

**Request for Bids  
New Boiler Project  
McClelland Elementary School  
(WVA Project No. 19130)**

The Rochester School District is seeking proposals for the addition of three new boilers at the McClelland Elementary School. Bids will be accepted until 12:00 noon EST on Thursday, June 25, 2020. The bids will be opened publicly and read aloud at that time.

**A MANDATORY pre-bid conference and walk through will be held on Friday, June 12, 2020 at 10:00 a.m.** meeting at the McClelland Elementary School (59 Brock Street, Rochester, NH). Prospective bidders are encouraged to obtain the bid specifications prior to the walkthrough to familiarize themselves with the project and the project requirements. Drawings and Specifications may be examined at the offices of WV Engineering Associates, PA, 11 King Court, Keene, NH, and at Rochester School Department, Facilities Office 150 Wakefield Street Rochester, NH.

Bids shall be submitted to Kyle Repucci, Superintendent of Schools, Rochester School Department, 150 Wakefield Street, Suite 8, Rochester, New Hampshire 03867. Bids must be submitted in sealed envelopes plainly marked **Bid for New Boilers at McClelland Elementary School**. Failure to properly mark the envelope will result in disqualification of the bid if it is prematurely opened.

Specifications with the required Bid Form may be obtained at no cost from the Superintendent of Schools Office or on the District website at: [www.rochesterschools.com/SAU/bids/bids.html](http://www.rochesterschools.com/SAU/bids/bids.html)

## **BID SPECIFICATIONS:**

### **Scope of Work -**

The Rochester School District is seeking proposals for the addition of three new gas fired boilers at the McClelland Elementary School. This project involves supplying and installing three (3) new LAARS OmniTherm near condensing boilers or equivalent as detailed in the attached mechanical drawings.

### **Boiler Replacement to Include (refer to drawings for complete detail):**

- Furnish and install three (3) new Laars OmniTherm Boilers or approved equivalent.
- Furnish and install pumps as drawn.
- Furnish and install gas boiler flue in compliance with manufacturer's instructions and mechanical drawings.
- Rig and set all new equipment.
- Furnish and install all necessary piping to meet industry best practices
- Furnish and install all necessary electric and control wiring to meet current code.
- Pull all required permits and follow required inspection process. (Permits are provided without fee.)
- Control integration with existing Honeywell EBI system (to be performed by Honeywell).
- Start up and test new system.

### **Conditions of the Work**

**A.** Each bidder must inform himself fully of the conditions relating to construction and labor under which the work is now or will be performed by carefully examining the documents (including all addenda) and the existing building. Failure to do so will not relieve the successful bidder of his obligation to furnish all material and labor necessary to complete the contemplated work for the consideration set forth in his Bid.

**B.** Insofar as possible, the Contractor in carrying out his work must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

### **Addenda and Interpretations**

**A.** No interpretations of the meaning of the plans, specifications, or other contract documents will be made to any bidder orally. Every request for such interpretation should be made in writing addressed to WV Engineering Associates, PA, 11 King Court, Keene, NH 03431, to be given consideration, must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be emailed to all prospective bidders of record (at the respective addresses furnished for such purposes) not later than three days prior to the date fixed for the opening of bids. Questions received less than five days before the bid opening cannot be answered.

**B.** Failure of any bidder to receive any such addendum or interpretation shall not relieve the

bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

**Period of Performance**

Work shall be completed by October 1, 2020.

All bids shall be submitted on the Bid Proposal Form (attached).

The successful contractor is expected to execute a contractual agreement with the Rochester School Department, Rochester, New Hampshire, prior to commencement of work and to provide a certificate of general liability insurance not less than \$5,000,000.

The Rochester School Department reserves the right to reject any and all bids and to award the contract to other than the low bidder.

No less than 10% of the full contract price shall be withheld pending issuance of a Certificate of Occupancy or Code Enforcement final approval. No less than 3% of the full contract price shall be withheld until all punch list items have been approved by the School Department.

**BID PROPOSAL FORM**  
**New Boiler Project**  
**McClelland Elementary School**

Company Name: \_\_\_\_\_

Phone #: \_\_\_\_\_ Fax #: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Person: \_\_\_\_\_

E-mail: \_\_\_\_\_

Boiler Replacement Cost \$ \_\_\_\_\_

**Attach the following:**

- Specifications for any equipment other than that described in the drawings.

Any questions or concerns can be directed to:

David G. Totty, Director of Facilities  
Rochester School Department  
Phone: 603-332-3678 \*1145





SECTION 23 50 00 - MECHANICAL SPECIFICATION

1.0 PART 1 - GENERAL

- 1.1 THE SCOPE OF WORK IS TO PROVIDE LABOR, MATERIALS, SERVICES, SUPPLIES, TOOLS, EQUIPMENT, PERMITS, TRANSPORTATION AND FACILITIES NECESSARY TO FURNISH AND MODIFY EXISTING AND INSTALL THE COMPLETE AND OPERABLE SYSTEMS AS CALLED FOR.
- 1.2 THE COMPLETE INSTALLATION SHALL BE IN COMPLIANCE WITH THE APPLICABLE LATEST OR ACCEPTED EDITION OF THE BUILDING CODES AND REGULATIONS ADOPTED BY THE STATE OF NEW HAMPSHIRE AND AMENDED BY CITY OF ROCHESTER, NFPA, AND OTHER APPLICABLE RULES AND REGULATIONS AS PRESCRIBED BY THE ADMINISTRATIVE AUTHORITY.
- 1.3 THESE DRAWINGS ARE DIAGRAMMATIC ONLY AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT. BASIC DESIGN CONCEPTS MUST BE FOLLOWED OR BETTERED. DO NOT SCALE DRAWINGS, FIELD VERIFY DIMENSIONS AND FIELD CONDITIONS.
- 1.4 IT IS NOT INTENDED THAT DRAWINGS SHOW EVERY DETAIL. PROVIDE OFFSETS, CHANGES IN ELEVATION AND ITEMS NECESSARY FOR PROPER INSTALLATION AND OPERATION OF SYSTEM SO THAT WORK WILL BE COMPLETE AND READY FOR OPERATION.
- 1.5 COORDINATE WORK WITH OTHER TRADES. VERIFY BUILDING CONDITIONS AND STRUCTURAL CONDITIONS PRIOR TO INSTALLATION.
- 1.6 IN THE EVENT OF A DISCREPANCY, IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE. DO NOT PROCEED WITH INSTALLATION IN AREAS OF DISCREPANCY UNTIL SUCH DISCREPANCIES HAVE BEEN RESOLVED.
- 1.7 PROVIDE IDENTIFICATION TAGS FOR VALVES, PANELS, STARTERS AND HVAC EQUIPMENT WITH CHART AND SCHEDULE OF LOCATION AND FUNCTION.
- 1.8 EXECUTE WORK IN A NEAT AND WORKMANLIKE MANNER IN CONFORMANCE WITH BEST MODERN TRADE PRACTICE, (I.E. ASME, SMACNA, ANSI, ASHRAE, ASPE, AGA, API) BY COMPETENT, EXPERIENCED MECHANICS, PRESENTING A NEAT AND CLEAN WORKMANSHIP. REPLACE WORK NOT APPROVED BY OWNER'S REPRESENTATIVE WITHOUT ADDITIONAL CHARGE.
- 1.9 SUBMIT COMPLETE ELECTRONIC PDF COPY OF CATALOG INFORMATION FOR MATERIALS AND EQUIPMENT. INFORMATION REQUIRED INCLUDES MANUFACTURER, CAPACITY, TYPE, CURVES, CERTIFICATION, ACCESSORIES, PHYSICAL AND PERFORMANCE DATA, FINISHES, MATERIALS AND LOCATION. CONFIRM DIMENSIONS AT JOB SITE TO INSURE THAT ITEMS TO BE FURNISHED FIT THE SPACE AND ARE AVAILABLE. SUBMIT SHOP DRAWINGS PRIOR TO INSTALLATION OR PURCHASE WITH THE DATE, CONTRACTORS STAMP AND SIGNATURE PROVIDED. NO INSTALLATION IS PERMITTED PRIOR TO REVIEW.
- 1.10 MAINTAIN AT THE SITE ONE RECORD SET OF DRAWINGS, SPECIFICATIONS, ADDENDA, CHANGE ORDERS, ACCEPTED SHOP DRAWINGS AND ACCEPTED SUBMITTALS TO REMAIN AS RECORD DRAWINGS OF THE WORK AS INSTALLED. TRANSFER RECORD DATA TO FILES. PROVIDE ONE FULL SIZE SET OF THE CORRECTED RECORD DRAWINGS AND A CD WITH ELECTRONIC COPY OF THE CAD DRAWING FILES AND PLOT FILE TO THE OWNER.
- 1.11 OPERATING AND MAINTENANCE MANUALS: BEFORE FINAL ACCEPTANCE OF PROJECT SUBMIT THREE (3) COPIES OF COMPLETE OPERATING INSTRUCTIONS AND SERVICE MANUALS NEATLY BOUND AND CONSISTING OF THE FOLLOWING: NEATLY TYPED PRINTED INSTRUCTIONS ON ALL EQUIPMENT OPERATION, PARTS REPLACEMENT INFORMATION, GUARANTEES AND WARRANTIES, TESTING AND BALANCING REPORTS, SERVICE MANUALS, AUTOMATIC TEMPERATURE CONTROL DRAWINGS AND DIAGRAMMATIC CHARTS.
- 1.12 EQUIPMENT SHALL MEET UL AND NEC STANDARDS. EQUIPMENT AND MATERIALS FOR WHICH THERE IS A LISTING SERVICE SHALL BEAR A UL LABEL. GAS FIRED EQUIPMENT SHALL MEET AGA REQUIREMENTS AND HAVE AN AGA LABEL. MATERIALS SHALL HAVE A FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPMENT RATING OF 50 OR LESS. MATERIAL SHALL BE ASBESTOS FREE.
- 1.13 PROVIDE CUTTING AND PATCHING AS REQUIRED FOR THE INSTALLATION OF CONTRACT WORK. PATCHING MATERIALS AND METHODS SHALL MATCH ADJACENT MATERIALS.
- 1.14 PROVIDE 4 INCH HIGH, 3,000 LB REINFORCED CONCRETE BASES FOR FLOOR MOUNTED EQUIPMENT.
- 1.15 PRIME COAT AND PAINT EXPOSED METAL PIPE, SUPPORTS AND EQUIPMENT EXCEPT THOSE ITEMS WITH GALVANIZED OR FACTORY FINISH.
- 1.16 FIRE STOPPING FOR OPENINGS THROUGH FIRE AND SMOKE RATED WALL AND FLOOR ASSEMBLIES: PROVIDE MATERIALS AND PRODUCTS LISTED OR CLASSIFIED BY AN APPROVED INDEPENDENT TESTING LABORATORY FOR "THROUGH-PENETRATION FIRESTOP SYSTEMS". THE SYSTEMS SHALL MEET THE REQUIREMENTS OF "FIRE TESTS OF THROUGH-PENETRATIONS FIRESTOPS" DESIGNATED ASTM E814. PROVIDE FIRESTOP SYSTEM SEALS AT LOCATIONS WHERE PIPING, TUBING, CONDUIT, ELECTRICAL CABLES AND WIRES, DUCTWORK AND SIMILAR UTILITIES PASS THROUGH OR PENETRATE FIRE RATED WALL OR FLOOR ASSEMBLY. THE MINIMUM REQUIRED FIRE RESISTANCE RATINGS OF THE WALL OR FLOOR ASSEMBLY SHALL BE MAINTAINED BY THE FIRESTOP SYSTEM. THE INSTALLATION SHALL PROVIDE AN AIR AND WATERTIGHT SEAL. PENETRATION OPENINGS SHALL BE AS SMALL AS POSSIBLE. MAKE: DON CORNING FIRESTOP SYSTEM FOAMS AND SEALANTS, NELSON ELECTRIC FIRESTOP SYSTEM PUTTY, GKL AND NRP, 3M BRAND FIRE BARRIER SYSTEM.
- 1.17 MOTORS SHALL BE SINGLE PHASE UP TO 1/3 HP, THREE PHASE 1/2 HP AND UP, 60 HZ, IN COMPLIANCE WITH NEMA, CLASS B TEMPERATURE RISE, 115 MINIMUM SERVICE FACTOR, 20,000 HR. BEARINGS, PREMIUM EFFICIENCY TYPE, IEEE STANDARD 112 METHOD B. MOTORS FOR SOLID STATE DRIVEN VARIABLE SPEED PUMPS SHALL BE DESIGNED FOR DEFINITE PURPOSE ENERGY EFFICIENT DRIVE CONTROL. PROVIDE MOTOR WITH BEARING GROUNDING RING. MOTORS FOR GENERAL PURPOSES SHALL BE OPEN-DRIP-PROOF. GENERAL ELECTRIC, GOULD, LINCOLN, RELIANCE OR WESTINGHOUSE.
- 1.18 STARTERS, CONTACTORS AND CONTROLLERS SHALL COMPLY WITH NEMA STANDARDS. SHORT CIRCUIT PROTECTION SHALL BE TIME DELAY MANUAL RESET TYPE, THERMAL OVERLOADS SHALL BE MANUAL RESET TYPE, PILOT LIGHTS SHALL BE SIX VOLT EXTENDED LIFE. EACH STARTER SUBJECT TO ELECTRICAL INTERLOCK OR AUTOMATIC CONTROL SHALL HAVE THE NECESSARY AUXILIARY CONTACTS. EQUIP WITH SELF-CONTAINED FUSED AND GROUNDED 120 VOLT CONTROL TRANSFORMERS. STARTER TO INCLUDE PHASE LOSS RELAY, INTERLOCK TO OPEN STARTER CONTACTS ON LOW VOLTAGE OR LOSS OF PHASE.
- 1.19 MANUAL STARTERS SHALL BE TOGGLE OPERATED, SINGLE POLE LINE TO NEUTRAL, TWO POLE LINE TO LINE, FLUSH MOUNTED UNLESS OTHERWISE CALLED FOR.
- 1.20 COMBINATION MAGNETIC STARTERS SHALL BE ACROSS THE LINE TYPE WIRED FOR MAINTAINED CONTACT, HAND-OFF-AUTO SINGLE SPEED UNLESS OTHERWISE CALLED FOR.
- 1.21 DISCONNECTS SHALL BE HEAVY DUTY 250 VOLT. GENERAL PURPOSE ENCLOSURES SHALL BE NEMA 1, OUTDOOR LOCATIONS SHALL BE NEMA 3R, BELOW GRADE, DAMP OR HIGH HUMIDITY SHALL BE NEMA 4, HAZARDOUS SHALL BE EXPLOSION PROOF. ALLEN-BRADLEY, CUTLER-HAMMER, GENERAL ELECTRIC, ITE, SQUARE D, WESTINGHOUSE.
- 1.22 PROVIDE WIRING CIRCUITS UP TO AND INCLUDING 120 VOLTS FOR EQUIPMENT IN DIVISION 23 "MECHANICAL" INCLUDING POWER, CONTROL AND COMMUNICATION WIRING TO AND BETWEEN PANELS AND DEVICES. REFER TO NEC FOR REQUIREMENTS FOR CONDUCTORS, RACEWAY AND WIRING DEVICES. MECHANICAL CONTRACTOR RESPONSIBLE FOR WIRING LICENSED ELECTRICIAN TO PERFORM ELECTRICAL WORK ASSOCIATED WITH THIS PROJECT.
- 1.23 PROVIDE COMPLETE WIRING DIAGRAMS FOR EQUIPMENT AND SYSTEMS. DELIVER WIRING DIAGRAMS TO PROPER PARTIES IN TIME FOR ROUGHING OF CONDUIT AND EQUIPMENT CONNECTIONS TO AVOID DELAY IN CONSTRUCTION SCHEDULE. WIRING DIAGRAMS AND ROUGHING INFORMATION TO CLEARLY INDICATE ITEMS TO BE MOUNTED AND/OR WIRED AS PART OF THE WORK "ELECTRICAL".

2.0 PART 2 - PIPING AND PIPING ACCESSORIES

- 2.1 STEEL PIPE AND FITTINGS: ASTM A53 OR A106, SCHEDULE 40 OR 80, BLACK OR GALVANIZED FINISH AS CALLED FOR. WELDED FITTINGS SHOULD FACTORY FORGED, BUTT WELD TYPE, CHAMFERED ENDS, "NELDOUTS" OR "THREEDOUTS" MAY BE USED WHERE BRANCH CONNECTION SIZE IS TWO OR MORE SIZES SMALLER THAN THE MAIN. WELDING IN COMPLIANCE WITH THE NATIONAL CERTIFIED PIPE WELDING BUREAU.

- 2.2 SCREWED FITTING SHALL BE CAST OR MALLEABLE IRON, BLACK OR GALVANIZED OR DRAINAGE TYPE AS CALLED FOR. MAKE JOINTS WITH APPROPRIATE COMPOUND. UNIONS 2 INCH AND SMALL SHALL BE MALLEABLE CAST IRON, BRONZE TO IRON SEAT. 300 LB WMP COMPANION FLANGES FOR 2-1/2 INCH AND LARGER.
- 2.3 MECHANICAL PRESS FITTINGS FOR CARBON STEEL PIPING, ASTM 106, PRESS FIT EPM SEALING ELEMENT APPLIED AND INSTALLED IN STRICT COMPLIANCE WITH MANUFACTURER. VIEGA "MEPRESS" OR APPROVED EQUAL.
- 2.4 THERMOPLASTIC PIPE AND FITTINGS: PVC, SCHEDULE 40 OR 80, ASTM D1785, SOCKET FITTINGS, SCHEDULE 40 OR 80, ASTM D2467. VALVES, SOCKET BALL VALVES 100 PSI WMP AT 250 DEGREES F, TEFLON SEAT. SOLVENT CEMENT ASTM D2564, BACK WELD 3 INCH AND LARGER.
- 2.5 GROOVED MECHANICAL FITTINGS SHALL BE MALLEABLE IRON ASTM A470 OR DUCTILE IRON ASTM A536, FACTORY PAINT FINISH, EPM GRADE E GASKET, SERVICE -30 DEGREES F, VICTAULIC "STYLE 07 R16ID", VICTAULIC "STYLE TT FLEXIBLE" OR CONAC, GRINNELL, AUSTIN-BACON.
- 2.6 HANGERS SHALL BE ADJUSTABLE, MALLEABLE IRON OR STEEL, CADMIUM PLATED OR GALVANIZED. COPPER PLATED OR PVC COATED FOR COPPER PIPE. GLEVIS TYPE FOR 2-1/2 INCH AND LARGER.

PIPE SIZE	STEEL	PVC	ROD SIZE
3/4 TO 1 IN.	8 FT.	3 FT.	1/2 IN.
1-1/4 TO 2 IN.	10 FT.	3 FT.	3/8 IN.
2-1/2 TO 4 IN.	12 FT.	4 FT.	3/8 IN.
5 AND 6 IN.	12 FT.	4 FT.	5/8 IN.

- 2.7 PROVIDE SEISMIC RESTRAINT FOR ALL PIPING EXCEPT WHERE HANGERS ARE 12 INCH LONG OR LESS, 1 INCH OR LESS IN BOILER AND MECHANICAL ROOMS OR 2 INCH OR LESS IN ALL OTHER AREAS. WHERE SEISMIC RESTRAINTS ARE REQUIRED SPACE AT 40 FT. (20 FT. FOR GAS PIPING) FOR TRANSVERSE BRACING AND AT 80 FT. (40 FT. FOR GAS PIPING) FOR LONGITUDINAL BRACING, SUBMIT CERTIFIED ENGINEER SHOP DRAWING PRIOR TO INSTALLATION.
- 2.8 SUPPORTS SPACED FOR A MAXIMUM OF 1000 LBS, DRILLING INSERTS PHILLIPS "RED HEAD", UNISTRUT, BEAM CLAMPS AND OTHER STRUCTURALLY REVIEWED SUPPORT, FACTOR OF SAFETY SHALL BE AT LEAST FOUR.
- 2.9 DIELECTRIC PIPE FITTINGS ASTM B16.8, UNION 250 PSI, FLANGED 175 PSI, EPC OR CAPITOL MANUFACTURING. PROVIDE AT ALL DISSIMILAR PIPING CONNECTIONS.

2.10 PIPING MATERIALS SCHEDULE:

SERVICE	PIPE MATERIALS	FITTINGS	CONNECTIONS
HOT WATER HEATING	SCHEDULE 40, BLACK STEEL	MALLEABLE IRON AND BUTT NELD WELDED 2-1/2 IN. AND LARGER	SCREWED 2IN. AND SMALLER
HOT WATER HEATING (OPTIONAL)	SCHEDULE 40, BLACK STEEL	MECHANICAL FITTINGS	PRESS FITTINGS INSTALLED IN COMPLIANCE WITH MANUFACTURER
GAS (INTERIOR)	SCHEDULE 40, BLACK STEEL	2" AND SMALLER MALLEABLE	SCREWED
COIL CONDENSATE DRAIN	SCHEDULE 40, PVC	SOCKET TYPE PVC	SOCKET NELD GEMENT NOTE 1
EXTENSION OF EXISTING PIPING	MATCH EXISTING	MATCH EXISTING	EMPLOY MATERIALS AND METHODS TO MATCH EXISTING SYSTEMS

- 2.11 PIPE INSULATION (GLASS FIBER): FOUR POUND NOMINAL DENSITY FIBERGLASS, WHITE KRAFT OUTER JACKET BONDED TO ALUMINUM FOIL WITH FIBERGLASS YARN REINFORCEMENT. MAXIMUM THERMAL CONDUCTIVITY (K) SHALL BE 0.25 BTU/50. FT. HR. DEGREE F/INCH AT 75 DEGREE F MEAN TEMPERATURE. PREMOLDED "ZESTON" FITTING COVER. CERTAINTED, KNAUF, MANVILLE, OWENS-CORNING.

2.12 PIPE INSULATION MATERIALS SCHEDULE:

SERVICE	INSULATION MATERIAL	THICKNESS	REMARKS
HOT WATER	GLASS FIBER	1-1/2 IN. AND UP - 2 IN. UP TO 1-1/4 IN - 1-1/2 IN.	
2.13	GLOBE VALVES: 2-1/2 IN. AND LARGER, IBBT, RENEWABLE SEAT AND DISC, OS4Y, FLANGED, 125 SNP, PONELL #241 OR #243 OR KENNEDY, NIBCO.		
2.14	CHECK VALVES: 2-1/2 IN. AND LARGER, IBBT, RENEWABLE SEAT AND DISC, BOLTED FLANGE CAP, FLANGED ENDS, 125 SNP, PONELL #559 OR KENNEDY, NIBCO.		
2.15	GAS VALVES: 2-1/2 IN. AND LARGER, LEVER ACTUATORS BOLTED 6LAND TYPE, SHORT PATTERN, LUBRICATED PLUG TYPE, 175 LB. WOG, FLANGED, ROCKWELL, F16, #143, UL LISTED.		
2.16	GAS VALVES: 2 IN. AND SMALLER, 175 LB. WOG, MANUALLY ACTUATED, BOLTED COVER, SHORT PATTERN, LUBRICATED PLUG, SCREWED END, ROCKWELL F16, #142, UL LISTED.		
2.17	HOSE THREAD DRAIN VALVES: BRONZE BODY WITH TYPE 316 STAINLESS STEEL BALL, TEFLON SEAT, END ENTRANCE, 225 PSI NP, N.O.S. SCREWED ENDS, MATTS F16, #B6400-55, SOLDER ENDS, MATTS F16, #B6401-55 OR JAMESBURY, NIBCO, PONELL, 1/8 INCH BODY WITH HOSE THREAD END, BRASS CAP AND CHAIN.		
2.18	RELIEF VALVE: TO RELIEVE FULL HEATING CAPACITY, ASME CONSTRUCTION, MCDONNELL-MILLER "SERIES 240" OR BELL & GOSSETT.		
2.19	STRAINERS FOR WATER SERVICE: CAST SEMI-STEEL BODY OR CAST IRON CONSTRUCTION FOR STEEL PIPING AND BRONZE BODY CONSTRUCTION FOR COPPER PIPING, EQUIPPED WITH REMOVABLE, MONEL OR STAINLESS STEEL SCREEN, MAXIMUM PRESSURE DROP 2 PSI WITH FREE AREA AT LEAST FOUR TIMES AREA OF PIPE. PROVIDED WITH BLOW-OFF OUTLET WHERE CALLED FOR. ILLINOIS OR MUELLER, WEBSTER.		
2.20	FLOW BALANCER: CONSTRUCTED FOR 125 PSI AT 250 DEGREES F, CALIBRATED BALANCE VALVE WITH PROVISIONS FOR CONNECTING A PORTABLE DIFFERENTIAL PRESSURE METER SUITABLE AS A SERVICE VALVE. METER CONNECTIONS TO HAVE BUILT-IN CHECK VALVES. AN INTEGRAL POINTER SHALL REGISTER DEGREE OF VALVE OPENINGS. VALVE SHALL HAVE INTERNAL SEALS. MANUFACTURER'S RECOMMENDED METER FOR BALANCING. BELL & GOSSETT "CIRCUIT SETTER" OR ILLINOIS, TACO.		
2.21	WATER SYSTEMS INSTALLED WITH TOP OF PIPE IN LINE, TOP CONNECTIONS FOR UPFEED, SIDE OR BOTTOM CONNECTIONS FOR DOWNFEED, GRADE OFF LEVEL UP IN DIRECTION OF FLOW AND DOWN TO DRAIN. ISOLATE EXISTING SYSTEMS AND TEST AT 100 PSI FOR 2 HOURS. AFTER NEW SYSTEM IS TESTED, FLUSH, INTRODUCE TRISODIUM PHOSPHATE (1 LB./50 GALLONS) OR SODIUM CARBONATE (1 LB./30 GALLONS). CIRCULATE THROUGH THE SYSTEM, FLUSH UNTIL STRAINERS ARE FOUND CLEAN, CHECK VALVES AND AIR VENTS FOR PROPER FUNCTION, REPLACE IF DAMAGED.		

- 2.22 AFTER CLEANING, FILL EACH SYSTEM FROM LOW POINT WITH PUMPS OFF, VENT MAINS RISERS, SUBMITS, AND UNITS, WORKING CONSECUTIVELY FROM LOW TO HIGH POINT IN BUILDING. OBTAIN APPROXIMATELY 2 PSI AT HIGHEST POINT. OBTAIN PROPER AIR CUSHION IN COMPRESSION TANKS. TEST EXISTING SYSTEM FOR GLYCOL AND MEASURE CONCENTRATION. FILL WITH CONCENTRATION TO MATCH EXISTING, DON CHEMICAL "DOWNFROST".
- 2.23 TESTS: TEST PIPING AND ACCESSORIES BEFORE INSULATION, CONNECTION TO EXISTING PIPING OR CONCEALMENT. REPEAT AS MANY TIMES AS NECESSARY TO PROVE THE SYSTEM. NOTIFY OWNER OF TEST RESULTS IMMEDIATELY AT LEAST SEVEN DAYS IN ADVANCE OF EACH TEST. ISOLATE VALVES AND EQUIPMENT NOT CAPABLE OF WITHSTANDING TEST PRESSURES. MAKE LEAKS TIGHT; NO GASKING PERMITTED. REMOVE AND REPLACE DEFECTIVE FITTINGS, PIPE OR CONNECTIONS. FURNISH NECESSARY PUMPS, GAUGES, EQUIPMENT, PIPING, VALVING, POWER AND LABOR FOR TESTING.  
HOT WATER: HYDROSTATIC, 100 PSIG AT HIGH POINT OF SYSTEM; TWO HOURS DURATION.  
GAS PIPING: 100 PSI AIR PRESSURE, BUT NOT FOR LESS THAN SIX HOURS WITH A MAXIMUM LOSS 1/2 LB. OR AS REQUIRED BY LOCAL UTILITY COMPANY.  
OTHER PIPING SYSTEMS: 150% OF NORMAL WORKING AIR PRESSURE, TWO HOURS DURATION.
- 2.24 PROVIDE WRITTEN CERTIFICATION THAT TESTS HAVE BEEN CONDUCTED AND SUCCESSFULLY COMPLETED. SUBMIT TO THE OWNER'S REPRESENTATIVE. PAY FOR ALL TESTING.

3.0 PART 3 - EQUIPMENT

- 3.1 HOT WATER BOILER (CONDENSING GAS): FIELD ERRECTED AND TESTED, 50 PSI WMP, STAINLESS STEEL HOT WATER BOILER-BURNER UNIT, CAPABLE OF BURNING NATURAL GAS. IN COMPLIANCE WITH THE ASME BOILER AND PRESSURE VESSEL CODE. ELECTRIC CONTROLS, DEVICES AND PANELS SHALL BE UL LABELED. WIRING SHALL BE IN COMPLIANCE WITH NEC. AGA DESIGN CERTIFIED. GAS TRAIN AND BURNER IN COMPLIANCE WITH ANSI, FACTORY MUTUAL (FM) AND GAS SUPPLIER'S REQUIREMENTS. BOILER SHALL BE TESTED AND MEET THE REQUIREMENTS OF THE U.S. DEPARTMENT OF ENERGY AND IBC. SEALED COMBUSTION, POWER VENTED. NON-METALLIC VENTING AND ROOF VENT KIT. INSULATED METAL JACKET, REMOVABLE FOR SERVICE, FACTORY FINISHED, 1-1/2 LB CONDENSATE INSULATION, HIGH LIMIT ADJUSTABLE AND LOW WATER LEVEL SAFETIES. WATER SYSTEM THERMOMETERS, 30 DEGREE TO 300 DEGREE F RANGE. PRESSURE GAUGES, 0 TO 100 PSI WITH PRESSURE SNUBBER, WALL MOUNTED, ASSEMBLE IN FULL COMPLIANCE WITH AND UNDER SUPERVISION OF THE MANUFACTURER'S AUTHORIZED REPRESENTATIVE. ARRANGE FOR THE SERVICES OF MANUFACTURER'S REPRESENTATIVE FOR START-UP SERVICES INCLUDING VERIFICATION OF FINAL ASSEMBLY, FINAL WIRING AND INITIAL BOIL-OFF, CLEANING OF THE BOILER, AND INTRODUCING WATER. TREATMENT INGREDIENTS AND GLYCOL MATERIALS INSTALLED IN FULL COMPLIANCE WITH BOILER MANUFACTURER'S REQUIREMENTS. PROVIDE VENTING MATERIALS AND INSTALLATION IN FULL COMPLIANCE WITH BOILER MANUFACTURER'S REQUIREMENTS. PROVIDE CONDENSATE NEUTRALIZATION ASSEMBLY, PIPE TO FLOOR DRAIN. BAGNET COMPATIBLE FOR CONTROL AND MONITORING BY THE DDC SYSTEM. VERIFY GAS REGISTER REQUIREMENTS WITH THE MANUFACTURER'S GAS SUPPLIER. CERTIFY IN WRITING THAT FACTORY STARTUP AND OWNER INSTRUCTIONS ARE PROVIDED. MAKE: LAARS.
- 3.2 IN-LINE GLOBE COUPLED PUMP, NONOVERLOADING, STATIC AND DYNAMICALLY BALANCED, MECHANICAL SEALS WITH CARBON RING AND TUNGSTEN CARBIDE SEAT. SINGLE STAGE, END SUCTION, CAST IRON CASE, ENCLOSED BRONZE IMPELLER, ALLOY STEEL SHAFT, BRONZE BEARING. PRESSURE TAPS ON PUMP SUCTION AND DISCHARGE. SUITABLE FOR MAXIMUM 175 PSI WATER TEMPERATURE AND MAXIMUM 250 DEGREE F WATER TEMPERATURE. DIRECT DRIVE, VARIABLE SPEED MOTOR, INTEGRATED MOTOR CONTROLLER, BAGNET COMPATIBLE FOR CONTROL AND MONITORING BY THE DDC SYSTEM, FLEXIBLE COUPLING. BELL & GOSSETT OR ARMSTRONG, GRUNDFOS.
- 3.3 PREFABRICATED CHIMNEY: SUITABLE FOR GAS FIRED EQUIPMENT, DOUBLE WALL INSULATING AIR SPACE, STAINLESS STEEL, UL LISTED, IN COMPLIANCE WITH NFPA 54. PROVIDE WIRING, GUIDES, DRAIN TIES, WALL THIMBLE AND BAROMETRIC DAMPERS AS CALLED FOR. SELKIRK "B-VENT" OR AMPCO, METLVENT.
- 4.0 PART 4 - CONTROLS, ADJUSTING AND BALANCING
- 4.1 PROVIDE A COMPLETE AUTOMATIC TEMPERATURE CONTROL SYSTEM. SYSTEM SHALL INTEGRATE INTO EXISTING MICROPROCESSOR BASED CONTROL PLATFORM AND UTILIZE THE ELECTRIC SYSTEM FOR VALVE OPERATORS, HONEYWELL XL5000.  
PROVIDE WIRING AND CONDUIT AS REQUIRED TO CONNECT DEVICES FURNISHED AS PART OF OR ADJUNCTIVE TO THIS AUTOMATIC CONTROL SYSTEM REGARDLESS OF THE SOURCE OF SUPPLY. POWER AND CONTROL CIRCUITS, 120 VOLT MAXIMUM, TO ELECTRICAL PANELS. COMMUNICATION WIRING TO TELEPHONE SERVICE ENTRANCE. INSTALLED WIRING IN ACCORDANCE WITH REQUIREMENTS OF DIVISION 26 "ELECTRICAL" AND NATIONAL ELECTRICAL CODE.  
PROVIDE WIRING, CONDUIT AND DEVICES REQUIRED FOR PROPER SYSTEM OPERATION INCLUDING SPECIAL INSTRUCTION, HIGH LIMIT ADJUSTABLE AND DISCONNECT SWITCHES, RELAYS, CIRCUIT BREAKER PROTECTION, AND OTHER DEVICES AS REQUIRED.  
CONTROL VALVES SHALL BE SIZED BY THE CONTROL MANUFACTURER, NOT MORE THAN 10 FEET OF PRESSURE DROP, EQUAL PERCENTAGE TYPE, 316 STAINLESS STEEL STEM, REPLACEABLE COMPOSITION DISK, RUBBER DIAPHRAGMS, SCREWED BODY 2 INCH AND SMALLER, FLANGED BODY 2-1/2 INCH AND LARGER, 125 PSI, FAIL SAFE AS CALLED FOR.

- 4.2 GUARANTEE THE NEW CONTROL SYSTEM FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP, EXCEPT FOR DAMAGES FROM OTHER CAUSES, FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE OR OWNER OCCUPANCY, WHICHEVER IS EARLIER. MAINTAIN TEMPERATURES WITHIN 1 DEGREE F ABOVE AND BELOW SETTING.  
WHEN THE WORK HAS BEEN COMPLETED, COMPLETELY ADJUST THE CONTROL SYSTEM. TAG EQUIPMENT WITH DESIGNATION FROM THE CONTROL DIAGRAM. PROVIDE COMPETENT CONTROL TECHNICIANS TO INSTRUCT THE OWNER'S OPERATING PERSONNEL AND TURN OVER THREE COPIES OF MAINTENANCE MANUAL, TOTAL OF ONE (1) WORKING DAY. CERTIFY IN WRITING THAT FACTORY STARTUP AND OWNER INSTRUCTIONS ARE PROVIDED.

- 4.3 HEATING PLANT (NEW AND EXISTING)  
DDC SYSTEM SHALL MONITOR AND CONTROL THE HEATING PLANT.  
THE HEATING PLANT CONSISTS OF THREE NEW BOILERS WITH CIRCULATING PUMPS, AN EXISTING BOILER AND TWO EXISTING PRIMARY DISTRIBUTION PUMPS WITH ONE ON STANDBY.  
EXISTING HEATING PLANT OPERATIONAL CONTROLS TO REMAIN. INTERLOCK NEW INDIVIDUAL BOILERS WITH ITS CORRESPONDING CIRCULATORY PUMP FOR SIMULTANEOUS OPERATION. NEW BOILER SHALL SEND CONTROL SIGNALS TO ITS CORRESPONDING CIRCULATORY PUMP TO MODULATE PUMP SPEED BASED OFF DIFFERENTIAL TEMPERATURE MEASURED AT BOILER INLET AND OUTLET.  
EXISTING OUTSIDE AIR RESET SCHEDULE TO REMAIN.  
PROVIDE BOILER CHANGE OVER AT THE DDC INTERFACE TO ENABLE/DISABLE NEW AND EXISTING BOILER OPERATION. PROVIDE A SELECTOR SWITCH TO INDEX EITHER BOILER AS LEAD. THE LEAD BOILER SHALL OPERATE TO MAINTAIN SCHEDULED HOT WATER SUPPLY TEMPERATURE. IF THE LEAD BOILER IS UNABLE TO PROVIDE SUFFICIENT CAPACITY TO MEET SCHEDULED SUPPLY WATER TEMPERATURE, THEN THE LAG BOILER SHALL BE ALLOWED TO OPERATE.  
PROVIDE INVERSE ACTING CONTROL VALVES SET TO CYCLE BASED ON NEW OR EXISTING BOILER ENABLE/DISABLE SETTINGS. WHEN EXISTING BOILER OPERATION IS ENABLED, AND NEW BOILER OPERATION IS DISABLED CONTROL VALVE (CV-1) SHALL BE OPEN AND CV-2 SHALL BE CLOSED. WHEN EXISTING BOILER IS DISABLED AND NEW BOILER OPERATION IS ENABLED CV-1 SHALL BE CLOSED AND CV-2 SHALL BE OPEN. EXISTING BOILER SHALL BE PREVENTED FROM FIRING UPON NO WATER FLOW AT FLOW SWITCH (FS-1). NEW BOILERS SHALL BE PREVENTED FROM FIRING UPON NO WATER FLOW AT FS-2.  
EXISTING PRIMARY DISTRIBUTION PUMP ONLINE/STANDBY CONTROLS TO REMAIN.  
DDC SHALL MONITOR SUPPLY AND RETURN WATER TEMPERATURE AT EACH BOILER, BOILER STATUS, PUMP STATUS, CONTROL VALVE POSITIONING AND FLOW SWITCHES.

- 4.4 ADJUSTING AND BALANCING: BALANCING REPORT SHALL BE TYPED AND THREE COPIES SUBMITTED FOR REVIEW. RESULTS SHALL BE GUARANTEED. CONTRACTOR SHALL BE SUBJECT TO RECALL TO SITE TO VERIFY THE REPORT INFORMATION BEFORE ACCEPTANCE OF THE REPORT BY THE OWNER'S REPRESENTATIVE.  
BALANCING CONTRACTOR SHALL FOLLOW THE PROCEDURES OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).  
PLACE SYSTEMS IN SATISFACTORY OPERATING CONDITION. ADJUSTING AND BALANCING SHALL BE ACCOMPLISHED AS SOON AS THE SYSTEMS ARE COMPLETE AND BEFORE OWNER TAKES POSSESSION. ADJUSTING AND BALANCING SHALL BE ACCOMPLISHED UNDER APPROPRIATE OUTDOOR TEMPERATURE CONDITIONS. CHANGE FULLEYS AS REQUIRED TO MEET SYSTEM PERFORMANCE REQUIREMENTS. PERFORM NECESSARY MECHANICAL ADJUSTMENTS IN CONJUNCTION WITH BALANCING PROCEDURE. REPLACE BALANCING COCKS AND FLOW BALANCERS IN SYSTEMS THAT CANNOT BE MANIPULATED TO SATISFY BALANCING REQUIREMENTS.  
TEST AND RECORD ENTERING AND LEAVING AIR TEMPERATURE AT COILS.  
TEST AND ADJUST ZONES TO PROPER DESIGN SUPPLY, RETURN AND EXHAUST CFM. ADJUST TERMINAL UNITS TO DESIGN CFM. TEST AND ADJUST EACH DIFFUSER, GRILLE AND REGISTER TO WITHIN 10% OF DESIGN REQUIREMENTS.  
WATER SYSTEMS: SET PUMPS TO PROPER GALLONS PER MINUTE DELIVERY. TEST AND RECORD SUCTION AND DISCHARGE PRESSURES, RATED AND ACTUAL FULL LOAD MOTOR AMPS. CHECK AND SET OPERATING TEMPERATURES AND ADJUST FLOW FOR DESIGN REQUIREMENTS.

END OF SECTION 23 50 00

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