

[illegible]

FIRE SYSTEM INFORMATION

FIRE SYSTEM NO	TAG	TYPE	SIZE	FLOW POINTS	INSTALLATION	
					SYSTEM	LOCATION ON HOOD
1		TANK FS	4.0/4.0	36	WALL UTILITY CABINET LEFT	N/A
2		TANK FS	4.0/4.0	36	WALL UTILITY CABINET LEFT	N/A

GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		SC ELECTRICAL	2.000	CAPTIVEAIRE SYSTEMS
2		SC ELECTRICAL	2.000	CAPTIVEAIRE SYSTEMS

NOTES

- FIELD PIPE DROPS AS SHOWN
- PIPING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- FIELD INSTALLED DROP: FACTORY WILL PROVIDE QTY 2 60IN LONG PIECES OF CHROME PLATED PIPING SHIPPED LOOSE TO BE FIELD-INSTALLED.
- SHIP LOOSE DROP: FACTORY WILL PROVIDE THE EXACT CHROME PIPE LENGTH NEEDED SHIPPED LOOSE TO BE FIELD-INSTALLED.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- OVERLAPPING COVERAGE SHALL NOT BE USED ON ANY APPLIANCE WITH AN OBSTRUCTION.
- IF APPLICABLE, EXTENDED PRE-PIPED DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.

- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.

- THIS FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

- DL-F NOZZLE PART NUMBER REPLACES 3070-3/8H-10-SS

SYSTEM SIZE: TANK-SP-2-WC TOTAL FP REQUIRED: 36.
HOOD # 2 4' 0.00' LONG x 36" WIDE x 50" HIGH.
RISER # 1 SIZE: 8" x 8"
HOOD # 2 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 3 4' 0.00' LONG x 36" WIDE x 50" HIGH.
RISER # 1 SIZE: 8" x 8"
HOOD # 3 METAL BLOW-OFF CAPS INCLUDED.

- HEAVY-DUTY APPLIANCES (RATED 600°F) WILL REQUIRE AN ADDITIONAL DOWNSTREAM FIRESTAT IN THE EVENT THAT THE DUCTWORK CONTAINS ANY HORIZONTAL RUNS OVER 25 FT IN LENGTH.
- MEDIUM TO LIGHT-DUTY APPLIANCES (RATED 450°F) WILL NOT REQUIRE ANY ADDITIONAL DOWNSTREAM DETECTION.

LEGEND - FIRE CABINET TANK SYSTEM

- 4 GALLON TANK.
- PRIMARY ACTUATOR RELEASE.
- SECONDARY ACTUATOR RELEASE.
- PRESSURE SUPERVISION SWITCH.
- PRIMARY HOSE ASSEMBLY.
- SECONDARY HOSE ASSEMBLY.
- REMOTE MANUAL ACTUATION DEVICE.

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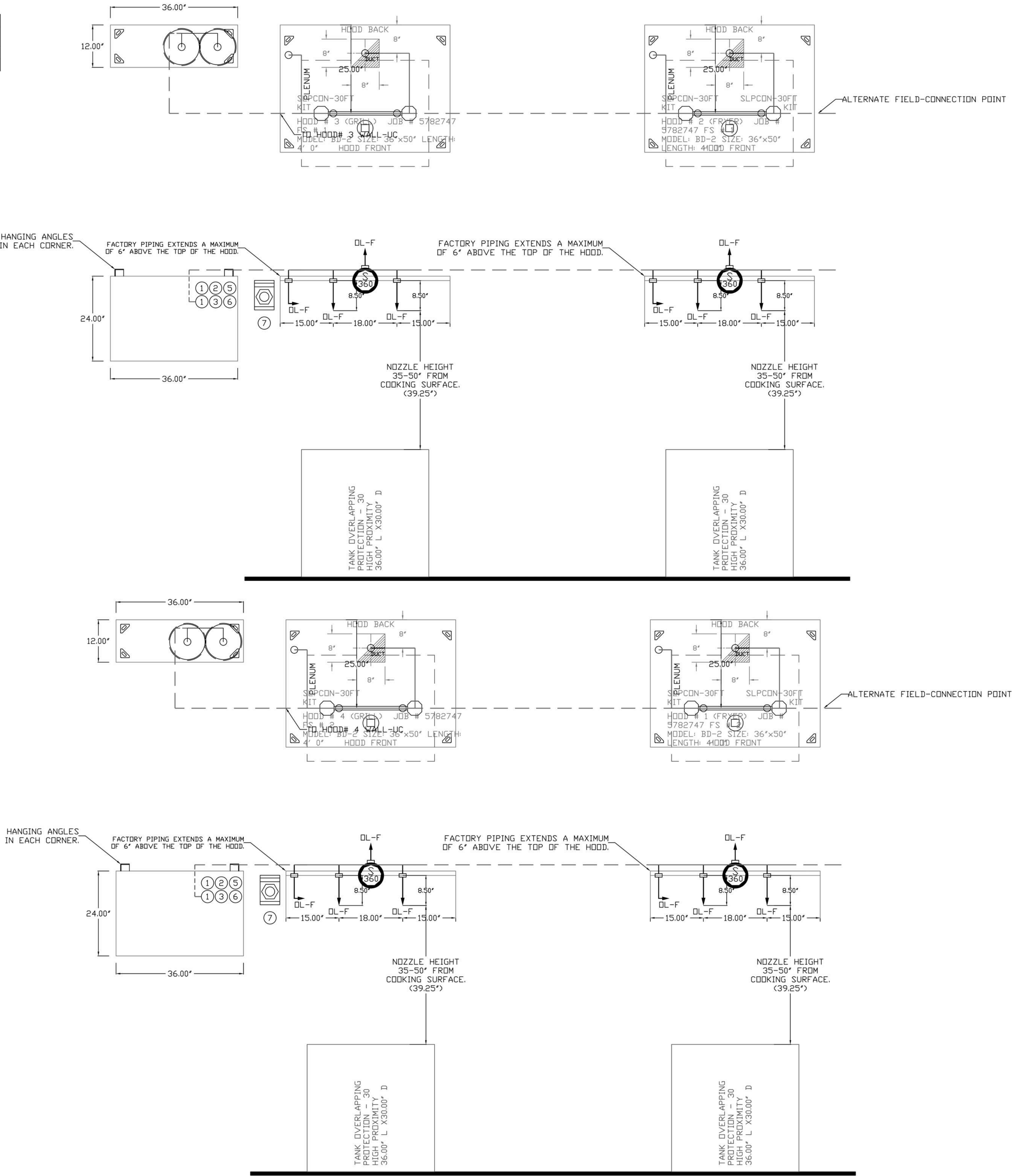
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REVISIONS

DESCRIPTION	DATE



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CAPTIVEAIRE

Shake Shack-1375-Pike 7, VA-R2(Kitchen)
VIENNA, VA, 22182

DATE: 4/24/2023

DWG.#:
5967839

DRAWN BY: Joe.shilba

SCALE:
3/4" = 1'-0"

MASTER DRAWING

SHEET NO.
2



VA - 1375 - PIKE 7
8350 LEESBURG PIKE
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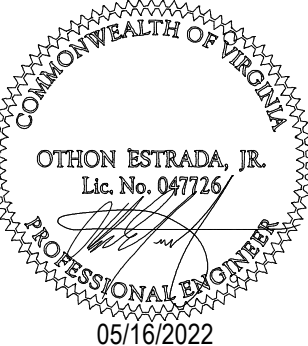
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Seal / Signature



Project Name

PIKE 7

Project Number

069.6538.000

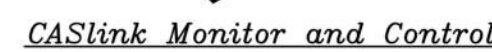
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Scale

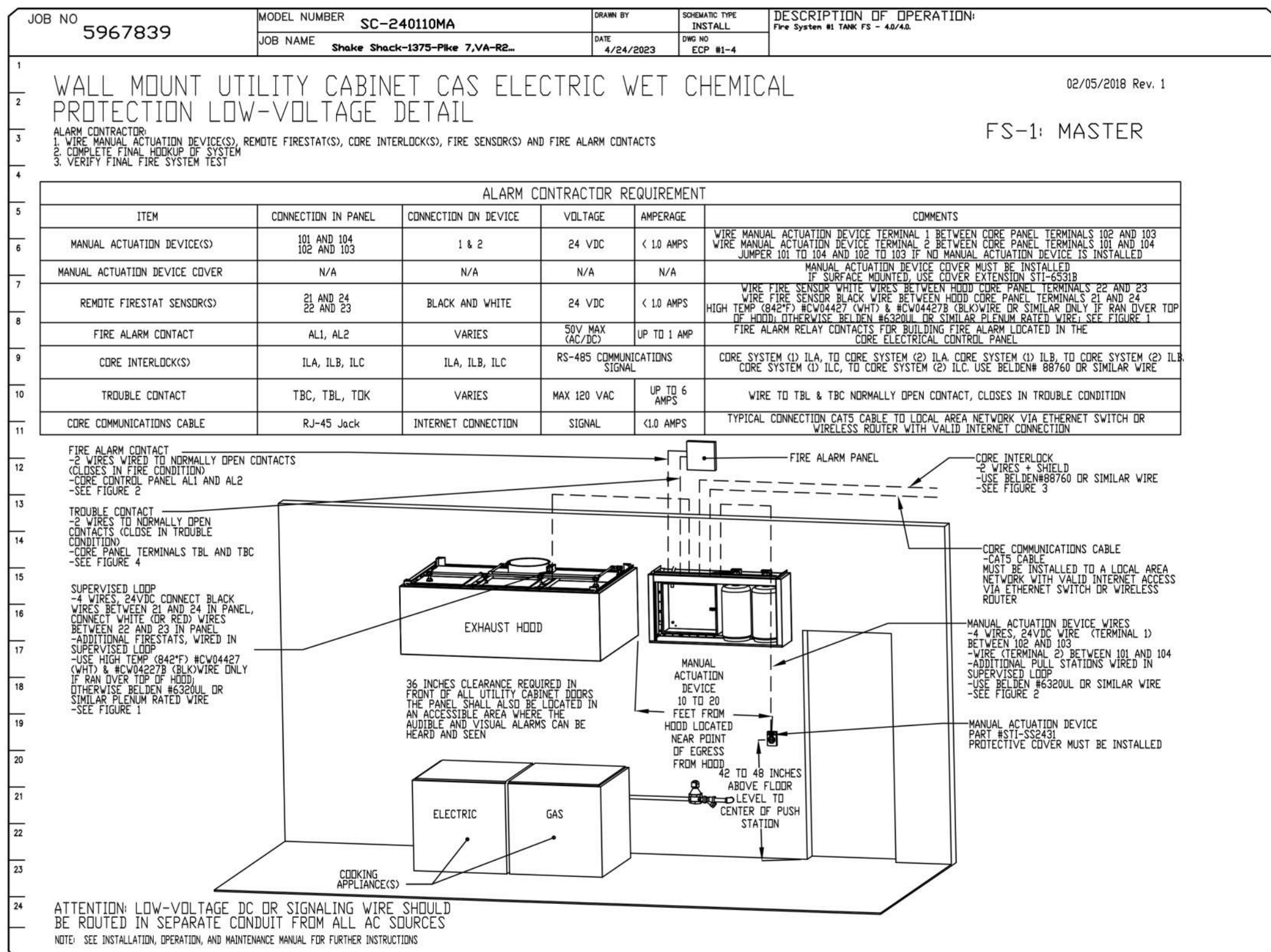
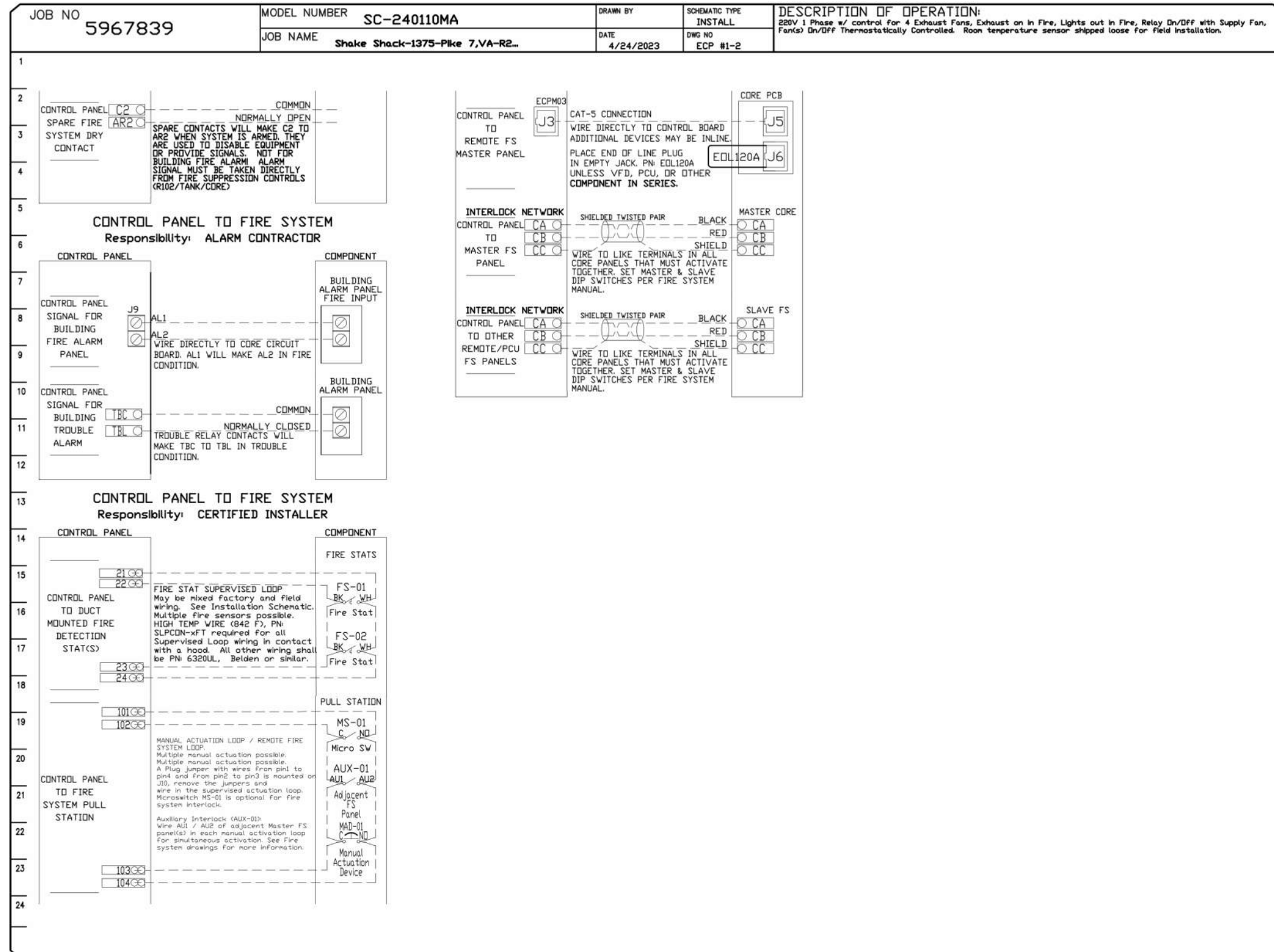
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NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED					
				LOCATION	QUANTITY		FAN TAG	TYPE	Φ	HP	VOLT	FLA
1		SC-240110MA	WALL MOUNT IN SS BOX 18" x 18" x 6"	05 ~ SS WALL MOUNT BOX	1 LIGHT	SMART CONTROLS THERMOSTATIC CONTROL W/ RELAY ON/OFF WITH SUPPLY	KEF-1	EXHAUST	1	0.500	208	3.8
					1 FAN		KEF-2	EXHAUST	1	0.500	208	3.8
							KEF-3	EXHAUST	1	0.500	208	3.8
							KEF-4	EXHAUST	1	0.500	208	3.8

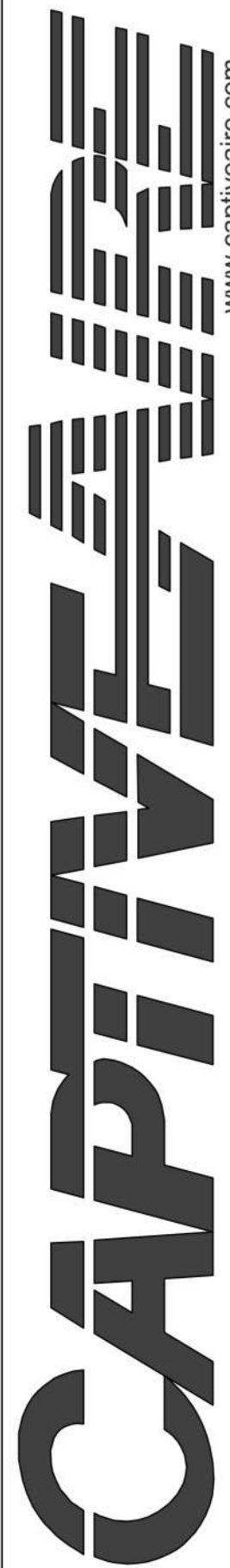


- Hood control panel to support communications to cloud-based Building Management System.
- Hood Control Panel to allow cloud-based Building Management System to monitor real time parameters outlined as MONITOR in the points list.
- Hood Control Panel to allow cloud-based Building Management System to control parameters outlined as CONTROL in the points list.
- Hood Control Panel to allow cloud-based Building Management System to implement SYSTEM ECONOMIZER control strategies for fully integrated Building Management.

DC Padings	Function	DC Padings	Function
Room Temperature	MONITOR	Room Temperature(s)	MONITOR
Duct Temperature(s)	MONITOR	Duct Temperature(s)	MONITOR
Water Discharge Temperature	MONITOR	Water Discharge Temperature	MONITOR
Aluminum Duct Discharge Temperature	MONITOR	Aluminum Duct Discharge Temperature	MONITOR
Fan Speed	MONITOR	Controlled Fans	MONITOR
Fan Amperage	MONITOR	Fan Faults	MONITOR
Fan Power	MONITOR	Fan Status	MONITOR
Controlled Fans	MONITOR	PICT Filter Chip Peripherals	MONITOR
Fan Faults	MONITOR	Fan Conditions	MONITOR
Fan Status	MONITOR	CPU Fan Operation	MONITOR
PICT Faults	MONITOR	Bus/IO Error Messages	MONITOR
PICT Filter Chip Peripherals	MONITOR	Fan Failure(s)	MONITOR
Fan Conditions	MONITOR	Light Pollution	MONITOR & CONTROL
CPU Fan Operation	MONITOR	Push Buttons	MONITOR & CONTROL
Bus/IO Error Messages	MONITOR		
Pushing Presence	MONITOR		
Drive Time Buttons	MONITOR & CONTROL		
Fuse Status	MONITOR & CONTROL		
Light Pollution	MONITOR & CONTROL		
Push Buttons	MONITOR & CONTROL		



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DESCRIPTION	DATE:
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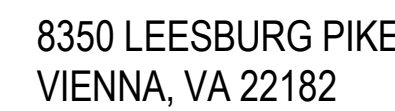


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4



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Seal / Signature



PIKE 7

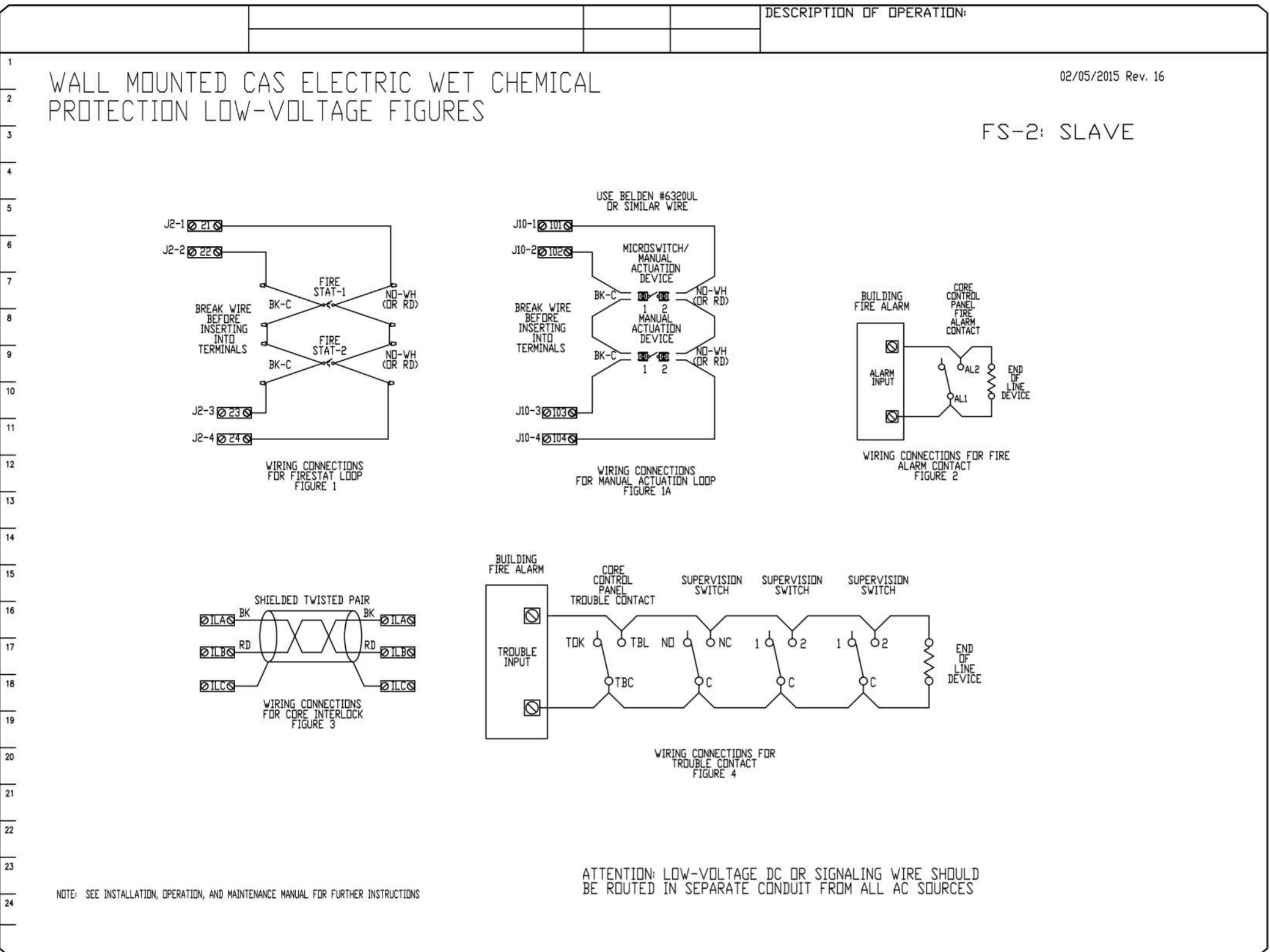
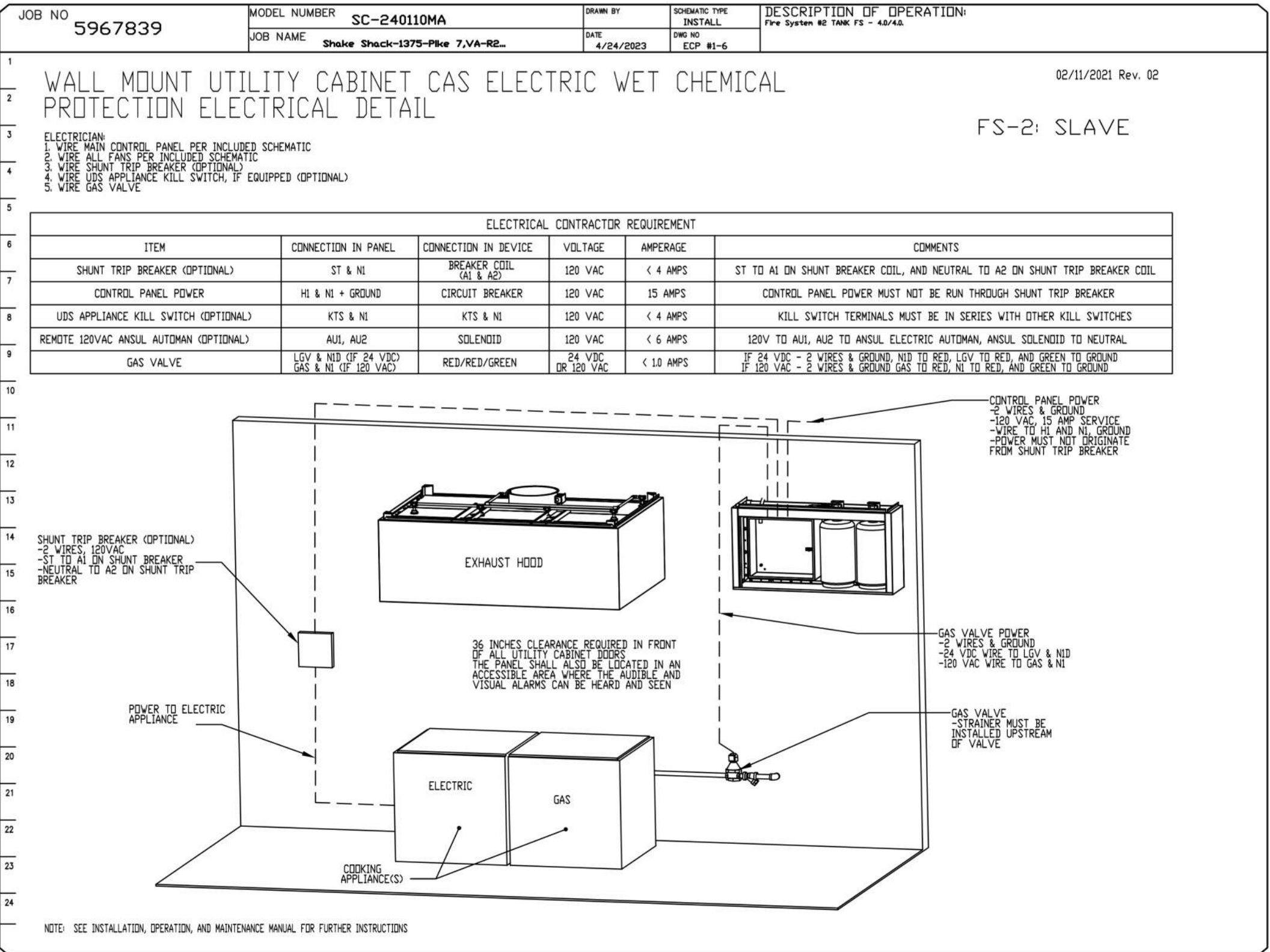
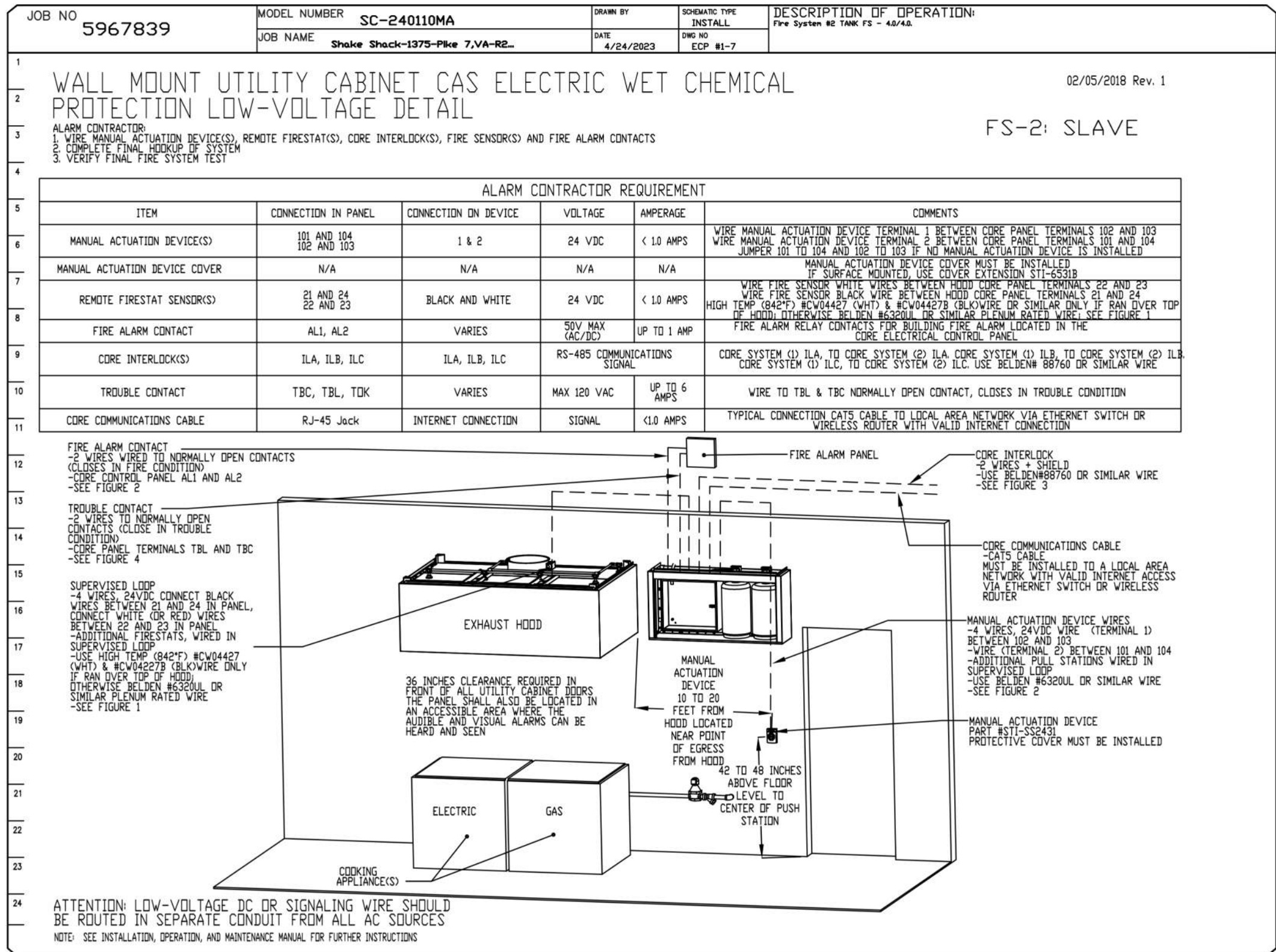
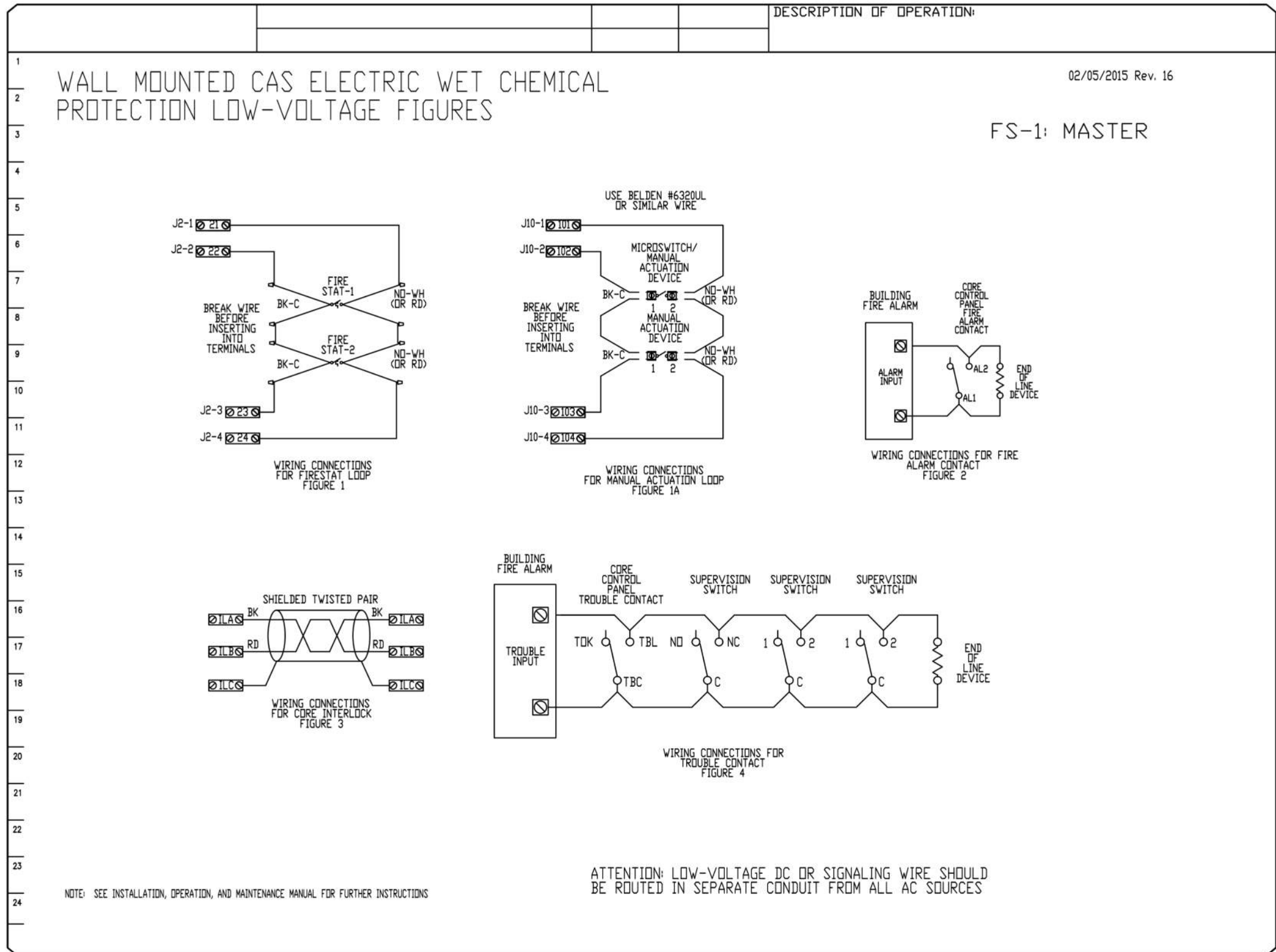
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Shake Shack-1375-Pike 7, VA-R2(Kitchen)

VIENNA, VA, 22182

DATE: 4/24/2023

DWG.#: 5967839

DRAWN BY: Joe.shilba

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 5

SHAKE SHACK

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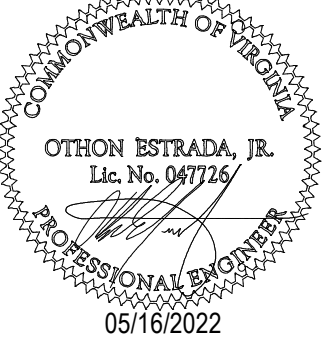
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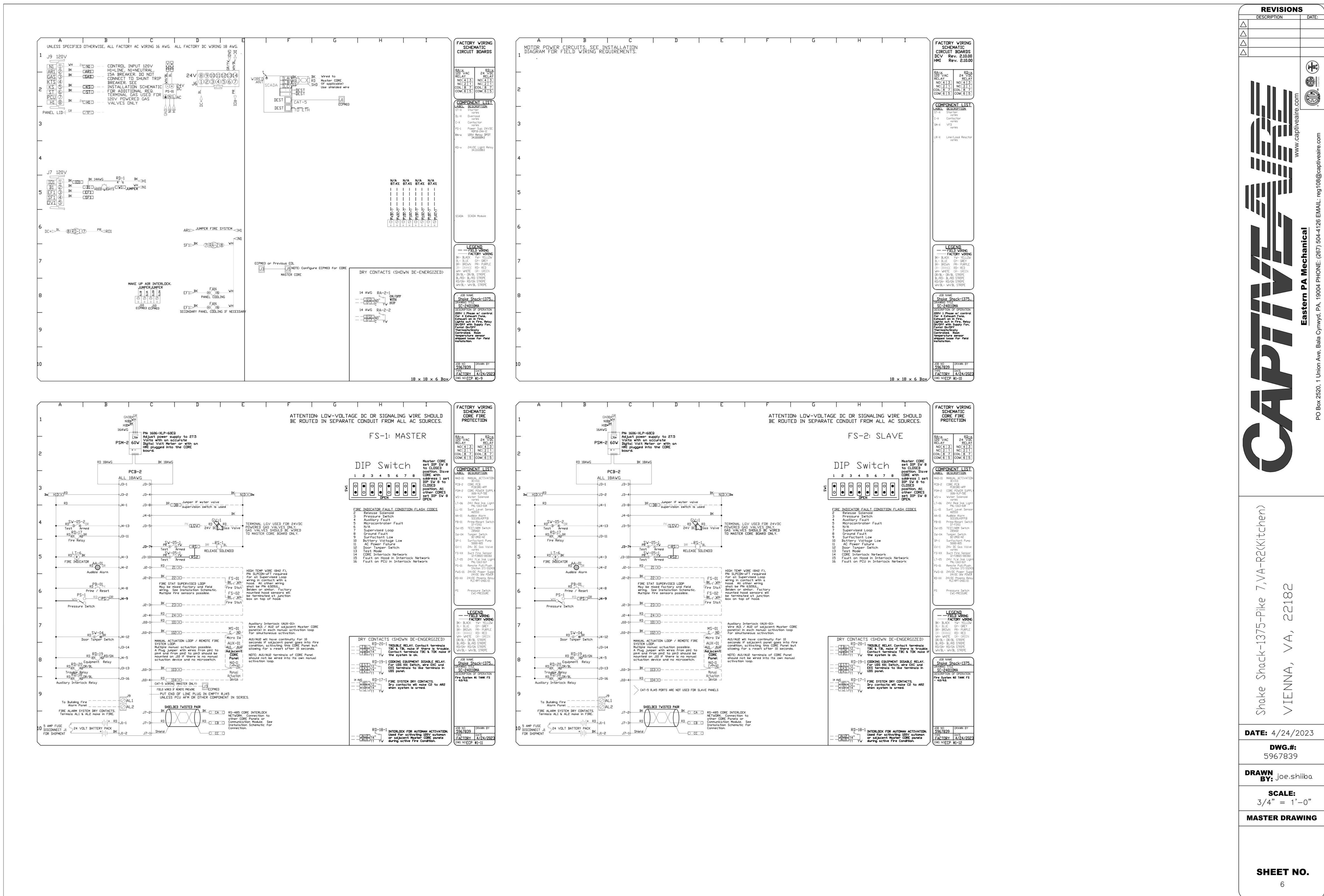
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M805



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Snake Shack-1375-Pike 7, VA-R2(Kitchen)
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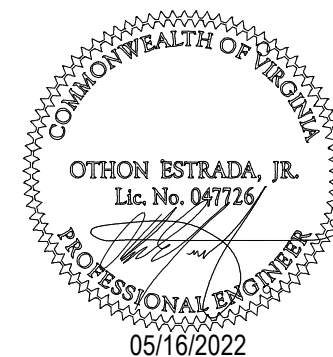
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MASTER DRAWING

SHEET NO.
6

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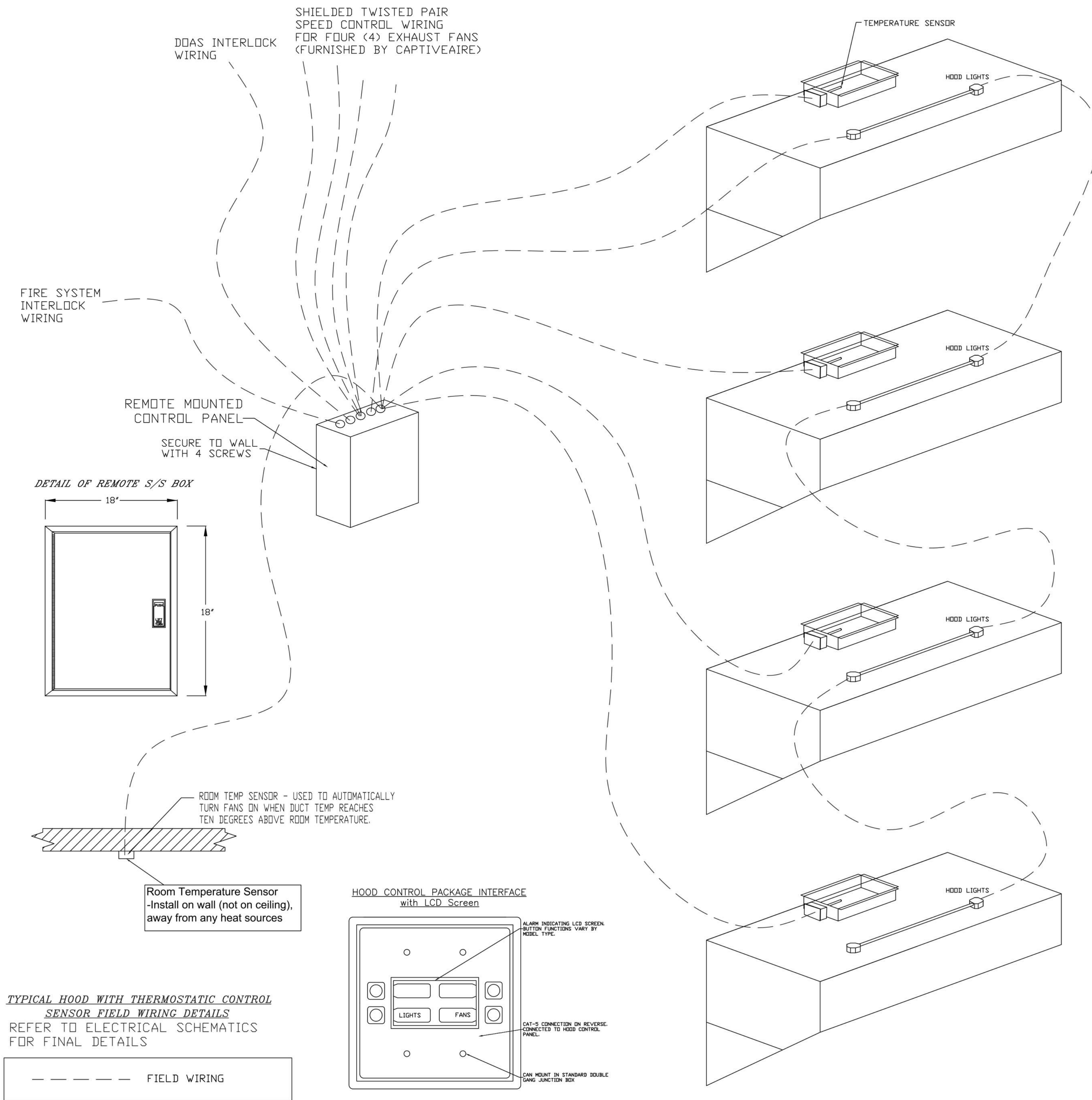
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M806

CRIMSON+ CONTROL DETAILS

LOW VOLTAGE & INTERLOCKS (SEE SCHEMATICS FOR LINE VOLTAGE)



SC- Specification:

The Electrical Package, typically FP, is designed to thermostatically activate the exhaust fans for an exhaust hood whenever elevated temperatures are sensed in the exhaust system. This option will meet the requirements of IMC 507.2.1.1 by providing a thermostat(s) mounted in the duct or hood riser to sense increased exhaust temperatures. Controls shall be listed by ETL (UL 508A). The control enclosure shall be NEMA 1 rated and listed for installation inside of the exhaust hood utility cabinet. The control enclosure may be constructed of stainless steel or painted steel.

Temperature probes(s) located in the duct riser shall be constructed of Stainless Steel. A room temperature sensor is also provided for field installation in the kitchen space in order to start the fan(s) based on the temperature differential between the room and the exhaust air in the duct, rather than fixed set-points. The system is factory pre-set to activate the fans at 10 deg F° above the room temperature.

Once the duct temperature reaches the activation point, the exhaust fans will be activated. The controls also provide hysteresis to prevent cycling of the fans after the cooking appliances have been turned off and the heat in the exhaust system is reduced. The hysteresis is factory set 2 degrees and will keep the exhaust running until the temperature falls 2 degrees below the activation set point. A hysteresis timer also exists to keep the fans running for at least 30 min after being activated by the temperature rise.

The activation and hysteresis settings may be field adjusted on the board LCD interface located inside the control enclosure to meet application needs. The panel is factory configured to shut down supply fans, turn on the exhaust fans and turn off the hood lights in a fire condition.

CUSTOMER APPROVAL TO MANUFACTURE:

Approved as Noted ☐
Approved with NO Exception Taken ☐
Revise and Resubmit ☐
SIGNATURE _____
Your Title _____ Date _____

REVISIONS	
DESCRIPTION	DATE

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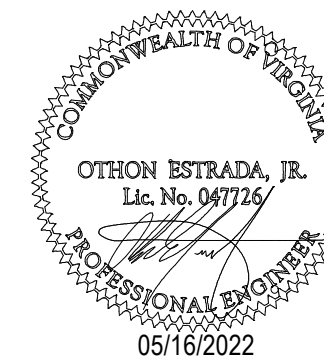
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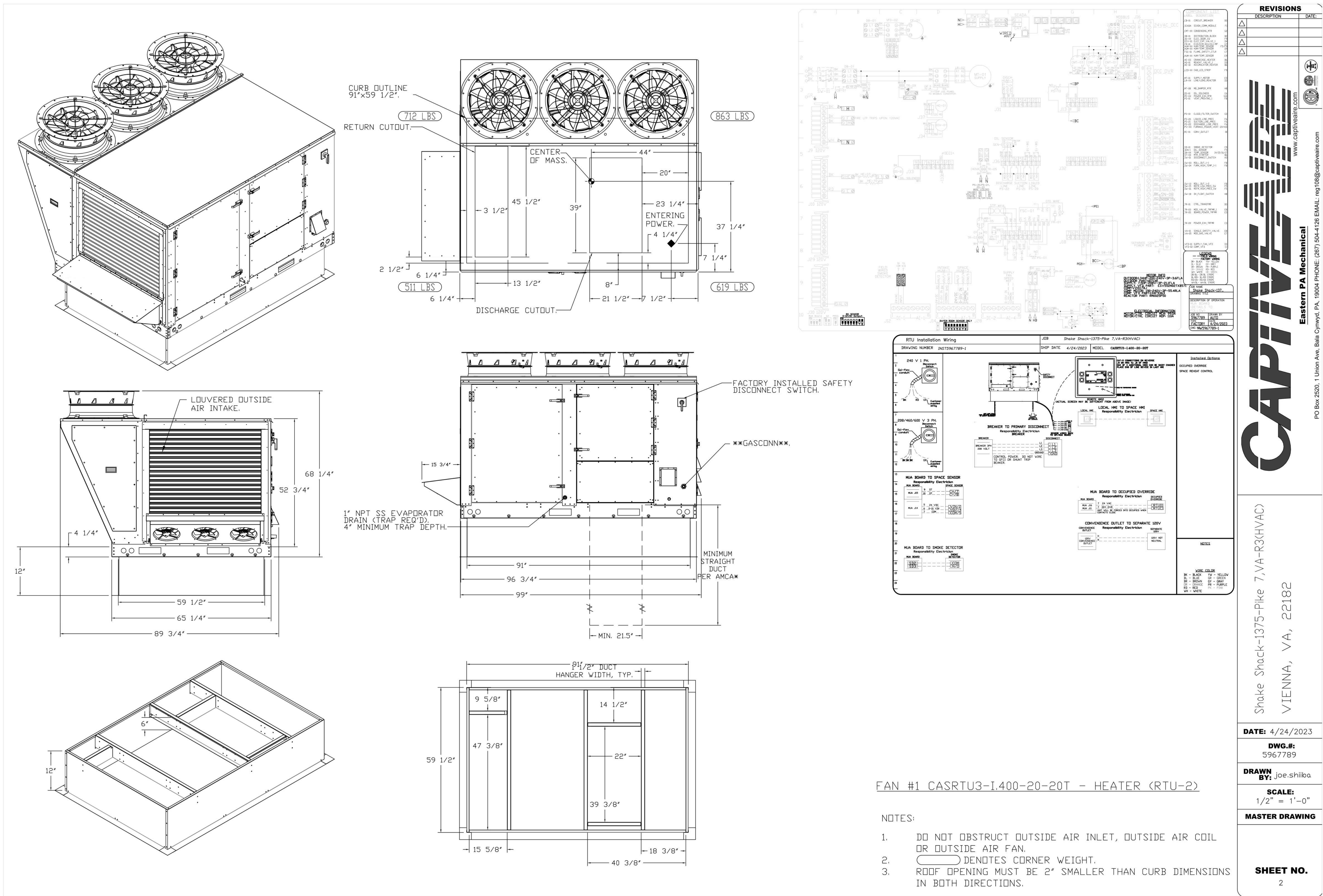
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Description

CAPTIVEAIRE DRAWINGS

Scale

M807



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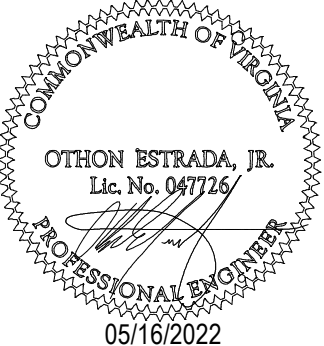
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CAPTIVEAIRE DRAWINGS

Scale

M808

RESPONSIBILITY MATRIX							
THIS SCHEDULE IS PROVIDED FOR QUICK REFERENCE ONLY. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL WORK DESCRIBED IN THE CONSTRUCTION DOCUMENTS. CONFLICTS BETWEEN THIS SCHEDULE AND THE REST OF THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ARCHITECT'S ATTENTION PRIOR TO BEGINNING WORK.							
DESCRIPTION	FURNISHED			INSTALLED			REMARKS
	GENERAL CONTRACTOR	OWNER	LANDLORD	GENERAL CONTRACTOR	OWNER	LANDLORD	
DIVISION 23: HEATING, VENTILATING, AND AIR CONDITIONING							
23.1 HVAC DUCTWORK AND PIPING IDENTIFICATION							
23.1.1 HVAC DUCTWORK SYSTEM IDENTIFICATION	•			•			
23.1.2 PIPING SYSTEM IDENTIFICATION	•			•			
23.1.3 UTILITY SHUT OFF IDENTIFICATION IN KITCHEN	•			•			
23.1.4 VALVE TAGS AND CHART	•			•			
23.1.5 HVAC DAMPER IDENTIFICATION	•			•			
23.2 ROOF CURBS							
23.2.1 EXHAUST FAN CURBS	•			•			GENERAL CONTRACTOR SCOPE OF WORK TO INCLUDE RIGGING, CURBS, AND ACCESSORIES
23.2.2 ROOFTOP UNIT CURBS	•			•			GENERAL CONTRACTOR SCOPE OF WORK TO INCLUDE RIGGING, CURBS, AND ACCESSORIES
23.2.3 CONDENSING UNIT CURBS	•			•			GENERAL CONTRACTOR SCOPE OF WORK TO INCLUDE RIGGING, CURBS, AND ACCESSORIES
23.2.4 MAKE UP AIR AND DOAS UNIT CURBS		•		•			GENERAL CONTRACTOR SCOPE OF WORK TO INCLUDE RIGGING, CURBS, AND ACCESSORIES
23.2.5 KITCHEN EXHAUST FAN CURBS		•		•			GENERAL CONTRACTOR SCOPE OF WORK TO INCLUDE RIGGING, CURBS, AND ACCESSORIES
23.3 HVAC DUCTWORK SYSTEM COMPONENTS							
23.3.1 HVAC DUCTWORK	•			•			
23.3.2 INSULATION AND FIRE WRAP	•			•			GENERAL CONTACTOR SCOPE OF WORK TO INCLUDE TENANT FIT OUT FROM LANDLORD POINT OF CONNECTION
23.3.3 DAMPERS	•			•			
23.3.4 SMOKE DETECTORS	•			•			
23.3.5 SUPPLY, RETURN, AND EXHAUST GRILLS AND REGISTERS	•			•			
23.4 MECHANICAL PIPING SYSTEM COMPONENTS							
23.4.1 WALK-IN COOLER AND FREEZER REFRIGERATION		•			•		WALK-IN COOLER AND FREEZER SUPPLIED BY VENDOR NO. 27 GENERAL CONTRACTOR SCOPE OF WORK TO INCLUDE PIPING INSTALLATION AND FINAL CONNECTION
23.4.2 REFRIGERATION FOR OTHER HVAC EQUIPMENT	•			•			
23.4.3 CHILLED WATER	•			•			
23.4.4 CONDENSER WATER	•			•			
23.4.5 HEATING HOT WATER	•			•			
23.4.6 VALVES AND ACCESSORIES (E.G. AIR VENTS)	•			•			
23.5 HVAC EQUIPMENT							GENERAL CONTRACTOR SCOPE OF WORK TO INCLUDE RIGGING FOR ALL ROOFTOP EQUIPMENT
23.5.1 SUPPLY FAN	•			•			
23.5.2 TOILET EXHAUST FAN	•			•			
23.5.3 KITCHEN EXHAUST FAN		•		•			SUPPLIED BY VENDOR NO. 26
23.5.4 DUCTED AND NON-DUCTED HEATING AND COOLING UNITS	•			•			
23.5.5 MAKE UP AIR AND DOAS UNITS		•		•			SUPPLIED BY VENDOR NO. 26
23.5.6 ELECTRIC PATIO HEATERS	•			•			
23.5.7 HVAC CONDENSING UNITS	•			•			
23.5.8 REFRIGERATION CONDENSING UNITS		•		•			
23.5.9 RGF PHI SYSTEM	•			•			GENERAL CONTRACTOR TO PURCHASE FROM VENDOR NO. 12 VENDOR SUBSTITUTION IS NOT PERMITTED
23.6 KITCHEN EXHAUST WITH FIRE SUPPRESSION SYSTEM							
23.6.1 HOOD CONTROL PANEL		•		•			SUPPLIED BY VENDOR NO. 26
23.6.2 KITCHEN EXHAUST HOOD		•		•			SUPPLIED BY VENDOR NO. 26
23.6.3 STRUCTURAL SUPPORT	•			•			
23.6.4 ELECTRICAL AND CONTROL WIRING	•			•			
23.6.5 ANSUL SYSTEM		•		•			SUPPLIED BY VENDOR NO. 26 GENERAL CONTRACTOR TO COORDINATE AND FACILITATE SYSTEM SIGN-OFF
23.6.6 ANSUAL WIRING AND UTILITIES CONNECTION	•			•			
23.6.7 ANSUAL GAS VALVE		•		•			SUPPLIED BY VENDOR NO. 26
23.7 COMMISSIONING ACTIVITIES							
23.7.1 GREASE EXHAUST WATER LEAKAGE TEST	•			•			GENERAL CONTRACTOR TO PURCHASE FROM VENDOR NO. 10 VENDOR SUBSTITUTION IS NOT PERMITTED
23.7.2 TESTING AIR BALANCE (TAB) REPORT	•			•			GENERAL CONTRACTOR TO PURCHASE FROM VENDOR NO. 12 VENDOR SUBSTITUTION IS NOT PERMITTED



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△	Date	Description
	05/16/2022	PERMIT AND BID
1	07/25/2022	ADDENDUM #1
2	09/02/2022	ADDENDUM #2
3	10/07/2022	ISSUE FOR BID
5	02/10/2023	BID SET
F	06/27/2023	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

PIKE 7

Project Number

069.6538.000

Description

MECHANICAL RESPONSIBILITY INDEX

Scale

M002

COMcheck Software Version 4.1.5.3
Mechanical Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title:
Location: Vienna, Virginia
Climate Zone: 4a
Project Type: New Construction

Construction Site: Owner/Agent: Designer/Contractor:

Additional Efficiency Package(s)

Credits: 1.0 Required 1.0 Proposed
Reduced Lighting Power, 1.0 credit

Mechanical Systems List

Quantity System Type & Description

- 1 RTU-1 (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 150 kBtu/h
Proposed Efficiency = 80.00% EI, Required Efficiency: 80.00 % EI or 80% AFUE
Cooling: 1 each - Single Package DX Unit, Capacity = 140 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 13.90 EER, Required Efficiency: 10.86 EER + 12.2 IEER
Fan System: RTU-1 [Driving - Compliance (Brake HP method) - Passes
Fans:
FAN 1 Supply, Constant Volume, 5200 CFM, 5.0 motor nameplate hp, 2.5 design brake hp (2.5 max. BHP), 0.0 fan efficiency grade
- 1 RTU-2 (DOAS) (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 394 kBtu/h
Proposed Efficiency = 80.00% EI, Required Efficiency: 80.00 % EI
Cooling: 1 each - Single Package DX Unit, Capacity = 263 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 12.00 EER, Required Efficiency: 9.80 EER + 11.4 IEER
Fan System: RTU-2 [Kitchen - Compliance (Brake HP method) - Passes
Fans:
FAN 2 Supply, Constant Volume, 5200 CFM, 5.0 motor nameplate hp, 3.0 design brake hp (3.0 max. BHP), 0.0 fan efficiency grade
- 1 FCU-1 (Single Zone):
Heating: 1 each - Unit Heater, Electric, Capacity = 10 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Split System, Capacity = 17 kBtu/h, Air-Cooled Condenser, No Economizer, Economizer exception: Low Capacity Residential
Proposed Efficiency = 14.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FCU-1/2 - Compliance (Brake HP method) - Passes
Fans:
FAN 5 Supply, Constant Volume, 600 CFM, 0.1 motor nameplate hp, 0.1 design brake hp (0.1 max. BHP), 0.0 fan efficiency grade
- 1 FCU-2 (Single Zone):
Heating: 1 each - Unit Heater, Electric, Capacity = 10 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Split System, Capacity = 17 kBtu/h, Air-Cooled Condenser, No Economizer, Economizer exception: Low Capacity Residential
Proposed Efficiency = 14.00 SEER, Required Efficiency: 13.00 SEER
Fan System: FCU-1/2 - Compliance (Brake HP method) - Passes
Fans:

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Quantity System Type & Description

- FAN 5 Supply, Constant Volume, 600 CFM, 0.1 motor nameplate hp, 0.1 design brake hp (0.1 max. BHP), 0.0 fan efficiency grade
- 2 Water Heater 1:
Gas Instantaneous Water Heater, Capacity: 65 gallons, Input Rating: 200 kBtu/h w/ Circulation Pump
No minimum efficiency requirement applies

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.5.3 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Othon Estrada Jr
Name - Title Signature Date 05/04/2022

Project Title:
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COMcheck Software Version 4.1.5.3
Inspection Checklist

Energy Code: 2018 IECC

Requirements: 100.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C103.2 [PR3] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the service water heating systems and equipment and document where exceptions to the standard are claimed. Hot water system sized per manufacturer's sizing guide.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C406 [PR5] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)
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Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6] ¹	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6] ¹	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6] ¹	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.5, C404.5.1, C404.5.2 [PL6] ¹	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C404.6.1, C404.6.2 [PL7] ¹	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C404.6.3 [PL7] ¹	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.6.3 [PL7] ¹	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.6.3 [PL7] ¹	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.6.3 [PL7] ¹	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.

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Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.7 [PL8] ¹	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.7 [PL8] ¹	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.7 [PL8] ¹	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.7 [PL8] ¹	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.7 [PL8] ¹	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.2.4 [ME41] ¹	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.11.3 [ME61] ¹	HVAC piping insulation insulated in accordance with Table C403.11.3. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M590
C403.11.3 [ME61] ¹	HVAC piping insulation insulated in accordance with Table C403.11.3. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M590
C403.8.4 [ME142] ¹	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.8.4 [ME142] ¹	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.8.4 [ME142] ¹	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.8.4 [ME142] ¹	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.8.4 [ME142] ¹	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.8.5 [ME143] ¹	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.8.5 [ME143] ¹	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Location on plans/spec: M701
C403.8.5 [ME143] ¹	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.

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Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.12.2 [FO9] ¹	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature and outdoor temperature. Future connection to controls.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)
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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.8.5 [ME143] ¹	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.12.1 [ME71] ¹	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.2.3 [ME55] ¹	HVAC equipment efficiency verified.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	See the Mechanical Systems list for values.
C403.5.5 [ME113] ¹	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.5.5 [ME113] ¹	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.2.2 [ME59] ¹	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.7.1 [ME59] ¹	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Systems with design outdoor air of less than 1200 cfm.
C403.7.2 [ME115] ¹	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.7.6 [ME141] ¹	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.7.6.1 and C403.7.6.2).	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.7.4 [ME57] ¹	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.7.5 [ME116] ¹	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)
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Date Description

- 05/16/2022 PERMIT AND BID
1 07/25/2022 ADDENDUM #1
2 09/02/2022 ADDENDUM #2
3 10/07/2022 ISSUE FOR BID
5 02/10/2023 BID SET
F 06/27/2023 ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

PIKE 7

Project Number

069.6538.000

Description

MECHANICAL COMCHECK FORMS

Scale

M003

Section # & Req. ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.1.1.1 C403.1.1.2 [ME601]	HVAC ducts and plenums insulated in accordance with C403.11.1 and constructed in accordance with C403.11.2, verification may need to occur during Foundation Inspection.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M590
C403.5.1 C403.5.2 [ME62]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off integrated economizer control, and provide a means to relieve excess outside air during operation.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.5.1 C403.5.2 [ME62]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off integrated economizer control, and provide a means to relieve excess outside air during operation.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.5.3.3 [ME124]	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.5.3.3 [ME124]	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.5.4 [ME125]	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.5.3.3 [ME125]	System capable of relieving excess outdoor air during air economizer operation to prevent overpressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.5.3.5 [ME126]	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.5.3.5 [ME126]	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701

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Section # & Req. ID	Final Inspection	Complies?	Comments/Assumptions
C403.2.4.2.3 [F141]	Systems include optimum start controls.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.2.4.2.3 [F141]	Systems include optimum start controls.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.2.4.2.3 [F141]	Systems include optimum start controls.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C404.3 [F111]	Heat traps installed on supply and discharge piping of non-circulating systems.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C404.4 [F125]	All piping insulated in accordance with section details and Table C403.11.3.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: P590
C404.6.1 [F112]	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.1.1 [F157]	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.2.1 [F126]	Commissioning plan developed by registered design professional or approved agency.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.2.3.1 [F131]	HVAC equipment has been tested to ensure proper operation.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.2.3.2 [F130]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.2.3.3 [F132]	Economizers have been tested to ensure proper operation.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.2.4 [F129]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

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Section # & Req. ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.1.4 [ME63]	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement does not apply. Exception: Requirement does not apply.
C403.3.3 [ME35]	Hot gas bypass limited to: <=240 kBTuh - 50% >240 kBTuh - 25%	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: NA
C403.3.3 [ME35]	Hot gas bypass limited to: <=240 kBTuh - 50% >240 kBTuh - 25%	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: NA
C403.3.3 [ME35]	Hot gas bypass limited to: <=240 kBTuh - 50% >240 kBTuh - 25%	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.3.3 [ME35]	Hot gas bypass limited to: <=240 kBTuh - 50% >240 kBTuh - 25%	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.2.2.1 [ME53]	Air outlets and zone terminal devices have means for air balancing.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M101
C403.5.1 C403.5.2 [ME123]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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Section # & Req. ID	Final Inspection	Complies?	Comments/Assumptions
C408.2.5. [F17]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.2.5. [F143]	An air and/or hydronic system balancing report is provided for HVAC systems.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C408.2.5. [F130]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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Section # & Req. ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.6 [EL26]	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C405.7 [EL27]	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C405.8.2.1 [EL28]	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C405.9 [EL29]	Total voltage drop across the combination of feeders and branch circuits <= 5%.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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Section # & Req. ID	Final Inspection	Complies?	Comments/Assumptions
C303.3. C408.2.5. [F18]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.2.2 [F127]	HVAC systems and equipment capacity does not exceed calculated loads.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.2.4.1 [F147]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.2.4.1 [F147]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.2.4.1 [F147]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.2.4.1 [F147]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met. Location on plans/spec: M701
C403.4.1.2 [F138]	Thermostatic controls have a 5 °F deadband.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.2.4.1 [F120]	Temperature controls have setpoint overlap restrictions.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Exception: Requirement does not apply.
C403.2.4.2 [F139]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.2.4.2.1. C403.2.4.2.2 [F140]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool), 7-day clock, 2-hour occupant override, 10-hour backup	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.
C403.2.4.2.3 [F141]	Systems include optimum start controls.	☐ Complies ☐ Does Not ☐ Not Observable ☐ Not Applicable	Requirement will be met.

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02/10/2023	BID SET
06/21/2023	ISSUE FOR CONSTRUCTION

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Project Name

PIKE 7

Project Number

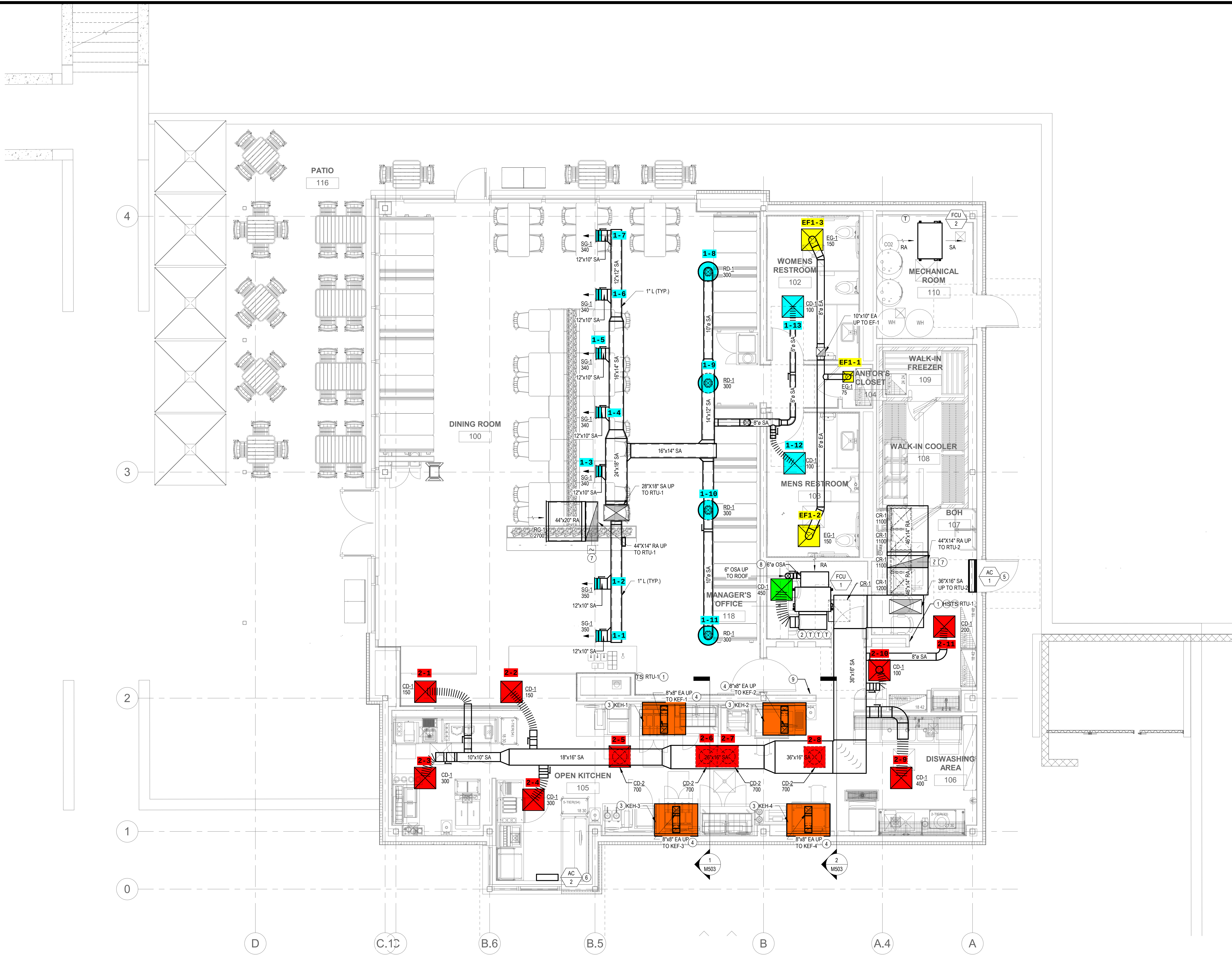
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Description

MECHANICAL COMCHECK FORMS

Scale

M004



SHEET NOTES

1. MOUNT REMOTE TEMPERATURE AND HUMIDITY SENSOR AT 48" ABOVE FINISHED FLOOR. COORDINATE FINAL LOCATION WITH ARCHITECT.
2. MOUNT THERMOSTAT CONTROLLER AT 48" ABOVE FINISHED FLOOR.
3. KITCHEN HOOD AND HOOD FIRE SUPPRESSION SYSTEM FURNISHED BY CAPTIVEAIRE AND INSTALLED BY CONTRACTOR. REFER TO KITCHEN EQUIPMENT DRAWINGS FOR ADDITIONAL INFORMATION. HOOD FIRE ALARM CONNECTIONS INSTALLED BY FIRE ALARM CONTRACTOR. COORDINATE WITH FIRE PROTECTION CONTRACTOR PRIOR TO INSTALLATION FOR REQUIREMENTS.
4. TYPE 1 GREASE EXHAUST DUCT FROM KITCHEN EXHAUST HOOD TO KITCHEN EXHAUST FAN. DUCT TO BE FIRE WRAPPED TO MAINTAIN 6" CLEARANCE TO COMBUSTIBLES.
5. PROVIDE AIR CURTAIN MOUNTED ABOVE DELIVERY DOOR.
6. PROVIDE AIR CURTAIN ABOVE TAKE-OUT WINDOW.
7. DUCT SMOKE DETECTOR TO BE SUPERVISED BY FIRE ALARM SYSTEM.
8. FCU-1 OSA DUCT. BALANCE TO 50 CFM.
9. INSTALL HOOD FIRE SUPPRESSION MANUAL PULL STATION. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH FIRE MARSHALL AND LOCAL CODE REQUIREMENTS.



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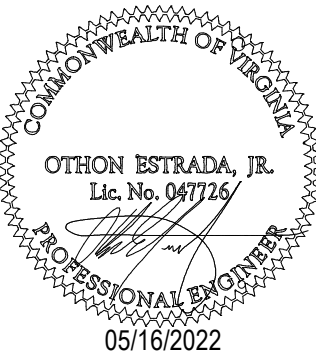
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Project Name

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Project Number

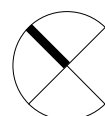
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Description

MECHANICAL FLOOR PLAN

Scale

1/4" = 1'-0"



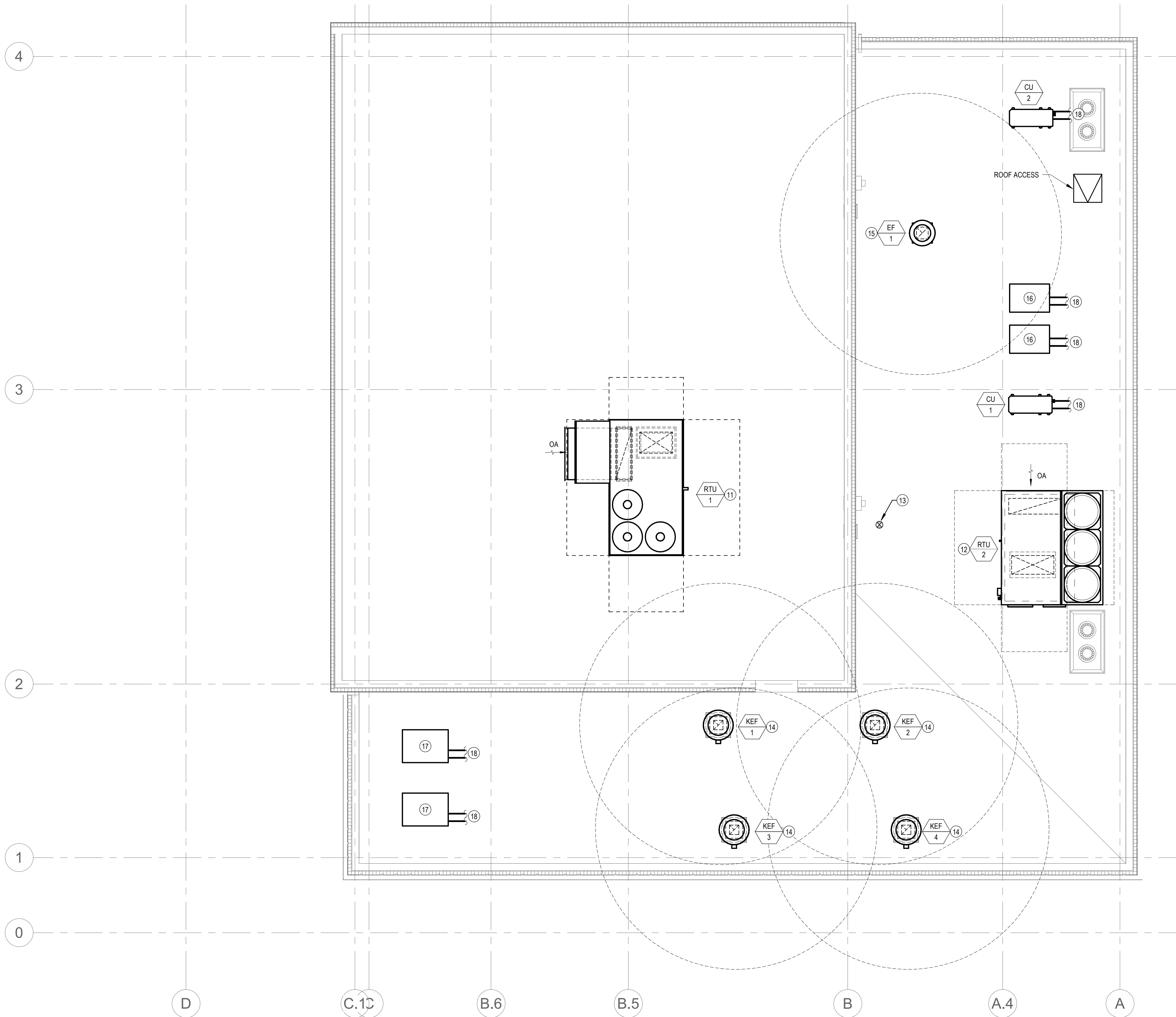
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MECHANICAL ROOF PLAN

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



SHEET NOTES

- 11 RTU SERVING DINING.
- 12 RTU SERVING KITCHEN FURNISHED BY CAPTIVEAIRE AND INSTALLED BY MECHANICAL CONTRACTOR.
- 13 FDU-1 OSA AIR INTAKE. TERMINATE ON ROOF WITH RAINCAP.
- 14 KITCHEN EXHAUST FAN FURNISHED BY CAPTIVEAIRE AND INSTALLED BY MECHANICAL CONTRACTOR.
- 15 EXHAUST FAN SERVING RESTROOMS.
- 16 COOLER/FREEZER CONDENSING UNITS BY OTHERS.
- 17 CUSTARD MACHINE CONDENSING UNIT BY OTHERS.
- 18 FIELD COORDINATE REFRIGERANT PIPING ROUTING.



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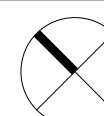
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Description

MECHANICAL ROOF PLAN

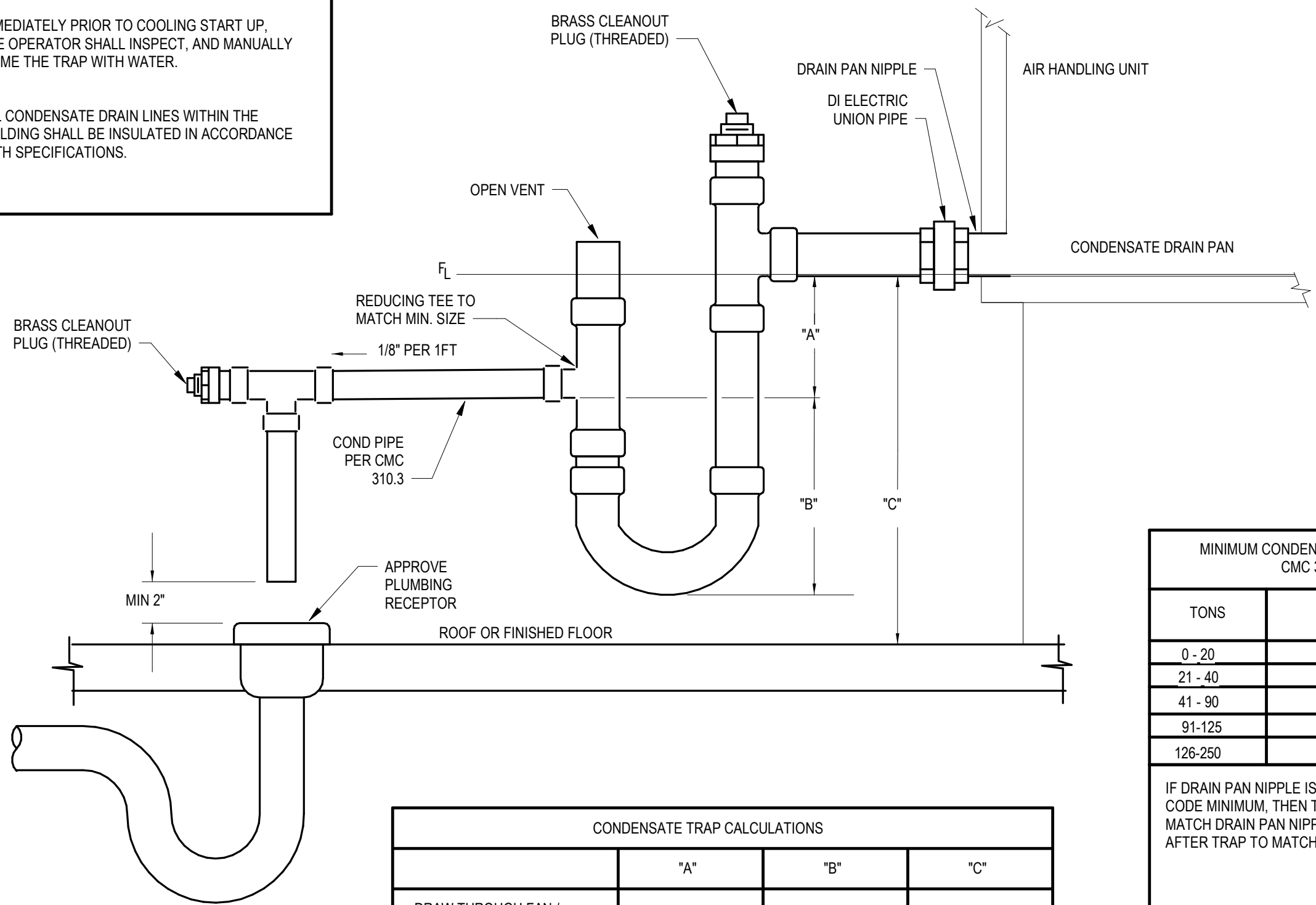
Scale

1/4" = 1'-0"



M121

- NOTES:
- TYPE "L" COPPER CONDENSATE DRAIN PIPE TO RECEPTOR.
 - IMMEDIATELY PRIOR TO COOLING START UP, THE OPERATOR SHALL INSPECT, AND MANUALLY PRIME THE TRAP WITH WATER.
 - ALL CONDENSATE DRAIN LINES WITHIN THE BUILDING SHALL BE INSULATED IN ACCORDANCE WITH SPECIFICATIONS.

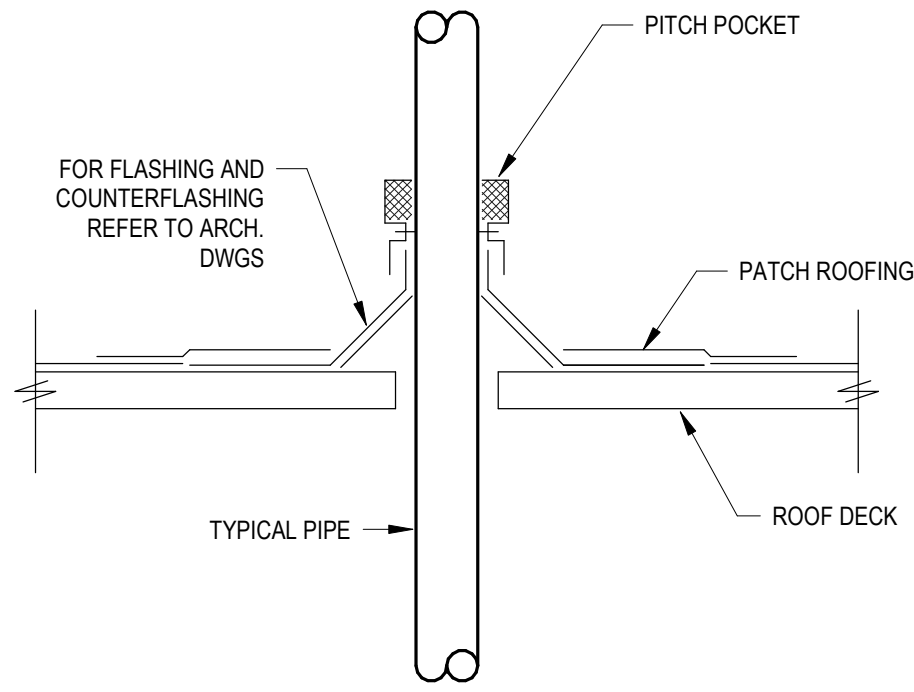


CONDENSATE TRAP CALCULATIONS			
	"A"	"B"	"C"
DRAW THROUGH FAN / NEGATIVE PRESSURE TRAP	TSP+1"	0.5A+PIPE O.D.	MIN. A+B+2"
BLOW THROUGH FAN / POSITIVE PRESSURE TRAP	1" MIN.	TSP+1"	MIN. A+B+2"
TSP= TOTAL STATIC PRESSURE			

MINIMUM CONDENSATE DRAIN SIZE CMC 310.3	
TONS	NOM. PIPE SIZE
0 - 20	3/4"
21 - 40	1"
41 - 90	1-1/4"
91-125	1-1/2"
126-250	2"

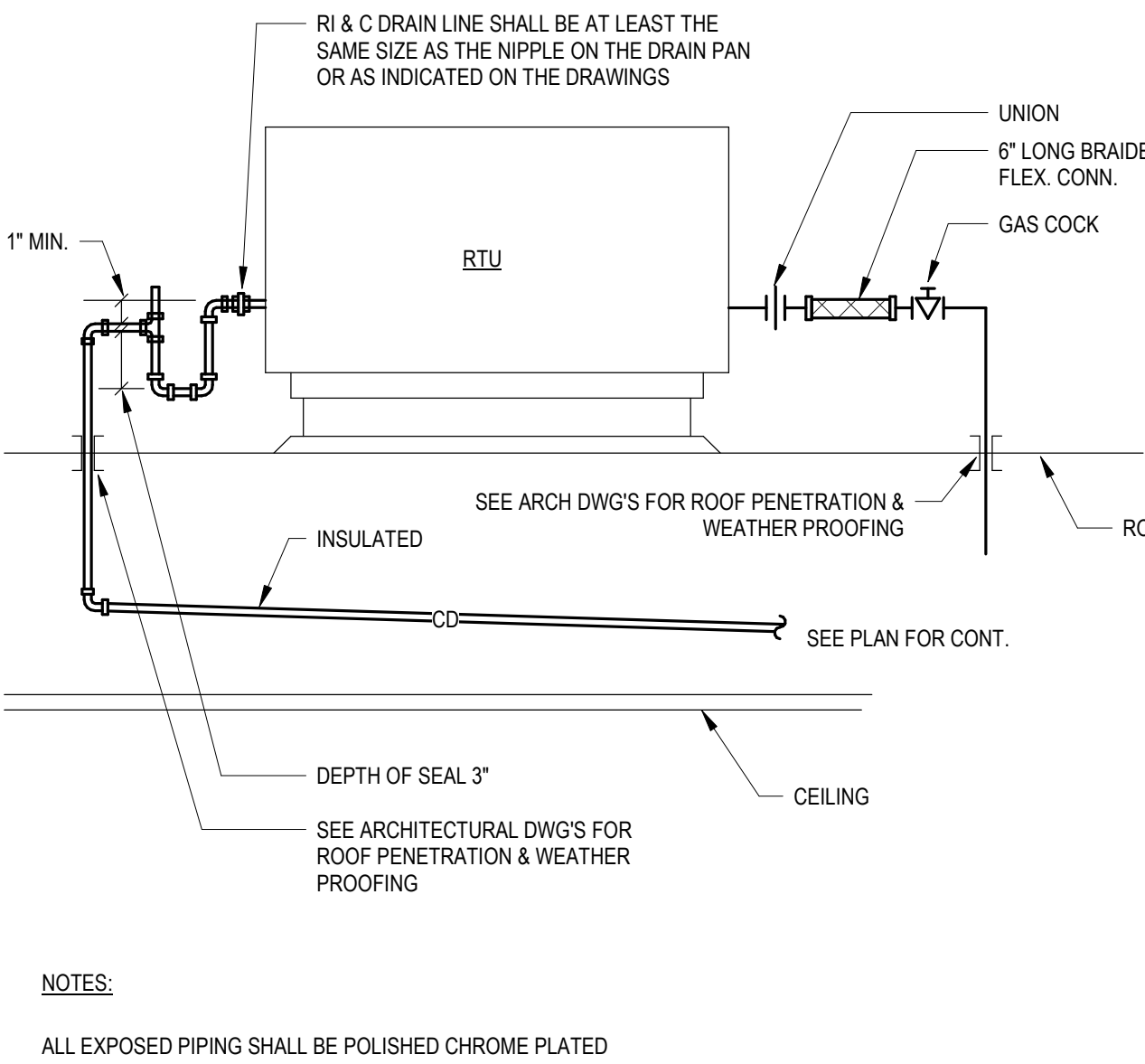
IF DRAIN PAN NIPPLE IS LARGER THAN CODE MINIMUM, THEN TRAP SHALL MATCH DRAIN PAN NIPPLE. REDUCE AFTER TRAP TO MATCH MINIMUM SIZE.

CONDENSATE TRAP DETAIL 10



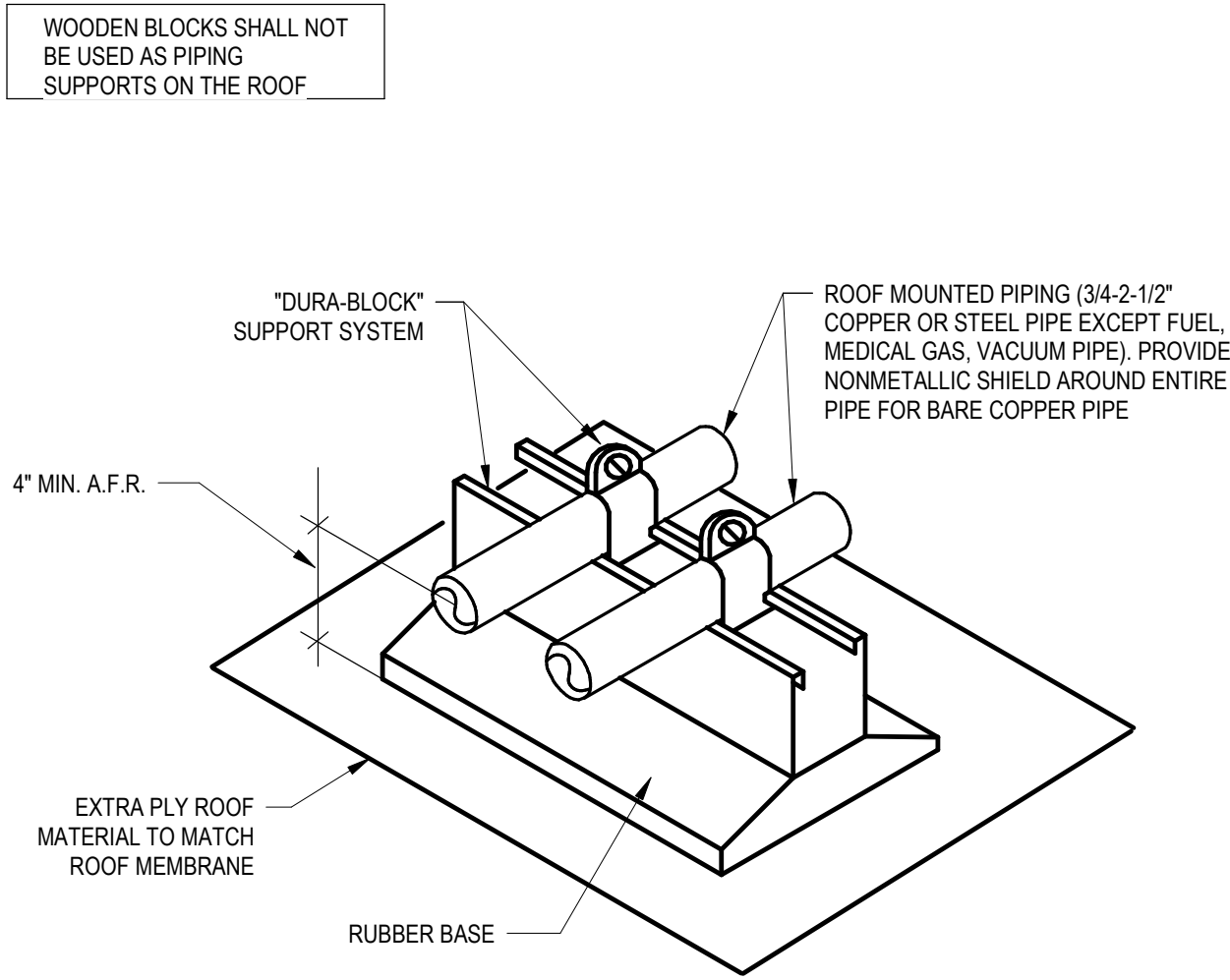
- NOTES:
- PROVIDE PITCH POCKET CONSTRUCTION, ADDITIONAL FLASHING OR WEATHER CAP AS REQUIRED FOR WATERPROOF CONSTRUCTION. DO NOT MECHANICALLY FASTEN PIPE TO STRUCTURE IN ANY WAY.
 - SPACE BETWEEN PIPE AND SLEEVE SHALL BE FREE OF ANY FOREIGN MATERIALS.
 - PIPE SHALL NOT CONTACT STRUCTURE, AND WEDGES SHALL NOT BE USED TO MAINTAIN PIPE IN POSITION.
 - PIPE TO BE CENTERED IN OPENING; PROVIDE ADDITIONAL CLEARANCE FOR POSITIONAL CHANGE OF PIPE DUE TO LOADING OF PIPE OR OPERATION OF SYSTEM.

PIPE THROUGH ROOF 9



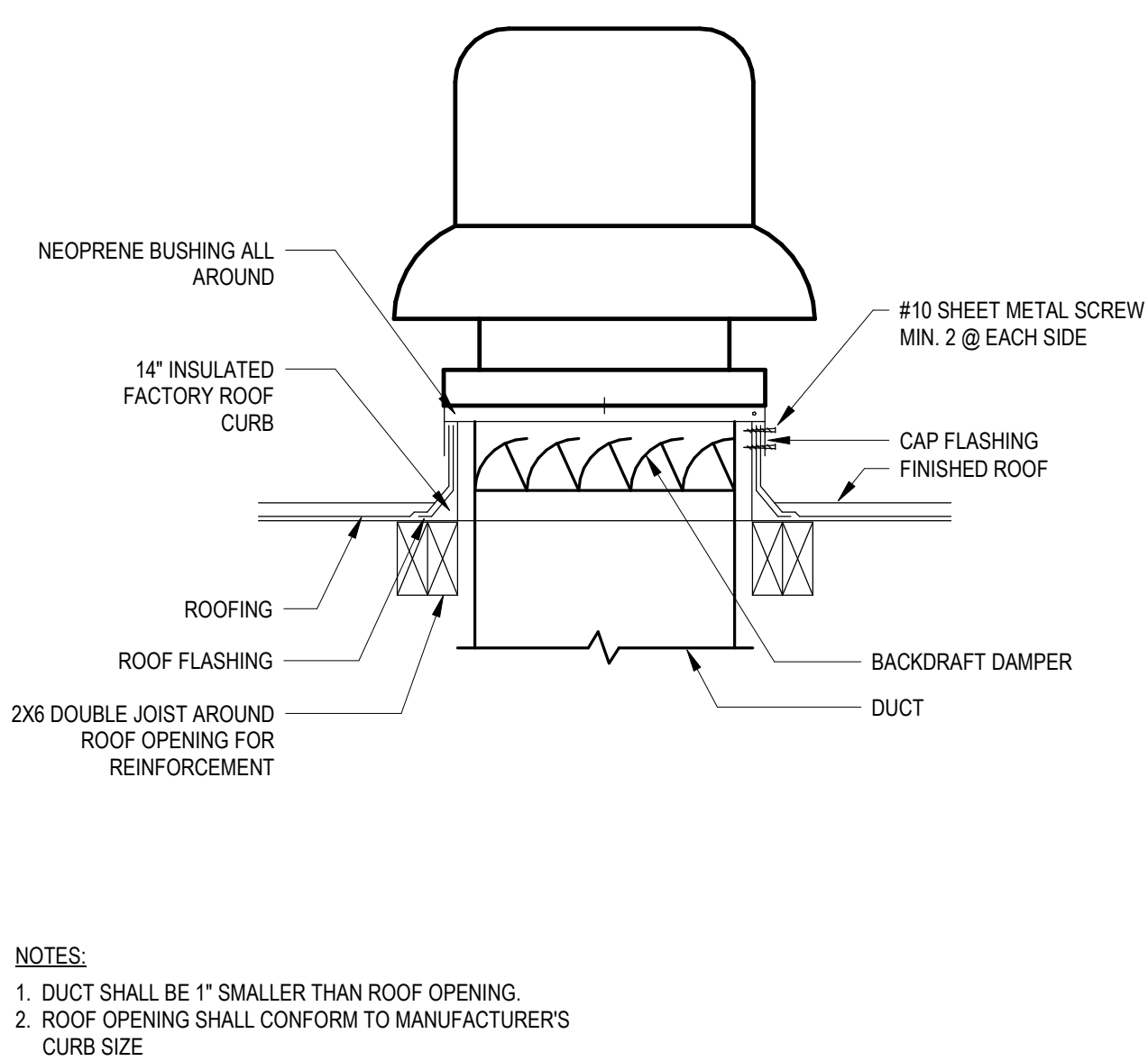
- NOTES:
- ALL EXPOSED PIPING SHALL BE POLISHED CHROME PLATED

RTU GAS & COND. DRAIN CONNECTION 8



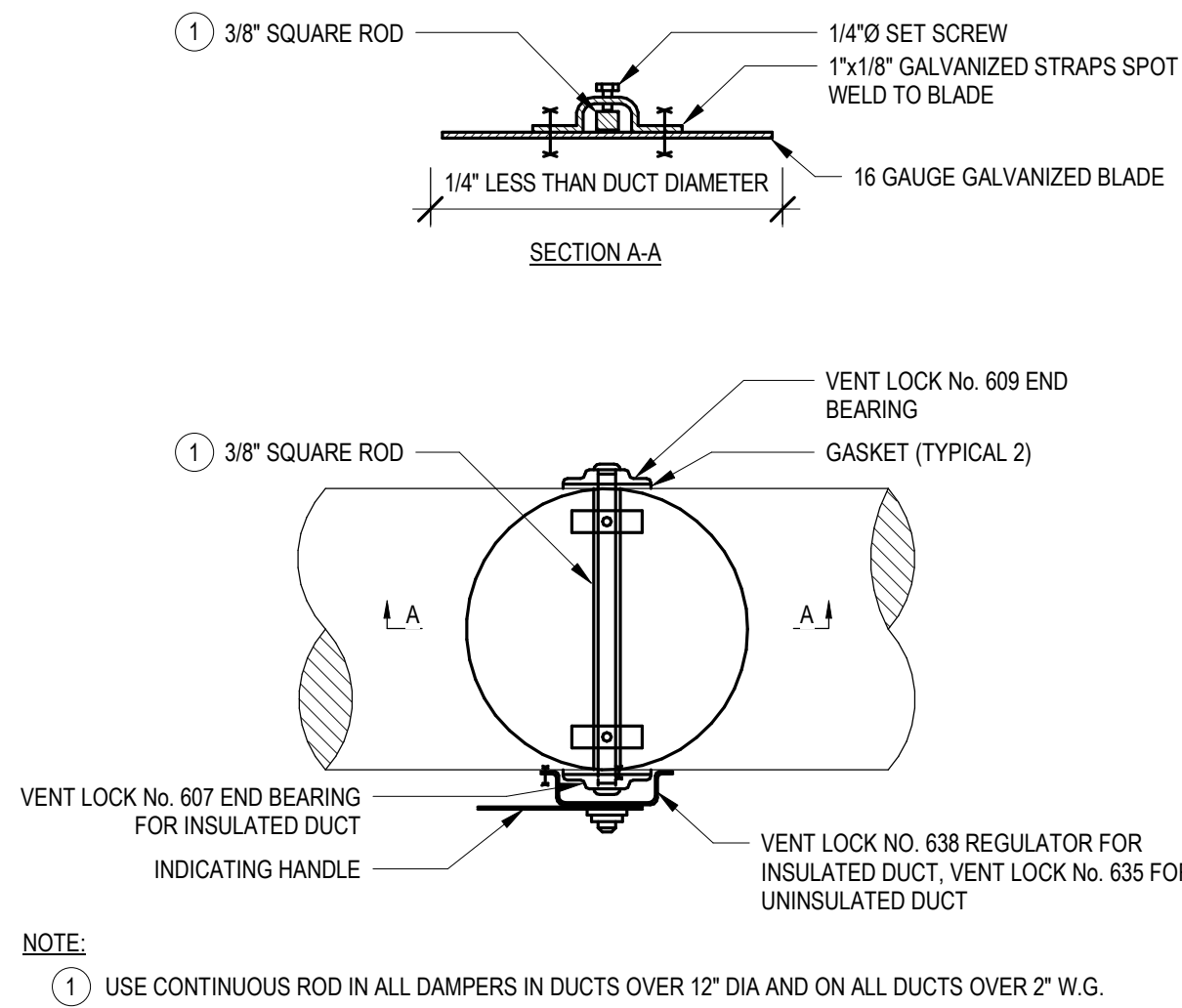
- NOTE:
- SUPPORTS SHALL BE INSTALLED A MAXIMUM 8'-0" O.C. AND AT EACH CHANGE OF DIRECTION OF PIPING.

ROOF PIPE SUPPORT 7



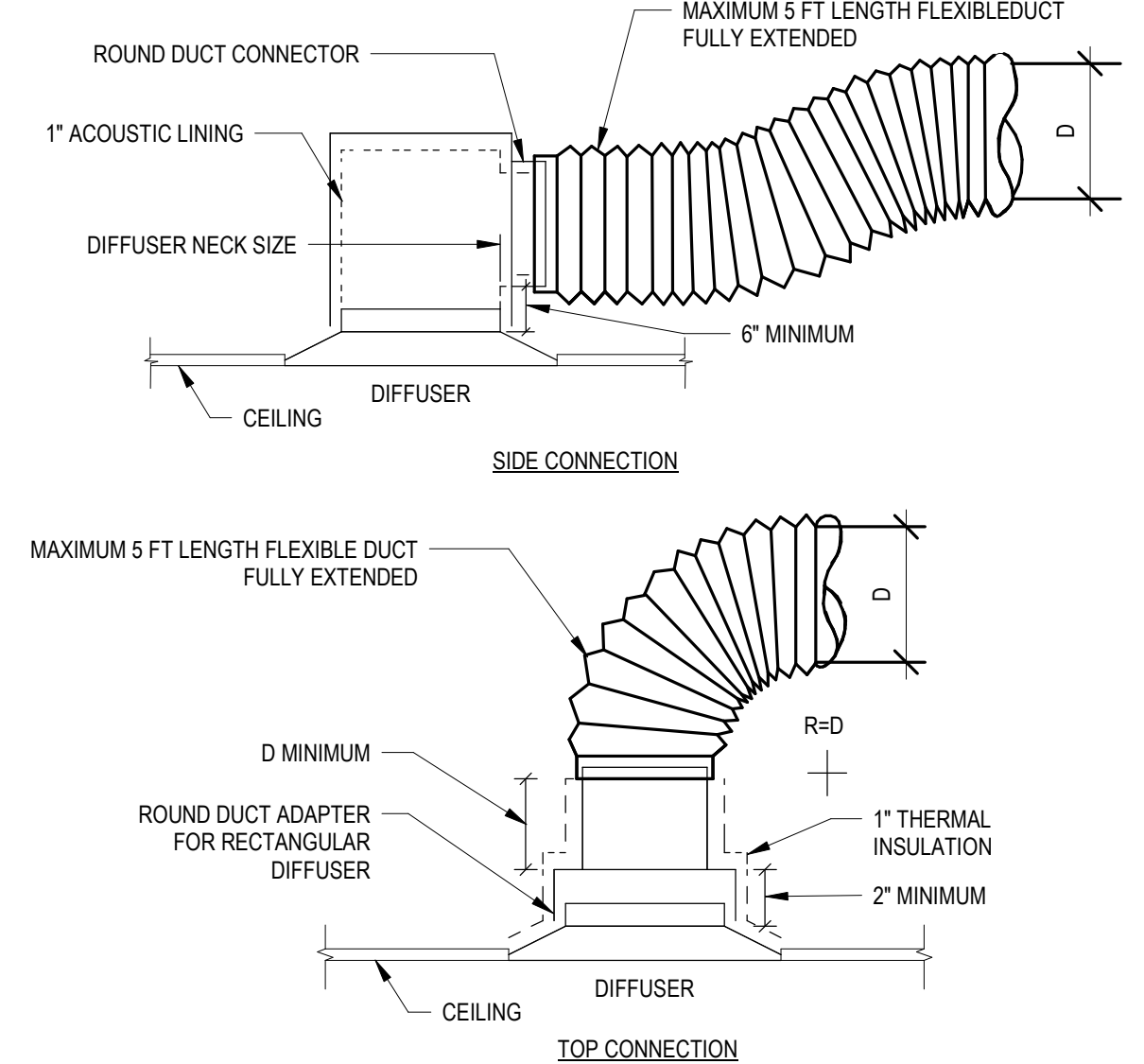
- NOTES:
- DUCT SHALL BE 1" SMALLER THAN ROOF OPENING.
 - ROOF OPENING SHALL CONFORM TO MANUFACTURER'S CURB SIZE

EXHAUST FAN MOUNTING DETAIL 6

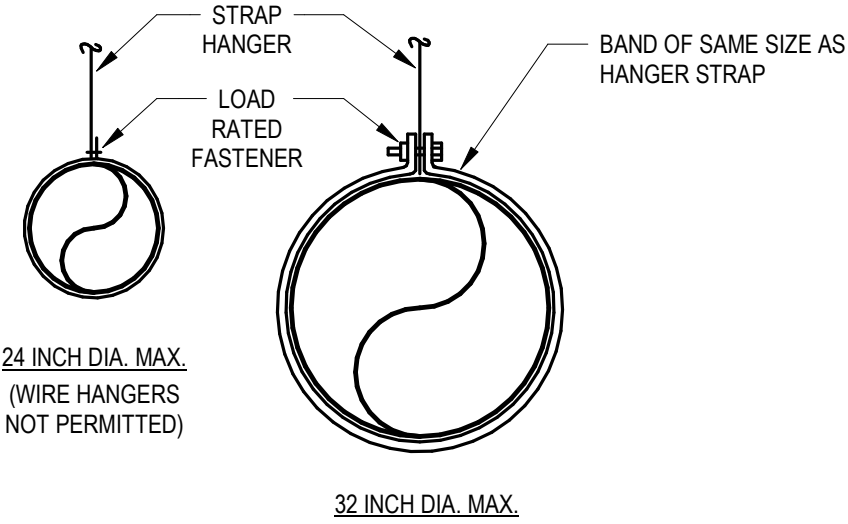


- NOTE:
- USE CONTINUOUS ROD IN ALL DAMPERS IN DUCTS OVER 12" DIA AND ON ALL DUCTS OVER 2" W.G.

ROUND VOLUME DAMPER 4

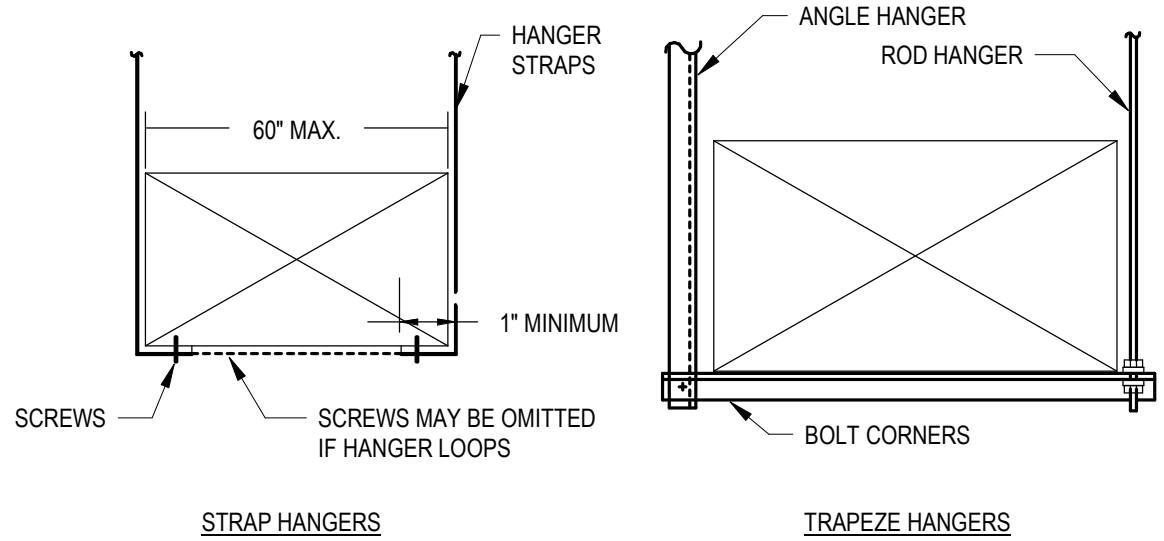


DIFFUSER CONNECTION DETAIL 3



- NOTES:
- APPLICABLE FOR DUCT SIZE UP TO MAXIMUM 32"Ø.
 - FOR HANGER SIZE AND SPACING, SEE SMACNA HVAC DUCT TABLE 5-2. FOR TRAPEZE ALLOWABLE LOAD SEE TABLE 5-3.
 - FOR UPPER ATTACHMENT TO BUILDING, SEE SMACNA HVAC DUCT CONSTRUCTION STANDARDS FIG. 5-1 TO 5-4, WITH SPECIFIC BUILDING STRUCTURAL ENGINEER APPROVAL. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH DETAILS AND SUPPORT LOCATIONS.
 - ALL DUCT HANGER AND ATTACHMENTS SHALL BE REVIEWED AND APPROVED BY SEOR BEFORE FABRICATION AND INSTALLATION.
 - APPLICABLE FOR DUCTS UP TO A MAXIMUM 32"Ø.

HORIZONTAL ROUND DUCT SUPPORT DETAIL 2



- NOTES:
- APPLICABLE FOR DUCT SIZE UP TO ITS CROSS SECTIONAL AREA OF MAXIMUM 6 SQ. FT.
 - FOR HANGERS SIZE AND SPACING, SEE SMACNA HVAC DUCT CONSTRUCTION STANDARDS TABLE 5-1.
 - FOR UPPER ATTACHMENT TO BUILDING, SEE SMACNA HVAC DUCT CONSTRUCTION STANDARDS FIG. 5-1 TO 5-4, WITH SPECIFIC BUILDING STRUCTURAL ENGINEER APPROVAL. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH DETAILS AND SUPPORT LOCATIONS.
 - ALL DUCT HANGER AND ATTACHMENTS SHALL BE REVIEWED AND APPROVED BY SEOR BEFORE FABRICATION AND INSTALLATION.

RECTANGULAR DUCT SUPPORT 1



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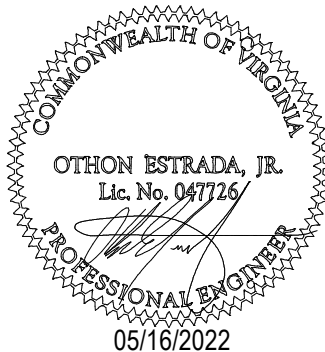
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Project Name

PIKE 7

Project Number

069.6538.000

Description

MECHANICAL DETAILS

Scale

As indicated

M501

Water Leak Testing of New and Existing Grease exhaust vent systems.
Summary: A high pressure multi-nozzle spiguit in conjunction (where needed) with a 15 degree or wider single nozzle lance is to be passed through all new grease exhaust vent systems with the water spray contacting all interior portions of the duct. This is to check for any liquid leakage in the system plan to check for adequate access and other problems that can be repaired during the construction or leak testing phase. All water used in the test must be collected in some fashion for discharge to a sanitary drain.

- The water testing job shall to be scheduled after the welded grease exhaust system with the hood and all access plates installed. The leaktesting can be done in multi stages for tall multi story runs or multi story multi duct runs, but there must be one final test of all connection joints.
- All testing is to be done before any fire-wrap is installed or with fire wrap removed.
- Testing Contractor shall verify water availability, building access, electrical availability, amount of high pressure hose needed to reach all areas of system, and any needed roof access with Job Superintendent when scheduling job.
- The testing company should also re-verify during job reminder phone call that is to be made by Testing Contractor to the Job site Superintendent the working day before the job is scheduled.
- A water source where a hose can be connected shall be available
- A high pressure washer with minimum capabilities of 1000PSI (g 3GPM) (minimum requirements to run a multi nozzle duct cleaner/knock as a spiguit or roto-nozzle)
- Adequate high pressure hose along with a 6" or 12" spiguit (or Roto-nozzle) shall be required.
- The work should normally start at the intake/hood portion of the system (or at the electrostatic precipitator where applicable). The leaktest may start from other areas of the system depending on layout.
- The nozzle shall progress through the system at a rate of approximately one foot every five seconds until it reaches the end point.
- With the hood in place, the Testing Company shall collect the wastewater similar to a routine cleaning with the hood taped and clamped up with at least two mil or thicker clear poly (Plastic) funneling into a large watertight brute (or similar) bucket.
- A water vacuum shall be used to make sure all excess water is removed from hood and ductwork when done.
- The general contractor's welder shall be on-site during the leaktesting with proper welding equipment(A MIG welder is highly recommended), a bright portable light, with access to all parts of the system.
- A spotter with the welder shall access the outside of the ductwork to spot any leaks.
- If the duct leaks, the leaks shall be repaired and the test is to be redone
- Additional leaks shall continue to be repaired and re-tested until no leaks exist.
- When testing is completed, The Testing Company shall dry out the duct, remove the plastic and return system to same condition as found (with leaks repaired).
- The Testing Company will take pictures of the system and procedure, then e-mail them to Environmental to verify the job is done correctly.

18. A leaktest form shall be filled out and signed that system is liquid tight as specified by NFPA96 guidelines.
19. The leaktest form shall note number of leaks found, number of re-testing required in needed, rough drawing of the system with access plate locations and where the leaks were found and repaired. The form shall have signature lines for both the job site representative and the testing company representative.

20. If any sealant (EX JB Weld, epoxies,etc) is found in a welded duct, the test shall immediately fail and the leaktesting will cease immediately until all sealant is removed to bare metal or bare welds.

21. For listed ducts with sealed joints, only the listed sealant shall be used. The leaktesting will progress in the same manner as the welded ducts EXCEPT leakage requiring sealant repairs will need cure for the required time before re-testing.

FireMaster® FastWrap® XL

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Product Features

- Thin and Lightweight at 1-1/2" (38mm) thick, 6 pcf (96 kg/m³) density
- Continuous in complex duct designs
- Grease duct installation UL and ULCC listed with butt joints at all seams on both layers
- Fully foil encapsulated for fast and clean installation
- Cost of 2102°F (1200°C) rated fibers
- Microbial Resistance validated by UL Environment
- Good sound absorption
- Compliant to IMC, NFPA 96, UMC, CMC, CNBC

Applications

- 2-hour enclosure and freestop system for kitchen exhaust duct
- Zero clearance to combustibles
- Engineered and tested solutions for fire protection of structural steel and storage vessels per ASTM E119, ISO 834, and UL 1709
- 2-hour electrical control integrity protection
- Engineered and tested solutions for fire protection of structural steel and storage vessels per ASTM E119, ISO 834, and UL 1709

Specifications - Division 23 07 00 (or 15080)

CSI Spec and AutoCAD available online. www.autocad.com/isc/interthermo.html

Thermal Ceramics FireMaster® FastWrap XL is a flexible high temperature insulation rated to 2102°F (1200°C) that is fully encapsulated in FRP lining. The duct enclosure system shall be listed by UL and for UL per ASTM E 2335, CANULC S144 and ISO 8844 for:

- 1-, 2- and 3-hour endurance and freestop system for hazardous exhaust ducts, pressurization ducts, clothes dryer exhaust ducts, trash and trash chutes, and other fire rated HVAC ducts
- 1-hour electrical control integrity protection
- Engineered and tested solutions for fire protection of structural steel and storage vessels per ASTM E119, ISO 834, and UL 1709

Thermal Ceramics FireMaster® FastWrap XL is a flexible high temperature insulation rated to 2102°F (1200°C) that is fully encapsulated in FRP lining. The duct enclosure system shall be listed by UL and for UL per ASTM E 2335, CANULC S144 and ISO 8844 for:

1-, 2- and 3-hour rating and zero clearance to combustibles, and tested per ASTM E84 for a flame/smoke rating less than 25/50. Insulation shall have a nominal zero clearance for kitchen exhaust ducts, electrical control protection, and as a component in UL freestop designs for fire resistance rated floors, ceilings, and walls. The core fibers in FastWrap XL are manufactured using Thermal Ceramics patented Superwool® fiber which is an alkaline-earth silicate wool with low temperature and therefore increased safety for installers. FastWrap XL is under UL's Follow-Up Service Program to ensure the consistent quality essential to this life-safety application.

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access cover plate to the duct.

F. Through Penetration Firestop System (Figure 2) - When the duct penetrates a fire rated assembly an approved fire stop system must be employed. Figure 2 provides a complete list of UL / ULCC freestop design listings which can be found in the Certifications Directory at www.ul.com for US systems and www.ul.ca for Canadian systems. Prior to installing any freestop system the surfaces of all openings and penetrating items must be clean and dry. The FireWrap XL core blanket (or mineral wool where allowed by the freestop design listing) must be compressed into the annular space. The packing material must be recessed a minimum depth from the surface of the concrete or gypsum assembly. The recessed opening must be filled with a minimum thickness of an approved freestop sealant. The packing material type and compression minimum recess (typically 1/4" (6mm)), and approved freestop sealant and thickness (typically 1/4" (6mm)) shall be as specified in an approved UL / ULCC freestop design listing. Where there is not sufficient annular space around the duct to run the FireWrap XL enclosure system continue through the fire rated assembly, the enclosure may terminate above and below the floor/ceiling assembly or on either side of a wall assembly as shown in Figure 2. When this method is used, the FastWrap XL must be mechanically attached on either side of the fire rated assembly using one of the attachment methods described in Section D, spaced at a maximum of 1-1/2" (38mm) from the fire rated assembly.

G. Support Hanger Systems

1) Grease ducts: Tripodce support hangers shall be spaced on maximum 60 in. (1500 mm) centers. Hanger rods or straps shall be anchored with steel drop in or wedge expansion type masonry anchors. No additional protection is required for hangers and supports meeting the requirements of the Table below.

Hanger Cross Section	Maximum Perimeter, in (mm)	Tripodce Support for maximum Free Strength, in (mm)
1/4" x 1/8" galv steel (32 mm x 3.2 galv steel)	100 (2540)	11 (280) x 11 (280) x 3/4" (19 mm)
3/4" x 1/8" threaded rod (19 x 3 mm threaded rod)	100 (2540)	11 (280) x 11 (280) x 3/4" (19 mm)
1/2" x 1/8" threaded rod (13 x 3 mm threaded rod)	100 (2540)	11 (280) x 11 (280) x 3/4" (19 mm)
1/2" x 1/8" threaded rod (13 x 3 mm threaded rod)	100 (2540)	11 (280) x 11 (280) x 3/4" (19 mm)

2) HVAC ducts: Tripodce support hangers shall be spaced on maximum 60 in. (1500 mm) centers. Hanger rods or straps shall be anchored with steel drop in or wedge expansion type masonry anchors. No additional

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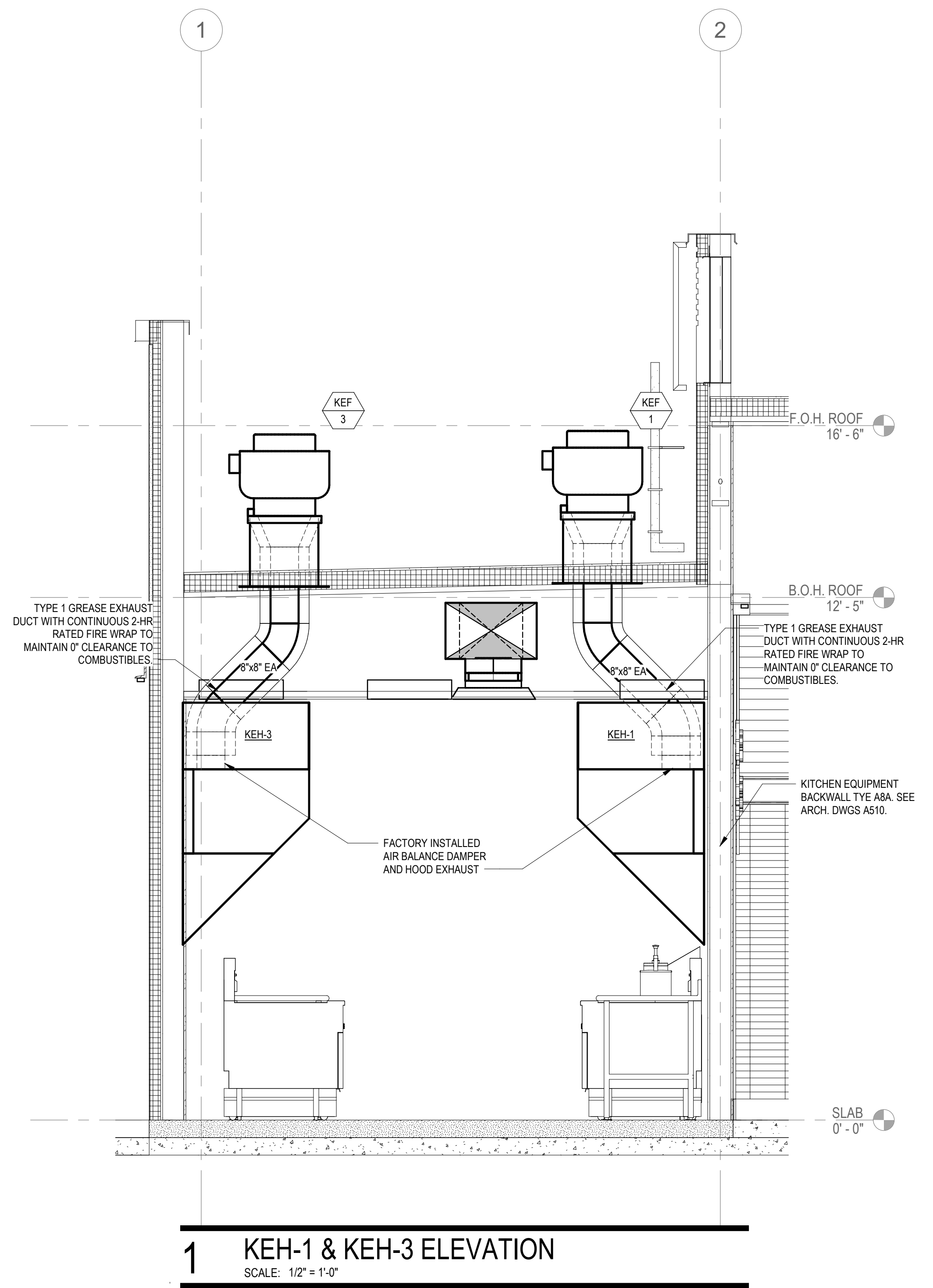
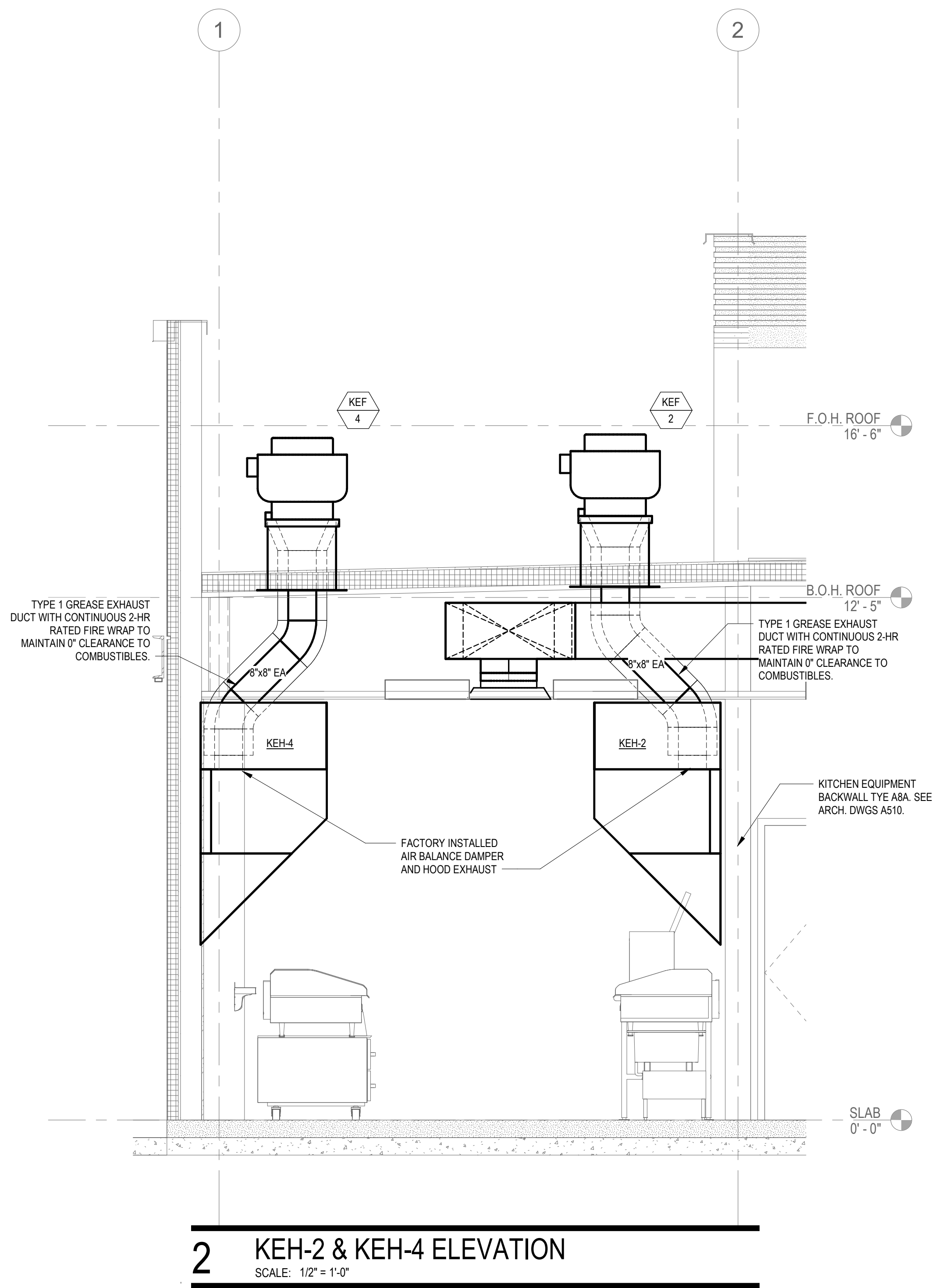
FireMaster® FastWrap® XL

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ASTM E 2338 Compliant Enclosure and Door System

FIGURE 3

FIGURE 3	FastDoor XL1 Access Doors Sizes
1. 1-1/2" (38mm) FastDoor XL access panel	Available Opening Sizes - Ordering Code
2. 2-1/2" (64mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
3. 3-1/2" (89mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
4. 4-1/2" (114mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
5. 5-1/2" (140mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
6. 6-1/2" (165mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
7. 7-1/2" (191mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
8. 8-1/2" (216mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
9. 9-1/2" (242mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
10. 10-1/2" (267mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
11. 11-1/2" (293mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
12. 12-1/2" (318mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
13. 13-1/2" (344mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
14. 14-1/2" (369mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
15. 15-1/2" (395mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
16. 16-1/2" (420mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
17. 17-1/2" (446mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
18. 18-1/2" (471mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
19. 19-1/2" (497mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
20. 20-1/2" (522mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
21. 21-1/2" (548mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
22. 22-1/2" (573mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
23. 23-1/2" (600mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
24. 24-1/2" (625mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
25. 25-1/2" (651mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
26. 26-1/2" (676mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
27. 27-1/2" (702mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
28. 28-1/2" (727mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
29. 29-1/2" (753mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
30. 30-1/2" (778mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
31. 31-1/2" (804mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
32. 32-1/2" (829mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
33. 33-1/2" (855mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
34. 34-1/2" (880mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
35. 35-1/2" (906mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
36. 36-1/2" (931mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
37. 37-1/2" (957mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
38. 38-1/2" (982mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
39. 39-1/2" (1008mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
40. 40-1/2" (1033mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
41. 41-1/2" (1059mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
42. 42-1/2" (1084mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
43. 43-1/2" (1110mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
44. 44-1/2" (1135mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
45. 45-1/2" (1161mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
46. 46-1/2" (1186mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
47. 47-1/2" (1212mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
48. 48-1/2" (1237mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
49. 49-1/2" (1263mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
50. 50-1/2" (1288mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
51. 51-1/2" (1314mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
52. 52-1/2" (1339mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
53. 53-1/2" (1365mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
54. 54-1/2" (1390mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
55. 55-1/2" (1416mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
56. 56-1/2" (1441mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
57. 57-1/2" (1467mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
58. 58-1/2" (1492mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
59. 59-1/2" (1518mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
60. 60-1/2" (1543mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
61. 61-1/2" (1569mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
62. 62-1/2" (1594mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
63. 63-1/2" (1620mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
64. 64-1/2" (1645mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
65. 65-1/2" (1671mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
66. 66-1/2" (1696mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
67. 67-1/2" (1722mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
68. 68-1/2" (1747mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
69. 69-1/2" (1773mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
70. 70-1/2" (1798mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
71. 71-1/2" (1824mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
72. 72-1/2" (1849mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
73. 73-1/2" (1875mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
74. 74-1/2" (1900mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
75. 75-1/2" (1926mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
76. 76-1/2" (1951mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
77. 77-1/2" (1977mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
78. 78-1/2" (2002mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
79. 79-1/2" (2028mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
80. 80-1/2" (2053mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
81. 81-1/2" (2079mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
82. 82-1/2" (2104mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
83. 83-1/2" (2130mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
84. 84-1/2" (2155mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
85. 85-1/2" (2181mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
86. 86-1/2" (2206mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
87. 87-1/2" (2232mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
88. 88-1/2" (2257mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
89. 89-1/2" (2283mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
90. 90-1/2" (2308mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
91. 91-1/2" (2334mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
92. 92-1/2" (2359mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
93. 93-1/2" (2385mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
94. 94-1/2" (2410mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
95. 95-1/2" (2436mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
96. 96-1/2" (2461mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
97. 97-1/2" (2487mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
98. 98-1/2" (2512mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
99. 99-1/2" (2538mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
100. 100-1/2" (2563mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
101. 101-1/2" (2589mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
102. 102-1/2" (2614mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
103. 103-1/2" (2640mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
104. 104-1/2" (2665mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
105. 105-1/2" (2691mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
106. 106-1/2" (2716mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
107. 107-1/2" (2742mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
108. 108-1/2" (2767mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
109. 109-1/2" (2793mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1
110. 110-1/2" (2818mm) FastDoor XL access panel	12" x 12" Door Opening - 434-8917-034-98X1



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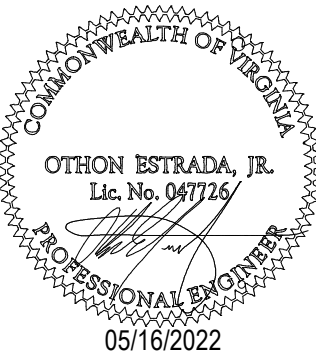
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Date	Description
05/16/2022	PERMIT AND BID
07/25/2022	ADDENDUM #1
09/02/2022	ADDENDUM #2
10/07/2022	ISSUE FOR BID
02/10/2023	BID SET
06/27/2023	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

PIKE 7

Project Number

069.6538.000

Description

MECHANICAL ELEVATIONS

Scale

1/2" = 1'-0"

M503

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SECTION 20600 - COMMON WORK RESULTS FOR HVAC
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SECTION 23300 - AIR DUCT ACCESSORIES
SECTION 23310 - DIFFUSERS, REGISTERS AND GRILLES

SECTION 20000 - ENERGY CONSERVATION

- A. HVAC SYSTEMS AND EQUIPMENT CAPACITIES DO NOT EXCEED CALCULATED LOADS.
- B. THERMOSTATIC CONTROLS
1. THERMOSTATIC CONTROLS SHALL HAVE A 5 DEG DEADBAND.
 2. THERMOSTATIC CONTROLS SHALL BE CAPABLE OF OPERATING THE DOWN TO 35 DEGF OR UP TO 85 DEGF.
 3. EACH ZONE SHALL BE PROVIDED WITH AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS FOR STARTING AND STOPPING THE SYSTEM FOR SEVERN DIFFERENT DAILY SCHEDULES PER WEEK.

SECTION 20600 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1. GENERAL PROVISIONS

- A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS, AND DIVISION A SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SCOPE OF WORK

- A. PROVIDE LABOR, INCLUDING FIELD ELECTION AND SUPERVISION, MATERIALS, EQUIPMENT AND ANCHLAGERS, AND COORDINATE, PROCURE, FABRICATE, DELIVER, ERECT OR INSTALL, INTERFACE WITH EXISTING WORK, START, DEBUG AND TEST ALL SYSTEMS AS NECESSARY TO PROVIDE THE OWNER WITH A COMPLETE, OPERATING FACILITY IN CONFORMANCE WITH THE CONTRACT DOCUMENTS AND IN CONFORMITY WITH REQUIREMENTS OF ALL AUTHORITIES HAVE JURISDICTION.
- B. THE WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
1. DEMOLITION AND REMOVAL OF MECHANICAL WORK
 2. DUCTWORK AND AIR OUTLETS
 3. AIR-CONDITIONING AND EXHAUST SYSTEMS
 4. KITCHEN HOOD AND EXHAUST SYSTEMS
 5. MAKEUP AIR SYSTEMS
 6. THERMAL INSULATION
 7. COORDINATION WITH OTHER TRADES FOR LOCATION OF DUCTWORK AND TO CONFORM THE GENERAL CONTRACTOR VIA DIMENSIONAL DRAWINGS) OF THE EXACT SIZE AND LOCATION OF ALL ROOF AND WALL OPENINGS.
 8. MISCELLANEOUS FIELD WORK, SUPPORTS AND HANGERS AND CUTTING AND PATCHING OF ROOF, WALLS AND PARTITIONS.
 9. RECORD DRAWINGS.
 10. CONTROL.
 11. TESTING, ADJUSTING, AND BALANCING.

- C. RELATED WORK INCLUDED IN THIS SECTION AND IN OTHER SECTIONS.
1. GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL WORK DESCRIBED IN THE CONSTRUCTION DOCUMENTS.
2. REFER TO THE RESPONSIBILITY MATRIX FOR ADDITIONAL INFORMATION.

1.3 SUBMITTALS

- A. PROVIDE CONTRACTOR SUBMITTAL MATERIAL, WITH DESCRIPTIVE DATA, FOR ALL PRODUCTS AND MATERIALS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING, PRIOR TO INSTALLATION. ALL SUBMITTALS SHALL BE HIGHLIGHTED TO IDENTIFY SPECIFIC PRODUCTS OR MATERIALS BEING USED. ALLOW MIN 5 DAYS FOR ENGINEER TO REVIEW SUBMITTALS.
1. COORDINATED LAYOUT PLANS, SHOWING WORK OF ALL TRADES, INCLUDING BUT NOT LIMITED TO DUCTWORK, HVAC, REFRIGERANT, PLUMBING, FIRE PROTECTION PIPING, ELECTRICAL CONDUITS AND BUS DUCTS, EQUIPMENT. DRAWINGS SHALL BE 1/4 SCALE.
 2. DUCTWORK ACCESSORIES
 3. DUCTWORK TYPICAL CONSTRUCTION
 4. DUCT SEALING
 5. REFRIGERANT PIPING
 6. DAMPERS
 7. DIFFUSERS, GRILLES AND REGISTERS
 8. CERTIFIED ACOUSTICAL TEST PERFORMANCE DATA FOR DIFFUSERS, REGISTERS, GRILLES AND TERMINAL AIR UNITS
 9. AIR AND WATER TEST AND BALANCE
 10. COMPLETE FORMS PROPOSED FOR USE IN COMPLYING AND RECORDING TEST AND BALANCE DATA
 11. CONTROL DEVICES AND SYSTEM DRAWINGS
 12. CONTROL, SEQUENCE AND SYSTEM DRAWINGS
 13. FIRE PROTECTION SYSTEM LAYOUTS IN CODE COMPLIANCE
 14. VIBRATION ISOLATION
 15. ONE SET OF AS-BUILT REPRODUCIBLE DRAWINGS

- B. PROVIDE 1 COPY OF APPROVED SUBMITTALS TO THE OFFICE OF THE BUILDING ENGINEER.

1.4 PRODUCT SUBSTITUTIONS

- A. THE CONTRACTOR SHALL CERTIFY THE FOLLOWING ITEMS ARE CORRECT WHEN USING SUBSTITUTED PRODUCTS OTHER THAN THOSE SCHEDULED OR SHOWN ON THE DRAWINGS AS A BASIS OF DESIGN.
1. THE PROPOSED SUBSTITUTION DOES NOT AFFECT DIMENSIONS SHOWN ON DRAWINGS.
 2. THE CONTRACTOR SHALL PAY FOR CHANGES TO BUILDING DESIGN, INCLUDING ENGINEERING DESIGN, DETAILING, STRUCTURAL SUPPORTS, AND CONSTRUCTION COSTS CAUSED BY PROPOSED SUBSTITUTION.
 3. THE PROPOSED SUBSTITUTION HAS NO ADVERSE EFFECT ON OTHER TRADES, CONSTRUCTION SCHEDULE, OR SPECIFIED WARRANTY REQUIREMENTS.
 4. MAINTENANCE AND SERVICE PARTS AVAILABLE LOCALLY ARE READILY OBTAINABLE FOR THE PROPOSED SUBSTITUTION.
- B. THE CONTRACTOR FURTHER CERTIFIES FUNCTION, APPEARANCE, AND QUALITY OF PROPOSED SUBSTITUTION ARE EQUIVALENT OR SUPERIOR TO SPECIFIED ITEM.
- C. THE CONTRACTOR AGREES THAT THE TERMS AND CONDITIONS FOR THE SUBSTITUTED PRODUCT THAT ARE FOUND IN THE CONTRACT DOCUMENTS APPLY TO THIS PROPOSED SUBSTITUTION.

1.5 MAINTENANCE MANUALS AND AS-BUILT DRAWINGS

- A. PROVIDE FOUR (4) COPIES OF OPERATING AND MAINTENANCE MANUAL FOR OWNERS USE FOR EACH PIECE OF EQUIPMENT WITHIN 90 DAYS OF ACCEPTANCE. EACH ITEM SHALL BE CROSS-REFERENCED AND NUMBERED WITH AS-BUILT DRAWING DESCRIPTIONS.
- B. SOFT COPY OF AS-BUILT DRAWINGS ON AUTOCAD AND PDF AND ONE SET OF HARD COPY SHALL BE DELIVERED TO OWNER WITHIN 90 DAYS OF SYSTEM ACCEPTANCE.

1.6 GUARANTEES

- A. GUARANTEE: ALL MATERIALS, APPARATUS AND WORKMANSHIP INSTALLED UNDER THIS SECTION SHALL BE UNCONDITIONALLY GUARANTEED FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OF WORK BY THE OWNER AGAINST FAILURE DUE TO FAULTY MATERIAL OR WORKMANSHIP. THE CONTRACTOR SHALL CORRECT DEFECTS AT NO ADDITIONAL COST TO THE OWNER. LABOR AND REPLACEMENT OF PARTS TO BE ACCOMPLISHED AT NO COST TO OWNER.

1.7 SEISMIC SUPPORT

- A. CONTRACTOR SHALL SUPPORT AND BRACE ALL NEW HVAC, PLUMBING AND FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH REQUIREMENTS SPECIFIED.

1.8 PRODUCT HANDLING

- A. PROTECTION: PROTECT MATERIALS AND EQUIPMENT FROM DAMAGE DURING SHIPPING, STORAGE AND HANDLING. REMOVE FROM THE SITE ANY WET OR DAMAGED DUCT LINER OR INSULATION.
- B. STORAGE: WHERE POSSIBLE, STORE MATERIALS AND EQUIPMENT INSIDE AND PROTECT FROM THE WEATHER. WHERE NECESSARY TO STORE OUTSIDE, STORE ABOVE GRADE AND ENCLOSE WITH WATERPROOF WRAPPING.
- C. REPLACEMENT: IN THE EVENT OF DAMAGE, IMMEDIATELY REPAIR ALL DAMAGED AND DEFECTIVE WORK TO THE APPROVAL OF THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.

1.9 CONTRACT DRAWINGS

- A. CONTRACT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF THE WORK AND INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, DUCTS, PIPING AND APPROXIMATE SIZES AND LOCATIONS OF EQUIPMENT AND OUTLETS. DO NOT SCALE DRAWINGS FOR MEASUREMENTS.
- B. CONSULT KITCHEN, MECHANICAL, PLUMBING, ARCHITECTURAL, STRUCTURAL AND ELECTRICAL CONTRACT DRAWINGS AND SPECIFICATIONS TO BECOME FAMILIAR WITH ALL CONDITIONS AFFECTING THE WORK, COORDINATE INTERCONNECTING WORK WITH OTHER TRADES AFFECTED, AND VERIFY ALL SPACES IN WHICH THE WORK WILL BE INSTALLED.

- C. WHERE JOB CONDITIONS REQUIRE REASONABLE CHANGES IN ORDER TO COORDINATE INSTALLATION WITH OTHER TRADES, THESE CHANGES SHALL BE MADE WITHOUT EXTRA COST TO THE OWNER.

1.10 DEMOLITION

- A. PROTECT ADJACENT MATERIALS INDICATED TO REMAIN. INSTALL AND MAINTAIN DUST AND NOISE BARRIERS TO KEEP DUST, DIRT, AND NOISE FROM BEING TRANSMITTED TO ADJACENT AREAS. REMOVE PROTECTION AND BARRIERS AFTER DEMOLITION OPERATIONS ARE COMPLETE.
- B. LOCATE, IDENTIFY AND PROTECT MECHANICAL SERVICES PASSING THROUGH DEMOLITION AREA AND SERVING OTHER AREAS OUTSIDE THE DEMOLITION LIMITS. MAINTAIN SERVICES TO AREAS OUTSIDE DEMOLITION LIMITS, WHEN SERVICES MUST BE INTERRUPTED, INSTALL TEMPORARY SERVICES FOR AFFECTED AREAS.

- C. MATERIALS AND EQUIPMENT TO BE SALVAGED: REMOVE, DEMOLISH AND DISCONNECT EXISTING MECHANICAL MATERIALS AND EQUIPMENT INDICATED TO BE REMOVED AND SALVAGED, AND DELIVER MATERIALS AND EQUIPMENT TO THE OWNER.

- D. REPAIR OR REPLACE EQUIPMENT OR MATERIALS DAMAGED DURING DEMOLITION TO SATISFACTION OF OWNERS DESIGNATED REPRESENTATIVE.

1.11 INTERRUPTION OF EXISTING UTILITY SERVICE

- A. COORDINATE THE SHUT-OFF AND DISCONNECTION OF UTILITY SERVICES WITH THE OWNER AND THE UTILITY COMPANY.
- B. NOTIFY THE OWNERS REPRESENTATIVE/OWNERS PROJECT REPRESENTATIVE AT LEAST 5 DAYS PRIOR TO COMMENCING DEMOLITION OPERATIONS.

1.12 SCHEDULING

- A. SUBMIT SCHEDULES INDICATING PROPOSED METHODS AND SEQUENCE OF OPERATIONS FOR DEMOLITION PRIOR TO COMMENCEMENT OF WORK. INCLUDE COORDINATION FOR SHUT-OFF OF UTILITY SERVICES AND DETAILS FOR DUST AND NOISE CONTROL.
- B. COORDINATE SEQUENCING WITH CONSTRUCTION PHASING AND OWNER OCCUPANCY.

1.13 MAINTENANCE OF EXISTING UTILITY SERVICES

- A. UNINTERRUPTED NORMAL USE OF THE EXISTING FACILITIES MUST BE MAINTAINED DURING THE TIME REQUIRED TO PERFORM THE COMPLETE INSTALLATION OF THE WORK INDICATED IN THE CONTRACT DOCUMENTS. IT IS MANDATORY THAT THE EXISTING BUILDINGS BE MAINTAINED IN SERVICE.
- B. INVESTIGATE EXISTING CONDITIONS AND THE LOCATION OF ALL EXISTING EQUIPMENT AND THE LOCATION OF ALL EXISTING SERVICES BEFORE STARTING.
- C. IF A SERVICE IS DISTURBED, IMMEDIATELY WITHOUT REGARD FOR WORKING HOURS, PLACE THE SERVICE BACK INTO OPERATION.
- D. SUFFICIENT ADVANCE NOTICE SHALL BE GIVEN TO THE OWNER AND ITS PERMISSION OBTAINED PRIOR TO INTERRUPTION OF PRESENT SERVICES. IT SHOULD BE ASSURED THAT DISRUPTION OF UTILITIES AND SERVICES WILL BE DONE AT OTHER THAN NORMAL WORKING HOURS. NO ADDITIONAL OR EXTRA PAYMENT WILL BE AUTHORIZED TO COMPLY WITH THESE REQUIREMENTS.
- E. REPAIR, REPLACE AND MAINTAIN IN SERVICE ANY UTILITIES, FACILITIES, OR SERVICES (UNDERGROUND, OVERGROUND, INTERIOR OR EXTERIOR) DAMAGED, BROKEN OR OTHERWISE RENDERED INOPERATIVE DURING THE COURSE OF CONSTRUCTION IN THE EXISTING BUILDING.
- F. ALL OPENINGS MUST BE SECURELY COVERED, OR OTHERWISE PROTECTED, TO PREVENT INJURY DUE TO CARELESSLY OR NAUGHTILY DROPPED TOOLS OR MATERIALS, GRIT, DIRT, OR ANY FOREIGN MATTER. DAMAGED WORK SHALL BE REPAIRED OR REPLACED UNTIL WORK IS FULLY AND FINALLY ACCEPTED.
- G. PROTECT HEATING EQUIPMENT AND ALL SIMILAR ITEMS OF EQUIPMENT FROM DIRT, GRIME, PLASTER, PAINT AND WATER DURING ALL PHASES OF CONSTRUCTION. THIS PROTECTION SHALL BE PROVIDED BY COVERING WITH TRANSPARENT PLASTIC SHEETING.
- H. MAKE ALL CONNECTIONS TO EXISTING SYSTEM PIPING AND EQUIPMENT SYSTEMS DURING DESIGNATED PERIODS UPON APPROVAL OF THE OWNER AND AT NO INCREASE IN THE CONTRACT SUM.
- I. DO NOT INTERRUPT EXISTING UTILITIES UTILIZED BY THE OWNER, EXCEPT AS APPROVED BY THE OWNER. INTERRUPTIONS MUST BE SCHEDULED TO SUIT THE OWNERS REQUIREMENTS.

- J. VERIFY ALL EXISTING WORK, WHERE EXISTING CONNECTIONS ARE PARTIAL, PROVIDE ALL NECESSARY MATERIALS, LABOR AND EQUIPMENT REQUIRED TO REPAIR EXISTING WORK. IN ADDITION, MAINTAIN INTEGRITY OF THE EXISTING SYSTEMS. RECTIFY ANY CONTAMINATION, DEGRADATION OF CLEANLINESS OR DAMAGE TO THE EXISTING SYSTEMS TO THE SATISFACTION OF THE OWNER.

1.14 INSTALLATION OF THE WORK

- A. THE CONTRACT DRAWINGS INDICATE THE GENERAL ARRANGEMENTS FOR THE HVAC, KITCHEN, PLUMBING, AND FIRE PROTECTION SYSTEMS.
1. DRAWINGS ARE DIAGRAMMATIC AND DO NOT INDICATE NECESSARY OFFSETS, OBSTRUCTIONS OR STRUCTURAL CONDITIONS.
 2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL THE WORK IN SUCH A MANNER THAT IT WILL BE AT THE HIGHEST ELEVATION POSSIBLE, CONFORM TO THE STRUCTURE, AND/OR DIMENSIONS, AND HEADROOM, LEAVE ADEQUATE CLEARANCES FOR LIGHT FIXTURES, RETURN AIR PATHWAYS, MAINTENANCE AND REPAIRS, AND PROVIDE CLEARANCE AND ACCESS AS REQUIRED BY CODES. NOTHING SHALL BE INSTALLED BELOW CEILING LEVEL WITHOUT ARCHITECTS WRITTEN CONSENT.
 3. ABOVE ITEMS TO BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
 4. PROCESSED AS RAPIDLY AS THE BUILDING CONSTRUCTION WILL PERMIT.
 5. THOROUGHLY CLEAN ITEMS BEFORE INSTALLATION. CAP OPENINGS TO EXCLUDE DIRT UNTIL FINAL CONNECTIONS HAVE BEEN MADE.
 6. CUT MATERIALS ACCURATELY, WORK INTO PLACE WITHOUT SPRINGING OR FORGING. PROPERLY CLEAR WINDOWS, DOORS AND OTHER OPENINGS. EXCESSIVE CUTTING OR OTHER WEAKENING OF THE BUILDING STRUCTURE WILL NOT BE PERMITTED.
 7. MANUFACTURERS DRAWINGS AND INSTRUCTIONS SHALL BE FOLLOWED IN ALL CASES WHERE THE MAKERS OF DEVICES AND EQUIPMENT FURNISH DIRECTIONS OR DETAILS NOT SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS.
 8. DRAWINGS ARE NOT INTENDED TO BE SCALED, BUT SHALL BE FOLLOWED WITH SUFFICIENT ACCURACY TO COORDINATE WITH OTHER WORK AND STRUCTURAL LIMITATIONS.
 9. SEISMIC DESIGN THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ANCHORS, SUPPORTS AND CONNECTIONS OF MECHANICAL WORK TO THE BUILDING STRUCTURE TO PREVENT DAMAGE AS A RESULT OF AN EARTHQUAKE. INCLUDING MANUFACTURED EQUIPMENT, THE CONNECTION AND INTEGRITY OF SHOP FABRICATED AND FIELD FABRICATED MATERIALS AND EQUIPMENT. ALL SUPPORTS, EQUIPMENT AND CONNECTIONS SHALL BE DESIGNED TO CONFORM TO REQUIREMENTS OF THE CALIFORNIA ADMINISTRATIVE CODE, OR OTHER GOVERNING CODES.
 10. ALL WORK SHALL BE PROPERLY SUPPORTED FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. INDEPENDENT OF THE CEILING SUPPORT SYSTEM, WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT DIRECT FASTENING OF SUPPORTS, FURNISH ADDITIONAL FRAMING.
 11. ALL EQUIPMENT SHALL BE SECURELY FASTENED TO BUILDING CONSTRUCTION WITH APPROVED SUPPORTS.
 12. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF DIFFUSERS, GRILLES, REGISTERS, AND THERMOSTATS (IF DEPICTED). IF THERMOSTATS ARE NOT DEPICTED SPECIFICALLY ON ARCHITECTS DRAWINGS, OBTAIN ARCHITECTS APPROVAL FOR LOCATIONS PRIOR TO INSTALLATION.
 13. COORDINATE THE WORK OF THIS SECTION WITH THE WORK OF OTHER SECTIONS IN AS MUCH TIME FOR PROPER INSTALLATION AND CONNECTION.
 14. CAREFULLY CHECK SPACE REQUIREMENTS, INCLUDING SERVING SPACE REQUIREMENTS, WITH OTHER SECTIONS TO ENSURE THAT ALL EQUIPMENT AND MATERIALS CAN BE INSTALLED IN THE SPACES ALLOTTED THERE TO.
 15. PREPARE DRAWINGS, ATTEND MEETINGS, OBTAIN ALL APPROVALS REQUIRED BY ALL AUTHORITIES HAVING JURISDICTION, CONDUCT REQUIRED TESTS AND OBTAIN REQUIRED PERMITS.

- B. GENERAL:
1. PAINTING:
 - a. PAINT:
 - 1) BEST GRADE FOR ITS PURPOSE.
 - 2) DELIVER IN ORIGINAL SEALED CONTAINERS.
 - 3) APPLY IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
 - 4) COLORS TO MATCH EXISTING OR AS SELECTED BY ENGINEER.
 - b. HOT DIPPED GALVANIZED OR DIPPED IN ZINC CHROMATE.
 - c. ZINC CHROMATE WITH FINISH TO MATCH SURROUNDINGS.
 2. CLEANING:
 - a. BRUSH AND CLEAN WORK SURF TO CONCEALING, PAINTING AND ACCEPTANCE.
 - b. PAINTED EXPOSED WORK SOLED OR DAMAGED: CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE.
 - c. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.
 3. CUTTING AND PATCHING: AS REQUIRED FOR NEW WORK

1.15 CONTROL AND DEVICES

- A. ALL CONTROL DEVICES NOT SPECIFIED TO BE FURNISHED AND INSTALLED UNDER THE ELECTRICAL SECTIONS SHALL BE PROVIDED UNDER THIS SECTION.

1.16 PROJECT CLOSE-OUT

- A. AFTER FINAL OPERATION FOR INSPECTION AND ACCEPTANCE DELIVER ALL COPIES OF OPERATION INSTRUCTIONS, MAINTENANCE MANUALS AND PARTS DESCRIPTIONS TO THE ENGINEER.
- B. ALL TOOLS SUPPLIED WITH THE EQUIPMENT FOR MAINTENANCE SHALL BE TAGGED AND TEMPORARILY SECURED TO THE UNIT, OR TURNED OVER TO THE OWNER.

1.17 ELECTRICAL

A. GENERAL:

1. ALL ELECTRICAL MATERIAL, EQUIPMENT, AND APPARATUS SPECIFIED HEREIN SHALL CONFORM TO THE REQUIREMENTS OF DIVISION 26. REFER TO THE RESPONSIBILITY MATRIX FOR ADDITIONAL INFORMATION.
 2. PROVIDE ALL MOTORS FOR EQUIPMENT SPECIFIED HEREIN. PROVIDE MOTOR STARTERS, CONTROLLERS AND OTHER ELECTRICAL APPARATUS AND WIRING WHICH ARE REQUIRED FOR THE OPERATION OF THE EQUIPMENT SPECIFIED HEREIN.
 3. SET AND ALIGN ALL MOTORS AND DRIVES IN EQUIPMENT SPECIFIED HEREIN.
 4. SPECIFIC ELECTRICAL REQUIREMENTS (I.E., HORSEPOWER AND ELECTRICAL CHARACTERISTICS) FOR MECHANICAL EQUIPMENT ARE SCHEDULED ON THE DRAWINGS.
- B. QUALITY ASSURANCE:
1. ELECTRICAL COMPONENTS AND MATERIALS SHALL BE UL, OR ETL, LISTED LABEL AS SUITABLE FOR LOCATION AND USE - NO EXCEPTIONS. SWITCHES INTO THE SYSTEM.
- C. STARTERS AND ELECTRICAL DEVICES:
1. MOTOR STARTER CHARACTERISTICS:
 - a. ENCLOSURES: NEMA 1 (GENERAL PURPOSE ENCLOSURES WITH PADLOCK EARS, EXCEPT IN WET LOCATIONS SHALL BE NEMA 3R WITH CONDUIT HUBS).
 - b. TYPE AND SIZE OF STARTER SHALL BE AS RECOMMENDED BY MOTOR MANUFACTURER AND THE DRIVEN EQUIPMENT MANUFACTURER FOR APPLICABLE PROTECTION AND START UP CONDITION.
 2. MANUAL SWITCHES SHALL HAVE PILOT LIGHTS AND ALL REQUIRED SWITCH POSITIONS FOR MULTI SPEED MOTORS. OVERLOAD PROTECTION: MELTING ALLOY OR METALLIC TYPE THERMAL OVERLOAD RELAYS, SIZED ACCORDING TO ACTUAL OPERATING CURRENT (FIELD MEASURED).
 3. MAGNETIC STARTERS:
 - a. HEAVY DUTY, OIL RESISTANT, HAND-OFF-AUTO (HOA), OR AS INDICATED, AND PILOT LIGHTS, PROPERLY ARRANGED FOR SINGLE SPEED OR MULTI SPEED OPERATION AS INDICATED.
 - b. TRIP FREE THERMAL OVERLOAD RELAYS, EACH PHASE, SIZED ACCORDING TO ACTUAL OPERATING CURRENT (FIELD MEASURED).
 - c. INTERLOCKS: PNEUMATIC SWITCHES AND SIMILAR DEVICES AS REQUIRED FOR COORDINATION WITH CONTROL REQUIREMENTS OF DIVISION 23 CONTROLS SECTIONS
 - d. BUILT IN PRIMARY AND SECONDARY FUSED CONTROL CIRCUIT TRANSFORMER, SUPPLIED FROM LOAD SIDE OF EQUIPMENT DISCONNECT, IF EXTERNALLY OPERATED MANUAL RESET.
 - e. UNDER VOLTAGE RELEASE OR PROTECTION FOR ALL MOTORS OVER 20 HP.
 2. MOTOR CONNECTIONS: LIQUID TIGHT, FLEXIBLE CONDUIT, EXCEPT WHERE PLUG IN ELECTRICAL COILS ARE SPECIFICALLY INDICATED.

- D. LOW VOLTAGE CONTROL WIRING:
1. GENERAL: 14 GAUGE, TYPE THHN, COLOR CODED, INSTALLED IN CONDUIT.
 2. MANUFACTURER: GENERAL CABLE CORP., ALCAN CABLE, AMERICAN INSULATED WIRE CORP., SENATOR WIRE AND CABLE CO., OR SOUTH-WIRE CO.

- E. DISCONNECT SWITCHES:
1. FUSIBLE SWITCHES: FOR EQUIPMENT 1/2 HP OR LARGER, PROVIDE FUSED, EACH PHASE, HEAVY DUTY, HORSEPOWER RATED, SPRING LOADED QUICK MAKE, QUICK BREAK MECHANISM, DEAD FRONT LINE SIDE SHEED, SOLDERLESS HUGS SUITABLE FOR COPPER OR ALUMINUM CONDUCTORS, SPRING REINFORCED FUSE CLIPS, ELECTRIC SILVER PLATED CURED CARRYING PARTS, LINGED DOORS, OPERATING LEVER ARRANGED FOR LOCKING IN THE "OPEN" POSITION, ARC QUENCHERS, CAPACITY AND CHARACTERISTICS AS INDICATED.
 2. NON FUSIBLE SWITCHES: FOR EQUIPMENT LESS THAN 1/2 HORSEPOWER, SWITCH SHALL BE HORSEPOWER RATED; TOGGLE SWITCH TYPE WITH THERMAL OVERLOAD QUANTITY OF POLES AND VOLTAGE RATING AS REQUIRED.

PART 2 - EXECUTION

2.1 GENERAL

- A. WORKMANSHIP SHALL BE PERFORMED BY LICENSED JOURNEYMEN OR MASTER MECHANICS AND SHALL RESULT IN AN INSTALLATION CONSISTENT WITH THE BEST PRACTICES OF TRADES.
- B. INSTALL WORK UNIFORM, LEVEL, AND PLUMB, IN RELATIONSHIP TO LINES OF BUILDING. DO NOT INSTALL ANY DIAGONAL OR OTHERWISE REGULAR WORK UNLESS SO INDICATED ON DRAWINGS OR APPROVED BY ARCHITECT.

2.2 MANUFACTURERS DIRECTIONS

- A. FOLLOW MANUFACTURERS DIRECTIONS AND RECOMMENDATIONS IN ALL CASES WHERE THE MANUFACTURERS ARTICLES USED ON THIS CONTRACT FURNISH DIRECTIONS COVERING POINTS NOT SHOWN ON THE DRAWINGS OR COVERED IN THESE SPECIFICATIONS.

2.3 INSTALLATION

- A. COORDINATE THE WORK BETWEEN THE VARIOUS MECHANICAL SECTIONS AND WITH THE WORK SPECIFIED UNDER OTHER DIVISIONS. IF ANY COOPERATIVE WORK MUST BE ALTERED DUE TO LACK OF PROPER SUPERVISION OR FAILURE TO MAKE PROPER AND TIMELY PROVISIONS, THE ALTERATIONS SHALL BE MADE TO THE SATISFACTION OF THE ARCHITECT AT THE CONTRACTORS COST. COORDINATE WALL AND CEILING WORK WITH THE GENERAL CONTRACTOR, AND HIS SUBCONTRACTORS IN LOCATING CEILING AIR OUTLETS, WALL REGISTERS, ETC.
- B. INSPECT ALL MATERIAL, EQUIPMENT, AND APPARATUS UPON DELIVERY AND DO NOT INSTALL ANY DAMAGED OR DEFECTED MATERIALS.

2.4 ELECTRICAL REQUIREMENTS

- A. MECHANICAL CONTRACTOR SHALL COORDINATE WITH DIVISION 26 WORK TO PROVIDE COMPLETE SYSTEMS AS REQUIRED TO OPERATE ALL MECHANICAL DEVICES INSTALLED UNDER THIS DIVISION OF WORK.
- B. INSTALLATION OF ELECTRICAL CONNECTIONS: FURNISH, INSTALL, AND WIRE (EXCEPT AS MAY BE OTHERWISE INDICATED) ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING AND FIRE PROTECTION, ETC., MOTORS AND CONTROLS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE AND IN ACCORDANCE WITH EQUIPMENT MANUFACTURERS WRITTEN INSTRUCTIONS AND WITH RECOGNIZED INDUSTRY PRACTICES, AND COMPLYING WITH APPLICABLE REQUIREMENTS OF UL, NEC, AND N.E.C.A.'S STANDARD OF INSTALLATION TO ENSURE THAT PRODUCTS FULLY MEET REQUIREMENTS. CAREFULLY COORDINATE WITH WORK PERFORMED UNDER THE MECHANICAL DIVISION OF THESE SPECIFICATIONS.
- C. DIVISION 23 HAS RESPONSIBILITIES FOR ELECTRICALLY POWERED OR CONTROLLED MECHANICAL EQUIPMENT WHICH IS SPECIFIED IN DIVISION 23 SPECIFICATIONS OR SCHEDULED ON DIVISION 23 DRAWINGS. THE SPECIFIC DIVISION OF RESPONSIBILITY FOR EQUIPMENT AND CONNECTIONS FOR FURNISHING OR WIRING THIS EQUIPMENT IS AS FOLLOWS:

1. DIVISION 26 MECHANICAL RESPONSIBILITIES:
- a. MOTORS: FURNISH AND INSTALL ALL MOTORS NECESSARY FOR MECHANICAL EQUIPMENT.
 - b. DISCONNECTS: PROVIDE THE DISCONNECTS WHICH ARE PART OF FACTORY WIRING DIVISION 23 EQUIPMENT. FACTORY WIRING TO INCLUDE WIRING BETWEEN MOTOR AND DISCONNECT OR COMBINATION STARTER/DISCONNECT.
 - c. CONTROLS: DIVISION 23 CONTRACTOR INCLUDING THE TEMPERATURE CONTROLS. SUBCONTRACTOR IS RESPONSIBLE FOR THE FOLLOWING: MOTORS, EQUIPMENT IN ITS ENTIRETY. THIS EQUIPMENT INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
 - 1) CONTROL RELAYS NECESSARY FOR CONTROLLING DIVISION 23 EQUIPMENT.
 - 2) CONTROL TRANSFORMERS NECESSARY FOR PROVIDING POWER TO CONTROLS FOR DIVISION 23 EQUIPMENT.
 - 3) LINE VOLTAGE THERMOSTATS.
 - 4) LOW OR NON-LOAD VOLTAGE CONTROL COMPONENTS.
 - 5) REMOTE BUILT THERMOSTATS.
 - 6) NON-LIFE SAFETY RELATED VALVE OR DAMPER ACTUATORS.
 - 7) FLOAT SWITCHES.
 - 8) SOLENOID VALVES, EP AND PE SWITCHES.
 - 9) REFRIGERATION CONTROLS. DIVISION 26 PROVIDES POWER TO REFRIGERATION PANELS.)
 - 10) PNEUMATIC THERMOSTATS.
 - d. FIRE AND LIFE SAFETY EQUIPMENT:
 - 1) FIRESMOKE DAMPERS: DIVISION 23 IS RESPONSIBLE FOR PROVIDING AND PHYSICALLY INSTALLING THE DAMPER AND FOR INSTALLING ANY REQUIRED CONTROL INTERFACE WIRING TO DIVISION 23 CONTROLS.
 - 2) WHERE FIRESMOKE DAMPERS ARE PART OF AN INTEGRATED SMOKE CONTROL SYSTEM, DIVISION 23 IS RESPONSIBLE FOR PROVIDING DAMPERS WITH NECESSARY END SWITCHES FOR PROOF OF CLOSURE.
 - 3) WHERE THESE DAMPERS ARE NOT PART OF AN INTEGRATED AREA WIDE SMOKE DETECTION SYSTEM, DIVISION 23 IS RESPONSIBLE FOR PROVIDING EACH FIRESMOKE DAMPER WITH A DEDICATED DUCT DETECTOR AND WIRING TO THE DETECTOR. THE DETECTOR IS TO BE INSTALLED BY DIV. 23 BUT WIRED FOR DAMPER CONTROL BY DIV. 26.
 - e. FIRE SPRINKLER SYSTEM: DIVISION 23 IS RESPONSIBLE FOR PROVIDING NECESSARY CONTROLS INCLUDING FLOW SWITCHES AND ALARM BELLS.
2. SPECIALIZED FIRE SUPPRESSION SYSTEMS: DIVISION 23 IS RESPONSIBLE FOR PROVIDING NECESSARY SYSTEM CONTROLS AND ANY REQUIRED CONTROL INTERFACE WIRING TO THESE CONTROLS. DIVISION 26 IS RESPONSIBLE FOR BRINGING POWER TO POINT OF CONNECTION WITH THE SYSTEM.

- D. DIVISION 26 HAS RESPONSIBILITIES FOR ELECTRICALLY POWERED OR CONTROLLED MECHANICAL EQUIPMENT WHICH IS SPECIFIED IN DIVISION 23 SPECIFICATIONS OR SCHEDULED ON DIVISION 23 DRAWINGS. THE SPECIFIC DIVISION OF RESPONSIBILITIES BETWEEN DIVISION 23 AND 26 FOR FURNISHING

OR WIRING THIS EQUIPMENT IS AS FOLLOWS:

1. DIVISION 26 ELECTRICAL RESPONSIBILITIES:
2. MOTORS: PROVIDE THE POWER WIRING FOR THE MOTORS.
3. DISCONNECTS: PROVIDE ALL DISCONNECTS NECESSARY FOR DIVISION 23 MECHANICAL EQUIPMENT WHICH ARE NOT PROVIDED AS PART OF FACTORY WIRING DIVISION 23 EQUIPMENT. PROVIDE POWER WIRING TO ALL DISCONNECTS. IN ADDITION PROVIDE POWER WIRING BETWEEN MOTOR AND DISCONNECT WHEN THE DISCONNECT IS NOT FACTORY INSTALLED. SEE ALSO VARIANCE FREQUENCY DRIVE ABOVE FOR SPECIAL WIRING REQUIREMENTS.
- a. CONTROLS: DIVISION 26 CONTRACTOR IS RESPONSIBLE FOR PROVIDING POWER TO CONTROL PANELS AND CONTROL CIRCUIT OUTLETS.
- b. FIRE AND LIFE SAFETY EQUIPMENT:
 - 1) FIRESMOKE DAMPERS: DIVISION 26 IS RESPONSIBLE FOR POWER WIRING TO THE DAMPER AND AS FOLLOWS:
 - a) WHERE THESE DAMPERS ARE PART OF AN INTEGRATED SMOKE CONTROL SYSTEM DIVISION 26 IS RESPONSIBLE FOR PROVIDING THE DETECTORS AND FOR ALL FIRE DETECTION SYSTEM WIRING NECESSARY TO INTEGRATE DAMPERS AND RELATED END SWITCHES INTO THE SYSTEM.
 - b) WHERE THESE DAMPERS ARE NOT PART OF AN INTEGRATED AREA WIDE SMOKE DETECTION SYSTEM, DIVISION 23 IS RESPONSIBLE FOR PROVIDING EACH FIRESMOKE DAMPER WITH A DEDICATED DUCT DETECTOR INSTALLED PER THE REQUIREMENTS OF THE BUILDING CODE. (SEE SECTION 15800.) IF NOT INTEGRAL WITH THE DAMPER ASSEMBLY, THE DETECTOR IS TO BE INSTALLED BY DIV. 23 BUT WIRED FOR DAMPER CONTROL BY DIV. 26.
 - 2) FIRE SPRINKLER SYSTEM: DIVISION 26 IS RESPONSIBLE FOR PROVIDING POWER WIRING TO FIRE PROTECTION CONTROLS INCLUDING FLOW SWITCHES AND ALARM BELLS.
 - 3) SPECIALIZED FIRE SUPPRESSION SYSTEMS: DIVISION 26 IS RESPONSIBLE FOR PROVIDING POWER WIRING TO SUPPRESSION SYSTEM AND ITS CONTROL.

- E. COORDINATE WITH OTHER WORK, INCLUDING WIRELESS CABLES, RACEWAY AND EQUIPMENT INSTALLATION, AS NECESSARY TO PROPERLY INTERFACE INSTALLATION OF ELECTRICAL CONNECTIONS FOR EQUIPMENT WITH OTHER WORK.
- F. CONNECT ELECTRICAL POWER SUPPLY CONDUCTORS TO EQUIPMENT CONDUCTORS IN ACCORDANCE WITH EQUIPMENT MANUFACTURERS WRITTEN INSTRUCTIONS AND WIRING DIAGRAMS. WIRE NECESSARY SCHEDULE MOMENTARY OUTAGES FOR REPLACING EXISTING WIRING SYSTEMS WITH NEW WIRING SYSTEMS. WHEN "CUTTING-OVER" HAS BEEN SUCCESSFULLY ACCOMPLISHED, REMOVE, RELOCATE, OR ABANDON EXISTING WIRING AS COVERED.

- G. COVER SPICES WITH ELECTRICAL INSULATING MATERIAL EQUIVALENT TO, OR GREATER INSULATION RESISTIVITY RATING, THAN ELECTRICAL INSULATION RATING OF THOSE CONDUCTORS BEING SPLICED.
- H. PREPARE CABLES AND WIRES, BY CUTTING AND STRIPPING COVERING ARMOR, JACKET, AND INSULATION PROPERLY TO ENSURE UNIFORM AND NEAT APPEARANCE WHERE CABLES AND WIRES ARE TERMINATED. EXERCISE CARE TO AVOID CUTTING THROUGH TAPES WHICH WILL REMAIN ON CONDUCTORS. ALSO AVOID "RINGING" COPPER CONDUCTORS WHILE SKINNING WIRE.

- I. MOTORS AND MOTOR CONTROL EQUIPMENT: CONFORM TO THE STANDARDS OF THE NEMA EQUIP MOTORS WITH MAGNETIC OR MANUAL LINE STARTERS WITH OVERLOAD PROTECTION. MOTOR STARTERS AND LINE VOLTAGE CONTROLS SHALL BE INSTALLED UNDER ELECTRICAL SECTION BUT LOCATED AND COORDINATED AS REQUIRED UNDER THIS SECTION OF THE WORK. THE STARTERS SHALL BE COMBINATION TYPE WITH NON FUSIBLE DISCONNECT SWITCHES. ALL SINGLE PHASE FRACTIONAL HORSEPOWER MOTORS SHALL HAVE BUILT IN OVERLOAD PROTECTION.

SECTION 20600 - HANGERS AND SUPPORTS

- A. PIPE HANGERS, SUPPORTS, AND GUIDES

1. GENERAL:

- A. HANGERS AND SUPPORTS TO BE DESIGNED AND INSTALLED PER SMACNA GUIDELINES.
1. ASSURE ADEQUATE SUPPORT FOR PIPE AND CONTENTS.
 2. PROVIDE RIGID INSULATION SECTION AT ALL HANGER SUPPORTS.
 3. PROVIDE SEISMIC RESTRAINTS TO MEET LOCAL CODES.
 4. PREVENT VIBRATION OR SWAYING.
 5. PROVIDE SLEEVING FOR ALL PIPING THAT PENETRATES FLOOR SLABS.
 6. PROVIDE FOR EXPANSION AND CONTRACTION OF PIPE.
 7. SUPPORTS OF WIRE, ROPE, WOOD, CHAIN, STRAP PERFORATED BAR OR ANY OTHER MAKE/SHIP DEVICE NOT PERMITTED.
 8. COMPLY WITH APPLICABLE REQUIREMENTS AT ANGLES B31.1 AND B31.2 FOR PIPING.
 9. SUPPORT PIPING INDEPENDENTLY SO THAT EQUIPMENT IS NOT STRESSED BY PIPING WEIGHT OF EXPANSION.
 10. HANGERS AND SUPPORTS SHALL HAVE MINIMUM SAFETY FACTOR OF THREE (3), BASED ON ULTIMATE TENSILE OR COMPRESSIVE STRENGTH, AS APPLICABLE, OF MATERIAL USED.
 11. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS, HANGERS AND SUPPORTS LOCATED IN CRAWL SPACES, PIPES SHAFTS AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED.
 12. HORIZONTAL PIPING, EXCEPT AS NOTED:
 - a. ADJUSTABLE CLEVIS TYPE AND ROD; ALL SERVICES AT OR BELOW 250 DEG F.
 - b. ROLLERS OR SLIDE BASES PIPE STAND, BRACKET, TRAPPIER OR OTHER EQUIVALENT STRUCTURAL SUPPORT. ROLLERS NOT REQUIRED WHERE SPRING HANGERS ARE CALLED FOR.
 13. TRAPPIZE HANGERS:
 - a. NOT PERMITTED FOR FIRE AND SPRINKLER PIPING.
 - b. GUIDE INDIVIDUAL PIPES ON TRAPEZES WITH 1/4 INCH U-BOLT OR SUPERSTRUT 702 PIPE CLAMP. INSTALL THERMAL HANGER SHIELD AT EACH SUPPORT POINTS WITH WRITTEN INSTRUCTIONS AND WITH RECOGNIZED INDUSTRY PRACTICES, AND COMPLYING WITH APPLICABLE REQUIREMENTS OF UL, NEC, AND N.E.C.A.'S STANDARD OF INSTALLATION TO ENSURE THAT PRODUCTS FULLY MEET REQUIREMENTS. CAREFULLY COORDINATE WITH WORK PERFORMED UNDER THE MECHANICAL DIVISION OF THESE SPECIFICATIONS.
 14. INSTALL PIPE ISOLATORS BETWEEN HANGERS AND:
 - a. UNINSULATED COPPER TUBING.
 - b. WHEREVER ANY PIPE REQUIRES SOUND AND VIBRATION ISOLATION.
 15. MISCELLANEOUS STEEL: PROVIDE MISCELLANEOUS STEEL MEMBERS, BEAMS, BRACKETS, ETC., FOR SUPPORT OF WORK IN THIS DIVISION UNLESS SPECIFICALLY INCLUDED IN OTHER DIVISIONS.
 16. PIPE SUPPORT SPACING: PER IMC SECTION 305.

D. HANGERS AND SUPPORTS

1. GENERAL:
- a. SUPPORT HORIZONTAL DUCTS WITH HANGERS OF SIZE AND SPACING AS INDICATED IN PERTINENT SMACNA DUCT CONSTRUCTION STANDARDS. SEAL AROUND ALL SCREWS.
 - b. PROVIDE SEISMIC CONSTRAINTS TO MEET LOCAL CODES.
2. HORIZONTAL DUCT SUPPORTS:
- a. INSTALL HANGERS AT EACH CHANGE IN DIRECTION OF DUCT.
 - b. STRAP HANGERS:
 - 2) EXTEND STRAP DOWN BOTH SIDES OF DUCTS.
 - 3) TURN UNDER BOTTOM ONE INCH MINIMUM.
 - 4) METAL SCREW HANGERS TO:
 - a) BOTTOM OF DUCT.
 - b) UPPER AND LOWER SIDES OF DUCTS.
 - c) NOT MORE THAN 12 INCHES ON CENTER.
 - 5) ANGLE HANGERS:
 - a) PROVIDE ANGLE HANGERS FORMED BY EXTENDED VERTICAL BRACING ANGLES.
 3. RECTANGULAR DUCT SUPPORT SPACING:
 - a. HORIZONTAL DUCTS (400" DIAMETER): 10'
 - b. VERTICAL DUCTS: 12'
 - c. TRAPEZE DUCTS: 8'
 4. ROUND DUCT SUPPORT SPACING:
 - a. HORIZONTAL DUCTS (400" DIAMETER): 10'
 - b. VERTICAL DUCTS: 12'
 - c. TRAPEZE DUCTS: 8'

HVAC EQUIPMENT

1. GENERAL:
- a. ALL FANS SHALL BE MOUNTED ON SPRING VIBRATION ISOLATORS.
 - b. COORDINATE LOCATION OF ALL EQUIPMENT WITH BUILDING OWNER.

D. ATTACHMENT TO STRUCTURE:

1. STEEL BEAM ANCHORS:
 - a. APPROVED BEAM OR CHANNEL CLAMPS.
 - b. DO NOT CUT OR WELD TO STRUCTURAL STEEL WITHOUT WRITTEN APPROVAL OF OWNER.
 - c. OTHER METHODS AS DETAILED ON DRAWINGS.
2. STUD WALL, SIDE-WALL SUPPORTS:
 - a. TOGGLE BOLTS.
 - b. STUDS WELDED TO STRUCTURAL STUDS.
 - c. LAG SCREWS INTO WOOD BACKING.
 - d. OTHER METHODS.
3. SUPPORT SPREADERS:
 - a. INSTALL SPREADERS SPANNING BETWEEN STRUCTURAL MEMBERS WHEN HANGERS FALL BETWEEN THEM AND HANGER LOAD IS TOO GREAT FOR SLAB OR DECK ATTACHMENT.
 - b. SPREADERS MAY BE ONE OF METHODS LISTED BELOW, OR COMBINATION OF BOTH AS REQUIRED.
 - 1) FABRICATED FROM STRUCTURAL CHANNEL END FITTINGS BOLTED OR WELDED. SECURE TO STRUCTURAL MEMBERS AS REQUIRED BY CONSTRUCTION AND AS APPROVED BY STRUCTURAL ENGINEER.

- 2) FORMED CHANNELS WITH FITTINGS, SIMILAR TO SUPERSTRUT; SUBMIT MANUFACTURERS CALCULATIONS FOR INSTALLATION.

SECTION 20600 - IDENTIFICATION

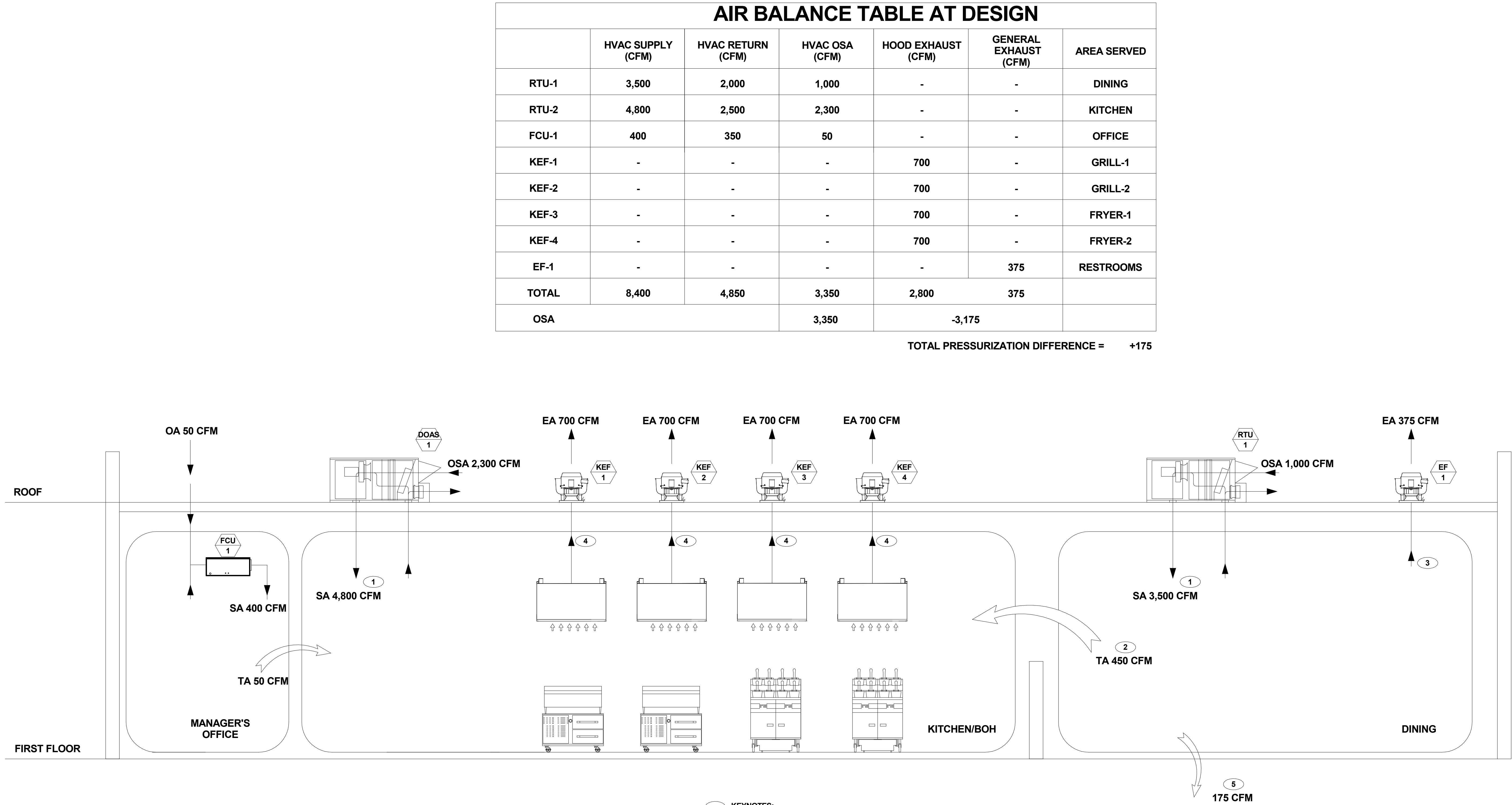
- A. AN IDENTIFICATION LABEL SHALL BE PROVIDED FOR THE FOLLOWING TYPES OF EQUIPMENT:
1. ROOF TOP UNITS.
 2. EXHAUST FANS.
 3. MAKEUP AIR UNITS.
 4. SPLIT SYSTEMS.
 5. CONDENSING UNITS.
 6. KITCHEN HOOD AND EXHAUST SYSTEMS.
- B. IDENTIFICATION LABELS SHALL BE BY SETON, OR EQUIVALENT. PROVIDE LABELS & FLOW ARROWS ON ALL DUCT AND PIPING @ 10' INTERVALS.
- C. TEMPERATURE CONTROL PANELS SHALL BE IDENTIFIED WITH ENGRAVED PHENOLIC NAMEPLATES AND EACH CONTROL COMPONENT SHALL BE IDENTIFIED WITH ITS SETPOINTS.
- D. ALL MECHANICAL EQUIPMENT INSTALLED ABOVE SUSPENDED CEILINGS SHALL BE MARKED ON THE BOTTOM WITH ITS EQUIPMENT NUMBER MATCHING THE EQUIPMENT SCHEDULE AND CONTROL GRAPHICS.
- E. ALL LABELING OF EXTERIOR EQUIPMENT SHALL USE ENGRAVED PHENOLIC LABELS.
- F. IDENTIFICATION LABEL SHALL CONFORM TO ANSI/MSEA 13.1 WHERE APPLICABLE.

SECTION 20600 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

A. GENERAL:

1. TAB SHALL BE PERFORMED BY NATIONAL TAB, NORTH KANSAS CITY, MO (WLL TURNBOUGH 314-964-6244), NO EXCEPTIONS.
2. AD

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VA - 1375 - PIKE 7
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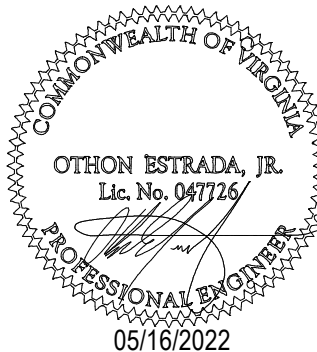
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FOODSERVICE CONSULTANT
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Date	Description
05/16/2022	PERMIT AND BID
07/25/2022	ADDENDUM #1
09/02/2022	ADDENDUM #2
10/07/2022	ISSUE FOR BID
02/10/2023	BID SET
06/27/2023	ISSUE FOR CONSTRUCTION

Seal / Signature



05/16/2022

Project Name

PIKE 7

Project Number

069.6538.000

Description

MECHANICAL AIRFLOW DIAGRAMS

Scale

3/8" = 1'-0"

M601



VA - 1375 - PIKE 7
8350 LEESBURG PIKE
VIENNA, VA 22182

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F 06/27/2023	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

PIKE 7

Project Number

069.6538.000

Description

MECHANICAL CONTROLS

Scale

NTS

M602

GENERAL

ALL ROOFTOP UNITS SHALL SHUT DOWN UPON ALARM FROM KITCHEN EXHAUST HOOD FIRE EXTINGUISHING SYSTEM.

RTU-1

- DURING OCCUPIED HOURS, UNIT SHALL RUN CONTINUOUSLY AND OUTDOOR AIR DAMPER AND RETURN AIR DAMPER SET TO MINIMUM POSITION TO MAINTAIN MINIMUM VENTILATION.
- WHEN FREE COOLING IS NOT AVAILABLE, THE COMPRESSORS WILL BE CONTROLLED BY THE ZONE THERMOSTAT. WHEN FREE COOLING IS AVAILABLE, THE OUTDOOR AIR DAMPER IS MODULATED BY ECONOMIZER CONTROL TO PROVIDE A 50 DEG-F TEMPERATURE INTO THE ZONE. AS THE MIXED AIR TEMPERATURE FLUCTUATES ABOVE 55DEG-F OR BELOW 50 DEG-F, DAMPERS WILL BE MODULATED (OPEN OR CLOSE) TO BRING THE MIXED-AIR TEMPERATURE BACK WITHIN CONTROL.
- IF MECHANICAL COOLING IS UTILIZED WITH FREE COOLING, THE OUTDOOR-AIR DAMPER WILL MAINTAIN ITS CURRENT POSITION AT THE TIME THE COMPRESSOR IS STARTED. IF THE INCREASE IN COOLING CAPACITY CAUSES THE MIXED-AIR TEMPERATURE TO DROP BELOW 45 DEG-F, THEN THE OUTDOOR AIR DAMPER POSITION WILL BE DECREASED TO THE MINIMUM POSITION. IF THE MIXED AIR TEMPERATURE CONTINUES TO FALL, THE OUTDOOR AIR DAMPER WILL CLOSE. CONTROL RETURNS TO NORMAL ONCE THE MIXED AIR TEMPERATURE RISES ABOVE 48 DEG-F.
- THE POWER EXHAUST FANS WILL BE ENERGIZED AND DE-ENERGIZED AS THE OUTDOOR AIR DAMPER OPENS AND CLOSES. FOR ECONOMIZER OPERATION, THERE MUST BE A THERMOSTAT CALL FOR THE FAN.
- IF THE UNIT IS ON, OCCUPIED MODE AND THE FAN IS ON, THE DAMPER WILL OPERATE AT MINIMUM POSITION. OTHERWISE, THE DAMPER WILL BE CLOSED. WHEN THE ECONOMIZER IS IN OCCUPIED MODE AND A CALL FOR COOLING EXISTS, THE CONTROL WILL FIRST CHECK FOR INDOOR FAN OPERATION. IF THE FAN IS NOT ON, THEN COOLING WILL NOT BE ACTIVATED.
- IF THE FAN IS ON, THEN THE CONTROL WILL OPEN THE ECONOMIZER TO THE MINIMUM POSITION. IF FREE COOLING CAN BE USED AS DETERMINED FROM THE APPROPRIATE CHANGEOVER COMMAND (73 DEG-F DB), THEN THE CONTROL WILL MODULATE THE DAMPERS OPEN TO MAINTAIN THE MIXED-AIR TEMPERATURE SET-POINT AT 50-DEG-F TO 55 DEG-F. IF THERE IS A FURTHER DEMAND FOR, THEN THE CONTROL WILL BRING ON COMPRESSOR STAGE 1 TO MAINTAIN THE MIXED-AIR TEMPERATURE SET POINT.

RTU-2 (DOAS)

- DURING OCCUPIED HOURS, UNIT SHALL RUN CONTINUOUSLY AND:
-WHEN THE EXHAUST HOOD CONTROLLER IS TURNED ON, ACTIVATING THE KITCHEN EXHAUST, THE MIXING BOX DAMPER IS MODULATED TO PROVIDE 2,300 CFM OF OA AIR FOR MAKE UP AIR.
-WHEN THE EXHAUST HOOD CONTROLLER IS TURNED OFF, DEACTIVATING THE KITCHEN EXHAUST, THE MIXING BOX DAMPER IS MODULATED TO PROVIDE 300 CFM OF OA AIR FOR MINIMUM VENTILATION.
- UNIT SHALL BE OUTFITTED WITH CASLINK FOR FUTURE CLOUD BASED MONITORING, WHICH MONITORS EVERY POINT OF OPERATION, PROVIDES CONFIGURABLE AUTOMATED FAULT ALERT E-MAILS, AND REMOTE CONTROL CAPABILITIES.
- SPACE TEMP CONTROL MAINTAINS A CONSTANT SUPPLY AIR VOLUME AND MODULATES THE COMPRESSOR FREQUENCY AND GAS HEAT TO ACCURATELY MAINTAIN THE DESIRED SPACE TEMPERATURE SET POINT AND COMPENSATE FOR FLUCTUATIONS IN ENTERING OA AIR TEMPERATURE USING PID CONTROLS DESIGNED SPECIFICALLY FOR THE DOAS.
- WHEN THE RELATIVE HUMIDITY IN THE SPACE IS ABOVE THE MAXIMUM SET POINT, THE COOLING CAPACITY SHALL BE STAGED TO PROVIDE A OFF COIL TEMPERATURE OF 54 DEG-F AND APPLY HOT GAS REAHEAT TO OBTAIN THE REQUIRED SUPPLY AIR TEMPERATURE TO ACHIEVE THE SPACE TEMPERATURE SET POINT.
- THE UNIT WILL BE CAPABLE OF MODULATING AND SHUTTING OFF THE COMPRESSOR TO PROVIDE FREE COOLING AND DEHUMIDIFICATION AS THE OUTDOOR AIR CONDITIONS ALLOW.

ECU-1 & 2

- DURING OCCUPIED HOURS, UNIT SHALL RUN CONTINUOUSLY.
- SPACE TEMP CONTROL MODULATES THE COMPRESSOR FREQUENCY TO ACCURATELY MAINTAIN THE DESIRED SPACE TEMPERATURE SET POINT AND COMPENSATE FOR FLUCTUATIONS IN ENTERING OA AIR TEMPERATURE.

KITCHEN EXHAUST FANS

- KEF 1,2,3 AND 4 SHALL BE ENERGIZED BY CONTACTORS IN THE HOOD CONTROLLER. COORDINATE INSTALLATION WITH ELECTRICAL CONTRACTOR.
- UPON ALARM FROM KITCHEN EXHAUST HOOD FIRE EXTINGUISHING SYSTEM, EXHAUST FAN SHALL CONTINUE TO RUN.
- NORMAL TEMPERATURE TEST: EXHAUST FANS SHALL OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300 DEG-F UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

RESTROOM EXHAUST FAN

- EXHAUST FAN EF-1 SHALL OPERATE CONTINUOUSLY DURING OCCUPIED HOURS. INTERLOCK WITH RTU-1.

KITCHEN EXHAUST HOODS

- THE ELECTRICAL PACKAGE, TYPICALLY FP, IS DESIGNED TO THERMOSTATICALLY ACTIVATE THE EXHAUST FANS FOR AN EXHAUST HOOD WHENEVER ELEVATED TEMPERATURES ARE SENSED IN THE EXHAUST SYSTEM. THIS OPTION WILL MEET THE REQUIREMENTS OF BY PROVIDING A THERMOSTAT(S) MOUNTED IN THE DUCT OR HOOD RISER TO SENSE INCREASED EXHAUST TEMPERATURES.
- CONTROLS SHALL BE LISTED BY ETL (UL 508A). THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBES(S) LOCATED IN THE DUCT RISER SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A ROOM TEMPERATURE SENSOR IS ALSO PROVIDED FOR FIELD INSTALLATION IN THE KITCHEN SPACE IN ORDER TO START THE FAN(S) BASED ON THE TEMPERATURE DIFFERENTIAL BETWEEN THE ROOM AND THE EXHAUST AIR IN THE DUCT, RATHER THAN FIXED SET-POINTS. THE SYSTEM IS FACTORY PRE-SET TO ACTIVATE THE FANS AT 10 DEG-F ABOVE THE ROOM TEMPERATURE.
- ONCE THE DUCT TEMPERATURE REACHES THE ACTIVATION POINT, THE EXHAUST FANS WILL BE ACTIVATED. THE CONTROLS ALSO PROVIDE HYSTERESIS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND THE HEAT IN THE EXHAUST SYSTEM IS REDUCED. THE HYSTERESIS IS FACTORY SET 2 DEGREES AND WILL KEEP THE EXHAUST RUNNING UNTIL THE TEMPERATURE FALLS 2 DEGREES BELOW THE ACTIVATION SET POINT. A HYSTERESIS TIMER ALSO EXISTS TO KEEP THE FANS RUNNING FOR AT LEAST 30 MIN AFTER BEING ACTIVATED BY THE TEMPERATURE RISE.
- THE ACTIVATION AND HYSTERESIS SETTINGS MAY BE FIELD ADJUSTED ON THE BOARD LCD INTERFACE LOCATED INSIDE THE CONTROL ENCLOSURE TO MEET APPLICATION NEEDS. THE PANEL IS FACTORY CONFIGURED TO SHUT DOWN SUPPLY FANS, TURN ON THE EXHAUST FANS AND TURN OFF THE HOOD LIGHTS IN A FIRE CONDITION.

PACKAGED DX COOLING/GAS HEATING ROOFTOP UNIT SCHEDULE																										
ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	SUPPLY FAN				OSA (CFM)	DX COOLING						GAS HEATING				ELECTRICAL (RTU)				REF.	WT. (LBS)	REMARKS
					CFM	E.S.P. (IN. WG.)	FAN RPM	BHP		NOM. TOTAL (TONS)	TOTAL (MBH)	SENSIBLE (MBH)	EAT (DB/WB)	LAT (DB/WB)	EER/ IEER	INPUT (MBH)	OUTPUT (MBH)	EAT (DB/WB)	LAT (DB/WB)	V	PH	MCA	MOCP			
RTU	1	CARRIER	48FCDM14	DINING	3,500	1.0	710	1.75	1,000	12.5	140	93	77/66	54/52	12.2/13.9	180	150	46	80	208	3	63	80	R-410A	1,500	1, 2, 3, 4, 5, 6, 7, 8, 9

- NOTES:
1. PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION.
 2. PROVIDE WITH VENSTAR T2900 7-DAY PROGRAMMABLE THERMOSTAT WITH WALLPLATE AND ACC-TSEN REMOTE TEMPERATURE SENSOR.
 3. PROVIDE WITH FACTORY FURNISHED DIRECT DRIVE 2 SPEED VFD FAN CONTROL.
 4. PROVIDE WITH BAROMETRIC RELIEF FIXED DRY-BULB ECONOMIZER. PROVIDE WITH ECONOMIZER FDD.
 5. PROVIDE WITH SMOKE DETECTOR FOR AUTOMATIC SHUT-DOWN OF UNIT UPON SMOKE DETECTION.
 6. PROVIDE WITH MERV-8 PRE FILTERS AND MERV-13 FINAL FILTERS.
 7. PROVIDE WITH MANUFACTURERS 14" CURB.
 8. PROVIDE WITH BACNET COMMUNICATION CARD FOR FUTURE CONNECTION.
 9. PROVIDE WITH NATIONAL TAB UV-PH INDOOR PURIFICATION SYSTEM PHI-PKG14-24V (GENERAL CONTRACTOR FURNISHED; TAB CONTRACTOR INSTALLED).

PACKAGED DX COOLING/GAS HEATING DOAS UNIT SCHEDULE																														
ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	SUPPLY FAN					HOODS ON OSA (CFM)	MIN OSA (CFM)	COOLING					HOT GAS REHEAT		GAS HEATING				ELECTRICAL				REF.	WT. (LBS)	REMARKS	
					SUPPLY CFM	E.S.P. (IN. WG.)	FAN RPM	BHP	HP			NOM. TOTAL (TONS)	CAP. TOTAL (MBH)	CAP. SENSIBLE (MBH)	EAT (F) (DB/WB)	LAT (F) (DB/WB)	EER/ IEER (AHR)	CAP. (MBH)	LAT (F)	INPUT (MBH)	OUTPUT (MBH)	EAT (F)	LAT (F)	V	PH	MCA				MOCP
RTU	2	CAPTIVEAIRE	CASRTU3-1400-20-20T	KITCHEN	4,800	1	-	5	7.5	2,300	300	20	263	172	82.5/68	50/49.5	-/18.2	129	73	394	315	32	87	208	3	99	110	R-410A	3,000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

- NOTES:
1. PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION.
 2. PROVIDE WITH POWERED EXHAUST WITH FIXED DRY-BULB ECONOMIZER.
 3. PROVIDE WITH VARIABLE SPEED INVERTER DUTY COMPRESSORS WITH ECM CONDENSING FANS.
 4. PROVIDE WITH REMOTE CASHMI INTERFACE AND REMOTE TEMPERATURE AND HUMIDITY SENSORS.
 5. PROVIDE WITH FACTORY MOUNTED AND WIRED VFD FOR SUPPLY FAN.
 6. PROVIDE WITH SMOKE DETECTOR FOR AUTOMATIC SHUT-DOWN OF UNIT UPON SMOKE DETECTION.
 7. PROVIDE WITH MERV-8 PRE FILTERS AND MERV-13 FINAL FILTERS.
 8. PROVIDE WITH CFM MONITORING.
 9. PROVIDE WITH MANUFACTURERS 14" CURB.
 10. PROVIDE WITH CASLINK COMMUNICATION CARD FOR FUTURE CONNECTION.
 11. PROVIDE WITH NATIONAL TAB UV-PH INDOOR PURIFICATION SYSTEM PHI-PKG14-24V (GENERAL CONTRACTOR FURNISHED; TAB CONTRACTOR INSTALLED).

AIR DISTRIBUTION SCHEDULE					
MARK NO.	MANUFACTURE MODEL NUMBER	NECK SIZE (IN)	CFM RANGE	MAX NC LEVEL	REMARKS
CD-1	PRICE PDS	6"	60-100	30	NOTE 1,2,3
		8"	101-200		
		10"	201-375		
		12"	376-500		
CD-2	PRICE PDR	14"	501-750	30	NOTE 1,2,3
		6"	60-100		
		8"	101-200		
		10"	201-375		
CR-1	PRICE PDR	12"	376-500	30	NOTE 1,2,3
		22"x22"	1,400		
RD-1	PRICE RCD	10"	301-500	30	NOTE 1, 2
SG-1	PRICE 510	MATCH DUCT SIZE	SEE PLAN	30	NOTE 1, 2
RG-1	PRICE 530	MATCH DUCT SIZE	SEE PLAN	30	NOTE 1, 2
EG-1	PRICE 530	8"x8"	SEE PLAN	30	NOTE 1, 2

- NOTES:
1. FURNISH WITH OFF-WHITE BAKED ENAMEL FINISH UON. COORDINATE EXACT FINISHES WITH ARCH.
 2. PROVIDE OPTIONAL INSULATION ON SUPPLY DIFFUSERS. OMIT INSULATION ON RETURN DIFFUSERS.
 3. PROVIDE LAY IN TYPE 24x24 BORDER, OTHERWISE COORDINATE BORDER TYPE WITH ARCH.

EXHAUST FAN SCHEDULE																			
ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	TYPE	DRIVE	AIRFLOW (CFM)	ESP	FAN RPM	MAX FAN RPM	STARTING MEANS	MOTOR			ELECTRICAL			WT. (LBS.)	REMARKS
												BHP	HP	RPM	V	PH	HZ		
EF	1	GREENHECK	G-100-VG	RESTROOM	DOWNBLAST	DIRECT	375	0.5	1,135	1,725	ECM	0.06	0.25	1,750	115	1	60	100	1, 2, 3, 4, 5
KEF	1	CAPTIVEAIRE	DU50HFA	KITCHEN HOOD	UPBLAST	DIRECT	700	1	1,573	-	ECM	0.31	0.5	-	208	1	60	150	6, 7
KEF	2	CAPTIVEAIRE	DU50HFA	KITCHEN HOOD	UPBLAST	DIRECT	700	1	1,573	-	ECM	0.31	0.5	-	208	1	60	150	6, 7
KEF	3	CAPTIVEAIRE	DU50HFA	KITCHEN HOOD	UPBLAST	DIRECT	700	1	1,573	-	ECM	0.31	0.5	-	208	1	60	150	6, 7
KEF	4	CAPTIVEAIRE	DU50HFA	KITCHEN HOOD	UPBLAST	DIRECT	700	1	1,573	-	ECM	0.31	0.5	-	208	1	60	150	6, 7

- NOTES:
1. PROVIDE WITH VARI-GREEN ECM WITH DIAL ONLY.
 2. PROVIDE WITH 14" STANDARD CURB.
 3. PROVIDE WITH NEMA-1 TOGGLE SWITCH.
 4. PROVIDE WITH BACKDRAFT DAMPER, GRAVITY OPERATED.
 5. EF-1 TO BE INTERLOCKED WITH RTU-1.
 6. PROVIDE WITH FACTORY CURB, GREASE BOX, ECM WIRING PACKAGE, AND FAN BASE CERAMIC SEAL.
 7. PROVIDE WITH UL 762 LISTING.

KITCHEN EXHAUST HOOD SCHEDULE													
ITEM	ITEM NO.	MANUFACTURER	MODEL	LENGTH	EXHAUST COLLAR				HOOD CONSTRUCTION	FIRE SYSTEM	FIRE SYSTEM PIPING	WT. (LBS)	REMARKS
					CFM	LENGTH	WIDTH	ESP					
KEH	1	CAPTIVEAIRE	3650 BD-2	4'-0"	700	8"	8"	-0.58	430 SS	ANSUL R102	YES	250	1
KEH	2	CAPTIVEAIRE	3650 BD-2	4'-0"	700	8"	8"	-0.58	430 SS	ANSUL R102	YES	250	1
KEH	3	CAPTIVEAIRE	3650 BD-2	4'-0"	700	8"	8"	-0.58	430 SS	ANSUL R102	YES	250	1
KEH	4	CAPTIVEAIRE	3650 BD-2	4'-0"	700	8"	8"	-0.58	430 SS	ANSUL R102	YES	250	1

- NOTES:
1. PROVIDE WITH UL APPROVED MANUAL AIR VOLUME DAMPER ON EXHAUST COLLAR BY HOOD MANUFACTURER.

HEAT PUMP FAN COIL UNIT W/ ELECTRIC HEATER																											
ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	SUPPLY FAN					OSA (CFM)	COOLING DX				HEATING ELECTRIC			ELECTRICAL				ELECTRICAL (HEATER)				WT. (LBS)	REMARKS
					SUPPLY CFM	E.S.P. (IN. WG.)	FAN RPM	BHP	HP		CAP. TOTAL (MBH)	CAP. SENSIBLE (MBH)	EAT (F) (DB/WB)	LAT (F) (DB/WB)	CAP (MBH)	EAT (F)	LAT (F)	V	PH	MCA	MOCP	V	PH	MCA	MOCP		
FCU	1	CARRIER	FMC4218 - EHK303	MANAGERS OFFICE	450	0.4	1,050	0.1	0.33	50	16.6	13.9	72/60	54/53	12.8	68	95	208	1	2.6	15	208	1	15.8	20	150	1,2,3
FCU	2	CARRIER	FMC4218 - EHK303	MECH ROOM	450	0.3	1,050	0.1	0.33	-	16.6	13.9	72/60	54/53	12.8	68	95	208	1	2.6	15	208	1	15.8	20	150	1,2

- NOTES:
1. PROVIDE WITH FIELD INSTALLED ELECTRIC HEAT PACKAGE EQUAL TO EHK303B. PROVIDE SEPARATE POWER CONNECTION.
 2. PROVIDE WITH PROGRAMMABLE THERMOSTAT.
 3. PROVIDE WITH MERV-8 FILTER.

AIR CURTAIN SCHEDULE													
ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	CFM	VELOCITY	HP	ELECTRICAL				WT. (LBS)	REMARKS
								V	PH	FLA	MOCP		
AC	1	MARS	LPV236-OB	DELIVERY DOOR	900	1800	1/6	120	1	2.4	-	50	1, 2, 5
AC	2	READY ACCESS	DTU03-2026E	TAKE OUT WINDOW	-	2800	1@1/12 1@1/20	120	1	16.4	20	50	1, 3, 4, 6

- NOTES:
1. PROVIDE WITH WALL MOUNTING BRACKET.
 2. AIR CURTAIN TO BE CONTROLLED BY DOOR SWITCH.
 3. PROVIDE WITH RELAY SWITCH KIT TO OPERATE UNIT WHEN WINDOW OPENS.
 4. PROVIDE WITH ELECTRIC HEATED OPTION.
 5. COORDINATE FINAL COLOR WITH ARCHITECT.
 6. FRAME COLOR SHALL BE BRONZE ANODIZED.

CONDENSING UNIT																	
ITEM	ITEM NO.	MANUFACTURER	MODEL	SERVICE	CAPACITY (MBH)	EER (ARI)	SEER (ARI)	COP (47F)	HSPF (ARI)	AMBIENT AIR TEMP. (F)	ELECTRICAL				REF.	WT. (LBS)	REMARKS
											V	PH	MCA	MOCP			
CU	1	CARRIER	25HHA418	FCU-1	1.5	11.5	14	3.74	8.2	95	208	1	11.8	20	R-410A	200	1
CU	2	CARRIER	25HHA418	FCU-2	1.5	11.5	14	3.74	8.2	95	208	1	11.8	20	R-410A	200	1

- NOTES:
1. PROVIDE WITH NEOPRENE ISOLATION PADS.



VA - 1375 - PIKE 7
8350 LEESBURG PIKE
VIENNA, VA 22182

Gensler

2020 K STREET NW
SUITE 200
WASHINGTON, DC 20006
UNITED STATES
SATELLITE OFFICE:
400 N ASHLEY DRIVE
SUITE C400
TAMPA, FL 33602
UNITED STATES
TEL 202.721.5200
FAX 202.872.8587
TEL 813.204.9000
FAX 813.223.6948



ST ENGINEER
700 S FLOWER ST
SUITE 2100
LOS ANGELES, CA 90017
TEL 213.418.0201



MEP ENGINEER
2361 ROSECRAVENS AVENUE
SUITE 368
EL SEGUNDO, CA 90245
TEL 310.220.2745

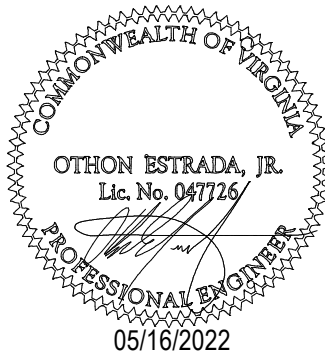


FOODSERVICE CONSULTANT
505 COLLINS ST
PO BOX 3505
SOUTH ATTLEBORO
MA 02703
TEL 508.399.6000
FAX 508.761.3620

Date	Description
------	-------------

- 05/16/2022 PERMIT AND BID
- 07/25/2022 ADDENDUM #1
- 09/02/2022 ADDENDUM #2
- 10/07/2022 ISSUE FOR BID
- 02/10/2023 BID SET
- 04/26/2023 SKETCH
- 06/27/2023 ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

PIKE 7

Project Number

069.6538.000

Description

MECHANICAL SCHEDULES

Scale

1/4" = 1'-0"

M701

System Checksums

By iFactor

FCU-1											
COOLING COIL PEAK				CLG SPACE PEAK				HEATING COIL PEAK			
Peaked at Time: Mo/Hr: 7 / 15 Outside Air: OADB/WSHR: 89 / 76 / 116				Mo/Hr: 6 / 17 OADB: 88				Mo/Hr: Heating Design OADB: 13			
Space	Plenum	Sens. + Lat	Net Percent	Space	Percent	Sens. + Lat	Net Percent	Space	Percent	Sens. + Lat	Net Percent
Sens. + Lat	Plenum	Sens. + Lat	Net Percent	Sens. + Lat	Percent	Sens. + Lat	Net Percent	Sens. + Lat	Percent	Sens. + Lat	Net Percent
Bluh	Bluh	Bluh	(%)	Bluh	(%)	Bluh	(%)	Bluh	(%)	Bluh	(%)
Envelope Loads	0	0	0	0	0	0	0	Envelope Loads	0	0	0
Skylite Solar	0	0	0	0	0	0	0	Skylite Solar	0	0	0
Skylite Cond	0	0	0	0	0	0	0	Skylite Cond	0	0	0
Roof Cond	0	159	159	0	0	0	0	Roof Cond	0	201	201
Glass Solar	0	0	0	0	0	0	0	Glass Solar	0	0	0
Glass/Door Cond	0	0	0	0	0	0	0	Glass/Door Cond	0	0	0
Wall Cond	0	0	0	0	0	0	0	Wall Cond	0	0	0
Partition/Door	0	0	0	0	0	0	0	Partition/Door	0	0	0
Floor	0	0	0	0	0	0	0	Floor	0	0	0
Adjacent Floor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Adjacent Floor	0.00	0.00	0.00
Infiltration	0	0	0	0	0	0	0	Infiltration	0	0	0
Sub Total ==>	0	159	159	2	0	0	0	Sub Total ==>	0	-118	11.85
Internal Loads	158	0	158	2	158	2	158	Internal Loads	0	0	0
Lights	158	0	158	2	158	2	158	Lights	0	0	0
People	800	0	800	8	490	6	490	People	0	0	0
Misc	7,800	0	7,800	78	7,800	90	7,800	Misc	0	0	0
Sub Total ==>	8,758	0	8,758	88	8,448	98	8,448	Sub Total ==>	0	0	0
Ceiling Load	159	-159	0	0	173	2	173	Ceiling Load	-118	0	0
Ventilation Load	0	0	833	8	0	0	0	Ventilation Load	0	-878	88.10
Adj Air Trans Heat	0	0	0	0	0	0	0	Adj Air Trans Heat	0	0	0
Dehumid. Ov Sizing	0	0	0	0	0	0	0	Dehumid. Ov Sizing	0	0	0
OverUnder Sizing	0	0	0	0	0	0	0	OverUnder Sizing	0	0	0
Exhaust Heat	0	0	0	0	0	0	0	Exhaust Heat	0	0	0
Sup. Fan Heat	0	0	0	0	0	0	0	Sup. Fan Heat	0	0	0
Ret. Fan Heat	0	0	0	0	0	0	0	Ret. Fan Heat	0	0	0
Duct Heat PkUp	0	0	0	0	0	0	0	Duct Heat PkUp	0	0	0
Underfrr Sup Ht PkUp	0	0	0	0	0	0	0	Underfrr Sup Ht PkUp	0	0	0
Supply Air Leakage	0	0	0	0	0	0	0	Supply Air Leakage	0	0	0
Grand Total ==>	8,917	0	9,992	100.00	8,621	100.00	8,621	Grand Total ==>	-118	-996	100.00
COOLING COIL SELECTION				AREAS				HEATING COIL SELECTION			
Total Capacity	Sense Cap.	Coil Airflow	Enter DB/WSHR	Gross Total	Glass	ft ² (%)		Capacity/Coil Airflow	Enter DB/WSHR	Ent	Lvg
ton	MBH	cfm	F °		ft ² (%)			cfm	F °	ft ²	ft ²
Main Clg	1.0	11.5	9.1	409	74.5	60.3	56.0	54.5	50.2	47.6	70.3
Aux Clg	0.0	0.0	0.0	0	0	0	0	0	0	0	0
Opt Vent	0.0	0.0	0.0	0	0	0	0	0	0	0	0
Total	1.0	11.5									

Project Name: Shake Shack Pike 7
Dataset Name: SHK21002.TRC

TRACE8: 700 v6.3.5 calculated at 01:40 PM on 07/19/2022
Alternative - 1 System Checksums Report Page 1 of 4

System Checksums

By iFactor

FCU-2											
COOLING COIL PEAK				CLG SPACE PEAK				HEATING COIL PEAK			
Peaked at Time: Mo/Hr: 7 / 14 Outside Air: OADB/WSHR: 88 / 76 / 115				Mo/Hr: 7 / 14 OADB: 88				Mo/Hr: Heating Design OADB: 13			
Space	Plenum	Sens. + Lat	Net Percent	Space	Percent	Sens. + Lat	Net Percent	Space	Percent	Sens. + Lat	Net Percent
Sens. + Lat	Plenum	Sens. + Lat	Net Percent	Sens. + Lat	Percent	Sens. + Lat	Net Percent	Sens. + Lat	Percent	Sens. + Lat	Net Percent
Bluh	Bluh	Bluh	(%)	Bluh	(%)	Bluh	(%)	Bluh	(%)	Bluh	(%)
Envelope Loads	0	0	0	0	0	0	0	Envelope Loads	0	0	0
Skylite Solar	0	0	0	0	0	0	0	Skylite Solar	0	0	0
Skylite Cond	0	0	0	0	0	0	0	Skylite Cond	0	0	0
Roof Cond	0	0	0	0	0	0	0	Roof Cond	0	-169	14.50
Glass Solar	0	0	0	0	0	0	0	Glass Solar	0	0	0
Glass/Door Cond	0	0	0	0	0	0	0	Glass/Door Cond	0	0	0
Wall Cond	509	155	664	13	509	10	664	Wall Cond	-749	-994	85.50
Partition/Door	0	0	0	0	0	0	0	Partition/Door	0	0	0
Floor	0	0	0	0	0	0	0	Floor	0	0	0
Adjacent Floor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Adjacent Floor	0.00	0.00	0.00
Infiltration	0	0	0	0	0	0	0	Infiltration	0	0	0
Sub Total ==>	509	356	865	17	509	10	865	Sub Total ==>	-749	-1,163	100.00
Internal Loads	258	0	258	5	258	5	258	Internal Loads	0	0	0
Lights	258	0	258	5	258	5	258	Lights	0	0	0
People	0	0	0	0	0	0	0	People	0	0	0
Misc	3,751	0	3,751	75	3,751	77	3,751	Misc	0	0	0
Sub Total ==>	4,009	0	4,009	80	4,009	82	4,009	Sub Total ==>	0	0	0
Ceiling Load	356	-356	0	0	356	7	356	Ceiling Load	-414	0	0
Ventilation Load	0	0	0	0	0	0	0	Ventilation Load	0	0	0
Adj Air Trans Heat	0	0	0	0	0	0	0	Adj Air Trans Heat	0	0	0
Dehumid. Ov Sizing	0	0	0	0	0	0	0	Dehumid. Ov Sizing	0	0	0
OverUnder Sizing	0	0	0	0	0	0	0	OverUnder Sizing	0	0	0
Exhaust Heat	0	0	0	0	0	0	0	Exhaust Heat	0	0	0
Sup. Fan Heat	0	0	0	0	0	0	0	Sup. Fan Heat	0	0	0
Ret. Fan Heat	0	0	0	0	0	0	0	Ret. Fan Heat	0	0	0
Duct Heat PkUp	0	0	0	0	0	0	0	Duct Heat PkUp	0	0	0
Underfrr Sup Ht PkUp	0	0	0	0	0	0	0	Underfrr Sup Ht PkUp	0	0	0
Supply Air Leakage	0	0	0	0	0	0	0	Supply Air Leakage	0	0	0
Grand Total ==>	4,874	0	5,011	100.00	4,874	100.00	4,874	Grand Total ==>	-1,163	-1,163	100.00
COOLING COIL SELECTION				AREAS				HEATING COIL SELECTION			
Total Capacity	Sense Cap.	Coil Airflow	Enter DB/WSHR	Gross Total	Glass	ft ² (%)		Capacity/Coil Airflow	Enter DB/WSHR	Ent	Lvg
ton	MBH	cfm	F °		ft ² (%)			cfm	F °	ft ²	ft ²
Main Clg	0.5	5.8	5.0	231	74.0	56.4	40.0	54.5	46.7	35.1	74.5
Aux Clg	0.0	0.0	0.0	0	0	0	0	0	0	0	0
Opt Vent	0.0	0.0	0.0	0	0	0	0	0	0	0	0
Total	0.5	5.8									

Project Name: Shake Shack Pike 7
Dataset Name: SHK21002.TRC

TRACE8: 700 v6.3.5 calculated at 01:40 PM on 07/19/2022
Alternative - 1 System Checksums Report Page 2 of 4

System Checksums

By iFactor

RTU-1											
COOLING COIL PEAK				CLG SPACE PEAK				HEATING COIL PEAK			
Peaked at Time: Mo/Hr: 7 / 19 Outside Air: OADB/WSHR: 83 / 72 / 103				Mo/Hr: 6 / 19 OADB: 83				Mo/Hr: Heating Design OADB: 13			
Space	Plenum	Sens. + Lat	Net Percent	Space	Percent	Sens. + Lat	Net Percent	Space	Percent	Sens. + Lat	Net Percent
Sens. + Lat	Plenum	Sens. + Lat	Net Percent	Sens. + Lat	Percent	Sens. + Lat	Net Percent	Sens. + Lat	Percent	Sens. + Lat	Net Percent
Bluh	Bluh	Bluh	(%)	Bluh	(%)	Bluh	(%)	Bluh	(%)	Bluh	(%)
Envelope Loads	0	0	0	0	0	0	0	Envelope Loads	0	0	0
Skylite Solar	0	0	0	0	0	0	0	Skylite Solar	0	0	0
Skylite Cond	0	0	0	0	0	0	0	Skylite Cond	0	0	0
Roof Cond	0	0	0	0	0	0	0	Roof Cond	0	-3,353	4.13
Glass Solar	26,027	0	26,027	24	26,027	43	26,027	Glass Solar	0	0	0
Glass/Door Cond	3,886	0	3,886	4	3,874	8	3,874	Glass/Door Cond	0	-20,975	25.97
Wall Cond	1,223	77	1,300	1	1,273	2	1,273	Wall Cond	-1,525	-1,689	2.09
Partition/Door	0	0	0	0	0	0	0	Partition/Door	0	0	0
Floor	0	0	0	0	0	0	0	Floor	0	0	0
Adjacent Floor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Adjacent Floor	0.00	0.00	0.00
Infiltration	0	0	0	0	0	0	0	Infiltration	0	0	0
Sub Total ==>	31,148	4,123	35,271	33	31,922	52	31,922	Sub Total ==>	-22,499	-25,996	32.19
Internal Loads	2,750	0	2,750	3	2,750	4	2,750	Internal Loads	0	0	0
Lights	2,750	0	2,750	3	2,750	4	2,750	Lights	0	0	0
People	33,750	0	33,750	31	18,750	30	18,750	People	0	0	0
Misc	4,224	0	4,224	4	4,224	7	4,224	Misc	0	0	0
Sub Total ==>	40,723	0	40,723	38	25,723	42	25,723	Sub Total ==>	0	0	0
Ceiling Load	4,123	-4,123	0	0	4,250	7	4,250	Ceiling Load	-3,497	0	0
Ventilation Load	0	0	31,376	29	0	0	0	Ventilation Load	0	-54,772	67.81
Adj Air Trans Heat	0	0	0	0	0	0	0	Adj Air Trans Heat	0	0	0
Dehumid. Ov Sizing	0	0	0	0	0	0	0	Dehumid. Ov Sizing	0	0	0
OverUnder Sizing	0	0	0	0	0	0	0	OverUnder Sizing	0	0	0
Exhaust Heat	0	0	0	0	0	0	0	Exhaust Heat	0	0	0
Sup. Fan Heat	0	0	0	0	0	0	0	Sup. Fan Heat	0	0	0
Ret. Fan Heat	0	0	0	0	0	0	0	Ret. Fan Heat	0	0	0
Duct Heat PkUp	0	0	0	0	0	0	0	Duct Heat PkUp	0	0	0
Underfrr Sup Ht PkUp	0	0	0	0	0	0	0	Underfrr Sup Ht PkUp	0	0	0
Supply Air Leakage	0	0	0	0	0	0	0	Supply Air Leakage	0	0	0
Grand Total ==>	75,994	0	108,241	100.00	61,885	100.00	61,885	Grand Total ==>	-25,996	-80,768	100.00
COOLING COIL SELECTION				AREAS				HEATING COIL SELECTION			
Total Capacity	Sense Cap.	Coil Airflow	Enter DB/WSHR	Gross Total	Glass	ft ² (%)		Capacity/Coil Airflow	Enter DB/WSHR	Ent	Lvg
ton	MBH	cfm	F °		ft ² (%)			cfm	F °	ft ²	ft ²
Main Clg	10.4	124.5	70.5	2,938	76.6	65.3	76.2	54.7	51.1	50.5	