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REGISTERED:
MICHIGAN
OHIO

MEMBER:
A.I.A.
N.C.A.R.B.

ADDENDUM #1

PROJECT: Mechanical Updates & Related Work
at Waterloo Elementary School
for Monroe Public Schools
#22114

The above plans and specifications are modified, corrected, augmented or supplemented as follows and this Addendum is hereby made a part of the contract documents. Contractor shall note on the Proposal Form that he has received this Addendum.

ITEM 1: Architectural Specification Updates

A. Division 00, Section 000110 – Table of Contents (Re-issued Herein)
   1. Updated Section 012400 – Alternates, added Alternate M-1
   2. Deleted reference to Section "019100 – Commissioning of HVAC and Electrical Systems"

B. Division 00, Section 001200 - Proposal Form and Supplements (Re-issued Herein)
   1. Added Alternate M-1
   2. Added Space to List Boiler Manufacturer

C. Division 00, Section 002113 Instructions to Bidders (Not Re-issued)
   1. Revised Article "5.01 Deposit and Opening of Bids" to read:

      "Proposals shall be submitted and delivered in opaque envelopes addressed to **Monroe Public Schools, Administration Building, 1275 N Macomb St, Monroe, MI 48162, ATTN: Mr. Jerry Oley, Director of Operations** and clearly marked **Proposal**. There shall also appear name and address of the bidder."

D. Division 01, Section 012400 – Alternates (Issued Herein)
   1. Added Alternate M-1

ITEM 2: Mechanical Drawings (Re-issued Herein)

A. Refer to drawing M1.01 LEGEND, SPECIFICATIONS AND SCHEDULES (Re-issued)
   1. Revised General Project Notes to add Section 1.11 Alternates. In Alternate M-1, a DX cooling coil shall be installed within each Unit Ventilator for future cooling.
   2. Revised BOILER SCHEDULE Remark 3 to clarify that boilers shall be furnished with BacNET MSTP network card.

B. Refer to drawing M1.02 SCHEDULES & CALCULATIONS (Re-issued)
   1. Revised UNIT VENTILATOR SCHEDULE to add Alternate M-1.

C. Add paragraph C to specification section 23 82 23 Unit Ventilators Paragraph 2.5

"C. Alternate M-1 Only: Indoor Refrigerant Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch, and brazed joints at fittings. Comply with AHRI 210/240, and leak test to minimum 450-psig for a minimum 300-psig working pressure. Include thermal expansion valve."

-END-

Distribution: Monroe Public Schools
DECA

+MAKE Things Better

SECTION 000110
TABLE OF CONTENTS

END OF SECTION

PROPOSAL FORM
(Submit in Duplicate)

To: Secretary of the School Board:

Having carefully examined the Instructions to Bidders, the Specifications and Drawings, including Addendum No._____, all entitled, “Mechanical Updates and Related Work at Waterloo Elementary School, 1933 South Custer Road, Monroe, MI., 48161 for Monroe Public Schools, 1275 North Macomb Street, Monroe, MI.", Architect's File #22114, as well as the premises and the conditions affecting the work, the undersigned agrees to furnish all labor and materials to perform the work, including All Trades, and agrees to accept in payment therefore, the sum of:

Proposal A (Base Bid) _____ Dollars

($_____)

Alternate E-1 (ADD) _____ Dollars

($_____)

Alternate M-1 (ADD) _____ Dollars

($_____) Each new Unit Vent to include Cooling Coil

Boiler Manufacturer included in Proposal A. List multiple manufacturers where owner has option to select.

_____

The following form of bid guarantee, as indicated below, is herewith enclosed, representing 5% of the amount of the Total Bid, including Alternates, payable to the Owner:

Certified Check_____ Bid Bond_____

It is agreed that this bid may not be withdrawn for a period of 60 days. The Owner reserves the right to waive any irregularities, reject any or all bids or accept the bid that in the opinion of the Owner will serve the best interest of the Owner.

Guaranteed Maximum percentage of mark-up values on change orders including Overhead, profit, bond, insurance, wage rates, and equipment rates for BOTH prime contractors and subcontractors will not more than _____%.

The undersigned agrees, if awarded the contract, to commence construction immediately and to complete work as noted in Division #1. (Notes: See Supplemental and Special conditions for Liquidated Damages and Instructions to Bidders for Architect's Inspections and Additional Services.)

SUB-CONTRACTORS - The undersigned submits for your approval herewith as a condition of being awarded the contract, the **separately attached list** of Contractors to whom it is proposed to let portions of this work, agreeing in every way to be responsible for the work, materials, equipment and supplies furnished by each and all of them. **A tentative list shall be submitted with bid and confirmed/verified no later than 24 hours after bid opening.**

PROPOSAL FORM
(Submit in Duplicate)

SUBSTITUTIONS - The following is a list of manufacturers or trade names of substitute materials and equipment, which the undersigned submit for consideration, guaranteeing the same to conform to exact requirements of the specifications. The additions, deductions or no-charge figures indicated are separate from and not part of the proposal. **A tentative list shall be submitted with bid and confirmed/verified no later than 24 hours after bid opening.**

Item	Substitute Mfr./Trade Name	Add	Deduct	No Charge
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

FAMILIAL DISCLOSURE – As required by the State of Michigan, and included as part of this proposal, shall be an Affidavit for Statement Regarding Familial Relationship, completely filled out and signed.

IRAN ECONOMIC SANCTIONS ACT COMPLIANCE - As required by the State of Michigan, and included as part of this proposal, shall be an Affidavit of Compliance of the Iran Economic Sanctions Act, Michigan Public Act No. 515 of 2012, completely filled out and signed.

BIDDER'S COMPLIANCE ASSURANCE- **Sign in the space provided below to confirm that you have read, understand, and will comply with the requirements as stated in this project manual, including, but not limited to the sections dealing with the following: (1) criminal/security checks/records and, (2) Qualification of Bidders.**

(PLEASE PRINT OR TYPE)

Date _____ Firm_____

Address _____ By _____

_____ Signature _____

Phone _____ Title _____

Email _____ Fed. Tax ID _____

SECTION 012400
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Alternates - work that is to be deducted or added to the Base Proposal for various items, including all labor and materials herein described.

1.02 RELATED REQUIREMENTS

A. See other related Divisions for the scope of work, type of materials, etc., if not specified herein.

B. Instructions to Bidders: Instructions for preparation of pricing for Alternates.

C. Proposal Form(s).

D. The Alternate work herein is bound by the same conditions and requirements in the main sections of these specifications as governs all other trade divisions. Included shall be Index, Advertisement for Bids, Instructions to Bidders, Bid Proposal Form, General and Special Conditions, etc.

E. Description(s) of Alternates in this section are not meant to be all inclusive, but give a general understanding of the work to be included. Reference the drawings and other sections of specifications for all work included.

1.03 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

B. The order of the Alternates are not listed in priority. The number of Alternates accepted will be determined by the Owner that serves their best interest.

C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.04 SCHEDULE OF ALTERNATES

A. **ALTERNATE E-1**

1. State the amount to be added to the base bid to furnish all material, labor, and equipment necessary for the complete installation.
2. Work includes, but is not limited to the following:
   a. New three-phase service (E.C. shall coordinate with utility company), pad mounted transformer, underground feeders, ats, mpd, three-phase panel, three-phase pumps & all connections and components as indicated.
   b. Furnish 208V/3ph motors and VFDs in lieu of 208V/1ph motors and VFDs for heating water pumps WA-HWP-1 and WA-HWP-2 with electrical system upgrade.
   c. Install new Concrete transformer pad, trenching/boring/backfilling of ug. electrical lines, grass restoration, and striping asphalt.

B. **ALTERNATE M-1**

1. State on the Bid Proposal Form the amount to be added to the base bid to furnish all materials, labor, and equipment necessary to furnish DX Cooling Coils on each new Unit Ventilator for future cooling.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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. MBC
C. MMC
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. 1

1.11. ALTERNATES:

A. REQUIREMENTS:
1. SUBMIT ALTERNATE WITH A FULL DESCRIPTION OF THE PROPOSED ALTERNATE AND THE EFFECT ON ADJACENT OR RELATED COMPONENTS.
2. ALTERNATE QUOTED ON BID FORMS WILL BE REVIEWED AND ACCEPTED AT THE OWNER'S OPTION. ACCEPTED ALTERNATE WILL BE IDENTIFIED IN THE OWNER-CONTRACTOR AGREEMENT.
3. COORDINATE AND MODIFY AS NECESSARY RELATED WORK IN ORDER TO INTEGRATE THE WORK OF EACH ALTERNATE.

B. ALTERNATE M-1:
1. STATE THE AMOUNT TO BE ADDED TO THE BASE BID TO FURNISH ALL MATERIAL, LABOR AND EQUIPMENT NECESSARY TO FURNISH DX COOLING COILS ON UNIT VENTILATORS WA-UV-1 THRU WA-UV-16 FOR FUTURE COOLING.

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	M.C. VIA BOILER MANUFACTURER	T.C.C.	T.C.C.	T.C.C.	
VARIABLE FREQUENCEY 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. MFTR. 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 DWG	LOCATION ROOM	THERMAL EFFICIENCY	FUEL	GAS PIPE CONN. SIZE	GAS PRESSURE MIN.	GAS PRESSURE MAX.	MBH INPUT	MBH OUTPUT	TURN DOWN	EWT (°F)	LWT (°F)	GPM	FLUID TYPE	MAX WPD (FT)	WATER VOLUME (GAL)	INLET SIZE	OUTLET SIZE	ELECTRICAL TOTAL AMPS	ELECTRICAL VOLTAGE	APPROX. WEIGHT	MAKE/ MODEL	REMARKS
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 MSTP NETWORK CARD, COORDINATE WITH TEMPERATURE CONTROL CONTRACTOR. 1

PUMP SCHEDULE

(REFER TO SPECIFICATIONS SECTION 232123 FOR ADDITIONAL REQUIREMENTS.)

TAG #	LOCATION DWG	LOCATION ROOM	SERVICE	TYPE	OPERATION	FLUID	GPM	MIN GPM	MAX GPM	HEAD PRESS. (FT.)	IMPELLER DIAMETER (IN.)	INLET SIZE (IN.)	OUTLET SIZE (IN.)	MOTOR DATA BHP	MOTOR DATA HP	MOTOR DATA RPM	MOTOR DATA VOLTAGE	B&G SERIES MODEL	REMARKS
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	DWH 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 DWG	LOCATION ROOM	TYPE	MOUNTING	CFM	EWT (°F)	LWT (°F)	GPM	FLUID TYPE	MAX. WPD (FT)	MBH	MOTOR DATA WATTS	MOTOR DATA VOLTS/ PHASE	CONTROL VALVE TYPE	T-STAT MTG	MAKE/ MODEL	REMARKS
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 DWG	LOCATION OF VFD ROOM	ELECTRICAL DATA HP	ELECTRICAL DATA VOLTAGE/PH	REMARKS
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

- EXISTING PIPING/ EQUIPMENT TO REMAIN AS IS
- EXISTING PIPING/ EQUIPMENT TO BE REMOVED
- NEW DUCT / PIPING/ EQUIPMENT
- T — THERMOSTAT
- T — EXISTING THERMOSTAT
- C — CARBON DIOXIDE SENSOR
- X — DRAWING KEY NOTE
- CONNECTION OF NEW TO EXISTING
- X / M-X — DETAIL TAG NUMBER / DRAWING REFERENCE NUMBER
- E.C. — ELECTRICAL CONTRACTOR
- F.C. — FLEXIBLE CONNECTION
- G.C. — GENERAL CONTRACTOR
- M.C. — MECHANICAL CONTRACTOR
- P.C. — PLUMBING CONTRACTOR
- T.C.C. — TEMPERATURE CONTROL CONTRACTOR
- A.F.F. — ABOVE FINISHED FLOOR
- W.O. — WALL OPENING
- MANUAL VOLUME BALANCING DAMPER
- MOTOR OPERATED DAMPER
- HWS — HOT WATER SUPPLY PIPING
- HWR — HOT WATER RETURN PIPING
- BALL VALVE
- THREE-WAY CONTROL VALVE
- RELIEF VALVE
- TWO-WAY CONTROL VALVE
- CHECK VALVE
- STRAINER
- UNION
- CAP
- FLEXIBLE CONNECTION
- PRESSURE GAUGE WITH STOP-COCK
- PRESSURE GAUGE
- THERMOMETER
- AV — AUTOMATIC AIR VENT
- MV — MANUAL AIR VENT
- FS — FLOW SWITCH
- AUTOMATIC FLOW CONTROL VALVE, FLOW AS INDICATED
- INLINE PUMP
- END SUCTION PUMP

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

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07/12/2022

STATE OF MICHIGAN — ROBERT T BRANNAN — ENGINEER NO. 35872 — LICENSED PROFESSIONAL ENGINEER

DATE	DESCRIPTION
07.12.2022	BIDDING & STATE REVIEW
08.03.2022	ADDENDUM #1

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

LEGEND, SPECIFICATIONS, AND SCHEDULES

M1.01

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UNIT VENTILATOR SCHEDULE

(REFER TO SPECIFICATIONS SECTION 238223 FOR ADDITIONAL REQUIREMENTS.)

TAG #	LOCATION DWG	LOCATION ROOM	UNIT TYPE	FAN DATA CFM HIGH SPEED	FAN DATA DESIGN CFM	FAN DATA MIN. OA CFM	FAN DATA HP	HW HEATING COIL EAT (°F)	HW HEATING COIL LAT (°F)	HW HEATING COIL MBH	HW HEATING COIL GPM	HW HEATING COIL FLUID	HW HEATING COIL EWT (°F)	HW HEATING COIL MAX. WPD (FT)	HW HEATING COIL ROWS	HW HEATING COIL CONTROL VALVE TYPE	DX COOLING COIL (FUTURE) MBH TOTAL	DX COOLING COIL (FUTURE) MBH SENS.	DX COOLING COIL (FUTURE) LAT DB	DX COOLING COIL (FUTURE) LAT WB	UNIT DIMENSIONS LENGTH (INCHES)	UNIT DIMENSIONS HEIGHT (INCHES)	UNIT DIMENSIONS DEPTH (INCHES)	ELECTRICAL VOLTS/ PHASE	ELECTRICAL MCA	ELECTRICAL MOCP	MAKE/ MODEL	REMARKS
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9, 12, 13
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	22.9	17.2	58.8	57.5	62	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H07	1 THRU 9, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 8, 10, 11, 12, 13
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	22.9	17.2	58.8	57.5	62	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H07	1 THRU 9, 12, 13
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	43.4	32.6	57.1	56.3	74	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H10	1 THRU 9, 12, 13
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	53.7	40.3	55.2	55.2	86	30-1/8	21-7/8	115/60/1	6.3	15	DAIKIN UAVV9H13	1 THRU 9, 12, 13

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 (DDC 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 INTREGRAL 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.
12. FURNISH UNIT WITH 18" WIDE UTILITY CABINET ON RIGHTHAND SIDE OF UNIT VENTILATOR FOR FUTURE COOLING.
13. ALTERNATE M-1 ONLY: FURNISH UNIT WITH DX COOLING COIL AS SCHEDULED, CHARGE WITH NITROGEN FROM THE FACTORY AND CAP. COIL CONDITIONS ARE BASED ON 80°F DB AND 67°F WB.

HOT WATER FIN-TUBE RADIATION SCHEDULE

(REFER TO SPECIFICATIONS SECTION 238236 FOR ADDITIONAL REQUIREMENTS.)

TAG #	LOCATION DWG	LOCATION 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 HP (WATTS)	FAN ELECT DATA VOLTS/ PHASE	MEANS OF CONTROL	APPROX. WEIGHT (LBS)	ROOF/WALL OPENING SIZE (IN)	GREENHECK MODEL	REMARKS:
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 VARIGREEN, ECM MOTOR AND VARIGREEN 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 — OR — 2" & SMALLER: SCHEDULE 40 BLACK STEEL, ASTM A53-S-A-ERW	SOLDER *	WROUGHT	PIPE LESS THAN 1 1/2"ø INSULATE WITH A MINIMUM 1 1/2" FIBERGLASS PIPE 1 1/2"ø AND LARGER INSULATE WITH 2" FIBERGLASS
			THREAD & COUPLE OR WELD *	150 PSIG	
		2-1/2" & LARGER: SCHEDULE 40 BLACK STEEL, ASTM A53-S-A-ERW — OR — 2-1/2" TO 4" TYPE L OR M HARD COPPER	WELD *	SCHEDULE 40	
			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 #	LOCATION DWG	LOCATION ROOM	MOUNTING	CFM	EWT (°F)	LWT (°F)	GPM	FLUID TYPE	WPD (FT)	MBH	COIL ROWS	MOTOR DATA HP	MOTOR DATA 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 (FT^2) Az	TIME AVERAGED OCCUPANCY Pz	REQUIRED OUTDOOR AIR (CFM/PERSON) Rp	REQUIRED OUTDOOR AIR (CFM/FT^2) Ra	UNCORRECTED OUTDOOR AIR Vbz=RpPz + RaAz	VENTILATION EFFICIENCY Ez	TOTAL REQUIRED OUTDOOR AIR Voz=Vbz/Ez
101 CLASSROOM	WA-UV-1	809.5	20.0	10.0	0.12	297	1.0	297.1
103 CLASSROOM	WA-UV-2	806.6	20.0	10.0	0.12	297	1.0	296.8
111 CLASSROOM	WA-UV-3	807.9	20.0	10.0	0.12	297	1.0	296.9
113 CLASSROOM	WA-UV-4	794.4	20.0	10.0	0.12	295	1.0	295.3
115 CLASSROOM	WA-UV-5	792.2	20.0	10.0	0.12	295	1.0	295.1
102 CLASSROOM	WA-UV-6	796.5	20.0	10.0	0.12	296	1.0	295.6
104 CLASSROOM	WA-UV-7	803.0	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	38	1.0	38.2
112 CLASSROOM	WA-UV-9	809.4	20.0	10.0	0.12	297	1.0	297.1
114 CLASSROOM	WA-UV-10	755.0	20.0	10.0	0.12	291	1.0	290.6
116 CLASSROOM	WA-UV-11	771.9	20.0	10.0	0.12	293	1.0	292.6
118 CLASSROOM	WA-UV-12	769.9	20.0	10.0	0.12	292	1.0	292.4
120 CLASSROOM	WA-UV-13	766.6	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	25	1.0	25.1
130 CLASSROOM	WA-UV-15	692.0	20.0	10.0	0.12	283	1.0	283.0
133 KINDERGARTEN CLASSROOM B	WA-UV-16	879.3	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

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07/12/2022

STATE OF MICHIGAN — ROBERT T BRANNAN — ENGINEER NO. 35872 — LICENSED PROFESSIONAL ENGINEER

DATE	DESCRIPTION
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08.03.2022	ADDENDUM #1

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WATERLOO ELEMENTARY SCHOOL
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FOR
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SCHEDULES & CALCULATIONS

M1.02

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