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Heat Pumps Replacement and Domestic Hot Water Conversion Project Design Scope of Work

Queens Botanical Garden
November 22, 2021

Overview

Queens Botanical Garden (QBG) is seeking to engage an engineering or architectural firm for design and construction administration for a project to replace eight heat pumps and convert a domestic hot water heater. This document provides background on the project and describes the desired scope of services.

Project Background

The Queens Botanical Garden is located on 39 acres of land owned by New York City. The 15,800 square foot Visitor and Administration Center opened in 2007 and includes a reception, auditorium, garden store, gallery space, meeting rooms, administrative offices, and mechanical spaces. Edison Energy performed an energy study of the facility in November 2020 to March 2021. That study recommended several energy conservation measures (ECMs) for the facility. The purpose of this project is to implement two of the ECMs that were selected by QBG.

Heat Pumps Replacement

The building has eight (8) water to water ClimateMaster Model GSW120AHC10NBCS heat pumps that are rated for about 10 tons cooling and 67 MBH to 100 MBH heating. Installed in 2007 the units are about 14 years old. The heat pumps provide chilled water during the cooling season and hot water during the heating season and are controlled by the Building Management System (BMS). The heat pumps are the focal point of the building hydronic systems that include the heat pump primary and secondary systems and the heat pump condenser water and well water systems. The heat pumps are experiencing operational issues during peak weather where they trip offline due to internal safety alarms. The hydronic system is not achieving loop and space temperature setpoints during certain outdoor air conditions causing comfort issues in both the heating and cooling season. There is likely pipe fouling from when well water was directly supplied to the units before the addition of a heat exchanger to separate the well water loop from the condenser water loop.

The proposed project is to replace the heat pumps and associated condenser water piping. Goals of the project are to address the operational and comfort issues and achieve energy savings.

Domestic Hot Water Heater Conversion

Domestic hot water for the building is generated by a tank type electric hot water heater that was installed in August of 2018. The heater manufacturer is Rheem the tank has a capacity of 50 gallons. The two electric heater elements are rated for 4,130 watts each, proving a total capacity of 8,260 watts.

The proposed scope is to replace the existing hot water heater with an electric heat pump water heater. The goal of this part of the project is to achieve energy savings and restore occupant comfort.



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Design and Construction Administration Services

The selected design firm shall provide the following services:

Project Kick-Off

- Attend a project kick-off meeting
- Review documentation to be provided by Edison Energy from the energy study
- Work shall be coordinated with Queens Botanical Garden and Edison Energy

Design Development

- General feasibility and constructability assessment
- Schedule of major equipment, including make, model, power, capacity, efficiencies, and dimensions as a basis of design
- Plan view layout to scale, including equipment layout and general pipe routing
- Identify power requirements and evaluate adequacy of existing power service and determine whether system upgrades are necessary and if necessary, describe those upgrades
- Site visit is required
- Provide a list of CSI master specification sections.
- Attend review meeting with owner and Edison Energy.

Construction Documents and Permit Drawings

- Respond to and address review comments to be provided by the owner and Edison Energy.
- Provide fully detailed control drawings; coordinate with owner's preferred automatic temperature control (ATC) provider.
- Provide fully detailed mechanical, plumbing, structural, and electrical drawings suitable for submission to the authorities having jurisdiction, including the New York City Department of Buildings (DOB).
- Include pipe sizing, valving, and equipment connections
- Provide complete edited CSI master project specification book.

NYC DOB Filings

- Design firm shall employ an expeditor with experience and expertise working with the DOB.
- Design firm shall be responsible for all design applications to the DOB and to any other city or state agencies, such as the Fire Department of New York (FDNY). This includes signed and sealed drawings, signed and seal DOB forms, and utilize DOB Now online system.
- Comments provided by authority having jurisdiction (DOB, FDNY, etc.) shall be addressed by the design firm.

Construction Administration

- Review shop drawings and submittals and respond to requests for information (RFIs).
- Attending construction job meetings is required. This shall consist of approximately 3 meetings on site and conference calls throughout the project duration.
- Respond to issues raised by the commissioning (Cx) agent, such as design issues that may appear on the Cx issues list.
- Review contractor Change Orders for conformance with design.



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- Review field changes.
- Design firm shall self-certify that the construction has been performed according to the code.
- Provide project punchlist.
- Assist with final close out of the project, including review and approval of contractor as-built drawings and updating design drawings per as-built conditions.

Qualifications

The selected design firm shall have the following qualifications:

- Professional Engineer registered in the State of New York
- Mechanical, Electrical, and Plumbing disciplines
- Project experience in New York City. Provide description of three reference projects.

Schedule

Design work shall begin as soon as possible, after selection, in December 2021. Construction is expected to be complete by June 30, 2022.

Contacts

For questions and additional information, please contact via email or phone:

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Submission

Please submit your price proposal **via email by December 8, 2021** to Rebecca Wolf at rwolf@queensbotanical.org including scope of services and example projects.