

HVAC ABBREVIATIONS

A	AMPERES	GX	GENERAL EXHAUST
AAV	AUTOMATIC AIR VENT	HT	HEIGHT
AC	AIR CONDITIONING	HC	HEATING COIL
ACS	AUTOMATIC CONTROL SYSTEM	HD	HEAD
AD	ACCESS DOOR	HR	HOUR
AFF	ABOVE FINISHED FLOOR	HWP	HOT WATER PUMP
AHU	AIR HANDLING UNIT	HWR	HOT WATER RETURN
AL	ALUMINUM	HWS	HOT WATER SUPPLY
AMCS	AUTOMATED MONITORING AND CONTROL SYSTEM	HZ	FREQUENCY
AP	ACCESS PANEL	KW	KILOWATT
B	BOILER	KX	KITCHEN EXHAUST
BB	BASEBOARD	LAT	LEAVING AIR TEMPERATURE
BD	BLOW DOWN	LBS	POUNDS
BDD	BACK DRAFT DAMPER	LDB	LEAVING DRY BULB TEMPERATURE
BFP	BOILER FEED PUMP	LRA	LOCKED ROTOR AMPS
BHD	BOTTOM HORIZONTAL DISCHARGE	LWB	LEAVING WET BULB TEMPERATURE
BHP	BRAKE HORSEPOWER	LWT	LEAVING WATER TEMPERATURE
BR	BOTTOM REGISTER	MAU	MAKEUP AIR UNIT
BT	BOTTOM THROAT	MBH	THOUSAND BTU PER HOUR
BTUH	BTU PER HOUR	MER	MECHANICAL EQUIPMENT ROOM
CBH	CABINET HEATER	MHP	MOTOR HORSEPOWER
CD	CEILING DIFFUSER	MIN	MINIMUM
CDU	CONDENSING UNIT	MOT	MOTOR
CFM	CUBIC FEET PER MINUTE	MX	MECHANICAL ROOM EXHAUST
CG	CEILING GRILLE	NC	NORMALLY CLOSED
COD	CLEAN-OUT DOOR	NIC	NOT IN CONTRACT
COMP	COMPRESSOR	NO	NORMALLY OPEN
COND	CONDENSATE	NTS	NOT TO SCALE
COV	CHAIN OPERATED VALVE	OA	OUTSIDE AIR
CP	CONDENSATE PUMP	OAI	OUTSIDE AIR INTAKE
CR	CEILING REGISTER	OD	OUTSIDE DIAMETER
CU FT	CUBIC FEET	P	PUMP
CU IN	CUBIC INCHES	PD	PRESSURE DROP
CUH	CABINET UNIT HEATER	PSI	POUNDS PER SQUARE INCH
CV	CONSTANT VOLUME	PSIA	PSI ABSOLUTE
D	DROP	PSIG	PSI GAUGE
DB	DRY BULB	RAD	RADIATION
DIAM	DIAMETER	RA	RETURN AIR
DMPR	DAMPER	RD	ROUND DIFFUSER
DN	DOWN	REFR	REFRIGERANT
DX	DIRECT EXPANSION	RF	RETURN FAN
EA	EXHAUST AIR	RH	RELATIVE HUMIDITY
EAT	ENTERING AIR TEMPERATURE	RLA	RUNNING LOAD AMPS
EDB	ENTERING DRY BULB TEMPERATURE	RM	ROOM
EF	EXHAUST FAN	SP	STATIC PRESSURE
EXH	EXHAUST	SPEC	SPECIFICATION
EXP	EXPANSION	SS	STAINLESS STEEL
F	FILTER	SX	SMOKE EXHAUST
°F	DEGREES FAHRENHEIT	T	THROAT
FA	FREE AREA (SQ.FT.)	TDH	TOTAL DYNAMIC HEAD
FC	FLEXIBLE CONNECTION	TEMP	TEMPERATURE
FCU	FAN COIL UNIT	TG	TOP GRILLE
FD	FIRE DAMPER	THD	TOP HORIZONTAL DISCHARGE
FF	FINAL FILTER	TR	TOP REGISTER
FG	FINISHED GRADE	TRF	TRANSFER FAN
FIN FL	FINISHED FLOOR	TRG	TRANSFER GRILLE
FLA	FULL LOAD AMPERES	TRD	TRANSFER DUCT
FPI	FINS PER INCH	TV	TURNING VANES
FPM	FEET PER MINUTE	TYP	TYPICAL
FPS	FEET PER SECOND	TX	TOILET EXHAUST
FR	FLOOR REGISTER	UH	UNIT HEATER
FT	FEET	V	VOLTS
FTR	FINNED TUBE RADIATION	W/	WITH
FV	FACE VELOCITY	W/O	WITHOUT
G	GAUGE	WB	WET BULB
GAL	GALLON	WC	WATER COLUMN
GPH	GALLONS PER HOUR	WG	WATER GAUGE
GPM	GALLONS PER MINUTE	WMS	WIRE MESH SCREEN

TR-1 SPECIAL INSPECTIONS			
INSPECTION CATEGORIES	CODE SECTION	YES	NO
FIRE ALARM TEST	BC 907		X
EMERGENCY & STANDBY POWER SYSTEMS	BC 1704.31		X
SMOKE CONTROL SYSTEMS	BC 1704.15		X
FUEL-OIL STORAGE AND FUEL-OIL PIPING SYSTEMS	BC 1704.17		X
MECHANICAL DEMOLITION	BC 1704.20.4		X
ON-SITE STORM WATER DRAIN, DISP./DETENT INSTALL	BC 1704.21.2		X
MECHANICAL SYSTEMS	BC 1704.16	X	
SPRINKLER SYSTEMS	BC 1704.23		X
STANDPIPE SYSTEMS	BC 1704.24		X
HEATING SYSTEMS	BC 1704.25		X
CHIMNEYS	BC 1704.26		X
FIRE-RESISTANT PENETRATIONS AND JOINTS (FIRE STOP)	BC 1704.27	X	
FINAL		X	
SPECIAL INSPECTION AGENCY	TAN ENGINEERING, P.C.		
SPECIAL INSPECTION AGENCY LIC. NO.	001291		

EXCEPT FOR FINAL INSPECTION BY ARCHITECT, ALL SPECIAL INSPECTIONS LISTED ABOVE INCLUDING ANY OTHER INSPECTIONS CALLED ON ENGINEER'S DRAWINGS AND REQUIRED BY THIS BUILDING DEPARTMENT AND ALL AGENCIES HAVING JURISDICTION, ARE TO BE PERFORMED BY INDEPENDENT AGENCIES WORKING UNDER THE DIRECTION OF THE OWNER. THE CONTRACTOR MUST NOTIFY THE SPECIAL INSPECTION AGENCY AT LEAST 72 HOURS BEFORE THEY ARE READY FOR INSPECTION TO BE PERFORMED. SPECIAL INSPECTION AND PROGRESS INSPECTIONS ARE REQUIRED IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE BUILDING CODE ARE LISTED IN THE TABLE ABOVE.

TR-8 PROGRESS INSPECTIONS (MECHANICAL)			
INSPECTION CATEGORIES	CODE SECTION	YES	NO
HVAC AND SERVICE WATER HEATING EQUIPMENT	IB3, IB3	X	
HVAC AND SERVICE WATER HEATING SYSTEM CONTROLS	IB4, IB4	X	
HVAC INSULATION AND SEALING	IB5, IB5	X	
INTERIOR LIGHTING POWER	IC2, IC3		X
EXTERIOR LIGHTING POWER	IIC4		X
LIGHTING CONTROLS	IIC5		X
MAINTENANCE INFORMATION	ID1, ID1	X	
SPECIAL INSPECTION AGENCY	TAN ENGINEERING, P.C.		
SPECIAL INSPECTION AGENCY LIC. NO.	001291		

ALL PROGRESS INSPECTIONS AND COMMISSIONING REQUIRED FOR COMPLIANCE HAS BEEN DETERMINED. THIS PROJECT DOES NOT REQUIRE COMMISSIONING. INTERIOR AND EXTERIOR LIGHTING POWER, LIGHTING CONTROLS SHALL BE UNDER ARCHITECTURAL SCOPE. REFER TO ARCHITECTURAL DOCUMENTS FOR ADDITIONAL INFO.

ENERGY CONSERVATION CODE OF 2020 NYC

"TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 NYC ENERGY CONSERVATION CODE."

HVAC DRAWING INDEX	
DRAWING NO.	DRAWING TITLE
EN-101	ENERGY TABULAR ANALYSIS I
M-101	MECHANICAL COVER SHEET I
M-102	MECHANICAL COVER SHEET II
M-201	FIRST FLOOR MECHANICAL INSTALLATION & DEMOLITION PLANS
M-202	FIRST FLOOR FRESH AIR AND PIPING INSTALLATION PLANS
M-203	CELLAR LEVEL MECHANICAL AND PIPING INSTALLATION PLANS
M-301	MECHANICAL SCHEDULES
M-401	MECHANICAL DETAILS I
M-501	MECHANICAL SPECIFICATIONS I
M-502	MECHANICAL SPECIFICATIONS II

NYC NOISE CODE:

1) NYC NOISE CODE SHALL BE ADHERED TO.

BUILDING NOTES:

- 1) ALL WORK SHALL BE IN COORDINATED WITH BUILDING STANDARDS, SPECIFICATIONS AND GUIDELINES.
- 2) ALL WORK SHALL BE COORDINATED WITH THE PROPERTY MANAGER.
- 3) ALL DEMOLITION WORK SHALL BE PERFORMED ON OVERTIME BASIS.

ECC COMPLIANCE NOTES:

- 1) MH-10: ALL DUCT INSULATION IN UNCONDITIONED SPACES SHALL BE INSULATED TO A MINIMUM OF R-6.
- 2) MH-4: TEMPERATURE AND/OR SETBACK CONTROLS BY THERMOSTAT AND SHOWN ON MECHANICAL DOCUMENTS.
- 3) MH11: OPERATING AND MAINTENANCE MANUAL OF ALL SPECIFIED EQUIPMENT SHALL BE PROVIDED TO BUILDING OWNER AND/OR TENANT.

NOTES FOR ALL EXPOSED DUCTWORK:

- 1) ALL EXPOSED DUCTWORK SHALL BE THOROUGHLY CLEANED, DEGREASED AND READY FOR PAINTING AND SHALL BE FREE FROM SCRATCHES AND BENT ANGLES. ALL DUCT SECTION LABELS SHALL BE APPLIED TO EITHER INSIDE OF DUCT OR TOP OF DUCT SECTION (NOT VISIBLE TO SPACE BELOW).
- 2) ALL EXPOSED DUCTWORK SHALL BE INTERNALLY LINED/INSULATED THROUGHOUT.
- 3) WHERE PERMISSIBLE, ALL EXPOSED DUCTWORK TRANSITIONS SHALL BE FLAT-BOTTOM TO MAINTAIN CONSISTENT BOTTOM OF DUCT ELEVATION IN OPEN AREAS.
- 4) NEW DUCTWORK IN OPEN AREAS SHALL RUN TO TO UNDERSIDE OF BEAMS. SOME AREAS MAY REQUIRE SLIGHT DUCTWORK RISES OR DROPS. COORDINATE EXACT ELEVATIONS WITH SPRINKLER CONTRACTOR PRIOR TO SHOP DRAWING SUBMITTAL.
- 5) LOW PRESSURE DUCTWORK IN OPEN AREAS SHALL BE CONSTRUCTED WITH FLUSH FLAT SEAMS.
- 6) COORDINATE LENGTHS OF DUCTWORK IN OPEN AREAS SO THAT TRANSVERSE DUCT JOINTS DO NOT CONFLICT WITH SPRINKLER PIPING AND BEAMS.

GENERAL NOTES:

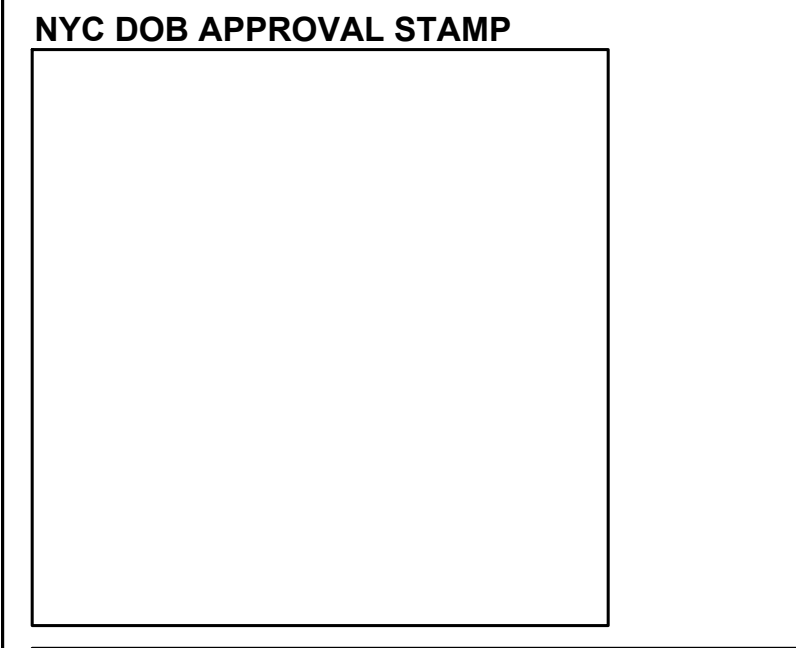
- 1) CONTRACTOR SHALL VISIT PREMISES PRIOR TO BID TO VERIFY EXISTING CONDITIONS AND DETERMINE IF THERE ARE ANY OBSTRUCTIONS OR ISSUES THAT MAY IMPEDE ON THE CONSTRUCTION OF PROPOSED WORK.
- 2) ANY ROOM ENCLOSED WITH FULL HEIGHT PARTITIONS SHALL BE PROVIDED WITH AN WALL OPENING WITH SHEET METAL SLEEVED AND WMS, SIZED AT 300 FEET PER MINUTE.
- 3) ANY EXISTING PIPING, DUCTWORK AND EQUIPMENT NOT SHOWN ON THIS DRAWING IS EXISTING TO REMAIN. ANY WORK WITH EQUIPMENT ASSOCIATED WITH OTHER TENANT'S SHALL BE COORDINATED WITH BUILDING MANAGEMENT.
- 4) ALL DUCT SPLITS AND TAKE-OFFS SHALL BE PROVIDED WITH VOLUME DAMPERS. PROVIDE CABLE OPERATED VOLUME DAMPERS FOR ALL DAMPERS ABOVE INACCESSIBLE CEILINGS. VOLUME DAMPERS IN BRANCH DUCTS SHALL BE LOCATED AS FAR AS POSSIBLE FROM AIR OUTLET OR INLET IN ORDER TO REDUCE NOISE AND TURBULENCE AT AIR OUTLETS.
- 5) KEEP ALL DUCTWORK TIGHT TO UNDERSIDE OF TYPICAL BEAMS AS NECESSARY. CROSS DUCTWORK BETWEEN BEAMS WHEREVER POSSIBLE, AND AVOID CROSSING DUCTWORK ABOVE RECESSED LIGHT FIXTURES TO PROVIDED MAXIMUM CLEARANCES.
- 6) ALL DUCTWORK SHALL BE INSULATED AND SEALED PER ASHRAE 90.1-2010 STANDARDS; DUCT INSULATION AND SEALING REQUIREMENTS IN COMMERCIAL BUILDINGS

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00	ISSUED FOR REVIEW	05 / 04 / 22
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PROJECT:

VETERINARY MEDICAL OFFICE

428 COLUMBUS AVE
NEW YORK, NY 10024

BUILDING OWNER:

DRAWING:

MECHANICAL COVER SHEET I

SEAL & SIGNATURE	DATE: 05/04/2022
	PROJECT No: Y220090
	DRAWN BY: MM
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	DWG No: M-101.00
	SHEET No: 02 OF 10

NEW YORK CITY BUILDING DEPARTMENT NOTE

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HVAC SYMBOLS

	SINGLE LINE DUCTWORK OR EQUIPMENT - NEW
	DUCT UNDER POSITIVE PRESSURE (SUPPLY AIR OR FAN DISCHARGE)
	DUCT UNDER NEGATIVE PRESSURE (RETURN, EXHAUST OR OUTSIDE AIR)
	VOLUME DAMPER
	FIRE DAMPER AND ACCESS DOOR
	COMBINATION SMOKE AND FIRE DAMPER (ELECTRIC)
	AUTOMATIC DAMPER (ELECTRIC)
	AUTOMATIC SMOKE DAMPER (ELECTRICAL)
	RISE IN DUCTWORK (IN DIRECTION OF AIR FLOW)
	DROP IN DUCTWORK (IN DIRECTION OF AIR FLOW)
	CENTER LINE
	CUBIC FEET PER MINUTE
	DIAMETER
	SQUARE FEET
	TYPE A CEILING DIFFUSER 400 CFM SUPPLY AIR
	10" BY 8" CEILING REGISTER (CEILING GRILLE) 300 CFM RETURN AIR
	10" BY 6" TOP REGISTER, 150 CFM SUPPLY AIR
	10" BY 6" TOP REGISTER (TOP GRILLE) 150 CFM RETURN AIR
	10" BY 6" BOTTOM REGISTER (BOTTOM GRILLE) 150 CFM RETURN AIR
	VANED ELBOW (SEE DETAIL)
	RADIUS ELBOW
	DUCT FLEXIBLE CONNECTION
	VERTICAL DUCT DROP (IN DIRECTION OF AIRFLOW)
	VERTICAL DUCT RISE (IN DIRECTION OF AIRFLOW)
	THERMOSTAT
	DUCT SMOKE DETECTOR
	NEW PIPE WITH DIRECTION OF FLOW
	PIPE DROP
	PIPE RISE
	PITCH UP IN DIRECTION OF FLOW
	PITCH DOWN IN DIRECTION OF FLOW
	UNION
	FLANGED END
	DEAD END - SCREWED CAP
	DEAD END - WELDED CAP
	GATE VALVE
	ANGLE GATE VALVE

	GLOBE VALVE
	ANGLE GLOBE VALVE
	DRAIN VALVE
	LOCK SHIELD VALVE
	CHECK VALVE, SWING OR LIFT
	SILENT CHECK VALVE
	FLEXIBLE CONNECTOR
	BUTTERFLY VALVE
	BALL VALVE
	SQUARE HEAD COCK
	BALANCING VALVE
	PLUG VALVE (TYPE AS NOTED)
	HOT WATER SUPPLY RISER - #
	HOT WATER RETURN RISER - #
	PRESSURE REDUCING VALVE
	AUTOMATIC CONTROL VALVE
	FLOW CONTROL VALVE
	SOLENOID VALVE
	ELECTRIC MOTORIZED VALVE OPERATOR
	PNEUMATIC VALVE OPERATOR
	Y-TYPE STRAINER W/BLOW OFF VALVE
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	VIBRATION ISOLATOR IN HANGER
	THERMOMETER WELL
	THERMOMETER AND WELL
	PRESSURE GAUGE
	SYPHON
	PUMP
	PUMP SUCTION DIFFUSER
	SEPARATOR
	FILTER, IN LINE
	FLOW METER
	FLOW ORIFICE
	ANGLE STOP CHECK VALVE
	HWS
	HWR
	DRAIN

BUILDING DEPARTMENT NOTES

2014 - NYC BUILDING CODE

ALL WORK SHALL COMPLY WITH THE APPLICABLE SECTIONS OF THE BUILDING CODE, CITY OF NEW YORK, EFFECTIVE DECEMBER 31, 2014 AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE. INSPECTIONS AND SIGN-OFF OF COMPLETED WORK SHALL BE MADE AS PER ARTICLE 28-116 OF THE GENERAL ADMINISTRATIVE PROVISIONS.

- THE FOLLOWING SPECIAL INSPECTIONS ARE REQUIRED BY THE NYC BUILDING CODE FOR HVAC SYSTEMS:
 - MECHANICAL SYSTEMS - BC 1704.16
- THE FOLLOWING PERIODIC SPECIAL INSPECTIONS ARE REQUIRED BY THE NYC BUILDING CODE FOR HVAC SYSTEMS:
 - THROUGH-PENETRATION FIRESTOP SYSTEMS - BC 1704.27
- TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION MC 107 AND THE FOLLOWING SECTIONS OF THE NEW YORK CITY MECHANICAL CODE:
 - VENTILATION SYSTEM BALANCING - 403.8
- THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
 - UPON COMPLETION OF THE VENTILATION SYSTEM:
 - A TEST SHALL BE CONDUCTED IN THE PRESENCE OF AND UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER QUALIFIED TO CONDUCT SUCH TESTS. THE TESTS SHALL SHOW COMPLIANCE WITH THE CODE REQUIREMENTS FOR VENTILATION AND THE PROPER FUNCTIONING OF ALL SMOKE DETECTION, FIRE PROTECTION AND OPERATING DEVICES BEFORE THE SYSTEM IS APPROVED.
 - THE LICENSED PROFESSIONAL ENGINEER WHO CONDUCTS THE TESTS SHALL FILE A CERTIFICATE AS TO WHETHER THE SYSTEM COMPLIES WITH THE APPLICABLE LAWS. THEY SHALL ALSO FILE WITH THIS CERTIFICATION A REPORT OF THE TEST. THE TEST AND REPORT SHALL BE MADE IN A MANNER SATISFACTORY TO THE OWNER.
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
 - STANDARDS OF HEATING - MC 309.1
 - NOISE CONTROL - MC 928
 - DUCT CONSTRUCTION, SUPPORT - MC 603
 - AIR INTAKES, EXHAUSTS AND RELIEFS - MC 401.4
 - AIR FILTERS - MC 605
 - FIRE DAMPERS AND SMOKE DAMPERS AND SMOKE DETECTORS - MC 607
 - MANUAL AND AUTOMATIC, FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS - MC 513
 - PIPING AND INSULATION - MC 1201
 - GAS FIRED EQUIPMENT - FUEL GAS CODE
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG F
- VENTILATION FOR ALL AREAS SHALL COMPLY WITH MC 401.
- A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATING SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY CODE MC 403.3
- ALL FIRE DAMPERS SHALL BE ACCEPTED FOR USE BY THE NEW YORK CITY DEPARTMENT OF BUILDINGS SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555, STANDARD FOR FIRE DAMPERS AND CEILING DAMPERS.
- COMBINATION FIRE/SMOKE DAMPERS AND SMOKE DAMPERS SHALL BE ACCEPTED FOR USE BY THE NEW YORK CITY DEPARTMENT OF BUILDINGS SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555S.
- SMOKE DETECTORS, COMBINATION FIRE/SMOKE DAMPERS AND SMOKE DAMPERS SHALL BE INSTALLED AS REQUIRED TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN - MC 606
- REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- TO THE BEST OF THE APPLICANT'S KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.
- TESTS OF SOUND POWER LEVEL OF MECHANICAL EQUIPMENT SHALL BE CONDUCTED AND RESULTS SUBMITTED WHERE WINDOWS OF A DWELLING UNIT ARE WITHIN 100 FEET OF EQUIPMENT. THE SOUND PRESSURE LEVEL SHALL NOT EXCEED THE LEVELS GIVEN IN MC 928.

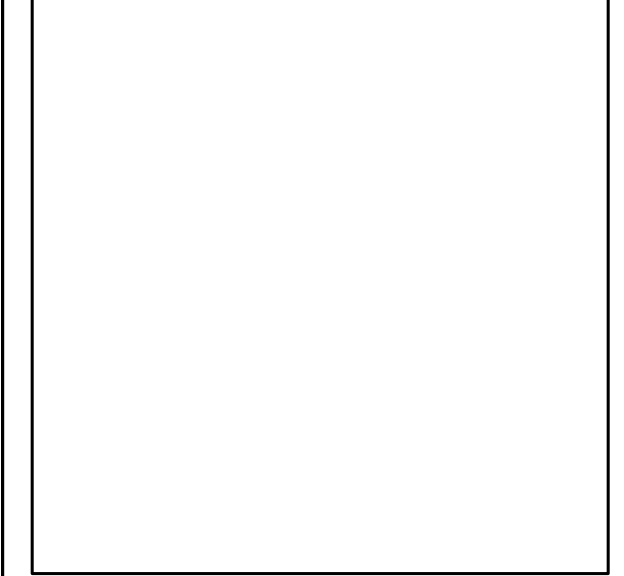
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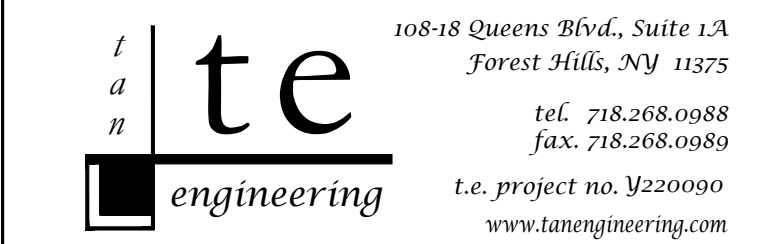
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NYC DOB APPROVAL STAMP



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MEP ENGINEER:



STRUCTURAL ENGINEER:

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PROJECT:

VETERINARY MEDICAL OFFICE

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NEW YORK, NY 10024

BUILDING OWNER:

DRAWING:

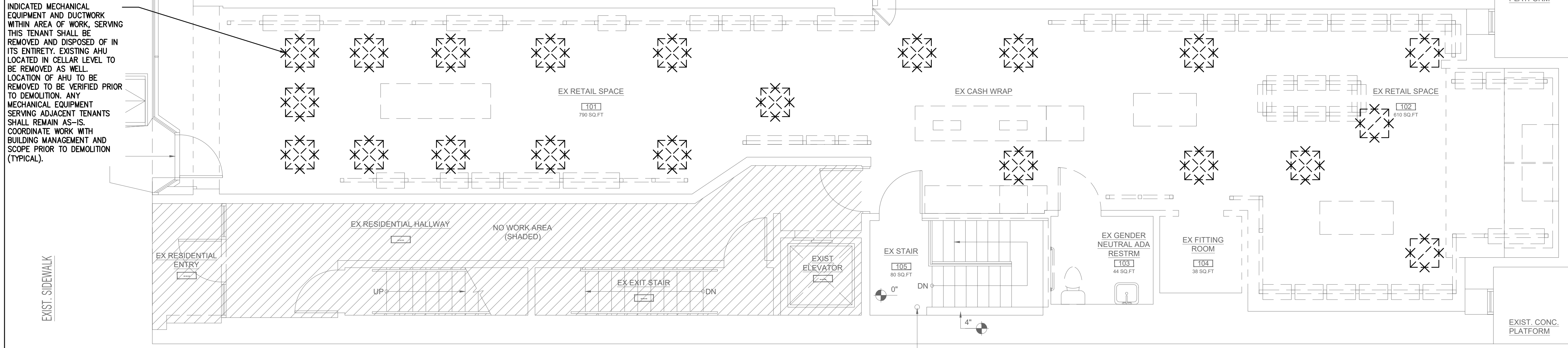
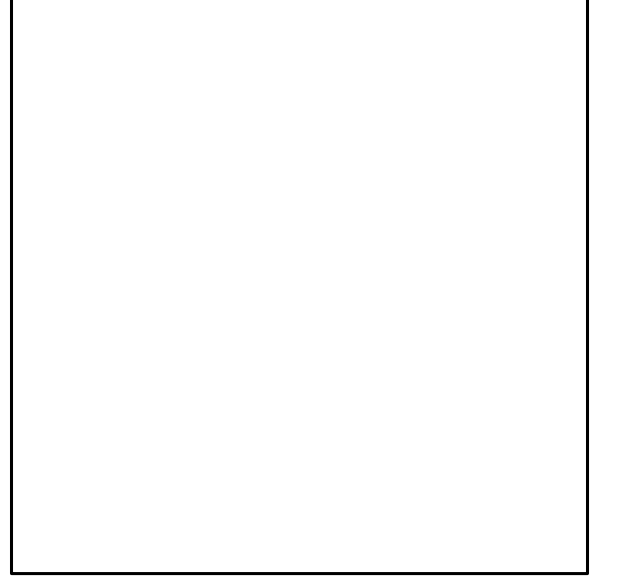
MECHANICAL COVER SHEET II

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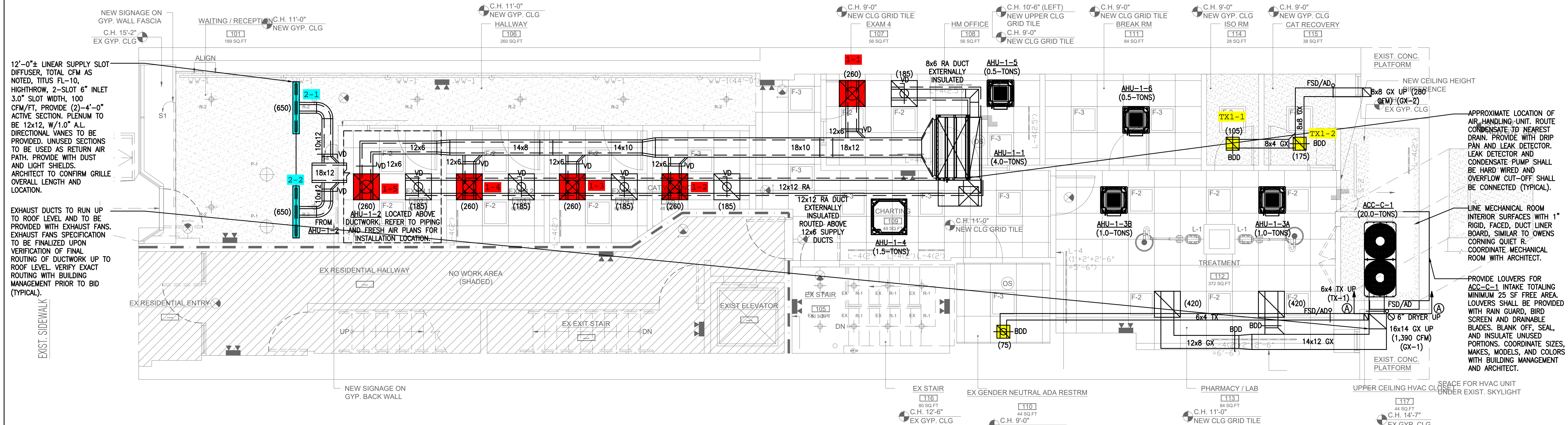
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1 First Floor Mechanical Demolition Plan
SCALE: 1/4" = 1'-0"



2 First Floor Mechanical Installation Plan
SCALE: 1/4" = 1'-0"

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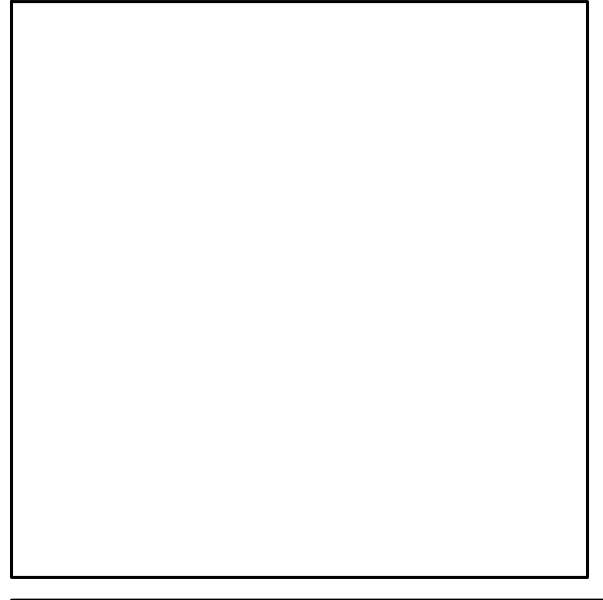
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BUILDING OWNER:

DRAWING:
FIRST FLOOR MECHANICAL INSTALLATION AND DEMOLITION PLANS

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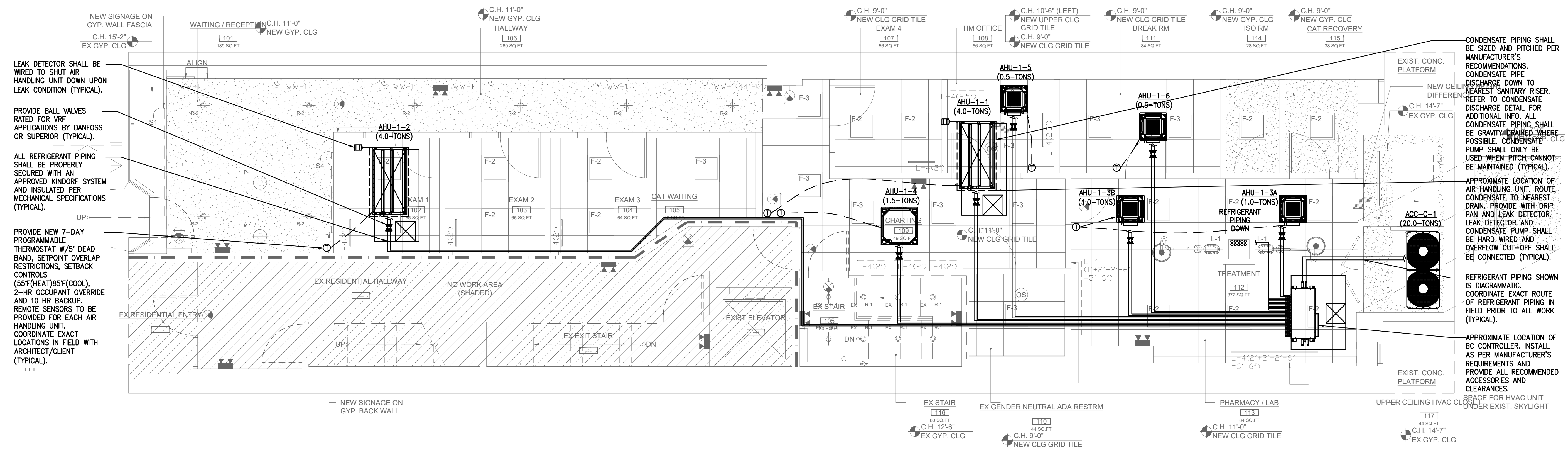


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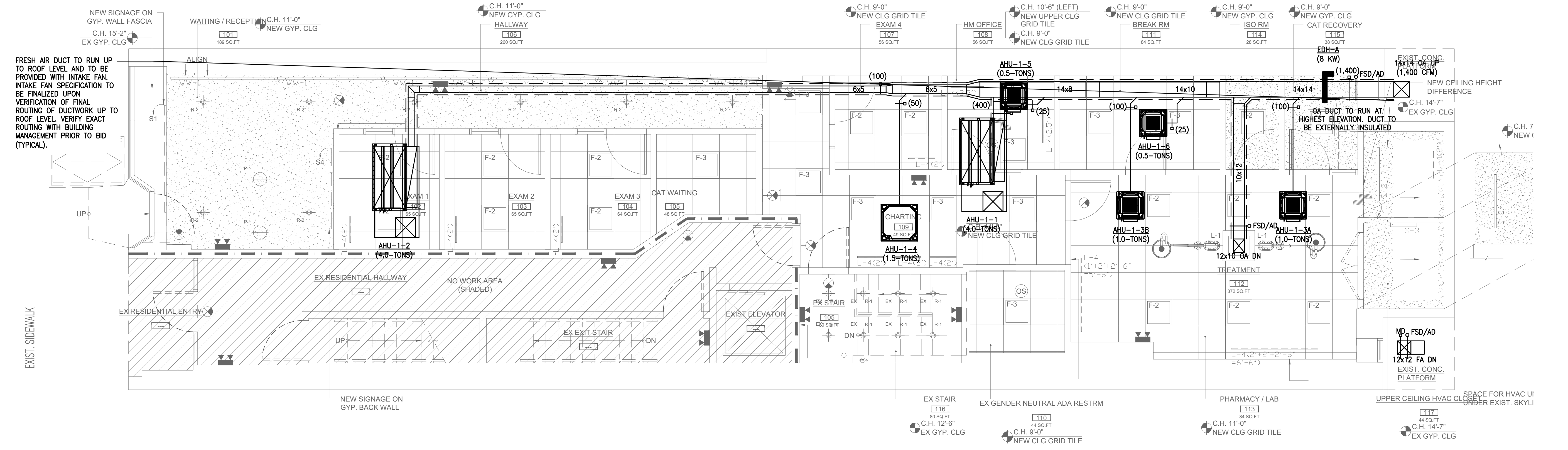
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DRAWING:
FIRST FLOOR FRESH AIR AND PIPING INSTALLATION PLANS

SEAL & SIGNATURE	DATE:
	05/04/2022
	PROJECT No: Y220090
	DRAWN BY: MM
	CHECK BY: RT
	DWG No: M-202.00
	SHEET No: 05 OF 10



1 First Floor Piping Installation Plan
SCALE: 1/4" = 1'-0"



2 First Floor Outside Air Installation Plan
SCALE: 1/4" = 1'-0"

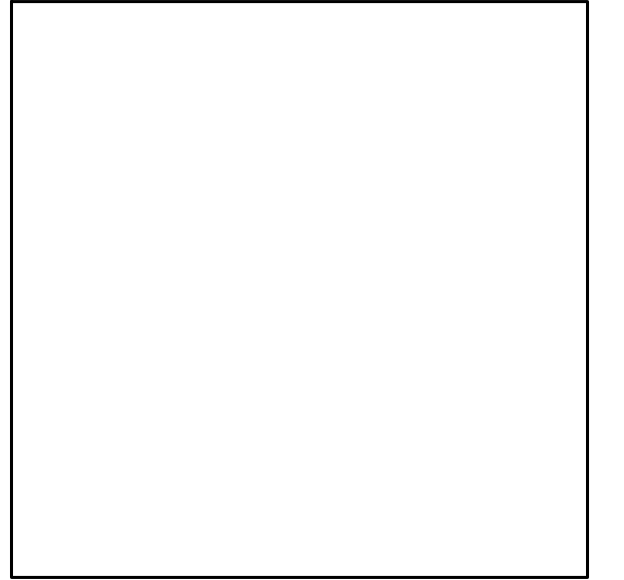
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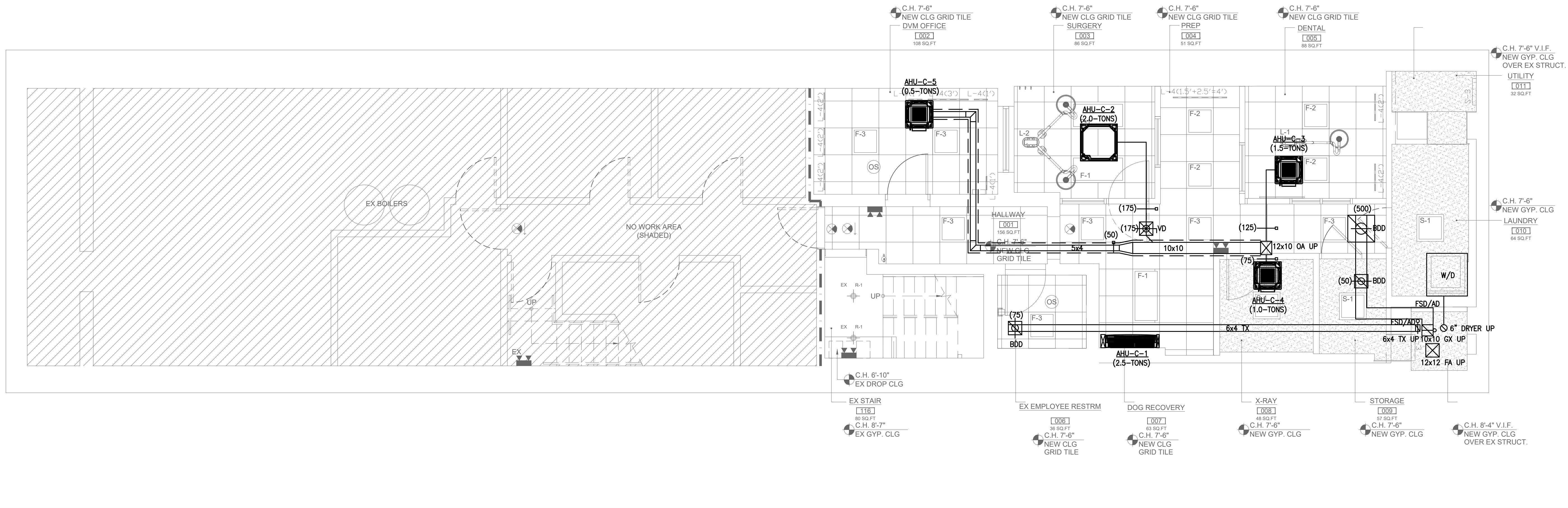
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NEW YORK, NY 10024

BUILDING OWNER:

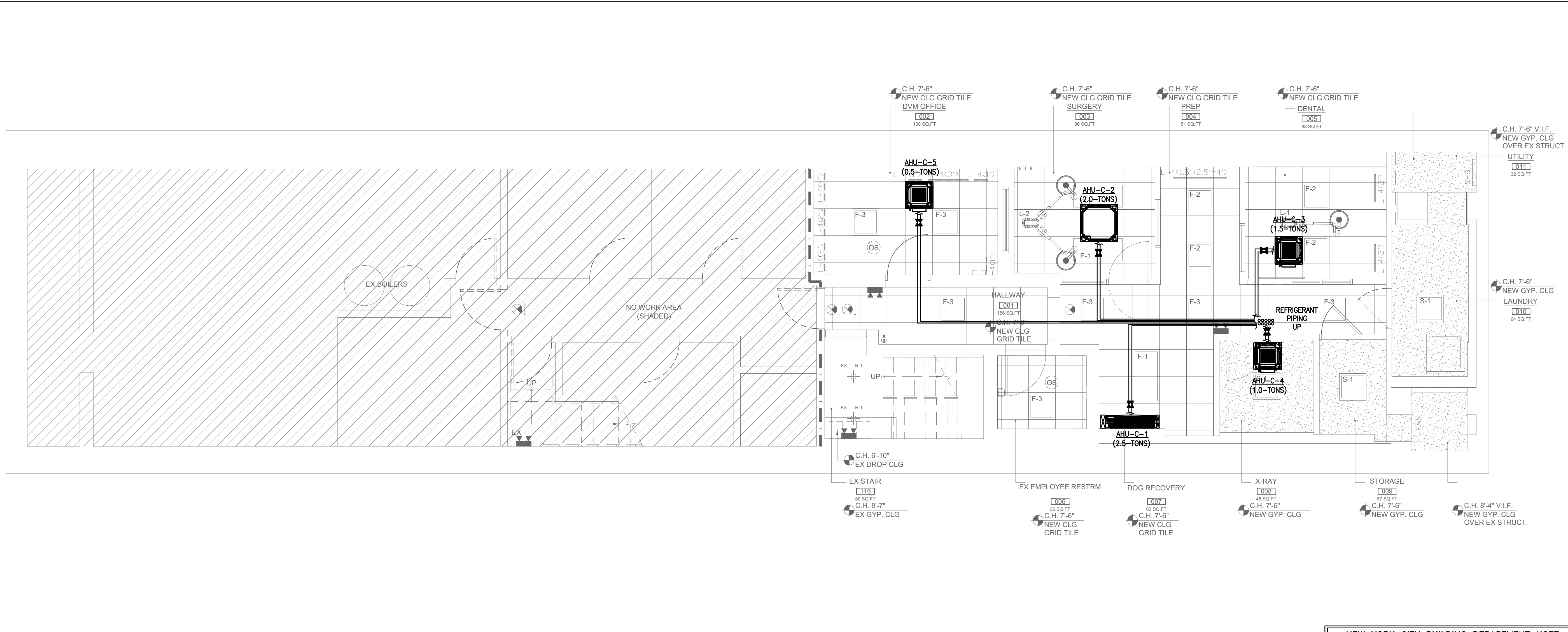
DRAWING:
CELLAR LEVEL MECHANICAL AND PIPING INSTALLATION PLANS

SEAL & SIGNATURE	DATE: 05/04/2022
	PROJECT No: Y220090
	DRAWN BY: MM
	CHECK BY: RT
	DWG No: M-203.00
	SHEET No: 06 OF 10

JEE WON KIM, R.A.



1 First Floor Piping Installation Plan
SCALE: 1/4" = 1'-0"



2 First Floor Outside Air Installation Plan
SCALE: 1/4" = 1'-0"

NEW YORK CITY BUILDING DEPARTMENT NOTE
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DX SPLIT AIR CONDITIONING UNIT SCHEDULE

INDOOR AIR HANDLING UNIT (BY TRANE-MITSUBISHI)										ELECTRICAL DATA (AHU)			OUTDOOR AIR COOLED CONDENSING UNIT										ELECTRICAL DATA (ACC)			SER#									
UNIT TAG	LOCATION	SERVICE	EVAP. FAN DATA	TOTAL COOLING	SENSIBLE COOLING	TOTAL HEATING	DIMENSIONS	WEIGHT	MODEL NUMBER	V/PH/HZ	MCA	MFS	UNIT NUMBER	LOCATION	SERVICE	TOTAL COOLING	TOTAL HEATING	CONDENSER FAN DATA			EFFICIENCY			COMP. DATA			DIMENSIONS	WEIGHT	MODEL NUMBER	V/PH/HZ	MCA	MFS			
			CFM (H)	(BTUH)	(BTUH)	(BTUH)	(H x W x D) (INCHES)	(LBS.)											AMBIENT (°F)	CFM	QTY	IEER	EER	COP	QTY	RLA	(H x W x L) (EA)	(LBS)							
AHU-1-1	CEILING	EXAM RMS	1,306	48,000	-	54,000	10x55x29	86	TPEFY048MA144A	208/1/60	4.38	15	ACC-1-1	1ST FL	AHU-1-1	240,000	250,000	-	14,500	2	19.6	10.5	3.2	1	-	72x69x29	887	TURYE2403AN40A	208/1/60	82/75	125/125				
AHU-1-2	CEILING	FDH	1,306	48,000	-	54,000	10x55x29	86	TPEFY048MA144A	208/1/60	4.38	15			AHU-1-2																				
AHU-1-3A	CEILING	TREATMENT	335	12,000	-	13,500	8x23x23	31	TPLFY012FM140A	208/1/60	0.29	15			AHU-1-3A																				
AHU-1-3B	CEILING	TREATMENT	335	12,000	-	13,500	8x23x23	31	TPLFY012FM140A	208/1/60	0.29	15			AHU-1-3B																				
AHU-1-4	CEILING	CHARTING	812	18,000	-	20,000	12x33x33	55	TPLFY018EM140B	208/1/60	0.54	15			AHU-1-4																				
AHU-1-5	CEILING	1ST OFFICE	280	5,000	-	5,600	8x23x23	29	TPLFY005FM140A	208/1/60	0.24	15			AHU-1-5																				
AHU-1-6	CEILING	BREAK RM	280	5,000	-	5,600	8x23x23	29	TPLFY005FM140A	208/1/60	0.24	15			AHU-1-6																				
AHU-C-1	WALL	PREP	920	30,000	-	34,000	14x46x12	46	TPKFY030KM142A	208/1/60	0.63	15			AHU-C-1																				
AHU-C-2	CEILING	SURGERY	812	24,000	-	27,000	12x33x33	55	TPLFY024EM140B	208/1/60	0.54	15			AHU-C-2																				
AHU-C-3	CEILING	DENTAL	460	18,000	-	20,000	8x23x23	31	TPLFY018FM140A	208/1/60	0.40	15			AHU-C-3																				
AHU-C-4	CEILING	XRAY	335	12,000	-	13,500	8x23x23	31	TPLFY012FM140A	208/1/60	0.29	15			AHU-C-4																				
AHU-C-5	CEILING	CEL OFFICE	280	5,000	-	5,600	8x23x23	29	TPLFY005FM140A	208/1/60	0.24	15			AHU-C-5																				

- NOTES:**
1. PROVIDE MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE AROUND ALL UNITS.
 2. PROVIDE CONDENSING UNITS WITH THE FOLLOWING OPTIONS:
A. ALL REQUIRED AND RECOMMENDED ACCESSORIES BY MANUFACTURER.
 3. PROVIDE AIR HANDLING UNITS WITH THE FOLLOWING OPTIONS:
A. DRAIN PUMP KIT
B. CONDENSATE PUMP
C. FILTER BOX
D. DRIP PAN
E. LEAK DETECTOR
 4. PROVIDE ALL UNITS WITH DISCONNECT SWITCH.
 5. ANY EXTERNAL ACCESSORIES SHALL BE HARD WIRED.

DIFFUSER/GRILLE SCHEDULE

FUNCTION	RANGE	NECK SIZE (IN.)/ NO. OF SLOTS	NOMINAL OVERALL DIMEN. WxL (IN.)	REMARKS
SUPPLY	0-75	8"	12x12	/
SUPPLY	76-150	10"	24x24	
SUPPLY	151-300	12"	24x24	
SUPPLY	301-500	14"	24x24	
SUPPLY	501-800	16"	24x24	
SUPPLY	AS SHOWN	AS SHOWN	24x24	
CD RETURN	ALL	AS SHOWN	AS SHOWN	
TR SUPPLY	ALL	AS SHOWN	AS SHOWN	
TR RETURN	ALL	AS SHOWN	AS SHOWN	

- NOTES:**
1. DIFFUSER AND GRILLE BORDERS SHALL BE COMPATIBLE WITH CEILING TYPE SPECIFIED BY ARCHITECT.
 2. ALL CEILING DIFFUSERS ARE BASED ON ANEMOSTAT EPL-D UNLESS OTHERWISE NOTED.
 3. ALL RETURN AIR GRILLES SHALL BE BASED ON ANEMOSTAT SAC3LD-D WITH CURVED BLADES WITH PERFORATED LIGHT SHIELD.
 4. ALL EXHAUST AIR GRILLES SHALL BE BASED ON ANEMOSTAT S30HD.

ELECTRIC DUCT HEATER SCHEDULE

UNIT NO.	ELECTRICAL DATA				KW	WIDTH	HEIGHT	LBS.	REMARKS
	VOLTS	PHASE	HZ	AMPS					
EDH-1	208	3	60	22.2	8	14	14	-	GREENHECK MODEL# IDHC SLIP-IN

- NOTES:**
1. PROVIDE WITH OAF FAN INTERLOCK
 2. PROVIDE WITH DISCONNECT SWITCH
 3. COORDINATE CONTROL SIDE LEFT VS. RIGHT IN FIELD.
 4. PROVIDE WITH DUCT MOUNTED THERMOSTAT AND SCR HEATER CONTROL.
 5. COORDINATE ANY OTHER REQUIRED ACCESSORIES WITH MANUFACTURER.
 6. SIZES ARE CLEAR INSIDE DUCT DIMENSIONS. COORDINATE EXACT DIMENSIONS WITH SHEET METAL CONTRACTOR.
 7. PROVIDE ALL CONTROL WIRING AND CONTROLS TO RENDER UNIT FULLY OPERATIONAL.

BRANCH DUCT SCHEDULE

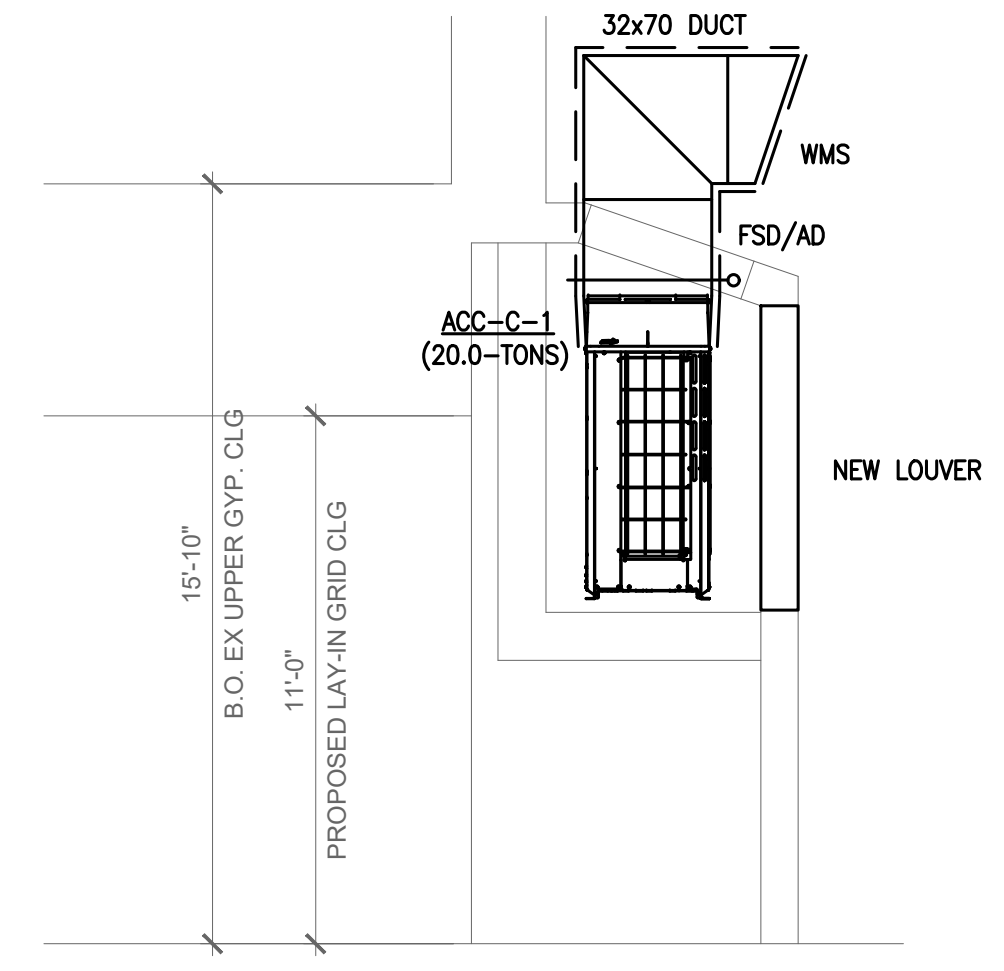
DUCT SIZE	CFM RANGE
12X6	UP TO 175
14X6	180-245
16X6, 12X8	250-285
18X6	290-335
20X6, 14X8	340-375
16X8	380-435
18X8, 14X10	440-515
20X8, 16X10	520-585
22X8	590-645
24X8, 18X10	650-715
26X8, 20X10	720-825
28X8, 22X10	830-895
32X8, 24X10, 20X12	900-1005

NOTE:
THIS SCHEDULE APPLIES TO BRANCH DUCTS TO INDIVIDUAL DIFFERS THAT ARE NOT SIZED ON PLANS.

FAN SCHEDULE

FAN TAG NO.	LOCATION	SERVICE	FAN DATA				MOTOR DATA					DIMENSIONS (L" x W" x H")	OPERATING WEIGHT (LBS.)	MANUFACTURER	MODEL NO.
			CFM	FAN SPEED (RPM)	EXTERNAL STATIC (IN. H2O)	HP/WATTS	MOTOR SPEED (RPM)	V/PH/HZ	STARTER	HP	FLA				
TX-1	ROOF	TOILET EXH	150	1,687	0.7	0.06 HP	1,725	115/1/60	TIME CLOCK	1/10	-	22x22x13	-	GREENHECK	CUE-080-VG
DAF-1	ROOF	FRESH AIR	1,400	1,750	0.9	0.50 HP	1,750	115/1/60	TIME CLOCK	3/4	-	35x35x17	-	GREENHECK	AS-16-428-A
GX-1	ROOF	GEN EXH	1,390	1,615	1	0.39 HP	1,725	115/1/60	TIME CLDCK	1/2	-	25x25x28	-	GREENHECK	CUE-120-VG
GX-2	ROOF	GEN EXH	280	1,669	1	0.12 HP	1,725	115/1/60	TIME CLOCK	1/4	-	25x25x28	-	GREENHECK	CUE-100HP-VG

- GENERAL NOTES:**
1. ALL FANS SHALL BE PROVIDED WITH STARTER TYPE INDICATED.
 2. ALL FANS SHALL BE PROVIDED WITH DISCONNECT SWITCH.
 3. PROVIDED WITH ALUMINUM GRILLE WITH WHITE ENAMEL FINISH.
 4. ALL FANS SHALL BE SUSPENDED FROM BUILDING STRUCTURE VIA SPRING ISOLATORS.
 5. DAF-1 AND EX-1 TO BE MOUNTED VERTICALLY. COORDINATE STRUCTURAL REQUIREMENTS AND PROVIDE MANUFACTURER'S REQUIRED ACCESSORIES FOR VERTICAL MOUNTING.
- TX-1/GX-1/GX-2 NOTES:**
1. EXHAUST FANS SHALL BE PROVIDED WITH BACKDRAFT DAMPERS. FINAL LOCATIONS TO BE DETERMINED IN FIELD PRIOR TO BID.

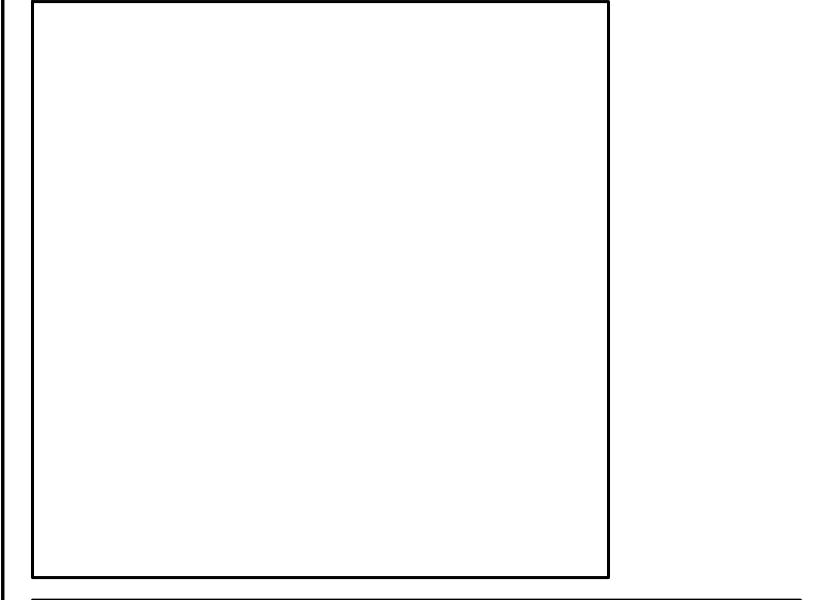


A Section View - 'A'
SCALE: 1/4" = 1'-0"

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STRUCTURAL ENGINEER:

REV:	ISSUE:	DATE:
00	ISSUED FOR REVIEW	05 / 04 / 22
01	ISSUED FOR LPC & DOB REVIEW & BID	05 / 16 / 22

PROJECT:
VETERINARY MEDICAL OFFICE
428 COLUMBUS AVE
NEW YORK, NY 10024

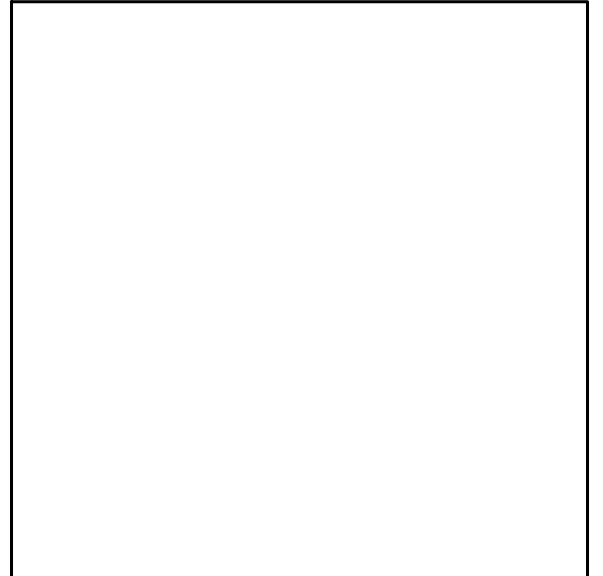
BUILDING OWNER:

DRAWING:
MECHANICAL SCHEDULES

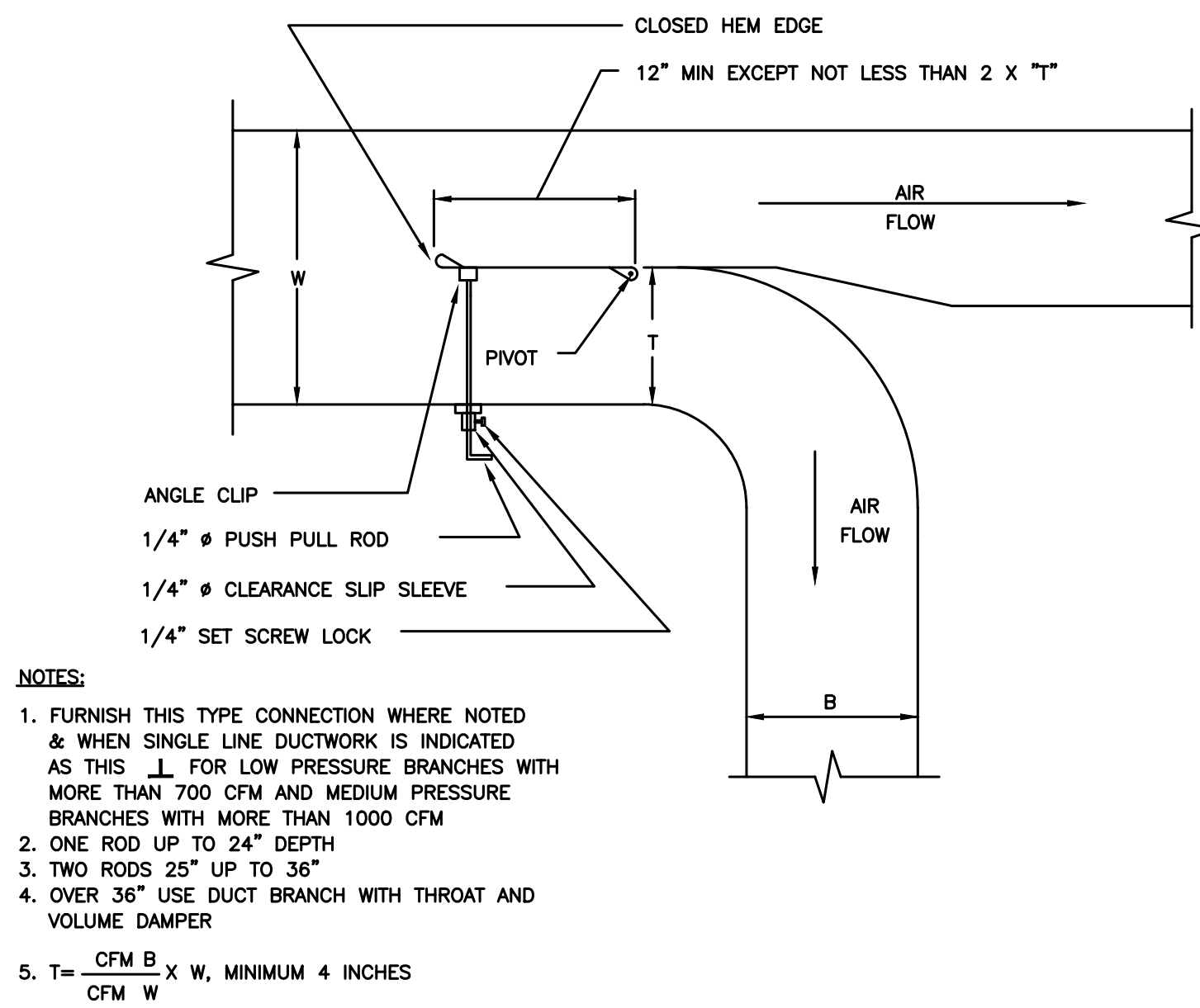
SEAL & SIGNATURE DATE: 05/04/2022
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CHECK BY: RT
DWG No:
M-301.00
SHEET No: 07 OF 10

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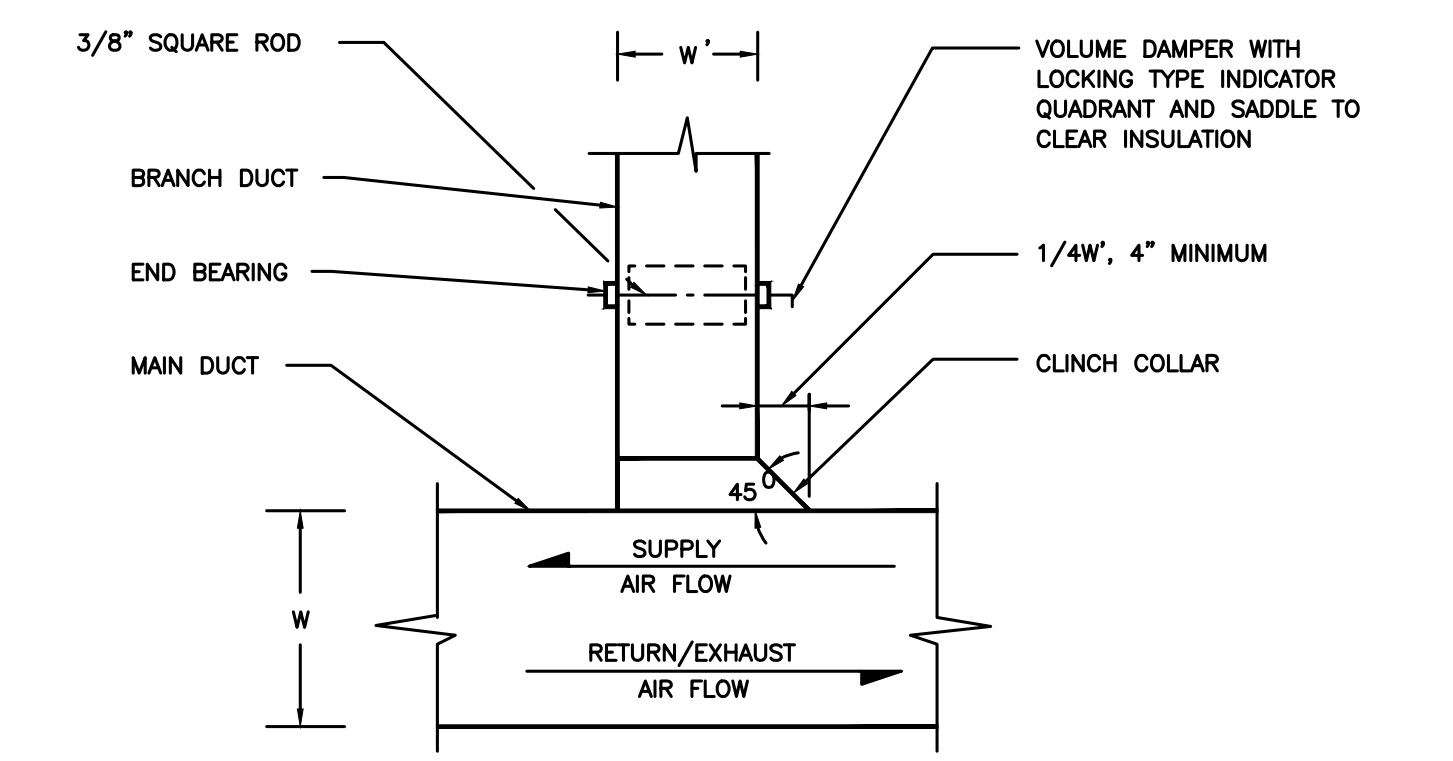
JEE WON KIM, R.A.



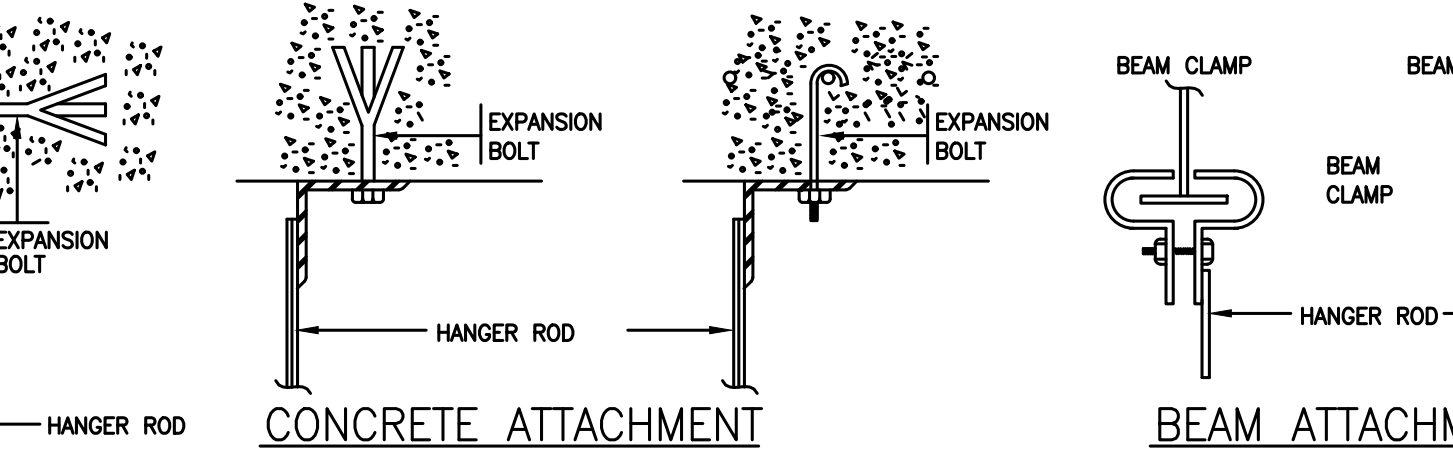
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00	ISSUED FOR REVIEW	05 / 04 / 22
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RECTANGULAR DUCT BRANCH WITH THROAT & SPLITTER DAMPER



RECTANGULAR DUCT ANGULAR TAP WITH VOLUME DAMPER

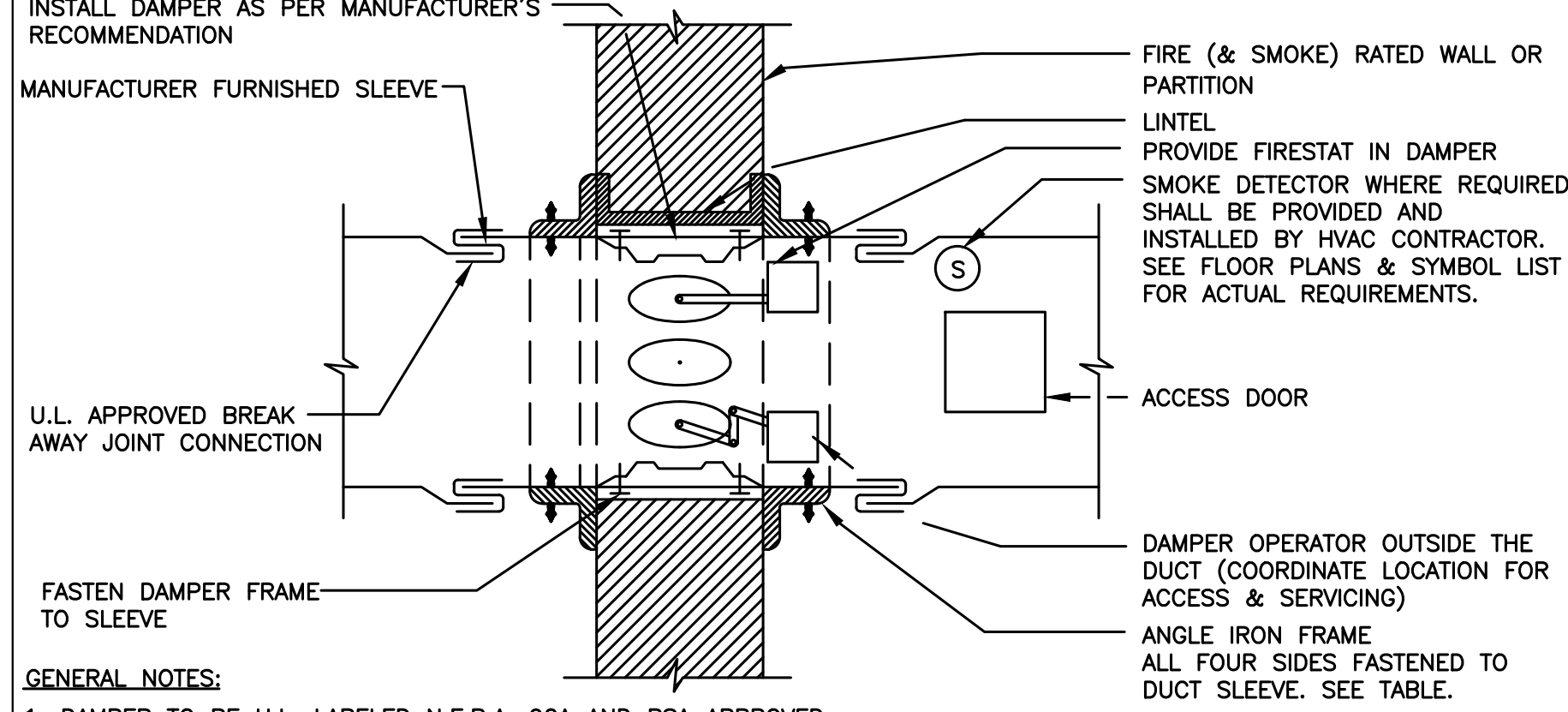


NOTES:

- ALL DUCT TO BE HUNG FROM BUILDING CONSTRUCTION NOT TO BE SUPPORTED FROM HUNG CEILING.
- WHEN DUCT AREA EXCEEDS 8 SQ.FT. ANGLE STIFFENERS REQUIRED AROUND CIRCUMFERENCE EVERY 4'-0".
- FOR DUCT OVER 48" WIDE HANGERS SHALL TURN UNDER DUCT AT LEAST 2" AND SHALL BE FASTENED TO THE BOTTOM AS WELL AS TO THE SIDES OF THE DUCT.
- FOR DUCTS WITH A CROSS SECTIONAL AREA OF 4 SQ.FT. OR LESS, HANGERS SHALL BE NO MORE THAN 8 FT. APART. FOR DUCTS WITH A CROSS SECTIONAL AREA OF MORE THAN 4 SQ.FT. BUT NOT OVER 8 SQ.FT. HANGERS SHALL BE NOT MORE THAN 8 FT. A PART, AND FOR DUCTS WITH A CROSS SECTIONAL AREA OF MORE THAN 8 SQ.FT. HANGERS SHALL BE NOT MORE THAN 4 FT. A PART. THE DISTANCES BETWEEN SHALL BE MEASURED LINEARLY ALONG THE DUCT.

LONGEST DIMENSION OF DUCT	ROUND HANGERS	MAX SPACING SEE NOTE #4	STRAP HANGERS	TRAPEZE SHELF ANGLES
UP TO 18"	8" GA WIRE	8'-0"	1"x1/8"	1"x1"x 1/8"
19" TO 30"	1/4" ROD	8'-0"	1"x1/8"	1"x1"x 1/8"
31" TO 42"	1/4" ROD	8'-0"	1"x1/8" GA.	1 1/2"x 1 1/2"x 1/8"
43" TO 60"	3/8" ROD	4'-0"	---	1 1/2"x 1 1/2"x 1/8"
61" TO 84"	3/8" ROD	4'-0"	---	2"x2"x 1/8"
85" TO 96"	3/8" ROD	4'-0"	---	2"x2"x 3/16"
OVER 97"	3/8" ROD	4'-0"	---	2"x2"x 1/4"

DUCT SUPPORT DETAIL



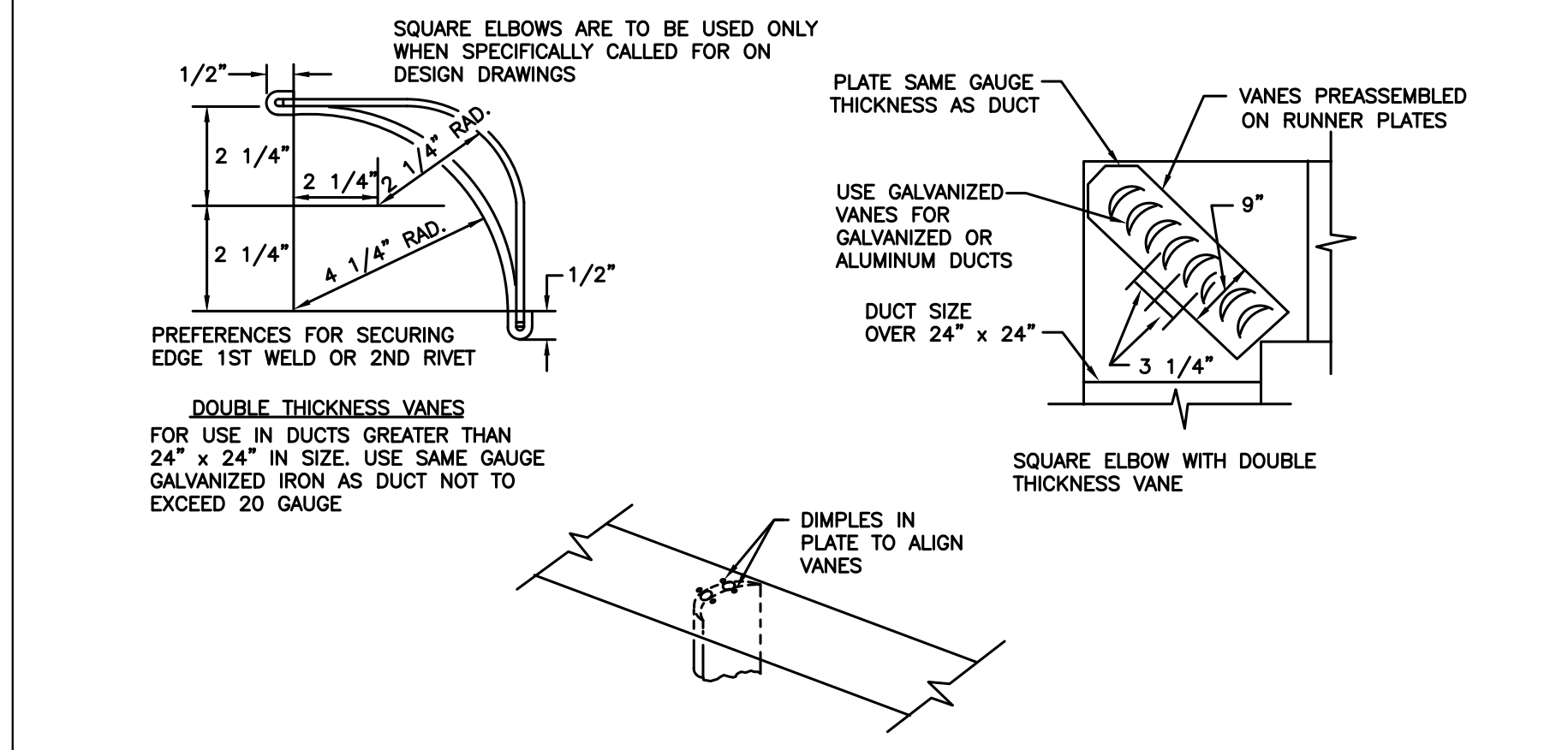
GENERAL NOTES:

- DAMPER TO BE U.L. LABELED N.F.P.A. 90A AND BSA APPROVED
- N.F.P.A. APPROVED INSTALLATION DETAILS TO BE PART OF SUBMISSION OF COMBINATION FIRE & SMOKE DAMPER FOR APPROVAL, WHICH SHALL MEET N.F.P.A. STANDARD 90A AND BSA APPROVED.
- DETAILS SHOWN ARE FOR COMBINATION FIRE AND SMOKE DAMPERS IN HORIZONTAL DUCTWORK. FOR DAMPERS IN VERTICAL DUCTWORK, DETAIL IS SIMILAR.
- ACCESS DOOR IS SHOWN IN SIDE OF DUCT.
- DETAIL FOR SMOKE DAMPER SHALL BE SIMILAR TO COMBINATION DAMPER EXCEPT DELETE FUSIBLE LINK IN DAMPER.
- THIS DETAIL IS FOR GUIDE ONLY. INSTALL DAMPER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

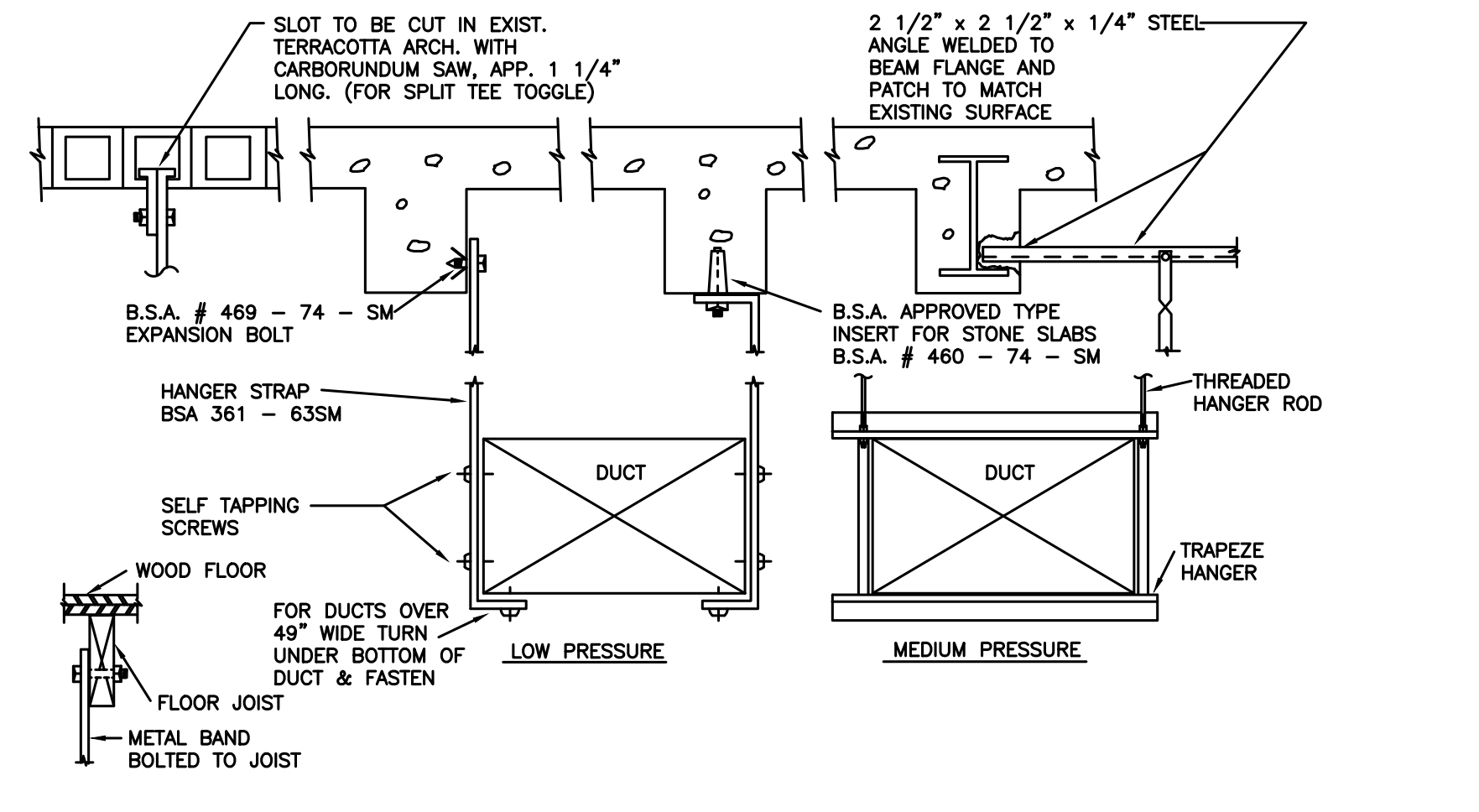
WALL OPENING	ANGLE SIZE
UP TO 54"	1 1/2"x1 1/2"x1/8"
55" TO 84"	3"x2"x 3/16"
85" TO 120"	3"x2"x 3/16"

NOTE: RETAINING ANGLES MUST LAP STRUCTURAL OPENING 1" MIN. AND COVER CORNERS OF OPENINGS

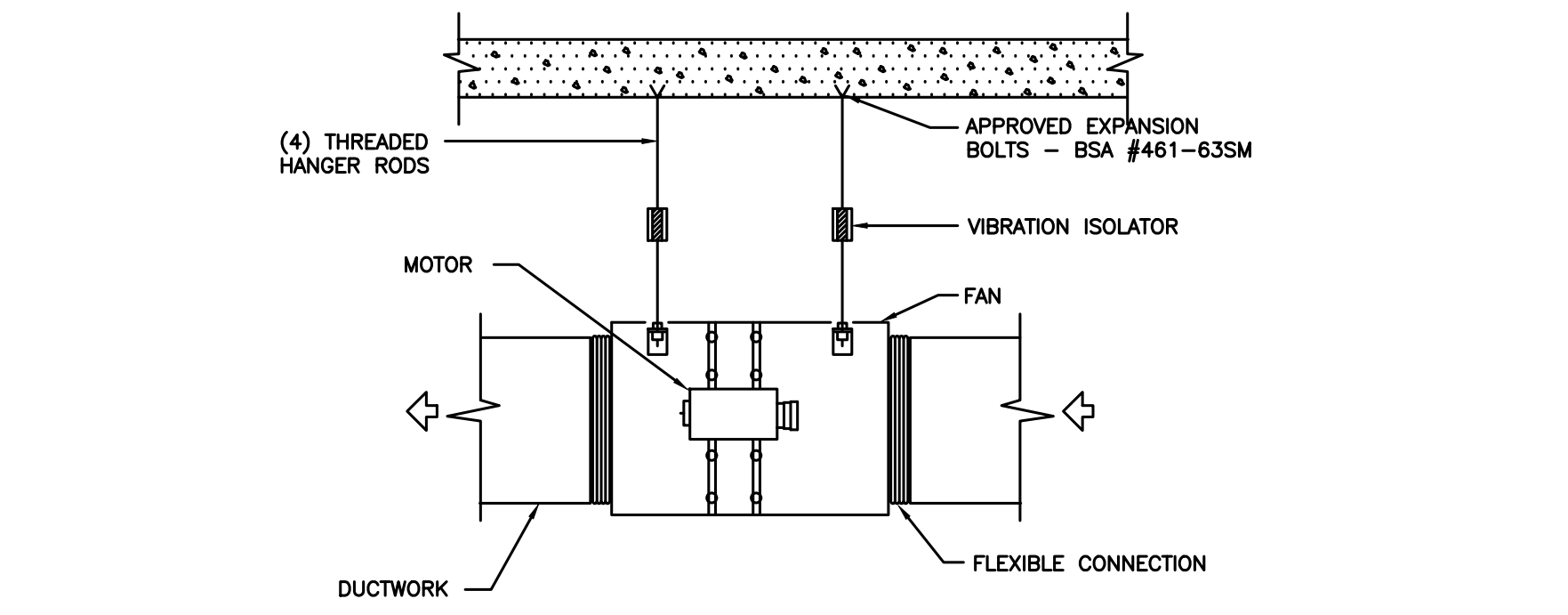
COMBINATION FIRE AND SMOKE DAMPER WITH FIRESTAT



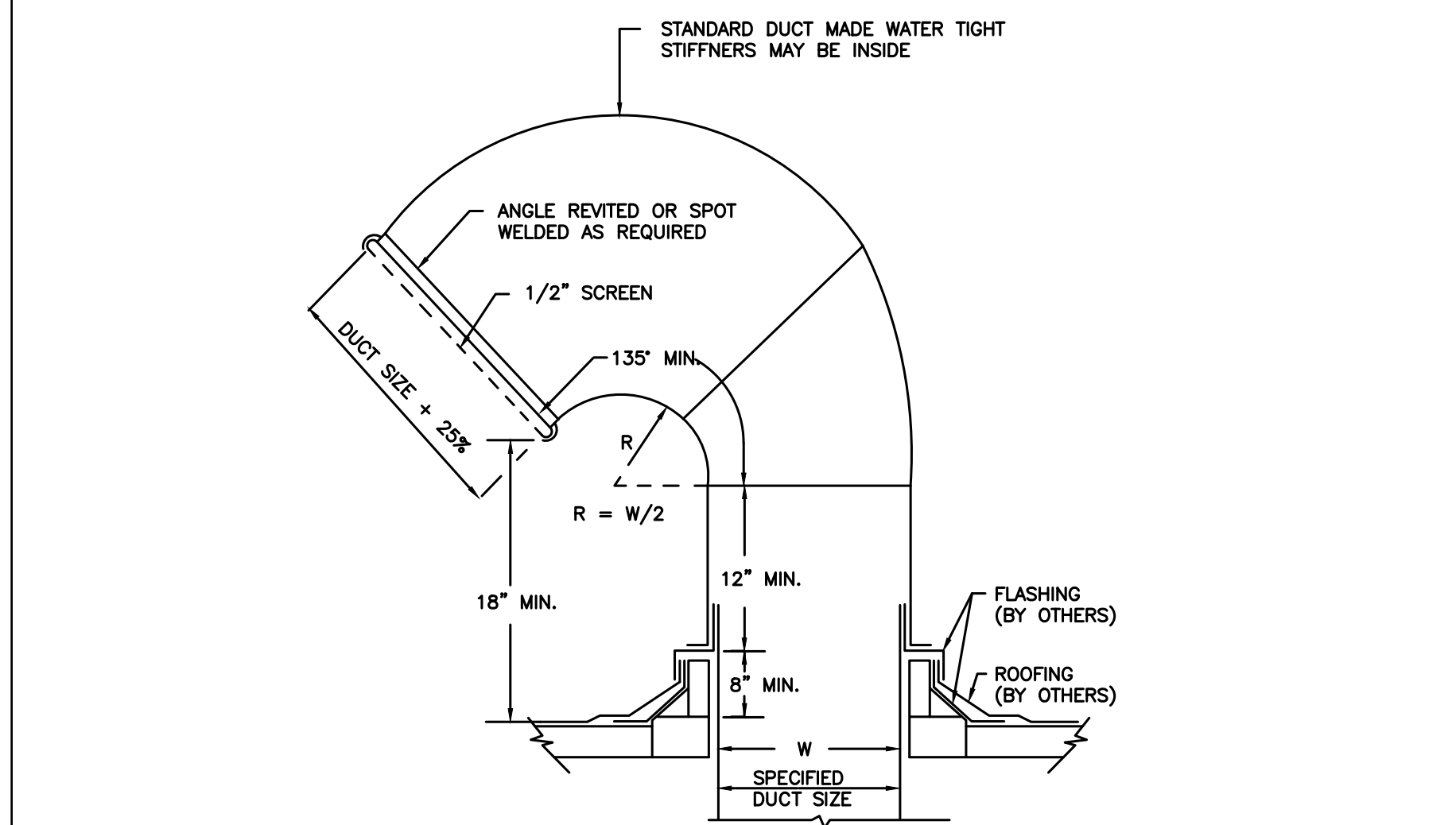
TURNING VANE DETAILS



DUCT SUPPORT DETAILS



INLINE FAN SUPPORT DETAIL



GOOSENECK DETAIL

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1. GENERAL

A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.

B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.

C. INVESTIGATE EACH SPACE THROUGH WITH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM BUILDING OWNER AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.

D. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.

E. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 8000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.

F. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

G. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL.

H. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.

I. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.

J. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.

K. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.

L. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL.

M. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.

N. ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE. ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

O. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

P. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.

Q. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

R. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

S. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.

T. ALL EQUIPMENT SHALL HAVE AN UL AND/OR BSA NUMBER. THIS INFORMATION MUST BE INCLUDED IN THE SUBMITTAL PACKAGE.

U. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

V. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.

W. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

X. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.

Y. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.

Z. DEFINITIONS:

- 1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
- 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
- 5) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
- 6) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
- 7) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

2. SCOPE OF WORK

A. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.

B. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OF ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

D. CONTROLLED INSPECTION BY A LICENSED PROFESSIONAL ENGINEER TO BE HIRED BY THIS CONTRACTOR.

E. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT PROVIDE COMPLETE SET OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, DUCTWORK, PIPING AND CONTROL SYSTEMS INDICATING CAPACITY DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

3. SHOP DRAWINGS

A. INDICATE ON EACH SUBMISSION: PROJECT NAME AND LOCATION, ARCHITECT AND ENGINEER, ITEM IDENTIFICATION AND APPROVAL STAMP OF PRIME CONTRACTOR.

B. SUBMISSIONS:

1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.

2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.

C. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

- 1) DUCTWORK LAYOUT AND SHEET METAL DESIGNS.
- 2) AIR OUTLETS.
- 3) AIR BALANCE REPORT.
- 4) AC UNITS AND FANS.
- 5) PIPING LAYOUT.
- 6) OPERATING SEQUENCES.
- 7) VIBRATION ISOLATION.
- 8) ELECTRIC DAMPER MOTORS.
- 9) AUTOMATIC CONTROL SYSTEMS AND DEVICES.
- 10) PUMPS.
- 11) PRECIPITATOR
- 12) EXHAUST FANS

4. AS-BUILTS AND EQUIPMENT OPERATION INSTRUCTIONS

A. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS, EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE-RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.

D. REPRODUCIBLE "AS-BUILT" DRAWINGS INDICATING AS INSTALLED CONDITIONS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

5. SHEET METAL WORK

A. EXCEPT AS OTHERWISE SHOWN OR NOTED, ALL DUCTWORK AND OTHER SHEET METAL WORK SHALL BE GALVANIZED SHEET STEEL AND SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. DUCT CONSTRUCTION STANDARDS, PRESSURE CLASSIFICATION 2 IN. W.G.

B. VOLUME DAMPERS: GALVANIZED STEEL. PER SMACNA "LOW VELOCITY MANUAL," EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT, WITH LEVER AND LOCKSCREW AT OTHER END. FOR INSULATED DUCTS, QUADRANTS MOUNTED ON COLLAR TO CLEAR INSULATION. INSTALL WITH LEVERS ACCESSIBLE.

C. ACCESS DOORS: INSULATED OR UNINSULATED, SAME AS DUCT.

1) PROVIDE MINIMUM 20 IN. X 14 IN. ON MAIN DUCTS, AND 12 IN. X 6 IN. ON BRANCH DUCTS, UNLESS OTHERWISE APPROVED, AT FIRE DAMPERS, AND AT ALL DUCT ACCESSORIES SUCH AS HUMIDIFIERS, DUCT SMOKE DETECTORS, AUTO DAMPERS, AND LOUVERS.

2) ALL ACCESS DOORS TO BE HINGED, WITH LATCH SIMILAR TO VENTLOCK NO. 100.

D. FLEXIBLE CONNECTIONS: NEOPRENE-COATED GLASS FABRIC, 30 OZ PER SQ YD WITH SEWED AND CEMENTED SEAMS; SIMILAR TO VENT FABRICS. PROVIDE WITH METAL COLLARS. ALLOW MINIMUM MOVEMENT OF 1 IN.

E. TURNING VANES: GALVANIZED STEEL SMALL DOUBLE-THICKNESS VANES WITH 2 IN. INSIDE RADIUS.

F. FIRE DAMPERS: UL LISTED, GALVANIZED STEEL CONSTRUCTION, MULTIBLADED TYPE, SPRING LOADED, EQUIPPED WITH FUSIBLE LINK, CONFORMING TO NFPA STANDARD 90A AND APPROVED BY NEW YORK CITY BOARD OF STANDARDS AND APPEALS FOR NYC CAL-100-65-5M. SIMILAR TO AIR BALANCE MODEL 319-P, RATED AS REQUIRED. SEE INSTALLATION ON DRAWING.

G. ALL DUCT DIMENSIONS INDICATED ON PLANS ARE INSIDE CLEAR DIMENSIONS.

H. AUTOMATIC DAMPERS: COMPLETE WITH LINKAGE AND ELECTRIC OPERATOR. OPPOSED BLADE DAMPER OR GALVANIZED STEEL MIN. 4 IN., MAX. 8 IN. WIDE WITH COMPRESSIBLE EDGE SEALS TO PREVENT LEAKAGE. FACTORY-ASSEMBLE STEEL LINKAGE AND SHAFT WITH NYLON OR OIL-IMPREGNATED BRONZE BEARINGS. MOTOR WITH SUFFICIENT POWER TO LIMIT LEAKAGE TO 10 CFM PER SQ FT. LINKAGE TO WITHSTAND LOAD EQUAL TO TWICE MAXIMUM OPERATING FORCE WITHOUT DEFLECTION. DAMPER MOUNTED IN WELDED STEEL CHANNEL FRAME.

I. EXTERIOR LOUVERS: 4 IN. WIDE STATIONARY LOUVER, EXTRUDED ALUMINUM, 0.081 IN. WALL THICKNESS, 6063T5 ALLOY BLADES AND FRAME WITH STAINLESS STEEL OR ALUMINUM FASTENERS. LOUVER TO INCORPORATE STRUCTURAL SUPPORT TO WITHSTAND WIND LOAD OF 20 LBS PER SQ FT. PROVIDE REMOVABLE 3/4 IN. X 3/4 IN. ALUMINUM BROSREEN IN AN ALUMINUM FRAME. AIR PERFORMANCE AND WATER PENETRATION LESS THAN OR EQUAL TO RUSKIN MODEL ELF-375 (TO BE APPROVED BY BUILDING MANAGEMENT).

J. ALUMINUM DUCTWORK: ALL OUTSIDE AIR, EXHAUST, AND RELIEF DUCTWORK WITHIN 5 FT OF LOUVERS SHALL BE ALUMINUM WITH SEAMS SEALED WATERTIGHT WITH ALCOA ALUMINASTIC TYPE C SEAM SEALER OR SOLDER. FITCH DUCTWORK TOWARDS LOUVER.

K. WIRE MESH SCREEN (WMS): NO. 16 USSG, 3/4 SQUARE MESH, IN 1 IN. WIDE GALVANIZED STEEL ENCLOSING FRAME. FLANGED DUCT OPENING TO RECEIVE FRAME.

L. LOW PRESSURE FLEXIBLE DUCT: SHALL BE A FACTORY FABRICATED HIGH TEMPERATURE COPOLYMER IMPREGNATED GLASS FABRIC, LOCKED TO COLD ROLLED FLAT STEEL SPIRAL. SIMILAR TO WIREMOLD 57. MAXIMUM INSTALLED LENGTH SHALL NOT EXCEED 18 IN.

M. COMBINATION FIRE AND SMOKE DAMPERS: UL LISTED, GALVANIZED STEEL CONSTRUCTION MULTI-BLADED TYPE. EQUIPPED WITH FUSIBLE LINK CONFORMING TO NFPA STANDARD 90A. SIMILAR TO RUSKIN MODEL FSD 60.

6. AIR OUTLETS

A. GENERAL:

1) MARGIN TYPES, COLORS, FINISH AND METHODS OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH ARCHITECTURAL CEILING AND WALL DETAILS AND SPECIFICATIONS.

2) FRAME TYPE SUITABLE FOR MOUNTING IN CEILING OR WALL CONSTRUCTION AS INDICATED ON ARCHITECTURAL PLANS.

3) EXACT LOCATION OF ALL AIR OUTLETS AS PER ARCHITECTURAL PLANS.

4) SUITABLE FOR OPERATION AT 20% EXCESS AND 20% LESS THAN NOTED CAPACITY FOR CONSTANT VOLUME SYSTEMS AND AT 20% EXCESS AND 60% LESS THAN NOTED CAPACITY FOR VARIABLE VOLUME SYSTEMS. MANUFACTURER RESPONSIBLE FOR EXAMINING APPLICATION OF EACH OUTLET AND GUARANTEE THAT EACH WILL PROVIDE REQUIRED NC LEVELS AND COMFORT SPACE CONDITIONS WITHOUT DRAFTS THROUGHOUT OPERATING RANGE.

5) ALL REGISTERS AND DIFFUSERS SHALL BE PROVIDED WITH OPPOSED BLADE VOLUME DAMPERS. DAMPER OPERATING LEVERS SHALL BE ACCESSIBLE AT THE FACE OF AIR OUTLETS.

B. SQUARE DIFFUSERS: DIFFUSERS SHALL BE STEEL CONSTRUCTION PAINTED WHITE SIMILAR TO ANEMOSTAT EPL-D SUITABLE FOR THE TYPE OF CEILING.

C. REGISTERS AND GRILLES:

1) RETURN AND EXHAUST REGISTERS: STEEL CONSTRUCTION WITH VOLUME DAMPER. SIMILAR TO ANEMOSTAT S30HD.

2) SUPPLY REGISTERS: ALUMINUM CONSTRUCTION ADJUSTABLE DOUBLE DEFLECTION ALUMINUM AIRFOIL LOUVERS, WITH VOLUME DAMPER. SIMILAR TO ANEMOSTAT S20. PROVIDE AIR EQUALIZING DEFLECTOR WHERE REGISTER COLLAR DUCT IS LESS THAN 2 FT LONG.

3) TRANSFER GRILLES: STEEL CONSTRUCTION WITHOUT VOLUME DAMPER. SIMILAR TO ANEMOSTAT S30HD.

7. NOISE CONTROL

A. ALL ROOM NC LEVELS SHALL BE 35 OR LESS.

B. PROVIDE SOUNDLINING FOR THE FOLLOWING DUCTWORK:

1) ALL DUCTWORK WITHIN MECHANICAL ROOMS AND NOT LESS THAN 20 FT ON EACH SIDE OF ALL FANS AND AC UNITS.

2) AIR TRANSFER DUCTS.

3) DOWNSTREAM OF ALL VARIABLE AIR VOLUME AND CONSTANT VOLUME BOXES FOR A MINIMUM OF 10 FT.

4) ALL MIXED AIR PLENUMS, EXCEPT WHERE MOISTURE CARRYOVER FROM OUTDOOR AIR LOUVER WILL OCCUR.

5) ALSO WHERE NOTED ON A DRAWING.

C. SOUNDLINING IN DUCTWORK: FIBROUS GLASS, MINIMUM 3 LB DENSITY, 1 IN. THICKNESS, MAXIMUM 0.25 K FACTOR AT 75 DEG F MEAN TEMPERATURE WITH ACRYLIC COATED FINISH FACTORY APPLIED EDGE COATING AND STENCILED IN ACCORDANCE WITH NFPA 90. FLAMESPREAD SHALL BE A MAXIMUM OF 25. LINING SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL BE TESTED IN ACCORDANCE WITH ASTM C 1071 AND ASTM G21/G22. SIMILAR TO MANVILLE PERMACOTE LINA COUSTIC.

D. ALL SOUNDLINING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, EXCEPT AS OTHERWISE NOTED.

8. TESTING AND BALANCING

A. AIR BALANCING SHALL BE ACCOMPLISHED BY ADJUSTMENT OF FANS AND BRANCH DAMPERS FOR MAJOR ADJUSTMENTS. ADJUSTMENT OF TERMINAL DAMPERS AND DEVICES SHALL BE FOR TRIM OR MINOR ADJUSTMENT ONLY. THIS SHALL BE DONE TO PERMIT THE LEAST NOISE GENERATION IN THE TERMINAL AREAS AND UTILIZE MINIMUM FAN ENERGY.

B. UPON COMPLETION OF THE INSTALLATION, THE CONTRACTOR SHALL REBALANCE ANY EXISTING PORTIONS OF AIR DISTRIBUTION SYSTEM AND WATER DISTRIBUTION SYSTEM AFFECTED BY THE RENOVATION AND ALSO BALANCE ALL NEW WORK.

C. THE CONTRACTOR SHALL PROVIDE ALL LABOR, PRESSURE GAUGES, FLOW METERS, SHEAVES, AND BELTS REQUIRED TO BALANCE SYSTEMS.

D. BALANCING REPORT SHALL BE PROVIDED ON ABC-TYPE FORMS.

E. FANS, AIR HANDLING UNITS, PUMPS, CHILLERS, HEAT EXCHANGERS AND COILS SHALL BE BALANCED TO WITHIN +5% OF THEIR DESIGN CAPACITIES. ALL OTHER AIR AND WATER QUANTITIES SHALL BE BALANCED TO WITHIN +10% OF THE DESIGN QUANTITIES.

F. BALANCING AND TESTING SHALL BE PERFORMED AND SUPERVISED BY ONE OF THE FOLLOWING INDEPENDENT FIRMS SPECIALIZING IN TESTING AND BALANCING:

1) PRECISION TESTING AND BALANCING, INC.

2) AIR CONDITIONING TEST AND BALANCING CORP.

3) CFM TESTING AND BALANCING CO.

G. THE PERFORMANCE AND CAPACITY OF ALL SYSTEMS AND EQUIPMENT TO BE DEMONSTRATED BY THE CONTRACTOR.

9. INSULATION - GENERAL REQUIREMENTS

A. ALL INSULATION MATERIALS, INCLUDING JACKETS, FACING, ADHESIVE, COATINGS, AND ACCESSORIES ARE TO BE FIRE HAZARD RATED AND LISTED BY UNDERWRITERS LABORATORIES, INC. USING STEINER TUNNEL TEST METHOD FOR FIRE HAZARD CLASSIFICATION OF BUILDING MATERIALS, STANDARD UL 723 (ASTM E-84), (ASA A2.5-1963). FLAMESPREAD: MAXIMUM 25. FUEL CONTRIBUTED AND SMOKE DEVELOPED: MAXIMUM 50. FLAMEPROOFING TREATMENTS SUBJECT TO DETERIORATION FROM MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.

B. DEFINITIONS:

1) EXPOSED: INDOOR DUCTS, PIPING OR EQUIPMENT LOCATED IN MECHANICAL EQUIPMENT ROOMS AND IN AREAS WHICH WILL BE VISIBLE WITHOUT REMOVING CEILINGS OR OPENING ACCESS PANELS.

2) CONCEALED: INDOOR DUCTS, PIPING OR EQUIPMENT WHICH IS NOT EXPOSED.

3) OUTDOOR: DUCTS, PIPING OR EQUIPMENT WHICH IS EXPOSED TO THE WEATHER.

10. DUCTWORK INSULATION

A. INSULATE ALL DUCTWORK IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

SERVICE	LOCATION	THICKNESS	MATERIAL	FINISH
SUPPLY/RETURN	CONCEALED	1"	D-1	VAPORSEAL
INTAKE	ALL	2"	D-3	VAPORSEAL
SUPPLY/RETURN	CONCEALED	1"	D-1	VAPORSEAL
SUPPLY/RETURN	EXPOSED	1"	D-2	VAPORSEAL
EXHAUST	MER EXPOSED	2"	D-3	VAPORSEAL

B. REINSULATE ALL DUCTWORK AND PIPING WHICH IS EXISTING AND DAMAGED DURING CONSTRUCTION OR SHOWN OR REQUIRED TO BE RELOCATED. INSULATE WITH SAME MATERIAL AND THICKNESS.

C. NON-INSULATED DUCTWORK:

1) WHERE SOUNDLINING IS OF MINIMUM THICKNESS SPECIFIED FOR INSULATION.

2) AIR CONDITIONING SUPPLY AIR DUCTWORK EXPOSED ON GROUND FLOOR, MEZZANINE LEVEL AND CONCOURSE LEVEL, SALES AREA ONLY.

3) AIR CONDITIONING RETURN AIR DUCTWORK EXPOSED IN AIR CONDITIONED SPACES AND INSTALLED IN HUNG CEILINGS WHERE SPACE IMMEDIATELY ABOVE AND BELOW ARE BOTH AIR CONDITIONED.

D. MATERIAL:

1) TYPE D-1: MINIMUM 1-LB DENSITY FIBERGLASS BLANKET, MAXIMUM 0.28 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FOIL-SKIRM-KRAFT FACING SIMILAR TO MANVILLE MICROLITE.

2) TYPE D-2: 3 LB. FIBERGLASS BOARD. THE MAXIMUM K FACTOR SHALL BE 0.23 AT 75 DEG F MEAN TEMPERATURE WITH A MINIMUM DENSITY OF 3 LB. THE INSULATION SHALL BE PROVIDED WITH A FACTORY-APPLIED ALL PURPOSE OR ALL SERVICE FACING. THE INSULATION SHALL BE EQUAL TO MANVILLE TYPE 814 SPIN-GLAS AP.

3) TYPE D-3: MINIMUM 6 LB FIBERGLASS BOARD. MAXIMUM 0.22 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY APPLIED ALL PURPOSE OR ALL SERVICE FACING. SIMILAR TO MANVILLE 817 SPIN-GLAS AP.

E. INSTALLATION:

1) FIBERGLASS BLANKET: 2 IN. LAP STRIPS AT ALL SEAMS. SECURE BOTTOM OF ALL DUCTS OVER 24 IN. WIDE WITH MIN. 2 ROWS OF WELD PINS 12 IN. ON CENTER. SECURE ALL SEAMS WITH FOIL VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE.

2) FIBERGLASS BOARD: SEAL JOINTS AND BREAKS IN FACING WITH 3 IN. WIDE TAPE TO MATCH FACING AND ADHERE WITH VAPOR SEAL ADHESIVE. APPLY 5 IN. WIDE TAPE AT CORNERS, WELD PINS ON TOP, SIDES AND BOTTOM.

11. PIPING INSULATION

A. INSULATE ALL PIPING IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

INSULATION SCHEDULE - PIPING

SERVICE	SIZE	THICKNESS	MATERIAL	FINISH
LOW TEMP TO 100 DEG F	4" UP TO 4"	1"	P-1	VAPORSEAL
REFRIGERANT LIQUID & SUCTION LINES	ALL	1/2"	P-6	VAPORSEAL

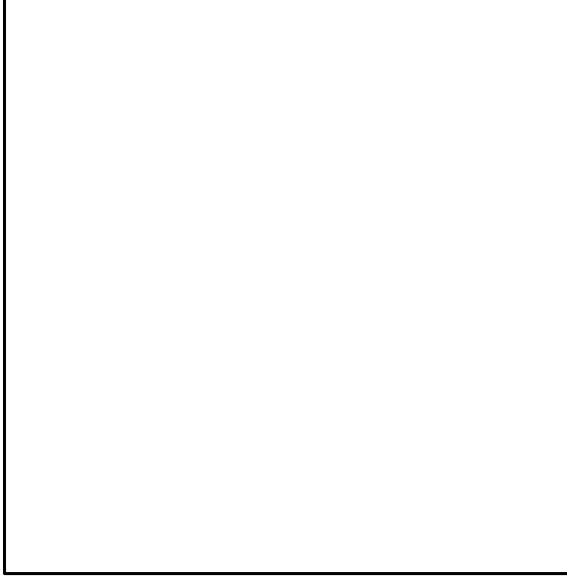
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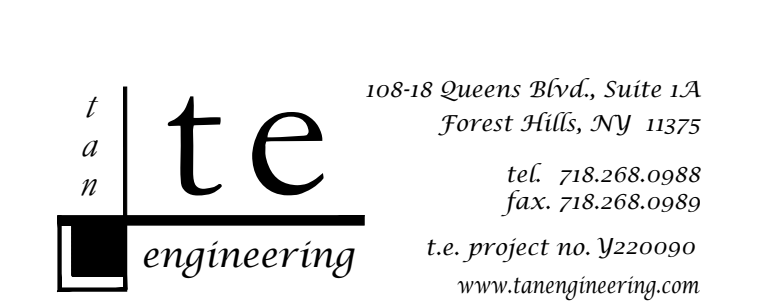
Jee Won Kim, R.A.
N.Y. 027624

NYC DOB APPROVAL STAMP



DOB B-SCAN#: Mxxxxxxx-11

MEP ENGINEER:



STRUCTURAL ENGINEER:

REV:	ISSUE:	DATE:
00	ISSUED FOR REVIEW	05 / 04 / 22
01	ISSUED FOR LPC & DOB REVIEW & BID	05 / 16 / 22

PROJECT:

VETERINARY MEDICAL OFFICE

428 COLUMBUS AVE
NEW YORK, NY 10024

BUILDING OWNER:

DRAWING:

MECHANICAL SPECIFICATIONS I

SEAL & SIGNATURE

DATE:	05/04/2022
PROJECT No:	Y220090
DRAWN BY:	MM
CHECK BY:	RT
DWG No:	
M-501.00	
SHEET No:	09 OF 10

JEE WON KIM, R.A.

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

B. PIPING, VALVES AND FITTINGS TO BE INSULATED:

1) LOW TEMPERATURE PIPING SYSTEMS – 40 TO 100 DEG F INCLUDING:

A. CONDENSATE DRAIN PIPING.

2) LOW TEMPERATURE HOT PIPING SYSTEMS – 100 TO 250 DEG F INCLUDING:

A. LOW PRESSURE CONDENSATE RETURN, EXCEPT STEAM TRAPS AND TRAP ASSEMBLY AND RADIATION RUNOUTS CONCEALED IN RADIATION ENCLOSURES.

B. PUMPED CONDENSATE DISCHARGE.

C. MATERIAL:

1) TYPE P-1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.23 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FIRE-RETARDANT FOIL-SKRIM-KRAFT FACING. ALL SERVICE JACKET. SIMILAR TO OWENS-CORNING 650 ASJ.

2) TYPE P-3: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS FITTING, MAXIMUM 0.23 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO EPOLUX HAMFAB MOLDED FITTINGS.

3) TYPE P-4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.28 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO MANVILLE HI-LO TEMP INSULATION INSERTS.

4) TYPE P-6: MINIMUM 6 LB MOLDED FOAMED PLASTIC. MAXIMUM 0.27 K-FACTOR AT 75 DEG F MEAN TEMPERATURE. MAXIMUM 0.17 PERMEANCE. SIMILAR TO ARMSTRONG ARMAFLEX II.

D. FINISH:

1) TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.

2) TYPE F-2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS, POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO FOSTER TITE-FIT, UL LABEL.

3) TYPE F-4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN. WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.

4) TYPE F-6: WHITE FINISHING AND INSULATING CEMENT APPLIED OVER HEXAGONAL WIRE MESH. CEMENT SIMILAR TO KEENE SUPERSLUCK.

E. OUTDOOR PIPING:

1) FOR ALL PIPING, FITTINGS AND VALVES LOCATED OUTDOORS, INCREASE SCHEDULED INSULATION THICKNESS BY A MINIMUM OF 1 IN. AND PROVIDE F-4 FINISH. PROVIDE VAPORSEAL ON ALL OUTDOOR PIPES, VALVES AND FITTINGS SUBJECT TO CONDENSATION.

F. INSTALLATION:

1) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.

2) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.

3) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION.

4) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.

12. VIBRATION ISOLATION

A. GENERAL:

1) PROVIDE ISOLATION FOR EQUIPMENT, PIPING AND DUCTWORK.

2) INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

3) PROVIDE LEVELING DEVICES AND APPROVED RESILIENT RESTRAINING DEVICES AS REQUIRED TO LIMIT EQUIPMENT AND PIPING MOTION IN EXCESS OF 1/4 IN.

4) ACCEPTABLE MANUFACTURERS:

A. MASON INDUSTRIES, INC.

B. VIBRATION ELIMINATOR CO.

C. KORFUND DYNAMICS CORP.

B. CEILING-HUNG FANS AND EQUIPMENT:

1) PROVIDE SPRING HANGER ROD ISOLATORS. STEEL COMPRESSION SPRING AND NEOPRENE SOUND PAD WITHIN A STEEL RETAINER BOX. SIMILAR TO MASON TYPE PCHS.

2) 1 IN. MINIMUM STATIC DEFLECTION. 1/2 IN. MINIMUM RESERVE DEFLECTION. FACTORY-PRELOADED TO 75% OF RATED LOAD.

3) PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE EQUIPMENT OR STRUCTURE CANNOT SUPPORT POINT LOADS.

C. FLOOR MOUNTED EQUIPMENT HAVING INTERNAL ISOLATION:

1) PROVIDE 5/16 IN.-THICK NEOPRENE ACOUSTICAL BASE PADS OF RIBBED OR WAFFLE CONSTRUCTION. SIMILAR TO MASON TYPE W.

2) 50 PSI MAXIMUM LOADING. PROVIDE STEEL BEARING PLATE TO DISTRIBUTE LOAD WHERE REQUIRED.

D. FLOOR-MOUNTED EQUIPMENT REQUIRING EXTERNAL VIBRATION ISOLATION:

1) PROVIDE BUILT-IN RESILIENT VERTICAL LIMIT STOPS. PROVIDE TWO LAYERS OF 1/4 IN. NEOPRENE BASE PAD SEPARATED BY 1/16 IN. SHEET STEEL. TAPPED HOLES SHALL BE IN TOP PLATE FOR BOLTING TO EQUIPMENT. ISOLATORS SHALL BE CAPABLE OF SUPPORTING EQUIPMENT AT A FIXED ELEVATION DURING ISOLATION.

2) 1 IN. MINIMUM STATIC DEFLECTION.

3) CORROSION RESISTANT WHEN EXPOSED TO WEATHER.

4) PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE EQUIPMENT OR STRUCTURE CANNOT SUPPORT POINT LOADS.

13. KITCHEN EXHAUST SYSTEM

A. KITCHEN HOOD EXHAUST DUCT INCLUDING FAN DISCHARGE TO ATMOSPHERE SHALL BE PROVIDED AS FOLLOWS:

1) TYPE I HOOD

A. MINIMUM NO. 16 GAGE STEEL FOR DUCTS WITH 155 SQ INCHES OF CROSS SECTIONAL AREA OR LESS.

B. MINIMUM NO. 14 GAGE STEEL FOR DUCTS OVER 155 SQ INCHES BUT LESS THAN 200 SQ INCHES OF CROSS SECTIONAL AREA.

C. MINIMUM NO. 12 GAGE STEEL FOR DUCTS OVER 200 SQ INCHES OF CROSS SECTIONAL AREA.

D. DUCT SYSTEMS SHALL BE INSTALLED TO SLOPE NOT LESS THAN 1/4 UNIT VERTICAL IN 12 UNITS HORIZONTAL (2% SLOPE) TOWARD HOOD OR AN APPROVED GREASE RESERVOIR.

2) TYPE II HOOD

A. MINIMUM NO. 16 GAGE FOR GALVANIZED SHEET DUCT

B. DUCT SHALL BE CONSTRUCTED OF RIGID METALLIC MATERIALS.

3) ALL SEAMS, JOINTS AND PENETRATIONS SHALL BE WATER TIGHT CONTINUOUS EXTERNAL ARC WELDED, EXCEPT WHERE THE DUCT STUB COLLAR OF THE HOOD CONNECTS TO EXHAUST DUCT. CONNECTION TO THE HOOD SHALL BE CONTINUOUS WATER TIGHT EXTERNAL ARC WELDED OR IN ACCORDANCE WITH NFPA 96, 1984.

4) ANGLE REINFORCING SHALL BE MINIMUM 1-1/2 X 1-1/2 X 3/8 INCH AT MAXIMUM 4FT ON CENTERS AND IN ACCORDANCE WITH SMACNA RECTANGULAR INDUSTRIAL DUCT CONSTRUCTION STANDARDS.

5) CLEANOUT DOORS SHALL BE PROVIDED ON HORIZONTAL DUCTS AND SHALL BE MOUNTED MAXIMUM 12 FT APART AND AT EACH CHANGE OF DIRECTION. CLEANOUT DOORS ON HORIZONTAL DUCT SHALL BE MOUNTED ON SIDE OF DUCT. BOTTOM EDGE SHALL BE NOT LESS THAN 1 INCH ABOVE THE BOTTOM OF DUCT. CLEANOUT DOORS AT VERTICAL DUCTS SHALL BE MOUNTED AT BASE. DOOR AND FRAME SHALL BE SAME GAUGE AS DUCT. HINGES SHALL BE VENTLOCK NO. 260, EXTRA HEAVY ZINC PLATED. LATCHES SHALL BE VENTLOCK NO. 140, CAST ZINC. GASKETS SHALL BE BETWEEN DOOR AND FRAME. GASKETS SHALL BE 1/8 INCH DOUBLE THICKNESS RATED FOR 2000 DEG F. CLEANOUT DOOR SIZE SHALL BE MAXIMUM 24 INCH X 24 INCH AND MINIMUM SHALL BE 24 INCH ONE SIDE, AND OTHER SIDE SHALL BE 2 INCH LESS THAT DUCT HEIGHT.

B. ALL KITCHEN HOOD EXHAUST DUCTWORK SHALL BE INSULATED AS FOLLOWS:

1) INSULATION: PROVIDE 2 HOUR FIRE RATING AND NOT LESS THAN 2 LAYERS OF FIRE WRAP. INSULATION SHALL BE INSTALLED IN TWO EQUAL THICKNESS LAYERS WITH STAGGERED JOINTS OR SEAMS. THE INSULATION SHALL BE ASBESTOS FREE AND BE SIMILAR TO MANVILLE THERMO-12.

2) THERMAL CERAMICS DUCT WRAP SHALL BE INSTALLED DIRECTLY ONTO THE DUCT AND APPLIED FROM THE HOOD CONNECTION TO THE CONNECTION TO THE FAN. THERMAL CERAMICS DUCT ENCLOSURE SYSTEM SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND UL LISTINGS.

3) FINISH: WHITE FINISHING AND INSULATING CEMENT. ONE (1) COAT SHALL BE APPLIED OVER HEXAGONAL WIRE MESH. THE CEMENT SHALL BE SIMILAR TO KEENE SUPERSLUCK.

C. KITCHEN EXHAUST FAN: FLOOR MOUNTED UTILITY FAN OF SPUN ALUMINUM CONSTRUCTION HORIZONTAL DISCHARGE CONFIGURATION. FAN WHEELS, ADJUSTABLE BELT DRIVE, MOTOR OUT OF AIR STREAM WITH FORCED MOTOR COOLING AND INTERNAL VIBRATION ISOLATED FAN ASSEMBLIES. FURNISH WITH 6 IN. HIGH CONCRETE PAD AND DISCONNECT SWITCH. SEE CAPTVAIRE DRAWINGS.

14. PIPING – GENERAL REQUIREMENTS

A. COMPLETE WITH: PIPE, FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDE, SLEEVES, AND ACCESSORIES.

B. ALL ITEMS SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS:

1) AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).

2) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).

3) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).

4) MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS).

C. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE. REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.

D. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.

E. PIPE SUPPORTS:

1) PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.

2) HORIZONTAL PIPING TO BE SUPPORTED BY FORGED STEEL ADJUSTABLE CLEVIS TYPE HANGER. MAXIMUM SPACING AS FOLLOWS:

A. STEEL 1 IN. AND SMALLER: 7 FT.

B. STEEL 1-1/4 IN. AND LARGER: 10 FT.

C. COPPER 3 IN. AND SMALLER: 7 FT.

D. ADDITIONAL SUPPORTS AT CHANGES IN DIRECTION, RUNOUTS, AND CONCENTRATED LOADS DUE TO VALVES, ETC.

3) VERTICAL PIPING:

A. BASE ELBOW SUPPORT WITH BEARING PLATE ON STRUCTURAL SUPPORT.

B. GUIDES AT EVERY SECOND FLOOR (SPACING NOT TO EXCEED 25 FT).

C. TOP SUPPORT HANGER OR SADDLE IN HORIZONTAL CONNECTION WITH PROVISIONS FOR EXPANSION.

D. INTERMEDIATE STEEL RISER CLAMP SUPPORT BOLTED AND WELDED TO PIPE BEARING ON STRUCTURAL STEEL OR BEARING PLATE AT FLOOR.

15. CONDENSATE DRAIN PIPING

A. PIPE: ASTM B88, HARD DRAWN COPPER TUBING TYPE "L".

B. FITTINGS: SOLDERED JOINT FITTINGS, 95/5 SOLDER.

C. PITCH, EXCEPT AS NOTED:

1) 1 IN. IN 4 FT PREFERRED.

2) 1 IN. IN 8 FT MINIMUM.

D. SWING CHECK VALVES: AT CONDENSATE PUMP DISCHARGE. 300 LB WOG, BRONZE BODY SOLDER ENDS, REGRIND BRONZE DISC TO BE USED WITH COPPER TUBING. JENKINS FIG. 1222.

16. MOTORS:

A. MOTORS (UNDER HVAC WORK): IN ACCORDANCE WITH NEMA, IEEE AND ANSI C50 STANDARDS:

1) STANDARD EFFICIENCY UNLESS OTHERWISE NOTED.

2) 1.15 SERVICE FACTOR.

3) SQUIRREL CAGE INDUCTION, OPEN DRIPPROOF TYPE, 1750 RPM, NEMA TYPE B INSULATION CLASS, CONTINUOUS DUTY, EXCEPT AS NOTED.

17. MOTOR CONTROLLERS

A. PROVIDED BY HVAC CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.

B. NEMA ENCLOSURE, WEATHERPROOF WHERE MOUNTED OUTDOORS.

C. WITH OVERLOAD PROTECTION. COORDINATE ALL MOTOR CONTROLLER TYPES AND SIZES WITH MOTOR TYPES AND SIZES.

D. 1/3 HP AND SMALLER: PROVIDE MANUAL STARTER EXCEPT USE MAGNETIC TYPE WHERE AUTOMATICALLY CONTROLLED.

1) MANUAL TYPE: 2-POLE TOGGLE SWITCH WITH OVERLOAD PROTECTION AND PILOT LIGHT.

E. 1/2 HP AND LARGER: PROVIDE MAGNETIC STARTER:

1) COMBINATION UNFUSED DISCONNECT SWITCH AND MAGNETIC STARTER EXCEPT AS NOTED.

2) OVERLOAD PROTECTION IN EACH PHASE LEG WITH RESET IN ENCLOSURE.

3) HOA SELECTOR SWITCH FOR AUTOMATICALLY OPERATED MOTORS. SAFETY CONTROLS COMMON TO BOTH CONTROLS.

4) RED, GREEN AND AMBER PILOT LIGHTS.

5) SWITCHES: HORSE-POWER-RATED, EXTERNAL PADLOCKING TYPE.

6) HOLDING COILS: 10 WATT, 120 VOLT.

7) CONTACTS: MAIN LINE AND MINIMUM (2) – NORMALLY OPEN, (2) – NORMALLY CLOSED 10 AMP AUXILIARIES, IN ADDITION TO CONTACTS REQUIRED FOR CONTROLS SPECIFIED.

8) CONTROL TRANSFORMER: FOR MOTORS OVER 120 VOLTS, TO STEP DOWN CONTROL VOLTAGE TO 120 VOLTS; OF THE REQUIRED CAPACITY WITH FUSE AND GROUND CONNECTION ON VOLTAGE SIDE.

9) FUSES: SIMILAR TO BUSSMAN.

10) RELAYS: TO SUPPLEMENT AUXILIARY CONTACTS IN CONTROLLER. MINIMUM 10 WATT COIL AND TWO 10 AMP CONTACTS.

11) TERMINALS: SUITABLE FOR CONDUCTORS NOTED AND AS APPROVED.

F. ACCEPTABLE MANUFACTURERS:

1) CUTLER-HAMMER.

2) SQUARE D.

3) ALLEN BRADLEY.

18. SMOKE DETECTORS

A. THE ELECTRICAL CONTRACTOR SHALL SUPPLY DUCT MOUNTED IONIZATION-TYPE SMOKE DETECTORS AND PROVIDE ALL WIRING.

B. THIS CONTRACTOR SHALL INSTALL THE SMOKE DETECTOR IN THE DUCT AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL NOT INSTALL A SMOKE DETECTOR IN A LOCATION WHERE ITS OPERATING RANGE (TYPICALLY 32-100 DEG F) WILL BE EXCEEDED.

C. THE SUPPLY FAN AND ALL ASSOCIATED EQUIPMENT SHALL STOP AND ALL DAMPERS SHALL RETURN TO THEIR "NORMAL" POSITIONS IF PRODUCTS OF COMBUSTION ARE DETECTED. RESET FOR THE SMOKE DETECTOR SHALL BE AT THE FIRE ALARM PANEL (OR FIRE COMMAND STATION).

D. THIS CONTRACTOR SHALL ASSIST THE ELECTRICAL CONTRACTOR IN TESTING THE DUCT-MOUNTED SMOKE DETECTION SYSTEM.

19. EQUIPMENT

A. FANS:

1) GENERAL (APPLIES TO ALL FAN TYPES EXCEPT AS NOTED):

A. PROVIDE CENTRIFUGAL TYPE, NON-OVERLOADING DESIGN EXCEPT AS NOTED WITH MINIMUM CAPACITIES AS NOTED AND WITH CERTIFIED RATINGS BY AMCA. WHEEL SHALL BE FACTORY BALANCED STATICALLY AND DYNAMICALLY. BRAKE HORSEPOWER RATINGS SHALL NOT BE MORE THAN 5 PERCENT ABOVE WHAT IS NOTED ON DRAWINGS. DRIVES SHALL BE MATCHED, MULTIPLE V-BELT DRIVE UNLESS OTHERWISE NOTED WITH MINIMUM CAPACITY OF 1.4 TIMES RATED MOTOR HP. PULLEYS SHALL BE CAST IRON.

B. MOTOR PULLEY SHALL BE VARIABLE PITCH DIAMETER EXCEPT FANS WITH VARIABLE INLET VANES. SUPPLY AND INSTALL ONE FIXED PITCH PULLEY CHARGE AS REQUIRED PER FAN TO BALANCE SYSTEMS. COMPANION SHEAVES SHALL MAINTAIN BELTS PARALLEL. BELT GUARDS SHALL BE IN COMPLIANCE WITH OSHA REGULATIONS AND WITH TACHOMETER OPENING FOR FAN SPEED MEASUREMENTS. MANUFACTURER SHALL PROVIDE REPLACEMENT FIXED PITCHED SHEAVES WHERE NEEDED TO BALANCE SYSTEM.

C. PROVIDE REMOVABLE FLANGED SCREENS AT INLETS OR OUTLETS WHERE NO CONNECTING DUCTWORK IS INDICATED.

D. BEARINGS BALL ROLLER OR TAPER. PROVIDE PRESSURE TYPE LUBRICATING FITTINGS WITH PRESSURE RELIEF FITTINGS EXTENDED TO ACCESSIBLE LOCATIONS. MINIMUM L-10 LIFE RATING; 50,000 HOURS PER AFBMA STANDARD B-10 OR 250,00 HOURS AVERAGE (B-50) LIFE AT MAXIMUM CATALOG RATING.

2) IN-LINE CENTRIFUGAL FANS (ILOF): SHALL HAVE FULL WELDED HOUSING WITH CAM TYPE LEVER ACCESS DOOR, ADJUSTABLE MOTOR BASE, INLET AND OUTLET FLANGES AND BEARINGS OUT OF THE AIR STREAM. SIMILAR TO BARRY BLOWER TUBULAR 8000.

B. AIR HANDLING UNITS:

1) FACTORY FABRICATED VERTICAL DRAW THROUGH AIR HANDLING UNITS SHIPPED IN SIZES SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES.

20. AUTOMATIC CONTROLS – GENERAL REQUIREMENTS

A. FURNISH AND INSTALL A COMPLETE ELECTRIC OR ELECTRONIC CONTROL SYSTEM TO PROVIDE TEMPERATURE CONTROL AS SPECIFIED UNDER DESCRIPTION OF OPERATION.

B. WORK SHALL INCLUDE ALL WIRING, CONTROL EQUIPMENT, AND ACCESSORIES NECESSARY TO MAKE THIS SYSTEM COMPLETE. ALL WIRING SHALL BE 24 VOLT. COORDINATE WITH MANUFACTURER FOR INTERCONNECTION WITH CONTROLS INCLUDED IN EQUIPMENT. ALL CONTROL WORK SHALL BE INSTALLED BY HVAC CONTRACTOR.

C. ACCEPTABLE MANUFACTURERS:

1) JOHNSON SERVICE CO.

2) HONEYWELL, INC.

D. OPERATION OF TYPICAL CONTROL SAFETY DEVICES.

1) HOA SUPPLY FAN SWITCHES: SAFETY DEVICES SHALL BE INTERLOCKED WITH "HAND" AND "AUTOMATIC" POSITIONS IN SERIES WITH MOTOR CONTROLLER HOLDING COIL CIRCUIT. INTERLOCKING WITH OTHER FANS AND EQUIPMENT OF SYSTEM SHALL BE THROUGH "AUTOMATIC" POSITION ONLY. "HAND" POSITION SHALL BE FOR MAINTENANCE ONLY.

2) RETURN FAN, TRANSFER FAN, EXHAUST FAN HOA SWITCHES (INTERLOCKED WITH SUPPLY FANS): REMOTE STARTING SHALL BE FROM SUPPLY FAN THROUGH "AUTOMATIC" POSITION ONLY. "HAND" POSITION SHALL BE FOR MAINTENANCE OPERATION ONLY. INTERLOCK THROUGH AUXILIARY CONTACT OF LEAD EQUIPMENT MOTOR CONTROLLER.

3) EXHAUST FANS, SUCH AS GENERAL OR TOILET (OPERATING INDEPENDENTLY): ALL SAFETY DEVICES SHALL BE INTERLOCKED WITH "HAND" AND "AUTOMATIC" POSITIONS IN SERIES WITH MOTOR CONTROLLER HOLDING COIL CIRCUIT. REMOTE STARTING SHALL BE THROUGH AUTOMATIC POSITION ONLY. "HAND" POSITION SHALL BE FOR MAINTENANCE OPERATION ONLY.

4) SAFETY DEVICES FOR ALL SYSTEMS, EXCEPT AS OTHERWISE NOTED BELOW:

A. ONE FREEZE PROTECTION THERMOSTAT PER COIL SECTION, WIRED TO STOP SUPPLY FAN. THERMOSTAT SHALL BE AUTOMATIC RESET TYPE.

B. FOR SYSTEMS OVER 2,000 CFM, A DUCT MOUNTED SMOKE DETECTOR OF THE IONIZATION TYPE LOCATED IN THE SUPPLY DUCT SHALL STOP THE SUPPLY FAN AND ASSOCIATED INTERLOCKED EQUIPMENT SHOULD PRODUCTS OF COMBUSTION BE SENSED.

C. LOW STATIC PRESSURE LIMIT SWITCHES WITH MANUAL RESET SHALL STOP ASSOCIATED SUPPLY FANS WHEN STATIC PRESSURE AT SUPPLY FOR INLET SECTIONS FALLS TO ITS SETTING.

D. DAMPER END SWITCHES SHALL PREVENT OPERATION OF FANS UNTIL DAMPER IS FULLY OPEN. PROVIDE RELAYS SO IT WILL NOT BE NECESSARY TO HOLD START BUTTON UNTIL DAMPER IS FULLY OPEN. PROVIDE DAMPER END SWITCHES ON ALL AUTOMATIC DAMPERS.

E. SEQUENCE:

1) CONSTANT VOLUME SYSTEM:

A. FAN OFF: 7-DAY PROGRAMMABLE T-STAT SIGNALS SUPPLY FANS TO SHUT OFF. INTERLOCKED FANS AND MOTORIZED DAMPERS TO SHUT OFF. OUTSIDE AIR AND RELIEF AIR DAMPERS TO CLOSE AND RETURN AIR DAMPER TO GO TO MAXIMUM OPEN POSITION. COOLING COIL VALVES TO CLOSE (IF APPLICABLE).

B. SUMMER/WINTER OPERATION DETERMINED BY RESETTABLE OUTSIDE AIR THERMOSTAT INITIALLY SET AT 60 DEG F.

C. FAN ON (SUMMER): 7-DAY PROGRAMMABLE T-STAT SIGNALS FANS TO START, CIRCUITS ARE ENERGIZED, MINIMUM OUTSIDE AIR DAMPERS TO OPEN AND RELIEF AIR DAMPERS (IF APPLICABLE) TO OPEN TO MINIMUM POSITION. AFTER DAMPERS ARE FULLY OPEN DAMPER END SWITCHES SHALL START SUPPLY FANS AND THROUGH INTERLOCKS TO START.

(1) AS RETURN AIR TEMPERATURE RISES TO THE MAXIMUM OUTDOOR AIR DAMPERS SHALL MODULATE CLOSED TO MAINTAIN SETPOINT. AS RETURN AIR TEMPERATURE RISES COOLING COIL VALVES TO MODULATE OPEN TO MAINTAIN SETPOINT.

D. FAN ON (WINTER): 7-DAY PROGRAMMABLE T-STAT SIGNALS FANS TO START, CIRCUITS ARE ENERGIZED, MINIMUM AND MAXIMUM OUTDOOR AIR DAMPERS TO REMAIN CLOSED. END SWITCHES SHALL START SUPPLY FANS AND THROUGH INTERLOCKS TO START.

(1) AIR TO RECIRCULATE FOR WARM-UP CYCLE.

2) AHU-1-1, 1-2 HEATING (UNOCCUPIED):

A. HEATER SHALL BE STARTED AND STOPPED VIA 7-DAY PROGRAMMABLE THERMOSTAT LOCATED ON GROUND LEVEL. UPON DETECTION OF SPACE TEMPERATURE OF 55°F AND BELOW (ADJUSTABLE), T-STAT SHALL SIGNAL EVAPORATOR FAN TO START AND ENERGIZE HEAT PUMP. ONCE SPACE TEMPERATURE REACHES 56°F AND ABOVE (ADJUSTABLE), T-STAT SHALL DE-ENERGIZE ELECTRIC DUCT HEATER AND EVAPORATOR FAN.

3) OUTSIDE AIR FAN:

A. FAN OPERATION SHALL BE INTERLOCKED WITH EVAPORATOR / COMPRESSOR FANS.

END OF SECTION

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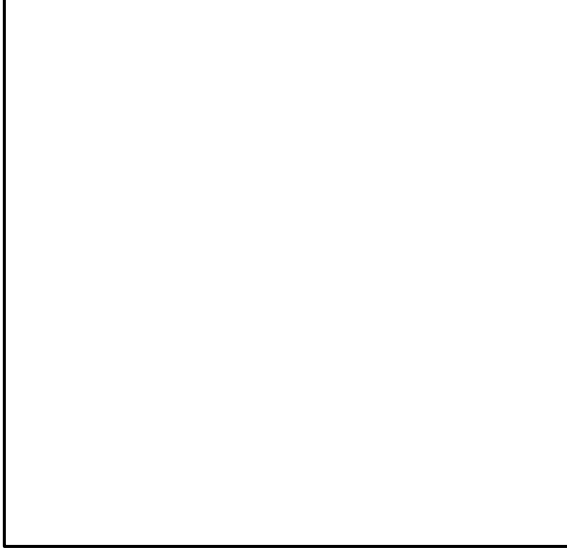


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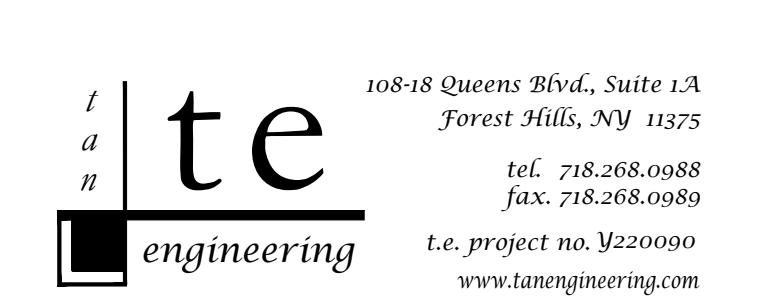
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