July 27, 2023

The URETEK Method™
Deep Injection™

Mr. Scott Langford, P.E.
Public Works Director
Town of Tyrone
950 Senoia Road, Suite A
Tyrone, GA 30290

RE: Proposal for Sinkhole Repair – 220 Stonewyck Drive, Tyrone, GA

Dear Mr. Langford:

URETEK USA, Inc. (URETEK) proposes to fill voids and stabilize the soils in the area of the sinkhole located at 220 Stonewyck Drive in Tyrone, GA, as illustrated in the attached drawing (ATTACHMENT #1), utilizing the **URETEK Deep Injection Process**. This repair will be performed utilizing the high-density, hydro-insensitive polyurethane structural polymer, URETEK 486Star. URETEK will provide all supervision, labor, materials, supplies, insurance, tools, and equipment.

URETEK offers this ground densification process as a permanent repair method to stabilize soil-supported structures. The lightweight nature of the URETEK material when compared to competing cementitious products used for the same purpose, allows for a shallower scope of injections that essentially transfers the loads across weaker layers of soils deeper down without the necessity of injecting full depth to a deeper load-bearing stratum. For this proposal we have assumed the injection elevations indicated in ATTACHMENT #1.

Since it is not possible to accurately verify the size and extent of all possible voids and soil conditions in the project area, all work will be performed and invoiced under the unit-price method. However, based on our observations of the project area and information provided, we would estimate the cost to fill voids and stabilize the soils to be $ 29,328.00. This estimated cost is based upon 4,160 pounds of URETEK 486Star being required to complete the repair. If less than the estimated quantity of URETEK 486Star is required to complete the repair you will only be invoiced for the amount of material actually injected at $7.05 per pound. Due to unknown conditions, should any additional URETEK 486Star be required to complete this repair, it would be invoiced at $7.05 per pound. We will not inject any material above the total estimated quantity without your prior approval.

All work under this proposal shall be performed under and subject to the attached Specifications (EXHIBIT I) and the attached Terms and Conditions (EXHIBIT II). Any Contract or Purchase Order covering work performed from this proposal shall include and reference this proposal, including said Specifications and Terms and Conditions.

URETEK USA, Inc.
482 Hannah Road
Newnan, GA 30263

(404) 310-2508
Fax (630) 839-0761
www.uretekusa.com

The contract, purchase order, or change orders should be made to:

URETEK USA, Inc.
P.O. Box 1929
Tomball, TX 77377-1929

ATTN: Robert D. Emfinger

Email: remfinger@uretekusa.com
Phone: 404-310-2508

We look forward to working with you on this project. If you have any questions or need any additional information, please contact me.

Sincerely,

Robert D. Emfinger

Attachments (4)

EXHIBIT I

SOIL & STRUCTURE STABILIZATION AND LIFTING WITH POLYURETHANE MATERIAL

1.0 Description.

1.1 This work shall consist of the URETEK Deep Injection Process of soil densification to repair base and sub-grade soils under soil-supported structures by furnishing and injecting polyurethane structural polymer into the soils beneath the pavement through injection tubes inserted into drilled holes at locations and depths as shown on the drawing while continuously monitoring at the surface for movement.

2.0 Material Requirements.

2.1 The material used shall be URETEK 486STAR.

2.2 The material shall be a two-part, one-to-one ratio by volume, closed cell, hydro-insensitive, high density polyurethane system.

2.3 The material shall have a minimum free rise density of 3.8 lbs/cubic foot maximum of 4.5 lbs/cubic foot.

2.4 The material shall have a minimum compressive strength of 60 psi.

2.5 The material shall have a minimum tensile strength of 60 psi.

2.6 The material shall reach 90% compressive strength in 30 minutes after the last injection of material.

2.7 The material shall be a polyurethane-forming mixture, having a water insoluble diluent, which permits the formation of structural polyurethanes in excess water.

3.0 Equipment Requirements. The contractor shall provide at a minimum, the following equipment:

3.1 A truck-mounted pumping unit capable of injecting the high density polyurethane material beneath the pavement through tubes to the depths required. The pumping unit shall be capable of controlling the rate of flow of material as required to densify soils and prevent pavement blowouts. The unit shall be equipped with certified flow meters for each chemical component to measure the amount of each chemical injected at each location. The certified flow meters shall have a digital output in both pounds and gallons.

3.2 Pressure and temperature control devices capable of maintaining proper temperature and proportionate mixing of the polyurethane component materials.

3.3 Pneumatic or electric drills capable of efficiently drilling 5/8" to 2" diameter injection holes through the surface without damaging the structural integrity of the surrounding surface material.

3.4 Laser levels or dial indicator devices capable of monitoring movement at the surface of the structure to verify that the injected base and sub-base soils have been properly densified.

3.5 A portable dynamic cone penetrometer for on-site soils investigation to assist in location of weak sub-base soils and determination of injection pattern through tubes to densify weak soils.

3.6 All necessary light towers, electric generators, compressors, heaters, hoses, containers, valves and gauges to efficiently conduct and control the work.

4.0 Construction Requirements.

4.1 A quality check shall be performed, using the flow meters, on the ration of the two part chemical system. The part A (Resin) to the part B (ISO) ratio by volume should be 1:1. Prior to performing the work each day, the contractor shall reset the flow meters on the pumping units to zero. The contractor shall perform a test shot of material from one gun at a time with a minimum of 1 gallon of each material, comparing the digital output in gallons of resin to the gallons of ISO to determine the injected ratio. If the ratio is less than 0.95 or greater than 1.05, the system is to be checked for problems, adjusted, and the ratio rechecked until a proper ratio is assured. Contractor shall repeat the quality check for all the injection guns.

4.2 Dynamic cone penetrometer testing shall be performed to confirm existing sub-grade soil conditions.

4.3 For soil densification and compaction of unconsolidated base soils, a series of 5/8" diameter holes (as required for tube placement) shall be drilled at approximately 4 foot spaced intervals through the surface above the area requiring soil remediation. The polyurethane material shall then be injected through injection tubes inserted into the drilled holes to the proper depth or depths as required. The exact location, spacing, hole size and depth shall be selected by the contractor and approved by the engineer. The material shall be injected until movement of 1mm is detected demonstrating that the load bearing capacity of the soils have been sufficiently increased.

4.4 Continuous laser level or dial indicator micrometer readings shall be in place and monitored by the contractor during injection to determine sufficient material usage and soils densification as indicated by surface movement of 1mm.

5.0 Testing Requirements.

5.1 Dynamic Cone Penetrometer (DCP) Testing – At the request of the Engineer the Contractor shall provide pre-injection DCP testing in various locations as determined by the Engineer to assist in determination of the injection pattern and injection depth(s). To perform the DCP test(s), a 1-1/2" diameter hole shall be drilled through the surface to allow the penetrometer rod to be drilled into the subgrade soils.

6.0 Basis of Payment. The accepted quantities of polyurethane material as displayed by the certified flow meters will be paid for at the contract unit price. All testing as requested by the Engineer shall be paid for at the contract unit price.

7.0 Warranty. A two-year unconditional warranty against movement of more than ¼" of the surface. In the event that movement of more than ¼" in the injected areas occurs, Contractor

shall return to inject the affected area to lift to proper grade at no additional charge to the owner. One exception to warranty – if the DCP tests reveal deeper problems and the owner does not authorize payment to address these issues, warranty will not be valid.

8.0 Experience

8.1 The Contractor, as well as the project supervisor, proposed for the project must have a minimum three years' experience injecting expansive polymers through tubes, into soils while monitoring at the surface for movement to demonstrate sufficient densification of the soils. As part of the bid submittal, Contractor must submit evidence of prior experience such as prior specifications and bid documents as well as client references to demonstrate the minimum three years' experience.

8.2 The Contractor must have as an employee of the company a licensed professional engineer with a minimum of three years' experience with injection of expansive polymers into soils. The Contractor must submit with the bid the name, hire date, and resume of the registered professional engineer.

9.0 Safety

9.1 The Contractor must have a comprehensive Safety Manual pertaining to the equipment, material, and process, demonstrating capability of safely conducting the work at the base.

EXHIBIT II

TERMS AND CONDITIONS

The Customer understands that the URETEK processes involve drilling 5/8" – ¾" holes through the surface, installation of injection tubes, and the injection of URETEK synthetic resins, which expand to fill voids, stabilize and densify soils, and realign structures, if required.

URETEK carries workman's compensation and limited general liability insurance.

URETEK will not be responsible for or repair damage to utilities, including but not limited to, electrical or telephone cabling, drain, fire sprinkler, sewer and/or water lines. URETEK will not be held liable for any damage to other parts of the structure or finish work within the work area, which may result from void-filling or structure realignment and will not repair such damage.

Area of work will be left free from trash and debris related to the work of URETEK crews.

URETEK makes no representations and will not be responsible for any damage to the repair area caused by ground subsidence or settlement of native soils, subsoil conditions, structural problems, dynamic or static loads much higher than the design loads at the time of the URETEK intervention, damages caused by excavations, product tampering, natural catastrophes (storms, floods, drought, tides, earthquakes, explosions, fire, etc.).

URETEK warrants that the materials injected will not shrink or deteriorate for a period of ten (10) years from the date of injection. During the warranty period, URETEK will replace, by re-injection, any material that fails to perform as warranted. This limited warranty supersedes any other warranties, expressed or implied.

Where bonding is required, the Warranty in the Contract will be as follows:
URETEK warrants to the Owner that: (1) materials and labor under this Contract are guaranteed for a period of one year from the date of final acceptance; (2) materials furnished under this Contract will be new and of good quality; (3) the Work will be free from defects not inherent in the quality required.

This proposal is subject to State and local sales and use taxes, as applicable, unless client provides acceptable exemption certification.

Customer will provide –

- Adequate access to the work sites.
- Any necessary authorizations or permits.
- Customer or representative on site during the time work is taking place.

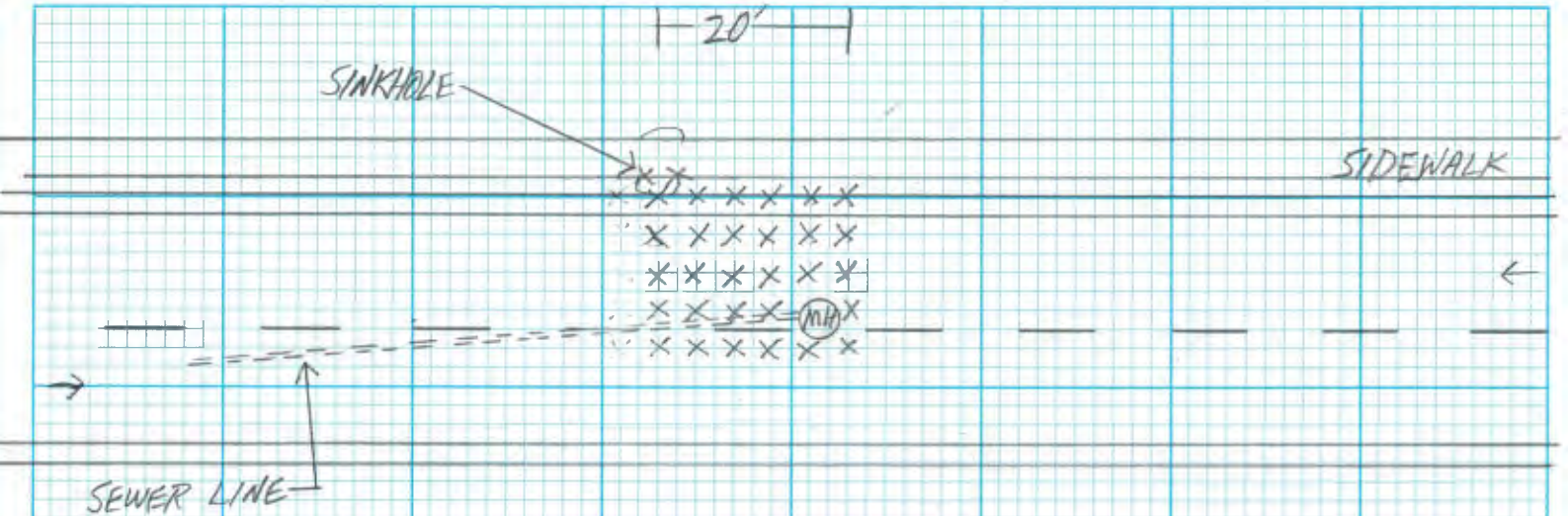
This proposal is valid for 90 days from the date of this proposal.

URETEK USA
www.uretekusa.com

Client: CITY OF TYRONE
Location: 220 STONEWYCK DRIVE
FAYETTE COUNTY
By: R. EMEINGER Date: 7/27/23

Title: SINKHOLE
1" = 20'
Scale
0 20' 40'

Notes: **ATTACHMENT #1**
33.507192 / -84.583013



URETEK DEEP INJECTION -
X INJECTIONS @ -4', -8', -12', -16', & -20'

Town of Tyrone, GA
Sinkhole Repair
220 Stonewyck Drive

33.507192 / -84.583013
Fayette County

COST ESTIMATE

Description	Number of Injections	URETEK 486 / Injection (Lbs.)	Estimated URETEK 486 (Lbs.)
URETEK Deep Injection -			
@ -4' to fill voids, densify and stabilize soils under asphalt pavement	32	20	640
@ -8' to fill voids, densify and stabilize soils under asphalt pavement	32	20	640
@ -12' to fill voids, densify and stabilize soils under asphalt pavement	32	25	800
@ -16' to fill voids, densify and stabilize soils under asphalt pavement	32	30	960
@ -20' to fill voids, densify and stabilize soils under asphalt pavement	32	35	1,120
Estimated URETEK 486			4,160
The URETEK Method			-
Total Estimated URETEK 486			4,160
	@ Cost per Lb.		$ 7.05
Estimated Cost of Soil Stabilization and Lifting			**$ 29,328.00**

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Tyrone, GA

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Sinkhole - 220 Stonewyck Drive, Tyrone, GA
Fayette County
Legend
33.507192 / -84.583013
33.507192 / -84.583013
Google Earth
Image Landsat / Copernicus
N
200 ft