

Engineering Department

June 8, 2016

MEMORANDUM

To: Jason Tomanek
Assistant City Administrator

From: Gabe J. Schell, PE 
City Engineer

Re: **AGENDA ITEM**
Geotechnical Services

Please schedule the following for consideration by the Board of City Commissioners at its meeting to be held on Tuesday, June 14, 2016, at 5:15 p.m. in the Tom Baker Room.

In 2015 Terracon was selected by a selection committee to provide geotechnical services for various roadway projects to assist with subgrade and pavement design. The original contract was for a period of three years. The initial contract indicated that each year a scope of work and fee schedule would be brought to the Board of City Commissioners for approval.

For initial services in 2016, we have negotiated a scope of work and fee for \$38,380.63 with the option to negotiate for additional services. These services are to be funded through sales tax and special assessments not to exceed \$50,000.00. Final reports for the initial work will be delivered by September 1, 2016. See attached scope of services.

As this is the second year of a three year contract, a scope of work and fee schedule will again be determined and brought to the Board of City Commissioners for approval for geotechnical services in 2017.

GJS/ps
Enc.

Gabriel J. Schell, PE, City Engineer

Phone: 701-355-1505 • TDD: 711 • Fax: 701-222-6593 • 221 N. Fifth St. • PO Box 5503 • Bismarck, ND 58506-5503
Email: bisengd@bismarcknd.gov • www.bismarcknd.gov

CONTRACT REVIEW

ENGINEERING DEPARTMENT

Contract between the City of Bismarck and Terracon

Purpose of Contract: Geotechnical Services

Contract Amount: \$50,000.00*

Contract Period: Complete work by December 31, 2016

Funding Source: Sales Tax and Special Assessments

Federal Project Number (if applicable): N/A

City Project Number: _____

Comments: * \$38,380.63 for initial services with negotiation for additional services not to exceed \$50,000.00 in the fiscal year of 2016.

After Mayor's signature, route to: Tom Kary, Assistant Administrator *TK*

Department Signature *Art Hill* 6/2/16
Date

CITY ATTORNEY

Comments: OK

City Attorney Signature: *Clawson* 6-2-16
Date

FISCAL

Comments: OK w/ Commission Approval / 2nd gr
18 3gr
Already approved

Director of Finance Signature: *Mark Medina* 6-2-16
Date

APPROVAL

City Administrator Signature: *Greg Hinkle* 6-2-16
Date



May 23, 2016

Engineering Dept/City of Bismarck
221 North 5th Street
PO Box 5503
Bismarck, ND 58506-5503

Attn: Mel Bullinger, P.E., City Engineer
P: (701) 222 6580
E: mbullinger@bismarcknd.gov

Re: Proposed Geotechnical Engineering Services
Subgrade & Pavement Evaluation – Scattered Locations - 2016
Bismarck, North Dakota
Terracon Proposal No. PM2165061

Dear Mr. Bullinger:

We appreciate the opportunity to provide geotechnical engineering services for the above referenced project. This document provides our understanding of the project, anticipated planned work scope, our fee schedule, and terms and conditions associated with the performance of this work.

1.0 PROJECT INFORMATION

The City of Bismarck Engineering Department awarded Terracon a three year contract for geotechnical services to assist with subgrade and pavement design with an option to extend the contract for an additional two years. A scope of work will be developed on a year by year basis with fees negotiated on an annual basis.

This proposal specifically addresses projects under consideration at various locations throughout the city for the 2016 calendar year. Specific project locations have been defined (see attached). We understand four areas are currently under consideration for 2016. Additional geotechnical services may be identified at a later date.

2.0 SCOPE OF SERVICES

The projects will consist of field exploration and laboratory testing to characterize the subsurface and pavement conditions and develop geotechnical design and construction recommendations concerning subgrade and pavement design. The following sections provide an overview of the work scope for each of these aspects of the project.

2.1 Field Exploration

Our field exploration work includes the drilling and sampling of exploratory soil borings at a depth of 5 feet. Additionally, asphalt cores will be obtained as directed. Site specific scopes are defined on the attached drawings provided by your office.

Terracon Consultants, Inc 1805 Hancock Dr, PO Box 2084 Bismarck, ND 58502-2084
P [701] 258 2833 F [701] 258 2857 terracon.com

Environmental



Facilities



Geotechnical



Materials

Terracon has several employees who have completed the North Dakota flagger training offered through the North Dakota Safety Council and will be utilized in conjunction with traffic control during the field portion of the work where needed.

2.1.1 Procedures

The City of Bismarck has provided boring and core locations. We will also locate the soil borings and cores by field measurements with the assistance of a hand-held GPS device which is capable of locating the exploration points with an accuracy of about 20 feet. The elevations of the borings will be measured in the field using a surveyor's level and grade rod.

The five foot deep borings will be sampled using split spoon sampling devices consistent with ASTM D1586 and thinwall sampling devices consistent with ASTM D1587. Sample intervals will be as necessary to collect the required data for design, but in no case greater than 2.5 feet on center. Bulk samples will be collected on the major soil types encountered within each project boundary.

The field exploration will also include observations for groundwater. This will occur during the exploration program while the borehole is being advanced. No provisions have been made to collect water level data other than the observations made during the advancement of the borings. All borings will be backfilled immediately after their completion with auger cuttings and the surface completed with like material.

2.1.2 Safety

We are committed to the conduct of our work safely. Our field exploration work on this project will be conducted under the guidance of site-specific safety plans that take into account the information that we know about each site as it relates to safety and potential safety hazards.

Terracon will contact North Dakota One Call for location of utilities. However, such utility location services only delineate subsurface utilities in public easements, and the potential to encounter other, unknown underground hazards remains. All private lines should be marked by others prior to commencement of drilling. Also, we are not aware of environmental concerns at this project site that would create health or safety hazards associated with our exploration program. Our scope considers that standard Type D Personal Protection Equipment (PPE) is appropriate.

In order to more completely address the potential for underground utilities or environmental hazards, and, in order to more completely understand other potential safety hazards associated with our field exploration program, we may interview you or a representative that you suggest to obtain information about these concerns. The results of our interview will be included in the site-specific safety plans. We are not responsible for damage to private utilities that are not made aware to us.

2.2 Laboratory Testing

Representative soil samples will be tested in our laboratory to determine pertinent engineering characteristics. Testing will include visual classification, moisture content, dry density determination, Atterberg limits, mechanical analysis, hydrometer analysis, moisture-density relationship, resistance value (R-value) and California Bearing Ratio (CBR), as appropriate. Our laboratory procedures will follow ASTM or AASHTO standards.

2.3 Geotechnical Engineering Analysis and Report

The results of our field and laboratory programs will be evaluated by a professional geotechnical engineer. The engineer will develop an analysis of subsurface conditions, perform the engineering calculations necessary to develop appropriate geotechnical engineering design criteria for the project. At the completion of our engineering analyses, we will prepare a geotechnical engineering report that provides the following:

- Soil boring logs with field and laboratory data, soil stratification based on visual soil classification
- Groundwater levels observed during and after completion of drilling
- Site and boring/core location plans
- Subsurface exploration procedures
- Description of subsurface conditions
- Pictures of asphalt cores
- Subgrade preparation/earthwork recommendations (as required)
- Recommended pavement options and design parameters (as required)

3.0 SCHEDULE

We anticipate submitting all reports by September 1, 2016. The field exploration, laboratory testing and geotechnical engineering services will depend on the scope of each project (see attached individual cost estimates).

4.0 COMPENSATION

For the 2016 calendar year, we will provide the geotechnical services work scopes as shown for a combined fee of \$38,380.63.

We understand that additional services may be identified within this calendar year. Additional services will also be provided in accordance with the attached fee schedule rates. Items not shown on the attached fee schedule will be performed at the rate listed in our 2015 Soil Investigation Fee Schedule (also attached).

5.0 AUTHORIZATION

Work will be performed under the provisions of the attached Agreement for Services. Your authorization for Terracon to proceed in accordance with this proposal can be issued by signing the attached Agreement for Services along with this proposal and returning an original copy of these documents to our Bismarck, North Dakota office.

Proposed Geotechnical Engineering Services

Subgrade & Pavement Evaluation – Scattered Locations - 2016

Bismarck, North Dakota

May 23, 2016 ■ Terracon Proposal No. PM2165061



A fax or email of the signed Agreement for Services can also be submitted to expedite the commencement of services, but we request that a signed original follow.

We appreciate the opportunity to provide this proposal and look forward to the opportunity of working with you.

Sincerely,
Terracon Consultants, Inc

A handwritten signature in cursive script, appearing to read "Steven S. Smith".

Steven S. Smith, P.E.
Department Manager

A handwritten signature in cursive script, appearing to read "Kate D. Kelly".

Kate D. Kelly, E.I.
Staff Geotechnical Engineer

SSS/cb

Attachments: Cost Estimates (4 pages)
 Fee Schedule (3 pages)
 Site Locations & Description (3 pages)
 Agreement for Services (2 pages)

Estimated Cost Schedule

Fieldwork	Qty.	Unit	Rate		Subtotal
Mobilization	14	miles @	\$7.00	/mi.	\$98.00
Daily Travel (pickup & 2 man crew)	2	hours @	\$225.00	/hr.	\$450.00
Two Flaggers	10.5	hours @	\$162.00	/hr.	\$1,701.00
Drilling and sampling (4 @ 5 ft)	20	feet@	\$14.75	/ft.	\$295.00
Well Materials (10 ft deep well)	0	each @	\$185.00	/ea.	\$0.00
Well Installations	0	hours @	\$225.00	/hr.	\$0.00
Well Abandonments	0	hours @	\$225.00	/hr.	\$0.00
Coring (one man & equipment) (20 locations)	7	hours @	\$165.00	/hr.	\$1,155.00
Bit Wear	140	inches@	\$2.76	/in.	\$386.40
Boring layout, cleanup, and downtime	3	hours @	\$225.00	/hr.	\$675.00
Fieldwork Subtotal:					\$4,760.40
Laboratory Testing	Qty.	Unit	Rate		Subtotal
Moisture content	8	each @	\$12.00	/ea.	\$96.00
Moisture density relationship - AASHTO T99	0	each @	\$168.00	/ea.	\$0.00
Moisture density relationship - AASHTO T180	0	each @	\$194.00	/ea.	\$0.00
Atterberg limits	4	each @	\$104.00	/ea.	\$416.00
Sieve analysis	0	each @	\$98.00	/ea.	\$0.00
Hydrometer analysis	2	each @	\$192.00	/ea.	\$384.00
California Bearing Ratio (CBR)	0	each @	\$365.00	/ea.	\$0.00
Resistance Value (R-Value)	0	each @	\$525.00	/ea.	\$0.00
Cement stabilized subgrade mix design	0	each @	\$2,200.00	/ea.	\$0.00
Laboratory Testing Subtotal:					\$896.00
Project Management, Analysis and Reporting	Qty.	Unit	Rate		Subtotal
<i>Summary Reports</i>					
Senior Engineer	3	hours @	\$184.00	/hr.	\$552.00
Staff Engineer/Geologist	12	hours @	\$147.00	/hr.	\$1,764.00
Engineering Technician	2	hours @	\$104.00	/hr.	\$208.00
<i>Full Geotechnical Reports</i>					
Senior Engineer	0	hours @	\$184.00	/hr.	\$0.00
Staff Engineer/ Geologist	0	hours @	\$147.00	/hr.	\$0.00
Engineering Technician	0	hours @	\$104.00	/hr.	\$0.00
Project Management, Analysis, and Reporting Subtotal:					\$2,524.00
Estimated Total:					\$8,180.40

Estimated Cost Schedule

Fieldwork	Qty.	Unit	Rate	Subtotal
Mobilization	8	miles @	\$7.00 /mi.	\$56.00
Daily Travel (pickup & 2 man crew)	2	hours @	\$225.00 /hr.	\$450.00
Two Flaggers	10.5	hours @	\$162.00 /hr.	\$1,701.00
Drilling and sampling (4 @ 5 ft)	20	feet@	\$14.75 /ft.	\$295.00
Well Materials (10 ft deep well)	0	each @	\$185.00 /ea.	\$0.00
Well Installations	0	hours @	\$225.00 /hr.	\$0.00
Well Abandonments	0	hours @	\$225.00 /hr.	\$0.00
Coring (one man & equipment) (19 locations)	7	hours @	\$165.00 /hr.	\$1,155.00
Bit Wear	133	inches@	\$2.76 /in.	\$367.08
Boring layout, cleanup, and downtime	3	hours @	\$225.00 /hr.	\$675.00
Fieldwork Subtotal:				\$4,699.08
Laboratory Testing	Qty.	Unit	Rate	Subtotal
Moisture content	8	each @	\$12.00 /ea.	\$96.00
Moisture density relationship - AASHTO T99	0	each @	\$168.00 /ea.	\$0.00
Moisture density relationship - AASHTO T180	0	each @	\$194.00 /ea.	\$0.00
Atterberg limits	4	each @	\$104.00 /ea.	\$416.00
Sieve analysis	0	each @	\$98.00 /ea.	\$0.00
Hydrometer analysis	2	each @	\$192.00 /ea.	\$384.00
California Bearing Ratio (CBR)	0	each @	\$365.00 /ea.	\$0.00
Resistance Value (R-Value)	0	each @	\$525.00 /ea.	\$0.00
Cement stabilized subgrade mix design	0	each @	\$2,200.00 /ea.	\$0.00
Laboratory Testing Subtotal:				\$896.00
Project Management, Analysis and Reporting	Qty.	Unit	Rate	Subtotal
<i>Summary Reports</i>				
Senior Engineer	3	hours @	\$184.00 /hr.	\$552.00
Staff Engineer/Geologist	12	hours @	\$147.00 /hr.	\$1,764.00
Engineering Technician	2	hours @	\$104.00 /hr.	\$208.00
<i>Full Geotechnical Reports</i>				
Senior Engineer	0	hours @	\$184.00 /hr.	\$0.00
Staff Engineer/ Geologist	0	hours @	\$147.00 /hr.	\$0.00
Engineering Technician	0	hours @	\$104.00 /hr.	\$0.00
Project Management, Analysis, and Reporting Subtotal:				\$2,524.00
Estimated Total:				\$8,119.08

Estimated Cost Schedule

Fieldwork	Qty.	Unit	Rate		Subtotal
Mobilization	8	miles @	\$7.00	/mi.	\$56.00
Daily Travel (pickup & 2 man crew)	2	hours @	\$225.00	/hr.	\$450.00
Two Flaggers	10.5	hours @	\$162.00	/hr.	\$1,701.00
Drilling and sampling (4 @ 5 ft)	20	feet@	\$14.75	/ft.	\$295.00
Well Materials (10 ft deep well)	0	each @	\$185.00	/ea.	\$0.00
Well Installations	0	hours @	\$225.00	/hr.	\$0.00
Well Abandonments	0	hours @	\$225.00	/hr.	\$0.00
Coring (one man & equipment) (20 locations)	7	hours @	\$165.00	/hr.	\$1,155.00
Bit Wear	140	inches@	\$2.76	/in.	\$386.40
Boring layout, cleanup, and downtime	3	hours @	\$225.00	/hr.	\$675.00
				Fieldwork Subtotal:	\$4,718.40
Laboratory Testing	Qty.	Unit	Rate		Subtotal
Moisture content	8	each @	\$12.00	/ea.	\$96.00
Moisture density relationship - AASHTO T99	0	each @	\$168.00	/ea.	\$0.00
Moisture density relationship - AASHTO T180	0	each @	\$194.00	/ea.	\$0.00
Atterberg limits	4	each @	\$104.00	/ea.	\$416.00
Sieve analysis	0	each @	\$98.00	/ea.	\$0.00
Hydrometer analysis	2	each @	\$192.00	/ea.	\$384.00
California Bearing Ratio (CBR)	0	each @	\$365.00	/ea.	\$0.00
Resistance Value (R-Value)	0	each @	\$525.00	/ea.	\$0.00
Cement stabilized subgrade mix design	0	each @	\$2,200.00	/ea.	\$0.00
				Laboratory Testing Subtotal:	\$896.00
Project Management, Analysis and Reporting	Qty.	Unit	Rate		Subtotal
<i>Summary Reports</i>					
Senior Engineer	3	hours @	\$184.00	/hr.	\$552.00
Staff Engineer/Geologist	13	hours @	\$147.00	/hr.	\$1,911.00
Engineering Technician	2	hours @	\$104.00	/hr.	\$208.00
<i>Full Geotechnical Reports</i>					
Senior Engineer	0	hours @	\$184.00	/hr.	\$0.00
Staff Engineer/ Geologist	0	hours @	\$147.00	/hr.	\$0.00
Engineering Technician	0	hours @	\$104.00	/hr.	\$0.00
				Project Management, Analysis, and Reporting Subtotal:	\$2,671.00
				Estimated Total:	\$8,285.40

Estimated Cost Schedule

Fieldwork	Qty.	Unit	Rate		Subtotal
Mobilization	14	miles @	\$7.00	/mi.	\$98.00
Daily Travel (pickup & 2 man crew)	4	hours @	\$225.00	/hr.	\$900.00
Two Flaggers	8	hours @	\$162.00	/hr.	\$1,296.00
Drilling and sampling (4 @ 5 ft)	65	feet@	\$14.75	/ft.	\$958.75
Well Materials (10 ft deep well)	0	each @	\$185.00	/ea.	\$0.00
Well Installations	0	hours @	\$225.00	/hr.	\$0.00
Well Abandonments	0	hours @	\$225.00	/hr.	\$0.00
Bit Wear	0	inches@	\$2.76	/in.	\$0.00
Boring layout, cleanup, and downtime	5	hours @	\$225.00	/hr.	\$1,125.00
				Fieldwork Subtotal:	\$4,377.75
Laboratory Testing	Qty.	Unit	Rate		Subtotal
Moisture content	26	each @	\$12.00	/ea.	\$312.00
Moisture density relationship - AASHTO T99	0	each @	\$168.00	/ea.	\$0.00
Moisture density relationship - AASHTO T180	2	each @	\$194.00	/ea.	\$388.00
Atterberg limits	9	each @	\$104.00	/ea.	\$936.00
Sieve analysis	0	each @	\$98.00	/ea.	\$0.00
Hydrometer analysis	6	each @	\$192.00	/ea.	\$1,152.00
California Bearing Ratio (CBR)	0	each @	\$365.00	/ea.	\$0.00
Resistance Value (R-Value)	0	each @	\$525.00	/ea.	\$0.00
Cement stabilized subgrade mix design	2	each @	\$2,200.00	/ea.	\$4,400.00
				Laboratory Testing Subtotal:	\$7,188.00
Project Management, Analysis and Reporting	Qty.	Unit	Rate		Subtotal
<i>Summary Reports</i>					
Senior Engineer	3	hours @	\$184.00	/hr.	\$552.00
Staff Engineer/Geologist	10	hours @	\$147.00	/hr.	\$1,470.00
Engineering Technician	2	hours @	\$104.00	/hr.	\$208.00
<i>Full Geotechnical Reports</i>					
Senior Engineer	0	hours @	\$184.00	/hr.	\$0.00
Staff Engineer/ Geologist	0	hours @	\$147.00	/hr.	\$0.00
Engineering Technician	0	hours @	\$104.00	/hr.	\$0.00
				Project Management, Analysis, and Reporting Subtotal:	\$2,230.00
				Estimated Total:	\$13,795.75

TERRACON CONSULTANTS, INC.
2015 SOIL INVESTIGATION FEE SCHEDULE
ENGINEERING DEPARTMENT - CITY OF BISMARCK, NORTH DAKOTA
(MAY 1, 2016 THROUGH DECEMBER 31, 2016)

I. FIELD WORK

A.	1.	Standard two-man field crew and truck-mounted rotary drill capable of performing standard penetration borings, with boring advancement by flight or hollow stem auger, or by rotary mud drilling methods.	Per Hour	\$295.00
	2.	Same as A.1., but with all-terrain vehicle.	Per Hour	\$365.00
	3.	Standard two-man field crew for boring layout, utility locations, elevations, site clean-up, and standby time due to site access or other site problems.	Per Hour	\$225.00
	4.	Same as A.3., but with ATV-mounted drill rig.	Per Hour	\$245.00
	5.	Additional crew man when use will reduce overall cost of work.	Per Hour	\$105.00
	6.	Overtime		
	a.	Saturday		Rate x \$1.25
	b.	Sunday or Holiday		Rate x \$1.40
B.	1.	Mobilization to and from sites outside the immediate vicinity of the laboratory. Truck-mounted drill rig, support vehicle and standard two-man crew.	Per Mile	\$7.00
	2.	Mobilization to and from all job sites. ATV-mounted drill rig and tractor-trailer, support vehicle and two-man crew.	\$205.00	+\$7.50/mi
C.		Job Site Mileage	Per Mile	\$1.05
D.		Job Site Services or Consultation (Portal to Portal)		
	1.	Principal Engineer	Per Hour	\$240.00
	2.	Senior Engineer	Per Hour	\$184.00
	3.	Project Engineer	Per Hour	\$173.00
	4.	Certified Senior Engineering Technician	Per Hour	\$152.00
	5.	Staff Engineer/Geologist	Per Hour	\$147.00
	6.	Certified Engineering Technician	Per Hour	\$120.00
	7.	Engineering Technician	Per Hour	\$104.00
	8.	Technician	Per Hour	\$81.00
	9.	Mileage	Per Mile	\$0.89
E.		Living expenses when personnel are required to remain away from home overnight.		Actual +20%
F.		Miscellaneous job expenses such as snow removal, communication charges, freight charges and rental of special equipment.		Actual +20%
G.		Materials.		Actual +20%
H.		Required Permits.		Actual
I.		Decontamination of equipment with hot water pressure:		
	1.	Drill rig and tools before job	Per Job	\$415.00
	2.	Rental of hot water pressure washer--on site	Per Day	\$190.00
J.		Abandoned sampling equipment, casing or auger, when it is considered more economical to abandon than to recover.		Actual Value
K.		Case of soil sample jars (24). Thin Walls (3")		\$44.00 \$22.00

II. LABORATORY TESTS

A.		Unconfined Compressive Strength ASTM:D2166		
	1.	Reporting maximum stress at failure		\$72.00
	2.	Reporting complete stress strain curve		\$99.00
	3.	Sample preparation - recompacted		\$109.00

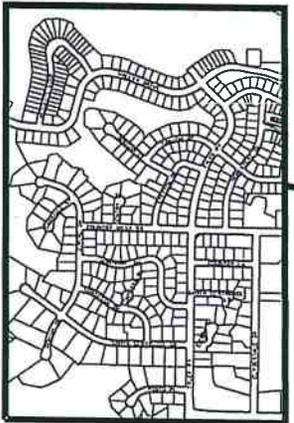
B.	Moisture Content and Density		
	1. Hg immersion or direct measurement method		\$67.00
	2. In-tube measurement		\$78.00
	3. Moisture only		\$12.00
C.	Atterberg Limits		
	1. Liquid and Plastic Limit		\$104.00
	2. Liquid Limit or Plastic Limit only		\$83.00
	3. Shrinkage Limit ASTM:D427		\$93.00
D.	Specific Gravity ASTM:D854		\$105.00
E.	Mechanical Analysis (Jar Samples)		
	1. Through #200 sieve ASTM:D422		\$98.00
	2. Percent Passing #200 ASTM:D1140		\$68.00
	3. Through .001 mm size, hydrometer analysis ASTM:D422		\$192.00
	4. Determine .005 or 0.02 mm (clay content)		\$168.00
F.	Determination of Organic Soil		
	1. ASTM:D2487		\$135.00
	2. Organic Content (combustion method) ASTM:D2974		\$98.00
G.	Coefficient of Permeability		
	1. Falling Head Method		\$340.00
	2. Falling Head Method (ASTM:D5856) - Recompacted		\$425.00
	3. Constant Head Method (Granular Soils) ASTM:D2434		\$415.00
	4. Flexible Wall (ASTM:D5084)		\$520.00
	a. Sample preparation - recompactd		\$93.00
H.	Moisture-Density Relations of Soils		
	1. ASTM:D698 or AASHTO:T99	Each	\$168.00
	a. Method "A"-#4 basis		
	b. Method "B"-3/8" basis		
	c. Method "C"-3/4" basis		
	2. ASTM:D1557 or AASHTO:T180	Each	\$194.00
	a. Method "A"-#4 basis		
	b. Method "B"-3/8" basis		
	c. Method "C"-3/4" basis		
	3. Preparation of Fat Clay Soils	Each	\$63.00
I.	Tests of Expansive Soils ASTM:D4546		
	1. Percent Swell		\$180.00
	2. Swell pressure		\$365.00
J.	Hand Penetrometer		\$6.75
K.	Consolidation Tests ASTM:D2435		
	1. Reporting log p-e curve		\$610.00
	2. Reporting log p-e curve with time settlement curves		\$795.00
	3. Cyclic loadings	Per Load	\$49.00
L.	California Bearing Ratio (CBR) ASTM:D1883		
	1. Granular material	First Point	\$320.00
	a. Additional points	Per Point	\$192.00
	2. Cohesive material	First Point	\$405.00
	a. Additional points	Per Point	\$239.00
M.	Field CBRs (in accordance with Chapter 8 of the Asphalt Institute for Design of Asphalt Pavement Structures, MS-10).		Hourly Rate Per Section I
N.	Plate Load Tests (Client to provide reaction)		
	1. Engineer, portal to portal	Per Hour	\$145.00
	2. Technician to aid when necessary	Per Hour	\$80.00
	3. Mileage	Per Mile	\$0.89

O.	Pile Load Tests (Client to provide reaction)		
	1. Engineer, portal to portal	Per Hour	\$145.00
	2. Technician to aid when necessary	Per Hour	\$80.00
	3. Pile Driving Analyzer		Q.O.R.
	4. Mileage	Per Mile	\$0.89
P.	Field Resistivity Tests		
	1. Engineering Technician & Equipment, portal to portal	Per Hour	\$135.00
	2. Mileage	Per Mile	\$0.89
Q.	Direct Shear Tests (per normal pressure)		
	1. Unconsolidated-undrained		\$175.00
	2. Consolidated-undrained		
	a. Granular soil		\$225.00
	b. Cohesive soil		\$315.00
	3. Consolidated-drained ASTM:D3080		
	a. Granular soil		\$260.00
	b. Cohesive soil		\$400.00
	4. Sample preparation - recompacted		\$93.00
	5. Sample preparation - fragile specimens	Per Hour	\$119.00
R.	Triaxial Compression Test (per confining pressure)		
	1. Unconsolidated-undrained ASTM:D2850		\$285.00
	2. Consolidated-undrained ASTM:D4767 (inc. pore-pressure readings)		\$390.00
	3. Consolidated-drained (inc. pore-pressure readings)		Q.O.R.
	4. Back pressure saturation		\$240.00
	5. Staged confining pressure		50% of above
	6. Sample preparation-recompacted		\$93.00
S.	Chemical Tests of Soil		
	1. Redox		\$100.00
	2. Sulfate content		\$70.00
	3. Chloride content		\$70.00
	4. Electrical conductivity		\$70.00
	5. pH		\$27.00
T.	Miller Box Resistivity	Per Point	\$205.00
U.	Pinhole Test ASTM D4647		\$370.00

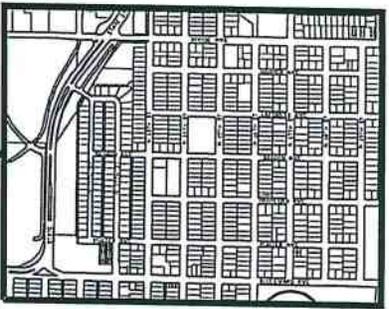
III. OFFICE AND LABORATORY

A.	Analysis, Consultation and Reporting		
	1. Principal Engineer	Per Hour	\$240.00
	2. Senior Engineer	Per Hour	\$184.00
	3. Project Engineer	Per Hour	\$173.00
	4. Certified Senior Engineering Technician	Per Hour	\$152.00
	5. Staff Engineer/Geologist	Per Hour	\$147.00
	6. Certified Engineering Technician	Per Hour	\$120.00
	7. Engineering Technician	Per Hour	\$104.00
	8. Technician	Per Hour	\$81.00
	9. Clerical	Per Hour	\$72.50
B.	Reproduction of reports		
	1. Additional copies beyond first 3 copies	Per Page	\$0.57
	2. Additional reports at a later date		
	a. Copied		\$41.00 +\$0.57/page
	b. Faxed		\$41.00 +\$1.15/page
	c. Emailed		\$41.00

SITE 1



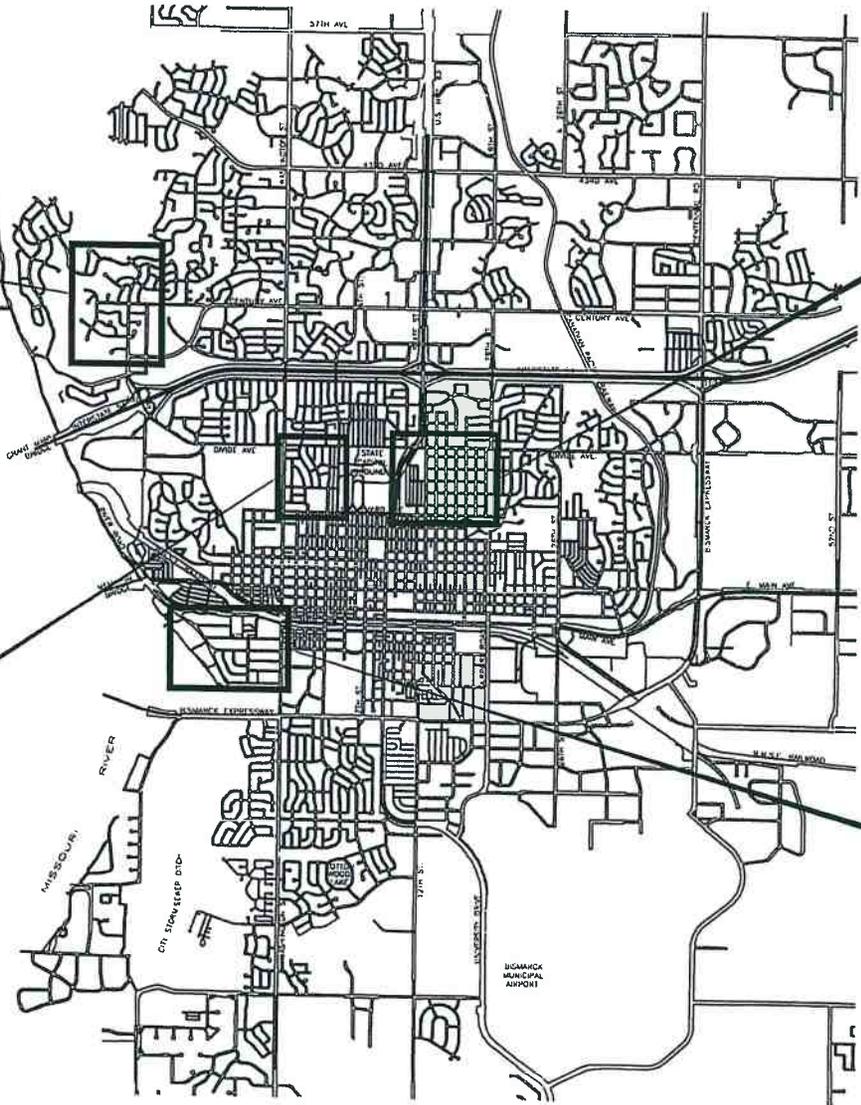
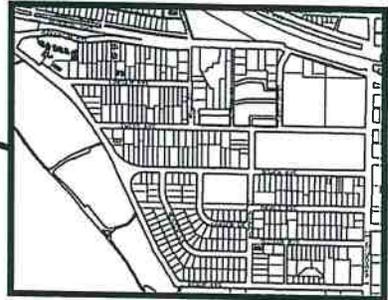
SITE 2



SITE 3



SITE 4



SITE 1
 20 - PVMT THICKNESS
 4 - 5' BORINGS



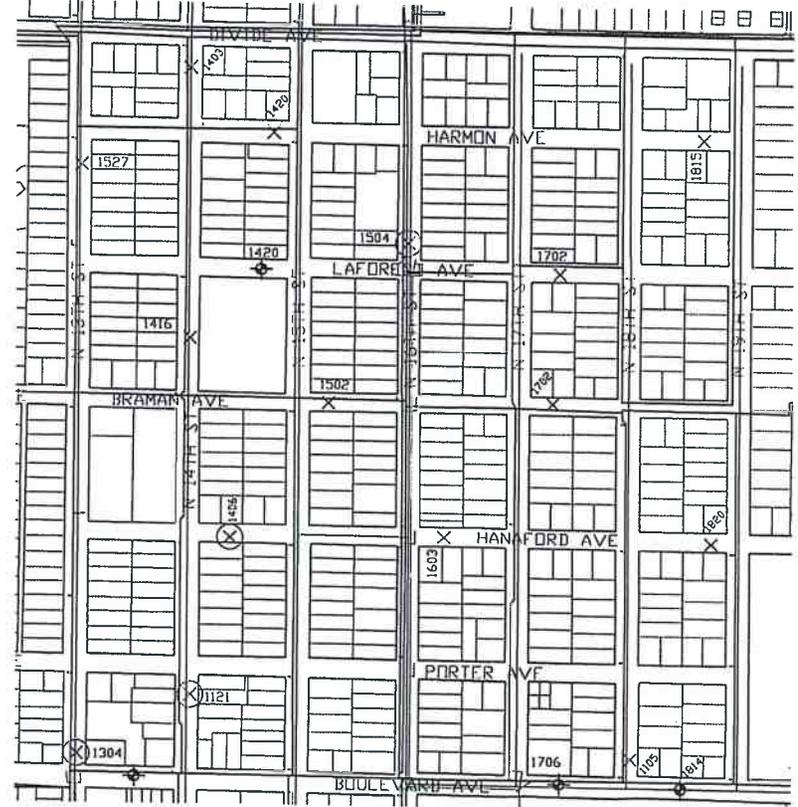
APPROXIMATE QUANTITIES

- 8 - 5' BORINGS
- 39 - PVMT THICKNESS
- 2 - SUMMARY GEOTECHNICAL REPORTS

CONSTRUCTION NOTES

- ☐ WATER UTILITIES
- ☐ SANITARY SEWER UTILITIES
- ☐ STORM SEWER UTILITIES
- ⊗ PVMT THICKNESS - 2 CORES
- ⊗ PVMT THICKNESS
- ⊕ 5' BORINGS

SITE 2
 19 - PVMT THICKNESS
 4 - 5' BORINGS



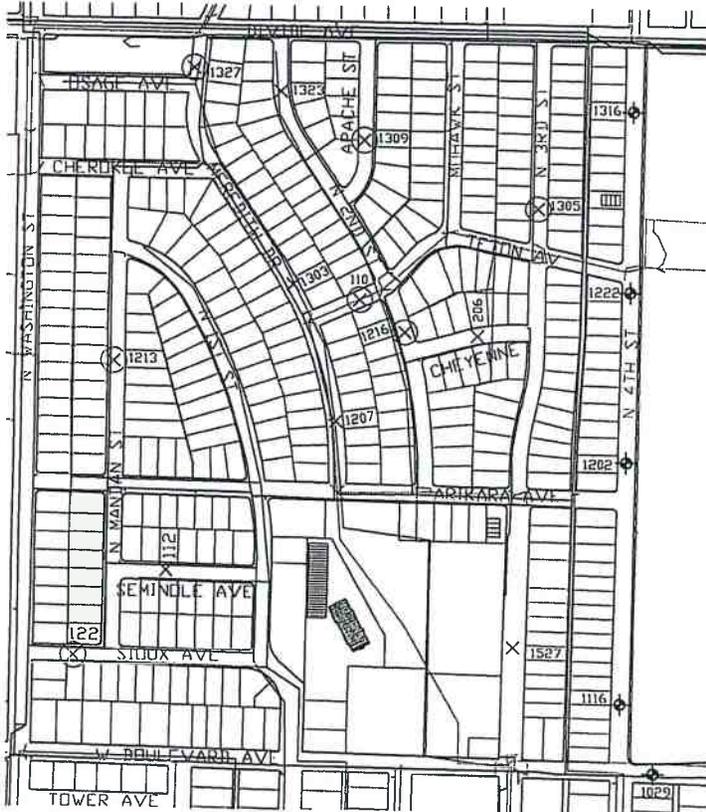
CAUTION
 UTILITY LOCATIONS ARE APPROXIMATE.
 CONTRACTOR IS RESPONSIBLE FOR
 VERIFYING LOCATION PRIOR TO
 BORING.

Bismarck Engineering Department

RESURFACE
SITE 1
SITE 2

BISMARCK, N.D. DATE: 5/5/2016

SITE 3
 20 - PVMT THICKNESS
 5 - 5' BORINGS



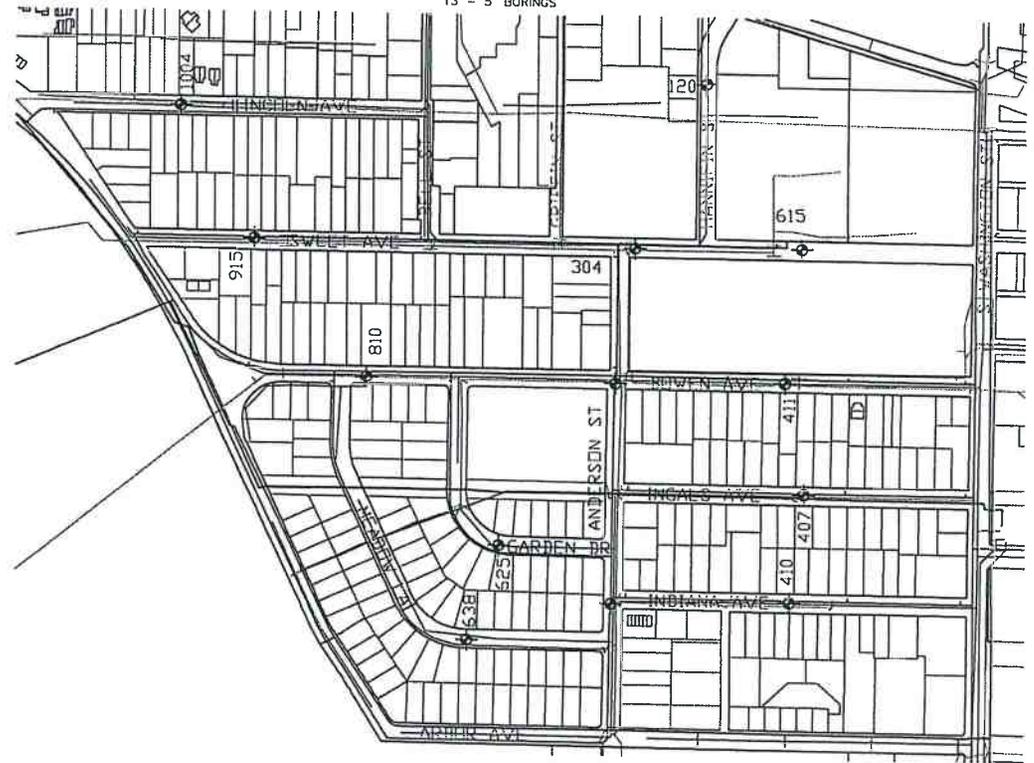
APPROXIMATE QUANTITIES

- 18 - 5' BORINGS
- 20 - PAVEMENT THICKNESS
- 2 - SUMMARY GEOTECHNICAL REPORTS

CONSTRUCTION NOTES

- WATER UTILITIES
- SANIARY SEWER UTILITIES
- STORM SEWER UTILITIES
- PVMT THICKNESS - 2 CORES
- PVMT THICKNESS
- 5' BORINGS

SITE 4
 13 - 5' BORINGS



CAUTION
 UTILITY LOCATIONS ARE APPROXIMATE.
 CONTRACTOR IS RESPONSIBLE FOR
 VERIFYING LOCATION PRIOR TO
 BORING.

Bismarck Engineering Department

SITE 3 -- RESURFACE
SITE 4 -- HARDSURFACE

BISMARCK, N.D. DATE: 5/5/2016

AGREEMENT FOR SERVICES

This **AGREEMENT** is between Engineering Dept/City of Bismarck ("Client") and Terracon Consultants, Inc. ("Consultant") for Services to be provided by Consultant for Client on the Subgrade & Pavement Evaluation - Scattered Locations - 2016, Bismarck, North Dakota project ("Project"), as described in the Project Information section of Consultant's Proposal dated 05/23/2016 ("Proposal") unless the Project is otherwise described in Exhibit A to this Agreement (which section or Exhibit is incorporated into this Agreement).

- 1. Scope of Services.** The scope of Consultant's services is described in the Scope of Services section of the Proposal ("Services"), unless Services are otherwise described in Exhibit B to this Agreement (which section or exhibit is incorporated into this Agreement). Portions of the Services may be subcontracted. Consultant's Services do not include the investigation or detection of, nor do recommendations in Consultant's reports address the presence or prevention of biological pollutants (e.g., mold, fungi, bacteria, viruses, or their byproducts) or occupant safety issues, such as vulnerability to natural disasters, terrorism, or violence. If Services include purchase of software, Client will execute a separate software license agreement. Consultant's findings, opinions, and recommendations are based solely upon data and information obtained by and furnished to Consultant at the time of the Services.
- 2. Acceptance/ Termination.** Client agrees that execution of this Agreement is a material element of the consideration Consultant requires to execute the Services, and if Services are initiated by Consultant prior to execution of this Agreement as an accommodation for Client at Client's request, both parties shall consider that commencement of Services constitutes formal acceptance of all terms and conditions of this Agreement. Additional terms and conditions may be added or changed only by written amendment to this Agreement signed by both parties. In the event Client uses a purchase order or other form to administer this Agreement, the use of such form shall be for convenience purposes only and any additional or conflicting terms it contains are stricken. This Agreement shall not be assigned by either party without prior written consent of the other party. Either party may terminate this Agreement or the Services upon written notice to the other. In such case, Consultant shall be paid costs incurred and fees earned to the date of termination plus reasonable costs of closing the project.
- 3. Change Orders.** Client may request changes to the scope of Services by altering or adding to the Services to be performed. If Client so requests, Consultant will return to Client a statement (or supplemental proposal) of the change setting forth an adjustment to the Services and fees for the requested changes. Following Client's review, Client shall provide written acceptance. If Client does not follow these procedures, but instead directs, authorizes, or permits Consultant to perform changed or additional work, the Services are changed accordingly and Consultant will be paid for this work according to the fees stated or its current fee schedule. If project conditions change materially from those observed at the site or described to Consultant at the time of proposal, Consultant is entitled to a change order equitably adjusting its Services and fee.
- 4. Compensation and Terms of Payment.** Client shall pay compensation for the Services performed at the fees stated in the Compensation section of the Proposal unless fees are otherwise stated in Exhibit C to this Agreement (which section or Exhibit is incorporated into this Agreement). If not stated in either, fees will be according to Consultant's current fee schedule. Fee schedules are valid for the calendar year in which they are issued. Fees do not include sales tax. Client will pay applicable sales tax as required by law. Consultant may invoice Client at least monthly and payment is due upon receipt of invoice. Client shall notify Consultant in writing, at the address below, within 15 days of the date of the invoice if Client objects to any portion of the charges on the invoice, and shall promptly pay the undisputed portion. Client shall pay a finance fee of 1.5% per month, but not exceeding the maximum rate allowed by law, for all unpaid amounts 30 days or older. Client agrees to pay all collection-related costs that Consultant incurs, including attorney fees. Consultant may suspend Services for lack of timely payment. It is the responsibility of Client to determine whether federal, state, or local prevailing wage requirements apply and to notify Consultant if prevailing wages apply. If it is later determined that prevailing wages apply, and Consultant was not previously notified by Client, Client agrees to pay the prevailing wage from that point forward, as well as a retroactive payment adjustment to bring previously paid amounts in line with prevailing wages. Client also agrees to defend, indemnify, and hold harmless Consultant from any alleged violations made by any governmental agency regulating prevailing wage activity for failing to pay prevailing wages, including the payment of any fines or penalties.
- 5. Third Party Reliance.** This Agreement and the Services provided are for Consultant and Client's sole benefit and exclusive use with no third party beneficiaries intended. Reliance upon the Services and any work product is limited to Client, and is not intended for third parties. For a limited time period not to exceed three months from the date of the report, Consultant will issue additional reports to others agreed upon with Client, however Client understands that such reliance will not be granted until those parties sign and return Consultant's reliance agreement and Consultant receives the agreed-upon reliance fee.
- 6. LIMITATION OF LIABILITY. CLIENT AND CONSULTANT HAVE EVALUATED THE RISKS AND REWARDS ASSOCIATED WITH THIS PROJECT, INCLUDING CONSULTANT'S FEE RELATIVE TO THE RISKS ASSUMED, AND AGREE TO ALLOCATE CERTAIN OF THE ASSOCIATED RISKS. TO THE FULLEST EXTENT PERMITTED BY LAW, THE TOTAL AGGREGATE LIABILITY OF CONSULTANT (AND ITS RELATED CORPORATIONS AND EMPLOYEES) TO CLIENT AND THIRD PARTIES GRANTED RELIANCE IS LIMITED TO THE GREATER OF \$50,000 OR CONSULTANT'S FEE, FOR ANY AND ALL INJURIES, DAMAGES, CLAIMS, LOSSES, OR EXPENSES (INCLUDING ATTORNEY AND EXPERT FEES) ARISING OUT OF CONSULTANT'S SERVICES OR THIS AGREEMENT. PRIOR TO ACCEPTANCE OF THIS AGREEMENT AND UPON WRITTEN REQUEST FROM CLIENT, CONSULTANT MAY NEGOTIATE A HIGHER LIMITATION FOR ADDITIONAL CONSIDERATION. THIS LIMITATION SHALL APPLY REGARDLESS OF AVAILABLE PROFESSIONAL LIABILITY INSURANCE COVERAGE, CAUSE(S) OR THE THEORY OF LIABILITY, INCLUDING NEGLIGENCE, INDEMNITY, OR OTHER RECOVERY. THIS LIMITATION SHALL NOT APPLY TO THE EXTENT THE DAMAGE IS PAID UNDER CONSULTANT'S COMMERCIAL GENERAL LIABILITY POLICY.**
- 7. Indemnity/Statute of Limitations.** Consultant and Client shall indemnify and hold harmless the other and their respective employees from and against legal liability for claims, losses, damages, and expenses to the extent such claims, losses, damages, or expenses are legally determined to be caused by their negligent acts, errors, or omissions. In the event such claims, losses, damages, or expenses are legally determined to be caused by the joint or concurrent negligence of Consultant and Client, they shall be borne by each party in proportion to its own negligence under comparative fault principles. Neither party shall have a duty to defend the other party, and no duty to defend is hereby created by this indemnity provision and such duty is explicitly waived under this Agreement. Causes of action arising out of Consultant's services or this Agreement regardless of cause(s) or the theory of liability, including negligence, indemnity or other recovery shall be deemed to have accrued and the applicable statute of limitations shall commence to run not later than the date of Consultant's substantial completion of services on the project.
- 8. Warranty.** Consultant will perform the Services in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. **EXCEPT FOR THE STANDARD OF CARE PREVIOUSLY STATED, CONSULTANT MAKES NO WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, RELATING TO CONSULTANT'S SERVICES AND CONSULTANT DISCLAIMS ANY IMPLIED WARRANTIES OR WARRANTIES IMPOSED BY LAW, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
- 9. Insurance.** Consultant represents that it now carries, and will continue to carry: (i) workers' compensation insurance in accordance with the laws of the states having jurisdiction over Consultant's employees who are engaged in the Services, and employer's liability insurance (\$1,000,000); (ii) commercial general liability insurance (\$1,000,000 occ / \$2,000,000 agg); (iii) automobile liability insurance (\$1,000,000 B.I. and P.D. combined single

limit); and (iv) professional liability insurance (\$1,000,000 claim / agg). Certificates of insurance will be provided upon request. Client and Consultant shall waive subrogation against the other party on all general liability and property coverage.

- 10. CONSEQUENTIAL DAMAGES.** NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR LOSS OF PROFITS OR REVENUE; LOSS OF USE OR OPPORTUNITY; LOSS OF GOOD WILL; COST OF SUBSTITUTE FACILITIES, GOODS, OR SERVICES; COST OF CAPITAL; OR FOR ANY SPECIAL, CONSEQUENTIAL, INDIRECT, PUNITIVE, OR EXEMPLARY DAMAGES.
- 11. Dispute Resolution.** Client shall not be entitled to assert a Claim against Consultant based on any theory of professional negligence unless and until Client has obtained the written opinion from a registered, independent, and reputable engineer, architect, or geologist that Consultant has violated the standard of care applicable to Consultant's performance of the Services. Client shall provide this opinion to Consultant and the parties shall endeavor to resolve the dispute within 30 days, after which Client may pursue its remedies at law. This Agreement shall be governed by and construed according to Kansas law.
- 12. Subsurface Explorations.** Subsurface conditions throughout the site may vary from those depicted on logs of discrete borings, test pits, or other exploratory services. Client understands Consultant's layout of boring and test locations is approximate and that Consultant may deviate a reasonable distance from those locations. Consultant will take reasonable precautions to reduce damage to the site when performing Services; however, Client accepts that invasive services such as drilling or sampling may damage or alter the site. Site restoration is not provided unless specifically included in the Services.
- 13. Testing and Observations.** Client understands that testing and observation are discrete sampling procedures, and that such procedures indicate conditions only at the depths, locations, and times the procedures were performed. Consultant will provide test results and opinions based on tests and field observations only for the work tested. Client understands that testing and observation are not continuous or exhaustive, and are conducted to reduce - not eliminate - project risk. Client agrees to the level or amount of testing performed and the associated risk. Client is responsible (even if delegated to contractor) for requesting services, and notifying and scheduling Consultant so Consultant can perform these Services. Consultant is not responsible for damages caused by services not performed due to a failure to request or schedule Consultant's services. Consultant shall not be responsible for the quality and completeness of Client's contractor's work or their adherence to the project documents, and Consultant's performance of testing and observation services shall not relieve Client's contractor in any way from its responsibility for defects discovered in its work, or create a warranty or guarantee. Consultant will not supervise or direct the work performed by Client's contractor or its subcontractors and is not responsible for their means and methods.
- 14. Sample Disposition, Affected Materials, and Indemnity.** Samples are consumed in testing or disposed of upon completion of tests (unless stated otherwise in the Services). Client shall furnish or cause to be furnished to Consultant all documents and information known or available to Client that relate to the identity, location, quantity, nature, or characteristic of any hazardous waste, toxic, radioactive, or contaminated materials ("Affected Materials") at or near the site, and shall immediately transmit new, updated, or revised information as it becomes available. Client agrees that Consultant is not responsible for the disposition of Affected Material unless specifically provided in the Services, and that Client is responsible for directing such disposition. In the event that test samples obtained during the performance of Services (i) contain substances hazardous to health, safety, or the environment, or (ii) equipment used during the Services cannot reasonably be decontaminated, Client shall sign documentation (if necessary) required to ensure the equipment and/or samples are transported and disposed of properly, and agrees to pay Consultant the fair market value of this equipment and reasonable disposal costs. In no event shall Consultant be required to sign a hazardous waste manifest or take title to any Affected Materials. Client shall have the obligation to make all spill or release notifications to appropriate governmental agencies. The Client agrees that Consultant neither created nor contributed to the creation or existence of any Affected Materials conditions at the site. Accordingly, Client waives any claim against Consultant and agrees to indemnify and save Consultant, its agents, employees, and related companies harmless from any claim, liability or defense cost, including attorney and expert fees, for injury or loss sustained by any party from such exposures allegedly arising out of Consultant's non-negligent performance of services hereunder, or for any claims against Consultant as a generator, disposer, or arranger of Affected Materials under federal, state, or local law or ordinance.
- 15. Ownership of Documents.** Work product, such as reports, logs, data, notes, or calculations, prepared by Consultant shall remain Consultant's property. Proprietary concepts, systems, and ideas developed during performance of the Services shall remain the sole property of Consultant. Files shall be maintained in general accordance with Consultant's document retention policies and practices.
- 16. Utilities.** Client shall provide the location and/or arrange for the marking of private utilities and subterranean structures. Consultant shall take reasonable precautions to avoid damage or injury to subterranean structures or utilities. Consultant shall not be responsible for damage to subterranean structures or utilities that are not called to Consultant's attention, are not correctly marked, including by a utility locate service, or are incorrectly shown on the plans furnished to Consultant.
- 17. Site Access and Safety.** Client shall secure all necessary site related approvals, permits, licenses, and consents necessary to commence and complete the Services and will execute any necessary site access agreement. Consultant will be responsible for supervision and site safety measures for its own employees, but shall not be responsible for the supervision or health and safety precautions for any other parties, including Client, Client's contractors, subcontractors, or other parties present at the site.

Consultant: Terracon Consultants, Inc.
 By: *Steven S. Smith* Date: 5/23/2016
 Name/Title: Steven S Smith / Senior Associate
 Address: 1805 Hancock Dr PO Box 2084
Bismarck, ND 58501
 Phone: (701) 258-2833 Fax: (701) 258-2857
 Email: Steve.Smith@terracon.com

Client: Engineering Dept/City of Bismarck
 By: _____ Date: _____
 Name/Title: /
 Address: PO Box 5503
Bismarck, ND 58506-5503
 Phone: (701) 222-6580 Fax: _____
 Email: mbullinger@bismarcknd.gov

Reference Number: PM2165061