



Hazen and Sawyer
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October 23, 2017

Danny Briggs, EI
Senior Civil Project Engineer, Department of Water Resources
City of Greensboro
2602 S. Elm-Eugene St.
Greensboro, NC 27406

Re: Scope and Fee Proposal for Construction Management and RPR Services for the BNR Upgrade Project - Package 4

Dear Mr. Briggs:

Hazen and Sawyer is pleased to submit the enclosed proposal to provide Construction Management and Resident Project Representative Services as described below for the TZ Osborne WRF BNR Upgrade Project - Package 4.

The scope of the single prime contract will be to install six (6) new BNR aeration basins, modifications to the existing twelve (12) aeration basins to convert to BNR, installation of a new parallel air header pipe among other items.

The following major tasks are anticipated as part of this project:

1. Construction Management Office Services
2. Construction Field Services
3. BNR Startup and Operational Support
4. Plant O&M Revision and SOP Technical Support
5. Plant LOTO and Arc Flash Studies
6. Additional Services Reserve

1. Construction Office Services

Construction Phase services will include the Office services as described below.

Construction Clarification, Work Changes and Claims: Hazen and Sawyer will review, in partnership with the City of Greensboro, all questions requested by the General Contractor (RFI's) and all construction related claims resulting from the work as required by the General Conditions. Hazen will prepare Work Change Directives and Change Orders documentation when necessary.

Shop Drawings and Submittals: Hazen expects to review administrative submittals including the baseline progress schedule, shop drawing schedule, schedule of values, monthly progress schedule updates, and monthly progress payment along with all technical specification submittals throughout the project.

Meetings: Hazen will organize, prepare agendas, record meeting minutes and conduct progress meetings from the pre-construction meeting to the end of the 36 month project. Meetings will also include onsite

Contractor coordination meetings and operations meetings as required by the City. For budgetary purposes a total of 72 meetings are anticipated.

Construction Materials Testing: Hazen excludes all third party construction materials testing required from this contract but is expected to work with the City's selected testing agency for coordination when needed. Hazen will aid in selection and review of scope for this contract if desired by the City.

Startup and Testing of Equipment: Hazen will provide technical support during startup and testing of all equipment associated with the project. Hazen will also provide support and coordination with CITI to program and commission all SCADA required and will review new screens for the proposed BNR Upgrade. This cost will be included in the lump sum office services.

Record Drawings: Hazen will prepare record drawings for Hazen's design scope and coordinate with the General Contractor to provide a comprehensive document for the project.

Miscellaneous Project Management Items: Along with other project management items discussed in previous items, Hazen and Sawyer will prepare a monthly update to include ongoing progress, relevant monthly updates, status of project contingency, status of partial progress payments among other items as they relate to the progress of the project.

2. Construction Field Services

Inspection Services: Hazen will provide full-time inspection services for the Package 4 work as detailed below:

Field Inspection Services are intended to be billed by the hour at a negotiated rate with a not to exceed ceiling.

- The Construction Manager's role will be to work with the Contractor's management staff to answer field questions, construction clarifications, etc. and be the support to coordinate activities between the Contractor and the Owner.
- The Resident Project Engineer (RPR), expected to be Mark Armand, will spend full time 40 hours per week on average for 36 months and bill at the Senior RPR rate in Table 2. His role will be to provide supervision of the onsite field team and work directly with the Contractor's field staff.
- James Houk will serve as the field inspector and will be responsible for observing the work ensuring quality control during construction working directly with the Construction Manager, Senior RPR and field representative from Crittek Engineering. Mr. Houk's time will be split in the first 9 months between the CMAR project and Package 4. At the completion of the CMAR, he will be expected to work full time on Package 4 through completion. The field inspector will bill to the lower RPR rate in Table 2.
- In the event Hazen decides to hire an intern during the duration of the project, they will be charged at the technician rate in Package 2.
- Crittek Engineering is a minority subconsultant to Hazen and Sawyer and will provide 40 hours per week of inspection for 36 months on Package 4.

Hazen

3. BNR Startup and Operational Support

Hazen and Sawyer proposes to provide a total of 9 training sessions throughout the duration of the project in preparation of the BNR upgrade. Training topics will rely on the desired topics of staff but are proposed to be based on BNR theory, operation, lab and monitoring techniques.

Hazen also proposes to provide full-time 40 hour/week operational support for the first three (3) months of operation as needed or the equivalent thereof. We have also provided cost to provide consultation for additional three (3) months on an on-call basis as requested by the City.

4. Plant O&M Revisions and SOP Technical Support

As requested by plant staff, the scope includes support to address and write technical standard operating procedures for both new and existing operating equipment as needed. We will also revise the Plant O&M to reflect the changes to the BNR project upgrade and review the remainder of the document to provide an updated comprehensive manual.

5. Plant Comprehensive LOTO and Arc Flash Study

As requested, Hazen and Sawyer will update the existing Arc Flash study performed by Hazen in 2012 with the electrical facilities installed in the most recent projects at the TZ Osborne WWTP, North Buffalo WWTP, and Transfer Pumping Station, including Packages 1-4, the Electrical CMAR upgrade project, NPW Pump Station, Ash Clarifier and Belt Filter Press Project. The study will take place upon their completion and the City of Greensboro will provide all shop drawings for equipment on projects managed by others.

The Arc Flash studies will include the following equipment installed under the projects listed above:

- Low and medium voltage switchgear
- Low and medium voltage motor control centers
- Primary/secondary substations
- Panelboards and Switchboards
- Motor Controllers and VFDs
- Standby power generator equipment
- Other electrical equipment where live parts are likely to be exposed for maintenance and repairs.

Install Arc Flash Warning Labels for all new equipment included in the Arc Flash Studies. The Arc Flash label format will be coordinated with the City so that the label format matches the format of exiting Arc Flash labels currently installed at other City facilities. Arc Flash labels will be printed on durable weather resistant film.

Perform the 5 year update to the 2012 Arc Flash Study per NFPA 70E requirements and provide and install updated labels for all electrical equipment included in the study

Update the 2012 Arc Flash Hazard Analysis report to include the updated information developed under these tasks.

Lock Out Tag Out (LOTO) Procedures:

Develop Lockout-Tagout procedures for the new equipment installed under the following projects at the TZ Osbourne WWTP, North Buffalo WWTP, and Transfer Pumping Station. LOTO procedures will be



in the same format and agreed to during the original LOTO contract with Hazen. LOTO procedures will be provided for the following equipment included in this contract:

- Process equipment with an electrical connection of 240VAC or above
- Process equipment with moving parts that handles process water, chemicals, or pressurized air
- All medium and low voltage electrical switchgear, motor control centers, and other equipment with multiple sources of power (i.e. main-tie-main equipment)
- All medium voltage power distribution transformers, feeders, unit substations and switches.

LOTO procedures for the major process units affected by the above projects will be developed and will include procedures to place process units in a safe working condition for repairs and maintenance and maintenance.

6. Additional Services Reserve

As requested, Hazen and Sawyer has included a task for Additional Services Reserve of \$300,000. This task will only be utilized at a mutual agreement between the City and the Engineer at a later date.

Hazen and Sawyer is pleased to partner with Crittek Engineering and Westcott, Small & Associates, PLLC as a subconsultant for the construction phase services for the above referenced project. Both Crittek (M) and Westcott, Small (W) are City approved M/WBE consultants and we look forward to the opportunity of working with them on this project. Crittek will provide inspection services at 40 hours/week for a period of 36 months at \$110/hour for a total of \$686,400. Westcott, Small and Associates will provide design services, periodic erosion control inspections and site/civil shop drawing review for a total of \$50,000.00. Hazen will include a 10% subcontractor markup to account for administrative management of the subconsultant.



Please find Table 1 below summarizing the total effort for this project. Lump Sum and Not to Exceed items have been noted.

Table 1 - Summarized Fee for the BNR Upgrades – Package 4

Task	Fee	Type
Hazen Construction Office Services	\$1,824,312	Lump Sum
BNR Training and Seminars	\$277,636	Lump Sum
Plant O&M and SOP Support	\$103,455	Lump Sum
Additional Services Reserve	\$300,000	Lump Sum
Hazen Construction Field Services	\$1,812,237	Cost Ceiling – Not to Exceed; Billed by fixed categorical rates per Table 2.
Startup-Operational and Onsite Support Services	\$93,000	Cost Ceiling – Not to Exceed; Billed by fixed categorical rates per Table 2.
Arc Flash and LOFO Procedures	\$300,000	Cost Ceiling – Not to Exceed; Billed by fixed categorical rates per Table 2.
Westcott, Small & Associates, PLLC	\$55,220*	Lump Sum (\$25,200)/CC (\$25,000)
Critek Engineering	\$755,040*	Cost Ceiling - Not to Exceed; Billed by fixed categorical rates per Table 2.
Total Contract Value	\$5,520,900	

*Includes Hazen 10% Administration and Management Cost

Table 2 – Categorical Billing Rates

Task	Fee per hour
Senior Associate	\$200
Associate	\$175
Senior Principal Engineer	\$150
Principal Engineer	\$130
Engineer	\$110
Senior Resident Project Representative	\$155
Resident Project Representative	\$100
Technician/Intern	\$45
Critek Engineering	\$110
Westcott, Small & Associates	\$135

Please feel free to contact us at any time if you have any questions or would like to meet to discuss the items enclosed. Thank you again for the opportunity and we look forward to continuing to work with the City of Greensboro.

Very truly yours,



Aaron D. Babson, PE
Senior Associate

cc: Alan Stone, PE