

PERFORMANCE TEST REPORT

**SERIES 251
OFFSET GLAZING STACK SYSTEM
FOR 1" GLASS CAPTURED MULLION
(2" x 4 1/2")**

CCLW JOB #08-5129-5

SEPTEMBER 14, 2009

DATE OF FORMAL TESTING

SEPTEMBER 11, 2009

TESTED FOR AND INSTALLED BY

**PRL ALUMINUM, INC.
14760 DON JULIAN ROAD
CITY OF INDUSTRY, CA 91746**

TEST LOCATION

**CONSTRUCTION CONSULTING LABORATORY WEST
4751 WEST STATE STREET, SUITE B
ONTARIO, CA 91762**

PH: 909-591-1789

FAX: 909-627-9020

MOCK UP DESCRIPTION

The mock-up specimen for testing was a flat wall specimen, nominal one (1) story high, consisting of a 4 1/2" deep, offset glazed, aluminum window wall system, measuring approx. 10' wide by 10' high (3 lites wide by 2 lites high). The system was glazed with 1" insulated glass.

For a complete description and framing details, see drawings at the conclusion of this report (sheet 1- 8). This report is not complete unless these drawings marked and stamped by this laboratory are included.

All references to positive pressures are considered inward acting and negative is outward.

The mock up was tested in accordance with each applicable ASTM standard.

TEST EQUIPMENT

The specimen was installed into a test chamber constructed of structural angles, beams, and columns covered with steel and plywood bulkheads, accessible through a bulkhead door.

Air infiltration was measured with a Meriam LFE and a Dwyer electronic manometer.

Water was applied from a vertical spray rack mounted 22" to 24" from the specimen. The rack was equipped with swirl-type nozzles spaced two (2) feet on center, vertically and horizontally, which delivered five (5) gallons of water per hour per square foot of wall frontal area.

Pressure differentials were measured with a Dwyer electronic manometer.

The pressure differential between the exterior and interior of the chamber was created by a positive and negative blower system.

WITNESSED BY (all or partial)

Jack W. Jackson
Chad C. Jackson
Michael Dubuque

Construction Consulting Laboratory West
Construction Consulting Laboratory West
Construction Consulting Laboratory West

PRELOAD

To set the specimen for testing, a positive pressure differential of **10.0 psf** was applied to the specimen while exhausting air in the air infiltration test. It was held for ten (10) seconds and then reduced to **6.24 psf** to complete the air test. There was no indication of any failure.

AIR INFILTRATION TEST per ASTM E283-99

The exterior of the wall area was sealed with a visqueen material and tape. The exterior face of the specimen was then subjected to a positive static pressure differential of **6.24 psf**. This infiltration reading represented the amount of air infiltration through the chamber (tare). The visqueen was removed and another reading were recorded at **6.24 psf** pressure differential representing the amount of air infiltration through the wall specimen and the chamber (gross).

Subtracting the former reading from the latter reading yields the amount of air infiltration through the tested specimen.

ALLOWABLE

Air infiltration shall not exceed **0.06 cfm** per square foot of wall area. Net allowable based on measurements was **10.4 cfm** total. Area = 100 s/f x 0.06 cfm = **6.0 cfm** total.

RESULT

Specimen passed. At 6.24 psf, air leakage was measured at **3.9 cfm** total.

STATIC WATER PENETRATION TEST per ASTM E331-00

Water was applied to the exterior face of the specimen, at a minimum rate of five (5) gallons per hour per square foot of wall frontal area, in such a way as to completely cover the exterior face of the specimen. At the same time, a positive differential static pressure of **6.24 psf** was applied to the face of the specimen, see below. The application of pressure and water was maintained for a period of fifteen (15) minutes, with observers viewing the interior of the specimen.

ALLOWABLE

Water leakage is defined as "uncontrolled" water infiltrating the system or appearing on systems normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained back to the exterior and cannot damage adjacent materials or finishes is not water leakage.

RESULT

Specimen passed. There was no water leakage noted.

UNIFORM STRUCTURAL TEST @ DESIGN - ASTM E-330-97

The test specimen was subjected to a positive load of **10.0 psf**. The pressure was held for ten (10) seconds and released. Indicators were set.

The test specimen was subjected to a positive load of **20.0 psf**, held for ten (10) seconds and released. Indicators were read and data was recorded.

The blower system, along with the measuring equipment, was then reversed. The test specimen was subjected to a negative load of **10.0 psf**. The pressure was held for ten (10) seconds and released. Indicators were set.

The test specimen was subjected to a negative load of **20.0 psf**, held for ten (10) seconds and released. Indicators were read and data was recorded.

ALLOWABLE

At design load, limit deflection of framing members, to **L/175**.

RESULT

Specimen passed. All measured structural spans complied with specified criteria. See elevation drawing for dial indicator locations. See Charts #1 through #2 on page 6 for deflection/permanent set results (ref. bold number - **xx/xx** for **deflection**/perm. set).

UNIFORM STRUCTURAL PROOF LOAD TEST per ASTM E330-97

The test specimen was subjected to a positive load of **15.0 psf** (75% design load). The pressure was held for ten (10) seconds and released, with indicators then set to zero.

The test specimen was subjected to a positive load of **30.0 psf** (150% design load), held for ten (10) seconds and released. Indicators were read and all data recorded.

The blower system along with the measuring equipment was reversed. The test specimen was subjected to a negative load of **15.0 psf** (75% design load). The pressure was held for ten (10) seconds and released, with indicators set to zero.

The test specimen was subjected to a negative load of **30.0 psf** (150% design load), held for ten (10) seconds and released. Indicators were read and all data recorded.

ALLOWABLE

Permanent deformation of system or main framing members shall be limited to **L/1000**.

RESULTS

Specimen passed. All measured structural spans complied with specified criteria. See elevation drawing for dial indicator locations. See Charts #3 through #4 on page 6 for deflection/permanent set results (ref. bold number - xx/xx for deflection/**permanent set**).

END OF TESTING

The as built mock-up drawings sheets 1 through 8, reviewed and stamped by the laboratory, should accompany and are a part of this report.



**CONSTRUCTION CONSULTING LABORATORY WEST
JACK W. JACKSON
PRESIDENT/MANAGER OF TESTING**

**STRUCTURAL READINGS
100% DESIGN LOAD**

**CCLW REPORT NO: 08-5129-5
SERIES 251 - OFFSET**

CHART 1 OF 4

TEST PRESSURE = 20.0 PSF POSITIVE

DIAL IND.	MEMBER / D'TL	REF.	POSITION	GROSS READ	NET READ	ALLOW L/175	SPAN
1	VERTICAL MULL.		BOTTOM	07/03	-	-	-
2	VERTICAL MULL.	(1&3)	MID SPAN	42/02	34/00	68	120"
3	VERTICAL MULL.		TOP	10/01	-	-	-

CHART 2 OF 4

TEST PRESSURE = 20.0 PSF NEGATIVE

DIAL IND.	MEMBER / D'TL	REF.	POSITION	GROSS READ	NET READ	ALLOW L/175	SPAN
1	VERTICAL MULL.		BOTTOM	12/07	-	-	-
2	VERTICAL MULL.	(1&3)	MID SPAN	54/06	46/02	68	120"
3	VERTICAL MULL.		TOP	04/01	-	-	-

READINGS ARE IN HUNDRETHS OF INCH
READINGS ARE DEFLECTION/PERMANENT SET

DEFL. LIMIT = L/175 OR 3/4" MAX.

150% DESIGN LOAD

CHART 3 OF 4

TEST PRESSURE = 30.0 PSF POSITIVE

DIAL IND.	MEMBER / D'TL	REF.	POSITION	GROSS READ	NET READ	ALLOW L/1000	SPAN
1	VERTICAL MULL.		BOTTOM	07/02	-	-	-
2	VERTICAL MULL.	(1&3)	MID SPAN	48/02	39/00	12	120"
3	VERTICAL MULL.		TOP	12/02	-	-	-

CHART 4 OF 4

TEST PRESSURE = 30.0 PSF NEGATIVE

DIAL IND.	MEMBER / D'TL	REF.	POSITION	GROSS READ	NET READ	ALLOW L/1000	SPAN
1	VERTICAL MULL.		BOTTOM	06/01	-	-	-
2	VERTICAL MULL.	(1&3)	MID SPAN	59/02	53/01	12	120"
3	VERTICAL MULL.		TOP	06/02	-	-	-

READINGS ARE IN HUNDRETHS OF INCH
READINGS ARE DEFLECTION/PERMANENT SET

PERMANENT DEFL. LIMIT = L/1000