
Bear Creek Water Treatment Plant – High Service Pumping Station

Jackson County Pump No. 8 – Variable Frequency Drive Conversion

Background

Bear Creek Water Treatment Plant (BCWTP) delivers potable water to Barrow/Oconee Counties and Jackson County through dedicated high service pumps. The high service pumping station houses six pumps. One set of three pumps is dedicated to the Barrow/Oconee County Service Area, and one set of three pumps is dedicated to the Jackson County Service Area. The pump discharge pipe from each set of pumps consists of a 16-inch diameter pipe that is not interconnected.

The design capacities of the high service pumps are as follows:

- Barrow/Oconee County Service Area:
 - Pump Nos. 1, 2, and 3
 - Flow = 4200 gpm
 - TDH = 420 feet
 - Pump No. 1 and Pump No. 2 - variable frequency drive
 - Pump No. 3 - constant speed
- Jackson County Service Area
 - Pump Nos. 6, 7, and 8
 - Flow = 3200 gpm
 - TDH = 470 feet
 - Pump No. 6 and Pump No. 7 – variable frequency drive
 - Pump No. 8 – constant speed

Following a recent review and discussion of interconnection between the Barrow/Oconee County and the Jackson County high service pump discharge pipes, the Jackson County Water Authority contacted the Upper Oconee Basin Water Authority (UOBWA) regarding possible modifications to High Service Pump No.8 so as to change the pump drive from a constant speed to a variable frequency drive. This modification would allow greater control over the discharge flow and head conditions when this pump is utilized.

As a result, the UOBWA has requested Jacobs prepare a proposal to provide an evaluation of such a modification, design of any related modifications, preparation of bid documents, evaluation of bids, and construction contract administration services.

Task 1 – Preliminary Engineering

This task will consist of identifying the modifications required to convert the operation of Pump No. 8 from constant speed to variable frequency drive (VFD). The evaluation will investigate the equipment needed to support the change in operation that includes pump motor, motor control panel and electrical equipment. Jacobs will examine the current electrical panels and motor controls to determine the available space to support the installation of a new VFD and associated equipment.

Task 1 - Deliverable

A Preliminary Engineering Report (PER) will be prepared from the information gathered in Task 1. The report will include the following information:

1. Pump Motor Modifications
2. VFD characteristics

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3. Electrical Modifications
 4. Conceptual layout of VFD and electrical equipment for Pump No. 8
 5. Opinion of Probable Construction Cost

The information provided in this PER will be used to prepare design drawings and specifications described in Task 2. The draft PER will be submitted to the UOBWA for review. Jacobs will meet with UOBWA personnel to review the draft PER, update, and submit a final PER following receipt of review comments.

Task 1 – Meetings

Jacobs will conduct one site visit to the High Service Pump Station to examine current configuration, space availability and wiring. PER review meeting will be held with UOBWA personnel.

Task 1 - Schedule

The site visit will be conducted within five days following receipt of notice to proceed.

Jacobs will submit the draft PER to the UOBWA for review within four weeks of receipt of a notice to proceed. The final PER will be submitted within two weeks of receiving review comments from UOBWA personnel.

Task 2 – Final Design

Upon completion of Task 1 and with concurrence of UOBWA and Jackson County, Jacobs will prepare drawings and specifications to detail the necessary modifications for operation of Pump No. 8 with VFD.

Task 2 - Deliverable

Drawings and specifications will be submitted to the UOBWA for review and comment at the 95- percent design level. This submission will include an updated Opinion of Probable Construction Cost.

Final drawings, specifications and Opinion of Probable Construction Cost will be submitted to the UOBWA personnel following receipt of comments from 95-percent review.

Task 2 - Meetings

Design review meetings will be held with UOBWA personnel at the 95-percent design phase.

Task 2 - Schedule

Jacobs will complete Task 2 within eight weeks following the completion of Task 1.

Task 3 - Bid Phase/Construction Administration

Task 3A - Bid Phase

Jacobs will provide bid phase services including:

- Prepare Invitation to Bid for use in legal advertisement of the project. The UOBWA will publish the bid advertisement.
 - Distribute courtesy copies of Invitation to Bid to plan rooms and potential bidders.
 - Distribute contract documents to interested contractors, suppliers, and plan rooms and maintain a plan holders list.
 - Conduct a pre-bid meeting and site visit to discuss project with interested Bidders.
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- Respond to questions from Bidders.
 - Prepare and issue one addendum if necessary.
 - Attend one bid opening.
 - Evaluate bids received including preparation of the tabulation of bids.
 - Provide a recommendation to UOBWA for award.
 - Prepare notice of award (NOA) letter for UOBWA's use.

Task 3B - Construction Administration

Jacobs will provide construction administration and observation services including:

- Conform contract documents to incorporate one addendum, if required, and provide UOBWA one full-size hardcopy of the conformed contract documents.
- Prepare conformed documents and transmit up to five full-size hard-copy sets to the contractor.
- Review insurance certificates and bonds.
- Conduct and prepare minutes of pre-construction conference.
- Prepare notice to proceed (NTP) letter for UOBWA's use.
- Review shop drawings.
- Conduct and provide minutes of monthly construction progress meetings during active on-site construction period with Contractor(s) and UOBWA.
- Review work for conformance with contract documents.
- Perform limited construction observation of work on a weekly basis (up to 24 hours total per week) to assess progress, confirm general conformance with the contract documents and note any observed construction issues. For basis of estimating, it is planned that the monthly construction progress meeting will occur while the RPR is on site.
- Respond to contractor's requests for information.
- Review monthly Contractor pay requests; make recommendations for payment.
- Review the requirements for and prepare necessary change orders.
- Perform pre-final and final inspections.
- Provide assistance during start-up and training of equipment.
- Prepare Record Drawings based on the contractors' markups of drawings.
- Close out of project.

Assumptions

1. All meetings will be coordinated by and held at UOBWA facilities.
2. UOBWA will provide Jacobs staff with access to the site and all relevant locations and equipment for the purpose of documenting existing conditions and preparing design documents.
3. UOBWA will review documents provided to them in a timely manner and provide review comments in a single, coordinated response.
4. Review documents will be provided to the UOBWA in electronic PDF format.
5. Final documents will be provided to the UOBWA in one hard-copy set and one electronic PDF format set.
6. No field survey services are required for this scope of work.
7. No geotechnical services are required for this scope of work.
8. No permitting services are required for this scope of work.
9. Wetlands delineation, ACOE jurisdictional determinations, or associated permits are not necessary for the project.
10. No land disturbance permitting assistance is required for this scope of work.
11. Permit application fees shall be paid by the UOBWA.
12. Project drawings will be prepared using AutoCAD 2010 and will be 22 by 34 inches.

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13. Bidding and Contractual documents shall be prepared using Jacobs' standard front-end documents.
 14. Technical Specifications shall be prepared using Jacobs' standard technical specifications (2012 CSI- Divisions 1 to 46).
 15. The project construction documents will be based on lump sum pricing with minor unit price items used to determine upfront pricing for additional work requested by the UOBWA for unforeseen conditions.
 16. For all Bid Phase and related services, Jacobs shall be appointed as the UOBWA's agent for the limited purpose of performing any bid or procurement services under the contract and shall have no liability associated with the services procured by on the UOBWA's behalf. Such services shall be performed under the UOBWA's direction and in accordance to such forms, terms and conditions, or modifications or revisions to same as the UOBWA may in its sole discretion at any time instruct Jacobs to use. All services shall be carried out in accordance with the procedures mutually agreed upon by the UOBWA and Jacobs.
 17. Construction Contract Time will include a five-month administrative period, followed by a two-month period of on-site construction activity.
 18. Shop drawing review scope of services is based upon one initial review for comments and one follow up review to confirm correction of any issues. Multiple reviews beyond these limits required due to Contractor's errors, oversight or proposed alternatives are outside this scope of work.
 19. Construction Observation budget is based on a total of up to 24 hours per week of observation services during a two-month period of on-site construction activity.
 20. For all Construction Administration Phase and related services, where Jacobs is called upon to observe the work of the Construction Contractor(s) for the detection of defects or deficiencies in such work, Jacobs will not bear any responsibility or liability for such defects or deficiencies or for the failure to so detect. Jacobs shall not have control over or charge of and shall not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the work of each of the Contractors since these are solely the Contractor's responsibility under contract for construction between the UOBWA and Contractor.

Compensation

The fee for performing this Scope of Services is a not-to-exceed amount of \$86,810.

Upper Oconee Basin Water Authority
Task Order No. xx
Jackson County Pump No. 8 - VFD Conversion
Jacobs Engineering Group Inc.
Staff Hours Work Breakdown Structure

	Budgeted Staff Hours										Project Budget			
Staff/Category	John Scioscia	Richard Lawrence	Tom Middlebrooks	Elias Mageas	Larry Taylor	Diana Jackson	Jude Abella	Philip Argo	Terra Kroger-Dubin	Total Hours	Labor	Direct Costs	Not To Exceed Total	
Tasks														
1 - Preliminary Engineering	56	2	72	2	16	4	8	0	0	160	\$28,106.00	\$200.00	\$28,306.00	
2 - Final Design Phase	12	8	40	1	40	0	8	0	0	109	\$17,704.00	\$0.00	\$17,704.00	
3A - Bid Phase	7	0	10	0	2	0	0	0	12	31	\$4,342.00	\$1,000.00	\$5,342.00	
3B - Construction Phase	19	0	38	0	24	0	0	200	0	281	\$34,958.00	\$500.00	\$35,458.00	
Totals	94	10	160	3	82	4	16	200	12	581	\$85,110.00	\$1,700.00	\$86,810.00	