	HANICAL ABBREVIATIONS
(E) AC	EXISTING TO REMAIN AIR CONDITIONING UNIT
AC	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AL AP	ACOUSTICAL LINING ACCESS PANEL
BDD	BACK DRAFT DAMPER
BFC	BELOW FINISHED CEILING
BHP	BRAKE HORSEPOWER
BMS	BUILDING MANAGEMENT SYSTEM
BTU CA	BRITISH THERMAL UNIT COMPRESSED AIR
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHP CHR	CHILLED WATER PUMP CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CO	CLEAN OUT
COND	
CP CRAC	CONDENSATE PUMP COMPUTER ROOM AIR CONDITIONING UNIT
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CWP	
CWR CWS	CONDENSER WATER RETURN CONDENSER WATER SUPPLY
DB	DRY BULB
DWP	DOMESTIC WATER PUMP
DX	
EAT	ENTERING AIR TEMPERATURE
EF ERU	EXHAUST FAN ENERGY RECOVERY UNIT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EWC EWT	ELECTRIC WATER COOLER ENTERING WATER TEMPERATURE
FA	FREE AREA
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FLR FOP	FLOOR FUEL OIL PUMP
FP	FIRE PUMP
FPM	FEET PER MINUTE
FPTU	FAN POWERED TERMINAL UNIT
FSD GPM	COMBINATION FIRE AND SMOKE DAMPER GALLONS PER MINUTE
HP	HORSEPOWER
HP	HEAT PUMP
HW	HOT WATER
HWP HWR	HOT WATER PUMP HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
HX	HEAT EXCHANGER
HZ	
ID KW	INSIDE DIAMETER KILOWATT
LAT	LEAVING AIR TEMPERATURE
LB	POUND
LF	
LWT MA	LEAVING WATER TEMPERATURE MAKE-UP AIR (OUTSIDE AIR)
MBH	THOUSAND BTU PER HOUR
MOCP	MAXIMUM OVERCURRENT PROTECTION
MOD	MOTOR OPERATED DAMPER
MTD MUA	MOUNTED MAKE-UP AIR UNIT
NC NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NK	NECK
NO	NORMALLY OPEN
NTS OA	NOT TO SCALE OUTSIDE AIR
OAHU	OUTSIDE AIR HANDLING UNIT
OAT	OUTSIDE AIR TEMPERATURE
OBD	OPPOSED BLADE DAMPER
OD PBD	OUTSIDE DIAMETER PARALLEL BLADE DAMPER
PBD	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH (GAUGE)
PTAC	PACKAGED TERMINAL AIR CONDITIONER
RA	RETURN AIR RETURN AIR GRILL
RAG RCP	RETURN AIR GRILL REFLECTED CEILING PLAN
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHC	
RPM RTU	REVOLUTIONS PER MINUTE ROOFTOP UNIT
SA	SUPPLY AIR
SD	SMOKE DAMPER
SEF	SMOKE EXHAUST FAN
SF	SUPPLY FAN
SP TYP	STATIC PRESSURE TYPICAL
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
VAV	VARIABLE AIR VOLUME UNIT
VD	
VFD VTR	VARIABLE FREQUENCY DRIVE VENT THROUGH ROOF
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MECHANICAL LEGEND

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A SIZE (CFM)

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BUTTERFLY VALVE
BALL VALVE
SWING CHECK VALVE
GATE VALVE, ANGLE
THREE WAY CONTROL VALVE
TWO WAY CONTROL VALVE
SOLENOID VALVE
PRESSURE REDUCING VALVE (PRV)
MANUAL AIR VENT
BALANCING VALVE
DIRECTION OF FLOW
STRAINER
STRAINER WITH BLOW OFF VALVE
PIPE RISING UP
PIPE DROPPING DOWN
PIPE CAP
CONCENTRIC REDUCER
ECCENTRIC REDUCER
UNION
ANCHOR
GUIDE
EXPANSION JOINT
THERMOMETER
GAS PRESSURE REGULATOR
STRAINER
ELECTRICALLY TRACED PIPING
EXPANSION LOOP (WxH)
RETURN LINEAR DIFFUSER
LINEAR DIFFUSER WITH PLENUM
SUPPLY DIFFUSER
FLEXIBLE DUCTWORK
RETURN GRILLE
EXHAUST GRILLE
DIRECTION OF FLOW
THERMOSTAT
HUMIDISTAT
PRESSURE SENSOR
EQUIPMENT DESIGNATION
AIR OUTLET/INLET DEVICE DESIGNATION

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MECHANICAL LEGEND

POINT OF CONNECTION (NEW TO EXISTING)

DUCT SIZE (CLEAR INSIDE DIMENSION)

FIRST FIGURE INDICATES PLAN SIZE ROUND DUCT DIAMETER SIZE (CLEAR INSIDE DIMENSION) RECTANGULAR OR SQUARE TO ROUND OR OVAL TRANSITION ROUND EXHAUST DUCT UP

ROUND EXHAUST DUCT DOWN

ROUND RETURN DUCT UP

ROUND RETURN DUCT DOWN

ROUND SUPPLY DUCT UP

ROUND SUPPLY DUCT DOWN

RECTANGULAR EXHAUST DUCT UP

RECTANGULAR EXHAUST DUCT DOWN

RECTANGULAR RETURN DUCT DOWN

RECTANGULAR SUPPLY DUCT UP

RECTANGULAR SUPPLY DUCT DOWN

VOLUME DAMPER (MANUAL)

FLEXIBLE CONNECTION

MOTORIZED DAMPER

SMOKE DAMPER

FUSIBLE LINK FIRE DAMPER

MOTORIZED FIRE SMOKE DAMPER

BACK DRAFT DAMPER

VANED ELBOW

RADIUS ELBOW

ACCESS DOOR (AD)

BRANCH DUCT TAKE-OFF

INTERNALLY LINED DUCT

EXISTING TO REMAIN

DEMOLISHED OR RELOCATED EQUIPMENT OR MATERIALS

NEW CONSTRUCTION

MECHANICAL GENERAL NOTES ALL WORK PERFORMED FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL BUILDING CODES, MECHANICAL CODES, ENERGY CODES AND THEIR AMENDMENTS. THE MORE STRINGENT CODE SHALL APPI Y CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK UNDER THEIR 2 CONTACT PRIOR TO FABRICATION, ROUGH-IN AND FINAL CONNECTION. HVAC WORK IS SHOWN DIAGRAMMATIC IN NATURE. DRAWINGS SHOULD NOT BE SCALED. PROVIDE ALL OFFSETS AND FITTINGS REQUIRED TO FIT WITHIN AVAILABLE SPACE. COORDINATE WORK WITH STRUCTURAL, ARCHITECTURAL, PLUMBING AND ELECTRICAL PRIOR TO INSTALLATION. 4 LOCATE ALL EQUIPMENT TO ALLOW FOR SERVICE ACCESS. COORDINATE LOCATION WITH OTHER TRADES. DO NOT ALLOW ACCESS TO BE ENCROACHED UPON BY CONDUITS, PIPE AND OTHER MATERIALS. PROVIDE ACCESS DOORS FOR ALL EQUIPMENT, VALVES, DAMPERS, ETC. ABOVE 5 ALL NON-LAY-IN CEILINGS FOR MAINTENANCE AND SERVICE. ALL RECTANGULAR AND ROUND DUCTWORK IS TO BE CONSTRUCTED OF 6 GALVANIZED SHEET METAL, UNLESS NOTED OTHERWISE. ALL DUCTWORK SHALL BE CONSTRUCTED PER THE LATEST SMACNA DUCT STANDARDS. ALL DUCTWORK SIZES INDICATED ARE CLEAR INSIDE DIMENSIONS. CONTRACTOR TO ALLOW FOR DUCT LINING AS REQUIRED. IF RESIZING IS REQUIRED IT SHALL BE DONE PER THE EQUAL FRICTION METHOD. DUCT RUN-OUTS TO SUPPLY AIR DIFFUSERS SHALL BE THE SAME SIZE AS THE 8 DIFFUSER NECK.

FOR EACH HEATING OR COOLING UNIT PROVIDE A TEMPERATURE SENSING 9 DEVICE. LOCATE DEVICE WHERE SHOWN ON DRAWINGS AND COORDINATE LOCATION WITH ARCHITECT, OTHER WALL DEVICES AND PER ADA GUIDELINES. INSTALL ALL MECHANICAL EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS AND 10 RECOMMENDATIONS. IF CONTRACTOR SUBSTITUTES EQUIPMENT AND AFTER APPROVAL BY THE ENGINEER, THE CONTRACTOR SHALL MAKE ALL NECESSARY MODIFICATIONS TO THE SYSTEM AS REQUIRED TO PROVIDE INSTALLATION. CONTRACTOR TO VERIFY ALL ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT WITH ELECTRICAL DRAWINGS BEFORE EQUIPMENT RELEASE. COORDINATE ALL SLEEVE, CHASE AND SLAB BLOCK-OUTS WITH EXISTING 12 STRUCTURE. COORDINATE ACTUAL EQUIPMENT DIMENSION WITH OTHER TRADES. CEILING DIFFUSER FRAME TYPES COLORS TO BE WHITE. 13 PROVIDE 1-1/2" ACOUSTICAL LINING ON ALL DUCTWORK WITHIN 10'-0" OF RTU/AHU. 15 ALL OTHER DUCTWORK IS TO BE INSULATED WITH 1-1/2" FIBERGLASS WRAP/INSULATION. PROVIDE ALL TRANSITION AS NECESSARY TO MAKE CONNECTION TO HVAC 16 EQUIPMENT. ALL PIPING, DUCTWORK AND EQUIPMENT SHALL BE SUPPORTED PER THE LATEST 17 EDITION OF SMACNA. PROVIDE DUCT ACCESS DOORS ON ALL MOTORIZED DAMPERS, FIRE DAMPERS, 18 SMOKE DAMPERS, BACKDRAFT DAMPERS AND FIRE/SMOKE DAMPERS. FLEXIBLE DUCTWORK FOR CONNECTION TO AIR DEVICES SHALL BE LIMITED TO 19 5'-0" IN LENGTH. FOR LONGER CONNECTIONS USE INSULATED RIGID SPIRAL ROUND DUCTWORK. SPLIT SEAM ROUND DUCTWORK IS NOT ALLOWED. PROVIDE MANUAL VOLUME DAMPERS AT DUCT TAKEOFFS FROM MAINS. 20 DAMPERS SHALL BE LOCATED IN ACCESSIBLE LOCATIONS. AVOID THE INSTALLATION OF DAMPERS AT DIFFUSERS DUE TO NOISE ISSUES. 21 PROVIDE SMACNA DUCT TRANSITIONS TO ALL TERMINAL UNIT INLETS AND

 OUTLETS FOR CONNECTION TO DUCTWORK.

 22
 ALL EXHAUST FAN OUTLETS SHALL BE A MINIMUM OF 10' FROM ALL BUILDING AIR INTAKES AND OPENINGS.

23 ALL EXTERIOR BUILDING PENETRATION SHALL BE SEALED WATER TIGHT. ALL INTERIOR WALL AND FLOOR PENETRATIONS FOR DUCTWORK AND PIPING SHALL BE MEET THE FIRE RATING OF THE ARCHITECTURAL PLANS AND WILL BE INSTALLED TO MEET ALL UL ASSEMBLY REQUIREMENTS.

 PROVIDE MANUAL BALANCE DAMPERS AT EACH BRANCH DUCT TO ALL SUPPLY DIFFUSERS, EXHAUST GRILLS AND DUCTED RETURN GRILLES.
 REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOUVER LOCATIONS AND

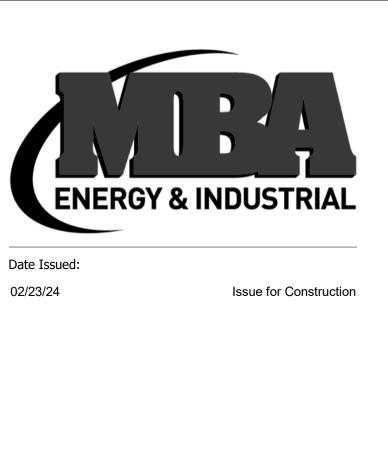
27 COORDINATE LOUVER PLACEMENT WITH ARCHITECT. 27 PROVIDE MOTORIZED DAMPERS ON ALL EXTERIOR BUILDING PENETRATIONS. INTERLOCK WITH RESPECTIVE FANS. DAMPER TO FAIL CLOSED, UNLESS NOTED

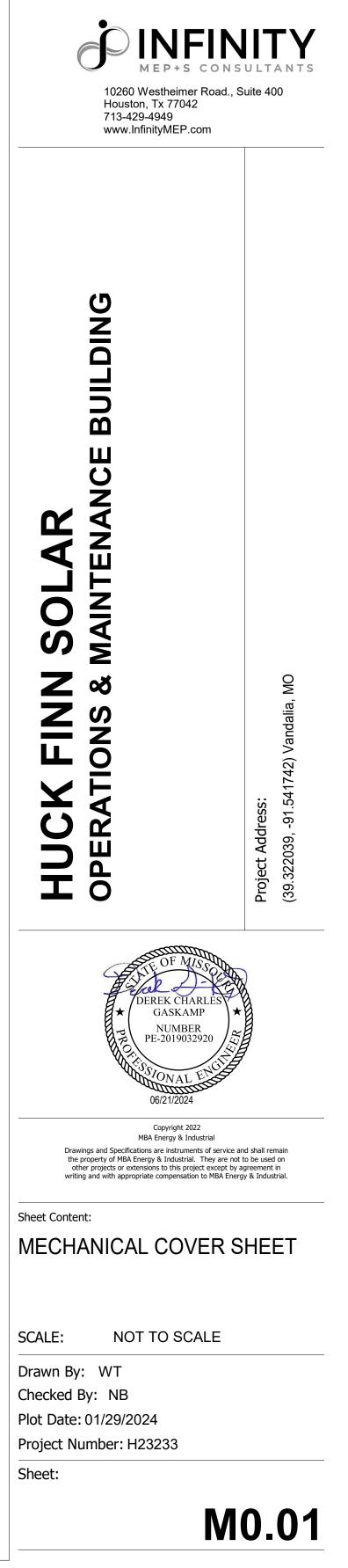
OTHERWISE. 28 PROVIDE SMOKE DETECTOR/S ON ALL AIR HANDLING EQUIPMENT 2,000 CFM OR GREATER TO MEET ALL NFPA REQUIREMENTS. FOR AIR HANDLING EQUIPMENT 15,000 CFM OR GREATER PROVIDE MOTORIZED ISOLATION DAMPERS ON ALL INITES AND OUTLETS OF THE UNIT TO MEET ALL NEPA REQUIREMENTS. DAMPER

15,000 CFM OR GREATER PROVIDE MOTORIZED ISOLATION DAMPERS ON ALL INLETS AND OUTLETS OF THE UNIT TO MEET ALL NFPA REQUIREMENTS. DAMPERS TO BE INTERLOCKED WITH UNIT.

N	IECHANICAL SHEET LIST
SHEET NUMBER	SHEET NAME
M0.01	MECHANICAL COVER SHEET
M0.02	MECHANICAL SCHEDULES
M0.03	MECHANICAL SCHEDULES
M0.04	MECHANICAL SPECIFICATIONS
M0.05	MECHANICAL SPECIFICATIONS
M2.01	MECHANICAL PLAN
M6.01	MECHANICAL DETAILS
M6.02	MECHANICAL DETAILS
M6.03	MECHANICAL DETAILS

	CODE	SUMMARY
A.	2. STATE OF MISSOURI	BUT ARE NOT LIMITED TO: MECHANICAL CODE: 2015 IMC. BUILDING CODE: 2015 IBC. COMMERCIAL ENERGY CONSERVATION CODE: 2009
B.	2. OUTDOOR DESIGN C AMENDMENTS, TABL a. 94.7°F DB, 7	'5.7⁰F WB SUMMER; 3.2⁰F DB WINTER EE DAYS COOLING; 1371 DEGREE DAYS HEATING
C.	••••••••••	- MISSOURI, IMC TABLE 403.3.1.1 0.06 CFM /SQ FT + 5 CFM/ PERSON 0.06 CFM /SQ FT + 5 CFM/ PERSON 0.06 CFM /SQ FT 0.06 CFM /SQ FT + 5 CFM/ PERSON





DIFFUSER NE

SUPPLY CFM (MIN-MAX)	RETURN CFM (MIN-MAX)	RECTANGULAR NECK SIZE (IN.)	ROUND NECK SIZE (Ø)
0 - 100	0-90	6x6	6"
101 - 200	91-200	8x8	8"
201 - 400	201-300	10x10	10"
401 - 600	301-450	12x12	12"
601 - 900	451-700	14x14	14"
	701-2000	22 x 22	

DUCT INS IND ROUND/ F RECTANGI <u>NOTES:</u> ¹. R⊾

FQU				UNIT T	FAN S				MOTOR		FI	FCTRIC	CAL DA	ТА			<u>.</u>		
TYPE	NUMBER	SERVICE	LOCATION	MANUFACTURER	MODEL	CFM	EXT. S.P. (IN W.G.)	RPM	ВНР	웃	VOLTAGE	PHASE	FLA	MOCP	EMERGENCY POWER	VARIABLE SPEED	PERATIONAL WEIGHT (LBS.)	WALL OPENING SIZE (IN)	NOT
EF	2	EXHAUST	RESTROOM	BY SUBMITTAL	CEILING MTD.	100	0.25	<u>950</u>		<u> </u>	120	1	0.19	15	N	N	20		1,2,5
	3	VENTILATION	IT ROOM	BY SUBMITTAL	CEILING MTD.	500	0.3	1200	-	1/4	120	1	3.5	15	N	Y	35		1,3,

		OUT	SIDE A	AIR C	ALCU	LATI	ON		
ROOM TYPE	PEOPLE	PEOPLE OUTSIDE AIR RATE	OCCUPANT AIR RATE	ROOM AREA	AREA OUTSIDE AIR RATE	AREA AIR RATE 2	BREATHING ZONE OUTDOOR AIR	ZONE AIR DISTRIBUTION EFFECTIVENESS	ZONE OUTDOOR AIR
CONFERENCE	6	5	30	640	0.06	38	68	0.8	85.5
OFFICE	1	5	5	150	0.06	9	14	0.8	17.5
STORAGE	0	0	0	95	0.06	6	6	0.8	7.125
TOTAL:			5				88 CFM		110 CFM
	-	BALAN	NCE OUTSIDE	AIR DAMPE	R FOR FCU-1	TO: 110 CFI	и		

		OUT	SIDE A	AIR C	ALCU	LATI	ON		
ROOM TYPE	PEOPLE	PEOPLE OUTSIDE AIR RATE	OCCUPANT AIR RATE	ROOM AREA	AREA OUTSIDE AIR RATE	AREA AIR RATE 2	BREATHING ZONE OUTDOOR AIR	ZONE AIR DISTRIBUTION EFFECTIVENESS	ZONE OUTDOOR AIR
WAREHOUSE	10	5	50	1000	0.06	60	110	1	110
TOTAL:							110 CFM		110 CFM

						AIR DEVI	CE SCI	HEDULE									
DESIG	NATION	MANUFACTURE	R MODEL	MATERIAL	SERVICE	FACE DIMENSIONS	NECK DIMENSIONS			DESCRI	PTION					NOTES	
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1. PRO 2. BOR	VIDE WITH BALA	ANCING DAMPER AT BI COLOR TO BE WHITE. CABLE DAMPER WHERI	RANCH TAKEOFF.														Date Issued: 02/23/24 Issue for Const 06/26/24 IFC Set Addend
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IENTS AND JAC	KET DETAILS.																Houston, Tx 77042 713-429-4949 www.InfinityMEP.com
ALL BE INSULA	ATED WITH ACR	TYPE INSULATION HAV	/ING A THERMAL RES	ISTIVITY OF NOT LE	ESS THAN R-4.												
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						EQUIPMENT		UNIT		DIM	ENSIO	NS		(Wc	%) W.G.)		
TION			2			TYPE NUMBER	SERVICE	MANUFACTURER	MODEL	LENGTH (IN)	HEIGHT (IN)	WIDTH (IN)	CFM	VELOCITY (I	INIMUM FREE AREA (%) PRESSURE DROP (IN 1	NOTES	
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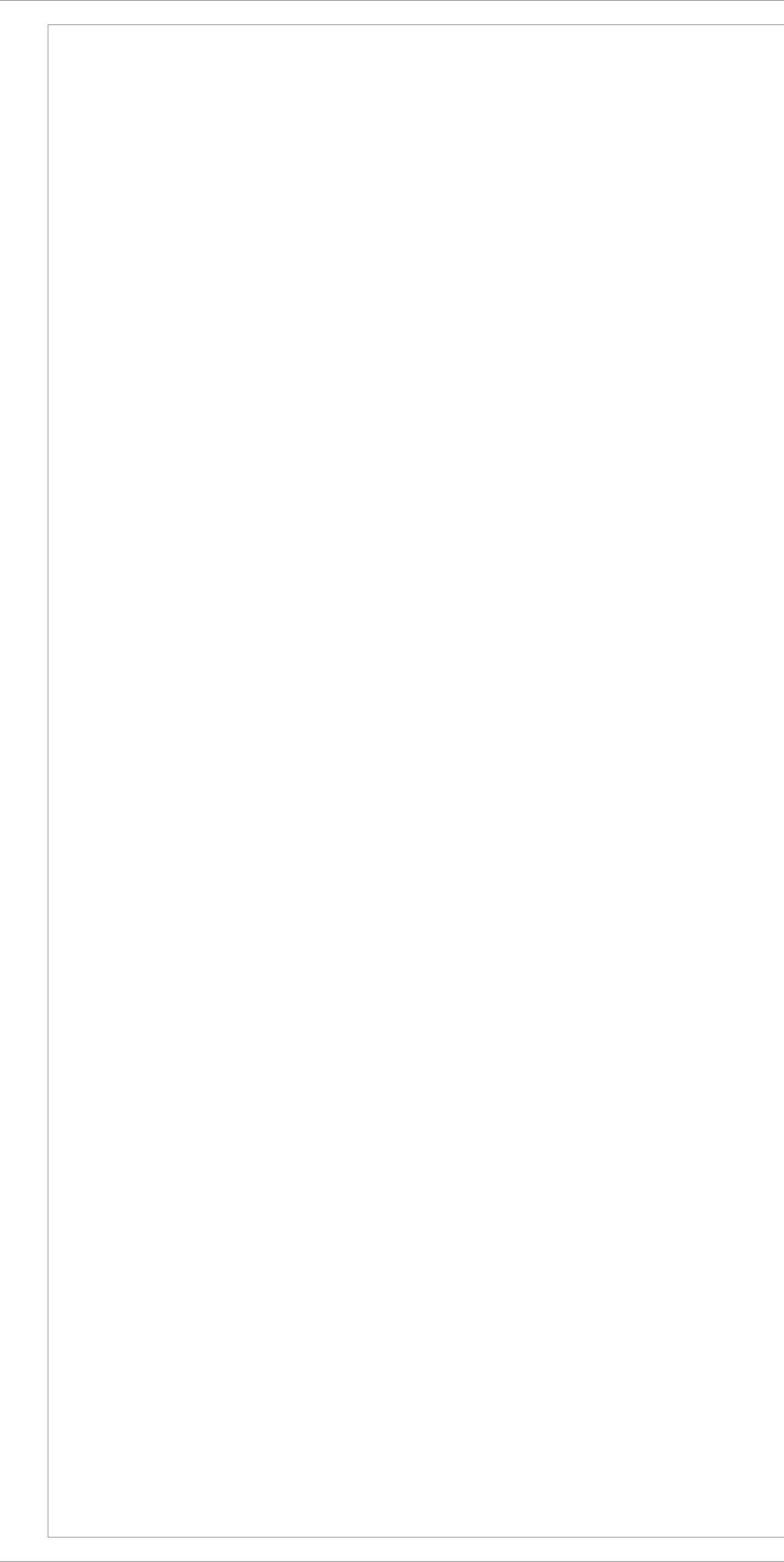
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 E		SERVICE			DIMEN		CFM		MINIMUM FREE AREA (%)	PRESSURE DROP (IN W	NOTES		FINN SOLAR	NTENANCE) Vandalia, MO
	PE NUMBER	EXHAUST	UNIT MANUFACTURER BY SUBMITTAL BY SUBMITTAL	MODEL BY SUBMITTAL BY SUBMITTAL	CENCETH (IN)	NSIONS (I) HEIGHT (IN) HIDIH 12 12	100 110	MAX FACE VELOCITY (FP	WINIWNW EKEE	NOV (IN MAX. PRESSURE DROP (IN M	ALL		K FINN SOLAR	NTENANCE		:: 541742) Vandalia, MO
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	PE NUMBER PE 2 3 CONFIRM FINAL	EXHAUST INTAKE INTAKE LOUVER SIZE, COI	UNIT MANUFACTURER BY SUBMITTAL BY SUBMITTAL	MODEL BY SUBMITTAL BY SUBMITTAL BY SUBMITTAL BY SUBMITTAL	CINCHAS	NSIONS	100 110 110 MB OR GA	WAX FACE VELOCITY (FP	WINIM 50 50 50	0.04 0.04 0.04	ALL ALL ALL		HUCK FINN SOLAR	ATIONS & MAINTENANCE I		Project Address: (39.322039, -91.541742) Vandalia, MO

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Drawn By: WT Checked By: NB Plot Date: 01/29/2024 Project Number: H23233 Sheet:

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EQUIPMENT						(CFM)	AIRFLOW (CFM)		SUPP LY FAN	DX COOLING COIL						HEAT PUMP		
				5) MO	FLO	ш		EÆ	NT L		AT	CAPACITY		_		7
TYPE	NUMBER	LOCATION	MANUFACTURER	MODEL	TYPE	TOTAL AIRFLO	MIN. OUTSIDE AIRI	TONAGE	E.S.P. (IN W.G.)	DB (°F)	WB (°F)	DB (°F)	WB (°F)	TOTAL MBH	SENSIBLE MBH	CAPACITY (MBH)	EAT (°F)	LAT (°F)
FCU	1	PLENUM	BY SUBMITTAL	BY SUBMITTAL	HORIZONTAL	1100	110	n zh	0.8	76.9	63.8	\sim 55	54	~ 34	26.2	40	65.12	A 90
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FCU	3	PLENUM	BY SUBMITTAL	BY SUBMITTAL	HORIZONTAL	1100	110	3	0.8	76.9	63.8	55	54	31	24	40	65.12	90

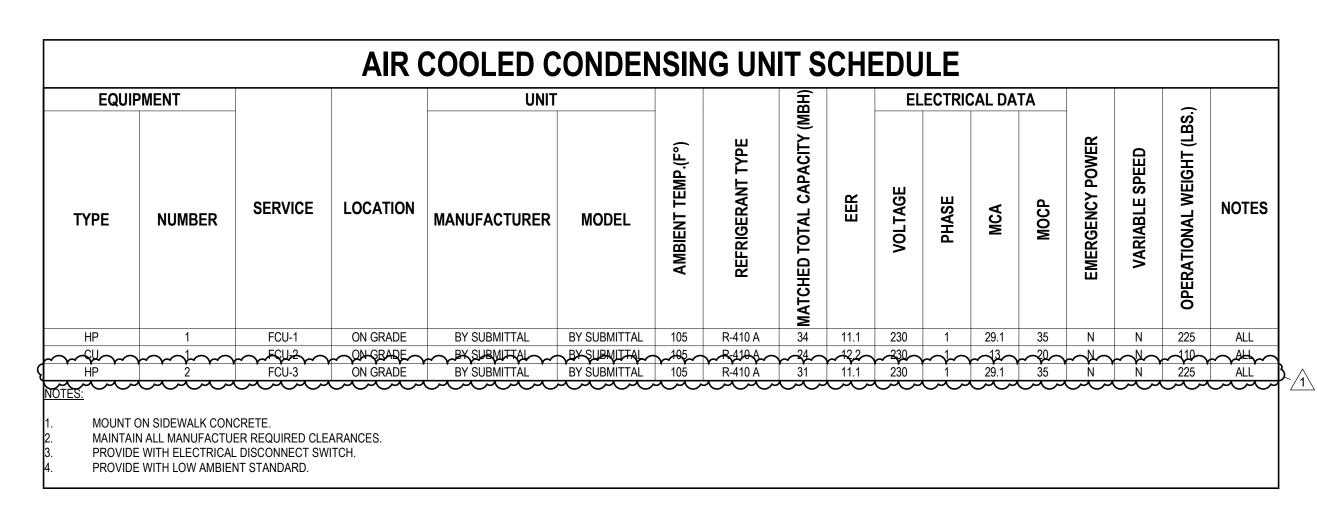
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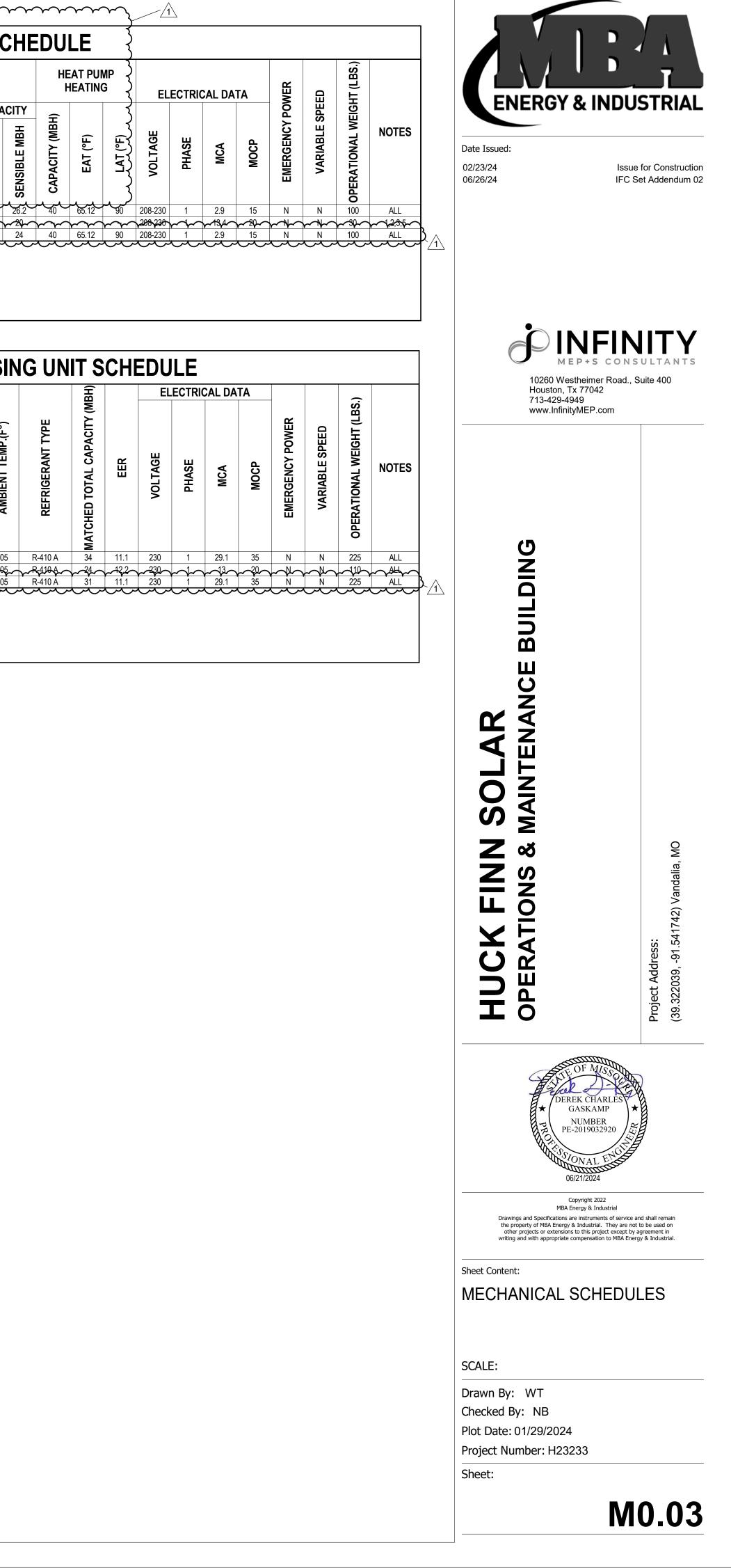
PROVIDE WITH ELECTRICAL DISCONNECT SWITCH AND SINGLE POINT POWER CONNECTION.

PROVIDE WITH EC MOTORS. UNIT TO BE SELECTED AT MEDIUM SPEED.

PROVIDE WITH 2" DISPOSABLE FILTER.

IF REQUIRED FOR FINAL CONDENSATE ROUTING: PROVIDE WITH CONDENSATE PUMP. 115V/ 1¢ MOTOR. INTERLOCK CONDENSATE PUMP WITH INTEGRAL FLOAT SWITCH.





	NN 23 05 00 - COMMON WORK RESULTS FOR HVAC COORDINATION: PROVIDE ELECTRICAL CONTRACTOR WITH ELECTRICAL REQUIREMENTS OF APPROVED	SECTION 23 05 48.13 – VIBRATION CONTROLS FOR HVAC 1. AIR HANDLERS, FURNACES, FANS AND FAN COILS SHALL BE SUSPENDED OR SUPPORTED WITH SI
1. 2.	EQUIPMENT IN SUFFICIENT TIME TO ORDER PANEL BOARDS, DISCONNECTS, ETC. ACCESS DOORS: PROVIDE MILCOR OR APPROVED EQUAL AS REQUIRED FOR ACCESS TO ALL VALVES, FILTERS,	 AIR HANDLERS, FORNACES, FANS AND FAN COILS SHALL BE SUSPENDED OR SUFFORTED WITH SI UNLESS INTERNALLY ISOLATED. PROVIDE FLEXIBLE DUCT CONNECTIONS AT ALL AIR HANDLERS, ROOFTOP UNITS AND FANS, UNLESS
	CONTROLS, DAMPERS OR OTHER DEVICES REQUIRING ATTENTION. DOORS SHALL MATCH WALL OR CEILING RATING. ARCHITECT MUST APPROVE LOCATION AND APPEARANCE OF ALL ACCESS DOORS. ACCESS PANELS	ISOLATED.3. PIPE: ALL PIPING SHALL BE VIBRATION ISOLATED WITHIN 50 FT OF VIBRATING EQUIPMENT. FIRST
	FOR FIRE OR SMOKE DAMPERS SHALL HAVE THE ABILITY TO OPEN WITHOUT THE USE OF TOOLS. SLEEVES: PROVIDE METAL SLEEVES WHERE PIPES OR CONTROL WIRING PENETRATE WALLS.	SHALL BE SAME DEFLECTION AS EQUIPMENT ISOLATORS (BUT MAXIMUM OF 2"); REMAINING HAN 0.75" DEFLECTION SPRING OR SPRING+RUBBER. FIRST 2 HANGERS CLOSEST TO EQUIPMENT SH/
	WARRANTY: GUARANTEE LABOR AND MATERIALS FOR 2 YEAR. WARRANTIES BEGIN UPON OWNER'S ACCEPTANCE OF SUBSTANTIAL COMPLETION OF THE INSTALLATION.	 POSITIONING OR PRE-COMPRESSED TYPE, TO PREVENT LOAD TRANSFER TO EQUIPMENT FLANG FILLED. ELASTOMERIC MOUNT IN A STEEL FRAME WITH UPPER AND LOWER STEEL HANGER RODS:
	OPERATIONS AND MAINTENANCE INSTRUCTIONS: PROVIDE 3 COPIES OF OPERATION AND MAINTENANCE MANUALS TO OWNER. PROVIDE WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE. THESE MANUALS SHALL BE IN ACCORDANCE WITH INDUSTRY-ACCEPTED STANDARD SUCH AS ASHRAE GUIDELINE 1 AND SHALL	 ELAS TOMERIC MOUNT IN A STEEL FRAME WITH UPPER AND LOWER STEEL HANGER RODS: A. MANUFACTURERS: KINETICS NOISE CONTROL, INC., MASON INDUSTRIES, INC., NOVIA; A C&P. OR APPROVED EQUAL.
	INCLUDE, AT A MINIMUM, THE FOLLOWING: A. SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF	B. FRAME: STEEL, FABRICATED WITH A CONNECTION FOR AN UPPER THREADED HANGER OPENING ON THE UNDERSIDE TO ALLOW FOR A MAXIMUM OF 30 DEGREES OF ANGULAR
	EQUIPMENT REQUIRING MAINTENANCE. B. OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING	HANGER-ROD MISALIGNMENT WITHOUT BINDING OR REDUCING ISOLATION EFFICIENCY ELEMENT: MOLDED, OIL-RESISTANT RUBBER, NEOPRENE, OR OTHER ELASTOMERIC MA
	MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.	PROJECTING BUSHING FOR THE UNDERSIDE OPENING PREVENTING STEEL TO STEEL O 5. COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGER WITH SPRING AND INSERT IN C
	 NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY. HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING 	A. MANUFACTURERS: KINETICS NOISE CONTROL, INC., MASON INDUSTRIES, INC., NOVIA; A C&P. OR APPROVED EQUAL.
	DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SETPOINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR,	B. FRAME: STEEL, FABRICATED FOR CONNECTION TO THREADED HANGER RODS AND TO A MAXIMUM OF 30 DEGREES OF ANGULAR HANGER-ROD MISALIGNMENT WITHOUT BINDIN
	FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS. E. A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SUGGESTED SETPOINTS. PROVIDE INSTRUCTION ON SYSTEM OPERATION TO OWNER'S REPRESENTATIVES.	ISOLATION EFFICIENCY. C. OUTSIDE SPRING DIAMETER: NOT LESS THAN 80 PERCENT OF THE COMPRESSED HEIGI SPRING AT RATED LOAD.
	SUBMITTALS/ SHOP DRAWINGS: SUBMIT COMPLETE INFORMATION ON ALL EQUIPMENT, AIR DEVICES, VALVES, DUCT ACCESSORIES AND CONTROLS. SUBMIT COMPLETE DUCTWORK AND PIPING SHOP DRAWINGS, BASED ON	 D. MINIMUM ADDITIONAL TRAVEL: 50 PERCENT OF THE REQUIRED DEFLECTION AT RATED E. LATERAL STIFFNESS: MORE THAN 80 PERCENT OF RATED VERTICAL STIFFNESS.
	APPROVED EQUIPMENT AND FIELD OBSERVATION OF BUILDING CONDITIONS. ALL SUBMISSIONS THAT DERIATE FROM THE CONTRACT DOCUMENTS SHALL CONTAIN A CONSTRUCTION STANDARD INSTITUTE (CSI) FORM 1.5C	F. OVERLOAD CAPACITY: SUPPORT 200 PERCENT OF RATED LOAD, FULLY COMPRESSED, DEFORMATION OR FAILURE.
	PRIOR TO BIDDING OR A CSI FORM 13.1A AFTER THE BIDDING/NEGOTIAION PHASE. SUBMIT DETAILED LAYOUT OF MECHANICAL ROOMS AND YARDS. INCOMPLETE SUBMITTALS WILL BE RETURNED TO THE CONTRACTOR	G. ELASTOMERIC ELEMENT: MOLDED, OIL-RESISTANT RUBBER OR NEOPRENE. STEEL-WAS REINFORCED CUP TO SUPPORT SPRING AND BUSHING PROJECTING THROUGH BOTTO
	UNREVIEWED. NO TIME EXTENSIONS OR COST INCREASES WILL BE ALLOWED FOR DELAYS CAUSED BY RETURN OF INCOMPLETE SUBMITTALS. WHERE EQUIPMENT OF THE ACCEPTABLE MANUFACTURERS REQUIRE	H. ADJUSTABLE VERTICAL STOP: STEEL WASHER WITH NEOPRENE WASHER "UP-STOP" OF THREADED ROD.
	DIFFERENT ARRANGEMENT OR CONNECTIONS FROM THOSE SHOWN, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL THE EQUIPMENT TO OPERATE PROPERLY AND IN HARMONY WITH THE ORIGINAL INTENT OF THE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL MAKE ALL NECESSARY CHANGES IN	I. SELF-CENTERING HANGER ROD CAP TO ENSURE CONCENTRICITY BETWEEN HANGER F SUPPORT SPRING COIL.
	ALL AFFECTED RELATED WORK PROVIDED UNDER OTHER SECTIONS INCLUDING LOCATION OF ROUGH-IN CONNECTIONS BY OTHER TRADES, CONDUIT SUPPORTS, INSULATION, ETC. ALL CHANGES SHALL BE MADE AT	SECTION 23 05 53 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT 1. EQUIPMENT: PERMANENT LABEL (STENCIL, METAL TAG OR ENGRAVED PLASTIC) WITH UNIT TAG
	NO INCREASE IN THE CONTRACTED AMOUNT OR ADDITIONAL COST TO THE OTHER TRADES AND/OR OWNER. RECORD DRAWINGS: WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, PROVIDE RECORD	AREA OR SPACE SERVED. 2. FIRE DAMPER ACCESS DOORS: SEE FIRE DAMPER SPECIFICATIONS.
	DRAWINGS IN CAD/REVIT FORMAT (USING THE SAME SOFTWARE AND VERSION THE PROJECT WAS DESIGNED IN), PLUS FULL SIZE HARD COPY. PROJECT DESIGNED IN REVIT. ELECTRONIC DRAWINGS MAY BE AVAILABLE	3. CEILING TACKS: PROVIDE CEILING TACKS TO LOCATE VALVES OR DAMPERS ABOVE T-BAR TYPE LOCATE IN CORNER OF PANEL CLOSEST TO EQUIPMENT. COLOR CODE: EQUIPMENT:
	FROM ENGINEER FOR A FEE. RECORD DRAWINGS SHALL INCLUDE AS A MINIMUM THE INSTALLED LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, AIR DEVICES, CONTROL SENSORS, CONTROL	A. YELLOW. FIRE DAMPERS/SMOKE DAMPERS: RED. VALVES: BLUE.
	PANELS, GENERAL CONFIGURATION OF DUCT AND PIPE DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES.	SECTION 23 05 93 – TESTING, ADJUSTING, AND BALANCING FOR HVAC EXECUTION
	OVERFLOW DRAIN PANS: PROVIDE UNDER ALL FURRED IN UNITS. PANS TO BE MINIMUM 24 GAUGE GALVANIZED SHEET STEEL; MINIMUM 1-1/2" DEEP AND NOT LESS THAN 3" LARGER THAN UNIT OR COIL DIMENSIONS. PROVIDE SEPARATE 3/4" DRAIN FROM PAN TO CONSPICUOUS LOCATION; PROVIDE ESCUTCHEON PLATES AT CEILING	 REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERFORMANCE OF TAB PROCEDURE RECORD SYSTEM REACTIONS TO CHANGES IN CONDITIONS. RECORD DEFAULT SET POINTS IF D INDICATED VALUES.
	PENETRATE 3/4 DRAIN FROM PAN TO CONSPICUOUS LOCATION; PROVIDE ESCUTCHEON PLATES AT CEILING PENETRATIONS. WHEN ALLOWED BY LOCAL AUTHORITY, CONTRACTOR MAY PROVIDE A FLOAT SWITCH IN THE OVERFLOW PAN, INSTEAD OF DISCHARGE PIPING. FLOAT SWITCH SHALL SHUT UNIT OFF IF STANDING WATER	 INDICATED VALUES. NO ADJUSTMENT TO EXISTING AIR HANDLERS AND FANS SERVING THE AREA ARE ALLOWED WIT EXPRESS KNOWLEDGE AND CONSENT.
	IS DETECTED IN THE OVERFLOW DRAIN PAN. PANS EQUIPPED WITH FLOAT SWITCH SHALL HAVE SCREW CAP NIPPLE ON BOTTOM OR SIDE OF PAN TO ALLOW WATER TO BE DRAINED FROM PAN.	 PERFORM SYSTEM-READINESS CHECKS OF HVAC SYSTEMS AND EQUIPMENT TO VERIFY SYSTEM TAB WORK.
	CONDENSATE CONTROL IN COOLING AIR UNITS: ROUTE CONDENSATE DRAIN TO NEAREST ROOF DRAIN; OR, TO INTERIOR FLOOR DRAIN. AS AN ALTERNATIVE, CONTRACTOR MAY ROUTE CONDENSATE DRAIN TO A SUITABLE	4. GENERAL PROCEDURES FOR TESTING AND BALANCING: A. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO
	LAVATORY TAILPIECE. THIS ALTERNATIVE MUST BE COORDINATED WITH THE PLUMBING CONTRACTOR, TO ENSURE THE PROPER LAVATORY TAILPIECE ACCESSORIES ARE PROVIDED TO ACCOMMODATE THE	PROCEDURES CONTAINED IN AABC (ASSOCIATED AIR BALANCE COUNCIL) "NATIONAL S TOTAL SYSTEM BALANCE", NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTI
	CONDENSATE DRAIN PIPING CONNECTION. IN ADDITION, A FLOAT SWITCH SHALL BE PROVIDED THAT TURNS UNIT OFF, IF STANDING WATER IS DETECTED IN THE PRIMARY PAN. CONDENSATE PIPING SHALL BE ASTM B88, TYPE L OD DWAY CODDED, DVO DIDING IO NOT ACCEPTABLE.	BALANCING OF ENVIRONMENTAL SYSTEMS", SMACNA'S "HVAC SYSTEMS - TESTING, AD BALANCING" AND IN THIS SECTION. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT
	TYPE L OR DWV COPPER. PVC PIPING IS NOT ACCEPTABLE. CONTRACTOR TO PROVIDE TESTING AND COMMISSIONING OF THE HVAC SYSTEMS IN SCOPE IN ACCORDANCE WITH IECC SECTION C408. CONTRACTOR SHALL INCLUDE IN BID THE SERVICES OF A REGISTERED DESIGN	B. INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY FOR TAB PROC B. MARK EQUIPMENT AND BALANCING DEVICES, INCLUDING DAMPER-CONTROL POSITION DOSITION INDICATORS, FAN SPEED CONTROL LEVERS, AND SIMILAR CONTROLS AND D
	PROFESSIONAL TO PRODUCE A COMMISSIONING PLAN TO CONFIRM THAT TESTING AND CALIBRATION HAVE BEEN PERFORMED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS. COPIES OF ALL DOCUMENTATION	POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND D PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL TO SHOW FINAL S C. TAKE AND REPORT TESTING AND BALANCING MEASUREMENTS IN INCH-POUND (IP)UNIT
	SHALL BE GIVEN TO THE OWNER OR OWNER'S AUTHORIZED AGENT WITHIN 90 DAYS OF RECEIPT OF CERTIFICATE OF OCCUPANCY AND MADE AVAILABLE TO CODE OFFICIAL UPON REQUEST IN ACCORDANCE WITH	D. VERIFY FINAL SYSTEM CONDITIONS.
	SECTIONS C408.2.4 AND C408.2.5. REFER TO SPEC SECTION 23 08 00 - COMMISSIONING OF HVAC. WIND LOAD & EQUIPMENT ANCHORAGE	SECTION 23 07 13- DUCT INSULATION 1. MINERAL-FIBER BLANKET INSULATION: MINERAL OR GLASS FIBERS BONDED WITH A THERMOSE COMPLY WITH A STARD FEEL AND ASTARD 42000 TYPE III WITH FACTORY ADDITION FEEL AND ASTARD 42000 TYPE III WITH FACTORY ADDITION
	A. PER CITY/ CODE AMENDMENTS, EXTERIOR HVAC EQUIPMENT SHALL BE SECURELY FASTENED IN PLACE. SUPPORTS SHALL BE DESIGNED AND CONSTRUCTED TO SUSTAIN VERTICAL AND HORIZONTAL	 COMPLY WITH ASTM C 553, TYPE II AND ASTM C 1290, TYPE III WITH FACTORY-APPLIED FSK JACK APPLIED JACKET REQUIREMENTS ARE SPECIFIED IN "FACTORY-APPLIED JACKETS" ARTICLE. MANUFACTURERS: JOHNS MANVILLE; A BERKSHIRE HATHAWAY COMPANY., OWENS CORNING, O
	LOADS WITHIN THE STRESS LIMITATIONS SPECIFIED IN THE BUILDING CODE. EXTERIOR DUCTS SHALL BE SUPPORTED IN A LIKE MANNER.	 MANUFACTURERS: JOHNS MANVILLE; A BERKSHIRE HATHAWAY COMPANY., OWENS CORNING, OF EQUAL. FIRE-RATED BLANKET: HIGH-TEMPERATURE, FLEXIBLE, BLANKET INSULATION WITH FSK JACKET
,	B. REPLACEMENTS OF EQUIPMENT IN KIND NEED ONLY MATCH THE FASTENING OF THE EQUIPMENT REPLACED.	AND CERTIFIED TO PROVIDE A 1-HOUR FIRE RATING BY AN NRTL ACCEPTABLE TO AUTHORITIES JURISDICTION.
J	IN 23 05 13 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT TEST MOTORS IN ACCORDANCE WITH NEMA MG 1, INCLUDING WINDING RESISTANCE, NO-LOAD SPEED AND CURRENT, LOCKED ROTOR CURRENT, INSULATION HIGH-POTENTIAL TEST, AND MECHANICAL ALIGNMENT	4. MANUFACTURERS: JOHNS MANVILLE; A BERKSHIRE HATHAWAY COMPANY, NELSON FIRESTOP; A EMERSON INDUSTRIAL AUTOMATION, THERMAL CERAMICS. OR APPROVED EQUAL.
	TESTS. INSTALL SECURELY ON FIRM FOUNDATION. MOUNT BALL BEARING MOTORS WITH SHAFT IN ANY POSITION. INSTALL ENGRAVED PLASTIC NAMEPLATES. GROUND AND BOND MOTORS.	 ADHESIVES: A. MATERIALS SHALL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBS BONDING INSULATION TO ITSELF AND TO SURFACES TO BE INSULATED UNLESS OTHER
	SINGLE-PHASE MOTORS: PERMANENT SPLIT-CAPACITOR TYPE, WHERE AVAILABLE; OTHERWISE, USE SPLIT- PHASE START/CAPACITOR RUN OR CAPACITOR START/CAPACITOR RUN MOTOR. TERMINAL LUGS TO MATCH	B. ADHESIVE: COMPLY WITH MIL-A-24179A, TYPE II, CLASS I. C. MANUFACTURERS: ARMACELL LLC., FOSTER BRAND; H. B. FULLER CONSTRUCTION PRO
	BRANCH CIRCUIT CONDUCTOR QUANTITIES, SIZES AND MATERIALS. SINGLE-PHASE MOTORS: NEMA MG 1, DESIGN B, PREMIUM -EFFICIENCY SQUIRREL-CAGE INDUCTION MOTOR,	USA. OR APPROVED EQUAL. 6. SEALANTS:
	WITH WINDINGS TO ACCOMPLISH STARTING METHODS AND NUMBER OF SPEEDS INDICATED. SERVICE FACTOR: 1.15 UNLESS OTHERWISE INDICATED ON DRAWINGS. ENCLOSURE: MEET CONDITIONS OF INSTALLATION UNLESS SPECIFIC ENCLOSURE IS SPECIFIED OR INDICATED. DESIGN FOR CONTINUOUS OPERATION IN 40 DEGREES C	A. SEALANTS MANUFACTURERS: CHILDERS BRAND; H. B. FULLER CONSTRUCTION PRODUCE BRIDGES - MARATHON INDUSTRIES, FOSTER BRAND; H. B. FULLER CONSTRUCTION PRODUCE
	SPECIFIC ENCLOSURE IS SPECIFIED OR INDICATED. DESIGN FOR CONTINUOUS OPERATION IN 40 DEGREES C ENVIRONMENT, WITH TEMPERATURE RISE IN ACCORDANCE WITH NEMA MG 1 LIMITS FOR INSULATION CLASS, SERVICE FACTOR, AND MOTOR ENCLOSURE TYPE. INSULATION SYSTEM: NEMA CLASS F. MOTOR FRAMES:	APPROVED EQUAL. 7. FACTORY-APPLIED JACKETS:
	NEMA STANDARD T-FRAMES OF STEEL, ALUMINUM, OR CAST IRON WITH END BRACKETS OF CAST IRON OR ALUMINUM WITH STEEL INSERTS. THERMISTOR SYSTEM (MOTOR FRAME SIZES 254T AND LARGER): THREE PTC	 A. MANUFACTURERS: CHILDERS BRAND; H. B. FULLER CONSTRUCTION PRODUCTS. OR AP B. TAPES MANUFACTURERS: IDEAL TAPE CO., INC., AN AMERICAN BILTRITE COMPANY, KN. VENTURE TAPE, OR APPROVED FOLIAL
	THERMISTORS EMBEDDED IN MOTOR WINDINGS AND EPOXY ENCAPSULATED SOLID STATE CONTROL RELAY WITH WIRING TO TERMINAL BOX. BEARINGS: GREASE LUBRICATED ANTI-FRICTION BALL BEARINGS WITH	VENTURE TAPE. OR APPROVED EQUAL. SECTION 23 09 23.12 - CONTROL DAMPERS
	HOUSINGS EQUIPPED WITH PLUGGED PROVISION FOR RELUBRICATION, RATED FOR MINIMUM ABMA 9, L-10 LIFE OF 200,000 HOURS. CALCULATE BEARING LOAD WITH NEMA MINIMUM V-BELT PULLEY WITH BELT CENTER LINE	RECTANGULAR DAMPERS WITH ALUMINUM AIRFOIL BLADES: A. MANUFACTURERS: ARROW UNITED INDUSTRIES, RUSKIN COMPANY (REQUIREMENTS II SUPPARACEARDUS DEL OWARDE RACER ON PUBLICITY (STORES SERVICE)
	AT END OF NEMA STANDARD SHAFT EXTENSION. STAMP BEARING SIZES ON NAMEPLATE. SOUND POWER LEVELS: CONFORM TO NEMA MG 1. TERMINAL LUGS TO MATCH BRANCH CIRCUIT CONDUCTOR QUANTITIES, SIZES AND MATERIALS	SUBPARAGRAPHS BELOW ARE BASED ON RUSKIN'S "CD50 SERIES.") B. PERFORMANCE: LEAKAGE: AMCA 511, CLASS 1A. LEAKAGE SHALL NOT EXCEED 3 CFM 1-IN. WG DIFFERENTIAL STATIC PRESSURE., PRESSURE DROP: 0.05-IN. WG AT 1500 FPM
	SIZES AND MATERIALS.	BY-24-INCH DAMPER WHEN TESTED ACCORDING TO AMCA 500-D, FIGURE 5.3. 2. GENERAL CONTROL-DAMPER ACTUATORS REQUIREMENTS
		A. ACTUATORS SHALL OPERATE RELATED DAMPER(S) WITH SUFFICIENT RESERVE POWE SMOOTH MODULATING ACTION OR TWO-POSITION ACTION AND PROPER SPEED OF RE
		VELOCITY AND PRESSURE CONDITIONS TO WHICH THE DAMPER IS SUBJECTED. B. ACTUATORS SHALL PRODUCE SUFFICIENT POWER AND TORQUE TO CLOSE OFF AGAIN
כ	N 23 05 29 – HANGERS AND SUPPORTS FOR HVAC METAL PIPE HANGERS AND SUPPORTS CARBON-STEEL PIPE HANGERS AND SUPPORTS:	SYSTEM PRESSURES ENCOUNTERED. ACTUATORS SHALL BE SIZED TO CLOSE OFF AG SHUTOFF PRESSURE AS A MINIMUM REQUIREMENT.
	 A. DESCRIPTION: MSS SP-58, TYPES 1 THROUGH 58, FACTORY-FABRICATED COMPONENTS, GALVANIZED METALLIC B. COATINGS: GALVANIZED OR HOT DIPPED 	3. ELECTRIC AND ELECTRONIC ACTUATORS A. TYPE: MOTOR OPERATED, WITH OR WITHOUT GEARS, ELECTRIC AND ELECTRONIC.
	 B. COATINGS: GALVANIZED OR HOT DIPPED C. COATINGS: PLASTIC COATING, JACKET, OR LINER. D. PADDED HANGERS: HANGER WITH FIBERGLASS OR OTHER PIPE INSULATION PAD OR CUSHION TO 	B. VOLTAGE: 24 V UNLESS 120 V IS REQUIRED BASED ON DAMPER SIZE AND CLOSING FO BASED ON AIR PRESSURE. COORDINATE WITH EQUIPMENT VOLTAGES. PROVIDE TRAN NECESSARY, ACTUATION OF A DEVICE DEPUNDED FOR CONTINUOUS UNITED
	SUPPORT BEARING SURFACE OF PIPING, GALVANIZED HANGER RODS: CONTINUOUS-THREAD ROD, NUTS, AND GALVANIZED METALLIC WASHERS.	NECESSARY. ACTUATOR SHALL DELIVER TORQUE REQUIRED FOR CONTINUOUS UNIFO OF CONTROLLED DEVICE FROM LIMIT TO LIMIT WHEN OPERATED AT RATED VOLTAGE. C. TWO-POSITION ACTUATORS: SINGLE DIRECTION, SPRING RETURN OR REVERSING TYP
	TRAPEZE PIPE HANGERS: A. DESCRIPTION: MSS SP-69, TYPE 59, SHOP- OR FIELD-FABRICATED PIPE-SUPPORT ASSEMBLY MADE	SECTION 23 37 13.13 – AIR DIFFUSERS, REGISTERS AND GRILLES
	FROM STRUCTURAL CARBON-STEEL SHAPES WITH MSS SP-58 GALVANIZED METALLIC HANGER RODS, NUTS, SADDLES, AND U-BOLTS.	1. PRODUCTS A. MANUFACTURERS: METALAIRE, INC., NAILOR INDUSTRIES INC., PRICE INDUSTRIES, TITU
	THERMAL-HANGER SHIELD INSERTS A. INSULATION-INSERT MATERIAL FOR COLD PIPING: ASTM C 552, TYPE II CELLULAR GLASS WITH 100-PSIG	EQUAL. B. DEVICES SHALL BE SPECIFICALLY DESIGNED FOR VARIABLE-AIR-VOLUME FLOWS.
	OR ASTM C 591, TYPE VI, GRADE 1 POLYISOCYANURATE WITH 125-PSIG MINIMUM COMPRESSIVE STRENGTH AND VAPOR BARRIER. B. INSULATION-INSERT MATERIAL FOR HOT PIPING: WATER-REPELLENT TREATED, ASTM C 533, TYPE I	C. VERIFICATION OF PERFORMANCE: RATE DIFFUSERS ACCORDING TO ASHRAE 70, "MET FOR RATING THE PERFORMANCE OF AIR OUTLETS AND INLETS."
	B. INSULATION-INSERT MATERIAL FOR HOT PIPING: WATER-REPELLENT TREATED, ASTM C 533, TYPE T CALCIUM SILICATE WITH 100-PSIG, ASTM C 552, TYPE II CELLULAR GLASS WITH 100-PSIG OR ASTM C 591, TYPE VI, GRADE 1 POLYISOCYANURATE WITH 125-PSIG MINIMUM COMPRESSIVE	SECTION 23 09 23.01 - BUILDING CONTROL SYSTEM FOR HVAC
	STRENGTH. FOR TRAPEZE OR CLAMPED SYSTEMS:	1. ELECTRIC CONTROLS FOR HVAC A. ELECTRIC, PROGRAMMABLE MULTISTAGE THERMOSTATS, AUTOMATIC CHANGEOVER,
	A. INSERT AND SHIELD SHALL COVER ENTIRE CIRCUMFERENCE OF PIPE. FOR CLEVIS OR BAND HANGERS:	BACKUP. HONEYWELL TB7220 SERIES OR EQUAL.
	 A. INSERT AND SHIELD SHALL COVER LOWER 180 DEGREES OF PIPE. B. INSERT LENGTH: EXTEND 2 INCHES BEYOND SHEET METAL SHIELD FOR PIPING OPERATING BELOW 	
	AMBIENT AIR TEMPERATURE. C. DESCRIPTION: WELDED, SHOP- OR FIELD-FABRICATED EQUIPMENT SUPPORT MADE FROM STRUCTURAL CARBON-STEEL SHAPES	
	STRUCTURAL CARBON-STEEL SHAPES. STRUCTURAL STEEL: A. ASTM A 36/A 36M, CARBON-STEEL PLATES, SHAPES, AND BARS; GALVANIZED.	
	A. ASTM A 30/A 30M, CARBON-STEEL PLATES, SHAPES, AND BARS, GALVANIZED. GROUT: A. ASTM C 1107, FACTORY-MIXED AND -PACKAGED, DRY, HYDRAULIC-CEMENT, NONSHRINK AND	
	 ASTM C TIOT, FACTORT-MIXED AND FACINGED, DRT, ITTERACIC-CEMENT, NONSTRINK AND NONMETALLIC GROUT; SUITABLE FOR INTERIOR AND EXTERIOR APPLICATIONS. a. PROPERTIES: NONSTAINING, NONCORROSIVE, AND NONGASEOUS. 	

MECHANICAL SPECIFICATIONS

CONTROLS FOR HVAC

ES, FANS AND FAN COILS SHALL BE SUSPENDED OR SUPPORTED WITH SPRING ISOLATOR CONNECTIONS AT ALL AIR HANDLERS, ROOFTOP UNITS AND FANS, UNLESS INTERNALLY

BE VIBRATION ISOLATED WITHIN 50 FT OF VIBRATING EQUIPMENT. FIRST 3 HANGERS FION AS EQUIPMENT ISOLATORS (BUT MAXIMUM OF 2"); REMAINING HANGERS SHALL BE G OR SPRING+RUBBER. FIRST 2 HANGERS CLOSEST TO EQUIPMENT SHALL BE MPRESSED TYPE, TO PREVENT LOAD TRANSFER TO EQUIPMENT FLANGES WHEN PIPE IS

A STEEL FRAME WITH UPPER AND LOWER STEEL HANGER RODS: RS: KINETICS NOISE CONTROL, INC., MASON INDUSTRIES, INC., NOVIA; A DIVISION OF

VED EQUAL. FABRICATED WITH A CONNECTION FOR AN UPPER THREADED HANGER ROD AND AN E UNDERSIDE TO ALLOW FOR A MAXIMUM OF 30 DEGREES OF ANGULAR LOWER ISALIGNMENT WITHOUT BINDING OR REDUCING ISOLATION EFFICIENCY, DAMPENING DED, OIL-RESISTANT RUBBER, NEOPRENE, OR OTHER ELASTOMERIC MATERIAL WITH A ISHING FOR THE UNDERSIDE OPENING PREVENTING STEEL TO STEEL CONTACT.

NG AND ELASTOMERIC-INSERT HANGER WITH SPRING AND INSERT IN COMPRESSION: RS: KINETICS NOISE CONTROL, INC., MASON INDUSTRIES, INC., NOVIA; A DIVISION OF VED EQUAL FABRICATED FOR CONNECTION TO THREADED HANGER RODS AND TO ALLOW FOR A

DEGREES OF ANGULAR HANGER-ROD MISALIGNMENT WITHOUT BINDING OR REDUCING CIENCY G DIAMETER: NOT LESS THAN 80 PERCENT OF THE COMPRESSED HEIGHT OF THE

ED LOAD. IONAL TRAVEL: 50 PERCENT OF THE REQUIRED DEFLECTION AT RATED LOAD. NESS: MORE THAN 80 PERCENT OF RATED VERTICAL STIFFNESS.

ACITY: SUPPORT 200 PERCENT OF RATED LOAD, FULLY COMPRESSED, WITHOUT OR FAILURE. ELEMENT: MOLDED, OIL-RESISTANT RUBBER OR NEOPRENE. STEEL-WASHER-JP TO SUPPORT SPRING AND BUSHING PROJECTING THROUGH BOTTOM OF FRAME.

RTICAL STOP: STEEL WASHER WITH NEOPRENE WASHER "UP-STOP" ON LOWER

G HANGER ROD CAP TO ENSURE CONCENTRICITY BETWEEN HANGER ROD AND IG COIL.

N FOR HVAC PIPING AND EQUIPMENT LABEL (STENCIL, METAL TAG OR ENGRAVED PLASTIC) WITH UNIT TAG OR NAME AND

OORS: SEE FIRE DAMPER SPECIFICATIONS. E CEILING TACKS TO LOCATE VALVES OR DAMPERS ABOVE T-BAR TYPE PANEL CEILINGS.

ANEL CLOSEST TO EQUIPMENT. COLOR CODE: EQUIPMENT: AMPERS/SMOKE DAMPERS: RED. VALVES: BLUE.

JSTING, AND BALANCING FOR HVAC

ISCOVERED BEFORE AND DURING PERFORMANCE OF TAB PROCEDURES. OBSERVE AND IONS TO CHANGES IN CONDITIONS. RECORD DEFAULT SET POINTS IF DIFFERENT FROM

STING AIR HANDLERS AND FANS SERVING THE AREA ARE ALLOWED WITHOUT OWNER'S ND CONSENT.

INESS CHECKS OF HVAC SYSTEMS AND EQUIPMENT TO VERIFY SYSTEM READINESS FOR

FOR TESTING AND BALANCING:

ING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE CONTAINED IN AABC (ASSOCIATED AIR BALANCE COUNCIL) "NATIONAL STANDARDS FOR BALANCE", NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND ENVIRONMENTAL SYSTEMS", SMACNA'S "HVAC SYSTEMS - TESTING, ADJUSTING, AND D IN THIS SECTION. CUT INSULATION. DUCTS, PIPES, AND EQUIPMENT CABINETS FOR OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY FOR TAB PROCEDURES. NT AND BALANCING DEVICES, INCLUDING DAMPER-CONTROL POSITIONS, VALVE ATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, WITH R SUITABLE. PERMANENT IDENTIFICATION MATERIAL TO SHOW FINAL SETTINGS. ORT TESTING AND BALANCING MEASUREMENTS IN INCH-POUND (IP)UNITS. YSTEM CONDITIONS.

INSULATION: MINERAL OR GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. 3, TYPE II AND ASTM C 1290, TYPE III WITH FACTORY-APPLIED FSK JACKET. FACTORY-EMENTS ARE SPECIFIED IN "FACTORY-APPLIED JACKETS" ARTICLE. S MANVILLE: A BERKSHIRE HATHAWAY COMPANY., OWENS CORNING, OR APPROVED

GH-TEMPERATURE, FLEXIBLE, BLANKET INSULATION WITH FSK JACKET THAT IS TESTED IDE A 1-HOUR FIRE RATING BY AN NRTL ACCEPTABLE TO AUTHORITIES HAVING

S MANVILLE; A BERKSHIRE HATHAWAY COMPANY, NELSON FIRESTOP; A BRAND OF JTOMATION, THERMAL CERAMICS. OR APPROVED EQUAL.

LL BE COMPATIBLE WITH INSULATION MATERIALS, JACKETS, AND SUBSTRATES AND FOR ATION TO ITSELF AND TO SURFACES TO BE INSULATED UNLESS OTHERWISE INDICATED. PLY WITH MIL-A-24179A, TYPE II, CLASS I. RS: ARMACELL LLC., FOSTER BRAND; H. B. FULLER CONSTRUCTION PRODUCTS, K-FLEX

UFACTURERS: CHILDERS BRAND; H. B. FULLER CONSTRUCTION PRODUCTS., EAGLE ATHON INDUSTRIES, FOSTER BRAND: H. B. FULLER CONSTRUCTION PRODUCTS, OR

RS: CHILDERS BRAND; H. B. FULLER CONSTRUCTION PRODUCTS. OR APPROVED EQUAL. CTURERS: IDEAL TAPE CO., INC., AN AMERICAN BILTRITE COMPANY, KNAUF INSULATION, OR APPROVED EQUAL.

AMPERS

: LEAKAGE: AMCA 511, CLASS 1A. LEAKAGE SHALL NOT EXCEED 3 CFM/SQ. FT. AGAINST RENTIAL STATIC PRESSURE., PRESSURE DROP: 0.05-IN. WG AT 1500 FPM ACROSS A 24-IPER WHEN TESTED ACCORDING TO AMCA 500-D, FIGURE 5.3.

PER ACTUATORS REQUIREMENTS ALL OPERATE RELATED DAMPER(S) WITH SUFFICIENT RESERVE POWER TO PROVIDE LATING ACTION OR TWO-POSITION ACTION AND PROPER SPEED OF RESPONSE AT PRESSURE CONDITIONS TO WHICH THE DAMPER IS SUBJECTED.

ALL PRODUCE SUFFICIENT POWER AND TORQUE TO CLOSE OFF AGAINST THE MAXIMUM URES ENCOUNTERED. ACTUATORS SHALL BE SIZED TO CLOSE OFF AGAINST THE FAN SURE AS A MINIMUM REQUIREMENT.

NIC ACTUATORS PERATED, WITH OR WITHOUT GEARS, ELECTRIC AND ELECTRONIC. UNLESS 120 V IS REQUIRED BASED ON DAMPER SIZE AND CLOSING FORCE REQUIRED RESSURE. COORDINATE WITH EQUIPMENT VOLTAGES. PROVIDE TRANSFORMERS AS TUATOR SHALL DELIVER TORQUE REQUIRED FOR CONTINUOUS UNIFORM MOVEMENT D DEVICE FROM LIMIT TO LIMIT WHEN OPERATED AT RATED VOLTAGE.

RS: METALAIRE, INC., NAILOR INDUSTRIES INC., PRICE INDUSTRIES, TITUS, OR APPROVED

BE SPECIFICALLY DESIGNED FOR VARIABLE-AIR-VOLUME FLOWS. OF PERFORMANCE: RATE DIFFUSERS ACCORDING TO ASHRAE 70, "METHOD OF TESTING

ONTROL SYSTEM FOR HVAC

R HVAC GRAMMABLE MULTISTAGE THERMOSTATS, AUTOMATIC CHANGEOVER, BATTERY WELL TB7220 SERIES OR EQUAL.

SECTION 23 08 00 – COMMISSIONING OF HVAC

- ALL THIRD PARTY COMMISSIONING AGENTS SHALL BE CERTIFIED BY ONE OF THE FOLLOWING ORGANIZATIONS: CBCP - CERTIFIED BUILDING COMMISSIONING PROFESSIONAL - ASSOCIATION OF ENERGY ENGINEERS CCP - CERTIFIED COMMISSIONING PROFESSIONAL - BUILDING COMMISSIONING ASSOCATION
- CPMP CERTIFIED PROCESS MANAGEMENT PROFESSIONAL ASHRAE CXA - CERTIFIED COMMISSIONING AUTHORITY - AABC COMMISSIONING GROUP
- BSC BUILDING SYSTEM COMMISSIONING CERTIFICATION NATHIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB

CERTIFY THAT HVAC&R SYSTEMS, SUBSYSTEMS, AND EQUIPMENT HAVE BEEN INSTALLED, CALIBRATED, AND STARTED AND OPERATING ACCORDING TO THE CONTRACT DOCUMENTS, APPROVED SHOP DRAWINGS AND SUBMITTALS.

CERTIFY THAT HVAC&R INSTRUMENTATION AND CONTROL SYSTEMS HAVE BEEN COMPLETED AND CALIBRATED, THAT THEY ARE OPERATING ACCORDING TO THE CONTRACT DOCUMENTS, APPROVED SHOP DRAWINGS, SUBMITTALS, AND PRETEST SET POINTS HAVE BEEN RECORDED.

- CERTIFY THAT TAB PROCEDURES HAVE BEEN COMPLETED, TAB REPORTS HAVE BEEN SUBMITTED, DISCREPANCIES CORRECTED, AND CORRECTIVE WORK APPROVED.
- SET SYSTEMS, SUBSYSTEMS, AND EQUIPMENT INTO OPERATING MODE TO BE TESTED ACCORDING TO
- APPROVED TEST PROCEDURES (E.G., NORMAL SHUTDOWN, NORMAL AUTO POSITION, NORMAL MANUAL POSITION. UNOCCUPIED CYCLE, EMERGENCY POWER, AND ALARM CONDITIONS) MEASURE CAPACITIES AND EFFECTIVENESS OF SYSTEMS, ASSEMBLIES, SUBSYSTEMS, EQUIPMENT, AND COMPONENTS, INCLUDING OPERATIONAL AND CONTROL FUNCTIONS TO VERIFY COMPLIANCE WITH ACCEPTANCE
- CRITERIA TEST SYSTEMS, ASSEMBLIES, SUBSYSTEMS, EQUIPMENT, COMPONENTS OPERATING MODES, INTERLOCKS,
- CONTROL RESPONSES, RESPONSES TO ABNORMAL OR EMERGENCY CONDITIONS, AND RESPONSE ACCORDING TO ACCEPTANCE CRITERIA. CONSTRUCTION CHECKLISTS: PREPARE AND SUBMIT DETAILED CONSTRUCTION CHECKLISTS FOR HVAC&R
- SYSTEMS, SUBSYSTEMS, EQUIPMENT, AND COMPONENTS. PERFORM TESTS USING DESIGN CONDITIONS. WHENEVER POSSIBLE
- SIMULATED CONDITIONS MAY, WITH APPROVAL OF ARCHITECT/ENGINEER, BE IMPOSED USING AN ARTIFICIAL LOAD WHEN IT IS IMPRACTICAL TO TEST UNDER DESIGN CONDITIONS. BEFORE SIMULATING CONDITIONS. CALIBRATE TESTING INSTRUMENTS. PROVIDE EQUIPMENT TO SIMULATE LOADS. SET SIMULATED CONDITIONS AS DIRECTED BY COMMISSIONING COORDINATOR AND DOCUMENT SIMULATED CONDITIONS AND METHODS OF SIMULATION. AFTER TESTS, RETURN CONFIGURATIONS AND SETTINGS TO NORMAL OPERATING CONDITIONS.
- COMMISSIONING TEST PROCEDURES MAY DIRECT THAT SET POINTS BE ALTERED WHEN SIMULATING CONDITIONS IS IMPRACTICAL, COMMISSIONING TEST PROCEDURES MAY DIRECT THAT SENSOR VALUES BE ALTERED WITH A SIGNAL GENERATOR WHEN DESIGN OR SIMULATING CONDITIONS AND ALTERING SET POINTS ARE IMPRACTICAL. IF TESTS CANNOT BE COMPLETED BECAUSE OF A DEFICIENCY OUTSIDE THE SCOPE OF THE HVAC&R SYSTEM, DOCUMENT THE DEFICIENCY AND REPORT IT TO OWNER. AFTER DEFICIENCIES ARE RESOLVED, RESCHEDULE TESTS.
- IF SEASONAL TESTING IS SPECIFIED, COMPLETE APPROPRIATE INITIAL PERFORMANCE TESTS AND DOCUMENTATION AND SCHEDULE SEASONAL TESTS.
- COORDINATE SCHEDULE WITH, AND PERFORM COMMISSIONING ACTIVITIES AT THE DIRECTION OF. COMMISSIONING COORDINATOR
- COMPLY WITH CONSTRUCTION CHECKLIST REQUIREMENTS, INCLUDING MATERIAL VERIFICATION, INSTALLATION CHECKS, START-UP, AND PERFORMANCE TESTS REQUIREMENTS SPECIFIED IN SECTIONS SPECIFYING HVAC SYSTEMS AND EQUIPMENT PROVIDE TECHNICIANS, INSTRUMENTATION, TOOLS, AND EQUIPMENT TO COMPLETE AND DOCUMENT THE
- FOLLOWING: PERFORMANCE TESTS, DEMONSTRATION OF A SAMPLE OF PERFORMANCE TESTS, COMMISSIONING TESTS, COMMISSIONING TEST DEMONSTRATIONS CONTRACTOR TO VERIFY AND DOCUMENT PLUMBING SYSTEM OPERATION AND RECOVERY TIMES.
- CONTRACTOR TO ADJUST, VERIFY, AND DOCUMENT DOMESTIC HOT WATER TEMPERATURES FOR CIRCULATING PUMP(S) MEET CODE MINIMUM REQUIREMENTS.

CONTRACTOR TO VERIFY FIXTURE HOT WATER DELIVERY MEETS CODE MINIMUM DEMAND RESPONSE TIME.

- SECTION 23 31 13 METAL DUCT MANUFACTURERS: MCGILL AIRFLOW LLC., SEMCO LLC., SHEET METAL CONNECTORS, INC. OR APPROVED EQUAL. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-1, "ROUND DUCT TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FI FXIBI F
- TRANSVERSE JOINTS IN DUCTS LARGER THAN 60 INCHES IN DIAMETER: FLANGED.
- LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE." FABRICATE ROUND DUCTS LARGER THAN 90 INCHES IN DIAMETER WITH BUTT-WELDED LONGITUDINAL SEAMS
- FABRICATE FLAT-OVAL DUCTS LARGER THAN 72 INCHES IN WIDTH (MAJOR DIMENSION) WITH BUTT-WELDED LONGITUDINAL SEAMS.
- TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-5, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-6, "CONICAL TEES," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FI FXIBI F."

SHEET METAL MATERIALS

- GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESS, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTION.
- GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M. GALVANIZED COATING DESIGNATION: G60. FINISHES FOR SURFACES EXPOSED TO VIEW: MILL PHOSPHATIZED. CARBON-STEEL SHEETS: COMPLY WITH ASTM A 1008/A 1008M. WITH OILED, MATTE FINISH FOR EXPOSED
- DUCTS
- ALUMINUM SHEETS: COMPLY WITH ASTM B 209 ALLOY 3003, H14 TEMPER; WITH MILL FINISH FOR D. CONCEALED DUCTS. AND STANDARD. ONE-SIDE BRIGHT FINISH FOR DUCT SURFACES EXPOSED.
- REINFORCEMENT SHAPES AND PLATES: ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS; BLACK
- AND GALVANIZED. TIE RODS: GALVANIZED STEEL, 1/4-INCH MINIMUM DIAMETER FOR LENGTHS 36 INCHES OR LESS; 3/8-INCH
- MINIMUM DIAMETER FOR LENGTHS LONGER THAN 36 INCHES. FIBROUS-GLASS DUCT LINER: COMPLY WITH ASTM C665 (CORROSIVENESS TEST), ASTM C411 (MAXIMUM SERVICE TEMPERATURE TEST). ASTM C1071: TYPE 1 (AIR VELOCITY TEST). ASTM C1104 (WATER VAPOR SORPTION TEST). ASTM C1338, ASTM G21 ,& ASTM G22 (MICROBIAL GROWTH TEST), ASTM E84, UL 723, CAN/ULC S102 (SURFACE
- BURNING CHARACTERISTICS TEST), NFPA 90A OR NFPA 90B; AND WITH NAIMA AH124, "FIBROUS GLASS DUCT LINER STANDARD." MANUFACTURERS: JOHNS MANVILLE; A BERKSHIRE HATHAWAY COMPANY., KNAUF INSULATION,
- OWENS CORNING, OR APPROVED EQUAL. TYPE I, FLEXIBLE: 0.27 BTU X IN./H X SQ. FT. X DEG F AT 75 DEG F MEAN TEMPERATURE. TYPE II, RIGID: 0.23 BTU X IN./H X SQ. FT. X DEG F AT 75 DEG F MEAN TEMPERATURE, ANTIMICROBIAL EROSION-RESISTANT COATING: APPLY TO THE SURFACE OF THE LINER THAT WILL FORM THE INTERIOR SURFACE OF THE DUCT TO ACT AS A MOISTURE REPELLENT AND EROSION-RESISTANT COATING, ANTIMICROBIAL
- COMPOUND SHALL BE TESTED FOR EFFICACY BY AN NRTL AND REGISTERED BY THE EPA FOR USE IN HVAC SYSTEMS. WATER-BASED LINER ADHESIVE: COMPLY WITH NFPA 90A OR NFPA 90B AND WITH ASTM C916.LOW PRESSURE DUCT WILL BE CONSTRUCTED IN 2 INCH WG. MEDIUM PRESSURE DUCT SHALL BE
- CONSTRUCTED TO 4.0 IN WG. DUCT LINER ADHESIVE SHALL BE APPLIED TO THE SHEET METAL WITH A MINIMUM COVERAGE OF 90% ADHESIVE SHALL MEET THE REQUIRMEENTS OF ASTM C916. PRESSURE CLASS REQUIREMENTS FOR DUCT CONSTRUCTION:
- Α. SUPPLY DUCTWORK LOW PRESSURE DUCTWORK: +1" a.
- **RETURN DUCTWORK: -1"**
- GENERAL EXHAUST: -1" UPSTREAM OF FAN а.

SECTION 08 91 00 - STATIONARY BLADE WALL LOUVERS

MANUFACTURERS: RUSKIN, PRICE, GREENCHECK, NAILOR, OR APPROVED EQUAL.

MANUFACTURER SHALL BE ISO 9001 ACCREDITED. PERFORMANCE: LOUVERS LICENSED TO BEAR AMCA CERTIFIED RATINGS SEAL. RATINGS BASED ON TESTS AND PROCEDURES PERFORMED IN ACCORDANCE WITH AMCA 511 AND COMPLY WITH AMCA CERTIFIED RATINGS PROGRAM. AMCA CERTIFIED RATINGS SEAL APPLIES TO AIR PERFORMANCE AND WATER PENETRATION

RATINGS. LOUVER WARRANTY: MANUFACTURER SHALL PROVIDE STANDARD LIMITED WARRANTY FOR LOUVER SYSTEMS FOR A PERIOD OF FIVE YEARS (60 MONTHS) FROM DATE OF INSTALLATION, NO MORE THAN 60 MONTHS AFTER SHIPMENT FROM MANUFACTURING PLANT, WHEN NOTIFIED IN WRITING FROM THE OWNER OF A MANUFACTURING DEFECT, MANUFACTURER SHALL PROMPTLY CORRECT DEFICIENCIES WITHOUT COST TO THE OWNER

STATIONARY BLADE LOUVER:

- A. FABRICATION: DESIGN: STATIONARY DRAINABLE LOUVER TYPE WITH DRAIN GUTTERS IN EACH BLADE AND а. HEAD WITH DOWNSPOUTS IN JAMBS AND MULLIONS WITH ALL WELDED CONSTRUCTION. HIDDEN VERTICAL SUPPORTS TO ALLOW CONTINUOUS LINE APPEARANCE UP TO 120 INCHES (3,048 MM). STEEPLY ANGLED INTEGRAL SILL. FRAME
 - FRAME DEPTH: 6 INCHES (152 MM).
 - WALL THICKNESS: 0.081 INCH (2.1 MM), NOMINAL. MATERIAL: EXTRUDED ALUMINUM, ALLOY 6063-T6.
 - BLADES: C. STYLE: DRAINABLE. 37.5 DEGREES AT 5-29/32 INCHES (150 MM), NOMINAL
 - WALL THICKNESS: 0.081 INCH (2.1 MM), NOMINAL. MATERIAL: EXTRUDED ALUMINUM, ALLOY 6063-T6.
 - MINIMUM ASSEMBLY SIZE: 12 INCHES WIDE BY 12 INCHES HIGH (305 MM X 305 MM). MAXIMUM FACTORY ASSEMBLY SIZE: SINGLE SECTIONS SHALL NOT EXCEED 120 INCHES WIDE BY 90 INCHES HIGH (3048 MM X 2286 MM) OR 90 INCHES WIDE BY 120 INCHES HIGH (2286 MM X 3048). LOUVERS LARGER THAN THE MAXIMUM SINGLE SIZE SHALL BE REQUIRE FIELD ASSEMBLY OF SMALLER SECTIONS.
- EXECUTION EXAMINE, PREPARE, INSTALL, AND CLEAN LOUVERS AT LOCATIONS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. NOTIFY THE ARCHITECT OF CONDITIONS THAT WOULD ADVERSELY AFFECT THE INSTALLATION OR UTILIZATION OF THE LOUVERS.

SECTION 23 82 39 – WALL AND CEILING UNIT HEATERS

MANUFACTURERS: INDEECO, REZNOR, TRANE, OR APPROVED EQUAL. DESCRIPTION:

ASSEMBLY INCLUDING CHASSIS, ELECTRIC HEATING COIL, FAN, MOTOR, AND CONTROLS. COMPLY WITH UI 2021

ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION. CABINET

FRONT PANEL: STAMPED-STEEL LOUVER, WITH REMOVABLE PANELS FASTENED WITH TAMPERPROOF FASTENERS FINISH: BAKED ENAMEL OVER BAKED-ON PRIMER WITH MANUFACTURER'S **STANDARD** COLOR

SELECTED BY ARCHITECT, APPLIED TO FACTORY-ASSEMBLED AND -TESTED WALL AND CEILING HEATERS BEFORE SHIPPING.

SURFACE-MOUNTED CABINET ENCLOSURE: STEEL WITH FINISH TO MATCH CABINET.

ELECTRIC-RESISTANCE HEATING COIL: NICKEL-CHROMIUM HEATING WIRE, FREE FROM EXPANSION NOISE AND 60-HZ HUM, EMBEDDED IN MAGNESIUM OXIDE REFRACTORY AND SEALED IN CORROSION-RESISTANT METALLIC SHEATH. TERMINATE ELEMENTS IN STAINLESS-STEEL, MACHINE-STAKED TERMINALS SECURED WITH STAINLESS-STEEL HARDWARE, AND LIMIT CONTROLS FOR HIGH-TEMPERATURE PROTECTION. PROVIDE INTEGRAL CIRCUIT BREAKER FOR OVERCURRENT PROTECTION

FAN AND MOTOR:

COIL:

FAN: ALUMINUM PROPELLER DIRECTLY CONNECTED TO MOTOR. MOTOR: PERMANENTLY LUBRICATED, MULTISPEED.

- INSTALLATION:
 - INSTALL WALL AND CEILING UNIT HEATERS TO COMPLY WITH NFPA 90A.
 - INSTALL WALL AND CEILING UNIT HEATERS LEVEL AND PLUMB. INSTALL WALL-MOUNTED THERMOSTATS AND SWITCH CONTROLS IN ELECTRICAL OUTLET BOXES AT

HEIGHTS TO MATCH LIGHTING CONTROLS. VERIFY LOCATION OF THERMOSTATS AND OTHER EXPOSED CONTROL SENSORS WITH DRAWINGS AND ROOM DETAILS BEFORE INSTALLATION.

SECTION 23 34 00 - HVAC FANS DIRECT DRIVE CENTRIFUGAL FAN

MANUFACTURERS: COOK, TWIN CITY, GREENHECK, OR APPROVED EQUAL. MANUFACTURER SHALL BE ISO 9001 ACCREDITED PERFORMANCE CONFORM TO AMCA STANDARD 211 AND 311. FANS MUST BE TESTED IN ACCORDANCE WITH ANSI/AMCA STANDARD 210-99 AND AMCA STANDARD 300-96 IN AN AMCA ACCREDITED LABORATORY. FANS SHALL BE CERTIFIED TO BEAR THE AMCA LABEL FOR AIR AND SOUND

PERFORMANCE SEAL WARRANTY: MANUFACTURER SHALL PROVIDE STANDARD LIMITED WARRANTY FOR FAN EQUIPMENT (EXCLUDING MOTOR) FOR A PERIOD OF ONE YEAR (12 MONTHS) FROM DATE OF PURCHASE. MOTOR WARRANTY SHALL BE PROVIDED BY MOTOR MANUFACTURER FOR A PERIOD OF ONE YEAR (12 MONTHS) FROM DATE OF PURCHASE. WHEN NOTIFIED IN WRITING FROM THE OWNER OF A MANUFACTURING DEFECT, MANUFACTURER SHALL PROMPTLY CORRECT DEFICIENCIES WITHOUT COST TO THE OWNER. FABRICATION:

- MOTOR: OPEN TYPE, EC MOTOR SPECIFICALLY DESIGNED FOR FAN APPLICATIONS. AC а. INDUCTION TYPE MOTORS ARE NOT ACCEPTABLE. MOTOR SHALL BE PROVIDED WITH PERMANENTLY LUBRICATED BEARINGS AND INCLUDE IMPEDANCE OR THERMAL OVERLOAD PROTECTION AND DISCONNECT PLUG.
- HOUSING: MATERIAL: MINIMUM 22 GAUGE GALVANIZED STEEL; MATERIAL: MINIMUM 22 GAUGE GALVANIZED STEEL; DAMPER ON INLET/OUTLET AS SPECIFIED ON SCHEDULE; INLET AND OUTLET SHALL INCLUDE SQUARE DUCT COLLARS.
- WHEEL: STATICALLY AND DYNAMICALLY BALANCED IN ACCORDANCE TO AMCA STANDARD C. 204-05; THE WHEEL CONE AND FAN INLET WILL BE MATCHED AND SHALL HAVE PRECISE RUNNING TOLERANCES FOR MAXIMUM PERFORMANCE AND OPERATING EFFICIENCY: BLADES CONSTRUCTED OF ALUMINUM OR INJECTION MOLDED OF POLYPROPYLENE RESIN.
- EXECUTION COMPLIANCE: COMPLY WITH MANUFACTURER'S PRODUCT DATA, INCLUDING TECHNICAL а.
- BULLETINS, PRODUCT CATALOG INSTALLATION INSTRUCTIONS EXAMINATION: EXAMINE AREAS TO RECEIVE FANS. NOTIFY THE ENGINEER OF CONDITIONS THAT WOULD ADVERSELY AFFECT INSTALLATION OR SUBSEQUENT UTILIZATION AND
- MAINTENANCE OF FANS. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED. PREPARATION: ENSURE ROOF OPENINGS ARE SQUARE, ACCURATELY ALIGNED, CORRECTLY
- LOCATED, AND IN TOLERANCE; ENSURE DUCT IS PLUMB, SIZED CORRECTLY, AND TO PROPER ELEVATION ABOVE ROOF DECK. INSTALL DUCT AS SPECIFIED IN AIR DISTRIBUTION. INSTALLATION: INSTALL FANS SYSTEM AS INDICATED ON THE INSTALLATION, OPERATION AND MAINTENANCE MANUAL (IOM) AND CONTRACT DRAWINGS; INSTALL FANS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- SYSTEM STARTUP: REFER TO INSTALLATION, OPERATION, AND MAINTENANCE MANUAL (IOM). ADJUSTING: ADJUST EXHAUST FANS TO FUNCTION PROPERLY; ADJUST BELT TENSION (AS REQUIRED); LUBRICATE BEARINGS; ADJUST DRIVE FOR FINAL SYSTEM BALANCING; CHECK WHEEL OVERLAP.
- CLEANING: CLEAN AS RECOMMENDED BY MANUFACTURER. DO NOT USE MATERIAL OR
- METHODS WHICH MAY DAMAGE FINISH SURFACE OR SURROUNDING CONSTRUCTION. PROTECTION: PROTECT INSTALLED PRODUCT AND FINISHED SURFACES FROM DAMAGE
- DURING CONSTRUCTION: PROTECT INSTALLED EXHAUST FANS TO ENSURE THAT, EXCEPT FOR NORMAL WEATHERING, FANS WILL BE WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION.



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Sheet Content:

MECHANICAL SPECIFICATIONS

SCALE:

NOT TO SCALE

Drawn By: Author Checked By: Checker Plot Date: 01/29/2024 Project Number: H23233 Sheet:



STAN	00 – AIR DUCT ACCESSORIES DARD, STEEL, MANUAL VOLUME DAMPERS:	SECTIO		HVAC POWER V
Α.	MANUFACTURERS: MCGILL AIRFLOW LLC., NAILOR INDUSTRIES INC., RUSKIN COMPANY. OR APPROVED EQUAL.	2.	FAN PER	FORMANCE SHO
В.	STANDARD LEAKAGE RATING, WITH LINKAGE OUTSIDE AIRSTREAM. SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS.	3.	SIDEWAL	L PROPELLER FA
FIRE A.	DAMPERS: FIRE DAMPERS MANUFACTURERS: NAILOR INDUSTRIES INC., POTTORFF. OR APPROVED EQUAL.			BAKED-ENAMEL FAN WHEELS: FO
В. С.	TYPE: STATIC; RATED AND LABELED ACCORDING TO UL 555 BY AN NRTL. CLOSING RATING IN DUCTS UP TO 4-INCH WG STATIC PRESSURE CLASS AND MINIMUM 2000-FPM>			IRON HUB. FAN WHEEL: REI
D.	VELOCITY. FIRE RATING: 1-HOURS.			FACTORY SET P FAN DRIVE: DIRE
E.	FRAME: CURTAIN TYPE WITH BLADES OUTSIDE AIRSTREAM; FABRICATED WITH ROLL-FORMED, 0.034-			LOCATED ON OU
F.	INCH-THICK GALVANIZED STEEL; WITH MITERED AND INTERLOCKING CORNERS. MOUNTING SLEEVE: FACTORY- OR FIELD-INSTALLED, GALVANIZED SHEET STEEL.			FAN DRIVE: BEL BALANCED, SELI
G. H.	MINIMUM THICKNESS: 0.39 INCH THICK, AS INDICATED, AND OF LENGTH TO SUIT APPLICATION. MOUNTING ORIENTATION: VERTICAL OR HORIZONTAL AS INDICATED.			HORSEPOWER, ' GREASE FITTING
I.	BLADES: ROLL-FORMED, INTERLOCKING, 0.034-INCH- THICK, GALVANIZED SHEET STEEL. IN PLACE OF INTERLOCKING BLADES, USE FULL-LENGTH, 0.034-INCH-THICK, GALVANIZED-STEEL BLADE CONNECTORS.			MOTOR SIZE: 1.4 BEARINGS: PERI A RATING LIFE: /
J. K.	HORIZONTAL DAMPERS: INCLUDE BLADE LOCK AND STAINLESS-STEEL CLOSURE SPRING. HEAT-RESPONSIVE DEVICE: REPLACEABLE, 165 DEG F RATED, FUSIBLE LINKS.			DYNAMICALLY B THROUGH 5 HP;
L.	HEAT-RESPONSIVE DEVICE: REPLACEABLE LINK AND SWITCH PACKAGE, FACTORY INSTALLED, 165 DEG F RATED.			IS AT THE MIDDL
	(E DAMPERS:			NONSPARKING, FABRICATE OF S
A.	MANUFACTURERS: GREENHECK FAN CORPORATION, NAILOR INDUSTRIES INC., RUSKIN, COMPANY.GENERAL REQUIREMENTS: LABEL ACCORDING TO UL 555S BY AN NRTL. OR APPROVED			ACCESSORIES: a. DISCOI
B.	EQUAL. SMOKE DETECTOR: INTEGRAL, FACTORY WIRED FOR SINGLE-POINT CONNECTION.			b. MOTOF
C.	FRAME: HAT-SHAPED, 0.094-INCH-THICK, GALVANIZED SHEET STEEL, WITH WELDED CORNERS AND MOUNTING FLANGE.			c. MOTOF
D.	BLADES: AIR FOIL, ROLL-FORMED, HORIZONTAL, INTERLOCKING, 0.063-INCH- THICK, GALVANIZED SHEET STEEL.			REMO\
E.	LEAKAGE: CLASS I.	4.	MOTORS	d. WALL S : COMPLY WITH I
F. G.	RATED PRESSURE AND VELOCITY TO EXCEED DESIGN AIRFLOW CONDITIONS. MOUNTING SLEEVE: FACTORY-INSTALLED, 0.05-INCH THICK, GALVANIZED SHEET STEEL; LENGTH TO		EQUIPME	
H.	SUIT WALL OR FLOOR APPLICATION WITH FACTORY-FURNISHED SILICONE CALKING. DAMPER MOTORS: TWO-POSITION ACTIONDEFAULT MOTOR CHARACTERISTICS ARE SPECIFIED IN	5.		IALITY CONTROL MANUFACTURE
I.	SECTION 230513 "COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT." COMPLY WITH NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, ENCLOSURE TYPE, AND			INCLUDING TECH EXAMINATION: E
	EFFICIENCY REQUIREMENTS FOR MOTORS SPECIFIED IN SECTION 230513 "COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT."			WOULD ADVERS
J.	MOTOR SIZES: MINIMUM SIZE AS INDICATED. IF NOT INDICATED, LARGE ENOUGH SO DRIVEN LOAD WILL		C.	DO NOT PROCE
K.	NOT REQUIRE MOTOR TO OPERATE IN SERVICE FACTOR RANGE ABOVE 1.0. CONTROLLERS, ELECTRICAL DEVICES, AND WIRING: COMPLY WITH REQUIREMENTS FOR ELECTRICAL			AND IN TOLERAN ROOF DECK. INS
	DEVICES AND CONNECTIONS SPECIFIED IN SECTION 230923 "DIRECT DIGITAL CONTROL (DDC) SYSTEM FOR HVAC."			INSTALLATION: I MAINTENANCE N
L.	PERMANENT-SPLIT-CAPACITOR OR SHADED-POLE MOTORS: WITH OIL-IMMERSED AND SEALED GEAR TRAINS. SPRING-RETURN MOTORS: EQUIP WITH AN INTEGRAL SPIRAL-SPRING MECHANISM WHERE			MANUFACTUREF SYSTEM STARTI
	INDICATED. ENCLOSE ENTIRE SPRING MECHANISM IN A REMOVABLE HOUSING DESIGNED FOR SERVICE OR ADJUSTMENTS. SIZE FOR RUNNING TORQUE RATING OF 150 IN. X LBF AND BREAKAWAY TORQUE		F.	CLEANING: CLEA
	RATING OF 150 IN. X LBF. OUTDOOR MOTORS AND MOTORS IN OUTDOOR-AIR INTAKES: EQUIP WITH O-		G.	WHICH MAY DAM PROTECTION: PI
	RING GASKETS DESIGNED TO MAKE MOTORS WEATHERPROOF. EQUIP MOTORS WITH INTERNAL HEATERS TO PERMIT NORMAL OPERATION AT MINUS 40 DEG F.			CONSTRUCTION WEATHERING, F
М.	NONSPRING-RETURN MOTORS: FOR DAMPERS LARGER THAN 25 SQ. FT., SIZE MOTOR FOR RUNNING TORQUE RATING OF 150 IN. X LBF AND BREAKAWAY TORQUE RATING OF 300 IN. X LBF.			COMPLETION.
N. O.	ELECTRICAL CONNECTION: 115 V, SINGLE PHASE, 60 HZ. ACCESSORIES: AUXILIARY SWITCHES FOR SIGNALING. TEST AND RESET SWITCHES, DUCT MOUNTED.			
COM	BINATION FIRE AND SMOKE DAMPERS			
A.	MANUFACTURERS: GREENHECK FAN CORPORATION, POTTORFF, RUSKIN COMPANY. OR APPROVED EQUAL.			
В. С.	TYPE: DYNAMIC; RATED AND LABELED ACCORDING TO UL 555 AND UL 555S BY AN NRTL. CLOSING RATING IN DUCTS UP TO 4-INCH WG STATIC PRESSURE CLASS AND MINIMUM 2000-FPM			
D.	VELOCITY. FIRE RATING: 1- HOURS.			
E.	FRAME: HAT-SHAPED, 0.094-INCH-THICK, GALVANIZED SHEET STEEL, WITH WELDED CORNERS AND MOUNTING FLANGE.			
F.	HEAT-RESPONSIVE DEVICE: RESETTABLE LINK AND SWITCH PACKAGE, FACTORY INSTALLED, RATED. SMOKE DETECTOR: INTEGRAL, FACTORY WIRED FOR SINGLE-POINT CONNECTION.			
G. H.	BLADES: AIR FOIL, ROLL-FORMED, HORIZONTAL, INTERLOCKING THICK, GALVANIZED SHEET STEEL.			
I.	LEAKAGE: CLASS I. RATED PRESSURE AND VELOCITY TO EXCEED DESIGN AIRFLOW CONDITIONS. MOUNTING SLEEVE: FACTORY-INSTALLED, 0.05-INCH-THICK, GALVANIZED SHEET STEEL; LENGTH TO			
J.	SUIT WALL OR FLOOR APPLICATION WITH FACTORY-FURNISHED SILICONE CALKING. MANUFACTURED TURNING VANES FOR METAL DUCTS: CURVED BLADES OF GALVANIZED SHEET STEEL;			
	SUPPORT WITH BARS PERPENDICULAR TO BLADES SET; SET INTO VANE RUNNERS SUITABLE FOR DUCT MOUNTING.			
K.	VANE CONSTRUCTION: DOUBLE WALL.			
L.	VANE CONSTRUCTION: SINGLE WALL FOR DUCTS UP TO 36 INCHES WIDE AND DOUBLE WALL FOR LARGER DIMENSIONS.			
REMO A.	TE DAMPER OPERATORS MANUFACTURERS: POTTORFF, VENTFABRICS, INC., YOUNG REGULATOR COMPANY. OR APPROVED			
DUCI	EQUAL. -MOUNTED ACCESS DOORS			
A.	MANUFACTURERS: GREENHECK FAN CORPORATION, MCGILL AIRFLOW LLC., NAILOR INDUSTRIES INC. OR APPROVED EQUAL.			
В.	FABRICATE ACCESS PANELS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS -			
	METAL AND FLEXIBLE"; FIGURES 7-2, "DUCT ACCESS DOORS AND PANELS," AND 7-3, "ACCESS DOORS - ROUND DUCT.			
_	BLE DUCT	1		
FLEX A.	MANUFACTURERS: FLEXMASTER U.S.A., INC., JP LAMBORN CO., MCGILL AIRFLOW LLC., THERMAFLEX; A			

MECHANICAL SPECIFICATIONS

/ENTILATORS NHECK, TWIN CITY, LOREN COOK COMPANY. OR APPROVED EQUAL. ULD BE SELECTED IN ACCORDANCE TO THE "CODE INFORMATION" AND LOCATION CAL COVER SHEET.

ANIZED-STEEL SHEET WITH FLANGED EDGES AND INTEGRAL ORIFICE RING, WITH FINISH COAT APPLIED AFTER ASSEMBLY.

ORMED-STEEL BLADES RIVETED TO HEAVY-GAUGE STEEL SPIDER BOLTED TO CAST-

PLACEABLE, CAST-ALUMINUM, AIRFOIL BLADES FASTENED TO CAST-ALUMINUM HUB; PITCH ANGLE OF BLADES. ECT-DRIVE MOTOR MOUNTED IN AIRSTREAM, FACTORY WIRED TO DISCONNECT SWITCH

JTSIDE OF FAN HOUSING. T DRIVE, RESILIENTLY MOUNTED TO HOUSING, STATICALLY AND DYNAMICALLY ECTED FOR CONTINUOUS OPERATION AT MAXIMUM RATED FAN SPEED AND MOTOR WITH FINAL ALIGNMENT AND BELT ADJUSTMENT MADE AFTER INSTALLATION; EXTEND G TO ACCESSIBLE LOCATION OUTSIDE OF UNIT; SERVICE FACTOR BASED ON FAN .; FAN SHAFT: TURNED, GROUND, AND POLISHED STEEL; KEYED TO WHEEL HUB.; SHAFT MANENTLY LUBRICATED, PERMANENTLY SEALED, SELF-ALIGNING BALL BEARINGS WITH ABMA 9, L(10) OF 100,000 HOURS.; PULLEYS: CAST IRON WITH SPLIT, TAPERED BUSHING; BALANCED AT FACTORY.; MOTOR PULLEYS: ADJUSTABLE PITCH FOR USE WITH MOTORS FIXED PITCH FOR USE WITH LARGER MOTORS. SELECT PULLEY SO PITCH ADJUSTMENT LE OF ADJUSTMENT RANGE AT FAN DESIGN CONDITIONS.; BELTS: OIL RESISTANT, AND NONSTATIC; MATCHED SETS FOR MULTIPLE BELT DRIVES.; BELT GUARDS: TEEL FOR MOTORS MOUNTED ON OUTSIDE OF FAN CABINET.

NNECT SWITCH: NONFUSIBLE TYPE, WITH THERMAL-OVERLOAD PROTECTION MOUNTED E FAN HOUSING, FACTORY WIRED THROUGH AN INTERNAL ALUMINUM CONDUIT. RIZED DAMPERS: PARALLEL-BLADE DAMPERS WITH ELECTRIC ACTUATOR WIRED TO WHEN FAN STOPS.

R-SIDE BACK GUARD: GALVANIZED STEEL, COMPLYING WITH OSHA SPECIFICATIONS, ABLE FOR MAINTENANCE.

SLEEVE: GALVANIZED STEEL TO MATCH FAN AND ACCESSORY SIZE. NEMA DESIGNATION, TEMPERATURE RATING, SERVICE FACTOR, AND EFFICIENCY FORS SPECIFIED IN SECTION 230513 "COMMON MOTOR REQUIREMENTS FOR HVAC

<u>R'S INSTRUCTIONS:</u> COMPLIANCE: COMPLY WITH MANUFACTURER'S PRODUCT DATA, INICAL BULLETINS, PRODUCT CATALOG INSTALLATION INSTRUCTIONS. EXAMINE AREAS TO RECEIVE FANS. NOTIFY THE ENGINEER OF CONDITIONS THAT ELY AFFECT INSTALLATION OR SUBSEQUENT UTILIZATION AND MAINTENANCE OF FANS. ED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED. ENSURE ROOF OPENINGS ARE SQUARE, ACCURATELY ALIGNED, CORRECTLY LOCATED, ANCE; ENSURE DUCT IS PLUMB, SIZED CORRECTLY, AND TO PROPER ELEVATION ABOVE TALL DUCT AS SPECIFIED IN AIR DISTRIBUTION (DIVISION 23). INSTALL FANS SYSTEM AS INDICATED ON THE INSTALLATION, OPERATION AND

MANUAL (IOM) AND CONTRACT DRAWINGS; INSTALL FANS IN ACCORDANCE WITH R'S INSTRUCTIONS. UP: REFER TO INSTALLATION, OPERATION, AND MAINTENANCE MANUAL (IOM).

AN AS RECOMMENDED BY MANUFACTURER. DO NOT USE MATERIAL OR METHODS MAGE FINISH SURFACE OR SURROUNDING CONSTRUCTION. ROTECT INSTALLED PRODUCT AND FINISHED SURFACES FROM DAMAGE DURING ; PROTECT INSTALLED EXHAUST FANS TO ENSURE THAT, EXCEPT FOR NORMAL

ANS WILL BE WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL

ECTION 23 82 19 – WALL MOUNTED MINI SPLIT FAN COIL UNITS MANUFACTURERS: TRANE, DAIKIN, SAMSUNG, MITSUBISHI, LG ELECTRONICS, OR APPROVED EQUAL. FAN COIL UNIT COIL WILL BE SINGLE REFRIGERANT CIRCUIT. SURFACE-BURNING CHARACTERISTICS: INSULATION AND ADHESIVE SHALL HAVE A COMBINED MAXIMUM FLAME-SPREAD INDEX OF 25 AND SMOKE-DEVELOPED INDEX OF 50 WHEN TESTED ACCORDING TO ASTM E 84 BY A QUALIFIED TESTING AGENCY. DRAIN PANS: STAINLESS STEEL OR HIGH IMPACT POLYSTYRENE RESIN (HIPS). STAINLESS STEEL PANS AND DRAIN CONNECTIONS TO COMPLY WITH ASHRAE 62.1. DRAIN PANS SHALL BE REMOVABLE. CHASSIS: HEAVY DUTY ACRYLONITRILE BUTADIENE STYRENE(ABS) AND HIGH IMPACT POLYSTYRENE (HIPS). CABINET: HEAVY DUTY ACRYLONITRILE BUTADIENE STYRENE(ABS) AND HIGH IMPACT POLYSTYRENE (HIPS). STEEL RECESSING FLANGES FOR RECESSING FAN COIL UNITS INTO CEILING OR WALL. FILTERS: FACTORY PROVIDED WASHABLE FILTER. INDOOR REFRIGERANT COILS: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS BRAZED JOINTS AT FITTINGS. NO MORE THAN 21 FINS PER INCH. COMPLY WITH AHRI 210/240, AND LEAK TEST TO MINIMUM 450 PSIG FOR A MINIMUM 300-PSIG WORKING PRESSURE. FAN AND MOTOR BOARD: REMOVABLE. FANS: DIRECTLY DRIVEN AND MOUNTED ON A COMMON SHAFT. MADE OF HIGH STRENGTH ABS GP-2200 POLYMERIC RESIN OR APPROVED ALTERNATIVE. MOTOR: PERMANENTLY LUBRICATED, MULTISPEED; RESILIENTLY MOUNTED ON MOTOR BOARD. COMPLY WITH REQUIREMENTS IN SECTION 230513 "COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT." WIRING TERMINATION: CONNECT MOTOR TO CHASSIS WIRING WITH PLUG CONNECTION. PROVIDE UNITS THAT ARE FACTORY WIRED WITH NECESSARY ELECTRICAL COMPONENTS, INTEGRAL MICROPROCESSORS, PRINTED CIRCUIT BOARDS, THERMISTORS, SENSORS, TERMINAL BLOCKS, AND LUGS FOR POWFR WIRING PROVIDE MICROPROCESSOR-BASED ALGORITHMS FOR COMPONENT PROTECTION, SOFT-START CAPABILITY, REFRIGERATION SYSTEM PRESSURE, TEMPERATURE, DEFROST, AND AMBIENT CONTROL. PROVIDE A MATCHED WIRED TEMPERATURE SENSOR WITH SIMPLE OPERATOR INTERFACE TO CONTROL UNIT MODE, COOLING AND HEATING SETPOINTS, 7 DAY SCHEDULING, AND FAN SPEED. PROVIDE EXTERNAL CONDENSATE PUMP.

ECTION 23 82 20 – MINI SPLIT CONDENSING UNITS

WARRANTY ON THE COMPRESSOR

MANUFACTURERS: TRANE, DAIKIN, SAMSUNG, MITSUBISHI, LG ELECTRONICS, OR APPROVED EQUAL. CASE: OUTDOOR UNIT CASE TO BE CONSTRUCTED FORM 22-GAUGE COATED METAL. EXTERIOR PANELS ARE TO HAVE A WEATHER-RESISTANT BAKED ENAMEL FINISHED. OUTDOOR UNIT COIL IS TO BE PROTECTED WITH A HEAVY GAUGE STEEL WIRE GUARD FINISHED WITH BAKE ENAMEL.

- COILS: OUTDOOR UNIT COILS TO BE MANUFACTURED USING COPPER TUBS WITH MECHANICALLY BONDED ALUMINUM LOUVERED FINS. COILS TO BE PRESSURE TESTED AT A MINIMUM OF 551 PSI. FACTORY APPLIED CORROSION RESISTANT GOLDFIN MATERIAL WITH HYDROPHILIC COATING. FANS: FAN BLADES TO BE MADE OF DURABLE ACRYLONITRILE BUTADIENE STYRENE (ABS) POLYMERIC RESIN OR
- APPROVED ALTERNATIVE. OUTDOOR FAN TO BE VARIABLE SPEED PROPELLER TYPE. THE BRUSHLESS DIGITALLY CONTROLLED FAN MOTOR SHALL HAVE INHERENT PROTECTION, PERMANENTLY LUBRICATED BEARINGS, AND VARIABLE SPEED.
- REFRIGERATION SYSTEM: THE REFRIGERATION SYSTEM CONSISTS OF A SINGLE REFRIGERATION CIRCUIT AND USES R410A REFRIGERANT. THE OUTDOOR UNIT SHALL BE PROVIDED WITH FACTORY INSTALLED COMPONENTS INCLUDING A REFRIGERANT STRAINER, FOUR-WAY REVERSING VALVE, ELECTRONIC CONTROLLED EXPANSION VALVE (EEV), HIGH AND LOW SIDE CHARGING PORTS, SERVICE VALVES, AND INTERCONNECTING PIPING. COMPRESSOR: UNIT SHALL BE EQUIPPED WITH A HERMETIC, DIGITALLY-CONTROLLED INVERTER COMPRESSOR. MODULATION RANGE SHALL BE BETWEEN 10 Hz TO 84 Hz FOR 3/4-TON UNIT, BETWEEN 10 Hz TO 92 Hz FOR 1-TON UNIT, BETWEEN 10 Hz TO 93 Hz FOR 1.5-TON UNIT, AND BETWEEN 10Hz TO 100 Hz FOR 2, 2.5, AND 3 TON UNITS.
- EXTERNAL SUCTION AND DISCHARGE TEMPERATURE AND PRESSURE SENSORS TO BE PROVIDED TO PROTECT COMPRESSOR FROM DAMAGE CAUSED BY OVER/ UNDER TEMPERATURE OR OVER/ UNDER PRESSURE CONDITIONS. COMPRESSOR SHALL BE PROVIDED WITH A CENTRIFUGAL OIL SEPARATOR AND CONTROLS TO ENSURE SUFFICIENT OIL SUPPLY IS MAINTAINED. WARRANTY: PROVIDE A 2 YEAR LIMITED PARTS WARRANTY ON THE COMPLETE UNIT AND 5-YEAR PARTS

SECTION 23 82 19 – INDOOR DX AIR HANDLING UNIT/ FAN COIL UNITS

MANUFACTURERS: TEMPMASTER, TRANE, DAIKIN, CARRIER LENNOX, OR APPROVED EQUAL SURFACE-BURNING CHARACTERISTICS: INSULATION AND ADHESIVE SHALL HAVE A COMBINED MAXIMUM FLAME-SPREAD INDEX OF 25 AND SMOKE-DEVELOPED INDEX OF 50 WHEN TESTED ACCORDING TO ASTM E 84 BY A

QUALIFIED TESTING AGENCY. DRAIN PANS: GALVANIZED STEEL OR POLYMER RESIN. PANS AND DRAIN CONNECTIONS TO COMPLY WITH ASHRAE 62.1. DRAIN PANS SHALL BE REMOVABLE.

CABINET: 18 GAUGE, ZINC COATED STEEL, FIBERGLASS INSULATED, FINISHED WITH A POWDER PAINT PROCESS CAPABLE OF WITHSTANDING A MINIMUM 750 SALT SPRAY HOURS ACCORDING TO ASTM B117.

FILTERS: PROVIDE FACTORY INSTALLED 2" FILTER RACK WITH SCHEDULED FILTERS INDOOR REFRIGERANT COILS: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS BRAZED JOINTS AT FITTINGS. COMPLY WITH AHRI 210/240, AND LEAK TEST TO MINIMUM 450 PSIG FOR A MINIMUM 300-PSIG WORKING PRESSURE. PROVIDE FACTORY MOUNTED DISTRIBUTORS, EXPANSION VALVES, AND SOLENOID VALVES. FAN AND MOTOR BOARD: REMOVABLE.

FANS: PROVIDE A BELT DRIVE FAN WITH ADJUSTABLE PITCH MOTOR PULLEY. FAN WHEEL SHALL BE DOUBLE-INLET TYPE WITH FORWARD CURVED BLADES. DYNAMICALLY BALANCED TO OPERATE SMOOTHLY THROUGHOUT THE ENTIRE RANGE OF OPERATION. BEARINGS SHALL BE PERMANENTLY SEALED AND PERMANENTLY LUBRICATED.

SCHEDULE: REFER TO MECHANICAL SCHEDULE NOTES FOR ADDITIONAL UNIT OPTION REQUIREMENTS. IF ANY NOTES CONFLICT WITH THE SPECIFICATION ABOVE, THE SCHEDULE NOTES SHALL SUPERSEDE THE SPECIFICATION.

SECTION 23 82 20 – OUTDOOR DX CONDENSING UNITS

MANUFACTURERS: TEMPMASTER, TRANE, DAIKIN, CARRIER OR APPROVED EQUAL CASE: OUTDOOR UNIT CASE TO BE CONSTRUCTED FROM ZINC-COATED GALVANIZED STEEL. EXTERIOR

SURFACES SHALL BE BONDED AND COATED WITH BAKED ENAMEL FINISH BY A POWDER PAINT PROCESS CAPABLE OF WITHSTANDING A MINIMUM 1000 HOUR SALT SPRAY TEST. UNIT TO HAVE PERMANENTLY ATTACHED HEAVY-GAUGE PERIMETER BASE RAILS WITH FORKLIFT SLOTS AND LIFTING HOLES.

COILS: OUTDOOR UNIT COILS TO BE MANUFACTURED USING ALL ALUMINUM MICRO-CHANNEL FINS AND TUBING. FANS: PROVIDE DIRECT DRIVEN PROPELLER-TYPE FANS. FANS SHALL BE ALUMINUM CONSTRUCTION BLADES RIVETED TO CORROSION RESISTANT STEEL SPIDER BRACKETS. PROVIDE PVC COATED STEEL WIRE SAFETY GUARDS. FAN MOTORS TO BE TEAO WITH PERMANENTLY LUBRICATED BEARINGS.

REFRIGERATION SYSTEM: PROVIDE A FULL REFRIGERATION SYSTEM UTILIZING R-410A REFRIGERANT. PROVIDE SOLID CORE FILTER-DRIERS FOR FIELD INSTALLATION, LIQUID AND SUCTION LINE SERVICE VALVES WITH GAUGE PORTS, AND LIQUID LINE MAGNETIC CHECK VALVES.

COMPRESSOR: UNIT SHALL BE EQUIPPED WITH HERMETIC SCROLL TYPE COMPRESSORS THAT ARE INTERNALLY PROTECTED WITH HIGH PRESSURE RELIEF AND OVER TEMPERATURE PROTECTION. PROVIDE COMPRESSORS THAT ARE SUCTION GAS COOLED. MOUNT COMPRESSORS ON NEOPRENE ISOLATORS DESIGNED TO MINIMIZE SOUND TRANSMISSION AND VIBRATION. PROVIDE BELLY-BAND CRANKCASE HEATERS.

CONTROLS: PROVIDE A 24-VOLT CONTROL CIRCUIT POWERED BY A 24 VOLT TRANSFORMER AND PROTECTED BY A RESETTABLE BREAKER. PROVIDE FIELD INSTALLED THERMOSTAT. PROVIDE LOW VOLTAGE TERMINAL STRIP FOR SIMPLE HOOK-UP. PROVIDE COMPRESSOR MOTOR PROTECTION TO SHUT DOWN UNIT FOR MOTOR OVER-CURRENT, OVER-TEMPERATURE, OR LOW VOLTAGE CONDITIONS. PROVIDE SAFETY LOCKOUTS, A LOSS OF CHARGE/LOW PRESSURE SWITCH, A HIGH PRESSURE SWITCH, AND A CONTROL BOARD WITH DIAGNOSTICS AND FAULT MESSAGE DISPLAY.

WARRANTY: PROVIDE A 2 YEAR LIMITED PARTS WARRANTY ON THE COMPLETE UNIT AND 5-YEAR PARTS WARRANTY ON THE COMPRESSOR

SCHEDULE: REFER TO MECHANICAL SCHEDULE NOTES FOR ADDITIONAL UNIT OPTION REQUIREMENTS. IF ANY NOTES CONFLICT WITH THE SPECIFICATION ABOVE. THE SCHEDULE NOTES SHALL SUPERSEDE THE SPECIFICATION.

SECTION 23 23 00 – REFRIGERANT PIPING

SIZE PER A/C UNIT MANUFACTURER'S RECOMMENDATION, INCLUDING REQUIREMENT FOR LONG LINE APPLICATIONS. PROVIDE SOLENOID VALVES, TRAPS AND/OR ACCUMULATOR WHEN RECOMMENDED BY CONDENSING UNIT VENDOR, SUCH AS FOR UNDERGROUND LINES. USE FACTORY SEALED LINE SETS, UNLESS SIZE OR DISTANCE EXCEEDS FACTORY SET AVAILABILITY. ROUTE HIDDEN FROM VIEW. INSULATE SUCTION LINE IN INDOOR APPLICATIONS AND BOTH REFRIGERANT LIQUID AND SUCTION FOR OUTDOOR APPLICATIONS. WALL PENETRATIONS TO BE PROVIDED AND INSTALLED WITH COMPRESSION GASKET AND SEAL CONSISTING OF A WALL FASTENING COMPRESSION MOUNTING METHOD AND TO MUST BE SUPPLIED AND FASTENED WITH ICC-ES LISTED NON-CORROSIVE SCREWS WITH PRE-LOADED NEOPRENE WASHERS. WALL OUTLET MUST PROVIDE AN INTEGRATED OVER-MOLDED FLEXIBLE ELASTOMERIC SLEEVE FOR SEALING, ISOLATING, AND SUPPORTING REFRIGERANT PIPES FOR VIBRATION. THE WALL OUTLET MUST ALSO PROVIDE EXPANSION AND CONTRACTION WALL PROTECTION FEATURES WITH GASKETS AND SEALS AS PER ENERGY CODE REQUIREMENTS. A STAINLESS STEEL CLAMP MUST BE SUPPLIED TO ALLOW A MECHANICAL CONNECTION AS INTENDED PER THE ENERGY CODES ALLOWING OFF/ ON REMOVABLE/ REUSABLE MAINTENANCE CAPABILITIES, AND SIZED TO CO-ACT AND FIT WITH THE PIPE INSULATION PROTECTIVE COVER. WALL OUTLET INSTALLED MUST ENSURE THAT THE INSULATION PROTECTOR AND THE WALL SEAL ARE BOTH SECURELY AND MECHANICALLY FASTENED TOGETHER WITHOUT

THE USE OF ADHESIVES OR ADHESIVES TAPES AS PER ENERGY CODE REQUIREMENTS. WALL OUTLET SHALL BE TESTED AND MEET THE FOLLOWING TESTING: ASTM E 331, ASTM E 283, AND ASTM E 2178. SEAL WALL PENETRATIONS WATER TIGHT. PROVIDE A FLEXIBLE PVC PLASTIC UV/WEATHER PROTECTIVE COVER FOR EXTERIOR PIPING INSULATION

SIMILAR TO AIREX PRO-SYSTEM KIT. THE PIPE INSULATION UV/PROTECTIVE COVER SHALL FEATURE AN OUTDOOR INDUSTRIAL GRADE COMBINED METHOD WITH MOLECULAR BONDING THAT FEATURES AN INTEGRAL PRE-FASTENING SYSTEM THAT ALLOWS REMOVABLE/ REUSABLE USE FOR MAINTENANCE AND FULL-ENCLOSURE INCLUDING CUT TO LENGTH CAPABILITIES WITHOUT THE USE OF ADHESIVES AS AN ATTACHMENT. ALL PIPE INSULATION MATERIAL MUST BE COMPLETELY COVERED AND PROTECTED. THE USE OF ANY ADHESIVES IS NOT PERMITTED FOR THIS APPLICATION. INSULATION PROTECTIVE COVER SHALL BE TESTED AND MEET ASTM E 96. ASTM G 153, ASTM D 412, ASTM 570, ASTM E 84, AND ASTM G 21, AND SHALL MEET CLASS II VAPOR RETARDER PER ASTM E 96 - 1 PERM OR LESS. WRAPPING TAPE OR ADHESIVE TAPE IS NOT PERMITTED AS PER ENERGY CODES.

SECTION 23 07 19 – HVAC PIPING INSULATION

PIPE INSULATIONS, MASTICS AND JACKETS LOCATED IN ENVIRONMENTAL AIR PLENUMS SHALL HAVE MAXIMUM FLAME SPREAD INDEX OF 25 AND MAXIMUM SMOKE DEVELOPED INDEX OF NOT EXCEEDING 50 IN ACCORDANCE WITH ASTM F84.

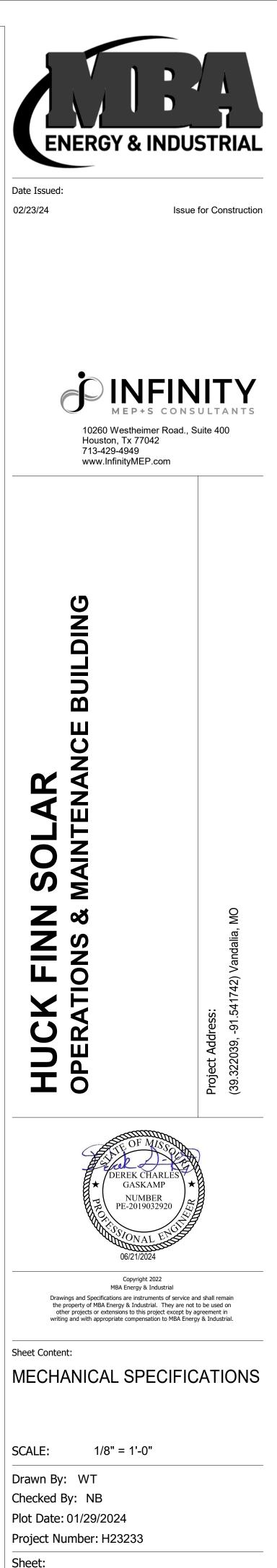
FLEXIBLE ELASTOMERIC INSULATION:

Α.

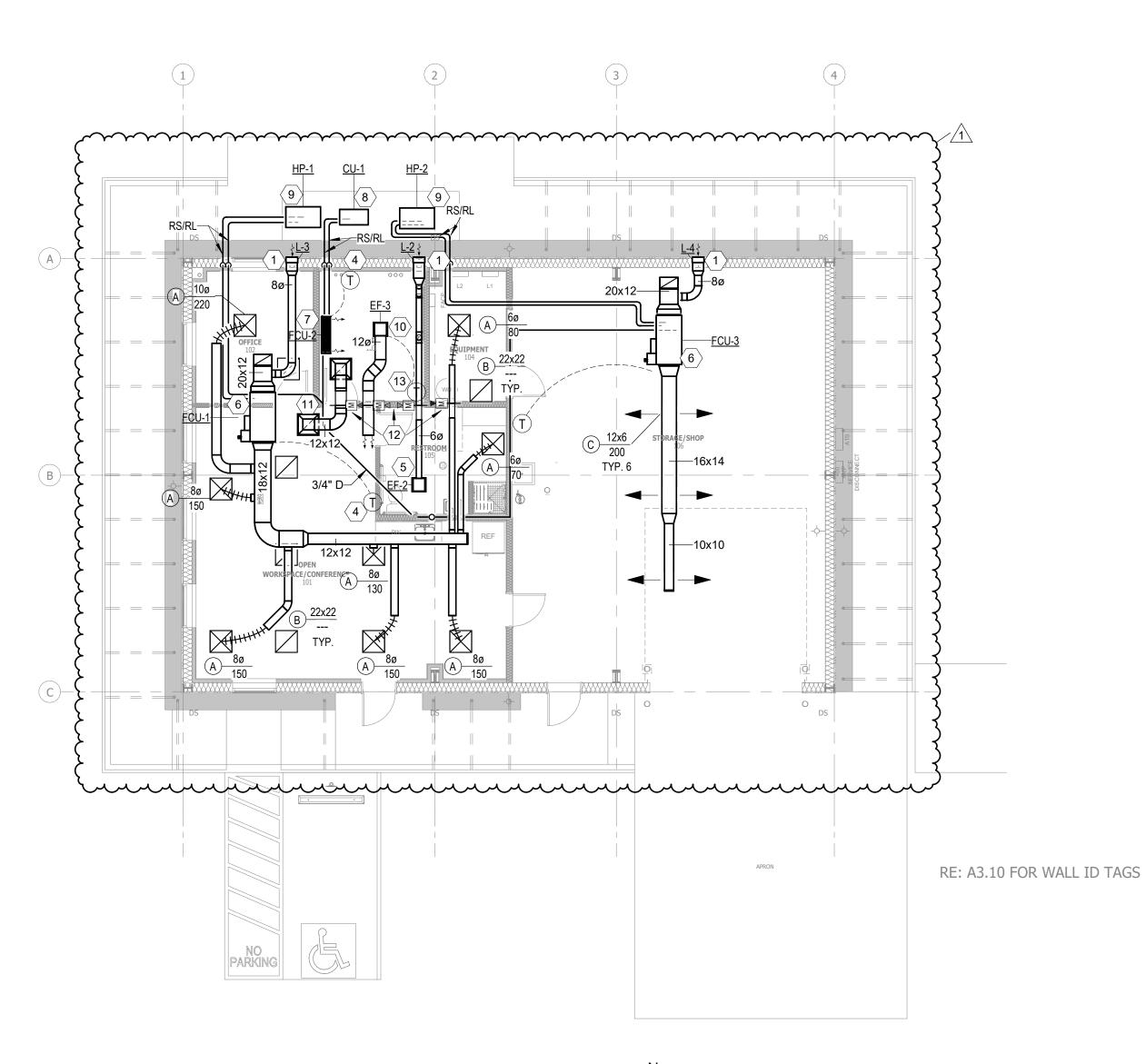
A. CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I FOR TUBULAR MATERIALS. MANUFACTURERS: AIREX MANUFACTURING, ARMACELL LLC, K-FLEX USA, OR APPROVED EQUAL.

PRIMARY CONDENSATE DRAINS: INSIDE BUILDINGS- 3/4" ELASTOMERIC INSULATION FOR ENTIRE LENGTH. NO INSULATION REQUIRED OUTDOORS. INSULATION OF SECONDARY (OVERFLOW) CONDENSATE DRAINS NOT REQUIRED.

REFRIGERANT SUCTION PIPING: 1" ELASTOMERIC INSULATION. PAINT OUTDOOR PORTIONS WITH MANUFACTURER'S RECOMMENDED WATER RETARDANT ULTRAVIOLET SOLAR RADIATION PROTECTIVE COATING.



M0.05



GENERAL NOTES

SHALL VERIFY THERMOSTATS SERVE THEIR RESPECTIVE ZONES.
 SHALL REPORT ANY DISCREPANCIES, OMISSIONS, OR INCONSISTENCIES ON THE DRAWINGS TO THE ENGINEER FOR
 VERIFICATION BEFORE STARTING CONSTRUCTION.

KEYNOTE	
1	WALL MOUNTE HEIGHT AND L OUTDOOR AIR
4	NEW PROGRA
5	NEW CEILING EXTERIOR OF BETWEEN OUT
6	NEW FAN COIL CONDENSATE MANUFACTUR BALANCING DA RETURN AIR C
7	NEW WALL MC CONDENSATE GRADE. MANU
8	NEW CONDEN
9	NEW HEAT PU REFRIGERANT
10	PROVIDE NEW BY ASSOCIATE
11	PROVIDE NEW
12	PROVIDE 1-HO REQUIREMENT
13	SET EMERGEN



KEYNOTES DESCRIPTION

ED EXTERIOR LOUVER SHALL BE LOCATED IN APPROXIMATE LOCATION SHOWN. COORDINATE EXACT MOUNTING LOCATION WITH ARCHITECT. RE: SCHEDULE AND DETAILS. EXHAUST LOUVER SHALL BE 10'-0" AWAY FROM ANY R INTAKES.

AMMABLE THERMOSTAT TO BE LOCATED IN APPROXIMATE LOCATION SHOWN. THERMOSTAT TO CONTROL

G MOUNTED EXHAUST FAN SHALL BE LOCATED IN APPROXIMATE LOCATION SHOWN. ROUTE EXHAUST DUCT TO F BUILDING. PROVIDE WALL LOUVER AT PENETRATION. SEE SCHEDULES. MAINTAIN MINIMUM 10'-0" SEPARATION JTSIDE AIR INTAKE AND EXHAUST OUTLET.

IL UNIT LOCATED ABOVE CEILING. MAINTAIN ALL MANUFACTURER'S RECOMMENDED CLEARANCES. ROUTE 3/4" E TO FUNNEL DRAIN AS SHOWN. ROUTE REFRIGERANT LINES TO ASSOCIATED HEAT PUMP LOCATED ON GRADE. RER TO SIZE REFRIGERANT PIPING BASED ON FINAL EQUIPMENT PLACEMENT. PROVIDE REQUIRED MANUAL DAMPERS TO BALANCE RETURN/OUTDOOR AIR. SIZE DAMPERS AS INDICTAED. PROVIDE 1/4" BIRD SCREEN ON OPENING. SEE SCHEDULE.

OUNTED MINI SPLIT SYSTEM. MAINTAIN ALL MANUFACTURER'S RECOMMENDED CLEARANCES. ROUTE 3/4" E TO FUNNEL DRAIN AS SHOWN. ROUTE REFRIGERANT LINES TO ASSOCIATED CONDENSING UNIT LOCATED ON UFACTURER TO SIZE REFRIGERANT PIPING BASED ON FINAL EQUIPMENT PLACEMENT. SEE SCHEDULE. NSING UNIT TO BE IN APPROXIMATE LOCATION SHOWN. UNIT TO BE PLACED ON SIDEWALK CONCRETE. ROUTE T PIPING TO ASSOCIATED FAN COIL UNIT PER MANUFACTURER REQUIREMENTS. RE: SCHEDULES AND DETAILS. JMP TO BE IN APPROXIMATE LOCATION SHOWN. UNIT TO BE PLACED ON SIDEWALK CONCRETE. ROUTE T PIPING TO ASSOCIATED FAN COIL UNIT PER MANUFACTURER REQUIREMENTS. RE: SCHEDULES AND DETAILS. V CEILING MOUNTED EXHAUST FAN IN IT ROOM. FAN TO DISCHARGE INTO THE PLENUM. FAN TO BE CONTROLLED T HERMOSTAT. FAN SHALL ENERGIZE WHEN ROOM TEMP EXCEEDS 70 DEGREES. SEE SCHEDULES AND DETAILS. V RETURN AIR JUMPER DUCT, AS SHOWN. SIZE AS INDICATED.

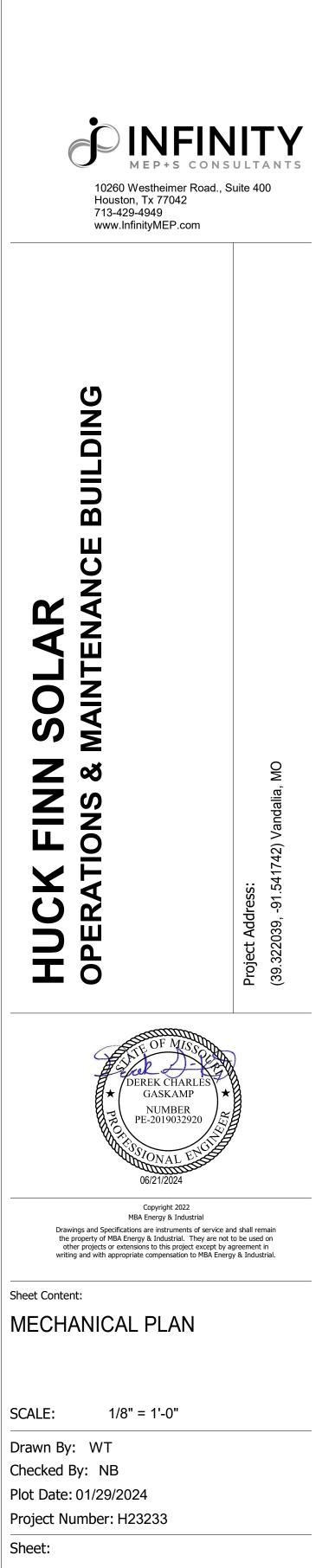
W RETURN AIR JUMPER DUCT, AS SHOWN. SIZE AS INDICATED. HOUR FIRE/SMOKE DAMPER AT THE WALL PENETRATION. COORDINATE PER MANUFACTURER'S ELECTRICAL ENTS. SIZE AS INDICATED.

ENCY VENTILATION FAN THERMOSTATIC TO +2 DEGF HIGHER (ADJ.) THAN THE PRIMARY FCU-2 THERMOSTAT.



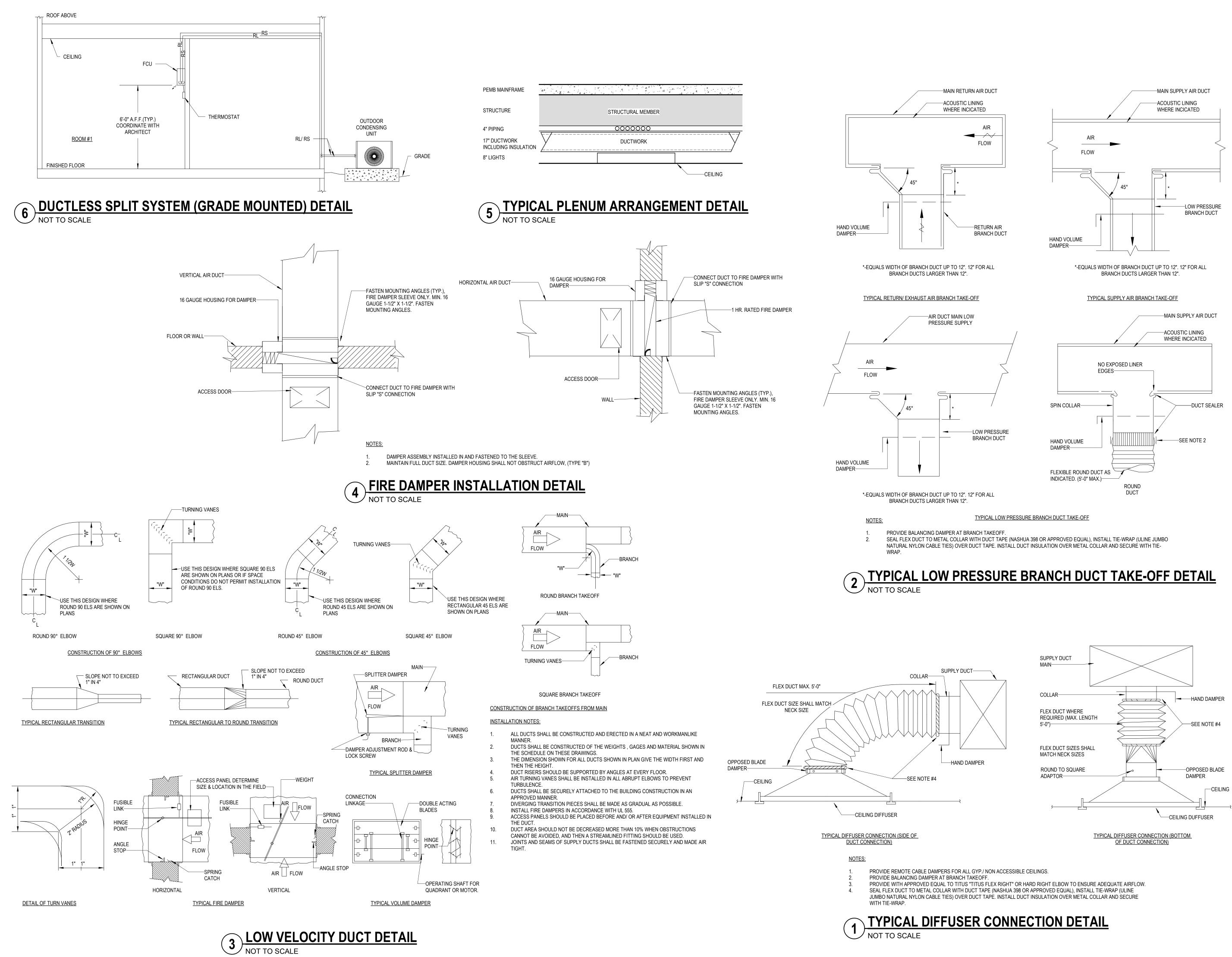
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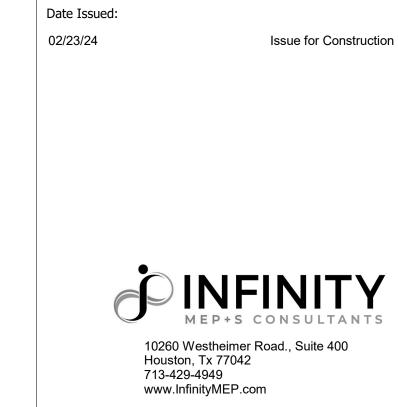
Issue for Construction IFC Set Addendum 02



M2.01

BUILDING ORIENTATION UPDATED.



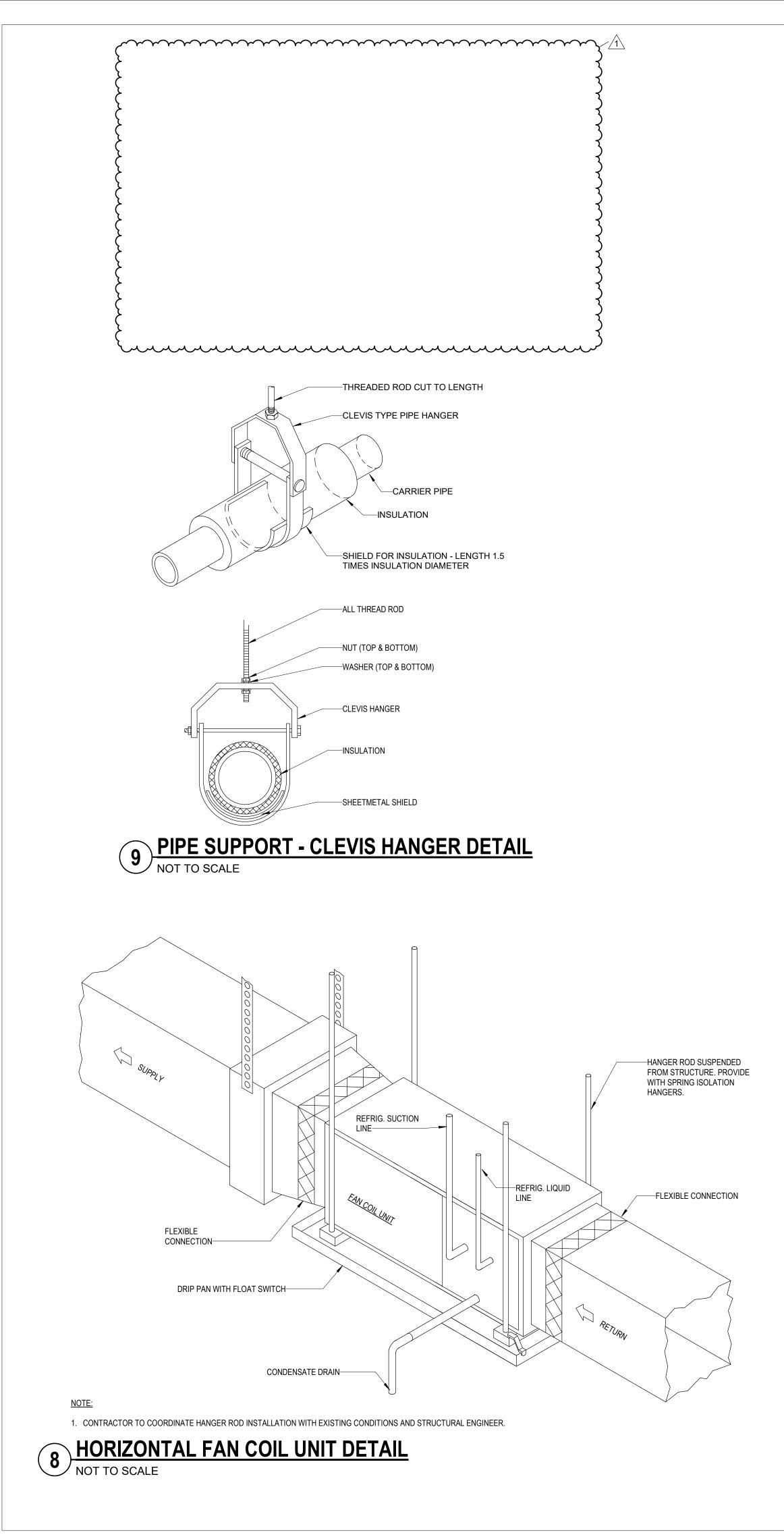


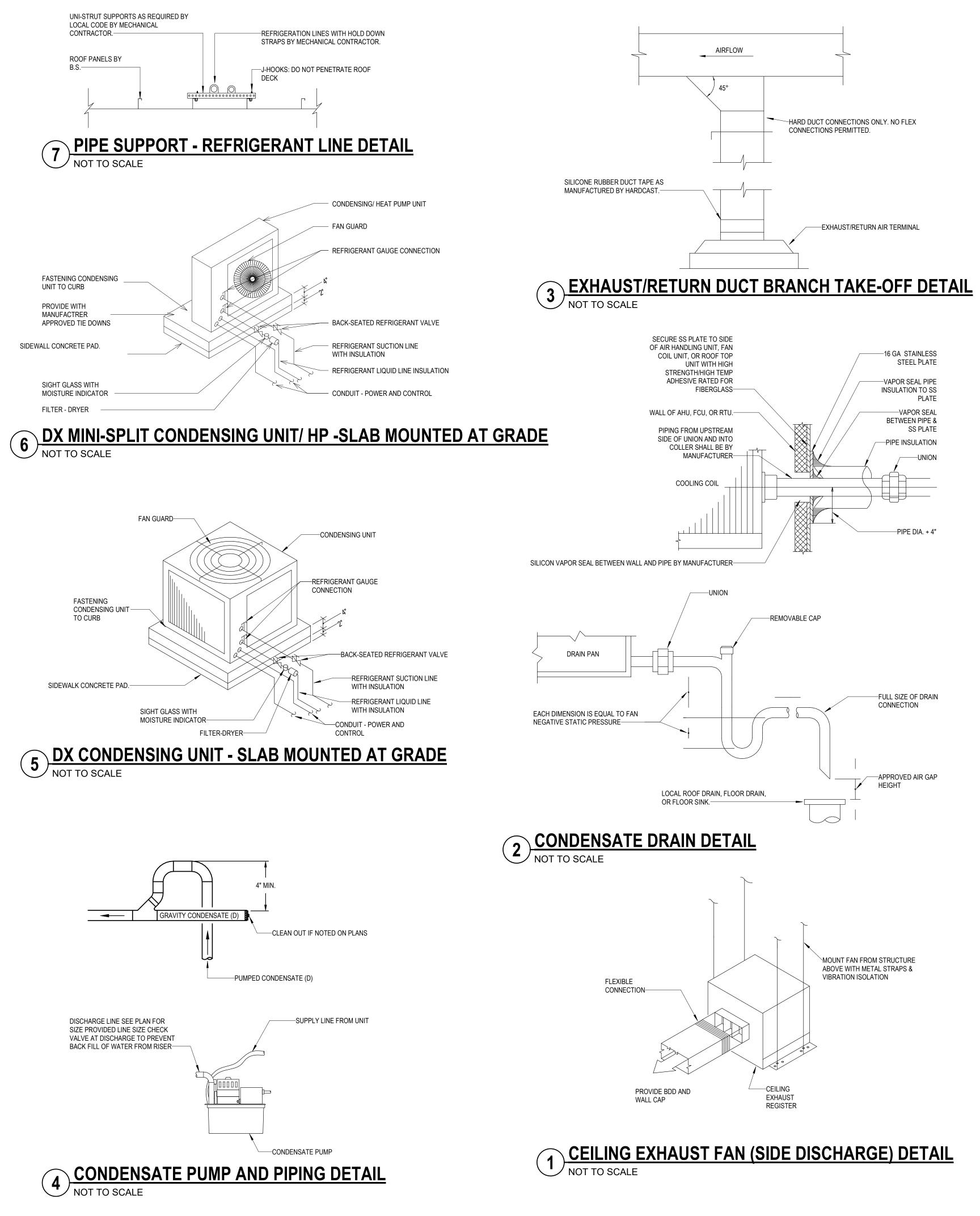
ENERGY & INDUSTRIAL

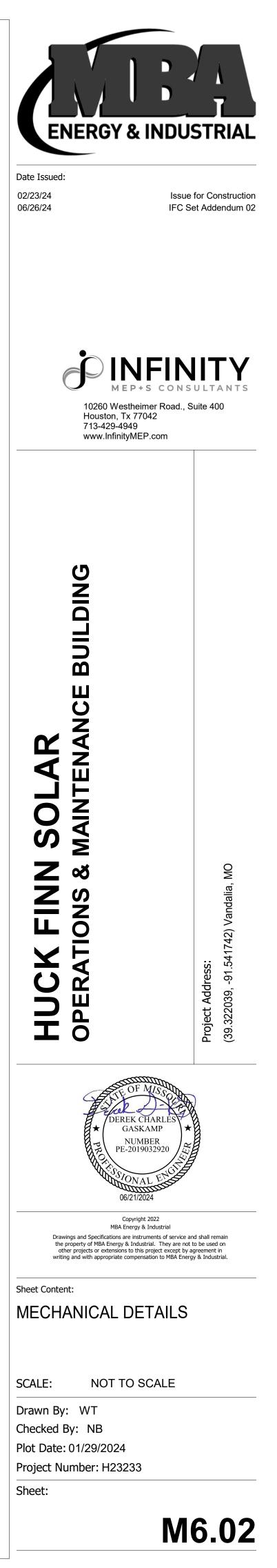
DING BUIL INTENANCE R \square MA S Š Ζ Ζ S Ζ LL Ο F U 2 Ш H DEREK CHARLE GASKAMP NUMBER PE-2019032920 Copyright 2022 MBA Energy & Industrial Drawings and Specifications are instruments of service and shall remain the property of MBA Energy & Industrial. They are not to be used on other projects or extensions to this project except by agreement in writing and with appropriate compensation to MBA Energy & Industrial. Sheet Content: MECHANICAL DETAILS SCALE: As indicated

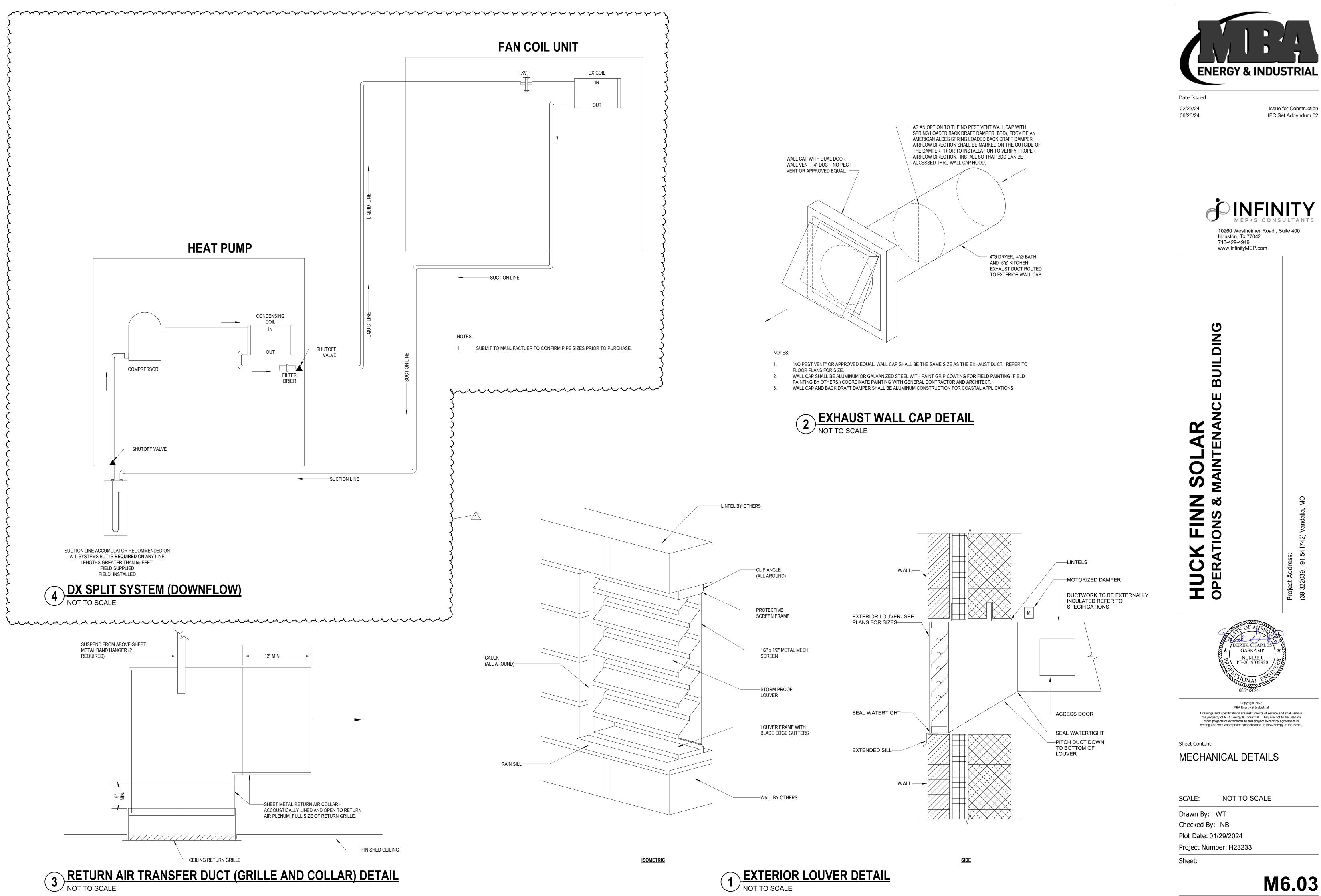
Drawn By: WT Checked By: NB Plot Date: 01/29/2024 Project Number: H23233 Sheet:

M6.01









M6.03