

STEAM FANCOIL UNIT SPECIFICATION	
1.	<p>CONCEALED UNIT BASIC CONSTRUCTION</p> <p>A. THE BASIC UNIT INCLUDES THE COIL, CHASSIS, FAN(S) AND FAN CASING(S), FAN BOARD AND MOTOR(S). STEEL PARTS EXPOSED TO MOISTURE ARE GALVANIZED. THE FAN BOARD ASSEMBLY INCLUDES A QUIET DISCONNECT MOTOR PLUG. THE CHASSIS IS THE STRUCTURAL FRAME CONSTRUCTED OF 18 GAUGE GALVANIZED STEEL. THE UNIT IS ACOUSTICALLY INSULATED WITH CLOSED CELL INSULATION.</p> <p>2. FAN</p> <p>A. THE GALVANIZED STEEL FAN WHEELS ARE CENTRIFUGAL FORWARD-CURVED AND DOUBLE-WIDTH. FAN WHEELS AND HOUSINGS ARE CORROSION RESISTANT. FAN HOUSINGS ARE CONSTRUCTED OF FORMED SHEET METAL.</p> <p>3. ELECTRONICALLY COMMUTATED MOTORS (ECM)</p> <p>A. ALL MOTORS ARE BRUSHLESS DC (BLDC) ELECTRONICALLY COMMUTATED MOTORS (ECM) FACTORY PROGRAMMED AND RUN TESTED IN ASSEMBLED UNITS.</p> <p>B. THE MOTOR OR COIL IS MOUNTED IN A CONTROL BOX WITH A BUILT IN INTEGRATED USER INTERFACE AND LED TACHOMETER. IF ADJUSTMENTS ARE NEEDED, MOTOR PARAMETERS CAN BE ADJUSTED THROUGH MOMENTARY CONTACT SWITCHES ACCESSIBLE WITHOUT FACTORY SERVICE PERSONNEL ON THE MOTOR CONTROL BOARD.</p> <p>C. MOTORS WILL SOFT RAMP BETWEEN SPEEDS TO LESSEN THE ACOUSTICS DUE TO SUDDEN SPEED CHANGES.</p> <p>D. MOTORS CAN BE OPERATED AT THREE SPEEDS OR AT VARIABLE SPEED WITH FACTORY SUPPLIED OR FIELD SUPPLIED CONTROLLERS. THE MOTOR WILL CHOOSE THE HIGHEST SPEED IF THERE ARE SIMULTANEOUS OR CONFLICTING SPEED REQUESTS. ALL MOTORS HAVE INTEGRAL OVERLOAD PROTECTION WITH A MAXIMUM AMBIENT OPERATING TEMPERATURE OF 104°F AND USE PERMANENTLY SEALED BALL BEARINGS.</p> <p>E. MOTORS CAN OPERATE AT PLUS OR MINUS 10 PERCENT OF RATED VOLTAGE ON ALL SPEED SETTINGS.</p> <p>4. COIL CONNECTIONS (RH/LH)</p> <p>A. CONTRACTOR SHALL VERIFY PRIOR TO ORDERING.</p> <p>5. STEAM HEATING COIL</p> <p>A. THE STEAM HEATING COIL IS A ONE-ROW DISTRIBUTING TYPE COIL. THE COIL IS CONSTRUCTED OF ALUMINUM FINS MECHANICALLY BONDED TO .031" [79MM] OD COPPER TUBING. THE STEAM HEATING COIL IS BURST TESTED AT 250 PSIG AIR. MAXIMUM COIL WORKING PRESSURE IS 100 PSIG. MAXIMUM ENTERING STEAM TEMPERATURE IS 325 DEGREES F (108 DEGREES C). SUPPLY COIL CONNECTIONS ARE 1" DIAMETER [25MM] NPTI & RETURN COIL CONNECTIONS ARE .75" DIAMETER [19MM] NPTI. COIL CONNECTIONS ONLY ARE PROVIDED.</p> <p>6. CSTT - THERMOSTAT INTERFACE</p> <p>A. THE CONTROL INTERFACE IS INTENDED TO BE USED WITH A FIELD-SUPPLIED, LOW-VOLTAGE THERMOSTAT OR CONTROLLER. THE CONTROL BOX CONTAINS A RELAY BOARD WHICH INCLUDES A LINE VOLTAGE TO 24VOLT TRANSFORMER, QUIET CONTACTORS (FOR ELECTRIC HEAT UNITS), AND A DISCONNECT SWITCH. ALL END DEVICES ARE WIRED TO A LOW VOLTAGE TERMINAL BLOCK AND RUN TESTED, SO THE ONLY A POWER CONNECTION AND THERMOSTAT CONNECTION IS NEEDED TO COMMISSION THE UNIT. CHANGE-OVER SENSORS AND CONTROLS ARE PROVIDED WHENEVER A CHANGE OVER COIL IS SELECTED. WHEN NO VALVES ARE SELECTED, INVERTING RELAYS ARE PROVIDED FOR USE WITH STANDARD THERMOSTATS.</p> <p>7. DISCONNECT SWITCH</p> <p>A. A UNIT MOUNTED NON-FUSED DISCONNECT SWITCH</p> <p>8. 1" MERV 8 FILTER</p> <p>A. THE FILTER IS CONCEALED FROM SIGHT AND EASILY REMOVABLE. A 1" MERV 8 FILTER IS PROVIDED IN THE UNIT. THE MERV 8 FILTERS HAVE A RATING BASED ON ASHRAE STANDARD 52.2. THE AVERAGE DUST SPOT EFFICIENCY IS NO LESS THAN 35 TO 40 PERCENT WHEN TESTED IN ACCORDANCE WITH ASHRAE 52.1 ATMOSPHERIC DUST SPOT METHOD.</p>

STEAM CONTROL VALVE SPECIFICATION	
1.	<p>GENERAL</p> <p>A. CONTROL VALVES ASSEMBLIES SHALL BE PROVIDED AND DELIVERED FROM A SINGLE MANUFACTURER AS A COMPLETE ASSEMBLY. THE MANUFACTURER SHALL WARRANT ALL COMPONENTS FOR A PERIOD OF 5 YEARS FROM THE DATE OF PRODUCTION WITH THE FIRST TWO YEARS UNCONDITIONAL.</p> <p>2. BALL-STYLE CONTROL VALVES</p> <p>A. MANUFACTURED, BRAND LABELED OR DISTRIBUTED BY BELIMO.</p> <p>B. 2-WAY HIGH TEMPERATURE BALL VALVE WITH CHARACTERIZING DISC</p> <p>C. MATERIALS:</p> <p>a. BODY: DZR BRASS.</p> <p>b. BALL: STAINLESS STEEL.</p> <p>c. SEATS/SEALS: ETFE, FKM O-RING (VITON™).</p> <p>d. STEM/SEALS: STAINLESS STEEL, EPDM O-RING.</p> <p>e. CHARACTERIZING DISC: ETFE (TEFZEL™).</p> <p>D. PIPING CONNECTIONS:</p> <p>a. FEMALE NPT.</p> <p>E. MEDIA:</p> <p>a. STEAM (≤ 15 PSIG)</p> <p>F. PERFORMANCE:</p> <p>a. MEDIA TEMPERATURE:</p> <p>- STEAM: MAXIMUM 250°F</p> <p>b. PRESSURE:</p> <p>- BODY: 600 PSI</p> <p>- MAXIMUM OPERATING DIFFERENTIAL:</p> <p>1. STEAM: 15 PSID</p> <p>2. MAXIMUM INLET: 15 PSIG</p> <p>3. CLOSE-OFF VALVE AND ACTUATION ASSEMBLY: 200 PSID</p> <p>4. LEAKAGE: 0% (A-AB)</p> <p>G. LABELING: VALVE BODY SHALL BE FURNISHED WITH A LABEL CONTAINING THE FOLLOWING DATA:</p> <p>a. MANUFACTURER'S NAME AND MODEL NUMBER;</p> <p>b. NOMINAL SIZE.</p> <p>3. ELECTRIC AND ELECTRONIC CONTROL VALVE ACTUATORS</p> <p>A. MANUFACTURED, BRAND LABELED OR DISTRIBUTED BY BELIMO.</p> <p>B. AGENCY LISTINGS: ISO 9001, UL 873 OR UL 60730, CE, AND CSA.</p> <p>C. THE VALVE ASSEMBLY (CONTROL VALVE AND ACTUATOR) SHALL BE PROVIDED AND DELIVERED FROM A SINGLE MANUFACTURER.</p> <p>D. THE MANUFACTURER SHALL WARRANT ALL COMPONENTS FOR A PERIOD OF 5 YEARS FROM THE DATE OF PRODUCTION WITH THE FIRST TWO YEARS UNCONDITIONAL.</p> <p>E. TYPE: MOTOR OPERATED, WITH GEARS, ELECTRIC AND ELECTRONIC.</p> <p>F. ACTUATORS FOR STEAM CONTROL VALVES: SHUTOFF AGAINST 1.5 TIMES STEAM DESIGN PRESSURE.</p> <p>G. VOLTAGE:</p> <p>a. 24 V</p> <p>b. ACTUATOR SHALL DELIVER TORQUE REQUIRED FOR CONTINUOUS UNIFORM MOVEMENT OF CONTROLLED DEVICE FROM LIMIT TO LIMIT WHEN OPERATED AT RATED VOLTAGE AND TEMPERATURES.</p> <p>H. MODULATING ACTUATORS:</p> <p>a. CAPABLE OF STOPPING AT NUMEROUS POINTS ACROSS FULL MOVEMENT RANGE, AND STARTING IN EITHER DIRECTION FROM ANY POINT IN RANGE.</p> <p>b. CONTROL INPUT SIGNAL:</p> <p>- PROPORTIONAL: ACTUATOR DRIVES PROPORTIONAL TO INPUT SIGNAL AND MODULATES THROUGHOUT ITS ANGLE OF ROTATION.</p> <p>4. FAIL-SAFE:</p> <p>A. PROVIDE ACTUATOR TO FAIL AT OPEN POSITION.</p> <p>B. MECHANICAL SPRING RETURN MECHANISM TO DRIVE CONTROLLED DEVICE TO AN END POSITION (OPEN) ON LOSS OF POWER.</p> <p>C. ELECTRONIC FAIL-SAFE SHALL INCORPORATE AN ACTIVE BALANCING CIRCUIT TO MAINTAIN EQUAL CHARGING RATES AMONG THE SUPER CAPACITORS. THE POWER FAIL POSITION SHALL BE PROPORTIONALLY ADJUSTABLE BETWEEN 0 TO 100% IN 10 DEGREE INCREMENTS WITH A 2 SECOND OPERATIONAL DELAY.</p> <p>5. INTEGRAL OVERLOAD PROTECTION:</p> <p>A. PROVIDE ELECTRONIC OVERLOAD PROTECTION THROUGHOUT THE ENTIRE OPERATING RANGE IN BOTH DIRECTIONS.</p> <p>6. VALVE ATTACHMENT:</p> <p>A. ATTACH ACTUATOR TO VALVE DRIVE SHAFT IN A WAY THAT ENSURE MAXIMUM TRANSFER OF POWER AND TORQUE WITHOUT SLIPPAGE.</p> <p>B. ACTUATORS SHALL BE CAPABLE OF BEING MECHANICALLY AND ELECTRICALLY PARALLELED TO INCREASE TORQUE IF REQUIRED.</p> <p>C. 4-BOLT DUAL NUT CLAMP WITH A V-SHAPED TOOTHED CRADLE, DIRECTLY COUPLE AND MOUNT TO THE VALVE BONNET STEM, OR ISO-STYLE DIRECT-COUPLED MOUNTING PAD.</p> <p>7. TEMPERATURE AND HUMIDITY:</p> <p>A. TEMPERATURE: SUITABLE FOR OPERATING TEMPERATURE RANGE ENCOUNTERED BY APPLICATION WITH MINIMUM OPERATING TEMPERATURE RANGE OF -22 TO 122 DEG F</p> <p>B. HUMIDITY: SUITABLE FOR HUMIDITY RANGE ENCOUNTERED BY APPLICATION; MINIMUM OPERATING RANGE SHALL BE FROM 5 TO 95 PERCENT RELATIVE HUMIDITY, NON-CONDENSING.</p> <p>8. ENCLOSURE:</p> <p>A. SUITABLE FOR AMBIENT CONDITIONS ENCOUNTERED BY APPLICATION.</p> <p>B. NEMA TYPE 1 FOR INDOOR INSTALLATION IN AN EQUIPMENT ENCLOSURE.</p> <p>C. NEMA TYPE 2 FOR INDOOR AND PROTECTED APPLICATIONS.</p> <p>D. NEMA TYPE 4 OR TYPE 4X FOR OUTDOOR AND UNPROTECTED APPLICATIONS.</p> <p>E. PROVIDE ACTUATOR ENCLOSURE WITH A HEATER AND CONTROLLER WHERE REQUIRED BY APPLICATION.</p>


CONTROLS GENERAL NOTES	
1.	<p>GENERAL</p> <p>A. SEQUENCES OUTLINED SHALL BE PERFORMED BY DIRECT DIGITAL CONTROL FIELD PANELS (DDCFPS) AND LOCALLY MOUNTED DIRECT DIGITAL UNIT CONTROLLERS CONNECTED TO A CENTRAL BUILDING AUTOMATION SYSTEM, UNLESS OTHERWISE SPECIFIED. SYSTEM ARCHITECTURE SHALL BE BASED ON A PEER-TO-PEER DISTRIBUTED CONTROL SYSTEM NETWORK. SYSTEM SHALL INTEGRATE OPEN COMMUNICATION PROTOCOL CONTROLLERS. ALL DDCFP AND LOCAL CONTROLLERS SHALL BE CAPABLE OF INDEPENDENT OPERATION REGARDLESS OF THE STATUS OF THE BAS WORKSTATION.</p> <p>B. BMS (BUILDING MANAGEMENT SYSTEM), BAS (BUILDING AUTOMATION SYSTEM) AND DDC (DIRECT DIGITAL CONTROLS) MAY BE USED INTERCHANGEABLY AND SHARE THE SAME MEANING.</p> <p>C. ADDRESS IDENTIFIERS FOR POINTS AND VARIABLES SHALL BE COORDINATED WITH OWNER.</p> <p>D. ABILITY TO REVIEW MEASURED DATA, CONTROL SETPOINTS AND FUNCTIONS SHALL BE PROVIDED AT BAS WORKSTATION AND ON LAPTOP SERVICE TOOL.</p> <p>E. COORDINATE SENSOR LOCATIONS WITH DUCTWORK AND PIPING SHOP DRAWINGS AND INDICATE PROPOSED LOCATIONS ON SUBMITTALS. PROVIDE MANUFACTURER'S RECOMMENDED UPSTREAM AND DOWNSTREAM PIPE OR DUCT DIAMETERS FOR FLOW SENSING ELEMENTS.</p> <p>F. PROVIDE COMMUNICATIONS INTERFACE INCLUDING SOFTWARE BETWEEN THE BAS AND EACH EQUIPMENT MANUFACTURER SUPPLIED CONTROL PANEL. BAS SHALL BE CAPABLE OF READING AND DISPLAYING ALL DATA USED BY THE EQUIPMENT MANUFACTURER CONTROL PANEL. SOFTWARE INTERFACE SHALL BE THROUGH LONMARK OR BACNET COMPLIANT PROTOCOL, WHERE THE BAS IS REQUIRED TO CONTROL THE OPERATION OF THE EQUIPMENT. PROVIDE COMPLETE INPUT AND OUTPUT INTERFACE.</p> <p>G. FAIL SAFE POSITIONS INDICATED ARE POSITIONS THAT DEVICES WILL GO TO WHEN THE ASSOCIATED EQUIPMENT IS DE-ENERGIZED.</p> <p>H. PROVIDE ADEQUATE DAMPING OF MODULATING CONTROL LOOPS TO PREVENT HUNTING. MAXIMUM RESPONSE TIME SHALL BE 30 SECONDS. CONTROL LOOPS SHALL BE TUNED TO PROVIDE FOR STABLE OPERATION OF THE CONTROL DEVICE. LOOP TUNING MAY BE REQUIRED TO BE PERFORMED MULTIPLE TIMES DURING MULTIPLE CONTROL SCENARIOS.</p> <p>I. CONTROL DEVICES SHALL BE INSTALLED IN SUCH A WAY TO BE ACCESSIBLE FOR MAINTENANCE AND REPAIR.</p> <p>J. DAMPER END SWITCHES SHALL BE INTERLOCKED VIA HARDWIRE TO THE START/STOP FUNCTION OF ITS ASSOCIATED FAN.</p> <p>2. WIRING</p> <p>A. PROVIDE CONTROLS, LOW VOLTAGE CONTROL WIRING, HARDWARE POINTS (ANALOG IN, ANALOG OUT, BINARY IN, BINARY OUT) AND ACCESSORIES AS REQUIRED TO PERFORM THE CONTROL SEQUENCES INDICATED. ADDITIONALLY, PROVIDE HARDWARE POINTS INDICATED REGARDLESS THAT SUCH POINTS MAY NOT BE REQUIRED TO PERFORM THE CONTROL SEQUENCES INDICATED.</p> <p>B. POWER WIRING SHALL COMPLY WITH REQUIREMENTS OF DIVISION 26 SECTIONS.</p> <p>C. PROVIDE NORMAL WIRING TO CONTROL DEVICES, INCLUDING CONTROL PANELS, WORKSTATION AND HOST COMPUTERS.</p> <p>D. ELECTRICAL CIRCUITS FOR CONTROLS SHALL BE DEDICATED ONLY TO THE BUILDING AUTOMATION CONTROL SYSTEM AND COMPONENTS. WIRING FROM AND INCLUDING DEDICATED CIRCUIT BREAKERS TO THE POINT OF USE SHALL BE PROVIDED.</p> <p>3. SAFETIES:</p> <p>A. FREEZE/STAT SHALL BE AUTOMATICALLY RESET FOR THE FIRST THREE TIMES AND REQUIRED TO BE MANUALLY RESET AFTER THAT.</p> <p>B. FCU SHALL OPERATE ON A SOFT PERMISSIVE, ONLY ALLOWING FANS TO START AND CONTROL VALVES TO OPEN WHEN SYSTEM IS IN HEATING MODE.</p> <p>4. ALARMS:</p> <p>A. REFER TO SEQUENCES FOR ALARM FUNCTIONS. WHENEVER AN ALARM IS INITIATED, THE BAS SHALL RETAIN IN MEMORY THE READING AND SETPOINT OF EACH ASSOCIATED DEVICE TO HELP THE OPERATOR IN ISOLATING THE CAUSE OF THE ALARM.</p> <p>B. IF ANY DDCFP OR EQUIPMENT MANUFACTURER'S CONTROL PANEL LOSES COMMUNICATION WITH THE BAS NETWORK, AN ALARM SHALL BE INITIATED AT THE BAS INDICATING THE LOCATION OF THE FAULT.</p> <p>C. WHENEVER A PIECE OF EQUIPMENT IS TAKEN OFFLINE FOR MAINTENANCE, ALARMS RELATED TO THIS PIECE OF EQUIPMENT SHALL BE TEMPORARILY DISABLED.</p> <p>5. ACCEPTED MANUFACTURER:</p> <p>A. HONEYWELL WEBS.</p> <p>B. NO OTHER MANUFACTURER IS ACCEPTED.</p>

DEMOLITION NOTES	
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1.	<p>CONTRACTOR SHALL VISIT AND CAREFULLY EXAMINE SITE TO IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK OF THIS SECTION. NO EXTRA PAYMENT WILL BE ALLOWED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY CONSTRUED BY EXPERIENCED OBSERVER.</p> <p>2. PREPARATORY WORK: BEFORE STARTING WORK IN A PARTICULAR AREA OF THE PROJECT, VISIT SITE AND EXAMINE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED INCLUDING PREPARATORY WORK DONE UNDER OTHER SECTIONS OR CONTRACTS BY OWNER. REPORT CONDITIONS THAT MIGHT AFFECT WORK ADVERSELY IN WRITING TO ARCHITECT AND OWNER. DO NOT PROCEED WITH WORK UNTIL DEFECTS HAVE BEEN CORRECTED AND CONDITIONS ARE SATISFACTORY. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING CONDITIONS AND PREPARATORY WORK.</p> <p>3. PHASING: DEMOLITION WORK SHALL COMPLY WITH THE PHASING REQUIREMENTS OF THE PROJECT AND BE COORDINATED WITH THE OWNER, ARCHITECT, CM AND ENGINEER. NO REMOVALS SHALL BE IMPLEMENTED WITHOUT A THOROUGH UNDERSTANDING OF THE PHASING REQUIREMENTS.</p> <p>4. ABANDONING OF DUCTWORK, PIPING OR EQUIPMENT IN PLACE WITHIN SCOPE AREA IS PROHIBITED.</p> <p>5. PROVIDE 2 WEEKS NOTICE TO OWNER FOR SHUT DOWN OF ANY SERVICES AND/OR SYSTEMS.</p> <p>6. COORDINATE EXISTING EQUIPMENT AND MATERIALS THAT SHALL REMAIN THE PROPERTY OF THE OWNER. ITEMS OF VALUE WHICH ARE NOT DIRECTLY REQUIRED TO BE RETURNED TO THE OWNER, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. STORAGE OR SALE OF ITEMS ON THE PROJECT SITE IS PROHIBITED.</p> <p>7. PROTECTION: ENSURE THE SAFE PASSAGE OF PERSONS IN AND AROUND THE BUILDING DURING DEMOLITION. PREVENT INJURY TO PERSONS AND DAMAGE TO PROPERTY. PROVIDE ADEQUATE SHORING AND BRACING TO PREVENT COLLAPSE. IMMEDIATELY REPAIR DAMAGED PROPERTY TO THE CONDITION BEFORE BEING DAMAGED. TAKE EFFECTIVE MEASURES TO PREVENT WINDBLOWN DUST.</p> <p>8. INFORMATION CONTAINED ON THESE DRAWINGS WAS OBTAINED FROM ARCHIVED DRAWINGS AND SITE VISITS. DRAWINGS ARE DIAGRAMMATIC ONLY AND REFLECT OVERALL SYSTEM REMOVAL, NOT EVERY ITEM OR COMPONENT OF A SYSTEM IS SHOWN. PROVIDE COMPLETE REMOVAL OF ASSOCIATED ANCLLARY PIPES, HANGERS, VALVES AND ACCESSORIES SERVING SYSTEM SHOWN.</p> <p>9. DEMOLITION WORK SHALL COMPLY WITH OSHA, EPA AND APPLICABLE STATE AND LOCAL CODES. COMPLY WITH HAULING AND DISPOSAL REGULATIONS.</p> <p>PRE-DEMO TESTING, ADJUSTING AND BALANCING (TAB)</p> <p>1. CONFIRM SUPPLY, RETURN AND EXHAUST SYSTEM AIRFLOW CAPACITY THROUGH PRE-CONSTRUCTION TESTING OF BALANCING OF SYSTEMS AFFECTED BY THE WORK. REPORTS SHALL INCLUDE COMPLETE FAN INFORMATION, CFM, ESP, TSP, RPM, VOLTS, AMPS AND VFD SPEEDS.</p> <p>2. CONFIRM STEAM PIPING CAPACITY THROUGH PRE-CONSTRUCTION TESTING AND BALANCING REPORTS OF SYSTEMS AFFECTED BY THE WORK. REPORTS SHALL INCLUDE PIPE SIZE AND STEAM PRESSURE (PSIG).</p>

GENERAL NOTES	
GENERAL	
1.	<p>DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO INDICATE CAPACITY, SIZE, APPROXIMATE LOCATION AND GENERAL ARRANGEMENT. COORDINATE LOCATIONS OF SYSTEMS AND COMPONENTS.</p> <p>2. COORDINATE WALL PENETRATIONS WITH WORK OF OTHER SECTIONS AND WITH FLASHING REQUIREMENTS. COORDINATE SLAB PENETRATIONS WITH WORK OF OTHER SECTIONS.</p> <p>3. RUN DUCTS AND PIPING CONCEALED, UNLESS SPECIFIED OTHERWISE NOTED.</p> <p>4. INSTALL SENSORS (TEMPERATURE, CO2, THERMOSTATS) AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY ARCHITECT. MOUNTING HEIGHT AFF SHALL COMPLY WITH ADA AND SHALL BE MOUNTED LEVEL WITH ADJACENT SWITCHES (IE LIGHT SWITCHES).</p> <p>5. COORDINATE WORK OF THIS SECTION WITH THAT OF OTHER SECTIONS AND WITH ALL TRADES INVOLVED. PROVIDE OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS.</p> <p>6. NOT ALL ACCESS DOORS HAVE BEEN SHOWN ON THE PLANS. PROVIDE ACCESS PANELS THROUGH BUILDING ASSEMBLIES TO SERVICE AND MAINTAIN EQUIPMENT UNLESS SUCH EQUIPMENT IS INSTALLED IN EXPOSED LOCATIONS OR ABOVE LAY-IN CEILINGS. COORDINATE THE LOCATION OF ACCESS DOORS AND PANELS AND VERIFY THE QUANTITY, SIZE, AND LOCATIONS AFTER THE SYSTEMS AND EQUIPMENT REQUIRING ACCESS HAVE BEEN INSTALLED AND PRIOR TO THE CLOSURE OF THE AFFECTED CEILINGS AND BUILDING ASSEMBLIES. SUBMIT ACCESS PANEL LOCATIONS FOR REVIEW.</p> <p>7. AT SUBSTANTIAL COMPLETION, THE FOLLOWING ITEMS, NEW OR EXISTING, SHALL BE FULLY AND REASONABLY ACCESSIBLE: HVAC CONTROL BOXES, JUNCTION BOXES, VALVES, DDC CONTROL BOXES, ELECTRICAL PANELS, FILTERS, BELTS, STEAM COILS, DISCONNECT SWITCHES AND ELEMENTS OF EQUIPMENT REQUIRING MAINTENANCE. FULLY AND REASONABLY ACCESSIBLE SHALL BE DEFINED AS NATIONAL ELECTRIC CODE REQUIRED CLEARANCE FOR POWERED EQUIPMENT AND CAPABLE OF BEING ACCESSED OR SERVICED WITHOUT REMOVING, MODIFYING OR DISTORTING OTHER COMPONENTS OF THE WORK. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCE FOR ALL EQUIPMENT.</p> <p>8. SUPPORT EQUIPMENT, PIPING AND DUCTWORK FROM BUILDING STRUCTURE OR WITH STEEL SUPPORTS AND PLATFORMS AS REQUIRED. PROVIDE VIBRATION ISOLATION FOR ROTATING EQUIPMENT, DUCTWORK AND PIPING IN ACCORDANCE WITH THE SPECIFICATIONS.</p> <p>9. CONTROL WIRING METHODS SHALL COMPLY WITH NEC, AND DIVISION 26 SPECIFICATIONS.</p> <p>10. VERIFY EQUIPMENT CONNECTIONS WITH MANUFACTURER'S DRAWINGS. VERIFY AND PROVIDE FITTINGS TO TRANSITION TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE DIMENSIONS BEFORE FABRICATION.</p> <p>11. PERFORM PRESSURE AND LEAKAGE TESTS BEFORE INSULATING DUCTWORK AND PIPING</p> <p>AIR SYSTEM SPECIFIC NOTES:</p> <p>1. PROVIDE UL FIRE DAMPERS OR SMOKE/FIRE DAMPERS AND ASSOCIATED ACCESS PANELS WHERE SHOWN ON DRAWINGS IN COMPLIANCE WITH NFPA 90A. FOR DUCTS THAT PENETRATE FIRE WALLS, FLOORS AND PARTITIONS PROVIDE SLEEVES WHERE PENETRATIONS ARE NOT PERPENDICULAR TO SURFACE PENETRATED.</p> <p>2. INTERNAL AIR FLOW DIMENSIONS ARE SHOWN FOR DUCTS. INCREASE SHEETMETAL SIZE FOR LINER IF APPLICABLE.</p> <p>3. PROVIDE FLEXIBLE CONNECTIONS ON DUCTS CONNECTING TO FANS AND AIR HANDLING UNITS UNLESS INTERNALLY ISOLATED.</p> <p>4. ELBOWS IN DUCT SYSTEMS SHALL BE FULL RADIUS (CENTERLINE RADIUS = 1.5 DUCT WIDTH) WHERE SPACE PERMITS. WHERE LIMITED CLEARANCE OCCURS PROVIDE SHORT RADIUS ELBOW WITH FULL LENGTH SPLITTER VANES PER SMACNA, OR MITERED ELBOW WITH TURNING VANES PER SMACNA.</p> <p>5. NOT ALL MANUAL DAMPERS ARE SHOWN ON THE DRAWINGS. PROVIDE MANUAL ADJUSTABLE DAMPERS ON EACH LOW PRESSURE SUPPLY, RETURN, AND EXHAUST DUCT TAKE OFF, AND AT TAKE OFFS TO REGISTERS, GRILLES, DIFFUSERS, AND CED; AS REQUIRED FOR PROPER BALANCE OF SYSTEM. PROVIDE CABLE OPERATED DAMPERS WHERE MANUAL DAMPER IS INACCESSIBLE.</p> <p>PIPING SYSTEM SPECIFIC NOTES:</p> <p>1. PROVIDE HANGERS, CLAMPS, OFFSETS, ANCHORS AND GUIDES AS NECESSARY TO PREVENT STRESS ON PIPING EXCEEDING ASME ALLOWABLE STRESS ON PIPING MATERIALS.</p> <p>GUARANTEE</p> <p>1. GUARANTEE WORK OF THESE CONTRACT DOCUMENTS IN WRITING FOR NOT LESS THAN ONE (1) YEAR FROM DATE OF FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN THIS PERIOD, PROMPT AND TO OWNER'S SATISFACTION AND CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE WITHIN CONTRACT PRICE.</p>

DUCTWORK LEGEND	
SYMBOL	DESCRIPTION
	RECTANGULAR DUCTWORK
	ROUND DUCTWORK
	DUCTWORK SHOWN SINGLE LINE
	ACOUSTICALLY LINED DUCTWORK
	ACOUSTICALLY LINED DUCTWORK (SINGLE LINE)
	RECTANGULAR SUPPLY DUCTWORK TOWARDS (UP IN PLAN)
	ROUND SUPPLY DUCTWORK TOWARDS (UP IN PLAN)
	RECTANGULAR RETURN DUCTWORK TOWARDS (UP IN PLAN)
	ROUND RETURN DUCTWORK TOWARDS (UP IN PLAN)
	RECTANGULAR RETURN DUCTWORK AWAY (DOWN IN PLAN)
	ROUND RETURN DUCTWORK AWAY (DOWN IN PLAN)
	RECTANGULAR EXHAUST DUCTWORK TOWARDS (UP IN PLAN)
	ROUND EXHAUST DUCTWORK TOWARDS (UP IN PLAN)
	RECTANGULAR EXHAUST DUCTWORK AWAY (DOWN IN PLAN)
	ROUND EXHAUST DUCTWORK AWAY (DOWN IN PLAN)
	FLEXIBLE DUCT
	OPEN ENDED DUCT WITH WIRE MESH SCREEN
	CAPPED DUCT
	DUCT TRANSITION

CONTROLS LEGEND COMPLETE		
PLAN SYMBOL	DIAGRAM SYMBOL	DESCRIPTION
		ANALOG INPUT
		ANALOG OUTPUT
		DIGITAL INPUT
		DIGITAL OUTPUT
		THERMOSTAT - STAND ALONE
		CO2 SENSOR
		DDC CONTROL PANEL NETWORKED TO BMS
ACTUATOR LEGEND		
SYMBOL	DESCRIPTION	
	DAMPER OR VALVE WITH TWO POSITION ACTUATOR	
	DAMPER OR VALVE WITH MODULATING ACTUATOR	



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REVISIONS		
NO.	DATE	DESCRIPTION

**K.T. MURPHY
 STEAM UH
 REPLACEMENT**

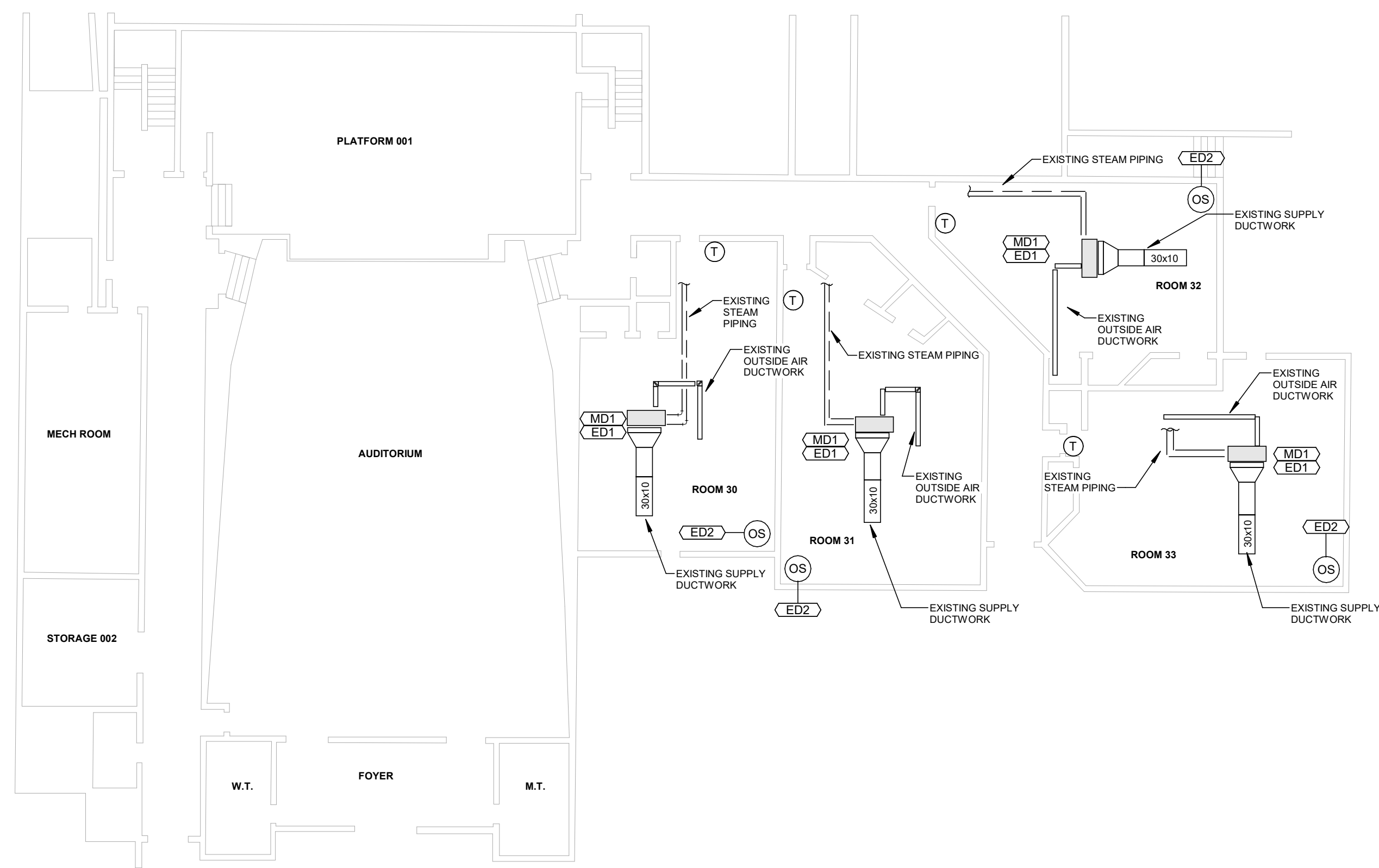
**19 HORTON ST
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**ABBREVIATIONS,
 NOTES, AND
 SYMBOLS**

DATE:	12/23/2022
PROJECT NO:	2022482.01
DRAWN:	CLB
CHECKED:	WKH
ISSUED FOR:	100% CD
REVISIONS:	

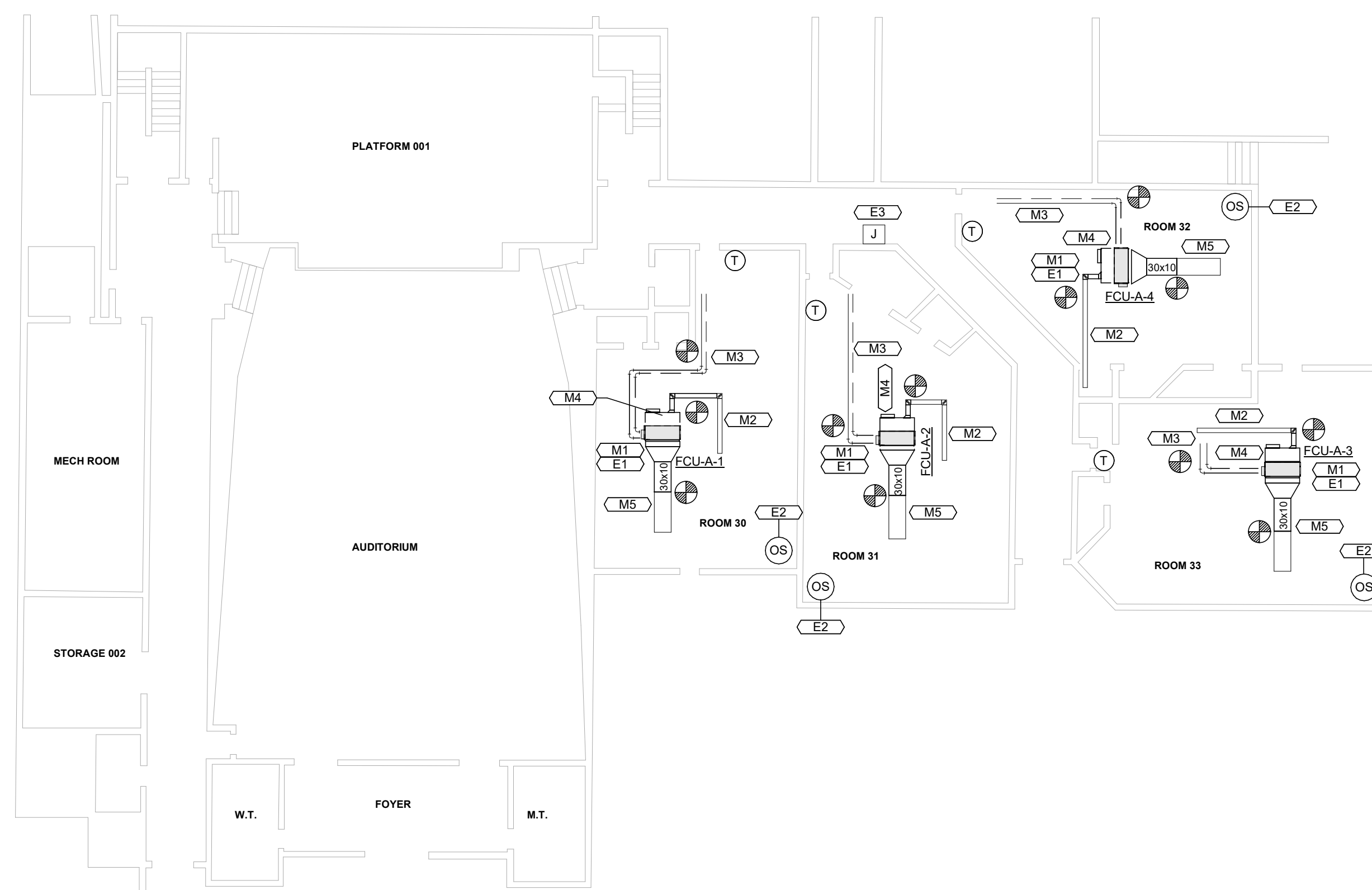
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KEYNOTES - DEMOLITION	
Key Value	Keynote Text
ED1	DISCONNECT ELECTRICAL CONNECTIONS TO EXISTING UNIT HEATER AND MAKE SAFE FOR CONNECTION TO NEW UNIT. REFER TO NEW WORK PLANS FOR ADDITIONAL INFORMATION.
ED2	DISCONNECT AND REMOVE EXISTING LOW VOLTAGE OCCUPANCY SENSOR AND REPLACE WITH NEW. REFER TO NEW WORK PLANS FOR ADDITIONAL INFORMATION.
MD1	REMOVE EXISTING STEAM UNIT HEATER, DISCONNECT SUPPLY AND OUTSIDE AIR DUCTWORK. CLEAN AND DISINFECT ASSOCIATED DUCTWORK, DAMPERS, DIFFUSERS, AND REGISTERS. REMOVE OUTSIDE AIR DAMPER ACTUATOR. PROVIDE DUCTWORK CAPS DURING CONSTRUCTION. REMOVE STEAM AND CONDENSATE PIPING BACK TO SHUT OFF VALVE. REPLACE SHUT OFF VALVE IN KIND. PROVIDE INSULATED PIPING CAP DURING CONSTRUCTION. REMOVE CONTROL WIRING BACK TO THE ASSOCIATED WALL THERMOSTAT. REMOVE ASSOCIATED THERMOSTAT. PATCH THE WALL TO MATCH EXISTING.

1 Ground Level - Demolition
1/16" = 1'-0"



KEYNOTES - NEW WORK	
Key Value	Keynote Text
E1	RECONNECT EXISTING ELECTRICAL BRANCH CIRCUIT TO NEW UNIT HEATER. COORDINATE CONNECTION POINT WITH DIV. 23. PROVIDE WIRE AND CONDUIT TO MATCH EXISTING, AS REQUIRED.
E2	PROVIDE LOW VOLTAGE OCCUPANCY SENSOR WITH AUXILIARY CONTACTS, ACUITY BRANDS CM-PDT-10-R OR EQUAL. CONNECT NEW OCCUPANCY SENSOR TO EXISTING POWER PACK. PROVIDE WIRING PER MANUFACTURER REQUIREMENTS. COORDINATE CONNECTION TO BUILDING MANAGEMENT SYSTEM WITH DIV. 23 CONTRACTOR.
E3	PROVIDE 120V, 1PH. POWER FOR HVAC CONTROLS VIA LOCAL UNSWITCHED RECEPTACLE CIRCUIT. COORDINATE EXACT LOCATION WITH DIV. 23.
M1	PROVIDE NEW STEAM UNIT HEATER. EXTEND EXISTING SUPPLY AND OUTSIDE AIR DUCTWORK AND CONNECT TO THE NEW UNIT WITH A FLEXIBLE DUCT CONNECTION. PROVIDE NEW INTERNALLY INSULATED RETURN AIR PLENUM WITH FILTER ACCESS. EXTEND EXISTING STEAM AND CONDENSATE PIPING AND CONNECT TO THE UNIT. REFER TO TYPICAL DETAILS FOR MORE INFORMATION. PROVIDE HANGER-MOUNT VIBRATION ISOLATORS.
M2	EXISTING OUTSIDE AIR DUCT. CONTRACTOR SHALL FIELD VERIFY DUCT SIZES.
M3	1" EXISTING STEAM AND 3/4" CONDENSATE PIPING. CONTRACTOR SHALL FIELD VERIFY PIPING SIZES.
M4	LINED RETURN PLENUM AND FILTER BOX. PROVIDE 24x10 RETURN OPENING WITH 1/2x1/2 SCREEN MESH.
M5	NEW DUCTWORK. COORDINATE DUCT TRANSITION SIZE IN THE FIELD. PROVIDE FLEXIBLE DUCT CONNECTION. RE-BALANCE EXISTING DIFFUSERS' AIRFLOW IN THE CLASSROOM.

2 Ground Level - New Work
1/16" = 1'-0"



STAMFORD PUBLIC SCHOOLS

888 WASHINGTON BLVD, 5TH FLOOR
STAMFORD, CT 06901

REVISIONS

NO.	DATE	DESCRIPTION

K.T. MURPHY STEAM UH REPLACEMENT

19 HORTON ST
STAMFORD, CT
06902

MECHANICAL AND ELECTRICAL FLOOR PLANS

DATE: 12/23/2022
PROJECT NO: 2022482.01
DRAWN: CLB
CHECKED: WKH
ISSUED FOR: 100% CD
REVISIONS:

SHEET NO.

ME1.00

STEAM FAN COIL UNIT SCHEDULE																	
GENERAL				PHYSICAL	PERFORMANCE					ELECTRICAL				REMARKS			
TAG	MANUFACTURER	MODEL	LOCATION	WEIGHT (LB)	FAN		COIL			WATTS	VOLTAGE	PHASE	MCA	TYPE	RATINGS	FEATURES	INSTALL
					CFM	ESP (IN WG)	MBH	PRESSURE (PSI)	LEAVING DB (°F)								
FCU-A	TRANE	FFCB100	REFER TO PLANS	200	1000	0.35	82.08	6.00	110.0	317	115	1	6.07	1	1	ALL	ALL
REMARKS - TYPE				REMARKS - RATINGS					REMARKS - FEATURES				REMARKS - INSTALL				
1. HORIZONTAL CONCEALED, STEAM COIL, ECM MOTOR				1. COIL PERFORMANCE CERTIFIED IN ACCORDANCE TO ARI 410, AT 40 °F EAT					1. MANUAL BACK OPENING OUTSIDE AIR DAMPER 2. BOTTOM TOE SPACE INLET 3. FRONT DUCT COLLAR OUTLET 4. KEYLOCK ACCESS DOOR 5. HIGH STATIC ECM MOTOR 6. 1" MERV 8 FILTER AND SPARE 7. DISCONNECT SWITCH 8. UNIT SHALL BE ACOUSTICALLY INSULATED WITH CLOSED CELL INSULATION				1. SEE DETAIL 1ME-101 2. SUSPEND UNIT FROM STRUCTURE ABOVE AT FOUR CORNERS WITH VIBRATION HANGERS 3. PROVIDE FLEXIBLE DUCT CONNECTIONS AT INLET AND DISCHARGE 4. CONTRACTOR SHALL FIELD VERIFY AND CHECK COIL ORIENTATION BEFORE ORDERING				



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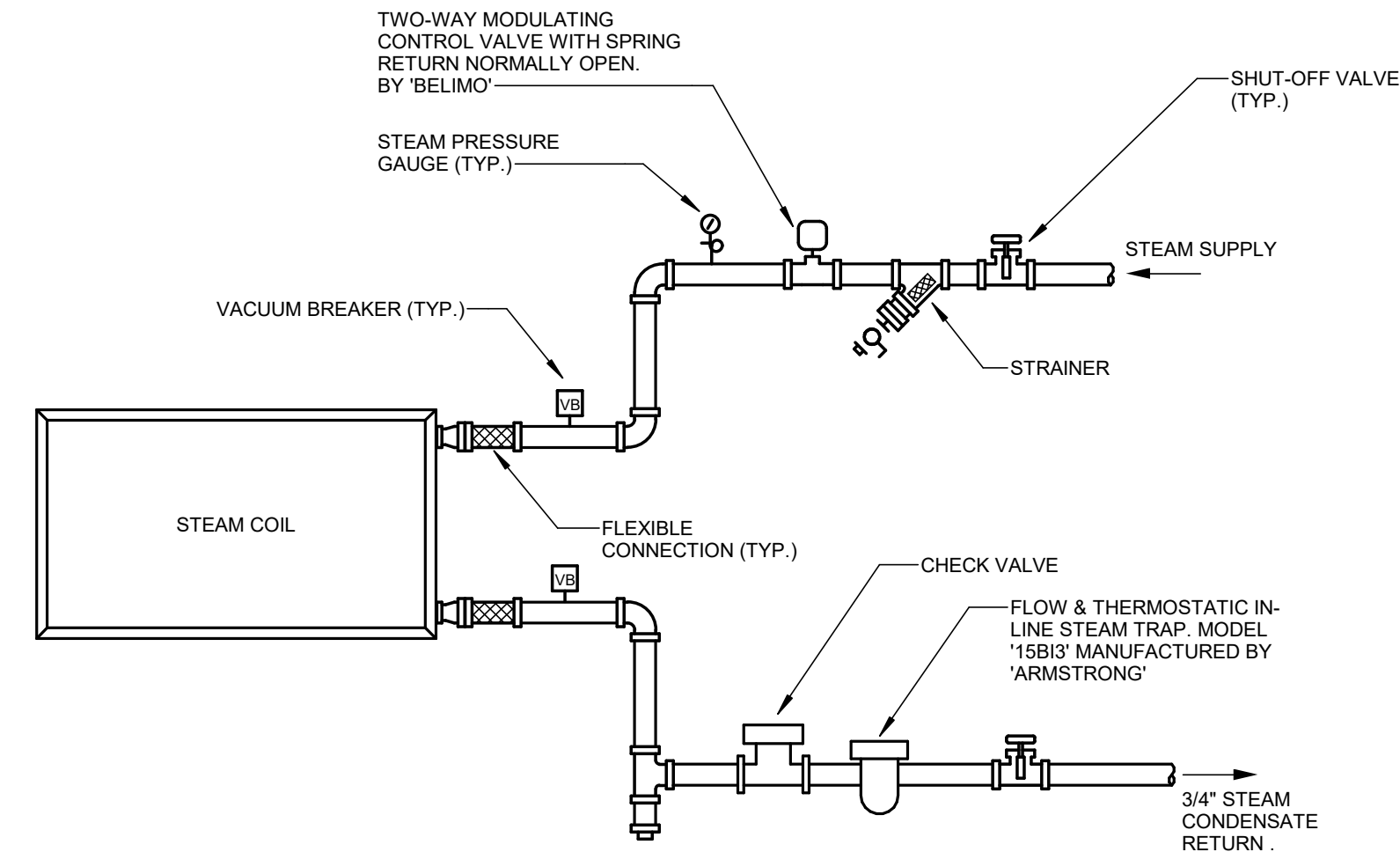
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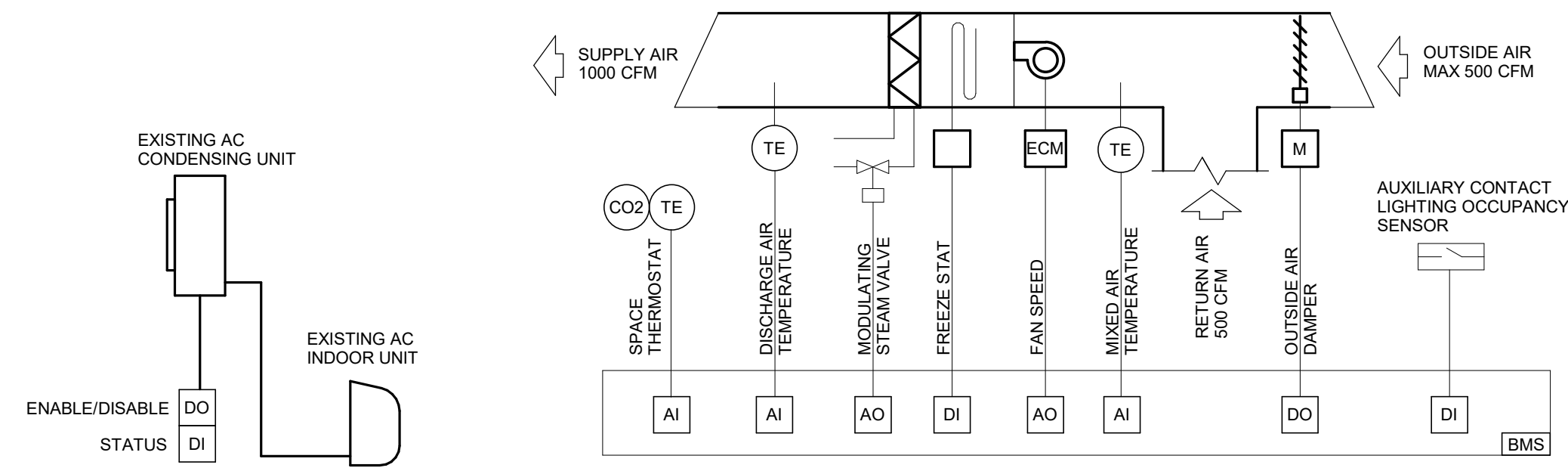
SCHEDULES AND DETAILS

DATE: 12/23/2022
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1 STEAM COIL PIPING DIAGRAM
NTS



SEQUENCE OF OPERATION

- UNIT SHALL BE DISABLED DURING THE HEATING SEASON, AND ENABLED DURING THE COOLING SEASON.
- HEATING AND COOLING SYSTEMS IN THE SPACE SHALL BE INTERLOCKED. WHEN THE HEATING SYSTEM IS ENABLED, THE COOLING SYSTEM SHALL BE DISABLED AND VICE VERSA.
- WHEN THE SPACE IS UNOCCUPIED FOR AN HOUR, DISABLE THE COOLING SYSTEM.

NOTES:

- EACH CLASSROOM HAS AN AC UNIT.
- PROVIDE A CURRENT SWITCH TO READ THE STATUS OF THE UNIT.
- PROVIDE A RELAY TO ENABLE/DISABLE THE SYSTEM.
- PROVIDE (2) 24VAC TRANSFORMER FOR THE NEW HVAC CONTROLLER.

SEQUENCE OF OPERATION

- CONTROLLER SHALL MODULATE THE STEAM VALVE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE. DISCHARGE AIR TEMPERATURE SHALL NOT BE MORE THAN 110°F.
- WHEN MIXED AIR TEMPERATURE IS LESS THAN 38°F, THE OUTSIDE AIR DAMPER SHALL CLOSE AND THE FAN SHALL RAMP UP TO MAXIMUM FLOW.
- UPON A SIGNAL FROM THE FREEZE STAT, THE OUTSIDE AIR DAMPER SHALL CLOSE, THE FAN SHALL BE AT MAX FLOW, AND AN ALARM SHALL BE GENERATED.
- CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE USING PROPORTIONAL - INTEGRAL PI CONTROL LOOP MECHANISM.
- HEATING AND COOLING SYSTEMS IN THE SPACE SHALL BE INTERLOCKED. WHEN THE HEATING SYSTEM IS ENABLED, THE COOLING SYSTEM SHALL BE DISABLED AND VICE VERSA.
- WHEN THE SPACE IS UNOCCUPIED FOR HALF AN HOUR, DRIFT THE TEMPERATURE SETPOINT FIVE DEGREES BELOW THE SETPOINT.
- TEMPERATURE SETPOINT SHALL BE BY THE BMS BASED ON OCCUPIED/UNOCCUPIED SCHEDULE.
- OCCUPANTS SHALL BE ABLE TO ADJUST THE SPACE TEMPERATURE SET POINT ±4 DEGREES (ADJ.). BMS SHOULD OVERRIDE THE SETPOINT ACCORDING TO A PRESET SCHEDULE.

NOTE:

- OUTSIDE AIR DAMPER ACTUATOR SHALL HAS SPRING RETURN AND FAIL ON CLOSE POSITION.

2 STEAM FAN COIL UNIT CONTROLS DIAGRAM
NTS