Architectural Testing

September 18, 2008

Mr. Robert Simon
Gossen Corporation
2030 West Bender Road
Wisconsin, Milwaukee 53209

RE: SNOW LOAD RATING FOR *WEATHERREADY*™ DECKING

Dear Mr. Simon:

Pursuant to your request, Architectural Testing has analyzed the test data for *WeatherReady*™ deck boards to determine the allowable design capacity for snow load at the 16.0 in design span.

Test data from Architectural Testing Report No. 79207.02-119-19 was utilized in the analysis.

The calculation methods of ICC-ES™ AC174 (effective March 1, 2007) *Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails)* were utilized with the exception that the End-Use Adjustment Factors for high temperature were not included. The long term creep effects due to snow load were not addressed in this analysis.

Summary for *WeatherReady*™ Decking:

220 psf allowable design snow load at **16.0 in span**

For ARCHITECTURAL TESTING:

Digitally Signed by: David H. Forney

David H. Forney, P.E.
Senior Project Engineer
Structural Systems Testing

Digitally Signed by: John A. Runkle

John A. Runkle, P.E.
Director
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REGISTERED PROFESSIONAL ENGINEER
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EXP. 09-30-10
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DHF:dhf/alb

cc: 85956.02-119-34
Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A - Snow Load Rating Calculations (1)

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Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	09/18/08	N/A	Original report issue

APPENDIX A

Snow Load Rating Calculations

Architectural Testing

Gossen Corporation *WeatherReady*™ Decking - Rating for Snow Load at 16.0 inch Span

Using calculational methods of ICC-ES AC 174 *Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails)* and based on flexural test data and all end-use adjustment factors (with the exception of high temperature (125°F)) from Architectural Testing Test Report 79207.02-119-19, Sections 9.5 and 8.2.

Equivalent Uniform Load using Equivalent **Bending Moments**:

Average ultimate test load = 1,292 lb
1,292 / 2.5 = 517 lb
5% Nonparametric ultimate test load = 1,182 lb
1,182 / 2.1 = 563 lb > 517 lb ∴ Average governs

For: P = total test load (lb) and W = total load, uniformly distributed load (lb)

$$M(uniform) = \frac{Wl}{8},\ M(3rd-Pt) = \frac{Pl}{6}$$

$$\frac{Wl}{8} = \frac{Pl}{6} \therefore W = \frac{4P}{3}$$

$$W = \frac{4P}{3} = \frac{4(517)}{3} = \mathbf{689\ lb}$$

Equivalent Uniform Load using Equivalent **Deflections**:

Test load at L/180 deflection:
16 in / 180 = 0.089 in
Average test load at 0.089 in Deflection = 105 lb

For: P = total test load (lb) and W = total load, uniformly distributed load (lb)

$$\Delta(uniform) = \frac{5Wl^3}{384EI},\ \Delta(3rd-Pt) = \frac{23Pl^3}{1296EI}$$

$$\frac{5Wl^3}{384EI} = \frac{23Pl^3}{1296EI} \therefore W = \frac{184P}{135}$$

$$W = \frac{184P}{135} = \frac{184(105)}{135} = \mathbf{143\ lb} < 689\ \text{lb} \therefore \text{Deflection governs}$$

Snow Load Rating:

Convert to lb/ft2 (psf):

For W = total load (lb) and w = uniform load (psf),
$w = W$ / Tributary Area of one deck board including 0.25 in gap

Tributary Area = (5.50+0.25) x 16.0 / 144 = 0.64 ft^2

Max uniform load rating for 16.0 in span, $w = \frac{143\ lb}{0.64\ ft^2} = 223\ psf$

WeatherReady™ Decking Snow Load Rating for a 16.0 in span: **220 psf**