

- A. SCOPE**
- INSTALL NEW ROOFTOP UNIT, AIR DISTRIBUTION, EXHAUST FANS, KITCHEN VENTILATION, AND CONTROLS.
  - METAL DUCTWORK, ELBOWS, AND ALL FITTINGS.
  - DIFFUSERS, REGISTERS, GRILLES.
  - DUCT INSULATION.
  - HVAC CONTROL SYSTEMS.
  - TESTING AND BALANCING.
  - PERMITS AND INSPECTIONS.
- B. RELATED WORK SPECIFIED IN OTHER SECTIONS**
- DISCONNECT SWITCHES AND LINE VOLTAGE CONNECTIONS (BY ELECTRICAL).
  - ALL LINE VOLTAGE WIRING AND CONDUIT (BY ELECTRICAL).
- C. DRAWINGS**
- BECAUSE OF THE SMALL SCALE OF THESE DRAWINGS, IT IS NOT ALWAYS POSSIBLE TO INDICATE ALL OFFSET, FITTINGS, AND ACCESSORIES WHICH MAY BE REQUIRED. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL EXISTING CONDITIONS BEFORE SUBMITTING HIS BID. NO ADDITIONAL COMPENSATION WILL BE MADE FOR EXTRA DUE TO CONTRACTOR'S FAILURE TO VISIT THE JOB SITE AND/OR FAILURE TO DETERMINE ALL EXISTING CONDITIONS BEFORE SUBMITTING HIS BID.
  - ALL APPLIANCES DESIGNED TO BE FIXED IN POSITION SHALL BE SECURELY FASTENED IN PLACE.
- D. CODE REQUIREMENTS**
- ALL WORK COVERED BY THIS SECTION OF THE SPECIFICATION SHALL CONFORM TO LATEST REQUIREMENTS OF THE NFPA, CBC, LOCAL BODY HAVING JURISDICTION.
  - MECHANICAL, PLUMBING, AND ELECTRICAL ENGINEERING AND INSTALLATION SHALL COMPLY WITH THE 2013 CMC, 2013 CPC, AND 2013 CEC EDITION OF THE CODES.
- E. FEES, PERMITS, AND INSPECTIONS**
- CONTRACTOR MUST OBTAIN AND PAY FEES FOR PERMITS, LICENSES, INSPECTIONS, ETC., WHICH ARE REQUIRED BY ANY LEGALLY CONSTITUTED AUTHORITY.
  - THE CONTRACTOR SHALL NOT ALLOW OR CAUSE ANY OF HIS WORK TO BE COVERED UP OR CLOSED IN UNTIL IT HAS BEEN INSPECTED, TESTED, AND APPROVED BY ALL AUTHORITIES HAVING JURISDICTION. SHOULD ANY OF HIS WORK BE COVERED UP OR CLOSED IN BEFORE SUCH INSPECTION, HE SHOULD, AT HIS OWN EXPENSE, UNCOVER THE WORK TO THE SATISFACTION OF THE INSPECTION PARTY. ALL RELATED REPAIR WORK COST SHALL BE BORNE BY THIS CONTRACTOR.
- F. SITE CONDITIONS**
- CONTRACTOR SHALL ACQUAINT HIMSELF WITH THE SITE CONDITIONS AND VERIFY IN FIELD THE EXACT LOCATIONS OF ALL UNDERGROUND AND ABOVE GROUND PIPING.
- G. PRODUCTS**
- HVAC CONTROLS: THERMOSTATS SHALL BE SIGLER T500 OR EQUIVALENT WITH 7-DAY PROGRAMMABLE AUTO-CHANGEOVER FEATURES. MOUNT THERMOSTATS BETWEEN 3 TO 4 FT. ABOVE FINISHED FLOOR.
  - RIGID DUCTWORK (DUCT PLENUM ONLY): PROVIDE GALVANIZED STEEL DUCT. TRANSVERSE JOINTS ON ALL SUPPLY DUCTS INSTALLED IN LOCATIONS WHERE AIR LEAKAGE WOULD BE NON-BENEFICIAL TO THE OCCUPIED AREA SHALL BE SEALED WITH 6 OZ. CANVAS SECURED IN PLACE WITH AN APPROVED LAGGING ADHESIVE, EC800 OR EQUAL DUCT SEALING COMPOUND OR DUCT TAPE.
  - FLEXIBLE DUCTWORK: ALUMIFLEX S-181 OR APPROVED EQUAL AND SHALL CONFORM TO NFPA BULLETIN #90-A. UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL TAKEOFFS FROM MAIN AND BRANCH DUCT SHALL BE 45° TAPS WITH VOLUME DAMPERS AS INDICATED ON THE DRAWINGS. GLASS-FLEX TYPE DUCT MAY BE USED AT ENTRANCE TO DIFFUSER, BUT MAY NOT EXCEED 7'-0" IN LENGTH.
  - DUCT SUPPORTS AND HANGERS: RECTANGULAR DUCTS WITH A MAXIMUM SIDE NOT EXCEEDING 30" SHALL HAVE 1" WIDE 18 GAUGE METAL STRAPS. SUPPORT DUCT ON OPPOSITE SIDES WITH SHEET METAL SCREWS TO THE SIDES AND BOTTOM. ROUND DUCTS SHALL HAVE 1" WIDE STRAPS OF THE SAME GAUGE AS THE DUCTS. BRACE AND GUY TO PREVENT LATERAL AN HORIZONTAL MOVEMENT. VERTICAL DUCTS SHALL BE SUPPORTED BY GALVANIZED STEEL ANGLES AND SECURED TO THE DUCTS AND WALL SUPPORTS. SUPPORTS TO HAVE A MAXIMUM SPACING OF 12' PER SMACNA STANDARDS AND CHAPTER 6 OF THE 2013 CMC.
  - VOLUME DAMPERS: PROVIDE SINGLE BLADE VOLUME DAMPERS IN DUCTS CONSTRUCTED OF 22 GAUGE GALVANIZED STEEL FOR DUCTS SMALLER THAN 11 INCHES, 20 GAUGE FOR DUCTS SMALLER THAN 21 INCHES, AND 18 GAUGE FOR DUCTS LARGER THAN 21 INCHES. PROVIDE LOCKING HARDWARE AS REQUIRED. PROVIDE AND INSTALL ON ALL SUPPLY, RETURN, AND EXHAUST DUCTS AS SHOWN ON THE DRAWINGS.
  - FLEXIBLE CONNECTIONS: PROVIDE FLEXIBLE CONNECTIONS BETWEEN AIR MOVING EQUIPMENT AND DUCTWORK.
  - DUCT INSULATION: ALL CONCEALED DUCTS SHALL BE WRAPPED WITH FLEXIBLE GLASS FIBER INSULATION EQUIVALENT TO R-4.2 IN SEMI-CONDITIONED SPACES AND R-8 IN NON-CONDITIONED SPACES. INSULATION NOT REQUIRED ON LINED DUCTS AND DUCTS EXPOSED TO CONDITIONED SPACE. INSTALL INSULATION ONLY AFTER DUCTWORK HAS BEEN INSPECTED AND APPROVED.
  - DUCT OPENINGS: MECHANICAL CONTRACTOR SHALL COORDINATE LOCATION OF ALL DUCT PENETRATIONS OF STRUCTURE WITH GENERAL CONTRACTOR.
  - T-BAR CEILING SUPPLY DIFFUSERS: TITUS MODEL PSS (STEEL, PERFORATED, STAR PATTERN DEFLECTOR, BORDER TYPE 3 FOR T-BAR) OR EQUAL WITH STANDARD #26 WHITE FINISH.
  - T-BAR CEILING RETURN REGISTERS (DUCTED): TITUS MODEL PAR (STEEL, PERFORATED, BORDER TYPE 3 FOR T-BAR) OR EQUAL WITH STANDARD #26 WHITE FINISH.
  - DUCT DETECTORS: SYSTEM SENSOR D4120 4-WIRE PHOTOELECTRIC DUCT SMOKE DETECTOR OR SIMILAR. SMOKE DETECTION FOR THE DUCT SYSTEM WHERE REQUIRED BY THE MECHANICAL CODE SHALL BE DESIGNED AND INSTALLED PER THE REQUIREMENTS SET FORTH IN NFPA 72 2013 EDITION.
- H. EQUIPMENT SUBMITTALS**
- EQUIPMENT SUBMITTALS FOR MECHANICAL EQUIPMENT SHALL BE SUBMITTED TO ARCHITECT AND ENGINEER FOR APPROVAL PRIOR TO ORDERING AND SHIPPING OF SUCH EQUIPMENT.
- I. TESTING**
- AFTER COMPLETION OF WORK, TEST AND BALANCE HVAC SYSTEM TO CONFORM TO THE AIR VOLUME INDICATED ON THE DRAWINGS. PROVIDE ALL TESTING APPARATUS NECESSARY TO PERFORM ALL TESTS. WHERE REQUIRED, PROVIDE LARGER OR SMALLER PULLEYS FOR BELT-DRIVEN FANS AT NO ADDITIONAL COSTS TO OWNER.
  - THE CONTRACTOR SHALL PERFORM THE SPECIFIED TESTS AND BALANCE ALL QUANTITIES TO WITHIN 5% OF THE INDICATED VALUES. IF SYSTEM CANNOT OBTAIN SPECIFIED AIRFLOW, DESIGN ENGINEER SHALL BE NOTIFIED.
- J. OPERATING INSTRUCTIONS**
- PREPARE THREE MANUALS WHICH INCLUDE:
    - PART NUMBERS OF ALL REPLACEMENT PARTS.
    - OILING AND LUBRICATION INSTRUCTIONS.
    - AIR FLOW AND AIR BALANCE REPORTS.
  - A MAINTENANCE SCHEDULE WHICH SHALL LIST ALL REQUIRED MAINTENANCE ON ALL EQUIPMENT FURNISHED UNDER THIS SECTION OF THE SPECIFICATIONS.
- K. GUARANTEE**
- THE CONTRACTOR SHALL GUARANTEE ALL WORK DONE HEREUNDER AGAINST FAILURE DUE TO DEFECTIVE MATERIALS AND/OR FAULTY WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OF THE COMPLETED PROJECT BY THE OWNER. IF, DURING THIS PERIOD, ANY MATERIALS OR APPARATUS PROVE TO BE DEFECTIVE OR ANY PART OF THE SYSTEM FAIL TO FUNCTION PROPERLY, THE CONTRACTOR SHALL CORRECT THE DEFECTS WITHOUT EXPENSE TO THE OWNER. IF A CONTINUAL PROBLEM EXISTS, IT SHALL BE CORRECTED AND THE GUARANTEE SHALL COMMENCE WHEN COMPLETE.

ROOFTOP PACKAGED UNITS														
UNIT NO.	TONS	MANUFACTURER & MODEL NO.	COOLING CAP. BTU/HR.	SEER [EER]	HEATING CAP. BTU/HR.	HSPF [COP]	AIR QUANTITY		ELECTRICAL			OPER. WT. (LBS.)	FILTERS (MERV-8)	REMARKS
							CFM	E.S.P. (IN.)	MCA	FUSE	VOLTAGE			
XAC60	5	CARRIER 48D6006	--	--	--	--	2,000	--	38	50	208V. 3ø	--	V.I.F.	EXISTING UNIT ON ROOF SHALL REMAIN. SHALL BE SERVICED TO OPTIMAL CONDITIONS AS REQUIRED.
HP60	5	CARRIER 50EZ-A60	57,000	13.5	57,000	7.7	2,000	0.8	31.8	45	208V. 3ø	630	24"x36"x2"	HEATPUMP. FACTORY CURB. 100% ECONOMIZER WITH DRY BULB SENSOR. F.D. SMOKE DETECTOR. TO REPLACE EXISTING UNIT.

EXHAUST FANS												
UNIT NO.	MANUFACTURER & MODEL NO.	AIR QUANTITY			ELECTRICAL		OPER. WT. (LBS.)	ROOF OPENING	SERVICE	REMARKS		
		CFM	RPM	S.P. (IN.)	HP, [WATTS]	VOLTAGE						
EF1	GREENHECK GB-DB1	400	1,250	0.5	1/4	120V. 1ø	58	14"x14"	RESTROOMS	DOWNBLAST FAN. FACTORY CURB. BACKDRAFT DAMPER. INTERLOCK WITH TIME CLOCK CONTROL.		
KEF1	CAPTIVE AIRE USB18BD-RM	2,600	1,058	1.0	1	208V. 3ø	346	AS NOTED	HOOD H-1	GREASE UTILITY FAN SERVING TYPE I HOOD. LEVEL PLATFORM U.L. #762 APPROVED. GREASE TRAP. VENTED GREASE TROUGH. INTERLOCK W/ MAU1.		
KEF3	CAPTIVE AIRE NCA18HPFA	1,600	999	1.0	1/2	120V. 1ø	133	24"x24"	HOOD H-2, H-3	UPBLAST FAN SERVING TYPE II HOOD. FACTORY CURB. INTERLOCK W/ MAU1.		

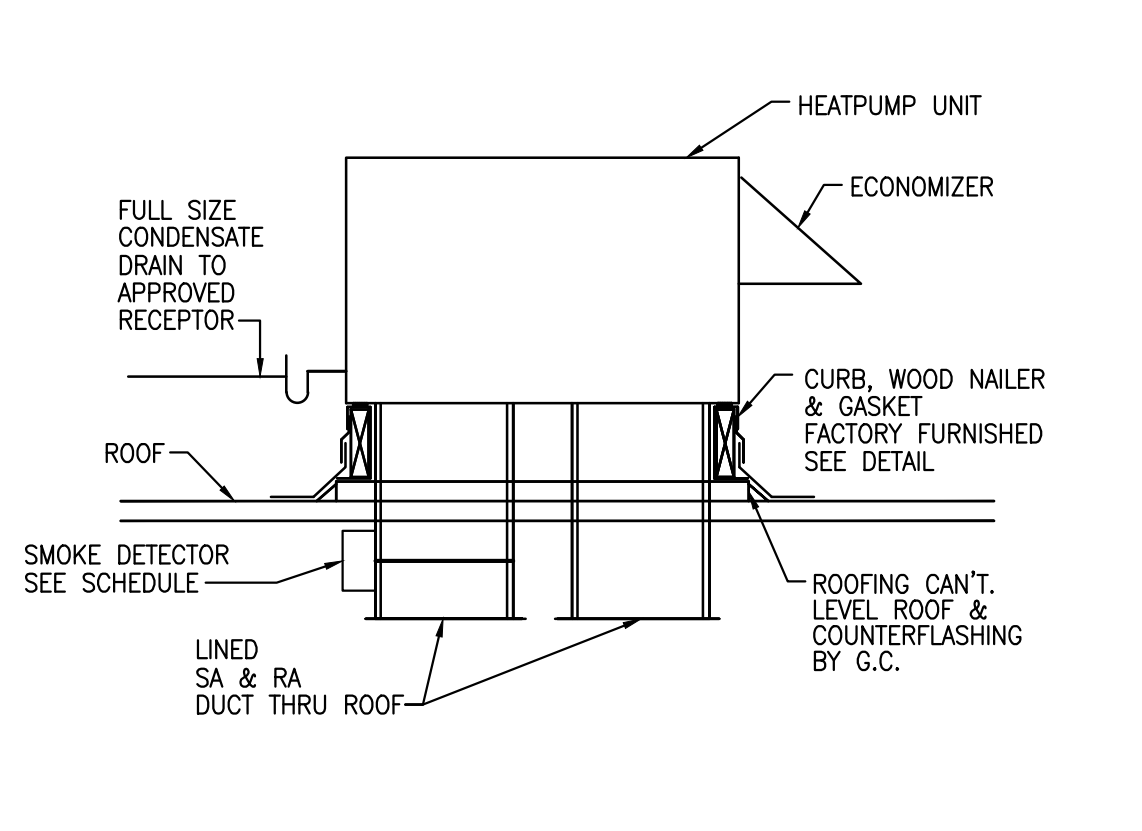
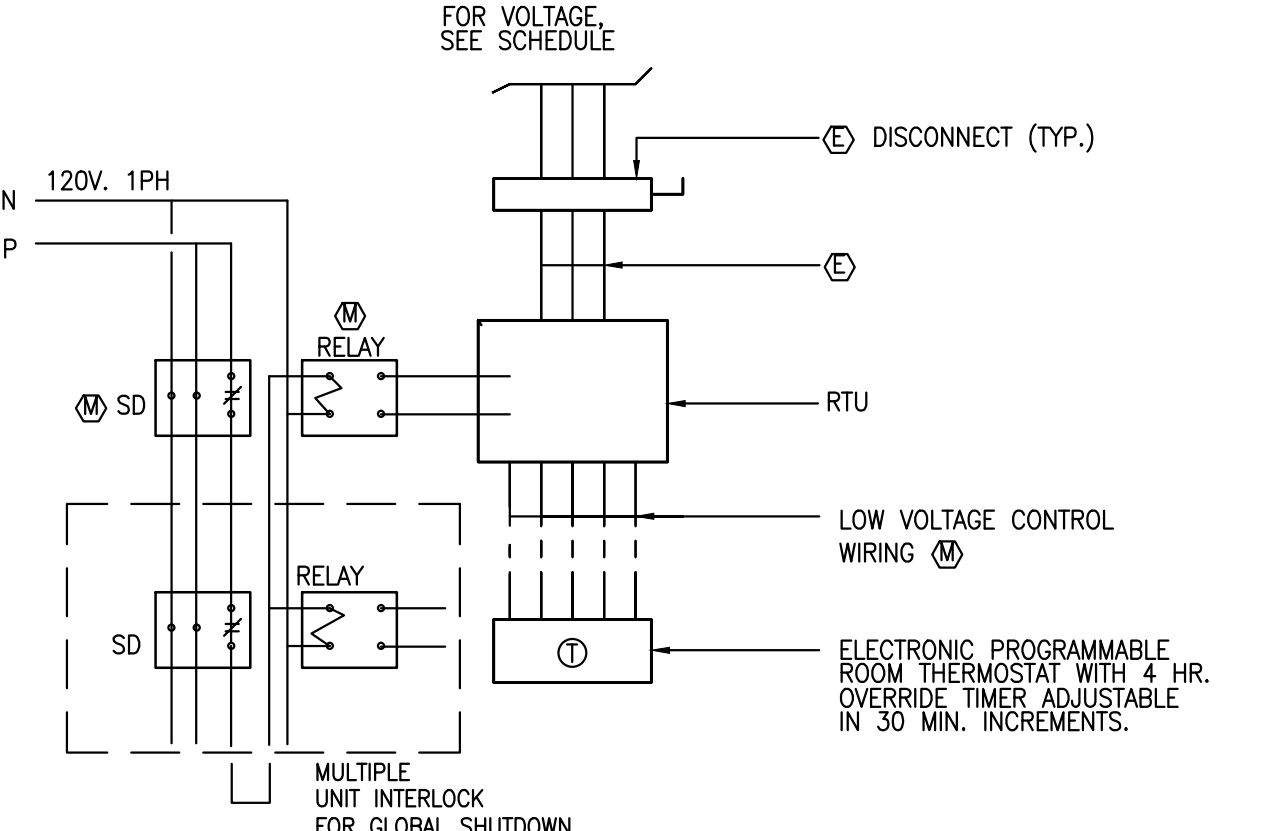
MAKE-UP AIR UNITS												
UNIT NO.	MANUFACTURER & MODEL NO.	CFM	EXT. S.P. (IN.)	SERVING	ELECTRICAL		OPER. WT. (LBS.)	CIRC. PUMP (PAET-1)	DUCT OPENING	REMARKS		
					HP	VOLTAGE						
MAU1	CHAMPION 5000 DD	3,880	0.4	H-1, H-2, H-3	3/4	120V. 1ø	310	110436	AS NOTED	EVAPORATIVE AIR COOLER. PROVIDE 1/2" CM FOR CIRCULATING PUMP. PROVIDE CONDENSATE DRAIN LINE. VERIFY WITH MANUFACTURER. INTERLOCK W/ KEF-1, KEF-3.		

AIR DOORS												
UNIT NO.	MANUFACTURER & MODEL NO.	CFM	FPM	RPM	SERVING	ELECTRICAL		OPER. WT. (LBS.)	REMARKS			
						HP	VOLTAGE					
AD1	MARS STD36-1U	2,550	3,400	1750	KITCHEN AREA ENTRY	1/2	120V. 1ø	55	PROVIDE MICRO DOOR SWITCH UNIT SHALL PROVIDE 1600 FT. PER MIN. VELOCITY AT 3 FT. ABOVE THE FLOOR			

### EQUIPMENT SCHEDULE

AIR BALANCE						
SYMBOL	SUPPLY AIR CFM	RETURN AIR CFM	OUTSIDE AIR CFM	EXHAUST AIR CFM	BLDG. PRESSURE	INTERLOCK
XAC60	2000	1500	500	0	500	
HP60	2000	1600	400	0	400	
MAU-1	3580	0	3580	0	3580	KEF-1,KEF-2,KEF-3
KEF-1				1400	-1400	MAU-1
KEF-2				900	-900	MAU-1
KEF-3				1600	-1600	MAU-1
EF-1				400	-400	TIME CLOCK
<b>TOTAL</b>	<b>7580</b>	<b>3100</b>	<b>4480</b>	<b>4300</b>	<b>180</b>	

### AIR BALANCE TABLE



SYMBOL	ABBREVIATION	DESCRIPTION
AD	AD	ACCESS DOOR
AFF	AFF	ABOVE FINISHED FLOOR
AP	AP	ACCESS PANEL
CD	CD	CEILING DIFFUSER
CD.D	CD.D	CONDENSATE DRAIN
DL	DL	DOOR LOUVER
DL	DL	DOOR LOUVER
EA	EA	EXHAUST AIR
EAR	EAR	EXHAUST AIR REGISTER
SFD	SFD	SMOKE FIRE DAMPER
FS	FS	FLOOR SINK
HW	HW	HOT WATER
OSA	OSA	OUTSIDE AIR
POC	POC	POINT OF CONNECTION
RA	RA	RETURN AIR
RAR	RAR	RETURN AIR REGISTER
RL	RL	REFRIGERANT LIQUID
RS	RS	REFRIGERANT SUCTION
SA	SA	SUPPLY AIR
SAR	SAR	SUPPLY AIR REGISTER
SD	SD	SMOKE DETECTOR
SLD	SLD	SOUND LINED DUCTWORK
STAT	STAT	THERMOSTAT AND ZONE NO.
T	T	THROAT
TG	TG	TRANSFER GRILLE
UC	UC	DOOR UNDERCUT
VD	VD	VOLUME DAMPER
X	X	EXISTING

(E) FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR  
 (M) FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR  
 (ME) FURNISHED BY MECHANICAL AND INSTALLED BY ELECTRICAL CONTRACTOR  
 (P) FURNISHED AND INSTALLED BY PLUMBING CONTRACTOR

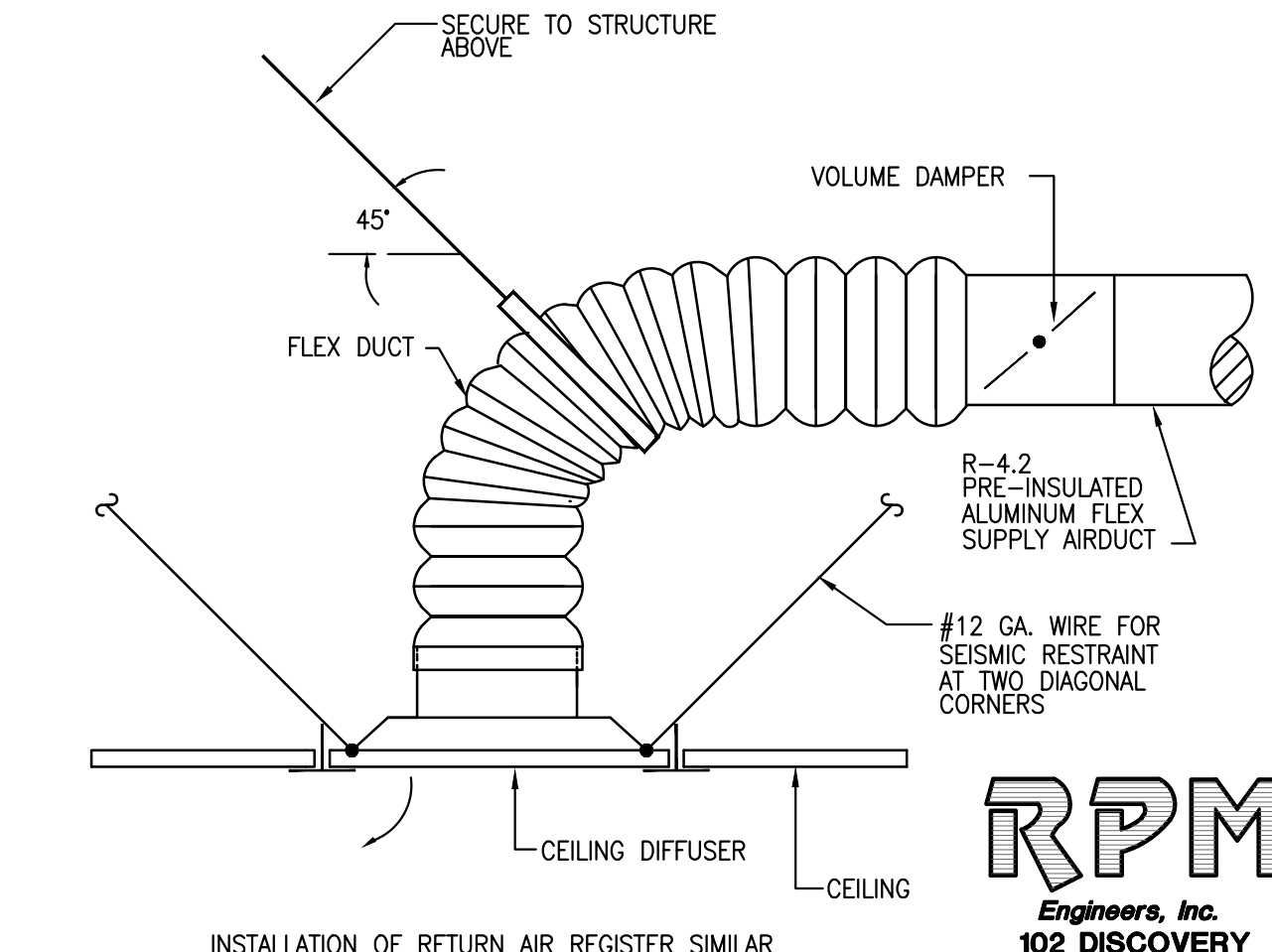
**CEILING DIFFUSER, RAR, AND EAR NOTATION**  
 NECK SIZE (IN DIA.)  
 AIR QUANTITY (CFM)

**LINEAR SUPPLY AIR REGISTER NOTATION**  
 NO. OF SLOT(S) WIDTH (IN.)  
 AIR QUANTITY PER FEET (CFM)  
 TOTAL LENGTH (FT.)

### MECHANICAL LEGEND

- M-1: HVAC SCHEDULES, DETAILS, NOTES, AND SPECIFICATIONS
- M-1.1: HVAC DETAILS
- M-2: HVAC PLAN
- M-3: ROOF PLAN
- M-4.1: HOOD SPECIFICATIONS
- M-4.2: HOOD SPECIFICATIONS
- M-4.3: FAN SPECIFICATIONS
- M-5.1: FIREMASTER DUCT WRAP
- M-5.2: DUCT FIRE WRAP ES REPORT
- M-6: TITLE 24 FORMS AND NOTES

### MECHANICAL SHEET INDEX



### NOTES AND SPECIFICATIONS

### RTU WIRING / GLOBAL SHUTDOWN

### WALL MOUNT AC UNIT

### CEILING DIFFUSER

2401 208th St., #5, Torrance, CA 90503  
TEL: (310) 516-1945 FAX: (310) 516-2672

11/2/14  
11/20/14  
01/20/15

PER CITY BLDG COMMENTS  
PER HEALTH DEPT COMMENTS  
PER HEALTH DEPT COMMENTS  
REVISION CHANGES

REVISIONS

**KULA SUSHI**  
4609 CONVOY ST. SUITE F,  
SAN DIEGO, CA 92111

OWNER / TENANT

**KULA**  
REVOLUTIONARY SUSHI BAR

DRAWING TITLE

HVAC SCHEDULES, NOTES, DETAILS, AND SPECIFICATIONS

PROJECT MGR. REF. NUMBER

SCALE DATE DRAWN BY

AS NOTED - RPM

SHEET NUMBER

**M-1**

RPM  
Engineers, Inc.  
102 DISCOVERY  
Irving, CA 92618  
Tel: 949-450-1229  
Fax: 949-450-1464  
Contact: Johnny Lai x206  
E-mail: johnnyl@rpmpe.com

RPM #14-505 01/27/15

**GREASE EXHAUST SYSTEM NOTES:**

ALL TYPE I GREASE EXHAUST SYSTEMS SHALL BE CONSTRUCTED AND INSTALLED IN STRICT ACCORDANCE WITH CHAPTER 5 OF CMC.

HOODS WITH TWO EXHAUST NECKS SHALL BE INSTALLED OVER CORRECT COOKING EQUIPMENT. SEE FOOD SERVICE LAYOUT FOR CORRECT ORIENTATION OF HOOD.

GREASE DUCT SHALL BE CONSTRUCTED OF MINIMUM 16 GAUGE GALVANIZED STEEL WITH ALL JOINTS AND SEAMS WELDED ON THE EXTERNAL SURFACE OF THE DUCT. ALL DUCTS EXPOSED TO WEATHER SHALL BE PROTECTED FROM CORROSION.

GREASE HORIZONTAL DUCT SHALL BE SLOPED NOT LESS THAN 1/4" PER LINEAR FOOT TOWARDS THE HOOD OR APPROVED RESERVOIR WITH A MAXIMUM SINGLE RUN NOT TO EXCEED 75'. IF HORIZONTAL RUN DOES EXCEED 75', SLOPE DUCT 1/7".

GREASE DUCT SYSTEM SHALL NOT HAVE OPENINGS OTHER THAN THOSE REQUIRED FOR PROPER OPERATION AND MAINTENANCE OF THE SYSTEM.

CLEAN-OUTS AND ACCESS DOORS SHALL BE PROVIDED TO ALLOW FOR PROPER OPERATION AND MAINTENANCE. CLEAN-OUTS SHALL BE CONSTRUCTED OF STEEL, EQUAL TO THAT OF THE DUCT. DOOR SHALL BE EQUIPPED WITH A SUBSTANTIAL METHOD OF LATCHING SUFFICIENT TO HOLD THE DOOR TIGHTLY CLOSED AND CAN BE OPENED WITHOUT THE USE OF A TOOL.

CLEANOUTS SHALL BE PROVIDED AT ALL DUCT BRANCHES, ELBOWS, DUCT LOW POINTS AND A MAXIMUM OF 12' APART PER CMC 510.3.

GENERAL CONTRACTOR TO FULLY WRAP GREASE DUCT WITH UL LISTED, FIRE RATED DUCT WRAP TO COMPLY WITH THE BUILDING CODE. DUCT WRAP SHALL BE AT LEAST ONE-HOUR FIRE RESISTIVE RATED IN ALL BUILDINGS AND SHALL BE TWO-HOUR FIRE-RESISTIVE RATED IN TYPE 1 AND 2 FIRE-RESISTIVE BUILDINGS.

AIR VELOCITY WITHIN THE DUCT SHALL NOT EXCEED 2500 FPM.

EXHAUST DUCT OUTLET SHALL HAVE AN EXTENSION THROUGH THE ROOF OF AT LEAST 18" ABOVE THE ROOF SURFACE. FAN DISCHARGE SHALL BE AT LEAST 40" ABOVE ROOF SURFACE AND 10 FEET FROM ADJACENT PROPERTY LINE OR AIR INTAKE OPENING.

SEE KITCHEN DRAWINGS FOR ADDITIONAL SPECIFICATIONS AND CALCULATIONS.

THE VERTICAL DISTANCE FROM LIP OF HOOD TO THE COOKING SURFACE SHALL BE NOT MORE THAN 4 FEET. THE ALLOWABLE DISTANCE BETWEEN THE LOWEST EDGE OF A GREASE FILTER AND THE COOKING SURFACE SHALL BE PER CMC 509.

METAL SHIELD (OR COLLAR) TO SEAL DUCT AT POINT OF PENETRATION OF CEILING.

HOODS LESS THAN 12" FROM THE CEILING OR WALL SHALL BE FLASHED SOLID (MIN. 22 GA. GALV. OR STAINLESS STEEL).

ALL CANOPY TYPE HOODS SHALL OVERHANG A MINIMUM OF 6" BEYOND THE COOKING SURFACE ON ALL OPEN SIDES.

THICKNESS OF HOOD SHALL BE MINIMUM 18 GAGE CARBON STEEL OR 20 GAGE STAINLESS STEEL PER CMC 508.1.1.

ALL SEAMS, JOINTS, AND PENETRATIONS OF THE HOOD ENCLOSURE THAT DIRECT AND CAPTURE GREASE-LADEN VAPORS AND EXHAUST GASES SHALL HAVE A LIQUID TIGHT CONTINUOUS EXTERNAL WELD TO THE LOWER OUTERMOST PERIMETER OF THE HOOD.

COMMERCIAL HOODS AND KITCHEN VENTILATION SHALL COMPLY WITH THE REQUIREMENTS OF CMC SECTIONS 507 THROUGH 511.

GREASE FILTERS SHALL BE INSTALLED AT AN ANGLE NOT LESS THAN 45° FROM HORIZONTAL.

LISTED GREASE HOOD ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE TERMS OF THEIR LISTING AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

FIELD APPLIED OR FACTORY BUILT GREASE DUCT ENCLOSURE SHALL BE INSTALLED PER THE LATEST MANUFACTURER'S INSTALLATION INSTRUCTIONS AND IN COMPLIANCE WITH TERMS OF ITS LISTING.

ALL END CUTS OR CUTS IN THE FOIL JACKET OF FIELD APPLIED GREASE DUCT ENCLOSURE SHALL BE SEALED PER THE MANUFACTURER'S RECOMMENDATIONS.

ALL INSTALLATIONS SHALL BE COMPLETELY ACCESSIBLE FOR VISUAL INSPECTION.

AT TIME OF INSPECTION, THE FIELD APPLIED OR FACTORY BUILT GREASE DUCT ENCLOSURE INSTALLATION INSTRUCTIONS SHALL BE MADE AVAILABLE AT THE JOB SITE.

**ADDITIONAL ITEMS:**

FIRE DEPARTMENT APPROVAL SHALL BE REQUIRED ONO FIRE PROTECTION SYSTEM FOR GREASE HOODS AND DUCTS AS REQUIRED BY SECTION 513 OF THE CALIFORNIA MECHANICAL CODE AND AS REQUIRED BY THE FIRE CODE.

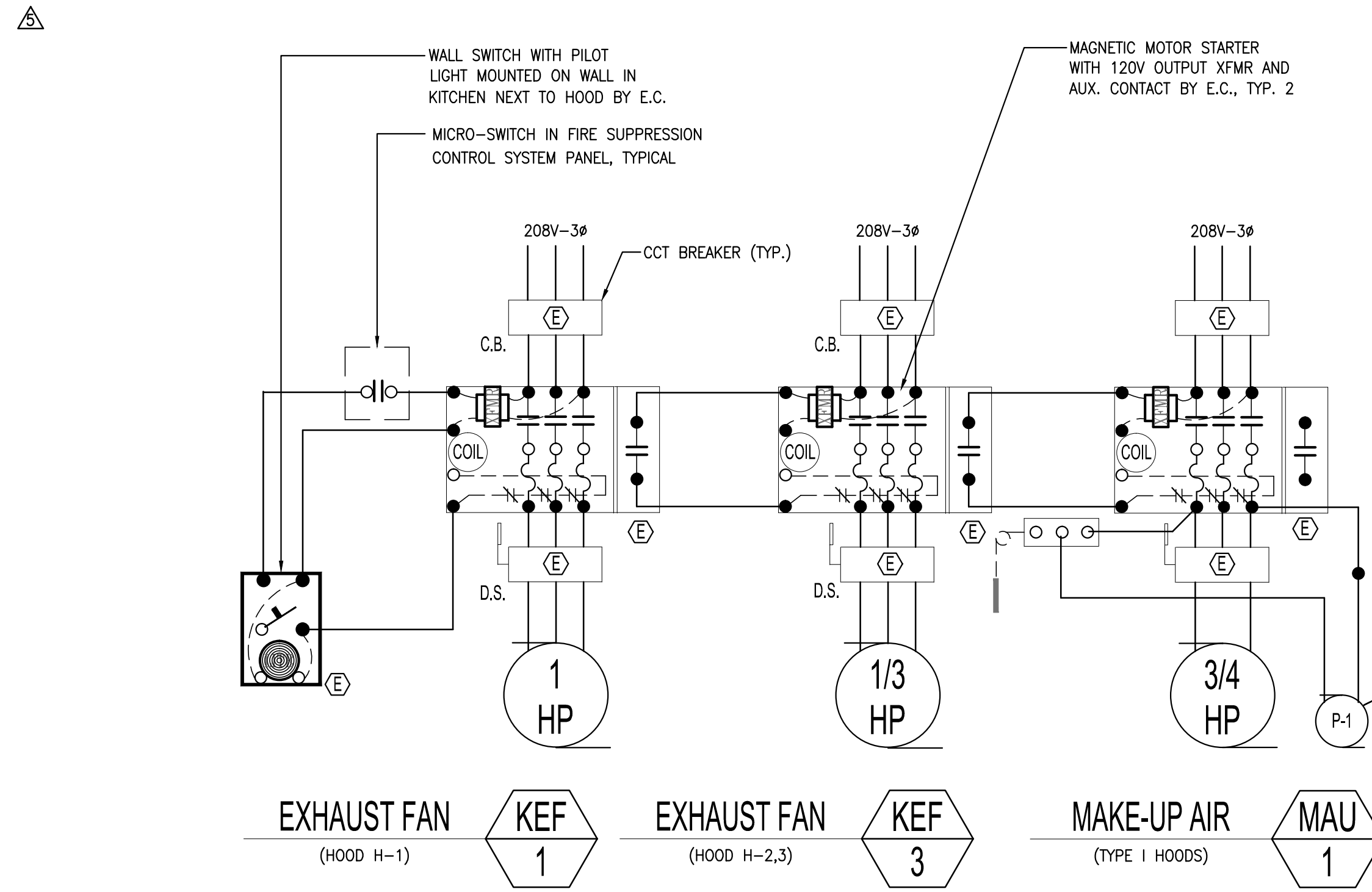
AL FIRE-EXTINGUISHING SYSTEMS SHALL BE INTERCONNECTED TO THE FUEL OR CURRENT SUPPLY SO THAT THE FUEL OR CURRENT IS AUTOMATICALLY SHUT OFF TO ALL EQUIPMENT UNDER THE HOOD WHEN THE SYSTEM IS ACTIVATED.

OWNER OF ESTABLISHMENT SHALL BE RESPONSIBLE FOR CLEANLINESS, MAINTENANCE, AND INSPECTION OF KITCHEN EXHAUST SYSTEM, FIRE PROTECTION, AND COOKING EQUIPMENT.

A DRAWING OF THE EXHAUST SYSTEM(S) INSTALLATION ALONG WITH A COPY OF OPERATING INSTRUCTIONS FOR SUBASSEMBLIES AND COMPONENTS USED IN THE EXHAUST SYSTEM(S), INCLUDING ELECTRICAL SCHEMATICS, SHALL BE MADE AVAILABLE ON THE PREMISES.

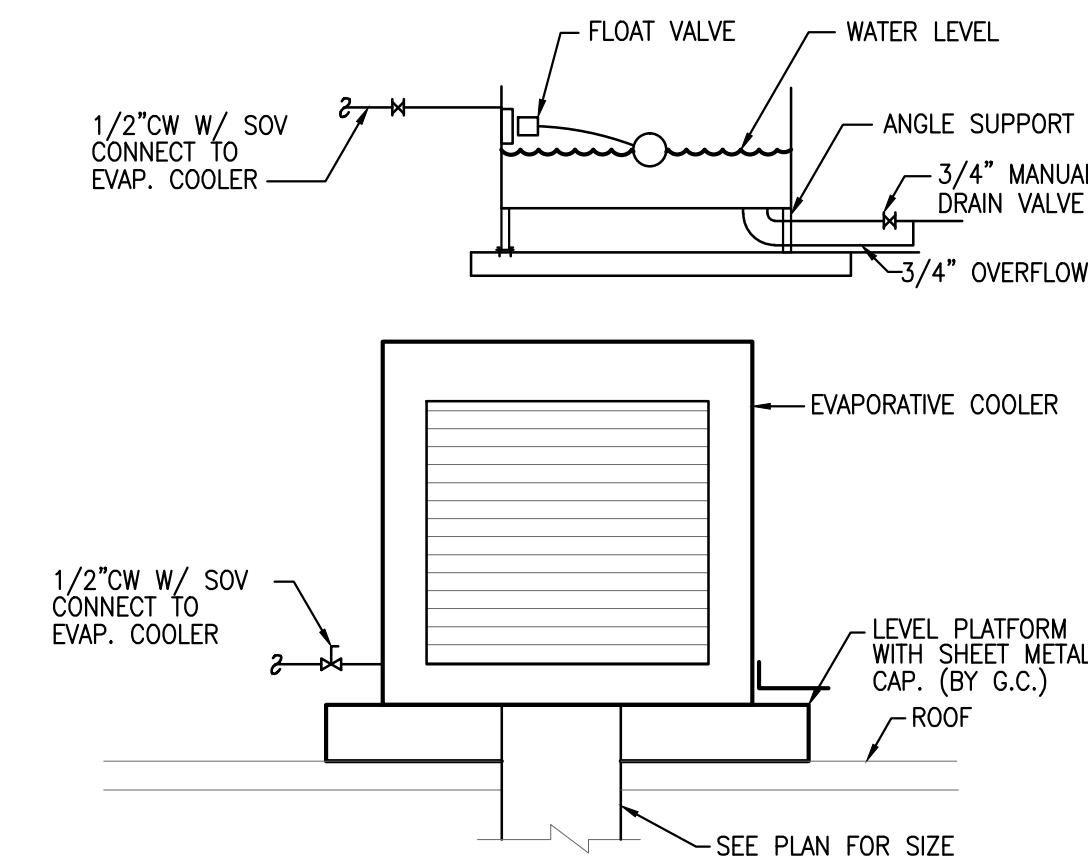
HOOD EXHAUST FAN SHALL CONTINUE TO OPERATE AFTER THE EXTINGUISHING SYSTEM HAS BEEN ACTIVATED, UNLESS FAN SHUTDOWN IS REQUIRED BY A LISTED COMPONENT OF THE VENTILATION SYSTEM.

**ADDITIONAL NOTES**

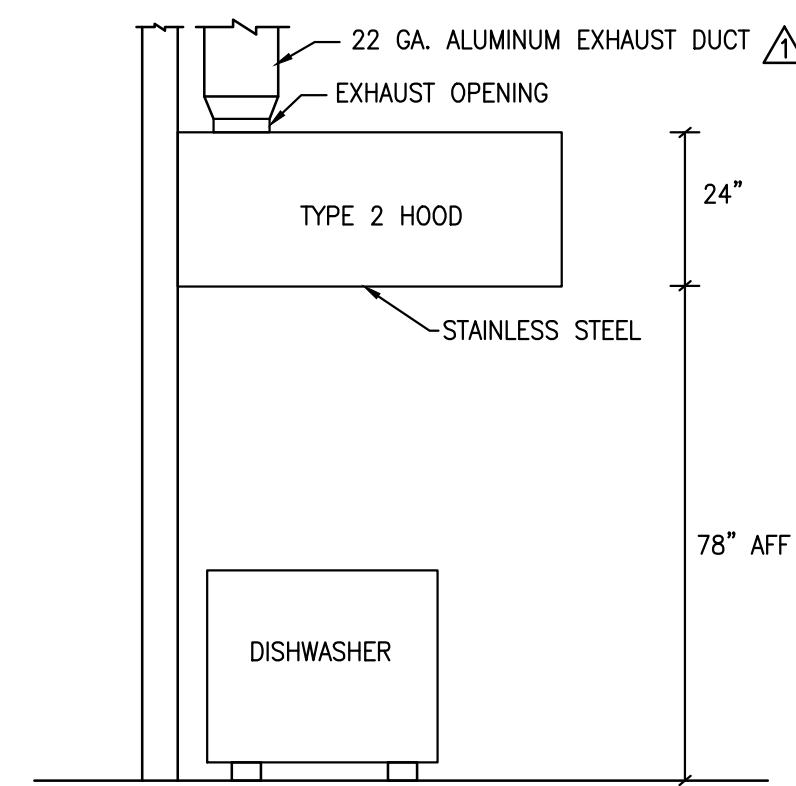


**NOTES:**  
THE EXHAUST FAN AND MAKE UP AIR SYSTEM SHALL BE CONNECTED BY AN ELECTRICAL INTERLOCK SWITCH.

**KITCHEN HOOD WIRING DIAGRAM**



**EVAPORATIVE COOLER**



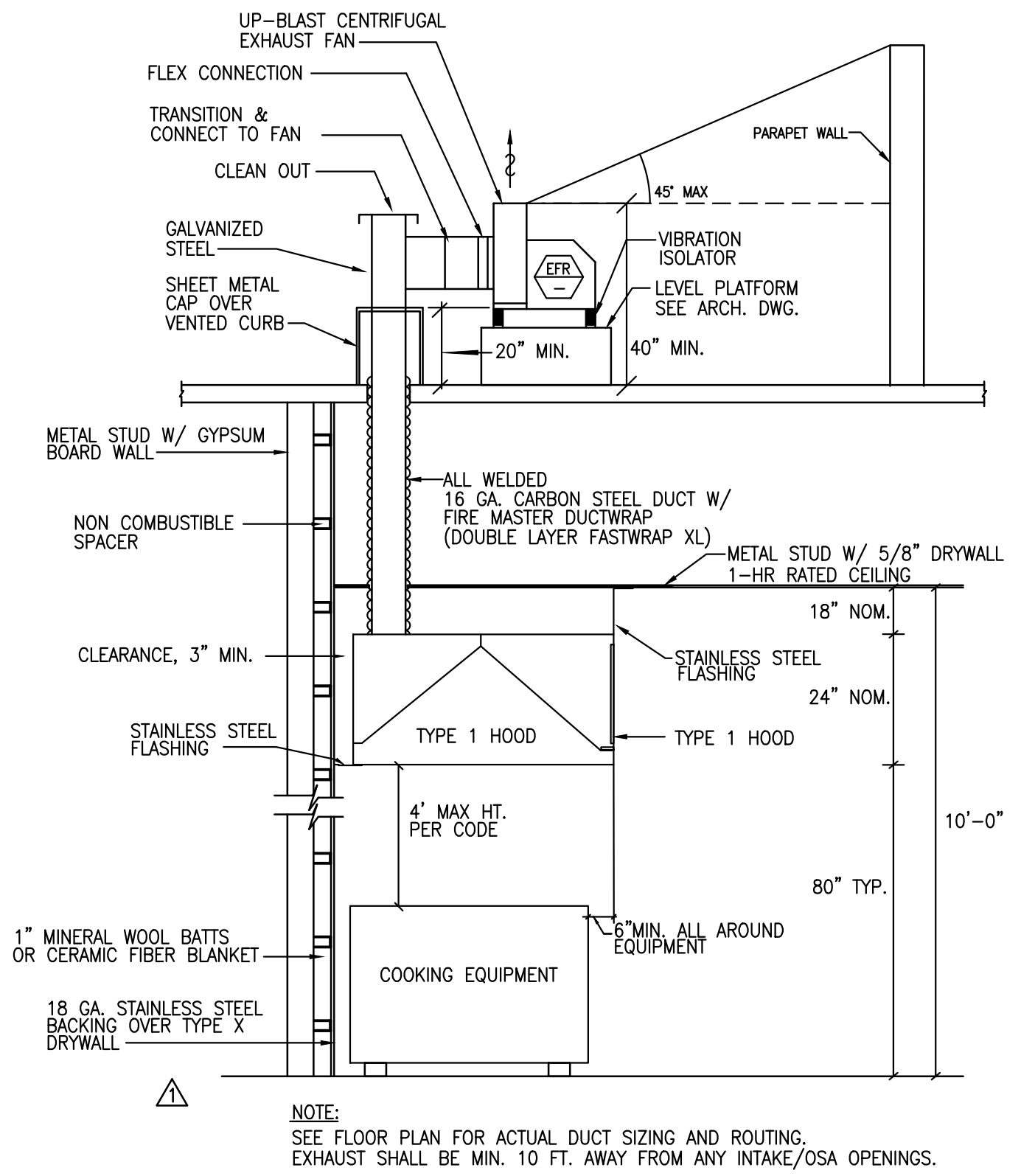
**NOTE:**  
SEE FLOOR PLAN FOR ACTUAL DUCT SIZING AND ROUTING. EXHAUST SHALL BE MIN. 10 FT. AWAY FROM ANY INTAKE/OSA OPENINGS.  
DUCT MATERIAL AND GAGE FOR TYPE II HOOD SHALL COMPLY WITH CHAPTER 6 CMC.  
SEAL COMPLETELY DUCT SEAMS TO PREVENT LEAKAGE DUE TO WATER CONDENSATION.

**TYPE II HOOD (TYP.)**

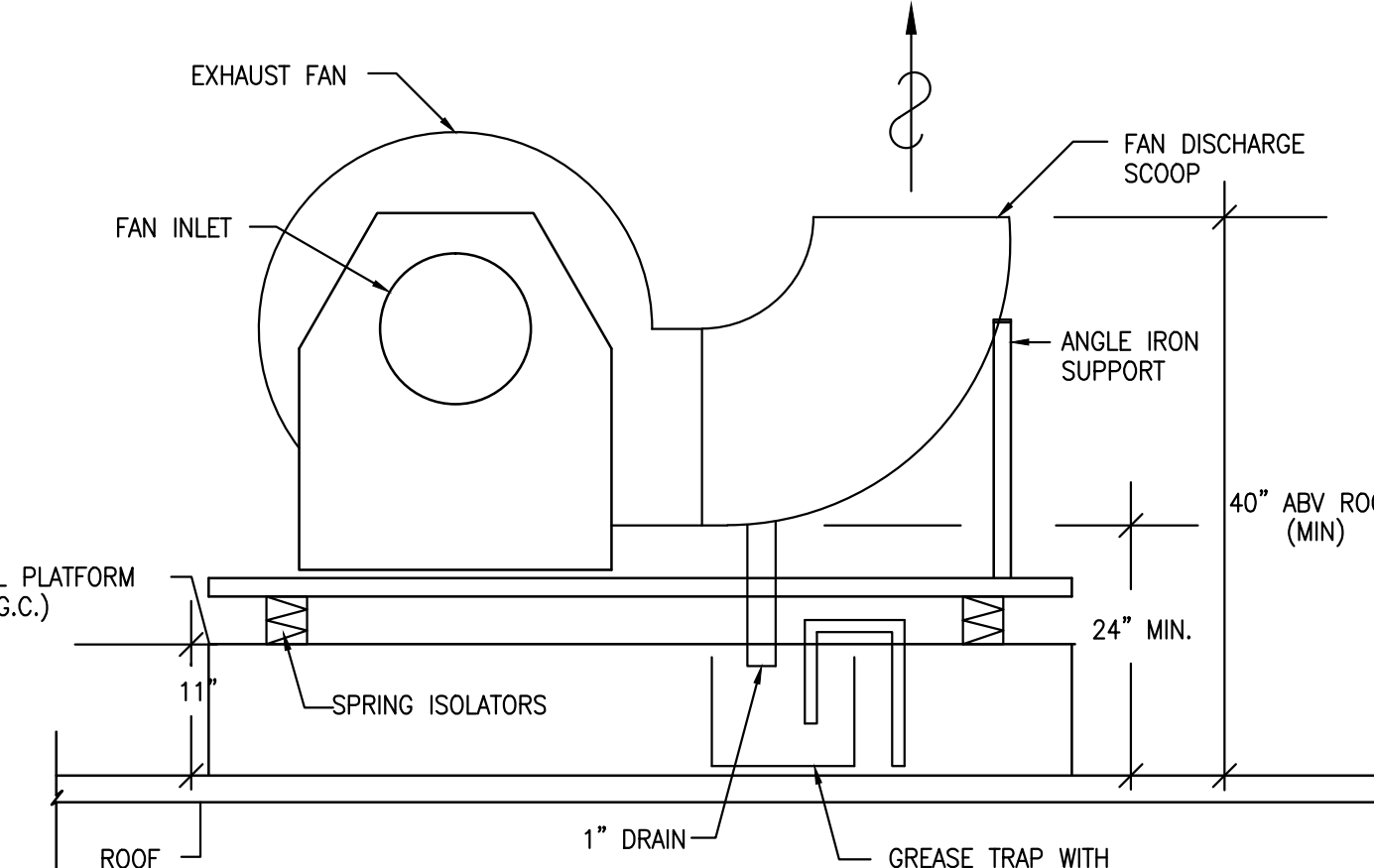
ROUND DUCT HANGERS				
DUCT DIAMETER, IN.	MAX. SPACING	WIRE DIAMETER	ROD	STRAP
10" DOWN	12'	ONE 12 GA.	1/4"	1" X 0.030 (22 GA.)
11 TO 18"	12'	TWO 12 GA. OR ONE 8 GA.	1/4"	1" X 0.030 (22 GA.)
19 TO 24"	12'	TWO 10 GA.	1/4"	1" X 0.030 (22 GA.)
25 TO 36"	12'	TWO 8 GA.	3/8"	1" X 0.036 (20 GA.)
37 TO 50"	12'	FI	TWO 3/8"	TWO 1" X 0.036 (20 GA.)
51 TO 80"	12'	FI	TWO 3/8"	TWO 1" X 0.047 (18 GA.)
81 TO 94"	12'	FI	TWO 3/8"	TWO 1" X 0.058 (16 GA.)

ALL SUPPLY AND RETURN AIR DUCT SHALL BE CONSTRUCTED PER TABLE 6-2-E & 6-2-G

**ROUND DUCT HANGERS**

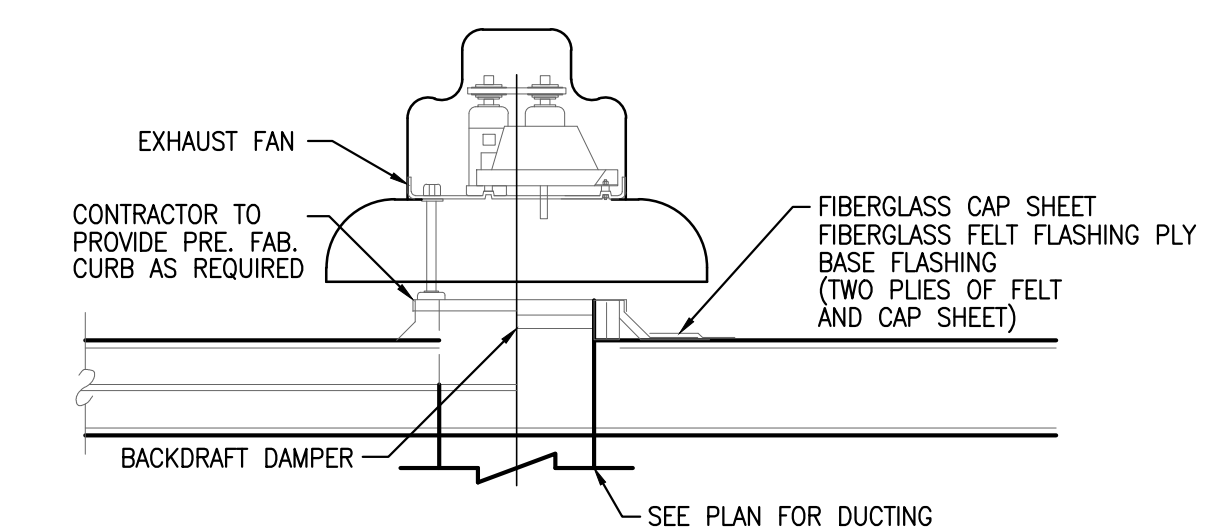


**TYPE I HOOD (TYP.)**



**NOTE:**  
MECHANICAL CONTRACTOR TO PROVIDE MISC. STEEL SUPPORT NECESSARY TO ACHIEVE A MIN 24" CLEARANCE AS NOTED.

**UTILITY-TYPE GREASE EXHAUST FAN**



**EXHAUST FAN (RESTROOM)**

**TSUKURU USA**  
CORPORATION  
2401 208th St., #5, Torrance, CA 90503  
TEL: (310) 516-1945 FAX: (310) 516-2672

REVISIONS	DATE	DESCRIPTION
11/20/14		PER CITY BLDG COMMENTS
11/20/14		PER HEALTH DEPT. COMMENTS
12/16/14		PER HEALTH DEPT. COMMENTS
01/20/15		REVISION CHANGES

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**PROFESSIONAL ENGINEER**  
**TSUKURU E.**  
No. 30465  
Exp. 12-31-15  
**MECHANICAL**  
STATE OF CALIFORNIA

**KULA SUSHI**  
4609 CONVOY ST. SUITE F,  
SAN DIEGO, CA 92111

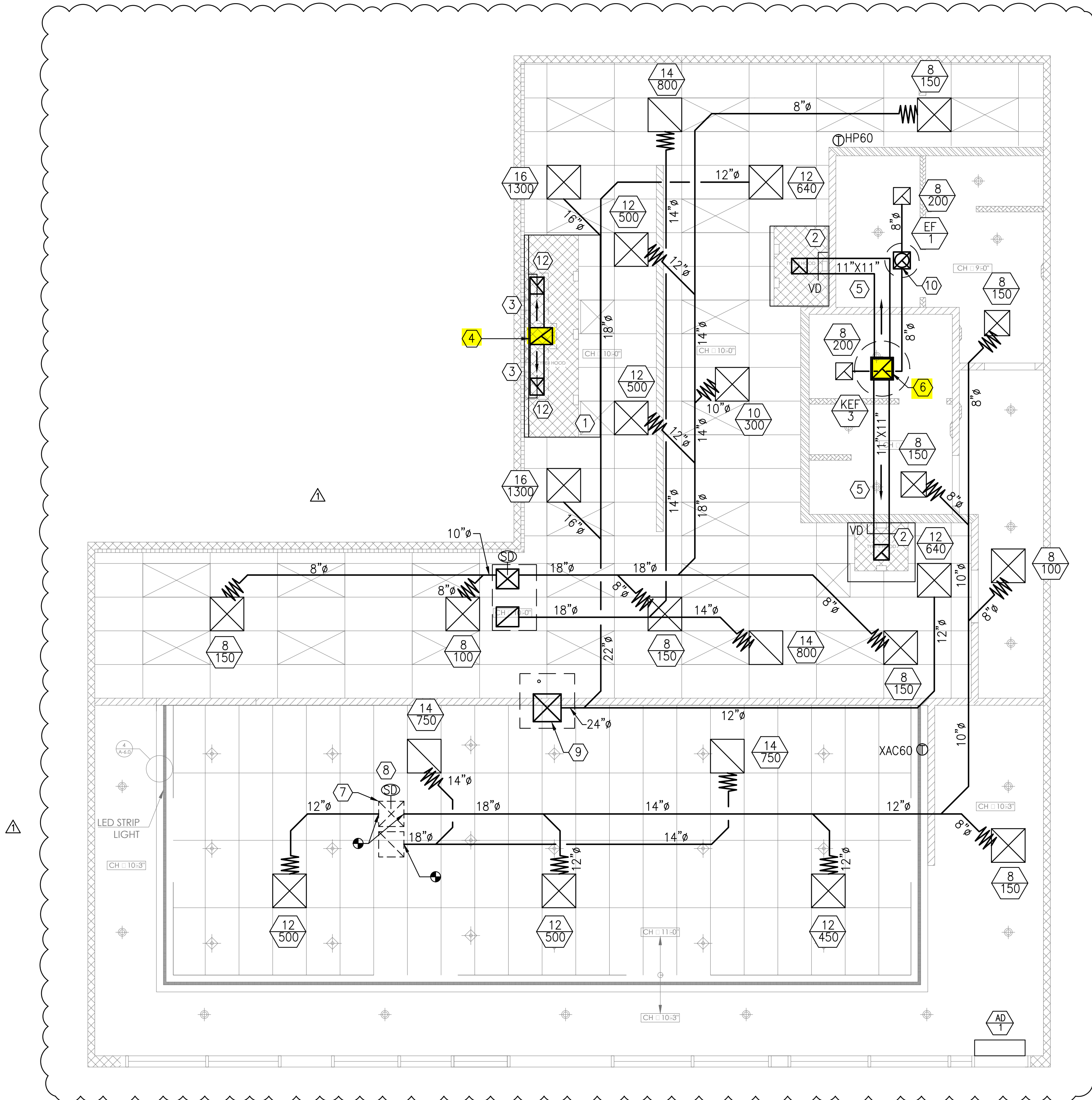
OWNER / TENANT  
**Kula**  
REVOLVING SUSHI BAR

DRAWING TITLE  
HVAC DETAILS

PROJECT MGR. REF. NUMBER  
SCALE DATE DRAWN BY  
AS NOTED - RPM

SHEET NUMBER  
**M-1.1**

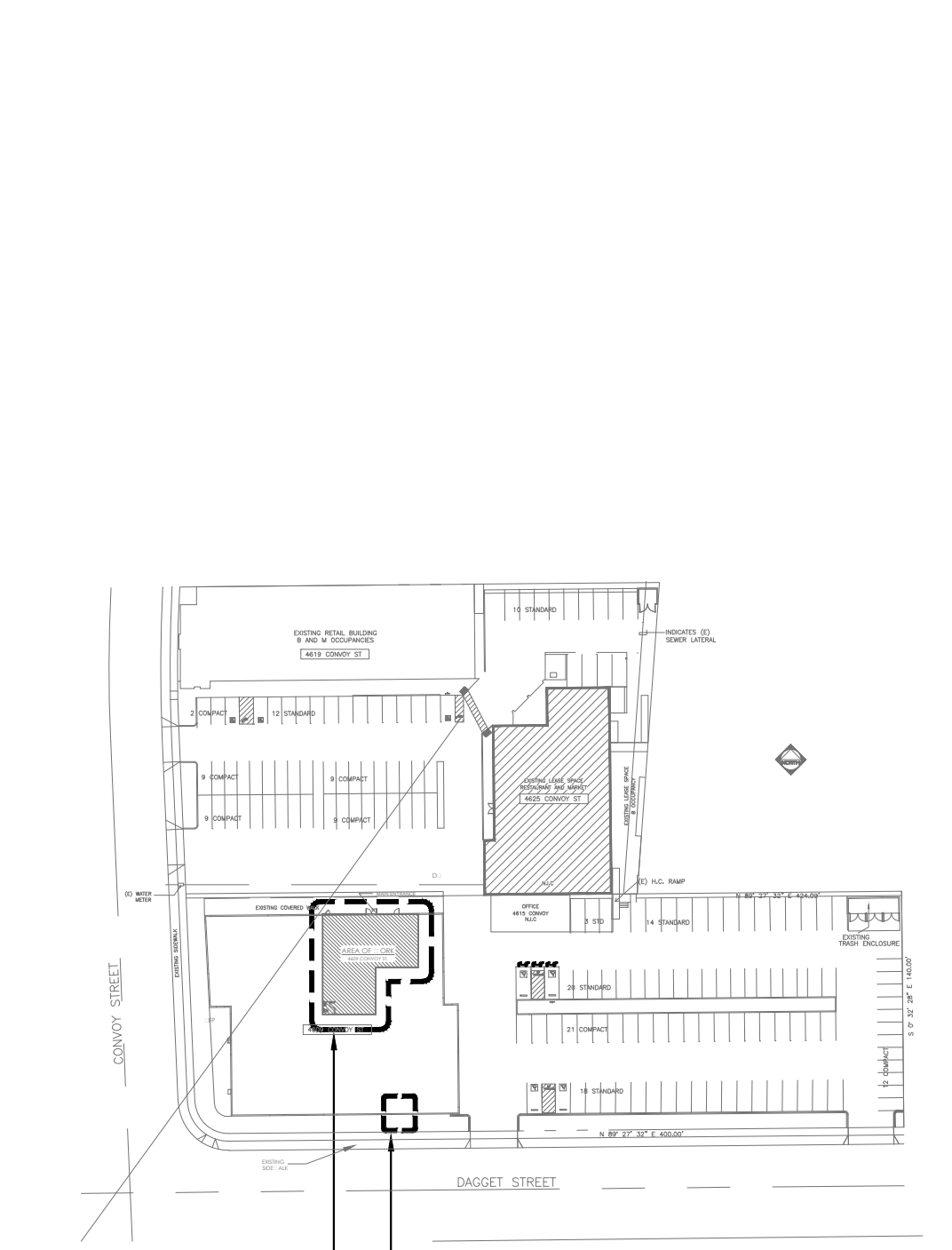
**RPM**  
Engineers, Inc.  
102 DISCOVERY  
Irvine, CA 92618  
Tel: 949-450-1229  
Fax: 949-450-1464  
Contact: Johnny Lai x206  
E-mail: johnny@rpmpe.com



- GENERAL NOTES**
- EXISTING BUILDING INSULATION SHALL REMAIN.
  - CONTRACTOR SHALL VERIFY EXISTING CONDITION AND SIZE OF EXISTING ROOFTOP UNITS. NOTIFY ENGINEER IF DUCTS ARE NOT CAPABLE OF PROVIDING AIRFLOW NOTED.
  - ALL EXISTING HVAC EQUIPMENT SHALL BE SERVICED TO OPTIMAL CONDITIONS. INFORM ARCHITECT OR ENGINEER IF ANY NEED TO BE REPLACED PRIOR TO BID.
  - AIR QUANTITY SHALL BE BALANCED AS SHOWN.
  - ALL EXISTING GRILLES AND DUCTWORK SHALL BE DEMO. VERIFY IN FIELD.
  - GREASE EXHAUST DUCTWORK CLEANOUTS SHALL BE PROVIDED AT EVERY 10' AND AT EVERY CHANGE OF DIRECTION.
  - ROOF ACCESS LADDER SHALL COMPLY WITH SECTION 304 CMC.
  - EXHAUST DUCTS SHALL BE EQUIPPED WITH BACKDRAFT DAMPERS PER SEC. 504.0 CMC.

- KEYED NOTES**
- NEW TYPE I HOODS (H-1, H-2). REFER TO SHEETS M-4.1 AND M-4.2.
  - NEW TYPE I HOODS (H-3, H-4). REFER TO SHEETS M-4.1 AND M-4.2.
  - NEW 10"X12" GREASE EXHAUST DUCTWORK, 1300 CFM, 1560 FPM, ALL WELDED, 16 GA, WRAPPED WITH TWO LAYERS OF FIREMASTER DUCT WRAP. SLOPED 1/4" PER FOOT DOWN TOWARDS HOOD IN DIRECTION OF ARROW. REFER TO SHEET M-1.1 FOR DETAILS.
  - NEW 12"X16" GREASE EXHAUST DUCTWORK, 2600 CFM, 1950 FPM, ALL WELDED, 16 GA, WRAPPED WITH TWO LAYERS OF FIREMASTER DUCT WRAP. UP THRU ROOF TO KEF-1. REFER TO SHEET M-1.1 FOR DETAILS.
  - NEW 11"X14" NON-GREASE EXHAUST DUCTWORK, 800 CFM, 953 FPM. SLOPED 1/4" PER FOOT DOWN TOWARDS HOOD (DIRECTION OF ARROW).
  - NEW 14"X14" NON-GREASE EXHAUST DUCTWORK, 1600 CFM, 1176 FPM, UP THRU ROOF TO KEF-3.
  - EXISTING DUCT PENETRATIONS SHALL REMAIN. VERIFY IN FIELD FOR EXACT LOCATIONS.
  - EXISTING SMOKE DETECTOR SHALL REMAIN. VERIFY IN FIELD. PROVIDE NEW AS REQUIRED.
  - 19"X19" SA DUCT UP THRU ROOF TO MAU-1.
  - 10" EA DUCT UP THRU ROOF.
  - NOT USED.
  - PROVIDE U.L. LISTED BALANCING BAFFLES FROM HOOD MANUFACTURER.

**NOTES AND SPECIFICATIONS**

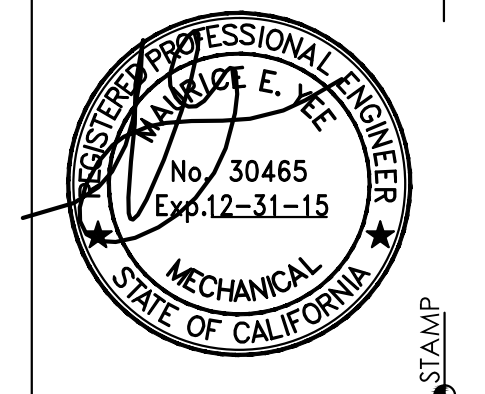


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 E-mail: johnnyl@rpmpe.com

**TSUKURU USA**  
 CORPORATION  
 2401 208th St., #5, Torrance, CA 90503  
 TEL: (310) 516-1945 FAX: (310) 516-2672

NO.	DATE	DESCRIPTION
1	11/2/14	PER CITY BLDG COMMENTS
2	11/20/14	PER HEALTH DEPT COMMENTS
3	12/16/14	PER HEALTH DEPT COMMENTS
4	01/22/15	REVISION CHANGES

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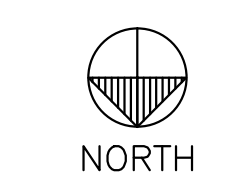


DRAWING TITLE  
**HVAC PLAN**

PROJECT MGR.	REF. NUMBER
AS NOTED	RPM

SHEET NUMBER  
**M-2**

HVAC PLAN



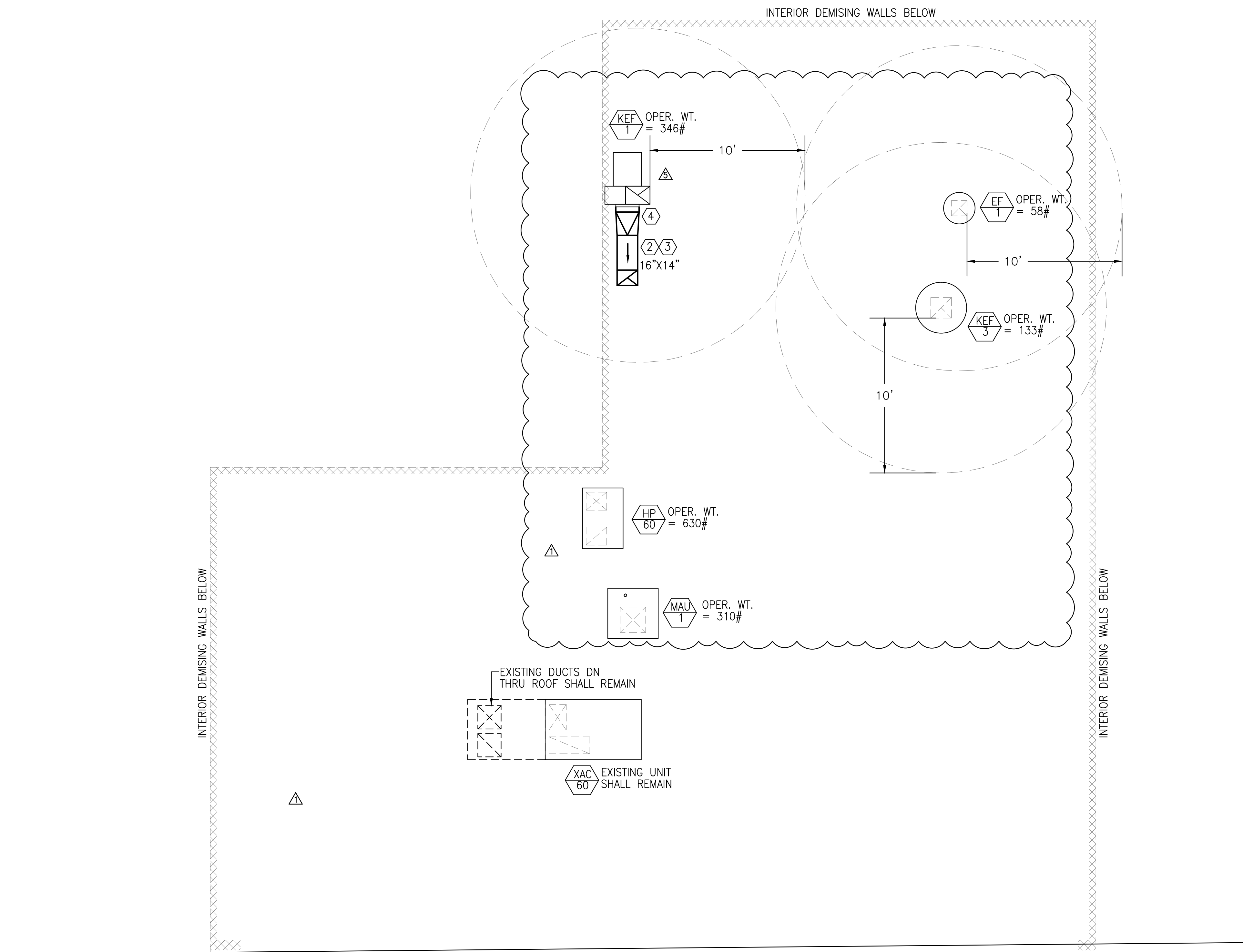
SCALE  
 1/4"=1'-0"

3

KEY PLAN

SCALE  
 N.T.S.

2



**GENERAL NOTES**

- EXISTING BUILDING INSULATION SHALL REMAIN.
- CONTRACTOR SHALL VERIFY EXISTING CONDITION AND SIZE OF EXISTING ROOFTOP UNITS, GRILLES, AND DUCTWORK. NOTIFY ENGINEER IF DUCTS ARE NOT CAPABLE OF PROVIDING AIRFLOW NOTED.
- ALL EXISTING HVAC EQUIPMENT SHALL BE SERVICED TO OPTIMAL CONDITIONS. INFORM ARCHITECT OR ENGINEER IF ANY NEED TO BE REPLACED PRIOR TO BID.
- ALL EXHAUST OUTLETS SHALL BE 10' AWAY FROM ANY AIR INTAKE OPENINGS.

**KEYED NOTES**

- NEW HVAC UNIT, HP60, SHALL REPLACE EXISTING. REUSE/ALTER EXISTING SEWERINGS AS REQUIRED.
- SLOPE DN AT 1/4" PER FOOT FROM EXHAUST FAN TOWARDS ROOF PENETRATION. FOLLOW ARROW AS SHOWN.
- ALL WELDED STEEL DUCT 16 GA MIN. THICKNESS. (TYP. FOR ALL EA GREASE DUCTWORK SHOWN IN PLAN).
- PROVIDE DUCT TRANSITIONS TO ALL EQUIPMENT AS REQUIRED.



PER CITY BLDG COMMENTS	11/12/14
PER HEALTH DEPT COMMENTS	11/20/14
PER HEALTH DEPT COMMENTS	12/16/14
REVISION CHANGES	01/12/2015

REVISIONS

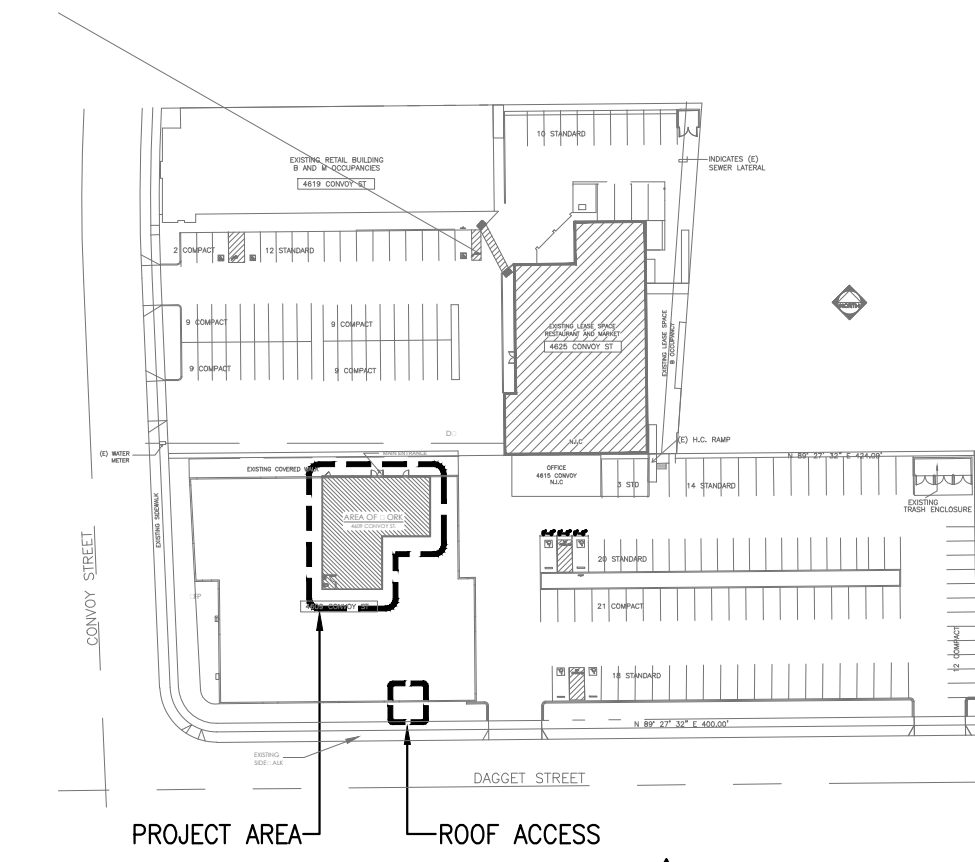
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STAMP

**NOTES AND SPECIFICATIONS**

1



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DRAWING TITLE  
**ROOF PLAN**

PROJECT MGR.	REF. NUMBER
SCALE AS NOTED	DATE
	DRAWN BY
	RPM
SHEET NUMBER	

**M-3**

**HVAC PLAN**



NORTH

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

**KEY PLAN**

SCALE	2
N.T.S.	

**HOOD INFORMATION - Job#2223263**

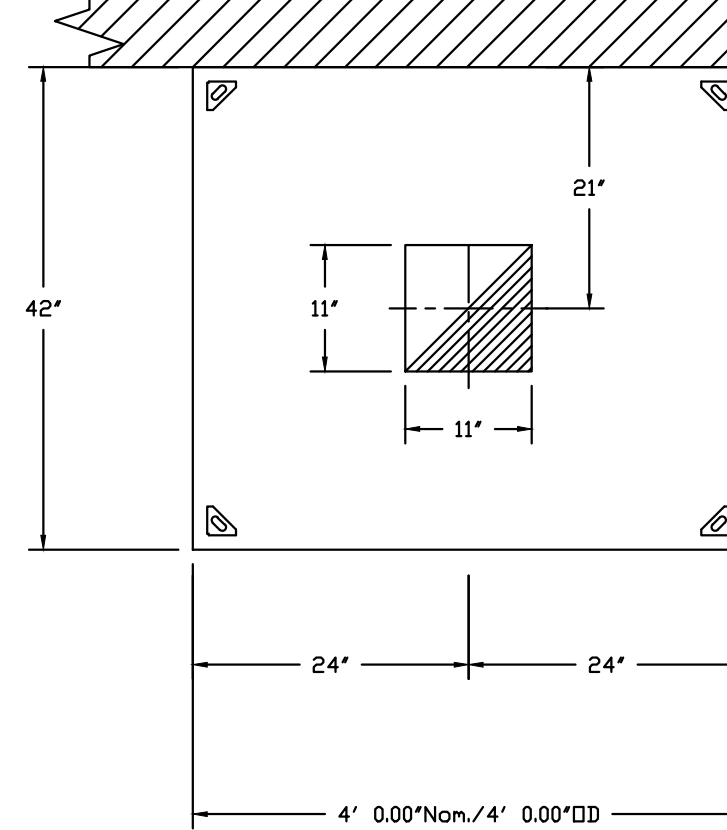
HOOD NO.	TAG	MODEL	LENGTH	MAX. COOKING TEMP.	TOTAL EXH. CFM	EXHAUST PLENUM RISER(S)			HOOD CONSTRUCTION	HOOD CONFIG.		
						WIDTH	LENG.	DIA.		CFM	S.P.	END TO END
1	34	5424 ND-2	12' 0.00'	450 Deg.	2600	10'	12"	1300	-0.370"	430 SS	ALONE	ALONE
2	35	4224 VHB-G	4' 0.00'	700 Deg.	800	11'	11"	800	-0.110"	304 SS	100%	ALONE
3	36	4224 VHB	4' 9.00'	700 Deg.	800	11'	11"	800	-0.090"	430 SS	100%	ALONE

**HOOD INFORMATION**

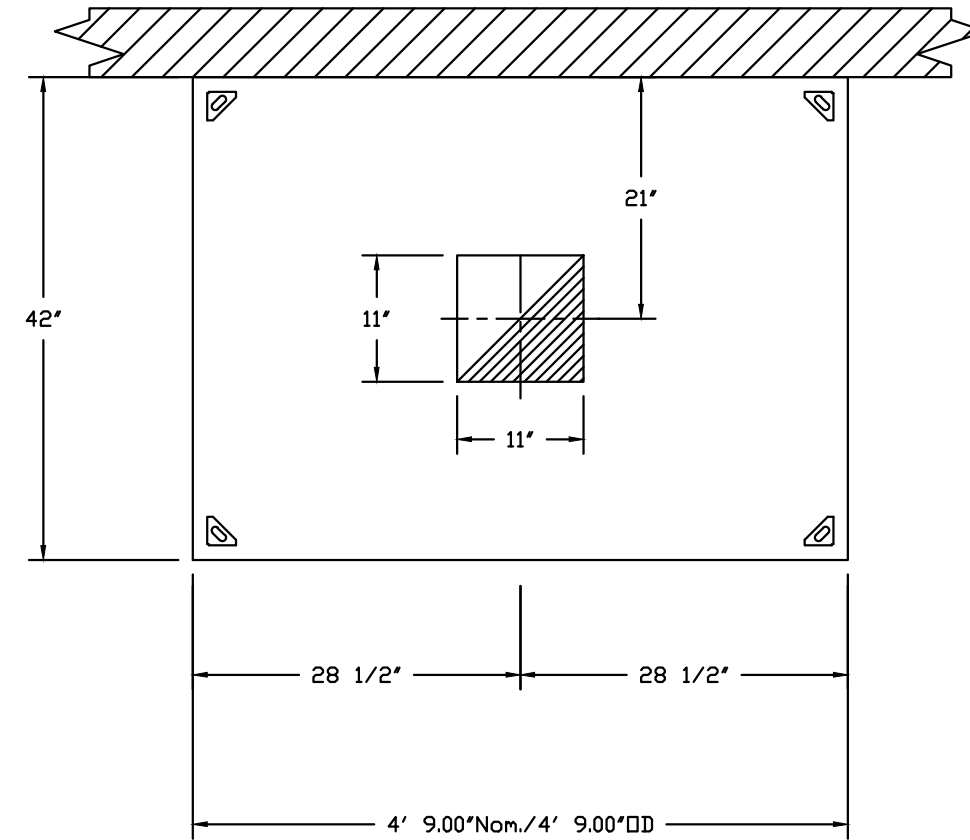
HOOD NO.	TAG	TYPE	FILTER(S)			LIGHT(S)			UTILITY CABINET(S)				FIRE SYSTEM PIPING	HOOD HANGING WGT	
			QTY.	HEIGHT	LENGTH	EFFICIENCY @ 9 MICRONS	QTY.	TYPE	WIRE GUARD	LOCATION	FIRE SYSTEM	SIZE			ELECTRICAL
1	34	SS Baffle with Handles	9	16"	16"	30%	4	L55 Series E26	NO					NO	463 LBS
2	35						0							NO	145 LBS
3	36						0							NO	154 LBS

**HOOD OPTIONS**

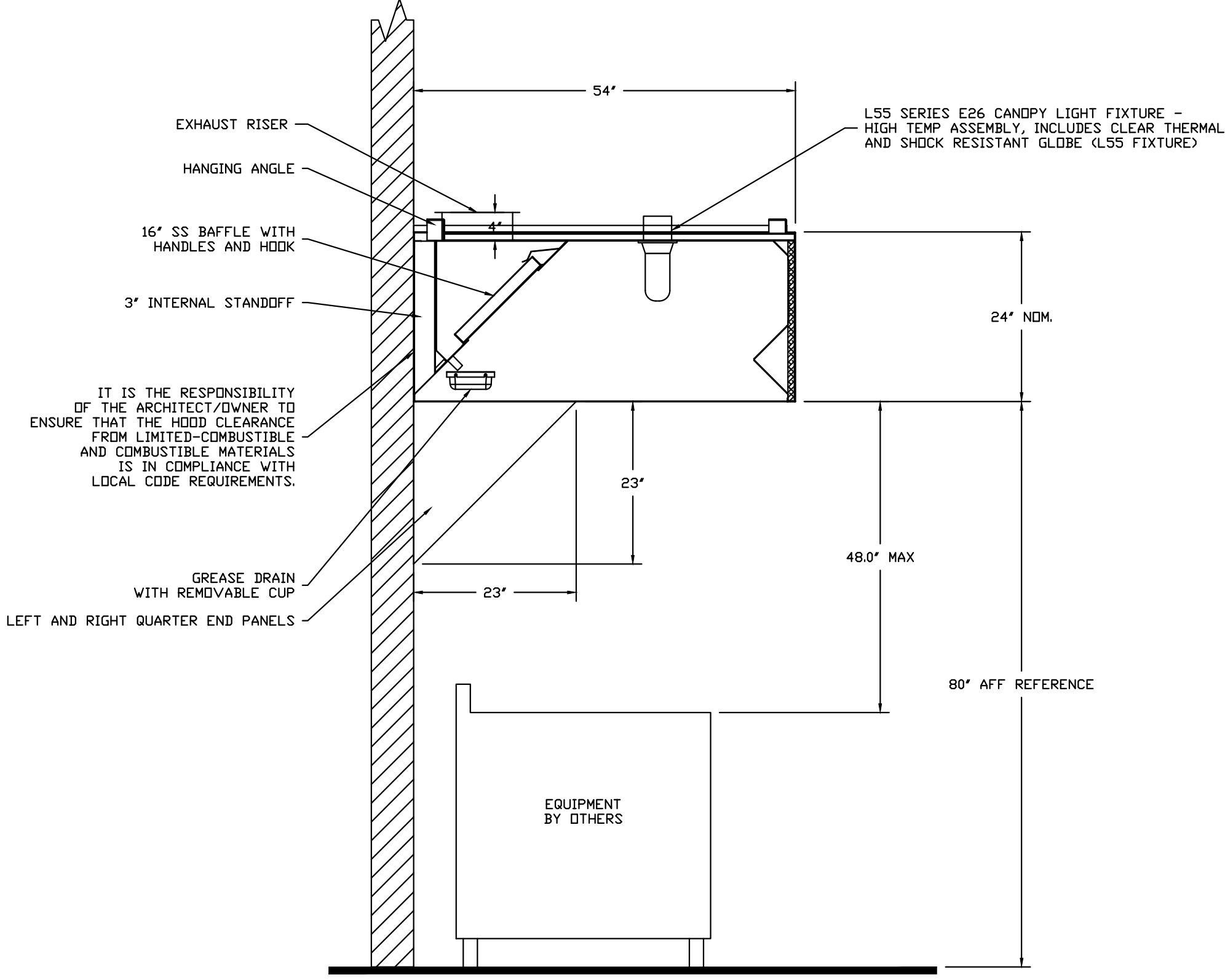
HOOD NO.	TAG	OPTION
1	34	LEFT QUARTER END PANEL 23' Top Width, 0' Bottom Width, 23' High 430 SS
		RIGHT QUARTER END PANEL 23' Top Width, 0' Bottom Width, 23' High 430 SS



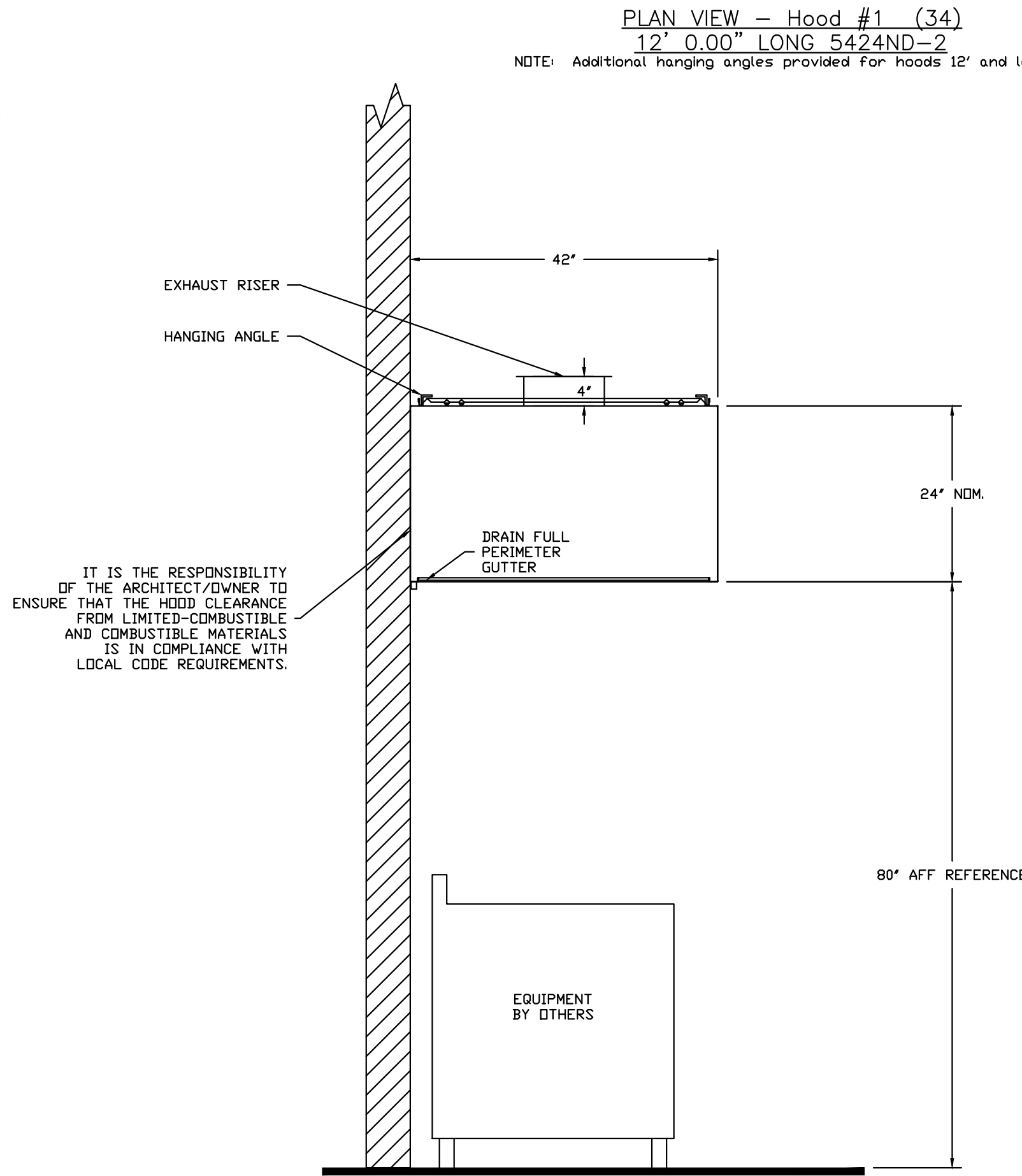
PLAN VIEW - Hood #2 (35)  
4' 0.00" LONG 4224VHB-G



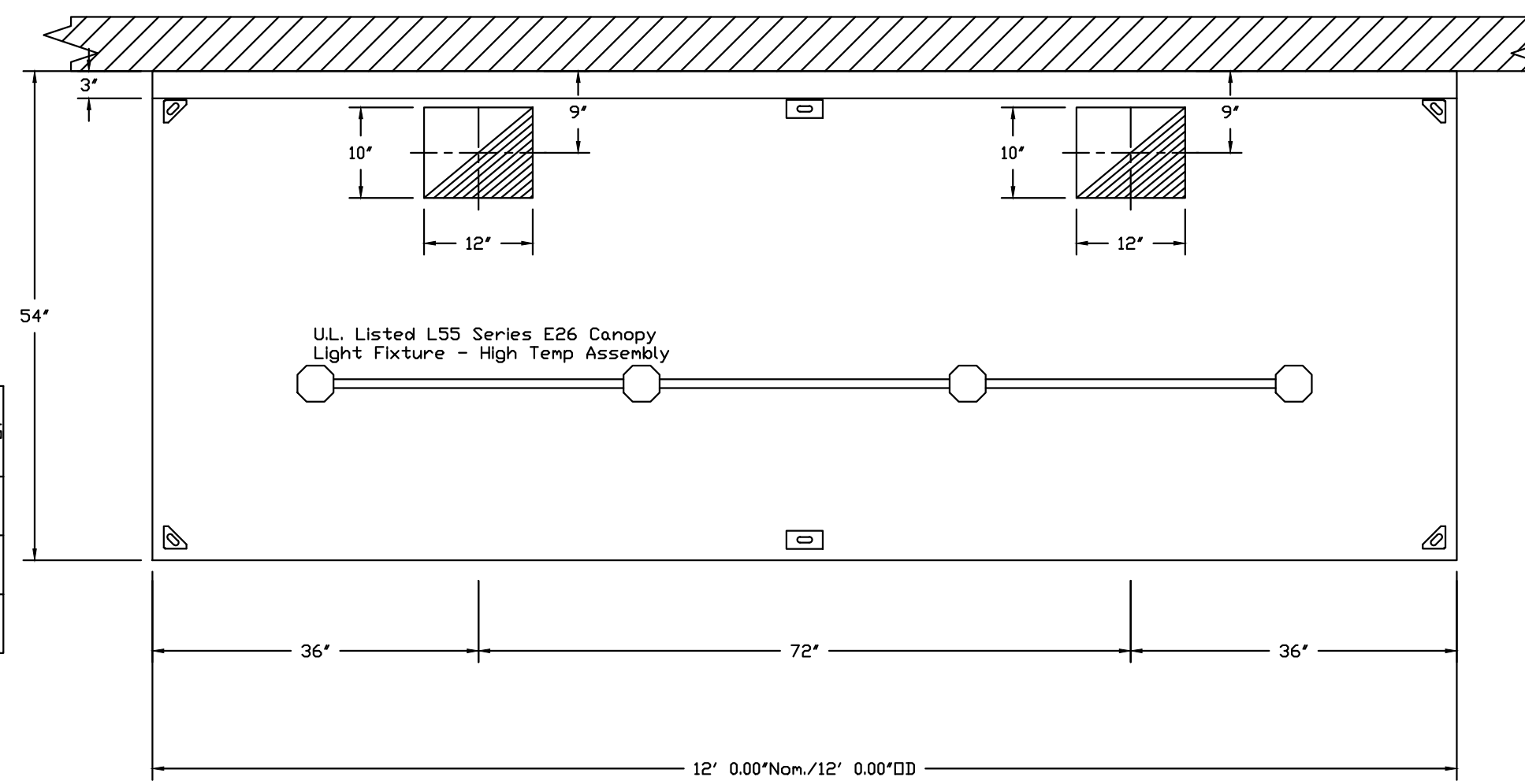
PLAN VIEW - Hood #3 (36)  
4' 9.00" LONG 4224VHB



SECTION VIEW - MODEL 5424ND-2  
HOOD - #1 (34)



SECTION VIEW - MODEL 4224VHB-G  
HOOD - #2 (35)



PLAN VIEW - Hood #1 (34)  
12' 0.00" LONG 5424ND-2

NOTE: Additional hanging angles provided for hoods 12' and longer.

**REVISIONS**

NO.	DESCRIPTION	DATE

**CAPTIVE**  
Southern California Office  
2015 Red Hill Ave, Suite C106, Costa Mesa, CA, 92626 PHONE: (714) 957-1500 FAX: (919) 227-5975 EMAIL: reg86@captive.com

Kula Sushi - San Diego CA - R2  
SAN DIEGO, CA, 92111

DATE: 1/12/2015  
DWG.#: 2223263  
DRAWN BY: AHJ-86  
SCALE: 3/4" = 1'-0"  
MASTER DRAWING

**SHEET NO.**  
1

**TSUKURU USA**  
CORPORATION  
2401 208th St., #5, Torrance, CA 90503  
TEL: (310) 516-1945 FAX: (310) 516-2672

PER QTY BLDG COMMENTS 11/12/14  
PRE-HEALTH DEPT. COMMENTS 11/20/14  
PER-HEALTH DEPT. COMMENTS 12/16/14  
REVISION CHANGES 01/12/2015

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No. 30465  
Exp. 12-31-15  
MECHANICAL  
STATE OF CALIFORNIA

**KULA SUSHI**  
4609 CONVOY ST. SUITE F,  
SAN DIEGO, CA 92111

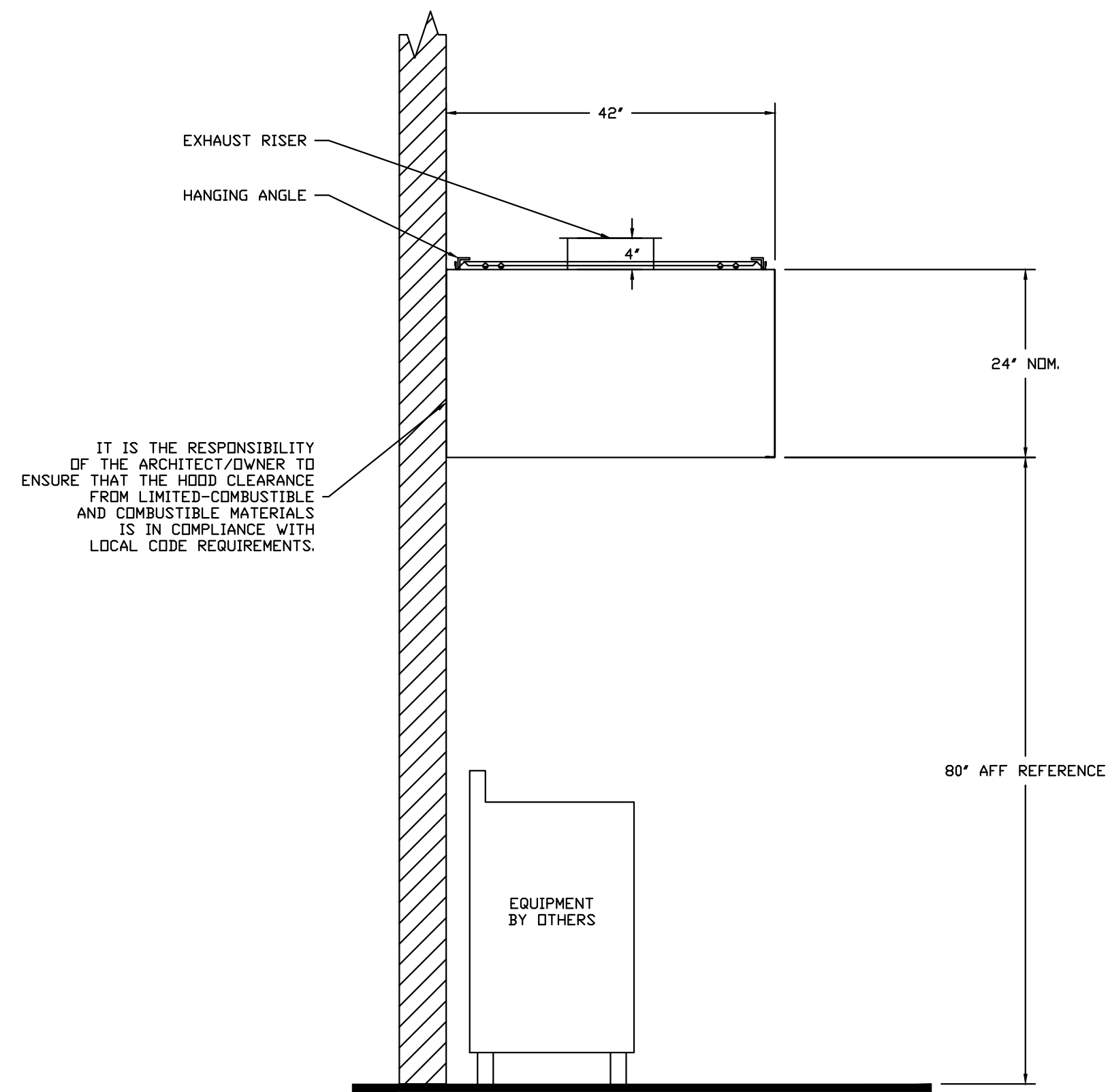
OWNER / TENANT  
**KULA**  
REVOLVING SUSHI BAR

DRAWING TITLE  
HOOD SPECIFICATIONS

PROJECT MGR. REF. NUMBER  
SCALE AS NOTED DATE DRAWN BY  
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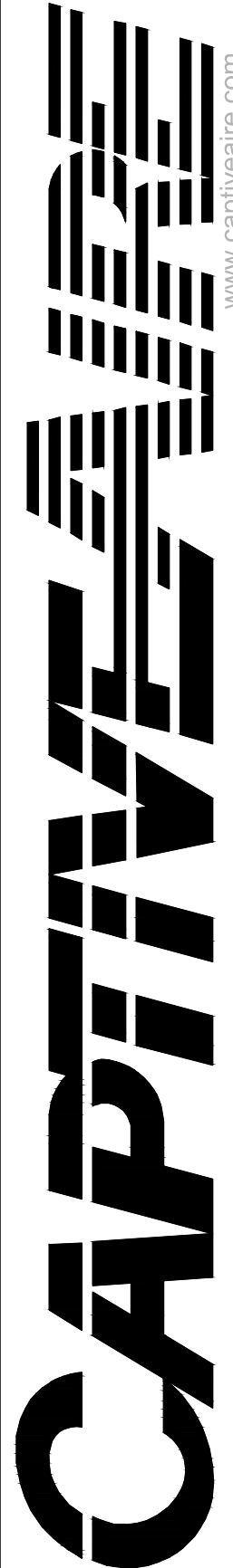
SHEET NUMBER  
**M-4.1**

**RPM**  
Engineers, Inc.  
102 DISCOVERY  
Irving, CA 92618  
Tel: 949-450-1229  
Fax: 949-450-1464  
Contact: Johnny Loi x206  
E-mail: johnnyl@rpmpe.com



SECTION VIEW - MODEL 4224VHB  
HOOD - #3 (36)

REVISIONS	
DESCRIPTION	DATE

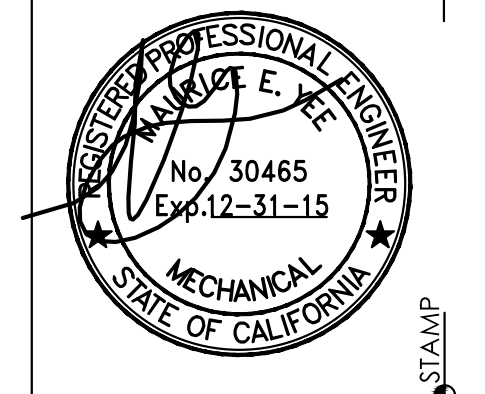
  
 Southern California Office  
 2915 Red Hill Ave, Suite C106, Costa Mesa, CA, 92626 PHONE: (714) 957-1500 FAX: (919) 227-5975 EMAIL: reg86@captiveair.com

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 SAN DIEGO, CA, 92111  
 DATE: 1/12/2015  
 DWG.#: 2223263  
 DRAWN BY: AHJ-86  
 SCALE: 3/4" = 1'-0"  
 MASTER DRAWING

SHEET NO. 2

REVISIONS
PER-CITY BLDG COMMENTS 11/12/14 PER-HEALTH DEPT. COMMENTS 11/20/14 PER-HEALTH DEPT. COMMENTS 12/16/14 REVISION CHANGES 01/12/2015

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DRAWING TITLE  
HOOD SPECIFICATIONS

PROJECT MGR.	REF. NUMBER
SCALE AS NOTED	DATE
DRAWN BY RPM	SHEET NUMBER

M-4.2

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 Engineers, Inc.  
 102 DISCOVERY  
 Irvine, CA 92618  
 Tel: 949-450-1229  
 Fax: 949-450-1454  
 Contact: Johnny Lai x206  
 E-mail: johnny@rpmpe.com

**EXHAUST FAN INFORMATION - Job#2223263**

FAN UNIT NO.	TAG	FAN UNIT MODEL #	CFM	ESP.	RPM	H.P.	B.H.P.	Ø	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS.)	SDNES
1		USB118BD-RM	2600	1.000	1058	1.000	0.8440	3	208	3.3	1333 FPM	346	13.1
2	KEF-3	NCA16HPFA	1600	1.000	999	0.500	0.4880	3	208	1.8		133	8.1

**FAN OPTIONS**

FAN UNIT NO.	TAG	OPTION (Qty. - Descr.)
1		1 - BI - Discharge Orientation Vertical Upper Left - CW Inlet Side.
		1 - Utility Set Grease Cup
		1 - BI18 - Inlet Ring Used To Connect Non-Factory Duct.
		1 - Rubber Vibration Isolators for BI Utility Sets (set of 6)

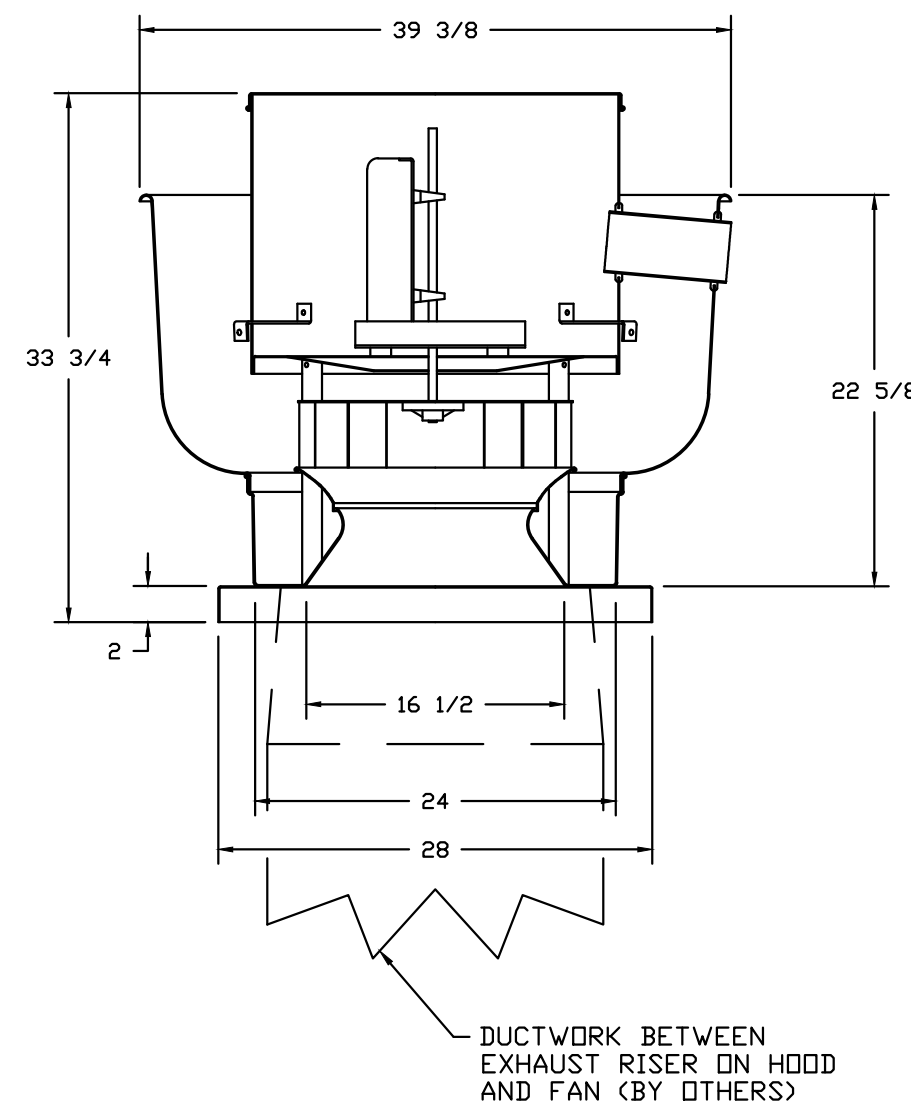
**FAN ACCESSORIES**

FAN UNIT NO.	TAG	EXHAUST				SUPPLY		
		GREASE CUP	GRAVITY DAMPER	WALL MDUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MDUNT
1		YES						
2	KEF-3							

**CURB ASSEMBLIES**

NO.	DN FAN	WEIGHT	ITEM	SIZE
1	# 1	25 LBS	Curb	4.000"W x 48.000"L x 10.000"H
2	# 2	25 LBS	Curb	26.500"W x 26.500"L x 14.000"H

**FAN #2 NCA16HPFA - EXHAUST FAN (KEF-3)**



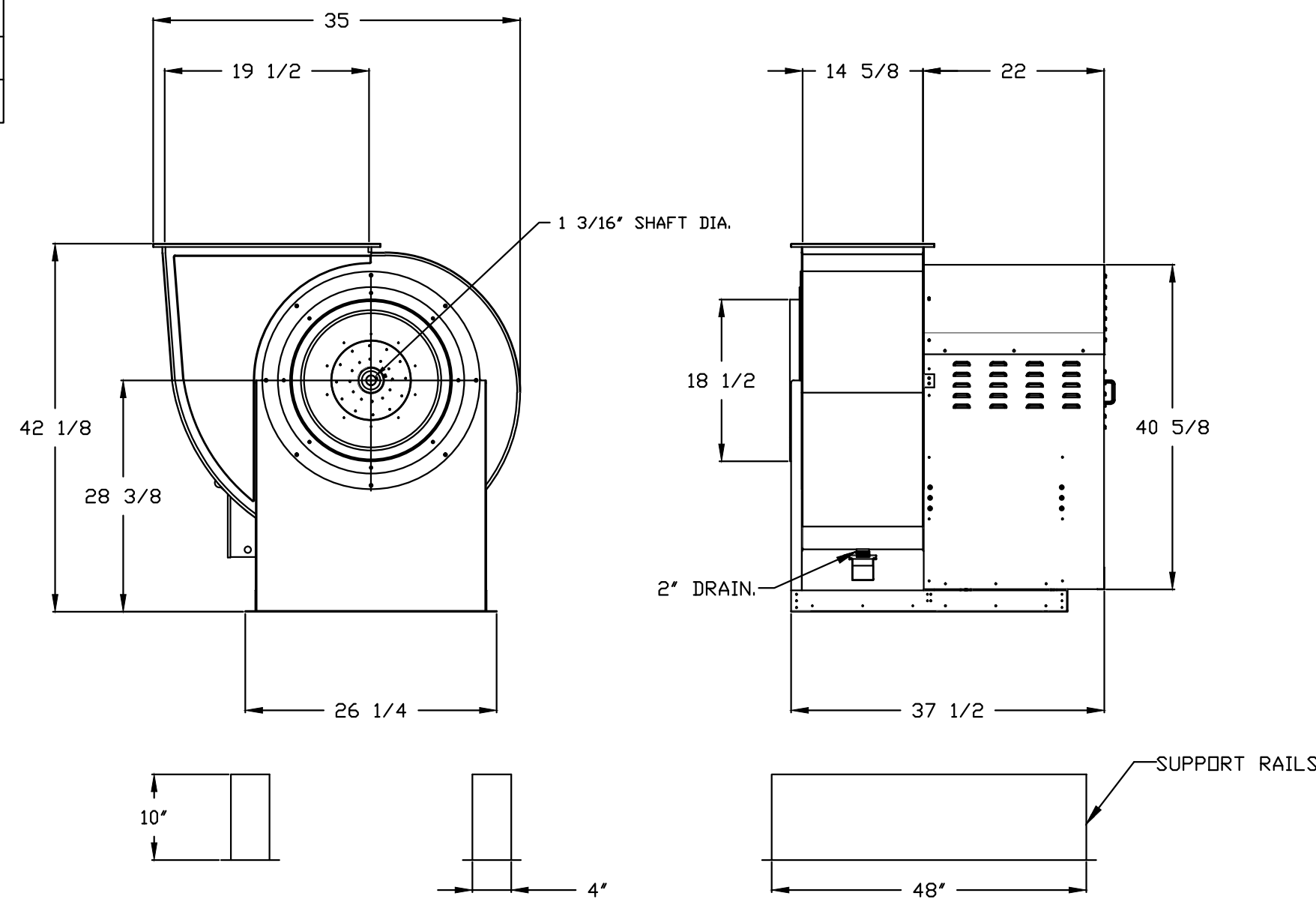
**FEATURES:**

- ROOF MOUNTED FANS
- RESTAURANT MODEL
- UL705 AND UL762
- AMCA SOUND AND AIR CERTIFIED
- WIRING FROM MOTOR TO DISCONNECT SWITCH
- WEATHERPROOF DISCONNECT
- HIGH HEAT OPERATION 300°F (149°C)
- GREASE CLASSIFICATION TESTING

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 DETERIORATING 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.

**FAN #1 USB118BD-RM - EXHAUST FAN**



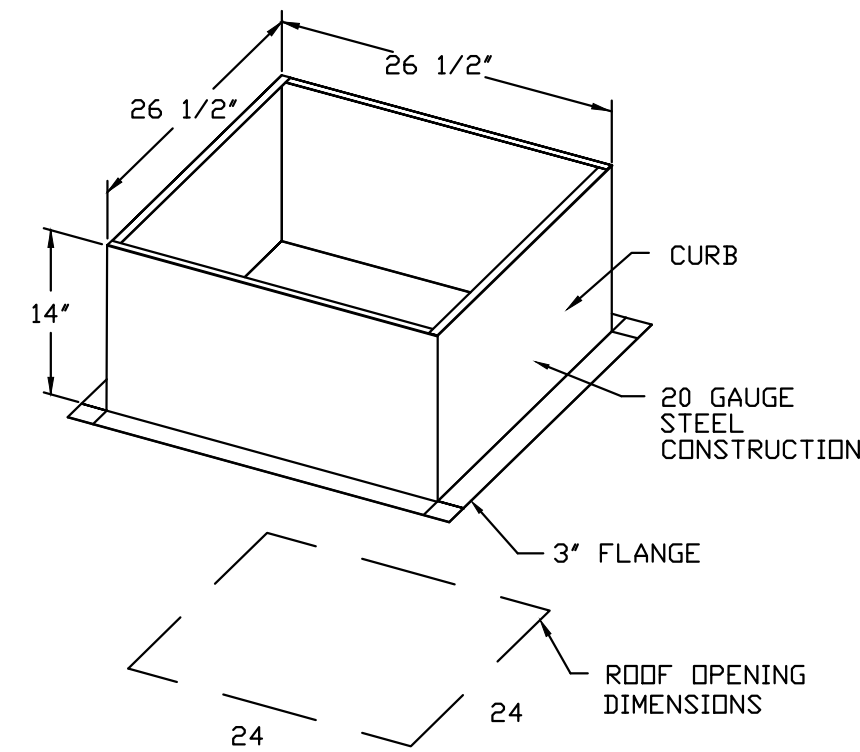
**FEATURES:**

- ROOF MOUNTED FANS
- RESTAURANT MODEL
- UL705
- UL762
- HIGH HEAT OPERATION DIRECT DRIVE 350°F (176°C)
- HIGH HEAT OPERATION BELT DRIVE 350°F (176°C)
- HEAT SLINGER
- GREASE CLASSIFICATION TESTING
- 2" DRAIN
- MOTOR WEATHER COVER
- FULLY SEALED SCROLL HOUSING
- SCROLL ACCESS DOOR
- FLANGE 1 1/4" - 11 THRU 20.
- FLANGE 2" - 24 THRU 36.

**OPTIONS**

- BI - DISCHARGE ORIENTATION VERTICAL UPPER LEFT - CW INLET SIDE.
- UTILITY SET GREASE CUP
- BI18 - INLET RING USED TO CONNECT NON-FACTORY DUCT.
- RUBBER VIBRATION ISOLATORS FOR BI UTILITY SETS (SET OF 6)

NORMAL TEMPERATURE TEST BELT DRIVE  
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 350°F (176°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.



**REVISIONS**

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**CAPTIVE**  
Southern California Office  
2015 Red Hill Ave, Suite C106, Costa Mesa, CA, 92626 PHONE: (714) 957-1500 FAX: (919) 227-5975 EMAIL: reg86@captiveair.com

Kula Sushi - San Diego CA - R2  
SAN DIEGO, CA, 92111

**DATE:** 1/12/2015  
**DWG.#:** 2223263  
**DRAWN BY:** AHJ-86  
**SCALE:** 3/4" = 1'-0"  
MASTER DRAWING

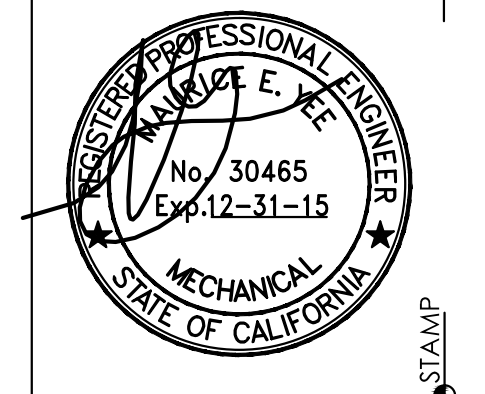
**SHEET NO.**  
3

**TSUKURU USA**  
CORPORATION  
2401 208th St. #5, Torrance, CA 90503  
TEL: (310) 516-1945 FAX: (310) 516-2672

NO.	DESCRIPTION	DATE
1	PER CITY BLDG COMMENTS	11/2/14
2	PER HEALTH DEPT COMMENTS	11/20/14
3	PER HEALTH DEPT COMMENTS	12/16/14
4	REVISION CHANGES	01/12/2015

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SAN DIEGO, CA 92111

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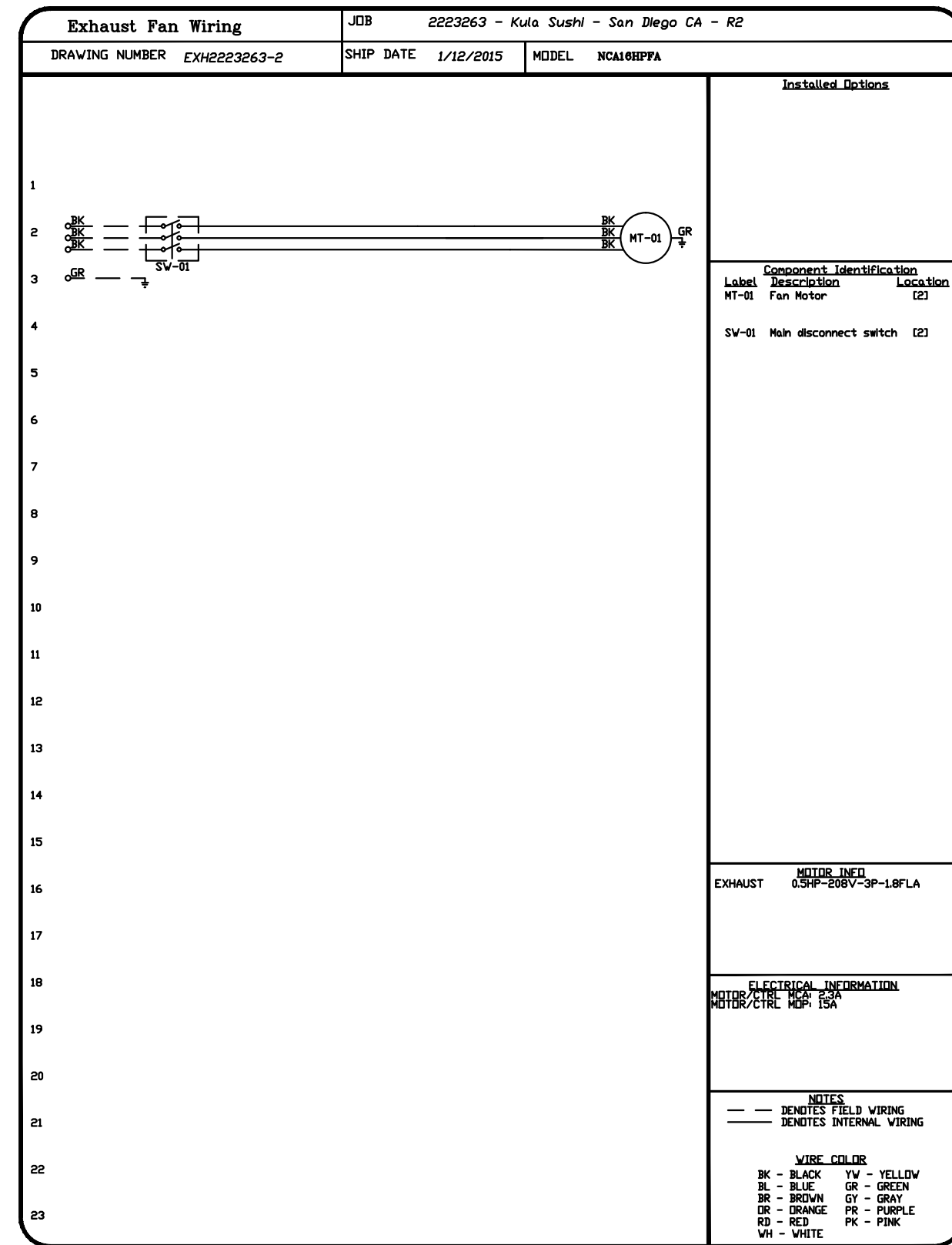
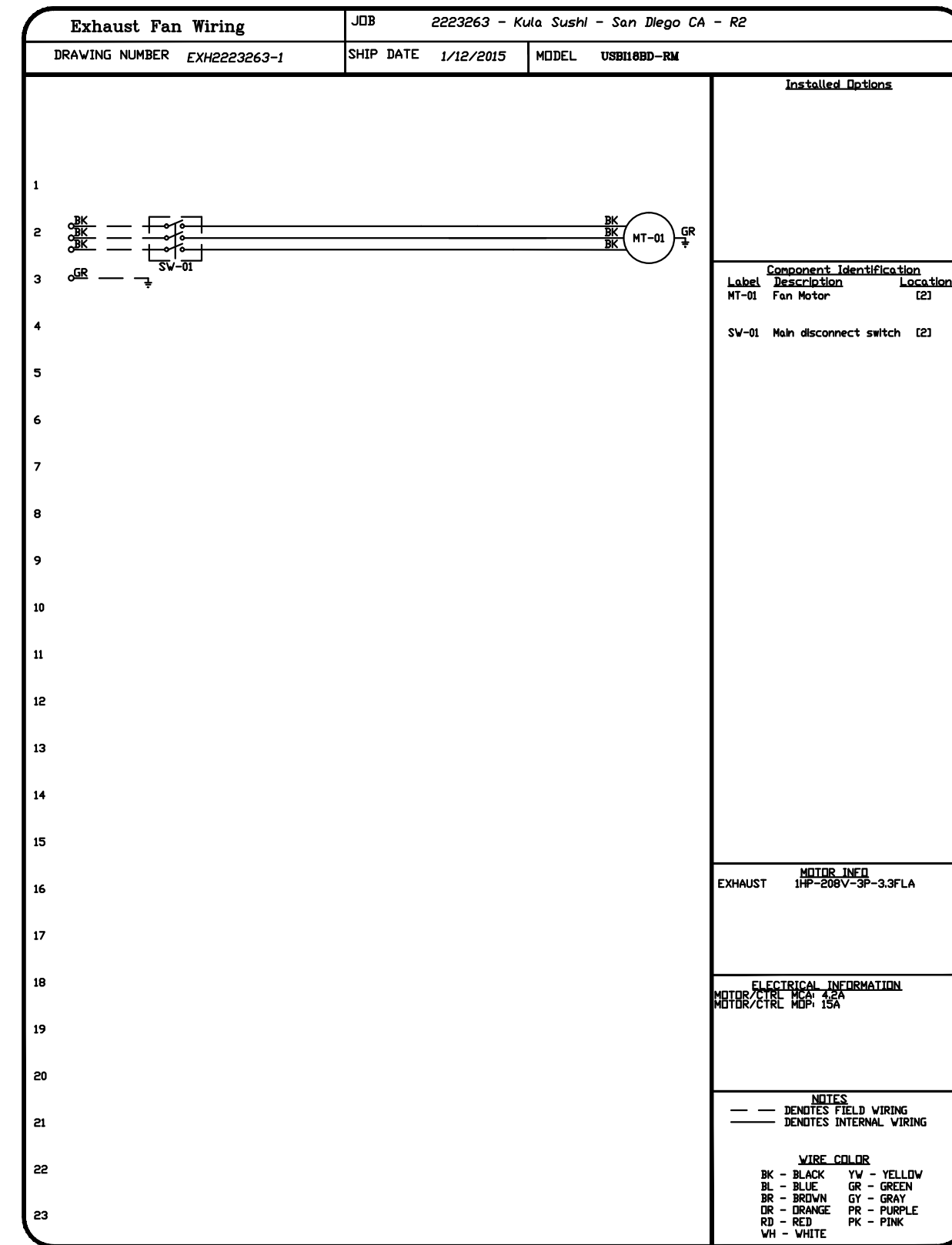
**KULA**  
REVOLVING SUSHI BAR

DRAWING TITLE  
FAN SPECIFICATIONS

PROJECT MGR. REF. NUMBER  
SCALE DATE DRAWN BY  
AS NOTED - RPM

SHEET NUMBER  
M-4.3

**RPM**  
Engineers, Inc.  
102 DISCOVERY  
Irvine, CA 92618  
Tel: 949-450-1229  
Fax: 949-450-1464  
Contact: Johnny Loi x206  
E-mail: johnny@rpmpe.com



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Southern California Office  
2915 Red Hill Ave, Suite C106, Costa Mesa, CA, 92626 PHONE: (714) 957-1500 FAX: (919) 227-5975 EMAIL: reg86@captiveair.com

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**SHEET NO.**  
4

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Engineers, Inc.  
102 DISCOVERY  
Irvine, CA 92618  
Tel: 949-450-1229  
Fax: 949-450-1454  
Contact: Johnny Lai x206  
E-mail: johnny@rpmpe.com

TSUKURU USA CORPORATION  
2401 208th St. #5, Torrance, CA 90503  
TEL: (310) 516-1945 FAX: (310) 516-2672

11/12/14 PER-CITY BLDG COMMENTS  
11/20/14 PER-HEALTH DEPT. COMMENTS  
12/16/14 PER-HEALTH DEPT. COMMENTS  
01/12/2015 REVISION CHANGES

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No. 30465  
Exp. 12-31-15  
MECHANICAL  
STATE OF CALIFORNIA

KULA SUSHI  
4609 CONVOY ST. SUITE F,  
SAN DIEGO, CA 92111

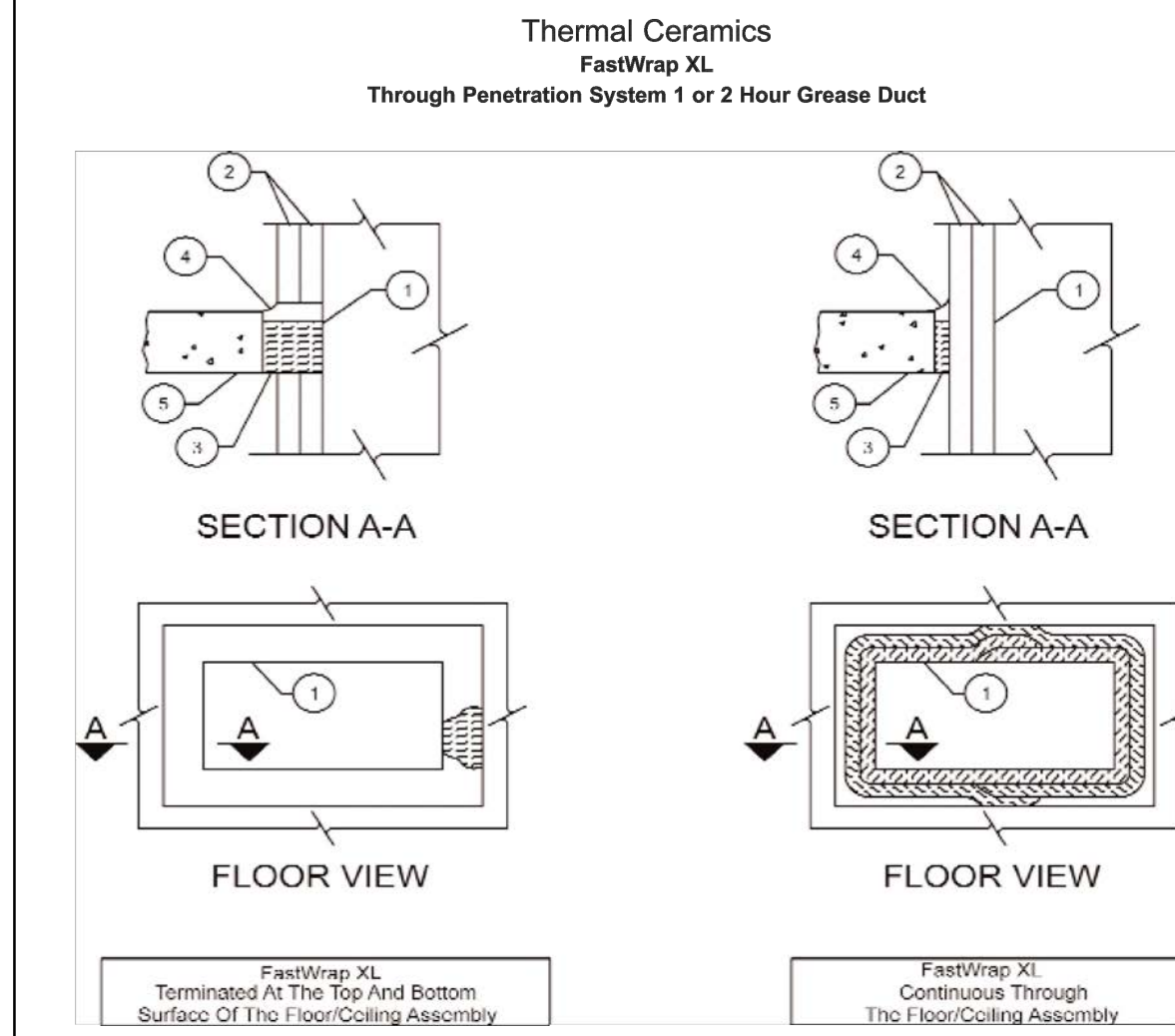
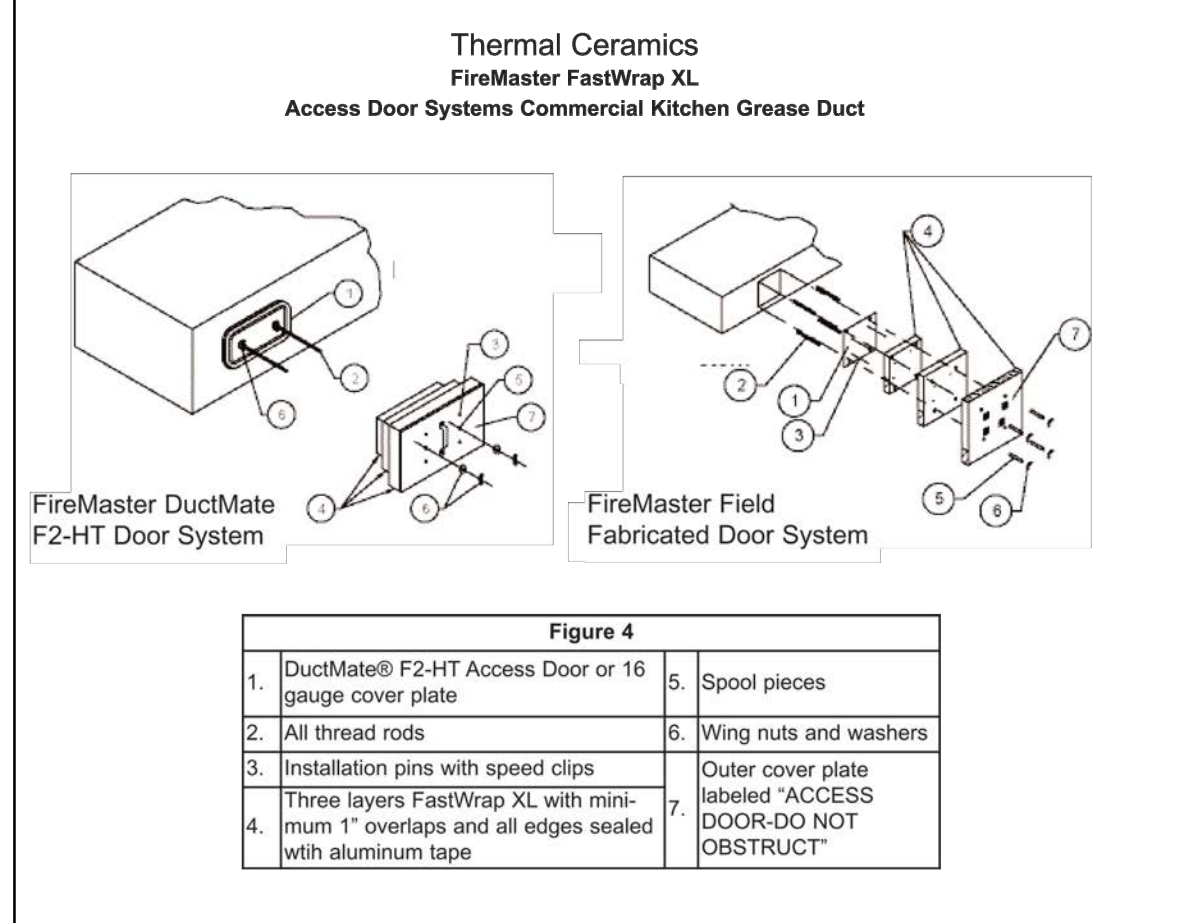
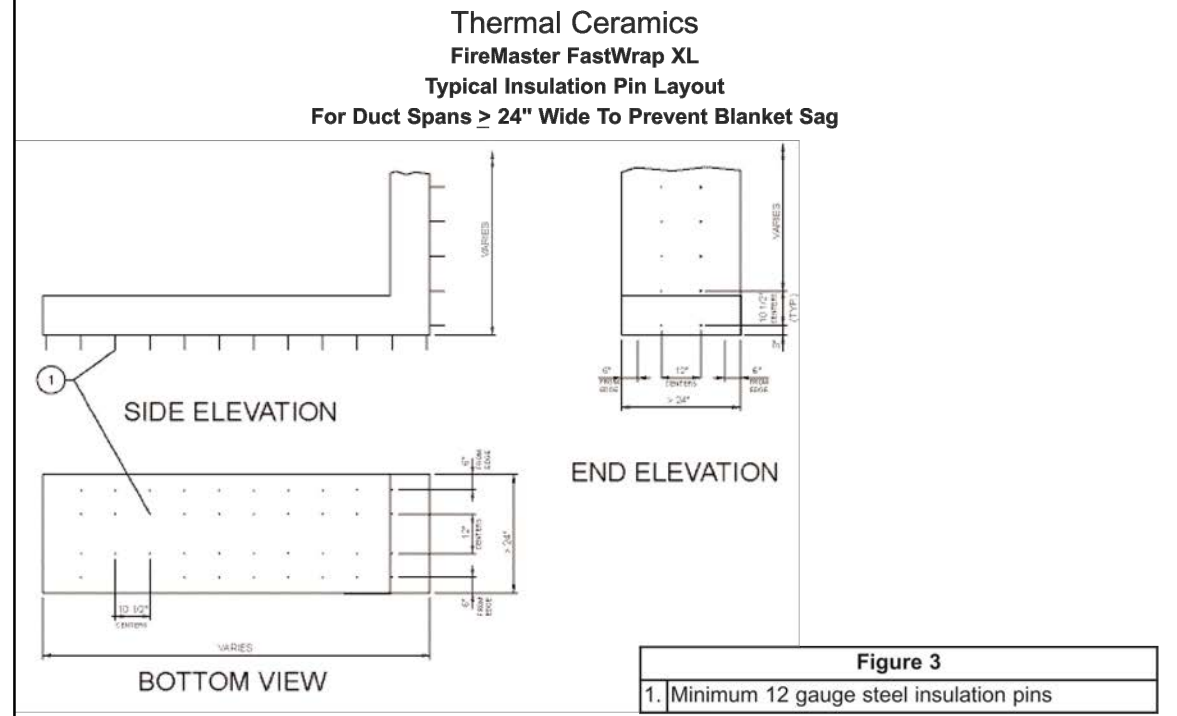
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REVOLVING SUSHI BAR

DRAWING TITLE  
FAN WIRING  
DIAGRAMS

PROJECT MGR. REF. NUMBER  
SCALE AS NOTED DATE DRAWN BY  
AS NOTED - RPM

SHEET NUMBER  
**M-4.4**

RPM #14-505 01/15/15



**Figure 5**

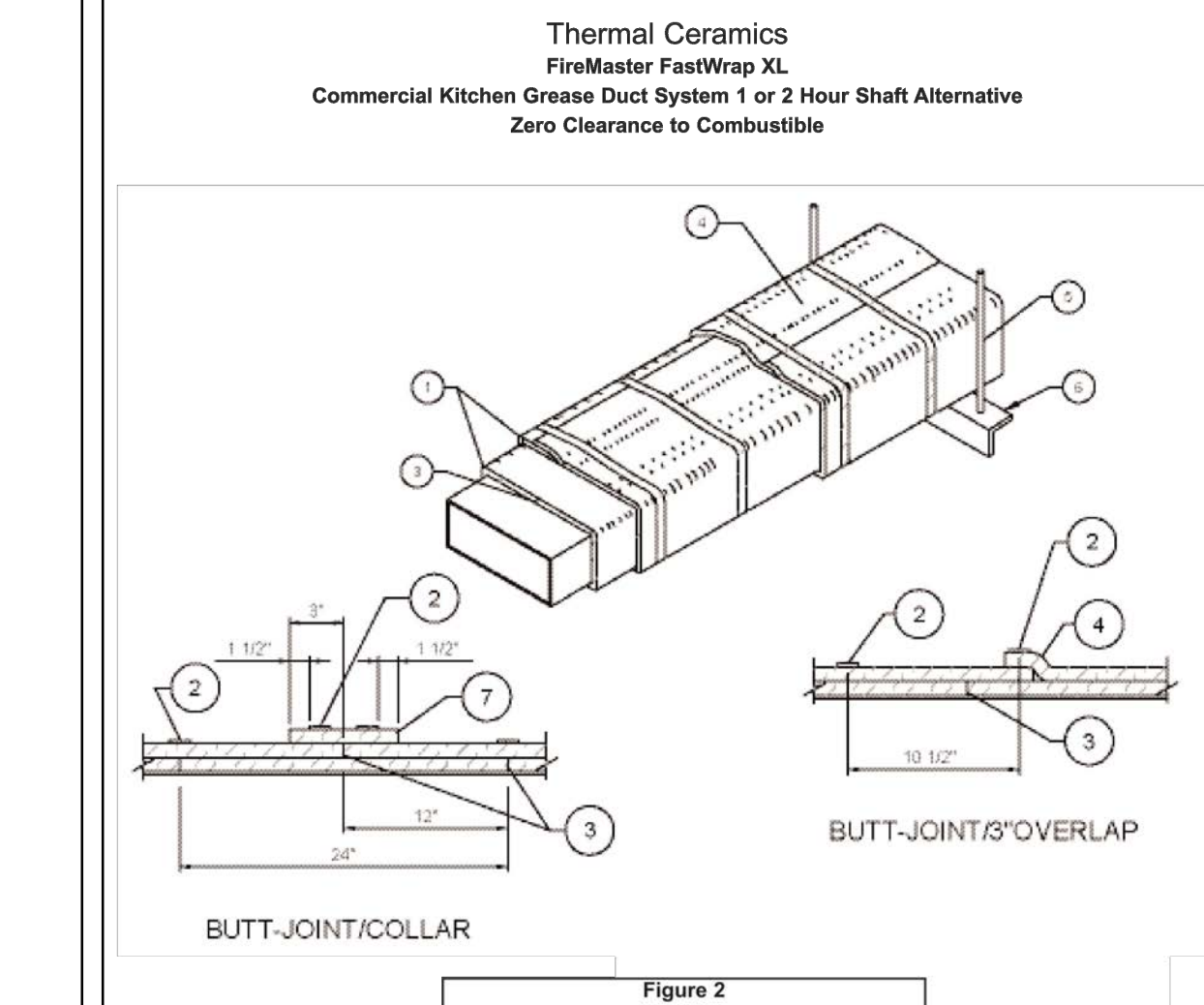
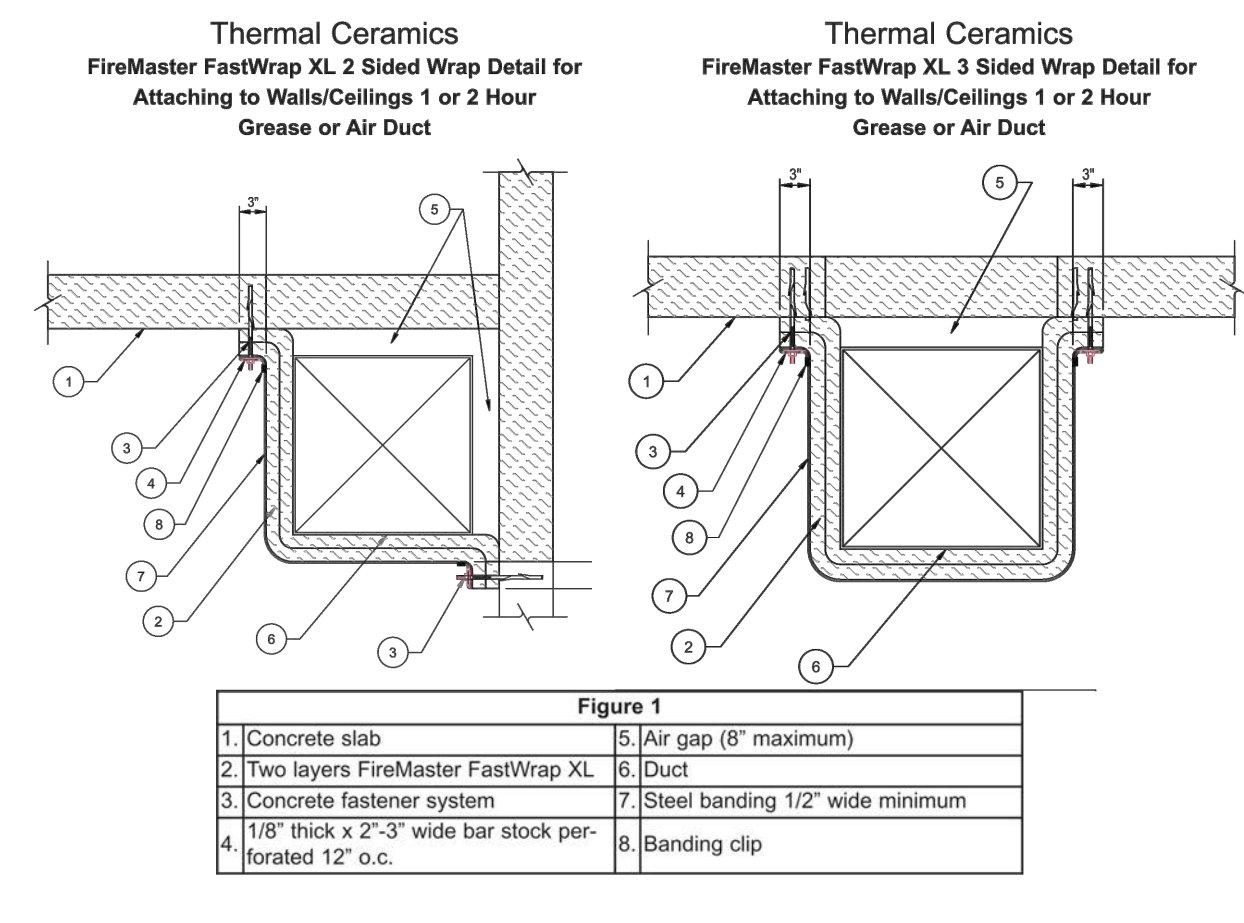
1. Duct
2. Two layers FastWrap XL
3. Scrap pieces of FastWrap XL
4. Approved Through Penetration FireStop Sealant
5. Rated floor or wall

**F. Through-Penetration Fire Stop System (Figure 5)**  
When the duct penetrates a fire rated wall, ceiling, or floor, an approved fire stop system must be employed.

**9. Maintenance and Repair**  
No maintenance is required when installed in accordance with Thermal Ceramics installation instructions.

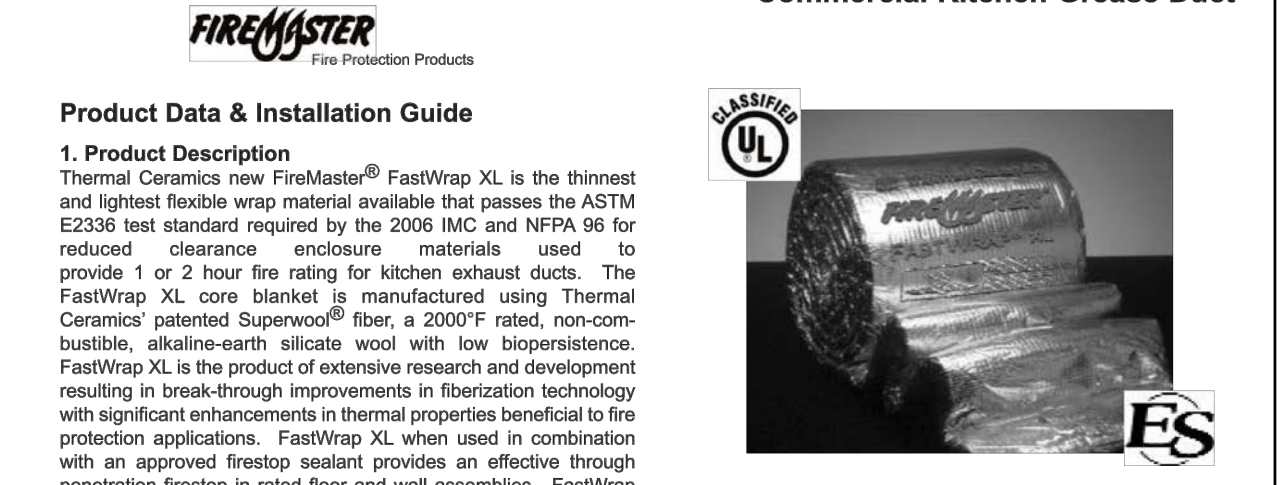
**10. Limitations**

- Thermal Ceramics FastWrap XL shall be installed in accordance with these installation instructions. The integrity of FastWrap XL systems is limited to the quality of the installation.



**Figure 2**

1. Two layers FireMaster FastWrap XL
2. Steel banding 1/2" wide minimum
3. Tight butt joints on inner layer
4. Minimum 3" overlap on perimeter and between adjacent blanket on outside layer
5. Minimum 3/8" diameter hanger rod
6. Minimum 2" x 2" x 1/8" angle
7. Optimal 6" FastWrap XL collar



**Product Data & Installation Guide**

**1. Product Description**  
Thermal Ceramics new FireMaster® FastWrap XL is the thinnest and lightest flexible wrap material available that passes the ASTM E2336 test standard required by the 2006 IMC and NFPA 96 for reduced clearance enclosure materials used to provide 1 or 2 hour fire rating for kitchen exhaust ducts. The FastWrap XL core blanket is manufactured using Thermal Ceramics' patented Superwool® fiber, a 2000°F rated, non-combustible, alkaline-earth silicate wool with low biopersistence. FastWrap XL is the product of extensive research and development resulting in break-through improvements in fiberization technology with significant enhancements in thermal properties beneficial to fire protection applications. FastWrap XL when used in combination with an approved firestop sealant provides an effective through penetration firestop in rated floor and wall assemblies. FastWrap XL is UL Classified and is part of UL's Listing and Follow-Up Service Program to ensure the consistent quality essential to the critical nature of this life-safety application.

**Product Features**

- Approval as a 1 or 2 hour shaft alternative in kitchen grease duct applications
- Zero clearance to combustibles at any location
- Thin and Lightweight at 1/16" thick, 6 pcf density
- Contours easily to complex duct designs
- Butt joints on inside layer to save labor and material
- Fully foil encapsulated for fast and clean installation
- Completely inorganic and non-combustible
- Contains 2000°F rated fibers for added safety margin
- Contains no low temperature mineral or glass fibers
- Resistant to mold growth (ASTM D6329)
- Extensive Listings and detailed installation instructions
- Recognized and accepted by inspectors requiring less job-site engineering judgments
- Available in space saving 50 and 100 square foot rolls for optimal job-site storage
- Available in 48 inch widths for less joints and installation labor

**2. Applications**

- Applied in 2 layers to provide 1 or 2 hour fire protection to grease ducts exhausting Type 1 hoods per IMC 2006, NFPA 96 and 2006 APMO UMC

**3. Physical Characteristics**

Duct FireMaster Fire Protection Product	Unit Size	Units/Ctn.	Wt./Ctn.
FastWrap XL	Roll 15' x 24' x 25'	1	37.5 lbs.
FastWrap XL	Roll 15' x 48' x 25'	1	75 lbs.
FastWrap XL Collar	Roll 15' x 6" x 25'	4	37.5 lbs.

Color: White blanket with silver foil encapsulation

**4. Performance Specifications**

Reference Standard	Standard No.	Performance
GreaseDuct Enclosure System	ASTM E2336	Pass
Section 16.1 - Non-Combustibility	ASTM E136	Pass
Section 16.2-Fire Resistance (wall)	ASTM E119	Pass
Section 16.3 - Durability Test	ASTM C518	Pass
Section 16.4 - Internal Fire Test	ASTM E2336	Pass
Section 16.5 - Fire Engulfment (duct)	ASTM E814/E119	Pass

**Surface Burning Characteristics**

Flame Spread (foils/blanket)	Smoke Developed (foils/blanket)	Thermal Resistance (R-value)	Mold Growth (75% humidity)	Mold Growth (95% humidity)
ASTM E84	ASTM E84	ASTM C518 (70F)	ASTM D6329	ASTM D6329
5/0	5/0	4.2 per inch	Resistant	Resistant

**5. Listings/Building Code Reports**

Listed Uses	Agency	Listing
Grease Duct Enclosure System (Zero Clearance) - AC101 (ASTM E2336)	UL	G18
Grease Duct Enclosure System (Zero Clearance) - ASTM E2336	ICC-ES	ESR 2213
Through Penetration FireStop System - ASTM E814/UL 1479	UL	C-AJ-7119

**International Code Council - Engineering Service**

**6. Storage:**  
When space does not allow for a complete wrap applied to the pallets. Pallets should not be stacked.

**7. Installation**  
FastWrap XL shall be installed by a qualified contractor in accordance with manufacturer's instructions and referenced standards. See figures 1 to 5 for complete details.

**Materials and Equipment:**

- FastWrap XL blanket
- Aluminum foil tape
- Minimum 2" wide filament tape (optional)
- Carbon steel or stainless steel banding material, minimum 1/2" wide, minimum 0.015" thick, with steel banding clips
- Hand banding tensioner and crimping tool
- Minimum 12 gauge steel insulation pins, steel speed clips, minimum 1/2" x 1/2" square or 1/2" dia., or equivalent sized cup-head pins
- Capacitor discharge stud gun
- FireMaster F2-HT-XL3 Prefabricated Door or Field Fabricated Door Hardware
- An approved firestop sealant

**General:**  
To minimize waste, FastWrap XL blanket should be rolled out tautly before measuring. Cut edges of the blanket shall be taped with aluminum foil tape to prevent exposed edges of the insulation from wicking moisture from condensation or grease from a compromised leaking duct joint into the material and causing degradation of the fire barrier. Overlaps are used to block heat transfer in the event of duct deformation resulting from thermal expansion. FastWrap XL blanket may be installed with either a mechanical banding system or insulation pins and clips (see Mechanical Attachment Methods below and figures 1 and 2). Support hanger systems do not need to be wrapped provided that the hanger rods are at least a minimum of 1/8" diameter and spaced a maximum of 60" on center along the length of the duct, and the angle iron is a minimum of 2" x 2" x 1/4" or SMACNA equivalent support system (SMACNA band strap support do not apply). Horizontal trapeze support system may be incorporated into the wrap enclosure.

**A. First Layer - Butt Joint (Figure 2)**  
The first layer of FastWrap XL is cut to completely wrap around the perimeter of the duct with enough excess to provide a tight butt joint where the blanket ends meet. The joints of adjacent blankets are firmly butted against each other. This interior layer can be held temporarily in place with filament tape spaced 1/12" from each blanket edge, and spaced on nominal 10-1/2" centers along the center of the blanket. While not required, the inside layer can be installed with 3" overlaps along perimeter and adjacent blankets.

**B. Second Layer - 3" Overlap, or 6" Collar (Figure 2)**  
The second layer of FastWrap XL is cut to completely wrap around the perimeter of the first layer, with enough excess to overlap itself not less than 3". Joints in the second layer should be staggered a minimum of 12 inches from joints on the inner layer. Adjacent blankets on the second layer must overlap each other by not less than 3". As an alternative to overlaps on adjacent blankets installed on the second layer, adjacent blankets can be tightly butted and wrapped with a 6" wide FastWrap XL collar centered over the butt joint. This outside layer can be held temporarily in place with filament tape spaced 1/12" from each blanket edge, and spaced on nominal 10-1/2" centers along the center of the blanket. Mechanical attachment as described in Section D must be used to make the installation permanent.

**C. 2 & 3 Sided Wrap Installation (Figure 1)**  
When space does not allow for a complete wrap applied to the duct on all four sides, the FastWrap XL is approved for 2 or 3 sided installations with mechanical attachment to a concrete or CMU assembly. The FastWrap XL is installed on the 2 or 3 sides of the duct as described in one of the installation methods described in sections A or B with the starting edge of the blanket attached to the concrete or CMU assembly and then wrapped around the duct until the other end can be affixed to the other concrete or CMU assembly, thus encapsulating the duct with insulation around all accessible sides. The blanket is to fringe out onto the concrete or CMU assembly. It shall be secured to the other concrete or CMU assembly, thus encapsulating the duct with insulation around all accessible sides. The blanket is to fringe out onto the concrete or CMU assembly. It shall be secured to the other concrete or CMU assembly, thus encapsulating the duct with insulation around all accessible sides. The blanket is to fringe out onto the concrete or CMU assembly. It shall be secured to the other concrete or CMU assembly, thus encapsulating the duct with insulation around all accessible sides.

**D. Mechanical Attachment Methods for Insulation Wrap**

**1. Banding (Figure 2)** - Minimum 2" wide carbon steel or stainless steel banding, 0.015" thick, is placed around the entire perimeter of the insulated duct with maximum 10" spacing centers and 1/2" from each blanket edge or 1/2" from each collar edge when using the butt joint and collar method. When banding, filament tape can be used to temporarily hold the blanket in place until the banding is applied. The banding is placed around the material and tightened so as to firmly hold the FastWrap XL in place against the duct, but not cause any cutting or damage to the blanket.

**2. Pinning (Figure 3)** - For duct spans 24" or larger, min. 12 gauge, 5" long steel insulation pins are welded to the duct in columns spaced 12" apart, 6" - 12" from each edge and on 10" centers along bottom horizontal and outside vertical runs to prevent blanket sag. Pins are also required 1" from the end of a duct and 1" from any edge near a 90° bend, spaced on 8" centers. Pins are locked into place with 1/2" diameter round or square, galvanized steel, speed clips or cup head pins. Pins that extend beyond the outer blanket wrap layer shall be turned down to eliminate sharp edges or the excess length cut off.

**E. Grease Duct Access Door Installation (Figure 4)**  
Four galvanized steel threaded rods, 3/8" diameter by 4/8" to 5" long are welded to the duct at the corners of the door opening. Four 4" long steel tubes fit over the threaded rods to hold the door to the duct and protect the wrap from damage as the door is removed. Four 6" long 12 gage insulation pins are welded to the door panel for installation of the blanket. Three layers of FastWrap XL are impacted over the 12 gage insulation pins on the 16 gauge door panel and held in place with speed clips. Each layer must have minimum 1" overlap over the previous layer. When the door is installed, this first and second layer must fit tightly against the wrap surrounding the door opening to form tight butt joints. Pins that extend beyond the outer layer of FastWrap XL shall be turned down to avoid sharp points on the door. The steel tubes are placed over the threaded rods. The insulated door panel is placed over the threaded rods covered by the steel tubes and held in place with washers and wing nuts. FireMaster F2-HT-XL3 Access Doors are tested and approved per ESR 2213 as alternatives to field fabricated doors. Installation instructions for the F2-HT-XL3 door are included with the complete assembly.

PER CITY BLDG COMMENTS: 11/12/14  
PER HEALTH DEPT. COMMENTS: 12/01/14  
PER HEALTH DEPT. COMMENTS: 12/16/14  
REVISION CHANGES: 01/12/2015

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**KULA SUSHI**  
4609 CONVOY ST. SUITE F,  
SAN DIEGO, CA 92111

OWNER / TENANT

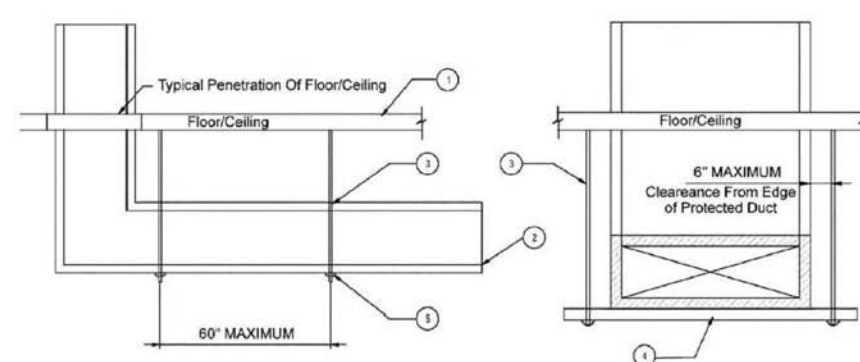


DRAWING TITLE  
FIREMASTER DUCT  
RAP

PROJECT NO. REF. NUMBER  
SCALE DATE DRAWN BY  
AS NOTED - RPM

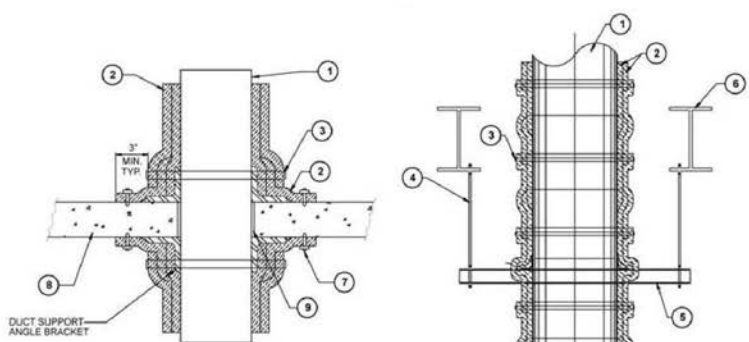
SHEET NUMBER  
**M-5.1**

**RPM**  
Engineers, Inc.  
102 DISCOVERY  
Irvine, CA 92618  
Tel: 949-450-1229  
Fax: 949-450-1454  
Contact: Johnny Loi x206  
E-mail: johnny@rpmpe.com



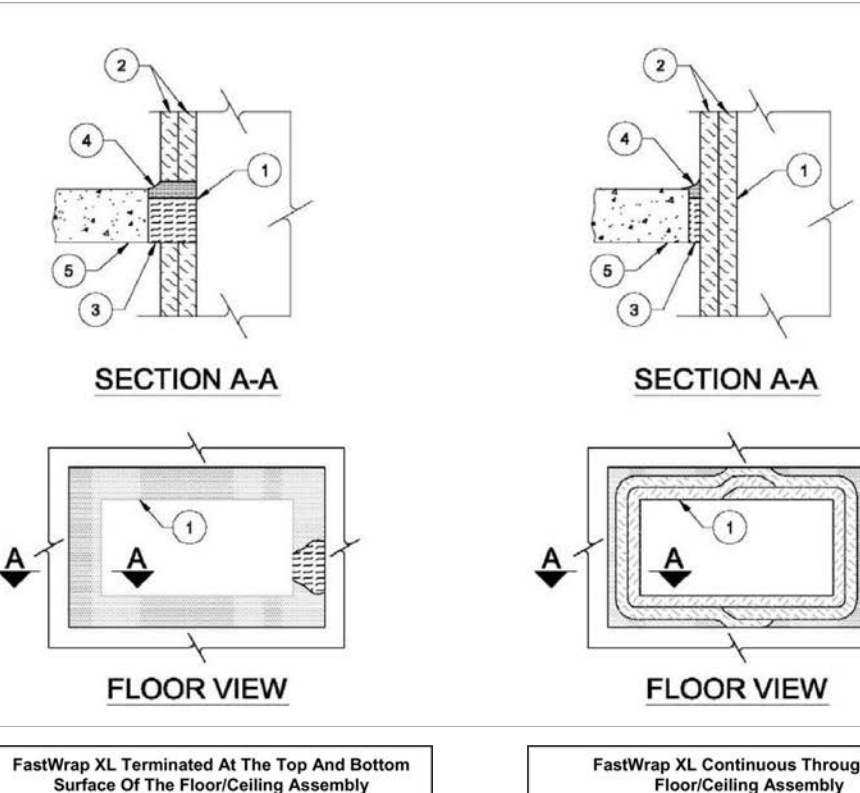
**FIGURE 3 - LEGEND**  
 1 FLOORCEILING ASSEMBLY  
 2 18 GAGE CARBON STEEL OR 18 GAGE STAINLESS STEEL DUCT  
 3 MAXIMUM 24X48" OR 34X36"  
 4 MIN. 3/8" ALL-THREAD ROD  
 5 2"x2"x1/8" STEEL ANGLE  
 6 STEEL WASHER & NUT SIZED TO FIT ITEM 3

FIGURE 3—FIREMASTER® FASTWRAP® XL HORIZONTAL SUPPORT DETAILS



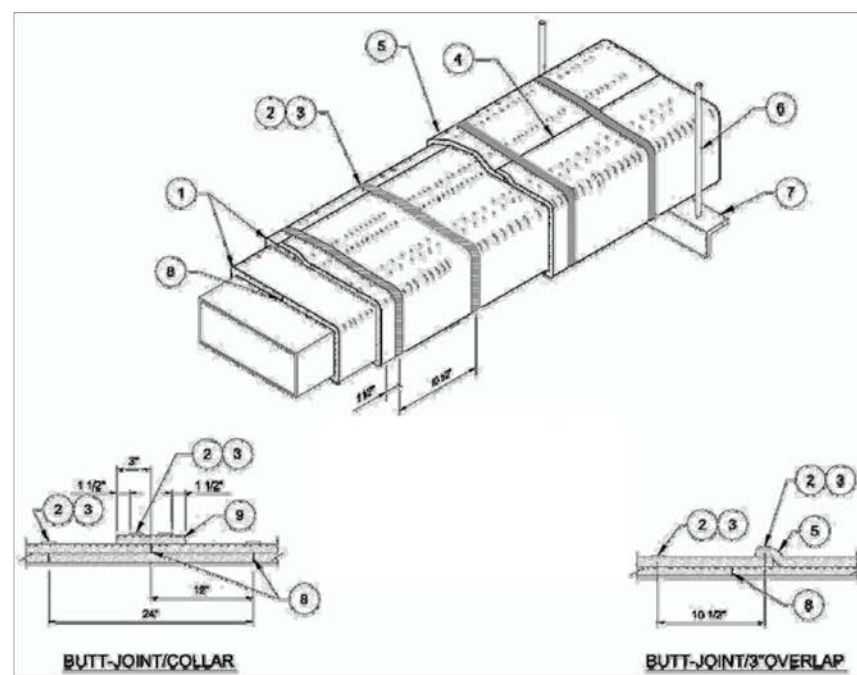
**FIGURE 4 - LEGEND**  
 1 DUCT  
 2 TWO LAYERS FIREMASTER FASTWRAP XL  
 3 STEEL BANDING  
 4 MIN. 3/8" DIAMETER HANGER ROD  
 5 MIN. 1 1/2"x1 1/2"x1/8" ANGLE  
 6 BUILDING STEEL FRAMING BY REGISTERED DESIGN PROFESSIONAL  
 7 MECHANICAL FASTENERS & WASHERS  
 8 RATED FLOOR  
 9 FIRESTOP SEALANT IN SECTION 3.5

FIGURE 4—FIREMASTER® FASTWRAP® XL VERTICAL SUPPORT DETAILS



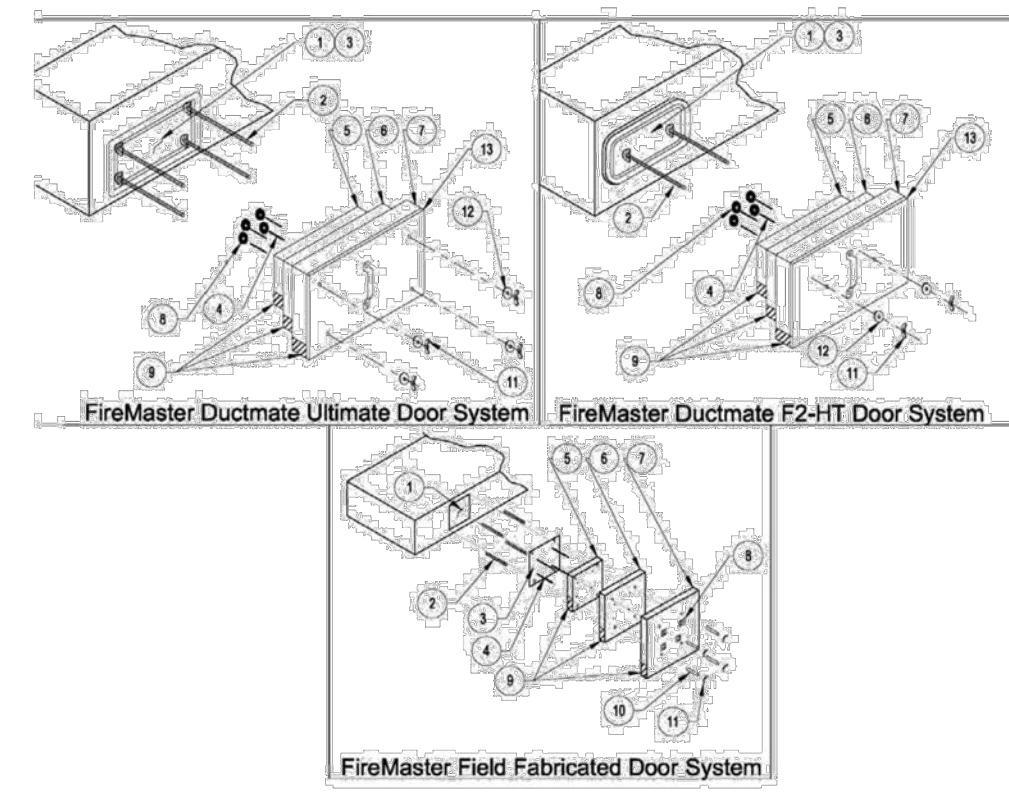
**Figure 5 - Legend**  
 1 Duct  
 2 Two layers Firemaster FastWrap XL  
 3 Scrap pieces of Firemaster FastWrap XL  
 4 Firestop Sealant Listed in Section 3.5  
 5 Rated Floor or Ceiling Assembly

FIGURE 5—FIREMASTER® FASTWRAP® XL 1 TO 2 HOUR FLOOR/CEILING THROUGH PENETRATION FIRESTOP SYSTEM DETAILS



**Figure 1 - Legend**  
 1 Two layers FireMaster FastWrap XL  
 2 Filament tape  
 3 Steel banding  
 4 3" longitudinal overlap  
 5 3" transverse overlap  
 6 Min. 3/8" diameter hanger rod  
 7 2" x 2" x 1/8" angle  
 8 1" compressed butt joint  
 9 6" wide FireMaster FastWrap XL collar

FIGURE 1—FIREMASTER® FASTWRAP® XL INSTALLATION METHODS



**Figure 2 - Legend**  
 1 Door hole  
 2 All thread rods (3/8" Ultimate, 1/4" F2-HT, 1/4" Field Fabricated)  
 3 18 gage access cover (Field Fabricated or Ductmate Door System)  
 4 Insulation pins - welded to plate or access cover  
 5 One layer Firemaster Duct Product (See note below)  
 6 One layer Firemaster Duct Product, 1 1/2" overlap  
 7 Aluminum layer or angle  
 8 1 1/2" Round or Square Speed clips  
 9 Aluminum layer or angle  
 10 (Scrap pieces for threaded rods (Field fab. only)  
 11 Wing nuts used to fit All Thread Rod in Item 2  
 12 Washers used to fit All Thread Rod in Item 2  
 13 Insulation plate

FIGURE 2—FIREMASTER® FASTWRAP® XL ACCESS DOOR SYSTEMS

**4.2.3 Duct Support:** Horizontal duct assemblies with maximum dimensions of 24 inches by 48 inches (610 mm by 1219 mm) or 34 inches by 36 inches (864 mm by 914 mm) are supported with minimum 1/2-inch-diameter (9.5 mm), all-thread steel rods and 2-inch-by-2-inch-by-1/2-inch (51 mm by 51 mm by 3.2 mm) steel angles, spaced a maximum of 80 inches (2046 mm) on center along the length of the duct. A maximum clearance of 6 inches (152 mm) is permitted between the edge of the protected duct and the steel rod. See Figure 3.

Vertical duct assemblies with maximum dimensions of 24 inches by 48 inches (610 mm by 1219 mm) are supported with 1 1/2-inch-by-1 1/2-inch-by-1/2-inch (38 mm by 38 mm by 3.2 mm) angle brackets, as shown in Figure 4. The brackets are located on opposite sides of the duct on the top and bottom of each floor/ceiling assembly, and are attached to the duct with welds or mechanical fasteners. As an alternative, the brackets are supported by minimum 3/8-inch-diameter (9.5 mm) all-thread rod. Maximum vertical spacing between supports is 12 feet (3658 mm).

**4.3 Through-penetrations:**

**4.3.1 General:** Where the systems penetrate fire-resistance assemblies, the through-penetration must be protected with an approved through-penetration fire-stop system. Section 4.3.2 describes a two-hour F- and T-rated through-penetration firestop assembly for walls, and Section 4.3.3 describes a two-hour F- and T-rated through-penetration firestop assembly for floor/ceilings. Where the grease duct enclosure system penetrates other than the concrete or concrete masonry assemblies described in those sections, or penetrates a roof/ceiling assembly, the through-penetration must be protected with a through-penetration firestop assembly complying with the applicable code provisions, and use of the firestop assembly must be approved by the code official.

**4.3.2 Wall Assembly—Two-hour F- and T-rated Through-penetration Fire-stop Assembly:** Where the grease duct protected with the FireMaster® enclosure assembly penetrates a fire-resistance-rated concrete or concrete masonry wall assembly complying with 2012 IBC Table 721.1(2) or 2009 IBC Table 720.1(2), as applicable, and the penetration requires protection, the annular space of the penetration must be protected as follows:

- Penetration opening: The maximum area of the opening in the fire-resistance-rated wall assembly is 3.059 square inches (1.98 m<sup>2</sup>), with a maximum perimeter dimension of 93 inches (2362 mm).
- Duct wrap material: The grease duct must be wrapped with the blanket material as described in Section 4.2.1.
- Packing material: Minimum 4 1/2-inch-wide (114 mm) unfaced scrap duct wrap material at 3 per (60 light) mineral wool batt insulation is firmly packed into the opening as a permanent form. The packing material must be recessed a minimum of 1/4 inch (6.4 mm) from both surfaces of the wall, to accommodate the sealant material.
- Sealant material: The recessed void created by the packing material must be filled to a minimum depth of 1/4 inch (6.4 mm) with one of the firestop sealants described in Section 3.5.

**4.3.3 Floor/Ceiling Assemblies—Two-hour F- and T-rated Through-penetration Fire-stop Assembly:** Where the grease duct protected with the FireMaster® enclosure assembly penetrates in Section 4.2.1 penetrates a minimum 4 1/2-inch-thick (114 mm) fire-resistance-rated floor/ceiling assembly complying with 2012 IBC Table 721.1(3) or 2009 IBC Table 720.1(3), the annular space of the penetration must be protected as illustrated in Figure 5 and as described below:

- Penetration opening: The annular space on each side of the wrapped duct shall be between 1/2 inch (12.7 mm) and 4 1/4 inches (121 mm). The duct must be located centrally within the opening. The maximum area of the opening in the floor/ceiling assembly is 1,122 square inches (0.724 m<sup>2</sup>), with a maximum opening dimension of 51 inches (1295 mm) when the duct wrap is continuous through the opening. When the duct wrap is terminated at the top and bottom surface of the floor/ceiling assembly, the maximum area of the opening is 762 square inches (0.488 m<sup>2</sup>), with a maximum opening dimension of 47 inches (1193 mm).
- Sealant material: The recessed void created by the packing material must be filled to a minimum depth of 1/4 inch (6.4 mm) with one of the firestop sealants described in Section 3.5.

**5.0 CONDITIONS OF USE**

The FireMaster® grease duct enclosure system described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- The enclosure system shall be constructed and installed in accordance with this report and the manufacturer's instructions. In the event of a conflict between this report and the manufacturer's instructions, this report governs.
- The blanket materials are manufactured in Augusta, Georgia, and Paducah, Kentucky, Mexico, under a quality control program with inspections by ICC-ES.

**6.0 EVIDENCE SUBMITTED**

- Data in accordance with the ICC-ES Acceptance Criteria for Grease Duct Enclosure Assemblies (CAC101), dated April 2001 (editorially revised October 2004).
- Reports of tests in accordance with ASTM E 2338-04 testing for fire-resistance grade duct enclosure systems in accordance with 2012 IBC Section 506.3.11 and 2009 IBC Section 506.3.10.

**7.0 IDENTIFICATION**

The FireMaster® blanket material bears a label indicating the product name (FireMaster® FastWrap XL), the name of the manufacturer (Thermal Ceramics), the evaluation report number (ESR-2213), and the words "FIRE RESISTIVE ENCLOSURE, DO NOT REMOVE" are inscribed on the blanket materials at regular intervals, and must be visible when the materials are in an installed condition. Firestop sealants used for through-penetration fire-stops are labeled with the sealant manufacturer's name and the product name. Prefabricated access doors are labeled with the DuctMate Industries, Inc. name, the product name and the model number.

**ICC EVALUATION SERVICE**  
**ICC-ES Evaluation Report**  
 ESR-2213  
 Reissued February 1, 2014  
 This report is subject to renewal April 1, 2015.  
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**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**Section: 07 81 33—Mineral-Fiber Fireproofing**

**REPORT HOLDER:**  
**THERMAL CERAMICS, INC.**  
 POST OFFICE BOX 923  
 AUGUSTA, GEORGIA 30903  
 (706) 798-4306  
 www.thermalceramics.com

**EVALUATION SUBJECT:**  
**FIREMASTER® FASTWRAP XL FIRE PROTECTION SYSTEM FOR GREASE DUCTS**

**1.0 EVALUATION SCOPE**  
 Compliance with the following codes:  
 ■ 2012 and 2009 International Building Code® (IBC)  
 ■ 2012 and 2009 International Mechanical Code® (IMC)  
 ■ 2009 IAPMO Uniform Mechanical Code (IAPMO UMC)  
 ■ Other Codes (see Section 8.0)

**Properties evaluated:**  
 ■ Fire resistance  
 ■ Noncombustibility  
 ■ Surface burning characteristics

**2.0 USES**  
 FireMaster flexible blankets, as described in this report, are used to construct zero-clearance, fire-resistance-rated grease duct enclosure assemblies serving Type I kitchen hoods. The duct wrap materials comply with 2012 IBC Section 506.3.11 and 2009 IBC Section 506.3.10, and are an alternative to the one- and two-hour fire-resistance-rated enclosure requirements of Section 703.4, 2009 IBC Section 708.4 and IAPMO Section 510.7.1, when installed in accordance with Section 4.0.

**3.0 DESCRIPTION**  
**3.1 FireMaster® FastWrap XL Insulating Blanket:**  
 The FireMaster® FastWrap XL Insulating Blanket is a calcium magnesium silicate blanket totally encapsulated with a polypropylene/aluminum foil scrim. The blanket, nominally 1 1/2 inches (38 mm) thick, is delivered to the jobsite in rolls 25 feet (7.6 m) long by 2 or 4 feet (610 or 1219 mm) wide. The blanket has a nominal density of 6 pcf (96 kg/m<sup>3</sup>) and has a flame-spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84.

**3.2 Duct System:**  
 Grease ducts serving Type I hoods must be constructed of minimum 0.055-inch-thick (1.40 mm) No. 16 gage carbon steel or stainless steel at least 0.044 inch (1.12 mm) (No. 18 gage) thick. Joints and seams of grease ducts must comply with 2012 or 2009 IBC Section 506.3.2 or IAPMO UMC Section 510.5.2, as applicable. Duct supports must comply with IBC Section 506.3.3 or IAPMO UMC Section 510.7.1, as applicable, and Section 4.2.3 of this report. When the duct system penetrates a floor/ceiling assembly required to be protected in accordance with 2012 IBC Section 713 or 2009 IBC Section 708, as applicable, the duct system must be supported as described in Figures 3 and 4. Maximum duct size is 24 inches by 48 inches (610 mm by 1219 mm) or 34 inches by 36 inches (864 mm by 914 mm) wide. The blanket has a nominal density of 6 pcf (96 kg/m<sup>3</sup>) and has a flame-spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84.

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**3.4 Banding Material:**  
 Banding material must be minimum 0.015-inch-thick (0.38 mm) carbon steel or Type 304 stainless steel. The banding is a minimum of 1/4 inch (12.7 mm) wide.

**3.5 Firestop Sealant:**  
 The following sealants are used for through-penetration fire-stops described in Section 4.3.2:  
**3.5.1 TREMstop™ Silicone (Fyre-sil):** TREMstop Silicone is a single-component, neutral cure, silicone elastomeric sealant, manufactured by TREMstop™ Fire Protection Systems Group. The cure time is from three to five days at 77°F (25°C) and 50 percent relative humidity. The sealant is packaged in caulking tubes, sausages and pails.  
**3.5.2 TREMstop™ Acrylic (GG) Gun Grade Acrylic Firestopping Sealant:** TREMstop™ Acrylic (GG) is a single-component, water-based, acrylic firestop sealant manufactured by TREMstop™ Fire Protection Systems Group. The cure time is from three to five days at 77°F (25°C) and 50 percent relative humidity. The sealant is packaged in caulking tubes, sausages and pails.

**TSUKURU USA CORPORATION**  
 2401 208th St., #5, Torrance, CA 90503  
 TEL: (310) 516-1945 FAX: (310) 516-2672

PER CITY BLDG COMMENTS: 11/12/14  
 PER HEALTH DEPT. COMMENTS: 12/01/14  
 PER HEALTH DEPT. COMMENTS: 12/16/14  
 REVISION CHANGES: 01/12/2015

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REVISIONS

STAMP

**KULA SUSHI**  
 4609 CONVOY ST. SUITE F,  
 SAN DIEGO, CA 92111

OWNER / TENANT

**KULA**  
 REVOLUTIONARY SUSHI BAR

DRAWING TITLE  
 DUCT FIRE RAP ES REPORT

PROJECT No. REF. NUMBER  
 SCALE DATE DRAWN BY  
 AS NOTED - RPM

SHEET NUMBER

**RPM**  
 Engineers, Inc.  
 102 DISCOVERY  
 Irvine, CA 92618  
 Tel: 949-450-1229  
 Fax: 949-450-1454  
 Contact: Johnny Loi x206  
 E-mail: johnny@rpmpe.com

M-5.2

RPM #14-505 01/15/15

ADMINISTRATIVE REQUIREMENTS

- A. The person with overall responsibility for construction or the person responsible for the installation of regulated features, materials, components, or manufactured devices shall make post, or make available with the building permit(s) issued for the building, the required installation Certificate(s) for features, materials, components, or manufactured devices regulated by the Appliance Efficiency Regulations or Part 6. Such installation Certificate(s) shall be made available to the enforcement agency for all appropriate inspections. These certificates shall:
1) Identify features, materials, components, or manufactured devices required to verify compliance with the Appliance Efficiency Regulations and Part 6.
2) Include a statement indicating that the features, materials, components, or manufactured devices conform to the Appliance Efficiency Regulations and Part 6 and the requirements for such features, materials, components, or manufactured devices given in the plans and specifications approved by the local enforcement agency.
3) State the number of the building permit under which the construction or installation was performed.
B. After installing wall, ceiling, or floor insulation, the installer shall make available to the enforcement agency or post in a conspicuous location in the building a certificate signed by the installer stating that the installation is consistent with the plans and specifications described in Section 10-103 (a) 2. The certificate shall also state the manufacturer's name and material identification and the installed R-value.
C. Within 90 days after issuance of certificate of occupancy, record drawings shall be provided to the owner. If any characteristic is materially changed before final construction and installation such that the building may no longer comply with Part 6, the building must be brought into compliance and so indicated on amended plans and Certificate of Compliance that shall be submitted for plan approval.
D. The builder shall provide the building owner or the person(s) responsible for building maintenance (in case of multi-tenant or centrally operated buildings) at occupancy the following:
1) Operating information: The appropriate certificate(s) of compliance and a list of the features, materials, components, and mechanical devices installed in the building and instruction on how to operate them efficiently.
2) Maintenance information: Required routine maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label may be limited to identifying the operation and maintenance manual.
3) Ventilation information: A description of the quantities of outdoor and recirculated air that the ventilation system are designed to provide to each area.
E. For building that have used a compliance option that requires field verification and diagnostic testing, the building department shall not approve the building until the building department has received a Certificate of Field Verification and Diagnostic Testing that has been signed and dated by the HERS Rater.

MANDATORY MEASURES:

- A. Manufactured fenestration products and exterior doors shall:
1) Have a temporary label meeting the requirements of Sec. 10-111 (a) 1, not to be removed before inspection by the enforcement agency, listing the certified U-factor and SHGC, and certifying that the air leakage requirements of Sec. 116 (a) 1 are met for each product line; and
2) Have a permanent label meeting the requirement of Sec. 10-111 (a) 2 if the product is rated using NFRC procedures.
B. Field fabricated fenestration and field-fabricated exterior doors shall be caulked between the fenestration products or exterior door and the building, and shall be weather stripped. EXCEPTION: Unframed glass doors and fire doors.
C. Joints and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weather stripped, or otherwise sealed to limit infiltration and exfiltration.
D. The opaque portions of framed demising walls in nonresidential buildings shall be insulated with an installed R-value of no less than R-13 between framing members.
E. All insulating material shall be installed in compliance with the flamespread rating and smoke density requirements of the CBC.
F. Any roof product used as a cool roof shall be certified and labeled in accordance with the requirements of Sec. 10-113 by the Cool Roof Rating Council (CRRC) and meet conditions set in Sec. 118(f).
G. Heat pumps with supplementary electric resistance heaters shall have controls:
1) That prevent supplementary heater operation when the heating load can be met by the heat pump alone; and
2) In which the cut-on temperature for compression heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.
H. The lesser of the minimum rate of outdoor air required by Sec. 121 (b) 2 or three complete air changes shall be supplied to the entire building during the one-hour period immediately before the building is normally occupied.
I. Hotel/motel guest room thermostats shall have numeric temperature setpoints in degree F and setpoint slope accessible only to authorized personnel to restrict over-heating and over-cooling.
J. All air distribution system ducts and plenums, including, but not limited to, building cavities, mechanical closets, air-handler boxes and supply platforms used as ducts or plenums, shall be installed, sealed, and insulated to meet the requirements of Chapter 6 of the California Mechanical Code. Supply air and return air ducts conveying heated or cooled air shall be insulated to a minimum installed level of R-8, unless ducts are in conditioned space.
K. The thermostatic controls for HVAC systems shall meet the following requirements as applicable:
1) Each space conditioning zone shall be controlled by an individual thermostatic control that responds to temperature within the zone and meets the applicable requirements of Subsection (b).
2) Each thermostatic control required by Subsection (a) shall be capable of being set locally or remotely by adjustment or selection of sensors to control:
a) Comfort heating down to 55 °F or lower.
b) Comfort cooling up to 85 °F or higher.
c) Both heating and cooling, the thermostatic controls shall be capable of providing a temperature range or dead band of at least 5 °F within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.
L. Outdoor air supply and exhaust equipment shall be installed with dampers that automatically close upon fan shutdown.
M. Demand Control Ventilation devices (CO sensors) shall be installed in accordance with Sec. 121 (c) 4.
N. Each space conditioning system shall be installed with controls that comply with items 1 and 2 below:
1) Are capable of automatically shutting off the system during periods of non-use and shall have:
a) An automatic time switch control device complying with Sec. 119 (c) with an accessible manual override that allows operation of the system for up to 4 hours; or
b) An occupancy sensor; or
c) A 4-hour timer that can be manually operated.
EXCEPTION: Mechanical systems serving retail stores and associated malls, restaurants, grocery stores, churches, and theaters equipped with 7-day programmable timers.
2) Automatically restart and temporarily operate the system as required to maintain:
a) A setback heating thermostat setpoint, if the system provides mechanical heating; and
EXCEPTION: Area with the design winter outdoor temperature of greater than 32 °F.
b) A setback cooling thermostat setpoint, if the system provides mechanical cooling.
EXCEPTION: Area with the design summer outdoor temperature of less than 100 °F.
EXCEPTION: Systems serving hotel/motel guest rooms if they have a readily accessible manual shut-off switch.
O. The piping for all space conditioning and service water heating systems shall be insulated in accordance with TABLE 123-A.
P. Water heater systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use as listed in Table 2, Chapter 49 of the ASHRAE Handbook, HVAC Applications Volume.
Q. Service water heating systems and equipment shall meet the applicable requirements of the Appliance Efficiency Regulations as required by Sec. 111.
R. Service hot water systems with circulating pumps or with electrical heat trace systems shall be capable of automatically turning off the system.
S. Lavatories in public restrooms shall have controls that limit the water supply temperature to 110 °F.

AIR CONDITIONING SYSTEM (HVAC) COMPLIANCE:

- A. Duct systems used with blower type equipment which are portions of a heating, cooling, absorption, evaporative cooling or outdoor air ventilation system shall be sized in accordance with Chapter 17 of the California Mechanical Code.

STATE OF CALIFORNIA
HVAC SYSTEM REQUIREMENTS
CERTIFICATE OF COMPLIANCE
HVAC Wet System Requirements
Project Name: KULA SUSHI
Date Prepared: 9/30/2014

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
I, the undersigned, certify that the information provided in this Certificate of Compliance is true and correct.
Documentation Author Name: MAURICE E. YEE
Signature Date: 9/30/2014
Company: RPM ENGINEERS, INC.
Address: 102 DISCOVERY IRVINE, CA 92618
Phone: (949) 450-1229

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.
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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.

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2014

STATE OF CALIFORNIA
MECHANICAL VENTILATION AND REHEAT
CERTIFICATE OF COMPLIANCE
Mechanical Ventilation & Reheat
Project Name: KULA SUSHI
Date Prepared: 9/30/2014

Table with columns: ACTUAL DESIGN INFO FROM EQUIPMENT SCHEDULES (E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T) and AREA BASIS, OCCUPANCY BASIS, MINIMUM, VAV Return Primary Air CFM, VAV Deadband Primary Air CFM. Includes rows for HP60 and XAC60.

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MECHANICAL VENTILATION AND REHEAT
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STATE OF CALIFORNIA
HVAC SYSTEM REQUIREMENTS
CERTIFICATE OF COMPLIANCE
HVAC Dry System Requirements
Project Name: KULA SUSHI
Date Prepared: 9/30/2014

Equipment Tags and System Description
MANDATORY MEASURES
Heating Equipment Efficiency
Cooling Equipment Efficiency
HVAC or Heat Pump Thermostats
Furnace Standby Loss Control
Low Leakage Air/Ls
Ventilation
Demand Control Ventilation
Occupant Sensor Ventilation Control
Shutoff and Reset Controls
Outdoor Air and Exhaust Damper Control
Isolation Zones
Automatic Demand Shed Controls
Economizer FPD
Duct Insulation
PRESCRIPTIVE MEASURES
Equipment is sized in conformance with 140.4(a & b)
Supply Fan Pressure Control
Simultaneous Heat/Cool
Economizer
Heat and Cool Air Supply Reset
Electric Resistance Heating
Duct Leakage Sealing and Testing

Table with columns: Equipment, Test Description, MCH-02A, MCH-02A Air, MCH-02A Single Zone, MCH-02A Distribution Ducts, MCH-02A Economizer, MCH-02A Demand Control Ventilation (DCV), MCH-02A Supply Fan VAV, MCH-02A Valve Leakage Test, MCH-02A Supply Water Temp. Reset, MCH-02A Supply Water Variable Flow Control, MCH-02A Hydraulic Demand Shed Control, MCH-02A Automatic Demand Shed Control.

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2014

STATE OF CALIFORNIA
HVAC WET SYSTEM REQUIREMENTS
CERTIFICATE OF COMPLIANCE
HVAC Wet System Requirements
Project Name: KULA SUSHI
Date Prepared: 9/30/2014

Equipment Tags and System Description
MANDATORY MEASURES
Heating Hot Water Equipment Efficiency
Cooling Chilled and Condenser Water Equipment Efficiency
Open and Closed Circuit Cooling Towers
Maximum Achievable Cycles of Concentration (L50)
Open and Closed Circuit Cooling Towers Flow Meter with analog output
Open and Closed Circuit Cooling Towers Overflow Alarm
Open and Closed Circuit Cooling Towers Efficient Drift Eliminators
Pipe Insulation
PRESCRIPTIVE MEASURES
Cooling Tower Fan Controls
Cooling Tower Flow Controls
Centrifugal Fan Cooling Towers
Air-Cooled Chiller Limitation
Variable Flow System Design
Chiller and Boiler Interlocks
CHW and HWW Reset Controls
WHP/Isolation Valves
VSD on CHW, CW & WHP Pumps >5HP
DP Sensor Location

Table with columns: Equipment, Test Description, MCH-12A, MCH-13A, MCH-14A, MCH-15A, MCH-16A, MCH-17A, MCH-18A. Includes rows for HP60.

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2014

STATE OF CALIFORNIA
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CERTIFICATE OF COMPLIANCE
Mechanical Systems
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STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CERTIFICATE OF COMPLIANCE
Mechanical Systems
Project Name: KULA SUSHI
Date Prepared: 9/30/2014

MECHANICAL COMPLIANCE FORMS & WORKSHEETS (check box if worksheet is included)
For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, refer to the 2013 Nonresidential Manual Note: The Enforcement Agency may require all forms to be incorporated into the building plans.

MECHANICAL HVAC ACCEPTANCE FORMS (check box for required forms)
This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2014

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CERTIFICATE OF COMPLIANCE
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Date Prepared: 9/30/2014

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CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2014

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CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2014

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CERTIFICATE OF COMPLIANCE
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CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2014



PER CITY BLDG COMMENTS: 11/12/14
PER HEALTH DEPT. COMMENTS: 12/01/14
PER HEALTH DEPT. COMMENTS: 01/12/2015
REVISIONS

These drawings and specifications are instruments of TsukurU USA. All drawings and specifications are restricted for use only on the project. Federal law prohibits the production, sale, or other disposition of these drawings and specifications without the written permission of TsukurU USA. Visual contact with these drawings and specifications shall constitute prima facie evidence of the acceptance of these restrictions.



KULA SUSHI
4609 CONVOY ST. SUITE F,
SAN DIEGO, CA 92111

OWNER / TENANT



DRAWING TITLE
TITLE 24 FORMS
NOTES

Table with columns: PROJECT MGR., REF. NUMBER, SCALE, DATE, DRAWN BY, SHEET NUMBER.

RPM Engineers, Inc.
102 DISCOVERY
Irvine, CA 92618
Tel: 949-450-1229
Fax: 949-450-1454
Contact: Johnny Lai x206
E-mail: johnny@rpmpe.com