MINIMIZE DISRUPTION TO THE BUILDING DURING CONSTRUCTION.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NORTH CAROLINA CODES AND THE LOCAL FIRE MARSHALL'S REQUIREMENTS.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL OTHER TRADES/ SUBCONTRACTORS INCLUDING BUT NOT LIMITED TO AUTOMATIC TEMPERATURE CONTROLS, ELECTRICAL, AND GENERAL TRADES.
5. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL STAIRWELLS AND EGRESS CORRIDORS DURING CONSTRUCTION.
6. ALL PENETRATIONS IN THE SMOKE BARRIER OR FIRE WALLS MUST BE SEALED WITH AN APPROVED UL LISTED FIRE STOP MATERIAL AFTER SERVICES ARE RUN THROUGH. ALL PENETRATIONS THROUGH EXTERIOR WALLS ABOVE AND BELOW GRADE OR SLAB ON GRADE MUST BE WATERPROOFED.
7. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE COMMENCING WORK.
8. THIS CONTRACT REQUIRES COMPLETE, FINISHED WORKABLE PROJECT OF THE AREAS INDICATED BY THE CONTRACT DOCUMENTS, AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY TO COMPLETE SAME, REGARDLESS OF WHETHER OR NOT EACH AND EVERY NECESSARY WORK OR ITEM IS SPECIFICALLY INDICATED ON ANY OTHER PORTION OF THE DRAWING AND/OR NOTES.
9. ALL DETAILS AND SECTIONS SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL BE CONSTRUCTED TO APPLY TO ANY SIMILAR SITUATION ELSEWHERE ON THE PROJECT, EXCEPT WHERE A DIFFERENT DETAIL IS SHOWN.
10. CONTRACTOR SHALL FURNISH ALL ADDITIONAL DATA AND DOCUMENTATION TO SECURE ALL REQUIRED PERMITS AND SHALL COORDINATE THIS DATA WITH THE CONSTRUCTION DOCUMENTS WHERE REQUIRED.
11. AS A MINIMUM, ALL WORK SHALL CONFORM TO THE INTERNATIONAL BUILDING CODE WITH NORTH CAROLINA STATE AMENDMENTS, WHERE MORE STRINGENT CODES ARE ADOPTED, THEY SHALL GOVERN THE WORK.
12. ALL WORK SHALL CONFORM TO APPLICABLE FEDERAL, STATE, COUNTY AND LOCAL CODES AND ORDINANCES.
13. TO PROVIDE ACCESSIBILITY FOR THE PHYSICALLY HANDICAPPED, ALL WORK SHALL CONFORM TO PUBLIC LAW 101-336 (AMERICANS WITH DISABILITIES ACT OF 1993).
14. ALL WORK SHALL CONFORM TO THE NFPA 101-LIFE SAFETY CODE.
15. AROUND ALL EXPOSED PIPES, CONDUIT OR DUCTS, INSTALL ENCLOSURES OF THE SAME MATERIAL AND FINISH AS ADJACENT WORK, UNLESS NOTED OTHERWISE.
16. FIELD CHECK ALL ROUGH AND/OR FINISH DIMENSIONS FOR ACCURATE FITTING OF EQUIPMENT, CABINETS, COUNTERS, FIXTURES AND ACCESSORIES BEFORE FABRICATION. PROVIDE AND INSTALL ALL NECESSARY FILLERS, SCRIBE STRIPS, PANELS, BASES OR TRIM TO COMPLETE AND FINISH INSTALLATIONS.
17. ALL SWITCHES, OUTLETS, THERMOSTATS, CLOCKS, SPEAKERS OR OTHER WALL MOUNTED DEVICES OR CONTROLS SHALL BE INSTALLED IN LOCATIONS WHICH ARE UNOBSTRUCTED BY CABINETS, COUNTERS, RACKS, FIXTURES, FURNISHINGS OR EQUIPMENT. ITEMS INTENDED FOR WALL MOUNTING SHALL NOT BE INSTALLED ON, THROUGH OR INTO ANY OTHER EQUIPMENT UNLESS SPECIFICALLY CALLED FOR. VERIFY MOUNTING HEIGHTS WITH ADA REQUIREMENTS.
18. PROVIDE AND INSTALL ALL NECESSARY HARDWARE, BRACKETS, BRACING, ANCHORING, INSERTS, BLOCKING, FURRING OR OTHER SUPPLEMENTARY ITEMS NEEDED FOR COMPLETE INSTALLATION OF EQUIPMENT, CABINETS, FIXTURES, AND ACCESSORIES.
19. ALL CONTRACTORS ARE TO COORDINATE THE WORK OF EACH OTHER, SO THAT THE WORK AND SCHEDULE ARE NOT IMPEDED. SCHEDULE WORK PROGRESS THROUGHOUT THE ENTIRE PROJECT TO PREVENT CONFLICTS AND INTERFERENCE. OBTAIN ALL NECESSARY INFORMATION SUCH AS SIZES, LOCATIONS, TEMPLATES, LAYOUT, DIMENSIONS AND ALL OTHER INFORMATION NECESSARY FOR A PROPER AND WELL COORDINATED INSTALLATION. PRIOR TO INSTALLATION OF ITEMS, CONFER WITH EACH CONTRACTOR EXACT LOCATION OF ALL ITEMS.
20. WHERE MATERIALS REFERENCED ON DRAWINGS, OR NECESSARY TO COMPLETE THE WORK OF THIS CONTRACT ARE NOT SPECIFIED HEREIN, PROVIDE BEST QUALITY MATERIALS. WHERE MATERIALS ARE INTENDED TO MATCH EXISTING, PROVIDE CLOSEST POSSIBLE MATCH, SUBJECT TO OWNER'S APPROVAL. ALL ITEMS AND WORK ON DRAWINGS ARE NEW UNLESS INDICATED OTHERWISE. ALL WORK WHICH HAS BEEN DAMAGED SHALL BE REPAIRED OR REPLACED. WHERE ITEM CANNOT BE REPAIRED TO A "NEW CONDITION", OR WHERE THE STRUCTURAL INTEGRITY HAS BEEN AFFECTED, ITEM SHALL BE REPLACED.
21. CONTRACTOR SHALL OBTAIN FROM OWNER ALL REQUIREMENTS FOR INSTALLATION OF OWNER PROVIDED EQUIPMENT INCLUDING ROUGHING DIAGRAMS, INSTALLATION INSTRUCTIONS, ELECTRICAL SCHEMATICS, TEMPLATES, LAYOUTS AND DIMENSIONS AND ALL OTHER INFORMATION NECESSARY FOR A PROPER, WELL COORDINATED INSTALLATION. PRIOR TO ROUGH-IN SERVICES, CONFER WITH OWNER EXACT LOCATION OF ALL ITEMS.
22. ALL CONDUIT SHALL BE ROUTED CONCEALED IN WALLS EXCEPT IN ELECTRICAL/DATA ROOMS, OR WHERE INDICATED ON DRAWINGS.
23. CONDUITS SHALL BE ROUTED THROUGH BLOCKOUTS AT SHEAR WALLS. CORE DRILLS SHALL NOT BE ALLOWED. COORDINATE LOCATIONS WITH STRUCTURAL PLANS.
24. CONDUIT SHALL NOT BE ROUTED IN SLAB EXCEPT TO SERVE SLAB ON GRADE AREA FLOOR BOXES AND/OR ISLAND MILLWORK.
25. ALL 120V BRANCH CIRCUIT FEEDERS GREATER THAN 100-FT BUT LESS THAN 200-FT SHALL BE MINIMUM #10 AWG, THOSE GREATER THAN 200-FT SHALL BE #8 AWG. COORDINATE FINAL CONDUCTOR SIZE BASED ON VOLTAGE DROP PER NEC REQUIREMENTS. REFER TO SPECIFICATIONS.
26. COORDINATE MECHANICAL AIR DEVICE EQUIPMENT LOCATIONS AND QUANTITIES WITH DIVISION 23 DOCUMENTS. DEVICES INDICATED ON MECHANICAL DRAWINGS AND MISSING FROM ELECTRICAL DRAWINGS SHALL BE CIRCUITED TO NEAREST ADJACENT AIR DEVICE EQUIPMENT CIRCUIT.
27. ALL 120V, 20A RECEPTACLES WITHIN 6-FT OF THE OUTSIDE EDGE OF A SINK SHALL BE GFI PROTECTED PER NEC ARTICLE 210.8.
28. ALL ELECTRICAL EQUIPMENT FURNISHED BY THIS CONTRACTOR SHALL BE THIRD PARTY LISTED.
29. FOR ALL FIRE SMOKE DAMPERS, ELECTRICAL CONTRACTOR SHALL SUPPLY POWER TO EXTERNALLY MOUNTED DISCONNECT SWITCH. COORDINATE EXACT LOCATIONS AND QUANTITIES WITH M.C. PRIOR TO INSTALLATION. DISCONNECT SHALL BE LOCATED IN ACCESSIBLE SPACE ABOVE CEILING.

GENERAL DEMOLITION NOTES

- 1. WHEN WORKING IN AND AROUND THE EXISTING BUILDING, EXTREME CARE SHALL BE EXERCISED WITH REGARD TO PROTECTION OF THE EXISTING STRUCTURE AND MECHANICAL AND ELECTRICAL SERVICES WHICH WILL REMAIN, REPAIR, REPLACE, OR RESTORE TO THE SATISFACTION OF THE ENGINEER ALL EXISTING WORK DAMAGED IN THE PERFORMANCE OF DEMOLITION AND/OR NEW WORK.
2. ALL EXISTING WIRING, EQUIPMENT, CONDUITS, AND MATERIALS NOT REQUIRED FOR RE-USE OR RE-INSTALLATION (SHOWN OR OTHERWISE) SHALL BE REMOVED. ALL EXISTING MATERIALS AND EQUIPMENT WHICH ARE REMOVED AND ARE DESIRED BY THE OWNER, OR ARE INDICATED TO REMAIN THE PROPERTY OF THE OWNER, SHALL BE DELIVERED TO HIM ON THE PREMISES BY THE CONTRACTOR WHERE DIRECTED BY THE ENGINEER. ALL OTHER MATERIALS AND EQUIPMENT WHICH ARE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED BY THE CONTRACTOR FROM THE PREMISES.
3. EXISTING CONDITIONS, I.E., PRESENCE AND LOCATION OF PANELBOARDS, LIGHTING FIXTURES, RECEPTACLES, EQUIPMENT, AND MATERIALS, INDICATED ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE RECORD DRAWINGS AND FIELD SURVEYS AND ARE NOT WARRANTED TO BE COMPLETE OR CORRECT. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF ALL CONDUITS, EQUIPMENT, AND MATERIALS IN THE FIELD PRIOR TO STARTING ALL WORK.
4. EXISTING EQUIPMENT SIZES NOTED ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND ARE NOT WARRANTED TO BE CORRECT. CONTRACTOR SHALL VERIFY ALL SIZES IN THE FIELD IF THEY AFFECT THEIR WORK.
5. WHEN EXISTING MECHANICAL AND ELECTRICAL WORK IS REMOVED, ALL CONDUITS, WIRING AND MATERIALS SHALL BE REMOVED TO A POINT BELOW THE FINISHED FLOORS OR BEHIND FINISHED WALLS AND CAPPED. SUCH POINTS SHALL BE FAR ENOUGH BEHIND FINISHED SURFACES TO ALLOW FOR THE INSTALLATION OF THE NORMAL THICKNESS OF FINISHED MATERIAL.
6. EXISTING WIRING & CONDUIT NO LONGER REQUIRED TO REMAIN IN SERVICE (SHOWN OR OTHERWISE) SHALL BE DISCONNECTED AND REMOVED BACK TO PANEL- BOARD UNLESS OTHERWISE INDICATED OR NOTED ON THE PLANS. REMOVE EXISTING PIPE HANGERS, SUPPORTS, CONDUIT, ETC., UNDERGROUND CONDUIT TO BE REMOVED SHALL BE LIMITED TO PIPING IN THE AREAS OCCUPIED BY THE NEW CONSTRUCTION AND FIVE FEET (5') BEYOND THE NEW CONSTRUCTION. EXISTING CONDUIT INDICATED OR REQUIRED TO REMAIN IN SERVICE OR IN PLACE SHALL BE CAPPED, PLUGGED, OTHERWISE SEALED. NO EXISTING CONDUIT SHALL BE LEFT OPEN END.
7. EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT, CONDUIT, WIRING, DEVICES, AND MATERIALS AFFECTED BY DEMOLITION OR NEW WORK INSTALLATION AND REQUIRED TO REMAIN IN SERVICE SHALL BE REINSTALLED OR SUPPORTED AS REQUIRED IN ACCORDANCE WITH NEW WORK SPECIFICATION. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE ENGINEER AND AT NO ADDITIONAL CONTRACT COST.
8. PATCH TO MATCH EXISTING ALL NEW AND EXISTING OPENINGS AND WALLS, CEILINGS, ROOF, AND FLOOR SURFACES DAMAGED OR CREATED BY DEMOLITION WORK. PATCHING WHERE POSSIBLE SHALL MATCH EXISTING ADJACENT SURFACES AS TO THICKNESS, TEXTURES MATERIALS, AND COLOR. ALL PATCHING SHALL BE PERFORMED TO THE SATISFACTION OF THE ENGINEER AND AT NO ADDITIONAL CONTRACT COST.
9. IN GENERAL ALL EQUIPMENT AND MATERIALS SHOWN "LIGHT" IS EXISTING TO REMAIN. ALL EQUIPMENT AND MATERIALS SHOWN "HEAVY AND DASHED" IS EXISTING AND SHALL BE DEMOLISHED.

SCOPE OF WORK

THE SCOPE OF WORK SHALL INCLUDE THE FOLLOWING:

BASE BID:

CHILLER
REPLACEMENT OF THE AIR-COOLED CHILLER AND ASSOCIATED CONTROLS.

EXHAUST FANS
REPLACEMENT OF LABORATORY EQUIPMENT EXHAUST FANS ALONG WITH NEW AUTOMATIC CONTROLS INCLUDING EF-1, EF-2, EF-4, EF-7, EF-8, EF-9, EF-10, EF-11, EF-12, EF-14. BASE BID FANS TO HAVE COMBINATION STARTER/DISCONNECT SWITCH.

TEST & BALANCE WITH COMMISSIONING
COMPLETE START-UP, BALANCING, AND COMMISSIONING WORK FOR THE BUILDING IN ACCORDANCE WITH THE PROJECT DRAWINGS AND SPECIFICATIONS. CERTIFICATION OF THE LAB FUME HOOD AIRFLOW PERFORMANCE.

ALTERNATE ONE:

DUCTLESS SPLIT SYSTEM
INSTALLATION OF A NEW DUCTLESS SPLIT SYSTEM IN MECHANICAL ROOM 137 WITH INDEPENDENT CONTROLS TO BE MONITORED BY SIEMENS BAS.

ALTERNATE TWO:

CHILLED WATER PUMP
INSTALLATION OF A NEW STANDBY CHILLED WATER PUMP WITH AUTOMATIC CONTROLS.

ALTERNATE THREE:

EXHAUST FANS
PROVIDE VARIABLE FREQUENCY DRIVE IN LIEU OF COMBINATION STARTER/DISCONNECT FOR REPLACEMENT EXHAUST FANS EF-1, EF-2, EF-4, EF-7, EF-8, EF-9, EF-10, EF-11, EF-12, EF-14

ALTERNATE FOUR:

AHU-1A & AHU-1B
REMOVAL OF THE SUPPLY FAN INLET GUIDE VANES. INSTALLATION OF INVERTER-DUTY FAN MOTORS. INSTALLATION OF NEW VARIABLE FREQUENCY DRIVES WITH AUTOMATIC CONTROLS.



Table with 3 columns: REV, DESCRIPTION, DATE

BID DOCUMENTS

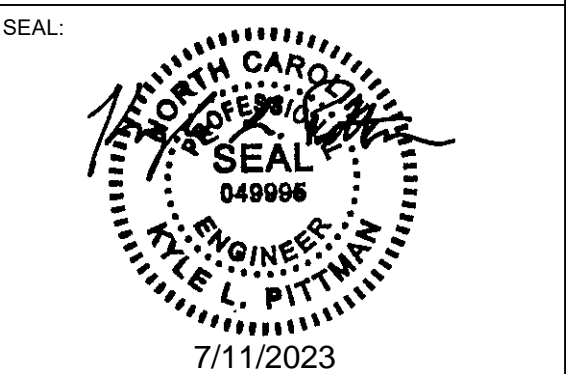


Table with 2 columns: DRAWN BY, DATE; DESIGNED BY, SCALE; CHECKED BY, RMF JOB NO.; PROJ. MGR., CLIENT JOB #

PROJECT NAME: Eaddy Building HVAC & Lab Exhaust Upgrades & Repairs
SCO ID: #22-24510-01A
PROJECT ADDRESS: 4300 REEDY CREEK, EADDY BUILDING, RALEIGH, NC 27607

DRAWING TITLE: ELECTRICAL NOTES

DRAWING NUMBER: E-002

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DRAWING NOTES

- ① EXISTING CHILLER ACC-1 ALONG WITH ALL ASSOCIATED WIRING, CONDUIT AND CONTROLS TO BE REMOVED AND REPLACED. EXISTING UNDERGROUND CONDUIT SHALL BE REUSED FOR NEW WIRING BACK TO UTILITY TRANSFORMER. COORDINATE ALL SHUTDOWNS WITH THE UTILITY AND OWNER WITH MINIMUM 2 WEEK NOTICE.
- ② REMOVE EXISTING MOTOR STARTERS SERVING EXHAUST FANS WHICH ARE DESIGNATED FOR REMOVAL ALONG WITH ALL ASSOCIATED WIRING AND CONDUIT BACK TO SOURCE. SEE ROOF DEMOLITION PLAN FOR SPECIFIC EXHAUST FANS DESIGNATED FOR REMOVAL.

GENERAL NOTES

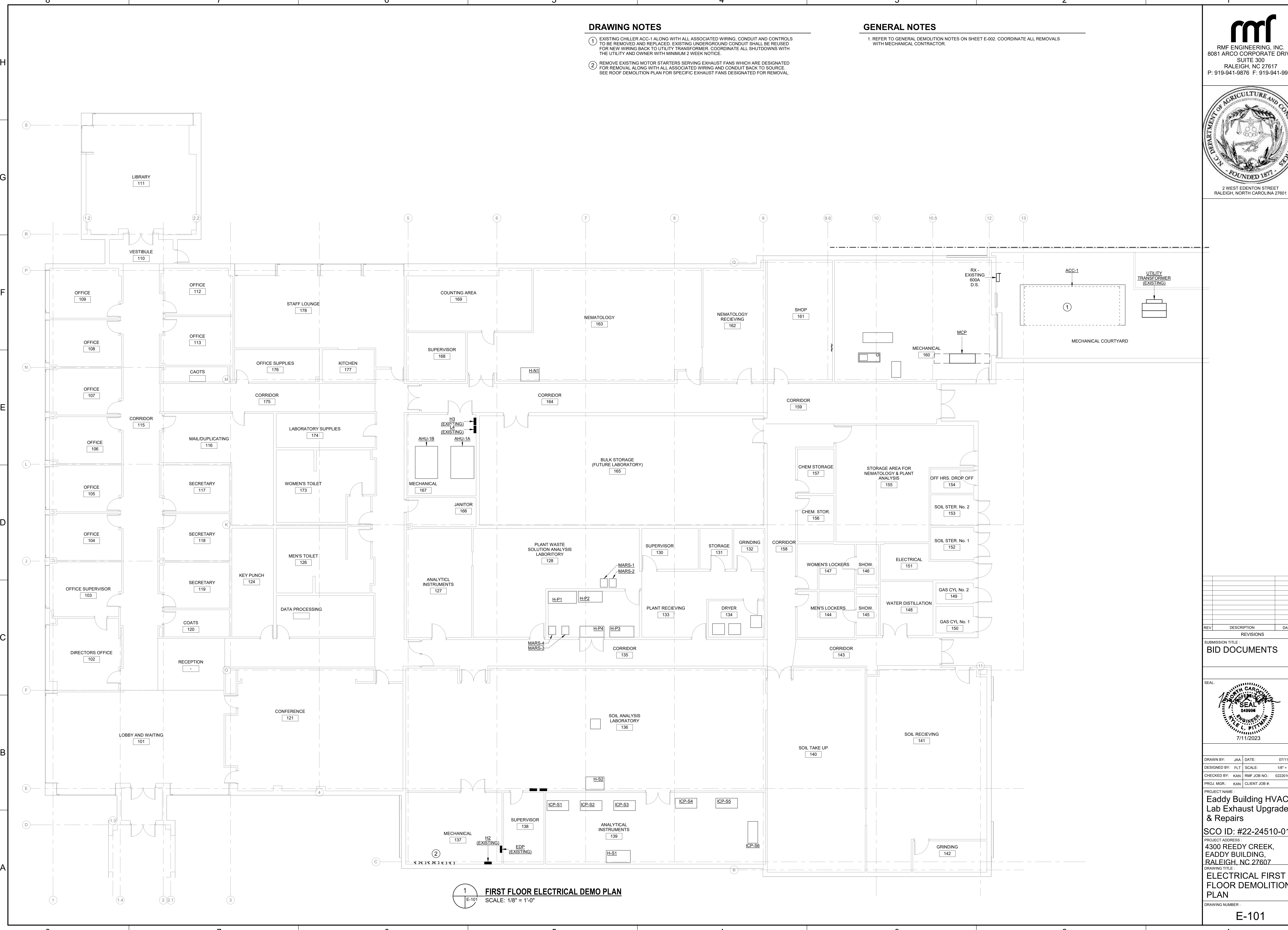
- 1. REFER TO GENERAL DEMOLITION NOTES ON SHEET E-002. COORDINATE ALL REMOVALS WITH MECHANICAL CONTRACTOR.



RMF ENGINEERING, INC.
8081 ARCO CORPORATE DRIVE
SUITE 300
RALEIGH, NC 27617
P: 919-941-9876 F: 919-941-9957



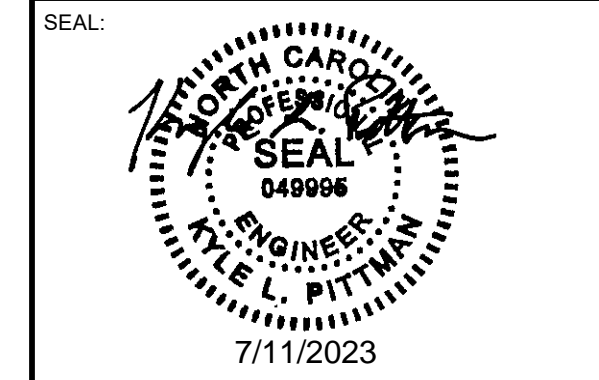
2 WEST EDENTON STREET
RALEIGH, NORTH CAROLINA 27601



1
E-101
FIRST FLOOR ELECTRICAL DEMO PLAN
SCALE: 1/8" = 1'-0"

REV	DESCRIPTION	DATE
REVISIONS		

SUBMISSION TITLE:
BID DOCUMENTS



DRAWN BY: JAA	DATE: 07/11/2023
DESIGNED BY: FLT	SCALE: 1/8" = 1'-0"
CHECKED BY: KAN	RMF JOB NO.: 02220164.A0
PROJ. MGR.: KAN	CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs

SCO ID: #22-24510-01A

PROJECT ADDRESS:
4300 REEDY CREEK, EDDY BUILDING, RALEIGH, NC 27607

DRAWING TITLE:
ELECTRICAL FIRST FLOOR DEMOLITION PLAN

DRAWING NUMBER:
E-101

Autodesk Docs\02220164\A0-Eddy Bldg - HVAC Lab Exhaust Upgrades\02220164.A0_MEP_22.rvt

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DRAWING NOTES

① DISCONNECT EXISTING EF. REMOVE ALL ASSOCIATED WIRING, CONDUIT, AND CONTROLS TO BE REMOVED BACK TO SOURCE

GENERAL NOTES

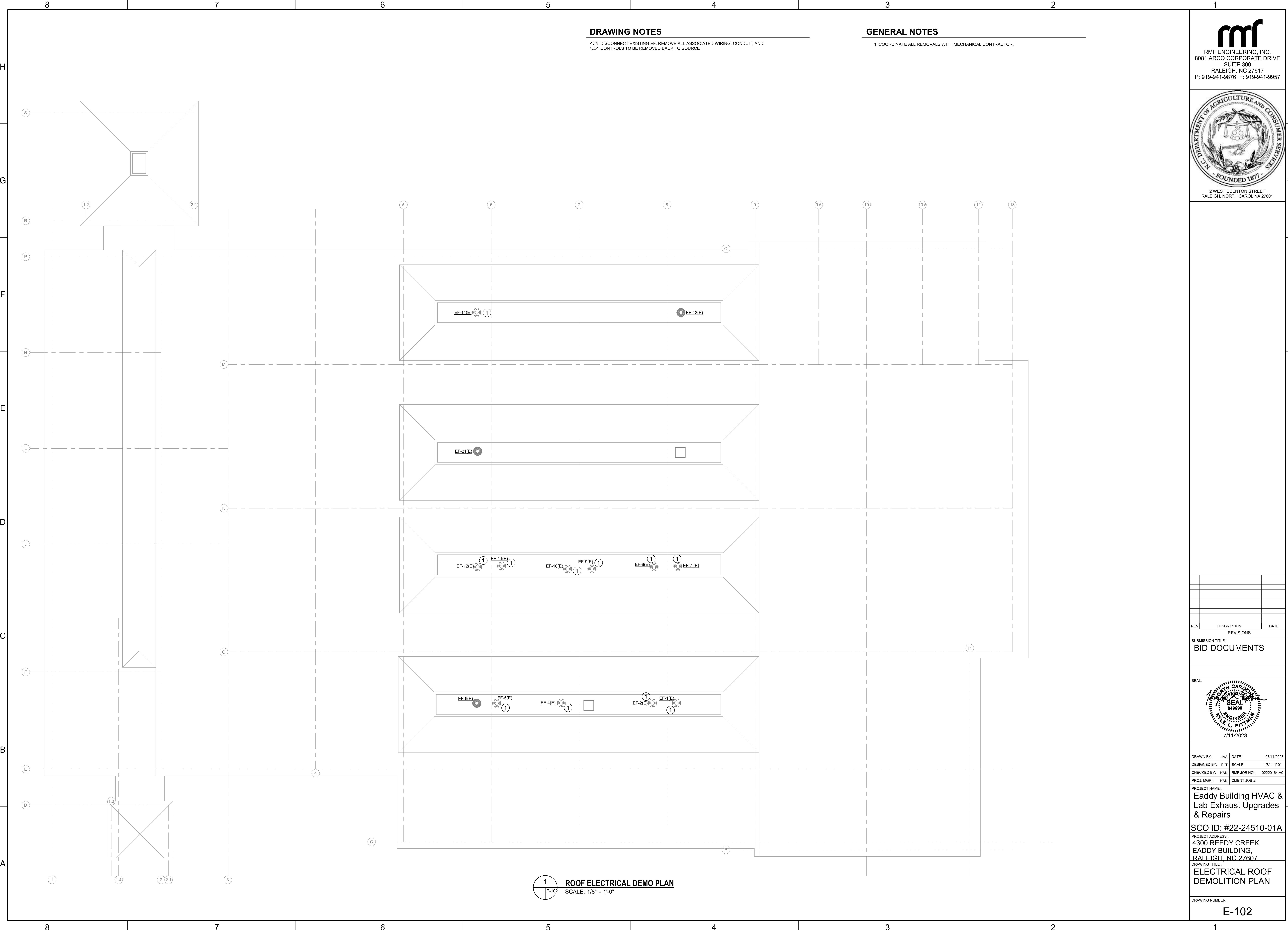
1. COORDINATE ALL REMOVALS WITH MECHANICAL CONTRACTOR.



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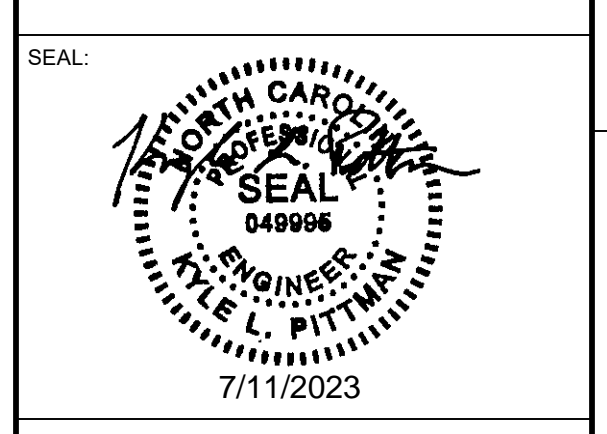
2 WEST EDENTON STREET
RALEIGH, NORTH CAROLINA 27601



1 ROOF ELECTRICAL DEMO PLAN
E-102 SCALE: 1/8" = 1'-0"

REV	DESCRIPTION	DATE

SUBMISSION TITLE:
BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
DESIGNED BY: FLT SCALE: 1/8" = 1'-0"
CHECKED BY: KAN RMF JOB NO.: 02220164.A0
PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs
SCO ID: #22-24510-01A
PROJECT ADDRESS:
4300 REEDY CREEK,
EDDY BUILDING,
RALEIGH, NC 27607

DRAWING TITLE:
ELECTRICAL ROOF DEMOLITION PLAN

DRAWING NUMBER:
E-102

Autodesk Docs/02220164.A0-Eddy Bldg - HVAC Lab Exhaust Upgrades/02220164.A0_MEP_Z2.rvt 7/11/2023 5:30:56 PM

8

7

6

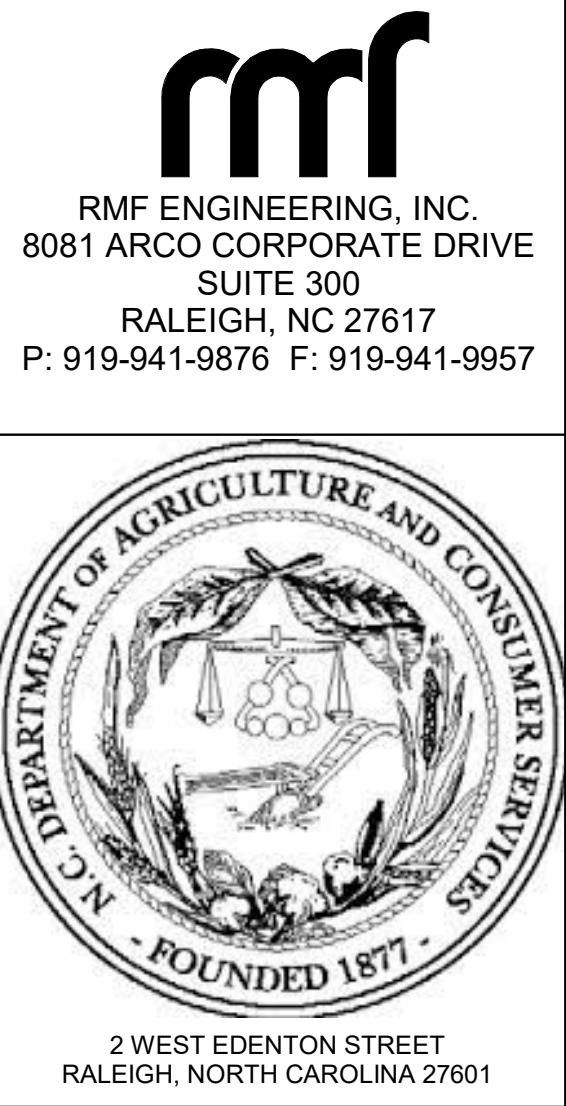
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4

3

2

1



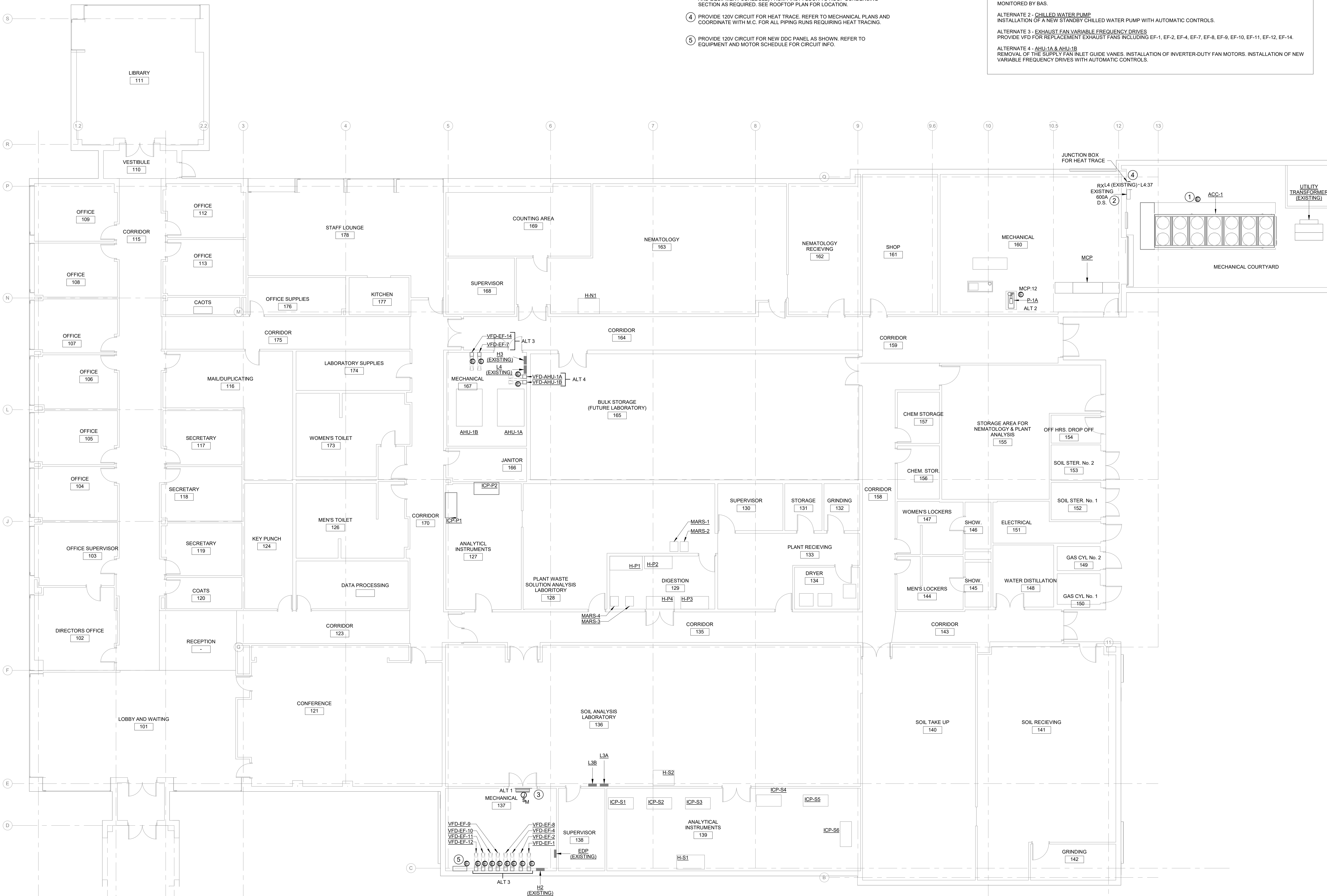
DRAWING NOTES

- ① NEW CHILLER ACC-1. SEE SINGLE LINE DIAGRAM AND EQUIPMENT AND MOTOR SCHEDULE FOR DETAILS. PROVIDE CONNECTION AS SHOWN.
- ② REMOVE AND REPLACE EXISTING 600A DISCONNECT. SEE SINGLE LINE FOR ADDITIONAL NOTES.
- ③ ALTERNATE 1: INTERIOR EVAPORATING SECTION IS POWERED FROM ROOFTOP CONDENSING SECTION. PROVIDE CONDUIT AND WIRE (AS INDICATED IN MOTOR AND EQUIPMENT SCHEDULE) FROM FIRST FLOOR TO ROOF CONDENSING SECTION AS REQUIRED. SEE ROOFTOP PLAN FOR LOCATION.
- ④ PROVIDE 120V CIRCUIT FOR HEAT TRACE. REFER TO MECHANICAL PLANS AND COORDINATE WITH M.C. FOR ALL PIPING RUNS REQUIRING HEAT TRACING.
- ⑤ PROVIDE 120V CIRCUIT FOR NEW DDC PANEL AS SHOWN. REFER TO EQUIPMENT AND MOTOR SCHEDULE FOR CIRCUIT INFO.

GENERAL NOTES

- 1. COORDINATE ALL SHUTDOWNS AND PHASING WITH OWNER, GC AND MC.
- 2. FOR CIRCUITING INFORMATION REFER TO EQUIPMENT AND MOTOR SCHEDULE ON SHEET E-601.

PRICING ALTERNATES
 ALTERNATE 1 - DUCTLESS SPLIT SYSTEM
 INSTALLATION OF A NEW DUCTLESS SPLIT SYSTEM IN MECHANICAL ROOM 137 WITH INDEPENDENT CONTROLS TO BE MONITORED BY BAS.
 ALTERNATE 2 - CHILLED WATER PUMP
 INSTALLATION OF A NEW STANDBY CHILLED WATER PUMP WITH AUTOMATIC CONTROLS.
 ALTERNATE 3 - EXHAUST FAN VARIABLE FREQUENCY DRIVES
 PROVIDE VFD FOR REPLACEMENT EXHAUST FANS INCLUDING EF-1, EF-2, EF-4, EF-7, EF-8, EF-9, EF-10, EF-11, EF-12, EF-14.
 ALTERNATE 4 - AHU-1A & AHU-1B
 REMOVAL OF THE SUPPLY FAN INLET GUIDE VANES. INSTALLATION OF INVERTER-DUTY FAN MOTORS. INSTALLATION OF NEW VARIABLE FREQUENCY DRIVES WITH AUTOMATIC CONTROLS.



1
E-103
FIRST FLOOR ELECTRICAL NEW WORK PLAN
SCALE: 1/8" = 1'-0"

REV	DESCRIPTION	DATE

SUBMISSION TITLE: BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
 DESIGNED BY: FLT SCALE: 1/8" = 1'-0"
 CHECKED BY: KAN RME JOB NO.: 02220164.A0
 PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs
 SCO ID: #22-24510-01A
 PROJECT ADDRESS:
 4300 REEDY CREEK,
 EDDY BUILDING,
 RALEIGH, NC 27607

DRAWING TITLE: ELECTRICAL FIRST FLOOR POWER PLAN

DRAWING NUMBER:
E-103

Autodesk Docs\02220164A0-Eddy Bldg - HVAC Lab Exhaust Upgrades\02220164A0_MEP_22.rvt 7/11/2023 5:30:58 PM

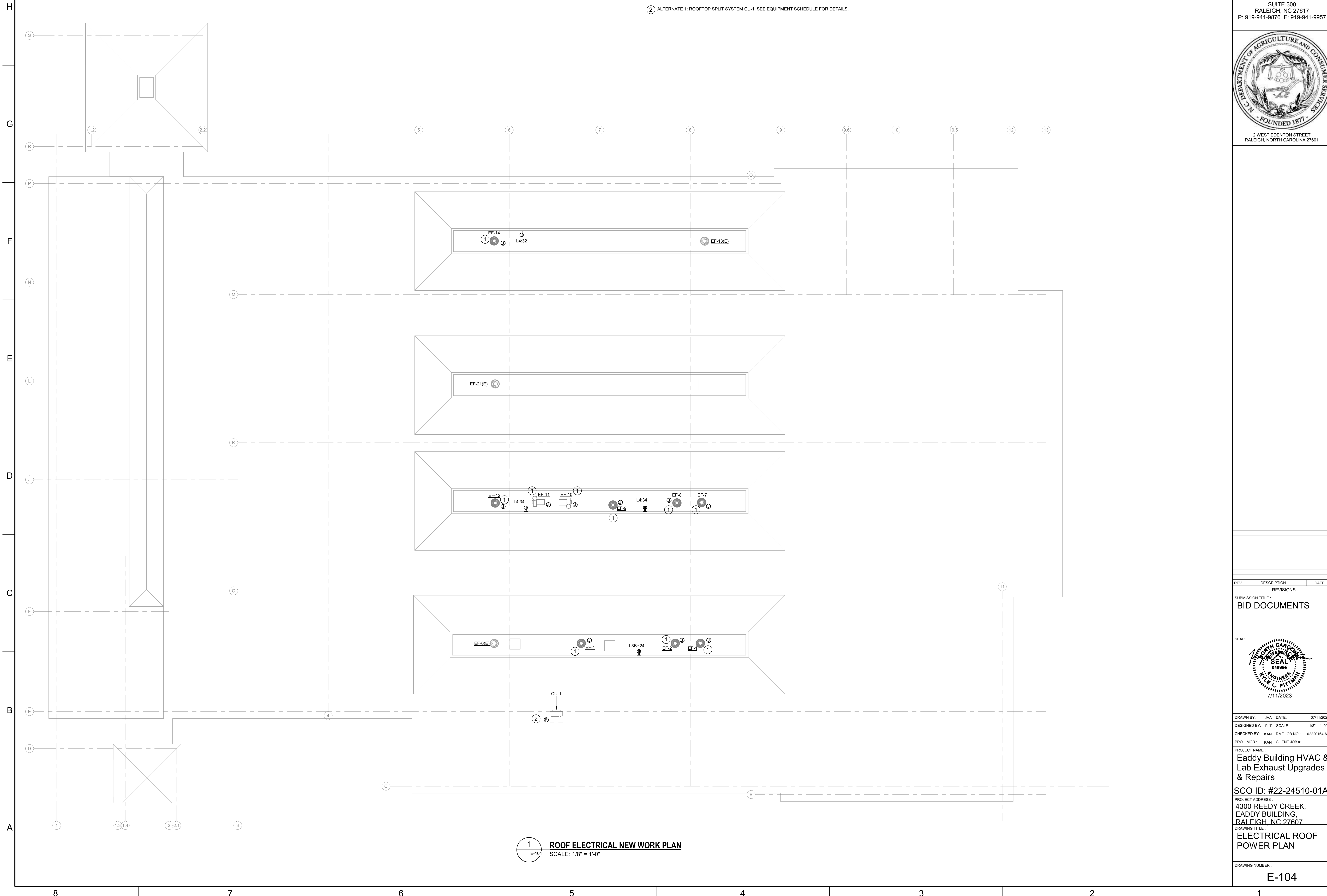
8 7 6 5 4 3 2 1

DRAWING NOTES

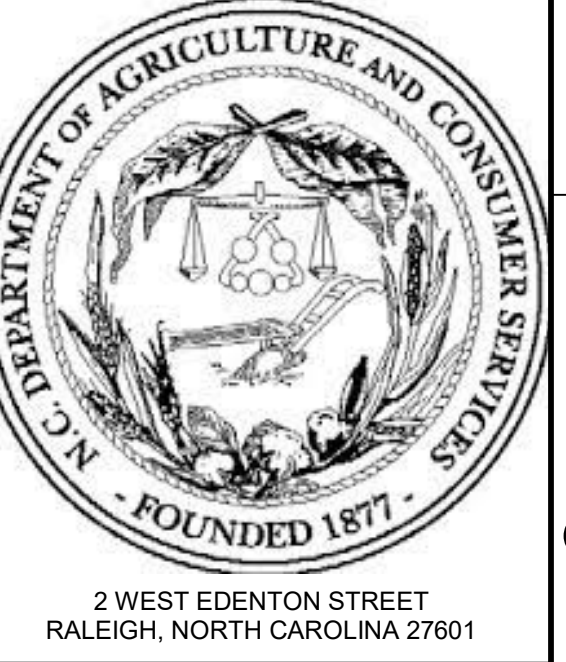
- ① NEW EXHAUST FAN. PROVIDE LOCAL DISCONNECT SAFETY SWITCH WITH AUXILIARY CONTACT FOR INTERLOCK SHUTDOWN OF VFD. SEE DETAIL SHEET E-501. CONTROL WIRING MUST BE RUN IN SEPARATE CONDUIT FROM POWER WIRING. TYPICAL FOR ALL ROOFTOP EQUIPMENT.
- ② ALTERNATE 1: ROOFTOP SPLIT SYSTEM CU-1. SEE EQUIPMENT SCHEDULE FOR DETAILS.

GENERAL NOTES

1. COORDINATE ALL SHUTDOWNS AND PHASING WITH OWNER, G.C. AND M.C.



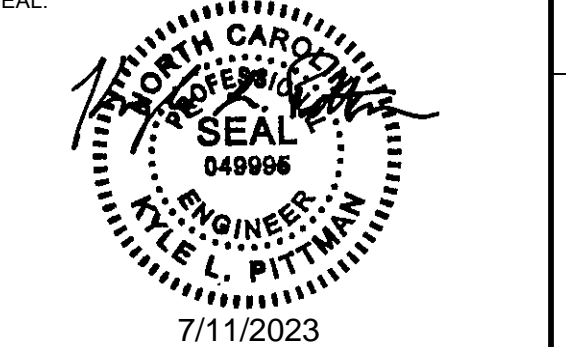
rmf
 RMF ENGINEERING, INC.
 8081 ARCO CORPORATE DRIVE
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 RALEIGH, NC 27617
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2 WEST EDENTON STREET
 RALEIGH, NORTH CAROLINA 27601

REV	DESCRIPTION	DATE

SUBMISSION TITLE:
BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
 DESIGNED BY: FLT SCALE: 1/8" = 1'-0"
 CHECKED BY: KAN RMF JOB NO.: 02220164.A0
 PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eaddy Building HVAC & Lab Exhaust Upgrades & Repairs
 SCO ID: #22-24510-01A
 PROJECT ADDRESS:
 4300 REEDY CREEK,
 EADDY BUILDING,
 RALEIGH, NC 27607

DRAWING TITLE:
ELECTRICAL ROOF POWER PLAN

DRAWING NUMBER:
E-104

1
 E-104
ROOF ELECTRICAL NEW WORK PLAN
 SCALE: 1/8" = 1'-0"



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REV	DESCRIPTION	DATE
REVISIONS		

SUBMISSION TITLE:
BID DOCUMENTS



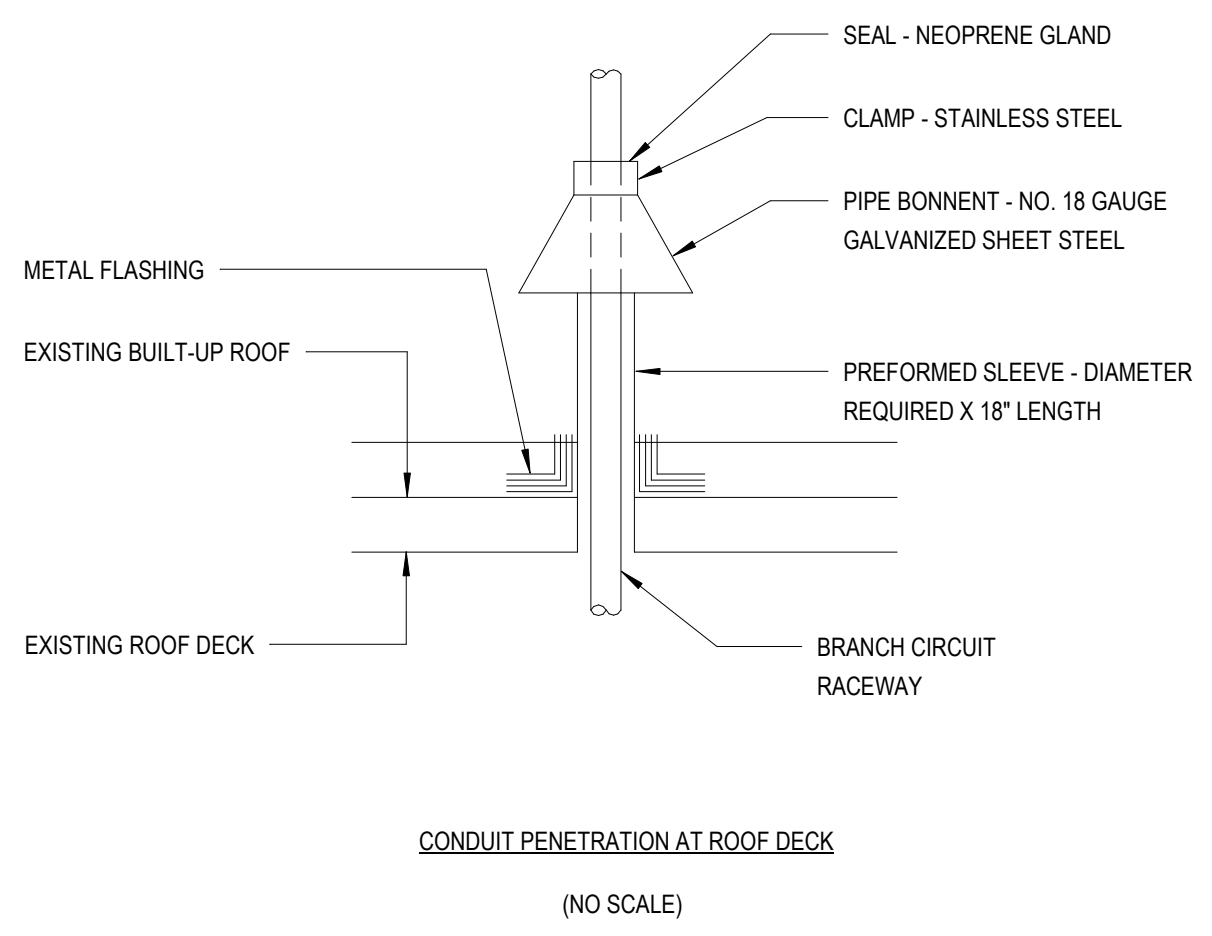
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DESIGNED BY: FLT SCALE: 12" = 1'-0"
CHECKED BY: KAN RMF JOB NO.: 02220164.A0
PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs

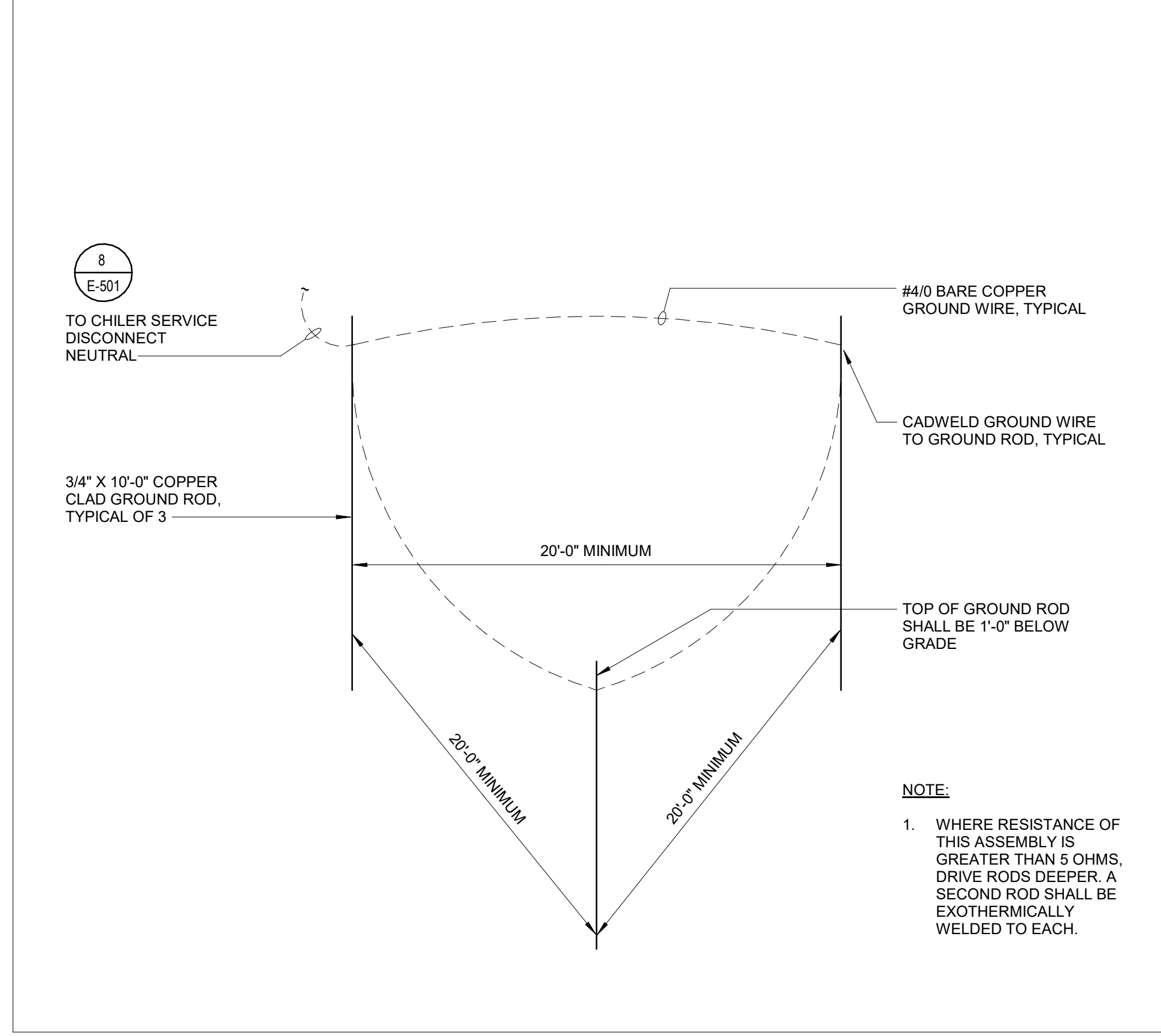
SCO ID: #22-24510-01A
PROJECT ADDRESS:
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EDDY BUILDING,
RALEIGH, NC 27607

DRAWING TITLE:
**ELECTRICAL
DETAILS**

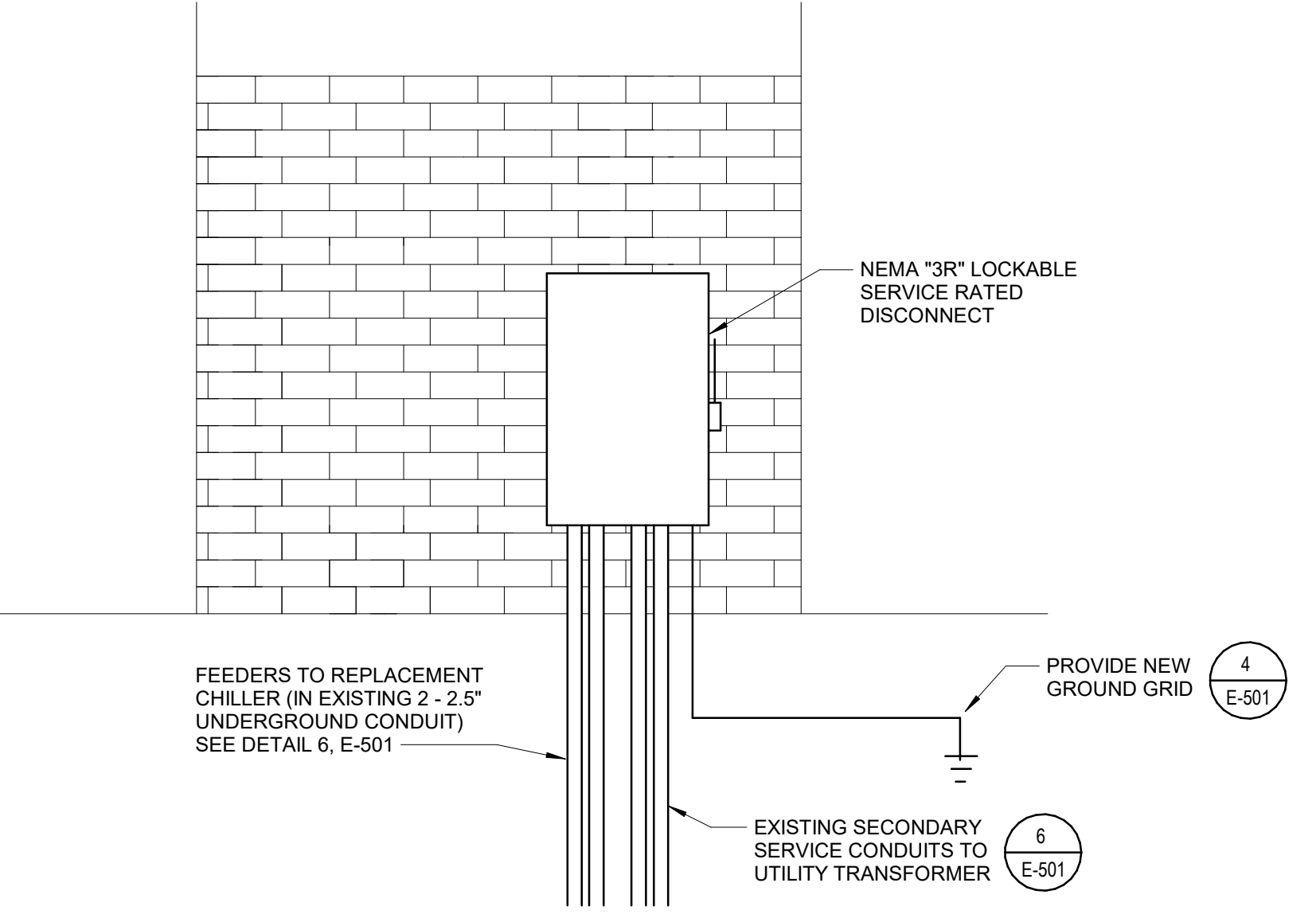
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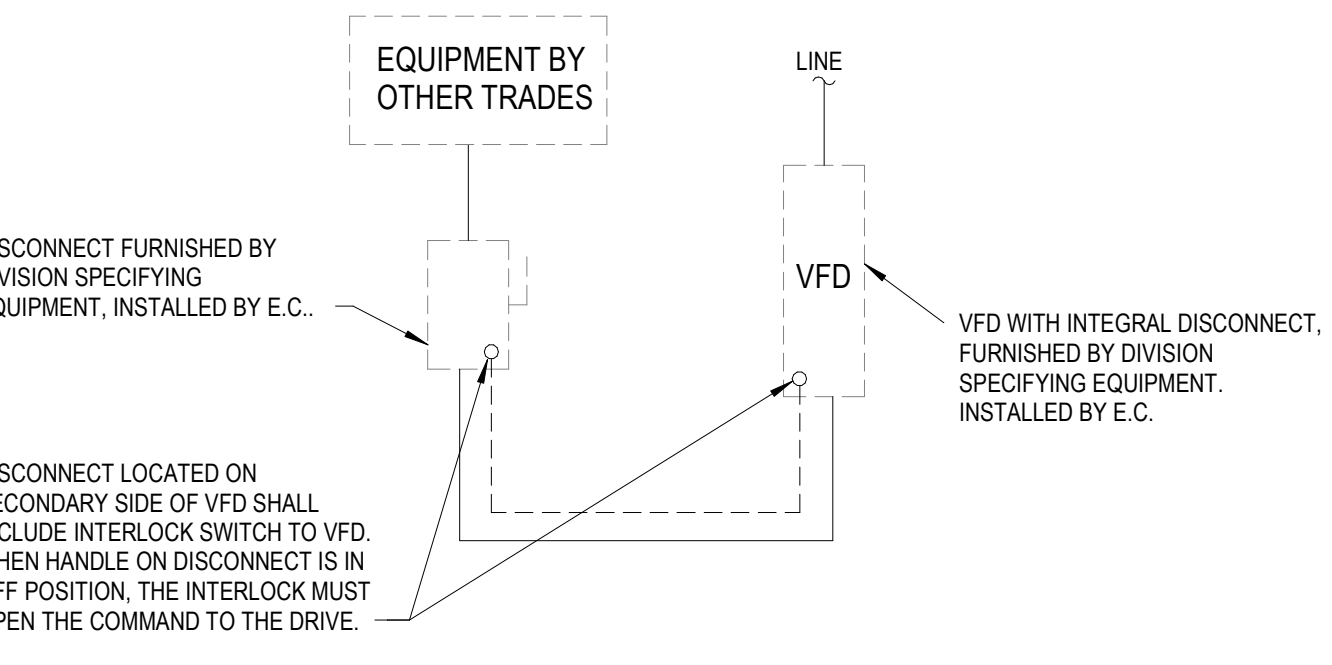
3
E-501
DETAIL - CONDUIT ROOF PENETRATION
SCALE: N.T.S.



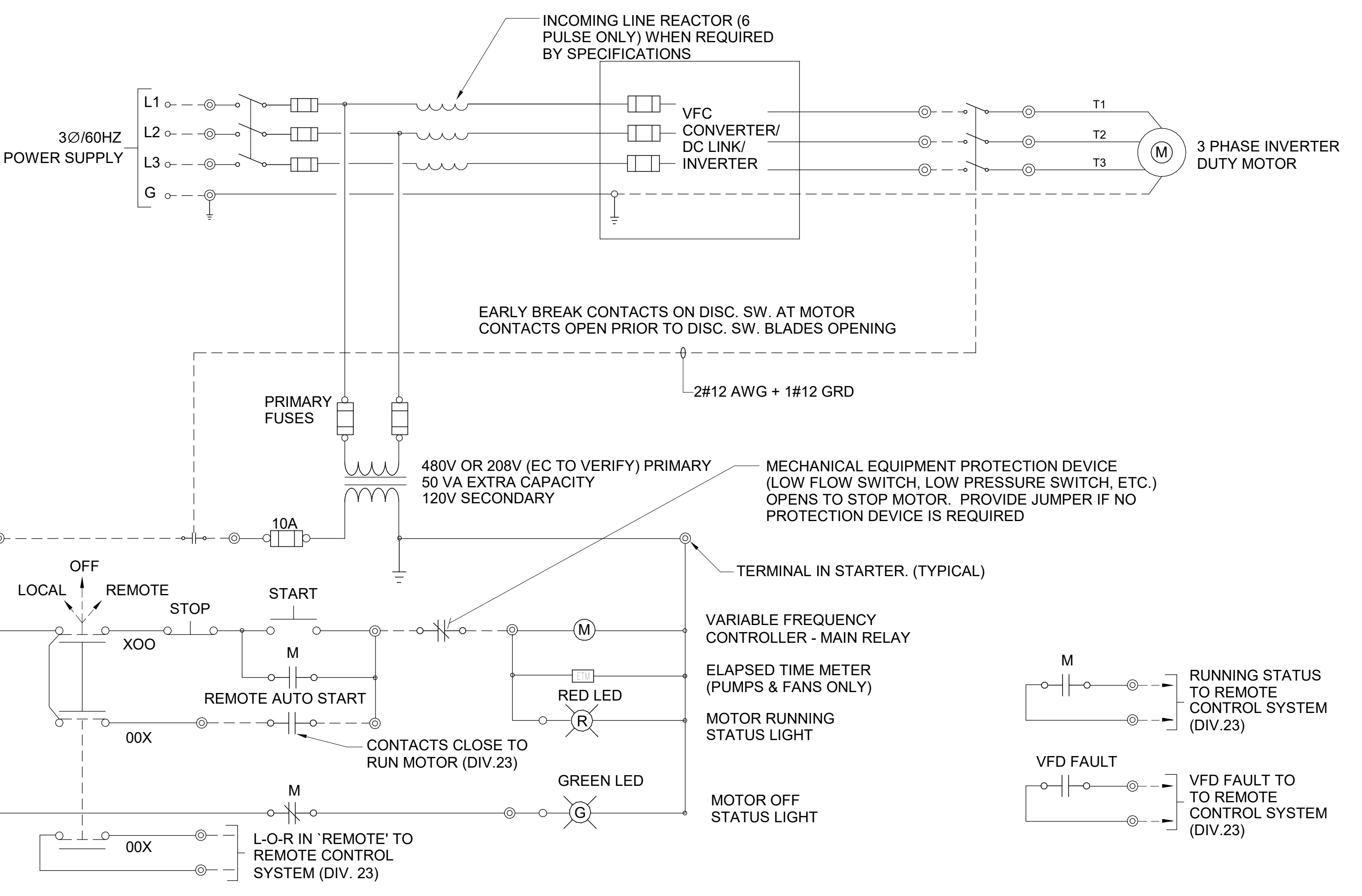
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E-501
E - DETAIL - GROUND GRID
SCALE: 12" = 1'-0"



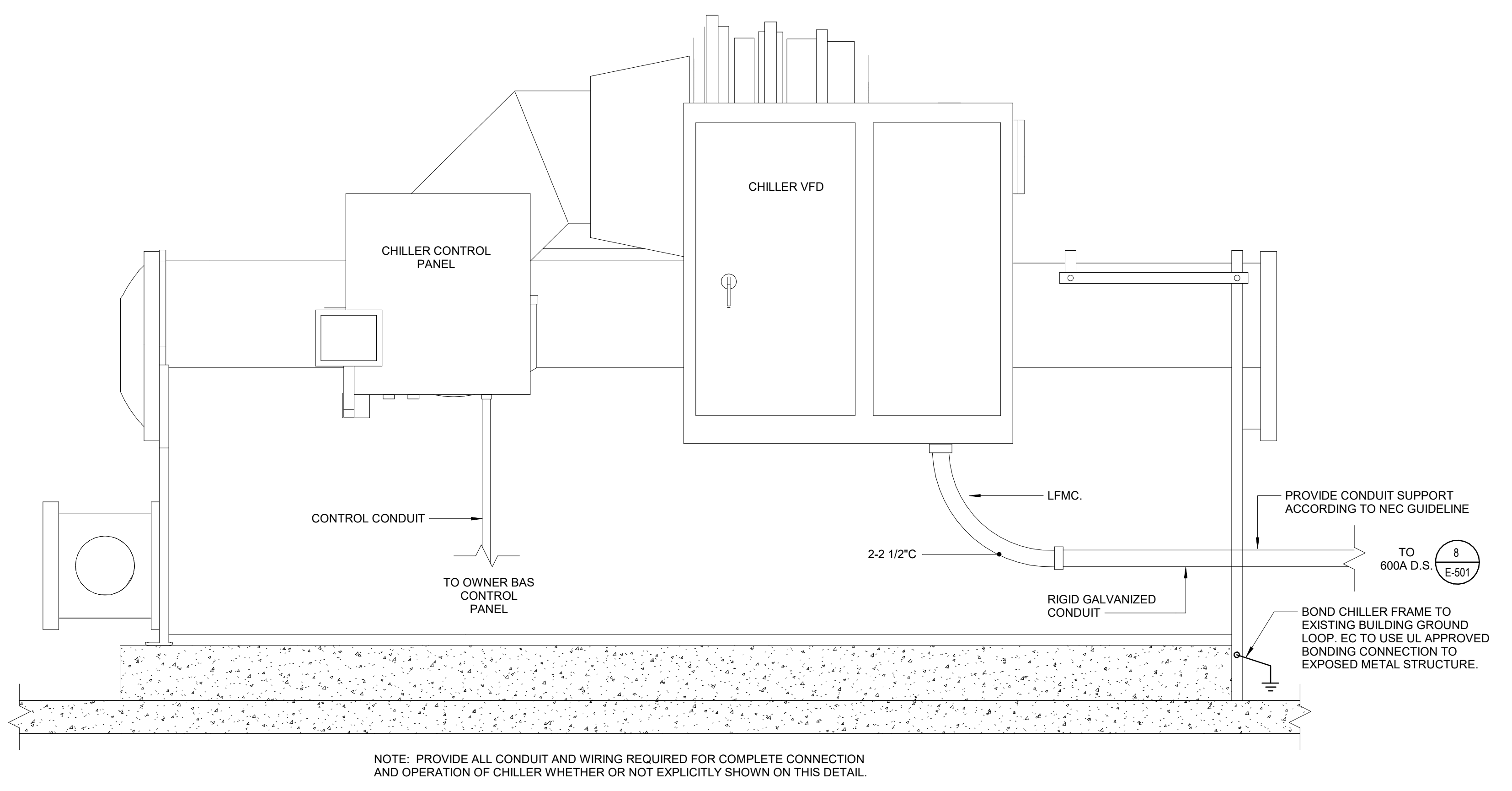
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E-501
E - DETAIL - SERVICE ENTRANCE
SCALE: N.T.S.



2
E-501
DETAIL - TYPICAL VFD DETAIL
SCALE: N.T.S.



1
E-501
DETAIL - TYP. VARIABLE FREQUENCY DRIVE MOTOR CONTROL - MINIMUM REQUIREMENTS
SCALE: N.T.S.



6
E-501
DETAIL - CHILLER CONDUIT CONNECTION
SCALE: N.T.S.

Autodesk Docs/02220164.A0-Eddy Bldg - HVAC Lab Exhaust Upgrades/02220164.A0_MEP_Z2.rvt
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Switchboard: MCP
 Location: MECHANICAL 160
 Supply From: Volts: 480/277 Wye
 Phases: 3 Mains Type: DO NOT USE
 Mounting: Wires: 4
 Enclosure: Mains Rating: 400
 MCB Rating: 400

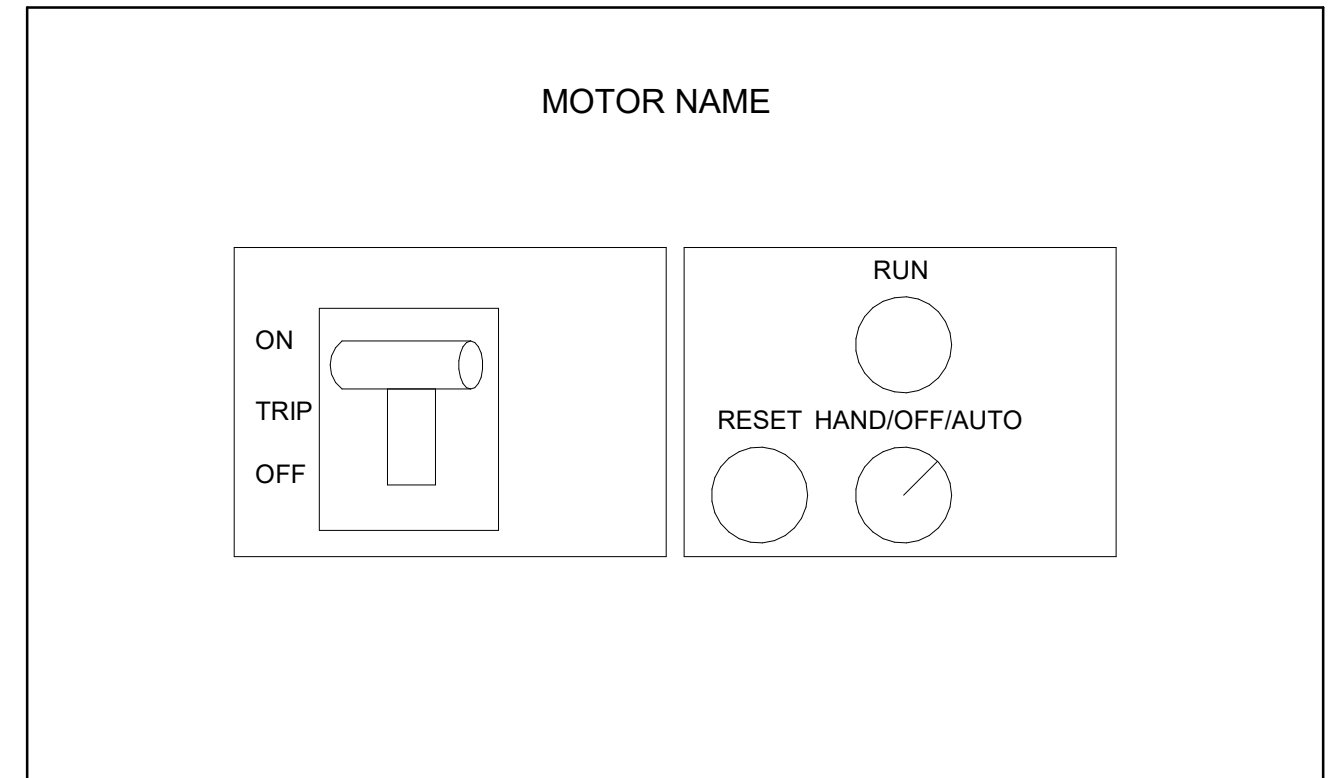
Notes:

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
MCP-1	P-1	3	100	30	19.90	
MCP-2	P-2	3	100	15	9.90	
MCP-3	AHU-2	3	100	45	26.20	
MCP-4	PANEL H2	3	400	125	59.00	
MCP-5	BOILER #1	3	100	15	3.74	
MCP-6	BOILER #2	3	100	15	3.74	
MCP-7	CP-1	3	100	15	3.74	
MCP-8	DEAERATOR	3	100	15	6.65	
MCP-9	AIR COMP.	3	100	20	14.50	
MCP-10	AIR COMP.	3	100	15	5.80	
MCP-11	P-3	3	100	15	4.98	
MCP-12	CHILLED WATER PUMP P-1A (ALT #2)	3	100	40	17.45	PROVIDE NEW CB IN SPARE SECTION. SEE DETAIL #3
MCP-13	SPACE	3	400	20	0.00	
MCP-14	SPACE	3	400	20	0.00	
MCP-15	SPACE	3	400	20	0.00	
MCP-16	SPACE	3	400	20	0.00	
MCP-17	SPACE	3	400	20	0.00	
MCP-18	SPACE	3	400	20	0.00	
MCP-19	SPACE	3	400	20	0.00	
MCP-20	SPACE	3	400	20	0.00	
					Total Conn. Load:	175.60
					Total Amps:	211

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Equipment	17.45	100.00%	17.45	
Spare	158.15	100.00%	158.15	
				Total Conn. Load (kVA): 175.60
				Total Est. Demand (kVA): 175.60
				Total Conn. (Amps): 211
				Total Est. Demand (Amps): 211

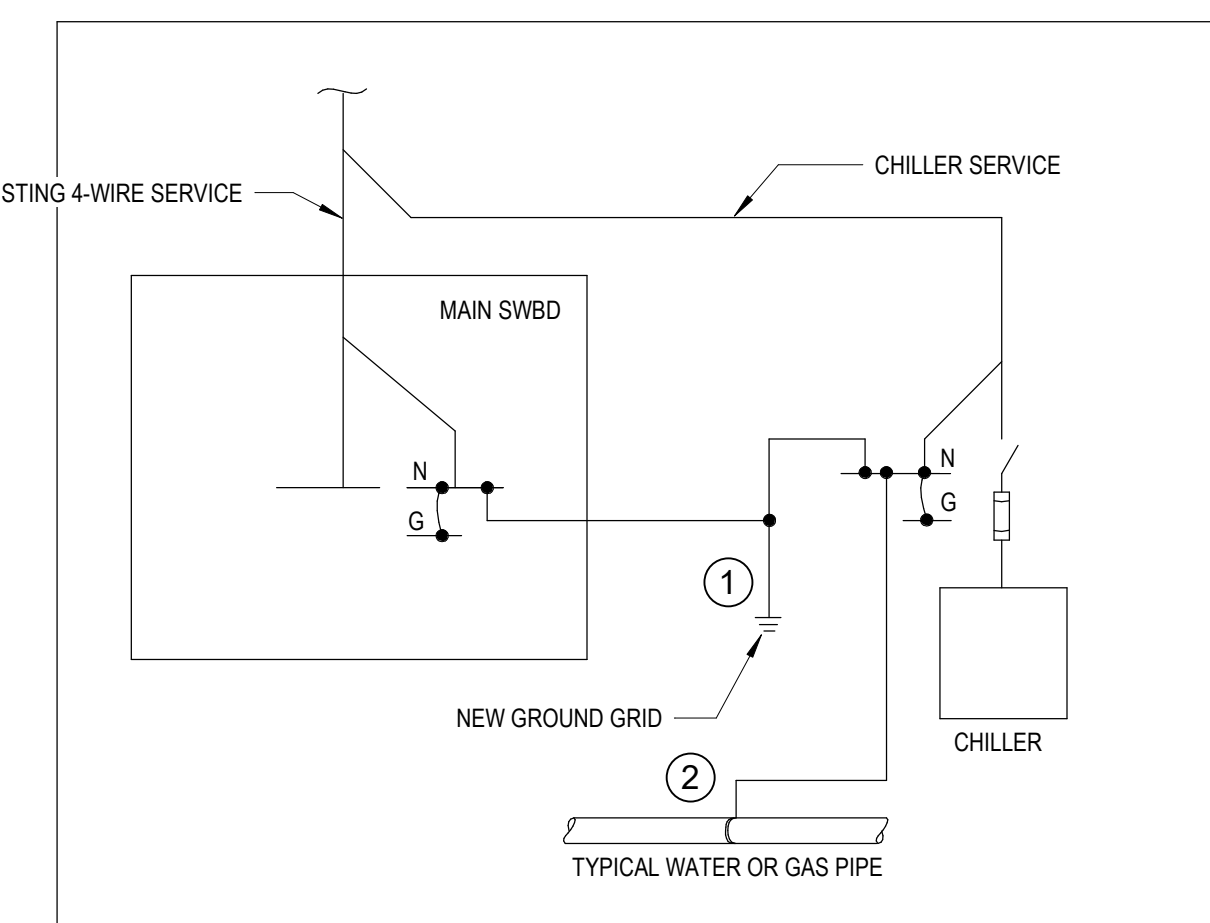
Notes:



NOTE:
 1. FOR MCC BUCKETS CONTAINING STARTERS BEING REPLACED WITH FEEDER BREAKERS, CONTRACTOR MUST ASSURE ONLY THE NEW CIRCUIT BREAKER TO REMAIN IN BUCKET. CONTACTOR, MOTOR OVERLOAD, TERMINAL BLOCKS, FUSE BLOCKS, CABLES, MOTOR CIRCUIT PROTECTOR, ETC. TO BE REMOVED FROM BUCKET. REMOVE PILOT LIGHTS AND UNUSED DEVICES IN FRONT DOOR COVER AND PROVIDE NEW DOORS AND/OR MANUFACTURERS SUPPLIED CLOSURES FOR DEVICE OPENINGS

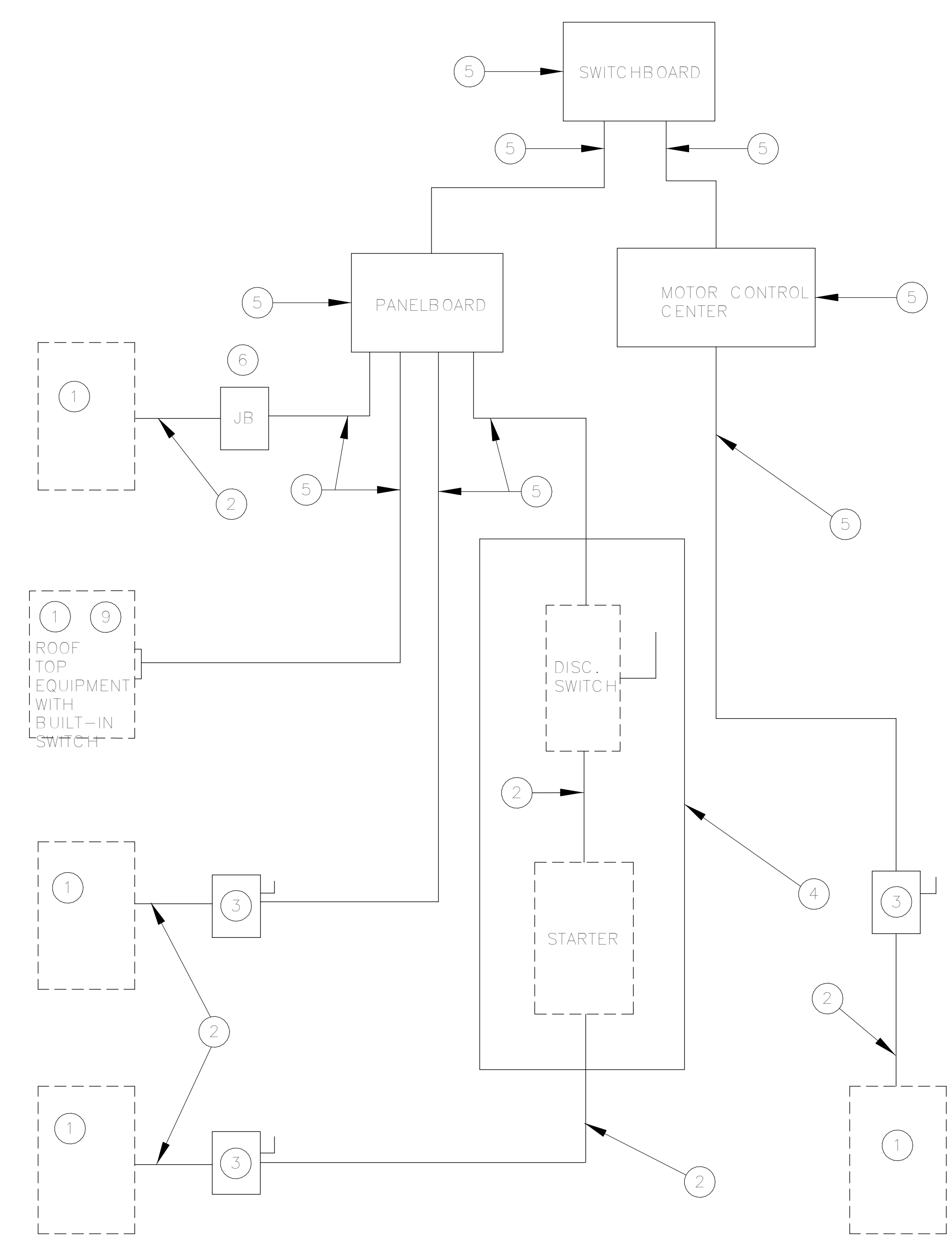
E - DETAIL - MCC BUCKET REPLACEMENT
 SCALE: 12" = 1'-0"

LOAD SUMMARY
 EXISTING LOAD 158.15 KW
 LOADS REMOVED 0.00 KW
 LOADS ADDED 17.45 KW
 NET LOAD 175.60 KW



GROUNDING DETAILS

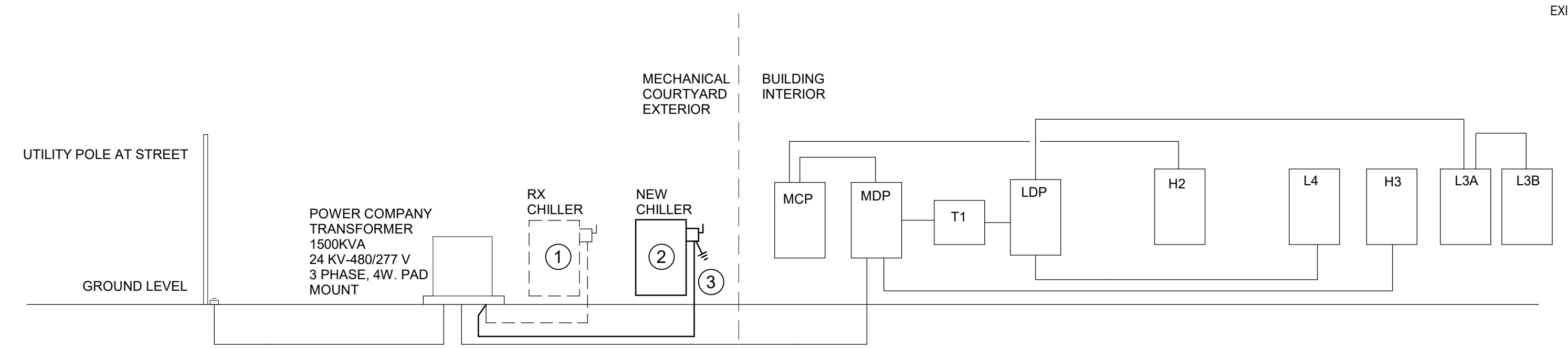
- 1 PROVIDE (3) NEW 3/4" x 10" GROUND RODS, REFER TO DETAIL #4, E501, #4/0 AWG BARE CU GROUND. TIE IN WITH EXISTING BUILDING GROUNDING SYSTEM AND BOND TO MAIN SERVICE NEUTRAL BUS AND CHILLER SERVICE DISCONNECT NEUTRAL BAR.
- 2 BOND GAS AND WATER PIPING SYSTEMS TO THE GROUND CONDUCTOR AT THE CHILLER SERVICE.



ELECTRICAL NOTES

- 1 EQUIPMENT PROVIDED BY TRADES OTHER THAN ELECTRICAL.
- 2 CONDUIT & WIRING BY MECHANICAL, PLUMBING CONTRACTOR OR OTHER TRADES OTHER THAN ELECTRICAL.
- 3 IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC, IT SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR PROVIDING THE EQUIPMENT.
- 4 A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER. LOCATE ADJACENT TO EQUIPMENT. DISCONNECT SWITCH, VFD AND/OR STARTER SHALL BE PROVIDED BY THE CONTRACTOR PROVIDING THE EQUIPMENT.
- 5 SWITCHBOARD, PANELBOARD, FEEDER CIRCUIT WIRING AND CONDUIT PROVIDED BY ELECTRICAL TRADE AS SHOWN ON THE ELECTRICAL DRAWINGS. SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
- 6 JUNCTION BOX MAY BE SHOWN ON ELECTRICAL PLANS FOR SOME EQUIPMENT. IF NO STARTER OR DISCONNECT IS SUPPLIED, A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX. LOAD SIDE WIRING WILL BE PROVIDED BY MECHANICAL, PLUMBING CONTRACTOR OR OTHER TRADES OTHER THAN ELECTRICAL.
- 7 FOR PROJECTS UTILIZING AN MCC, THE STARTER, CB, AND/OR THE VFD LOCATED IN THE MCC SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
- 8 IN ALL CASES THE CONTRACTOR SUPPLYING THE EQUIPMENT SHALL MAKE THE FINAL ELECTRICAL TERMINATIONS, START UP, AND TEST THE EQUIPMENT.
- 9 IF THE ROOF TOP EQUIPMENT IS NOT PROVIDED WITH BUILT IN DISCONNECT SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH.

1 DETAIL - SCO DIV OF RESPONSIBILITIES
 SCALE: 12" = 1'-0"



PARTIAL SINGLE LINE DIAGRAM - EXISTING
 SCALE: N.T.S.

SERVICE LOAD SUMMARY

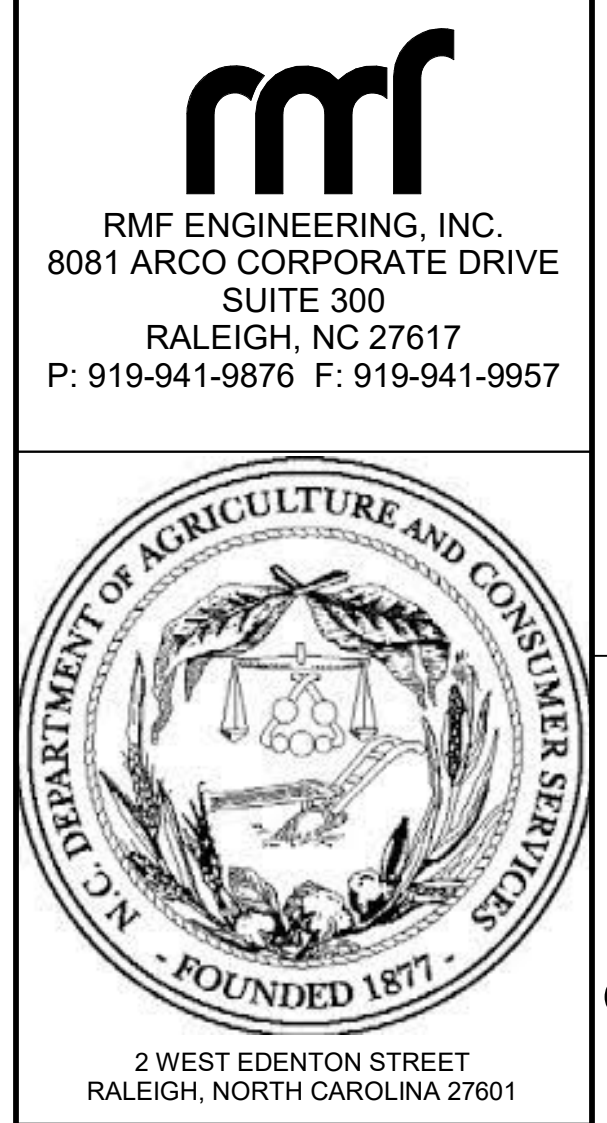
EXISTING LOAD	737.00 KW
LOADS REMOVED	251.47 KW
LOADS ADDED	315.58 KW
NET LOAD	64.11 KW
TOTAL LOAD	801.11 KW

- UNLESS OTHERWISE NOTED, ALL EQUIPMENT SHOWN ABOVE IS EXISTING TO REMAIN.
- 1 EXISTING CHILLER ALONG WITH ASSOCIATED WIRING AND DISCONNECT TO BE REMOVED AND REPLACED. REFER TO MECHANICAL DRAWINGS, FLOORPLANS AND EQUIPMENT SCHEDULE BELOW FOR ADDITIONAL DETAILS. REMOVE AND REPLACE EXISTING WIRING FROM UTILITY TRANSFORMER TO CHILLER. EXISTING UNDERGROUND CONDUIT SHALL BE REUSED. ALL EXISTING UTILITY METERING SHALL REMAIN, AND BE RE-CONNECTED AS REQUIRED.
 - 2 PROVIDE NEW SERVICE RATED 600A DISCONNECT IN NEMA 3R ENCLOSURE. SEE DETAIL #4 ON SHEET E-601
 - 3 PROVIDE (3) NEW 3/4" x 10" GROUND RODS, #4 AWG BARE CU GROUND. TIE IN WITH EXISTING BUILDING GROUNDING SYSTEM. SEE DETAIL #4 E501 FOR GROUNDING GRID INFORMATION.

EQUIPMENT & MOTOR SCHEDULE

DESIGNATION	DESCRIPTION	KVA	VOLT	POLES	HP	PANEL NAME	CIRCUIT #	WIRE SIZE (MINIMUM)	OCB	STARTER / CONTROLLER	STARTER/CONTROLLER PROVIDED / INSTALLED BY	DISCONNECT	DISCONNECT PROVIDED BY / INSTALLED BY	REMARKS
ACC-1	CHILLER	276.00	480	3				2 SETS (#250KCMIL, #1/0G, IN EX. 2.5°C)	450A	D.S.	MC/EC	600A	MC/EC	FED FROM UTILITY TRANSFORMER
CU-1	DUCTLESS SPLIT SYSTEM	2.28	208	2	N/A	L3B	15,17	2#12, #12G, 3/4"C	20A				MC/EC	ALTERNATE 1
DDC PANEL	DDC CONTROL PANEL	0.10	120	1	N/A	L3B	13	2#12, #12G, 3/4"C	20A	N/A	N/A	N/A	MC/EC	
P-1A	CHILLED WATER PUMP	17.45	480	3	15	MCP	MCP-12	3#8, #10G, 3/4"C	40A	VFD	MC/MC	60A	MC/EC	ALTERNATE 2
VFD-AHU-1A	AIR HANDLER FAN	17.45	480	3	15	H3 (EXISTING)	38,40,42	3#10, #10G, 3/4"C	40A	VFD	MC/MC	30A	MC/EC	ALTERNATE 4
VFD-AHU-1B	AIR HANDLER FAN	17.45	480	3	15	H3 (EXISTING)	32,34,36	3#10, #10G, 3/4"C	40A	VFD	MC/MC	30A	MC/EC	ALTERNATE 4
VFD-EF-1	EXHAUST FAN EF-1	2.49	480	3	1.5	H2 (EXISTING)	19,21,23	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-2	EXHAUST FAN EF-2	2.49	480	3	1.5	H2 (EXISTING)	19,21,23	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-4	EXHAUST FAN EF-4	1.75	480	3	1	H2 (EXISTING)	1,3,5	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-7	EXHAUST FAN EF-7	2.49	480	3	1.5	H3 (EXISTING)	25,27,29	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-8	EXHAUST FAN EF-8	1.33	480	3	0.75	H2 (EXISTING)	7,9,11	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-9	EXHAUST FAN EF-9	2.83	480	3	2	H2 (EXISTING)	7,9,11	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-10	EXHAUST FAN EF-10	2.83	480	3	2	H2 (EXISTING)	7,9,11	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-11	EXHAUST FAN EF-11	2.83	480	3	2	H2 (EXISTING)	13,15,17	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-12	EXHAUST FAN EF-12	1.75	480	3	1	H2 (EXISTING)	13,15,17	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3
VFD-EF-14	EXHAUST FAN EF-14	1.75	480	3	1	H3 (EXISTING)	8,10,12	3#12, #12G, 3/4"C	15A	VFD	MC/MC	30A	MC/EC	ALTERNATE 3

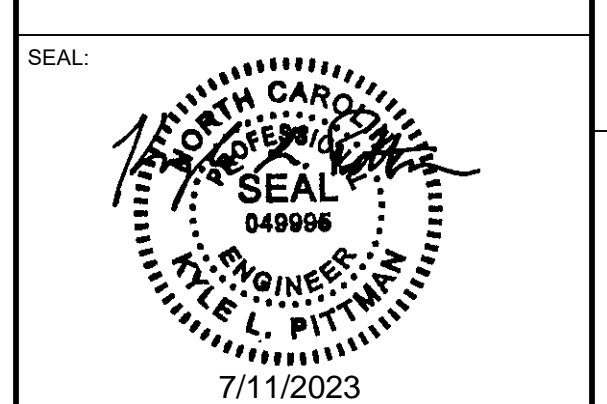
PRICING ALTERNATES
 ALTERNATE 1 - DUCTLESS SPLIT SYSTEM
 INSTALLATION OF A NEW DUCTLESS SPLIT SYSTEM IN MECHANICAL ROOM 137 WITH INDEPENDENT CONTROLS TO BE MONITORED BY BAS.
 ALTERNATE 2 - CHILLED WATER PUMP
 INSTALLATION OF A NEW STANDBY CHILLED WATER PUMP WITH AUTOMATIC CONTROLS.
 ALTERNATE 3 - EXHAUST FAN VARIABLE FREQUENCY DRIVES
 PROVIDE VFD FOR REPLACEMENT EXHAUST FANS INCLUDING EF-1, EF-2, EF-4, EF-7, EF-8, EF-9, EF-10, EF-11, EF-12, EF-14.
 ALTERNATE 4 - AHU-1A & AHU-1B
 REMOVAL OF THE SUPPLY FAN INLET GUIDE VANES. INSTALLATION OF INVERTER-DUTY FAN MOTORS. INSTALLATION OF NEW VARIABLE FREQUENCY DRIVES WITH AUTOMATIC CONTROLS.



2 WEST EDENTON STREET
 RALEIGH, NORTH CAROLINA 27601

REV	DESCRIPTION	DATE

BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
 DESIGNED BY: FLT SCALE: 12" = 1'-0"
 CHECKED BY: KAN RFM JOB NO.: 02220164.0
 PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME:
Eddy Building HVAC & Lab Exhaust Upgrades & Repairs
 SCO ID: #22-24510-01A
 PROJECT ADDRESS:
 4300 REEDY CREEK,
 EDDY BUILDING,
 RALEIGH, NC 27607

ELECTRICAL SINGLE LINE DIAGRAM

DRAWING NUMBER:
E-601

GENERAL NOTES

1. CIRCUITS SHOWN IN HALFTONE ARE EXISTING TO REMAIN
CIRCUITS SHOWN IN BOLD DENOTES SCOPE OF WORK.



PANELBOARD: H2 (EXISTING) LOCATION: MOUNTING: ENCL NEMA: MIN AIC: MAINS: MCB VOLTS: 480/277 Wye PHASE: 3 WIRES: 4 AMPS: 225

PANEL NOTES: PROVIDE GROUND BUS PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE A LIGHTING LOAD OF 2.21 KVA HAS BEEN ESTIMATED FOR LIGHTING CIRCUITS

Table with columns: WIRE SIZE, LOAD DESCRIPTION, P, TRIP AMPS, TYPE, CKT, A, B, C, CT, TYPE, TRIP AMPS, P, LOAD DESCRIPTION, WIRE SIZE. Lists various electrical loads and their specifications.

BREAKER TYPE KEYS: LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL) ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Summary table for Panel H2: Load Classification, Connected Load, Demand Factor, Estimated Demand, Panel Totals (Total Conn. Load, Total Est. Demand, Total Conn. Current, Total Est. Demand Current).

LOAD SUMMARY: EXISTING LOAD 109.34 KW, LOADS REMOVED 12.47 KW, LOADS ADDED 18.30 KW, NET LOAD 5.83 KW, TOTAL LOAD 115.17 KW

PANELBOARD: H3 (EXISTING) LOCATION: MOUNTING: ENCL NEMA: MIN AIC: MAINS: MCB VOLTS: 480/277 Wye PHASE: 3 WIRES: 4 AMPS: 225

PANEL NOTES: PROVIDE GROUND BUS PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE A LIGHTING LOAD OF 2.21 KVA HAS BEEN ESTIMATED FOR LIGHTING CIRCUITS

Table with columns: WIRE SIZE, LOAD DESCRIPTION, P, TRIP AMPS, TYPE, CKT, A, B, C, CT, TYPE, TRIP AMPS, P, LOAD DESCRIPTION, WIRE SIZE. Lists various electrical loads and their specifications.

BREAKER TYPE KEYS: LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL) ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Summary table for Panel H3: Load Classification, Connected Load, Demand Factor, Estimated Demand, Panel Totals (Total Conn. Load, Total Est. Demand, Total Conn. Current, Total Est. Demand Current).

LOAD SUMMARY: EXISTING LOAD 71.34 KW, LOADS REMOVED 0.00 KW, LOADS ADDED 0.00 KW, NET LOAD 0.00 KW, TOTAL LOAD 71.34 KW

PANELBOARD: L3B LOCATION: MOUNTING: ENCL NEMA: MIN AIC: MAINS: MCB VOLTS: 208/120 Wye PHASE: 3 WIRES: 4 AMPS: 225

PANEL NOTES: PROVIDE GROUND BUS PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

Table with columns: WIRE SIZE, LOAD DESCRIPTION, P, TRIP AMPS, TYPE, CKT, A, B, C, CT, TYPE, TRIP AMPS, P, LOAD DESCRIPTION, WIRE SIZE. Lists various electrical loads and their specifications.

BREAKER TYPE KEYS: LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL) ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Summary table for Panel L3B: Load Classification, Connected Load, Demand Factor, Estimated Demand, Panel Totals (Total Conn. Load, Total Est. Demand, Total Conn. Current, Total Est. Demand Current).

LOAD SUMMARY: EXISTING LOAD 19.55 KW, LOADS REMOVED 0.00 KW, LOADS ADDED 2.56 KW, NET LOAD 2.56 KW, TOTAL LOAD 22.11 KW

PANELBOARD: L4 (EXISTING) LOCATION: MOUNTING: ENCL NEMA: MIN AIC: MAINS: MLO VOLTS: 208/120 Wye PHASE: 3 WIRES: 4 AMPS: 225

PANEL NOTES: PROVIDE GROUND BUS PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

Table with columns: WIRE SIZE, LOAD DESCRIPTION, P, TRIP AMPS, TYPE, CKT, A, B, C, CT, TYPE, TRIP AMPS, P, LOAD DESCRIPTION, WIRE SIZE. Lists various electrical loads and their specifications.

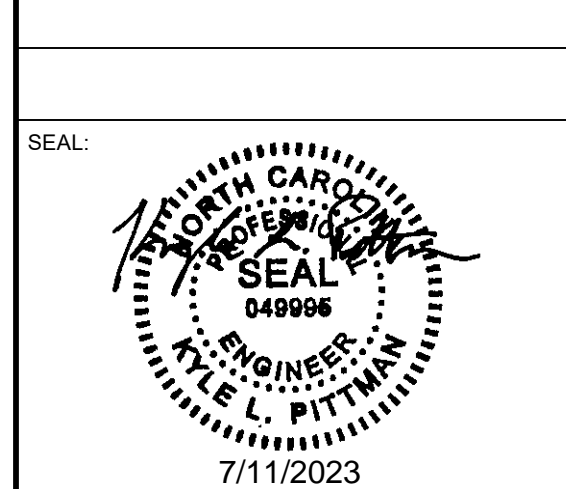
BREAKER TYPE KEYS: LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL) ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Summary table for Panel L4: Load Classification, Connected Load, Demand Factor, Estimated Demand, Panel Totals (Total Conn. Load, Total Est. Demand, Total Conn. Current, Total Est. Demand Current).

LOAD SUMMARY: EXISTING LOAD 21.18 KW, LOADS REMOVED 0.00 KW, LOADS ADDED 1.54 KW, NET LOAD 1.54 KW, TOTAL LOAD 22.72 KW

Table with columns: REV, DESCRIPTION, DATE. Revision tracking table.

BID DOCUMENTS



DRAWN BY: JAA DATE: 07/11/2023
DESIGNED BY: FLT SCALE:

CHECKED BY: KAN RMF JOB NO.: 02220164.0
PROJ. MGR.: KAN CLIENT JOB #:

PROJECT NAME: Eddy Building HVAC & Lab Exhaust Upgrades & Repairs

SCO ID: #22-24510-01A
PROJECT ADDRESS: 4300 REEDY CREEK, EDDY BUILDING, RALEIGH, NC 27607

DRAWING TITLE: ELECTRICAL PANEL SCHEDULES

DRAWING NUMBER: E-602