

May 24, 2017 (revised)

Danny Briggs, EI
Senior Civil Engineer
City of Greensboro
Water Resources Department
2602 South Elm Eugene Street
Greensboro, NC 27406

Reference: Proposal for Construction Materials Testing (CMT) and Special Inspections (SI) Services
T.Z. Osborne Reclamation Facility – Package 4
Biological Nutrient Removal Upgrade Project
2350 Huffine Mill Road
McLeansville, North Carolina
Summit Proposal No.: T17-0027 (revised)

Dear Mr. Briggs:

Summit Design and Engineering Services, PLLC is pleased to present this proposal to perform Construction Material Testing (CMT) and Special Inspections (SI) services for the above referenced project. As a provider of professional engineering services, Summit brings the City of Greensboro a proven successful CMT and SI team led by experienced engineers, engineering technicians/inspectors and project managers. The purpose of our services is to provide the required testing and inspections, per the project plans and specifications, to assess compliance with project documents. Our services will be performed as a means of quality assurance inspections and testing on behalf of the owner. The following information forms the basis of this proposal and our scope of services:

- Past experience on similar size projects and our familiarity with local soil conditions, site geology and subsurface conditions;
- Review of the project plans for Package 4 dated April, 2017;
- Review of the project plans and schedule with Hazen and Sawyer design team representative Aaron Babson; and
- Review of scope of services required with City of Greensboro representative.

Per our understanding of this project, Summit is committed to providing up to two (2) field personnel (lead inspector and a structural steel inspector), as requested by the owners designated representative, to provide inspection and testing on an on call basis during construction. Summit's field personnel maintain multiple ICC, ACI and NCDOT certifications, and are well qualified to perform CMT & SI services for this project. Site activities include: site grading, the placement of structural fill, foundation installation, cast-in-place concrete construction, reinforcing steel installation, masonry construction, structural steel framing and hardscapes. At the time of this proposal preparation, a construction schedule had not been confirmed.

PROJECT DESCRIPTION

We understand that the existing Aeration Basin will be upgraded with the addition of 6 new basins and 2 new structural masonry electrical buildings. Construction will primarily consist of earthwork and grading, foundation walls and spread footings, slab on grade, structural masonry and structural steel framing.

This project is scheduled to break ground in January 2018 and has an estimated construction schedule of approximately 36 months. We anticipate being onsite on a full-time basis during construction of the 2 new electrical buildings and full-time to part-time basis during construction of the 6 new Aeration Basins. After this initial work is completed, we anticipate dropping back to a part-time basis to perform cast-in-place concrete, structural steel observations, monitoring of structural fill placement and asphalt density testing. If any of our scheduling assumptions need to be altered, we will adjust accordingly based on a Time and Materials basis.

SCOPE OF SERVICES

Our scope of services is described below and provides the basis of our fee estimate. It should be noted our services will exclude: (1) supervision, direction, or acceptance of the contractor's work; (2) interpretation or modification of the project plans or specifications; (3) submittal of test results or reports to any regulatory agency (unless specifically requested by client in writing); or (4) job site safety. The following tasks outline our proposed scope of services for this project.

Task 001 – Pre-Construction Meeting and Review of Project Documents

Summit's Project Manager and Lead Inspector will attend a pre-construction meeting alongside the owner's representative, general contractor, and design team members to review requirements for the project prior to beginning construction activities. We will also review grading and utility plans prepared for the project. The plans will be reviewed from a geotechnical perspective for conformance with recommendations provided in the final geotechnical report for the project.

Task 002 – Geotechnical Observation and Testing Services

Summit will provide a Special Inspections Agent and/or a senior engineering technician working under the supervision of a registered engineer to observe proofrolls, subgrade preparation, and to perform compaction testing services during onsite grading activities. We anticipate that the following observations and testing will be required during earthwork and associated construction for the following:

- Site work and grading;
- Utility trench backfill;
- Foundation observations and testing;
- Subgrade preparation and compaction for grade slabs.

Compaction testing following grading will be performed in general accordance with the project's geotechnical report and project documents. We anticipate we will be required to perform field

density testing using American Society for Testing and Materials (ASTM) procedures. Our personnel will sample on-site and imported materials used as fill and transport these samples to our laboratory for testing.

We estimate that the construction schedule will require 740 hours of onsite time for observation and testing related to soil inspection services.

Task 003 – Cast-In-Place Concrete Construction and Reinforcement Placement

Summit will provide a Special Inspections Agent and/or a senior engineering technician working under the supervision of a registered engineer for full-time inspection, sampling, and field testing services during placement of structural concrete for foundations and foundation walls, grade slabs, elevated slabs and hardscapes.

Prior to the placement of concrete, we will provide a Special Inspections Agent to periodically observe the size, type, and placement (lap lengths, ties, and cover) of the reinforcing steel (rebar) prior to placement of structural cast-in-place concrete. We will also provide a Special Inspections Agent to observe the placement, curing, and protection of cast-in-place concrete. We will perform slump, air content, unit weight, and temperature testing during cast-in-place concrete placement. Concrete batch tickets will be monitored during placement for mix design compliance.

We will mold one set of five 4x8 inch concrete compression test cylinders at frequencies specified in the project specifications, for each type of concrete placed per day. Concrete specimens will be picked up and delivered to our laboratory after the initial on-site curing period.

We estimate that the construction schedule will require 2340 hours of onsite time for observation and testing related to concrete inspection services.

Task 004 – Structural Masonry and Grout Placement

We will provide a Special Inspections Agent to observe the grout spaces, the size, type, and lap lengths of the reinforcing steel prior to grout placement and perform masonry grout testing. In addition, we will provide a senior engineering technician to assist with grout sampling for during grouting operations. In general the testing will consist of slump and mix temperature testing and molding of one set of three (4) grout samples according to the testing frequencies in the specifications for laboratory compressive strength testing.

Grout samples will be retrieved from the site and transported to our laboratory and placed in the proper curing facilities within 48 hours. A site-curing box will be required to maintain proper curing temperatures during the initial 24 to 48 hours.

We estimate that the construction schedule will require 240 hours of onsite time for observation and testing related to masonry inspection services.

Task 005 – Structural Steel Field Welding

As needed, we will provide a Special Inspections Agent and/or a Certified Welding Inspector (AWS-CWI) for observation and inspection during field welding and review of welding materials, equipment, and welder qualifications. We will perform visual inspection of structural bolting and field welding in accordance with the project specifications. We have assumed that fabrication of structural steel will be performed in the shop of an approved fabricator; thus eliminating the need for shop inspection services by Summit. Summit can perform these services on a time-and-materials basis in general accordance with the attached fee schedule, if requested.

During structural steel bolting and fit up, our services will include observation of torquing and tensioning of high strength bolts involved in critical connections as required by project plans and specifications. Additional testing fees beyond those factored in this proposal will be incurred if bolt assembly mill certifications are unavailable.

We estimate that the construction schedule will require 40 hours of onsite time for observation and testing related to structural steel inspection services.

Task 005 – Pavements and Bases Observation and Testing

Summit will provide a Special Inspections Agent or senior engineering technician working under the supervision of a registered engineer to observe proofrolls of the prepared soil subgrade prior to ABC stone, observe and test asphalt and concrete paving operations, and obtain cores samples for density requirements. ABC stone base compaction tests will also be performed by the nuclear gauge method or sand-cone method, as related to a standard proctor laboratory compaction test. We will provide a Senior Engineering Technician as needed to observe the placement of concrete and hot-mix asphalt pavements. Additionally, we will periodically monitor hot-mix asphalt delivery temperatures, rolled thickness, and perform asphalt density testing with a nuclear gauge.

We estimate that the construction schedule will require 40 hours of onsite time for observation and testing related to pavement inspection services.

Task 006 – Laboratory Testing

In an effort to maintain the highest quality control standards within our company, our laboratory, equipment, and personnel are inspected both by our internal Quality Control Group and a variety of external agencies. Our laboratory and personnel periodically go through inspections and have received accreditations through CCRL (Cement and Concrete Reference Laboratory) relating to ASTM C1077 Standards; and AMRL (AASHTO Materials Reference Laboratory) relating to AASHTO and ASTM D 3740 Standards. Each of these organizations is part of the National Institute of Standards and Technology. We have also been inspected and accredited by the Soil and Materials Laboratory of NCDOT. Laboratory testing will be performed in accordance with the project document requirements to evaluate that materials comply with project requirements. Results of laboratory testing will be provided to the construction manager and designated project team members as soon as practicably available.

We anticipate that testing will be required for backfill material and concrete cylinders. Samples collected from the job site will be secured and returned to our laboratory for testing, as required. Our budget includes laboratory testing of soils, including maximum dry unit weight/optimum moisture curves, Atterberg limits, and No. 200 wash sieves for 4 samples and compressive strength testing for up to 3040 concrete cylinders, 72 grout prisms and 12 samples for aggregate silica reaction testing.

Task 007 – Project Management and Engineering Consultation

Our project organization will include various field testing/inspections staff working under the supervision of Jeff Elliott, P.E. and Glaston Jones who will oversee the administrative functions for the project, including assignment of appropriate field personnel, review of field data, laboratory data, inspection reports, and communication the following with project team personnel and owner:

- The results of our field testing and inspections for each day will be summarized in a daily field report, with all results communicated to appropriate on site personnel.
- Unusual occurrences will be communicated in a timely manner.
- Scheduling conflicts do to contractor error, work cancellations upon Summit's arrival, retesting and non-compliance testing, and contractor's convenience testing will be tracked throughout project and reported to owner for tracking purposes of appropriate back charges to contractor.
- Non-conforming items that are not corrected on the same date that they are initially observed, will be communicated to the owner, building official, general contractor, and design team immediately.
- The results of concrete, grout and mortar compressive strength testing will be available electronically to the project team within 48 hours, as the tests are performed. Test results will be available through e-mail, and summarized in our monthly summary report.
- A typed final report of our services will be prepared by our Project Manager, reviewed and sealed by our Registered Engineer, and distributed to specified members of the project team on a monthly basis, as well as a Final Report at the end of project.

The project will be closely managed to identify potential budget and schedule impacts during the course of the project. Summit's project manager will also monitor field operations for possible out-of-scope items that develop during the course of the project that are not included in this proposal and preliminary fee estimate.

We have included budget for construction kickoff meeting, technical consultation and for special site meetings due to unanticipated conditions or design changes during construction. Since this scope cannot be fully defined at this time, we allocated budget based on prior projects of similar nature.

We estimate that the construction schedule will require 136 hours of time for project management related services.

Task 008 – Final Report

Upon completion of the project, a final summary report will be prepared by Summit to document geotechnical observations, testing services and laboratory testing services during this phase of construction. In the event other project deliverables become required for reasons unknown at this time, including but not limited to failed test items requiring further analysis and/or reporting, additional fees may be incurred beyond those contained in the attached fee estimate.

SCHEDULE

We anticipate that 1 Summit representative will be required onsite on a full-time to part-time basis throughout construction, with the exception of slab pours which will require 2 Summit representatives onsite. For scheduling of our field-personnel, Summit must be contacted prior to 1:00 p.m. the day before our services are required and/or at least 24 hours in advance. Our visits will be coordinated with the contractor's project site superintendent and/or an owner's representative. Summit will be available for inspection services 7 days a week and 24 hours per day, as requested.

ADDITIONAL SERVICES ALLOWANCE

Our recommend budget allowance is based on providing the scope of services outlined herein only. If the construction schedule, actual material quantities, or requirements for the project are different from what we have described herein, we reserve the right to review our scope and budget allowance with respect to the new information and propose necessary changes to you. Some factors that commonly affect our proposed budget allowance include re-testing and re-inspections, overtime work, adverse weather events that affect the construction materials on-site or our scheduling, additional laboratory testing, performance of additional services not explicitly listed herein, and poor scheduling (or late cancelling) of our field services by the general contractor's personnel. We will attempt to coordinate our services with the contractor to efficiently service the project.

We estimate that an additional services allowance of \$18,160 be included for additional services.

FEE ESTIMATE

Based on the scope of services outlined herein and our understanding of the available project construction information, we recommend an estimated allowance of **\$331,417** be included for the cost of our CMT/SI services as described herein. Please note that the budget allowance stated and illustrated herein **does not** constitute a "lump sum" fee for our services. **CMT/SI services will be invoiced on an on-call, time and materials basis at the rates indicated on the attached unit fee schedule for those services we are requested to provide by the general contractor throughout the project construction duration.** Our proposed budget allowance will not be exceeded without prior client notification, and would be increased only via contract amendment.

ASSUMPTIONS

During our proposal preparation certain assumptions were required based on our review of the project plans. Based on the available information (noted above), the following assumptions apply:

- Rates associated with overtime work are at 1.5 times the listed hourly rates in the attached fee schedule and rates shown on the Fee Summary. Overtime for our services is defined as work on the project by a single person in excess of 40 hours per week and all time on weekends, Summit recognized holidays, and night shifts;
- Weekend and/or night work is not anticipated for this project;
- Extensive amounts of Overtime is not anticipated for this project;
- Crews will be working at a pace and distance from one another such that 1 field personnel per day is sufficient to observe the work, with the exception of large concrete pours which will require 2 field personnel;
- Due to the construction sequencing shown in the construction schedule, we anticipate being onsite on a full-time basis during construction of the 2 new electrical buildings and full-time to part-time basis during construction of the 6 new Aeration Basins. After this initial work is completed, we anticipate dropping back to a part-time basis to perform cast-in-place concrete, structural steel observations, monitoring of structural fill placement and asphalt density testing/observations;
- We assume the majority of workdays will consist of 6-8 hour days;
- We assume hours for our Principal Engineer Review and 136 hours for our Project Manager will be required to provide project oversight, recommendations during construction, engineering review and project management activities;
- Laboratory testing and field compaction testing will be performed in general accordance with ASTM standards; and
- We assume steel fabrication shop inspections will not be required for this project.

LIMITATIONS

Construction materials observation, testing, and special inspection services provided by Summit will be performed in accordance with generally accepted procedures practiced within the project area. It should be noted even with diligent monitoring construction defects may occur. In all cases, the contractor is solely responsible for the direction and quality of the work, adherence to plans and specifications, and repair of defects regardless of when they are found.

If Summit's services are performed on an on-call or intermittent basis, we will be unable to provide an opinion regarding specifications compliance unless our representative has sufficient opportunity to observe the work performed and/or tested.

The presence of our field representative does not imply that Summit is providing any direction, supervision, or layout of the work of the contractor. Our services are not intended to, and therefore will not, include an evaluation of the safety practices of the contractor or his workmen. The contractor is solely responsible for achieving these items.

Safety of our employees is of paramount concern to Summit. You will be notified if the location of the project represents a potential safety concern to our employees. Unsafe conditions for field work will require a modification of our estimated scope of work and associated fees. We will advise you of the additional costs necessary to mitigate these unanticipated conditions, if applicable.

Our work will be performed in a manner consistent with that level of care and skill ordinarily exercised by other members of Summit's profession practicing in the same locality, under similar conditions, and at the date the services are provided. Our conclusions, opinions, and recommendations will be based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. Summit makes no guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided

CLOSURE

We appreciate the opportunity to submit this proposal and look forward to working with you on this project. If we have excluded any services that are required, please contact us so that we can modify this proposal, or provide an additional proposal, for these services. If you have any questions concerning this proposal, please contact us at your convenience at (919) 732-3883.

Sincerely,
SUMMIT DESIGN AND ENGINEERING SERVICES, PLLC
Firm's NC License No. P-0339



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Schedule of Standard Rates Construction Materials Testing & Inspections

FIELD TESTING AND OBSERVATION SERVICES

Engineering Technician	\$48.00	Per Hour
Senior Engineering Technician	\$58.00	Per Hour
Special Inspections Agent	\$70.00	Per Hour
AWS CWI Certified Welding Inspection	\$85.00	Per Hour
Trip Charge (Portal to Portal)	\$50.00	Per Trip
Overtime: (Over 40 hr/week, nights & Saturdays)	Regular Time x 1.5	Per Hour
Doubletime: (Sundays and Holidays)	Regular Time x 2.0	Per Hour

FIELD TESTING EQUIPMENT

Nuclear Density Equipment	\$30.00	Per Day
Ultrasonic Equipment	\$100.00	Per Day
Dipstick (Floor Flatness Profiler)	\$100.00	Per Day
Coring Equipment	\$250.00	Per Day
Direct Expenses	Cost + 15%	

LABORATORY SERVICES

Engineering Classification ASTM D2487 or D2488	\$4.00	Per Test
Natural Moisture Content ASTM D2216	\$8.00	Per Test
Wash #200 Sieve Analysis ASTM D1140	\$40.00	Per Test
Wash #200 Sieve w/Grain Size Analysis ASTM D422	\$100.00	Per Test
Atterberg Limits ASTM D4318	\$70.00	Per Test
Standard Proctor ASTM D698	\$130.00	Per Test
Modified Proctor ASTM D1557	\$150.00	Per Test
ABC Stone Proctor ASTM D698 or ASTM D1557	\$175.00	Per Test
Concrete Compressive Strength ASTM C39	\$15.00	Per Test
Aggregate Silica Reaction ASTM C1260	\$1,200.00	Per Test
Lightweight Concrete Density ASTM C567	\$30.00	Per Test
Concrete Core Compressive Strength ASTM C42	\$35.00	Per Test
Mortar Compressive Strength ASTM C109	\$15.00	Per Test
Grout Compressive Strength ASTM C1019	\$30.00	Per Test
Specific Gravity/Density of Asphalt Core ASTM D2726	\$35.00	Per Test
Flexural Strength of Concrete ASTM C78	\$40.00	Per Test
CMU Testing ASTM C140	\$225.00	Per Test
California Bearing Ration (3 Point Test)	\$450.00	Per Test
Specific Gravity of Soils ASTM D854	\$80.00	Per Test

ENGINEERING & PROJECT MANAGEMENT SERVICES

Admin/Clerical	\$50.00	Per Hour
Staff Professional	\$90.00	Per Hour
Project Technical Lead	\$110.00	Per Hour
Field Engineer/Project Engineer	\$120.00	Per Hour
Project Manager	\$125.00	Per Hour
Senior Geotechnical Engineer	\$140.00	Per Hour
Chief Geotechnical Engineer	\$150.00	Per Hour

Notes

Scheduling of field services requires no less than 24 hours advance notice.
 There is a 2-hour Cancellation charge for all field services upon arrival to the project site.
 Unit Prices are in effect for 30 days from the date of proposal.
 Rates are billed upon arrival until departure from the project site.
 Lab Reports will charged .25 hours of PM review time per report.

SUMMARY OF COST ESTIMATE
T17-0027 TZO_BNR_CMT & SI Fee Estimate

LABOR CATEGORY	Sr. Eng. Tech.	Special Inspector	PM	QPR	TOTAL HOURS	TASK LABOR FEE	TASK LAB FEE	TASK UNITS AND EXPENSES	TASK SUB-CONSULTANTS	TOTAL TASK FEE
	6 - Technician III	6 - Technician III	10 - Project Manager I	11 - Senior Professional						
<i>Billing rate (\$/hr)</i>	\$58.00	\$70.00	\$125.00	\$140.00						
10-000L Laboratory Testing	0	0	0	0	0	\$0	\$63,447	\$0	\$0	\$63,447
10-1000 Soils Insp & Testing	740	0	0	0	740	\$42,920	\$0	\$0	\$0	\$42,920
10-2000 Concrete Insp & Testing	2340	0	0	0	2340	\$135,720	\$0	\$0	\$0	\$135,720
10-3000 Masonry Insp & Testing	0	240	0	0	240	\$16,800	\$0	\$0	\$0	\$16,800
10-4000 Steel Insp & Testing	0	40	0	0	40	\$2,800	\$0	\$0	\$0	\$2,800
10-6000 Concrete/Asphalt Paving	40	0	0	0	40	\$2,320	\$0	\$1,000	\$0	\$3,320
10-7000 Project Management	0	0	136	0	136	\$17,000	\$0	\$0	\$0	\$17,000
Trip Charges (660 trips @ \$50/trip)	0	0	0	0	0	\$0	\$0	\$31,250	\$0	\$31,250
Additional Services Allowance	120	80	0	40	240	\$18,160	\$0	\$0	\$0	\$18,160
LABOR HOURS	3240	360	136	40	3776					
LABOR FEE	\$187,920	\$25,200	\$17,000	\$5,600		\$235,720	\$63,447	\$32,250	\$0	\$331,417