# NORTHFIELD TOWNSHIP

Memo

**To:** Northfield Township Board

**From:** Howard Fink

**Date:** 5/5/2016

**Re:** Whitmore Lake Road Soil Borings

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Dear Township Board,

Attached is the soil borings for the Equalization Basin. I have already made my opinion clear that this is something the board should consider and investigate. Based on Mr. Rubel's report, I would recommend using TTL to perform the services. The soil borings will give us insight into how big the foundation will need to be. The next decision will be whether or not to move forward with detailed engineering, which would be in the neighborhood of 5 to 10 % of project costs or approximately $150,000 to $300,000 dollars (very rough estimate).

Respectfully Submitted,

Howard Fink

TETRA TECH, INC.

# INTEROFFICE MEMORANDUM

**TO:** Tim Hardesty

**FROM:** Brian Rubel

**DATE:** May 3, 2016

**SUBJECT:** Wet Weather Storage Tank Soil Borings

At the Board of Trustees meeting on April 26, Tetra Tech was directed to obtain proposals for completing geotechnical analyses (i.e. soil borings and foundation recommendations) of a proposed storage tank at the WWTP. Tetra Tech solicited proposals from TTL of Plymouth and MTC of Ann Arbor. Tetra Tech has worked with both firms and have been satisfied with their work.

The firms developed their recommended scopes of work independently from background information provided by Tetra Tech. The scopes proposed by each firm were nearly identical. TTL was slightly more specific in identifying their report although we believe MTC's report would be equally valuable to the Township. Similarly, the fees were nearly identical with TTL proposing a fee of $8,285 and MTC proposing a fee of $8,500.

Northfield Township should feel free to accept either proposal presented. However, the Township has retained TTL to perform work on the Whitmore Lake Road Sewer SAD and this work has gone well. There are benefits beyond the initial fee that the Township may realize by working with the same professional.

I will be traveling the week of May 9 on business. Joe Siwek of my office is available to answer questions the Board may have on these proposals. While each firm addressed their proposals to Tetra Tech, we do recommend that the Township contract for this work directly with the selected firm. The selected firm will be receptive to modifying their letter accordingly.

Materials Testing Consultants, INC

Corporate Office
693 Plymouth NE • Grand Rapids, MI 49505 • (616) 456.5469 • FAX (616) 456.5784

Southeast Michigan
253 Dino Drive, Suite B • Ann Arbor, MI 48103 • (800) 968.8378 • (734) 619.8868

MATERIALS Engineers, Independent TESTING Laboratories, Geotechnical & Environmental CONSULTANTS — Since 1968

May 3, 2016
Proposal No. 12347

Tetra Tech
710 Avis Drive, Suite 100
Ann Arbor, Michigan 48108

Attention: Mr. Brian Rubel, P.E.

Reference: Proposal For Geotechnical Investigation
Northfield Township Wet Weather Storage Tank
Northfield Township, Michigan

Dear Mr.Rubel:

In response to your RFP received by email on April 29, 2016, Materials Testing Consultants is pleased to submit this proposal for providing a geotechnical investigation and engineering services. A description of the geotechnical scope of service and associated fees are provided herein.

**Scope of Service**

The proposed project will consist of constructing a 1.5 MG wet weather storage tank west of the existing wastewater treatment plant. The tank is proposed to be an above ground steel tank, 100 ft in diameter. Approximately 2 ft to 5 ft of fill is expected to be placed under the proposed tank based on the provided site plan.

A total of 4 soil borings are proposed with boring depths ranging from 40 ft to 60 ft for a total drilling footage of 180 ft. Three borings will be performed to a depth of 40 ft around the perimeter of the tank with 120° of separation between the borings and one boring will be performed to a depth of 60 ft in the center of the tank. Shelby tube samples will be collected where cohesive soil is encountered for the option of performing laboratory consolidation testing. Any laboratory testing will be reviewed with and approved by Tetra Tech prior to performing testing. We will mobilize an all-terrain drill rig so that problems accessing between boring locations in soft ground or in light to medium wooded areas should not occur. The cost for mobilizing an all-terrain drill rig to the site is included in our estimated fee.

Soil sampling will be through the Standard Penetration Test, ASTM D 1586, and through Thin-Walled Tube Sampling (Shelby tube), ASTM D 1587, where directed by our project manager. Four samples will be taken in the first 10 ft then one sample every 5 ft.

| | |
|---|---|
| Boring Schedule: | 3 at 40 ft, 1 at 60 ft; 180 lf of drilling |
| Field Engineer: | Site reconnaissance, stake borings, estimate boring elevations |
| Borings Staked By: | MTC engineer |
| Utility Clearance By: | Miss Dig and Owner |

It should be understood the Owner will be responsible for clearing Owner-owned underground utility lines; Miss Dig will not locate these lines and MTC will not be responsible for their repair cost should the owner not mark these lines. Our Client should coordinate this directly with the Owner or supply MTC with an Owner contact. If the Owner is unable to locate private utilities, MTC is capable of exploring their locations using ground penetrating radar (GPR). If GPR is needed for utility clearance, it will be outside the scope of this proposal and at an additional cost.

An MTC engineer will survey the boring elevations using a laser level at the time of our reconnaissance. The recovered soil samples will be reviewed by an MTC engineer and classified by the methods of ASTM D 2488. Calibrated penetrometer tests will be performed on samples of cohesive soil to approximate the unconfined compressive strength. A geotechnical report will be prepared summarizing the encountered conditions and providing foundation and other pertinent geotechnical recommendations.

**Fees**

We have estimated a fee on the order of $8,500 itemized as follows:

- Test Drilling, 180 lf — $3,500
- Field Engineering — $2,000
- Engineering and report preparation — $3,000
- Consolidation Testing — add $750/test

The estimated fee is based on the previously described scope of service and considering good, unrestricted access (no fences, site delays) to the boring locations. An invoice will be submitted upon work completion based on the actual quantities of work performed and the unit rates in the attached fee schedule. This proposal includes the mobilization of the drilling equipment and drilling through normal subsurface conditions. If additional drilling is necessary due to the

presence of compressible or unsuitable soil, drilling footage beyond that considered herein will be performed at $25/ft. Addiitonal drilling will be discussed with Tetra Tech for approval prior to performing. Environmental contamination, marginal soil conditions, underground obstructions, rubble, concrete, cobbles, boulders or other difficult drilling conditions, or crew access or standby time are outside of the estimated fee. We should be informed in writing of any environmental conditions that may be present. Rutting of the ground surface may occur. Our general conditions are attached.

We look forward to providing these services on this project. Should you have any questions or wish to proceed, please contact our office at your convenience.

Sincerely,

**MATERIALS TESTING CONSULTANTS, INC**

Daniel S. Elliott, P.E.
Southeast Michigan Branch Manager

Douglas W. Sabin, P.E.
Geotechnical Division Manager

Atts: Fee Schedule
General Conditions
Women's Business Enterprise Certificate

Materials Testing Consultants, Inc.

# FEE SCHEDULE

## PERSONNEL CHARGES

| | |
|---|---|
| Principal | $150.00/hr |
| Sr. Project Manager | $135.00/hr |
| Project Manager | $120.00/hr |
| Sr. Proj Eng/Geol/Env Professional | $115.00/hr |
| Project Eng/Geol/Env Professional | $105.00/hr |
| Asst Proj Eng/Geol/Env Professional | $100.00/hr |
| Sr. Staff Eng/Geol/Env Professional | $95.00/hr |
| Staff Eng/Geol/Env Professional | $85.00/hr |
| Field/Lab/SST Manager | $95.00/hr |
| SST Technician III | $95.00/hr |
| SST Technician II | $85.00/hr |
| SST Technician I | $75.00/hr |
| Technician III | $65.00/hr |
| Technician II | $53.00/hr |
| Technician I | $48.00/hr |
| Project Assistant | $45.00/hr |

*Minimum charge for field assignment is two hours per trip. Overtime charge is 1.3 times regular rate. Overtime is time worked prior to 8:00 a.m. or after 4:30 p.m., in excess of eight hours per day, Saturdays, Sundays or holidays. Chargeable time includes travel (portal to portal), time on-site, and required office time. Review of field and laboratory reports is mandatory practice. Review time will be charged at the appropriate level required.*

## OTHER CHARGES

| | |
|---|---|
| Mileage | $0.70/mile |
| Per diem - meals (overnight assignments) | $45.00/day |
| Direct reimbursable expenses | Cost plus 15% |

Materials Testing Consultants, INC.

# FEE SCHEDULE

## EQUIPMENT CHARGES

| | Per Day | | Per Day |
|---|---|---|---|
| Nuclear Density Gauge | $50.00 | Infrared Camera | $120.00 |
| Asphalt Extraction Equipment | $100.00 | Avongard Crack Monitor | $40.00 |
| Rice Equipment | $70.00 | SFRM Cohesion/Adhesion Kit | $40.00/ea |
| Concrete Maturity Reader | $75.00 | Magnetic Particle Equipment | $60.00 |
| Concrete Maturity Tag | Quoted | Torque Wrench | $65.00 |
| Coring Machine | $150.00 | Torque Multiplier | $65.00 |
| Bit charge | $4.50/in | Positector Paint Thickness Gage | $70.00 |
| D-Meter Profiler | $180.00 | Panametrics Thickness Gage | $70.00 |
| Floor Moisture Vapor Kit | $45.00/ea | Skidmore® Bolt Tension Calibrator | $100.00 |
| Relative Humidity Kit, F2170 | $100/location | Ultrasonic Equipment | $120.00 |
| Schmidt Hammer | $150.00 | UT Thickness Gauge | $100.00 |
| Windsor Probe | $100.00 | Visible Dye Penetrant | $30.00/can |
| Windsor Probe Charge Set | $60.00 | Bailer | $12.00/ea |
| Earth Resistivity Equipment, Biddle | $170.00 | Barrel Filter | $50.00/ea |
| Earth Resistivity Equipment, AGI Supersting | $300.00 | DO Meter | $50.00 |
| Menard Pressuremeter – GC | $2500/wk | Interface Probe | $60.00 |
| Pile Load Test Instrumentation | $500.00 | Level D PPE | $40.00 |
| Pile Echo Tester | $150.00 | Methanol Soil Preservative Kit | $30.00/ea |
| Hydraulic Ram Jack | $70.00 | Peristaltic Pump | $40.00 |
| Slope Inclinometer | $300.00 | pH/Cond/Temperature | $40.00 |
| Arrowboard | $120.00 | Photo-Ionization Detector | $200.00 |
| Safety Cone | $7.00/ea | Four Gas Monitor | $80.00 |
| 48" Traffic Sign | $35.00/ea | Water Level Meter | $40.00 |
| Ground Penetrating Radar (GPR) | $550.00 | Turbidity Meter | $25.00 |
| GPS Ashtech Mapper | $90.00 | Air Sampling Equipment | $65.00 |
| GPS Trimble | $120.00 | Bulk Sampling Equipment | $50.00 |

Materials Testing Consultants, INC.

# FEE SCHEDULE

## LABORATORY RATES

| Geotechnical | Per Test |
|---|---|
| Proctor – granular, D1557, D698 | $150.00 |
| Proctor – cohesive, D1557, D698 | $180.00 |
| Proctor – method C, 6" mold, add | $70.00 |
| Maximum Index Density, D4253 | $210.00 |
| Minimum Index Density, D4254 | $160.00 |
| Sieve Analysis and LBW, D6913, D1140 | $130.00 |
| Grain Size Distribution, Hydrometer, D422 | $195.00 |
| Specific Gravity, D854 | $95.00 |
| Atterberg Limits, D4318 | $95.00 |
| Soil pH, D4972 | $60.00 |
| Organic Content/Loss on Ignition, D2974 | $85.00 |
| California Bearing Ratio (per pt), D1883 | $370.00 |
| Total Porosity, D854, D2216, D7263 | $120.00 |
| Density & Mst, D2216, D7263 | $40.00 |
| Natural Moisture, D2216 | $18.00 |
| Unconfined Compression, D2166 | $70.00 |
| Shelby Tube - Visual Classification, D2488 | $60.00 |
| Shelby Tube - Extrusion, D2488 | $40.00 |
| Direct Shear (up to 3 pts), D3080 | $650.00 |
| Triaxial UU (up to 3 pts), D2850 | $700.00 |
| Triaxial CU (up to 3 pts), D4767 | $1100.00 |
| Laboratory Vane Shear, D4648 | $95.00 |
| Consolidation, D2435, Method B | $550.00 |
| Consolidation, D2435, Method A | Quoted |
| Permeability – Constant Head, D2434 | $260.00 |
| Permeability – Fall. Head, EM 1110-IV-1906 | $260.00 |
| Permeability – Flex Wall, D5084 | $410.00 |
| Remolding of Samples, add | $75.00 |
| Soil Resistivity, G57 | $230.00 |

| Aggregates | Per Test |
|---|---|
| Aggregate Sieve Analysis, C136, MTM 109 | $75.00 |
| Loss-by-Wash, C117, MTM 108 | $55.00 |
| Deleterious Materials, MTM 110 | $85.00 |
| Deleterious Materials, ASTM Methods | Quoted |
| Percent Crushed, MTM 117 | $55.00 |
| Soundness, C88 | $400.00 |
| L.A. Abrasion, C131 | $320.00 |
| Specific Gravity + Absorption, C127 | $200.00 |
| Specific Gravity + Absorption, C128 | $220.00 |
| Unit Weight, dry-rodded, C29 | $125.00 |
| Organic Impurities in Fine Aggregate, C40 | $125.00 |
| Sand Equivalent Value, D2419 | $225.00 |
| Fine Aggregate Angularity, MTM 118 | $120.00 |
| Angularity Index, C1252 | $120.00 |
| Flat and Elongated Particles, D4791 | $100.00 |

| Concrete | Per Test |
|---|---|
| Concrete Compression, per cylinder, C39 | $16.00 |
| Cylinder Molds (cyls. not molded by MTC) | $2.50 |
| Saw Cutting of Cylinders | $15.00 |
| Core Compression (including saw cut), C42 | $55.00 |
| Shotcrete cores (cut/comp. or spare), C1140 | $75.00 |
| Splitting Tensile Strength, C496 | $60.00 |
| Beam Flexure, C293, C78 | $80.00 |
| Petrographic Services | Quoted |
| Shrinkage Test (3 specimens), C157 | $400.00 |
| Concrete Core Absorption | $60.00 |
| Potential ASR (Mortar Bar), set of 3, C1567, C1260 | $600.00 |

*For special testing where a specific rate is not provided herein, fees will be based on laboratory technician and equipment hourly rate of $100.00/hour with a 1 hour minimum charge.*

Materials Testing Consultants, INC.

# FEE SCHEDULE

## LABORATORY RATES (continued)

| Masonry | Per Test |
|---|---|
| Grout Prism Compression, per prism, C1019 | $55.00 |
| Hyd. Cement Cube Compression, per cube, C109 | $17.00 |
| Compression of Concrete Block, per block, C140 | $130.00 |
| Linear Shrinkage Concrete Block, set of 3, C426 | $550.00 |
| Comp. of Concrete Block Prisms, per block, C1314 | $250.00 |
| Moisture, Absorption, Net Area of Concrete Block, per block, C140 | $120.00 |
| Brick Compressive Strength, Absorption, Saturation, IRA, Efflorescence, set of 15, C67 | $700.00 |

| Rock Core | Per Test |
|---|---|
| Unconfined Compression, D7012 | $170.00 |
| Unconfined Compression w/ Strain, D7012 | $330.00 |
| Unconfined Comp. w/ Poisson Ratio, D7012 | $450.00 |
| Slake Durability Index, D4644 | $220.00 |
| Point Load Strength, D5731 | $120.00 |
| Rock Hardness by Rebound Hammer (10 Strikes), D5873 | $170.00 |
| Indirect Tensile (per pt), D3967 | $65.00 |

| Bituminous Mixtures | Per Test |
|---|---|
| Mix Verification (extraction, sieve, LBW, crush), MTM 325, 108, 109, 117 | $300.00 |
| Marshall Stability and Flow, per plug, D6927 | $95.00 |
| Bulk Specific Gravity, per plug/core, D2726 | $95.00 |
| Molding Marshall Plugs, per plug, D6926 | $60.00 |
| Theoretical Maximum Density (Rice), D2041 | $175.00 |
| Molding Gyratory Plugs, per plug, D6925 | $140.00 |
| Preparation of Bituminous Core | $20.00 |
| Core Thickness, per core, D3549 | $25.00 |
| Moisture Content, D1461 | $60.00 |

| Steel | Per Test |
|---|---|
| Fireproofing Density Test, AWCI Manual 12-A | $65.00 |
| Side Bends – Machine/bend, E190 | $130.00 |
| Face/Root Bends – Machine/bend, E190 | $125.00 |
| Plates and Supplies | Quoted |
| Welder Qualification | Quoted |
| Tensile < 1" dia., A370 | $120.00 |
| Tensile > 1" dia., A370 | $150.00 |
| Stress/Strain Curves Tensile | $30.00 |
| Elongation, Reduction in Area, A370 | $50.00 |
| Jack Calibration | $350.00 |

| Pipe | Per Test |
|---|---|
| ABS Truss Pipe Test, 8" – 15" dia., D2680 | $175.00 |
| PVC Pipe Test, 6" – 8" dia., D3034 | $200.00 |

*For special testing where a specific rate is not provided herein, fees will be based on laboratory technician and equipment hourly rate of $100.00/hour with a 1 hour minimum charge.*

Materials Testing Consultants, INC.

# FEE SCHEDULE

## SOIL TEST DRILLING SERVICES

| **Mob/Demob - 2-man crew:** | CME55Track | Geoprobe | CME750 | CME95 | Marshmaster |
|---|---|---|---|---|---|
| Within 30 mile radius | $ 450.00 | $ 450.00 | $600.00 | $ 600.00 | $750.00 |
| Outside 30 mile radius/mile/one-way | $15.00 | $15.00 | $20.00 | $20.00 | $25.00 |

**Soil Test Drilling**:

| | |
|---|---|
| Normal soil conditions (N<60), 5 ft interval SPT sampling | $13.50/l.f. |
| Difficult soil conditions (N>59, rubble or cobbles), 5 ft interval SPT sampling | $23.00/l.f. |
| Drilling surcharge for 50 to 75 ft depth | $15.00/l.f. |
| Drilling surcharge for 75 to 100 ft depth | $19.00/l.f. |
| All-terrain drill rig daily premium | $300.00/day |
| NX Rock Coring, D2113 | $70.00/l.f. |
| Rock Core Setup Fee | $275.00 |
| Extra SPT samples, D1586 | $25.00/ea |
| Undisturbed thin-walled samples (Shelby tubes), D1587 | $65.00/attempt |
| Drilling through concrete or brick at surface (less than 10" thick) | $16.00/in |
| Grout boring closed | $8.00/l.f. |
| Well/Piezometer construction (not including material) | $8.50/l.f. |
| Locking Protective Cover | $150.00/ea |
| Flush Locking Protective Cover | $150.00/ea |
| Steam Cleaner rental | $175.00/day |
| 55-gallon Drum (disposal not included) | $60.00/ea |
| Bagged Materials (sand, bentonite, cement) | $15.00/bag |
| Piezometer and well materials | Quoted |
| Per Diem (lodging and meals, 2-man crew) | $220.00/day |

*Drill crew rate per hour for special testing, borehole grouting, monitoring well construction, access, on-site setup, site clean-up, standby, water hauling or steam cleaning:*

| CME55 | Geoprobe | CME750 | CME95 | Marshmaster |
|---|---|---|---|---|
| $220.00 | $200.00 | $240.00 | $250.00 | $350.00 |

*Drill crew access time may be charged if soft ground conditions, wooded areas, or other site conditions/restraints are encountered.*

# GENERAL CONDITIONS

1. The scope of work includes the specific geotechnical, testing or other services to be performed by Materials Testing Consultants, Inc. (MTC) as set forth in MTC's proposal, the client's acceptance thereof if accepted by MTC and these general conditions. "Client" refers to the person or business entity ordering the work to be performed by MTC. If the client is ordering the work on behalf of another, the client represents and warrants that the client is the duly authorized agent of said party for the purpose of ordering and directing the work. Unless otherwise stated in writing, the client assumes sole responsibility for determining whether the quantity and the nature of the work ordered by the client is adequate and sufficient for the client's intended purpose. The ordering of work from MTC shall constitute acceptance of the terms of MTC's proposal and these General Conditions.

2. Client will arrange for and provide access to the site as is necessary for MTC to perform the work. MTC, unless specifically indicated otherwise in the proposal, has not included cost for restoration due to damage to the site that may occur during the work. MTC agrees to exercise reasonable measures to minimize damage to the site during the performance of the work.

3. Test samples will be disposed immediately upon completion of the assigned tests unless prior written arrangements have been made to hold the samples for a longer period of time. Samples from drilling operations will be held for 90 days after submittal of MTC's report.

4. MTC's work shall not include supervising construction or determining the means, methods, techniques or sequences of construction. MTC shall not be responsible for evaluating, reporting or affecting job conditions concerning health, safety or welfare.

5. Client shall cause all tests and inspections of the site, materials and work performed by MTC or others to be timely and properly performed in accordance with the plans, specifications and contract documents and MTC's recommendations. No claims for loss, damage or injury shall be brought against MTC by client or any third party unless all tests and inspections have been so performed and unless MTC's recommendations have been followed. Client agrees to indemnify, defend and hold MTC, its officers, employees and agent harmless from any and all claims, suits, losses, costs and expenses, including, but not limited to, court costs and reasonable attorney's fees in the event that all such tests and inspections are not so performed or not so followed except to the extent that such failure is the result of the negligence, willful of wanton act or omission of MTC, subject to the limitation contained in paragraph 9.

6. Client represents and warrants that he has advised MTC of any known or suspected hazardous materials, utility lines and pollutants at any site at which MTC is to do work hereunder, and unless MTC has assumed in writing the responsibility of locating subsurface objects, structures, lines or conduits, client agrees to defend, indemnify and save MTC harmless from all claims, suits, losses, costs and expenses, including reasonable attorney's fees as a result of personal injury, death or property damage occurring with respect to MTC's performance of its work and resulting to or caused by contact with subsurface or latent objects, structures, lines or conduits where the actual or potential presence and location thereof was not revealed to MTC.

7. Client shall be invoiced once each month for work performed during the preceding period. Client agrees to pay each invoice within thirty days of its receipt. Client further agrees to pay interest on all amounts invoiced and not paid or objected to for valid cause in writing within said thirty day period at the rate of eighteen percent per annum until paid. Client agrees to pay MTC's cost of collection of all amounts due and unpaid after sixty days, including court costs and reasonable attorney's fees. MTC shall not be bound by any provision or agreement requiring or providing for arbitration of disputes or controversies arising out of this agreement, any provision wherein MTC waives any right to a mechanics' lien, or any provision conditioning MTC's right to receive payment for its work upon payment to client by any third party. These General Conditions are notice, where required, that MTC shall file a lien whenever necessary to collect past due amounts. Failure to make payment within 30 days of invoice shall constitute a release of MTC from any and all claims which client may have, either in tort or contract, and whether known or unknown at the time.

8. Nothing contained within this agreement shall be construed or interpreted as requiring MTC to assume the status of an owner, operator, generator, storer, transporter, treater or disposal facility as those terms appear within RCRA or within any Federal or State statute or regulation governing the generation, transportation, treatment, storage and disposal of pollutants. Client assumes full responsibility for compliance with the provisions of RCRA and any other Federal or State statute or regulation governing the handling, treatment, storage and disposal of pollutants.

9. Ground Penetrating Radar ("GPR") Services. Client acknowledges that the use of GPR technology is not error free and there are limitations on the use of GPR to locate buried or embedded objects in the ground or in structures (for example, field conditions, soil moisture content, material type, masking of deeper embodiments by shallow embodiments and thickness of the material to which the GPR Services are to be applied; and only center lines of embedded objects can be located) which may make GPR less precise than other embedded object location technologies. MTC may rely on statements and plans of Client's representatives (including on-site employees or employees or representatives of contractors or subcontractors working for Client) as to the characteristics of the structure or location to be tested using GPR Services. Client agrees that it shall have the sole responsibility for the use of any information obtained as a result of the GPR Services, including reliance on any data there from in order to determine the location of drilling operations or other penetration of the location, area of structure to which the GPR Services are applied. MTC has no responsibility or obligation other than to deliver the GPR Services and the results obtained from application of GPR. How and when the work product from the GPR Services shall be used (or not used) shall be in the sole and exclusive discretion of Client, and MTC shall have no obligation or responsibility to Client after the required GPR Services are completed and the work product is delivered.

10. MTC's SERVICES WILL BE PERFORMED, ITS FINDINGS OBTAINED AND ITS REPORTS PREPARED IN ACCORDANCE WITH THIS AGREEMENT AND WITH GENERALLY ACCEPTED PRINCIPLES AND PRACTICES. IN PERFORMING ITS PROFESSIONAL SERVICES, MTC WILL USE THAT DEGREE OF CARE AND SKILL ORDINARILY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY MEMBERS OF ITS PROFESSION. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR REPRESENTATIONS, EITHER EXPRESS OR IMPLIED. STATEMENTS MADE IN MTC REPORTS ARE OPINIONS BASED UPON ENGINEERING JUDGMENT AND ARE NOT TO BE CONSTRUED AS REPRESENTATIONS OF FACT.

SHOULD MTC OR ANY OF ITS PROFESSIONAL EMPLOYEES BE FOUND TO HAVE BEEN NEGLIGENT IN THE PERFORMANCE OF ITS WORK, OR TO HAVE MADE AND BREACHED ANY EXPRESS OR IMPLIED WARRANTY, REPRESENTATION OR CONTRACT, CLIENT, ALL PARTIES CLAIMING THROUGH CLIENT AND ALL PARTIES CLAIMING TO HAVE IN ANY WAY RELIED UPON MTC's WORK AGREE THAT THE MAXIMUM AGGREGATE AMOUNT OF THE LIABILITY OF MTC, ITS OFFICERS, EMPLOYEES AND AGENTS SHALL BE LIMITED TO $25,000 OR THE TOTAL AMOUNT OF THE FEE PAID TO MTC FOR ITS WORK PERFORMED WITH RESPECT TO THE PROJECT, WHICHEVER IS GREATER.

11. Subject to the foregoing limitations, MTC agrees to indemnify and hold client harmless from and against any and all claims, suits, costs and expenses including reasonable attorney's fees and court costs arising out of MTC's negligence to the extent of MTC's negligence. Client shall provide the same protection to the extent of its negligence. In the event that client or client's principal shall bring any suit, cause of action, claim or counterclaim against MTC, the party initiating such action shall pay to MTC the costs and expenses incurred by MTC to investigate, answer and defend it, including reasonable attorney's and witness fees and court costs to the extent that MTC shall prevail in such suit.

12. MTC's employees shall not be retained as expert witnesses except by separate, written agreement. Client agrees to pay MTC's legal expenses, administrative costs and fees pursuant to MTC's then current fee schedule for MTC to respond to any subpoena.

13. In the event any of the provisions of these General Conditions should be found to be unenforceable, it shall be stricken and the remaining provisions shall be enforceable.

14. This agreement constitutes the entire understanding of the parties, and there are no representations, warranties or undertakings made other than as set forth herein. This agreement may be amended, modified or terminated only in writing, signed by each of the parties hereto.

15. This agreement may be terminated by either party upon seven day's prior written notice. In the event of termination, MTC shall be compensated by client for all services performed up to and including the termination date, including reimbursable expenses, and for the completion of such services and records as are necessary to place MTC's files in order and/or protect its professional reputation.

WBENC | Women's Business Enterprise National Council

hereby grants

# National Women's Business Enterprise Certification

to

## Materials Testing Consultants, Inc.

who has successfully met WBENC's standards as a Women's Business Enterprise (WBE).
This certification affirms the business is woman-owned, operated and controlled; and is valid through the date herein.

WBENC National WBE Certification was processed and validated by Women's Business Enterprise Council – Great Lakes, a WBENC Regional Partner Organization.

Expiration Date: 05/27/2016
WBENC National Certificate Number: 2005108134

Authorized by Michelle Richards, President,
Women's Business Enterprise Council – Great Lakes

WBEC Great Lakes an initiative of CEED

NAICS Codes: 541330, 541380, 541620

UNSPSC Codes: 81100000, 77000000

Astra | ORVAWBC | WBEA | WBEC | WBEC SOUTH | Women's Business Enterprise Council

TTL associates inc
Environmental, Geotechnical Engineering & Testing

44265 Plymouth Oaks Boulevard
Plymouth, Michigan 48170
T 734-455-8600
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January 5, 2016

**Proposal No. 13647.01**

Mr. Brian M. Rubel, P.E.
Tetra Tech
710 Avis Drive
Ann Arbor, Michigan 48108

**Geotechnical Subsurface Investigation**
**Proposed Above Ground Wet Weather Storage Tank and Valve Vault**
**Northfield Township Wastewater Treatment Plant**
**Whitmore Lake, Michigan**

Dear Mr. Rubel:

TTL Associates, Inc. (TTL) is pleased to provide this proposal to Tetra Tech for a geotechnical subsurface investigation for the above referenced project. TTL has developed this proposal for services based on an email Request for Proposal (RFP) from you to Ms. Katherine Chulski of TTL on December 18, 2015, which included a proposed site plan, as well as email correspondence sent from you to Ms. Chulski from December 18, 2015 and December 30,2015, regarding valve vault depth and proposed future expansion.

## PROJECT DESCRIPTION

It is our understanding that the project consists of construction of a new above-ground wet weather storage tank and a new valve vault at the existing Northfield Township wastewater treatment plant (WWTP). The WWTP is located approximately ½ mile north of 8 Mile Road and ¼ mile west of Lemen Road in Whitmore Lake, Michigan.

The site for the new tank is mostly undeveloped at this time, and includes a partially wooded area with a grassy path that traverses around the facility. The perimeter of the new tank is preliminary designed with slopes on the order of 4 horizontal to 1 vertical (4H:1V). Existing site grades are generally flat, indicated to range from Elevs. 913 to 910, although at the eastern edge of the tank perimeter a shallow depression with a bottom of Elev. 906 is indicated.

The tank will have a diameter of 100 feet with a tank floor indicated at Elev. 915. Based on existing site grades, approximately 3 to 4 feet of fill is required to raise site grades for the proposed tank. It is anticipated that the structure will have a concrete ringwall supported on footings. Structural loads were not available at the time of preparing this proposal. Maximum loads are assumed to not exceed 2,000 pounds per square foot (psf).

The valve vault will have a footprint of approximately 25 feet by 15 feet, with the bottom slab for this structure at a depth of roughly 6 to 8 feet below existing grade. Structural loads were not available at the time of preparing this proposal. Maximum loads are assumed to not exceed 2,000 psf.

We understand that soil borings are not needed for the future plant expansion immediately south of the existing facility. It is understood that this work is projected approximately 10 years in the future.

## SCOPE OF WORK

TTL proposes to conduct a geotechnical subsurface investigation to evaluate the properties of the underlying soils with respect to design and construction of foundations at the above referenced location. A drill rig and crew will be utilized to advance soil borings into the underlying soils for the purpose of collecting soil samples and performing in-situ tests. Laboratory testing will be conducted on the collected soil samples to provide physical properties and characteristics of the underlying materials. Geotechnical engineering recommendations pertaining to design and construction will be developed based on information obtained from the drilling and laboratory testing.

The proposed scope has been divided into the following three tasks.

### Task 1 - Mobilization, Drilling and Sampling

Based on the provided information, four (4) borings are proposed for this investigation. One boring will be performed near the center of the tank footprint and extended to a planned depth of 100 feet below existing grade. Three borings will be performed around the perimeter of the proposed tank footprint and extended to a planned depth of 20 feet. One of these perimeter borings will be located in the area of the proposed valve vault. The borings will be extended to these planned depths or to auger refusal, whichever is first encountered. If encountered soil conditions are such that deep foundations may be required, TTL will notify Tetra Tech to determine if deeper borings are warranted.

TTL will mobilize a drill rig and crew to the site, perform the indicated test borings, and return the collected soil samples to our laboratory for testing. The test borings will be located in the field by TTL in general accordance with the provided site plan. The borings will be located by taping or pacing methods. TTL will notify the utilities protection service (MISS DIG) for utility markings and clearances. **The client is to furnish TTL with plans identifying on-site underground structures and utilities, and to notify TTL of those structures and utilities not shown on said plans.** If obstructions, overhead power lines, or underground utilities are encountered, the test borings may have to be relocated. The relocation distance shall be kept to a minimum.

The test borings will be performed in general accordance with ASTM D 1586 and D 5434. Soil samples will be generally be collected at 2½-foot intervals to a depth of 10 feet and at 5-foot intervals thereafter using a split-spoon sampler. For the valve vault boring, soil samples will be collected at 2½-foot intervals to boring termination. Standard Penetration Tests will be performed at the same intervals. If soft to medium stiff cohesive soils are encountered, up to two Shelby tube samples will be obtained in general accordance with ASTM D 1587.

Groundwater readings will be obtained during drilling and upon completion of drilling operations. Upon completion of the drilling operations, each test boring will be backfilled with a mixture of bentonite chips and auger cuttings.

## Task 2 - Laboratory Testing

Design and construction recommendations pertaining to foundations will be evaluated using soil index properties and engineering parameters determined from laboratory tests performed on the recovered soil samples. These tests will include the following:

- Moisture content determinations (ASTM D 2216)
- Dry density determinations and unconfined compressive strength tests (ASTM D 2166)
- Atterberg limits tests (ASTM D 4318)
- Particle size analyses (ASTM D 422)

All recovered soil samples will be tested for moisture content and visually or manually classified in accordance with the Unified Soil Classification System (ASTM D 2487 and D 2488). Dry density determinations and unconfined compressive strength tests will be performed on approximately 20 percent of the intact cohesive split-spoon samples as well as all recovered Shelby tube samples. Unconfined compressive strength estimates will be obtained for the remaining intact cohesive samples using a calibrated hand penetrometer. Additionally, an Atterberg limits test and a particle size analysis will be performed on two representative soil samples.

## Task 3 - Engineering Analysis, Recommendations and Report Preparation

A geotechnical engineer will take the information from the driller's field logs and prepare engineering logs describing each encountered stratum. Geotechnical-related design and construction recommendations will be prepared under the direction of a licensed professional engineer. The recommendations will address soil conditions and characteristics, bearing capacities, and anticipated settlements. In addition, general construction recommendations will be provided by the geotechnical engineer, including excavation and backfill requirements, as well as groundwater conditions and control.

The final report will contain the field investigation and laboratory test data, state our findings and observations, and include a site plan and log identifying each test boring. The final report will also include the recommendations for tank foundations and valve vault foundations prepared under the direction of a licensed professional engineer.

## ESTIMATED COST

TTL proposes to conduct the investigation described herein for a lump sum fee of **$8,285.00**. This fee includes $3,980 for drilling and sampling of subsoils not exceeding 160 lineal feet, $855 for laboratory testing, and $3,450 for engineering analysis and report preparation. Additional drilling and sampling of overburden soils, if deemed necessary by subsurface conditions and authorized by Tetra Tech prior to demobilization, would be performed on an add basis of $30.00 per lineal foot. Delays incurred by the drilling crew due to circumstances beyond our control will be billed at the rate of $222.00 per hour.

The engineering fee includes analysis and consultation through submittal of the final report. Any project meetings, as well as additional analysis and consultation services, will be invoiced in accordance with the following unit rates:

- Project Engineer for additional analysis and engineering evaluation, per hour ..... $ 110.00
- Chief Geotechnical Engineer (P.E.) for meetings and consultation, per hour..... $ 146.00

## TERMS AND CONDITIONS

Work shall be performed in accordance with the attached TTL Agreement for Services. Please execute both copies of the agreement form and return one copy to our office as our authorization to proceed. As an alternative, you may provide a Purchase Order referencing this proposal by number and date.

TTL will apply reasonable care to avoid encountering underground structures and utilities, including notifying MISS DIG prior to the field work to obtain clearances within MISS DIG's jurisdiction. **The client is to furnish TTL with plans identifying on-site underground structures and utilities, and to notify TTL of those structures and utilities not shown on said plans.** Any claims resulting from damage to structures/utilities not identified or mismarked by MISS DIG locaters and/or the client are not the responsibility of TTL, regardless if such damages are direct, indirect, or consequential.

## SCHEDULE

TTL is prepared to begin work on this project upon receipt of written authorization to proceed. Based on our current drilling schedule, we anticipate that the field work can be completed within two weeks of receipt of written authorization and site plans showing existing on-site underground structures and utilities. Field operations are anticipated to require two days for completion. A PDF electronic copy

of our final report will be available approximately two weeks after completion of the drilling operations.

TTL Associates, Inc. appreciates this opportunity to provide Tetra Tech with our quality geotechnical services and we look forward to working with you on this project. Should you have any questions regarding this proposal, please contact us at (734) 455-8600.

Respectfully submitted,

**TTL Associates, Inc.**

Katherine D. Chulski, P.E.
Geotechnical Engineer

Curtis E. Roupe P.E.
Vice President

Attachments - Agreement for Services
- Terms and Conditions

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## AGREEMENT FOR SERVICES

**THIS AGREEMENT is by and between** _____

Tetra Tech

710 Avis Drive

Ann Arbor, Michigan 48108

hereinafter called **CLIENT** and TTL Associates, Inc. of 44265 Plymouth Oaks Boulevard, Plymouth, Michigan 48170, hereinafter called **TTL** who agrees as follows:

**DECLARATIONS**. **CLIENT** desires to engage **TTL** to provide services as described in **TTL** Proposal No. 13647.01 dated January 5, 2016, a copy of which is attached hereto, and along with the **TERMS AND CONDITIONS**, which appear on the reverse side of this document, are made a part of this **AGREEMENT**.

**ACCEPTANCE**. Execution of this **AGREEMENT** or the issuance of any other written authorization by **CLIENT** to **TTL** such as a written Purchase Order will constitute acceptance of this **AGREEMENT**.

For **CLIENT**, By _____
Signature

_____
Name

_____
Title

EXECUTED THIS _____ DAY OF _____ , 20_____

For **TTL Associates, Inc.**, By _____
Signature

Curtis E. Roupe, P.E.
Name

Vice President
Title

EXECUTED THIS 5th DAY OF January, 2016

Please sign one copy of this agreement and return it to TTL. The proposal is valid for 120 days.

# TERMS AND CONDITIONS
# SCHEDULE A

As used herein, the word Client refers to the party purchasing services for work from TTL Associates, Inc. (TTL). The following terms and conditions shall govern the performance of services or work by TTL for or on behalf of Client, as contemplated by the order set forth on the reverse side hereof. Modification of these terms and conditions may be made only with the prior written consent of both parties and any attempts to alter such terms and conditions with purchase orders, acknowledgements, similar or other documentation shall be void.

1. Scope; Standards. TTL shall provide the services described on the reverse side hereof in accordance with generally accepted industry standards.

2. Work Product. Reports and results of TTL services are rendered for the exclusive use of Client, but at all times remain the property of TTL. The Client shall not advertise, publish or otherwise communicate TTL's work product to any third party without the prior written approval of an officer of TTL.

3. Legal Proceedings. If TTL work product is to be used in any legal proceeding, TTL shall charge and Client shall pay all TTL expenses together with then applicable TTL hourly rates for any court appearance, deposition, affidavit or the like by any TTL personnel. Preparation time shall also be billed and paid at such rates.

4. Adversarial Proceedings. In the event that TTL is ordered or subpoenaed to produce documents or testify on behalf of a third party, TTL shall so advise Client, whenever possible. Client may then determine whether it wishes to contest the subpoena or order.

5. **WARRANTY DISCLAIMER. OTHER THAN ITS COMMITMENT TO PERFORM SERVICES IN ACCORDANCE WITH GENERALLY ACCEPTED INDUSTRY STANDARDS, TTL MAKES NO WARRANTY WHATSOEVER. TTL MAKES NO WARRENTY OF MERCHANTABILITY AND NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE.**

6. **Limitation of Liability. In no event will TTL's liability to Client, or to third parties claiming through Client (including, without limitation, Client's insurers) exceed $50,000 regardless of the legal theory upon which a claim may be based, including contract, warranty, tort and indemnification. Without limiting the generality of the foregoing, this limitation is applicable to loss, destruction, or damage to Client property while in the possession or control of TTL. In no event will TTL be liable to Client or to third parties claiming through Client (including Client's insurers) for any incidental or consequential damages whatsoever regardless of the legal theory upon which a claim may be based.**

7. Samples. In the event that TTL services involve test samples, such samples will be obtained with reasonable care and preserved for a period of thirty (30) days. TTL reports relative to samples are applicable only to the specific samples tested and only depict conditions at the specific location of the test.

8. Pricing. Prices quoted by TTL are subject to change if not accepted by Client within sixty (60) days of the date of quotation or if the work is not commenced (through no fault of TTL) within sixty (60) days of the date of acceptance of such quotation.

9. Payment. **TTL invoices shall be paid within thirty (30) days of invoice date.** Amounts unpaid when due shall bear interest at the rate of one percent (1.0%) per month, compounded monthly, until paid.

10. Governing Law. This agreement and all transactions relating hereto shall be governed by the laws of the State of Ohio.

11. Entire Agreement. This proposal constitutes the entire agreement between TTL and Client regarding the subject matter hereof and replaces all prior written or oral agreements and understandings. It may be amended or altered only in a writing signed by both parties.