



Date: May 22, 2018

To: Thomas J. Bonfield, City Manager

Through: W. Bowman Ferguson, Deputy City Manager

From: Donald F. Greeley, Director; Water Management

Subject: Sewer System Evaluation Survey Services
Award Contract for Professional Engineering Services to CDM Smith

Executive Summary

The Department of Water Management (DWM) issued a Request for Qualifications (RFQ) for Sewer System Evaluation Survey Services (SSESS). The SSESS is a professional engineering consultant whose role is to coordinate and evaluate field data gathered from several City-contracted programs, as well as data gathered from the DWM Water & Sewer Maintenance (WSM) division. The programs include smoke testing/dye testing, closed-circuit television (CCTV), sewer lining, sewer point repairs, and manhole inspections.

The status of each task and information gathered from them will be integrated with the City's GIS system and work order system for the sewer collection system (CityWorks). The SSESS will work with DWM staff to evaluate alternatives for repair, rehabilitation, and/or further data gathering. Pending approval from DWM staff, the SSESS will initiate the recommended work with their subcontractors and City contractors. The SSESS may be requested to provide a field representative for subcontractor/contractor work on an as-needed basis.

The SSES Coordinator will assist DWM with the several projects set to start by summer 2018. These projects are estimated at \$20 Million (total). The amount of data that is gathered, reviewed, and evaluated from these projects will be extensive and exceed the department's resources.

The DWM received four responses to the RFQ. CDM Smith was selected for the project and a scope of services for the project was negotiated in the amount of \$1,390,000.00.

Recommendation

The Department of Water Management recommends that the City Council:

1. Authorize the City Manager to execute a contract with CDM Smith for Professional Engineering Services in an amount not to exceed \$1,390,000.00 for the Sewer System Evaluation Survey Services contract.

Background

The DWM is responsible for infrastructure operation, maintenance, evaluation, rehabilitation and improvement of the sewer collection system throughout the City of Durham. The sewer system is partitioned into 47 sub-basins of various sizes; and overall, it consists of 1,200 miles of sewer mains and 29,000 manholes. Approximately 535 miles were installed over 45 years ago. Since the 1990s, the City has replaced and rehabilitated approximately 62 miles of sewer mains and 500 manholes.

The environmental condition of a sewer system is very corrosive, and crumbling sewer systems are a common ailment for municipalities. Sewer gases destroy components made of the unprotected iron

and concrete that made up much of sewer infrastructure until around the 1980s. Still, some corrosive-resistant mains and manholes have been installed improperly, resulting in structural failures as well as requiring the City to re-establish and re-enforce design and construction standards for engineers and contractors to adhere to.

In an effort to improve the City's rehabilitation efforts, DWM embarked on a Rain-Derived Inflow/Infiltration (RDI/I) reduction program consisting of increased sewer-flow monitoring and basin modeling in 2016. RDI/I is a term used for the rainfall that enters a sewer system via overland flow/runoff or rain-derived groundwater.

The effect of RDI/I is that it is choking off available capacity in the City's sewer mains, at several sewage lift stations, and at the two City Water Reclamation Facilities. If the RDI/I is not reduced, infrastructure will need to be up-sized to handle the sewage and its treatment. Just as important, development will need to be paced to allow for completion of the infrastructure improvements in order to avoid sanitary sewer overflows (SSOs).

The study centered on 16 sub-basins where DWM had broad-scale evidence of high RDI/I. Details of the RDI/I reduction effort are described in the study, *Flow Monitoring, I/I, SSES, and Rehabilitation Program*, conducted by CDM Smith. The study further broke the sub-basins down to 103 sub-sub-basins, aggregated the data, and prioritized the sub-sub-basins using the following Key Performance Indices (KPIs):

- Maximum Peaking Factor
- Maximum Incremental R-Value
- Maximum Value of Rain Derived Inflow and Infiltration (RDII)

The flow monitoring and modeling narrowed the possible locations of high RDI/I. This resulted in recommendations for rehabilitation, replacement, or further data gathering.

This contract is for assistance in gathering more data via smoke testing, dye testing, CCTV, and inspection; then sifting through the data, recording and storing locations, and recommending rehabilitation or replacement.

DWM has recently bid, and will be advertising, large projects to help address the leaky basins. The projects include the following:

- 2018 Sewer Lining Program - North at \$8,000,000.00 (Construction award approved June 4, 2018)
- 2018 Sewer Lining Program - South at \$7,000,000.00 (Construction award approved June 4, 2018)
- 2018 Manhole Rehabilitation Program at \$1,000,000.00 (Construction award approved June 4, 2018)
- 2018 CCTV Program at \$1,000,000.00 (Construction award approved June 18, 2018)
- 2018 Sewer Point Repairs Program at \$3,000,000.00 (to be advertised in August)

Each contract is anticipated to last approximately a year. The amount of data gathered will be extensive, and staff will need consultant assistance in processing the information in the City's GIS and work order system for the sewer collection system (CityWorks).

Issues and Analysis

In December 2017, the DWM advertised for an RFQ. Four firms responded to the RFQ:

BB Foster Consulting
Hazen and Sawyer*

CDM Smith*
Highfill Infrastructure*

Three firms were short listed (identified by an “*”) and participated in onsite interviews conducted by the selection committee. The selection committee was comprised of staff from the DWM Utility Engineering Division and the Equal Opportunity/Equity Assurance Department.

In their proposal and their interview, CDM Smith provided the most comprehensive understanding of the project and the City’s objective. They also assembled the strongest project team to address the project needs.

Based on their proposal and their project team’s experience, the committee selected CDM Smith for the project. Below is a task breakdown along with their hourly, Not-To-Exceed costs. Specific elements of the tasks will be approved by the City/DWM staff prior to commencement.

Task	Lump Sum Amt	Not-To-Exceed Amount
Project Management	-	\$ 70,000
Contractor Management	-	\$ 115,000
Part Time RPR Services	-	\$ 460,000
Data Management	-	\$ 195,000
Collect SSES Data	-	\$ 250,000
Data Analysis, Recommendations, and Planning	-	\$ 300,000
TOTALS	\$ 0	\$1,390,000

Alternatives

Alternative #1 – Do not move forward with the project. This alternative would perpetuate the issue of excess inflow and infiltration into the sanitary sewer system, continue to reduce capacity of the system, and increase the treatment of rain water at the treatment plants.

Alternative #2 – Do not move forward with the contract and conduct the data collection and evaluation of the data in-house. Department staff does not have the resources or availability to oversee all the construction activities, data collection, GIS, and future planning for programs of this magnitude. DWM will still handle its share of these tasks; but because the effort is several times more voluminous than the normal effort, assistance is needed to handle extra volume.

Financial Impact

Funding for this contract is available in the following accounts:

Professional Services Funds 4100P002-731004-P28PC \$1,390,000.00

Total Project Funds \$1,390,000.00

UBE Summary

The Equal Opportunity/Equity Assurance Department reviewed the specifications submitted for the above-referenced project to determine appropriate UBE participation goals.

M/UBE Participation Goal

Based on the specifications outlined for this project, the M/UBE participation goal should be 0%.

W/UBE Participation Goal

Based on the specifications outlined for this project, the M/UBE participation goal should be 0%.

WORKFORCE STATISTICS

Workforce statistics for CDM Smith, Inc. are as follows:
(Consolidated)

Total Workforce	3271	
Total Females	1054	(32%)
Total Males	2227	(68%)
Black Males	61	(2%)
White Males	1860	(56%)
Other Males	306	(10%)
Black Females	65	(2%)
White Females	833	(25%)
Other Females	156	(5%)

Attachments: Attachment A - Scope of Services
Attachment B - Contract
Attachment C - Map