

DESIGN ARCHITECT	Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	CLIENT	Shake Shack 225 Varick St. Suite 301 New York, NY 10014
	HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018		Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703
MECHANICAL ENGINEER		MECHANICAL CONSULTANT	
LANDLORD	Gemstone Main POC Joseph Janell	GENERAL CONTRACTOR	CM&B INC. Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001

MECHANICAL CODES

BUILDING CODE:	2022 NEW YORK CITY BUILDING CODE
MECHANICAL CODE:	2022 NEW YORK CITY MECHANICAL CODE
ENERGY CODE:	2020 NEW YORK CITY ENERGY CONSERVATION CODE
FIRE CODE:	2015 NEW YORK CITY FIRE CODE
ACCESSIBILITY CODE:	ICC/ANSI A117.1-2009

NYC SPECIAL INSPECTION NOTES

- A TEST OR TESTS SHALL BE CONDUCTED UNDER DIRECTION OF A SPECIAL INSPECTOR SUPERVISING THE INSTALLATION OF THE MECHANICAL SYSTEMS. THE TEST(S) SHALL SHOW COMPLIANCE WITH BUILDING CODE REQUIREMENTS AND CHAPTER 17 OF THE NEW YORK CITY BUILDING CODE.
- THE FOLLOWING SPECIAL INSPECTIONS SHALL BE REQUIRED:

MECHANICAL SYSTEMS	BC 1704.16
FIRE RESISTANT PENETRATIONS AND JOINTS	BC 1704.27
- THE SPECIAL INSPECTOR SUPERVISING THE INSTALLATION OF MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS SHALL FILE A CERTIFICATE AND REPORT OF TEST(S) THAT THE SYSTEM COMPLIES WITH APPLICABLE LAWS.

NYCECC PROGRESS INSPECTION NOTES

- THE FOLLOWING PROCESS INSPECTIONS SHALL BE REQUIRED:

SHUT-OFF DAMPERS	IB2
HVAC AND SERVICE WATER HEATING EQUIPMENT	IB3
HVAC AND SERVICE WATER HEATING SYSTEM CONTROLS	IB4
HVAC INSULATION AND SEALING	IB5
MAINTENANCE INFO	ID1

NYC PROGRESS INSPECTION NOTES

- THE FOLLOWING PROCESS INSPECTIONS SHALL BE REQUIRED:

FINAL	BC 110.5, DIRECTIVE 14 OF 1975 AND RONY 101-10
-------	------------------------------------------------

NYC 2022 DEPARTMENT OF BUILDING NOTES

- UPON COMPLETION OF THE VENTILATION SYSTEM, CONDUCT A TEST UNDER THE PRESENCE AND DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR REGISTERED ARCHITECT QUALIFIED TO OBSERVE SUCH A TEST. THE TEST SHALL SHOW COMPLIANCE WITH CODE REQUIREMENTS FOR VENTILATION AND PROPER FUNCTION OF ALL OPERATING DEVICES BEFORE THE SYSTEM IS APPROVED.
- THE LICENSED PROFESSIONAL ENGINEER OR REGISTERED ARCHITECT WHO OBSERVES THE TESTS SHALL FILE THE CERTIFICATE TO DEMONSTRATE THAT THE SYSTEM COMPLIES WITH APPLICABLE LAWS. THE TEST AND REPORT SHALL BE MADE IN A MANNER SATISFACTORY TO THE SUPERINTENDENT.
- A STATEMENT SHALL BE FILED BY THE OWNER THAT THE SYSTEM OF VENTILATION WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THIS BUILDING AS ORDERED IN THE APPLICABLE SECTION OF THE CODE.
- 2022 NEW YORK CITY MECHANICAL CODE CHAPTER 4 SECTION 401 SHALL GOVERN THE VENTILATION OF SPACES WITHIN A BUILDING INTENDED TO BE OCCUPIED.
- MECHANICAL VENTILATION BY A METHOD OF SUPPLY AIR AND RETURN OR EXHAUST AIR SHALL BE PROVIDED AS PER 2022 NEW YORK CITY MECHANICAL CODE CHAPTER 4 SECTION 403. THE AMOUNT OF SUPPLY AIR SHALL BE APPROXIMATELY EQUAL TO THE AMOUNT OF RETURN AND EXHAUST AIR. THE SYSTEM SHALL NOT BE PROHIBITED FROM PRODUCING NEGATIVE OR POSITIVE PRESSURE. THE SYSTEM TO CONVEY VENTILATION AIR SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH 2022 NEW YORK CITY MECHANICAL CODE CHAPTER 6.
- MECHANICAL VENTILATION SYSTEMS SHALL BE PROVIDED WITH MANUAL OR AUTOMATIC CONTROLS AS PER 2022 NEW YORK CITY MECHANICAL CODE CHAPTER 4 SECTION 405.
- THE DESIGN, CONSTRUCTION, AND INSTALLATION OF MECHANICAL EXHAUST SYSTEMS, INCLUDING DUST, STOCK, AND REFUSE CONVEYOR SYSTEMS, EXHAUST SYSTEMS SERVING COMMERCIAL COOKING APPLIANCES, AND ENERGY RECOVERY VENTILATION SYSTEMS, SHALL BE AS PER 2022 NEW YORK CITY MECHANICAL CODE CHAPTER 5 SECTION 501.
- MECHANICAL AND PASSIVE SMOKE CONTROL SYSTEMS THAT ARE REQUIRED BY THE 2022 NEW YORK CITY MECHANICAL CODE SHALL BE INSTALLED IN ACCORDANCE WITH 2022 NEW YORK CITY MECHANICAL CODE SECTION 513.2. SPECIAL INSPECTION AND TEST REQUIREMENTS SHALL BE IN ACCORDANCE WITH 2022 NEW YORK CITY MECHANICAL CODE SECTION 513.3.
- DUCT SYSTEMS USED FOR THE MOVEMENT OF AIR IN AIR-CONDITIONING, HEATING, VENTILATING AND EXHAUST SYSTEMS SHALL CONFORM TO THE PROVISIONS OF 2022 NEW YORK CITY MECHANICAL CODE CHAPTER 6, SECTION 601.
- THE INSTALLATION AND CONSTRUCTION OF DUCTWORK SHALL BE AS PER 2022 NEW YORK CITY MECHANICAL CODE CHAPTER 6, SECTION 603.
- PROTECTION OF DUCT PENETRATIONS AND AIR TRANSFER OPENINGS IN ASSEMBLIES REQUIRED TO BE PROTECTED SHALL BE AS PER 2022 NEW YORK CITY MECHANICAL CODE CHAPTER 6, SECTION 607. FIRE DAMPERS, SMOKE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS AND CEILING RADIATION DAMPERS SHALL BE PROVIDED AT THE LOCATIONS PRESCRIBED IN SECTIONS 607.5 THROUGH 607.6. WHERE AN ASSEMBLY IS REQUIRED TO HAVE BOTH FIRE DAMPERS AND SMOKE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS OR A FIRE DAMPER AND A SMOKE DAMPER SHALL BE REQUIRED.
- DUCT AND AIR TRANSFER OPENINGS THAT PENETRATE FIRE RATED PARTITIONS SHALL COMPLY WITH ALL REQUIREMENTS LISTED UNDER THE 2022 BUILDING CODE SECTION BC 716 AS APPLICABLE TO SYSTEM DESIGN.
- ALL FIRE DAMPERS ARE TO BE OF TYPE APPROVED BY THE BOARD OF FIRE UNDERWRITERS. WHERE ENTERING OR LEAVING SHAFTS, FIRE DAMPERS SHALL BE EQUIVALENT TO 1 HOUR FIRE WALL RATING.
- COMPLY WITH THE VENTILATION RULES OF THE DEPARTMENT OF BUILDINGS ADOPTED JANUARY 1, 2015.

INDEX OF DRAWINGS

M001.01	MECHANICAL TITLE SHEET	M701.00	CAPTIVE AIRE DRAWINGS
M002.00	MECHANICAL GENERAL INFORMATION	M702.00	CAPTIVE AIRE DRAWINGS
M101.00	MECHANICAL FLOOR PLAN	M703.00	CAPTIVE AIRE DRAWINGS
M150.00	MECHANICAL ROOF PLAN	M704.00	CAPTIVE AIRE DRAWINGS
M501.00	MECHANICAL DETAILS	M705.00	CAPTIVE AIRE DRAWINGS
M590.00	MECHANICAL SPECIFICATIONS	M706.00	CAPTIVE AIRE DRAWINGS
M591.00	MECHANICAL SPECIFICATIONS	EN100.00	ELECTRICAL ENERGY CODE COMPLIANCE
M592.00	MECHANICAL SPECIFICATIONS	EN200.00	MECHANICAL ENERGY CODE COMPLIANCE
M601.00	MECHANICAL SCHEDULES		

PROGRESS INSPECTIONS DESCRIPTIONS

PROGRESS INSPECTIONS - DESCRIPTIONS:				
	INSPECTIONS/TEST	FREQUENCY (MINIMUM)	REFERENCE STANDARD (SEE ECC (CHAPTER 6) OR OTHER CRITERIA)	ECC OR OTHER CITATION
IBB	MECHANICAL AND SERVICE WATER HEATING INSPECTIONS			
IBB1	FIREPLACES: PROVISION OF COMBUSTION AIR AND TIGHT-FITTING FIREPLACE DOORS SHALL BE VERIFIED BY VISUAL INSPECTION.	PRIOR TO FINAL CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS: ANSI Z21.60 (SEE ALSO MC 904), ANSI Z21.50	C402.2.7, BC 2111, MC CHAPTERS 7, 9; FGC CHAPTER 6
IBB2	SHUT OFF DAMPERS: DAMPERS FOR STAIR AND ELEVATOR SHAFT VENTS AND OTHER OUTDOOR AIR INTAKES AND EXHAUST OPENINGS INTEGRAL TO THE BUILDING ENVELOPE SHALL BE VISUALLY INSPECTED TO VERIFY THAT SUCH DAMPERS EXCEPT WHERE PERMITTED TO BE GRAVITY DAMPERS COMPLY WITH APPROVED CONSTRUCTION DRAWINGS LITERATURE SHALL BE REVIEWED TO VERIFY THAT THE PRODUCT HAS BEEN TESTED AND FOUND TO MEET THE STANDARD.	AS REQUIRED DURING INSTALLATION	APPROVED CONSTRUCTION DOCUMENTS: AMCA 500D	C403.2.4.4; ASHRAE 90.1 CA - 6.4.3.4
IBB3	HVAC, SERVICE WATER HEATING AND POOL EQUIPMENT SIZING AND PERFORMANCE: EQUIPMENT SIZING, EFFICIENCIES AND OTHER PERFORMANCE FACTORS OF ALL MAJOR EQUIPMENT UNITS, AS DETERMINED BY THE APPLICANT OF RECORD, AND NO LESS THAN 10% OF MINOR EQUIPMENT UNITS, SHALL BE VERIFIED BY VISUAL INSPECTION AND, WHERE NECESSARY, REVIEW OF MANUFACTURER'S DATA.	PRIOR TO FINAL PLUMBING AND CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS	C403.2, C404.2, C404.7; ASHRAE 90.1 CA - 6.3, 6.4.1, 6.4.2, 6.8, 7.4, 7.8
IBB4	POOL, HEATERS AND COVERS SHALL BE VERIFIED BY VISUAL INSPECTION. HVAC SERVICE CONTROLS AND ECONOMIZERS AND SERVICE HOT WATER SYSTEM CONTROLS: NO LESS THAN 20% OF EACH TYPE OF REQUIRED CONTROLS AND ECONOMIZERS SHALL BE VERIFIED BY VISUAL INSPECTION AND TESTED FOR FUNCTIONALITY AND PROPER OPERATION. SUCH CONTROLS SHALL INCLUDE, BUT ARE NOT LIMITED TO: THERMOSTATIC SET POINT OVERLAP RESTRICTION OFF-HOUR SHUT-OFF DAMPER SNOW-MELT SYSTEM DEMAND CONTROL SYSTEMS ZONES ECONOMIZERS AIR SYSTEMS: - VARIABLE AIR VOLUME FAN HYDRONIC SYSTEMS HEAT REJECTION EQUIPMENT FAN SPEED - COMPLEX MECHANICAL SYSTEMS SERVING MULTIPLE ZONES VENTILATION ENERGY RECOVERY SYSTEMS HOT GAS BYPASS LIMITATION TEMPERATURE SERVICE WATER HEATING HOT WATER SYSTEM POOL HEATER AND TIME SWITCHES EXHAUST HOODS RADIANT HEATING SYSTEMS CONTROLS WITH SEASONALLY DEPENDENT FUNCTIONALITY: CONTROLS WHOSE COMPLETE OPERATION CANNOT BE DEMONSTRATED DUE TO PREVAILING WEATHER CONDITIONS TYPICAL OF THE SEASON DURING WHICH PROGRESS INSPECTIONS WILL BE PERFORMED SHALL BE PERMITTED TO BE SIGNED OFF FOR THE PURPOSE OF A TEMPORARY CERTIFICATE OF OCCUPANCY WITH ONLY A VISUAL INSPECTION PROVIDED. HOWEVER, THAT THE PROGRESS INSPECTOR SHALL PERFORM A SUPPLEMENTAL INSPECTION WHERE THE CONTROLS ARE VISUALLY INSPECTED AND TESTED FOR FUNCTIONALITY AND PROPER OPERATION DURING THE NEXT IMMEDIATE SEASON THEREAFTER. THE OWNER SHALL PROVIDE FULL ACCESS TO THE PROGRESS INSPECTOR WITHIN TWO WEEKS OF THE PROGRESS INSPECTOR'S REQUEST FOR SUCH ACCESS FOR SUCH SUPPLEMENTAL INSPECTIONS. THE DEPARTMENT SHALL BE NOTIFIED BY THE APPROVED PROGRESS INSPECTION AGENCY OF ANY UNSOLVED DEFICIENCIES IN THE INSTALLED WORK WITHIN 180 DAYS OF SUCH SUPPLEMENTAL INSPECTION.	AFTER INSTALLATION AND PRIOR TO FINAL ELECTRICAL AND CONSTRUCTION INSPECTION, EXCEPT THAT FOR CONTROLS WITH SEASONALLY DEPENDENT FUNCTIONALITY, SUCH TESTING SHALL BE PERFORMED BEFORE SIGN-OFF FOR ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY	APPROVED CONSTRUCTION DOCUMENTS, INCLUDING CONTROL SYSTEM NARRATIVES; ASHRAE GUIDELINE 1: THE HVAC COMMISSIONING PROCESS WHERE APPLICABLE	C403.2.4, C403.2.5, C403.2.11; C403.3, C403.4, C404.3, C404.6, C404.7; ASHRAE 90.1 CA - 6.3, 6.4, 6.5, 6.7.2.4, 7.4.4, 7.4.5
IBB5	HVAC INSULATION AND SEALING: INSTALLED DUCT AND PIPING INSULATION SHALL BE VISUALLY INSPECTED TO VERIFY PROPER INSULATION PLACEMENT AND VALUES.	PRIOR TO FINAL CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS, SMACNA DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE	C403.2.9.1.1, C403.2.9.1.2, C403.2.10, C404.4, MC 604.9; ASHRAE 90.1 CA - 6.3, 6.4.4, 6.8.2, 6.8.3, 7.4.3
IBB6	DUCT LEAKAGE TESTING: FOR DUCT SYSTEMS DESIGNED TO OPERATE AT STATIC PRESSURES IN EXCESS OF 3 INCHES W.G. (76 PA), REPRESENTATIVE SECTIONS, AS DETERMINED BY THE PROGRESS INSPECTOR, TOTALING AT LEAST 20% OF THE DUCT AREA, PER ECC C403.2.1.3, SHALL BE TESTED TO VERIFY THAT ACTUAL AIR LEAKAGE IS BELOW ALLOWABLE AMOUNTS.	AFTER INSTALLATION AND SEALING AND PRIOR TO CLOSING SHAFTS, CEILING AND WALLS	APPROVED CONSTRUCTION DOCUMENTS, SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL	C403.2.9.1.3; ASHRAE 90.1 CA - 6.4.4.2.2
ID	OTHER			
ID1	MAINTENANCE INFORMATION: MAINTENANCE MANUALS FOR MECHANICAL, SERVICE HOT WATER AND ELECTRICAL EQUIPMENT AND SYSTEMS REQUIRING PREVENTIVE MAINTENANCE SHALL BE REVIEWED FOR APPLICABILITY TO INSTALLED EQUIPMENT AND SYSTEMS BEFORE SUCH MANUALS ARE PROVIDED TO THE OWNER. LABELS REQUIRED FOR SUCH EQUIPMENT OR SYSTEMS SHALL BE INSPECTED FOR ACCURACY AND COMPLETENESS.	PRIOR TO SIGN-OFF OR ISSUANCE OF FINAL CERTIFICATE OF OCCUPANCY	APPROVED CONSTRUCTION DOCUMENTS, INCLUDING ELECTRICAL DRAWINGS WHERE APPLICABLE; ASHRAE GUIDELINE 4: PREPARATION OF OPERATING AND MAINTENANCE DOCUMENTATION FOR BUILDING SYSTEMS	C303.3, C408.5.2; ASHRAE 90.1 CA - 4.2.2.3, 6.7.2.2, 8.7.2

AREA/LOCATION MAP



AREA/LOCATION MAP
N.T.S.

46-20 QUEENS BOULEVARD
QUEENS, NY 11104
BLOCK 152
LOT: 1

KEY PLAN



KEY PLAN
N.T.S.

NOTE: EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT: IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY FOLLOWS BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.	SPECIAL INSPECTIONS: OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.	BUILDING DEPARTMENT FILING NOTE: THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
-------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



1	4.8.2024	IFC SET
	12.21.2023	PERMIT SET

NO.	BY	DATE	DESCRIPTION
-----	----	------	-------------

MECHANICAL TITLE SHEET

M-001.00

1 OF 19

2250003796	Q00972537-S1
------------	--------------

MECHANICAL SHEET INDEX

M-001.00	MECHANICAL TITLE SHEET
M-002.00	MECHANICAL GENERAL INFORMATION
M-101.00	MECHANICAL FLOOR PLAN
M-150.00	MECHANICAL ROOF PLAN
M-501.00	MECHANICAL DETAILS
M-590.00	MECHANICAL SPECIFICATIONS
M-591.00	MECHANICAL SPECIFICATIONS
M-592.00	MECHANICAL SPECIFICATIONS
M-601.00	MECHANICAL SCHEDULES
M-701.00	CAPTIVE AIRE DRAWINGS
M-702.00	CAPTIVE AIRE DRAWINGS
M-703.00	CAPTIVE AIRE DRAWINGS
M-704.00	CAPTIVE AIRE DRAWINGS
M-705.00	CAPTIVE AIRE DRAWINGS
M-706.00	CAPTIVE AIRE DRAWINGS
EN-100.00	ELECTRICAL ENERGY CODE COMPLIANCE
EN-200.00	MECHANICAL ENERGY CODE COMPLIANCE

RESPONSIBILITY MATRIX

DESCRIPTION	FURNISHED		INSTALLED		REMARKS
	GC	OWNER	GC	OWNER	
DIVISION 23: HEATING, VENTILATING, AND AIR CONDITIONING					
23.1 HVAC DUCTWORK AND PIPING IDENTIFICATION					
HVAC DUCTWORK SYSTEM IDENTIFICATION	•		•		
PIPING SYSTEM IDENTIFICATION	•		•		
UTILITY SHUT OFF IDENTIFICATION IN KITCHEN	•		•		
VALVE TAGS AND CHART	•		•		
HVAC DAMPER IDENTIFICATION	•		•		
23.2 ROOF CURBS					
EXHAUST FAN CURB	•		•		
CONDENSING UNIT CURBS	•		•		
POLLUTION CONTROL UNIT CURB	•		•		
23.3 HVAC DUCTWORK SYSTEM COMPONENTS					
HVAC DUCTWORK	•		•		
GREASE DUCTWORK OUTSIDE TENANT SPACE	•		•		
GREASE DUCTWORK INSIDE TENANT SPACE	•		•		
OUTSIDE AIR DUCTWORK	•		•		
OUTSIDE AIR LOUVER	•		•		
TOILET EXHAUST AIR DUCTWORK INSIDE TENANT SPACE	•		•		
TOILET EXHAUST AIR DUCTWORK OUTSIDE TENANT SPACE	•		•		
RELIEF EXHAUST AIR DUCTWORK	•		•		
RELIEF EXHAUST AIR LOUVER	•		•		
INSULATION AND FIRE WRAP	•		•		
DAMPERS	•		•		
SMOKE DETECTORS	•		•		
SUPPLY, RETURN, AND EXHAUST GRILLS AND REGISTERS	•		•		
23.4 MECHANICAL PIPING SYSTEM COMPONENTS					
WALK-IN COOLER AND FREEZER WATER COOLED CONDENSERS	•		•		A
REFRIGERANT PIPING FOR HVAC EQUIPMENT	•		•		
VALVES AND ACCESSORIES (E.G. AIR VENTS)	•		•		
23.5 HVAC EQUIPMENT					
RELIEF EXHAUST FAN	•		•		
TOILET EXHAUST FAN	•		•		
KITCHEN EXHAUST FAN	•		•		
DUCTED AND NON-DUCTED HEATING AND COOLING UNITS	•		•		
23.6 KITCHEN EXHAUST WITH FIRE SUPPRESSION SYSTEM					
HOOD CONTROL PANEL	•		•		
KITCHEN EXHAUST HOOD	•		•		
STRUCTURAL SUPPORT	•		•		
ELECTRICAL AND CONTROL WIRING	•		•		
TANK FIRE SUPPRESSION SYSTEM	•		•		B
TANK FIRE SUPPRESSION WIRING AND UTILITIES CONNECTION	•		•		
TANK FIRE SUPPRESSION VALVE	•		•		
23.7 COMMISSIONING ACTIVITIES					
GREASE EXHAUST WATER LEAKAGE TEST	•		•		
TEST AND BALANCE (TAB) REPORT	•		•		
GENERAL NOTES:					
1. INFORMATION CONTAINED WITHIN IS BASED ON OUR INTERPRETATION OF THE FINAL EXECUTED WORK LETTER.					
2. CONTRACTOR TO CONFIRM ALL SCOPE WITH FINAL WORK LETTER PRIOR TO PROCUREMENT OF WORK RESPONSIBILITIES.					
REMARKS:					
A. WALK-IN COOLER AND FREEZER SUPPLIED BY VENDOR NO. 27. GENERAL CONTRACTOR SCOPE OF WORK TO INCLUDE PIPING INSTALLATION AND FINAL CONNECTION.					
B. GENERAL CONTRACTOR TO COORDINATE AND FACILITATE SYSTEM SIGN-OFF.					

SUBMITTAL MATRIX

SUBMITTAL DESCRIPTION	Required Review Time (Business Days)		Shake Shack	Physical Sample Required	Submit for Record	Submit for Record Only
	Days	Architect of Record				
Diffusers, Grills & Registers	5	X			X	
Ductwork Layout (if there are significant changes in field)	5	X			X	
HVAC Equipment (if Captive Aire - Submitted by Owner/Vendor directly to Owner/AOR prior to construction)	5	X			X	
MEP Tests, Start-Up, and Programming Reports	5	X			X	

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 THE 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 EQUIPMENT.
- REFER TO ARCHITECTURAL DRAWINGS FOR RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. VERIFY CHASES AND PENETRATIONS 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 DECK 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 GRILLS WITH THE SUPPLIER TO MEET THE CALLING, WALL AND DUCT INSTALLATION REQUIREMENTS.
- ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLS 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 GRILLS 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. INSTALL 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 TO BE 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 GRILLS. PROVIDE WITH INTEGRAL MANUAL BALANCING DAMPER AND LOCKING 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.
- FIELD VERIFY THAT THE EXISTING EQUIPMENT INCLUDING ACCESSORIES BEING REUSED FOR THIS PROJECT IS NOT DAMAGED AND IS IN GOOD WORKING ORDER. REPORT ANY DEFICIENCIES TO THE OWNER OR ARCHITECT. SUBMIT TO THE OWNER AND ARCHITECT A WRITTEN REPORT DESCRIBING TESTS PERFORMED TO VERIFY OPERATION AND RESULTS OF THE TESTS.
- CLEAN EXISTING EQUIPMENT AND EQUIPMENT COMPONENTS BEING REUSED FOR THIS PROJECT. PROVIDE NEW FILTERS FOR EXISTING AIR HANDLING EQUIPMENT PRIOR TO STARTUP OF EQUIPMENT. NEW FILTERS SHALL BE COMPATIBLE WITH THE EXISTING EQUIPMENT AND EQUAL IN PERFORMANCE TO THE EXISTING FILTERS AT NEW CONDITION UNLESS OTHERWISE NOTED. CLEAN STRAINERS IN PIPING SYSTEMS PRIOR TO STARTING PUMPS.
- 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.

MECHANICAL SYMBOLS

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

V2.08

STANDARD MOUNTING HEIGHT		HVAC DUCTWORK AND ACCESSORIES		PIPING SYMBOLS																																																																																																																																																																																																																																																																																	
<p>THERMOSTATS (USER ADJUSTABLE/TOP OF DEVICE) 48"</p> <p>CONTROLS (TOP OF DEVICE) 48"</p>		<p>LINEAR SLOTT DIFFUSER</p> <p>INSULATED FLEXIBLE DUCT (MAX. 5'-0" LONG)</p> <p>BRANCH DUCT WITH 45° RECTANGLE ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER</p> <p>ELBOW WITH TURNING VANES</p> <p>BRANCH DUCT WITH BELL-MOUTH FITTING & MANUAL VOLUME CONTROL DAMPER</p> <p>RETURN, EXHAUST, OR OUTSIDE AIR DUCT UP</p> <p>RETURN, EXHAUST, OR OUTSIDE AIR DUCT DOWN</p> <p>SUPPLY AIR DUCT UP</p> <p>SUPPLY AIR DUCT DOWN</p> <p>EQUIPMENT WITH FLEXIBLE DUCT CONNECTION</p> <p>10" (NECK SIZE) CSD-1 (TYPE) 300 CFM (CFM OF SUPPLY DIFFUSER OR REGISTER)</p> <p>24x24 (NECK SIZE) CEG-1 (TYPE) 800 CFM (CFM OF EXHAUST GRILLE)</p> <p>MANUAL VOLUME DAMPER</p> <p>SQUARE TO ROUND TRANSITION</p> <p>DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RD=RETURN)</p> <p>ROUND DUCT TAG INDICATING DIAMETER</p> <p>RECTANGULAR DUCT TAG INDICATING INTERNAL DUCT DIMENSIONS.</p> <p>FLAT oval DUCT TAG INDICATING INTERNAL DUCT DIMENSIONS.</p> <p>RISER DESIGNATION</p> <p>FIRE DAMPER</p> <p>FIRE SMOKE DAMPER</p> <p>SMOKE DAMPER</p> <p>VOLUME DAMPER</p> <p>MOTORIZED DAMPER</p> <p>BACKDRAFT DAMPER</p>	<p>DIRECTION OF FLOW</p> <p>CONTROL VALVE</p> <p>THREE-WAY CONTROL VALVE</p> <p>SHUTOFF VALVE</p> <p>CHECK VALVE</p> <p>BALANCING VALVE WITH PRESSURE PORTS</p> <p>TRIPLE DUTY VALVE WITH PRESSURE PORTS</p> <p>STRAINER</p> <p>STRAINER WITH BLOWDOWN VALVE</p> <p>RELIEF / SAFETY VALVE</p> <p>SOLENOID VALVE</p> <p>PRESSURE REDUCING VALVE</p> <p>GAS PRESSURE REGULATOR</p> <p>THERMOSTATIC MIXING VALVE</p> <p>Pipe Anchor</p> <p>EXPANSION JOINT</p> <p>PIPE GUIDE</p> <p>PIPE SUPPORT</p> <p>F & T TRAP</p> <p>BUCKET TRAP</p> <p>THERMOSTATIC TRAP</p> <p>BACKFLOW PREVENTER</p> <p>PRESSURE GAUGE</p> <p>THERMOMETER</p> <p>PRESSURE AND TEMPERATURE TEST PLUG</p> <p>UNION</p> <p>FLANGE CONNECTION</p> <p>VACUUM RELIEF VALVE</p> <p>AUTOMATIC AIR VENT</p> <p>MANUAL AIR VENT</p> <p>PRESSURE / VACUUM SWITCH</p> <p>CLEANOUT</p> <p>CAP</p> <p>ELBOW UP</p> <p>ELBOW DOWN</p> <p>TEE UP</p> <p>TEE DOWN</p> <p>ELBOW UP WITH SHUT-OFF VALVE (SOV)</p> <p>ELBOW DOWN WITH SHUT-OFF VALVE (SOV)</p> <p>TEE UP WITH SHUT-OFF VALVE (SOV)</p> <p>TEE DOWN WITH SHUT-OFF VALVE (SOV)</p> <p>REDUCER</p> <p>RECIRCULATION PUMP</p> <p>P-TRAP</p> <p>GAS COCK</p> <p>TOP BEAM CLAMP</p> <p>TRAPEZIE HANGER</p> <p>FLEXIBLE CONNECTION</p>																																																																																																																																																																																																																																																																																		
<p>ANNOTATION</p> <p>MECHANICAL PLAN NOTE CALLOUT</p> <p>MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)</p> <p>CONNECTION POINT OF NEW WORK TO EXISTING</p> <p>DETAIL REFERENCE. UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER</p> <p>SECTION CUT DESIGNATION</p>		<p>ABBREVIATIONS</p> <table border="1"> <tr> <td>A/C</td><td>AIR CONDITIONING</td> <td>HWP</td><td>HEATING WATER PUMP</td> </tr> <tr> <td>ACC</td><td>AIR COOLED CHILLER</td> <td>INX</td><td>INCHES OF WATER COLUMN</td> </tr> <tr> <td>ACCU</td><td>AIR COOLED CONDENSING UNIT</td> <td>L</td><td>LEAVING AIR TEMPERATURE</td> </tr> <tr> <td>AFC</td><td>ABOVE FINISHED CEILING</td> <td>LAT</td><td>LEAVING AIR TEMPERATURE</td> </tr> <tr> <td>AFF</td><td>ABOVE FINISHED FLOOR</td> <td>LD</td><td>LEAVING DRY BULB TEMPERATURE</td> </tr> <tr> <td>AFG</td><td>ABOVE FINISHED GRADE</td> <td>LP</td><td>LOW PRESSURE</td> </tr> <tr> <td>AHJ</td><td>AUTHORITY HAVING JURISDICTION</td> <td>LWB</td><td>LEAVING WET BULB TEMPERATURE</td> </tr> <tr> <td>AHU</td><td>AIR HANDLING UNIT</td> <td>LWT</td><td>LEAVING WATER TEMPERATURE</td> </tr> <tr> <td>AI</td><td>ANALOG INPUT</td> <td>MAU</td><td>MAKE-UP AIR UNIT</td> </tr> <tr> <td>AO</td><td>ACCESS PANEL</td> <td>MAX</td><td>MAXIMUM</td> </tr> <tr> <td>AP</td><td>AIR PRESSURE DROP</td> <td>MBH</td><td>1000 BTU PER HOUR</td> </tr> <tr> <td>AWG</td><td>AMERICAN WIRE GAUGE</td> <td>MD</td><td>MOTORIZED DAMPER</td> </tr> <tr> <td>B</td><td>BOILER</td> <td>MFR</td><td>MANUFACTURER</td> </tr> <tr> <td>BAS</td><td>BUILDING AUTOMATION SYSTEM</td> <td>MIN</td><td>MINIMUM</td> </tr> <tr> <td>BB</td><td>BACKSLOPE</td> <td>N/A</td><td>NOT APPLICABLE</td> </tr> <tr> <td>BD</td><td>BACKDRAFT DAMPER</td> <td>NC</td><td>NORMALLY CLOSED</td> </tr> <tr> <td>BD</td><td>BLOWDOWN</td> <td>NO</td><td>NORMALLY OPEN</td> </tr> <tr> <td>BFC</td><td>BELOW FINISHED CEILING</td> <td>NOM</td><td>NOMINAL</td> </tr> <tr> <td>BFF</td><td>BELOW FINISHED FLOOR</td> <td>NC</td><td>NON-FUSED</td> </tr> <tr> <td>BFG</td><td>BELOW FINISHED GRADE</td> <td>NF</td><td>NON-FUSED</td> </tr> <tr> <td>BFP</td><td>BOILER FEED PUMP</td> <td>NIC</td><td>NOT IN CONTRACT</td> </tr> <tr> <td>BHP</td><td>BRAKE HORSEPOWER</td> <td>NIC</td><td>NOT IN CONTRACT</td> </tr> <tr> <td>BI</td><td>BINARY INPUT</td> <td>PCV</td><td>PRESSURE INDEP. CONTROL VALVE</td> </tr> <tr> <td>BIT</td><td>BINARY OUTPUT</td> <td>PROV</td><td>PROVIDE/FURNISH AND INSTALL</td> </tr> <tr> <td>BOD</td><td>BOTTOM OF DUCT</td> <td>QTY</td><td>QUANTITY</td> </tr> <tr> <td>BOS</td><td>BOTTOM OF STRUCTURE</td> <td>RA</td><td>RETURN AIR</td> </tr> <tr> <td>BTU</td><td>BRITISH THERMAL UNIT</td> <td>RC</td><td>ROOM CRITERIA</td> </tr> <tr> <td>CFM</td><td>CUBIC FEET PER MINUTE</td> <td>RD</td><td>RETURN DUCT</td> </tr> <tr> <td>CH</td><td>CHILLER</td> <td>REA</td><td>RELIEF AIR</td> </tr> <tr> <td>CLG</td><td>COOLING</td> <td>RFN</td><td>RETURN FAN</td> </tr> <tr> <td>CO</td><td>CLEANOUT</td> <td>RFR</td><td>REFRIGERANT</td> </tr> <tr> <td>CP</td><td>CONDENSATE PUMP</td> <td>RH</td><td>RELATIVE HUMIDITY</td> </tr> <tr> <td>CPT</td><td>CONTROL POWER TRANSFORMER</td> <td>RH</td><td>ROOF HOOD</td> </tr> <tr> <td>CRAC</td><td>COMPUTER ROOM AIR CONDITIONING UNIT</td> <td>RTU</td><td>ROOFTOP UNIT</td> </tr> <tr> <td>CRU</td><td>COMPUTER ROOM UNIT</td> <td>SA</td><td>SUPPLY AIR</td> </tr> <tr> <td>CT</td><td>COOLING TOWER</td> <td>SCP</td><td>STEAM CONDENSATE PUMP</td> </tr> <tr> <td>CVP</td><td>CONDENSER</td> <td>SD</td><td>SMOKE DUCT DETECTOR</td> </tr> <tr> <td>CU</td><td>WATER PUMP</td> <td>SD</td><td>SUPPLY DUCT</td> </tr> <tr> <td>CHWP</td><td>CONDENSING UNIT CHILLED WATER PUMP</td> <td>SF</td><td>SUPPLY FAN</td> </tr> <tr> <td>DB</td><td>DECIBELS</td> <td>SH</td><td>SENSIBLE HEAT CAPACITY</td> </tr> <tr> <td>DBA</td><td>DECIBEL AVERAGE</td> <td>SI</td><td>SCOPE OF WORK</td> </tr> <tr> <td>DDC</td><td>DIRECT DIGITAL CONTROL</td> <td>SP</td><td>STATIC PRESSURE</td> </tr> <tr> <td>DJ</td><td>DIGITAL INPUT</td> <td>ST</td><td>STEAM TRAP</td> </tr> <tr> <td>DISC</td><td>DISCONNECT</td> <td>STM</td><td>STEAM</td> </tr> <tr> <td>DN</td><td>DOWN</td> <td>TBD</td><td>TO BE DETERMINED</td> </tr> <tr> <td>DX</td><td>DUCT SILENCER</td> <td>TC/C</td><td>TEMPERATURE CONTROLS</td> </tr> <tr> <td>EA</td><td>ENTERING AIR</td> <td>TC/C</td><td>TEMPERATURE CONTROL</td> </tr> <tr> <td>EAT</td><td>ENTERING AIR TEMPERATURE</td> <td>TF</td><td>TRANSFER FAN</td> </tr> <tr> <td>ED</td><td>EXHAUST DUCT</td> <td>TFA</td><td>TO FLOOR ABOVE</td> </tr> <tr> <td>EDB</td><td>ENTERING DRY BULB</td> <td>TFB</td><td>TO FLOOR BELOW</td> </tr> <tr> <td>EF</td><td>EXHAUST FAN</td> <td>TE</td><td>TOTAL HEAT CAPACITY</td> </tr> <tr> <td>EFF</td><td>EFFICIENCY</td> <td>TSP</td><td>TOTAL STATIC PRESSURE</td> </tr> <tr> <td>EMS</td><td>ENERGY MANAGEMENT SYSTEM</td> <td>TT</td><td>TEMPERATURE TRANSMITTAL</td> </tr> <tr> <td>ESP</td><td>EXTERNAL STATIC PRESSURE</td> <td>UHF</td><td>UNDERFLOOR</td> </tr> <tr> <td>ETR</td><td>EXISTING TO REMAIN</td> <td>UG</td><td>UNDERGROUND</td> </tr> <tr> <td>EWB</td><td>ENTERING WET BULB</td> <td>UIS</td><td>UNDERSLAB</td> </tr> <tr> <td>EWT</td><td>ENTERING WATER TEMPERATURE</td> <td>UO</td><td>UNLESS NOTED OTHERWISE</td> </tr> <tr> <td>FCU</td><td>FAN COIL UNIT</td> <td>VAV</td><td>VARIABLE AIR VOLUME</td> </tr> <tr> <td>FFA</td><td>FROM FLOOR ABOVE</td> <td>VEL</td><td>VELOCITY</td> </tr> <tr> <td>FFB</td><td>FROM FLOOR BELOW</td> <td>VPD</td><td>VARIABLE FREQUENCY DRIVE</td> </tr> <tr> <td>FF</td><td>FINISHED FLOOR</td> <td>VRF</td><td>VARIABLE REFRIGERANT FLOW</td> </tr> <tr> <td>FPI</td><td>FEET PER INCH</td> <td>VRV</td><td>VARIABLE REFRIGERANT VOLUME</td> </tr> <tr> <td>FPM</td><td>FEET PER MINUTE</td> <td>W</td><td>WITH</td> </tr> <tr> <td>GC</td><td>GENERAL CONTRACTOR</td> <td>W/O</td><td>WITHOUT</td> </tr> <tr> <td>GPM</td><td>GALLONS PER MINUTE</td> <td>WB</td><td>WET BULB</td> </tr> <tr> <td>HOA</td><td>HAND-OFF-AUTOMATIC</td> <td>WC</td><td>WATER COLUMN</td> </tr> <tr> <td>HP</td><td>HORSEPOWER</td> <td>WPD</td><td>WATER PRESSURE DROP</td> </tr> <tr> <td>HTG</td><td>HEATING</td> <td>XP</td><td>EXPLOSION PROOF</td> </tr> </table>				A/C	AIR CONDITIONING	HWP	HEATING WATER PUMP	ACC	AIR COOLED CHILLER	INX	INCHES OF WATER COLUMN	ACCU	AIR COOLED CONDENSING UNIT	L	LEAVING AIR TEMPERATURE	AFC	ABOVE FINISHED CEILING	LAT	LEAVING AIR TEMPERATURE	AFF	ABOVE FINISHED FLOOR	LD	LEAVING DRY BULB TEMPERATURE	AFG	ABOVE FINISHED GRADE	LP	LOW PRESSURE	AHJ	AUTHORITY HAVING JURISDICTION	LWB	LEAVING WET BULB TEMPERATURE	AHU	AIR HANDLING UNIT	LWT	LEAVING WATER TEMPERATURE	AI	ANALOG INPUT	MAU	MAKE-UP AIR UNIT	AO	ACCESS PANEL	MAX	MAXIMUM	AP	AIR PRESSURE DROP	MBH	1000 BTU PER HOUR	AWG	AMERICAN WIRE GAUGE	MD	MOTORIZED DAMPER	B	BOILER	MFR	MANUFACTURER	BAS	BUILDING AUTOMATION SYSTEM	MIN	MINIMUM	BB	BACKSLOPE	N/A	NOT APPLICABLE	BD	BACKDRAFT DAMPER	NC	NORMALLY CLOSED	BD	BLOWDOWN	NO	NORMALLY OPEN	BFC	BELOW FINISHED CEILING	NOM	NOMINAL	BFF	BELOW FINISHED FLOOR	NC	NON-FUSED	BFG	BELOW FINISHED GRADE	NF	NON-FUSED	BFP	BOILER FEED PUMP	NIC	NOT IN CONTRACT	BHP	BRAKE HORSEPOWER	NIC	NOT IN CONTRACT	BI	BINARY INPUT	PCV	PRESSURE INDEP. CONTROL VALVE	BIT	BINARY OUTPUT	PROV	PROVIDE/FURNISH AND INSTALL	BOD	BOTTOM OF DUCT	QTY	QUANTITY	BOS	BOTTOM OF STRUCTURE	RA	RETURN AIR	BTU	BRITISH THERMAL UNIT	RC	ROOM CRITERIA	CFM	CUBIC FEET PER MINUTE	RD	RETURN DUCT	CH	CHILLER	REA	RELIEF AIR	CLG	COOLING	RFN	RETURN FAN	CO	CLEANOUT	RFR	REFRIGERANT	CP	CONDENSATE PUMP	RH	RELATIVE HUMIDITY	CPT	CONTROL POWER TRANSFORMER	RH	ROOF HOOD	CRAC	COMPUTER ROOM AIR CONDITIONING UNIT	RTU	ROOFTOP UNIT	CRU	COMPUTER ROOM UNIT	SA	SUPPLY AIR	CT	COOLING TOWER	SCP	STEAM CONDENSATE PUMP	CVP	CONDENSER	SD	SMOKE DUCT DETECTOR	CU	WATER PUMP	SD	SUPPLY DUCT	CHWP	CONDENSING UNIT CHILLED WATER PUMP	SF	SUPPLY FAN	DB	DECIBELS	SH	SENSIBLE HEAT CAPACITY	DBA	DECIBEL AVERAGE	SI	SCOPE OF WORK	DDC	DIRECT DIGITAL CONTROL	SP	STATIC PRESSURE	DJ	DIGITAL INPUT	ST	STEAM TRAP	DISC	DISCONNECT	STM	STEAM	DN	DOWN	TBD	TO BE DETERMINED	DX	DUCT SILENCER	TC/C	TEMPERATURE CONTROLS	EA	ENTERING AIR	TC/C	TEMPERATURE CONTROL	EAT	ENTERING AIR TEMPERATURE	TF	TRANSFER FAN	ED	EXHAUST DUCT	TFA	TO FLOOR ABOVE	EDB	ENTERING DRY BULB	TFB	TO FLOOR BELOW	EF	EXHAUST FAN	TE	TOTAL HEAT CAPACITY	EFF	EFFICIENCY	TSP	TOTAL STATIC PRESSURE	EMS	ENERGY MANAGEMENT SYSTEM	TT	TEMPERATURE TRANSMITTAL	ESP	EXTERNAL STATIC PRESSURE	UHF	UNDERFLOOR	ETR	EXISTING TO REMAIN	UG	UNDERGROUND	EWB	ENTERING WET BULB	UIS	UNDERSLAB	EWT	ENTERING WATER TEMPERATURE	UO	UNLESS NOTED OTHERWISE	FCU	FAN COIL UNIT	VAV	VARIABLE AIR VOLUME	FFA	FROM FLOOR ABOVE	VEL	VELOCITY	FFB	FROM FLOOR BELOW	VPD	VARIABLE FREQUENCY DRIVE	FF	FINISHED FLOOR	VRF	VARIABLE REFRIGERANT FLOW	FPI	FEET PER INCH	VRV	VARIABLE REFRIGERANT VOLUME	FPM	FEET PER MINUTE	W	WITH	GC	GENERAL CONTRACTOR	W/O	WITHOUT	GPM	GALLONS PER MINUTE	WB	WET BULB	HOA	HAND-OFF-AUTOMATIC	WC	WATER COLUMN	HP	HORSEPOWER	WPD	WATER PRESSURE DROP	HTG	HEATING	XP	EXPLOSION PROOF
A/C	AIR CONDITIONING	HWP	HEATING WATER PUMP																																																																																																																																																																																																																																																																																		
ACC	AIR COOLED CHILLER	INX	INCHES OF WATER COLUMN																																																																																																																																																																																																																																																																																		
ACCU	AIR COOLED CONDENSING UNIT	L	LEAVING AIR TEMPERATURE																																																																																																																																																																																																																																																																																		
AFC	ABOVE FINISHED CEILING	LAT	LEAVING AIR TEMPERATURE																																																																																																																																																																																																																																																																																		
AFF	ABOVE FINISHED FLOOR	LD	LEAVING DRY BULB TEMPERATURE																																																																																																																																																																																																																																																																																		
AFG	ABOVE FINISHED GRADE	LP	LOW PRESSURE																																																																																																																																																																																																																																																																																		
AHJ	AUTHORITY HAVING JURISDICTION	LWB	LEAVING WET BULB TEMPERATURE																																																																																																																																																																																																																																																																																		
AHU	AIR HANDLING UNIT	LWT	LEAVING WATER TEMPERATURE																																																																																																																																																																																																																																																																																		
AI	ANALOG INPUT	MAU	MAKE-UP AIR UNIT																																																																																																																																																																																																																																																																																		
AO	ACCESS PANEL	MAX	MAXIMUM																																																																																																																																																																																																																																																																																		
AP	AIR PRESSURE DROP	MBH	1000 BTU PER HOUR																																																																																																																																																																																																																																																																																		
AWG	AMERICAN WIRE GAUGE	MD	MOTORIZED DAMPER																																																																																																																																																																																																																																																																																		
B	BOILER	MFR	MANUFACTURER																																																																																																																																																																																																																																																																																		
BAS	BUILDING AUTOMATION SYSTEM	MIN	MINIMUM																																																																																																																																																																																																																																																																																		
BB	BACKSLOPE	N/A	NOT APPLICABLE																																																																																																																																																																																																																																																																																		
BD	BACKDRAFT DAMPER	NC	NORMALLY CLOSED																																																																																																																																																																																																																																																																																		
BD	BLOWDOWN	NO	NORMALLY OPEN																																																																																																																																																																																																																																																																																		
BFC	BELOW FINISHED CEILING	NOM	NOMINAL																																																																																																																																																																																																																																																																																		
BFF	BELOW FINISHED FLOOR	NC	NON-FUSED																																																																																																																																																																																																																																																																																		
BFG	BELOW FINISHED GRADE	NF	NON-FUSED																																																																																																																																																																																																																																																																																		
BFP	BOILER FEED PUMP	NIC	NOT IN CONTRACT																																																																																																																																																																																																																																																																																		
BHP	BRAKE HORSEPOWER	NIC	NOT IN CONTRACT																																																																																																																																																																																																																																																																																		
BI	BINARY INPUT	PCV	PRESSURE INDEP. CONTROL VALVE																																																																																																																																																																																																																																																																																		
BIT	BINARY OUTPUT	PROV	PROVIDE/FURNISH AND INSTALL																																																																																																																																																																																																																																																																																		
BOD	BOTTOM OF DUCT	QTY	QUANTITY																																																																																																																																																																																																																																																																																		
BOS	BOTTOM OF STRUCTURE	RA	RETURN AIR																																																																																																																																																																																																																																																																																		
BTU	BRITISH THERMAL UNIT	RC	ROOM CRITERIA																																																																																																																																																																																																																																																																																		
CFM	CUBIC FEET PER MINUTE	RD	RETURN DUCT																																																																																																																																																																																																																																																																																		
CH	CHILLER	REA	RELIEF AIR																																																																																																																																																																																																																																																																																		
CLG	COOLING	RFN	RETURN FAN																																																																																																																																																																																																																																																																																		
CO	CLEANOUT	RFR	REFRIGERANT																																																																																																																																																																																																																																																																																		
CP	CONDENSATE PUMP	RH	RELATIVE HUMIDITY																																																																																																																																																																																																																																																																																		
CPT	CONTROL POWER TRANSFORMER	RH	ROOF HOOD																																																																																																																																																																																																																																																																																		
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT	RTU	ROOFTOP UNIT																																																																																																																																																																																																																																																																																		
CRU	COMPUTER ROOM UNIT	SA	SUPPLY AIR																																																																																																																																																																																																																																																																																		
CT	COOLING TOWER	SCP	STEAM CONDENSATE PUMP																																																																																																																																																																																																																																																																																		
CVP	CONDENSER	SD	SMOKE DUCT DETECTOR																																																																																																																																																																																																																																																																																		
CU	WATER PUMP	SD	SUPPLY DUCT																																																																																																																																																																																																																																																																																		
CHWP	CONDENSING UNIT CHILLED WATER PUMP	SF	SUPPLY FAN																																																																																																																																																																																																																																																																																		
DB	DECIBELS	SH	SENSIBLE HEAT CAPACITY																																																																																																																																																																																																																																																																																		
DBA	DECIBEL AVERAGE	SI	SCOPE OF WORK																																																																																																																																																																																																																																																																																		
DDC	DIRECT DIGITAL CONTROL	SP	STATIC PRESSURE																																																																																																																																																																																																																																																																																		
DJ	DIGITAL INPUT	ST	STEAM TRAP																																																																																																																																																																																																																																																																																		
DISC	DISCONNECT	STM	STEAM																																																																																																																																																																																																																																																																																		
DN	DOWN	TBD	TO BE DETERMINED																																																																																																																																																																																																																																																																																		
DX	DUCT SILENCER	TC/C	TEMPERATURE CONTROLS																																																																																																																																																																																																																																																																																		
EA	ENTERING AIR	TC/C	TEMPERATURE CONTROL																																																																																																																																																																																																																																																																																		
EAT	ENTERING AIR TEMPERATURE	TF	TRANSFER FAN																																																																																																																																																																																																																																																																																		
ED	EXHAUST DUCT	TFA	TO FLOOR ABOVE																																																																																																																																																																																																																																																																																		
EDB	ENTERING DRY BULB	TFB	TO FLOOR BELOW																																																																																																																																																																																																																																																																																		
EF	EXHAUST FAN	TE	TOTAL HEAT CAPACITY																																																																																																																																																																																																																																																																																		
EFF	EFFICIENCY	TSP	TOTAL STATIC PRESSURE																																																																																																																																																																																																																																																																																		
EMS	ENERGY MANAGEMENT SYSTEM	TT	TEMPERATURE TRANSMITTAL																																																																																																																																																																																																																																																																																		
ESP	EXTERNAL STATIC PRESSURE	UHF	UNDERFLOOR																																																																																																																																																																																																																																																																																		
ETR	EXISTING TO REMAIN	UG	UNDERGROUND																																																																																																																																																																																																																																																																																		
EWB	ENTERING WET BULB	UIS	UNDERSLAB																																																																																																																																																																																																																																																																																		
EWT	ENTERING WATER TEMPERATURE	UO	UNLESS NOTED OTHERWISE																																																																																																																																																																																																																																																																																		
FCU	FAN COIL UNIT	VAV	VARIABLE AIR VOLUME																																																																																																																																																																																																																																																																																		
FFA	FROM FLOOR ABOVE	VEL	VELOCITY																																																																																																																																																																																																																																																																																		
FFB	FROM FLOOR BELOW	VPD	VARIABLE FREQUENCY DRIVE																																																																																																																																																																																																																																																																																		
FF	FINISHED FLOOR	VRF	VARIABLE REFRIGERANT FLOW																																																																																																																																																																																																																																																																																		
FPI	FEET PER INCH	VRV	VARIABLE REFRIGERANT VOLUME																																																																																																																																																																																																																																																																																		
FPM	FEET PER MINUTE	W	WITH																																																																																																																																																																																																																																																																																		
GC	GENERAL CONTRACTOR	W/O	WITHOUT																																																																																																																																																																																																																																																																																		
GPM	GALLONS PER MINUTE	WB	WET BULB																																																																																																																																																																																																																																																																																		
HOA	HAND-OFF-AUTOMATIC	WC	WATER COLUMN																																																																																																																																																																																																																																																																																		
HP	HORSEPOWER	WPD	WATER PRESSURE DROP																																																																																																																																																																																																																																																																																		
HTG	HEATING	XP	EXPLOSION PROOF																																																																																																																																																																																																																																																																																		
<p>ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE DIMENSIONS. REFER TO DUCTWORK SPECIFICATIONS FOR DUCTWORK INSULATION AND LINER INFORMATION.</p>		<p>HVAC CONTROL DEVICES</p> <p>HUMIDISTAT</p> <p>THERMOSTAT</p> <p>CARBON MONOXIDE SENSOR</p> <p>CARBON DIOXIDE SENSOR</p> <p>CARBON DIOXIDE SENSOR</p> <p>DIFFERENTIAL PRESSURE SENSOR</p> <p>FLOW SWITCH</p> <p>HUMIDITY SENSOR</p> <p>PULL STATION</p> <p>REMOTE TESTING STATION WITH INDICATING LIGHT</p> <p>STATIC PRESSURE</p> <p>TEMPERATURE SENSOR</p>																																																																																																																																																																																																																																																																																			



SUNNYSIDE SHAKE SHACK

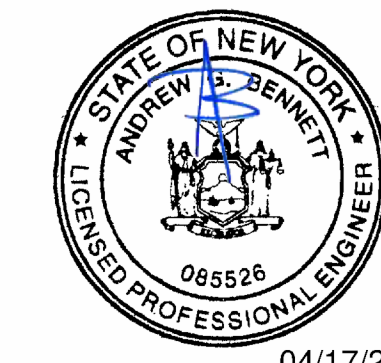
46-20 QUEENS BLVD
QUEENS, NY 11104
SHACK # 1479

<p>Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018</p>	<p>Shake Shack 225 Varick St. Suite 301 New York, NY 10014</p>
<p>HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018</p>	<p>Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703</p>
<p>Gemstone Main POC Joseph Janeli</p>	<p>CM&B INC. Stephen Malenchini 305 7th Avenue, 14th Floor New York, NY 10001</p>



240 WEST 37TH STREET, 3RD FLOOR
NEW YORK, NY 10018
PH: 212.413.8400
www.hny-eng.com
2250003796

SEAL SIGNATURE



04/17/2024

1	4.8.2024	IFC SET
NO	BY	DATE
		PERMIT SET
		DESCRIPTION

MECHANICAL GENERAL INFORMATION

M-002.00

12" = 1'-0" 2 OF 19

2250003796 C00972537-S1

NOTE:

EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT:

IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION."

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.

ANDREW G. BENNETT

SPECIAL INSPECTIONS:

OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE:

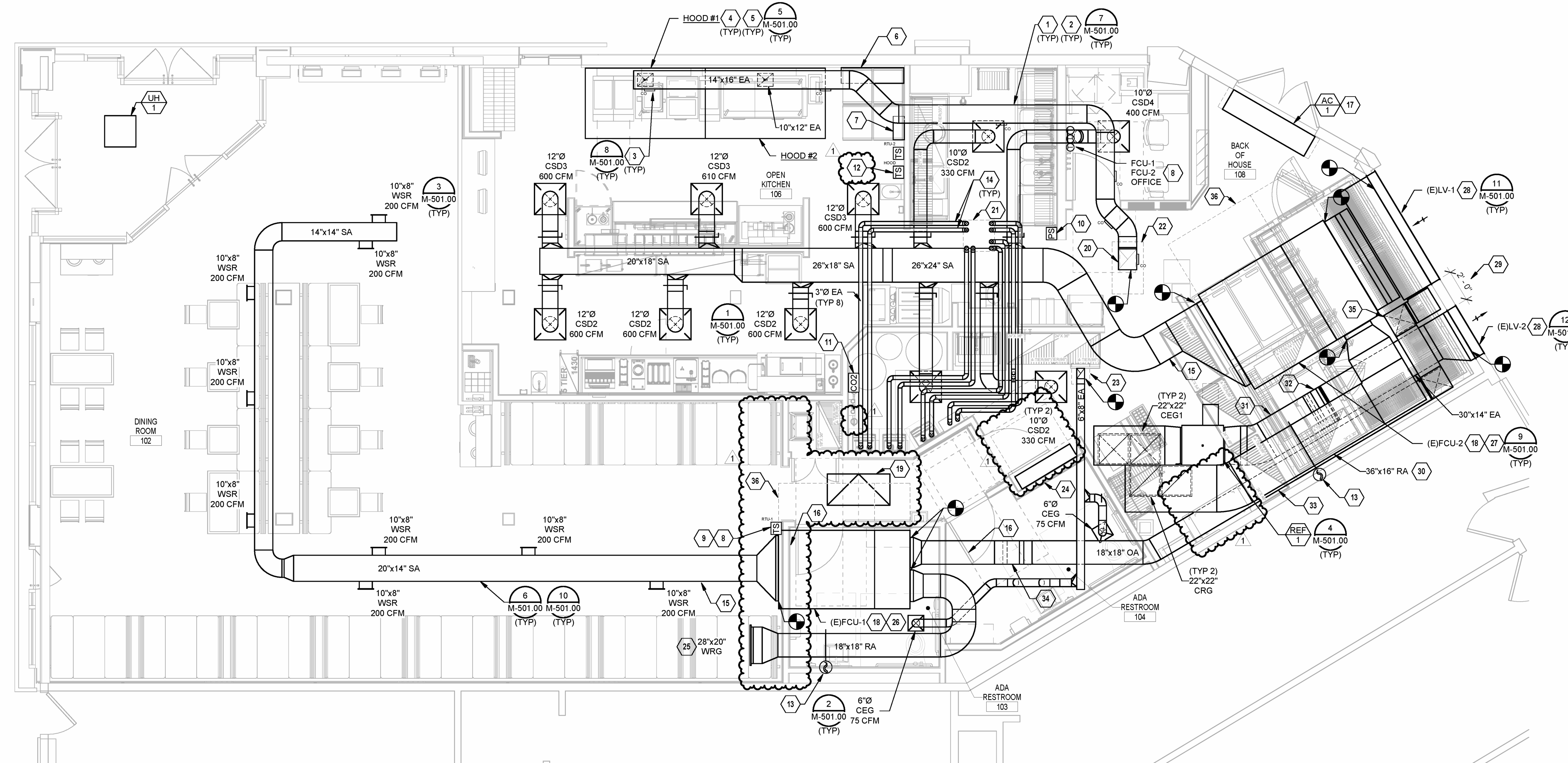
THIS PLAN IS APPROVED ONLY FOR THE

MECHANICAL GENERAL NOTES:

- DO NOT ROUTE ANY DUCTWORK OR PIPING ABOVE ELECTRICAL PANELS.
- REFER TO SHEET M002 FOR ADDITIONAL GENERAL NOTES AND REQUIREMENTS.
- REFER TO DETAILS AND SCHEDULES SHEETS FOR FURTHER INFORMATION.
- MOUNT ALL THERMOSTATS AND SENSORS CONTROLLING HVAC EQUIPMENT AT 48" AFF UNLESS OTHERWISE NOTED.

MECHANICAL PLAN NOTES:

- TYPE I GREASE HOOD EXHAUST DUCTWORK SHALL BE MINIMUM SPECIFIED THICKNESS WITH LIQUID TIGHT WELDS PER NYC MECHANICAL CODE. THE MINIMUM REQUIRED THICKNESS SHALL COMPLY WITH THE FOLLOWING: DUCTS WITH A CROSS-SECTIONAL AREA UP TO AND INCLUDING 155 SQUARE INCHES SHALL BE 16 GAGE STEEL. DUCTS WITH A CROSS-SECTIONAL AREA OVER 155 SQUARE INCHES, BUT NOT MORE THAN 200 SQUARE INCHES SHALL BE 14 GAGE STEEL. DUCTS WITH A CROSS-SECTIONAL AREA EQUAL TO OR MORE THAN 200 SQUARE INCHES SHALL BE CONSTRUCTED OF 12 GAGE STEEL. IF STAINLESS STEEL IS USED FOR DUCT MATERIAL, THE GAGE STEEL MAY BE INCREASED UPWARD BY 1" EVEN SIZE.
- 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 OFFSETS 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.
- INSTALL "DUCTMATE ULTIMATE DOOR" ON DUCTS 12" OR LARGER AND INSTALL "DUCTMATE F1 SANDWICH ACCESS DOOR" FOR DUCTS LESS THAN 12" ON GREASE DUCT FOR CLEANING IN LOCATION SHOWN AT A MINIMUM AND AS REQUIRED BY NFPA 96 AND LOCAL CODES.
- 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.
- HOOD SHALL OVERHANG THE COOKING SURFACE BY AT LEAST 6" ON BOTH SIDES.
- INSTALL CAPTIVE AIRE REMOTE HOOD TANK SYSTEM TIGHT TO CEILING LINE PER MANUFACTURER'S INSTRUCTIONS.
- INSTALL REMOTE MOUNTED HOOD MONITORING PANEL TIGHT TO CEILING LINE PER MANUFACTURER'S INSTRUCTIONS.
- MOUNT THERMOSTATS, HUMIDITY SENSORS, AND TEMPERATURE SENSOR(S) ON WALL. THERMOSTATS AND SENSORS 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.
- COMBINATION TEMPERATURE SENSOR AND HUMIDITY SENSOR.
- INSTALL HOOD FIRE SUPPRESSION MANUAL PULL STATION. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH FIRE SUPPRESSION SYSTEM INSTALLER AND THE ARCHITECTURAL DRAWING CONTRACTOR.
- CARBON DIOXIDE SENSOR WITH REMOTE ALARM REPEATER FURNISHED BY OWNER'S CO2 VENDOR AND LOCATED AT 12" AFF. THE SENSOR SHALL BE EQUIPPED WITH A LOCAL AUDIBLE AND VISUAL ALARM. THE LOW-LEVEL ALARM SHALL ACTIVATE THE LOCAL AUDIBLE AND VISUAL ALARM. IF THE BUILDING HAS A FIRE ALARM, PROVIDE THE APPROPRIATE FIRE ALARM INTERFACE MODULE TO INTERLOCK WITH THE BUILDING FIRE ALARM SYSTEM. THE HIGH-LEVEL CO2 ALARM SHALL SIGNAL BUILDING FIRE ALARM WHEN EQUIPPED. LOW LEVEL ALARM - 0.5% = 5,000 PPM. HIGH LEVEL ALARM - 3.0% = 30,000 PPM.
- MOUNT TEMPERATURE SENSOR PROVIDED WITH KITCHEN EXHAUST HOODS ONLY.
- INSTALL DUCT SMOKE DETECTOR IN RETURN AIR PLenum.
- PROVIDE COMBUSTION AIR AND EXHAUST PIPE AND ROUTE TO CONCENTRIC VENT THROUGH ROOF.
- CONTRACTOR SHALL COORDINATE WITH NATIONAL TAB TO PROVIDE UV-PHI INDOOR AIR PURIFICATION SYSTEM, MODEL PH-PKG-24V. INSTALL IN UNIT BLOWER COMPARTMENT PER MANUFACTURER'S INSTRUCTIONS.
- CONTRACTOR TO COORDINATE 1" UNDERCUT ON DOOR FOR EXHAUST AIR PATH.
- AIR CURTAIN MOUNTED ABOVE DOOR. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- REFERENCE PLUMBING DRAWINGS FOR CONDENSATE DRAIN ROUTING AND TERMINATION REQUIREMENTS.
- MOUNT STANDARD SIZE 24"x24" ACCESS PANEL FOR DAMPERS OVER HARD HALLWAY CEILING.
- 9"x9" GREASE EXHAUST DUCT UP TO KEF-1 ON ROOF.
- SHAFT UP TO ROOF FOR WATER HEATER VENT AND EXHAUST DUCTS.
- SHAFT UP TO ROOF FOR KITCHEN EXHAUST DUCTWORK.
- SHAFT UP TO ROOF FOR TOILET EXHAUST DUCTWORK.
- INSTALL REMOTE MOUNTED CONTROL CABINETS FOR FCU 1 & 2 STACKED TIGHT TOGETHER TIGHT TO CEILING LINE.
- MOUNT CENTER OF RETURN GRILL TO CENTER OF DUCT.
- SUSPEND FCU-1 FROM STRUCTURE WITH BOTTOM OF UNIT AT 9'-4" AFF.
- SUSPEND FCU-2 FROM STRUCTURE WITH BOTTOM OF UNIT AT 9'-2" AFF.
- LOUVER TO BE INSTALLED WITH BOTTOM OF LOUVER AT 7'-11" AFF.
- LOUVERS TO BE INSTALLED WITH A MINIMUM 2'-0" SPACE BETWEEN TO ALLOW FOR CONNECTION OF THE OA DUCT FOR FCU-1, TO THE PLENUM BOX OF LV-1.
- RETURN AIR DUCT TO BE SUSPENDED WITH BOTTOM OF DUCT AT 10'-4" AFF.
- RELIEF AIR DUCT TO BE SUSPENDED WITH BOTTOM OF DUCT AT 9'-0" AFF.
- RELIEF AIR DUCT TO DROP DOWN TO BE SUSPENDED WITH BOTTOM OF DUCT AT 8'-4" AFF.
- OUTDOOR AIR DUCT TO BE SUSPENDED WITH BOTTOM OF DUCT AT 8'-6" AFF.
- OUTDOOR AIR DUCT TO OFFSET UP TO CONNECT WITH FCU-1 MIXING BOX.
- OUTDOOR AIR DUCT TO ELBOW UP AND OVER THE RELIEF AIR DUCT CONNECTED TO LV-2. ONCE OA DUCT HAS CLEARED RELIEF DUCT, DUCT SHALL ELBOW BACK DOWN SO BOTTOM OF DUCT IS AT 8'-6" AFF.
- AREA RESERVED FOR THE MAINTENANCE OF MECHANICAL EQUIPMENT. COORDINATE WITH OTHER DISCIPLINE TO KEEP AREA FREE AND CLEAR OF ALL PIPING AND CONDUIT.



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

DESIGN ARCHITECT	Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	Shake Shack 225 Varick St. Suite 301 New York, NY 10014
MEP ENGINEER	HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018	Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703
LANDSCAPE	Gemstone Main POC Joseph Janell	CM&B INC. Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001

HNY CONSULTING ENGINEERS
240 WEST 37TH STREET, 3RD FLOOR
NEW YORK, NY 10018
TEL: 212.415.8400
WWW.HNY-ENG.COM
2250003796

SEAL/SIGNATURE

NO.	BY	DATE	DESCRIPTION
1		4.8.2024	IFC SET
		12.21.2023	PERMIT SET

MECHANICAL FLOOR PLAN

M-101.00

1/4" = 1'-0" 3 OF 19

2250003796 C00972537-S1

NOTE: EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT: IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED. THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

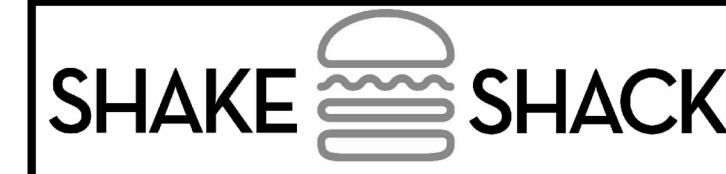
TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.

SPECIAL INSPECTIONS: OWNER SHALL SUBCONTRACT WITH A NEW YORK STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDIENTER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE: THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

Emporium Design, LLC
54 West 39th Street, Floor 16
New York, New York 10018

MECHANICAL PLAN NOTES:
 1 PROVIDE CONCENTRIC VENT MODEL NUMBER PVC-3CT.



SUNNYSIDE SHAKE SHACK

46-20 QUEENS BLVD
 QUEENS, NY 11104
 SHACK # 1479

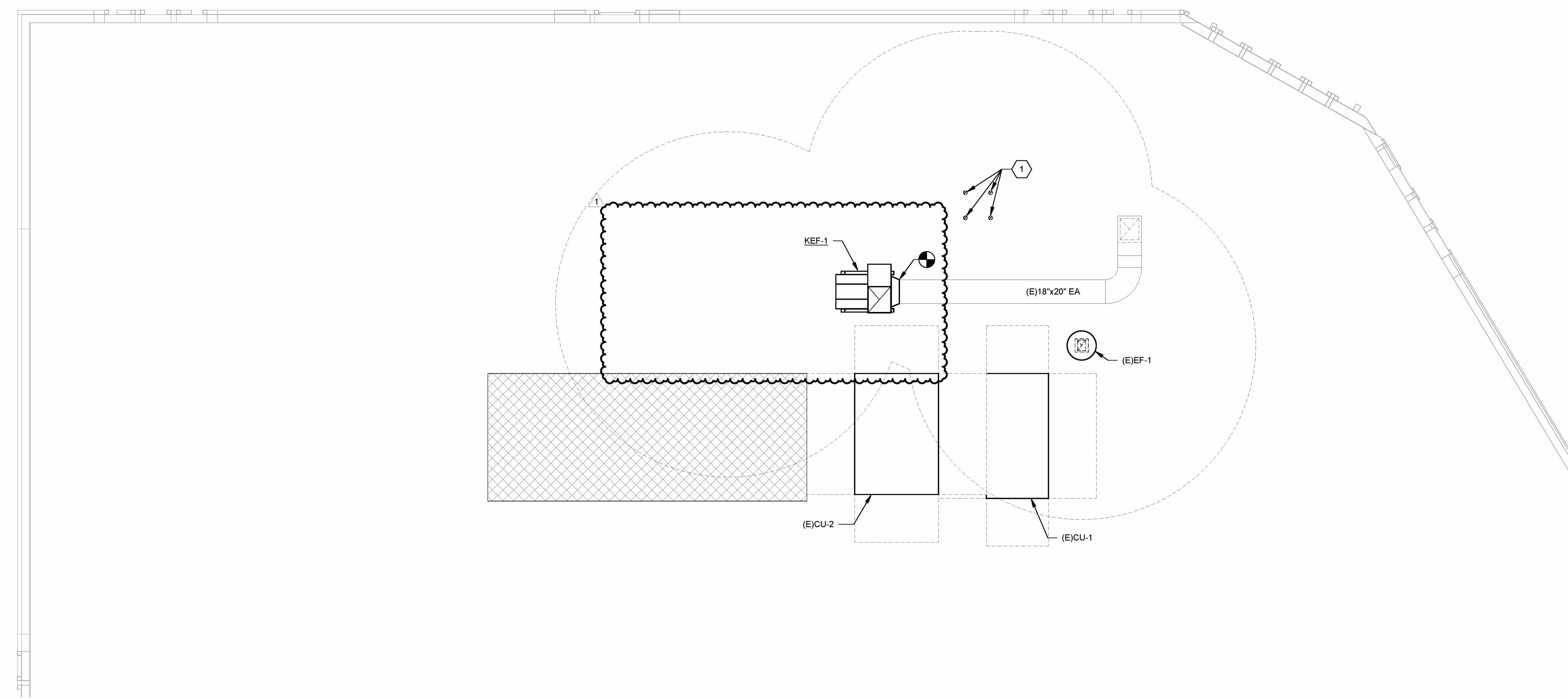
DESIGN ARCHITECT	Emporium Design, LLC Tim Welsh, AIA Robert Skansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	CLIENT	Shake Shack 225 Varick St. Suite 301 New York, NY 10014
	MEP ENGINEER		HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018
LANDSCAPE	Gemstone Main POC Joseph Janell	GENERAL CONTRACTOR	CM&B INC. Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001

HNY
 CONSULTING
 ENGINEERS
 240 WEST 37TH STREET, 3RD FLOOR
 NEW YORK, NY 10018
 TEL: 212.415.8400
 WWW.HNY-ENG.COM
 2250003796

SEAL/SIGNATURE



04/17/2024



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

NO.	BY	DATE	DESCRIPTION
1		4.8.2024	I/F C SET
		12.21.2023	PERMIT SET

MECHANICAL ROOF PLAN

M-150.00

1/4" = 1'-0" 4 OF 19
 2250003796 Q00972537-S1

NOTE:
 EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT:
 IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED. THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.

SPECIAL INSPECTIONS:
 OWNER SHALL SUBCONTRACT WITH A NEW YORK STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE:
 THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

ANDREW G. BENNETT

ANDREW G. BENNETT

Emporium Design, LLC
 54 West 39th Street, Floor 16
 New York, New York, 10018

DESIGN ARCHITECT	Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	CLIENT	Shake Shack 225 Varick St. Suite 301 New York, NY 10014
MECHANICAL ENGINEER	HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018	MECHANICAL CONTRACTOR	Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703
GENERAL CONTRACTOR	Gemstone Main POC Joseph Janell	CM&B INC.	Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001

HNY CONSULTING ENGINEERS
240 WEST 37TH STREET, 3RD FLOOR
NEW YORK, NY 10018
TEL: 212.413.8400
WWW.HNY-ENG.COM
2250003796

SEAL/SIGNATURE

NO.	BY	DATE	PERMIT SET	DESCRIPTION
1		4.8.2024	IFC SET	
		12.21.2023	PERMIT SET	

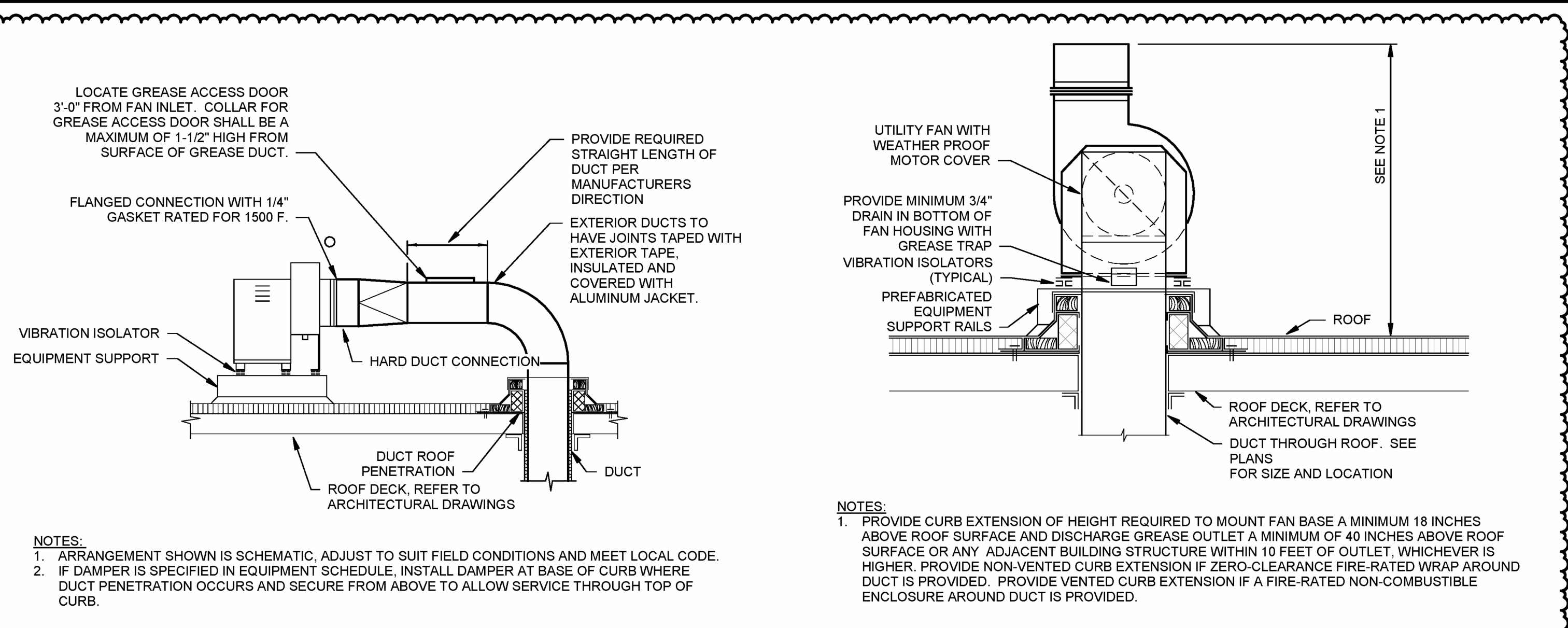
MECHANICAL DETAILS

M-501.00

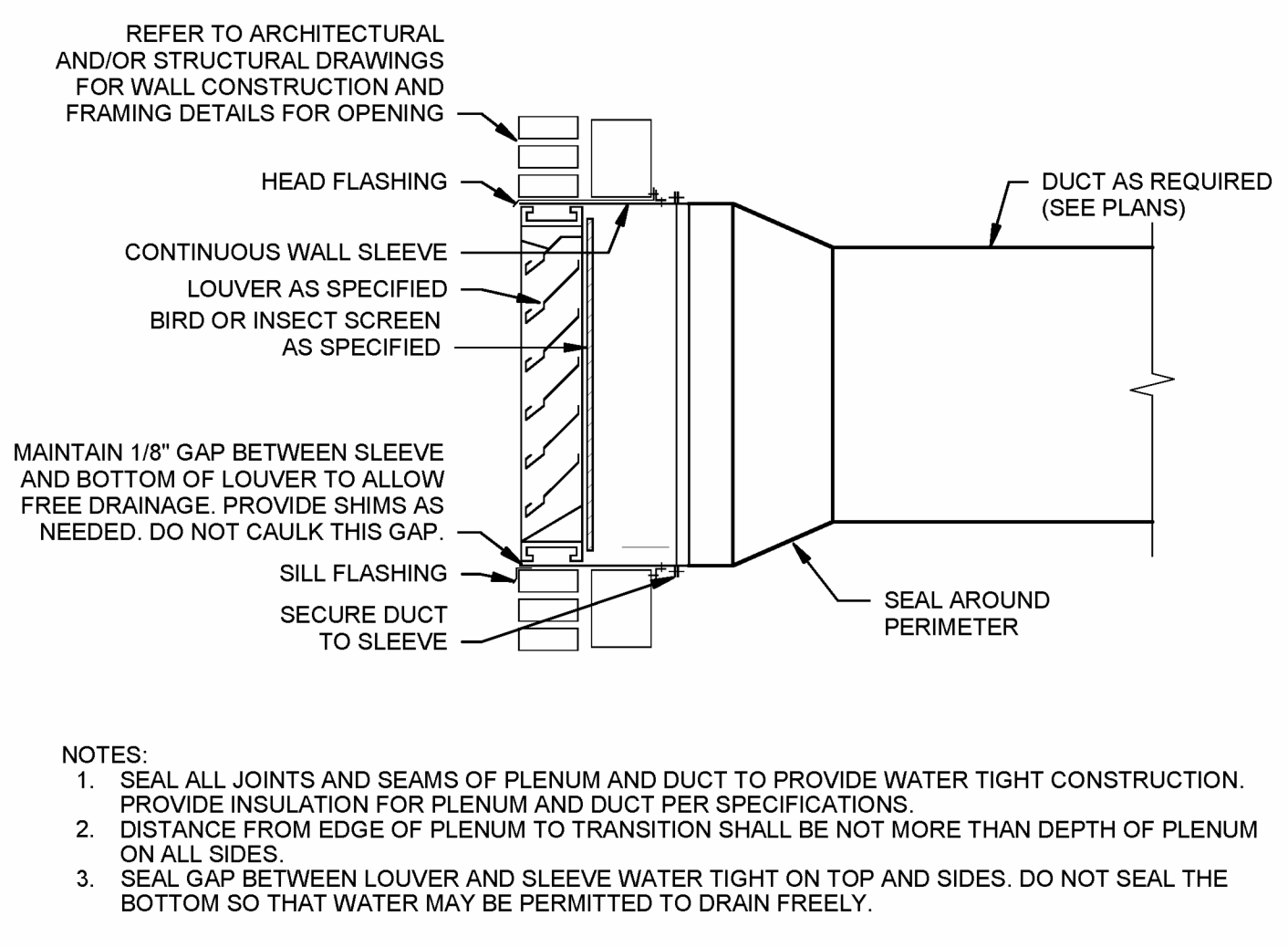
12" = 1'-0" 5 OF 19

2250003796 C00972537-S1

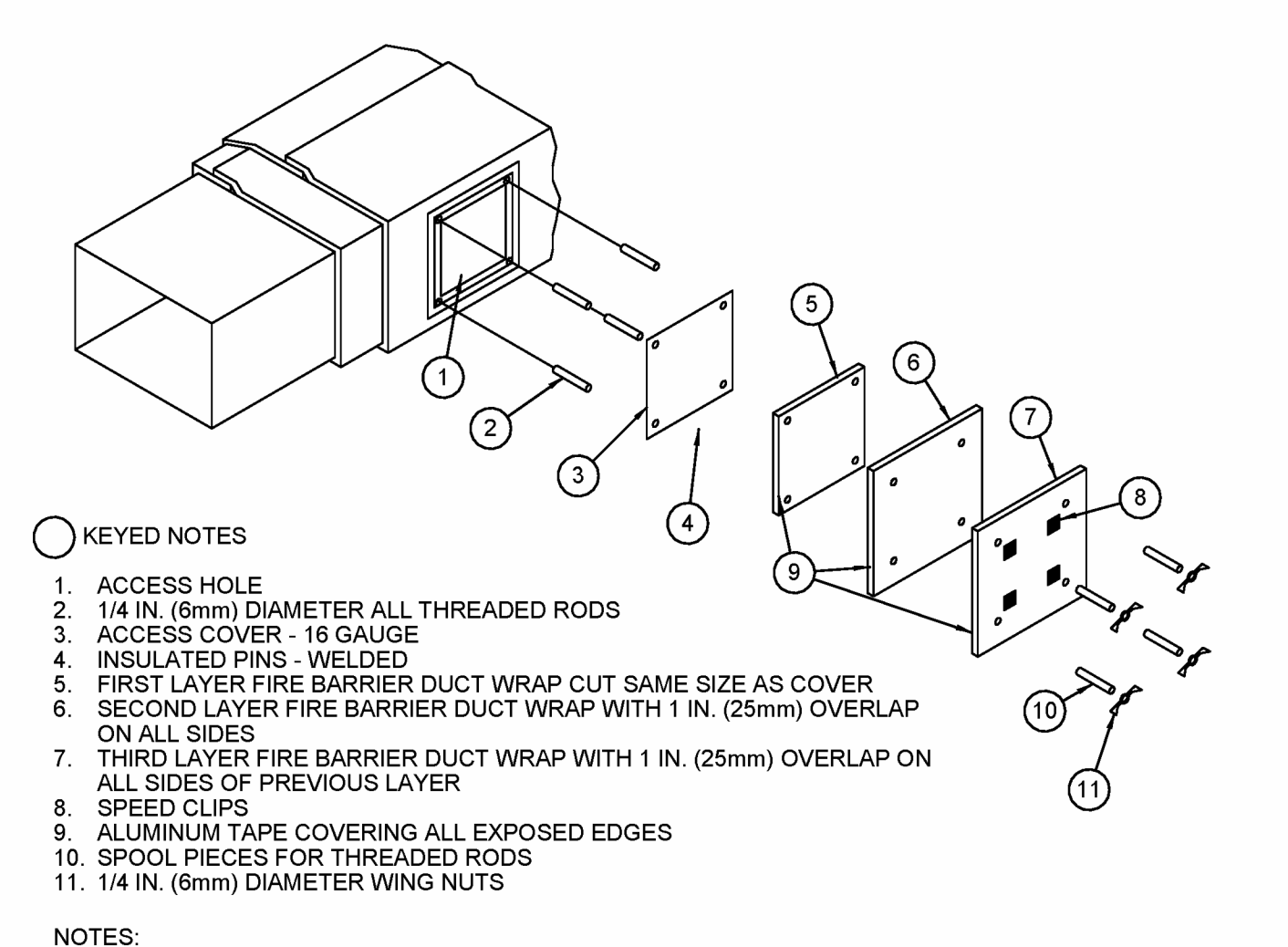
Emporium Design, LLC
54 West 39th Street, Floor 16
New York, New York 10018



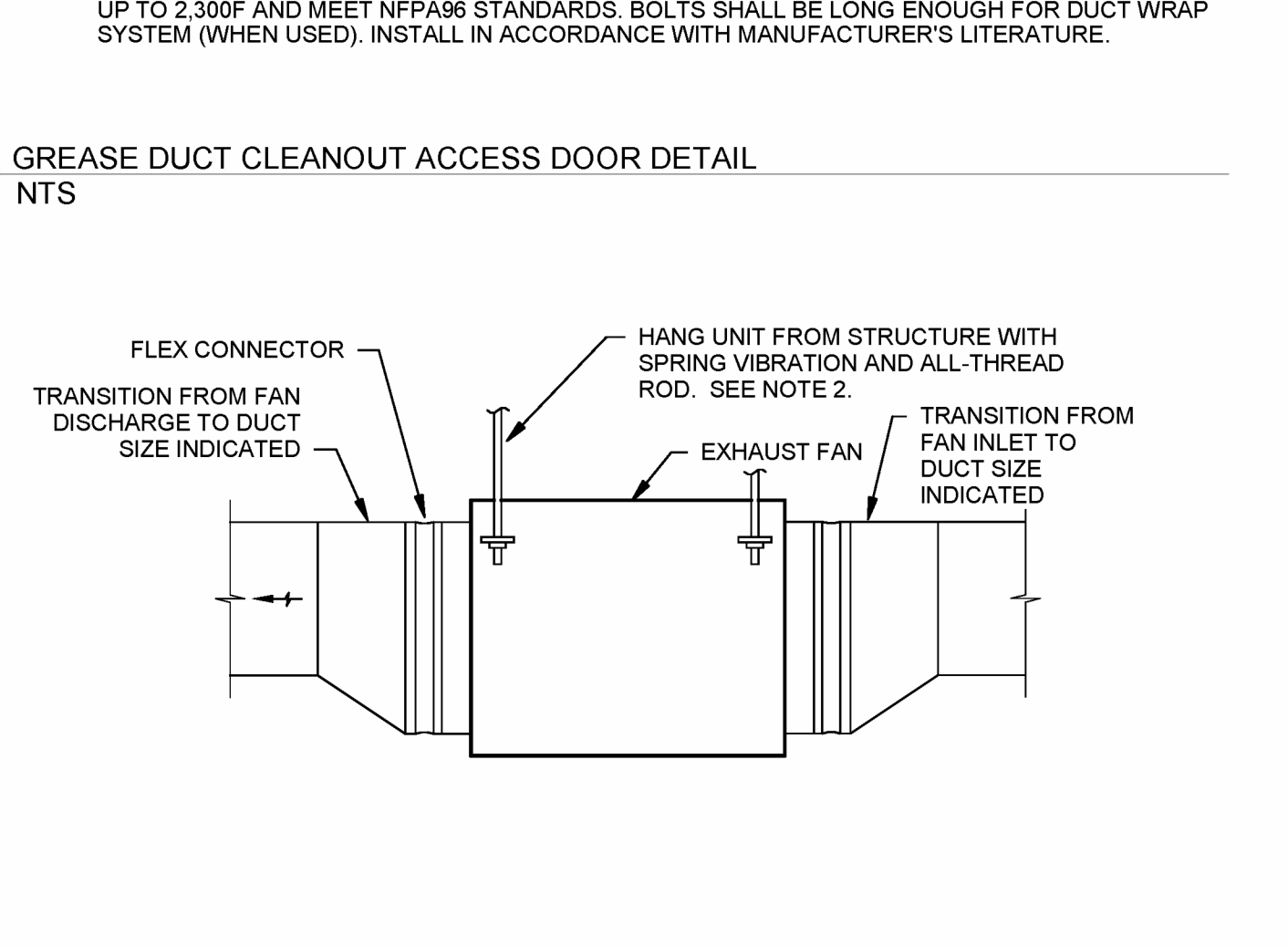
14 UTILITY VENT SET FAN INLET DETAIL NTS



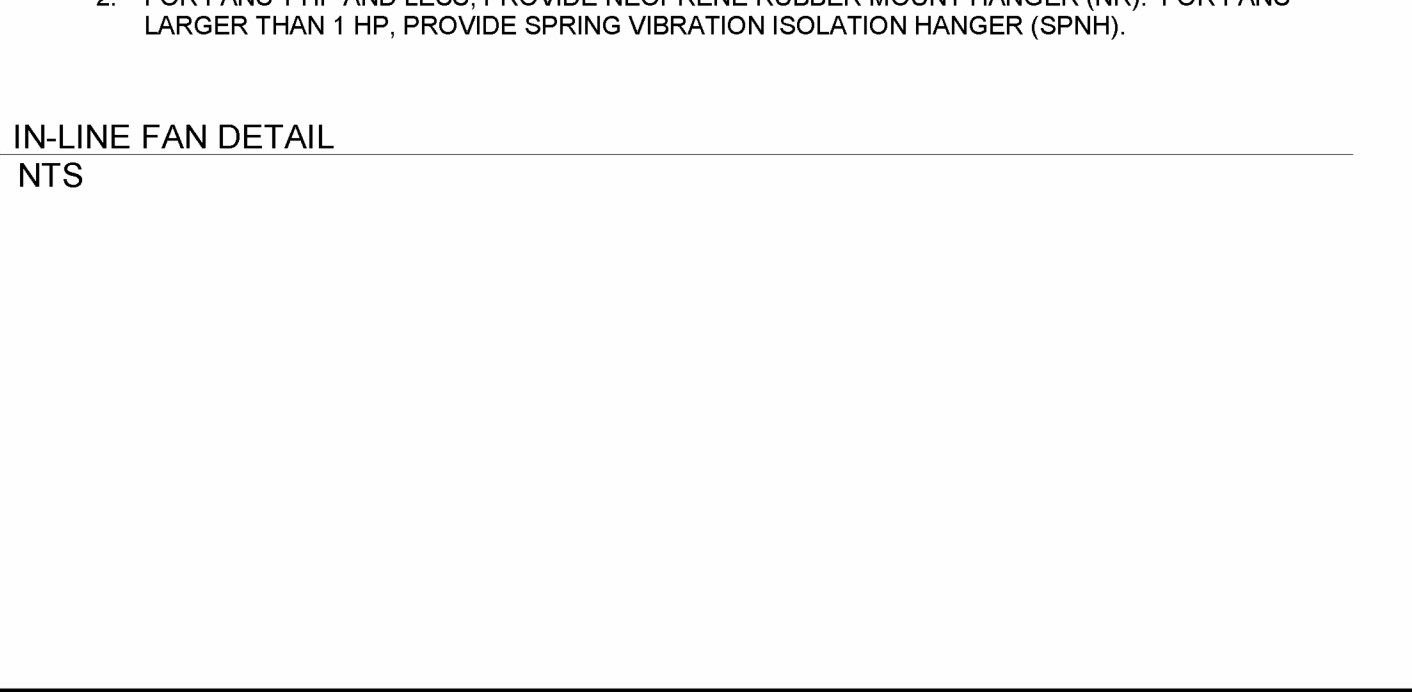
12 RELIEF LOUVER INSTALLATION DETAIL NTS



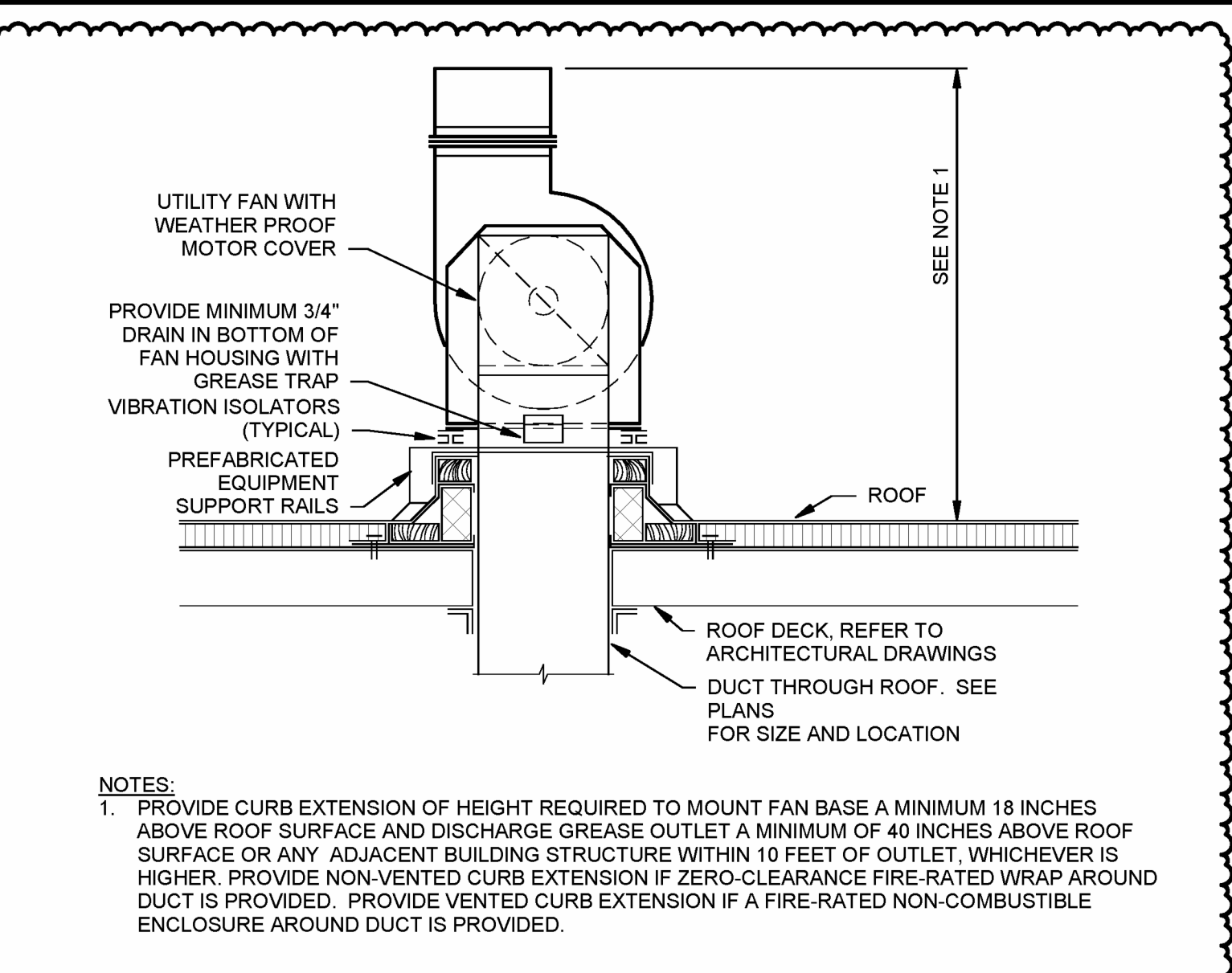
8 GREASE DUCT CLEANOUT ACCESS DOOR DETAIL NTS



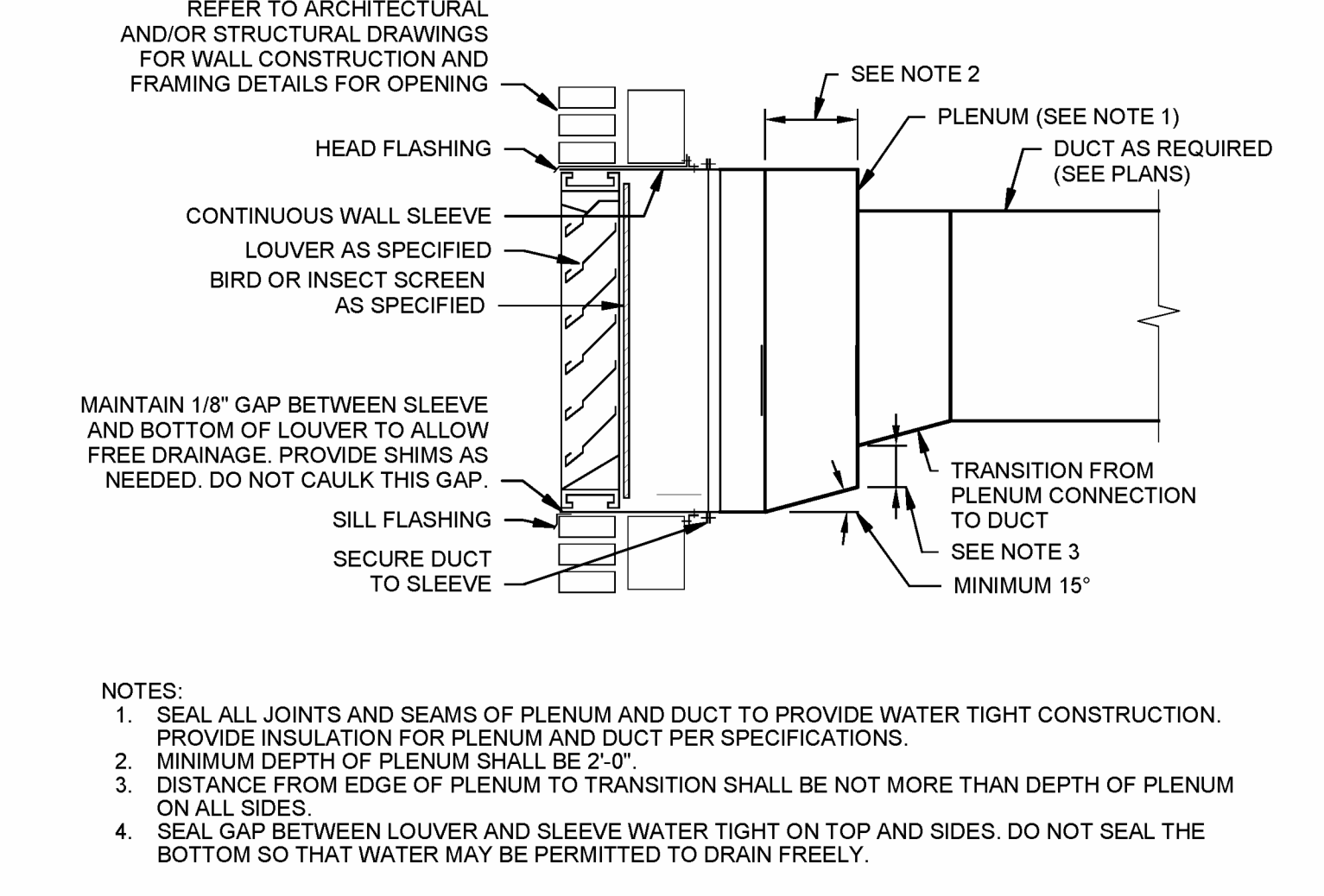
7 GREASE DUCT FIRE WRAP INSULATION INSTALLATION DETAIL NTS



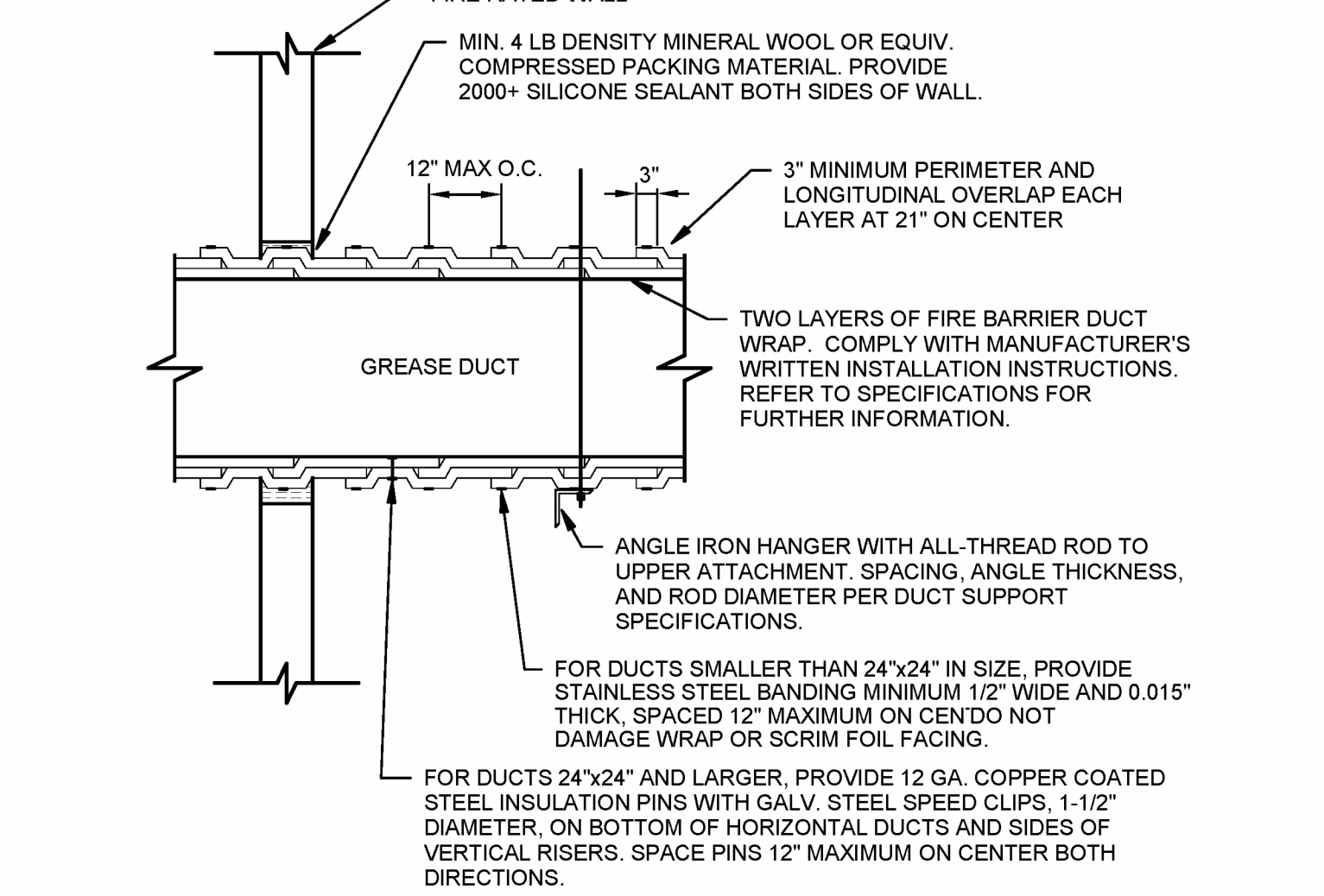
3 DUCT MOUNTED REGISTER DETAIL NTS



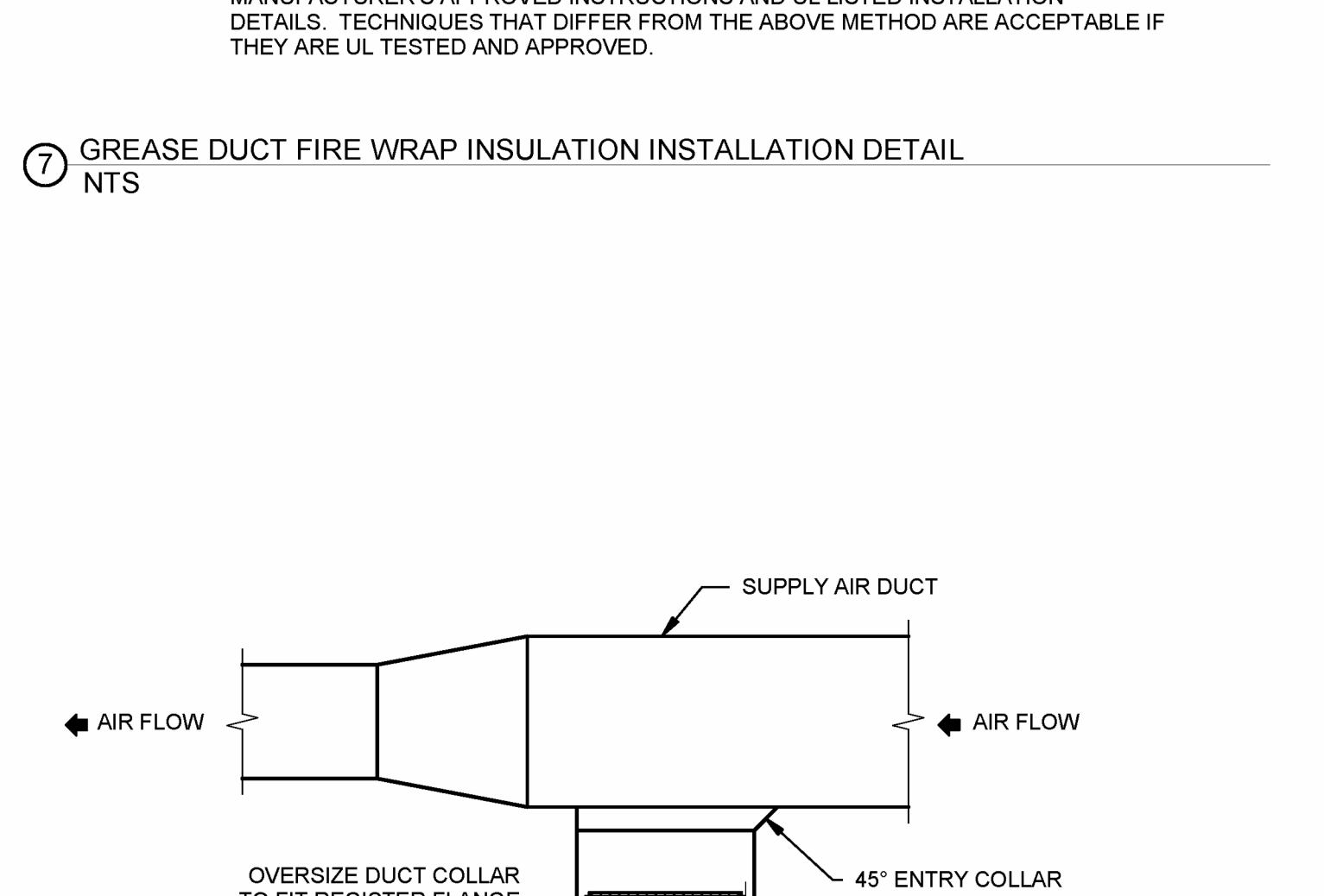
13 UTILITY SET FAN FOR GREASE EXHAUST DETAIL NTS



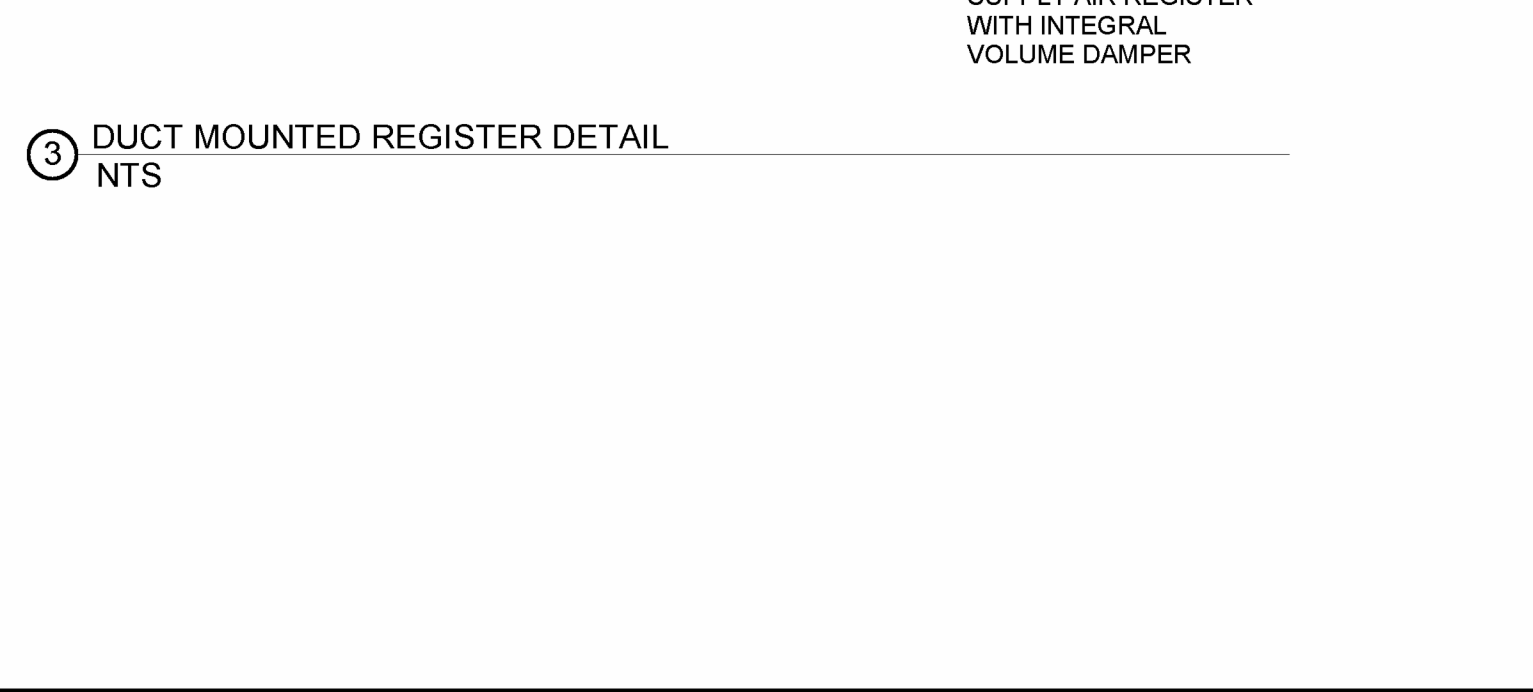
11 INTAKE LOUVER INSTALLATION DETAIL NTS



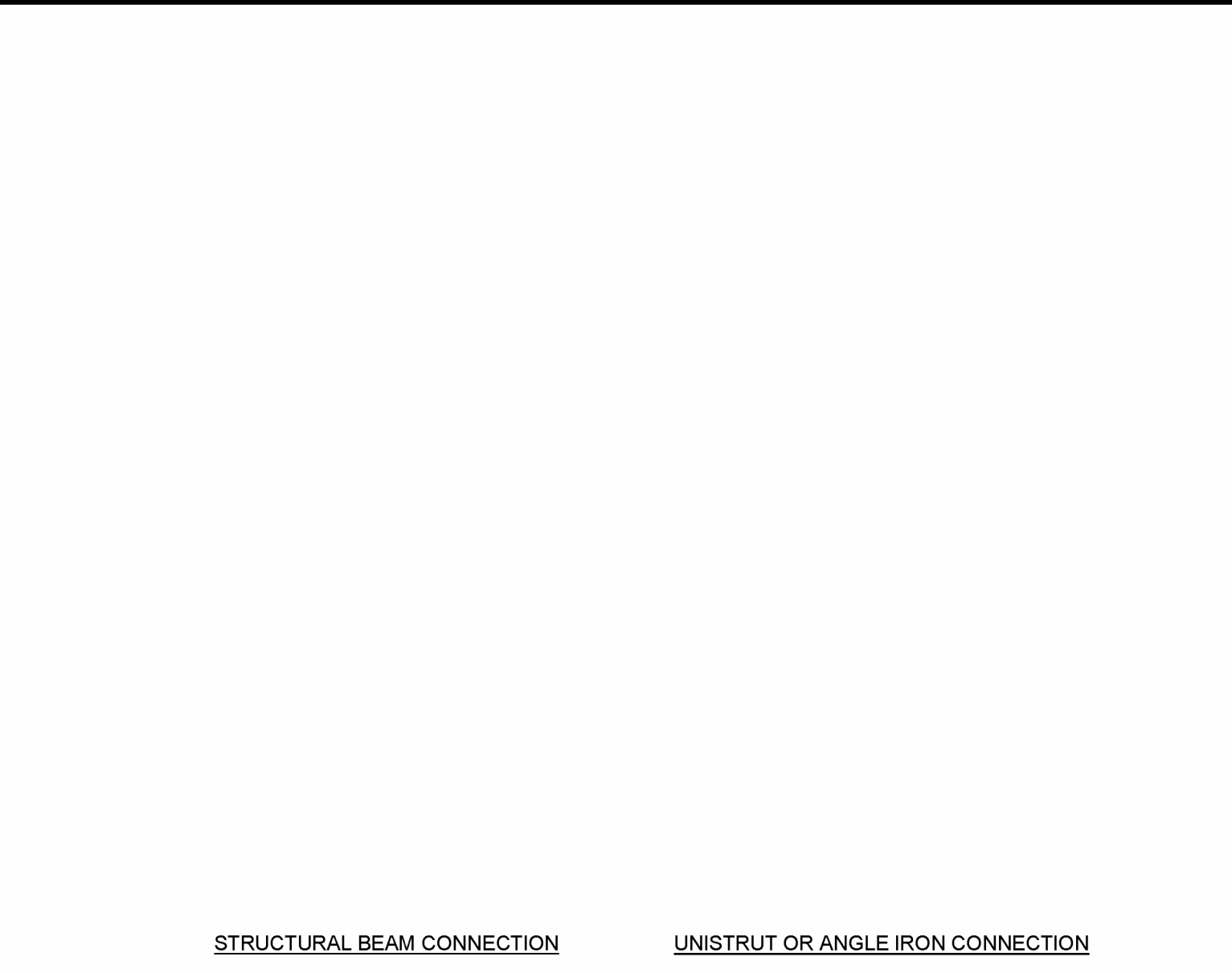
9 HORIZONTAL HVAC UNIT DETAIL NTS



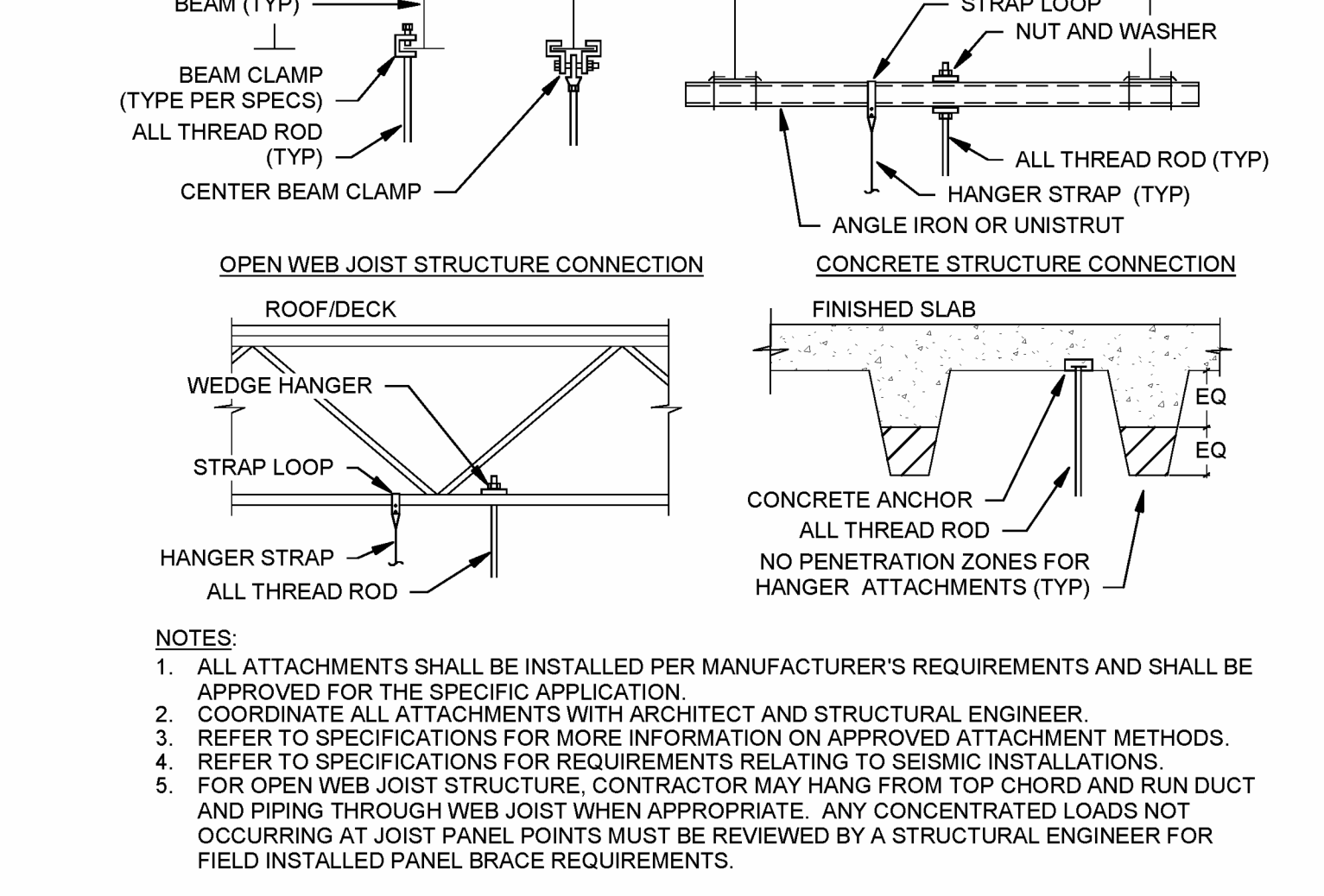
6 DUCT HANGER LOWER ATTACHMENT DETAILS NTS



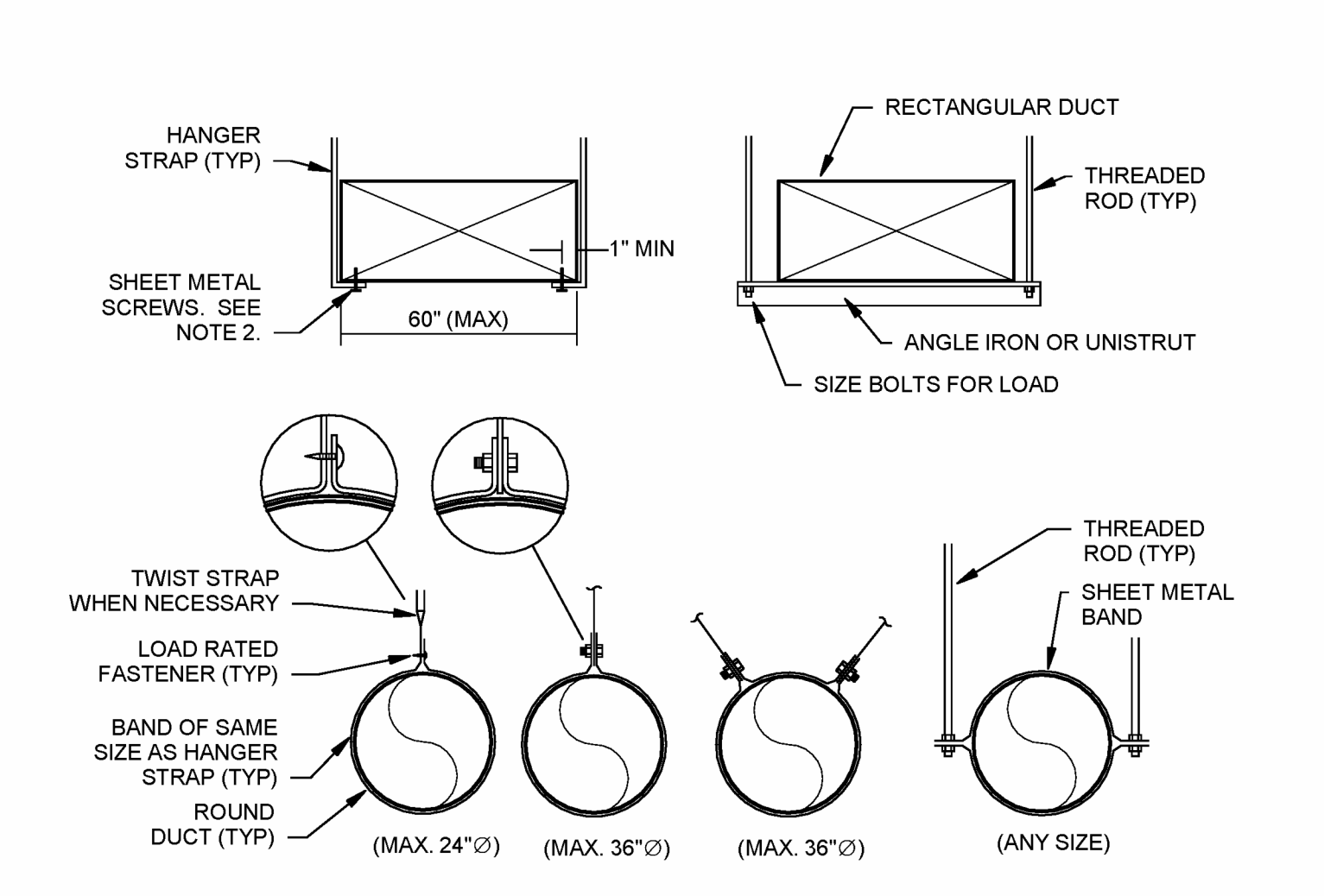
2 HARD CEILING DIFFUSER DETAIL NTS



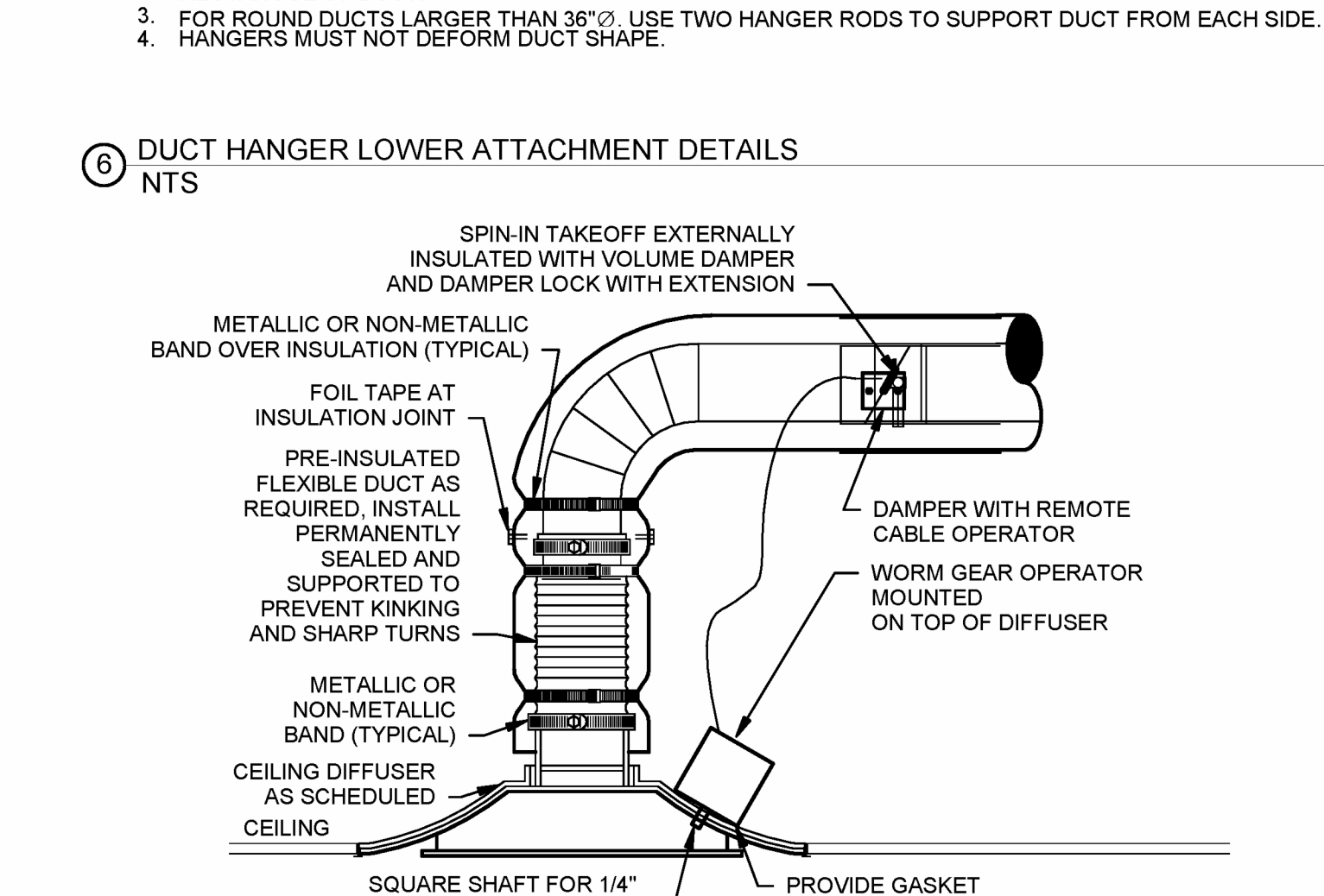
10 HANGER UPPER ATTACHMENT DETAILS NTS



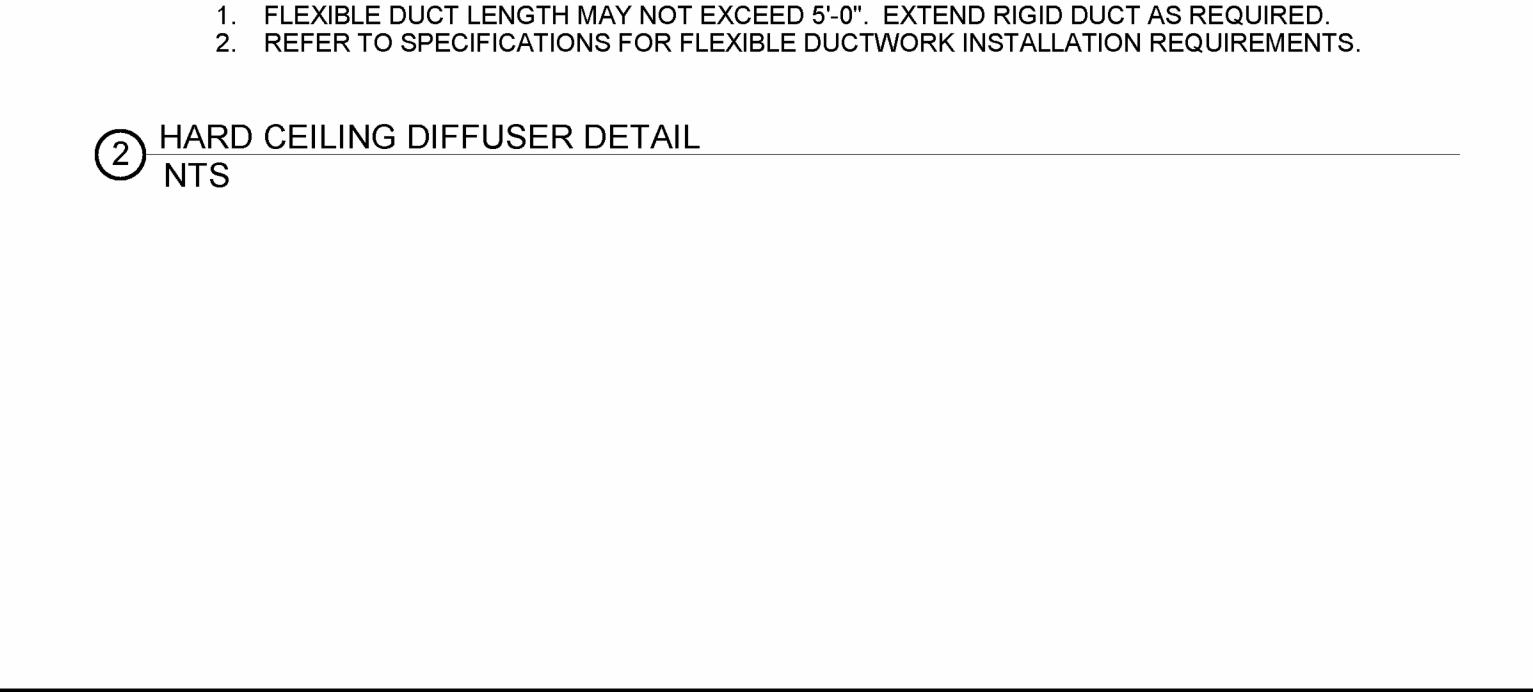
5 KITCHEN EXHAUST HOOD ELEVATION DETAIL NTS



1 LAY-IN CEILING DIFFUSER DETAIL NTS



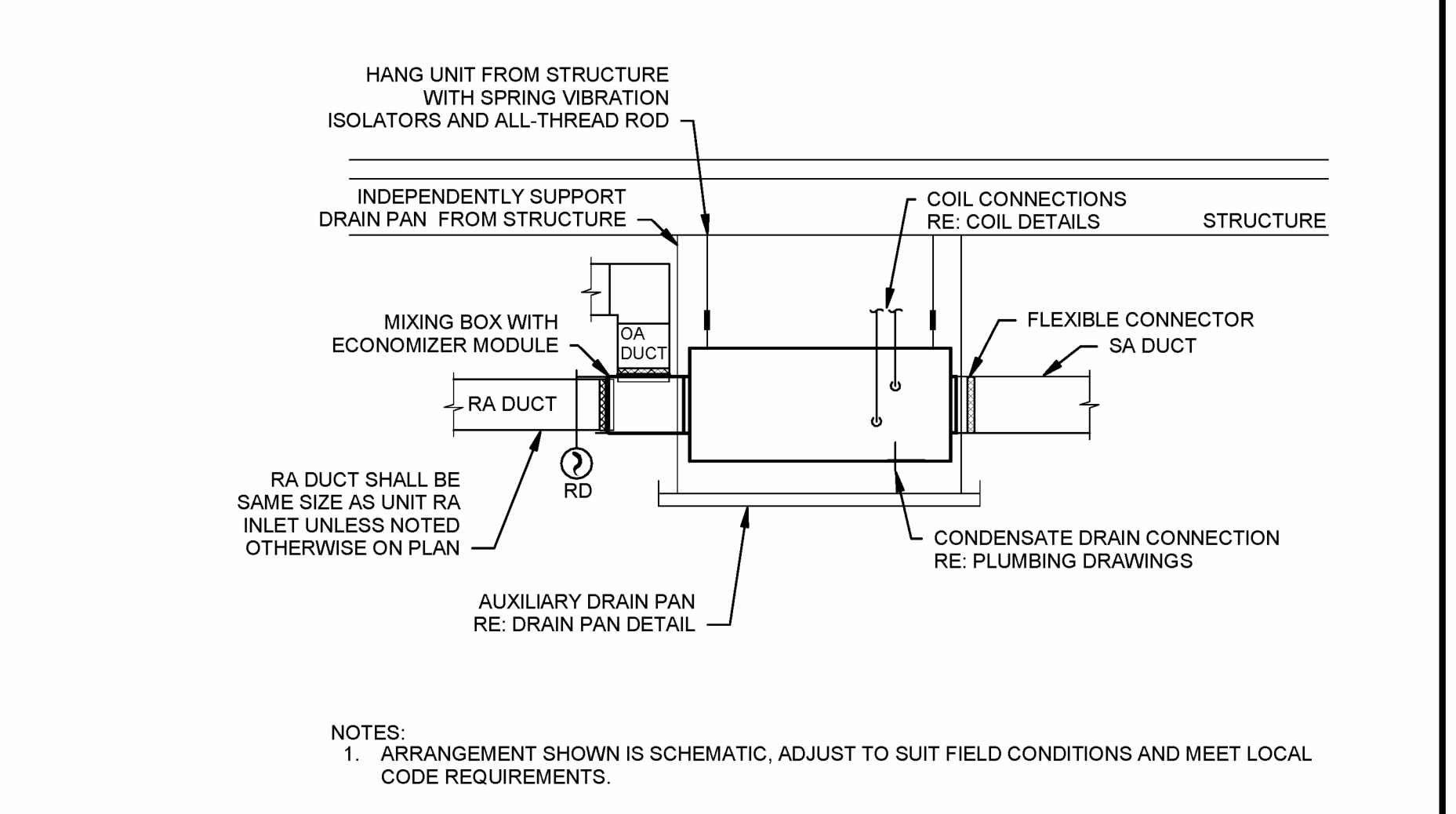
4 IN-LINE FAN DETAIL NTS



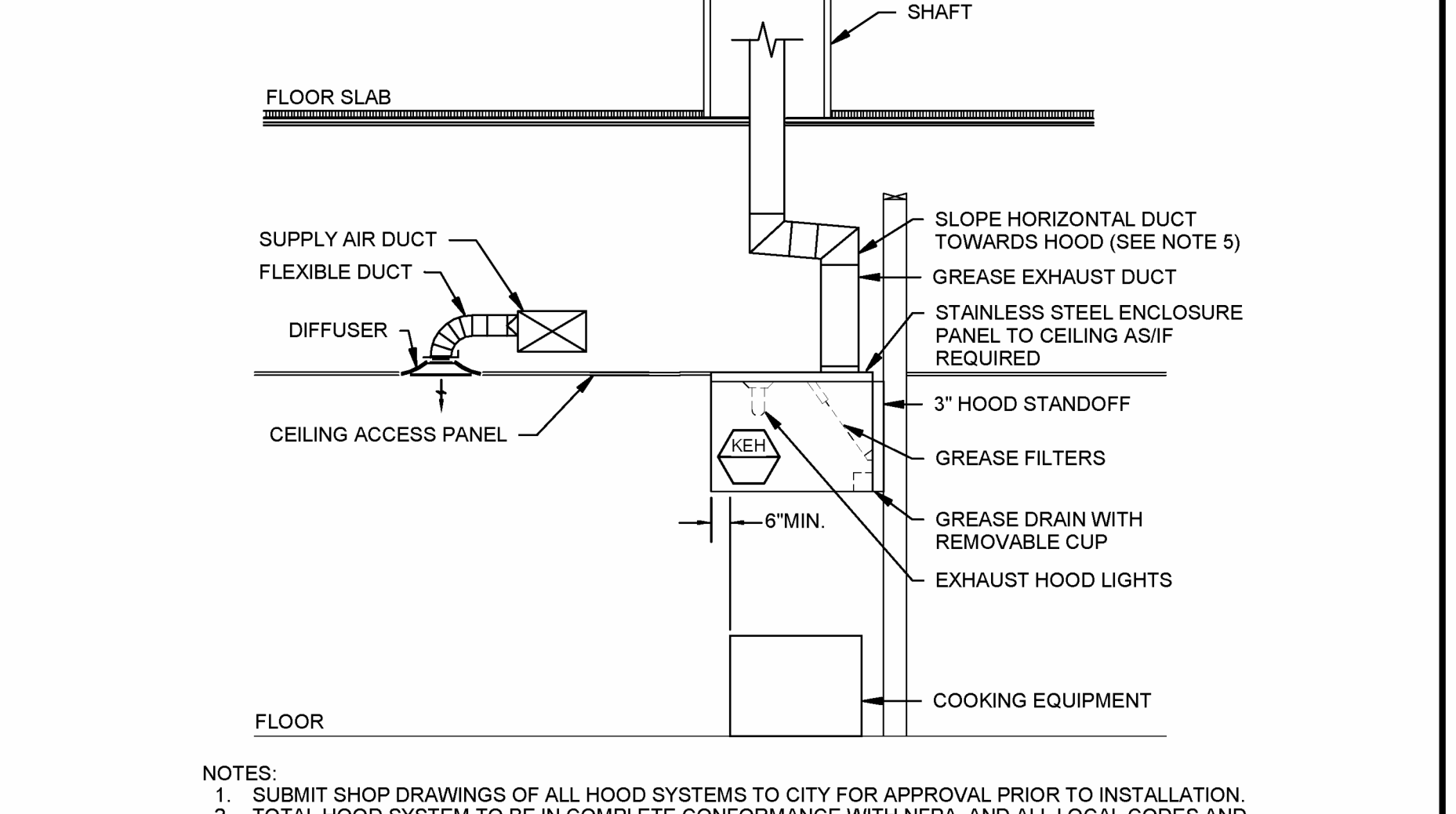
14 UTILITY VENT SET FAN INLET DETAIL NTS



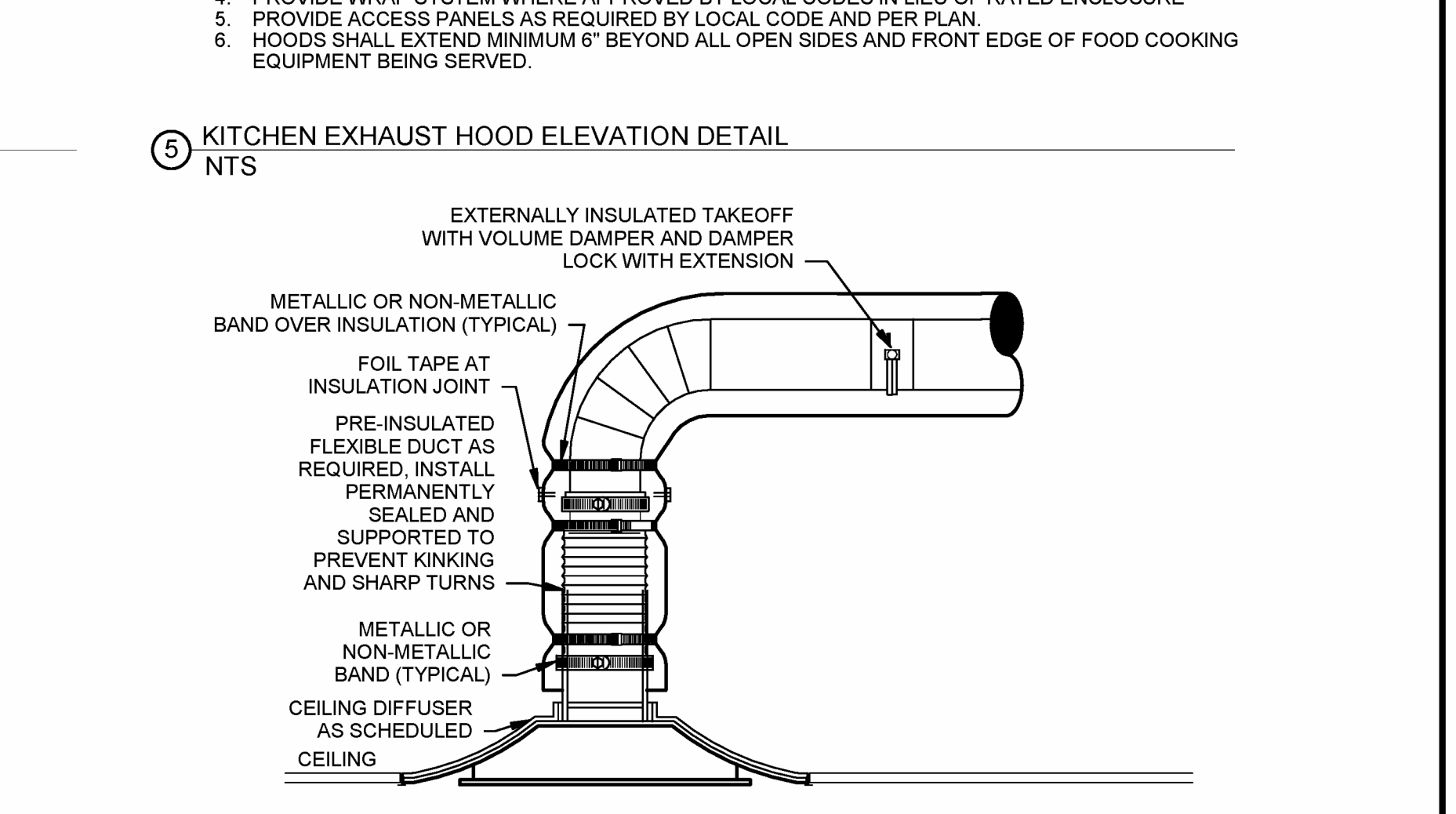
13 UTILITY SET FAN FOR GREASE EXHAUST DETAIL NTS



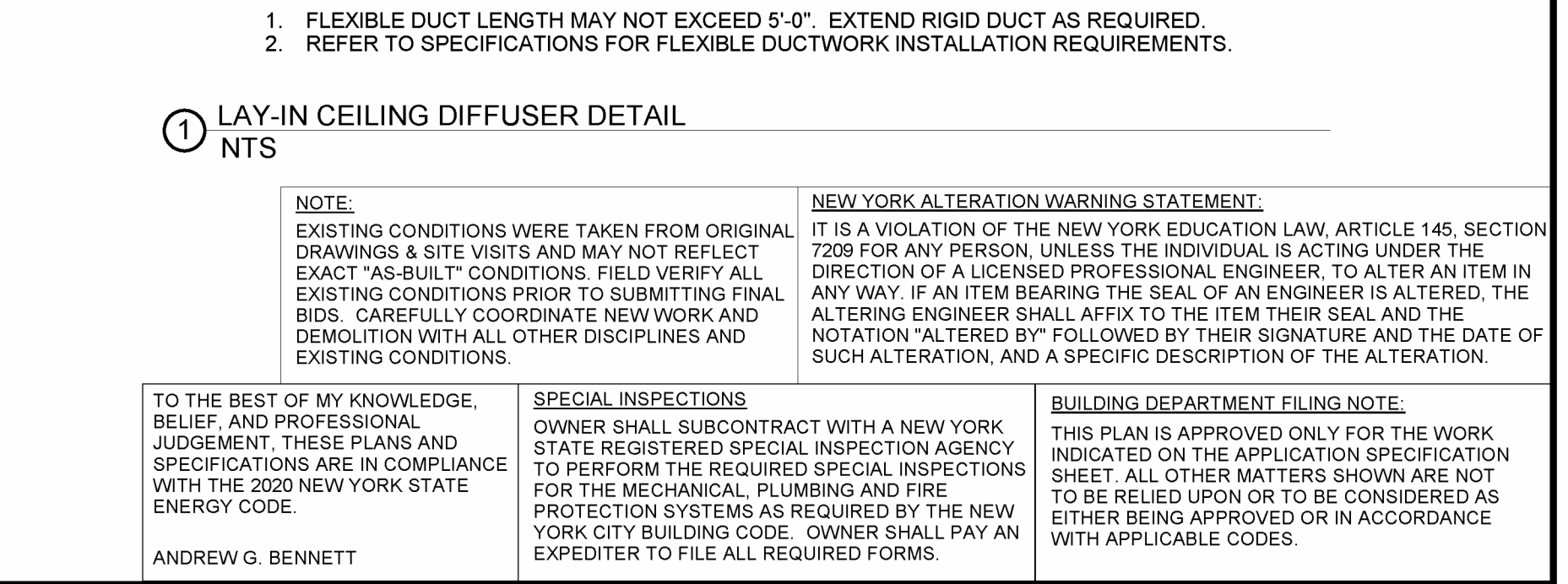
11 INTAKE LOUVER INSTALLATION DETAIL NTS



9 HORIZONTAL HVAC UNIT DETAIL NTS



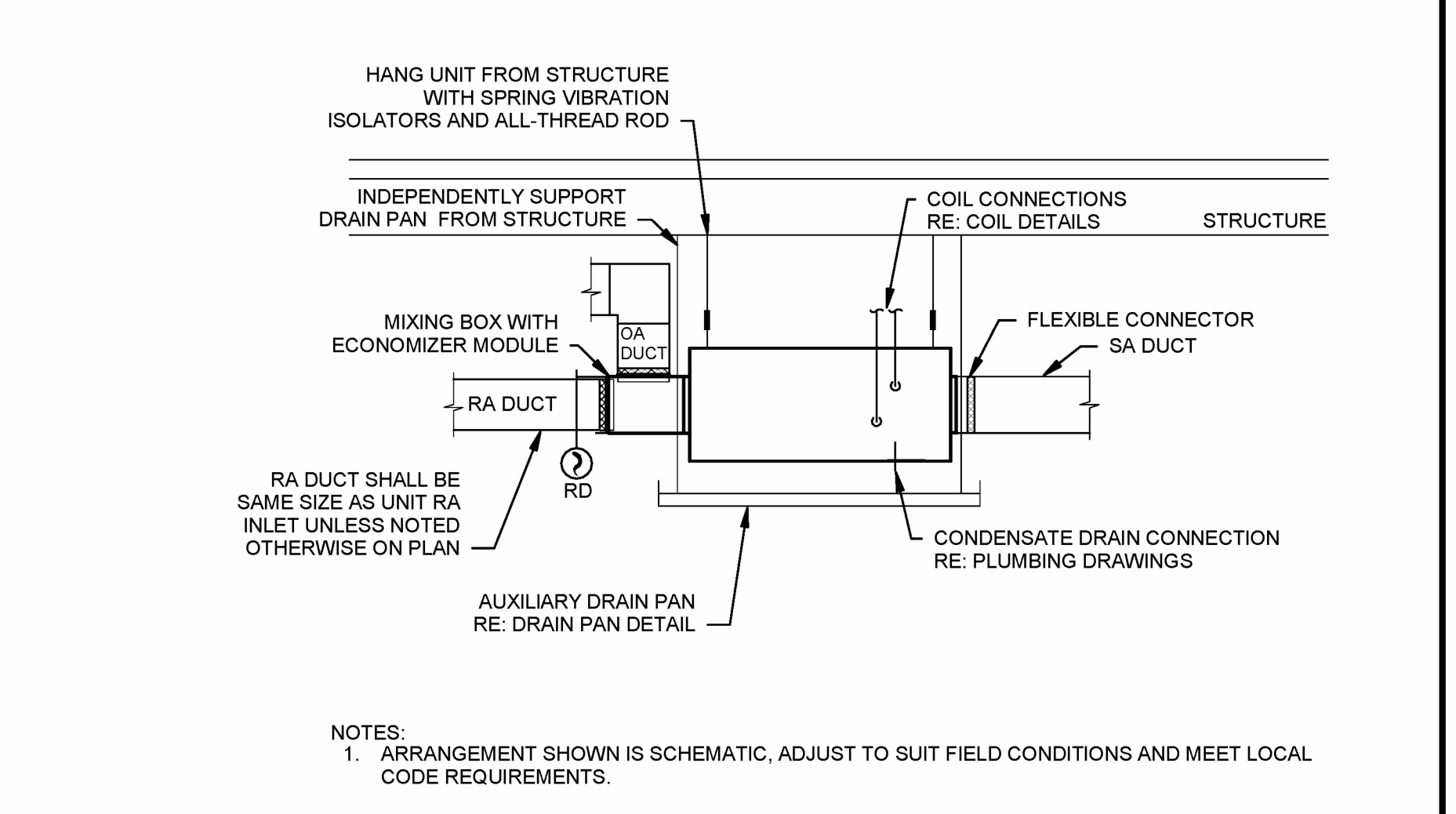
6 DUCT HANGER LOWER ATTACHMENT DETAILS NTS



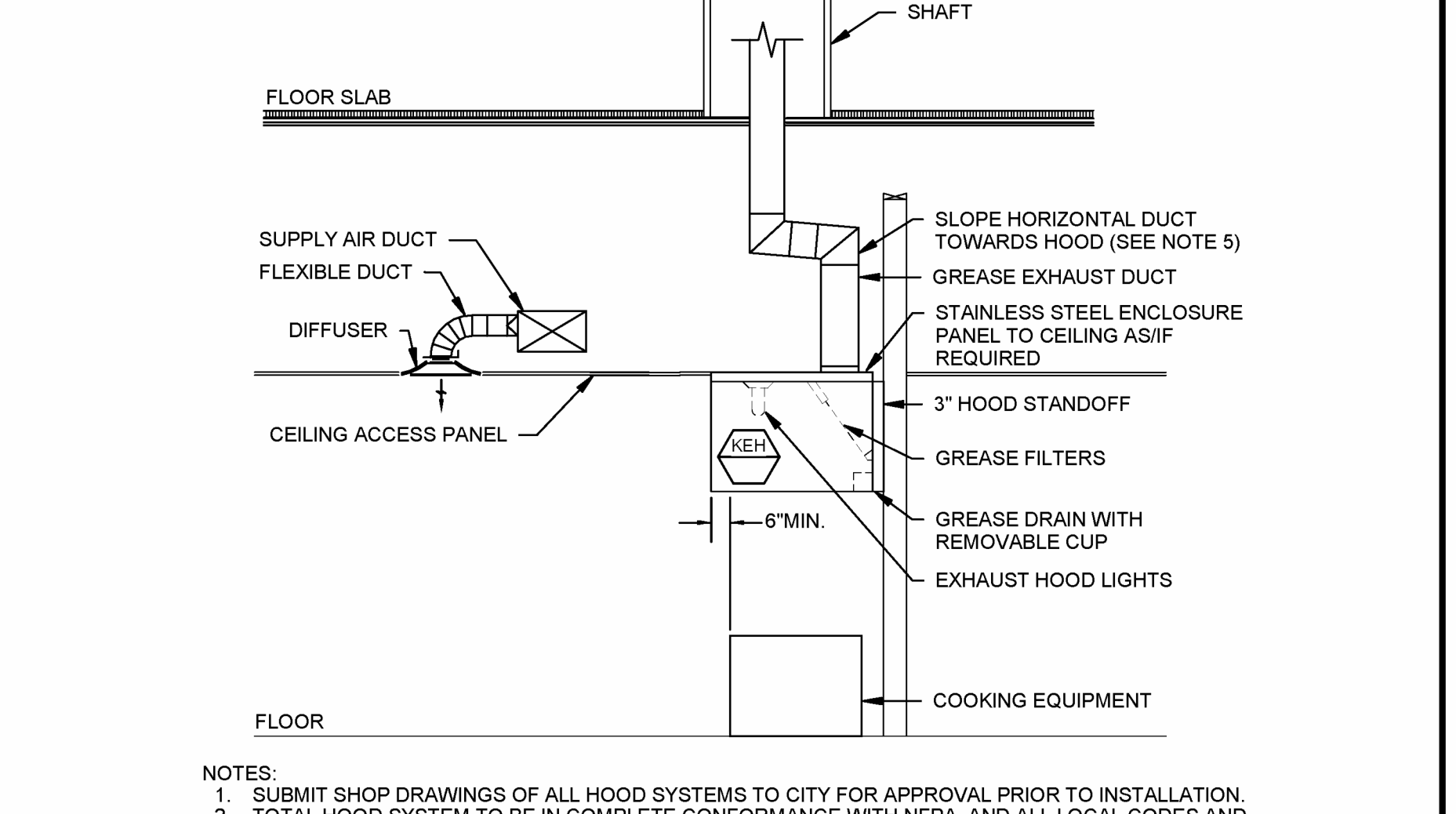
2 HARD CEILING DIFFUSER DETAIL NTS



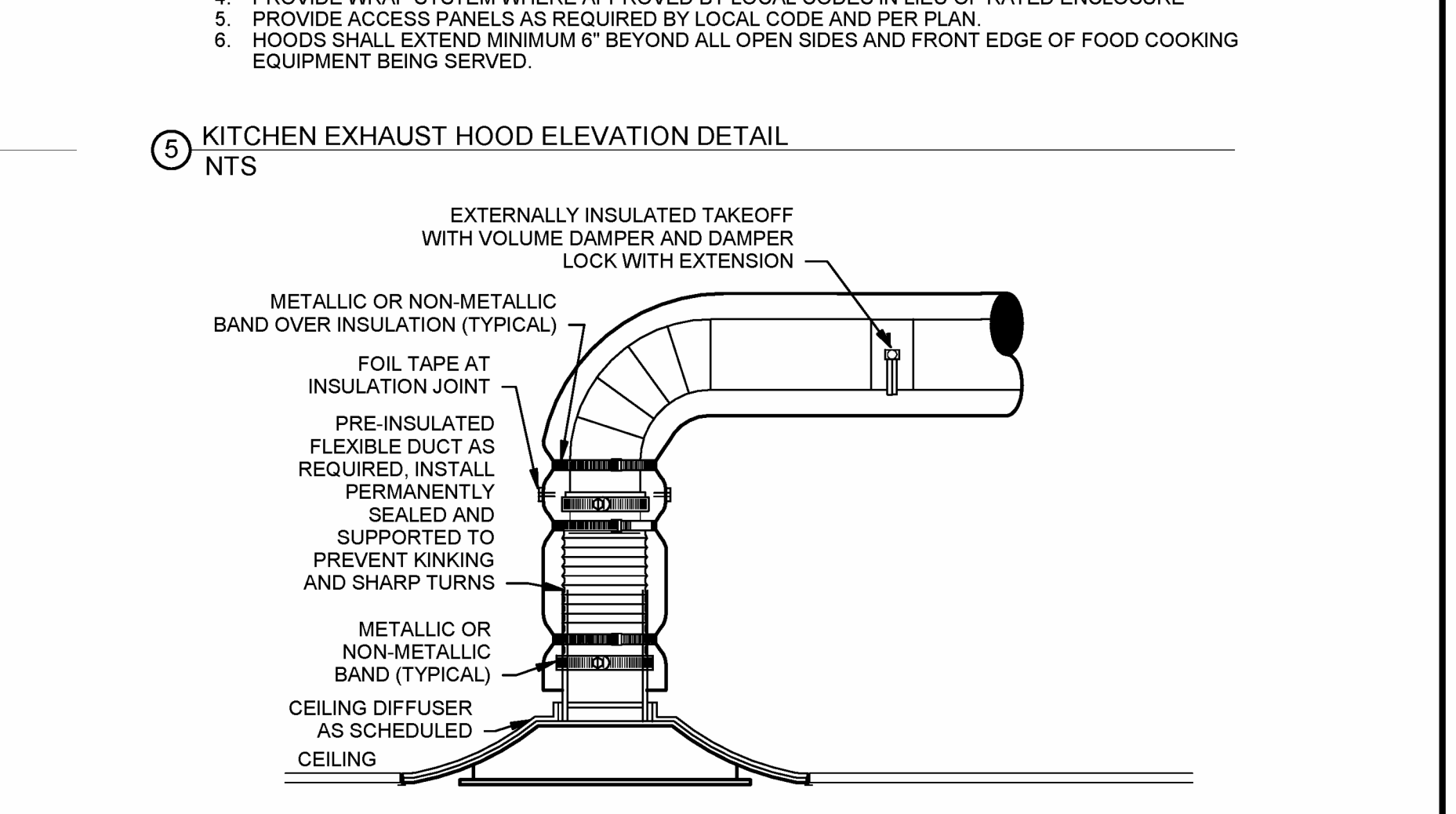
10 HANGER UPPER ATTACHMENT DETAILS NTS



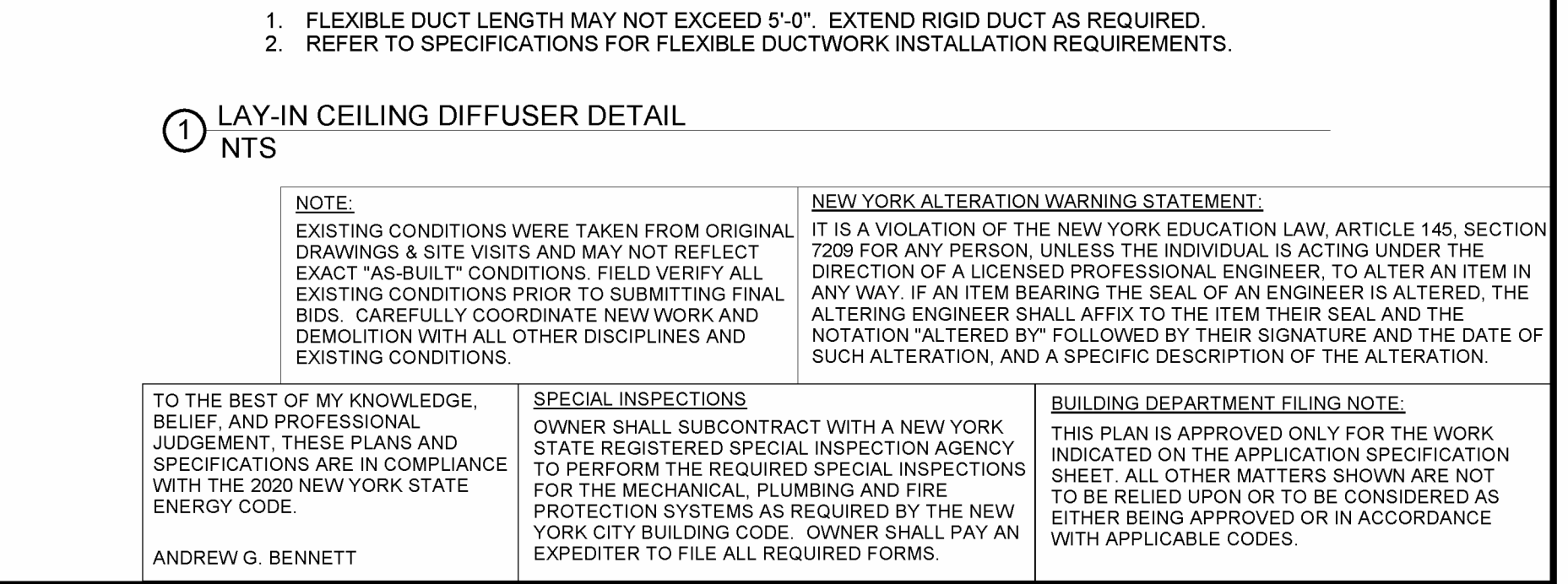
5 KITCHEN EXHAUST HOOD ELEVATION DETAIL NTS



1 LAY-IN CEILING DIFFUSER DETAIL NTS



4 IN-LINE FAN DETAIL NTS



14 UTILITY VENT SET FAN INLET DETAIL NTS

NEW YORK ALTERATION WARNING STATEMENT:
IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER AN ITEM IN EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

SPECIAL INSPECTIONS:
OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE:
THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.

ANDREW G. BENNETT

<p>Division 23: TABLE OF CONTENTS</p> <p>GENERAL MECHANICAL REQUIREMENTS</p> <p>1. GENERAL INSTRUCTIONS</p> <p>A. GENERAL REQUIREMENTS B. DEFINITIONS C. PRE-BID SITE VISIT D. MATERIAL AND WORKMANSHIP E. MANUFACTURERS F. COORDINATION G. ORDINANCES AND CODES H. PROTECTION OF EQUIPMENT AND MATERIALS I. SUBSTITUTIONS J. SUBMITTALS K. ELECTRONIC DRAWINGS FILES L. RECORD DRAWINGS (AS-BUILT DRAWINGS) M. OPERATION AND MAINTENANCE INSTRUCTIONS N. SPARE PARTS O. TRAINING P. WARRANTIES</p> <p>2. GENERAL MATERIALS AND INSTALLATION</p> <p>A. BUILDING OPERATION B. EXISTING EQUIPMENT REUSE AND REMOVAL C. EXCAVATION AND BACKFILLING D. COINCIDENTAL DAMAGE E. CUTTING AND PATCHING F. ROUGH-IN G. STRUCTURAL SUPPORT SYSTEMS H. PRE-ENGINEERED ROOF EQUIPMENT SUPPORTS AND CURBS I. ACCESS PANELS AND DOORS J. PENETRATIONS K. FIRESTOPPING L. MOTORS AND STARTERS M. VARIABLE FREQUENCY DRIVES N. ELECTRICAL WIRING O. EQUIPMENT FURNISHED BY OTHERS P. SYSTEM TESTING, ADJUSTING, AND BALANCING Q. VIBRATION ISOLATION R. SEISMIC CONTROLS FOR MEFP SYSTEMS S. AIR FILTERS T. REFRIGERANT AND OIL U. IDENTIFICATION</p> <p>3. DUCT INSULATION, DUCTWORK, ACCESSORIES, FLUES AND FANS</p> <p>A. DUCT INSULATION B. DUCTWORK C. FLEXIBLE DUCT D. PLASTIC FLUE GAS VENTS E. AIR DEVICES F. CONTROL DAMPERS G. EXHAUST AIR SYSTEMS H. KITCHEN EXHAUST AIR SYSTEMS</p> <p>4. HVAC EQUIPMENT</p> <p>A. ROOFTOP UNITS (GAS FIRED HEAT) 3-25 TONS B. ELECTRIC UNIT HEATERS C. NATURAL GAS RADIANT HEATERS D. SPLIT DUCTLESS AIR-CONDITIONING SYSTEMS E. AIR CURTAINS</p> <p>5. PIPING AND PIPING SPECIALTIES</p> <p>A. REFRIGERANT PIPING AND INSULATION B. SYSTEM EVACUATION AND CHARGING</p> <p>6. TEMPERATURE CONTROLS</p> <p>A. GENERAL REQUIREMENTS B. WIRING C. THERMOSTAT CONTROL EQUIPMENT D. SENSORS AND RELAYS</p> <p>7. SEQUENCE OF OPERATION</p> <p>A. FAN COIL UNIT CONTROL B. KITCHEN EXHAUST FAN CONTROL C. MAKE-UP AIR UNIT CONTROL D. ROOFTOP UNIT CONTROL E. RESTROOM EXHAUST FAN (EF-1) CONTROL F. AIR CURTAIN CONTROL G. ELECTRIC UNIT HEATER CONTROL</p> <p>8. ALTERNATIVES</p> <p>A. DESCRIPTION</p> <p>9. COMMISSIONING OF MECHANICAL SYSTEM</p> <p>A. GENERAL B. EXECUTION</p> <p>DESIGNER NOTE: EDIT THIS TABLE OF CONTENTS AS REQUIRED FOR YOUR PROJECT</p>	<p>Division 23: HEATING, VENTILATING, AND AIR CONDITIONING</p> <p>1. GENERAL INSTRUCTIONS</p> <p>A. GENERAL REQUIREMENTS</p> <p>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 all its contents prior to reviewing proposals 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.</p> <p>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.</p> <p>Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and quantities. They control the work. They take precedence over the specifications. The 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 when when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory, and properly operating system.</p> <p>B. DEFINITIONS</p> <p>Division: References contained in this specification follow the numbering system defined in the Construction Specifications Institute (CSI) MasterFormat 2004 Edition. Specification Divisions 01 through 12 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:</p> <table border="1"> <tr> <td>2004 Edition</td> <td>1995 Edition</td> </tr> <tr> <td>1. Division 21 - Duct Suppression</td> <td>Division 15</td> </tr> <tr> <td>2. Division 22 - Plumbing</td> <td>Division 15</td> </tr> <tr> <td>3. Division 23 - HVAC</td> <td>Division 15</td> </tr> <tr> <td>4. Division 24 - Electrical</td> <td>Division 16</td> </tr> <tr> <td>5. Division 27 - Communications</td> <td>Division 16</td> </tr> <tr> <td>6. Division 28 - Electronic Safety and Security</td> <td>Division 16</td> </tr> </table> <p>Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations."</p> <p>Install: "to perform all operations at the project site including, but not limited to, the actual unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."</p> <p>Provide: "to furnish and install."</p> <p>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."</p> <p>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 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.</p> <p>AHJ: The local code and/or inspection agency (Authority) Having Jurisdiction over the work.</p> <p>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.</p> <p>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.</p> <p>1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.</p> <p>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.</p> <p>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.</p> <p>C. PREBID SITE VISIT</p> <p>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.</p> <p>D. MATERIAL AND WORKMANSHIP</p> <p>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 item, written descriptions of the item govern model numbers.</p> <p>Pipe, pipe fittings, pipe specialties and valves shall be manufactured in plants located in the United States or certified to meet the specified ASTM and ANSI standards.</p> <p>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 best possible by experienced mechanics. Installations shall comply with applicable codes and laws.</p> <p>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.</p> <p>Remove from the premises waste material present as a result of work, including cartons, crating, paper, stickers, and/or excavation material not used in backfilling. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.</p> <p>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.</p> <p>E. MANUFACTURERS</p> <p>In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.</p> <p>Where a list is provided, manufacturers are listed alphabetically and not in accordance with any ranking or preference.</p> <p>Where 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.</p> <p>F. COORDINATION</p> <p>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 no additional cost to the Owner.</p> <p>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 as to not interfere with or delay the work of other trades.</p> <p>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.</p> <p>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.</p> <p>G. ORDINANCES AND CODES</p> <p>Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished 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:</p> <ol style="list-style-type: none"> National Electrical Code (NEC) National Fire Protection Association (NFPA) Underwriters Laboratories (UL) Occupational Safety and Health Administration (OSHA) American Society of Mechanical Engineers (ASME) American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) American National Standards Institute (ANSI) American Society of Testing and Materials (ASTM) Other national standards and codes where applicable. <p>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.</p> <p>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.</p> <p>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.</p> <p>H. PROTECTION OF EQUIPMENT AND MATERIALS</p> <p>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 inside 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. Seal any tears or joints of internal fiberglass insulation. Equipment and material damaged by construction activities shall be rejected and Contractor shall furnish new equipment and material of a like kind at his own expense.</p> <p>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.</p> <p>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.</p> <p>I. SUBSTITUTIONS</p> <p>Materials, products, equipment, and systems described in the Bidding Documents establish a standard of required form, 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.</p>	2004 Edition	1995 Edition	1. Division 21 - Duct Suppression	Division 15	2. Division 22 - Plumbing	Division 15	3. Division 23 - HVAC	Division 15	4. Division 24 - Electrical	Division 16	5. Division 27 - Communications	Division 16	6. Division 28 - Electronic Safety and Security	Division 16	<p>Unless stated otherwise in writing to the Engineer by the Contractor, Contractor warrants to the Engineer, Architect, and Owner the following:</p> <ol style="list-style-type: none"> 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. Proposed substitution is consistent with the Contract Documents and will produce indicated results, including functional clearances, maintenance service, and sourcing of replacement parts so as to demonstrate compliance with the Contract Documents. Proposed substitution has received necessary approvals of authorities having jurisdiction. Same warranty will be furnished for proposed substitution as for specified Work. If accepted substitution fails to perform as required, Contractor shall replace substitute material or system with that originally specified and bear costs incurred thereby. Coordination, installation and changes in the Work as necessary for accepted substitution will be complete in all respects. <p>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 is bid has been received by the Engineer at least ten (10) calendar days prior to the date for receipt of bids.</p> <p>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.</p> <p>J. SUBMITTALS</p> <p>Assemble and submit for review shop drawings, material lists, manufacturer product literature for to be furnished, and items requiring coordination between trades under this contract. Provide 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.</p> <p>Transmit submittals as early as required to support the project schedule. Allow for two weeks Engineer review time, plus 15% from mailing time via the Architect, plus a duplication of this time for resubmittal, if required. Only resubmit those sections requested for resubmittal.</p> <p>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 sheets, and other submittal data. 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.</p> <p>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.</p> <p>Prepare submittals according to individual specification sections. Illegible submittals will be rejected and returned without review. Catalog data shall be properly bound, 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 up inapplicable items. Shop drawings will be returned without review if the above mentioned requirements are not met.</p> <p>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 specified 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.</p> <p>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.</p> <p>K. ELECTRONIC DRAWING FILES</p> <p>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 and to specify shipping method and drawing format. 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.</p> <p>L. RECORD DRAWINGS (AS-BUILT DRAWINGS)</p> <p>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 above.</p> <p>See Division 01 and General Conditions for additional information.</p> <p>M. OPERATION AND MAINTENANCE INSTRUCTIONS</p> <p>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.</p> <p>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.</p> <p>Include Record Drawings as described above.</p> <p>Refer to Division 01 for acceptance of electronic manuals for this project. For electronic manuals, refer to paragraph "Submittals" for requirements.</p> <p>N. SPARE PARTS</p> <p>Furnish to Owner, with receipt, the following spare parts for the equipment furnished for this project:</p> <ol style="list-style-type: none"> 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 the Owner. Furnish one complete set of belts for each fan. Furnish three operating keys for each type of air outlet and inlet that require them. <p>O. TRAINING</p> <p>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.</p> <p>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 startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.</p> <p>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.</p> <p>Schedule training with Owner with at least 7 days advance notice.</p> <p>P. WARRANTIES</p> <p>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 terms are noted to carry a longer warranty in the construction documents 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.</p> <p>2. GENERAL MATERIALS AND INSTALLATION</p> <p>A. BUILDING OPERATION</p> <p>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 will only written approval of building Owner and tenant. Coordinate interruption of building operation with the Owner and/or tenant a minimum of seven (7) days in advance of work.</p> <p>B. EXISTING EQUIPMENT REUSE AND REMOVAL</p> <p>Remove all unused equipment, ductwork, piping, and associated supports. Cap ductwork and piping at mains and seal air and water tight.</p> <p>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.</p> <p>Seal airtight existing ductwork required to be abandoned in place or not in use at the termination of the work.</p> <p>Cap and seal weathertight existing roof curbs and roof openings to be abandoned in place as a result of equipment removal.</p> <p>Clean and rebalance existing ductwork, diffusers, registers, and grilles intended for reuse as required or as indicated on drawings.</p> <p>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.</p> <p>C. EXCAVATION AND BACKFILLING</p> <p>Perform excavation and backfill required for installation of underground work under this contract. Trenches shall be of sufficient width. Crib or brace trenches to prevent cave-in or settlement. Do not excavate trenches close to columns and walls of new building without prior consultation with the Architect. Use pumping equipment if required to keep trenches free of water. Backfill trenches in maximum 6 inch layers of well-tamped dry earth in a manner to prevent future settlement.</p> <p>Excavation as specified herein shall be classified as common excavation. Common excavation shall comprise the satisfactory removal and disposition of material of whatever substances and of every description encountered, including rock, if any, within the limits of the work as specified and shown on the drawings. Excavation shall be performed to the lines and grades indicated on the drawings. Excavated materials that are considered unsuitable for backfill and surplus of excavated material which is not required for backfill to the satisfaction of the Architect.</p> <p>D. COINCIDENTAL DAMAGE</p> <p>Repair streets, sidewalks, drives, paving, walls, finishes, and other facilities damaged in the course of the work. Repair materials shall match existing conditions. Repair work shall meet all requirements of the Owner, local authorities having jurisdiction, and meet the satisfaction of the Architect.</p>	<p>E. CUTTING AND PATCHING</p> <p>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 refresh areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the Architect.</p> <p>F. ROUGH-IN</p> <p>Coordinate without delay all roughing-in with other divisions. Conceal piping, conduit, and rough-in except in unfinished areas and where otherwise shown.</p> <p>G. STRUCTURAL SUPPORT SYSTEMS</p> <p>Structural steel used for support of equipment, ductwork and piping shall be new, clean, and conform to ASTM Designation A-36.</p> <p>Support mechanical components from the building structure. Do not support mechanical components from ceilings, other mechanical or electrical components, and other non-structural elements.</p> <p>H. PRE-ENGINEERED ROOF EQUIPMENT SUPPORTS AND CURBS</p> <p>Provide prefabricated equipment support rails and roof curbs manufactured by AES Industries, Custom Curb, Inc., Pate Company, Thybar or approved equal. Provide with fully miller 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 maintain continuous 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.</p> <p>Attach equipment directly to pre-engineered roof equipment support using one of the following methods:</p> <ol style="list-style-type: none"> Rail Equipment Supports: Secure each equipment support leg to the rail with a minimum of 4 points of connection per leg. Roof Curbs: Secure each corner of the equipment to the nailer using a minimum of 4 leg 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 wrap around top of curb and under equipment base rail with sufficient horizontal offset to cover overlap gap between the equipment rail and curb. Secure bracket 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. 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 III(III or IV) and a Design Wind Speed of XXX mph. 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. <p>Provide seismic restraints in accordance with Article "Seismic Controls for MEFP Systems."</p> <p>I. ACCESS PANELS AND DOORS</p> <p>Refer to Architectural documents for specification of access panels and doors.</p> <p>Provide access doors for all concealed equipment and duct and piping assemblies that require service where indicated or as required, except where above lay-in ceilings. Access doors shall be adequately sized for the devices served with a minimum size of 18 inches x 18 inches. Access doors must be of 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, Zum, or equal.</p> <p>J. PENETRATIONS</p> <p>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 sleeves are acceptable for installation in areas without return air plenums.</p> <p>Seal elevated floor, exterior wall and roof penetrations watertight and weather-tight with non-shrink, non-hardening commercial sealant. Pack with mineral wool seal both ends with minimum of 1/2 inch of sealant.</p> <p>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.</p> <p>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 annular clear space between inside of sleeve and outside of insulation.</p> <p>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.</p> <p>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.</p> <p>Seal concrete or masonry exterior wall penetrations below grade with "wall pipes" and mechanical sleeve seals. Provide cast iron "wall pipes" with integral watertight ring manufactured by Jor W. Smith, Josam, Wade, Watts or Zum. Provide modular mechanical sleeve seals, manufactured by Calpicco, Metraflex, or Thunderbolt Link Seal.</p> <p>Seal elevated concrete slab with water proof membrane penetrations with "wall pipes" and water proof sealant. Secure waterproof membrane flashing between existing masonry walls, concrete floors or roofs. Provide cast iron "wall pipes" with integral watertight ring manufactured by Jor W. Smith, Josam, Wade, Watts or Zum.</p> <p>Provide sleeves for horizontal pipe passing through or under foundation. Sleeves shall be cast iron soil pipe two nominal pipe sizes larger than the pipe served.</p> <p>Provide Schedule 40 PVC pipe sleeves for vertical pressure pipe passing through concrete slab on grade. Sleeves shall be one nominal pipe size larger than the pipe served and two pipe sizes larger than pipe served for ductile iron pipes with restraining rods. Seal watertight with silicone caulk.</p> <p>Provide 1/2 inch thick cellular foam insulation around perimeter of non-pressure pipe passing thru concrete slab on grade. Insulation shall extend to 2 inches above and below the concrete slab.</p> <p>K. FIRESTOPPING</p> <p>Sealants and accessories shall have fire-resistance ratings indicated, as established by testing identical assemblies in accordance with UL 2079 or ASTM E 814, or other NRTL acceptable to AHJ.</p> <p>Manufacturers: Hilli, RectorSeal, Specified Technologies Inc., United States Gypsum Company, or 3M corp.</p> <p>Through and Membrane Penetration Firestopping Systems Product Schedule: Provide UL listing, location, wall or floor rating, and installation drawing for each penetration fire stop system.</p> <p>Where project conditions require modification to qualified testing and inspecting agency's illustrations, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Include qualifications data for testing agency.</p> <p>L. MOTORS AND STARTERS</p> <p>Provide motors and starting equipment where not furnished with the equipment package. Motors shall have copper windings, Class B insulation, and standard squirrel cage with starting torque characteristics suitable for the equipment served. Motors controlled by variable frequency drives shall be rated for voltage peaks and minimum run times in accordance with NEMA Part 31. Motors 5 horsepower and larger controlled by variable frequency drives shall be provided with a shaft grounding system equal to Aegis SGR Bearing Protection Ring, InproSeal Current Divider Ring (CGR) or approved equal. Motors for air handling equipment shall be selected for quiet operation. Each motor shall be checked for proper rotation after electrical connection has been completed. Provide drip-proof enclosures for locations protected from weather and not in steam of fan, and totally enclosed fan cooled enclosure for motors exposed to weather. Motors shall be manufactured by Century, General Electric, Louis Allis, Westinghouse, or approved equal.</p> <p>Provide every motor, except fractional horsepower single phase motors with an approved type of "built-in" thermal overload protection, with a motor starter. Each starter shall be provided with overload heaters sized to the motor rating, and every three phase motor starter shall have overload heaters in each phase. Ambient compensated heaters shall be installed wherever necessary. Unless noted otherwise, motor starters shall be furnished by the Division 23 Contractor for installation and connection by the Division 26 Contractor. Starters shall be Allen-Bradley, Rockwell, Clark, Furnas, Square D, or approved equal.</p> <p>M. VARIABLE FREQUENCY DRIVES</p> <p>Provide PWM variable frequency drives (VFD) to control fan or pump motors as indicated on the drawings. Provide VFD as manufactured by AC Technology, Asea Brown Boveri, Danfoss, Reliance Electric, or Yaskawa. Include an integral, door-interlocked input circuit breaker or fused disconnect which may be padlocked in the "OFF" position.</p> <p>Provide a magnetic contactor manual bypass integral to each drive. Provide two magnetic contactors, mechanically and electrically interlocked, to isolate the inverter output from line voltage. The inverter input shall be isolated by either a third magnetic contactor or a second freestopping contact switch to allow removal of power to the inverter for service while still operating the motor across the line. Bypass shall include a 120V/60 cycle transformer, fused on both the primary and secondary, and bi-metallic thermal motor overload relays with adjustable trip settings.</p> <p>Provide input AC line reactors without exception. Reactors shall be minimum 3 percent impedance, and "K" rated per IEEE C57-110 for harmonic current content. Reactors shall be integral to the drive enclosure without need for field wiring.</p> <p>The VFD shall have an RS-485 port as standard. The standard protocols shall be Johnson Controls N2 bus, Modbus, and Siemens Building Technologies FLN. Optional protocols for BACnet, DeviceNet, Ethernet, LonWorks, and Profibus shall be available. Each individual drive shall have the protocol in the base VFD. The use of third party gateways and multiplexers is not acceptable. All protocols shall be "settled" by the governing authority. Use of non-certified protocols is not allowed. The VFD shall allow the DDC system to control the digital and analog outputs of the drive via the serial interface. This control shall be independent of any VFD function. In addition, all the digital and analog inputs of the drive shall be capable of being monitored by the DDC system.</p> <p>Drive supplier shall provide jobsite start-up, Owner training, and a one-year parts and on-site labor warranty. Multiple visits shall be included to allow for tuning and troubleshooting of the controls system as required.</p> <p>N. ELECTRICAL WIRING</p> <p>High voltage wiring is defined as 50 Volts or higher. Low voltage wiring is defined as less than 50 Volts. Line voltage wiring shall be provided by Division 26. Line voltage control and interlock wiring for mechanical systems shall also be provided by Division 26. Low voltage control wiring shall be provided by Division 23. Furnish wiring diagrams to Division 26 to ensure for proper equipment hookup. Coordinate with Division 26 the actual wire sizing amps for mechanical equipment (from the equipment nameplate) as required for proper installation.</p> <p>Provide power and communication wiring with transient protection in accordance with IEEE C62.41.2. All control and interlock wiring shall comply with the NEC. Control wiring shall be sized to accommodate the voltage drop associated with the distance between the control device and the equipment. Control wiring not installed in conduit shall be UL rated for plenum installation. All NEC Class 1 (line voltage) wiring shall be UL listed in approved raceway according to the NEC and Division 26 requirements. Maximum allowable voltage for control wiring shall be 120 V. All low-voltage wiring shall meet NEC Class 2 requirements. Low-voltage power circuits shall be sub-fused when required to meet Class 2 current limit.</p> <p>Conduit for Control Wiring: EMT with compression fittings, cold rolled steel, zinc coated or zinc-coated rigid steel with threaded connections.</p> <p>Pull and Junction Boxes: Size according to number, size, and position of entering raceway as required by National Electrical Codes. Enclosure type shall be suited to location.</p>	<p>SHAKE SHACK</p> <p>SUNNYSIDE SHAKE SHACK</p> <p>46-20 QUEENS BLVD QUEENS, NY 11104 SHACK # 1479</p> <table border="1"> <tr> <td rowspan="2">DESIGN ARCHITECT</td> <td>Emporium Design, LLC</td> <td>Shake Shack</td> </tr> <tr> <td>Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018</td> <td>225 Varick St. Suite 301 New York, NY 10014</td> </tr> <tr> <td rowspan="2">MEP ENGINEER</td> <td>HNY Consulting Engineers</td> <td>Trimark United East Food Service Design</td> </tr> <tr> <td>Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018</td> <td>Steve Dungey 505 Collins Street South Attleboro, MA 02703</td> </tr> <tr> <td rowspan="2">LANDSCAPE</td> <td>Gemstone Main POC</td> <td>CMB&B INC.</td> </tr> <tr> <td>Joseph Janeli</td> <td>Stephen Malenchini 503 7th Avenue, 14th Floor New York, NY 10001</td> </tr> </table> <p>HNY CONSULTING ENGINEERS</p> <p>240 WEST 37TH STREET, 3RD FLOOR NEW YORK, NY 10018 Tel: 212.413.8400 www.hnyeng.com 225003796</p> <p>SEAL SIGNATURE</p> <p></p> <p>04/17/2024</p> <table border="1"> <thead> <tr> <th>NO</th> <th>BY</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>4.8.2024</td> <td>IFC SET</td> </tr> <tr> <td></td> <td></td> <td>12.21.2023</td> <td>PERMIT SET</td> </tr> </tbody> </table> <p>M-590.00</p> <p>6 OF 19</p> <p>2250003796</p> <p>000972537-S1</p> <p>Emporium Design, LLC 54 West 39th Street, Floor 16 New York, New York 10018</p>	DESIGN ARCHITECT	Emporium Design, LLC	Shake Shack	Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	225 Varick St. Suite 301 New York, NY 10014	MEP ENGINEER	HNY Consulting Engineers	Trimark United East Food Service Design	Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018	Steve Dungey 505 Collins Street South Attleboro, MA 02703	LANDSCAPE	Gemstone Main POC	CMB&B INC.	Joseph Janeli	Stephen Malenchini 503 7th Avenue, 14th Floor New York, NY 10001	NO	BY	DATE	DESCRIPTION	1		4.8.2024	IFC SET			12.21.2023	PERMIT SET
2004 Edition	1995 Edition																																												
1. Division 21 - Duct Suppression	Division 15																																												
2. Division 22 - Plumbing	Division 15																																												
3. Division 23 - HVAC	Division 15																																												
4. Division 24 - Electrical	Division 16																																												
5. Division 27 - Communications	Division 16																																												
6. Division 28 - Electronic Safety and Security	Division 16																																												
DESIGN ARCHITECT	Emporium Design, LLC	Shake Shack																																											
	Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	225 Varick St. Suite 301 New York, NY 10014																																											
MEP ENGINEER	HNY Consulting Engineers	Trimark United East Food Service Design																																											
	Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018	Steve Dungey 505 Collins Street South Attleboro, MA 02703																																											
LANDSCAPE	Gemstone Main POC	CMB&B INC.																																											
	Joseph Janeli	Stephen Malenchini 503 7th Avenue, 14th Floor New York, NY 10001																																											
NO	BY	DATE	DESCRIPTION																																										
1		4.8.2024	IFC SET																																										
		12.21.2023	PERMIT SET																																										

NOTE: EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL DIMENSIONS AND CONDITIONS. ALL DIMENSIONS AND CONDITIONS ARE TO BE SHOWN ON THE BIDS. CAREFULLY COORDINATE NEW WORK AND PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPERT/TESTER TO FILE ALL REQUIRED FORMS.	SPECIAL INSPECTIONS: OWNER SHALL SUBCONTRACT WITH A NEW YORK STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPERT/TESTER TO FILE ALL REQUIRED FORMS.	BUILDING DEPARTMENT FILING NOTE: THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Install wiring parallel to building lines wherever possible. Conceal all control wiring in finished rooms. Do not install Class 2 wiring in raceway containing Class 1 wiring. Boxes and panels containing high voltage wiring and equipment are not to be used for low-voltage wiring except for the purpose of interlocking the two wires (e.g. relays and transformers). All wire to device and wire to wire connections shall be made at a terminal block or terminal strip. All runs of communication wiring shall be unspliced length when that length is commercially available. Verify the integrity of the entire network following the cable installation. Use appropriate test measures for each patch panel and within 2 inches of termination with the controller. Label all wiring and termination with the controller termination number. Label control devices used in the system with permanent labels using the identifiers that match the record documents.

O. EQUIPMENT FURNISHED BY OTHERS

Provide necessary equipment and accessories that are not provided by the equipment supplier or Owner to complete installation of equipment furnished by others in locations as indicated on the drawings, vents, intakes, or both. Equipment and accessories not provided by the equipment supplier may include, but not be limited to louvers, specified hoods, all associated rod jacks and caps to outdoors, dampers, in-line fans, roof fans, and control interlocks, etc. as required for proper operation of the complete system in accordance with the manufacturer's instructions.

Contractor shall be responsible for correct rough-in dimensions and shall verify them with Architect and/or equipment supplier prior to service installations.

P. SYSTEM TESTING, ADJUSTING, AND BALANCING

Upon completion of each phase of the installation, test each system in conformance with local code requirements and as noted below. Furnish labor and equipment required to test each system installed under the contract. Assume all costs involved in making the tests and repairing and/or replacing any damages resulting therefrom.

The final test and balance of the building HVAC systems shall be completed by National TAB (no exceptions) and contracted by the General Contractor. The representative from National TAB shall be certified by the National Environmental Balance Bureau (NEBB), Associated Air Balance Council (AABC), or Testing, Adjusting and Balancing Bureau (TABB). TAB shall be performed in accordance with the most current edition of the certified agencies procedural standard for testing, adjusting and balancing and shall comply with the strictest interlock that is standard for execution and reporting of all TAB work.

Work shall include but not be limited to: Perform test readings on fans, units, coils, pumps, etc. and adjust equipment to deliver specified amounts of air. Prepare testing and balancing report log showing air supply quantities, air entering and leaving temperatures and pressures at design flow, fan and unit test readings, motor voltage and amp draws, etc., and submit six copies of the final report to the Architect for final approval before completion of the project. Balance systems by the slot diffuser method within plus or minus 10 percent for terminal devices and branch lines and plus or minus 5 percent for main ducts and air handling equipment of the amount of air shown on the drawings. TAB Contractor shall record space temperatures and make adjustments in airflow to each diffuser to obtain uniform temperature (no greater than +/- 3 F) in spaces. Document temperatures and adjustments in tab report. Adjust equipment to operate as intended by the specification. TAB report shall include a 'report summary/markers' section in accordance with the procedural standard that provides both system set up and a summary of deficiencies as defined by the procedural standard.

TAB Contractor shall be responsible to calibrate, set, and adjust automatic temperature control sensors, actuators and control devices. Check proper sequencing of interlock systems, and operation of safety controls, adjust thermostats, and control setpoints, limits and time based adjustments to operate in accordance with the performance requirements of the Construction Documents. Adjust pumps, fans, etc. for proper and efficient operation. Certify to Architect that adjustments have been made and that system is operating satisfactorily. Calibrate, set, and adjust automatic temperature controls. Check proper sequencing of interlock systems, and operation of safety controls.

Division 23 contractor shall align bearings and replace bearings that have dirt or foreign material in them with new bearings without additional cost to the Owner.

Q. VIBRATION ISOLATION

Provide vibration isolation equipment and materials by a single manufacturer. If type and deflection for specific equipment is not specified within the contract documents, reference ASHRAE Handbook "HVAC Applications" or provide per manufacturer's recommendations. Approved manufacturers include Calroy, Kinetics Noise Control, Inc., Vibration Eliminator Co., Inc., Vibration Mounting and Controls, or Vibro-Acoustics, provided their systems are in compliance with the specified design and performance requirements.

General Requirements: Select vibration isolators by the weight distribution to produce uniform deflection. Vibration isolators shall have either known un-deflected height or calibration markings so that, after adjustment, the static deflection can be verified, thus determining that the load is within the proper range of the isolator. Isolators shall operate in the linear portion of their load versus deflection curves. Spring isolators shall have 50 percent excess capacity without becoming coil bound. Coast-sprung isolators with factory-applied paint. Coast vibration isolators exposed to weather and other corrosive environments with factory-applied corrosion resistance protection. Install and adjust vibration isolators in accordance with manufacturer's written instructions.

Pipe connections: Provide flexible connectors for piping system connections on equipment side of shafted valves for all pumps, mechanical equipment supported or suspended by spring isolators, and where indicated on drawings. Fabricate flexible piping connectors from stainless steel or rubber materials as suitable for system fluid. Flexible piping connectors shall be bellows, spherical or braided hose type as recommended by the manufacturer for the application.

Isolator Types:

1. Type WP (Waffle Pads): Provide 5/16 inch thick neoprene pads ribbed or waffled on both sides. Manufacture pads with bridge bearing quality neoprene and select for a maximum diameter of 50 and designed for 15 percent strain, with a static deflection of 0.05 inches. Incorporate steel load-spreading plates where required between the equipment and the neoprene pad to provide selected load bearing. If the isolator is bolted, install a neoprene mounting sleeve under the bolt head between the steel washer and the base plate to prevent metal to metal contact. Provide Mason Industries Type W or equal.

2. Type SPNH (Spring and Neoprene Hangers): Provide a steel hanger box containing a laterally stable, double-deflecting neoprene isolator in series with a steel spring. Design springs so the ratio of the horizontal to vertical spring constant is between one and two. The spring damper shall be not less than 80 percent of the compressed height of the spring at rated load. Loaded springs shall operate within the linear portion of their load versus deflection curve over a deflection range of not less than 50 percent above design deflection. Spring damper and hanger box hole size shall be large enough to permit the hanger rod to swing through a 30 degree arc. Include a neoprene bushing to prevent contact between the lower hanger rod and hanger box and short-circuiting the deflection function. The neoprene element shall have a maximum diameter of 50 and designed for 15 percent strain, with a static deflection of not less than 0.4 inches. Unless otherwise specified, the static deflection of SPNH hangers shall be 2 inches. Provide SPNH hangers with 1 inch static deflection for water source heat pumps and fan-powered VAV terminal units. When installed, do not cook the spring element and do not allow the hanger box to rotate through a full 360 degree arc without encountering obstructions. Provide Mason Industries Type 30N or equal.

3. Type NR (Neoprene Bushing): Provide neoprene, rubber-in-shear bushings for lightweight (less than 100 pounds), suspended equipment supported from structure with all thread rod and angle iron or Unistrut. Select for a maximum diameter of 50 and designed for 15 percent strain, with a static deflection of 0.15 inches. Provide Mason Industries Type HM1B or equal.

R. SEISMIC CONTROLS FOR MEPP SYSTEMS

Seismic Protection Criteria:
 Risk/Occupancy Category: [I, II or III/IV]
 Site Soil Category: Contractor's Seismic Engineer to Determine.
 Seismic Design Category: Contractor's Seismic Engineer to Determine.
 Component Importance Factor: Determined from ASCE 7, most recent version.

The Contractor shall be responsible for determining the requirements for seismic bracing of mechanical, electrical, and plumbing systems. Seismic protection criteria used to determine seismic bracing requirements of all mechanical, electrical, and plumbing systems shall be determined by the applicable code adopted in the project jurisdiction. Where not already determined within the contract documents, the Contractor shall be responsible for contracting a licensed professional engineer to establish building site class, seismic design category, seismic zone, or any other criteria necessary to determine the requirements for seismic bracing on mechanical, electrical, and/or plumbing systems.

Seismic bracing of fire protection systems shall be installed in strict accordance with the provisions of NFPA 13 (2010 or later edition). The Contractor shall determine the type and location of seismic bracing required for the mechanical, electrical, and plumbing elements shown on the drawings based on the established seismic criteria, the size and weight of the supported element, and the distance from structure of the supported element.

The Contractor shall submit the following shop drawing information to the AHJ and the Engineer for review and approval:
 1. Seismic analysis listing all applicable seismic design criteria.
 2. Descriptive catalog data of seismic bracing materials.
 3. Shop drawings showing bracing type and location.
 4. Installation details of all bracing used.
 5. Calculations showing that the seismic restraints meet the seismic requirements.
 Shop drawings and calculations shall be signed and sealed by a registered professional engineer, licensed in the state of the project and employed by the manufacturer of the seismic bracing products. Calculations shall include dead loads, static seismic loads, and capacity of materials utilized for connections.

Seismic bracing, restraints, isolators, and isolation materials shall be of the same manufacturer and shall be certified by the manufacturer. Approved manufacturers are Amber/Booth Company, Inc., B-LineTolco, ISAT, Kinetics Noise Control, Inc., Loos & Company, Inc., Mason Industries, Inc., Uni-struct, and Vibro-Acoustics. Each device shall have a pre-approval number from California OSHPD or other recognized governing agency showing maximum restraint ratings.

Seismic bracing measures to be applied to mechanical, electrical, and plumbing equipment/systems shall be installed in strict accordance with all applicable local, state, and/or federal codes and as well as manufacturer's requirements. The most stringent criteria shall apply. All anchor connections to structure for support of mechanical and electrical equipment, regardless of the need for seismic restraints, shall be shown on shop drawings.

S. AIR FILTERS

Provide AAF/Flanders Perfect Pleat HC ME, Camfil Farr 3030, pleated, throwaway type filters, minimum MERV 8, or similar as manufactured by Air Filter, Inc., Bioclimatic, Columbus, Koh, or approved equal, unless otherwise indicated.

Temporary filters used to protect openings in ductwork and inside equipment when permanent HVAC equipment is used during the construction period shall be pleated, throwaway type filters, minimum MERV 6.

T. REFRIGERANT AND OIL

Provide full refrigerant and oil charge in new air conditioning refrigeration systems, and maintain it for full term of the guarantee.

U. IDENTIFICATION

Provide manufacturer's standard pre-printed, semi-rigid snap-on or permanent adhesive, pressure-sensitive vinyl pipe markers. Color code pipe markers to comply with ANSI A13.1.

Install pipe markers on each HVAC piping system and include arrows to show normal direction of flow.

Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

Provide plastic laminate or brass valve tag on every valve, shut-off and control device in each HVAC piping system; exclude check valves, valves within factory-fabricated equipment units, and shut-off valves at HVAC terminal devices and similar rough-in connections of end-use fixtures and units.

Provide manufacturer's standard laminated plastic, color coded equipment markers. Conform to the following color code: Green for Cooling; Yellow for Heating; Yellow/Green for combination Cooling and Heating; Brown for Energy Recovering; Blue for other equipment types. Conform to ANSI A13.1 for Hazardous Equipment.

Provide stenciled signs for equipment identification at Contractor's option or where distance of required identification requires lettering larger than 1 inch height. Stencil panel shall be exterior type, oil-based, alkylid enamel, minimum 1-1/4 inch height or greater as required for long distance identification, white or black color for best contrast.

Provide duct markers or provide stenciled signs and arrows indicating ductwork service and flow direction in black or white lettering for best contrast with duct or insulation color. Locate markers maximum 50 feet along each duct side and within 5 feet of center and within 6 inches of bends. Bends shall not exceed a centerline radius of one duct diameter. Duct sag shall not exceed 1/2 inch. Supporting material in direct contact with the duct shall not be less than 1-1/2 inches in width.

3. DUCT INSULATION, DUCTWORK, ACCESSORIES, FLUES AND FANS

A. DUCT INSULATION

Provide fiberglass duct liner with fibers firmly bonded together with a thermosetting resin. Liner surface shall serve as a barrier against infiltration of dust and dirt. Shall meet ASTM C1338 for fungi resistance, and shall be cleanable using duct cleaning methods and equipment outlined by and shall meet ASTM International Association (NAIMA) duct cleaning guide. Install with liner adhesive and mechanical fasteners in accordance with manufacturer's instructions and recommendations. Ductwork sizes shown on drawings are inside clear dimensions. Increase sheet metal by liner thickness in both directions where liner is installed.

Provide rectangular liner conforming to ASTM C1071, Type I or II that is 1-1/2 inch thick, 1-1/2 pound density, minimum R-6.0 CertainTeed Corp., "Toughguard" or equivalent, Johns Manville, Owens-Corning, or Knauf.

Provide round liner that is 1-1/2 inch thick, 4 pound density, minimum R-6.0 Johns Manville "Spiracoustic-Plus" or equivalent, CertainTeed or Owens-Corning.

Provide liner on the following interior air ducts and where specified on the drawings:

- 1. Exposed round and rectangular supply ductwork.
- 2. Exposed round and rectangular return ductwork.

At interface of lined and wrapped ductwork, overlap lined ductwork at least 2 feet beyond wrapped insulation.

Cover concealed, rigid ductwork with ASTM C553, Type II flexible fiberglass insulation. Installed insulation shall be 2 inch thick, 3/4 pound density, minimum R-6 Duct-wr. CertainTeed or equivalent Johns Manville, Owens-Corning, or Knauf with heavy-duty foil-scrim-kraft facing, and with joints taped with 3 inch wide foil tape as follows:

- 1. Round and rectangular supply and return air ductwork.
- 2. Unlined Round and rectangular outside air ductwork.
- 3. Round and rectangular exhaust and relief air ductwork within 10 feet of exterior discharge.

Cover Outdoor Air, Exhaust Air and Relief Air plenums connected to exterior louvers with 1-1/2 inch thick, 1.5 pound density, rigid fiberglass insulation conforming to ASTM C612, Class 2.

Insulating materials, adhesives, coatings, etc., shall not exceed flame spread rating of 25 and smoke developed rating of 50 per ASTM E84. Containers for mastics and adhesives shall have U.L. Label.

For supply and return ductwork located exterior to the building, insulation shall be minimum R-8.0. Provide insulation and jacket in accordance with one of the following three options:

- 1. Exterior insulation and jacket consisting of 2 inch thickness of Armaflex flexible elastomeric insulation or equivalent meeting ASTM C534 with integral 12 mils thick UV resistant cladding laminated at factory. Cover all seams with Armaflex seal tape.
- 2. Exterior insulation consisting of 2 inch thickness of flexible elastomeric insulation meeting ASTM C534 or 3 lb density rigid fiberglass meeting ASTM C512, and jacket consisting of 20 gauge corrugated aluminum jacket with aluminum fitting covers and minimum three aluminum attachment bands per section.
- 3. Exterior insulation consisting of 2 inch thickness of flexible elastomeric insulation meeting ASTM C534 or 3 lb density rigid fiberglass meeting ASTM C512, and jacket consisting of 15.5 mils thick Venturacel Plus UV resistant cladding.

Install exterior ductwork with sufficient slope to ensure that water cannot pond anywhere on the duct. Drainage must be achieved by sloping ductwork - not by varying the insulation thickness. Locate longitudinal seams of outer shell (aluminum, flexible elastomeric, or cladding as applicable) at bottom of duct. Install cladding in strict conformance with cladding manufacturer's instructions.

B. DUCTWORK

Provide galvanized steel ductwork and housings as shown on drawings. Construct ductwork including fittings and transitions in conformance with current SMACNA standards relative to gauge, bracing joints, etc. Minimum thickness of duct shall be 26-gauge sheet metal. Reinforce housings and ductwork over 30 inches with 1-1/4 inch angles not less than 5"-6" on centers, and closer if required for sufficient rigidity to prevent vibration. Support horizontal runs of duct from strap iron hangers on centers not to exceed 6'-0". Do not support ceiling grid, conduits, pipes, equipment, etc. from ductwork. Coordinate routing of ductwork with other contractors such that piping, electrical conduit, and associated supports are not routed through the ductwork.

Provide pre-engineered roof duct supports by Cooper B-Line, Elite Components, ERICO, FNN, Miro, PHD Manufacturing, PHP Systems, Roof Top Box, Unistrut (Altkore), Zai Foster, or approved equal. Support ductwork on the roof with pre-engineered roof duct supports that rest on top of the roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with embedded support fixture designed to support the duct. Provide pedestal type supports with minimum 1x8 1/8 inch thermoplastic or rubber base or 4 inch wide closed-cell polyethylene block with length as required. Maintain minimum 6 inches clearance under duct to finished roof surface.

Coordinate with the pre-engineered roof duct support manufacturer to anchor the duct supports directly to the roof structure in accordance with the manufacturer's installation instructions or provide intermediate duct supports engineered to meet the wind resistance and seismic design criteria. Reference Section "PRE-ENGINEERED ROOF EQUIPMENT SUPPORTS".

Construct non-VAV supply ducts to meet SMACNA positive pressure of 2 inches w.g. Construct Return, Outdoor and Exhaust ductwork upstream of fans to meet SMACNA negative pressure of 1 inch w.g. Construct exhaust ductwork downstream of fans to meet SMACNA positive pressure of 1 inch w.g.

Provide mill phosphatized or galvanized finish for exposed ductwork to be field painted. Shop treated sheet metal shall have galvanized metal primer applied in the shop after fabrication and prior to shipping.

Seal ductwork with heavy liquid sealant, Hardcoat Tringon 601, Design Polyp DP 1010, United McGill duct sealer or approved equal, applied according to sealant manufacturer's instructions. Seal all longitudinal and transverse ductwork joints airtight to meet SMACNA Seal Class A. Tapes and mastics shall be listed and listed in accordance with UL 181A.

Provide radius above, turns, and offsets with a minimum centerline radius of 1-1/2 times the duct width. Where space does not permit full radius elbows, provide short radius elbows with a minimum of two continuous spigot vanes. Vanes shall be the entire length of the bend. Provide mitered elbows where space does not permit radius elbows, where shown on the drawings, or at the option of the contractor with the engineer's approval. Mitered elbows less than 45 degrees shall not require turning vanes. Mitered elbows 45 degrees and greater shall have single thickness turning vanes of same gauge as ductwork, rigidly fastened with gudge strips in ductwork. Vanes for mitered elbows shall be provided in all supply and exhaust ductwork and in return and outside air ductwork that has an air velocity exceeding 100 fpm. Do not install vanes in grease ductwork. The use of square throat, radial heel elbows is prohibited. Remove and replace all installed elbows of this type with an approved elbow at no additional cost to the owner.

Connect ducts to vibrating equipment and when transitioning between two different material duct materials (e.g., aluminum to galvanized steel) by means of flexible connectors. Flexible connectors shall be neoprene coated glass cloth canvas connectors, Duro-Dyme, Elgen, Ventfabric or equal. Flexible connectors shall have a flame spread of 25 less and smoke developed rating not higher than 50. Make airtight joints and install with minimum 1-1/2 inches louver.

Provide balancing dampers, manufactured by Gesco, Greenheck, Louvers & Dampers, Nailor Industries, Pottoff, Ruskin, Tamco, or approved equal, where shown on drawings and wherever necessary for complete control of air flow. Splitter dampers shall be controlled by means of flexible connectors. Flexible connectors shall be neoprene coated glass cloth canvas connectors. Duro-Dyme, Elgen, Ventfabric or equal. Flexible connectors shall have a flame spread of 25 less and smoke developed rating not higher than 50. Make airtight joints and install with minimum 1-1/2 inches louver.

Provide balancing dampers, manufactured by Gesco, Greenheck, Louvers & Dampers, Nailor Industries, Pottoff, Ruskin, Tamco, or approved equal, where shown on drawings and wherever necessary for complete control of air flow. Splitter dampers shall be controlled by means of flexible connectors. Flexible connectors shall be neoprene coated glass cloth canvas connectors. Duro-Dyme, Elgen, Ventfabric or equal. Flexible connectors shall have a flame spread of 25 less and smoke developed rating not higher than 50. Make airtight joints and install with minimum 1-1/2 inches louver.

Round or oval ductwork shall be FlakGroup Semco, United, Hercules Industries or equal, sheetmetal, with smooth interior surface, with low pressure (duct pressure class up to and including 2 inches w.g.) Round ductwork gauges per the following table (reference SMACNA HVAC duct construction standards for gauges when pressures exceed 2 inches w.g.):

Size	Duct Gauge	Fitting Gauge
14" & under	26	24
15" thru 26"	24	22
28" thru 36"	22	20
38" thru 50"	20	18
52" thru 60"	18	16

Levis & Lambert, Linc Industries Lindab Seal, or approved equal factory-manufactured round ductwork and fittings may be substituted for specified round branch ductwork, at Contractors option. Heavy liquid joint sealant may be omitted on factory-manufactured round ductwork.

Low pressure (duct pressure class up to and including 2 inches w.g.) Fittings 24 inches in diameter and less shall be prefabricated, spot-welded and internally sealed. Continuously welded fittings larger than 24 inches in diameter. Fitting gauge shall be 22 gauge for 36 inch fittings and under, 20 gauge for larger sizes, 18 gauge for less than 36 inch fittings. Seal longitudinal and transverse ductwork joints airtight with heavy liquid sealant applied according to manufacturer's instructions. Provide gauge thickness in medium pressure (duct pressure class 3 inches to 6 inches w.g.) ductwork as recommended by SMACNA.

C. FLEXIBLE DUCT

Low pressure (duct pressure class up to and including 2 inches w.g.) and medium pressure (duct pressure class 2 1/4 inch to 6 inches w.g.) flexible duct shall be Flexmaster type 8B, ThermoFlex type G-M, M-KE, JPL type Silver Jacket, or equal (fire retardant polyethylene) protective vapor barrier, U.L. 181 Class 1, acoustical insulated duct, R-6.0 fiberglass insulation. Provide CPE liner with steel wire helix mechanically locked or permanently bonded to the liner.

Flexible duct runs shall not exceed 5 feet in length, and shall be installed fully extended and straight as possible avoiding tight turns. Install flexible duct in accordance with manufacturer's instructions. Support flexible duct at maximum 5 feet between supports and within 6 inches of bends. Bends shall not exceed a centerline radius of one duct diameter. Duct sag shall not exceed 1/2 inch. Supporting material in direct contact with the duct shall not be less than 1-1/2 inches in width.

Connect flexible duct to rigid metal duct or air devices as recommended by the manufacturer. At a minimum, install two wraps of duct tape around the inner core connection and a metallic or non-metallic clamp over the tape and two wraps of duct tape or a clamp over the outer jacket. Duct dampers shall be labeled in accordance with UL-181B and marked 181B-C. Duct tape shall be labeled in accordance with UL 181B and marked 181B-FX.

D. PLASTIC FLUE GAS VENTS

Provide UL 1738 listed plastic flue gas vents, with positive or negative flow pressures complying with NFPA 211 and suitable for condensing gas appliances. Provide PVC system by IPEX System 1738, or Polypropylene system by Centrotrem "Infloune" or equal by Nova Flex Group "Z-DENS."

Vents and combustion air ducts for condensing type appliances shall be Schedule 40 PVC pipe and socket fittings meeting ASTM D2685 and UL 1738, manufactured by IPEX. Use solvent cement meeting ASTM D2564 and make joints in accordance with ASTM D2555.

Where plastic gas vents are installed in a return air plenum, wrap the vent with fire rated plenum insulation. Reference Article "Plenum Insulation" for plenum rated fire wrap. Coordinate vent material compatibility with the appliance manufacturer's installation instructions prior to purchasing and installation.

E. AIR DEVICES

Provide air devices as scheduled on drawings, manufactured by Carnes, Krueger, Metabaire, Nailor Industries, Price, Tiltus, or Tuffe & Bailey. Select air devices to limit room noise level to no higher than NC-30 unless otherwise shown. Provide devices with a soft plastic gasket to make an airtight seal against the mounting surface. Coordinate final location, frame, and mounting type of air devices with Architectural reflected ceiling plans.

Submit complete shop drawings including information on noise level, pressure drop, return, CFM for each air device, styles, borders, etc. Clearly marked with specified equipment number. Submit samples of each air device as requested by the Engineer.

Provide wall return air grilles and exhaust air registers with horizontal 35 or 45 degree angle vision-proof bars. Provide concealed fasteners for air mounted registers and grilles. Provide floor supply air registers of aluminum heavy duty type with 0 degree deflection. Provide opposed blade dampers for supply air registers and exhaust air registers unless indicated otherwise.

Provide ceiling mounted air devices of lay-in or surface mounted type as required to be compatible with ceiling construction. Provide ceiling diffusers and grilles with white enamel finish unless noted otherwise.

Provide linear slot diffusers of standard one-piece lengths up to 6-feet and furnish in multiple sections greater than 6-feet. Join multiple sections together end-to-end with alignment pins to form a continuous slot appearance. For installations in a hard ceiling, install diffuser per manufacturer's installation instructions prior to installation of drywall. Contractor shall use manufacturer's hard ceiling clips for mounting to ceiling framing. Screws through face of linear slot diffuser are not acceptable. Provide alignment components by the manufacturer. Provide plenums by the slot diffuser manufacturer. Plenums shall be internally insulated by the manufacturer with minimum 1/4 inch thick, fiberglass insulation.

F. CONTROL DAMPERS

Provide factory fabricated, parallel blade control dampers sized as shown on the drawings and as specified. Individual damper sections shall not be larger than 48 inches x 60 inches with maximum blade width of 6 inches. Frame construction shall be minimum 16 gauge galvanized steel for rectangular dampers, 20 gauge for round, 1/8 inch thick for aluminum, with flanges for duct mounting. Provide elastomeric or neoprene seals, mechanically attached and field replaceable. Provide a minimum of one damper actuator per section. Test damper performance in accordance with AMCA 500-D.

Provide modulating dampers with linear flow characteristics. Size modulating dampers based on the smaller of 1,500 CFM through the damper or full open air pressure drop of 0.1 inches WG. Size two-position dampers full range size and select to minimize pressure drop. Motorized dampers open for ventilation air intake, exhaust air, or relief air shall have leakage rates not to exceed 4.0 CFM/square foot in full closed position at 1 inch WG, pressure differential across the damper.

Provide dampers as manufactured by Greenheck, CESCO, Pottoff, Nailor, or Ruskin. Reference manufacturer with model number for outside air dampers is Ruskin CD-50 constructed of aluminum, and all other applications is Ruskin CD-35 constructed of galvanized steel.

Provide damper operator for each automatic damper with sufficient capacity to operate the damper under all conditions and to guarantee tight close-off of dampers against system pressure encountered. Each operator shall be provided with spring/return for normally closed or normally open position for fail safe operation to account for fire, low temperatures, or power interruption as required by the control systems specified on the drawings. Damper operators shall be manufactured by Belimo, Johnson Controls or approved equal. Provide transformer for damper motors if different voltages are required.

G. EXHAUST AIR SYSTEMS

Provide roof mounted exhaust fans as scheduled on the drawings, or equal ACME, Carnes, Cook, Greenheck, Pennbray, or Twin City Fans complete with aluminum housing, aluminum centrifugal wheel, motor with integral thermal overload protection, disconnect switch mounted inside the housing, birdscreen, backdraft damper, and pate prefabricated roof curb. Three phase fans shall be furnished with magnetic starters with push button station.

H. KITCHEN EXHAUST AIR SYSTEMS

Install kitchen grease exhaust package furnished by the owner. System includes kitchen hood, grease exhaust fan/plenum control unit, filtered makeup air unit and a mechanical or electrical gas shutoff valve provided with the kitchen exhaust system to shutoff fuel or power source to cooking equipment upon detection of fire. Valve shall have a clearly marked open/closed indicator.

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 transition at connection to fan with opening size equal to or greater than the venting 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 1 hood grease exhaust duct applications and shall conform to ASTM E2396 where required to comply with IMC. Insulation shall be flexible wrap enclosure rated for minimum 2000 degrees Fahrenheit and for zero clearance to combustibles. Insulation shall be non-mineral wool, passive, low-pH-persistent fiber 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 lineal foot. At Contractor's option, a UL listed concentric ductwork package that complies with UL 1078 standard for grease ducts may be used in lieu of the welded black iron duct for connecting hood to exhaust fan. Ductwork package shall be as manufactured by Metal-Fab, Schebler, Selkirk, or approved equal. Provide manufacturer's UL listing number and verification certificate as a part of the shop drawing submittal. Install duct package in strict conformance with manufacturer's instructions and recommendations.

All portions of grease duct systems shall be tested for leakage in accordance with the "Grease Duct Test" paragraph of the IMC. Leakage tests shall be by water leakage type or equivalent test methods as approved by the local code official to determine that all joints are airtight. Water leakage test shall be performed by Environmental Corporation of America or owner approved testing contractor. Tests shall be performed in the presence of the local code official. Any joints found defective shall be repaired and retested until satisfactory results are obtained. The contractor shall submit a copy of the grease duct leakage test report to the architect/engineer complete with the approval signature of the local code official.

4. HVAC EQUIPMENT

A. ELECTRIC UNIT HEATERS

Provide electric unit heaters as scheduled on the drawings, manufactured by Berko, Brasch, Indesco, Market, O'Mark, or Raywall. standard type propeller unit heaters with adjustable mounting brackets and hardware for horizontal airflow. Furnish heater fan motors complete with a manual motor starter with automatic thermal cutouts sized to the motor load, disconnect switch, and other code required safety devices. Provide unit mounted thermostat and manual summer/winter changeover switch.

B. AIR CURTAINS

Provide air curtains manufactured by Berner, Marley, Mars, or Powered Air, of sizes and capacities shown on drawings. Units shall comply with AMCA 220, AHRI 410 and NSF 37. Unit housing shall be constructed of aluminum, aluminumized steel, or galvanized steelwith powder coatedandodendzfish, with steel mounting brackets. Unit shall have an adjustment by way of multi-speed motors or adjustable intake louvers. Unit shall have an adjustable intake discharge nozzle. Units shall have statically and dynamically balanced fans with direct drive fan drives. Motors shall be single-speedreliably mounted, continuous duty, with permanently sealed pre-lubricated ball bearings, and internal disconnect.

Furnish unit with washable panel filters with welded galvanized steel mounting frames, gasketed, with fasteners for bolting together built-up filter banks. Furnish unit with built-in line voltage thermostat wired to air curtain junction box. Furnish with plunger-type automatic door switch, star-start pushbutton switch, factory-installed time-delay relay, and mounting brackets and accessories. Furnish unit with motor control panel complete with motor starter, 115V transformer with primary and secondary fuses, terminal strip, and NEMA 250 enclosure.

5. PIPING AND PIPING SPECIALTIES

A. REFRIGERANT PIPING AND INSULATION

Copper Tubing: ASTM B260, Type ACR, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

Refrigerant Line Kits: Soft-annealed copper tubing with pipe diameters as recommended by the manufacturer and of length as required for the installation. Tubing shall be factory or field insulated with flexible unicellular insulation with thickness as specified below.

Fittings: wrought-copper fittings: ANSI B16.22, steamlined pattern.

Solder filler metals: ASTM B32, 95-5 Tin-Antimony.

Brazing filler metals:
 1. AWS A5.8, Classification BAg-5, Silver (Ag) 44.0-46.0 percent, Zinc (Zn) 23.0-27.0 percent, and Copper (Cu) 29.0-31.0 percent.
 2. AWS A5.8, Classification BCu-9, Phosphorus (P) 4-9.5-2 percent, Silver (Ag) 14.5-15.5 percent, and Copper (Cu) remainder.

Braze mechanical joints: Solder joints connecting to refrigerant valves and specialties. Continuously purge the pipe and fittings during brazing with an inert gas per manufacturer's recommendation (e.g., dry nitrogen) to prevent oxidation of the pipe. Maintain purge until the joint is cool to the touch. Provide temporary cap or cover on completed joints with open ends to prevent entry of contaminating materials.

Insulate refrigerant lines with flexible elastomeric insulation, Armaflex or equal. Insulate suction and liquid lines between the expansion valve, evaporator, and compressor with 1/2 inch thick insulation on pipes less than 1 inch in size and 1 inch thick for pipes 1 inch and larger. Insulate hot gas and liquid lines between the compressor condenser, and expansion valve with 1 inch thick insulation on pipes less than 1-1/2 inch and 1-1/2 inch thick for pipes 1-1/2 inch and larger. Piping insulation shall have a flame-spread of 25 or less, and a smoke developed rating of 50 or less, in accordance with ASTM E84. Coat insulation that is exposed to the elements with a protective sealer, install and support piping to keep noise and vibration to a minimum. Support and secure piping to Unistrut type supports so that no vibration passes to the building structure. Pipe attachments shall be copper-plated or have nonmetallic coating for electrolytic protection where attachments are in direct contact with copper tubing. Install a support within one foot of each change

Provide remote sensors where indicated on the drawings and integrate them with the thermostat control equipment. Remote sensors shall have the following features:

1. Wired connection.
2. Temperature sensor.
3. Humidity sensor.
4. Blank faceplate.
5. Where multiple remote sensors are shown for a single unit, the sensors shall be provided in a single device.

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 drift less than 1 percent full scale per year. Pressure transmitters at a minimum shall be accurate to +/- 1 percent full scale with drift 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 device in an approved location if smoke detectors are not connected to a fire alarm panel and label device as "Air Duct Detector Trouble".

Provide 24 Volt or 120 Volt timeswitches Intermatic Series FM1D20 or equal programmable type with 7-day programming with up to two "ons" and "offs" per day. Battery backup shall provide 48 hours of memory retention. Override timer switches shall be spring wound, 6-hour, normally open type. Coordinate 120 V wiring of timeswitch with electrical contractor if 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 shall be obtained without the use of hooks, latches, or semi-permanent magnets. Operating and release times shall be 100 milliseconds or less.

7. SEQUENCE OF OPERATION

A. 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.

B. FAN COIL UNIT CONTROL

Refer to FAN COIL UNIT CONTROL MATRIX on Sheet M601 for required rooftop unit control options.

C. RESTROOM EXHAUST FAN CONTROL

Operate exhaust fans continuously during occupied hours and shut down during unoccupied hours. Provide a 7-day timeclock to switch each system between occupied and unoccupied operation.

D. AIR CURTAIN CONTROL

Interlock air curtain with door limit switch to energize when the door opens. Units scheduled with heating coils shall cycle the stages of heat to maintain room temperature setpoint of 70 F (adj).

E. ELECTRIC UNIT HEATER CONTROL

Unit heater shall be activated by unit mounted thermostat to maintain room temperature setpoint (80 deg F).

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, materials, equipment, and transportation services necessary for and incidental to the 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.

9. COMMISSIONING OF MECHANICAL SYSTEMS
Commissioning of HVAC System

A. 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. Fan coil units and terminal units
 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 Requirement."
- c. Refrigerant piping, including the following:
 1. Refrigerant piping, fittings, and specialties.
 2. Refrigerant charge.
 3. General duty and specialty valves.
 4. Meters and gages.
- d. 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.
 5. Duct-mounted access doors and panels.
- e. Kitchen exhaust system, including the following:
 1. Exhaust and makeup air system.
 2. Metal ducts, liners, and fittings.
 3. Air-duct accessories, including volume dampers, fire and smoke dampers, turning vanes, sound attenuators, and flexible connectors.
 4. Duct-mounted access doors and panels.
 5. Exhaust fans.
 6. Make-Up air unit
- f. 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.

B. 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.
 1. Air and hydronic distribution systems, including the following:
 - a. Supply, return, outdoor-air, and exhaust-air distribution systems.
 - b. Automatic dampers.
 - c. Control valves.
 2. Heating and cooling terminal and unitary equipment, including the following:
 - a. Unit heaters.
 - b. Fan coil units.
 - c. Electric heating.
 3. 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.

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 instructions:
 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.

3.10 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 filters after start-up.

3.11 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.

3.12 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, bolts, and other moving parts with factory-recommended lubricants.
 7. Stroke all dampers to ensure free and full travel.

3.13 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.

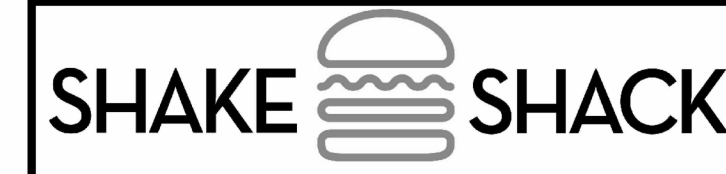
END OF SECTION 23

NOTE: EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT: IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS. ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION."

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.	SPECIAL INSPECTIONS: OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.	BUILDING DEPARTMENT FILING NOTE: THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
-------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

ANDREW G. BENNETT



SUNNYSIDE SHAKE SHACK

46-20 QUEENS BLVD
QUEENS, NY 11104
SHACK # 1479

DESIGN ARCHITECT Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	CLIENT Shake Shack 225 Varick St. Suite 301 New York, NY 10014
MEP ENGINEER HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018	INTERIOR CONSULTANT Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703
LANDSCAPE Joseph Janell	GENERAL CONTRACTOR CM&B INC. Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001

HNY CONSULTING ENGINEERS
240 WEST 37TH STREET, 3RD FLOOR
NEW YORK, NY 10018
TEL: 212.413.8400
WWW.HNY-ENG.COM
2250003796

SEAL/SIGNATURE

04/17/2024

1	4.8.2024	IFC SET
NO	BY	DATE
		PERMIT SET
		DESCRIPTION

MECHANICAL SPECIFICATIONS

M-592.00

8 OF 19

2250003796 C00972537-S1

Emporium Design, LLC
54 West 39th Street, Floor 16
New York, New York 10018

FAN COIL UNIT CONTROL MATRIX					
CONTROL FEATURE	UNITS	FCU-1 (DINING) SETPOINT OR Y/N	FCU-2 (KITCHEN) SETPOINT OR Y/N	NOTES	
SETPOINTS					
COOLING - OCCUPIED SETPOINT	"F	75	75		
COOLING - UNOCCUPIED SETPOINT	"F	80	80		
DEAD BAND - MINIMUM HEATING AND COOLING TEMPERATURE SETPOINT DIFFERENCE	"F	5	5		
HEATING - OCCUPIED SETPOINT	"F	70	70		
HEATING - UNOCCUPIED SETPOINT	"F	60	60		
PROGRAMMED CONTROL FEATURES					
HVAC SYSTEM OCCUPIED/UNOCCUPIED MODE - PROGRAMMABLE THERMOSTAT		Y	Y	B	
EQUIPMENT ACCESSORIES AND CONTROL MODULES					
INTEGRATED ECONOMIZER - DIFFERENTIAL ENTHALPY ENABLE (OA ENTHALPY - RA ENTHALPY)	BTULB	Y	N	E	
ECONOMIZER FAULT DETECTION AND DIAGNOSTICS (FDD) SYSTEM		Y	N	F, G	
COOLING COIL (DX - STAGED)		Y	Y	M	
SUPPLY FAN CONTROL METHOD					
ON DURING OCCUPIED HOURS		Y	Y		
OPTIMUM START SEQUENCE		Y	Y	T	
CONSTANT VOLUME FAN CONTROL		Y	N		
VARIABLE VOLUME - STAGED FAN CONTROL IN RESPONSE TO ZONE TEMPERATURE		Y	N	M, Q	
SAFETIES, INTERLOCKS, AND ALARMS					
SUPPLY AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	Y	C	
RETURN AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	Y	C	
LOW LIMIT FREEZESTAT - FREEZE PROTECTION SAFETY SHUTDOWN		Y	Y	F	
DIFFERENTIAL PRESSURE SWITCH - FILTER CHANGE ALARM		Y	Y	F	
FIRE ALARM CONTROL PANEL - SAFETY SHUTDOWN INTERLOCK		Y	Y	B	
KITCHEN EXHAUST SYSTEM INTERLOCK		N	Y	S	
DIV 15 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.					
NOTES:					
B. DIVISION 23 CONTRACTOR SHALL PROVIDE DEVICE. REFER TO SPECIFICATIONS FOR DEVICE REQUIREMENTS.					
C. DIVISION 26 CONTRACTOR SHALL PROVIDE DEVICE. REFERENCE SPECIFICATIONS FOR SENSOR REQUIREMENTS.					
E. THE FOLLOWING SENSORS SHALL DETERMINE ECONOMIZER ON POINT. REFERENCE SPECIFICATIONS FOR DEVICE REQUIREMENTS:					
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.					
G. PROVIDE UNIT WITH AN FDD SYSTEM CONSISTING OF PERMANENTLY INSTALLED OUTSIDE AIR, SUPPLY AIR, AND 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/DISABLE WHEN ECONOMIZER SHOULD BE OFF, RESPECTIVELY, DAMPER NOT MODULATING, AND EXCESS OUTSIDE AIR.					
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. PROVIDE STAGED FAN CONTROL WITH MINIMUM 2 FAN SPEEDS. LOW SPEED SHALL NOT EXCEED 66% OF FULL SPEED AND SHALL DRAW NO MORE THAN 40% OF FAN POWER AT FULL SPEED. FOR DX UNITS, COMPRESSORS SHALL BE CONTROLLED TO MATCH CAPACITY OF 2-STAGE SUPPLY FAN SUCH THAT LEAVING AIR TEMPERATURE REMAINS CONSTANT.					
S. INTERLOCK FDU WITH KITCHEN EXHAUST HOOD SYSTEMS) TO SHUT DOWN UPON SIGNAL FROM HOOD FIRE EXTINGUISHING SYSTEM. INTERLOCK RTU WITH KITCHEN EXHAUST FAN TO EMERGENCY WHEN HOOD SYSTEM IS ENERGIZED FOR PRESSURIZATION.					
T. DURING OPTIMUM START SEQUENCE, THE UNIT SHALL SUPPLY THE LESSER OF THE MINIMUM RATE OF OUTDOOR AIR OR SUPPLY 3 COMPLETE AIR CHANGES DURING THE 1-HOUR PERIOD BEFORE NORMAL OCCUPIED MODE.					

GRILLE, REGISTER, AND DIFFUSER SCHEDULE										
MARK	MANUFACTURER	SERVICE	MODEL	CONSTRUCTION MATERIAL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	MAX. NC	NOTES	
CEG	E.H. PRICE	EXHAUST GRILLE W/ DAMPER	80D	STEEL	EGGCRATE	SURFACE	12x12	30	A B C F G H	
CRG1	E.H. PRICE	RETURN GRILLE	80D	STEEL	EGGCRATE	LAY-IN	24x24	30	A B C F H	
CRG2	E.H. PRICE	RETURN GRILLE	80D	STEEL	EGGCRATE	LAY-IN	12x12	30	A B C F H	
CSDF	E.H. PRICE	SUPPLY DIFFUSER	SCD	STEEL	SQUARE CONE	SURFACE	12x12	30	A B C F H J K L	
CSDF	E.H. PRICE	SUPPLY DIFFUSER	SCD	STEEL	SQUARE CONE	LAY-IN	24x24	30	A B C F H K	
CSDF	E.H. PRICE	SUPPLY DIFFUSER	PPDR	STEEL	PERFORATED	LAY-IN	24x24	30	A B C F H	
CSDF	E.H. PRICE	SUPPLY DIFFUSER	PPD	STEEL	SQUARE CONE	LAY-IN	24x24	30	A B C F H K M	
WRD	E.H. PRICE	RETURN GRILLE W/DAMPER	SDSD	STEEL	LOUVERED FACE	WALL OR DUCT (SEE PLANS)	30	A B C D F H		
WSR	E.H. PRICE	SUPPLY REGISTER W/DAMPER	SDSD	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" NPT 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 PLENUM DIFFUSER. (RE: 2M01)										
K. 4-WAY THROW PATTERN UNLESS OTHERWISE INDICATED BY FLOW ARROWS ON DRAWINGS.										
L. PROVIDE RAPID MOUNT FRAME FOR INSTALLATION IN HARD CEILING.										
M. VARIABLE VOLUME DIFFUSER SHALL BE INTERLOCKED WITH SPACE MOUNTED THERMOSTAT. PROVIDE (1) POWER SUPPLY FOR CONTROL OF VAV DIFFUSER IN EACH INDIVIDUAL ROOM. REFER TO ELECTRICAL PLANS FOR POWER SUPPLY LOCATION AND POWER REQUIREMENTS. DIFFUSERS SHALL BE EQUIPPED WITH AUTOMATIC CHANGE-OVER AND RELIEF RING. MINIMUM AIRFLOW SHALL BE 40% OF MAXIMUM AIRFLOW.										

PROJECT DESIGN CONDITIONS																			
CLIMATE CONDITIONS							BUILDING OPERATING HOURS:												
WEATHER STATION: NEW YORK LA GUARDIA, NY, USA							MONDAY - FRIDAY: TBD BY OWNER												
CLIMATE ZONE: 4A							SATURDAY: TBD BY OWNER												
HEATING (DB): 99.6% 13.8 "F							SUNDAY: TBD BY OWNER												
COOLING (DB/MCW): 0.4% 92.6 "F/ 73.9 "F/							HOLIDAY: TBD BY OWNER												
SPACE / UNIT DESCRIPTION		COOLING / DE-HUMIDIFICATION				HEATING				HUMIDIFICATION				ZONE VENTILATION RESET		SPACE OPERATING HOURS OCCUPIED / UNOCCUPIED		NOTES	
		OCC		UNOCC		OCC		UNOCC		MIN		MAX		BASE		MAXIMUM			
		"F		RH %		"F		RH %		RH %		RH %		METHOD		PPM		M.F	
DINING AREAS		75		80		50%		NA		70		60		NA		NA		TBD	
OFFICES		75		80		50%		NA		70		60		NA		NA		TBD	
MECHANICAL ROOM		NA		NA		NA		NA		70		60		NA		NA		TBD	
KITCHEN/BOH		75		80		50%		NA		70		60		NA		NA		TBD	
NOTES:																			
A. ZONE LEVEL SET POINT CONDITIONS SHALL BE AS SCHEDULED UNLESS OTHERWISE SCHEDULED OR NOTED ON THE DRAWINGS FOR ROOM SPECIFIC SPACE CONDITIONS.																			
B. ZONE LEVEL OCCUPANCY HOUR SCHEDULE SHALL BE PER BUILDING OPERATING HOURS UNLESS OTHERWISE SCHEDULED.																			
C. ZONE LEVEL CONTROLS SHALL BE CAPABLE OF OPERATING WITH INDEPENDENT OCCUPANCY SCHEDULES.																			

FAN SCHEDULE														
MARK	SERVICE (EA, RA, SA/OA)	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	DRIVE (BELT/DIRECT)	HP	FAN RPM	VFD (Y/N)	VPH	DISC. TYPE	STARTER TYPE	NOTES
(E)EF-1	EA	GREENHECK	ROOF	G-097-VG	150	0.5	DIRECT	1/4	1236	N	120/1	NF	COMBINATION	A,B,C,D,E
REF-1	REA	GREENHECK	INLINE	BSQ-200	3600	0.5	DIRECT	1	834	N	120/1	NF	COMBINATION	A,B,C,D,E
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.														
B. INTERLOCK FAN OPERATION WITH ECONOMIZER FUNCTION OF FCU UNITS.														
C. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.														
D. DIVISION 26 CONTRACTOR TO FURNISH STARTER.														
E. PROVIDE WITH MANUFACTURER'S FAN SPEED CONTROLLER FOR BALANCING PURPOSES.														

DEDICATED OUTDOOR AIR SYSTEM - HEAT PUMP FAN COIL UNIT AND AUX. ELECTRIC HEAT																													
SCHEDULE FOR REFERENCE ONLY. EQUIPMENT FURNISHED BY LANDLORD.																													
MARK	MANUFACTURER	MODEL	NOMINAL TONS	UNIT TYPE	SUPPLY FAN					COOLING COIL					TOTAL HTG CAP (MBH)	AUXILIARY HEATER					MIN OIA CFM	ELECTRICAL VPH	DISC TYPE	WEIGHT (LBS)	NOTES				
					DESIGN CFM	ESP (IN)	BHP	NOM HP	VFD (Y/N)	REFR TYPE	TH (MBH)	SH (MBH)	EAT (F DB)	LAT (F DB)		(F WB)	(F DB)	(F DB)	(F DB)	MIN OUT (MBH)						NOM (KW)	MIN NO STAGES		
(E)FCU-1	AAON	H3-CRB-8-0-142D	11	SPLIT DOAS	1,800	1.5	1.1	2.3	Y	R410a	106.4	65.8	94.8	69.5	51.7	50.3	30.1	38.7	85	107.5	21.5	2	1000	209/3	113	125	NON-FUSED	927	A,U
(E)FCU-2	AAON	H3-DRB-8-0-142D	25	SPLIT DOAS	5,000	1.5	2.3	2.3	Y	R410a	214.8	148.3	82.8	67.9	55.6	54.1	215	45.2	85	179.2	52.5	2	2200	209/3	167	175	NON-FUSED	1165	A,U
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 FAN COIL UNIT CONTROL MATRIX FOR ADDITIONAL UNIT FEATURES, COMPONENTS, MODULES, ACCESSORIES, AND CONTROLS THAT SHALL BE PROVIDED WITH THE EQUIPMENT.																													
B. EQUIPMENT SIZED FOR 32.6 "F AMBIENT TEMPERATURE.																													
C. PROVIDE 2" MERV 8 EFFICIENT, FLATED 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 TO FACILITATE MODULATING FAN SPEED CONTROL.																													
H. PROVIDE SINGLE POINT POWER CONNECTION.																													
J. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.																													
L. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.																													
N. 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.																													
R. SCHEDULED WEIGHT IS THE MAXIMUM ALLOWABLE OPERATING WEIGHT OF THE EQUIPMENT.																													
S. COOLING COIL LAT IS LEAVING AIR TEMPERATURE OF COIL.																													
U. TOTAL HEATING CAPACITY INCLUDES THE HEAT PUMP HEATING COIL CAPACITY AT THE AMBIENT DRY BULB TEMPERATURE LISTED PLUS THE AUXILIARY HEATING COIL OUTPUT LISTED. HEAT PUMP HEATING COIL MINIMUM EFFICIENCY IS CALCULATED AT 13.6°F.																													

UNIT HEATER SCHEDULE (ELECTRIC)							
MARK	MANUFACTURER	MODEL	OUTPUT (KW)	MIN. NO. OF STAGES	CFM	VPH	NOTES
EUH-1	QMARK	CDF-558	5	1	300	208/1	B C E F G
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. MOUNT 8 FEET ABOVE FINISHED FLOOR WITHOUT OBSTRUCTING AIRFLOW.							
B. PROVIDE WITH FACTORY INSTALLED THERMOSTAT.							
C. EQUIPMENT FURNISHED AND INSTALLED PER THE RESPONSIBILITY SCHEDULE IN ARCHITECTURAL SET.							
D. PROVIDE NECESSARY MOUNTING BRACKET AND ACCESSORIES FOR WALL MOUNTING.							
E. PROVIDE FACTORY INSTALLED DISCONNECT SWITCH.							
F. SUPPORT UNIT AS RECOMMENDED BY UNIT MANUFACTURER.							
G. FURNISH WITH RECESSED MOUNTING ENCLOSURE.							
H. PROVIDE WITH WALL MOUNTED LINE VOLTAGE THERMOSTAT.							

HEAT PUMP CONDENSING UNIT SCHEDULE															
SCHEDULE FOR REFERENCE ONLY. EQUIPMENT FURNISHED BY LANDLORD.															
MARK	SERVICE	MANUFACTURER	MODEL	REFR	COOLING CAPACITY			HEATING CAPACITY			MCA	MOCOP	VPH	WEIGHT (LBS)	NOTES
					TH (MBH)	AMBIENT (DB)	MIN EFF (EER)	CAP (MBH)	AMBIENT (DB)	MIN EFF COP-47°F					
(E)CU-1	FCU-1	AAON	CFA-011-B-A-8	R410A	106.40	98.0	12.1	90.1	13.6	3.76	43	60	209/3	1068	A,H
(E)CU-2	FCU-2	AAON	CFA-025-C-A-8	R410A	214.80	98.0	9.5	179.2	13.6	2.98	122	150	209/3	1498	A,H
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.															

AIR CURTAIN SCHEDULE										
MARK	SERVICE AREA	MANUFACTURER	MODEL	UNIT SPECS			VPH/HZ	NOTES		
				LENGTH (IN)	MAX. AIRFLOW	HEATING CAPACITY (KW)				
AC-1	SERVICE ENTRY	MARS	STD2	72	2758	24	(2) 1/2 HP	208/3	A-E	
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 BY MECHANICAL CONTRACTOR, REF ARCHITECTURAL DRAWINGS.										
B. MOUNT UNIT PER MANUFACTURER'S RECOMMENDATIONS TO FACE OF WALL AND SUPPORT VERTICALLY.										
C. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.										
D. PROVIDE AIR CURTAIN WITH NORMALLY CLOSED DOOR LIMIT SWITCH FOR INSTALLATION ON DOOR. THE IR CURTAIN SHALL ENERGIZE WHEN DOOR OPENS.										
E. PROVIDE WITH DELAY MICROSWITCH WITH ADJUSTABLE DELAY TIMERS PRE MOUNTED IN THE AIR CURTAIN CONTROL PANEL.										

LOUVER SCHEDULE									
SCHEDULE FOR REFERENCE ONLY. EQUIPMENT FURNISHED BY LANDLORD.									
MARK	SERVICE	MANUFACTURER	MODEL	SIZE (WxH)	CFM	MIN FREE AREA (SF)	MAX. VEL. (FPM)	MAX. P.D. (DB V.C.)	NOTES
(ELV-1)	OUTDOOR AIR	RUSKIN	ELF375X	96" x 36"	6900	12.5	548	0.09	A-G
(ELV-2)	RELIEF AIR	RUSKIN	ELF375X	42" x 36"	3600	5.3	682	0.09	A-G
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. PROVIDE 1/4" MESH ALUMINUM BIRD SCREEN.									
B. PROVIDE ANODIZED FINISH. COLOR AS SELECTED BY ARCHITECT.									
C. FRAME TYPE SHALL MATCH WALL CONSTRUCTION, COORDINATE WITH ARCHITECT.									
D. PROVIDE WINDBOURNE DEBRIS IMPACT RESISTANCE LOUVER.									
E. PROVIDE LOUVER WITH SEISMIC RATING AND SUPPORTS TO MEET SPECIFIED PROJECT SEISMIC CRITERIA.									
F. PROVIDE LOUVER WITH WIND DRIVEN RAIN PERFORMANCE AS DEFINED IN THE SPECIFICATIONS.									
G. PROVIDE SNOW ELIMINATOR FACTORY INSTALLED WITH LOUVER.									

RESTAURANT AIR BALANCE SCHEDULE											
KITCHEN						DINING					
OUTDOOR AIR SOURCE EQUIPMENT	AREA/EQUIPMENT SERVED	SUPPLY AIR (CFM)	DESIGN OA (CFM)	PERCENT O/A/S	PERCENT O/A/S	OUTDOOR AIR EQUIPMENT	AREA/EQUIPMENT SERVED	SUPPLY AIR (CFM)	DESIGN OA (CFM)	PERCENT O/A/S	PERCENT O/A/S
(E)FCU-2	KITCHEN	5000	2200	44.0%	44.0%	(E)FCU-1	DINING	1800	1000	55.6%	55.6%
TOTAL AIRFLOW		5,000	2,200	44.0%	44.0%	TOTAL AIRFLOW		1,800	1,000	55.6%	55.6%
TOTAL EXHAUST EQUIPMENT	EXHAUST EQUIPMENT	AREA DESCRIPTION	EXHAUST EQUIPMENT	AREA DESCRIPTION	AREA DESCRIPTION	EXHAUST EQUIPMENT	AREA DESCRIPTION	EXHAUST EQUIPMENT	AREA DESCRIPTION	AREA DESCRIPTION	AREA DESCRIPTION
(E)FCU-1	ROOF	KITCHEN	2684	2684	100%	(E)EF-1	ROOF	150	150	100%	100%
TOTAL EXHAUST			2,684	2,684	100%	TOTAL EXHAUST		150	150	100%	100%
TOTAL KITCHEN POSITIVE/NEGATIVE AIR FLOW			494	-494	0%	TOTAL DINING POSITIVE/NEGATIVE AIR FLOW					</

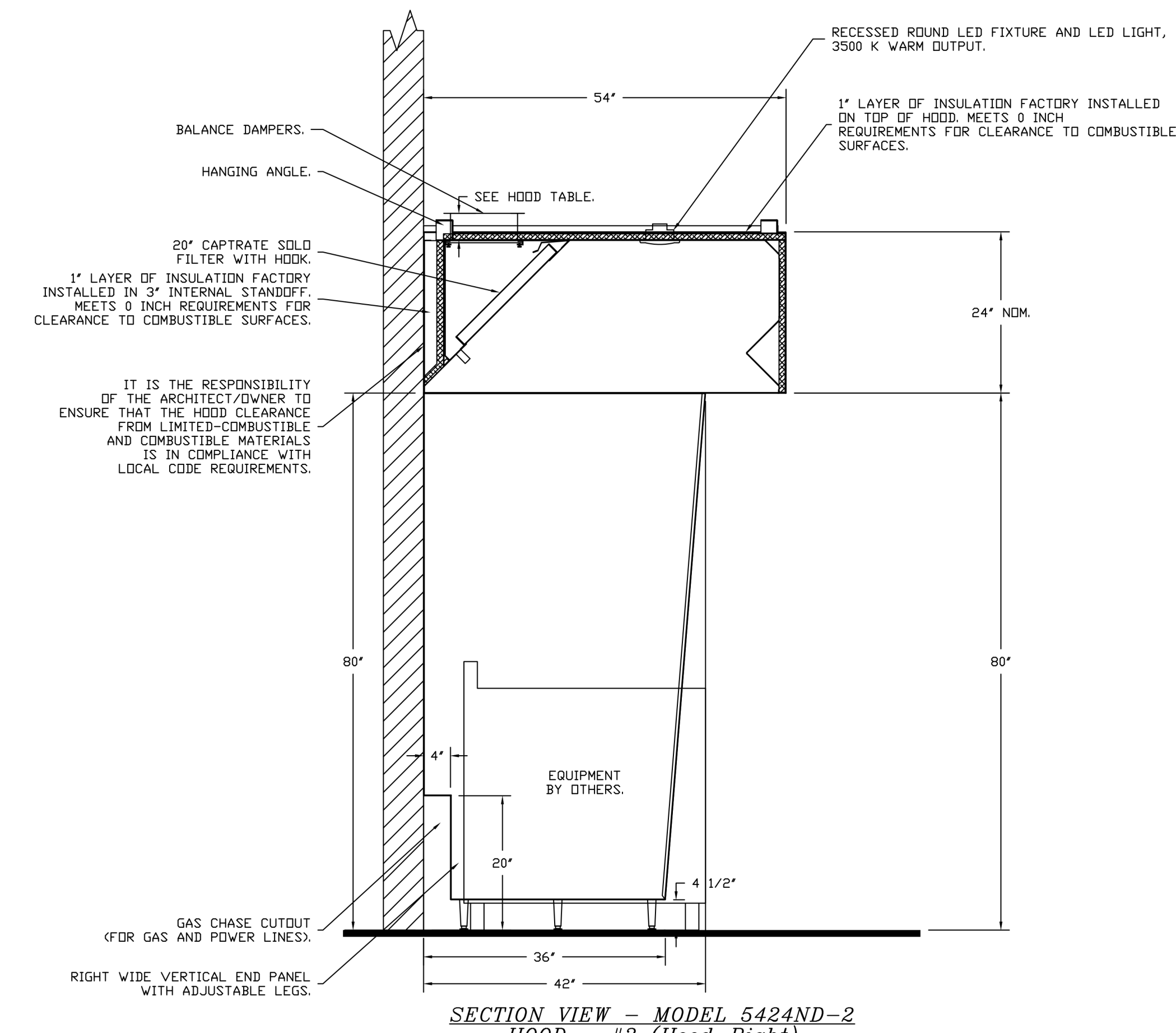
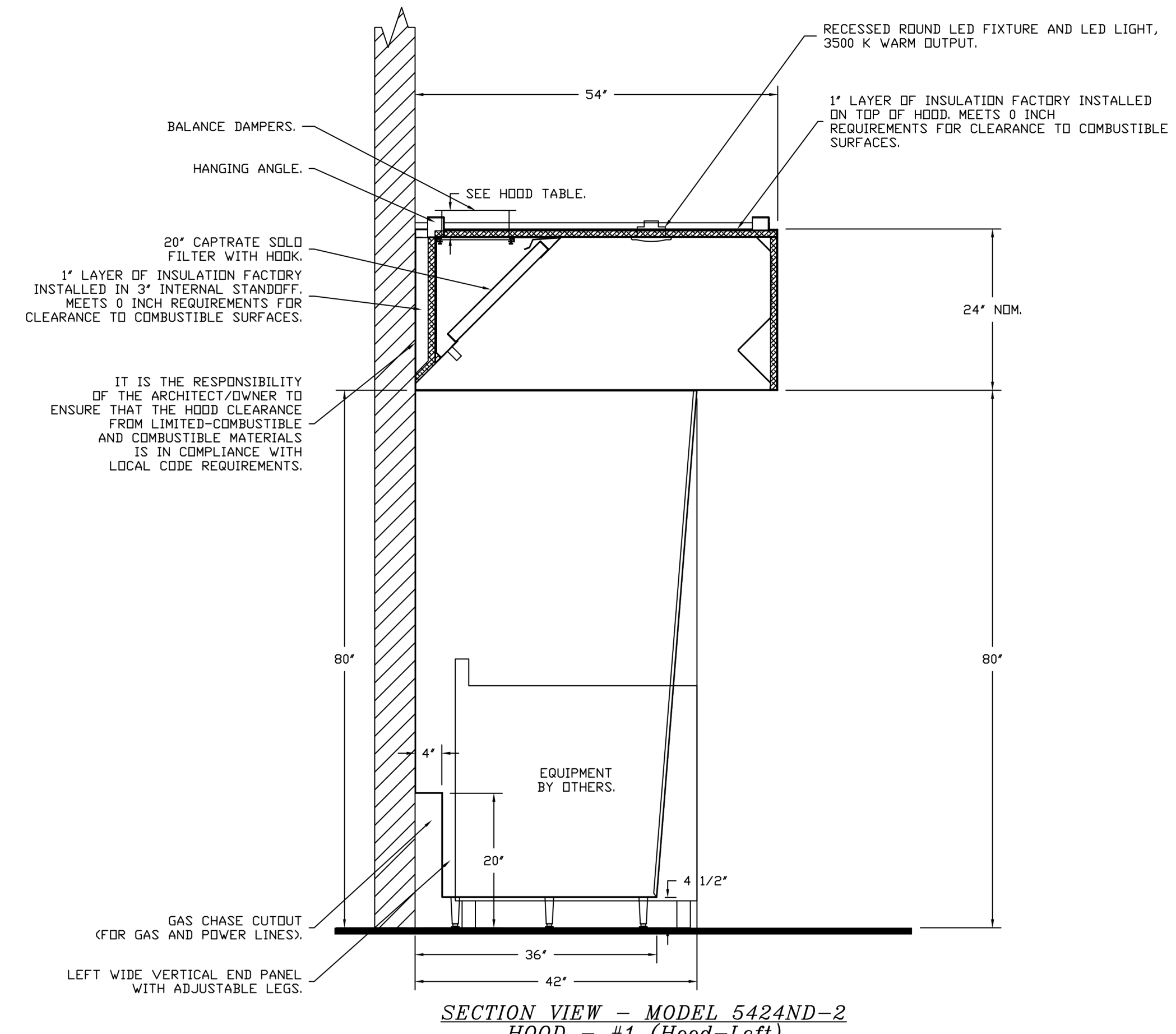
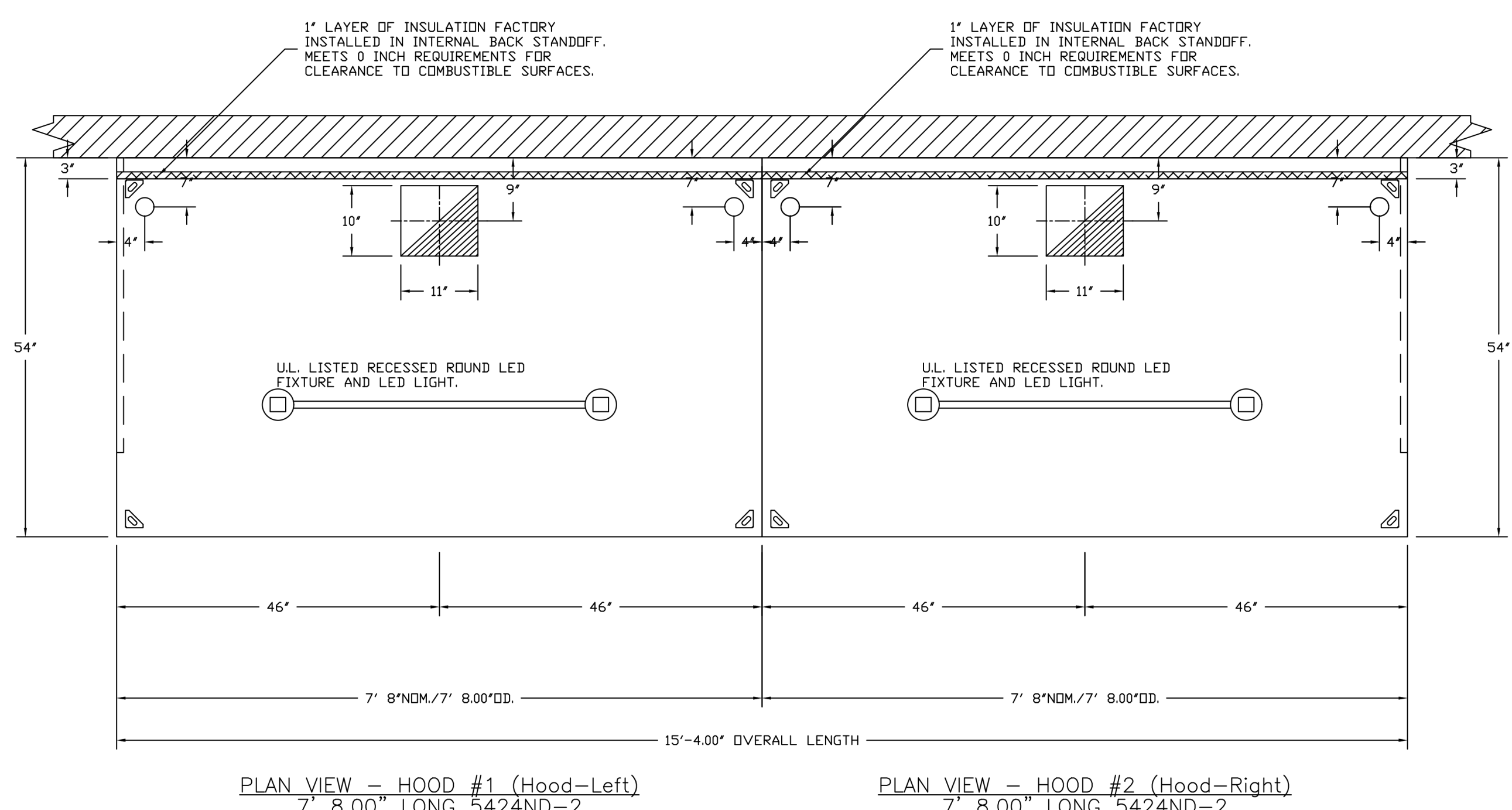
46-20 QUEENS BLVD
QUEENS, NY 11104
SHACK # 1479

DESIGN ARCHITECT	Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	CLIENT	Shake Shack 225 Varick St. Suite 301 New York, NY 10014
MECHANICAL ENGINEER	HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018	MECHANICAL CONSULTANT	Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703
LOADING	Gemstone Main POC Joseph Janell	GENERAL CONTRACTOR	CM&B INC. Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001

REVISIONS

NO.	DESCRIPTION	DATE

CAPTIVE AIRE
www.captiveaire.com
Eastern PA Mechanical
PO Box 2520, 1 Union Ave. Bala Cynwyd, PA 19004 PHONE: (267) 304-4726 EMAIL: reg108@captiveaire.com



Shake Shack-1479-Sunnyside_NY_R3
JAMAICA, NY, 11432

DATE: 2/9/2024
DWG.#: 6604270
DRAWN BY: Joe.shiiba
SCALE: 3/4" = 1'-0"
MASTER DRAWING

SHEET NO. 2

SEAL SIGNATURE:
FOR REFERENCE ONLY

NO.	BY	DATE	PERMIT SET	DESCRIPTION
1		4.8.2024	IFC SET	
		12.21.2023	PERMIT SET	

CAPTIVE AIRE DRAWINGS

M-702.00

PROJECT	2250003796	SCALE	11 OF 19
DATE	02/09/2024	PROJECT NO.	Q00972537-S1

Emporium Design, LLC
54 West 39th Street, Floor 16
New York, New York 10018

NOTE:
THE DOCUMENTATION CONTAINED ON THIS SHEET WAS NOT PREPARED BY HENDERSON ENGINEERS AND IS INCLUDED IN THIS SET FOR REFERENCE ONLY. HENDERSON ENGINEERS REVIEWED THE DOCUMENTATION ON THIS SHEET FOR GENERAL COMPLIANCE WITH DESIGN INTENT. SUPPLIER IS RESPONSIBLE THAT ALL FURNISHED EQUIPMENT ON THIS SHEET COMPLES WITH APPLICABLE LOCAL, STATE, AND FEDERAL LAWS, CODES, AND REGULATIONS.

NOTE:
EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT 'AS-BUILT' CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT:
IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED. THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION 'ALTERED BY' FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.

SPECIAL INSPECTIONS:
OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE:
THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

DESIGN ARCHITECT	Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	CLIENT	Shake Shack 225 Varick St. Suite 301 New York, NY 10014
------------------	----------------------------------------------------------------------------------------------------------------------------------	--------	------------------------------------------------------------------

MECHANICAL ENGINEER	HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018	MECHANICAL CONSULTANT	Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703
---------------------	--------------------------------------------------------------------------------------------------------	-----------------------	---------------------------------------------------------------------------------------------------------------

LANDLORD	Gemstone Main POC Joseph Janell	GENERAL CONTRACTOR	CM&B INC. Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001
----------	------------------------------------	--------------------	-------------------------------------------------------------------------------------

SEAL SIGNATURE

FOR REFERENCE ONLY

NO.	BY	DATE	PERMIT SET	DESCRIPTION
1		4.8.2024	IFC SET	
		12.21.2023	PERMIT SET	

CAPTIVE AIRE DRAWINGS

M-703.00

PROJECT	SCALE	DATE	NO. OF SHEETS	OF
2250003796			12	19

Emporium Design, LLC
54 West 39th Street, Floor 16
New York, New York 10018

FIRE SYSTEM INFORMATION - JOB#6604270

FIRE SYSTEM NO	TAG	TYPE	SIZE	MAX FP	DESIGN FP	INSTALLATION	
						SYSTEM	LOCATION ON HOOD
1	HOOD TANK	TANK FS	4.0/4.0/4.0	60	46	WALL UTILITY CABINET LEFT	N/A

GAS VALVE(S)

FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1	HOOD TANK	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 #: 6604270.

JOB NAME: SHAKE SHACK-1479-SUNNYSIDE,NY_R3.

SYSTEM SIZE: TANK-SP-3-VC DESIGN FP: 46, MAXIMUM FP: 60.

HOOD # 1 7' 8.00' LONG x 54" WIDE x 24" HIGH.

RISER # 1 SIZE: 10" x 11".

HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.

HOOD # 2 7' 8.00' LONG x 54" WIDE x 24" HIGH.

RISER # 1 SIZE: 10" x 11".

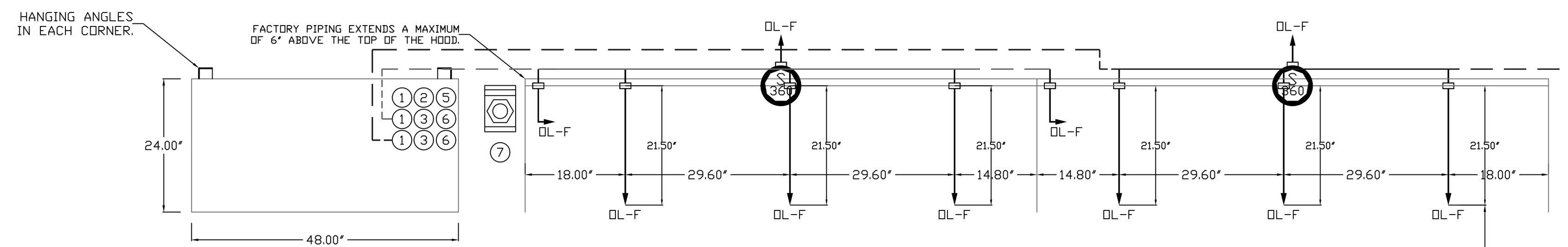
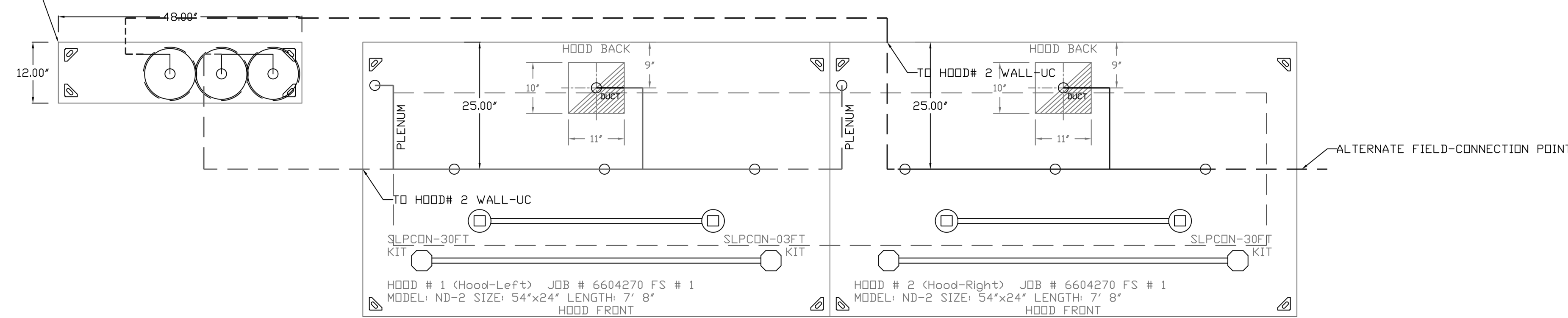
HOOD # 2 METAL BLOW-OFF CAPS INCLUDED.

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

LEGEND - FIRE CABINET TANK SYSTEM

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

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



TANK OVERLAPPING PROTECTION - 30 HIGH PROXIMITY 172.00' L X 30.00' D

NOTE:
THE DOCUMENTATION CONTAINED ON THIS SHEET WAS NOT PREPARED BY HENDERSON ENGINEERS AND IS INCLUDED IN THIS SET FOR REFERENCE ONLY. HENDERSON ENGINEERS REVIEWED THE DOCUMENTATION ON THIS SHEET FOR GENERAL COMPLIANCE WITH DESIGN INTENT. SUPPLIER IS RESPONSIBLE THAT ALL FURNISHED EQUIPMENT ON THIS SHEET COMPLES WITH APPLICABLE LOCAL, STATE, AND FEDERAL LAWS, CODES, AND REGULATIONS.

NOTE:
EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT:
IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

SPECIAL INSPECTIONS:
OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE:
THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

REVISIONS

NO.	DESCRIPTION	DATE

CAPTIVE AIRE

Eastern PA Mechanical
PO Box 2520, 1 Union Ave, Bala Cynwyd, PA, 19004 PHONE: (267) 504-4479 EMAIL: mg108@captiveaire.com

Shake Shack-1479-Sunnyside,NY_R3
JAMAICA, NY, 11432

DATE: 2/9/2024
DWG.#: 6604270
DRAWN BY: Joe.shilba
SCALE: 3/4" = 1'-0"
MASTER DRAWING

SHEET NO.
3

46-20 QUEENS BLVD
QUEENS, NY 11104
SHACK # 1479

Emporium Design, LLC
Tim Welsh, AIA
Robert Stansell, AIA
54 West 39th Street
Floor 16
New York, New York
10018

Shake Shack
225 Varick St.
Suite 301
New York, NY 10014

HNY Consulting Engineers
Brandon Manning
240 West 37th Street
3rd Floor
New York, NY 10018

Trimark United East Food Service Design
Steve Dungey
505 Collins Street
South Attleboro, MA
02703

Gemstone Main POC
Joseph Janell

CM&B INC.
Stephen Malenchini
363 7th Avenue, 14th Floor
New York, NY 10001

SEAL SIGNATURE:

FOR REFERENCE ONLY

EXHAUST FAN INFORMATION - JOB#6604270

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SDNES
1	KEF-1	1	USB118DD-RM	CAPTIVEAIRE	2684	2,000	1360	DDP, PREMIUM	1.500	1.4330	3	208	6.6	1376 FPM	416	21.7

FAN OPTIONS

FAN UNIT NO	TAG	QTY	DESCRIPTION
1	KEF-1	1	B118 - INLET SERVICE DUCT CONNECTION, USED TO CONNECT TO STANDARD 20" GREASE DUCT OR FIELD WELDED DUCT. INCLUDES (2) 7" RISERS BOLTED TO STANDARD INLET RISER
		1	UTILITY SET GREASE CUP
		1	B118 - 24" DISCHARGE EXTENSION
		1	B1 - DISCHARGE ORIENTATION VERTICAL UPPER LEFT - CW INLET SIDE
		1	B118 - INLET CONNECTION STANDARD 20" FLANGED GREASE DUCT
		1	UTILITY SET - SPRING VIBRATION ISOLATORS - B118 / EQUIVALENT SIZED UTILITY SET - INDOOR/OUTDOOR USE
1	2 YEAR PARTS WARRANTY		

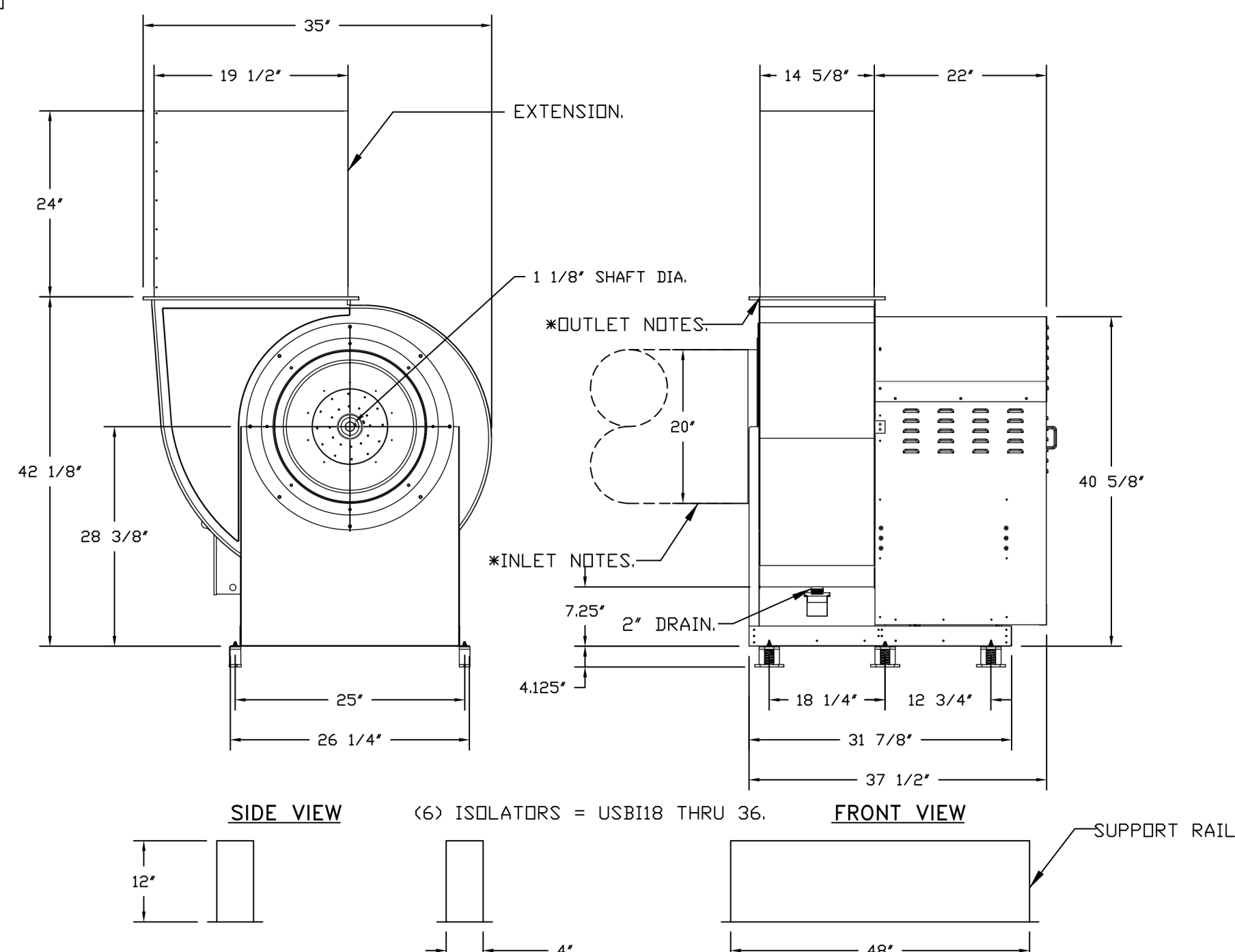
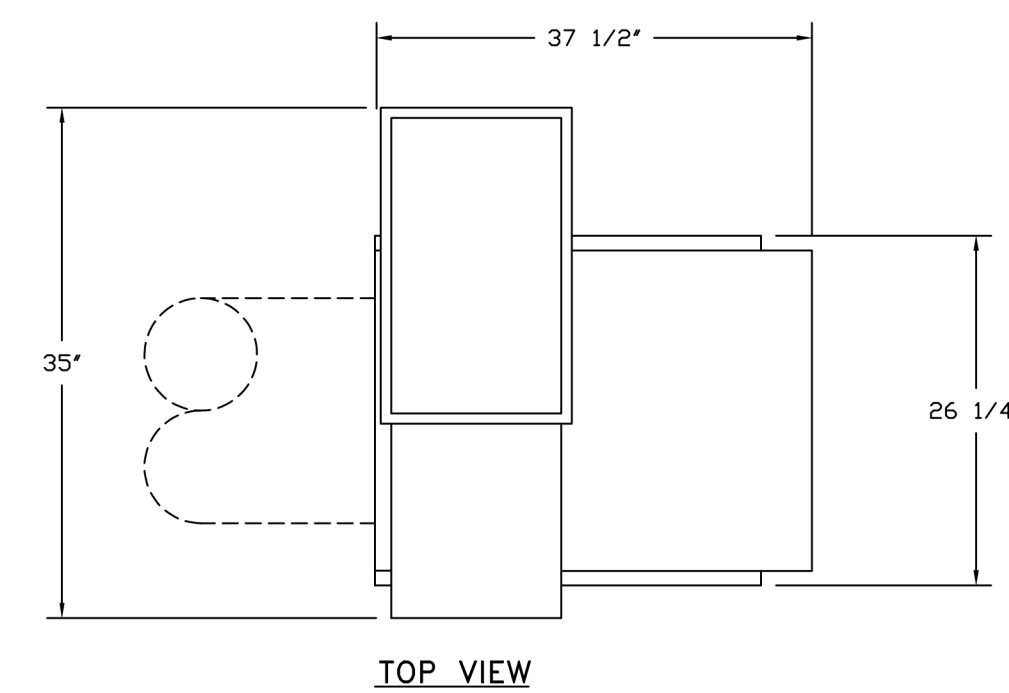
FAN ACCESSORIES

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

CURB ASSEMBLIES

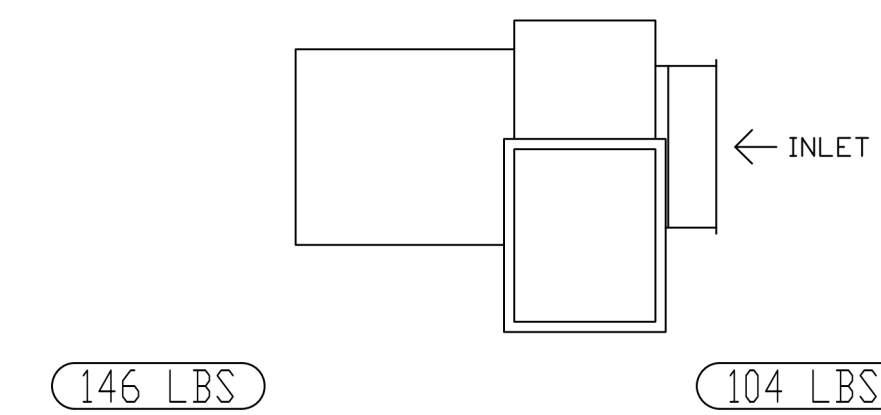
NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	48 LBS	RAIL	4.000"W X 48.000"L X 12.000"H COMES AS A SET OF 2.

FAN #1 USB118DD-RM - EXHAUST FAN (KEF-1)



* INLET/OUTLET NOTES:
LENGTH OF THE STRAIGHT DUCT ON THE INLET AND OUTLET TO BE 3 TIMES THE EQUIVALENT DUCT DIAMETER BEFORE CONNECTING TO ANY FITTINGS SUCH AS ELBOWS TO AVOID SYSTEM EFFECT.

UNIT PLAN VIEW CORNER WEIGHTS:
CORNER WEIGHTS ARE CALCULATED BASED ON VERTICAL DISCHARGE. SUPPORT DUCT PROPERLY BEFORE FAN TO ENSURE CORNER WEIGHTS ARE NOT AFFECTED.



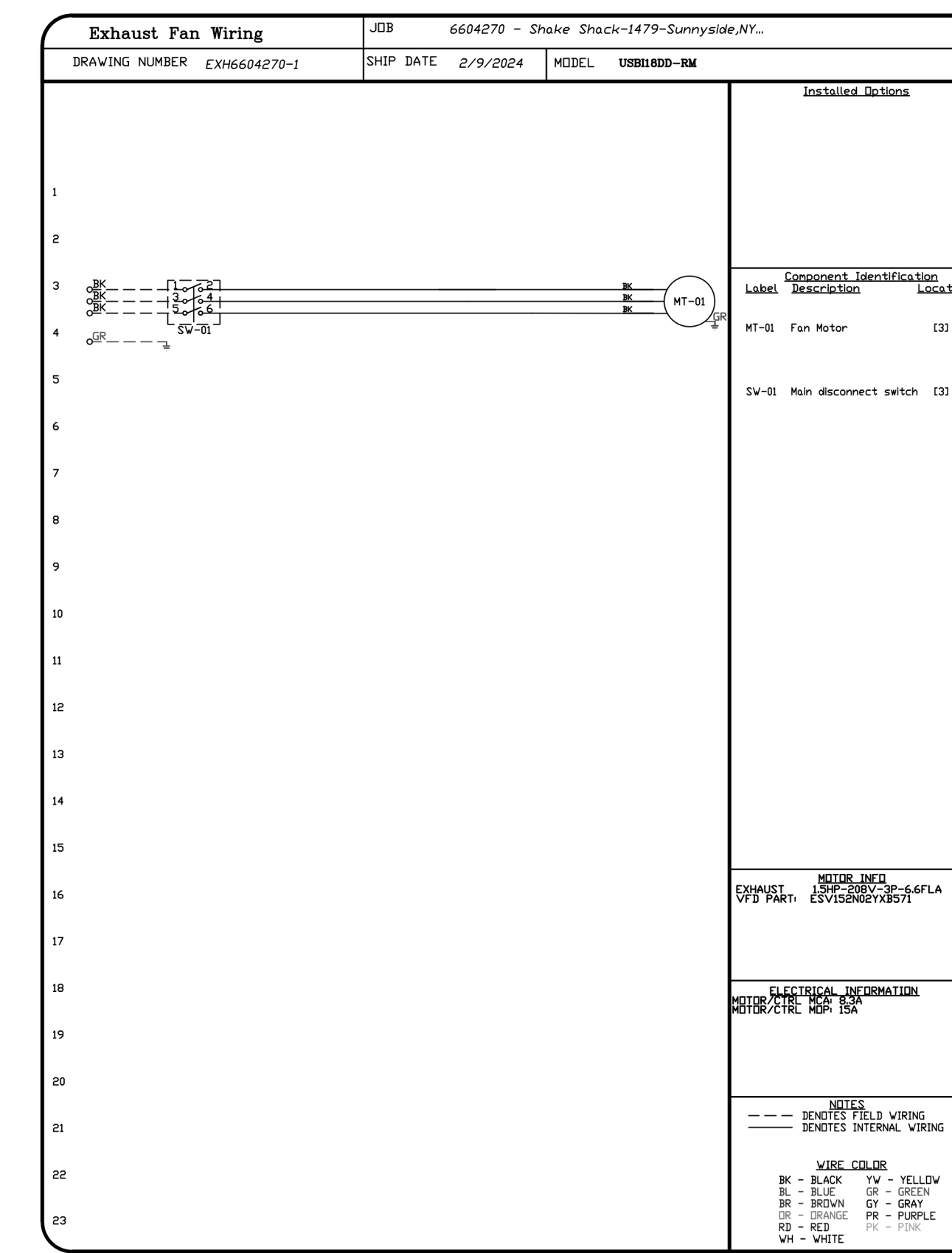
NORMAL TEMPERATURE TEST DIRECT DRIVE EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 350°F (176°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETRIMENTAL EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

FEATURES:

- ROOF MOUNTED FANS.
- UL705.
- UL762 AND ULC-S645 (RESTAURANT MODEL).
- HIGH HEAT OPERATION DIRECT DRIVE 350°F (176°C).
- HEAT SLINGER.
- NEMA 3R SAFETY DISCONNECT SWITCH.
- GREASE CLASSIFICATION TESTING.
- 2" DRAIN.
- MOTOR WEATHER COVER.
- FULLY SEALED SCROLL HOUSING.
- SCROLL ACCESS DOOR.
- FLANGE 1 1/4".

OPTIONS

- B118 - INLET SERVICE DUCT CONNECTION, USED TO CONNECT TO STANDARD 20" GREASE DUCT OR FIELD WELDED DUCT. INCLUDES (2) 7" RISERS BOLTED TO STANDARD INLET RISER.
- UTILITY SET GREASE CUP.
- B118 - 24" DISCHARGE EXTENSION.
- B1 - DISCHARGE ORIENTATION VERTICAL UPPER LEFT - CW INLET SIDE.
- B118 - INLET CONNECTION STANDARD 20" FLANGED GREASE DUCT.
- UTILITY SET - SPRING VIBRATION ISOLATORS - B118 / EQUIVALENT SIZED UTILITY SET - INDOOR/OUTDOOR USE.
- 2 YEAR PARTS WARRANTY.



REVISIONS

NO.	DESCRIPTION	DATE
1		
2		
3		
4		



Shake Shack-1479-Sunnyside, NY_R3
JAMAICA, NY, 11432

DATE: 2/9/2024
DWG.#: 6604270
DRAWN BY: Joe.shilba
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 4

NOTE:
EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT:
IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED. THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL, AND THE NOTATION ALTERED BY FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

NOTE:
THE DOCUMENTATION CONTAINED ON THIS SHEET WAS NOT PREPARED BY HENDERSON ENGINEERS AND IS INCLUDED IN THIS SET FOR REFERENCE ONLY. HENDERSON ENGINEERS REVIEWED THE DOCUMENTATION ON THIS SHEET FOR GENERAL COMPLIANCE WITH DESIGN INTENT. SUPPLIER IS RESPONSIBLE THAT ALL FURNISHED EQUIPMENT ON THIS SHEET COMPLIES WITH APPLICABLE LOCAL, STATE, AND FEDERAL LAWS, CODES, AND REGULATIONS.

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.

SPECIAL INSPECTIONS
OWNER SHALL SUBCONTRACT WITH A NEW YORK STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE:
THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

M-704.00
13 OF 19
2250003796
Q00972537-S1

Emporium Design, LLC
54 West 39th Street, Floor 16
New York, New York 10018

46-20 QUEENS BLVD
QUEENS, NY 11104
SHACK # 1479

DESIGN ARCHITECT	Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	CLIENT	Shake Shack 225 Varick St. Suite 301 New York, NY 10014
------------------	----------------------------------------------------------------------------------------------------------------------------------	--------	------------------------------------------------------------------

MECHANICAL ENGINEER	HNY Consulting Engineers Brandon Manning 240 West 37th Street 3rd Floor New York, NY 10018	MECHANICAL CONSULTANT	Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703
---------------------	--------------------------------------------------------------------------------------------------------	-----------------------	---------------------------------------------------------------------------------------------------------------

LANDLORD	Gemstone Main POC Joseph Janell	GENERAL CONTRACTOR	CM&B INC. Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001
----------	------------------------------------	--------------------	-------------------------------------------------------------------------------------

SEAL SIGNATURE:

FOR
REFERENCE
ONLY

NO.	BY	DATE	PERMIT SET	DESCRIPTION
1		4.8.2024	IFC SET	
		12.21.2023	PERMIT SET	

CAPTIVE AIRE DRAWINGS

M-706.00

PROJECT	2250003796	SCALE	15 OF 19
DATE	12/21/2023	PROJECT	Q00972537-S1

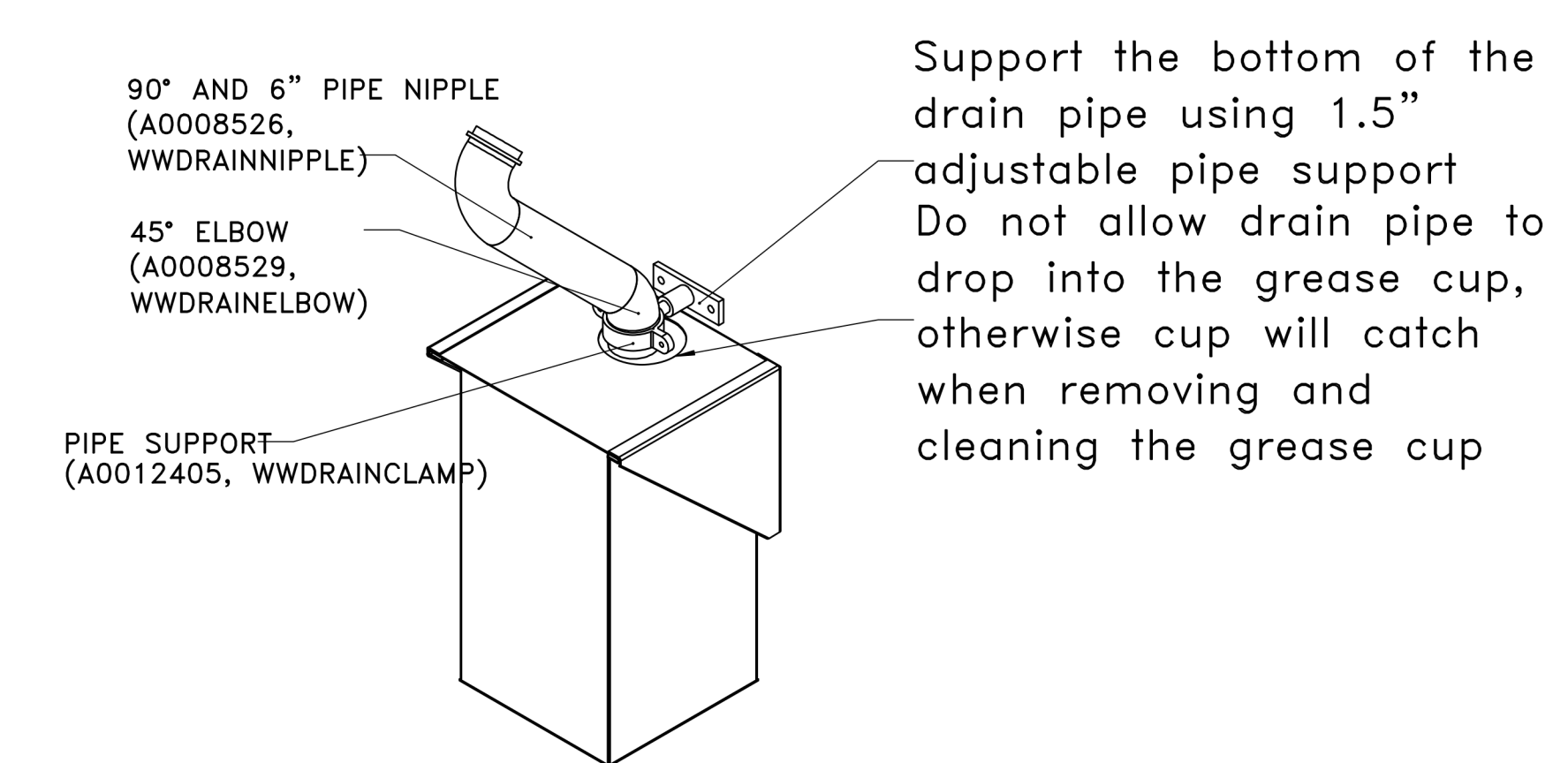
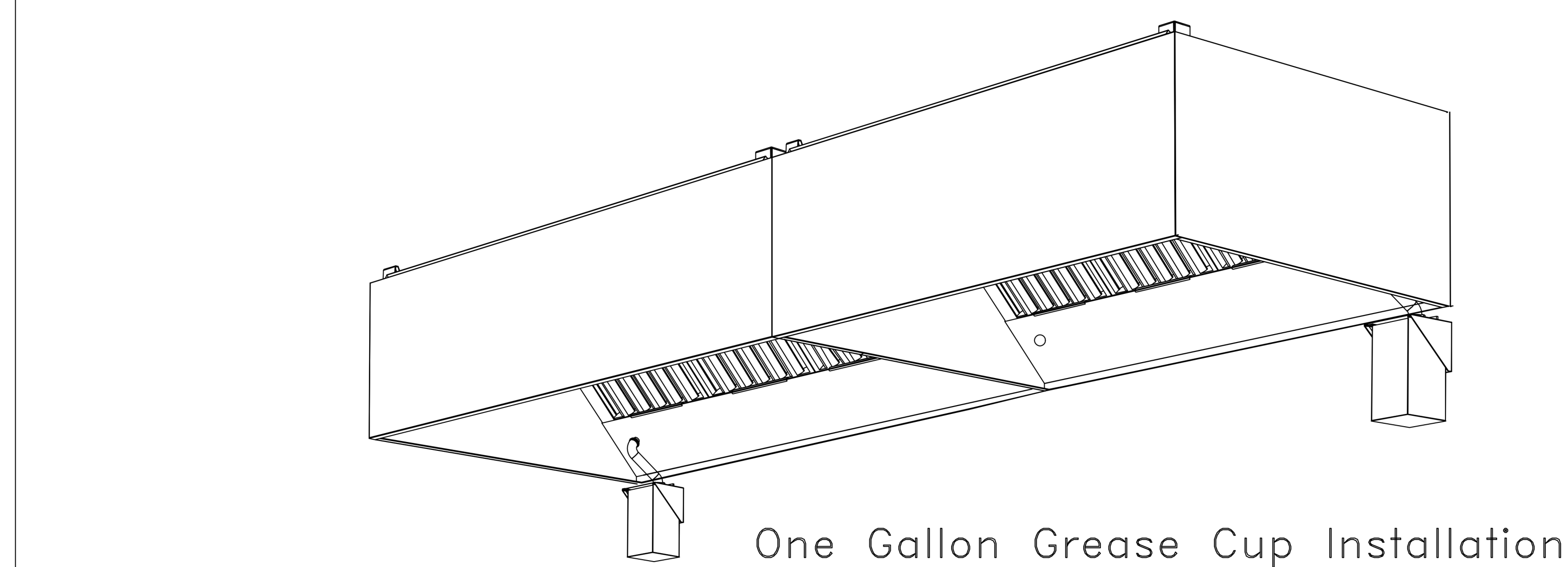
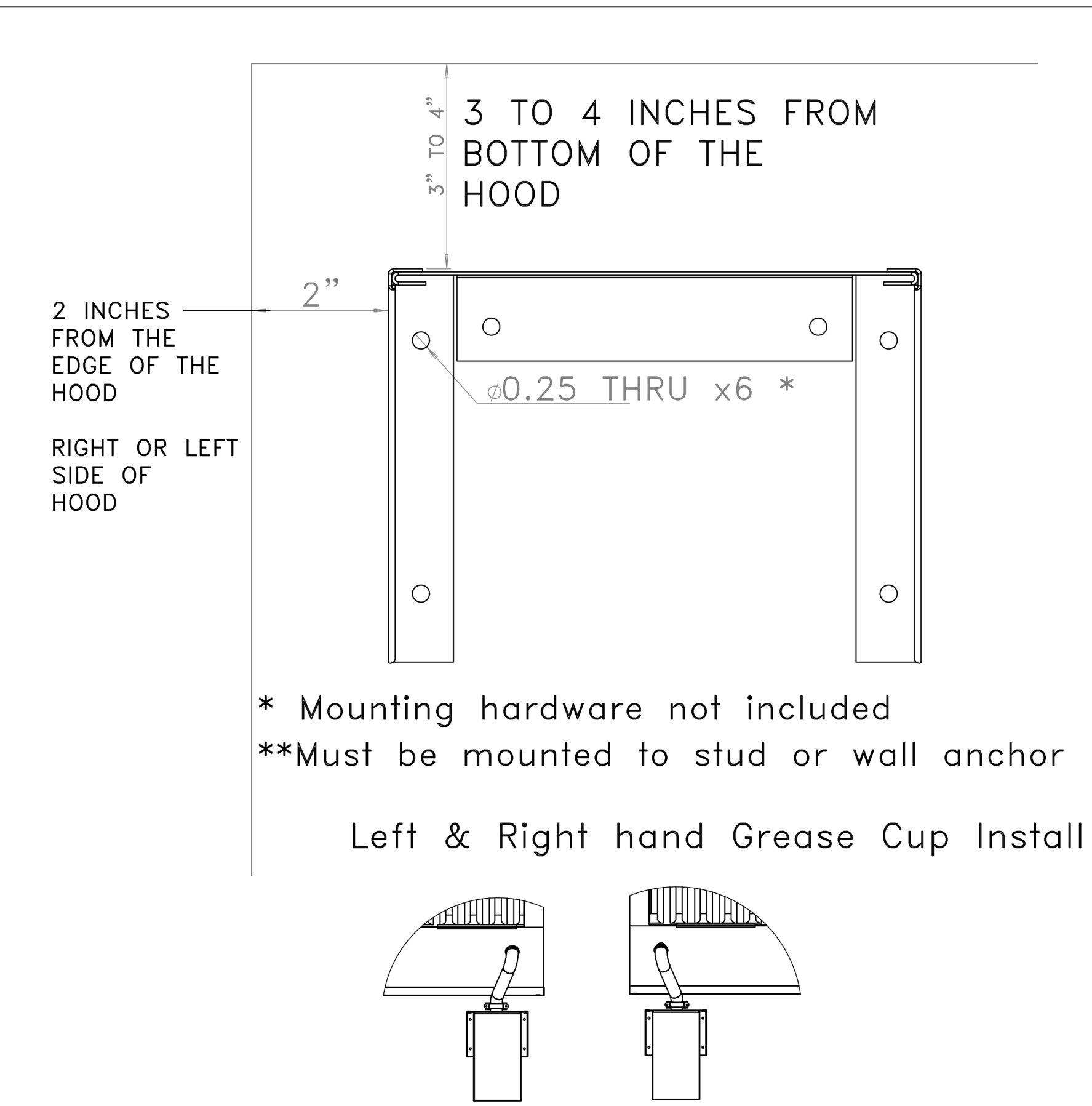
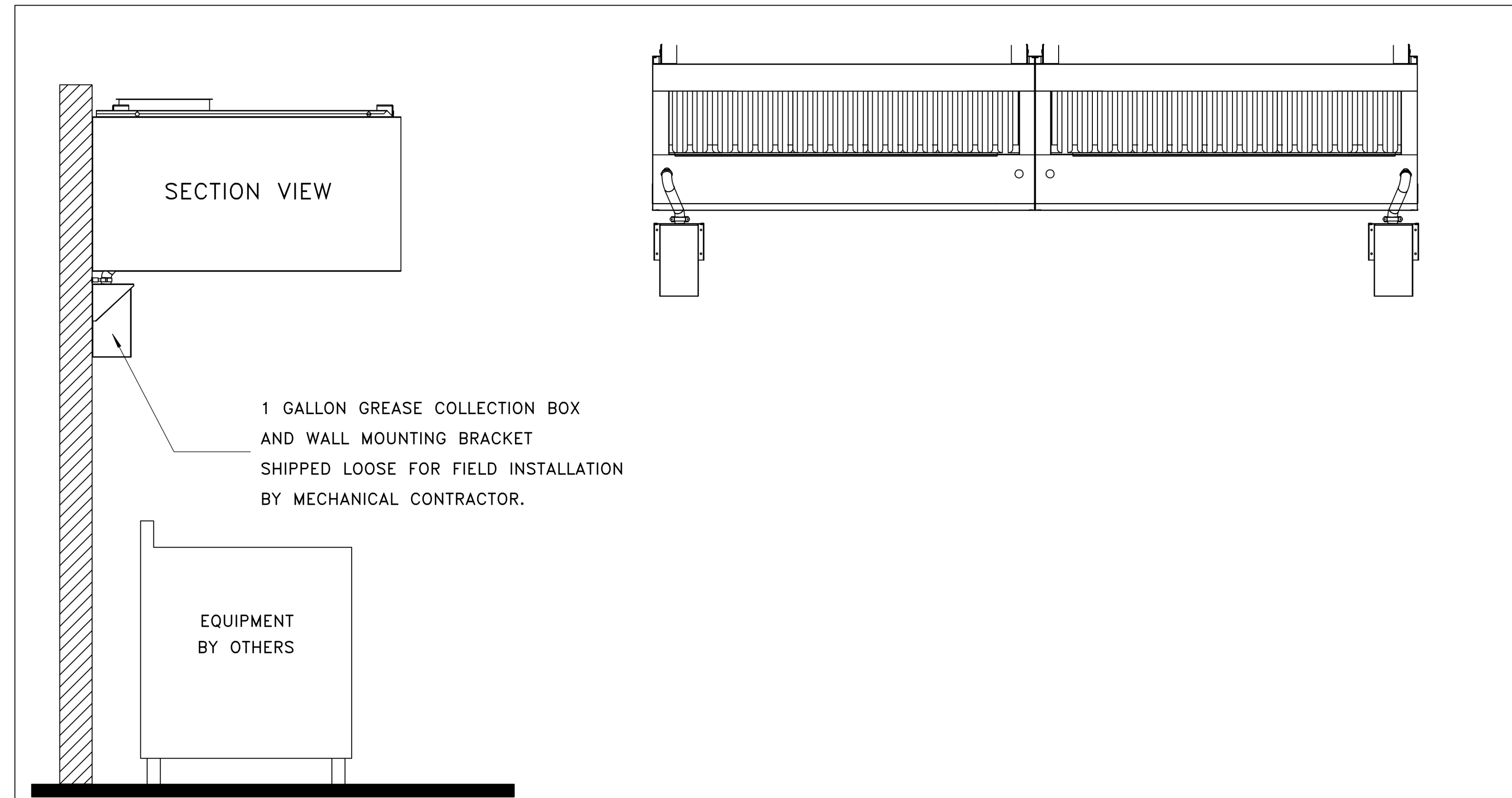
Emporium Design, LLC
54 West 39th Street, Floor 16
New York, New York 10018

REVISIONS	
DESCRIPTION	DATE

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

Shake Shack-1479-Sunnyside, NY_R3
 JAMAICA, NY, 11432

DATE: 2/9/2024
 DWG.#: 6604270
 DRAWN BY: Joe Shiba
 SCALE: 3/4" = 1'-0"
 MASTER DRAWING
 SHEET NO. 6



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.

Support the bottom of the drain pipe using 1.5" adjustable pipe support. Do not allow drain pipe to drop into the grease cup, otherwise cup will catch when removing and cleaning the grease cup.

Gallon Grease Cup Assembly

1	Mounting Bracket
2	Gallon Grease Cup

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

NOTE:
 THE DOCUMENTATION CONTAINED ON THIS SHEET WAS NOT PREPARED BY HENDERSON ENGINEERS AND IS INCLUDED IN THIS SET FOR REFERENCE ONLY. HENDERSON ENGINEERS REVIEWED THE DOCUMENTATION ON THIS SHEET FOR GENERAL COMPLIANCE WITH DESIGN INTENT. SUPPLIER IS RESPONSIBLE THAT ALL FURNISHED EQUIPMENT ON THIS SHEET COMPLIES WITH APPLICABLE LOCAL, STATE, AND FEDERAL LAWS, CODES, AND REGULATIONS.

NEW YORK ALTERATION WARNING STATEMENT:
 IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED. THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION."

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.

SPECIAL INSPECTIONS:
 OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDIENTER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE:
 THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

COMcheck Software Version COMcheckWeb
Interior Lighting Compliance Certificate

Project Information
Energy Code: 2020 NYStretch Energy Code - 2018 IECC
Project Title: Shake Shack - 1479 - ELEC
Project Type: New Construction

Owner/Agent: Shake Shack
Design/Contractor: Henderson Engineers
Lenexa, KS

Additional Efficiency Package(s)

Credits: L0 Required L0 Proposed
Reduced Lighting Power: 0.00
Allowed Interior Lighting Power: 0.00

Allowed Interior Lighting Power

Area Category	B Floor Area (F2)	C Allowed Watts / F2	D Allowed Watts
1-DINING (Common Space Types:Dining Area - Cafeteria/Fast Food)	1363	0.48	654
Allowance: Decorative Appearance (not lobbies) / Fix. ID: WS1	485 (a)	0.75	352 (b)
2-KITCHEN/BAR (Common Space Types:Food Preparation)	1138	0.83	945
Allowance: Decorative Appearance (not lobbies) / Fix. ID: RA	1138 (a)	0.75	60 (b)
3-R CORRIDOR (Common Space Types:Corridor/Transition <= 8 ft wide)	62	0.52	32
4-ADA RR - 103 (Common Space Types:Restrooms)	94	0.68	64
5-ADA RR - 104 (Common Space Types:Restrooms)	103	0.68	70
6-OFFICE (Common Space Types:Office - Executive)	66	0.77	52
7-VESTIBULE (Common Space Types:Corridor/Transition >= 8 ft wide)	139	0.52	62
Total Allowed Watts =			2091

(a) Area claimed must not exceed the illuminated area permitted for this allowance type.
(b) Allowance is (B x C) or the actual wattage of the fixtures given in Section 2, whichever is less.

Proposed Interior Lighting Power

Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Watt. (C X D)
5-ADA RR - 104 (Common Space Types:Restrooms) LED 1 copy 7: R2: LED DOWNLIGHT: Other:	1	4	12
6-OFFICE (Common Space Types:Office - Executive) LED 1 copy 4: A1A3:EM: 2X4 LED TROFFER: Other:	1	2	50
LED 1 copy 5: B1: UNDERCABINET LIG: Other:	1	2	10
LED 1 copy 6: A2A2:EM: 2X4 LED TROFFER: Other:	1	4	12
7-VESTIBULE (Common Space Types:Corridor/Transition >= 8 ft wide) LED 1 copy 8: R2: LED DOWNLIGHT: Other:	1	4	12
Total Proposed Watts =			2042

Project Title: Shake Shack - 1479 - ELEC
Data Filename: _____

Report date: 04/15/24
Page 1 of 7

Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Watt. (C X D)
5-ADA RR - 104 (Common Space Types:Restrooms) LED 1 copy 7: R2: LED DOWNLIGHT: Other:	1	4	12
6-OFFICE (Common Space Types:Office - Executive) LED 1 copy 4: A1A3:EM: 2X4 LED TROFFER: Other:	1	2	50
LED 1 copy 5: B1: UNDERCABINET LIG: Other:	1	2	10
LED 1 copy 6: A2A2:EM: 2X4 LED TROFFER: Other:	1	4	12
7-VESTIBULE (Common Space Types:Corridor/Transition >= 8 ft wide) LED 1 copy 8: R2: LED DOWNLIGHT: Other:	1	4	12
Total Proposed Watts =			2042

Owner/Agent: Shake Shack
Design/Contractor: Henderson Engineers
Lenexa, KS

Additional Efficiency Package(s)

Credits: L0 Required L0 Proposed
Reduced Lighting Power: 0.00
Allowed Interior Lighting Power: 0.00

Allowed Interior Lighting Power

Area Category	B Floor Area (F2)	C Allowed Watts / F2	D Allowed Watts
1-DINING (Common Space Types:Dining Area - Cafeteria/Fast Food)	1363	0.48	654
Allowance: Decorative Appearance (not lobbies) / Fix. ID: WS1	485 (a)	0.75	352 (b)
2-KITCHEN/BAR (Common Space Types:Food Preparation)	1138	0.83	945
Allowance: Decorative Appearance (not lobbies) / Fix. ID: RA	1138 (a)	0.75	60 (b)
3-R CORRIDOR (Common Space Types:Corridor/Transition <= 8 ft wide)	62	0.52	32
4-ADA RR - 103 (Common Space Types:Restrooms)	94	0.68	64
5-ADA RR - 104 (Common Space Types:Restrooms)	103	0.68	70
6-OFFICE (Common Space Types:Office - Executive)	66	0.77	52
7-VESTIBULE (Common Space Types:Corridor/Transition >= 8 ft wide)	139	0.52	62
Total Allowed Watts =			2091

(a) Area claimed must not exceed the illuminated area permitted for this allowance type.
(b) Allowance is (B x C) or the actual wattage of the fixtures given in Section 2, whichever is less.

Proposed Interior Lighting Power

Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Watt. (C X D)
5-ADA RR - 104 (Common Space Types:Restrooms) LED 1 copy 7: R2: LED DOWNLIGHT: Other:	1	4	12
6-OFFICE (Common Space Types:Office - Executive) LED 1 copy 4: A1A3:EM: 2X4 LED TROFFER: Other:	1	2	50
LED 1 copy 5: B1: UNDERCABINET LIG: Other:	1	2	10
LED 1 copy 6: A2A2:EM: 2X4 LED TROFFER: Other:	1	4	12
7-VESTIBULE (Common Space Types:Corridor/Transition >= 8 ft wide) LED 1 copy 8: R2: LED DOWNLIGHT: Other:	1	4	12
Total Proposed Watts =			2042

Project Title: Shake Shack - 1479 - ELEC
Data Filename: _____

Report date: 04/15/24
Page 2 of 7

COMcheck Software Version COMcheckWeb
Inspection Checklist

Energy Code: 2020 NYStretch Energy Code - 2018 IECC

Requirements: 100.0% were addressed directly in the COMcheck software
Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req ID	Plan Review	Complies?	Comments/Assumptions
C102.2 (PR4)	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment, and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C406 (PR9)	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.10 (PR3B)	New parking garages and new parking lots powered by the energy services for a building, and with 10 or greater parking spaces, provide either: 1. Panel capacity and conduct for the future installation of minimum 200KVA or more outlets for 5 percent of the total parking spaces and not less than two parking spaces, or 2. Minimum 200kVA 40-amp outlets for 5 percent of the total parking spaces and not less than two parking spaces.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.

Additional Comments/Assumptions:

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

Project Title: Shake Shack - 1479 - ELEC
Data Filename: _____

Report date: 04/15/24
Page 3 of 7

Section # & Req ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.2 (EL22)	Spaces required to have light-reduction controls have a manual control that allows the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern >= 50 percent.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.2.1 (EL18)	Occupancy sensors installed in classrooms, meeting rooms, conference/meeting/multipurpose rooms, copy/print areas, corridors/transition areas, lounge/breakrooms, enclosed offices, open plan office areas, restrooms, storage rooms, locker rooms, warehouse storage areas, and other spaces <= 200 sq ft that are enclosed by floor-to-ceiling height partitions. Reference section language C405.2.1.2 for control function in warehouses and section C405.2.1.3 for open plan office spaces.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Automatic on controls are allowed in corridors, stairways, restrooms, primary building entrance areas and lobbies, and areas where manual-on controls could impact safety or security.
C405.2.1 (EL30)	Occupant sensor control function for egress illumination: luminaires serving the exit egress and providing means of egress illumination required by Section 1008.1 of the IBC, including luminaires that function as both normal and emergency means of egress illumination are controlled by a combination of listed emergency way out occupancy sensors, or signal from another building control system, that automatically reduces the lighting power by 50% when unoccupied for a period longer than 15 minutes.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.2.1 (EL19)	Occupancy sensors control function in warehouses: In warehouses, the lighting in aiseways and open areas is controlled with occupancy sensors that automatically reduce lighting power by 50% or more when the areas are unoccupied. The occupancy sensor control lighting in each aiseway independently and does not control lighting beyond the aiseway being controlled by the sensor.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.

Project Title: Shake Shack - 1479 - ELEC
Data Filename: _____

Report date: 04/15/24
Page 4 of 7

Section # & Req ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.1 (EL20)	Occupant sensor control function in open plan office areas: Occupant sensor controls in open office spaces >= 200 sq ft are required to be configured so that general lighting can be controlled by the occupant sensor zones with floor areas <= 600 sq ft within the space. 2) automatically turn off general lighting in all control zones within 10 minutes after all occupants have left the space. 3) are configured so that general lighting power in each control zone is reduced by >= 80% of the full zone general lighting power within 10 minutes of all occupants leaving the control zone, and 4) are configured such that any single responsive control will activate space general lighting only when occupancy for the same area is detected.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.
C405.2.1 (EL21)	Each area not served by occupancy sensors (per C405.2.1) have time-switch controls and functions detailed in sections C405.2.2.1 and C405.2.2.2.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.2.3 (EL23)	Daylight zones provided with individual controls that control the lights independent of general area lighting within daylight zones in the following spaces: 1. Spaces with a total of more than 100 watts of general lighting within daylight zones complying with section C405.2.3.2. General lighting does not include lighting that is required to have specific application controls in accordance with Section C405.2.4. 2. Spaces with a total of more than 100 watts of general lighting within daylight zones complying with Section C405.2.3.3. See code section C405.2.3.1 Daylight responsive control function and section	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Sidelit zones on first floor in Group A-2 and M occupancies.
C405.2.4 (EL4)	Separate lighting control devices for specific uses installed per approved lighting plans.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.2.4 (EL27)	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.3 (EL6)	Exit signs do not exceed 5 watts per face.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

Project Title: Shake Shack - 1479 - ELEC
Data Filename: _____

Report date: 04/15/24
Page 5 of 7

Section # & Req ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.6 (EL25)	Low-voltage dry-type distribution electric equipment meet the minimum efficiency requirements of Table C405.6.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.
C405.7 (EL27)	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.8.2 (EL3)	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.
C405.9 (EL29)	Total voltage drop across the combination of feeders and branch circuits <= 3%.	<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 - 1479 - ELEC
Data Filename: _____

Report date: 04/15/24
Page 6 of 7

Section # & Req ID	Final Inspection	Complies?	Comments/Assumptions
C303.3 (R11)	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.4 (R18)	Interior installed lamp and fixture lighting power consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the interior lighting fixture schedule for values.
C408.1.1 (R9)	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturer information, specifications, programming procedures and means of illustrating to owner how building equipment and systems are intended to be installed, maintained, and operated.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.3 (R33)	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	<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 - 1479 - ELEC
Data Filename: _____

Report date: 04/15/24
Page 7 of 7



**SUNNYSIDE
SHAKE SHACK**

46-20 QUEENS BLVD
QUEENS, NY 11104
SHACK # 1479

DESIGN ARCHITECT	CLIENT
Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA	Shake Shack 225 Varick St. Suite 301 New York, NY 10014
MECHANICAL	MECHANICAL CONSULTANT
HNY Consulting Engineers Brandon Manning	Trimark United East Food Service Design Steve Dungey
ELECTRICAL	ELECTRICAL CONSULTANT
Gemstone Main POC Joseph Janell	CM&B INC. Stephen Malenchini
LANDSCAPE	GENERAL CONTRACTOR
	363 7th Avenue, 14th Floor New York, NY 10001



240 WEST 37TH STREET, 3RD FLOOR
NEW YORK, NY 10018
Tel: 212.415.8400
www.hny-eng.com
2250003796

SEAL/SIGNATURE



04/17/2024

NO.	BY	DATE	PERMIT SET	DESCRIPTION
1		4.8.2024	IFC SET	
		12.21.2023	PERMIT SET	

**ELECTRICAL ENERGY CODE
COMPLIANCE**

EN-100.00

2250003796 18 OF 19
C08:00:00
C09:00:00
C00:00:00

NOTE:
EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT:
IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY WAY, IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED. THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION."

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.
ANDREW G. BENNETT

SPECIAL INSPECTIONS:
OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE:
THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

Emporium Design, LLC
54 West 38th Street, Floor 19
New York, New York, 10018

COMcheck Software Version COMcheckWeb
Mechanical Compliance Certificate

Project Information
 Energy Code: 2020 NYStretch Energy Code - 2018 IECC
 Project Title: Shake Shack - Sunnyside
 Location: New York, New York
 Climate Zone: 4a
 Project Type: New Construction

Construction Site: Owner/Agent: Designer/Contractor:

Additional Efficiency Packages(s)

Credits: 1.0 Required 0.0 Proposed

Mechanical Systems List

Quantity System Type & Description

- 1 WH-1: Gas Instantaneous Water Heater, Capacity: 0 gallons, Input Rating: 199 kBtu/h
No minimum efficiency requirement applies
- 1 WH-2: Gas Instantaneous Water Heater, Capacity: 0 gallons, Input Rating: 199 kBtu/h
No minimum efficiency requirement applies
- 1 WH-3: Gas Instantaneous Water Heater, Capacity: 0 gallons, Input Rating: 199 kBtu/h
No minimum efficiency requirement applies
- 1 WH-4: Gas Instantaneous Water Heater, Capacity: 0 gallons, Input Rating: 199 kBtu/h
No minimum efficiency requirement applies

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2020 NYStretch Energy Code - 2018 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

DALTON JUENEMANN - DESIGNER *Dalton Juennemann* **08/01/2023**
 Name - Title Signature Date

Project Title: Shake Shack - Sunnyside Report date: 08/01/23
 Data filename: Page 1 of 6

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.6 [EL26]	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.7 [EL27]	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.8.2 [EL28]	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.9 [EL29]	Total voltage drop across the combination of feeders and branch circuits ≤ 5%.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

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

Project Title: Shake Shack - Sunnyside Report date: 08/01/23
 Data filename: Page 5 of 6

COMcheck Software Version COMcheckWeb
Inspection Checklist

Energy Code: 2020 NYStretch Energy Code - 2018 IECC

Requirements: 100.0% were addressed directly in the COMcheck software

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

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [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.
C406 [PR9]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.10 [PR38]	New parking garages and new parking lots powered by the energy services for a building, and with 10 or greater parking spaces, provide either: 1. Panel capacity and conduit for the future installation of minimum 208/240V 40-amp outlets for 5 percent of the total parking spaces and not less than two parking spaces; or 2. Minimum 208/240V 40-amp outlets for 5 percent of the total parking spaces and not less than two parking spaces.	<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 - Sunnyside Report date: 08/01/23
 Data filename: Page 2 of 6

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C404.3 [F11]	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 [F12]	All piping insulated in accordance with section details and Table C403.11.3.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.1.1 [F15]	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturer's information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.1 [F18]	Mechanical systems, Renewable Systems, and SWH Commissioning: Commissioning plan developed by registered design professional or approved agency. See 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.
C408.2.3 [F13]	Mechanical systems, Renewable Systems, and SWH Commissioning: HVAC equipment has been tested to ensure proper operation. See 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.
C408.2.3 [F10]	Mechanical systems, Renewable Systems, and SWH Commissioning: HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls. See 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.
C408.2.4 [F12]	Mechanical systems, Renewable Systems, and SWH Commissioning: Preliminary commissioning report completed and certified by registered design professional or approved agency. See 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.
C408.2.5 [F17]	Mechanical systems, Renewable Systems, and SWH Commissioning: Furnished HVAC as-built drawings submitted within 90 days of system acceptance. See 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.
C408.2.5 [F4]	Mechanical systems, Renewable Systems, and SWH Commissioning: An air and/or hydronic system balancing report is provided for HVAC systems. See 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.
C408.2.5 [F10]	Mechanical systems, Renewable Systems, and SWH Commissioning: Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy. See 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.

Additional Comments/Assumptions:

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

Project Title: Shake Shack - Sunnyside Report date: 08/01/23
 Data filename: Page 6 of 6

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, 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.
C404.6.3 [PL7]	Pumps that circulate water between a heater and storage tank have controls that limit operation from starting 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	Exception: Requirement does not apply.
C404.7 [PL8]	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<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 - Sunnyside Report date: 08/01/23
 Data filename: Page 3 of 6

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41]	Thermally ineffective panel surfaces of sensible heating panels have insulation ≥ R-3.5.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C405.8.1.1 [ME36]	New traction elevators with a rise of 75 feet or more have a power conversion system that complies as follows: C405.8.1.1.1 Induction motors with a Class IE2 efficiency ratings are used. C405.8.1.1.2 Transmissions does not reduce the efficiency of the combined motor/transmission below that shown for the Class IE2 motor for elevators with capacities below 4,000 lbs. C405.8.1.1.3 Potential energy released during motion recovered with a regenerative drive that supplies electrical energy to the building electrical system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.
C405.9 [ME37]	Commercial kitchen equipment shall comply with the minimum efficiency requirements of Tables C405.9(1) through C405.9(5).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.7.2 [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	Exception: Requirement does not apply.
C403.7.5 [ME116]	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and safety hood rating requirements and maximum exhaust rate criteria. See 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.
C403.4.1 [ME63]	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45°F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint = 60°F and cooling setpoint = 85°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.2 [ME53]	Mechanical systems, Renewable Systems, and SWH Commissioning: Air outlets and zone terminal devices have means for air balancing. See 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.
C403.10.1 [ME123]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2.	<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 - Sunnyside Report date: 08/01/23
 Data filename: Page 4 of 6



SUNNYSIDE
SHAKE SHACK

46-20 QUEENS BLVD
 QUEENS, NY 11104
 SHACK # 1479

DESIGN ARCHITECT Emporium Design, LLC Tim Welsh, AIA Robert Stansell, AIA 54 West 39th Street Floor 16 New York, New York 10018	CLIENT Shake Shack 225 Varick St. Suite 301 New York, NY 10014
MECHANICAL ENGINEER HNY Consulting Engineers Brandon Manning	MECHANICAL CONSULTANT Trimark United East Food Service Design Steve Dungey 505 Collins Street South Attleboro, MA 02703
LANDSCAPE ARCHITECT Joseph Janell	GENERAL CONTRACTOR CM&B INC. Stephen Malenchini 363 7th Avenue, 14th Floor New York, NY 10001



240 WEST 37TH STREET, 3RD FLOOR
 NEW YORK, NY 10018
 TEL: 212.413.8400
 www.hny-eng.com
 2250003796

SEALED SIGNATURE



04/17/2024

1	4.8.2024	IFC SET
NO	BY	DATE
		PERMIT SET
		DESCRIPTION

MECHANICAL ENERGY CODE COMPLIANCE

EN-200.00

19 OF 19

2250003796 C00972537-S1

NOTE: EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS & SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

NEW YORK ALTERATION WARNING STATEMENT: IT IS A VIOLATION OF THE NEW YORK EDUCATION LAW, ARTICLE 145, SECTION 7209 FOR ANY PERSON, UNLESS THE INDIVIDUAL IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY MANNER IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED. THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM THEIR SEAL AND THE NOTATION "ALTERED BY FOLLOWED BY THEIR SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION."

TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NEW YORK STATE ENERGY CODE.

SPECIAL INSPECTIONS: OWNER SHALL SUBCONTRACT WITH A NEW YORK, STATE REGISTERED SPECIAL INSPECTION AGENCY TO PERFORM THE REQUIRED SPECIAL INSPECTIONS FOR THE MECHANICAL, PLUMBING AND FIRE PROTECTION SYSTEMS AS REQUIRED BY THE NEW YORK CITY BUILDING CODE. OWNER SHALL PAY AN EXPEDITER TO FILE ALL REQUIRED FORMS.

BUILDING DEPARTMENT FILING NOTE: THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

ANDREW G. BENNETT

Emporium Design, LLC
 54 West 39th Street, Floor 16
 New York, New York 10018