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Testing. Advising. Assuring.

**PERFORMANCE EVALUATION OF THE WINDSPEC INC.,
“WINDSPEC 5500 HTP SERIES FIXED” UNIT
IN ACCORDANCE NAFS - AAMA/WDMA/CSA 101/I.S.2/A440-08
AND CSA A440 S1-09 CAN SUPPLEMENT SECTION 5**

Report to: Windspec Inc.
1310 Creditstone Road
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L4K 5T7

Attention: Mr. Oren Anava

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Report No.: 14-06-M0446-1
5 Pages, 1 Appendix

Proposal No.: 14-006-327230

Date: December 14, 2014

Product Manufacturer:	Windspec Inc.
Product Type:	Fixed Window
Product series/model:	Windspec 5500 HTP Series Fixed
Primary product designator:	Class AW-PG70-FW - 1,524 x 2,514mm (60 x 99") – Type FW
Optional Secondary designator:	Canadian Air Infiltration/Exfiltration = Fixed Level Canadian Water Penetration Resistance = 730Pa (15.0 PSF) Negative Design Pressure (DP) = - 3,360 Pa (-70.0 PSF) Positive Design Pressure (DP) = + 3,360 Pa (+70.0 PSF) Test Completion Date: November 26, 2014

1.0 INTRODUCTION

At the request of Windspec Inc., Exova was retained to conduct the performance evaluation of a fixed aluminum window identified as the "Windspec 5500 HTP Series Fixed" window unit, in accordance with NAFS - AAMA/WDMA/CSA 101/I.S.2/A440-08 and CSA A440 S1-09 Supplement, Section 5 Fenestration Standard as outlined in proposal number 14-006-327230.

Exova Specimen No.:	14-06-M0446-1
Type:	Aluminium Fixed Window
Model:	Windspec 5500 HTP Series Fixed
Overall Window Size:	1,524 mm (wide) x 2,514 mm (high)
Glazing:	6 mm Clear / 13 mm Argon/ 6 mm Clear (Tempered) – 1" Overall
Glazing Size:	1,524 mm (wide) x 2,413 mm (high)
Glazing Type:	Warm Edge Spacer, 13 mm Overall Spacer Width
Glazing Stop Method:	Aluminium Pressure Plate
Weatherstripping:	EPDM Seals
Frame Material:	Extruded Aluminium (5 ¼") with Thermal Break
Thermal Break:	Flexible PVC Thermal Break
Reinforcement:	None
Drainage:	None

Installation Guide:

Shimming: N/A

Fasteners: Fastened with Aluminium angle "L" bracket, 3"x1" x 3/16". (See Appendix A)

Bucking Material: SPF (2" x 10")

Sealant Locations: Backer rod with Sealant Around perimeter of frame to rough opening, interior side.

Pressure Plate: Fastened approximately every 4" all around.

Weatherstripping Configuration:

<u>Type:</u>	<u>Quantity Installed & Size:</u>	<u>Location:</u>
EPDM	1 Row	Frame to Glass
EPDM	1 Row	Pressure Plate to Glass

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

2.0 PROCEDURE

The Building Performance Centre at Exova Mississauga evaluated the above window in accordance with the procedures of the NAFS - AAMA/WDMA/CSA 101/I.S.2/A440-08 Window test standard. The following specific test program was conducted:

• Air Leakage Resistance	Section 5.3.2 & CSA A440 S1-09 CAN Supplement, Section 5.3
• Water Penetration Resistance	Section 5.3.3 & CSA A440 S1-09 CAN Supplement, Section 5.4
• Uniform Load Tests	Section 5.3.4
• Forced Entry Resistance Test	Section 5.3.5

3.0 RESULTS

Table 1- Summarized Testing Results in Accordance with NAFS - AAMA/WDMA/CSA 101/I.S.2/A440-08 Exova Specimen No.: 14-06-M0446-1			
Test	Requirements	Test Results	Rating
Air Leakage Resistance* (Clause: 5.3.2) Test Date: November 26, 2014	Maximum Allowable Air Leakage: 0.2 L/s m ² @ 300 Pa (For Fixed Products) Canadian Air Infiltration / Exfiltration Levels (AW-Class): A2 Level: < 0.5 L/s m ² A3 Level: < 0.5 L/s m ² Fixed Level: < 0.2 L/s m ²	Infiltration Q = 0.01 L/s m ² Exfiltration Q = 0.01 L/s m ² Average Q = 0.01 L/s m ² @ 300 Pa Unit Area = 3.831 m ²	Meets Gateway: FW-AW Canadian Level: Fixed
Water Penetration Resistance (Clause 5.3.3) Test Date: November 26, 2014	Gateway Performance Requirements for FW-AW40: Pressure: 390 Pa Optional Performance Requirements for FW-AW70-100 (US / CAN): Pressure: 730 Pa Requirement: No water leakage or penetration at specified pressure differential	No water penetration occurred at pressure differential of 390 Pa. Meets FW-AW40 Class for Water Penetration Resistance No water penetration occurred at pressure differential of 730 Pa. Meets FW-AW100 Class for Water Penetration Resistance	Meets Gateway: FW-AW40 Highest Class Achieved: FW-AW100 (US / CAN)
Water Penetration Resistance (Clause 5.3.3) Test Date: November 26, 2014	AW Specimen shall be tested for water penetration resistance in accordance with ASTM E311. Test load shall be applied for 15 minutes Client Specified Test Pressure: 730 Pa Requirement: No water leakage or penetration at specified pressure differential	Meets ASTM E 311 @ 730Pa No water penetration occurred at pressure differential of 730 Pa	Meets: ASTM E 331

Table 1 (Continued) - Summarized Testing Results in Accordance with NAFS - AAMA/WDMA/CSA 101/I.S.2/A440-08 Exova Specimen No.: 14-06-M0446-1			
Test	Requirements	Test Results	Rating
Uniform Load Deflection Test at Design Pressure (Clause 5.3.4.2) Test Date: November 26, 2014	Gateway Performance Design Pressure for FW-AW40: +/- 1,920 Pa Requirements: - No permanent damage - Report $L/175$ Net Deflection Results - Report and Residual Deflection Optional Performance Requirements for FW-AW70 (US / CAN): +/- 3,360 Pa	Frame Length (L) = 2,514 mm Allowable ($L/175$) = 14.3mm Net Deflection at Design Pressure: + 3,360 Pa = 1.2 mm - 3,360 Pa = -0.0 mm Residual Deflection: + 3,360 Pa = 0.8 mm - 3,360 Pa = -0.1 mm - No Permanent Damage Observed - Window Meets $L/175$ deflection requirement	Meets Gateway: FW-AW40 Highest Class Achieved: FW-AW70 (US / CAN)
Uniform Load Structural Test at 150% Design Pressure (Clause 5.3.4.2) Test Date: November 26, 2014	Gateway Performance Structural Pressure for FW-AW40: +/- 2,880 Pa Requirements: - No permanent damage - Report Residual Sash Deflection - Frame Length = 2,514 mm - Allowable residual = 0.3% of Frame Length Optional Performance Requirements for FW-AW70 (US / CAN): +/- 5,040 Pa	Allowable residual = 7.5 mm Residual Deflection: + 5,040 Pa = 0.2 mm (0.040%) - 5,040 Pa = 0.3 mm (0.004%) - No Permanent Damage Observed - Window Operates	Meets Gateway: FW-AW40 Highest Class Achieved: FW-AW70 (US / CAN)
Forced Entry Resistance Type D Window (Clause 5.3.5) Test Date: November 26, 2014	Initial Preparation : Remove all exterior screws, glazing retainers or other fasteners which can be removed using common tools , within a period of five (5) minutes	No Removable Exterior Fixtures	Grade 20

4.0 MODIFICATIONS

No modification was made to the Windspec Inc., "Windspec 5500 HTP Series Fixed" window unit, Exova Specimen No.: 14-06-M0446-1, 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., "Windspec 5500 HTP Series Fixed" Window Unit, Exova Specimen No.: 14-06-M0446-1 met the following requirements as outlined in the NAFS - AAMA/WDMA/CSA 101/I.S.2/A440-08 Window Standard:

Performance Rating

- Air Leakage Resistance FW-AW: 300Pa (6.2PSF) (Fixed Level Canadian)
- Water Penetration Resistance FW-AW70-100: 730Pa (15.0 PSF)
- Water Penetration Resistance (ASTM E311) 15 minutes @ 730Pa.
- Uniform Load Tests FW-AW70
- Forced Entry Resistance Test Grade 20

Product Designation

- Class AW-PG70-FW 1,524 x 2,514mm (60 x 99") – Type FW

Product Manufacturer:	Windspec Inc.
Product Type:	Fixed Window
Product series/model:	Windspec 5500 HTP Series Fixed
Primary product designator:	Class AW-PG70-FW - 1,524 x 2,514mm (60 x 99") – Type FW
Optional Secondary designator:	Canadian Air Infiltration/Exfiltration = Fixed Level Canadian
	Water Penetration Resistance = 730Pa (15.0 PSF)
	Negative Design Pressure (DP) = - 3,360 Pa (-70.0 PSF)
	Positive Design Pressure (DP) = + 3,360 Pa (+70.0 PSF)
	Test Completion Date: November 26, 2014

6.0 REPORT REVISION SUMMARY

Revision No:
Original

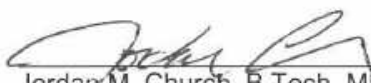
Date:
2014-December 14

Description of Revisions:
Original Document

Reported by:

Reviewed by:


Sunny Ling, C.E.T, MET Ext. 11412
Project Technologist, Building Systems
Products Testing Division

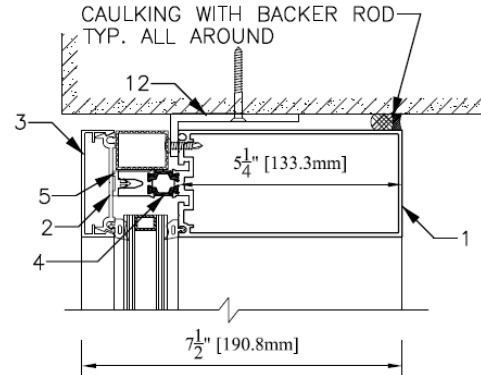
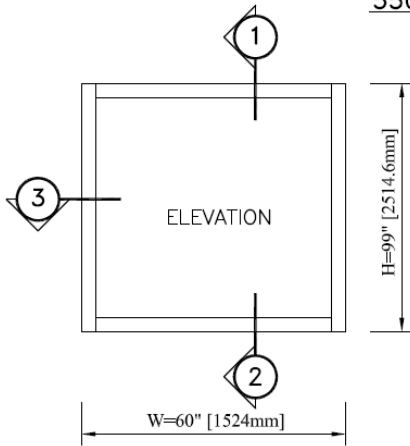

Jordan M. Church, B.Tech, MET, Ext. 11546
Technical Manager, Building Systems
Product Testing Division

APPENDIX A

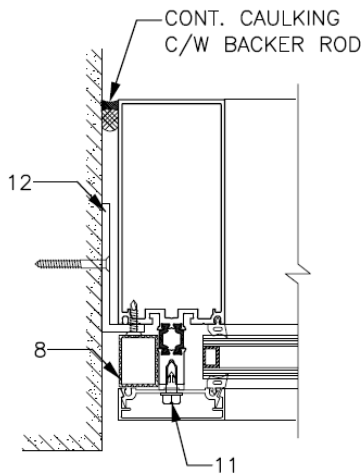
Manufacturer's Detail Drawings

(5 Pages)

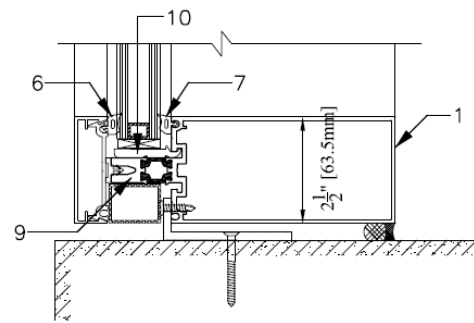
5500 HTP SERIES CURTAINWALL



1 DETAIL



3 DETAIL



2 DETAIL

SEALED UNIT GLAZING 1" THK:

EXTERIOR GLASS: 6mm CLEAR TEMPERED
13mm AIR SPACE WITH ALUM. SPACERS
INTERIOR GLASS: 6mm CLEAR TEMPERED
1 @ 56"x95"

#	DIE #	DESCRIPTION
1	C-55203	NEW ALUM. HTP MULLION
2	C-55206	NEW ALUM. PRESSURE PLATE
3	C-55004	ALUM. SNAP-ON CAP
4	N/A	BAUTEC STRIP NYLON 18mm WIDE
5	R-55202	FLEXIBLE PVC THERMAL BREAK
6	R-55005	EXTERIOR EPDM GASCKET
7	R-55104	INTERIOR EPDM GASCKET
8	R-55001	PVC POCKET FILLER
9	N/A	NEW ALUM. NECK
10	H-55104	SUPPORT TAB
11	N/A	FASTENER #14x3/4" LG
12	N/A	ALUM. ANGLE L-3"x1"x3/16"

PHYSICAL TEST
#1



WINDSPEC INC.

MANUFACTURERS OF HIGH PERFORMANCE 'WINDSPEC' WINDOWS
ALUMINUM ENTRANCE SYSTEMS AND ARCHITECTURAL PANELS
1310 CREDITSTONE RD, CONCORD, ONTARIO L4K 5T7
Telephone (905) 738-8311 Fax (905) 738-6188

SCALE: NTS

DESCRIPTION:
5500 HTP SERIES FIXED WINDOW

DRAWING NO.:
001

NOTE: BREAK ALL CORNERS WITH 0.015" (.38 MM) RADIUS UNLESS OTHERWISE NOTED. STANDARD TOLERANCES TO APPLY UNLESS OTHERWISE SPECIFIED.

CUSTOMER		DIE No. DIENO	REV. No. REV
DESCRIPTION	CUSTOMER PART No. CUSTOMER #	QUOTE No. QUOTE #	PROPOSAL No. DWGNAME

PLS. INDICATE
EXPOSED SURFACES
I.D. MARK

ACTUAL SIZE

DETAIL: 1.5=1

WALL THICKNESS		WALLS		EXCEPT AS SHOWN	
DATE	REV	DESCRIPTION	BY		
EST.AREA	AREAIMP	IN. ²	EST.AREA	AREAMET	MM. ²
EST.WT.	MASSIMP	LBS./FT.	EST.WT.	MASSMET	KG/M.
EST.PER.	PERIMP	IN.	EST.PER.	PERMET	MM.
OUT PER.	OPIMP	IN.	OUT PER.	OPMET	MM.
C.C.D.	CCDIMP	IN.	C.C.D.	CCDMET	MM.
FINISH	FINISH		ALLOY	ALLOY	
OKD BY	FACT	SCALE	DWN BY	CADMAN	DATE

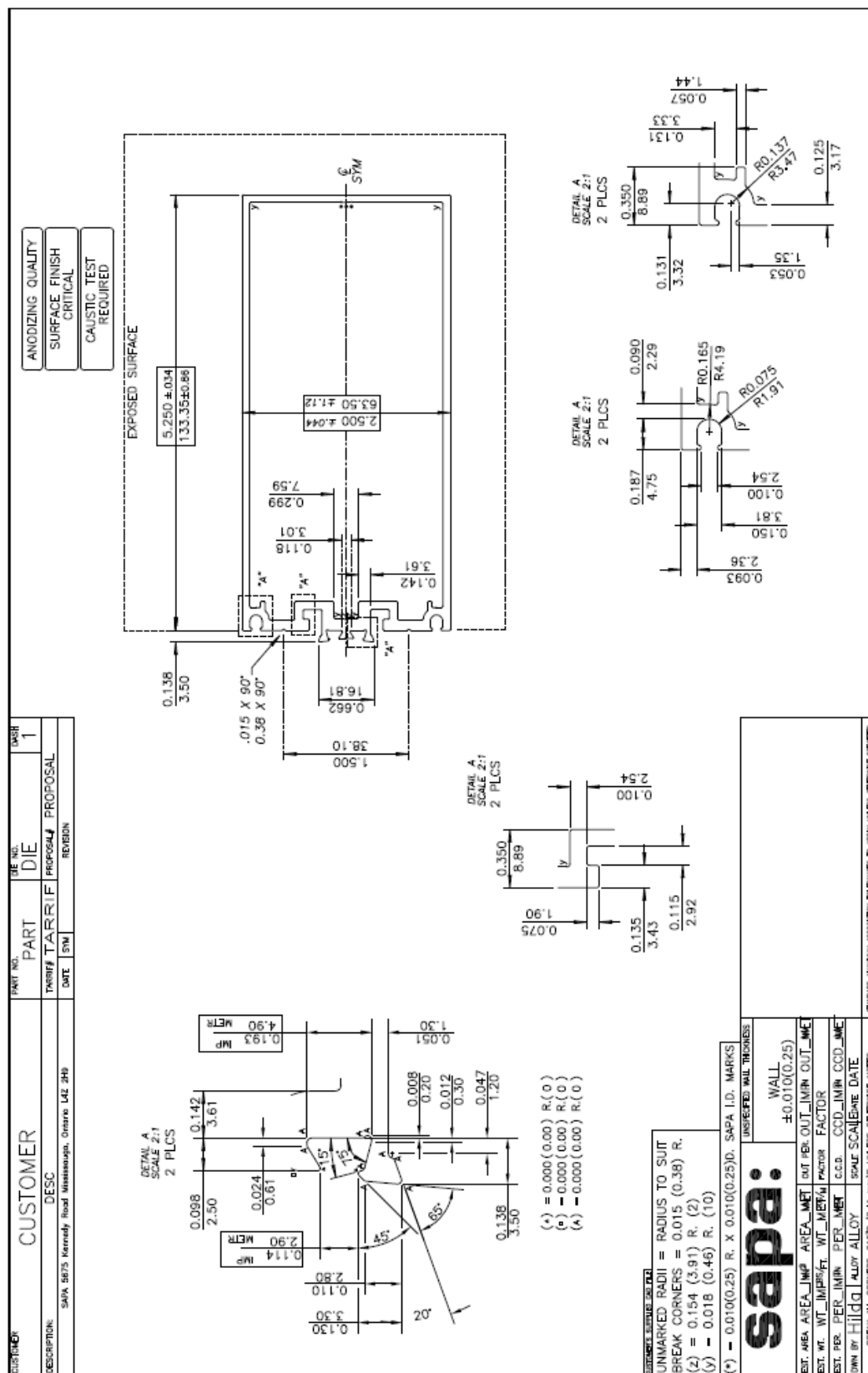
CAN ART

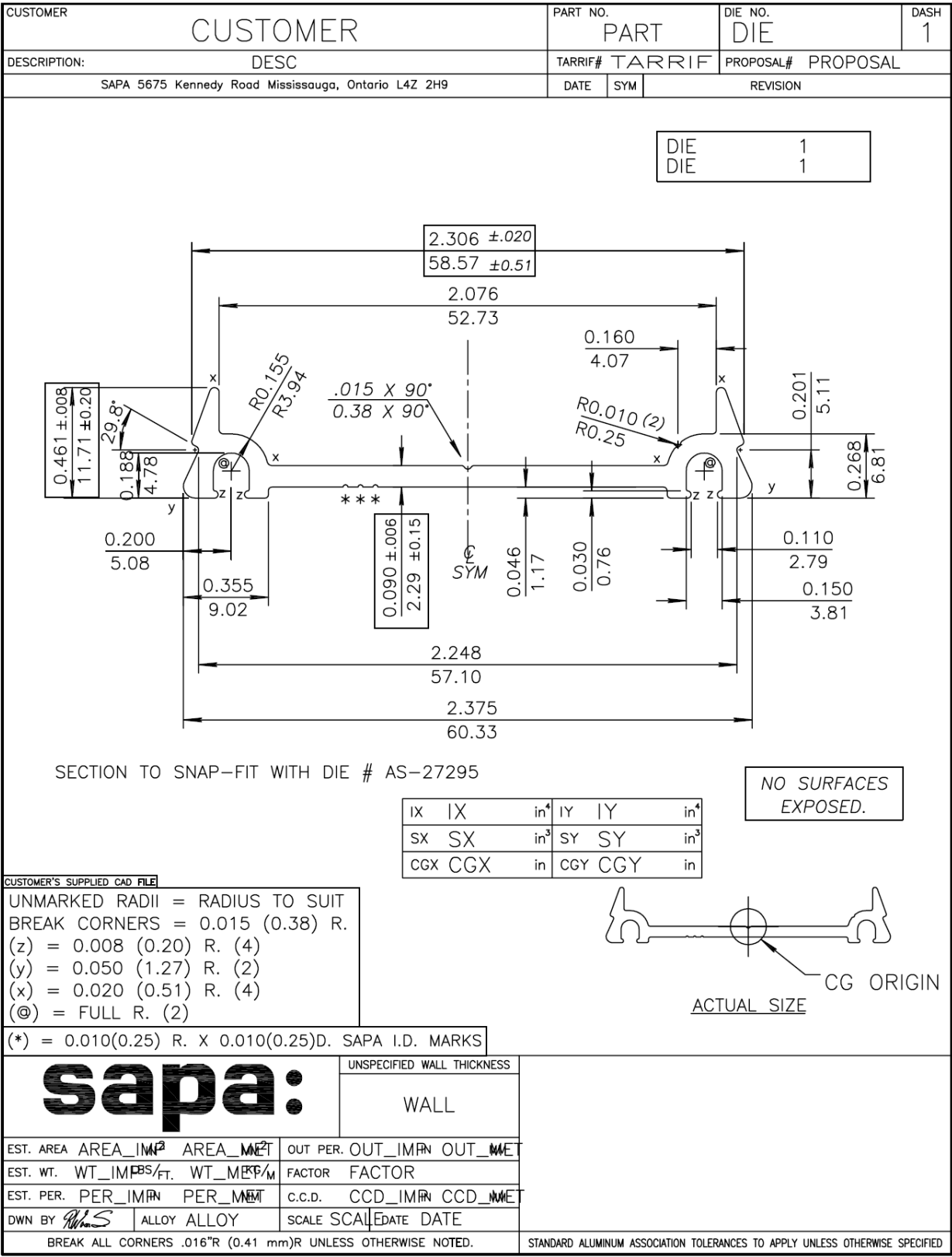
ALUMINUM EXTRUSION INC.

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TEL. NO. (905) 791-1464
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SIGNED: _____ DATE: _____





CUSTOMER		PART NO.		DIE NO.		DASH	
CUSTOMER		PART		DIE		1	
DESCRIPTION:		TARRIF#		PROPOSAL#		PROPOSAL	
INDALEX LIMITED 5675 Kennedy Road Mississauga, Ontario L4Z 2H9		DATE		SYM		REVISION	
REDRAWN							
USE PRIME BILLET ONLY							
ANODIZED QUALITY							
SURFACE FINISH CRITICAL							
NOTE: TO SNAP-FIT WITH DIE AS27294							
$\circ = 0.015(0.38)$ R. (2) $\times = 0.031(0.79)$ R. (6) UNMARKED RADII = RADIUS TO SUIT							
EXPOSED SURFACE ACTUAL SIZE							
				UNSPECIFIED WALL THICKNESS			
				WALL			
EST. AREA		AREA_IN ²		OUT PER.		OUT_IN ²	
EST. WT.		WT_LBS/FT.		FACTOR		FACTOR	
EST. PER.		PER_IN ²		C.C.D.		CCD_IN ²	
DWN BY		G.S.		SCALE		DATE	
BREAK ALL CORNERS .010"R (0.25R) UNLESS OTHERWISE NOTED.							
STANDARD ALUMINUM ASSOCIATION TOLERANCES TO APPLY UNLESS OTHERWISE SPECIFIED							