

Mr. Robert H. Bald, PE
Water Resources Department
City of Greensboro
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Subject: Proposal for Engineering Services
Hilltop Lift Station & Force Main Relocation
Preliminary & Final Design
Our ref: GRGRN110.D001
Date: November 24, 2015

NC Engineering License # C-1869
NC Surveying License # C-1869

Dear Mr. Bald:

ARCADIS is pleased to submit this proposal to provide engineering services for the Preliminary Design and Final Design Phases of the Hilltop Lift Station and Force Main Relocation improvements project. The design of these improvements will closely follow the recommendations made in the "Hilltop Lift Station Location Alternatives" report published in December 2014 and the "Hilltop Lift Station Siting Study" summary letter report published in May 2015.

ARCADIS will work with sub-consultants Davis-Martin-Powell and Associates, Inc. and S&ME, Inc. to perform these services. Spatial Data Consultants, Inc., Cartographic Aerial Mapping, Inc., J.C.Waller & Associates, PC, Sturgill Engineering, PA, and Engineered Concepts, Inc. will be second-tier subconsultants.

Separate proposals for Bidding Phase and the Construction Phase services will be submitted following completion of the Final Design Phase at the appropriate time.

Project Considerations

The Hilltop Lift Station (HLS) is nearing its capacity of 475 gpm due to ongoing development projects in the Hilltop drainage basin. To address this and future capacity concerns the City intends to locate a higher capacity lift station downstream of the existing HLS along Bull Run Creek just downstream of Sedgefield Lake. The drainage basin tributary to the new HLS is expected to have an average daily flow of 1.15 mgd and peak wet weather flow of approximately 2.8 mgd (1,950 gpm) by Y2050. The dry weather pump rate will be set at 1,250 gpm to maintain 2 fps velocity in the proposed force main and the wet weather pump rate will be set at the full 1,950 gpm to meet peak flow requirements. A

submersible triplex pump station arrangement will be used to handle the expected flow variations.

Along with a pumping capacity expansion, the HLS system will require increased capacity gravity sewer downstream of the existing station leading to the new station and a new force main to discharge into a short section of new gravity sewer connecting to the South Buffalo Outfall near I-40 and Bridford Parkway. The proposed gravity line tributary to the new HLS will consist of approximately 200 LF of 12-inch and 4,400 LF of 14-inch sewer. The proposed force main will be approximately 12,200 LF of 16-inch force main and will run generally along Bull Run Creek, Hilltop Road, and Bridford Parkway. The new force main would discharge into a proposed 1,200 LF section of 24-inch gravity sewer crossing the I-40 r/w leading to the South Buffalo Outfall. The existing HLS will be abandoned as a result of these improvements.

Preliminary and Final Design

Design services will begin with a preliminary design based on results of the Hilltop Lift Station location and Siting studies. The preliminary design phase will generally identify the “basis of design” for the Hilltop Lift Station (general lift station equipment, system, and operational improvements) and associate gravity sewer and force main (route, anticipated utility conflicts, property and regulatory concerns, etc.). This phase will generate preliminary drawings for the City’s approval.

During the final design phase of this project, detailed drawings and specifications, contract documents, and an estimate of the overall construction cost will be prepared and provided to the City. The design phase also includes a detailed quality assurance review by an experienced quality control engineer with ARCADIS. The design phase will conclude by addressing any comments received from the quality assurance review, the review with the City, and the review by regulatory agencies required for Authorization to Construct.

Specific tasks anticipated for these phases include the following:

Task A. Communications

1. Meet initially with the City to review and finalize design scope and mutually agreeable schedule.
2. Meet with City staff and officials and others throughout the design phase (particularly at approximately 30%, 60% and 90% completion as a minimum) and develop and distribute meeting minutes.

3. Communicate as needed with various project stakeholders (utility companies, regulatory agencies, etc.).

Task B. Survey

1. Surveying services will be provided in coordination with Davis-Martin-Powell. Spatial Data Consultants, Cartographic Aerial Mapping, Inc., and J.C. Waller and Associates will provide sub-consultant services to DMP.
2. Utilize horizontal survey control along the project route to Class AA boundary survey specifications as defined in the Standards of Practice for Land Surveying in North Carolina, NCAC Title 21, Chapter 56.1600 and based on NAD 83. The horizontal control survey will be coordinated with the City's Engineering and Inspections Department staff to facilitate their work in regard to additional horizontal control for property acquisition, and eventual construction staking.
3. Utilize vertical control along the project route to Class A vertical control survey specifications as defined in the Standards of Practice for Land Surveying in North Carolina, NCAC Title 21, Chapter 56.1600 and based on NAVD 88.
4. Notify potentially affected property owners 30 days prior to accessing their property.
5. Perform location surveys of planimetric features by aerial photography followed by ground survey to confirm location of existing objects at the lift station and in the force main construction corridor.
6. Develop topographic information at the lift station and along the proposed gravity sewer routes and force main route.
7. Locate buried utility designation markings within the project corridor and indicate those crossings as required. Locate conflicting utilities vertically based on vacuum excavations to expose the utilities.
8. Horizontally and vertically locate nearby sanitary and storm sewer structures needed to evaluate potential conflicts with sewers that cross the proposed utilities and any relevant features at the lift station (esp. to confirm vertical datum).

Task C. Preliminary Design

1. Refine the gravity sewer and force main routes proposed in the Location Alternatives report, based upon actual field conditions.
2. Determine, to the extent necessary for Preliminary Design, the pump station improvements required for the new station, including:
 - a. Confirming Lift Station site layout proposed in the Siting study report.

- b. Determining Control Building, wetwell, valve vaults, auxiliary power and other station features.
 - c. Confirming pump selection proposed in the Location Alternatives report.
 - d. Designing piping and valves, structural, equipment/material handling, HVAC, and electrical and communications (SCADA) systems.
- 3. Provide subsurface utility location services (includes up to 25 soft digs).
 - 4. Provide geotechnical services via a sub-consultant (includes up to 15 soil bores).
 - 5. Identify regulatory requirements/restrictions for the lift station, gravity sewer, and force main improvements (e.g. NCDENR-DWR and USACE stream buffers, NCDOT right-of-way encroachments, COG Floodplain Development, etc.).
 - 6. Develop base plan and profile sheets in a format consistent with City standards and indicating locations of potential conflicts/obstacles.
 - 7. Develop base existing Lift Station abandonment design plan sheet.
 - 8. Develop preliminary table of contents for the basic technical specifications sections anticipated.

Task D. Final Design Construction Contract Documents Development

- 1. Prepare final drawings and specifications to define the scope, extent, and character of the work to be performed by contractors.
- 2. Reference the City's standard construction drawing details where available and develop additional project-specific drawing details as needed.
- 3. Develop material and equipment specifications, bidding documents, general and supplemental conditions, contract agreement forms, etc. in concert with the City Master specifications and the City staff input. Develop project-specific specifications as needed.
- 4. Identify and show property owner information on the drawings. House/building numbers will be added where applicable.
- 5. Indicate required permanent and temporary utility easement widths associated with the improvements.
- 6. Complete in-house quality and constructability reviews. Revise documents and submit to City staff for review and approval.
- 7. Furnish an itemized opinion of probable construction cost for the project based on the final drawings and specifications in the City's bid form (bidder proposal) format.
- 8. Provide three (3) sets of final drawings and specifications for City's use.

Task E. Regulatory Permitting

1. Prepare applications, technical criteria and design data for use in obtaining regulatory agency approvals. Submittals will be required for:
 - a. NCDENR-Division of Water Resources (sanitary sewer/PS/FM permit)
 - b. NCDENR-Division of Water Resources and USACE (PCN for 401/404 permit)
 - c. NCDENR-Division of Energy, Mineral and Land Resources (erosion control permit)
 - d. NC Department of Transportation (encroachment agreements)
 - e. COG-Stormwater Services (Floodplain Development permit).
2. Prepare applications, technical criteria and design data for use in obtaining property right-of-way encroachment approvals from affected utility companies (e.g. gas and telecommunications encroachments).
3. Coordinate the payment of application fees to regulatory agencies by the City.
4. Furnish copies of the drawings and specifications for agency review purposes.
5. Respond to any comments received from review agencies.

Task F. Easement Mapping and Legal Descriptions

1. A subdivision plat will be prepared for the property where the HLS will be located. This plat will meet the requirements of the City's Planning Department and will be suitable for recordation.
2. Easement documents will include individual easement maps as required by City of Greensboro for up to forty (40) affected private properties, including metes and bounds descriptions of easement on each property in conformance with the City standards. These documents will be prepared by DMP (sub-consultant to ARCADIS) and will be suitable for recordation.
3. The scope of services will include conversations and meetings with the City or property owners throughout the property/easement acquisition phase. Design drawing changes, revisions to regulatory permits or applications, or significant easement adjustments resulting from property/easement negotiations with the property owner will be considered additional services and eligible for additional fee. Advance notice will be given to the City as these occurrences are foreseen.

Responsibilities of the City

It is our understanding that the City will be responsible for the following:

1. Furnish available information pertinent to the project to allow ARCADIS to provide the scope of services contained herein.
2. Provide information pertaining to major material and equipment selection preferences for the project.
3. Assist in locating and clearing existing City utility R/W's as requested and at times convenient to the City.
4. Provide existing record drawings and existing utility mapping in either AutoCAD (.dwg) or GIS (shape file) format. Information will include digital orthophotography, property lines, contours, existing sanitary sewer, storm sewer, and water line locations, stream locations, and other data that may be available.
5. Pay for all fees associated with various regulatory review submittals.
6. Provide, as required for the project, accounting, financial, insurance, or legal advisory services to address issues that the City requires or ARCADIS reasonably requests.
7. Advise ARCADIS of associated project issues as they arise, such as changes in scope or schedule.
8. Attend project meetings as necessary for timely information exchange and decision-making.
9. Give prompt notice to ARCADIS when City becomes aware of any environmental condition (hazardous or otherwise), or other developments that affect scope or schedule of services provided by ARCADIS.
10. Provide private property-owner public outreach as necessary. ARCADIS' private-property-owner public outreach involvement will be provided as an additional services if requested.

Fee Proposal

ARCADIS proposes to provide the above engineering services according to the terms of the existing On-Call Services agreement on a time and materials fee basis with a 3.2 multiplier on direct labor, plus expenses at a 1.0 multiplier, for the maximum estimated fee of \$865,000. The contract maximum fee will not be exceeded without prior authorization by the City.

Reimbursable expenses are described as follows:

1. Mileage and associated travel costs for employees working on the project at current IRS-approved rate per mile. Rental car costs associated with staff traveling to the project site from other offices.
2. Hotel and meal costs associated with overnight stays for staff from other offices being in Greensboro to work directly on the project.
3. Reproduction of project-related materials by outside vendors.
4. Postage and shipping charges associated with the project.
5. Subcontractor expenses at a multiplier of 1.0.

Fees for Bidding and Construction Administration Phase engineering services for the improvements are considered additional services and associated scopes and fees will be negotiated after the City's review and acceptance of the Final Design or when requested.

We look forward to assisting the City of Greensboro in providing these services. If this proposal meets your approval, please provide a Supplemental Agreement to our existing Agreement for Professional Services for execution. We and our sub-consultant team thank you very much for this opportunity.

Sincerely,



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Project Manager

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