# Advertisement for Bids
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# Notice of Public Meeting for Proposed Alternate Bids for Preferred Products

Sealed proposals will be received by NC State University. Attention Damian Lallathin, until 3:00 PM on 8/28/18 in conference room 101, Administrative Services III Building 2701 Sullivan Drive, Raleigh, NC 27695 and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment for the construction of:

North Carolina State University
Centennial Campus Utility Infrastructure; TES Package (Bid Package A)
SCO# 16-15945-01A
NC State# 2001620013

**PROJECT DESCRIPTION:**

This project design expands chilled water capacity with the addition of a stratified chilled water thermal energy storage tank (TES) located adjacent to Centennial Campus Central Utility Plant.

**CIVIL**

The TES site will be graded in preparation for deep foundation work and to provide a service vehicular entrance road on the north side of the tank with two 8ft wide entry gates. Additionally, a concrete perimeter service access drive/walkway will be established. A modular concrete retaining wall will be utilized from tank one-o-clock to tank six-o-clock. Storm water will sheet flow from the tank area to the west and south. A sanitary connection for TES overflow will also be provided. A short run of 20”underground ductile-iron chilled water piping will be routed from tank connections to just outside of the plant.

**ARCHITECTURAL**

The TES is a significant structure on campus, however its placement is ideal in that views are obscured from most vantage points with exception of the Partners II surface parking lot and associated access road. The tank will be clad with vertical standing seamed, insulated, metal panels. The panel pattern utilizes a stack of two to three vertical segments of varying heights and three custom colors including white and various grey tones. The tank color scheme concentrates darker on the lower portion of the tank and trends to lighter gray and white on the upper vertical segments. Tank siting and aesthetics have been approved by the Campus Design Review Panel (CDRP).

TES security is important to the project as it provides a large “canvas” for potential vandalism. Fence plus retaining wall height will be a minimum of 8 feet tall around the perimeter of the tank. Fencing will be basic chain-link type matching existing campus security fencing.

Adjacent to the site are three greenhouses which will be minimally impacted by the shade of the tank. A shading study was performed indicating that on the worst day of the year, the tank will shade on the eastern-most greenhouse less than an hour more than the existing trees. Further, shading by the tank will be solid, while the trees will provide some amount of diffuse light during the shaded periods of the day.

## STRUCTURAL

A geotechnical investigation performed by Stewart Inc. on the site soils under the TES found that the tank would settle 10" – 12" from the anticipated ~6,000 psf bearing pressure. Stewart recommended the use of aggregate piers for the support of the tank and estimated a total settlement not to exceed 2". Upon request by the University Stewart also investigated the use of a steel pile foundation and determined that estimated total settlements would be less than an inch. The University then directed RMF Engineering to move forward with the steel pile foundation option. 250 kip capacity steel H-piles were selected to be driven to refusal in the weathered rock 45' to 50' below grade. The piles have been laid out evenly under the footprint of the tank at a 6' spacing. The tops of the piles will be embedded 6" into the bottom of a three foot thick reinforced concrete pile cap on which the TES will bear. Installation and testing of all steel piles will be performed per NCDOT specifications.

## MECHANICAL SYSTEMS

Stratified Chilled Water Thermal Energy Storage Tank

TES increases the chilled water capacity on Centennial Campus without a costly plant expansion. Charging the TES during off peak periods improves utilization of existing chillers, reduces demand on the power grid, and reduces energy cost. Chilled water is then discharged during periods of highest cooling demand. The charge and discharge concept is very similar that of a rechargeable battery.

The TES will store 25,000 ton-hrs of cooling when operated at a 12 degree temperature differential (42F-54F) and hold roughly 3.5 million gallons of water. The field erected steel tank per API-650 or AWWA D-100 will charge and discharge through an octagonal piped or radial plate steel diffuser system. A stairway aligned with the tank radius will provide operator access to side-mounted temperature transmitters and roof mounted level transmitters. The tank manufacturer's package will also include an insulated metal panel system.

From a hydraulic perspective the TES will replace the current plant primary to secondary bridge / de-coupler. If the primary loop generates more flow than the secondary is consuming, the excess flow will charge the tank. If the secondary loop is consuming more than the primary is generating then the tank will discharge. Maximum design charge and discharge rate is 12,000 GPM or 6,000 tons at 12 degree temperature differential.

Controls

After the cogeneration project is completed, primary plant controls will universally reside on Honeywell PLC controllers and share a common Iconics graphics platform. This project will incorporate TES field devices and sequencing along with guidance provisions for the condensing steam turbine generator (STG) as it pertains to campus power demand reduction. Programming and graphics to monitor and track campus power demand, predict campus chilled water loads, monitor chiller efficiency trends, stage chillers, and stage the STG has been included.

## ELECTRICAL SYSTEMS

Pole mounted lighting will be provided in the TES tank area and be controlled by luminaire mounted photocells. Convenience receptacles will also be installed. The TES tank area will also receive raceway in preparation for security camera monitoring. Lightning protection is also included.

Bids will be received for **single prime bid** contracts. All Proposals will be lump sum.

**The following General Contractors have been pre-qualified to bid this job**:

- Caldwell Tanks, Inc.....Louisville , KY
- CB&I LLC..... .....The Woodlands,TX
- The Christman Co..... .....Greensboro, NC
- Flintco LLC/Alberici Constructors .....Houston, TX
- Greenland Enterprises, Inc.....Hampton, VA
- Mid-Atlantic Infrastructure Systems..... .Winston-Salem, NC
- TA Loving.....Goldsboro, NC

Bid documents are available for examination in the plan rooms:

1. iSQFT; http://www.isqft.com/start/ handles Associated General Contractors plan room.
2. The local North Carolina offices of Dodge Data and Analytics;
3. The Eastern Regional Offices of CMD Group in Norcross, GA;
4. The offices of the Designer: RMF Engineering, Raleigh NC.
5. The North Carolina Institute of Minority Economic Development, Inc. (NCIMED) Plan and Resource Center at 114 W. Parrish St., 6th Floor, Durham, NC; 919-956-8889 or 919-287-3036
6. The Hispanic Contractors Association of the Carolinas (HCAC) in Winston-Salem, Charlotte and Raleigh Areas – 877-227-1680;

Complete plans and specifications for this project in electronic format can be obtained from RMF Engineering during normal office hours after 8/1/18. Email requests for the electronic documents may be sent to jonathan.eveleth@rmf.com. Full printed copies may be obtained by those qualified as prime bidders, upon deposit of two hundred dollars ($200) in cash or certified check with a minimum of 48 hours' notice to jonathan.eveleth@rmf.com. The full plan deposit will be returned to those bidders provided all documents are returned in BOUND, good, usable condition within ten (10) days after the bid date.

Partial or full printed copies of the project documents may be purchased from Arc Document Solutions. Phone number for ordering is 919-388-9902. Documents may also be purchased from Document Imaging Systems, Inc.at 231 East Johnson Street, Units E, F, &G, Cary, NC 27513. Phone number for ordering is 919-460-9440.

The State reserves the unqualified right to reject any and all proposals.

North Carolina State University has an affirmative policy of fostering, promoting and conducting business with minority owned enterprises. Minority contractors are encouraged to participate in the bidding process.

The bidder must include completed minority business subcontractor documentation form(s) with their proposal or the bid may be considered non-responsive and invalid.

**Pre-Bid Meeting**

A Pre-bid meeting and site visit will be held for all interested bidders on 8/9/18 at 2:00 p.m. in Room 101 of Administrative Services III Building at 2701 Sullivan Drive, Raleigh, NC 27695. **ATTENDANCE AT THE PRE-BID MEETING IS MANDATORY.** The meeting will address project specific questions and provide an opportunity for bidders to assess the project's existing conditions.

**Notice of Public Meeting for Proposed Alternate Bids for Preferred Products.**

An open public meeting will be held on 8/9/18 at 3:30 pm in Room 101 of Administrative Services III Building at 2701 Sullivan Drive, Raleigh, NC 27695. The meeting is to identify preferred brand alternates and their performance standards pertinent to this project.

In accordance with GS133-3, Section 64. (C) and State Construction Office procedures the following preferred brand items are being considered as Alternates by the owner for this project:

- AC Technical Services – Controls
- Flexim – CHW Flow Meter

A copy of pertinent sections of the performance standards may be obtained by contacting the designer at the address or phone number noted above.

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