

HVAC GENERAL NOTES

ARCHITECTURAL

- DO NOT SCALE DRAWINGS. REFER TO ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
- LIGHT FIXTURE LOCATIONS TAKE PRECEDENCE OVER DIFFUSER AND GRILLE LOCATIONS. LOCATE DIFFUSERS AND GRILLES TO ACCOMMODATE LIGHTING LAYOUT.
- REFER TO ARCHITECTURAL FLOOR PLANS FOR LOCATION AND RATING OF ALL FIRE WALLS.

GENERAL

- THE HVAC CONTRACTOR SHALL VISIT THE JOB SITE AND BE FAMILIAR WITH ALL PROJECT CONDITIONS PRIOR TO FABRICATING DUCTWORK, EQUIPMENT, ETC. NO ALLOWANCES WILL BE MADE FOR CONTRACTOR'S UNFAMILIARITY WITH PROJECT CONDITIONS.
- DUCTWORK ROUTING SHOWN IS SCHEMATIC. HVAC CONTRACTOR SHALL PROVIDE ANY ADDITIONAL OFFSETS AND FITTINGS, INCLUDING DIVIDED DUCTS, REQUIRED FOR PROPER INSTALLATION AND TO MAINTAIN CLEARANCES AS ENCOUNTERED IN THE FIELD.
- FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETE INSTALLATION AND OPERATION OF ALL SYSTEMS IN THIS SECTION OF WORK IN ACCORDANCE WITH ALL APPLICABLE CODES, ASHRAE, SMACNA, NFPA, EPA, ETC.
- PRIOR TO INSTALLATION OF ASSOCIATED WORK, INSTALLER SHALL MEET AT PROJECT SITE WITH GENERAL CONTRACTOR, INSTALLER OF EACH COMPONENT OF ASSOCIATED WORK, INSPECTION AND TESTING AGENCY REPRESENTATIVES (IF ANY), INSTALLERS OF OTHER WORK REQUIRING COORDINATION WITH WORK OF THIS SECTION AND ARCHITECT / OWNER FOR PURPOSE OF COORDINATING LOCATIONS OF PROPOSED SYSTEMS, REVIEWING MATERIAL SELECTIONS, AND PROCEDURES TO BE FOLLOWED IN PERFORMING THE WORK IN COMPLIANCE WITH REQUIREMENTS SPECIFIED.
- COORDINATE SCHEDULE FOR HOOK-UPS TO EXISTING SYSTEMS AND EQUIPMENT REMOVAL OR RELOCATIONS WITH THE OWNER AND PERFORM THIS WORK AT SUCH TIMES TO ENSURE THAT PERIODS OF SHUTDOWN WILL BE ACCEPTABLE TO THE OWNER.
- COORDINATE INSTALLATION AND LOCATIONS OF NEW DUCTWORK AND PIPING WITH BUILDING STRUCTURE, PLUMBING PIPING, ELECTRICAL CONDUIT, LIGHTING, ETC. PRIOR TO PURCHASING OR INSTALLING EQUIPMENT AND MATERIALS.
- VERIFY EXACT SIZES OF EXISTING DUCTWORK AND / OR PIPING IN FIELD PRIOR TO MAKING NEW CONNECTION.
- VERIFY EXACT LOCATION OF CONNECTION POINTS (NEW TO EXISTING) IN FIELD PRIOR TO CONSTRUCTION.
- RELOCATE EXISTING DUCTWORK AND / OR PIPING IN EXISTING CEILING SPACES TO ACCOMMODATE ALL RENOVATIONS AND ADDITIONS.
- ALL PIPING AND DUCTS EXTENDING THROUGH WALLS SHALL BE SEALED WITH AN APPROVED FIRESTOPPING MATERIAL.

EQUIPMENT

- FLEXIBLE CONNECTORS SHALL BE INSTALLED ON SUPPLY AIR DUCTS AT ALL EQUIPMENT CONNECTIONS.

PIPING

- ALL PIPING LINES, INCLUDING CONDENSATE DRAINS, SHALL BE FULLY INSULATED.
- CONDENSATE PIPING FROM AIR CONDITIONING EQUIPMENT SHALL BE PITCHED A MINIMUM OF 1/4" PER FOOT, IN THE DIRECTION OF FLOW.
- CONDENSATE DRAIN PIPES SHALL HAVE CLEANOUTS AT EVERY CHANGE IN DIRECTION, DISTANCES GREATER THAN 3 FEET, AND AT THE BEGINNING OF LONG STRAIGHT RUNS.

DUCTWORK

- RUN ALL DUCTWORK AND PIPING AS TIGHT TO BOTTOM OF STEEL AS POSSIBLE.
- DUCTWORK SHALL NOT BE SUPPORTED FROM BRIDGING, CONDUIT, PIPING, ETC. OF ANY KIND. DO NOT USE FASTENERS THAT PENETRATE ROOF DECKS.
- ASPECT RATIO SHALL NOT EXCEED 3:1.
- ALL DUCTWORK INSTALLATION SHALL RUN CONTINUOUSLY THROUGH PARTITIONS.
- LOCATE ALL DUCT BALANCING DAMPERS, CONTROL DAMPERS AND FIRE DAMPERS ABOVE ACCESSIBLE CEILINGS OR PROVIDE ACCESS DOORS.
- PROVIDE VOLUME CONTROL DAMPERS WITH QUADRANT AND LOCK AND STANDOFF COLLAR AT ALL BRANCH DUCTS TO DIFFUSERS. INSTALL AT A MINIMUM OF TWO DUCT WIDTHS FROM BRANCH TAKEOFF.
- DUCTWORK SIZES INDICATED ON DRAWINGS ARE INSIDE, FREE AND CLEAR DIMENSIONS. INCREASE DUCT OUTSIDE DIMENSION SIZE BY TWO (2) TIME THE THICKNESS OF THE INSULATION.
- ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS.
- ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL IN AREAS WITH FINISHED CEILINGS.
- WHERE RECTANGULAR DUCTWORK IS INDICATED, AND AT INSTALLERS OPTION, SPIRAL AND ROUND DUCTWORK MAY BE SUBSTITUTED FOR RECTANGULAR DUCTWORK PROVIDED THEY ARE EQUIVALENT TO THE RECTANGULAR DIMENSIONS INDICATED ON THE DRAWINGS (i.e.: 8x4 = 8", 10x6 = 10").
- ALL CONCEALED SUPPLY AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH MINIMUM 1-1/2" THICK, 0.75 LB DENSITY, FOIL-BACK INSULATION WITH VAPOR BARRIER AND A MINIMUM R-VALUE OF R-6, FLAME SPREAD RATING OF 25 OR LESS, AND SMOKE-DEVELOPED RATING OF 50 OR LESS.
- ALL RETURN AND TRANSFER AIR DUCTWORK SHALL BE INTERNALLY LINED.
- ALL DUCT LINERS SHALL BE MINIMUM 1-1/2" THICK, COATED TO PREVENT ELEMENTS FROM ENTERING THE AIRSTREAM (COATING SHALL MEET ASHRAE 62 - LATEST EDITION), AND ENVIRONMENTALLY FRIENDLY WITH A MINIMUM R-VALUE OF R-6. LINER SHALL BE BLACK IN COLOR SO IT IS NOT NOTICEABLE FROM THE INSIDE OF REGISTERS AND GRILLES.
- ALL SQUARE ELBOWS SHALL HAVE AIRFOIL TYPE TURNING VANES.
- MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0". ALL FLEXIBLE DUCT SHALL CONFORM TO THE REQUIREMENTS OF U.L. 181 FOR CLASS 1 FLEXIBLE AIR DUCTS, WITH A MINIMUM R-VALUE OF R-6. SUPPORT FLEXIBLE DUCT TO ELIMINATE KINKING AND SAGGING. (FLEXIBLE DUCT NOT PERMITTED IN EXPOSED AREAS).

CONTROLS

- ALL CONTROL WIRING AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) AND NFPA 70.
- ALL CONTROL WIRING AND POWER CONDUCTOR INSULATION SHALL BE PLENUM RATED.
- ALL EXPOSED CONTROL WIRING SHALL BE INSTALLED IN 3/4" EMT CONDUIT.

BALANCING

- AN INDEPENDENT TESTING AND BALANCING CONTRACTOR, WHO IS CERTIFIED BY EITHER THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB); WHO IS NOT THE INSTALLER OF THE SYSTEM BEING TESTED, WHO IS NOT AFFILIATED WITH THE INSTALLER OF THE PROJECT, AND IS OTHERWISE INDEPENDENT OF THE PROJECT, SHALL BALANCE THE SYSTEM TO WITHIN 5% OF AIR QUANTITIES INDICATED ON PLANS AND PROVIDE THE OWNER AND ENGINEER WITH A COMPLETE, SIGNED AND SEALED BALANCE REPORT.

HVAC CONTROL SYMBOLS

SYMBOL	DESCRIPTION
	PROGRAMMABLE, 7-DAY, 24-HOUR THERMOSTAT
	CONTROL WIRING (PLENUM RATED)

HVAC DUCTWORK SYMBOLS

SYMBOL	DESCRIPTION
	EXISTING DUCTWORK TO BE REMOVED
	EXISTING DUCTWORK TO REMAIN
	FLEXIBLE DUCT
	INTERNALLY LINED DUCTWORK
	MANUAL VOLUME DAMPERS
	POINT OF CONNECTION (NEW TO EXISTING)
	ROUND
	SUPPLY AIR DEVICE -- FIRST NO. TYPE, SECOND NO. NECK SIZE THIRD NO. CFM (REFER TO SCHEDULE FOR SIZE)
	RETURN AIR DEVICE -- TYPE (REFER TO SCHEDULE FOR SIZE)

HVAC DRAWING LIST

M-1	HVAC GENERAL NOTES, DETAILS AND SCHEDULES
M-2	HVAC DEMOLITION FLOOR PLAN
M-3	HVAC DUCTWORK FLOOR PLAN
M-4	HVAC SPECIFICATIONS
M-5	HVAC SPECIFICATIONS (CONTINUED)

HVAC ABBREVIATIONS

CFM	CUBIC FEET PER MINUTE
DDC	DIRECT DIGITAL CONTROL
(E)	EXISTING
HVAC	HEATING, VENTILATING, AIR CONDITIONING
OA	OUTSIDE AIR
OED	OPEN-ENDED DUCTWORK
VD	VOLUME DAMPER
W/	WITH

SCHEDULE OF EXISTING AIR DISTRIBUTION DEVICES TO BE REPLACED AND ADDED AS REQUIRED.

SYMBOL	STYLE & SIZE	MOUNTING	DESCRIPTION	PRICE NO. & DESCRIPTION	MAX. CFM
	Supply 24x24	Lay-In	Perforated Diffuser, 24X24 lay-in with dampers and with four field adjustable pattern controllers.	neck size (See Dwg.) 24X24 PDN 3 B12	
	Return 24x24	Lay-In	Lay-in, plenum return, 24X24, with damper, matching appearance, except size, to type 1, this schedule.	24X24/PDDR/3/B12	
	Supply 7x5		Double deflection, louvered face supply register with damper, 1-1/4" flat borders & 3/4" blade spacing. Front blades parallel to short dimension. (steel)	7x5/520D/ S/L/A/B12	125 CFM
	Supply 72x6	Surface	Double deflection, louvered face supply register with damper, 1-1/4" flat borders & 3/4" blade spacing. Front blades parallel to short dimension. (aluminum)	72x6/620D/ S/L/A/B12	800 CFM
	Supply 54x9	Surface	Double deflection, louvered face supply register with damper, 1-1/4" flat borders & 3/4" blade spacing. Front blades parallel to short dimension. (aluminum)	54x9/620D/ S/L/A/B12	800 CFM
	Transfer 16x8 (Note 3)	Surface	Louvered face return register, 1-1/4" flat borders, fixed blades @ 45° & 3/4" blade spacing. Front blades parallel to long dimension. (steel)	16x8/530D/ F/L/A/B12	375 CFM
	Transfer 8x4 (Note 3)	Surface	Louvered face return register, 1-1/4" flat borders, fixed blades @ 45° & 3/4" blade spacing. Front blades parallel to long dimension. (steel)	8x4/530D/ F/L/A/B12	60 CFM
	Transfer 10x6 (Note 3)	Surface	Louvered face return register, 1-1/4" flat borders, fixed blades @ 45° & 3/4" blade spacing. Front blades parallel to long dimension. (steel)	10x6/530D/ F/L/A/B12	150 CFM
	Transfer 14x6 (Note 3)	Surface	Louvered face return register, 1-1/4" flat borders, fixed blades @ 45° & 3/4" blade spacing. Front blades parallel to long dimension. (steel)	14x6/530D/ F/L/A/B12	205 CFM
	Transfer 36x12 (Note 3)	Surface	Louvered face return register, 1-1/4" flat borders, fixed blades @ 45° & 3/4" blade spacing. Front blades parallel to long dimension. (steel)	36x12/530D/ F/L/A/B12	800 CFM
	Exhaust 10x10	SURFACE MOUNTED	Louvered face exhaust register with damper, 1-1/4" flat borders, fixed blades @ 45° & 3/4" blade spacing.	10"x10"/530D/ F/L/A/B12	225 CFM
	Exhaust 12x12	SURFACE MOUNTED	Louvered face exhaust register with damper, 1-1/4" flat borders, fixed blades @ 45° & 3/4" blade spacing.	12"x12"/530D/ F/L/A/B12	275 CFM
	Supply 14x6	Surface	Double deflection, louvered face supply register with damper, 1-1/4" flat borders & 3/4" blade spacing. Front blades parallel to short dimension. (steel)	14x6/520D/ S/L/A/B12	150 CFM
	Supply 16x8	Surface	Double deflection, louvered face supply register with damper, 1-1/4" flat borders & 3/4" blade spacing. Front blades parallel to short dimension. (steel)	16x8/520D/ S/L/A/B12	250 CFM
	Supply 13X3	DUCT MTD. DN SPIRAL	Double deflection, louvered face supply register with damper, 1-1/4" flat borders & 3/4" blade spacing. Front blades parallel to short dimension. (steel)	SPIROcomfort RGS-3 (13x3 NECK)	100 CFM
	Supply 17X3	DUCT MTD. DN SPIRAL	Double deflection, louvered face supply register with damper, 1-1/4" flat borders & 3/4" blade spacing. Front blades parallel to short dimension. (steel)	SPIROcomfort RGS-3 (17x3 NECK)	150 CFM

AIR DEVICE SCHEDULE NOTES:

- BASIS OF DESIGN: PRICE OR SPIRO-COMFORT AS NOTED IN SCHEDULE. ACCEPTABLE MANUFACTURERS INCLUDE: TUTTLE & BAILEY, ANEMOSTAT OR TITUS.
- MAXIMUM SOUND LEVEL FOR ALL LOUVRES, GRILLES, REGISTERS, DIFFUSERS IS NC-19 AT MAXIMUM CFM SCHEDULED.
- EACH DEVICE LISTED AS A TRANSFER GRILLE SHALL CONSIST OF TWO (2) FIXED BLADE REGISTERS WITH FULL SIZE DUCT CONNECTION BETWEEN.

EXISTING GREENHECK EXHAUST FAN SCHEDULE FOR REFERENCE

MARK	AREAS SERVED	FAN TYPE	FAN LOCATION	DRIVE TYPE	CFM	ESP IN./W.G.	MOTOR HP	VOLTS	PH	RPM	SONES	GREENHECK MODEL NO.	CURB NO.
EF-1	BASEMENT, 1ST,2ND,3RD,4TH TOILET ROOMS	CENTRIFUGAL	ROOF (SLOPED)	BELT DRIVE	2,025	1.0	3/4	208	3	1175	13.0	GB-161-7	GPIP SERIES, 24" HIGH
EF-2	3RD,4TH FLOOR TOILET ROOMS	CENTRIFUGAL	ROOF (SLOPED)	BELT DRIVE	375	0.5	1/4	120	1	1247	6.4	GB-091-4	GPIP SERIES, 24" HIGH
EF-3	3RD,4TH FLOOR TOILET ROOMS	CENTRIFUGAL	ROOF (SLOPED)	BELT DRIVE	450	0.5	1/4	120	1	1401	8.0	GB-091-4	GPIP SERIES, 24" HIGH

EXISTING HORIZONTAL FAN COIL UNIT SCHEDULE (COOLING ONLY) FOR REFERENCE

MARK	MAKE & MODEL	CFM			MOTOR	FAN	COOLING ONLY (NO HEATING)				
MARK TYPE	CARRIER MODEL NO.	TOTAL CFM	FRESH	ESP (IN./WG)	MTR. HP	FAN SPEED	COIL ROWS	MBH	FLOW GPM	P/D F-W/C	NOTES
V	42DC-06	300	NOTE 6	0.20	1, 1/5	LOW	4	9.0	2.0	1.41	1 THRU 8
W	42DC-08	400	NOTE 6	0.20	1, 1/5	LOW	4	12.0	3.0	1.80	1 THRU 8
X	42DC-08	500	NOTE 6	0.20	1, 1/4	MED	4	15.0	4.0	2.45	1 THRU 8
Y	42DC-10	600	NOTE 6	0.20	1, 1/4	LOW	4	18.0	4.5	2.81	1 THRU 8
Z	42DC-14	800	300	0.25	2, 1/5	LOW	4	31.0	10.0	1.41	1 THRU 8

FAN COIL NOTES:

- ENTERING AIR TEMP. DRY BULB - 75° F ENTERING AIR TEMP. WET BULB - 63° F
- AVERAGE CHILLED WATER TEMP. - 50° F
- FLUID - 60% WATER / 40% PROPYLENE GLYCOL.
- FAN MOTORS FOR OPERATION FROM 120 VOLT, SINGLE PHASE SUPPLY.
- BASIS OF DESIGN IS CARRIER. ACCEPTABLE MANUFACTURERS: McQUAY, TRANE, FIRST COMPANY, OR SUPERIOR REEX.
- SUPPLY AIR IS DUCTED FROM FRONT OF UNIT. RETURN AIR IS DUCTED FROM REAR OF UNIT. OUTSIDE AIR IS DUCTED FROM REAR OF UNIT. ALL ACCESS FOR SERVICING UNIT IS TO BE FROM BOTTOM OF UNIT.
- FRESH AIR WILL BE DELIVERED TO THE UNIT, DURING THE COOLING SEASON AT 74°F DB AND IS THEREFORE ASSUMED TO HAVE NO CONTRIBUTION TO THE COOLING LOAD.
- UNITS SHALL BE DESIGNED FOR USE WITH 2" THROW-AWAY FILTERS. FURNISH 1 SUCH FILTER WITH EACH UNIT.

EXISTING VERTICAL FAN COIL UNIT SCHEDULE (WHELAN) FOR REFERENCE

MARK	MAKE & MODEL	CFM	MOTOR	FAN	COOLING ONLY (NO HEATING)
MARK TYPE	WHELAN MODEL NO.	TOTAL CFM	VOLTS-PH-HZ	FAN SPEED	MBH
A	W202F	200	120/1/60	MED	4.6
B	W302F	300	120/1/60	MED	6.7
C	W402F	400	120/1/60	MED	9.5
D	W502F	500	120/1/60	MED	10.3
E	W602F	600	120/1/60	MED	13.2

FAN COIL NOTES:

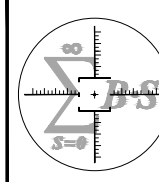
- ENTERING AIR TEMP. DRY BULB - 75° F ENTERING AIR TEMP. WET BULB - 63° F
- AVERAGE CHILLED WATER TEMP. - 50° F
- FLUID - 60% WATER 40% PROPYLENE GLYCOL.

EXISTING AIR HANDLING UNIT SCHEDULE FOR REFERENCE

MARK	UNIT LOCATION	UNIT SIZE	SUPPLY AIR CFM	FRESH AIR CFM	STATIC PRESS. IN. WG EXT.	DESCRIPTION	MANUFACTURER (BASIS OF DESIGN)	MODEL NO.	CHILLED WATER (COOLING COIL)					HOT WATER (HEATING COIL)					SUPPLY AIR FAN			AIRFLOW ARROW	OPERATING WEIGHT (LBS.)		
									MBH	GPM	EAT °F	LAT °F	MIN. ROWS	MBH	GPM	EAT °F	LAT °F	MIN. ROWS	RPM	BHP	HP	VOLTS/PH	INLET	OUTLET	
MAU-1	BOILER ROOM AT BASEMENT CEILING	08	4345	4345	1.5	INDOOR CENTRAL STATION AIR HANDLING UNIT	CARRIER	39MN-10	240	46	90°F	55°F	10 (8 FIN'')	460	47	0°F	90°F	2 (14 FIN'')	2912	4.0	5.0	208/3/60	REAR	FRONT	2,066
MAU-2	ROOFTOP	10	3795	3795	1.5	ROOFTOP MOUNTED CENTRAL STATION AIR HANDLING UNIT (WEATHERPROOF)	CARRIER	39MW-10	225	45	90°F	55°F	6 (14 FIN'')	400	40	0°F	90°F	2 (11 FIN'')	2821	3.7	5.0	208/3/60	REAR (HOOD)	DOWN FLOW	3,700
MAU-3	PENTHOUSE 5TH FLOOR	10	3200	3200	1.5	INDOOR CENTRAL STATION AIR HANDLING UNIT	CARRIER	39MN-08	225	45	90°F	55°F	6 (14 FIN'')	350	40	0°F	90°F	2 (11 FIN'')	2756	3.4	5.0	208/3/60	FROM ABOVE	DOWN FLOW	2,289

NOTICE

This document, the property of, prepared and issued by the architect, is submitted for the specific project namely _____ and the recipient by accepting this document assumes custody and agrees that this document will not be copied or reproduced in part or in whole, and any special features peculiar to this design shall not be incorporated in any other project, unless prior agreement has been obtained in writing. These documents will be returned immediately upon completion of the project or upon the request of the architect. This document is the exclusive property of the architect, no rights to ownership are transferable, or shall be lost by the filing of this document with any and all public authorities for the purpose of compliance with Codes and or Ordinances, i.e. Building Permit, etc.



EBS ENGINEERING, PC
ENGINEERED BUILDING SYSTEMS
MECHANICAL ELECTRICAL ENGINEERS
2508 WALDEN AVENUE
SUITE 107
CHEEKS FLOWERS, NEW YORK 14225
PHONE: (716) 836-9600
FAX: (716) 836-9636
EMAIL: MAIL@EBSPE.COM
WEBSITE: WWW.EBSPE.COM

COPYRIGHT © 2020 ENGINEERED BUILDING SYSTEMS

D'Youville College - Koessler Administration Building
320 Porter Ave
Buffalo, NY

ISSUE:

02-18-2020 BID SET - NOT FOR CONSTRUCTION

SA PROJECT TEAM: PRINCIPAL P.Silvestri

PROJ. ARCH. _____ DRAFTER M.Velocci

JOB CAPT. M.Velocci INTERIORS N.Catuzza

SEAL:

TITLE:

MECHANICAL HVAC SCHEDULES, NOTES AND LEGENDS



SILVESTRI ARCHITECTS • PC

1321 MILLERSPORT HWY PH. 716.691.0900
AMHERST, NY 14221 FAX 716.691.4773

SA JOB #:

19092.01

DATE:

02-18-20

DRAWING #:

M-1

This document, the property of, prepared and issued by the architect, is submitted for the specific project namely _____ and _____ and the recipient by accepting this document assumes custody and agrees that this document will not be copied or reproduced in part or in whole, and any special features peculiar to this design shall not be incorporated in any other project. If no written agreement has been obtained in writing, These documents will be returned immediately upon completion of the project or upon the request of the architect.

This document is the exclusive property of the architect, no rights to ownership are transferable, or shall be lost by the filing of this document with any and all public authorities for the purpose of compliance with Codes and/or Ordinances, i.e. Building Permit, etc.



ISSUE:
02-18-2020 BID SET - NOT FOR
CONSTRUCTION

SEAL:



1321 MILLERSPORT HWY PH. 716.691.0900
AMHERST, NY 14221 FAX 716.691.4773

DRAWING #: **M-2**

MARK	AREA SERVED	MANUFACTURER	MODEL NO.	MBH	REFRIGERANT CONNECTIONS			MOTOR			MCA	SEER	OPERATING WEIGHT (LBS.)
					HOT GAS	SUCTION	LIQUID	RPM	KW	VOLTS / PH			
CU-1	FCU-1 thru FCU-5	CARRIER	38VMA072 HDSS-1	72.0 (COOLING) 80.0 (HEATING)	---	7/8"	3/8"	---	2 @ 90W EACH	208/3/60	45.0	14.1 EER 22.5 IEER	659

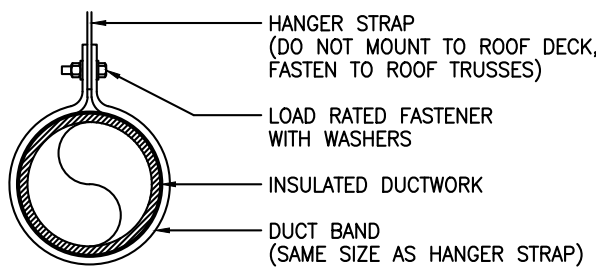
11. ACCEPTABLE MANUFACTURER'S - CARRIER, LG, DAIKIN, TRANE

MARK	AREA SERVED	TONS	SUPPLY AIR CFM	RETURN AIR CFM	OUTSIDE AIR CFM	STATIC PRESS. IN, WG EXT.	MANUFACTURER	MODEL NO.	ELECTRIC HEATING			DX HEATING			DX COOLING			SUPPLY FAN				MCA	OPERATING WEIGHT (LBS.)	
									MBH	KW	FLA	MBH	EAT °F	LAT °F	MBH	EAT °F	LAT °F	RPM	BHP	WATTS	VOLTS / PH			
FCU-1	FIFTH FLOOR OFFICE	0.5	245	245	---	---	CARRIER	40VMW005---	3	---	---	---	6.0	60	95	5.0	80	67	---	---	9	208/1/60	0.29	28.0
FCU-2	FIFTH FLOOR OFFICE	1.5	400 (LOW) 650 (HIGH)	400 (LOW) 650 (HIGH)	---	---	CARRIER	40VMF018---	3	---	---	---	21.0	60	95	18.0	80	67	---	---	80	208/1/60	0.98	54.0
FCU-3	FIFTH FLOOR OFFICE	1.5	400 (LOW) 650 (HIGH)	400 (LOW) 650 (HIGH)	---	---	CARRIER	40VMF018---	3	---	---	---	21.0	60	95	18.0	80	67	---	---	80	208/1/60	0.98	54.0
FCU-4	FIFTH FLOOR OFFICE	1.5	400 (LOW) 650 (HIGH)	400 (LOW) 650 (HIGH)	---	---	CARRIER	40VMF018---	3	---	---	---	21.0	60	95	18.0	80	67	---	---	80	208/1/60	0.98	54.0
FCU-5	FIFTH FLOOR OFFICE	1.5	400 (LOW) 650 (HIGH)	400 (LOW) 650 (HIGH)	---	---	CARRIER	40VMF018---	3	---	---	---	21.0	60	95	18.0	80	67	---	---	80	208/1/60	0.98	54.0

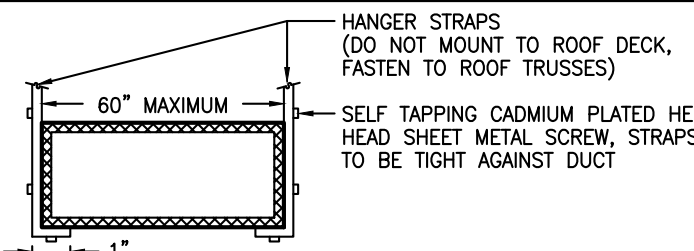
1. UNITS SHALL BE LISTED AND LABELED WITH THE ENERGY STAR LOGO.
2. COMPACT CEILING CASSETTE OR WALL HEAT PUMP UNIT.
3. MINIMUM 20-GAUGE, FACTORY FINISHED, BONDERIZED STEEL CABINET.
4. UNIT SHALL HAVE:
 - A. R410A REFRIGERANT.
 - B. INDEPENDENT LOUVER CONTROL.
 - C. 3-SPEED DIRECT DRIVEN CENTRIFUGAL MOTOR.
 - D. FAN MOTOR THERMAL OVERLOAD PROTECTOR.
 - E. CONTROL CIRCUIT BOARD.
 - F. MICROPROCESSOR CONTROLS.
 - G. SELF-DIAGNOSTICS.
 - H. AUTO-RESTART FUNCTION.
 - I. CONDENSATE DRAIN PAN WITH CONDENSATE PUMP.
 - J. WASHABLE FILTER WITH MILDREW PROOF RESIN.

6. ACCEPTABLE MANUFACTURER'S - CARRIER, LG, DAIKIN, TRANE.

*NOTE: FAN COIL UNITS ARE NOT POWERED BY IT'S ASSOCIATED CONDENSING UNIT POWER.

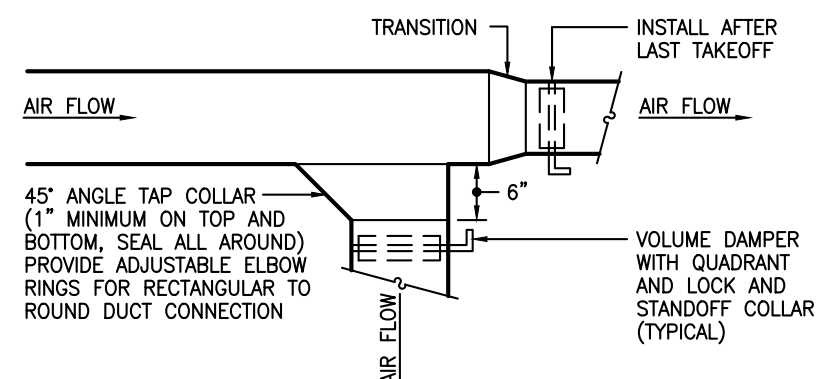


HANGER SIZES FOR ROUND DUCT				
DUCT DIAMETER	ROUND HANGERS	STRAP HANGERS	MAXIMUM SPACING	NUMBER OF HANGERS
UP THRU 18"	1/4" ROD	1" x 16 GAUGE	10'-0"	1
19" THRU 36"	3/8" ROD	1" x 12 GAUGE	10'-0"	1

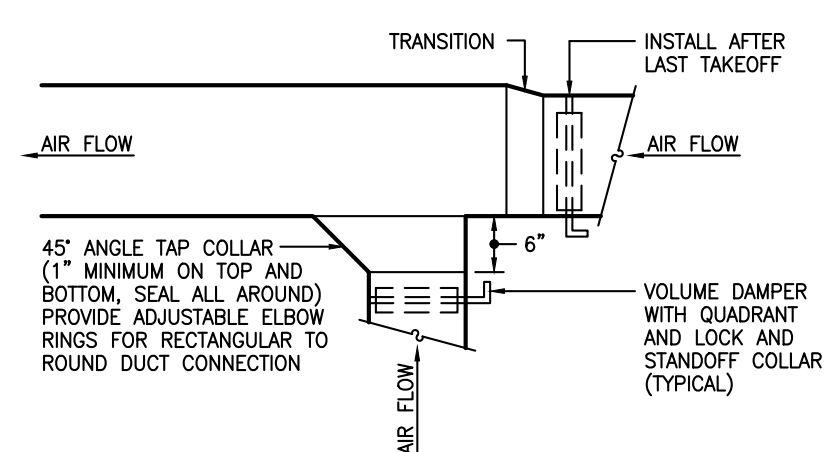


HANGER SIZES FOR RECTANGULAR DUCT			
LONGEST DIMENSION OF DUCT	ROUND HANGERS	STRAP HANGERS	MAXIMUM SPACING
UP THRU 18"	1/4" ROD	1" x 16 GAUGE	10'-0"
19" THRU 30"	1/4" ROD	1" x 16 GAUGE	10'-0"

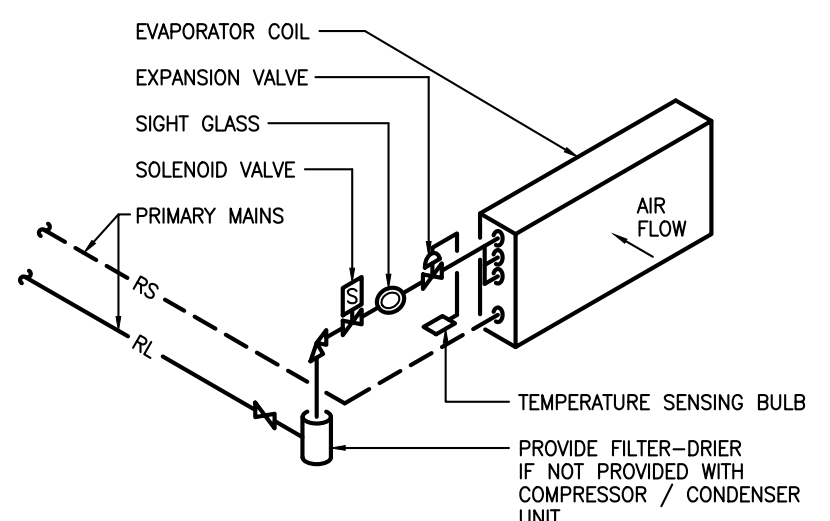
DUCT HANGER DETAIL



SUPPLY BRANCH TAKEOFF FITTING DETAIL

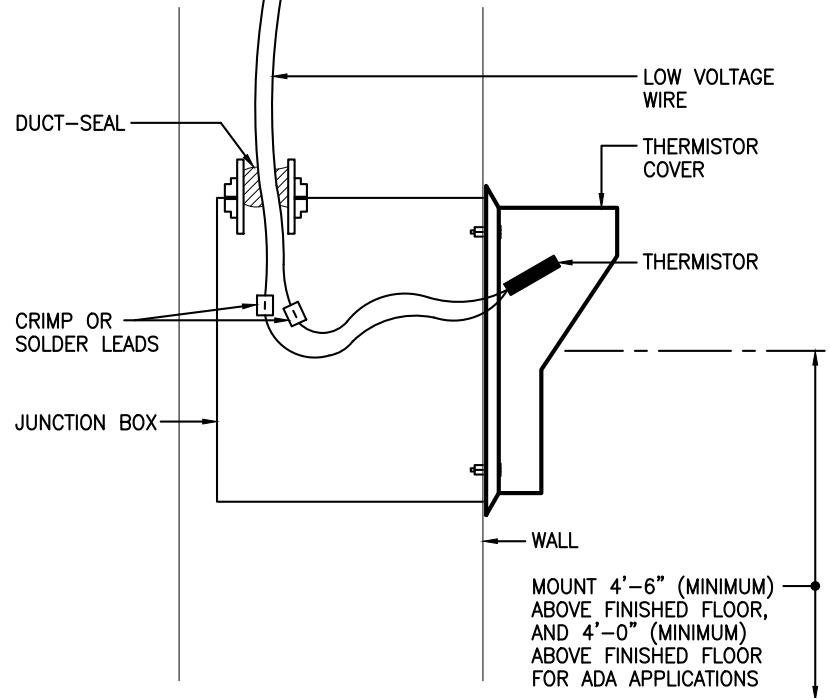


RETURN / EXHAUST BRANCH TAKEOFF FITTING DETAIL

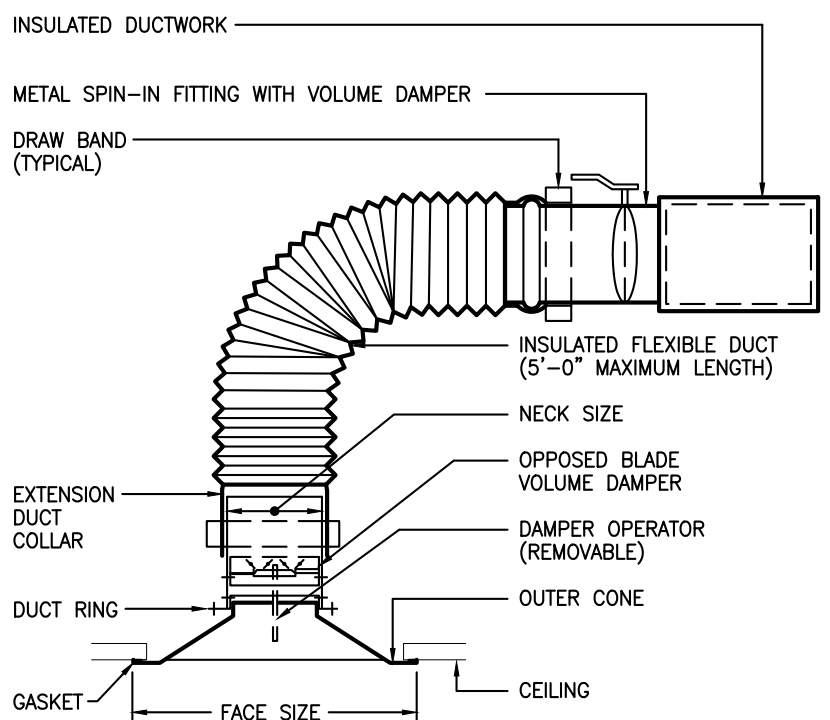


- NOTES:
- PITCH ALL GAS LINES IN DIRECTION OF FLOW, 1/16 INCH/FOOT (MINIMUM).
 - PROVIDE DOUBLE RISER WHERE NECESSARY TO MAINTAIN REQUIRED VELOCITIES FOR OIL FLOW.
 - PROVIDE A TRAP FOR EVERY 25 FEET OF VERTICAL RISE IN GAS LINES.
 - HVAC EQUIPMENT SUPPLIER SHALL SIZE REFRIGERANT LINES TO MEET SYSTEM REQUIREMENTS.

DX COOLING COIL PIPING DETAIL

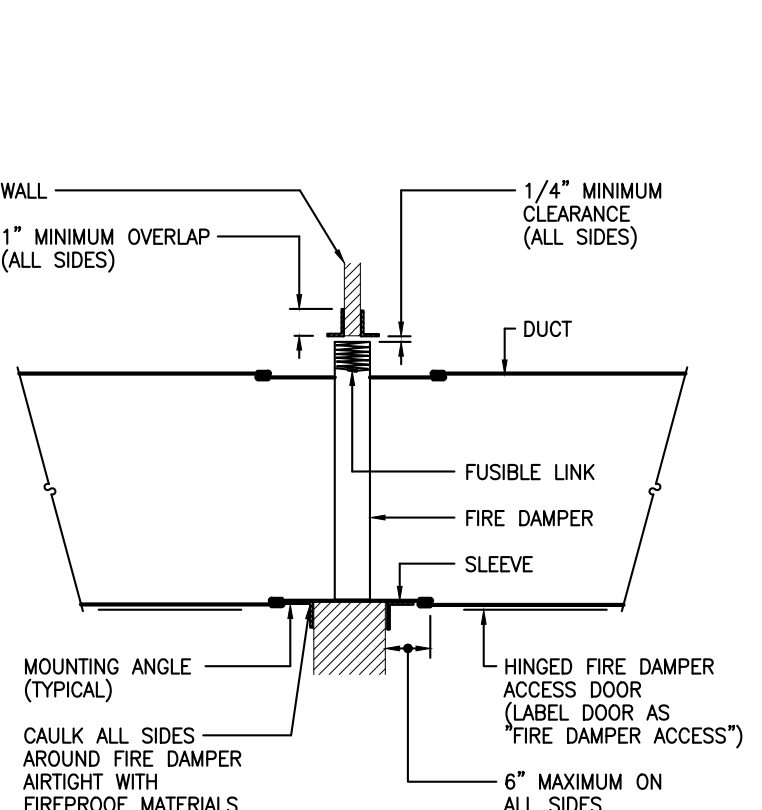


THERMOSTAT MOUNTING DETAIL



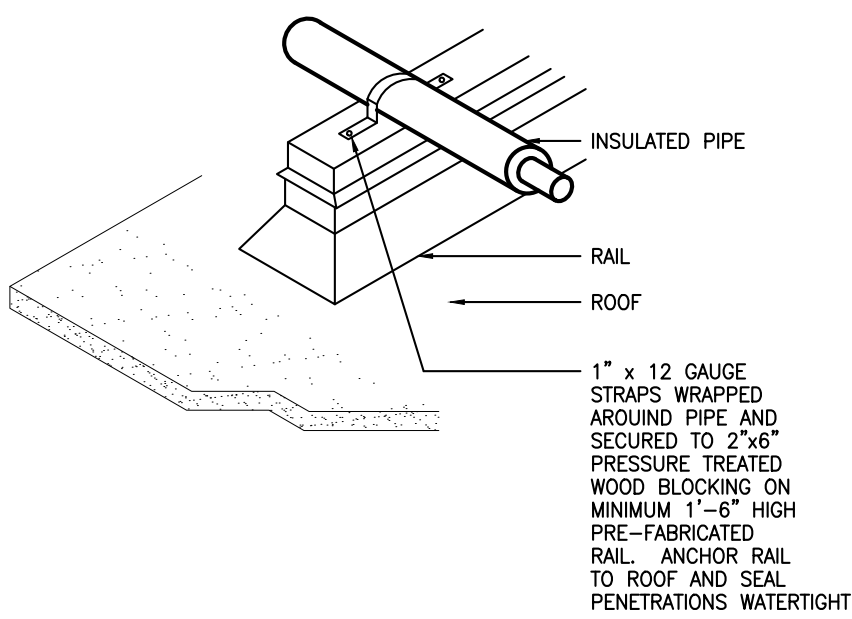
- INSTALLATION NOTES:
- FASTEN DUCT RING TO EXTENSION DUCT COLLAR WITH SHEET METAL SCREWS.

CEILING DIFFUSER CONNECTION DETAIL

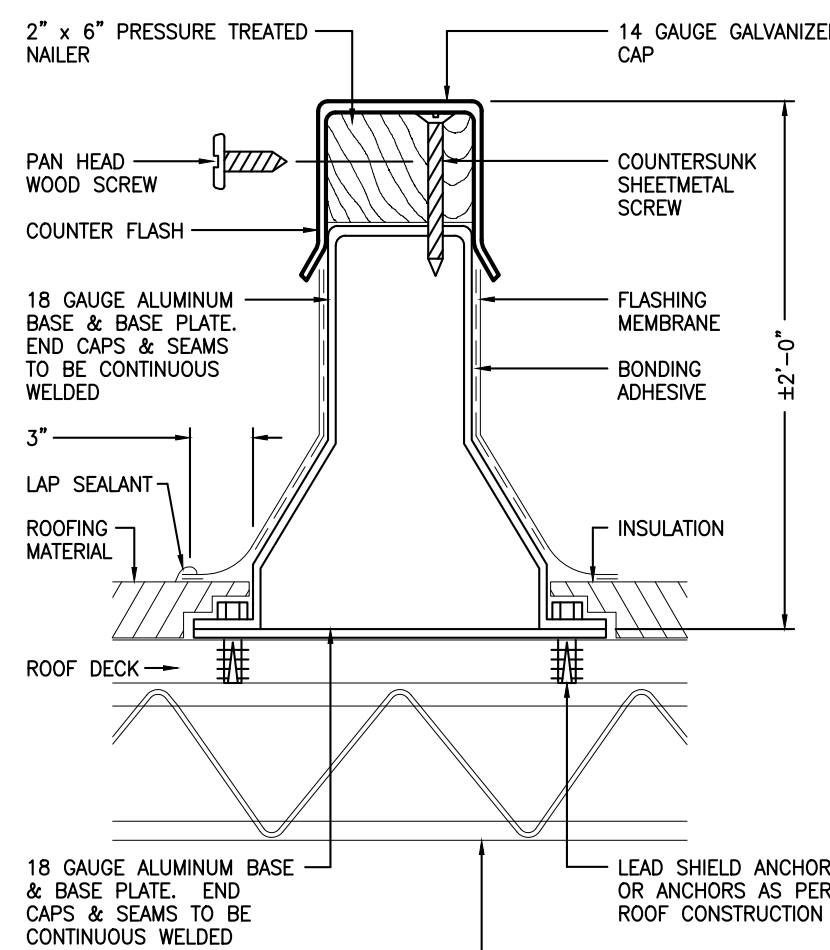


FIRE DAMPER (OUTSIDE DUCT) DETAIL

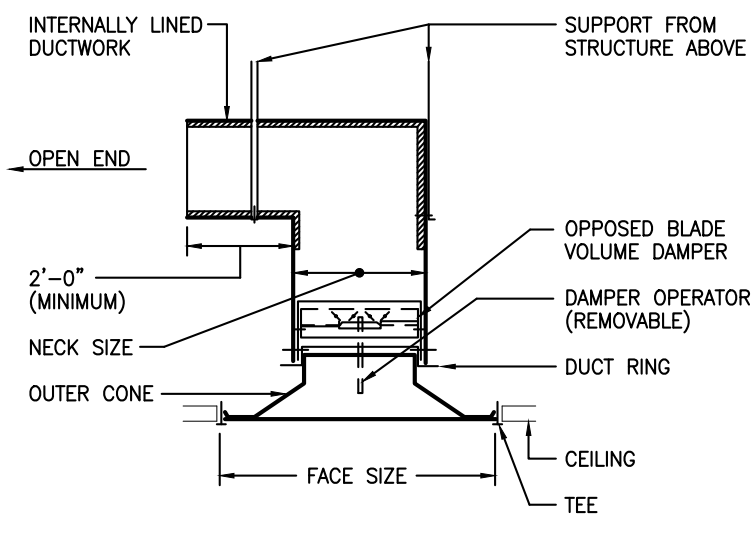
- NOTES:
- OPENINGS IN WALL SHALL BE 1/8" PER FOOT LARGER THAN DAMPER DIMENSIONS (3/16" LARGER PER FOOT FOR STAINLESS STEEL). MINIMUM CLEARANCE OF 1/4" REQUIRED FOR ALL INSTALLATIONS.
 - SLEEVE GAUGE SHALL BE AT LEAST EQUAL TO THE GAUGE OF THE DUCT AS DEFINED BY THE APPROPRIATE SMACNA DUCT CONSTRUCTION STANDARDS AND NFPA 90A. WHEN ONE OR MORE OF THE FOLLOWING DUCT SLEEVE CONNECTIONS ARE USED:
A. PLAIN "S" SLIP.
B. HEMMED "S" SLIP.
C. STANDING "S" SLIP.
D. REINFORCED STANDING "S" SLIP.
E. INSIDE SLIP JOINT.
F. DOUBLE "S" SLIP.
 - IF ANY OTHER DUCT SLEEVE CONNECTIONS ARE USED, THE SLEEVE SHALL BE MINIMUM 16-GAUGE FOR DAMPERS UP TO 36"W x 24"H AND 14-GAUGE IF WIDTH EXCEEDS 36" OR HEIGHT EXCEEDS 24".
 - MOUNTING ANGLE SHALL BE MINIMUM OF 2"x1"x14-GAUGE AND BOLTED, TACK WELDED OR SCREWED TO SLEEVE AT MAXIMUM SPACING OF 12" AND WITH MINIMUM OF TWO CONNECTIONS IN EACH SIDE, TOP AND BOTTOM. MOUNTING ANGLES SHALL OVERLAP WALL A MINIMUM OF 1" ON ALL FOUR SIDES.
 - DAMPER SHALL BE BOLTED, TACK WELDED OR SCREWED TO SLEEVE ON SAME SPACING AS ANGLES. SLEEVES SHALL NOT EXTEND MORE THAN 6" OUTSIDE OF WALL.



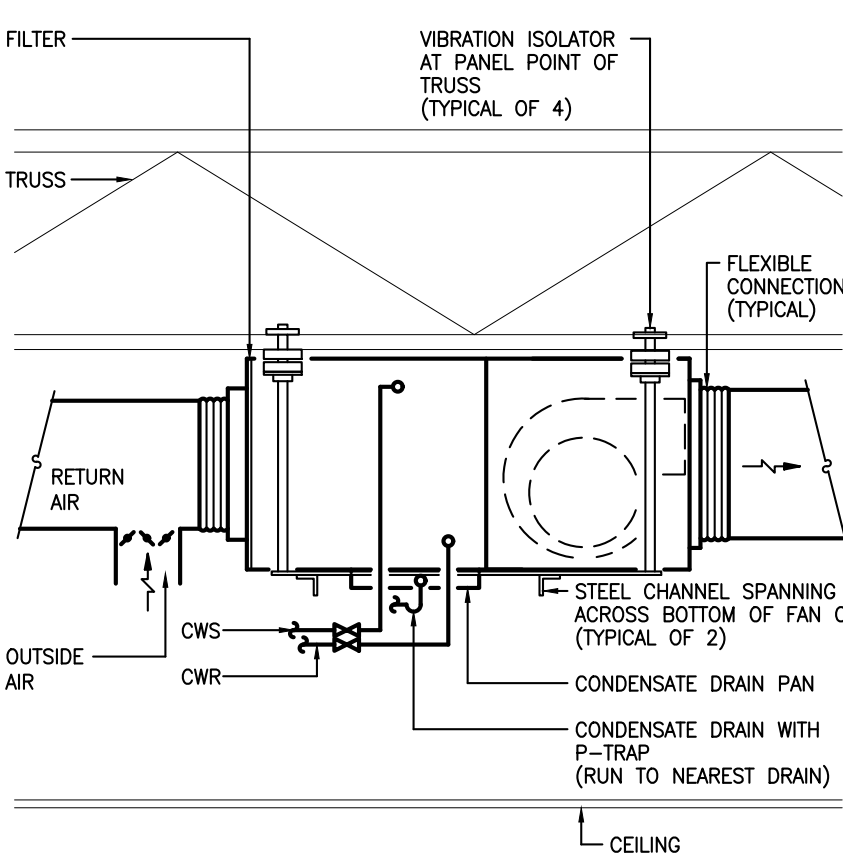
ROOF MOUNTED PIPE SUPPORT DETAIL



ROOF MOUNTED EQUIPMENT RAIL DETAIL

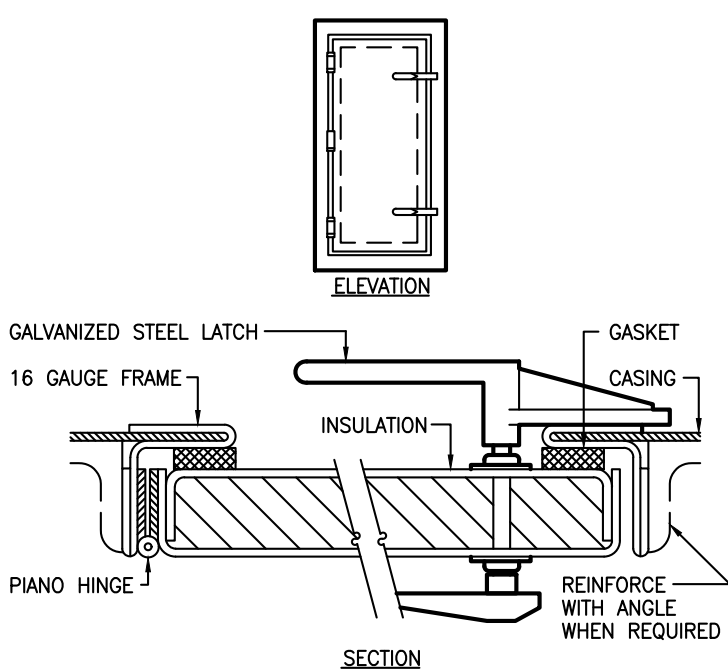


RETURN GRILLE CONNECTION DETAIL



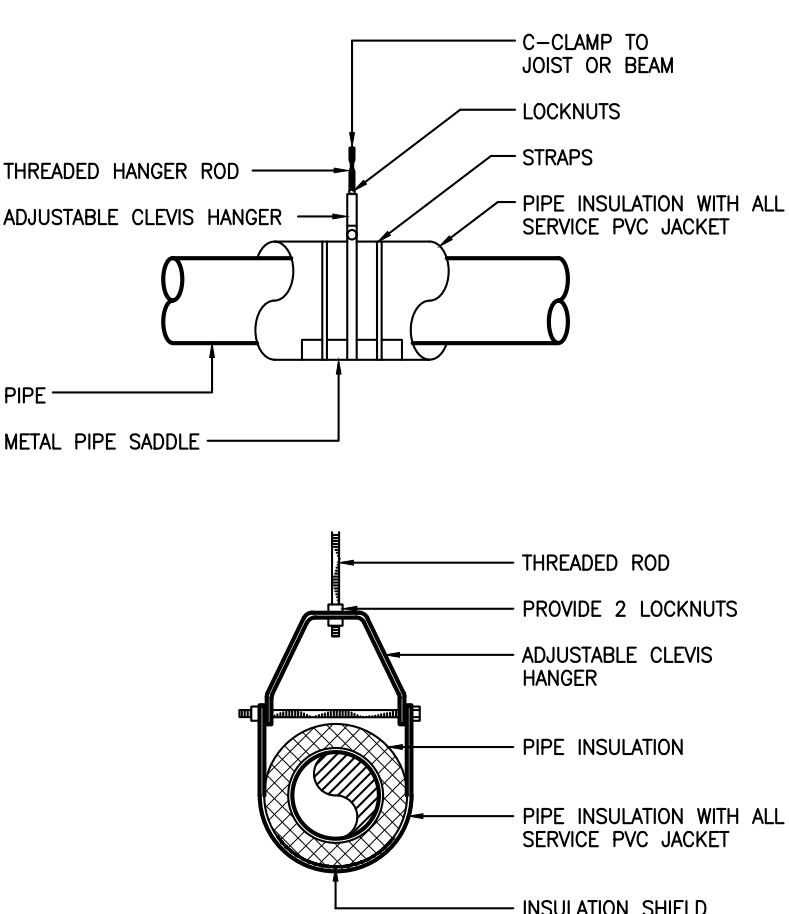
- NOTES:
- DETAIL SHOWN DOES NOT DEPICT ALL FAN COIL DUCTWORK ARRANGEMENTS.

FAN COIL UNIT DETAIL

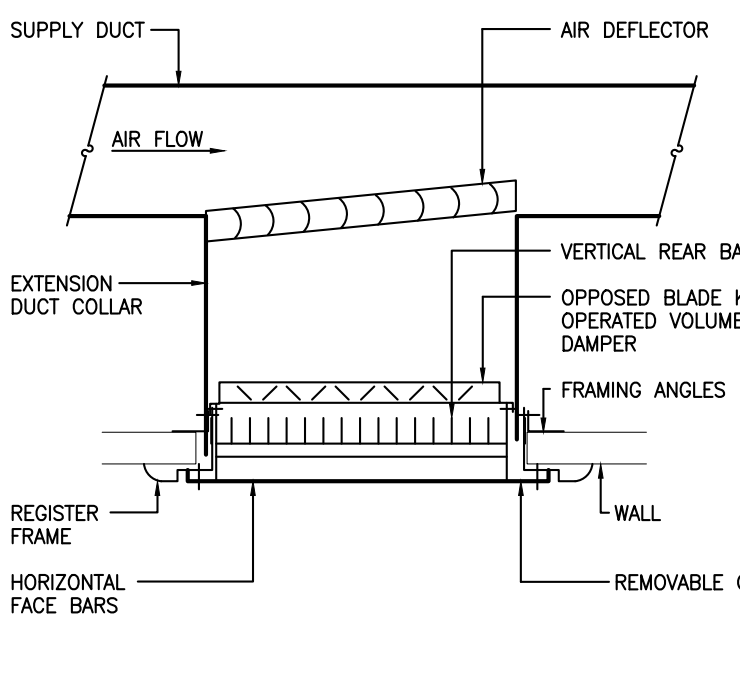


- NOTE:
- ALL DOORS TO OPEN AGAINST PRESSURE.
 - LABEL DOOR "FIRE DAMPER ACCESS".

DUCT ACCESS DOOR DETAIL

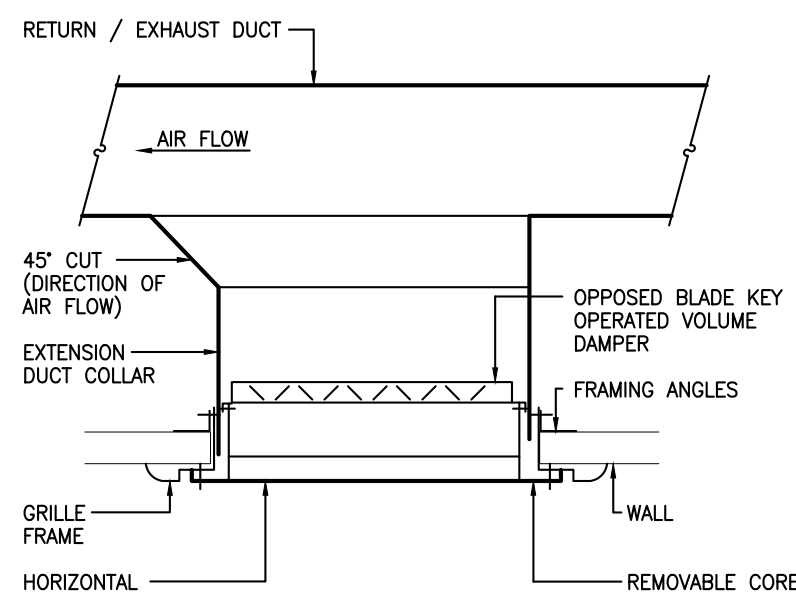


SINGLE PIPE HANGER DETAIL



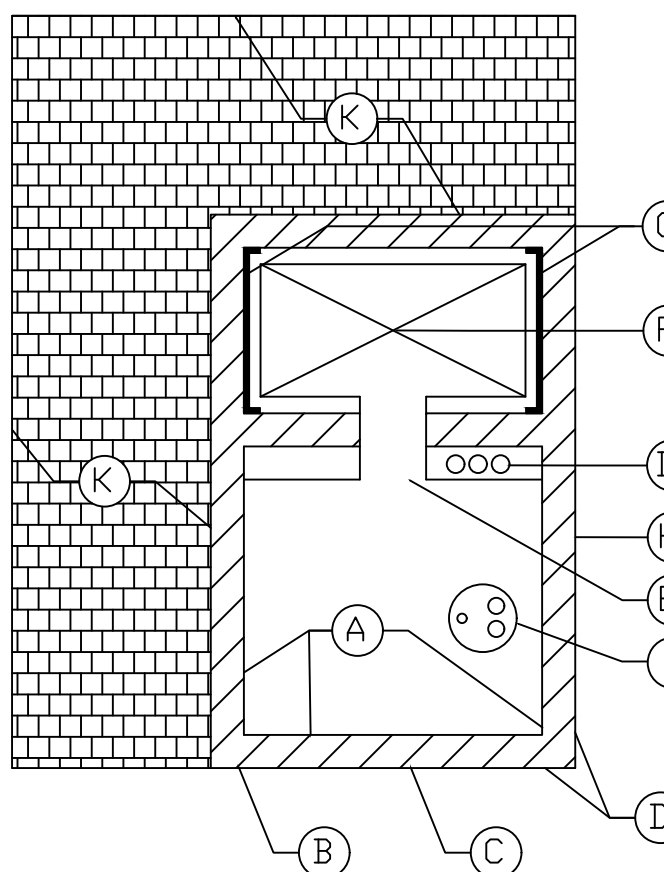
- INSTALLATION NOTES:
- FASTEN EXTENSION DUCT COLLAR TO DUCTWORK WITH SHEET METAL SCREWS. AFTER WALL IS INSTALLED, SECURE FRAME TO WALL FRAMING ANGLES AND TO EXTENSION DUCT COLLAR.
 - INSTALL REMOVABLE CORE DAMPER ASSEMBLY.

SUPPLY SIDEWALL REGISTER DETAIL

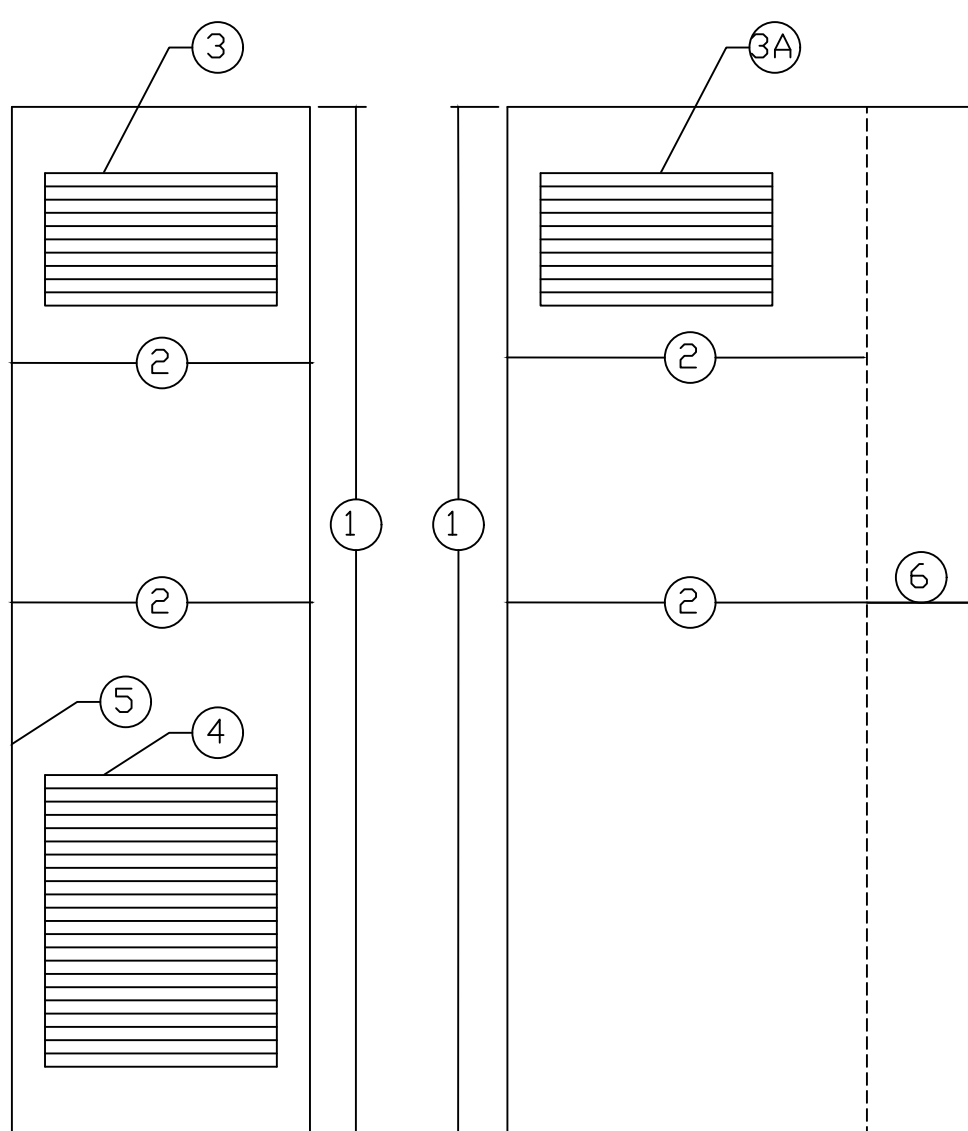
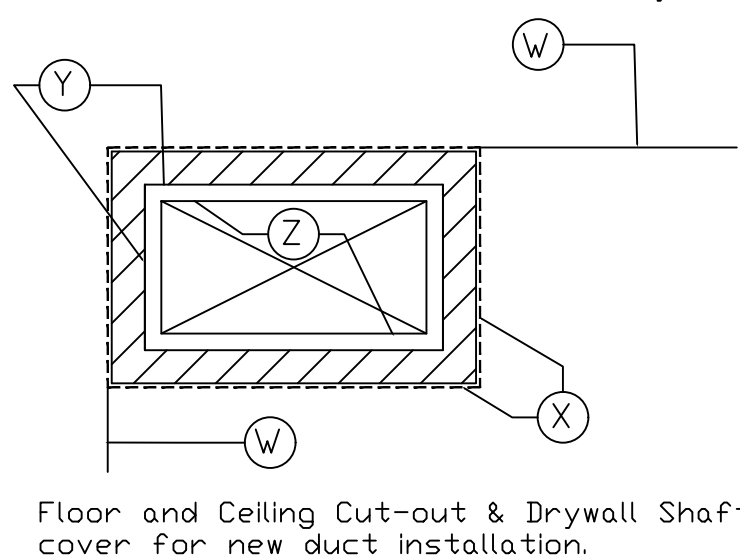


- INSTALLATION NOTES:
- FASTEN EXTENSION DUCT COLLAR TO DUCTWORK WITH SHEET METAL SCREWS. AFTER WALL IS INSTALLED, SECURE FRAME TO WALL FRAMING ANGLES AND TO EXTENSION DUCT COLLAR.
 - INSTALL REMOVABLE CORE DAMPER ASSEMBLY.

RETURN / EXHAUST SIDEWALL GRILLE DETAIL



Horizontal Section through New Vertical Fan Coil Unit Make-Up Air Duct Piping Installation. See detail below for floor and ceiling cutout and drywall shaft.



Front Elevation of New Vertical Fan Coil

Side Elevation of New Vertical Fan Coil

- 1A. EXISTING Vertical Fan Coil Unit configured for air delivery or Cooling (2-Pipe) only. Basis of design is:
- *Whelan with "DDC" controlled face and bypass damper for temperature control. Cabinetry of various heights to suit various ceiling heights and with optional supply grille locations on front or side. OR
 - *"SUPERIDR-REX", "AVS" series with 2-way motorized valve ("DDC" Temperature Control). Cabinetry to permit location of supply air grill on front or side and at various heights as determined by finished ceiling height.
- Acceptable manufacturers of Vertical Fan Coil units are: Whelan or Superior Rex as above or equivalent Trane, Carrier, McQuay.
- B. Drywall enclosure, fully finished (no painting) for vertical fan coil unit from floor to ceiling of each location. Drywall surrounding vertical ductwork must be fire-rated.
- C. Combination return air grill and access door for air filter/fan coil unit.
- D. Double deflection supply air grill having NC-18 or lower sound rating (for fan at high speed) and natural aluminum finish.
- E. Nominally 8"x8" fresh air intake (with fusible link fire damper) for fresh air intake from duct to fan coil.
- F. New vertical fresh air (make-up air) duct from make-up air unit. Provide volume damper in addition to fire damper at each unit.
- G. 8" nominal 18 gauge drywall framing channels extending from floor to floor.
- H. Fire rated drywall enclosure. (See item "B" above for additional requirements).
- I. Vertical CHWS, CHWR & CD piping for use with "Whelan" style units.
- 1A. Alternate location of CHWS, CHWR & CD piping for use with "Superior Rex" style units. With this installation vertical piping shall be insulated with vapor barrier (including CD).
- J. Complete caulking of all joints using "UL" approved material is required.
- K. Existing building walls and partitions throughout have in general plastered walls and ceilings with "White Puttycoat" finish. These surfaces shall be left undamaged by the contractor with the exception of where wall penetrations are required.
- 2V. Existing Building Walls & Partitions- See item "K" above.
- X. Floors throughout (1 through 4 & Penthouse) are of wood construction; openings are to be sawed, drilled or cored throughout. Openings are to be sized for the passage of the designated ductwork (all of which has ductliner) and the fire-rated drywall.
- Y. The drywall framing the shaft for the ductwork shall pass "unbroken" (or uncut) through the existing floor and ceiling assembly. All corner joints shall be taped and filled in accordance with UL standards.
- Z. New fresh air (make-up air) ductwork shall be sized as per the drawing and lined as specified. Provide fire dampers at all connections to fan coil units.
3. (1) Overall height of each vertical fan coil unit shall be determined by ceiling height of room into which it is to be installed. Given below are the heights to be maintained to the bottom of the supply air register under the range of ceiling heights:
- | Room Ceiling Height | Height To Bottom Of Supply Air Register |
|-------------------------------|---|
| Less than 9 ft. 0 inches | 7 ft. 6 inches |
| 9 ft. 0 thru 10 ft. 0 inches | 8 ft. 6 inches |
| 10 ft. 0 inches thru 12 ft. 0 | 9 ft. 4 inches |
| Greater than 12 ft. 0 inches | 11 ft. 0 inches |
2. Vertical fan coil cabinetry by unit manufacturer. Fully fabricated, assembled and tested units shall be delivered to the building without registers and access panels in place. Unit shall be covered with drywall as per detail #1 and trim items installed following drywall finishing.
3. Location of Supply Air register:
- 3A. Alternate location of Supply Air Register. Registers shall be double deflection design, of aluminum construction with natural finish and have a sound rating of NC-20 or less at high fan speed. See Item #1 above for information on height.
4. Return air grille & access panel located near bottom of unit. Construction shall be aluminum to match appearance and finish of supply air register.
5. Speed control switch (3-speed settings) shall be located within unit cabinet and shall be accessible through access panel or return grille.
6. Drywall shaft for make-up air duct (See details #1 & #2). *Whelan style units have integral piping for vertical CHWS, CHWR & CD. *Superior-Rex style units will require a greater depth than detailed to contain vertical "CHWS", "CHWR" & "CD" piping.

GENERAL

- Vertical fancoil supply fan will run continually during occupied cycle.
- During cooling cycle fresh air will be supplied at nominally 71°F, which will add no load to cooling coil.

NOTICE

This document, the property of, prepared and issued by the architect, is submitted for the specific project namely _____ and the recipient by accepting this document assumes custody and agrees that this document will not be copied or reproduced in part or in whole, and any special features peculiar to this design shall not be incorporated in any other project, unless prior agreement has been obtained in writing. These documents will be returned immediately upon completion of the project or upon the request of the architect.

This document is the exclusive property of the architect, no rights to ownership are transferable, or shall be lost by the filing of this document with any and all public authorities for the purpose of compliance with Codes and or Ordinances, i.e. Building Permit, etc.



COPYRIGHT © 2020 ENGINEERED BUILDING SYSTEMS

D'Youville College - Koessler Administration Building
320 Porter Ave
Buffalo, NY

ISSUE:

02-18-2020 BID SET - NOT FOR CONSTRUCTION

SA PROJECT TEAM: PRINCIPAL P.Silvestri
PROJ. ARCH. _____ DRAFTER M.Velocci
JOB CAPT. M.Velocci INTERIORS N.Catuzza

SEAL:

TITLE:

MECHANICAL HVAC DETAILS



SILVESTRI ARCHITECTS • PC

1321 MILLERSPORT HWY PH. 716.691.0900
AMHERST, NY 14221 FAX 716.691.4773

SA JOB #:

19092.01

DATE:

02-18-20

DRAWING #:

M-3



- FAN COILS, CONTROLS, CONTROL VALVES AND FIN TUBE RADIATION ARE EXISTING. ALL BIDDERS SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO BID SUBMISSION. PROVIDE THE FOLLOWING IN THIS SCOPE OF WORK:
- REPLACE ALL CONTROL VALVES WITH NEW. MATCH EXISTING MANUFACTURER.
 - REPLACE ALL DAMAGED FIN TUBE RADIATOR COVERS. MATCH EXISTING MANUFACTURER AND COLORS.
 - TURN OVER UNUSED SENSORS TO THE OWNER.
 - CHECK EXISTING CONTROL WIRING FOR SHORTS. REPLACE WIRING IF DAMAGED DURING DEMOLITION.
 - PROVIDE FOR DDC PROGRAMMING MODIFICATIONS TO SUPPORT NEW OFFICE LAYOUTS AND SENSOR WIRING CONFIGURATIONS.

NOTICE

This document, the property of, prepared and issued by the architect, is submitted for the specific project namely _____ and the recipient by accepting this document assumes custody and agrees that this document will not be copied or reproduced in part or in whole, and any special features peculiar to this design shall not be incorporated in any other project, unless prior agreement has been obtained in writing. These documents will be returned immediately upon completion of the project or upon the request of the architect.

This document is the exclusive property of the architect, no rights to ownership are transferable, or shall be lost by the filing of this document with any governmental authority for the purpose of compliance with Codes and/or Ordinances, i.e. Building Permit, etc.



D'Youville
College -
Koessler
Administration
Building
320 Porter Ave
Buffalo, NY

ISSUE:
02-18-2020 BID SET - NOT FOR
CONSTRUCTION

A PROJECT TEAM: PRINCIPAL P.Silvestri
 PROJ. ARCH. _____ DRAFTER M.Velocci
 DB CAPT. M.Velocci INTERIORS N.Catuzza

SEAL: _____

TITLE:
MECHANICAL
HVAC 4TH
FLOOR PIPING &
FIN TUBE
RADIATION



SILVESTRI
ARCHITECTS • PC

1321 MILLERSPORT HWY PH. 716.691.0900
AMHERST, NY 14221 FAX 716.691.4773

SA JOB #:	DATE:
19092.01	02-18-20

DRAWING #: M-4

NOTICE
This document, the property of, prepared and issued by the architect, is submitted for the specific project namely _____ and the recipient by accepting this document assumes custody and agrees that this document will not be copied or reproduced in part or in whole, and any special features peculiar to this design shall not be incorporated in any other project, unless prior agreement has been obtained in writing. These documents will be returned immediately upon completion of the project or upon the request of the architect.
This document is the exclusive property of the architect, no rights to ownership are transferable, or shall be lost by the filing of this document with any and all public authorities for the purpose of compliance with Codes and or Ordinances, i.e. Building Permit, etc.

ERS ENGINEERING, PC
ENGINEERED BUILDING SYSTEMS
MECHANICAL ELECTRICAL ENGINEERS
2508 WALDEN AVENUE
SUITE 107
CHEEKTOWAGA, NEW YORK 14225
PHONE: (716) 836-9600
FAX: (716) 836-9636
EMAIL: MAIL@ERSPE.COM
WEBSITE: WWW.ERSPE.COM
COPYRIGHT © 2020 ENGINEERED BUILDING SYSTEMS

**D'Youville
College -
Koessler
Administration
Building**
320 Porter Ave
Buffalo, NY

ISSUE:
02-18-2020 BID SET - NOT FOR
CONSTRUCTION

SA PROJECT TEAM: PRINCIPAL P.Silvestri
PROJ. ARCH. _____ DRAFTER M.Velocci
JOB CAPT. M.Velocci INTERIORS N.Catuzza

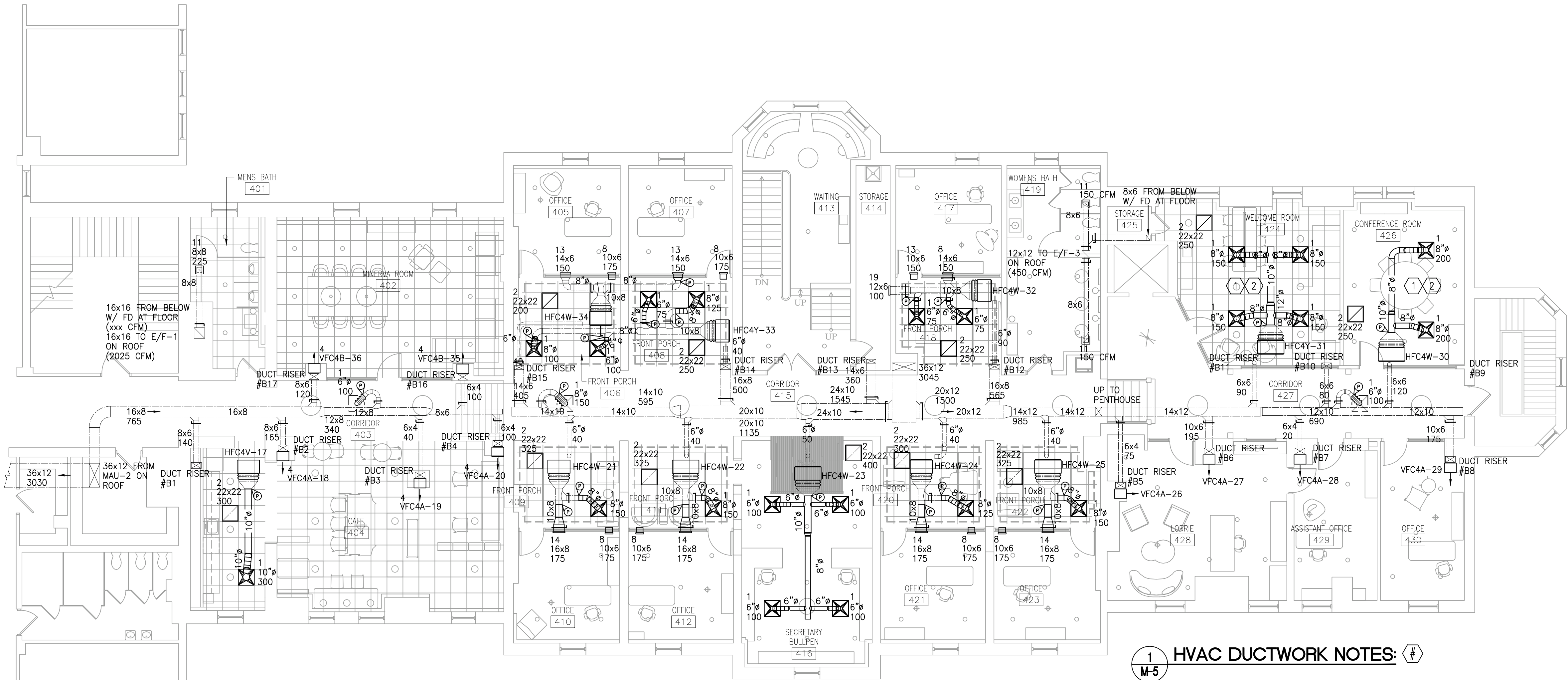
SEAL:

TITLE:
**MECHANICAL
HVAC 4TH & 5TH
FLOOR FAN
COILS &
DUCTWORK**

**SILVESTRI
ARCHITECTS • PC**
1321 MILLERSPORT HWY PH. 716.691.0900
AMHERST, NY 14221 FAX 716.691.4773

SA JOB #: 19092.01 DATE: 02-18-20

DRAWING #: **M-5**



1 HVAC FAN COILS, DUCTWORK + DIFFUSERS - PARTIAL 4TH FL. PLAN
SCALE: 1/8" = 1'-0"

1 HVAC DUCTWORK NOTES:

- MECHANICAL CONTRACTOR TO PROVIDE CONDENSATE CONNECTIONS TO NEAREST SANITARY.
- SWITCH EXISTING FAN COILS IN CONFERENCE AND WELCOME ROOMS. PROVIDE NEW DUCTWORK, EXTEND CWS AND CWR PIPING AND PROVIDE CONDENSATE CONNECTIONS AS REQUIRED.

FAN COILS, CONTROLS SUPPLY/RETURNS AND FRESH AIR DUCTWORK ARE EXISTING. ALL BIDDERS SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO BID SUBMISSION. PROVIDE THE FOLLOWING IN THIS SCOPE OF WORK:

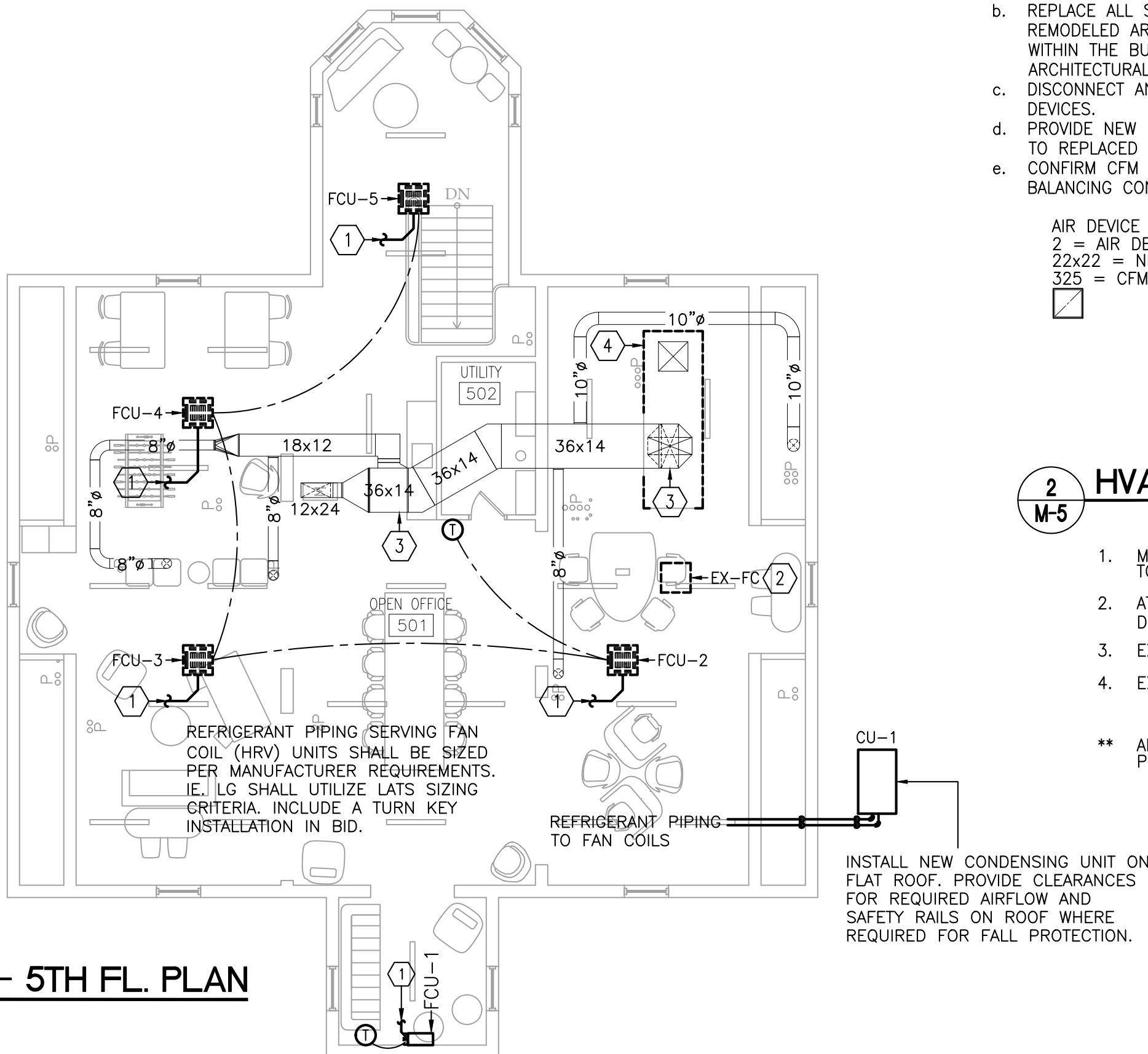
- REPLACE ALL FILTERS IN FAN COILS.
- REPLACE ALL SUPPLY, RETURN AND EXHAUST REGISTERS WITHIN THE REMODELED AREAS. NEW AIR TERMINAL UNITS SHALL MATCH EXISTING WITHIN THE BUILDING. COORDINATE ACT AND DRYWALL CEILINGS WITH ARCHITECTURAL RCPs.
- DISCONNECT AND REMOVE UNUSED DUCTWORK AND REPLACED AIR DEVICES.
- PROVIDE NEW DUCTWORK AND FLEX CONNECTIONS WHERE SHOWN AND TO REPLACED DIFFUSERS.
- CONFIRM CFM VALUES AND HAVE THE SPACE BALANCED BY A CERTIFIED BALANCING CONTRACTOR.

AIR DEVICE KEY:
2 = AIR DEVICE TYPE
22x22 = NECK SIZE
325 = CFM VALUE
1 = AIR DEVICE TYPE
8" = NECK SIZE
200 = CFM VALUE

2 HVAC DUCTWORK NOTES:

- MECHANICAL CONTRACTOR TO PROVIDE CONDENSATE CONNECTIONS TO NEAREST SANITARY.
- AT THE OWNER'S DIRECTION, EITHER DISCONNECT AND REMOVE OR DECOMMISSION ONE EXISTING FAN COIL IN PLACE AND ASSOCIATED CONTROLS.
- EXISTING SUPPLY AIR DUCTWORK SHOWN FOR REFERENCE AND TO REMAIN.
- EXISTING MAKEUP AIR UNIT SHOWN FOR REFERENCE AND TO REMAIN.

** ALL REFRIGERANT PIPING TO BE SIZED, INSULATED AND INSTALLED PER SUCCESSFUL MANUFACTURER REQUIREMENTS.



2 HVAC FAN COILS, DUCTWORK + DIFFUSERS - 5TH FL. PLAN
SCALE: 1/8" = 1'-0"

HVAC SPECIFICATIONS

PART 1 – GENERAL

1.1 QUALITY ASSURANCE

- A. MATERIALS AND EQUIPMENT SHALL BE PROVIDED BY ONE OF THE MANUFACTURERS LISTED IN PART 2 – PRODUCTS.
1. MATERIALS AND EQUIPMENT FROM OTHER MANUFACTURERS MAY BE ACCEPTED IF PROVEN EQUAL TO THOSE SPECIFIED.
- a. EQUIPMENT SELECTION OF HIGHER ELECTRICAL CHARACTERISTICS, PHYSICAL DIMENSIONS, CAPACITIES, AND RATINGS MAY BE FURNISHED PROVIDED SUCH PROPOSED EQUIPMENT IS APPROVED IN WRITING AND CONNECTING MECHANICAL AND ELECTRICAL SERVICES, CIRCUIT BREAKERS, CONDUIT, MOTOR, BASES, AND EQUIPMENT SPACES ARE INCREASED.
- 1). DIVISION 23 ALSO IS LIABLE FOR ALL COSTS AND CHANGES IN THE WORK REQUIRED BY SUBSTITUTE EQUIPMENT.
- a). NO ADDITIONAL COSTS WILL BE APPROVED FOR THESE INCREASES, IF LARGER EQUIPMENT IS APPROVED.
- 2). IF MINIMUM ENERGY RATINGS OR EFFICIENCIES OF EQUIPMENT ARE SPECIFIED, EQUIPMENT MUST MEET DESIGN AND COMMISSIONING REQUIREMENTS.
2. DIVISION 23 IS LIABLE FOR AND SHALL PAY FOR, ALL ARCHITECTURAL AND ENGINEERING REVIEWS AND REDESIGN COSTS FOR SUBSTITUTE MATERIALS AND EQUIPMENT.
- B. THE LENGTH OF TIME THE MANUFACTURER HAS BEEN IN BUSINESS, THE LOCATION AND CAPABILITY OF COMPLETE REPAIR FACILITIES, AVAILABILITY OF REPAIR PARTS AND ANNUAL MAINTENANCE CONTRACTS ALL WILL BE CONSIDERED IN DETERMINING EQUALITY.

1.2 LAWS, PERMITS, INSPECTIONS

- A. WORK SHALL COMPLY WITH THE LATEST REVISIONS OF NEW YORK STATE BUILDING CODE, NEW YORK STATE MECHANICAL CODE, NEW YORK STATE UNIFORM FIRE PROTECTION AND CONSTRUCTION CODE, NEW YORK STATE ENERGY CONSERVATION CODE, AND ANY LOCAL CODES OR REGULATIONS THAT APPLY.
- B. COMPLY WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODES AS APPLICABLE.
- C. COMPLY TO REQUIREMENTS OF DRAWINGS AND SPECIFICATIONS THAT ARE IN EXCESS OF GOVERNING CODES.
- D. DO NOT INSTALL WORK AS SPECIFIED OR SHOWN IF IN CONFLICT WITH GOVERNING CODES.
1. NOTIFY ENGINEER IN WRITING AND REQUEST DIRECTION.
- E. PROVIDE CERTIFICATE OF INSPECTION FROM ALL GOVERNING AUTHORITIES.
- F. WORK SHALL COMPLY WITH THE LATEST REVISIONS OF NEW YORK STATE BUILDING CODE, NEW YORK STATE MECHANICAL CODE, NEW YORK STATE UNIFORM FIRE PROTECTION AND CONSTRUCTION CODE, NEW YORK STATE ENERGY CONSERVATION CODE, LANDLORDS LEASING SPECIFICATION, AND ANY LOCAL CODES OR REGULATIONS THAT APPLY.
1. IN CASE OF CONFLICTS BETWEEN DRAWINGS, SPECIFICATIONS, AND INTERPRETATION OF CODES BY LOCAL AUTHORITY, LATER SHALL GOVERN.

1.3 INSTALLERS QUALIFICATIONS

- A. SKILLED MECHANICS WHO HAVE SUCCESSFULLY COMPLETED AN APPRENTICESHIP PROGRAM OR ANOTHER CRAFT TRAINING PROGRAM CERTIFIED BY THE U.S. DEPARTMENT OF LABOR, BUREAU OF APPRENTICESHIP AND TRAINING.
- B. DIVISION 23 SHALL BE LICENSED TO PERFORM MECHANICAL WORK IN THE MUNICIPALITY IN WHICH THE PROJECT IS LOCATED.

1.4 OMISSIONS.

- A. OMISSIONS, DISCREPANCIES OR POINTS OF QUESTION FOUND BY A BIDDER IN THE PLANS OR SPECIFICATIONS SHALL BE REFERRED TO THE ARCHITECT, WHO WILL FORWARD TO THE ENGINEER TO MAKE ANY CLARIFICATIONS IN WRITING.

1.5 SHOP DRAWINGS

- A. DIVISION 23 SUBMITTALS SHALL BE DELIVERED TO THE ENGINEER IN FIVE (5) COMPLETE SETS, WITH FOUR (4) BEING RETURNED.
1. DIVISION 23 SHALL CHECK, SIGN, STAMP AND DATE ALL SUBMITTALS BEFORE SENDING THEM TO THE ENGINEER FOR REVIEW.
2. THE ENGINEER SHALL BE ALLOWED 10-WORKING DAYS FOR SUBMITTAL REVIEWS BEFORE RETURNING THEM TO THE DIVISION 23 CONTRACTOR.

1.6 RECORD (AS-BUILT) DRAWINGS

- A. DURING THE PROGRESS OF CONSTRUCTION, THE RECORD DRAWINGS SHALL BE CORRECTED BY DIVISION 23 TO INDICATE ACTUAL INSTALLATIONS.
- B. UPON COMPLETION OF THE PROJECT, 3-SETS OF FINAL RECORD DRAWINGS SHALL PRODUCED, WITH 1-SET EACH BEING DELIVERED TO THE OWNER, ARCHITECT AND ENGINEER.

1.7 PROTECTION

- A. DELIVER PIPES AND TUBES WITH FACTORY APPLIED END-CAPS.
1. MAINTAIN END-CAPS THROUGH SHIPPING, STORAGE AND HANDLING TO PREVENT PIPE-END DAMAGE AND PREVENT ENTRANCE OF DIRT, DEBRIS AND MOISTURE.
- B. CLOSE AND WATERPROOF BETWEEN OPENINGS, PIPES AND VOIDS IN WALLS TO PREVENT ENTRANCE OF WATER OR MOISTURE.
- C. PROTECT STORED PIPES AND TUBES FROM MOISTURE AND DIRT.
1. ELEVATE ABOVE GRADE.
- D. SEAL ALL DUCTWORK AND PIPING, INCLUDING OPEN-ENDED DUCTWORK, AT THE END OF EACH DAY TO PREVENT DUST, DEBRIS, ETC. FROM ENTERING THE DUCTWORK AND PIPING.

1.8 GUARANTEES.

- A. DIVISION 23 SHALL GUARANTEE ALL WORK PERFORMED AND MATERIALS FURNISHED UNDER THIS CONTRACT AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF THE OWNER'S FINAL ACCEPTANCE OF THE WORK. ANY DEFECTS SHALL BE RECTIFIED BY DIVISION 23 WITHOUT ANY ADDITIONAL COST TO THE OWNER.

1.9 PUNCH LIST.

- A. DIVISION 23 SHALL SCHEDULE, THROUGH THE ARCHITECT WITH A MINIMUM OF 7-DAYS NOTICE, THE ENGINEER TO PERFORM THE FOLLOWING:
1. PRE-PUNCH LIST: VERIFICATION OF MECHANICAL ITEMS SUCH AS, BUT NOT LIMITED TO, DUCTWORK SIZES, LOCATIONS, METHODS OF ASSEMBLY / INSTALLATION, BEFORE ITEMS ARE ENCLOSED BY CEILINGS, WALLS, ETC.
- a. DIVISION 23 SHALL DELIVER TO BOTH THE ARCHITECT AND ENGINEER, A LETTER STATING THAT ALL ITEMS IN THE PRE-PUNCH LIST HAVE BEEN CORRECTED OR ADJUSTED ACCORDING TO THE GENERAL CONDITIONS OF THE CONTRACT BEFORE ANY CEILINGS, WALLS, ETC. CAN BE INSTALLED TO ENCLOSE MECHANICAL ITEMS.
2. FINAL PUNCH LIST: VERIFICATION OF MECHANICAL ITEMS SUCH AS, BUT NOT LIMITED TO, UNIT OPERATION, SENSOR LOCATIONS, COLORS SELECTED BY ARCHITECT.
- a. BEFORE PROCEEDING WITH THE FINAL PUNCH LIST, DIVISION 23 SHALL PROVIDE THE ENGINEER WITH A COMPLETE SIGNED AND SEALED BALANCE REPORT.
- 1). THE ENGINEER SHALL NOT PERFORM A FINAL PUNCH LIST UNTIL A COMPLETED BALANCE REPORT IS RECEIVED.
- b. DIVISION 23 SHALL, AT THE REQUEST OF THE ENGINEER, PROVIDE A LADDER AND ONE EMPLOYEE TO REMOVE AND REPLACE CEILING TILES, OPEN ACCESS DOORS, ETC. FOR INSPECTION OF MECHANICAL ITEMS.
- 1). THE EMPLOYEE SHALL BE MADE IMMEDIATELY AVAILABLE TO REMOVE ITEMS THAT ARE REQUESTED BY THE ENGINEER.
- 2). ANY CEILING TILE THAT IS DAMAGED SHALL BE REPLACED WITH NEW (TO MATCH EXISTING) AT DIVISION 23's EXPENSE.
- c. DIVISION 23 SHALL DELIVER TO BOTH THE ARCHITECT AND ENGINEER, A LETTER STATING THAT ALL ITEMS IN THE FINAL PUNCH LIST HAVE BEEN CORRECTED OR ADJUSTED ACCORDING TO THE GENERAL CONDITIONS OF THE CONTRACT.

PART 2 – PRODUCTS

2.1 FIRESTOPPING

- A. PROVIDE UL LISTED AND TESTED FIRESTOPPING MATERIAL, SILICONE ELASTOMER SPECIFICALLY FORMULATED FOR USE IN HORIZONTAL AND VERTICAL APPLICATIONS.
1. THE MATERIAL SHALL POSSESS INTUMESCENT CHARACTERISTICS, AND UPON EXPOSURE TO HEAT ABOVE 285° F, SHALL EXPAND TO NOT LESS THAN FIVE TIMES ITS ORIGINAL VOLUME TO FORM A FIREPROOF ENVELOPE UL RATED FOR 2 AND 3-HOURS PROTECTION, WHEN APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- B. UNUSED SLOTS AND OTHER PENETRATIONS IN WALLS OR OTHER GENERAL CONSTRUCTION SHALL BE CLOSED AND SEALED WITH AN APPROVED FIRESTOPPING MATERIAL.
1. OPENINGS IN WALLS SHALL BE CLOSED WITH 16 GAGE GALVANIZED STEEL SHEET SECURELY ATTACHED AT THE MIDPOINT OF THE WALL THICKNESS AND FIRESTOPPED ON BOTH SIDES OF THE STEEL SHEET WITH NOT LESS THAN 1/8-INCH THICK LAYER OF NON-SAGGING SILICONE ELASTOMER TO FULLY COVER THE OPENING.
2. SINGLE OR MULTIPLE PIPES PASSING THROUGH WALLS SHALL HAVE THE ANNULAR SPACE BETWEEN PIPES AND STRUCTURE FILLED WITH SILICONE ELASTOMER TO PROVIDE A MINIMUM 2-HOUR RATED FIRESTOP FOR WALLS.
- C. PIPES AND DUCTS: THE ANNULUS BETWEEN PIPING AND DUCTWORK AND WALLS IN FINISHED SPACES SHALL BE FILLED, SEALED, AND PAINTED TO MATCH ADJACENT SURFACES.

2.2 MECHANICAL IDENTIFICATION

- A. DUCT IDENTIFICATION DEVICES.
1. PLASTIC DUCT MARKERS: MANUFACTURERS STANDARD LAMINATED PLASTIC, COLOR CODED, CONTACT-TYPE, PERMANENT ADHESIVE.
- a. LETTER SIZE: MINIMUM 1/4" FOR NAME OF UNITS IF VIEWING DISTANCE IS LESS THAN 2'-0", 1/2" FOR VIEWING DISTANCES UP TO 6'-0", AND PROPORTIONALLY LARGER LETTERING FOR GREATER VIEWING DISTANCES.
- b. CONFORM TO THE FOLLOWING COLOR CODE:
- 1). YELLOW: SUPPLY AIR.
- 2). BLUE: EXHAUST AIR.
- 3). NOMENCLATURE: INCLUDE THE FOLLOWING, AS A MINIMUM:
- a). DIRECTION OF AIRFLOW.
- b). DUCT SERVICE (SUPPLY, RETURN, EXHAUST, ETC.).
2. LOCATE DUCT MARKERS NEAT POINTS WHERE DUCTS ENTER INTO CONCEALED SPACES AND AT MAXIMUM INTERVALS OF 25'-0" IN EACH SPACE WHERE DUCTS ARE EXPOSED OR CONCEALED BY REMOVABLE CEILING SYSTEMS.
- B. PIPING IDENTIFICATION DEVICES.
1. MANUFACTURED PIPE MARKERS: PRE-PRINTED, COLOR CODED WITH LETTERING INDICATING SERVICE, AND SHOWING DIRECTION OF FLOW.
- a. COLORS: COMPLY WITH ASME A-13.1 UNLESS OTHERWISE INDICATED.
- b. PIPES WITH OD, INCLUDING INSULATION, LESS THAN 6": FULL-BAND PIPE MARKERS EXTENDING 360-DEGREES AROUND PIPE AT EACH LOCATION.
- c. ARROWS: INTEGRAL WITH PIPING SYSTEM SERVICE LETTERING TO ACCOMMODATE BOTH DIRECTIONS, OR AS SEPARATE UNIT ON EACH PIPE MARKER TO INDICATE DIRECTION OF FLOW.
2. LOCATE PIPE MARKERS AS FOLLOWS:
- a. NEAR PENETRATIONS THROUGH WALLS; ONE PER SIDE OF PENETRATION.
- b. SPACED AT MAXIMUM INTERVALS OF 25'-0" ALONG EACH RUN.
- C. EQUIPMENT IDENTIFICATION DEVICES.
1. EQUIPMENT NAMEPLATES: METAL NAMEPLATE WITH OPERATIONAL DATA ENGRAVED OR STAMPED, PERMANENTLY ATTACHED TO EQUIPMENT.
- a. DATA: MANUFACTURER, PRODUCT NAME, MODEL NUMBER, SERIAL NUMBER, CAPACITY, OPERATING AND POWER CHARACTERISTICS, LABELS OF TESTED COMPLIANCES, AND SIMILAR ESSENTIAL DATA.
- 1). ENGRAVING: MANUFACTURER'S STANDARD LETTER STYLE, OF SIZES AND WITH TERMS TO MATCH EQUIPMENT IDENTIFICATION.
- 2). THICKNESS: 1/16 INCH FOR UNITS UP TO 20 SQUARE INCHES OR 8-INCHES IN LENGTH, AND 1/8 INCH FOR LARGER UNITS.
- b. LOCATION: AN ACCESSIBLE AND VISIBLE LOCATION.
- c. FASTENERS: AS REQUIRED TO MOUNT ON EQUIPMENT.

2.3 PIPING MATERIALS

- A. FAN COIL & RADIANT PIPING.: ALL SIZES, TYPE L ANNEALED-TEMPER COPPER, ASTM B-280, TYPE ACR.
- B. CONDENSATE PIPING: TYPE L DRAWN-TEMPER COPPER, ASTM B-88. WITH CRIMPED SOLDERED JOINTS.
- C. FITTINGS: WROUGHT COPPER COMPLYING WITH ASME B16.22.
- D. PIPING INSULATION: FIRE-TEST RESPONSE CHARACTERISTICS: FLAME-SPREAD RATING OF 25 OR LESS, AND SMOKE-DEVELOPED RATING OF 50 OR LESS; COMPLYING WITH ASTM E-84.

2.4 DUCTWORK ACCESSORIES

- A. VOLUME DAMPERS.
1. LOW LEAKAGE VOLUME DAMPERS: MULTIPLE OR SINGLE-BLADE, OPPOSED BLADE DESIGN, LOW LEAKAGE RATING, LINKAGE OUTSIDE OF AIRSTREAM, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS.
- a. STEEL FRAMES: HAT-SHAPED, GALVANIZED SHEET STEEL CHANNELS, MINIMUM OF 0.064" THICK, WITH MITERED AND WELDED CORNERS; FRAMES WITH FLANGES FOR ATTACHING TO WALLS, FLANGELESS FRAMES FOR INSTALLATION IN DUCTS.
- b. ROLL-FORMED STEEL BLADES: 0.064" THICK, GALVANIZED SHEET STEEL.
- c. BLADE AXLES: 1/2", GALVANIZED STEEL.
- d. BEARINGS: TWO-PIECE MOLDED SYNTHETIC THRUST OR BALL.
- e. BLADE SEALS: FELT OR NEOPRENE.
- f. JAMB SEALS: CAMBERED STAINLESS STEEL.
- g. TIE BARS AND BRACKETS: GALVANIZED STEEL.
- h. FINISH: MILL.
2. JACKSHAFT: 1" DIAMETER, GALVANIZED STEEL PIPE ROTATING WITHIN PIPE-BEARING ASSEMBLY MOUNTED ON SUPPORTS AT EACH MULLION AND AT EACH END OF MULTIPLE DAMPER ASSEMBLIES.
3. DAMPER HARDWARE: ZINC-PLATED, DIE-CAST CORE WITH DIAL AND HANDLE MADE OF 3/32" THICK ZINC-PLATED STEEL, AND A 3/4" HEXAGON LOCKING NUT.
- a. INCLUDE CENTER HOLE TO SUIT DAMPER OPERATING-ROD SIZE. INCLUDE ELEVATED PLATFORM FOR INSULATED DUCT MOUNTING.
4. DUCT ACCESSORY HARDWARE.
- a. QUADRANT LOCKS: PROVIDE FOR EACH VOLUME DAMPER, QUADRANT LOCK DEVICE ON ONE END OF SHAFT; AND END BEARING PLATE ON OTHER END FOR DAMPER LENGTHS OVER 12".
- 1). PROVIDE EXTENDED QUADRANT LOCKS FOR EXTERNALLY INSULATED DUCTWORK.
- 2). MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE QUADRANT LOCKS OF ONE OF THE FOLLOWING:
- a). VENT FABRICS, INC.
- b). YOUNG REGULATOR COMPANY.
5. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE VOLUME DAMPERS OF ONE OF THE FOLLOWING:

- a. AIR BALANCE, INC.
- b. MCGILL AIRFLOW CORPORATION.
- c. RUSKIN COMPANY.

B. DUCT-MOUNTING ACCESS DOORS.

1. DESCRIPTION: FABRICATE DOORS AIRTIGHT AND SUITABLE FOR DUCT PRESSURE CLASS.
- a. PROVIDE ACCESS DOORS IN DUCTS FOR READY ACCESS TO OPERATING PARTS INCLUDING FIRE DAMPERS, ETC.
2. ACCESS DOORS IN DUCTS – PROVIDE AND SIZE DOOR AS FOLLOWS:
- a. INSTALL THE FOLLOWING MINIMUM SIZES FOR DUCT-MOUNTING, RECTANGULAR ACCESS DOORS:
- 1). HEAD AND HAND ACCESS: 18 BY 10 INCHES.
- b. INSTALL THE FOLLOWING MINIMUM SIZES FOR DUCT-MOUNTING, ROUND ACCESS DOORS:
- 1). HEAD AND HAND ACCESS: 12 INCHES IN DIAMETER.
- c. WHEN FIELD CONDITIONS REQUIRE AN ACCESS OPENING SMALLER THAN 18-INCH BY 10-INCH OR 12-INCHES IN DIAMETER, PROVIDE A 24-INCH LONG REMOVABLE SECTION OF CASING OR DUCT, SECURED WITH QUICK ACTING LOCKING DEVICES, 6 INCHES ON CENTERS, TO PERMIT READY ACCESS WITHOUT DISMANTLING OTHER EQUIPMENT.
- d. LABEL FIRE DAMPERS ACCESS DOORS IN ACCORDANCE WITH NFPA AND DRAWINGS.
3. RECTANGULAR DOORS: MINIMUM 22-GAUGE, DOUBLE-WALL, DUCT MOUNTING, FABRICATED OF GALVANIZED SHEET METAL (OR MATERIAL MATCHING ADJOINING DUCTWORK).
- 1). INCLUDE CONTINUOUS PIANO HINGE AND CAM LATCHES.
- 2). FRAME: MINIMUM 22-GAUGE GALVANIZED SHEET STEEL, WITH BEND-OVER TABS AND FOAM GASKETS.
- 3). LOCKS: MINIMUM 16-GAUGE GALVANIZED STEEL CAM AND 20-GAUGE GALVANIZED STEEL LATCH.
- 4). ARRANGE DOORS SO THAT SYSTEM AIR PRESSURE WILL ASSIST CLOSURE AND PREVENT OPENING WHEN THE SYSTEM IS IN OPERATION.
- 5). MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE RECTANGULAR ACCESS DOORS OF ONE OF THE FOLLOWING:
- a). DUCTMATE INDUSTRIES, INC.
- b). MCGILL AIRFLOW CORPORATION.
- c). RUSKIN COMPANY.
4. ROUND DOORS: MINIMUM 22-GAUGE, DOUBLE WALL, DUCT MOUNTING; FABRICATED OF GALVANIZED SHEET METAL (OR MATERIAL MATCHING ADJOINING DUCTWORK).
- 1). INCLUDE CAM LATCHES.
- 2). FRAME: MINIMUM 22-GAUGE GALVANIZED SHEET STEEL, WITH SPIN-IN NOTCHED FRAME.
- 3). ARRANGE DOORS SO THAT SYSTEM AIR PRESSURE WILL ASSIST CLOSURE AND PREVENT OPENING WHEN THE SYSTEM IS IN OPERATION.
- 4). MANUFACTURER: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ROUND ACCESS DOORS BY ONE OF THE FOLLOWING:
- a). DUCTMATE INDUSTRIES, INC.
- b). FLEXMASTER U.S.A., INC.
5. SEAL AROUND FRAME ATTACHMENT TO DUCT AND DOOR TO FRAME WITH NEOPRENE OR FOAM RUBBER GASKET.
6. INSULATION: 1-INCH THICK, FIBROUS-GLASS OR POLYSTYRENE-FOAM BOARD.
- C. FIRE DAMPERS.

1. DESCRIPTION: LABELED ACCORDING TO UL 555, HORIZONTAL OR VERTICAL MOUNTING, MILL FINISH.
- a. FIRE RATING: 1-1/2 AND 2 HOURS.
- b. FRAME: CURTAIN TYPE WITH BLADES INSIDE AIRSTREAM; FABRICATED WITH ROLL-FORMED, MINIMUM 20-GAUGE GALVANIZED STEEL; WITH MITERED AND INTERLOCKING CORNERS.
- c. FRAME: CURTAIN TYPE WITH BLADES OUTSIDE AIRSTREAM; FABRICATED WITH ROLL-FORMED, MINIMUM 20-GAUGE GALVANIZED STEEL; WITH MITERED AND INTERLOCKING CORNERS.
- d. MOUNTING SLEEVE: FACTORY FURNISHED, FIELD INSTALLED, MINIMUM 20-GAUGE GALVANIZED SHEET STEEL AND RETAINING ANGLS.
- 1). MINIMUM THICKNESS: 0.138" THICK AND OF LENGTH TO SUIT APPLICATION.
- 2). EXCEPTIONS: OMIT SLEEVE WHERE DAMPER FRAME WIDTH PERMITS DIRECT ATTACHMENT OF PERIMETER MOUNTING ANGLES ON EACH SIDE OF WALL OR FLOOR, AND THICKNESS OF DAMPER FRAME COMPLIES WITH SLEEVE REQUIREMENTS.
- d. BLADES: ROLL-FORMED, INTERLOCKING, MINIMUM 24-GAUGE GALVANIZED SHEET STEEL.
- 1). IN PLACE OF INTERLOCKING BLADES, USE FULL LENGTH, 0.034" THICK, GALVANIZED STEEL BLADE CONNECTORS.
- e. HORIZONTAL MOUNTING: INCLUDE BLADE LOCK AND 301 STAINLESS STEEL CONSTANT FORCE TYPE CLOSURE SPRING.
- f. FUSIBLE LINK: REPLACEABLE, 165° F, VIBRATION PROOF AND SECURED WITH CLINCHED "S" HOOKS OR STAINLESS STEEL BOLTS AND LOCK NUTS.
2. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE FIRE DAMPERS OF ONE OF THE FOLLOWING:
- a. AIR BALANCE, INC.
- b. GREENHECK.
- c. RUSKIN COMPANY.

2.5 DIFFUSERS, REGISTERS AND GRILLES

- A. CEILING COMPATIBILITY: PROVIDE DIFFUSERS AND GRILLES WITH BORDER STYLES THAT ARE COMPATIBLE WITH ADJACENT CEILING SYSTEMS, AND THAT ARE SPECIFICALLY MANUFACTURED TO FIT INTO CEILING MODULE AND WITH ACCURATE FIT AND ADEQUATE SUPPORT.
- B. PERFORMANCE: PROVIDE CEILING DIFFUSERS THAT HAVE, AS MINIMUM, TEMPERATURE AND VELOCITY TRAVERSES, THROW AND DROP, AND NOISE CRITERIA RATINGS FOR EACH SIZE DEVICE AS LISTED IN MANUFACTURERS CURRENT DATA.
1. NOISE LEVELS OF NC 20 OR LESS.
- C. CEILING SUPPLY DIFFUSERS.
1. LOUVERED FACE DIFFUSER.
- a. MATERIAL: STEEL.
- b. FINISH: BAKED ENAMEL, WHITE.
- c. FACE SIZE: 24"x24".
- c. FACE STYLE: PROVIDE 18"x18" BACKPAN (NECK SIZE AS SHOWN ON DRAWINGS FOR FULL PANEL APPLICATION) WITH FULL FACE DIFFUSER, EASILY REMOVABLE CORE OF CONCENTRIC LOUVERS (FLUSH WITH FACE), SQUARE OR ROUND DUCT CONNECTION.
- 1). MINIMUM 22-GAUGE STEEL BACKPAN (WELDED-IN INLETS AND CORNER JOINTS ARE NOT ACCEPTABLE).
- d. MOUNTING: T-BAR (LAY-IN) & DRYWALL.
- e. PATTERN (THROW): 4-WAY, FIXED, HORIZONTAL DISCHARGE.
- f. DAMPERS: ADJUSTABLE, OPPOSED-BLADE, KEY OPERATED FROM FACE OF DIFFUSER.
- g. ACCESSORIES.
- 1). SQUARE TO ROUND NECK ADAPTOR.
- 2). PLASTER RING.
- D. CEILING RETURN GRILLES.
1. MATERIAL: STEEL.
2. FINISH: BAKED ENAMEL, WHITE.
3. FACE SIZE: 24"x24".
4. FACE STYLE: FLUSH, MINIMUM 22-GAUGE STEEL,, HOUSING COVERED WITH REMOVABLE PERFORATED PANEL (PERFORATED SCREEN WITH 3/16" DIAMETER HOLES ON 1/4" STAGGERED CENTERS) IN FRAME, MINIMUM 51% FREE AREA, PROVIDE 22"x22" BACKPAN (NECK SIZE AS SHOWN ON DRAWINGS, STANDARD NECK SIZE WHERE NOT INDICATED).
- 1). MINIMUM 22-GAUGE STEEL BACKPAN (WELDED-IN INLETS AND CORNER JOINTS ARE NOT ACCEPTABLE).
5. MOUNTING: T-BAR (LAY-IN) & DRYWALL.
6. DAMPERS: ADJUSTABLE, OPPOSED-BLADE, KEY OPERATED FROM FACE OF DIFFUSER.
- E. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE DIFFUSERS, REGISTERS AND GRILLES OF ONE OF THE FOLLOWING:
1. PRICE INDUSTRIES.
2. TITUS.

2.6 DUCTWORK CLEANING

- A. EXISTING DUCTWORK RETAINED FOR REUSE AND ALL NEW DUCTWORK INSTALLED UNDER THIS SCOPE SHALL BE CLEANED, TESTED, AND DEMONSTRATED TO BE CLEAN IN ACCORDANCE WITH THE STANDARDS SET FORTH BY NADCA. THE CLEANING, TESTING, AND DEMONSTRATION TO ARCHITECT, OWNER AND GOVERNMENT REPRESENTATIVE SHALL OCCUR IMMEDIATELY PRIOR TO GOV'T OCCUPANCY TO AVOID CONTAMINATION FROM CONSTRUCTION DUST AND OTHER AIRBORNE PARTICULATES.

NOTICE

This document, the property of, prepared and issued by the architect, is submitted for the specific project namely _____, and the recipient by accepting this document assumes custody and agrees that this document will not be copied or reproduced in part or in whole, and any special features peculiar to this design shall not be incorporated in any other project, unless prior agreement has been obtained in writing. These documents will be returned immediately upon completion of the project or upon the request of the architect.

This document is the exclusive property of the architect, no rights to ownership are transferable, or shall be lost by the filing of this document with any and all public authorities for the purpose of compliance with Codes and or Ordinances, i.e. Building Permit, etc.



COPYRIGHT © 2020 ENGINEERED BUILDING SYSTEMS

D'Youville
College -
Koessler
Administration
Building
320 Porter Ave
Buffalo, NY

ISSUE:

02-18-2020 BID SET - NOT FOR
CONSTRUCTION

SA PROJECT TEAM: PRINCIPAL P.Silvestri
PROJ. ARCH. _____ DRAFTER M.Velocci
JOB CAPT. M.Velocci INTERIORS N.Catuzza

SEAL:

TITLE:

MECHANICAL
HVAC
SPECIFICATIONS



SILVESTRI
ARCHITECTS • PC

1321 MILLERSPORT HWY PH. 716.691.9900
AMHERST, NY 14221 FAX 716.691.4773

SA JOB #:

19092.01

DATE:

02-18-20

DRAWING #:

M-6

HVAC SPECIFICATIONS (cont'd)

PART 3 – TESTING, ADJUSTING AND BALANCING

3.1 TESTING, ADJUSTING AND BALANCING AFTER PARTITIONS ARE INSTALLED.

- A. GENERAL: MULTIPLE MOBILIZATIONS ARE REQUIRED PER EACH COMPLETED WORK AREA / PHASE (i.e. PRIOR TO OWNER'S OCCUPANCY SPACE).
1. HVAC PRIME CONTRACTOR SHALL REVIEW THE PHASING PLANS AND INCLUDE IN BASE BID, SEPARATE BALANCE REPORTS FOR EACH COMPLETED AREA OF WORK.
- B. TAB FIRM QUALIFICATIONS: ENGAGE A TAB FIRM CERTIFIED BY EITHER ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).
1. A SPECIALIST WITH AT LEAST 5-YEARS OF EXPERIENCE IN THOSE TESTING, ADJUSTING AND BALANCING REQUIREMENTS SIMILAR TO THOSE REQUIRED FOR THIS PROJECT, WHO IS NOT THE INSTALLER OF THE SYSTEM TO TESTED AND IS OTHERWISE INDEPENDENT OF THE PROJECT AND INSTALLER.
- a. SUBMIT BIOGRAPHICAL DATA ON TAB SUPERVISOR WHO IS DIRECTLY SUPERVISING TESTING, ADJUSTING AND BALANCING WORK.
- b. SUBMIT THE INDIVIDUAL QUALIFICATIONS OF ALL PERSONS RESPONSIBLE FOR SUPERVISING AND PERFORMING THE ACTUAL WORK.
- C. TAB FORM REPORTS: USE STANDARD FORMS FROM AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING., AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING AND BALANCING OF ENVIRONMENTAL SYSTEMS".
- D. PROJECT CONDITIONS.
1. GENERAL: DO NOT PROCEED WITH TESTING, ADJUSTING AND BALANCING WORK UNTIL THE FOLLOWING CONDITIONS HAVE BEEN MET.
- a. WORK HAS BEEN COMPLETED AND IS OPERABLE.
- b. WORK SCHEDULED FOR TESTING, ADJUSTING AND BALANCING IS CLEAN AND FREE FROM DEBRIS, DIRT AND DISCARDED BUILDING MATERIALS.
- c. ALL ARCHITECTURAL OPENINGS (DOORS, WINDOWS, AND OTHER OPENINGS) WHICH MAY AFFECT THE OPERATION OF THE SYSTEM TO BE TESTED, ADJUSTED AND BALANCED SHALL BE AT THEIR NORMAL STATES.
- d. ALL RELATED MECHANICAL SYSTEMS, WHICH MAY AFFECT THE OPERATION OF THE SYSTEM TO BE TESTED, ADJUSTED AND BALANCED SHALL BE AT THEIR NORMAL OPERATING CONDITIONS; COORDINATE WITH CONTROLS CONTRACTOR.
- e. UNIT FILTERS HAVE BEEN REPLACED WITH NEW.
- E. GENERAL PROCEDURES FOR TESTING AND BALANCING.
1. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS".
2. CUT INSULATION, DUCTS, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY TO ALLOW ADEQUATE PERFORMANCE OF PROCEDURES.
- a. AFTER TESTING AND BALANCING, CLOSE PROBE HOLES AND PATCH INSULATION WITH NEW MATERIALS IDENTICAL TO THOSE REMOVED.
3. MARK EQUIPMENT AND BALANCING DEVICE SETTINGS WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL, INCLUDING DAMPER-CONTROL POSITIONS, FAN-SPEED CONTROL LEVERS, AND SIMILAR CONTROL DEVICES, TO SHOW FINAL SETTINGS.

F. TOLERANCES.

1. SUPPLY FANS: 0% TO PLUS 5%.
2. AIR OUTLETS AND INLETS: 0% TO PLUS 5%.

G. FINAL REPORT.

1. GENERAL: PROVIDE TYPEWRITTEN OR COMPUTER PRINTOUT IN LETTER-QUALITY FONT, ON STANDARD BOND PAPER, IN THREE-RING BINDER, TABULATED AND DIVIDED INTO SECTIONS BY TESTED AND BALANCED SYSTEM.
- a. INCLUDE A CERTIFICATION SHEET IN FRONT OF BINDER, SEALED AND SIGNED BY THE TESTING AND BALANCING ENGINEER.
- b. INCLUDE A LIST OF INSTRUMENTS USED FOR PROCEDURES, ALONG WITH PROOF OF CALIBRATION.
2. GENERAL REPORT DATA: IN ADDITION TO FORM TITLES AND ENTRIES, INCLUDE THE FOLLOWING DATA IN THE FINAL REPORT, AS APPLICABLE.
- a. TITLE PAGE.
- b. NAME AND ADDRESS OF TAB FIRM.
- c. PROJECT NAME AND LOCATION.
- d. ARCHITECT'S NAME AND ADDRESS.
- e. ENGINEER'S NAME AND ADDRESS.
- f. MECHANICAL CONTRACTORS NAME AND ADDRESS.
- g. REPORT DATE.
- h. TABLE OF CONTENTS WITH THE TOTAL NUMBER OF PAGES (NUMBER EACH PAGE IN REPORT) DEFINED FOR EACH SECTION OF THE REPORT.
- i. SUMMARY OF CONTENTS INCLUDING THE FOLLOWING:
- 1). INDICATED VERSUS FINAL PERFORMANCE.
- 2). NOTABLE CHARACTERISTICS OF SYSTEMS.
- 3). DESCRIPTION OF SYSTEM OPERATION SEQUENCE IF IT VARIES FROM THE CONTRACT DOCUMENTS.

H. INSPECTIONS.

1. INITIAL INSPECTION.
- a. AFTER TESTING AND BALANCING ARE COMPLETE, OPERATE EACH SYSTEM AND RANDOMLY CHECK MEASUREMENTS TO VERIFY THAT THE SYSTEM IS OPERATING ACCORDING TO THE FINAL TEST AND BALANCE READINGS DOCUMENTED IN THE FINAL REPORT.
- 1). RANDOMLY CHECK THE FOLLOWING FOR EACH SYSTEM:
- a). MEASURE AIRFLOW OF AT LEAST 10% OF AIR OUTLETS.
- b). MEASURE ROOM TEMPERATURE AT EACH THERMOSTAT.
- c). MEASURE SPACE PRESSURE OF AT LEAST 10% OF LOCATIONS.
- d). VERIFY THAT BALANCING DEVICES ARE MARKED WITH FINAL BALANCE POSITION.
2. FINAL INSPECTION.
- a. AFTER INITIAL INSPECTION IS COMPLETE AND EVIDENCE BY RANDOM CHECKS VERIFIES THAT TESTING AND BALANCING ARE COMPLETE AND ACCURATELY DOCUMENTED IN THE FINAL REPORT, REQUEST THAT A FINAL INSPECTION BE MADE BY THE ARCHITECT, OWNER AND GOVERNMENT REPRESENTATIVE.
- 1). TAB FIRM TEST AND BALANCE ENGINEER SHALL CONDUCT THE INSPECTION IN THE PRESENCE OF THE ARCHITECT, OWNER AND GOVERNMENT REPRESENTATIVE.
- b. ARCHITECT, OWNER AND GOVERNMENT REPRESENTATIVE SHALL RANDOMLY SELECT MEASUREMENTS DOCUMENTED IN THE FINAL REPORT TO BE RECHECKED.
- 1). THE RECHECKING SHALL BE LIMITED TO EITHER 10% OF THE TOTAL MEASUREMENTS RECORDED, OR THE EXTENT OF THE MEASUREMENTS THAT CAN BE ACCOMPLISHED IN A NORMAL 8-HOUR BUSINESS DAY.
- c. IF THE RECHECKS YIELD MEASUREMENTS THAT DIFFER FROM THE MEASUREMENTS DOCUMENTED IN THE FINAL REPORT BY MORE THAN THE TOLERANCES ALLOWED, THE MEASUREMENTS SHALL BE NOTED AS "FAILED".
- 1). IF THE NUMBER OF "FAILED" MEASUREMENTS IS GREATER THAN 10% OF THE TOTAL MEASUREMENTS CHECKED DURING THE FINAL INSPECTION, OR A SOUND LEVEL OF 2 db OR MORE GREATER THAN THAT RECORDED IN THE REPORT LISTINGS, THE TESTING AND BALANCING SHALL BE CONSIDERED INCOMPLETE AND SHALL BE REJECTED.
- a). IN THE EVENT THE REPORT IS REJECTED, ALL SYSTEMS SHALL BE READJUSTED AND TESTED, NEW DATA RECORDED, NEW CERTIFIED REPORTS SUBMITTED, AND NEW INSPECTIONS TEST MADE, ALL AT NO ADDITIONAL COST.
- d. TAB FIRM SHALL RECHECK ALL MEASUREMENTS AND MAKE READJUSTMENTS.
- 1). REVISE THE FINAL REPORT AND BALANCE DEVICE SETTINGS TO INCLUDE ALL CHANGES AND RESUBMIT THE FINAL REPORT.
- e. REQUEST A SECOND FINAL INSPECTION.
- 1). IF THE SECOND FINAL INSPECTION ALSO FAILS, THE OWNER SHALL CONTRACT THE SERVICES OF ANOTHER QUALIFIED TAB FIRM TO COMPLETE THE TESTING AND BALANCING IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND DEDUCT THE COST OF THE SERVICES FROM THE FINAL PAYMENT OF THE ORIGINAL TAB FIRM.

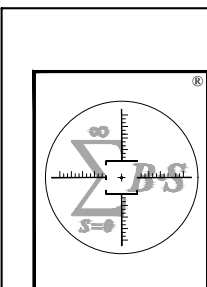
3.2 EQUIPMENT REPORT TEST DATA.

- A. TEST DATA REQUIREMENTS: PROVIDE THE FOLLOWING, AS A MINIMUM, INDICATED AND ACTUAL VALUES PER EACH PIECE OF SYSTEM TESTED.
1. FAN COIL UNITS.
- a. TOTAL AIRFLOW RATE IN CFM.
- b. TOTAL SYSTEM STATIC PRESSURE IN INCHES WG.
- c. FAN RPM.
- d. OUTSIDE AND RETURN AIRFLOW IN CFM.
- e. ENTERING AIR TEMPERATURE IN DEGREES F.
- f. LEAVING AIR TEMPERATURE IN DEGREES F.
- g. COOLING COIL STATIC PRESSURE IN INCHES WG.
- h. MOTOR VOLTAGE AT EACH CONNECTION.
- i. MOTOR AMPERAGE FOR EACH PHASE.
2. AIR TERMINAL DEVICES.
- a. AIRFLOW RATE IN CFM.
- b. AIR VELOCITY IN FPM.
- c. PRELIMINARY AIRFLOW RATE AS NEEDED IN CFM.
- d. PRELIMINARY VELOCITY AS NEEDED IN FPM.
- e. FINAL AIRFLOW RATE IN CFM.
- f. FINAL VELOCITY IN FPM.
- g. SPACE TEMPERATURE IN DEGREES F.
3. RECTANGULAR AND ROUND DUCTWORK.
- a. SYSTEM AND UNIT NUMBER.
- b. DUCT STATIC PRESSURE IN INCHES WG.
- c. DUCT SIZE IN INCHES.
- d. ACTUAL AIRFLOW RATE IN CFM.
- e. ACTUAL VELOCITY IN FPM.

NOTICE

This document, the property of, prepared and issued by the architect, is submitted for the specific project namely _____, and the recipient by accepting this document assumes custody and agrees that this document will not be copied or reproduced in part or in whole, and any special features peculiar to this design shall not be incorporated in any other project, unless prior agreement has been obtained in writing. These documents will be returned immediately upon completion of the project or upon the request of the architect.

This document is the exclusive property of the architect, no rights to ownership are transferable, or shall be lost by the filing of this document with any and all public authorities for the purpose of compliance with Codes and or Ordinances, i.e. Building Permit, etc.



EBS ENGINEERING, PC
ENGINEERED BUILDING SYSTEMS
MECHANICAL / ELECTRICAL ENGINEERS
2508 WALDEN AVENUE
SUITE 107
CHELSEA, NEW YORK 10025
PHONE: (716) 836-9600
FAX: (716) 836-9636
EMAIL: MAIL@EBSPE.COM
WEBSITE: WWW.EBSPE.COM

COPYRIGHT © 2020 ENGINEERED BUILDING SYSTEMS

D'Youville
College -
Koessler
Administration
Building
320 Porter Ave
Buffalo, NY

ISSUE:
02-18-2020 BID SET - NOT FOR
CONSTRUCTION

SA PROJECT TEAM: PRINCIPAL P.Silvestri
PROJ. ARCH. _____ DRAFTER M.Velocci
JOB CAPT. M.Velocci INTERIORS N.Catuzza

SEAL:

TITLE:
MECHANICAL
HVAC
SPECIFICATIONS



SILVESTRI
ARCHITECTS • PC

1321 MILLERSPORT HWY PH. 716.691.0900
AMHERST, NY 14221 FAX 716.691.4773

SA JOB #: 19092.01
DATE: 02-18-20

DRAWING #: M-7