

February 4, 2025

Town of Apex, NC 53 Hunter St. Apex, NC 27502

Attn: Angela Reincke

RE: EB-6021 Beaver Creek Greenway Extensions, Phases 1, 2 and 1A

Subj: RCO-02-Waterline Locating-Electromagnetic Pipe Tracing-R2

Mrs. Reincke:

We would like to submit this request for change order due to the waterline location issues which have been experienced on the project. FSC has spent several days pot holing and soft digging trying to locate the waterline, as well as the town of Apex. Due to some issues within the town, the town is not exactly sure of the waterline location and has asked FSC to hire Geo Solutions Limited, Inc to attempt to locate the 16" waterline. FSC would like to request the following item be added to the contract via supplemental agreement:

#	Description	Qty	Unit	U	nit Price	E	xtention
1	1 Electromagnetic pipe tracing		1 LS		6,050.00	\$	6,050.00

If you have any questions or concerns, please do not hesitate to call me at (919) 520-4154.

Respectfully, Fred Smith Company

in Q. Curs

Brian Conrad Project Manager

Cc: 1812575 File Jason Hilton, Fred Smith Company

Backup:



#	Description	Qty	Unit	Unit Price	Total		Bond	Overhead	Mark Up	Sub	Total
1	Electromagnetic pipe tracing	1	LS	\$ 5,500.00	\$	5,500.00			10%	\$	6,050.00



January 07, 2025

Mr. Jon Persson, MESH Gannett Fleming TranSystems One Glenwood Avenue Suite 900 Raleigh, NC 27603

Re: **Proposal: Geophysical Evaluation – City of Apex Water Main**

Dear Mr. Persson:

Geo Solutions Limited, Inc. (Geo Solutions) is pleased to submit this proposal to Gannet Fleming TranSystems for a geophysical evaluation to detect and mark a water main in the area of a new Greenway for the City of Apex. One section of the greenway requires that an elevated walkway be constructed over a wet area. The water main runs through this area. It is critical that the piles for the elevated walkway not impact the water main. The City of Apex has tried to locate the pipe using traditional subsurface utility locating methods but have been unsuccessful. Vacuum excavation has also been completed to pothole the water main but has also been unsuccessful. Gannett Fleming TranSystems contacted Geo Solutions to discuss other methods for locating the pipe and requested a proposal to complete a geophysical evaluation of the area.

Technical Approach

Geo Solutions proposes to conduct the following geophysical evaluation to identify the water main at the area of the planned elevated walkway of the new greenway in Apex, NC. Below are three recommended methods to evaluation the location of the water main.

Electromagnetic (EM) Pipe Tracing

Geo Solutions recommends the completion of an EM pipe tracing evaluation using a Radio Detection RD 7800 pipe and cable locator. Based on conversation with the City of Apex, the pipe is constructed of ductile iron and is accessible a few hundred yards from the area of concern. Geo Solutions proposed to connect to the ductile iron pipe and trace it through the area of the construction. The depth of the pipe may also be estimated with this method. The location of the pipe will be painted with ground marking paint and wooden survey stakes through the area of construction.

Total Field Magnetic Evaluation

Geo Solutions recommends the completion of a detailed magnetometry evaluation also known as a total field magnetic evaluation. Here, Geo Solutions will utilize a GEM Systems GSMP-35 total field magnetometer equipped with a submeter accuracy GPS survey unit. The magnetometer responds to ferrous metal such as ductile iron pipe and has a detection depth of over 25 feet deep.

Ground-penetrating Radar (GPR) Evaluation

If the ground is not too wet, Geo Solutions will complete a ground-penetrating radar (GPR) evaluation to image the pipe in cross sectional view. However, it is unlikely that the pipe will be detectable due to clayey soil conditions. Geo Solutions proposes to utilize a GSSI SIR 4000 equipped with a 200 MHz antenna.

Limitations

The detection of subsurface objects is dependent upon parameters that include size, physical composition, and depth of burial. The combination of these parameters may produce a response that is below the detection threshold for a given geophysical method. Geo Solutions Limited, Inc cannot guarantee that the water main will be detectable.

Schedule and Cost

Below is a summary of costs and estimated project duration.

Item	Description	Unit	Estimated	Lump
			Duration	Sum
				Cost
Geophysical	Complete geophysical evaluation to	Lump	1 Day	\$5,500
Evaluation	detect and trace the water main.			
Field Work	Deliverables for this project will			
	include paint and wooden stakes on			
	the ground and a map of the results.			
	Lump Sum Cost			\$5,500

If awarded, billing for this project will be **NET 45**. We are pleased to be provided this opportunity; please give me a call should you have any questions concerning the above.

Very truly yours,

GEO SOLUTIONS LIMITED, INC.

John DeSoutch

John DeLoatch, PG Project Manager