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HVAC SYMBOLS	
	RECTANGULAR, FLAT OVAL OR ROUND AIR DUCT
	AIR DUCT WITH ACOUSTICAL LINING
	SUPPLY AIR DUCT UP
	SUPPLY AIR DUCT DOWN
	RETURN AIR DUCT UP
	RETURN AIR DUCT DOWN
	EXHAUST AIR DUCT UP
	EXHAUST AIR DUCT DOWN
	TURNING VANES
	ACCESS DOOR
	FLEXIBLE DUCT CONNECTION
	CEILING SUPPLY DIFFUSERS
	CEILING RETURN / EXHAUST GRILLE
	HARD DUCTED DIFFUSER OR GRILLE WITH FULL SIZE BOTTOM TAKE-OFF
	DIRECTION OF SUPPLY OR OUTDOOR AIRFLOW
	DIRECTION OF RETURN OR EXHAUST AIRFLOW
	DOOR UNDERCUT
	BACK DRAFT DAMPER
	VOLUME DAMPER
	FIRE DAMPER
	FIRE DAMPER WITH INTEGRAL SECURITY BARS
	FIRE/SMOKE DAMPER
	SMOKE DAMPER SYSTEM AND ASSOCIATED DEVICES PER SPECIFICATIONS AND MEP DETAILS
	MOTORIZED DAMPER
	HUMIDIFIER TUBE/PANEL
	SUPPLY PIPING, REFER TO ABBREVIATION LIST FOR DESIGNATION (XXX)
	RETURN PIPING, REFER TO ABBREVIATION LIST FOR DESIGNATION (XXX)
	DUCT SMOKE DETECTOR WITH REMOTE INDICATING LIGHT AND TEST SWITCH
	DUCT STATIC PRESSURE SENSOR
	DIFFERENTIAL PRESSURE SENSOR
	VARIABLE FREQUENCY DRIVE
	AIR FLOW STATION
	DUCT SOUND ATTENUATOR
	ROOM THERMOSTAT
	ROOM TEMPERATURE SENSOR
	CARBON MONOXIDE SENSOR
	CARBON DIOXIDE SENSOR
	HUMIDISTAT
	FINNED TUBE RADIATION
	FLOW METER
	VRF REMOTE CONTROL
MECHANICAL SYMBOLS NOTES: 1. ALL SYMBOLS MAY NOT BE USED.	

### ABBREVIATIONS

(A)	EXISTING TO BE ABANDONED	FPI	FINS PER INCH
(D)	EXISTING TO BE DEMOLISHED	GC	GENERAL TRADES CONTRACTOR
(E)	EXISTING TO REMAIN	ID	INNER DIAMETER
(F)	FUTURE	LAT	LEAVING AIR TEMPERATURE
(R)	EXISTING TO BE RELOCATED	LWT	LEAVING WATER TEMPERATURE
AAV	AUTOMATIC AIR VENT	MAU	MAKEUP AIR UNIT
AFF	ABOVE FINISHED FLOOR	MC	MECHANICAL CONTRACTOR
AHJ	AUTHORITY HAVING JURISDICTION	MFR	MANUFACTURER
AMB	AMBIENT	N/A	NOT APPLICABLE
APD	AIR PRESSURE DROP	NC	NORMALLY CLOSED
BAS	BUILDING AUTOMATIC SYSTEM	NO	NORMALLY OPEN
BFP	BACKFLOW PREVENTER	NTS	NOT TO SCALE
BLDG	BUILDING	OA	OUTSIDE AIR
BOB	BOTTOM OF BEAM	OD	OUTSIDE DIAMETER
BOD	BOTTOM OF DUCT	PD	PRESSURE DROP
BOP	BOTTOM OF PIPE	PRV	PRESSURE REDUCING VALVE
BOS	BOTTOM OF STRUCTURE	RA	RETURN AIR
CL	CENTER LINE	REL	RELIEF AIR
DB	DRY BULB	RTU	ROOFTOP UNIT
DIA	DIAMETER	SA	SUPPLY AIR
DN	DOWN	SCC	SENSIBLE COOLING CAPACITY
EA	EXHAUST AIR	SP	STATIC PRESSURE
EAT	ENTERING AIR TEMPERATURE	TCP	TEMPERATURE CONTROL PANEL
EC	ELECTRICAL CONTRACTOR	TSP	TOTAL STATIC PRESSURE
EF	EXHAUST FAN	TYP	TYPICAL
EFF	EFFICIENCY	UNO	UNLESS NOTED OTHERWISE
EG	ETHYLENE GLYCOL	VFD	VARIABLE FREQUENCY DRIVE
ESP	EXTERNAL STATIC PRESSURE	WB	WET BULB
EWT	ENTERING WATER TEMPERATURE	WG	WATER GAUGE
EXH	EXHAUST	WPD	WATER PRESSURE DROP

### FITTINGS AND VALVES

	BACKFLOW PREVENTER
	STRAINER OR STRAINER WITH BLOW-DOWN VALVE HOSE END, CAP AND CHAIN
	PIPE ELBOW UP OR PIPE TEE UP
	PIPE ELBOW DOWN
	PIPE TEE DOWN
	TAKEOFF FROM BOTTOM OF MAIN PIPE
	TAKEOFF FROM TOP OF MAIN PIPE
	IN-LINE EXPANSION COMPENSATOR
	PIPE ANCHOR
	COMPANION FLANGE
	PIPE CAP OR CAPPED END OF PIPE
	UNION
	PIPE GUIDES
	PUMP
	DIRECTION OF FLUID FLOW
	VALVE ON RISER
	VALVE ON DROP
	AIR VENT
	FLOW SENSOR
	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
	BALL VALVE
	CALIBRATED BALANCING VALVE
	SHUT-OFF VALVE (SEE SPECIFICATIONS FOR APPLICATION TYPE)
	BUTTERFLY VALVE
	CHECK VALVE
	GLOBE VALVE
	GATE VALVE
	PRESSURE REDUCING VALVE
	TRIPLE DUTY VALVE
	OS&Y VALVE
	DRAIN VALVE WITH HOSE END, CAP & CHAIN OR WALL HYDRANT / HOSE BIBB
	MOTORIZED BUTTERFLY VALVE
	PRESSURE RELIEF SAFETY VALVE
	AQUASTAT
	TEMPERATURE SENSOR WITH SEPARABLE SOCKET IN IMMERSIBLE WELL
	TEMPERATURE GAUGE WITH SEPARABLE SOCKET IN IMMERSIBLE WELL
	THERMOMETER WITH SEPARABLE SOCKET IN IMMERSIBLE WELL
	PRESSURE GAUGE
	PRESSURE SENSOR WITH SIPHON (STEAM)
	FLEXIBLE CONNECTOR
DUCT SIZING	
20x12	RECTANGULAR DUCT
20/12	FLAT OVAL DUCT
20"ø	ROUND DUCT

### SEQUENCE OF OPERATIONS

**EXISTING PACKAGED ROOF TOP UNIT RTU-T1A AND RTU-T1B**

PROVIDE STAND ALONE OR APPLICATIONS SPECIFIC CONTROLLERS AS REQUIRED TO PERFORM THE FOLLOWING SEQUENCES OF OPERATION.

**PACKAGED ROOF TOP UNITS:**

- UNIT SHALL CONSIST OF SUPPLY AIR FAN, FILTERS, DX COOLING COIL, GAS FIRED HEAT SECTION, AND 7-DAY PROGRAMMABLE THERMOSTAT.
- PROVIDE AN OVERRIDE SWITCH TO OPERATE THE UNIT UNOCCUPIED HOURS. THIS SWITCH SHALL BE PART OF THE PROGRAMMABLE THERMOSTAT. OVERRIDE SWITCH ALLOWS THE UNIT TO OPERATE FOR TWO HOURS (ADJUSTABLE).
- OCCUPIED MODE: BASED ON THE ROOF TOP UNIT'S HOURS OF OCCUPANCY, START THE UNIT AT BEGINNING OF THE OCCUPANCY AND SHUT DOWN THE UNIT AT THE END OF OCCUPANCY (NOTE: OUTSIDE AIR DAMPER WITHIN THE RTU SHALL OPEN AND THEN THE RTU SHALL START). THE UNIT SHALL START EARLIER AS DETERMINED BY THE PROGRAM FOR EARLY WARM-UP OR COOL DOWN, ON A SYSTEM STARTUP. THE RTU FAN SHALL START AND RUN CONTINUOUSLY AND THE INTERNAL FACTORY CONTROLS SHALL BE ENABLED. BASED ON THE SPACE TEMPERATURE SENSOR, THE UNIT SHALL CYCLE THE HEATING/COOLING TO MAINTAIN THE SPACE TEMPERATURE SETPOINT (COOLING 75 DEGREE F, HEATING TO DEGREE F).
  - ECONOMIZER MODE: WHEN ENTHALPY OF OA IS BELOW 28 BTU/LB, ECONOMIZER MODE SHALL BE ENABLED. ECONOMIZER SHALL LINEARLY MODULATE OUTDOOR AIR CFM FROM MINIMUM OA CFM TO 100% BASED ON ENTHALPY READINGS.
  - HUMIDITY CONTROL (WHEN NEEDED BASED ON CLIMATE); UPON DETECTION OF RELATIVE HUMIDITY ABOVE 55%, THE UNIT SHALL CYCLE INTO DEHUMIDIFICATION MODE IF NOT ALREADY IN COOLING.
- UNOCCUPIED MODE: THE RTU INTERNAL OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED WHEN THE BUILDING IS NOT OCCUPIED. THE RTU SHALL STOP HEATING/COOLING AND THE FAN SHALL STOP. IF THE SPACE TEMPERATURE FALLS BELOW 56 DEGREES F (ADJUSTABLE), AND THE UNIT SHALL START AND HEAT UNTIL THE SPACE TEMPERATURE IS 60 DEGREE F (ADJUSTABLE), AND THEN SHUT DOWN. IF THE SPACE TEMPERATURE RISES ABOVE 85 DEGREES F (ADJUSTABLE), THE UNIT SHALL START AND COOL UNTIL THE SPACE TEMPERATURE IS 80 DEGREES F (ADJUSTABLE) AND THEN SHUT DOWN.
- UPON DETECTION OF SMOKE BY UNIT SMOKE DETECTOR BOTH RTUS SHALL SHUT DOWN AND AN ALARM SHALL BE SENT TO THE FIRE ALARM CONTROL PANEL (WHERE APPLICABLE). LOCAL REMOTE ANNUNCIATORS SHALL ALSO BE ACTIVATED.

**KITCHEN HOOD EXHAUST FAN (KEF-1)**

THE KITCHEN HOOD EXHAUST FAN SHALL BE ENABLED WHEN ANY COOKING APPLIANCE LOCATED UNDER ITS RESPECTIVE HOOD, IS IN USE.

**MAKE UP AIR UNIT**

- THE MAKE UP AIR UNIT SHALL BE ENABLED WHEN THE KITCHEN HOOD EXHAUST FAN (KEF-1) IS ENERGIZED. THE INTERNAL MOTORIZED DAMPER WITHIN MAU-1 SHALL OPEN AND THE FAN SHALL RUN, IF OA IS LESS THAN 65 DEGREES (ADJUSTABLE), THE MAU-1 GAS FIRED HEAT SECTION SHALL BE ENABLED TO MAINTAIN A MINIMUM OF 65 DEGREES.
- WHEN KEF-1 IS OFF, MAU-1 SHALL BE DE-ENERGIZED AND THE INTERNAL MOTORIZED DAMPER SHALL CLOSE.

**ANSUL SYSTEM ACTIVATION**

UPON ACTIVATION OF ANSUL SYSTEM, SHUT DOWN MAU-1, RTU-1 AND RTU-2. PROVIDE RELAYS, CONTACTS, INTERLOCKS, TRANSFORMERS AND ALL ASSOCIATED WIRING TO ACCOMPLISH SEQUENCE. MAU-1 IS ALREADY PRE WIRED TO SHUT DOWN IN HOOD CONTROL PANEL. MECHANICAL CONTRACTOR SHALL INTERLOCK RTU-1 AND RTU-2 TO ALSO SHUT DOWN.

**AIR CURTAIN:**

SHALL BE CONTROLLED BY INTEGRAL THERMOSTAT.

**EXHAUST FANS:**

EF-1 AND EF-2 SHALL BE INTERLOCKED WITH LIGHT SWITCH.

**DEMAND CONTROL VENTILATION OCCUPIED DAMPER CONTROL :**

CO2 DAMPER CONTROL SHALL BE ENABLED WHEN THE FOLLOWING CONDITIONS ARE TRUE:  
AN ASSOCIATED ZONE IS AT OR ABOVE THE ZONE CO2 LEVEL SETPOINT FOR 15 MINUTES OR MORE.

THE OUTDOOR CO2 LEVEL IS BELOW THE INDOOR LEVEL SETPOINT.

WHEN DEMAND CONTROL VENTILATION IS ENABLED:  
MODULATE OA DAMPER BETWEEN SCHEDULED MINIMUM DAMPER POSITION AND FULLY OPEN DAMPER POSITION AS REQUIRED TO MAINTAIN CO2 LEVEL AT SETPOINT.

WHEN ALL ASSOCIATED ZONES ARE WITHIN THE CO2 LEVEL SETPOINT, THE UNIT WILL RESUME IN THE OCCUPIED MODE.

### GENERAL NOTES

- ALL WORK TO BE PERFORMED TO MEET ALL STATE, CITY & LOCAL CODE REQUIREMENTS.
- ALL WALL PATCHING TO BE BY GC.
- MC IS TO COORDINATE WITH OTHER TRADES BEFORE INSTALLING DUCTWORK. IF THE MC FAILS TO COORDINATE WITH OTHER TRADES AND THE WORK MUST BE ALTERED THE MC WILL CHANGE IT AT HIS OWN EXPENSE.
- COORDINATE THE EXACT LOCATION OF ALL GRILLES, REGISTERS & DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLAN.
- MECHANICAL CONTRACTOR IS TO VISIT THE SITE PRIOR TO SUBMITTING A BID & INCLUDE IN TH BID ANY ITEMS NECESSARY FOR A COMPLETE & OPERATIONAL SYSTEM.
- DRAWINGS ARE SCHEMATIC IN NATURE & MC IS TO INCLUDE ANY ITEMS REQUIRED FOR A COMPLETE & OPERATIONAL SYSTEM WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS.
- MC TO FURNISH ALL PERMITS REQUIRED FOR HIS PORTION OF THE WORK.
- MC TO COORDINATE WITH ELECTRICAL CONTRACTOR CONCERNING ELECTRICAL REQUIREMENTS BEFORE ORDERING ANY EQUIPMENT.
- CONTRACTOR IS RESPONSIBLE FOR ADHERING TO THE ENTIRETY OF THIS DRAWING SET, INCLUDING BUT NOT LIMITED TO, PLANS, ELEVATIONS, DETAILS, SCHEDULES, AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL DRAWINGS OF OTHER TRADES, INCLUDING BUT NOT LIMITED TO, ARCHITECTURAL, PLUMBING, ELECTRICAL, CIVIL, AND STRUCTURAL.
- ALL CUTTING AND PATCHING OF ROOF IS TO BE BY GC.

### ATTACHMENTS TO ROOF DECK AND LANDLORD'S PIPING

- UNLESS OTHERWISE NOTED, CONNECTION, AND/OR ATTACHMENT TO ANY PART OF THE ROOF DECKING IS NOT ALLOWED. SUPPORT FOR HANGERS AND SUPPORTS TO PREVENT LATERAL MOVEMENT OF WALLS, SOFFITS AND CEILINGS MUST BE PROVIDED BY STRUCTURAL ROOF FRAMING MEMBERS OR OTHER STRUCTURAL ELEMENTS (i.e. BEAMS, GIRDERS AND COLUMNS). SUPPORT FOR SUSPENDED ELEMENTS MUST BE MADE TO THE TOP CHORD ONLY.
- SUPPORT WIRES FOR LAY-IN CEILING GRID MUST NOT BE CONNECTED TO ANY OF THE LANDLORD'S MECHANICAL, ELECTRICAL, PLUMBING OR FIRE PROTECTION PIPING OR EQUIPMENT.

### HVAC GENERAL NOTES

- ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH CURRENT APPLICABLE CODES, ORDINANCES, THE REGULATORY AGENCIES HAVING JURISDICTION AND THE SPECIFICATIONS. THE SPECIFICATIONS MAY EXCEED THE REQUIREMENTS OF THE CODE, IN WHICH CASE, THE SPECIFICATION MUST BE FOLLOWED.
- THE INTENT OF THESE DOCUMENTS IS FOR THE MEP TRADES TO FURNISH AND INSTALL COMPLETE MECHANICAL AND ELECTRICAL SYSTEMS. THE SPECIFIED HVAC SYSTEM SHALL BE COMPLETE IN ALL RESPECTS; OPERATIONAL, TESTED, ADJUSTED, APPROVED BY THE AUTHORITIES HAVING JURISDICTION AND READY FOR BENEFICIAL USE BY THE OWNER.
- THE TRADES SHALL OBTAIN AND REVIEW ALL CONTRACT DOCUMENTS BEFORE SUBMITTING A BID. INFORMATION IS PROVIDED ON THE VARIOUS DRAWINGS, SCHEDULES, SPECIFICATIONS AND ALL OF THE VARIOUS DOCUMENTS IN THE BIDDING PACKAGE. THE CONTRACT DOCUMENTS ARE COMPLEMENTARY AND FORM A TOTAL PROJECT DESIGN AND INFORMATION SOURCE FOR CONSTRUCTION PURPOSES.
- THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN THE CONTRACT. COORDINATE LOCATIONS OF EQUIPMENT WITH OTHER TRADES BEFORE AND DURING CONSTRUCTION. ANY MODIFICATION TO THE EQUIPMENT LAYOUT, REQUIRED FOR INSTALLATION, IS TO BE PERFORMED UNDER THE CONTRACT AGREEMENT, AT NO ADDITIONAL COST. REFER TO DETAILS, SCHEDULES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT DOCUMENTS OF ALL TRADES. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND PIPING. THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF EQUIPMENT AND PIPING INSTALLATION WITH ALL THE TRADES BEFORE COMMENCING WORK.
- EQUIPMENT SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS, WHEN EQUIPMENT MUST BE LOCATED ABOVE AN INACCESSIBLE CEILING (GYP BOARD OR EQUIVALENT), OR BEHIND A WALL, AN APPROPRIATE ACCESS DOOR SHALL BE PROVIDED. IF AN ACCESS DOOR IS REQUIRED, IT SHALL BE OF A RATING APPROPRIATE FOR THE WALL/CEILING IN WHICH IT IS TO BE INSTALLED. THE CONTRACTOR SHALL COORDINATE LOCATIONS OF ACCESS PANELS FOR ALL VALVES AND DEVICES, REQUIRING ACCESS, WITH THE ARCHITECT, PRIOR TO INSTALLATION OF SUCH DEVICES OR OTHER APPURTENANCES.
- WHERE A CONFLICT OCCURS BETWEEN THE DOCUMENTS, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. CARRY AS PART OF THE BID THE LARGER QUANTITY AND/OR MORE EXPENSIVE ITEM(S).
- THIS CONTRACT SHALL INCLUDE ALL THE NECESSARY PIPING, FITTINGS, TRANSITIONS ETC. AS REQUIRED TO INSTALL PIPING AND EQUIPMENT, AND TO AVOID ANY CONFLICTS WITH OTHER TRADES AND THE BUILDING STRUCTURE. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY ASSUMPTIONS, OMISSIONS OR ERRORS HE MAKES AS A RESULT OF HIS FAILURE TO COORDINATE WITH OTHER TRADES OR BECOME FULLY FAMILIAR WITH THE PROJECT DOCUMENTS OF ALL TRADES.
- DO NOT INSTALL ANY PIPING OVER ELECTRICAL PANELS, TRANSFORMERS, SPECIAL EQUIPMENT, OR THROUGH ELECTRICAL ROOMS, DATA ROOMS, ELEVATOR MACHINE ROOM, STAIRWELL OR STAIRWELL WALLS THAT ARE NOT ASSOCIATED WITH OR SERVE THE RESPECTIVE ROOMS. COORDINATE THE LOCATION OF ELECTRICAL EQUIPMENT IN THE FIELD AND ADJUST AS NECESSARY.
- INSTALL SMOKE DETECTORS IN BOTH SUPPLY & RETURN AIR DUCTS FOR AIR HANDLING EQUIPMENT 2,000 CFM AND GREATER.
- PROVIDE SMOKE DAMPERS IN BOTH SUPPLY & RETURN AIR DUCTS FOR AIR HANDLING EQUIPMENT 15,000 CFM AND GREATER.
- PROVIDE SMOKE DAMPERS AND SMOKE DETECTORS AT DUCT PENETRATIONS OF SMOKE-BARRIERS, AND AT ELEVATOR SHAFT VENTS PER CODE REQUIREMENTS.
- PROVIDE FIRE DAMPERS AT DUCT PENETRATIONS OF FIRE-RATED CONSTRUCTION, INCLUDING WALLS, SHAFTS AND FLOOR PENETRATIONS. COORDINATE WITH ARCHITECTURAL DRAWINGS.
- PROVIDE AN AUTOMATIC TEMPERATURE CONTROL SYSTEM COMPLETE IN ALL REGARDS. ALL ZONES, VAVS AND SYSTEM SHALL BE THERMOSTATICALLY CONTROLLED. REVIEW THE PLANS AND SPECIFICATIONS OF ALL MEP TRADES FOR A COMPLETE SCOPE OF THE WORK.
- PIPING SHALL BE SUPPORTED FROM STRUCTURE ABOVE. TO MAXIMIZE HEAD ROOM, INSTALL PIPING TIGHT TO BOTTOM OF BEAMS WHEN RUNNING PERPENDICULAR TO BEAM. INSTALL PIPING TIGHT TO FLOOR SLAB WHEN RUNNING PARALLEL TO BEAM; PROVIDE ALL NECESSARY FITTINGS AND TRANSITIONS.
- PROVIDE THROTTLING VALVES AND SHUT-OFF VALVES AS INDICATED IN SPECIFICATIONS IN ADDITION TO THOSE INDICATED ON THE DOCUMENTS.
- INSTALL ALL EQUIPMENT VALVES AS REQUIRED BY MANUFACTURERS INSTRUCTIONS AND RECOMMENDATIONS AND AS DETAILED.
- PROVIDE AIR VENTS AT ALL HIGH POINTS AND DRAINS AT ALL LOW POINTS.
- PROVIDE PRESSURE RELIEF DOORS FOR AIR SYSTEMS, PER THE SPECIFICATIONS.
- PROVIDE MOTORIZED DAMPERS AT ALL PERMANENT OPENINGS (EXHAUST, SUPPLY, RELIEF, O.A. INTAKES, MAKE-UP AIR, SMOKE VENTS, ETC.) EXCEPT DRYER, KITCHEN, AND FUME EXHAUST AND PROVIDE A MEANS TO CONTROL THE DAMPER OPERATION.
- ALL SUPPLY RECTANGULAR 90° ELBOWS SHALL HAVE TURNING VANES.
- PROVIDE DUCT TAKE-OFF TYPES AND VOLUME DAMPERS PER THE SPECIFICATIONS AND DUCT TAKE-OFF DETAILS ON DRAWINGS. TAKE-OFFS SHOWN ON FLOOR PLANS DO NOT REPRESENT THE SPECIFIC TYPE OF TAKE-OFF REQUIRED; CONSULT THE DETAILS AND SPECIFICATIONS.
- PROVIDE VOLUME DAMPERS ON ALL SUPPLY, EXHAUST, AND RETURN BRANCH DUCTS.
- COORDINATE AND VERIFY LOCATIONS OF ALL ITEMS REQUIRING ACCESS WITH ARCHITECT IN FIELD, INCLUDING VALVES, VOLUME DAMPERS, FIRE DAMPERS, ETC.
- ALL EQUIPMENT LOCATED ON THE ROOF THAT REQUIRES SERVICING SHALL BE LOCATED A MINIMUM 10'-0" FROM EDGE OF THE ROOF.
- ALL EXPOSED DUCTWORK SHALL BE FLAT, OVAL, OR ROUND. COORDINATE WITH ARCHITECT'S CEILING PLANS AND IDENTIFY ON DUCTWORK SHOP DRAWINGS.
- ALL DUCTWORK AND PIPING CROSSING SEISMIC JOINTS SHALL ACCOMMODATE DIFFERENTIAL MOTION. REFER TO DETAILS AND SPECIFICATIONS FOR MORE INFORMATION. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR LOCATIONS.
- ALL THERMOSTATS LOCATED ON OUTSIDE WALL SHALL HAVE INSULATED PAD BEHIND.
- ALL MOTORIZED DAMPERS SHALL BE WIRED BY ATC CONTRACTOR, COORDINATE VOLTAGE REQUIREMENTS WITH EQUIPMENT.
- ALL TOILETS & BATHROOMS SHALL HAVE 3/4" UNDERCUT DOORS.
- ALL LOUVERS ARE SELECTED AND SCHEDULED BY ARCHITECT. LOUVER TAGS ARE SHOWN FOR COORDINATION ONLY.
- SEISMICALLY SUPPORT THE EQUIPMENT AS REQUIRED BY CODE. THE AUTHORITY HAVING JURISDICTION, AND/OR AS SPECIFIED, SUBMIT ENGINEERED INSTALLATION DETAILS PER THE SPECIFICATIONS. THE CONTRACTOR'S SEISMIC ENGINEER SHALL REVIEW THE INSTALLATION AND PROVIDE A DETAILED REPORT FOR THE RECORD.
- PROVIDE PIPE EXPANSION COMPENSATION FOR THE VARIOUS PIPING SYSTEMS. SUBMIT ENGINEERED DETAILS FOR APPROVAL AND VERIFY INSTALLATION IS IN ACCORDANCE WITH THE CODE. THE CONTRACTOR'S CONSULTING ENGINEER SHALL REVIEW THE INSTALLATION AND PROVIDE A REPORT OF THE FINDINGS.
- UNLESS OTHERWISE NOTED, CONNECTION AND/OR ATTACHMENT TO ANY PART OF THE ROOF DECKING IS NOT ALLOWED. SUPPORT FOR HANGERS AND SUPPORTS TO PREVENT LATERAL MOVEMENT OF WALLS, SOFFITS AND CEILINGS MUST BE PROVIDED BY STRUCTURAL ROOF FRAMING MEMBERS OR OTHER STRUCTURAL ELEMENTS (i.e. BEAMS, GIRDERS AND COLUMNS). SUPPORT FOR SUSPENDED ELEMENTS MUST BE MADE TO THE TOP CHORD ONLY.
- SUPPORT WIRES FOR LAY-IN CEILING GRID MUST NOT BE CONNECTED TO ANY OF THE LANDLORDS MECHANICAL, ELECTRICAL, PLUMBING OR FIRE PROTECTION PIPING OR EQUIPMENT.

### GENERAL LINETYPES

	THICK, DARK LINES INDICATE NEW OR RELOCATED ITEMS
	THIN, LIGHT LINES INDICATE EXISTING ITEMS TO REMAIN IN PLACE AND BE REUSED
	ON DEMOLITION DRAWINGS, THICK, DASHED LINES INDICATE EXISTING ITEMS TO BE REMOVED
	POINT OF NEW TO EXISTING CONNECTION, INCLUDING TRANSITIONS

ARCHITECT

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SEAL

ISSUED

DATE	DESCRIPTION
5-10-24	SD SET
5-11-24	ZONING SET
5-29-24	BID SET
10-9-24	ISSUED FOR PERMIT
2-14-25	REISSUED FOR PERMIT

REVISIONS

DATE	DESCRIPTION
12-09-24	REVISION 1
01-24-25	REVISED CUT ZONES

OWNER/CLIENT

PROJECT

CAVA - BURLINGTON

101 MIDDLESEX TURNPIKE,  
BURLINGTON, MA 01803

DRAWING TITLE

MECHANICAL GENERAL  
INFORMATION

DRAWING INFORMATION

Job Number: 221193

Checked By: REP

Drawn By: SJH

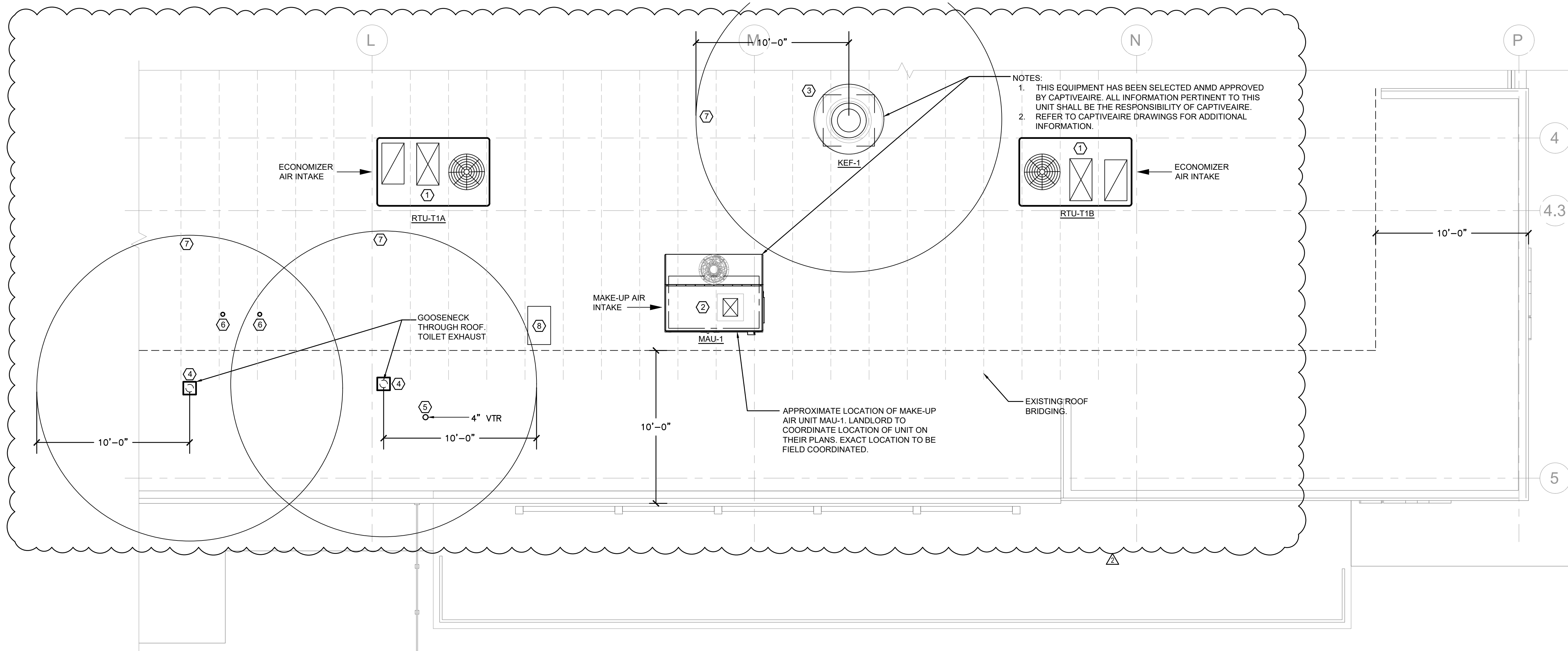
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NOTES:  
 1. THIS EQUIPMENT HAS BEEN SELECTED ANMD APPROVED BY CAPTIVEAIRE. ALL INFORMATION PERTINENT TO THIS UNIT SHALL BE THE RESPONSIBILITY OF CAPTIVEAIRE.  
 2. REFER TO CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.

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

- GENERAL NOTES**
- A. DO NOT PENETRATE KITCHEN EXHAUST HOODS OR DUCTWORK WITH ANY TYPE OF FASTENING ASSEMBLY (I.E. SCREWS, RIVETS).
  - B. IF NOT PAINTED, ALL DUCTWORK SHALL HAVE GASKET A SEAL.
  - C. EXPOSED DUCTWORK IN THE DINING AREA SHALL BE MADE OF ELECTRO-GALVANIZED STEEL (PAINTLOCK). SEE MECHANICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

**FIELD VERIFY ALL CONDITIONS**

DESIGN DRAWINGS ARE SCHEMATIC AND ARE BASED ON AS-BUILT/RECORD DRAWINGS PROVIDED BY OWNER. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE ACCURACY OF THESE PLANS AND GATHER ADDITIONAL INFORMATION NECESSARY TO PRODUCE DETAILED SHOP DRAWINGS OF THE CHANGES AND MODIFICATIONS REQUIRED TO RENOVATE THE SPACE. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.

THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST.

BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

- CODED NOTES** #
1. INSTALL ROOFTOP UNIT ON MANUFACTURERS ROOF CURB. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF CURB TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
  2. INSTALL MAKE-UP AIR UNIT ON MANUFACTURERS ROOF CURB. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF CURB TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
  3. INSTALL HOOD EXHAUST FAN ON MANUFACTURERS ROOF CURB. ENSURE LOCATION IS A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKES. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF CURB TO MAINTAIN ANY APPLICABLE ROOF WARRANTY.
  4. INSTALL 10"x10" EXHAUST DUCT WITH GOOSENECK AND BIRDSCREEN. ENSURE LOCATION IS A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKES. CONTRACTOR SHALL CUT, PATCH, FLASH, AND AND COUNTER FLASH AROUND ROOF PENETRATION TP MAINTAIN ANY APPLICABLE ROOF WARRANTY.
  5. 4" VENT THROUGH ROOF. CONTRACTOR SHALL ENSURE LOCATION IS A MINIMUM OF 10'-0" ANY OUTSIDE AIR INTAKES.
  6. COMBINATION AIR INTAKE AND FLUE EXHAUST FOR WATER HEATER. INSTALL PER MANUFACTURERS RECOMMENDATIONS. CONTRACTOR SHALL INSURE LOCATION IS A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKES.
  7. ENSURE TO MAINTAIN 10'-0" CLEARANCE TO OUTSIDE AIR INTAKES.
  8. GC TO INSTALL WALK-IN COOLER CONDENSER ON ROOF PER MANUFACTURER'S RECOMMENDATIONS.
  9. 3" VENT THROUGH ROOF FOR GRAVITY GREASE INTERCEPTOR. CONTRACTOR SHALL ENSURE LOCATION IS A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKES.

SEAL

ISSUED

DATE	DESCRIPTION
5-10-24	SD SET
6-11-24	ZONING SET
8-8-24	BID SET
10-9-24	ISSUED FOR PERMIT
2-14-25	REISSUED FOR PERMIT

REVISIONS

DATE	DESCRIPTION
1	12-09-24 REVISION 1
2	01-24-25 REVISED CUT ZONES

OWNER/CLIENT

PROJECT  
 CAVA - BURLINGTON

101 MIDDLESEX TURNPIKE,  
 BURLINGTON, MA 01803

DRAWING TITLE  
 MECHANICAL ROOF PLAN

DRAWING INFORMATION  
 Job Number: 221193  
 Checked By: REP  
 Drawn By: SJH

DRAWING NUMBER  
**M**  
**102**

DATE	DESCRIPTION
5-10-24	SD SET
6-11-24	ZONING SET
8-8-24	BID SET
10-9-24	ISSUED FOR PERMIT
2-14-25	REISSUED FOR PERMIT

NO.	DATE	DESCRIPTION
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2	01-24-25	REVISED CUT ZONES

ROOFTOP UNIT SCHEDULE WITH GAS HEAT (LANDLORD SUPPLIED AND INSTALLED)																				
UNIT NO.	MANUFACTURER	MODEL NUMBER	AREA SERVED	TONS	SUPPLY FAN				HEATING SECTION			COOLING COIL				ELECTRICAL				OPER. WEIGHT (LBS)
					TOTAL CFM	MIN OA CFM	ESP IN. W.C.	MOTOR HP	NO. OF STAGES	INPUT MBH	OUTPUT MBH	TOTAL MBH	SENSIBLE MBH	EAT DB/WB	AMB. AIR	VOLTS	PHASE	MCA	MOCP	
RTU-T1A	TRANE	YSJ120A4S0H	CAVA	10	4,000	288	1.17	3.0	2	240.0	194.4	117.0	95.0	80/67	95	208	3	54	70	1230
RTU-T1B	TRANE	YSJ120A4S0H	CAVA	10	4,000	288	1.17	3.0	2	240.0	194.4	117.0	95.0	80/67	95	208	3	54	70	1230

NOTE:  
 THIS SCHEDULE IS FOR REFERENCE ONLY.  
 SEE LANDLORD DRAWINGS FOR FINAL SCHEDULE, PERFORMANCE AND ACCESSORIES.

FAN SCHEDULE														
TAG	MANUFACTURER	MODEL	SERVES	TYPE	FAN					SOUND PRESS. LEVEL (dBA)	ELECTRICAL DATA			REMARKS
					FLOW (CFM)	ESP (in-wg)	RPM	DRIVE TYPE	MOTOR POWER WATTS		SONES	VOLT	PH	
EF-1	LOREN COOK	GC-186	TOILET RM.	CEILING	125	0.38	796	DIRECT	61.5	42	2.5	120 V	1	
EF-2	LOREN COOK	GC-186	TOILET RM.	CEILING	125	0.38	796	DIRECT	61.5	42	2.5	120 V	1	

NOTES:  
 1. ACCEPTABLE MANUFACTURERS BY COOK, GREENHECK AND ACME.  
 2. FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. WIRED BY ELECTRICAL CONTRACTOR.  
 3. FAN SHALL RUN CONTINUOUSLY. REFER TO SEQUENCE OF OPERATION.  
 4. FAN CONTROLLED BY LIGHT SWITCH. REFER TO SEQUENCE OF OPERATION.

ELECTRIC AIR CURTAIN SCHEDULE														
TAG	MANUFACTURER	MODEL	FAN			DIMENSIONS				ELECTRICAL DATA			REMARKS	
			POWER (hp)	MAX VELOCITY (FPM)	MAX VOLUME (CFM)	LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)	WEIGHT (LBS)	NOZZLE LENGTH (IN)	VOLT	PH		
AC-1	BERNER	AE08-E-1072A	0.5	1870	1988	72	23	11	133	72	120 V	1	FINISH TO MATCH STOREFRONT	
AC-2	BERNER	AE08-E-1042A	0.5	2150	1077	42	23	2	82	42	120 V	1	FINISH TO MATCH STOREFRONT	

NOTES:  
 1. PROVIDE WITH ALL NECESSARY MOUNTING HARDWARE INCLUDING TANDEM MOUNTING KIT.  
 2. PROVIDE WITH MANUFACTURER RECOMMENDED DOOR LIMIT SWITCH.  
 3. PROVIDE WITH 120V CONTROLLER WITH ADJUSTABLE TIME DELAY.  
 4. COORDINATE WITH OWNER FOR DESIRED CONTROL SETTINGS (RECOMMEND TIME DELAY OVERLAP FOR FAN, SEASONAL USAGE, ETC.).  
 5. PROVIDE WITH ELECTRIC HEAT OPTION.  
 6. INSTALLATION HEIGHT PER MANUFACTURER'S RECOMMENDED INSTALLATION HEIGHT. INCLUDE DETAIL FOR MOUNTING.

VENTILATION AIR SCHEDULE											
OCCUPANCY CLASSIFICATION	AREA (SF) AZ	AREA OUTDOOR AIR RATE PER IMC 403.3 Ra	AREA OUTDOOR AIR	OCCUPANT DENSITY RATE PER IMC TABLE 403.3 (PEOPLE/100 ft²)	OCCUPANCY C* F/1000, Pz	OCCUPANT OUTDOOR AIR RATE PER TABLE 403.3 Rp	OCCUPANT OUTDOOR AIR RpPz	BREATHING ZONE OUTDOOR AIR Vz = RpPz + RaAZ	ZONE AIR DISTRIBUTION EFFECTIVENESS, Ez	ZONE OUTDOOR AIR, Vz = Vz/Ez	SUPPLY AIR DESIGN, Vz
DINING ROOM	1442	0.18	260	7.5	11	7.5	83	343	0.8	429	430
CORRIDOR	171	0.06	11	-	-	-	-	-	0.8	14	15
BOH	838	0.12	101	-	-	-	-	-	0.8	127	131
										TOTAL REQUIRED VENTILATION AIR	570
										TOTAL VENTILATION AIR PROVIDED	576

**ODOR REDUCTION NOTE**  
 CAPTIVEAIRE HOODS ARE FITTED WITH SPECIALTY 2-STAGE CAPTRATE COMBO GREASE EXTRACTION FILTERS (SPECIFICATION ABOVE). CAPTRATE COMBO FILTERS ARE INDEPENDENTLY TESTED TO REMOVE 99% OF GREASE PARTICULATE AT 7 MICRONS OR LARGER. BY REMOVING VIRTUALLY ALL SIGNIFICANT GREASE PARTICULATE AT THE KITCHEN HOOD, COOKING ODORS FROM RESTAURANT WILL BE REDUCED TO INSIGNIFICANT LEVELS.

AIR BALANCE SCHEDULE					
COMPONENT	SUPPLY CFM	RETURN CFM	OUTDOOR MAKE-UP AIR	EXHAUST AIR	BUILDING PRESSURE
RTU-1	4000	3650	--	--	
RTU-2	4000	3650	--	--	
MAU-1	--	--	1694	--	
KEF-1	--	--	--	2311	
EF-1	--	--	--	125	
EF-2	--	--	--	125	
TOTAL	8000	7300	1694	2561	167

THIS EQUIPMENT HAS BEEN SELECTED AND APPROVED BY CAPTIVEAIRE. ALL INFORMATION PERTINENT TO THIS UNIT SHALL BE THE SOLE RESPONSIBILITY OF CAPTIVEAIRE.																
MAKEUP AIR UNIT SCHEDULE																
UNIT TAG	MODEL	AIR FLOW				HEATING (MBH)			COOLING (MBH)			CONDENSER ELECTRIC		WEIGHT (LBS)	NOTES	
		CFM	OA MIN.	ESP	MOTOR HP	INPUT	OUTPUT	AFUE %	TOTAL	SENS.	IEER	MCA/MCOP	VOLT			
MAU-1	EARTU1-1.200-15-ST-MPU	1,694	1,694	0.500	1.00	170,341	137,976	92	64.0	41.9	17.9	88db/72wb	25.5/30.0	208/3/60	1,202	1.

NOTE: 1. REFER TO KES AND CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.

THIS EQUIPMENT HAS BEEN SELECTED AND APPROVED BY CAPTIVEAIRE. ALL INFORMATION PERTINENT TO THIS UNIT SHALL BE THE SOLE RESPONSIBILITY OF CAPTIVEAIRE.										
KITCHEN HOOD SCHEDULE										
TAG	MODEL	UNIT DATA			LIGHTS		MISC.			COMMENTS
		HOOD LENGTH	MAX COOKING TEMP.	TOTAL EXHAUST CFM	QTY.	TYPE	FIRE SUPP. SYSTEM	HANGING WEIGHT (LBS.)		
H-1	6030 ND-2-ACPPSP-F	10'-7"	600°F	2,117	4	L55 SERIES E26	YES	1,014		1

NOTE: 1. REFER TO KES AND CAPTIVEAIRE DRAWINGS FOR ACCESSORY INFORMATION.

THIS EQUIPMENT HAS BEEN SELECTED AND APPROVED BY CAPTIVEAIRE. ALL INFORMATION PERTINENT TO THIS UNIT SHALL BE THE SOLE RESPONSIBILITY OF CAPTIVEAIRE.												
KITCHEN EXHAUST FAN SCHEDULE												
TAG	MODEL	FUNCTION	FAN TYPE	PERFORMANCE DATA			MOTOR DATA					
				CFM	ESP	DAMPER	BELT OR DIRECT	SONES RATING	HP	VOLT	PHASE	COMMENTS
KEF-1	DU180HFA	HOOD EXH.	UPBLAST	2,311	1,250	--	DIRECT	11.9	1.00	208	3	1

NOTE: 1. REFER TO KES AND CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.

GRILLES, DIFFUSERS AND REGISTERS SCHEDULE (BASED ON PRICE)					
SEE ARCHITECTURAL DRAWINGS FOR CEILING TYPES AND CONSTRUCTION. SIZE AND CFM INDICATED ON MECHANICAL DRAWINGS					
A - MODEL SMD DIRECTIONAL DIFFUSER, LOUVERED FACE, 4-WAY THROW (UNLESS SHOWN OTHERWISE), 24X24 MODULE SIZE, LAY-IN BORDER, STEEL CONSTRUCTION, WHITE FINISH. PROVIDE MODEL SR ADAPTER. COORDINATE FINISH WITH ARCHITECT.					
A1 - MODEL SMD DIRECTIONAL DIFFUSER, LOUVERED FACE, 4-WAY THROW (UNLESS SHOWN OTHERWISE), SURFACE MOUNT FRAME, STEEL CONSTRUCTION, OPPOSED BLADE DAMPER, COORDINATE FINISH WITH ARCHITECT.					
B - MODEL 350RL RETURN GRILLE, 45° FIXED LOUVERS, 3/4" BLADE SPACING, 24X24 MODULE SIZE, LAY-IN BORDER, STEEL CONSTRUCTION, COORDINATE FINISH WITH ARCHITECT.					
B1 - MODEL 350RL RETURN GRILLE, 45° FIXED LOUVERS, 3/4" BLADE SPACING PARALLEL TO LONG DIMENSION, SURFACE MOUNT BORDER, STEEL CONSTRUCTION, COORDINATE FINISH WITH ARCHITECT.					
C - MODEL 520D LOUVERED SUPPLY REGISTER, DOUBLE DEFLECTION CORE, 3/4" BLADE SPACING PARALLEL TO LONG DIMENSION, SURFACE MOUNT FRAME, STEEL CONSTRUCTION, OPPOSED BLADE DAMPER, COORDINATE FINISH WITH ARCHITECT.					
D - MODEL SDGE SPIRAL DUCT SUPPLY GRILLE, DOUBLE DEFLECTION CORE, EXTRUDED ALUMINUM CONSTRUCTION, COORDINATE FINISH WITH ARCHITECT. PROVIDE OPTIONAL AIR EXTRACTOR/DAMPER.					
E - MODEL SDS LINEAR SLOT DIFFUSER, (2) 1" SLOTS, SURFACE MOUNT FRAME, ALUMINUM CONSTRUCTION, COORDINATE FINISH WITH ARCHITECT, BLACK PATTERN CONTROLLERS. PROVIDE INSULATED PLENUM.					
CEILING SUPPLY DIFFUSER TYPE A & A1		CEILING RETURN/EXHAUST DIFFUSER TYPE B & B1		FLEXIBLE DUCT SIZE	
CFM	NECK SIZE	CFM	NECK SIZE	CFM	NECK SIZE
0 - 100	6 X 6	0 - 100	6 X 6	0 - 35	4"Ø
101 - 225	9 X 9	101 - 150	8 X 8	36 - 70	5"Ø
226 - 400	12 X 12	151 - 250	10 X 10	71 - 95	6"Ø
401 - 625	15 X 15	251 - 350	12 X 12	96 - 150	8"Ø
626 - 900	18 X 18	351 - 500	14 X 14	151 - 225	9"Ø
		501 - 650	16 X 16	226 - 275	10"Ø
		651 - 800	18 X 18	276 - 400	12"Ø
		801 - 1200	22 X 22	401 - 500	14"Ø
				501 - 700	16"Ø
				701 - 900	18"Ø
				901 - 1100	20"Ø
				1101 - 1300	22"Ø

ISSUED

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REVISIONS

DATE	DESCRIPTION
1	12-09-24 REVISION 1
2	01-24-25 REVISED CUT ZONES

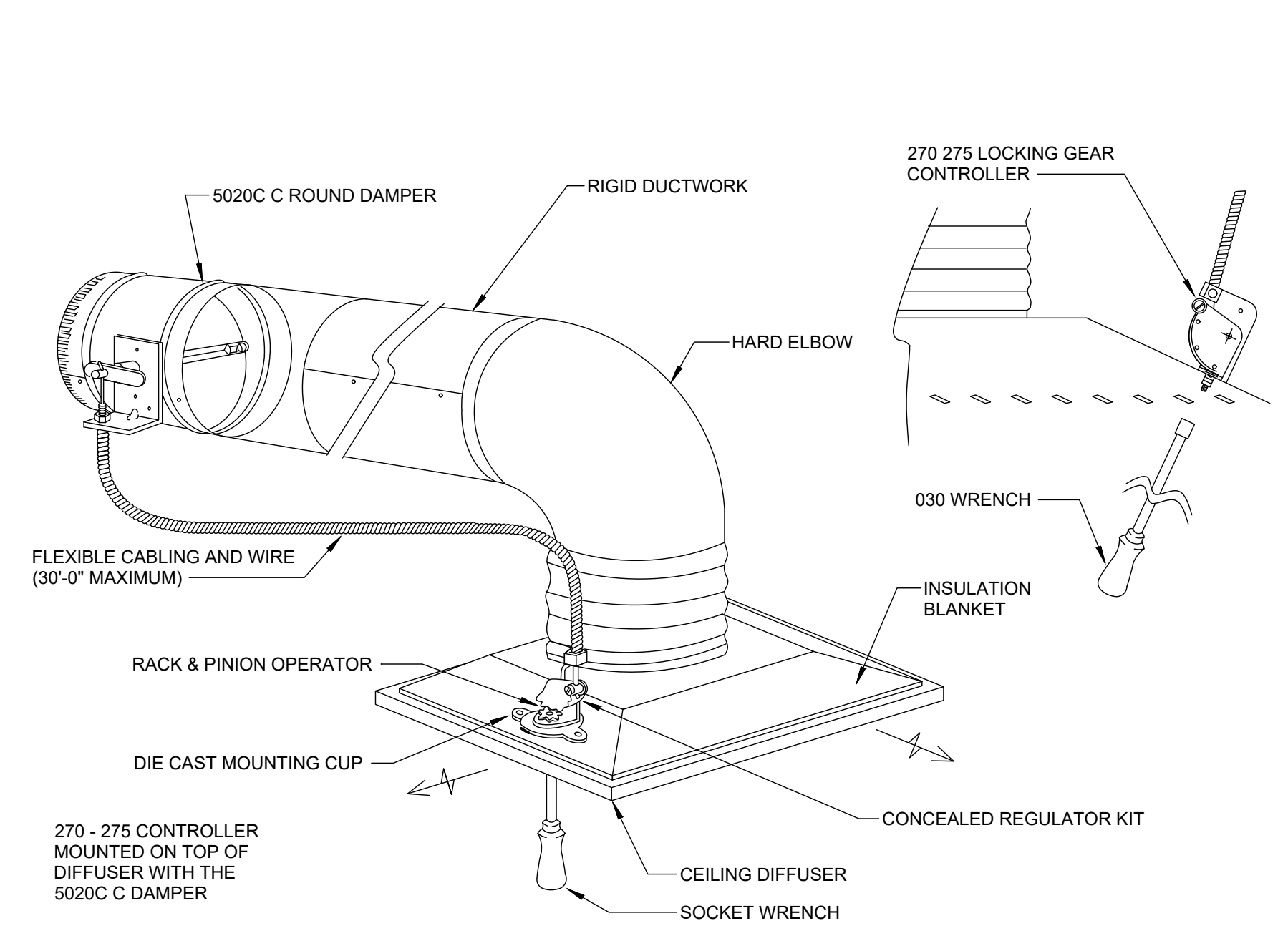
OWNER/CLIENT

PROJECT  
**CAVA - BURLINGTON**

101 MIDDLESEX TURNPIKE,  
 BURLINGTON, MA 01803

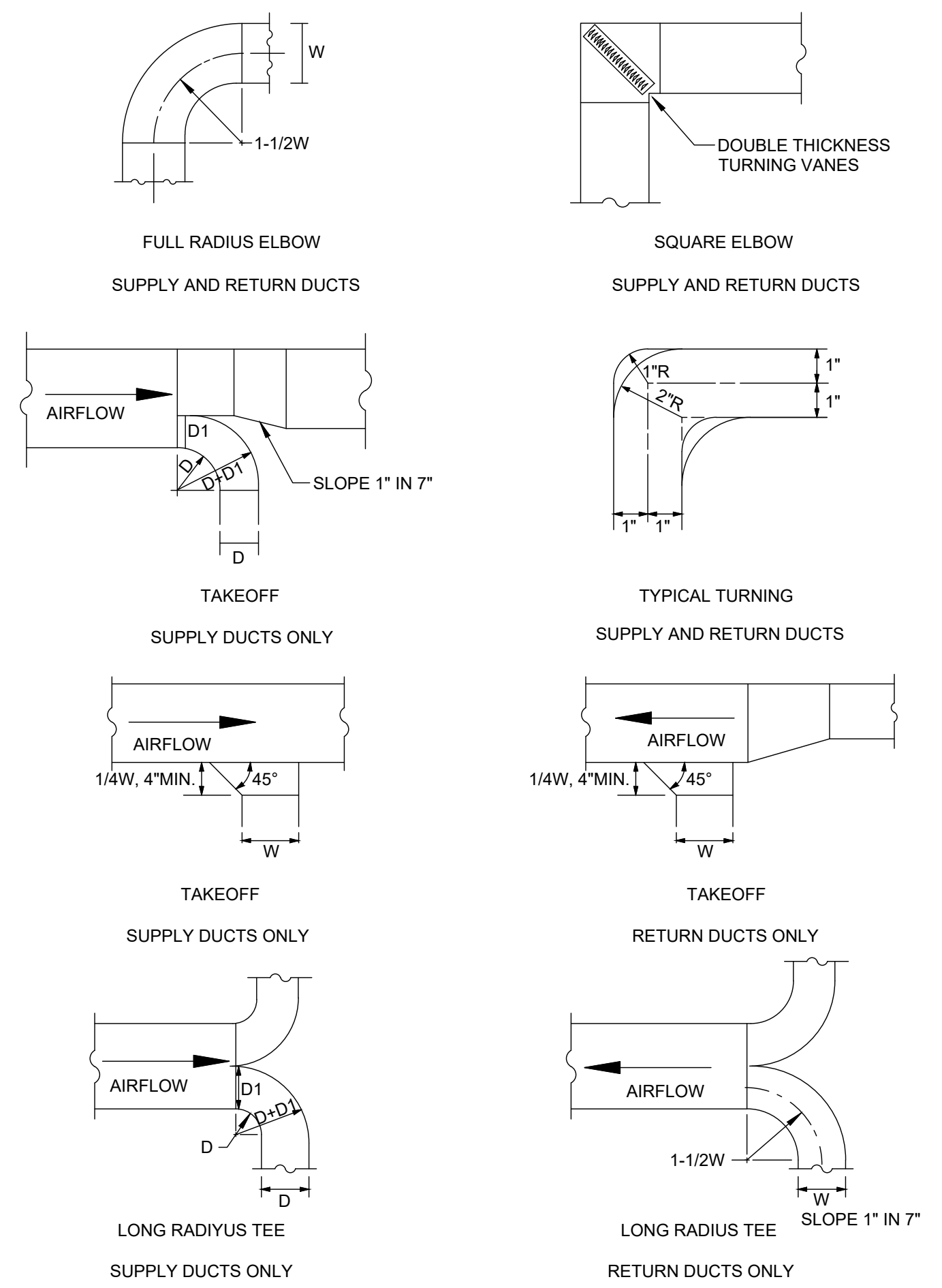
DRAWING TITLE  
**MECHANICAL DETAILS**

DRAWING INFORMATION  
 Job Number: 221193  
 Checked By: REP  
 Drawn By: SJH  
 DRAWING NUMBER

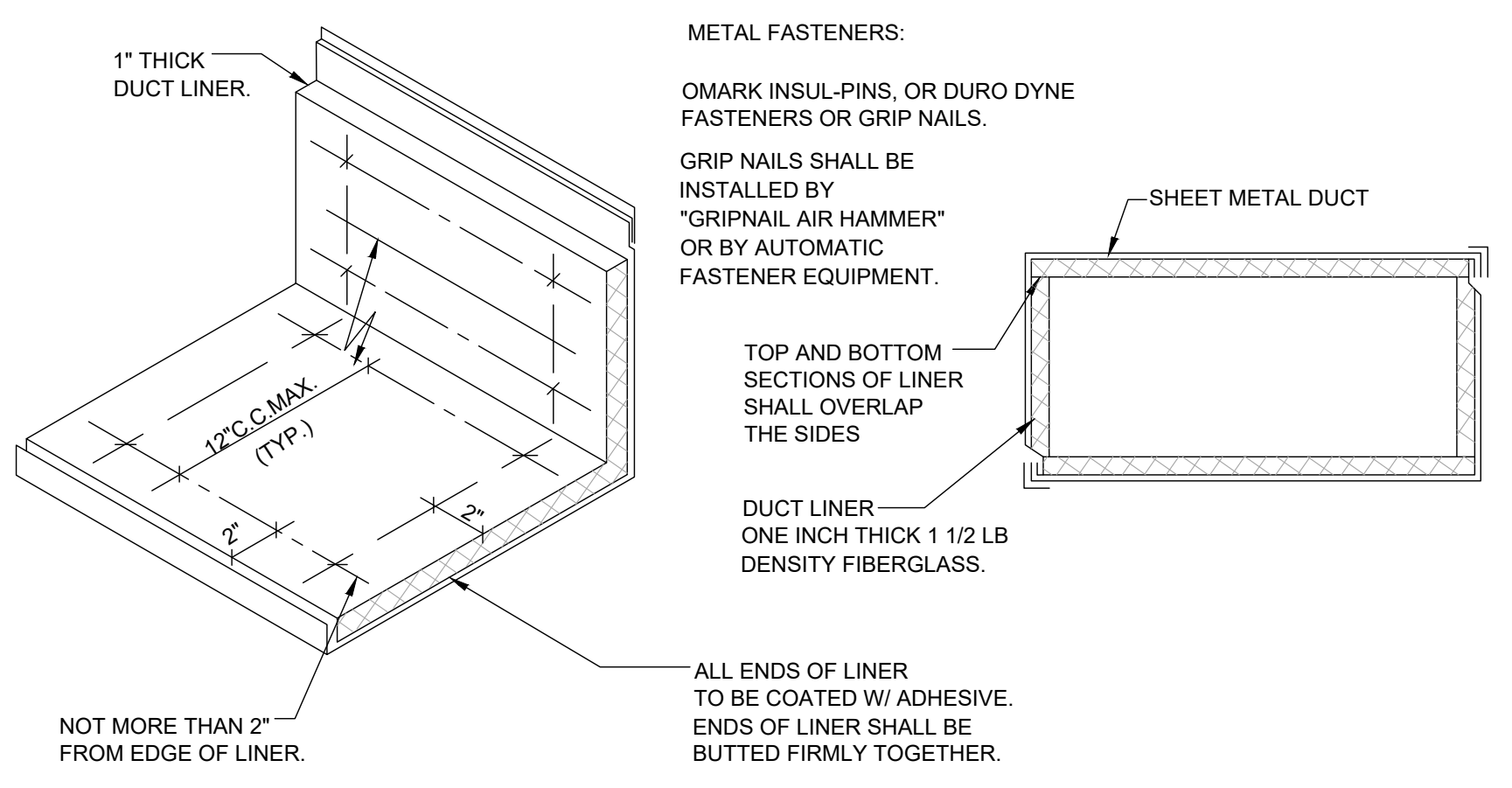


NOTE:  
 1. COORDINATE EXACT LOCATION OF CEILING MOUNTED CONCEALED REGULATOR WITH ARCHITECT PRIOR TO INSTALLATION.  
 2. YOUNG REGULATOR SHOULD ONLY BE USED WHERE ACCESS FOR VOLUME IS LIMITED AND CAN NOT BE DONE VIA DIFFUSER.

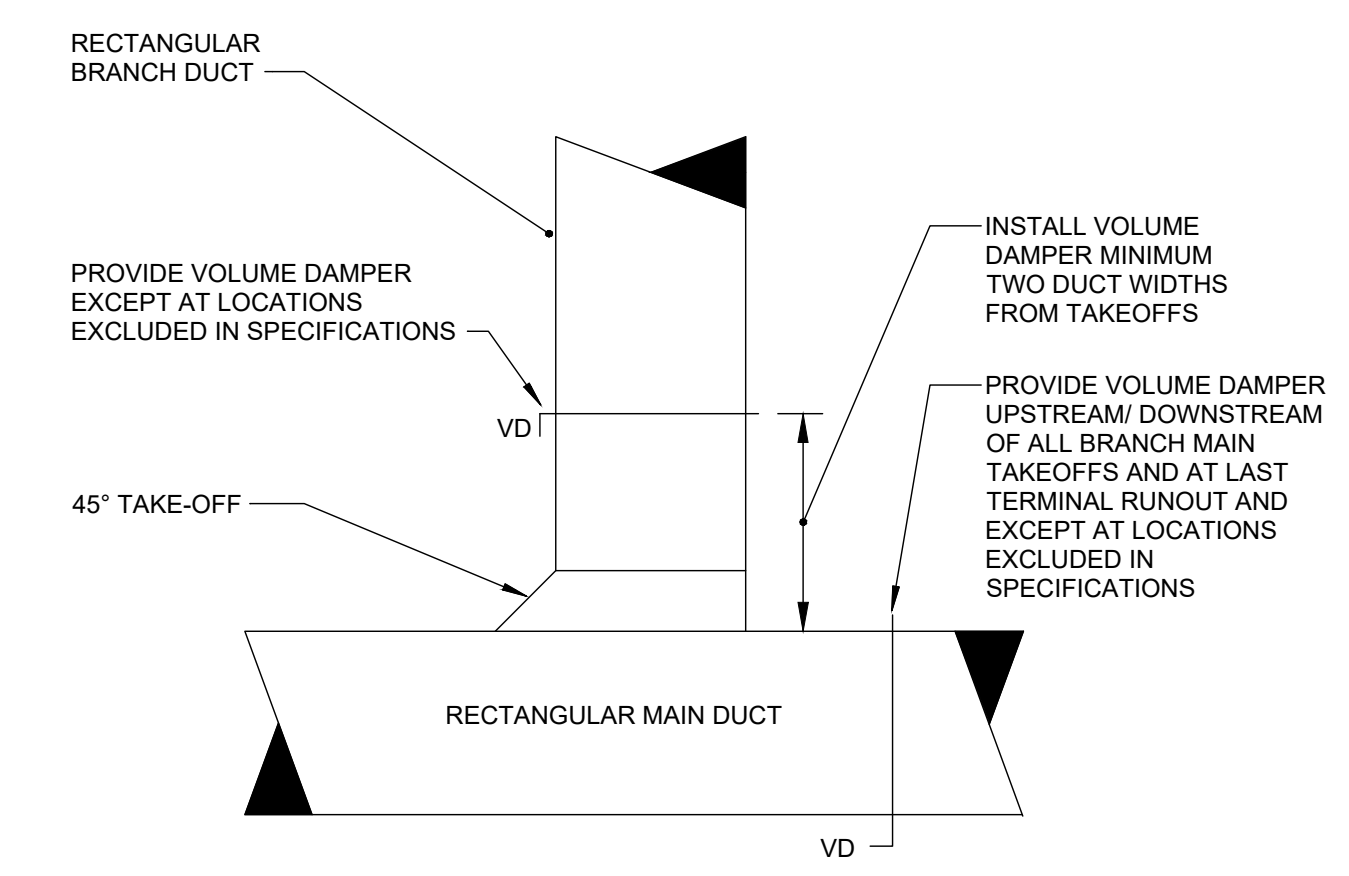
**1 YOUNG REGULATOR WITH REMOTE CABLE**  
 NOT TO SCALE



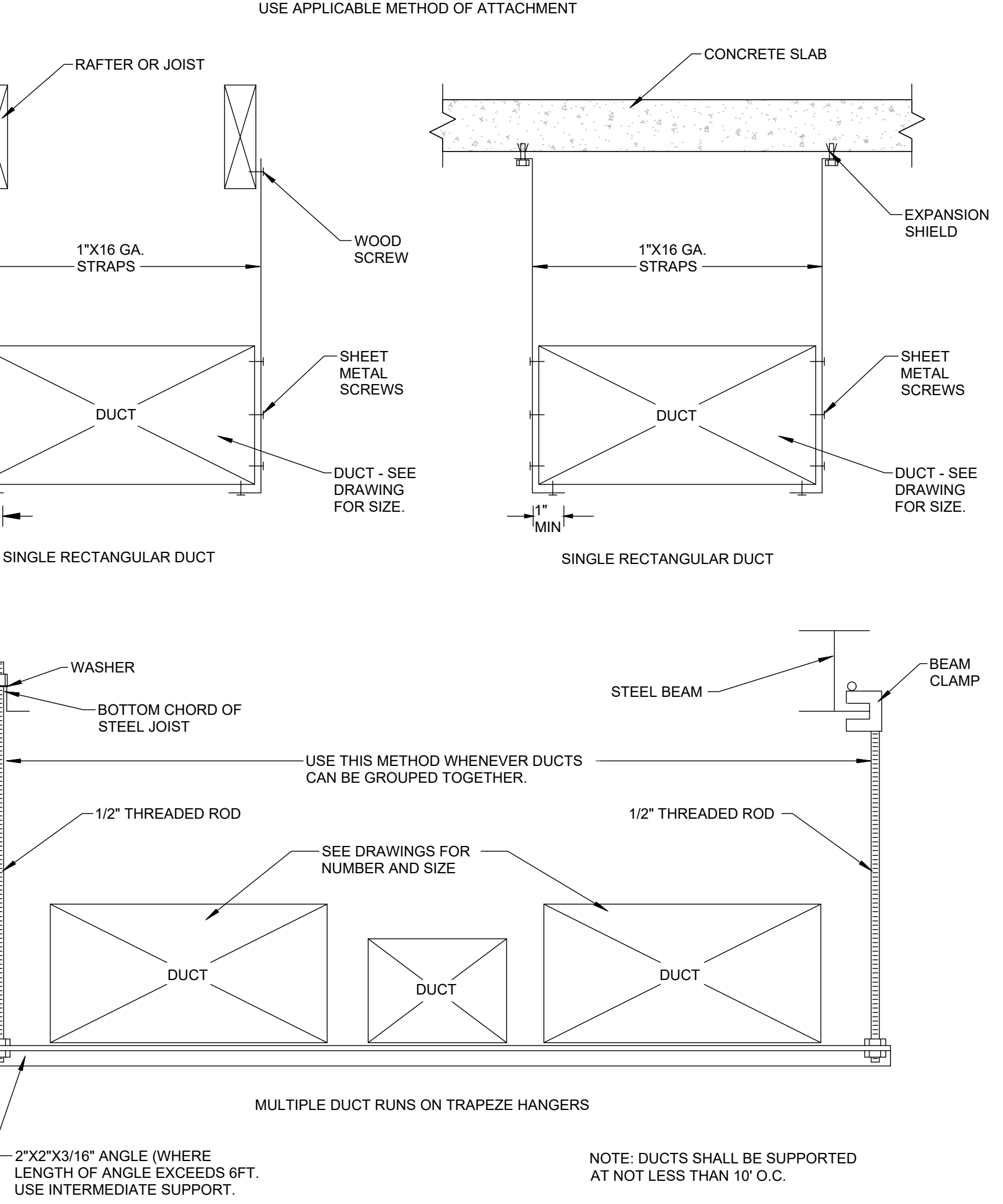
**2 TYPICAL DUCT DETAILS**  
 NOT TO SCALE



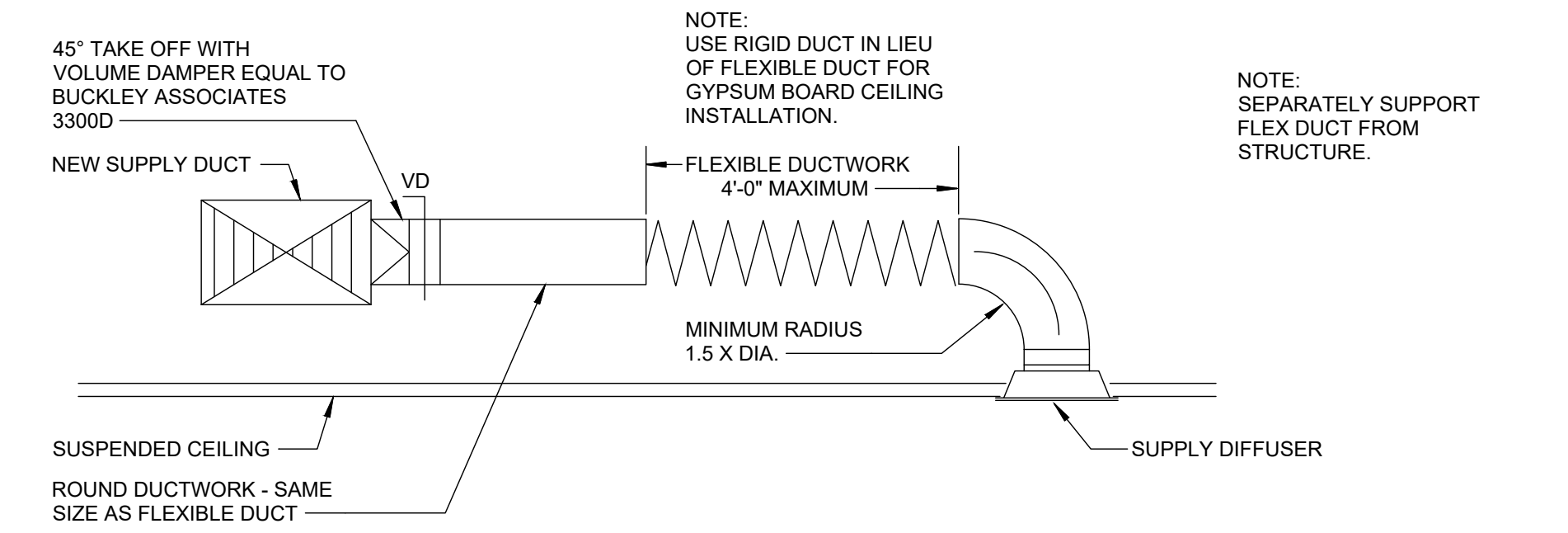
**4 DUCT LINER DETAIL**  
 NOT TO SCALE



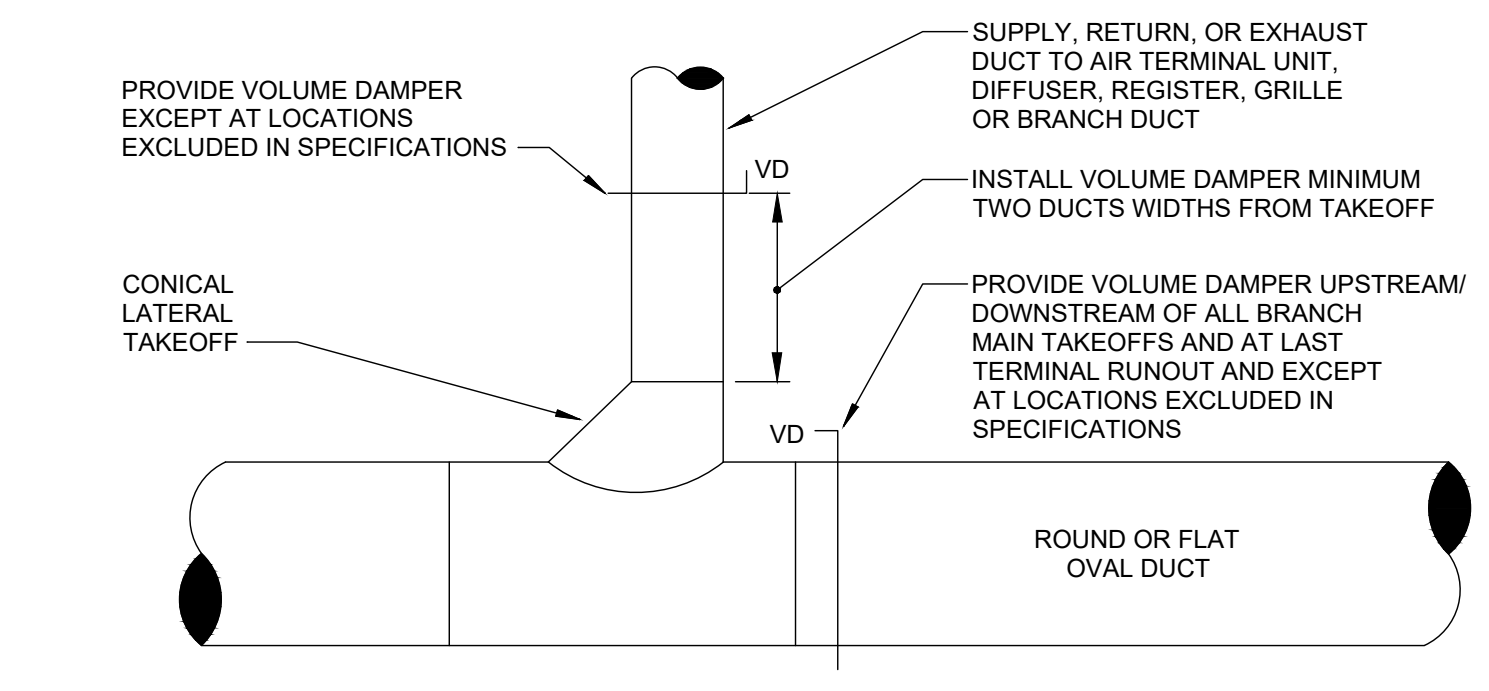
**5 RECTANGULAR BRANCH TAKEOFF DETAIL**  
 NOT TO SCALE



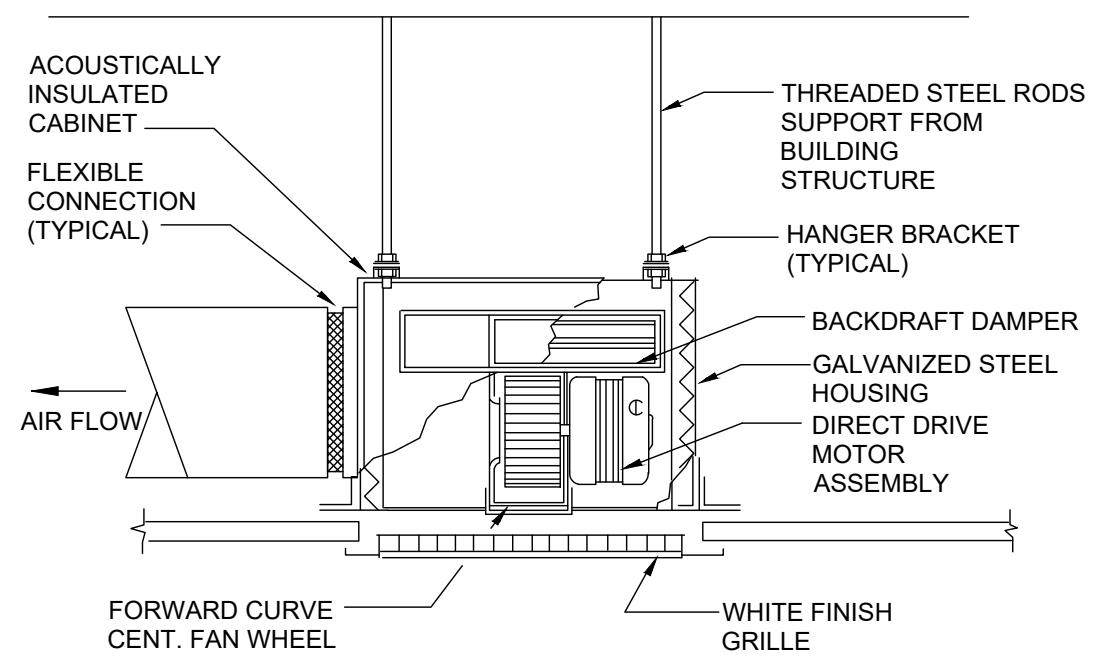
**3 DUCT INSTALLATION DETAIL**  
 NOT TO SCALE



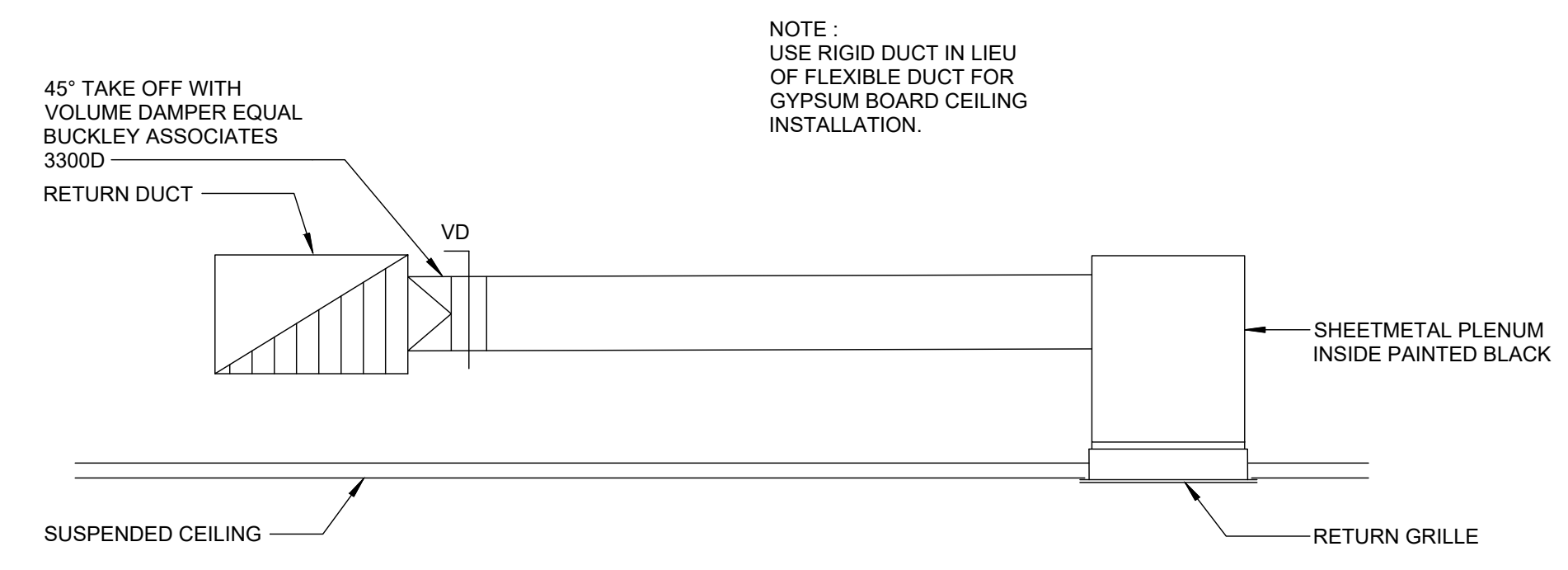
**6 TYPICAL CEILING MOUNTED SUPPLY DIFFUSER DETAIL**  
 NOT TO SCALE



**7 ROUND FLAT OVAL DUCT TAKEOFF DETAIL**  
 NOT TO SCALE



**8 TOILET EXHAUST FAN DETAIL**  
 NOT TO SCALE



**9 TYPICAL CEILING MOUNTED RETURN AIR GRILL DETAIL**  
 NOT TO SCALE

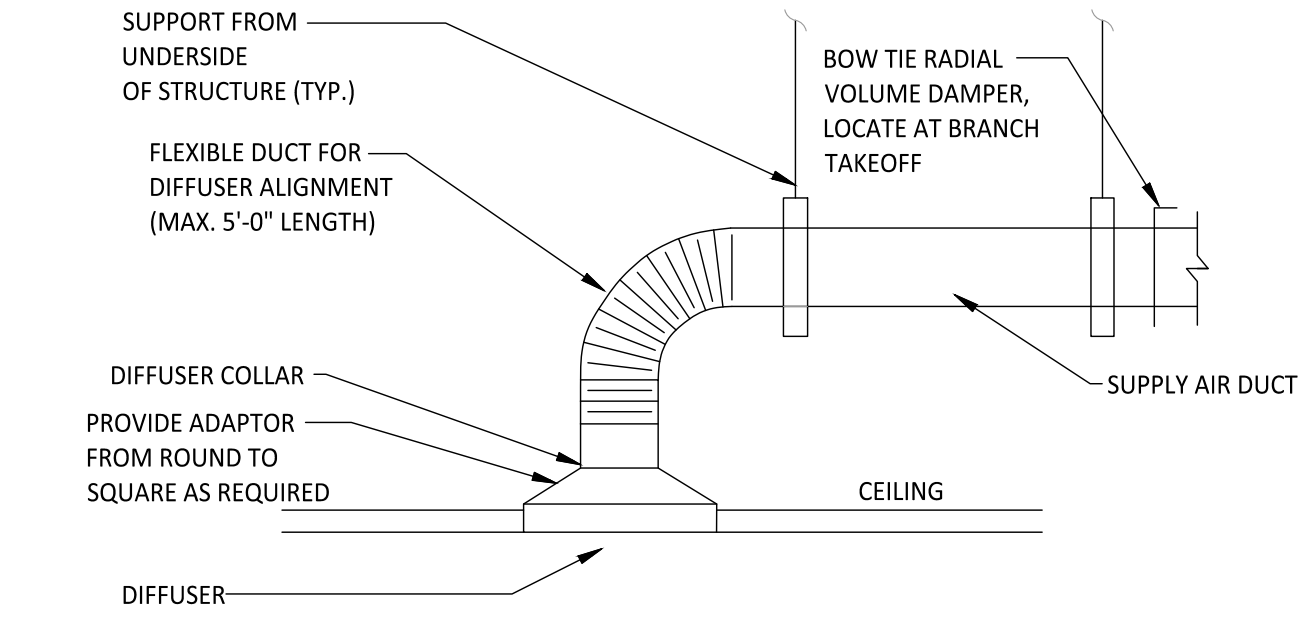
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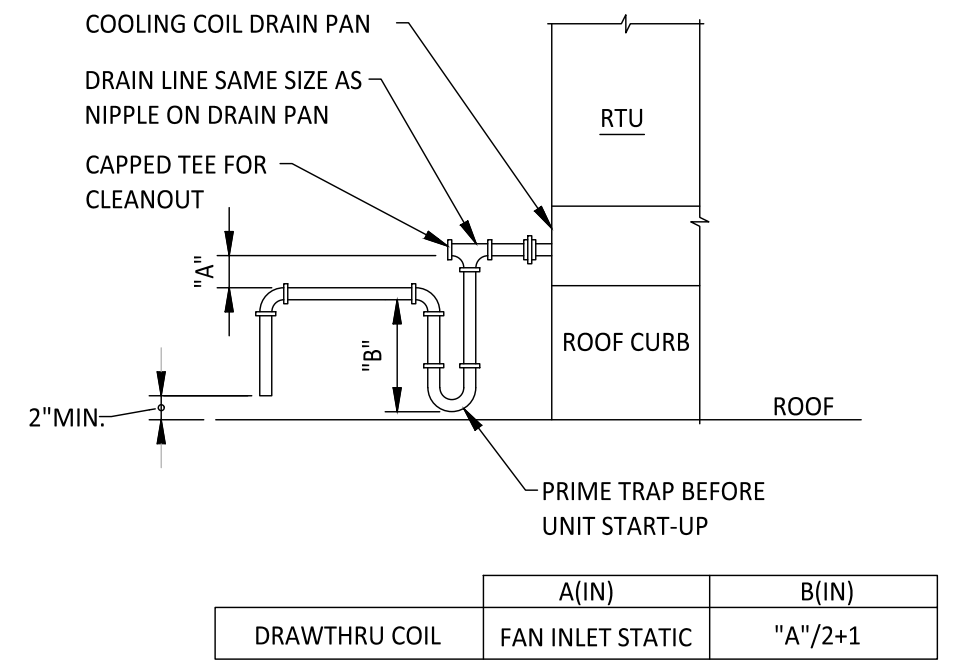
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DATE	DESCRIPTION
5-10-24	SD SET
8-11-24	ZONING SET
8-28-24	BD SET
10-9-24	ISSUED FOR PERMIT
2-14-25	REISSUED FOR PERMIT

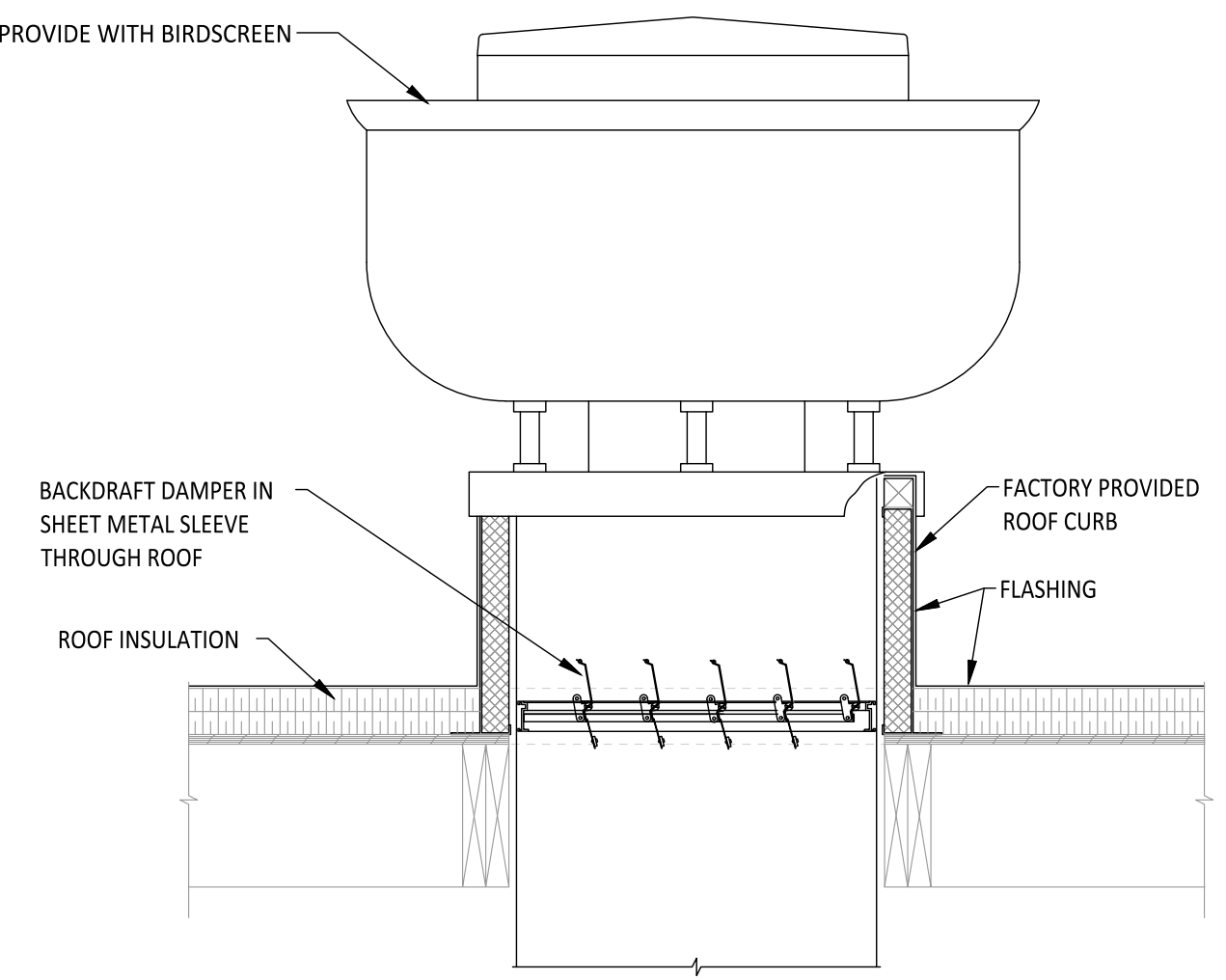
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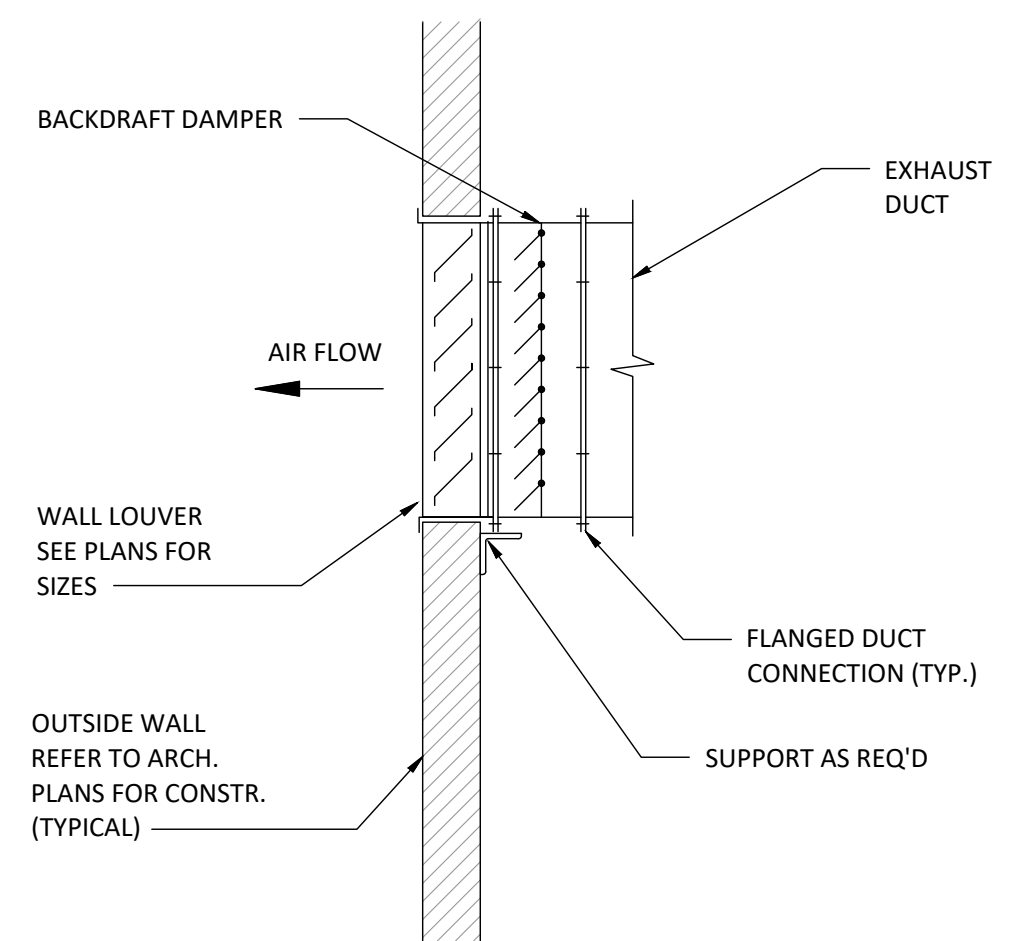
**1** DIFFUSER AND VOLUME DAMPER INSTALLATION DETAIL  
 N.T.S.



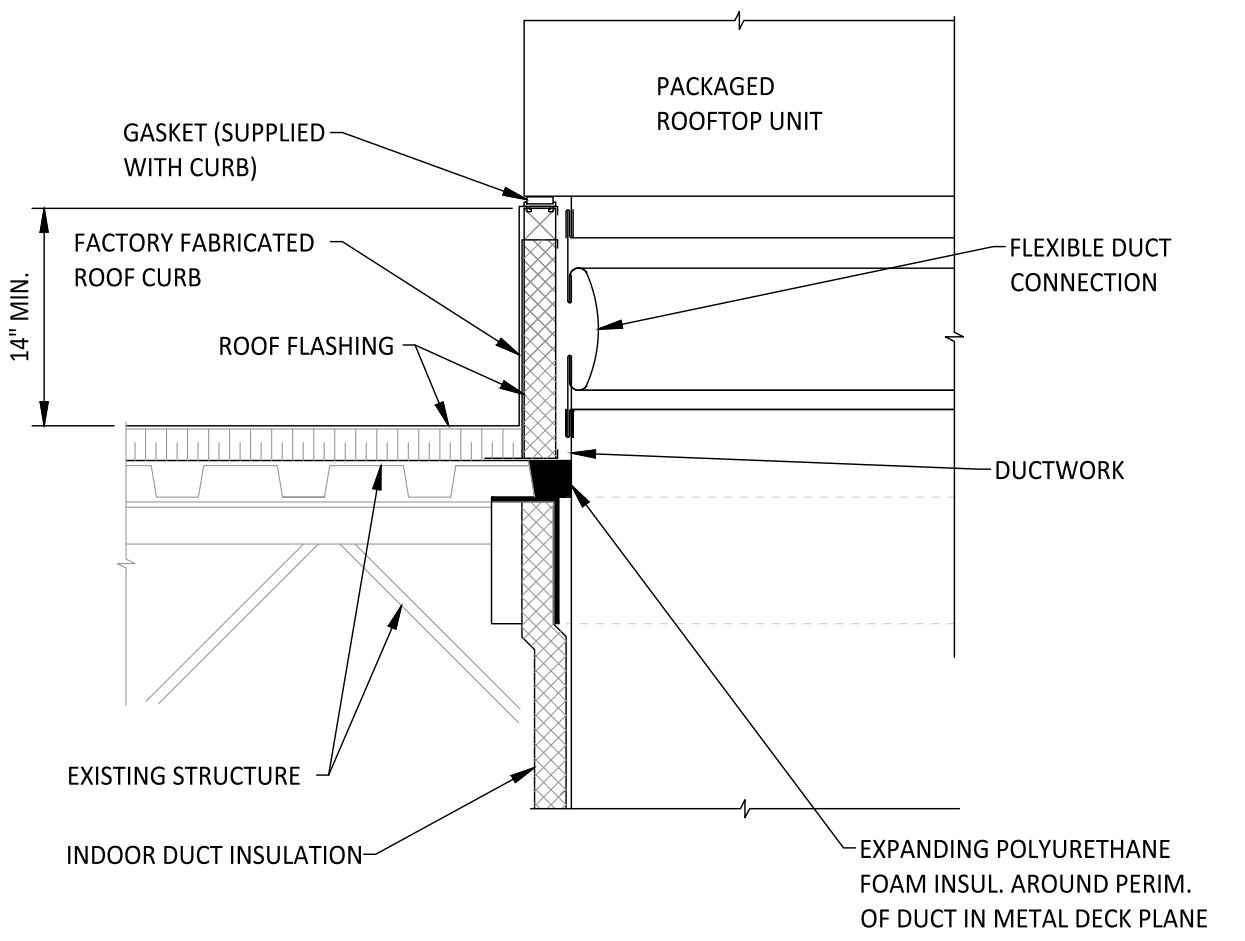
**2** RTU CONDENSATE DRAIN DETAIL  
 N.T.S.



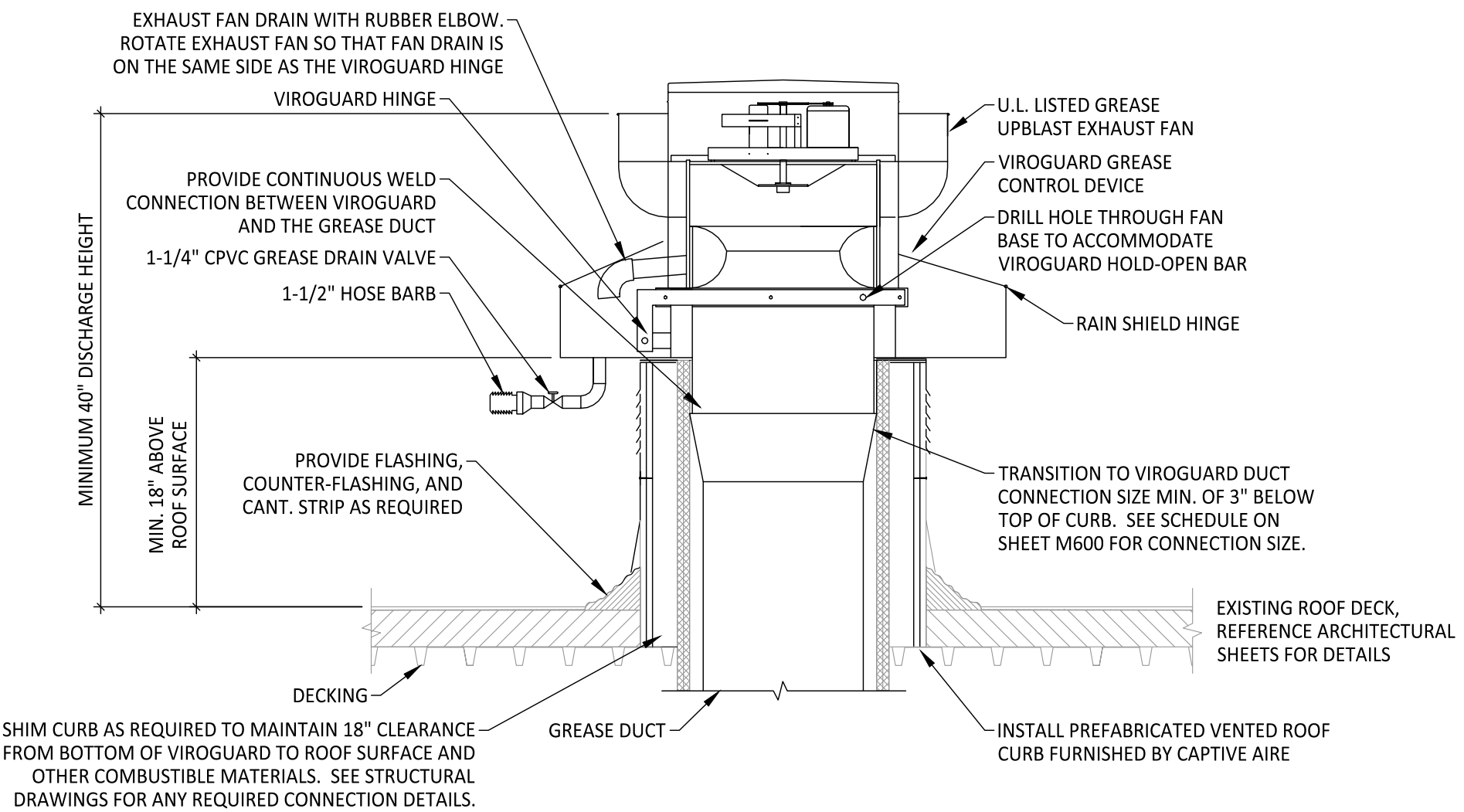
**3** GENERAL EXHAUST FAN DETAIL  
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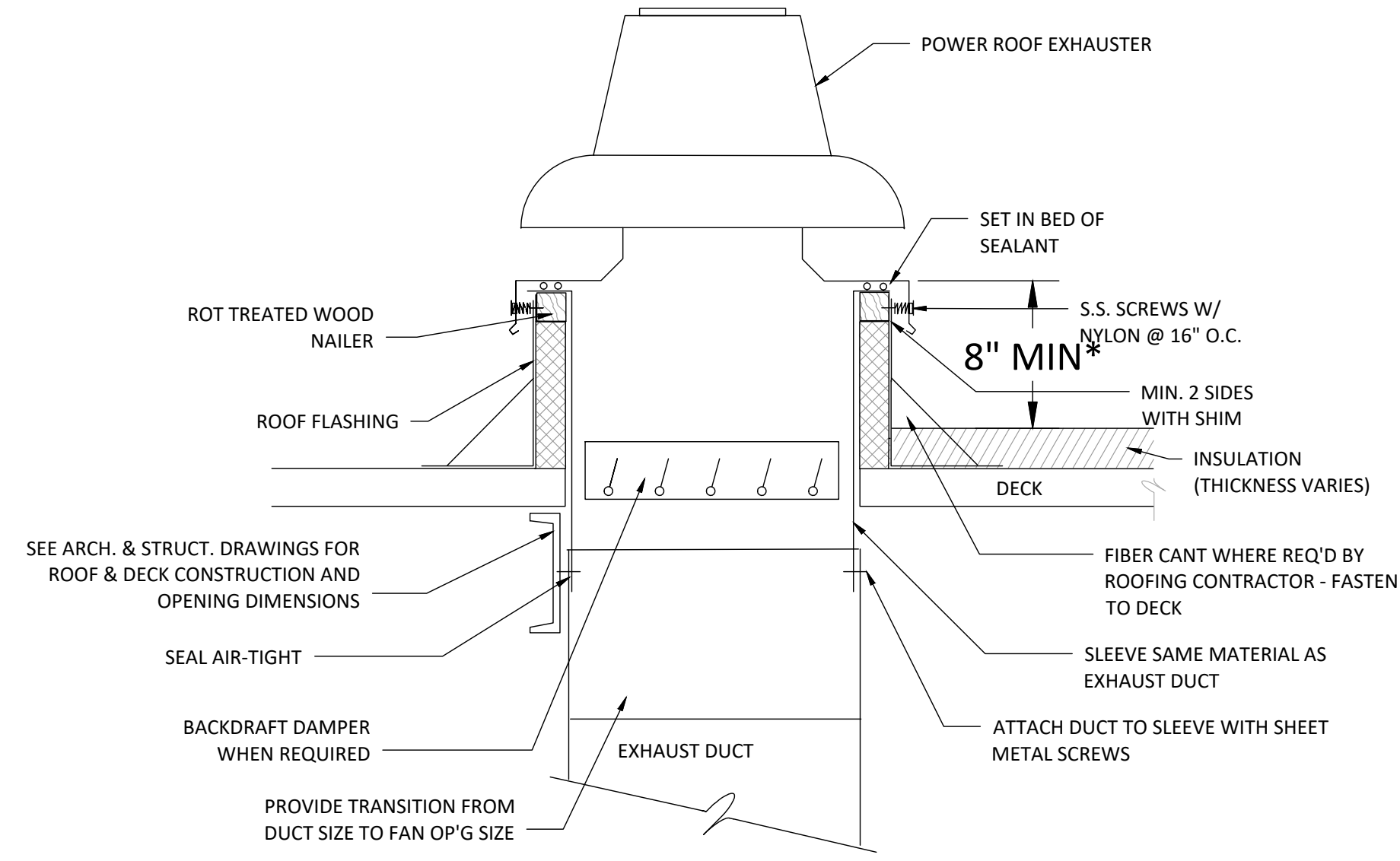
**4** LOUVER WITH BACKDRAFT DAMPER  
 N.T.S.



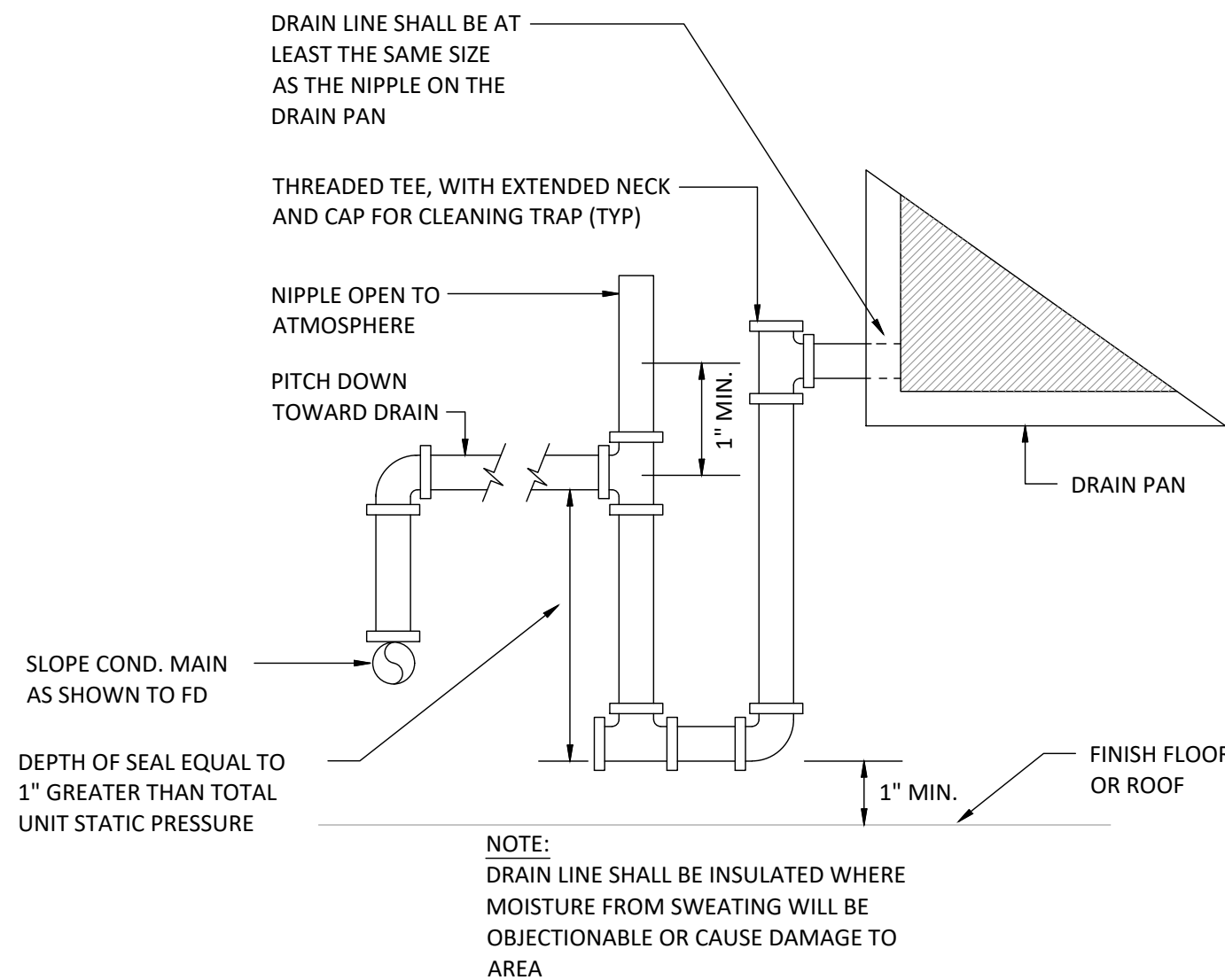
**5** PACKAGED ROOFTOP UNIT DETAIL  
 N.T.S.



**6** GREASE EXHAUST FAN DETAIL  
 N.T.S.



**7** GENERAL EXHAUST FAN DETAIL  
 N.T.S.



**8** AHU CONDENSATE DRAIN DETAIL  
 N.T.S.

# SPECIFICATIONS - DIVISION 23 - HVAC

## SECTION 230500 - GENERAL MECHANICAL REQUIREMENTS:

HVAC SUBCONTRACTOR SHALL PROVIDE AT BID TIME A BID TO PROVIDE PREVENTATIVE MAINTENANCE SERVICES FOR ONE YEAR.

FURNISH TO THE OWNER ALL OPERATING & MAINTENANCE MANUALS, RECORD DRAWINGS, TEST & BALANCE REPORT. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER REPRESENTATIVES FOR EMPLOYEE TRAINING REQUIREMENTS FOR ALL EQUIPMENT.

MECHANICAL CONTRACTOR SHALL SUBMIT COMPLIANCE CHECKLIST TO BUILDING OFFICIAL UPON SUBSTANTIAL COMPLETION OF PROJECT. PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

**DEFINITIONS:**  
**FURNISH:** MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION.  
**INSTALL:** MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE.  
**PROVIDE:** MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

**WARRANTY:**  
 PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE. AT THE OWNER'S OPTION, CONTRACTOR SHALL INCLUDE ONE YEAR WARRANTY ON OWNER FURNISHED EQUIPMENT. CONTRACTOR SHALL INCLUDE COSTS FOR RECEIVING, HANDLING, STORAGE, AND HOISTING OF OWNER FURNISHED EQUIPMENT.

**COORDINATION:**  
 COORDINATE WITH THE WORK OF OTHER SECTIONS. EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.

**DUCT DIMENSIONS:**  
 UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.

**MAKE-UP AIR UNIT:**  
 UNIT SHALL HAVE AN INTEGRAL DISCHARGE THERMOSTAT LINKED TO THE INTERNAL CONTROLS. THE HEATER SHALL BE SET TO MAINTAIN DUCT SUPPLY TEMPERATURE AT NO LESS THAN 45 DEG. F. (ADJ.). HIGH LIMIT SWITCH SET TO 180 DEG. F. INTAKE AIR SENSOR SET TO 10 DEG. F. (ADJ.) LOWER THAN DISCHARGE AIR SENSOR.

**TEMPERATURE CONTROLS:**  
 PROVIDE PROGRAMMABLE THERMOSTATS WITH REMOTE TEMPERATURE SENSORS AND REMOTE HUMIDISTATS COMPATIBLE WITH ROOFTOP UNIT. CONTROL WIRING SHALL BE INSTALLED IN CONDUIT. THERMOSTAT SHALL MEET SETPOINT ADJUSTMENT FOR UNOCCUPIED MODE: HEATING DOWN TO 55 DEGREES AND COOLING UP TO 85 DEGREES. PROVIDE INTERLOCK CONTROL WIRING BETWEEN HOOD EXHAUST FANS AND ROOFTOP UNITS.

## END OF SECTION

## SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. SUBMITTALS:
    1. CERTIFIED TAB REPORTS.
  - B. TAB FIRM QUALIFICATIONS: NBC CERTIFIED.
  - C. TAB REPORT FORMS: STANDARD TAB CONTRACTOR'S FORMS APPROVED BY ARCHITECT.
- PART 2 - PRODUCTS (NOT USED)
- PART 3 - EXECUTION
- 3.1 EXAMINATION
    - A. EXAMINE THE CONTRACT DOCUMENTS TO BECOME FAMILIAR WITH PROJECT REQUIREMENTS AND TO DISCOVER CONDITIONS IN SYSTEMS' DESIGNS THAT MAY PRECLUDE PROPER TAB OF SYSTEMS AND EQUIPMENT.
    - B. EXAMINE THE APPROVED SUBMITTALS FOR HVAC SYSTEMS AND EQUIPMENT.
    - C. EXAMINE SYSTEMS FOR INSTALLED BALANCING DEVICES, SUCH AS TEST PORTS, GAGE COCKS, THERMOMETER WELLS, FLOW-CONTROL DEVICES, BALANCING VALVES AND FITTINGS, AND MANUAL VOLUME DAMPERS. VERIFY THAT LOCATIONS OF THESE BALANCING DEVICES ARE ACCESSIBLE.
    - D. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS AND VERIFY THAT FIELD QUALITY-CONTROL TESTING, CLEANING, AND ADJUSTING SPECIFIED IN INDIVIDUAL SECTIONS HAVE BEEN PERFORMED.
    - E. EXAMINE HVAC EQUIPMENT AND FILTERS AND VERIFY THAT BEARINGS ARE GREASED, BELTS ARE ALIGNED AND TIGHT, AND EQUIPMENT WITH FUNCTIONING CONTROLS IS READY FOR OPERATION.
    - F. EXAMINE TERMINAL UNITS, SUCH AS VARIABLE-AIR-VOLUME BOXES, AND VERIFY THAT THEY ARE ACCESSIBLE AND THEIR CONTROLS ARE CONNECTED AND FUNCTIONING.
    - G. EXAMINE AUTOMATIC TEMPERATURE SYSTEM COMPONENTS TO VERIFY THE FOLLOWING:
      1. DAMPERS, VALVES, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
      2. DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER.
      3. INTEGRITY OF DAMPERS AND VALVES FOR FREE AND FULL OPERATION AND FOR TIGHTNESS OF FULLY CLOSED AND FULLY OPEN POSITIONS, THIS INCLUDES DAMPERS IN MULTIZONE UNITS, MIXING BOXES, AND VARIABLE-AIR-VOLUME TERMINALS.
      4. AUTOMATIC MODULATING AND SHUTOFF VALVES, INCLUDING TWO-WAY VALVES AND THREE-WAY MIXING AND DIVERTING VALVES, ARE PROPERLY CONNECTED.
      5. THERMOSTATS AND HUMIDISTATS ARE LOCATED TO AVOID ADVERSE EFFECTS OF SUNLIGHT, DRAFTS, AND COLD WALLS.
      6. SENSORS ARE LOCATED TO SENSE ONLY THE INTENDED CONDITIONS.
      7. SEQUENCE OF OPERATION FOR CONTROL MODES IS ACCORDING TO THE CONTRACT DOCUMENTS.
      8. CONTROLLER SET POINTS ARE SET AT INDICATED VALUES.
      9. INTERLOCKED SYSTEMS ARE OPERATING.
      10. CHANGEOVER FROM HEATING TO COOLING MODE OCCURS ACCORDING TO INDICATED VALUES.
    - H. REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERFORMANCE OF TEST AND BALANCE PROCEDURES.
  - 3.2 GENERAL PROCEDURES FOR TESTING AND BALANCING
    - A. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE", NBC, ASHRAE 111, NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS" OR SMACNA'S "HVAC SYSTEMS - TESTING, ADJUSTING, AND BALANCING" AND IN THIS SECTION.
    - B. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY FOR TAB PROCEDURES. AFTER TESTING AND BALANCING, PATCH PROBE HOLES IN DUCTS WITH SAME MATERIAL AND THICKNESS AS USED TO CONSTRUCT DUCTS. INSTALL AND JOIN NEW INSULATION THAT MATCHES REMOVED MATERIALS. RESTORE INSULATION, COVERINGS, VAPOR BARRIER, AND FINISH.
    - C. MARK EQUIPMENT AND BALANCING DEVICES, INCLUDING DAMPER-CONTROL POSITIONS, VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL TO SHOW FINAL SETTINGS.
  - 3.3 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS
    - A. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS "AS-BUILT" DUCT LAYOUTS.
    - B. FOR VARIABLE-AIR-VOLUME SYSTEMS, DEVELOP A PLAN TO SIMULATE DIVERSITY.
    - C. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT AIRFLOW MEASUREMENTS.
    - D. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.
    - E. CHECK FOR AIRFLOW LOCKAGES.

- F. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.
- G. CHECK FOR PROPER SEALING OF AIR-HANDLING UNIT COMPONENTS.
- H. CHECK FOR PROPER SEALING OF AIR DUCT SYSTEM.

- 3.4 TOLERANCES
- A. SET HVAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES:
    1. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: PLUS OR MINUS 5 PERCENT.
    2. AIR OUTLETS AND INLETS: PLUS OR MINUS 10 PERCENT.

## END OF SECTION

## SECTION 230700 - HVAC INSULATION

### PART 1 - GENERAL

- 1.1 SECTION REQUIREMENTS
  - A. QUALITY ASSURANCE: LABELED WITH MAXIMUM FLAME-SPREAD INDEX OF 25 AND MAXIMUM SMOKE-DEVELOPED INDEX OF 50 ACCORDING TO ASTM E 84.

### PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
  - A. SURFACE-BURNING CHARACTERISTICS:
    1. INDOOR INSULATION AND RELATED MATERIALS: TO BE FACTORY LABELED DESIGNATING MAXIMUM FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS ACCORDING TO ASTM E 84.
- 2.2 INSULATION MATERIALS
  - A. FLEXIBLE ELASTOMERIC: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I FOR TUBULAR MATERIALS AND TYPE II FOR SHEET MATERIALS.
  - B. MINERAL-FIBER BLANKET INSULATION: COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE I
    1. FSK JACKET: ALUMINUM-FOIL, FIBERGLASS-REINFORCED SCRIM WITH KRAFT-PAPER BACKING; COMPLYING WITH ASTM C 1136, TYPE II.
    2. FSK TAPE: FOIL-FACE, VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE; COMPLYING WITH ASTM C 1136.
  - C. MINERAL-FIBER, PIPE AND TANK INSULATION: COMPLYING WITH ASTM C 1393, TYPE II OR TYPE IIA CATEGORY 2, OR WITH PROPERTIES SIMILAR TO ASTM C 612, TYPE IB; AND HAVING FACTORY-APPLIED ASJ JACKET. NOMINAL DENSITY IS 2.5 LB/CU. FT. OR MORE. THERMAL CONDUCTIVITY (K-VALUE) AT 100 DEG F IS 0.29 BTU X IN./H X SQ. FT. X DEG F OR LESS.
    1. ASJ: WHITE, KRAFT-PAPER, FIBERGLASS-REINFORCED SCRIM WITH ALUMINUM-FOIL BACKING; COMPLYING WITH ASTM C 1136, TYPE I.
    2. ASJ TAPE: WHITE VAPOR-RETARDER TAPE MATCHING FACTORY-APPLIED JACKET WITH ACRYLIC ADHESIVE, COMPLYING WITH ASTM C 1136.
  - D. FLEXIBLE ELASTOMERIC ADHESIVE: COMPLY WITH MIL-A-24179A, TYPE I, CLASS I.
  - E. MINERAL-FIBER ADHESIVE: COMPLY WITH MIL-A-3316C, CLASS 2, GRADE A.
  - F. VAPOR-BARRIER MASTIC: WATER BASED; SUITABLE FOR INDOOR AND OUTDOOR USE ON BELOW AMBIENT SERVICES; COMPLY WITH MIL-PRF-19565C, TYPE II.

### PART 3 - EXECUTION

- 3.1 INSULATION INSTALLATION
  - A. COMPLY WITH REQUIREMENTS OF THE MIDWEST INSULATION CONTRACTORS ASSOCIATION'S "NATIONAL COMMERCIAL & INDUSTRIAL INSULATION STANDARDS" FOR INSULATION INSTALLATION ON PIPES AND EQUIPMENT.
  - B. INSULATION INSTALLATION AT INTERIOR WALLS AND PARTITION PENETRATIONS (THAT ARE NOT FIRE RATED): INSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS.
  - C. INSULATION INSTALLATION AT FIRE-RATED WALL, PARTITION, AND FLOOR PENETRATIONS: INSTALL INSULATION CONTINUOUSLY THROUGH PENETRATIONS. SEAL PENETRATIONS. COMPLY WITH REQUIREMENTS IN SECTION 078400.
  - D. FLEXIBLE ELASTOMERIC INSULATION INSTALLATION:
    1. SEAL LONGITUDINAL SEAMS AND END JOINTS WITH ADHESIVE TO ELIMINATE OPENINGS IN INSULATION THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.
    2. INSULATION INSTALLATION ON PIPE FITTINGS AND ELBOWS: INSTALL MITERED SECTIONS OF PIPE INSULATION. SECURE INSULATION MATERIALS AND SEAL SEAMS WITH ADHESIVE TO ELIMINATE OPENINGS IN INSULATION THAT ALLOW PASSAGE OF AIR TO SURFACE BEING INSULATED.
  - E. MINERAL-FIBER INSULATION INSTALLATION:
    1. INSULATION INSTALLATION ON STRAIGHT PIPES AND TUBES: WHERE VAPOR BARRIERS ARE INDICATED, SEAL LONGITUDINAL SEAMS, END JOINTS, AND PROTRUSIONS WITH VAPOR-BARRIER MASTIC AND JOINT SEALANT.
    2. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON ABOVE AMBIENT SURFACES, SECURE LAPS WITH OUTWARD CLINCHED STAPLES AT 6 INCHES O.C.
    3. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON BELOW AMBIENT SURFACES, DO NOT STAPLE LONGITUDINAL TABS BUT SECURE TABS WITH ADDITIONAL ADHESIVE AS RECOMMENDED BY INSULATION MATERIAL MANUFACTURER AND SEAL WITH VAPOR-BARRIER MASTIC AND FLASHING SEALANT.
    4. BLANKET INSULATION INSTALLATION ON DUCTS AND PLENUMS: SECURE WITH ADHESIVE AND INSULATION PINS.
    5. FOR DUCTS AND PLENUMS WITH SURFACE TEMPERATURES BELOW AMBIENT, INSTALL A CONTINUOUS UNBROKEN VAPOR BARRIER.
  - F. PLENUMS AND DUCTS REQUIRING INSULATION:
    1. CONCEALED SUPPLY AIR.
    2. CONCEALED AND EXPOSED OUTDOOR AIR.
    3. CONCEALED AND EXPOSED RETURN AIR LOCATED IN NONCONDITIONED SPACE.
- 3.2 DUCT AND PLENUM INSULATION SCHEDULE
 

RETAIN " ONE OF" OPTION IN PARAGRAPHS IN THIS ARTICLE TO ALLOW CONTRACTOR TO SELECT PIPING MATERIALS FROM THOSE RETAINED.

  - A. CONCEALED DUCT INSULATION SHALL BE 1-1/2 " THICK MINERAL-FIBER BLANKET WITH A 1.5-LB/CU. FT. NOMINAL DENSITY.
- 3.3 HVAC PIPING INSULATION SCHEDULE
  - A. CONDENSATE PIPING: INSULATION SHALL BE 1 " THICK FLEXIBLE ELASTOMERIC.
  - B. REFRIGERANT PIPING: INSULATION SHALL BE 1 " THICK FLEXIBLE ELASTOMERIC.

## END OF SECTION

## SECTION 233100 - HVAC DUCTS AND CASINGS

### PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
  - A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
  - B. STRUCTURAL PERFORMANCE: DUCT HANGERS AND SUPPORTS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS DESCRIBED IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
  - C. COMPLY WITH NFPA 96 FOR DUCTS CONNECTED TO COMMERCIAL KITCHEN HOODS.
- 2.2 DUCTS
  - A. ELECTROGALVANIZED STEEL SHEET: ASTM A 879
    1. PAINT/LOK/PAINTLOCK OR EQUAL.
  - B. GENERAL DUCTWORK SHALL BE GALVANIZED STEEL, ASTM A653/A635M, CONSTRUCTED TO THE GAUGE AND CORRESPONDING REINFORCING SCHEDULE AS INDICATED IN THE LATEST EDITION OF SMACNA.
  - C. TYPE 1 KITCHEN EXHAUST DUCTWORK
    1. FACTORY-BUILT COMMERCIAL KITCHEN GREASE DUCT:
      - a. INSTALL REDUCED CLEARANCE, ROUND, DOUBLE-WALL GREASE DUCT AS SPECIFIED MEETING UL 978 REQUIREMENTS. REFER TO KITCHEN EQUIPMENT SUPPLIER DRAWINGS FOR REQUIREMENTS.
      - b. DUCTWORK AND FITTINGS FURNISHED BY OWNER FOR INSTALLATION BY THIS CONTRACTOR.
      - c. NO FIRE WRAP SHALL BE REQUIRED FOR THIS INSTALLATION.

- D. TYPE 2 KITCHEN EXHAUST DUCTWORK: 18 GAUGE ALUMINUM OR STAINLESS STEEL. SEAMS SHALL BE CONTINUOUSLY WELDED LIQUID TIGHT.
- E. JOINT AND SEAM TAPE, AND SEALANT: COMPLY WITH UL 181A. PROVIDE POLYMERIC RUBBER TYPE SEALANT FOR USE ON BOTH INTERIOR LOCATED DUCTWORK AND DUCTWORK EXPOSED TO OUTDOOR CONDITIONS. SEALER SHALL HAVE HIGH BONDING STRENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW, MEDIUM, AND HIGH PRESSURE DUCT SYSTEMS. SEALER SHALL BE HIGH IN SOLID CONTENT. PROVIDE A TWO PART TAPE SEALING SYSTEM, CONSISTING OF WOVEN FIBER TAPE IMPREGNATED WITH A GYPSUM MINERAL COMPOUND, AND A MODIFIED ACRYLIC/SILOXANE ACTIVATOR THAT REACTS EXOTHERMICALLY WITH THE TAPE. TWO PART TAPE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION. TAPE SHALL NOT CONTAIN ASBESTOS.
- F. METAL DUCT FABRICATION: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

### 2.3 ACCESSORIES

- A. VOLUME DAMPERS AND CONTROL DAMPERS: SINGLE-BLADE AND MULTIPLE OPPOSED-BLADE DAMPERS, STANDARD LEAKAGE RATING, HEAVY DUTY, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS; FACTORY FABRICATED AND COMPLETE WITH REQUIRED HARDWARE AND ACCESSORIES.
2. ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BRACKET BEYOND DUCT COVERING, WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE. PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED.
3. RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM 1/2" HEXAGONAL AXLE, BOLDEN SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT, LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".
- B. FLEXIBLE DUCT CONNECTORS: FLAME-RETARDED OR NONCOMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181, CLASS 1, CONNECTOR TO BE 30 OUNCE, NEOPRENE COATED, FIBERGLASS FABRIC.
- C. FLEXIBLE DUCTS: FACTORY ASSEMBLED, UL 181, CLASS 1, WITH 1-1/2-INCH THICK (R-0 MIN.), 1 PCF FIBERGLASS INSULATION AND REINFORCED OUTER PROTECTIVE COVER/VAPOR BARRIER. FLEXIBLE DUCT SHALL MEET NFPA 90A WITH FLAME SPREAD UNDER 25, SMOKE DEVELOPED UNDER 50, AND SHALL BE RATED FOR MINIMUM 2-INCH WG PRESSURE AND 0 TO 250°F TEMPERATURE. PROVIDE SCREW-OPERATED METAL ADJUSTABLE CLAMPING DEVICES. USE TWIST-LOCK CONICAL TAP COLLARS AT CONNECTIONS INTO SHEET METAL DUCTWORK. MAXIMUM EXTENDED LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.
- D. TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS"; PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE.
- E. BIRD SCREENS AND FRAMES: PROVIDE BIRD SCREENS THAT CONFORM TO ASTM E 2016, NO. 2 MESH, ALUMINUM OR STAINLESS STEEL. PROVIDE "MEDIUM-LIGHT " RATED ALUMINUM SCREENS. PROVIDE "LIGHT" RATES STAINLESS STEEL SCREENS.
- F. DUCT-MOUNTED ACCESS DOORS: FABRICATE ACCESS PANELS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE"; FIGURES 2-10, "DUCT ACCESS DOORS AND PANELS," AND 2-11, "ACCESS PANELS - ROUND DUCT."

### PART 3 - EXECUTION

- 3.1 INSTALLATION
  - A. INSTALL DUCTWORK, ACCESSORIES, AND SUPPORTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.
  - B. SEAL DUCTS TO THE FOLLOWING SEAL CLASSES ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE": 1-INCH WG, SEAL CLASS A.
  - C. AVOID PASSING THROUGH OR ABOVE ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES.
  - D. CLEAN DUCT SYSTEMS BEFORE TESTING, ADJUSTING, AND BALANCING.
- 3.2 DUCTWORK SCHEDULE
  - A. EXPOSED DUCTWORK IN ARCHITECTURALLY FINISHED SPACES- ELECTRO-GALVANIZED STEEL SHEET.
  - B. CONCEALED DUCTWORK AND DUCTWORK IN UNFINISHED ARCHITECTURAL SPACES- GALVANIZED STEEL.

## END OF SECTION

## SECTION 233423 - HVAC EXHAUST FANS

### PART 2 - PRODUCTS

- 2.1 PERFORMANCE REQUIREMENTS
  - A. PRODUCTS SHALL BE LICENSED TO USE THE AMCA-CERTIFIED RATINGS SEAL.
  - B. EXHAUST FANS SHALL COMPLY WITH UL 705, TYPE 1 FANS SHALL ALSO COMPLY WITH UL 762.
  - C. TYPE 1 FANS TO BE DESIGNED FOR HIGH HEAT OPERATION AT 300°F.
  - D. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- 2.2 CENTRIFUGAL VENTILATORS
  - A. HOUSING: REMOVABLE, SPUN-ALUMINUM, DOME TOP AND OUTLET BAFFLE; SQUARE, ONE-PIECE, ALUMINUM BASE WITH VENTURI INLET CONE.
    1. UPBLAST UNITS: ALUMINUM DISCHARGE BAFFLE TO DIRECT DISCHARGE AIR UPWARD, WITH RAIN AND SNOW DRAINS.
  - B. FAN WHEELS: ALUMINUM HUB AND WHEEL WITH BACKWARD-INCLINED BLADES.

### C. BELT-DRIVEN DRIVE ASSEMBLY: RESILIENTLY MOUNTED TO HOUSING.

1. FAN SHAFT: TURNED, GROUND, AND POLISHED STEEL, KEYED TO WHEEL HUB.
  2. SHAFT BEARINGS: PERMANENTLY LUBRICATED, PERMANENTLY SEALED, SELF-ALIGNING BALL BEARINGS.
  3. PULLEYS: CAST-IRON, ADJUSTABLE-PITCH MOTOR PULLEY.
  4. FAN AND MOTOR ISOLATED FROM EXHAUST AIRSTREAM.
- D. ACCESSORIES
1. DISCONNECT SWITCH: NON-FUSIBLE TYPE, WITH THERMAL-OVERLOAD PROTECTION, FACTORY WIRED THROUGH AN INTERNAL ALUMINUM CONDUIT.
  2. BIRD SCREENS: REMOVABLE, 1/2-INCH MESH, ALUMINUM OR BRASS WIRE.
  3. DAMPERS: COUNTERBALANCED, PARALLEL-BLADE, BACKDRAFT DAMPERS MOUNTED IN CURB BASE; FACTORY SET TO CLOSE WHEN FAN STOPS.
  4. MOTORIZED DAMPERS: PARALLEL-BLADE DAMPERS MOUNTED IN CURB BASE WITH ELECTRIC ACTUATOR; WIRED TO CLOSE WHEN FAN STOPS.
- E. ROOF CURBS: 20 GAUGE GALVANIZED STEEL; MITERED AND WELDED CORNERS; 1-1/2-INCH THICK, RIGID, FIBERGLASS INSULATION ADHERED TO INSIDE WALLS; AND 1-1/2-INCH WOOD NAILER. SIZE AS REQUIRED TO SUIT ROOF OPENING AND FAN BASE.
1. CONFIGURATION: SELF-FLASHING WITHOUT A CANT STRIP, WITH MOUNTING FLANGE.
  2. OVERALL HEIGHT: 12 INCHES FOR GENERAL EXHAUST FANS; 20 INCHES FOR KITCHEN EXHAUST FANS.
  3. PITCH MOUNTING: MANUFACTURE CURB FOR ROOF SLOPE.
  4. MOUNTING PEDESTAL: GALVANIZED STEEL WITH REMOVABLE ACCESS PANEL.
  5. TYPE 1 ROOF CURBS TO BE VENTED TYPE.
  6. TYPE 1 AND TYPE 2 ROOF CURBS TO BE HINGED TYPE.
- F. CAPACITIES AND CHARACTERISTICS:
1. SEE SCHEDULE.
- G. MOTORS
- A.A. COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND EFFICIENCY REQUIREMENTS FOR MOTORS.
    - 1.1. MOTOR SIZES: MINIMUM SIZE AS INDICATED, IF NOT INDICATED, LARGE ENOUGH SO DRIVE LOAD WILL NOT REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 1.0.
  - A.B. ENCLOSURE TYPE: TOTALLY ENCLOSED, FAN COOLED.

### PART 3 - EXECUTION

- 3.1 INSTALLATION
  - A. INSTALL UNITS WITH CLEARANCES FOR SERVICE AND MAINTENANCE.
  - B. ROOF-MOUNTED UNITS: INSTALL ROOF CURB OR ROOF STRUCTURE, ACCORDING TO ARI GUIDELINE B. INSTALL AND SECURE ROOF-MOUNTED FANS ON CURBS, AND COORDINATE ROOF PENETRATIONS AND FLASHING WITH ROOF CONTRACTOR.

## END OF SECTION

## SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

### PART 1 - GENERAL

### PART 2 - PRODUCTS

- 2.1 DIFFUSERS, REGISTERS, AND GRILLES:
  - A. REFER TO SCHEDULES FOR FINISH TYPE, COLOR, MATERIAL, AND MOUNTING.

### PART 3 - EXECUTION

- 3.1 INSTALLATION
  - A. INSTALL DIFFUSERS, REGISTERS, AND GRILLES LEVEL AND PLUMB.
  - B. CEILING-MOUNTED OUTLETS AND INLETS: DRAWINGS INDICATE GENERAL ARRANGEMENT OF DUCTS, FITTINGS, AND ACCESSORIES. MAKE FINAL LOCATIONS WHERE INDICATED, AS MUCH AS PRACTICAL. FOR UNITS INSTALLED IN LAY-IN CEILING PANELS, LOCATE UNITS IN THE CENTER OF PANEL UNLESS OTHERWISE INDICATED. WHERE ARCHITECTURAL FEATURES OR OTHER ITEMS CONFLICT WITH INSTALLATION, NOTIFY ARCHITECT FOR A DETERMINATION OF FINAL LOCATION.
  - C. AFTER INSTALLATION, ADJUST DIFFUSERS, REGISTERS, AND GRILLES TO AIR PATTERNS INDICATED, OR AS DIRECTED, BEFORE STARTING AIR BALANCING.

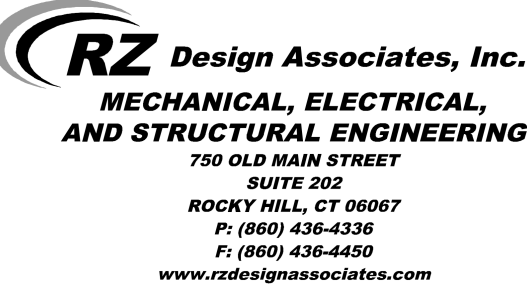
### 2. END OF SECTION

## ARCHITECT

# BKA ARCHITECTS

BKA Architects, Inc.  
 Boston + Tampa  
 bkaarchitects.com

## CONSULTANT



## SEAL

## ISSUED

DATE	DESCRIPTION
5-10-24	SD SET
6-11-24	ZONING SET
8-29-24	PIP SET
10-9-24	ISSUED FOR PERMIT
2-14-25	REISSUED FOR PERMIT

## REVISIONS

NO.	DATE	DESCRIPTION
1	12-09-24	REVISION 1
2	01-24-25	REVISED CUT ZONES

## OWNER/CLIENT

## PROJECT

CAVA - BURLINGTON

101 MIDDLESEX TURNPIKE,  
 BURLINGTON, MA 01803

## DRAWING TITLE

MECHANICAL SPECIFICATIONS

## DRAWING INFORMATION

Job Number: 221193

Checked By: REP

Drawn By: SJH

## DRAWING NUMBER

M

500

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DATE	DESCRIPTION
5-10-24	SD SET
6-11-24	ZONING SET
8-9-24	BID SET
10-9-24	ISSUED FOR PERMIT
2-14-25	REISSUED FOR PERMIT

NO.	DATE	DESCRIPTION
1	12-09-24	REVISION 1
2	01-24-25	REVISED CUT ZONES

FOR QUESTIONS, CALL THE  
 Maryland Mechanical  
 REGION 76  
 PHONE: (800) 988 - 0881  
 EMAIL: reg76@captivateire.com

PATENT NUMBERS  
 AC-PSP (UNITED STATES) - US PATENT 7963830 B2.  
 AC-PSP WALL (CANADA) - CA PATENT 2820509.  
 AC-PSP ISLAND (CANADA) - CA PATENT 2520330.

**HOOD INFORMATION - JOB#7187717**

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/F1	TOTAL EXH CFM	EXHAUST PLENUM (RISERS)				MUA CFM	AC CFM	HOOD CONSTRUCTION	HOOD CONFIG		
										WIDTH	LENG	HEIGHT	DIA				CFM	VEL	SP
1		ND-2-ACFSP-F	CAPTIVEAIRE	10' 7"	600 DEG	I	HEAVY	200	2117	4"	14"	2117	1980	-1.166"	1694	844	430 SS WHERE EXPOSED	ALONE	ALONE

**HOOD INFORMATION**

HOOD NO	TAG	TYPE	FILTER(S)			EFFICIENCY @ 7 MICRONS	QTY	LIGHT(S)			UTILITY CABINET(S)			FIRE HOOD SYSTEM	HOOD WEIGHT		
			QTY	HEIGHT	LENGTH			TYPE	SIZE	WIRE GUARD	LOCATION	SIZE	FIRE SYSTEM			ELECTRICAL MODEL #	SWITCHES QUANTITY
1		CAPTIRATE COMBO WITH	7	20"	16"	99%	SEE FILTER SPEC	4	L55 SERIES E26	NO	RIGHT	12"x60"x30"	TANK FS	4.0		YES	1014 LBS

**HOOD OPTIONS**

HOOD NO	TAG	OPTION
1		FIELD WRAPPER 18.00" HIGH FRONT, RIGHT. LEFT END STANDOFF (FINISHED) 3" WIDE 60" LONG INSULATED. INSULATION FOR BACK OF HOOD. RIGHT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 80" HIGH INSULATED 430 SS. LEFT WALL AS END PANEL.

**PERFORATED SUPPLY PLENUM(S)**

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISERS			
							WIDTH	LENG	DIA	CFM
1		Front	142"	22"	6"	MUA	10"	28"	564	0.148"
						MUA	10"	28"	564	0.148"
						AC	8"	26"	422	0.095"
						AC	8"	26"	422	0.095"

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

CAPTIVEAIRE SYSTEMS RECOMMENDS THE USE OF LISTED, PRE-FABRICATED ROUND GREASE EXHAUST DUCT TO REDUCE STATIC PRESSURE IN THE SYSTEM, MINIMIZE INSTALLATION AND INSPECTION TIMES, AND ENSURE DUCT IS LIQUID TIGHT

**VERIFY CEILING HEIGHT**

- - -

HEIGHT REQUIRED TO VERIFY THAT HOOD FITS SPACE AND TO SIZE THE ENCLOSURE PANELS

**HVAC DISTRIBUTION NOTE**  
 HIGH VELOCITY DIFFUSERS OR HVAC RETURNS SHOULD NOT BE PLACED WITHIN TEN (10) FEET OF THE EXHAUST HOOD. PERFORATED DIFFUSERS ARE RECOMMENDED.

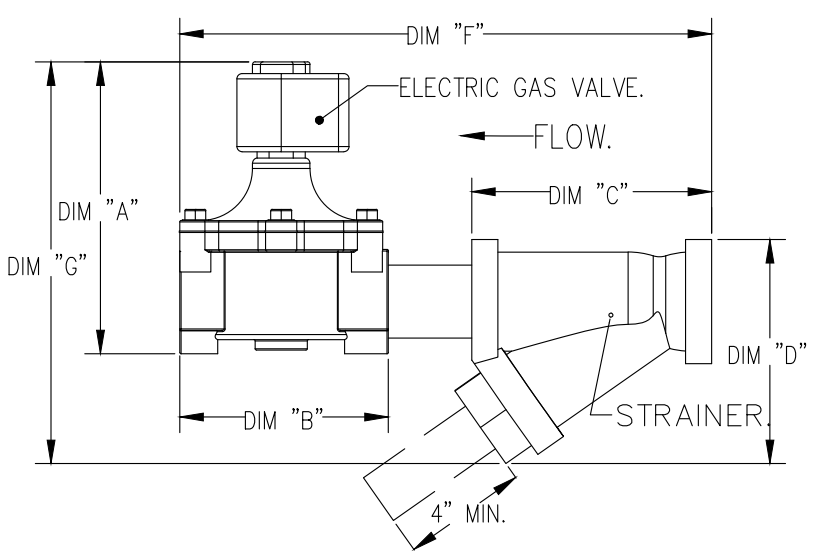
**CUSTOMER APPROVAL TO MANUFACTURE:**

APPROVED AS NOTED   
 APPROVED WITH NO EXCEPTION TAKEN   
 REVISE AND RESUBMIT   
 SIGNATURE \_\_\_\_\_  
 YOUR TITLE \_\_\_\_\_ DATE \_\_\_\_\_

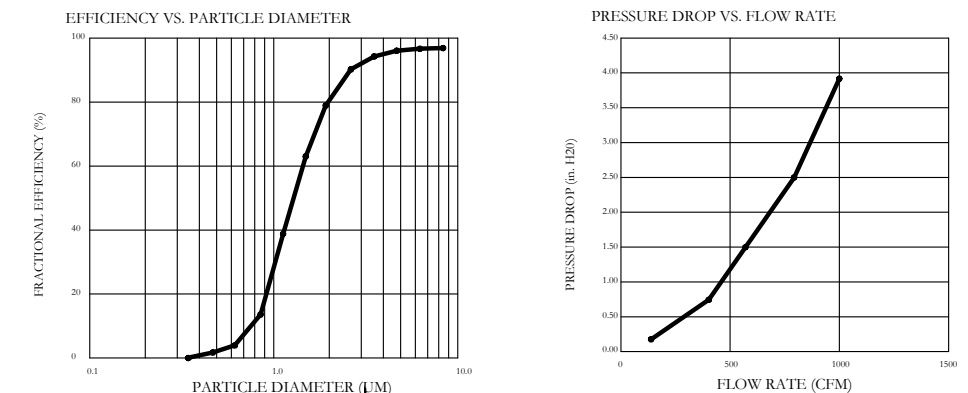
**GAS VALVES AND STRAINERS**

TYPE	SIZE	VOLTAGE	GAS VALVE SIZING		GAS VALVE DIMENSIONS				INSTALLATION	GAS VALVE PART NUMBER	STRAINER PART NUMBER	GAS VALVE /STRAINER KIT		
			MIN. INLET PRESSURE (0 IN.W.C.)	MAX. INLET PRESSURE (138 IN.W.C.)	DIM "A"	DIM "B"	DIM "C"	DIM "D"					DIM "E"	
ELECTRICAL	2"	120 VAC	2.24	2.24	7-5/8"	6-3/8"	7-1/4"	7-13/16"	15-5/8"	13-15/16"	HORIZONTAL	8274280	4417668	(SC2)GVA2

**LEAKAGE GAS VALVES ONLY:**  
 3/4" - 2" 120VAC GAS VALVES CAN BE MOUNTED WITH THE SOLID IN ANY POSITION ABOVE HORIZONTAL.  
 2 1/2" - 3" 120VAC GAS VALVES MUST BE MOUNTED WITH THE SOLID IN VERTICAL AND UPRIGHT.  
 240VAC GAS VALVES MUST BE MOUNTED WITH THE SOLID IN VERTICAL AND UPRIGHT.



**SPECIFICATION: CAPTRATE GREASE-STOP COMBO FILTER**  
 THE CAPTRATE GREASE-STOP COMBO FILTER IS A MULTI-STAGE FILTRATION SYSTEM CONSISTING OF A HIGH PERFORMANCE S-BAFFLE COMPONENT COMBINED WITH A SECONDARY PACKED-BED FILTER OF POROUS CERAMIC MEDIA.  
 FILTER ASSEMBLY SHALL FIT INTO STANDARD TWO-INCH DEEP HOOD CHANNEL(S).  
 METALLIC COMPONENTS SHALL BE STAINLESS STEEL CONSTRUCTION AND SIZED TO FIT AND DURABLE MICRO-POROUS CERAMIC MEDIA THAT IS CAPABLE OF ABSORBING SMALLER GREASE PARTICULATE BY MEANS OF CAPILLARY ACTION.  
 UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.  
 GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 97% OF THE TOTAL MASS EMITTED GREASE PARTICLES AND HAVING FUNCTIONAL EFFICIENCY OF 60% GREATER OF GREASE PARTICLES EMITTED TWO MICRONS IN SIZE AND LARGER.  
 THE CAPTRATE GREASE-STOP COMBO WAS TESTED TO ASTM STANDARD ASTM F2519-05.



CAPTIRATE FILTERS ARE BUILT IN COMPLIANCE WITH:  
 NEPA #96  
 NSF STANDARD #2  
 UL STANDARD #546  
 INT. MECH. CODE (M.C.)  
 ULC-5649.

**ODOR REDUCTION NOTE**  
 CAPTIVEAIRE HOODS ARE FITTED WITH SPECIALTY 2-STAGE CAPTRATE COMBO GREASE EXTRACTION FILTERS (SPECIFICATION ABOVE). CAPTRATE COMBO FILTERS ARE INDEPENDENTLY TESTED TO REMOVE 99% OF GREASE PARTICULATE AT 7 MICRONS OR LARGER. BY REMOVING VIRTUALLY ALL SIGNIFICANT GREASE PARTICULATE AT THE KITCHEN HOOD, COOKING ODORS FROM RESTAURANT WILL BE REDUCED TO INSIGNIFICANT LEVELS.

**REVISIONS**

NO.	DESCRIPTION	DATE

CAPTIVEAIRE

Maryland Mechanical  
 8120 Woodmont Avenue, Suite 270, Bethesda, MD 20814 PHONE: (800) 988-0881 FAX: 9192275801 EMAIL: reg76@captivateire.com

CAVA - Burlington, MA\_R2  
 75 Middlesex Turnpike,  
 BURLINGTON, MA, 01803

DATE: 12/9/2024  
 DWG.#: 7187717  
 DRAWN BY: ABS-76  
 SCALE: NTS  
 MASTER DRAWING

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8-8-24	BD SET
10-9-24	ISSUED FOR PERMIT
2-14-25	REISSUED FOR PERMIT

REVISIONS

DATE	DESCRIPTION
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2	01-24-25 REVISED CUT ZONES

OWNER/CLIENT

PROJECT  
CAVA - BURLINGTON

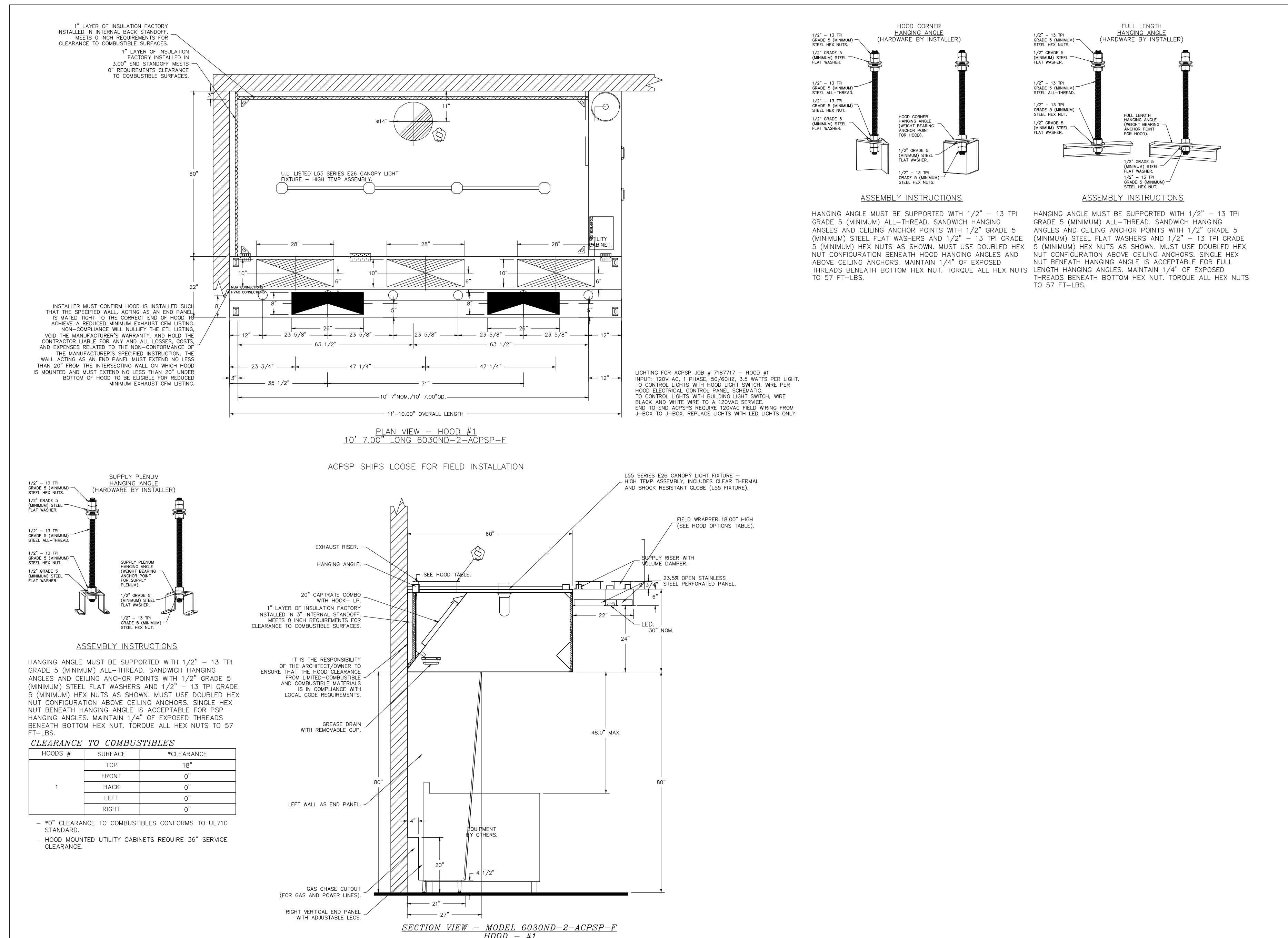
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REVISIONS	DESCRIPTION	DATE

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CAVA - BURLINGTON

101 MIDDLESEX TURNPIKE,  
BURLINGTON, MA 01803

DRAWING TITLE

CAPTIVEAIRE

DRAWING INFORMATION

Job Number: 221193  
Checked By: REP  
Drawn By: SJH

DRAWING NUMBER

H

1.3

**FIRE SYSTEM INFORMATION - JOB#7187717**

FIRE SYSTEM NO.	TAG	TYPE	SIZE	MAX FP	DESIGN FP	SYSTEM	LOCATION ON HOOD
1	33.1	TANK FS	4.0	20	12	FIRE CABINET RIGHT	RIGHT, HOOD 1

**GAS VALVE(S)**

FIRE SYSTEM NO.	TAG	TYPE	SIZE	SUPPLIED BY
1	33.1	SC ELECTRICAL	2,000	CAPTIVEAIRE SYSTEMS

**FIRE SYSTEM PARTS LIST KEY**

FIRE SYSTEM NO.	TAG	KEY NUMBER - PART DESCRIPTION	QTY BY FACTORY	QTY BY DIST
1	33.1	0 - 0 - TANK FIRE SUPPRESSION POST-DISCHARGE PROCEDURE UTILITY CABINET LABEL SHEET.	1	0
		0 - 0 - TANK FIRE SUPPRESSION MAINTENANCE GUIDE UTILITY CABINET LABEL SHEET.	1	0
		0 - 0 - 12-726021-32144-017-360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. NO. CLOSE ON TEMP RISE AT 360°F. (A0034310).	1	0
		0 - 0 - 32-00002 QUIK SEAL - 1/2" (UL).	1	0
		0 - 0 - 4429K153 1/2" X 1/4" BRASS REDUCING BUSHING.	1	0
		0 - 0 - 4429K422 1/2" X 1/4" BRASS REDUCING BUSHING.	1	0
		0 - 0 - 79525 1/2" 90 PRO-PRESS ELBOW WITH 1/2"NPT FEMALE CONNECTION, VEGA.	1	0
		0 - 0 - 79580 1/2" X 1/2" PRO-PRESS TEE X 1/2"NPT FEMALE CONNECTION, VEGA.	1	0
		0 - 0 - 87-300001-001 TANK - PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION.	1	0
		0 - 0 - 87-300030-001 PRIMARY ACTUATOR KIT (PAK) - ACTUATOR AND RELEASE SOLENOID ASSEMBLY, ONE NEEDED PER FIRE SYSTEM SUPERVISED, TANK FIRE SUPPRESSION.	1	0
		0 - 0 - 87-300152-001 HARDWARE, SVA BOLTS, TANK FIRE SUPPRESSION.	4	0
		0 - 0 - 9055455PC PRO PRESS 1/2 PRESS X PRESS 90 ELBOW LD.	5	0
		0 - 0 - 9097200PC PRO PRESS P0611 1/2 PRESS TEE LD.	2	0
		0 - 0 - 98644115 HARDWARE, DATANKLOCK LOCKING BRACKET SQUARE NUTS 5/16" ZINC, TANK FIRE SUPPRESSION.	2	0
		0 - 0 - A0034332 JUNCTION BOX FOR MANUAL PULL STATION, 1.5" DEEP BACK BOX, RED COLOR.	1	0
		0 - 0 - A31484 1/4" NPT SCHRADER VALVE AND CAP, JB INDUSTRIES, 1/4" FLARE X 1/4" NPT HALF UNION, USED ON TANK SERVICE PORT.	1	0
		0 - 0 - B1145 3/8" BLACK IRON 90 ELL.	3	0
		0 - 0 - DATANKLOCK DISCHARGE ADAPTER TANK LOCKING PLATE FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	1	0
		0 - 0 - TANK STRAP TANK STRAP - USED FOR TANK FIRE SUPPRESSION.	3	0
		0 - 0 - TFS-UCTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS, TANK FIRE SUPPRESSION.	1	0
		0 - 0 - 8K-283952-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION.	1	0
		16 - 16 - 79210 1/2" X 3/8" NPT MALE ADAPTER, VEGA.	3	0
		16 - 16 - OL-F NOZZLE - TANK PROTECTION APPLIANCE COVERAGE NOZZLE (INCLUDES METAL BLOW OFF CAP, LANYARD, USED WITH CHROME-PLATED PIPE).	3	0
		26 - 26 - QSA-3/8 QUIK SEAL - 3/8" (UL).	3	0
		34 - 34 - A0034331 24VDC SINGLE ACTION MANUAL ACTUATION DEVICE (PUSH/PULL STATION) WITH PROTECTIVE COVER, ONE (1) NORMALLY OPEN CONTACT, RED COLOR.	1	0

**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 FIRE-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.
- OL-F NOZZLE PART NUMBER REPLACES 3070-3/8H-10-SS
- JOB #: 7187717.
- JOB NAME: CAVA - BURLINGTON, MA\_R2.
- SYSTEM SIZE: TANK-SP-1 DESIGN FP: 12, MAXIMUM FP: 20.
- HOOD # 1 10" 7.00" LONG X 60" WIDE X 30" HIGH.
- RISER # 1 SIZE: 14" DIA.
- HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.
- HEAVY-DUTY APPLIANCES (RATED 600F) 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 450F) WILL NOT REQUIRE ANY ADDITIONAL DOWNSTREAM DETECTION.

**LEGEND - FIRE CABINET TANK SYSTEM**

AGENT DISTRIBUTION PIPING LIMITATIONS	MAX PIPE LENGTH (FT)
PIPE SECTION	42
MAX SUPPLY LINE TO FIRST OVERLAPPING NOZZLE	42
OVERLAPPING NOZZLE APPLIANCE BRANCH	10
DEDICATED NOZZLE APPLIANCE BRANCH	10

INCLUDES: FIELD INSTALLATION AND HOOKUP DURING NORMAL BUSINESS HOURS BY CERTIFIED INSTALLERS ONLY IN THE LOCATION NOTED ABOVE. TWO SITE VISITS ONLY (ONE VISIT TO SET PULL STATION & SYSTEM HOOKUP AND ONE VISIT FOR ONE TEST. ADDITIONAL VISITS WILL RESULT IN ADDITIONAL CHARGES). ONE MECHANICAL OR ELECTRICAL GAS VALVE PER SYSTEM AT A MAXIMUM SIZE OF 2", PERMIT, AND SYSTEM TEST.  
EXCLUDES: UNION LABOR & PREVAILING WAGE (LABOR & WAGES WILL BE ADDED IF APPLICABLE), GAS VALVE INSTALLATION, ELECTRICAL HOOKUP AND CONNECTIONS, HANGING OF FIRE CABINET, SHUNT TRIP, HANDHELD EXTINGUISHER(S), ON-SITE RE-PIPING DUE TO EQUIPMENT LAYOUT CHANGES.

**SECTION VIEW - MODEL 6030ND-2-ACPSP-F HOOD - #1**

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REVISIONS

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2	01-24-25	REVISED CUT ZONES

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BURLINGTON, MA 01803

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CAPTIVEAIRE

DRAWING INFORMATION

Job Number: 221193  
Checked By: REP  
Drawn By: SJH

DRAWING NUMBER

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1.4

**EXHAUST FAN INFORMATION - JOB#2187717**

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1		1	DUI180HFA	CAPTIVEAIRE	2311	1.250	1123	OOP, PREMIUM	1,000	0.7460	3	208	3.8	534 FPM	152	11.9

**DOAS/RTU FAN SCHEDULE - JOB#2187717**

FAN UNIT NO	TAG	QTY	DOAS/RTU MODEL #	MANUFACTURER	FAN INFORMATION				ELECTRICAL INFORMATION				COOLING INFORMATION				GAS HEAT INFORMATION				NOTES													
					BLOWER	RETURN AIR CFM	MAX OUTSIDE AIR CFM	TOTAL CFM	WEIGHT (LBS)	ESP	HP	PHASE	VOLT	MCA	MOCP	OUTSIDE AIR DB	WB	MIXED AIR DB	WB	LEAVING AIR DB		WB	DP	TOTAL	SENS.	IEER	ISMRE	GAS TYPE	INPUT BTUH	OUTPUT BTUH	TEMP RISE	REQUIRED INPUT GAS PRESSURE		
2		1	EARTU1-1200-15-5T-MPU	ECON-AIR	15P-1	0	1694	1694	1202	0.500	1.00	3	208	25.5A	30A	88.0F	72.0F	88.0F	72.0F	64.6F	60.6F	58.3F	64.0	MBH	41.9	MBH	17.9	6.1	NATURAL	170341	137976	67F	7 IN. W.C. - 14 IN. W.C.	1,2,3,4,5,6,7,8,9,10,11,12,13

**NOTES:**

- INVERTER SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
- DIRECT DRIVE PLENUM BLOWER. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
- INTEGRATED MONITORING VIA CELLULAR CONNECTION BY MANUFACTURER
- REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
- EC MOTOR CONDENSING FANS
- ELECTRONIC EXPANSION VALVE. TXV NOT ACCEPTABLE
- SUCTION LINE ACCUMULATOR
- FACTORY COMMISSIONING WITH 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER
- AVERAGING INTAKE, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITHIN UNIT)
- 81% EFFICIENT FURNACE. WITH MODULATING INDUCER TO MAINTAIN CONSTANT COMBUSTION EFFICIENCY ACROSS FIRING RANGE. 6:1 TURNDOWN WITH NG AND 5:1 TURNDOWN WITH LP
- SUPPLY CFM MONITORING INTEGRAL TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
- 1" EXTERIOR DUAL-WALL CONSTRUCTION W/ R-4.3 INSULATION-MINIMUM 24GA EXTERIOR W/ 18GA BASE
- DOWN DISCHARGE/NO RETURN

**FAN OPTIONS**

FAN UNIT NO	TAG	QTY	DESCRIPTION
1		1	GREASE BOX
		1	FAN BASE CERAMIC SEAL - DU/DRI180HFA - INSTALLED AT PLANT - FOR GREASE DUCTS
		1	2 YEAR PARTS WARRANTY
		1	INLET PRESSURE GAUGE, 0-35"
		1	MANIFOLD PRESSURE GAUGE, 0 TO 10" WC, 1 FURNACE
		1	SHIP LOOSE GAS STRAINER 3/4"
		1	CASLINK BUILDING MONITORING SYSTEM - INTERNET OR CELLULAR CONNECTION REQUIRED
		1	CONSTRUCTION MODE - MODIFIES START-UP SETTINGS TO ALLOW TEMPERING A BUILDING STILL UNDER CONSTRUCTION
		1	2" MERV 13 FILTERS FOR RTU1 (QTY. 4)
		1	2" MERV 8 FILTERS FOR RTU1 (QTY. 4)
		1	TOTAL CFM MONITORING
		1	RTU1 DOWN DISCHARGE
		1	RTU1 FIXED 100% OA INTAKE CONTROL
		1	DISCHARGE FIRESTAT SET TO 240F
		1	FREESTAT
2		1	INTAKE FIRESTAT SET TO 135F
		1	RTU1 NO RETURN - 100% OA - MPU
		1	RTU1 CURB DUCT HANGER
		1	120V FIRE INPUT
		1	5 TON MODULATING COOLING OPTION, 208/230V, R454B REFRIGERANT, VARIABLE SPEED COMPRESSOR, DL ECM CONDENSING FAN
		1	R454B LEAK DETECTOR OPTION FOR RTUS
		1	RTU1 BLOWER DOOR SWITCH
		1	SIZE 1 MOISTURE ELIMINATOR FOR SIZE 1, 5 TON RTU, NO REHEAT
		1	SINGLE POINT ELECTRICAL CONNECTION FOR RTU, 750VA TRANSFORMER USED, IF A NON-DCV PREWIRE CONTROLS THIS UNIT, THE #28, #47, "MA", OR "T2" PREWIRE OPTION MUST BE SELECTED. DOES NOT PROVIDE SUPPLY STARTER IN PREWIRE
		1	UNIT MOUNTED VFD CONFIGURED FOR DCV
		1	LOAD REACTOR MOUNTED IN FAN
		1	5 YEAR ENTIRE UNIT PARTS WARRANTY, 10 YEAR ENTIRE UNIT PARTS WARRANTY WITH REMOTE MONITORING AND CAPTIVEAIRE SERVICE CONTRACT, 25 YEAR STAINLESS STEEL FURNACE PARTS WARRANTY (SEE ADDITIONAL DETAILS)
		1	EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET

**FAN ACCESSORIES**

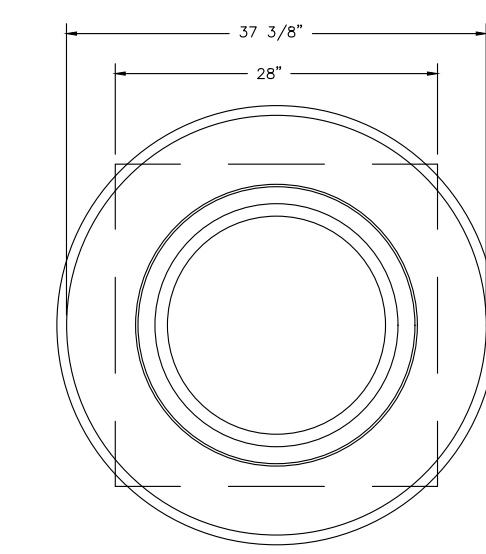
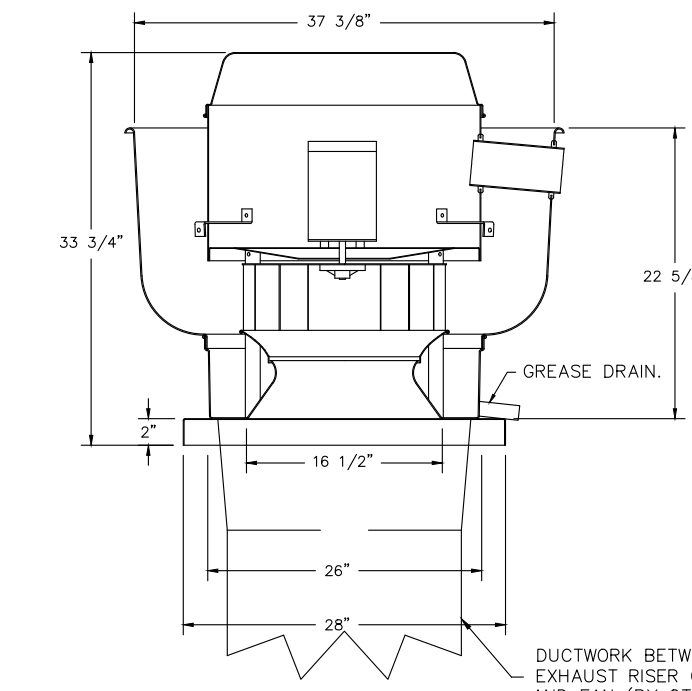
FAN UNIT NO	TAG	EXHAUST	SUPPLY
1		GREASE CUP	GRAVITY DAMPER
		WALL MOUNT	SIDE DISCHARGE
		YES	GRAVITY DAMPER

**CURB ASSEMBLIES**

NO	ON FAN	WEIGHT	ITEM	SIZE
1	# 1	43 LBS	CURB	26.500"W X 26.500"L X 20.000"H VENTED HINGED.
2	# 2	103 LBS	CURB	41.000"W X 71.000"L X 20.000"H INSULATED.

HMI SCHEDULE				
UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	MODBUS ADDRESS
FAN #2	HMI #1 - UNIT	IN UNIT	NOT AVERAGED	55

FAN #1 DUI180HFA - EXHAUST FAN



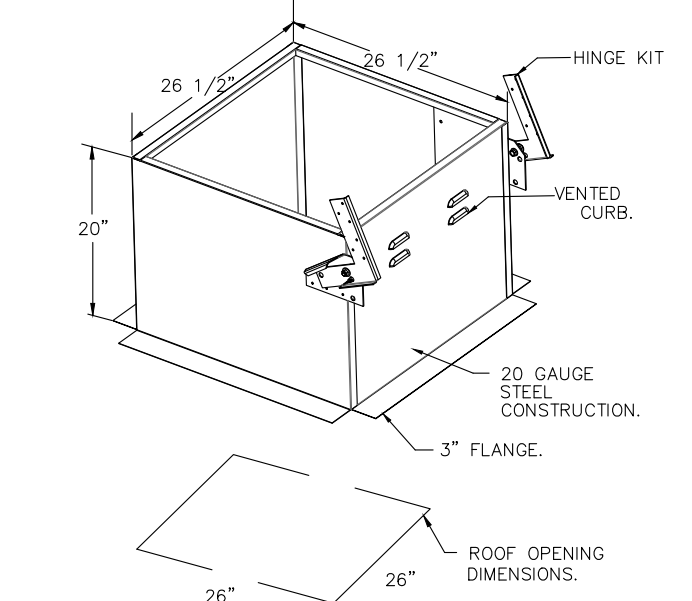
TOP VIEW

**FEATURES:**

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS)
  - ROOF MOUNTED FANS
  - RESTAURANT MODE
  - UL705 AND UL782 AND ILL-5645
  - VARIABLE SPEED CONTROL
  - INTERNAL WIRING
  - THERMAL OVERLOAD PROTECTION (SINGLE PHASE)
  - HIGH HEAT OPERATION 300F (149C)
  - GREASE CLASSIFICATION TESTING
  - NEMA 3R SAFETY DISCONNECT SWITCH
- NORMAL TEMPERATURE TEST**  
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300F (149C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETRIMENTAL EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.
- ABNORMAL FLARE-UP TEST**  
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600F (316C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

**DETAILS:**

- GREASE BOX
- FAN BASE CERAMIC SEAL - DU/DRI180HFA
- INSTALLED AT PLANT - FOR GREASE DUCTS
- 2 YEAR PARTS WARRANTY



**REVISIONS**

NO.	DESCRIPTION	DATE

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8120 Woodmont Avenue, Suite 720, Bethesda, MD, 20814 PHONE: (800) 888-0881 FAX: (301) 279-9191 EMAIL: rsg786@captivaire.com

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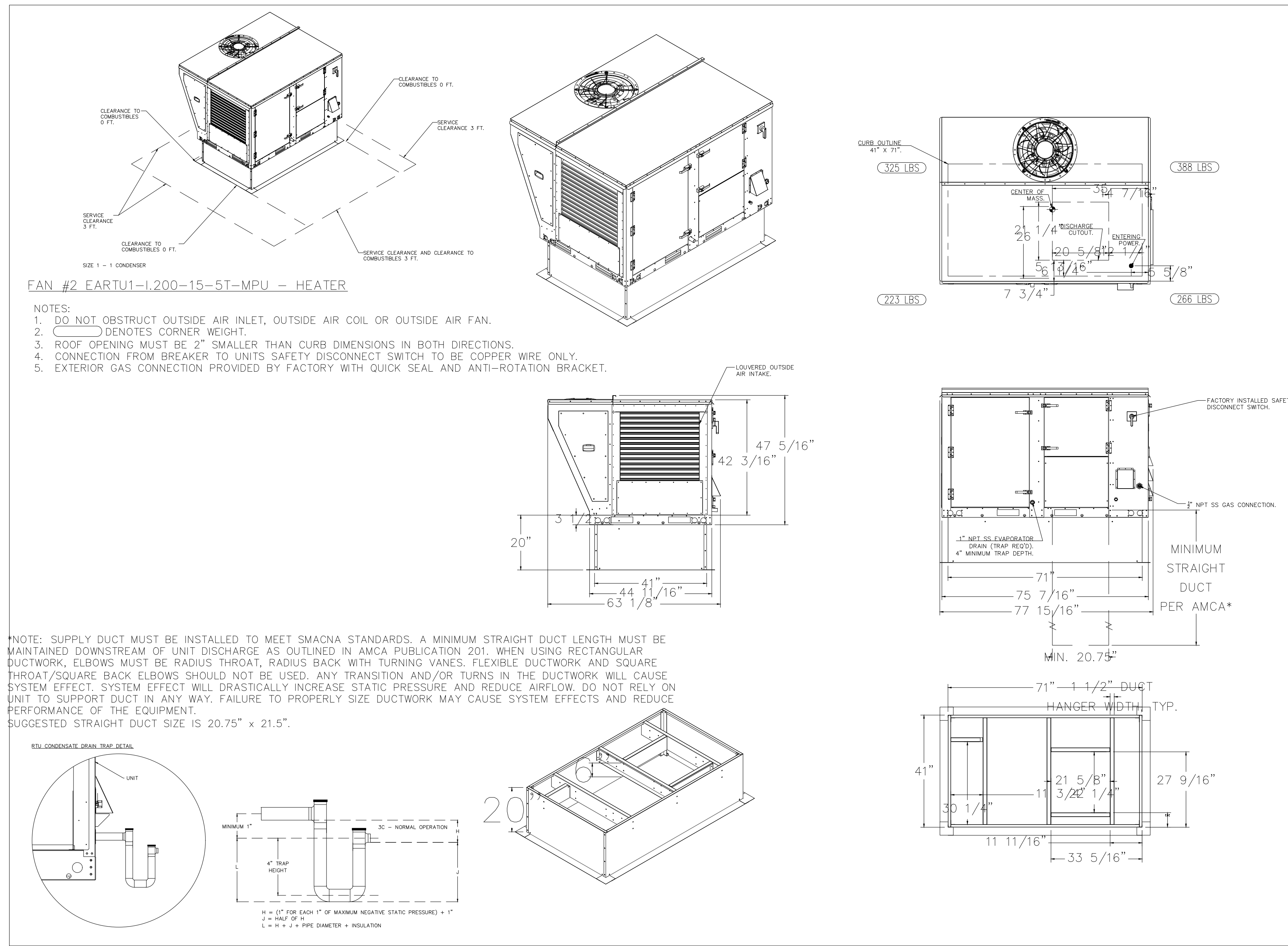
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8-3-24	BID SET
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**REVISIONS**

NO.	DESCRIPTION	DATE

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DATE: 12/9/2024  
 DWG.#: 7187717  
 DRAWN BY: ABS-76  
 SCALE: NTS  
 MASTER DRAWING

SHEET NO. 13

PROJECT  
**CAVA - BURLINGTON**

101 MIDDLESEX TURNPIKE,  
 BURLINGTON, MA 01803

DRAWING TITLE  
**CAPTIVEAIRE**

DRAWING INFORMATION  
 Job Number: 221193  
 Checked By: REP  
 Drawn By: SJH

DRAWING NUMBER  
**H**  
**1.5**

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DATE	DESCRIPTION
5-10-24	SD SET
8-11-24	ZONING SET
8-30-24	BID SET
10-9-24	ISSUED FOR PERMIT
2-14-25	REISSUED FOR PERMIT

DATE	DESCRIPTION
1	12-09-24 REVISION 1
2	01-24-25 REVISED CUT ZONES

Job Number: 221193  
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**GREASE DUCT & CHIMNEY SPECIFICATIONS:**  
 PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW"  
 ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW"  
 IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING  
 CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW"  
 DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER  
 THE MANUFACTURES INSTALLATION GUIDE.  
 PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER  
 MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16"  
 PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12".  
 DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE  
 ACCUMULATION IN HORIZONTAL RUNS.

IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR  
 UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE  
 SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER  
 DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

**CUSTOMER APPROVAL TO MANUFACTURE:**

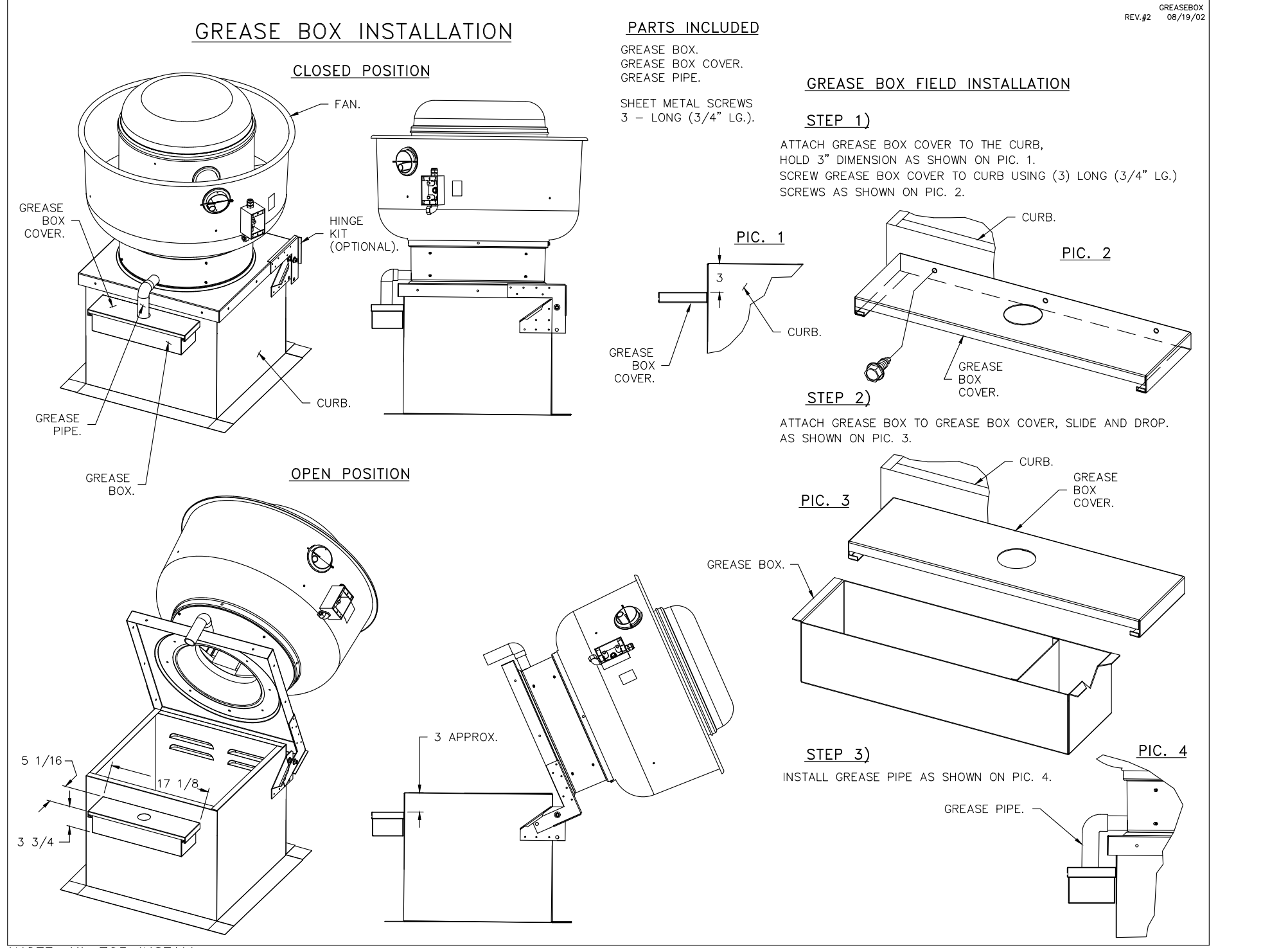
APPROVED AS NOTED

APPROVED WITH NO EXCEPTION TAKEN

REVISE AND RESUBMIT

SIGNATURE \_\_\_\_\_

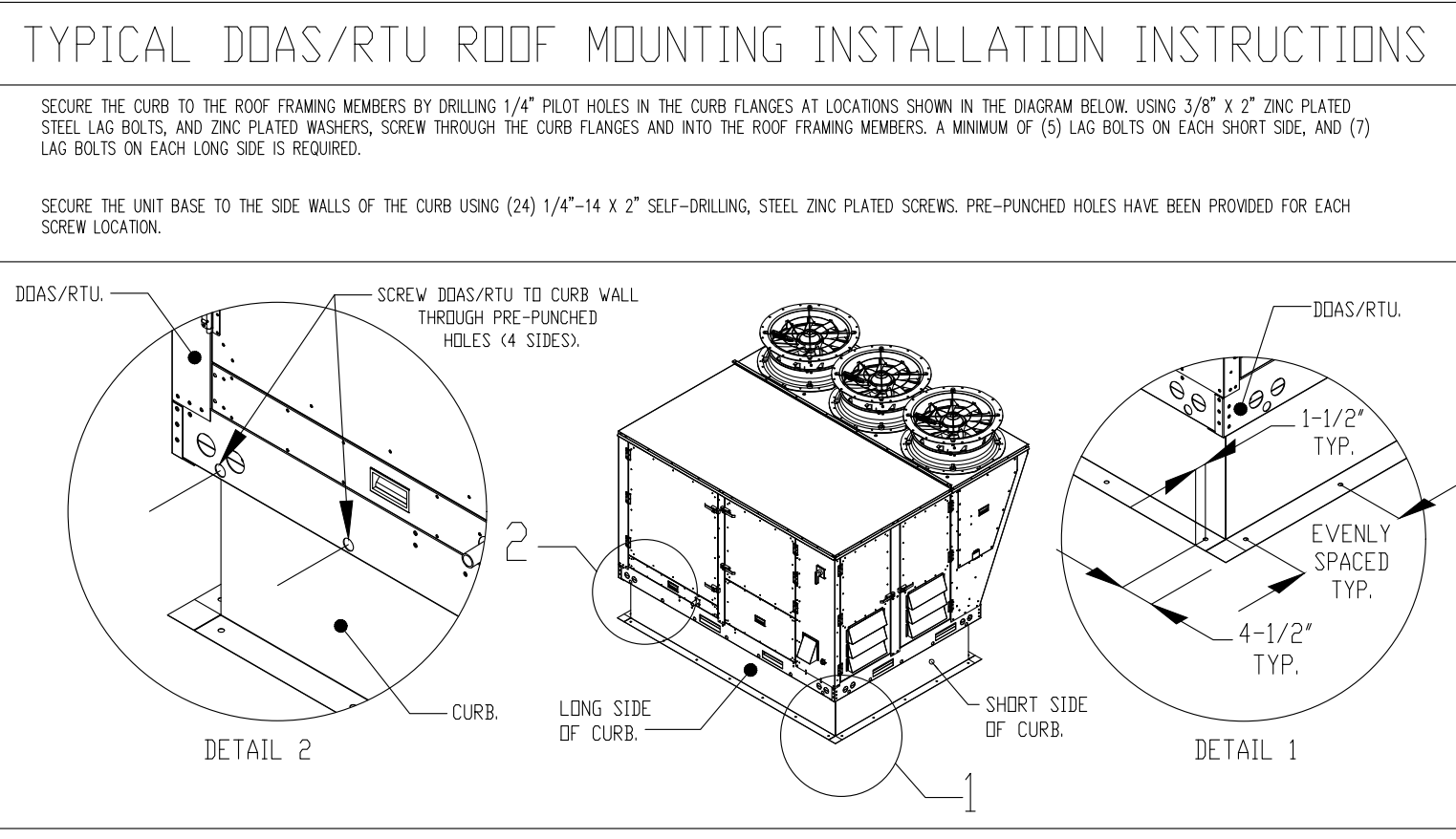
YOUR TITLE \_\_\_\_\_ DATE \_\_\_\_\_



**AIR DIFFUSION SUPPLY DUCT SPECIFICATIONS:**  
 PROVIDE AIR DIFFUSION SUPPLY DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL DW-50(HC), DW-590(HC), & DW-5180(HC).  
 THREE DISTINCT HOLE PATTERN OPTIONS TO COVER A VARIETY OF CEILING HEIGHTS.  
 NO ADDITIONAL DIFFUSERS REQUIRED, AS THE DUCT ITSELF PROVIDES AIR DIFFUSION.  
 MADE OF HIGH QUALITY STAINLESS STEEL DESIGNED TO LAST 20+ YEARS.  
 HIGH INDUCTION SUPPLY DUCT IS CONSTRUCTED USING 24 GAUGE, 430 SS - 5" THRU 24".  
 HIGH INDUCTION SUPPLY DUCT IS CONSTRUCTED USING 20 GAUGE, 430 SS - 26" THRU 36".  
 QUICK ON-SITE ASSEMBLY USING EPDM GASKETS & UNIVERSAL V-BANDS.  
 DOUBLE WALL SUPPLY DUCT AVAILABLE FOR INTERIOR AND EXTERIOR SPACES, EITHER CONDITIONED OR UNCONDITIONED.  
 DOUBLE WALL SUPPLY DUCT AVAILABLE IN DW-1S, DW-2S, & DW-3S TO MEET SPECIFIC REGIONAL "R" VALUE REQUIREMENTS.

Supply Duct Type	Minimum R-value	Space Type
Single Wall - 5" & -HC	N/A	Conditioned Space Only
Double Wall - 1S	R-4	Unconditioned Interior Space Only
Double Wall - 2S	R-8	Unconditioned Space Climate Zones 1-4
Double Wall - 3S	R-12	Unconditioned Space Climate Zones 5-8

DOUBLE WALL SUPPLY DUCT IS INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.  
 AIR DIFFUSION SUPPLY DUCT COMPLIES WITH SMACNA (SHEET METAL AND AIR CONDITIONING CONTRACTORS) BEST PRACTICES.  
 POSITIONING OF SPRINKLERS TO AVOID OBSTRUCTION TO DISCHARGE, SEE NFPA 13, TABLE 8.12.5.1.1.



**REVISIONS**

NO.	DESCRIPTION	DATE

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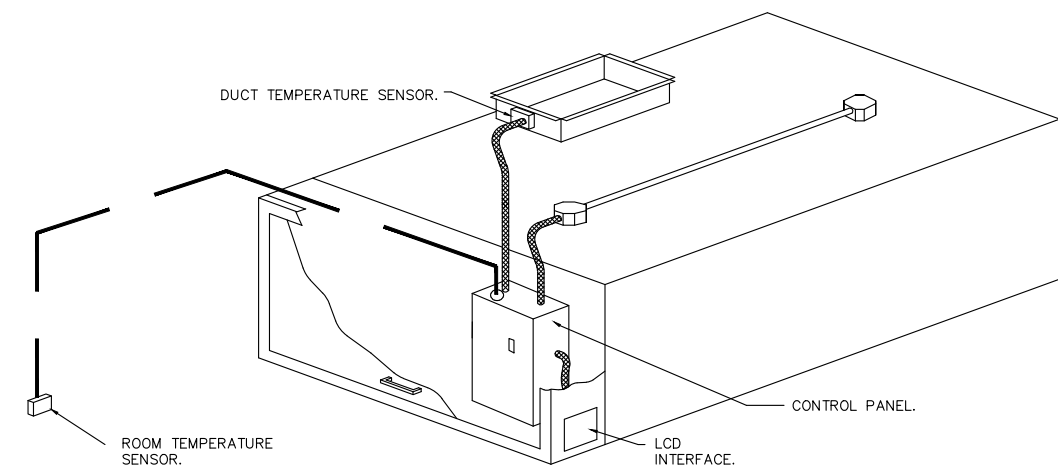




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**DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:**

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN IECC 403.2.8 (2015).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURE SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMO 507.1.1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFD) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDs BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED. OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
  - A. ON/OFF PUSH BUTTON FAN & LIGHT SWITCH ACTIVATION.
  - B. INTEGRATED GAS VALVE RESET FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
  - C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  - D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  - E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  - F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
  - G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDs.



**TYPICAL HOOD CONTROL PANEL INSTALLATION**

**SEQUENCE OF OPERATIONS:**

- THE HOOD CONTROL PANEL IS CAPABLE OF OPERATING IN ONE OR MORE OF THE FOLLOWING STATES AT ANY GIVEN TIME:
  - **AUTOMATIC:** THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CAVITY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS EC MOTORS OR VFD DRIVEN MOTORS) MODULATE WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS "DYNAMIC", THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS "STATIC", FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 403.2.8.
  - **MANUAL:** THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
  - **SCHEDULE:** A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
  - **OTHER:** THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DOC, BMS OR HARD-WIRED INTERLOCK).
  - **FIRE:** UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

**SYSTEM DESIGN VERIFICATION (SDV)**

IF ORDERED, CAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE.

ANY FIELD RELATED DISCREPANCIES THAT ARE DISCOVERED DURING THE SDV WILL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR AND CORRESPONDING TRADES ON SITE. THESE ISSUES WILL BE DOCUMENTED AND FORWARDED TO THE APPROPRIATE SALES OFFICE. IF CAS SERVICE HAS TO RESOLVE A DISCREPANCY THAT IS A FIELD ISSUE, THE GENERAL CONTRACTOR WILL BE NOTIFIED AND BILLED FOR THE WORK. SHOULD A RETURN TRIP BE REQUIRED DUE TO ANY FIELD RELATED DISCREPANCY THAT CANNOT BE RESOLVED DURING THE SDV, THERE WILL BE ADDITIONAL TRIP CHARGES.

DURING THE SDV, CAS SERVICE WILL ADDRESS ANY DISCREPANCY THAT IS THE FAULT OF THE MANUFACTURER. SHOULD A RETURN TRIP BE REQUIRED, THE GENERAL CONTRACTOR AND APPROPRIATE SALES OFFICE WILL BE NOTIFIED. THERE WILL BE NO ADDITIONAL CHARGES FOR MANUFACTURER DISCREPANCIES.

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**SHEET NO.**  
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ARCHITECT

**BKA** ARCHITECTS

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SEAL

ISSUED

DATE	DESCRIPTION
5-10-24	SD SET
6-11-24	ZONING SET
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REVISIONS

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1	12-09-24	REVISION 1
2	01-24-25	REVISED CUT ZONES

OWNER/CLIENT

PROJECT

CAVA - BURLINGTON

101 MIDDLESEX TURNPIKE,  
 BURLINGTON, MA 01803

DRAWING TITLE

CAPTIVEAIRE

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Job Number: 221193  
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