



SMITH-EMERY LABORATORIES

An Independent Commercial Testing Laboratory, Established 1904

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December 14, 2021 Revised February 24, 2022

Porcelanosa USA
600 Route 17 North
Ramsey, NJ 07446

Attn: Ignacio Vidal, Teo Berndt

Project:

AAMA 501.6-18 – Recommended Dynamic Test Method for Determining the Seismic Drift Causing
Fallout from a Wall System

Mr. Vidal,

At your request Smith-Emery Laboratories provided testing at our facility the accompanying report number CW21-295 presents a description of the tests performed, the results of our testing, and our conclusions.

We appreciate this opportunity to be of service to you. If you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully Submitted,
SMITH EMERY LABORATORIES, INC.

Dana Nelson
Smith-Emery Laboratories



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AAMA Accrediated Lab since 1983

OSHPD# OPL-0015-14

DSA LEA# 25, 56 AASHTO Accredited

City of Los Angeles Testing Agency Approval #TA02122

City Of San Francisco Special Inspection and Testing Agency

Our Laboratories are located in the following locations:

Los Angeles, San Francisco, Fresno, Anaheim, CA, Washington, China, and Mexico.

Attachment: Report No CW21-295

cc: File



SMITH - EMERY LABORATORIES, INC.
781 E. WASHINGTON BLVD. • LOS ANGELES, CA 90021

REPORT OF:

PREPARED FOR:

Porcelanosa USA
600 Route 17 North
Ramsey, NJ 07446

PROJECT NUMBER: 476631-2

REPORT NUMBER: CW21- 295

REPORT DATE: December 14, 2021

TEST DATE: DECEMBER 9, 2021

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OSHPD Approved Lab #OPL-0015-14 and #OPL-0020-15

DSA LEA Lab Approval # 25 and # 56



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1.0 INTRODUCTION

1.1 Purpose

The purpose of our testing was to evaluate the installed conditions of the test specimen.

1.2 Scope of Testing

The general scope of this testing program included the following:

- Perform testing in accordance with the ASTM and AAMA specifications.
- Preparation of this report providing descriptions and results of the above testing and our conclusions.

1.3 Specimen Description



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See attached As-built As-tested detailed drawings provided by Porcelanosa USA for a detailed description of materials used during fabrication of the test assemblies

1.3.1 Model and Frame Series:

6" 16 Ga galvanized metal studs with 1-5/8" Fl. 6" galvanized stud track with 1-1/2" Fl and cold rolled channel 1-1/2" The stud framing was screwed together using specified materials and the attached drawing.

1.3.2 Construction:

The test assembly was installed at the lab for testing by Porcelanosa USA. See attached documents and drawings identifying materials used and dimensions.

1.4 Test Methods

Porcelanosa USA testing procedure was developed using the AAMA 501.6 Test Drawings and Procedures in Appendix 3 of the Testing Criteria.

AAMA 501.6 Recommended Dynamic Test Method for Determining the Seismic Drift Causing Fallout from a Wall System

Test Procedure and Acceptance Criteria:

1. "Crescendo tests," similar in concept and configuration to the "multiple step test" described in ATC-24 (1992), shall consist of a concatenated series of "ramp up" intervals and "constant amplitude" intervals. As depicted in Figure 3, in-plane (horizontal) racking displacement steps between constant amplitude intervals shall be 6mm (0.25 in). Ramp up intervals and constant amplitude intervals shall consist of four sinusoidal cycles each. Crescendo tests shall be performed at a frequency of 0.8 +0.1/-0.0 Hz for total applied racking displacements (drift amplitudes) of ± 75 mm (± 3 in) or less, and 0.4 + 0.1/-0.0 Hz for total applied racking displacements (drift amplitudes) greater than ± 75 mm (± 3 in). The displacement measuring system shall be accurate to within ± 2 mm ($\pm 1/16$ in).

To address the specific Delta Fallout value of 4.0625" as applicable for the Porcelanosa USA System Criteria, the crescendo racking shall first be performed until the Design displacement value of 4.0625" Per AAMA the testing will be performed to 3.0" then be stopped for visual examination. Then continued until the displacement of 4.0625" has been reached or until "porcelain". fall out occurs. The testing will then be stopped for visual examination. If the wall assembly has met the delta fall out displacement of 4.0625" without fallout, the testing will be Complete. Any displacement beyond the 4.0625" is for information only. The testing was continued until it reached 6.00" below is the steps that were performed until the 6" displacement was reached.



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0" to 1" at 8 hz pause for visual examination
1" to 2" at 8 hz pause for visual examination
2" to 3" at 8 hz pause for visual examination

3" to 4" at 4 hz pause for visual examination
4" to 5" at 4 hz pause for visual examination
5" to 6" at 6 hz pause for visual examination

2. Each crescendo test shall be run continuously until completion. Each crescendo test shall proceed until the first of the following conditions exist: (1) "porcelain". fallout, as defined in Section 3, occurs; (2) the drift index over the height of the panel is at least 0.10 (10%); or (3) a dynamic racking displacement of ± 150 mm (± 6 in) is applied to the test specimen.
3. One test specimen of porcelain panel configuration in the fallout test plan shall be subjected to the crescendo test. The dynamic racking amplitude associated with fallout, fall shall be measured and recorded during the crescendo test. The fallout value measured during the crescendo test shall be the controlling value reported for that set of specimens. Measurement of fallout shall be accomplished either by synchronized videotaping of the crescendo test or by another measurement technique approved by the specifier. Porcelain. fallout is considered to have occurred when an individual fragment larger than 650 mm² (1.0 in²) falls in any direction from the test mockup. If no porcelain. fallout occurs by the end of the crescendo test, fallout for that specimen shall be reported as being "greater than" the maximum drift amplitude in mm (in) imposed on the test specimen during the crescendo test.
4. Although the focus of this test method is on fallout, the dynamic racking amplitude associated with fallout of other wall system components shall also be noted and recorded during each crescendo test for information purposes. This information is particularly relevant if component fallout occurs before porcelain fallout during a given crescendo test.
5. The dynamic racking amplitude associated with initial porcelain. cracking may also be recorded as an option during each crescendo test. (Fallout is a life safety limit state of panels during seismic movements, while cracking is a serviceability limit state of porcelain. panel during seismic movements. Life safety considerations from the primary basis for current model building code provisions. A cracked porcelain. panel would require replacement, so it would no longer be "serviceable." However, a cracked porcelain panel could also present a longer-term life safety hazard if fallout were to occur before a replacement "porcelain". unit is installed.) If cracking values are measured, results from the individual crescendo test shall be reported, but the lowest cracking value measured during the crescendo test shall be the controlling value reported for that specimen. If no "porcelain" cracking occurs by the end of



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the crescendo test, cracking for that specimen shall be reported as being “greater than” the maximum drift amplitude in mm (in) imposed on the test specimen during the crescendo test.

Optional Cracking Test

The dynamic racking amplitude associated with initial porcelain. cracking may also be recorded as an option during each crescendo test. (Fallout is a life safety limit state of panels during seismic movements, while cracking is a serviceability limit state of panel during seismic movements. Life safety considerations from the primary basis for current model building code provisions. A cracked porcelain. panel would require replacement, so it would no longer be “serviceable.” However, a cracked "porcelain". panel could also present a longer-term life safety hazard if panel fallout were to occur before a replacement unit is installed.) If cracking values are measured, results from all three individual crescendo tests shall be reported, but the lowest cracking value measured during the three crescendo tests shall be the controlling value reported for that set of specimens. If no "porcelain". cracking occurs by the end of the crescendo test, cracking for that specimen shall be reported as being “greater than” the maximum drift amplitude in mm (in) imposed on the test specimen during the crescendo test.

In addition to the test standards noted above, testing was performed in general accordance with generally accepted engineering principles and practices. They have incorporated federal, state, and local laws, codes, ordinances, and regulations, which in our professional opinion are applicable at the time of preparation of this report.

1.5 Test Witnesses

Name	Company
Dana Nelson	Smith-Emery Labs / OSHPD Special Inspector
Eric Nelson	Smith-Emery Labs
Rob Benjamin	Smith-Emery International
Taylor Edmondson	CDC
Teo Berndt	Porcelanosa USA
Borja Domenech	Porcelanosa USA
Fabio Chica	Porcelanosa USA
Steven Gaynor	Façade Consultant

2.0 Testing & Findings

2.1 Test Results

The required delta-fall out for the Porcelanosa, System was established as +/- 4.0625” for the system tested. Testing criterion was determined by the structural engineer prior to the testing using one or both of



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the following methods ASCE7-05 / AAMA 501.4-18 section 11.3

Date	Test	Fallout	Cracking	Observations
December 9, 2021	1	None	None	No fallout or cracking was observed

2.2 Findings

After the completion of each test a visual examination was performed to note any damage to the assembly caused during the testing up to amplitude of +/- 6.00" or failure then the samples were removed and again a visual examination was performed.

2.2.1. Damage was observed at the bottom angle clips after 4" displacement.

2.2.2. Anchors at head **which support the weight of the wall**, and their fasteners were found fully engaged.

2.2.3. Anchors at sill and their fasteners were found fully engaged.

2.2.4. Screws were observed to loosen up between 3" to 6" displacement.

3.0 CONCLUSIONS AND CLOSURE

3.1 CONCLUSIONS

The purpose of our testing was to evaluate the installed conditions of the test specimen. The general scope of this testing program was done in accordance with the AAMA specifications. We make no statement of compliance other than a pass-fail result of the material tested or analyzed to any specification. Based on specific data and information contained in this report, our general understanding of the test methods and principals involved, and general experience in the materials testing field, **it is our professional judgment that all the tested assemblies meet the requirements set forth in the testing specifications and documents this was a successful test and there isn't concern with the wall's dead load brackets following a seismic event.**

3.2 CLOSURE

The findings in this report were prepared in accordance with generally accepted material engineering and testing principles and practices. No other warranty, either expressed or implied, is made. This report has been prepared for the above-named client for the above-named project. The use of this report for any other purpose shall be at the user's own discretion based on their own interpretation of the results contained within.



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END OF REPORT

Respectfully Submitted,
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