

SYMBOLS (NOT ALL USED)		ABBREVIATIONS (NOT ALL USED)	
GENERAL		DUCT ACCESSORIES & CONTROLS INSTRUMENTATION	
	NORTH ARROW	T	THERMOSTAT
	DETAIL IDENTIFICATION NUMBER	TS	TEMPERATURE SENSOR
	SECTION OR ELEVATION IDENTIFICATION LETTER	RT	REMOTE TEMPERATURE SENSOR
	EQUIPMENT ABBREVIATION (SEE ABBREVIATION LIST)	C	CO2 SENSOR
	REVISION	H	HUMIDITY SENSOR
	POINT OF CONNECTION (P.O.C.)	PH	ROOM PRESSURE MONITOR
	POINT OF DISCONNECTION (P.O.D.)	MM	MULTIROOM PRESSURE MONITOR
	KEYNOTE	M	AUTOMATIC DAMPER (ELECTRIC)
	REVISION	AM	AUTOMATIC DAMPER (PNEUMATIC)
	POINT OF CONNECTION (P.O.C.)	FD	COMBINATION FIRE SMOKE DAMPER (CFSD)
	POINT OF DISCONNECTION (P.O.D.)	CG	CEILING GRILLE
	KEYNOTE	CHWP	CHILLED WATER PUMP
	POINT OF CONNECTION (P.O.C.)	CHWR	CHILLED WATER RETURN
	POINT OF DISCONNECTION (P.O.D.)	CHWS	CHILLED WATER SUPPLY
	KEYNOTE	CLG	CEILING
	POINT OF CONNECTION (P.O.C.)	CNC	CALIFORNIA MECHANICAL CODE
	POINT OF DISCONNECTION (P.O.D.)	COND	CONDENSATE
	KEYNOTE	CONN	CONNECTION
	POINT OF CONNECTION (P.O.C.)	CONT	CONTINUATION
	POINT OF DISCONNECTION (P.O.D.)	CR	CEILING RETURN
	KEYNOTE	CU FT	CUBIC FEET
	POINT OF CONNECTION (P.O.C.)	CU IN	CUBIC INCHES
	POINT OF DISCONNECTION (P.O.D.)	DOWN	DOWN
	KEYNOTE	DWG	DRAWING
	POINT OF CONNECTION (P.O.C.)	EA	EXHAUST AIR
	POINT OF DISCONNECTION (P.O.D.)	EAT	ENTERING AIR TEMPERATURE
	KEYNOTE	EBS	ENTERING DRY BULB TEMPERATURE
	POINT OF CONNECTION (P.O.C.)	EES	ENERGY EFFICIENCY STANDARD (TITLE 24)
	POINT OF DISCONNECTION (P.O.D.)	EF	EXHAUST FAN
	KEYNOTE	ELEV	ELEVATION
	POINT OF CONNECTION (P.O.C.)	ENT	ENTERING
	POINT OF DISCONNECTION (P.O.D.)	EQPM	EQUIPMENT
	KEYNOTE	ESP	EXTERNAL STATIC PRESSURE
	POINT OF CONNECTION (P.O.C.)	EWB	ENTERING WET BULB TEMPERATURE
	POINT OF DISCONNECTION (P.O.D.)	EWY	ENTERING WATER TEMPERATURE
	KEYNOTE	EXH	EXHAUST
	POINT OF CONNECTION (P.O.C.)	F	DEGREES FAHRENHEIT
	POINT OF DISCONNECTION (P.O.D.)	FD	FUTURE
	KEYNOTE	FD	FIRE DAMPER
	POINT OF CONNECTION (P.O.C.)	FF	FINAL FILTER
	POINT OF DISCONNECTION (P.O.D.)	FLA	FULL LOAD AMPERES
	KEYNOTE	FLR	FLOOR
	POINT OF CONNECTION (P.O.C.)	FLX	FLEXIBLE CONNECTION
	POINT OF DISCONNECTION (P.O.D.)	FSM	FEET PER MINUTE
	KEYNOTE	FPS	FEET PER SECOND
	POINT OF CONNECTION (P.O.C.)	FT	FEET
	POINT OF DISCONNECTION (P.O.D.)	GA	GALLON
	KEYNOTE	GAL	GALLON
	POINT OF CONNECTION (P.O.C.)	GC	GENERAL CONTRACTOR
	POINT OF DISCONNECTION (P.O.D.)	GPH	GALLON PER HOUR
	KEYNOTE	GPM	GALLON PER MINUTE
	POINT OF CONNECTION (P.O.C.)	H	HEIGHT
	POINT OF DISCONNECTION (P.O.D.)	HC	HEATING COIL
	KEYNOTE	HD	HOT DECK/HOT DUCT
	POINT OF CONNECTION (P.O.C.)	HHWR	HEATING HOT WATER RETURN
	POINT OF DISCONNECTION (P.O.D.)	HHWS	HEATING HOT WATER SUPPLY
	KEYNOTE	KW	KILOWATT
	POINT OF CONNECTION (P.O.C.)	L	LENGTH
	POINT OF DISCONNECTION (P.O.D.)	L	LINED DUCTWORK
	KEYNOTE	LAT	LEAVING AIR TEMPERATURE
	POINT OF CONNECTION (P.O.C.)	LBS	POUNDS
	POINT OF DISCONNECTION (P.O.D.)	LBD	LEAVING DRY BULB TEMPERATURE
	KEYNOTE	LN FT	LINEAR FEET
	POINT OF CONNECTION (P.O.C.)	LNG	LEAVING WET BULB TEMPERATURE
	POINT OF DISCONNECTION (P.O.D.)	LWB	LEAVING WATER TEMPERATURE
	KEYNOTE	LWT	LEAVING WATER TEMPERATURE
	POINT OF CONNECTION (P.O.C.)	MAX	MAXIMUM
	POINT OF DISCONNECTION (P.O.D.)	MB	MIXING BOX
	KEYNOTE	MBH	THOUSAND BTU PER HOUR
	POINT OF CONNECTION (P.O.C.)	MIN	MINIMUM
	POINT OF DISCONNECTION (P.O.D.)	MUA	MAKE UP AIR
	KEYNOTE	NIC	N/OT IN CONTACT
	POINT OF CONNECTION (P.O.C.)	NTS	N/OT TO SCALE
	POINT OF DISCONNECTION (P.O.D.)	OSA/OA	OUTSIDE AIR
	KEYNOTE	OD	OUTSIDE DIAMETER
	POINT OF CONNECTION (P.O.C.)	POC	POINT OF CONNECTION
	POINT OF DISCONNECTION (P.O.D.)	POD	POINT OF DISCONNECTION
	KEYNOTE	RA	RETURN AIR
	POINT OF CONNECTION (P.O.C.)	RG	RETURN GRILLE
	POINT OF DISCONNECTION (P.O.D.)	RH	REPEAT LIGHT ROOM
	KEYNOTE	RM	ROOM
	POINT OF CONNECTION (P.O.C.)	RRM	REVOLUTIONS PER MINUTE
	POINT OF DISCONNECTION (P.O.D.)	SA	SUPPLY AIR
	KEYNOTE	SF	SUPPLY FAN
	POINT OF CONNECTION (P.O.C.)	SOV	SHUT OFF VALVE
	POINT OF DISCONNECTION (P.O.D.)	SP	STATIC PRESSURE
	KEYNOTE	SPEC	SPECIFICATION
	POINT OF CONNECTION (P.O.C.)	SQ FT	SQUARE FOOT
	POINT OF DISCONNECTION (P.O.D.)	SS	STAINLESS STEEL
	KEYNOTE	TA	TRANSFER AIR
	POINT OF CONNECTION (P.O.C.)	TEMP	TEMPERATURE
	POINT OF DISCONNECTION (P.O.D.)	TRF	TRANSFER FAN
	KEYNOTE	TG	TRANSFER GRILLE
	POINT OF CONNECTION (P.O.C.)	TV	TURNING VANES
	POINT OF DISCONNECTION (P.O.D.)	TYF	TYPICAL
	KEYNOTE	UDR	UNLESS OTHERWISE NOTED
	POINT OF CONNECTION (P.O.C.)	UTR	UP THROUGH ROOF
	POINT OF DISCONNECTION (P.O.D.)	V	VOLTS
	KEYNOTE	VAV	VARIABLE AIR VOLUME
	POINT OF CONNECTION (P.O.C.)	VD	VOLUME DAMPER
	POINT OF DISCONNECTION (P.O.D.)	VENT	VENTILATION AIR
	KEYNOTE	W	WIDTH
	POINT OF CONNECTION (P.O.C.)	WI	WITH
	POINT OF DISCONNECTION (P.O.D.)	WO	WITHOUT
	KEYNOTE	WB	WET BULB
	POINT OF CONNECTION (P.O.C.)	WO	WATER COLUMN
	POINT OF DISCONNECTION (P.O.D.)	WG	WATER GAUGE
	KEYNOTE	WMS	WIRE MESH SCREEN
	POINT OF CONNECTION (P.O.C.)		
	POINT OF DISCONNECTION (P.O.D.)		
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	POINT OF DISCONNECTION (P.O.D.)		

STATE OF CALIFORNIA
Mechanical Systems
 NRCC-MCH-E CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-MCH-E
 This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2, for alterations.

Project Name: Shake Shack Studio City Report Page: (Page 2 of 12)
 Project Address: Date Prepared: 2023-02-07T12:00:13-05:00

A. GENERAL INFORMATION

01 Project Location (city)	Studio City	04 Total Conditioned Floor Area	3500
02 Climate Zone	9	05 Total Unconditioned Floor Area	0
03 Occupancy Types Within Project:		06 # of Stories (Habitable Above Grade)	1
<input type="checkbox"/> Office (B)	<input type="checkbox"/> Retail (M)	<input type="checkbox"/> Non-refrigerated Warehouse (S)	
<input type="checkbox"/> Hotel/ Motel Guest Rooms (R-1)	<input type="checkbox"/> School (E)	<input type="checkbox"/> Healthcare Facility (I)	
<input type="checkbox"/> High-Rise Residential (R-2/R-3)	<input type="checkbox"/> Relocatable Class Bldg (E)	<input checked="" type="checkbox"/> Other (Write in)	Restaurant

B. PROJECT SCOPE
 This table includes mechanical systems or components that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2, for alterations.

01	02	03
Air System(s)	Wet System Components	Dry System Components
<input checked="" type="checkbox"/> Heating Air System	<input type="checkbox"/> Water Economizer	<input checked="" type="checkbox"/> Air Economizer
<input checked="" type="checkbox"/> Cooling Air System	<input type="checkbox"/> Pumps	<input type="checkbox"/> Electric Resistance Heat
Mechanical Controls	System Piping	Fan Systems
<input checked="" type="checkbox"/> Mechanical Controls (existing to remain, altered or new)	<input type="checkbox"/> Cooling Towers	<input checked="" type="checkbox"/> Ductwork (existing to remain, altered or new)
	<input type="checkbox"/> Chillers	<input checked="" type="checkbox"/> Ventilation
	<input type="checkbox"/> Boilers	<input type="checkbox"/> Zonal Systems/ Terminal Boxes

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F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)
 Dry System Equipment Efficiency (other than Package Terminal Air Conditioners (PTAC) and Package Terminal Heat Pumps (PTHP))

01	02	03	04	05	06	07	08	09
Name or Item Tag	Size Category (Btu/h)	Rating Condition (°F)	Efficiency Unit	Minimum Efficiency Required per Tables 110.2 / Title 20	Design Efficiency	Efficiency Unit	Minimum Efficiency Required per Tables 110.2 / Title 20	Design Efficiency
RTU-1	>=135,000 and <240,000	47 *Fdb/ 43 *Fwb OSA	COP	3.2	3.3	EER IEEER	10.4 11.4	11.8 21.3
RTU-2	>=135,000 and <240,000	47 *Fdb/ 43 *Fwb OSA	COP	3.2	3.3	EER IEEER	10.4 11.4	12 18.8

G. PUMPS
 This section does not apply to this project.

H. FAN SYSTEMS & AIR ECONOMIZERS
 This table is used to demonstrate compliance with prescriptive requirements found in §140.4(c), §140.4(e), and §140.4(m), for fan systems. Fan systems serving only process loads are exempt from these requirements and do not need to be included in Table H.

System Name:	RTU-1	Economizer: ¹	Differential Temperature	Economizer Controls:	Designed per §140.4(e) and (m)	System Fan Type:	Constant Volume
01	02	03	04	05	06	07	08
Fan Name or Item Tag	Fan Function	Qty	Maximum Design Supply Airflow (CFM)	HP Unit ²	Design HP	Fan Power Pressure Drop Adjustment - Table 140.4-B	Design Airflow through Device (CFM)
RTU-1	Supply	1	4000	Nameplate HP	5		
Total System Design Supply Airflow (CFM):			4000	Total System Design (BHP):	5	Maximum System Fan Power (BHP):	

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J. VENTILATION AND INDOOR AIR QUALITY

17	Total System Required Min OA CFM	935	18	Ventilation for this System Complies?	Yes			
04	05	06	07	Air Filtration per §120.1(c) and §141.0(b)2 ² Provided per §141.0(b)2c (alteration)				
08	09	10	11	12	13	14	15	16
Space Name or Item Tag	Occupancy Type ⁴	Conditioned Floor Area (ft ²)	# of Shower heads/ toilets	# of people ⁵	Required Min OA CFM	Required Min CFM	Provided per Design CFM	DCV or Sensor Controls per §120.1(d)3, §120.1(d)5, and §120.1(e)3 ⁶
106 - OPEN KITCHEN	Kitchen (cooking)	420		8	120	294	2785	DCV NA: Processes that generate dust, fumes, etc. and no local exhaust
108 - DISHWASH	Occupiable storage rooms for dry materials	96		2	30			DCV NA: Processes that generate dust, fumes, etc. and no local exhaust
109 - BOH	Occupiable storage rooms for dry materials	710		2	106.5			DCV NA: Processes that generate dust, fumes, etc. and no local exhaust

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C. COMPLIANCE RESULTS
 Table C will indicate if the project data input into the compliance document is compliant with mechanical requirements. This table is not editable by the user. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D, or the table indicated as not compliant for guidance.

01	02	03	04	05	06	07	08	09
System Summary §110.1, §110.2, §140.4	AND Pumps §140.4(h)	AND Fans/Economizers §140.4(c), §140.4(e)	AND System Controls §110.2, §120.2, §140.4(i)	AND Ventilation §120.1	AND Terminal Box Controls §140.4(d)	AND Distribution §120.3, §140.4(i)	AND Cooling Towers §110.2(a)2	Compliance Results
(See Table F)	(See Table G)	(See Table H)	(See Table I)	(See Table J)	(See Table K)	(See Table L)	(See Table M)	COMPLIES

D. EXCEPTIONAL CONDITIONS
 This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS
 This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

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H. FAN SYSTEMS & AIR ECONOMIZERS

System Name:	RTU-2	Economizer: ¹	Differential Temperature	Economizer Controls:	Designed per §140.4(e) and (m)	System Fan Type:	Constant Volume
01	02	03	04	05	06	07	08
Fan Name or Item Tag	Fan Function	Qty	Maximum Design Supply Airflow (CFM)	HP Unit ²	Design HP	Fan Power Pressure Drop Adjustment - Table 140.4-B	Design Airflow through Device (CFM)
RTU-2	Supply	1	4500	Nameplate HP	5		
Total System Design Supply Airflow (CFM):			4500	Total System Design (BHP):	5	Maximum System Fan Power (BHP):	

¹ FOOTNOTES: Computer room economizers must meet requirements of §140.9(a), and will be documented on the NRCC-PRC-E document.
² The unit used for HP must be consistent for all fans within a system.

I. SYSTEM CONTROLS
 This table is used to demonstrate compliance with mandatory controls in §120.2 and §120.2, and prescriptive controls in §140.4(i) and (n) or requirements in §141.0(b)2E for altered space conditioning systems.

01	02	03	04	05	06	07	08	09
System Name	System Zoning	Conditioned Floor Area Being Served (ft ²)	Thermostats §110.2(b) & (c) ¹ , §120.2(a)or §141.0(b)2E	Shut-Off Controls §120.2(e)	Isolation Zone Controls §120.2(g)	Demand Response §110.12 and §120.2(b)	Supply Air Temp. Reset §140.4(f)	Window Interlocks per §140.4(i)
RTU-1	Single zone	<= 25,000 ft ²	Setback	Auto Timer Switch	NA: Single Zone	DR Tstat per §110.12	NA: Single Zone	NA: No operable windows
RTU-2	Single zone	<= 25,000 ft ²	Setback	Auto Timer Switch	Auto Timer Switch	DR Tstat per §110.12	NA: Single Zone	NA: No operable windows

¹ FOOTNOTES: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves are not required to have setback thermostats.
 *Notes: Controls with a * require a note in the space below explaining how compliance is achieved. EX: system 1: SA Temp Reset: Exempt because zones compliant with §140.4(d); EXCEPTION 1 to §140.4(i)

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J. VENTILATION AND INDOOR AIR QUALITY

17	Total System Required Min OA CFM	286.5	18	Ventilation for this System Complies?	Yes			
110 - MANAGERS OFFICE	Office space	100		2	30			DCV NA: Processes that generate dust, fumes, etc. and no local exhaust

¹ FOOTNOTES: System CFM should include both mechanical and natural ventilation for the zone/system.
² Air filtration requirements apply to the following three system types per §120.1(c)3A: space conditioning systems utilizing ducts to supply air to occupiable space; supply-only ventilation systems providing outside air to occupiable space; supply side of balanced ventilation systems including heat recovery and energy recovery ventilation systems providing outside air to occupiable space.
³ Uniform Mechanical Code may have more stringent ventilation requirements; the most stringent code requirement takes precedence.
⁴ See Standards Tables 120.3-A and 120.3-B.
⁵ For lecture halls with fixed seating, the expected number of occupants shall be determined in accordance with the California Building Code.
⁶ §120.2(a)3 requires systems serving rooms that are required by §120.1(c)1 to have lighting occupancy sensors shall also have occupancy sensing zone controls for ventilation. Examples of spaces which require lighting occupancy sensors include offices 250ft² or smaller, multipurpose rooms less than 1,000ft², classrooms, conference rooms, restrooms, aisles and open areas in warehouses, library book stack aisles, corridors, stairwells, parking garages, and loading and unloading zones, unless excepted by §130.1(c).

K. TERMINAL BOX CONTROLS
 This section does not apply to this project.

L. DISTRIBUTION (DUCTWORK and PIPING)
 This table is used to show compliance with mandatory pipe insulation requirements found in §120.3 and prescriptive requirements found in §140.4(i) for duct leakage testing.

11	No	The scope of the project includes only duct systems serving healthcare facilities
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.
13	Yes	The space conditioning system serves less than 5,000 ft ² of conditioned floor area.
14	No	The combined surface area of the ducts in the following locations is more than 25% of the total surface area of the entire duct system:

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F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)
 This table is used to demonstrate compliance for mechanical equipment with mandatory requirements found in §110.1, and §110.2(a), and prescriptive requirements found in §140.4(i), §140.4(j) and §140.4(k), or §141.0(b)2, for alterations.

Dry System Equipment Sizing (includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters)

01	02	03	04	05	06	07	08	09	10	11		
Name or Item Tag	Equipment Category per Tables 110.2	Equipment Type per Tables 110.2 / Title 20	Smallest Size Available ¹ §140.4(a)	Equipment Sizing per Mechanical Schedule (kBtu/h) §140.4 (a)(8)			Heating Output ^{2,3}		Cooling Output ^{2,3}		Load Calculations ⁴	
				Per Design (kBtu/h)	Rated (kBtu/h)	Supp. Heating Output (kBtu/h)	Sensible Per Design (kBtu/h)	Rated (kBtu/h)	Total Heating Load (kBtu/h)	Sensible Cooling Load (kBtu/h)		
RTU-1	Unitary Heat Pumps (no elec. resistance)	Air-cooled, pkg (3 phase)	Yes	180	180	0	122	153	85	112		
RTU-2	Unitary Heat Pumps (no elec. resistance)	Air-cooled, pkg (3 phase)	Yes	180	180	0	156	185	85	134		

¹ FOOTNOTES: Equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building per §140.4(a). Healthcare facilities are exempt.
² It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables.
³ If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank.
⁴ Authority Having Jurisdiction may ask for load calculations used for compliance per §140.4(b).

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J. VENTILATION AND INDOOR AIR QUALITY
 This table is used to demonstrate compliance with mandatory ventilation requirements in §120.1 and §120.2(a)3B, for all nonresidential, high-rise residential and hotel/motel occupancies. For alterations, only ventilation systems being altered within the scope of the permit application need to be documented in this table. In lieu of this table, the required outdoor ventilation rates and airflow may be shown on the plans or the calculations can be presented in a spreadsheet.

01	02	03	04	05	06	07
01	<input type="checkbox"/>	Check this box if the project is showing ventilation calculations on the plans, or attaching the calculations instead of completing this table.				
02	<input checked="" type="checkbox"/>	Check this box if the project included Nonresidential or Hotel/Motel spaces				
03	<input type="checkbox"/>	Check this box if the project included new or altered high-rise residential dwelling units.				
03	<input type="checkbox"/>	Check the box if the project is using natural ventilation in any nonresidential or hotel/motel spaces to meet required ventilation rates per §120.1(c)2.				

Nonresidential and Hotel/ Motel Ventilation Systems

System Name	RTU-1	System Design OA CFM Airflow ¹	950	System Design Transfer Air CFM	0	Air Filtration per §120.1(c) and §141.0(b)2 ² Provided per §141.0(b)2c (alteration)		
08	09	10	11	12	13	14	15	16
Space Name or Item Tag	Occupancy Type ⁴	Conditioned Floor Area (ft ²)	# of Shower heads/ toilets	# of people ⁵	Required Min OA CFM	Required Min CFM	Provided per Design CFM	DCV or Sensor Controls per §120.1(d)3, §120.1(d)5, and §120.1(e)3 ⁶
101 QUEUING AREA	Restaurant Dining Rooms	310		8	155			DCV NA: Processes that generate dust, fumes, etc. and no local exhaust
								Occ Sensor NA: Continuously operated per §120.2(a)3 exception
101 - DINING	Restaurant Dining Rooms	1050		52	780			DCV NA: Processes that generate dust, fumes, etc. and no local exhaust
								Occ Sensor NA: Continuously operated per §120.2(a)3 exception

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L. DISTRIBUTION (DUCTWORK and PIPING)

15	No	The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.
16	No	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.
17	No	Duct system shall be sealed in accordance with the California Mechanical Code.

The answers to the questions below apply to the following duct systems: RTU-2 Duct leakage testing triggered for these systems? Yes

The answers to the questions below apply to the following duct systems: RTU-2 Duct leakage testing triggered for these systems? Yes

11	No	The scope of the project includes only duct systems serving healthcare facilities.
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.
13	Yes	The space conditioning system serves less than 5,000 ft ² of conditioned floor area.
14	Yes	The combined surface area of the ducts in the following locations is more than 25% of the total surface area of the entire duct system:

Outdoors
 In a space directly under a roof that has a U-factor greater than the u-factor of the ceiling, or if the roof does not meet the requirements of §140.3(a)1B or if the roof has fixed vents or openings to the outside/ unconditioned spaces
 In an unconditioned crawl space
 In other unconditioned spaces

Outdoors
 In a space directly under a roof that has a U-factor greater than the u-factor of the ceiling, or if the roof does not meet the requirements of §140.3(a)1B or if the roof has fixed vents or openings to the outside/ unconditioned spaces
 In an unconditioned crawl space
 In other unconditioned spaces

Outdoors
 In a space directly under a roof that has a U-factor greater than the u-factor of the ceiling, or if the roof does not meet the requirements of §140.3(a)1B or if the roof has fixed vents or openings to the outside/ unconditioned spaces
 In an unconditioned crawl space
 In other unconditioned spaces

Outdoors
 In a space directly under a roof that has a U-factor greater than the u-factor of the ceiling, or if the roof does not meet the requirements of §140.3(a)1B or if the roof has fixed vents or openings to the outside/ unconditioned spaces
 In an unconditioned crawl space
 In other unconditioned spaces

M. COOLING TOWERS
 This section does not apply to this project.

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13003 VENTURA BOULEVARD
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Gensler

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700 FLOWER STREET
 SUITE 2100
 LOS ANGELES, CA 90017
 Tel 213.372.3400
 Contact:
 Claudia Walker
 Tel 213.310.8495

Date	Description
12/20/2022	ISSUE FOR PERMIT/BD
1 02/09/2023	ADDENDUM 1
2 03/10/2023	ADDENDUM 2
3 04/12/2023	ADDENDUM 3
4 05/02/2023	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
MECHANICAL T24 FORMS

Scale

M002

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N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
 Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

Form/Title	Systems/Spaces To Be Field Verified
NRCA-MCH-01-E - Must be submitted for all buildings	
NRCA-MCH-02-A - Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.	RTU-1; RTU-2
NRCA-MCH-04-A - Air Distribution Duct Leakage	RTU-2
NRCA-MCH-05-A - Air Economizer Controls	RTU-1; RTU-2

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE
 Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

Form/Title	Systems/Spaces To Be Field Verified
NRCA-MCH-04-H Duct Leakage Test NOTE: Must be completed by a HERS Rater	RTU-2

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Q. MANDATORY MEASURES DOCUMENTATION LOCATION
 This table is used to indicate where mandatory measures are documented in the plan set or construction documentation.

01	02
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block	No
03	04
Mandatory Measure	Plan sheet or construction document location
Heating Equipment Efficiency per §110.1	M701
Cooling Equipment Efficiency per §110.1	M701
Furnace Standby Loss Control per §110.2(d)	NA
Duct Insulation per §120.4	M603
Heat Pump with Supplemental electric Resistance Heater Controls per §110.2(b)	NA
The air duct and plenum system is designed per §120.4(a)-(f)	M603
Kitchen range hoods shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2	M801

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
 I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Alexander Macher
 Signature Date: 02/07/2023
 Company: INFRASTRUCTURE FACTOR CONSULTING, INC.
 Address: 2361 ROSECRANS AVE., SUITE 368
 City/State/Zip: EL SEGUNDO, CA 90245
 CEV/HERS Certification Identification (if applicable):
 Phone: 310-220-2721

RESPONSIBLE PERSON'S DECLARATION STATEMENT
 I certify the following under penalty of perjury, under the laws of the State of California:
 1. The information provided on this Certificate of Compliance is true and correct.
 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Alexander Macher
 Responsible Designer Signature:
 Date Signed: 02/07/2023
 Company: INFRASTRUCTURE FACTOR CONSULTING, INC.
 License: M40400
 Address: 2361 ROSECRANS AVE., SUITE 368
 City/State/Zip: EL SEGUNDO, CA 90245
 Phone: 310-220-2721

Registration Number: CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance
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A. GENERAL INFORMATION

01 Project Location (city)	Studio City	04 Total Conditioned Floor Area	3500
02 Climate Zone	9	05 Total Unconditioned Floor Area	0
03 Occupancy Types Within Project:		06 # of Stories (Habitable Above Grade)	1
<input type="checkbox"/> Office	<input type="checkbox"/> Retail	<input type="checkbox"/> Non-refrigerated Warehouse	
<input type="checkbox"/> Hotel/ Motel	<input type="checkbox"/> School	<input type="checkbox"/> Healthcare facility	
<input type="checkbox"/> High-Rise Residential	<input type="checkbox"/> Relocatable Class Bldg	<input checked="" type="checkbox"/> Other (write in)	Restaurant

B. PROJECT SCOPE
 This table includes process systems that are within the scope of the permit application and are demonstrating compliance with mandatory requirements in §120.6 or prescriptive requirements in §140.3.
 My project consists of: (check all that apply):

01	02
<input checked="" type="checkbox"/> Refrigerated Spaces <3,000 ft ² Total (no Title 24, Part 6 requirements)	<input type="checkbox"/> Elevator Lighting & Ventilation Controls (mandatory §120.6(f))
<input type="checkbox"/> Refrigerated Spaces >=3,000 ft ² Total (mandatory §120.6(a))	<input type="checkbox"/> Escalator & Moving Walkway Speed Controls (mandatory §120.6(a))
<input type="checkbox"/> Food Stores <8,000 ft ² cfa (mandatory §120.6(b))	<input type="checkbox"/> Computer Rooms >20 W/ ft ² Power Density (prescriptive §140.9(a)) ¹
<input type="checkbox"/> Enclosed Parking Garage Exhaust >=10,000 cfm (mandatory §120.6(c))	<input checked="" type="checkbox"/> Commercial Kitchen Ventilation/Exhaust (prescriptive §140.9(b)) ¹
<input type="checkbox"/> Newly Installed Process Boilers (mandatory §120.6(d))	<input checked="" type="checkbox"/> Laboratory Exhaust/Factory Exhaust & Fume Hood (prescriptive §140.9(c)) ¹
<input type="checkbox"/> Compressed Air Systems Combined HP >= 25 (mandatory §120.6(e))	

¹ FOOTNOTES: These building features can comply using the performance method. If using the performance method for these features, compliance should be demonstrated on the NRCC-PRC-E.

Alert! Refrigerated Warehouses and refrigerated spaces that are less than 3,000 square feet do not have requirements under Title 24, Part 6 and therefore are not documented on the NRCC-PRC-E. Systems serving these spaces shall meet the requirements of the Appliance Efficiency Regulations for walk-in coolers or freezers contained in the Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601 through 1608).

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C. COMPLIANCE RESULTS
 Results in this table are automatically calculated from data input and calculations in Tables F through O. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01	02	03	04	05	06	07	08	09	10	11
Refrigerated Warehouse/Space (See Table F)	Commercial Refrigeration §120.6(b)	Parking Garage Exhaust §120.6(d)	Process Boilers §120.6(d)	Compressed Air Systems §120.6(e)	Elevators §120.6(f)	Escalators & Moving Walkways §120.6(f)	Computer Rooms §140.9(a)	Commercial Kitchens Exhaust §140.9(c)	Laboratory/Factory Exhaust (See Table O)	Compliance Results
										Yes
										COMPLIES

D. EXCEPTIONAL CONDITIONS
 This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS
 This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. REFRIGERATED WAREHOUSES/SPACES
 This section does not apply to this project.

G. COMMERCIAL REFRIGERATION
 This section does not apply to this project.

H. ENCLOSED PARKING GARAGE EXHAUST
 This section does not apply to this project.

I. PROCESS BOILER
 This section does not apply to this project.

J. COMPRESSED AIR SYSTEMS
 This section does not apply to this project.

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K. ELEVATOR LIGHTING AND VENTILATION
 This section does not apply to this project.

L. ESCALATORS AND MOVING WALKWAYS SPEED CONTROLS
 This section does not apply to this project.

M. COMPUTER ROOM SYSTEM SUMMARY
 This section does not apply to this project.

N. COMMERCIAL KITCHEN EXHAUST AND VENTILATION
 This table contains all new and replacement hoods being installed within the scope of the permit application. Table N is used to demonstrate compliance with prescriptive requirements found in §140.9(b).

Kitchen Ventilation §140.9(b)2

01	02	03	04	05	06	07	08	
<input type="checkbox"/>	Existing kitchen hoods not being replaced as part of an addition or alteration (do not need to meet requirements)	Requirements						
		Replacement Air to Hood Compliance Method §140.9(b)1A						
		Not providing replacement air directly to the hood(s)						
		Mechanically cooled or heated makeup air delivered to any space with a kitchen hood is designed per 140.9(b)2A to not exceed the greater of: The supply flow required to meet the space heating and cooling load						
		Location that is supplying transfer air:						
		The kitchen/ dining facility has a total Type I and Type II kitchen hood exhaust airflow > 5000 cfm and is designed to have one of the following per 140.9(b)2B: NA: Not a kitchen/ dining facility having a total Type I and Type II kitchen hood exhaust airflow rate > 5,000 cfm						
Kitchen Exhaust: Airflow Rate §140.9(b)1B								
01	Kitchen Name or Item Tag	106 - OPEN KITCHEN	Compliance Method per §140.9(b)1B	NA: Kitchen/ dining facility has a total Type I and Type II kitchen hood exhaust airflow rate <= 5,000 cfm	07	08		
02	03	04	05	06	07	08		
Name or Item Tag	Hood Type ¹	Hood Style	Hood Length (ft)	Equipment Duty	Design Hood Exhaust Rate CFM	Max Hood Exhaust Rate Allowed CFM		
KEH-1 & KEH-2	Type I				2785			

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N. COMMERCIAL KITCHEN EXHAUST AND VENTILATION
¹ FOOTNOTES: Type II hoods do not have a max hood exhaust air rate per §140.9(b)1B

O. LABORATORY AND FACTORY EXHAUST AND FUME HOODS
 This section does not apply to this project.

P. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
 Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

Form/Title	Systems/Spaces To Be Field Verified
NRCA-PRC-01-E - Covered Process	
NRCA-PRC-02-F Kitchen Exhaust	106 - OPEN KITCHEN

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 Project Address: 2022-11-16T10:55:05-05:00 Date Prepared:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
 I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Alexander Macher
 Signature Date: 02/07/2023
 Company: INFRASTRUCTURE FACTOR CONSULTING, INC.
 Address: 2361 ROSECRANS AVE., SUITE 368
 City/State/Zip: EL SEGUNDO, CA 90245
 CEV/HERS Certification Identification (if applicable):
 Phone: 310-220-2721

RESPONSIBLE PERSON'S DECLARATION STATEMENT
 I certify the following under penalty of perjury, under the laws of the State of California:
 1. The information provided on this Certificate of Compliance is true and correct.
 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
 3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Alexander Macher
 Responsible Designer Signature:
 Date Signed: 02/07/2023
 Company: INFRASTRUCTURE FACTOR CONSULTING, INC.
 License: M40400
 Address: 2361 ROSECRANS AVE., SUITE 368
 City/State/Zip: EL SEGUNDO, CA 90245
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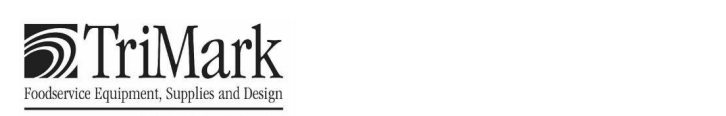
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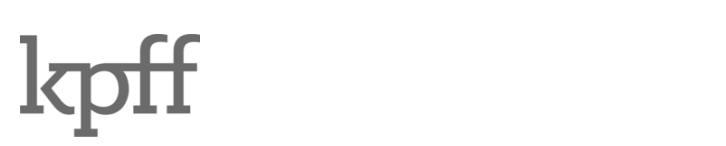
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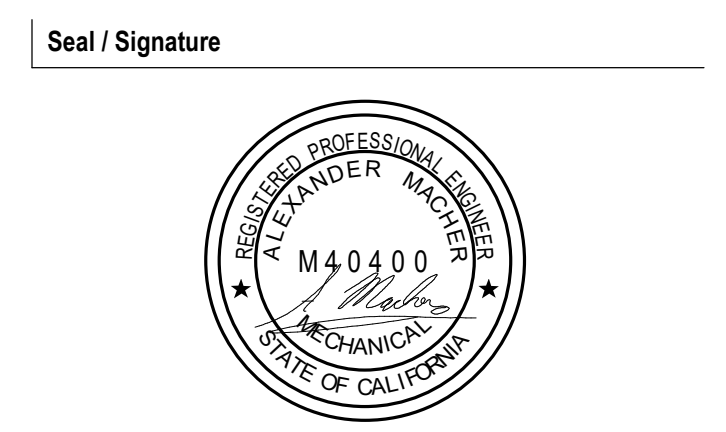


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 Tel: 213.372.3400
 Contact:
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 Tel: 213.310.8495

Date	Description
12/20/2022	ISSUE FOR PERMIT/BD
1 02/09/2023	ADDENDUM 1
2 03/10/2023	ADDENDUM 2
3 04/12/2023	ADDENDUM 3
4 05/02/2023	ISSUE FOR CONSTRUCTION



Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
MECHANICAL T24 FORMS

Scale

M003

FLOOR PLAN GENERAL NOTES
 1. SCOPE OF BUILDING CONTAINS NO INTERIOR FIRE RATED WALLS.



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 CAPTIVEAIR 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 0' CLEARANCE TO COMBUSTIBLES.
- 5 PROVIDE AIR CURTAIN MOUNTED ABOVE DELIVERY DOOR.
- 6 DUCT SMOKE DETECTOR TO BE SUPERVISED BY FIRE ALARM SYSTEM.
- 7 PROVIDE MOTORIZED VAV DIFFUSER WITH LCD THERMOSTAT.
- 8 DIRECT VENTED WATER HEATERS, CONCENTRIC COMBUSTION AIR INTAKE AND FLUE PIPE UP TO ROOF INSTALLED PER MANUFACTURER'S INSTRUCTIONS.



13003 VENTURA BOULEVARD
 STUDIO CITY, CA 91604

Gensler

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Seal / Signature



Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
MECHANICAL FLOOR PLAN

Scale
1/4" = 1'-0"

M111

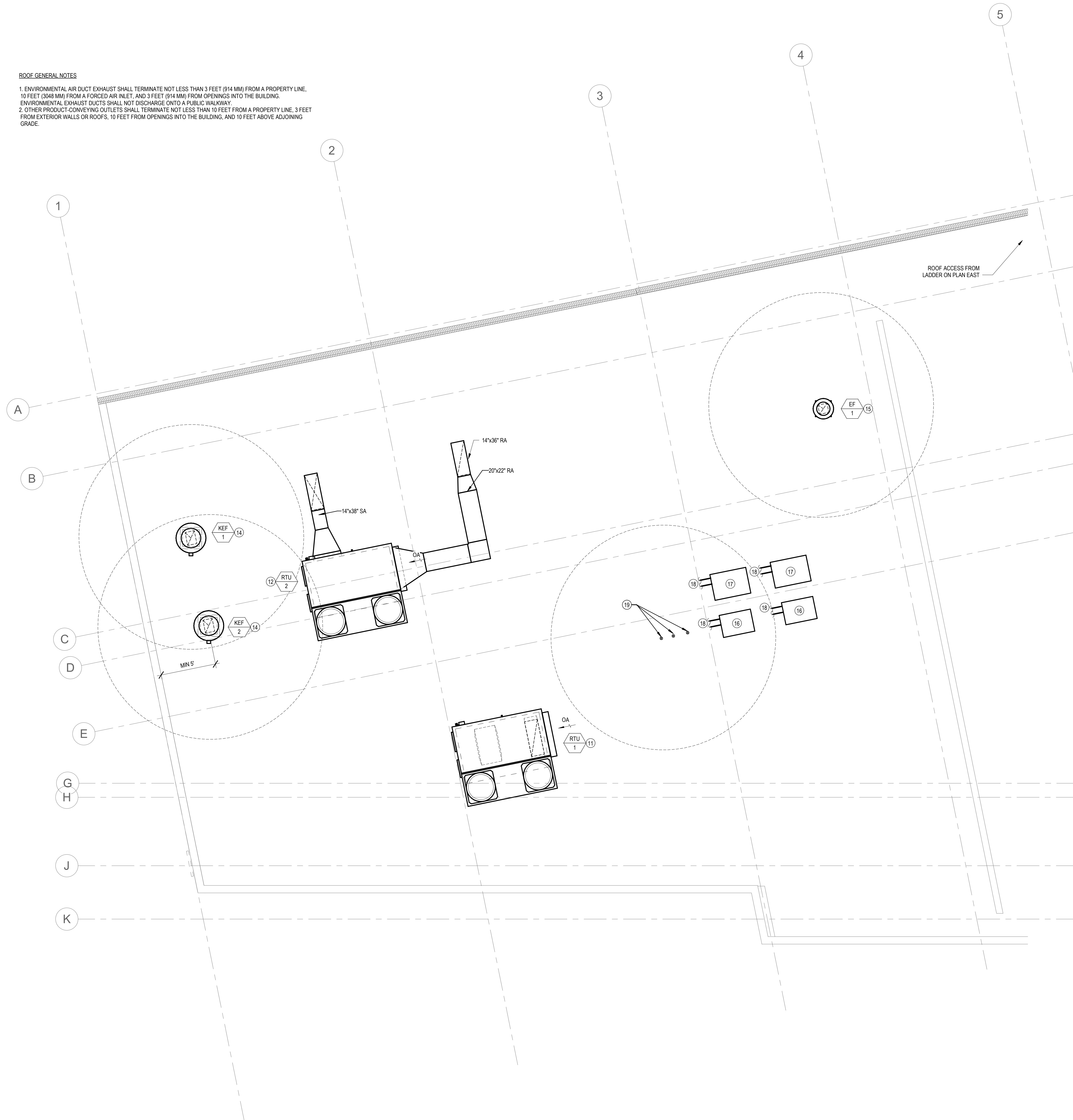
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1 MECHANICAL FLOOR PLAN
 SCALE: 1/4" = 1'-0"

VENTURA BLVD

ROOF GENERAL NOTES

1. ENVIRONMENTAL AIR DUCT EXHAUST SHALL TERMINATE NOT LESS THAN 3 FEET (914 MM) FROM A PROPERTY LINE, 10 FEET (3048 MM) FROM A FORCED AIR INLET, AND 3 FEET (914 MM) FROM OPENINGS INTO THE BUILDING. ENVIRONMENTAL EXHAUST DUCTS SHALL NOT DISCHARGE ONTO A PUBLIC WALKWAY.
2. OTHER PRODUCT-CONVEYING OUTLETS SHALL TERMINATE NOT LESS THAN 10 FEET FROM A PROPERTY LINE, 3 FEET FROM EXTERIOR WALLS OR ROOFS, 10 FEET FROM OPENINGS INTO THE BUILDING, AND 10 FEET ABOVE ADJOINING GRADE.



SHEET NOTES

- 11 RTU SERVING DINING.
- 12 RTU SERVING KITCHEN.
- 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 PIPE CURB FOR REFRIGERANT PIPING. FIELD COORDINATE EXACT LOCATION AND ROUTING.
- 19 CONCENTRIC COMBUSTION AIR INTAKE AND FLUE PIPE TERMINATION OF ROOF FOR EACH WATER HEATER. INSTALL PER MANUFACTURERS RECOMMENDATION.



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Seal / Signature



Project Name
SS 1485 - STUDIO CITY

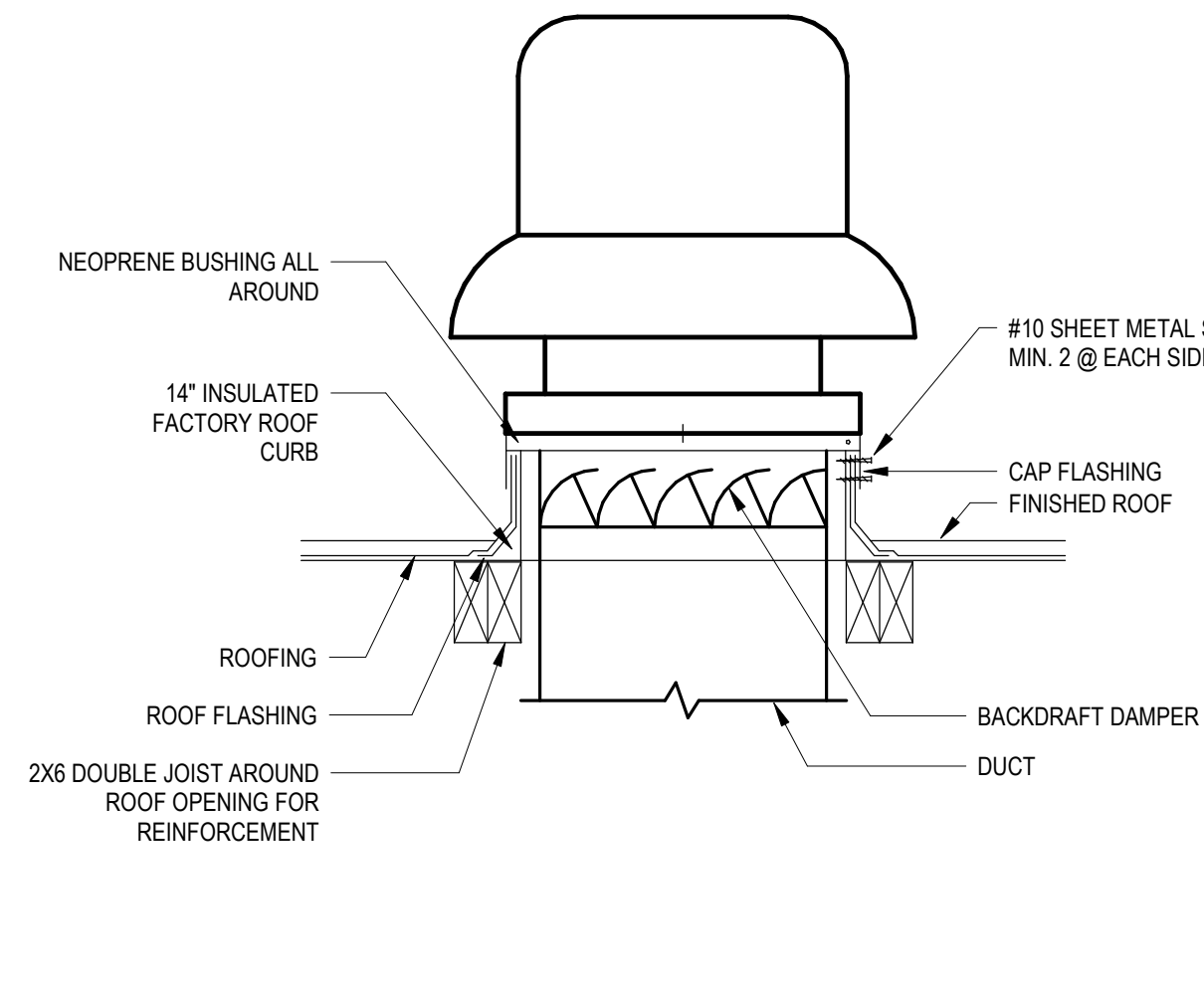
Project Number
005.4293.000

Description
MECHANICAL ROOF PLAN

Scale
1/4" = 1'-0"

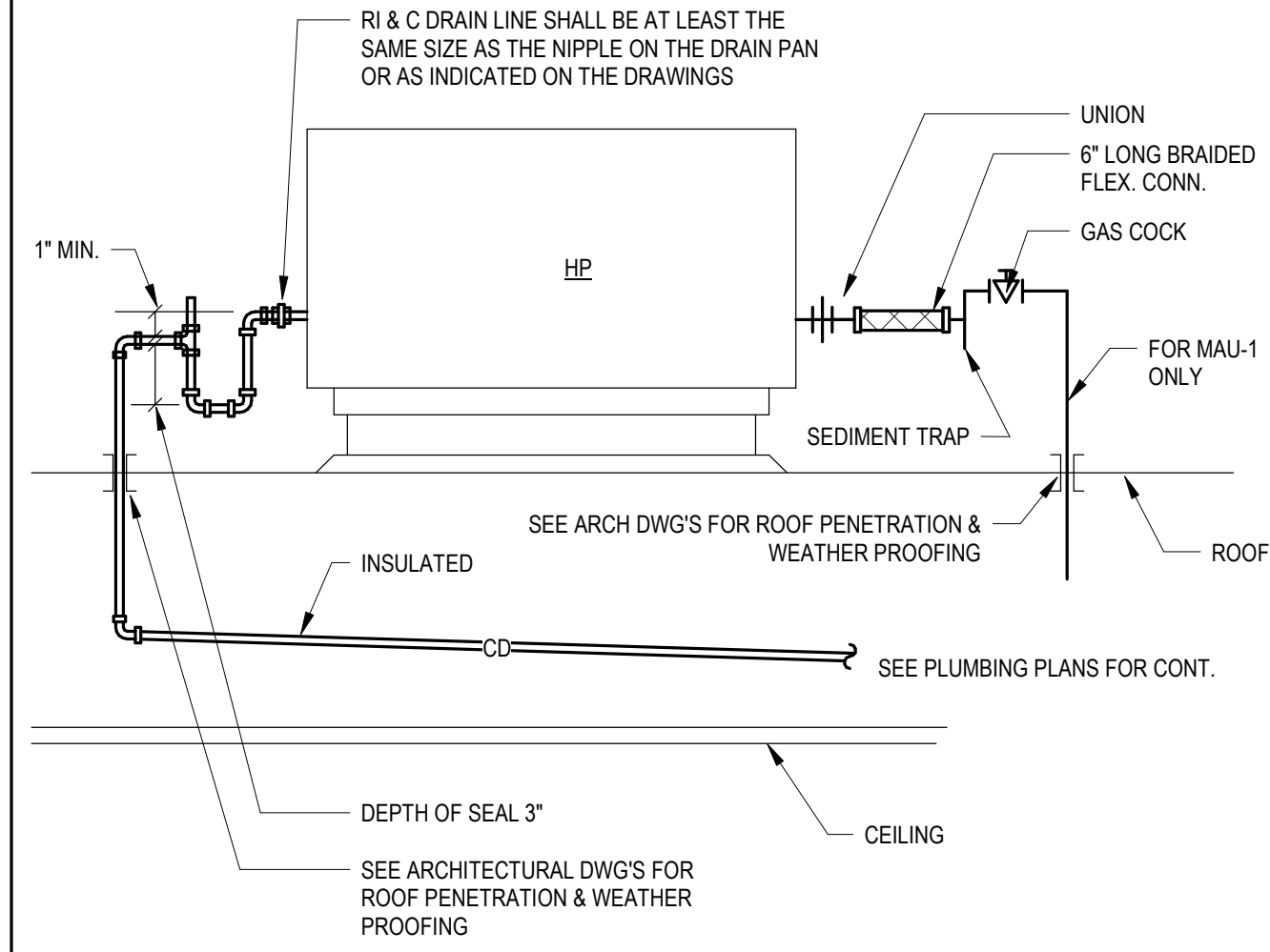
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Date	Description
12/20/2022	ISSUE FOR PERMIT/BD
02/09/2023	ADDENDUM 1
03/10/2023	ADDENDUM 2
04/12/2023	ADDENDUM 3
05/02/2022	ISSUE FOR CONSTRUCTION



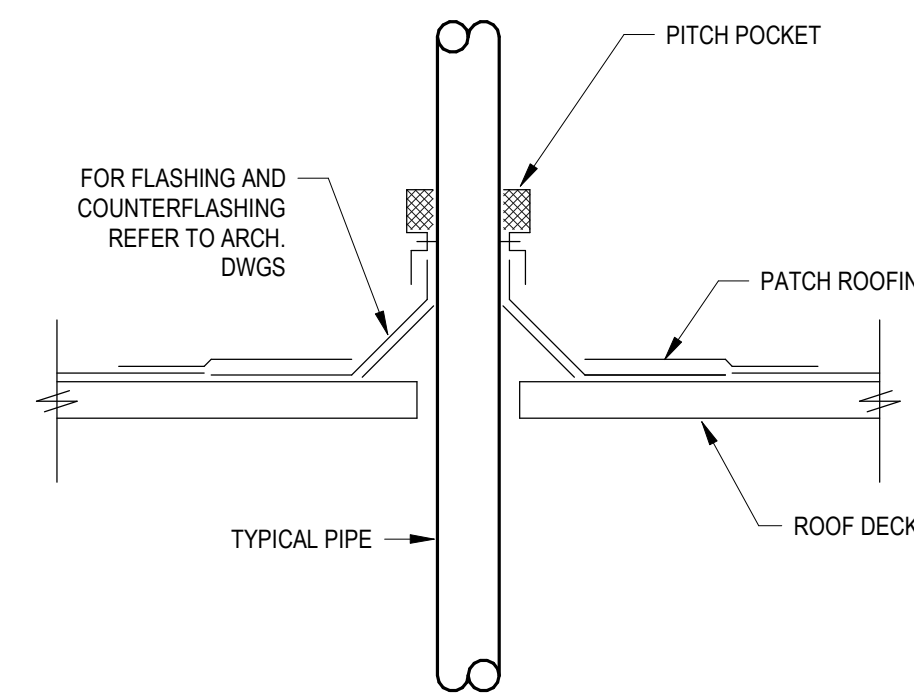
- NOTES:**
- DUCT SHALL BE 1" SMALLER THAN ROOF OPENING.
 - ROOF OPENING SHALL CONFORM TO MANUFACTURER'S CURB SIZE.

EXHAUST FAN MOUNTING DETAIL 5



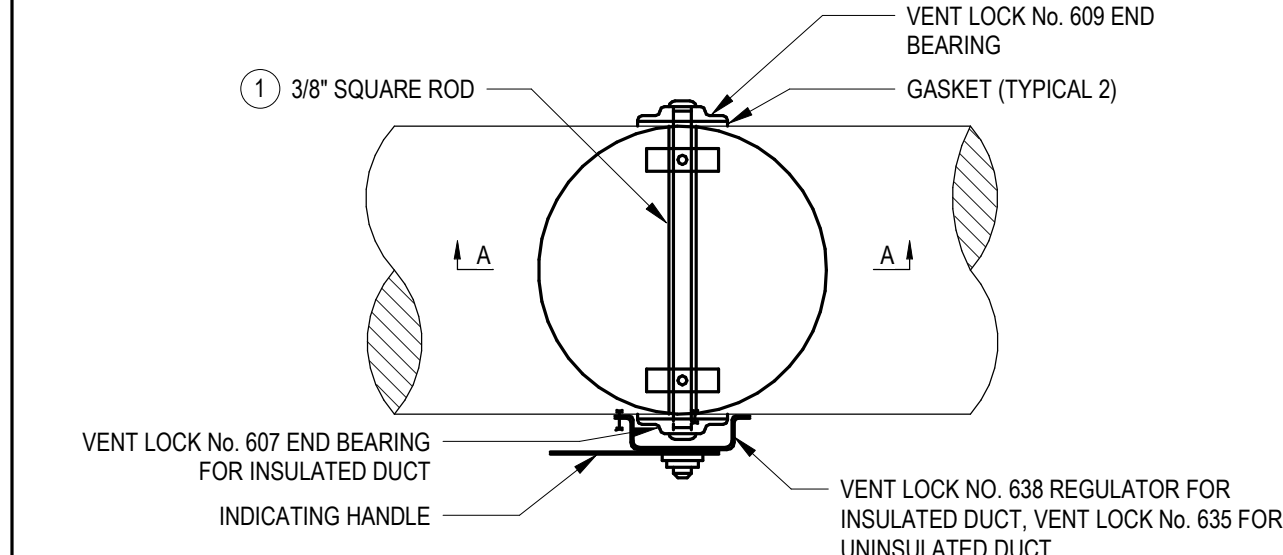
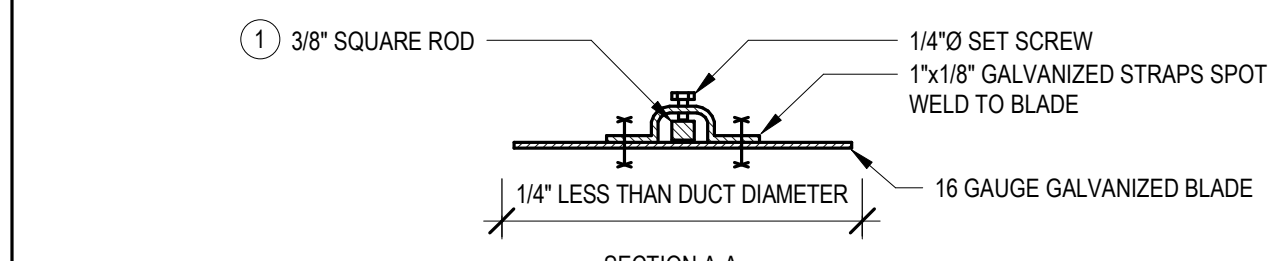
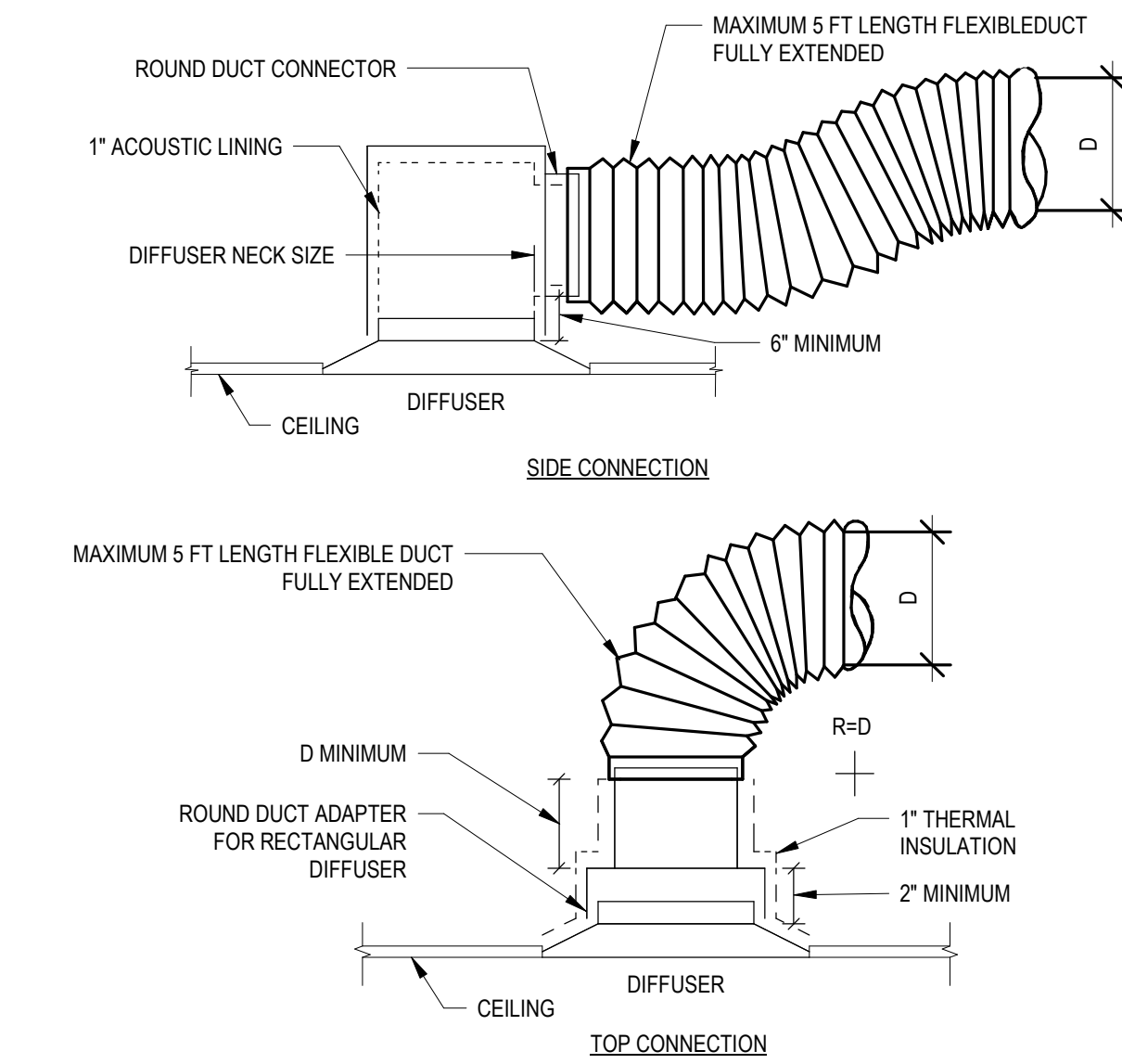
- NOTES:**
- ALL EXPOSED PIPING SHALL BE POLISHED CHROME PLATED.

HP GAS/COND. DRAIN CONNECTION 3



- 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.

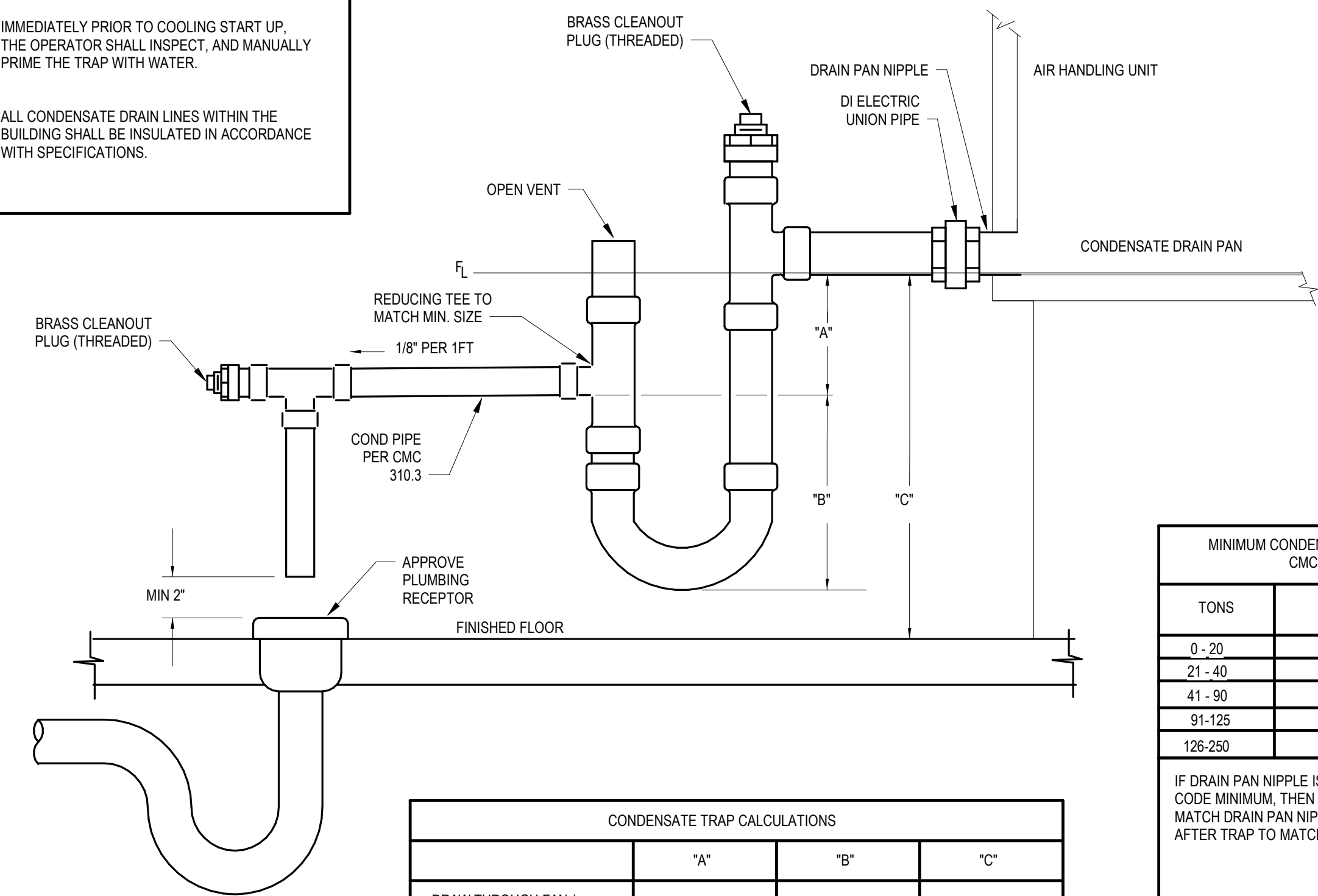
PIPE THROUGH ROOF 8



- NOTE:**
- USE CONTINUOUS ROD IN ALL DAMPERS IN DUCTS OVER 12\"/>

ROUND VOLUME DAMPER 2

- 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.

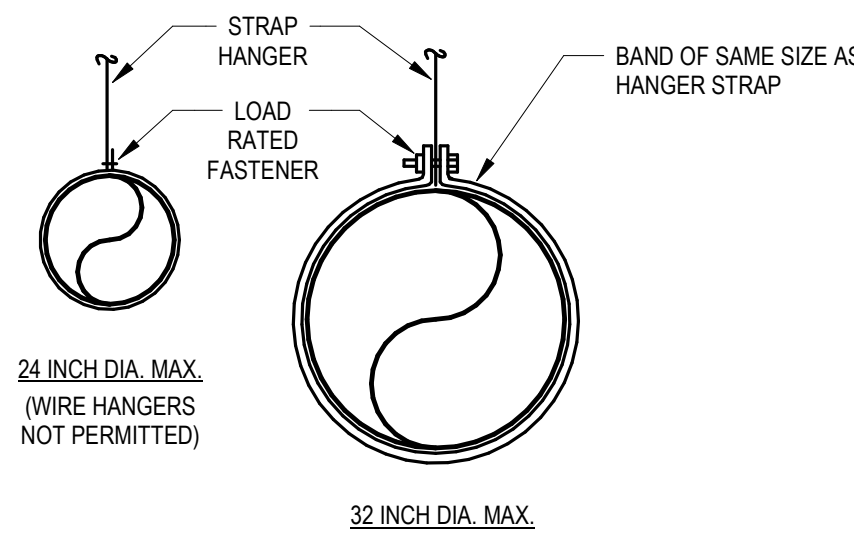


TONS	NOM. PIPE SIZE
0 - 20	3/4"
21 - 40	1"
41 - 60	1-1/4"
61 - 125	1-1/2"
126 - 250	2"

	"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"

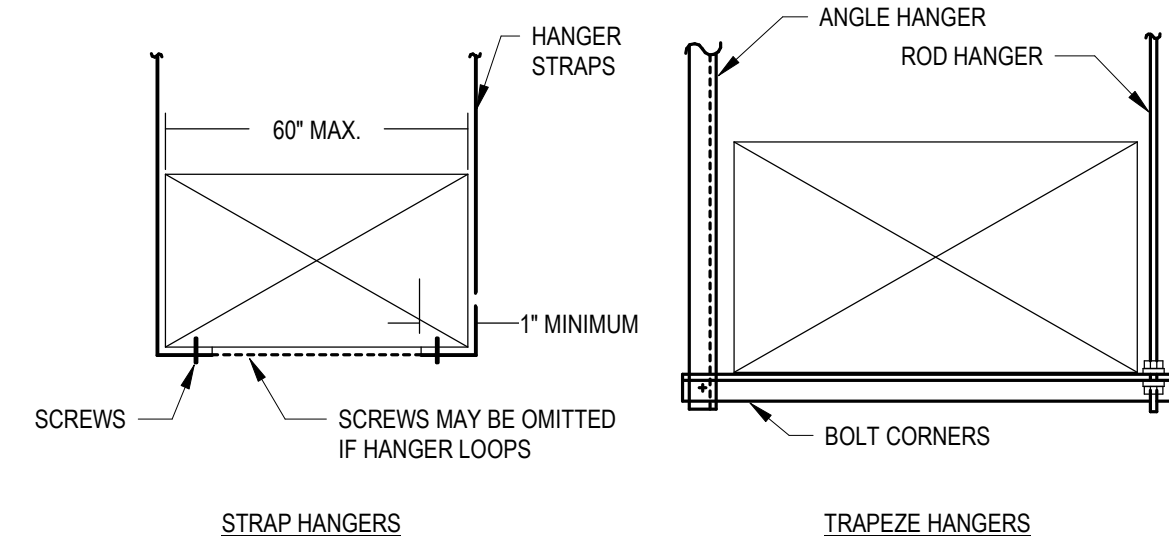
TSP= TOTAL STATIC PRESSURE

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



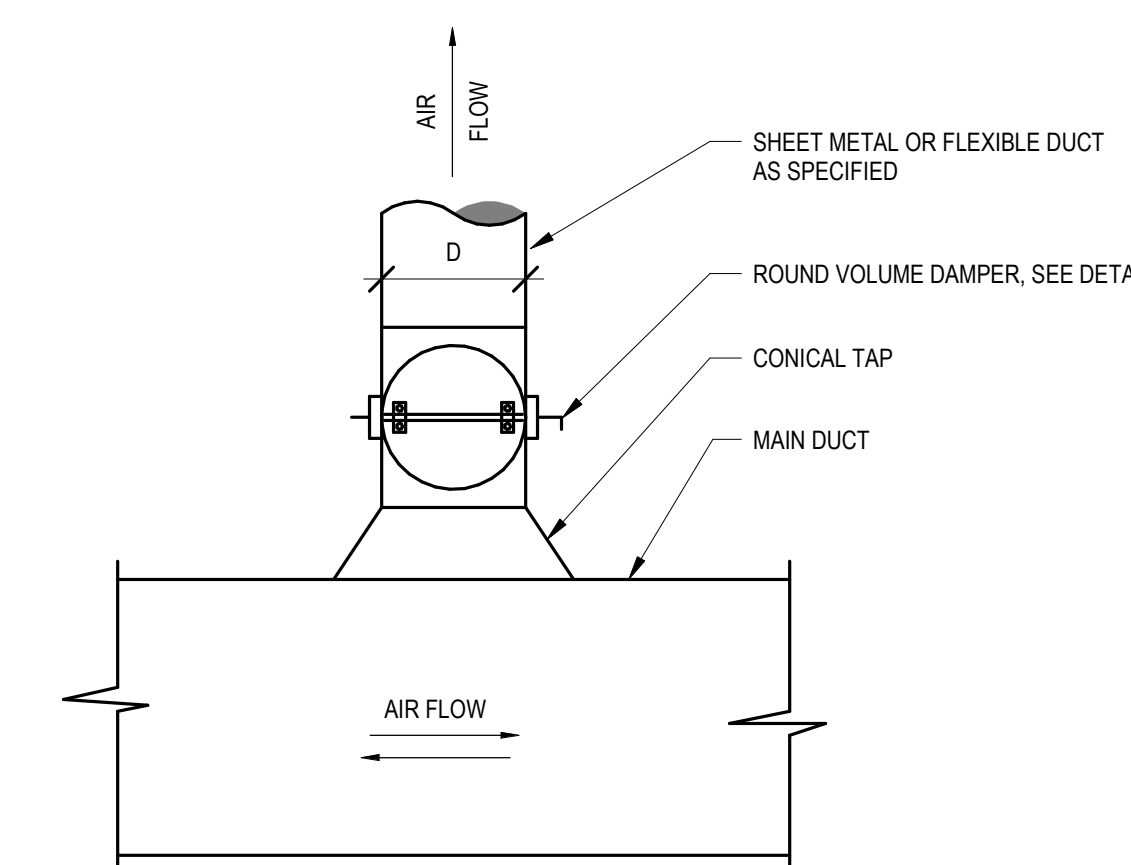
- NOTES:**
- APPLICABLE FOR DUCT SIZE UP TO MAXIMUM 32\"/>

HORIZONTAL ROUND DUCT SUPPORT DETAIL 7

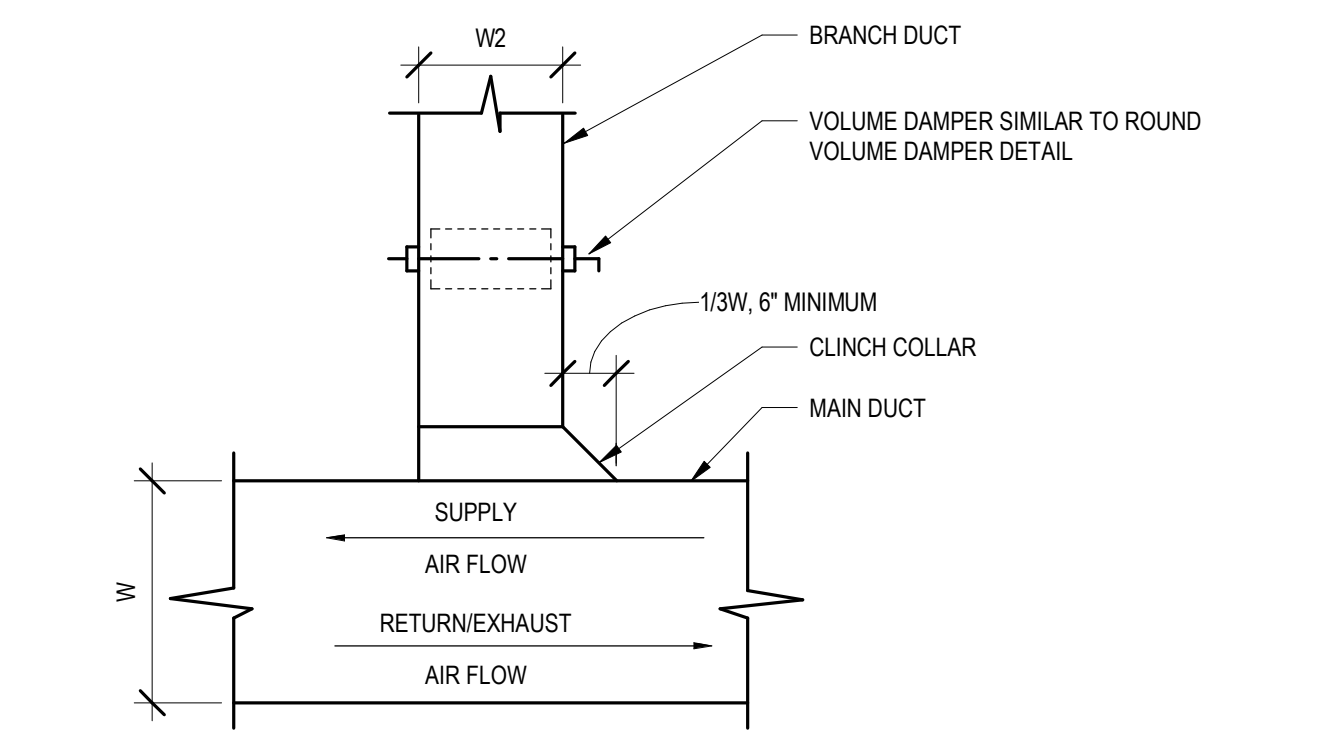


- NOTES:**
- APPLICABLE FOR DUCT SIZE UP TO ITS CROSS SECTIONAL AREA OF MAXIMUM 6 SQ. FT.
 - FOR HANGERS SIZE AND SPACING, SEE SMACNA HVAC DUCT CONSTRUCTION STANDARDS TABLE 5.1.
 - FOR UPPER ATTACHMENT TO BUILDING, SEE SMACNA HVAC DUCT CONSTRUCTION STANDARDS FIG. 5-1 TO 5-4, WITH SPECIFIC BUILDING STRUCTURAL 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 6

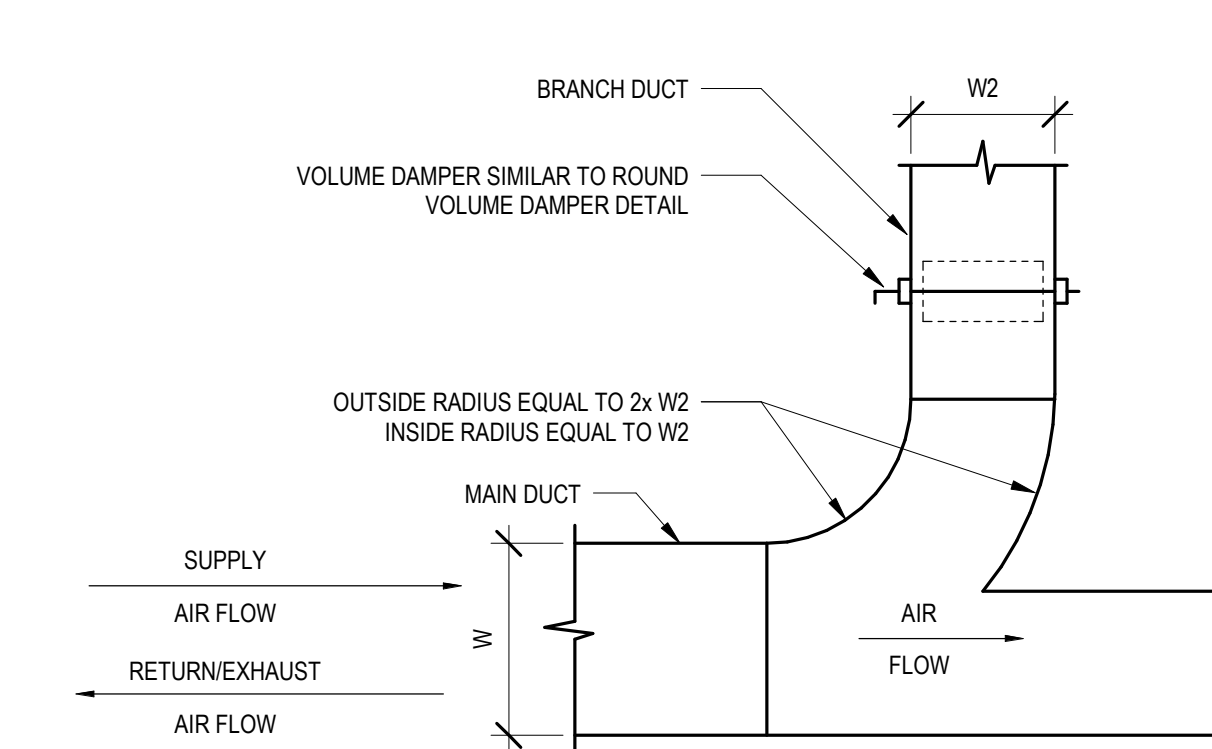


- NOTES:**
- DEPTH OF MAIN DUCT MUST BE 2" LARGER THAN CONICAL DIAMETER.



- NOTES:**
- DEPTH AT W1 MUST BE AT LEAST 2" THAN DEPTH AT W2.

DUCTWORK CONNECTION DETAIL 1



- NOTES:**
- DEPTH OF DUCT FOR W1 AND W2 SHOULD BE EQUAL.

CONDENSATE TRAP DETAIL 9

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STATIC PRESSURE CALCULATION KEF-1

EXHAUST FAN AIRFLOW: 1385 CFM
DUCT FRICTION: 0.25" PER 100'

KITCHEN HOOD FILTERS = 0.51"
DUCT LENGTH = 10'
FITTINGS = 0.1"

SAFETY FACTOR = 25%
TOTAL S.P. = 0.89"

STATIC PRESSURE CALCULATION KEF-2

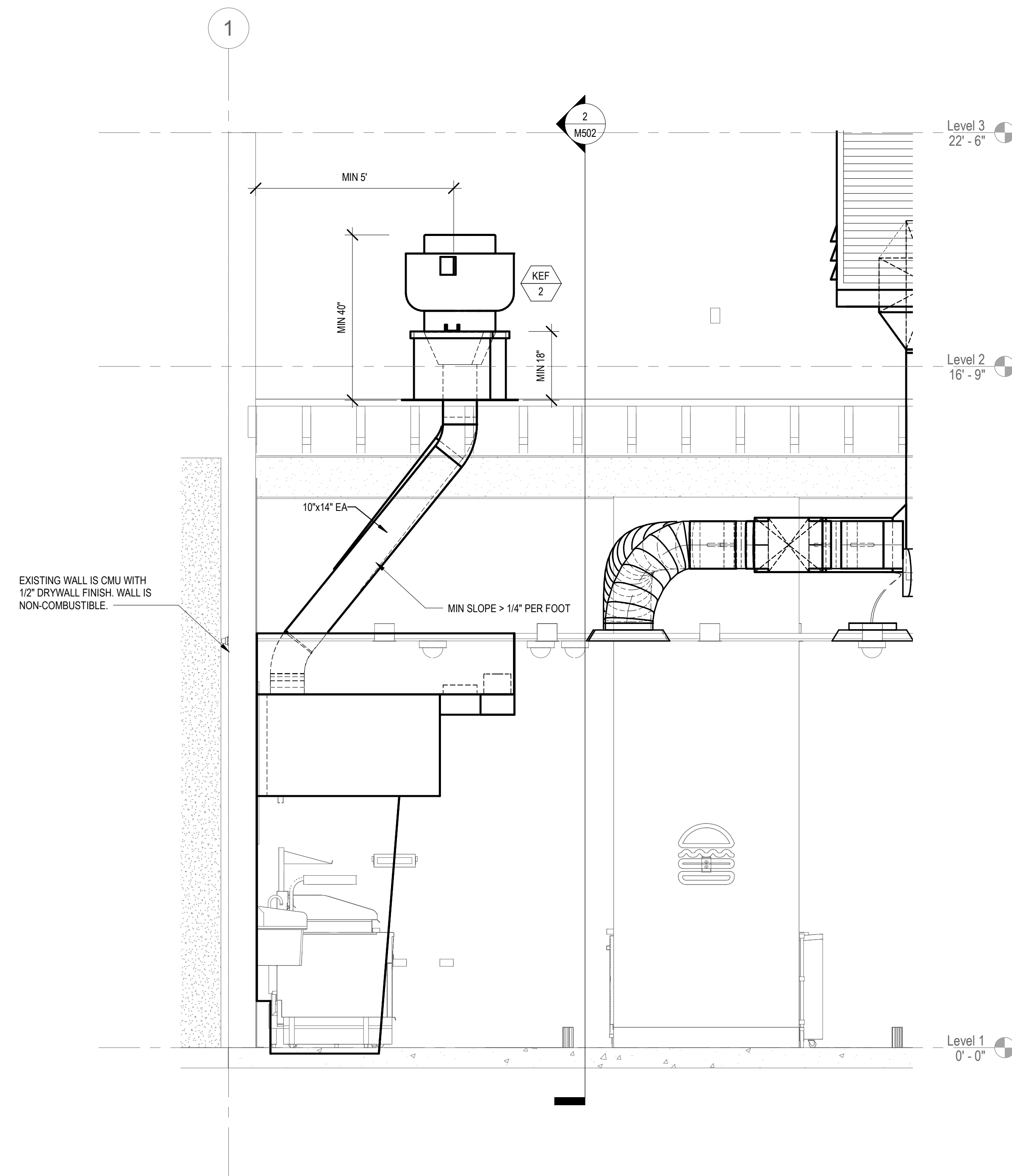
EXHAUST FAN AIRFLOW: 1400
DUCT FRICTION: 0.25" PER 100'

KITCHEN HOOD FILTERS = 0.53"
DUCT LENGTH = 10'
FITTINGS = 0.1"

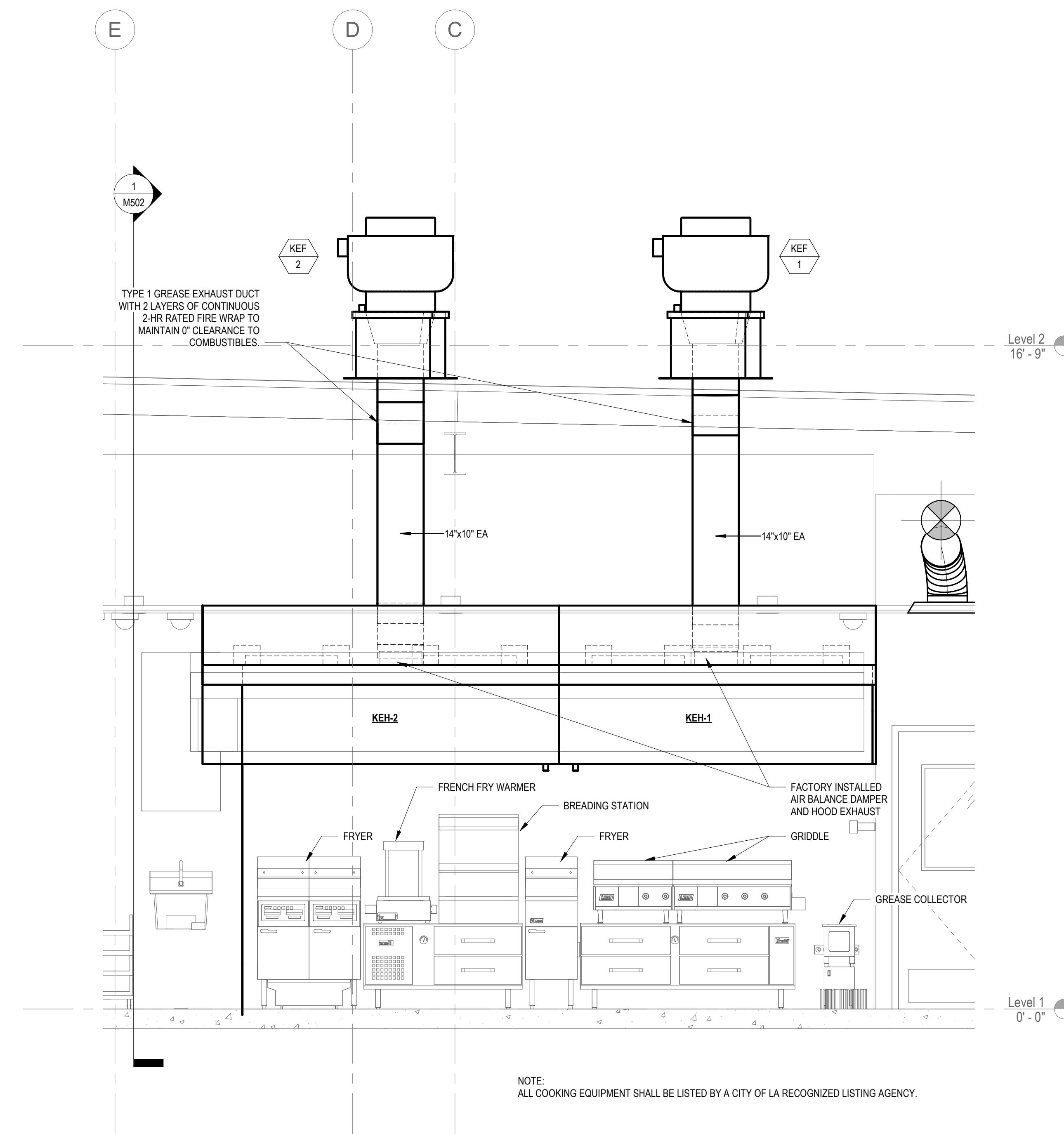
SAFETY FACTOR = 25%
TOTAL S.P. = 0.91"

HOOD NOTES

- A PERFORMANCE TEST SHALL BE CONDUCTED UPON COMPLETION AND BEFORE APPROVAL OF A VENTILATION SYSTEM SERVING COMMERCIAL COOKING APPLIANCES. THE TEST SHALL VERIFY THE EXHAUST AIRFLOW RATE IN ACCORDANCE WITH SECTIONS 508.10.1.2 THRU 508.10.1.5 OR THE AIRFLOW RATE STAMPED ON LISTED HOOD.
- THE PERMIT HOLDER SHALL VERIFY A CAPTURE AND CONTAINMENT PERFORMANCE OF THE HOOD. A FIELD TEST SHALL BE PERFORMED WITH COOKING EQUIPMENT AT NORMAL OPERATING TEMPERATURE AND CAPTURE AND CONTAINMENT SHALL BE VERIFIED THROUGH A VISUAL OBSERVATION OF SMOKE OR STEAM PRODUCED BY SMOKE CANDLES OR PUFFERS. SMOKE BOMBS ARE PROHIBITED FROM USE ON THIS TEST.
- PRIOR TO USE OR CONCEALMENT, A GREASE DUCT LEAKAGE TEST SHALL BE PERFORMED TO VERIFY THE WELDED SEAMS AND JOINTS ARE LIQUID TIGHT. THE TEST SHALL BE A WATER TEST, A LIGHT TEST, OR AN APPROVED EQUIVALENT TEST. THE PERMIT HOLDER SHALL BE RESPONSIBLE FOR PROVIDING THE EQUIPMENT AND FOR PERFORMING THE TEST.
- TYPE I GREASE HOOD EXHAUST DUCTWORK OF MINIMUM 16 GAUGE COLD ROLLED STEEL, OR 18 GA. STAINLESS STEEL WITH LIQUID TIGHT WELDS.



1 KITCHEN HOOD ELEVATION 2
SCALE: 1/2" = 1'-0"



2 KITCHEN HOOD ELEVATION 1
SCALE: 1/2" = 1'-0"

NOTE:
ALL COOKING EQUIPMENT SHALL BE LISTED BY A CITY OF LA RECOGNIZED LISTING AGENCY.

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Seal / Signature



Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
MECHANICAL ELEVATIONS

Scale
1/2" = 1'-0"

M502

Water Leak Testing of New and Existing Grease exhaust vent systems. Summary: A high pressure multi-nozzle sprayer in conjunction (when 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 plus 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 be scheduled after the welded grease exhaust system with the hood and all access plates installed. The leak testing 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 @ 10GPM, (minimum requirements to run a multi nozzle duct cleaner known as spinjet or roto-nozzle) shall be required.
- Adequate high pressure hose along with a 6" or 12" spinjet (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 nozzles 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) funneing into a large watertight brue (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 observe 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 Enviromatic to verify the job is done correctly.

- The leastest form shall be filled out and signed that system is liquid tight as specified by NFPA96 guidelines.
- The leastest 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.
- If any soot (EX: IR Weld, spoxies, etc) is found in a welded duct, the test shall immediately fail and the leaktesting will cease immediately until all soot is removed to bare welds.
- For listed ducts with sealed joints, only the listed sealant shall be used. The leaktest will progress in the same manner as the welded ducts EXCEPT leakage requiring sealant repairs will need to cure for the required time before re-testing.

FireMaster® FastWrap® XL

Database Code: US: 714-236
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Product Features

- Thin and lightweight at 1-1/2" (38mm) thick, 9.0 pf (98 kg/m³) density.
- Conforms easily to complex duct designs.
- Grease duct installation UL, and ULC listed with butt joints at all seams on both layers.
- Fully foil encapsulated for fast and clean installation.
- Contact 202° F (375° F) raised fires.
- Mechanical Resistance validated by UL Environment.
- Good sound absorption.
- Compliant to IMC, NFPA 96, UMC, CMCC, CNBC.

2. Applications

- 2-hour enclosure and firestop system for kitchen exhaust duct.
- Zero clearance to combustibles.
- 1, 2 and 3-hour enclosure and firestop system for hazardous exhaust ducts, pressurization ducts, droplet ether exhaust ducts, trash and linen chutes, and other fire rated HVAC ducts.
- 1-hour electrical circuit integrity protection.
- Engineered and tested solutions for fire protection of structural steel and storage vessels per ASTM E119, ISO 854, and UL 1709.

3. Specifications - Division 23 07 00 (or 1500)

CSI Spec and AutoCAD available online. www.aiaa.com/collections/firemaster.html

Thermal Ceramics FireMaster FastWrap XL is a flexible blanket composed of high temperature fibers classified for applications to 2192° F (1200° C) and fully encapsulated in a durable glass fiber reinforced foil facing for easy handling and installation. Thermal Ceramics FastWrap XL is UL and ULC listed for 1- and 2-hour fire resistive enclosure protection, zero clearance for kitchen exhaust ducts, electrical circuit protection, and as a component of UL firestop designs for fire resistance rated "Supernote" floor which is an alkaline earth silicate wool with low porosity 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.

4. Physical Characteristics

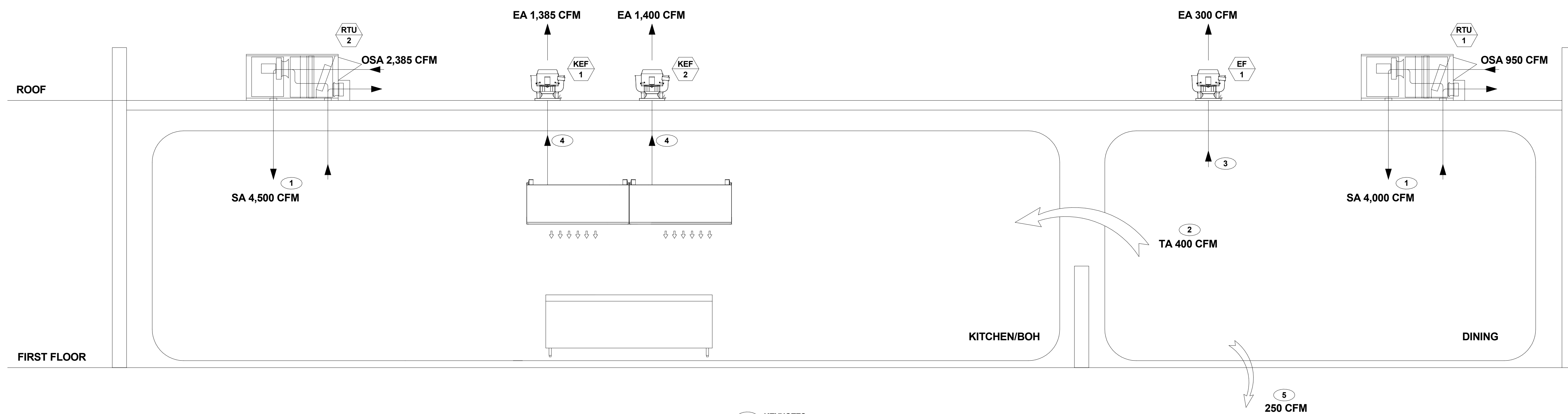
Product	Unit	Size	Weight (lb)	Weight (kg)
FastWrap XL	Roll	1'-12" x 24" x 25'	1	37.5 lbs.
FastWrap XL	Roll	1'-12" x 48" x 25'	1	75 lbs.

5. Performance Specifications

Reference Standard	Standard No.	Performance
Grease Duct Enclosure System	ASTM E2338	Pass
Section 16.1 - Non-Combustibility	ASTM E136	Pass
Section 16.2 Fire Resistance (wall)	ASTM E119	Pass
Section 16.3 Durability Test	ASTM D216	Pass
Section 16.4 - Wetted Fire Test	ASTM E2338	Pass
Section 16.5 - Fire Penetration (duct)	ASTM E814	Pass
ULC Grease Duct Test Protocol	E119	Pass
Standard Methods of Fire Resistance Tests - Grease Duct Assemblies	CANULC E114	Pass
Grease Duct Enclosure	UL 1709	Pass
Air Ventilation Duct Enclosure	UL 1044	Pass
Section 16.6 - Wetted Fire Test	ASTM E2338	Pass
Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
ULC Grease Duct Test Protocol	E119	Pass
Standard Methods of Fire Resistance Tests - Grease Duct Assemblies	CANULC E114	Pass
Air Ventilation Duct Enclosure	UL 1044	Pass
Section 16.6 - Wetted Fire Test	ASTM E2338	Pass
Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
ULC Grease Duct Test Protocol	E119	Pass
Standard Methods of Fire Resistance Tests - Grease Duct Assemblies	CANULC E114	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
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Standard Methods of Fire Resistance Tests - Grease Duct Assemblies	CANULC E114	Pass
Air Ventilation Duct Enclosure	UL 1044	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
ULC Grease Duct Test Protocol	E119	Pass
Standard Methods of Fire Resistance Tests - Grease Duct Assemblies	CANULC E114	Pass
Air Ventilation Duct Enclosure	UL 1044	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
ULC Grease Duct Test Protocol	E119	Pass
Standard Methods of Fire Resistance Tests - Grease Duct Assemblies	CANULC E114	Pass
Air Ventilation Duct Enclosure	UL 1044	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
ULC Grease Duct Test Protocol	E119	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
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Standard Methods of Fire Resistance Tests - Grease Duct Assemblies	CANULC E114	Pass
Air Ventilation Duct Enclosure	UL 1044	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
ULC Grease Duct Test Protocol	E119	Pass
Standard Methods of Fire Resistance Tests - Grease Duct Assemblies	CANULC E114	Pass
Air Ventilation Duct Enclosure	UL 1044	Pass
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Section 16.7 - Fire Penetration (duct)	ASTM E814	Pass
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Section 16.7 - Fire Penetration		

AIR BALANCE TABLE AT DESIGN							
	HVAC SUPPLY (CFM)	HVAC RETURN (CFM)	HVAC OSA (CFM)	HOOD OSA (CFM)	HOOD EXHAUST (CFM)	GENERAL EXHAUST (CFM)	AREA SERVED
RTU-1	4,000	3,000	950	-	-	-	DINING
RTU-2	4,500	4,200	2,385	-	-	-	BOH
KEF-1	-	-	-	-	1,385	-	KEH-1
KEF-2	-	-	-	-	1,400	-	KEH-2
EF-1	-	-	-	-	-	300	RESTROOMS
TOTAL	8,500	7,200	3,335	-	2,785	300	
OSA			3,335		-3,085		

TOTAL PRESSURIZATION DIFFERENCE = +250



- KEYNOTES:
1. TOTAL OF AIR INLETS / OUTLETS.
 2. TRANSFER AIR TO KITCHEN FROM ADJACENT SPACE.
 3. TOTAL OF RESTROOM EXHAUST FANS.
 4. KITCHEN HOOD EXHAUST.
 5. EXFILTRATION.

Date	Description
12/20/2022	ISSUE FOR PERMIT/BID
1 02/09/2023	ADDENDUM 1
2 03/10/2023	ADDENDUM 2
3 04/12/2023	ADDENDUM 3
4 05/02/2022	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
MECHANICAL AIRFLOW DIAGRAM

Scale
3/8" = 1'-0"

M601

Gensler

500 South Figueroa Street
Los Angeles, California 90071
United States
Contact:
Bryan Walsingham
Tel 213.239.8240

Tel 213.327.3600
Fax 213.327.3601



2361 ROSECRANS AVENUE
SUITE 368
EL SEGUNDO, CA 90245
Tel 310.725.1500
Fax 310.725.4699
Contact:
Yves Yanuaría
Tel 323.617.0332



505 COLLINS ST
PO BOX 3505
SOUTH ATTLEBORO
MA 02703
Tel 508.399.6000
Fax 508.761.3620

Contact:
Michael Henderson
Tel 508.399.2392



700 FLOWER STREET
SUITE 2100
LOS ANGELES, CA 90017
Tel 213.372.3400

Contact:
Claudia Walker
Tel 213.310.8495

△ Date	Description
12/20/2022	ISSUE FOR PERMIT/BID
1 02/09/2023	ADDENDUM 1
2 03/10/2023	ADDENDUM 2
3 04/12/2023	ADDENDUM 3
4 05/02/2022	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

SS 1485 - STUDIO CITY

Project Number

005.4293.000

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 (3 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

- 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 2,385 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 (HEAT PUMP) MAINTAINS A CONSTANT SUPPLY AIR VOLUME AND MODULATES THE COMPRESSOR FREQUENCY 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.

KITCHEN EXHAUST FANS

- KEF 1 AND 2 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 PROBE(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.

SPECIFICATION TABLE OF CONTENTS

SECTION 23090 - COMMON WORK RESULTS FOR HVAC
SECTION 23029 - HANGERS AND SUPPORTS
SECTION 23053 - IDENTIFICATION
SECTION 23055 - TESTING, ADJUSTING, AND BALANCING FOR HVAC
SECTION 23070 - HVAC INSULATION
SECTION 23080 - COMMISSIONING
SECTION 23200 - REFRIGERANT PIPING
SECTION 23313 - METAL DUCTS
SECTION 23315 - DUCT ACCESSORIES
SECTION 23313 - DIFFUSERS, REGISTERS AND GRILLES

SECTION 23050 - 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 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.2 SCOPE OF WORK
A. PROVIDE LABOR, INCLUDING FIELD ERECTION AND SUPERVISION, MATERIALS, EQUIPMENT AND ANCHORS, 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 HAVING 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 VERIFY THE GENERAL CONTRACTOR (VA DIMENSIONAL DRAWINGS) OF THE EXACT SIZE AND LOCATION OF ALL ROOF AND WALL OPENINGS,
8. MISCELLANEOUS STEEL WORK, SUPPORTS AND HANGERS AND CUTTING AND PATCHING OF ROOF, WALLS AND PARTITIONS,
9. RECORD DRAWINGS,
10. CONTROLS,
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 CONTRACT DOCUMENTS.
2. REFER TO THE RESPONSIBILITY MATRIX FOR ADDITIONAL INFORMATION.

1.3 QUALITY ASSURANCE
D. CODES AND STANDARDS
1. IN ADDITION TO THE REQUIREMENTS OF ALL GOVERNING CODES, ORDINANCES AND AGENCIES, CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES AND STANDARDS:
2. STATE OF CALIFORNIA ADMINISTRATIVE CODE,
3. HEALTH AND SAFETY CODE, STATE OF CALIFORNIA,
4. TITLE 24 CALIFORNIA CODES OF REGULATIONS,
a. PART 1 2019 CALIFORNIA ADMINISTRATIVE CODE
b. PART 2 2019 CALIFORNIA BUILDING CODE
c. PART 3 2019 CALIFORNIA ELECTRICAL CODE
d. PART 4 2019 CALIFORNIA MECHANICAL CODE
e. PART 5 2019 CALIFORNIA PLUMBING CODE
f. PART 6 2019 CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARD
g. PART 9 2019 CALIFORNIA FIRE CODE

1.4 SUBMITTALS
A. PROVIDE FOUR (4) COPIES OF 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 INDICATE 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. REFERENCING 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 COMPILING AND RECORDING TEST AND BALANCE DATA,
11. CONTROL DEVICES AND SYSTEMS,
12. CONTROL SEQUENCE AND SYSTEM DRAWINGS,
13. FIRE PROTECTION SYSTEM LAISTS 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.

1.5 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, DETAILS, 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.

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

1.7 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 FACTORY 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.

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

1.9 PRODUCT HANDLING
A. PROTECTION: PROTECT MATERIALS AND EQUIPMENT FROM DAMAGE DURING SHIPPING, STORAGE AND HANDLING. REMOVE FROM THE SITE ANY WET OR DAMAGED DUCT UNDER 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.

1.10 CONTRACT DRAWINGS
A. CONTRACTOR 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.

1.11 DEMOLITION
A. PROTECT ADJACENT MATERIALS INDICATED TO REMAIN. INSTALL AND MAINTAIN DUST AND NOISE BARRIERS TO KEEP DIRT, DUST, 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 AREA OUTSIDE DEMOLITION LIMITS. WHEN DEMOLITION 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.

1.12 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 OWNER'S REPRESENTATIVE, OWNER'S PROJECT REPRESENTATIVE AT LEAST 14 DAYS PRIOR TO COMMENCING DEMOLITION OPERATIONS.

1.14 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.

1.15 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. THIS SHOULD BE ASSUMED THAT DISRUPTION OF UTILITIES AND SERVICES WILL BE DONE AT OTHER THAN NORMAL WORKING HOURS. NO WORK SHALL BE PERFORMED UNLESS 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 MALICIOUSLY, DROPPED TOOLS OR MATERIALS, GRT, DIRT, OR ANY FOREIGN MATTER. DAMAGED WORK SHALL BE REPAIRED OR REPLACED UNTIL WORK IS FULLY 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 OWNER'S REQUIREMENTS.
J. VERIFY ALL EXISTING WORK, WHERE EXISTING CONNECTIONS ARE PARTIAL, PROVIDE ALL NECESSARY MATERIALS, LABOR AND EQUIPMENT REQUIRED TO MODIFY 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.

1.16 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 NO OBSTRUCTIONS, MANTAIN HEADROOM, LEAVE ADEQUATE CLEARANCES FOR LIGHT FIXTURES, RETURN AIR PATHWAYS, MAINTENANCE AND REPAIRS, AND PROVIDE CLEARANCE AND ACCESS AS REQUIRED BY CODES. GRILLES AND TERMINAL AIR UNITS SHALL BE INSTALLED BELOW CEILING LEVEL WITHOUT ARCHITECT'S WRITTEN CONSENT.
3. ABOVE ITEMS TO BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
4. PROCEED 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 FORCING. PROPERLY CLEAR WINDOWS, DOORS AND OTHER OPENINGS. EXCESSIVE CUTTING OR OTHER WEAKENING OF THE BUILDING STRUCTURE WILL NOT BE PERMITTED.
7. MANUFACTURER'S DRAWINGS AND INSTRUCTIONS SHALL BE FOLLOWED IN ALL CASES WHERE THE MANUFACTURER'S DEVICES AND EQUIPMENT ARE COVERED IN DIRECTIONS OR DETAILS NOT SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS.
8. DRAWINGS ARE NOT INTENDED TO BE SCALED. 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 EQUIPMENT 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 THEREON 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 WHERE NECESSARY TO SUPPORT THE WORK.
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 ARCHITECT'S DRAWINGS, OBTAIN ARCHITECT'S APPROVAL FOR LOCATIONS PRIOR TO INSTALLATION.
13. COORDINATE THE WORK OF THIS SECTION WITH THE WORK OF OTHER SECTIONS IN AMLE. TIME FOR PROPER INSTALLATION AND CONNECTION.
14. CAREFULLY CHECK SPACE REQUIREMENTS, INCLUDING SERVICING 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 MANUFACTURER'S INSTRUCTIONS,
4) COLORS TO MATCH EXISTING OR AS SELECTED BY ENGINEER.
b. GALVANIZED IRON PRIMER,
c. HOT DIPPED GALVANIZED OR DIPPED IN ZINC CHROMATE,
d. ZINC CHROMATE WITH FINISH TO MATCH SURROUNDINGS.
2. CLEANING
a. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE.
b. PAINTED EXPOSED WORK SOILED 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

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

1.18 PRODUCT CLOSE-OUT
A. AFTER FINAL OPERATION FOR INSPECTION AND ACCEPTANCE DELIVER ALL COPIES OF OPERATION AND MAINTENANCE MANUALS 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.

1.19 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/LABELLED AS SUITABLE FOR LOCATION AND USE - NO EXCEPTIONS.
C. STARTERS AND ELECTRICAL DEVICES:
1. MOTOR STARTER CHARACTERISTICS:
a. ENCLLOSURES: NEMA 1, GENERAL PURPOSE ENCLOSURES WITH PALLOCK EARLS EXPOSED IN WET LOCATIONS SHALL BE NEMA 3R WITH CONDUIT HUBS.
b. TYPE AND SIZE OF STARTER SHALL AS IS RECOMMENDED BY MOTOR MANUFACTURER AND THE DRIVEN EQUIPMENT MANUFACTURERS 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 FULT OR BI METALLIC THERMAL OVERLOAD RELAYS, SIZED ACCORDING TO ACTUAL OPERATING CURRENT (FIELD MEASURED).
3. MAGNETIC STARTERS:
a. HEAVY DUTY, OR RESISTANT, HAND-OFF-AUTO (H/OA), 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 CONTROL SECTIONS.
d. BUILT IN PRIMARY AND SECONDARY FUSED CIRCUIT CIRCUIT TRANSFORMER, SUPPLIED FROM LOAD SIDE OF EQUIPMENT DISCONNECT.
e. EXTERNALLY OPERATED MANUAL RESET.
1. UNDER VOLTAGE RELEASE OR PROTECTION FOR ALL MOTORS OVER 20 HP.
4. MOTOR CONNECTIONS: LIQUID FLEXIBLE CONDUIT, EXCEPT WHERE PLUG IN ELECTRICAL CORDS ARE SPECIFICALLY INDICATED.
D. LOW VOLTAGE CONTROL WIRING
1. GENERAL: 1/4 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 SOUTHWIRE CO.
E. DISCONNECT SWITCHES:
1. FUSIBLE SWITCHES: FOR EQUIPMENT 1/2 HP OR LARGER, PROVIDED FUSED, EACH PHASE: HEAVY DUTY; HORSEPOWER RATED, SPRING LOADED QUICK MAKE, QUICK BREAK MECHANISM, DEAD FRONT LINE SIDE SHIELD, SCALDLESS LUGS SUITABLE FOR COPPER OR ALUMINUM CONDUCTORS; SPRING REINFORCED FUSE CLIPS, ELECTRO SILVER PLATED CURRENT CARRYING PARTS; HINGED 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 IRREGULAR WORK UNLESS SO INDICATED ON DRAWINGS OR APPROVED BY ARCHITECT.
2.2 MANUFACTURER'S DIRECTIONS
A. FOLLOW MANUFACTURER'S DIRECTIONS AND RECOMMENDATIONS IN ALL CASES WHERE THE MANUFACTURER'S ARTICLES USED ON THIS CONTRACT FURNISH DIRECTIONS COVERING WORK NOT SHOWN ON THE DRAWINGS OR COVERED IN THESE SPECIFICATIONS.
2.3 INSTALLATION
A. COORDINATE THE WORK BETWEEN THE VARIOUS MECHANICAL SECTIONS AND WITH ALL OTHER 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 ENGINEER AND AT THE CONTRACTOR'S 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 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 MANUFACTURER'S WRITTEN INSTRUCTIONS AND WITH RECOGNIZED INDUSTRY PRACTICES, AND COMPLYING WITH APPLICABLE REQUIREMENTS OF UL, N.E.C. AND NECA'S "STANDARDS OF INSTALLATION" TO ENSURE THAT PRODUCTS FULLY 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 RESPONSIBILITIES BETWEEN DIVISION 23 AND 26 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 WIRED DIVISION 22 EQUIPMENT. FACTORY WIRING TO INCLUDE WIRING BETWEEN MOTOR AND DISCONNECT OR COMBINATION STARTER/DISCONNECT.
c. CONTROLS: DIVISION 23 CONTRACTOR (INCLUDING THE TEMPERATURE CONTROL SYSTEMS) IS RESPONSIBLE FOR THE FOLLOWING 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 BULB 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. COLORS: TO MATCH EXISTING OR AS SELECTED BY ENGINEER.
2. FIRE SMOKE DAMPERS: DIVISION 23 IS RESPONSIBLE FOR PROVIDING AND PHYSICALLY INSTALLING THE DAMPER AND FOR INSTALLING ANY REQUIRED CONTROL, INTERFACE WIRING TO DIVISION 23 CONTROLS.
a) WHERE FIRE SMOKE DAMPERS ARE PART OF AN INTEGRATED SMOKE CONTROL SYSTEM, DIVISION 23 IS RESPONSIBLE FOR PROVIDING DAMPERS WITH NECESSARY END SWITCHES FOR PROOF OF CLOSURE.
b) WHERE THESE DAMPERS ARE NOT PART OF AN INTEGRATED AREA WIDE SMOKE DETECTION SYSTEM, DIVISION 23 IS RESPONSIBLE FOR PROVIDING EACH FIRE SMOKE DAMPER WITH A DEDICATED DUCT DETECTOR INSTALLED PER THE REQUIREMENTS OF THE BUILDING CODE. IF NOT INTEGRAL WITH THE DAMPER ASSEMBLY, THE DETECTOR IS TO BE INSTALLED BY DIV. 23 BUT WIRED FOR DAMPER CONTROL BY DIV. 26.
3. FIRE SPRINKLER SYSTEM: DIVISION 23 IS RESPONSIBLE FOR PROVIDING NECESSARY CONTROLS INCLUDING FLOW SWITCHES AND ALARM BELLS.
4. FIRE SUPPRESSOR SYSTEMS: DIVISION 23 IS RESPONSIBLE FOR PROVIDING NECESSARY SYSTEM CONTROLS AND ANY REQUIRED CONTROL INTERFACE WIRING TO THESE CONTROLS.
5. SUPPORT SPREADERS: FIRE SUPPRESSION SYSTEMS: DIVISION 23 IS RESPONSIBLE FOR PROVIDING NECESSARY SYSTEM CONTROLS AND ANY REQUIRED CONTROL INTERFACE WIRING TO THESE CONTROLS.
6. 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 WIRED DIVISION 23 EQUIPMENT. PROVIDE POWER WIRING TO ALL DISCONNECTS. IN ADDITION PROVIDE WIRING BETWEEN MOTOR AND DISCONNECT WHEN THE DISCONNECT IS NOT FACTORY INSTALLED. SEE ALSO VARIABLE 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) FIRE SMOKE 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 FIRE SMOKE DAMPER WITH A DEDICATED DUCT DETECTOR INSTALLED PER THE REQUIREMENTS OF THE BUILDING CODE. (SEE SECTION 5980) 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 CONTROLS.
4. COORDINATE WITH OTHER WORK, INCLUDING WIRELESS, RACEWAY AND EQUIPMENT INSTALLATION, AS NECESSARY TO PROPERLY INTERFACE INTERRUPTED ELECTRICAL CONNECTIONS FOR EQUIPMENT WITH OTHER WORK.
5. CONNECT ELECTRICAL POWER SUPPLY CONDUCTORS TO EQUIPMENT CONDUCTORS IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS AND WIRING DIAGRAMS. MAINTAIN CLEARANCES OF ELECTRICAL CONNECTIONS FOR PROPER INTERFACE BETWEEN ELECTRICAL POWER SUPPLIES AND INSTALLED EQUIPMENT.
6. MAINTAIN EXISTING ELECTRICAL SERVICE AND FEEDERS TO OCCUPIED AREAS AND OPERATIONAL FACILITIES, UNLESS OTHERWISE INDICATED, OR WHEN AUTHORIZED OTHERWISE IN WRITING BY OWNER, OR ARCHITECT/ENGINEER, PROVIDE TEMPORARY SERVICE DURING INTERRUPTED ELECTRICAL SERVICE. WHEN NECESSARY, SCHEDULE MOMENTARY OUTAGES FOR REPLACING EXISTING WIRING SYSTEMS WITH NEW WIRING SYSTEMS, WHEN THAT "CUTTING-OVER" HAS BEEN SUCCESSFULLY ACCOMPLISHED, REMOVE, REMOVE, OR ABANDON EXISTING WIRING AS INDICATED.
7. COVER SPLICES WITH ELECTRICAL INSULATING MATERIAL EQUIVALENT TO, OR OF GREATER INSULATION RESISTIVITY RATING, THAN THE ELECTRICAL INSULATION RATING OF THOSE CONDUCTORS BEING SPLICED.
8. 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.
E. MOTORS AND MOTOR CONTROL EQUIPMENT: CONFORM TO THE STANDARDS OF THE NEMA EQUIPMENT 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. STARTERS SHALL BE COMBINATION TYPE WITH NON-FUSIBLE DISCONNECT SWITCHES. ALL SINGLE PHASE FRACTIONAL HORSEPOWER MOTORS SHALL HAVE BUILT-IN OVERLOAD PROTECTION.

SECTION 23029 - HANGERS AND SUPPORTS
A. PIPE HANGERS, SUPPORTS, AND GUIDES:
1. GENERAL:
a. HANGERS AND SUPPORTS TO BE DESIGNED AND INSTALLED PER SMACNA GUIDELINES.
b. ASSURE ADEQUATE SUPPORT FOR PIPE AND CONTENTS.
c. PROVIDE RIGID INSULATION SECTION TO ALL HANGER SUPPORTS.
d. PROVIDE SEISMIC RESTRAINTS TO MEET LOCAL CODES.
e. PREVENT VIBRATION OR SWAYING.
f. PROVIDE SLEEVING FOR ALL PIPING THAT PENETRATES FLOOR SLABS.
g. PROVIDE FOR EXPANSION AND CONTRACTION.
h. SUPPORTS OF WIRE, ROPE, WOOD, CHAIN, STRAP PERFORATED BAR OR ANY OTHER MAKE/SHIP DEVICE NOT PERMITTED.
i. COMPLY WITH APPLICABLE REQUIREMENTS AT ANS B31.1.0 AND B31.2 FOR PIPING.
j. SUPPORT PIPING INDEPENDENTLY SO THAT EQUIPMENT IS NOT STRESSED BY PIPING WEIGHT OR EXPANSION.
k. HANGERS AND SUPPORTS SHALL HAVE MINIMUM SEAFLOOR STRENGTH OF THREE (3) BASED ON LIFT/MATE/TENSE OR COMPRESSION FACTORS, AS APPLICABLE OF MATERIAL USED.
l. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AND SUPPORTS LOCATED IN CEILING SPACES, PIPES SHAFTS AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED.
2. 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, TRAPEZE OR OTHER EQUIVALENT STRUCTURAL SUPPORT. ROLLERS NOT REQUIRED WHERE SPRING HANGERS ARE CALLED FOR.
3. TRAPEZE 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 POINT.
4. INSTALL PIPE ISOLATORS BETWEEN HANGERS AND:
a. UNINSULATED COPPER TUBING,
b. WHEREVER ANY PIPE REQUIRES SOUND AND VIBRATION ISOLATION.
5. MISCELLANEOUS STEEL: PROVIDE MISCELLANEOUS STEEL MEMBERS, BEAMS, BRACKETS, ETC., FOR SUPPORT OF WORK IN THIS DIVISION UNLESS SPECIFICALLY INCLUDED IN OTHER DIVISIONS.
6. DUCT 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 SCREENS.
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:
1) EXTEND STRAP DOWN BOTH SIDES OF DUCTS.
2) TURN UNDER BOTTOM ONE INCH MINIMUM.
c. METAL SCREW HANGERS:
a) BOTTOM OF DUCT,
b) UPPER AND LOWER SIDES OF DUCTS,
c) NOT MORE THAN 12 INCHES ON CENTER.
d) ANGLE HANGERS:
a) PROVIDE ANGLE HANGERS FORMED BY EXTENDED VERTICAL BRACING ANGLES.
3. RECTANGULAR DUCT SUPPORT SPACING:
a. HORIZONTAL DUCTS: 10'
b. VERTICAL DUCTS: 12'
c. TRAPEZE DUCTS: 8'
4. ROUND DUCT SUPPORT SPACING:
a. HORIZONTAL DUCTS (40" DIAMETER): 10'
b. VERTICAL DUCTS: 12'
c. TRAPEZE DUCTS: 8'

SECTION 23050 - COMMISSIONING
1. MECHANICAL CONTRACTOR SHALL ALLOCATE ADEQUATE TIME IN THEIR PROPOSAL TO ASSIST IN ALL COMMISSIONING ACTIVITIES AS PRESCRIBED. CONSULT WITH THE GENERAL CONTRACTOR TO DETERMINE THE SPECIFIC COMMISSIONING SCOPE OF WORK.
2. COMMISSIONING WILL BE PERFORMED FOR THE FOLLOWING SYSTEMS:
1. AIR HANDLING EQUIPMENT INCLUDING PACKAGED EQUIPMENT AND EXHAUST FANS,
2. SPLIT SYSTEMS,
3. KITCHEN HOOD, EXHAUST, AND MAKEUP AIR SYSTEMS,
4. CONTROLS.
SECTION 23200 - REFRIGERANT PIPING
A. COPPER PIPE AND FITTINGS
1. COPPER TYPE: ASTM B 280, TYPE L (STRAIGHT LENGTH) ACR
2. WROUGHT-COPPER FITTINGS: ASME B16.22
3. WROUGHT-COPPER LINES: ASME B16.22
4. BRAZING FILLER METALS: AWS A5.8
B. PIPE JOINT CONSTRUCTION
1. BRAZED JOINTS: CONSTRUCT JOINTS ACCORDING TO AWS'S "BRAZING HANDBOOK" CHAPTER "PIPE AND TUBE."
C. HANGERS AND SUPPORTS
1. PIPING HANGERS AND SUPPORTS MUST ACCOMMODATE EXPANSION AND CONTRACTION, VIBRATION, DEAD LOAD OF PIPING AND ITS CONTENTS, AND SEISMIC-BRACING REQUIREMENTS.
D. INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:
1. MFS 1/2" MAXIMUM SPAN, 60 INCHES, MINIMUM ROD SIZE, 1/4 INCH.
2. MFS 3/8" MAXIMUM SPAN, 60 INCHES, MINIMUM ROD SIZE, 1/4 INCH.
3. MFS 1" MAXIMUM SPAN, 20 INCHES, MINIMUM ROD SIZE, 1/4 INCH.
E. SUPPORT MULTI-FLOOR VERTICAL RUNS AT LEAST AT EACH FLOOR.
F. INSULATION
1. ALL REFRIGERANT COPPER LINES MUST BE FREE OF EXTRANEOUS CHEMICALS SUCH AS CORROSIVE CLEANERS OR BUILDING MATERIALS DUST PRIOR TO THE INSTALLATION OF THE INSULATION. THE INSULATION MUST BE CLEAN AND DRY PRIOR TO INSTALLATION.
2. REFRIGERANT PIPE SHALL BE SEALED WHILE SUPPLYING ON INSULATION TO PREVENT FOREIGN MATTER FROM ENTERING THE TUBE.

2) FORMED CHANNELS WITH FITTINGS, SIMILAR TO SUPERSTRUT; SUBMIT MANUFACTURER'S CALCULATIONS FOR INSTALLATION.
SECTION 23053 - IDENTIFICATION
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 CEILING 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 SHALL CONFORM TO ANSI/MSEA A13.1 WHERE APPLICABLE.
SECTION 23055 - TESTING, ADJUSTING, AND BALANCING FOR HVAC
A. GENERAL:
1. TAB SHALL BE PERFORMED BY NATIONAL TAB, NORTH KANSAS CITY, MO (WILL TURNSHUGH 314-964-6244), NO EXCEPTIONS.
2. ADJUSTMENT: EACH PIECE OF EQUIPMENT AND ALL OF THE SYSTEMS SHALL BE ADJUSTED TO INSURE PROPER FUNCTIONING OF ALL CONTROLS AND SHALL BE LEFT IN OPERATING CONDITION. CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE EXHAUST MOTOR SHEAVES AND FAN BELTS AS REQUIRED.
3. PRELIMINARY OPERATION: THE OWNER RESERVES THE RIGHT TO OPERATE ANY SYSTEMS OR EQUIPMENT PRIOR TO FINAL COMPLETION AND ACCEPTANCE OF THE WORK. SUCH PRELIMINARY OPERATION SHALL NOT BE CONSTRUED AS ACCEPTANCE OF ANY WORK.
B. AIR DISTRIBUTION SYSTEMS:
1. BALANCE AND ADJUST AIR DISTRIBUTION SYSTEM TO QUANTITIES INDICATED ON DRAWINGS IN ACCORDANCE WITH ASSOCIATED AIR BALANCE COUNCIL (IAABC) MANUAL, LATEST EDITION.
2. BALANCING AND TESTING SHALL BE PERFORMED AND SUPERVISED BY A CERTIFIED INDEPENDENT FIRM SPECIALIZING IN TESTING AND BALANCING. FIRM SHALL BE AN APPROVED TAB CONTRACTOR. TEST REPORTS SHALL BE SUBMITTED TO BUILDING FOLDERS AND ON APPROVED FSK JACKET. ALL AIR INLET/OUTLET SHALL BE IDENTIFIED BY DESIGNATIONS ON DRAWINGS.
3. ALL TESTING DATA SHALL BE PROVIDED IN A MICROSOFT EXCEL COMPATIBLE FORMAT.
4. DIFFUSER AIR DELIVERY SHALL NOT BE LESS THAN NOR EXCEED BY MORE THAN 10% THE AIR DELIVERY INDICATED ON THE PLAN.
5. VOLUME DAMPERS IN AIR INLET/OUTLETS SHALL BE USED ONLY FOR MINOR ADJUSTMENT (LESS THAN 10% OF SPECIFIED CHAIN AVAILABLE).
6. CONTRACTOR SHALL PROVIDE MANUAL VOLUME DAMPERS IN DUCTS AS REQUIRED.
7. UPON COMPLETION OF THE INSTALLATION, CONTRACTOR SHALL REBALANCE AIR DISTRIBUTION SYSTEM AFFECTED BY THE RENOVATION, INCLUDING TERMINAL AIR UNITS AND AIR OUTLETS.
C. ADDITIONAL NOTES:
1. KITCHEN HOODS MUST BE BALANCED WITH KITCHEN.
2. KITCHEN SHALL BE NEGATIVE WITH RESPECT TO DINING AREA.
3. RESTAURANT SHALL BE POSITIVE WITH RESPECT TO AMBIENT.
SECTION 23070 - HVAC INSULATION
A. MINERAL-FIBER BLANKET INSULATION: MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN; COMPLY WITH ASTM C 553, TYPE 1 AND ASTM 1290, TYPE 2. ALL INSULATION SHALL BE FSK JACKET, KNIFE EDGE (FRIENDLY) OR JOHNS MANVILLE (FORMALDEHYDE FREE).
B. CLOSED CELL PIPE INSULATION: ASTM C 534 TYPE 1, AEROFLEX OR ARMACEL.
C. INSULATING GEMENTS: MINERAL-FIBER, HYDRULIC-SETTING INSULATING AND FINISHING CEMENT; COMPLY WITH ASTM C 449C 448A.
D. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2 GRADE A. USE ADHESIVE THAT HAS A VOC CONTENT OF 80 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 89, SUBPART D (EPA METHOD 24).
E. FSK AND PVD: JACKET ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2 GRADE A FOR BONDING INSULATION TO WALL SEAMS AND JOINTS.
F. FSK AND METAL JACKET FLASHING SEALANTS:
1. MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES.
2. FIRE AND WATER RESISTANT, FLEXIBLE ELASTOMERIC SEALANT.
3. SERVICE TEMPERATURE RANGE: MINUS 40 TO PLUS 250 DEG F.
4. COLOR: ALUMINUM.
5. FOR INDOOR APPLICATIONS, USE SEALANTS THAT HAVE A VOC CONTENT OF 250 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 89, SUBPART D (EPA METHOD 24).
G. FACTORY APPLIED FSK JACKET: ALUMINUM/FOIL, FIBERGLASS-REINFORCED SCRIM WITH KRAFT-PAPEER BACKING, COMPLYING WITH ASTM C 1136, TYPE II.
H. FIELD APPLIED ALUMINUM JACKET: ALUMINUM ROLL-STOCK WITH 3-MIL MOISTURE BARRIER; COMPLYING WITH ASTM C1729. PROVIDE FACTORY-FABRICATED COVERS FOR FITTINGS.
I. TYPE OF INSULATION
1. CONCEALED DUCT: INSULATION MINERAL-FIBER BLANKET INSULATION & R/VALVE
PROVIDE WEATHERPROOF JACKET ON OUTDOOR DUCT. EXTERNALLY INSULATE ALL DUCT WHEN CONCEALED ABOVE CEILING SPACES.
2. EXPOSED DUCT: 2-INCH THICK AIR APARAMEX DUCT LINER.
3. PIPING:
a. CONDENSATE: 1/2" THICK, K= 25
b. REFRIGERANT PIPING LESS THAN 1 1/2" DIAMETER: CLOSED-CELL PIPE INSULATION, 1/2" THICK, K= 25. PROVIDE WEATHERPROOF JACKET ON OUTDOOR PIPING.
c. REFRIGERANT PIPING 1 1/2" AND GREATER DIAMETER: CLOSED-CELL PIPE INSULATION, 1" THICK, K= 25. PROVIDE WEATHERPROOF JACKET ON OUTDOOR PIPING.
SECTION 23080 - COMMISSIONING
A. MECHANICAL CONTRACTOR SHALL ALLOCATE ADEQUATE TIME IN THEIR PROPOSAL TO ASSIST IN ALL COMMISSIONING ACTIVITIES AS PRESCRIBED. CONSULT WITH THE GENERAL CONTRACTOR TO DETERMINE THE SPECIFIC COMMISSIONING SCOPE OF WORK.
B. COMMISSIONING WILL BE PERFORMED FOR THE FOLLOWING SYSTEMS:
1. AIR HANDLING EQUIPMENT INCLUDING PACKAGED EQUIPMENT AND EXHAUST FANS,
2. SPLIT SYSTEMS,
3. KITCHEN HOOD, EXHAUST, AND MAKEUP AIR SYSTEMS,
4. CONTROLS.
SECTION 23200 - REFRIG

PACKAGED DX ROOFTOP UNIT - HEAT PUMP																													
MARK	MANUFACTURER / MODEL NO.	SERVICE	SUPPLY FAN			MIN OA AIR (CFM)	HOODS ON OA AIR (CFM)	COOLING - DX						HEATING - HEAT PUMP				HEATING - NATURAL GAS				ELECTRICAL			WT. (LBS)	REMARKS			
			AIRFLOW (CFM)	ESP (N. WG.)	HP			CAPACITY (MBH)		EAT (F)		LAT (F)		EER (ARI)	IEER	CAPACITY (MBH)		EAT (F)	LAT (F)	COP (47 F)	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	EAT (F)	LAT (F)			VPHHZ	MCA	MOCP
			TOTAL	SENSIBLE	DB			WB	DB	WB																			
RTU-1	CAPTIVEAIRE / CASRTU3-1250-24-12-5T	DINING	4000	1	5	950	-	153	122	79	64	55	54	11.8	21.3	-	59.0	-	-	-	-	-	-	208/360	72.1	80	2800	1-9	
RTU-2	CAPTIVEAIRE / CASRTU3-1300-24-15T	KITCHEN	4850	1	5	300	2250	185	156	83	66	55	54	12	18.8	-	51.0	80.0	-	180.0	150.0	51.0	80.0	208/360	75.2	90	2800	1-6, 8-10	

- NOTES:
1. PROVIDE WITH CASHMI INTERFACE AND REMOTE TEMPERATURE AND HUMIDITY SENSORS.
2. PROVIDE WITH FACTORY MOUNTED AND WIRED VFD FOR SUPPLY FAN.
3. PROVIDE WITH VARIABLE SPEED COMPRESSOR AND ECM CONDENSING FANS.
4. PROVIDE WITH BAROMETRIC RELIEF DIFFERENTIAL DRY BULB TEMPERATURE ECONOMIZER.
5. PROVIDE WITH SMOKE DETECTOR FOR AUTOMATIC SHUT-DOWN OF UNIT UPON SMOKE DETECTION.
6. PROVIDE WITH MERV-8 PRE FILTER AND MERV 13 FINAL FILTER.
7. PROVIDE WITH MANUFACTURERS 12" CURB.
8. PROVIDE WITH CASLINK COMMUNICATION CARD FOR FUTURE CONNECTION.
9. PROVIDE WITH NATIONAL TAB UV-PH1 INDOOR PURIFICATION SYSTEM PH1-PKG14-24V (GENERAL CONTRACTOR FURNISHED, TAB CONTRACTOR INSTALLED).
10. PROVIDE WITH A 30" PLENUM CURB. FIELD CUT THE PLENUM CURB TO PER INSTALLATION MANUAL AS REQUIRED TO PROVIDE SIDE SUPPLY AND RETURN DUCT CONNECTIONS.

AIR DISTRIBUTION SCHEDULE					
MARK	MANUFACTURER / MODEL NO.	MODULE SIZE (IN)	NECK SIZE (IN)	CFM RANGE	MAX NC
CD-1	TITUS / OMN-AA	24x24	6 8 10 12 14	0-100 101-200 201-350 351-500 501-700	25
CD-2	TITUS / PAR-AA	24x24	6 8 10 12 14	0-100 101-200 201-350 351-500 501-700	25
CD-3	TITUS / T3SQ	24x24	12	376-500	25
SG-1	TITUS / 300FL	-	MATCH DUCT SIZE	ON PLANS	25
CR-1 / EG-1	TITUS / PAR-AA	24x24	6 8 10 12 14 22x22	0-100 101-200 201-350 351-500 501-700 701-1800	25
EG-2	TITUS / 350FL	-	MATCH DUCT SIZE	ON PLANS	25

- NOTES:
1. FURNISH WITH OFF-WHITE BAKED ENAMEL FINISH UN. COORDINATE EXACT FINISH WITH ARCHITECT.
2. PROVIDE LAY-IN BORDER TYPE FOR ACOUSTICAL TILE CEILINGS. PROVIDE SURFACE MOUNT BORDER FOR OTHER.
3. PROVIDE OPTIONAL INSULATION ON SUPPLY DIFFUSERS.
4. PROVIDE CD-3 WITH THERMOSTAT CONTROLLER

EXHAUST FAN														
MARK	MANUFACTURER / MODEL NO.	SERVICE	FAN TYPE	DRIVE	AIRFLOW (CFM)	ESP	FAN RPM	STARTING MEANS	MOTOR DATA			ELECTRICAL	WT. (LBS)	REMARKS
									BHP	HP	RPM			
EF-1	GREENHECK / G-100-VG	RESTROOMS	DOWNBLAST	DIRECT	300	0.5	1263	ECM	0.1	0.25	1725	120/160	100	1-4
KEF-1	CAPTIVEAIRE / DUBSHFA	HOOD	UPBLAST	DIRECT	1385	1	1252	ECM	0.35	0.75	-	208/360	150	5-8
KEF-2	CAPTIVEAIRE / DUBSHFA	HOOD	UPBLAST	DIRECT	1400	1	1256	ECM	0.35	0.75	-	208/360	150	5-8

- NOTES:
1. PROVIDE WITH VARL-GREEN ECM WITH DIAL ONLY.
2. INTERLOCK EF-1 WITH LIGHT SWITCH.
3. PROVIDE WITH STANDARD 14" CURB.
4. PROVIDE WITH BACKDRAFT DAMPER, GRAVITY OPERATED.
5. INTERLOCK KITCHEN FANS WITH RTU-2.
6. PROVIDE WITH FACTORY CURB, GREASE BOX, ECM WIRING PACKAGE, AND FAN BASE CERAMIC SEAL.
7. PROVIDE WITH UL782 LISTING.
8. SEE CAPTIVE AIRE DRAWINGS FOR ADDITIONAL REQUIREMENTS AND FIELD WIRING.

KITCHEN EXHAUST HOOD											
MARK	MANUFACTURER / MODEL NO.	LENGTH	DESIGN (CFM/FT)	EXHAUST COLLAR			HOOD CONSTRUCTION	FIRE SYSTEM	FIRE PIPING SYSTEM (Y/N)	WT. (LBS)	
				CFM	LENGTH (INCH)	WIDTH (INCH)					ESP
KEH-1	CAPTIVEAIRE / S430 ND-2	7'-11"	175	1385	13	10	-0.53	430 SS	ANSUL R102	Y	550
KEH-2	CAPTIVEAIRE / S430 ND-2	8'-0"	175	1400	13	10	-0.51	430 SS	ANSUL R102	Y	1100

- NOTES:
1. PROVIDE WITH UL APPROVED MANUAL AIR VOLUME DAMPER ON EXHAUST COLLAR BY HOOD MANUFACTURER.
2. SEE CAPTIVE AIRE DRAWINGS FOR ADDITIONAL REQUIREMENTS AND FIELD WIRING.

AIR CURTAIN									
MARK	MANUFACTURER / MODEL NO.	SERVICE	FLOW RATE (CFM)	VELOCITY (FPM)	HP	VPHHZ	FLA	MOCP	REMARKS
AC-1	MARS / LPV236-0B	DELIVERY DOOR	900	1800	1.6	120/160	2.4	15	1-2

- NOTES:
1. PROVIDE WITH WALL MOUNTING BRACKET.
2. AIR CURTAIN TO BE CONTROL BY DOOR SWITCH.

OUTDOOR AIR CALCULATION											
SPACE	ENERGY CODE (PEOPLE)			ENERGY CODE (AREA)			MECHANICAL CODE			MAX OF 3 METHODS	MIN OUTDOOR AIR USED
	PEOPLE (Pd)	CFM PER PERSON (Rp)	OUTDOOR AIR	FLOOR AREA (A _f)	CFM PER SF (Ra)	OUTDOOR AIR	PEOPLE OA RATE (CFM/PERSON) (Rp)	AREA OA RATE (CFM/SF) (Ra)	OUTDOOR AIR		
RTU-1											
101 QUEUE/ING AREA	8	15	120	310	0.5	155	7.5	0.18	116	155	950
102 DINING AREA	52	15	780	1050	0.5	525	7.5	0.18	579	780	
RTU-2											
106 OPEN KITCHEN	8	15	120	420	0.12	50	7.5	0.12	110	120	300
108 DISHWASH	2	15	30	96	0.12	12	7.5	0.12	27	30	
109 BOH	2	15	30	710	0.12	85	7.5	0.12	100	100	
110 MANAGERS OFFICE	2	15	30	100	0.06	6	5	0.06	16	30	



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Contact:
Claudia Walker
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△ Date Description

- 12/20/2022 ISSUE FOR PERMIT/BID
- 02/09/2023 ADDENDUM 1
- 03/10/2023 ADDENDUM 2
- 04/12/2023 ADDENDUM 3
- 05/02/2022 ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
MECHANICAL SCHEDULES

Scale

M701

Date	Description
12/20/2022	ISSUE FOR PERMIT/BD
1 02/09/2023	ADDENDUM 1
3 03/10/2023	ADDENDUM 2
3 04/12/2023	ADDENDUM 3
05/02/2022	ISSUE FOR CONSTRUCTION

Seal / Signature

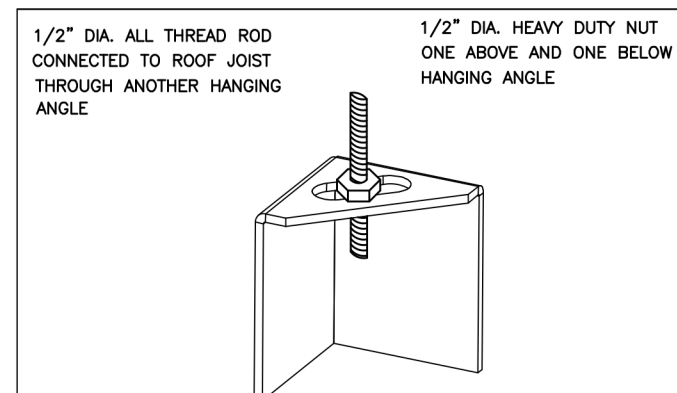


Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
CAPTIVEAIRE DRAWINGS

Scale



HOOD AND NUTS TO BE SUPPLIED BY INSTALLING CONTRACTOR. HANGING ANGLE IS PRE-FINISHED AT FACTORY.

HANGING ANGLE DETAILS

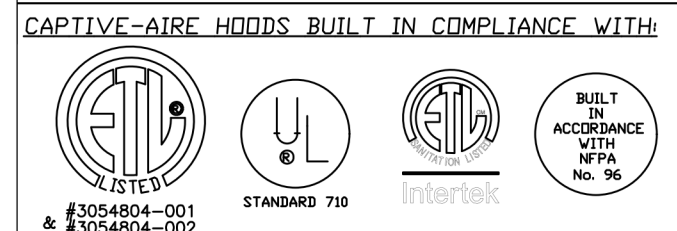
HOOD STYLE / MODEL	450 DEGREES cfm/ft.	600 DEGREES cfm/ft.	700 DEGREES cfm/ft.
CANOPY ND-2	150	200	250
CANOPY ND-2 W/ END PANELS	105	140	175
SLOPED SMD-2	228	294	-
ISLAND ND-2WI	269	300	350
ISLAND ND-2I	346	422	475

ETL HOOD LISTING DETAIL

EXHAUST CFM = LENGTH OF HOOD X CFM/IN.FT. (LOAD)
SUPPLY CFM = EXHAUST CFM X PERCENTAGE REQUIRED
TOTAL DUCT AREA (sq. in.) = 144 X CFM
DUCT LENGTH = TOTAL DUCT AREA
DUCT WIDTH

CALCULATIONS UTILIZED

CAPTIVE-AIRE HOODS BUILT IN COMPLIANCE WITH:



BUILDING CODES

CAPTIVE-AIRE HOODS HAVE OPTIONAL CLEARANCE REDUCTION SYSTEMS AVAILABLE AS FOLLOWS:

MATERIAL	CLEARANCE	REDUCTION SYSTEM
NON-COMBUSTIBLE	NONE REQUIRED	
LIMITED-COMBUSTIBLE	3" UNINSULATED STANDOFF	
COMBUSTIBLE	1" INSULATED STANDOFF	

CLEARANCE TO COMBUSTIBLES

INSTALLATION

1. ALL ELECTRICAL "TIE" CONNECTIONS AND RELATED INTERCONNECTIONS BY ELECTRICAL CONTRACTORS.
2. ALL PLUMBING "TIE" CONNECTIONS AND RELATED INTERCONNECTIONS BY PLUMBING CONTRACTORS.
3. HANGING BRACKETS LOCATED AND WELDED AS SHOWN ON PANELS. ALL OTHER HANGING MATERIALS PROVIDED BY INSTALLING CONTRACTORS.
4. ALL CONNECTIONS FROM CAPTIVEAIRE HOOD PER MECHANICAL CONTRACTOR'S PLANS.
5. COOKING EQUIPMENT TO SHUT OFF IN EVENT OF FIRE.
6. EXHAUST FANS TO TURN ON IN EVENT OF FIRE.
7. ALL LIGHT FIXTURES SHOWN INSTALLED BY CAPTIVEAIRE ARE FACTORY PREWIRED. INTERCONNECTIONS BETWEEN HOODS AND TO SWITCHES ARE BY ELECTRICAL CONTRACTOR.
8. LAMPS FOR LIGHT FIXTURES BY INSTALLING CONTRACTORS.
9. SIGNIFICANT RETENTION ARE RESPONSIBILITY OF INSTALLING CONTRACTOR.
10. INSTALLING CONTRACTORS ASSUME ALL RELATED RESPONSIBILITY FOR VERIFICATION OF DIMENSIONAL ACCURACY, INTEGRATION, AND ADMINISTRATION OF CODE REQUIREMENTS IN EFFECT PRIOR TO ANY RELEASE FOR PRODUCTION OF EQUIPMENT SHOWN.

BALANCE

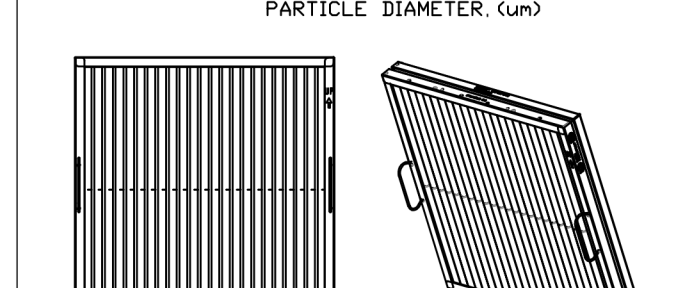
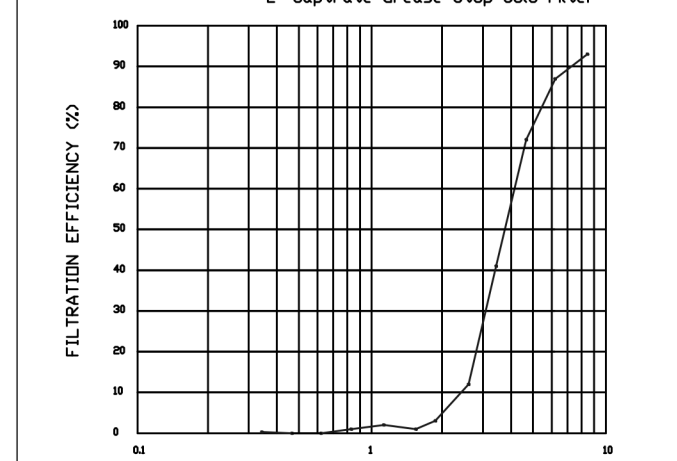
11. KITCHEN HOODS MUST BE BALANCED WITH KITCHEN.
12. KITCHEN SHALL BE NEGATIVE WITH RESPECT TO DINING AREA.
13. RESTAURANT SHALL BE POSITIVE WITH RESPECT TO AMBIENT PRESSURE.

ADDITIONAL

14. WRITTEN HOOD DIMENSIONS HAVE PRECEDENCE OVER SCALE.
15. SIGNED AND "APPROVED" COPIES OF THIS DOCUMENT MUST BE RECEIVED BY THE FACTORY PRIOR TO COMMENCEMENT OF FABRICATION.

GENERAL NOTES

FILTER COLLECTION EFFICIENCY



CaptiveAire Captrate Solo Filter
ETL Listed Grease Extracting Filters
Made From 430 Stainless Steel

FILTER DETAIL

FOR QUESTIONS, CALL THE
Eastern PA Mechanical
REGION 108
PHONE: (267) 504-4126
EMAIL: reg108@captiveaire.com

HOOD INFORMATION - JOB#5726759

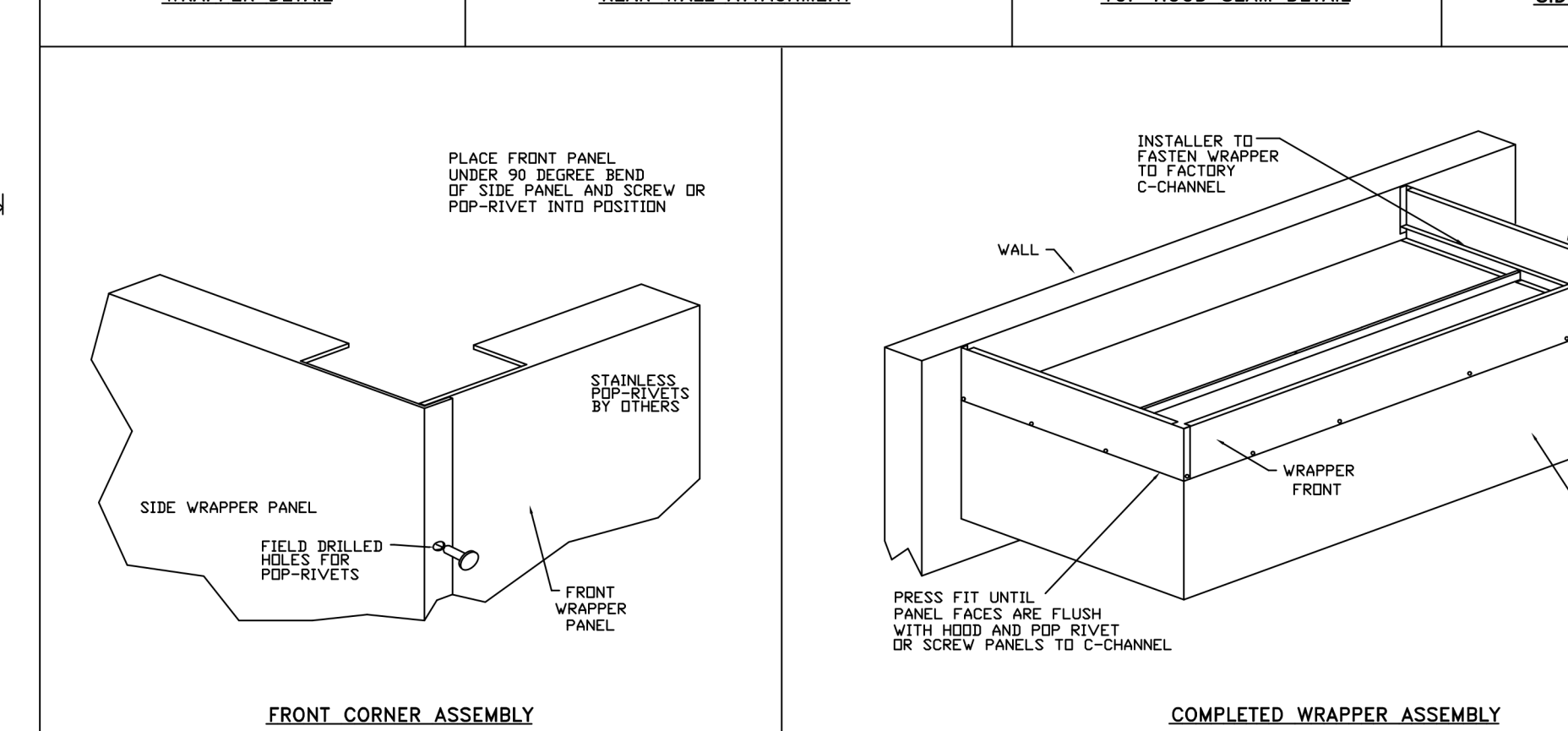
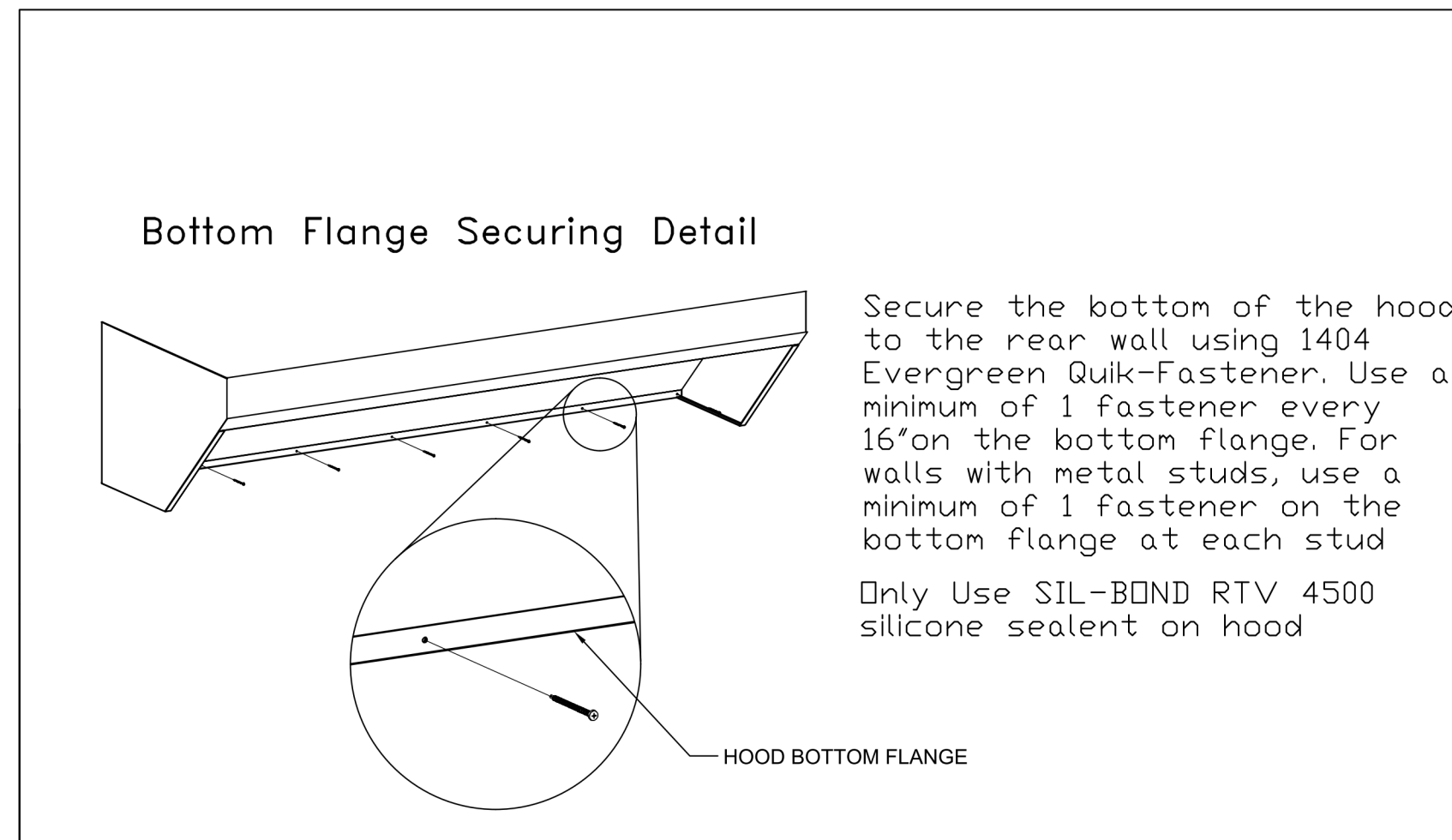
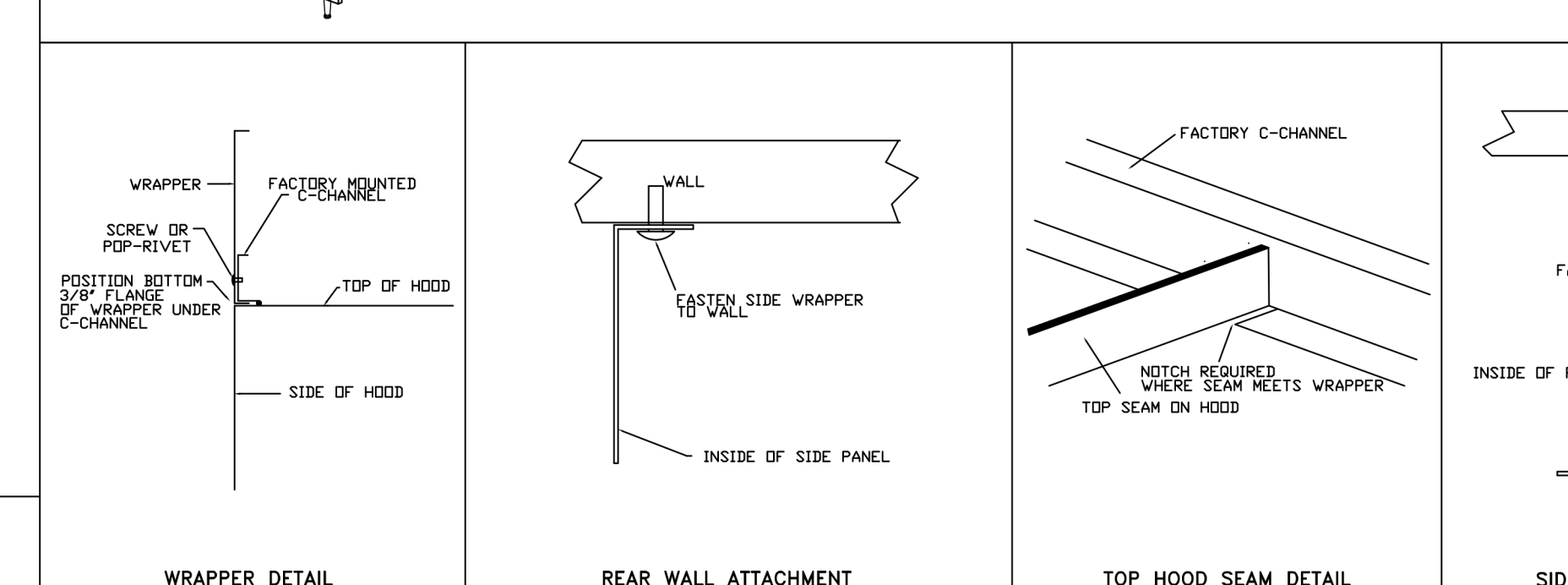
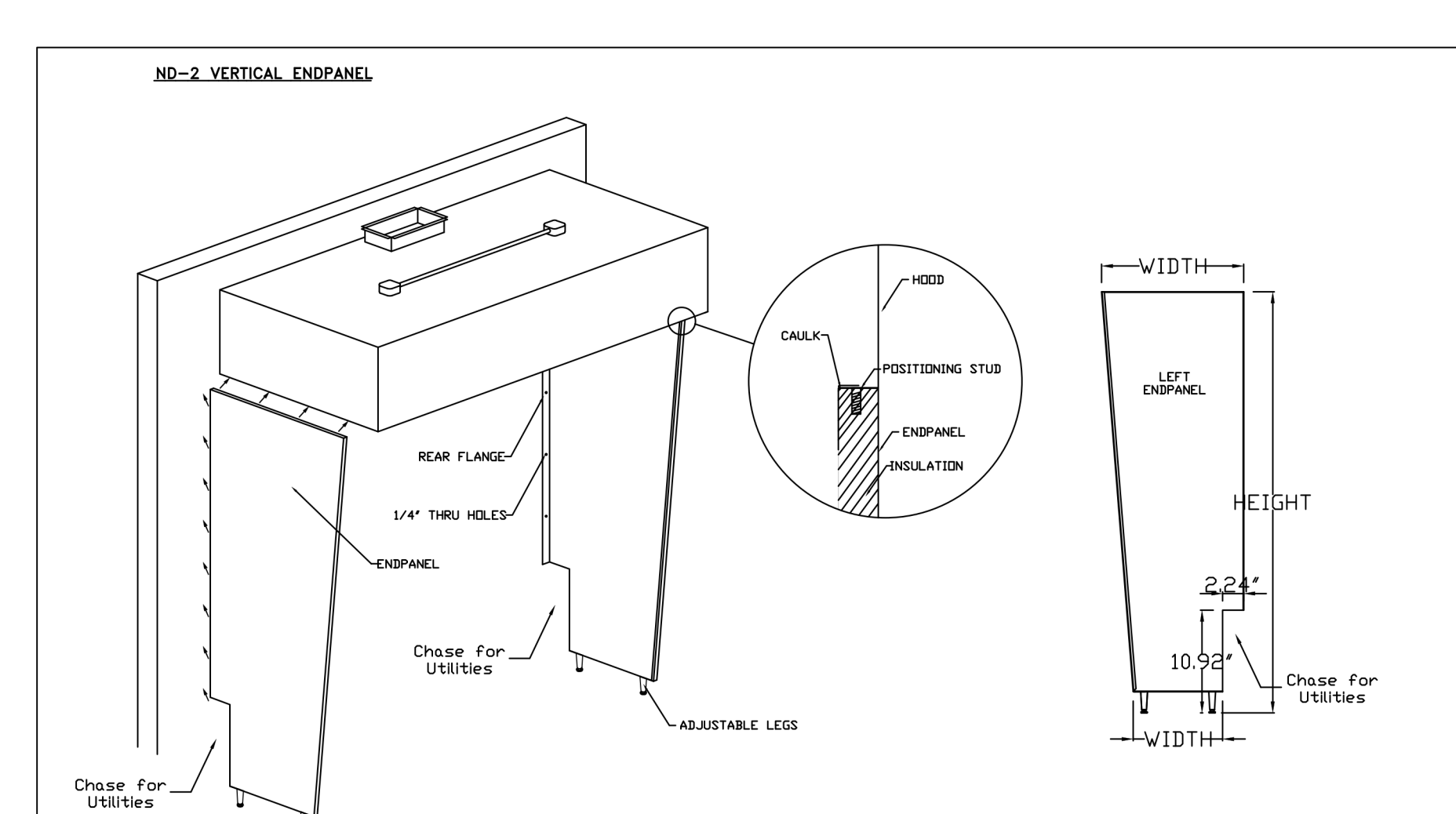
HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S)				HOOD CONSTRUCTION	HOOD CONFIG			
										WIDTH	LENG	HEIGHT	DIA		CFM	VEL	SP	END TO
1	Hood-Right	5430 ND-2	CAPTIVEAIRE	7' 11"	600 DEG	I	HEAVY	175	1385	10'	13'	4'	1385	1534	-0.525'	430 SS WHERE EXPOSED	RIGHT	ALONE
2	Hood-Left	5430 ND-2	CAPTIVEAIRE	8' 0"	600 DEG	I	HEAVY	175	1400	10'	13'	4'	1400	1551	-0.507'	430 SS WHERE EXPOSED	LEFT	ALONE

HOOD INFORMATION

HOOD NO	TAG	TYPE	FILTER(S)			LIGHT(S)			UTILITY CABINET(S)			FIRE SYSTEM	ELECTRICAL	SWITCHES	FIRE SYSTEM HANGING PIPING	HOOD WEIGHT	
			QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	WIRE GUARD	LOCATION	SIZE						TYPE
1	Hood-Right	CAPTRATE SOLO FILTER	5	20"	16"	85% SEE FILTER SPEC	3	RECESSED ROUND	ND							YES	404 LBS
2	Hood-Left	CAPTRATE SOLO FILTER	5	20"	16"	85% SEE FILTER SPEC	3	RECESSED ROUND	ND	LEFT	12"x54"x30"	TANK FS	4.0/4.0/4.0			YES	878 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1	Hood-Right	FIELD WRAPPER 18.00" HIGH FRONT. RIGHT END STANDOFF (FINISHED) 1' WIDE 54" LONG INSULATED. RISER SENSOR INSTALL 6IN PLEN. RIGHT WALL AS END PANEL.
2	Hood-Left	FIELD WRAPPER 18.00" HIGH FRONT, LEFT. RISER SENSOR INSTALL 6IN PLEN. LEFT WIDE VERTICAL END PANEL 42" TOP WIDTH, 36" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.



REVISIONS

NO	DESCRIPTION	DATE

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Shake Shack-1485-Studio City, CA(Kitchen)
STUDIO CITY, CA, 91604

DATE: 11/14/2022
DWG.#: 5726759
DRAWN BY: joe.shilba
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 1

Date	Description
12/20/2022	ISSUE FOR PERMIT/BD
1 02/09/2023	ADDENDUM 1
2 03/10/2023	ADDENDUM 2
3 04/12/2023	ADDENDUM 3
4 05/02/2022	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
CAPTIVEAIRE DRAWINGS

Scale

REVISIONS	
DESCRIPTION	DATE

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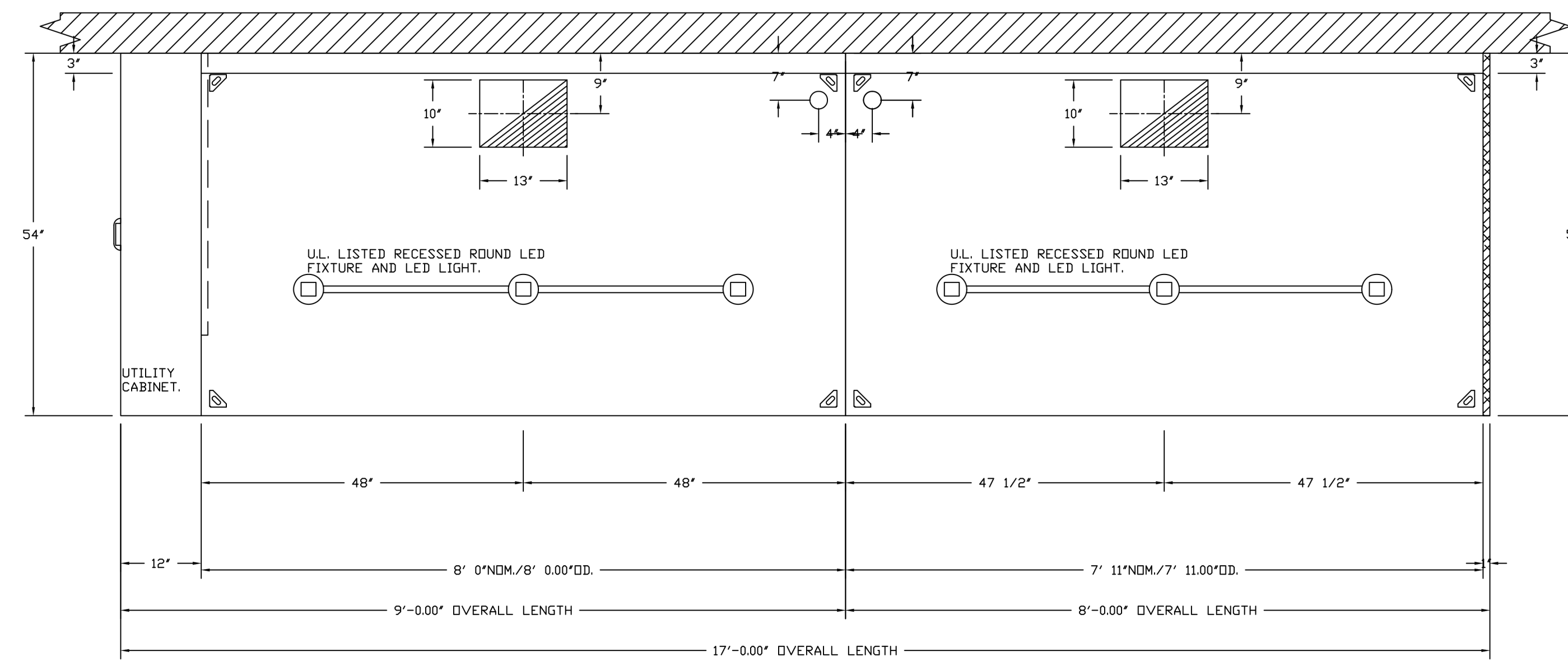
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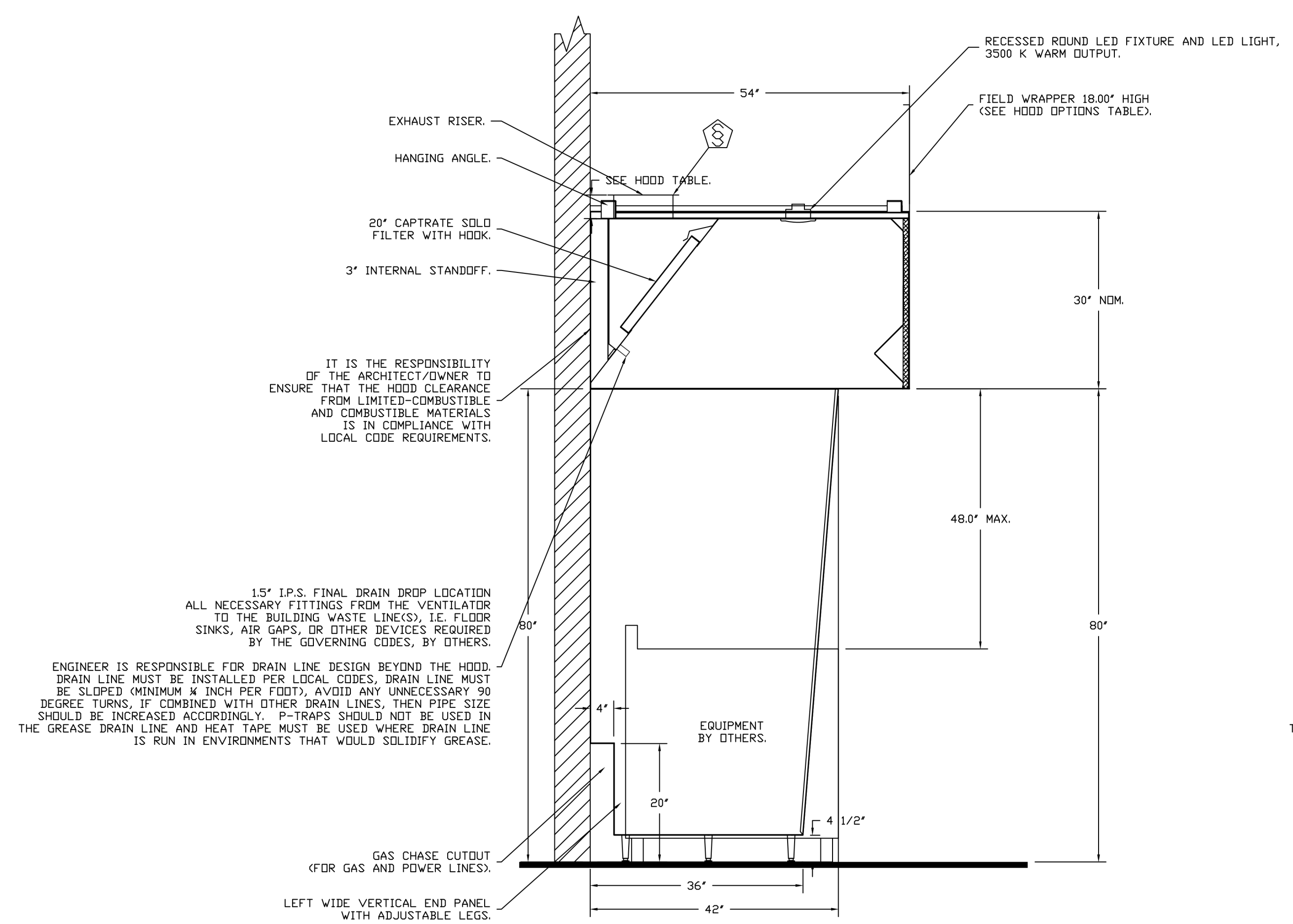
DATE: 11/14/2022
DWG.#: 5726759
DRAWN BY: Joe.shiba
SCALE: 3/4" = 1'-0"
MASTER DRAWING

SHEET NO.
2

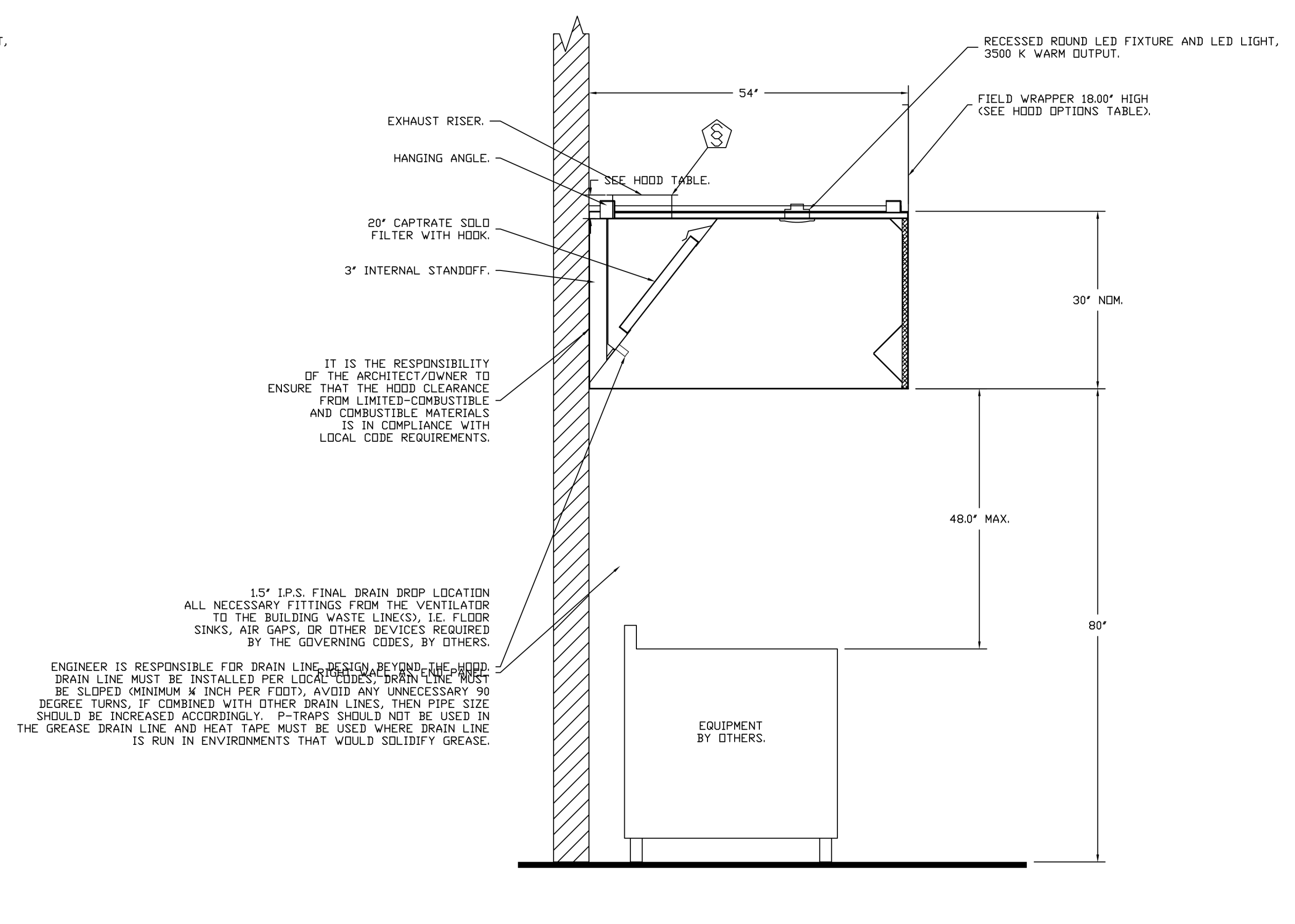


PLAN VIEW - HOOD #2 (Hood-Left)
8'-0.00" LONG 54.30ND-2

PLAN VIEW - HOOD #1 (Hood-Right)
7'-11.00" LONG 54.30ND-2



SECTION VIEW - MODEL 5430ND-2
HOOD - #2 (Hood-Left)



SECTION VIEW - MODEL 5430ND-2
HOOD - #1 (Hood-Right)

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Description
CAPTIVEAIRE DRAWINGS

Scale

FIRE SYSTEM INFORMATION - JOB#5726759

FIRE SYSTEM NO	TAG	TYPE	SIZE	FLOW POINTS	INSTALLATION	
					SYSTEM	LOCATION ON HOOD
1		TANK FS	4.0/4.0/4.0	56	FIRE CABINET LEFT	LEFT, HOOD 2

GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		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

JOB #: 5726759.
JOB NAME: SHAKE SHACK-1485-STUDIO CITY,CA(KITCHEN).

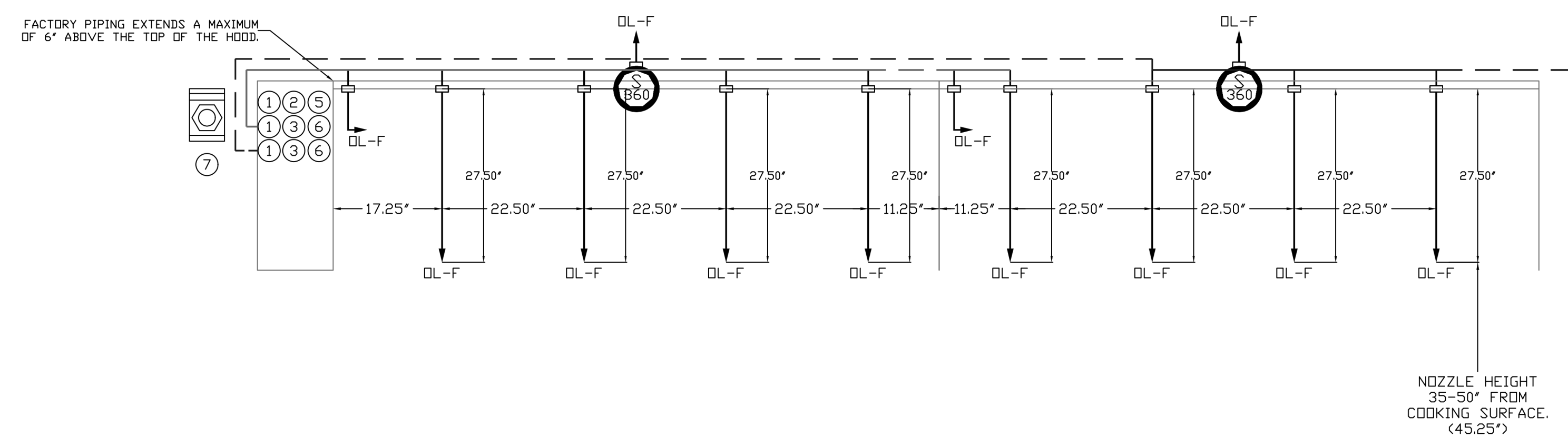
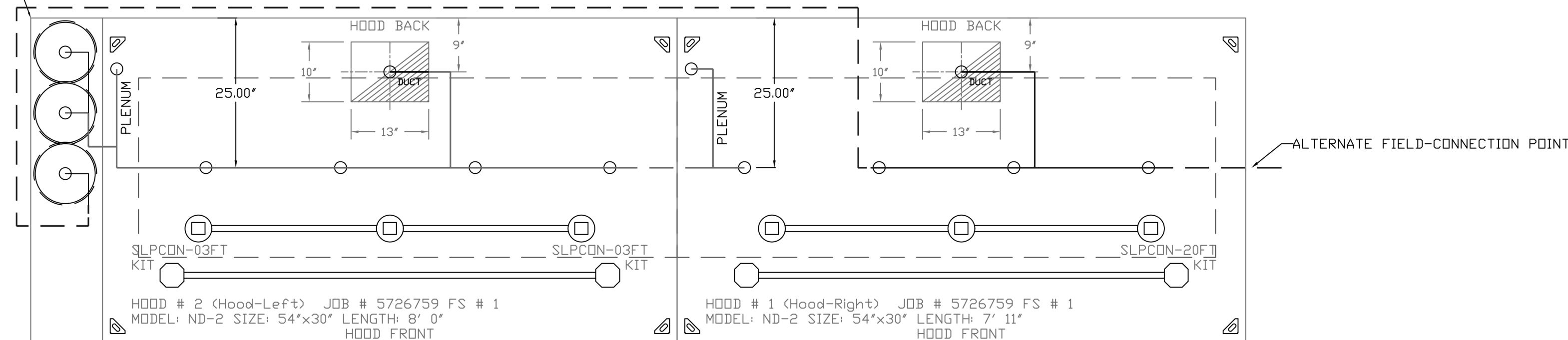
SYSTEM SIZE: TANK-SP-3 TOTAL FP REQUIRED: 56.
HOOD # 1 7' 11.00" LONG x 54" WIDE x 30" HIGH.
RISER # 1 SIZE: 10" x 13".
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 2 8' 0.00" LONG x 54" WIDE x 30" HIGH.
RISER # 1 SIZE: 10" x 13".
HOOD # 2 METAL BLOW-OFF CAPS INCLUDED.

- 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.

- SYSTEM REQUIRES A MINIMUM OF 7 FT OF EQUIVALENT PIPE LENGTH BETWEEN TANK AND NEAREST APPLIANCE NOZZLE FOR MOST APPLIANCES. EACH 90 DEGREE ELBOW ADDS 13 FT OF EQUIVALENT LENGTH. SEE MANUAL FOR DETAILS



TANK OVERLAPPING PROTECTION - 3/8 HIGH PROXIMITY 9000" L X 3000" D

TANK OVERLAPPING PROTECTION - 3/8 HIGH PROXIMITY 9000" L X 3000" D

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DWG.#:
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DRAWN BY: joe.shilba

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

MASTER DRAWING

SHEET NO.
3

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Seal / Signature



Project Name
SS 1485 - STUDIO CITY

Project Number
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Description
CAPTIVEAIRE DRAWINGS

Scale

EXHAUST FAN INFORMATION - JOB#5726759

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTDR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1	KEF-1	1	DUBSHFA	CAPTIVEAIRE	1385	1.000	1252	DDP	0.750	0.3470	3	208	2.6	438 FPM	99	9.7
2	KEF-2	1	DUBSHFA	CAPTIVEAIRE	1400	1.000	1256	DDP	0.750	0.3500	3	208	2.6	443 FPM	99	9.8

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	KEF-1	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - INSTALLED AT PLANT - FDR GREASE DUCTS
		1	2 YEAR PARTS WARRANTY
2	KEF-2	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - INSTALLED AT PLANT - FDR GREASE DUCTS
		1	2 YEAR PARTS WARRANTY

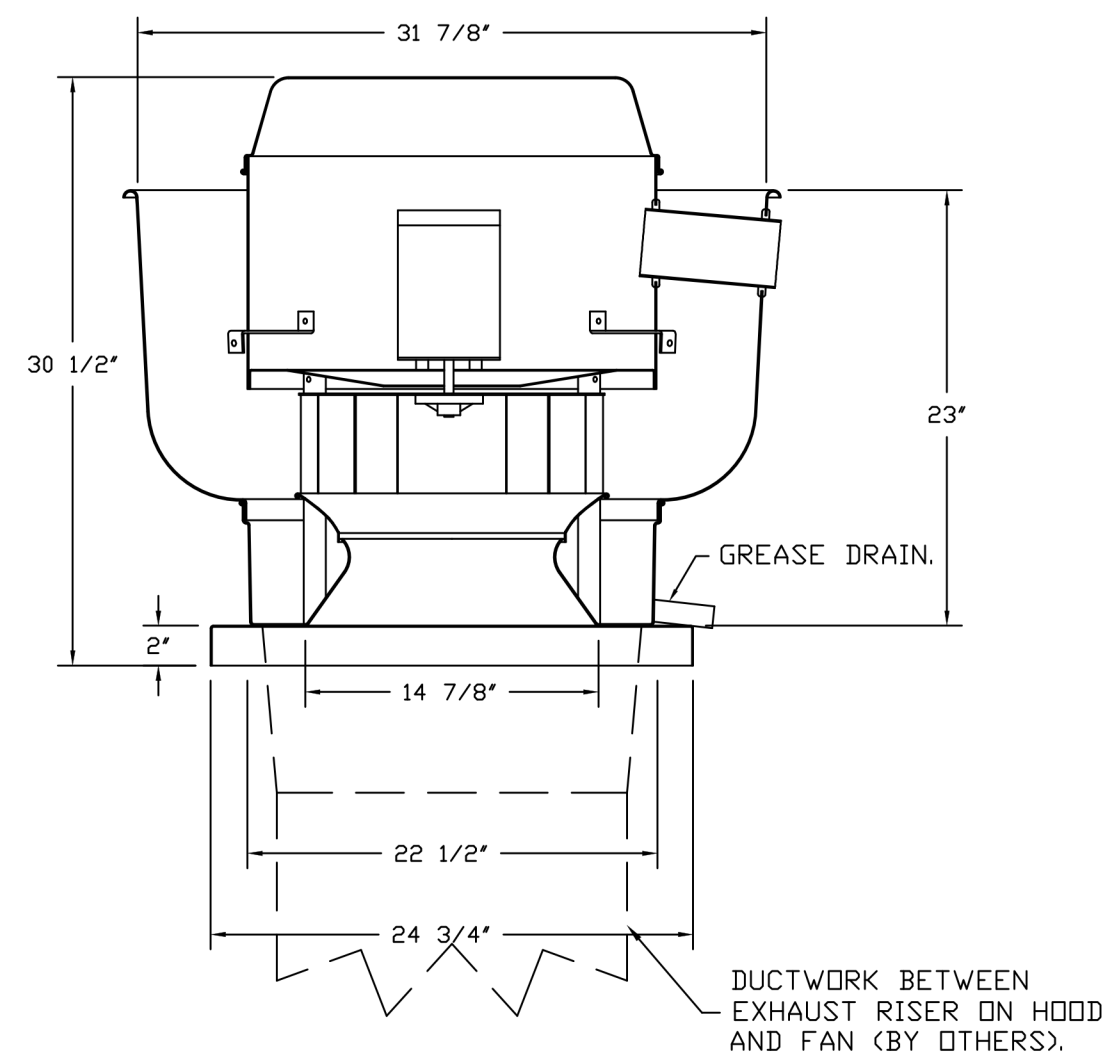
FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST				SUPPLY		
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	KEF-1	YES						
2	KEF-2	YES						

CURB ASSEMBLIES

NO	DN FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	36 LBS	CURB	23.000"W X 23.000"L X 20.000"H ALONG LENGTH, RIGHT VENTED HINGED.
2	# 2	KEF-1	36 LBS	CURB	23.000"W X 23.000"L X 20.000"H ALONG LENGTH, RIGHT VENTED HINGED.

FANS #1 (KEF-1), #2 (KEF-2) - DUBSHFA EXHAUST FAN



TOP VIEW

FEATURES:

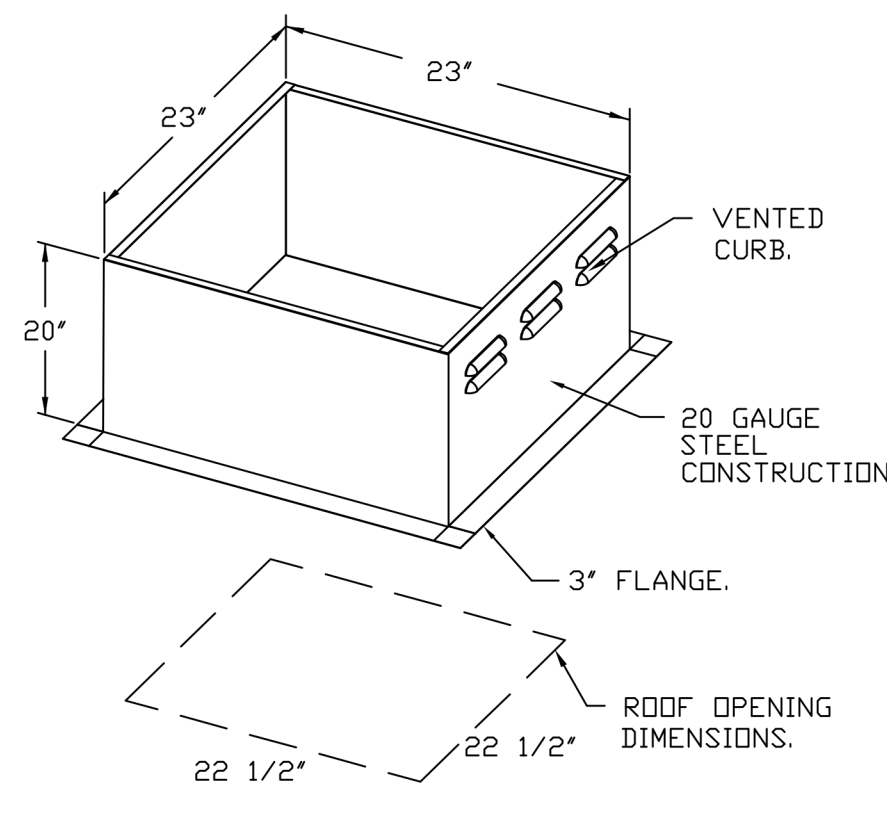
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DEGRADATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

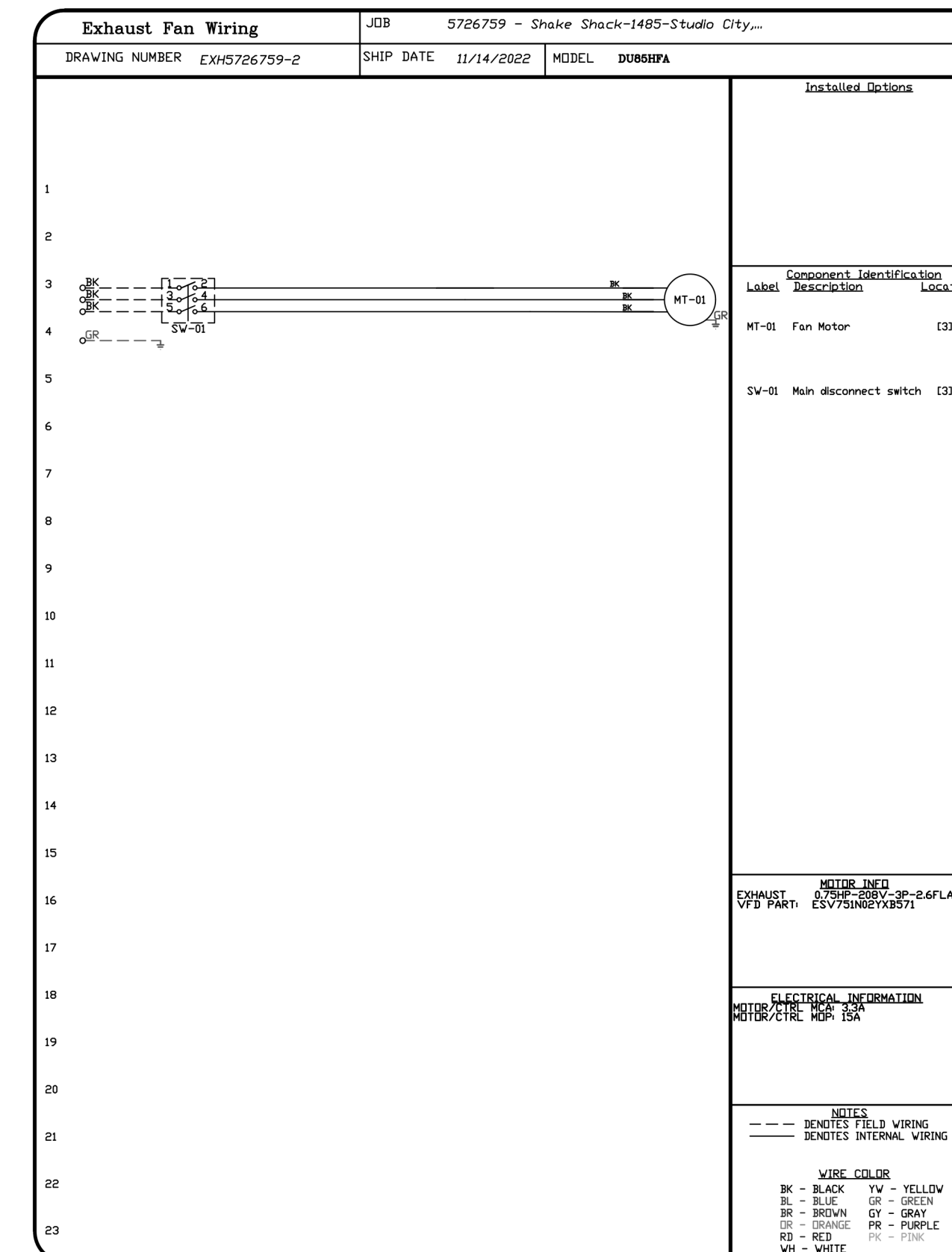
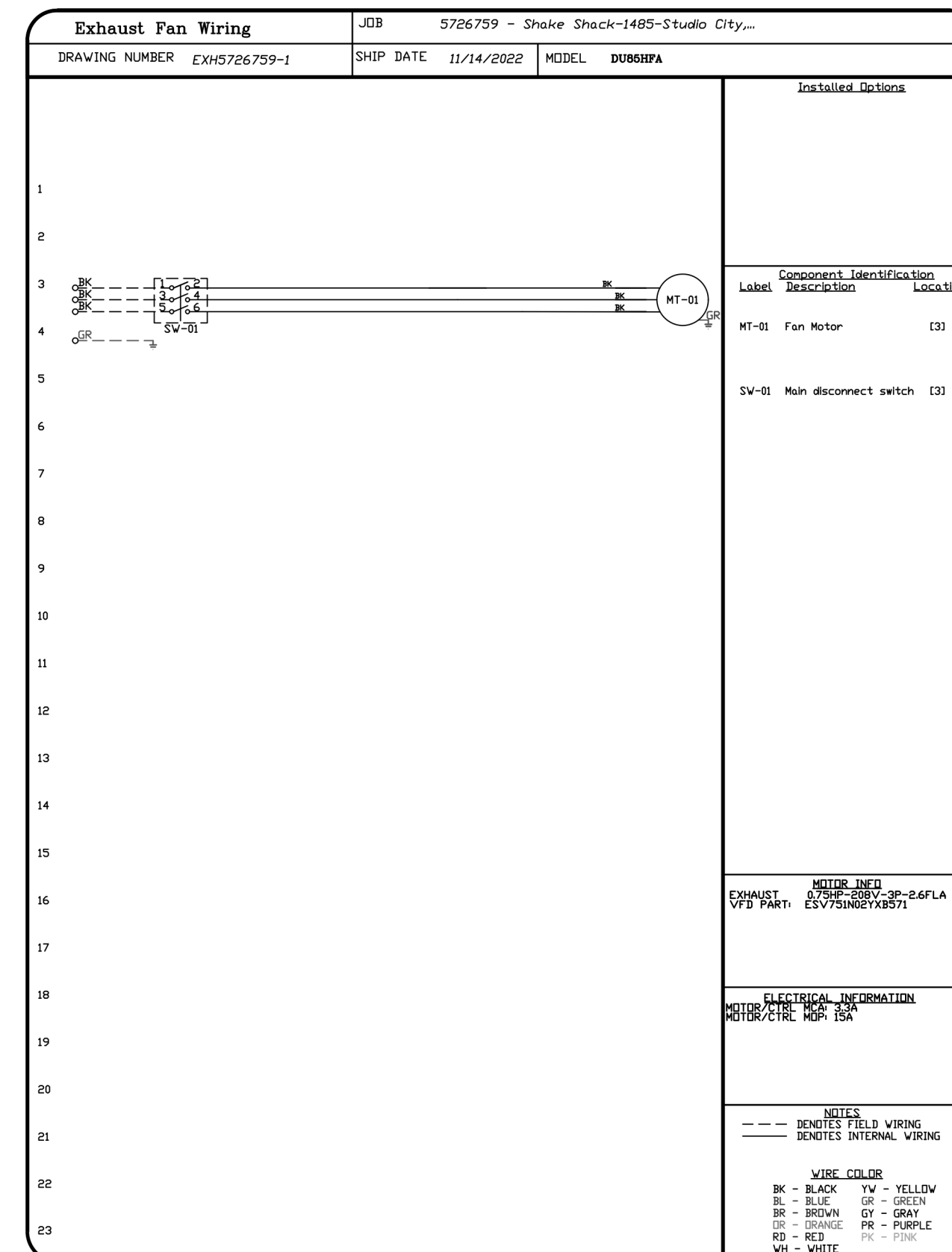
ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS

- GREASE BOX
- FAN BASE CERAMIC SEAL - INSTALLED AT PLANT - FDR GREASE DUCTS.
- 2 YEAR PARTS WARRANTY.



PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.
SPECIFY PITCH
EXAMPLE: 7/12 PITCH = 30° SLOPE.



REVISIONS

NO	DESCRIPTION	DATE
1		
2		
3		
4		

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Shake Shack-1485-Studio City, CA(Kitchen)
STUDIO CITY, CA, 91604

DATE: 11/14/2022

DWG.#: 5726759

DRAWN BY: joe.shilba

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

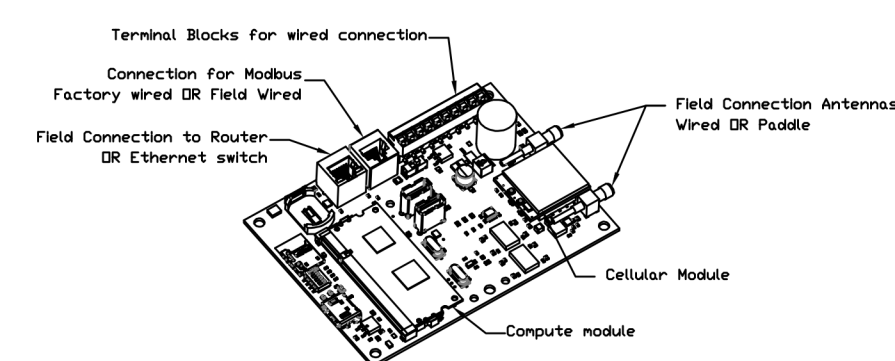
MASTER DRAWING

SHEET NO. 4



ELECTRICAL PACKAGE - JOB#5726759

NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED					
				LOCATION	QUANTITY		FAN TAG	TYPE	#	HP	VOLT	FLA
1		SC-320110MA	WALL MOUNT IN SS BOX	OS - SS WALL MOUNT BOX	1 LIGHT 1 FAN	SMART CONTROL THERMOSTATIC CONTROL W/ RELAY ON/OFF WITH SUPPLY	KEF-1	EXHAUST	3	0.750	208	2.6

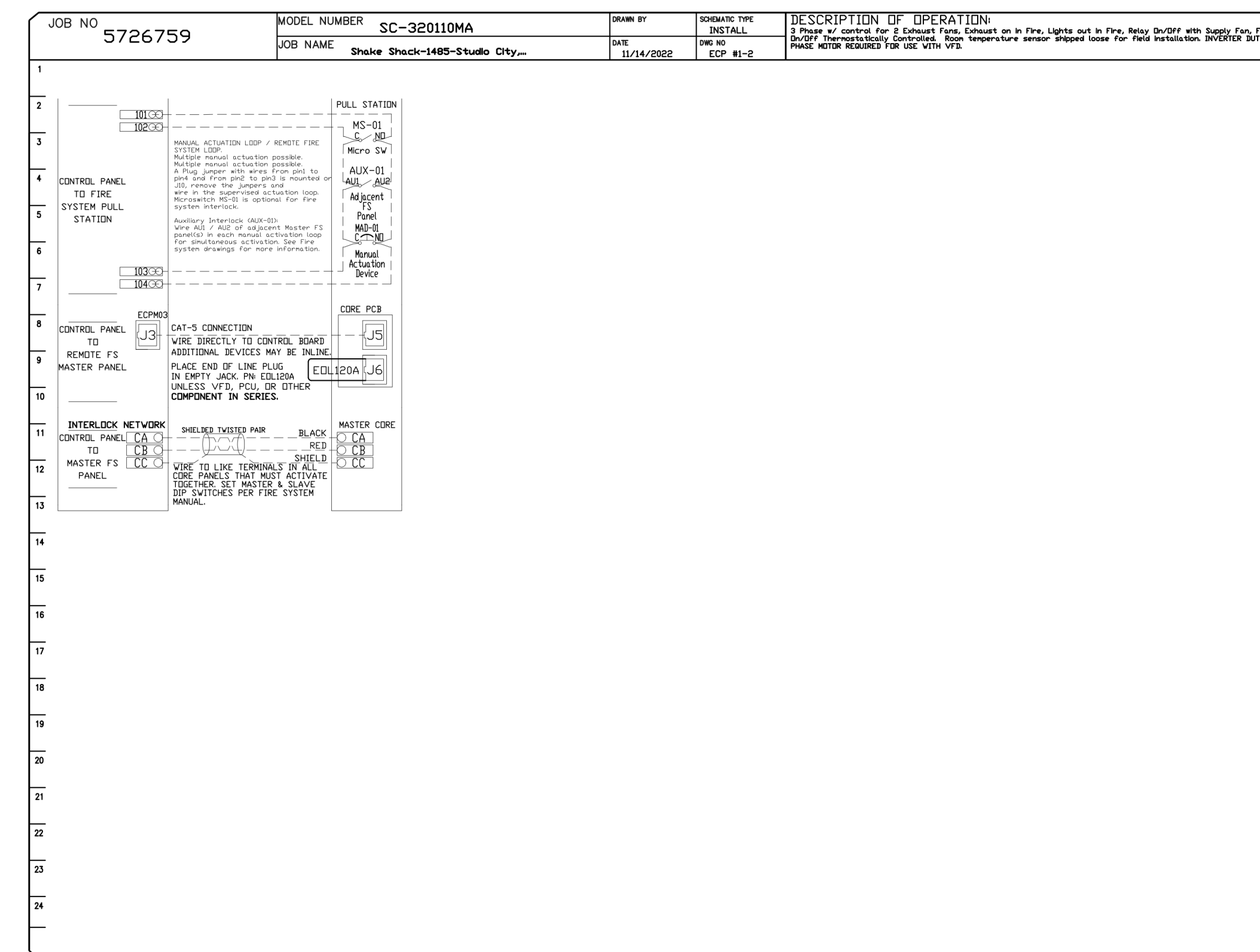
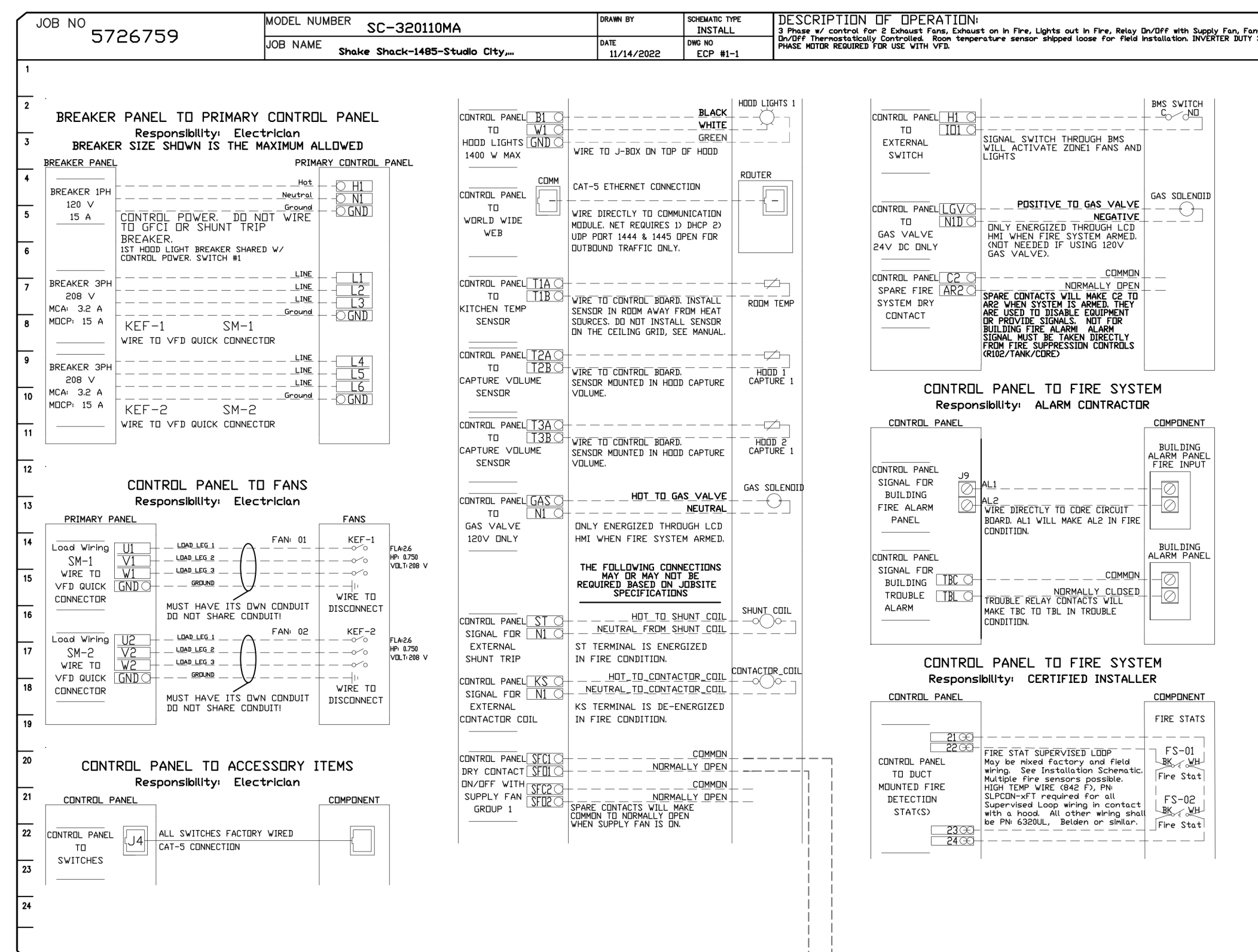


CASink Monitor and Control

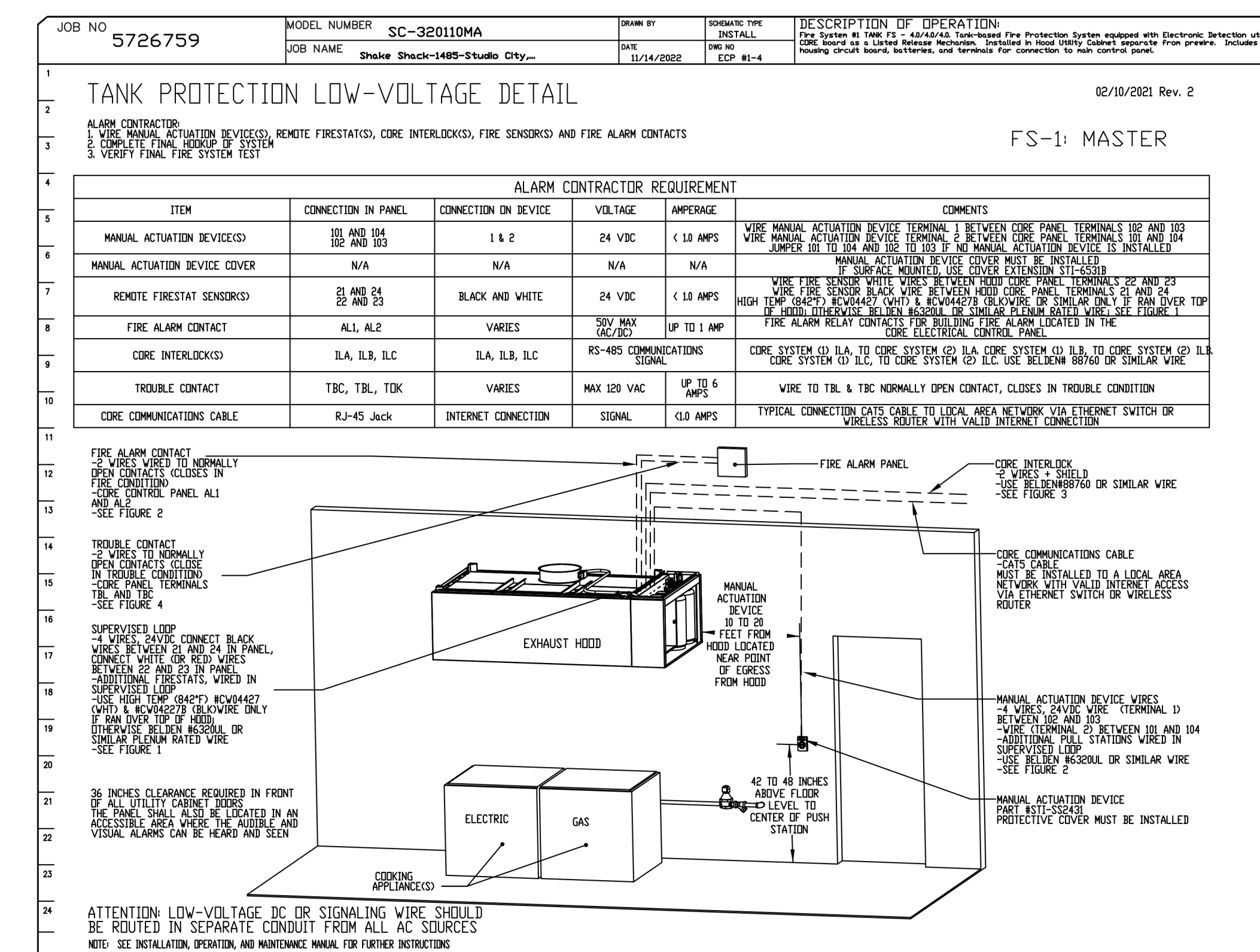
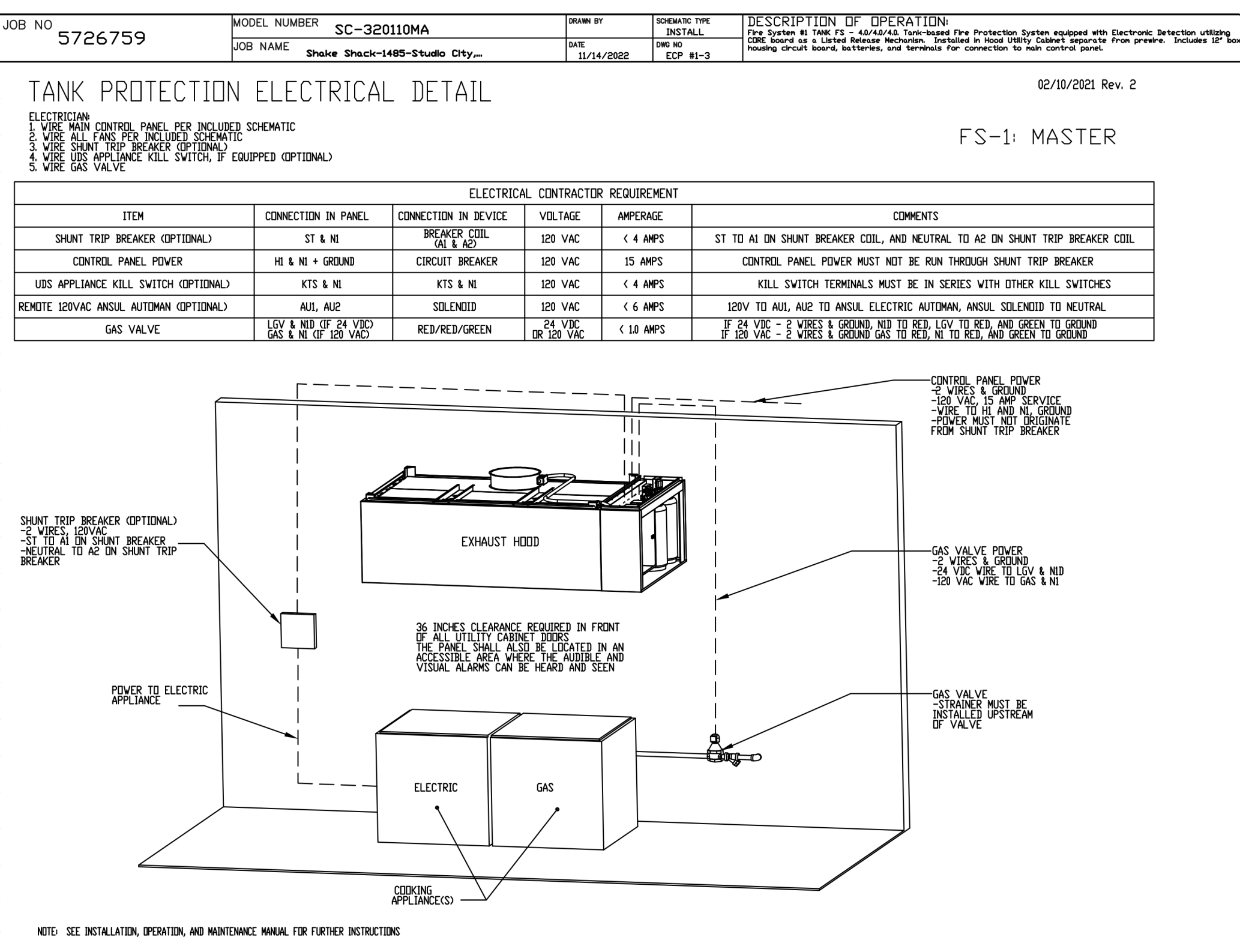
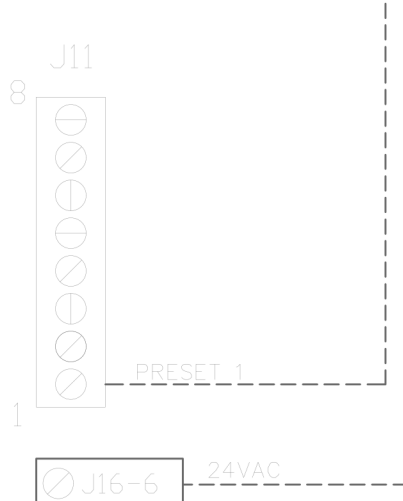
Flood control panel to support communications to cloud-based Building Management System to monitor real time parameters maintained as MONITOR in the panel list.
Flood Control Panel to allow cloud-based Building Management System to control parameters maintained as CONTROL in the panel list.
Flood Control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

MONITORING AND CONTROL POINTS LIST

DCP Packages	Function	DC Packages	Function
Room Temperature	MONITOR	Room Temperature(s)	MONITOR
Chill Temperature(s)	MONITOR	Chill Temperature(s)	MONITOR
Water Discharge Temperature	MONITOR	Water Discharge Temperature	MONITOR
Return AHU Discharge Temperature	MONITOR	Return AHU Discharge Temperature	MONITOR
Fan Speed	MONITOR	Controler Faults	MONITOR
Fan Temperature	MONITOR	Fan Status	MONITOR
Fan Pressure	MONITOR	Fan Status	MONITOR
VFD Faults	MONITOR	VFD Faults	MONITOR
Fan Faults	MONITOR	VFD Filter Clap Percentage	MONITOR
Fan Status	MONITOR	Fan Status	MONITOR
COSE Fire System	MONITOR	COSE Fire System	MONITOR
Building Pressure	MONITOR	Building Pressure	MONITOR
VFD Filter Clap Percentage	MONITOR	VFD Filter Clap Percentage	MONITOR & CONTROL
Fan Status	MONITOR	Fan Status	MONITOR
COSE Fire System	MONITOR	COSE Fire System	MONITOR & CONTROL
Building Pressure	MONITOR	Building Pressure	MONITOR & CONTROL
Prep Time Button	MONITOR & CONTROL	Prep Time Button	MONITOR & CONTROL
Alarm Button	MONITOR & CONTROL	Alarm Button	MONITOR & CONTROL
Light Button	MONITOR & CONTROL	Light Button	MONITOR & CONTROL
Flash Button	MONITOR & CONTROL	Flash Button	MONITOR & CONTROL

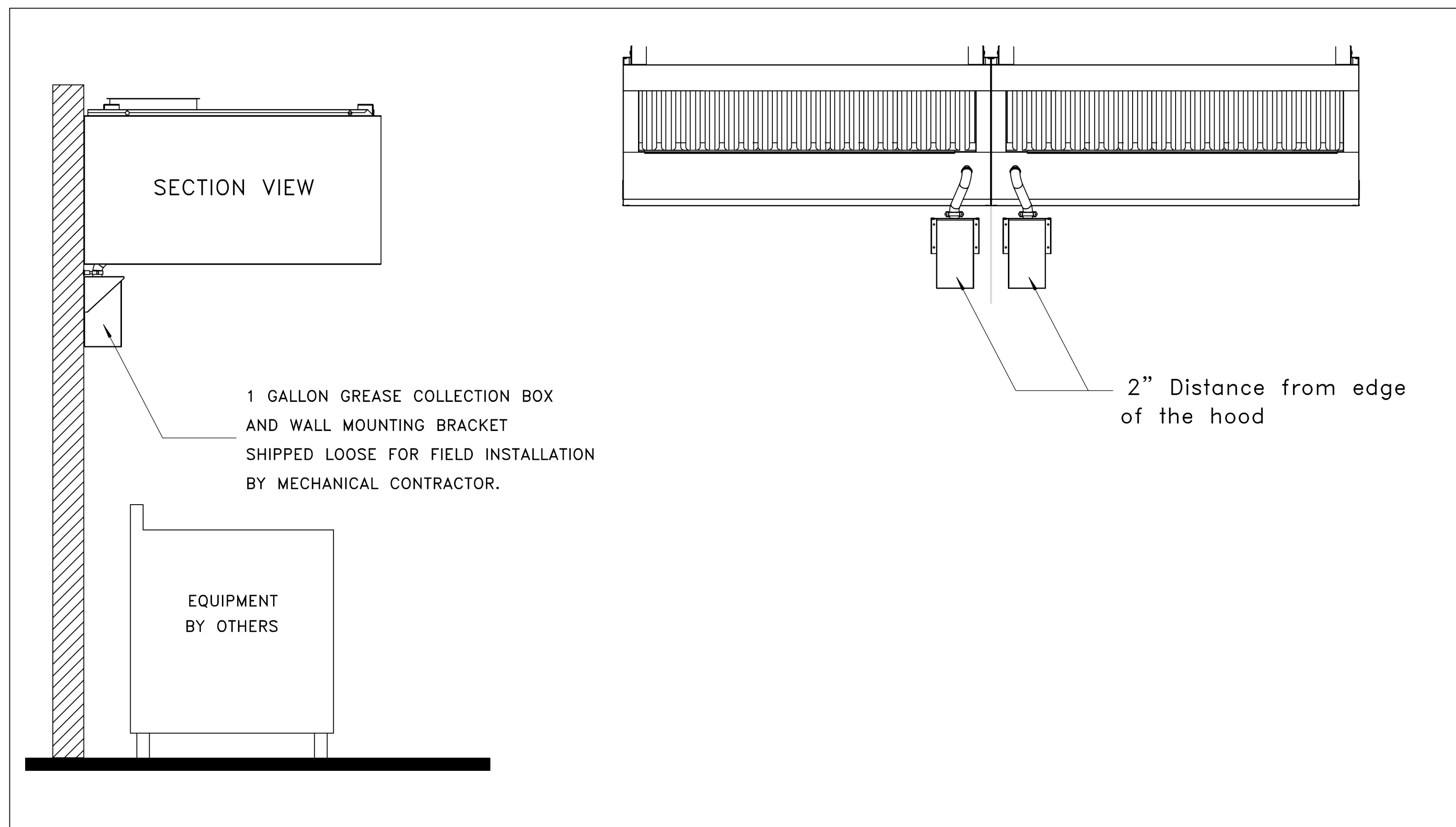


DOAS-1 MIXING BOX INTERLOCKS



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 Shake Shack-1485-Studio City, CA, 91604
 STUDIO CITY, CA, 91604
 DATE: 11/14/2022
 DWG.#: 5726759
 DRAWN BY: Joe.shibba
 SCALE: 3/4" = 1'-0"
 MASTER DRAWING
 SHEET NO. 5

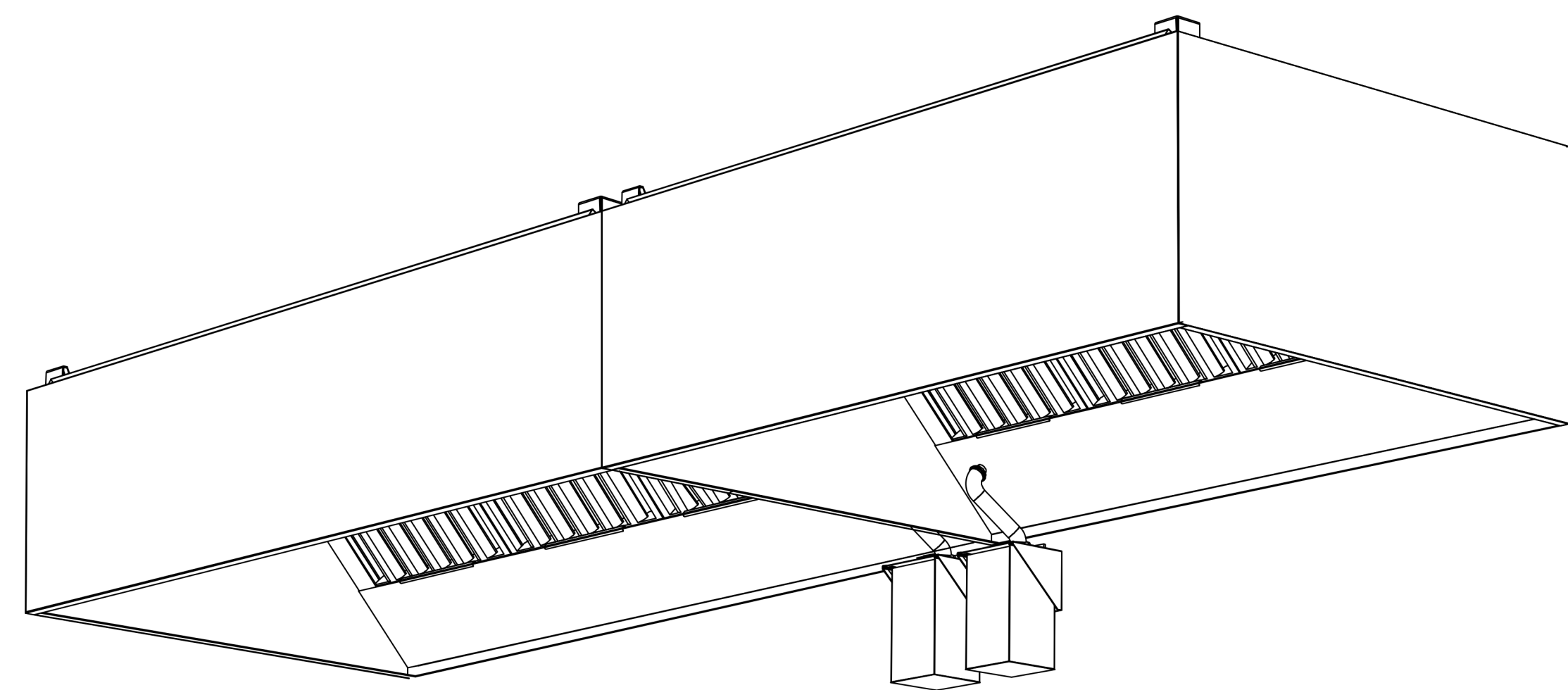
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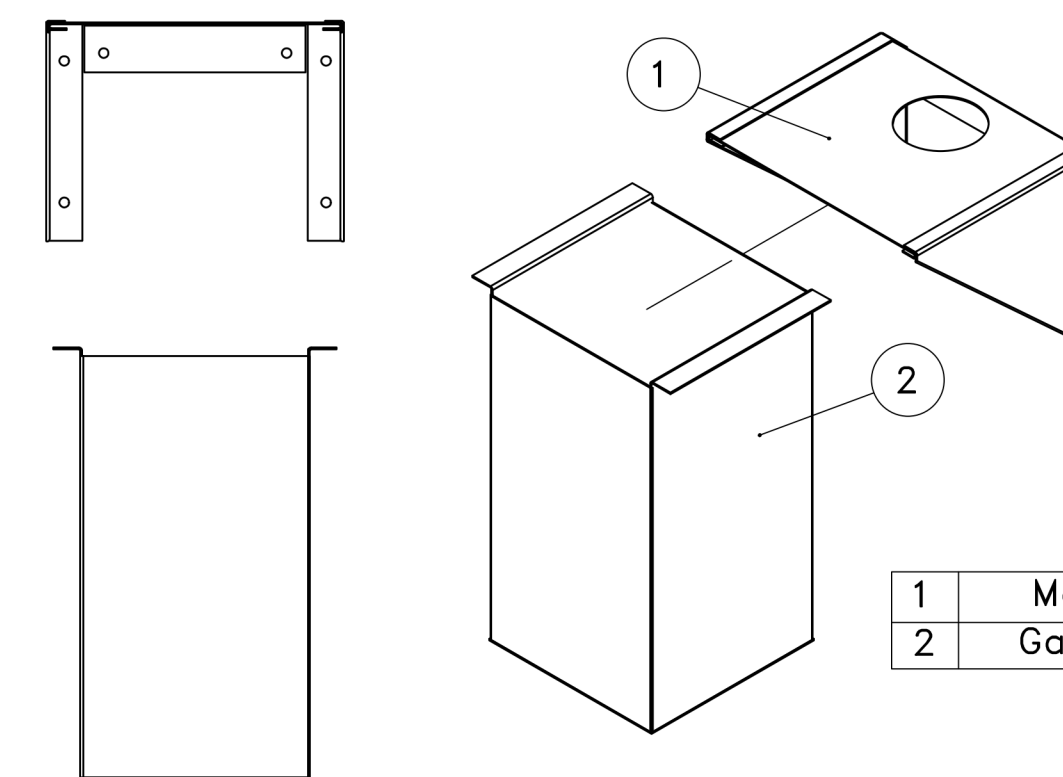
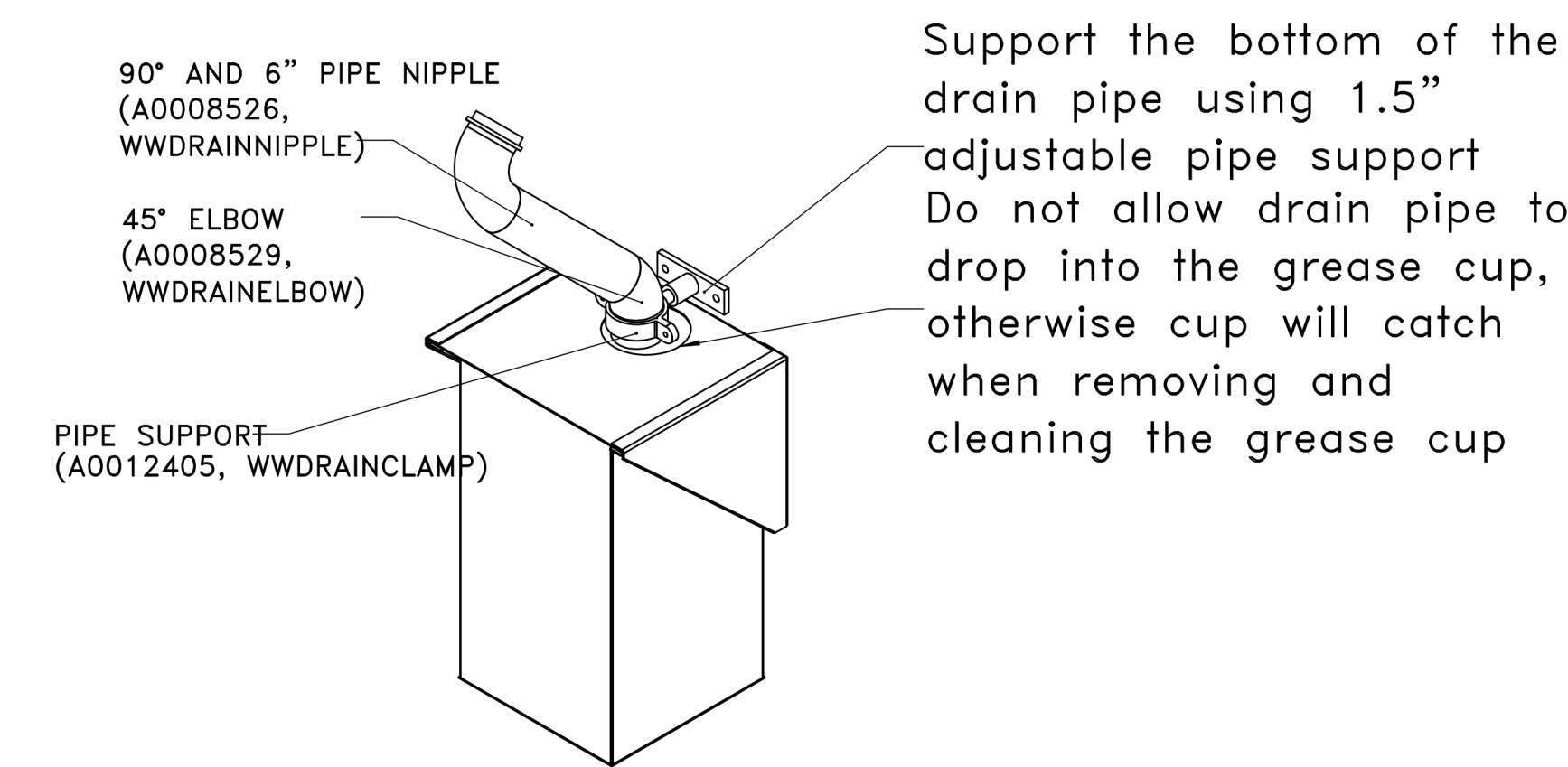
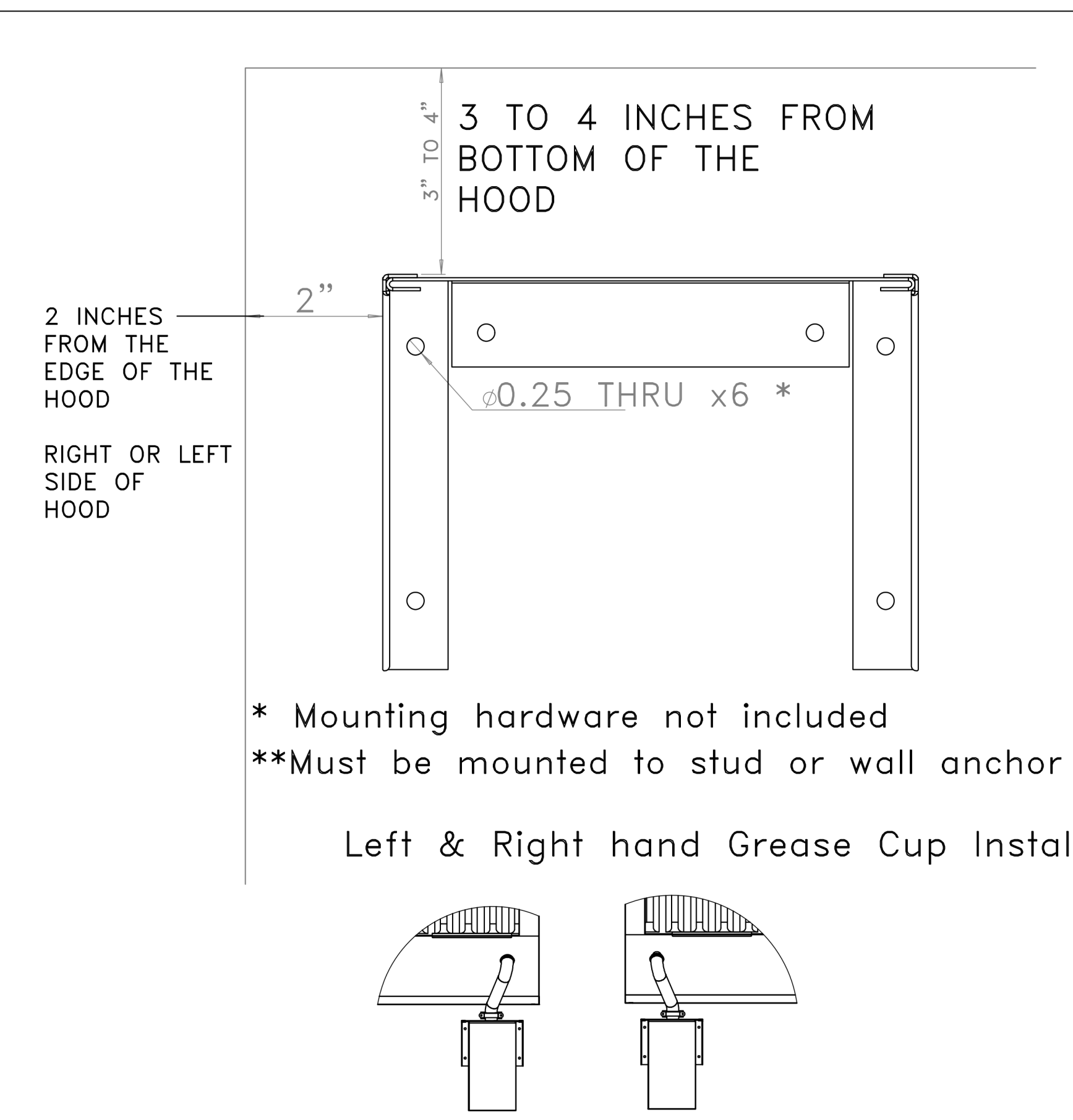
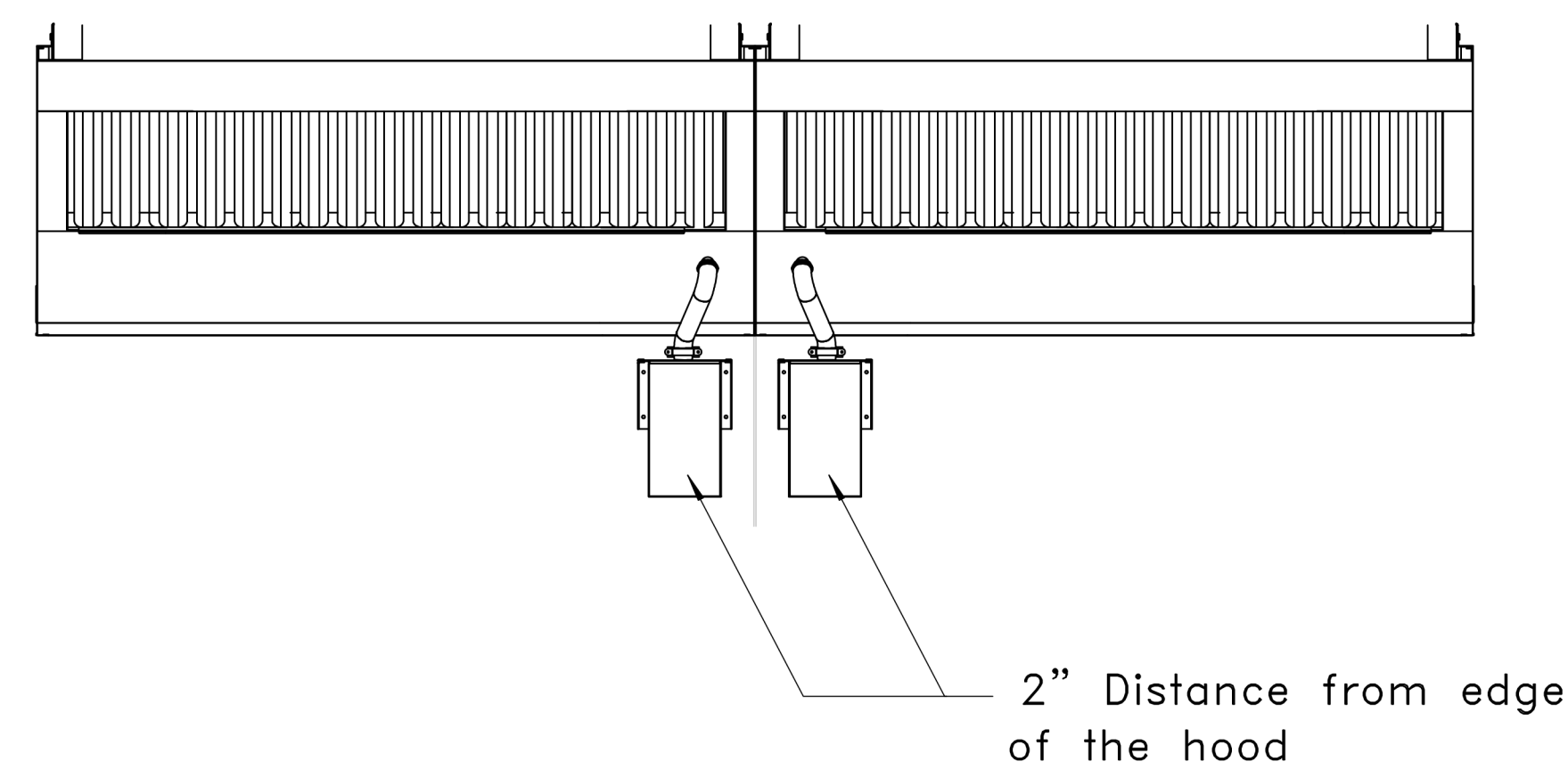
Instructions below outline single, or dual, one gallon grease cup installation for ND-2 hood models.

The one gallon grease cup comes as an assembly of stainless steel wall mounting bracket and one gallon cup. The mounting bracket should be installed 2" from the edge of the containment plenum and 3"-4" below the bottom of the hood.

Piping from the hood grease drain should route to the opening of the grease cup, but not into the cup, otherwise the cup will not be able to be removed and emptied.



One Gallon Grease Cup Installation



1 GALLON GREASE COLLECTION BOX AND WALL MOUNTING BRACKET SHIPPED LOOSE FOR FIELD INSTALLATION BY MECHANICAL CONTRACTOR.

REVISIONS	
DESCRIPTION	DATE

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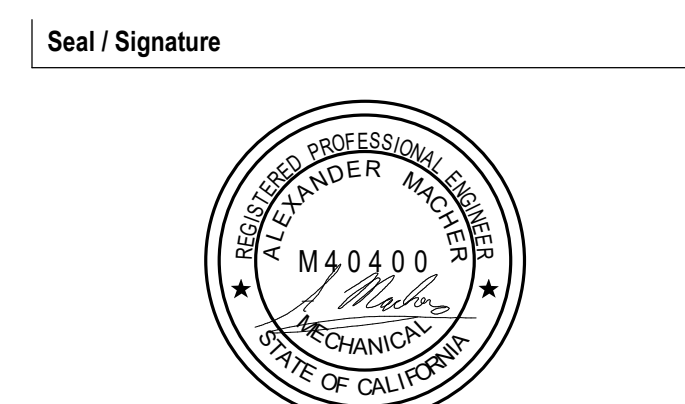
Project Name
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Project Number
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CAPTIVEAIRE DRAWINGS

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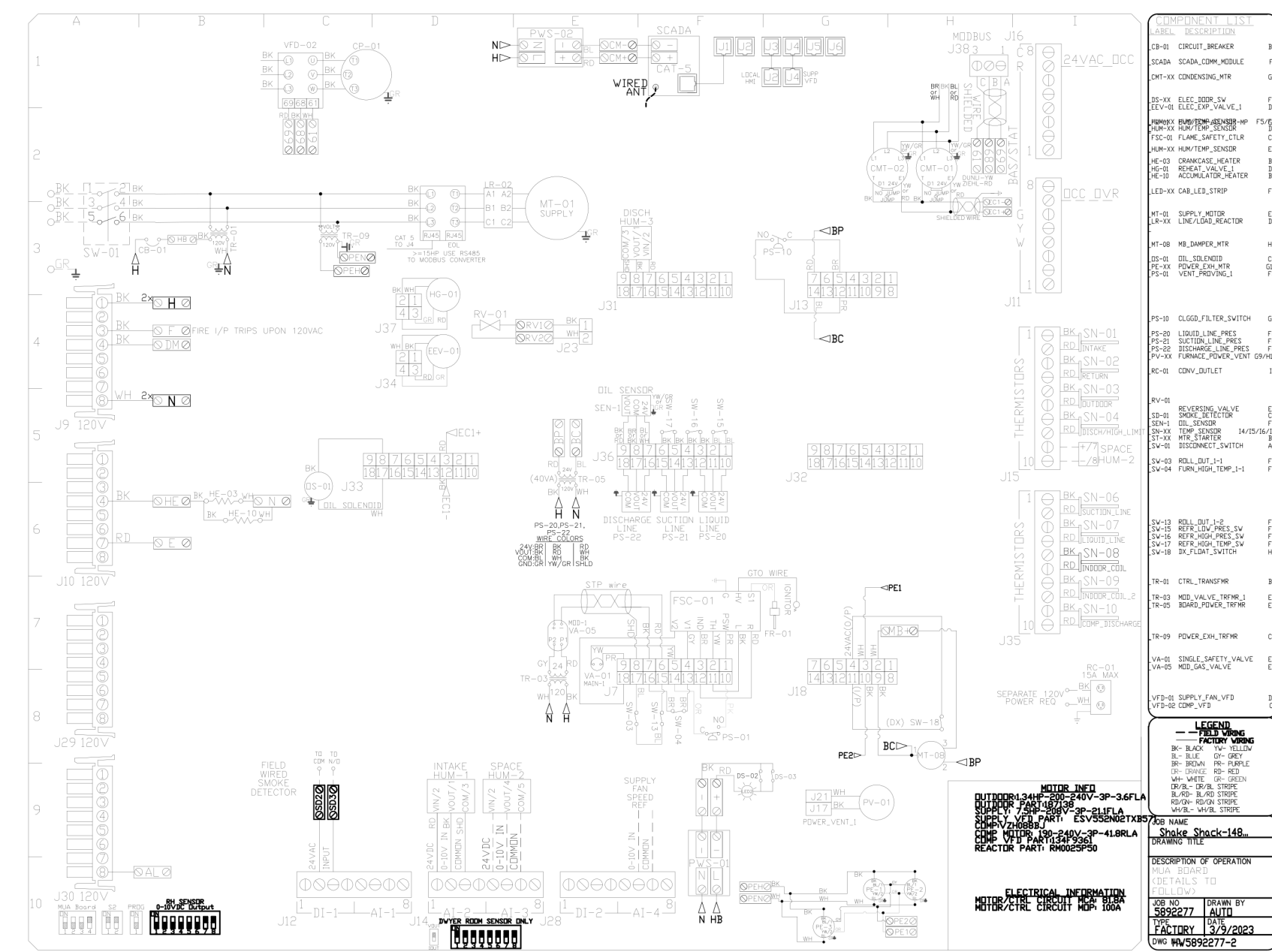
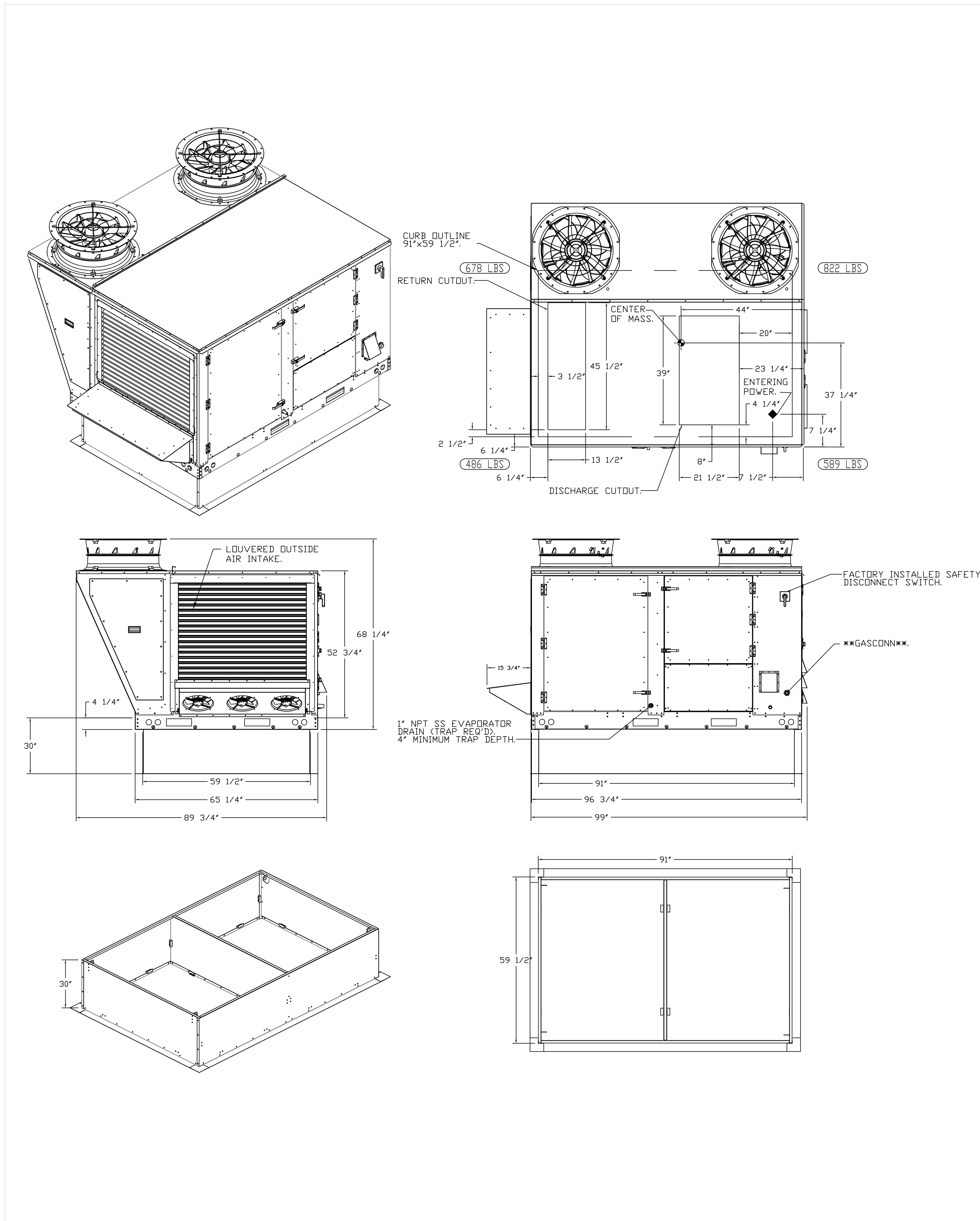
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DWG.#: 5892277
DRAWN BY: Joe Shilba
SCALE: 1/2" = 1'-0"
MASTER DRAWING

SHEET NO.
2

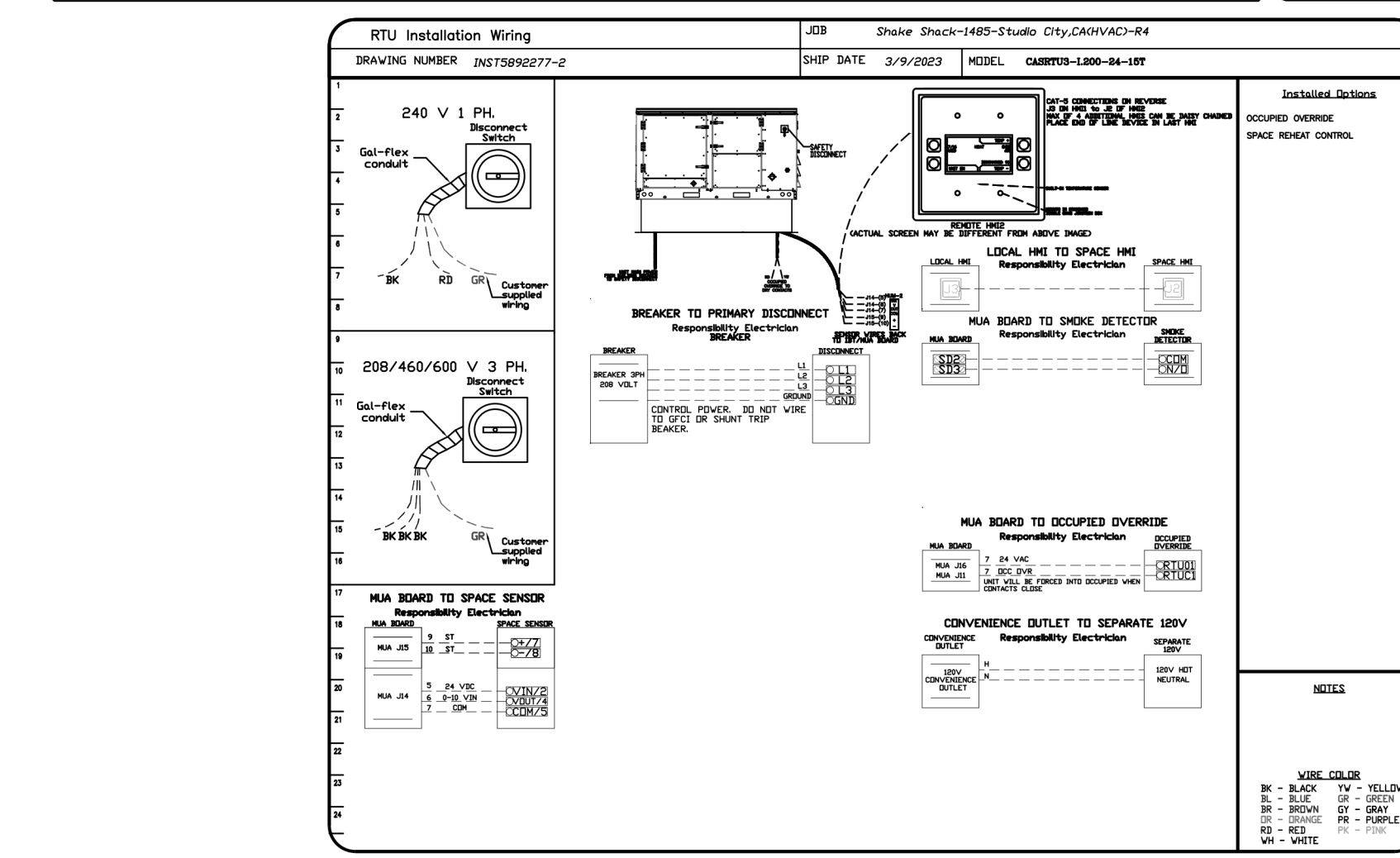
FAN #1 CASRTU3-E.152-20-12.5T - HEATER (RTU-1)

NOTES:

- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
- DENOTES CORNER WEIGHT.
- ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.



NO.	DESCRIPTION	DATE
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4	ADDENDUM 3	04/12/2023
5	ISSUE FOR CONSTRUCTION	05/02/2022



FAN #2 CASRTU3-1.200-24MF-15T - HEATER (RTU-2)

- NOTES:
- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
 - DENOTES CORNER WEIGHT.
 - ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.

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DATE: 3/9/2023

DWG.#: 5892277

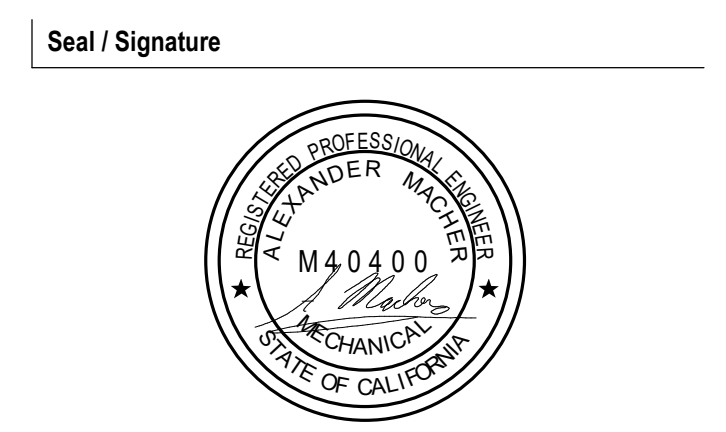
DRAWN BY: Joe Shilba

SCALE: 1/2" = 1'-0"

MASTER DRAWING

SHEET NO. 3

Date	Description
12/20/2022	ISSUE FOR PERMIT/BID
02/09/2023	ADDENDUM 1
03/10/2023	ADDENDUM 2
04/12/2023	ADDENDUM 3
05/02/2022	ISSUE FOR CONSTRUCTION



Project Name
SS 1485 - STUDIO CITY

Project Number
005.4293.000

Description
CAPTIVEAIRE DRAWINGS

Scale