Requesting Bids for the Design and Installation of a Wood Pellet Boiler at Hanford Mills Museum

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Issued By: Hanford Mills Museum

Point of Contact: Liz Callahan, Executive Director: lizc@hanfordmills.org / *607-278-5744*

REQUEST FOR BIDS

Hanford Mills Museum is seeking bids from qualified mechanical contractors interested in the wood pellet boiler installation and associated improvements of the mechanical room at Hanford Mills Museum located in East Meredith, NY. Work includes installing a new pellet boiler and associated equipment, including thermal storage; tying it into the existing distribution system; adding distribution via underground insulated piping to a second building; and installing an exterior pellet silo. The selected mechanical contractor is required to hold the prime contract with the owner and coordinate all associated sub-trades. The budget for the work is $59,250. Bids are due by 5:00pm EST Friday, January 22, 2015. Proposals must be submitted electronically in PDF format. Electronic submissions must be sent to Liz Callahan, Executive Director, Hanford Mills Museum, at lizc@hanfordmills.org.

Project Background

Hanford Mills Museum (HMM) is a historic nineteenth century mill located in East Meredith, NY that has been included in the State and National Registers of Historic Places. Hanford Mills Museum operates an authentic water- and steam-powered mill facility comprising several buildings. Its mission is to "inspire audiences of all ages to explore connections among energy, technology, natural resources, and entrepreneurship in rural communities, with a focus on sustainable choices."

Fitting in with that mission, HMM is a proposed demonstration site for the Southern Tier Bulk Wood Pellet Infrastructure Boost Program ("Bulk Wood Pellet Program"). This Cleaner Greener Communities program, led by Cornell Cooperative Extension of Tompkins County and funded through the New York State Energy Research and Development Authority (NYSERDA), has three main components: 1) financial support for the purchase of two bulk wood pellet delivery trucks and bulk wood pellet fuel depots associated with these trucks; 2) financial and expertise support for the installation of three commercial-scale demonstration wood pellet boilers (of which HMM is one); and 3) market analysis to identify barriers to the broader adoption of residential- and commercial-scale heating with wood pellets, research into market potential, and collecting data on other successful models around the world.

Energy modeling has been conducted as a first step to design an appropriate wood pellet-fired heating system to provide heat for Hanford Mills Museum's main office building in the Walter Smith Hardware Store (WSHS), as well as an adjacent building, Monroe House (MH), used mainly for housing archives. The attached Manual J reports are based on completion of proposed building energy efficiency upgrades discussed further below.

The WSHS is a large two-story, circa 1904 balloon-framed structure with clapboard siding, measuring over 3100 square feet of conditioned floor space. The interior spaces are split into four distinct sections: US Post Office on the south end of the first floor; reception, kitchen and conference rooms occupying

the rest of the first floor; office space in the back half of the second floor; and archive space in the front half of the second floor. Heating, dehumidification and hot water mechanical systems are located in the full basement.

The Monroe House (MH) sits adjacent to WSHS across a gravel parking lot. This circa 1900 balloon-framed, clapboard-sided building measuring 1440 SF on the 1st and 2nd floors, with another 720 SF basement, is currently unconditioned (although there is an oil-fired boiler heating the space) and used for storing a variety of artifacts.

Heat load estimations have been calculated on both buildings and heat loads have been modeled taking into account expected building energy-related upgrades. These proposed energy-related improvements to be undertaken prior to the installation of the wood pellet boiler include:

- Monroe House envelope improvements will include sidewall and attic insulation, air sealing, and above-grade basement wall foam
- Walter Smith Hardware Store envelope improvements include air sealing and insulation in the attic, band joist, and exterior doors
- In addition, funding permitting, HMM would like to strategically install interior storm windows on some windows in the WSHS

Critical water- and moisture-control measures are also being planned for both buildings.

Attached to this request for bids are the energy assessments conducted by L&S Energy Services, Inc., showing modeled heat load calculations for the two buildings after these envelope and other energy and site improvements have been made.

The current proposal is to have a single wood pellet-fired boiler serve both buildings, with hydronic heat distribution connected through insulated underground pipes. The proposed biomass heating system operation shall be optimized using an energy management system (EMS) to provide maximum efficiency on a seasonal and diurnal basis and minimize boiler cycling for both the pellet boiler and any stand-by existing boilers. The proposed boiler should be sized to cover roughly 60% of the building's maximum heat demand, per NYSERDA program requirements. The oil-fired boilers in both buildings shall be retained in case of emergency, and their operation as back-up and/or peaking units may be incorporated into the system sizing and design.

As a part of the Bulk Wood Pellet Program, the pellet-fired boiler will have to conform to NYSERDA's Cleaner Greener Communities biomass heating requirements (included with this bid package, or see "Biomass – CGC Commercial Program Requirements" available at www.hanfordmills.org/about-hanford-mills-museum/pellet-boiler-project-rfp). *It is very important that any prospective bidder on this project fully familiarize themselves with NYSERDA's technical requirements for Cleaner Greener Communities biomass heating projects.*

Scope of Project

HMM is seeking bids from qualified firms willing to provide design, procurement and installation of an appropriate wood pellet-fired boiler system. Interested bidders shall submit their qualifications and proposals for completing the following work:

- detailed engineering designs, heating system schematic, schedule of values, boiler specifications, and statement of compliance with NYSERDA's Cleaner Greener Communities (CGC) biomass heating systems requirements and any supporting documents

- Data Acquisition Systems (DAS) and Monitoring Plan including schematic showing the flow meters and temperature sensors
- boiler system installation, including all requirements specified in NYSERDA's CGC biomass heating systems requirements, to appropriately serve both buildings at HMM (WSHS and MH) and tying the new wood pellet-fired boiler into the existing heating plant for maximum efficiency

Chosen contractors must provide commissioning, system calibration, and start-up training, along with one year of service. In addition, chosen contractors must be available to provide a total of not more than four walk-throughs for representatives from the Bulk Wood Pellet Program and NYSERDA to inspect the equipment and to witness test operations over a period of six months following completion of equipment installation, with no additional compensation.

The bid document must include how your firm proposes to complete this work, including budget and timeline, and what equipment your firm recommends for this application (boiler specs, piping, valves, controls, thermal storage, bulk pellet storage bin, underground insulated piping, exhaust, etc.). At time of submission, all bids must also include general information about three to five projects of similar scope completed in the past two years, with appropriate contact information.

It is HMM's desire that the boiler system and all its components be on-line and fully operational by June 2016. A proposed timeline is below, but any prospective bidder is requested to provide a realistic timeline they will adhere to if contracted to perform the work. Detailed engineered drawings are not expected at this time, but deliverables such as these should be included in the cost estimates. All work must comply with all local, municipal, state and federal regulations, and contractor is solely responsible for attaining all necessary permits.

Bidders are strongly encouraged to visit the site and become familiar with the general, local, and site conditions that may affect cost, progress, and performance of the work. A tour will be given to any prospective bidders on December 17, 2015, at 10 am, with the facility remaining open for site visits until 4 pm of the same day; other times and dates may be arranged by request through Liz Callahan. No request for extra compensation will be considered for hardships encountered that would have been disclosed or made evident by a reasonable examination of the site.

Bid Process

Site Visit

A site visit is scheduled for December 17, 2015, between the hours of 10 am and 4 pm, where any prospective bidder may visit the project site; a tour of the facilities will be given at 10 am of that day. Other times and dates may be arranged by request through Liz Callahan.

Questions Relating to the RFP

Formal questions must be submitted in writing (via email) to the RFP Point of Contact, Liz Callahan, Executive Director, Hanford Mills Museum, at lizc@hanfordmills.org by 5pm EST Friday, January 8. Questions and answers will be posted in FAQ format at www.hanfordmills.org/about-hanford-mills-museum/pellet-boiler-project-rfp by January 15. Informal requests for clarifications can be submitted at any time by email (lizc@hanfordmills.org) or telephone (607-278-5744), but if a question is deemed to be significant, it may be posted, and answered, publicly on the program website.

Due Date for Proposals and Submittal Process

Proposals must be received no later than 5pm EST Friday, January 22, 2015. Proposals must be submitted electronically in PDF format. Electronic submissions must be sent to Liz Callahan, Executive Director, Hanford Mills Museum, at lizc@hanfordmills.org. All emailed proposals will generate an emailed response confirming receipt of proposal. If you do not receive a confirmation email, please contact Liz Callahan at lizc@hanfordmills.org or Guillermo Metz, Bulk Wood Pellet Program Manager at gm52@cornell.edu or 607-272-2292, x185. Proposals must be signed with a digitally captured signature or via scanned document with signature. Submission of a signed proposal will be interpreted to mean that the proposer has agreed to all terms and conditions set forth in this solicitation document. Faxed, incomplete, and late proposals will not be accepted.

Modification or Withdrawal

The proposer may submit a written modification in accordance with the instructions for submitting a proposal as identified above. Any modification is required to have a date and time placed on it by the proposer, and the words "This modification amends and supersedes the prior offer" written on page one of the modification. A proposer may request to withdraw a proposal by filing such request in writing, signed by an authorized representative.

All communications shall be through the Points of Contact listed above (Liz Callahan or Guillermo Metz). Communications with any other members of the Bulk Wood Pellet Program or technical advisors for the purpose of influencing the outcome of the RFP may be cause for the proposal to be rejected and disqualified from further consideration.

By submitting a bid, bidder represents that:

A. the bid is genuine and not made in the interest of or on the behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation;
B. bidder has not directly or indirectly induced or solicited any other bidder to submit a false or sham bid;
C. bidder has not solicited or induced any individual or entity to refrain from bidding; and
D. bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the contract. For the purposes of this paragraph:
    1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
    2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive owner of the benefits of free and open competition;
    3. "collusive practice" means a scheme or arrangement between two or more bidders, with or without the knowledge of owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
    4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the contract.

Program Timeline

11/30/2015	Request for Bids Release
12/17/2015	Site Visit
1/8/2016	Questions Concerning Request for Bids Due
1/15/2016	Answers to Questions Concerning Request for Bids Released

1/22/2016	Bids Due
2/12/2016	Bids Reviewed, Contractor Selected
3/4/2016	Contracts Signed
3/1–4/4/2016	Installations Start
5/27/2016	Wood Pellet Boiler System On-Line
7/1/2016	Commissioning Completed

Scope of Work

Design of the Wood Pellet Boiler Heating System with respect to load profiles determined, including:

- heating system optimized for annual thermal efficiency by accounting for the existing supplemental non-wood pellet boiler's ability to meet peak heating loads (when operating in tandem with the pellet system) as well as low loads often experienced during the shoulder months. It is anticipated that the wood pellet boiler system shall be sized at <60% of the design day heating load. *See attached Cleaner Greener Communities (CGC) biomass heating requirements (*included with this bid package, or see "Biomass – CGC Commercial Program Requirements" available at www.hanfordmills.org/about-hanford-mills-museum/pellet-boiler-project-rfp) *for additional requirements.*
- boiler performance documentation including thermal efficiency and emissions performance for the boiler model being installed with wood pellets as the fuel input to demonstrate that the boiler meets the basic performance requirements in the CGC document (referenced above).
- details of the Heating System Design, including detailed engineering designs, heating system schematic with all components including but not limited to the pellet boiler, thermal storage, any non-wood boiler heating source/boiler, heat distribution system (zones and emitters), piping, heat exchangers, return water temperature protection, balancing valves, three-way mixing valves, drain valves, expansion tanks, air separators, circulators, outdoor temperature sensors, thermostats, power outage protection scheme, energy management system, wiring schematic, CO detector, and pellet storage and feed infrastructure between storage and boiler.
- strategies to prevent excessive cycling of the existing oil-fired boilers in the integrated heating system design and how this will be measured and verified.
- the minimum size thermal storage shall be based on the boiler manufacturer's recommendation for the application and size of the boiler but must not be less than 20 gallons per 10,000 Btu/h. For very small commercial pellet boiler projects, the minimum thermal storage for boilers less than or equal to 25 kW (<85,000 Btu/h) is 119 gallons. All pellet storage shall be located outside of the building. Commercial projects are subject to Occupational Safety and Health Administration (OSHA) requirements.
- include a carbon monoxide (CO) detection system in the boiler room that has the ability to sound an audible alarm, and then trigger an automatic pellet boiler shutdown if necessary (documentation of equivalent safety features in boiler design will be considered).
- design and location of exhaust stack to prevent exposure to building occupants and visitors or to people in frequently occupied outdoor areas such as playgrounds. The boiler's stack height and location must be sufficient to adequately disperse emissions from the immediate vicinity and prevent entrainment of exhaust gases and particles into the building air intakes and to minimize exposure at ground level adjacent to the building on which the stack is being located. The stack shall be a minimum of 5 feet above the highest point of a large flat building that it is heating and above the roof height of any other taller building within 100 feet of the unit. In no case should the stack height be at or below the building height. In addition, the stack shall not be placed in close proximity to an air intake or operable window. Stack design shall also minimize horizontal

piping and bends. (See, for example, www.epa.gov/ttn/scram/guidance_permit.htm for some EPA documents on good engineering stack height and modeling.)
- steps to minimize thermal losses to non-heated spaces. Considerations may include insulating the container that houses the boiler and thermal storage tank.
- simple schematic of the system that conveys the functional layout of the system in order to understand the energy flows and thermodynamic boundaries. This shall include the flow of fuel and thermal energy between heating system components and the site. The number of heat exchange steps, the direction of fluid flow, the operational temperature of each loop, and net heat supplied to the building are to be shown.
- the wood pellet boiler must have a flue gas CO concentration at rated output of no more than 270 parts per million (ppm) at 7% oxygen at high load. The wood pellet boiler must have a minimum thermal efficiency of 85% at rated output using the higher heating value (HHV) of the pellet fuel if tested using an input/output method. Alternatively, a simple full load, steady state combustion efficiency measurement by the stack loss method (Canadian Standards Association B415) may be used, but in this case, the minimum efficiency requirement is 88% HHV. Additionally, the wood pellet boiler heating system must have a Particulate Matter (PM) emissions rate of no more than 0.080 lb/MMBtu.

Plan for Monitoring/Performance Tracking

The bid document shall include the design of a Data Acquisition System (DAS) and Monitoring Plan to measure and record data related to the heating system performance, including the new pellet-fired components and existing heating system's components. This DAS and Monitoring Plan:

- shall be used to support system operation evaluation and metering of delivered heat to the customer by pellets and oil or propane.
- may consist of a combination of the built-in microprocessor boiler controls and may also require installation of additional sensors and or loggers to collect the system performance data and interface with the site's boiler management system as appropriate to collect and archive the data, as determined by NYSERDA Project Manager.
- shall collect key performance data at 15-minute intervals with greater than 90% data capture through the use of sensors and loggers.
- shall include measurement of baseline thermal efficiency of the heating system operations at 100% load, 75% load, 50% load, and 30% boiler thermal load.
- shall also verify thermal storage temperatures at the top and bottom of the tank and the programming of the energy management system for optimizing these components under load conditions such as the design day heat load profile and a shoulder day heat load profile.

The data are intended to quantify load profiles, pellet and oil consumption, useful thermal outputs, response time to call for heat, compatibility with any existing energy management system and heating system parasitic loads, equipment run times, and to verify system economics. The system shall also be able to determine and report the extent to which the existing boiler is cycling and the number of hours in standby mode.

Conditions and Reservations

HMM is not obligated as a result of the submission of a bid to enter into a contract with any proposer, and has no financial obligation to any bidder arising from this Request for Bids. Furthermore, HMM reserves all rights regarding this Request for Bids, including, without limitations, the right to:

- amend, delay or cancel the Request for Bids without liability if HMM or members of the Bulk Wood Pellet Program find it is in the best interest of the program to do so. In the event it

becomes necessary to amend any part of this Request for Bids, notice will be provided in the same manner as notice of the original solicitation;
- reject any or all bids received upon finding that it is in the best interest of the program to do so;
- reject any bid that fails to comply with all prescribed portions of this Request for Bids;
- waive any minor informality or non-conformance with the provisions or procedures of the Request for Bids, and seek clarification of any bid, if required; and
- negotiate and/or amend the Scope of Work to serve the best interest of the program.

The selected contractor will be expected to sign a Memorandum of Understanding (MOU) with HMM to confirm each organization's roles and responsibilities prior to work starting.

Confidentiality Statement
HMM will maintain the confidentiality of all bids and not release them without express permission from the bidders.

Indemnification
The contractor shall indemnify, hold harmless, and defend the individuals associated with the Bulk Wood Pellet Program, Cornell Cooperative Extension, Cornell University, and their officers, employees, and agents from and against any and all claims and actions brought against such parties and its officers, employees, and agents for injury or death to any person or persons or damage to property arising out of the performance of this program work by the contractor, its employees, subcontractors or agents.

Attachments
Attached to this request for bids are the following documents:
- Heat load calculations for both WSHS and MH buildings
- Cleaner Greener Communities biomass program heating system requirements

Bidders are to submit the form on the following page with their bids:

Bid Submittal

This bid is submitted by:
If bidder is an Individual:
Name (typed or printed):
_____
Title: _____

If bidder is a business:
Bidder's business address:
_____
_____
Business phone no. (_____)_____
Business fax no. (_____)_____
Business e-mail address
_____
State Contractor License No. _____. (If applicable)
Employer's Tax ID No. _____
Phone and fax numbers, and address for receipt of official communications, if different from business contact information given above:
_____
_____

Bid submitted on _____, 20___.

Signature: _____.