



## Report of Threaded Rod Shear Test

**Client:** Bonstone Material Corporation  
**Project No.:** 0611892

**Report No.:** 902317  
**Date of Service:** June 30, 2006

**Stone Type:** Indiana Limestone  
**Adhesive:** Fast Set Extreme Epoxy

**Test Method:** ASTM C 1354, Standard Test Method for Strength of Individual Stone  
Anchorages in Dimension Stone

**Calculation:** Anchorage system load = Test machine load

**Loading:** Constant rate of loading at 600 lbs./minute until failure

**Anchor Description:** 1/4" diameter threaded rod with nominal 1" embedment

**Nominal Dimensions:**

| Length<br>(inches) | Width<br>(inches) | Thickness<br>(inches) |
|--------------------|-------------------|-----------------------|
| 12                 | 12                | 2.00                  |

**Conditioning:** Tested in an "as is" condition

**Finish:** Honed

| Sample Number                         | Failure Mode   | Anchorage System Load (lbf.) |
|---------------------------------------|----------------|------------------------------|
| 1                                     | Bolt sheared   | 2,542                        |
| 2                                     | Bolt sheared   | 2,511                        |
| 3                                     | Anchor pullout | 2,112                        |
| 4                                     | Bolt sheared   | 2,291                        |
| 5                                     | Bolt sheared   | 2,407                        |
| <b>Average Anchorage System Load:</b> |                | <b>2,373</b>                 |
| Standard Deviation:                   |                | 176                          |
| Variance (percent):                   |                | 7.42                         |



## Report of Threaded Rod Anchor Pullout Test

**Client:** Bonstone Material Corporation  
**Project No.:** 0611892

**Report No.:** 902317  
**Date of Service:** June 30, 2006

**Stone Type:** Indiana Limestone  
**Adhesive:** Fast Set Extreme Epoxy

**Test Method:** ASTM C 1354, Standard Test Method for Strength of Individual Stone Anchorages in Dimension Stone

**Calculation:** Anchorage system load = Test machine load

**Loading:** Constant rate of loading at 600 lbs./minute until failure

**Anchor Description:** 1/4" diameter threaded rod with nominal 1" embedment

**Nominal Dimensions:**

| Length (inches) | Width (inches) | Thickness (inches) |
|-----------------|----------------|--------------------|
| 12              | 12             | 2.00               |

**Conditioning:** Tested in an "as is" condition

**Finish:** Honed

| Sample Number                         | Failure Mode                  | Anchorage System Load (lbf.) |
|---------------------------------------|-------------------------------|------------------------------|
| 1                                     | Stone fracture through anchor | 1,445                        |
| 2                                     | 6" cone                       | 1,715                        |
| 3                                     | Stone fracture through anchor | 1,387                        |
| 4                                     | Stone fracture through anchor | 1,641                        |
| 5                                     | 3" cone                       | 1,586                        |
| <b>Average Anchorage System Load:</b> |                               | <b>1,555</b>                 |
| Standard Deviation:                   |                               | 136                          |
| Variance (percent):                   |                               | 8.75                         |

LIMITATIONS: The test results presented herein were prepared based upon the specific samples provided for testing. We assume no responsibility for variation in quality (composition, appearance, performance, etc.) or any other feature of similar subject matter provided by persons or conditions over which we have no control. Our letters and reports are for the exclusive use of the clients to whom they are addressed and shall not be reproduced except in full without the written approval of Rone Engineering Services, Ltd.



## Report of Threaded Rod Anchor Pullout Test

**Client:** Bonstone Material Corporation  
**Project No.:** 0611892

**Report No.:** 902317  
**Date of Service:** June 30, 2006

**Stone Type:** Cold Spring Granite  
**Adhesive:** Fast Set Extreme Epoxy

**Test Method:** ASTM C 1354, Standard Test Method for Strength of Individual Stone  
Anchorages in Dimension Stone

**Calculation:** Anchorage system load = Test machine load

**Loading:** Constant rate of loading at 600 lbs./minute until failure

**Anchor Description:** 1/4" diameter threaded rod with nominal 1" embedment

**Nominal Dimensions:**

| Length<br>(inches) | Width<br>(inches) | Thickness<br>(inches) |
|--------------------|-------------------|-----------------------|
| 12                 | 12                | 2.00                  |

**Conditioning:** Tested in an "as is" condition

**Finish:** Honed

| Sample Number                         | Failure Mode            | Anchorage System Load (lbf.) |
|---------------------------------------|-------------------------|------------------------------|
| 1                                     | Anchor pullout, 1" cone | 2,479                        |
| 2                                     | Anchor pullout, 1" cone | 2,411                        |
| 3                                     | Anchor pullout, 3" cone | 2,688                        |
| 4                                     | Anchor pullout, 1" cone | 2,412                        |
| 5                                     | Anchor pullout, 1" cone | 2,897                        |
| <b>Average Anchorage System Load:</b> |                         | <b>2,577</b>                 |
| Standard Deviation:                   |                         | 212                          |
| Variance (percent):                   |                         | 8.23                         |



## Report of Threaded Rod Shear Test

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**Stone Type:** Cold Spring Granite  
**Adhesive:** Fast Set Extreme Epoxy

**Test Method:** ASTM C 1354, Standard Test Method for Strength of Individual Stone  
Anchorages in Dimension Stone

**Calculation:** Anchorage system load = Test machine load

**Loading:** Constant rate of loading at 600 lbs./minute until failure

**Anchor Description:** 1/4" diameter threaded rod with nominal 1" embedment

**Nominal Dimensions:**

| Length<br>(inches) | Width<br>(inches) | Thickness<br>(inches) |
|--------------------|-------------------|-----------------------|
| 12                 | 12                | 2.00                  |

**Conditioning:** Tested in an "as is" condition

**Finish:** Honed

| Sample Number                         | Failure Mode | Anchorage System Load (lbf.) |
|---------------------------------------|--------------|------------------------------|
| 1                                     | Bolt sheared | 2,932                        |
| 2                                     | Bolt sheared | 2,758                        |
| 3                                     | Bolt sheared | 2,861                        |
| 4                                     | Bolt sheared | 2,711                        |
| 5                                     | Bolt sheared | 2,912                        |
| <b>Average Anchorage System Load:</b> |              | <b>2,835</b>                 |
| Standard Deviation:                   |              | 97                           |
| Variance (percent):                   |              | 3.42                         |

## Report of Threaded Rod Anchor Pullout Test

**Client:** Bonstone Material Corporation  
**Project No.:** 0611892

**Report No.:** 902317  
**Date of Service:** June 30, 2006

**Stone Type:** Concrete ( approximately 4000 psi)  
**Adhesive:** Fast Set Extreme Epoxy

**Test Method:** ASTM C 1354, Standard Test Method for Strength of Individual Stone  
Anchorages in Dimension Stone

**Calculation:** Anchorage system load = Test machine load

**Loading:** Constant rate of loading at 600 lbs./minute until failure

**Anchor Description:** 1/4" diameter threaded rod with nominal 1" embedment

### Nominal Dimensions:

| Length<br>(inches) | Width<br>(inches) | Thickness<br>(inches) |
|--------------------|-------------------|-----------------------|
| 12                 | 12                | 2.00                  |

**Conditioning:** Tested in an "as is" condition

**Finish:** Honed

| Sample Number                         | Failure Mode | Anchorage System Load (lbf.) |
|---------------------------------------|--------------|------------------------------|
| 1                                     | 7" cone      | 2,306                        |
| 2                                     | 3.5" cone    | 2,036                        |
| 3                                     | 4" cone      | 1,970                        |
| 4                                     | 6" cone      | 1,998                        |
| 5                                     | 8" cone      | 2,069                        |
| <b>Average Anchorage System Load:</b> |              | <b>2,076</b>                 |
| Standard Deviation:                   |              | 134                          |
| Variance (percent):                   |              | 6.46                         |

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**Stone Type:** Concrete ( approximately 4000 psi)  
**Adhesive:** Fast Set Extreme Epoxy

**Test Method:** ASTM C 1354, Standard Test Method for Strength of Individual Stone  
 Anchorages in Dimension Stone

**Calculation:** Anchorage system load = Test machine load

**Loading:** Constant rate of loading at 600 lbs./minute until failure

**Anchor Description:** 1/4" diameter threaded rod with nominal 1" embedment

**Nominal Dimensions:**

| Length<br>(inches) | Width<br>(inches) | Thickness<br>(inches) |
|--------------------|-------------------|-----------------------|
| 12                 | 12                | 2.00                  |

**Conditioning:** Tested in an "as is" condition

**Finish:** Honed

| Sample Number                         | Failure Mode | Anchorage System Load (lbf.) |
|---------------------------------------|--------------|------------------------------|
| 1                                     | Bolt sheared | 2,715                        |
| 2                                     | Bolt sheared | 2,952                        |
| 3                                     | Bolt sheared | 2,552                        |
| 4                                     | Bolt sheared | 2,598                        |
| 5                                     | Bolt sheared | 2,739                        |
| <b>Average Anchorage System Load:</b> |              | <b>2,711</b>                 |
| Standard Deviation:                   |              | 156                          |
| Variance (percent):                   |              | 5.75                         |