

Alliance Concrete Concepts, Inc.
Structural Wall Load Testing
Moderra Stone
January 27, 2006
TCT Project #325043

DATE: January 27, 2006
TO: Mr. Ray Price
Alliance Concrete Concepts, Inc.
325 Alliance Place NE
Rochester, MN 55906
PROJECT: MODERRA STONE TESTING

Material Testing • Non-Destructive Testing
Product Evaluation • Construction Materials

662 Cromwell Avenue
St. Paul, MN 55114
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STRUCTURAL LOAD TESTING

INTRODUCTION:

This report presents the results of our laboratory testing of stone material submitted by Alliance Concrete Concepts of Rochester, Minnesota. The following is a summary of our scope of services:

1. Perform uniform load testing of the entire assembly using differential pressures.
2. Monitor deflection during loading.
3. Present a report of our test results.

Our work was requested and authorized by Mr. Ray Price of Alliance Concrete Concepts on July 17, 2005.

SUMMARY OF TEST RESULTS:

The following is a summary of our test results:

| <u>Sample Number</u> | <u>Stone Type</u> | <u>Wall Size</u> | <u>Installation</u> | <u>Load Direction</u> | <u>Ultimate Load, mph</u> |
|----------------------|-------------------|------------------|---------------------|-----------------------|---------------------------|
| 1A | Moderra | 4' x 4' | w/o Mortar | Negative | 247 |
| 1B | Moderra | 4' x 4' | w/o Mortar | Positive | 255 |

SAMPLE DESCRIPTION:

The Moderra Stone samples were submitted to our laboratory on July 18, 2005. The anchors used for testing were received on December 15, 2005.

Sample Type: Moderra Stone
Manufacturer: Alliance Concrete Concepts, Inc.
Submitted By: Mr. Ray Price

Wall fabrication was conducted at Stork Twin City Testing in St. Paul, Minnesota. Fabrication was conducted by Stork Twin City Testing personnel according to procedures giving by Mr. Ray Price of Alliance Concrete Concepts.

The wall was made according to standard stud wall construction. The wall was made with 2" x 4" lumber with verticals spaced at 16" on center. The studs were nailed together with 16 penny nails. The skin material of the wall was Oriented Strand Board (OSB). The OSB was fastened using 8 penny nails.

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SAMPLE DESCRIPTION: (cont.)

The Moderra Stone were attached using the Moderra Brackets, supplied by Alliance Concrete Concepts. The Moderra Brackets were place on each side of the stone, with the bracket holding two stones and fastened through the OSB and into the stud framing. The Moderra Brackets were fastened using 1-1/2" screw with a1/4" hex head.

TEST PROCEDURES

On January 5, 2006 and subsequent dates, the completed wall assemblies were load tested. The following is a summary of the test procedures used:

The testing of the completed fence assembly was conducted according to applicable sections of ASTM:C330-97, "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference". The following is a summary of our test results:

1. A wood buck was installed around the wall sample to serve as a connection point to the test wall. The buck was secured to the sample at the wood wall using screws.
2. A plastic sheet was then placed on one side of the test sample to prevent air leakage. The sheet was applied in such a way so as to not affect the test, i.e. loosely. The sample was then enclosed with an additional wood backing within our laboratory.
3. Once the sample was secured, deflection measurement devices were positioned on the quarter and center marks between opposite corners of the test sample.
4. The load was then applied using a differential air source. The load was applied incrementally with deflection readings taken at every increment. The sample was loaded until failure, or machine peak, at which time the failure load and mode were recorded.

TEST RESULTS:

Please see attached data sheets.

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STRUCTURAL LOAD TESTING

REMARKS.

Unless further notice is received, the test samples will be retained for a period of two weeks and discarded.

If you have any questions about this report please feel free to contact us at (651) 659-7399.

STORK TWIN CITY TESTING CORPORATION



Thaddeaus Harnois, P.E.
Staff Engineer
Construction Materials Department
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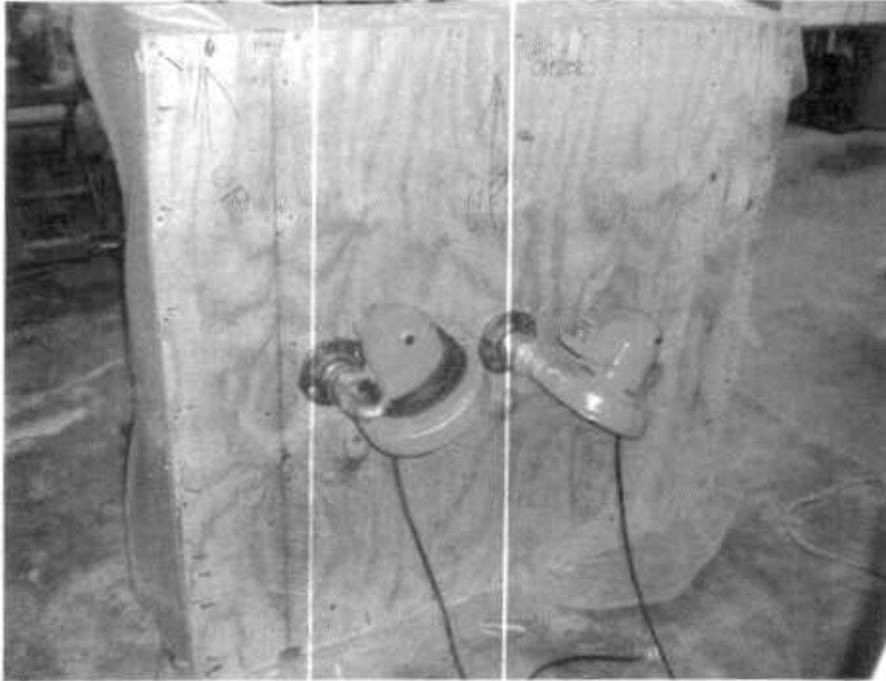
Thomas A. Kolden, P.E.
Manager of Specialty Testing
Construction Materials Department

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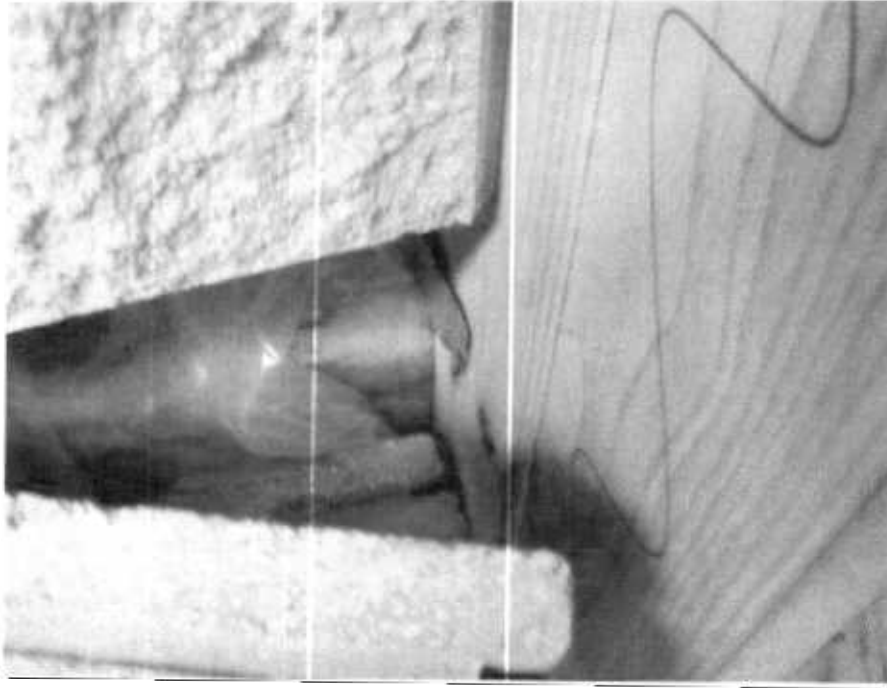
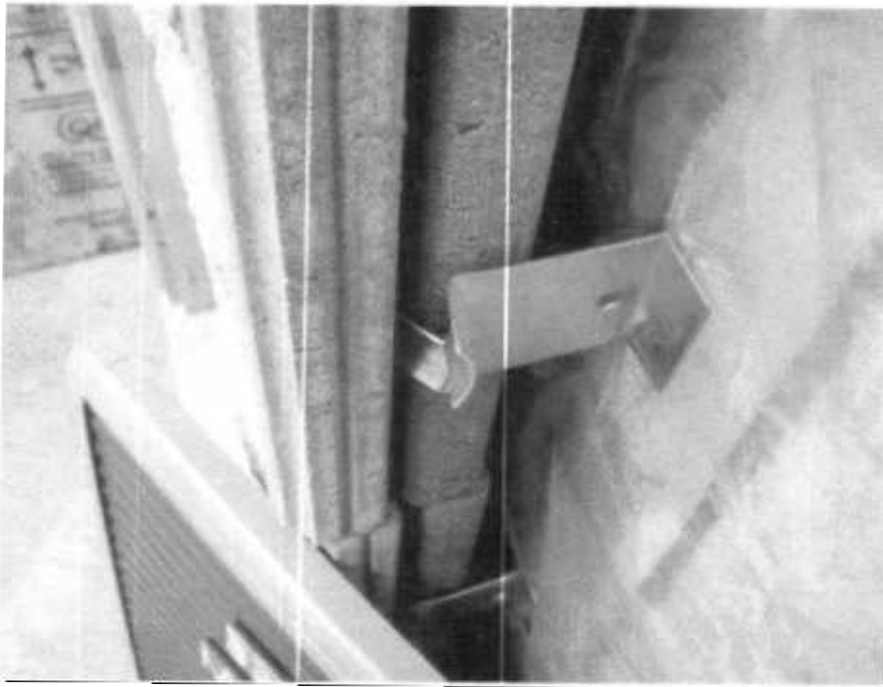
STRUCTURAL LOAD TESTING



Typical Test Set-up for Moderra (Positive)



Typical Test Set-up for Moderra Stone (Negative)

PROJECT NO: 304111**DATE:** January 27, 2006**PAGE:** 5 of 13**STRUCTURAL LOAD TESTING****Failure From Negative Pressure on Moderra Wall****Failure From Negative Pressure on Moderra Wall**

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**STRUCTURAL LOAD TEST OF
DIMENSION STONE**

| | |
|--|---|
| Manufactured by: | Alliance Concrete Concepts Rochester, Minnesota |
| Stone Description - Installation - Direction of Load - Structural Member Description - | Moderra Stone With out Mortar Negative Wood wall 48" in length, 48" in height and 4" in width 2" x 4" lumber spaced 16" on center |
| Testing Conditions - Testing Methods - Tested By - Witnessed By - Date Tested - | 75 deg. F, 55% Humidity ASTM E330 D. Leisz Thaddeaus Harnois, P.E. January 5, 2006 and subsequent dates |

Deflection (inches) of Sample 1A

| <u>Applied Load (in of Water)</u> | <u>Applied Load (mph)</u> | <u>Point 1</u> | <u>Point 2</u> | <u>Point 3</u> |
|---------------------------------------|-------------------------------|----------------|----------------|----------------|
| 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 64 | 0.013 | 0.015 | 0.008 |
| 4 | 90 | 0.033 | 0.027 | 0.014 |
| 6 | 110 | 0.078 | 0.042 | 0.022 |
| 8 | 127 | 0.101 | 0.060 | 0.033 |
| 10 | 143 | 0.114 | 0.081 | 0.045 |
| 12 | 156 | 0.126 | 0.099 | 0.055 |
| 14 | 169 | 0.140 | 0.119 | 0.067 |
| 16 | 180 | 0.153 | 0.136 | 0.076 |
| 18 | 191 | 0.171 | 0.166 | 0.093 |
| 20 | 202 | 0.190 | 0.190 | 0.107 |
| 22 | 211 | 0.218 | 0.222 | 0.129 |
| 24 | 221 | 0.247 | 0.258 | 0.146 |
| 26 | 230 | 0.273 | 0.285 | 0.178 |
| 28 | 238 | 0.317 | 0.326 | 0.219 |
| 30 | 247 | 0.341 | 0.359 | 0.247 |

**Ultimate
Load (mph) 247**

Deflection points were located at the quarter (1,3) and half (2) points between opposite corners.

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Deflection (inches) of Sample 1B

| Applied Load (in of Water) | Applied Load (mph) | Point 1 | Point 2 | Point 3 |
|-------------------------------|-----------------------|---------|---------|---------|
| 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 64 | 0.019 | 0.022 | 0.009 |
| 4 | 90 | 0.028 | 0.044 | 0.021 |
| 6 | 110 | 0.045 | 0.063 | 0.030 |
| 8 | 127 | 0.068 | 0.086 | 0.041 |
| 10 | 143 | 0.090 | 0.108 | 0.051 |
| 12 | 156 | 0.104 | 0.125 | 0.061 |
| 14 | 169 | 0.113 | 0.137 | 0.069 |
| 16 | 180 | 0.120 | 0.151 | 0.079 |
| 18 | 191 | 0.129 | 0.167 | 0.087 |
| 20 | 202 | 0.139 | 0.185 | 0.096 |
| 22 | 211 | 0.151 | 0.201 | 0.104 |
| 24 | 221 | 0.163 | 0.219 | 0.113 |
| 26 | 230 | 0.174 | 0.235 | 0.121 |
| 28 | 238 | 0.187 | 0.255 | 0.132 |
| 30 | 247 | 0.200 | 0.275 | 0.142 |
| 32 | 255 | 0.216 | 0.299 | 0.155 |

**Ultimate
Load (mph) 255**

Deflection points were located at the quarter (1,3) and half (2) points between opposite corners.

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