

July 5, 2016

Mr. Jeremy Bores
Kafka Granite, LLC
550 East Highway 153
Mosinee, WI 54455

Re: Mohs Hardness Testing
2016 Construction Projects
Schofield, WI
AET Project No. 12-02155

Mr. Bores:

This report presents the results of our Mohs hardness testing of one sample of stone submitted by you on June 27, 2016. The stone is to be referred to as "Buff River Tan Pebbles". Seven stones were submitted to our laboratory and all were used for testing. The scope of our work in this report was confined to performing Mohs hardness testing on the stone sample.

Conclusions

Based on our observations and analysis our opinions are as follows:

1. The overall hardness of the "Buff River Tan Pebbles" stone is approximately 4.5 to 5.5 on the Mohs scale. The number is based upon testing values of the overall hardness of the seven rocks using Mohs hardness picks and then taking the average.
2. The stone generally consisted of a naturally occurring gravel. A hardness value determination of the stone based upon the mineral assemblage was not conducted. Mohs picks with hardness 3 thru 8 were used on all seven stones. The Mohs hardness was determined for each of the seven particles and then a low and high average was taken. The Mohs hardness picks determined an approximate overall average hardness of 4.5 to 5.5. This hardness is a more consistent result than using the mineral assemblage because the Mohs hardness picks were drawn directly across a freshly lapped surface of the stone.
3. In general, rocks are not homogeneous with regards to Mohs mineral hardness. The best effort was made to accomplish the hardness analysis at a representative area within the stone selected. Because rocks can consist of several different minerals with different quantities and different hardness, and the Mohs scale represents the hardness of individual minerals, the Mohs scale should only be used as an approximation when determining the overall hardness of a rock.

Mr. Jeremy Bores
Sample ID: Buff River Tan Pebbles
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Procedures

Our work was performed on June 30, 2016 and subsequent dates. The hardness testing was completed through the use of standard geologic Mohs hardness points and optical microscopy on a lapped hand sample. The review was performed in general accordance with Standard Operating Procedure 24-LAB-004, "Petrographic Examination of Aggregates for Concrete, ASTM C295." Observations were made using an Olympus SZX-12 stereo-zoom binocular microscope with magnification up to 160x.

Photographs are included to illustrate our work and conclusions.

Remarks

The sample will be retained for a period of at least sixty days from the date of this report. Unless further instructions are received by that time, the sample may be discarded. The geologic services for this project have been conducted in a manner consistent with that level of care and skill exercised by members of the profession currently practicing in this area under similar budget and time constraints. The results relate only to the sample analyzed. No warranty, express or implied, is made.

It has been a pleasure to serve you on this project. Should you have any questions on this report, please do not hesitate to call.

Respectfully,

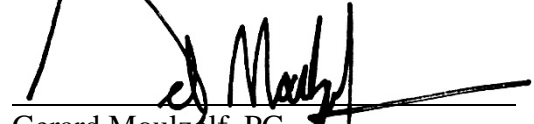
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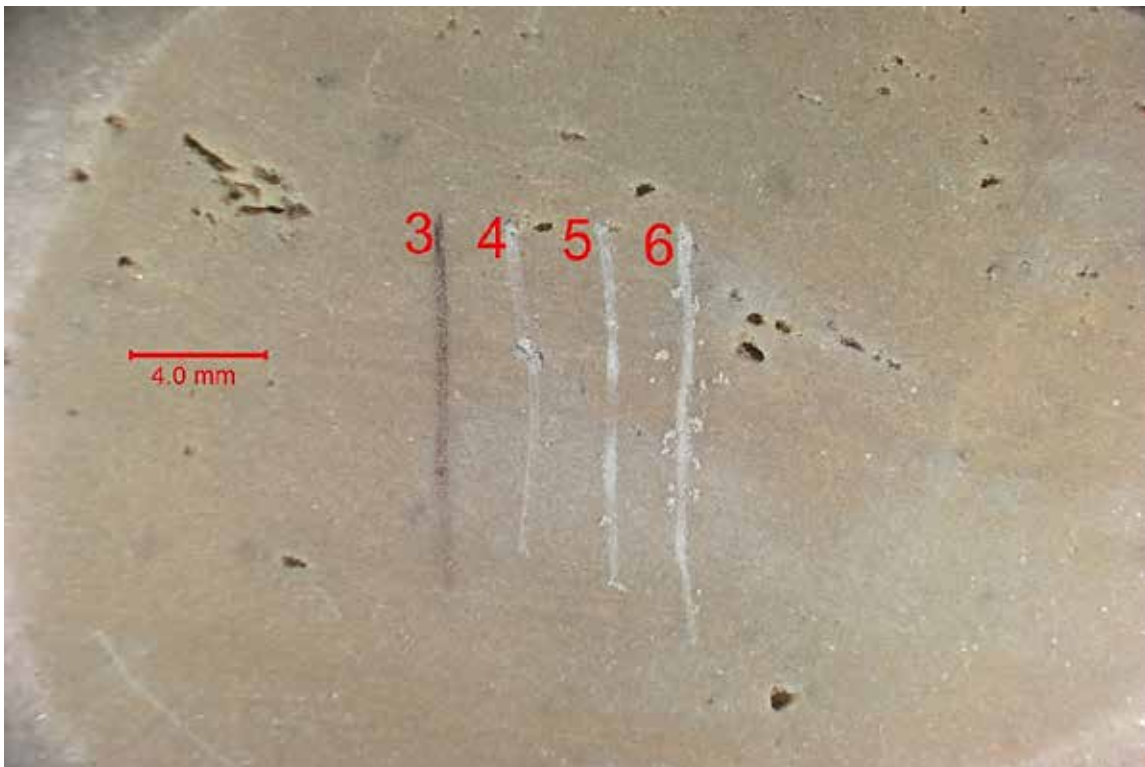
Attachment: "Materials Test Report"

PHOTO: 1



SAMPLE ID: Buff River Tan Pebbles **DESCRIPTION:** Overall view of the sample as received.

PHOTO: 2



SAMPLE ID: Buff River Tan Pebbles **DESCRIPTION:** View of the lapped cross section of the stone after Mohs hardness testing. Note that hardness pick 3 did not scratch, hardness picks 4 and 5 scratched a few to several minerals, and hardness pick 6 scratched all minerals. The general Mohs hardness would be approximately 4.5 to 5.

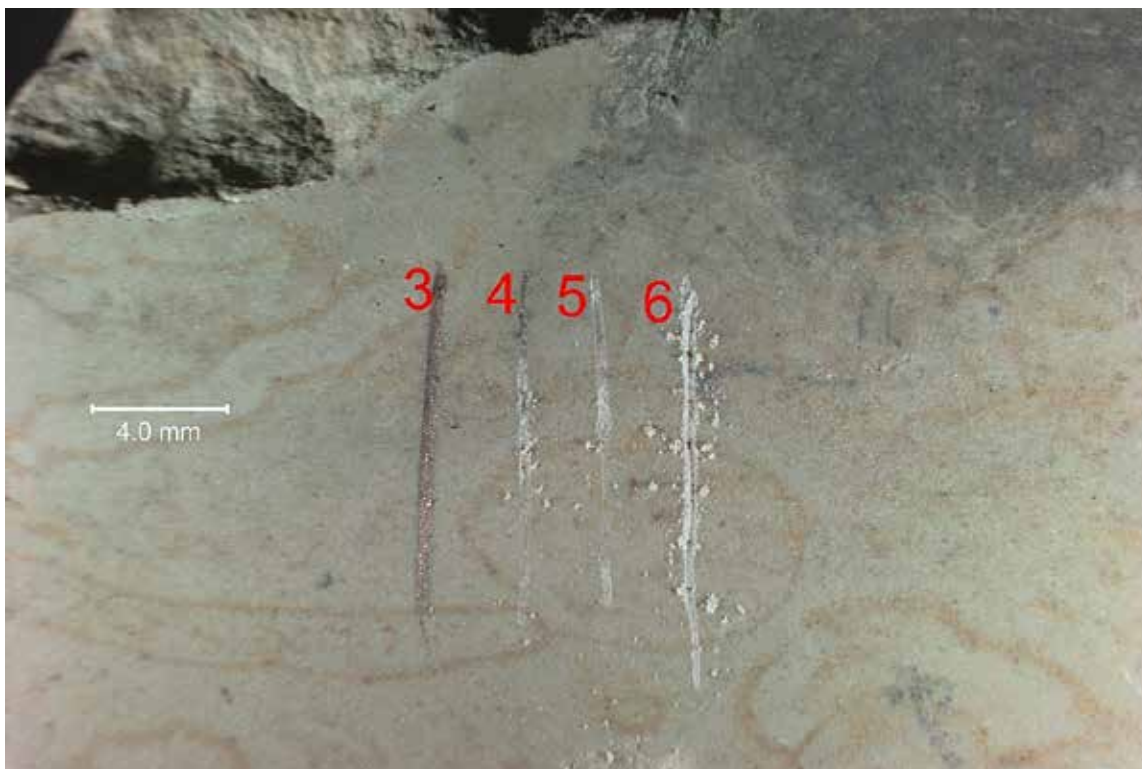
PHOTO: 3



SAMPLE ID: Buff River Tan Pebbles

DESCRIPTION: View of the lapped cross section of the stone after Mohs hardness testing. Note that hardness pick 3 scratched several minerals and hardness pick 4 scratched all minerals. The general Mohs hardness would be approximately 2.5 to 3.

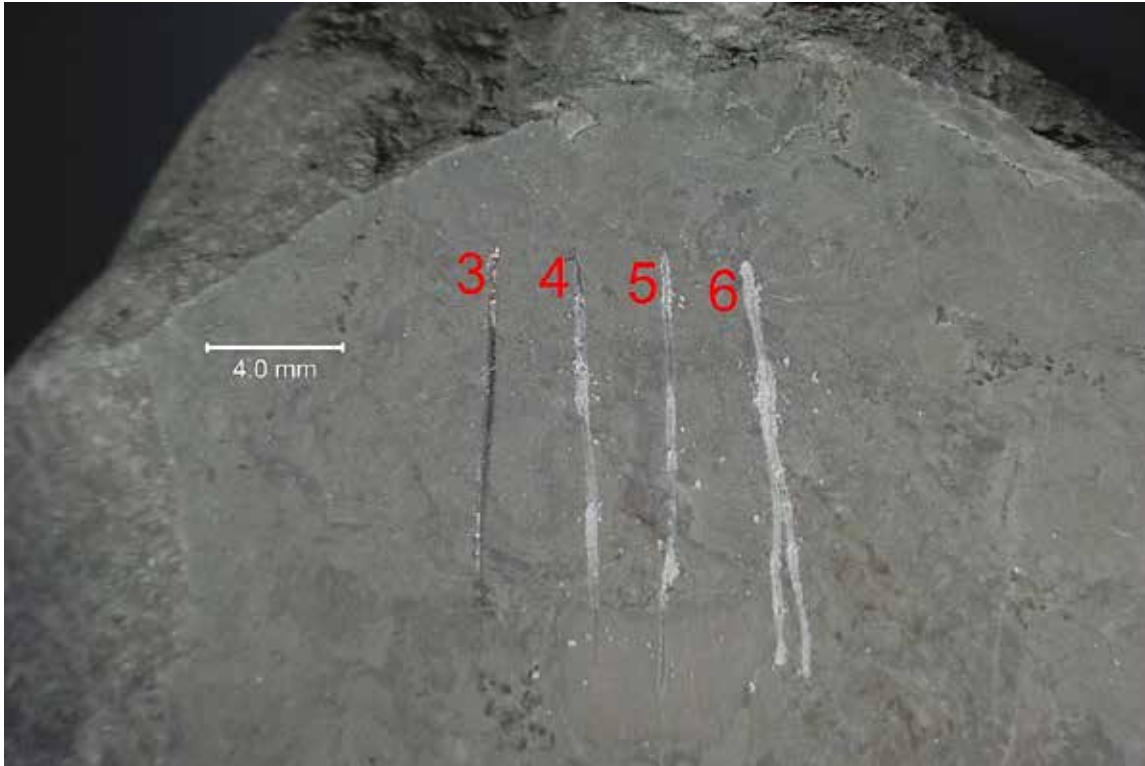
PHOTO: 4



SAMPLE ID: Buff River Tan Pebbles

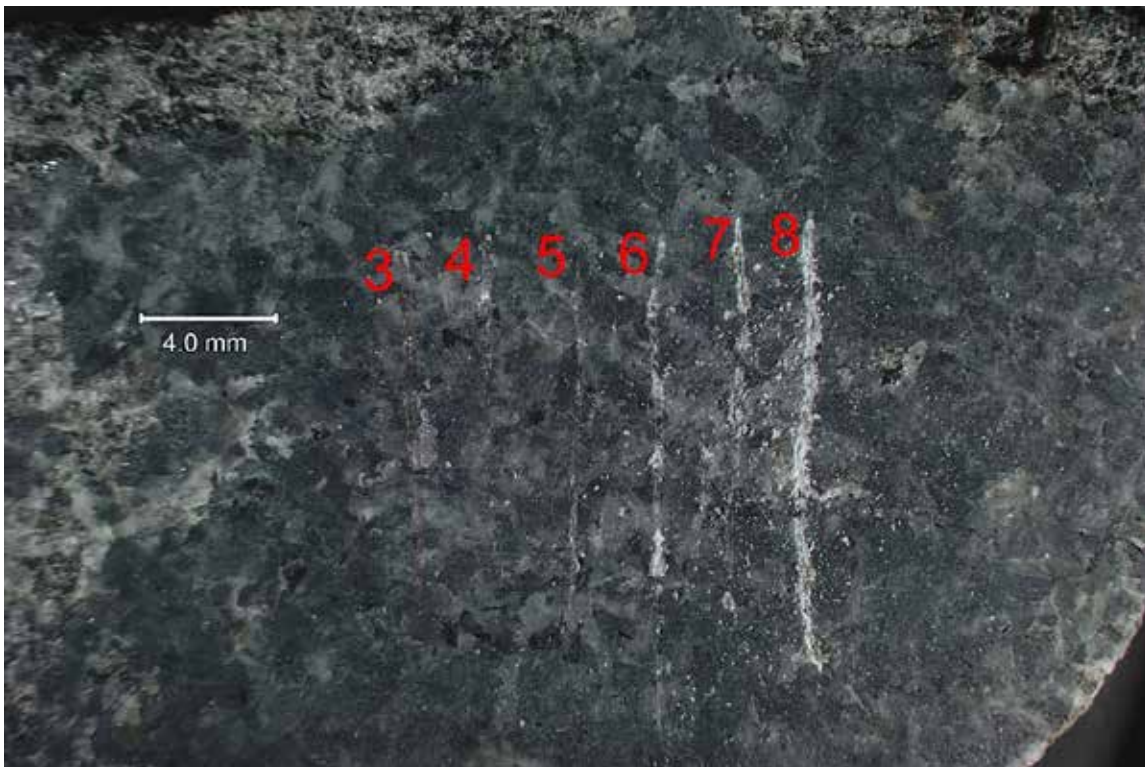
DESCRIPTION: View of the lapped cross section of the stone after Mohs hardness testing. Note that hardness pick 3 did not scratch, hardness picks 4 and 5 scratched a few to several minerals, and hardness pick 6 scratched all minerals. The general Mohs hardness would be approximately 4.5 to 5.

PHOTO: 5



SAMPLE ID: Buff River Tan Pebbles **DESCRIPTION:** View of the lapped cross section of the stone after Mohs hardness testing. Note that hardness pick 3 did not scratch, hardness pick 4 scratched several minerals, and hardness picks 5 and 6 scratched all minerals. The general Mohs hardness would be approximately 3.5 to 4.

PHOTO: 6



SAMPLE ID: Buff River Tan Pebbles **DESCRIPTION:** View of the lapped cross section of the stone after Mohs hardness testing. Note that hardness picks 3, 4, and 5 did not scratch, hardness picks 6 and 7 scratched a few to several minerals, and hardness pick 8 scratched all minerals. The general Mohs hardness would be approximately 6.5 to 7.

PHOTO: 7



SAMPLE ID: Buff River Tan Pebbles

DESCRIPTION: View of the lapped cross section of the stone after Mohs hardness testing. Note that hardness picks 3, 4, 5, and 6 scratched a few to several minerals and hardness picks 7 and 8 scratched all minerals. The general Mohs hardness would be approximately 5.5 to 6.

PHOTO: 8



SAMPLE ID: Buff River Tan Pebbles

DESCRIPTION: View of the lapped cross section of the stone after Mohs hardness testing. Note that hardness picks 3, 4, and 5 did not scratch, hardness picks 6 and 7 scratched a few to several minerals, and hardness pick 8 scratched all minerals. The general Mohs hardness would be approximately 6.5 to 7.




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Material Test Report

Report No: MAT:16-05932-S7
Issue No: 1

Client: KAFKA GRANITE, LLC
CC: Jeremy Bores
 John Meyer
Project: 2016 CONSTRUCTION PROJECTS
Job No: 12-02155

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Date of Issue: 7/1/2016
Reviewed By: Paul Michlig, CET
 Construction Manager

Sample Details

Sample ID 16-05932-S7
Field Sample ID 7
Date Sampled 6/22/2016
Source Kafka Granite
Material Buff River Tan Pebbles
Specification None
Sampling Method Sampled by Client
Location Kafka Granite
Date Submitted 6/23/2016

Test Results

Description	Method	Result	Limits
Specific Gravity (OD)	ASTM C 127	2.61	
Specific Gravity (SSD)		2.66	
Apparent Specific Gravity		2.75	
Absorption (%)		2.0	
Density Determined Without First Drying?		No	
Additional Notes			
Date Tested		6/28/2016	

Comments
 N/A