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# Executive Summary

## Project Intent

The Bay St. Louis - Waveland School District ESSER – IAQ Energy Services project will replace HVAC water source heat pumps (WSHP) and outside air ventilation split systems located at the Bay Waveland Middle School. This project is intended to improve the indoor air quality for the classrooms and other spaces included in this scope of work. This project will be paid for through federal Elementary and Secondary Education Emergency Relief (ESSER) II funds. The HVAC systems are beyond their useful life expectancy and are not functioning as need to meet the needed indoor air quality conditions. The use of ESSER II Funds to replace and upgrade the scoped systems requires the deadline for completion of work for reimbursement to be prior to September 15, 2023.

## General Scope

All work included in this section will be performed at the Bay Waveland Middle School. All the WSHPs and OAU equipment listed in the scope of work and on the plans will be replaced. For reference, the existing equipment data with pictures of the existing conditions for each system is provided in Appendix C – Existing Conditions and the original plans for the school have also been provided in Appendix B – Original Drawings.

**Equipment included in project:**

6th Grade Wing – Qty 13 Horizontal WHSPs and Qty 1 OSA ventilation split system

7th Grade Wing – Qty 14 Horizontal WHSPs and Qty 1 OSA ventilation split system

8th Grade Wing – Qty 15 Horizontal WHSPs and Qty 1 OSA ventilation split system

Gym/Chorus/Restrooms/Dressing– Qty 7 Vertical WSHPs

Band Hall – Qty 2 Vertical WSHPs

Library/Media Center – Qty 1 Vertical WSHPs

Teacher Lounge/Counselors – Qty 2 Vertical WSHPs

Office/Admin – Qty 2 DX heat pump split systems

Cafetorium/Kitchen – Qty 2 Vertical WSHPs

**Total of qty 56 WSHPs, 2 DX split systems, and 3 OSA split systems. Please verify that these quantities are correct prior to proposal submission.**

Note: Due to limited availability of large units above 25 Tons, the two (2) large 40 Ton WSHPs serving the GYM (tag HP-7) and Cafetorium (tag HP-12) will be replaced with 2 smaller 20 Ton units each as an add alternate.

The scope of work follows the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) epidemic task force core recommendations for reducing airborne infectious aerosol exposure to improve the indoor air quality and mitigate the spread of airborne pathogens. In summary, the guidelines recommend the following for schools:

- Utilize 2-inch pleated media MERV 13 filter efficiency with a sealed filter rack to capture particulates more effectively in systems with recirculated air.
- Introduce the optimum amount of outside fresh air ventilation to the space to help dilute pollutants in the zone.
- Properly control space temperature and humidity to help control the indoor air quality of the space.
- Use appropriate air cleaning devices to help improve the effectiveness of the air filtration.
- Perform commissioning along with testing and balancing of the air flow for the systems to ensure the operation and performance is as intended.

This project will include the follow recommendations from the ASHRAE guidelines to upgrade the HVAC system replacements in this scope of work. The contractor will provide and install these upgrades as detailed in the project scope of work section below and the drawings included in Appendix A1 – Project Drawings

**Use of unit installed 2-inch filter racks with MERV 13 Filters:** All new units shall be provided with 2" filter racks in on the return side of the units. Provide four (4) sets of new MERV 13 filters to match the filer size of the new filter rack. One (1) set is for initial start-up and operation. Another set (1) is to be installed for test and balance. The remaining two (2) sets shall be turned over to the owner for their routine maintenance replacement inventory.

**Outside Air Ventilation:** The existing outside air ventilation units have excessive outside air amounts and are oversized which lead to humidity issues and consume too much energy. These units are currently not working and need to be replaced with new smaller systems per the equipment schedule on the new plans.

**Air Cleaning Devise Support:** To help improve indoor air quality, Bipolar Ion Generators will be provided and installed by others. The mechanical contractor is not responsible for providing or installing these devises but shall support this effort by others. The new Bipolar Ion Generators will be powered with 24 volts from the indoor HVAC units' control transformer (wiring by controls contractor).

**Air Distribution and Control:** How the correct amount of air is delivered and how outside air is introduced into the space is critical to the success of this solution. Certified Test and Balancing of the air flows and water flows for each system will be required as part of the mechanical contractor's scope of work.

**Performance Based Commissioning:** MPC will perform commissioning on the systems after installation. The contractor will need to provide water test and balance for this activity and personnel for commissioning assistance to MPC during the commissioning process. The personnel will be there to help operate the systems and make corrections if needed for any deficiencies found with the newly installed systems. This contractor would not be responsible for existing conditions found that are outside of this scope of work.

**The HVAC building automation controls will be provided under a separate contract with Powers of Mississippi per the owners direction. MPC will coordinate controls work with the mechanical work included in this scope of work. The mechanical contractor will allow for coordination with the controls contractor.**

## Existing Conditions

The systems are horizontal water source heat pumps for the classrooms, vertical water source heat pumps for all other areas, and DX heat pump splits systems for the office. The classrooms wings (3) are served by three (3) 100% outside air energy recovery ventilator that have DX cooling coils connected to ground mounted condensing units located adjacent to the classroom wings they serve. One (1) system serves each of the three (3) classroom wings.

The listed systems are well beyond their ASHRAE standard for useful and use R22 refrigerant. Most systems do not have properly controlled and measured outside air (OSA) ventilation.

## Utility Interruptions

Installation of the proposed work will require the isolation of electrical circuits, as well as the shut down for HVAC systems. The contractor will coordinate these interruptions with the Bay St. Louis - Waveland School District and provide ample notice to minimize any disruption to normal activities.

## Environmental Compliance Documentation and Hazardous Materials

The scope of work does not include costs for unforeseen conditions including abatement of asbestos, lead-based paint, contaminated soils, and other environmental issues/hazardous material associated with the project that were not identified by the Bay St. Louis - Waveland School District. At any time during the installation, or acceptance phase, should the contractor discover any one of the listed hazards, MPC and the Bay St. Louis - Waveland School District shall be notified immediately to determine how work in that area should proceed.

# Project Scope of Work

## Mechanical Work

The Bay Waveland Middle School will have all the HVAC systems per the drawings in Appendix A1 and this scope of work replaced with upgrades/modifications shown on the drawings and listed under this scope of work.

All WSHP system shall have new piping packages provided and installed with Circuit Setters, Unions, Manual shut off ball valves, PT ports on supply and return lines, and stainless-steel flex houses.

Automated 24 volt shut off valves will be provided by the controls contractor and installed in the return water line by the mechanical contractor as part of this scope.

Provide new duct connection transitions and canvases to match the new equipment supply and return opening and insulate. The supply and return duct transitions shall be provided as needed to properly connect the new equipment to the existing ductwork.

Include new emergency drain pan foam blocks under the classroom units and treated wood blocking under the larger non-classroom units.

Install all new condensate run out lines to the existing main drains. Provide new p-traps with clean outs on both sides and sized by the equipment manufacturer. Insulate all new piping and p-traps with 1/2" Armaflex and glue joints. Provide and install inline condensate shut off switches in the 3/4" condensate line for the classroom units. Locate the condensate switches in the auxiliary drain connection of the DX split systems serving the offices.

All vertical WSHPs except HP-6 and 8 (total qty 10) have existing return loop water reheat coils mounted in the supply air duct. Allow for cleaning of these coils in place prior to installation of the new units.

## Electrical

The associated electrical work is limited to disconnection, demolition, replacement, and reconnection of the scoped HVAC equipment "whips" from the existing unit disconnect to the new units except for the electrical work required to convert the two large 40 ton WSHPs in the GYM and Cafetorium into four 20 ton WSHPs in the additive alternate. Also, the breakers serving the OSA split system (inside and outside units) will need to be reduced in size to match the new smaller sized equipment.

## Warranty

Contractor warranty and manufacturing warranty shall start when the Bay St. Louis - Waveland School District provides a letter of acceptance as work is completed. Warranty term for the project

shall be two (2) years from date of acceptance/substantial completion from Mississippi Power Company and Bay St. Louis - Waveland School District. HVAC equipment shall be provided with five-year (5) parts, labor and refrigerant warranties. Equipment warranties shall be passed onto Bay St. Louis – Waveland School District after the two-year contractor warranty ends. Equipment warranty will start at six months from delivery or startup of equipment, whichever comes first.

# Training, Operations and Maintenance

The information below details the training and O&M activities for this project.

## Training

Training for the School District Staff is a critical element of an HVAC project involving energy efficiency and indoor air quality improvement because the personnel that will be operating the new equipment needs to understand operating procedures and the associated requirements of the new systems. MPC understands the importance of providing training and education for Bay St. Louis - Waveland School District facility and maintenance personnel on the new equipment that will be installed. We will provide O&M manuals and hands-on site training to designated School District employees and we will work with the local facility team to determine the appropriate audience. This on-site training will occur concurrently with the start-up of the new equipment. Training will take place at the project scoped schools and the duration will be based on the complexity of the types of systems installed.

The basic elements of the training will include the following:

- Basic Operation Procedures
  - Start up
  - Shut down
  - Operation checks
  - Maintenance checks
  - Safety and operation requirements
  - Emergency shut down

## O&M Responsibility

Upon project completion, O&M of the new equipment will be the responsibility of personnel at the school district. Equipment warranties will be transferred to the Bay St. Louis - Waveland School District after the two-year contractor warranty period and O&M training will be provided to the staff as outlined within the training section.

## Performance Assurance Assistance

MPC will require assistance during the Performance Assurance verification of system performance and energy savings one (1) year after the completion of the project. The intent is to confirm that the systems are operating as intended once in operation for a period of actual use by the end users. This process helps determine if any unintended issues exist that could be detrimental to the long-term operation of the systems. MPC will execute the Performance Assurance verification similar to the commissioning phase and will require the contractor to provide personnel to assist with operational testing of the equipment.