

Alternative Procurement: Owner-Furnished Equipment

Craig Riddle

A local municipality contracted with AECOM to perform a plant upgrade on its wastewater treatment facility. Existing average daily flow of the facility was 3 million gallons per day (MGD). The municipality desired to upgrade the capacity to handle an average daily flow of 4 MGD. The upgrade included:

- ◆ Addition of a new headworks building with grit, screening, and flow measurement equipment.
- ◆ Installation of new influent pumps and motors.
- ◆ Modification of existing sludge lagoons to permit flow equalization and storage.
- ◆ Installation of a tertiary disc filter and septage handling system.
- ◆ Installation of two standby emergency generators.

In discussions with the municipality, overall project cost was a very significant factor. During a traditional design-bid-build

project, a contractor will purchase all equipment and items necessary to meet the requirements of the contract documents. Typically, the contractor will mark up each piece of equipment 10 to 20 percent. After comparing available funding to anticipated construction costs, the municipality requested that AECOM assist in procuring the major pieces of equipment directly in order to avoid these contractor mark-ups.

Discussion

In order to meet the needs of the client, AECOM had to first identify the pieces of equipment that could be purchased directly. It was decided that all minor or ancillary equipment should be provided by the contractor because the cost benefit would not outweigh the potential complexities and difficulties caused by owner procurement. The following 10 types of major equipment were procured by the

Craig Riddle, P.E., is an associate with the Roanoke, Virginia, office of the engineering firm AECOM Water. This article was presented as a technical paper at the 2009 South Carolina Environmental Conference.

owner for this project:

- ◆ Influent Pumps and Motors
- ◆ Influent Pump/Motor Shafts
- ◆ High-Pressure Non-Potable Water Pump
- ◆ Headworks Bar Screen Equipment
- ◆ Headworks Grit Equipment
- ◆ Equalization Lagoon Aerators
- ◆ Tertiary Disc Filter
- ◆ Septage Handling System
- ◆ Forklift Truck
- ◆ Two Emergency Standby Generators

Some of these pieces of equipment re-

Continued on page 18

Continued from page 17

placed existing units, while others were necessary for new structures and facilities being constructed as part of the upgrade.

In conjunction with the owner, AECOM utilized a three-phased approach to procure the equipment. The first phase was to publicly advertise the project and request that interested equipment suppliers/manufacturers submit formal “expressions of interest” to provide the equipment for the project. Contract documents were made available at area plan rooms during this phase, and copies could be purchased by interested equipment suppliers for a nominal fee.

The engineer responded to multiple requests for information during this phase. Once all “expressions of interest” were received, the engineering firm reviewed each manufacturer’s submitted documents to ensure that suppliers were qualified to provide the specified equipment. It was important during this process to contact several manufacturers to ensure that they understood the entirety of the contract requirements and were capable of supplying the equipment as specified.

The next phase was to issue formal “requests for firm price quotations” to qualified equipment suppliers. Once all the firm quotations were received, the engineer then evaluated the quotations for each piece of equipment to ensure all the requirements of

the contract documents were met or exceeded. Multiple quotations required revisions based on deficiencies, or particular misinterpretations of the contract documents. In each case, the engineer contacted the equipment supplier, and acquired a revised firm quotation.

The final phase was to actually select equipment suppliers and procure the equipment. The engineer compiled and tabulated all the information received from the suppliers in order for the owner to make selections. In addition to price, factors such as extended warranties and certain desirable features (identified in “request for firm price quotation” solicitations) were considered in the selection process.

Here is a detailed summary of the services provided by the engineer during the entire process:

- ◆ Identified on the construction documents the equipment to be owner-furnished.
- ◆ Prepared and issued a public advertisement requesting “expressions of interest” from equipment suppliers/manufacturers to provide the owner-furnished equipment.
- ◆ Responded to questions from equipment suppliers/manufacturers, contractors, and plan rooms.
- ◆ Received and reviewed the “expressions of interest.”

- ◆ Prepared and issued “requests for firm quotations” to the valid equipment suppliers/manufacturers.
- ◆ Received and evaluated the firm quotations. Coordinated with equipment suppliers/manufacturers to ensure firm quotations were responsible.
- ◆ Compiled the firm quotations and advised the owner of the equipment suppliers/manufacturers offering the lowest responsible firm quotations.
- ◆ Reviewed recommendations with the owner.
- ◆ Assisted the owner in the procurement of equipment.
- ◆ Provided construction-phase services (submittal review, coordination, etc.).

As with any process or approach, there are advantages and disadvantages inherent to each particular methodology. An owner should thoroughly understand these pros and cons before selecting any alternative to traditional design-bid-build (i.e., be careful before you leap into the unknown).

Some of the potential advantages of owner procurement over traditional design-bid-build are:

- ◆ Cost Competitiveness
- ◆ Direct Contact with Equipment Suppliers/Manufacturers (Better Conflict Resolution)

- ◆ More Control over Equipment Selection
- ◆ More Control During Construction
- ◆ Accelerated Delivery Prior to Construction (Must Account for Storage)

The owner realized a modest cost savings utilizing this procurement method. Total project cost for the upgrade was \$3.5 million dollars. Cost for the equipment purchased by the owner was approximately \$1.0 million. Assuming a contractor mark-up of 10 to 20 percent, the owner saved \$100,000-200,000 on the equipment purchase itself. Discounting the \$25,000 paid for engineering services provided, the net savings to the owner was \$75,000-175,000, or 2 to 5 percent of the total project cost.

Some of the potential disadvantages of owner procurement over traditional design-bid-build are:

- ◆ Extensive Coordination Required
- ◆ Increased Complexity of the Construction Process
- ◆ Construction Delays without Owner Compensation
- ◆ Accountability/Responsibility (Rests with Whom?)

In terms of complexity, a traditional design-bid-build project generally follows a linear communication protocol where the owner and the design professional (engineer/architect) will communicate and coordinate, and the design professional and the construction professional (contractor) will communicate as required. Occasionally, communication and coordination between all three parties together will be necessary.

During this project, multiple issues required a more complex communication and coordination pattern among the design professional, the construction professional, and the equipment supplier/manufacturer. Once a potential solution was reached, this had to be forwarded by the design professional to the owner for review. Owner comments and desires then sometimes necessitated additional coordination among some or all of the concerned parties before an effective resolution could be reached.

Equipment coordination was reasonably significant regarding the influent pumping system during this project. The pump manufacturer and supplier, the intermediate drive shaft manufacturer, and the engineer were in regular contact with each other over a period of several weeks to ensure that system components were compatible and fabricated properly. Some of the required coordination included:

- ◆ Performing precise dimensional analysis to ensure that shafts mated properly with pumps and motors and were segmented as required for stabilizing bearings.
- ◆ Ensuring that fittings on shafts were compatible with pumps and motors.

Continued on page 20

Continued from page 19

- ◆ Ensuring that shaft material was adequate to sustain forces produced by motors at all speeds.

Additionally, installation coordination was required among the contractor and all the indicated parties to ensure that the system functioned as specified in the project documents.

Conclusions

This project involved considerable additional effort for both the engineer and the owner (as opposed to traditional design-bid-build) to ensure that utilizing owner-furnished equipment procurement was beneficial. An owner must understand and be responsible for the following tasks in order to achieve the goal of success:

- ◆ Review quotations and procure equipment (engineer services).
- ◆ Receive delivery of equipment and provide temporary storage.
- ◆ Procure insurance for equipment.
- ◆ Purchase extended warranties for equipment.
- ◆ Receive and ensure that equipment submittals comply with project documents (engineer services).
- ◆ Ensure that equipment painting, electrical work, and start-up services comply with project documents (engineer services).

The engineer learned many valuable lessons, and made some critical observations during this project. The most important of these were:

- ◆ Owner-furnished equipment can result in cost savings.
- ◆ Additional complexity and effort (owner/engineer) must be anticipated and understood by all parties.
- ◆ Communication among all parties is more important than ever.
- ◆ It is essential to complete the procurement process prior to the project bidding phase.

In order to determine whether a municipality will benefit from this procurement method, it is important to assess the capabilities of staff members. A staff must have a reasonable technical background in order to anticipate and resolve issues that arise. Effective communication is essential because the additional parties and coordination required.

A municipality should perform an honest, thorough assessment to ensure that the cumulative experience and background of its staff is sufficient to address the challenges and difficulties inherent with this method of procurement. Before proceeding, the municipality should perform a risk-versus-benefit analysis and ensure that all stakeholders (i.e., governmental officials, facility staff, legal counsel, the public, etc.) are comfortable with the process and feel confident that a net benefit will be achieved. ◊