OPS BLACKBURN HIGH SCHOOL HVAC IMPROVEMENTS 2606 HAMILTON STREET OMAHA, NEBRASKA 68131 CONSTRUCTION SET: 05-20-2025

PROJECT LOCATION



DISCOVERY ALLOWANCE:

CONTRACTOR TO INCLUDE A REQUIRED \$20,000 DISCOVERY ALLOWANCE IS INCLUDED IN THE BID. THE DISCOVERY ALLOWANCE IS TO BE USED AT THE OWNER'S DIRECTIVE. PROPOSED CHANGE COSTS SHALL BE SUBMITTED FOR THE REVIEW BEFORE APPROVAL. ANY REMAINING UNUSED FUNDS SHALL BE CREDITED TO THE OWNER ON THE FINAL PAY APP. THE ALLOWANCE SHALL BE TRACKED ON ALL PAY APPS AND INCLUDE ANY DEDUCTIONS AND REMAINING BALANCE.



DIRECTIVE OF THE OWNER DURING THE PROJECT. CONTROL VALVE REPLACEMENT - REPLACE EXISTING CONTROL VALVE WITH NEW MODULATING 1-1/2", 2", 3", CONTROL DAMPER ACTUATOR REPLACEMENT - REPLACE EXISTING DAMPER CONTROL DAMPER WIRING AND PROGRAMMING.

CONTRACTOR SHALL PROVIDE A PRICE FOR THE FOLLOWING UNIT COSTS. COSTS SHALL INCLUDE ALL MATERIALS AND LABOR FOR THE FOLLOWING ITEMS TO BE COMPLETED AT THE

CONTROL VALVE AND ACTUATOR WITH ASSOCIATED WIRING AND PROGRAMMING. 1/2", 3/4", 1",

WITH NEW MODULATING CONTROL ACTUATOR WITH ASSOCIATED WIRING AND PROGRAMMING. DUCT TEMPERATURE SENSOR - INSTALL NEW DUCT TEMPERATURE SENSOR WITH ASSOCIATED

WATER TEMPERATURE SENSOR - INSTALL NEW WATER TEMPERATURE SENSOR WITH THERMAL WELL WITH ASSOCIATED WIRING AND PROGRAMMING.

SHEET SCHEDULES

T0.0 COVER SHEET

	, TANICAL
M0.0	HVAC ZONING PLAN, NOTES AND SYMBOLS
MD1.1	FIRST FLOOR MECHANICAL DEMO PLAN - AREA A
MD1.2	FIRST FLOOR MECHANICAL DEMO PLAN - AREA B
MD1.3	FIRST FLOOR MECHANICAL DEMO PLAN - AREA C
MD2.1	SECOND FLOOR MECHANICAL DEMO PLAN - AREA D
MD2.2	SECOND FLOOR MECHANICAL DEMO PLAN - AREA E
M1.1	FIRST FLOOR MECHANICAL PLAN - AREA A
M1.2	FIRST FLOOR MECHANICAL PLAN - AREA B
M1.3	FIRST FLOOR MECHANICAL PLAN - AREA C
M2.1	SECOND FLOOR MECHANICAL PLAN - AREA D
M2.2	SECOND FLOOR MECHANICAL PLAN - AREA E
M3.1	MECHANICAL DETAILS AND SCHEDULES

PROJECT SCHEDULE









OMAHA PUBLIC SCHOOLS BID NUMBER: 25-017

NOTE:

NORMAL OPERATING TIMES AT THIS FACILITY ARE FROM 7:00 AM TO 5:00 PM MONDAY THROUGH FRIDAY. GENERAL CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL WORK WITH OWNER AT WEEKLY MEETINGS DURING THE ENTIRE ONSTRUCTION PERIOD. ALL WORK SHALL BE COORDINATED WITH THE FACILITY DIRECTOR AT LEAST 1 WEEK PRIOR TO OMMENCING ACTIVITY IN ANY PARTICULAR AREA.

- GENERAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING INFORMATION ON ALL CONTRACTORS AND SUB-CONTRACTOR (INFORMATION TO INCLUDE BUT NOT LIMITED TO: NAME, ADDRESS, AND DATE OF BIRTH) TO THE NEBRASKA STATE PATROL FOR BACKGROUND CHECK. GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY APPLICABLE FEE FOR BACKGROUND CHECK. GENERAL CONTRACTOR IS TO PROVIDE OWNER WITH STATE PATROL'S REPORT LISTING CONTRACTORS WHO HAVE PASSED THE BACKGROUND CHECK.
- THIS IS A TOBACCO FREE FACILITY. CONSTRUCTION PROJECT EMPLOYEES MAY USE TOBACCO PRODUCTS ONLY IN THE DESIGNATED AREAS. CONTRACTOR IS RESPONSIBLE FOR PROPER NOTIFICATION OF WORK THAT MAY AFFECT THE BUILDING OCCUPANTS;
- WORK INCLUDES, BUT NOT LIMITED TO, TEMPORARY BLOCKAGE OF EGRESS AND EXITS, DEACTIVATION OF FIRE ALARM AND/OR FIRE SUPPRESSION SYSTEM, OR ANY UTILITY INTERRUPTION. CONTRACTOR IS RESPONSIBLE FOR INFORMING OWNER VIA HOT WORK (WELDING, BRAZING, SOLDERING) PERMIT OF ALL HOT WORK BEING PERFORMED.
- CONTRACTOR IS RESPONSIBLE FOR FILLING OUT AND FILING ALL REQUIRED PERMITS AND PAPERWORK SYSTEM SHUT DOWNS SHALL BE COORDINATED WITH THE OWNER A MINIMUM 1 WEEK PRIOR TO ACTUAL SHUT
- DOWN. SHUTDOWNS WILL BE WEATHER DEPENDANT. SHUT DOWN AT THE END OF EACH PHASE SHALL BE AS SHORT AS POSSIBLE TO A MAXIMUM OF 2 DAYS. ALL EFFORTS SHALL BE MADE TO REDUCE THE LENGTH OF THE SHUTDOWN CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY CONDITIONS FOR EXACT SIZES AND LOCATIONS, ALL EXISTING CONDITIONS ARE SHOWN BASED ON VISIBLE EXISTING CONDITIONS AND ORIGINAL DESIGN DRAWINGS.

WORK FOR THESE UNITS TO BE DONE DURING NON-SCHOOL HOURS AND DURING NON SCHOOL

COORDINATING PROFESSIONAL





I, KYLE J. WILKINSON AM THE COORDINATING PROFESSIONAL ON THE OPS BLACKBURN HIGH SCHOOL HVAC IMPROVEMENTS PROJECT









ENERAL LI	<u>ST - NOT ALL MAY APPLY</u> EXISTING	(#)	KEY NOTE
(R) (D)	RELOCATED DEMOLISHED		CROSS SECTION INDI
ACH ADJ	AIR CHANGES PER HOUR ADJACENT, ADJUSTABLE ABOVE EINISHED ELOOR	X	D = DETAIL DRAWING P = PARTIAL DRAWING
AFF AHJ ALT	ABOVE FINISHED FLOOR AUTHORITY HAVING JURISDICTION ALTERNATE	X	R = RISER DIAGRAM S = CROSS SECTION I
ANSI PPROX	AMERICAN NATIONAL STANDARDS INSTITUTE APPROXIMATELY		NEW TO EXISTING CO
ARCH SHRAE	ARCHITECT, ARCHITECTURE AMERICAN SOCIETY OF HEATING AND DEEDICEDATION ENCINEERS	X"(E)	EXISTING PIPE ABOVE
ASME ASTM	AMERICAN SOCIETY OF MECHANICAL ENGINEERS AMERICAN SOCIETY OF TESTING AND MATERIALS	÷∻∻∻×X"(D)÷∻∻∻∻ — ک	DEMOLITION HATCH
AVG BAS	AVERAGE BUILDING AUTOMATION SYSTEM		
BFF BFP	BELOW FINISHED FLOOR BACKFLOW PREVENTER		WATER SERVICE PIPI
BJS BLDG	BELOW JOIST SPACE BUILDING	SAN	STORM SEWER PIPIN
BTUH CAR	BRITISH THERMAL UNITS BRITISH THERMAL UNITS PER HOUR CARACITY	F	FIRE SERVICE PIPING
CFM CLG	CUBIC FEET PER MINUTE		DOMESTIC HOT WATE DOMESTIC HOT WATE
CUFT DB	CUBIC FEET DRY BULB	——RO —FW	REVERSE OSMOSIS W FILTERED WATER
DCW DECO	DOMESTIC COLD WATER DOUBLE EXTERIOR CLEANOUT	SW	SOFTENED WATER
DEG, ° DEMO	DEGREE(S) DEMOLITION	SHW	SOFTENED HOT WATE
DFU DIA, Ø	DRAINAGE FIXTURE UNITS DIAMETER DOMESTIC HOT WATER		BELOW GRADE SANIT
DN DWG	DOWN DRAWING	——V ——GT	VENT PIPING GREASE TRAP PIPING
EAT ECO	ENTERING AIR TEMPERATURE EXTERIOR CLEANOUT	——HD—— ——R——	HUMIDITY DRAIN PIPI RAIN WATER PIPING
EER EFF	ENERGY EFFICIENCY RATIO EFFICIENCY	OR	
EQUIP ESP	EQUIPMENT EXTERNAL STATIC PRESSURE	GV	GAS VENT PIPING
EWT EXIST	ENTERING WATER TEMPERATURE EXISTING	——HPS—— ——HPR——	HEAT PUMP SUPPLY F
F FDC EDM		CWS	CHILLED WATER SUP
FPM FSC FT	FOOD SERVICE CONTRACTOR	——HWS—— ——HWR——	HOT WATER HEATING
FUT GAL	FUTURE GALLON(S)		CONDENSER WATER
GC	GALVANIZED GENERAL CONTRACTOR	FOS	FUEL OIL SUPPLY PIP
GPH GPM	GALLONS PER HOUR GALLONS PER MINUTE	FOV	FUEL OIL VENT PIPING
IORIZ HP	HORIZONTAL HORSEPOWER	LPS MPS	LOW PRESSURE STEA
HIG IVAC IBC	HEATING HEATING, VENTILATION, & AIR CONDITIONING INTERNATIONAL BUILDING CODE	——CR—— ——IJS——	STEAM CONDENSATE PIPE IN JOIST SPACE
IE IECC	INVERT ELEVATION INTERNATIONAL ENERGY CONSERVATION CODE	——BJS—— ——TJS——	PIPE BELOW JOIST SF PIPE THROUGH JOIST
IFC IJS	INTERNATIONAL FIRE CODE IN JOIST SPACE		WASTE PIPING CONNI
IN IMC	INCH(ES) INTERNATIONAL MECHANICAL CODE)	WASTE PIPING ELBOV
IPC NSUL	INTERNATIONAL PLUMBING CODE INSULATION	×+- +-×+- ++	WASTE PIPING ELBOV PIPING ELBOWS 45° A
LAT	LEAVING AIR TEMPERATURE	о , , , , , , , , , , , , , , , , , , , 	PIPING ELBOWS UP A PIPING TEES UP, DOW
LP LWT	LOW PRESSURE LEAVING WATER TEMPERATURE	& ſ□	SOLENOID VALVE BALL VALVE
MAX MBH	MAXIMUM THOUSAND BTU'S PER HOUR	ō	
MECH MC	MECHANICAL MECHANICAL CONTRACTOR		CALIBRATED BALANC
MCA MFR	MINIMUM CIRCUIT AMPACITY MANUFACTURER MINIMUM	 	UNION
MISC	MINIMOM MISCELLANEOUS MAXIMUM OVER CURRENT PROTECTION		CHECK VALVE STRAINER
MTL NC	METAL NORMALLY CLOSED	O∢₁ +	VALVE IN VERTICAL P WALL HYDRANT
NFPA NO	NATIONAL FIRE PROTECTION ASSOCIATION NORMALLY OPEN		BELOW AND ABOVE G
NTS DPNG	NOT TO SCALE OPENING	ۍ جر	SINK P-TRAP
PC PD	PLUMBING CONTRACTOR PRESSURE DROP	س س	ROOF DRAIN (REGULA
PIV PI BG	POST INDICATOR VALVE		DOWN SPOUT OBSERVATION POINT
PRV PSI	PRESSURE REDUCING VALVE POUNDS PER SQUARE INCH	®	PRESSURE SENSOR I
PSIG QTY	POUNDS PER SQUARE INCH, GAUGE QUANTITY		TEMPERATURE SENS
RCP ECIRC	REFLECTED CEILING PLAN RECIRCULATION		EQUIPMENT DESIGNA
REQD			
RPM RP7	RELATIVE HOMIDITY REVOLUTIONS PER MINUTE REDUCED PRESSURE ZONE		
CHED	SCHEDULE SENSIBLE		
SEER //ACNA	SEASONAL ENERGY EFFICIENCY RATIO SHEET METAL AND AIR CONDITIONING		
SPEC	CONTRACTORS NATIONAL ASSOCIATION SPECIFICATION		
STD SURF	SUGARE FEET STANDARD SURFACE		
SUSP TD	SUSPENDED TEMPERATURE DIFFERENTIAL		
TEMP TJS	TEMPERATURE THROUGH JOIST SPACE		
TSP TYP	TOTAL STATIC PRESSURE TYPICAL		
	UNDER FLOOR UNDERWRITERS LABORATORIES		
UPC W	UNIFORM PLUMBING CODE WATTS		
WB WC	WET BULB WATER COLUMN		
WG VGHT	WATER GAUGE WEIGHT		
WPD VSFU	WATER PRESSURE DROP WATER SUPPLY FIXTURE UNITS		
VTR	VENT THRU ROOF		

ABBREVIATIONS & SYMBOLS

×	PIPING BREAK MARK
	PIPING ABOVE GROUP
	PIPING BELOW GROU
W	WATER SERVICE PIPI
SAN	SANITARY SEWER PIF
-ST	STORM SEWER PIPIN
—F——	FIRE SERVICE PIPING
	DOMESTIC COLD WAT
	DOMESTIC HOT WATE
	DOMESTIC HOT WATE
—R0——	REVERSE OSMOSIS W
—FW——	FILTERED WATER
—SW——	SOFTENED WATER
-SCW	SOFTENED COLD WA
-SHW	SOFTENED HOT WATE
	BELOW GRADE SANII
	ABOVE GRADE SANIT
V	
—GI——	
— пD——	
-CWS	
-CWR	CHILLED WATER RETI
-HWS	HOT WATER HEATING
-HWR	HOT WATER HEATING
	CONDENSER WATER
-CDR	CONDENSER WATER
-FOS	FUEL OIL SUPPLY PIP
-FOR	FUEL OIL RETURN PIP
-FOV	FUEL OIL VENT PIPINO
-LPS	LOW PRESSURE STEA
-MPS	MEDIUM PRESSURE S
—CR——	STEAM CONDENSATE
—IJS——	PIPE IN JOIST SPACE
-BJS	PIPE BELOW JOIST SF
-TJS	PIPE THROUGH JOIST
J	
	WASTE PIPING CONNI
	WASTE PIPING ELBOV
`	WASTE PIPING ELBOV
┽╲┎┽╴┽┧	PIPING ELBOWS 45° A
с ,	PIPING ELBOWS UP A
	PIPING TEES UP, DOW
×	SOLENOID VALVE
¢	BALL VALVE
- <u>c</u>	GATE VALVE
	BUTTERFLY VALVE
	CALIBRATED BALANC
	PRESSURE REGULATI
·>'	
∕ı	BELOW AND ABOVE G
	FLOOR DRAIN AND CO
~~~	SINK P-TRAP
<b>_</b> ~~	BELOW AND ABOVE G
ര്	ROOF DRAIN (REGULA
- <u>-</u>	
•	

					— GENERAL PROJECT NOTES	
(#)	KEY NOTE	XX(E)	EXISTING DUCT		GENERAL NOTES A. THE ENTIRE INSTALLATION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE LOCAL CITY STATE AND NATIONAL CODES	THAT IS NOT ACCESSIBLE FROM BELOW BY ITSELF. COORDINATE FINISH COLOR WITH ARCHITECT PRIOR TO ORDERING.
	CROSS SECTION INDICATOR	ZZZZ XX(D)       ZZZZ XX(D)	DEMOLITION HATCH DUCT BREAK MARK		LAWS, ACTS AND ORDINANCES AND ALL AUTHORITIES HAVING JURISDICTION, THE OWNERS INSURANCE COMPANY BEOLUBEMENTS, UTILITY COMPANY BEOLUBEMENTS	H. IT IS THE RESPONSIBILITY OF THE MANUFACTURER / SUPPLIER TO MAKE SURE ALL UNITS FIT IN THE REQUIRED SPACE
XX X	D = DETAIL DRAWING P = PARTIAL DRAWING R = RISER DIAGRAM		FIRE DAMPER IN DUCT		APPLICABLE INDUSTRY STANDARDS OF GOOD PRACTICE AND SAFETY, THE MANUFACTURER'S STRICTEST REQUIREMENTS	INTENDED WITH RECOMMENDED MAINTENANCE AND ACCESS CLEARANCES. ALL COILS INSTALLED SHALL HAVE PROPER CLEARANCE FOR REMOVAL WITHOUT INTERFERENCE ANY
<b></b>	S = CROSS SECTION DRAWING NEW TO EXISTING CONNECTION	FSD	FIRE/SMOKE DAMPER IN DUCT		AND RECOMMENDATIONS FOR EQUIPMENT AND PRODUCT APPLICATION AND INSTALLATION.	CHANGES NEEDED WILL BE THE RESPONSIBILITY OF THE MANUFACTURER AT NO ADDITIONAL COST TO THE PROJECT.
- X"(E)	EXISTING PIPE ABOVE GRADE EXISTING PIPE BELOW GRADE				B. DRAWINGS ARE LARGELY SCHEMATIC IN NATURE. THOUGH A LOT OF DETAILS MAY BE SHOWN THEY ARE NOT INTENDED TO SHOW EVERY DETAIL. IT IS THE CONTRACTOR'S	I. THE MINIMUM MANUFACTURER RECOMMENDED CLEARANCE OR 36" CLEARANCE, WHICHEVER IS GREATER MUST BE MAINTAINED FOR ALL FOURMENT (VALVING NEEDING ACCESS
↔X"(D) <del>∻∻∻∻</del>			BACK DRAFT DAMPER IN DUCT		RESPONSIBILITY TO COORDINATE WITH ALL OTHER TRADES AND EXISTING/SITE CONDITIONS TO PROVIDE A FULLY FUNCTIONAL SYSTEM PER THE INTENT OF DESIGN. ALL	ALL ACCESS PANELS SHALL HAVE ADEQUATE CLEARANCE. CONSULT THE ENGINEER IF THIS IS NOT POSSIBLE.
	PIPING BREAK MARK PIPING ABOVE GROUND/FLOOR		TURNING VANES IN ELBOW		REQUIRED PIPING, SUPPORTS AND DUCTS SHALL BE PROVIDED FOR A FULLY FUNCTIONAL SYSTEM PER THE DESIGN INTENT. IF ROUTING IS NOT SHOWN ON THE PLANS, COORDINATE WITH	J. ALL EQUIPMENT SHALL BE SUPPORTED BY: A HOUSE KEEPING PAD, METAL STAND, OR SUPPORTED FROM THE STRUCTURE.
	WATER SERVICE PIPING	$\sim$	SUPPLY AIR DUCT CROSS SECTION		THE ENGINEER PRIOR TO BIDDING.	<ul><li>K. ALL EQUIPMENT SHALL BE PROPERLY ALIGNED, LUBRICATED</li></ul>
-SAN			RETURN AND FRESH AIR DUCT CROSS SECTION		DRAWINGS, THE MORE STRINGENT/EXPENSIVE SHOULD BE BID UNLESS A ADDENDUM CAN BE ISSUED IN TIME TO CORRECT THE SITUATION	AND OILED BEFORE START UP AND FINAL ACCEPTANCE BY OWNER.
	DOMESTIC COLD WATER PIPING	$\square$	EXHAUST AIR DUCT CROSS SECTION		GENERAL COORDINATION	L. ALL DUCT AND EQUIPMENT SHALL BE PROTECTED DURING CONSTRUCTING AND CLEANED AS NEEDED BEFORE ANY FAN IS TURNED ON. FILTERS OF THE SPECIFIED EFFICIENCY MUST BE
RO	DOMESTIC HOT WATER CIRCULATING PIPING REVERSE OSMOSIS WATER PIPING	SPIRAL Ø DWS	SINGLE WALL SPIRAL DUCT DOUBLE WALL INSULATED SPIRAL DUCT		A. ALL WORK SHALL BE COORDINATED BETWEEN TRADES BEFORE ANY CONSTRUCTION/ FABRICATING BEGINS IN A "KICK-OFF" MEETING. CONTACT ENGINEER/ ARCHITECT FOR QUESTIONS.	IN PLACE WHEN FANS ARE RUNNING AND CHANGED AS NECESSARY THROUGHOUT CONSTRUCTION. NEW FILTERS SHALL BE INSTALLED JUST PRIOR TO OWNERS ACCEPTANCE.
—FW——	FILTERED WATER		SUPPLY DIFFUSER		B. PHASING OF PROJECT SHALL BE CLOSELY COORDINATED WITH THE GENERAL CONTRACTOR AND ARCHITECTURAL PLANS. ANY	EQUIPMENT MUST BE TESTED AND COMPLETED PRIOR TO SUBSTANTIAL COMPLETION AND TURNING OVER TO OWNER.
-scw	SOFTENED COLD WATER		SUPPLY REGISTER		ADDITIONAL DAMPER, VALVE, OR ACCESSORY SHALL BE PROVIDED AT NO ADDITIONAL COST. EACH PHASE SHALL BE 100% COMPLETE WHEN TURNED OVER TO THE OWNER.	M. ALL BARE, SCRATCHED OR MARRED AREAS ON EQUIPMENT SHALL BE PAINTED WITH FACTORY PAINT OR AN OWNER APPROVED EQUAL
	BELOW GRADE SANITARY WASTE PIPING				C. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE WITH THE ELECTRICAL	<ul> <li>N. ANY SPECIAL TOOL NEEDED FOR ASSEMBLY, MAINTENANCE OR ADJUSTMENT OF ANY FOURMENT SHALL BE SUPPLIED TO THE</li> </ul>
—_V —_GT	VENT PIPING GREASE TRAP PIPING		EXHAUST GRILLE		CONTRACTOR ON ALL ELECTRICAL REQUIREMENTS FOR THE EQUIPMENT PRIOR TO ORDERING. ALL REQUIREMENT CHANGES SHALL BE THE RESPONSIBILITY OF THE MECHANICAL	OWNER AT NO ADDITIONAL COST.
— HD——- — R——	HUMIDITY DRAIN PIPING RAIN WATER PIPING	┟╂╌╴			CONTRACTOR / SUPPLIER AT NO ADDITIONAL COST TO THE PROJECT.	SCHEDULE IN MICROSOFT WORD FORMAT FOR ALL EQUIPMENT TO OWNER/ ENGINEER AT THE COMPLETION OF THE PROJECT.
—OR—— —G——	OVERFLOW RAIN WATER PIPING GAS PIPING		FLEXIBLE DUCT CONNECTION		D. NO DUCT OR PIPING SHALL BE INSTALLED ABOVE ANY ELECTRICAL PANEL.	EXISTING PROJECT
—GV—— —HPS——	GAS VENT PIPING HEAT PUMP SUPPLY PIPING		SQUARE TO ROUND/ SPIRAL FITTING		E. EXACT LOCATION OF ALL PIPING, DUCTS, DIFFUSERS, GRILLES AND SUPPORTS SHALL BE COORDINATED WITH STRUCTURE, LIGHTS, CEILING GRID, HVAC, PLUMBING FIXTURES	A. CONTRACTOR SHALL VISIT JOB SITE PRIOR TO BIDDING TO SEE SPECIFIC JOB SITE CONDITIONS FOR THIS PROJECT.
—HPR—— —CWS——	HEAT PUMP RETURN PIPING CHILLED WATER SUPPLY PIPING	₹ ₹	HIGH EFFICIENCY DUCT TAKE OFF		COORDINATE LOCATION WITH FIRE SPRINKLER PIPING IF APPLICABLE. SEE ELECTRICAL LIGHTING PLANS AND APCHITECTURAL REFLECTED CEILING PLANS FOR	B. FIELD VERIFY EXACT LOCATION OF EXISTING DUCT AND PIPING BEFORE BEGINNING CONSTRUCTION.
–CWR—— –HWS——	CHILLED WATER RETURN PIPING HOT WATER HEATING SUPPLY PIPING	₽ ₽	ROUND TO ROUND FITTING			C. IF HAZARDOUS MATERIALS ARE ENCOUNTERED, STOP WORK IMMEDIATELY AND INFORM THE OWNER'S REPRESENTATIVE IN WRITING. THE OWNER'S REPRESENTATIVE WILL THEN BE
—HWR—— —CDS———	HOT WATER HEATING RETURN PIPING CONDENSER WATER SUPPLY PIPING	SA RA	SUPPLY AIR DUCT		ROOF/WALLS SHALL BE COORDINATED WITH STRUCTURE. VERIFY LOCATION WITH GC/ ARCHITECT PRIOR TO CUTTING	RESPONSIBLE TO TAKE THE APPROPRIATE ACTIONS.
-CDR FOS	CONDENSER WATER RETURN PIPING FUEL OIL SUPPLY PIPING	TA	TRANSFER AIR DUCT		G. WHEN ALL WORK IS COMPLETED NO MATERIALS SHALL BE LEFT	DETECTORS SHALL BE COVERED AND TEMPORARY FANS SHALL BE USED TO EXHAUST AREA OF SMOKE/DUST. COORDINATE WITH OWNER.
—FOR—— —FOV———	FUEL OIL RETURN PIPING FUEL OIL VENT PIPING	FA	FRESH (OUTDOOR) AIR DUCT OUTDOOR AIR DUCT		ALL MATERIALS TO BE DISPOSED OF PROPERLY.	E. THE CONTRACTOR SHALL PROVIDE AND INSTALL NEW SUPPORTS AND HANGERS FOR ALL EXISTING PIPING. CABLING
—LPS—— —MPS——	LOW PRESSURE STEAM SUPPLY PIPING MEDIUM PRESSURE STEAM SUPPLY PIPING	RFA	RELIEF AIR DUCT		AND MAINTAIN ALL FIRE RATINGS.	AND WIRING (HIGH AND LOW VOLTAGE) THAT ARE TO REMAIN. THIS INCLUDES RESUPPORTING ANYTHING THAT IS SUPPORTED BY ANY ITEM SCHEDULED TO BE REMOVED, ANY
—CR—— —IJS——	STEAM CONDENSATE RETURN PIPING PIPE IN JOIST SPACE	MUA	MAKE UP AIR DUCT EXHAUST AIR DUCT		A. ENTIRE PROJECT INCLUDING ALL MATERIALS AND LABOR SHALL BE WARRANTED FOR A MINIMUM OF 1 YEAR FROM	DAMAGE TO THE EXISTING SYSTEMS TO REMAIN MUST BE REPAIRED AND TESTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER
—BJS <del>—</del> — —TJS——	PIPE BELOW JOIST SPACE PIPE THROUGH JOIST SPACE	CA			SUBSTANTIAL COMPLETION. PRIOR APPROVALS AND FILE SHARING	F. MAINTAIN ALL EXISTING ROOF WARRANTIES AS APPLICABLE.
<u> </u>	WASTE PIPING CONNECTION	(IJS)	DUCT IN JOIST SPACE		A. ALL SHEETS REQUESTED IN CAD (.DWG) FORMAT SHALL BE PROVIDED AT A CHARGE OF \$25/SHEET (MINIMUM \$250). FOR EIRE ALARM AND FIRE SPRINKLER CONTRACTORS ALL OTHERS	CONTROLS A. THE CONTROLS CONTRACTOR SHALL BE FULLY RESPONSIBLE
>	WASTE PIPING ELBOW 90Ø WASTE PIPING ELBOWS UP AND DOWN	(BJS)	DUCT BELOW JOIST SPACE		REQUESTING CAD FILES SHALL BE CHARGED \$50/SHEET (MINIMUM \$250). PRIOR TO TRANSMISSION OF FILES, THE	FOR COORDINATION WITH THE MECHANICAL, HVAC, AND ELECTRICAL CONTRACTORS TO PROVIDE AND INSTALL SYSTEMS AS SPECIFIED. THE CONTROLS CONTRACTOR IS
-+×++++ c+++	PIPING ELBOWS 45° AND 90° PIPING ELBOWS UP AND DOWN		REFRIGERANT PIPING PAIR		DISCLAIMER" TO AES.	RESPONSIBLE FOR ALL CONDUIT AND WIRE NOT SHOWN ON MECHANICAL AND ELECTRICAL DOCUMENTS BUT THAT ARE REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. ALL CONTROL
	PIPING TEES UP, DOWN AND STRAIGHT SOLENOID VALVE	(XXXX	SENSOR S = SENSOR		B. PRIOR APPROVAL REQUEST NOT REQUIRED. SUBSTITUTION PRODUCTS MUST MEET GUIDELINES OUTLINED BELOW.	VALVE, DAMPERS, SENSOR, WELLS, ETC SHOWN AND NOT SHOWN SHALL INSTALLED. MECHANICAL CONTRACTOR TO COORDINATE CLOSELY WITH CONTROLS CONTRACTOR.
-\$	BALL VALVE GATE VALVE		C = CO2 SENSOR P = PRESSURE H = HUMIDITY SENSOR T = THERMOSTAT		C. PROPOSED SUBSTITUTIONS OF MECHANICAL, ELECTRICAL AND PLUMBING PRODUCTS MAY BE SUBMITTED FOR REVIEW DURING THE SHOP DRAWING/ PRODUCT DATA SUBMITTAL	MECHANICAL AND CONTROLS CONTRACTOR SHALL READ CONTROLS SEQUENCES AND SPECIFICATIONS.
			XXXX = UNIT/SYSTEM SENSOR IS SERVING		STAGE. D. PROPOSED SUBSTITUTIONS SHALL BE EQUAL TO OR SUPERIOR	B. ALL POINTS FOR THE CONTROL SYSTEM SHALL BE MADE AVAILABLE BY THE EQUIPMENT MANUFACTURER AND SHALL BE PICKED UP BY THE CONTROLS CONTRACTOR.
		$(\mathbf{w})$	SENSOR BAS = BUILDING AUTOMATION SYSTEM MO = MONITORING PURPOSE ONLY		E. PROPOSED SUBSTITUTIONS SHALL HAVE THE SAME	HYDRONIC
	STRAINER VALVE IN VERTICAL PIPING		CN = CARBON MONOXIDE/NITROGEN DIOXIDE CO = CARBON MONOXIDE NO = NITROGEN DIOXIDE		WARRANTY AS THE SPECIFIED PRODUCT.         F.       PROPOSED SUBSTITUTIONS WILL HAVE NO ADVERSE EFFECT	A. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION AND CLEANED BEFORE USE. PIPING SHALL BE COVERED AND HAVE THE ENDS TAPED SHUT WHILE BEING STORED
	WALL HYDRANT BELOW AND ABOVE GRADE CLEAN OUT				ON THE OTHER TRADES. G. PROPOSED SUBSTITUTION WILL NOT AFFECT DIMENSIONS AND	<ul> <li>B. CONTRACTOR IS RESPONSIBLE FOR ALL TRANSITIONS, EL BOWS, DEESETS IN PIPING TO MAKE SYSTEMS EIT WITHIN</li> </ul>
, ⊚ ×⊏	FLOOR DRAIN AND COVER SINK P-TRAP				FUNCTIONAL CLEARANCES. H. PRODUCT DATA AND SHOP DRAWING FOR PROPOSED	SPACE AND STRUCTURE PROVIDED.
൙ഁ൙ ഁ	BELOW AND ABOVE GRADE P-TRAP ROOF DRAIN (REGULAR AND OVERFLOW)				SUBSTITUTIONS MUST BE PROJECT SPECIFIC AND INCLUDING ALL COMPONENTS IDENTIFIED FOR COMPARISON TO THE ORIGINAL PRODUCT.	INSIDE DIAMETER WITH THE PROPER TOOLS, SPRINGING OR RUBBING OF PIPES IS NOT ALLOWED.
-+ ()	DOWN SPOUT OBSERVATION POINT FOR TESTING				I. THE BURDEN OF PROOF OF THE EQUIVALENCE ON THE PROPOSED SUBSTITUTION IS ON THE PROPOSER.	D. NO BUSHINGS ARE ALLOWED, ONLY ECCENTRIC FITTINGS ARE ALLOWED.
P	PRESSURE SENSOR IN PIPING				DUCT A. ALL ROUND DUCT SHOWN MUST BE HARD DUCT, FLEX DUCT	E. ALL PIPE PENETRATIONS THROUGH; WALLS, CEILINGS, FLOORS, AND STRUCTURE SHALL BE COMPLETELY SEALED. FIRE CAULK SHALL BE USED IN FIRE RATED WALLS PER UN REQUIREMENTS
$(\underline{\mathbf{J}})$	TEMPERATURE SENSOR IN PIPING				MAY ONLY BE 3'-0" MIN 5'-0" MAX NEAR THE DIFFUSER AS SHOWN IN THE SUPPLY DIFFUSER DETAIL. DUCT RUNNING IN THE WEBBING OF THE JOISTS MUST ALSO BE HARD DUCT.	AND ESCUTCHEONS (LARGE ENOUGH TO COVER OPENING IN WALL) SHALL BE USED IN ALL EXPOSED LOCATIONS (MECHANICAL BOOMS AND JANITORS CLOSET NOT INCLUDED)
					B. ALL DUCT DIMENSIONS ARE INSIDE CLEAR DIMENSIONS.	F. NO HYDRONIC PIPING SHALL BE INSTALLED IN AN UNCONDITIONED SPACE
					C. DUCT SIZE TO DIFFUSERS, REGISTERS, GRILLES, ETC. SHALL BE SIZE OF NECK UNLESS OTHERWISE STATED.	G. NO PIPING SHALL BE INSTALLED ABOVE ANY ELECTRICAL
					D. ALL DUCT ELBOWS SHALL BE RADIUS-RADIUS OR SQUARE WITH TURNING VANES.	H. ALL BRANCH LINES SHALL COME OFF THE TOP OF THE MAIN
					E. CONTRACTOR IS RESPONSIBLE FOR ALL TRANSITIONS, ELBOWS, OFFSETS IN DUCT TO MAKE SYSTEMS FIT WITHIN SPACE AND STRUCTURE PROVIDED.	DIRECTION IN BRANCH PIPING FROM MAINS TO TERMINAL DEVICES WITH ISOLATION VALVES WITHIN 3'-0" OF MAIN.
					F. HIGH EFFICIENCY DUCT TAKE-OFFS (HET) WITH INTEGRAL DAMPERS MUST BE INSTALLED AT EACH TAKE-OFF ON ALL	I. SHUT-OFF VALVES SHALL BE PROVIDED IN HOT AND/OR COLD WATER PIPING AT CONNECTION TO EQUIPMENT AT AN ACCESSIBLE LOCATION
					DUCTS (SA,RA,XA,OA). DUCTS WITH VAV BOXES DOWN STREAM SHALL NOT HAVE VOLUME DAMPERS INSTALLED IN HETS. HET SHALL BE A ONE PIECE OR FACTORY SEALED	J. ALL PRESSURE AND TEMPERATURE PORTS IN PIPING
					FITTING WITH PRE-INSTALLED GASKETED FLANGE TO CONNECT TO DUCT. WHERE A HIGH EFFICIENCY TAKE-OFF WILL NOT FIT DECAUSE OF STRUCTURE A SIMPLE DUCT COLLAR MAX BE	OF THE CONTRACTOR.
					USED ALONG WITH AN OPPOSED BLADE DAMPER AT THE DIFFUSER. EVERY LOCATION WITH AN OPPOSED BLADE DAMPER IN THE DIFFUSER WIST BE ADDROVED BY ENCINEER	<ul> <li>PROVIDE AN ISOLATION VALVE ON BOTH SIDES OF ALL HYDRONIC PIPING SPECIALTIES INCLUDING: BALANCE VALVES, CONTROL VALVES, AIR SEPARATORS, ETC.</li> </ul>
					BEFORE INSTALLATION. ALL DAMPERS SHALL HAVE A LONG STEM (THROUGH DUCT) AND A STAND-OFF SUPPORT FOR	
					G. ALL DAMPERS SHALL BE INSTALLED AT AN EASILY ACCESSIBLE	
					H. ALL BLADES ON RETURN GRILLES SHALL BE PARALLEL TO THE	
					BLADES POINT TO THE CEILING IF MOUNTED ABOVE 5'-0" AFF AND POINT TO THE FLOOR IF MOUNTED BELOW 5'-0" AFF.	
					I. ALL VISIBLE RETURN, EXHAUST AND RELIEF AIR DUCTS SHALL BE PAINTED BLACK ON THE INSIDE INCLUDING INSULATION AND DINS RELIND ALL COULTS AND DUFFLICTED	
					J. ALL FILTERS AND FILTER RACKS SHALL BE 2" AND ONE OF	
			_		BIG BOX RETAIL STORES.	
					A. ALL DUCT AND DUCT CONNECTION TO EQUIPMENT SHALL BE SEALED WITH EITHER FOIL TAPE OR DUCT SEAL COMPOUND ON	
					ALL JOINTS INCLUDING LONG TRANSVERSE JOINTS IN SQUARE DUCT.	
				ľ	B. ALL DUCT, CONDUIT, AND PIPING CONNECTING TO EQUIPMENT SHALL HAVE FLEXIBLE CONNECTIONS INSTALLED AT CONNECTION TO EQUIPMENT. FLEXIBLE DUCT WITH 1" SLACK	
					SHALL BE INSTALLED IN BOTH THE SUPPLY AND RETURN DUCTS.	
				(	C. ALL EQUIPMENT WITH ELECTRICAL HARD WIRED CONNECTIONS MUST BE UL LISTED ASSEMBLIES OR THE PROPER FIELD TESTING FOR FIELD RATINGS TO A UL LISTED ASSEMBLY MUST	
					BE INCLUDED WITH DOCUMENTATION PROVIDED TO THE AUTHORITY HAVING JURISDICTION, OWNER AND DESIGN TEAM UPON COMPLETION.	
				1	D. ALL MOTORS BEING CONTROLLED BY VFDS ON PUMPS, FANS, ETC. SHALL BE COMPATIBLE FOR USE WITH A VFD, SHALL BE INVERTER DUTY RATED AND PROVIDED WITH A SHAFT	

- GROUNDING KIT. A 10'-0" MINIMUM CLEARANCE MUST BE KEPT BETWEEN ALL MECHANICAL FRESH AIR INTAKES AND ALL PLUMBING VENTS, EXHAUST VENTS AND EXHAUST FANS. A 3'-0" MINIMUM CLEARANCE MUST BE KEPT BETWEEN ALL ENVIRONMENTAL AIR EXHAUST (RESTROOMS, ETC.) AND ALL OPERABLE OPENINGS INTO BUILDING.
- ALL REFRIGERANT PIPING MUST BE SIZED ACCORDING TO MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS.
- B. PROVIDE APPROVED MANUFACTURER'S ACCESS DOOR IN ALL HARD CEILINGS ADJACENT TO ANY EQUIPMENT/CONTROLS



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31 S 681 Z C NE 5 2606 OMA







- EXISTING VAV AND REHEAT COIL, ACCESSORIES, DUCTWORK AND THERMOSTAT TO BE REMOVED AS REQUIRED FOR VAV AND REHEAT COIL TO BE INSTALLED. REMOVE / REWORK HOT WATER PIPING AS REQUIRED. EXISTING CONTROL WIRING TO BE REUSED TO EXTENT POSSIBLE.
- EXISTING VAV, ACCESSORIES, DUCTWORK AND THERMOSTAT TO BE REMOVED AS REQUIRED FOR VAV TO BE INSTALLED. EXISTING CONTROL WIRING TO BE REUSED TO EXTENT POSSIBLE.
- REMOVE EXITING THERMOSTAT / SENSOR. NEW THERMOSTAT / SENSOR TO BE INSTALLED IN THE SAME LOCATION. REUSE WIRING TO EXTENT POSSIBLE, REWORK AS REQUIRED. FIELD VERIFY EXACT LOCATION.

## NOTE:

- CONTRACTOR SHALL WORK THROUGH ALL EXISTING CEILING. CEILING MAY BE REMOVED AND REINSTALLED AT THE
- CEILING MAY BE REMOVED AND REINSTALLED AT THE CONTRACTORS DISCRETION. CONTRACTOR SHALL PHOTOGRAPH CEILING BEFORE BEGINNING WORK TO DOCUMENT EXISTING CONDITIONS. ALL DAMAGED CEILING TO BE REPLACED.
- EXISTING DUCT, UNIT AND EQUIPMENT LAYOUT APPROXIMATE, CONTRACTOR SHALL VERIFY EXACT ROUTING AS REQUIRED ON SITE.



SYMBOL =



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- EXISTING VAV AND REHEAT COIL, ACCESSORIES, DUCTWORK AND THERMOSTAT TO BE REMOVED AS REQUIRED FOR VAV AND REHEAT COIL TO BE INSTALLED. REMOVE / REWORK HOT WATER PIPING AS REQUIRED. EXISTING CONTROL WIRING TO BE REUSED TO EXTEND POSSIBLE.
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SYMBOL =



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**MD1.2** 

![](_page_4_Figure_0.jpeg)

- EXISTING DUAL DUCT VAV, ACCESSORIES, DUCTWORK AND THERMOSTAT TO BE REMOVED AS REQUIRED FOR VAV TO BE INSTALLED. EXISTING CONTROL WIRING TO BE REUSED TO EXTENT POSSIBLE.
- REMOVE EXITING THERMOSTAT / SENSOR. NEW THERMOSTAT / SENSOR TO BE INSTALLED IN THE SAME LOCATION. REUSE WIRING TO EXTENT POSSIBLE, REWORK AS REQUIRED. FIELD VERIFY EXACT LOCATION.

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- EXISTING DUCT, UNIT AND EQUIPMENT LAYOUT APPROXIMATE,

![](_page_4_Figure_8.jpeg)

SYMBOL =

CONTRACTOR SHALL WORK THROUGH ALL EXISTING CEILING.

CONTRACTOR SHALL VERIFY EXACT ROUTING AS REQUIRED ON

![](_page_4_Picture_13.jpeg)

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![](_page_4_Figure_16.jpeg)

![](_page_4_Figure_17.jpeg)

![](_page_4_Picture_18.jpeg)

![](_page_5_Picture_0.jpeg)

# MECHANICAL ROOM PARTIAL PLAN SCALE: 1/4" = 1'-0"

![](_page_5_Figure_2.jpeg)

![](_page_5_Picture_3.jpeg)

### **KEY NOTES**

- EXISTING VAV AND REHEAT COIL, ACCESSORIES, DUCTWORK AND THERMOSTAT TO BE REMOVED AS REQUIRED FOR VAV AND REHEAT COIL TO BE INSTALLED. REMOVE / REWORK HOT WATER PIPING AS REQUIRED. EXISTING CONTROL WIRING TO BE REUSED TO EXTENT POSSIBLE.
- EXISTING DUAL DUCT VAV, ACCESSORIES, DUCTWORK AND THERMOSTAT TO BE REMOVED AS REQUIRED FOR VAV TO BE INSTALLED. EXISTING CONTROL WIRING TO BE REUSED TO EXTENT POSSIBLE.
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- EXISTING DUCT, UNIT AND EQUIPMENT LAYOUT APPROXIMATE, CONTRACTOR SHALL VERIFY EXACT ROUTING AS REQUIRED ON SITE.

![](_page_5_Figure_12.jpeg)

SYMBOL =

![](_page_5_Picture_17.jpeg)

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![](_page_5_Figure_20.jpeg)

![](_page_5_Figure_21.jpeg)

**MD2.1** 

![](_page_6_Figure_0.jpeg)

![](_page_6_Picture_1.jpeg)

![](_page_6_Figure_2.jpeg)

![](_page_6_Figure_4.jpeg)

![](_page_6_Figure_5.jpeg)

SYMBOL =

![](_page_6_Picture_10.jpeg)

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![](_page_6_Figure_13.jpeg)

![](_page_6_Figure_14.jpeg)

![](_page_7_Figure_1.jpeg)

- CONNECT NEW VAV AND REHEAT COIL TO EXISTING DUCT AND PIPING AS REQUIRED. PROVIDE NEW DUCT TRANSITIONS AS REQUIRED TO EXISTING DUCT. REWORK PIPING AS REQUIRED PER DETAIL AND TO EXTEND PIPING TO CONNECTION LOCATION.
- CONNECT NEW VAV TO EXISTING DUCT AS REQUIRED. PROVIDE NEW DUCT TRANSITIONS AS REQUIRED TO EXISTING DUCT. . INSTALL THERMOSTAT / SENSOR IN SAME LOCATION AS DEMO DEVICE. REUSE WIRE AND CONDUIT TO EXTENT POSSIBLE. PROVIDE COVER PLATE AS / IF REQUIRED. PROVIDE NEW WIRING
- AS REQUIRED.

## NOTE:

- CONTRACTOR SHALL WORK THROUGH ALL EXISTING CEILING. CEILING MAY BE REMOVED AND REINSTALLED AT THE CONTRACTOR'S DISCRETION CONTRACTOR SHALL PHOTOGRAPH CEILING BEFORE BEGINNING WORK TO DOCUMENT EXISTING CONDITION. ALL DAMAGED CEILING TO BE REPLACED.
- EXISTING DUCT, UNIT AND EQUIPMENT LAYOUT APPROXIMATE, CONTRACTOR SHALL VERIFY EXACT ROUTING AS REQUIRED ON SITE.

![](_page_7_Figure_9.jpeg)

SYMBOL =

![](_page_7_Picture_12.jpeg)

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![](_page_7_Figure_15.jpeg)

![](_page_7_Figure_16.jpeg)

**M1.1** 

![](_page_8_Figure_0.jpeg)

![](_page_8_Picture_1.jpeg)

![](_page_8_Figure_3.jpeg)

![](_page_8_Figure_4.jpeg)

SYMBOL =

![](_page_8_Picture_7.jpeg)

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![](_page_8_Figure_10.jpeg)

![](_page_8_Figure_11.jpeg)

**M1.2** 

![](_page_9_Figure_0.jpeg)

FIRST FLOOR MECHANICAL PLAN - AREA C SCALE: 1/8" = 1'-0"

### **KEY NOTES**

DUCT. 2. INSTALL THERMOSTAT / SENSOR IN SAME LOCATION AS DEMO DEVICE. REUSE WIRE AND CONDUIT TO EXTENT POSSIBLE. PROVIDE COVER PLATE AS / IF REQUIRED. PROVIDE NEW WIRING AS REQUIRED.

### NOTE:

- CONTRACTOR SHALL WORK THROUGH ALL EXISTING CEILING. CEILING MAY BE REMOVED AND REINSTALLED AT THE CONTRACTOR'S DISCRETION CONTRACTOR SHALL PHOTOGRAPH CEILING BEFORE BEGINNING WORK TO DOCUMENT EXISTING CONDITION. ALL DAMAGED CEILING TO BE REPLACED.
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![](_page_9_Figure_23.jpeg)

SYM<u>BOL =(#</u>) CONNECT NEW DUAL DUCT VAV TO EXISTING DUCT AS REQUIRED. PROVIDE NEW DUCT TRANSITIONS AS REQUIRED TO EXISTING

![](_page_9_Picture_27.jpeg)

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![](_page_9_Figure_30.jpeg)

![](_page_9_Figure_31.jpeg)

![](_page_9_Picture_32.jpeg)

**M1.3** 

![](_page_10_Picture_0.jpeg)

![](_page_10_Picture_1.jpeg)

![](_page_10_Figure_2.jpeg)

![](_page_10_Picture_3.jpeg)

- CONNECT NEW VAV AND REHEAT COIL TO EXISTING DUCT AND PIPING AS REQUIRED. PROVIDE NEW DUCT TRANSITIONS AS REQUIRED TO EXISTING DUCT. REWORK PIPING AS REQUIRED PER DETAIL AND TO EXTEND PIPING TO CONNECTION LOCATION.
- CONNECT NEW DUAL DUCT VAV TO EXISTING DUCT AS REQUIRED. PROVIDE NEW DUCT TRANSITIONS AS REQUIRED TO EXISTING DUCT.
- NOT INSTALL THERMOSTAT / SENSOR IN SAME LOCATION AS DEMO DEVICE. REUSE WIRE AND CONDUIT TO EXTENT POSSIBLE. PROVIDE COVER PLATE AS / IF REQUIRED. PROVIDE NEW WIRING AS REQUIRED.

### NOTE:

- CONTRACTOR'S DISCRETION CONTRACTOR SHALL PHOTOGRAPH CEILING BEFORE BEGINNING WORK TO DOCUMENT EXISTING CONDITION. ALL DAMAGED CEILING TO BE REPLACED.
- EXISTING DUCT, UNIT AND EQUIPMENT LAYOUT APPROXIMATE, CONTRACTOR SHALL VERIFY EXACT ROUTING AS REQUIRED ON SITE.

![](_page_10_Figure_12.jpeg)

SYMBOL =

CONTRACTOR SHALL WORK THROUGH ALL EXISTING CEILING. CEILING MAY BE REMOVED AND REINSTALLED AT THE

![](_page_10_Picture_16.jpeg)

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![](_page_10_Figure_19.jpeg)

![](_page_10_Figure_20.jpeg)

![](_page_11_Figure_0.jpeg)

![](_page_11_Picture_1.jpeg)

![](_page_11_Figure_2.jpeg)

- CONNECT NEW VAV AND REHEAT COIL TO EXISTING DUCT AND PIPING AS REQUIRED. PROVIDE NEW DUCT TRANSITIONS AS REQUIRED TO EXISTING DUCT. REWORK PIPING AS REQUIRED PER DETAIL AND TO EXTEND PIPING TO CONNECTION LOCATION.
- . CONNECT NEW DUAL DUCT VAV TO EXISTING DUCT AS REQUIRED. PROVIDE NEW DUCT TRANSITIONS AS REQUIRED TO EXISTING DUCT.
- CONNECT NEW FAN POWERED VAV AND HEATING COIL TO EXISTING DUCT AND PIPING AS REQUIRED. CONNECT NEW EQUIPMENT TO EXISTING / WIRE AND DISCONNECTION MEANS. CONTRACTOR TO FIELD VERIFY CONDITION OF EXISTING CONDUIT / WIRE AND PROVIDE NEW AS NECESSARY.
- INSTALL THERMOSTAT / SENSOR IN SAME LOCATION AS DEMO DEVICE. REUSE WIRE AND CONDUIT TO EXTENT POSSIBLE. PROVIDE COVER PLATE AS / IF REQUIRED. PROVIDE NEW WIRING AS REQUIRED.

### NOTE:

- EXISTING DUCT, UNIT AND EQUIPMENT LAYOUT APPROXIMATE, CONTRACTOR SHALL VERIFY EXACT ROUTING AS REQUIRED ON SITE.

![](_page_11_Figure_12.jpeg)

SYMBOL =

CONTRACTOR SHALL WORK THROUGH ALL EXISTING CEILING. CEILING MAY BE REMOVED AND REINSTALLED AT THE CEILING MAY BE REMOVED AND REINSTALLED AT THE CONTRACTOR'S DISCRETION CONTRACTOR SHALL PHOTOGRAPH CEILING BEFORE BEGINNING WORK TO DOCUMENT EXISTING CONDITION. ALL DAMAGED CEILING TO BE REPLACED.

![](_page_11_Picture_17.jpeg)

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![](_page_11_Figure_20.jpeg)

![](_page_11_Figure_21.jpeg)

![](_page_12_Figure_0.jpeg)

![](_page_12_Figure_1.jpeg)

![](_page_12_Figure_2.jpeg)

NOTES	
1,2,3,4	
1,2,3,4	
1,2,3,4	
1,2,3,4	

RE⊦	REHEAT COIL					
AT HEATING CFM	HEATING DAT	NOTES				
165	>100°	1,2,3,4				
253	>100°	1,2,3,4				
468	>100°	1,2,3,4				
715	>100°	1,2,3,4				

NOTES	
NOTED	
1,2,3,4	
1,2,3,4	
1,2,3,4	
1,2,3,4	
1,2,3,4	
1,2,3,4	
1,2,3,4	

EAT HEATING HEATING CFM DAT	NOTES
275 >100°F	1,2,3,4
715 >100°F	1,2,3,4
1001 >100°F	1,2,3,4

- ANGLE IRON SUPPORTS.	STRUCTURAL
	TC PROVIDE SHEET METAL SADDLE TO PROTECT INSULATION
CS CE	ILING HUNG CLEVIS

	DUCT		DUCT CONSTRUCTION				DUCT INSULATION				
DUCT	LOCATION	SPACE	MATERIAL	TYPE	CONNECTION	TYPE	MATERIAL TYPE	SKIN TYPE	THICKNESS	DENSITY	"
SUPPLY AIR	CONCEALED	PARTIALLY CONDITIONED	GALVANIZED STEEL	SINGLE WALL	SLIP & DRIVE	WRAP	FIBERGLASS	ALUMINUM FSK JACKET	2"	3/4	
SUPPLY AIR	CONCEALED	CONDITIONED	GALVANIZED STEEL	SINGLE WALL	SLIP & DRIVE	WRAP	FIBERGLASS	ALUMINUM FSK JACKET	1"	3/4	
SUPPLY AIR	EXPOSED	CONDITIONED	PAINT GRIP STEEL	SINGLE WALL	SLIP & DRIVE	LINER	FIBERGLASS	ACRYLIC POLYMER ANTI-MICROBIAL COATIN	G 1"	1-1/2	
SUPPLY AIR	CONCEALED	UNCONDITIONED	GALVANIZED STEEL	SINGLE WALL	SLIP & DRIVE	WRAP	FIBERGLASS	ALUMINUM FSK JACKET	3"	3/4	
SUPPLY AIR	EXPOSED	EXTERIOR (OUTSIDE)	GALVANIZED STEEL	SINGLE WALL	SLIP & DRIVE	WRAP	CLOSED CELL	UV RESISTANT LAMINATE PAINTED ON POLYMER	3"	3-6	
SUPPLY AIR	EXPOSED	EXTERIOR (OUTSIDE)	GALVANIZED STEEL	SINGLE WALL	SLIP & DRIVE	WRAP	POLY ISO BOARD	ALUMAGUARD JACKET	3"	3-6	
SPACE DE	FINITION							DUCT	LOCATIC	N DEF	1
AND THE S CRAWL SF	Y CONDITION SURROUNDIN PACE, GARAG	ED SPACE: A SPAC G GREATER THAN E, MECHANICAL / E	E THAT HAS A 15°. EXAMPLE LECTRICAL R	TEMPERATUR S INCLUDE: A OOM, NON PLE	RE DIFFERENTIA ITIC SPACE (WI ENUM RETURN (	L BETWE TH INSUL CEILING S	EEN THE AIR IN ATION ON ROO SPACE.	I DUCT A. <u>COM</u> DF), EXA JAN SPA	<u>ICEALED</u> : AN IMPLES INCLU ITORS ROOM ICES.	Y NON VIS JDE: MECI IS, ATTICS	31 -1 5 _
SURROUN	IDING LESS TI PACE.	HAN 15°. EXAMPLE	S INCLUDE: AE	BOVE CEILING	RETURN PLENU	JM SPAC	E, HEATED ANI	D B. <u>EXF</u> OR	OSED: ANY V OCCUPIABLE	ISIBLE DU SPACE. E	)(
C. <u>UNCONDI</u> FROM ROO CHASES.	TIONED SPAC	<u>E:</u> A SPACE WHOSI I) OR IS THE OUTD	E TEMPERATU OORS. EXAMF	IRE IS THE SAM PLES INCLUDIN	ME AS OUTDOO IG: ATTIC WITH	RS OR W INSULAT	ORSE (FURTHI ION AT CEILING	ER G, DUCT	LUDE: STORA	GE ROOM	
D. <u>EXTERIOR</u>	<u>R (OUTSIDE):</u> L	OCATED OUTSIDE	OF THE BUILD	ING ENVELOF	E. EXPOSED TO	THE WE	ATHER.				

DUCT MATER		<b>AFS</b>
DUCT	DUCT CONSTRUCTION DUCT INSULATION MINIMUM	
DUCT LOCATION	PACE     MATERIAL     TYPE     CONNECTION     TYPE     MATERIAL     SKIN TYPE     THICKNESS     DENSITY     INSTALLED     NOTES       RTIALLY     GALVANIZED     SINGLE WALL     SLIP &     WRAP     EIBERGLASS     ALLIMINUM ESK JACKET     2"     3/4     5     12.3	
SUPPLY AIR CONCEALED CON	DITIONED     STEEL     SINGLE WALL     SLIP & DRIVE     WRAP     FIBERGLASS     ALUMINUM FSK JACKET     1"     3/4     3     1,2,3	ADVANCED
SUPPLY AIR EXPOSED COM	DITIONED     PAINT GRIP STEEL     SINGLE WALL     SLIP & DRIVE     LINER     FIBERGLASS     ACRYLIC POLYMER ANTI-MICROBIAL COATING     1"     1-1/2     3     1,2,4,5	ENGINEERING
SUPPLY AIR CONCEALED UNCO	NDITIONED GALVANIZED SINGLE WALL SLIP & DRIVE WRAP FIBERGLASS ALUMINUM FSK JACKET 3" 3/4 8 1,2,3	SYSTEMS
SUPPLY AIR EXPOSED (C	TERIOR JTSIDE)       GALVANIZED STEEL       SINGLE WALL       SLIP & DRIVE       WRAP       CLOSED CELL       UV RESISTANT LAMINATE PAINTED ON POLYMER       3"       3-6       8       1,3         TERIOR       GALVANIZED       SLIP &       POLY ISO       POLY ISO       Image: SLIP &	620 N 129TH ST.
SUPPLY AIR EXPOSED (C	JTSIDE) STEEL SINGLE WALL DRIVE WRAP BOARD ALUMAGUARD JACKET 3" 3-6 8 1,3 DRIVE DRIVE BOARD BOARD BOARD ALUMAGUARD JACKET 3" 3-6 8 1,3	OMAHA, NE 68154 P: (402) 504-3885
A. PARTIALLY CONDITIONED SP AND THE SURROUNDING GRI	<u>.CE</u> : A SPACE THAT HAS A TEMPERATURE DIFFERENTIAL BETWEEN THE AIR IN DUCT ATER THAN 15°. EXAMPLES INCLUDE: ATTIC SPACE (WITH INSULATION ON ROOF), ATER THAN 15°. EXAMPLES INCLUDE: MECHANICAL ROOMS,	F: (402) 504-5885 F: (402) 504-4598
CRAWL SPACE, GARAGE, ME	HANICAL / ELECTRICAL ROOM, NON PLENUM RETURN CEILING SPACE. JANITORS ROOMS, ATTICS AND CRAWL SPACES.	<u>www.a-e-sys.com</u>
SURROUNDING LESS THAN 1 COOLED SPACE.	^a . EXAMPLES INCLUDE: ABOVE CEILING RETURN PLENUM SPACE, HEATED AND B. <u>EXPOSED</u> : ANY VISIBLE DUCT IN ANY PUBLIC OR OCCUPIABLE SPACE. EXAMPLES INCLUDE: STORAGE ROOMS, CLOSETS	© ADVANCED ENGINEERING SYSTEMS
C. UNCONDITIONED SPACE: A S FROM ROOM SET POINT) OR	ACE WHOSE TEMPERATURE IS THE SAME AS OUTDOORS OR WORSE (FURTHER 3 THE OUTDOORS. EXAMPLES INCLUDING: ATTIC WITH INSULATION AT CEILING, DUCT	AUTHORIZATION #: CA-1800
CHASES. D. EXTERIOR (OUTSIDE): LOCAT	D OUTSIDE OF THE BUILDING ENVELOPE. EXPOSED TO THE WEATHER.	PROJECT #: 25-063
WHERE DUCT INSULATI	<u>DN IS SPECIFIED:</u>	
A. ALL DUCTS SHALL BE COMPL INSULATION SEALED TO SUP	TELY INSULATED ON ALL SIDES ENCOMPASSING DUCT SUPPORTS/ HANGERS WITH ORTS AS THEY PENETRATE INSULATION.	
B. ALL SUPPLY AND FRESH AIR WRAPPED IN INSULATION DC	IFFUSERS AND REGISTERS INCLUDING DUCT BOOTS SHALL BE COMPLETELY VN TO THE CEILING TO PREVENT CONDENSATION.	
C. ALL INSULATION HOLES FRO	/ TESTING AND BALANCING SHALL BE RE-SEALED.	
D. ALL BALANCING DAMPERS SI SHAFT LENGTH TO ALLOW PI	ALL HAVE THE HANDLES OUTSIDE THE INSULATION, WITH A PROPER STANDOFF/ OPER DAMPER ADJUSTMENT.	
	SULATION SCHEDULE NOTES	
1. ALL DUCTWORK SHALL BE CO OF CURRENT EDITION OF INT FAN PRESSURE THE DUCTS /	NSTRUCTED, REINFORCED AND SUPPORTED ACCORDING TO CURRENT MECHANICAL CODE, SMACNA STANDARDS, AND PER REQUIREMENTS ERNATIONAL ENERGY CODES. THE MINIMUM ACCEPTABLE DUCT THICKNESS IS 26 GA. DUCTS SHALL BE CONSTRUCTED BASED ON THE TOTAL RE CONNECTED TO (A MINIMUM OF 2") AND BE TAKEN AS POSITIVE ON THE FAN DISCHARGE SIDE AND NEGATIVE ON THE FAN SUCTION SIDE. IT	
IS THE CONTRACTOR'S RESP TAPE OR DUCT SEAL COMPO	INSIBILITY TO VERIFY THE FAN PRESSURES BEFORE BIDDING AND CONSTRUCTION. SINGLE WALL DUCT SHALL BE SEALED WITH EITHER FOIL JND ON ALL JOINTS INCLUDING LONG TRANSVERSE JOINTS. FOR LOW PRESSURE (< 2" W.C.) NON SPIRAL DUCT, ADJUSTABLE 1xRADIUS ARE ACCEPTABLE. FOR DUCT MATE/TDC CONNECTIONS FORM TAPE AND BLASTIC CLEATS ARE NOT ACCEPTABLE. BUTYL TAPE, METAL	
CLEATS AND NUT & BOLTS M 2. INSULATION SHALL HAVE A F	ST BE USED. IC OF 25/50 AND BE CLASSIFIED AS MEETING THE REQUIREMENTS OF LIMITED COMBUSTIBILITY.	
<ol> <li>DUCT WRAP INSULATION: INS SHALL BE COMPLETELY TAPPE RECOMMENDATIONS</li> </ol>	JLATION SHALL COMPLY WITH ASTM C 553. TAPE AND SEAL INSULATION ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. EVERY JOINT ED WITH FACED TAPE (MEETING UL181 STANDARD) TO MATCH INSULATION AND COMPLETELY SEAL INSULATION PER MANUFACTURER'S	
<ol> <li>DUCT LINER INSULATION: INS MINOR SURFACE DAMAGE. W EDGES SUALL BE CONTED W</li> </ol>	JLATION SHALL COMPLY WITH ASTM C 1071. PROVIDE MANUFACTURER'S SEALANT FOR COATING OF ALL EXPOSED EDGES, CONNECTIONS, OR ELD PINS OF SUFFICIENT LENGTH AND GLUE OR STAPLES WITH SHEET METAL DISCS SHALL BE USED TO FASTEN LINER TO DUCT. ALL BUTT	
LINER. ALL ROUND RETURN I 5. IF DUCT IS GOING TO BE PAIN	THADHESIVE AND PRESSED TOGETHER. DUCT LINER SHALL HAVE PERMACOTE ANTIFUNGTAND BACTERIA GROWTH AGENT APPLIED TO THE JCT MUST BE WRAPPED WITH DUCT WRAP INSULATION OF AN EQUAL INSTALLED "R" VALUE SCHEDULED LINER. TED, THOROUGHLY CLEAN AND DRY OUTSIDE OF DUCT WITH A WARM SOAPY SOLUTION CONSISTING OF "SIMPLE GREEN" CLEANER AND	<u>   \S</u>
WATER PRIOR TO BEING PAI	TED. THIS SHALL BE WITNESSED BY THE GENERAL CONTRACTOR AND PAINTER.	
PIPE SUPPOR	<b>F SCHEDULE</b>	
1/2" - 1-1/4" MAX. ROD	1-1/2"         2"         2-1/2"         3"         4"         6"         8"         10"         12" - UP           MAX.         ROD         MAX	
STEEL 8' 3/8"	PACING SIZE SPACING S	
COPPER 6' 3/8"	6'       3/8"       8'       3/8"       10'       1/2"       10'       1/2"       10'       5/8"       10'       3/4"       10'       7/8"       10'       7/8"       10'       7/8"       10'       7/8"       10'       7/8"       10'       1,2,3	
PVC / CPVC 4' 3/8"	4'       3/8"       4'       3/8"       4'       1/2"       4'       1/2"       4'       5/8"       4'       3/4"       4'       1,2,3	
	E NOTES	
2. SPACING SUPPORT VERTICALL TO BE IF THE STRUCTURE CA	AXIMUM DISTANCE, SUPPORTS CAN BE INSTALLED IN SMALLER INTERVALS AND MAY NEED NOT HANDLE THE LOAD AT THE MAXIMUM SPACING, VERIFY WITH STRUCTURAL. A MINIMUM	
OF ONE SUPPORT FOR EVER HANGERS MUST BE PROVIDE ALL SUPPORTS SHOULD BE A	BRANCH OR PIPE SEGMENT IN EACH DIRECTION CHANGE SHALL BE PROVIDED. TWO (2) ON ALL LENGTH OF PIPE LONGER THAN 10'. NCHORED SECURELY TO THE STRUCTURE BUT NOT THE PIPING. THE SUPPORT SHOULD	
ALLOW FREE MOVEMENT CAU TO THE STRUCTURE WILL NO	SED BY THERMAL EXPANSION. PIPING STRAPS AND CLAMPS THAT HOLD THE PIPING TIGHT BE ALLOWED. TYPICAL ACCEPTABLE SUPPORTS INCLUDE BUT ARE NOT LIMITED TO CLEVIS	
HANGERS, ADJUSTABLE SWI	EL RING SUPPORT, ROLLER HANGER AND DOUBLE BOLT PIPE CLAMP.	
	PIPING MUST PIPING INSULATION "K VALUE"	
PIPE PIPE SIZE RELATING HOT	ION ADE     MATERIAL     FITTING TYPE     MINIMUM SLOPE     VALVES     COMPLY WITH     INSULATION     MATERIAL TYPE     THICKNESSDENSITY INCH     MIN.     AT VALUE     AT TEMP       SCHEDULE 40     SCHEDULE 40     BALL     MOLDED     JACKETED	
WATER 1/2" - 1-1/4" ABC	VE     Schedule 40 BLACK STEEL     THREADED     -     BALL, BUTTERFLY     ASTM A 53     MOLDED     SACKETED     1-1/2"     3     .22     75°     1,2       CONTINUOUSLY     DALL,     DALL,     DALL,     DALL,     DALL,     DALL,     FIBERGLASS     1-1/2"     3     .22     75°     1,2	
WATER 1-1/2" - UP ABC	VE     SCHEDULE 40 BLACK STEEL     WELDED / VICTAULIC     -     BALL, BUTTERFLY     ASTM A 53     MOLDED SECTION     JACKETED FIBERGLASS     2"     3     .22     75°     1,2	
PIPE MATERIAL AND INS	ULATION GENERAL NOTES VALVE SCHEDULE	一版のか
<ul> <li>A. DOMESTIC WATER INSULATION</li> <li>1. HOT WATER RECIRCULATION CONSERVATION CODE.</li> </ul>	A. CALIBRATED BALANCE VALVES: SHALL BE A BRONZE OR BRASS BALL VALVE PIPING SHALL BE INSULATED PER INTERNATIONAL ENERGY B. BALL VALVE: SHALL BE NSF RATED FOR POTABLE WATER, BRASS OR BRONZE	<b>し</b> 2 2 人
2. DOMESTIC COLD-WATER MAIL SEALING LAP FIBERGLASS PIL 3 NO INSULATION ON ANY OF T	S SHALL BE INSULATED WITH 1" THICK, HINGED WITH SELF       BODY WITH CHROME PLATED BRONZE BALL.         E INSULATION.       C.       BUTTERFLY VALVE: SHALL BE CAST IRON BODY WITH FLANGED ENDS,         JE PIPING SERVING APARTMENTS (UNITS) UNITESS REQUIRED       WAFFER STYLE VALVES ARE NOT ALLOWED	
BY CODE. B. INSTALL ALL PIPING ACCORD	AND SOLID BRONZE WEDGE.	
C. ALL PIPING SHALL BE TESTEI SYSTEMS SHALL BE PRESSU FOR NO LESS THAN 4 HOURS	CLEANED AND CERTIFIED FOR INTENDED USE. ALL PIPING       E.       GLOBE VALVE: SHALL BE A BRONZE OR CAST IRON BODY WITH A BRONZE         .E TESTED WITH 1-1/2 TIMES THE OPERATING PRESSURE       DISC         PIPING TO BE CLEANED AND FLUSHED WITH CRITICAL       F.       ALL VALVES SHALL BE LINE SIZE FULL PORT INSTALLED WITH FULL	A A
CONTROL VALVES BYPASSEI	DI-ELECTRIC FITTINGS SHALL BE SOFT SOLDERED TO THE VERTICALLY DOWN.	
E. ALL WELDED PIPE AND FUSIO WELDER/FUSION CONTRACT	NS SHALL BE USED. N WELDED SHALL BE WELDED BY A CERTIFIED IR. ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER	
(CERTIFICATED MUST BE SUE FLANGES SHALL BE INSTALL	VITTED) AND ALL WORK SHALL BE STAMPED. BOLTED D ON 2" AND LARGER PIPE TO SECTIONALIZE SYSTEM INTO	
WORKABLE SECTIONS INSUL		ll s
WORKABLE SECTIONS, INSUL F. PROVIDE PIPE LABELING ON LETTERING MATCHING DRAW	ATION SHALL GO AROUND FLANGES. LL NEW PIPING WITH PRE-PRINTED, COLOR-CODED WITH NG DESIGNATIONS AND SHOWING FLOW DIRECTION.	P S
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DUCT MATE		ALS
	SPACE     MATERIAL     TYPE     CONNECTION     TYPE     MATERIAL TYPE     SKIN TYPE     THICKNESS     DENSITY LB./FT ³ INSTALLED NOTES       PARTIALLY     GALVANIZED     SLIP &     WEAD     SUPER SUP	
SUPPLY AIR CONCEALED (	CONDITIONED       STEEL       SINGLE WALL       DRIVE       WRAP       FIBERGLASS       ALUMINUM FSK JACKET       2"       3/4       5       1,2,3         CONDITIONED       GALVANIZED STEEL       SINGLE WALL       SLIP & DRIVE       WRAP       FIBERGLASS       ALUMINUM FSK JACKET       1"       3/4       3       1,2,3	ADVANCED
SUPPLY AIR EXPOSED	CONDITIONED       PAINT GRIP STEEL       SINGLE WALL       SLIP & DRIVE       LINER       FIBERGLASS       ACRYLIC POLYMER ANTI-MICROBIAL COATING       1"       1-1/2       3       1,2,4,5         CONDITIONED       GALVANIZED       SLIP &       VIENT       SLIP &       VIENT	ENGINEERING SYSTEMS
SUPPLY AIR CONCEALED UN	ACONDITIONED       STEEL       SINGLE WALL       DRIVE       WRAP       FIBERGLASS       ALUMINUM FSK JACKE I       3"       3/4       8       1,2,3         EXTERIOR (OUTSIDE)       GALVANIZED STEEL       SINGLE WALL       SLIP & DRIVE       WRAP       CLOSED CELL       UV RESISTANT LAMINATE PAINTED ON POLYMER       3"       3-6       8       1,3	
	EXTERIOR (OUTSIDE)       GALVANIZED STEEL       SINGLE WALL       SLIP & DRIVE       WRAP       POLY ISO BOARD       ALUMAGUARD JACKET       3"       3-6       8       1,3	620 N 129TH ST. OMAHA, NE 68154
A. PARTIALLY CONDITIONED AND THE SURROUNDING (	SPACE: A SPACE THAT HAS A TEMPERATURE DIFFERENTIAL BETWEEN THE AIR IN DUCT       A.       CONCEALED: ANY NON VISIBLE DUCT.         GREATER THAN 15°. EXAMPLES INCLUDE: ATTIC SPACE (WITH INSULATION ON ROOF),       EXAMPLES INCLUDE: MECHANICAL ROOMS,         MECHANICAL (ELECTRICAL ROOM NON RIDETURIN CELLING SPACE)       INTERPRETING CELING SPACE	P: (402) 504-3885 F: (402) 504-4598
B. <u>CONDITIONED SPACE</u> : A S SURROUNDING LESS THAI	MECHANICAL / ELECTRICAL ROOM, NON PLENOM RETORN CEILING SPACE. SPACES. PACE THAT HAS A TEMPERATURE DIFFERENTIAL BETWEEN THE AIR IN DUCT AND THE N 15°. EXAMPLES INCLUDE: ABOVE CEILING RETURN PLENUM SPACE, HEATED AND B. <u>EXPOSED</u> : ANY VISIBLE DUCT IN ANY PUBLIC	$\bigcirc \text{ Advanced engineering systems}$
COOLED SPACE. C. UNCONDITIONED SPACE:	OR OCCUPIABLE SPACE. EXAMPLES INCLUDE: STORAGE ROOMS, CLOSETS.	CERTIFICATE OF
CHASES. D. <u>EXTERIOR (OUTSIDE):</u> LOC	ATED OUTSIDE OF THE BUILDING ENVELOPE. EXPOSED TO THE WEATHER.	PROJECT #: 25-063
WHERE DUCT INSULA A. ALL DUCTS SHALL BE CON	TION IS SPECIFIED: IPLETELY INSULATED ON ALL SIDES ENCOMPASSING DUCT SUPPORTS/ HANGERS WITH	
INSULATION SEALED TO S B. ALL SUPPLY AND FRESH A WRAPPED IN INSULATION	UPPORTS AS THEY PENETRATE INSULATION. IR DIFFUSERS AND REGISTERS INCLUDING DUCT BOOTS SHALL BE COMPLETELY DOWN TO THE CELLING TO PREVENT CONDENSATION	
C. ALL INSULATION HOLES F	ROM TESTING AND BALANCING SHALL BE RE-SEALED.	
D. ALL BALANCING DAMPERS SHAFT LENGTH TO ALLOW	S SHALL HAVE THE HANDLES OUTSIDE THE INSULATION, WITH A PROPER STANDOFF/ / PROPER DAMPER ADJUSTMENT.	
DUCT MATERIAL AND 1. ALL DUCTWORK SHALL BE OF CURRENT EDITION OF	INSULATION SCHEDULE NOTES CONSTRUCTED, REINFORCED AND SUPPORTED ACCORDING TO CURRENT MECHANICAL CODE, SMACNA STANDARDS, AND PER REQUIREMENTS INTERNATIONAL ENERGY CODES, THE MINIMUM ACCEPTABLE DUCT THICKNESS IS 26 GA, DUCTS SHALL BE CONSTRUCTED BASED ON THE TOTAL	
FAN PRESSURE THE DUCT IS THE CONTRACTOR'S RE TAPE OR DUCT SEAL COM	S ARE CONNECTED TO (A MINIMUM OF 2") AND BE TAKEN AS POSITIVE ON THE FAN DISCHARGE SIDE AND NEGATIVE ON THE FAN SUCTION SIDE. IT SPONSIBILITY TO VERIFY THE FAN PRESSURES BEFORE BIDDING AND CONSTRUCTION. SINGLE WALL DUCT SHALL BE SEALED WITH EITHER FOIL POUND ON ALL JOINTS INCLUDING LONG TRANSVERSE JOINTS. FOR LOW PRESSURE (< 2" W.C.) NON SPIRAL DUCT, ADJUSTABLE 1xRADIUS	
ELBOWS AND SNAPLOCK I CLEATS AND NUT & BOLTS 2. INSULATION SHALL HAVE A	PIPE ARE ACCEPTABLE. FOR DUCT MATE/TDC CONNECTIONS FOAM TAPE AND PLASTIC CLEATS ARE NOT ACCEPTABLE, BUTYL TAPE, METAL S MUST BE USED. A FHC OF 25/50 AND BE CLASSIFIED AS MEETING THE REQUIREMENTS OF LIMITED COMBUSTIBILITY.	
<ol> <li>DUCT WRAP INSULATION: SHALL BE COMPLETELY T/ RECOMMENDATIONS.</li> <li>DUCT LINER INSULATION:</li> </ol>	INSULATION SHALL COMPLY WITH ASTM C 553. TAPE AND SEAL INSULATION ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. EVERY JOINT APPED WITH FACED TAPE (MEETING UL181 STANDARD) TO MATCH INSULATION AND COMPLETELY SEAL INSULATION PER MANUFACTURER'S INSULATION SHALL COMPLY WITH ASTM C 1071. PROVIDE MANUFACTURER'S SEALANT FOR COATING OF ALL EXPOSED EDGES. CONNECTIONS. OR	
MINOR SURFACE DAMAGE EDGES SHALL BE COATED LINER. ALL ROUND RETUR	WELD PINS OF SUFFICIENT LENGTH AND GLUE OR STAPLES WITH SHEET METAL DISCS SHALL BE USED TO FASTEN LINER TO DUCT. ALL BUTT WITH ADHESIVE AND PRESSED TOGETHER. DUCT LINER SHALL HAVE PERMACOTE ANTI FUNGI AND BACTERIA GROWTH AGENT APPLIED TO THE N DUCT MUST BE WRAPPED WITH DUCT WRAP INSULATION OF AN EQUAL INSTALLED "R" VALUE SCHEDULED LINER.	
5. IF DUCT IS GOING TO BE P WATER PRIOR TO BEING F	AINTED, THOROUGHLY CLEAN AND DRY OUTSIDE OF DUCT WITH A WARM SOAPY SOLUTION CONSISTING OF "SIMPLE GREEN" CLEANER AND PAINTED. THIS SHALL BE WITNESSED BY THE GENERAL CONTRACTOR AND PAINTER.	
PIPE SUPPO		
PIPE MATERIAL SPACING SI	1-1/2"       2"       2-1/2"       3"       4"       6"       8"       10"       12" - UP         DD       MAX.       ROD       MAX. <td></td>	
STEEL 8' 3/	8"       9'       3/8"       10'       3/8"       11'       1/2"       12'       5/8"       12'       3/4"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'       7/8"       12'	
PVC / CPVC 4' 3/	8"       4'       3/8"       4'       3/8"       4'       3/8"       4'       1/2"       4'       1/2"       4'       5/8"       4'       3/4"       1,2,3	
PIPE SUPPORT SCHED	DULE NOTES LLY EVERY 12' OR EVERY LEVEL WHICH EVER IS LESS.	
2. SPACING SCHEDULED IS T TO BE IF THE STRUCTURE OF ONE SUPPORT FOR EVI HANGERS MUST BE PROVI	HE MAXIMUM DISTANCE, SUPPORTS CAN BE INSTALLED IN SMALLER INTERVALS AND MAY NEED CAN NOT HANDLE THE LOAD AT THE MAXIMUM SPACING, VERIFY WITH STRUCTURAL. A MINIMUM ERY BRANCH OR PIPE SEGMENT IN EACH DIRECTION CHANGE SHALL BE PROVIDED. TWO (2) DED ON ALL LENGTH OF PIPE LONGER THAN 10'	
3. ALL SUPPORTS SHOULD B ALLOW FREE MOVEMENT ( TO THE STRUCTURE WILL	E ANCHORED SECURELY TO THE STRUCTURE BUT NOT THE PIPING. THE SUPPORT SHOULD CAUSED BY THERMAL EXPANSION. PIPING STRAPS AND CLAMPS THAT HOLD THE PIPING TIGHT NOT BE ALLOWED. TYPICAL ACCEPTABLE SUPPORTS INCLUDE BUT ARE NOT LIMITED TO CLEVIS	
HANGERS, ADJUSTABLE S	WIVEL RING SUPPORT, ROLLER HANGER AND DOUBLE BOLT PIPE CLAMP.	
PIPE MATER	IAL AND INSULATION	
	PIPING WATERIAL FITTING TYPE MINIMUM SLOPE VALVES WITH TYPE TYPE INCH LBS/FT ³ VALUE TEMP NOTES	
HEATING HOT WATER 1/2" - 1-1/4" /	ABOVE SCHEDULE 40 BLACK STEEL THREADED - BALL, BUTTERFLY ASTM A 53 MOLDED JACKETED 1-1/2" 3 .22 75° 1,2 SCHEDULE 40 CONTINUOUSLY BALL, BEALL,	
WATER 1-1/2" - UP	ABOVE BLACK STEEL WELDED / - BUTTERFLY ASTM A 53 SECTION FIBERGLASS 2" 3 .22 75° 1,2	
A. DOMESTIC WATER INSULA 1. HOT WATER RECIRCULATI	NSULATION GENERAL NOTES       VALVE SCHEDULE         TION REQUIREMENTS:       A. CALIBRATED BALANCE VALVES: SHALL BE A BRONZE OR BRASS BALL VALVE         ON PIPING SHALL BE INSULATED PER INTERNATIONAL ENERGY       A. CALIBRATED BALANCE VALVES: SHALL BE A BRONZE OR BRASS BALL VALVE	NO C
CONSERVATION CODE. 2. DOMESTIC COLD-WATER N SEALING LAP FIBERGLASS	B. BALL VALVE: SHALL BE NSF RATED FOR POTABLE WATER, BRASS OR BRONZE BODY WITH CHROME PLATED BRONZE BALL. PIPE INSULATION. C. BUTTERFLY VALVE: SHALL BE CAST IRON BODY WITH FLANGED ENDS,	0 <u>50</u> (B)
3. NO INSULATION ON ANY O BY CODE. B. INSTALL ALL PIPING ACCO	F THE PIPING SERVING APARTMENTS (UNITS) UNLESS REQUIRED WAFFER STYLE VALVES ARE NOT ALLOWED. D. GATE VALVE: SHALL BE A BRONZE OR CAST IRON BODY WITH A RISING STEM AND SOLID BRONZE WEDGE. TED CLEANED AND CERTIFIED FOR INTENDED USE ALL PIPING E GLOBE VALVE: SHALL BE A BRONZE OR CAST IRON BODY WITH A BRONZE	
SYSTEMS SHALL BE PRES FOR NO LESS THAN 4 HOU CONTROL VALVES BYPAS	SURE TESTED WITH 1-1/2 TIMES THE OPERATING PRESSURE RS. PIPING TO BE CLEANED AND FLUSHED WITH CRITICAL SED. CHILD AND FLUSHED WITH CRITICAL STEM/HANDLE MOVEMENT. HANDLES SHALL NEVER BE INSTALLED	Ă I
<ul> <li>ALL FITTINGS CONNECTIN PIPING. NO DI-ELECTRIC U</li> <li>ALL WELDED PIPE AND FU</li> </ul>	G TO DI-ELECTRIC FITTINGS SHALL BE SOFT SOLDERED TO THE VERTICALLY DOWN. NIONS SHALL BE USED. SION WELDED SHALL BE WELDED BY A CERTIFIED	BL
WELDER/FUSION CONTRA (CERTIFICATED MUST BE S FLANGES SHALL BE INSTA	CTOR. ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER SUBMITTED) AND ALL WORK SHALL BE STAMPED. BOLTED LLED ON 2" AND LARGER PIPE TO SECTIONALIZE SYSTEM INTO SHI ATION SHALL CO ABOUND ELANCES	S
F. PROVIDE PIPE LABELING C LETTERING MATCHING DR LETTERING MUST BE A MII	ALL NEW PIPING WITH PRE-PRINTED, COLOR-CODED WITH AWING DESIGNATIONS AND SHOWING FLOW DIRECTION. NIMUM OF 1-1/2" IN SIZE. PIPE LABELS SHALL BE ON ALL PIPING	
ABOVE ACCESSIBLE CEILI EVERY 30' AND AT ALL ACC ENGINEER AND OWNER PI	NGS, EXPOSED AREAS, TUNNELS AND IN MECHANICAL ROOMS CESS DOORS. VERIFY LABEL COLORING SCHEME WITH RIOR TO ORDERING.	
	NSULATION SCHEDULE NOTES SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPED RATING OF 50 OR LESS ACCORDING TO ASTM STANDARD AND	
NFPA 255. INSULATION SH JOINTS SHALL BE PROPER SHALL BE JACKETED WITH	ALL BE INSTALLED BY A SKILLED INSTALLER IN A CLEAN WORKMANSHIP LIKE MANNER AFTER THE SYSTEM HAS BEEN PROPERLY TESTED. ALL RLY SEALED TO KEEP INTEGRITY OF VAPOR BARRIER INTACT. ALL INSULATION SHALL HAVE PVC JACKETS ON ALL ELBOWS AND THE ENTIRE PIPING I PVC WHERE EXPOSED IN PUBLICLY ACCESSIBLE AREAS.	
2. COPPER PIPING WITH SOL	DERED OR MECHANICAL CONNECTIONS IS AN ACCEPTABLE ALTERNATIVE.	
SEE COVER SHEET F	OR DISCOVERY ALLOWANCE AND UNIT PRICE REQUIREMENTS	
		No. Issued For Date
	MIN. 1"X22 GA. STRAP	
	STRUCTURE. MOUNTING SCREWS MUST BE 3" (E) PRIMARY AWAY FROM DAMPER SUPPLY	
ER WITH BLUE . AND DIE UM CASE IN	VAV BOX	
OCKET	RE-HEAT COIL	DATE: 05/20/25
	TRANSITION TO	MECHANIC
	SUPPLY DUCT SIZE SHOWN ON PLANS	KYLE J.
	(E) SUPPLY	E-12957
		W W2-20-2020 E
	HOT WATER CONNECTIONS DAMPER ACTUATOR (MAINTAIN MANUFACTURER	STATE OF NEBRUS
	HOT WATER CONNECTIONS MANUFACTURER RECOMMENDED CLEARANCE IN FRONT OF BOX) EXISTING HOT WATER	TATE OF NEDRUS
	ALE	TATE OF NEBRUS
E FULL PORT TH 8:1 SCREEN. 1 3/4" DRAIN WITH	ALE	THE OF MEDRUS STAT

![](_page_12_Figure_35.jpeg)

**DISINGLE DUCT VAV BOX DETAIL** M3.1 SCALE: NONE

![](_page_12_Picture_37.jpeg)

AND SCHEDULES