

SYMBOLS (NOT ALL USED)		ABBREVIATIONS (NOT ALL USED)		GENERAL NOTES		MECHANICAL NOTES		CODES AND STANDARDS	
GENERAL		DUCT ACCESSORIES & CONTROLS INSTRUMENTATION							
	NORTH ARROW		T THERMOSTAT	<p>1. ALL WORK, INSTALLATION, AND MATERIALS SHALL COMPLY WITH ALL CURRENT GOVERNING CODES, BUILDING STANDARDS, REGULATIONS, SPECIFICATIONS, AND ALL OTHER REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION. WHERE REQUIREMENTS BETWEEN THESE VARY, THE MOST STRINGENT SHALL APPLY.</p> <p>2. ALL WORK SHALL BE PERMITTED. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS, FEES, AND LICENSES, UNLESS OTHERWISE DEFINED BY OWNER.</p> <p>3. CONTRACTOR SHALL EXAMINE THE COMPLETE SET OF DRAWINGS AND SPECIFICATIONS FOR ALL TRADES PRIOR TO SUBMITTING BID AND START OF WORK.</p> <p>4. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID AND THOROUGHLY FAMILIARIZE THEMSELVES WITH THE EXISTING FIELD CONDITIONS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, THE EXISTING INSTALLATIONS, POINTS OF DISCONNECTION, AND REQUIRED CLEARANCES. CONTRACTOR SHALL MAKE ANY MINOR ADJUSTMENTS NECESSARY TO AVOID CONFLICTS WITH THE BUILDING STRUCTURE AND THE WORK OF OTHER TRADES. THIS SHALL BE VERIFIED PRIOR TO BID SUBMITTAL. START OF CONSTRUCTION, AND/OR FABRICATION OF MATERIALS, BY THE ACT OF SUBMITTING A BID, THE CONTRACTOR ACCEPTS THE GIVEN WORKING CONDITIONS.</p> <p>5. IF DISCREPANCIES ARE ENCOUNTERED BETWEEN THE DRAWINGS, BUILDING STANDARDS, SPECIFICATIONS, AND/OR CURRENT CONDITIONS, THE ENGINEER AND ARCHITECT SHALL BE NOTIFIED IN WRITING PRIOR TO COMMENCEMENT OF WORK. IF WORK IS DONE WITHOUT WRITTEN APPROVAL FROM OWNER REPRESENTATIVE, THE WORK SHALL BE CONSIDERED AT-RISK, AND A NON-COMFORMABLE INSTALLATION.</p> <p>6. ALL DRAWINGS AND LAYOUTS ARE DIAGRAMMATIC TO SHOW DESIGN INTENT ONLY. CONTRACTOR SHALL COORDINATE NEW WORK WITH THE WORK OF ALL OTHER TRADES AND EXISTING CONDITIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSTALL ALL WORK IN SUCH A MANNER AS TO AVOID OBSTRUCTIONS, PRESERVE HEADROOM, KEEP OPENINGS AND PASSAGEWAYS CLEAR, AND MAKE ALL EQUIPMENT REQUIRING INSPECTION, MAINTENANCE, AND REPAIR ACCESSIBLE WITH EXTRA COST TO THE OWNER. NO CONSIDERATION SHALL BE GRANTED DUE TO LACK OF FAMILIARITY ON THE PART OF THE CONTRACTOR WITH ACTUAL PHYSICAL CONDITIONS, REQUIREMENTS, AND PRACTICES AT THE SITE.</p> <p>7. SUBMIT ELECTRONIC PDF COPIES OF SUBMITTALS WITH DESCRIPTIVE DATA AND PROJECT-SPECIFIC PERFORMANCE FOR ALL PRODUCTS AND MATERIALS PROPOSED FOR THE PROJECT. CLEARLY INDICATE EXACT MAKE/MODEL INCLUDING ANY ACCESSORIES AND OPTIONS PROPOSED. SHOP DRAWINGS AT THE SAME SCALE AS THE CONSTRUCTION DOCUMENTS OR LARGER SHALL BE INCLUDED WITH SUBMITTALS AS REQUIRED. HARD COPY SUBMITTALS WILL NOT BE ACCEPTED. ALLOW A MINIMUM OF FIVE (5) WORKING DAYS FOR ENGINEER TO REVIEW SUBMITTALS. SUBMITTALS SHALL BE FOR A COMPLETE SYSTEM AND NOT A PARTIAL REPRESENTATION OF A SYSTEM.</p> <p>8. SUBMIT REQUEST FOR INFORMATION (RFI) IN ELECTRONIC PDF FORMAT WITH PROPOSED SOLUTION INCLUDED, IF APPLICABLE. ALLOW MINIMUM OF THREE (3) WORKING DAYS FOR ENGINEER TO REVIEW AND RESPOND.</p> <p>9. PREPARE COORDINATED SHOP DRAWINGS WITH ALL TRADES, INCLUDING BUT NOT LIMITED TO MECHANICAL, PLUMBING, ELECTRICAL, FIRE PROTECTION, STRUCTURAL, ETC. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO INSTALLATION OF NEW/RELOCATED COMPONENTS. CONTRACTOR SHALL NOT USE THE ENGINEERED CAD FILES AS SHOP DRAWINGS. SHOP DRAWINGS SHALL CONFORM TO ALL SECTIONS OF AIA 201.</p> <p>10. CONTRACTOR SHALL COMPLY WITH ALL CONTRACT DOCUMENTS IN LAYING OUT AND INSTALLING THEIR WORK AND EQUIPMENT. PRIOR TO INSTALLATION, COORDINATE WORK WITH THE WORK OF ALL OTHER TRADES AND JOB CONDITIONS.</p> <p>11. CONTRACTOR SHALL OBTAIN AND FOLLOW ALL LOCAL/OWNER REQUIREMENTS, GUIDELINES, RULES, AND PROCEDURES FOR CONSTRUCTION. CONTRACTOR SHALL PROVIDE INSURANCE IN ACCORDANCE WITH THE BUILDING'S CERTIFICATE OF INSURANCE REQUIREMENTS.</p> <p>12. IF ANY EQUIPMENT SUBMITTED BY THE CONTRACTOR IS DIFFERENT FROM THE BASIS OF DESIGN SPECIFIED, CHANGES SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL. SUBMITTALS SHALL INDICATE ANY RESULTING CREDIT, ADDED COST, AND/OR ADJUSTMENT IN LEAD TIME. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PAYMENT OF ALL CHARGES RESULTING FROM ADDITIONS OR CHANGES IN THE WORK OF OTHER TRADES THAT ARE NECESSARY TO ACCOMMODATE THE REQUESTED SUBSTITUTION UNLESS APPROVED BY OWNER. CONTRACTOR WILL PROCEED AT HIS OWN RISK IF CHANGES OCCUR WITHOUT PRIOR APPROVAL.</p> <p>13. ALL PENETRATIONS OF DUCTWORK, PIPING, CONDUITS, AND VENTS THROUGH FIRE, SMOKE, OR COMBINATION FIRE/SMOKE RATED BARRIERS SHALL HAVE A MINIMUM BUILDING CODE AND AUTHORIZED HAVING JURISDICTION. FIRESTOP AND SMOKE STOP PRODUCTS SHALL BE UL LISTED.</p> <p>14. ALL PENETRATIONS OF DUCTWORK, PIPING, CONDUITS, AND VENTS THROUGH NON-RATED CONSTRUCTION SHALL BE PROPERLY AND GENERALLY CALLED OUT WITH SOUND-RESISTANT AND NON-HARDENING MATERIAL, SUCH AS SILICONE.</p> <p>15. COORDINATE WITH OWNER'S ROOFING CONTRACTOR PRIOR TO MAKING ANY PENETRATIONS THROUGH ROOF. ROOF WARRANTY SHALL BE MAINTAINED.</p> <p>16. FLASHING, COUNTER-FLASHING, AND ROOF MEMBRANE PATCHES AT ALL ROOF OPENINGS SHALL MATCH AND BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE EXISTING ROOFING SYSTEM.</p> <p>17. PROVIDE GENERAL CONTRACTOR WITH FINA, SIZES AND LOCATIONS OF ALL WALL, FLOOR, AND ROOF PENETRATIONS TO COORDINATE REQUIRED STRUCTURAL FRAMING MEMBERS.</p> <p>18. COORDINATE ALL CUTTING, DRILLING, PATCHING, AND REINFORCING REQUIRED FOR WORK WITH THE GENERAL CONTRACTOR.</p> <p>19. PROVIDE ACCESS PANELS/DOORS FOR ALL EQUIPMENT LOCATED IN INACCESSIBLE AREAS, SUCH AS ABOVE HANG LID CEILING OR BEHIND WALLS. ALL ACCESS PANEL/DOOR LOCATIONS SHALL BE COORDINATED WITH ARCHITECT.</p> <p>20. REQUIRED ACCESS AND WORKING SPACE CLEARANCES FOR ALL EQUIPMENT AND CONTROL DEVICES MUST BE MAINTAINED TO ALLOW READY AND SAFE OPERATION, EXAMINATION, AND MAINTENANCE. REQUIRED CLEARANCES SHALL BE PER MANUFACTURER'S RECOMMENDATION AND GOVERNING CODES.</p> <p>21. CONTRACTOR SHALL SECURE SITE WHILE WORK IS IN PROGRESS AND UNTIL THE WORK IS ACCEPTED BY OWNER'S REPRESENTATIVE.</p> <p>22. THE CONTRACTOR IS SOLELY RESPONSIBLE TO PROVIDE METHODS OF PROCEDURE AND PERFORM ALL CONSTRUCTION MEANS AND METHODS.</p> <p>23. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE, CAUSED BY THE WORK, TO EXISTING CONDITIONS OR THE WORK OF OTHER TRADES.</p> <p>24. CONTRACTOR SHALL COORDINATE MOVEMENT AND STORAGE OF EQUIPMENT AND ALL OTHER COMPONENTS, INCLUDING TAKING ALL NECESSARY PRECAUTIONS TO COVER ALL EQUIPMENT/COMPONENTS TO PROTECT THEM FROM EXPOSURE TO OUTDOOR SMOKE SEAL CONDITIONS OUTSIDE OF MANUFACTURER'S STORAGE CONDITIONS, AND CONSTRUCTION DEBRIS, WHETHER OR NOT EQUIPMENT IS POWERED OR IN USE.</p> <p>25. ALL MATERIALS SHALL BE NEW, BEAR THE UNDERWRITERS LABORATORIES (UL) OR EQUIVALENT TESTING AGENCY LABEL, AND BE APPROVED BY THE AUTHORITIES HAVING JURISDICTION. CONTRACTOR SHALL MAINTAIN RED-LINED AS-BUILT DRAWINGS DURING CONSTRUCTION TO DOCUMENT ALL CHANGES AND MODIFICATIONS TO THE CONTRACT DOCUMENTS. CONTRACTOR SHALL SUBMIT COMPLETE RED-LINED AS-BUILT DRAWINGS, UPON COMPLETION OF THE WORK, FOR REVIEW BY THE ARCHITECT/ENGINEER.</p> <p>27. FURNISH FINAL CERTIFICATE OF INSPECTION OR WRITTEN EVIDENCE OF ACCEPTANCE BY INSPECTION AUTHORITIES FOR ALL WORK INSTALLED.</p> <p>28. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A CLEAN AND SAFE WORK ENVIRONMENT THROUGHOUT THE DURATION OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL CONSTRUCTION DEBRIS, WITH ALL COSTS FOR DISPOSAL BORNE BY CONTRACTOR. UPON COMPLETION OF WORK, AREAS OF WORK SHALL BE LEFT IN A CLEAN CONDITION, ACCEPTABLE TO OWNER.</p> <p>29. ALL CONSTRUCTION DEBRIS SHALL BE DISPOSED OF IN AN ENVIRONMENTALLY RESPONSIBLE FASHION. RECYCLABLE MATERIAL SHALL BE PROPERLY RECYCLED, AND HAZARDOUS MATERIALS SHALL BE DISPOSED OF WITH PROPER CHAIN OF CUSTODY.</p> <p>30. ALL PLANS APPROVED BY GOVERNING AGENCIES SHALL BE KEPT IN A SECURE PLACE AND SHALL NOT BE USED BY WORKERS. CONTRACTOR SHALL FURNISH ALL SUBCONTRACTORS CONSTRUCTION SETS REFLECTING THE APPROVED PLANS. CONTRACTOR SHALL ALSO MAINTAIN, IN GOOD CONDITION, ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS. THIS COMPLETE SET SHALL REMAIN ON PREMISES AT ALL TIMES, UNDER CARE OF THE JOB SUPERINTENDENT.</p> <p>31. CONTRACTOR SHALL PROVIDE A WRITTEN WARRANTY TO REPLACE OR REMEDY ALL FAULTY, IMPROPER, OR INFERIOR MATERIALS AND/OR CORRECT FAULTY INSTALLATION AT NO COST TO OWNER, INCLUDING PARTS AND LABOR, FOR A PERIOD OF ONE (1) YEAR FROM DATE OF OWNER'S WRITTEN ACCEPTANCE OF ALL WORK INSTALLED.</p> <p>32. PROVIDE OWNER WITH OPERATION AND MAINTENANCE MANUALS, GUARANTEES, AND WARRANTIES FOR ALL EQUIPMENT INSTALLED IN THE PROJECT.</p>					
	DETAIL IDENTIFICATION NUMBER		ARCH ARCHITECTURAL						
	SHEET ON WHICH DETAIL IS DRAWN		BDD BACKDRAFT DAMPER						
	SECTION OR ELEVATION IDENTIFICATION LETTER		BHP BRAKE HORSEPOWER						
	SHEET ON WHICH SECTION OR ELEVATION IS DRAWN		BMS BUILDING MANAGEMENT SYSTEM						
	EQUIPMENT ABBREVIATION (SEE ABBREVIATION LIST)		BTU PER HOUR						
	EQUIPMENT NUMBER		°C DEGREE CENTIGRADE (CELIUS)						
	REVISION CLOUD		CBC CALIFORNIA BUILDING CODE						
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	POINT OF CONNECTION (P.O.C.)		CD CONDENSATE DRAIN						
	POINT OF DISCONNECTION (P.O.D.)		CFC CALIFORNIA FIRE CODE						
	LINETYPE		CFM CUBIC FOOT/FEET PER MINUTE						
	NEW WORK		CFSD COMBINATION FIRE/SMOKE DAMPER						
	EXISTING WORK		CHWP CHILLED WATER PUMP						
	WORK TO BE REMOVED		CHWR CHILLED WATER RETURN						
	FUTURE		CHWS CHILLED WATER SUPPLY						
	EQUIPMENT AIR MOVING DEVICE & COMPONENTS		CLG CEILING MECHANICAL CODE						
	CENTRIFUGAL FAN		COND CONDENSATE						
	PROPELLER FAN		CONN CONNECTION						
	ROOF VENTILATOR, INTAKE		CONT CONTINUATION						
	ROOF VENTILATOR, EXHAUST		CR CEILING RETURN						
	DUCT SECTION, SUPPLY (POSITIVE)		CU IN CUBIC INCHES						
	DUCT SECTION, RETURN (NEGATIVE)		DN DOWN						
	DUCT SECTION, EXHAUST (NEGATIVE)		DWG DRAWING						
	DUCT SECTION, EXHAUST (NEGATIVE)		EA EXHAUST AIR						
	DIRECTION OF FLOW		EAT ENTERING AIR TEMPERATURE						
	DUCT SIZE, WHERE FIRST DIMENSION IS VISIBLE DUCT		EDB ENTERING DRY BULB TEMPERATURE						
	CHANGE OF ELEVATION RISE (R) DROP (D)		EES ENERGY EFFICIENCY STANDARD (TITLE 24)						
	DUCTWORK, DOUBLE LINE		EF EXHAUST FAN						
	ACOUSTICAL LINED DUCTWORK, DOUBLE LINE SIZE SHOWN INDICATES NET INSIDE DIMENSION		EL ELEVATION						
	DUCTWORK, SINGLE LINE		ELEC ELECTRICAL						
	ACOUSTICAL LINED DUCTWORK, SINGLE LINE SIZE SHOWN INDICATES NET INSIDE DIMENSION		ENT ENTERING EQUIPMENT						
	CEILING SUPPLY DIFFUSER WITH 4-WAY BLOW PATTERN		ESP EXTERNAL STATIC PRESSURE						
	CEILING SUPPLY DIFFUSER WITH 3-WAY BLOW PATTERN		EWB ENTERING WET BULB TEMPERATURE						
	CEILING RETURN REGISTER		EWT EXHAUST WATER TEMPERATURE						
	CEILING EXHAUST GRILLE		EXH EXHAUST						
	DIFFUSER/REGISTER NUMBER		°F DEGREES FAHRENHEIT						
	AIR INLET/OUTLET IDENTIFICATION		(F) FUTURE						
	AIRFLOW		FD FIRE DAMPER						
	UNDERCUT DOOR, 1 INCH, 100 CFM		FF FINA FILTER						
			FLA FIRE LOAD AMPERES						
			FLR FLOOR						
			FLX FLEXIBLE CONNECTION						
			FBM FEET PER MINUTE						
			FPS FEET PER SECOND						
			GA GAUGE						
			GAL GALLON						
			GC GENERAL CONTRACTOR						
			GPM GALLON PER MINUTE						
			H HEIGHT						
			HC HEATING COIL						
			HD HOT DECK/HOT DUCT						
			HHWR HEATING HOT WATER RETURN						
			HHWS HEATING HOT WATER SUPPLY						
			KW KILOWATT						
			L LENGTH						
			(L) LINE DUCTWORK						
			LAT LEAVING AIR TEMPERATURE						
			LBS POUNDS						
			LBD LEAVING DRY BULB TEMPERATURE						
			LN FT LINEAL FEET						
			LVG LEAVING						
			LWB LEAVING WET BULB TEMPERATURE						
			LWT LEAVING WATER TEMPERATURE						
			MAX MAXIMUM						
			MB MIXING BOX						
			MBH THOUSAND BTU PER HOUR						
			MIN MINIMUM						
			MUA MAKE-UP AIR						
			NIC NOT IN CONTACT						
			NTS NOT TO SCALE						
			OSA/OA OUTSIDE AIR						
			OD OUTSIDE DIAMETER						
			POC POINT OF CONNECTION						
			POD POINT OF DISCONNECTION						
			RA RETURN AIR						
			RG RETURN GRILLE						
			RH REHEAT COIL						
			RM ROOM						
			RPM REVOLUTIONS PER MINUTE						
			SA SUPPLY AIR						
			SF SUPPLY FAN						
			SOV SHIFT OFF VALVE						
			SP STATIC PRESSURE						
			SPEC SPECIFICATION						
			SQ.FT. SQUARE FOOT						
			SS STAINLESS STEEL						
			TA TRANSFER AIR						
			TEMP TEMPERATURE						
			TF TRANSFER FAN						
			TG TRANSFER GRILLE						
			TV TURNING VANES						
			TYP TYPICAL						
			UNON UNLESS OTHERWISE NOTED						
			UTR UP THROUGH ROOF						
			V VOLTS						
			VAV VARIABLE AIR VOLUME						
			VD VOLUME DAMPER						
			VENT VENTILATION AIR						
			W WIDTH						
			W/O WITHOUT						
			WB WET BULB						
			WC WATER COLUMN						
			WG WATER GAUGE						
			WMS WIRE MESH SCREEN						

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GENERAL		DUCT ACCESSORIES & CONTROLS INSTRUMENTATION							
	NORTH ARROW		T THERMOSTAT	<p>1. ALL DRAWINGS AND LAYOUTS ARE DIAGRAMMATIC TO SHOW DESIGN INTENT ONLY. LOCATIONS OF DUCTWORK, PIPING, AND EQUIPMENT ARE APPROXIMATE. DUCT/TPIPE OFFSETS, TRANSITIONS, SUPPORTS, AND HANGERS MAY BE DIFFERENT FROM THAT SHOWN IN THE CONTRACT DOCUMENTS. SUCH CHANGES SHALL BE PRESENTED TO THE ENGINEER OF RECORD AND OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING. AND THE RECORD DRAWING SHALL BE ACCURATELY REVISED TO SHOW THE CHANGES COMPLETED.</p> <p>2. DUE TO STRUCTURAL CONDITIONS, DUCTWORK OR PIPING INTERFERENCE, EXISTING OBSTRUCTIONS, OR OTHER REASONS, THE CONTRACTOR MAY WANT TO INSTALL WORK IN A MANNER DIFFERENT FROM THAT SHOWN IN THE CONTRACT DOCUMENTS. SUCH CHANGES SHALL BE PRESENTED TO THE ENGINEER OF RECORD AND OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING. AND THE RECORD DRAWING SHALL BE ACCURATELY REVISED TO SHOW THE CHANGES COMPLETED.</p> <p>3. ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE NET CLEAR INSIDE DIMENSIONS AFTER INSULATION/LINING HAS BEEN INSTALLED.</p> <p>4. PIPING ANCHORAGE, SUPPORT, AND THERMAL EXPANSION DEVICES ARE TO BE PROVIDED BY THE CONTRACTOR TO MEET ALL CODE REQUIREMENTS. PIPING SUPPORTS AND THERMAL EXPANSION DEVICES SHALL BE INCORPORATED INTO THE SHOP DRAWINGS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR APPROVAL.</p> <p>5. ALL DUCTWORK AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF THE WORKING PRESSURES INDICATED IN THE SPECIFICATIONS.</p> <p>6. WHERE DEMOLITION DOES NOT ALLOW FOR MAINTAINING EXISTING HVAC SERVICE, CONTRACTOR SHALL PROVIDE TEMPORARY COOLING AND/OR HEATING WITH SUFFICIENT CAPACITY TO MAINTAIN COMFORT COOLING AND/OR HEATING, AT NO ADDITIONAL COST TO OWNER.</p> <p>7. DUCTWORK PIPING AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF THE WORKING PRESSURES INDICATED IN THE SPECIFICATIONS.</p> <p>8. ALL DUCTWORK SHALL BE CONSTRUCTED, ERECTED, AND TESTED IN ACCORDANCE WITH THE MOST RESTRICTIVE OF LOCAL REGULATIONS AND PROCEDURES DETAILED IN THE ASHRAE HANDBOOK OF FUNDAMENTALS AND THE APPLICABLE STANDARDS ADOPTED BY SMOCA. PROVIDE RECTANGULAR DUCTS OF GALVANIZED STEEL AND PREFABRICATED SPIRAL LOCKSEAM DUCTS AND FITTINGS.</p> <p>9. DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CHAPTER 6 OF THE CMC.</p> <p>10. AT THE TIME OF ROUGH INSTALLATION AND DURING STORAGE ON THE CONSTRUCTION SITE, ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEET METAL, OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST, WATER, AND DEBRIS WHICH MAY ENTER THE SYSTEM.</p> <p>11. ALL PIPING AND ASSOCIATED FITTINGS AND VALVES SHALL BE OF SIMILAR MATERIAL PER CODE, UNLESS APPROVED OTHERWISE. DISSIMILAR MATERIALS SHALL BE CONNECTED OR FASTENED BY DELETED WORK APPROVED BY ARCHITECT.</p> <p>12. ALL PIPING AND DUCTWORK SHALL BE INSULATED CONSISTENT WITH THE REQUIREMENTS IN SECTIONS 120.3 AND 120.4 OF THE BUILDING ENERGY EFFICIENCY STANDARDS AND CHAPTER 6 OF THE CMC.</p> <p>13. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT ALL EQUIPMENT CONNECTIONS, UNLESS OTHERWISE NOTED.</p> <p>14. ALL MECHANICAL EQUIPMENT PADS SHALL EXTEND A MINIMUM OF 6" BEYOND THE FOOTPRINT OF THE UNIT ON ALL SIDES. MECHANICAL EQUIPMENT PADS LOCATED ON THE ROOF SHALL BE A MINIMUM OF 8" HIGH FOR FLASHING.</p> <p>15. SUPPORT ALL SUSPENDED MECHANICAL EQUIPMENT WITH FULLY THREADED RODS AND VIBRATION ISOLATORS PER THE ASHRAE HANDBOOK OF HVAC APPLICATIONS.</p> <p>16. ALL SUSPENDED CEILING MECHANICAL FIXTURES SHALL BE SUPPORTED BY ADDITIONAL INDEPENDENT 12 GAUGE WIRES ATTACHED TO EACH CORNER OF FIXTURES. (ASCE 7 SECTION 13.6.2.2, CISCA)</p> <p>17. FIRE DAMPERS AND/OR SMOKE DAMPERS AND THE NECESSARY ACCESS PANELS SHALL BE PROVIDED FOR ALL DUCTS PENETRATING FIRE AND/OR SMOKE BARRIERS/PARTITIONS, AS REQUIRED BY CODE. SEE ARCHITECTURAL DRAWINGS FOR THE EXACT LOCATIONS OF FIRE AND/OR SMOKE RATED BARRIERS/PARTITIONS.</p> <p>18. SMOKE DETECTORS AND REMOTE ANNUNCIATOR ARE SUPPLIED BY MECHANICAL CONTRACTOR. SMOKE DETECTORS SHALL BE INSTALLED AND INTERLOCKED FOR SHUTDOWN IN ACCORDANCE WITH DIVISION 23 SEE SPECIFICATIONS.</p> <p>19. ALL DUCT SMOKE DETECTORS INDICATED ON MECHANICAL DRAWINGS ARE FOR REFERENCE ONLY AND SHALL BE FURNISHED, INSTALLED AND WIRED UNDER ELECTRICAL WORK DIVISION 26/000.07 OF SPECIFICATION.</p> <p>20. MATERIALS EXPOSED WITHIN DUCTWORK OR PLENUMS SHALL HAVE A MAXIMUM FLAME SPREAD INDEX OF 25 AND MAXIMUM SMOKE DEVELOPMENT RATINGS OF 50, WHEN TESTED IN ACCORDANCE WITH ASTM E84.</p> <p>21. ALL NEW THERMOSTATS SHALL COMPLY WITH THE LATEST BUILDING ENERGY EFFICIENCY STANDARDS REFERENCE JOINT APPENDIX J.S.</p> <p>22. ROOM THERMOSTATS SHALL BE CAPABLE OF BEING SET TO MAINTAIN SPACE TEMPERATURE SET POINTS FROM 55°F TO 85°F AND BE CAPABLE OF OPERATING THE HEATING AND COOLING IN SEQUENCE. THERMOSTATS SHALL BE ADJUSTABLE TO PROVIDE A TEMPERATURE RANGE OF UP TO 1°F BETWEEN HEATING AND COOLING SETPOINTS. CONTROLS SHALL HAVE CAPABILITY OF LIMITING HEATING SETPOINT ADJUSTMENT TO A MAXIMUM OF 70°F AND LIMITING COOLING SETPOINT ADJUSTMENT TO A MINIMUM OF 70°F.</p> <p>23. THERMOSTATS SHALL BE LOCATED PER CBC FOR ADA COMPLIANCE AND CENTERED DIRECTLY ABOVE LIGHT SWITCHES UNLESS OTHERWISE NOTED. COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION.</p> <p>24. CO2 SENSORS SHALL BE LOCATED BETWEEN 9' TO 6' AFF. COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION.</p> <p>25. PROVIDE STEEL SUPPORTS FOR ALL WORK AS REQUIRED FOR A COMPLETE INSTALLATION IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS. PROVIDE SUPPLEMENTARY FRAMING AS REQUIRED FOR ATTACHMENT OF HANGERS, SUPPORTS, AND ANCHORS. DESIGN SUPPLEMENTAL FRAMING UNDER DIRECT SUPERVISION OF STRUCTURAL ENGINEER LICENSED IN THE STATE OF CALIFORNIA AND SUBMIT FOR ARCHITECT/ENGINEER REVIEW.</p> <p>26. CONTRACTOR SHALL COORDINATE AND PROVIDE STRUCTURAL MOUNTING FOR ALL EQUIPMENT SHOWN ON THE PLANS OR SPECIFIED, INCLUDING THOSE SHOWN SPECIFICALLY ON THE DETAIL SHEETS).</p> <p>28. CONTRACTOR SHALL COORDINATE VOLTAGE AND PHASE OF EACH PIECE OF EQUIPMENT REQUIRING POWER WITH THE ELECTRICAL CONTRACTOR.</p> <p>29. PROVIDE MANUAL BALANCING DAMPER AT EACH SUPPLY/RETURN/EXHAUST BRANCH DUCT AS FAR FROM AIR INLET/OUTLET AS POSSIBLE. PROVIDE MANUAL BALANCING DAMPER WITH REMOTE CONTROL WHEN IS LOCATED ABOVE OPERATED CEILING.</p> <p>30. ALL BRANCH DUCT SIZES SHALL MATCH AIR INLET/OUTLET NECK SIZE UNON.</p>					
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	DIFFUSER/REGISTER NUMBER		°F DEGREES FAHRENHEIT						
	AIR INLET/OUTLET IDENTIFICATION		(F) FUTURE						
	AIRFLOW		FD FIRE DAMPER						
	UNDERCUT DOOR, 1 INCH, 100 CFM		FF FINA FILTER						
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STATE OF CALIFORNIA
Mechanical Systems
 NRC-MCH-E (Revised 09/2020)
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 Date Prepared: 2021-06-10

YES	NO	Form/Title	Field Inspector	Pass	Fail
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-12-A FDD for Packaged Direct Expansion Units		<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCA-MCH-13-A Automatic FDD for Air Handling Units and Zone Terminal Units Acceptance	RTU-1,2,3	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-14-A Distributed Energy Storage DX AC Systems Acceptance NOTE: This form does not automatically move to "Yes". If Distributed Energy Storage DX AC Systems are included in the scope, permit applicant should move this form to "Yes".		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-15-A Thermal Energy Storage (TES) System Acceptance NOTE: This form does not automatically move to "Yes". If Chilled Water Storage, Ice-on-Coil Internal Melt, Ice-on-Coil External Melt, Ice Harvesting, Brine, Ice Slurry, Electric Salt, Lithiate Hydrate Slurry (CHS), Cryogenics or Encapsulated (Ice Ball) Systems are included in the scope, permit applicant should move this form to "Yes".		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-16-A Supply Air Temperature Reset Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-17-A Condenser Water Temperature Reset Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-18 Energy Management Control Systems		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-19 Occupancy Sensor Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-20 Multi-Family Ventilation		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-MCH-21 Multi-Family Envelope Leakage		<input type="checkbox"/>	<input type="checkbox"/>

STATE OF CALIFORNIA
Mechanical Systems
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P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION
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YES	NO	Form/Title	Field Inspector	Pass	Fail
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCV-MCH-04-H Duct Leakage Test NOTE: Must be completed by a HERS Rater		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCV-MCH-24 Enclosure Air Leakage Worksheet NOTE: Must be completed by a HERS Rater		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCV-MCH-27 High-rise Residential NOTE: Must be completed by a HERS Rater		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCV-MCH-32 Local Mechanical Exhaust NOTE: Must be completed by a HERS Rater		<input type="checkbox"/>	<input type="checkbox"/>

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Q. MANDATORY MEASURES DOCUMENTATION LOCATION
 Table Instructions: Indicate where mandatory measures are documented in the plan set or construction documentation. For any mandatory measures that do not apply, mark the plan sheet or construction document location as "N/A"; any active cells that are left blank will result in non-compliance in Table E.

01	02	03	04
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block	Plan sheet or construction document location	Mandatory Measure	Plan sheet or construction document location
<input type="checkbox"/>		Heating Equipment Efficiency per §120.1	M701
<input type="checkbox"/>		Control Equipment Efficiency per §120.1	M701
<input type="checkbox"/>		Furnace Standby Loss Control per §120.2(d)	N/A
<input type="checkbox"/>		Duct Insulation per §120.4	M602
<input type="checkbox"/>		Heating Hot Water Equipment Efficiency per §120.1	N/A
<input type="checkbox"/>		Cooling Chilled and Condenser Water Equipment Efficiency per §120.1	N/A
<input type="checkbox"/>		Open and Closed Circuit Cooling Towers conductivity of flow-based controls per §120.2(a)(1)	N/A
<input type="checkbox"/>		Open and Closed Circuit Cooling Towers Flow Meter with analog output per §120.2(a)(2)	N/A
<input type="checkbox"/>		Open and Closed Circuit Cooling Towers Overflow Alarm per §120.2(a)(3)	N/A
<input type="checkbox"/>		Open and Closed Circuit Cooling Towers Efficient DTR Elimination per §120.2(a)(5)	N/A
<input type="checkbox"/>		Pipe Insulation per §120.2(b)	N/A
<input type="checkbox"/>		Combustion air shutoff, combustion air fan controls and stack design and controls for boilers per §120.3	N/A
<input type="checkbox"/>		Heat Pump with Supplementary Electric Resistance Heater Controls per §120.2(b)	M701
<input type="checkbox"/>		The air duct and plenum system is designed per §120.4(a)-(d)	N/A
<input type="checkbox"/>		Kitchen range hoods shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2	YES

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 Report Page: Page 14 of 14
 Date Prepared: 2021-06-10

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

Documentation Author Name: OTHON ESTRADA, JR.
 Company: INFRASTRUCTURE FACTOR CONSULTING, INC.
 Address: 2361 ROSECRANS AVE., SUITE 368
 City/State/Zip: EL SEGUNDO, CA 90245

Documentation Author Signature: [Signature]
 Signature Date: 6/10/2021
 CEAH HERS Certification Identification (if applicable):
 Phone: 310-725-1500

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: OTHON ESTRADA, JR.
 Company: INFRASTRUCTURE FACTOR CONSULTING, INC.
 Address: 2361 ROSECRANS AVE., SUITE 368
 City/State/Zip: EL SEGUNDO, CA 90245

Responsible Designer Signature: [Signature]
 Date Signed: 6/10/2021
 License: M36244
 Phone: 310-725-1500

STATE OF CALIFORNIA
Process Systems
 NRC-PRC-E (Revised 01/21)
 CERTIFICATE OF COMPLIANCE
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 Project Name: SHAKE SHACK
 Project Address: 2901 SANTA MONICA BLVD., BEVERLY HILLS, CA 92802
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A. GENERAL INFORMATION

01 Project Location (City)	BEVERLY HILLS	04 Total Conditioned Floor Area	2,322
02 Climate Zone	9	05 Total Unconditioned Floor Area	
03 Occupancy Types Within Project:		06 # of Stories (Habitable Above Grade)	1
<input type="checkbox"/> Office	<input checked="" 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 type="checkbox"/> Other (Write In):	

B. PROJECT SCOPE
 Table Instructions: Include any process systems listed below within the scope of the permit application that are demonstrating compliance with mandatory requirements in §120.6 or prescriptive requirements in §140.9.
 My project consists of [check all that apply]:

01	02
<input type="checkbox"/> Refrigerated Spaces <1,000 Ft ² Total (no Title 24, Pt 6 requirements)	<input type="checkbox"/> Elevator Lighting & Ventilation Controls (mandatory §120.6(i))
<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 < 6,000 Ft ² (mandatory §120.6(b))	<input type="checkbox"/> Computer Rooms > 20W/Ft ² Power Density (prescriptive §140.9(a))
<input type="checkbox"/> Enclosed Parking Garage Exhaust ≥ 10,000 CFM (mandatory §140.9(c))	<input type="checkbox"/> Commercial Kitchen Ventilation/Exhaust (prescriptive §140.9(b)(1))
<input type="checkbox"/> Newly Installed Process Boilers (mandatory §120.6(d))	<input type="checkbox"/> Laboratory Exhaust/Factory Exhaust & Fume Hood (prescriptive §140.9(c))
<input type="checkbox"/> Compressed Air Systems Combined HP ≥ 25 (mandatory §120.6(e))	

C. COMPLIANCE RESULTS
 Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D, for guidance.

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

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D. EXCEPTIONAL CONDITIONS
 This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.
 No exceptional conditions apply to this project.

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

F. REFRIGERATED WAREHOUSE/SPACES
 This Section Does Not Apply

G. COMMERCIAL REFRIGERATION
 This Section Does Not Apply

H. ENCLOSED PARKING GARAGE EXHAUST
 This Section Does Not Apply

I. PROCESS BOILER
 This Section Does Not Apply

J. COMPRESSED AIR SYSTEMS
 This Section Does Not Apply

K. ELEVATOR LIGHTING AND VENTILATION
 This Section Does Not Apply

L. ESCALATORS AND MOVING WALKWAYS SPEED CONTROLS
 This Section Does Not Apply

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M. COMPUTER ROOM SYSTEM SUMMARY
 This Section Does Not Apply

N. COMMERCIAL KITCHEN EXHAUST AND VENTILATION
 Table Instructions: Complete the following table to demonstrate compliance with prescriptive requirements found in §140.9(b). Requirements only apply to new hoods or replacement hoods being installed as part of the permitted scope. Existing hoods not being replaced, or any hoods within a health-care facility do not need to meet requirements.
 Kitchen Ventilation §140.9(b)(2)

01	02	03	04	05	06	07	08
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)(3)	Not providing replacement air directly to the hood(s)	Compliance Method per §140.9(b)(1)	Type I hood design exhaust rates do not exceed the maximum allowed per §140.9(b)1 as documented below.	Design Hood Exhaust Rate (CFM)	Max Hood Exhaust Rate Allowed (CFM)
<input type="checkbox"/>	<input type="checkbox"/>	Mechanically cooled or heated makeup air delivered to any space with a kitchen hood is designed per §140.9(b)(2) to not exceed the greater of: The hood exhaust flow minus the available transfer air from adjacent spaces.	<input type="checkbox"/>				
03	04	05	06	07	08	09	10
01 Location that is supplying transfer air:	FROM DINING ROOM						
05	06	07	08	09	10	11	12
The kitchen/dining facility has a total Type I and Type II kitchen hood exhaust airflow rate > 5000 cfm and is sign to have one of the following per 140.9(b)(2): NA: Not a kitchen/dining facility having a total Type I and Type II kitchen hood exhaust airflow rate > 5,000 cfm							

Table Continued

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Kitchen Exhaust: Airflow Rate §140.9(b)(2)

01	02	03	04	05	06	07	08
Kitchen Name or Tag	Hood Type ¹	Wall-mounted Canopy	Heavy Duty	Hood Length (ft)	Equipment Duty	Design Hood Exhaust Rate (CFM)	Max Hood Exhaust Rate Allowed (CFM)
KEH-1	Type I	Wall-mounted Canopy	8.2	Heavy Duty	1,633	2,296	
KEH-2	Type I	Wall-mounted Canopy	8.2	Heavy Duty	1,617	2,296	

¹ FOOTNOTE: Type II hoods do not have a max hood exhaust air rate per Part 6. §140.9(b)(1B).

O. LABORATORY AND FACTORY EXHAUST AND FUME HOODS
 This Section Does Not Apply

P. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
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YES	NO	Form/Title	Field Inspector	Pass	Fail
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRC-PRC-01-E Covered Process		<input type="checkbox"/>	<input type="checkbox"/>

Q. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE
 Table Instructions: 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/NRC/A

YES	NO	Form/Title	Field Inspector	Pass	Fail
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-01-F Compressed Air Systems		<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCA-PRC-02-F Kitchen Exhaust		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-03-F Garage Exhaust		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-04-F Refrigerated Warehouses - Evaporator Fan Motor Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-05-F Refrigerated Warehouses - Evaporator Fan Motor Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-06-F Refrigerated Warehouses - Air Cooled Condenser Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-16-F Refrigerated Warehouses - Adiabatic Condenser Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-07-F Refrigerated Warehouses - Variable Speed Compressor		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-08-F Refrigerated Warehouses - Electric Resistance Under-slab Heating System		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-12-F Elevator Lighting & Ventilation Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-13-F Escalators & Moving Walkways Speed Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-14-F Lab Exhaust Ventilation Systems		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-15-F Fume Hood Automatic Sash Closure Systems		<input type="checkbox"/>	<input type="checkbox"/>

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 Company: INFRASTRUCTURE FACTOR CONSULTING, INC.
 Address: 2361 ROSECRANS AVE., SUITE 368
 City/State/Zip: EL SEGUNDO, CA 90245

Documentation Author Signature: [Signature]
 Signature Date: 6/10/2021
 CEAH HERS Certification Identification (if applicable):
 Phone: 310-725-1500

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 Address: 2361 ROSECRANS AVE., SUITE 368
 City/State/Zip: EL SEGUNDO, CA 90245

Responsible Designer Signature: [Signature]
 Date Signed: 6/10/2021
 License: M36244
 Phone: 310-725-1500

Add Responsible Person Remove List

STATE OF CALIFORNIA
Process Systems
 NRC-PRC-E (Revised 01/21)
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YES	NO	Form/Title	Field Inspector	Pass	Fail
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-01-F Compressed Air Systems		<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCA-PRC-02-F Kitchen Exhaust		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-03-F Garage Exhaust		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-04-F Refrigerated Warehouses - Evaporator Fan Motor Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-05-F Refrigerated Warehouses - Evaporator Fan Motor Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-06-F Refrigerated Warehouses - Air Cooled Condenser Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-16-F Refrigerated Warehouses - Adiabatic Condenser Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-07-F Refrigerated Warehouses - Variable Speed Compressor		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-08-F Refrigerated Warehouses - Electric Resistance Under-slab Heating System		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-12-F Elevator Lighting & Ventilation Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-13-F Escalators & Moving Walkways Speed Controls		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-14-F Lab Exhaust Ventilation Systems		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRCA-PRC-15-F Fume Hood Automatic Sash Closure Systems		<input type="checkbox"/>	<input type="checkbox"/>



9601 S. SANTA MONICA BLVD.
 BEVERLY HILLS, CA 90210

Gensler

Gensler

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Tel 213.372.3400

STRUCTURAL
Contact:
Claudia Walker
Tel 213.310.8495

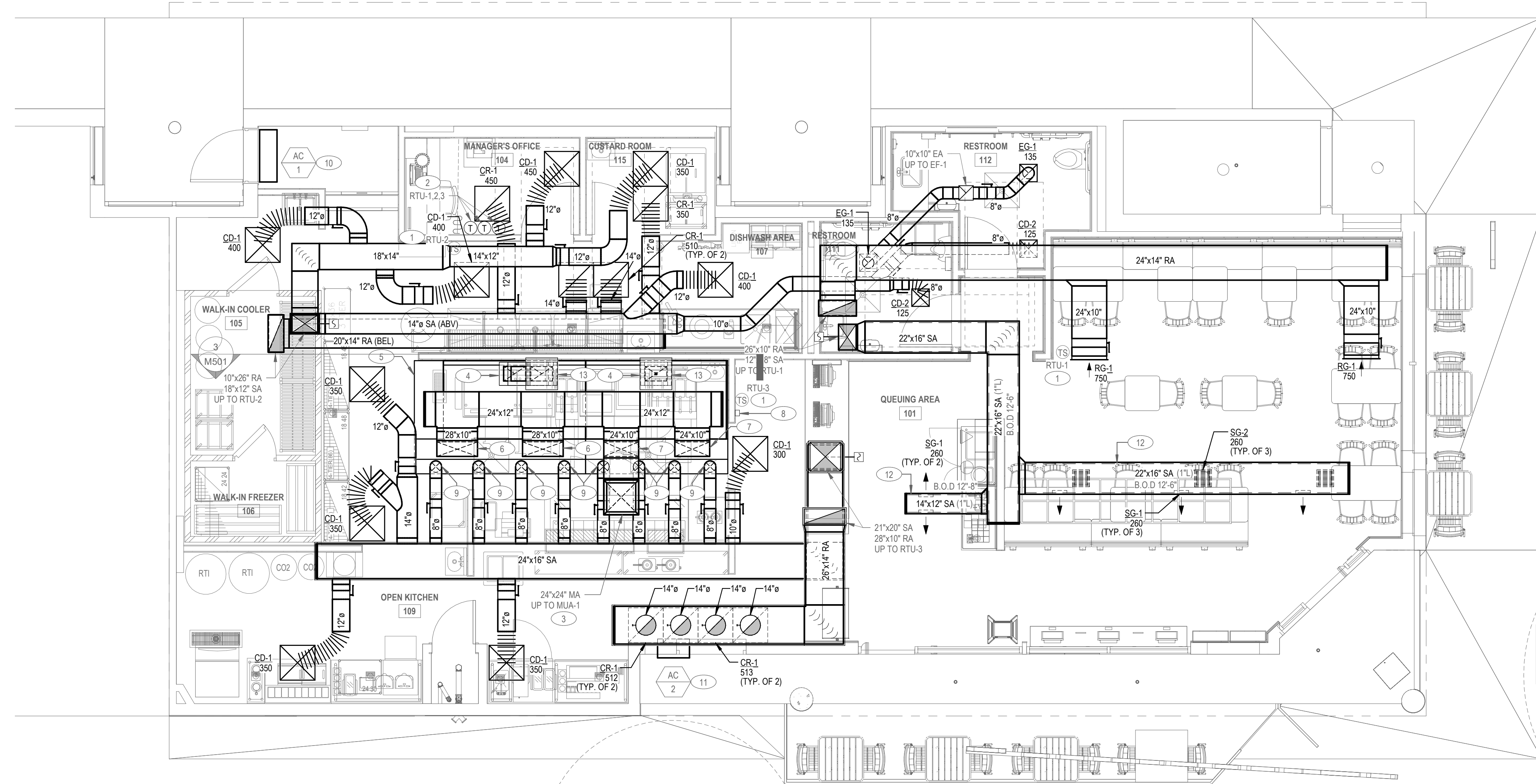
CIVIL
Contact:
Douglas Conlon
Tel 213.418.0201

RENOVATION KEY NOTES

- MOUNT REMOTE TEMPERATURE SENSOR AT 48" ABOVE FINISHED FLOOR. COORDINATE WITH ARCHITECT FOR EXACT LOCATION.
- MOUNT THERMOSTAT CONTROLLER AT 48" ABOVE FINISHED FLOOR. COORDINATE WITH ARCHITECT FOR EXACT LOCATION.
- MAKEUP AIR DUCT ROUTED UP TO MUA-1 ON ROOF. INSULATE ALL DUCTWORK FROM HOOD TO FAN AS INDICATED IN SPECIFICATIONS.
- PROVIDE TYPE 1 GREASE EXHAUST DUCT FROM KITCHEN EXHAUST HOOD TO KITCHEN EXHAUST FAN. TRANSITION GREASE DUCT AS REQUIRED TO CONNECT TO NEW EXHAUST FAN KEF-1 & 2 ON ROOF. GREASE DUCT TO BE WRAPPED WITH FIRE WRAP TO MAINTAIN 6" CLEARANCE TO COMBUSTIBLE.
- KITCHEN HOOD AND HOOD FIRE SUPPRESSION CABINET FURNISHED BY CAPTIVEWARE AND INSTALLED BY CONTRACTOR. REFER TO KITCHEN EQUIPMENT DRAWINGS FOR ADDITIONAL INFORMATION. HOOD FIRE ALARM CONNECTION INSTALLED BY FIRE ALARM CONTRACTOR. COORDINATE EQUIPMENT FIRE PROTECTION REQUIREMENTS WITH THE FIRE PROTECTION CONTRACTORS PRIOR TO INSTALLATION.
- PROVIDE 28"x10" SUPPLY DUCT DROP TO CONNECT TO MAKEUP AIR SUPPLY RISER WITH DAMPER AT HOOD. BALANCE EACH CONNECTION TO AIRFLOW INDICATED ON THE HOOD MANUFACTURER DRAWINGS.
- PROVIDE 24"x10" SUPPLY DUCT DROP TO CONNECT TO MAKEUP AIR SUPPLY RISER WITH DAMPER AT HOOD. BALANCE EACH CONNECTION TO AIRFLOW INDICATED ON THE HOOD MANUFACTURER DRAWINGS.
- INSTALL HOOD FIRE SUPPRESSION MANUAL PULL STATION. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH FIRE MARSHAL AND LOCAL CODE REQUIREMENTS.
- DROP 8" SUPPLY DUCT DOWN TO HOOD CONNECTION. PROVIDE BALANCE DAMPER IN DUCT DROP. BALANCE AIRFLOW TO 100 CFM FOR EACH HOOD CONNECTION AS INDICATED ON HOOD MANUFACTURER DRAWINGS SERIES M6.
- PROVIDE AIR CURTAIN MOUNTED ABOVE DELIVERY DOOR. PROVIDE WITH DOOR SWITCH. AIR CURTAIN TO OPERATE CONTINUOUSLY WHEN DOOR IS OPEN.
- PROVIDE AIR CURTAIN MOUNTED ABOVE TAKE-OUT WINDOW. PROVIDE WITH WINDOW SWITCH. AIR CURTAIN TO OPERATE CONTINUOUSLY WHEN WINDOW IS OPEN.
- INSTALL EXPOSED SUPPLY DUCTWORK FOR DINING AREA. COORDINATE WITH OWNER AND FIELD CONDITIONS PRIOR TO INSTALLATION.
- PROVIDE 15"x10" TYPE 1 GREASE DUCT DROP TO CONNECT TO EXHAUST RISER WITH DAMPER AT HOOD. BALANCE TO AIRFLOW INDICATED ON THE HOOD MANUFACTURER DRAWINGS.

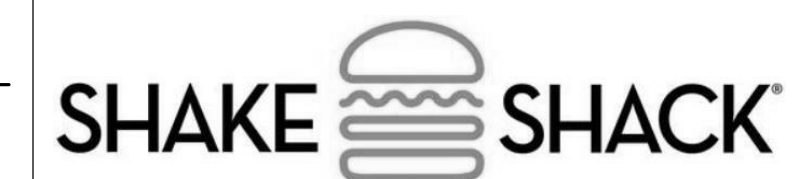
GENERAL NOTES

- WHERE ENCLOSURES ARE NOT REQUIRED, HOODS, GREASE REMOVAL DEVICES, EXHAUST FANS, AND DUCTS SHALL HAVE A CLEARANCE OF NOT LESS THAN 18 INCHES TO COMBUSTIBLE MATERIAL, 3 INCHES TO LIMITED-COMBUSTIBLE MATERIAL, AND 0 INCHES TO NONCOMBUSTIBLE MATERIAL PER 2019 CMR, SEC. 307.4.



DEMOLITION KEY NOTES

- 1 DISCONNECT AND DEMOLISHED ALL EXISTING EQUIPMENT AND EXISTING EQUIPMENT PAD. PREPARE ROOF FOR INSTALLATION OF NEW EQUIPMENT.



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Tel 213.310.8495

CIVIL
Contact:
Douglas Conlon
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DEMOLITION NOTES

1. ALL DEMOLITION SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.
2. THE CONTRACTOR SHALL FIELD SURVEY THE EXISTING CONDITIONS PRIOR TO STARTING ANY WORK.
3. DURING DEMOLITION, THE CONTRACTOR SHALL ALWAYS BE AWARE OF THE INTENDED FINAL RENOVATED CONDITIONS OF THE BUILDING AND THE REASON OF DEMOLITION WORK IS BEING DONE.
4. THE CONTRACTOR SHALL RESTORE TO ITS EXISTING CONDITION ANY EXISTING WORK DAMAGED DURING DEMOLITION INDICATED "EXISTING TO REMAIN" ON THE DRAWINGS.
5. THE CONTRACTOR SHALL TURN OVER ALL DEMOLISHED EQUIPMENT AND MATERIALS, OR DISPOSE AS DIRECTED BY THE OWNER. CONTRACTOR SHALL INCLUDE ANY DISPOSAL FEE AS REQUIRED AS PART OF BASE BID.
6. PROVIDE TEMPORARY ENCLOSURE/PROTECTION/BARRICADES OR WARNING WHERE REQUIRED BY APPLICABLE SAFETY ORDINANCES PRIOR TO START OF DEMOLITION. REMOVE WHEN NO LONGER NEEDED.
7. CONTRACTOR SHALL DEMOLISH AS REQUIRED TO PROVIDE THE NEW LAYOUT ON THIS PLAN.
8. DEMOLISH ALL SERVICES BACK TO MAIN AND CAP AS APPLICABLE.

Date	Description
05/17/21	75% CD SET
06/15/21	ISSUE FOR PERMIT/BID
01/06/22	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name
SHAKE SHACK

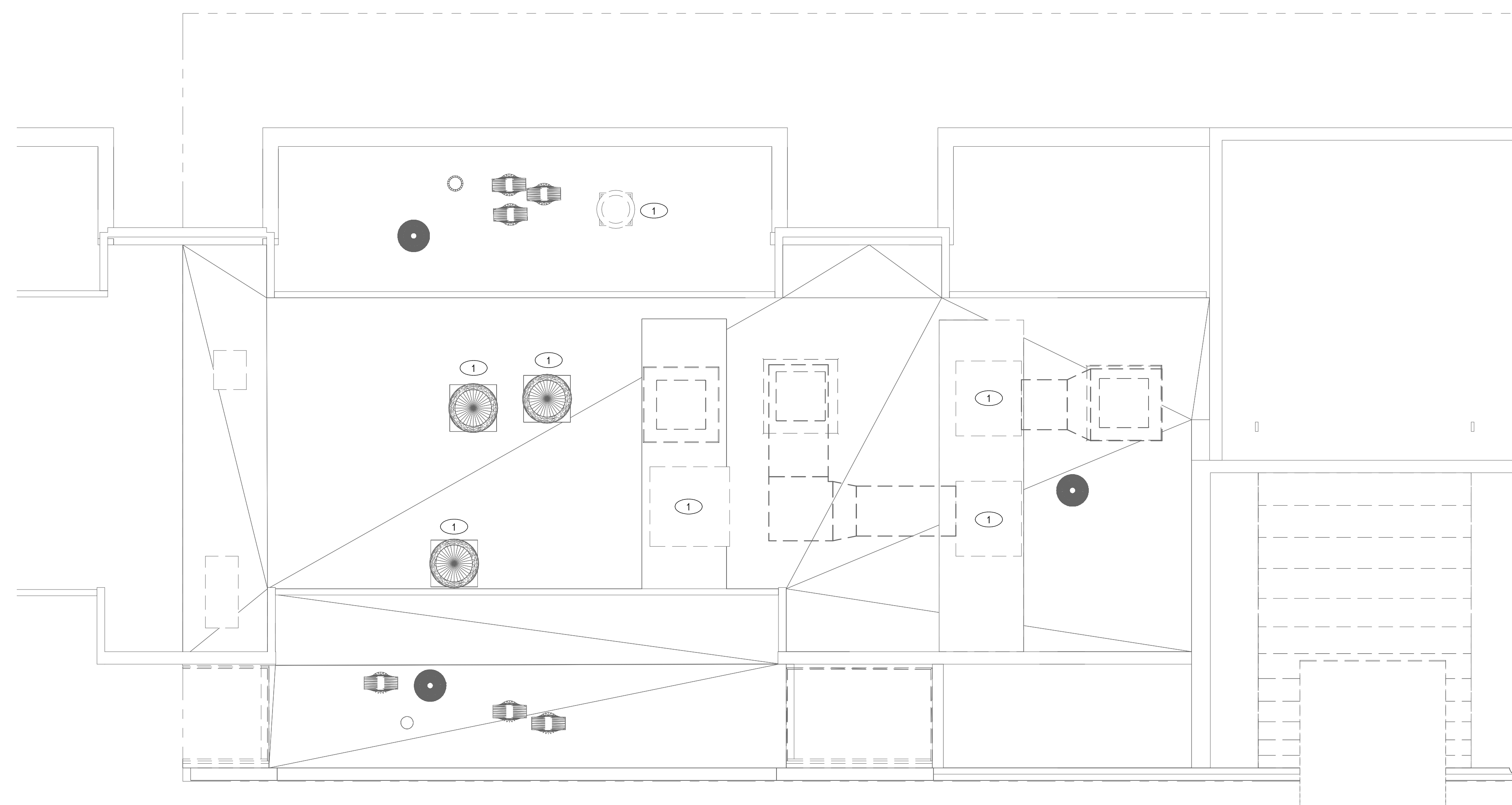
Project Number
SHK-21-001

Description
MECHANICAL DEMOLITION ROOF PLAN

Scale
1/4" = 1'-0"

M121

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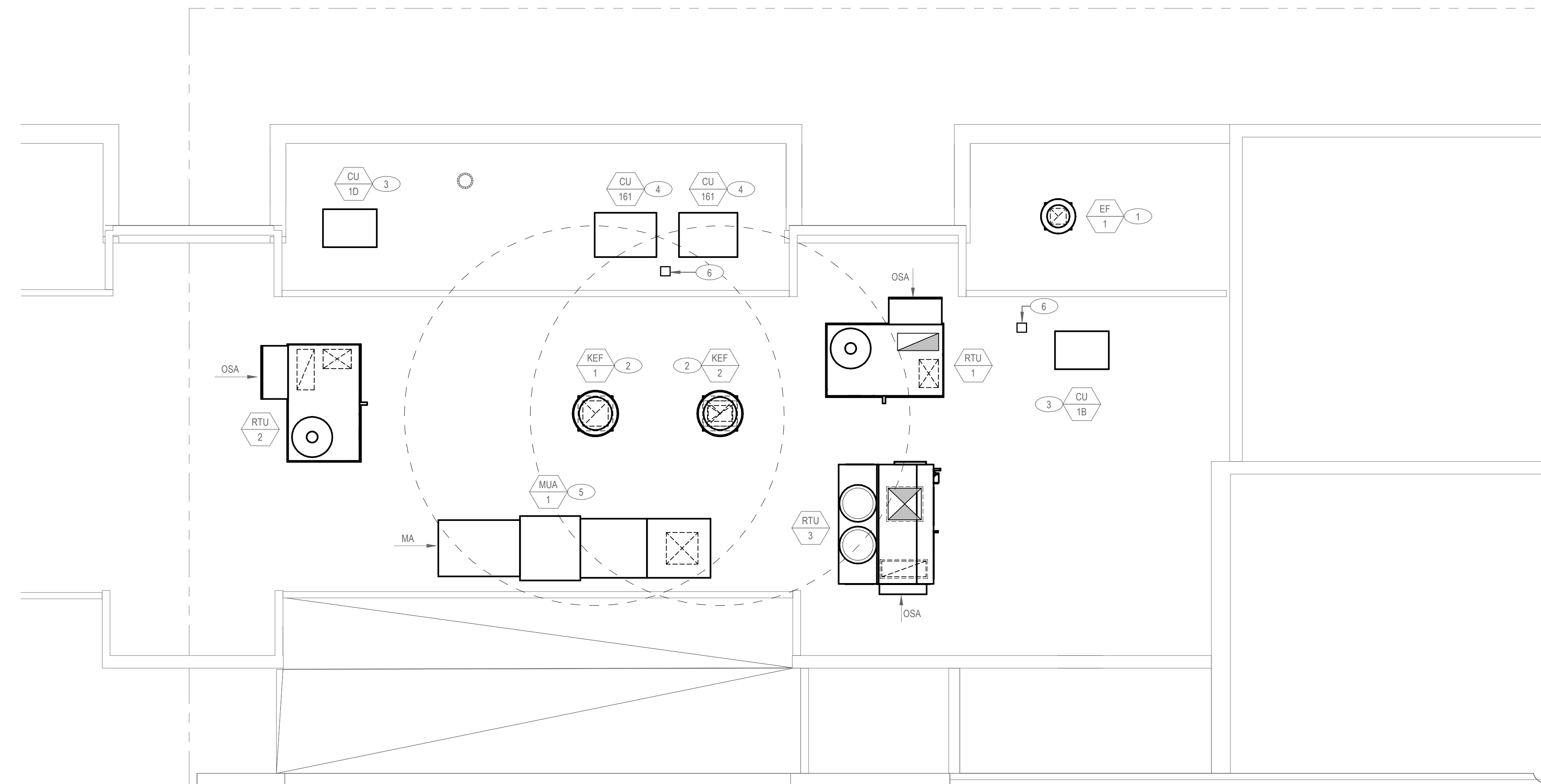


1 MECHANICAL ROOF DEMOLITION PLAN

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

RENOVATION KEY NOTES

- 1 RESTROOM EXHAUST FAN. INSTALLED PER MANUFACTURER'S RECOMMENDATION.
- 2 KITCHEN HOOD EXHAUST FAN FURNISHED BY CAPTIVEAIRE AND INSTALLED BY MECHANICAL CONTRACTOR. INSTALL PER MANUFACTURER'S RECOMMENDATION. REFER TO HALTON DRAWING SERIES M8.
- 3 COOLER/FREEZER CONDENSING UNITS TO BE PROVIDED BY VENDOR. INSTALLED PER MANUFACTURER'S RECOMMENDATION. REFER TO KITCHEN EQUIPMENT SCHEDULE FOR SPECIFICATIONS.
- 4 CUSTARD MACHINE CONDENSING UNITS TO BE PROVIDED BY VENDOR. INSTALLED PER MANUFACTURER'S RECOMMENDATION. REFER TO KITCHEN EQUIPMENT SCHEDULE FOR SPECIFICATIONS.
- 5 MAKEUP AIR UNIT FURNISHED BY CAPTIVEAIRE AND INSTALLED BY MECHANICAL CONTRACTOR. PROVIDE SEISMIC CURB WITH SPRING VIBRATION ISOLATION FOR INSTALLATION OF MAKEUP AIR UNIT. COORDINATE CURB REQUIREMENTS WITH MANUFACTURER AND STRUCTURAL DRAWINGS. INSTALL PER MANUFACTURER'S RECOMMENDATION. REFER TO HALTON DRAWING SERIES M8.
- 6 PIPE CURB FOR REFRIGERANT PIPING. FIELD COORDINATE EXACT LOCATION AND ROUTING.



Date	Description
05/17/21	75% CD SET
06/15/21	ISSUE FOR PERMIT/BID
1 08/11/21	ADDENDUM #1
01/06/22	ISSUE FOR CONSTRUCTION

Seal / Signature



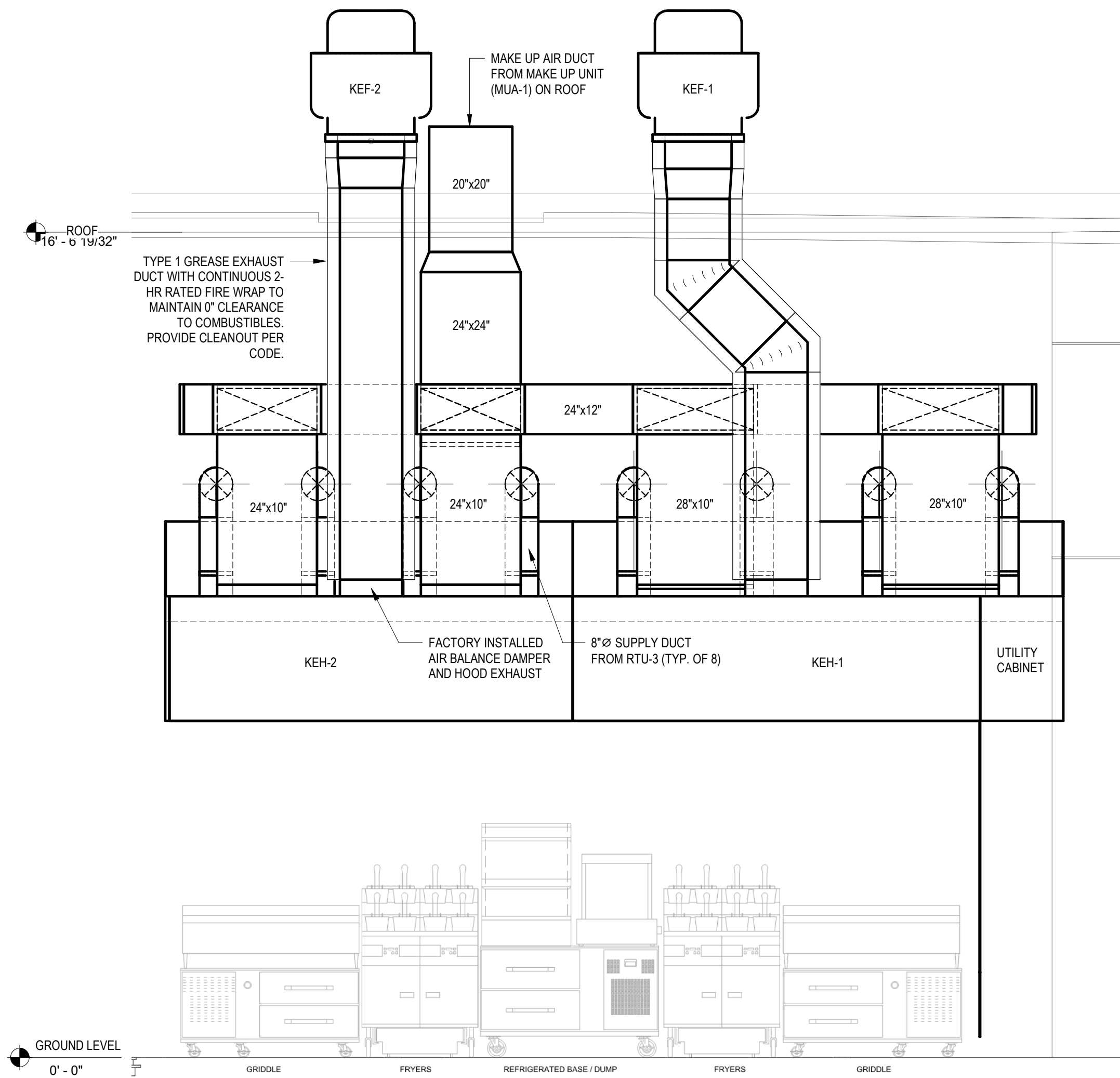
Project Name
SHAKE SHACK

Project Number
SHK-21-001

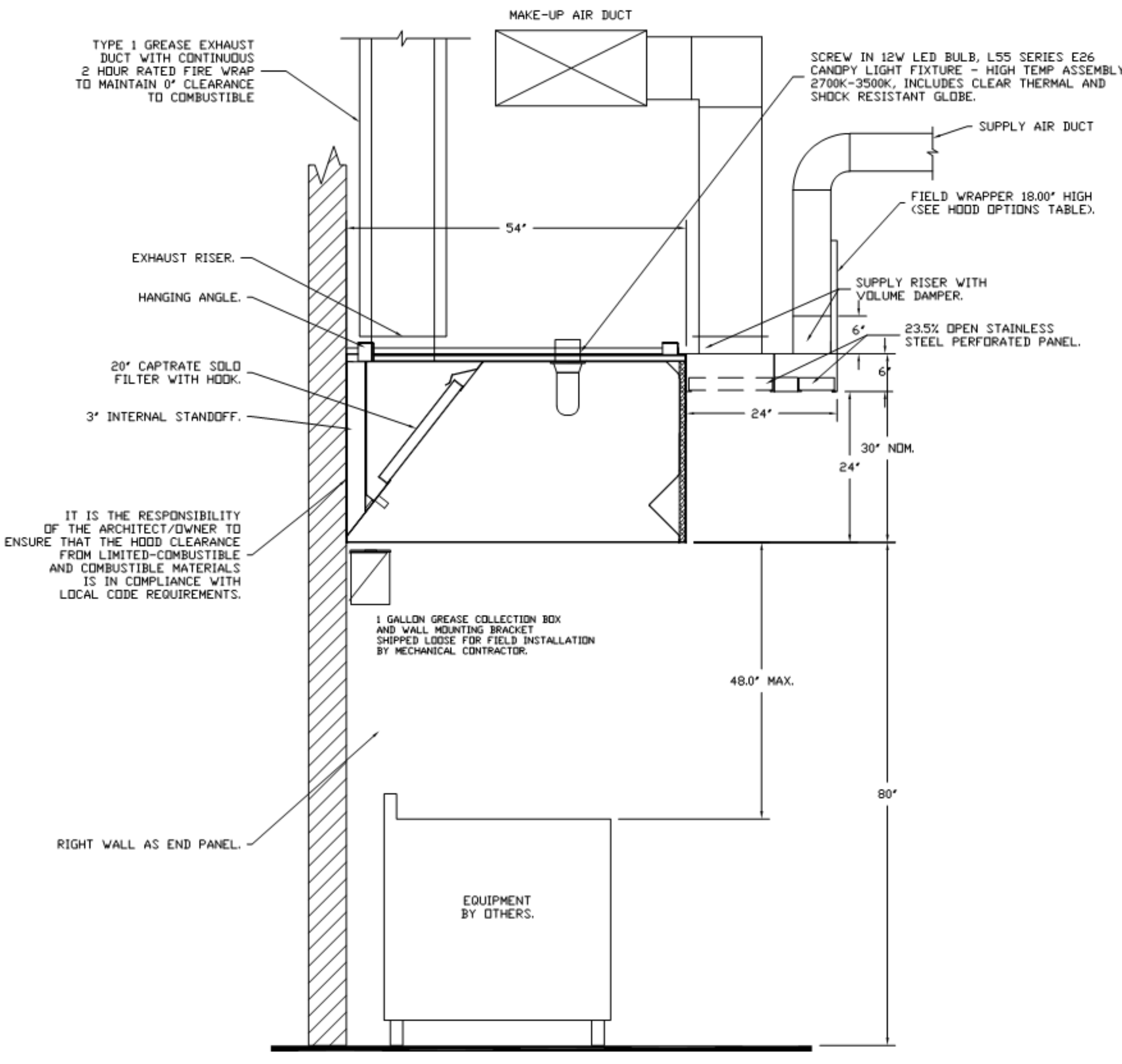
Description
MECHANICAL REMODEL ROOF PLAN

Scale
1/4" = 1'-0"

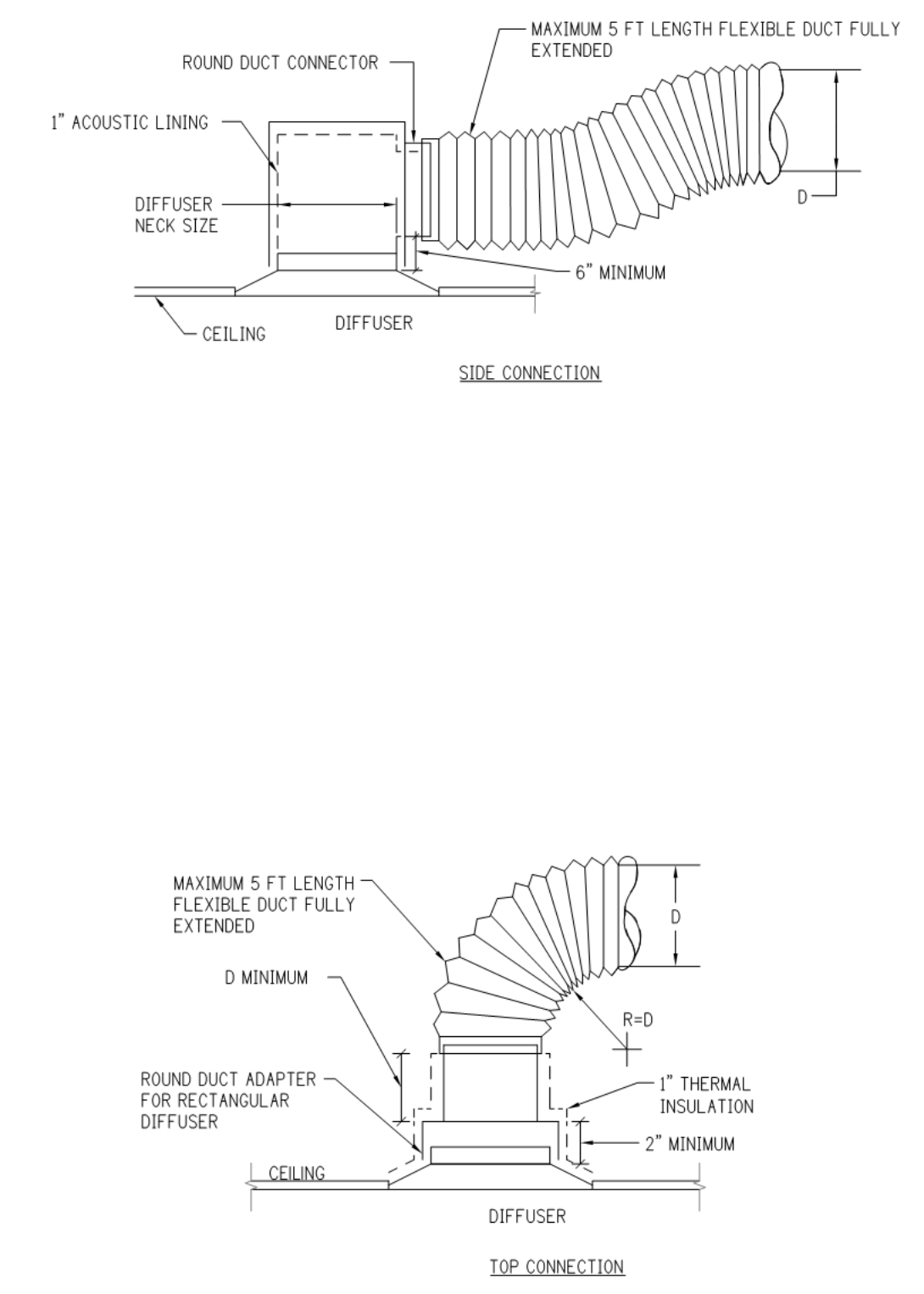
M122



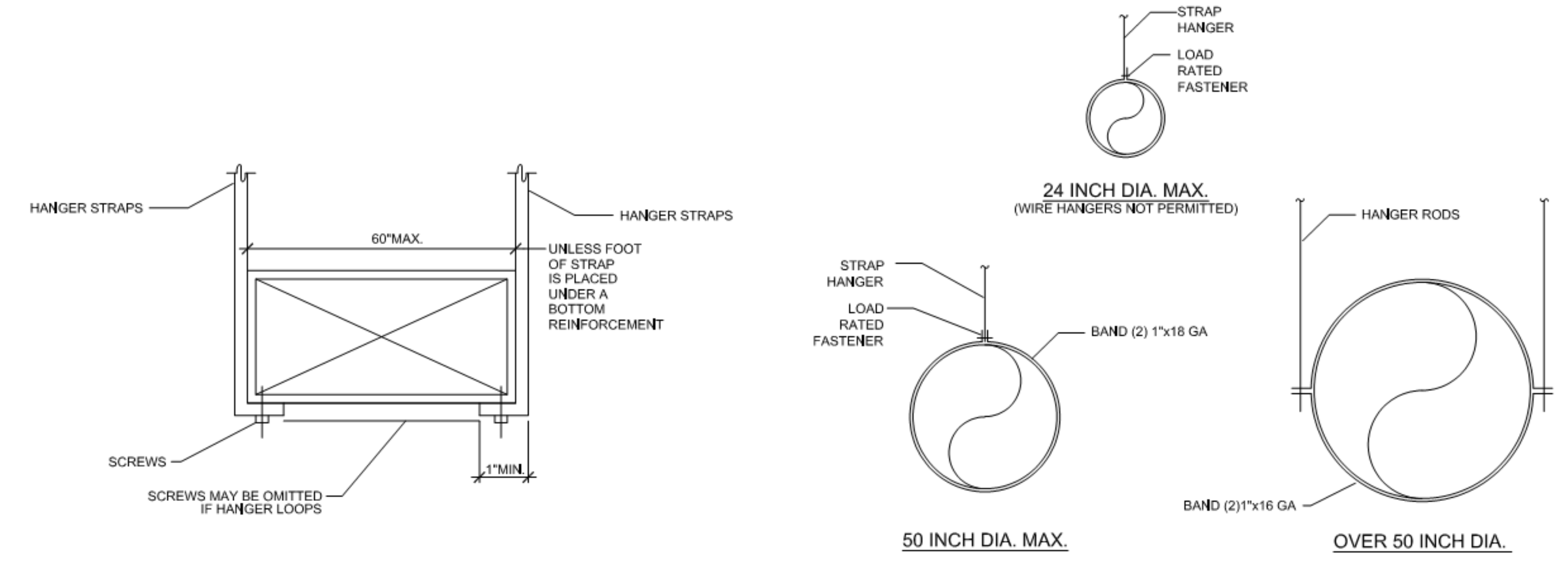
Mechanical Hood Elevation SCALE 1/2" = 1'-0" 3



Kitchen Hood Elevation SCALE NTS 2



Diffuser Connection Detail SCALE NTS 1



- NOTES:
- FOR HANGER SIZE AND SPACING, SEE SMACNA HVAC DUCT CONSTRUCTION STANDARDS TABLE.
 - FOR UPPER ATTACHMENT TO BUILDING SEE SMACNA HVAC DUCT CONSTRUCTION STANDARDS, WITH SPECIFIC STRUCTURAL ENGINEER APPROVAL.
 - FOR BRACING AND OTHER SEISMIC REQUIREMENTS SEE SPECIFICATIONS

Duct Support Detail SCALE NTS 4

Date	Description
05/17/21	75% CD SET
06/15/21	ISSUE FOR PERMIT/BID
1 08/11/21	ADDENDUM #1
01/06/22	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name
SHAKE SHACK

Project Number
SHK-21-001

Description
MECHANICAL DETAILS

Scale
As indicated

M501

Water Leak Testing of New and Existing Grease exhaust vent systems.
Summary: A high pressure multi-nozzle spritjet in conjunction (where needed) with a 15 degree or wider single nozzle lance is to be passed through all new grease exhaust vent systems with the water spray contacting all interior portions of the duct. This is to check for any liquid leakage in the system 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.

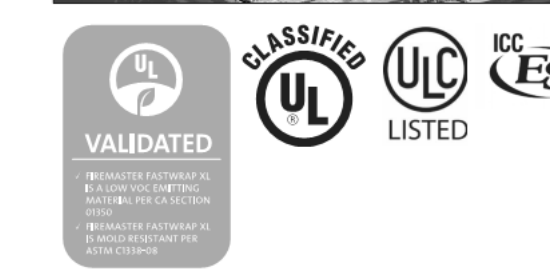
- The water testing job shall be scheduled after the welded grease exhaust system with the hood and all access plates installed. The leaktesting can be done in multi stages for all multi story runs or multi story multi duct runs, but there must be one final test of all connection joints.
- All testing 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 @ 3GPM (minimum requirements to run a multi nozzle duct cleaner/known as a spritjet or roto-nozzle) shall be required.
- The work should normally start at the intake(hood) portion of the system (or 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) fanning into a large watertight brate (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/MG welder is highly recommended), a bright portable light, with access to all parts of the system.
- A spotter with the welder shall access the outside of the ductwork to spot any leaks.
- If the duct leaks, the leaks shall be repaired and the test is to be redone.
- Additional leaks shall continue to be repaired and re-tested until no leaks exist.
- When testing is completed, the Testing Company shall dry out the duct, remove the plastic and return system to same condition as found (with leaks repaired).
- The Testing Company will take pictures of the system and procedure, then e-mail them to Enviromatic to verify the job is done correctly.

- A leaktest form shall be filled out and signed that system is liquid tight as specified by NFPA96 guidelines.
- The leaktest form shall note number of leaks found, number of re-testing required in needed, rough drawing of the system with access plate locations and where the leaks were found and repaired. The form shall have signature lines for both the job-site representative and the testing company representative.
- If any sealant (EX: JB Weld, epoxies, etc) is found in a welded duct, the test shall immediately fail and the leaktesting will cease immediately until all sealant is removed to bare metal or bare welds.
- For listed ducts with sealed joints, only the listed sealant shall be used. The leaktesting will progress in the same manner as the welded ducts EXCEPT leakage requiring sealant repairs will need to cure for the required time before re-testing.

FireMaster® FastWrap® XL

Datasheet Code US 714-236

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Grease Duct Enclosure System
Air Ventilation Duct Enclosure System
Product Data & Installation Guide

1. Product Description
Thermal Ceramics FireMaster® FastWrap XL is a flexible blanket composed of high temperature fibers classified for applications to 2192°F (200°C) and fully encapsulated in a durable glass fiber reinforced foil facing for easy handling and installation. Thermal Ceramics FastWrap XL is UL and ULCC listed for 1 and 2 hour fire resistive enclosures, protection, zero clearance for kitchen exhaust ducts, electrical circuit protection, and as a component in UL tested designs for fire resistance rated floors, ceilings, and walls. The core fibers in FastWrap XL are manufactured using Thermal Ceramics patented Superwool® fiber which is an alkaline earth silicate wool with low 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.

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FireMaster® FastWrap® XL

General
Cut edges of the blanket shall be taped with aluminum foil tape to prevent exposed edges of the insulation absorbing grease and moisture in the event of a compromised grease duct joint or condensation. Overlaps and/or tightly butted joints are used to block heat transfer in the event of duct deformation resulting from thermal expansion. Flammant tape is suggested to hold the blanket in place until steel banding or pinning is installed or permanently secured to the surface.

A. Installation on Grease Duct per ASTM E2336 and CANULC S144 (Figure 1)
System requires two layers of insulation applied directly to the duct with tight butted joints at all seams on both layers. The first layer of insulation is cut to a length sufficient to wrap around the duct and provide a tight but joint where the blanket ends meet. Adjacent blankets on the first layer are butted tightly together with longitudinal seams offset minimum 6" (150mm). The second layer of insulation is installed in the same method as the first layer, with seams between layers offset a minimum of 6" (150mm). Banding and/or pinning per Section D is used to permanently secure the insulation to the duct.

B. Installation on HVAC Duct per ISO 8844 (Figure 1)
System requires one layer of insulation applied directly to the duct with 3" (75mm) overlap at all seams. The insulation is cut to a length sufficient to wrap around the duct and provide a 3" (75mm) overlap where the blanket ends meet. Adjacent blankets are installed to provide a minimum overlap of 3" (75mm). Banding and/or pinning per Section D is used to permanently secure the insulation to the duct.

C. 2 & 3 Sided Wrap Installation (Figure 4)
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 steel concrete or CMU assembly. (See Figure 4 for installation details.)

D. Mechanical Attachment Methods
1) **Banding (Figure 1)** - Minimum 1/2" (13mm) wide carbon steel or stainless steel banding, 0.015" (0.4mm) thick, is placed around the entire perimeter of the insulated duct on maximum 10-1/2" (270mm) centers and 1-1/2" (38mm) from each blanket edge or 1-1/2" (38mm) from each outer edge when using the but joint

and collar method. The banding is placed around the blanket and tightened to firmly hold the FastWrap XL in place against the duct, but not cause any cutting or damage to the blanket.

2) **Pinning** - Pinning on all sides of the duct may be used as an alternative to banding. For ducts wider than 24" (610mm) pinning is required on the bottom of horizontal runs, or on one side of vertical runs (in addition to steel banding). When applicable, 1/2" (6.4mm) steel pins are installed on 12" (305mm) centers along the width of the duct and 10-1/2" (270mm) centers along the length of the duct. Pins that extend beyond the outer blanket layer shall be turned down or the excessive length cut off to prevent sharp edges. Shroud through pins (cup head pins) may be used in conjunction with steel banding to prevent blanket sag.

E. Access Doors
1) **FastDoor™ XL (Figure 3)** - FastDoor XL is a UL Listed, liquid tight duct cover panel supplied complete with a single layer insulation cover per UL Listing HMKC 018. The FastDoor XL is installed per included installation instructions. No field welding is required.

2) **Field Fabricated Access Doors** - Each access door assembly has four threaded rods 1/4 inch (6mm) in diameter and 5" (127mm) in length, with one welded to each corner of the door opening. Hollow steel tubes, 4x-1/2" (114mm) long are installed outside the access cover plate and over the threaded rods. Four 1/2" (12.7mm) and 4-1/2" (114mm) long steel insulation pins are welded to the access cover plate to allow for installation of the three layers of FastWrap XL. One layer of FastWrap XL is cut to approximately the same size as the access panel, and installed over the insulation pins on the panel. A second layer of FastWrap XL is cut so as to overlap the first layer a minimum of 1-1/2" (38mm). It is essential that the first and second layer fit tightly against the surrounding wrap with no through openings. The first and outside layer should be cut to overlap the second insulation layer by a minimum of 1-1/2" (38mm). Minimum 1-1/2" (38mm) round or square insulation clips are installed on the insulation pins to secure the three layers of insulation to the access cover plate. All cut edges of the insulation shall be taped with minimum 3" (75mm) wide aluminum foil tape. Wing nuts and washers are installed on the four threaded rods, and tightened against the hollow steel tubes to seal the

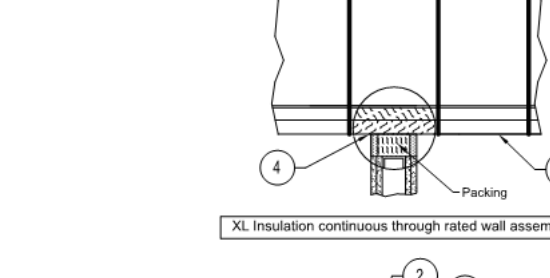
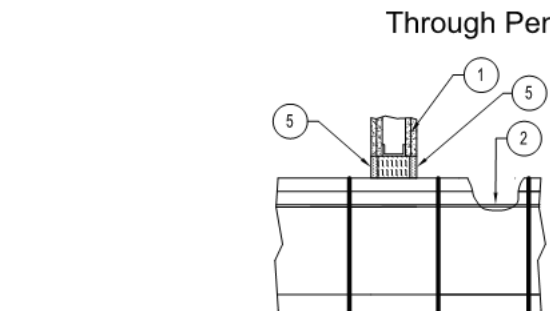
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FireMaster® FastWrap® XL

Datasheet Code US 714-236

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Grease Duct Enclosure System
Air Ventilation Duct Enclosure System
Through Penetration Firestop System

1. Product Description
Thermal Ceramics FireMaster® FastWrap XL is a flexible blanket composed of high temperature fibers classified for applications to 2192°F (200°C) and fully encapsulated in a durable glass fiber reinforced foil facing for easy handling and installation. Thermal Ceramics FastWrap XL is UL and ULCC listed for 1 and 2 hour fire resistive enclosures, protection, zero clearance for kitchen exhaust ducts, electrical circuit protection, and as a component in UL tested designs for fire resistance rated floors, ceilings, and walls. The core fibers in FastWrap XL are manufactured using Thermal Ceramics patented Superwool® fiber which is an alkaline earth silicate wool with low 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.

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FireMaster® FastWrap® XL

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Grease Duct Enclosure System
Air Ventilation Duct Enclosure System
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Thermal Ceramics FireMaster® FastWrap XL is a flexible blanket composed of high temperature fibers classified for applications to 2192°F (200°C) and fully encapsulated in a durable glass fiber reinforced foil facing for easy handling and installation. Thermal Ceramics FastWrap XL is UL and ULCC listed for 1 and 2 hour fire resistive enclosures, protection, zero clearance for kitchen exhaust ducts, electrical circuit protection, and as a component in UL tested designs for fire resistance rated floors, ceilings, and walls. The core fibers in FastWrap XL are manufactured using Thermal Ceramics patented Superwool® fiber which is an alkaline earth silicate wool with low 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.

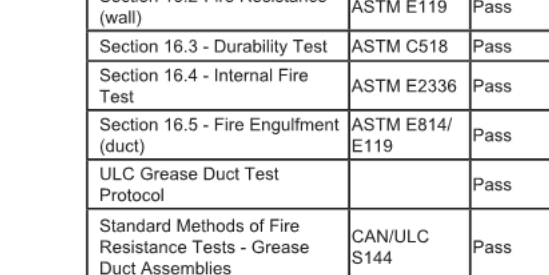
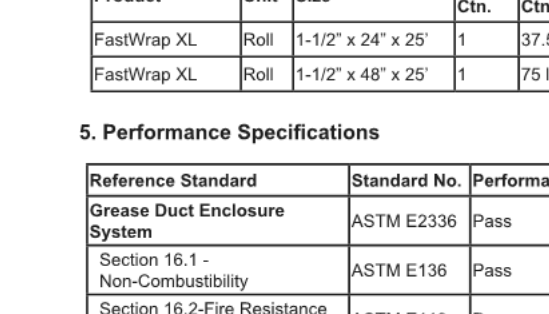
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FireMaster® FastWrap® XL

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Grease Duct Enclosure System
Air Ventilation Duct Enclosure System
Product Data & Installation Guide

4. Physical Characteristics
Product Unit Size Unit Weight
FastWrap XL Roll 11'-0" x 24' x 25' 1 37.5 lbs.
FastWrap XL Roll 11'-0" x 48' x 25' 1 75 lbs.

5. Performance Specifications
Reference Standard Standard No. Performance
Grease Duct Enclosure System ASTM E2336 Pass
Section 16.1 - Non-Combustibility ASTM E136 Pass
Section 16.2 - Fire Resistance (min) ASTM E119 Pass
Section 16.4 - Internal Fire Test ASTM E2336 Pass
Section 16.5 - Fire Engulfment (dot) ASTM E84 Pass
ULC Grease Duct Test Protocol Pass
Standard Methods of Fire Resistance Tests - Grease Duct Assemblies CANULC S144 Pass
Grease Duct Clearance UL 1978 Pass
Air Ventilation Duct Enclosure ISO 8844 Pass
Surface Burning Characteristics ASTM E84 <25/0
Thermal Resistance ASTM C518 7.3 per layer
Mold Growth ASTM C1338 N/A (valued)
Lead Content CA Standard 01350 N/A (valued)

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FireMaster® FastWrap® XL

6. Listings/Building Code Reports
Listed Tests Agency Listing Layers
Grease Duct Enclosure per ASTM E2336 and AC107 (2006) ICC-ES ESR-2215 1 or 2
ULC Grease Duct Test Protocol and CANULC S144 ULC PRD 4, 7, 2
Grease Duct Test Protocol (2003 IBC) DPL TC08 130-0-1
Through Penetration Firestop System per ASTM E814, ULC See Figure 2 1 or 2
1- or 2-hour Ventilation Duct Enclosure per ISO 8844-1985 ULC HNLJ.V1, HNLJ.V2, HNLJ.V3, HNLJ.V4 1
2-hour Ventilation Duct Enclosure per ISO 8844-1985 ULC PRD 3, 5, 6, 15 1
Electrical Circuit Protection System ICA PWT8.9 2

7. Storage
Thermal Ceramics FastWrap XL must be stored in a dry warehouse environment on pallets. Pallets should not be stacked.

8. Installation
Thermal Ceramics FastWrap XL shall be installed by a qualified contractor in accordance with manufacturer's instructions and laboratory design listings.
Materials and Equipment
Thermal Ceramics FastWrap XL blanket
Aluminum foil tape
Glass filament reinforced tape (optional)
Carbon steel or stainless steel banding material, minimum 1/2" (38mm) wide, minimum 0.015" (0.4mm) thick, with steel banding clips
Hand banding instrument and crimping tool
Minimum 12 gauge (3mm) steel insulation pins, steel steel clips, minimum 1-1/2" (38mm) square or 1-1/2" (38mm) diameter, or equivalent sized cup-head pins
Calculator discharge stud gun
Thermal Ceramics FastDoor™ XL
An approved firestop sealant

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

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

Hanger Section	Max. Penetration (in mm)	Trapeze Support (or equivalent) Yield Strength, (in mm)
17" x 16" page strap (25 mm x 13 mm strap)	200 (2540)	50 (350)
4" x 4" in. threaded rod w/ 1/2" (12.7mm)	100 (2540)	50 (350) x 1/2" (38mm) x 3/4" (19mm)
3/4" x 1/2" in. threaded rod w/ 1/2" (12.7mm)	100 (2540)	50 (350) x 1/2" (38mm) x 3/4" (19mm)
1/2" x 1/2" in. threaded rod w/ 1/2" (12.7mm)	218 (5542)	2 (15) x 2 (15) x 14 (35) angle

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

Hanger Section	Maximum Penetration (in mm)	Trapeze Support (or equivalent) Yield Strength, (in mm)
17" x 16" page strap (25 mm x 13 mm strap)	148 (3750)	2 (15) x 2 (15) x 14 (35) in angle

10. Limitations
Thermal Ceramics FireMaster FastWrap XL shall be installed in accordance with these installation instructions and appropriate laboratory design listings. The integrity of FastWrap XL systems is limited to the quality of the installation.

* For general protective equipment recommendations, please see SDS. Thermal Ceramics, FireMaster, and FastWrap are trademarks of Morgan Advanced Materials. FireMaster products are manufactured by Thermal Ceramics and are distributed by Enviro-matic.

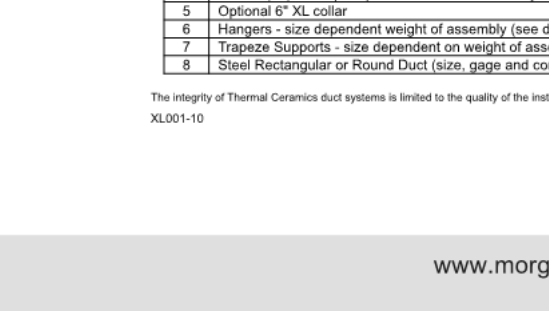
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FireMaster® FastWrap® XL

Datasheet Code US 714-236

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Grease and HVAC Duct Enclosure System
1 or 2 Hour Shaft Alternative / Zero Clearance to Combustibles

1. Product Description
Thermal Ceramics FireMaster® FastWrap XL is a flexible blanket composed of high temperature fibers classified for applications to 2192°F (200°C) and fully encapsulated in a durable glass fiber reinforced foil facing for easy handling and installation. Thermal Ceramics FastWrap XL is UL and ULCC listed for 1 and 2 hour fire resistive enclosures, protection, zero clearance for kitchen exhaust ducts, electrical circuit protection, and as a component in UL tested designs for fire resistance rated floors, ceilings, and walls. The core fibers in FastWrap XL are manufactured using Thermal Ceramics patented Superwool® fiber which is an alkaline earth silicate wool with low 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.

www.morganthermalceramics.com

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Grease and HVAC Duct Enclosure System
1 or 2 Hour Shaft Alternative / Zero Clearance to Combustibles

1. Product Description
Thermal Ceramics FireMaster® FastWrap XL is a flexible blanket composed of high temperature fibers classified for applications to 2192°F (200°C) and fully encapsulated in a durable glass fiber reinforced foil facing for easy handling and installation. Thermal Ceramics FastWrap XL is UL and ULCC listed for 1 and 2 hour fire resistive enclosures, protection, zero clearance for kitchen exhaust ducts, electrical circuit protection, and as a component in UL tested designs for fire resistance rated floors, ceilings, and walls. The core fibers in FastWrap XL are manufactured using Thermal Ceramics patented Superwool® fiber which is an alkaline earth silicate wool with low 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.

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12/2014 Page 8 of 8

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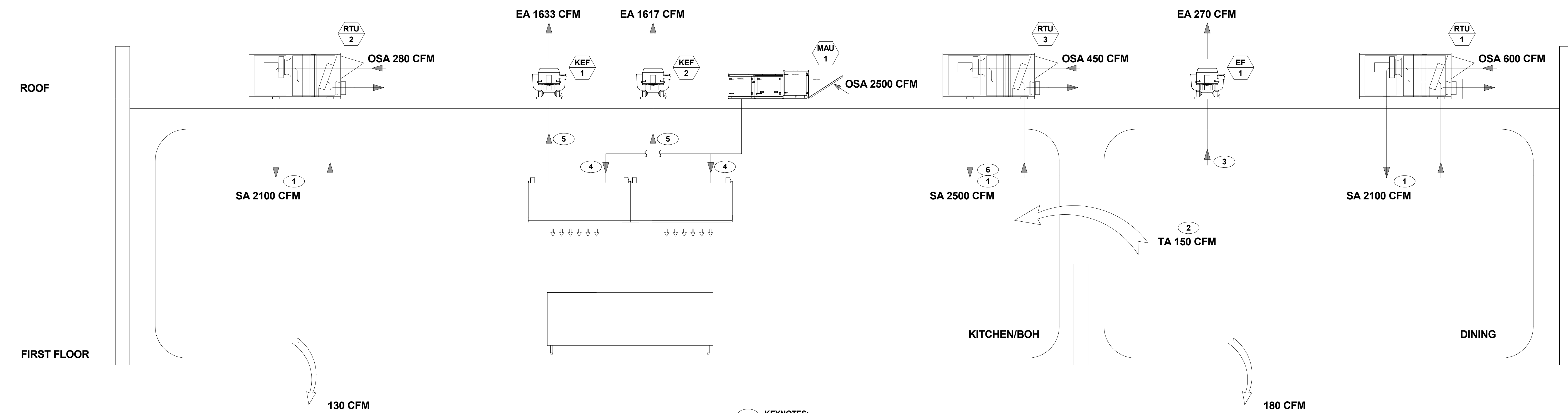
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AIR BALANCE TABLE AT DESIGN							
	HVAC SUPPLY (CFM)	HVAC RETURN (CFM)	HVAC OSA (CFM)	HOOD OSA (CFM)	HOOD EXHAUST (CFM)	GENERAL EXHAUST (CFM)	AREA SERVED
RTU-1	2100	1500	600	-	-	-	DINING
RTU-2	2100	1820	280	-	-	-	BOH
RTU-3	2500	2050	450	-	-	-	KITCHEN
MUA-1	-	-	-	2500	-	-	KEH-1/2
KEF-1	-	-	-	-	1633	-	KEH-1
KEF-2	-	-	-	-	1617	-	KEH-2
EF-1	-	-	-	-	-	270	RESTROOMS
TOTAL	6700	5370	1330	2500	3250	270	
OSA			3830		-3520		

TOTAL PRESSURIZATION DIFFERENCE = +310



- KEYNOTES:**
1. TOTAL OF AIR INLETS / OUTLETS.
 2. TRANSFER AIR TO KITCHEN FROM ADJACENT SPACE.
 3. TOTAL OF RESTROOM EXHAUST FANS.
 4. MAKE UP AIR TO SUPPLY KITCHEN HOOD.
 5. KITCHEN HOOD EXHAUST.
 6. INCLUDES SUPPLY TO KITCHEN HOOD.

Date	Description
05/17/21	75% CD SET
06/15/21	ISSUE FOR PERMIT/BID
01/06/22	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name
SHAKE SHACK

Project Number
SHK-21-001

Description
MECHANICAL AIRFLOW DIAGRAMS

Scale
NTS

M601

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GENERAL

1. ALL ROOF TOP UNITS SHALL SHUT DOWN UPON ALARM FROM KITCHEN EXHAUST HOOD FIRE EXTINGUISHING SYSTEM.

RTU-1 AND RTU-2

1. DURING OCCUPIED HOURS, UNITS SUPPLY FANS SHALL RUN CONTINUOUSLY AND OUTDOOR AIR DAMPER AND RETURN AIR DAMPER SET TO MINIMUM POSITION TO MAINTAIN MINIMUM VENTILATION.
2. 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 TO 55 DEG-F MIXED-AIR TEMPERATURE INTO THE ZONE. AS THE MIXED AIR TEMPERATURE FLUCTUATES ABOVE 55 DEG-F OR BELOW 50 DEG-F, DAMPERS WILL BE MODULATED (OPEN OR CLOSE) TO BRING THE MIXED-AIR TEMPERATURE BACK WITHIN CONTROL.
3. 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.
4. 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.
5. IF THE UNIT IS OCCUPIED AND THE FAN IS ON, THE DAMPER WILL OPERATE AT MINIMUM POSITION. OTHERWISE, THE DAMPER WILL BE CLOSED. WHEN THE ECONOMIZER IS IN THE 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.
6. IF THE FAN IS ON, THEN THE CONTROL WILL OPEN THE ECONOMIZER TO THE MINIMUM POSITION. IF FREE COOLING CAN BE USED AS DETERMINED FROM THE APPROPRIATE CHANGEOVER COMMAND (73 DEG-F DRY BULB), 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-3

1. UNIT SHALL BE OUTFITTED WITH A CONTROL BOARD TO ALLOW FOR FULL CONTROL OF THE ENTIRE UNIT.
2. ALL UNITS 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.
3. ACTIVATION: THE UNIT SHALL ACTIVATE WHEN THE SPACE TEMPERATURE RISES ABOVE THE DESIRED COOLING SETPOINT OF 74 DEG-F (ADJ.) OR WHEN THE SPACE TEMPERATURE DROPS BELOW THE DESIRED HEATING SETPOINT OF 70 DEG-F (ADJ.).
4. SPACE TEMP CONTROL (HEAT PUMP) UNIT MODULATES THE COMPRESSOR FREQUENCY TO ACCURATELY MAINTAIN THE DESIRED SPACE TEMPERATURE SET POINT AND COMPENSATE FOR FLUCTUATIONS IN ENTERING AIR TEMPERATURE, AIR VOLUME AND % OF OA USING HEATING PID CONTROLS DESIGNED SPECIFICALLY FOR THE DOAS. MINIMUM AND MAXIMUM DISCHARGE SET POINTS CAN BE SET TO LIMIT THE TEMPERATURE ENTERING THE SPACE. WHEN AMBIENT TEMPERATURES DROP BELOW A USER CONFIGURABLE MINIMUM OUTDOOR AIR TEMPERATURE SET POINT, OR THE UNIT IS NOT ABLE TO MAINTAIN A USER CONFIGURABLE MINIMUM DISCHARGE TEMP FOR 5 MINUTES TIME, THE HEAT PUMP WILL INITIATE ITS BACKUP HEAT SOURCE. INITIATION OF BACKUP HEATER OPERATION SHALL ENSURE DISCHARGE TEMPS ARE MAINTAINED PRIOR TO DISABLING HEAT PUMP TO MAKE SURE DISCHARGE TEMPS ARE NEVER IMPACTED DURING CHANGEOVER. AN OPTIONAL ADDITIONAL HMI OR ROOM THERMOSTAT CAN BE USED TO DETERMINE THE SPACE TEMPERATURE. IN THE CASE THAT NO TEMPERATURE SENSOR IS AVAILABLE IN THE SPACE, THE UNIT WILL USE AN INTERNAL RETURN TEMPERATURE SENSOR.
5. ADVANCED TOTAL UNIT ECONOMIZER: THE CONTROL SYSTEM IS OUTFITTED STANDARD, WITHOUT NEED FOR ANY ADDITIONAL HARDWARE, WITH AN ADVANCED TOTAL UNIT ECONOMIZER WHICH WILL TAKE MAXIMUM ADVANTAGE OF AS MUCH ENERGY AVAILABLE IN THE OUTDOOR AIR CONDITIONS IN ORDER TO RUN THE COMPRESSOR THE MINIMUM AMOUNT REQUIRED AT ANY GIVEN INCOMING AIR CONDITIONS. IF THE DIFFERENTIAL ENTHALPY PERMITS, THE UNIT WILL BE CAPABLE OF COMPLETELY MODULATING AND SHUTTING OFF COMPRESSOR TO PROVIDE "FREE" COOLING AND DEHUMIDIFICATION AS THE OUTDOOR AIR CONDITIONS ALLOW.

MAU-1

1. MAKE-UP UNIT SUPPLY AIR FAN SHALL BE ENERGIZED AND THE OUTSIDE AIR DAMPER SHALL OPEN 100% WHEN EXHAUST FAN KEF-1 AND KEF-2 ARE ENERGIZED.
2. MAKE-UP UNIT SUPPLY AIR FAN SHALL BE DE-ENERGIZED BY ANY KITCHEN EXHAUST HOOD FIRE EXTINGUISHING SYSTEM, SMOKE DETECTOR ALARMS, OR UPON ALARM FROM DUCT MOUNTED SMOKE DETECTOR OF MAU-1.
3. EVAPORATIVE COOLING OR GAS HEAT SHALL ENABLE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE BETWEEN 75 DEG-F (ADJ.) AND 60 DEG-F (ADJ.).

KITCHEN EXHAUST FANS

1. KEF-1 AND KEF-2 SHALL BE ENERGIZED BY CONTACTORS IN HOOD CONTROL PANEL. COORDINATE INSTALLATION WITH ELECTRICAL CONTRACTOR.
2. INTERLOCK THE MAKEUP AIR UNIT WITH KEF-1 AND KEF-2 SO THE MAKEUP AIR UNIT SUPPLY AIR FAN IS ENERGIZED WHEN THE EXHAUST FANS ARE ENERGIZED.
3. UPON ALARM FROM KITCHEN EXHAUST HOOD FIRE EXTINGUISHING SYSTEM, EXHAUST FANS SHALL CONTINUE TO RUN.
4. 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 (EF-1)

1. EXHAUST FAN SHALL OPERATE CONTINUOUSLY DURING OCCUPIED HOURS AND SHALL BE SHUT DOWN DURING UNOCCUPIED HOURS.

KITCHEN EXHAUST HOODS (KEH-1 AND KEH-2)

1. 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.
2. 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.
3. TEMPERATURE PROBES(S) LOCATED IN THE DUCT RISER SHALL BE CONSTRUCTED OF STAINLESS STEEL.
4. 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.
5. 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.
6. 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.

Date	Description
05/17/21	75% CD SET
06/15/21	ISSUE FOR PERMIT/BID
01/06/22	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

SHAKE SHACK

Project Number

SHK-21-001

Description

CONTROLS

Scale

NTS

M602

SEQUENCE OF OPERATION

SCALE
NTS

1

SPECIFICATION TABLE OF CONTENTS

- SECTION 23050 - COMMON WORK RESULTS FOR HVAC
SECTION 23059 - HANGERS AND SUPPORTS
SECTION 23063 - IDENTIFICATION
SECTION 23069 - TESTING, ADJUSTING, AND BALANCING FOR HVAC
SECTION 23070 - HVAC INSULATION
SECTION 23800 - COMMISSIONING
SECTION 23230 - REFRIGERANT PIPING
SECTION 23313 - METAL DUCTS
SECTION 23330 - AIR DUCT ACCESSORIES
SECTION 23313 - DIFFUSERS, REGISTERS AND GRILLES

SECTION 23050 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 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 ANCHLAGES, 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 INFORM THE GENERAL CONTRACTOR (VIA 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 CONSTRUCTION DOCUMENTS.
2. REFER TO THE RESPONSIBILITY MATRIX FOR ADDITIONAL INFORMATION.

1.3 QUALITY ASSURANCE

D. CODES AND STANDARDS
1. IN ADDITION TO REQUIREMENTS OF ALL GOVERNING CODES, ORDINANCES AND AGENCIES, CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES AND STANDARDS.
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. REFRIGERANT PIPING.
6. DAMPERS.
7. DIFFUSERS, GRILLES AND REGISTERS.
8. CERTIFIED ACOUSTICAL TEST PERFORMANCE DATA FOR DIFFUSERS, REGISTERS, GRILLES AND TERMINAL AIR UNITS.
9. AIR AND WATER TEST AND ANALYSE.
10. COMPLETE FORMS PROPOSED FOR USE IN COMPLYING AND RECORDING TEST RESULTS.
11. CONTROL DEVICES AND SYSTEMS.
12. CONTROL SEQUENCE AND SYSTEM DRAWINGS.
13. FIRE PROTECTION SYSTEM LAYOUTS IN CODE COMPLIANCE.
14. VIBRATION ISOLATION.
15. ONE SET OF AS-BUILT REPRODUCIBLE DRAWINGS.
B. PROVIDE 1 COPY OF APPROVED SUBMITTALS TO THE OFFICE OF THE BUILDING ENGINEER.

1.5 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 SUBSTITUTE.
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.

16. 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 ON AUTOCAD AND PDF AND ONE SET OF HARD COPY SHALL BE DELIVERED TO OWNER.

17. GUARANTEES

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

18. SEISMIC SUPPORT

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

19. PRODUCT HANDLING

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

20. CONTRACT DRAWINGS

A. CONTRACT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF THE WORK AND INDICATE GENERAL ARRANGEMENTS 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 BE PROVIDED. 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.

21.1 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 AREAS OUTSIDE DEMOLITION LIMITS. WHEN SERVICES MUST BE INTERRUPTED, INSTALL TEMPORARY SERVICES FOR AFFECTED AREAS.

C. MATERIALS AND EQUIPMENT TO BE SALVAGED: REMOVE, DEMOUNT, AND DISCONNECT EXISTING MECHANICAL MATERIALS AND EQUIPMENT INDICATED TO BE RECOVERED AND SALVAGED, AND DELIVER MATERIALS AND EQUIPMENT TO THE OWNER AND/OR TO INTRUDEE DAMPERS AND RELATED END SWITCHES INTO THE SYSTEM.

D. REPAIR OR REPLACE EQUIPMENT OR MATERIALS DAMAGED DURING DEMOLITION TO SATISFACTION OF OWNER'S DESIGNATED REPRESENTATIVE.

1.2.3 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 OR OWNER'S PROJECT REPRESENTATIVE AT LEAST 5 DAYS PRIOR TO COMMENCING DEMOLITION OPERATIONS.

1.4 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.

1.5 MAINTENANCE OF EXISTING UTILITY SERVICES

A. UNINTERRUPTED NORMAL USE OF THE EXISTING UTILITIES 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 OF THE LOCATION OF ALL EXISTING SERVICES BEFORE STARTING.
C. IF A SERVICE IS DISTURBED, IMMEDIATELY WITHOUT REGARD FOR WORKING HOURS, PLACE THE SERVICE BACK INTO OPERATION.

D. SUFFICIENT ADVANCE NOTICE SHALL BE GIVEN TO THE OWNER AND ITS PERMISSION OBTAINED PRIOR TO INTERRUPTION OF PRESENT SERVICES. IT SHOULD BE ASSUMED THAT DISRUPTION OF UTILITIES AND SERVICES WILL BE DONE AT OTHER THAN NORMAL WORKING HOURS. NO EXTRA WORK OR EXTRA PAYMENT WILL BE AUTHORIZED TO COMPLY WITH THESE REQUIREMENTS.

E. REPAIR, REPLACE AND MAINTAIN IN SERVICE ANY UTILITIES, FACILITIES, OR SERVICES (UNDERGROUND, OVERGROUND, INTERIOR OR EXTERIOR) DAMAGED, BROKEN OR OTHERWISE RENDERED IMPROPER 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 WATER. DAMAGED WORK SHALL BE REPAIRED OR REPLACED UNTIL WORK IS FULLY AND FINALLY ACCEPTED.

G. PROTECT HEATING EQUIPMENT AND ALL SIMILAR ITEMS OF EQUIPMENT FROM DIRT, GRIME, PLASTER, PAINT AND WATER DURING ALL PHASES OF CONSTRUCTION. THIS PROTECTION SHALL BE PROVIDED BY COVERING WITH TRANSPARENT PLASTIC SHEETING.

H. MAKE ALL CONNECTIONS TO EXISTING SYSTEM PIPING AND EQUIPMENT SYSTEMS DURING DESIGNATED PERIODS UPON APPROVAL OF THE OWNER AND AT NO INCREASE IN THE CONTRACT SUM.

I. DO NOT INTERRUPT EXISTING UTILITIES UTILIZED BY THE OWNER, EXCEPT AS APPROVED BY THE OWNER. INTERRUPTIONS MUST BE SCHEDULED TO SUIT THE 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.

2.1.6 INSTALLATION OF THE WORK

A. THE CONTRACT DRAWINGS INDICATE THE GENERAL ARRANGEMENTS FOR THE HVAC, INTUBING, 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 LEVEL AND EQUIPMENT FITS AND CONFORM TO THE STRUCTURE, AVOID OBSTRUCTIONS, MAINTAIN HEADROOM, LEAVE ADEQUATE CLEARANCES FOR LIGHT FIXTURES, RETURN AIR PATHWAYS, MAINTENANCE AND REPAIRS, AND PROVIDE CLEARANCE AND ACCESS AS REQUIRED BY CODES. NOTHING SHALL BE INSTALLED BELOW CEILING LEVEL WITHOUT 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. MANUFACTURERS DRAWINGS AND INSTRUCTIONS SHALL BE FOLLOWED IN ALL CASES WHERE THE MARKERS OF DEVICES AND EQUIPMENT FURNISH DIRECTIONS OR DETAILS NOT SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS.
8. DRAWINGS ARE NOT INTENDED TO BE SCALED, BUT SHALL BE FOLLOWED WITH SUFFICIENT ACCURACY TO COORDINATE WITH OTHER WORK AND STRUCTURAL LIMITATIONS.
9. SEISMIC DESIGN: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ANCHORS, SUPPORTS AND CONNECTIONS OF MECHANICAL WORK TO THE BUILDING STRUCTURE TO PREVENT DAMAGE AS A RESULT OF AN EARTHQUAKE, INCLUDING MANUFACTURED EQUIPMENT, THE CONNECTION AND INTEGRITY OF SHOP FABRICATED AND FIELD FABRICATED MECHANICAL WORK AND EQUIPMENT. ALL SUPPORTS, EQUIPMENT AND CONNECTIONS THERETO 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 FASTENERS OF SUPPORTS, FURNISH ADDITIONAL FRAMING.
11. ALL EQUIPMENT SHALL BE SECURELY FASTENED TO BUILDING CONSTRUCTION WITH APPROVED SUPPORTS.
12. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF DIFFUSERS, GRILLES, REGISTERS, AND THERMOSTATS (IF SPECIFIED). 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 AMPLI TIME FOR PROPER INSTALLATION AND CONNECTION.
14. CAREFULLY CHECK SPACE REQUIREMENTS, INCLUDING SERVING SPACE REQUIREMENTS, WITH OTHER SECTIONS TO ENSURE THAT ALL EQUIPMENT AND MATERIALS CAN BE INSTALLED IN THE SPACES ALLOTTED THERE TO.
15. PREPARE DRAWINGS, ATTEND MEETINGS, OBTAIN ALL APPROVALS REQUIRED BY ALL AUTHORITIES HAVING JURISDICTION, CONDUCT REQUIRED TESTS AND OBTAIN REQUIRED PERMITS.

2.1.7 GENERAL

A. BRUSH AND CLEAN WORK PRIOR TO CONCRETING, 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

2.1.8 CONTROL AND DEVICES

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

2.1.9 PROJECT CLOSE-OUT

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

2.1.10 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. ENCLOSURES: NEMA 1 GENERAL PURPOSE ENCLOSURES WITH PADLOCK EARS, EXCEPT IN WET LOCATIONS SHALL BE NEMA 3R WITH CONDUIT HUBS.
b. TYPE AND SIZE OF STARTER SHALL AS BE RECOMMENDED BY MOTOR MANUFACTURER AND THE DRIVEN EQUIPMENT MANUFACTURER FOR APPLICABLE PROTECTION AND START UP CONDITION.
2. MANUAL SWITCHES SHALL HAVE PILOT LIGHTS AND ALL REQUIRED SWITCH POSITIONS FOR THE MOTOR SPEED. OVERLOAD PROTECTION: MELTING ALLOW OR BI METALLIC TYPE THERMAL OVERLOAD RELAYS, SIZED ACCORDING TO ACTUAL OPERATING CURRENT (FIELD MEASURED).

3. MAGNETIC STARTERS:
a. TYPIC FREE THERMAL TRIP OVERLOAD RELAYS, EACH PHASE, SIZED ACCORDING TO ACTUAL OPERATING CURRENT (FIELD MEASURED).
b. INTERLOCKS, PNEUMATIC SWITCHES AND SIMLAR DEVICES AS REQUIRED FOR COORDINATION WITH CONTROL REQUIREMENTS OF DIVISION 23 CONTROLS SECTION.

4. BUILT IN PRIMARY AND SECONDARY FUSED CONTROL CIRCUIT TRANSFORMER, SUPPLIED FROM LOAD SIDE OF EQUIPMENT DISCONNECT.
5. EXTERNALLY OPERATED MANUAL RESET.
6. UNDER VOLT RELEASE OR PROTECTION FOR ALL MOTORS OVER 20 HP.
7. MOTOR CONNECTIONS: LIQUID TIGHT, 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 AND CABLE CO., SEAWAY WIRE AND CABLE CO., OR SOUTH BEND CO.
E. DISCONNECT SWITCHES:
1. FUSIBLE SWITCHES: FOR EQUIPMENT 1/2 HP OR LARGER, PROVIDE FUSED, EACH PHASE: HEAVY DUTY, HORSEPOWER RATED, SPRING LOADED QUICK MAKE, QUICK BREAK MINIMUM DEAD FRONT LINE SIDE SWITCH. SOLID BRASS LEVER HANDLE 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

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 WORK DIAGONAL OR OTHERWISE IRREGULAR WORK UNLESS SO INDICATED ON DRAWINGS OR APPROVED BY ARCHITECT.

C. PROVIDE RIGID INSULATION SECTION AT ALL HANGER SUPPORTS.
D. PROVIDE SEISMIC RESTRAINTS TO MEET LOCAL CODES.
e. PREVENT VIBRATION OR SWAYING.
f. PROVIDE SLUVEING OR ALL FRINGE THAT PENETRATES FLOOR SLABS.
g. PROVIDE FOR EXPANSION AND CONTRACTION.
h. SUPPORTS OF WIRE, ROPE, WOOD, CHAIN, STRAP PERFORATED BAR OR ANY OTHER MANEKFISH TYPE NOT PERMITTED.
i. COMPLY WITH APPLICABLE REQUIREMENTS AT ANSI B1.1.0 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 SAFETY FACTOR OF THREE (3), BASED ON ULTIMATE TENSILE OR COMPRESSIVE STRENGTH, AS APPLICABLE, OF MATERIAL USED.
l. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS, HANGERS AND SUPPORTS LOCATED IN CRANE, SPACE PRESS SHIFTS 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 MECHANICAL 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 IN HUB-OR-LIP SUPERSTRUT TIE ROD CLAMP. INSTALL THERMAL HANGER SHIELD AT EACH SUPPORT POINT.
4. INSTALL PIPE ISOLATORS BETWEEN HANGERS AND
a. UNSULATED COPPER TUBING.
b. WHEREVER ANY PIPE REQUIRES SOUND AND VIBRATION ISOLATION.
5. MISCELLANEOUS STEEL: PROVIDE MISCELLANEOUS STEEL MEMBERS, BEAMS, BRACKETS (LESS THAN 1-1/2" DIAMETER); CLOSED-PIPE INSULATION, 1/2" THICK, K=25. PROVIDE WEATHERPROOF JACKET ON OUTDOOR PIPING.
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 SCREWS.
b. PROVIDE SEISMIC CONSTRAINTS TO MEET LOCAL CODES.
2. HORIZONTAL DUCT SUPPORTS:
a. INSTALL HANGERS AT EACH CHANGE IN DIRECTION OF DUCT.
b. STRAP HANGERS.
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.
5) 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 (4" RT. DIAMETER); 10'
b. VERTICAL DUCTS: 12'
c. TRAPEZE DUCTS: 8'

C. HVAC EQUIPMENT

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

D. DIVISION 26 HAS RESPONSIBILITIES FOR ELECTRICALLY POWERED OR CONTROLLED MECHANICAL EQUIPMENT WHICH IS SPECIFIED IN DIVISION 23 SPECIFICATION OR SCHEDULED IN DIVISION 23 DRAWINGS. THE SPECIFIC DIVISION OF RESPONSIBILITIES BETWEEN DIVISION 23 AND 26 FOR FURNISHING OR WRING THIS EQUIPMENT IS AS FOLLOWS:
1. DIVISION 26 MECHANICAL REQUIREMENTS:
a. SUPPORT HORIZONTAL DUCTS WITH HANGERS OF SIZE AND SPACING AS INDICATED IN PERTINENT SMACNA DUCT CONSTRUCTION STANDARDS. SEAL AROUND ALL SCREWS.
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c. OTHER METHODS AS DETAILED ON DRAWINGS.
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a. TOGGLE BOLTS.
b. STUDS WELDED TO STRUCTURAL STUDS.
c. LAG SCREWS INTO WOOD BACKING.
d. OTHER METHODS.
3. SUPPORT SPREADERS:
a. INSTALL SPREADERS SPANNING BETWEEN STRUCTURAL MEMBERS WHEN HANGERS FALL BETWEEN THEM, AND HANGER LOAD IS TOO GREAT FOR SLAB OR DECK ATTACHMENT.
b. SPREADERS MAY BE ONE OF METHODS LISTED BELOW, OR COMBINATION OF BOTH AS REQUIRED.
1) FABRICATED FROM STRUCTURAL CHANNEL END FITTINGS BOLTED OR WELDED. SECURE TO STRUCTURE. MEMBERS AS REQUIRED BY CONSTRUCTION AND AS APPROVED BY STRUCTURAL ENGINEER.

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OR WRING THIS EQUIPMENT IS AS FOLLOWS:
1. DIVISION 26 ELECTRICAL DISCONNECTS
2. MOTORS: PROVIDE THE MOTOR WIRING AND ALL THE MOTORS.
3. DISCONNECTS: PROVIDE ALL RESPONSIBILITIES NECESSARY FOR DIVISION 23 MECHANICAL EQUIPMENT WHICH ARE NOT PROVIDED AS PART OF FACTORY WIRING DIVISION 23 EQUIPMENT. PROVIDE POWER WIRING TO ALL DISCONNECTS. IN ADDITION PROVIDE POWER WIRING BETWEEN MOTOR AND DISCONNECT WHEN THE DISCONNECT IS NOT FACTORY INSTALLED. SEE ALSO VARIABLE FREQUENCY DRIVE ABOVE FOR SPECIAL WIRING REQUIREMENTS.
a. CONTROLS: DIVISION 23 EQUIPMENT 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 INTRUDEE 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 POWER WIRING TO FIRE PROTECTION CONTROLS INCLUDING FLOW SWITCHES AND ALARM BELLS.
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 SYSTEMS AND ITS CONTROLS.
4. COORDINATE WITH OTHER WORK, INCLUDING WIRES/CABLES, RACEWAY AND EQUIPMENT INSTALLATION, AS NECESSARY TO PROPERLY INTERFACE INSTALLATION OF 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. MAKE AND MATCH CONDUCTORS OF ELECTRICAL CONNECTIONS FOR PROPER INTERFACE BETWEEN ELECTRICAL POWER SUPPLIES AND INSTALLED EQUIPMENT.
6. MAINT AN EXISTING ELECTRICAL SYSTEM AND FEEDERS TO OCCUPIED AREAS AND OPERATIONAL FACILITIES, UNLESS OTHERWISE INDICATED, OR WHEN AUTHORIZED OTHERWISE IN WRITING BY OWNER, OR ARCHITECT. PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION INTERRUPTIONS TO EXISTING FACILITIES. WHEN NECESSARY, SCHEDULE MOMENTARY OUTAGES FOR REPLACING EXISTING WIRING SYSTEMS WITH NEW WIRING SYSTEMS. WHEN THAT CUTTING-OVER WORK IS NECESSARY, IT SHALL BE 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 ELECTRICAL INSULATION RATING OF THOSE CONDUCTORS BEING SPLICED.
8. PREPARE CABLES AND WIRES, BY CUTTING AND STRIPPING COVERING ARMOR, JACKET, AND INSULATION PROPERLY TO PROVIDE 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" CONDUCTOR WIRES WHILE SKINNING WIRE.
E. MOTORS AND MOTOR CONTROL EQUIPMENT: CONFORM TO THE STANDARDS OF THE NEMA EQUIPMENT WITH MAGNETIC OR MANUAL LINE STARTERS WITH OVERLOAD PROTECTION. MOTOR STARTERS AND LINE VOLTAGE CONTROLS SHALL BE INSTALLED UNDER ELECTRICAL SECTION 23 DRAWINGS. THE SPECIFIC REQUIREMENTS UNDER THIS SECTION OF THE WORK. STARTERS SHALL BE COMBINATION TYPE WITH NON FUSIBLE DISCONNECT SWITCHES. ALL SINGLE PHASE FRACTONAL HORSEPOWER MOTORS SHALL HAVE BUILT IN OVERLOAD PROTECTION.

SECTION 23059 - 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 AT ALL HANGER SUPPORTS.
d. PROVIDE SEISMIC RESTRAINTS TO MEET LOCAL CODES.
e. PREVENT VIBRATION OR SWAYING.
f. PROVIDE SLUVEING OR ALL FRINGE THAT PENETRATES FLOOR SLABS.
g. PROVIDE FOR EXPANSION AND CONTRACTION.
h. SUPPORTS OF WIRE, ROPE, WOOD, CHAIN, STRAP PERFORATED BAR OR ANY OTHER MANEKFISH TYPE NOT PERMITTED.
i. COMPLY WITH APPLICABLE REQUIREMENTS AT ANSI B1.1.0 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 SAFETY FACTOR OF THREE (3), BASED ON ULTIMATE TENSILE OR COMPRESSIVE STRENGTH, AS APPLICABLE, OF MATERIAL USED.
l. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS, HANGERS AND SUPPORTS LOCATED IN CRANE, SPACE PRESS SHIFTS 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 MECHANICAL 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 IN HUB-OR-LIP SUPERSTRUT TIE ROD CLAMP. INSTALL THERMAL HANGER SHIELD AT EACH SUPPORT POINT.
4. INSTALL PIPE ISOLATORS BETWEEN HANGERS AND
a. UNSULATED COPPER TUBING.
b. WHEREVER ANY PIPE REQUIRES SOUND AND VIBRATION ISOLATION.
5. MISCELLANEOUS STEEL: PROVIDE MISCELLANEOUS STEEL MEMBERS, BEAMS, BRACKETS (LESS THAN 1-1/2" DIAMETER); CLOSED-PIPE INSULATION, 1/2" THICK, K=25. PROVIDE WEATHERPROOF JACKET ON OUTDOOR PIPING.
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 SCREWS.
b. PROVIDE SEISMIC CONSTRAINTS TO MEET LOCAL CODES.
2. HORIZONTAL DUCT SUPPORTS:
a. INSTALL HANGERS AT EACH CHANGE IN DIRECTION OF DUCT.
b. STRAP HANGERS.
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.
5) 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 (4" RT. DIAMETER); 10'
b. VERTICAL DUCTS: 12'
c. TRAPEZE DUCTS: 8'

SECTION 23063 - IDENTIFICATION

A. AN IDENTIFICATION LABEL SHALL BE PROVIDED FOR THE FOLLOWING TYPES OF EQUIPMENT:
1. ROOF TOP UNITS.
2. EXHAUST FANS.
3. MAKEUP AIR UNITS.
4. SPLIT SYSTEMS.
5. CONDENSING UNITS.
6. KITCHEN HOOD AND EXHAUST SYSTEMS.

B. IDENTIFICATION LABELS SHALL BE BY SETON, OR EQUIVALENT. PROVIDE LABELS & FLOW ARROWS ON ALL DUCT AND PIPING @ 10' INTERVALS.

C. TEMPERATURE CONTROL PANELS SHALL BE IDENTIFIED WITH ENGRAVED PHENOLIC NAMEPLATES AND EACH CONTROL COMPONENT SHALL BE IDENTIFIED WITH ITS SETPOINTS.

D. ALL MECHANICAL EQUIPMENT INSTALLED ABOVE SUSPENDED 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/MISEA A13.1 WHERE APPLICABLE.

SECTION 23069 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

A. GENERAL

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CIVIL
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Date	Description
05/17/21	75% CD SET
06/15/21	ISSUE FOR PERMIT/BID
01/06/22	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

SHAKE SHACK

Project Number

SHK-21-001

Description

MECHANICAL SCHEDULES

Scale

NTS

M701

PACKAGED GAS/ELECTRIC ROOFTOP UNIT SCHEDULE

ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	SUPPLY FAN				OSA (CFM)	COOLING						HEATING				ELECTRICAL (RTU)				ELECTRICAL (POWER EXHAUST)				REF.	WT. (LBS)	REMARKS
					CFM	E.S.P. (IN. WG.)	FAN RPM	FAN BHP		NOM. TOTAL (TONS)	TOTAL (MBH)	SENSIBLE (MBH)	EAT (DB/WB)	LAT (DB/WB)	EER/ SEER	OUTPUT (MBH)	EAT (DB/WB)	LAT (DB/WB)	THERMAL EFF.	V	PH	MCA	MOCP	V	PH	MCA	MOCP			
RTU	1	CARRIER	48GCLM06A2A3-0A0A0	DINING	2100	1.0	2310	1.32	600	5	57.26	43.31	77.0/63.8	56.2/54.0	12.0/16.1	49.0	70.0	91.6	81.7%	230	1	39.0	60	230	1	6.25	15	R-410A	1146	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
RTU	2	CARRIER	48GCLM06A2A3-0A0A0	BOH	2100	1.0	2310	1.32	280	5	57.26	43.31	77.0/63.8	56.2/54.0	12.0/16.1	49.0	70.0	91.6	81.7%	230	1	39.0	60	230	1	6.25	15	R-410A	1146	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

NOTES:

- EFFICIENCY BASED ON AHRI 210/240 STANDARD RATING CONDITIONS.
- PROVIDE WITH 2-STAGE COOLING.
- PROVIDE WITH VENSTAR T2900 7-DAY PROGRAMMABLE THERMOSTAT WITH WALL PLATE AND ACC-TSEN REMOTE TEMPERATURE SENSOR.
- PROVIDE WITH FACTORY FURNISHED DIRECT DRIVE - ECOBLUE - MEDIUM STATIC FAN CONTROL.
- PROVIDE WITH CANFAB 1118-PE/MPPE-***** POWER EXHAUST/DRY-BULB ECONOMIZER. PROVIDE WITH ECONOMIZER FDD. UNIT IS POWERED SEPARATELY FROM RTU.
- PROVIDE WITH SMOKE DETECTOR FOR AUTOMATIC SHUT-DOWN OF UNIT UPON SMOKE DETECTION.
- PROVIDE WITH MERV-13 FILTERS.
- PROVIDE WITH 14" INSULATED SEISMICALLY RATED VIBRATION ISOLATION CURB.
- PROVIDE WITH BACNET COMMUNICATION CARD FOR FUTURE CONNECTION.
- PROVIDE WITH NATIONAL TAB UV-PH INDOOR PURIFICATION SYSTEM PHI-PKG14-24V (GENERAL CONTRACTOR FURNISHED; TAB CONTRACTOR INSTALLED).

HEAT PUMP ROOFTOP UNIT SCHEDULE

ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	SUPPLY FAN				OSA (CFM)	COOLING						HEATING				ELECTRICAL				REF.	WT. (LBS)	REMARKS
					CFM	E.S.P. (IN. WG.)	FAN RPM	FAN BHP		NOM. TOTAL (TONS)	TOTAL (MBH)	SENSIBLE (MBH)	EAT (DB/WB)	LAT (DB/WB)	EER/ SEER	OUTPUT (MBH)	EAT (DB/WB)	LAT (DB/WB)	COP	V	PH	MCA	MOCP			
RTU	3	CAPTIVEAIRE	CASRTU1-E.151-16-7.5T	KITCHEN	2500	1.7	2304	1.4	450	7.5	72.2	63.9	76.2/62.4	54.0/52.0	11.4/18.6	60.0	70.0	91.6	3.3	240	1	70.3	80	R-410A	1389	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

NOTES:

- EFFICIENCY BASED ON AHRI 340/360 STANDARD RATING CONDITIONS.
- PROVIDE WITH VARIABLE SPEED INVERTER DUTY COMPRESSORS WITH ECM CONDENSING FAN(S).
- PROVIDE WITH REMOTE HM2 INTERFACE AND REMOTE TEMPERATURE SENSOR.
- PROVIDE WITH FACTORY FURNISHED ECM SUPPLY FAN MOTOR CONTROL.
- PROVIDE WITH BAROMETRIC RELIEF DAMPER.
- PROVIDE WITH DIFFERENTIAL DRY-BULB ECONOMIZER. PROVIDE WITH ECONOMIZER FDD.
- PROVIDE WITH SUPPLEMENTAL 15 KW ELECTRIC RESISTANCE HEAT. PROVIDE WITH CONTROLS TO PREVENT SUPPLEMENTARY HEATER OPERATION PER T-24 110.2(B).
- PROVIDE WITH SMOKE DETECTOR FOR AUTOMATIC SHUT-DOWN OF UNIT UPON SMOKE DETECTION.
- PROVIDE WITH MERV-13 FILTERS.
- PROVIDE WITH CFM MONITORING FOR MUA UNITS.
- PROVIDE WITH 14" FACTORY CURB.
- PROVIDE WITH CASLINK COMMUNICATION CARD FOR FUTURE CONNECTION.
- PROVIDE WITH NATIONAL TAB UV-PH INDOOR PURIFICATION SYSTEM PHI-PKG14-24V (GENERAL CONTRACTOR FURNISHED; TAB CONTRACTOR INSTALLED).

EXHAUST FAN SCHEDULE

ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	SUPPLY FAN						ELECTRICAL						WT. (LBS.)	REMARKS
					CFM	ESP	TYPE	DRIVE	RPM	HP	V	PH	HZ	FLA				
EF	1	GREENHECK	G-070-VG	RESTROOM	270	0.25	DOWNBLAST	DIRECT	1542	0.06	230	1	60	0.65	36	1, 2, 3, 4, 5		
KEF	1	CAPTIVEAIRE	DU8SHFA	KITCHEN HOOD	1633	1.0	UPBLAST	DIRECT	1323	0.75	230	1	60	5.0	93	6, 7		
KEF	2	CAPTIVEAIRE	DU8SHFA	KITCHEN HOOD	1617	1.0	UPBLAST	DIRECT	1318	0.75	230	1	60	5.0	93	6, 7		

NOTES:

- PROVIDE WITH VARI-GREEN ECM WITH DIAL ONLY.
- PROVIDE WITH STANDARD CURB CAP SIZE - 17" SQUARE.
- PROVIDE WITH NEMA-1 TOGGLE SWITCH.
- PROVIDE WITH BACKDRAFT DAMPER, GRAVITY OPERATED.
- EF-1 TO BE INTERLOCK WITH RTU-2.
- PROVIDE WITH FACTORY CURB, GREASE BOX, ECM WIRING PACKAGE, AND FAN BASE CERAMIC SEAL.
- SEE M806 FOR FIELD WIRING.

EVAPORATIVE COOLING/GAS HEATING MAKEUP AIR UNIT SCHEDULE

ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	CFM	E.S.P. (IN. WG.)	SUPPLY FAN				EVAPORATIVE COOLING				HEATING				ELECTRICAL				FILTER EFF. (%)	WT. (LBS)	REMARKS		
							FAN RPM	FAN BHP	HP	EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	GPH	INPUT (MBH)	OUTPUT (MBH)	TEMP RISE (DEG-F)	EFF.	INLET (IN.)	V	PH	FLA				MCA	MOCP
MUA	1	CAPTIVEAIRE	A2-D.250-20D	KITCHEN	2500	0.75	1207	1.32	2	95.0	68.0	75.0	68.0	3.97	109.6	100.8	35	92%	3/4"	230	1	8.3	22.6	35	MERV-13	949	1, 2, 3, 4, 5, 6

NOTES:

- PROVIDE WITH CASLINK BUILDING MONITORING SYSTEM FOR FUTURE CONNECTION.
- PROVIDE WITH INLET AND MANIFOLD PRESSURE GAUGES.
- PROVIDE WITH MOTORIZE BACKDRAFT DAMPER.
- PROVIDE WITH FAN VFD.
- PROVIDE WITH SEISMICALLY RATED CURB VIBRATION ISOLATION. COORDINATE CURB REQUIREMENTS WITH MANUFACTURER.
- SEE M806 FOR FIELD WIRING.

KITCHEN EXHAUST HOOD SCHEDULE

ITEM	ITEM NO.	MANUFACTURER	MODEL	LENGTH X WIDTH	EXHAUST COLLAR				SUPPLY COLLAR				HOOD CONSTRUCTION	FIRE SYSTEM	FIRE SYSTEM PIPING	WT. (LBS)	REMARKS
					CFM	LENGTH	WIDTH	ESP	CFM	LENGTH	WIDTH	ESP					
KEH	1	CAPTIVEAIRE	5430 ND-2-ACSPSP-F	8'-2" X 54"	1633	15"	10"	-0.59	1470	118"	24"	0.21	430 SS	ANSUL R102	YES	861	1, 2, 3
KEH	2	CAPTIVEAIRE	5430 ND-2-ACSPSP-F	8'-1" X 54"	1617	15"	10"	-0.58	1294	98"	24"	0.22	430 SS	ANSUL R102	YES	575	1, 2, 3

NOTES:

- INSTALLED PER MANUFACTURER'S RECOMMENDATION.
- PROVIDE WITH UL APPROVED MANUAL AIR VOLUME DAMPER ON EXHAUST COLLAR BY HOOD MANUFACTURER.
- SEE M801-M805 FOR ADDITIONAL REQUIREMENTS AND FIELD WIRING.

AIR CURTAIN SCHEDULE

ITEM	ITEM NO.	MANUFACTURER	MODEL	AREA SERVED	CFM	VELOCITY	HP	ELECTRICAL				WT. (LBS)	REMARKS
								V	PH	FLA	MOCP		
AC	1	MARS	LPV236-OB	DELIVERY DOOR	900	1800	1/6	230	1	1.2	-	32	1, 2, 3
AC	2	READY ACCESS	AA100 FLY FAN	TAKE OUT WINDOW	-	1800	1/6	120	1	5	15	29	1, 3, 4

NOTES:

- INSTALLED PER MANUFACTURER'S RECOMMENDATION.
- AIR CURTAIN TO BE CONTROLLED BY DOOR SWITCH.
- PROVIDE WITH WALL MOUNTING BRACKET.
- PROVIDE WITH RELAY SWITCH KIT TO OPERATE UNIT WHEN WINDOW OPENS.

DUCT SIZING CHART

MARK NO.	SIZE (IN)
210	10X6 OR 8"
215 TO 380	14X8 OR 10"
381 TO 610	16X8 OR 12"
610 TO 910	20X8 OR 14"
911 TO 1300	24X10 OR 16"
1301 TO 1790	30X10 OR 18"
1791 TO 2000	30X12 OR 20"

FOR LOW VELOCITY SUPPLY AND RETURN DUCT

AIR DISTRIBUTION SCHEDULE

MARK NO.	MANUFACTURE MODEL NUMBER	NECK SIZE (IN)	CFM RANGE	MAX NC LEVEL	REMARKS
CD-1	PRICE SPD	6"	60-100	30	NOTE 1,2,3
	PRICE SPD	8"	101-200	30	NOTE 1,2,3
	PRICE SPD	10"	201-375	30	NOTE 1,2,3
	PRICE SPD	12"	376-900	30	NOTE 1,2,3
	PRICE SPD	14"	501-750	30	NOTE 1,2,3
CD-2	PRICE SPD	6"	60-100	30	NOTE 1,2,3
	PRICE 80SR	6"	60-100	30	NOTE 1,2,3,4
CR-1	PRICE 80SR	8"	101-200	30	NOTE 1,2,3,4
	PRICE 80SR	10"	201-375	30	NOTE 1,2,3,4
	PRICE 80SR	12"	376-900	30	NOTE 1,2,3,4
	PRICE 80SR	14"	501-750	30	NOTE 1,2,3,4
SG-1	PRICE 510	10"x6"	SEE PLAN	30	NOTE 1,2
SG-2	PRICE 510	10"x10"	SEE PLAN	30	NOTE 1,2
RG-1	PRICE 530	24"x10"	SEE PLAN	30	NOTE 1,2
EG-1	PRICE 530	12"x12"	SEE PLAN	30	NOTE 1,2

NOTES:

- FURNISH WITH OFF-WHITE BAKED ENAMEL FINISH UON. COORDINATE EXACT FINISHES WITH ARCH.
- PROVIDE OPTIONAL INSULATION ON SUPPLY DIFFUSERS. OMIT INSULATION ON RETURN DIFFUSERS.
- PROVIDE LAY IN TYPE 24x24 BORDER. OTHERWISE COORDINATE BORDER TYPE WITH ARCH. PRIOR TO ORDERING.
- PROVIDE WITH CORE OF 1/2"x1/2"x1/2".

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Seal / Signature



Project Name

SHAKE SHACK

Project Number

SHK-21-001

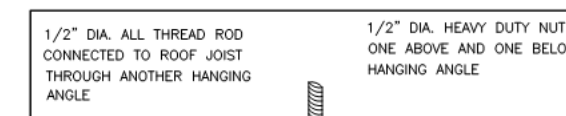
Description

CAPTIVEAIRE DRAWINGS

Scale

NTS

M801



HANGING ANGLE DETAILS

*HOOD AND HOODS TO BE SUPPLIED BY INSTALLING CONTRACTOR
HANGING ANGLE TO BE PRE-CONSTRUCTED BY FACTORY

EXHAUST CFM = LENGTH OF HOOD X CFM/INCH (LOAD)
SUPPLY CFM = EXHAUST CFM X PERCENTAGE REQUIRED
TOTAL DUCT AREA (Sq. Ft.) = 144 X CFM / FPM
DUCT LENGTH = TOTAL DUCT AREA

*CAPTURED VENTILATION DUCT SIZES ARE CALCULATED USING AN EXHAUST VELOCITY OF 2000 FPM AND A SUPPLY VELOCITY OF 1000 FPM

CAPTIVE-AIRE HOODS BUILT IN COMPLIANCE WITH

BUILDING CODES

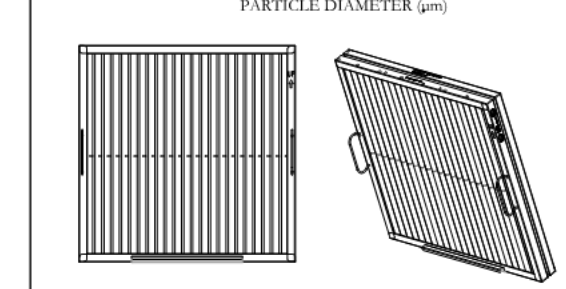
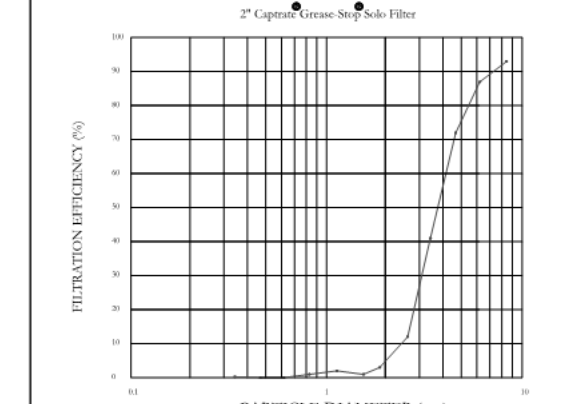
CLEARANCE TO COMBUSTIBLES

INSTALLATION

BALANCE

ADDITIONAL

GENERAL NOTES



FILTER DETAIL

HOOD INFORMATION - JOB#4861359

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RESERVOIR				MUA CFM	AC CFM	HOOD CONSTRUCTION	HOOD CONFIG		
										WIDTH	LENGTH	HEIGHT	DIA				CFM	VEL	SP
1	LEFT	5430	ND-2-ACPS-F	8' 2"	600 DEG	I	HEAVY	200	1633	10'	15'	4'	1633	1568	-0.590'	1470	430 SS WHERE EXPOSED	LEFT	ALONE
2	RIGHT	5430	ND-2-ACPS-F	8' 1"	600 DEG	I	HEAVY	200	1617	10'	15'	4'	1617	1552	-0.578'	1294	430 SS WHERE EXPOSED	RIGHT	ALONE

HOOD INFORMATION

HOOD NO	TAG	TYPE	FILTER(S)		EFFICIENCY @ 7 MICRONS	QTY	LIGHT(S)		WIRE GUARD	LOCATION	SIZE	UTILITY CABINET(S)		ELECTRICAL	SWITCHES	FIRE HOOD SYSTEM/HANGING PIPING WEIGHT
			QTY	HEIGHT			LENGTH	TYPE				SIZE				
1	LEFT	CAPTRATE SOLO FILTER	6	20"	16"	95% SEE FILTER SPEC	4	SCREW IN 12V LED	ND	LEFT	20"x54"x30"	ANSUL R102	3.0/3.0/3.0/3.0	SC-E0101HA	1 LIGHT 1 FAN	YES 861 LBS
2	RIGHT	CAPTRATE SOLO FILTER	6	20"	16"	95% SEE FILTER SPEC	4	SCREW IN 12V LED	ND	RIGHT	20"x54"x30"	ANSUL R102	3.0/3.0/3.0/3.0	SC-E0101HA	1 LIGHT 1 FAN	YES 875 LBS

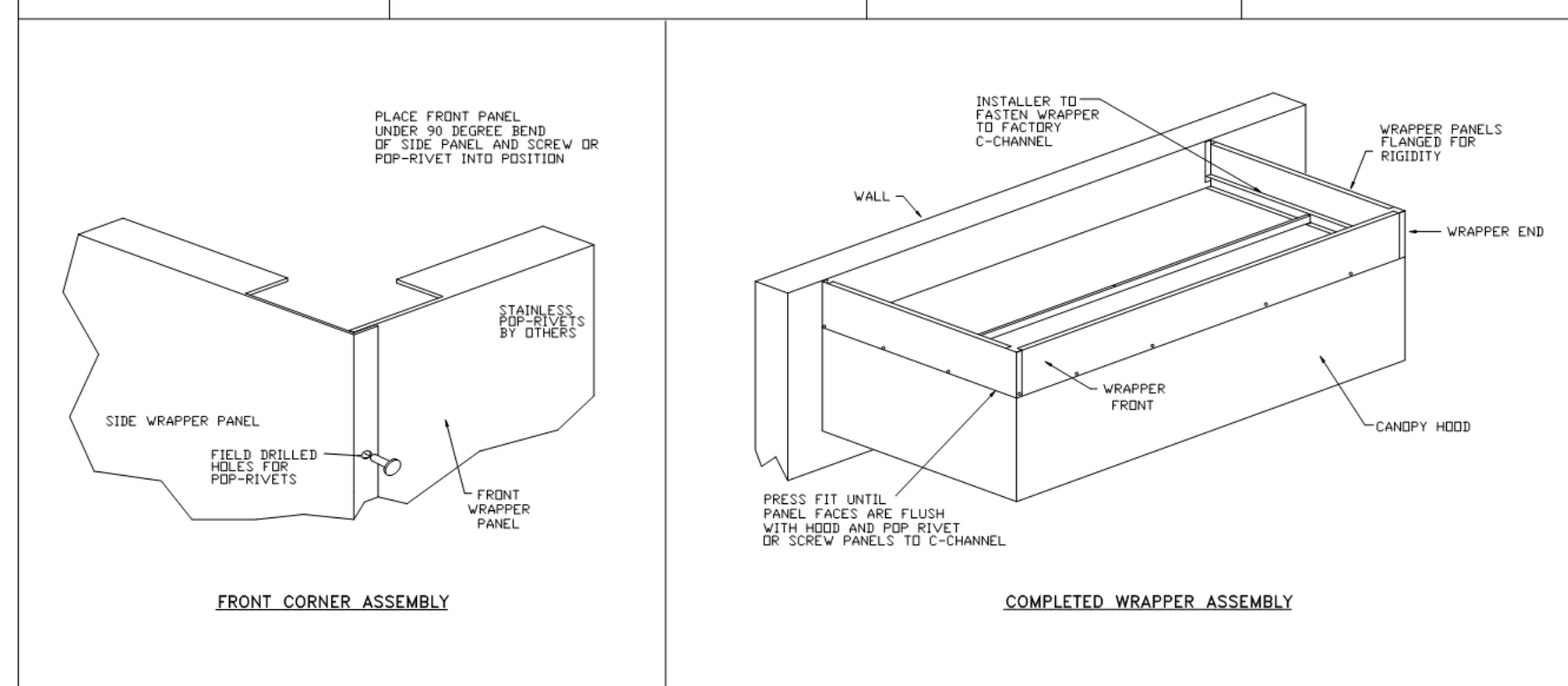
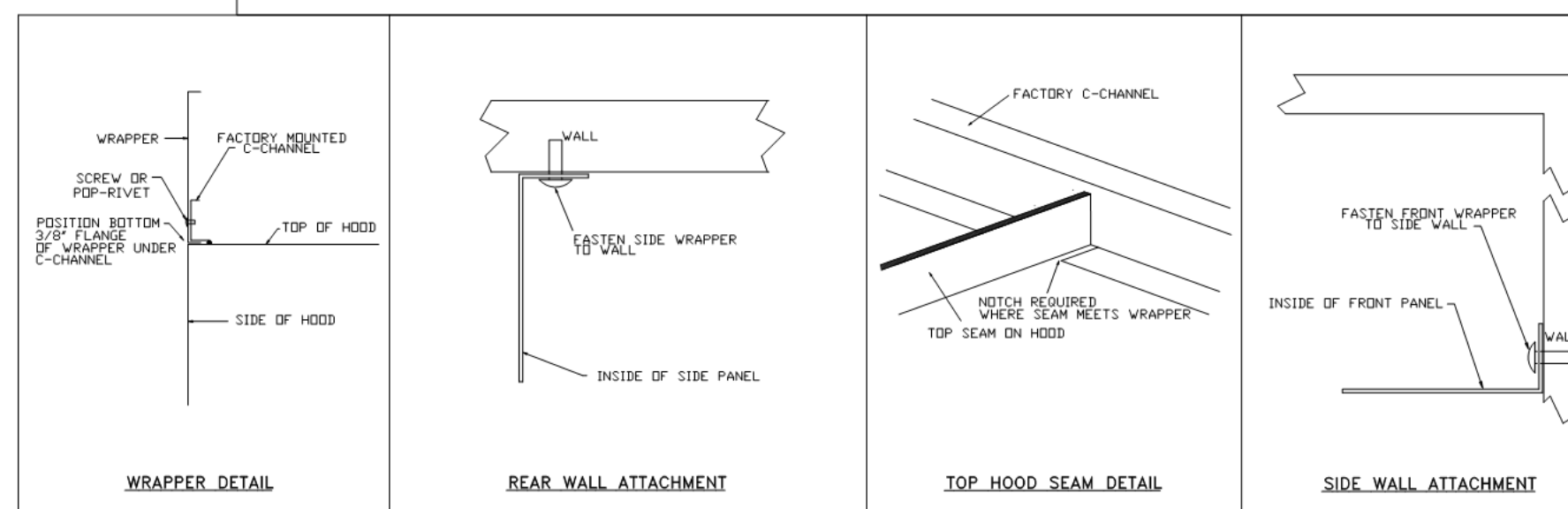
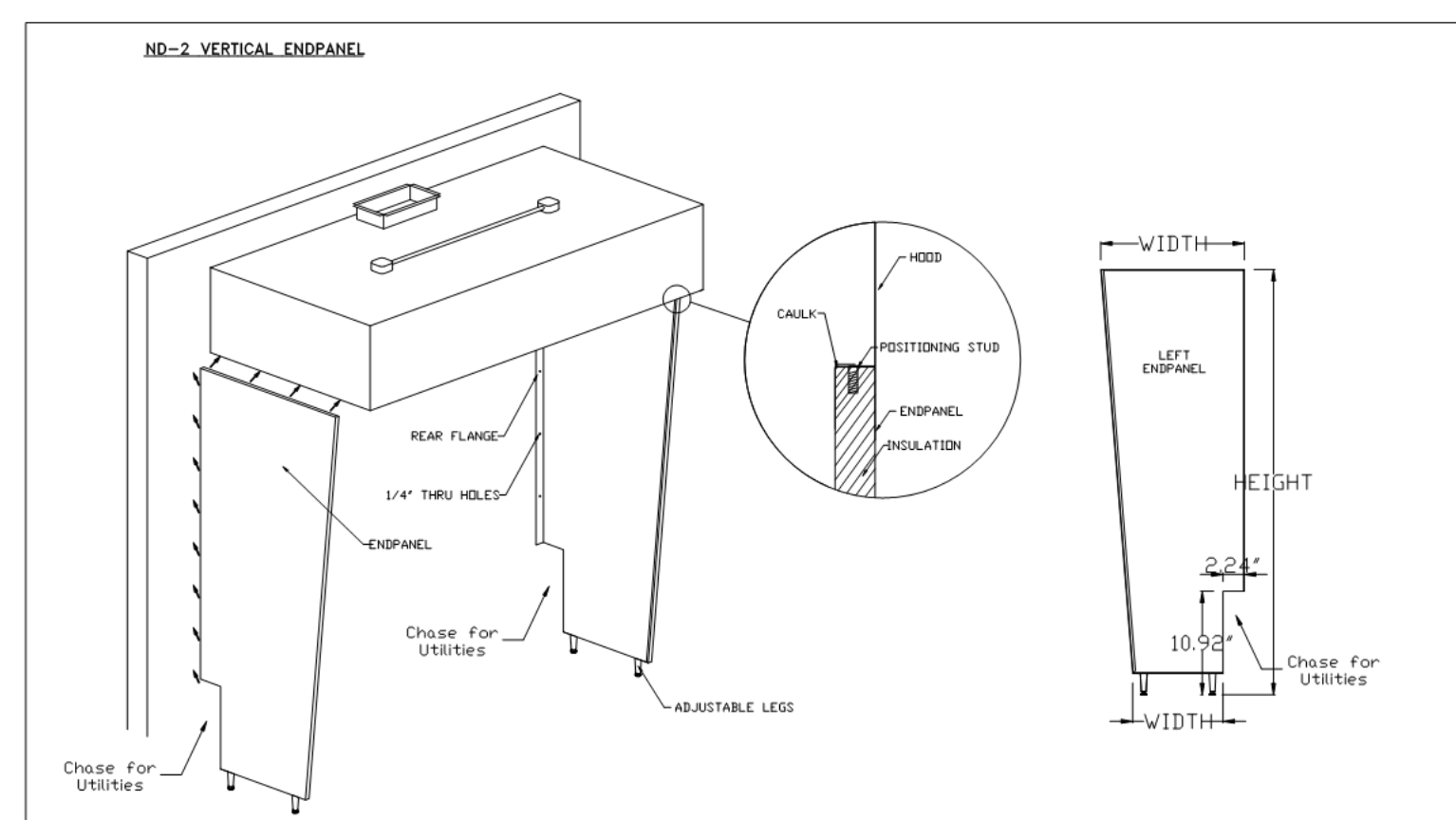
HOOD OPTIONS

HOOD NO	TAG	OPTION
1	LEFT	FIELD WRAPPER 1800" HIGH FRONT, LEFT. LEFT WIDE VERTICAL END PANEL 42" TOP WIDTH, 36" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.
2	RIGHT	FIELD WRAPPER 1800" HIGH FRONT, RIGHT. RIGHT END STANDOFF (FINISHED) 1" WIDE 54" LONG INSULATED. RIGHT WALL AS END PANEL.

PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S)		
							WIDTH	LENGTH	SP
1	LEFT	Front	118"	24"	6"	MJA	10"	28"	735 0.210"
							10"	28"	735 0.210"
							AC	8"	100 0.032"
							AC	8"	100 0.032"
							AC	8"	100 0.032"
							AC	8"	100 0.032"
2	RIGHT	Front	98"	24"	6"	MJA	10"	24"	647 0.224"
							10"	24"	647 0.224"
							AC	8"	100 0.032"
							AC	8"	100 0.032"
							AC	8"	100 0.032"
							AC	8"	100 0.032"

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REVISIONS

NO.	DESCRIPTION	DATE

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Shake Shack - 1380 - Beverly Hills, CA
BEVERLY HILLS, CA, 90210

DATE: 4/30/2021
DWG.#: 4861359
DRAWN BY: EB-108
SCALE:
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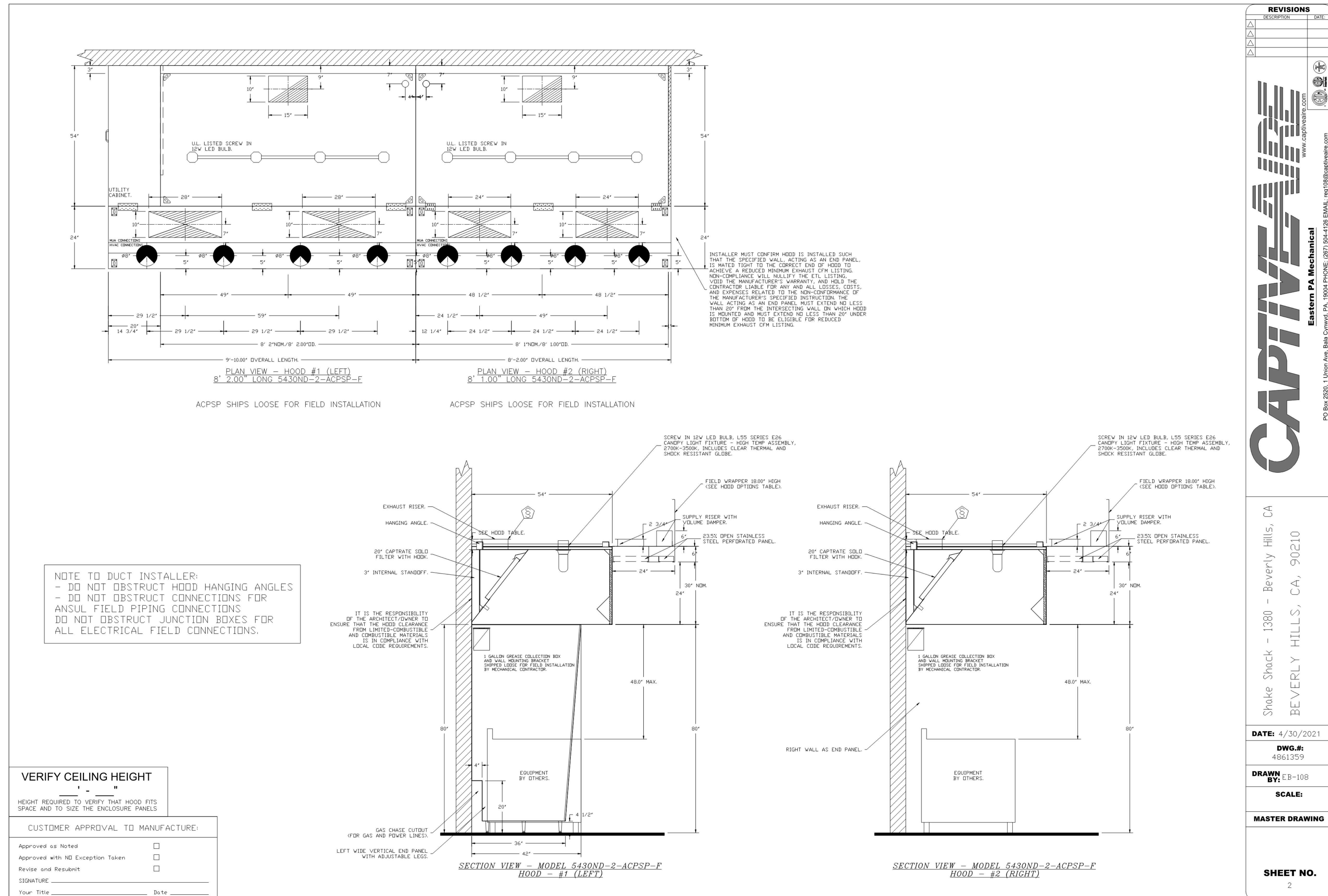
Project Name
SHAKE SHACK

Project Number
SHK-21-001

Description
CAPTIVEAIRE DRAWINGS

Scale
NTS

M802



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Date	Description
05/17/21	75% CD SET
06/15/21	ISSUE FOR PERMIT/BID
01/06/22	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name

SHAKE SHACK

Project Number

SHK-21-001

Description

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FIRE SYSTEM INFORMATION - JOB#4861359

FIRE SYSTEM NO	TAG	TYPE	SIZE	FLOW POINTS	INSTALLATION	
					SYSTEM	LOCATION ON HOOD
1		ANSUL R102	3.0/3.0/3.0/3.0	36	FIRE CABINET LEFT	LEFT, HOOD 1

GAS VALVE(S)

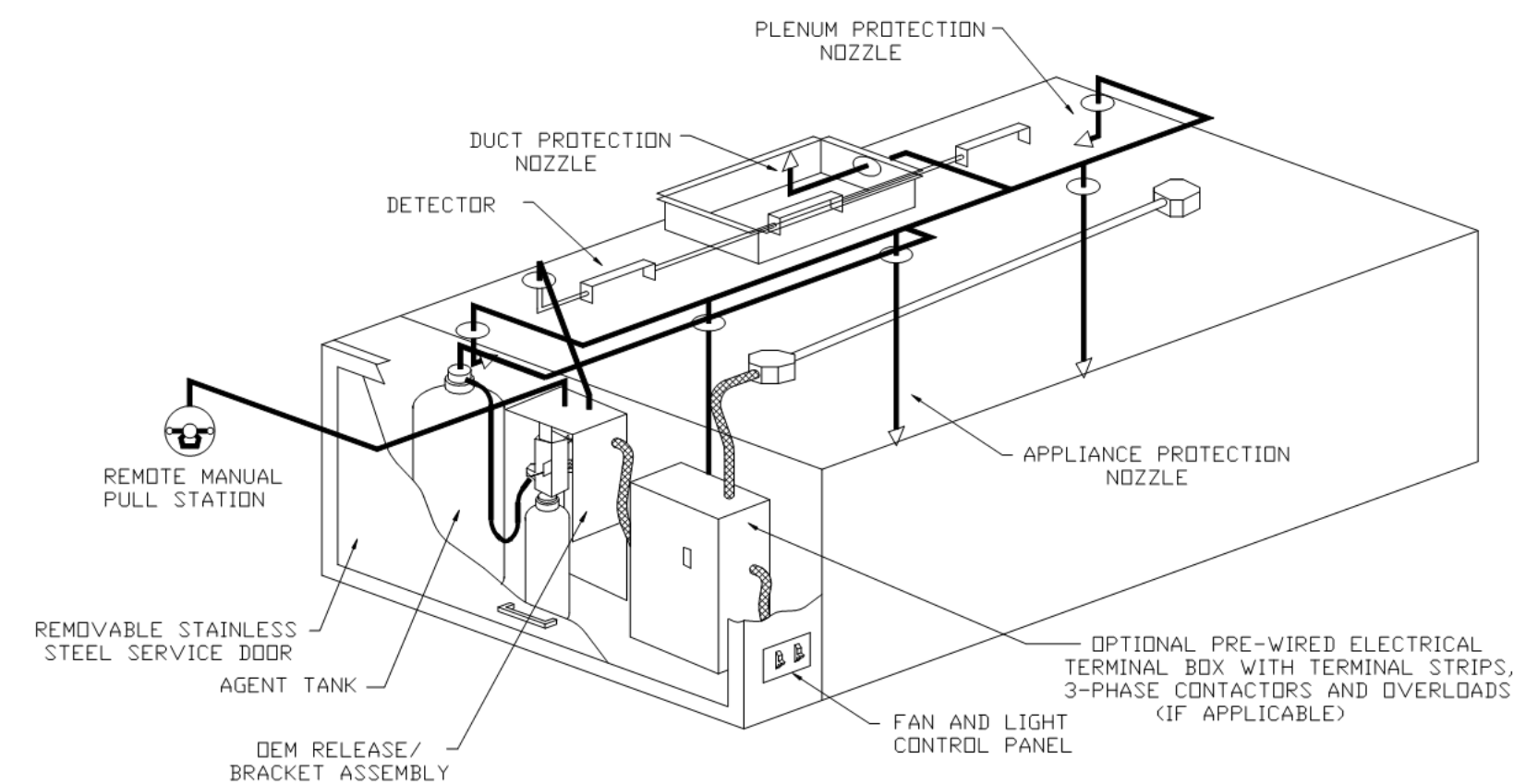
FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		MECHANICAL	VFY	CAPTIVEAIRE SYSTEMS

NOTES

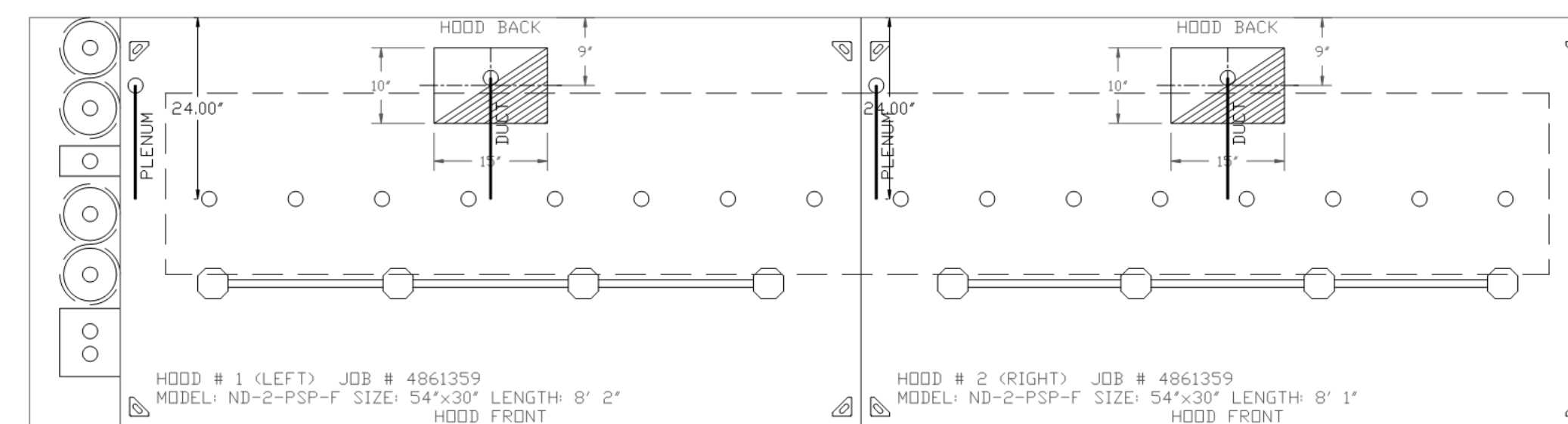
- FIELD PIPE DROPS AS SHOWN
- SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- MINIMUM 9" ELBOWS IN SUPPLY LINE.
- MINIMUM 72" INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE COVERING A RANGE, FRYER, OR WOK TO REFLECT GENERAL PIPING REQUIREMENTS.
- IF APPLICABLE, PRE-PIPED CHARBROILER 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 UL 300 REQUIREMENTS.

JOB #: 4861359
JOB NAME: SHAK SHACK - 1380 - BEVERLY HILLS, CA.

SYSTEM SIZE: ANSUL-3.0/3.0/3.0/3.0 TOTAL FP REQUIRED: 36.
HOOD # 1 (LEFT) - 2.00' LONG X 54" WIDE X 30" HIGH.
RISER # 1 SIZE: 10" X 15".
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.
HOOD # 2 (RIGHT) - 1.00' LONG X 54" WIDE X 30" HIGH.
RISER # 1 SIZE: 10" X 15".
HOOD # 2 METAL BLOW-OFF CAPS INCLUDED.



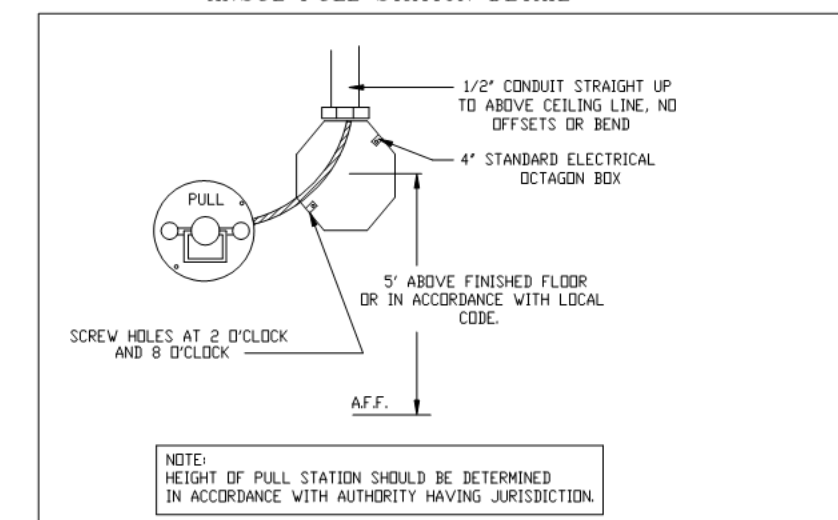
TYPICAL ANSUL R-102 SYSTEM LAYOUT



LEGEND - FIRE CABINET ANSUL SYSTEM

- 1A 1.5 GALLON TANK.
- 1B 3 GALLON TANK.
- 2 DEM AUTOMAN RELEASE.
- 3 DEM REGULATED RELEASE.
- 4 DEM REGULATED ACTUATOR.
- 5 ANSULEX LIQUID AGENT (3 GAL.).
- 6 ANSULEX LIQUID AGENT (1.5 GAL.).
- 7 CARTRIDGE (101-20).
- 8 CARTRIDGE (101-10).
- 9 CARTRIDGE (101-30).
- 9A CARTRIDGE (LT-A-101-30).
- 9B DOUBLE TANK CARTRIDGE.
- 10 TEST LINK.
- 11 DOUBLE MICROSWITCH.
- 12 HOSE ASSEMBLY.
- 1100 DUCT NOZZLE (430913).
- 2W DUCT NOZZLE (419337).
- 1W NOZZLE ASSEMBLY (419336).
- 1F NOZZLE ASSEMBLY (419333).
- 1N NOZZLE ASSEMBLY (419335).
- 1/2N NOZZLE ASSEMBLY (419334).
- 3N NOZZLE ASSEMBLY (419338).
- 245 NOZZLE ASSEMBLY (419340).
- 230 NOZZLE ASSEMBLY (419339).
- 2120 NOZZLE ASSEMBLY (419343).
- 290 NOZZLE ASSEMBLY (419342).
- 250 NOZZLE ASSEMBLY (419341).
- 28 DETECTOR BRACKET.
- 29 LOW TEMP FUSIBLE LINK.
- 30 HIGH TEMP FUSIBLE LINK.
- MGV MECHANICAL GAS VALVE.
- EGV ELECTRICAL GAS VALVE.
- 34 REMOTE MANUAL PULL STATION.
- S SWIVEL ADAPTOR.

ANSUL PULL STATION DETAIL



CUSTOMER APPROVAL TO MANUFACTURE:

Approved as Noted	<input type="checkbox"/>
Approved with NO Exception Taken	<input type="checkbox"/>
Revise and Resubmit	<input type="checkbox"/>
SIGNATURE _____	
Your Title _____	Date _____

ANSUL OVERLAPPING
HIGH PRIORITY
ISSUE L X24.00' D

REVISIONS	DESCRIPTION	DATE

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DWG.#: 4861359

DRAWN BY: EB-108

SCALE:

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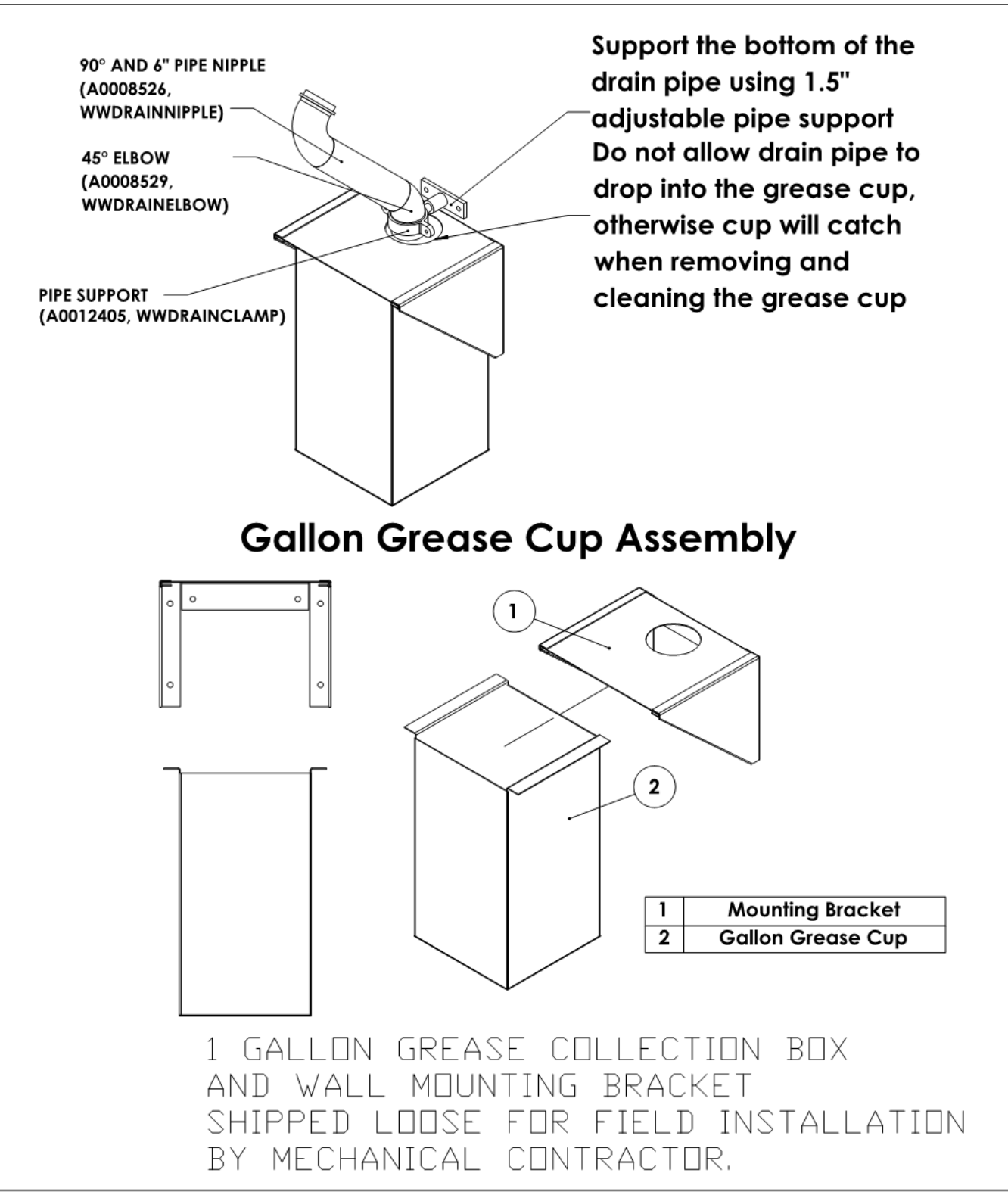
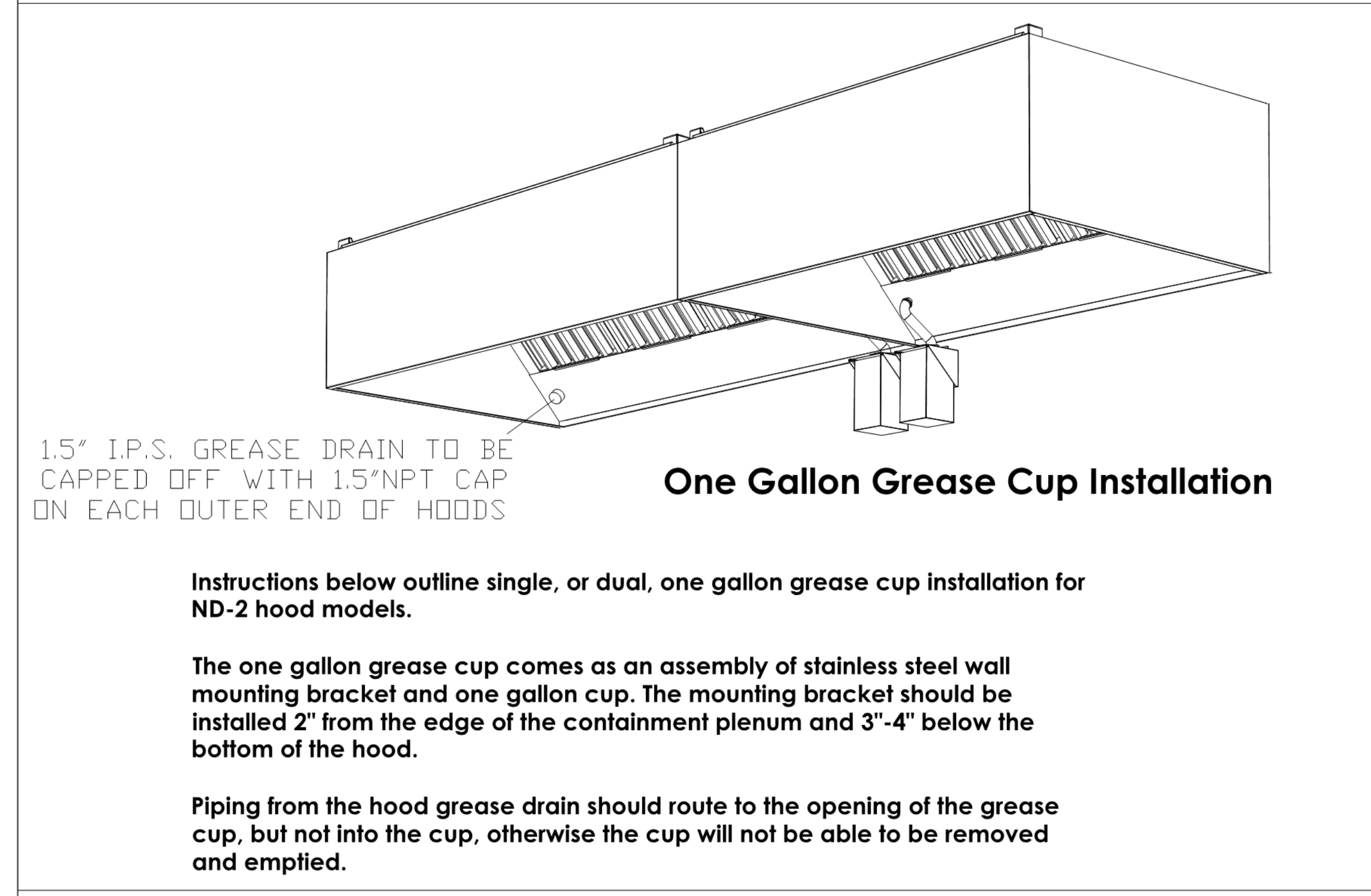
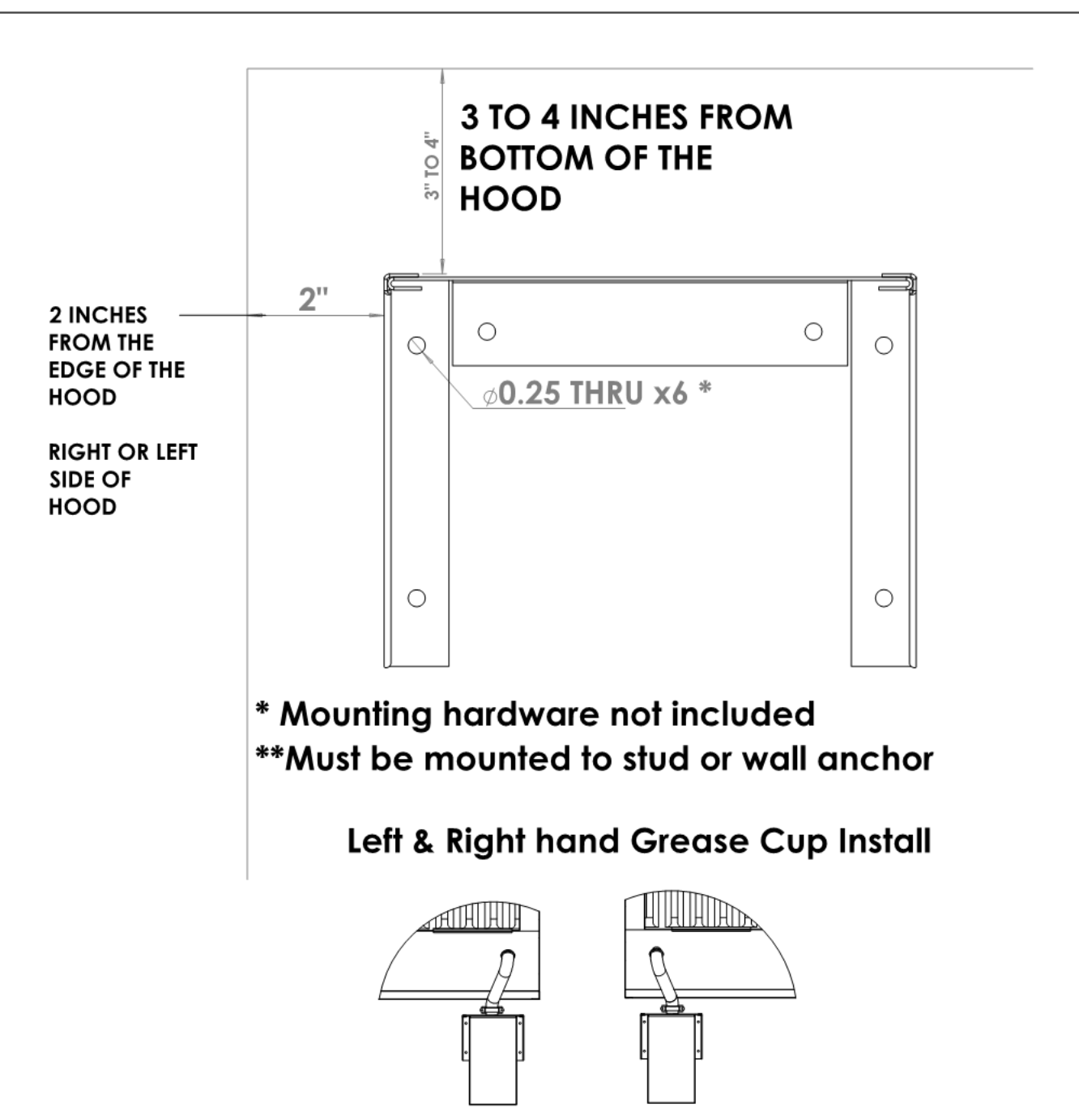
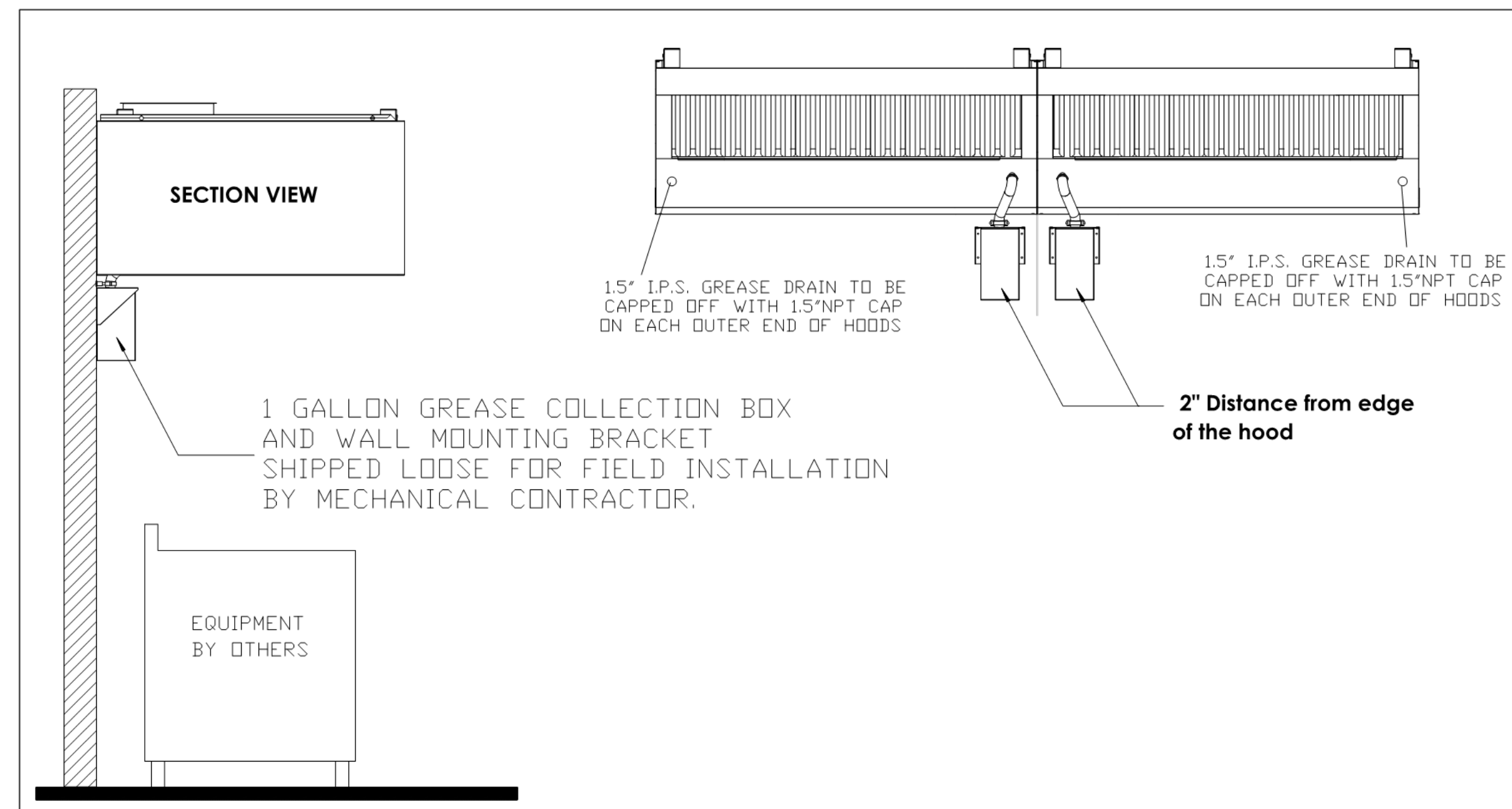


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MASTER DRAWING

SHEET NO.
4

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EXHAUST FAN INFORMATION - JOB#4861359

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SDNES
1	KEF-1	1	DUBSHFA	CAPTIVEAIRE	1633	1.000	1323	TEAD-ECM	0.750	0.4110	1	230	5.0	517 FPM	93	12.3
2	KEF-2	1	DUBSHFA	CAPTIVEAIRE	1617	1.000	1318	TEAD-ECM	0.750	0.4060	1	230	5.0	512 FPM	93	12.2

MUA FAN INFORMATION - JOB#4861359

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	BLOWER	HOUSING	MIN CFM	DESIGN CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	MCA	MDCP	EVAP FLOW RATE (GAL/Hr)	EVAP COOLER ENTERING DB TEMP	EVAP COOLER ENTERING WB TEMP	EVAP COOLER LEAVING DB TEMP	EVAP COOLER LEAVING WB TEMP	WEIGHT (LBS)	SDNES
3	MAU-1	1	A2-D250-20D	20MF-2-MDD	A2-D250	2000	276.4	0.750	1335	DDP-PREMIUM	2.000	1.2680	3	208	8.3	22.6A	35A	3.97	95.0°F	68.0°F	75.0°F	68.0°F	949	12.1

*Evap Flow Rate is variable based on water pressure.

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO	TAG	INPUT BTUs	OUTPUT BTUs	TEMP RISE	REQUIRED INPUT GAS PRESSURE	GAS TYPE	BURNER EFFICIENCY(%)
3	MAU-1	109605	100837	35°F	7 IN. W.C. - 14 IN. W.C.	NATURAL	92

*** SINGLE PHASE POWER FEED TO MAU DISCONNECT ***
 *** REFER TO HOOD CONTROL PANEL WIRING SCHEMATICS ***

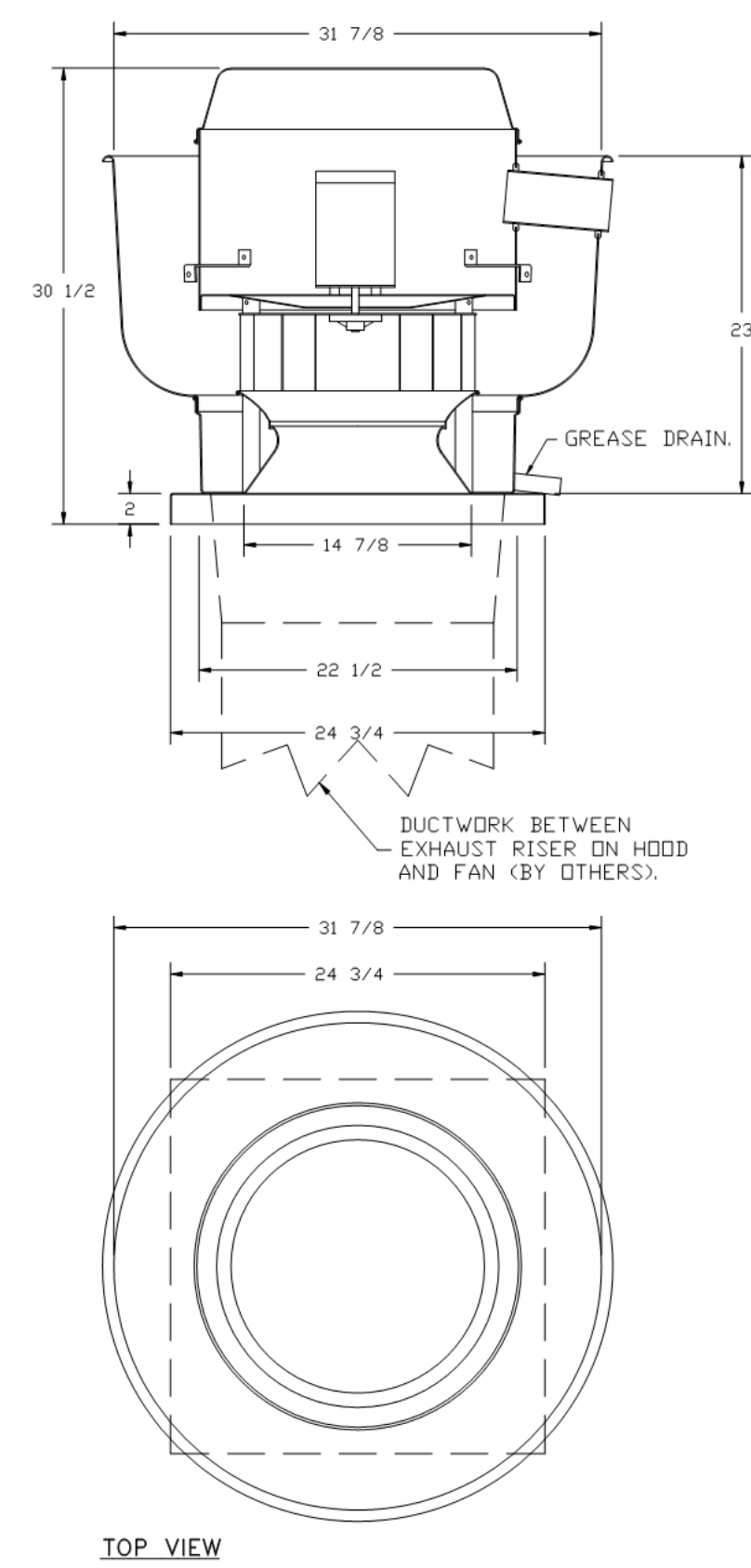
FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	KEF-1	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - INSTALLED AT PLANT - FOR GREASE DUCTS
		1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREVIRE (TELCD MOTOR), CCW ROTATION, 2 YEAR PARTS WARRANTY.
2	KEF-2	1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - INSTALLED AT PLANT - FOR GREASE DUCTS
		1	ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREVIRE (TELCD MOTOR), CCW ROTATION, 2 YEAR PARTS WARRANTY.
3	MAU-1	1	INLET PRESSURE GAUGE, 0-35"
		1	MANIFOLD PRESSURE GAUGE, -5 TO 15" WC
		1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED.
		1	MOTORIZED BACK-DRAFT DAMPER FOR A2-D HOUSING MEETS AMCA CLASS 1A RATING.
		1	TOTAL CFM MONITORING FOR MUA UNITS
		1	IBT/MUA EVAP INTERLOCK.
		1	CLOGGED FILTER SWITCH WITH NOTIFICATION ON HMI.
1	SIZE 2 DIRECT FIRED HEATER LOW CFM PROFILE PACKAGE. USED ON HEATERS UNDER 2500 CFM.		
1	UNIT MOUNTED VFD FOR USE WITH ECPM03.		
1	2 YEAR PARTS WARRANTY.		

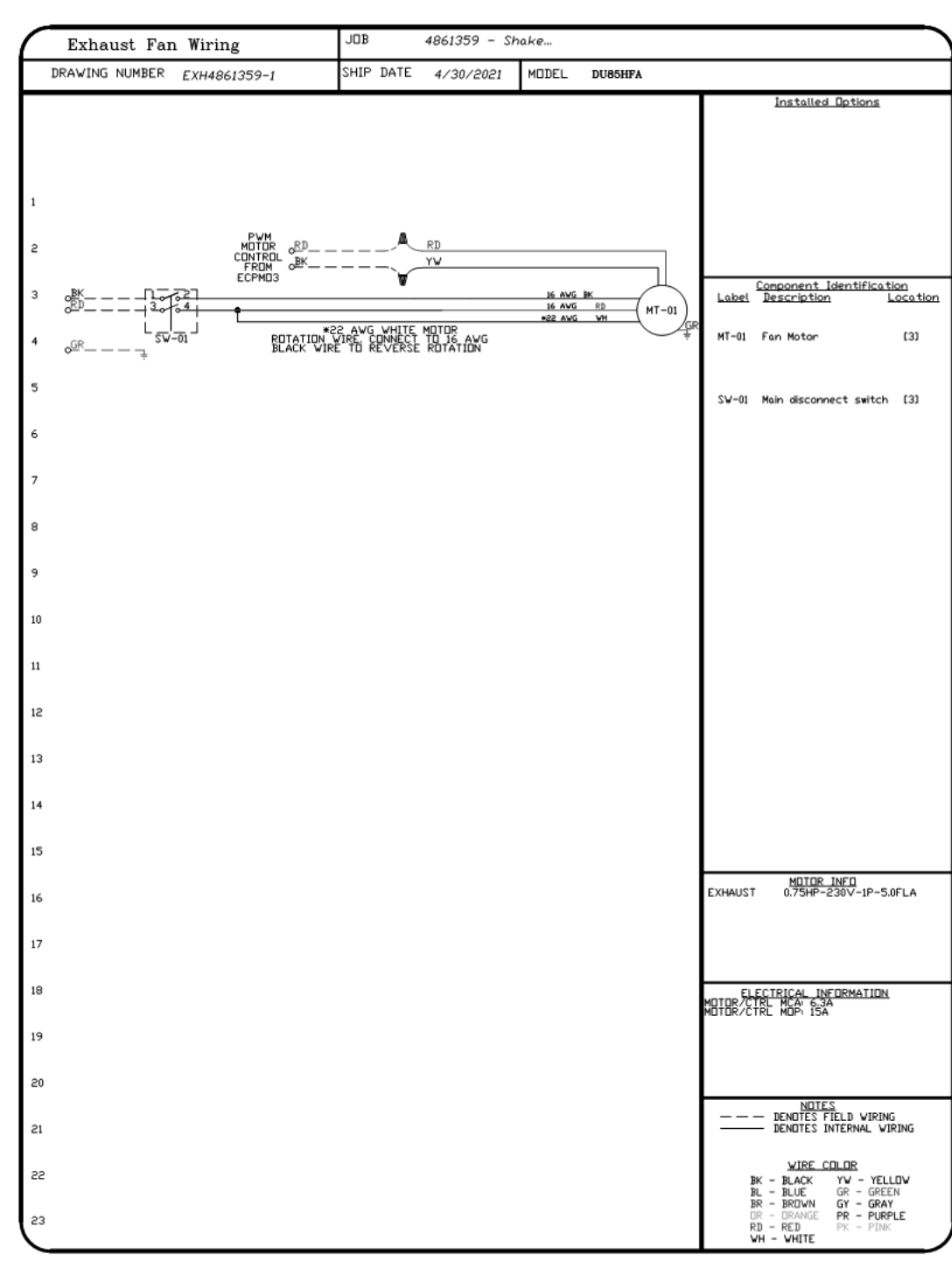
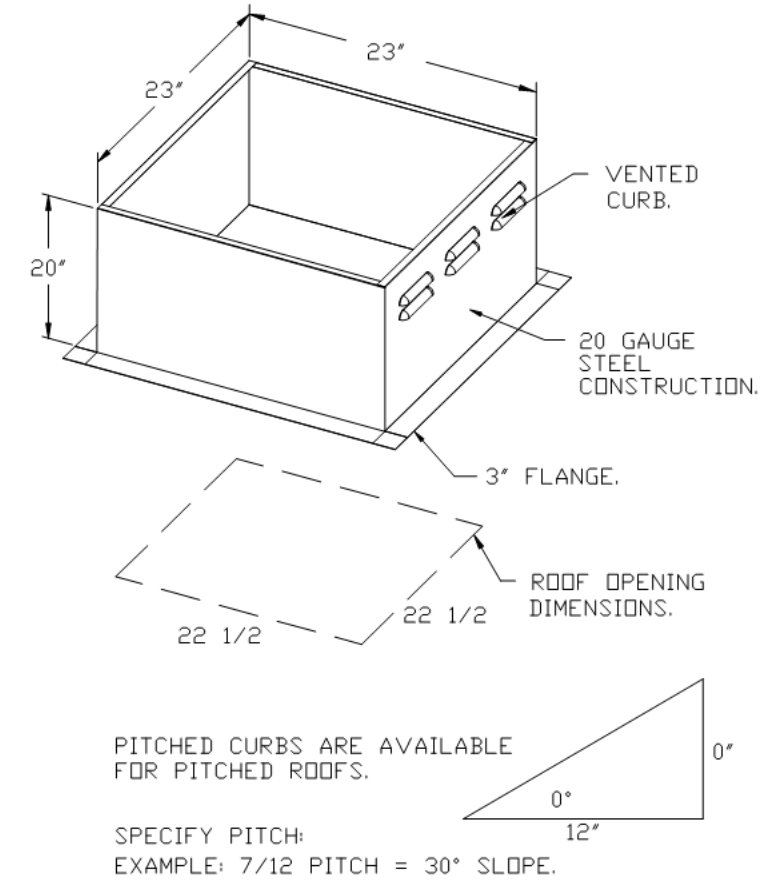
CURB ASSEMBLIES

NO	QTY	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-2	36 LBS	CURB	23.000"W X 23.000"L X 20.000"H ALONG LENGTH, RIGHT VENTED HINGED.
3	# 3	MAU-1	86 LBS	CURB	31.000"W X 79.000"L X 18.000"H ALONG WIDTH, RIGHT INSULATED.
	# 3			RAIL	4.000"W X 4.000"L X 36.000"H RIGHT.

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



- FEATURES:**
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
 - ROOF MOUNTED FANS.
 - RESTAURANT MODEL.
 - UL705 AND UL762 AND UL5645
 - 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 DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.
- ABNORMAL FLAME-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.
- NOTES:**
- GREASE BOX.
 - FAN BASE CERAMIC SEAL - INSTALLED AT PLANT - FOR GREASE DUCTS.
 - ECM WIRING PACKAGE - PWM SIGNAL FROM ECPM03 PREVIRE (TELCD MOTOR), CCW ROTATION.
 - 2 YEAR PARTS WARRANTY.



REVISIONS

NO	DATE	DESCRIPTION
1		
2		
3		

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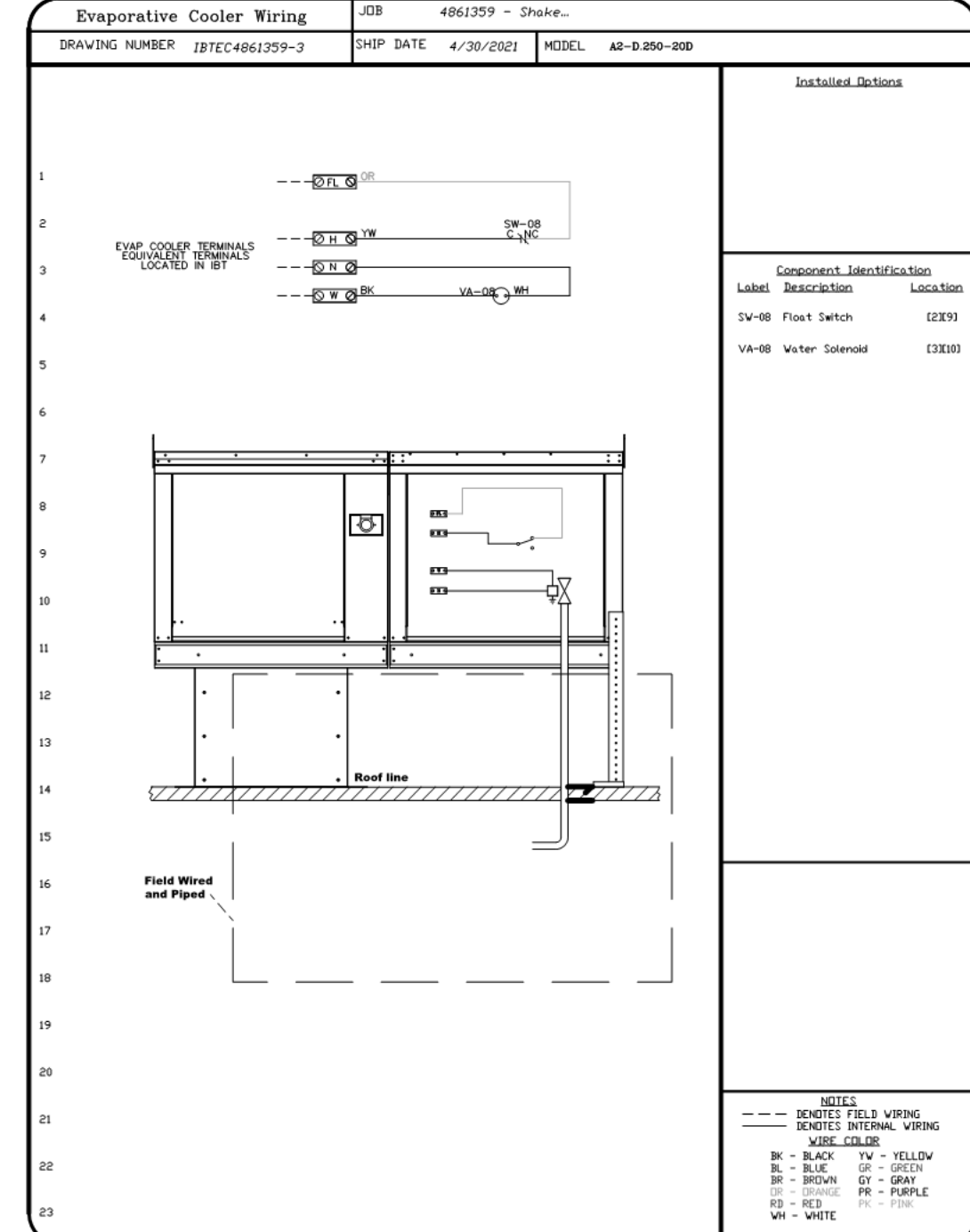
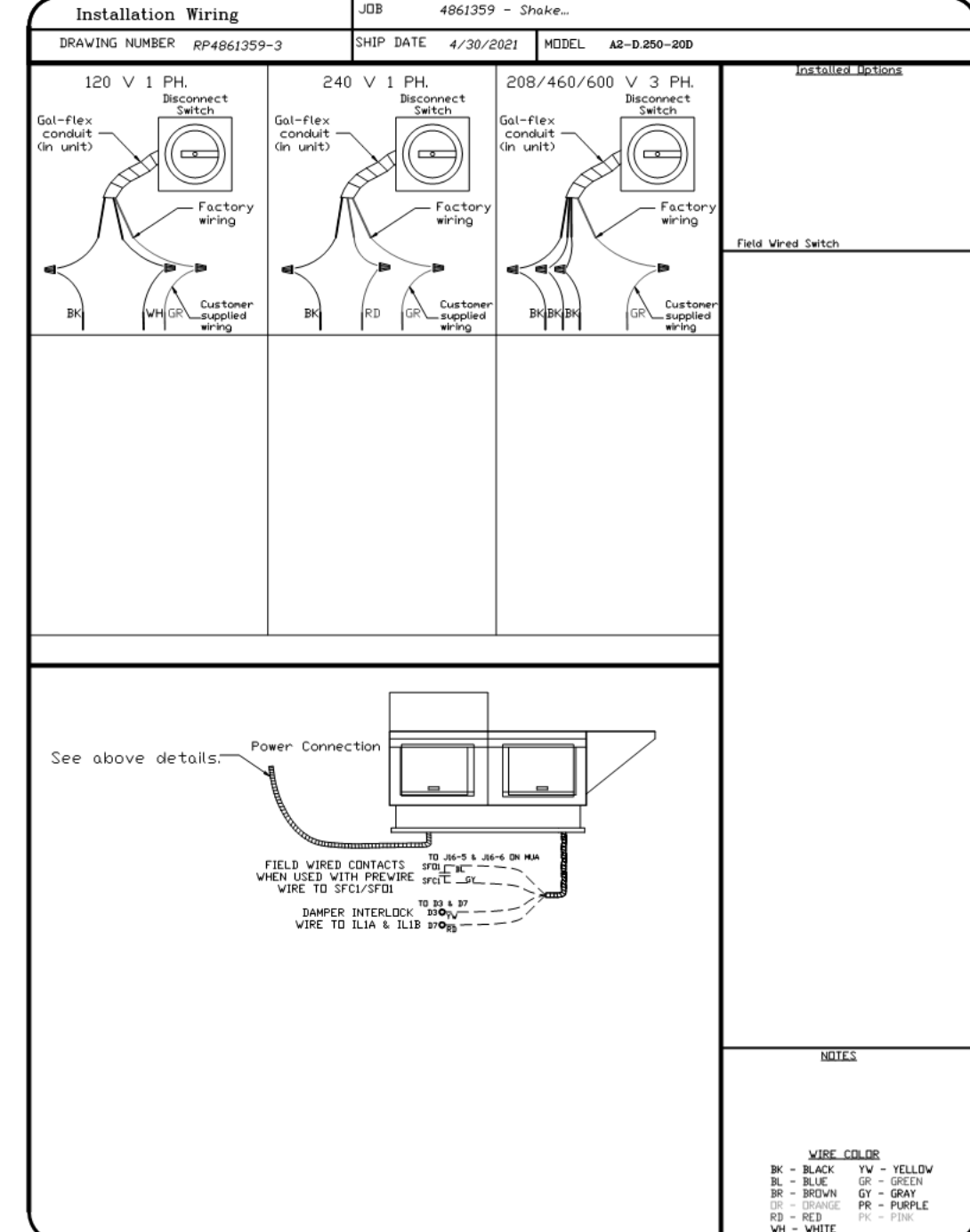
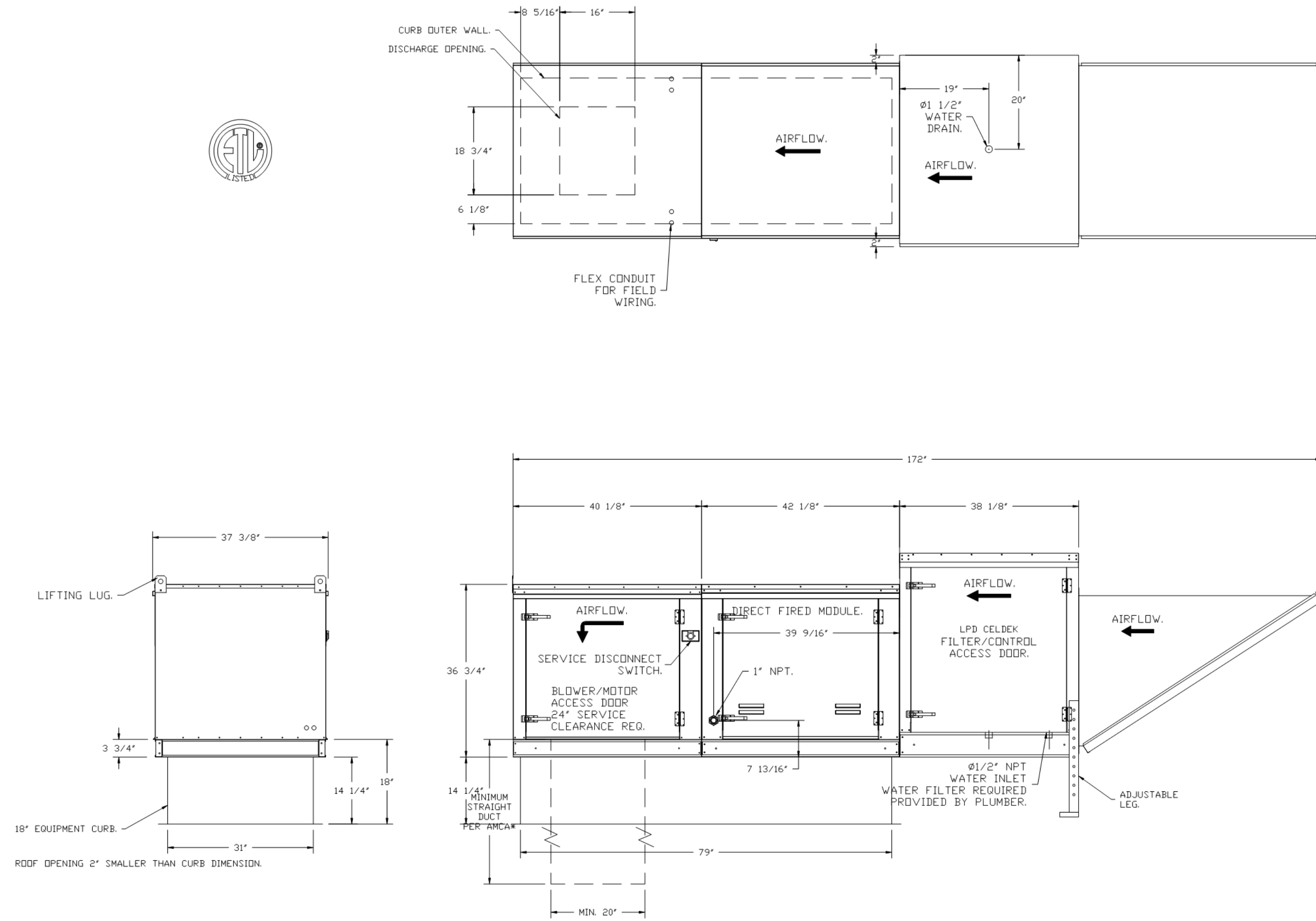
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- FAN #3 AD-2550-205 - HEATER (MAU-1)
- DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 20" MIXED FLOW DIRECT DRIVE FAN
 - EVAP COOLER (LPD CELBEK) - 1/2" INTAKE HOOD V/EZ FILTERS
 - DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT
 - GAS PRESSURE GAUGE, 0-25" W.G. DIAMETER, 1/4" THREAD SIZE
 - GAS PRESSURE GAUGE, 0-25" W.G. DIAMETER, 1/4" THREAD SIZE
 - CASLINK BUILDING MONITORING SYSTEM COMMUNICATIONS MODULE REQUIRES INTERNET & FIELD WIRED ETHERNET CONNECTION OR 5G CELLULAR SERVICE. INCLUDES REV 3 COMM MODULE, RJ45 TO MODBUS CONVERTER, 3 FT CAT5 CABLE, AND 1 FT OF SHIELDED TWISTED PAIR.
 - MOTORIZED BACK DRAFT DAMPER 22.75" X 24" FOR SIZE 2 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, LOW LEAKAGE, LP1000 ACTUATOR INCLUDED.
 - TOTAL CFM MONITORING FOR MAU UNITS USES 1/4" ID PRESSURE TRANSDUCER, RIVET NUTS, 1/4" AIRFLW TUBING AND PUSH TO CONNECT FITTINGS.
 - LAYER CONTROL FOR 1ST EVAP.
 - CLOGGED FILTER SWITCH WITH IDENTIFICATION ON AHS.
 - PROFILE PLATE CONFIGURATION FOR SIZE 2 DIRECT FIRED UNIT FOR LOW CFM APPLICATIONS.
 - UNIT MOUNTED VFD FOR USE WITH EXEMBS.
 - HINGED DOUBLE WALL INSULATED EOOD ASSEMBLY (BURNER/BLDWER/EVAP SECTION).
 - 2 YEAR PARTS WARRANTY.

NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 200. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT RADIOS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT SQUARE BACK ELBOWS SHOULD NOT BE USED ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT SYSTEM EFFECT WILL DRAMATICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT. SUGGESTED STRAIGHT DUCT SIZE IS 20" X 20".

SUPPLY SIDE HEATER INFORMATION
 WINTER TEMPERATURE = 42°F, TEMP RISE = 35°F.
 BTUH CALCULATED ON ACTUAL AIR DENSITY.
 OUTPUT BTUH AT ALTITUDE OF 60 FT = 105966.
 INPUT BTUH AT ALTITUDE OF 60 FT = 111920.
 OUTPUT BTUH AT ALTITUDE OF 577 FT = 106837.
 INPUT BTUH AT ALTITUDE OF 577 FT = 109566.



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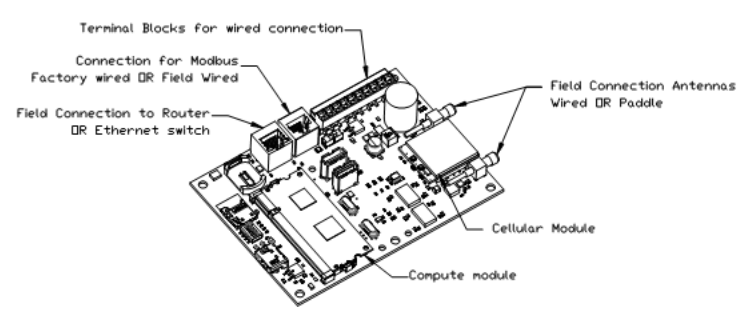
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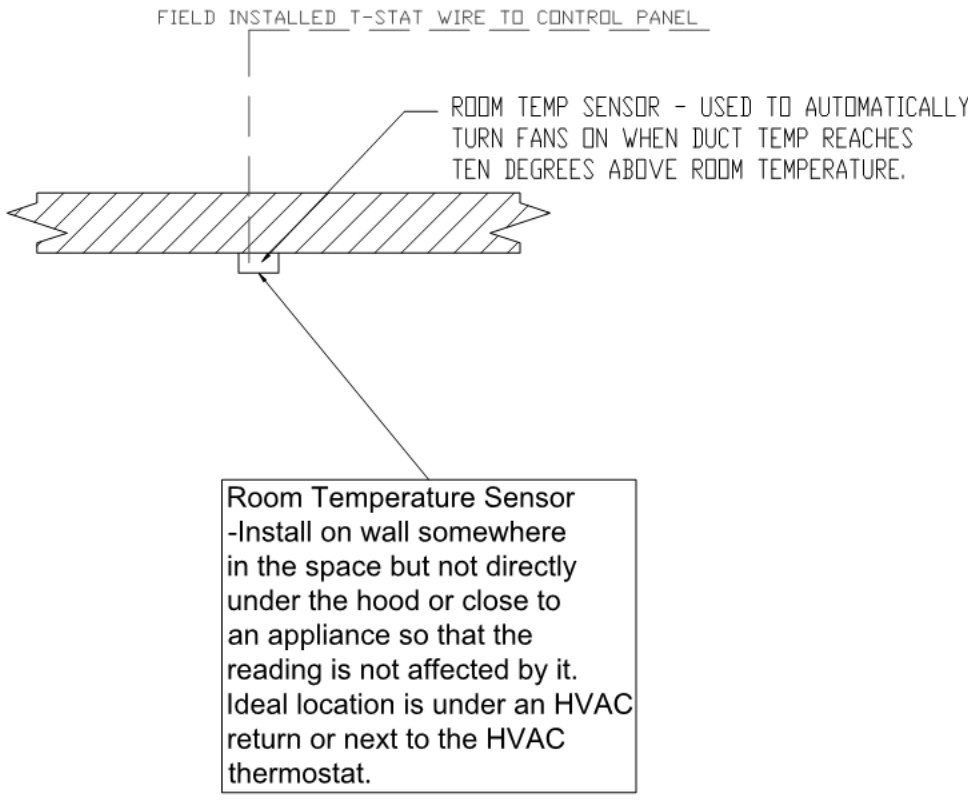
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ELECTRICAL PACKAGE - JOB#4861359						
NO.	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION
				LOCATION	QUANTITY	
1		SC-E010101A	UTILITY CABINET LEFT	03 - UTILITY CABINET LEFT	1 LIGHT	SMART CONTROL/ THERMOSTATIC CONTROL V/ RELAY ON/OFF WITH SUPPLY
				HOOD # 1	1 FAN	



CASHMI Monitor and Control
 - Smart control panel to support communications to cloud-based Building Management System.
 - Smart Control Panel to allow cloud-based Building Management System to monitor and control hood equipment. Installation in the panel for cloud-based Building Management System is required.
 - Smart Control Panel to allow cloud-based Building Management System to control generators without an external BMS.
 - Smart Control Panel to allow cloud-based Building Management System to monitor and control generators for fully integrated Building Management System.

MONITORING AND CONTROL POINTS LIST			
IFT Package	Function	IFT Package	Function
Room Temperature	Room Temperature	Room Temperature	Room Temperature
Duct Temperature	Duct Temperature	Duct Temperature	Duct Temperature
MTS Discharge Temperature	MTS Discharge Temperature	MTS Discharge Temperature	MTS Discharge Temperature
Exhaust MTS Discharge Temperature	Exhaust MTS Discharge Temperature	Exhaust MTS Discharge Temperature	Exhaust MTS Discharge Temperature
Fan Speed	Exhaust Fan	Exhaust Fan	Exhaust Fan
Fan Ampage	Fan Ampage	Fan Ampage	Fan Ampage
Fan Power	Fan Power	Fan Power	Fan Power
UPS Faults	UPS Faults	UPS Faults	UPS Faults
Generator Faults	Generator Faults	Generator Faults	Generator Faults
Fan Status	Fan Status	Fan Status	Fan Status
IFT Faults	IFT Faults	IFT Faults	IFT Faults
IFT Filter Oil Percentage	IFT Filter Oil Percentage	IFT Filter Oil Percentage	IFT Filter Oil Percentage
Fan Condition	Fan Condition	Fan Condition	Fan Condition
Control Fan System	Control Fan System	Control Fan System	Control Fan System
Building Presence	Building Presence	Building Presence	Building Presence
Panel Stop Button	Panel Stop Button	Panel Stop Button	Panel Stop Button
Panel Start Button	Panel Start Button	Panel Start Button	Panel Start Button
Panel Stop Button	Panel Stop Button	Panel Stop Button	Panel Stop Button



Room Temperature Sensor
 - Install on wall somewhere in the space but not directly under the hood or close to an appliance so that the reading is not affected by it. Ideal location is under an HVAC return or next to the HVAC thermostat.

CUSTOMER APPROVAL TO MANUFACTURE:

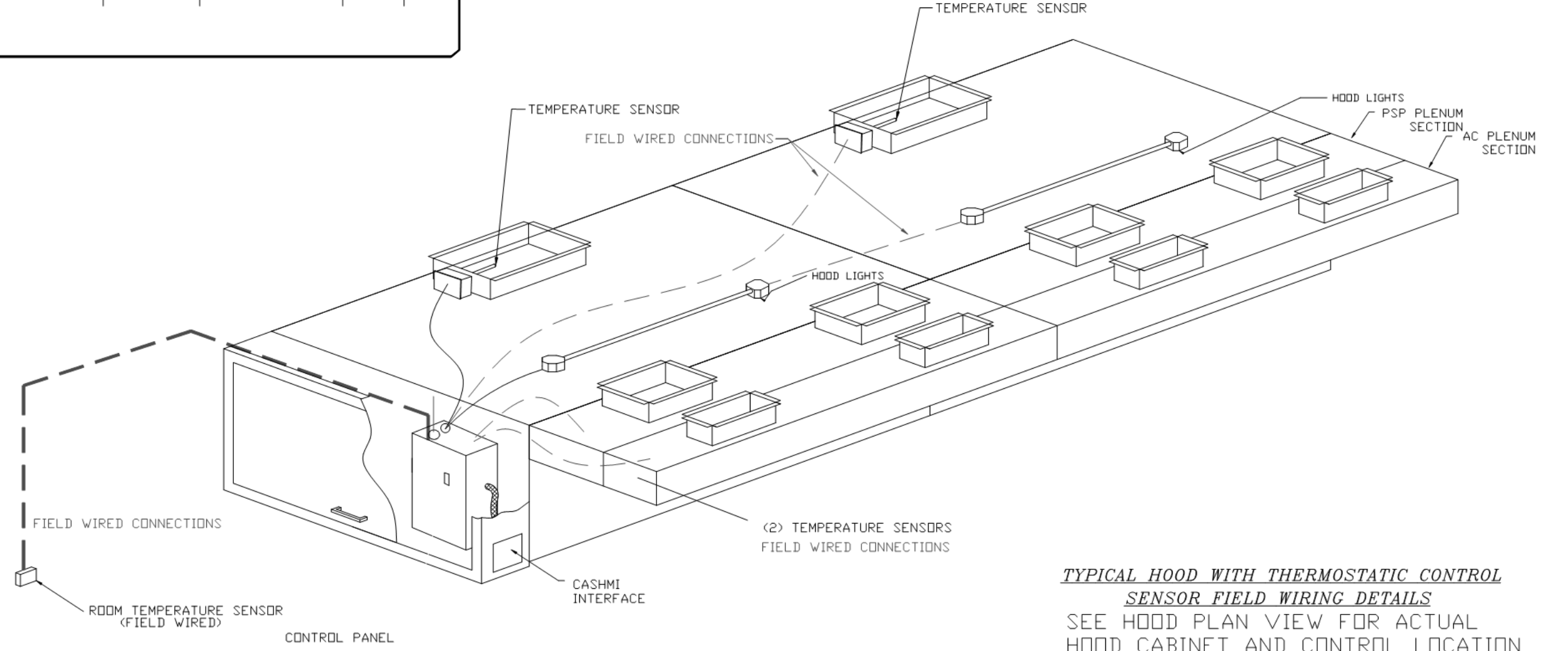
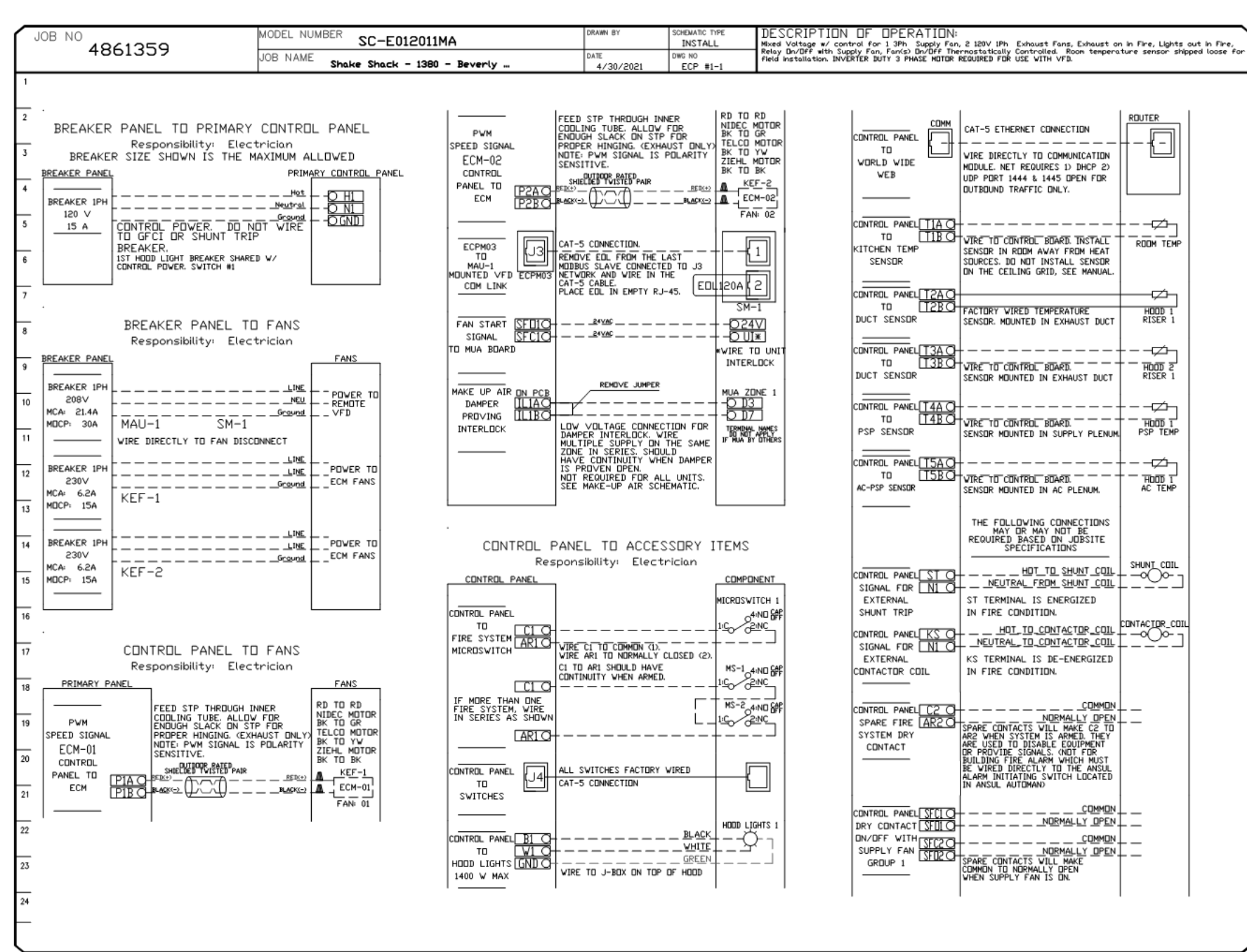
Approved as Noted

Approved with ND Exception Taken

Revise and Resubmit

SIGNATURE _____

Your Title _____ Date _____



TYPICAL HOOD WITH THERMOSTATIC CONTROL SENSOR FIELD WIRING DETAILS
 SEE HOOD PLAN VIEW FOR ACTUAL HOOD CABINET AND CONTROL LOCATION

--- FIELD WIRING
 - (4) TEMP SENSORS TO CONTROL PANEL
 - REMOTE ROOM SENSOR TO CONTROL PANEL

NOTE: TEMP SENSOR IN HOOD THAT DOES NOT HAVE BUILT IN END CABINET AND ROOM TEMP SENSOR MUST BE FIELD WIRED TO CONTROL PANEL

SC- Specification:

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

Temperature 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.

REVISIONS

NO.	DESCRIPTION	DATE

CAPTIVE
 Eastern PA Mechanical
 www.captivepa.com
 PO Box 2520, 1 Union Ave, Bala Cynwyd, PA 19004 PHONE: (610) 504-4125 EMAIL: rep108@captivemechanical.com

Shake Shack - 1380 - Beverly Hills, CA
 BEVERLY HILLS, CA, 90210

DATE: 4/30/2021
 DWG.#: 4861359
 DRAWN BY: EB-108
 SCALE:
 MASTER DRAWING

SHEET NO. 7

Date	Description
05/17/21	75% CD SET
06/15/21	ISSUE FOR PERMIT/BID
01/06/22	ISSUE FOR CONSTRUCTION

Seal / Signature



Project Name
SHAKE SHACK

Project Number
SHK-21-001

Description
CAPTIVEAIRE DRAWINGS

Scale
 NTS

M807