

GENERAL PROJECT NOTES

1.01. CONTRACT DRAWINGS: IN GENERAL, DRAWINGS ARE SCHEMATIC IN NATURE AND ARE INTENDED AS A GUIDE TO THE CONTRACTOR, BUT DO NOT NECESSARILY SHOW ALL DETAILS, OFFSETS, ETC. ALL DRAWINGS SHALL BE THOROUGHLY INSPECTED BY THE CONTRACTOR. THE CONTRACTOR'S WORK SHALL CONFORM TO THE INFORMATION CONTAINED IN THIS SPECIFICATION AND/OR AS INDICATED IN THE LATEST REVISION OF THE DRAWINGS REFERRED TO THEREIN. THE CONTRACTOR SHALL CONSULT WITH THE ENGINEER REGARDING ALL QUESTIONS, UPON WHICH HE MAY BE IN DOUBT, BEFORE PROCEEDING WITH FABRICATION OF PARTS AFFECTED. AT HIS OWN EXPENSE, THE CONTRACTOR SHALL PREPARE ALL ADDITIONAL DETAIL OR FIELD INSTALLATION DRAWINGS NECESSARY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS INDICATED ON THE ENGINEER'S LAYOUT DRAWINGS AND DETERMINE IF ANY CHANGES ARE REQUIRED IN CONDUITS, PIPING RUNS, DRAINS, ETC. TO AVOID INTERFERENCE. MAJOR CHANGES SHALL NOT BE MADE WITHOUT THE APPROVAL OF THE ENGINEER. WHILE THE DRAWINGS SHALL BE ADHERED TO AS CLOSELY AS POSSIBLE, THE CONTRACTOR HAS THE RIGHT TO VARY THE RUN OF CONDUITS, PIPING AND/OR DUCTS DURING PROGRESS OF THE WORK AS MAY BE FOUND NECESSARY OR DESIRABLE TO AVOID INTERFERENCES. MAJOR REVISIONS SHALL BE VERIFIED WITH THE ENGINEER.

1.02. VERIFICATION:
A. BEFORE RUNNING ANY CONDUITS, DUCTS, PIPING, ETC., WITHIN THE BUILDING, THIS CONTRACTOR SHALL ASSURE HIMSELF THAT THESE MATERIALS CAN BE INSTALLED AS CONTEMPLATED, WITHOUT TRAPPING OR INTERFERING WITH COLUMNS, BEAMS, PIPING, FIXTURES, ETC. ANY NECESSARY MAJOR DEVIATION SHALL BE REFERRED TO THE ENGINEER FOR ADJUSTMENT BEFORE MATERIALS ARE INSTALLED. OF NECESSITY, OPENINGS, SUPPORTING STEEL, FIELD BUILT CURBS, ELECTRICAL DATA, SPACE REQUIREMENTS, ETC., WERE DESIGNED AROUND SPECIFIC PARAMETERS. WHEN THE CONTRACTOR DETERMINES THE MAKE OF EQUIPMENT TO BE PROVIDED FOR THE JOB, IT SHALL BE HIS RESPONSIBILITY TO VERIFY AND COORDINATE UNIT DIMENSIONS WITH THE GENERAL CONTRACTOR AND ALL OTHER INTERESTED CONTRACTORS ON THE JOB. IT SHALL ALSO BECOME THE CONTRACTOR'S RESPONSIBILITY TO CHANGE AS NECESSARY, THROUGH THE ENGINEER, ALL REQUIRED DIMENSIONS SO THAT OPENINGS, SUPPORTING STEEL, CURBS, ELECTRICAL DATA, ETC. WILL FIT THE EQUIPMENT SUPPLIED. ANY ADDITIONAL COST WILL BE THE SOLE RESPONSIBILITY OF THIS CONTRACTOR. IN ADDITION, ELECTRICAL POWER, INTERLOCK AND CONTROL DIAGRAMS AND PIPING ARRANGEMENTS WERE DESIGNED AROUND ONE SPECIFIC MANUFACTURER. IF ADDITIONAL WIRING, PIPING CONTROLS, ETC., ARE REQUIRED FOR OTHER EQUIPMENT, THIS CONTRACTOR SHALL INCLUDE THE COST OF THE SAME IN HIS PRICE.
B. ALL MEASUREMENTS, THE EXACT DETERMINATION OF RELATIVE ELEVATIONS OR LOCATIONS, THE ASCERTAINING OF ACCURACY OF ALL GIVEN ELEVATIONS AND DIMENSIONS AND THE ASCERTAINING OF ALL NECESSARY ADDITIONAL INFORMATION TO INSURE THE PROPER FIT AND COORDINATION OF ALL CONDUIT EQUIPMENT, DUCTS, AND PIPING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.03. SITE VISIT: ALL CONTRACTORS, BIDDING THE WORK INDICATED THROUGHOUT THE CONTRACT DOCUMENTS, ARE REQUIRED TO VISIT, AND THOROUGHLY EXAMINE THE PROJECT SITE AND ITS ASSOCIATED CONDITIONS. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS UNDER WHICH THIS WORK MUST BE PERFORMED. ALL CONTRACTORS SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO SUBMITTING A BID PROPOSAL. FAILURE TO DO SO SHALL BE DEEMED AS ACCEPTANCE OF EXISTING CONDITIONS. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR ANY DEVIATIONS OR DISCREPANCIES TO THESE PLANS AFTER A CONTRACTOR HAS BEEN SELECTED.

1.04. GUARANTEE: THE CONTRACTOR GUARANTEES, BY HIS ACCEPTANCE OF THE CONTRACT, THAT ALL WORK WILL BE FREE FROM DEFECTS IN WORKMANSHIP AND/OR MATERIALS, FOR A PERIOD OF TWO YEARS FOLLOWING PROJECT COMPLETION UNLESS NOTED OTHERWISE, AND THAT ALL APPARATUS WILL DEVELOP CAPACITIES AND CHARACTERISTICS SPECIFIED. SHOULD ANY DEFECTS IN WORKMANSHIP AND/OR MATERIALS REQUIRE REDESIGN OF ANY PART OF THE ELECTRICAL, MECHANICAL, PLUMBING OR ARCHITECTURAL LAYOUT, ALL SUCH REDESIGN AND ALL NEW DRAWINGS AND DETAILING REQUIRED THEREOF SHALL, WITH THE APPROVAL OF THE ARCHITECT, BE PREPARED BY THE CONTRACTOR AT HIS OWN EXPENSE. WHERE SUCH APPROVED DEVIATION REQUIRES A DIFFERENT QUANTITY AND ARRANGEMENT OF DUCTWORK, PIPING, WIRING, CONDUIT AND/OR EQUIPMENT FROM THAT SPECIFIED OR DETAILED ON THE DRAWINGS, WITH THE APPROVAL OF THE ARCHITECT, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL SUCH MATERIALS AND/OR EQUIPMENT REQUIRED BY THE SYSTEM AT NO ADDITIONAL COST TO THE OWNER.

1.05. PERMITS AND CODES: CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH PERMITS, TAXES AND INSURANCE. ALL WORK SHALL BE INSTALLED IN COMPLETE CONFORMITY WITH LOCAL CODES AND ORDINANCES AS WELL AS THE FOLLOWING:
 A. NFPA 90
 B. MEC
 C. MEC
 D. LOCAL CODES & ORDINANCES
 E. ASHRAE/IECC
 F. ANSI
 G. ASTM
 H. UL
 I. NEC
 J. AMCA
 K. SMACNA

1.06. CONNECTIONS TO EXISTING WORK: PLAN THE INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH THE REGULAR OPERATION OF THE EXISTING FACILITIES. SUBMIT TO THE ARCHITECT, FOR HIS APPROVAL, A PROGRESS SCHEDULE INDICATING ALL NECESSARY TEMPORARY SHUTDOWNS OF EXISTING SERVICES. ALL SHUTDOWNS SHALL BE MADE AT SUCH TIMES AS WILL NOT INTERFERE WITH REGULAR OPERATION OF THE EXISTING FACILITIES AND ONLY AFTER WRITTEN APPROVAL FROM THE ARCHITECT.

1.07. NEW WORK: UNLESS OTHERWISE NOTED, ALL WORK INDICATED THROUGHOUT THESE DRAWINGS SHALL BE CONSIDERED AS NEW WORK AND SHALL BE INCLUDED AS AN INTEGRAL PART OF THIS CONTRACT.

1.08. DUCTWORK CONSTRUCTION: ALL DUCTWORK SHALL BE CONSTRUCTED FOR THE STATIC PRESSURE CLASSIFICATION INDICATED IN THE "DUCTWORK MATERIAL CONSTRUCTION SCHEDULE." FURNISH TURNING VANES IN ALL SUPPLY AIR RECTANGULAR DUCTWORK ELBOWS AND T-SPLITS (REFER TO APPROPRIATE DETAIL FOR ADDITIONAL REQUIREMENTS). THE GENERAL ROUTING SHALL BE DETERMINED BY THE JOB SITE CONDITIONS AND SHALL BE COORDINATED WITH ALL OTHER CONSTRUCTION TRADES.

1.09. AIR DEVICE LOCATIONS: THE MECHANICAL CONTRACTOR SHALL REFER TO THE ARCHITECTURAL CEILING PLAN AND THE ELECTRICAL LIGHTING PLAN FOR ALL AIR DEVICE LOCATIONS. THE LOCATIONS INDICATED ON THE HVAC FLOOR PLAN ARE INTENDED FOR GENERAL POSITIONING PURPOSES ONLY.

1.10. SYSTEM INSTALLATION: MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE INSTALLATION OF ALL SYSTEMS SHOWN OR NOTED WITHIN CONTRACT DOCUMENTS. INSTALLATION SHALL BE COMPLETED PER ALL EQUIPMENT MANUFACTURERS WRITTEN INSTRUCTIONS. DEVIATIONS OF THIS SHALL NOT BE ACCEPTED UNLESS SPECIFIC WRITTEN CONSENT IS GIVEN BY PROJECTS ENGINEER. ALL POTENTIAL INSTALLATION CONCERNS SHALL BE SUBMITTED TO ARCHITECT PRIOR TO BID SUBMISSION.

CONTRACTOR RESPONSIBILITY MATRIX

WORK	FURNISHED BY...	INSTALLED BY...	LOW VOLT. WIRING BY...	LINE POWER BY...	REMARKS
TCS LOW VOLTAGE & COMMUNICATION WIRING	T.C.C.	T.C.C.	T.C.C.	NOT APPLICABLE	
TCS CONDUIT & RACEWAYS	T.C.C.	T.C.C.	T.C.C.	NOT APPLICABLE	
TCS CURRENT SWITCHES	T.C.C.	T.C.C.	T.C.C.	T.C.C.	
TCS RELAYS	T.C.C.	T.C.C.	T.C.C.	T.C.C.	
TCS NODES, EQUIPMENT, HOUSINGS, ENCLOSURES & PANELS	T.C.C.	T.C.C.	T.C.C.	NOT APPLICABLE	
PRESSURE DIFFERENTIAL SWITCH	T.C.C.	M.C.	T.C.C.	NOT APPLICABLE	
TCS INTERFACE WITH BOILER CONTROLS	T.C.C.	T.C.C.	T.C.C.	T.C.C.	
BOILER CONTROLS INTERFACE WITH TCS	VIA BOILER MANUFACTURER	T.C.C.	T.C.C.	T.C.C.	
VARIABLE FREQUENCY DRIVES	T.C.C.	M.C.	T.C.C.	E.C.	1
UNIT HEATER CONTROLS	UNIT MOUNTED BY M.C.; OTHERWISE, T.C.C.	UNIT MOUNTED BY M.C.; OTHERWISE, T.C.C.	T.C.C.	T.C.C.	
MOTORIZED DAMPERS INTEGRAL TO EQUIPMENT	M.C.	M.C.	T.C.C.	T.C.C.	
MOTORIZED DAMPER OPERATORS	T.C.C.	T.C.C.	T.C.C.	T.C.C.	
MOTORIZED VALVES & VALVE OPERATORS	T.C.C.	M.C.	T.C.C.	NOT APPLICABLE	
SELF CONTAINED THERMOSTATIC CONTROL VALVES & ACTUATORS	T.C.C.	M.C.	NOT APPLICABLE	NOT APPLICABLE	
CONTROLLERS FOR TERMINAL CONTROL UNITS	T.C.C.	IN FIELD BY T.C.C.	T.C.C.	T.C.C.	
MANUAL VALVES	M.C.	M.C.	NOT APPLICABLE	NOT APPLICABLE	
PIPE INSERTION DEVICES & TAPS INCLUDING THERMOWELLS, FLOW & PRESSURE STATIONS	T.C.C.	M.C.	T.C.C.	T.C.C.	
PNEUMATIC CONTROLS SYSTEMS DEMO WORK	T.C.C.	T.C.C.	---	---	

REMARKS:
 1. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL LINE-SIDE POWER TO VFD AND LOAD SIDE POWER CONNECTIONS BETWEEN VFD AND ASSOCIATED MOTOR.

KEY:
 E.C. ELECTRICAL CONTRACTOR
 M.C. MECHANICAL CONTRACTOR
 T.C.C. TEMPERATURE CONTROL SYSTEM CONTRACTOR
 T.C.U. MFR. TEMPERATURE CONTROL SYSTEM CONTRACTOR MANUFACTURER
 T.C.S. TEMPERATURE CONTROL SYSTEM
 LINE POWER ≥ 110 VOLTS
 LOW VOLT ≤ 100 VOLTS

HOT WATER BOILER SCHEDULE

(REFER TO SPECIFICATION SECTION 235216 FOR ADDITIONAL REQUIREMENTS.)

TAG #	LOCATION		THERMAL EFFICIENCY	FUEL	GAS PRESSURE		MBH INPUT	MBH OUTPUT	TURN DOWN	EWT (°F)	LWT (°F)	GPM	FLUID TYPE	MAX WPD (FT)	WATER VOLUME (GAL)	INLET SIZE	OUTLET SIZE	ELECTRICAL		APPROX. WEIGHT	MAKE/ MODEL	REMARKS	
	DWG	ROOM			MIN.	MAX.												TOTAL AMPS	VOLTAGE				
WA-B-1	M3.02	BOILER ROOM 129	97.7	NATURAL GAS	1"	4"	14"	500	489	10:1	140	180	24	WATER	2.8	12	2"	2"	12	120	470	LOCHINVAR FTX500N	1, 2, & 3
WA-B-2	M3.02	BOILER ROOM 129	97.7	NATURAL GAS	1"	4"	14"	500	489	10:1	140	180	24	WATER	2.8	12	2"	2"	12	120	470	LOCHINVAR FTX500N	1, 2, & 3

REMARKS:
 1. FURNISH BOILER WITH MODULATING FIRING CONTROL, STAINLESS STEEL BURNERS, DIAGNOSTIC CONTROL PANEL, LOW WATER CUT-OFF, FLOW SWITCH, OUTDOOR RESET AND CONDENSATE NEUTRALIZATION KIT.
 2. FURNISH BOILER WITH THE PIPING INSTALLATION PROCEDURES ILLUSTRATED BY THE FLOW DIAGRAM ON DRAWING M5.01.
 3. FURNISH BOILER WITH BACNET NETWORK CARD, COORDINATE WITH TEMPERATURE CONTROL CONTRACTOR.

PUMP SCHEDULE

(REFER TO SPECIFICATIONS SECTION 232123 FOR ADDITIONAL REQUIREMENTS.)

TAG #	LOCATION		SERVICE	TYPE	OPERATION	FLUID	GPM	MIN GPM	MAX GPM	HEAD PRESS. (FT)	IMPELLER DIAMETER (IN)	INLET SIZE (IN)	OUTLET SIZE (IN)	MOTOR DATA				B&G SERIES MODEL	REMARKS		
	DWG	ROOM												BHP	HP	RPM	VOLTAGE				
WA-HWP-1	M3.02	BOILER ROOM 129	HEATING WATER	END SUCTION	PRIMARY	WATER	98	15	105	57	7.75	2	2	2.4	3	1,800	240/3	E-1510/1.5BC	1 THRU 6		
WA-HWP-2	M3.02	BOILER ROOM 129	HEATING WATER	END SUCTION	BACK-UP	WATER	98	15	105	57	7.75	2	2	2.4	3	1,800	240/3	E-1510/1.5BC	1 THRU 6		
WA-HWS-1	M3.02	BOILER ROOM 129	DHW INDIRECT TANK	IN-LINE	SINGLE	WATER	---	---	---	---	---	---	---	---	---	---	---	---	---	---	7

REMARKS:
 1. PROVIDE TAPPED CONNECTIONS IN FLANGES FOR INSTALLATION OF PRESSURE GAUGES.
 2. PROVIDE GUARD OVER EXPOSED ROTATING COUPLINGS.
 3. PUMP SHALL NOT OVERLOAD MOTOR AT ANY POINT ON HEAD CAPACITY CURVE.
 4. FURNISH PUMP WITH END SUCTION DIFFUSER.
 5. PROVIDE PUMP WITH INVERTER DUTY MOTOR.
 6. IN BASE BID, FURNISH UNIT WITH DANFOSS MOTOR FREQUENCY CONVERTER TO CONVERT THE POWER FROM 240V/1PH BUILDING POWER TO 240V/3PH MOTOR POWER. ALTERNATE E-1 DESIGN ELIMINATES THE DANFOSS MOTOR FREQUENCY CONVERTER AND IS 240V/3PH BUILDING POWER WITH ELECTRICAL SYSTEM UPGRADE. REFER TO VFD SCHEDULE ON THIS DRAWING.
 7. REFER TO PLUMBING SHEET P1.01 FOR PUMP SPECIFICATION.

HOT WATER UNIT HEATER SCHEDULE

(REFER TO SPECIFICATIONS SECTION 238240 FOR ADDITIONAL REQUIREMENTS.)

TAG #	LOCATION		TYPE	MOUNTING	CFM	EWT (°F)	LWT (°F)	GPM	FLUID TYPE	MAX WPD (FT)	MBH	MOTOR DATA		CONTROL VALVE TYPE	T-STAT MTG	MAKE/ MODEL	REMARKS
	DWG	ROOM										WATTS	VOLTS/ PHASE				
WA-UH-1	M3.02	KITCHEN 119	HORIZONTAL	CEILING	500	180	160	1.6	WATER	2.2	15.7	16	115/1	2-WAY	WALL	STERLING HS-118A	1 & 2
WA-UH-2	M3.02	BOILER ROOM 129	HORIZONTAL	CEILING	580	180	160	2.1	WATER	2.2	21.3	25	115/1	2-WAY	WALL	STERLING HS-125A	1 & 2

REMARKS:
 1. SUSPEND UNIT FROM STRUCTURE ABOVE WITH ALL-THREADED ROD, SIZED PER MANUFACTURER'S REQUIREMENTS.
 2. FURNISH UNIT WITH ADJUSTABLE 4-WAY DISCHARGE LOUVER.

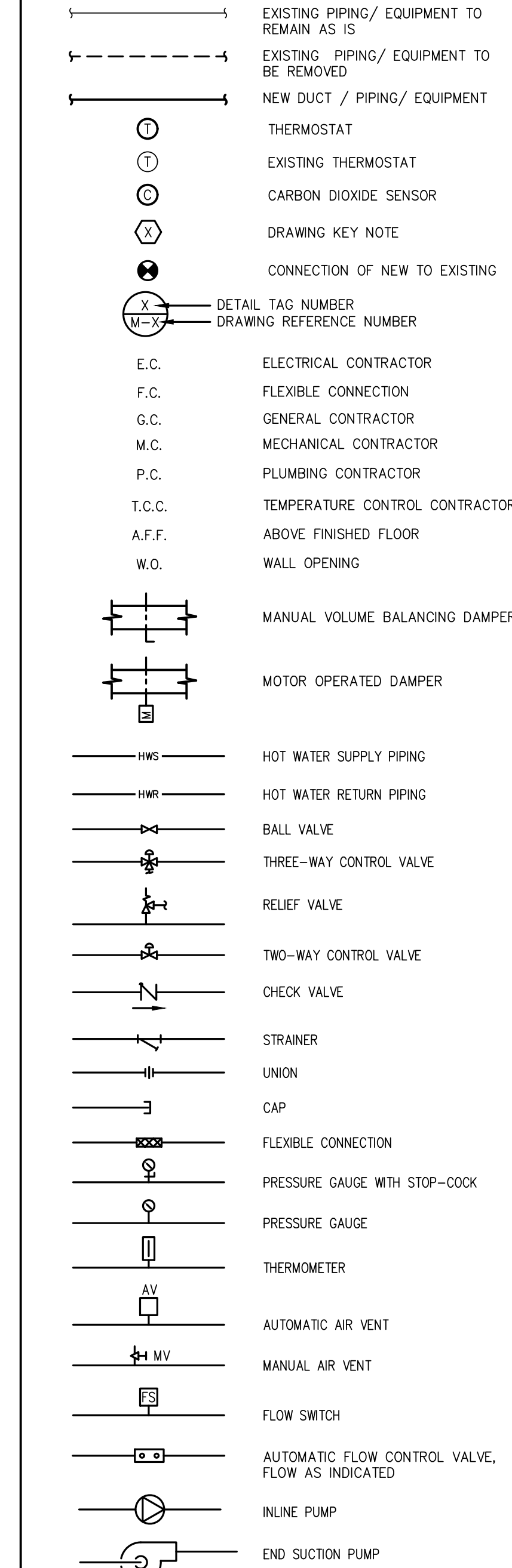
VFD SCHEDULE

(REFER TO SPECIFICATIONS SECTION 15890 FOR ADDITIONAL REQUIREMENTS.)

ITEM	LOCATION OF VFD		ELECTRICAL DATA		REMARKS
	DWG	ROOM	HP	VOLTAGE/PH	
PUMP WA-HWP-1 WA-VFD-1	M3.02	BOILER ROOM 129	3	240/3	1,2
PUMP WA-HWP-2 WA-VFD-2	M3.02	BOILER ROOM 129	3	240/3	1,2

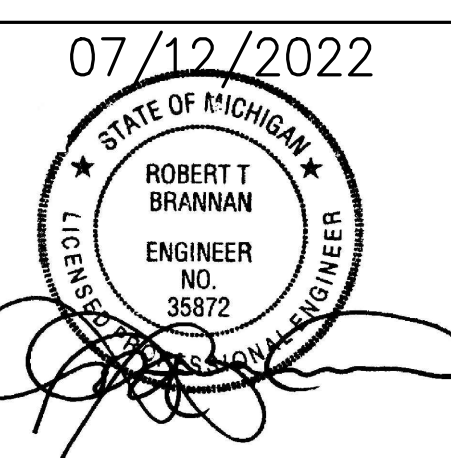
REMARKS:
 1. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF VFD'S INCLUDING ANY MISCELLANEOUS STEEL UNISTRUT NECESSARY TO SUPPORT VFD'S INDEPENDENT OF EQUIPMENT SERVED.
 2. BASE BID DESIGN PUMP IS 240V/3 PH WITH DANFOSS MOTOR FREQUENCY CONVERTER TO CONVERT FROM THE BUILDING POWER OF 240V/1PH. ALTERNATE E-1 DESIGN ELIMINATES THE DANFOSS MOTOR FREQUENCY CONVERTER AND IS 240V/3PH BUILDING POWER WITH ELECTRICAL SYSTEM UPGRADE.

MECHANICAL LEGEND



HVAC DRAWING LIST

DWG NO.	TITLE	FILE NO.
M1.01	LEGEND, SPECIFICATIONS, AND SCHEDULES	22079M1.01.dwg
M1.02	SCHEDULES AND CALCULATIONS	22079M1.02.dwg
M1.03	DETAILS	22079M1.03.dwg
M1.04	DETAILS	22079M1.04.dwg
M2.01	PARTIAL FIRST FLOOR DEMO PLAN (SOUTH END)	22079M2.01.dwg
M2.02	PARTIAL FIRST FLOOR DEMO PLAN (NORTH END)	22079M2.02.dwg
M3.01	PARTIAL FIRST FLOOR PLAN (SOUTH END)	22079M3.01.dwg
M3.02	PARTIAL FIRST FLOOR PLAN (NORTH END)	22079M3.02.dwg
M5.01	FLOW DIAGRAMS	22079M5.01.dwg
M6.01	TEMPERATURE CONTROLS	22079M6.01.dwg
M6.02	TEMPERATURE CONTROLS	22079M6.02.dwg
M6.03	TEMPERATURE CONTROLS	22079M6.03.dwg



DATE	DESCRIPTION
07.12.2022	BIDDING & STATE REVIEW

MECHANICAL UPDATES & RELATED WORK
 WATERLOO ELEMENTARY SCHOOL
 1933 SOUTH CUSTER ROAD, MONROE, MI 48161
 MONROE PUBLIC SCHOOLS
 1275 N. MACOMB STREET, MONROE, MI 48162

JOB #	22114
DRAWN	JDC
CHECKED	ERS

LEGEND, SPECIFICATIONS, AND SCHEDULES
M1.01

THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY ROBERT TIMOTHY BRANNAN, PE, USING A DIGITAL SIGNATURE AND DATE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED, AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

UNIT VENTILATOR SCHEDULE (REFER TO SPECIFICATIONS SECTION 238223 FOR ADDITIONAL REQUIREMENTS.)

TAG #	LOCATION		UNIT TYPE	FAN DATA				HW HEATING COIL						UNIT DIMENSIONS			ELECTRICAL			MAKE/ MODEL	REMARKS			
	DWG	ROOM		CFM HIGH SPEED	DESIGN CFM	MIN. OA CFM	HP	EAT (°F)	LAT (°F)	MBH	GPM	FLUID	EWT (°F)	MAX. WPD (FT)	ROWS	CONTROL VALVE TYPE	LENGTH (INCHES)	HEIGHT (INCHES)	DEPTH (INCHES)			VOLTS/ PHASE	MCA	MOCF
WA-UV-1	M3.01	CLASSROOM 101	VERTICAL	1,000	890	300	1/3	50.0	106.2	59.7	2.6	WATER	180	1.46	2	3-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9
WA-UV-2	M3.01	CLASSROOM 103	VERTICAL	1,000	890	300	1/3	50.0	96.4	50.2	2.6	WATER	180	1.07	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9
WA-UV-3	M3.01	CLASSROOM 111	VERTICAL	1,000	890	300	1/3	50.0	96.4	50.2	2.6	WATER	180	1.07	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9
WA-UV-4	M3.01	CLASSROOM 113	VERTICAL	1,000	890	300	1/3	50.0	96.4	50.2	2.6	WATER	180	1.07	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11
WA-UV-5	M3.01	CLASSROOM 115	VERTICAL	1,000	890	300	1/3	50.0	95.3	49.1	2.4	WATER	180	0.91	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11
WA-UV-6	M3.01	CLASSROOM 102	VERTICAL	1,000	890	300	1/3	50.0	106.2	59.7	2.6	WATER	180	1.46	2	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9
WA-UV-7	M3.01	CLASSROOM 104	VERTICAL	1,000	890	300	1/3	50.0	104.6	57.9	2.4	WATER	180	1.24	2	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9
WA-UV-8	M3.01	EXISTING MEETING ROOM	VERTICAL	750	650	75	1/3	50.0	95.1	36.6	2.0	WATER	180	0.61	1	2-WAY	62	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H07	1 THRU 9
WA-UV-9	M3.01	CLASSROOM 112	VERTICAL	1,000	890	300	1/3	50.0	95.3	49.0	2.4	WATER	180	0.91	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9
WA-UV-10	M3.01	CLASSROOM 114	VERTICAL	1,000	890	300	1/3	50.0	95.3	49.0	2.4	WATER	180	0.91	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11
WA-UV-11	M3.01	CLASSROOM 116	VERTICAL	1,000	890	300	1/3	50.0	95.3	49.0	2.4	WATER	180	0.91	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11
WA-UV-12	M3.02	CLASSROOM 118	VERTICAL	1,000	890	300	1/3	50.0	95.3	49.0	2.4	WATER	180	0.91	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11
WA-UV-13	M3.02	CLASSROOM 120	VERTICAL	1,000	890	300	1/3	50.0	95.3	49.0	2.4	WATER	180	0.91	1	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11
WA-UV-14	M3.02	IT/STOR. 128	VERTICAL	750	650	75	1/3	50.0	95.1	36.6	2.0	WATER	180	0.61	1	2-WAY	62	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H07	1 THRU 9
WA-UV-15	M3.02	CLASSROOM D 130	VERTICAL	1,000	890	300	1/3	50.0	106.2	59.7	2.6	WATER	180	1.46	2	2-WAY	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9
WA-UV-16	M3.02	KINDERGARTEN CLASSROOM B 133	VERTICAL	1,250	1,090	310	1/3	50.0	102.7	69.3	2.8	WATER	180	1.13	2	2-WAY	86	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H13	1 THRU 9

REMARKS:
 1. CONNECT HOT WATER COIL IN ACCORDANCE WITH DETAIL "E" ON DRAWING M1.04.
 2. FURNISH UNIT WITH CONDENSATE DRAIN PAN, (FOR FUTURE COOLING)
 3. FURNISH UNIT WITH PENCIL PROOF DISCHARGE GRILLE AND 3-SPEED FAN SWITCH.
 4. UNIT AND GRILLE FINISH SHALL BE SELECTED BY ARCHITECT FROM MANUFACTURER'S STANDARD COLOR CHART.
 5. EXISTING WALL OPENING AND EXTERIOR GRILLE SHALL REMAIN.
 6. DIGITAL READY UNIT WITH SENSORS AND ACTUATORS (DCC CONTROLLER BY TCC)
 7. FURNISH UNITS WITH END PANELS, FILLER SECTIONS AND SUB-BASE AS REQUIRED FOR COMPLETE AND FINISHED INSTALLATION AND AS REQUIRED FOR UNIT VENTILATOR TO BE TIGHT TO BOTTOM OF EXISTING WINDOW SILL.
 8. COORDINATE FINISH COLOR WITH ARCHITECT. COLOR SHALL BE SELECTED FROM MANUFACTURER'S STANDARD COLOR CHART.
 9. FURNISH UNIT WITH ARRANGEMENT "AM" WITH INTEGRAL 21-7/8" TOP BAR GRILLE WITH 2" STEP DOWN, FULL ADAPTER BACK, AND INTEGRAL CLOSED PIPE TUNNEL WITH SOLID BACK.
 10. FURNISH UNIT WITH ARRANGEMENT "AB" WITH INTEGRAL 21-7/8" TOP BAR GRILLE, FULL ADAPTER BACK, AND INTEGRAL CLOSED PIPE TUNNEL WITH SOLID BACK.
 11. FURNISH UNIT WITH SHELVING AS INDICATED ON DRAWINGS. FURNISH UNIT WITH 18" WIDE UTILITY CABINET ON RIGHTHAND SIDE OF UNIT VENTILATOR FOR FUTURE COOLING.

HOT WATER FIN-TUBE RADIATION SCHEDULE (REFER TO SPECIFICATIONS SECTION 238236 FOR ADDITIONAL REQUIREMENTS.)

TAG #	DWG	ROOM	ELEMENT LENGTH FT	ENCLOSURE HEIGHT (IN)	# OF TIERS	COPPER TUBE DIAM (INCHES)	ALUMINUM FIN SIZE (INCHES)	AVG. WATER TEMP.	MINIMUM CAPACITY (BTUH)	STERLING ELEMENT MODEL	STERLING ENCLOSURE MODEL	REMARKS
WA-FT-1	M3.01	CLASSROOM 101	14'-0"	14	1	3/4"	4-1/4" x 4-1/4"	170	17,416	C3/4-435	JVB-S14	1
WA-FT-2	M3.01	CLASSROOM 102	14'-0"	14	1	3/4"	4-1/4" x 4-1/4"	170	17,416	C3/4-435	JVB-S14	1
WA-FT-E3	M3.01	EXISTING MEETING ROOM	---	---	---	---	---	---	---	---	---	3
WA-FT-E4	M3.02	TOILET 122A	---	---	---	---	---	---	---	---	---	2
WA-FT-E5	M3.02	LOUNGE 122	---	---	---	---	---	---	---	---	---	3
WA-FT-E6	M3.02	OFFICE 126	---	---	---	---	---	---	---	---	---	3
WA-FT-E7	M3.02	MEETING ROOM 124	---	---	---	---	---	---	---	---	---	2
WA-FT-E8	M3.02	GIRL'S TOILET 121	---	---	---	---	---	---	---	---	---	2
WA-FT-E9	M3.02	BOY'S TOILET 125	---	---	---	---	---	---	---	---	---	2

REMARKS:
 1. FURNISH & INSTALL FIN-TUBE ELEMENT AND ENCLOSURE WITH ACCESS PANEL FOR VALVES. CONTRACTOR SHALL VERIFY ENCLOSURE SIZE PRIOR TO ORDERING ELEMENT. PROVIDE HANGARS AND OTHER HARDWARE AS REQUIRED FOR COMPLETE INSTALLATION.
 2. EXISTING FIN TUBE ELEMENT AND ENCLOSURE SHALL REMAIN. ADD AUTOMATIC FLOW VALVE AND MODULATING 2-WAY CONTROL VALVE ON RETURN SIDE OF FIN TUBE. REFER TO DETAIL "B" ON SHEET M1.03 FOR ADDITIONAL REQUIREMENTS.
 3. EXISTING FIN TUBE ELEMENT AND ENCLOSURE SHALL REMAIN. ADD AUTOMATIC FLOW VALVE AND MODULATING 2-WAY CONTROL VALVE ON RETURN SIDE OF FIN TUBE. REFER TO DETAIL "C" ON SHEET M1.03 FOR ADDITIONAL REQUIREMENTS. ADD ACCESS PANEL TO EXISTING FIN TUBE ENCLOSURE FOR ACCESS TO VALVES.

FAN SCHEDULE (REFER TO SPECIFICATIONS SECTION 233423 FOR ADDITIONAL REQUIREMENTS.)

TAG #	DWG #	AREA SERVED	SERVICE	CFM	ESP (IN. W.C.)	FAN RPM	BHP	DRIVE TYPE	DISC'T BY FAN MANF'T	BIRD SCREEN BY FAN MANF'T	BACK DRAFT DMPR BY FAN MANF'T	MAX. SOUND LEVEL (SONES)	FAN ELECT DATA	MEANS OF CONTROL	APPROX. WEIGHT (LBS)	ROOF/WALL OPENING SIZE (IN)	GREENHECK MODEL	REMARKS	
													HP (WATTS)	VOLTS/ PHASE					
WA-SF-1	M3.02	BOILER ROOM 129	VENTILATION	500	0.375	964	0.09	DIRECT	NO	YES	YES	9.2	1/4	115/1	B	250	27.5x27.5	AER-S20C-610-VG	1 THRU 4

MEANS OF CONTROL: FAN SHALL SEQUENCE IN CONJUNCTION WITH...
 A ...TEMPERATURE CONTROL SYSTEM TIME CLOCK (CONTROL WIRING BY TEMPERATURE CONTROL CONTRACTOR, POWER WIRING BY ELECTRICAL CONTRACTOR)
 B ...WALL MOUNTED THERMOSTAT (T-STAT & CONTROL WIRING BY TEMPERATURE CONTROL CONTRACTOR; POWER WIRING BY ELECTRICAL CONTRACTOR)

REMARKS:
 1. FURNISH FAN MOTOR WITH THERMAL OVERLOADS.
 2. FURNISH FAN WITH MOTORIZED BACKDRAFT DAMPER.
 3. FURNISH FAN WITH VARIOUS, ECM MOTOR AND VARIOUS HOA CONTROLLER.
 4. FURNISH FAN WITH WALL HOUSING, WEATHERHOOD WITH WIRE MESH BIRD SCREEN, AND OSHA GUARD

PIPE MATERIAL CONSTRUCTION & INSULATION SCHEDULE (REFER TO SPECIFICATIONS SECTIONS 230719 & 232113 FOR ADDITIONAL REQUIREMENTS.)

SERVICE DESCRIPTIONS	ABBREVIATION	PIPING MATERIAL	MEANS OF CONNECT	FITTINGS	INSULATION
DOMESTIC COLD WATER	DCW	TYPE L HARD COPPER	95/5 SOLDER •	WROUGHT	1" PIPE & SMALLER: 1/2" FIBERGLASS 1-1/4" TO 4" PIPE: 1" FIBERGLASS
HEATING HOT WATER	HWS & HWR	2" & SMALLER: TYPE K, L OR M HARD COPPER	SOLDER •	WROUGHT	PIPE LESS THAN 1 1/2"Ø INSULATE WITH A MINIMUM 1 1/2" FIBERGLASS
		2" & SMALLER: SCHEDULE 40 BLACK STEEL, ASTM A53-S-A-ERW	THREAD & COUPLE OR WELD •	150 PSIG	PIPE 1 1/2"Ø AND LARGER INSULATE WITH 2" FIBERGLASS
		2-1/2" & LARGER: SCHEDULE 40 BLACK STEEL, ASTM A53-S-A-ERW	WELD •	SCHEDULE 40	
2-1/2" TO 4" TYPE L OR M HARD COPPER	SOLDER •	WROUGHT			
CONDENSATE DRAIN LINES	CDL	2" & SMALLER: TYPE L HARD COPPER	THREAD & COUPLE •	WROUGHT	3/4" FIBERGLASS

* PRO PRESS STYLE OR MECHANICAL FITTINGS ARE NOT ACCEPTABLE

HOT WATER CABINET UNIT HEATER SCHEDULE (REFER TO SPECIFICATIONS SECTION 238239 FOR ADDITIONAL REQUIREMENTS.)

TAG #	DWG	ROOM	MOUNTING	CFM	EWT (°F)	LWT (°F)	GPM	FLUID TYPE	WPD (FT)	MBH	COIL ROWS	HP	VOLTAGE	DIMENSIONS WxHxD (INCHES)	STERLING MODEL	REMARKS
WA-CUH-1	M3.01	CORRIDOR 100	SURFACE WALL	430	180	140	1.0	WATER	0.1	21.2	1	1/10	120	47x25x9.5	W-1080-04	1, 2, 5, 7
WA-CUH-E2	M3.01	VESTIBULE 50	---	---	---	---	---	---	---	---	---	---	---	---	---	6, 7
WA-CUH-E3	M3.01	CORRIDOR 100	---	---	---	---	---	---	---	---	---	---	---	---	---	6, 7
WA-CUH-4	M3.01	CORRIDOR 100	SURFACE WALL	230	180	140	0.6	WATER	0.03	11.7	1	1/15	120	35x25x9.5	W-1080-02	1, 2, 3, 7
WA-CUH-E5	M3.01	GIRLS 105	---	---	---	---	---	---	---	---	---	---	---	---	---	6, 7
WA-CUH-E6	M3.01	BOYS 109	---	---	---	---	---	---	---	---	---	---	---	---	---	6, 7
WA-CUH-7	M3.02	CORRIDOR 100	SURFACE WALL	845	180	140	3.0	WATER	1.13	62.3	2	1/10 & 1/15	120	61x25x9.5	W-1080-08	1, 2, 4, 7

REMARKS:
 1. PRIOR TO ORDERING HEATER, MECHANICAL CONTRACTOR SHALL VERIFY WITH THE GENERAL CONTRACTOR THE INSTALLATION ALONG WALL FOR SURFACE, SEMI-RECESSED OR FULLY RECESSED MOUNTING.
 2. SEQUENCE OF OPERATION SHALL INCLUDE CYCLING OF FAN WITH THERMOSTAT SETTING. HOT WATER SHALL FLOW CONTINUOUSLY THROUGH UNIT DURING HEATING SEASON. FURNISH AQUASTAT FOR UNIT'S DETERMINATION THAT HOT WATER TEMPERATURE IS GREATER THAN 90°F (ADJUSTABLE). IF WATER TEMPERATURE IS LESS THAN 70°F (ADJUSTABLE) FAN WILL NOT BE PERMITTED TO ENERGIZE.
 3. FURNISH UNIT WITH 3-WAY CONTROL VALVE. REFER TO DETAIL "E" ON SHEET M1.03
 4. FURNISH UNIT WITH 2-WAY CONTROL VALVE. REFER TO DETAIL "F" ON SHEET M1.03
 5. FURNISH UNIT WITH 2-WAY CONTROL VALVE. REFER TO DETAIL "G" ON SHEET M1.03
 6. UNIT IS EXISTING AND SHALL REMAIN. FURNISH TWO-WAY CONTROL VALVE AND AUTO-FLOW VALVE IN RETURN BRANCH FROM UNIT AND FURNISH WITH REMOTE, WALL-MOUNTED PROGRAMMABLE 7-DAY THERMOSTAT.
 7. FURNISH EACH WALL MOUNTED THERMOSTAT WITH KEY LOCKABLE GUARD WITH CLEAR PLASTIC COVER.

RELIEF HOOD SCHEDULE (REFER TO SPECIFICATIONS SECTION 233723 FOR ADDITIONAL REQUIREMENTS.)

TAG #	DWG #	ROOM	SERVICE	CFM	THROAT SIZE (INCHES)	MAX THROAT VELOCITY (FPM)	MAX PRESS. DROP (WC)	MIN FREE AREA (SQ. FT)	OVERALL PLAN DIMENSIONS (INCHES)	GREENHECK MODEL	REMARKS
WA-RH-1	M3.02	BOILER ROOM 129	RELIEF	500	16.25x16.25	345	0.013	1.45	29"Ø	GRSR-16	1 THRU 4

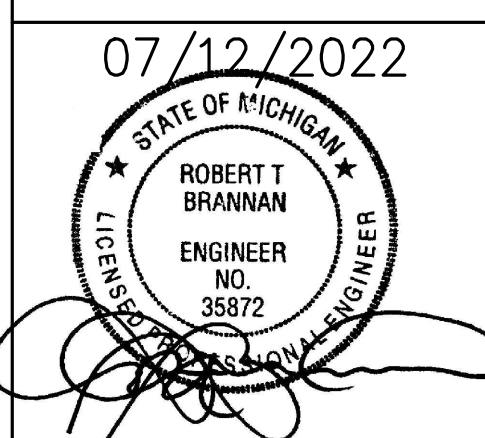
REMARKS:
 1. FURNISH UNIT WITH 1" FIBERGLASS HOOD INSULATION.
 2. FURNISH INTAKE HOOD WITH BIRD SCREEN.
 3. FURNISH UNIT WITH KYNAR FINISH. COLOR TO BE SELECTED BY ARCHITECT FROM MANUFACTURERS STANDARD COLOR CHART.
 4. FURNISH UNIT WITH 14" ROOF CURB

SINGLE ZONE SYSTEM VENTILATION CALCULATIONS:

ZONE NAME/ SPACE NAME	EQUIPMENT TAG	FLOOR AREA (FT²)	TIME AVERAGED OCCUPANCY		REQUIRED OUTDOOR AIR (CFM/PERSON)	REQUIRED OUTDOOR AIR (CFM/FT²)	UNCORRECTED OUTDOOR AIR	VENTILATION EFFICIENCY	TOTAL REQUIRED OUTDOOR AIR
			Az	Pz					
101 CLASSROOM	WA-UV-1	809.5	20.0	20.0	10.0	0.12	297	1.0	297.1
103 CLASSROOM	WA-UV-2	806.6	20.0	20.0	10.0	0.12	297	1.0	296.8
111 CLASSROOM	WA-UV-3	807.9	20.0	20.0	10.0	0.12	297	1.0	296.9
113 CLASSROOM	WA-UV-4	794.4	20.0	20.0	10.0	0.12	295	1.0	295.3
115 CLASSROOM	WA-UV-5	792.2	20.0	20.0	10.0	0.12	295	1.0	295.1
102 CLASSROOM	WA-UV-6	796.5	20.0	20.0	10.0	0.12	296	1.0	295.6
104 CLASSROOM	WA-UV-7	803.0	20.0	20.0	10.0	0.12	296	1.0	296.4
EXISTING MEETING ROOM	WA-UV-8	470.8	2.0	5.0	0.06	0.38	1.0	38.2	
112 CLASSROOM	WA-UV-9	809.4	20.0	20.0	10.0	0.12	297	1.0	297.1
114 CLASSROOM	WA-UV-10	755.0	20.0	20.0	10.0	0.12	291	1.0	290.6
116 CLASSROOM	WA-UV-11	771.9	20.0	20.0	10.0	0.12	293	1.0	292.6
118 CLASSROOM	WA-UV-12	769.9	20.0	20.0	10.0	0.12	292	1.0	292.4
120 CLASSROOM	WA-UV-13	766.6	20.0	20.0	10.0	0.12	292	1.0	292.0
128 IT/STOR	WA-UV-14	335.6	1.0	5.0	0.06	0.25	1.0	25.1	
130 CLASSROOM	WA-UV-15	692.0	20.0	20.0	10.0	0.12	283	1.0	283.0
133 KINDERGARTEN CLASSROOM B	WA-UV-16	879.3	20.0	20.0	10.0	0.12	306	1.0	305.5

NATURAL VENTILATION CALCULATIONS

ROOM	AREA OF ROOM (SQ. FT.)	REQUIRED OPENABLE AREA (SQ. FT.)	ACTUAL OPENABLE AREA (SQ. FT.)
BOILER ROOM 129	389.1	15.6	44.3



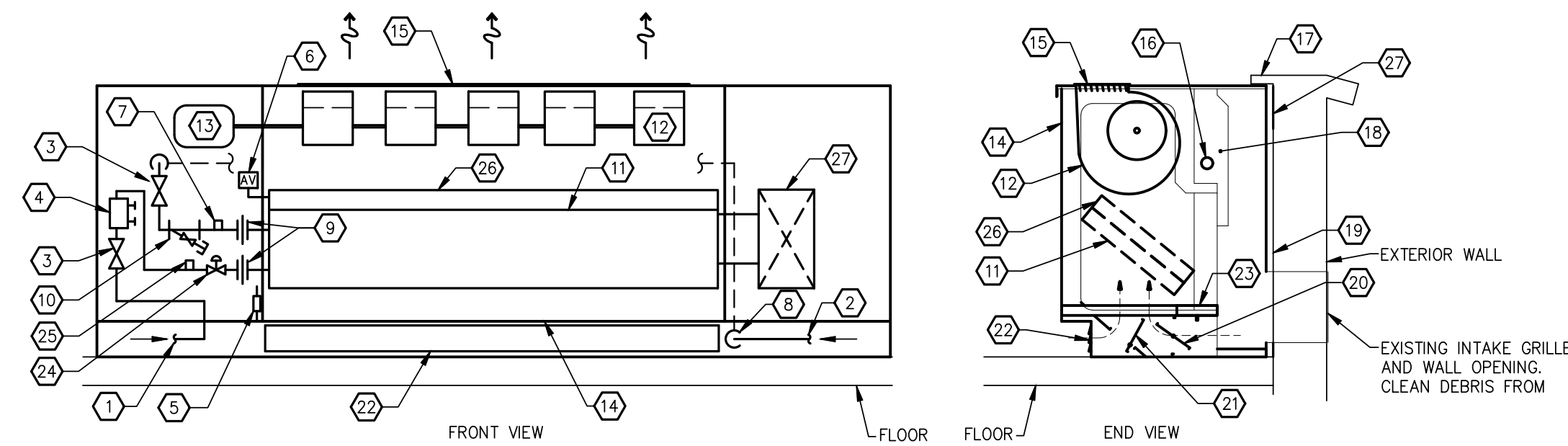
DATE: 07.12.2022
 DESCRIPTION: BIDDING & STATE REVIEW

MECHANICAL UPDATES & RELATED WORK
WATERLOO ELEMENTARY SCHOOL
 1933 SOUTH CUSTER ROAD, MONROE, MI 48161
MONROE PUBLIC SCHOOLS
 1275 N. MACOMB STREET, MONROE, MI 48162

JOB # **22114**
 DRAWN JDC
 CHECKED ERS

SCHEDULES & CALCULATIONS
M1.02

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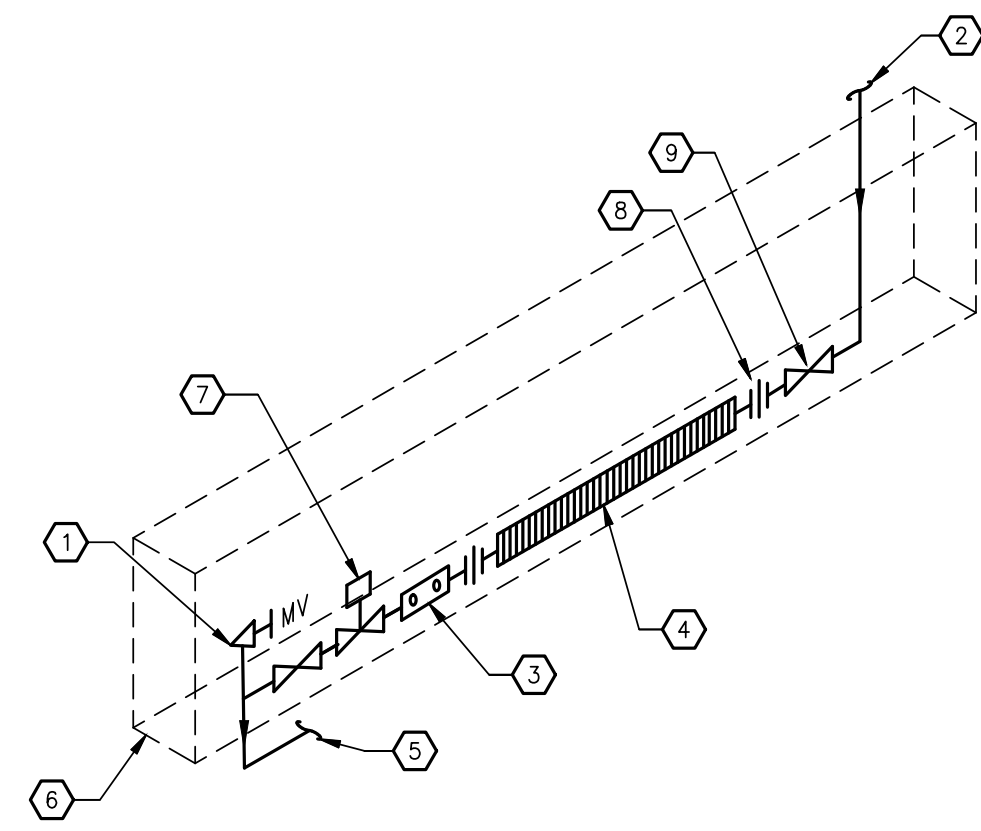


- 1 HW RETURN LINE THRU WALL ENCLOSURE, OR BELOW SHELF. COORDINATE WITH PLANS FOR LOCATION.
- 2 HW SUPPLY LINE THRU WALL ENCLOSURE, OR BELOW SHELF. COORDINATE WITH PLANS FOR LOCATION.
- 3 SHUT-OFF VALVE (BALL VALVE)
- 4 AUTOMATIC FLOW CONTROL VALVE
- 5 DAMPER ACTUATOR
- 6 MANUAL AIR VENT W/ HOSE CONNECTION
- 7 PRESS.-TEMP (PT) PLUG
- 8 EXTEND INTO PANEL LOCATED BETWEEN UNIT AND EXTERIOR WALL. FLANGES OR UNIONS CLEAR OF COIL REMOVAL
- 9 STRAINER WITH 3/4" VALVE & CAPPED DRAIN & HOSE CONNECTION
- 10 HOT WATER COIL
- 12 BLOWER
- 13 ECM MOTOR
- 14 REMOVABLE FRONT ACCESS PANEL WITH TAMPER-RESISTANT FASTENERS
- 15 REMOVABLE HEAVY DUTY STEEL-BAR DISCHARGE GRILLE
- 16 HEATING HOT WATER SUPPLY PIPE
- 17 WINDOW SILL
- 18 CLOSED PIPE TUNNEL
- 19 GASKET SEAL
- 20 OUTSIDE AIR DAMPER
- 21 RETURN AIR DAMPER
- 22 SLOTTED KICKPLATE (FOR ROOM AIR RETURN)
- 23 CONDENSATE PAN
- 24 2-WAY MODULATING CONTROL VALVE (FAIL OPEN) (UV-1 ONLY; 3-WAY MODULATING CONTROL VALVE)
- 25 COOLING (DX) COIL (FUTURE)
- 26 VALVE PACKAGE FOR VRF PIPING (FUTURE)
- 27 INSULATE AGAINST EXTERIOR WALL BY GENERAL CONTRACTOR

UNIT VENTILATORS FURNISHED WITH DRAIN PAN FACTORY INSTALLED FOR FUTURE COOLING.

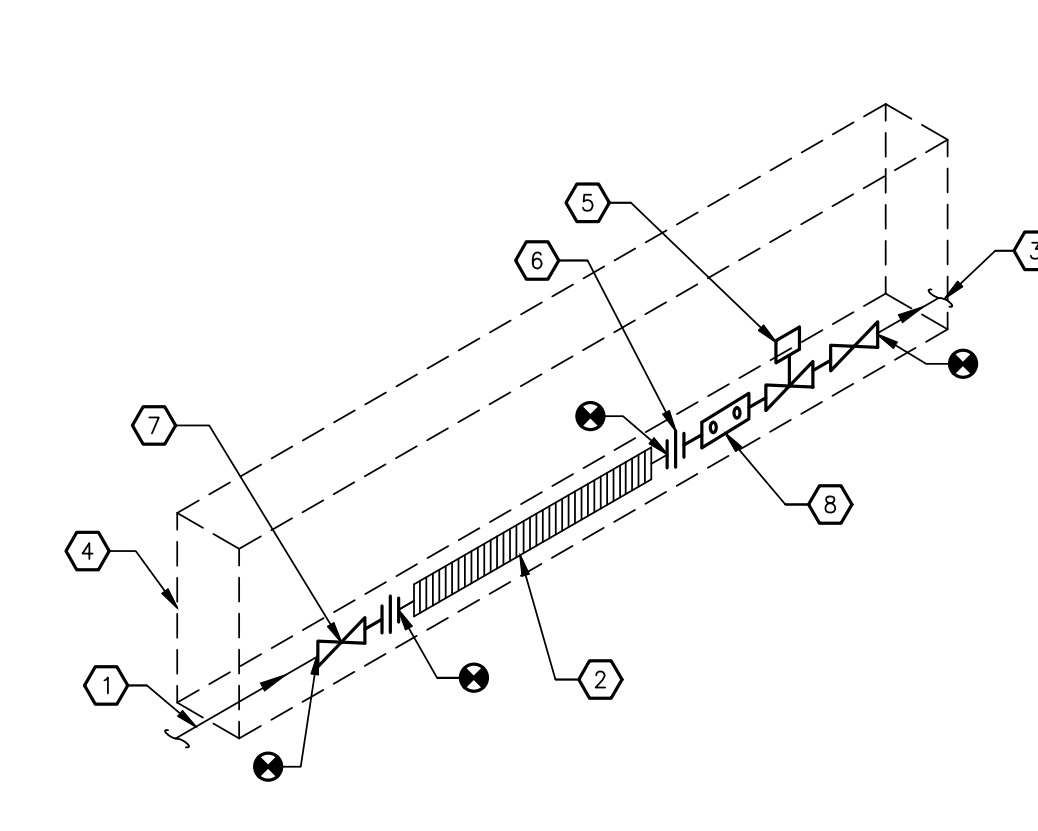
LEFT/RIGHT PIPING LOCATIONS VARY BY MANUFACTURER, COORDINATE PIPE PENETRATIONS TO MATCH UNIT PIPING REQUIREMENTS.

A UNIT VENTILATOR DETAIL (WA-UV-1 THRU 16)
M3.01&2 NO SCALE



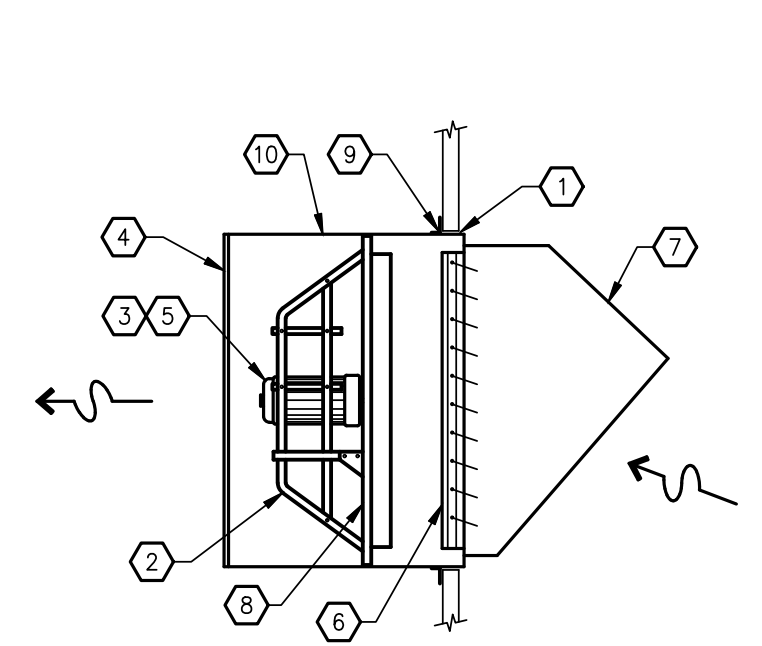
- 1 MANUAL AIR VENT (TYPICAL)
- 2 HOT WATER SUPPLY, REFER TO PLANS FOR SIZE
- 3 AUTOMATIC FLOW CONTROL VALVE
- 4 HEATING ELEMENT W/ FINES, SEE SCHEDULE FOR SIZES
- 5 HOT WATER RETURN ROUTED BELOW ELEMENT, REFER TO PLANS FOR SIZE
- 6 COVER
- 7 CONTROL VALVE, DANFOSS MODEL RA 2000 OR ENGINEER APPROVED EQUAL, WITH REMOTE ENCLOSURE MOUNTED DIAL AND REMOTE MOUNTED SENSOR
- 8 UNION (TYPICAL)
- 9 BALL VALVE W/ BALANCING STOP (TYPICAL)

B HOT WATER FIN-TUBE RADIATION DETAIL (WA-FT-1 & WA-FT-2)
M3.01 NO SCALE



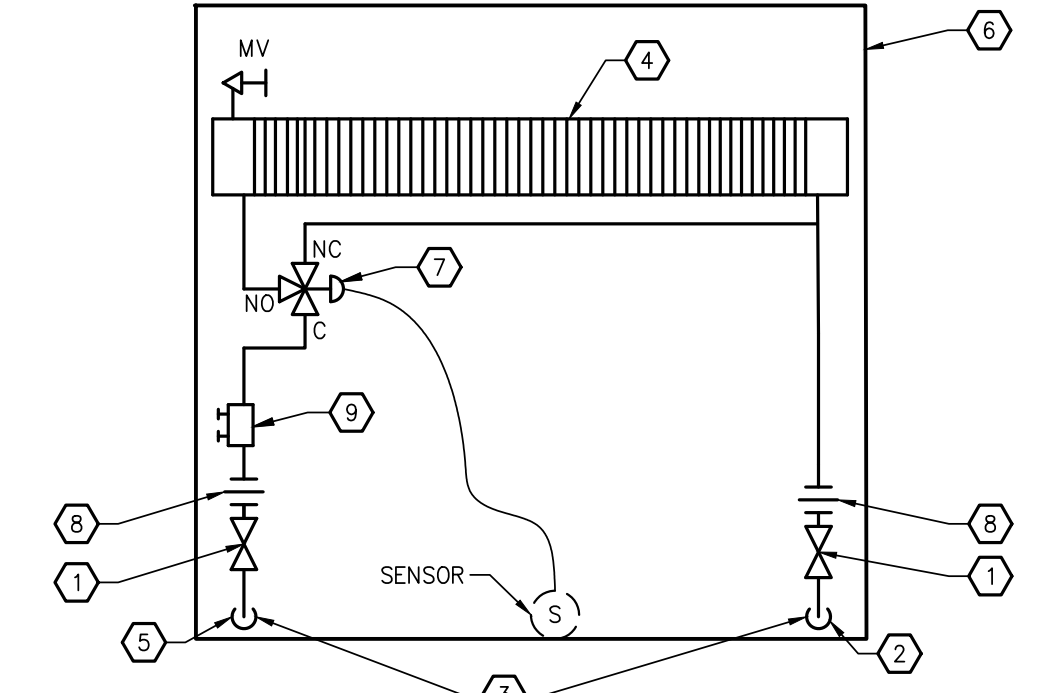
- 1 HOT WATER SUPPLY (EXISTING), REFER TO PLANS FOR SIZE
- 2 HEATING ELEMENT W/ FINES (EXISTING)
- 3 HOT WATER RETURN (EXISTING), REFER TO PLANS FOR SIZE
- 4 COVER (EXISTING)
- 5 CONTROL VALVE, DANFOSS MODEL RA 2000 OR ENGINEER APPROVED EQUAL, WITH REMOTE ENCLOSURE MOUNTED DIAL AND REMOTE MOUNTED SENSOR
- 6 UNION (TYPICAL)
- 7 BALL VALVE W/ BALANCING STOP (TYPICAL)
- 8 AUTOMATIC FLOW CONTROL VALVE

C HOT WATER FIN-TUBE RADIATION DETAIL (WA-FT-E3, WA-FT-E5, WA-FT-E6, & WA-FT-E7)
M3.02 NO SCALE



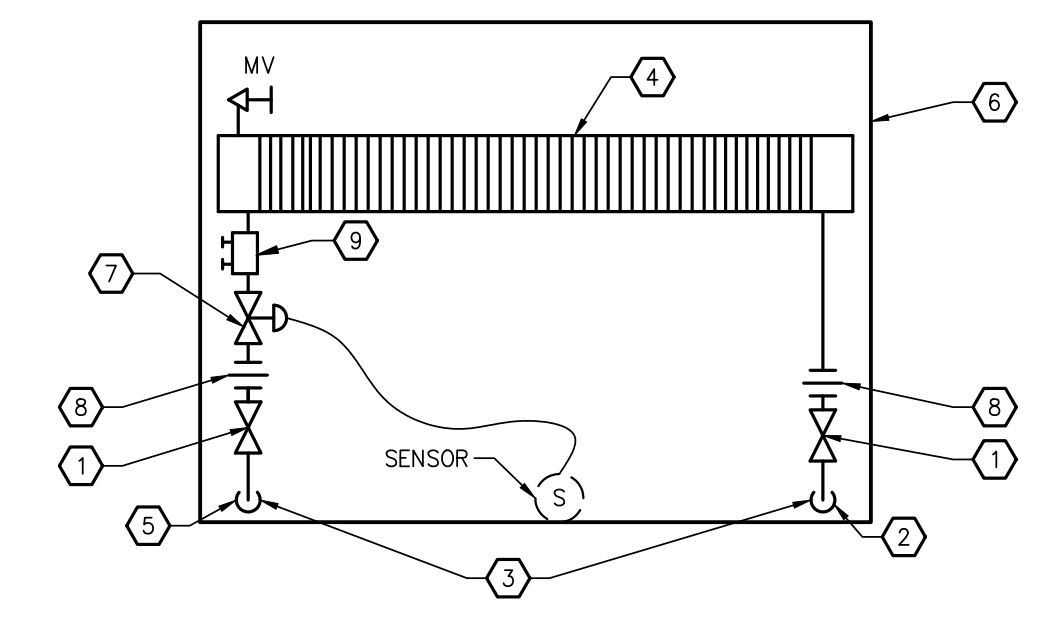
- 1 RUBBER IN SHEAR VIBRATION ELIMINATION PADS AT ALL FOUR CORNERS
- 2 FAN FRAME
- 3 MOTOR
- 4 INTAKE GUARD
- 5 PROVIDE SINGLE POINT ELECTRICAL CONNECTION W/FLEXIBLE METAL CONDUIT
- 6 BACKDRAFT DAMPER, MOTOR OPERATED
- 7 SHEET METAL WEATHERHOOD
- 8 ORIFICE RING
- 9 SECURE TO BUILDING WITH STEEL ANGLE IRON
- 10 WALL SLEEVE

D PROPELLER FAN DETAIL (WA-SF-1)
M3.02 NO SCALE



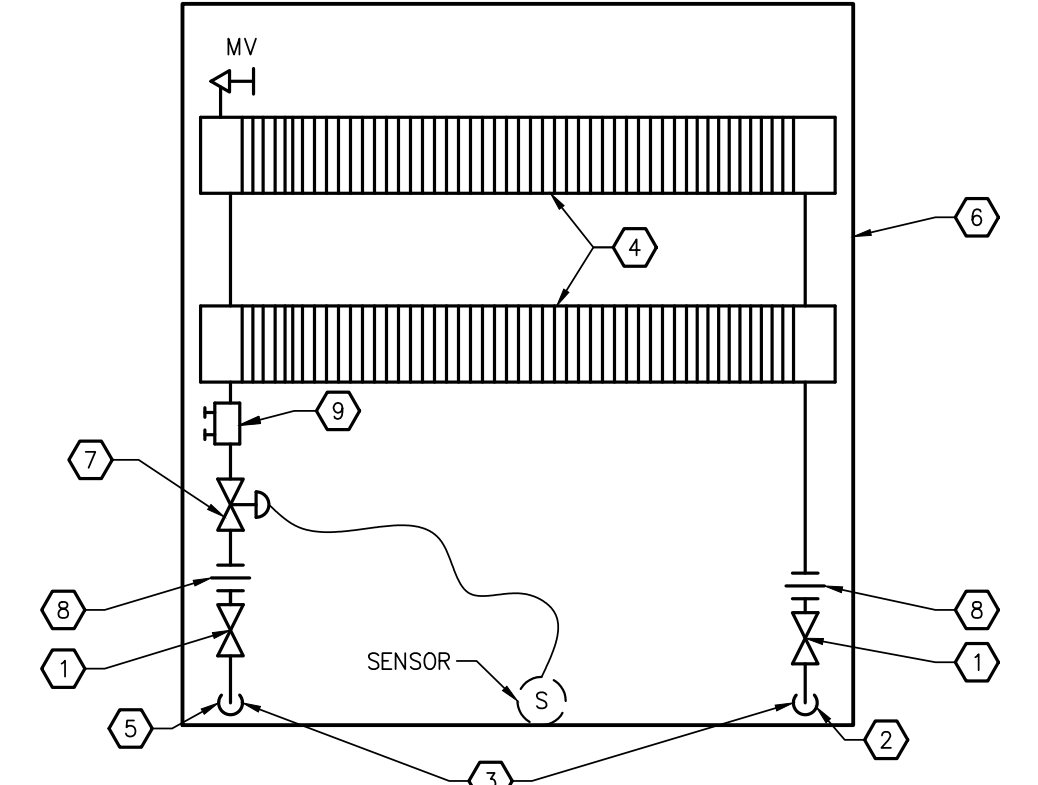
- 1 SHUT-OFF VALVE (BALL VALVE)
- 2 HOT WATER SUPPLY, REFER TO PLANS FOR SIZE. COORDINATE WITH PLANS FOR LEFT OR RIGHT SUPPLY LOCATION.
- 3 EXISTING WALL OPENING
- 4 HEATING ELEMENT W/ FINES, SEE SCHEDULE FOR SIZES. LOWER ELEMENT SHALL BE FURNISHED WITH TOP AND BOTTOM PIPE CONNECTIONS.
- 5 HOT WATER RETURN, REFER TO PLANS FOR SIZE COORDINATE WITH PLANS FOR LEFT OR RIGHT RETURN LOCATION.
- 6 ENCLOSURE
- 7 3-WAY MODULATING CONTROL VALVE BY T.C.C.
- 8 UNION (TYPICAL)
- 9 AUTOMATIC FLOW CONTROL VALVE

E CABINET UNIT HEATER DETAIL (WA-CUH-1)
M3.01 NO SCALE



- 1 SHUT-OFF VALVE (BALL VALVE)
- 2 HOT WATER SUPPLY, REFER TO PLANS FOR SIZE. COORDINATE WITH PLANS FOR LEFT OR RIGHT SUPPLY LOCATION. ACTUAL PIPING COMPARTMENT MAY VARY DEPENDING ON PROVIDED EQUIPMENT MANUFACTURER. M.C. SHALL COORDINATE AS REQUIRED. IF VALVE ASSEMBLY CANNOT FIT IN MANUFACTURER PROVIDED AREA, VALVE ASSEMBLY SHALL BE LOCATED ABOVE ACCESSIBLE CEILING.
- 3 EXISTING WALL OPENING
- 4 HEATING ELEMENT W/ FINES, SEE SCHEDULE FOR SIZES. LOWER ELEMENT SHALL BE FURNISHED WITH TOP AND BOTTOM PIPE CONNECTIONS.
- 5 HOT WATER RETURN, REFER TO PLANS FOR SIZE COORDINATE WITH PLANS FOR LEFT OR RIGHT RETURN LOCATION.
- 6 ENCLOSURE
- 7 2-WAY MODULATING CONTROL VALVE BY T.C.C.
- 8 UNION (TYPICAL)
- 9 AUTOMATIC FLOW CONTROL VALVE

F CABINET UNIT HEATER DETAIL (WA-CUH-4)
M3.01 NO SCALE



- 1 SHUT-OFF VALVE (BALL VALVE)
- 2 HOT WATER SUPPLY, REFER TO PLANS FOR SIZE. COORDINATE WITH PLANS FOR LEFT OR RIGHT SUPPLY LOCATION. ACTUAL PIPING COMPARTMENT MAY VARY DEPENDING ON PROVIDED EQUIPMENT MANUFACTURER. M.C. SHALL COORDINATE AS REQUIRED. IF VALVE ASSEMBLY CANNOT FIT IN MANUFACTURER PROVIDED AREA, VALVE ASSEMBLY SHALL BE LOCATED ABOVE ACCESSIBLE CEILING.
- 3 EXISTING WALL OPENING
- 4 HEATING ELEMENT W/ FINES, SEE SCHEDULE FOR SIZES. LOWER ELEMENT SHALL BE FURNISHED WITH TOP AND BOTTOM PIPE CONNECTIONS.
- 5 HOT WATER RETURN, REFER TO PLANS FOR SIZE COORDINATE WITH PLANS FOR LEFT OR RIGHT RETURN LOCATION.
- 6 ENCLOSURE
- 7 2-WAY MODULATING CONTROL VALVE BY T.C.C.
- 8 UNION (TYPICAL)
- 9 AUTOMATIC FLOW CONTROL VALVE

G TWO ROW CABINET UNIT HEATER DETAIL (WA-CUH-7)
M3.02 NO SCALE

DATE	DESCRIPTION
07.12.2022	BIDDING & STATE REVIEW

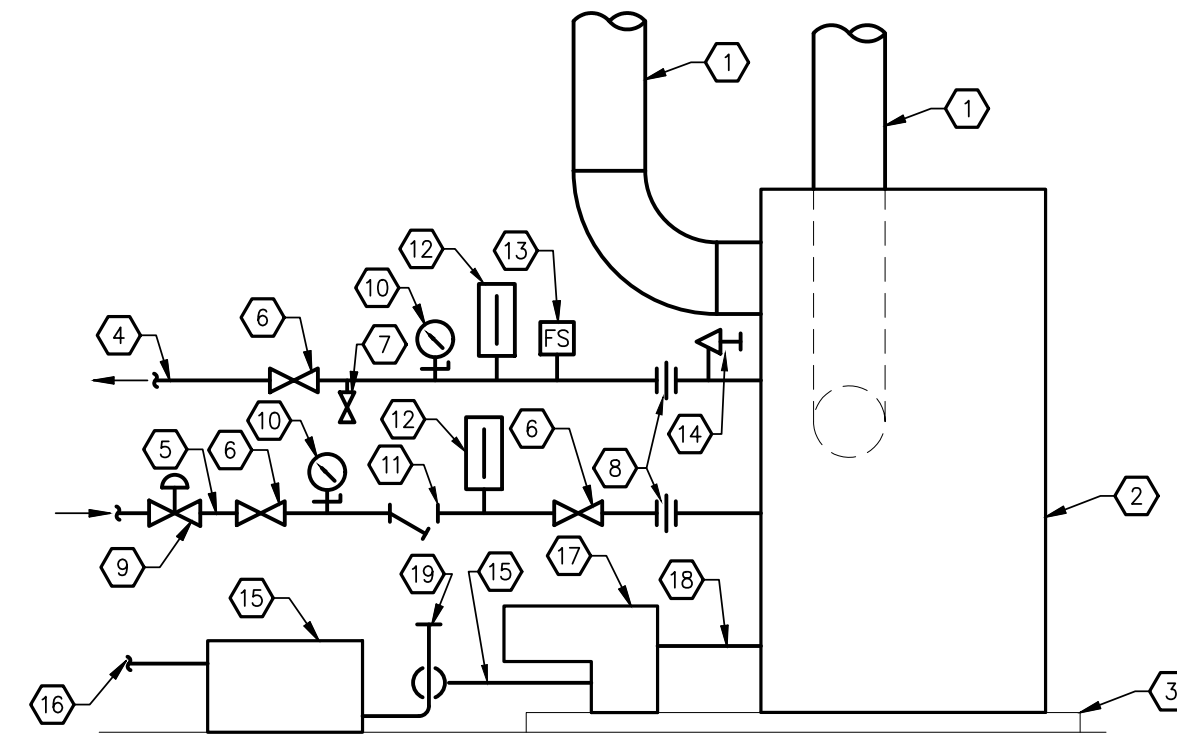
MECHANICAL UPDATES & RELATED WORK
WATERLOO ELEMENTARY SCHOOL
1933 SOUTH CUSTER ROAD, MONROE, MI 48161
MONROE PUBLIC SCHOOLS
1275 N. MACOMB STREET, MONROE, MI 48162

AT	FOR
JOB #	22114
DRAWN	JDC
CHECKED	ERS

DETAILS

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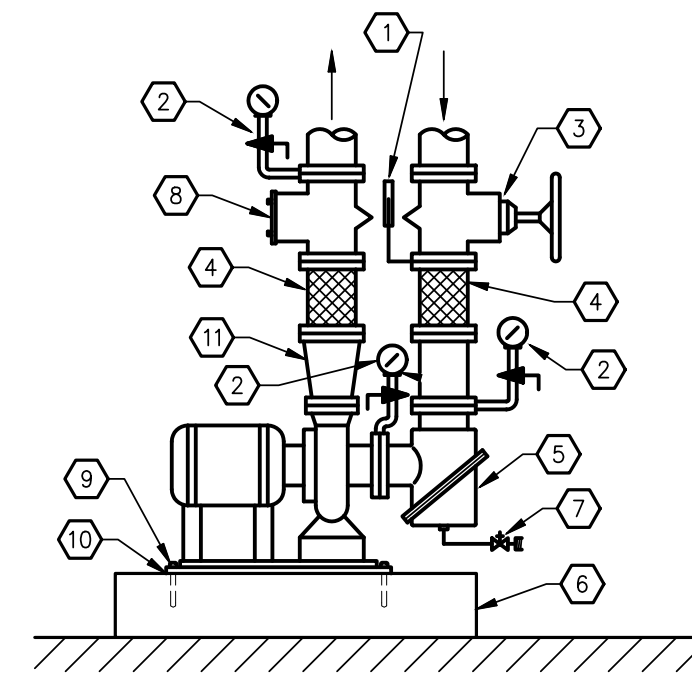
M1.03



- 1 COMBUSTION AIR INTAKE AND FLUE PIPING. SIZE AND INSTALL PER MANUFACTURERS WRITTEN INSTRUCTIONS. FIELD VERIFY EXACT ROUTING.
- 2 BOILER
- 3 HOUSE KEEPING PAD (EXISTING)
- 4 SUPPLY LINE (REFER TO PLANS FOR SIZE)
- 5 RETURN LINE (REFER TO PLANS FOR SIZE)
- 6 SHUT OFF VALVE
- 7 DRAIN PORT
- 8 UNION
- 9 TWO-WAY MOTORIZED ISOLATION VALVE
- 10 PRESSURE GAUGE
- 11 STRAINER
- 12 THERMOMETER
- 13 FLOW SWITCH
- 14 TEMPERATURE, PRESSURE RELIEF VALVE
- 15 MANUFACTURERS PROVIDED CONDENSATE NEUTRALIZATION KIT
- 16 EXTEND CONDENSATE TO FLOOR DRAIN.
- 17 MANUFACTURERS PROVIDED CONDENSATE TRAP.
- 18 SIZE AND INSTALL CONDENSATE LINE PER MANUFACTURERS WRITTEN INSTRUCTIONS
- 19 VACUUM BREAK

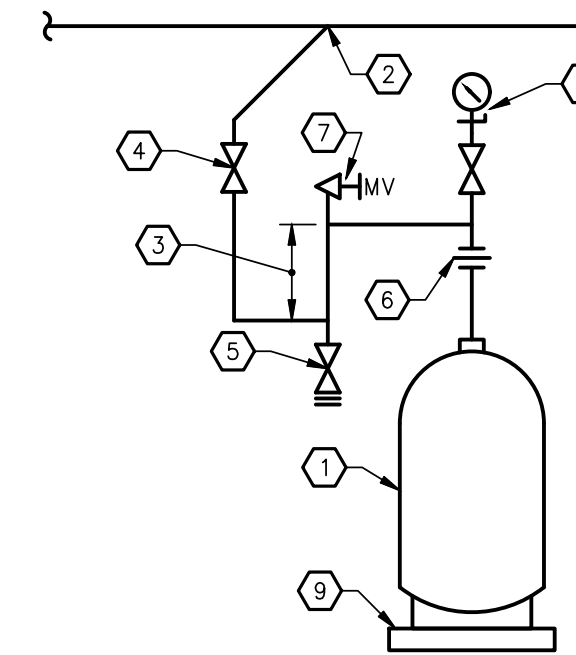
NOTE: ALL SUPPLY, RETURN AND BYPASS PIPING AND ASSOCIATED VALVES, ETC. INDICATED IN THIS DETAIL SHALL BE INSTALLED FULL SIZE FOR EACH COIL.

H BOILER PIPING DETAIL
M3.02 NO SCALE



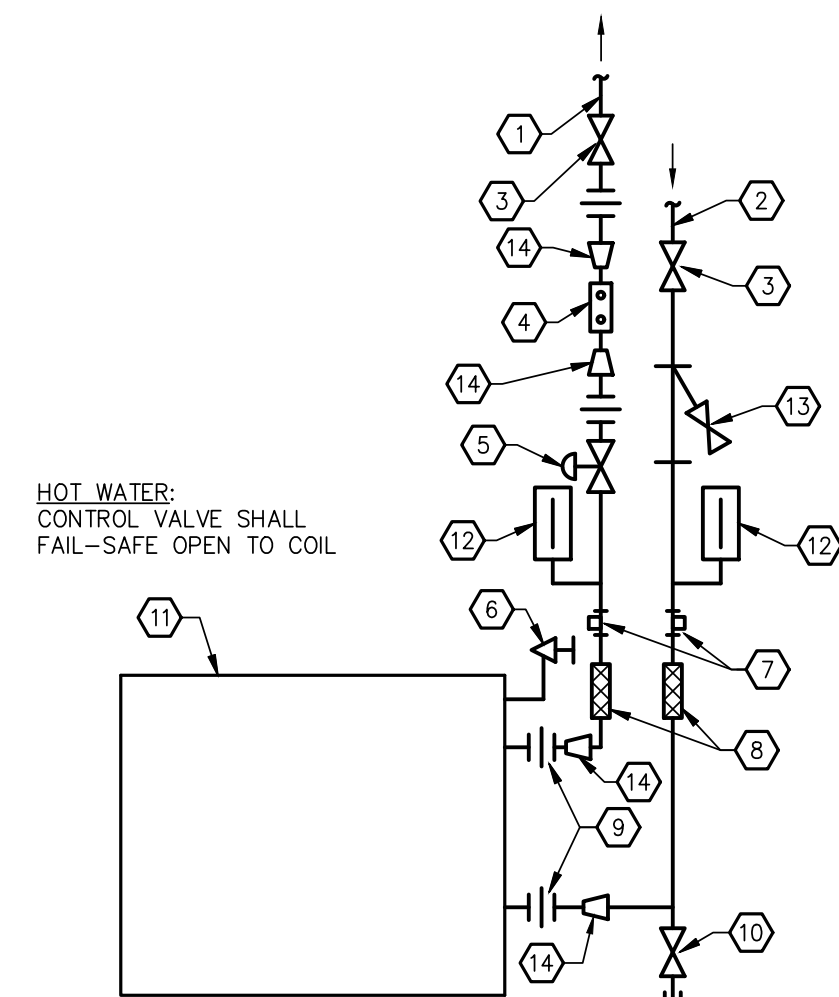
- 1 THERMOMETER POSITIONED FOR OPTIMUM VIEWING
- 2 PRESSURE GAUGE W/ 1-1/4" COCK POSITIONED FOR OPTIMUM VIEWING
- 3 SHUT-OFF VALVE
- 4 FLEXIBLE CONNECTION (PIPE SIZE AS INDICATED ON PLAN)
- 5 SUCTION DIFFUSER, STRAINER, REDUCER. SUCTION DIFFUSER INLET TO MATCH PIPE SIZE INDICATED ON PLANS.
- 6 EXISTING HOUSEKEEPING PAD
- 7 BLOWDOWN VALVE & HOSE BIBB CONNECTION
- 8 TRIPLE DUTY VALVE (ISOLATION, CHECK & BALANCING W/ PRESSURE TAPS)
- 9 BOLT PUMP BASE TO PAD
- 10 NEOPRENE PAD AT EACH BOLTED CONNECTION
- 11 TRANSITION FROM PUMP DISCHARGE TO PIPE SIZE INDICATED ON PLAN.

J END SUCTION PUMP DETAIL (WA-HP-1 & 2)
M3.02 NO SCALE



- 1 DIAPHRAGM TYPE EXPANSION TANK
ACCEPTANCE VOLUME = 80
TOTAL VOLUME = 80
INITIAL PRESSURE = 15
 - 2 CONNECT TO SIDE OF MAIN
 - 3 ANTI-THERMOSIPHON LOOP, MINIMUM 12" DROP
 - 4 SHUT-OFF VALVE
 - 5 DRAIN CONNECTION
 - 6 UNION
 - 7 MANUAL AIR VENT
 - 8 PRESSURE GAUGE WITH STOP-COCK
 - 9 4" HOUSEKEEPING PAD
- PIPE SIZE FROM TANK TO SYSTEM:**
EQUIVALENT PIPE LENGTH UP TO 30' AND MAX. AVERAGE DESIGN TEMPERATURE OF 200° F.
BOILER MBH SIZE
UP TO 1,000 1/2"

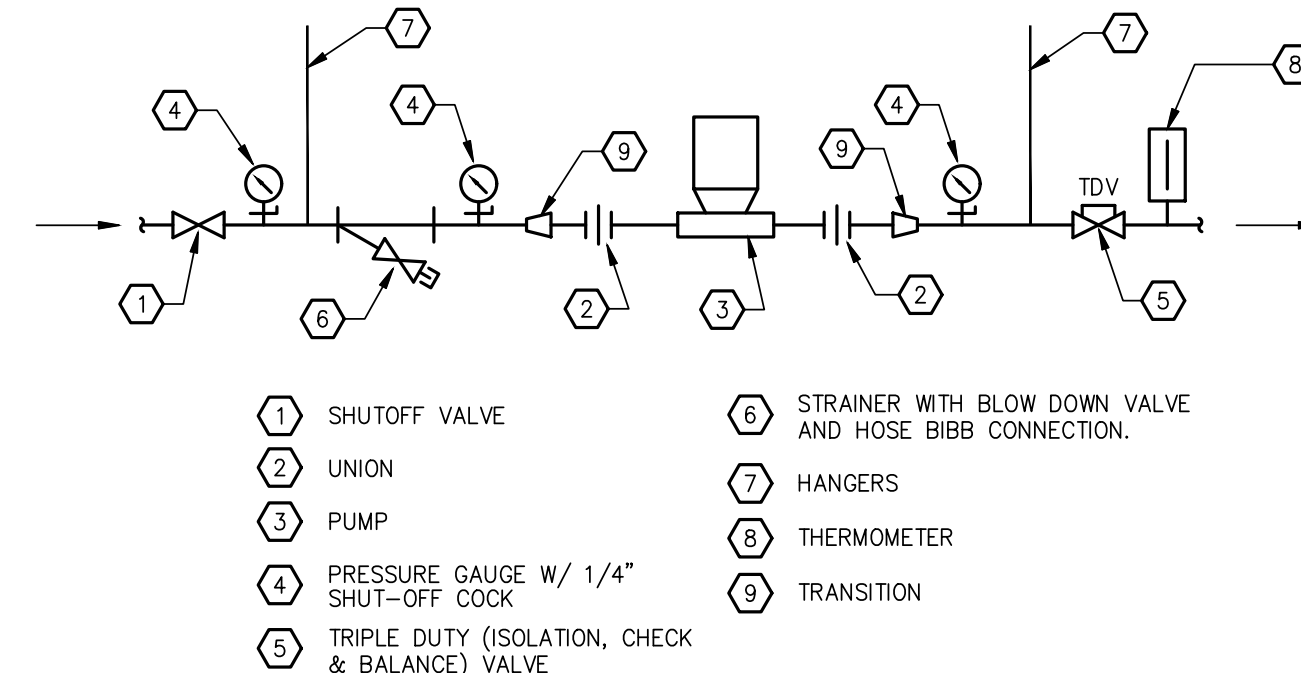
K TYPICAL DIAPHRAGM EXPANSION TANK PIPING DETAIL
M3.02 NO SCALE



- 1 RETURN LINE (REFER TO PLANS FOR SIZE)
- 2 SUPPLY LINE (REFER TO PLANS FOR SIZE)
- 3 SHUT-OFF VALVE
- 4 AUTOFLOW VALVE
- 5 MODULATING 2-WAY CONTROL VALVE
- 6 MANUAL AIR VENT W/ HOSE CONNECTION
- 7 PRESS.-TEMP (P-T) PLUG
- 8 FLEXIBLE CONNECTION
- 9 FLANGES OR UNIONS
- 10 3/4" VALVED & CAPPED DRAIN W/ HOSE CONNECTION
- 11 UNIT HEATER
- 12 THERMOMETER
- 13 STRAINER W/ BLOWDOWN VALVE
- 14 CONCENTRIC TRANSITION

NOTE: ALL SUPPLY, RETURN AND BYPASS PIPING AND ASSOCIATED VALVES, ETC. INDICATED IN THIS DETAIL SHALL BE INSTALLED FULL SIZE FOR EACH COIL.

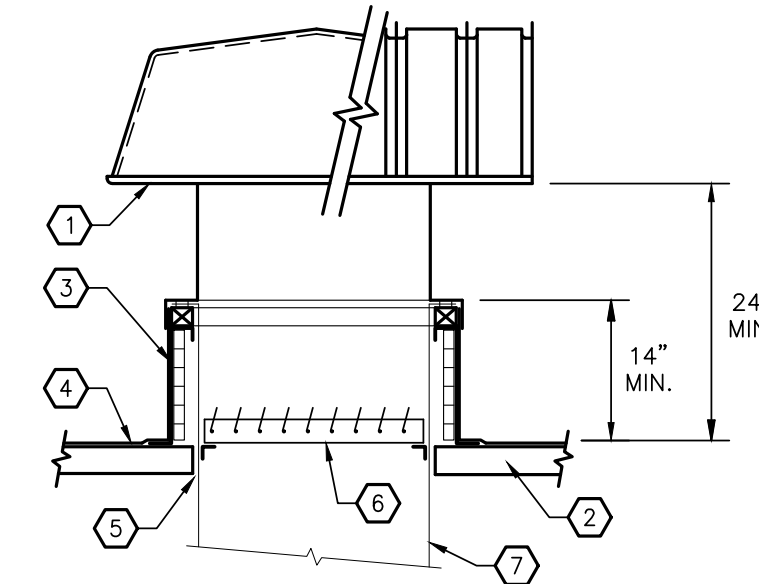
L HOT WATER UNIT HEATER PIPING DETAIL
M3.02 NO SCALE



- 1 SHUTOFF VALVE
- 2 UNION
- 3 PUMP
- 4 PRESSURE GAUGE W/ 1/4" SHUT-OFF COCK
- 5 TRIPLE DUTY (ISOLATION, CHECK & BALANCE) VALVE
- 6 STRAINER WITH BLOW DOWN VALVE AND HOSE BIBB CONNECTION.
- 7 HANGERS
- 8 THERMOMETER
- 9 TRANSITION

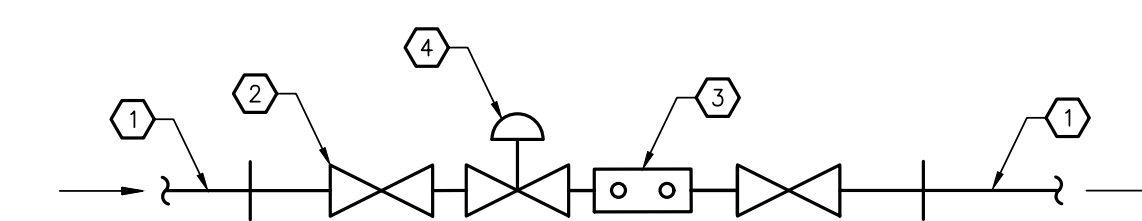
NOTE: ALL SUPPLY, RETURN AND BYPASS PIPING AND ASSOCIATED VALVES, ETC. INDICATED IN THIS DETAIL SHALL BE INSTALLED FULL SIZE FOR EACH COIL.

M VERTICAL IN-LINE PUMP WITH HORIZONTAL PIPING DETAIL (WA-HWS-1)
M3.02 NO SCALE



- 1 BIRD SCREEN
- 2 ROOF CONSTRUCTION ASSEMBLY
- 3 MECHANICAL CONTRACTOR SHALL INSTALL FAN AND ASSOCIATED ROOF CURB PER MANUFACTURERS WRITTEN INSTRUCTIONS.
- 4 ROOF MEMBRANE
- 5 FREE AREA ROOF OPENING TO FAN
- 6 MOTOR OPERATED BACKDRAFT DAMPER (RELIEF HOOD WA-RH-1 ONLY)
- 7 DUCTWORK

N RELIEF HOOD DETAIL (WA-RH-1)
M3.02 NO SCALE



- 1 HOT WATER RETURN, REFER TO PLANS FOR SIZE
- 2 BALL VALVE W/ BALANCING STOP (TYPICAL)
- 3 AUTOMATIC FLOW CONTROL VALVE
- 4 CONTROL VALVE, DANFOSS MODEL RA 2000 OR ENGINEER APPROVED EQUAL, WITH REMOTE ENCLOSURE MOUNTED DIAL AND REMOTE MOUNTED SENSOR

P FLOW CONTROL VALVE DETAIL
M3.01&2 NO SCALE

DATE	DESCRIPTION
07.12.2022	BIDDING & STATE REVIEW

MECHANICAL UPDATES & RELATED WORK
WATERLOO ELEMENTARY SCHOOL
1833 SOUTH CUSTER ROAD, MONROE, MI 48161
MONROE PUBLIC SCHOOLS
1275 N. MACOMB STREET, MONROE, MI 48162

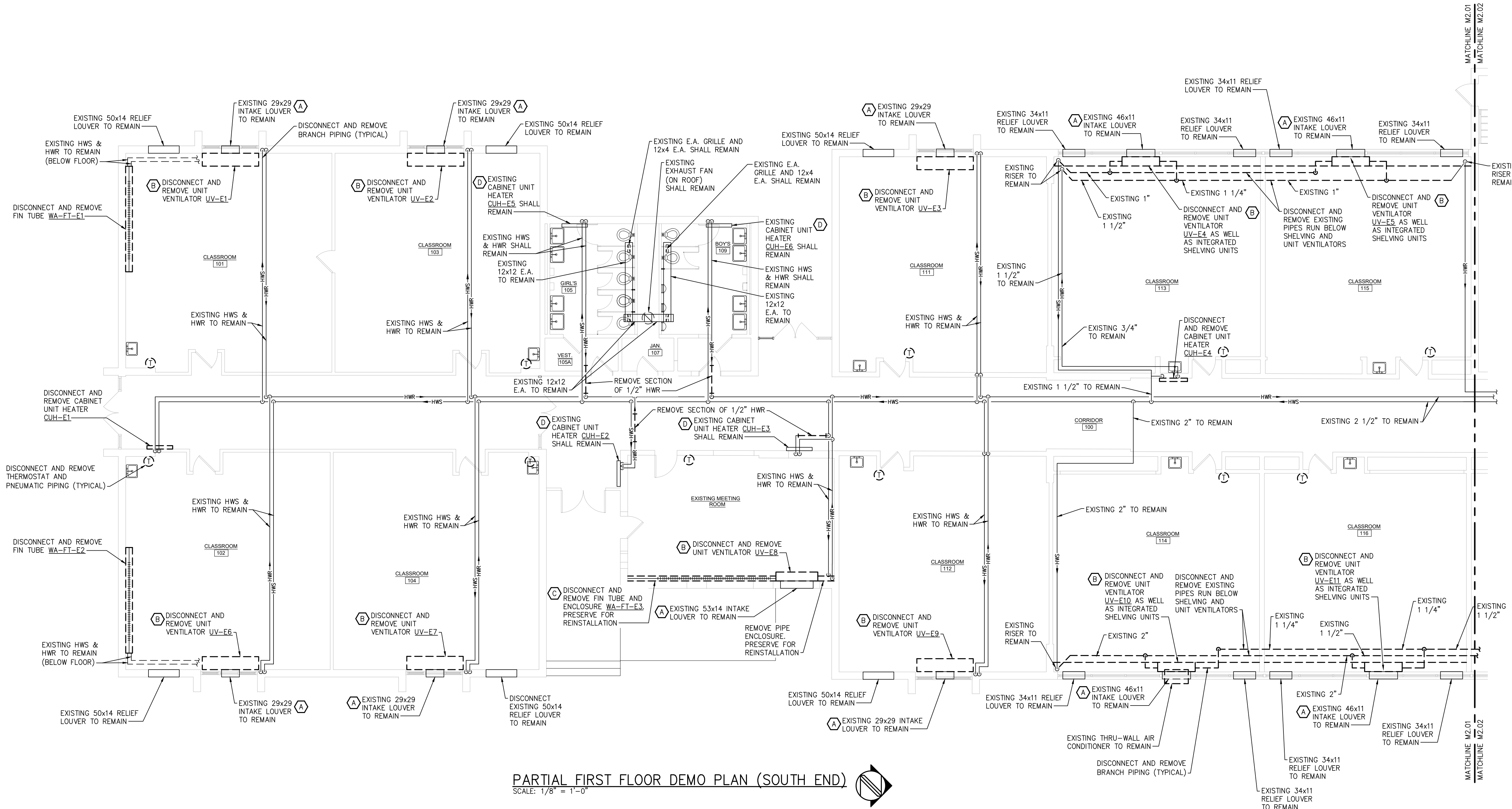
JOB #	22114
DRAWN	JDC
CHECKED	ERS

DETAILS

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M1.04

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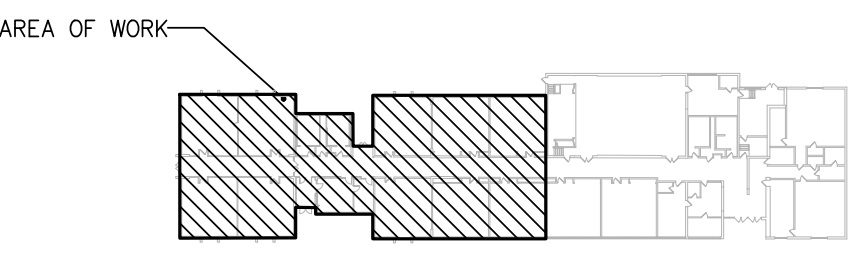
PARTIAL FIRST FLOOR DEMO PLAN (SOUTH END)
 SCALE: 1/8" = 1'-0"

PLAN NOTES:

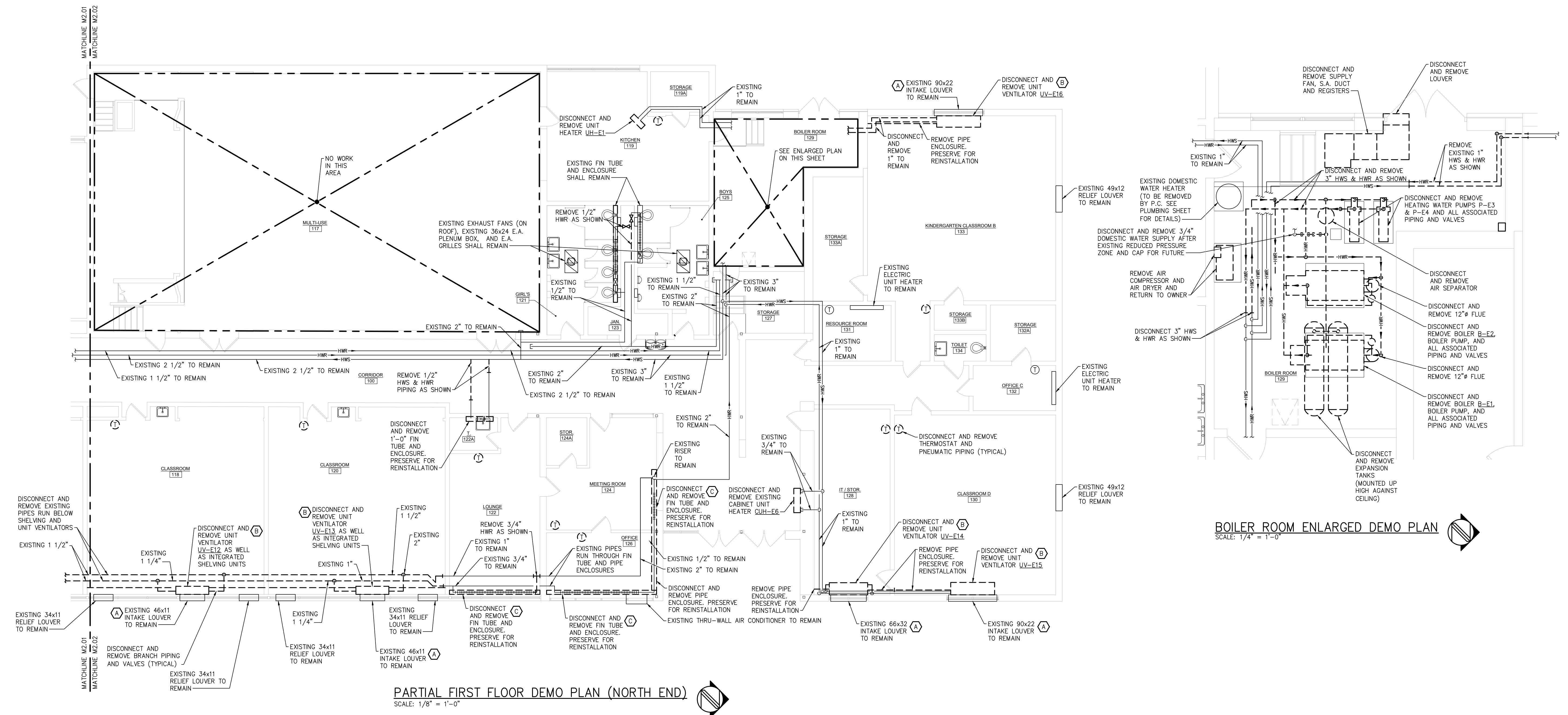
- 1. CLEAN DEBRIS FROM EXISTING SCREEN AND WALL LOUVER GRILLE. TEMPORARILY BLANK OFF WALL OPENING WITH METAL PLATE IN PREPARATION FOR THE INSTALLATION OF NEW UNIT VENTILATOR.
- 2. DISCONNECT AND REMOVE EXISTING 1" HOT WATER BRANCH PIPING AS REQUIRED FOR INSTALLATION OF NEW UNIT VENTILATOR.
- 3. M.C. SHALL REMOVE EXISTING CONTROL VALVE AND PREPARE FOR NEW VALVE ASSEMBLIES AS SHOWN ON DWG M3.01. CLEAN, PREP, POWDER COAT, AND REINSTALL EXISTING FIN TUBE AND PIPE ENCLOSURES. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT. ADD 2-WAY CONTROL VALVE AND AUTOFLOW VALVE PER DETAIL "C" ON SHEET M1.03.
- 4. EXISTING CUH SHALL REMAIN. EXISTING PNEUMATICS SHALL BE REMOVED AND REPLACED WITH DDC CONTROLS. EXISTING FLOW SHALL BE MEASURED TO DETERMINE AUTOFLOW VALVE SIZING. AND NEW AUTOFLOW VALVE SHALL BE INSTALLED. WIRE NEW DDC TSTAT TO EXISTING CUH.

GENERAL NOTES:

- 1. ALL EXISTING PNEUMATIC TEMPERATURE CONTROLS RELATED TO THIS WORK SHALL BE REMOVED.
- 2. ALL EXISTING CONDITIONS SHALL BE FIELD VERIFIED.
- 3. EXISTING TEMPERATURE CONTROL SYSTEM SHALL BE EXPANDED AS REQUIRED TO INCLUDE ALL NEW EQUIPMENT INDICATED ON THESE DRAWINGS.
- 4. ALL EQUIPMENT REMOVED SHALL HAVE ALL ASSOCIATED GRAPHICS REMOVED FROM CONTROL SYSTEM.
- 5. ALL ASSOCIATED TEMPERATURE CONTROL EQUIPMENT NOT SPECIFICALLY ASSOCIATED WITH A PIECE OF EQUIPMENT SHALL BE LOCATED IN ALREADY ACCESSIBLE LOCATION, I.E. STORAGE ROOM, CLOSET, MECHANICAL ROOM, AND SHALL BE CLEARLY LABELED.
- 6. ALL EXISTING CONTROL SYSTEM GRAPHICS SHALL BE UPDATED TO INCLUDE ALL NEW EQUIPMENT ASSOCIATED WITH THIS SCHOOL BUILDING.
- 7. CLEAN, PREP, POWDER COAT, AND REINSTALL EXISTING FIN TUBE AND PIPE ENCLOSURES. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT. POWDER COAT SHALL BE IFS STANDARD POLYESTER IFS 300SP RATED FOR INTERIOR APPLICATION, AND SHALL MEET OR EXCEED THE PERFORMANCE REQUIREMENTS OF AAMA 2603.



KEY PLAN
 NO SCALE



PARTIAL FIRST FLOOR DEMO PLAN (NORTH END)
 SCALE: 1/8" = 1'-0"

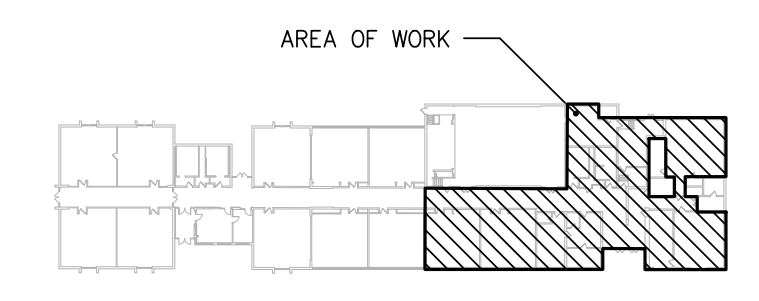
BOILER ROOM ENLARGED DEMO PLAN
 SCALE: 1/4" = 1'-0"

PLAN NOTES:

- (A) CLEAN DEBRIS FROM EXISTING SCREEN AND WALL LOUVER GRILLE. TEMPORARILY BLANK OFF WALL OPENING WITH METAL PLATE IN PREPARATION FOR THE INSTALLATION OF NEW UNIT VENTILATOR.
- (B) DISCONNECT AND REMOVE EXISTING 1" HOT WATER BRANCH PIPING AS REQUIRED FOR INSTALLATION OF NEW UNIT VENTILATOR.
- (C) M.C. SHALL REMOVE EXISTING CONTROL VALVE AND PREPARE FOR NEW VALVE ASSEMBLIES AS SHOWN ON DWG M3.01. CLEAN, PREP, POWDER COAT, AND REINSTALL EXISTING FIN TUBE AND PIPE ENCLOSURES. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT. ADD 2-WAY CONTROL VALVE AND AUTOFLOW VALVE PER DETAIL "C" ON SHEET M1.03.

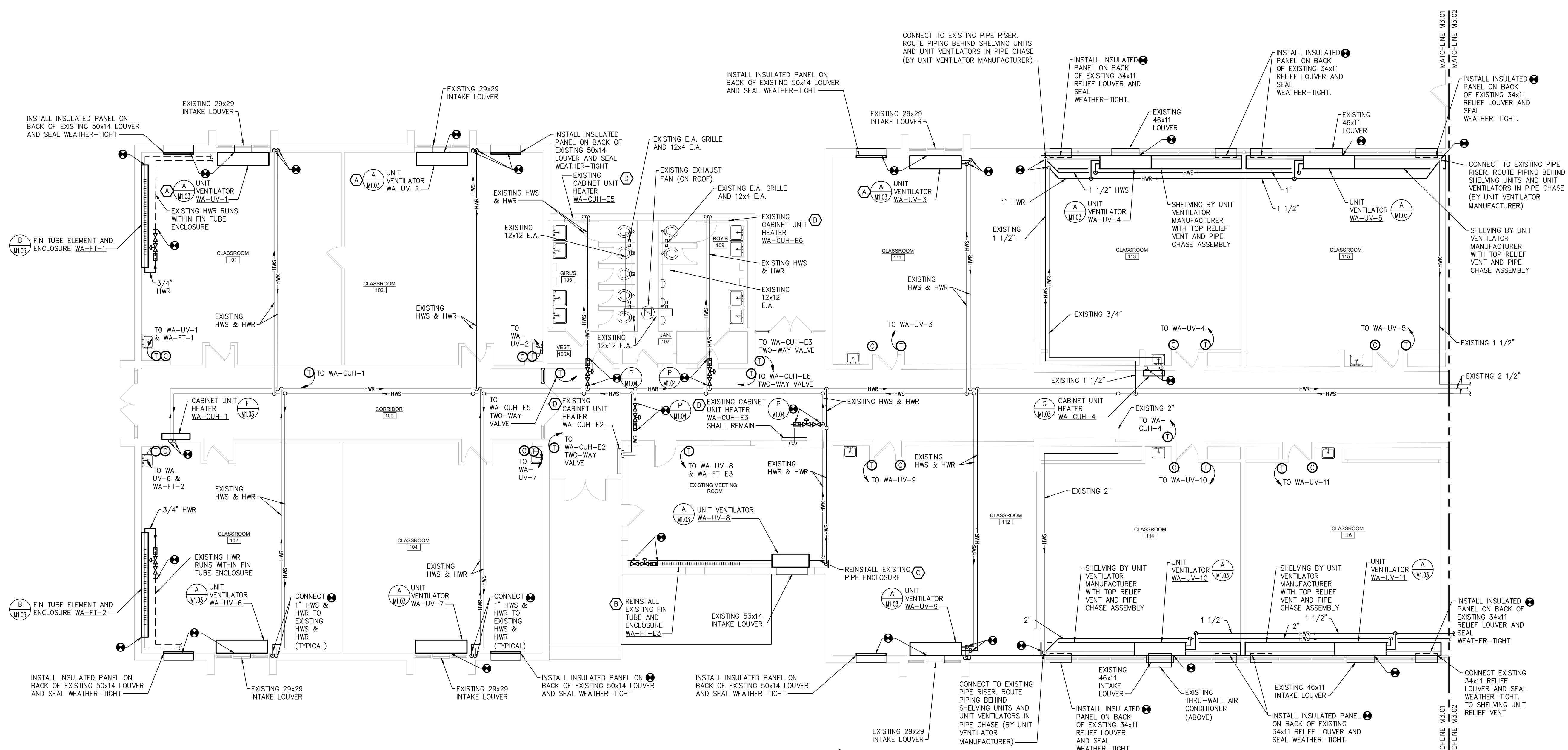
GENERAL NOTES:

1. ALL EXISTING PNEUMATIC TEMPERATURE CONTROLS RELATED SHALL BE REMOVED.
2. ALL EXISTING CONDITIONS SHALL BE FIELD VERIFIED.
3. EXISTING TEMPERATURE CONTROL SYSTEM SHALL BE EXPANDED AS REQUIRED TO INCLUDE ALL NEW EQUIPMENT INDICATED ON THESE DRAWINGS
4. ALL EQUIPMENT REMOVED SHALL HAVE ALL ASSOCIATED GRAPHICS REMOVED FROM CONTROL SYSTEM.
5. ALL ASSOCIATED TEMPERATURE CONTROL EQUIPMENT NOT SPECIFICALLY ASSOCIATED WITH A PIECE OF EQUIPMENT SHALL BE LOCATED IN ALREADY ACCESSIBLE LOCATION, I.E. STORAGE ROOM, CLOSET, MECHANICAL ROOM, AND SHALL BE CLEARLY LABELED.
6. ALL EXISTING CONTROL SYSTEM GRAPHICS SHALL BE UPDATED TO INCLUDE ALL NEW EQUIPMENT ASSOCIATED WITH THIS SCHOOL BUILDING.
7. CLEAN, PREP, POWDER COAT, AND REINSTALL EXISTING FIN TUBE AND PIPE ENCLOSURES. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT. POWDER COAT SHALL BE IFS STANDARD POLYESTER IFS 300SP RATED FOR INTERIOR APPLICATION, AND SHALL MEET OR EXCEED THE PERFORMANCE REQUIREMENTS OF AAMA 2603.



KEY PLAN
 NO SCALE

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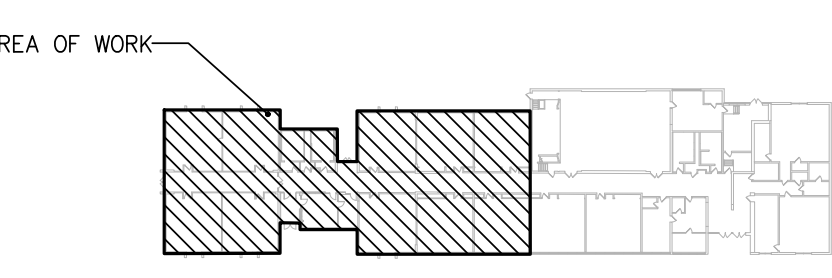
PARTIAL FIRST FLOOR PLAN (SOUTH END)
 SCALE: 1/8" = 1'-0"

PLAN NOTES:

- A HOT WATER SUPPLY AND RETURN PIPING CONNECTION IS ON THE LEFT-HAND SIDE OF UNIT VENTILATOR. ROUTE PIPING THROUGH PIPE CHASE WITHIN UNIT VENTILATOR TO MAKE COIL CONNECTION.
- B INSTALL ACCESS PANEL IN EXISTING ENCLOSURE FOR ACCESS TO CONTROL VALVES. CLEAN, PREP, POWDER COAT, AND REINSTALL EXISTING FIN TUBE AND PIPE ENCLOSURES. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT. REPLACE EXISTING SHUT OFF VALVES. INSTALL NEW VALVE ASSEMBLY INCLUDING CONTROL VALVE AND AUTOFLOW VALVE PER DETAIL "C" ON SHEET M1.03.
- C CLEAN, POWDER COAT, AND REINSTALL EXISTING PIPE ENCLOSURE. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT. THE NEW UNIT VENTILATOR IS APPROXIMATELY 2" IN WIDTH LESS THAN EXISTING UNIT VENTILATOR. CONTRACTOR SHALL PROVIDE ADDITIONAL POWDER COATED SHEET METAL TO MATCH EXISTING REPAINTED PIPE ENCLOSURE, AND CLOSE ANY REMAINING GAP BETWEEN PIPE ENCLOSURE AND WALL.
- D EXISTING CUH SHALL REMAIN. EXISTING PNEUMATICS SHALL BE REMOVED AND REPLACED WITH DDC CONTROLS. EXISTING FLOW SHALL BE MEASURED TO DETERMINE AUTOFLOW VALVE SIZING, AND NEW AUTOFLOW VALVE SHALL BE INSTALLED. WIRE NEW DDC TSTAT TO EXISTING CUH.

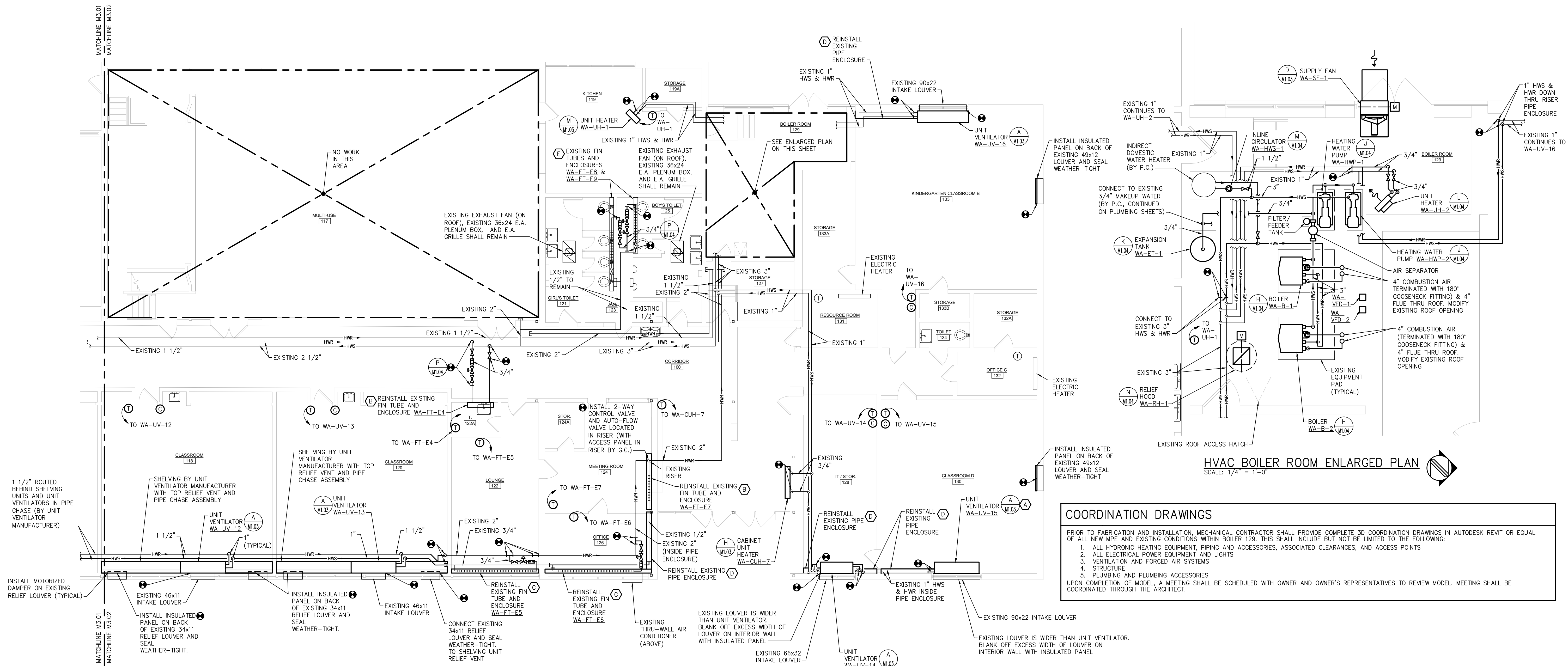
GENERAL NOTES:

- 1. FRESH AIR INTAKE SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY EXHAUST OUTLET, FLUE OR PLUMBING VENT. COORDINATE EQUIPMENT AND VENT LOCATIONS WITH PLUMBING CONTRACTOR.
- 2. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE/PLUMBING CHASES WITH ALL OTHER TRADES.
- 3. PIPE PENETRATIONS THRU ALL FIRE RATED WALLS SHALL BE SEALED BY THE MECHANICAL CONTRACTOR, TO PREVENT SPREAD OF FIRE AND SMOKE AND INGRESS OF MOISTURE.
- 4. PROVIDE ALL HANGERS, SUPPORTS AND MISCELLANEOUS STEEL REQUIRED FOR THE PROPER INSTALLATION OF ALL PIPE AND EQUIPMENT.
- 5. COORDINATE DUCTWORK, PIPING AND EQUIPMENT LOCATIONS WITH ALL OTHER TRADES
- 6. MAINTAIN REQUIRED MANUFACTURERS' CLEARANCES ON ALL EQUIPMENT.
- 7. PREP AND PAINT ALL BARE METAL.
- 8. ALL EXISTING TEMPERATURE CONTROLS RELATED TO THE DEMOLITION, PNEUMATIC AND ELECTRIC SHALL BE REMOVED. PNEUMATIC PIPING SHOULD BE CUT BACK TO MAIN AND CAPPED. EXISTING PNEUMATIC SYSTEM OPERATION SHALL BE FIELD VERIFIED IMMEDIATELY AFTER DEMOLITION. PNEUMATIC SYSTEM OPERATION FOR EXISTING EQUIPMENT MUST BE RETAINED.
- 9. EXISTING TEMPERATURE CONTROL SYSTEM SHALL BE EXPANDED AS REQUIRED TO INCLUDE ALL NEW EQUIPMENT INDICATED ON THESE DRAWINGS
- 10. ALL EQUIPMENT REMOVED SHALL HAVE ALL ASSOCIATED GRAPHICS REMOVED FROM CONTROL SYSTEM.
- 11. ALL ASSOCIATED TEMPERATURE CONTROL EQUIPMENT NOT SPECIFICALLY ASSOCIATED WITH A PIECE OF EQUIPMENT SHALL BE LOCATED IN EASILY ACCESSIBLE SPACE (I.E. STORAGE ROOM, MECHANICAL ROOM, ETC.) AND SHALL BE CLEARLY TAGGED.
- 12. ALL EQUIPMENT AND PIPING ACCESSORIES SHALL BE INSTALLED IN A MANNER IN WHICH ALL ITEMS ARE EASILY ACCESSIBLE AND MAINTAINED. IN NO WAY SHALL MANUAL OR AUTOMATIC AIR VENTS BE LOCATED ABOVE POWERED EQUIPMENT.
- 13. ALL EXISTING CONDITIONS SHALL BE FIELD VERIFIED.
- 14. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPING CHASES WITH ALL OTHER TRADES.
- 15. COORDINATE UNIT VENTILATOR INSTALLATION WITH GENERAL CONTRACTOR.



KEY PLAN
 NO SCALE

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COORDINATION DRAWINGS

PRIOR TO FABRICATION AND INSTALLATION, MECHANICAL CONTRACTOR SHALL PROVIDE COMPLETE 3D COORDINATION DRAWINGS IN AUTODESK REVIT OR EQUAL OF ALL NEW MPE AND EXISTING CONDITIONS WITHIN BOILER 129. THIS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

1. ALL HYDRONIC HEATING EQUIPMENT, PIPING AND ACCESSORIES, ASSOCIATED CLEARANCES, AND ACCESS POINTS
2. ALL ELECTRICAL POWER EQUIPMENT AND LIGHTS
3. VENTILATION AND FORCED AIR SYSTEMS
4. STRUCTURE
5. PLUMBING AND PLUMBING ACCESSORIES

UPON COMPLETION OF MODEL, A MEETING SHALL BE SCHEDULED WITH OWNER AND OWNER'S REPRESENTATIVES TO REVIEW MODEL. MEETING SHALL BE COORDINATED THROUGH THE ARCHITECT.

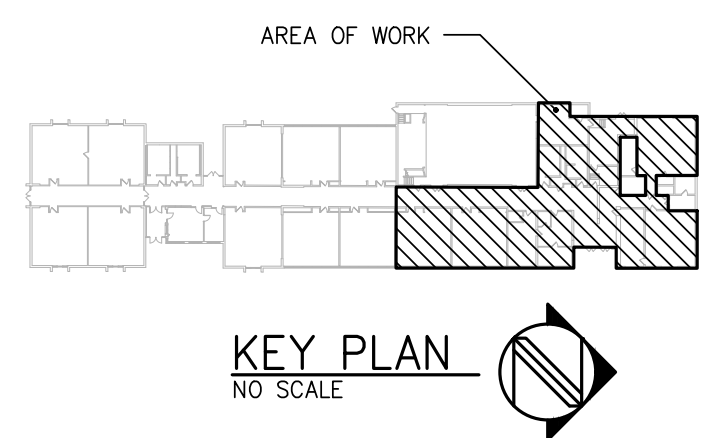
PARTIAL FIRST FLOOR PLAN (SOUTH END)
 SCALE: 1/8" = 1'-0"

PLAN NOTES:

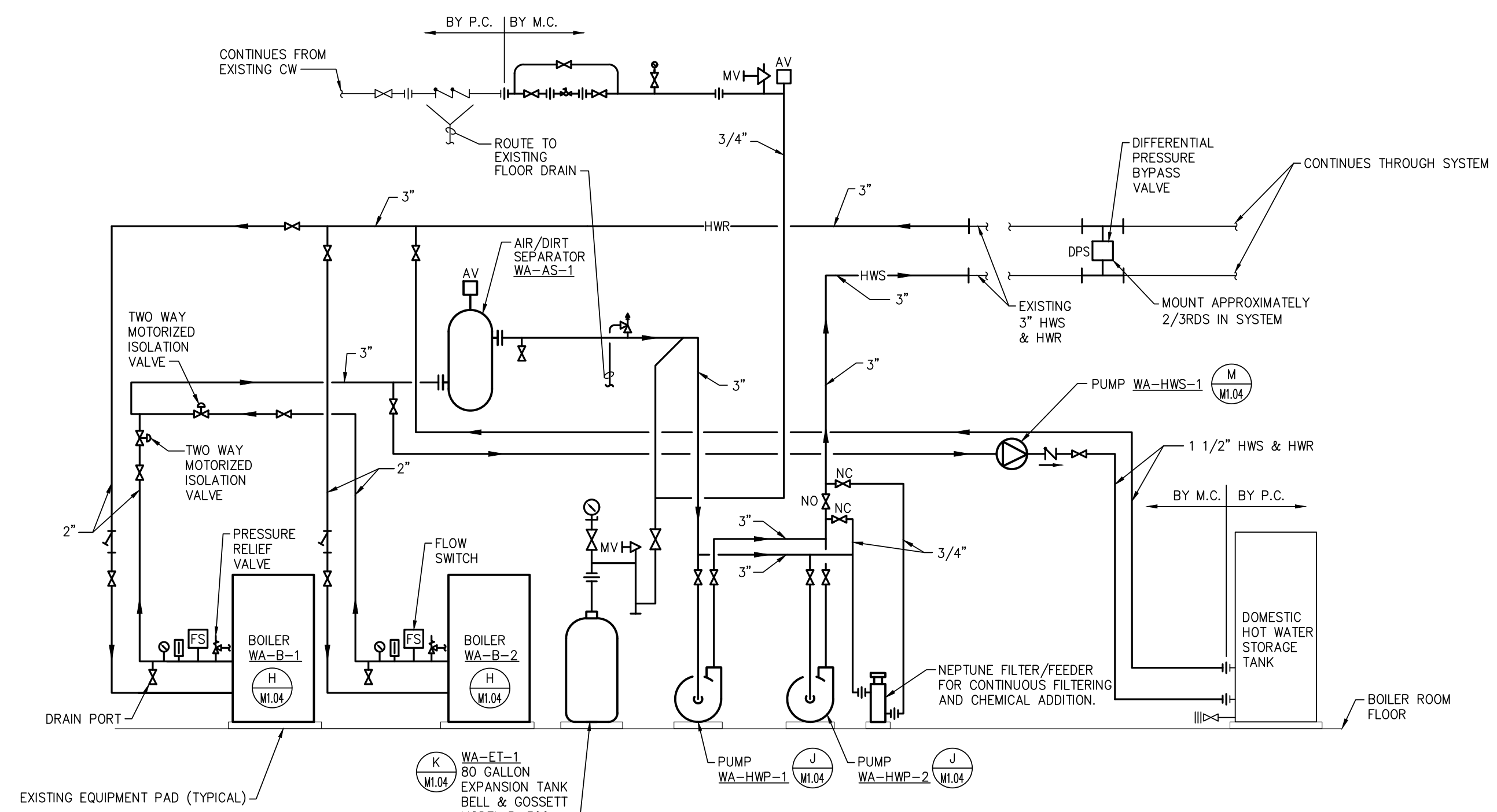
- (A) HOT WATER SUPPLY AND RETURN PIPING CONNECTION IS ON THE LEFT-HAND SIDE OF UNIT VENTILATOR. ROUTE PIPING THROUGH PIPE CHASE WITHIN UNIT VENTILATOR TO MAKE COIL CONNECTION.
- (B) CLEAN, PREP, POWDER COAT, AND REINSTALL EXISTING FIN TUBE AND PIPE ENCLOSURES. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT. REPLACE EXISTING SHUT OFF VALVES. INSTALL NEW VALVE ASSEMBLY INCLUDING CONTROL VALVE AND AUTOFLOW VALVE PER DETAIL "C" ON SHEET M1.03.
- (C) INSTALL ACCESS PANEL IN EXISTING ENCLOSURE FOR ACCESS TO CONTROL VALVES. CLEAN, PREP, POWDER COAT, AND REINSTALL EXISTING FIN TUBE AND PIPE ENCLOSURES. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT. REPLACE EXISTING SHUT OFF VALVES. INSTALL NEW VALVE ASSEMBLY INCLUDING CONTROL VALVE AND AUTOFLOW VALVE PER DETAIL "C" ON SHEET M1.03.
- (D) CLEAN, POWDER COAT, AND REINSTALL EXISTING PIPE ENCLOSURES. POWDER COAT COLOR TO BE SELECTED BY ARCHITECT.
- (E) REPLACE EXISTING SHUT OFF VALVES. INSTALL NEW VALVE ASSEMBLY INCLUDING AUTOFLOW VALVE AND CONTROL VALVE.

GENERAL NOTES:

1. FRESH AIR INTAKE SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY EXHAUST OUTLET, FLUE OR PLUMBING VENT. COORDINATE EQUIPMENT AND VENT LOCATIONS WITH PLUMBING CONTRACTOR.
2. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPE/PLUMBING CHASES WITH ALL OTHER TRADES.
3. PIPE PENETRATIONS THRU ALL FIRE RATED WALLS SHALL BE SEALED BY THE MECHANICAL CONTRACTOR, TO PREVENT SPREAD OF FIRE AND SMOKE AND INGRESS OF MOISTURE.
4. PROVIDE ALL HANGERS, SUPPORTS AND MISCELLANEOUS STEEL REQUIRED FOR THE PROPER INSTALLATION OF ALL PIPE AND EQUIPMENT.
5. COORDINATE DUCTWORK, PIPING AND EQUIPMENT LOCATIONS WITH ALL OTHER TRADES
6. MAINTAIN REQUIRED MANUFACTURERS' CLEARANCES ON ALL EQUIPMENT.
7. PREP AND PAINT ALL BARE METAL.
8. EXISTING TEMPERATURE CONTROL SYSTEM SHALL BE EXPANDED AS REQUIRED TO INCLUDE ALL NEW EQUIPMENT INDICATED ON THESE DRAWINGS
9. ALL EQUIPMENT REMOVED SHALL HAVE ALL ASSOCIATED GRAPHICS REMOVED FROM CONTROL SYSTEM.
10. ALL ASSOCIATED TEMPERATURE CONTROL EQUIPMENT NOT SPECIFICALLY ASSOCIATED WITH A PIECE OF EQUIPMENT SHALL BE LOCATED IN EASILY ACCESSIBLE SPACE (I.E. STORAGE ROOM, MECHANICAL ROOM, ETC.) AND SHALL BE CLEARLY TAGGED.
11. ALL EQUIPMENT AND PIPING ACCESSORIES SHALL BE INSTALLED IN A MANNER IN WHICH ALL ITEMS ARE EASILY ACCESSIBLE AND MAINTAINED. IN NO WAY SHALL MANUAL OR AUTOMATIC AIR VENTS BE LOCATED ABOVE POWERED EQUIPMENT.
12. ALL EXISTING CONDITIONS SHALL BE FIELD VERIFIED.
13. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PIPING CHASES WITH ALL OTHER TRADES.
14. COORDINATE UNIT VENTILATOR INSTALLATION WITH GENERAL CONTRACTOR.
15. ALL ROOF MOUNTED EQUIPMENT REQUIRING SERVICE SHALL BE LOCATED A MINIMUM OF 10'-0" FROM THE EDGE OF ROOF
16. ROOF CURBS SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR. REFER TO ARCHITECTURAL DRAWINGS FOR ROOF CONSTRUCTION.
17. REFER TO SHEET M5.01 FOR HEATING WATER FLOW DIAGRAM.



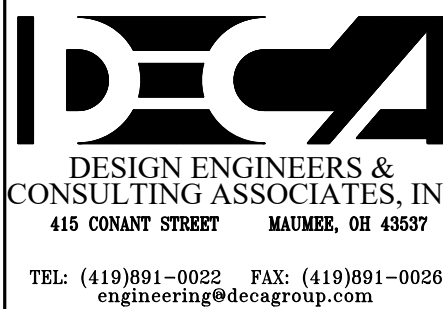
S:\22\22079\dwg\22079M5.01.dwg 07/07/22 19:45:28 ESchwarzkopf



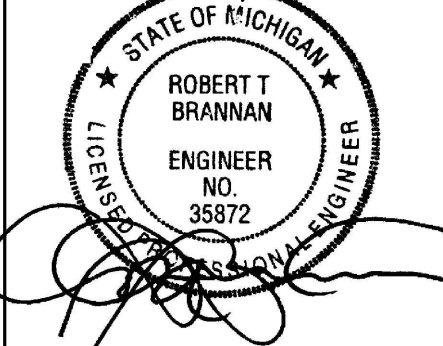
HEATING WATER SYSTEM FLOW DIAGRAM
SCALE: NONE

GENERAL NOTES:

1. ALL ASSOCIATED TEMPERATURE CONTROL EQUIPMENT NOT SPECIFICALLY ASSOCIATED WITH A PIECE OF EQUIPMENT SHALL BE LOCATED IN EASILY ACCESSIBLE SPACE (I.E. STORAGE ROOM, MECHANICAL ROOM, ETC.) AND SHALL BE CLEARLY TAGGED.
2. ALL EQUIPMENT AND PIPING ACCESSORIES SHALL BE INSTALLED IN A MANNER IN WHICH ALL ITEMS ARE EASILY ACCESSIBLE AND MAINTAINED. IN NO WAY SHALL MANUAL OR AUTOMATIC AIR VENTS BE LOCATED ABOVE POWERED EQUIPMENT OR NOT ACCESSIBLE FOR REPLACEMENT.



07/12/2022



DATE	DESCRIPTION
07.12.2022	BIDDING & STATE REVIEW

MECHANICAL UPDATES & RELATED WORK

WATERLOO ELEMENTARY SCHOOL
1933 SOUTH CUSTER ROAD, MONROE, MI 48161
MONROE PUBLIC SCHOOLS
1275 N. MACOMB STREET, MONROE, MI 48162

AT FOR

JOB #	22114
DRAWN	JDC
CHECKED	ERS

FLOW DIAGRAMS

M5.01

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TEMPERATURE CONTROL SYSTEM POINT LIST											
SYSTEM POINT DESCRIPTION	HARDWARE POINTS				SOFTWARE POINTS					SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM		
BOILER WA-B-1 HOT WATER RETURN TEMP	X							X		X	
BOILER WA-B-1 HOT WATER SUPPLY TEMP	X							X		X	
BOILER WA-B-2 HOT WATER RETURN TEMP	X							X		X	
BOILER WA-B-2 HOT WATER SUPPLY TEMP	X							X		X	
BOILER WA-B-1 & WA-B-2 HOT WATER SUPPLY TEMP SETPOINT RESET (QTY. 2)		X						X		X	
BOILER WA-B-1 STATUS			X					X		X	
BOILER WA-B-2 STATUS			X					X		X	
BOILER WA-B-1 ENABLE				X						X	
BOILER WA-B-2 ENABLE				X						X	
BOILER WA-B-1 FAILURE										X	
BOILER WA-B-2 FAILURE										X	
BOILER WA-B-1 RUNTIME EXCEEDED										X	
BOILER WA-B-2 RUNTIME EXCEEDED										X	
BOILER WA-B-1 HIGH HOT WATER SUPPLY TEMP										X	
BOILER WA-B-2 HIGH HOT WATER SUPPLY TEMP										X	
BOILER WA-B-1 LOW HOT WATER SUPPLY TEMP										X	
BOILER WA-B-2 LOW HOT WATER SUPPLY TEMP										X	
BOILER WA-B-1 ISOLATION VALVE CLOSE		X									
BOILER WA-B-1 ISOLATION VALVE OPEN		X									
BOILER WA-B-1 ISOLATION VALVE POSITION					X			X		X	
BOILER WA-B-2 ISOLATION VALVE CLOSE		X									
BOILER WA-B-2 ISOLATION VALVE OPEN		X									
BOILER WA-B-2 ISOLATION VALVE POSITION					X			X		X	
HOT WATER DIFFERENTIAL PRESSURE	X							X		X	
HOT WATER DIFFERENTIAL PRESSURE SETPOINT					X			X		X	
HIGH HOT WATER DIFFERENTIAL PRESSURE									X		
LOW HOT WATER DIFFERENTIAL PRESSURE									X		
PRIMARY HOT WATER RETURN TEMP	X							X		X	
PRIMARY HOT WATER SUPPLY TEMP	X							X		X	
HIGH PRIMARY HOT WATER SUPPLY TEMP									X		
LOW PRIMARY HOT WATER SUPPLY TEMP									X		
HOT WATER PUMP WA-HWP-1 VFD SPEED		X						X		X	
HOT WATER PUMP WA-HWP-2 VFD SPEED		X						X		X	
HOT WATER PUMP WA-HWP-1 VFD FAULT			X						X	X	
HOT WATER PUMP WA-HWP-2 VFD FAULT			X						X	X	
HOT WATER PUMP WA-HWP-1 STATUS			X					X		X	
HOT WATER PUMP WA-HWP-2 STATUS			X					X		X	
HOT WATER PUMP WA-HWP-1 START/STOP				X						X	
HOT WATER PUMP WA-HWP-2 START/STOP				X						X	
HOT WATER PUMP WA-HWP-1 FAILURE										X	
HOT WATER PUMP WA-HWP-2 FAILURE										X	
HOT WATER PUMP WA-HWP-1 RUNNING IN HAND										X	
HOT WATER PUMP WA-HWP-2 RUNNING IN HAND										X	
HOT WATER PUMP WA-HWP-1 RUNTIME EXCEEDED										X	
HOT WATER PUMP WA-HWP-2 RUNTIME EXCEEDED										X	
HOT WATER PUMP WA-HWS-1 STATUS			X					X		X	
HOT WATER PUMP WA-HWS-1 START/STOP				X						X	
HOT WATER PUMP WA-HWS-1 FAILURE										X	
HOT WATER PUMP WA-HWS-1 RUNNING IN HAND										X	
HOT WATER PUMP WA-HWS-1 RUNTIME EXCEEDED										X	
MAKEUP WATER FILL				X				X		X	

TEMPERATURE CONTROL SYSTEM POINT LIST											
SYSTEM POINT DESCRIPTION	HARDWARE POINTS				SOFTWARE POINTS					SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND		ALARM
STORAGE TANK TEMPERATURE	X								X		X
DOMESTIC HOT WATER SUPPLY TEMPERATURE	X								X		X
DOMESTIC HOT WATER RETURN TEMPERATURE	X								X		X
TANK CIRCULATION PUMP STATUS			X						X		X
DOMESTIC HOT WATER CIRCULATION PUMP STATUS			X						X		X
WATER HEATER ALARM			X							X	X
WATER HEATER ENABLE				X					X		X
DOMESTIC HOT WATER CIRCULATION PUMP START/STOP				X					X		X
TANK CIRCULATION PUMP FAILURE										X	
TANK CIRCULATION PUMP IN HAND										X	
TANK CIRCULATION PUMP RUNTIME ALARM										X	
DOMESTIC HOT WATER CIRCULATION PUMP FAILURE										X	
DOMESTIC HOT WATER CIRCULATION PUMP IN HAND										X	
DOMESTIC HOT WATER CIRCULATION PUMP RUNTIME ALARM										X	

TEMPERATURE CONTROL SYSTEM POINT LIST											
SYSTEM POINT DESCRIPTION	HARDWARE POINTS				SOFTWARE POINTS					SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND		ALARM
UNIT HEATERS (WA-UH-1&2) & CABINET UNIT HEATERS (WA-CUH-1, 4 & 7)											
ZONE SETPOINT ADJUST	X										X
FAN STATUS			X						X		X
FAN START/STOP				X					X		X
HEATING VALVE CLOSE		X									
HEATING VALVE OPEN		X									
ZONE TEMPERATURE					X				X		X
HEATING SETPOINT					X				X		X
HEATING VALVE POSITION				X					X		X
SCHEDULE								X			
LOW ZONE TEMPERATURE										X	X
FAN FAILURE										X	
FAN IN HAND										X	
FAN RUNTIME EXCEEDED										X	

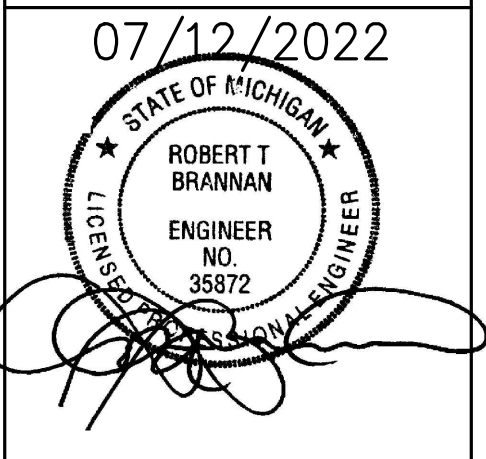
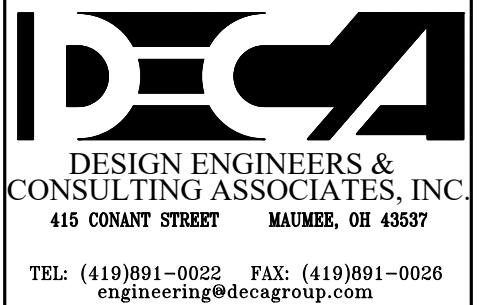
TEMPERATURE CONTROL SYSTEM POINT LIST											
SYSTEM POINT DESCRIPTION	HARDWARE POINTS				SOFTWARE POINTS					SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND		ALARM
UNIT HEATERS (WA-UH-1&2) & CABINET UNIT HEATERS (WA-CUH-E2, E3, E5 & E6)											
ZONE SETPOINT ADJUST	X										X
HEATING VALVE CLOSE		X									
HEATING VALVE OPEN		X									
ZONE TEMPERATURE					X				X		X
HEATING SETPOINT					X				X		X
HEATING VALVE POSITION				X					X		X
SCHEDULE								X			
LOW ZONE TEMPERATURE										X	X

TEMPERATURE CONTROL SYSTEM POINT LIST											
SYSTEM POINT DESCRIPTION	HARDWARE POINTS				SOFTWARE POINTS					SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND		ALARM
FIN-TUBES (WA-FT-1 THRU E9)											
ZONE TEMP		X							X		X
ZONE TEMP SETPOINT			X								X
HOT WATER VALVE POSITION					X				X		X
LOW ZONE TEMPERATURE										X	X
SCHEDULE								X			

TEMPERATURE CONTROL SYSTEM POINT LIST											
SYSTEM POINT DESCRIPTION	HARDWARE POINTS				SOFTWARE POINTS					SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND		ALARM
BOILER ROOM VENTILATION											
SUPPLY FAN WA-SF-1 STATUS			X						X		X
SUPPLY FAN WA-SF-1 START/STOP				X					X		X
RELIEF HOOD WA-RH-1 EXHAUST AIR DAMPER				X					X		X
SUPPLY FAN SF-1 INTAKE AIR DAMPER				X					X		X
COOLING SETPOINT					X				X		X
ZONE TEMPERATURE					X				X		X
HIGH ZONE TEMPERATURE										X	
FAN FAILURE										X	
FAN IN HAND										X	
FAN RUNTIME EXCEEDED										X	

GENERAL NOTES:

1. ALL ASSOCIATED TEMPERATURE CONTROL EQUIPMENT NOT SPECIFICALLY ASSOCIATED WITH A PIECE OF EQUIPMENT SHALL BE LOCATED IN EASILY ACCESSIBLE SPACE (I.E. STORAGE ROOM, MECHANICAL ROOM, ETC.) AND SHALL BE CLEARLY TAGGED.



DATE	DESCRIPTION
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MECHANICAL UPDATES & RELATED WORK
 AT **WATERLOO ELEMENTARY SCHOOL**
 1933 SOUTH CUSTER ROAD, MONROE, MI 48161
 FOR **MONROE PUBLIC SCHOOLS**
 1275 N. MACOMB STREET, MONROE, MI 48162

JOB #	22114
DRAWN	JDC
CHECKED	ERS

TEMPERATURE CONTROLS

M6.01

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TEMPERATURE CONTROL SYSTEM POINT LIST												
SYSTEM POINT DESCRIPTION (WA-UV-1 THRU 16)	HARDWARE POINTS				SOFTWARE POINTS						SHOW ON GRAPHIC	
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM		
	ZONE SETPOINT ADJUST	X								X		
DISCHARGE AIR TEMP	X								X		X	
HEATING VALVE AT UNIT VENTILATOR		X							X		X	
HEATING VALVE AT ASSOCIATED CONVECTOR (WHERE APPLICABLE)		X							X		X	
MIXED AIR DAMPERS		X							X		X	
ZONE OVERRIDE			X						X		X	
FAN STATUS			X						X		X	
FAN START/STOP				X					X		X	
ZONE TEMP					X				X		X	
HEATING SETPOINT					X				X		X	
COOLING SETPOINT (FUTURE)					X				X		X	
SCHEDULE								X				
HIGH ZONE TEMP										X		
LOW ZONE TEMP										X		
PURGE							X					
RETURN AIR CO2 LEVEL	X								X	X	X	
O.A. DAMPER POSITION	X								X		X	

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TEMPERATURE CONTROL SYSTEM SEQUENCE OF OPERATION

GENERAL NOTES:

THE INTENT OF THIS SPECIFICATION IS TO VERBALLY DESCRIBE THE DESIRED ACTIONS OF THE HVAC EQUIPMENT SPECIFIED HEREIN FOR THIS FACILITY. EACH TEMPERATURE CONTROL CONTRACTOR (T.C.C.) AND EACH MECHANICAL CONTRACTOR (M.C.) SHALL FAMILIARIZE HIMSELF WITH THESE WRITTEN SEQUENCES. WHETHER OR NOT EXPLICITLY SHOWN ON THE DRAWINGS, ALL DEVICES AND ITEMS REQUIRED FOR THE EXECUTION OF THESE SEQUENCES ARE THE RESPONSIBILITY OF THE BIDDING CONTRACTOR.

UNIT VENTILATORS (WA-UV-1 THRU 16):

1. DURING THE OCCUPIED MODE, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER (FURNISHED WITH THE UNIT) SHALL OPEN TO ACCOMMODATE THE MINIMUM QUANTITY OF VENTILATION AIR AS INDICATED ON THE EQUIPMENT SCHEDULE. UPON THE DETERMINATION OF THE TIME CLOCK FUNCTION FOR THE UNOCCUPIED MODE, THE OUTDOOR AIR DAMPER SHALL CLOSE 100%. NIGHT SETBACK FOR BOTH HEATING AND COOLING (FUTURE) SHALL BE FURNISHED FOR ALL ROOFTOP SYSTEMS. THIS SEQUENCE SHALL BE CONSISTENT FOR BOTH THE HEATING AND COOLING (FUTURE) SEASON.
2. SPACE HEATING: WITH A CALL FOR HEATING, THE HEATING SYSTEM SHALL SEQUENCE TO SATISFY ITS RESPECTIVE THERMOSTAT SETPOINT. THE SUPPLY AIR FAN SHALL RUN CONTINUOUSLY WITH THE HEATING SYSTEM BEING CYCLED TO MAINTAIN THE TEMPERATURE SETPOINT.
3. PURGE MODE: PRIOR TO MORNING WARM-UP / COOL-DOWN, OUTSIDE AIR DAMPER SHALL OPEN 100%, AND THE UNIT SHALL RUN FOR 15 MINUTES (ADJUSTABLE). AT THE END OF SCHEDULED OCCUPIED MODE, THE UNITS OUTSIDE AIR DAMPER SHALL OPEN 100%, AND UNIT SHALL RUN FOR 15 MINUTES (ADJUSTABLE). AT THE END OF PURGE MODE, OUTSIDE AIR DAMPER SHALL CLOSE AND THE UNIT SHALL RETURN TO CURRENT SEQUENCE OPERATION. AT ANY TIME DURING PURGE MODE, IF ROOFTOP UNIT LEAVING AIR TEMPERATURE DROPS BELOW SPACE SETPOINT, OUTSIDE AIR DAMPER SHALL ADJUST AS REQUIRED TO MEET SPACE SETPOINT. PURGE MODE TIME SHALL BE EXTENDED BASED ON THE FOLLOWING:
 - A. O.A. DAMPER POSITION OF 90% OPEN: 10 MINUTES
 - B. O.A. DAMPER POSITION OF 70% OPEN: 20 MINUTES
 - C. O.A. DAMPER POSITION OF 60% OPEN: 25 MINUTES
 - D. O.A. DAMPER POSITION OF 50% OPEN: 30 MINUTES
4. CO2 MONITORING: DURING OCCUPIED MODE, OUTSIDE AIR DAMPER SHALL MODULATE AS REQUIRED TO PREVENT CO2 LEVEL FROM EXCEEDING 1,000 PPM (ADJUSTABLE). CO2 SENSORS SHALL BE MOUNTED IN ROOM.

BOILER ROOM HEATING AND VENTILATION (SUPPLY FAN WA-SF-1, RELIEF HOOD WA-RH-1, AND UNIT HEATER WA-UH-1):

1. SPACE COOLING: SUPPLY FAN WA-SF-1 SHALL ENERGIZE AND RELIEF HOOD WA-RH-1 DAMPER SHALL OPEN WHEN SPACE TEMP EXCEEDS 80 DEGREES F (ADJUSTABLE). WHEN SPACE TEMPERATURE DROPS BELOW SETPOINT, FAN SHALL DE-ENERGIZE AND DAMPERS SHALL CLOSE.
2. SPACE HEATING: UNIT HEATER AND CONTROL VALVE SHALL OPERATE TO MAINTAIN SPACE SETPOINT. AT NO TIME SHALL SUPPLY FAN AND RELIEF HOOD ACTIVATE WHEN HEATING MODE IS ACTIVATED.

HOT WATER SYSTEM (BOILERS WA-B-1 & 2, HEATING WATER PRIMARY PUMPS WA-HWP-1 & 2, AND HEATING WATER SECONDARY PUMP WA-HWS-1):

1. EACH BOILER IS PROVIDED WITH ALL NECESSARY SAFETY AND OPERATING CONTROLS BY THE BOILER MANUFACTURER. EACH BOILER'S OPERATING TEMPERATURE IS MANUALLY SET TO MAINTAIN 180°F (ADJ.) WATER TEMPERATURE. THE HIGH LIMIT AQUASTAT SUPPLIED WITH THE BOILER SHALL BE SET AT 210°F (ADJ.).
2. THE BOILER SYSTEM SHALL BE INITIATED BELOW 65°F (ADJ.) OUTSIDE AIR TEMPERATURE. THE LEAD BOILER SHALL BE STARTED WITH THE FOLLOWING SEQUENCE:
 - A. UPON A CALL FOR HEAT FROM THE BOILER CONTROLS AND UPON A PROOF OF FLOW FROM A CURRENT SWITCH ON THE LEAD HOT WATER PUMP, THE BOILER SHALL BE ENABLED.
 - B. SHOULD LEAD HOT WATER PUMP FAIL TO PROVE FLOW, LAG PUMP SHALL ENABLE. IF LAG PUMP FAILS, THE BOILER SHALL BE DISABLED AND AN ALARM SHALL BE GENERATED THROUGH THE DDC SYSTEM.
3. HOT WATER LOOP SHALL BE LINEARLY RESET BASED ON OUTDOOR AIR TEMPERATURE.
4. PROVIDE LEAD/LAG CONTROL TO ALLOW SELECTION OF LEAD/LAG BOILER. BOILERS SHALL ALTERNATE BETWEEN LEAD AND LAG AUTOMATICALLY ON A WEEKLY BASIS (BY TCC).
5. LEAD BOILER'S ASSOCIATED ISOLATION VALVE SHALL OPEN, AND BOILER SHALL FIRE ON LOW FIRE. BOILER SHALL MODULATE AS REQUIRED TO MAINTAIN LOOP TEMPERATURE. IF LEAD BOILER CAN NOT MAINTAIN LOOP TEMPERATURE, LEAD BOILER SHALL RAMP DOWN TO LOW FIRE, AND ISOLATION VALVE FOR SECOND BOILER SHALL OPEN AND SECOND BOILER SHALL FIRE ON LOW FIRE. BOTH BOILERS SHALL MODULATE TO MAINTAIN LOOP TEMPERATURE. ONCE LOOP IS SATISFIED LAG BOILER SHALL DE-ENERGIZE. AFTER FIVE MINUTES ISOLATION VALVE SHALL CLOSE.
6. DOMESTIC HOT WATER: ASSOCIATED DOMESTIC INDIRECT WATER HEATER CIRCULATION PUMP SHALL ENERGIZE TO MAINTAIN INDIRECT HOT WATER STORAGE TANKS WATER TEMPERATURE. WHEN STORAGE TANK SET POINT IS MET, CIRCULATION PUMP SHALL DE-ENERGIZE.

FIN TUBES (WA-FT-1 THRU F9):

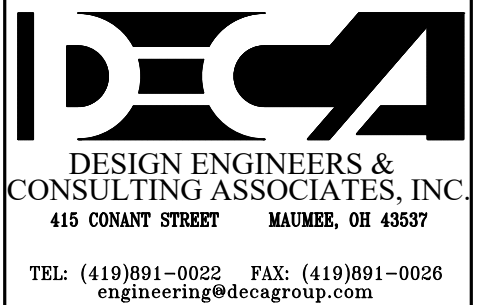
TWO-WAY VALVE SHALL MODULATE TO MAINTAIN SPACE SETPOINT.

CABINET UNIT HEATERS (WA-CUH-1, 4 & 7) AND UNIT HEATER (WA-UH-2):

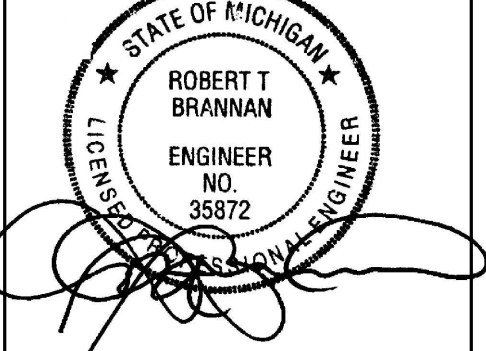
CABINET UNIT HEATERS AND UNIT HEATERS, AS WELL AS THEIR COORDINATING CONTROL VALVES, SHALL OPERATE TO MAINTAIN SPACE SETPOINT.

CABINET UNIT HEATERS WA-CUH-F2, F3, F5, & F6:

TWO-WAY VALVE SHALL MODULATE TO MAINTAIN SPACE SETPOINT.



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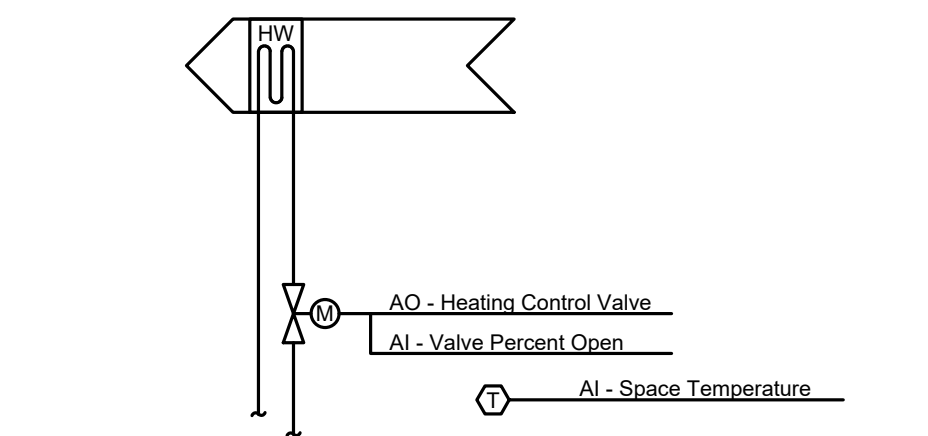
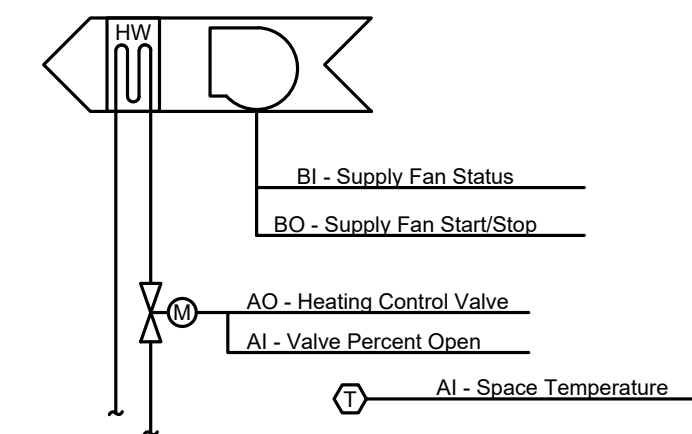
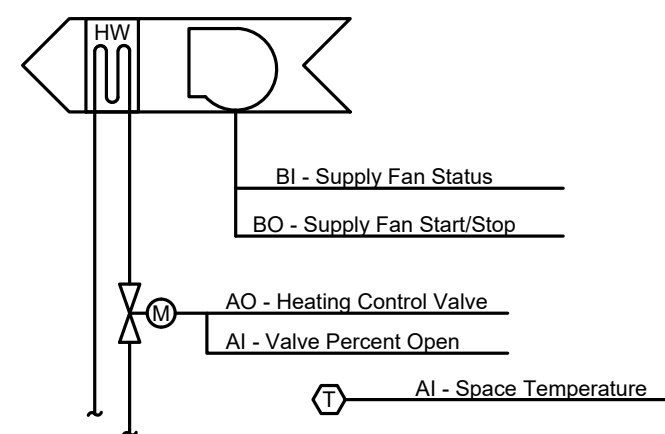
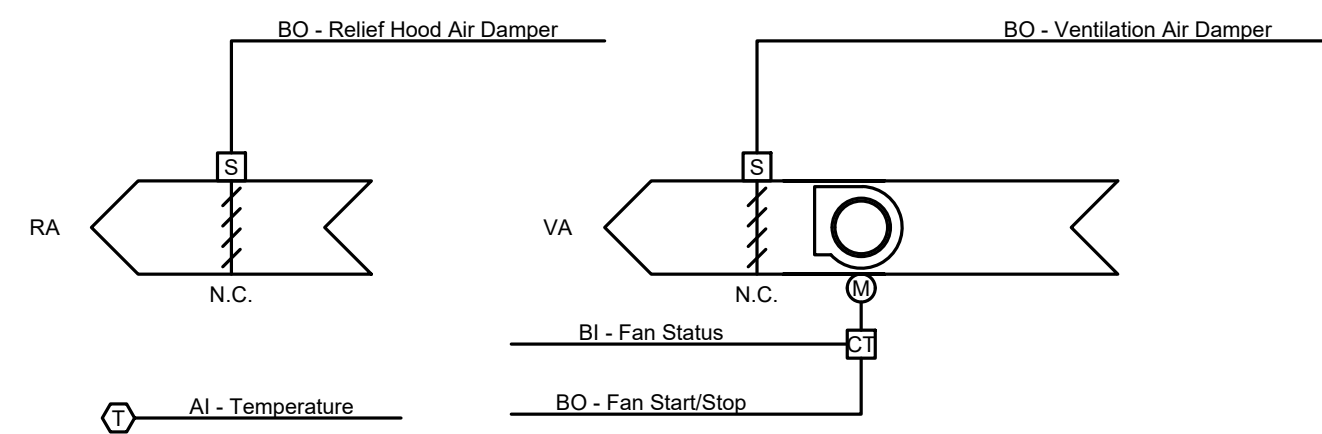
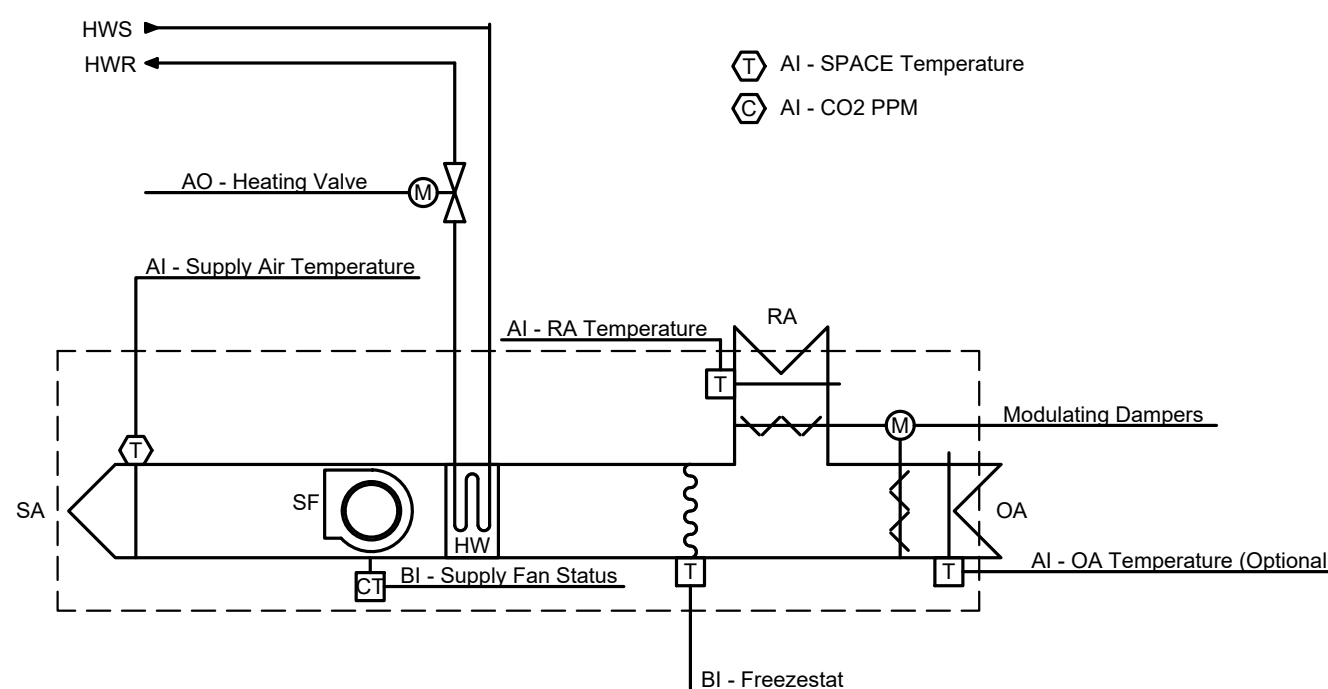
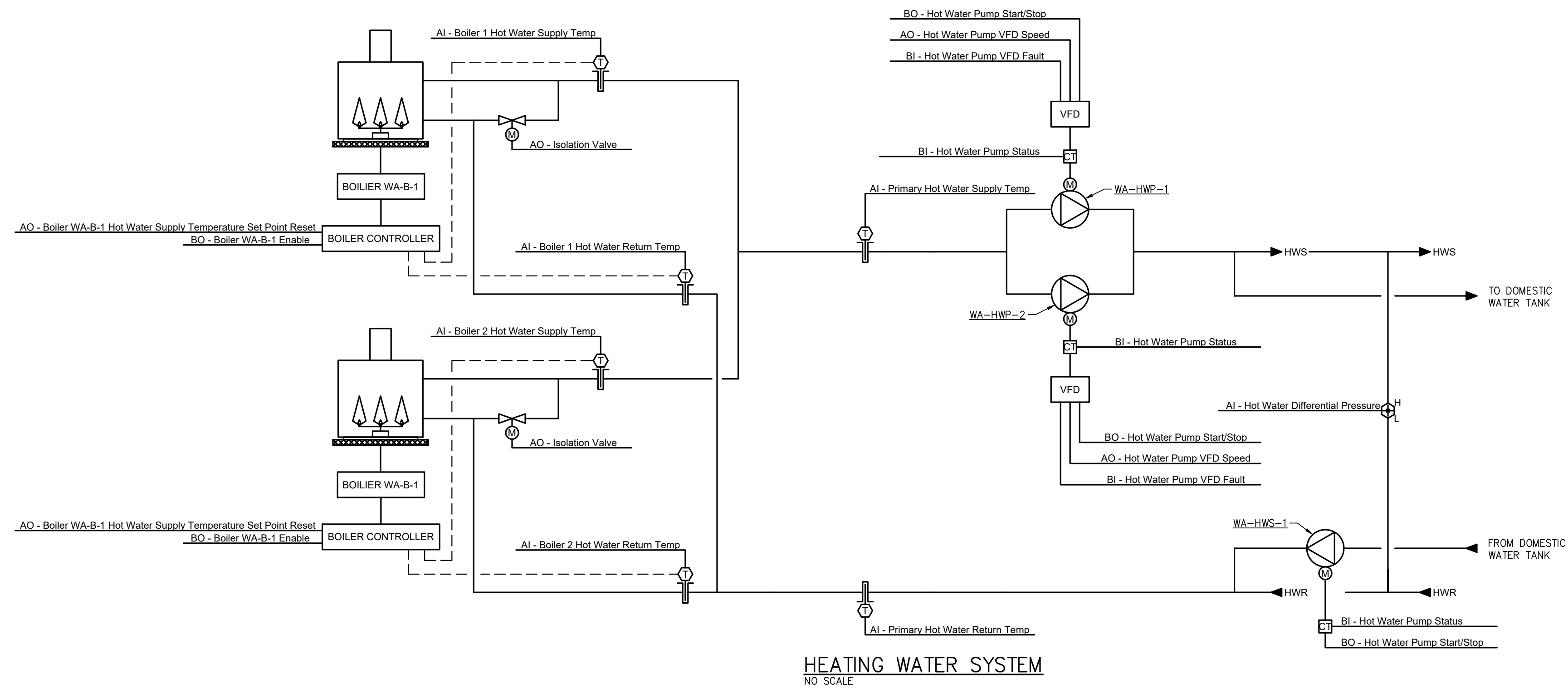
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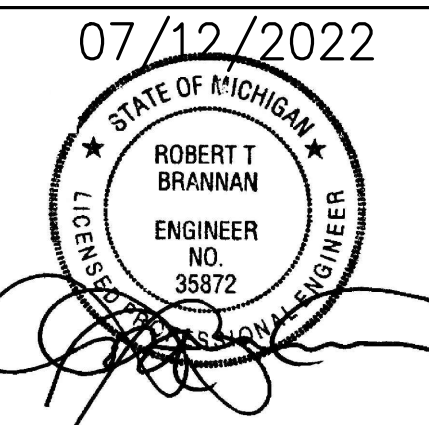
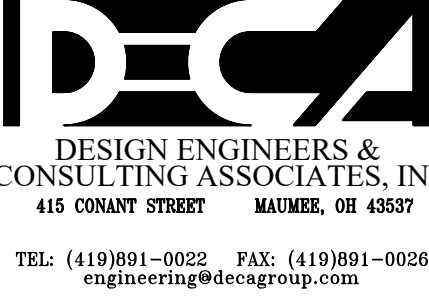
TEMPERATURE CONTROLS

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