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August 11, 2014

Mr. Ponciano Longoria, P.E., C.F.M.
The City of Edinburg
P.O. Box 1079
Edinburg, Texas 78540

Subject: West Water Treatment Plant – Expansion Addendum
2 MGD Ground Storage Tank
Southeast Corner (SEC) of Freddy Gonzalez & Mon Mack Road
Edinburg, Texas

TSI File No.: TLF-1421R

Dear Mr. Longoria,

We are pleased to submit this addendum for the 2 MGD Ground Storage Tank of our geotechnical engineering study for the proposed West Water Treatment Plant - Expansion located in Edinburg, Texas. This addendum should be used in conjunction with our Geotechnical Engineering Report – TLF-1421 West Water Treatment Plant – Expansion, dated May 22, 2014.

Project Description

Based on the new information provided the existing elevation is approximately 99-feet and the finished floor elevation will be 97-feet. The preferred foundation system is a slab on grade with a thickened perimeter footing.

Foundation System

The foundation system for the structures must satisfy two independent engineering criteria with respect to the soil conditions. First, the foundation system should be designed with an appropriate factor of safety against bearing capacity failure of the foundation soils. Second, the movement of the foundation system due to compression (consolidation) or expansion (swell) of the soils supporting the foundation system must be within tolerable limits for the structure. When foundation movements are caused by soil mass, differential movement of

structural elements, rather than total movement, is generally responsible for structural distress.

The soils underlying the proposed ground storage tank are medium stiff to very stiff clays this site are stiff clays that are competent to support the proposed structures on several types of foundations. We understand the preferred foundation system is a structural fill supported slab on grade with an exterior thickened footing.

Foundation excavations will be required to be carefully inspected by a TSI engineer/representative prior to concrete placement. The purpose of this inspection is to ascertain that the exposed bearing materials are suitable for the design bearing pressure. If incompetent clay layers are exposed in the bottom of the excavations, the unsuitable materials should be removed. The footings should be extended deeper to bear directly upon competent materials and the over excavated areas can be backfilled to the design footing elevation or design bottom with structural concrete.

Slab-On-Grade With a Thickened Perimeter Footing

Subgrade/Earthwork Excavation: The current elevation is 99-feet and we understand that the finished floor elevation will be at 97-feet. In order to reduce to the PVR to less than one inch a minimum of five feet of structural fill should be placed that is properly compacted and moisture conditioned as noted in the "Select Fill Placement" and "Granular Leveling Base" sections of this addendum. The final subgrade elevation should be at a minimum of 91-feet. The subgrade should be scarified to a minimum depth of 6-inches, moisture adjusted to within 3% wet of the optimum moisture content, and compacted to at least 98% of the Standard Effort (ASTM D 698) maximum dry density.

Select Fill Placement: Grade adjustments, a minimum of four and a half feet, up to the granular leveling base within the tank structure area should be accomplished with select fill composed of clean lean clay, sandy lean clay, or clayey sand soils with a plasticity index ranging between 7 and 20 percent. Select fill should be placed on prepared surfaces in lifts not to exceed 8 inches loose measure, with compacted thickness not to exceed 6 inches. The select fill should be compacted to at least 95% of the Modified Effort (ASTM D 1557) maximum dry density within 2% of the optimum moisture content.

Granular Leveling Base: The granular leveling base shall be a minimum of 6-inches placed directly beneath foundation slab and 6 Mil polyethylene membrane. The granular leveling base should be a crushed stone with angular or subangular granular material. The granular base should meet the 2004 TxDOT Item 247 Grade 2 or better Gradation requirements. No more than 8% by weight of base material should pass the No. 200 sieve.

Backfilling: Backfill material meeting the properties described in the "Select Fill Placement" section should be placed in 8-inch loose lifts with compacted thickness not to exceed 6-inches around the periphery of the tank to the final grade elevation of 99-feet. Backfill should be compacted to at least 95% of the Standard Effort (ASTM D 698) maximum dry density within 2% of the optimum moisture content.

Bearing Capacity Design Criteria: The ground storage tank may be supported by a slab-on-grade with a thickened perimeter footing. Slab-on-grade floor slabs and the thickened perimeter footing may be designed for an allowable bearing pressure of **3,000 psf** with a factor of safety of 3. A subgrade modulus of 75 pci may be used in design.

Monitoring: Depth to competent bearing soils is based on conditions encountered only at the boring locations. Significant variations can occur over short horizontal distances from the boring locations. Our representative should be present during foundation construction to verify that the proper bearing stratum has been reached, the pier dimensions are as designed, the reinforcement steel is as specified, and that the excavation is clean and dry before reinforcing and concrete placement.

We appreciate the opportunity to assist in this phase of the project. Please feel free to call us if you have any questions regarding this report or if we may be of further service.

Respectfully submitted,



TSI Laboratories, Inc.


Murphy Scurry, P.E.
Branch Manager



Daniel Tesfai, P.E.

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