



FIELD TEST REPORT

Rendered to:

**REAL ESTATE AND CONSTRUCTION SERVICES
DEPARTMENT OF ADMINISTRATION
STATE OF MINNESOTA**

**PROJECT: New Replacement Windows – Phase I
State Capital Building
St. Paul, Minnesota**

**Report No.: D7138.01-201-43
Test Dates: 07/21/14
Through: 07/25/14
Report Date: 08/01/14**

Consultant's Report



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REAL ESTATE AND CONSTRUCTION SERVICES
Department of Administration
State of Minnesota
301 Administration Building
50 Sherburne Avenue
St. Paul, Minnesota 55155

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Project Identification: New Replacement Windows – Phase I
State Capital Building
St. Paul, Minnesota

Project Summary: Architectural Testing was contracted to perform on-site testing at the above referenced project. Air infiltration and water penetration tests were conducted on nine (9) specimens consisting of a wood single hung and fixed windows. The specimens tested met the performance requirements listed herein.

Test Methods: Tests were conducted in accordance with the following:

AAMA 502-12, *Voluntary Specification for Field Testing of Newly Installed Fenestration Products.*

ASTM E 783-02 (Re-Approved 2010), *Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.*

ASTM E 1105-00 (Re-Approved 2008), *Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.*

Pre-Test Inspection:

A visual inspection of the designated test areas were performed prior to testing. The operable test specimens were operated, closed, and locked prior to testing. No obvious deficiencies were observed.

**Test Procedure:**

The perimeter of the chamber was attached and sealed to exterior stone surrounding the window openings. The stone and mortar joints surrounding the test areas were shielded from the test conditions with plastic, duct tape and sealant (only the window frame and sash were tested).

The chambers were equipped with a centrifugal blower/vacuum pump, air flow meter, and a pressure sensing device to maintain the desired air pressure differential across the assembly.

Air infiltration tests were conducted at 6.24 psf pressure differential for the fixed windows and 1.57 psf pressure differential for the operating windows.

Water penetration tests were conducted at 3.06 psf air pressure differential. Four cycles were employed during the test. Each cycle consisted of 5 minutes with the air pressure applied and 1 minute with the air pressure released. Water was applied continuously at the required rate of 5gph/ft². During testing, the interior face of the test area was inspected for water leakage.

Performance Criteria: Provided by Real Estate and Construction Services per job site specifications.

Maximum Allowable Air Infiltration: Operable at 1.57 psf: 0.45 cfm/ft²
Fixed at 6.24 psf: 0.10 cfm/ft²

Water Leakage: (Field Water Definition)

TEST RESULTS

Date: 07/21/14

Ambient Exterior Air Temperature: 81°F

Barometric Pressure: 29.86 in.

General Note #1: All locations referenced are as viewed from the interior unless otherwise noted.

General Note #2: Unless specifically noted within this report, atmospheric conditions at the time of testing did not have an adverse impact on the results of the test. These environmental conditions are recorded for informational use only to confirm that the conditions will not have a negative impact on testing.

General Note #3: The test areas were chosen by the client or client representative.



Test Results: (Continued)

Test Specimen #1:

Manufacturer: Re-View Windows
Description: Wood Fixed Window – Type A
Overall Size: 60" wide by 83-5/16" high
Location: North elevation, ground floor, GN07

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 6.24 psf	0.02 cfm/ft ²	0.10 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage

TEST RESULTS

Date: 07/22/14

Ambient Exterior Air Temperature: 76°F

Barometric Pressure: 29.96 in.

Test Specimen #2:

Manufacturer: Re-View Windows
Description: Wood Single Hung Arch Top Window – Type D
Overall Size: 66" wide by 131" high
Location: North elevation, first floor, 1N12

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 1.57 psf	0.10 cfm/ft ²	0.45 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage



TEST RESULTS

Date: 07/23/14

Ambient Exterior Air Temperature: 70°F

Barometric Pressure: 30.19 in.

Test Specimen #3:

Manufacturer: Re-View Windows
Description: Wood Single Hung Arch Top Window – Type H
Overall Size: 60-1/4" wide by 117-5/8" high
Location: East elevation, first floor, 1E20

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 1.57 psf	0.04 cfm/ft ²	0.45 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage

Test Specimen #4:

Manufacturer: Re-View Windows
Description: Wood Single Hung Window – Type J
Overall Size: 63" wide by 120" high
Location: North elevation, second floor, 2N13

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 1.57 psf	0.03 cfm/ft ²	0.45 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage



TEST RESULTS

Date: 07/24/14

Ambient Exterior Air Temperature: 70°F

Barometric Pressure: 30.04 in.

Test Specimen #5:

Manufacturer: Re-View Windows
Description: Wood Single Hung Window – Type J
Overall Size: 63" wide by 120" high
Location: East elevation, second floor, 2E17

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 1.57 psf	0.03 cfm/ft ²	0.45 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage

Test Specimen #6:

Manufacturer: Re-View Windows
Description: Wood Fixed Window – Type O
Overall Size: 50-1/8" wide by 97-3/4" high
Location: East elevation, second floor landing, 2E15

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 6.24 psf	0.01 cfm/ft ²	0.10 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage



TEST RESULTS

Date: 07/25/14

Ambient Exterior Air Temperature: 72°F

Barometric Pressure: 29.82 in.

Test Specimen #7:

Manufacturer: Re-View Windows
Description: Wood Single Hung Window – Type S
Overall Size: 52" wide by 63-5/8" high
Location: East elevation, third floor, 3E21

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 1.57 psf	0.07 cfm/ft ²	0.45 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage

Test Specimen #8:

Manufacturer: Re-View Windows
Description: Wood Single Hung Window – Type J
Overall Size: 56" wide by 74-7/8" high
Location: East elevation, third floor, 3E04

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 1.57 psf	0.02 cfm/ft ²	0.45 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage

Test Results: (Continued)

Test Specimen #9:

Manufacturer: Re-View Windows
Description: Wood Single Hung Arch Top Window – Type A
Overall Size: 60" wide by 83" high
Location: East elevation, Ground, GE15

<u>Title of Test</u>	<u>Test Results</u>	<u>Allowable</u>
Air Infiltration @ 1.57 psf	0.04 cfm/ft ²	0.45 cfm/ft ²
Water Penetration @ 3.06 psf	No water leakage	No water leakage

Witnesses: The following representatives witnessed all or part of the testing.

<u>Name</u>	<u>Company</u>
Deb Young	HGA
Todd Maxwell	Re-view Windows
Mark Pelz	Architectural Testing, Inc.
Dax R. Stoehr	Architectural Testing, Inc.



This report is prepared for the convenience of our customer and endeavors to provide accurate and timely project information. It contains a summary of observations made by a qualified representative of Architectural Testing. This report is intended to help in your Quality Assurance Program, but it does not represent a continuous nor exhaustive evaluation. The statements made herein do not constitute approval, disapproval, certification, acceptance of performance or materials, or an endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimens tested.

A copy of this report will be retained by Architectural Testing for a period of four years from the report date. Architectural Testing will service this report for the entire test record retention period. Test records such as detailed drawings, data sheets, representative sample of test specimens or other pertinent project documentation will be retained by Architectural Testing for the entire test retention period.

For ARCHITECTURAL TESTING, INC:

Digitally Signed by: Dax Stoehr

Dax R. Stoehr
Technician

Digitally Signed by: Daniel A. Johnson

Daniel A. Johnson
Director – Regional Operations

DRS/jb

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix A: Photographs (2 pages)



Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	08/01/14	N/A	Original report issue.



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APPENDIX A

Photographs



Photo No. 1: exterior isolation.



Photo No. 2: Exterior view with chamber installed.



Photo No. 3: Interior view.