



Independent Testing Technologies, Inc.

January 23, 2013

Ms. Rena Weber
City of Rockville
PO Box 93
Rockville, MN 56302

RE: 13-010 Report of Geotechnical Exploration
 Burg Street Improvements
 Rockville, Minnesota

Dear Ms. Weber:

As requested and authorized by you, Independent Testing Technologies, Inc. recently conducted soil borings on the above referenced project in Rockville, Minnesota. The purpose of our subsurface investigation was to assist your engineer, Mr. Dave Blommel with SEH, with pavement rehabilitation project design. An electronic copy of this report was sent directly to him.

Exploration:

On January 16, 2013, eight (8) split-spoon borings were conducted on this project with a truck mounted drill rig. The split-spoon borings were planned to be advanced to depths of 5 feet using a 3 1/4-inch hollow stem auger. Samples were obtained every 2 1/2 feet using a 2-inch O.D. split spoon sampler in accordance with ASTM D1586. Standard penetration values (N-values) were obtained at each sample interval by driving a sampler into the soil using a 140-pound hammer falling 30 inches. After an initial set of 6 inches, the number of blows required to drive the sampler 12 inches is known as the standard penetration resistance or N-value. SPT samples were not taken in frozen soils. Groundwater levels were noted during drilling. The holes were backfilled with the auger cuttings. Some settlement of the boreholes is likely.

The site is an existing large lot residential neighborhood. The borings were conducted in the

bituminous surfaced roadways and encountered 2.0 to 3.5 inches of bituminous pavement over 4.0 to 8.0 inches of aggregate base material. Boring B-3 was conducted in an area where the bituminous pavement was gone and only gravel was left. Boring B-3 encountered 8 inches of aggregate at the surface.

Below the pavement, borings B-1 through B-6 generally encountered clayey sand (SC) fill, silty sand (SM) fill and silty clayey sand (SC-SM) fill to depths of 3.5 to more than 5.0. Below the fill, the borings encountered native silty sand (SM) and clayey sand (SC) glacial till soils.

Boring B-7 encountered native silty clayey sand (SC-SM) below the pavement to termination at 5.0 feet. Boring B-8 encountered native, silty sand (SM) to refusal at 3.5 feet. Refusal was due to a cobble or boulder in the native soils.

The standard penetration blow counts in the sand fill soils ranged from 11 to 12 which are moderate to high, indicating that they are in a medium to dense condition. The standard penetration blow counts in the native sand soils ranged from 10 to 17 which are moderate to high, indicating that they are in a medium to dense condition. Groundwater was not encountered in any of the borings at the time of our investigation.

Recommendations

Based on the results of our borings, it is our opinion that the silty and clayey sands (SC, SC-SM, SM) fill soils on this site are considered fair material for roadway subgrade material. These soils can sometimes be difficult to compact if the moisture content is too high. The on-site soils are also somewhat poorly drained, which can exacerbate pavement deterioration.

We recommend that any unsuitable, uncompacted, or unstable soils be removed from beneath the proposed pavement section. Generally in these soil types, we recommend the existing subgrade soils be subcut a minimum of 12 inches and be replaced with select granular borrow. We recommend that any excavation below pavement section be oversized one foot for every foot of fill placed to reach planned grade (1:1 oversizing).

The on-site soils consisting of clayey sands (SC) and silty clayey sands (SM) are considered fair to poor material for use as structural fill. These soils are susceptible to moisture variations and may be difficult to work with if they become wet. They will require drying or mixing to reach optimum moisture for compaction if they become wet prior to compaction. They also appear to be wet as they exist.

The expected subgrade soils on the project appear to consist of fine grained silty and clayey sand soils (SC, SC-SM, SM) and are classified as A-4 soils in accordance with the American Association of State Highway Transportation Officials (AASHTO) classification system. A-4 soils are rated fair to poor material for use as roadway subgrade material. Without benefit of

a laboratory R-value determination and based on Mn/DOT guidelines, an R-value of 20 can be assumed for the onsite soils.

In using the assumed R-value, it is essential that the subgrade be constructed of uniform soils at a moisture content and density in accordance with Mn/DOT specification 2105 and capable of passing a test roll in accordance with Mn/DOT specification 2111. The in-place soils may need preparation (drying and compacting) to pass a proof roll. If the subgrade is not compacted, uniform and capable of passing a test roll, then we recommend the subgrade be scarified and recompacted or subcut and geotextile fabric placed along with select granular material meeting Mn/DOT specification 3149. The top of subgrade should be compacted to a minimum of 100% of standard proctor maximum density. The subgrade should be sloped towards the edges to provide drainage.

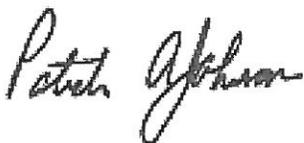
Our work was performed for geotechnical purposes only and not to document the presence or extent of any contamination on the site. We can note that our crew did not detect any obvious contamination by sight or smell during drilling operations. However, human senses are limited in terms of contamination detection and, therefore, the lack of detection through human sensing does not preclude the possibility of the presence of contamination of the site.

This report represents the result of our subsurface investigation and is based on information gathered at specific locations. Subsurface conditions can change a great deal over short horizontal distances. Also, the actual interface between strata will likely be a gradual transition rather than an abrupt change as represented on the boring logs.

Geotechnical engineering is based extensively on opinion. Therefore, the data contained in this report should be used as a guide, and we recommend that construction monitoring be performed by a qualified geotechnical engineer or technician. Any changes in the subsurface conditions from those found during this geotechnical exploration should be brought to the attention of a soils engineer.

Ms. Weber, it has been our pleasure to be of service to you on this project. Please feel free to contact me if you have any questions or need additional services.

Sincerely,



Patrick A. Johnson, P.E.
MN Registration #22037

c:b13010-ltr



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FILE NO.
ROCKV 121741

DATE:
09-18-12

2013 STREET IMPROVEMENTS
BURG STREET
ROCKVILLE, MINNESOTA

FIGURE
NO. 1

**PROJECT: 13-010 CITY OF ROCKVILLE
BURG STREET IMPROVEMENTS
ROCKVILLE, MINNESOTA**

**DATE: 1/16/13 BORING #: B-1
START TIME: 1:07 END TIME: 1:19**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: RB / RK
ELEVATION: N/A**

LOCATION: See Boring Location Plan

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	Water Table	Notes
7.5"		3.5" Bituminous, 4.0" Aggregate Base				
	SC-SM	SILTY CLAYEY SAND, fine to medium grained, w/ a trace of GRAVEL, brown, mottled. (FILL)	1	*		* Soil frozen.
5.0			2	12		
		Boring complete to 5.0 feet. Water was not encountered during drilling. Water was not present to cave-in depth of 3.0 feet after completion of bore hole.				

PROJECT: **13-010 CITY OF ROCKVILLE
BURG STREET IMPROVEMENTS
ROCKVILLE, MINNESOTA**

DATE: **1/16/13** BORING #: **B-2**
START TIME: **1:49** END TIME: **2:06**

METHOD: **3 1/4" I.D. Hollow Stem Auger**
CREW: **RB / RK**
ELEVATION: **N/A**

LOCATION: **See Boring Location Plan**

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	Water Table	Notes
10.0"		2.0" Bituminous, 8.0" Aggregate Base				
3.5	SC-SM	SILTY CLAYEY SAND, fine to medium grained, w/ a trace of GRAVEL, brown, mottled. (FILL)	1	*		* Soil frozen.
5.0	SM	SILTY SAND, fine grained, w/ a trace of GRAVEL, greyish-brown.	2	17		
Boring complete to 5.0 feet. Water was not encountered during drilling. Water was not present to cave-in depth of 3.0 feet after completion of bore hole.						

**PROJECT: 13-010 CITY OF ROCKVILLE
BURG STREET IMPROVEMENTS
ROCKVILLE, MINNESOTA**

**DATE: 1/16/13 BORING #: B-3
START TIME: 2:08 END TIME: 2:22**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: RB / RK
ELEVATION: N/A**

LOCATION: See Boring Location Plan

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	Water Table	Notes
8.0"		8.0" Aggregate Base				
	SC-SM	SILTY CLAYEY SAND, fine grained, w/ a trace of GRAVEL, brown, mottled. (FILL)	1	*		* Soil frozen.
3.5						
	SM	SILTY SAND, fine grained, w/ a trace of GRAVEL, brown. brown.	2	8		
5.0						
		Boring complete to 5.0 feet. Water was not encountered during drilling. Water was not present to cave-in depth of 3.0 feet after completion of bore hole.				

**PROJECT: 13-010 CITY OF ROCKVILLE
BURG STREET IMPROVEMENTS
ROCKVILLE, MINNESOTA**

**DATE: 1/16/13 BORING #: B-4
START TIME: 2:41 END TIME: 2:58**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: RB / RK
ELEVATION: N/A**

LOCATION: See Boring Location Plan

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	Water Table	Notes
8.5"		2.5" Bituminous, 6.0" Aggregate Base				
	SC	CLAYEY SAND, fine grained, brown, mottled.				
		(FILL)	1	*		* Soil frozen.
			2	11		
5.0		Boring complete to 5.0 feet. Water was not encountered during drilling. Water was not present to cave-in depth of 3.0 feet after completion of bore hole.				

**PROJECT: 13-010 CITY OF ROCKVILLE
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ROCKVILLE, MINNESOTA**

**DATE: 1/16/13 BORING #: B-5
START TIME: 3:05 END TIME: 3:20**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: RB / RK
ELEVATION: N/A**

LOCATION: See Boring Location Plan

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	Water Table	Notes
8.5"		2.5" Bituminous, 6.0" Aggregate Base				
	SM	SILTY SAND, fine grained, w/ a trace of GRAVEL, brown, mottled. (FILL)	1	*		* Soil frozen.
4.0						
5.0	SC	CLAYEY SAND, fine grained, brown, mottled.	2	15		
		Boring complete to 5.0 feet. Water was not encountered during drilling. Water was not present to cave-in depth of 3.0 feet after completion of bore hole.				

**PROJECT: 13-010 CITY OF ROCKVILLE
BURG STREET IMPROVEMENTS
ROCKVILLE, MINNESOTA**

**DATE: 1/16/13 BORING #: B-6
START TIME: 3:23 END TIME: 3:48**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: RB / RK
ELEVATION: N/A**

LOCATION: See Boring Location Plan

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	Water Table	Notes
8.5"		2.5" Bituminous, 6.0" Aggregate Base				
	SC-SM	SILTY CLAYEY SAND, fine grained, w/ a little GRAVEL, brown, mottled.				
		(FILL)	1	*		* Soil frozen.
			2	12		
5.0		Boring complete to 5.0 feet. Water was not encountered during drilling. Water was not present to cave-in depth of 3.0 feet after completion of bore hole.				

**PROJECT: 13-010 CITY OF ROCKVILLE
BURG STREET IMPROVEMENTS
ROCKVILLE, MINNESOTA**

**DATE: 1/16/13 BORING #: B-7
START TIME: 1:31 END TIME: 1:47**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: RB / RK
ELEVATION: N/A**

LOCATION: See Boring Location Plan

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	Water Table	Notes
10.0"		3.0" Bituminous, 7.0" Aggregate Base				
	SC-SM	SILTY CLAYEY SAND, fine to medium grained, w/ a trace of GRAVEL, brown.	1	*		* Soil frozen.
5.0			2	10		
		Boring complete to 5.0 feet. Water was not encountered during drilling. Water was not present to cave-in depth of 3.0 feet after completion of bore hole.				

**PROJECT: 13-010 CITY OF ROCKVILLE
BURG STREET IMPROVEMENTS
ROCKVILLE, MINNESOTA**

**DATE: 1/16/13 BORING #: B-8
START TIME: 2:28 END TIME: 2:38**

**METHOD: 3 1/4" I.D. Hollow Stem Auger
CREW: RB / RK
ELEVATION: N/A**

LOCATION: See Boring Location Plan

Depth (Feet)	ASTM Symbol	Soil Description	Sample #	N Value	Water Table	Notes
9.5"		2.5" Bituminous, 7.0" Aggregate Base				
3.5	SM	SILTY SAND, fine grained, w/ a trace of GRAVEL, brown.	1	*		* Soil frozen.
		Refusal encountered at 3.5 feet due to rock. Boring terminated. Water was not encountered during drilling. Water was not present to cave-in depth of 3.0 feet after completion of bore hole.				