



MEMO

To: Anna Stoddard, City of Greensboro
From: Tracey Riepenhoff, LJB Inc.
Copy: Mike Borchers and Monica Jarrett, City of Greensboro
Roberto Canales and Thom Kramer, LJB Inc.
Date: August 20, 2020
Subject: Fall Protection System Services- project update regarding scope and change order request
Project #: 0118551A.00

Anna,

The purpose of this memo is to bring to the City of Greensboro's attention two updates related to the scope of work for the reference project.

First, the majority of the water towers had areas that could not be safely accessed to complete a thorough initial assessment due to a lack of existing controls or the ability to improvise a safe personal fall protection system. It should be noted that these items could not be visually identified during our scoping process. In addition, the final engineering design will require detailed information that could not be collected on-site or from other information provided by the City.

If you recall, the current ladder climbing systems are no longer in service. To climb these ladders for the assessment, LJB developed a safety protocol that kept our team protected during the climbing of many of the tank ladders. The hazards that prevented a complete assessment included:

- > Top of ladder altered to a narrow width with questionable structural capacity due to this modification without additional reinforcing



Muir's Chapel Tank shown (similar condition at Gate City Boulevard Tank)

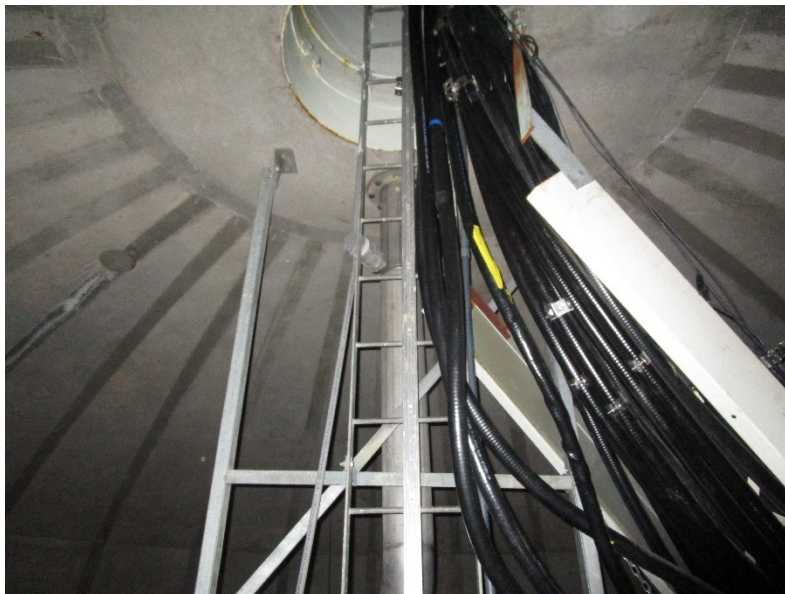
- > Only access to top of tank from catwalk was a curved ladder with a negative angle (sloping backwards from vertical)



Gorrell Street Tank shown (similar condition at Lees Chapel Road Tank and Gate City Boulevard Tank)

Regional Road Tank shown

- > Hatch at top of drywell to access the top of the tower could not be opened (Winola Court Tank)
- > Ladder inaccessible due to telecommunications equipment creating obstructions that encroached on the ladder width and climbing side of the ladder clearances



For other projects, we have encountered similar type issues and have found successful ways to address these to better meet our client's needs. LJB recommends that a drone or Unmanned Aerial Vehicle (UAV) be utilized for the collection of this critical data. Utilizing a UAV allows the remaining portion of the assessment to occur from a safe location and provides accurate dimensional data for use throughout this project. In addition, the City of Greensboro would receive high resolution ortho-mosaic photographs of

their water towers for future stages of this project as well as potential other uses. For the interior ladder issue at the Regional Road Tank, LJB will work with the City of Greensboro to address this situation with the telecommunications carriers.

LJB has attached a proposal outlining the scope of work to provide these additional UAV professional services. Since there were two towers that LJB did not have time to assess in our last visit (Battleground Avenue Tank and Groometown Road Tank), the proposal will show a fee deduction for the time that will no longer be required to access the top of those two towers.

Unrelated to the need for additional UAV services, LJB wanted to share that there are hazards requiring controls observed at the 10 water tower locations for this project that are not included in the scope of this project. We are sharing this for informational purposes, but they are not a part of the previously described need for additional services. Since these hazards were adjacent to or co-existed with items in our scope, we noted the following items during our initial assessment for the ladder fall protection systems:

1. Hazards associated with the wet well ladders
 - a. Fall hazards at:
 - i. Ladders – during climbing and exiting the top
 - ii. Non-compliances at landings and intermediate platforms
 - b. Confined space retrieval for wet well ladders
2. Fall hazards associated with painting the tank
3. Hazards associated with vaults/pits in the vicinity of the tanks including:
 - a. Confined space retrieval
 - b. Fall hazard at open vault/pit
4. Radiofrequency emissions hazard exposure on top of tanks

LJB can help with addressing these hazards in the future at your request.



September 2, 2020

Ms. Anna Stoddard
Safety Administrator
City of Greensboro Water Resources Department
2602 South Elm-Eugene Street
Greensboro, NC 27406

Re: Fall Protection System Services Proposal – additional UAV services

Dear Anna:

Thank you for the opportunity to submit LJB Inc.'s proposal for additional UAV services for this important safety project for the City of Greensboro. As outlined in the memo dated August 10, 2020, in the course of our field work LJB discovered the majority of the water towers had areas that could not be safely accessed. Additionally, LJB reviewed the information provided by the City including existing drawings, S&ME reports and past drone flights. While this provided some general information, it did not provide the key information needed for this project. This inability to collect detailed information results in an incomplete assessment of the existing conditions and prevents the completion of the final engineering design.

LJB recommends that a drone or Unmanned Aerial Vehicle (UAV) be utilized for the collection of this critical data. Utilizing a UAV allows the remaining portion of the assessment to occur from a safe location and provides accurate dimensional data for use throughout this project to allow for better assessment, final engineering design, construction estimating and bidding. In addition, the City of Greensboro would receive high resolution ortho-mosaic photographs of their water towers for future stages of this project as well as potentially many other uses.

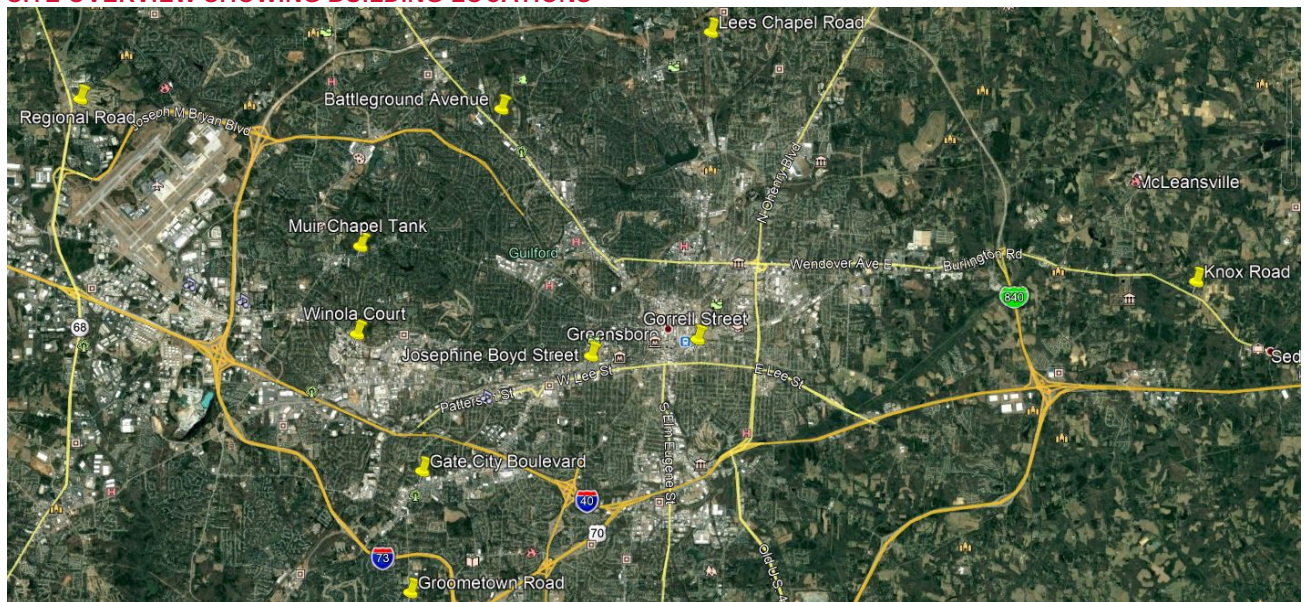
SCOPE OF WORK

We have developed a scope and fee to utilize a drone or Unmanned Aerial Vehicle (UAV) for the safe collection of data for this project as follows:

- > Site work to collect data for each structure utilizing a UAV
 - LJB's FAA certified UAV pilot will collect data for the 10 water towers that City of Greensboro has included in this project.
 - This data will include both geospatial information as well as high resolution photographs for each building
 - » Set 2 control points based on North Carolina State Plane Grid Coordinates at each site location
 - » Utilize DJI Phantom IV RTK drone to collect aerial imagery

- » No property or boundary line data from GIS sources is included. This is not a boundary survey and will not show property lines
- When flights are in proximity to an airport, then the FAA requires a waiver be submitted for review and approval. LJB will prepare the required documentation and follow the submittal with a phone call. There are three towers that require this process.
 - Regional Road Tank, Winola Court Tank and Muirs Chapel Tank – these locations require a waiver be submitted due to their proximity to the airport
- We will coordinate closely with City of Greensboro when scheduling all the flights and will require some support to provide access to these site locations for our pilot's staging and launching of the UAV.
- > Office work to process data and create 3-D point cloud files (.LAS format) that will be used by our team for this project
- > Office work to complete the initial assessment as described in the base proposal but utilizing 3-D models in addition to the access that has been able to be completed safely to date.

SITE OVERVIEW SHOWING BUILDING LOCATIONS



DELIVERABLES

- > Completion of the assessment and final engineering design portions of the project
- > High resolution ortho-mosaic photographs (.TIF format) for the water towers
- > 3-D point cloud files (.LAS format) for the water towers. This can serve as a tool for measuring dimensions, calculating square footage, etc.

FEE AND SCHEDULE

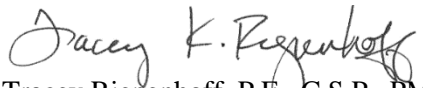
SCOPE OF SERVICES	TOTAL FEE	LJB FEE	BB FOSTER FEE	DURATION (SOME SERVICES COMPLETED IN PARALLEL)
Additional UAV services	\$30,000	\$23,043	\$6,957	2-3 weeks
Deduct for two tanks not assessed	(\$8,100)	(\$7,305)	(\$795)	N/A
SUBTOTAL	\$21,900	\$15,738	\$6,162	N/A
Project contingency (15%)	\$40,897	undetermined	undetermined	N/A
TOTAL CO	\$62,797	undetermined	undetermined	N/A
ORIGINAL CONTRACT	\$272,650	\$249,905	\$26,745	N/A
NEW CONTRACT	\$335,447	undetermined	\$32,907 (min)	N/A

This change order maintains the 9.81% M/WBE participation with our partner BB Foster.

We look forward to continuing to work with the City of Greensboro to reduce risk and improve safety for work at height. If you need more information or have any questions, please contact me at (419) 236-7050 or TRiepenhoff@LJBinc.com.

Sincerely,

LJB Inc.



Tracey Riepenhoff, P.E., C.S.P., PMP
 Project Manager

cc: Mr. Mike Borchers and Ms. Monica Jarrett, City of Greensboro; Mr. Roberto Canales and Mr. Thom Kramer, LJB; file 0118551A.00