

GENERAL NEW NOTES:

- PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
- EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
- COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AND PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.
- WHERE SHUTDOWN OF EXISTING SYSTEMS IS REQUIRED DURING NEW WORK, COORDINATE SHUTDOWN TIME AND DURATION WITH THE OWNER TO MINIMIZE DOWNTIME. NOTIFY OWNER SEVEN (7) DAYS PRIOR TO INTERRUPTION OF SERVICE.
- DURING INSTALLATION OF NEW WORK, AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.
- PROVIDE TEMPORARY BARRIERS TO CONTAIN DUST AND DEBRIS RESULTING FROM THE PERFORMANCE OF THE WORK TO THE AREA WHERE WORK IS BEING PERFORMED.
- ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY DIVISION 23 UNLESS OTHERWISE NOTED.
- NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND THE EQUIPMENT.
- REFER TO ARCHITECTURAL DRAWINGS FOR RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. VERIFY CHANGES AND PERMITS SHOWN ON ARCHITECTURAL DRAWINGS THAT ARE INTENDED FOR DUCTWORK AND PIPING MEET REQUIREMENTS.
- COORDINATE LOCATION OF ROOF MOUNTED HVAC EQUIPMENT AND ROOF PENETRATIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
- INDOOR AIR QUALITY MEASURES: PROTECT INSIDE OF (INSTALLED AND DELIVERED) DUCTWORK AND HVAC UNITS FROM EXPOSURE TO DUST, DIRT, PAINT AND MOISTURE. REPLACE INSULATION THAT HAS BECOME WET AT ANY TIME DURING CONSTRUCTION. DRYING THE INSULATION IS NOT ACCEPTABLE. SEAL ANY TEARS OR JOINTS OF INTERNAL FIBERGLASS INSULATION. REMOVE DEBRIS FROM CEILING/RETURN AIR PLENUM INCLUDING DUST. AN INDEPENDENT PROFESSIONAL DUCT CLEANING COMPANY SHALL VACUUM CLEAN ANY DUCTWORK CONNECTED TO HVAC UNITS THAT WERE OPERATED DURING THE CONSTRUCTION PERIOD AFTER NEW FILTERS ARE INSTALLED AND PRIOR TO TURNING SYSTEM OVER TO THE OWNER. THE INTERNAL SURFACES AND ASSOCIATED COILS OF ANY HVAC UNITS THAT WERE OPERATED SHALL ALSO BE CLEANED.
- INSTALL DUCTWORK AND PIPING PARALLEL TO BUILDING COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED.
- OVERHEAD HANGERS AND SUPPORTS FOR EQUIPMENT, DUCTWORK AND PIPING SHALL BE FASTENED TO BUILDING JOISTS OR BEAMS. DO NOT ATTACH HANGERS AND SUPPORTS TO THE ABOVE FLOOR SLAB OR ROOF EXCEPT WHERE CONCRETE INSERTS IN CONCRETE SLABS ARE ALLOWED BY THE SPECIFICATIONS.
- COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO ENABLE SERVICE OF EQUIPMENT AND/OR FILTER REPLACEMENT.
- SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
- COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.
- ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES AS REQUIRED TO ACCOMMODATE FINAL CEILING GRID AND LIGHTING LOCATIONS.
- PAINT PORTIONS OF DUCTWORK AND INSULATION THAT ARE EXPOSED TO VIEW BY THE INSTALLATION OF DIFFUSERS, REGISTERS, AND GRILLES IN CEILINGS OR WALLS FLAT BLACK. PORTIONS INCLUDE BOTH THE INTERIOR OF UNLINED DUCTWORK AND THE EXTERIOR OF DUCTWORK AND INSULATION.
- LOCATE AND SET THERMOSTATS AND HUMIDISTATS AT LOCATIONS SHOWN ON PLANS. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL DEVICES WITH TOP OF DEVICE AT MAXIMUM 48" AFF TO MEET ADA REQUIREMENTS UNLESS NOTED OTHERWISE ON PLANS. PROVIDE INSULATED BACKING FOR THERMOSTATS MOUNTED ON EXTERIOR BUILDING WALLS. INSTANT WIRING IN CONDUIT PROVIDED BY DIVISION 26. AT A MINIMUM, PROVIDE CONDUIT IN THE WALL FROM THE JUNCTION BOX TO 6" ABOVE THE CEILING.
- COORDINATE THE LOCATION AND ELEVATION OF WALL-MOUNTED DEVICES WITH PRESENTATION BOARDS, DISPLAY CABINETS, SHELVES OR OTHER COMPONENTS SHOWN ON THE ARCHITECTURAL DRAWINGS THAT ARE INSTALLED UNDER OTHER DIVISIONS. CONTRACTOR WILL NOT BE REIMBURSED FOR RELOCATION OF WALL-MOUNTED DEVICES CAUSED BY A LACK OF COORDINATION.
- PROVIDE A MANUAL BALANCING DAMPER IN EACH DUCT TAKEOFF FROM SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTS.
- PROVIDE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING FOR BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS AND GRILLES. PROVIDE WITH INTEGRAL MANUAL BALANCING DAMPER AND LOOKING QUADRANT WHERE INDICATED ON PLANS.
- BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS OTHERWISE NOTED.
- REFER TO SPECIFICATIONS FOR DUCTWORK AND PIPING INSULATION REQUIREMENTS. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE AIRFLOW DIMENSIONS. INCREASE SHEET METAL SIZES ACCORDINGLY TO ACCOUNT FOR THICKNESS OF DUCT LINER.
- FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORTED TO AVOID SHARP BENDS AND SAGGING. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- PROVIDE EQUIPMENT VENTS AND FLUES PER EQUIPMENT MANUFACTURERS RECOMMENDATIONS AND EQUIPMENT SPECIFICATIONS. KEEP PENETRATIONS THROUGH ROOF A MINIMUM OF 10'-0" FROM HVAC EQUIPMENT FRESH AIR INLETS AND 2'-0" FROM ROOF PARAPETS.
- PROVIDE TYPE I GREASE HOOD EXHAUST DUCTWORK OF MINIMUM 16 GAUGE BLACK IRON WITH LIQUID TIGHT WELDS. WITH ACCESS PANELS FOR GREASE CLEANING AS REQUIRED BY NFPA 96 AND LOCAL CODES. SLOPE DUCT BACK TOWARDS HOOD AT MINIMUM OF 1/4" PER LINEAL FOOT MAINTAINING 18" CLEARANCE TO COMBUSTIBLE MATERIALS. INSTALL GREASE DUCTS IN AN APPROVED FIRE RATED ENCLOSURE SEPARATED FROM THE EXHAUST DUCT BY A MINIMUM OF 6" AND MAXIMUM OF 12". VENTILATE ENCLOSURE TO THE OUTSIDE AIR IF REQUIRED BY CODE. AS AN OPTION, IF APPROVED BY LOCAL CODES, PROVIDE AN APPROVED WRAP SYSTEM IN LIEU OF THE RATED DUCT ENCLOSURE SYSTEM. DUCT WRAP SYSTEM SHALL MEET UL REQUIREMENTS FOR GREASE DUCT ENCLOSURES.
- PROVIDE A NEW SET OF AIR FILTERS IN UNITS PRIOR TO TESTING, ADJUSTING AND BALANCING AND BEFORE TURNING SYSTEM(S) OVER TO OWNER.
- TEMPORARY INSTALLATIONS OF INFECTION CONTROL MEASURES DURING CONSTRUCTION SHALL BE COORDINATED WITH THE FACILITY'S INFECTION CONTROL STAFF. PRIOR TO CONSTRUCTION PROVIDE ALL REQUIRED TEMPORARY INSTALLATIONS, INCLUDING DETAILS OF THE INFECTION CONTROL MEASURES SUCH AS TEMPORARY BARRIERS AND MEMBRANES, PORTABLE EXHAUST FANS AND TEMPORARY DUCTWORK. TEMPORARY INSTALLATIONS MUST NOT HAVE A NEGATIVE IMPACT ON EXISTING SYSTEMS NOR CAUSE UNSAFE CONDITIONS. TEMPORARY INSTALLATIONS SHALL MAINTAIN ADEQUATE EGRESS AND SHALL NOT OBSTRUCT EXISTING EXITS. CREATE A FIRE HAZARD OR REDUCE REQUIRED FIRE RESISTANCE. TEMPORARY VENTILATION SYSTEMS SHALL NOT CAUSE THE AIR BALANCE OF ADJACENT ROOMS OR SPACES TO BE IMPACTED OR ALTER THE PERFORMANCE OF PERMANENT BUILDING VENTILATION SYSTEMS. AIRFLOW MEASUREMENTS SHALL BE TAKEN TO VERIFY ADJACENT ROOMS OR SPACES ARE NOT IMPACTED.

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MECHANICAL SYMBOLS

THIS IS A MASTER LISTING AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED

STANDARD MOUNTING HEIGHT	HVAC DUCTWORK AND ACCESSORIES	PIPING SYMBOLS	PIPING LINETYPES
THERMOSTATS (USER ADJUSTABLE)(TOP OF DEVICE) 48" CONTROLS (TOP OF DEVICE) 48"	LINEAR SLOT DIFFUSER INSULATED FLEXIBLE DUCT (MAX. 5'-0" LONG) BRANCH DUCT WITH 45° RECTANGLE ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER ELBOW WITH TURNING VANES BRANCH DUCT WITH BELL-MOUTH FITTING & MANUAL VOLUME CONTROL DAMPER RETURN, EXHAUST, OR OUTSIDE AIR DUCT UP RETURN, EXHAUST, OR OUTSIDE AIR DUCT DOWN SUPPLY AIR DUCT UP SUPPLY AIR DUCT DOWN EQUIPMENT WITH FLEXIBLE DUCT CONNECTION 10" (NECK SIZE) CSD-1 (TYPE) 300 CFM (CFM OF SUPPLY DIFFUSER OR REGISTER) 24x24 (NECK SIZE) 800 CFM (CFM OF EXHAUST GRILLE) MANUAL VOLUME DAMPER SQUARE TO ROUND TRANSITION DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RO=RETURN) ROUND DUCT TAG INDICATING DIAMETER RECTANGULAR DUCT TAG INDICATING INTERNAL DUCT DIMENSIONS. FLAT OVAL DUCT TAG INDICATING INTERNAL DUCT DIMENSIONS RISER DESIGNATION FIRE DAMPER FIRE SMOKE DAMPER SMOKE DAMPER VOLUME DAMPER MOTORIZED DAMPER BACKDRAFT DAMPER	DIRECTION OF FLOW CONTROL VALVE THREE-WAY CONTROL VALVE SHUTOFF VALVE CHECK VALVE BALANCING VALVE WITH PRESSURE PORTS TRIPLE DUTY VALVE WITH PRESSURE PORTS STRAINER STRAINER WITH BLOWDOWN VALVE RELIEF / SAFETY VALVE SOLENOID VALVE PRESSURE REDUCING VALVE GAS PRESSURE REGULATOR THERMOSTATIC MIXING VALVE PIPE ANCHOR EXPANSION JOINT PIPING SUPPORT F & T TRAP BUCKET TRAP THERMOSTATIC TRAP BACKFLOW PREVENTER PRESSURE GAUGE THERMOMETER PRESSURE AND TEMPERATURE TEST PLUG UNION FLANGE CONNECTION VACUUM RELIEF VALVE AUTOMATIC AIR VENT MANUAL AIR VENT PRESSURE / VACUUM SWITCH CLEANOUT CAP ELBOW UP ELBOW DOWN TEE UP TEE DOWN ELBOW UP WITH SHUT-OFF VALVE (SOV) ELBOW DOWN WITH SHUT-OFF VALVE (SOV) TEE UP WITH SHUT-OFF VALVE (SOV) TEE DOWN WITH SHUT-OFF VALVE (SOV) REDUCER RECIRCULATION PUMP P-TRAP GAS COCK TOP BEAM CLAMP TRAPEZE HANGER FLEXIBLE CONNECTION	—CD— CONDENSATE DRAIN (CD) —ACD— AUXILIARY CONDENSATE DRAIN (ACD) —NPW— NON-POTABLE WATER (NPW) —G— NATURAL GAS (G) —G— NATURAL GAS ON ROOF (G) —MPG— MEDIUM PRESSURE NATURAL GAS (MPG) —MPG— MEDIUM PRESSURE NATURAL GAS ON ROOF (MPG) —FOS— FUEL OIL SUPPLY (FOS) —FOR— FUEL OIL RETURN (FOR) —FOV— FUEL OIL VENT (FOV) —LPG— LIQUEFIED PETROLEUM GAS (LPG) —BFW— BOILER FEED WATER (BFW) —HPS— HIGH PRESSURE STEAM SUPPLY (HPS) —HPC— HIGH PRESSURE STEAM CONDENSATE (HPC) —LPS— LOW PRESSURE STEAM SUPPLY (LPS) —LPC— LOW PRESSURE STEAM CONDENSATE (LPC) —PD— CONDENSATE PUMP DISCHARGE (PD) —HWS— HEATING HOT WATER SUPPLY (HWS) —HWR— HEATING HOT WATER RETURN (HWR) —CHWS— CHILLED WATER SUPPLY (CHWS) —CHWR— CHILLED WATER RETURN (CHWR) —HCS— HOT / CHILLED WATER SUPPLY (HCS) —HCR— HOT / CHILLED WATER SUPPLY (HCR) —CWS— CONDENSER WATER SUPPLY (CWS) —CWR— CONDENSER WATER RETURN (CWR) —HPWS— HEAT PUMP WATER SUPPLY (HPWS) —HPWR— HEAT PUMP WATER RETURN (HPWR) —RL— REFRIGERANT LIQUID (RL) —RD— REFRIGERANT DISCHARGE (HOT GAS) (RD) —RS— REFRIGERANT SUCTION (RS) —ROB— REFRIGERANT DISCHARGE BYPASS (ROB) —RV— REFRIGERANT VENT (RV)
ANNOTATION	MECHANICAL PLAN NOTE CALLOUT MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE) CONNECTION POINT OF NEW WORK TO EXISTING DETAIL REFERENCE. UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER SECTION CUT DESIGNATION		
ABBREVIATIONS	A/C AIR CONDITIONING ACC AIR COOLED CHILLER ACCU AIR COOLED CONDENSING UNIT AFC ABOVE FINISHED CEILING AFF ABOVE FINISHED FLOOR AFG ABOVE FINISHED GRADE AHJ AUTHORITY HAVING JURISDICTION AHU AIR HANDLING UNIT AI ANALOG INPUT AO ANALOG OUTPUT AP ACCESS PANEL ADP AIR PRESSURE DROP AWG AMERICAN WIRE GAUGE B BOILER BAS BUILDING AUTOMATION SYSTEM BB BACKBONE BD BACKDRAFT DAMPER BDM BLOWDOWN BFC BELOW FINISHED CEILING BFF BELOW FINISHED FLOOR BFG BELOW FINISHED GRADE BFP BOILER FEED PUMP BHP BRAKE HORSEPOWER BI BINARY INPUT BO BINARY OUTPUT BOD BOTTOM OF DUCT BS BOTTOM OF STRUCTURE BTU BRITISH THERMAL UNIT CFM CUBIC FEET PER MINUTE CH CHILLER CLG COOLING CP CONDENSATE PUMP CPT CONTROL POWER TRANSFORMER CRAC COMPUTER ROOM AIR CONDITIONING UNIT CRU COMPUTER ROOM UNIT CT COOLING TOWER CV CONTROL VALVE CWP CONDENSER CU WATER PUMP CU CONDENSING UNIT CHWP CHILLED WATER PUMP DB DECIBELS DBA DECIBEL AVERAGE DDC DIRECT DIGITAL CONTROL DI DIGITAL INPUT DISC DISCONNECT DN DOWN DSC DUCT SILENCER DX DIRECT EXPANSION (E) EXISTING EA EXHAUST AIR EAT ENTERING AIR TEMPERATURE ED EXHAUST DUCT EDB ENTERING DRY BULB TEMPERATURE EF EXHAUST FAN EFF EFFICIENCY EMS ENERGY MANAGEMENT SYSTEM ESP EXTERNAL STATIC PRESSURE ETR EXISTING TO REMAIN EWB ENTERING WET BULB TEMPERATURE EWT ENTERING WATER TEMPERATURE FCU FAN COIL UNIT FFA FROM FLOOR ABOVE FFB FROM FLOOR BELOW FFL FINISHED FLOOR FPI FINIS PER INCH FPM FEET PER MINUTE GC GENERAL CONTRACTOR GPM GALLONS PER MINUTE HOA HAND-OFF-AUTOMATIC HP HORSEPOWER HTG HEATING HWP HEATING WATER PUMP IN WC INCHES OF WATER COLUMN L LOUVER LAT LEAVING AIR TEMPERATURE LDB LEAVING DRY BULB LOW PRESSURE LP LEAVING WET BULB LEAVING WATER TEMPERATURE MAU MAKE-UP AIR UNIT MAX MAXIMUM MBH 1000 BTU PER HOUR MD MOTORIZED DAMPER MFR MANUFACTURER MIN MINIMUM N/A NOT APPLICABLE NC NORMALLY CLOSED NO NORMALLY OPEN NOM NOMINAL NC NOISE CRITERIA NF NON-FUSED NIC NOT IN CONTRACT OA OUTSIDE AIR PICV PRESSURE INDEP. CONTROL VALVE PROVIDE FURNISH AND INSTALL QTY QUANTITY RA RETURN AIR RC ROOM CRITERIA RD RETURN DUCT REA RELIEF AIR RF RETURN FAN RFR REFRIGERANT RH RELATIVE HUMIDITY RH ROOF HOOD RPM REVOLUTIONS PER MINUTE RTU ROOFTOP UNIT SA SUPPLY AIR SCP STEAM CONDENSATE PUMP SD SMOKE DUCT DETECTOR SD SUPPLY DUCT SF SUPPLY FAN SH SENSIBLE HEAT CAPACITY SOW SCOPE OF WORK SP STATIC PRESSURE ST STEAM TRAP STM STEAM TBD TO BE DETERMINED TCC TEMPERATURE CONTROLS CONTRACTOR TCP TEMPERATURE CONTROL PANEL TF TRANSFER FAN TFA TO FLOOR ABOVE TFL TO FLOOR BELOW TH TOTAL HEAT CAPACITY TSP TOTAL STATIC PRESSURE TEMPERATURE TRANSMITTAL TYP TYPICAL ULF UNDERFLOOR UG UNDERGROUND UIS UNDERSLAB UH UNIT HEATER UNO UNLESS NOTED OTHERWISE VAV VARIABLE AIR VOLUME VEL VELOCITY VFD VARIABLE FREQUENCY DRIVE VRF VARIABLE REFRIGERANT FLOW VRV VARIABLE REFRIGERANT VOLUME W/ WITH W/O WITHOUT WB WET BULB WC WATER COLUMN WPD WATER PRESSURE DROP XP EXPLOSION PROOF		
	HVAC CONTROL DEVICES		
	RESponsibility Matrix		
	SUBMITTAL MATRIX		



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STORE NO:  
**CT #1322**



STANDARD  
64 INCHES  
STANDARD  
CONNECTICUT 06806

DATE	DESCRIPTION
02/24/23	REVISION J
02/23/23	REVISION L
06/09/23	REVISION K
09/01/23	REVISION L
10/23/23	REVISION M
12/22/23	REVISION T

STATUS:  
**IFC SET**



12/22/2023

FIELD VERIFICATION:  
The contractor shall verify all signed dimensions and location of the project site and verify Zebra Architecture, PLLC of any dimensional errors, to contractors of discrepancies noted, approvals or reworking any work. Do not proceed until all issues are resolved.

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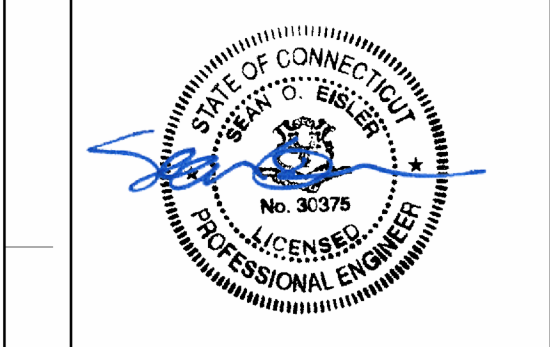
SHEET NAME:  
**MECHANICAL GENERAL INFORMATION**

DATE: 03/05/2021 PROJECT NO: 32074  
DRAWN: AJP SCALE: NTS

SHEET NO:  
**M001**

REVISION	
DATE	DESCRIPTION
I 02/24/23	REVISION I
J 03/03/23	REVISION J
K 06/09/23	REVISION K
L 09/01/23	REVISION L
M 10/23/23	REVISION M
T 12/22/23	REVISION T

STATUS:  
**IFC SET**



12/22/2023

**FIELD VERIFICATION:**  
The contractor shall verify all figured dimensions and location of the project site and notify Zebra Architecture, PLLC of any dimensional errors or omissions or discrepancies before beginning or resuming any work. Do not proceed otherwise.

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SHEET NAME:  
**MECHANICAL FLOOR PLAN**

DATE: 03/05/2021 PROJECT NO: 32074

DRAWN: AJP SCALE: AS NOTED

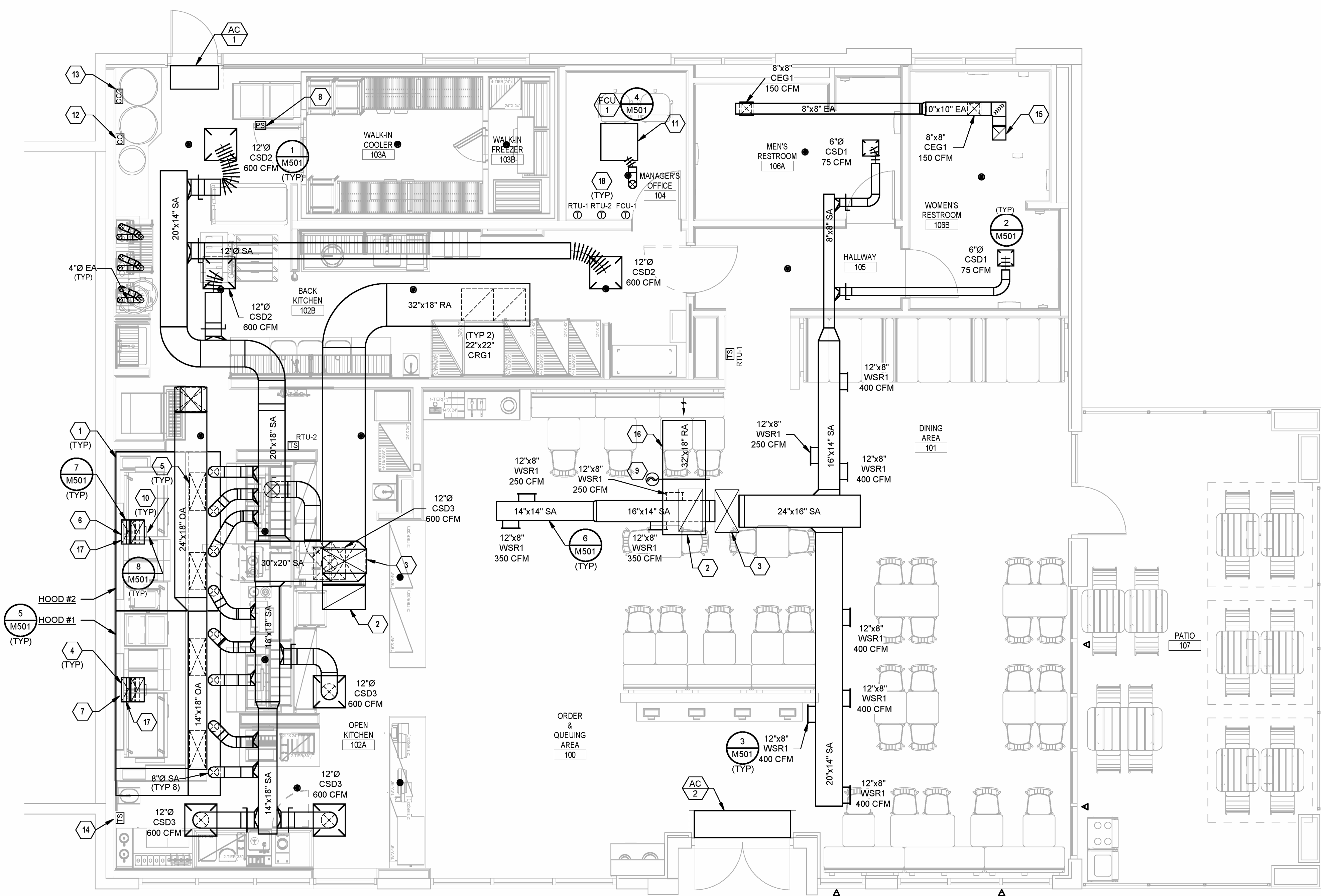
SHEET NO:  
**M101**

- MECHANICAL PLAN NOTES:**
- TYPE I HOODS SHALL BE FURNISHED COMPLETE WITH INTERNALLY PIPED FIRE SUPPRESSION SYSTEM AND EXTERNAL FOAM SUPPLY BOTTLES WITH REMOTE PULL CONTROLS AND IN COMPLIANCE WITH NFPA 96. DIVISION 23 SHALL COORDINATE COMPLETE INSTALLATION WITH FIRE PROTECTION CONTRACTOR TO MEET APPROVAL OF LOCAL INSPECTOR AND CODE COMPLIANCE INCLUDING TESTING.
  - PROVIDE RA DUCT THROUGH ROOF. FULL SIZE OF UNIT OPENING, AND CONNECT TO UNIT WITH FLEXIBLE CONNECTOR.
  - PROVIDE SA DUCT THROUGH ROOF. FULL SIZE OF UNIT OPENING, AND CONNECT TO UNIT WITH FLEXIBLE CONNECTOR.
  - TYPE I GREASE HOOD EXHAUST DUCTWORK SHALL BE MINIMUM 16 GAUGE STEEL OR MINIMUM 18 GAUGE STAINLESS STEEL WITH LIQUID TIGHT WELDS. INSTALL ACCESS PANELS FOR CLEANING AS REQUIRED BY NFPA 96 AND LOCAL CODES. TRANSITION GREASE DUCTWORK AS REQUIRED TO HOOD AND FAN CONNECTIONS. PROVIDE 45° MAX OFF-SETS AS REQUIRED TO COORDINATE WITH STRUCTURE. PROVIDE RADIUS ELBOWS WITHOUT TURNING VANES. SLOPE HORIZONTAL GREASE DUCT BACK TOWARDS HOOD AT MINIMUM OF 1/4" PER LINEAL FOOT. GREASE DUCTS SHALL BE CONTAINED IN A UL APPROVED GREASE DUCT WRAP SYSTEM.
  - REFER TO CAPTIVE AIRE DRAWINGS FOR INFORMATION REGARDING MAKEUP AIR CONNECTIONS AND SIZES.
  - 18"x10" GREASE EXHAUST DUCT UP THRU ROOF TO KEF-1, REF M150 FOR CONTINUATION. PROVIDE TRANSITION AS REQUIRED TO MAKE FULL SIZE CONNECTION TO FAN.
  - 18"x10" GREASE EXHAUST DUCT UP THRU ROOF TO KEF-2, REF M150 FOR CONTINUATION. PROVIDE TRANSITION AS REQUIRED TO MAKE FULL SIZE CONNECTION TO FAN.
  - INSTALL HOOD FIRE SUPPRESSION MANUAL PULL STATION, COORDINATE EXACT LOCATION AND REQUIREMENTS WITH FIRE SUPPRESSION SYSTEM INSTALLER AND THE AUTHORITY HAVING JURISDICTION.
  - INSTALL DUCT SMOKE DETECTOR IN RETURN AIR PLENUM.
  - INSTALL "DUCTMATE ULTIMATE DOOR" GREASE DUCT ACCESS PANELS FOR CLEANING IN LOCATION SHOWN AT A MINIMUM AND AS REQUIRED BY NFPA 96 AND LOCAL CODES.
  - REFRIGERANT PIPING UP TO CU-1 ON ROOF. REF 1/1M150.
  - CARBON MONOXIDE DETECTOR FURNISHED BY OWNER. INSTALL AT 5'-0" AFF. COORDINATE FINAL LOCATION WITH OWNER REPRESENTATIVE.
  - CARBON DIOXIDE SENSOR WITH REMOTE ALARM REPEATER AND RELAY PROVIDED BY CO2 VENDOR. RELAY SHALL BE INTERLOCKED WITH THE BUILDING FIRE ALARM SYSTEM. THE SENSOR SHALL BE EQUIPPED WITH A LOCAL AUDIBLE AND VISUAL ALARM. THE LOW LEVEL ALARM SHALL ACTIVATE THE LOCAL AUDIBLE AND VISUAL ALARM. THE HIGH LEVEL ALARM SHALL ACTIVATE RELAY.
  - MOUNT TEMPERATURE SENSOR PROVIDED WITH KITCHEN EXHAUST HOODS ON WALL.
  - 18"x10" EA DUCT UP TO EF-1 ON ROOF. PROVIDE TRANSITION AS REQUIRED TO MAKE FULL SIZE CONNECTION TO FAN.
  - MOUNT BOTTOM OF RETURN AIR DUCTWORK AT 13'-10" A.F.F. PROVIDE 1/4" GALVANIZED CONSTRUCTION. HARDWARE CLOTH SCREEN OVER OPEN END OF RETURN DUCT. PROVIDE DUCT LINER IN BOOT. RETURN AIR DUCT SHALL BE MINIMUM 36" HORIZONTAL EXTENSION FOR SOUND ATTENUATION.
  - REFER TO CAPTIVE AIRE DRAWINGS FOR DUCT CONNECTION SIZES TO KITCHEN EXHAUST HOODS.
  - MOUNT THERMOSTATS AND TEMPERATURE SENSOR(S) ON WALL. THERMOSTATS AND SENSOR(S) SHALL BE LABELED TO MATCH THE UNIT TAG AND CORRESPOND TO THE ELECTRICAL LEGEND IN THE ELECTRICAL PANELBOARD SERVING THE EQUIPMENT. COORDINATE COLOR WITH ARCHITECT.

ALL GREASE DUCT TO BE WATER TESTED BY ENVIROMATIC AT MECHANICAL CONTRACTOR'S EXPENSE. CONTACT OWNER'S NATIONAL ACCOUNT VENDOR  
ENVIROMATIC  
DON PFLIEGERER  
1.800.325.8475  
INSPECTIONS@ENVIROMATIC.COM

THE BUILDINGS HVAC SYSTEM SHALL BE BALANCED BY NATIONAL TAB (NO EXCEPTIONS) AND CONTRACTED BY THE GENERAL CONTRACTOR.

CONTACT:  
WILL TURNBOUGH  
WILL@NATIONALTAB.COM  
855-682-6822 ext704



**MECHANICAL FLOOR PLAN**  
1/4" = 1'-0"

RFI #1.1 RESPONSE  
DATE: 10/02/2023  
SCALE: 1/4" = 1'-0"  
REVISION TO SHEET: M101

MSK  
02

**SHAKE SHACK**  
STAMFORD BRANCH UNIT 2  
64 HUSKINS AVENUE  
STAMFORD, CONNECTICUT 06905

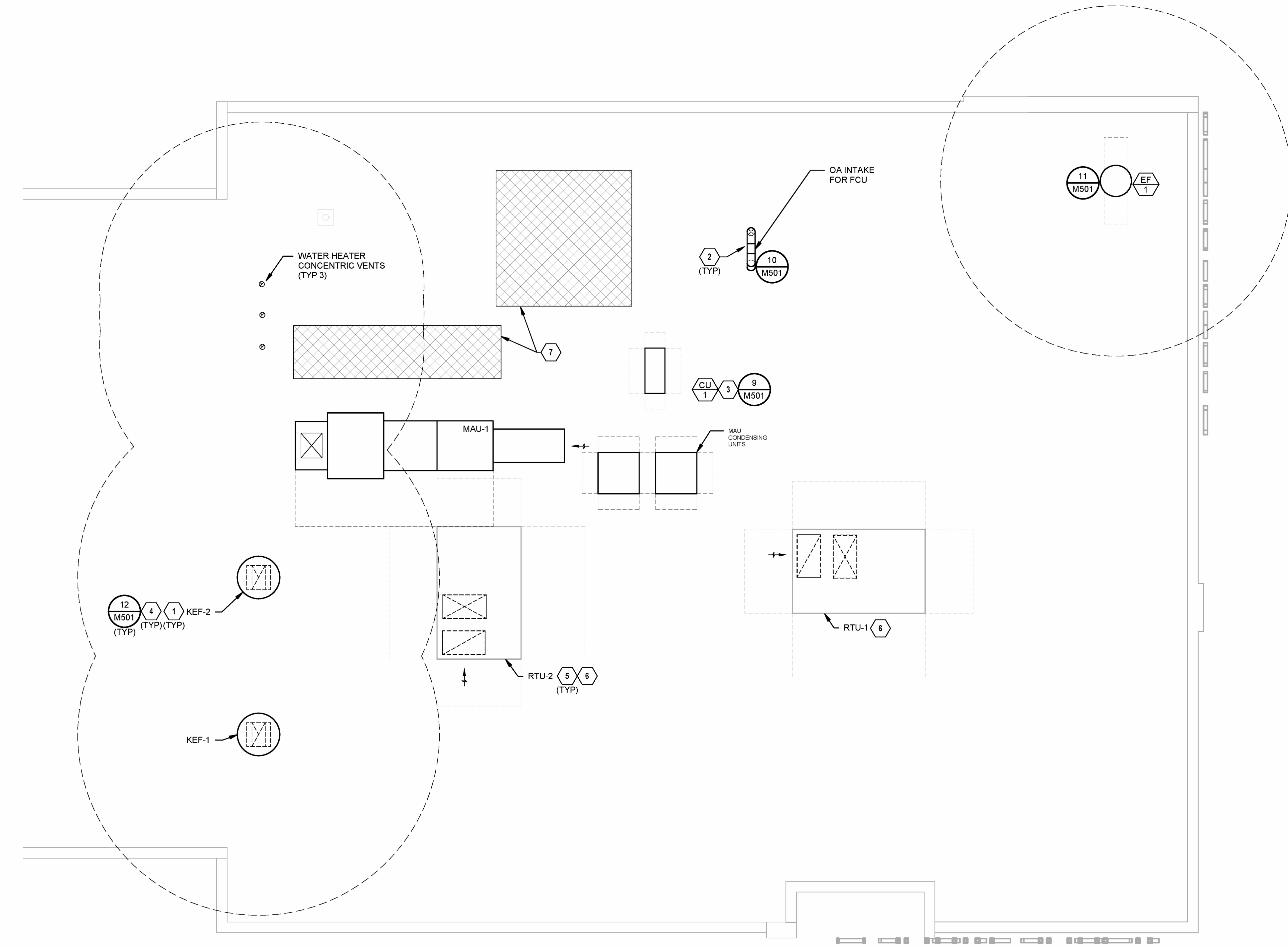
- MECHANICAL PLAN NOTES:**
- 1 MAINTAIN ALL OUTSIDE AIR INTAKES A MINIMUM OF 10'-0" RADIUS FROM EXHAUST, TYPICAL.
  - 2 TURN DOWN 6" Ø INTAKE AND END OPEN OVER ROOF (MIN. 24") WITH INSECT SCREEN.
  - 3 CONTRACTOR SHALL VERIFY WITH EQUIPMENT SUPPLIER EXACT ROUTING AND SIZE OF INSULATED REFRIGERANT PIPING. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
  - 4 REFER TO CAPTIVEAIRE DRAWINGS FOR INFORMATION REGARDING GREASE FAN GUARDS.
  - 5 REFERENCE P150 FOR CONDENSATE DRAIN ROUTING AND TERMINATION REQUIREMENTS.
  - 6 PROVIDE EQUIPMENT WITH NATIONAL TAB UV-PI INDOOR AIR PURIFICATION SYSTEM, MODEL PHI PKG-24V. INSTALL IN UNIT SLOWER COMPARTMENT PER MANUFACTURER'S INSTRUCTIONS.
  - 7 AREA RESERVED FOR REFRIGERATION CONDENSER(S) PROVIDED BY KITCHEN EQUIPMENT CONTRACTOR. COORDINATE EQUIPMENT LOCATION AND CONDENSER INSTALLATION WITH KITCHEN EQUIPMENT CONTRACTOR.

ALL GREASE DUCT TO BE WATER TESTED BY ENVIROMATIC AT MECHANICAL CONTRACTOR'S EXPENSE. CONTACT OWNER'S NATIONAL ACCOUNT VENDOR.

ENVIROMATIC  
DON PFLEGER  
1.800.325.6476  
INSPECTIONS@ENVIROMATIC.COM

THE BUILDINGS HVAC SYSTEM SHALL BE BALANCED BY NATIONAL TAB (NO EXCEPTIONS) AND CONTRACTED BY THE GENERAL CONTRACTOR.

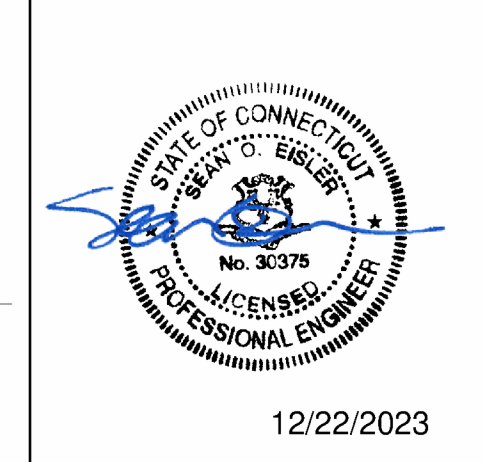
CONTACT:  
WILL TURNBOUGH  
WILL@NATIONALTAB.COM  
855-682-6822 ext1704



**MECHANICAL ROOF PLAN**  
1/4" = 1'-0"

REVISION	
DATE	DESCRIPTION
I 02/24/23	REVISION I
J 05/03/23	REVISION J
K 06/09/23	REVISION K
L 09/10/23	REVISION L
M 10/23/23	REVISION M
T 12/22/23	REVISION T

STATUS:  
**IFC SET**



12/22/2023

**FIELD VERIFICATION:**  
The contractor shall verify all listed dimensions and location at the project site and notify Zebra Architecture, PLLC of any dimensional errors or omissions or discrepancies before beginning or completing any work. Do not make these drawings.

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SHEET NAME:  
**MECHANICAL ROOF PLAN**

DATE: 03/05/2021 PROJECT NO: 32074  
DRAWN: AJP SCALE: AS NOTED

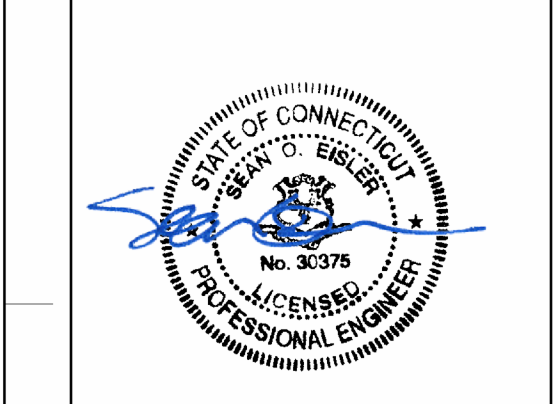
RFI #1.1 RESPONSE  
DATE: 10/02/2023  
SCALE: 1/4" = 1'-0"  
REVISION TO SHEET: M150

**MSK**  
**01**

SHEET NO:  
**M150**

REVISION	
DATE	DESCRIPTION
I 02/24/23	REVISION I
J 03/03/23	REVISION J
K 06/09/23	REVISION K
L 09/01/23	REVISION L
M 10/23/23	REVISION M
T 12/22/23	REVISION T

STATUS:  
IFC SET



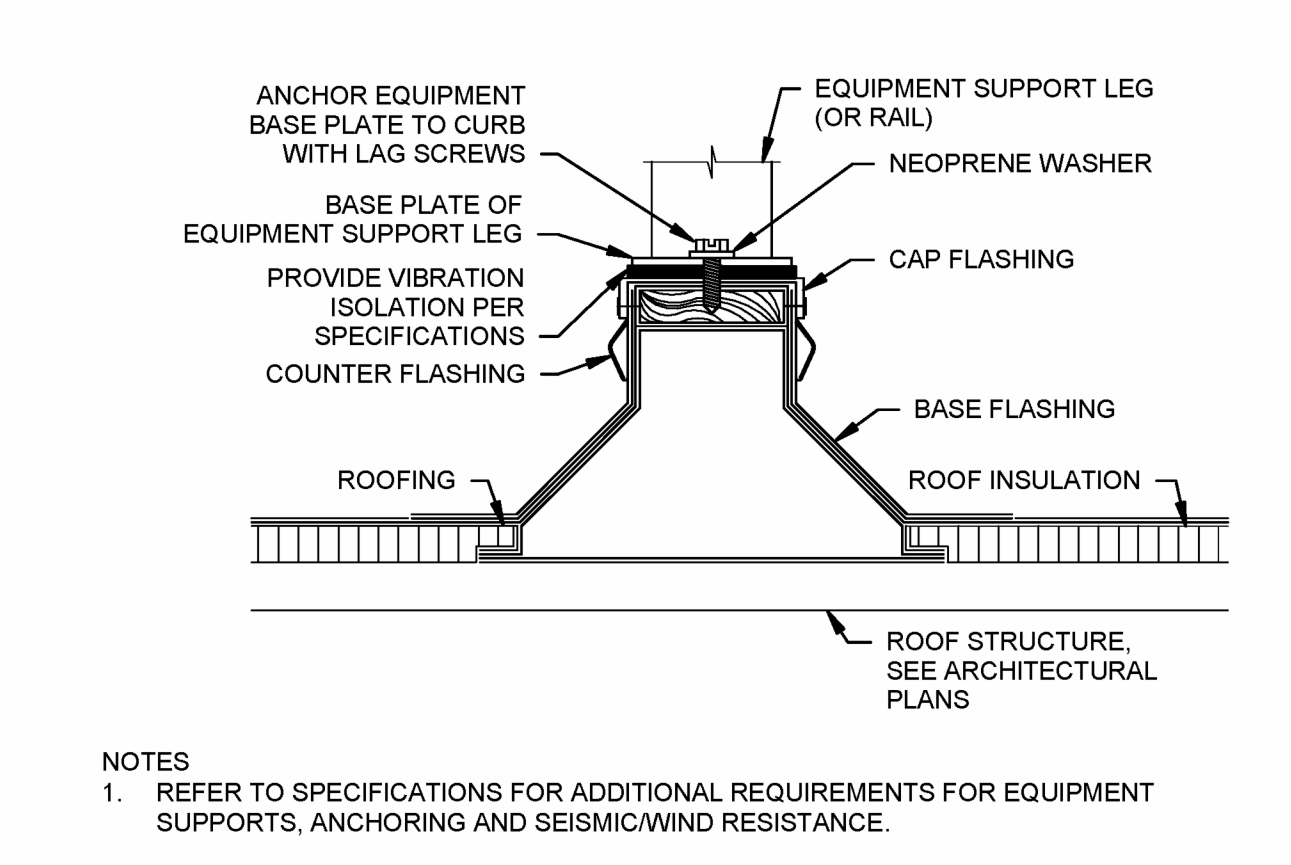
FIELD VERIFICATION:  
The contractor shall verify all figured dimensions and location of the project and notify Zebra Architecture, PLLC of any dimensional errors, or omissions of dimensions and/or omissions of materials or workmanship. Do not proceed until approved by the architect.

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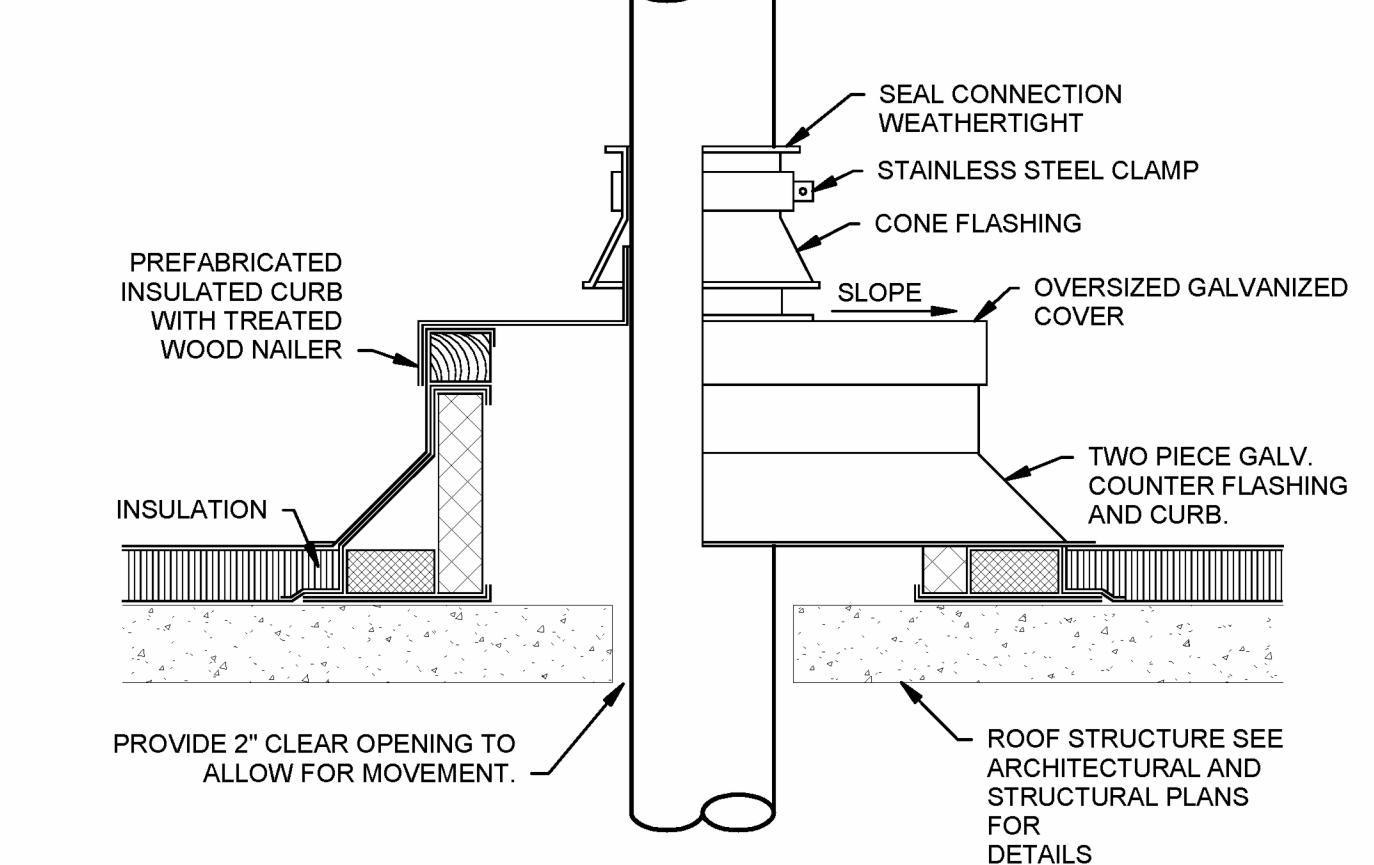
SHEET NAME:  
**MECHANICAL DETAILS**

DATE: 03/05/2021 PROJECT NO: 32074  
DRAWN: AJP SCALE: AS NOTED

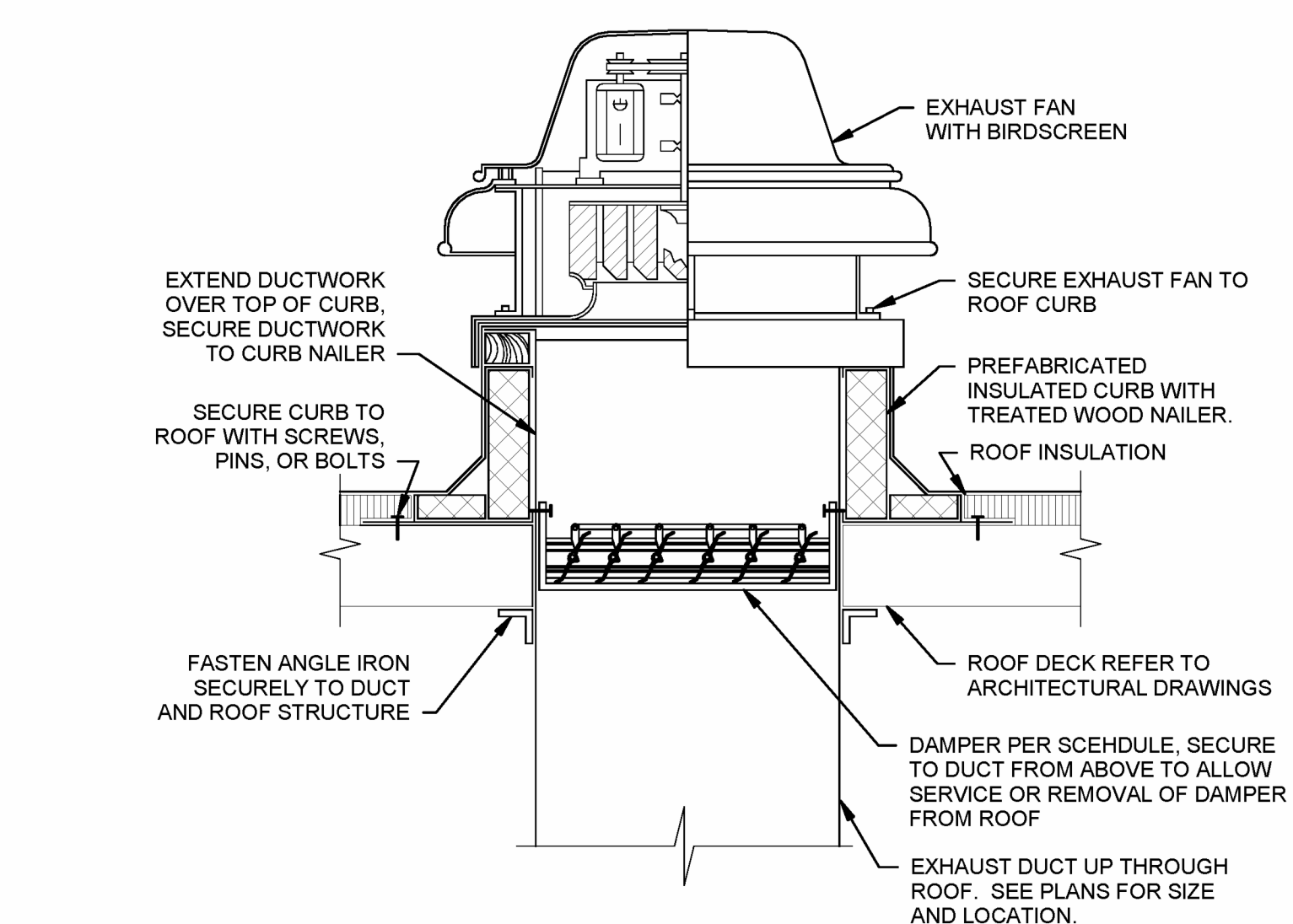
SHEET NO:  
**M501**



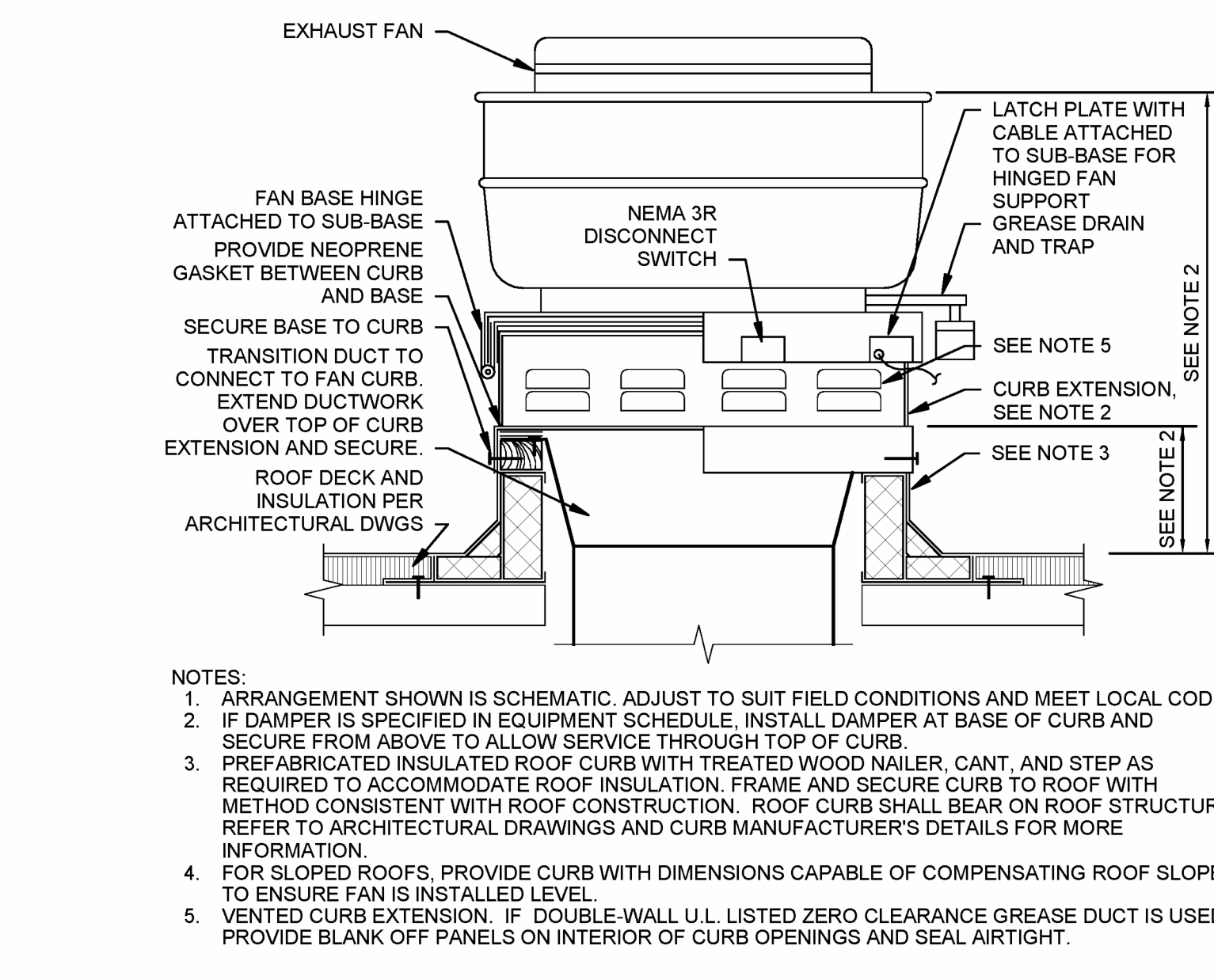
9 ROOF EQUIPMENT SUPPORT RAIL DETAIL  
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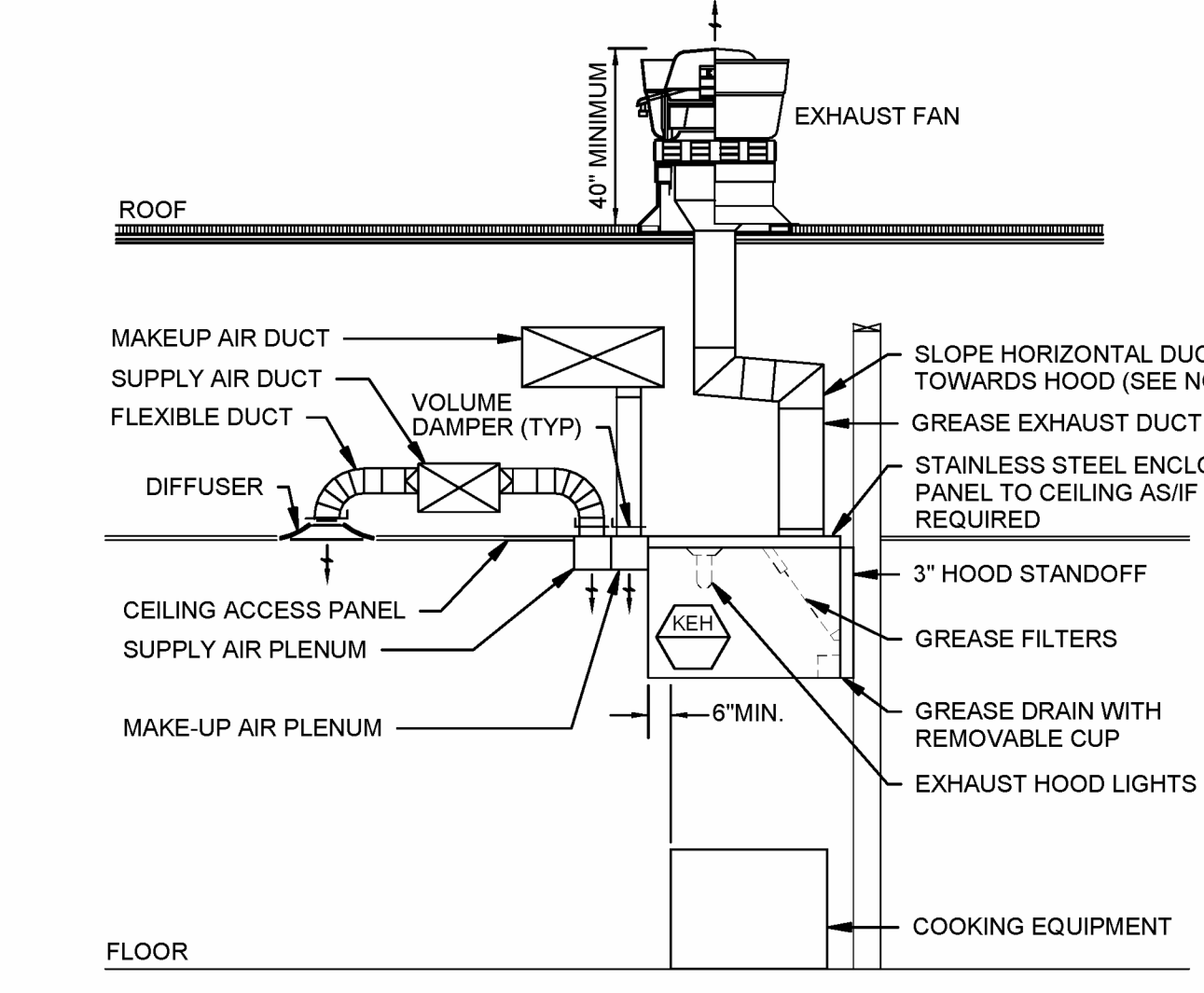
10 ROUND AIR DUCT OR PIPE PENETRATION THROUGH ROOF DETAIL  
NTS



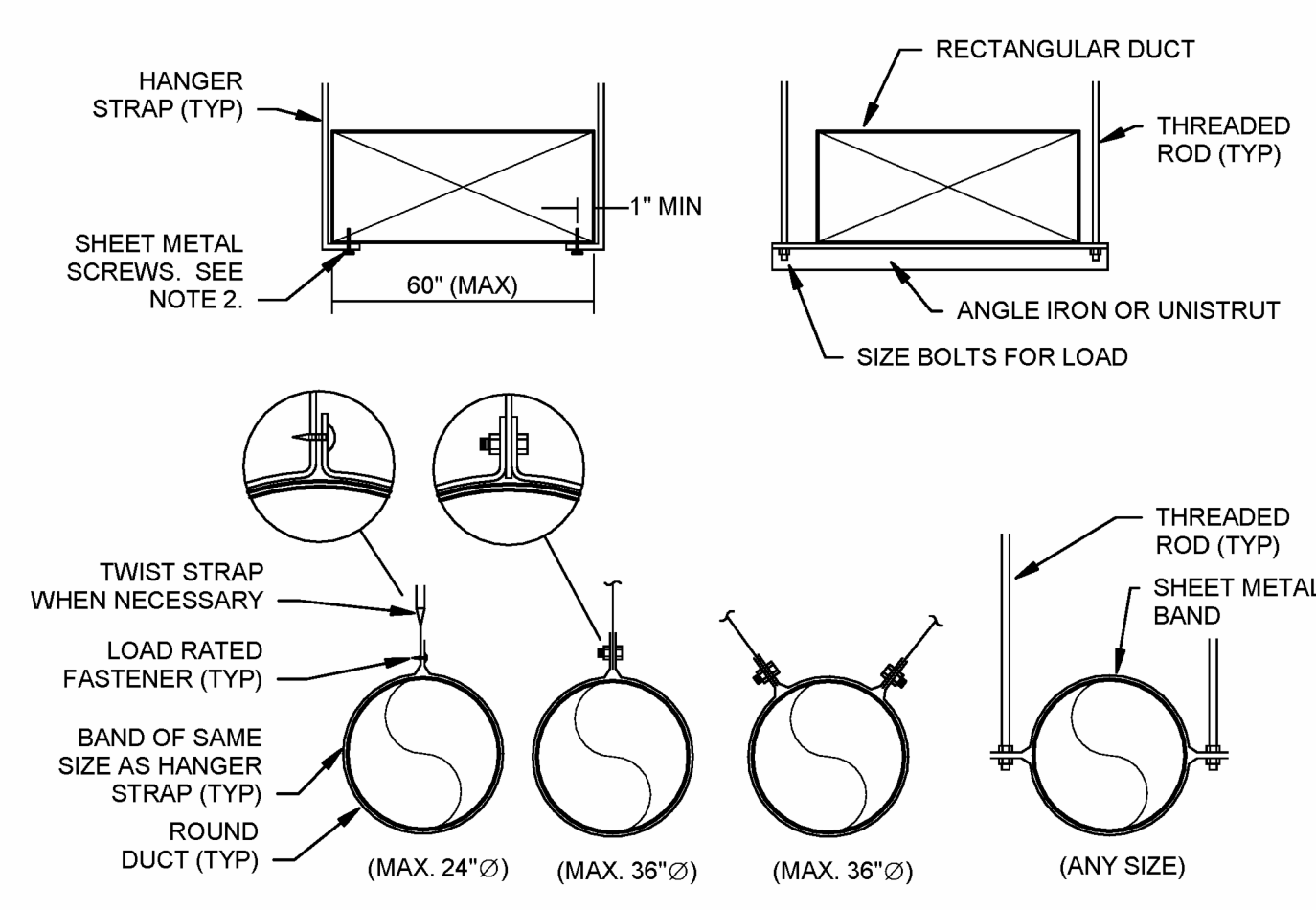
11 DOWNBLAST EXHAUST FAN DETAIL  
NTS



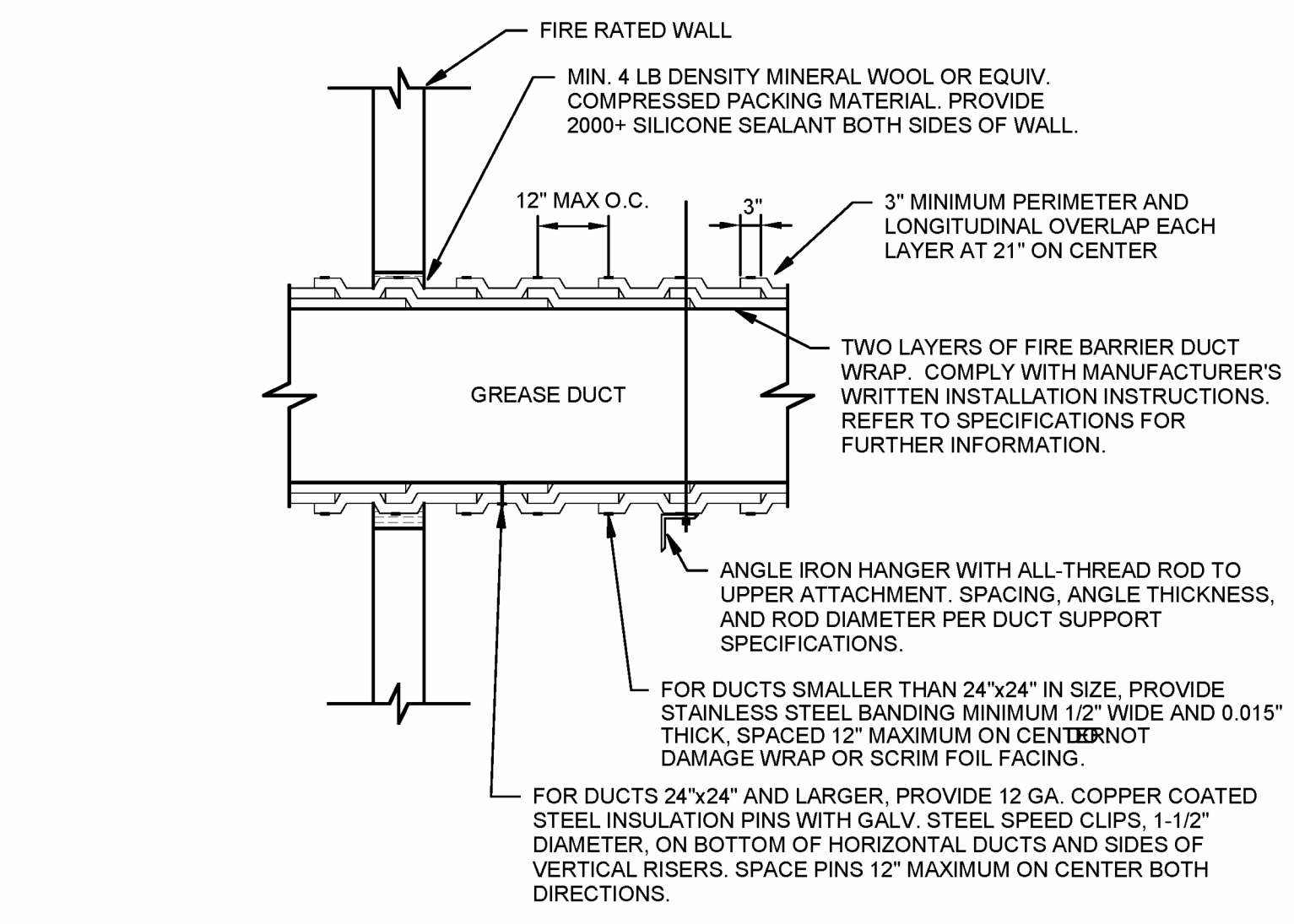
12 UPBLAST GREASE EXHAUST FAN DETAIL  
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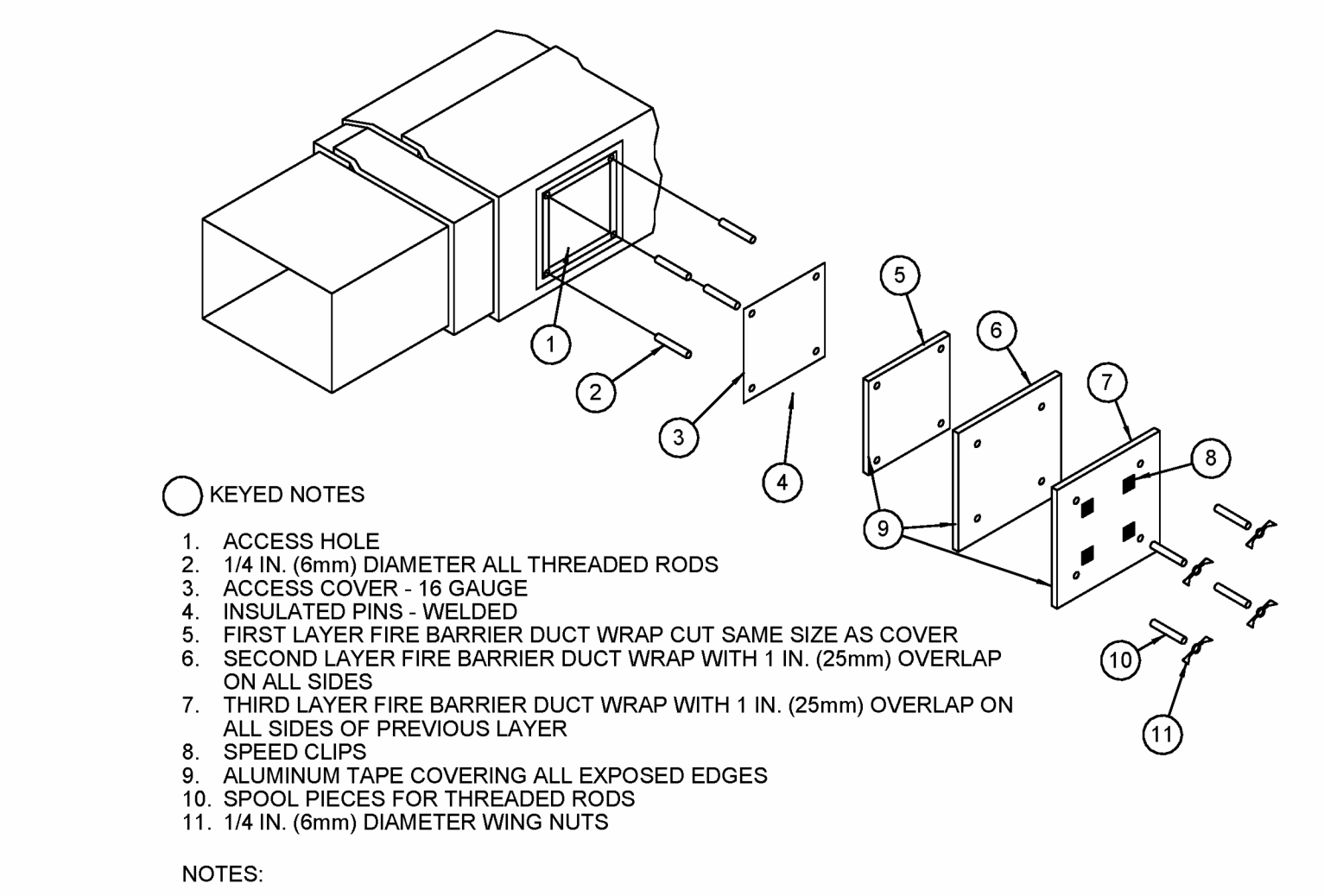
5 KITCHEN EXHAUST HOOD ELEVATION DETAIL  
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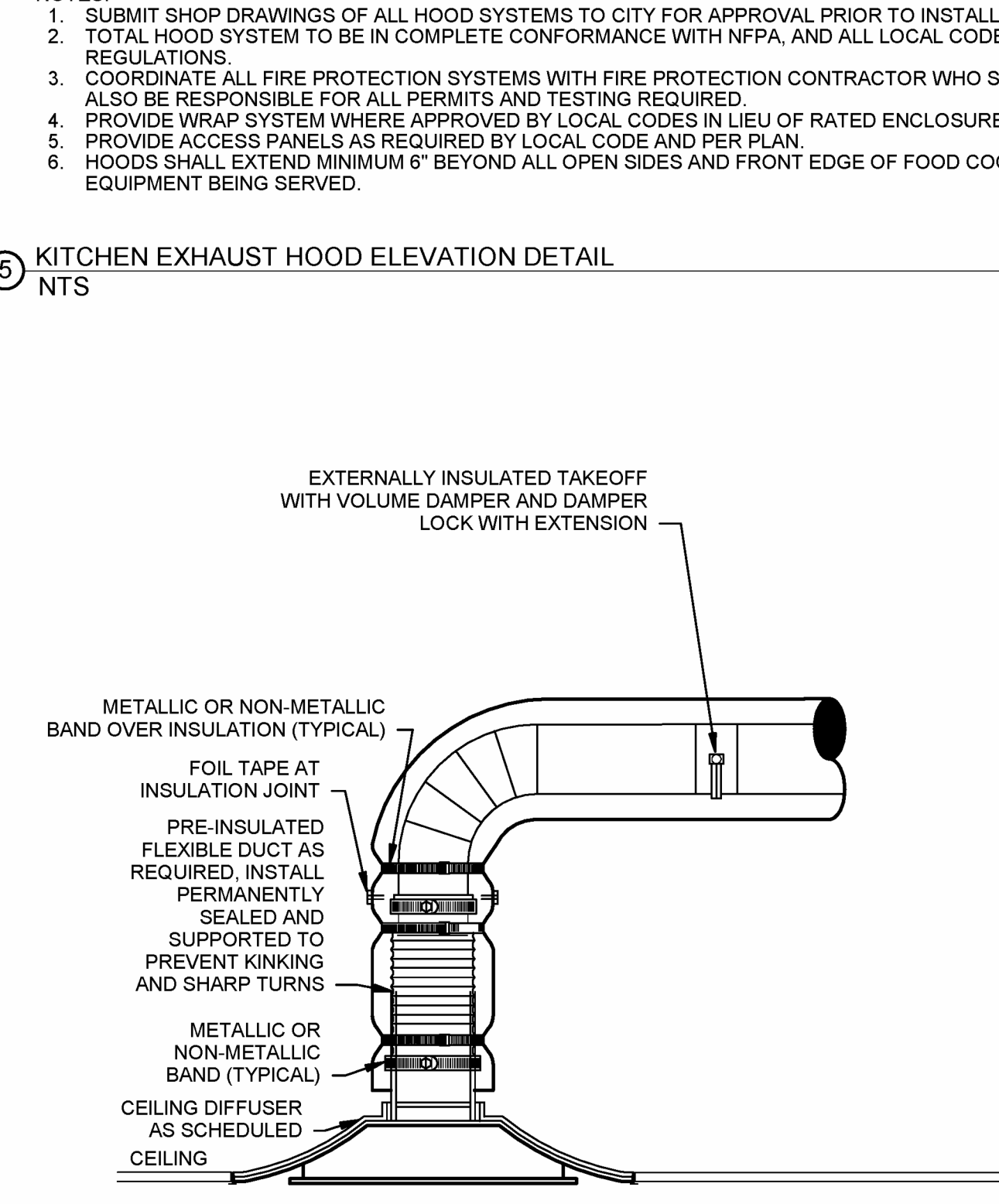
6 DUCT HANGER LOWER ATTACHMENT DETAILS  
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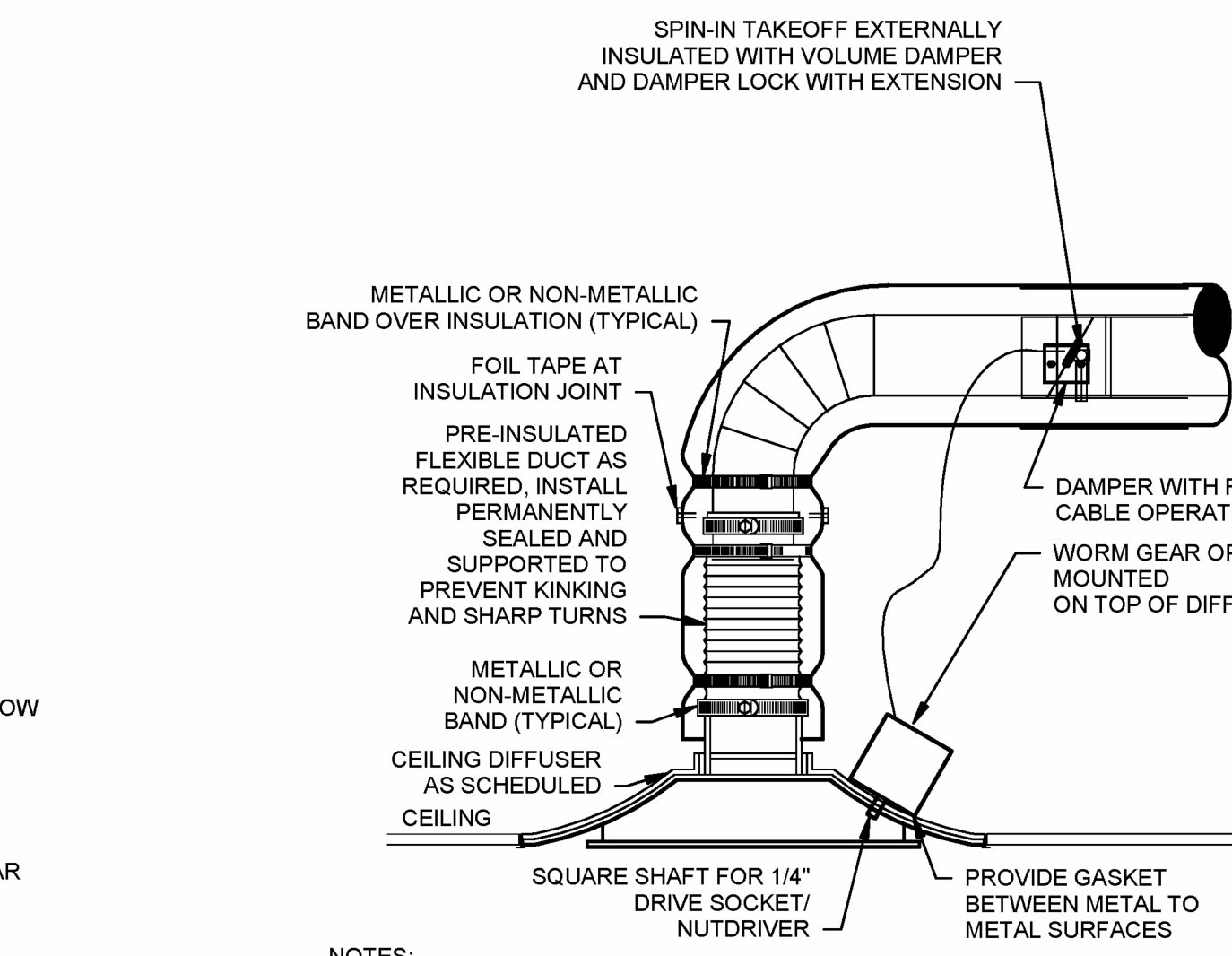
7 GREASE DUCT FIRE WRAP INSULATION INSTALLATION DETAIL  
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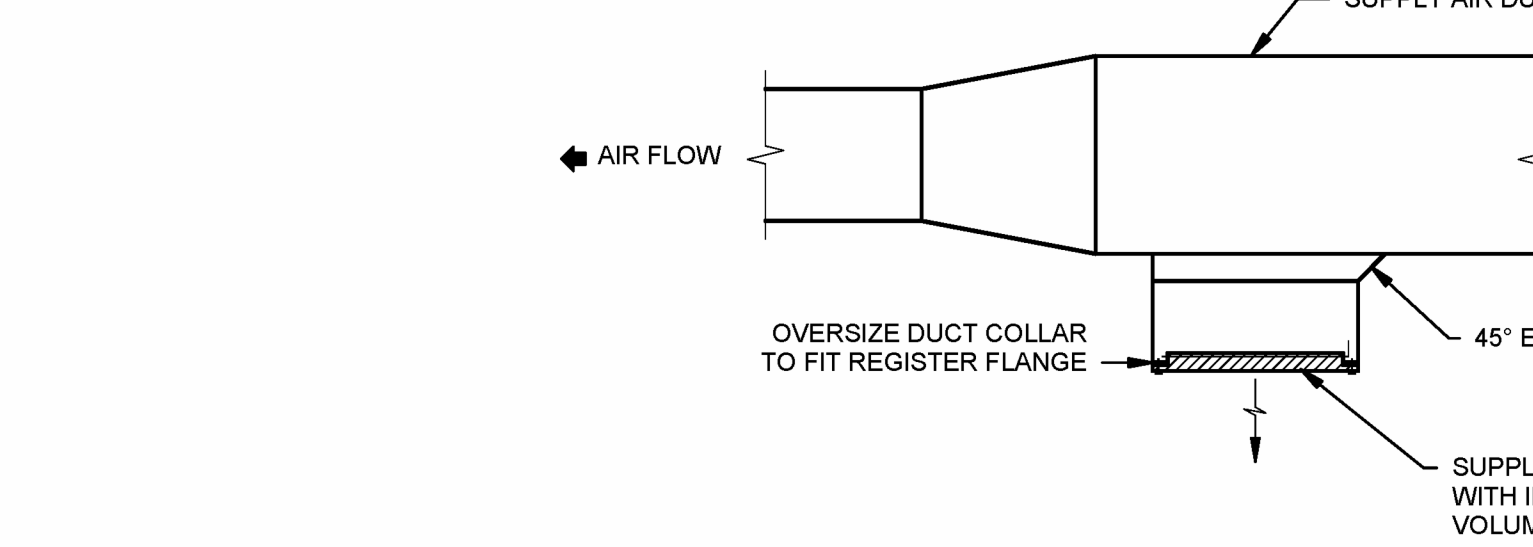
8 GREASE DUCT CLEANOUT ACCESS DOOR DETAIL  
NTS



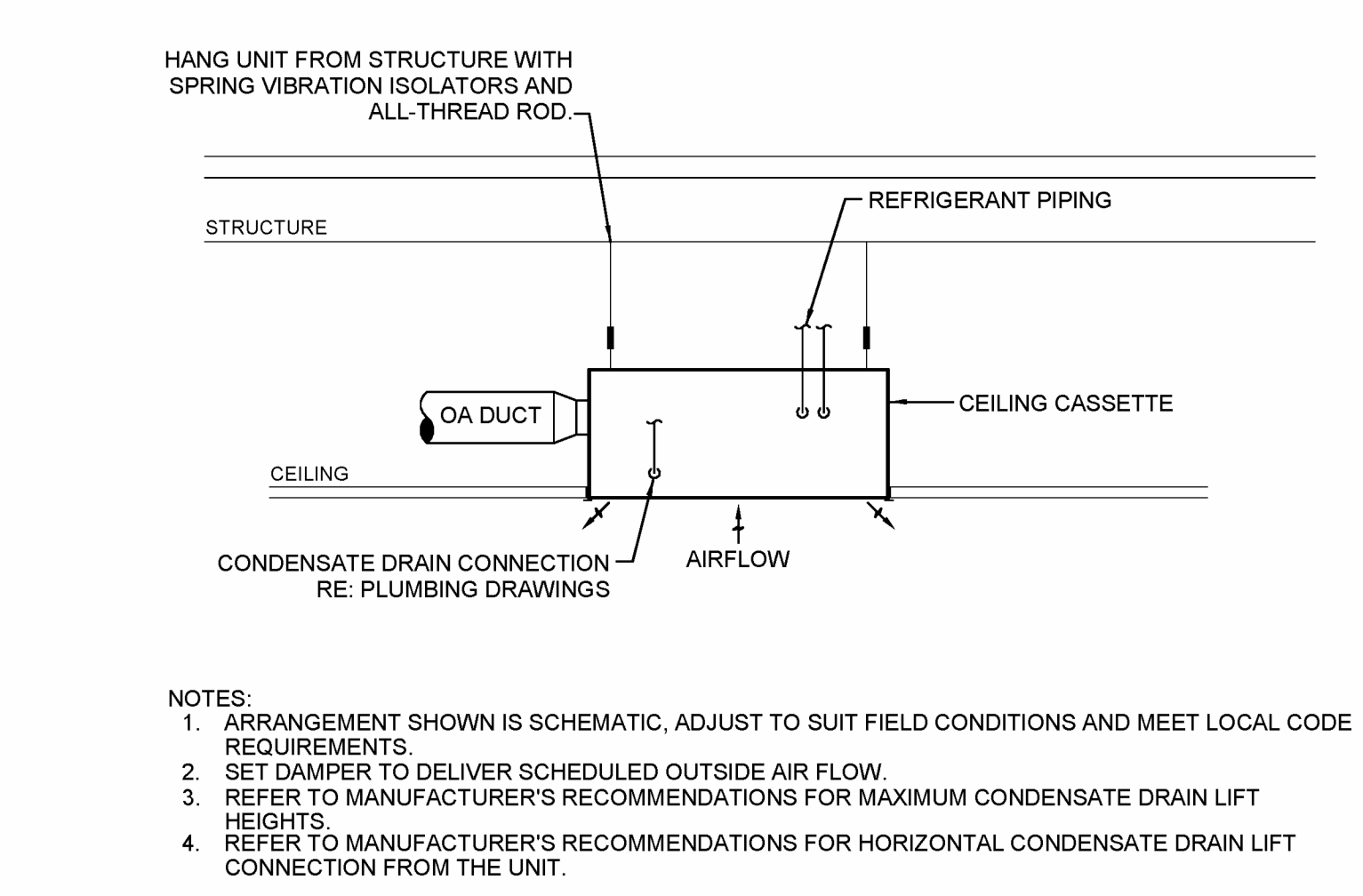
1 LAY-IN CEILING DIFFUSER DETAIL  
NTS



2 HARD CEILING DIFFUSER DETAIL  
NTS



3 DUCT MOUNTED REGISTER DETAIL  
NTS



4 CEILING CASSETTE DETAIL  
NTS

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Division 23: HEATING, VENTILATING, AND AIR CONDITIONING

1. GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

All requirements under Division 01 and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 01, this section and division take precedence. Become thoroughly familiar with the specifications that affect this division, section, or both. Work required under this division includes all material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate the function of each system as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and any portion of work described in one shall be provided as if described in both. In the event of discrepancies, notify the Engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including showing the scope of work, indicating the intended general arrangement of the systems without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory, and properly operating system.

B. DEFINITIONS

Division: References contained in this specification follow the numbering system defined in the Construction Specifications Institute (CSI) MasterFormat 2004 Edition. Specification Divisions 01 through 13 provided with this project may reference the CSI MasterFormat 1995 Edition. The corresponding division references between the 2004 Edition and 1995 Edition are as follows:

1. Division 21 - Fire Suppression	Division 15
2. Division 22 - Electrical	Division 15
3. Division 23 - HVAC	Division 15
4. Division 26 - Electrical	Division 16
5. Division 27 - Communications	Division 16
6. Division 28 - Electronic Safety and Security	Division 16

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations."

Install: "to perform all operations at the project site including, but not limited to, the actual unloading, unpacking, assembling, erecting, locating, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install."

Furnished by Owner (or Owner-Furnished) or Furnished by Others: "an item furnished by the Owner or under other divisions or contracts, and installed under the requirements of this division, complete and ready for intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division."

Engineer: Where referenced in this division, "Engineer" is the Engineer of Record and the Design Professional for the work under this division, and is a consultant to, and an authorized representative of the Architect, as defined in the General and/or Supplementary Conditions. When used in this division, Engineer means increased involvement by and obligations to the Engineer, in addition to involvement by and obligations to the Architect.

AHJ: The local code and/or inspection agency (Authority) Having Jurisdiction over the work.

NRTL: Nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project. Nationally recognized testing laboratories and standards listed are used only to represent the characteristics required and are not intended to restrict the use of other NRTLs that are acceptable to the AHJ and standards that meet the specified criteria.

Substitution: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Substitutions include Value Engineering proposals.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of materials, equipment, or methods of construction, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the Engineer as equivalent to the item or manufacturer specified." The term "approved" shall mean labeled, listed, or both, by an NRTL, and acceptable to the AHJ over this project.

C. PREBID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to comply with this requirement shall not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

D. MATERIAL AND WORKMANSHIP

Provide new material, equipment, and apparatus under this contract unless otherwise stated herein, of best quality normally used for the purpose in good commercial practice, and free from defects. Install material and equipment in accordance with the manufacturer's installation instructions. Model numbers listed in the specifications or shown on the drawings are not necessarily intended to designate the required trim, written descriptions of the trim govern model numbers.

Pipe, pipe fittings, pipe specialties and valves shall be manufactured in plants located in the United States or certified to meet specified ASTM and ANSI standards.

Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the Architect and Engineer. Workmanship shall be the finest possible by experienced mechanics. Installations shall comply with applicable codes and laws.

The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal noise caused by rattling equipment, piping, ducts, air devices, and squeaks in rotating components shall not be acceptable. Materials and equipment shall be of commercial specification grade in quality. Light duty and residential grade equipment shall not be accepted unless otherwise indicated.

Remove from the premises waste material present as a result of work, including cartons, crating, paper, stickers, and/or excavated material not used in backfilling, etc. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction. Provide all safety lights, guards, and warning signs required for the performance of the work and for the safety of the public.

E. MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers are listed alphabetically and not in accordance with any ranking or preference.

When manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

F. COORDINATION

Coordinate work with that of other trades so that the various components of the systems are installed at the proper time, will fit the available space, and will allow proper service access to those items requiring maintenance. Components which are installed without regard to the above shall be relocated at an additional cost to the Owner.

Unless otherwise indicated, the General Contractor shall provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the General Contractor with information where chases and openings are required. Contractor shall keep informed as to the work of other trades engaged in the construction of the project and shall execute work in a manner so as not to interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor shall be held responsible for errors that could have been avoided by proper checking and inspection.

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the specifications or shown on the drawings are not intended to designate the required trim.

G. ORDINANCES AND CODES

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ, including any amendments and standards as set forth by the following:

1. National Electrical Code (NEC)
2. National Fire Protection Association (NFPA)
3. Underwriters Laboratories (UL)
4. Occupational Safety and Health Administration (OSHA)
5. American Society of Mechanical Engineers (ASME)
6. American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
7. American National Standards Institute (ANSI)
8. American Society of Testing and Materials (ASTM)
9. Other national standards and codes where applicable.

Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence. Where conflicts between various codes, ordinances, rules, and regulations exist, comply with the most stringent.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the attention of the Architect and Engineer for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for, and furnish certificates of inspection to Owner.

H. PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy tarp or polyethylene plastic as required to protect from plaster, dust, dirt, paint, water, or physical damage. Replace insulation that has become wet at any time during construction. Drying the insulation is not acceptable. In any case of internal fiberglass insulation, equipment and materials damaged by construction activities shall be rejected and Contractor shall furnish new equipment and material of a like kind at his own expense.

Keep premises broom clean of foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work. Remove debris from ceiling/return air plenum, including dust.

Plug, seal, or cap open ends of ductwork and piping systems while stored and installed during construction when not in use to prevent the entrance of debris into the systems. Remove temporary protection prior to starting equipment and turning the system over to the owner.

I. SUBSTITUTIONS

Materials, products, equipment, and systems described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by the proposed substitution. The base bid shall include only the products from manufacturers specifically named in the drawings and specifications. To request a substitution, request the Substitution Request Form from the Architect or Engineer. Complete and send the Substitution Request Form for each material, product, equipment, or system that is proposed to be substituted. The burden of proof of the merit of the proposed substitution is upon the proposer.

Unless stated otherwise in writing to the Engineer by the Contractor, Contractor warrants to the Engineer, Architect, and Owner the following:

1. Proposed substitution has been fully investigated and determined to meet or exceed the specified Work in all respects unless stated otherwise in the substitution request.
2. Proposed substitution is consistent with the Contract Documents and will produce indicated results, including functional clearances, maintenance service, and sourcing of replacement parts.
3. Proposed substitution has received necessary approvals of authorities having jurisdiction.
4. Same warranty will be furnished for proposed substitution as for specified Work.

5. If accepted substitution fails to perform as required, Contractor shall replace substitute material or system with that originally specified and bear costs incurred thereby.
6. Coordination, installation and changes in the Work as necessary for accepted substitution will be complete in all respects.

No substitutions will be considered unless the Substitution Request Form is completed and attached with the appropriate substitution documentation. No substitution will be considered prior to receipt of bids unless written request for approval to bid has been received by the Engineer at least ten (10) calendar days prior to the date for receipt of bids.

If the proposed substitution is approved prior to receipt of bids, such approval will be stated in an addendum. Bidders shall not rely upon approvals made in any other way. Verbal approval will not be given. No substitutions will be considered after the contract is awarded unless specifically provided in the contract documents.

J. SUBMITTALS

Assemble and submit for review shop drawings, material lists, manufacturer product literature for equipment to be furnished, and items requiring coordination between contractors under this contract. Prepare submittals in sufficient detail so as to demonstrate compliance with these contract documents and the design concept. Prior to transmitting submittals, verify that the equipment submitted is mutually compatible and suitable for the intended use, will fit the available space, and maintain manufacturer recommended service clearances. If the size of equipment furnished makes necessary any change in location or configuration, submit a shop drawing showing the proposed layout.

Transmit submittals as early as required to support the project schedule. Allow for two weeks Engineer review time, plus to/from mailing time to the Architect, plus a duplication of this time for resubmittal, if required. Only resubmit those sections requiring resubmittal.

Submittals shall contain the project name, applicable specification section, submittal date, equipment identification acronym as used on the drawings, and the Contractor's stamp. The stamp shall certify that the submittal has been checked by the Contractor, complies with the drawings and specifications, and is coordinated with other trades. Manufacturer product literature shall include shop drawings, product data, performance sheets, samples and other submittals required by this division. Highlight, mark, list, or indicate the materials, performance criteria, and accessories that are being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

Submittals and shop drawings shall not contain the firm name, logo, seal, or signature of the Engineer. They shall not be copies of the work product of the Engineer. If the Contractor desires to use elements of such product, refer to paragraph "Electronic Drawing Files" for procedures to be used.

Separate submittals according to individual specification sections. Illegible submittals will be rejected and returned without review. Catalog data shall be properly bound, identified, indexed and tabbed in a 3-ring binder. Each item or model number shall be clearly marked and accessories indicated. Label the catalog data with the equipment identification acronym or number as used on the drawings and include performance curves, capacities, sizes, weights, materials, finishes, wiring diagrams, electrical requirements and deviations from specified equipment or materials. For equipment with motor starters or VFDs, include short circuit current ratings. Mark out applicable items. Shop drawings will be returned without review if the above mentioned requirements are not met.

Provide the quantity of submittals required by Division 01. If not indicated and hard-copy sets are provided, submit a minimum of six (6) copies. Refer to Division 01 for acceptance of electronic submittals for this project. For electronic submittals, Contractor shall submit the documents in accordance with the procedures established in Division 01. Contractor shall notify the Architect and Engineer that the submittals have been posted. If electronic submittal procedures are not defined in Division 01, Contractor shall include the website, user name, and password information needed to access the submittals. For submittals sent by e-mail, Contractor shall copy the designated representatives of the Architect and Engineer. Contractor shall allow for the Engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal.

The checking and subsequent acceptance of submittals by the Engineer and/or Architect shall not relieve the Contractor from responsibility for deviations from the drawings and specifications, errors in dimensions, details, size of members, or quantities, omissions of components or fittings, coordination of electrical requirements, and not coordinating items with actual building conditions and adjacent work. Proceed with the procurement and installation of equipment only after receiving approved shop drawings relative to each item.

K. ELECTRONIC DRAWING FILES

In preparation of shop drawings or record drawings, Contractor may, at his option, obtain electronic drawing files in AutoCAD or DXF format on CD-ROM disk, DVD disk, flash drive or direct download, as desired, from the Engineer for a shipping and handling fee of \$200 for a drawing set up to 12 sheets and \$15 per sheet for each additional sheet. Contact the Architect for written authorization and Engineer for the necessary release agreement form. In addition to payment, the written authorization from the Architect and release agreement form from the Engineer must be received before electronic drawing files will be sent.

L. RECORD DRAWINGS (AS-BUILT DRAWINGS)

During progress of the work in this division, Contractor shall maintain an accurate record of all changes made during the installation of the system. Upon completion of the work, accurately transfer all record information to three identical sets of the approved shop drawings. Insert one set into each copy of the manual described below.

M. OPERATION AND MAINTENANCE INSTRUCTIONS

During the course of construction, collect and compile a complete brochure of equipment furnished and installed on this project. Include operational and maintenance instructions, manufacturer's catalog sheets, wiring diagrams, parts lists, approved submittals and shop drawings, warranties, and descriptive literature as furnished by the equipment manufacturer. Include an inside cover sheet that lists the project name, date, Owner, Architect, Engineer, General Contractor, Sub-Contractor, and an index of contents.

Submit three copies of literature bound in approved binders with index and tabs separating equipment types to the Architect, for Engineer's review, at the termination of the work. Paper clips, staples, rubber bands, loose-leaf binding, and mailing envelopes are not considered approved binders. Final approval of systems installed under this contract shall be withheld until this equipment brochure is received and deemed complete by the Architect and Engineer. Instruct workmen to save required literature shipped with the equipment itself for inclusion in this brochure.

Include Record Drawings as described above.

Refer to Division 01 for acceptance of electronic manuals for this project. For electronic manuals, refer to paragraph "Submittals" for requirements.

N. SPARE PARTS

Furnish to Owner, with receipt, the following spare parts for the equipment furnished for this project:

1. One set of spare filters of each type required for each unit. In addition to the spare set of filters, install new filters prior to testing, adjusting, and balancing work and before turning system over to Owner.
2. Furnish one complete set of belts for each fan.
3. Furnish three operating keys for each type of air outlet and inlet that require them.

O. TRAINING

At a time mutually agreed upon between the Owner and Contractor, provide the services of a factory trained and authorized representative to train Owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include, but not be limited to, an overview of the system and/or equipment as it relates to the facility as a whole; operation and maintenance procedures and schedules related to start-up and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention, and review of data included in the operation and maintenance manuals.

Submit a certification letter to the Architect stating that the Owner's designated representative has been trained as specified herein. Letter shall include date, time, attendees and subject of training. The Contractor and the Owner's representative shall sign the certification letter indicating agreement that the training has been provided.

Schedule training with Owner with at least 7 days advance notice.

P. WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design, or material for a period of 12 months from date of Substantial Completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds 12 months. Remedy all defects, occurring within the warranty period(s), as stated in the General Conditions and Division 01.

Warranties shall include labor and material, including travel expenses. Make repairs or replacements without any additional costs to the Owner, and to the satisfaction of the Owner, Architect, and Engineer.

Perform the remedial work promptly, upon written notice from the Engineer or Owner.

At the time of Substantial Completion, deliver to the Owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the one year period and any actions the Owner must take in order to maintain warranty status. Each warranty instrument shall be addressed to the Owner and state the commencement date and term.

2. GENERAL MATERIALS AND INSTALLATION

A. BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Accomplish work requiring interruption of building operation at a time when the building is not in operation and only with written approval of building Owner and/or tenant. Coordinate interruption of building operation with the Owner and/or tenant a minimum of seven (7) days in advance of work.

B. EXISTING EQUIPMENT REUSE AND REMOVAL

Remove all unused equipment, ductwork, piping, and associated supports. Cap ductwork and piping at mains and seal air and water tight.

Provide items of HVAC systems modification required because of building remodeling, as noted on the drawings or necessary for proper operation. Match existing materials and construction techniques when modifying existing systems unless specified otherwise. Coordinate additional requirements with General Contractor and Architect.

Seal airtight existing ductwork required to be abandoned in place or not in use at the termination of the work.

Cap and seal weathertight existing roof curbs and roof openings to be abandoned in place as a result of equipment removal.

Clean and rebalance existing ductwork, diffusers, registers, and grilles intended for reuse as required or as indicated on drawings.

Clean and refurbish existing HVAC equipment intended for reuse as required for proper operation including replacement of filters, belts, motors, remote controls, and safety interlocks.

C. COINCIDENTAL DAMAGE

Repair streets, sidewalks, drives, paving, walls, finishes, and other facilities damaged in the course of the work. Repair materials shall match existing construction. Repair work shall meet all requirements of the Owner, local authorities having jurisdiction, and meet the satisfaction of the Architect.

D. CUTTING AND PATCHING

Conform to the requirements in Division 01. Cut walls, floors, ceilings, and other portions of the facility as required to install work under this division. Obtain permission from the Architect prior to cutting. Do not cut or disturb structural members without prior approval from the Architect and Structural Engineer. For post-tensioning slabs, x-ray slab and closely coordinate all core drill locations with Architect and Structural Engineer prior to performing any work. Obtain approval from Architect and Structural Engineer for all core drills and penetrations at least four days prior to performing work. Penetrations shall be made as small as possible while maintaining required clearances between the building element penetrated and the system component. Patch around openings to match the adjacent construction including fire ratings, if applicable. Repair and refinish areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the Architect.

E. ROUGH-IN

Coordinate without delay all roughing-in with other divisions. Conceal piping, conduit, and rough-in except in unfinished areas and where otherwise shown.

F. STRUCTURAL SUPPORT SYSTEMS

Structural steel used for support of equipment, ductwork and piping shall be new, clean, and conform to ASTM Designation A-36.

Support mechanical components from the building structure. Do not support mechanical components from ceilings, other mechanical or electrical components, and other non-structural elements.

G. PRE-ENGINEERED ROOF EQUIPMENT SUPPORTS AND CURBS

Pre-fabricated equipment support rails and roof curbs manufactured by AES Industries, Custom Curb, Inc., Pate Company, Thybar or approved equal. Provide with fully mitered raised cant and step to match roof insulation thickness, welded, minimum 18 gauge galvanized steel shell, internally reinforced to load bearing factors of equipment being supported, minimum 1-1/2 inch thick, 3 pound rigid insulation internal to shell to match roof insulation where required. Factory installed wood nailer, and minimum 18 gauge jacket with counterflashing where equipment does not fully cover the equipment support. Provide sloped roof equipment supports to enable level installation. Provide rigid backing material behind cant to maintain cant slope. Provide multiple support rails to uniformly support the equipment. Attach to roof structure according to manufacturer's installation instructions.

Attach equipment directly to pre-engineered roof equipment support using one of the following methods:

1. Rail Equipment Supports: Secure each equipment support leg to the rail with a minimum of 4 points of connection per leg.
2. Roof Curbs: Secure each corner of the equipment to the curb nailer using a minimum of 4 lag screws, located along the length of the equipment. Alternatively, secure equipment to the curb using hold-down brackets. Provide minimum 6 inch long, 14 gauge galvanized steel brackets sized to work under equipment with sufficient horizontal offset to cover overlap gap between the equipment rail and curb. Secure brackets to equipment and curb nailer using a minimum of 8 points of connection per bracket. Provide one bracket at each corner along the length of the unit.
3. Hold-Down Brackets: Coordinate with the curb manufacturer to determine the quantity and size of hold-down brackets and fasteners, with installation instructions for each unit to meet a Building Design Risk Category of I.
4. Submit signed and sealed drawings that indicate the design and installation requirements of pre-engineered roof supports can withstand the design criteria listed. Include installation requirements for anchoring to the roof structure. The Engineer is not responsible and will not provide the seal and signature. Deliver submittal to the local AHJ for approval prior to installation of the contractor provided, pre-engineered roof supports.
5. Provide seismic restraints in accordance with Article "Seismic Controls for MEPP Systems."

H. ACCESS PANELS AND DOORS

Refer to Architectural documents for specification of access panels and doors.

Provide access doors for all concealed equipment and duct and piping accessories that require service where indicated or as required, except where above in-ceiling. Access doors shall be adequately sized for the devices served with a minimum size of 18 inches x 18 inches. Access doors may be the proper construction for type of construction in which it is installed. Obtain Architect's approval of type, size, location and color before ordering. Provide factory-fabricated and assembled units, complete with attachment devices and fasteners ready for installation, concealed hinges, flush screwdriver-operated cam lock, and anchor straps. Provide access doors manufactured by Greenheck, Milcor, Tibus, Zurn, or equal.

I. PENETRATIONS

Provide sleeves for pipes passing through above grade concrete or masonry walls, concrete floor or roof slabs. Sleeves are not required for core drilled holes in existing masonry walls, concrete floors or roofs. Provide 10 gauge galvanized steel sleeves for sleeves 6 inches and smaller. Provide galvanized steel metal sleeves for larger than 6 inches. Schedule 40 PVC gloves are acceptable for installation in areas without return air plenums.

Seal elevated floor, exterior wall and roof penetrations watertight and weathertight with non-shrink, non-hardening commercial sealant. Pack with mineral wool and seal both ends with minimum of 1/2 inch of sealant.

Seal around penetrations of fire rated assemblies. Coordinate fire ratings and locations with the architectural drawings. Refer to architectural specifications for fire stoppings. Provide a product schedule for UL listing, location, wall or floor rating and installation drawing for each penetration fire stop system.

Extend pipe insulation for insulated pipe through floor, wall and roof penetrations, including fire rated walls and floors. The vapor barrier shall be maintained. Size sleeve for a minimum of 1 inch annual clear space between inside of sleeve and outside of insulation.

Provide prefabricated roof curbs where pipes and/or ductwork penetrate elevated slabs or the roof to the exterior. Provide cover curb of weather-resistant material and seal duct or pipe penetrations through the cover. Provide pipe collar of weather-resistant material with stainless steel pipe clamps for piping penetrations.

Provide box frames for rectangular openings welded 12 gauge galvanized steel attached to forms and of a maximum dimension established by the Architect. Notify the General Contractor or Architect before installing any box openings not shown on the Architectural or Structural drawings.

Seal concrete or masonry exterior wall penetrations below grade with "wall pipes" and mechanical sleeve seals. Provide cast iron "wall pipes" with integral waterstop ring manufactured by Jay R. Smith, Josam, Wade, Watts or Zurn. Provide modular mechanical sleeve

Install control devices with top of device at 48 inches AFF to meet ADA requirements unless otherwise noted on the plans.

**B. WIRING**  
 Provide electrical and control wiring as specified under the section "Electrical Wiring."

**C. THERMOSTAT CONTROL EQUIPMENT**  
 Manufacturers and model numbers are listed for reference as to quality and features required for the control devices. Provide control devices by Honeywell with quality and features as indicated.

Seven day programmable, occupied/unoccupied thermostats for on/off or multiple stages of heating and cooling systems shall be Honeywell series T7350 or equal with integral subbase. Over thermostat with multi-stage capability as required to match scheduled unit cooling/heating stages.

Control of economizer system shall be Honeywell YW720 Jade Economizer module kit or equal. Economizer module kit shall include the economizer logic module, damper actuator, and sensors of type required to implement the type of economizer scheduled on the drawings.

Remote sensors integrated with the seven day programmable thermostat shall be Honeywell TR1/TR21-H remote sensor.

**D. SENSORS AND RELAYS**

Provide general-purpose type elements for use in input and output sensors. Provide transmitters or transducers with sensor as required, compatible with the controllers used, with range suitable for the systems encountered. Transmitters and transducers shall have offset and span adjustments, temperature compensation, shock and vibration immunity, and zeroing capability. Accuracy requirements shall include the combined effects of linearity, hysteresis, repeatability, and the transmitter.

Dry-bulb temperature sensors at a minimum shall be accurate to +/- 2 degrees Fahrenheit over the range of 40 to 80 degrees Fahrenheit. Wet-bulb temperature shall be calculated using dry-bulb temperature and humidity and shall be accurate to +/- 2 degrees Fahrenheit. Enthalpy shall be calculated using dry-bulb temperature and humidity and shall be accurate to +/- 3 BTU/lb over the range of 20 to 36 BTU/lb. Humidity sensors at a minimum shall be accurate within +/- 3 percent full range between 20 and 85 percent, with less than 1 percent full scale per year. Pressure transmitters at a minimum shall be accurate to +/- 1 percent full scale with less than 1 percent full scale per year.

Smoke detectors furnished and installed as indicated in this section or as scheduled on the plans (or heat detectors, if permitted by code) shall shut down each associated unit supply fan upon activation where required by code. Provide remote visual and audible alarm devices in an approved location if smoke detectors are not connected to a fire alarm panel and label device as "Air with CO Detector Trouble."

Provide 24 Volt or 120 Volt linearelectrics Intermatic Series FMD20 or equal programmable type with 7 day programming with up to two "on" and "off" time periods. Dry-bulb outdoor shall provide 48 hours of memory with clock. Batteries shall be provided. Provide 6-hour, normally open type. Coordinate 120 V wiring of timeswitch with electrical contractor's 120 V model is provided.

Provide relays with contact rating, configuration, and coil voltage that is suitable for the application. Relay shall be general purpose, enclosed plug-in type and protected by a heat and shock resistant dust cover. Number of contacts and operational function shall be as required. Transient suppression shall be provided as an integral part of the relay. Contactors shall be single coil, electrically operated, mechanically held, double-break, silver-to-silver type protected by arcing contacts. Positive-locking type shall be obtained without the use of hooks, latches, or semi-permanent magnets. Operating and locking times shall be 100 milliseconds or less.

**7. SEQUENCE OF OPERATION**  
**A. FAN COIL UNIT CONTROL**  
 During occupied hours, operate fan coil unit supply fan continuously and open outdoor air damper to maintain minimum ventilation. Cycle stage(s) of DX cooling and electric heating to maintain room thermostat set point (75 degrees Fahrenheit cooling, 70 degrees Fahrenheit heating). Duct-mounted smoke detectors shall shutdown unit upon alarm.

During unoccupied hours, cycle the fan coil unit supply fan and cooling or heating system to maintain unoccupied setback temperature set points. Outdoor air damper shall be closed during unoccupied hours.

Connect the Outdoor air damper to the same time clock as the unoccupied hours.

**B. KITCHEN EXHAUST FAN CONTROL**  
 Kitchen exhaust fan shall be energized through on-off switches at the associated exhaust hoods or cooking equipment or through a master kitchen ventilation control panel as indicated on the drawings.  
 Kitchen fans shall be interlocked to operate with cooking appliances, make-up air and other air-handling equipment providing fresh air to the kitchen area as noted or scheduled on the drawings.

**C. MAKE-UP AIR UNIT CONTROL**  
 Make-up air unit supply air fan shall be energized and the outdoor air damper shall open 100% when exhaust fans are energized. Exhaust fans and make-up air fan shall be modulated thru the outside control panel. Refer to installation, operation, and maintenance manual.

**D. ROOFTOP UNIT CONTROL**  
 Refer to RTU CONTROL MATRIX on Sheet M601 for required rooftop unit control options.

**E. RESTROOM EXHAUST FAN (EF-1) CONTROL**  
 Operate exhaust fans continuously during occupied hours and shut down during unoccupied hours. Provide a 7-day timetable to switch each system between occupied and unoccupied operation.

**F. AIR CURTAIN CONTROL**  
 Interlock air curtain with door limit switch to energize when the doors open.

**8. ALTERNATES**  
**A. DESCRIPTION**  
 Refer to the architectural portion of the specification for list of alternates. Applicable sections of the base specifications shall apply to all work required by the alternate unless otherwise specified. Determine whether or not and how each alternate affects work. Include labor, material, and equipment, and transportation services necessary for installation and completion of work under each particular alternate. Furnish separate bid for each alternate applicable to work, stating the amount to be added or deducted from the base bid.

**END OF SECTION 23**  
**Commissioning of Mechanical System**  
 Commissioning of HVAC System

**Part 1 General**  
**1.1 Summary**  
 A. Section includes Cx process requirements for the following HVAC systems, assemblies, and equipment:  
 1. Air handling units (Supply fans, return fan, packaged units, roof top units, specialized fans)  
 2. Exhaust fans  
 3. Fans and motors  
 4. Condensing units  
 5. Make-Up air units  
 6. Ductwork and piping  
 B. Related Requirements:  
 1. Section 019113 "General Commissioning Requirements" for general Cx process requirement and CxA responsibilities.

**1.2 Informational Submittals**  
 A. Construction Checklists: Draft construction checklists will be created by CxA for Contractor review.  
 B. Construction Checklists: Installation and Performance test checklists for systems, assemblies, subsystems, equipment, and components to be part of the Cx process and according to requirement in Section 019113 "General Commissioning Requirements."

**1.3 Refrigigerant Piping, including the following:**  
 a. Refrigerant piping, fittings, and specialties.  
 b. Refrigerant charge.  
 c. Supply return, and specialty valves.  
 d. Meters and gauges.  
 e. Air distribution systems, including the following:  
 1. Supply return, and exhaust systems.  
 2. Metal ducts, liners, and fittings.  
 3. Nonmetal ducts and fittings.  
 4. Air-duct accessories, including volume dampers, fire and smoke dampers, turning vanes, sound attenuators, and flexible connectors.  
 f. Duct-mounted access doors and panels.  
 g. Exhaust fans.  
 h. Make-Up air unit.  
 i. Air-handling equipment, including the following:  
 1. Fans and motors.  
 2. Indoor air-handling units with and without coils, dampers, and filters.  
 3. Outdoor air-handling units with and without coils, dampers, and filters.

**Part 3 Execution**  
**3.1 Construction Checklists**  
 A. Complete detailed construction checklists (prefunctional checklists) prepared by the CxA for HVAC systems, assemblies, subsystems, equipment, and components.  
 B. Air and hydronic systems, and equipment to be installed, including the following:  
 1. Supply, return, outdoor-air, and exhaust-air distribution systems.  
 2. Automatic dampers.  
 3. Control valves.  
 4. Heating and cooling terminal and unitary equipment, including the following:  
 1. Unit heaters.  
 2. Fan coil units.  
 3. Electric heating.  
 4. TAB verification.

**3.2 Construction Checklist Review**  
 A. Review and provide written comments on draft construction checklists. CxA will create required draft construction checklists and provide them to Contractor.  
 B. Return draft construction checklist review comments within 5 days of receipt.  
 C. When review comments have been resolved, the CxA will provide final construction checklists marked "Approved for Use, (date)."  
 D. Use only construction checklists marked "Approved for Use, (date)."

**3.3 Cx Testing Preparation**  
 A. Certify that HVAC systems, subsystems, and equipment have been installed, calibrated, and started and that they are operating according to the Contract Documents and approved submittals.  
 B. Set systems, subsystems, and equipment into operating mode to be tested according to approved test procedures (for example, normal shutdown, normal auto position, normal manual position, unoccupied cycle, and alarm conditions).

**3.4 Cx Tests Common to HVAC Systems**  
 A. Comply with construction checklist requirements, including installation checks, startup, and performance tests requirements for HVAC systems and equipment.  
 B. Measure capacities and effectiveness of systems, assemblies, subsystems, equipment and components, including operational and control functions, to verify compliance with acceptance criteria.  
 C. Coordinate schedule with, and perform Cx activities at the direction of CxA.  
 D. Provide technicians, instrumentation, tools, and equipment to perform and document the following:  
 1. Construction checklist verification tests.  
 2. Construction checklist verification tests demonstrations  
 3. Cx test demonstrations.

Provide in-line (duct) mounted exhaust fans as scheduled on the drawings, ACME, Carnes, Cook, Greenheck, Pennbrary, or Twin City Fans complete with isolated blower unit and ceiling grille. Provide backdraft damper, discharge duct, [wall louver/roof jack/roof gooseneck] and vibration isolation as scheduled or shown on the drawings.

Provide vort vent fan as scheduled on the drawings by Enervex, Fantech or Tjernlund complete with direct or belt drive, factory-mounted, variable speed motor, and consisting of fan wheel and housing. Housing shall be steel with corrosion resistant finish or cast aluminum housing with duct connections designed to minimize air leakage. Housing shall be designed to allow the entire impeller and motor assembly to be removed as a unit. Provide a service door for cleaning and service. Provide Cast-aluminum, statically and dynamically balanced wheels. Provide totally enclosed, fan-cooled, variable speed motor with pre-lubricated and sealed ball bearings and Class B insulation. Provide modulating fan Controller. Suitable for maintaining constant pressure and/or constant volume. And 0.6 inches W.C. With a tolerance of 0.01 inches W. C. Duct probe with tubing and transducer and safety shut-off with visual alarm to shut down driver on insufficient duct pressure or fan failure.

**K. KITCHEN EXHAUST AIR SYSTEMS**  
 Provide kitchen hood exhaust fan/filtered makeup air packaged unit as scheduled on the drawings, manufactured by Accurex Captive Aire or Halton, complete with upblast exhaust fan designed for grease applications, downblast makeup air fan, makeup air intake weatherhood with 1 inch thick aluminum mesh washable air filters, roof curb extension for 48 inches minimum exhaust discharge height above roof surface, combination roof curb and weatherhood, low bio-solids impeller, low bio-solids impeller, low bio-solids impeller, heavy gauge aluminum housings, aluminum centrifugal fan wheels, heat baffle, belt drive motors with integral thermal overload protection, disconnect switch in housing, bird screens, provided control panel, and accessories required to meet or exceed NFPA 96 requirements for commercial kitchen installations. Provided vented curb extension if a fire-rated, non-combustible enclosure is utilized. Provide a non-vented curb extension or blank off the vented curb extension if zero-clearance fire-rated wrap insulation is constructed.

Provide ducts connecting Type 1 exhaust hoods to exhaust fans made of #16 gauge black iron with continuously welded joints and clean-out doors. Provide at least one opening that is minimum size of 20 inches by 20 inches for personnel entry. Where an opening of this size is not possible, provide access openings at each change in direction and at 12 foot intervals. Locate openings on sides of duct 1-1/2 inches minimum from bottom and 1/4 inch with grease-light covers of same material as duct. Support systems for ducts 24 inch and larger in any dimension shall be designed for the weight of the duct plus 800 pounds at any point in the duct system. Provide transition at connection to fan with opening size equal to or greater than the ventual opening of the fan inlet. Provide gasket at flanged connection to fan rated for 1500 degrees Fahrenheit and grease applications.

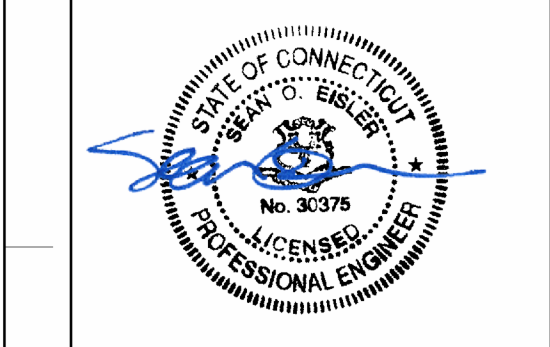
Enclose duct in fireproof enclosure per locally adopted mechanical code, or if approved by local code official, in fire rated wrap insulation. Insulation shall be minimum two-hour rated duct wrap insulation for Type I hood grease exhaust duct applications and shall conform to ASTM E2336 where required to comply with IMC. Insulation shall be flexible wrap enclosure rated for minimum 2000 degrees Fahrenheit and zero clearance to combustibles. Provide fire-rated, rigid fiberglass wrap with glass fibers. Cover outer totally encapsulated on all sides with aluminum foil. Insulation shall be as manufactured by Certainteed, Thermal Ceramics, Unifrax or 3M. Slope duct back towards hood at minimum of 1/4 inch per linear foot. Horizontal ducts that exceed 75 feet in length shall be sloped not less than 1 inch per foot. At Contractor's option, a UL listed fire-rated, rigid fiberglass wrap with glass fibers shall be used over totally encapsulated on all sides with aluminum foil. 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**CT #1322**

**SHAKE SHACK**  
STAMFORD, CONNECTICUT 06905  
64 HUSKINS AVENUE UNIT 8  
STAMFORD, CONNECTICUT 06905

REVISION	
Δ	DESCRIPTION
I	02/24/23 REVISION I
J	03/03/23 REVISION J
K	06/09/23 REVISION K
L	09/01/23 REVISION L
M	10/23/23 REVISION M
T	12/22/23 REVISION T

STATUS:  
**IFC SET**



**FIELD VERIFICATION:**  
The contractor shall verify all figured dimensions and location at the project site and notify Zebra Architecture, PLLC of any dimensional errors, or omissions of dimensions before beginning or following any work. Do not proceed until notified.  
**COPYRIGHT © 2022:**  
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SHEET NAME:  
**MECHANICAL SPECIFICATIONS**

DATE: 03/05/2021	PROJECT NO: 32074
DRAWN: AJP	SCALE: NTS

SHEET NO:  
**M592**

- 3.5 Start-Up Documentation Common to All Systems**
- A. The following Start-Up Documentation (Checklists and Tests) shall be considered common to all systems:
1. Checkout shall proceed from lower level devices to larger components to the entire system operation.
  2. Verify labeling is affixed per specification and visible.
  3. Verify prerequisite procedures are done.
  4. Inspect for damage and ensure none is present.
  5. Verify system is installed per the manufacturer's recommendations.
  6. Verify system has undergone Start-Up per the manufacturer's recommendations.
  7. Verify that access is provided for inspection, operation and repair.
  8. Verify that access is provided for eventual replacement of the equipment.
  9. Verify that record drawings, submittal data and O&M documentation accurately reflect the installed systems.
  10. Verify all gauges and test ports are provided as required by contract documents and manufacturer's recommendations.
  11. Verify all recorded nameplate data is accurate.
  12. Verify that the installation ensures safe operation and maintenance.
  13. Verify all rotating and moving parts are properly lubricated.
  14. Verify specified replacement material/stock has been provided as required by the Contract Documents.
  15. Verify all monitoring and ensure all alarms are active and set per requirements.
- 3.6 Mechanical Identification**
- A. Include all applicable "Start-Up Checks Common to All Systems".
- B. Start-Up Checks: Perform the following checks:
1. Verify all valve tags, piping, duct, and equipment labeling corresponds with drawings and indexes and meets requirements specified. Correct any deficiencies for all piping and duct system.
  2. Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.
  3. Cleaning: Clean face of identification devices, and glass frames of valve charts.
- 3.7 Mechanical Insulation**
- A. Include all applicable "Start-Up Checks Common to All Systems".
- B. Start-Up Checks: Examine all piping, systems and equipment specified to be insulated.
1. Ensure quality of insulation. Patch and repair all insulation damaged after installation.
  2. Ensure the integrity of vapor barrier around all cold surfaces.
- 3.8 Piping General**
- A. Include all applicable "Start-Up Checks Common to All Systems".
- B. Start-Up Checks: These procedures apply to all installed piping systems, including underground site utilities.
1. Inspect all piping for proper installation, adequate support (with appropriate vibration isolation where applicable) and adequate isolation valves for required service.
  2. Provide notifications of pipe cleaning and flushing activities.
  3. Flush and clean all piping and clean all strainers. Provide documentation of all related procedures.
  4. Ensure adequate drainage is provided at low points and venting is provided at high points.
  5. Ensure facilities to effectively drain and fill the system are in place.
  6. Ensure air is thoroughly removed from the system as applicable.
  7. Provide notification of pressure testing.
  8. Pressure and/or leak test all applicable systems in accordance with the requirements in the applicable Division 23 specification.
  9. Sterilize applicable piping systems as specified in the individual sections and as required by regulatory authorities.
  10. Submit pressure test reports that document the pressure testing results with certification of the results. Include drawings/diagrams indicating sections of pipe that are tested with the corresponding report.
  11. Set and adjust fill, pressure, or level controls to the required setting.
- 3.9 AC Motors**
- A. Include all applicable "Start-Up Checks Common to All Systems".
- B. Start-Up Checks: Perform the following checks during start-up and as specified in manufacturer's instructions:
1. Verify proper alignment, installation, and rotation.
  2. Verify properly sized overloads are in place.
- C. Start-Up Tests: Perform the following tests, measurements, or procedures during start-up and as specified in the manufacturer's instruction:
1. Measure voltage available to all phases. Measure amps and RPM after motor has been placed in operation and is under load.
  2. Record all motor nameplate data.
- 3.9 Packaged Heating and Cooling Units**
- A. Include all applicable "Start-Up Checks Common to All Systems".
- B. Refer to AC Motors in this section.
- C. General: Provide the services of a factory-authorized service representative to test and inspect unit installation, provide startup service, and to demonstrate and train Owner's maintenance personnel is required by the Owner.
- D. Start-Up Checks: Perform the following inspections/checks during start-up:
1. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
  2. Install new filter units after start-up.
- 3.10 Terminal Units**
- A. Include all applicable "Start-Up Checks Common to All Systems".
- B. Start-Up Checks: Perform the following inspections/checks during start-up:
1. After construction is completed, including painting if applicable, clean unit exposed surfaces.
  2. Clean factory-finished surfaces. Repair any marred or scratches surfaces with manufacturer's touch-up paint.
  3. Verify adequate access for maintenance.
  4. Check power and control voltages.
  5. Check rotation of fan where applicable.
  6. Check operation of water leak sensors.
  7. Check calibration and operation of the controlling elements.
  8. Check control valves for required close-off and fail position.
  9. Install new filter units for terminals requiring same.
- 3.11 Fans**
- A. Include all applicable "Start-Up Checks Common to All Systems".
- B. General: Provide the services of a factory-authorized service representative to test and inspect exhaust fan installation, provide startup service, and to demonstrate and train Owner's maintenance personnel is required by the Owner.
- C. Start-Up Checks: Perform the following inspections/checks during start-up:
1. Inspect the field assembly of components and installation of the units, piping, ductwork, and electrical connections.
  2. Clean unit cabinet interiors to remove foreign material and construction dirt and dust. Vacuum clean fan wheel, fan cabinet, coils entering air face. Ensure volatile irritants are contained and kept out of occupied spaces.
  3. Adjust and lubricate dampers and linkages for proper damper operation.
  4. Verify the unit is secure on mountings and supporting devices and connections for ductwork, and electrical are complete. Verify proper thermal overload protection is installed in motors, starters, and disconnects.
  5. Ensure vibration isolation integrity is maintained with the fan installation and associated connections.
  6. Lubricate bearings, pulleys, belts, and other moving parts with factory-recommended lubricants.
  7. Stroke all dampers to ensure free and full travel.
- 3.12 Ductwork Accessories**
- A. Include all applicable "Start-Up Checks Common to All Systems".
- B. Start-Up Checks: Perform the following checks during start-up and as specified:
1. Cleaning: Clean factory-finished surfaces. Repair any marred or scratches surfaces with manufacturer's touch-up paint.
- C. Start-Up Tests: In addition to specifications, perform the following as a minimum:
1. Operate installed ductwork accessories to demonstrate compliance with requirements. Test for air leakage while system is operating. Repair or replace faulty accessories, as required to obtain proper operation and leak proof performance.
  2. Label access doors in accordance with Division 21 Section "Mechanical Identification"
  3. Adjusting: Adjust ductwork accessories for proper settings, install fusible links in fire dampers and adjust for proper action.

### ROOFTOP UNIT CONTROL MATRIX

CONTROL FEATURE	UNITS	RTU-1		RTU-2		NOTES
		DINING SETPOINT OR Y/N	KITCHEN SETPOINT OR Y/N	DINING SETPOINT OR Y/N	KITCHEN SETPOINT OR Y/N	
<b>SETPOINTS</b>						
COOLING - OCCUPIED SETPOINT	*F	75	75			
COOLING - UNOCCUPIED SETPOINT	*F	60	60			
HEATING - OCCUPIED SETPOINT	*F	70	70			
HEATING - UNOCCUPIED SETPOINT	*F	60	60			
DEHUMIDIFICATION SETPOINT - HUMIDITY SENSOR FEEDBACK	% RH	50	NA			B
<b>PROGRAMMED CONTROL FEATURES</b>						
HVAC SYSTEM OCCUPIED/UNOCCUPIED MODE - PROGRAMMABLE THERMOSTAT		Y	Y			B
REMOTE TEMPERATURE SENSOR		Y	Y			B
<b>EQUIPMENT ACCESSORIES AND CONTROL MODULES</b>						
OUTSIDE AIR DAMPER - MOTOR OPERATED (MODULATING)		Y	Y			L
INTEGRATED ECONOMIZER - DIFFERENTIAL ENTHALPY ENABLE (OA ENTHALPY < RA ENTHALPY)	BTULB	Y	Y			F, G
ECONOMIZER FAULT DETECTION AND DIAGNOSTICS (FDD) SYSTEM		Y	Y			
RELIEF - BAROMETRIC DAMPER		Y	N			
RELIEF - CONSTANT VOLUME POWERED EXHAUST FAN		N	Y			H
COOLING COIL (DX - STAGED)		Y	Y			M
DEHUMIDIFICATION - HOT GAS REHEAT		Y	N			O
HEATING COIL (NATURAL GAS)		Y	Y			M
<b>SUPPLY FAN CONTROL METHODS</b>						
ON DURING OCCUPIED HOURS		Y	Y			
CYCLE WITH LOADS DURING UNOCCUPIED HOURS		Y	Y			
CONSTANT VOLUME FAN CONTROL		Y	Y			
<b>SAFETIES, INTERLOCKS, AND ALARMS</b>						
GAS VALVE SAFETY		Y	Y			F
RETURN AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	Y			U
FIRE ALARM CONTROL PANEL - SAFETY SHUTDOWN INTERLOCK		Y	Y			
KITCHEN EXHAUST SYSTEM INTERLOCK		Y	Y			S

DIV. 23 CONTRACTOR SHALL PROVIDE CONTROL PANEL(S), WIRING, THERMOSTAT(S), TEMPERATURE SENSOR(S), HUMIDISTAT(S), AND/OR CO2 SENSOR(S) WHERE SHOWN ON THE DRAWINGS AND AS REQUIRED TO FACILITATE THE SCHEDULED CONTROL MODULES AND SEQUENCES OF OPERATION. EACH UNIT SHALL CONTROL BASED ON ITS OWN INTERNAL SAFETIES, TIME DELAYS, AND SEQUENCES UNLESS NOTED OTHERWISE. COORDINATE WITH OWNER FINAL BUILDING AND EQUIPMENT SCHEDULES DURING STARTUP. REFERENCE DIVISION SPECIFICATIONS FOR INDIVIDUAL DEVICE REQUIREMENTS.

- NOTES:**
- A. DIVISION 23 CONTRACTOR SHALL PROVIDE DEVICE.
  - E. IF SETPOINT VALUE IS LISTED, IT INDICATES ECONOMIZER HIGH-LIMIT SHUTOFF. UNIT SHALL BE IN ECONOMIZER IF CONDITIONS ARE LESS THAN SETPOINT. THE FOLLOWING SENSORS SHALL DETERMINE ECONOMIZER ON POINT: OUTSIDE AIR TEMPERATURE; DIVISION 23 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE. RETURN AIR TEMPERATURE; DIVISION 23 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE. OUTSIDE AIR HUMIDITY; DIVISION 23 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE. RETURN AIR HUMIDITY; DIVISION 23 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE.
  - F. DEVICE SHALL BE FACTORY MOUNTED AND PRE-WIRED FOR OPERATION SUBJECT TO THE ONBOARD CONTROLLER. PROVIDE UNIT WITH AN FDD SYSTEM CONSISTING OF PERMANENTLY INSTALLED OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR TEMPERATURE SENSORS. THE UNIT CONTROLLER SHALL AT A MINIMUM BE CAPABLE OF PROVIDING SYSTEM STATUS OF ECONOMIZER, COMPRESSOR, HEATING, MIXED AIR LOW LIMIT ALARM, AND SENSOR VALUES. EACH OPERATING MODE SHALL BE CAPABLE OF INDEPENDENTLY OPERATING FOR TESTING. THE SYSTEM SHALL REPORT FAULTS TO AN APPLICATION ACCESSIBLE BY SERVICE PERSONNEL. THE FOLLOWING FAULTS SHALL BE DETECTED: AIR TEMPERATURE SENSOR FAILURE; ECONOMIZER ENABLE/DISABLED WHEN ECONOMIZER SHOULD BE OFF; RESPECTIVELY, DAMPER NOT MODULATING, AND EXCESS OUTSIDE AIR.
  - H. POWERED EXHAUST FAN SHALL STAGE ON AND OFF ACCORDING TO DAMPER POSITION.
  - L. EQUIPMENT MANUFACTURER SHALL PROVIDE MODULATING DAMPER AND CONTROLS CAPABLE OF ADJUSTING THE DAMPER POSITION TO MAINTAIN THE SCHEDULED OUTSIDE AIR ON THE DRAWINGS ACROSS ALL FAN SPEEDS. DIV. 23 CONTRACTOR SHALL PROGRAM MULTIPLE DAMPER POSITION SETPOINTS IN THE FIELD DURING TESTING AND BALANCING TO MAINTAIN MINIMUM VENTILATION WHEN NOT IN ECONOMIZER. DAMPER SHALL BE CLOSED DURING UNOCCUPIED HOURS.
  - M. UNITARY CONTROLLER SHALL MODULATE AND/OR CYCLE SUPPLY FAN SPEED SETTING AND COIL CAPACITY STAGES SUBJECT TO THE INTERNAL SAFETIES AND SEQUENCES TO MAINTAIN SCHEDULED SETPOINTS.
  - O. PROGRAM DEHUMIDIFICATION SEQUENCE BASED ON ZONE AIR HUMIDITY.
  - S. INTERLOCK RTU WITH KITCHEN EXHAUST HOOD SYSTEM(S) TO SHUT DOWN UPON SIGNAL FROM HOOD FIRE EXTINGUISHING SYSTEM. INTERLOCK RTU WITH KITCHEN EXHAUST FAN TO ENERGIZE WHEN HOOD SYSTEM IS ENERGIZED FOR PRESSURIZATION.
  - U. DIVISION 28 CONTRACTOR SHALL PROVIDE DEVICE.

### ROOFTOP UNIT SCHEDULE (DX COOLING, NATURAL GAS HEAT)

MARK	MANUFACTURER	MODEL	NOMINAL TONS	UNIT TYPE	SUPPLY FAN														COOLING COIL										HEAT EXCHANGER										MIN OIA CFM	VPH	MCA	MOCP	DISC TYPE	WEIGHT (LBS)	NOTES
					CFM	ESP (IN)	BHP	VFD (Y/N)	TH (MBH)	SH (MBH)	EAT (°F DB)	(°F WB)	(°F DB)	(°F WB)	REFR TYPE	MIN EFF (IEER)	(IEER)	MIN NO STAGES	MIN OUT (MBH)	NOM INPUT (MBH)	MIN EFF (°F DB)	EAT (°F DB)	MIN NO STAGES	MIN OUT OIA CFM	VPH	MCA	MOCP	DISC TYPE	WEIGHT (LBS)	NOTES															
					4.000	0.5	1.69	N	137.7	92.7	78.7	67.3	88.1	66.5	R410A	10.8	14	2	153	134	81	64.4	84.5	2	1150	2063	71	90	NONFUSED	1484	A-R														
RTU-1	TRANE	YSJ150	12.5	SINGLE ZONE	5.000	0.5	1.88	N	139.9	114.8	75.9	63.3	89.0	53.9	R410A	10.8	14	2	130	161	81	66.8	92.7	2	350	2063	71	90	NONFUSED	1484	A-R														
RTU-2	TRANE	YSJ150	12.5	SINGLE ZONE	5.000	0.5	1.88	N	139.9	114.8	75.9	63.3	89.0	53.9	R410A	10.8	14	2	130	161	81	66.8	92.7	2	350	2063	71	90	NONFUSED	1484	A-R														

\*EQUIPMENT FURNISHED AND INSTALLED PER THE RESPONSIBILITY SCHEDULE. MODEL NUMBERS AND NOMINAL TONS LISTED SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER, MODEL NUMBERS, OR NOMINAL TONS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

- NOTES:**
- A. REFER TO ROOFTOP UNIT CONTROL MATRIX FOR CONTROL FEATURES, MODULES, AND ACCESSORIES THAT SHALL BE PROVIDED WITH THE EQUIPMENT.
  - B. EQUIPMENT SIZED FOR 100°F AMBIENT TEMPERATURE.
  - C. PROVIDE 2" MERV 8 EFFICIENT PLATED THROWAWAY AIR FILTERS.
  - D. PROVIDE FACTORY MOUNTED DISCONNECT INSTALLED ON SERVICE SIDE OF UNIT.
  - E. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
  - F. PROVIDE FACTORY MOUNTED VARIABLE FREQUENCY DRIVE OR 2-SPEED MOTOR TO FACILITATE STAGED FAN SPEED CONTROL.
  - G. PROVIDE SINGLE POINT POWER CONNECTION.
  - H. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
  - J. PROVIDE 125 VAC, 20 AMP DUPLEX CONVENIENCE RECEPTACLE MOUNTED TO UNIT READY FOR FIELD WIRING WITH A COVER UL LISTED FOR WET AND DAMPER LOCATIONS WHEN IN USE.
  - K. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
  - L. PROVIDE MOTOR HORSEPOWER TO OVERCOME INTERNAL UNIT STATIC PRESSURE DROP PLUS SPECIFIED EXTERNAL STATIC PRESSURE DROP. NOMINAL MOTOR HP SHALL BE NO LARGER THAN THE FIRST AVAILABLE NOMINAL MOTOR SIZE GREATER THAN THE REQUIRED BHP.
  - M. PROVIDE INSULATED ROOF CURB WITH MINIMUM HEIGHT REQUIRED TO MAINTAIN BOTTOM OF EQUIPMENT A MINIMUM OF 18 INCHES ABOVE FINISHED ROOF SURFACE. PROVIDE SLOPED CURB IF NEEDED TO MATCH ROOF SLOPE. COORDINATE WITH ROOF INSULATION THICKNESS AND ROOF TAPE AT INSTALLED LOCATION. COORDINATE CURB TYPE WITH DRAWINGS.
  - N. SCHEDULED WEIGHT IS THE MAXIMUM ALLOWABLE OPERATING WEIGHT OF THE EQUIPMENT ONLY.
  - O. COOLING COIL LAT IS LEAVING AIR TEMPERATURE OF COIL.
  - P. PROVIDE GUARDS TO PROTECT CONDENSER COIL FROM HAIL OR OTHER DAMAGE.
  - Q. PROVIDE HEATER TO MEET OR EXCEED SCHEDULED MINIMUM MBH OUTPUT. NOMINAL INPUT IS BASED ON LISTED MANUFACTURER'S STANDARD PRODUCT. COORDINATE EQUIPMENT GAS LOAD WITH PLUMBING CONTRACTOR IF DIFFERENT FROM THAT SCHEDULED. MEET MINIMUM EFFICIENCY SCHEDULED.
  - R. PROVIDE EQUIPMENT WITH AIRBORNE DISINFECTION SYSTEM, RGF MODEL PHI-PKG14.24V.

### AIR CURTAIN SCHEDULE

MARK	SERVICE AREA	MANUFACTURER	MODEL	UNIT SPECS				VPH/VHZ	NOTES
				LENGTH (IN)	MAX AIRFLOW	HEATING CAPACITY (KW)	MOTOR (HP)		
AC-1	SERVICE ENTRY	POWERED AIRE	ETA-1.36	36	1379	NA	3/4	115/160	A, F
AC-2	ENTRANCE	POWERED AIRE	CHA-2.72E	72	2394	20	(2) @ 3/4	208/360	A, C, H

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

- NOTES:**
- A. EQUIPMENT FURNISHED AND INSTALLED PER THE RESPONSIBILITY SCHEDULE, REF ARCHITECTURAL DRAWINGS.
  - B. MOUNT UNIT PER MANUFACTURER'S RECOMMENDATIONS TO FACE OF WALL AND SUPPORT VERTICALLY.
  - C. PROVIDE INTEGRAL STARTER AND DISCONNECT SWITCH.
  - D. REFER TO SEQUENCE OF OPERATION FOR UNIT CONTROLS.
  - E. PROVIDE AIR CURTAIN WITH NORMALLY CLOSED DOOR LIMIT SWITCH FOR INSTALLATION ON DOOR. THE AIR CURTAIN SHALL ENERGIZE WHEN DOOR OPENS.
  - F. PROVIDE WITH DELAY MICROSWITCH WITH ADJUSTABLE DELAY TIMERS PRE MOUNTED IN THE AIR CURTAIN CONTROL PANEL.
  - G. PROVIDE WITH INTEGRAL THERMOSTAT.
  - H. MOUNT UNIT PER MANUFACTURER'S RECOMMENDATIONS TO SUSPENDED FROM STRUCTURE.

### GRILLE, REGISTER, AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	SERVICE	MODEL	CONSTRUCTION MATERIAL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	MAX NC	NOTES															
									A	B	C	D	E	F	G	H	I	J	K	L				
CEG1	E.H. PRICE	EXHAUST GRILLE W/ DAMPER	80D	STEEL	EGGGRATE	SURFACE	12x12	30	A	B	C	F	G	H										
CRG1	E.H. PRICE	RETURN GRILLE	80	STEEL	EGGGRATE	LAY-IN	24x24	30	A	B	C	F	H											
CS01	E.H. PRICE	SUPPLY DIFFUSER	SCD	STEEL	SQUARE CONE	SURFACE	12x12	30	A	B	C	F	H	J	K	L								
CS02	E.H. PRICE	SUPPLY DIFFUSER	SCD	STEEL	SQUARE CONE	LAY-IN	24x24	30	A	B	C	F	H	K										
CS03	E.H. PRICE	SUPPLY DIFFUSER	PDOR	STEEL	PERFORATED	LAY-IN	24x24	30	A	B	B	F	H											
WSR1	E.H. PRICE	SUPPLY REGISTER W/ DAMPER	520D	STEEL	LOUVERED FACE	WALL OR DUCT	(SEE PLANS)	30	A	B	C	D	E	F	G	H								

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

- NOTES:**
- A. EQUIPMENT FURNISHED AND INSTALLED PER THE EQUIPMENT RESPONSIBILITY SCHEDULE.
  - B. NECK SIZE SHOWN ON DRAWINGS. PROVIDE BRANCH DUCT TO MATCH NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
  - C. DIFFUSERS SHALL BE PREFINISHED TO MATCH CEILING/WALL/EXPOSED DUCT COLOR (COORDINATE WITH ARCHITECT).
  - D. FRONT BLADES PARALLEL TO LONG DIMENSION.
  - E. DOUBLE DEFLECTION BARS SHALL BE ADJUSTABLE.
  - F. FRAME TYPE TO MATCH CEILING/WALL CONSTRUCTION. COORDINATE WITH ARCHITECTURAL REFLECTED CEILING/WALL PLAN.
  - G. PROVIDE OPPOSED BLADE DAMPER ADJUSTABLE FROM FACE OF DEVICE.
  - H. PROVIDE DIFFUSERS, LINEAR SLOTS, AND GRILLES WITH NO EXPOSED MOUNTING SCREWS.
  - J. CONTRACTOR SHALL PROVIDE REMOTE CABLE-OPERATED VOLUME DAMPER BY METROPOLITAN AIR TECHNOLOGIES MODEL RT-250 WITH EXTERNAL WORM GEAR OPERATOR OR EQUIVALENT YOUNG REGULATOR BUTTERFLY DAMPER WITH 270-275 CONTROLLER. OPERATOR SHALL HAVE A SQUARE DRIVE FOR 1/4" NUT DRIVER. DAMPER ASSEMBLY SHALL INCLUDE GALVANIZED STEEL DUCT WITH ROLLED BEAD STIFFENERS, REINFORCED BLADE, SELF-LUBRICATING BEARING AND WORM GEAR MOUNTING PLATE. DAMPER SHALL BE INSTALLED IN BRANCH DUCT NOT INLET OF FLENUM DIFFUSER. (REF. 2M05V)
  - K. 4-WAY THROW PATTERN UNLESS OTHERWISE INDICATED BY FLOW ARROWS ON DRAWINGS.
  - L. PROVIDE THROUGH.

### FAN COIL UNIT SCHEDULE (HEAT PUMP)

MARK	MFR	MODEL	SUPPLY FAN				COOLING COIL				HEAT PUMP HEATING COIL				MIN OIA CFM	VPH	MCA	MOCP	DISC TYPE	WEIGHT (LBS)	NOTES		
			CFM	ESP (IN)	NOM	TH (°F DB)	SH (°F WB)	EAT (°F DB)	(°F WB)	(°F DB)	REFR TYPE	MIN OUT (MBH)	AMBIENT (DB)	EAT (°F DB)								(°F WB)	(CFM)
			420	0.025	0.061	11.6	10.0	76.5	62.6	54.6	53.0	R410A	12.2	8.7								64.2	90
FCU-1	CARRIER	40MB018C	420	0.025	0.061	11.6	10.0	76.5	62.6	54.6	53.0	R410A	12.2	8.7	64.2	90	40	206/1	NA	NA	NF	45	A-J

\*EQUIPMENT SHALL BE OBTAINED THROUGH SHAKE SHACK NATIONAL ACCOUNT. REFER TO T002 / VENDOR LIST FOR MORE INFORMATION. MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

- NOTES:**
- A. EQUIPMENT FURNISHED AND INSTALLED PER THE RESPONSIBILITY SCHEDULE, REF ARCHITECTURAL DRAWINGS.
  - B. ASSOCIATED CONDENSING UNIT SHALL BE BY THE SAME MANUFACTURER.
  - C. FOR COOLING, EQUIPMENT SIZED FOR 100°F AMBIENT TEMPERATURE. HEAT PUMP HEATING CAPACITY BASED ON AMBIENT TEMPERATURE LISTED.
  - D. PROVIDE UNIT WITH CLEANABLE AIR FILTERS.
  - E. PROVIDE WITH 7-DAY PROGRAMMABLE THERMOSTAT WITH STAGED HEATING AND COOLING CAPABILITY AS REQUIRED FOR OPERATION OF HEATING AND COOLING CONTROLS.
  - F. PROVIDE FACTORY MOUNTED STARTER AND DISCONNECT SWITCH INSTALLED ON SERVICE SIDE OF UNIT.
  - G. PROVIDE SINGLE POINT POWER CONNECTION.
  - H. PROVIDE WITH SPRING VIBRATION ISOLATION AND ALL-THREAD HANGING RODS.
  - J. ROUTE CONDENSATE DRAIN PIPING FROM UNIT TO NEAREST FLOOR DRAIN AND TERMINATE WITH CODE-APPROVED AIR GAP.

### HEAT PUMP CONDENSING UNIT SCHEDULE

MARK	SERVICE	MANUFACTURER	MODEL	REFR TYPE	COOLING CAPACITY			HEATING CAPACITY			ELECTRICAL			WEIGHT (LBS)	NOTES
					TH (MBH)	AMBIENT (DB)	MIN EFF (SEER)	CAP (MBH)	AMBIENT (DB)	MIN EFF (COP-47°F)	MCA	MOCP	VPH		
CU-1	FCU-1	CARRIER	38MAR018AA3	R410A	11.6	2.2	19.0	12.2	2.2	3.3	18	25	206/1	102.5	A-H

\*EQUIPMENT SHALL BE OBTAINED THROUGH SHAKE SHACK NATIONAL ACCOUNT. REFER TO T002 / VENDOR LIST FOR MORE INFORMATION. MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

- NOTES:**
- A. EQUIPMENT FURNISHED AND INSTALLED PER THE RESPONSIBILITY SCHEDULE, REF ARCHITECTURAL DRAWINGS.
  - B. EQUIPMENT CAPACITY SCHEDULED IS MINIMUM CAPACITY THAT MUST BE PROVIDED AT AMBIENT TEMPERATURE INDICATED.
  - C. CONTRACTOR SHALL VERIFY WITH EQUIPMENT SUPPLIER EXACT QUANTITY AND SIZE OF REFRIGERANT PIPING.
  - D. PROVIDE LIQUID LINE FILTER DRYER AND SIGHT GLASS.
  - E. PROVIDE PREFABRICATED EQUIPMENT SUPPORT RAILS.
  - F. PROVIDE FACTORY MOUNTED DISCONNECT INSTALLED ON SERVICE SIDE OF UNIT.
  - G. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
  - H. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.

### OUTSIDE AIR REQUIREMENTS, IMC-2015 (IP)

SYSTEM DESIGNATION	SYSTEM TAB NAME OR LIST 'SINGLE'	SINGLE-ZONE SYSTEMS ONLY		MULTI-ZONE SYSTEMS ONLY		FLOOR AREA SERVED BY SYSTEM [Aa]	SYSTEM AVERAGED AREA-BASED OUTDOOR AIR RATE (CFM/SF)	SYSTEM POPULATION [Pa]	SYSTEM AVERAGED PEOPLE-BASED OUTDOOR AIR RATE (CFM/P)	REQUIRED OA INTAKE FLOW [Vai] (CFM)	REQUIRED DCV OA INTAKE FLOW [Vai] (CFM)	DESIGN OA INTAKE FLOW [Vai] (CFM)	NOTES		
		SINGLE-ZONE WORST CASE ASSOCIATED VENTILATION ZONE	SINGLE-ZONE WORST CASE ZONE AIR DISTRIBUTION EFFECTIVENESS [Ez]	MULTI-ZONE SYSTEM VENTILATION EFFICIENCY [Ev]	MULTI-ZONE SYSTEM VENTILATION EFFICIENCY [Ev]										
RTU-1	MULTIZONE (RTU-1)	-	-	0.90	1.665	0.147	94	7.50	1.060	NA	1.150				
RTU-2	MULTIZONE (RTU-2)	-	-	1.00	990	0.000	12	0.00	0	NA	360	A			
FCU-1	SINGLE ZONE	OFFICE	0.80	-	69	0.060	2	6.50	18	NA	40				
											TOTALS	1.078	0	1.540	

- GENERAL NOTES:**
- VENTILATION CALCULATIONS BASED ON IMC-2015.
  - SYSTEM POPULATIONS BASED ON MAX SEATING AND/OR CODE MAXIMUM VALUES.
  - SINGLE ZONE SYSTEMS (Vai = Vdz): SYSTEM VENTILATION EFFICIENCY CALCULATION IS NOT REQUIRED FOR SINGLE ZONE SYSTEMS. WORST CASE AIR DISTRIBUTION EFFECTIVENESS BETWEEN HEATING AND COOLING MODES OF OPERATION IS SHOWN IN TABLE.
  - 100% OA SYSTEMS (Vai = 2.0 x Zpm x Vdz): WHEN ONE AIR HANDLER SUPPLIES ONLY OUTDOOR AIR TO ONE OR MORE ZONES. EACH ZONE IS INDIVIDUALLY CALCULATED WITH ITS WORST CASE ZONE AIR DISTRIBUTION EFFECTIVENESS (HEATING/COOLING).
  - MULTI-ZONE RECIRCULATING SYSTEMS: CALCULATOR USED TO DETERMINE VENTILATION AIRFLOW IN COMPLIANCE WITH IMC-2015 VPP AND ASHRAE 62.1-2013 APPENDIX A. VENTILATION RATE SHOWN IS ACTUAL CALCULATED WITH CORRECTION FACTORS INCLUDED. EACH ZONE IS CALCULATED WITH ITS WORST CASE ZONE AIR DISTRIBUTION EFFECTIVENESS (HEATING/COOLING) AS PART OF CALCULATIONS TO FIND EV.
- NOTES:**
- A. AIRFLOW IS FOR EXHAUST MAKEUP AS REQUIRED BY THE VENTILATION STANDARD.

### BUILDING AIR BALANCE SUMMARY ECONOMIZER MODE

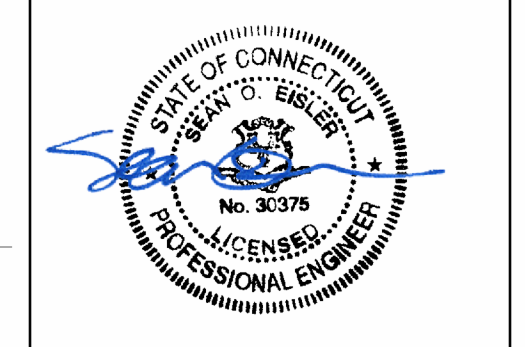
UNIT NO	SUPPLY (CFM)	OUTDOOR (CFM)	EXHAUST (CFM)	PERCENT OA/SA
MAU-1	3,300	3,300	--	100%
RTU-1	3,015	3,015	--	100%
RTU-2	3,350	3,350	--	100%
FCU-1	420	40	--	10%
KEF-1	--	--	1,967	--
KEF-2	--	--	1,967	--
EF-1	--	--	300	--
BAROMETRIC RELIEF RTU-1	--	--	1,855	--
POWER EF RTU-2	--	--	3,000	--
TOTAL	10,095	9,705	9,099	--
<b>DESIGN BUILDING PRESSURIZATION AIRFLOW (CFM)</b>				<b>606</b>
<b>PRESSURIZATION CHECK</b>				<b>6%</b>

### BUILDING AIR BALANCE SUMMARY NORMAL OPERATION

UNIT NO	SUPPLY (CFM)	OUTDOOR (CFM)	EXHAUST (CFM)	PERCENT OA/SA
MAU-1	2,900	2,900	--	100%
RTU-1	4,000	1,150	--	29%
RTU-2	5,000	350	--	7%
FCU-1	420	40	--	

REVISION	
Δ	DESCRIPTION
I	02/24/23 REVISION J
J	05/03/23 REVISION L
K	06/09/23 REVISION K
L	08/01/23 REVISION M
M	11/02/23 REVISION L
T	12/22/23 REVISION T

STATUS:  
**IFC SET**



12/22/2023

**FIELD VERIFICATION:**  
 The contractor shall verify all figure dimensions and location at the project site and notify Zebra Architecture, PLLC of any discrepancies, or omissions of observations before beginning or resuming any work. Do not proceed until approved in writing by the architect.

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**SHEET NAME:**  
**MECHANICAL ENERGY CODE COMPLIANCE**

DATE: 03/05/2021 PROJECT NO: 32074  
 DRAWN: AJP SCALE: NTS

SHEET NO:  
**M630**

**COMcheck Software Version 4.1.5.1**  
**Mechanical Compliance Certificate**

**Project Information**  
 Energy Code: 2015 IECC  
 Project Title: Shake Shack  
 Location: Stamford, Connecticut  
 Climate Zone: SA  
 Project Type: Alteration

Construction Site: Owner/Agent: Designer/Contractor:  
 5 Cold Spring Rd Stamford, CT Shake Shack Henderson Lenexa, KS

**Mechanical Systems List**

Quantity	System Type & Description
1	RTU-1 (Single Zone) Heating: 1 each - Other, Gas, Capacity = 195 kBtu/h No minimum efficiency requirement applies Cooling: 1 each - Single Package DX Unit, Capacity = 137 kBtu/h, Air-Cooled Condenser, Air Economizer Proposed Efficiency = 12.20 EER, Required Efficiency: 10.80 EER + 12.2 IEER Fan System: FAN SYSTEM 1 - Compliance (Motor nameplate HP method) - Passes Fans: FAN 1 Supply, Constant Volume, 4000 CFM, 1.3 motor nameplate hp, 0.0 fan efficiency grade
1	RTU-2 (Single Zone) Heating: 1 each - Other, Gas, Capacity = 146 kBtu/h No minimum efficiency requirement applies Cooling: 1 each - Single Package DX Unit, Capacity = 139 kBtu/h, Air-Cooled Condenser, Air Economizer Proposed Efficiency = 12.20 EER, Required Efficiency: 10.80 EER + 12.2 IEER Fan System: FAN SYSTEM 2 - Compliance (Motor nameplate HP method) - Passes Fans: FAN 2 Supply, Constant Volume, 5000 CFM, 2.0 motor nameplate hp, 0.0 fan efficiency grade
1	FCU-1/CLU-1 (Single Zone) Cooling: 1 each - Split System, Capacity = 11 kBtu/h, Air-Cooled Condenser, Unknown Economizer Proposed Efficiency = 19.00 SEER, Required Efficiency: 13.00 SEER Fan System: FAN SYSTEM 3 - Compliance (Motor nameplate HP method) - Passes Fans: FAN 3 Supply, Constant Volume, 420 CFM, 0.1 motor nameplate hp, 0.0 fan efficiency grade
2	Water Heater 1: Gas Storage Water Heater, Capacity: 0 gallons, Input Rating: 75 kBtu/h w/ Circulation Pump No minimum efficiency requirement applies

**Mechanical Compliance Statement**  
 Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in COMcheck Software Version 4.1.5.1 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Andrew Pettus - Mechanical Designer  
 Signature: [Signature] Date: 03/03/2023

Project Title: Shake Shack Report date: 03/05/21  
 Data filename: J:\Lenexa\Programs\P-T\Shake Shack\1950003390 Shake Shack 1322 - Stamford Page 1 of 11  
 CT0000Energy\COMcheck.cck

**COMcheck Software Version 4.1.5.1**  
**Inspection Checklist**  
 Energy Code: 2015 IECC

Requirements: 79.0% were addressed directly in the COMcheck software  
 Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

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

**Additional Comments/Assumptions:**

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)  
 Project Title: Shake Shack Report date: 03/05/21  
 Data filename: J:\Lenexa\Programs\P-T\Shake Shack\1950003390 Shake Shack 1322 - Stamford Page 2 of 11  
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Section # & Req. ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.2.4.5 [FO9]	Snow/melting system sensors for future connection to controls. Freeze protection systems have automatic controls installed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

**Additional Comments/Assumptions:**

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)  
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Section # & Req. ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5.1 [PL6]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.5.2 [PL6]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.5.3 [PL6]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.6.1 [PL3]	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.6.3 [PL7]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.6.3 [PL7]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.6.3 [PL7]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.6.3 [PL7]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.7 [PL8]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)  
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Section # & Req. ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.7 [PL8]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.7 [PL8]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.7 [PL8]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

**Additional Comments/Assumptions:**

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)  
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Section # & Req. ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME1]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-5.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.13 [ME7]	Unenclosed spaces that are heated use only radiant heat.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.3 [ME5]	HVAC equipment efficiency verified.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.2.4 [ME11]	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4 [ME11]	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.6 [ME59]	Demand control ventilation provided for spaces >500 ft <sup>2</sup> and >25 people/1000 ft <sup>2</sup> occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >= 3,000 cfm.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.6 [ME115]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.7 [ME57]	Exhaust air energy recovery on systems meeting Table C403.2.7(1) and C403.2.7(2).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.8 [ME116]	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.9 [ME60]	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation inspection.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.9 [ME10]	Ducts and plenums sealed based on static pressure and location.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.9 [ME11]	Ductwork operating >= 3 in. water column requires air leakage testing.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)  
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Section # & Req. ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.2.9 [ME11]	Ductwork operating >= 3 in. water column requires air leakage testing.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.9 [ME11]	Ductwork operating >= 3 in. water column requires air leakage testing.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.3 [ME62]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.3 [ME62]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.4.4 [ME110]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met. See the Mechanical Systems list for values.
C403.4.4 [ME110]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met. See the Mechanical Systems list for values.
C403.4.4 [ME110]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met. See the Mechanical Systems list for values.
C403.4.4 [ME110]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met. See the Mechanical Systems list for values.
C403.2.1 [ME111]	Gas-fired water-heating equipment installed in new buildings where a singular piece of water-heating equipment >= 1,000 kBtu/h serves the entire building, thermal efficiency >= 90 Et. Where multiple pieces of water-heating equipment serve the building with combined rating >= 1,000 kBtu/h, the combined input capacity-weighted average thermal efficiency >= 90 Et. Exclude input rating of equipment in individual dwelling units and equipment <= 100 kBtu/h.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.2 [ME53]	Air outlets and zone terminal devices have means for air balancing.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

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Section # & Req. ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.5.1 [ME13]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

**Additional Comments/Assumptions:**

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)  
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STORE NO:  
CT #1322

**SHAKE SHACK**  
STAMFORD  
64 HILLSIDE, SUITE 100  
STAMFORD, CONNECTICUT 06905

Section # & Req ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5 [F18]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.2 [F127]	HVAC systems and equipment capacity does not exceed calculated loads.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.1 [F147]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.1 [F147]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.1 [F147]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.1.2 [F138]	Thermostatic controls have a 5 °F deadband.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.1.3 [F120]	Temperature controls have setpoint overlap restrictions.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.2 [F139]	Each zone equipped with setback controls using automatic time clock or programmable control system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.2.1, C403.2.4.2.2 [F140]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.2.3 [F141]	Systems include optimum start controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.2.3 [F141]	Systems include optimum start controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.2.4.2.3 [F141]	Systems include optimum start controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

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Section # & Req ID	Final Inspection	Complies?	Comments/Assumptions
C404.3 [F111]	Heat traps installed on supply and discharge piping of non-circulating systems.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.4 [F125]	All piping insulated in accordance with section details and Table C403.2.10.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C404.6.1 [F112]	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.1 [F126]	Commissioning plan developed by registered design professional or approved agency.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.3.1 [F131]	HVAC equipment has been tested to ensure proper operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.3.2 [F110]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.3.3 [F132]	Economizers have been tested to ensure proper operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.4 [F129]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.5.1 [F17]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.5.3 [F143]	An air and/or hydronic system balancing report is provided for HVAC systems.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.5.4 [F130]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

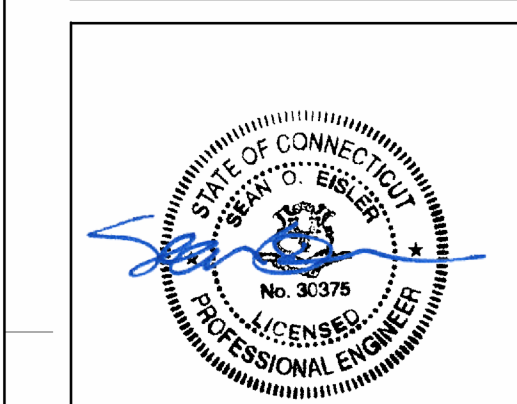
Project Title: Shake Shack Report date: 03/05/21  
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**REVISION**

DATE	DESCRIPTION
I 02/24/23	REVISION I
J 05/03/23	REVISION J
K 06/09/23	REVISION K
L 09/10/23	REVISION L
M 10/23/23	REVISION M
T 12/22/23	REVISION T

STATUS:  
IFC SET

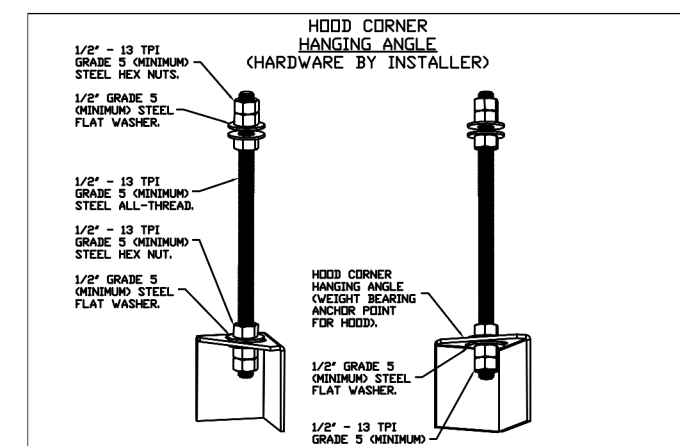


FIELD VERIFICATION:  
The contractor shall verify all figured dimensions and location at the project site and notify Zebra Architecture, PLLC of any dimensional errors, or omissions or discrepancies before beginning or resuming any work. Do not proceed with rework.  
COPYRIGHT © 2022:  
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SHEET NAME:  
**MECHANICAL ENERGY CODE COMPLIANCE**

DATE: 03/05/2021 PROJECT NO: 32074  
DRAWN: AJP SCALE: NTS

SHEET NO:  
**M631**



HOOD STYLE / MODEL	450 DEGREES	600 DEGREES	700 DEGREES
CANOPY	150	200	250
ISLAND	269	300	350
ISLAND	346	422	475

ETL HOOD LISTING DETAIL
EXHAUST CFM = LENGTH OF HOOD X CFM/LIN.FT. (LOAD)
SUPPLY CFM = EXHAUST CFM X PERCENTAGE REQUIRED
TOTAL DUCT AREA (sq. in.) = 144 X _____ CFM
DUCT LENGTH = _____ TOTAL DUCT AREA

CAPTIVEAIRE HOODS BUILT IN COMPLIANCE WITH:
ETL LISTED
UL LISTED
ETL LISTED
UL LISTED

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

**CLEARANCE TO COMBUSTIBLES**

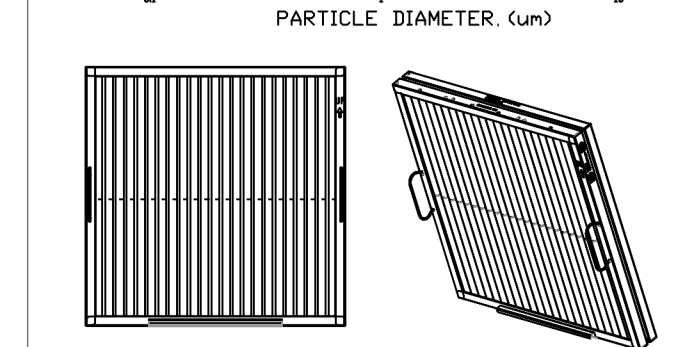
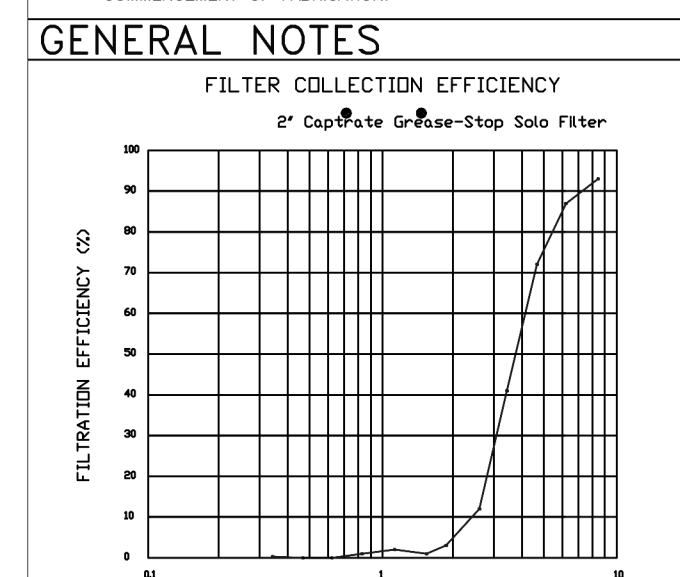
1. ALL ELECTRICAL "FIELD" CONNECTIONS AND RELATED INTERCONNECTIONS BY ELECTRICAL CONTRACTORS.  
 2. ALL PLUMBING "FIELD" CONNECTIONS AND RELATED INTERCONNECTIONS BY PLUMBING CONTRACTORS.  
 3. HANGING BRACKETS LOCATED AND WELDED AS SHOWN ON PLANS. ALL OTHER HANGER MATERIALS PROVIDED BY INSTALLING CONTRACTORS.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

**INSTALLATION**

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

**GENERAL NOTES**

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



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

**FILTER DETAIL**

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

**HOOD INFORMATION - JOB#5896030**

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S)				MUA CFM	AC CFM	HOOD CONSTRUCTION	HOOD CONFIG			
										WIDTH	LENG	HEIGHT	DIA				CFM	VEL	SP	END TO END
1	LEFT	5430 ND-2-ACPSP-F	CAPTIVEAIRE	9' 10"	600 DEG	I	HEAVY	200	1967	10'	18'	4'	1967	1574	-0.659"	1672	400	430 SS WHERE EXPOSED	LEFT	ALONE
2	RIGHT	5430 ND-2-ACPSP-F	CAPTIVEAIRE	9' 10"	600 DEG	I	HEAVY	200	1967	10'	18'	4'	1967	1574	-0.659"	1574	400	430 SS WHERE EXPOSED	RIGHT	ALONE

**HOOD INFORMATION**

HOOD NO	TAG	TYPE	FILTER(S)			LIGHT(S)			UTILITY CABINET(S)			ELECTRICAL	SWITCHES	FIRE SYSTEM	HOOD HANGING WEIGHT		
			QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	WIRE GUARD	LOCATION	SIZE					TYPE	SIZE
1	LEFT	CAPTRATE SOLID FILTER	7	20"	16"	85% SEE FILTER SPEC	3	RECESSED ROUND	NO	LEFT	20"x54"x30"	TANK FS	4.0/4.0/4.0			YES	1146 LBS
2	RIGHT	CAPTRATE SOLID FILTER	7	20"	16"	85% SEE FILTER SPEC	3	RECESSED ROUND	NO							YES	559 LBS

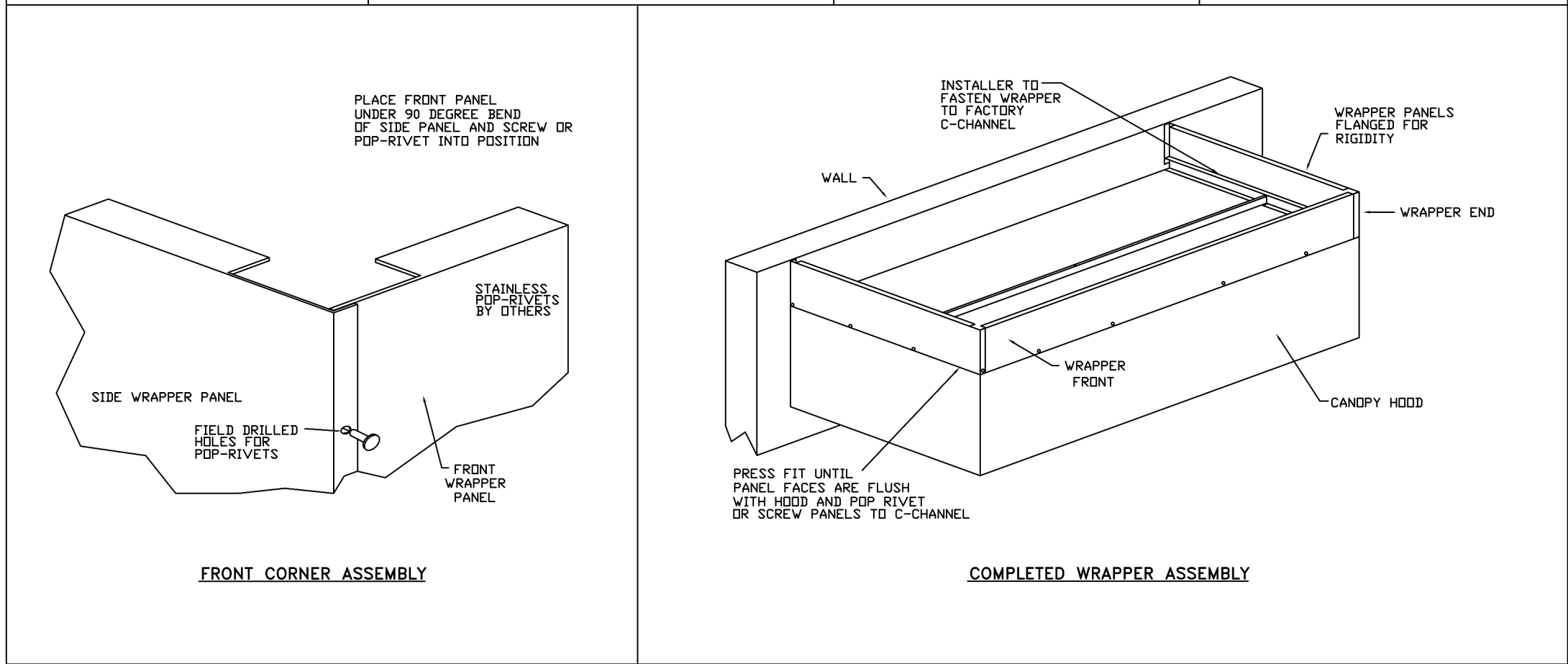
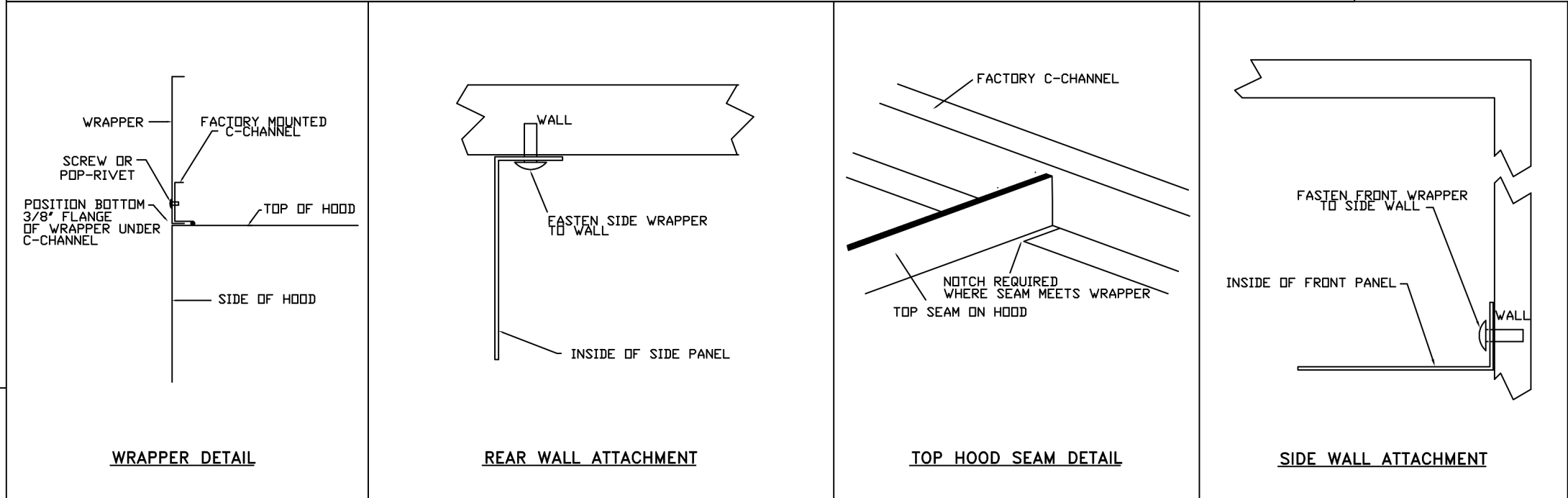
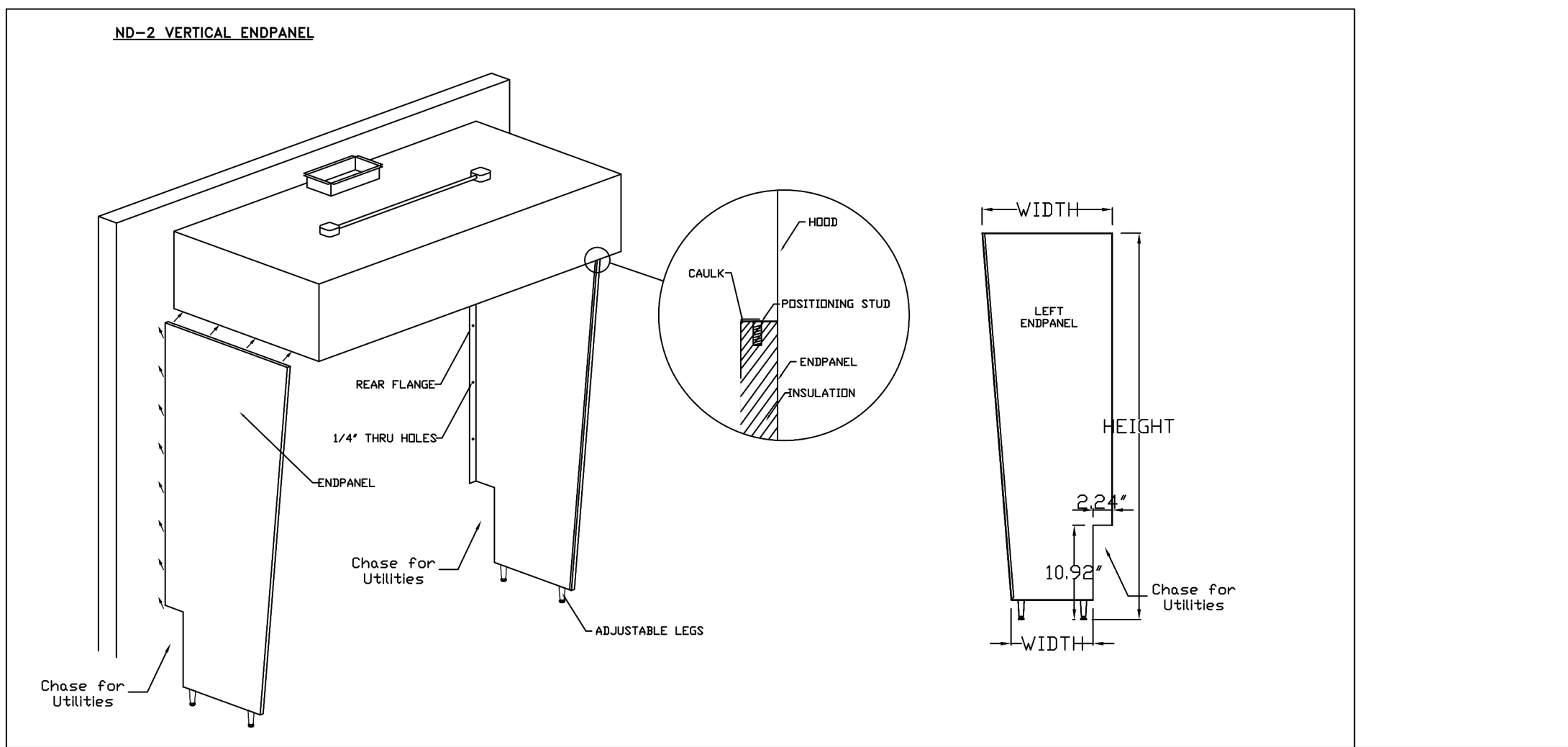
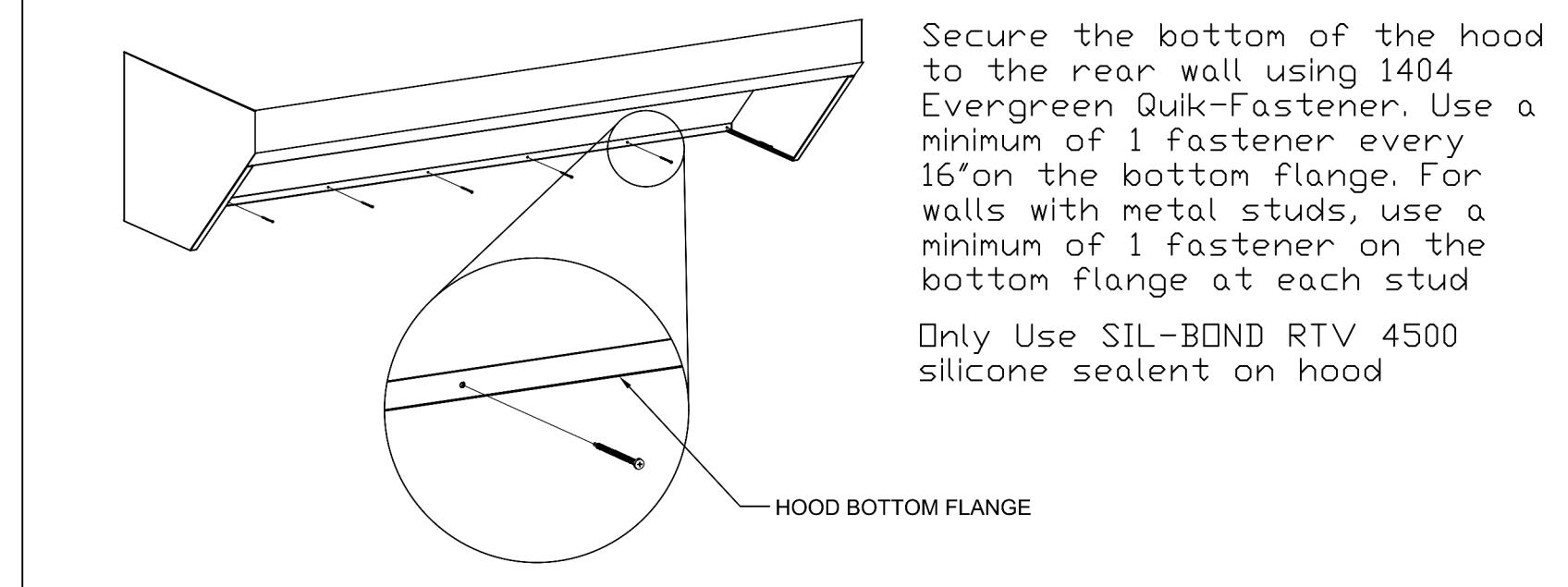
**HOOD OPTIONS**

HOOD NO	TAG	OPTION
1	LEFT	FIELD WRAPPER 12.00" HIGH FRONT, LEFT. RISER SENSOR INSTALL 6IN PLEN. LEFT WIDE VERTICAL END PANEL 42" TOP WIDTH, 36" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS.
2	RIGHT	FIELD WRAPPER 12.00" HIGH FRONT, RIGHT. RIGHT END STANDOFF (FINISHED) 1' WIDE 54" LONG INSULATED. RISER SENSOR INSTALL 6IN PLEN. RIGHT WALL AS END PANEL.

**PERFORATED SUPPLY PLENUM(S)**

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S)				
							WIDTH	LENG	DIA	CFM	SP
1	LEFT	Front	138"	24"	6'	MUA	12"	28"		836	0.207"
						MUA	12"	28"		836	0.207"
						AC			8"	100	0.032"
						AC			8"	100	0.032"
						AC			8"	100	0.032"
						AC			8"	100	0.032"
2	RIGHT	Front	119"	24"	6'	MUA	12"	28"		814	0.213"
						MUA	12"	28"		814	0.213"
						AC			8"	100	0.032"
						AC			8"	100	0.032"
						AC			8"	100	0.032"
						AC			8"	100	0.032"

**Bottom Flange Securing Detail**



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**REVISIONS**

NO.	DATE	DESCRIPTION
1	02/24/23	REVISION I
2	05/03/23	REVISION J
3	06/09/23	REVISION K
4	09/01/23	REVISION L
5	10/23/23	REVISION M
6	12/22/23	REVISION T

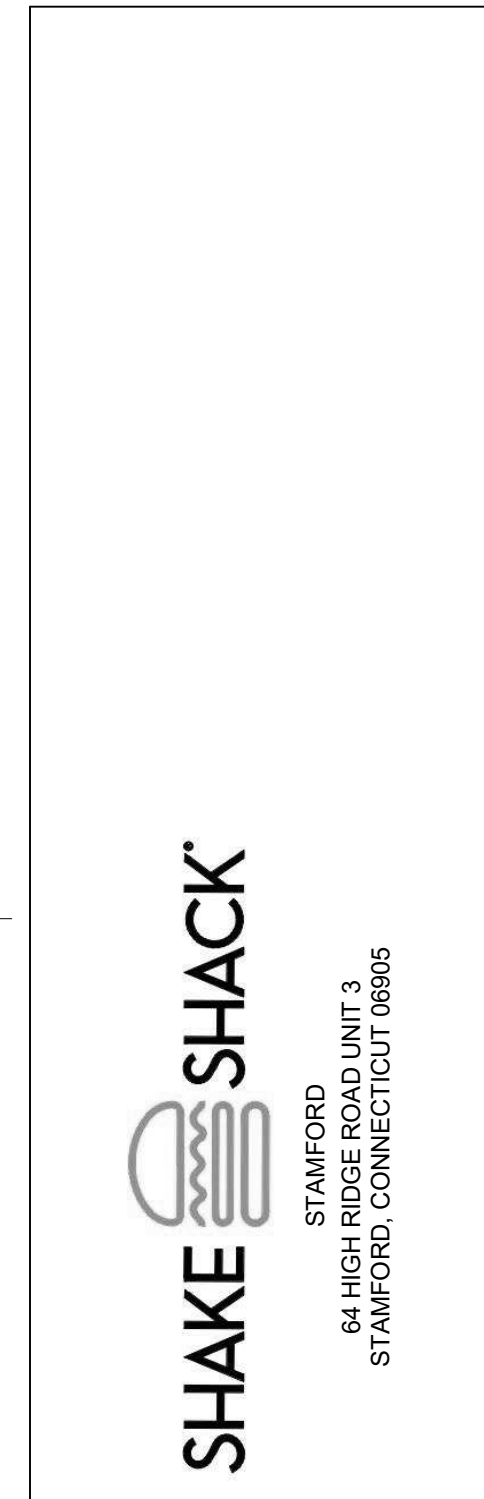
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 Eastern PA Mechanical  
 www.captiveaire.com  
 PO Box 2520, 1 Union Ave, Bliss Corners, PA, 19004 PHONE: (267) 504-4126 EMAIL: reg108@captiveaire.com

Shake Shack - 1322 - Stamford, CT\_R5  
 5 Cold Spring Rd,  
 Stamford, CT, 06905

**DATE:** 3/9/2023  
**DWG.#:** 5896030  
**DRAWN BY:** Joe.Shilka  
**SCALE:** 3/4" = 1'-0"  
**MASTER DRAWING**

**SHEET NO.**  
 1

STORE NO:  
**CT #1322**



**REVISION**

NO.	DATE	DESCRIPTION
I	02/24/23	REVISION I
J	05/03/23	REVISION J
K	06/09/23	REVISION K
L	09/01/23	REVISION L
M	10/23/23	REVISION M
T	12/22/23	REVISION T

STATUS:  
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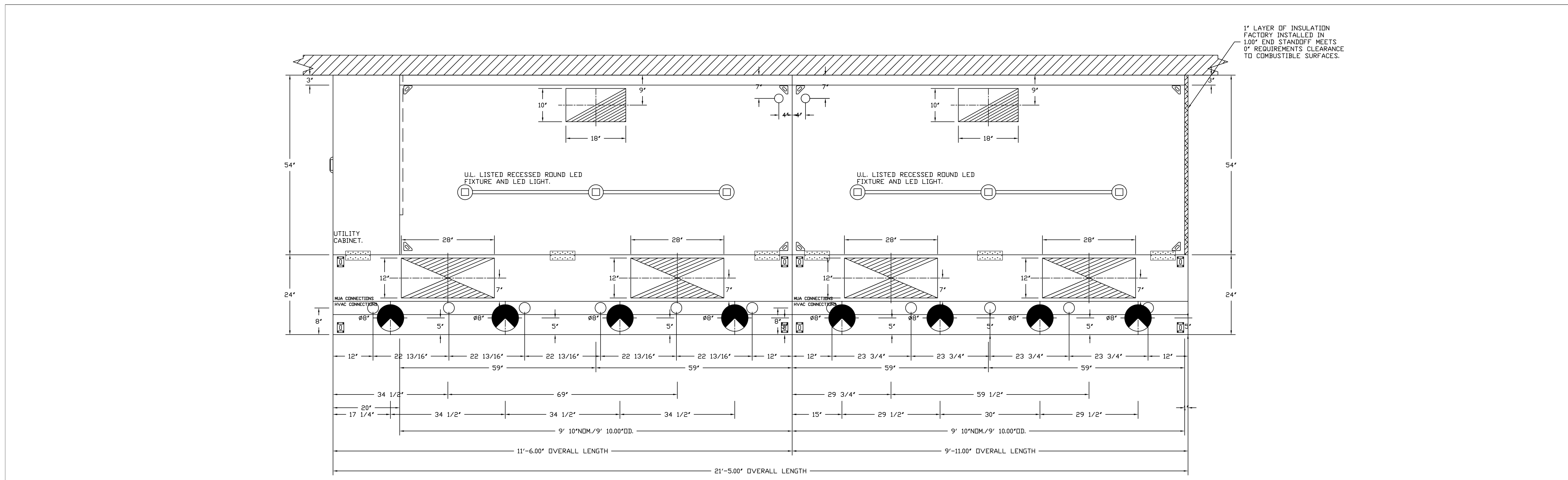
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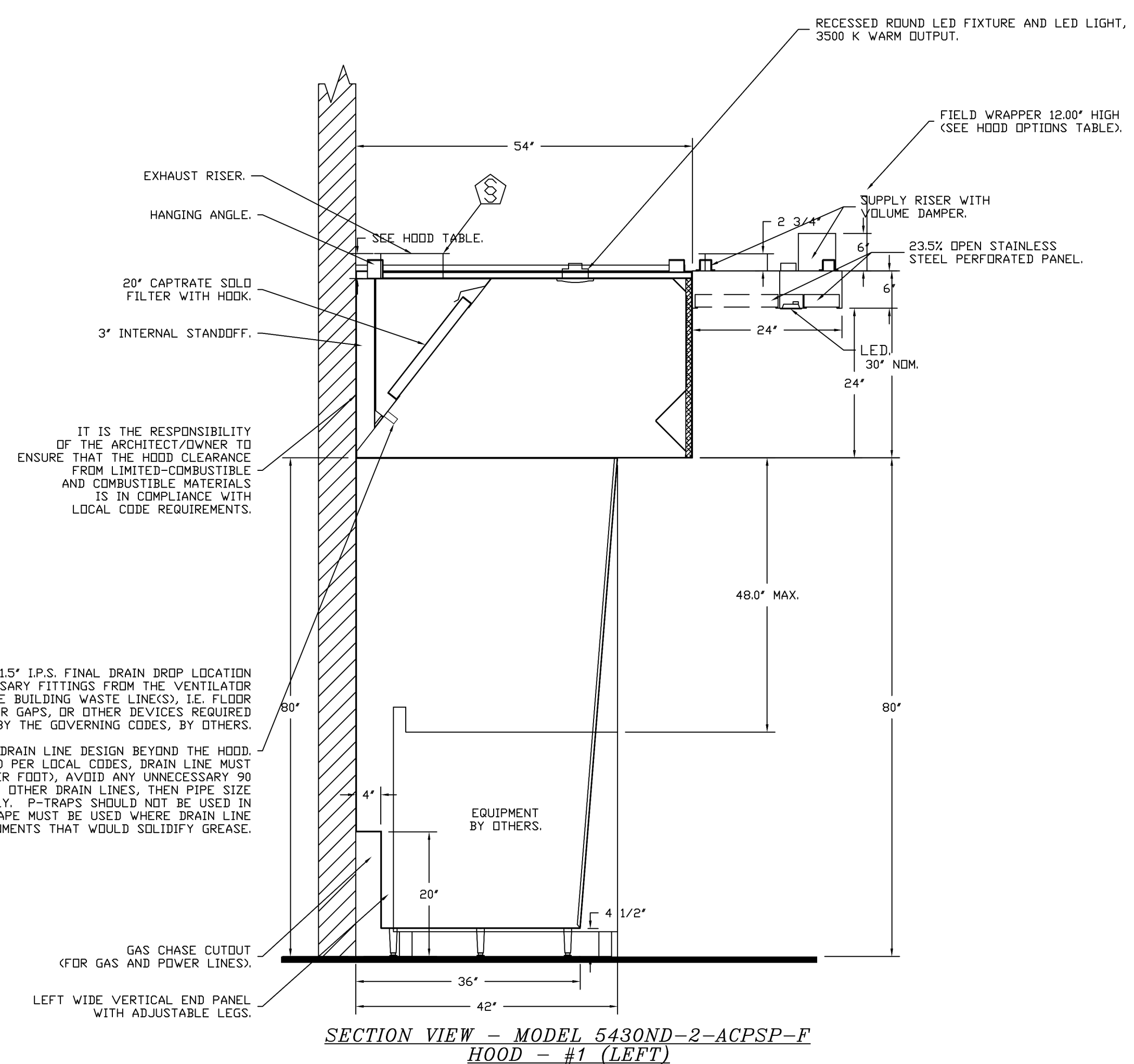
SHEET NAME:  
**CAPTIVE AIRE DRAWINGS**

DATE: 03/05/2021	PROJECT NO: 32074
DRAWN: AJP	SCALE: NTS

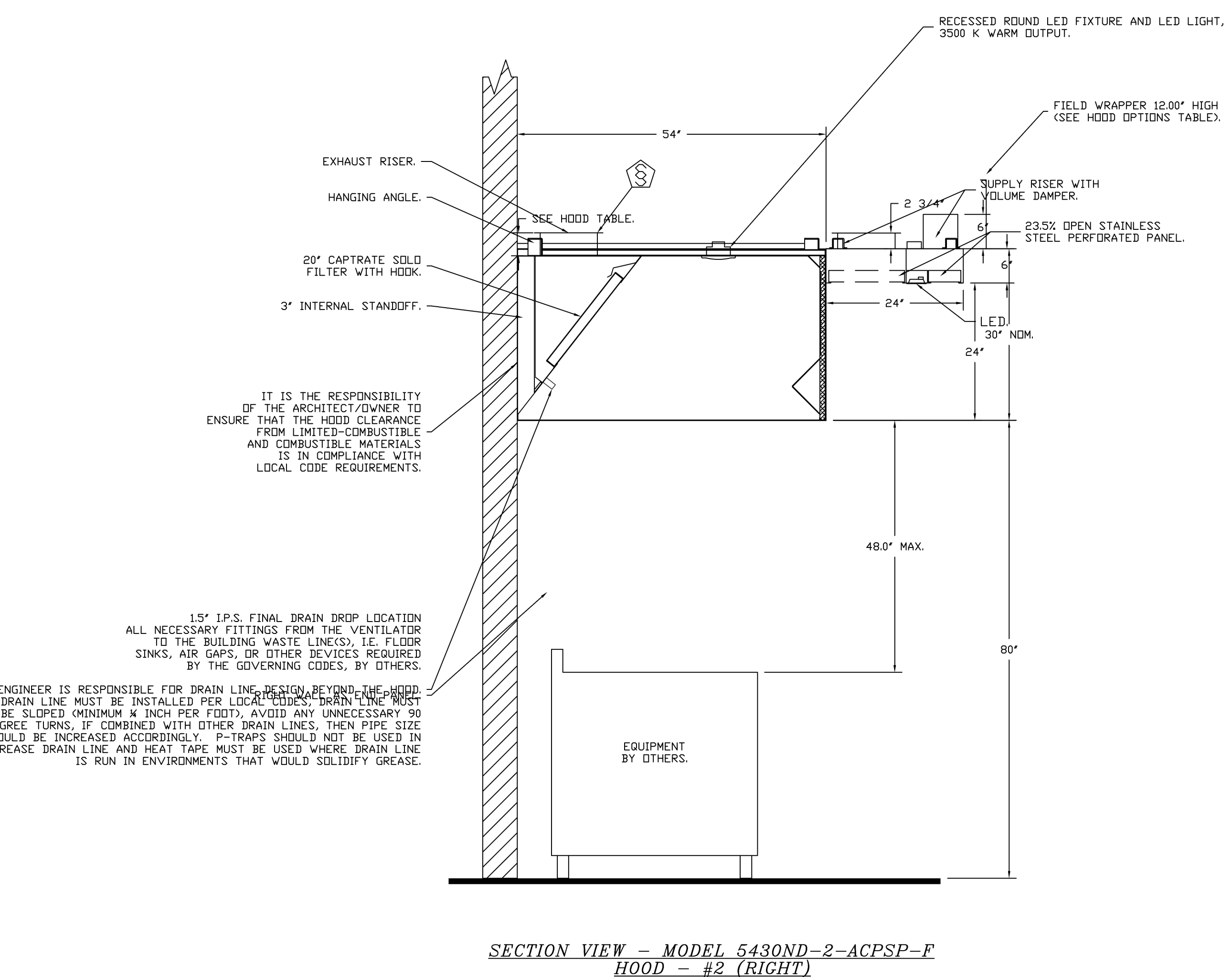
SHEET NO:  
**M701**



PLAN VIEW - HOOD #1 (LEFT)  
 9' 10.00\"/>



SECTION VIEW - MODEL 5430ND-2-ACPSP-F  
 HOOD - #1 (LEFT)



SECTION VIEW - MODEL 5430ND-2-ACPSP-F  
 HOOD - #2 (RIGHT)

**REVISIONS**

NO.	DESCRIPTION	DATE



Shake Shack - 1322 - Stamford, CT, R5  
 5 Cold Spring Rd,  
 Stamford, CT, 06905

DATE: 3/9/2023  
 DWG.#: 5896030  
 DRAWN BY: Joe Shiloo  
 SCALE: 3/4" = 1'-0"  
 MASTER DRAWING  
 SHEET NO. 2

STORE NO:  
 CT #1322



**REVISION**

NO.	DATE	DESCRIPTION
I	02/24/23	REVISION I
J	05/03/23	REVISION J
K	06/09/23	REVISION K
L	09/01/23	REVISION L
M	10/23/23	REVISION M
T	12/22/23	REVISION T

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SHEET NAME:  
 CAPTIVE AIRE DRAWINGS

DATE: 03/05/2021 PROJECT NO: 32074  
 DRAWN: AJP SCALE: NTS

SHEET NO:  
 M702

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**FIRE SYSTEM INFORMATION – JOB#5896030**

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

**GAS VALVE(S)**

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

**NOTES**

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

- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.
- THIS FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

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

JOB #: 5896030.

JOB NAME: SHAKE SHACK - 1322 - STAMFORD, CT\_R5.

SYSTEM SIZE: TANK-SP-3 TOTAL FP REQUIRED: 56.

HOOD # 1 9' 10.00" LONG x 54" WIDE x 30" HIGH.

RISER # 1 SIZE: 10" x 18".

HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.

HOOD # 2 9' 10.00" LONG x 54" WIDE x 30" HIGH.

RISER # 1 SIZE: 10" x 18".

HOOD # 2 METAL BLOW-OFF CAPS INCLUDED.

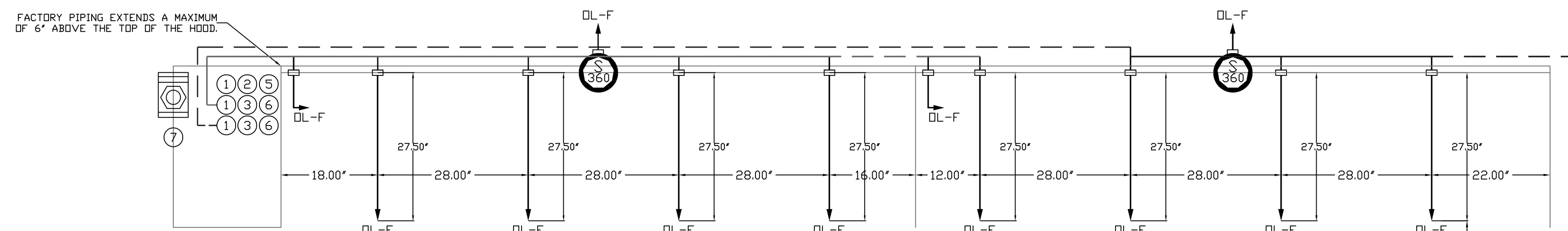
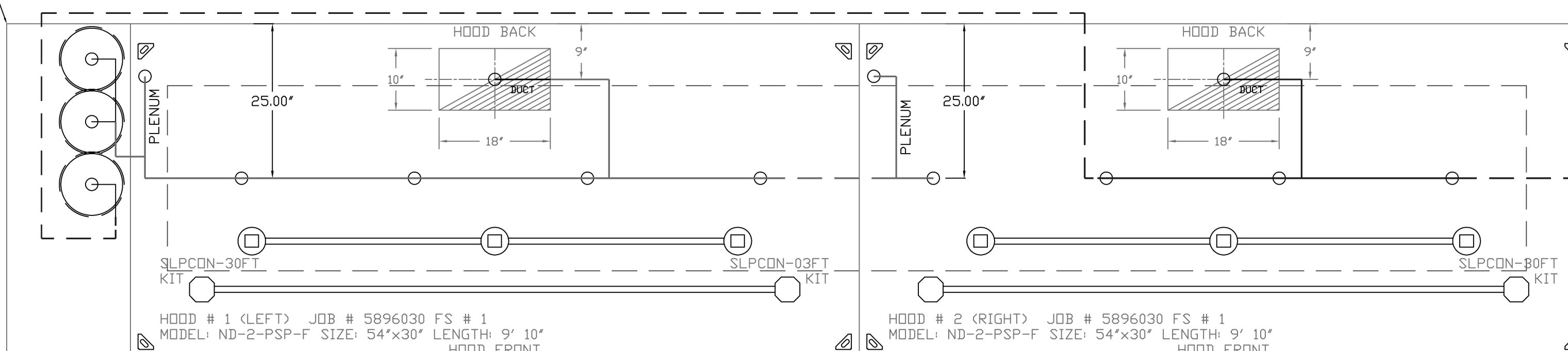
- HEAVY-DUTY APPLIANCES (RATED 600°F) WILL REQUIRE AN ADDITIONAL DOWNSTREAM FIRESTAT IN THE EVENT THAT THE DUCTWORK CONTAINS ANY HORIZONTAL RUNS OVER 25 FT IN LENGTH.

- MEDIUM TO LIGHT-DUTY APPLIANCES (RATED 450°F) WILL NOT REQUIRE ANY ADDITIONAL DOWNSTREAM DETECTION.

**LEGEND – FIRE CABINET TANK SYSTEM**

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

- SYSTEM REQUIRES A MINIMUM OF 7 FT OF EQUIVALENT PIPE LENGTH BETWEEN TANK AND NEAREST APPLIANCE NOZZLE FOR MOST APPLIANCES. EACH 90 DEGREE ELBOW ADDS 15 FT OF EQUIVALENT LENGTH. SEE MANUAL FOR DETAILS.



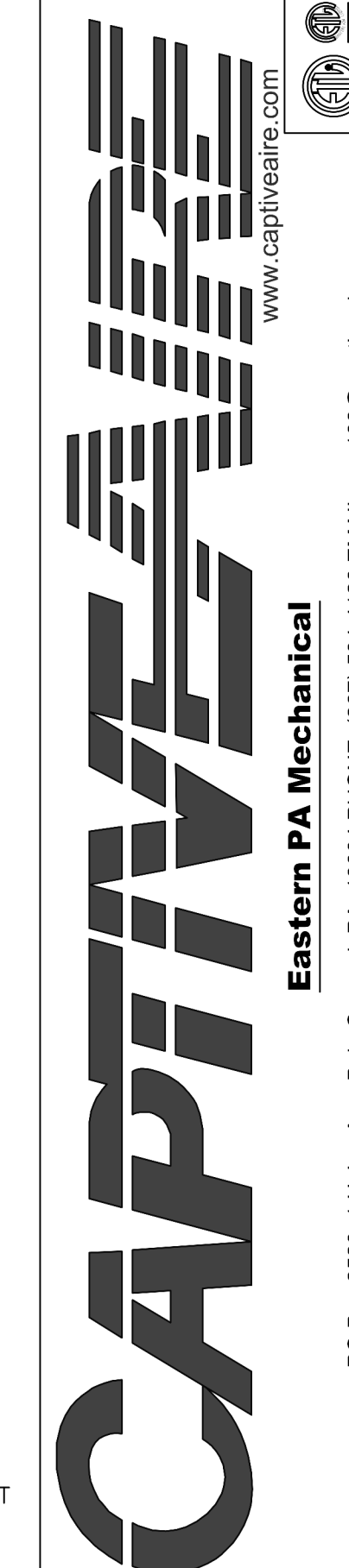
FACTORY PIPING EXTENDS A MAXIMUM OF 6' ABOVE THE TOP OF THE HOOD.

TANK OVERLAPPING  
 HEIGHT FROM HOOD FRONT  
 220.00" L x 30.00" D

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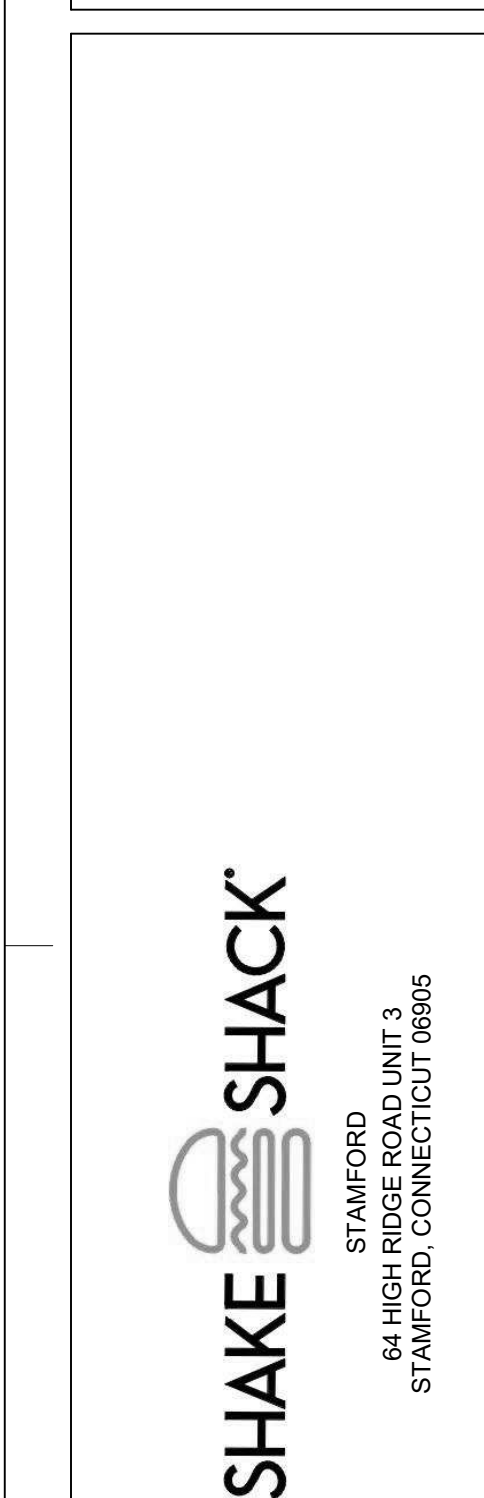
DESCRIPTION	DATE



Shake Shack - 1322 - Stamford, CT\_R5  
 5 Cold Spring Rd,  
 Stamford, CT, 06905

**DATE:** 3/9/2023  
**DWG.#:** 5896030  
**DRAWN BY:** Joe.shilba  
**SCALE:** 3/4" = 1'-0"  
**MASTER DRAWING**  
**SHEET NO.** 3

STORE NO:  
**CT #1322**



**REVISION**

DATE	DESCRIPTION
I 02/24/23	REVISION I
J 05/03/23	REVISION J
K 06/09/23	REVISION K
L 09/01/23	REVISION L
M 10/23/23	REVISION M
T 12/22/23	REVISION T

**STATUS:**  
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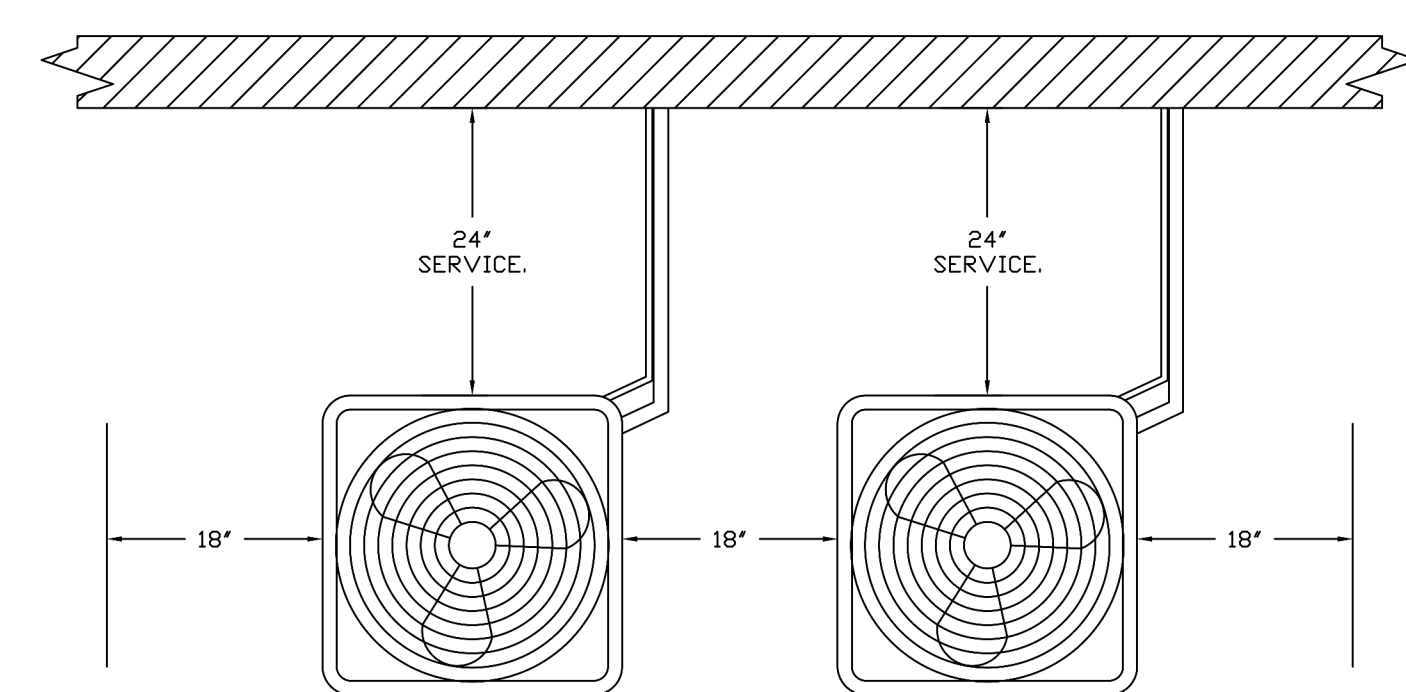
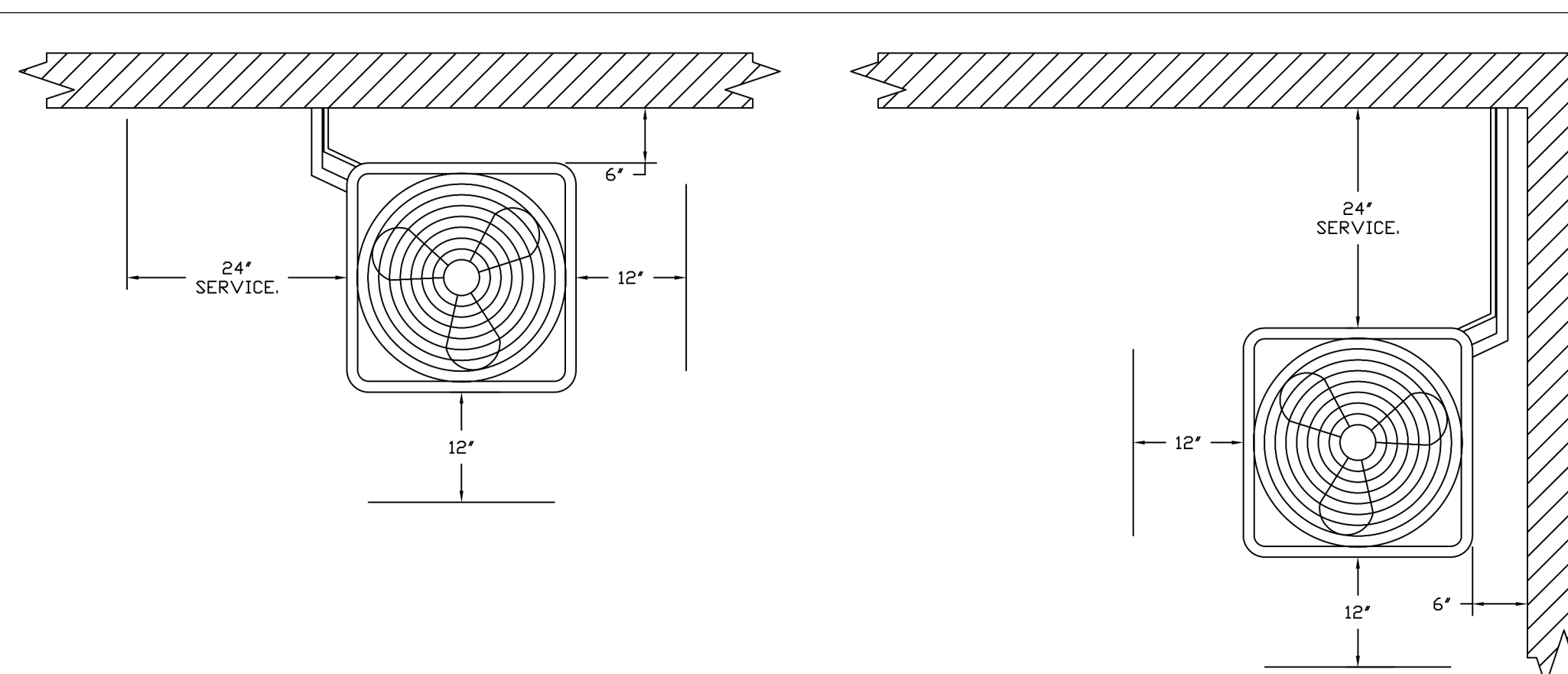
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**SHEET NAME:**  
 CAPTIVE AIRE DRAWINGS

**DATE:** 03/05/2021 **PROJECT NO:** 32074  
**DRAWN:** AJP **SCALE:** NTS

**SHEET NO.:**  
**M703**



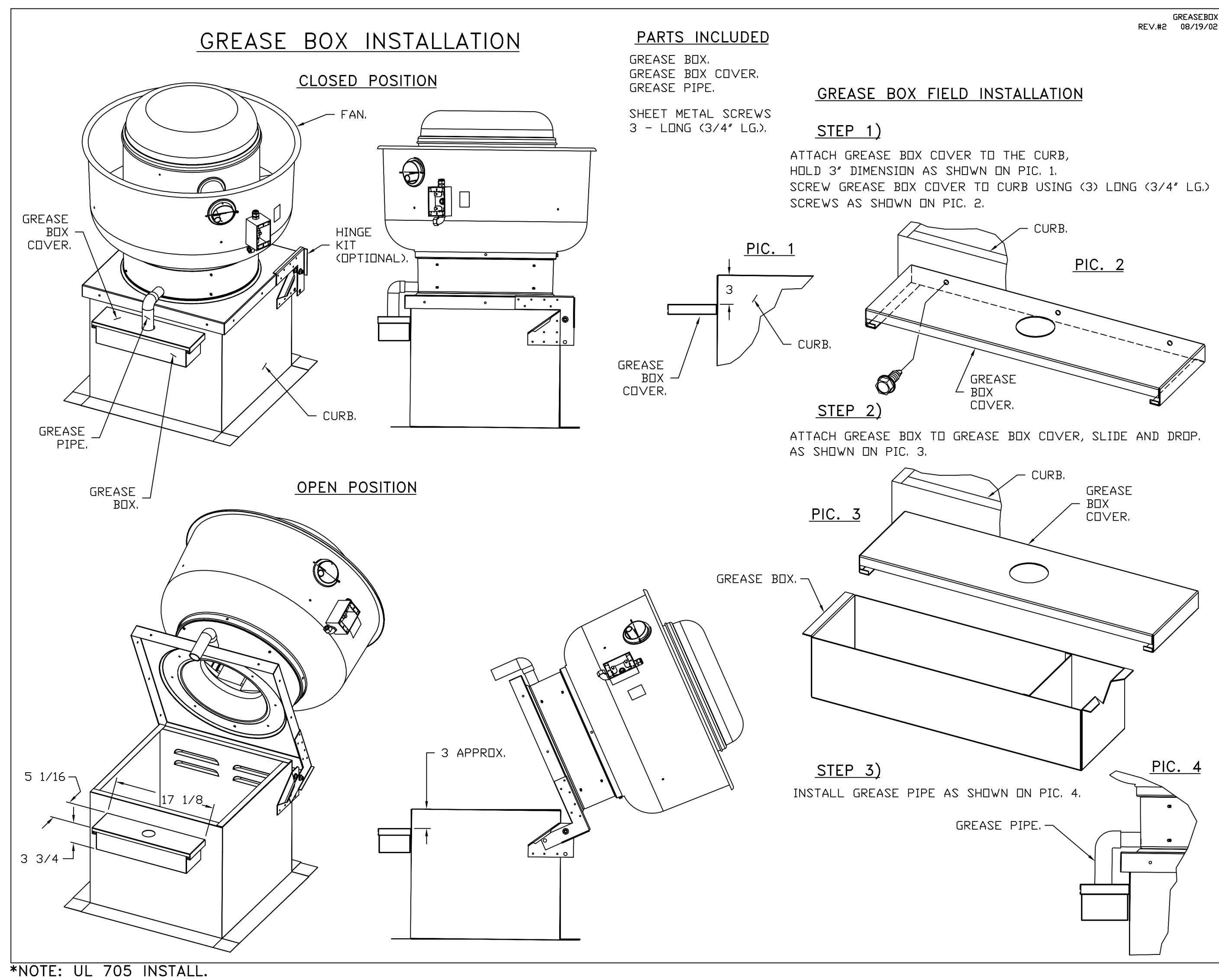


**CONDENSER CLEARANCES**  
 48" CLEARANCE REQUIRED ABOVE CONDENSERS.  
 (NOTE: \*\*CONDENSERS SHOWN HERE ARE NOT DRAWN AT SCALE).

**GREASE DUCT & CHIMNEY SPECIFICATIONS:**  
 PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER THE MANUFACTURES INSTALLATION GUIDE.  
 PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12". DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.  
 IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

**CUSTOMER APPROVAL TO MANUFACTURE:**

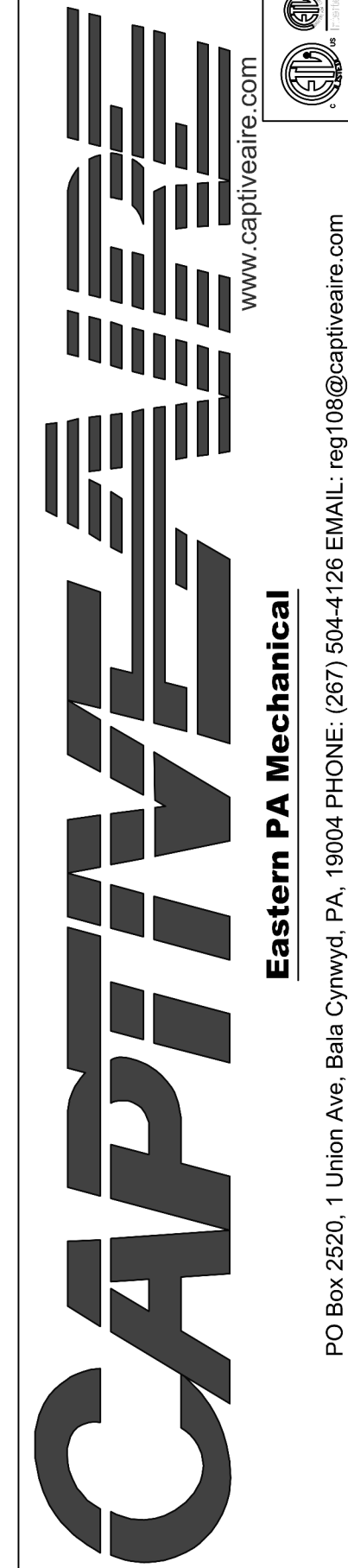
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APPROVED WITH NO EXCEPTION TAKEN	<input type="checkbox"/>
REVISE AND RESUBMIT	<input type="checkbox"/>
SIGNATURE _____	_____
YOUR TITLE _____	DATE _____



\*NOTE: UL 705 INSTALL.

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NO.	DESCRIPTION	DATE



Shake Shack - 1322 - Stamford, CT, R5  
 5 Cold Spring Rd,  
 Stamford, CT, 06905

**DATE:** 3/9/2023  
**DWG.#:** 5896030  
**DRAWN BY:** Joe.Shilba  
**SCALE:** 3/4" = 1'-0"  
**MASTER DRAWING**  
**SHEET NO.** 5

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**REVISION**

NO.	DATE	DESCRIPTION
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J	05/03/23	REVISION J
K	06/09/23	REVISION K
L	09/10/23	REVISION L
M	10/23/23	REVISION M
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**CAPTIVE AIRE DRAWINGS**

DATE: 03/05/2021	PROJECT NO: 32074
DRAWN: AJP	SCALE: NTS

SHEET NO:  
**M705**

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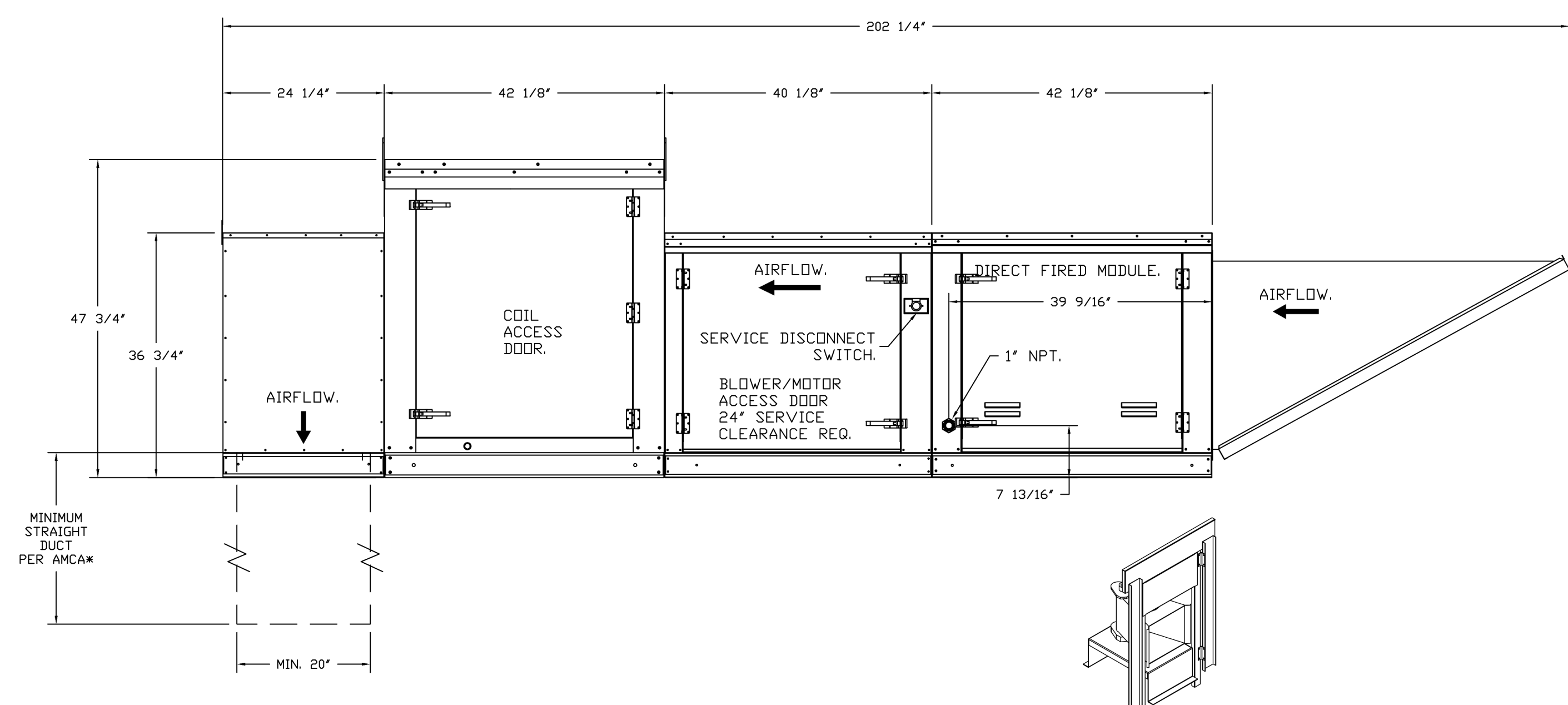
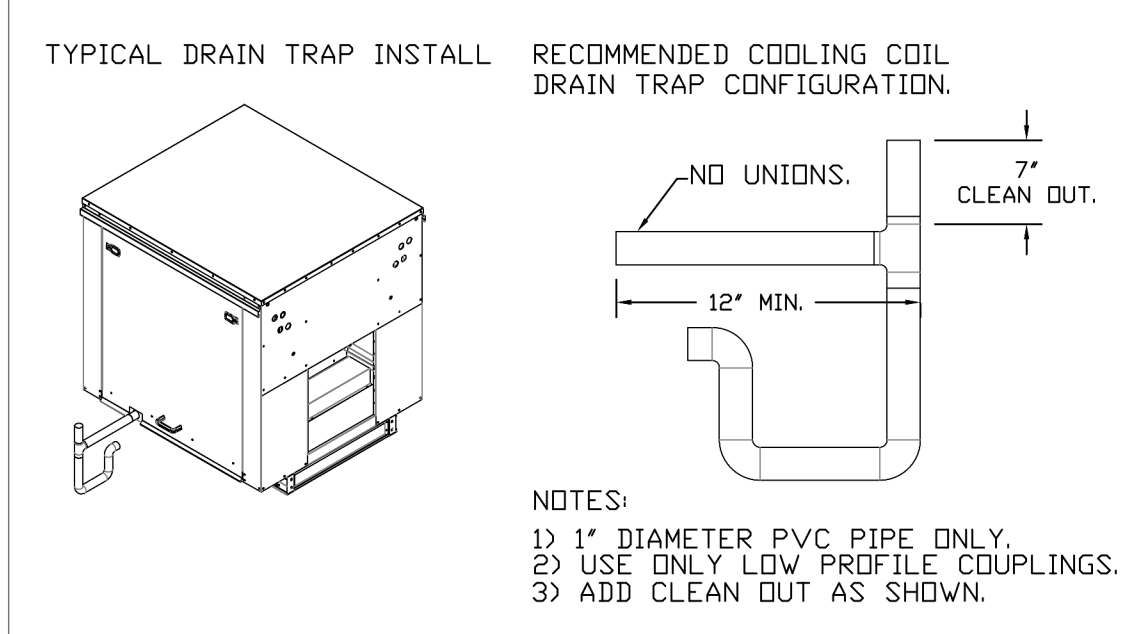
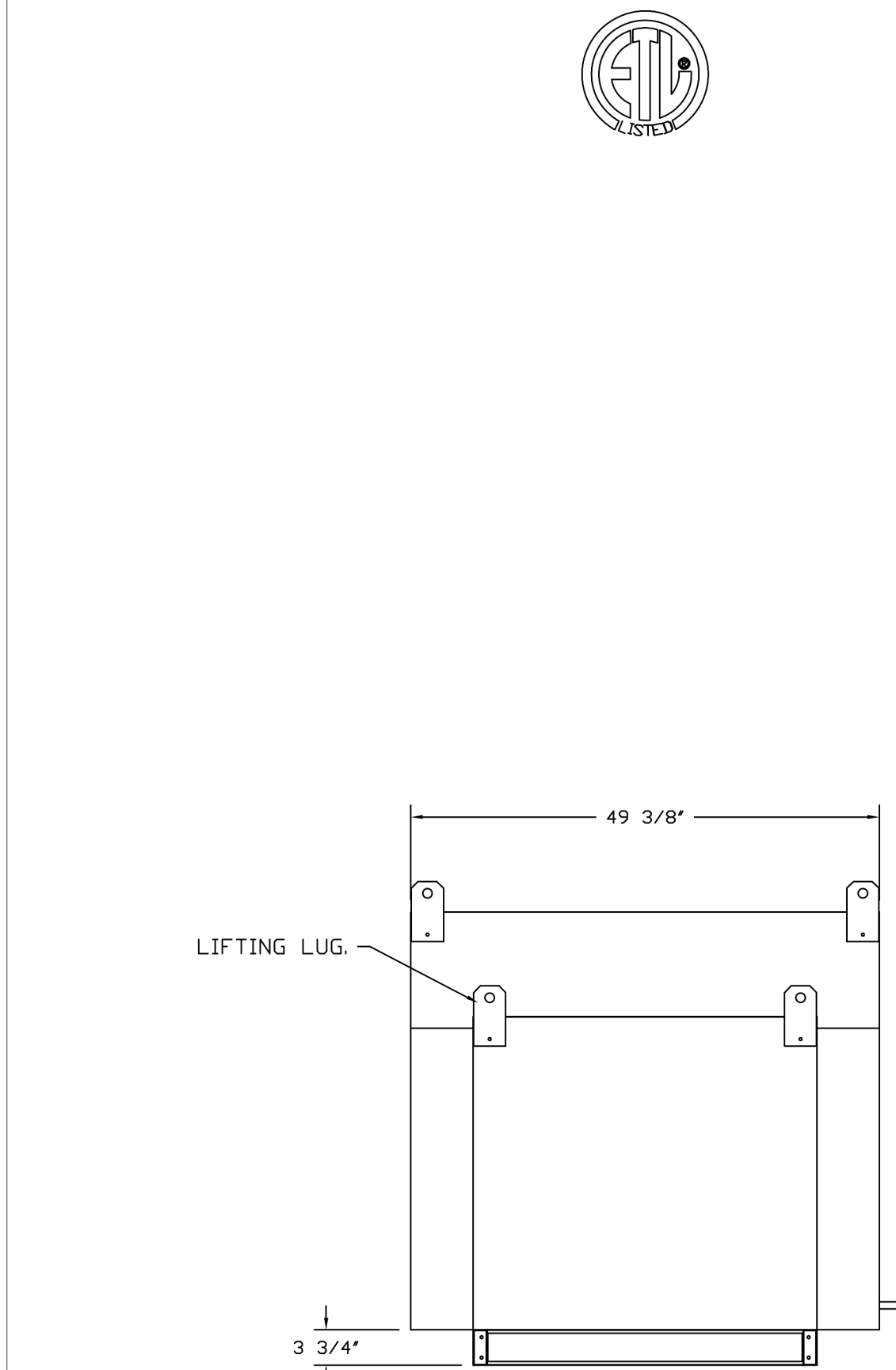
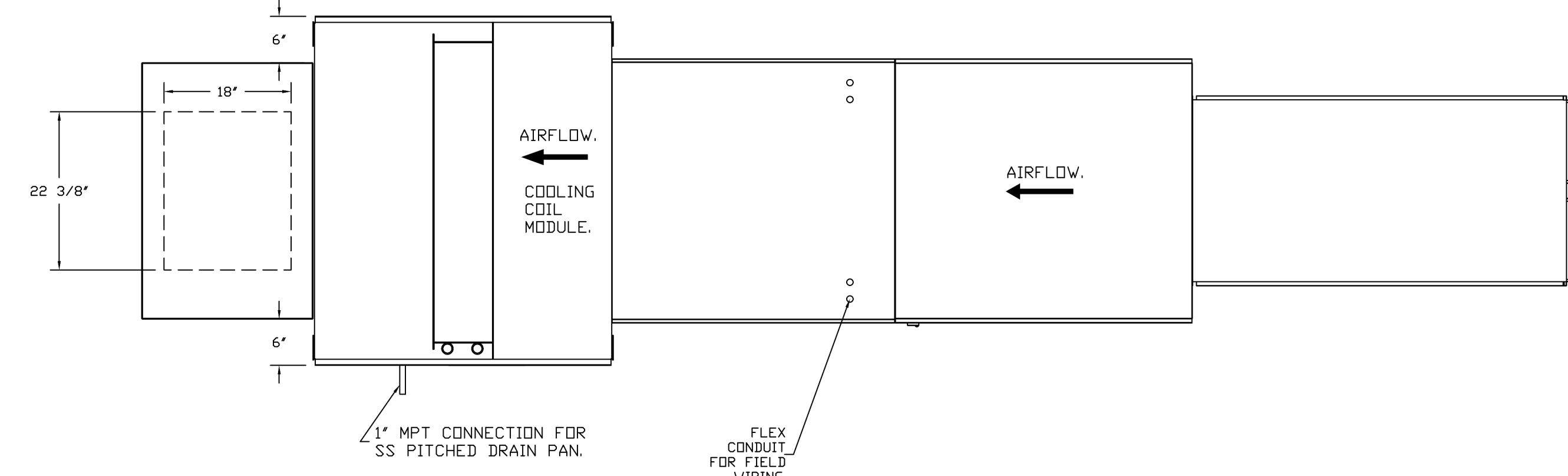
SEANO, ESILER

- FAN #3 A2-1500-200-MPU - HEATER (MAU-1)
- DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 20" MIXED FLOW DIRECT DRIVE FAN.
  - INTAKE HODD WITH EZ FILTERS.
  - DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT.
  - 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, LF2005 ACTUATOR INCLUDED.
  - LOW FIRE START - ALLOWS THE BURNER CIRCUIT TO ENERGIZE WHEN THE MODULATION CONTROL IS IN A LOW FIRE POSITION.
  - GAS PRESSURE GAUGE, 0-25" WG, 1/4" DIAMETER, 1/4" THREAD SIZE.
  - GAS PRESSURE GAUGE, 0-5 TO 415 INCHES WG, 2.5" DIAMETER, 1/4" THREAD SIZE.
  - CURB DUCT HANGER - 1-1/4" ANGLE IRON FRAME WELDED TO CURB TO SUPPORT STANDARD SIZE DUCTWORK. PRICED PER CURB. ONLY AVAILABLE WHEN CURB ASSEMBLY IS ORDERED.
  - BUTTERFLY MOD VALVE OPTION FOR MOD SIZE 2 (1" MOD VALVE).
  - FREESTAT FACTORY SET AT 25% AND 10 MINUTES.
  - COMMERCIAL SMOKE DETECTOR INTERLOCK (DETECTOR BY OTHERS).
  - CLOGGED FILTER SWITCH WITH NOTIFICATION ON HMI.
  - 8 TON DUAL CIRCUIT (3/2) MODULAR PACKAGED COOLING OPTION FOR SIZE 2 DF/EH MODULAR PACKAGED UNIT. INCLUDES CONDENSER, DX COIL, FILTER/DRYER KIT, THERMAL EXPANSION VALVE, R410A REFRIGERANT, AND REFRIGERANT PIPING (2,500 TO 4,800 CFM) WHEN ORDERED WITH OPPOSITE AIRFLOW CONDENSERS ACCESS AND COIL PIPING WILL REMAIN IN STANDARD POSITION. DRAIN AND SLEDS WILL MOVE TO THE OPPOSITE SIDE. ANY OTHER CHANGE WILL REQUIRE CLI. CONDENSERS REQUIRE SEPARATE 208V, 3 PHASE POWER SUPPLY UNLESS ORDERED WITH SINGLE POINT CONNECTION COIL = SE210103.
  - DOWNTURN PLENUM FOR SIZE 2 COOLING COIL MODULE - REQUIRED FOR DOWN DISCHARGE COOLING COIL APPLICATIONS.
  - SHIP CONDENSERS LODGE - THE REFRIGERATION LINES WILL NEED TO BE STUBBED OUT 12 INCHES. THE SUCTION LINES NEEDS TO BE INSULATED INSIDE THE COIL MODULE. ROTARY DISCONNECT SHOULD NOT BE INSTALLED ON THE POST. BLANK POST SHOULD BE USED IN PLACE.
  - SEPARATE 120VAC WIRING PACKAGE FOR MAKE-UP AIR UNITS. OPTION MUST BE SELECTED WHEN MOUNTING VFD IN PREWIRE PANEL OR WITH DCV PACKAGE. PROVIDES SEPARATE 120VAC INPUT TO SUPPLY FAN. THIS 120V SIGNAL MUST BE RUN BY ELECTRICIAN FROM DCV TO MUA SWITCH.
  - HINGED DOUBLE WALL INSULATED DOOR ASSEMBLY (BURNER/BLOWER/MPU 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 90L. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS 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 DRASTICALLY 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 = 12°F. TEMP. RISE = 65°F.  
 BTU'S CALCULATED OFF ACTUAL AIR DENSITY.  
 OUTPUT BTU'S AT ALTITUDE OF 0.0 FT. = 224569  
 INPUT BTU'S AT ALTITUDE OF 0.0 FT. = 244097  
 OUTPUT BTU'S AT ALTITUDE OF 161 FT. = 222866  
 INPUT BTU'S AT ALTITUDE OF 161 FT. = 242680.



**DIRECT FIRED (DF) PROFILE PLATE ASSEMBLY**

**DIRECT FIRED PROFILE PLATE ASSEMBLY DESCRIPTION:**  
 DIRECT FIRED BURNERS SHALL HAVE PATENTED (SEE PATENT NO. US6498938B3) SELF-ADJUSTING PROFILE PLATES DESIGNED TO ENSURE PROPER AIR VELOCITY AND PRESSURE DROP ACROSS THE BURNER. PROFILE PLATES SHALL ALLOW BURNERS TO ACHIEVE CLEAN COMBUSTION BY LIMITING BY-PRODUCT LEVELS TO A MAXIMUM OF 50PPM OF CARBON MONOXIDE (CO) AND 450PPM OF NITROGEN DIOXIDE (NO2). DIRECT FIRED UNITS SHALL BE CONFIGURED WITH THE BLOWER MOUNTED DOWNSTREAM OF THE BURNER. THIS ARRANGEMENT WILL ENSURE A CONSISTENT AIRFLOW, REGARDLESS OF INLET AIR TEMPERATURE.

**APPLICATION:**  
 SPRING-LOADED BURNER PROFILE PLATES ARE ENGINEERED TO AUTOMATICALLY REACT TO THE MOMENTUM OF A FRESH AIR STREAM, WITHOUT THE NEED FOR ANY MOTORS OR ACTUATORS TO MECHANICALLY ADJUST THEM WITH THIS FEATURE, ALL OF UNITS ARE DESIGNED FOR DEMAND CONTROL VENTILATION (DCV) REQUIREMENTS.

**GENERAL INFORMATION:**  
 ALL PROFILE PLATE ASSEMBLIES SHALL BE INCLUDED IN THE DF UNIT'S ETL LISTING AND COMPLY WITH COMBINED SAFETY STANDARDS ANSI Z95.4 AND CSA 3.7 (NON-REGULATING BY HEATED) AND ANSI Z95.18 (NON-REGULATING BY HEATED).

**GENERAL CONSTRUCTION:**  
 -PROFILE PLATES SHALL BE FORMED FROM 304 GALVANIZED STEEL.  
 -PROFILE PLATES SHALL VARY IN SIZE FOR UNIT.  
 -PROFILE PLATES SHALL BE MOUNTED ALONG THE SAME PLANE AS THE DISCHARGE OF THE BURNER.  
 -SECTION SHALL INCORPORATE PROPERLY TORQUED, PERMANENTLY MOUNTED SPRING HINGES.  
 -SPRING HINGES SHALL BE MADE FROM PLATED STEEL.

REVISIONS	
DESCRIPTION	DATE

**CAPTIVE**  
 Eastern PA Mechanical  
 PO Box 2520, 1 Union Ave, Ball Cymwyd, PA, 19004 PHONE: (267) 504-4128 EMAIL: reg108@capmech.com

Shake Shack - 1322 - Stamford, CT, R5  
 5 Cold Spring Rd,  
 Stamford, CT, 06905

**DATE:** 3/9/2023  
**DWG.#:** 5896030  
**DRAWN BY:** Joe.shilba  
**SCALE:** 3/4" = 1'-0"  
**MASTER DRAWING**

**SHEET NO.**  
 6

STORE NO:  
**CT #1322**

**SHAKE SHACK**  
 STAMFORD UNIT 5  
 STAMFORD, CONNECTICUT 06905

REVISION	
DATE	DESCRIPTION
I 02/24/23	REVISION I
J 05/03/23	REVISION J
K 06/09/23	REVISION K
L 09/01/23	REVISION L
M 10/23/23	REVISION M
T 12/22/23	REVISION T

STATUS:  
**IFC SET**

**FOR REFERENCE ONLY**

**FIELD VERIFICATION:**  
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SHEET NAME:  
**CAPTIVE AIRE DRAWINGS**

DATE: 03/05/2021 PROJECT NO: 32074  
 DRAWN: AJP SCALE: NTS

SHEET NO:  
**M706**

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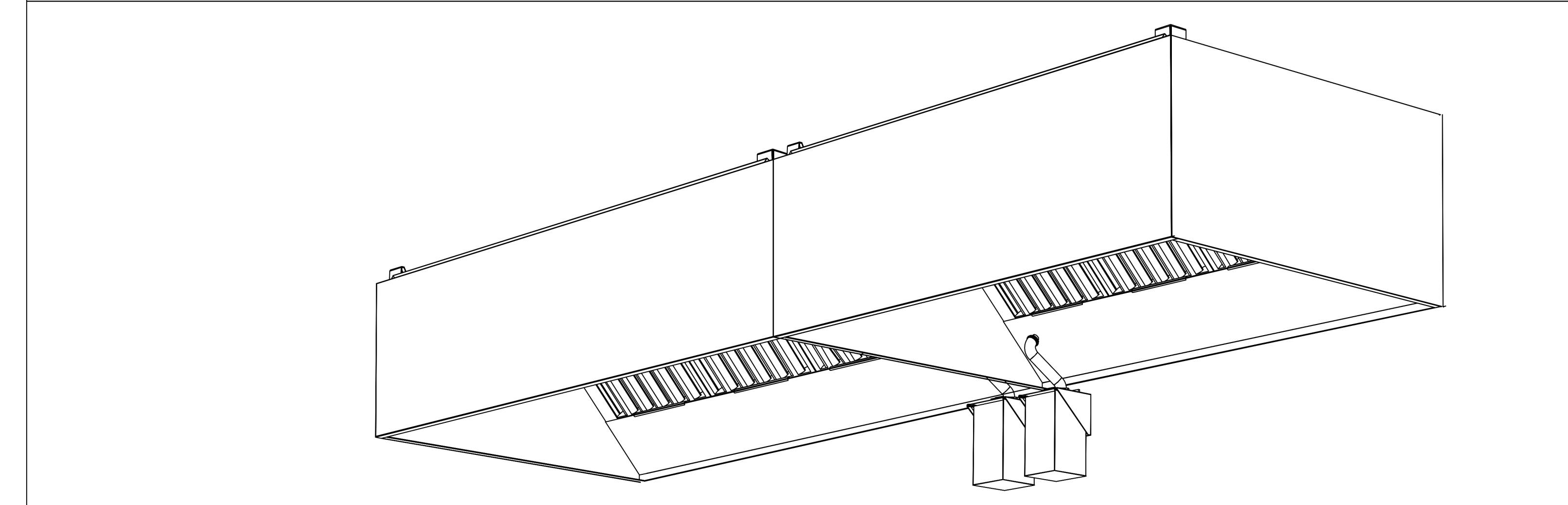
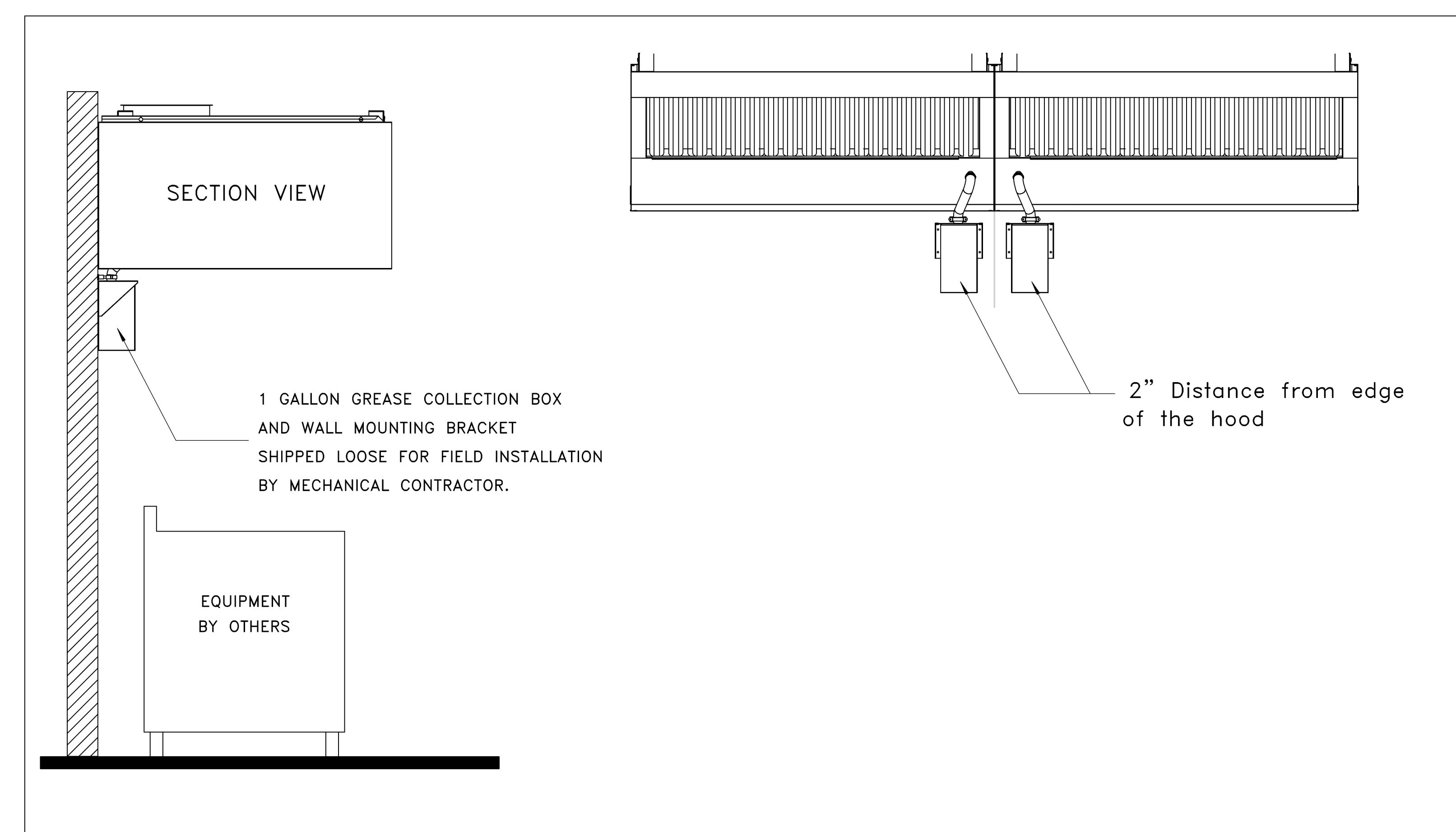






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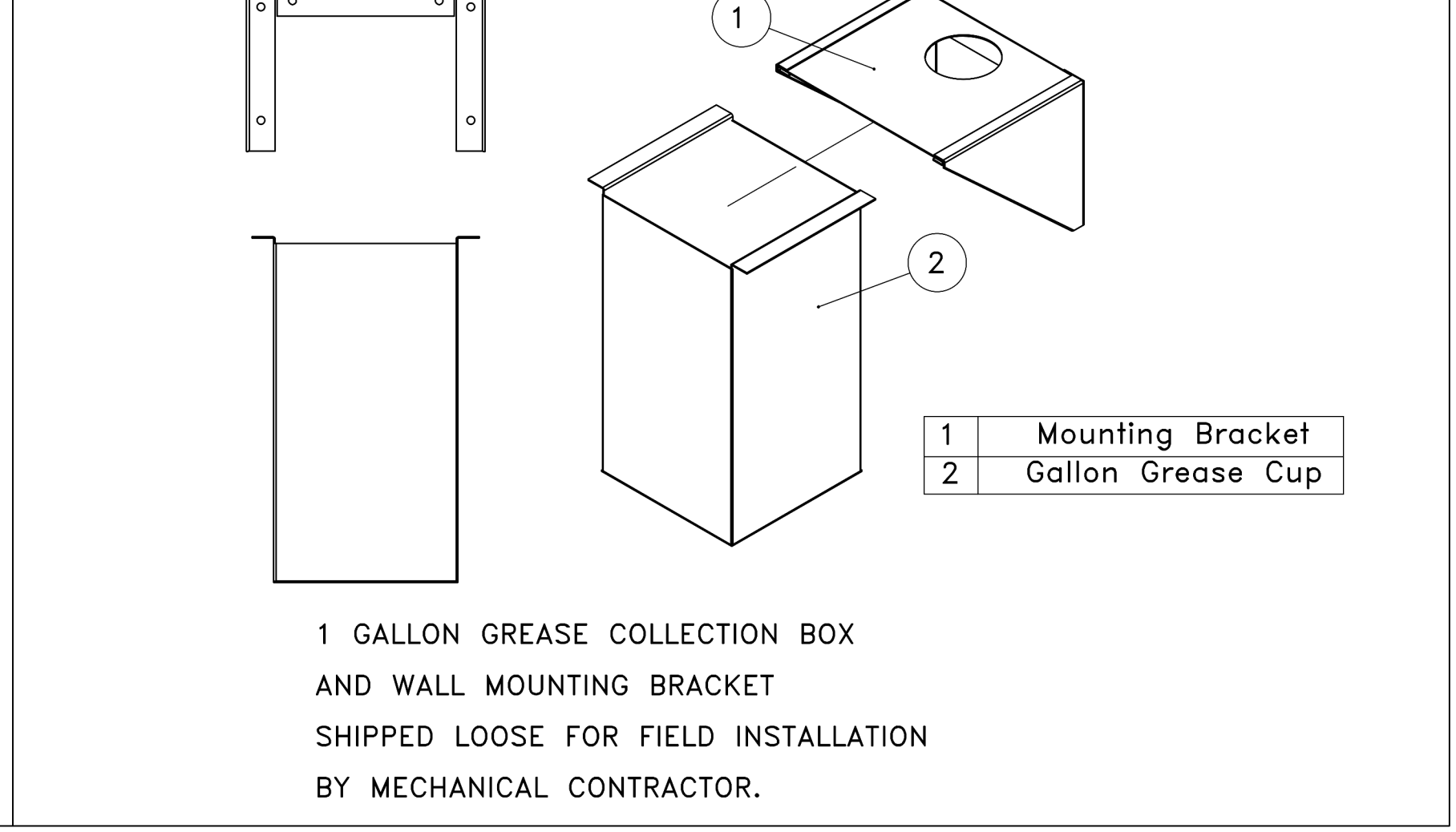
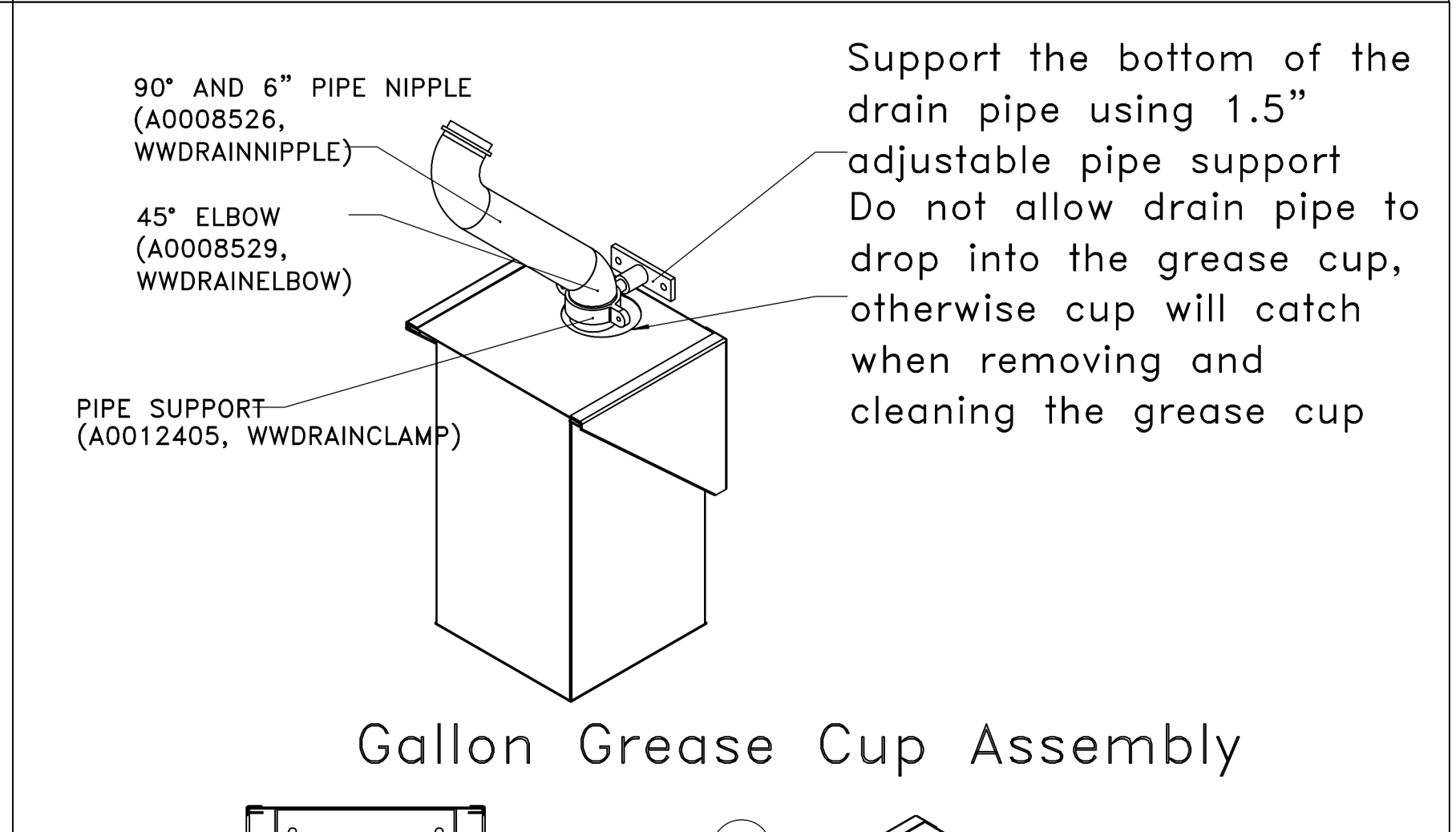
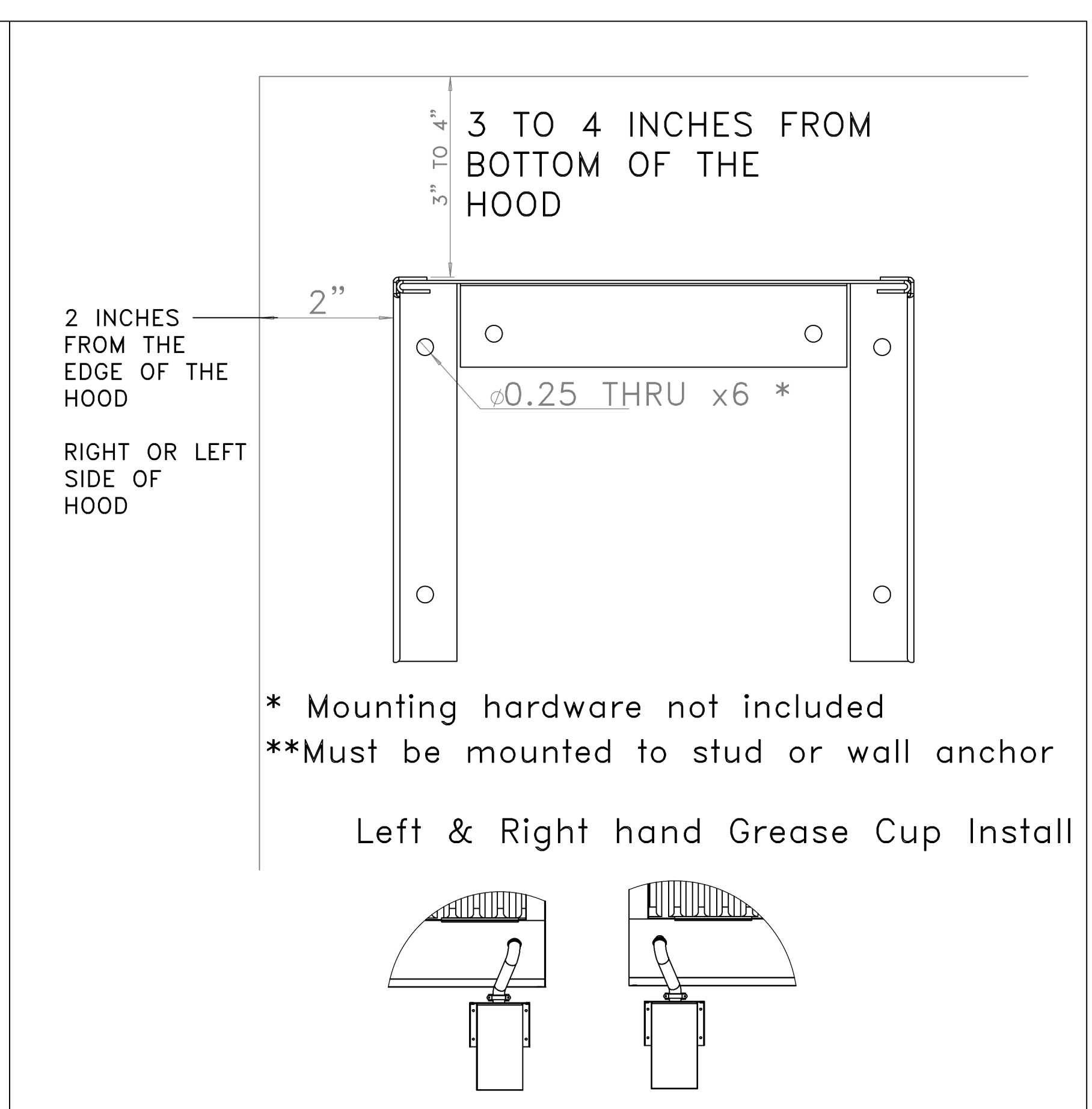


One Gallon Grease Cup Installation

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

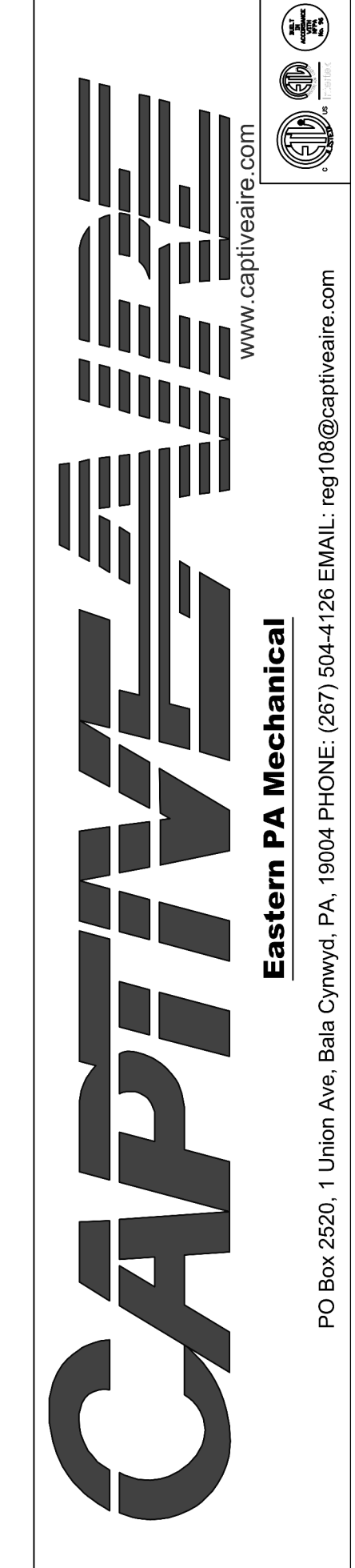
The one gallon grease cup comes as an assembly of stainless steel wall mounting bracket and one gallon cup. The mounting bracket should be installed 2" from the edge of the containment plenum and 3"-4" below the bottom of the hood.

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



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

REVISIONS	
REVISION	DATE



Shake Shack - 1322 - Stamford, CT\_R5  
 5 Cold Spring Rd,  
 Stamford, CT, 06905

DATE: 3/9/2023

DWG.#: 5896030

DRAWN BY: Joe.Shibbo

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

MASTER DRAWING

SHEET NO. 10

STORE NO: CT #1322



REVISION	
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SHEET NAME: CAPTIVE AIRE DRAWINGS

DATE: 03/03/23 PROJECT NO: 32074

DRAWN: Author SCALE:

SHEET NO: M710

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6 5 4 3 2 1