



SCOPE OF SERVICES

Solicitation Number: CLMP160

Project Name: Domain District Cooling Plant and Cooling Tower Improvements

PROJECT FOR:

CITY OF AUSTIN, AUSTIN ENERGY, THROUGH ITS CONTRACT MANAGEMENT DEPARTMENT

PROJECT TITLE:

Domain District Cooling Plant and Cooling Tower Improvements

OBJECTIVES OF THE PROJECT:

The City of Austin seeks a qualified firm to provide engineering services for the Domain District Cooling Plant and Cooling Tower Improvements project. The project objective is the decommissioning of the existing cooling towers, associated infrastructure, and appurtenances and replacement with safer, more efficient facilities. Plant operations must not be negatively impacted during any phase of the cooling tower replacement project. The selected firm shall plan for and integrate into the construction sequencing, measures to ensure uninterrupted chilled water operations during the replacement of the towers.

BACKGROUND:

The Austin Energy Domain District Cooling Plant is located at 3120 Kramer Lane, Austin, TX 78758 on the east side of the Domain development in an area that is largely populated with businesses, retail and housing. The plant operates 24 hour a day, 7 days a week. It was originally constructed in the 1980s as an integral part of the IBM campus.

The City of Austin and Austin Energy acquired the plant in 2001 and now utilize the plant as a district chilled water system that serves businesses and residents in the Domain District. Austin Energy distributes chilled water from its plant to individual buildings via a network of underground pipes and heat exchangers within the customer's mechanical rooms. The plant produces chilled water with seven water-cooled centrifugal chillers. Primary chilled water flow is accomplished with horizontal chilled water pumps with variable speed drives (VSDs).

A 2.4 million gallon concrete thermal energy storage (TES) tank was recently completed to provide 24,000 ton-hours of chilled water storage. The tank allows shifting a major portion of the electrical load from on-peak to off-peak. Secondary chilled water flow is accomplished with horizontal pumps with variable speed drives (VSDs).

Heat from the plant is rejected with two cooling tower banks. The two banks and associated condenser water components will be removed and replaced under this project.

ANTICIPATED SERVICES:

The selected firm will provide engineering and professional services for preliminary design, design, bid/award, construction, and warranty phases of the cooling tower replacement. The selected firm will develop options and make recommendations as to specific replacements, modifications and/or improvements to the existing facilities to achieve said objectives. Designed improvements shall address the hydraulic, mechanical, civil, structural, electrical/instrumentation & controls, and environmental aspects of the facility. The Firm will develop renderings and other visual aids to communicate the tower aesthetics to Domain property owners and stakeholders who will approve the final visual design.

The selected firm will have demonstrated experience with Fiberglass Cooling Towers. The tower design is elevated and exposed to different stresses than a ground mounted or building mounted system. The static and dynamic loads in this type of configuration will require careful consideration. These towers will have wind forces, vibration, varying live loads from fluid dynamics – both in standard operation, and when individual cells are isolated for maintenance. Fiberglass towers react differently from wood, concrete, or steel towers. The design shall incorporate these requirements.

The following is intended as a guide to the general nature of services that shall be provided; it is not an exhaustive list:

- **COST ESTIMATION:** Cost breakdown of each major element and comparison costs between Wood, Fiberglass, and Steel.
- **LIFE CYCLE COST EVALUATION:** Include comparison of Variable Frequency Drives, material types, tower design, pump selection, filter systems, etc.
- **SUBSURFACE UTILITY INSPECTION:** Plant site may have underground pipes that are not identified.
- **SITE PLAN:** Site grading and plant road for lifting components to tower roof.
- **ACOUSTIC ANALYSIS:** System shall not increase noise levels at property line.
- **AESTHETIC ANALYSIS:** Tower Design shall be approved by adjacent property owners.
- **STRUCTURAL AND VIBRATION ANALYSIS:** Elevated tower system shall have design life of 50-70 years.
- **CONSTRUCTION WORK PLAN TO ENSURE ZERO COOLING WATER OUTAGE TO SYSTEM:** Delivery of chilled water shall be maintained with no outages. Temporary cooling towers may be required as part of design.
- **CONSTRUCTION OVERSIGHT:** Including inspection and plant commissioning.

PRELIMINARY ENGINEERING

- Research, compare and evaluate alternative solutions and cooling tower technologies based on AE business goals of providing reliable chilled water service, safety, maintainability, efficiency, and cost performance.

- Obtain and review available data regarding the cooling tower site, the utility plant condenser and chilled water systems, electrical service, and other contributing project factors.
- Perform surveys for existing as-built conditions, topography, sub-surface utilities, and geotechnical conditions.
- Investigate and evaluate alternative cooling tower equipment general arrangements, materials of construction, condenser water pumping and tower sump design options, and constructability methods.
- Determine methods for safely and reliably demolishing existing cooling towers and associated equipment.
- Assess Federal, State and Local compliance requirements and prepare permit applications
- Prepare cost estimates and construction sequencing and schedules
- Prepare conceptual architectural renderings and other visual aids as needed for public involvement process

Deliverables:

1. Preliminary engineering report documenting survey findings, the various cooling tower options and costs, cooling tower general arrangements, preliminary pumping and piping plans, cooling tower basin plan, a final cooling tower arrangement and construction material recommendation,
2. Surveys for existing as-built conditions, topography, sub-surface utilities, and geotechnical conditions,
3. Architectural renderings and public involvement aids,
4. Permit requirements,
5. Weekly updates of design schedule and design costs to date.

DESIGN AND BID PHASE SERVICE

Following the preliminary engineering phase and approval of the preliminary engineering report, the selected firm will perform detailed design and preparation of documents required to bid the construction phase services. The design will consist of 30%, 60% and 90% completion incorporating City of Austin and Austin Energy Standards. At each of the milestones, the plans, specifications and calculations (if requested) shall be submitted to the City for review followed by a project review meeting.

Design elements shall include concrete drive and/or pavement to allow forklift access to new condenser water pumps, provide ground level and tower walkways, boom lift on tower fan deck, lightning protection system, fan deck lighting system and new fencing. Project shall be designed to be consistent with surrounding development aesthetics. Engineer will participate in public involvement process. Aesthetics of design will be vetted through all

stake holders. Design shall ensure decibel levels are below 70dB at property line or as agreed to by adjacent property stakeholders.

The selected firm shall prepare an estimate of probable construction cost at the 60%, 90% and 100% phase. The selected firm shall also be responsible for preparing all documents required for applicable Federal, State and Local permits and be responsible for permitting of improvements. The selected engineer shall provide bid phase services including the issuance of any addendums, participation in pre-bid conference, preparation of responses to questions from contractors, and work with the City's team to evaluate bids received and recommend the construction contract award.

Deliverables:

1. Detailed engineering documents sealed by a Professional Engineer licensed in the State of Texas. Engineering documents shall be delivered for City review at the 30%, 60%, 90%, and 100% stages of completion.
2. Associated services required for the bidding and construction of the cooling tower improvements.
3. Project schedules.
4. Opinion of probable construction cost beginning at 60% and greater stages.
5. Permit applications and utility coordination documents (if required).
6. Bid phase addenda's and response to questions.
7. Monthly updates of design schedule and design costs to date.

DEMOLITION AND CONSTRUCTION PHASE SERVICES

The selected firm shall provide construction phase services for each construction phase detailed below, which will include having an on-site representative at the construction site to monitor contractors performance during demolition and construction. Engineer shall review submittals and requests for information, review change orders, approve field design changes, attend weekly construction meetings, and make periodic site investigations to ensure project is constructed in accordance with engineer's design. Prepare as-built drawings for civil, mechanical and electrical drawings.

Deliverables

1. Approved submittals, requests for information, change orders and design changes.
2. As built drawings.
3. Inspection reports.
4. Weekly updates of design schedule and design costs to date.

Construction Phase 1: Demo West Cooling Tower

This work is anticipated to be scheduled in the order below:

- Isolate west cooling tower basin from east cooling tower basin.

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- Demo entire cooling tower structure including internal and external components such as five fans, fan shrouds, fan motors, fan gearboxes, valves, conduit (PVC and rigid), cables, instrumentation, lighting fixtures, stairs, ladder, hardware, fire protection system, fire protection shack, etc.
 - Demo the concrete basin and remove all contents of basin.
 - Demo above ground and below ground piping.
 - Demo the five motor-starters (located inside plant) for cooling tower fans.
 - Demo power and control conduit and conductors from breakers to starters and from starters to fans.

Construction Phase 2: Installation and Commissioning of the New Cooling Tower, Condenser Water Pumps and Piping

This work is anticipated to be scheduled in the order below:

- Install and commission new 15,000 ton, 5 cell, FM approved, cooling tower constructed from approved materials (fiberglass preferred) including but not limited to: tower structure, tower fans, gearboxes, motors, variable frequency drives, FRP condenser water piping, pumps, motors, sand filter system, lightning protection system, area lighting, and chemical storage area (meeting COA Fire code). The COA Fire Code may be accessed at the following link:
<http://www.austintexas.gov/department/firebuilding-code>
Furthermore, in the process of adopting the 2012 edition of the International Fire Code, the City of Austin adopted numerous local amendments to address concerns that were considered specific to the City which may be applicable to this project and should be considered within the construction phase.
- Install hard surface route to allow servicing of new tower and condenser water pumps with forklift, personnel lift and crane.
- Put new tower, piping and pumps in service by tying into existing condenser water piping and isolating old condenser water pumps.
- Install metal fence of the same style and design as the existing grey metal fence to surround the remaining outside property line.

Construction Phase 3: Demo East Cooling Tower, Original Condenser Water Pumps and Piping

This work is anticipated to be scheduled in the order below:

- Demo entire cooling tower structure including internal and external components such as fans, fan shrouds, fan motors, fan gearboxes, valves, conduit, cables, instrumentation, lighting fixtures, stairs, ladder, hardware, fire protection system, fire protection shack, etc.
- Demo the concrete basin and remove all contents of basin.

- Demo above ground and below ground piping.
- Demo the five motor-starters (located inside plant) for cooling tower fans.
- Demo power and control conduit and conductors from breakers to starters and from starters to fans.
- Demo Sand Filter including pump, motor, conduit and piping.
- Install new architectural grade fence to match existing.

WARRANTY PHASE SERVICES

Provide support to the City on an as needed basis to evaluate and make engineering recommendations regarding warranty issues related to the improvements.

PROPOSED SCHEDULE:

- Submit written questions to authorized contact person for this RFQ by July 31, 2014.
- Council selection of recommended firm November 2014.
- Contract execution by December 15, 2014
- Project design services shall start no later than January 2015 and completed design by June 2015.
- Bid/Award for Construction shall start no later than July 2015.
- Construction shall start in January 2016 for ordering long lead items.
- On-Site Construction is to start in November 2016 and substantially complete March 2017.
- Final completion of project, June 2017.

ENGINEERING COST ESTIMATE:

\$400,000 - \$700,000

MAJOR AND OTHER SCOPES OF WORK:

Below is a list of the major scopes of work that the City has identified for this project. ****There must be representation for all major scopes of work listed in the prime's statement of qualifications. The experience of the firms listed to perform the Major Scopes of Work, whether a subconsultant or prime firm, will be evaluated under Consideration Item 6 – Major Scopes of Work – Comparable Project Experience.*** In addition, the City has identified Other Scopes of work that MAY materialize during the course of the project. The City does not guarantee that the scopes listed under Other Scopes of work will materialize on this contract. If the prime consultant intends to enter into a subconsulting agreement on a scope of work not listed below, the prime consultant is required to contact SMBR and request an updated availability list of certified firms in each of the scopes of work for which the prime consultant intends to utilize a subconsultant.

*** Major Scopes of Work**

Civil Engineering
Cost Estimator
Electrical Engineering
Geotechnical Engineering
Mechanical Engineering
Structural Engineering
Surveying

OTHER SCOPES OF WORK

Public Involvement
Plant Commissioning

NOTES:

- Participation at the prime or subconsultant level may create a conflict of interest and thus necessitate exclusion from any contracts resulting from the work performed in the design phase.
- If the City determines that a conflict of interest exists at the prime or subconsultant level, the City reserves the right to replace/remove the prime or instruct the prime consultant to remove the subconsultant with the conflict of interest and to instruct the prime consultant to seek a post-award change to the prime consultant's compliance plan as described in City Code § 2-9B-23. Such substitutions will be dealt with on a case-by-case basis and will be considered for approval by Small and Minority Business Resources (SMBR) in the usual course of business. The City's decision to remove a prime or subconsultant because of a conflict of interest shall be final.
- Construction Inspection and Public Information and Communications are a sub-consultant opportunity. These services will be performed under this contract.
- A consultant performance evaluation will be performed on all professional services contracts. This evaluation will be conducted at the end of each Preliminary, Design and Construction phase.