

INDIVIDUAL PROJECT ORDER NUMBER 2020-02-10

Describing a specific agreement between Kimley-Horn and Associates, Inc. (the Consultant or KH), and The City of Greensboro, NC\_\_ (the Client) in accordance with the terms of the Professional Services Contract dated \_November 6, 2019\_, which is incorporated herein by reference.

Identification of Project: Greensboro Arboretum Stream Restoration

The City of Greensboro wishes to implement a stream restoration project within the Greensboro Arboretum. The project will include restoration, stabilization, or enhancement of approximately 2,000 feet of North Buffalo Creek within the approximate existing location of the stream. **Figure 1** shows the approximate project boundary and approximate extent of the stream restoration.

Specific scope of basic Services:

Task 1 – Survey and Geotechnical Services

Task 1.1 – Survey

KH will contract with a registered land surveyor to complete survey of the project site as shown in **Figure 1**. The survey will then be used to generate the base construction drawings. The City owns the property in the project area that may be affected so it is assumed there is no need to obtain access. The survey shall include:

- Aerial mapping will be completed for the project area
- Channel/floodplain information including centerline, thalweg, toe and top of bank elevation, major changes in slope of bank such that an accurate plan view and profile can be generated (1' topographic map) for North Buffalo Creek within the project boundaries;
- Size, location and downstream inverts of the culverts/pipes under W. Wendover Avenue;
- Location of other storm drain pipes and drainage structures;
- Location of sanitary sewer pipes and sewer structures including sizes, materials, invert elevations, direction, and rim elevations;
- Ground floor elevations of and locations of buildings within the survey area (assumed to be none);
- Any parking areas, retaining walls, guardrails, fences, and streets;
- Location, direction and approximate height of above-ground utilities;
- Location of other pertinent physical features (such as but not limited to man-holes, fences, walls, planters, sheds, gabion walls, rock outcrops) that are inside the project corridor;
- Location of all trees, shrubs, and planting beds within the survey area (label with size and type of trees/shrubs);
- Location of available property irons to the extent necessary for purposes of overlaying and verifying legal descriptions and plats;
- Location of easement boundaries and right-of-way (ROW) boundaries.
- Location of all pedestrian bridges including abutments, railings, low-cord and centerline of trail/path
- Level B SUE

Description, book, and page number of the official registry of all properties affected by the Project, including current

property owner name(s), tax parcel identification number, street address, existing property acquisitions, right of ways, and existing/recorded easements from the register of deeds.

#### Task 1.2 – Geotechnical Services

Geotechnical services may be required if a retaining wall or other structure is proposed for the project. KH will contract with a Sub Consultant to obtain 2 shallow, hand auger borings and a letter report containing recommendations for wall design parameters. If additional borings are required or if a wall design by the Sub Consultant is required, this will be considered additional services.

### Task 2 – Site Assessment

#### Task 2.1 - On-Site Geomorphic Assessment:

The following natural channel design assessment and measurements will be performed (Rosgen Level II and III).

- Representative detailed geomorphic longitudinal profile of approximately 20 bankfull lengths on the stream reach above or below the impoundment to establish existing conditions.
- Representative riffle and pool cross-sections.
- Measurements of channel geometry along the longitudinal profile (sinuosity, meander length, radius of curvature, amplitude, and belt width).
- Representative bed substrate analysis within the reach.
- Bank Erosion Hazard Index (BEHI) for the reach.
- Near Bank Stress based solely on visual indicators (NBS) for the reach.

(Note: The BEHI and the NBS alone will be used to evaluate bank erosion rates.)

A survey instrument may be used by KH to collect the limited channel assessment data listed above, but this data will not be collected to a level sufficient to provide base mapping for design. The morphological survey will only be of the detail sufficient for a geomorphic assessment and will be supplemented with the detailed field survey performed for the project area.

#### Task 2.2 On-Site Natural Resources Assessment:

- A cursory review of NRCS soil mapping along stream.
- Determine the potential for rare, threatened, or endangered (RTE) species habitat as identified and the potential effect of this project on that habitat.
  - Sub Consultant will send concurrence letters to the NHP and USFWS.
- Define vegetation communities/buffers
  - Sub Consultant will list observed species, dominant stratum, and note invasive/exotic species and buffer widths and densities
- Locate areas of severe erosion of visible channel problems and/or constraints.
- Storm drain features (ditches/storm drain pipes) for condition and potential to add water quality BMPs at outfalls (i.e. level spreaders, pocket/floodplain wetlands, or regenerative stormwater conveyance (RSCs))
- Review for potential constructability issues (access, staging, and potential on-site spoil areas)
- Review location of trails and arboretum amenities relative to stream

The team (KH + sub-consultant) will also perform the following:

- Complete stream and wetland field forms to be included in Task 6. Stream and wetland forms will only be completed for jurisdictional features that are inside of the Task 1 survey area.

- Wetland forms include:
  - *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0), April 2012. Wetland Determination Data Form - Eastern Mountains and Piedmont Region*
  - NC WAM Field Assessment Form
- Stream Forms include:
  - NCDWQ Methodology for Identification of Intermittent and Perennial Streams and Their Origins; Version 4.11; September 1, 2010
  - USACE Stream Quality Assessment Worksheet
- Delineate wetland areas using sub-meter GPS for survey to include in the base mapping (Task 1.1) completed by sub-consultant.
- Determine the absence or presence of wetlands and state open waters within the project corridor utilizing the three-parameter approach for wetland delineation as described in the current version of the Federal Manual for Identifying and Delineating Jurisdictional Wetlands. The jurisdictional limits will be flagged following the guidelines presented in the Interim Regional Supplement to the U.S. Army Corps of Engineers Manual: Eastern Mountains and Piedmont.
- Establish permanent photo point locations and photo document existing conditions (up to 10).
- KH will coordinate with the City PM to determine photo locations.

In addition to completing stream forms on each channel for the JD, the KH field team will walk the streams to the edge of the regulatory floodplain or proposed easement and note visual condition and restoration or enhancement opportunities. Tributaries will only be visual assessed to note a professional opinion of opportunity (i.e. rehabilitation) but are not intended to be included in the detail design other than providing a stable confluence with North Buffalo Creek.

KH will compile the data to include in the report under Task 4.

#### Task 2.3 – Stream Quantification Tool (SQT).

Based on the information gathered above KH will complete the NC Stream Quantification Tool (NC SQT) v3.0 Spreadsheet. This tool was recently developed to determine a numerical difference between existing (degraded) stream condition and proposed (rehabilitated) stream condition (a.k.a. functional lift). Data will include:

- Catchment Hydrology
- Reach Runoff
- Floodplain Connectivity
- Lateral Stability
- Riparian Vegetation
- Bed Material
- Bed Form Diversity
- Plan Form

#### Task 2.4 Reference Geomorphic Analysis:

KH will compile regional curve data, KH reference reach database information including information from previously restored projects in the piedmont of NC (KH data and data from others and field verified by KH staff), and any on-site reference reach data collected as described above to generate a reference reach database and project curve for piedmont of NC. The project reference reach database will be used to generate a morphology table and

design parameters. The morphology table will be included in the Preliminary Engineering Report (PER) prepared in Task 4. The geomorphic data is for performing analysis only and will not be sufficient to provide base mapping.

### Task 3 – Meetings and Design Workshops

KH will participate in up to 4 project milestone meetings during design with the City and will coordinate up to 2 design workshops, and 4 informal stakeholder meetings. It is assumed that these meetings may be with; the Arboretum/Parks and Recreation, the regulatory agencies (USACE, DWR, NC DEMLR), public or private utility owners, NCDOT and/or the general public.

The first design workshops will be at the beginning of project to clarify project goals, objectives, and priorities. The second design workshop will be to review the concept design completed after Task 4. For any formal meeting or workshop, it is assumed that the City will determine the attendees list and inform the attendees of the location and time of the meetings. For these formal meetings or design workshops KH will:

- Have up to 2 KH staff attend the meeting or workshop. Each meeting assumed to be a maximum of 4 hours in length (including set-up and break-down).
- Prepare up to 5 figures for discussion (assumed to be 24"x36" in size) or electronic for power point presentation). Visual aid will likely include photo or video simulations and landscape architect style renderings/sketches.
- Prepare draft meeting minutes to the City within 1 week following the meeting.
  - It is assumed that the City will distribute the final meeting minutes to the interested stakeholders.

For the informal meetings it is assumed:

- No meeting specific material (i.e. exhibits, figures, reports) will need to be generated beyond that produced under other tasks.
- Meeting minutes will be the only deliverable.
- Each informal meeting will include maximum of 2 hours in length and will involve a maximum of 2 KH staff.

### Task 4 – Concept Drawings and Preliminary Engineering Report

Upon completion of the above survey and site assessment, Consultant will develop conceptual design. The preliminary design will also seek to address issues and opportunities discovered because of the site assessment and avoid and compliment Arboretum gardens, structures, and other features. Consultant will investigate the feasibility of incorporating SCMs or other green infrastructure in the proposed design. After completion of Design Workshop 1 (Task 3) , Consultant will develop a report and preliminary design. The concept design will be up to 3 figures with the approximate design over an aerial image, showing the survey and any relevant, available GIS layers.

The report will summarize the information gathered as a result of the above Tasks and discuss potential constraints and opportunities to rehabilitate the stream corridor. The report will include the following:

- Geomorphic assessment results
- SQT Result Summaries (Existing vs. Proposed Functional Scores)
- Summary of jurisdictional (and non-jurisdictional) wetlands, streams, waters and buffers
- Potential Federally listed threatened and endangered species habitat
- Vegetation communities
- SHPO issues

- Stormwater infrastructure constraints and opportunities
- Photo documentation
- A narrative discussing the design approach
- Up to 10 figures describing the above

Consultant will submit the report to the City and make two rounds of revisions based on City and stakeholder comments. The report will also be used as documentation for the various permits required.

As part of this Task, Consultant will also prepare a preliminary engineer's opinion of probable construction cost (OPCC).

#### Task 5 – Permit Drawings

Engineer will prepare Permit drawings (~75% Plans) for up to 2,000 feet of stream restoration based on the data collected in previous tasks (see Figure 1). It is assumed that no utility relocation design will be necessary or required. There are underground power lines and irrigation lines in the project area. Detailed relocation plans will not be provided with this scope, but typical details will be provided in the drawings for reference for the contractor if or when these minor utilities are encountered during construction. The drawings will include:

- Cover sheet with location and vicinity map
- Standard plan and profile sheets with match lines showing existing and proposed alignment of project components, as well as existing contours, property lines, and appropriate physical features
- Delineated wetlands, streams, and open waters
- Location of known utilities
- Typical sections of channel and wetland improvements
- Typical details of instream features
- Staging areas and construction access
- Construction access and haul roads
  - Traffic Control Plans (as necessary)
- Vegetation plans
- Sediment and Erosion Control Plans and Details

Engineer will submit the permit drawings to the City and make two rounds of revisions based on City comments. It is assumed that no utility relocation or design will be required.

As part of this Task, Engineer will also prepare a preliminary engineer's opinion of probable construction cost (OPCC) once the City approves the permit drawings.

#### Task 6 – Permitting

##### Task 6.1 – 404/401 Permit

Environmental permitting services will be provided by a sub-consultant to Kimley-Horn. Services provided include:

Prepare and submit the 404/401 application (Nationwide 27) which will include:

- Agent Authorization Form

- Jurisdictional Determination Forms
- Pre-Construction Notification
- Draft Construction Plans
- 401 Permit Application Fee
- Plans and Document prepared in Task 5.

#### Task 6.2 – Erosion and Sediment Control Permit

A Sub Consultant will prepare an erosion and sediment control packet for submittal to NCDEQ, Land Quality Section. The packet will include the sediment and erosion control plans (prepared by Consultant), S&EC plan checklist, supporting calculations and documentation, and a financial responsibility/ownership form. The City will provide necessary signatures. The City will provide the application fee. The Kimley-Horn team will submit and track the permit. The Consultant and Sub Consultant will respond to requests for additional information or answer questions for DEQ.

#### Task 6.3 – Floodplain Development Permit

Consultant will use the existing HEC-RAS to model existing and proposed site conditions under present development scenario. The modeling will be done based on the topographic survey and existing HEC-RAS models obtained from the City, NCFMP, or FEMA. Consultant will update the model to a corrected-effective model that represents the existing condition based on the current survey. The corrected effective/existing condition model will be modeled in HEC-RAS. Proposed conditions will be modeled in HEC-RAS.

Design approaches (i.e. as typical sections and profiles are developed) will be modeled to evaluate if the restoration design approach complies with City and NCFMP requirements. It is anticipated that the stream will be designed for the bank-full event and the floodplain (i.e. benches) will be graded as necessary to prevent an increase change in the 100-year flood elevation.

It is assumed that a No-Impact Certification will be achieved based on the site conditions. Consultant will submit the No-Impact Certification with supporting data and documentation to the North Carolina Floodplain Mapping Program (NCFMP) and City floodplain manager. Consultant will make two (2) rounds of revisions to the model and/or plans based on state or City comments. Consultant will schedule and attend one meeting with City floodplain manager or NCFMP. Additional meetings and/or revisions beyond those listed above will be considered an additional service. It is assumed that a Flood Plain Development Permit will be required. Consultant will prepare a flood plain impact permit application on behalf of the City. If a CLOMR and/or LOMR is required (not anticipated), it shall be considered an additional service.

The City will provide any application fees associated with the Floodplain Development Permit. It is assumed that the Floodplain Development Permit must be obtained through NCDEQ since this is a City funded project.

#### Task 7 – Right of Way and Easement Coordination

The project is adjacent to NCDOT Right of Way on W Wendover Avenue. It is assumed that construction access will likely occur from W Wendover Avenue. This task includes coordination with NCDOT to gain right of entry and coordination that may be necessary to complete work within or adjacent to their right of way.

A Duke Energy power easement also runs through the length of the project parallel to the stream. Consultant will coordinate with Duke Energy to receive permission to work in this area.

Meeting with NCDOT or Duke would be included in Task 3.

## Task 8 – Construction Drawings and Specifications

Engineer will complete construction drawings based on the permit drawings and comments received during previous Tasks. It is assumed there will be no significant changes in design approach from the permit drawings. The plans will include updates and additions to the information (sheets) contained in the permit restoration drawings plus:

- General Notes and Sequence of Construction
- Sediment and Erosion Control Plan and Details

In addition to the construction drawings, Engineer will prepare technical specifications, a bid tab sheet, and an engineer's opinion of probable construction cost (OPCC). Engineer will submit draft construction drawings and technical specifications to the City for review. Engineer will make up to two (2) sets of revisions based on the City's comments. Engineer will assemble the above documents and any general conditions.

Engineer will prepare an engineer's opinion of probable construction cost (OPCC). OPCCs provided herein are based on the information known to the Engineer at this time and that represents only the Engineer's best judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

## Task 9 – Bid and Construction Phase Services

**Bid Phase** - It is assumed the City will assemble the bid package and manage the bid process. The Consultant shall assist the City during the bid process. Kimley-Horn will prepare answers to RFIs and assist the City in preparing any addenda. The Consultant shall attend the pre-bid meeting and review the bid tabs received.

**Construction Phase** - This scope of services is to provide for construction phase services for the construction of stabilization measures for that project. The total project duration is anticipated to be approximately 16 weeks including contractor mobilization, demobilization, and planting which do not require daily construction observation. The Consultant will prepare site visit reports (when visits occur), monthly status reports, prepare summary notes from onsite meetings, provide updates to the project schedule, and collect and review monthly pay applications. Also, Consultant's project engineer or project manager will visit the site an average of 1 time per week for shorter durations during the construction period as needed. The Consultant will also provide additional site visits with another subconsultant engineer to provide training to that engineer so that engineer can gain stream restoration construction phase services experiences that can be used on future City projects. It is assumed that mobilization, demobilization, clearing and grubbing, and planting activities do not need to be observed as often as the stabilization measures construction. The Consultant shall be assisted by a Sub Consultant to make site visits during construction to verify quantities, review pay apps, and other activities. This Sub Consultant will provide up to 100 hours of assistance during the construction phase. Additional construction observation (beyond the above) will be considered additional services and only executed based on written client authorization.

The Contractor shall track and provide the quantities and measurements to the Consultant for review of the pay applications.

**Final Review** - The Consultant will coordinate and conduct a review at substantial completion and at final completion. Punch Lists and documentation of any inspections will be generated by the City identifying deficiencies, if appropriate, and through correspondence will document the remedies. The Consultant will respond to questions from City regarding preparation for the meeting and documentation of inspections.

**Post-Construction Documentation** - The Consultant will assist the Contractor's surveyor reviewing the record drawings and providing comments based on as-built survey provided by the Contractor's surveyor. The Consultant will also provide a final summary memorandum for the City. The record drawings will be based on the as-built

survey. Consultant will seek to avoid monitoring requirements by the agencies. Monitoring the success of the project per agency requirements (post the completion of construction) shall be considered an additional service.

Deliverables and Activities:

- Preconstruction meeting agenda, summary notes, and attendance (1 total – 1 staff)
- Monthly meetings and summaries including final walk through (6 total – one staff each)
- Review payment applications from the Contractor for City to approve (6)
- Respond to RFIs and Change Orders (assume 6 total)
- Review substitutes and testing results (assume 3)
- Create and coordinate final punch list (1 set)
- Review record drawings (1 set)

The following is a more detailed description of services that may be rendered as part of this Task if listed above. However, it is understood that not all of the services may be rendered or may be necessary:

- 1) Pre-Construction Conference. Consultant will develop the agenda and attend a Pre-Construction Conference prior to commencement of Work at the Site.
- 2) Visits to Site and Observation of Construction. Consultant will provide limited on-site construction observation services during the construction phase. CONSULTANT will make visits at intervals as described above in order to observe the progress of the Work. Such visits and observations by Consultant are not intended to be exhaustive or to extend to every aspect of Contractor's work in progress. Observations are to be limited to spot checking, selective measurement, and similar methods of general observation of the Work based on Consultant's exercise of professional judgment. Based on information obtained during such visits and such observations, Consultant will evaluate whether Contractor's work is generally proceeding in accordance with the Contract Documents.

The purpose of Consultant's site visits will be to enable Consultant to better carry out the duties and responsibilities specifically assigned in this Scope to Consultant, and to provide the City a greater degree of confidence that the completed Work will conform in general to the Contract Documents. The Consultant shall not, during such visits or as a result of such observations of Contractor's work in progress, supervise, direct, or have control over Contractor's work, nor shall the CONSULTANT have authority over or responsibility for the means, methods, techniques, equipment choice and usage, sequences, schedules, or procedures of construction selected by Contractor, for safety precautions and programs incident to Contractor's work, nor for any failure of Contractor to comply with laws and regulations applicable to Contractor's furnishing and performing the Work. Accordingly, Consultant neither guarantees the performance of any Contractor nor assumes responsibility for any Contractor's failure to furnish and perform its work in accordance with the Contract Documents.

- 3) Recommendations with Respect to Defective Work. Consultant will recommend to the City that Contractor's work be disapproved and rejected while it is in progress if, on the basis of such observations, Consultant believes that such work will not produce a completed Project that conforms generally to Contract Documents.
- 4) Clarifications and Interpretations. Consultant will respond to reasonable and appropriate Contractor requests for information as described above. Consultant will base the response(s) on the Contract Documents. The City will review the response(s) and issue necessary clarifications and interpretations of the Contract Documents to Contractor as appropriate to the orderly completion of Contractor's work. Any orders authorizing variations from the Contract Documents will be approved by the City



- 5) Change Orders. Consultant may recommend Change Orders to the City, and will review and make recommendations related to Change Orders submitted or proposed by the Contractor.
- 6) Shop Drawings and Samples. Consultant may review, approve, or take other appropriate action in respect to Shop Drawings and Samples and other data which Contractor is required to submit (if requested by the City), but only for conformance with the information given in the Contract Documents. Such review and approvals or other action will not extend to means, methods, techniques, equipment choice and usage, sequences, schedules, or procedures of construction or to related safety precautions and programs.
- 7) Substitutes and "or-equal." Evaluate and determine the acceptability of substitute or "or-equal" materials and equipment proposed by Contractor in accordance with the Contract Documents, but subject to the provisions of applicable standards of state or local government entities. The Consultant will provide the CITY with the recommendation as to the acceptability of the substitute or "or-equal" materials and equipment, but the City shall make the final approval or disapproval of the substitute "or-equal".
- 8) Inspections and Tests. Consultant may make recommendations for special inspections or tests of Contractor's work to the City, and may receive and review certificates of inspections within Consultant's area of responsibility or of tests and approvals required by laws and regulations or the Contract Documents. The Consultant shall not provide the inspections or tests, however. Consultant's review of such certificates will be for the purpose of determining that the results certified indicate compliance with the Contract Documents and will not constitute an independent evaluation that the content or procedures of such inspections, tests, or approvals comply with the requirements of the Contract Documents. CONSULTANT shall be entitled to rely on the results of such tests and the facts being certified. The CITY shall make all decisions and/or approvals/disapprovals regarding inspections and tests.
- 9) Disagreements between the City and Contractor. Consultant will, if requested by the City, prepare recommendations for a written decision on claims of the City and Contractor relating to the acceptability of Contractor's work or the interpretation of the requirements of the Contract Documents pertaining to the progress of Contractor's work for the City's review and approval.
- 10) Applications for Payment. Based on its observations and on review of applications for payment and accompanying supporting documentation, Consultant will determine the amounts that Consultant recommends for Contractor payment. Such recommendations of payment will be in writing and will constitute Consultant's representation to the City, based on such observations and review, that, to the best of Consultant's knowledge, information and belief, Contractor's work has progressed to the point indicated and that such work-in-progress is generally in accordance with the Contract Documents subject to any qualifications stated in the recommendation. In the case of unit price work, Consultant's recommendations of payment will include assessments of quantities and classifications of Contractor's work, based on observations and measurements of quantities provided with pay requests by the Contractor. However, it will be the Contractor's responsibility to determine the quantities and the Consultant's responsibility to review the Contractor's quantities.

By recommending any payment, Consultant shall not thereby be deemed to have represented that its observations to check Contractor's work have been exhaustive, extended to every aspect of Contractor's work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Consultant in this Scope. It will also not impose responsibility on Consultant to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, nor to determine that title to any portion of the work in progress, materials, or equipment has passed to the City free and clear of any liens, claims, security interests, or encumbrances, nor that there may not be other matters at issue between the City and Contractor that might affect the amount that should be paid.

11) Substantial Completion. Consultant will, promptly after notice from Contractor that it considers the entire Work ready for its intended use, in company with the City and Contractor, conduct a site visit to determine if the Work is substantially complete. Work will be considered substantially complete following satisfactory completion of all items with the exception of those identified on a final punch list. If after considering any objections of the City, CONSULTANT considers the Work substantially complete, Consultant will notify the City and Contractor.

12) Final Notice of Acceptability of the Work. Consultant will conduct a final site visit to determine if the completed Work of Contractor is generally in accordance with the Contract Documents and the final punch list so that Consultant may recommend, in writing, final payment to Contractor. Accompanying the recommendation for final payment, Consultant shall also provide a recommendation that the Work is generally in accordance with the Contract Documents to the best of Consultant's knowledge, information, and belief based on the extent of its services and based upon information provided to Consultant upon which it is entitled to rely. The City and the Consultant shall make the final determinations regarding the acceptability of the work and shall issue any final notice of acceptability (as described above).

13) Limitation of Responsibilities. Consultant shall not be responsible for the acts or omissions of any Contractor, or of any of their subcontractors, suppliers, or of any other individual or entity performing or furnishing the Work. Consultant shall not have the authority or responsibility to stop the work of any Contractor.

It is understood that review of shop drawings, monthly pay applications, and minor dispute resolutions will be incorporated into the construction observation time referenced above. Non-scheduled observation days shall be considered additional services. Development of designs for project changes, claims, and/or dispute resolution requiring mediation or use of non-scheduled observation days shall be considered additional services.

#### Construction Phase Services; Means and Methods

The CONSULTANT shall have no responsibility for any contractor's means, methods, techniques, equipment choice and usage, sequence, schedule, safety programs, or safety practices, nor shall Consultant have any authority or responsibility to stop or direct the work of any contractor. The Consultant's visits will be for the purpose of endeavoring to provide the City a greater degree of confidence that the completed work of its contractors will generally conform to the construction documents prepared by the Consultant. Consultant neither guarantees the performance of contractors, nor assumes responsibility for any contractor's failure to perform its work in accordance with the contract documents. The CITY agrees that each contract with any contractor shall state that the contractor shall be solely responsible for job site safety and for its means and methods.

#### Tasks to be Completed by the City

- Arrange and schedule the City Council or other public meeting
- Secure all easements
- Provide timely review of all submittals
- Manage bid process and secure a contractor to construct the project
- Provide all necessary signatures and application fees for permitting
- Provide the information specified above

#### Information Provided By the City

The following information shall be provided by the City. We shall be entitled to rely on the completeness and accuracy of information provided by the City.

- Notice to proceed
- Files, reports, and other existing documents that relate to the project
- Existing hydrologic and hydraulic models
- Other information specified above

#### Deliverables by Consultant

- Monthly Invoices and Status reports
- Survey data of project area
- Preliminary Design Report
- 60% Drawings
- 404/401 Permit Application
- Flood Impact Assessment/No Impact Certification Documentation
- S&EC Permit Application
- Construction Drawings
- Construction Documents and special provisions

#### Additional Services

Any services not specifically provided for in the above scope will be billed as additional services and performed at our then current hourly rates.

#### Fee and Billing

Based on the above Scope of Services Tasks 1 through 2 and 4 through 8 will be completed for a lump sum fee (labor, expenses, and sub-contractors) of **\$262,089**.

CONSULTANT will provide Tasks 3 and 9, and any additional services, on a cost plus max labor fee plus expense basis. The estimated labor fee for Task 3 and 9 is **\$77,895**. Labor fee will be billed according to our then current rate schedule, which is subject to annual adjustment. As to these tasks, direct reimbursable expenses such as express delivery services, fees, air travel, and other direct expenses will be billed at 1.15 times cost. An amount will be added to each invoice to cover certain other expenses as to these tasks such as in-house duplicating, local mileage, telephone calls, facsimiles, postage, and word processing. Administrative time related to the project may be billed hourly.

All permitting, application, and similar project fees will be paid directly by the Client.

Fees and expenses will be invoiced monthly based, as applicable, upon the percentage of services performed or actual services performed and expenses incurred as of the invoice date. Payment will be due within 25 days of your receipt of the invoice.

ACCEPTED:

KIMLEY-HORN AND ASSOCIATES, INC.

BY: \_\_\_\_\_

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_



Jennifer Murphy, PE  
**Kimley Horn**  
421 Fayetteville Street, Suite 600  
Raleigh, N.C. 27601

Subject:  
Greensboro Arboretum Stream Survey  
Guilford County, North Carolina

Ms. Murphy:

CH Engineering is pleased to provide this proposal for subsurface utility mapping and Quality Level B SUE designating on the above referenced project. CH Engineering understands that the purpose of these requested services is to map the underground utilities inside the provided project limits.

The term “designate” in this scope of services means to indicate the presence and approximate horizontal location of underground utilities utilizing the application and interpretation of surface geophysical techniques, which include, but are not limited to, electromagnetic, magnetic, and ground penetrating radar methods.

#### **Description and Limits of Project:**

The project is in Lindley Park in Greensboro, North Carolina. The proposed project limits contain approximately eight (8) acres as shown outlined in red on the attached **Exhibit**. Approximately, 2100 feet of the northwest Right-of-Way of Wendover Avenue West is shown within the project limits. Streetlighting and an above ground pad mounted transformer were found indicating the presence of primary and secondary underground power facilities in this area. Approximately, 120 feet of the north Right-of-way of Walker Avenue is included as shown within the project limits near the large box culvert. Utility poles contain power and communication line drops in and outside of the project in this area. A gas line may be present along the northside of Walker Avenue. Approximately, 2,000 feet of the park path is shown within the northwest side limit of the project. Multiple irrigation control boxes were discovered along the path. There is Aerial piping crossing North Buffalo Creek that may be part of the irrigation system. Additional utilities such as power and communication may service the Gazebo. A manhole was found with a water manhole lid which may indicate that a significant size waterline may be running through the Park and under Wendover Avenue. Exposed PVC piping was discovered running below the top of bank near the large box culvert at the southern end of the project.

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Our ref:  
Greensboro Arboretum  
SUE Services

## Scope of Services:

### Utility Mapping and Quality Level B SUE designating Services:

- Determine which equipment, personnel and supplies are required to perform mapping services.
- Conduct appropriate records research and investigate site conditions along the entire project area as shown on the attached **Exhibit** map.
- Obtain data in accordance with the ASCE Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data (CI / ASCE 38-02).
- Translate utility data to the appropriate CADD format for direct incorporation of information into the design file.
- Depict non-conductive/ non-designatable utilities of record at their appropriate SUE Quality Level
  - Survey utility appurtenances, manholes, light poles, irrigation control valve boxes, electric meters, utility poles, other on-site and off-site utility structures and additional utility information that can be observed from the surface.
  - Correlate utility owner records to the surveyed data. Plot utility horizontal locations as supplied by and interpreted from utility owners' records into CADD file.
  - Review depicted information for accuracy, completeness, and reliability.
  - Survey utility poles, show connectivity, and record pole data along Walker Avenue as described above in the description and limits of the project. Approximately, seven (7) utility poles have been identified.

### For Level of Service B data:

- Designate existing utilities that are within project limits utilizing appropriate surface geophysical methods such as radio-frequency electromagnetic, magnetic, direct connection, clamping, and/or terrain conductivity techniques. Utilities designated will include those that transmit a signal from Pipe and Cable Locators and Magnetic Locators. Underground utilities may be identified by following the signal to an above ground utility feature within and outside the project limits. Time will be allowed to access above ground utility structures such as irrigation control boxes and valves; water manholes; light poles and other on-site utility structures and exterior panel boxes and conduits to verify designated marks through direct connection and clamping.
- Other surface geophysical methods, such as ground penetrating radar for utility detection will be used, as appropriate, to discriminate between and detect specific underground facilities. The effectiveness of ground penetrating radar varies by location. Highly conductive soil materials such as clay and salt contaminated soils limit performance of ground penetrating radar. It is recommended that ground penetrating radar be used during a dry season. Small diameter (1" to 6") non-conductive material such as polyvinyl chloride (PVC), polyethylene (PE), high-density polyethylene (HDPE) and larger diameter non-conductive materials **may not** be found without a trace wire and/or while performing designating with ground penetrating radar.
- CH Engineering **will not** enter permit required confined spaces; unless requested (time will be allowed to contact utility owner and/or sub-contractor to dewater the space, provide safety equipment, and perform continuous

atmosphere testing for safe entry). CH Engineering will open the access point to use telescoping poles to clamp or direct connect to utilities from the surface. CH Engineering may use 1.5" PVC tubing to guide steel trace wire into individual empty conduits and other utility systems to determine direction. Size and material of services may be difficult to verify inside underground vaults and manholes due to the position of the access point, depth of the structure, and size of the structure. Additional time will be included in the fee to perform this task.

- Prepare appropriate field sketches of marked utilities and survey designated marks (i.e. paint), which shall be referenced to project control either set by CH Engineering, PLLC or provided by Site Owner. CH Engineering will process and reduce collected survey field data to coordinates and plot points and utility line work in CADD.
- Compare survey information CADD file with information provided from field sketches/survey field notes and evaluate information in the field for accuracy and reliability.
- Review all information to account for any corrections noted from previous steps against a) records, b) field sketches, c) CADD drafting, d) field notes and e) utility owner correspondences. Depict non-conductive/non-designatable utilities of record at their appropriate SUE Quality Level.

**ACCURACY OF QUALITY LEVEL B SUBSURFACE DATA:** The accuracy of subsurface data (the position of the designating marks (i.e. paint)) can be influenced by factors beyond CH Engineering's control. The conductivity of material(s) of the utilities, their surroundings, moisture, proximity of other underground utilities, structures, and depth are the common factors. However, CH Engineering does carry professional liability insurance to cover negligent errors or omissions of its work product to the standard of care prevalent in the subsurface utility engineering and surveying profession. Markings placed on the ground by CH Engineering are not to be used for excavation purposes. The use of information provided by CH Engineering does not relieve any contractor from complying with utility damage prevention laws and regulations, including but not limited to, notifying utility owners, notifying Site Owners, and one-call centers.

### Assumptions and Statements

- CH Engineering assumes the following utilities will be encountered within the areas as shown on **Exhibit map**: electric, irrigation, water, communication (direct buried and conduit), gas, abandoned and unknown utilities.
- Kimley-horn will assist with obtaining utility record drawings and provide available shapefiles, pdf's, etc. of all available record information.
- Portions of the irrigation system **may not** be mapped without utility record drawing information and buried irrigation control wiring such as laterals and piping to sprinkler heads, etc.
- Quality Level A Locating (test holes) **is not** part of the scope and fee and will be considered additional services.
- Non-gravity storm and sanitary sewer is not part of this scope and will be included as a separate scope and fee under Conventional Survey Tasks.
- CH Engineering understands that several areas may be off limits to vehicles. Access to maintenance and service roads/paths may be needed.
- After evaluating the cost to complete the scope of work as shown above, it is more cost effective to have our field crews stay in Greensboro while completing this work, therefore expenses for hotels and per diem are included in the Lump Sum Fee as shown below.

## Deliverables

- Standalone SUE graphics file in AutoCAD to be merged into Final Survey File
- Pole data sheet

## Fees

A Lump Sum fee is proposed for the utility mapping and SUE Level B services as outlined above.

**Utility mapping and Quality Level B SUE Services: \$16,915.00**

## Schedule

CH Engineering will begin work within two days upon receipt of an approved and signed contract or notice to proceed.

## Liability Insurance

CH Engineering maintains liability insurance of \$1,000,000 professional liability for errors and omissions and is prepared to show proof of insurance upon request by the owner. We also maintain General Liability in the amount of \$2,000,000 with an aggregate of \$4,000,000. Please advise if you need copies of CH Engineering's insurance certificates for professional and general liability.

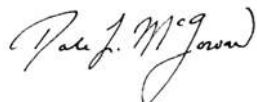
## DBE/WBE Certification

CH Engineering, PLLC is certified as a Disadvantaged Business Enterprise (DBE/WBE) with the North Carolina Department of Transportation, the City of Raleigh, Durham County, and the City of Durham, Triangle Transit Authority, Raleigh-Durham Airport, County of Charleston, SC, City of Charleston, SC and the South Carolina Department of Transportation DBE Unified Program. CH Engineering is also HUB certified as a Woman Owned Business Enterprise. CH Engineering is available and dedicated to serve its clients with experienced professionals in all facets a project may require.

## Terms of Payment

Invoices shall be submitted monthly for services rendered based on percent complete. After receipt of CH Engineering's invoice each month, client pledges to process payment to CH Engineering within 7 days from receipt of invoice.

Sincerely,



\_\_\_\_\_  
Dale L. McGowan, P.L.S  
SUE Manager

\_\_\_\_\_  
1/02/2020

\_\_\_\_\_  
Date

This proposal and its contents shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate the proposal. This proposal is not intended to be binding or form the terms of a contract. The scope and price of this proposal will be superseded by the contract. If this proposal is accepted and a contract is awarded to CH Engineering, PLLC as a result of—or in connection with—the submission of this proposal, CH Engineering, PLLC and/or the client shall have the right to make appropriate revisions of its terms, including scope and price, for purposes of the contract. Further, client shall have the right to duplicate, use, or disclose the data contained in this proposal only to the extent provided in the resulting contract.



# Exhibit

Greensboro Arboretum Survey Limits

## Legend

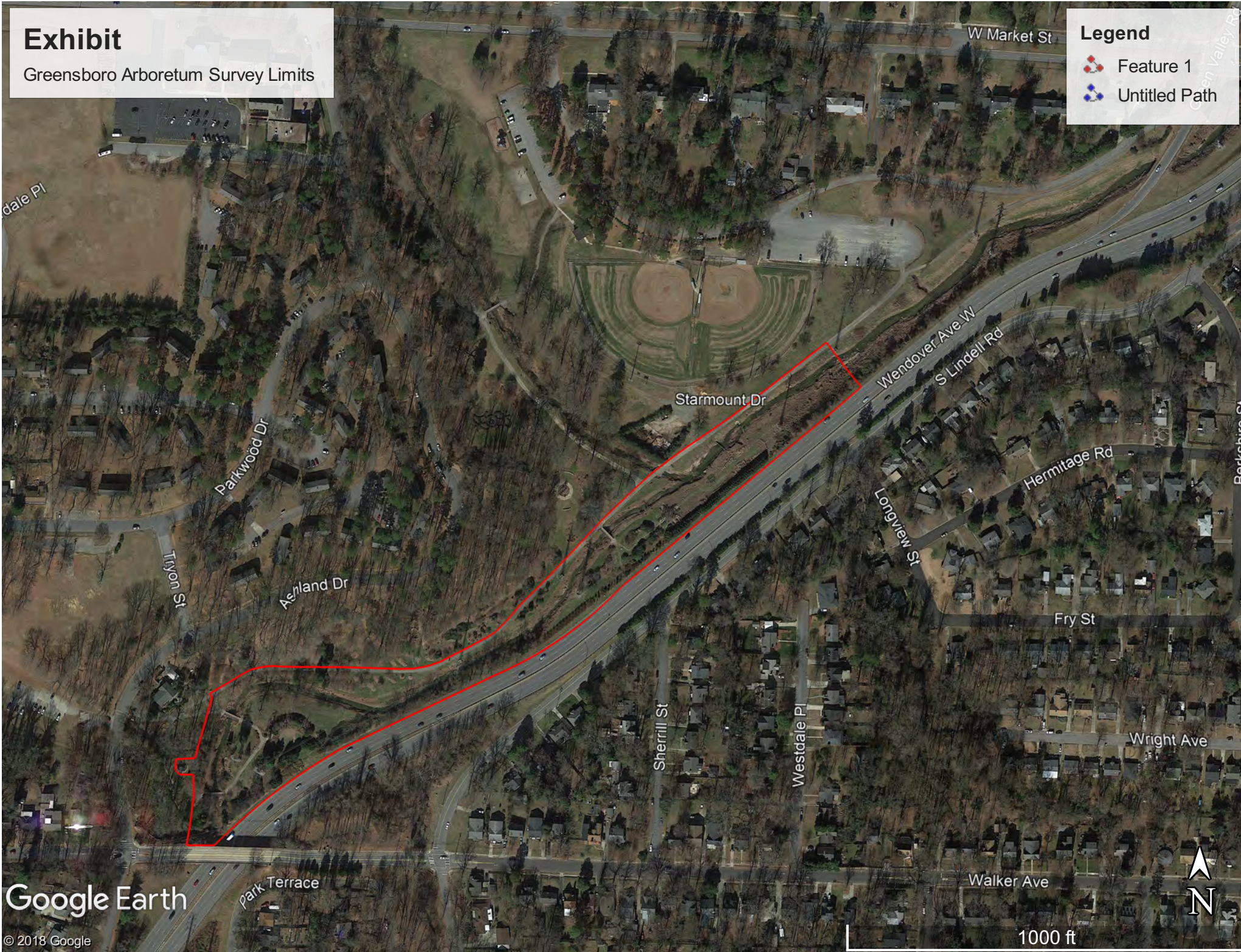
- Feature 1
- Untitled Path

Google Earth

© 2018 Google



1000 ft







CH Engineering, PLLC  
WBE Certified  
3220 Glen Royal Road  
Raleigh, NC 27617  
Tel 919 788 0224  
Fax 919 788 0232  
www.ch-engr.com

Jennifer Murphy, PE  
**Kimley Horn**  
421 Fayetteville Street, Suite 600  
Raleigh, N.C. 27601

Subject:  
Greensboro Arboretum Stream Survey  
Guilford County, North Carolina

Ms. Murphy:

CH Engineering is pleased to provide this proposal for surveying services on the above referenced project.

It is our understanding the purpose of this proposal is to provide a topographic and planimetric survey at Lindley Park/ Greensboro Arboretum site in Greensboro, North Carolina. The proposed survey limits contain approximately eight (8) acres as shown outlined in red on the attached **Exhibit**.

### **Survey Limits**

The proposed survey limits are shown outlined in red on the **Exhibit**.

### **Scope of Work – Task No. 1 - Aerial Mapping**

- 1) CH Engineering will establish North Carolina State Plane Coordinates on four (4) GPS point at the project site. The Horizontal datum (NAD 83/2011) adjustment for this project will be based on the North Carolina State Plane Coordinate System. The Vertical datum for this project will be based upon the NAVD 88 vertical datum. These proposed GPS control points will be established using a 24"- 5/8" rebar or other suitable material and witnessed with a 36" wooden stake marked with the point number designation.
- 2) Conventional project control points will be established for approximately 3,200 feet of conventional baseline traverse. These conventional control points will serve as the basis for all locations described below. These points will be established using a 12" bridge spikes or other suitable material and witnessed with a 36" wooden stake marked with the point number designation.

Date:  
2 January 2020

Contact:  
Jeff Munn, PLS

Phone:  
919.788-0224  
Ext. 5469

E-mail:  
jmun@munn@ch-engr.com

Our ref:  
Greensboro Arboretum  
Stream Survey

- 3) Provide three (3) temporary benchmarks set at approximately 1,000 foot intervals throughout the project limits.
- 4) Differential levels will be used to establish the NAVD '88 elevations on the proposed conventional project control points and the proposed temporary benchmarks.
- 5) CH Engineering will team with Spatial Data Consultants, Inc. from High Point, North Carolina to provide aerial mapping services using UAV technology. Spatial Data Consultants will provide color aerial photography and aerial mapping containing the visible planimetric features and lidar based topographic features for the visible above ground features for the survey limits as described above.
- 6) Spatial Data Consultants will install approximately six (6) aerial control panels. CH Engineering's conventional survey crews will establish the Localized North Carolina State Plane Coordinates for the proposed aerial control panels to enable Spatial Data Consultants to produce the final aerial mapping deliverables.
- 7) Once the aerial mapping is completed and delivered to CH Engineering, the aerial mapping data will be merged with the conventional survey data in auto-cad format at thirty (30) scale as defined by Kimley Horn.

#### **Scope of Work – Task No. 2 - Conventional Survey**

- 8) Property research will be completed for approximately twenty (20) parcels that are within or adjacent to the above described survey limits. Copies of the current deeds, plats, right of way documents and easement documents related to the parcels will be obtained for the records that can be found by searching the Guilford County Register of Deeds Office. CH Engineering will not be held liable for any records not found pertaining to land rights that a title opinion may reveal for the parcels involved.
- 9) Property ties will be completed for only one parcel, the Lindley Park parcel, only the portion of the existing park boundary lying adjacent to the western right of way of Wendover Avenue will be mapped in the base mapping files. These parcels as drawn should not be considered as full boundary surveys. Property corners will be searched for and located if found, these found corners will be used as the basis for the parcels as plotted or mapped by using the found deed and plat references as described above. These parcels as drawn should not be considered as complete or full boundary surveys.
- 10) Provide planimetric and topographic survey information along North Buffalo Creek within the survey limits using conventional survey methods to provide the following: top of bank, bottom of bank, centerline of creek or stream or thalweg location, major changes in slope of stream or creek bank, such as eroded areas, rock outcroppings within the stream bed and other surface break line features needed to accurately depict the stream or creek channel, ground shots at sufficient intervals will be obtained outside the stream or creek channel to accurately depict the contours drawn at a one foot contour interval.

- 11) Provide planimetric survey information for the areas considered as obscured in the aerial mapping as defined by Spatial Data Consultants, the following features will be included: roads, driveways, sidewalks, buildings, structures, finished floor elevations for the first floor of any permanent structures, parking areas, existing pedestrian bridges, visible gravity underground utilities, visible storm structures, aerial sewer pipe crossings, aerial sewer concrete piers, visible sanitary sewer manholes, inverts, pipe sizes and material types will be obtained if field accessible, headwalls, culverts, fences, signs, greenway trails, guardrails, retaining walls and other visible above ground improvements within the survey limits. The overhead utility features will be located and approximate height or sag point of the lowest utility line will be provided.
- 12) Provide tree locations for the existing trees 12" inches or larger within twenty feet of the existing stream banks. In other areas, the existing wood lines will be located, mulched areas or landscaped beds will be located or outlined, trees, bushes or plants will not be located in these mulched or landscaped areas.
- 13) Base mapping will be provided in Auto-cad format at thirty (30) scale as defined by Kimley Horn.

### **Deliverables**

- Provide a base mapping file in Auto-cad format depicting the items as shown in the scope of work above.
- Provide an XML file of the DTM or Tin file used to depict the contours as shown in the base mapping file.
- Provide a text file containing the X,Y and Z of the actual surveyed points.
- Provide a PDF of the survey base drawing signed and sealed by a North Carolina Licensed Land Surveyor.

### **Assumptions**

- **After evaluating the cost to complete the scope of work as shown above, it is more cost effective to have our field crews stay in Greensboro while completing this work, therefore expenses for hotels and per diem is included in the Lump Sum Fee as shown below.**
- **Minimal line cutting or clearing will be required to complete the scope of work as described above. No cutting or line cutting will be done in the planted or mulched areas if possible.**
- **Providing individual tree locations are only included for the areas within twenty feet of the top of bank of North Buffalo Creek. Providing tree, bush or plant locations will not be provided in the landscaped areas and will be considered as additional services if requested.**



- **Property owner contacts are not required since the City of Greensboro owns the park property.**
- **Providing SUE Level B non-gravity utility surveys is not a part of this scope of work and will be provided in a separate proposal provided by the SUE department at CH Engineering.**
- **Providing easement mapping or plats and preparing written legal descriptions is not a part of this scope of work and will be considered as additional services if requested.**
- **Providing wetland flag location surveys is not a part of this scope of work and will be considered as additional services if requested.**
- **Providing construction staking for future site improvements is not a part of this scope of work.**
- **Providing post construction as-built surveys is not a part of this scope of work and will be considered as additional services if requested.**

## **Fees**

The lump sum fees for the scope of work as described above are as follows:

**Lump Sum Fee Task No. 1 - \$ 14,979.00**

**Lump Sum Fee Task No. 2 - \$ 49,522.00**

## **Schedule**

CH Engineering will begin work within approximately one week upon receipt of an approved and signed contract or a notice to proceed.

## **DBE/WBE Certification**

CH Engineering, PLLC is certified as a Disadvantaged Business Enterprise (DBE/WBE) with the North Carolina Department of Transportation, the City of Raleigh, Durham County, and the City of Durham, Triangle Transit Authority, Raleigh-Durham Airport, County of Charleston, SC, City of Charleston, SC and the South Carolina Department of Transportation DBE Unified Program. CH Engineering is also HUB certified as a Woman Owned Business Enterprise. CH Engineering is available and dedicated to serve its clients with experienced professionals in all facets a project may require.

## **Liability Insurance**

CH Engineering maintains liability insurance of \$1,000,000 professional liability for errors and omissions and is prepared to show proof of insurance upon request by the owner. We also maintain General Liability in the amount of \$2,000,000 with an aggregate of \$4,000,000. Please advise if you need copies of CH Engineering's insurance certificates for professional and general liability.

## Terms of Payment

Invoices shall be submitted on a monthly basis for services rendered based on percent complete. After receipt of CH Engineering's invoice each month, owner pledges to process payment to CH Engineering within 7 days from receipt of invoice.

Sincerely,



1/2/2020

Jeff Munn, PLS Asst. Survey Manager – CH Engineering - Date

Accepted by,

Kimley-Horn

Authorized Signature

Date

This proposal and its contents shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate the proposal. This proposal is not intended to be binding or form the terms of a contract. The scope and price of this proposal will be superseded by the contract. If this proposal is accepted and a contract is awarded to CH Engineering, PLLC as a result of—or in connection with—the submission of this proposal, CH Engineering, PLLC and/or the client shall have the right to make appropriate revisions of its terms, including scope and price, for purposes of the contract. Further, client shall have the right to duplicate, use, or disclose the data contained in this proposal only to the extent provided in the resulting contract.



# Exhibit

Greensboro Arboretum Survey Limits

W Market St

## Legend

- Feature 1
- Untitled Path

dale Pl

Troy St

Parkwood Dr

Aspland Dr

Sherrill St

Starmount Dr

Westdale Pl

Longview St

Wendover Ave W  
S Lindell Rd

Hermitage Rd

Fry St

Berkshire St

Google Earth

© 2018 Google

Park Terrace

Walker Ave

Wright Ave

1000 ft





January 8, 2020

Ms. Jennifer Murphy, PE  
Kimley-Horn  
421 Fayetteville Street  
Suite 600  
Raleigh, NC 27601

**Subject: Professional Engineering Services for  
Stream Restoration - Arboretum**

Dear Ms. Murphy:

CriTek Engineering Group, P.C. (CriTek), at your request, is pleased to submit this proposal for engineering services for the Arboretum Stream Restoration in the City of Greensboro. CriTek has put together a team of professionals, of which have significant experience working on similar projects, to complete the work on the project

A scope of work is attached to provide more detail on the engineering scope, and the fee for our services. CriTek appreciates the opportunity to work with Kimley-Horn and the City of Greensboro towards the successful completion of this project. If you have any questions, or need additional assistance, please do not hesitate to call.

Very truly yours,

**CriTek Engineering Group**



J. Dawayne Crite, PE  
President  
GSO.2020.04



## **EXHIBIT A**

### **SCOPE OF WORK**

#### **PROJECT DESCRIPTION**

Based on initial discussions with Kimley-Horn, Inc. the project is anticipated to include erosion and sediment control permit preparation and construction observation for stormwater improvements for the Arboretum Stream Restoration project located at 401 Ashland Drive in Greensboro, North Carolina. The detailed scope of services for the basic services follows:

#### **Task 1: Sedimentation and Erosion Control Plan**

CriTek shall package and submit the Sedimentation and Erosion Control Plan for the project to the NCDEQ – Division of Energy, Mineral, and Land Resources (DEMLR). Throughout final design and permitting phase, CriTek will maintain regular contact with Kimley-Horn staff to ensure that the required information is reflected in the plan prior to submittal to NCDEQ.

The following assumptions were made during development of this Scope of Work:

- Kimley-Horn will provide CriTek with all necessary calculations used for the design of sedimentation and erosion control features (such as coir matting weight selection, dissipator sizing, diversion ditch sizing, temporary culvert sizing, etc.).
- Kimley-Horn will provide CriTek with all drawings, specifications and any other necessary permits (such as no rise certification, 404/401)
- Temporary and permanent (if required) erosion and sediment control features shall be design by Kimley-Horn or others.
- No more than two submittals to the NCDEQ – Division of Energy, Mineral, and Land Resources (DEMLR) will be required for erosion and sedimentation control approval.
- All other local, state and federal permits will be provided by others.
- The City of Greensboro will be responsible for paying all permitting fees to the respective agency.
- CriTek will prepare non-technical features of the Sedimentation and Erosion Control Plan such as any associated reports, narrative and maps (i.e. vicinity map, USGS quad map, soils).
- CriTek will obtain the appropriate signatures for the Financial Responsibility and Ownership Form
- CriTek will communicate directly with NCDEQ and respond to questions as it relates to the Plan.

**Deliverable(s):** CriTek will prepare and submit the following documents as described above and listed below:

- One (1) complete Sedimentation and Erosion Control Plan application to NCDEQ.

#### **Task 2: Construction Administration Services**

CriTek shall observe construction operations performed by the contractor at intervals necessary to monitor, record and review the contractor's compliance with the contract documents and progress schedule.

#### **Assumptions**

The following assumptions were made during development of this Scope of Work:

- Kimley-Horn will provide CriTek with a copy of the contract documents in hard copy print and PDF format.
- 100 hours for Tasks 2.

**Task 3: Meeting Attendance**

CriTek shall attend regular monthly design meetings with Kimley-Horn and the City of Greensboro attend regular design meetings

**SCHEDULE**

The tasks outlined above will be initiated within one week of a Notice to Proceed from Kimley-Horn. It is assumed that work for Task 3 will be performed within the 2020 calendar year, with work for Task 1 and 2 beginning and concluding in year 2021.

**STAFFING AND COORDINATION**

CriTek will perform work as a sub-consultant under the guidance of Kimley-Horn. CriTek will work directly with Kimley-Horn and their representatives to perform the scope of work. During preliminary and final design.

**PAYMENT FOR SERVICES**

For the Basic Services described above Kimley-Horn agrees to pay CriTek on a Time and Material Basis, Not-to-Exceed Twenty-Seven **Thousand Eight Hundred Dollars and Zero Cents (\$27,800.00)**. CriTek shall be paid monthly on the basis for the hours recorded by CriTek at the rates listed below. CriTek shall be paid for all invoices within 30 days of submittal to Kimley-Horn.

- Task 1 Fee = \$11,350.00
- Task 2 Fee = \$13,000.00
- Task 3 Fee = \$3,450.00

**Rates:**

- Sr. Project Manager: \$220
- Resident Project Representative: \$115
- Administration: \$65

## Hill, Johnnie

---

**From:** Jeremy Hamm <jhamm@falconengineers.com>  
**Sent:** Monday, December 23, 2019 9:27 AM  
**To:** Murphy, Jennifer  
**Subject:** RE: Geotech Sub needed in Greensboro

Jennifer,

Sorry it took me a little longer than planned to get back around to this. For the project as you have described, I would just propose two hand auger borings. We will put together a simple letter report with recommendations for the wall including design parameters. I assume the wall will either be designed by KHA or specified as a segmental wall with contractor deferred design. **Our fee will be \$3,500.**

If you need anything else from me to move forward with at this point let me know.

Thanks and Happy Holidays!

**JEREMY R. HAMM, PE**

GEOTECHNICAL SERVICES MANAGER

P: 919-302-9758

E: [JHAMM@FALCONENGINEERS.COM](mailto:jhamm@falconengineers.com)

---

**From:** Murphy, Jennifer <jennifer.murphy@kimley-horn.com>  
**Sent:** Tuesday, December 17, 2019 3:00 PM  
**To:** Jeremy Hamm <jhamm@falconengineers.com>  
**Subject:** RE: Geotech Sub needed in Greensboro

Good question – no I don't think we'll need borings outside of the wall borings. I also don't anticipate needing grain size distribution for this project.

thanks!

**Jennifer Murphy, P.E. (NC, VA)**

**Kimley-Horn** | 421 Fayetteville Street, Suite 600, Raleigh, NC 27601

Direct: 919 677 2072 | Mobile: 479 530 7259 | Main: 919 677 2000

---

**From:** Jeremy Hamm <[jhamm@falconengineers.com](mailto:jhamm@falconengineers.com)>  
**Sent:** Tuesday, December 17, 2019 1:39 PM  
**To:** Murphy, Jennifer <[jennifer.murphy@kimley-horn.com](mailto:jennifer.murphy@kimley-horn.com)>  
**Subject:** RE: Geotech Sub needed in Greensboro

Thank you, that's plenty to scope retaining wall services, but did you also want borings at some regular spacing along the stream corridor for general subsurface?

Any particular lab testing needs? In particular, grain size distribution (possibly including hydrometer for fines fractions) may be relevant to stream restoration work.

**JEREMY R. HAMM, PE**

GEOTECHNICAL SERVICES MANAGER

P: 919-302-9758

E: [JHAMM@FALCONENGINEERS.COM](mailto:JHAMM@FALCONENGINEERS.COM)

---

**From:** Murphy, Jennifer <[jennifer.murphy@kimley-horn.com](mailto:jennifer.murphy@kimley-horn.com)>  
**Sent:** Tuesday, December 17, 2019 11:46 AM  
**To:** Jeremy Hamm <[jhamm@falconengineers.com](mailto:jhamm@falconengineers.com)>  
**Subject:** RE: Geotech Sub needed in Greensboro

Hey Jeremy!

I talked to Jeff, what I'd like to do is give you some additional specifics so that you can put together a scope and fee that I can submit with our scope to the City. And as I mentioned before, this is for budgeting purposes only and we will do a final scope and fee with you once we determine exactly what we need.

I'd like to assume we would need 2 borings for a retaining wall recommendation, the wall being 4' or shorter and under 100 linear feet. Is that enough for you to prepare something as an estimate?

thanks!

**Jennifer Murphy, P.E. (NC, VA)**  
**Kimley-Horn** | 421 Fayetteville Street, Suite 600, Raleigh, NC 27601  
Direct: 919 677 2072 | Mobile: 479 530 7259 | Main: 919 677 2000

---

**From:** Jeremy Hamm <[jhamm@falconengineers.com](mailto:jhamm@falconengineers.com)>  
**Sent:** Wednesday, December 11, 2019 3:27 PM  
**To:** Murphy, Jennifer <[jennifer.murphy@kimley-horn.com](mailto:jennifer.murphy@kimley-horn.com)>  
**Subject:** RE: Geotech Sub needed in Greensboro

Hi Jennifer,

We would be glad to help you out. I will make sure and tell Jeff thanks next time I speak with him. However I think it will be hard to accurately scope/estimate at this point without some more information. If you have an idea of what we should assume for wall length/height, how many borings and what depths for the stream restoration, and any other assumptions I can certainly come up with something at least for a budgetary basis. It seems like we would be better off waiting to establish a contractual scope and fee until you get further into design and can determine what geotechnical services you need.

Let me know how you would like to proceed.

Thanks,  
**JEREMY R. HAMM, PE**  
**GEOTECHNICAL SERVICES MANAGER**  
P: 919-302-9758  
E: [JHAMM@FALCONENGINEERS.COM](mailto:JHAMM@FALCONENGINEERS.COM)

---

**From:** Murphy, Jennifer <[jennifer.murphy@kimley-horn.com](mailto:jennifer.murphy@kimley-horn.com)>  
**Sent:** Wednesday, December 11, 2019 7:56 AM  
**To:** Jeremy Hamm <[jhamm@falconengineers.com](mailto:jhamm@falconengineers.com)>  
**Subject:** Geotech Sub needed in Greensboro

Hello Jeremy!

Jeff Wilson passed along your contact information. I am scoping a stream restoration project for the City of Greensboro Water Resources department. I'd like to include some scope and a fee estimate for a few borings in the project area and potentially some retaining wall design, in the event we need a wall in or near the stream. I'm looking to provide a scope and fee estimate to the city by the end of next week if that is possible. I have attached the survey map so you can see the project area. It is located within the Greensboro Arboretum at 401 Ashland Drive.

The contract will have to go through the MWBE office and then to council, and we would be at least part way through design before determining if/when we need geotechnical services so that would be at least probably 6 months from now.

I'm in the field today but back this afternoon, please let me know what questions you have and if you could provide these services!

Thank you!

**Jennifer Murphy, P.E. (NC, VA)**

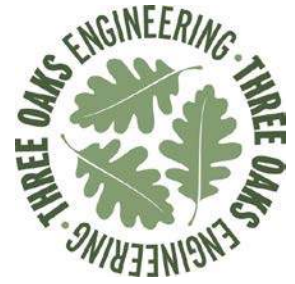
**Kimley-Horn** | 421 Fayetteville Street, Suite 600, Raleigh, NC 27601

Direct: 919 677 2072 | Mobile: 479 530 7259 | Main: 919 677 2000

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The electronic files ("Files") furnished by Kimley-Horn to the intended receiver of the Files ("Receiving Party") are provided only for the convenience of Receiving Party and only for its sole use. Receiving Party agrees that it shall be bound by and subject to the terms of this notice.

For any signed and sealed plans or final deliverables, if there are discrepancies between the Files and the hardcopy of the Files prepared by Kimley-Horn, the hardcopy shall govern. Only printed copies of such documents conveyed by Kimley-Horn may be relied upon. Any use of these electronic Files will be at the Receiving Party's sole risk. Receiving Party accepts the Files on an "as is" basis with all faults.



**Three Oaks Engineering, Inc.**  
324 Blackwell Street, Suite 1200  
Durham, NC 27701  
(919) 732-1300

**DRAFT Scope of Services**  
**Greensboro Arboretum Stream Restoration Project**  
**Greensboro, Guilford County, North Carolina**

Three Oaks Engineering, Inc. (Three Oaks) will perform tasks associated with protected species surveys and associated documentation/concurrence; terrestrial community identification; riparian buffer assessment; completion of a jurisdictional wetland and stream delineation; preparation of a Preliminary Jurisdictional Determination (PJD) Package and site visit with regulatory agencies; and permitting and buffer authorization for the proposed Greensboro Arboretum Stream Restoration Project. This project is being coordinated by the City of Greensboro Water Resources Department and is located at the Greensboro Arboretum, 401 Ashland Drive, in Greensboro, North Carolina. Three Oaks will be working as a sub-consultant to Kimley-Horn and Associates, Inc. (Kimley-Horn). Please see the following task list for details regarding each task:

**Tasks 1- 9 listed below will also appear on the cost estimate spreadsheet:**

**1. Pre-Field Work**

Preparation for field work will include, but is not limited to:

- a) Review of project mapping;
- b) Creation of mapping for field work;
- c) Review of USDA-NRCS Soil Survey Mapping (<https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>);
- d) Review of NCDEQ-NCDWR Surface Water Classifications Map (<https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications>);
- e) and review of NCDEQ-NCDWR 303(d) files (<https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment/integrated-report-files>).

**2. Protected Species Surveys**

Three Oaks will survey for federally listed species associated with the project, which is in Guilford County. As of October 4, 2018, the USFWS lists the following species for Guilford County:

- a) Bald eagle
- b) Cape Fear shiner
- c) Roanoke logperch



- d) Atlantic pigtoe
- e) Schweinitz's sunflower
- f) Small whorled pogonia

Cape Fear shiner, Roanoke logperch, and Atlantic pigtoe are all designated by USFWS as “range-by-basin species” and this project is not within their ranges. Additionally, as of January 9, 2020, the USFWS Information for Planning and Consultation (IPaC) website (<https://ecos.fws.gov/ipac/>) does not list these species for this project. Therefore, surveys will not be required for these species. Surveys for bald eagle, Schweinitz's sunflower, and small-whorled pogonia will be performed during the appropriate survey windows. Travel associated with this field work will be included in this task (it is assumed that two separate visits will be required since the sunflower and pogonia survey windows do not overlap).

A memorandum outlining the results of the protected species assessment, along with information regarding the terrestrial communities and riparian buffers, will be completed.

The project will also be run through the N.C. Natural Heritage Program Data Explorer (<https://ncnhde.natureserve.org/>) and concurrence will be requested from USFWS, if required.

### **3. Terrestrial Communities and Riparian Buffer Assessment**

Three Oaks will assess and define terrestrial communities associated with the project. The observed species, dominant strata, and presence of invasive/exotic species will be documented for each community. Three Oaks will also assess riparian buffer widths and plant densities.

A memorandum outlining the results of the terrestrial communities and riparian buffer assessment, along with information on the protected species assessment, will be completed.

### **4. Protected Species, Terrestrial Communities, and Riparian Buffer Assessment Memorandum**

Data collected during Task 2 and 3 will be compiled into a Protected Species, Terrestrial Communities, and Riparian Buffer Assessment Memorandum. Internal quality assurance using three-signature sign-off by the preparer, technical reviewer, and quality assurance reviewer will be documented and provided with the DRAFT document. A FINAL Draft will be provided within one week of receipt of comments.

### **5. Jurisdictional Wetland and Stream Delineation**

Three Oaks will complete jurisdictional wetland and stream delineations for the subject project, utilizing stream determination methods prescribed by NCDWR and wetland determination methods prescribed by USACE (specifically the Eastern Mountains and Piedmont Regional Supplement, Version 2.0). Three Oaks will utilize sub-meter GPS units to locate the feature boundaries. Wetland points will be identified in the field using pink and black flagging and stream points will be identified with blue flagging. Travel associated with this field work will be included in this task.



## **6. Preparation of Preliminary Jurisdictional Determination (PJD) Package**

DRAFT and FINAL PJD packages will be prepared for the subject project. Internal quality assurance using three signature sign-off by the preparer, technical reviewer, and quality assurance reviewer will be documented and provided with the DRAFT PJD Package. The PJD package will include the following:

- a) A cover letter identifying all features located on the project site (and whether Jordan Lake Watershed riparian buffers apply to any features);
- b) Agent Authorization form;
- c) All necessary wetland and stream forms for each feature;
- d) NCSAM and NCWAM forms for each feature;
- e) Project mapping, including a Vicinity Map, Topographic Map, and Jurisdictional Features Map;
- f) And any agency-required forms, including a USACE Jurisdictional Determination Request form, USACE PJD form, USACE Preliminary ORM Data Entry form, and USACE Waters Upload Sheet.

GIS shapefiles and CAD files will also be created to depict all potential features within the project site.

## **7. Agency site visit**

The above PJD Package will be submitted to regulatory agencies and a site visit will be requested to verify the delineated features. Travel associated with the site visit will be included in this task.

## **8. Nationwide Permit Application and Riparian Buffer Authorization Application**

Three Oaks will assist Kimley-Horn in developing the appropriate permit drawings, impact calculations, type of impacts, length and time period of disturbance, etc. that are necessary for compiling the permit application. Three Oaks will also assist with determining which permits are required for the project (i.e. Section 404, Section 401, Jordan Lake Watershed Riparian Buffer Authorization, etc.). At this time, it is assumed that a Nationwide Permit will be required for the project. Other items required to submit a complete permit application, such as a stormwater management plan and/or relevant cultural resource data, will need to be provided to Three Oaks for inclusion in the application. Three Oaks also assumes that appropriate threatened and endangered species surveys have been completed for the project.

Three Oaks will compile the permit application using the NCDWR on-line Pre-Construction Notification (PCN) Form ([https://edocs.deq.nc.gov/Forms/Pre-Construction Notification Form](https://edocs.deq.nc.gov/Forms/Pre-Construction%20Notification%20Form)). A draft will be submitted to Kimley-Horn and the City of Greensboro for review prior to submission to regulatory agencies.

## **9. Project Management**

This will involve project coordination, project billing, and coordination with the City of Greensboro and Kimley-Horn.





### **Deliverables**

- Draft and Final GIS shapefiles
- Draft and Final CAD files
- Draft and Final Protected Species, Terrestrial Communities, and Riparian Buffer Assessment Memorandum
- Draft and Final Preliminary Jurisdictional Determination Package
- All field forms (originals)
- One copy of all field notes in pdf format
- Corrected GPS file
- Draft and Final Permit Application
- Permits received from regulatory agencies
- QA/QC forms with reviewer initials

### **Schedule**

- Date for DRAFT PJD package and Protected Species, Terrestrial Communities, and Riparian Buffer Assessment Memorandum submittal to Kimley-Horn and the City of Greensboro will be determined once NTP is confirmed
- Final PJD package and Memorandum submitted to regulatory agencies within 1 week of comments from Kimley-Horn and the City of Greensboro; Three Oaks will coordinate site visit
- PJD visit with USACE and NCDWR will be requested at time of PJD package submission; visit date will depend on agency availability
- DRAFT permit application will be prepared once all required attachments have been prepared
- FINAL permit application will be submitted to regulatory agencies once it is reviewed by Kimley-Horn and the City of Greensboro

# Three Oaks Engineering, Inc.

## Cost Estimate: Greensboro Arboretum Stream Restoration Project

Task		Senior Permit Specialist	Permit Specialist	Senior Environmental Scientist	Environmental Scientist					Total Man Hr	Total Man Day
TASKS											
1. Pre-Field Work					2.00					2.00	0.250
2. Protected Species Surveys				8.00	10.00					18.00	2.250
3. Terrestrial Communities and Riparian Buffer Assessment				2.00	2.00					4.00	0.500
4. Protected Species, Terrestrial Communities, and Riparian Buffer Assessment Memorandum				2.00	5.00					7.00	0.875
5. Jurisdictional Wetland and Stream Delineation				8.00	8.00					16.00	2.000
6. Preparation of PJD Package				3.00	12.00					15.00	1.875
7. Agency Site Visit					6.00					6.00	0.750
8. Nationwide Permit Application and Riparian Buffer Authorization Application		2.00	14.00							16.00	2.000
9. Project Management				3.00						3.00	0.375
		2.00	14.00	26.00	45.00					87.00	10.875
TOTAL MAN HOURS		2.00	14.00	26.00	45.00					87.00	
TOTAL MAN DAYS		0.250	1.750	3.250	5.625						10.875

CLIENT NAME: City of Greensboro

DATE: 1/9/2020

PROJECT: Greensboro Arboretum Stream Restoration Project

SIZE: 8.8 acres

COUNTY: Guilford

### PROJECT EXPENSES

SALARIES	MAN HOURS		HOURLY RATE	SALARY COSTS
Senior Permit Specialist	2.00	X	\$ 200.00	\$ 400.00
Permit Specialist	14.00	X	\$ 115.00	\$ 1,610.00
Senior Environmental Scientist	26.00	X	\$ 140.00	\$ 3,640.00
Environmental Scientist	45.00	X	\$ 95.00	\$ 4,275.00
TOTAL:				\$ 9,925.00

### DIRECT COSTS

Mileage:	464	@	\$0.600	\$278.40
Printing/copies:	60	@	\$0.04	\$2.40
Per diem	0	@		\$0.00
Misc:	(Sample containers, cooler, Ice, etc)			
Sample Shipping:	Overnight 10 Samples			
TOTAL:				\$ 280.80

PROJECT GRAND TOTAL: \$ 10,205.80