



**Date:** July 11, 2017

**To:** Thomas J. Bonfield, City Manager

**Through:** W. Bowman Ferguson, Deputy City Manager

**From:** Donald F. Greeley, Director, Water Management

**Subject:** Emergency Action Plan for Critical Sewer Main Crossing  
Amendment No. 1 to Professional Engineering Services Contract  
Carter Engineering Company

**Executive Summary**

The Department of Water Management (DWM) owns, operates and maintains a 48-inch gravity sewer main that carries approximately 90% of all sewage entering the South Durham Water Reclamation Facility (SDWRF). The main crosses beneath US I-40, and extends roughly 3,500 feet from the SDWRF through Army Corp of Engineer’s wetlands. The location of the sewer main at the SDWRF is shown in Attachment 1.

DWM proposes construction of a secondary, parallel main through which sewage can be readily diverted in the event of failure of the pipe. A secondary main will also allow for maintenance and/or rehabilitation of the existing main, which was constructed in the late 1980’s.

On October 16, 2016, City Council approved a contract with K.F. Carter Engineering Company, PLLC (Carter Engineering) to provide professional engineering consulting services for evaluation, design, and permitting of an emergency alternative to address the possible failure of a critical sewer main feeding the SDWRF. The project resulted in a Preliminary Engineering Report (PER) that presented alternatives, advantages and disadvantages of each alternative, permitting requirements and estimated construction costs.

The PER recommends construction of a parallel 54-inch main the entire length of the existing 48-inch main (3,500 feet) and connection of the new main directly to the SDWRF Influent Pump Station. With this in place, DWM can bypass the entire 48-inch main to conduct a condition assessment, and if necessary, rehabilitate the older main. Once this activity is complete, the existing line will be used during maintenance on the new (proposed) 54-inch main or in the event of an emergency. DWM staff agrees with this recommendation.

This amendment will provide for the final phase of work which will include the final design, permitting, bidding services, construction administration, and construction observation. The original contract amount of \$81,141.00 and the original contingency of \$7,859.00 are essentially exhausted due to the contingency funds being used to smoke test the two 42-inch mains that feed the critical 48-inch main.

**Recommendation**

The Department of Water Management recommends that the City Council:

1. Authorize the City Manager to execute a contract amendment with K.F. Carter Engineering Company, PLLC for engineering services for the Emergency Action Plan for Critical 48-inch Sewer

- Main Crossing project in the total amount not to exceed \$536,295.00; and
2. Establish a revised contingency fund for the contract of \$63,705.00; and
  3. Authorize the City Manager or his designee to negotiate amendments to the contract provided that the total contract cost does not exceed \$689,000.00.

### **Background**

DWM owns, operates and maintains a 48-inch gravity sewer main that carries approximately 90% of all sewage entering the SDWRF. In August 2016, the daily flow through the main was more than 8,000,000 gallons. The main crosses beneath US I-40, and extends roughly 3,500 feet from the SDWRF through Army Corp of Engineer's wetlands. The location of the sewer main at the SDWRF is shown in Attachment 1.

DWM proposes construction of a secondary, parallel main; through which sewage can be readily diverted in the event of failure of the pipe. A secondary main will also allow for maintenance and/or rehabilitation of the existing main, which was constructed in the late 1980's. On October 16, 2016, City Council approved a contract with K.F. Carter Engineering Company, PLLC (Carter Engineering) to provide professional engineering consulting services for evaluation, design, and permitting of an emergency alternative to address the possible failure of a critical sewer main feeding the SDWRF. The project was performed in phases, where Phase I of the contract consisted of the following:

- Evaluating an alignment that is constructible without affecting flow through the existing main;
- Evaluating where the terminal points should be and type of structures needed;
- Gathering geotechnical, survey, and subsurface utility information; and
- Preparing a Preliminary Engineering Report (PER).

The PER presents alternatives, advantages and disadvantages of each alternative, permitting requirements, as well as estimated construction costs for the new sanitary main.

The PER recommends construction of a parallel 54-inch main the entire length of the existing 48-inch main (3,500 feet) and connection of the new main directly to the SDWRF Influent Pump Station. The larger diameter allows for future growth and the proposed 3,500-foot alignment allows DWM to bypass the entire 48-inch main, conduct a condition assessment of, and rehabilitate the older main to use as a backup for maintenance on the proposed 54-inch main or in the event of an emergency.

Also included in this phase will be the necessary survey and geotechnical evaluation for connecting the new main to the existing Influent Pump Station and improving emergency access; permitting services and fees; bidding services; and construction services.

The DWM recommends amending the original Carter Engineering contract for the project's next phase.

### **Issues/Analysis**

The requested amendment to the Carter Engineering contract was anticipated and referenced in the original agenda memo for contract award to Carter Engineering Company. The table below summarizes the funds requested as part of this amendment:

Description	Cost Type	Cost
Final Sanitary Sewer Design	Lump Sum	\$237,237.00
Bidding Services & Construction Admin	Not to Exceed	\$132,000.00
Quality Control Testing	Not to Exceed	\$11,000.00
Survey and Geotech Services at Influent PS	Not to Exceed	\$10,000.00
Regulatory and Environmental Permitting Fees	Not to Exceed	\$4,730.00
Construction Observation	Not to Exceed	\$141,328.00
<b>Amendment No. 1 Base Cost</b>		<b>\$536,295.00</b>
<b>Original Contract Base Cost</b>		<b>\$81,141.00</b>
<b>Contingency for Original Contract and Amendment</b>		<b>\$71,564.00</b>
<b>Total Contract Amount</b>		<b>\$689,000.00</b>

### Alternatives

Failure to move ahead with the project: There is no back-up to the existing main, which was constructed in the 1980's. This places the City at risk of having to address emergency issues that could have extensive environmental impacts and likely lengthy duration. Should the pipe collapse beneath I-40, this would create a great deal of damage to the highway's road surface creating a shutdown and the need for an emergency repair on the part of NCDOT and detours in a heavily travelled area.

### Financial Impacts

There are currently funds available in these accounts:

4100P002 – 731004 - P28AU	\$536,295.00
<u>4100P002 – 731900 - P28AU</u>	<u>\$ 63,705.00</u>
Total	\$600,000.00

### UBE REQUIREMENTS

This is a contract amendment. K. F. Carter Engineering Company, PLLC is a certified SLBE firm. K. F. Carter Engineering, PLLC will be using the following UBE firms for the additional scope of services:

Firm	ID	City/State	Amount	% of Contract
Hollins Construction Services, Inc.	MUBE	Wake Forest, NC	\$128,480	24.0%
A1 Consulting Group, Inc.	MUBE	Morrisville, NC	\$ 15,000	2.8%
Chao and Associates, Inc.	DBE/ MBE*	Columbia, SC	\$ 14,000	2.6%
Cooper & Associates, Surveyors, PA	WUBE	Morrisville, NC	\$ 5,000	1.0%

\*Chao & Associates, Inc. is a NCDOT certified DBE/MBE firm and this certification is recognized for UBE participation.