

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 "Birchwood". Eight stones were submitted to our laboratory and one was chosen for testing. The scope of our work in this report was confined to performing Mohs hardness testing on one stone sample.

### **Conclusions**

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

1. The overall hardness of the "Birchwood" stone is approximately 5 to 5.5 on the Mohs scale. The number is based upon testing values of the overall hardness of the rock using Mohs hardness picks.
2. The stone appeared to generally consist of a fine grained, sedimentary rock. A hardness value determination of the stone based upon the mineral assemblage was not conducted. Mohs picks with hardness 3 thru 6 were used on the stone. The Mohs hardness picks determined an approximate overall hardness of 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: Birchwood  
AET Project No. 12-02155  
July 5, 2016  
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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,

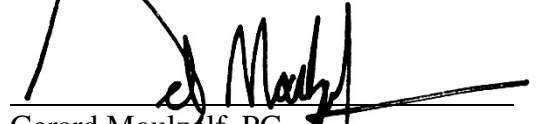
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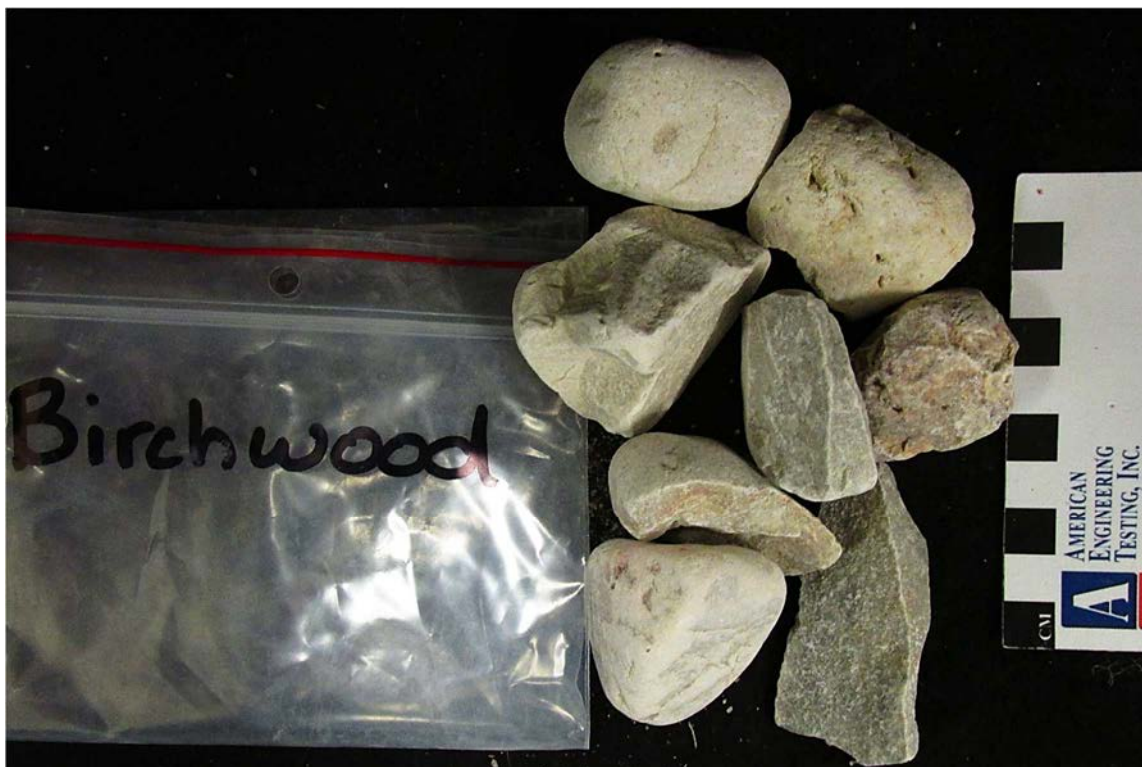
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Attachment: "Materials Test Report"

**PHOTO: 1**



**SAMPLE ID:** Birchwood      **DESCRIPTION:** Overall view of the sample as received.

**PHOTO: 2**



**SAMPLE ID:** Birchwood      **DESCRIPTION:** View of the stone selected for hardness testing.

**PHOTO: 3**



**SAMPLE ID:** Birchwood  
**MAG:** 5x

**DESCRIPTION:** View of the lapped cross section of the stone.

**PHOTO: 4**



**SAMPLE ID:** Birchwood  
**MAG:** 5x

**DESCRIPTION:** View of the lapped cross section of the stone after Mohs hardness testing. Note that hardness picks 3 and 4 did not scratch, hardness pick 5 scratched a few minerals, and hardness pick 6 scratched all minerals. The general Mohs hardness would be approximately 5 to 5.5.




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# Material Test Report

**Report No: MAT:16-05932-S10**  
**Issue No: 1**

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

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

## Sample Details

**Sample ID** 16-05932-S10  
**Field Sample ID** 10  
**Date Sampled** 6/22/2016  
**Source** Kafka Granite  
**Material** Birchwood  
**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	2.75	
Specific Gravity (SSD)		2.78	
Apparent Specific Gravity		2.83	
Absorption (%)		1.1	
Density Determined Without First Drying?		No	
Additional Notes			
Date Tested		6/28/2016	

**Comments**  
 N/A