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Testing. Advising. Assuring.

**PERFORMANCE EVALUATION OF
FIXED WINDOW – “655 Series”
For Windspec Inc.**

**IN ACCORDANCE WITH:
AAMA/WDMA/CSA 101/I.S.2/A440-08
AND CSA A440S1-09**

Report to: Windspec Inc
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Attention: Mr. Oren Anava

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Report No.: 16-06-M0062N
5 Pages, 1 Appendix

Proposal No.: 16-006-412864

Date: November 7, 2016

Product Manufacturer:	Windspec Inc.
Product Type:	Fixed Window
Product Series/Model:	655 Series
Primary Product Designator:	Class CW – 3360 – Size tested 1510 x 2510 mm – Fixed window Class CW – PG70 – Size tested 59.5 x 98.8 in – FW
Secondary Product Designator:	
Air Infiltration/Exfiltration	Canadian Fixed Level
Water Penetration Resistance:	730 Pa (15.00 psf)
Negative Design Pressure:	3360 Pa (70.00 psf)
Positive Design Pressure:	3360 Pa (70.00 psf)
Test Completion Date:	November 2, 2016

1.0 INTRODUCTION

At the request of Windspec Inc. Exova was retained to evaluate the physical performance of a Fixed Window identified as "655 Series", in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-08 Standard, "NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights" and CSA A440S1-09 Canadian Supplement, as outlined in proposal number 16-006-412864.

Exova Specimen No.: 16-06-M0062
Type: Fixed Window
Model: 655 Series
Overall Window Size: 1510 mm x 2510 mm (59.45" x 98.82")

2.0 SAMPLE DESCRIPTION

The following sample description has verified by Exova. Details and drawings of the described test specimen, as provided by the manufacturer, have been included in Appendix A.

Product Type: Fixed Window, Extruded Aluminum
Frame: Fixed Window, Extruded Aluminum, 1510 mm x 2510 mm x 114.3mm (59.45" x 98.82" x 4.50")
Joinery: Frame: Corners butte joined, each corner mechanically fastened with two #8x2" flat head screws, sealed with flexible sealant
Installation: Test buck: Wood buck
Anchorage/ Fasteners: Fastened with 10 #10x2" flat head screws, four per jamb, 540 mm (21.26") c/c, two at head, 150 mm (5.91") from the ends
Sealant: Interior and exterior frame perimeter sealed with flexible sealant
Glazing Type: Dual glazed, tempered, overall thickness 25 mm (0.98"), glass thickness 6 mm (0.24"), airspace size 13 mm (0.51"), aluminium spacer, air fill
Glazing Method: Channel glazed, dry glazed
Glazing Stop: Extruded Aluminum, one, sill, exterior face, sealed full length with flexible sealant
Setting block: EPDM, four, 27 mm x 65 mm x 5 mm (1.06" x 2.56" x 0.20"), sill, two at right side from interior, one at left side, one centre
EPDM, four, 27 mm x 50 mm x 2.5 mm (1.06" x 1.97" x 0.10"), jambs, three on right jamb, 125 mm (4.92") from ends and centre, one on left jamb, centre
Spline: EPDM, interior and exterior perimeter
Corner Cover: Plastic, two, 34 mm x 53 mm x 1 mm (1.34" x 2.09" x 0.04"), sill, glazing cavity, ends
Reinforcement: None
Thermal Break: Nylon, two rows, 18 mm x 5.99 mm (0.71" x 0.25"), insert frame perimeter
Two rows, 18 mm x 5.99 mm (0.71" x 0.25"), sill, main frame
Drainage/Ventilation: Frame:
Drain Notch: Two, 25 mm x 2.5 mm (0.98" x 0.10"), sill, glazing cavity, 100 mm from the ends
Drain Slot: Two, 25 mm x 5 mm (0.98" x 0.20"), sill exterior face, 100 mm from the ends

Note: Details and drawings as provided by the manufacturer for the above unit have been included in Appendix A.

3.0 TEST RESULTS

Table 1 - Summarized Testing Results in Accordance with AAMA/WDMA/CSA 101/I.S.2/A440-08 and CSA A440S1-09 Canadian Supplement					
Test	Requirements		Results		Rating
Air Leakage Resistance (Clause 5.3.2) <i>Per</i> <i>ASTM E283</i> Test Date: July 16, 2016	Allowable rate of air leakage shall be less than or equal to the following, L/s.m² (cfm/ft²), at the subsequent test pressure:		Test area, m² (ft²): 3.79 (40.80)		PASS Canadian Fixed Level
			Measured Air Leakage Rate, L/s.m² (cfm/ft²):		
	Test Pressure, Pa (psf):	75 (1.6)			
	Gateway:	1.5 (0.3)	Infiltration:	0.002 (0.0003)	
	Canadian Fixed Level:	0.2 (0.04)	Exfiltration:	0.17 (0.03)	
Water Penetration Resistance (Clause 5.3.3) <i>Per</i> <i>ASTM E547</i> Test Date: July 16, 2016	No water leakage shall be observed at the following specified pressure differential, Pa (psf):		No water leakage was observed at the following specified pressure differential, Pa (psf):		PASS Gateway (CW30-FW) Optional Performance (CW100-FW)
	Gateway Performance:		Gateway Performance:		
	Test Pressure:	220 (4.5)	Test Pressure:	220 (4.5)	
	Optional Performance: (US / CAN)		Optional Performance: (US / CAN)		
	Test Pressure (US):	580 (12.00)	Highest Test Pressure:	730 (15.00)	
	Test Pressure (CAN):	730 (15.00)			

**Table 1, Continued - Summarized Testing Results in Accordance with
AAMA/WDMA/CSA 101/I.S.2/A440-08 and
CSA A440S1-09 Canadian Supplement**

Test	Requirements					Results		Rating	
Uniform Load Deflection (Clause 5.3.4.2) <i>Per ASTM E330</i> Test Date: November 2, 2016	No member shall deflect more that L/175 of unsupported span at the following specified test pressures, Pa (psf):					Measured net deflection of Jamb, mm (in):		PASS Gateway (CW30-FW) Optional Performance (CW70-FW)	
	Allowable deflection, mm (in): 14.34 (0.56)					Jamb Span, mm (in): 2510 (98.82)			
	Gateway Performance:					Positive:	0.08 (0.003)		
	Test Pressure:		±1440 (30.00)			Negative:	-0.52 (-0.02)		
	Optional Performance:								
	Test Pressure:		±3360 (70.00)						
Uniform Load Structural (Clause 5.3.4.3) <i>Per ASTM E330</i> Test Date: November 2, 2016	There shall be no permanent damage to the window components after the following specified test pressures, Pa (psf). No member shall have permanent deflect more that 0.3% of span.					Measured net deflection of Jamb, mm (in):		PASS Gateway (CW30-FW) Optional Performance (CW70-FW)	
	Allowable permanent deflection, mm (in): 7.53 (0.30)					Jamb Span, mm (in): 2510 (98.82)			
	Gateway Performance:					Positive:	0.12 (0.005)		
	Test pressure:		±2160 (45.00)			Negative:	0.40 (0.02)		
	Optional Performance:								
	Test pressure:		±5040 (105.00)						
Forced-Entry Resistance (Clause 5.3.5) <i>Per ASTM F588</i> Test Date: November 2, 2016	No entry shall be gained during the following test sequence:					For Type D Window no entry was gained during the following specified test sequence:		PASS Grade 40	
	Load Identification	Grade Loads, N (lbf)							
		10	20	30	40				
	Disassembly T1:		5 min		10 min		Disassembly T1:		No Entry
	Manipulation T1:		5 min		10 min		Manipulation T1:		No Entry

4.0 MODIFICATIONS

The following modification was made to the test sample during testing in order to achieve the results stated in this report:

- Uniform Load Test: Sill exterior glazing stop was sealed full length with flexible sealant.

5.0 CONCLUSIONS

Based on the results of the testing summarised in Table 1, Windspec Inc. Fixed Window "655 Series," Exova Specimen No.: 16-06-M0062 met the following requirements as outlined in the AAMA/WDMA/CSA 101/I.S.2/A440-08 standard and CSA A440S1-09 Canadian Supplement.

Performance Rating

- | | |
|--------------------------------|---|
| • Air Leakage Resistance | Pass (Fixed Level Canadian) |
| • Water Penetration Resistance | 580 Pa (12.00 psf) (US)
730 Pa (15.00 psf) (CAN) |
| • Uniform Load Deflection | ±3360 Pa (70.00 psf) |
| • Uniform Load Structural | ±5040 Pa (105.00 psf) |
| • Forced Entry Resistance | Grade 40 |

Product Designation for Class CW:

- Class CW – PG3360 – Size tested 1510 x 2510 mm – Fixed Window
- Class CW – PG70 – Size tested 59.5 x 98.8 in – FW

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Primary Product Designator:	Class CW – PG3360 – Size tested 1510 x 2510 mm – Fixed window Class CW – PG70 – Size tested 59.5 x 98.8 in – FW
Secondary Product Designator:	Canadian Air Infiltration/Exfiltration = Canadian Fixed Level
Air Infiltration/Exfiltration	Canadian Fixed Level
Water Penetration Resistance:	730 Pa (15.00 psf)
Negative Design Pressure:	3360 Pa (70.00 psf)
Positive Design Pressure:	3360 Pa (70.00 psf)
Test Completion Date:	November 2, 2016

6.0 REPORT REVISION SUMMARY

Revision No:

Original

Date:

07-November-2016

Description of Revisions:

Original Document

Reported by:



Scott Hallam, B.Eng. Ext. 11511
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Products Testing Division

Reviewed by:



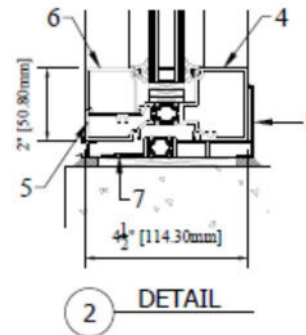
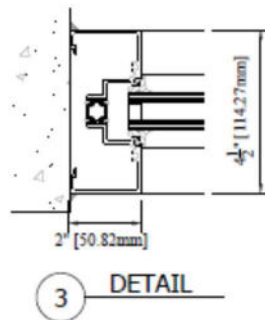
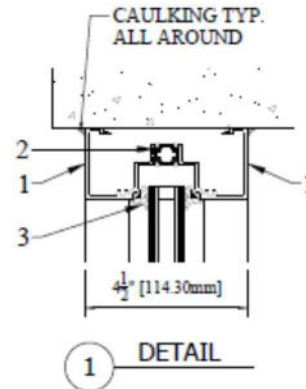
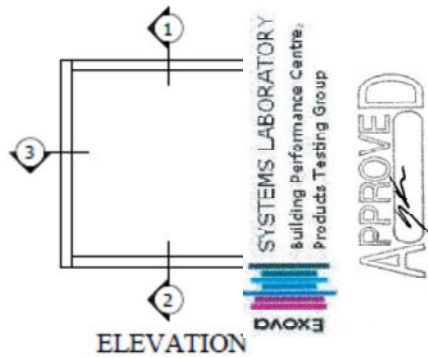
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APPENDIX A

Manufacturer's Detail Drawings

(2 Pages)

655 SERIES



#	DIE #	DESCRIPTION
1	C-65501	655 Open Back Half
2	N/A	Bautec Strip Nylon 18mm Wide
3	N/A	EPDM Gasket
4	C-65502	655 Mullion Half
5	C-65503	655 Sill Exterior Half
6	C-65004	Sill Glazing Stop
7	C-65512	655 Sill Track Exterior
8	C-65513	655 Sill Track Interior



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