

HVAC PLAN NOTES

- EC TO FURNISH RETURN DUCT MOUNTED SMOKE DETECTOR AND PROVIDE COMPATIBLE REMOTE ANNUNCIATOR/TEST SWITCH. MC TO INSTALL SMOKE DETECTOR IN RETURN DUCT, PRIOR TO ANY OUTDOOR AIR CONNECTIONS. MC TO PROVIDE INTERLOCK WIRING BETWEEN SMOKE DETECTOR AND UNIT TO SHUT DOWN UNIT UPON DETECTION OF SMOKE. EC SHALL PROVIDE WIRING FOR FINAL CONNECTION TO CENTRAL FIRE ALARM SYSTEM, IF APPLICABLE, AND WIRING TO REMOTE ANNUNCIATOR/TEST SWITCH.
- TYPICAL SUPPLY AIR DROP FROM MAKEUP AIR UNIT. PROVIDE DIRECTIONAL VANES AT BOTTOM OF DROP INSIDE DUCT. KEEP ALL MAKEUP AIR DUCTS ABOVE THE CEILING.
- TYPICAL SUPPLY FROM RTU. PROVIDE DIRECTIONAL VANES AT BOTTOM OF DROP INSIDE DUCT. 22 GA. MATERIAL.
- REPLACE EXISTING EXHAUST FAN AND REUSE EXISTING EXHAUST DUCT, ROOF PENETRATION AND VENT CAP.
- PROVIDE NEW THERMOSTAT AND MOUNT ON WALL 4 FEET A.F.F.

REQUIRED TESTING

- CONDUCT A LIGHT-TEST TO CHECK WELDS ON KITCHEN GREASE DUCTS. THE TEST MUST BE WITNESSED BY THE FIRE DEPARTMENT. NOTE: INSPECTORS MAY REQUIRE ALTERNATIVE TESTING UNDER CERTAIN CIRCUMSTANCES.
- A PUFF TEST IS REQUIRED ON THE KITCHEN SUPPRESSION SYSTEM.
- AN AIR-CAPTURE TEST IS REQUIRED ON THE KITCHEN HOOD(S).
- A TEST AND BALANCE REPORT IS REQUIRED.

HVAC SYMBOL LEGEND

SYMBOL	DESCRIPTION	SIZE	COLOR
	2 X 2 SQUARE CONE DIFFUSER (FIXED AIR PATTERN) PRICE - ASCD4CB12 ALUMINUM, W/ 3800-SERIES BUTTERFLY DAMPER	2' x 2'	FACTORY WHITE
	2 X 2 DIFFUSER (PERFORATED LOW-VELOCITY) PRICE - PDS W/ 3800-SERIES BUTTERFLY DAMPER	2' x 2'	FACTORY WHITE
	SLOT CEILING DIFFUSER	4' x 48"	FACTORY WHITE
	RETURN AIR GRILLE, MFR: PRICE, LOUVERED RETURN GRILLE, REMOVABLE FOR CLEANING. #530-FR, 6070 RETURN 22" X 22" / 600 / TB/ 24X24 B12 DO NOT INSTALL FILTER (FILTER COVERED BY HVAC UNIT), ANGLE DIFFUSERS AWAY FROM WALL, SPRAY PAINT PAN & COLLAR OF COLD AIR RETURN BLACK.	2' x 2'	FACTORY WHITE
	HONEYWELL VISIONPRO 8000 WIFI TOUCHSCREEN THERMOSTAT @ 4'-6" AFF PER HVAC PLAN.	-	WHITE
	DRYWALL CEILING DIFFUSER	8" Ø	FACTORY WHITE
	NEMA TYPE 3R (OUTDOOR RATED) DISCONNECT @ EACH PIECE OF ROOF EQUIPMENT, NUMBER INDICATES AMERAGE.	-	FACTORY
	SMOKE DETECTOR	-	INSTALLED IN RETURN AIR DUCT
	ALARM - SMOKE DETECTOR	-	INSTALLED ABOVE THERMOSTAT

USE BUTTERFLY DAMPERS FOR ALL TEMPERED SUPPLY DIFFUSERS (FEED FROM HVAC UNITS).
USE LOUVERS AND DAMPERS w/ LOCKING QUADRANTS FOR ALL MAKE-UP AIR FEEDS

MECHANICAL - FLOOR PLAN

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

Recommended this be performed. At times they install too close to hood & then causes performance issues if away. They dont always install exact location shown on prints, so fall safe.

To be 100 cfm Positive in pressure for building based upon RTU units OA amounts & including bathroom fan, & all hood exhaust we need the make up air unit to have 1460 CFM of supply air. Adjusted CFM at hood.

total exhaust = -2720
rtu OA = + 1335
SF1 (mua) = +1460
net = +75 CFM

Recommended grease duct size for performance & sound ratings.

MECHANICAL SPECIFICATIONS

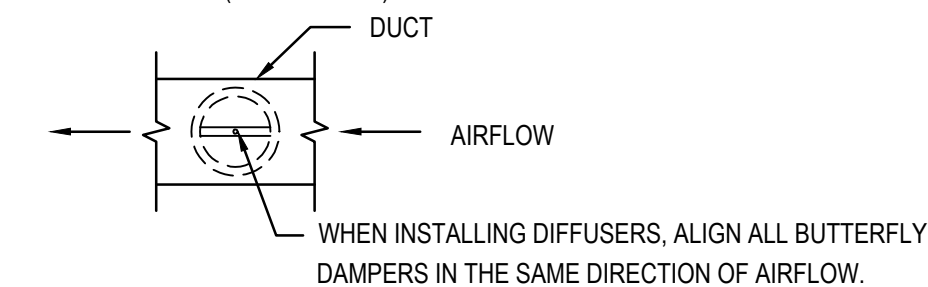
- HVAC SYSTEMS SHALL INCLUDE HIGH & LOW PRESSURE CONTROL SAFETY SWITCHES AND SHALL BE CHECKED FOR LOCAL CODE COMPLIANCE BY THE MECHANICAL CONTRACTOR.
- COORDINATE ALL WORK WITH THE EQUIPMENT CONTRACTOR IN TERMS OF ITEMS PROVIDED, SCOPE OF WORK, AND HOOK UP REQUIREMENTS.
- HOOD SUPPLIER SHALL PROVIDE SHOP DRAWINGS FOR EXHAUST HOOD INSTALLATION.
- GENERAL NOTES
 - NO PENETRATIONS SHALL OCCUR THROUGH THE TILE BASE
 - GAS LINE PENETRATIONS BEHIND SERVICE LINE MUST BE SUCH THAT OVEN, GRILLE AND FRYER CAN BE PULLED OUT TO NEAR FULL LENGTH OF FLEXIBLE GAS LINE CONNECTION LOCATIONS ON THESE PIECES OF EQUIPMENT, BUT NOT SO CLOSE THAT FITTINGS INTERFERE WITH EACH OTHER WHEN EQUIPMENT IS AGAINST THE WALL. GAS LINE MUST RUN INSIDE WALLS EXCEPT AT EQUIPMENT FEEDS. SEE "CABLE RESTRAINT DETAIL" ON SHEET A6.0.
- GENERAL CONTRACTOR MUST COORDINATE THE HVAC & HOOD CONTRACTORS SUCH THAT HVAC & HOOD SYSTEMS ARE INSTALLED TOGETHER PRIOR TO STORE OPENING. BOTH HVAC & HOOD SYSTEMS MUST BE COMPLETED AT LEAST 4 WORKING DAYS PRIOR TO AIR TEST & BALANCE TO ALLOW ENOUGH TIME FOR BALANCE TO TAKE PLACE. CHECKLIST SCHEDULE MUST BE COMPLETED AND TURNED IN TO NATIONAL T & B.
- LIMIT FLEX-PIPE RUNS TO 5'-0" MAXIMUM LENGTH.
- USE HARD-PIPE, 90° ELBOWS AT ALL DIFFUSERS UNLESS DIRECTLY UNDER A MAIN TRUNK LINE.
- ALL HANGERS AND INSTALLATION METHODS FOR HVAC DUCTWORK SHALL MEET SMACNA STANDARDS.
- PROVIDE 4" X 48" LINEAR DIFFUSERS ALONG COOK LINE. PROVIDE DAMPERS FOR EACH DIFFUSER.
- REFER TO CAPTIVEAIRE SHOP DRAWINGS FOR ELECTRICAL FEED DETAILS & LOCATIONS @ EXHAUST FANS.
- EXHAUST FANS BY NUTRONE OR EQUAL. EXHAUST TO EXTERIOR. WHITE. PROVIDE TWO INDIVIDUAL SINGLE PORT IN-LINE VENTILATOR TYPE FANS. COMBINE DUCTS AT END OF LINE FOR SINGLE ROOF OR WALL PENETRATION IF FIELD CONDITIONS PERMIT. (REFER TO ROOF / HVAC PLAN FOR EXIT TYPE).
- IN OCCUPIED MODE, THE HVAC UNIT FANS SHALL BE IN THE ON MODE FOR STORE CONSTANT BALANCE.

HVAC GENERAL NOTES

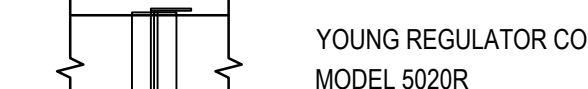
- SUPPLY DUCT SHALL BE IN THE FOLLOWING GAUGES (U.N.O.):
 - ROUND:
 - UP TO 12" Ø = 28 GAUGE
 - 14" Ø AND LARGER = 26 GAUGE
 - SQUARE / RECTANGULAR:
 - UP TO 10" X 12" = 28 GAUGE
 - 10" X 14" OR 12" X 12" AND LARGER = 26 GAUGE
- SUPPLY DROPS SHALL BE GALVANIZED IN 24 GAUGE MATERIAL.
- RETURN DUCT SHALL BE GALVANIZED IN 22 GAUGE MATERIAL.
- FOR ALL SQUARE / RECTANGULAR DUCT AND RETURN AIR DUCT, THE FIRST NUMBER = DUCT HEIGHT AND THE SECOND NUMBER = DUCT WIDTH (EXAMPLE: FOR 6" X 10" DUCT, IT IS 6" HIGH AND 10" WIDE).
- INSTALL ALL BOOTS FROM INSIDE DUCTWORK.
- ALL DUCTWORK WITHIN CEILING CAVITIES SHALL BE WRAPPED w/ INSULATION AND COVERED WITH A VAPOR RETARDER HAVING A MAXIMUM PERMEANCE OF 0.05 PERM OR ALUMINUM FOIL HAVING THICKNESS OF 2 MILS.
- FLEXIBLE DUCT CONNECTORS SHALL BE TESTED IN ACCORDANCE WITH UL181 AND SHALL BE LISTED AND LABELED AS CLASS O OR CLASS I DUCT.
- DUCT COVERINGS SHALL HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX NOT MORE THAN 50.
- ALL JOINTS, SEAMS, AND CONNECTIONS SHALL BE SECURELY SEALED AND FASTENED.
- RETURN AIR DUCT SMOKE DETECTORS SHALL BE IN COMPLIANCE WITH (SECTION 606 2012 IMC).
- VERIFY LOCATION OF ACCESS TO CONTROLS AND USE ALTERNATE POSITION IF REQUIRED.
- IF A BUILDING FIRE ALARM SYSTEM EXISTS, ALL HVAC DUCT SMOKE DETECTORS AND HOOD CONTROL PANEL MUST REPORT TO IT. COORDINATE W/ LANDLORD.

DAMPER NOTES:

- INSTALL KEYED BUTTERFLY DAMPERS AT ALL SQUARE & ROUND DIFFUSERS (NOT LINEARS)



- INSTALL IN-LINE DAMPERS WITH LOCKING HAND QUADRANT IN EACH TRIBUTARY DUCT WHERE IT LEAVES THE MAIN DUCT. AND IN LOCATION INDICATED BY THE FOLLOWING SYMBOL: MATCH DUCT DIAMETER.



VENTILATION SCHEDULE - O.M.C - 2017 - 403.3.1.1

ROOM #	ROOM NAME	SQFT	OCCUPANCY CATEGORY	Table 403.3.1.1		Vbz = Az x Ra + Rp x Pz		OA	AIR	SA	Zp =	Voz =	Voz / Ev	Vot =	
				Rp	Ra	Pz	Rp x Pz								Az x Ra
100	Vestibule	50	Corridor	0	0.06	0	0	3	3	0.8	4	50	11	0.08	4
101	Dining	1061	Dining	7.5	0.18	58	435	191	626	0.8	782	3950	869	0.20	869
	RTU-1	1111				58					786	4000	880		874
102	Serving	420	Kitchen	7.5	0.18	4	30	76	106	0.8	132	1975	298	0.07	132
103	Storage	41	Storage	0	0.12	0	0	5	5	0.8	6	50	8	0.12	6
104	Prep	370	Kitchen	7.5	0.18	2	15	67	82	0.8	102	675	102	0.15	102
105	Men's RR	42	N/A	0	0	0	0	0	0	0.8	0	50	8	0.00	0
106	Women's RR	42	N/A	0	0	0	0	0	0	0.8	0	50	8	0.00	0
107	Dry Storage	202	Storage	0	0.12	0	0	24	24	0.8	30	200	30	0.15	30
	RTU-2	1117				6					270	3000	455		270

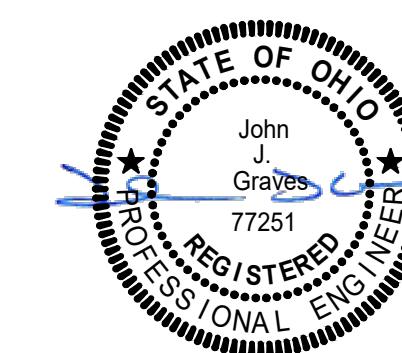
NEW TENANT FINISH FOR:



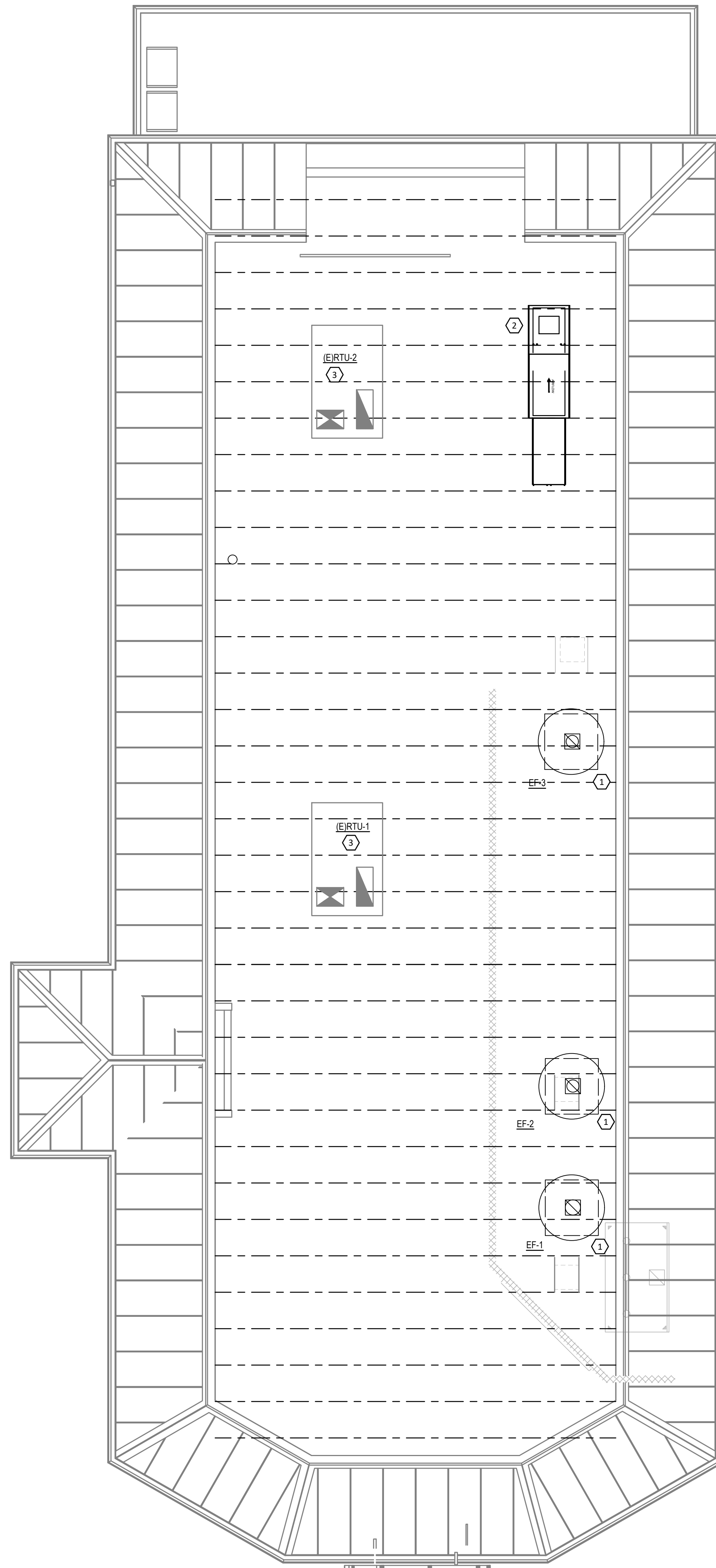
4175 OH-128 CLEVELS, OH 45002

REV. DATE CK'D
12/14/2023 HOOD UPDATES

Drawn By: Checked:
JJR JG



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ROOF PLAN GENERAL NOTES

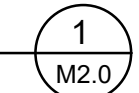
- A. SAND, PRIME AND PAINT EXISTING AND NEW EXPOSED GAS PIPING ON ROOF. (FEEDING PENN STATION ONLY) USE SAFETY YELLOW - OIL BASE.

ROOF PLAN KEY NOTES

- HINGE SIDE OF EXHAUST CURB. EXHAUST FAN TO BE AT LEAST 10' FROM THE EDGE OF BUILDING OR FROM ADJACENT TENANT SPACES.
- PROVIDE NEW MAKE UP AIR UNIT, CURB, CONTROL WIRING, AND STAND ALONE CONTROLS FOR UNIT OPERATION. ROUTE SUPPLY DUCT ALONG ROOF. UTILIZE PATE, OR EQUIVALENT DUCT SUPPORTS AND ROUTE DUCT THROUGH ROOF. UTILIZE ROOF CURB FOR DUCT PENETRATION. FLASH DUCT PENETRATION FOR A WEATHERPROOF SEAL. MAINTAIN MINIMUM 10' SEPARATION BETWEEN MAKEUP AIR UNIT INTAKE AND ALL EXHAUST FANS AND VENT THROUGH ROOFS.
- EXISTING ROOFTOP UNIT TO REMAIN. MECHANICAL CONTRACTOR TO FIELD VERIFY EXACT LOCATION PRIOR TO BID AND SERVICE UNIT TO ASSURE IT IS OPERATING PROPERLY. REPLACE ALL FILTERS PRIOR TO LEAVING JOB SITE. BALANCE SUPPLY AND OUTSIDE AIR TO CFM SCHEDULED.

MECHANICAL - ROOF PLAN

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



AIR BALANCE

- 2570	EXHAUST HOODS
- 150	R.R. EXHAUST FANS
- 2720	CFM
+	
+1630	MAKEUP AIR UNIT
+880	RTU-1
+455	RTU-2
+2965	CFM
TOTAL	
+245	CFM POSITIVE

NOTE:
COORDINATE ALL PENETRATIONS WITH OWNERS ROOFER SO AS NOT TO VOID WARRANTY.
MOUNT UNITS LEVEL TO ENSURE PROPER CONDENSATE DRAINING.
ALL VENTING SHALL BE DONE THROUGH THE ROOF AND NOT THE BACK WALL.

NOTE:
SEE CAPTIVEAIRE SHOP DRAWINGS FOR DETAIL INFORMATION REGARDING HOODS AND EXHAUST FANS.

ROOF TOP UNIT INFORMATION

	QTY	MANUFACTURER	MODEL NO.	SIZE TONS	ELECTRICAL			SUPPLY CFM	OSA CFM	GAS LOAD - MBH		SIZE (W x D x H)	WEIGHT	RATING	NOTES
					VOLT	PH	MCA			MOCP	INPUT				
(E)RTU-1	1	CARRIER	48TFD012--511--	10.0	208	3Ø	44.2	50	4,000	880	180.0	EXIST.	EXIST.	REFER TO A4-1	
(E)RTU-2	1	CARRIER	48TFD008--511--	7.5	208	3Ø	40.1	45	3,000	455	125.0	EXIST.	EXIST.	REFER TO A4-1	

- REMARKS**
- RTUS TO BE PROVIDED WITH 2 POSITION OSA MOTORIZED DAMPER AT OUTSIDE AIR HOOD OF RTU. FACTORY OR FIELD INSTALLED. DAMPER TO OPEN TO 880 CFM WHEN CONTROLS ARE IN OCCUPIED MODE.
 - EXISTING ROOFTOP UNITS. MECHANICAL CONTRACTOR TO SERVICE UNIT TO ASSURE IT IS OPERATING PROPERLY AND REPLACE ALL FILTERS.

NATURAL GAS MAKEUP AIR UNIT

	QTY	MANUFACTURER	MODEL NO.	BLOWER	HEATING BTUS		GAS TYPE	BURNER EFF.	ELECTRICAL			SUPPLY CFM	ESP.	WEIGHT	
					INPUT	OUTPUT			VOLT	PH	FLA				MOCP
MAU-1	1	CAPTIVEAIRE	A1-D.250-15D	15MF-1-MOD	110,372	101,542	NATURAL	92%	208	3Ø	4.4	15	1630	0.44	648

EXHAUST FAN SCHEDULE

ITEM No.	QTY	DESCRIPTION	MANUFACTURER	MODEL #	ELECTRICAL		LOAD	FLA	EXHAUST CFM	SIZE (W x D x H)	NOTES
					VOLT	PH					
EF-1	1	GRIDDLE	CAPTIVE-AIRE	DU85HFA	120	1Ø	1.8 AMP/1 hp	8.9	1120	33 3/4" DIA. x 30 1/2" x CURB	REFER TO H1
EF-2	1	OVEN FAN	CAPTIVE-AIRE	DU33HFA	120	1Ø	1.8 AMP/ 1/2 hp	4.3	600	33 3/4" DIA. x 30 1/2" x CURB	REFER TO H2
EF-3	1	FRYER FAN	CAPTIVE-AIRE	DU85HFA	120	1Ø	1.8 AMP/ 1/2 hp	8.8	850	33 3/4" DIA. x 30 1/2" x CURB	REFER TO H3

HVAC TEST & BALANCE SPECIFICATIONS

ALL BALANCING IS CONTRACTED BY THE GENERAL CONTRACTOR AND PERFORMED BY OUR PREFERRED TAB FIRM-NATIONAL TAB. NATIONAL TAB ASSIST THE OWNER IN THE BALANCING PROCESS FROM INITIAL PLANNING THRU DOCUMENTATION CLOSEOUT. ANY QUESTIONS AND QUOTATION, PLEASE CONTACT NATIONAL TAB AT (855)-682-6822 EXT: 706 (JENNIFER) OR SUBMIT REQUEST TO BIDS@NATIONALTAB.COM

1.0 GENERAL REQUIREMENTS: TEST AND BALANCE (TAB) OVERVIEW IS A GENERAL GUIDELINE OF THE PROPER FLOW OF PLANNING & BALANCING OF THE SYSTEM. IT MANDATES ALL TRADES, OWNERS, CONSTRUCTION PERSONNEL, VENDERS, & BALANCING FIRM PARTICIPATE IN THE PROCESS. PLANNING ENSURES PREPAREDNESS, PROPER INSTALLATION, AND SYSTEM READINESS. BALANCING ENSURES FUNCTION & PERFORMANCE OF THE VENTILATION SYSTEM. THE SPECIFIC TRADE REQUIREMENTS ARE TO BE CARRIED OUT TO ITS FULLEST EXTENT. EACH ASSIGNED TRADE WILL BE HELD ACCOUNTABLE. FINAL RETAINAGE (PAYMENT) IS NOT TO BE PAID BY THE OWNER UNTIL THE SPECIFIC TRADE REQUIREMENTS HAVE BEEN MET.

2.0 PHASE I (INITIAL PLANNING & REVIEW): PLANS & SUBMITTALS DISBURSED FOR REVIEW AND SCHEDULING. TAB PROCEDURES FINALIZED AND JOB READINESS CONFIRMED.

2.1 OWNER RESPONSIBILITIES: DISTRIBUTE ALL ARCHITECT PLANS/SUBMITTALS TO NATIONAL TAB AND PROVIDE THE REQUIRED OPENING DATES FOR THE RESTAURANT.

2.2 GENERAL CONTRACTOR RESPONSIBILITIES: CONSTRUCT A JOB SCHEDULE BASED UPON OWNER REQUIREMENTS, DATA & SCHEDULES COLLECTED FROM ALL TRADES. COMMUNICATE THE INFORMATION TO NATIONAL TAB. OBTAIN THE PRELIMINARY FIELD CHECKLIST FROM THE BALANCING CO. MANAGE ALL TRADES TO ENSURE THEY COMPLETE & SIGNOFF ON THEIR REQUIREMENTS BEFORE THE BALANCER IS SCHEDULED TO PERFORM ONSITE WORK. ENSURE THE GENERAL CONDITION OF THE BUILDING IS SIGNED-OFF BY THE JOB SUPERVISOR.

2.3 NATIONAL TAB (BALANCING) RESPONSIBILITIES: REVIEW ANY PLANS & SUBMITTALS FOR ANY POSSIBLE DEFICIENCIES AND DISCREPANCIES IN DATA OR DRAWINGS. FINALIZE FINAL TAB START DATE WITH THE GENERAL CONTRACTOR AND THE PRELIMINARY CHECKLIST IS COMPLETED OR ACTION STEPS DOCUMENTED FOR ITEMS ON THE CHECKLIST THAT ARE NOT COMPLETED BEFORE EXECUTION OF BALANCING.

3.0 PHASE II (PRELIMINARY FIELD PROCEDURE): VERIFICATION OF SITE AND EQUIPMENT CONDITIONS. ANALYSIS OF PROPER INSTALLATION AND PERFORM OPERATIONAL AND FUNCTIONAL TEST.

3.1 GENERAL CONTRACTOR RESPONSIBILITIES: ENSURE ALL REQUIRED TRADES ARE PRESENT OR READILY AVAILABLE FOR THE BALANCER'S INITIAL "WALK-THRU" & START-UP VERIFICATION. ENSURE ALL TRADES IMMEDIATELY FIX ANY ISSUE THAT THE BALANCER MAY UNCOVER DURING THE INITIAL "WALK-THRU" THAT MAY AFFECT EQUIP. PERFORMANCE.

3.2 NATIONAL TAB (BALANCING) RESPONSIBILITIES: BALANCER TO PERFORM A "WALK-THRU" IMMEDIATELY UPON ARRIVAL. ALL REQUIRED TRADES ARE TO BE PRESENT DURING THIS PROCESS OR READILY AVAILABLE. THE BALANCER MUST INFORM THE REGIONAL MANAGER AND OWNER OF ANY DEFICIENCIES THAT THE BALANCER AND TRADES NEED RESOLUTION BEFORE THE BALANCING IS COMPLETED. THE FOLLOWING GENERAL TASKS ARE TO BE PERFORMED:

3.2.1 VERIFICATION OF PROPER EQUIPMENT INSTALLED ON SITE.

3.2.2 VERIFICATION OF PROPER INSTALLATION OF MECHANICAL SYSTEMS.

3.2.3 START-UP ALL EQUIPMENT TO ENSURE IT WAS PROPERLY STARTED UP BY TRADES.

3.2.4 COORDINATE WITH SPECIFIC TRADES ANY DEFICIENCIES THAT NEED TO BE RESOLVED BEFORE INITIATING ANY BALANCING ON EACH SPECIFIC SYSTEM.

3.3 BALANCING & TESTING PROCEDURE: INITIATE & COMPLETE ALL REQUIRED BALANCING PROCEDURES AS STIPULATED FOR THE ACCOUNT.

3.3.1 NATIONAL TAB (BALANCING) RESPONSIBILITIES: INITIATE BALANCING OF THE SYSTEMS AS REQUIRED UNDER STRICT GUIDELINES SET FORTH UNDER NATIONAL TAB PROCEDURES & NEBB STANDARDS & PROCEDURES.

ANY ISSUES THAT ARISE DURING THE BALANCING SHALL BE DISCUSSED EXCLUSIVELY OR INCLUSIVELY WITH THE GENERAL CONTRACTOR, OWNER/CONSTRUCTION MANAGER, AND THE NATIONAL TAB BALANCING MANAGER.

3.4 FINAL ON-SITE ANALYSIS & PERFORMANCE TEST: ENSURES PERFORMANCE AND COMFORT.

3.4.1 OWNER/GENERAL CONTRACTOR RESPONSIBILITIES: PROVIDE REPRESENTATIVE TO BE PRESENT FOR ALL FINAL TESTS (SMOKE, BUILDING, ETC.) THAT THE BALANCER WILL PERFORM. SIGN OFF ON TEST IF IT MEETS REQUIREMENTS.

IF THERE IS STILL REMAINS ANY DEFICIENCIES UPON THE COMPLETION OF THE BALANCING. COORDINATE WITH THE REQUIRED TRADE AND OWNER TO RESOLVE THE ISSUE. IF THE BALANCER IS REQUIRED TO RETURN DUE TO THE INEFFICIENCY, A FEE MAY BE ASSESSED. THE FEE SHOULD BE PASSED ON TO THE TRADE WHO WAS DEFICIENT DURING THE BALANCING OF THE SYSTEM.

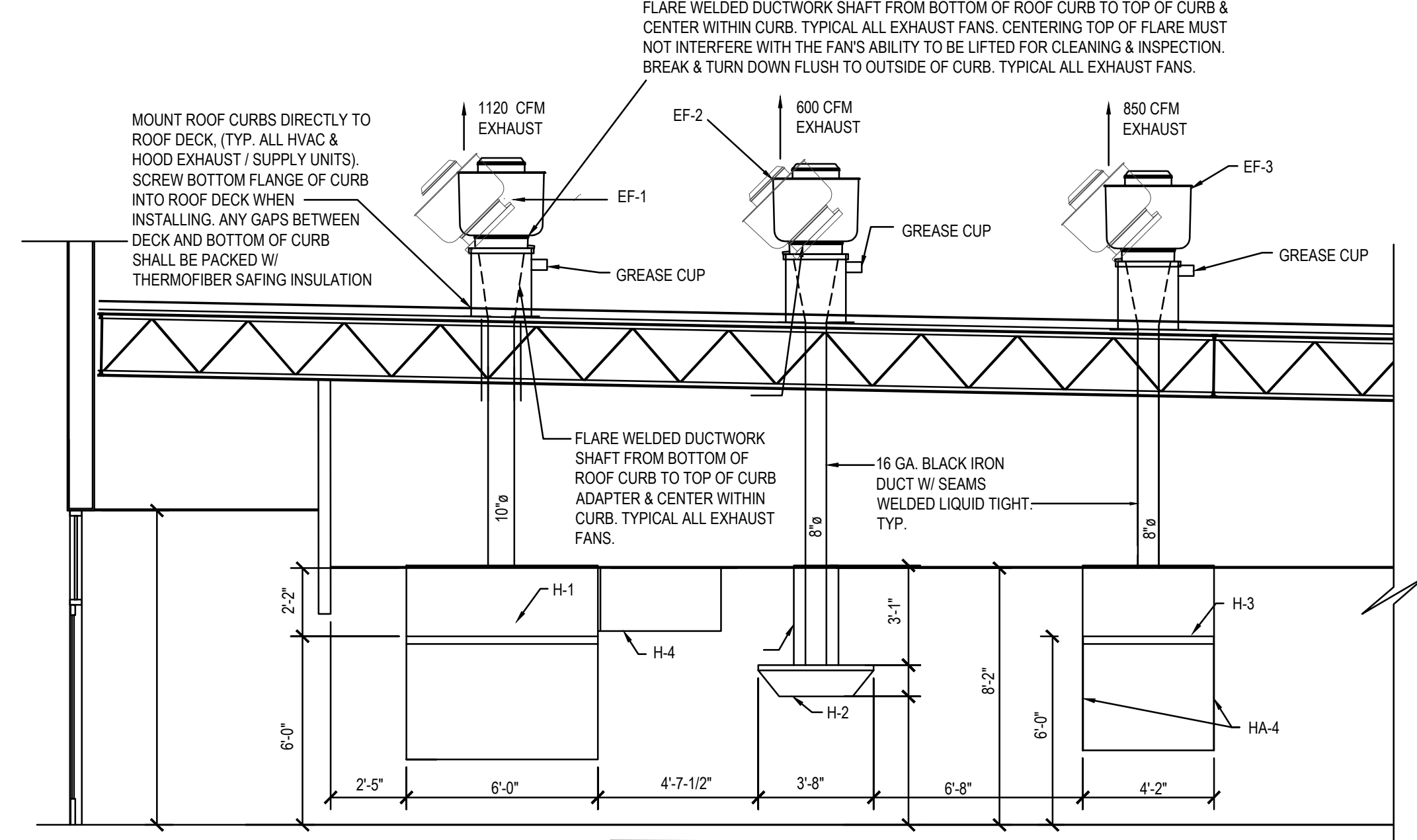
3.4.2 NATIONAL TAB (BALANCING) RESPONSIBILITIES: PERFORM A KITCHEN HOOD SMOKE TEST, AND BUILDING PRESSURE TEST IN WITNESS OF THE OWNER AND/OR GENERAL CONTRACTOR. PERFORM A FINAL WALK-THRU TO ENSURE NO EXTREME CONDITIONS OCCUR DUE TO AIRFLOW MOVEMENTS. ANY DEFICIENCIES OR UNSATISFACTORY CONDITIONS BY PERSONNEL WITNESSING THE TEST SHALL BE RESOLVED & RETESTED. IF FINAL ADJUSTMENTS ARE REQUIRED THAT ARE NOT WITHIN 10% OF DESIGN CRITERIA TO ENSURE EFFECTIVENESS OR COMFORT, CONTACT OWNER AND/OR MANAGING MEMBER FOR FURTHER EXECUTION. FINALIZE & SUBMIT FINAL DOCUMENTS FOR FINAL TAB SUPERVISOR REVIEW.

3.4.2.1 NATIONAL TAB TO ENSURE THERMOSTATS ARE PROGRAMMED AS FOLLOWS:
OCCUPIED TIME: 8:00 AM TO 10:00 PM / UNOCCUPIED TIME: 10:00 PM TO 8:00 AM
OCCUPIED MODE: FANS ON, HEATING TEMP SET POINT 68, COOLING TEMP SET POINT 70
UN-OCCUPIED MODE: FANS AUTO, HEATING TEMP SET POINT 65, COOLING TEMP SET POINT 73

4.0 PHASE III (FINAL DOCUMENTATION & CLOSEOUT): SUBMISSION AND APPROVAL OF BALANCE WORK.

4.1 OWNER RESPONSIBILITIES: ASSIST ON THE EXECUTION OF RESOLUTION ITEMS NOT RESOLVED DURING BALANCING.

4.2 NATIONAL TAB (BALANCING) RESPONSIBILITIES: ENSURE BALANCER DOCUMENTATION HAS BEEN SUBMITTED FOR MANAGEMENT & OWNER REVIEW IN A TIMELY FASHION. VERIFY COMPLETENESS OF BALANCING REPORT & DEFICIENCIES. IF ANY BALANCING ISSUES ARE UNCOVERED BY THE MANAGEMENT TEAM DURING REVIEW, IT WILL REQUIRE THE BALANCER TO PROVIDE RESOLUTION.



EXHAUST DETAIL
SCALE: NONE

NOTE:
SEE CAPTIVEAIRE SHOP DRAWINGS (H-SHEETS) FOR DETAILED INSTALLATION INFORMATION REGARDING HOODS AND EXHAUST FANS



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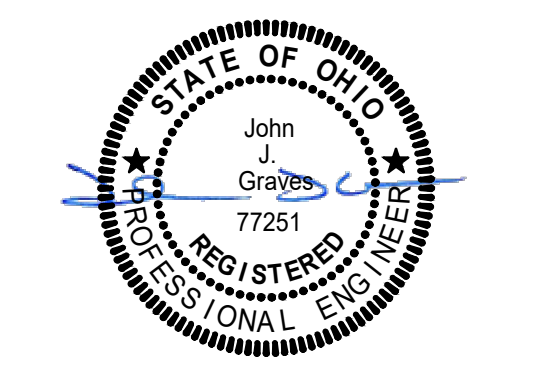
SHEET CONTENTS:
MECHANICAL - ROOF PLAN AND SCHEDULES & DETAILS



NEW TENANT FINISH FOR:
PENN STATION
EAST COAST SUBS
4175 OH-128 CLEVELAND, OH 45002

REV. DATE CK'D
12/14/2023 HOOD UPDATES

Drawn By: Checked:
JJR JG



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DIVISION 23 MECHANICAL SPECIFICATIONS

23 05 01 COMMON REQUIREMENTS FOR HVAC

ALL MECHANICAL WORK AND TESTS SHALL BE DONE IN STRICT ACCORDANCE WITH THE LATEST STATE, COUNTY, AND LOCAL REGULATIONS, LAWS, AND ORDINANCES WHICH MAY BE APPLICABLE.

BEFORE SUBMITTING A BID, EXAMINE DOCUMENTS OF ALL OTHER TRADES, VISIT THE SITE AND GET ACQUAINTED WITH ALL CONDITIONS THAT MAY IN ANY WAY AFFECT THE EXECUTION OF THIS CONTRACT. TAKE MEASUREMENTS AND BE RESPONSIBLE FOR EXACT SIZE AND LOCATIONS OF ALL OPENINGS REQUIRED. VERIFY INSTALLATION MAY BE MADE IN COMPLETE ACCORDANCE WITH ALL PERTINENT CODES AND REGULATIONS. IN THE EVENT OF DISCREPANCY, IMMEDIATELY NOTIFY THE PROFESSIONAL ENGINEER OF RECORD. DO NOT PROCEED WITH THE INSTALLATION IN AREAS OF DISCREPANCY UNTIL ALL SUCH DISCREPANCIES HAVE BEEN FULLY RESOLVED.

IT IS NOT THE INTENT OF THE DRAWINGS THAT EXISTING CONDITIONS BE ACCURATELY SHOWN. EXISTING MECHANICAL WORK IS SHOWN TO LIMITED EXTENT ON DRAWINGS AND IS SHOWN FOR GENERAL REFERENCE ONLY. LOCATIONS AND INFORMATION WERE DERIVED FROM CURSORY SITE VISUAL OBSERVATIONS OR FROM DOCUMENTS THAT WERE PREPARED FOR PREVIOUSLY INSTALLED WORK WHEN AVAILABLE.

THE WORK COVERED BY THESE SPECIFICATIONS SHALL CONSIST OF PROVIDING ALL NEW MATERIAL, LABOR, EQUIPMENT, AND SERVICES NECESSARY FOR A COMPLETE MECHANICAL INSTALLATION AS SPECIFIED HEREIN. WORK IN THIS SECTION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING ITEMS:

- PACKAGED ROOF TOP UNITS
- TOILET EXHAUST FANS
- KITCHEN HOOD AND EXHAUST FAN
- LOW VOLTAGE THERMOSTATS
- DUCT
- DAMPERS
- DIFFUSERS, REGISTERS, AND LOUVERS

WHENEVER THE WORDS "CONTRACTOR" APPEAR ON MECHANICAL DRAWINGS OR IN THESE SPECIFICATIONS, IT SHALL REFER TO THE MECHANICAL SUB-CONTRACTOR. WHENEVER THE WORD "PROVIDE" APPEARS IN THESE DOCUMENTS, IT SHALL BE INTERPRETED TO MEAN "FURNISH AND INSTALL".

COORDINATE ALL WORK WITH THE OWNER TO MINIMIZE INTERRUPTION OF BUILDING OPERATION.

COORDINATE THE INSTALLATION OF MECHANICAL ITEMS WITH THE SCHEDULES FOR WORK OF ALL OTHER TRADES TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

THIS CONTRACTOR SHALL VERIFY AND SATISFY HIMSELF THAT ALL EQUIPMENT FURNISHED WILL PROPERLY FIT IN THE SPACE PROVIDED, THAT IT WILL FUNCTION PROPERLY, AND THAT ALL PARTS OF EQUIPMENT REQUIRING SERVICE ARE READILY ACCESSIBLE.

ALL PIPING SHALL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING WALLS AND FRAMING SYSTEM. ALL VERTICAL RUNS SHALL BE HELD AGAINST WALLS, COLUMNS, ETC., AS POSSIBLE TO PERMIT MAKING OF PIPE JOINTS.

CONTRACTOR SHALL PROVIDE A GUARANTEE IN WRITTEN FORM STATING THAT ALL WORK SHALL BE FREE OF DEFECTS OR ERRORS, AND ALL EQUIPMENT, MATERIALS, OR PARTS FOR A PERIOD OF ONE YEAR FROM THE DATE OF OWNER'S FINAL ACCEPTANCE AND SHALL REPAIR, REVISE OR REPLACE AT NO COST TO THE OWNER ANY SUCH DEFECTS OCCURRING WITHIN THE GUARANTEE PERIOD.

CONTRACTOR SHALL ALSO STATE IN WRITTEN FORM THAT ANY ITEMS OR OCCURRENCES ARISING DURING THE GUARANTEE PERIOD WILL BE ATTENDED TO IN A TIMELY MANNER AND WILL IN NO CASE EXCEED THREE (3) WORKING DAYS FROM DATE OF NOTIFICATION BY OWNER.

PROVIDE A COMPLETE INSTALLATION IN CONFORMANCE WITH THE FOLLOWING STANDARDS:
AGA: AMERICAN GAS ASSOCIATION
ASHRAE: AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS
NFA: NATIONAL FIRE PROTECTION ASSOCIATION
SMACNA: SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION.
STATEWIDE BUILDING CODE
INTERNATIONAL MECHANICAL CODE

CONTRACTOR SHALL DO ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF THIS WORK. ALL OPENINGS IN WALLS, FLOORS OR CEILINGS SHALL BE PROPERLY SEALED AND RESTORED IN KIND. FLASH AND COUNTERFLASH AT ROOF OPENINGS.

ALL EQUIPMENT SHALL BE LISTED AND LABELED, UNLESS OTHERWISE APPROVED.

ALL WIRING SHALL MEET THE REQUIREMENTS LISTED IN THE ELECTRICAL SPECIFICATIONS. ALL CONTROL AND INTERLOCK WIRING AND CONDUIT (120V OR 24V) SHALL BE BY THE MECHANICAL CONTRACTOR.

EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE CONDITIONS OF LISTING AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THIS CODE.

CLEANING: THIS CONTRACTOR SHALL REMOVE FROM THE PREMISES ALL ACCUMULATION OF DIRT, DEBRIS, WASTE MATERIALS AND RUBBISH CAUSED BY HIS EMPLOYEES OR WORK, AT LEAST ONCE A WEEK, EXCEPT THAT COMBUSTIBLE MATERIALS SHALL BE REMOVED DAILY.

DURING PROGRESS OF THE WORK, MAINTAIN ON DRAWINGS AT THE SITE, AN ACCURATE RECORD OF THE INSTALLATION OF THE MECHANICAL SYSTEM, INDICATING ALL ITEMS WHICH HAVE BEEN CHANGED OR ADDED.

APPLY FOR AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED BY LOCAL AUTHORITY, FOR THE APPROVAL OF WORK.

A CERTIFICATE OF FINAL INSPECTION AND APPROVAL SHALL BE SUBMITTED WITH THE CONTRACTOR'S REQUEST FOR FINAL PAYMENT. NO FINAL PAYMENT WILL BE APPROVED WITHOUT THIS CERTIFICATE.

GUARANTEE ALL WORKMANSHIP, MATERIAL, AND EQUIPMENT AND REPLACE ANY FOUND DEFECTIVE WORK WITHOUT COST TO THE OWNER, FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE.

EXISTING CONDITIONS

DO NOT REUSE REMOVED MECHANICAL MATERIALS UNLESS SPECIFICALLY INDICATED ON DRAWINGS. EXISTING SYSTEMS MAY BE UTILIZED ONLY TO THE EXTENT INDICATED ON DRAWINGS.

IF REQUIRED TO ACCOMMODATE CONSTRUCTION RELATED ACTIVITIES TEMPORARILY REMOVE, STORE IN PROTECTED LOCATION ON SITE, AND REINSTALL CONFLICTING MECHANICAL EQUIPMENT, OR DEVICES THAT ARE TO REMAIN OR TO BE RELOCATED.

WHERE THE TERM "DEMOLITION" IS USED HEREIN, INTERPRET IT TO MEAN "DEMOLITION" OR "SELECTIVE DEMOLITION" WHERE APPLICABLE.

PROVIDE MECHANICAL DEMOLITION WORK AS REQUIRED TO ACCOMMODATE PROJECT DEMOLITION AND AS REQUIRED TO ACCOMMODATE NEW CONSTRUCTION. DISCONNECT AND REMOVE WORK TO BE ABANDONED, AND AS REQUIRED TO ACCOMMODATE WORK OF OTHER TRADES, IN AREAS AFFECTED BY THIS PROJECT.

LEGALLY DISPOSE OF MATERIALS TO SALVAGED OR REPAIRED.

23 05 03 SUBMITTALS FOR MECHANICAL SYSTEMS

DESIGN BASIS MANUFACTURERS OF MATERIAL AND EQUIPMENT ARE SPECIFIED AND PLANS ARE DETAILED ACCORDING TO THIS MATERIAL. CONTRACTOR SHALL BASE HIS BID ON FURNISHING AND INSTALLING THIS MAKE OF MATERIAL AND EQUIPMENT.

AN ACCEPTABLE MANUFACTURER'S NAME AND MODEL NUMBER OF A PRODUCT MAY BE PROVIDED IN THESE DOCUMENTS. THIS IS THE EQUIPMENT INCLUDED DURING THE DESIGN PROCESS AND FORMS THE BASIS OF A STANDARD OF QUALITY. WHERE MORE THAN ONE MAKE OF MATERIAL OR EQUIPMENT IS SPECIFIED, THE CONTRACTOR SHALL STATE IN HIS BID WHICH MAKE HE PROPOSES TO FURNISH AND INSTALL. SHOP DRAWING APPROVAL SHALL BE OBTAINED PRIOR TO SHIPMENT OF EQUIPMENT.

VERIFY THE MODEL NUMBER OR PRODUCT IS STILL ACCURATE AND MEETS ALL REQUIREMENTS SHOWN ON THE DRAWINGS. IF THERE IS A DISCREPANCY BETWEEN THE REQUIREMENTS AND THE PRODUCT OR MODEL NUMBER, THE STRICTER OF THE TWO SHALL GOVERN.

SUBMIT SHOP DRAWINGS AND/OR PRODUCT DATA (ELECTRONIC COPIES) ON THE FOLLOWING ITEMS FOR REVIEW BEFORE FABRICATION OR SHIPMENT:

- PACKAGED ROOF TOP UNITS
- TOILET EXHAUST FANS
- KITCHEN HOOD AND EXHAUST FAN
- LOW VOLTAGE THERMOSTATS
- DUCT
- DAMPERS
- DIFFUSERS, REGISTERS, AND LOUVERS

MAINTENANCE MANUALS: INCLUDE WIRING DIAGRAMS, MAINTENANCE AND OPERATING INSTRUCTIONS, PARTS LISTINGS, AND COPIES OF OTHER SUBMITTALS INDICATED FOR INCLUSION.

REVIEW AND CORRECTIONS OR COMMENTS MADE ON SHOP DRAWINGS, PRODUCT DATA: CATALOGS, COT SHEETS, CHARTS, AND OTHER ITEMS DURING CONSTRUCTION PHASE SUBMITTAL REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS, FOR PROVIDING A COMPLETE AND FUNCTIONING PROJECT, NOR SHALL THEY RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR DEVIATIONS OR ERRORS OF ANY SORT. THIS REVIEW IS FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH INFORMATION GIVEN AND THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS. CONTRACTOR REMAINS RESPONSIBLE FOR DETERMINING THE ACCURACY AND COMPLETENESS OF OTHER DETAILS SUCH AS DIMENSIONS AND QUANTITIES, FOR SUBSTANTIATING INSTRUCTIONS FOR INSTALLATIONS, VERIFYING MATERIALS REQUIRED, OBTAINING FIELD MEASUREMENTS AND RELATED CRITERIA, COORDINATING WORK WITH OTHER DISCIPLINES AND PERFORMING WORK IN COMPLIANCE WITH THE CONTRACT DOCUMENTS.

ANY CHANGES TO ITEMS SPECIFIED MUST BE SUBMITTED AS A SUBSTITUTION, WITH COMPLETE DOCUMENTATION OF PRICE DIFFERENTIAL AND EQUIPMENT DETAILS. ANY SUBSTITUTIONS PROVIDED SHALL BE REVIEWED AT MARQUE ENGINEERING'S HOURLY RATES. REVIEW SHALL BE PAID FOR BY THE CONTRACTOR TO MARQUE ENGINEERING AT NO COST TO THE OWNER. BY USING PRE-APPROVED SUBSTITUTIONS, THE CONTRACTOR ACCEPTS ALL RESPONSIBILITY AND ASSOCIATED COSTS FOR ALL REQUIRED MODIFICATIONS TO THE CONTRACT DOCUMENTS TO INCLUDE BUT NOT LIMITED TO MATERIAL OR EQUIPMENT COSTS FOR THEIR OR OTHER TRADES, AND ENSURING THAT SUBSTITUTED MATERIALS AND EQUIPMENT TO BE FURNISHED FIT INTO SPACE AVAILABLE.

EXTENSIVE REVISIONS NECESSITATED TO THE CONTRACT DOCUMENTS, OR SUBSTITUTION ACTIONS RELATED TO ANY SPECIFIED PRODUCT NOT ABLE TO BE PROVIDED DUE TO A FAILURE TO COMMENCE WORK, RELEASE PRODUCT OR COORDINATE CONSTRUCTION ACTIVITIES SHALL BE PROVIDED AT MARQUE ENGINEERING'S HOURLY RATES. COSTS SHALL BE BORN BY THE CONTRACTOR AT NO COST TO THE OWNER.

23 05 29 HANGERS AND SUPPORTS

SUPPORT ALL PIPING, DUCTWORK AND EQUIPMENT BY HANGERS OR BRACKETS. FURNISH STRUCTURAL STEEL MEMBERS WHERE REQUIRED TO SUPPORT PIPING AND EQUIPMENT. NO PORTION OF PIPING OR VALVES SHALL BE SUPPORTED BY EQUIPMENT.

DUCTWORK - SUPPORT BY MEANS OF HANGERS AS FOLLOWS:

DUCT WIDTH 30 OR LESS

HANGER SIZE (16 GAUGE)

TYPE MAX. SPACING 8

A PAIR OF HANGERS SHALL BE LOCATED AT EVERY TRANSVERSE JOINT AND ELSEWHERE ACCORDING TO THE TABLE.

23 05 93 HVAC SYSTEM TESTING , ADJUSTING AND BALANCING FOR HVAC

ALL SYSTEMS AND EQUIPMENT SHALL BE CAREFULLY PROVIDED TO PROVIDE COMFORTABLE AND UNIFORM CONDITIONS IN EACH AND EVERY SPACE TO THE OWNER'S SATISFACTION. ADVISE ANY REQUIRED DRIVES TO SATISFY QUANTITIES INDICATED. PROVIDE A CERTIFIED AIR BALANCE OF THE DIFFUSERS AND AIR HANDLERS.

AIR SYSTEM:

AIR BALANCE AND TESTING SHALL NOT BEGIN UNTIL THE SYSTEM HAS BEEN COMPLETED AND IS IN FULL WORKING ORDER. CONTRACTOR SHALL PUT ALL HEATING, VENTILATING AND AIR CONDITIONING SYSTEM AND EQUIPMENT INTO FULL OPERATION AND SHALL CONTINUE THE OPERATION OF SAME DURING EACH WORKING DAY OF TESTING AND BALANCING. CONTRACTOR SHALL SUBMIT WITHIN 30 DAYS AFTER RECEIPT OF CONTRACT, COPIES OF SUBMITTAL DATA FOR THE TESTING AND BALANCING OF THE AIR CONDITIONING, HEATING, AND VENTILATING SYSTEMS. THE AIR BALANCE AND TESTING AGENCY SHALL PROVIDE PROOF OF HAVING SUCCESSFULLY COMPLETED AT LAST FIVE PROJECTS OF SIMILAR SIZE AND SCOPE.

CONTRACTOR SHALL PROCURE THE SERVICES OF AN INDEPENDENT AIR BALANCE AND TESTING AGENCY, APPROVED BY THE ENGINEER, AND A MEMBER OF AABC OR NEBB, WHICH SPECIALIZES IN THE BALANCING AND TESTING OF HEATING VENTILATION AND AIR CONDITIONING SYSTEMS, TO BALANCE, ADJUST AND TEST AIR MOVING EQUIPMENT AND AIR DISTRIBUTION OR EXHAUST SYSTEMS AS HEREIN SPECIFIED.

ALL WORK BY THIS AGENCY SHALL BE DONE UNDER THE DIRECT SUPERVISION OF A QUALIFIED HEATING AND VENTILATING ENGINEER EMPLOYED BY THIS AGENCY. ALL INSTRUMENTS USED BY THIS AGENCY SHALL BE ACCURATELY CALIBRATED AND MAINTAINED IN GOOD WORKING ORDER.

23 07 13 DUCT INSTALLATION

INSULATE ALL SUPPLY, DIFFUSER PLENUMS, AND OUTSIDE AIR DUCTWORK OF ALL UNITS WITH OWENS CORNING "ALL SERVICE DUCT WRAP" TYPE 150 GLASS FIBER INSULATION UNLESS OTHERWISE NOTED. INSULATION SHALL BE 1-1/2" THICK (2" THICK FOR SUPPLY AND RETURN IN TRUSS SPACE), 1.5 PCF. DENSITY WITH FRK JACKET .002 THICK REINFORCED ALUMINIUM FOIL VAPOR BARRIER. INSULATION SHALL CONFORM TO NFPA 90A AND 90B PER ASTM E-84 FOR FLAME SPREAD AND SMOKE DEVELOPED RATING.

INSULATE ALL EXTERIOR SUPPLY AND RETURN DUCTWORK WITH RIGID FIBERGLASS BOARD INSULATION WITH OUTDOOR JACKET. INSULATION SHALL BE 2" THICK WITH A "K" VALUE OF 0.23 AT 75 F. INSTALL ON DUCTWORK USING IMPALE ANCHORS AND WIRES. SEAL VAPOR BARRIER WITH VAPOR BARRIER ADHESIVE.

PROVIDE INSULATION ON ALL CONCEALED SUPPLY, RETURN DUCTWORK. ALL LINERS, INSULATION AND ADHESIVES SHALL HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50.

RIGID FIBERGLASS DUCTWORK INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 612, TYPE IB, WITHOUT FACING AND WITH VAPOR BARRIER ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRM, ALUMINIUM FOIL, AND VINYL FILM. INSULATION SHALL HAVE A MINIMUM R VALUE AS REQUIRED BY CODE.

FLEXIBLE FIBERGLASS DUCTWORK INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE II, WITHOUT FACING AND WITH VAPOR BARRIER ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRM, ALUMINIUM FOIL, AND VINYL FILM. INSULATION SHALL HAVE A MINIMUM R VALUE AS REQUIRED BY CODE.

VAPOR BARRIER MATERIAL FOR DUCTWORK: PAPER-BACKED ALUMINIUM-FOIL, EXCEPT AS OTHERWISE INDICATED; STRENGTH AND PERMEABILITY RATING EQUIVALENT TO FACTORY-APPLIED VAPOR BARRIERS ON ADJOINING DUCTWORK INSULATION, WHERE AVAILABLE; WITH FOLLOWING ADDITIONAL CONSTRUCTION CHARACTERISTICS:

HIGH PUNCTURE RESISTANCE: LOW VAPOR TRANSMISSION (FOR DUCTS IN EXPOSED AREAS: MECH. ROOMS, ETC.)
MODERATE PUNCTURE RESISTANCE: MEDIUM VAPOR TRANSMISSION (FOR DUCTS IN CONCEALED AREAS).

INSTALLATION IS NOT PERMITTED ABOVE DRYWALL CEILINGS AND INACCESSIBLE CEILINGS.

23 09 93 SEQUENCE OF OPERATION

PACKAGED ROOFTOP UNIT STARTUP
THE UNIT SHALL OPERATE ON A 7 DAY/NIGHT PROGRAMMABLE THERMOSTAT. DURING STARTUP, THE FAN SHALL RUN WITH THE DAMPERS IN THE FULL RECIRCULATION POSITION. PROVIDE OCCUPIED CHANGEOVER SEQUENCE WITH OPTIMUM START FUNCTION. WHEN THE RETURN AIR TEMPERATURE REACHES OCCUPIED SETPOINT (ADJUSTABLE), THE MINIMUM OUTSIDE AIR DAMPER SHALL OPEN TO THE CONTROLLED MINIMUM OUTDOOR AIR POSITION.

SUPPLY FAN CONTROL
THE SUPPLY FAN SPEED SHALL BE CONSTANT AND SET TO THE REQUIRED CFM.

SPACE TEMPERATURE CONTROL
PROVIDE LOCAL WALL MOUNTED ROOM TEMPERATURE THERMOSTAT WITH DIGITAL DISPLAY OF ROOM TEMPERATURE AND SETPOINT (+/- DEG. F, ADJUSTABLE), AND OVERRIDE FEATURE. PROVIDE REMOTE SENSOR TO MONITOR SPACE TEMPERATURE AND MAINTAIN THERMOSTAT SETPOINT.

MINIMUM OUTSIDE AIR CONTROL
DURING OCCUPIED MODE THE MINIMUM OUTSIDE AIR DAMPER SHALL BE OPEN. PROVIDE MOTORIZED OUTDOOR AIR DAMPER.

ECONOMIZER CONTROL
DRY BULB CONTROLLED ECONOMIZER: OPERATED TO AUTOMATICALLY USE OUTDOOR AIR FOR "FREE COOLING" WHEN OUTDOOR AIR TEMPERATURE IS AT ACCEPTABLE LEVELS. AUTOMATICALLY MODULATED OUTDOOR AND RETURN AIR DAMPERS MAINTAIN PROPER DISCHARGE AIR TEMPERATURE INTO THE CONDITIONED SPACE. ADJUSTABLE MINIMUM POSITION CONTROL IS STANDARD. ECONOMIZER SHALL HAVE POWERED OR BAROMETRIC RELIEF, AS SCHEDULED.

FURTHER CALL FOR COOLING, ENABLE THE ECONOMIZER MODE. ON A FURTHER CALL FOR COOLING, DISABLE THE ECONOMIZER MODE AND THE MECHANICAL COOLING SHALL BE STAGED ON.

HEATING CONTROL
HEATING SHALL BE CONTROLLED TO MAINTAIN SPACE TEMPERATURE. SETPOINT. ON A CALL FOR HEATING, THE MECHANICAL COOLING SHALL BE OFF. ON A FURTHER CALL FOR HEATING, THE ECONOMIZER MODE SHALL BE DISABLED. ON A FURTHER CALL FOR HEATING THE GAS HEATING SHALL BE STAGED ON.

DEHUMIDIFICATION
PROVIDE HOT GAS REHEAT FOR DEHUMIDIFICATION. PROVIDE SPACE HUMIDITY SENSOR. WHEN THE SPACE HUMIDITY RISES ABOVE 60% (ADJUSTABLE), PROVIDE FULL COOLING AND MODULATE THE HOT GAS REHEAT TO MAINTAIN SPACE TEMPERATURE SETPOINT. WHEN THE SPACE HUMIDITY REACHES SETPOINT, RESUME WITH NORMAL HEATING & COOLING OPERATION.

SMOKE DETECTOR
WHEN THE SMOKE DETECTOR IS ALARMED, THE SYSTEM SHALL BE ALARMED AND THE AIR HANDLER SHALL FAIL SAFE WITH MANUAL RESET. ELECTRICAL CONTRACTOR SHALL FURNISH HVAC CONTRACTOR SHALL MOUNT & ELECTRICAL CONTRACTOR SHALL WIRE A UL LISTED PHOTOELECTRIC SMOKE DETECTOR PER LOCAL CODE AUTHORITY HAVING JURISDICTION.

UNOCCUPIED MODE
DURING THE UNOCCUPIED MODE OF OPERATION, THE RTU CONDENSING FURNACE SHALL GO INTO NIGHT SETBACK MODE. AT NIGHT SETBACK/SHUTDOWN THE RTU CONDENSING FURNACE SHALL GO TO FAIL SAFE POSITION. FAIL SAFE POSITION IS DEFINED BY THE FOLLOWING: THE SUPPLY FAN IS OFF, THE OUTDOOR AIR INTAKE DAMPER IS CLOSED, THE HEATING IS OFF AND THE MECHANICAL COOLING IS OFF. THE SUPPLY FAN SHALL CYCLE IN CONJUNCTION WITH EITHER THE HEATING OR COOLING SYSTEM TO MAINTAIN A MINIMUM/MAXIMUM SPACE TEMPERATURE DEPENDING ON THE SEASON.

LOW VOLTAGE THERMOSTATS SHALL BE PROVIDED AND WIRED BY THE HVAC CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE 4" SQUARE X 1- 1/2" DEEP WALL OUTLET BOXES (WITH SINGLE-GANG RINGS) FOR ALL THERMOSTATS/SENSORS. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE 3/4" EMPTY CONDUIT FROM EACH THERMOSTAT/SENSOR LOCATION, TURNED OUT ABOVE ACCESSIBLE CEILINGS (IN JOIST SPACE OR AGAINST OVERHEAD SLAB/DECK). HVAC/TEMPERATURE CONTROL CONTRACTOR SHALL PROVIDE ALL OTHER NECESSARY CONDUIT, RACEWAY AND WIRING RELATED WORK. CONDUIT SHALL BE IDENTIFIED IN CEILING CAVITY AND SHALL BE PROVIDED WITH SWEEP BENDS, BUSHINGS AND DRAGLINE.

EXHAUST FANS SHALL BE TIED TO LIGHT SWITCH, WHICH SHALL BE FURNISHED, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR. WHEN ACTIVATED, EXHAUST FAN MOTOR DAMPER SHALL OPEN AND FAN SHALL START.

KITCHEN HOOD EXHAUST FANS: PROVIDE HEAT DETECTOR IN HOOD COLLAR INTERLOCKED TO FAN OPERATION. KITCHEN HOOD EXHAUST SYSTEM SHALL BE INITIATED BY THE HEAT DETECTOR. PROVIDE INDICATOR LIGHT ON FACE OF HOOD. AT STARTUP, ENERGIZE EXHAUST FAN MOTOR. INTERLOCK TO MAKEUP AIR SYSTEM (WHETHER DEDICATED MAKEUP AIR OR MAKEUP AIR FROM HVAC SYSTEM), SO THAT MAKEUP AIR IS PROVIDED WHENEVER EXHAUST FAN IS RUNNING. EXHAUST FAN SHALL RUN CONTINUOUSLY AT CONSTANT SPEED. AT SHUTDOWN, THE EXHAUST FAN SHALL STOP.

PROVIDE ALL CONTROLS AND WIRING FOR COMPLETE INTERLOCK AND OPERATION OF KITCHEN HOOD, EXHAUST FAN, ROOFTOP UNIT, ETC. AND ALL ASSOCIATED MOTOR DAMPERS.

ALL DUCT SMOKE DETECTORS, FOR SMOKE DETECTORS, WILL BE FURNISHED PROVIDED AND WIRED BY ELECTRICAL CONTRACTOR, INSTALLED BY THE HVAC CONTRACTOR, AND WIRED BY THE ELECTRICAL CONTRACTOR FOR LOCAL CODES. HVAC CONTRACTOR WILL INTERLOCK FAN WITH SMOKE DETECTOR.

MOTOR OPERATED DAMPERS: ALL FRESH AIR INTAKES AND EXHAUST LOUVERS SHALL HAVE MOTOR OPERATED DAMPERS. DAMPERS SHALL BE LOW LEAK WITH BLADE AND EDGE SEALS. 24 V MOTOR OPERATED DAMPERS SHALL BE PROVIDED AND WIRED BY THE MECHANICAL CONTRACTOR, UNLESS OTHERWISE NOTED. PROVIDE ALL NECESSARY TRANSFORMERS, CONTACTORS, CONTROLS AND WIRING FOR INTERLOCKING EQUIPMENT TO MOTOR OPERATED DAMPERS.

SMOKE DAMPER: SMOKE DAMPERS TO BE FABRICATED IN ACCORDANCE WITH NFPA 90A AND UL 555 S.

DAMPERS: UL CLASS 1 AIRFOIL BLADE TYPE SMOKE DAMPER, NORMALLY OPEN, AUTOMATICALLY OPERATED BY ELECTRIC ACTUATOR BLADES TO INCLUDE SILICONE GASK SEALS. JAMBS TO INCLUDE STAINLESS STEEL JAMB SEALS.

23 22 00 CONDENSATE DRAIN PIPING

INSTALL TRAP AT EVAPORATOR COIL DRAIN. EXTEND DRAIN LINE FROM COIL TRAP TO DRAIN. PIPING SHALL BE STANDARD WEIGHT, PVC PIPE AND FITTINGS AND WITH JOINTS OF PVC SOLVENT CEMENT. PROVIDE CLEANOUTS THROUGHOUT RUN AND AT TOPS OF TRAPS.

23 30 00 AIR DISTRIBUTION SYSTEM

CEILING AIR DIFFUSERS:

SQUARE: SQUARE HOUSING, CORE OF SQUARE CONCENTRIC LOUVERS, SQUARE OR ROUND DUCT CONNECTION.

VAV DIFFUSER: THE VAV SQUARE PLAQUE DIFFUSER SHALL BE SUPPLIES TO DELIVER A 360 DEGREE RADIAL, HORIZONTAL AIR FLOW PATTERN. THE BACK CONE SHALL BE A ONE-PIECE DIE-FORMED DESIGN WITH SMOOTH, AERODYNAMICALLY DESIGNED SURFACES AND NO CORNER JOINTS.

CONSTRUCTION:
DIFFUSER CONSTRUCTION SHALL BE 24x24 STEEL WITH ONE-PIECE BACK PAN, AERODYNAMICALLY DESIGNED INNER CONE DAMPER ASSEMBLY, AND PLAQUE FACEPLATE.

A PLAQUE ASSEMBLY SHALL BE INCORPORATED AND SHALL DROP NO MORE THAN 4 INCH BELOW THE CEILING PLAN TO ASSURE PROPER AIR DISTRIBUTION PERFORMANCE

THE PLAQUE ASSEMBLY SHALL BE COMPLETELY REMOVABLE FROM THE DIFFUSER FACE TO ALLOW FOR FULL ACCESS TO ANY DAMPERS OR OTHER DUCTWORK COMPONENTS LOCATED NEAR THE DIFFUSER NECK.

POWER REQUIREMENTS:
THE VAV DIFFUSERS SHALL BE POWERED BY 24VAC, 3.0 VA PER UNIT, WITH SUPPLY POWER FREQUENCY: 60 HZ

MODULATING DAMPER ASSEMBLY:
THE MODULATING DAMPER ASSEMBLY SHALL HAVE THE FOLLOWING FEATURES:

- QUIET, ULTRA-LONG LIFE BRUSHLESS A DRIVE MOTOR
- DIRECT DRIVE SYSTEM WITHOUT GEARS, BELTS, OR LEVERS, RESULTING IN ZERO MAINTENANCE AND LONG LIFE

DIFFUSER SHALL BE SUPPLIED WITH A 120 VOLT 277 VOLT, 24 VAC 20 VA TRANSFORMER

A PRESSURE RELIEF COLLAR SHALL BE FITTED TO THE INLET COLLAR OF THE VAV DIFFUSER TO RELIEVE EXCESS STATIC PRESSURE ARISING FROM MODULATION OF THE AIR FLOW.

A WALL MOUNTED THERMOSTAT WILL PROVIDE ROOM TEMPERATURE SENSING AS WELL AS SET-POINT ADJUSTMENT FOR HEATING AND COOLING.

LINEAR: EXTRUDED ALUMINIUM CONTINUOUS SLOT, SINGLE OR MULTIPLE.

DIFFUSER MOUNTINGS:
SURFACE MOUNT: DIFFUSER SHALL HAVE ROLLED EDGE BELOW FINISHED CEILING FOR SURFACE MOUNTING OR DIFFUSER SHALL BE FURNISHED WITH ACCESSORY PLASTER FRAME.

LAV-IN: DIFFUSER HOUSING SIZED TO FIT BETWEEN CEILING EXPOSED SUSPENSION TEE BARS AND REST ON TOP SURFACE OF THE BAR.

DIFFUSER ACOUSTIC PERFORMANCE: NC LESS THAN OR EQUAL TO 30

DIFFUSER ACCESSORIES: PLASTER RING: PERIMETER RING DESIGNED TO ACT AS PLASTER STOP AND DIFFUSER ANCHOR.

DIFFUSER FINISHES: WHITE ENAMEL; SEMI-GLOSS WHITE ENAMEL PRIME FINISH.

CEILING AND WALL REGISTERS & GRILLES:
STEEL CONSTRUCTION: MANUFACTURER'S STANDARD STAMPED SHEET STEEL FRAME AND ADJUSTABLE BLADES.

REGISTER AND GRILLE FINISHES: WHITE ENAMEL; SEMI-GLOSS WHITE ENAMEL PRIME FINISH.

REGISTER AND GRILLE ACOUSTIC PERFORMANCE: NC LESS THAN OR EQUAL TO 30

23 31 13 METAL DUCTS

CONSTRUCTION, INSTALLATION AND SUPPORT OF ALL DUCTWORK SHALL CONFORM TO THE LATEST EDITION OF SMACNA "HVAC DUCT CONSTRUCTION STANDARD -METAL AND FLEXIBLE".

ASSEMBLE AND INSTALL DUCTWORK IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ACHIEVE AIR-TIGHT (5% LEAKAGE FOR SYSTEMS RATED 3" AND UNDER; 1% FOR SYSTEMS RATED OVER 3" AND NOISELESS (NO OBJECTIONABLE NOISE) SYSTEMS. INSTALL EACH RUN WITH MINIMUM NUMBER OF JOINTS. INSURE DUCTWORK ACCURATELY AT CONNECTIONS, WITHIN 1/8" MISALIGNMENT TOLERANCE AND WITH INTERNAL SURFACES SMOOTH.

SUPPORT VERTICAL DUCTS AT EVERY FLOOR. SUPPORT DUCT WITH APPROVED HANGERS AT INTERVALS NOT EXCEEDING 10 FEET.

DUCTS SHALL BE GALVANIZED SHEET METAL OF STANDARD GAUGES. DUCTWORK SHALL HAVE A MINIMUM THICKNESS OF .24 GAUGE. ALL DUCT ELBOWS SHALL BE EITHER FULL RADIUS OR WITH TURNING VANES.

WHERE DUCTWORK IS INDICATED TO BE EXPOSED IN OCCUPIED SPACES, PROVIDE MATERIALS WHICH ARE FREE FROM VISUAL IMPERFECTIONS INCLUDING PITTING, SEAM MARKS, ROLLER MARKS, STAINS AND DISCOLORATIONS, AND OTHER IMPERFECTIONS, INCLUDING THOSE WHICH WOULD IMPAIR PAINTING.

EXPOSED DUCTWORK WHICH IS TO BE PAINTED SHALL HAVE PAINT GRIP APPLIED.

PROVIDE VOLUME DAMPERS IN ALL BRANCH DUCTS OR AS REQUIRED FOR BALANCING TO REQUIRED AIR FLOWS.

PROVIDE RADIUS TYPE FITTINGS FABRICATED OF MULTIPLE SECTIONS WITH MAXIMUM 15 DEG. CHANGE OF DIRECTION PER SECTION, UNLESS DETAILED OTHERWISE, USE 45 DEG. LATERALS AND 45 DEG. ELBOWS FOR BRANCH TAKEOFF CONNECTIONS. WHERE 90 DEG. BRANCHES ARE INDICATED, PROVIDE CONICAL TYPE TEES.

PROVIDE DUCT SEALANT AND/OR CEMENT WHICH IS NON-HARDENING, NON-MIGRATING MASTIC OR LIQUID ELASTIC SEALANT, TYPE APPLICABLE FOR FABRICATION/INSTALLATION DETAIL, AS COMPOUNDED AND RECOMMENDED BY MANUFACTURER SPECIFICALLY FOR SEALING JOINTS AND SEAMS IN DUCTWORK.

FLEXIBLE DUCTS SHALL EITHER BE SPIRAL-WOUND SPRING STEEL WITH FLAMEPROOF VINYL SHEATHING OR CORRUGATED ALUMINIUM. THE MAXIMUM LENGTH OF FLEX DUCT ON THE SUPPLY EQUALS 5 FEET. FLEX IS NOT ALLOWED FOR RETURN, RELIEF OR EXHAUST APPLICATIONS.

ELECTRICAL CONTRACTOR SHALL FURNISH HVAC CONTRACTOR SHALL MOUNT & ELECTRICAL CONTRACTOR SHALL WIRE A UL LISTED PHOTOELECTRIC SMOKE DETECTOR PER LOCAL CODE AUTHORITY HAVING JURISDICTION.

WHERE INSTALLED IN UNCONDITIONED SPACES OTHER THAN RETURN AIR PLENUMS, PROVIDE 1" THICK 1-1/2 LB. CONTINUOUS FLEXIBLE FIBERGLASS SHEATH WITH VINYL VAPOR BARRIER JACKET.

SHOP FABRICATE DUCTWORK IN 4, 8, 10 OR 12-FT LENGTHS, OR REQUIRED TO COMPLETE RUNS.

FABRICATE DUCTWORK WITH DUCT LINER IN EACH SECTION OF DUCT WHERE INDICATED. LAMINATE LINER TO INTERNAL SURFACES OF DUCT IN ACCORDANCE WITH INSTRUCTIONS BY MANUFACTURERS OF LINING AND ADHESIVE, AND FASTEN WITH MECHANICAL FASTENERS. DUCT LINER TO BE 3-LB DENSITY FOR ACOUSTIC REQUIREMENTS 1" THICK OR AS NOTED. SIZE OF DUCTWORK SHOWN ON THE DRAWINGS IS FREE NET AREA, OUTSIDE DIMENSION OF DUCTS WILL NEED TO BE INCREASED IF LINED DUCT IS USED.

DUCT LINER SHALL BE OF FIBROUS GLASS OF THICKNESS INDICATED. 3-LB DENSITY. ALL LINERS, INSULATION AND ADHESIVES SHALL HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50.

23 33 13 DAMPERS

DAMPERS WITH LOCKING DEVICE, WHERE ACCESSIBLE, SHALL BE RUSKIN MD-35. OPPOSED BLADE FOR RECTANGULAR DUCTS 12 INCHES AND ABOVE, AND MODEL MD-25 PARALLEL BLADE FOR DUCTS 10 INCHES AND BELOW, AND MODEL MDRS-25 FOR ROUND DUCTS. INSTALL PER MANUFACTURER'S INSTRUCTIONS. SINGLE BLADE ROUND DAMPERS WITH LOCKING DEVICE SHALL BE IN SPIN-IN COLLARS.

FIRE DAMPERS SHALL BE RUSKIN MODEL IBD, STYLE B WITH BLADE PACKAGE OUT OF AIR STREAM. HORIZONTAL, INSTALL WHERE INDICATED ON DRAWINGS AND AS REQUIRED BY AUTHORITY HAVING LOCAL JURISDICTION.

ELECTRIC MOTORIZED DAMPER SHALL BE SIZED TO OPERATE WITH SUFFICIENT RESERVE POWER TO PROVIDE SMOOTH MODULATING ACTION OR TWO-POSITION ACTION. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

23 38 13.00- COMMERCIAL KITCHEN HOODS AND DUCTWORK

TYPE I HOOD

REFER TO CAPTIVE AIRE DRAWINGS FOR SPECIFICATIONS.

INSPECTION

GENERAL: EXAMINE AREAS AND CONDITIONS UNDER WHICH EQUIPMENT IS TO BE INSTALLED. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

INSTALLATION

COORDINATE WORK WITH WORK OF ROOFING, WALLS, AND CEILINGS, AS NECESSARY FOR PROPER INTERFACING. DUCT CONNECTIONS TO BE PROVIDED BY THE HVAC CONTRACTOR.

REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS.

ELECTRICAL WIRING: INSTALL ELECTRICAL DEVICES FURNISHED BY MANUFACTURER BUT NOT SPECIFIED TO BE FACTORY-MOUNTED. FURNISH COPY OF MANUFACTURER'S WIRING DIAGRAM SUBMITTAL TO ELECTRICAL INSTALLER.

VERIFY THAT ELECTRICAL WIRING INSTALLATION IS IN ACCORDANCE WITH MANUFACTURER'S SUBMITTAL AND INSTALLATION REQUIREMENTS OF DIVISION-16 SECTIONS.

ENSURE THAT ROTATION IS IN DIRECTION INDICATED AND INTENDED FOR PROPER PERFORMANCE.

DO NOT PROCEED WITH CENTRIFUGAL FAN START-UP UNTIL WIRING INSTALLATION IS ACCEPTABLE TO FAN INSTALLER.

FIELD QUALITY CONTROL

TESTING: AFTER INSTALLATION OF HOOD EXHAUST SYSTEM HAS BEEN COMPLETED, TEST EACH SYSTEM TO DEMONSTRATE PROPER OPERATION OF UNITS AT PERFORMANCE REQUIREMENTS SPECIFIED. WHEN POSSIBLE, FIELD CORRECT MALFUNCTIONING UNITS, THEN RETEST TO DEMONSTRATE COMPLIANCE. REPLACE UNITS WHICH CANNOT BE SATISFACTORILY CORRECTED.

PROVIDE TESTING, PERMITS AND APPROVALS AS REQUIRED BY STATE AND LOCAL AUTHORITIES.

ADJUSTING AND CLEANING

CLEAN FACTORY-FINISHED SURFACES.

REPAIR ANY MARRED OR SCRATCHED SURFACES.

TYPE I KITCHEN GREASE DUCT SPECIFICATION

FURNISH SINGLE WALL 16 GAUGE CARBON STEEL DUCTWORK WITH CONTINUOUS LIQUID TIGHT WELDS. ALL DUCTWORK SHALL BE WRAPPED WITH A FIRE RESISTIVE MATERIAL. THE DUCT WRAP SYSTEM SHALL BE UL LISTED PER ASTM E 2336 FOR ZERO CLEARANCE TO COMBUSTIBLES AND SHALL MAINTAIN A FLAME/SMOKE RATING LESS THAN