

Simulation Report For Vinyl window in accordance with ECBC 2007 (revised version May 2008)

Prepared for:

Mr. Y.P.Singh
Fenesta
Plot no 52, sector 32,
Institutional Area, Gurgaon
Phone: 0122-4513700/743
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Report: CEPT-1009-CS-Fenesta CW1 - 09/02/2009

Centre for Environmental Planning and Technology

K.L.Campus, Navarangoura, Ahmedabad 380 009

Phone : 79 2630 2074

Contact Person : Prof Rajan Rawal

SIMULATION REPORT

ECBC revised 2008 version modelling requirements (Add from the file)U-Factor (ECBC 2007), SHGC and VT (ECBC 2007 requirement).

Fenestration Product:	Vinyl (UPVC)		
Series Name	Series 3000		
Report#:	GBE-1009-CS-Fenesta CW1		
Submitted To:	Y P Singh		
Manufacturer:	Fenesta		
Address:	Plot no 52, sector 32, Institutional Area, Gurgaon		
Phone#:	Phone: 0122-4513700/743 Fax: 0122-4513704		
Results:	W/m2-k		
Option 1: Fenesta CW1 SG6mm	U-Factor = 3.971	SHGC = 0.58	VT = 0.63
Option 2: Fenesta CW1 DG24mm	U-Factor = 1.796	SHGC = 0.49	VT = 0.55
Option 3: Fenesta CW1 TG39mm	U-Factor = 1.337	SHGC = 0.44	VT = 0.51
Baseline Simulation Date:	09/02/2009		
Revision Date:			
Product Type:	Vinyl (UPVC) Frame Casement Windows		
Simulator:	Avlokita Agrawal		
Simulator-in-Charge:	Avlokita Agrawal Supervised by : Centre for Environmental Planning and Technology		
Simulation Method:	Approved NFRC Software THERM5.2 and WINDOW5.2 and NFRC WINDOW/THERM simulation manual. ECBC 2007 calculation procedure.		
Model/Type:	Vinyl (UPVC) Frame casement Windows		

Size:	1800mm x 1200mm
Frame Type and Finish:	Frame extrusion is UPVC and frame finish is Pristine white Glossy (extruded profile)
Sash Type and Finish:	Frame extrusion is UPVC and frame finish is Pristine white Glossy (extruded profile)
IG Glass Parameters:	<p>Option 1: 6 mm clear glass (IGDB – ID 103)</p> <p>Option 2: 24 mm 2 pane IG unit with 12 mm air cavity, 6mm Laminated (IGDB ID # 1862) and 6mm clear glass on outer side (IGDB – ID 103)</p> <p>Option 3: 39 mm 3pane IG unit with 10.5 mm air cavities, 6mm Laminated glass (IGDB ID # 1862) and 6mm clear glass on outer and middle layer(IGDB – ID 103)</p>
Glazing Method:	Glazing set with flexible vinyl gasket and exterior bead
Gas Fill Method:	-
Spacers:	Aluminum spacer system - single sealed.
Dividers:	None
Grouping:	None
Center-of-Glazing:	None
Frame:	None
Spacer:	None
Divider:	None
Miscellaneous:	-
General Assumptions	<ul style="list-style-type: none"> • Since the Glass code was not specified, it has been taken to be ID103 and ID1862 as per the qualitative specification given. • The mullion is considered to be in the center as the exact distance from edge is not specified. Location may have slight impact on the final U-value as the value is size dependant.
SHGC and VT Assumption:	Frame Absorption 0.3
THERM File Convention:	

File Paths:	..\ Therm = Therm files ... \ Window = WINDOW5 database file ... \ Drawing = Product drawing used for simulation ... \ Report = simulation report
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Disclaimer: The window U-factor, Solar Heat Gain Coefficient and Visible transmittance Resistance were determined using most recent ECBC 2007 requirements and simulation program THERM and WINDOW , International Glazing Database (IGDB) and calculation procedure in accordance with ECBC 2007 procedures and from information provided by the manufacturer. SI Units are the primary units for the standards mentioned, the data and report uses IEEE/ASTM SI 10 (1997) standard procedure for conversion of data to IP units in accordance with NFRC unit conversion policy. Rounding of numerical values has been performed as per IEEE/ASTM SI 10-1997 and all subsections except section 5.4.1.3. **This report does not constitute certification of this product and only relates to the fenestration products simulated.** Centre for Environmental Planning and Technology does not imply or claim that the product simulated in this report will perform as stated in actual use conditions. This report is the property of Centre for Environmental Planning and Technology and the client, and shall not be reproduced, except in full, without the written approval from Centre for Environmental Planning and Technology and the client. The report and the data shall be kept for a period of four years after which they may be destroyed.

Avlokita Agrawal
 Green Built Energy Pvt Ltd.
 Supervised and Issued by Centre for Environmental Planning and Technology

Procedure for Determining Fenestration Product UFactor and Solar Heat Gain Coefficient As per ECBC 2007 (revised May 2008)

§4.2.1.1 and §4.2.1.2 require that U-factors and solar heat gain coefficients (SHGC) be determined for the overall fenestration product (including the sash and frame) in accordance with ISO 15099. The building envelope trade-off option in §4.4 requires the use of visible light transmittance (VLT).

In several cases, ISO 15099 suggests that individual national standards will need to be more specific and in other cases the ISO document gives users the choice of two options. This section clarifies these specific issues as they are to be implemented for this code:

- (a) §4.1 of ISO 15099: For calculating the overall U-factor, ISO 15099 offers a choice between the linear thermal transmittance (4.1.2) and the area weighted method (4.1.3). The area weighted method (4.1.3) shall be used
- (b) §4.2.2 of ISO 15099: Frame and divider SHGC's shall be calculated in accordance with §4.2.2
- (c) §6.4 of ISO 15099 refers the issue of material properties to national standards. Material conductivities and emissivities shall be determined in accordance with Indian standards
- (d) §7 of ISO 15099 on shading systems is currently excluded
- (e) §8.2 of ISO 15099 addresses environmental conditions. The following are defined for India:

For U-factor calculations:

$T_{in} = 24^{\circ}\text{C}$

$T_{out} = 32^{\circ}\text{C}$

$V = 3.35 \text{ m/s}$

$T_{rm,out} = T_{out}$

$T_{rm,in} = T_{in}$

$I_s = 0 \text{ W/m}^2$

For SHGC calculations:

$T_{in} = 24^{\circ}\text{C}$

$T_{out} = 32^{\circ}\text{C}$

$V = 2.75 \text{ m/s}$

$T_{rm,out} = T_{out}$

Appendix C: Default Values for Typical Constructions

Energy Conservation Building Code 2007 C.2

$T_{rm,in} = T_{in}$

$I_s = 783 \text{ W/m}^2$

(f) §8.3 of ISO 15099 addresses convective film coefficients on the interior and exterior of the window product. In §8.3.1 of ISO 15099, simulations shall use the heat transfer coefficient based on the center of glass temperature and the entire window height; this film coefficient shall be used on all indoor surfaces, including frame sections. In §8.3.2 of ISO 15099, the formula from this section shall be applied to all outdoor exposed surfaces

(g) §8.4.2 of ISO 15099 presents two possible approaches for incorporating the impacts of self-viewing surfaces on interior radiative heat transfer calculations. Products shall use the method in §8.4.2.1 of ISO 15099 (Two-Dimensional Element to Element View Factor Based Radiation Heat Transfer Calculation). The alternate approach in §8.4.3 of ISO 15099 shall not be used

Table 1: Glazing Matrix

Glz ID	Name	Pane 1	Pane 2	Pane 3
1	Option 1: Fenesta CW1 SG6mm	103		
2	Option 2: Fenesta CW2 DG24mm	103	1862	
3	Option 3: Fenesta CW3 TG39mm	103	1862	103

Bill Of Material:

Option 1 CW1 SG6mm

Glazing		
Option 1: Fenesta CW1 SG6mm	Pane	6 mm clear glass (IGDB – ID 103)
Spacer		A1-S, Aluminium single seal spacer
Vertical Mullion	Part #	Material
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	C65PS1, SAP CODE:30505	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB4, SAP CODE:20508	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	A65RT1, SAP Code: 12683	Galvanized Steel Sheet
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Head -openable		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead

Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB4, SAP CODE:20508	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Jamb -Openable		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB4, SAP CODE:20508	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Sill - Openable		

Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB4, SAP CODE:20508	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Sill - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Bead	A65PB4, SAP CODE:20508	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Head - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP	VA- Vinyl reinforced frame

	CODE:30534	
Bead	A65PB4, SAP CODE:20508	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Jamb - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Bead	A65PB4, SAP CODE:20508	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet

Option 2: Fenesta CW1 DG24mm

Glazing		
Option 2: Fenesta CW1 DG 24mm	Pane	24 mm 2pane IG unit with 12 mm air cavity, 6mm Laminated glass (IGDB ID # 1862) and 6mm clear glass on outer side (IGDB – ID 103)
Spacer		A1-S, Aluminium single seal spacer
Vertical Mullion	Part #	Material

Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	C65PS1, SAP CODE:30505	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	A65RT1, SAP Code: 12683	Galvanized Steel Sheet
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Head -openable		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet

Jamb - Openable		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Sill - Openable		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1,	Galvanized Steel Sheet

	SAP Code: 12679	
Sill - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Head - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Jamb - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame

Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet

Option 3: Fenesta CW1 TG 39mm

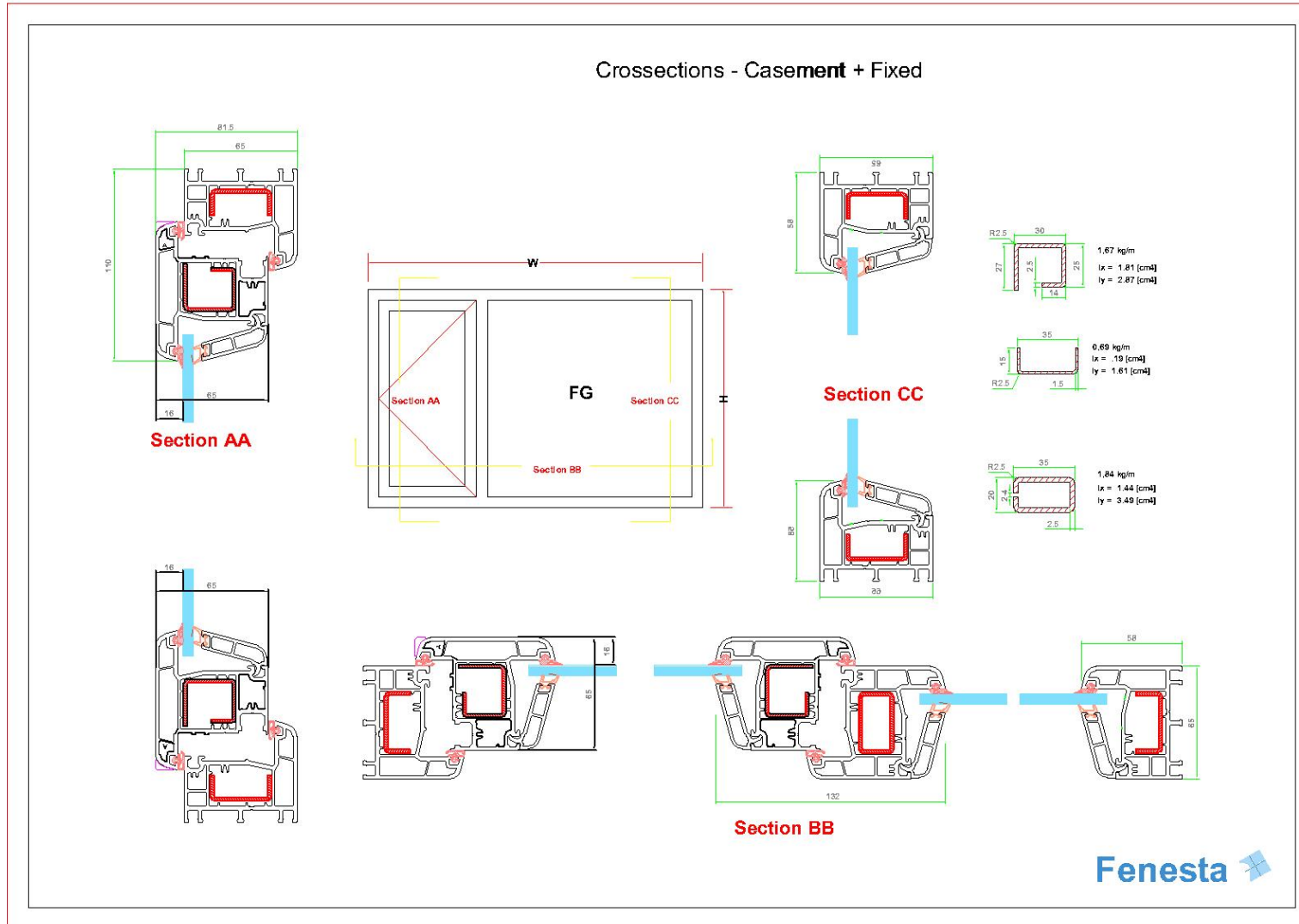
Glazing		
Option 3: Fenesta CW1 TG 39mm	Pane	39 mm 3 pane IG unit with 10.5 mm air cavities, 6mm Laminated glass (IGDB ID # 1862) and 6mm clear glass on outer and middle layer(IGDB – ID 103)
Spacer		A1-S, Aluminium single seal spacer
Vertical Mullion	Part #	Material
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	C65PS1, SAP CODE:30505	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	A65RT1, SAP Code:	Galvanized Steel Sheet

	12683	
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Head -openable		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Jamb -Openable		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead

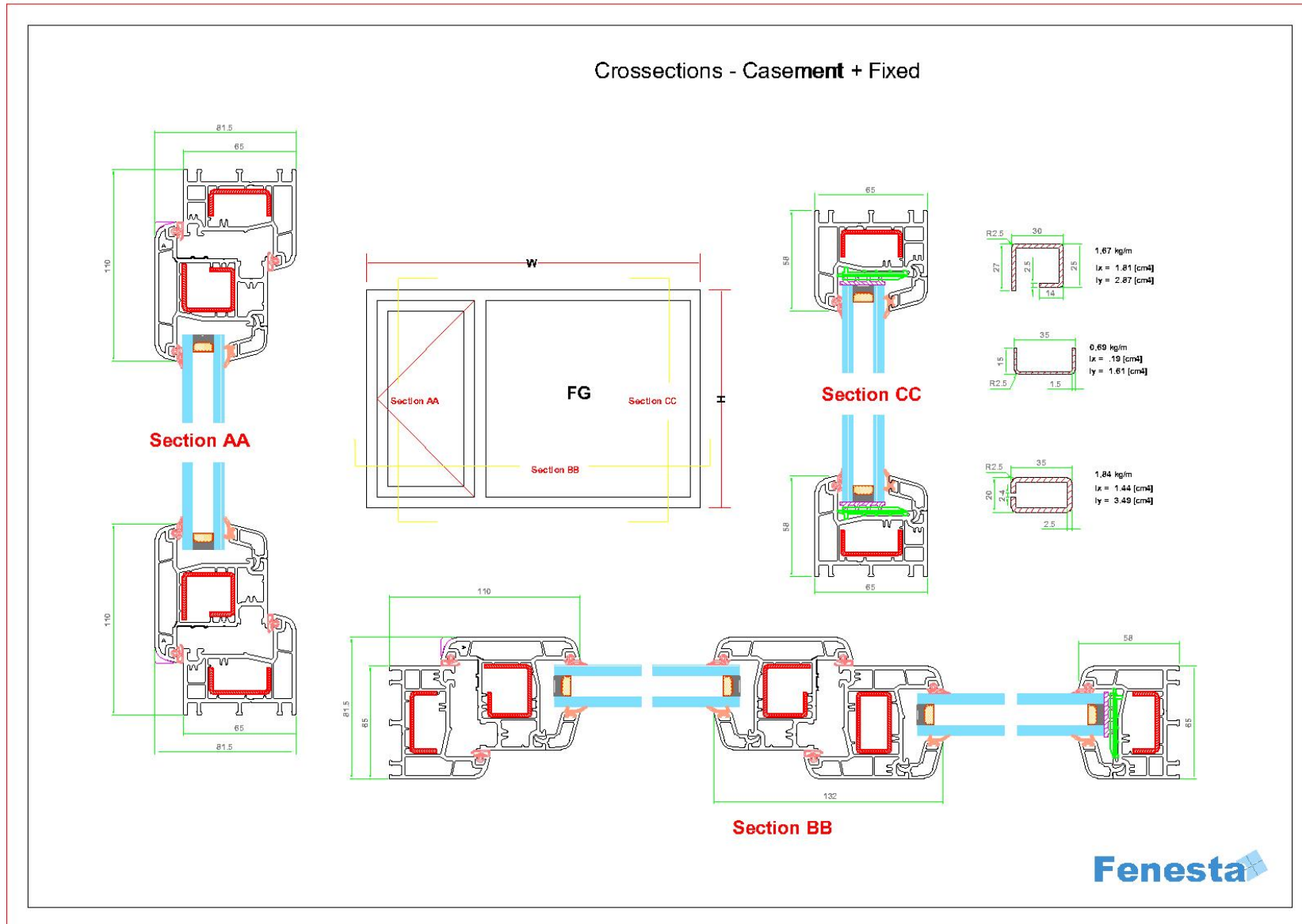
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Sill - Openable		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Frame	C65PS2, SAP CODE:30504	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	CS65RS5, SAP Code: 12695	Galvanized Steel Sheet
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Sill - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1,	Galvanized Steel Sheet

	SAP Code: 12679	
Head - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Jamb - Fixed		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	A65PF1, SAP CODE:30534	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
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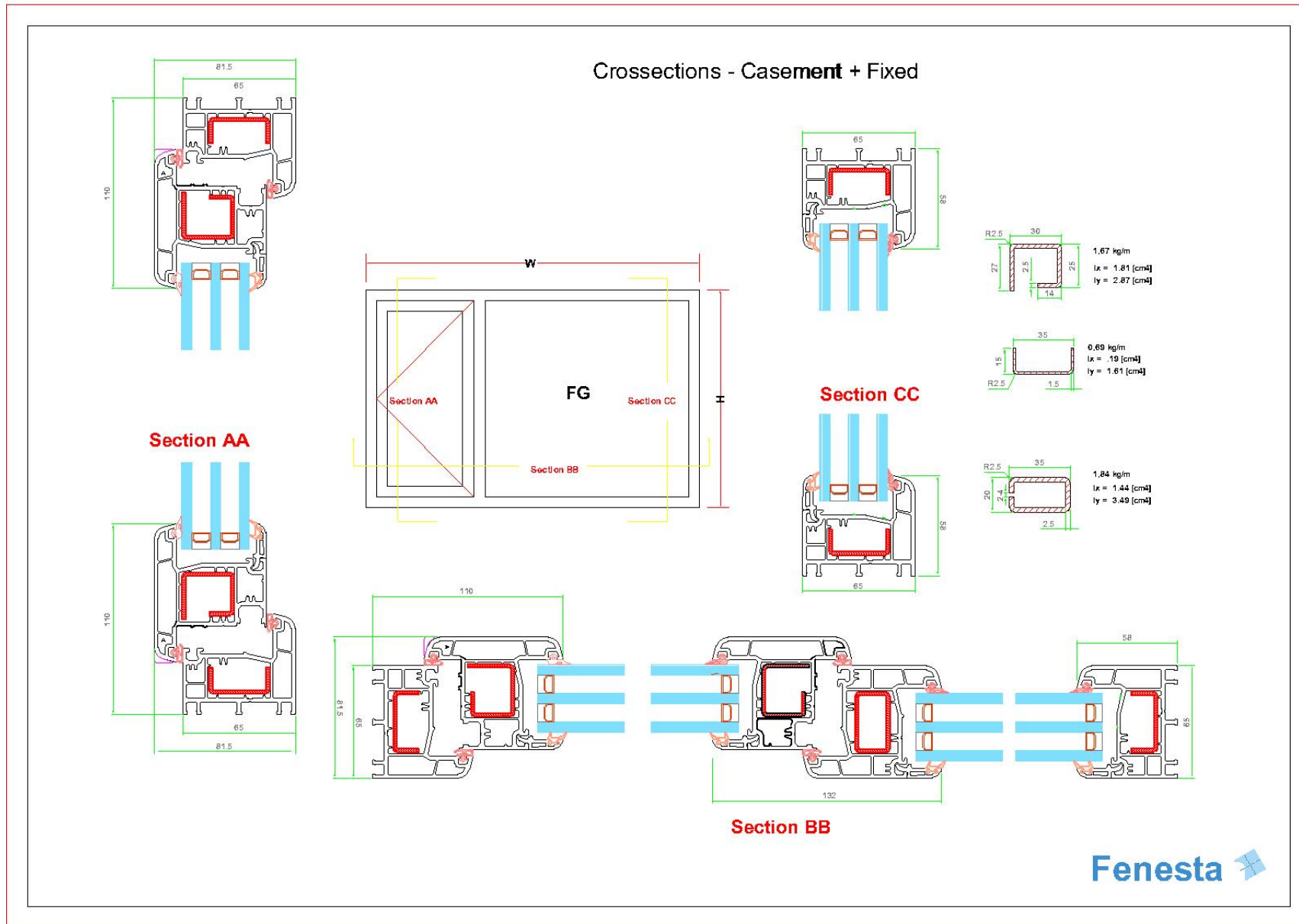
Appendix
Drawings
option 1 CW1 SG6mm



Option 2: CW1 DG24mm



Option 3: CW1 TG 39mm



FRAME AND SASH CODES

Code	FrameSashType	Definition	Category
VA	Vinyl w/ All Members Reinforced	Reinforcement of all members.	Vinyl

THERMAL BREAK MATERIAL CODES

Code	Material
N	No thermally broken frame/sash components.

GAP FILL CODES

Code	Gas
N	None

SPACER CODES

Code	Type	Definition
A1-S	Aluminum	Aluminum spacer system - single sealed.

GRID CODES

Code	Grid
N	No Muntins

Conversion Table used for SI to IP conversion
Source: ASTM SI-10 (1997) document

IP	SI	Multiply by
btu/hr-ft ² -F	W/m ² K	5.67823
btu/s	W	1055.056
ft ²	m ²	0.09290304
F	C	0.55555556
btu/h	W	0.2390711111
inch	mm	25.4
mph	m/s	0.44704
btu/h-ft ²	W/m ²	3.154591
lb/ft ³	kg/m ³	16.01846
lb	kg	0.45359237
ft ³	m ³	0.02831685
ft	m	0.3048
btu-in/h-ft ² -F	W/m-K	0.1442279
in ²	m ²	0.00064516
in ²	mm ²	645.16
psi	kpa	6.894757
btu/lb-F	J/kg-K	4186.8
btu/lb	J/kg	2326

Simulation Report

For Vinyl window in accordance with

ECBC 2007

(revised version May 2008)

Prepared for:

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SIMULATION REPORT

ECBC revised 2008 version modelling requirements (Add from the file)U-Factor (ECBC 2007), SHGC and VT (ECBC 2007 requirement).

Fenestration Product:	Vinyl (UPVC)		
Series Name	Series 3000		
Report#:	GBE-1009-CS-Fenesta SW1		
Submitted To:	Y P Singh		
Manufacturer:	Fenesta		
Address:	Plot no 52, sector 32, Institutional Area, Gurgaon		
Phone#:	Phone: 0122-4513700/743 Fax: 0122-4513704		
Results:	W/m ² -k		
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Option 2: Fenesta SW1 DG24mm	U-Factor = 1.91	SHGC = 0.41	VT = 0.47
Baseline Simulation Date:	09/02/2009		
Revision Date:			
Product Type:	Vinyl (UPVC) Frame Sliding Windows		
Simulator:	Avlokita Agrawal		
Simulator-in-Charge:	Avlokita Agrawal		
Simulation Method:	Approved NFRC Software THERM5.2 and WINDOW5.2 and NFRC WINDOW/THERM simulation manual. ECBC 2007 calculation procedure.		
Model/Type:	Vinyl (UPVC) Frame Sliding Windows		
Size:	1800mm x 1200mm		

Frame Type and Finish:	Frame extrusion is UPVC and frame finish is Pristine white Glossy (extruded profile)
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Glazing Method:	Glazing set with flexible vinyl gasket and exterior bead
Gas Fill Method:	-
Spacers:	Aluminum spacer system - single sealed.
Dividers:	None
Grouping:	None
Center-of-Glazing:	None
Frame:	None
Spacer:	None
Divider:	None
Miscellaneous:	-
General Assumptions	<ul style="list-style-type: none"> • Since the Glass code was not specified, it has been taken to be ID103 and ID1862 as per the qualitative specification given. • The mullion is considered to be in the center as the exact distance from edge is not specified. Location may have slight impact on the final U-value as the value is size dependant.
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Avlokita Agrawal

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$V = 3.35 \text{ m/s}$

$T_{rm,out} = T_{out}$

$T_{rm,in} = T_{in}$

$I_s = 0 \text{ W/m}^2$

For SHGC calculations:

$T_{in} = 24^{\circ}\text{C}$

$T_{out} = 32^{\circ}\text{C}$

$V = 2.75 \text{ m/s}$

$T_{rm,out} = T_{out}$

Appendix C: Default Values for Typical Constructions

Energy Conservation Building Code 2007 C.2

$T_{rm,in} = T_{in}$

$I_s = 783 \text{ W/m}^2$

(f) §8.3 of ISO 15099 addresses convective film coefficients on the interior and exterior of the window product. In §8.3.1 of ISO 15099, simulations shall use the heat transfer coefficient based on the center of glass temperature and the entire window height; this film coefficient shall be used on all indoor surfaces, including frame sections. In §8.3.2 of ISO 15099, the formula from this section shall be applied to all outdoor exposed surfaces

(g) §8.4.2 of ISO 15099 presents two possible approaches for incorporating the impacts of self-viewing surfaces on interior radiative heat transfer calculations. Products shall use the method in §8.4.2.1 of ISO 15099 (Two-Dimensional Element to Element View Factor Based Radiation Heat Transfer Calculation). The alternate approach in §8.4.3 of ISO 15099 shall not be used

Table 1: Glazing Matrix

<i>Glz ID</i>	<i>Name</i>	<i>Pane 1</i>	<i>Pane 2</i>	
1	Option 1: Fenesta SW1 SG6mm	103		
2	Option 2: Fenesta SW2 DG24mm	103	1862	

Bill Of Material:

Option 1 SW1 SG6mm

Glazing		
Option 1: Fenesta SW1 SG6mm	Pane	6 mm clear glass (IGDB – ID 103)
Spacer		
		A1-S, Aluminium single seal spacer
Vertical Mullion		
	Part #	Material
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	S65PS1, SAP CODE:30513	VA- Vinyl reinforced frame
Farne Cap	S65 PO1, SAP CODE:30522	Vinyl Interlock Cover
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	SS65RS1, SAP Code: 12699	Galvanized Steel Sheet
Head		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	S65PF3, SAP CODE:30514	VA- Vinyl reinforced frame
Frame	S65PS1, SAP CODE:30513	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Reinforcement	SS65RS1, SAP Code: 12699	Galvanized Steel Sheet

Jamb		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	S65PF3, SAP CODE:30514	VA- Vinyl reinforced frame
Frame	S65PS1, SAP CODE:30513	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Reinforcement	SS65RS1, SAP Code: 12699	Galvanized Steel Sheet
Sill		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	S65PF3, SAP CODE:30514	VA- Vinyl reinforced frame
Frame	S65PS1, SAP CODE:30513	VA- Vinyl reinforced frame
Bead	A65PB1, SAP CODE:20528	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Reinforcement	SS65RS1, SAP Code: 12699	Galvanized Steel Sheet

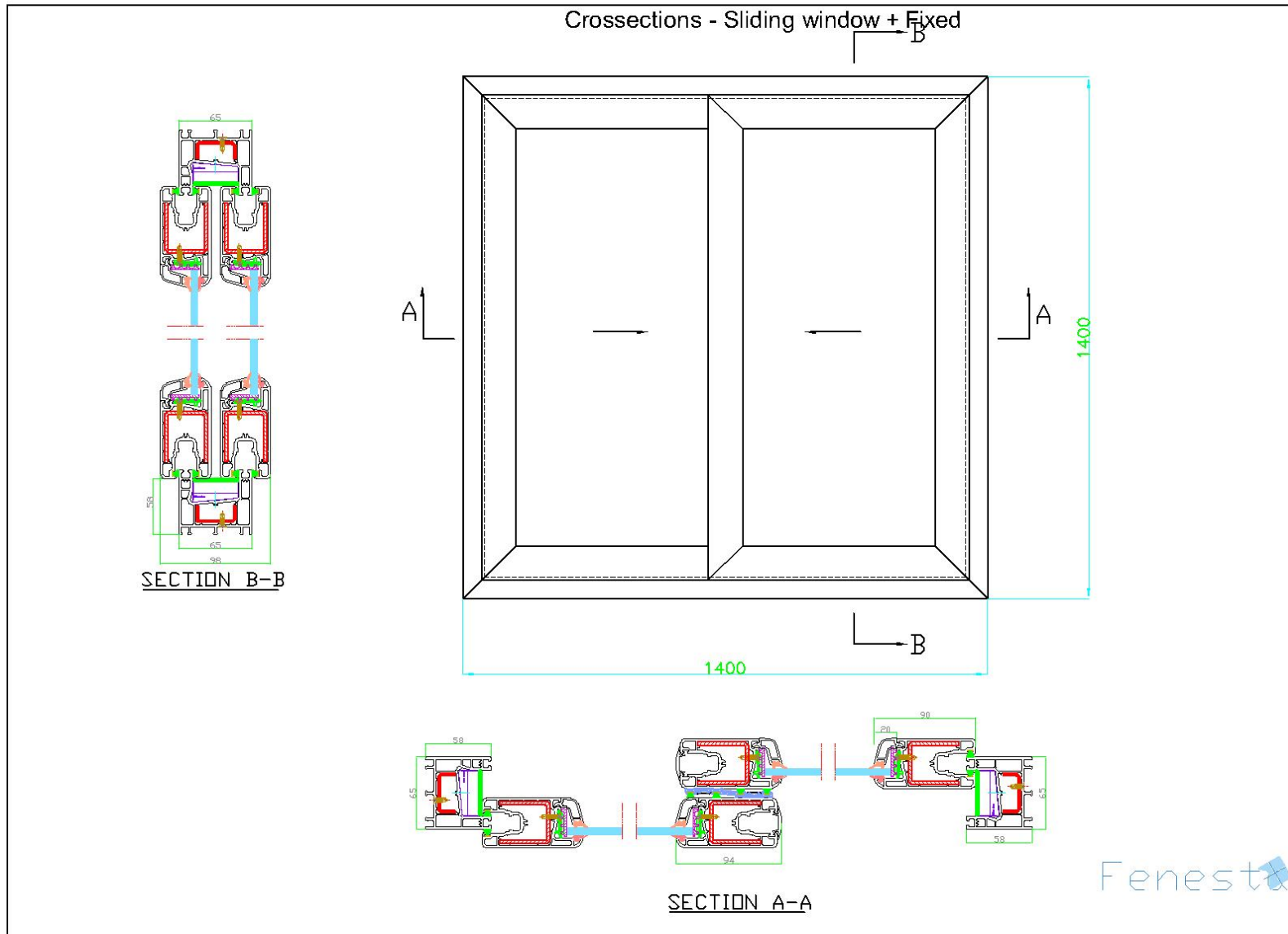
Option 2 SW1 DG24mm

Glazing		
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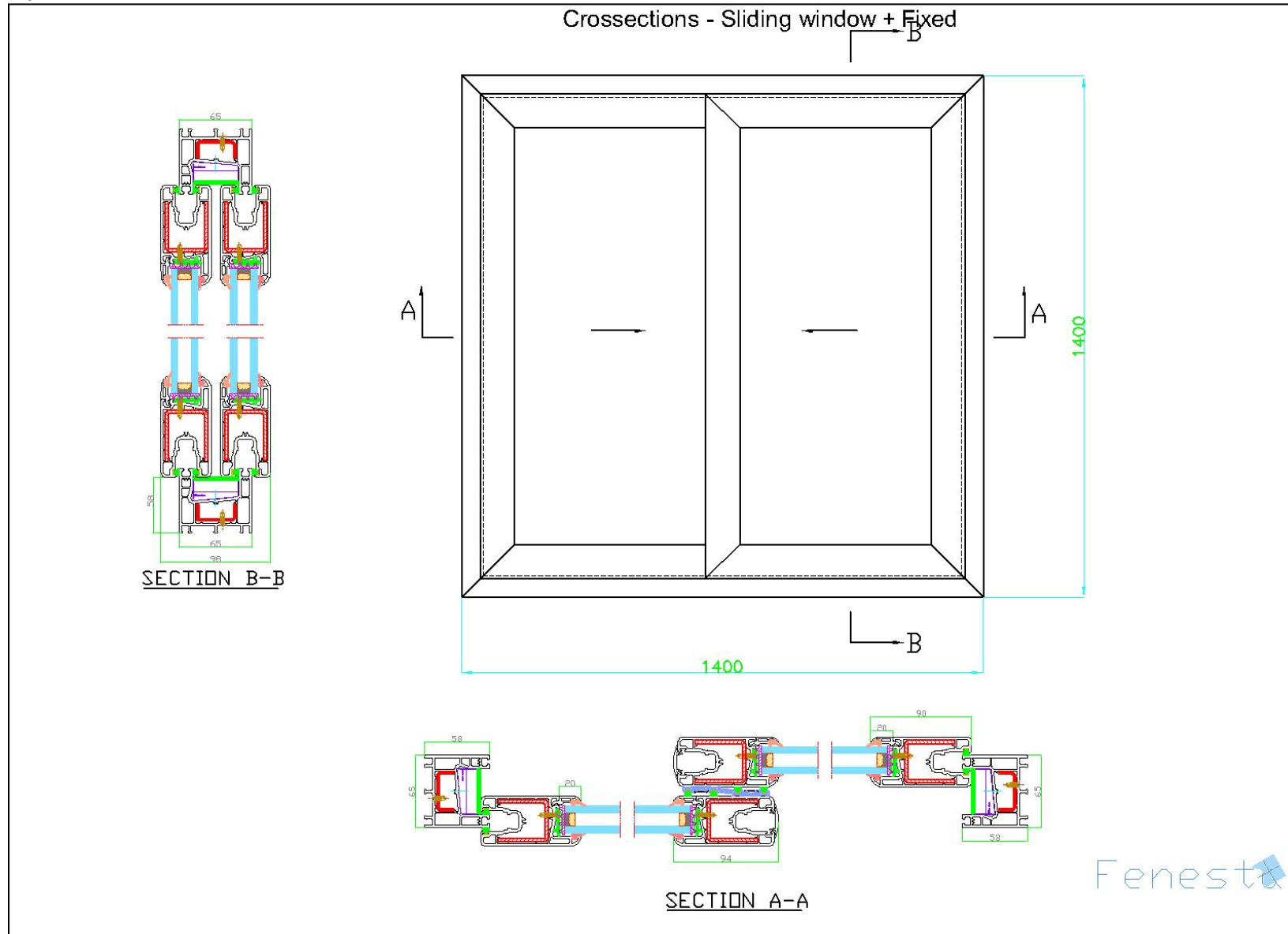
Option 1: Fenesta SW1 DG24mm	Pane	24 mm 2 pane IG unit with 12 mm air cavity, 6 mm Laminated glass (IGDB ID # 1862) and 6mm clear glass on outer side (IGDB – ID 103)
Spacer		A1-S, Aluminium single seal spacer
Vertical Mullion	Part #	Material
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	S65PS1, SAP CODE:30513	VA- Vinyl reinforced frame
Farne Cap	S65 PO1, SAP CODE:30522	Vinyl Interlock Cover
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	SS65RS1, SAP Code: 12699	Galvanized Steel Sheet
Head		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	S65PF3, SAP CODE:30514	VA- Vinyl reinforced frame
Frame	S65PS1, SAP CODE:30513	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Reinforcement	SS65RS1, SAP Code: 12699	Galvanized Steel Sheet
Jamb		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead

Frame	S65PF3, SAP CODE:30514	VA- Vinyl reinforced frame
Frame	S65PS1, SAP CODE:30513	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Reinforcement	SS65RS1, SAP Code: 12699	Galvanized Steel Sheet
Sill		
Glazing gasket		Glazing set with flexible vinyl gasket and exterior bead
Frame	S65PF3, SAP CODE:30514	VA- Vinyl reinforced frame
Frame	S65PS1, SAP CODE:30513	VA- Vinyl reinforced frame
Bead	A65PB2, SAP CODE:20524	Flexible Vinyl- Casement Single Glazing Bead
Reinforcement	AS65RF1, SAP Code: 12679	Galvanized Steel Sheet
Reinforcement	SS65RS1, SAP Code: 12699	Galvanized Steel Sheet

Option 1 SW1 SG6mm



Option 2: SW1 DG24mm



Codes used in report

FRAME AND SASH CODES

Code	FrameSashType	Definition	Category
VA	Vinyl w/ All Members Reinforced	Reinforcement of all members.	Vinyl

THERMAL BREAK MATERIAL CODES

Code	Material
N	No thermally broken frame/sash components.

GAP FILL CODES

Code	Gas
N	None

SPACER CODES

Code	Type	Definition
A1-S	Aluminum	Aluminum spacer system - single sealed.

GRID CODES

Code	Grid
N	No Muntins

Conversion Table used for SI to IP conversion
Source: ASTM SI-10 (1997) document

IP	SI	Multiply by
btu/hr-ft ² -F	W/m ² K	5.67823
btu/s	W	1055.056
ft ²	m ²	0.09290304
F	C	0.55555556
btu/h	W	0.2390711111
inch	mm	25.4
mph	m/s	0.44704
btu/h-ft ²	W/m ²	3.154591
lb/ft ³	kg/m ³	16.01846
lb	kg	0.45359237
ft ³	m ³	0.02831685
ft	m	0.3048
btu-in/h-ft ² -F	W/m-K	0.1442279
in ²	m ²	0.00064516
in ²	mm ²	645.16
psi	kpa	6.894757
btu/lb-F	J/kg-K	4186.8
btu/lb	J/kg	2326