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great taste in windows™

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Built on the West Coast for the West Coast

- Head Quarters & Factory: Powell River, BC
- Vancouver Island Offices: Courtenay & Duncan servicing all of Vancouver Island
- Manufacturer of Vinyl Energy Star (Nail on and Rebate Frame) and Aluminum Windows for 27 years
- 80 Employees
- QAI Approved Factory
- 2009 Energy Star Award Recipient

Supplier & Installer of multiple home renovation products:

Duradek

Railings

Patio Covers

Awnings

Siding

Entry Doors

Garage Doors

Sliding Patio Doors

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Vinyl 3000 & 4000 Series
CASEMENT / SLIDING WINDOWS

ENERGY STAR HIGH EFFICIENCY HAUTE EFFICACITÉ

Our Vinyl Energy Star Windows:

- Standard and custom sizing manufacturing (Sliders, Casement and awning)
- Rebate and Nail on Flange options
- Screens with every window
- Standard colours: Beige and Window + custom colours
- Full compliment of glass and grid options
- Tested & qualified for low rise, multi level residential & light commercial

Casement / Awning Windows

- Energy Star Qualified
- Heavy Duty Truth Hardware
- Double Seal System
- Externally Glazed
- Double Glazed 7/16"-7/8" Thick IG Units
- Standard White & Beige Colour
- Internal Screens

(Horizontal Slider Shown)

Sliding Windows

- Energy Star Qualified
- Heavy Duty Truth Hardware
- Removable Sash for Easy Cleaning
- Triple Fin Weather Stripping
- Removable Internal Screens
- Dual Brass Rollers on Sash
- Std. White & Beige Colour
- Optional Colours Available

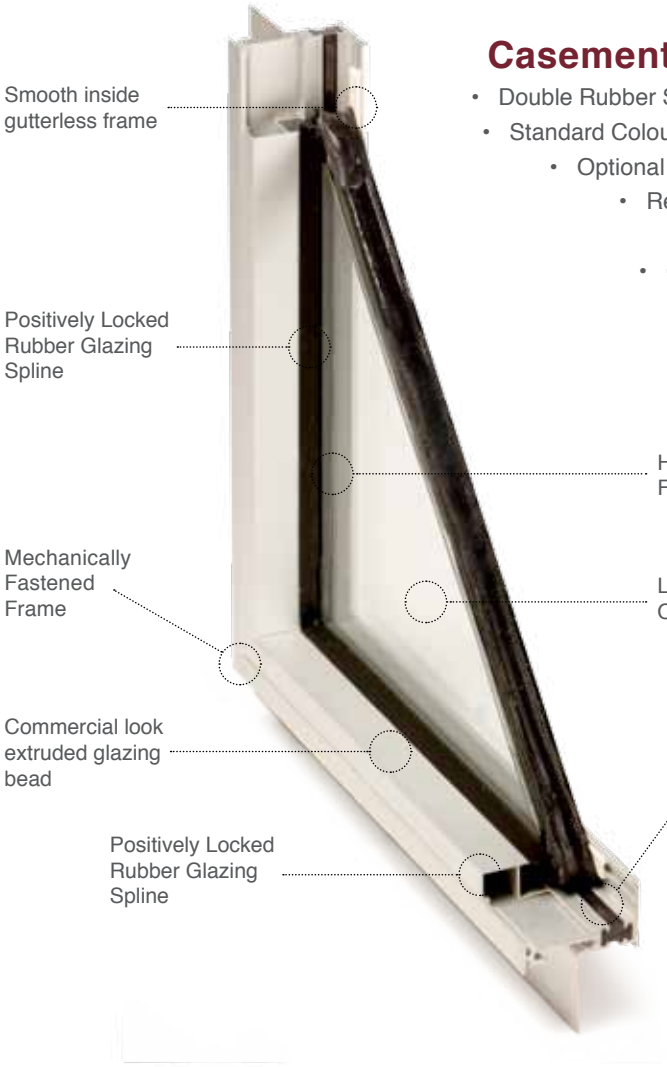
(Beige Horizontal Slider with Grids Shown)

A440.2 (LowE & Argon)	ER Zones	Airtightness	Watertightness	Wind Load Resistance	U-Value	Energy Rating
3000 Horizontal Slider	A	A3	B4/B7^	C3	1.62	21
3000 Vertical Slider	A	A3	B4/B7^	C5	1.62	21
3000 Picture	AB	FX	B7	C5	1.55	24
4000 Casement	AB	A3	B7	C5	1.55	20
4000 Awning	AB	A3	B7	C4	1.54	20
4000 Picture	AB	FX	B7	C5	1.52	25

*Modern's ratings are based on a Light Commercial test. Under Residential testing Modern's Sliders would most likely be a B6/B7 and C4/C5. Additional testing details are outlined in sections to follow. CAD files available upon request.

Aluminum 6000 & 7000 series
CASEMENT / SLIDING WINDOWS

Our Thermally Broken Aluminum Windows:



Casement Windows

- Double Rubber Seal Sash System
- Standard Colours White & Brown
- Optional Colours Available
- Removable Overlap Internal Screens
- Gutterless Design

Sliding Nail-On Windows

- Removable Internal Screens
- Std. White & Beige Colour
- Optional Colours Avail.
- High Efficient Foam Spacer
- Mechanically Fastened Frame & Sash
- Low E Coated Glass - Optional Argon Fill
- Themal Break Prevents Transfer of Temperature from Inside or Outside of Window
- Externally Glazed Snap-in System

Vinyl 3000 & 4000 Series Casement / Sliding Windows Thermal Simulation Test Report

TESTS:

Sampling:
Each subject window was submitted by Modern Aluminum & Vinyl Products Ltd. to Quality Auditing Institute Ltd. as a typical production sample then tested to the requirements of AAMA/WDMA/CSA 101/I.S.2 A440-08 as being representative of the models covered in this report. The products were examined against the submitted documentation supplied by Modern Aluminum & Vinyl Products Ltd.

Each subject window was submitted by Modern Aluminum & Vinyl Products Ltd. to Quality Auditing Institute Ltd. as a typical production sample then simulated to the requirements of CSA A440.2-04 "Energy Performance of Windows and other Fenestration Systems" as being representative of the models covered in this report. The products were examined against the submitted documentation supplied by Modern Aluminum & Vinyl Products Ltd.

Results:
Tests are carried out on a specimen of specific dimensions. Product performance may be affected by variations in the windows dimensions, assembly details and installation method. The reader is advised to ensure product conformity with all details of this evaluation report.

Test procedures are designed to test the performance of the test specimen only and are not used to test the performance of the installation, particularly the perimeter sealant joint and the anchoring of the assembly. Products shall be installed in accordance with the manufacturer's recommended instructions.

The following table summarizes the test report numbers and size of test specimens used for thermal simulation to CSA A440.2-04.

Window Series	Quality Auditing Institute CSA A440.2-04 Report No.	Thermal Simulation Test Size (Width x Height)
4000 Series Casement Cam Lock Window	T629-13 – Ed. 1 – Apr 23, 2010	600 mm x 1500 mm
4000 Series Casement Roto Operator Window	T629-13 – Ed. 1 – Apr 23, 2010	600 mm x 1500 mm
4000 Series Awning Cam Lock Window	T629-13 – Ed. 1 – Apr 23, 2010	1500 mm x 600 mm
4000 Series Awning Roto Operator Window	T629-13 – Ed. 1 – Apr 23, 2010	1500 mm x 600 mm
4000 Series Fixed Picture Window	T629-13 – Ed. 1 – Apr 23, 2010	1200 mm x 1500 mm
3000 Series Horizontal Sliding Window	T629-14 – Ed. 1 – Apr 23, 2010	1500 mm x 1200 mm
3000 Series Vertical Sliding Window	T629-14 – Ed. 1 – Apr 23, 2010	1200 mm x 1500 mm
3000 Series Fixed Picture Window	T629-14 – Ed. 1 – Apr 23, 2010	1200 mm x 1500 mm

Testing was conducted in accordance with CSA A440.2-04 with the results shown below.

Note: For combination windows, each individual window style must be evaluated by QAI for the entire product to be labeled. Tempered glass may be used instead of clear float glass without an affect on the energy performance of the product. Clear obscure glass may be used instead of clear float glass without an affect on the energy performance of the product. Products listed in the tables below with a total glass thickness of +-2mm of the rated product and glazing cavity widths of +-20% of the rated product may also be labeled with the same energy performance ratings.

Note: The manufacturers IGMAC ID # - 010707G

Simulation Summary – 4000 Series Casement (Push-Out)

Glass Option Number	Model Code	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	4000C(PUSH)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.45	1.73	0.24	16
1G1	4000C(PUSH)-LowE(4, e=.035)-Air(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/16" Grille	0.43	1.77	0.23	15
1G2	4000C(PUSH)-LowE(4, e=.035)-Air(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/8" Grille	0.41	1.79	0.22	14
2	4000C(PUSH)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.45	1.55	0.24	20
2G1	4000C(PUSH)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.43	1.58	0.23	19
2G2	4000C(PUSH)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.41	1.61	0.22	16

3000 Series Vertical Slider:

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
3000VS(NR)-LowE(4, e=.035)-Air(11)-Cl(4)	1.85	16
3000VS(18ga)-LowE(4, e=.035)-Air(11)-Cl(4)	1.87	16
3000VS(12ga)-LowE(4, e=.035)-Air(11)-Cl(4)	1.87	16
3000VS(NR)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.62	21
3000VS(NR)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.67	19
3000VS(NR)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.70	18
3000VS(18ga)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.63	21
3000VS(18ga)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.68	19
3000VS(18ga)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.72	17
3000VS(12ga)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.63	21
3000VS(12ga)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.68	19
3000VS(12ga)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.72	17

3000 Series Picture:

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
3000P-LowE(4, e=.035)-Air(11)-Cl(4)	1.79	19
3000P-LowE(4, e=.035)-Air(11-5/16"GRIDS)-Cl(4)	1.85	17
3000P-LowE(4, e=.035)-Air(11-5/8"GRIDS)-Cl(4)	1.88	15
3000P-LowE(4, e=.035)-Arg(11)-Cl(4)	1.55	24
3000P-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.61	22
3000P-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.65	20

Note: See Evaluation Report W442-1 Edition 2 for definition of each glazing option number. Windows are not intended for installation in storefronts, nonoperable portions of curtain wall, fixed glazing cast into precast concrete panels, greenhouses, skylights or sloped glazing. Test procedures are designed to test the performance of the test specimen only and are not necessarily used to test the performance of the installation, particularly the perimeter sealant joint and anchoring of the assembly.

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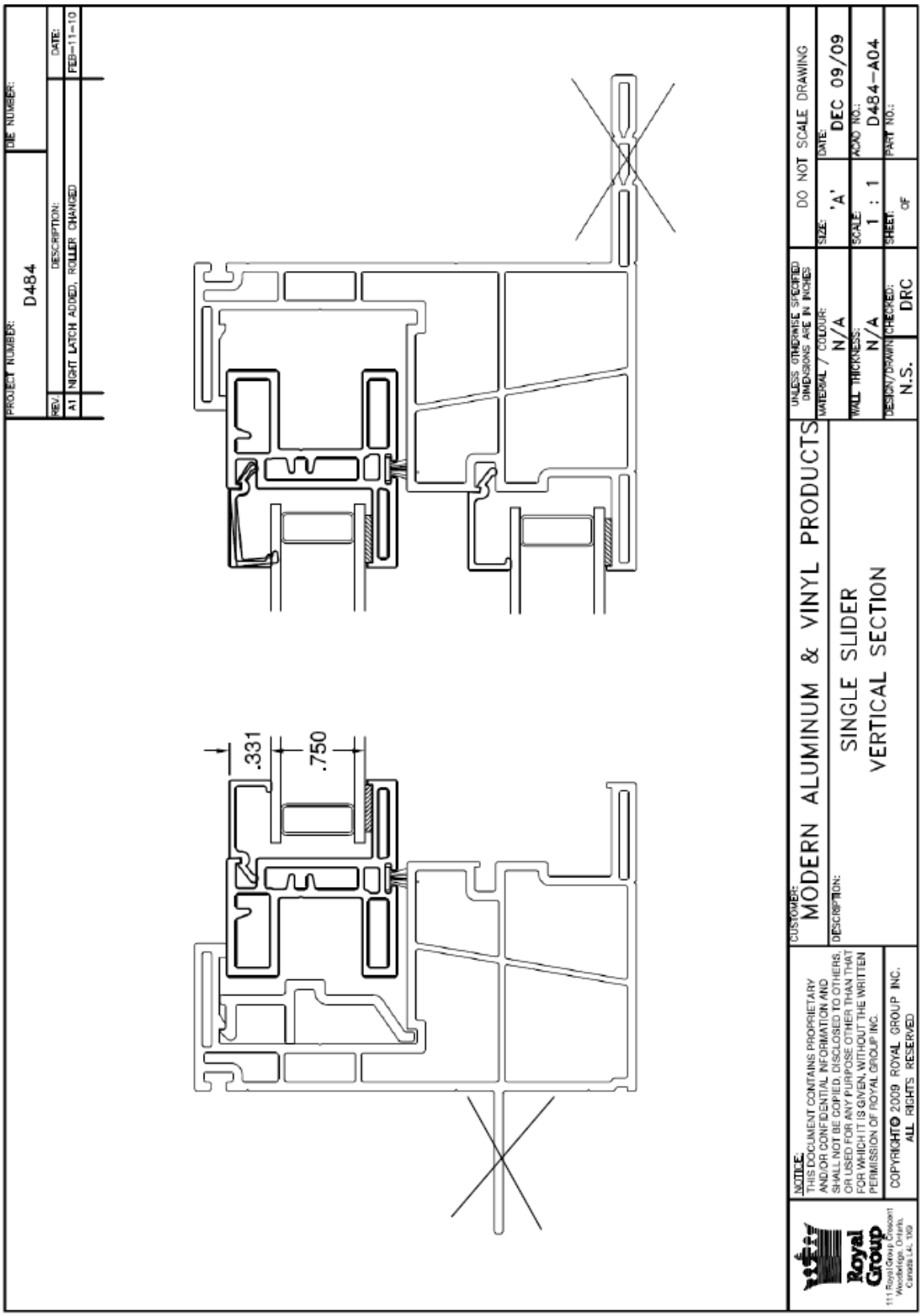
3000 Series Single Slider Vertical Section Details



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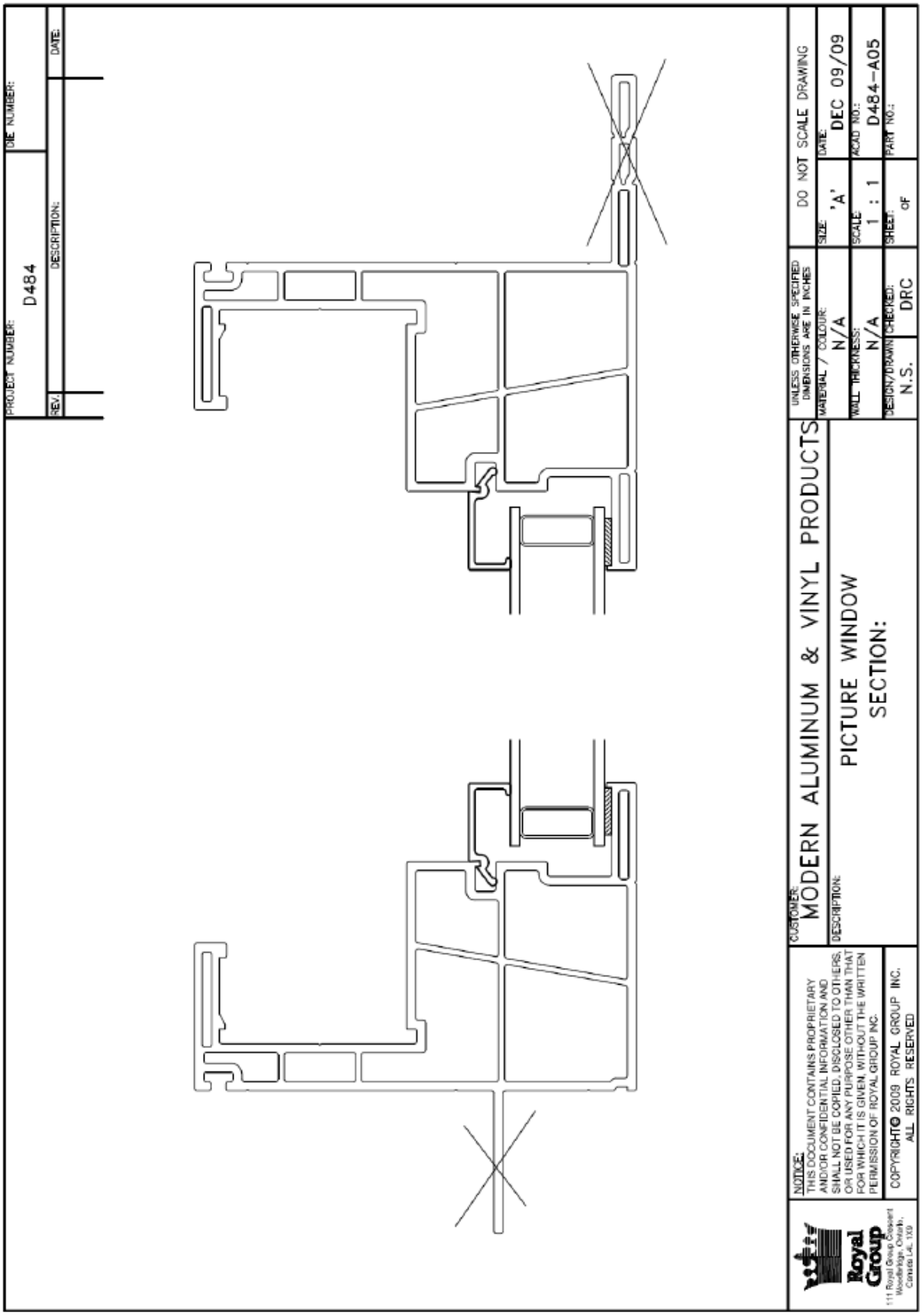
3000 Picture Window Section Details



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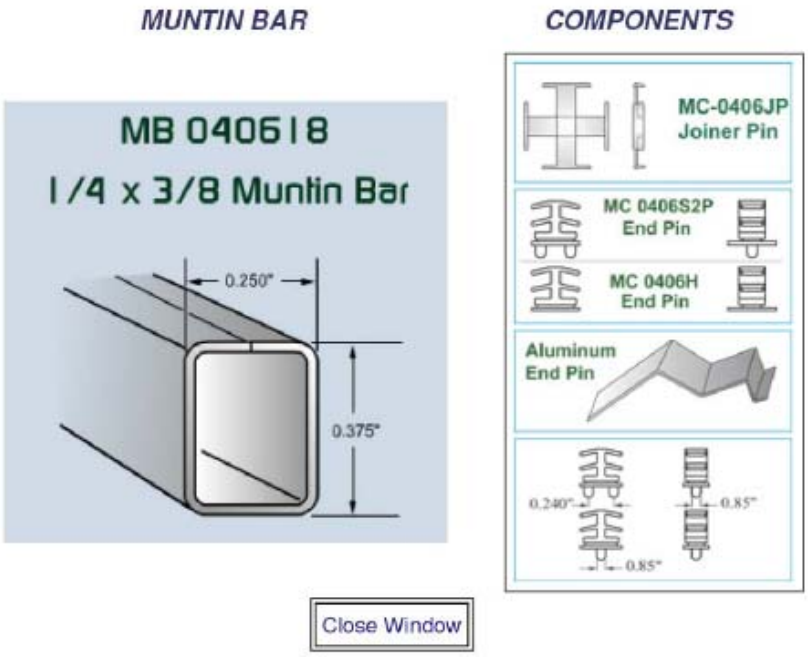
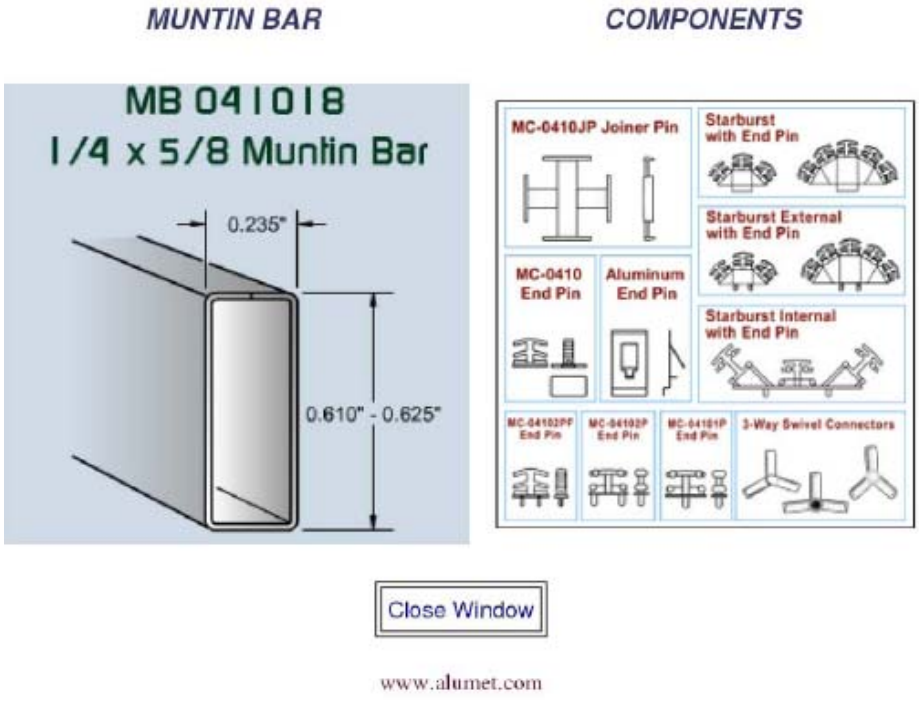
Optional Muntin Bar Details





WINDOW LISTING PROGRAM

Class: Fenestration Products – Vinyl – Energy Performance

Customer: Modern Aluminum & Vinyl Products Ltd.
Location: Powell River, British Columbia

Listing No. W442
Project No. W442-1 **Edition 2**
Effective Date: April 17, 2009
Last Revised: May 21, 2010

Product: Vinyl windows

Label: Each product is marked with the following content on a permanent label that is readily visible after installation:

- Manufacturer's name, Trademark or other recognized symbol or identification
- QAI File number (W442)
- QAI logo with "c" indicator
- **Evaluation for energy performance only to CSA A440.2-04.**
- **Évaluation pour le performance d'énergie seulement a CSA A440.2-04.**

Standard: CSA A440.2 "Energy Performance of Windows and Other Fenestration Systems"

Models: Vinyl windows with ratings as follows:

4000 Series Casement (Push-Out):

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
4000C(PUSH)-LowE(4, e=.035)-Air(11)-Cl(4)	1.73	16
4000C(PUSH)-LowE(4, e=.035)-Air(11-5/16"GRIDS)-Cl(4)	1.77	15
4000C(PUSH)-LowE(4, e=.035)-Air(11-5/8"GRIDS)-Cl(4)	1.79	14
4000C(PUSH)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.55	20
4000C(PUSH)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.58	19
4000C(PUSH)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.61	16

4000 Series Casement (Roto-Operator):

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
4000C(ROTO)-LowE(4, e=.035)-Air(11)-Cl(4)	1.73	16
4000C(ROTO)-LowE(4, e=.035)-Air(11-5/16"GRIDS)-Cl(4)	1.77	15
4000C(ROTO)-LowE(4, e=.035)-Air(11-5/8"GRIDS)-Cl(4)	1.79	14
4000C(ROTO)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.55	20
4000C(ROTO)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.58	19
4000C(ROTO)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.61	18

4000 Series Awning (Push-Out):

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
4000A(PUSH)-LowE(4, e=.035)-Air(11)-Cl(4)	1.73	16
4000A(PUSH)-LowE(4, e=.035)-Air(11-5/16"GRIDS)-Cl(4)	1.75	15
4000A(PUSH)-LowE(4, e=.035)-Air(11-5/8"GRIDS)-Cl(4)	1.77	14
4000A(PUSH)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.54	20
4000A(PUSH)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.57	19
4000A(PUSH)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.60	18

4000 Series Awning (Roto-Operator):

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
4000A(ROTO)-LowE(4, e=.035)-Air(11)-Cl(4)	1.73	16
4000A(ROTO)-LowE(4, e=.035)-Air(11-5/16"GRIDS)-Cl(4)	1.75	15
4000A(ROTO)-LowE(4, e=.035)-Air(11-5/8"GRIDS)-Cl(4)	1.77	14
4000A(ROTO)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.54	20
4000A(ROTO)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.57	19
4000A(ROTO)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.60	18

4000 Series Picture:

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
4000P-LowE(4, e=.035)-Air(11)-Cl(4)	1.77	19
4000P-LowE(4, e=.035)-Air(11-5/16"GRIDS)-Cl(4)	1.83	17
4000P-LowE(4, e=.035)-Air(11-5/8"GRIDS)-Cl(4)	1.86	16
4000P-LowE(4, e=.035)-Arg(11)-Cl(4)	1.52	25
4000P-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.58	23
4000P-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.62	21

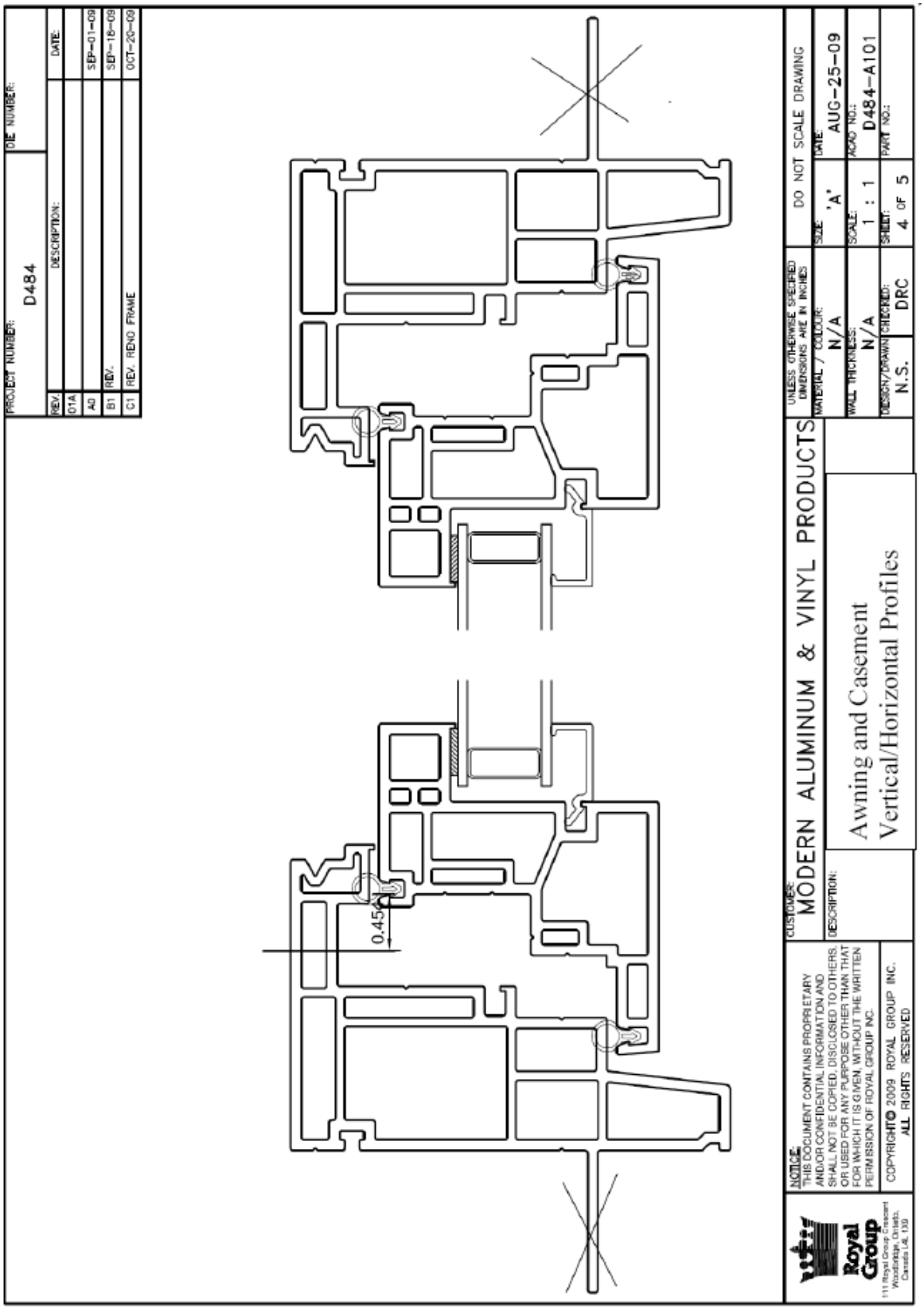
4000 Series Picture (With Backer Rod and Caulk):

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
4000P-LowE(4, e=.035)-Air(11)-Cl(4) ROD	1.74	20
4000P-LowE(4, e=.035)-Air(11-5/16"GRIDS)-Cl(4) ROD	1.80	18
4000P-LowE(4, e=.035)-Air(11-5/8"GRIDS)-Cl(4) ROD	1.83	16
4000P-LowE(4, e=.035)-Arg(11)-Cl(4) ROD	1.50	25
4000P-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4) ROD	1.55	23
4000P-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4) ROD	1.59	22

3000 Series Horizontal Slider:

Product Model Code:	U-Value (W/m^2*K)	Energy Rating
3000HS(NR)-LowE(4, e=.035)-Air(11)-Cl(4)	1.85	16
3000HS(18ga)-LowE(4, e=.035)-Air(11)-Cl(4)	1.87	16
3000HS(12ga)-LowE(4, e=.035)-Air(11)-Cl(4)	1.87	16
3000HS(NR)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.62	21
3000HS(NR)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.67	19
3000HS(NR)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.70	18
3000HS(18ga)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.64	21
3000HS(18ga)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.68	19
3000HS(18ga)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.72	18
3000HS(12ga)-LowE(4, e=.035)-Arg(11)-Cl(4)	1.64	21
3000HS(12ga)-LowE(4, e=.035)-Arg(11-5/16"GRIDS)-Cl(4)	1.68	19
3000HS(12ga)-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4)	1.72	17

4000 Casement / Awning Section Details



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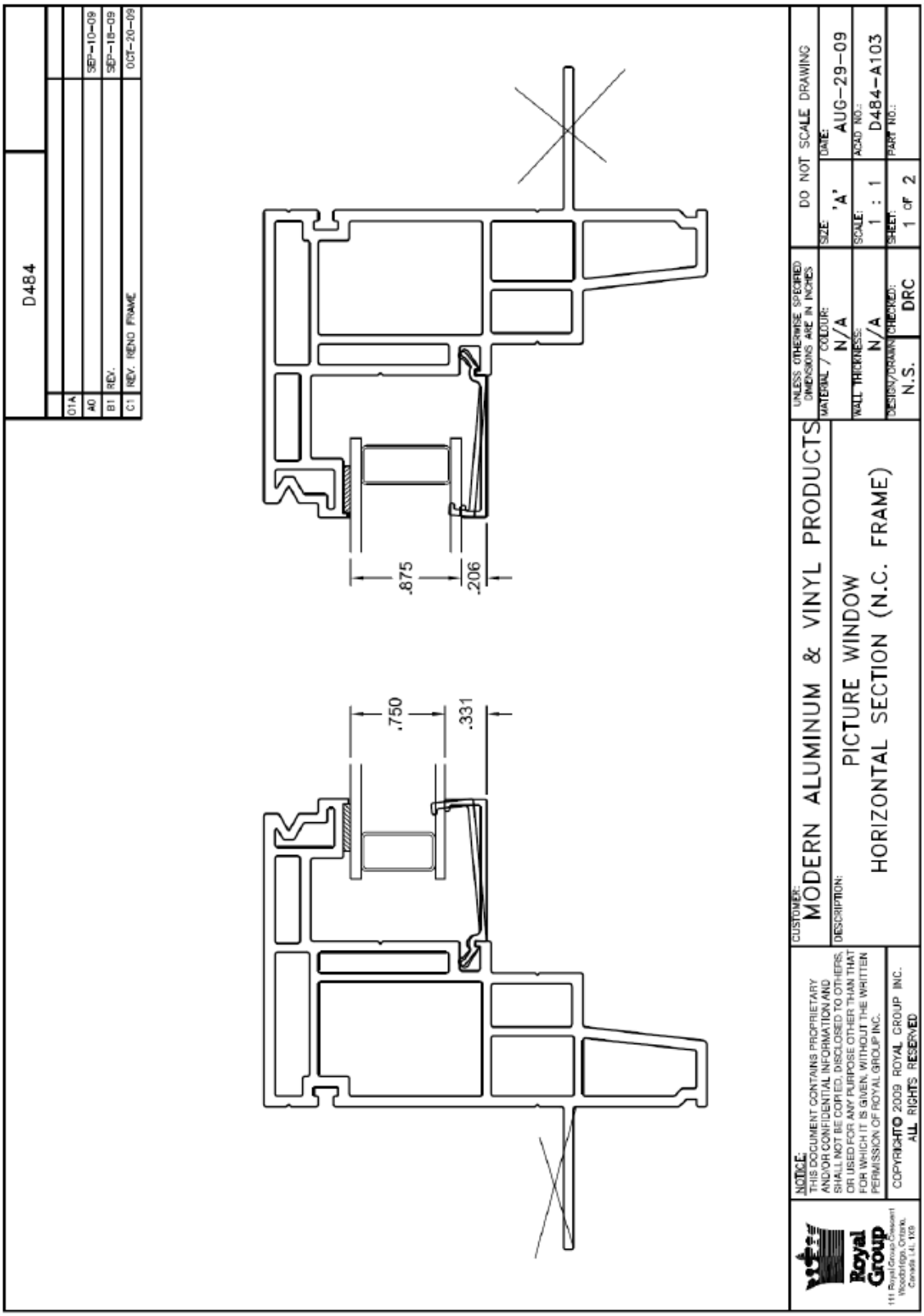
4000 Series Picture Section Details



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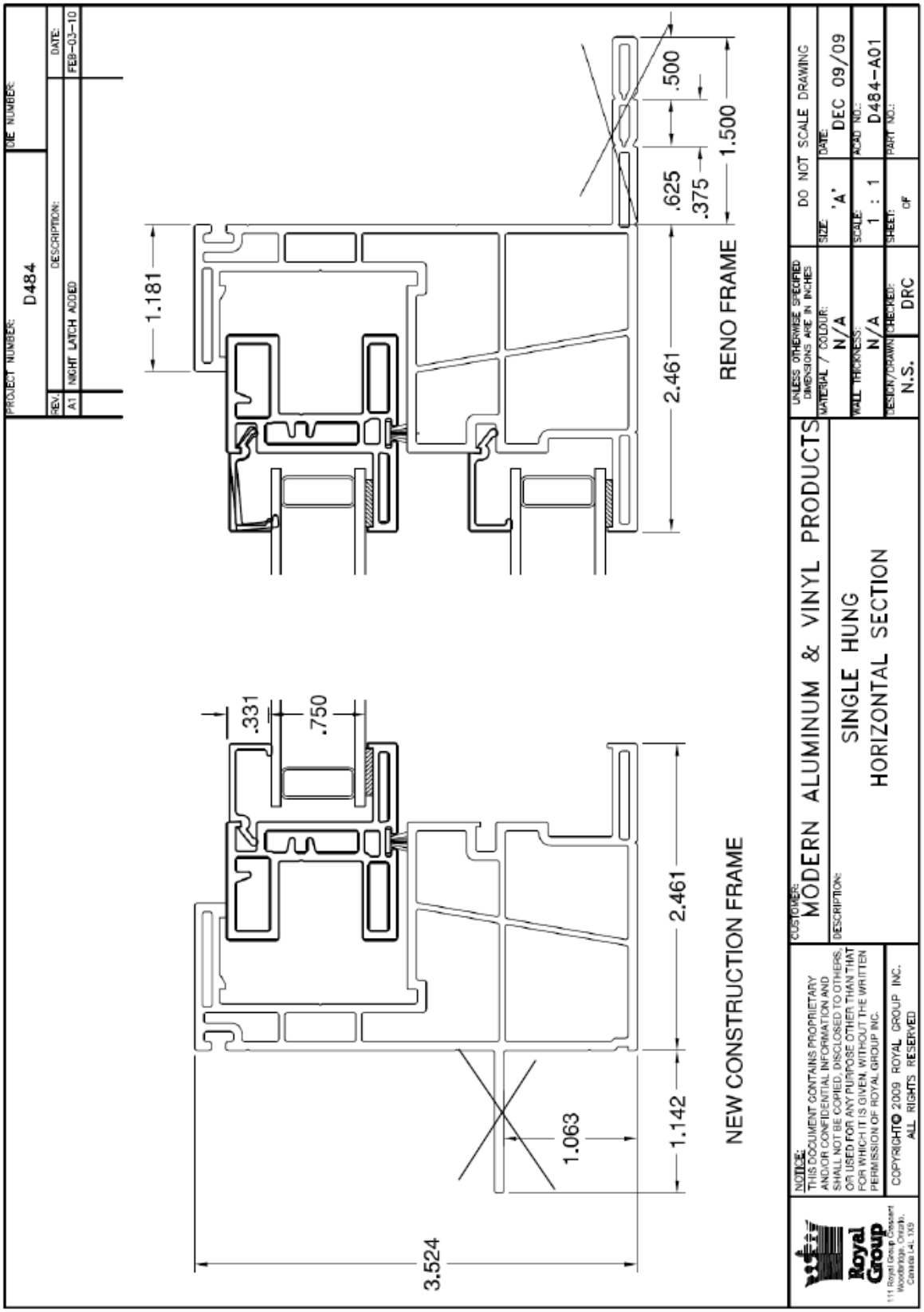
3000 Series Single Hung Horizontal Section Details



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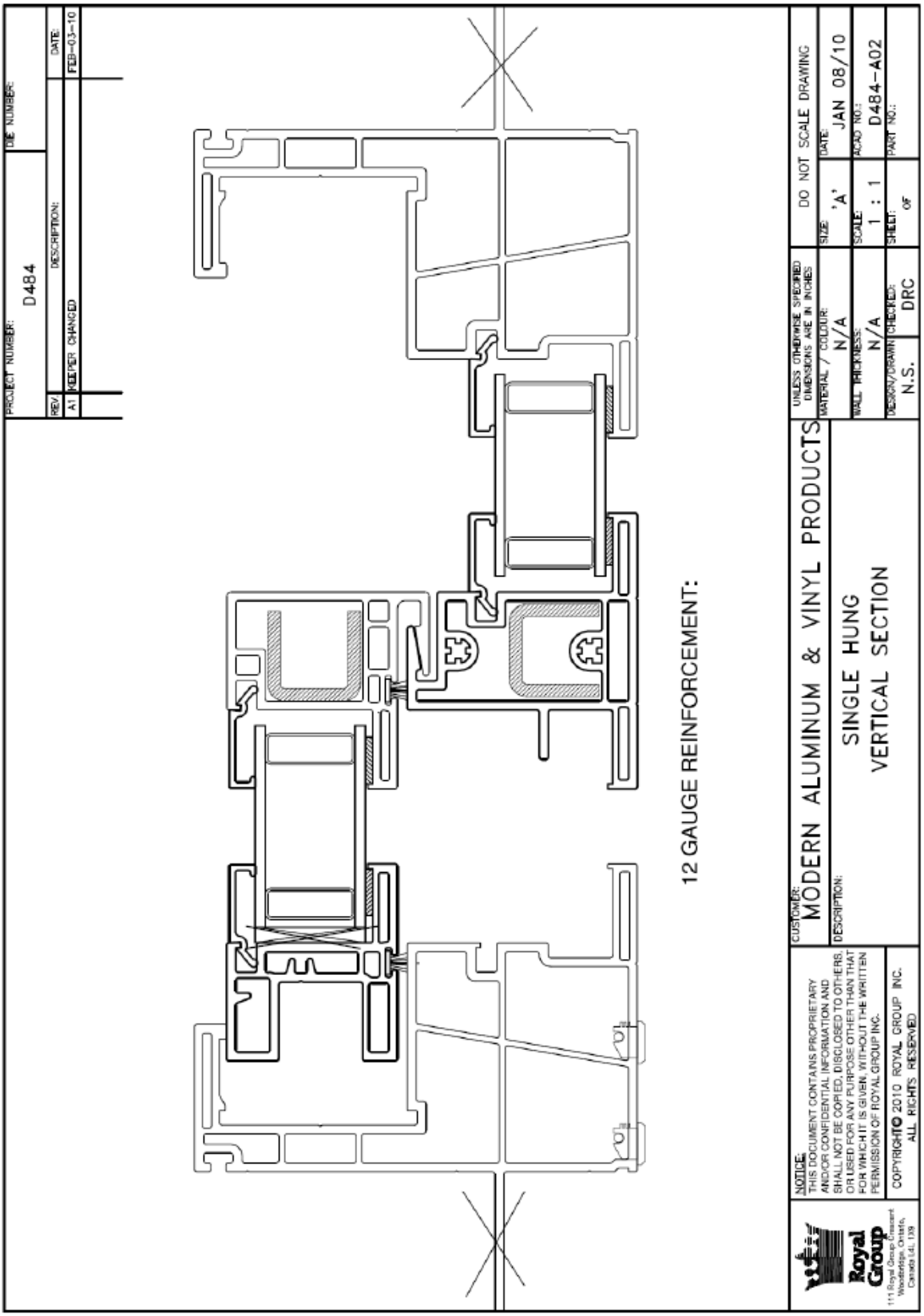
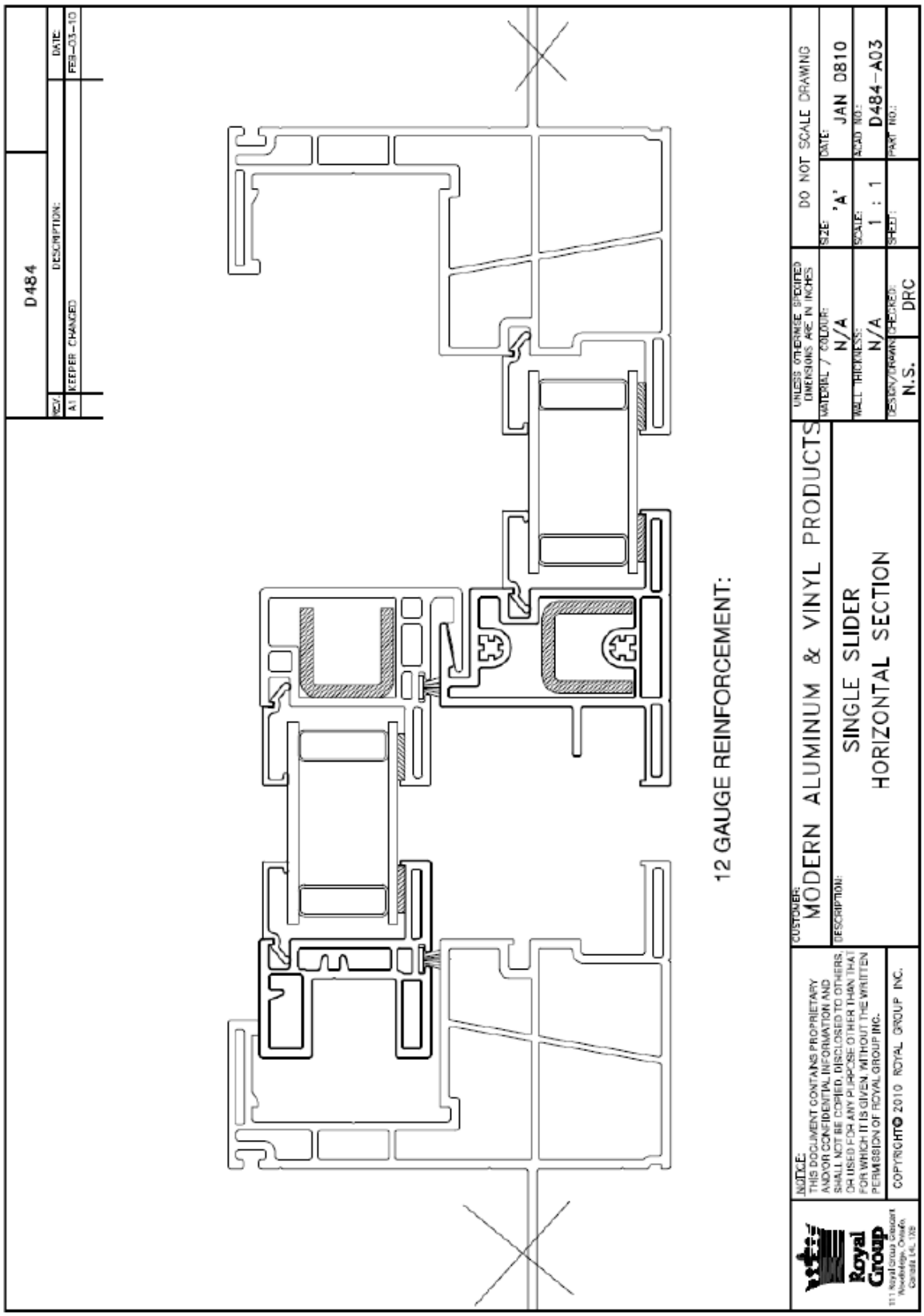
3000 Series Single Hung Vertical Section Details



3000 Series Single Slider Horizontal Section Details



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Simulation Summary – 4000 Series Casement (Roto-Operator)

Glass Option Number	Model Code	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	4000C(ROTO)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.45	1.73	0.24	16
1G1	4000C(ROTO)-LowE(4, e=.035)-Air(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/16" Grille	0.43	1.77	0.23	15
1G2	4000C(ROTO)-LowE(4, e=.035)-Air(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/8" Grille	0.41	1.79	0.22	14
2	4000C(ROTO)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.45	1.55	0.24	20
2G1	4000C(ROTO)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.43	1.58	0.23	19
2G2	4000C(ROTO)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.41	1.61	0.22	18

Simulation Summary – 4000 Series Awning (Push-Out)

Glass Option Number	Model Code	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	4000A(PUSH)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.45	1.73	0.24	16
1G1	4000A(PUSH)-LowE(4, e=.035)-Air(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/16" Grille	0.43	1.75	0.23	15
1G2	4000A(PUSH)-LowE(4, e=.035)-Air(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/8" Grille	0.41	1.77	0.22	14
2	4000A(PUSH)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.45	1.54	0.24	20
2G1	4000A(PUSH)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.43	1.57	0.23	19
2G2	4000A(PUSH)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.41	1.60	0.22	18

Simulation Summary – 4000 Series Awning (Roto-Operator)

Glass Option Number	Model Code	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	4000A(ROTO)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.45	1.73	0.24	16
1G1	4000A(ROTO)-LowE(4, e=.035)-Air(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/16" Grille	0.43	1.75	0.23	15
1G2	4000A(ROTO)-LowE(4, e=.035)-Air(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/8" Grille	0.41	1.77	0.22	14
2	4000A(ROTO)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.45	1.54	0.24	20
2G1	4000A(ROTO)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.43	1.57	0.23	19
2G2	4000A(ROTO)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.41	1.60	0.22	18

Simulation Summary – 4000 Series Picture

Glass Option Number	Model Code	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	4000P-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.59	1.77	0.31	19
1G1	4000P-LowE(4, e=.035)-Air(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/16" Grille	0.56	1.83	0.30	17
1G2	4000P-LowE(4, e=.035)-Air(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/8" Grille	0.54	1.86	0.29	16
2	4000P-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.59	1.52	0.31	25
2G1	4000P-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.56	1.58	0.30	23
2G2	4000P-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.54	1.62	0.29	21

Simulation Summary – 4000 Series Picture (With Backer Rod and Caulk)

Glass Option Number	Model Code	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	4000P-LowE(4, e=.035)-Air(11)-Cl(4) ROD	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.59	1.74	0.31	20
1G1	4000P-LowE(4, e=.035)-Air(11-5/16"G)-Cl(4) ROD	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/16" Grille	0.56	1.80	0.30	18
1G2	4000P-LowE(4, e=.035)-Air(11-5/8"G)-Cl(4) ROD	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/8" Grille	0.54	1.83	0.29	16
2	4000P-LowE(4, e=.035)-Arg(11)-Cl(4) ROD	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.59	1.50	0.31	25
2G1	4000P-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4) ROD	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.56	1.55	0.30	23
2G2	4000P-LowE(4, e=.035)-Arg(11-5/8"GRIDS)-Cl(4) ROD	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.54	1.59	0.29	22

Simulation Summary – 3000 Series Horizontal Slider

Glass Option Number	Model Code *	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	3000HS(NR)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.57	1.85	0.30	16
1	3000HS(18ga)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.57	1.87	0.30	16
1	3000HS(12ga)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.57	1.87	0.30	16
2	3000HS(NR)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.57	1.62	0.30	21
2G1	3000HS(NR)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.54	1.67	0.29	19
2G2	3000HS(NR)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.51	1.70	0.27	18

*NR = No Reinforcement, 18ga = 18 gauge steel reinforcement, 12ga = 12 gauge steel reinforcement

Simulation Summary – 3000 Series Horizontal Slider

Glass Option Number	Model Code *	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
2	3000HS(18ga)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.57	1.64	0.30	21
2G1	3000HS(18ga)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.54	1.68	0.29	19
2G2	3000HS(18ga)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.51	1.72	0.27	18
2	3000HS(12ga)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.57	1.64	0.30	21
2G1	3000HS(12ga)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.54	1.68	0.29	19
2G2	3000HS(12ga)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.51	1.72	0.27	17

*NR = No Reinforcement, 18ga = 18 gauge steel reinforcement, 12ga = 12 gauge steel reinforcement

Simulation Summary – 3000 Series Vertical Slider

Glass Option Number	Model Code *	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	3000VS(NR)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.57	1.85	0.30	16
1	3000VS(18ga)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.57	1.87	0.30	16
1	3000VS(12ga)-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.57	1.87	0.30	16
2	3000VS(NR)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.57	1.62	0.30	21
2G1	3000VS(NR)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.54	1.67	0.29	19
2G2	3000VS(NR)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.51	1.70	0.27	18

*NR = No Reinforcement, 18ga = 18 gauge steel reinforcement, 12ga = 12 gauge steel reinforcement

Simulation Summary – 3000 Series Vertical Slider

Glass Option Number	Model Code	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
2	3000VS(18ga)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.57	1.63	0.30	21
2G1	3000VS(18ga)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.54	1.68	0.29	19
2G2	3000VS(18ga)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.51	1.72	0.27	17
2	3000VS(12ga)-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.57	1.63	0.30	21
2G1	3000VS(12ga)-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.54	1.68	0.29	19
2G2	3000VS(12ga)-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.51	1.72	0.27	17

*NR = No Reinforcement, 18ga = 18 gauge steel reinforcement, 12ga = 12 gauge steel reinforcement

Simulation Summary – 3000 Series Picture

Glass Option Number	Model Code	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Grille Bar	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	3000P-LowE(4, e=.035)-Air(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	None	0.59	1.79	0.32	19
1G1	3000P-LowE(4, e=.035)-Air(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/16" Grille	0.56	1.85	0.30	17
1G2	3000P-LowE(4, e=.035)-Air(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Air	5mm Superspacer	5/8" Grille	0.54	1.88	0.29	15
2	3000P-LowE(4, e=.035)-Arg(11)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	None	0.59	1.55	0.31	24
2G1	3000P-LowE(4, e=.035)-Arg(11-5/16"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/16" Grille	0.56	1.61	0.30	22
2G2	3000P-LowE(4, e=.035)-Arg(11-5/8"G)-Cl(4)	2	4mm Solarban 60	4mm Clear	0.035	-	11.1mm Argon	5mm Superspacer	5/8" Grille	0.54	1.65	0.29	20

Notes:
Surfaces are numbered from exterior (1) to Interior.
ER = 57.76(SHGCw) – 21.90(Uw) – 0.54(L75/Aw) + 40
All glazing surface emissivities are assumed to be 0.84 unless otherwise stated.
The gas fill method is single probe with 90% argon fill.

Aluminum 6000 Series Casement / Awning Windows Thermal Simulation Test Report

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TEST REPORT

REPORT NUMBER T660-1

Edition 1: August 6, 2009
Contents: Pages 1-24

Modern Aluminum and Vinyl Products Ltd.

6000 Series Aluminum Casement and Awning Window

Test Method:	**CSA A440.2-04 "Energy Performance of Windows and Other Fenestration Products" – Computer Simulation Method**
Manufacturer /Client:	**Modern Aluminum and Vinyl Products Ltd.**
Manufacturer /Client Address:	Unit 1 – 7045 Field Street, Powell River, BC, V8A 0A1
Model Number:	6000 Series Aluminum Casement Window 6000 Series Aluminum Awning Window
Project Number:	T660-1
Description:	Aluminum Casement and Awning window with the following glass options: • 3mm Clear - 12.7mm Argon (5mm Superspacer) - 3mm Pilkington LOF • 3mm Guardian 7036 – 12.7mm Air (5mm Superspacer) – 3mm Clear • 3mm Guardian 7036 – 12.7mm Argon (5mm Superspacer) – 3mm Clear • 5mm Clear – 9.5mm Argon (5mm Superspacer) - 4mm Pilkington LOF • 4mm Guardian 7036 – 9.5mm Air (5mm Superspacer) – 5mm Clear • 4mm Guardian 7036 – 9.5mm Argon (5mm Superspacer) – 5mm Clear See Appendix A for CAD Drawings and Part Numbers
Test Lab:	Quality Auditing Institute Ltd. 2825 Murray Street, Port Moody BC, V3H 1X3

Test Conditions:

Quality Auditing Institute Ltd. (QAI) was retained by Modern Aluminum and Vinyl Products Ltd. to perform testing in accordance with the computer simulation method requirements of CSA A440.2-04 on a 6000 Series Aluminum Casement and Awning Window.

The overall coefficient of heat transfer and solar-optical properties were determined by computer simulation using THERM5 and WINDOW5 software. The WINDOW software program models the one-dimensional heat flow through the center-of-glass portion of the window. The THERM software program models the two-dimensional heat flow through the frame, edge-of-glass, divider, and divider-edge portions of the window. Input data for both programs is based on manufacturer's specifications.

The energy rating (ER) is obtained by combination of the u-value, solar heat gain coefficient (SHGC), and air leakage rate using the formula specified in CSA A440.2-04.

Air leakage values for the Aluminum Awning window were determined from QAI test report T642-1 dated June 15, 2009 located on file at QAI. The average air leakage was 0.018 $m^3/h/m$ of crack length with a crack length of 4.401 m.

Air leakage values for the Aluminum Casement window were determined from QAI test report T642-2 dated June 15, 2009 located on file at QAI. The average air leakage was 0.018 $m^3/h/m$ of crack length with a crack length of 4.534 m.

Product drawings and specifications were supplied by Modern Aluminum and Vinyl Products Ltd. and shown in Appendix A. The most currently approved spectral data files were used. Defaults for material thermal and optical properties are given in the computer programs. When values other than defaults are used they are documented in this report.

Ratings are determined for a fixed set of environmental conditions and a specific product size. Actual product performance may be affected by variations in the product dimensions, assembly details, installation method, and environmental conditions.

Quality Auditing Institute Ltd. and its employees do not recommend or warrant any product for any specific use.

Summary of Results:

6000 Series Aluminum Casement Window
Size: 600mm x 1500mm

Simulation Summary

Glass Option No.	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	2	3mm Clear	3mm Pilkington LOF	-	0.16	12.7mm Argon	Superspacer	0.57	2.43	0.54	18
2	2	3mm Guardian 7036	3mm Clear	0.04	-	12.7mm Air	Superspacer	0.49	2.43	0.25	1
3	2	3mm Guardian 7036	3mm Clear	0.04	-	12.7mm Argon	Superspacer	0.49	2.24	0.24	5
4	2	5mm Clear	4mm Pilkington LOF	-	0.16	9.5mm Argon	Superspacer	0.57	2.50	0.52	15
5	2	4mm Guardian 7036	5mm Clear	0.04	-	9.5mm Air	Superspacer	0.47	2.57	0.24	0
6	2	4mm Guardian 7036	5mm Clear	0.04	-	9.5mm Argon	Superspacer	0.47	2.32	0.24	3

Notes:
Surfaces are numbered from exterior (1) to Interior.
All glazing surface emissivities are assumed to be 0.84 unless otherwise stated.
The gas fill method is single probe with 90% argon fill.

Quality Auditing Institute
Test Report #: T660-1
Client: Modern Aluminum and Vinyl Products Ltd.
Date: August 6, 2009
6000 Series Aluminum Awning Window
Size: 1500mm x 600mm

Simulation Summary

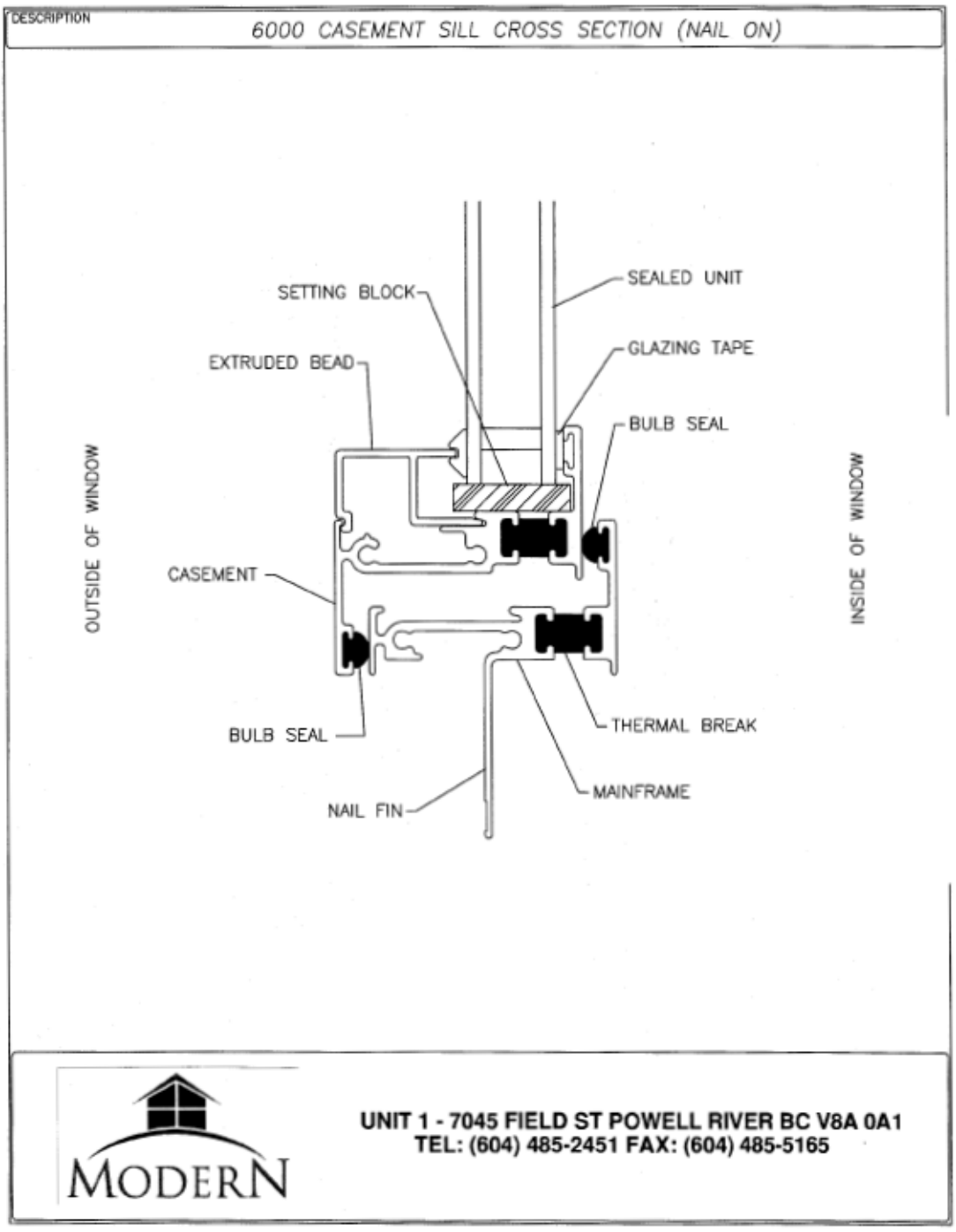
Glass Option No.	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	2	3mm Clear	3mm Pilkington LOF	-	0.16	12.7mm Argon	Superspacer	0.57	2.39	0.54	19
2	2	3mm Guardian 7036	3mm Clear	0.04	-	12.7mm Air	Superspacer	0.49	2.39	0.25	2
3	2	3mm Guardian 7036	3mm Clear	0.04	-	12.7mm Argon	Superspacer	0.49	2.20	0.24	6
4	2	5mm Clear	4mm Pilkington LOF	-	0.16	9.5mm Argon	Superspacer	0.57	2.46	0.52	16
5	2	4mm Guardian 7036	5mm Clear	0.04	-	9.5mm Air	Superspacer	0.47	2.53	0.24	0
6	2	4mm Guardian 7036	5mm Clear	0.04	-	9.5mm Argon	Superspacer	0.47	2.28	0.24	4

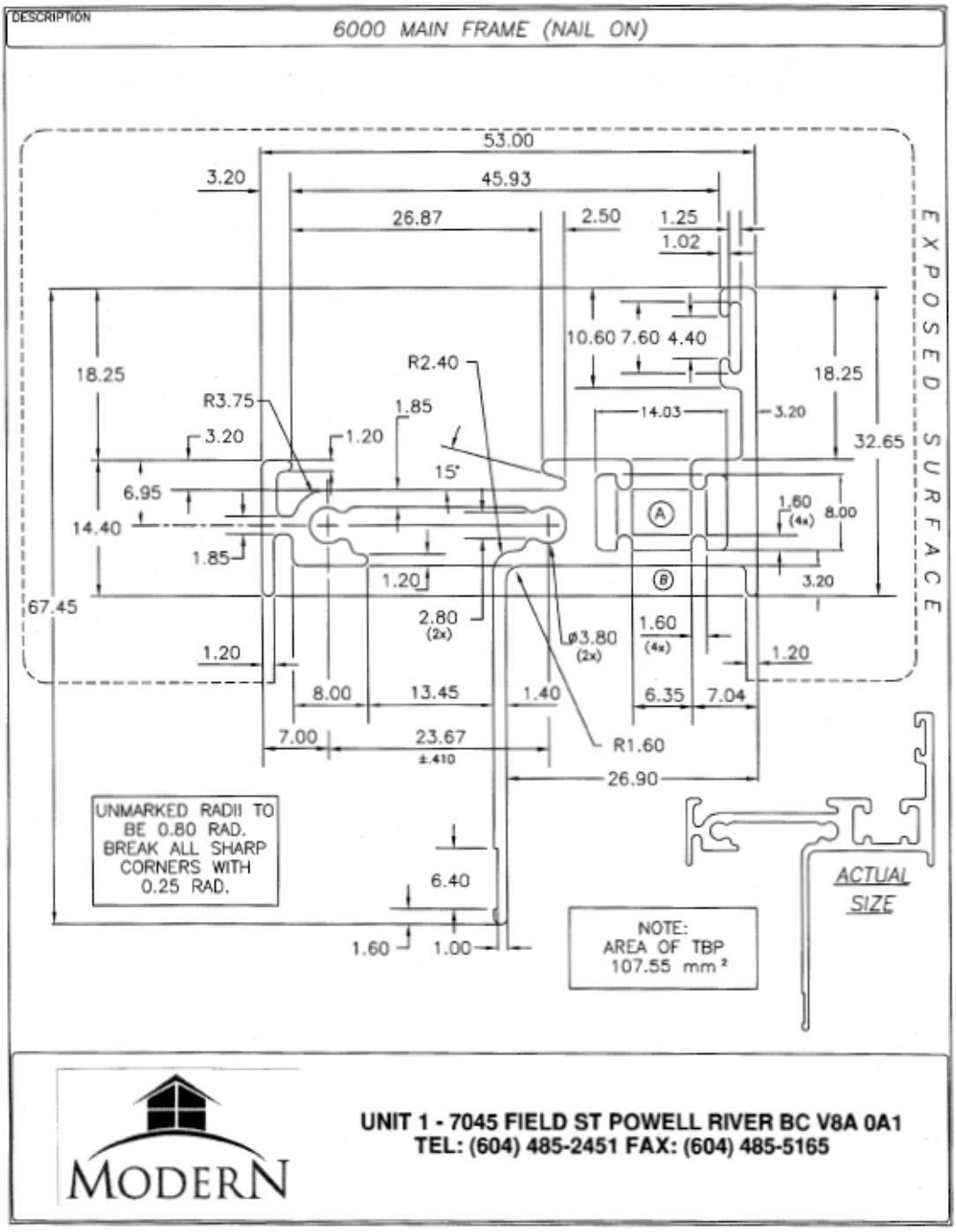
Notes:
Surfaces are numbered from exterior (1) to Interior.
All glazing surface emissivities are assumed to be 0.84 unless otherwise stated.
The gas fill method is single probe with 90% argon fill.

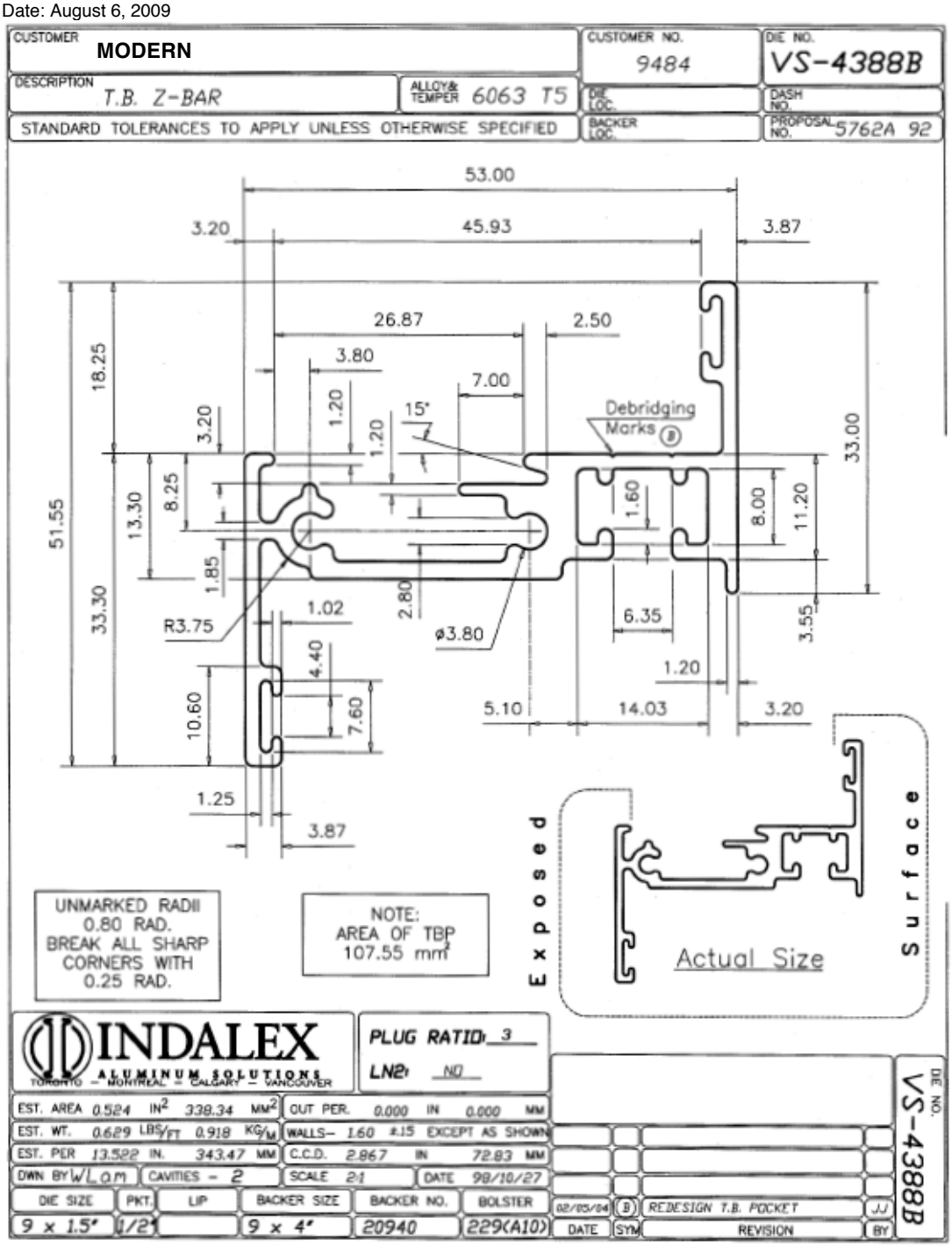
APPENDIX A

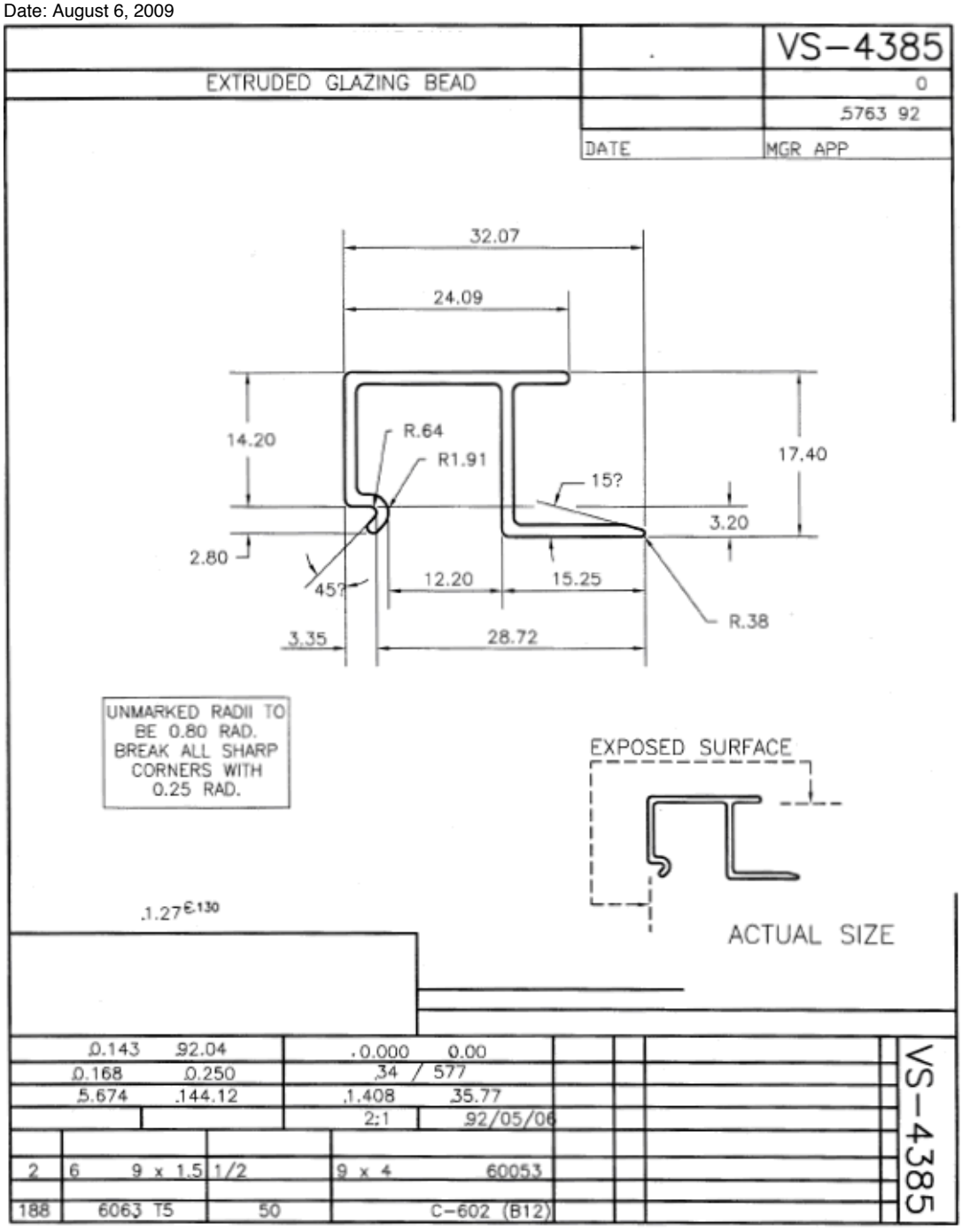
Section	Page	Title
A	8-11	AutoCAD Drawings
B	12	Spacer Bar Drawing
C	13-24	Modeling Data Sheets

Section A: Auto CAD Drawings









Aluminum 6000 Series Picture Windows
Thermal Simulation Test Report

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TEST REPORT

REPORT NUMBER T660-2

Edition 1: August 10, 2009
Contents: Pages 1-16

Modern Aluminum and Vinyl Products Ltd.

6000 Series Aluminum Picture Window

Test Method:	**CSA A440.2-04 "Energy Performance of Windows and Other Fenestration Products" – Computer Simulation Method**
Manufacturer /Client:	**Modern Aluminum and Vinyl Products Ltd.**
Manufacturer /Client Address:	Unit 1 – 7045 Field Street, Powell River, BC, V8A 0A1
Model Number:	6000 Series Aluminum Picture Window
Project Number:	T660-2
Description:	Aluminum Casement and Awning window with the following glass options: • 3mm Clear - 12.7mm Argon (5mm Superspacer) - 3mm Pilkington LOF • 3mm Guardian 7036 – 12.7mm Air (5mm Superspacer) – 3mm Clear • 3mm Guardian 7036 – 12.7mm Argon (5mm Superspacer) – 3mm Clear • 5mm Clear – 9.5mm Argon (5mm Superspacer) - 4mm Pilkington LOF • 4mm Guardian 7036 – 9.5mm Air (5mm Superspacer) – 5mm Clear • 4mm Guardian 7036 – 9.5mm Argon (5mm Superspacer) – 5mm Clear See Appendix A for CAD Drawings and Part Numbers
Test Lab:	Quality Auditing Institute Ltd. 2825 Murray Street, Port Moody BC, V3H 1X3

Test Conditions:

Quality Auditing Institute Ltd. (QAI) was retained by Modern Aluminum and Vinyl Products Ltd. to perform testing in accordance with the computer simulation method requirements of CSA A440.2-04 on a 6000 Series Aluminum Picture Window.

The overall coefficient of heat transfer and solar-optical properties were determined by computer simulation using THERM5 and WINDOW5 software. The WINDOW software program models the one-dimensional heat flow through the center-of-glass portion of the window. The THERM software program models the two-dimensional heat flow through the frame, edge-of-glass, divider, and divider-edge portions of the window. Input data for both programs is based on manufacturer's specifications.

The energy rating (ER) is obtained by combination of the u-value, solar heat gain coefficient (SHGC), and air leakage rate using the formula specified in CSA A440.2-04.

Air leakage values for the Aluminum Picture window were determined from Intertek Testing Service test report (Report Number 3040618, dated July 8, 2003) located on file at QAI. The average air leakage was 0.011 $m^3/h/m$ of crack length with a crack length of 7.760 m.

Product drawings and specifications were supplied by Modern Aluminum and Vinyl Products Ltd. and shown in Appendix A. The most currently approved spectral data files were used. Defaults for material thermal and optical properties are given in the computer programs. When values other than defaults are used they are documented in this report.

Ratings are determined for a fixed set of environmental conditions and a specific product size. Actual product performance may be affected by variations in the product dimensions, assembly details, installation method, and environmental conditions.

Quality Auditing Institute Ltd. and its employees do not recommend or warrant any product for any specific use.

Summary of Results:

6000 Series Aluminum Fixed Window
Size: 1200mm x 1500mm

Simulation Summary

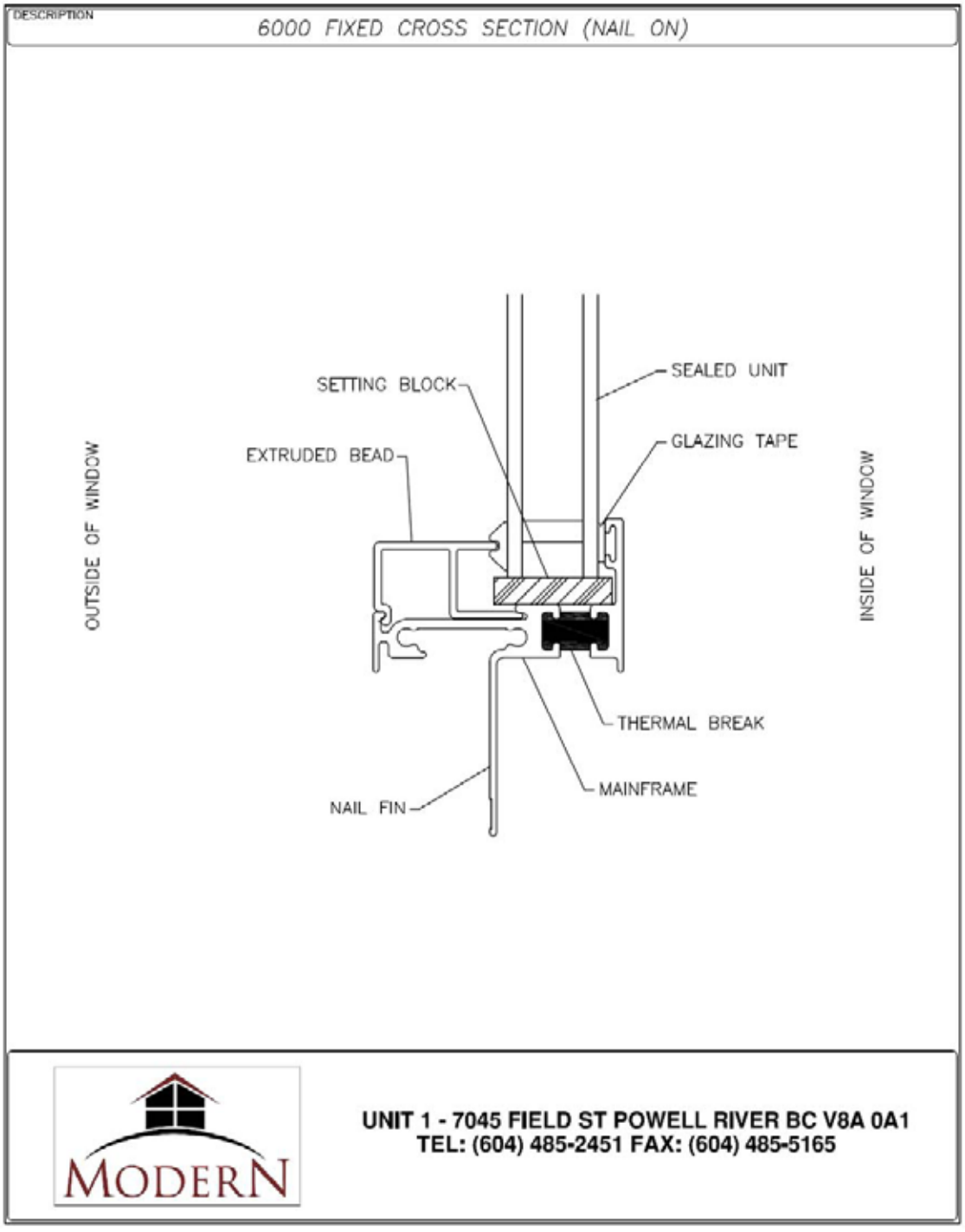
Glass Option No.	Number Of Layers	Exterior Layer	Interior Layer	Emissivity Surface 2	Emissivity Surface 3	Cavity 1	Spacer Bar Type	Visual Transmittance Total Window	Window U-Value (W/m2K)	Window SHGC	Energy Rating (ER)
1	2	3mm Clear	3mm Pilkington LOF	-	0.16	12.7mm Argon	Superspacer	0.68	1.97	0.64	33
2	2	3mm Guardian 7036	3mm Clear	0.04	-	12.7mm Air	Superspacer	0.58	1.98	0.29	13
3	2	3mm Guardian 7036	3mm Clear	0.04	-	12.7mm Argon	Superspacer	0.58	1.75	0.28	18
4	2	5mm Clear	4mm Pilkington LOF	-	0.16	9.5mm Argon	Superspacer	0.67	2.05	0.61	30
5	2	4mm Guardian 7036	5mm Clear	0.04	-	9.5mm Air	Superspacer	0.55	2.13	0.28	9
6	2	4mm Guardian 7036	5mm Clear	0.04	-	9.5mm Argon	Superspacer	0.56	1.80	0.27	16

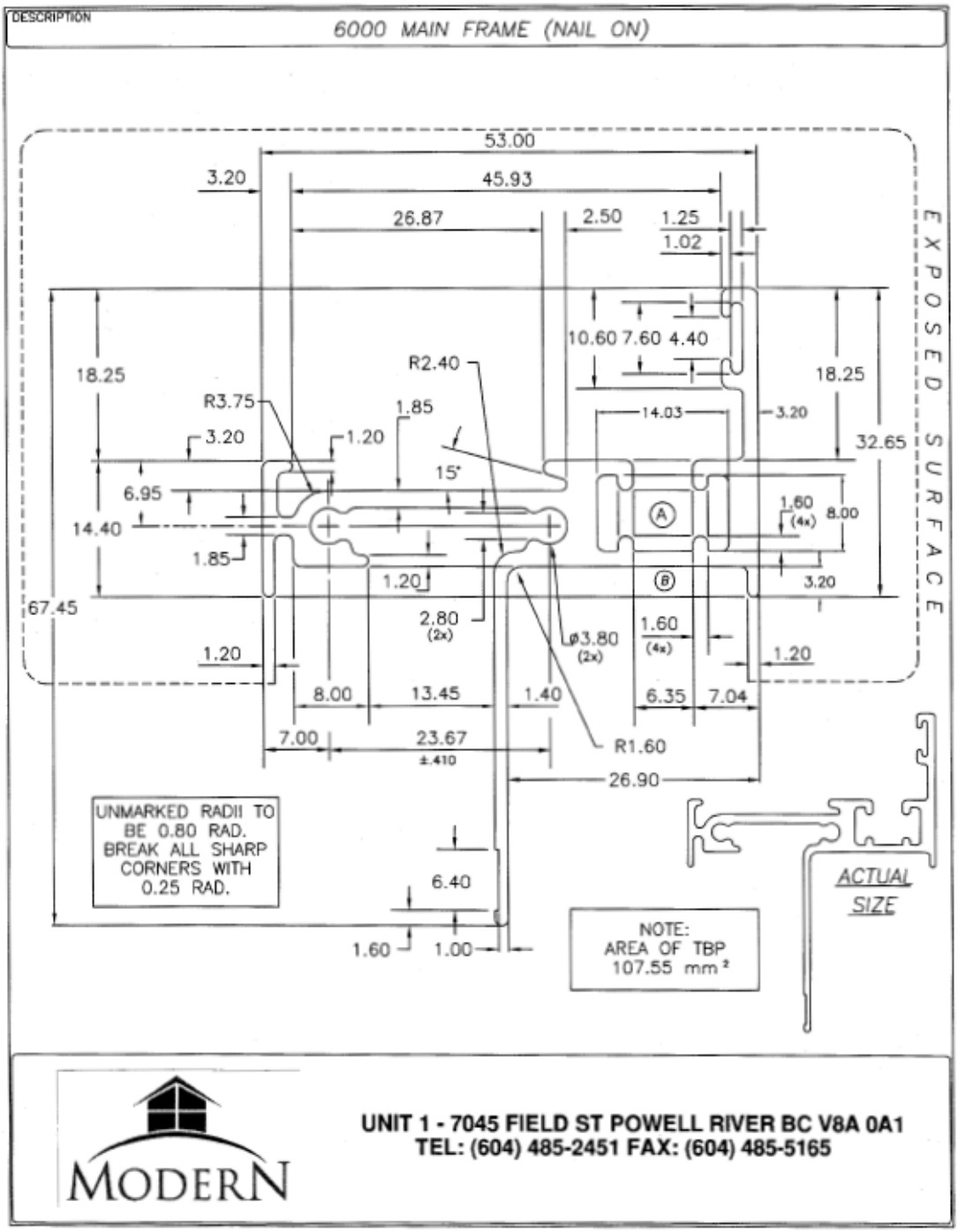
Notes:
Surfaces are numbered from exterior (1) to Interior.
All glazing surface emissivities are assumed to be 0.84 unless otherwise stated.
The gas fill method is single probe with 90% argon fill.

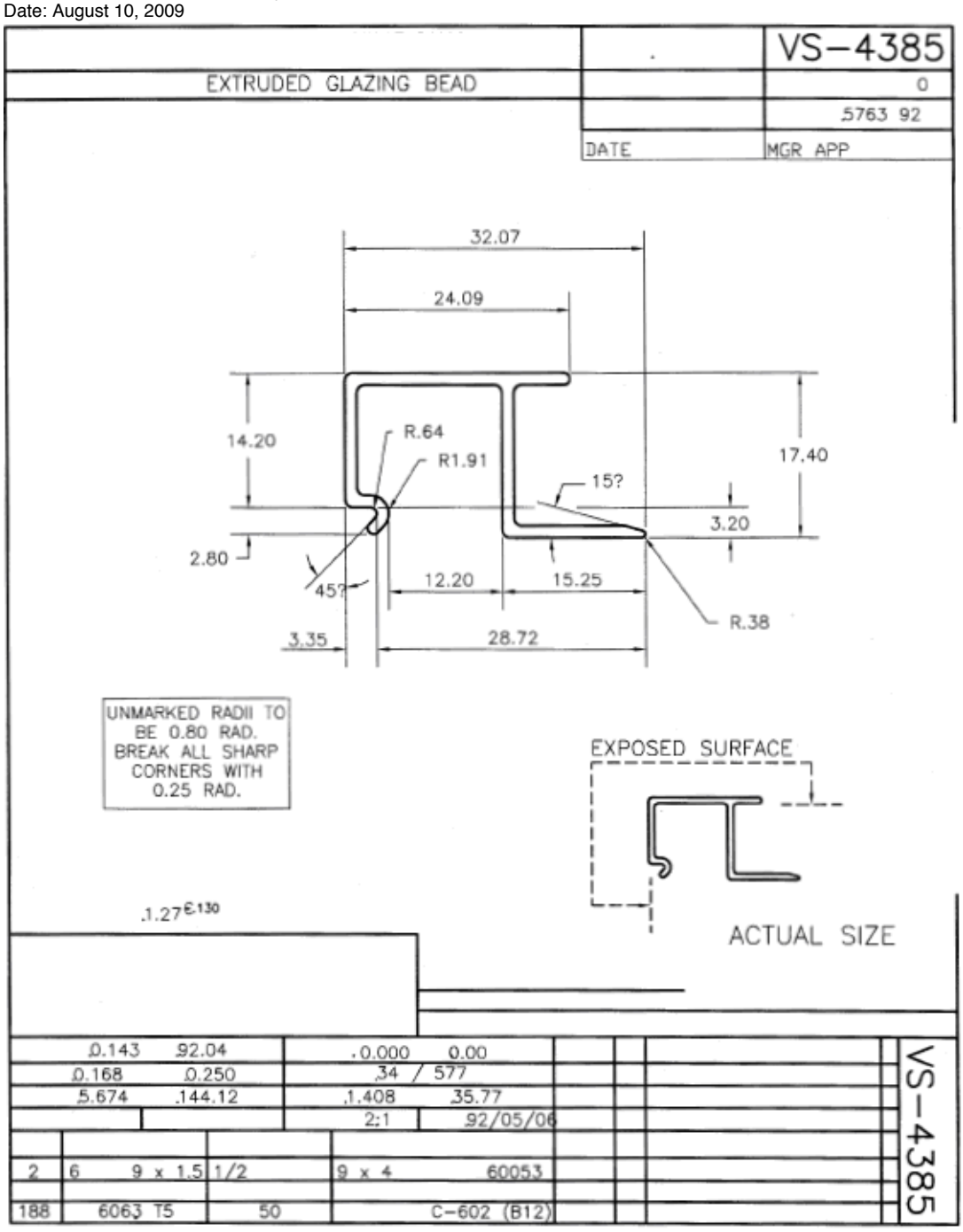
APPENDIX A

Section	Page	Title
A	7-9	AutoCAD Drawings
B	10	Spacer Bar Drawing
C	11-16	Modeling Data Sheets

Section A: Auto CAD Drawings







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