

September 23, 2016

Harper County
103 W. Steadman St.
Anthony, KS 67003

Attn: Mr. John McClure

P: (620) 842-2471

E: jmclure@harpercountyks.gov

Cc: Ms. Melinda McCurley

E: mmccurley@harpercountyks.gov

Re: Proposal for Exploratory Drilling and Geotechnical Engineering Services
Proposed Harper Co. Road Improvements – 16½ Miles
Harper County, Kansas
Terracon Proposal No. P01165150 – Revision A

Dear Mr. McClure:

Terracon appreciates the opportunity to submit this proposal for subsurface exploration and geotechnical engineering services for the proposed county road improvement projects.

Terracon's experience with similar projects in the general vicinity provides added value to our services. Terracon has provided geotechnical studies and construction observation and testing services for many successful projects for various roadway improvements. With our experience and expertise with the local soil conditions, Terracon has developed cost effective design recommendations for pavements that resulted in the required performance, often at significant construction cost savings for the Owner. We are looking forward to providing you our expertise on these projects.

A. PROJECT INFORMATION

The proposed project will involve the stabilization of a total of 16½ miles of gravel- and asphalt-surfaced roadways in Harper County, Kansas. The project will be divided amongst four sites in the County. The project locations are as follows:

- Along SE 90 Ave, from SE 70 Rd to SE 50 Rd (2 miles)
- Along NE 40 Ave, from K-44 to NE 30 Rd (3 miles)
- Along NE 30 Ave, from K-2 to Harper-Kingman County Line (5 miles)
- Along NW 110 Ave, from K-2 to Attica Ave (6½ miles)



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We understand that the 22-foot wide roadway subgrade will be stabilized with a cementitious agent. Following subgrade stabilization, the roadway surface will either be paved with a 2-inch thick layer of asphaltic concrete or a double layer of chip seal. Terracon will provide recommendations for the application rate of the cementitious agent, based on traffic data to be provided by Harper County.

B. SCOPE OF SERVICES

B.1 Exploratory Drilling Activities

The purpose of this subsurface exploration is to obtain data regarding existing gravel and asphaltic surfacing thicknesses and subgrade conditions, and to develop recommendations for subgrade preparation and stabilization. We plan to divide the project into fifteen (15) sections (approximately one mile each), and will provide individualized recommendations for each section.

We propose drilling a total of 60 borings (about 4 borings per mile) within the proposed roadway alignments to a depth of about 3 feet below existing ground surface (BGS). We plan to use our truck-mounted drill rig to drill the borings, and will measure the pavement/gravel thicknesses (where present) at the boring locations. We plan to obtain up to fifteen (15) composite samples of auger cuttings (about one sample per project mile) from depths of about 1 to 3 feet below the existing road surface for laboratory testing. In addition, we plan to collect up to fifteen (15) composite bulk samples of the material within about 12 inches BGS for subgrade stabilization testing.

We will backfill our borings with auger cuttings and sand after drilling, prior to leaving the project site. We will apply a temporary patch of quick-set concrete where we drill through existing pavement. Our scope of services does not include any responsibility for future maintenance.

For the work scope of this proposal, we understand that Harper County will provide the appropriate traffic control during our drilling activities (anticipated to be up to two days during daylight hours only). Should delays result in standby or our field work to last more than one day, the additional time will be billed at a rate of \$200 per hour. If you request, Terracon could provide the appropriate traffic control (signage and flagman) during our drilling activities for additional fees (about \$2,500 to \$3,000 per day). This proposal is based on the assumption that one traffic lane will be closed temporarily within a couple hundred feet of our drill rig during our drilling activities.

Terracon will provide an approximate layout of the borings. Distances from available reference features will be estimated using a measuring wheel, and angles will be estimated from existing

features. The locations of the borings should be considered accurate only to the degree implied by these methods.

Samples below the existing subgrade will be obtained at periodic depth intervals using thin-walled tube samplers, split-spoon samplers, or from auger cuttings. The soil samples obtained would be sealed in the field and returned to our laboratory for classification and testing.

B.2 Utilities

As part of our work scope, Terracon will contact *Kansas One-Call*, an underground public utility locate service. These must be notified 72-hours prior to our drilling activities. It is the client's responsibility to:

- Authorize Terracon's services sufficiently in advance to allow for marking of utilities.
- Provide accurate information to Terracon regarding the site/work location, to ensure that the correct areas are marked or cleared. It is the client's responsibility to provide Terracon an accurately scaled drawing that clearly shows the subject street reconstruction alignment, the direction of true north, and a scale bar intersection at least three working days prior to the client's requested start date for exploratory drilling operations. Alternately, this information could be provided in DWG format (AutoCAD) and e-mailed to ejmarko@terracon.com.

B.3 Laboratory Testing

Laboratory testing will include unconfined compression tests (or approximations using a hand penetrometer) and water content and density determinations performed on representative portions of thin-walled tube samples. Where applicable, we will perform water content and/or hand penetrometer tests on split-barrel samples. Sieve analyses tests (up to 10 total) and Atterberg limits tests (up to 30 total) will be conducted on selected samples.

We plan to perform a total of up to 15 standard Proctor tests and up to 15 California Bearing Ratio (CBR) tests on representative bulk samples of the proposed subgrade materials (from depths of 0 to 12 inches and 1 to 3 feet) along the project alignments. We will also perform up to 5 CBR tests on subgrade material mixed with cementitious product. We will perform up to 150 unconfined compression tests on remolded soil samples mixed with cementitious product.

B.4 Report Preparation

After completing the field exploration and laboratory testing phases, a written report will be prepared by a professional engineer licensed in the State of Kansas. The report will:

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- Describe the subsurface soil/rock and water level conditions encountered and present boring logs with soil/rock stratification based on visual soil classification and a boring location diagram
- Present the results of the laboratory tests performed
- Provide geotechnical recommendations regarding the recommended application rate of cementitious product for each project section

C. ADDITIONAL SERVICES

If authorized, for additional fees, Terracon could:

- *Provide construction observation and testing services* for these projects (under a separate workscope) to ensure the quality of the work, to protect the Client's investment, and to avoid or reduce construction delays. It is not economically practical to perform enough exploratory borings to identify all subsurface conditions at the site. Some conditions affecting the design may not become known until construction is in progress; therefore we recommend that Terracon be retained to monitor geotechnical aspects of the proposed construction, to verify that these projects are constructed consistent with our geotechnical recommendations and the project design/specifications, and to evaluate changed subsurface conditions if encountered.

D. COMPENSATION

Terracon will provide the geotechnical services defined above and invoice for them in accordance with our standard fee schedule. A partial fee schedule pertaining to these anticipated services is enclosed. We estimate that the total fee for our services will be within the range of \$33,000 to \$35,000. This fee is based on completing the drilling activities in one day and on performing only the scope of services outlined in Section B (excluding traffic control during our field activities). Unless you instruct otherwise, we will submit our invoice to the address shown at the beginning of this proposal.

The estimated fee for this project assumes a single mobilization to the site and assumes that the boring locations are accessible to our two-wheel drive, truck-mounted equipment. In the event the work locations are not accessible, costs incurred for tow trucks and/or remobilizations will be billed to the client. Our fee for additional remobilizations to the site would be invoiced in accordance with our standard fee schedule. If desired, Terracon could utilize all-terrain vehicles to access difficult work sites for an additional fee.

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E. CONDITIONS

Items to be provided by the client include the right-of-entry to conduct the exploration and an awareness and/or location of any subsurface utilities existing in the area. Any other restrictions or special requirements regarding the site or exploration should be made known to us prior to commencing fieldwork.

Terracon will take reasonable efforts to reduce damage to the roadway, such as rutting of the ground surface. However, it should also be understood that in the normal course of our work some such damage will likely occur. We have not budgeted to restore the site beyond backfilling our boreholes and distributing excess cuttings. Terracon will not be responsible for any pavement/grass damage that occurs due to our rig accessing the boring locations in our normal course of work.

F. AUTHORIZATION

Attached is our Master Services Agreement Task Order (Task Order) for the referenced project. This Task Order is issued in accordance with our Master Services Agreement with you dated November 10, 2014. This proposal may be accepted by signing and returning one original copy of the Task Order. You may email/fax a signed copy back to us to expedite the work. Please be aware that we will be unable to initiate work until a signed Task Order is received. This proposal is valid only if authorized within ninety (90) days from the stated proposal date.

We appreciate the opportunity to submit this proposal. If you have any questions, please let us know.

Sincerely,

Terracon Consultants, Inc.

A handwritten signature in blue ink, appearing to read "E. Marko".

Eric J. Marko, P.E.
Geotechnical Project Manager

A handwritten signature in blue ink, appearing to read "G. Tannoury".

George A. Tannoury, P.E.
Geotechnical Department Manager

Enclosures



2016 FEE SCHEDULE GEOTECHNICAL SERVICES

I. DRILLING

Supervision of Exploratory Borings and/or Engineering Reconnaissance.....	\$ 100.00/Hour
Mobilization/Moving of Equipment and Personnel (each way) for Auger Drilling On and Off-Site.....	\$ 4.00/Mile
Support Vehicle.....	\$ 0.74/Mile
Per Diem/Man.....	\$ 160.00/Day
Load/Unload Rig Usage.....	\$ 605.00/Day
Field Engineer/Geologist With Drill Rig.....	\$ 85.00/Hour
Location and Elevation of Borings (Two-Man Crew).....	\$ 200.00/Hour
Auger Drilling, Depth-Feet (Soil Sampling Using Split-Barrel or Shelby Tube Samplers at 5-Foot Intervals in Soil)	
0 – 20.....	\$ 13.00/Foot
20 – 40.....	\$ 14.00/Foot
40 – 60.....	\$ 16.50/Foot
60 – 80.....	\$ 20.00/Foot
Additional Fee for Use of Hollow-Stem Auger/Wash Boring.....	\$ 4.00/Foot
Additional Fee for Drilling Weathered Shale/Limestone.....	\$ 23.00/Foot
Additional Fee for ATV Mounted Drill Rig.....	\$ 200.00/Day
Hand Augering (Two-Man Crew, without drill rig).....	\$ 125.00/Hour
Backfilling of Borehole with Bentonite Chips.....	\$ 3.50/Foot
Cost of Special Equipment for Moving Drilling Equipment (Tow Fee) or Outside Services.....	Cost + 20%
Drill Rig + Crew Setup Time Above 1/4 Hr, Standby, Stuck.....	\$ 200.00/Hour
Rock Coring (NX Barrell).....	\$.40.00/ft+\$100 setup

II. TESTING

Unconfined Compression Test (Soil).....	\$ 55.00/Test
Calibrated Penetrometer Test.....	\$ 3.50/Test
Density Determination.....	\$ 10.00/Test
Water Content Test.....	\$ 9.00/Test
Sample Classification.....	\$ 5.00/Sample
Atterberg Limits or Sieve Analyses (including -#200 Sieve).....	\$ 60.00/Test
Sieve Analyses (washed over -#200 Sieve).....	\$ 77.00/Test
Sieve Analyses (unwashed).....	\$ 62.00/Test
Swell Test (3 Pressure).....	\$ 225.00/Test
Swell Test (1 Pressure).....	\$ 120.00/Test
One-Dimensional Consolidation Test (16 tsf)*.....	\$ 295.00/Test
Permeability Test (Includes Sample Preparation).....	\$ 300.00/Test
Standard Proctor Test (D-698).....	\$ 125.00/Test
California Bearing Ratio (CBR) Test.....	\$ 200.00/Test
Corrosion Suite (pH, Resistivity, Chloride, Sulfate, Redox Potential, Sulfide tests).....	\$ 200.00/Test
Logging and Stratification of Boring Logs.....	\$ 85.00/Hour

**Plus \$60.00 for Each Plotted Time Curve and \$110.00 for Each Additional Unload/Reload Cycle*

III. ENGINEERING

Senior Project Geotechnical Engineer (Registered).....	\$ 130.00/Hour
Project Geotechnical Engineer II.....	\$ 115.00/Hour
Project Geotechnical Engineer.....	\$ 105.00/Hour
Project Professional II/Geologist.....	\$ 85.00/Hour
CAD Operator II.....	\$ 70.00/Hour
Clerical/Administrative Staff.....	\$ 49.00/Hour

MASTER SERVICES AGREEMENT

TASK ORDER

This **TASK ORDER** is issued under the **MASTER SERVICES AGREEMENT** (dated 11/10/2014, agreement reference number MSA 01147095) between Harper County ("Client") and Terracon Consultants, Inc. ("Consultant") for Services to be provided by Consultant for Client on the Harper Co. Road Improvement Project - 16 1/2 Miles project ("Project"), as described in the Project Information section of the Consultant's Task Order Proposal dated 09/23/2016 ("Task Order Proposal") unless the Project is otherwise described below or in Exhibit A to this Task Order (which section or Exhibit are incorporated into this Task Order). This Task Order is incorporated into and part of the Master Services Agreement.

1. Project Information

Please see Terracon Proposal No. P01165150 – Revision A

2. Scope of Services

The scope of Services to be provided under this Task Order are described in the Scope of Services section of the Consultant's Task Order Proposal, unless Services are otherwise described below or in Exhibit B to this Task Order.

Please see Terracon Proposal No. P01165150 – Revision A

3. Compensation

Client shall pay compensation for the Services performed at the fees stated in the Task Order Proposal unless fees are otherwise stated below or in Exhibit C to this Task Order.

Please see Terracon Proposal No. P01165150 – Revision A

All terms and conditions of the **Master Services Agreement** shall continue in full force and effect. This Task Order is accepted and Consultant is authorized to proceed.

Consultant: **Terracon Consultants, Inc.**
By: _____ Date: **9/23/2016**
Name/Title: **George A Tannoury / Department Manager II**
Address: **1815 S Eisenhower St**
Wichita, KS 67209-2810
Phone: **(316) 262-0171** Fax: **(316) 262-6997**
Email: **George.Tannoury@terracon.com**

Client: **Harper County**
By: _____ Date: _____
Name/Title: _____
Address: **103 W. Steadman St**
Anthony, KS 67003
Phone: _____ Fax: _____
Email: _____

Reference Number: P01165150 - Revision A