JRS ENGINEERING
BUILDING ENVELOPE CONSULTANTS

April 1, 2019

To whom it may concern

Dear Sir/Madam:

We are pleased to provide a summary of the mock-up testing of the Grand View EAS Corp. (GV) window wall system, tested at the Architectural Testing Asia Inc. facility in Korea, on March 26 to March 29, 2019. Both Joel Schwartz and Adam Jarolim from JRS Engineering Ltd. were in attendance for the mock-up testing.

The procedure followed for the mock-up testing complies with *ASTM E 2099-00 Standard Practice for the Specification and Evaluation of Pre-Construction Laboratory Mockup of Exterior Wall Systems* and also complies with the more stringent procedure listed in *AAMA 501-15 Methods of Test for Exterior Walls*, as indicated in the enclosed summary table. ASTM E 2099 and AAMA 501 are the two most commonly specified mock-up evaluation standards for fenestration systems. The layout of the mock-up test chamber followed the typical unit/panel test specimen, as listed in AAMA 501, including a two-storey chamber with both 9ft and 10ft approximate vertical spans, as well as an inside and outside corner. The testing performance criteria was selected to be the maximum North American Fenestration Standard (NAFS) test values for the air and water penetration resistance testing, with the structural test pressures and interstorey lateral/vertical displacements selected based on general performance criteria for common high-rise buildings in North America.

Testing was completed with the GV window wall system successfully meeting the test criteria listed in the enclosed summary table.

Sincerely,

JRS ENGINEERING

Prepared by:

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GRAND VIEW WINDOW WALL MOCK-UP TEST SUMMARY (TEST DATES: MAR 26 - 29, 2019)				
Sequence	Test Standards	Description	Test Performance	
			~9 ft Vert. Span (2695mm)	~10 ft Vert. Span (3013mm)
1	ASTM E-330	Structural Performance by Static Pressure (50% Postive design Load)	+/- 25 psf (1200 Pa)	+/- 20 psf (960 Pa)
2	ASTM E-283	Air Infiltration & Exfiltration by Static Pressure (measure flow rate at 300 Pa air pressure diff.)	A3 @ 300 Pa (6.24 PSF: Fixed 0.04 CFM/ft2; Operable 0.1 CFM/ft2)	
3	ASTM E-331	Water Penetration under Static Pressure (Max NAFS test pressure)	720 Pa (15 PSF)	
4	AAMA 501.1	Water Penetration under Dynamic Pressure (Max NAFS test pressure)	720 Pa (15 PSF)	
5	AAMA 501.7	Interstory Vertical Displacement (80% of total expected vertical movement)	+/- 15mm	
6	ASTM E283	Air Infiltration & Exfiltration by Static Pressure	A3 @ 300 Pa (6.24 PSF: Fixed 0.04 CFM/ft2;Operable 0.1 CFM/ft2)	
7	ASTM E331	Water Penetration under Static Pressure	720 Pa (15 PSF)	
8	AAMA 501.4	Interstory Lateral Displacement (Design disp. width or 0.010 X max story height)	+/- 30mm	
9	ASTM E283	Air Infiltration & Exfiltration by Static Pressure	A3 @ 300 Pa (6.24 PSF: Fixed 0.04 CFM/ft2;Operable 0.1 CFM/ft2)	
10	ASTM E331	Water Penetration under Static Pressure	720 Pa (15 PSF)	
11	AAMA 501.5	Thermal Cycle Testing (Default high and low ambient air temps)	+82C to -18C: 3 cycles	
12	ASTM E283	Air Infiltration & Exfiltration by Static Pressure	A3 @ 300 Pa (6.24 PSF: Fixed 0.04 CFM/ft2;Operable 0.1 CFM/ft2)	
13	ASTM E331	Water Penetration under Static Pressure	720 Pa (15 PSF)	
14	ASTM E-330	Structural Performance by Static Pressure (100% Positive and negative design load)	+/- 50 psf (2400 Pa)	+/- 40 psf (1920 Pa)
15	ASTM E-283	Air Infiltration & Exfiltration by Static Pressure	A3 @ 300 Pa (6.24 PSF: Fixed 0.04 CFM/ft2;Operable 0.1 CFM/ft2)	
16	ASTM E-331	Water Penetration under Static Pressure	720 Pa (15 PSF)	
17	ASTM E-330	Structural Performance by Static Pressure (150% Positive and negative design load)	+/- 75 psf (3600 Pa)	+/- 60 psf (2880 Pa)
18	AAMA 501.4	Interstory Lateral Displacement (150% Design lateral displacement)	+/- 45mm	