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Testing. Advising. Assuring.

PERFORMANCE EVALUATION OF

FIXED WINDOW "875 Series"

For Windspec Inc.

IN ACCORDANCE WITH:
AAMA/WDMA/CSA 101/I.S.2/A440-11
AND A440S1-17

Report to:	Windspec Inc. 1310 Creditstone Road Concord, ON, Canada L4K 5T7
Attention:	Mr. Oren Anava
Telephone: Fax: Email:	905-738-8311 905-738-6188 oren@windspec.com
Report No.:	17-06-M0115-2N 5 Pages, 1 Appendix
Proposal No.:	17-006-498606
Date:	June 1, 2017

Product Manufacturer:	Windspec Inc.
Product Type:	Fixed Window
Product Series/Model:	875 Series
Primary Product Designator:	**Class AW – PG3360 – Size tested 1500 x 2500 mm – Fixed window** **Class AW – PG70 – Size tested 59.06 in x 98.43 in – FW**
Secondary Product Designator:	
Positive Design Pressure:	3360 Pa (70.18 psf)
Negative Design Pressure:	3360 Pa (70.18 psf)
Water Penetration Resistance:	720 Pa (15.04 psf)
Air Infiltration/Exfiltration:	Canadian Fixed Level
Test Completion Date:	June 1, 2017
Report Number:	17-06-M0115-2N

1.0 INTRODUCTION

At the request of Windspec Inc., Exova was retained to evaluate the physical performance of a Fixed Window identified as "875 Series", in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11 Standard, "NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights" and A440S1-17 Canadian Supplement, as outlined in proposal number 17-006-498606.

Exova Specimen No.:	17-06-M0115-2
Type:	Fixed Window
Model:	875 Series
Overall Window Size:	1500 mm x 2500 mm (59.06" x 98.43")
Sampling:	N/A

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
Frame:	Fixed Window, Extruded Aluminum, 1500 mm x 2500 mm x 133.35 mm (59.06" x 59.06" x 5.25")
Joinery:	
Frame:	Butte Joined, fastened with five #10x2" pan head screw, joints sealed with flexible sealant
Installation:	
Test buck:	Wood Buck
Fasteners:	Frame perimeter fastened with ten #10x1" flat head screws, five screws per jamb, at 450 mm (17.72") c/c
Sealant:	Interior and exterior frame perimeter sealed with flexible sealant
Glazing Type:	Dual glazed, tempered, overall thickness 25.4 mm (1.00"), glass thickness 6 mm (0.24"), gas cavity size 13 mm (0.51"), stainless steel spacer, dual sealed, air filled
Glazing Method:	Laid in glazed, wet glazed
Glazing Stop	Extruded Aluminum interior perimeter
Glazing Spline:	EPDM, one row, interior perimeter, at glazing stop, corners sealed with flexible sealant
Setting block:	Rubber, 14, 65 mm x 25 mm x 6 mm (2.56" x 0.98" x 0.24"), four per jamb, 550 mm (21.65") c/c, three per head/sill, 610 mm (24.02") c/c Plastic, three, 120 mm x 30 mm x 5 mm (4.72" x 1.18" x 0.20"), sill, under rubber setting blocks
Glazing Tape:	Butyl, one row, exterior perimeter
Needle Bead:	Flexible sealant, exterior surface at upstanding leg
Reinforcement:	None
Thermal Break:	Glass reinforced nylon, two rows, 18 mm (0.71"), frame perimeter

3.0 TEST RESULTS

Table 1 - Summarized Testing Results in Accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17 Canadian Supplement

Test	Requirements		Results		Rating
Initial Air Leakage Resistance (Clause 9.3.2) *Per ASTM E283* **Test Date:** May 18, 2017	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): 3.75 (40.37)		**PASS** Canadian Fixed Level
	Test Pressure, Pa (psf):	300 (6.27)	Measured Air Leakage Rate, L/s.m² (cfm/ft²):		
	Gateway:	1.5 (0.30)	Infiltration:	0.06 (0.01)	
	Canadian Fixed Level:	0.2 (0.04)	Exfiltration:	0.06 (0.01)	
Initial Water Penetration Resistance (Clause 9.3.3) *Per ASTM E547* **Test Date:** May 18, 2017	No water leakage shall be observed at the following specified cyclic pressure differential, Pa (psf):		No water leakage was observed at the following specified cyclic pressure differential, Pa (psf):		**PASS** Gateway **(AW40-FW)** Optional Performance **(AW100-FW)**
	Gateway Performance:		**Gateway Performance:**		
	Test Pressure:	390 (8.15)	Test Pressure:	390 (8.15)	
	Optional Performance: (US / CAN)		**Optional Performance: (US / CAN)**		
	Test Pressure (US):	580 (12.11)	Test Pressure:	720 (15.04)	
	Test Pressure (CAN):	720 (15.04)			
Initial Water Penetration Resistance (Clause 9.3.3) *Per ASTM E331* **Test Date:** May 18, 2017	No water leakage shall be observed at the following specified static pressure differential, Pa (psf):		No water leakage was observed at the following specified static pressure differential, Pa (psf):		**PASS** Gateway **(AW40-FW)** Optional Performance **(AW100-FW)**
	Gateway Performance:		**Gateway Performance:**		
	Test Pressure:	390 (8.15)	Test Pressure:	390 (8.15)	
	Optional Performance: (US / CAN)		**Optional Performance: (US / CAN)**		
	Test Pressure (US):	580 (12.11)	Test Pressure:	720 (15.04)	
	Test Pressure (CAN):	720 (15.04)			
Life Cycle Testing: (Clause 7.3.5) *Per AAMA 910-10* **Test Date:** May 29, 2017	**Thermal Cycling:**		No damage to fasteners, hardware parts, supports arms, window fully functional		**PASS**
	No damage to fasteners, hardware parts, supports arms, actuating mechanisms or any other damage which causes the window to malfunction after six cycles of the following temperatures, °C (°F):				
	High Temperature:	82 (180)			
	Low Temperature:	-18 (0)			

Table 1, Continued - Summarized Testing Results in Accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17 Canadian Supplement

Test	Requirements		Results		Rating
Uniform Load Deflection (Clause 9.3.4.2) *Per ASTM E330* **Test Date:** June 1, 2017	No member shall deflect more that L/175 of unsupported span at the following specified test pressures, Pa (psf):		Measured net deflection of Left Jamb, mm (in):		**PASS** Gateway **(AW40-FW)** Optional Performance **(AW70-FW)**
	Allowable deflection, mm (in): 14.29 (0.56)		Left Jamb span, mm (in): 2500 (98.43)		
	Gateway Performance:		Positive:	0.08 (0.003)	
	Test Pressure:	±1920 (40.10)	Negative:	-1.13 (-0.04)	
	Optional Performance:				
	Test Pressure:	±3360 (70.18)			
Post Design Pressure Air Leakage Resistance (Clause 9.3.2) *Per ASTM E283* **Test Date:** June 1, 2017	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): 3.75 (40.37)		**PASS** Canadian Fixed Level
			Measured Air Leakage Rate, L/s.m² (cfm/ft²):		
	Test Pressure, Pa (psf):	300 (6.27)			
	Gateway:	1.5 (0.30)	Infiltration:	0.06 (0.01)	
	Canadian Fixed Level:	0.2 (0.04)	Exfiltration:	0.06 (0.01)	
Post Design Pressure Water Penetration (Clause 9.3.3) *Per ASTM E547* **Test Date:** June 1, 2017	No water leakage shall be observed at the following specified cyclic pressure differential, Pa (psf):		No water leakage was observed at the following specified cyclic pressure differential, Pa (psf):		**PASS** Gateway **(AW40-FW)** Optional Performance **(AW100-FW)**
	Gateway Performance:		**Gateway Performance:**		
	Test Pressure:	390 (8.15)	Test Pressure:	390 (8.15)	
	Optional Performance: (US / CAN)		**Optional Performance: (US / CAN)**		
	Test Pressure (US):	580 (12.11)	Test Pressure:	720 (15.04)	
	Test Pressure (CAN):	720 (15.04)			
Post Design Pressure Water Penetration (Clause 9.3.3) *Per ASTM E331* **Test Date:** June 1, 2017	No water leakage shall be observed at the following specified static pressure differential, Pa (psf):		No water leakage was observed at the following specified pressure differential, Pa (psf):		**PASS** Gateway **(AW40-FW)** Optional Performance **(AW100-FW)**
	Gateway Performance:		**Gateway Performance:**		
	Test Pressure:	390 (8.15)	Test Pressure:	390 (8.15)	
	Optional Performance: (US / CAN)		**Optional Performance: (US / CAN)**		
	Test Pressure (US):	580 (12.11)	Test Pressure:	720 (15.04)	
	Test Pressure (CAN):	720 (15.04)			

Table 1, Continued - Summarized Testing Results in Accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17 Canadian Supplement

Test	Requirements					Results		Rating
Uniform Load Structural (Clause 5.3.4.3) *Per ASTM E330* **Test Date:** June 1, 2017	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 0.2% of span.					Measured permanent deflection of Left Jamb, mm (in):		**PASS** Gateway **(AW40-FW)** Optional Performance **(AW70-FW)**
	Allowable permanent deflection, mm (in): 5.33 (0.21)					Left Jamb span, mm (in): 2500 (98.43)		
	Gateway Performance:					Positive:	0.42 (0.02)	
	Test pressure:	±2880 (60.15)				Negative:	0.05 (0.002)	
	Optional Performance:							
	Test pressure:	±5040 (105.26)						
Forced-Entry Resistance (Clause 9.3.5) *Per ASTM F588* **Test Date:** June 1. 2017	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

No modification was made to the Windspec Inc., Fixed Window "875 Series," Exova Specimen No.: 17-06-M0115-2, during testing to achieve the results stated in this report.

5.0 CONCLUSIONS

Based on the results of the testing summarised in Table 1, Windspec Inc., Fixed Window "875 Series," Exova Specimen No.: 17-06-M0115-2 met the following requirements as outlined in the AAMA/WDMA/CSA 101/I.S.2/A440-11 standard and A440S1-17 Canadian Supplement.

Performance Rating

- Air Leakage Resistance — Pass (Fixed Level Canadian)
- Water Penetration Resistance — 580 Pa (12.11 psf) (US)
  720 Pa (15.04 psf) (CAN)
- Uniform Load Deflection — ±3360 Pa (70.18 psf)
- Uniform Load Structural — ±5040 Pa (105.26 psf)
- Forced Entry Resistance — Grade 40

Product Designation for Class AW:

- Class AW – PG3360 – Size tested 1500 x 2500 mm – Fixed Window
- Class AW – PG70 – Size tested 59.06 x 98.43 in – FW

Product Manufacturer:	Windspec Inc.
Product Type:	Fixed
Product Series/Model:	875 Series
Primary Product Designator:	Class AW – PG3360 – Size tested 1500 x 1800 mm – Fixed window Class AW – PG70 – Size tested 59.06 x 98.43 in – FW
Secondary Product Designator:	
Positive Design Pressure:	3360 Pa (70.18 psf)
Negative Design Pressure:	3360 Pa (70.8 psf)
Water Penetration Resistance:	720 Pa (15.04 psf)
Air Infiltration/Exfiltration:	Canadian Fixed Level
Test Completion Date:	June 1, 2017
Report Number:	17-06-M0115-2N

6.0 REPORT REVISION SUMMARY

Revision No:	Date:	Description of Revisions:
Original	2017-June-20	Original Document

Reported by:

Scott Hallam, Ext. 11511
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Reviewed by:

Haya Soghrati, B.Arch. Sc, (Building Science), Ext. 11227
Fenestration Services Project Manager, Building Systems
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APPENDIX A

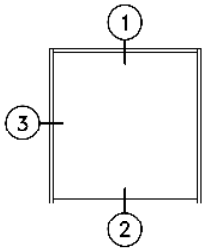
Manufacturer's Detail Drawings

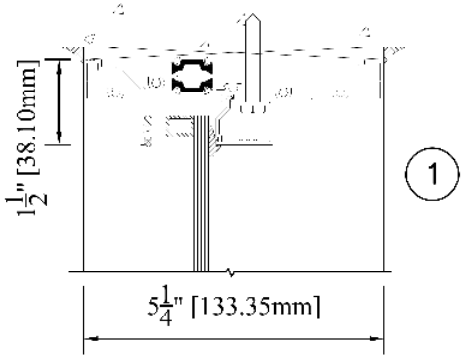
(2 Pages)

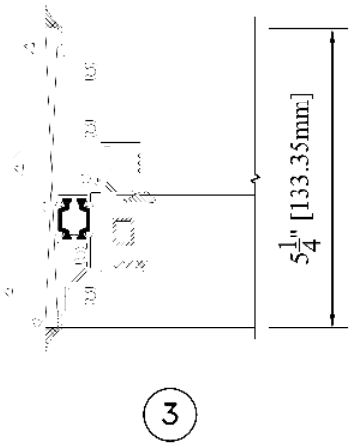
PAGE
875–001

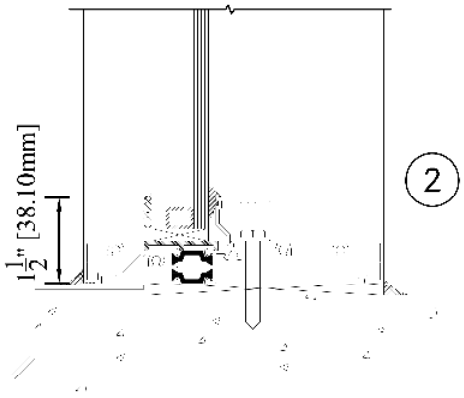
875 SERIES

TYPICAL DETAIL









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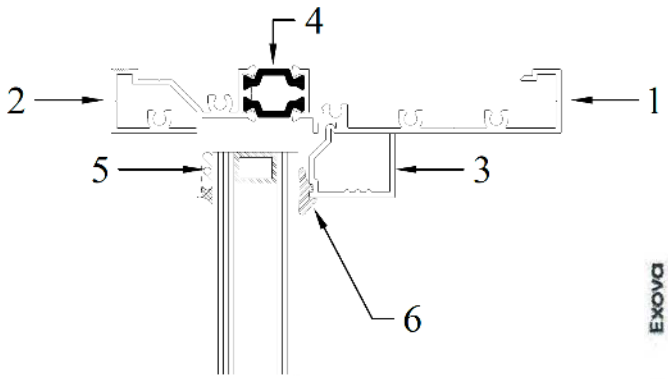
JUNE 2017

PAGE
875–002

875 SERIES

HEADER/SILL/JAMB DETAIL



1. 855 Perimeter Interior
2. 875 Perimeter Exterior
3. Glass Stop
4. 18mm Offset Strut
5. $\frac{1}{8}$" Polyshim
6. Wedge Gasket

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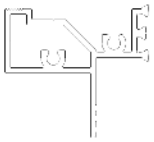
② 

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