G.James glass & aluminium

When Experience Matters

University of Queensland 2013 3rd year Architecture Presentation

Presenters: Gary Aspden – Glass National Marketing & Technical Manager
Jim Stringfellow – Commercial Façade Engineer

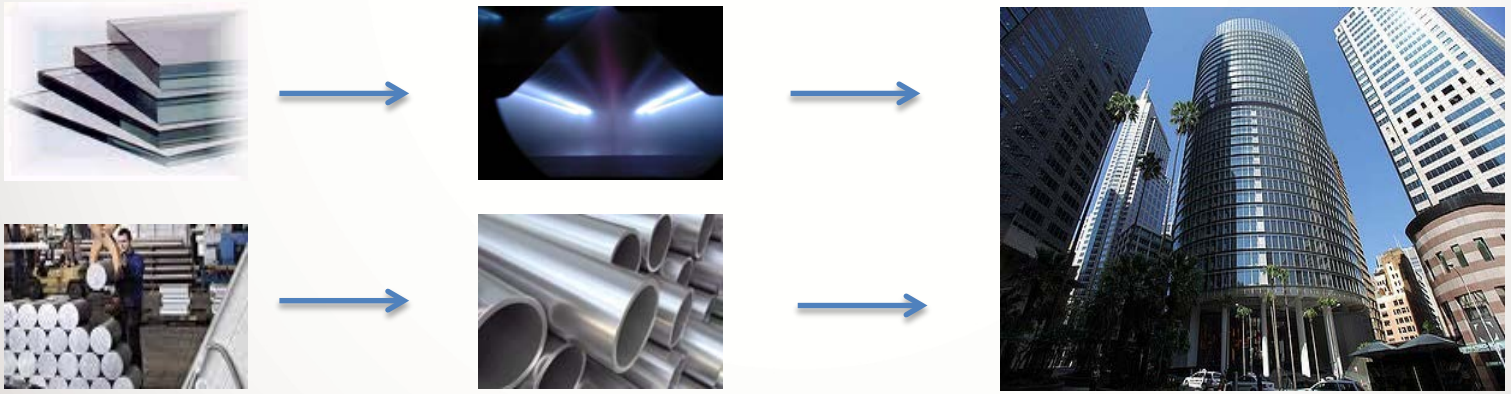
Forming a successful relationship.

H:\video\common\glass\Convert\Forming a successful relationship_shorter.wmv

G.James glass & aluminium

Why Choose G.James?

- Wealth of experience with in-house scientists driving an extensive R&D division
- Design office, engineering team & NATA Test Rig
- Fully integrated design, manufacture and installation from raw aluminium billets & float glass to finished facades of monumental skyscrapers.
- Manufactured locally



G.James glass & aluminium

G.James transforms Architect's dreams into reality….

A monumental building is an enduring work of art on a grand scale, viewed by a captive mass audience, functioning as a habitable structure.

Brisbane Convention & Exhibition Centre, Southbank

G.James glass & aluminium

… but compromise is needed for optimum results.

- Facades have budgets
- Practicalities of performance MUST NOT be compromised
- Flexibility of Architectural detailing can achieve the intent cost effectively

ABC Accommodation, Southbank

Withstand the actions of:
- Wind
- Rain
- Sunlight
- Heat & Cold

Control the passage of:
- Heat
- Air
- Light
- Sound

Consider practicalities of:
- Materials
- Longevity
- Manufacture
- Transport
- Installation

G.James glass & aluminium

Consider the options…

Riverside Centre vs. Riparian Plaza

"Good design doesn't date" - Harry Siedler

G.James glass & aluminium

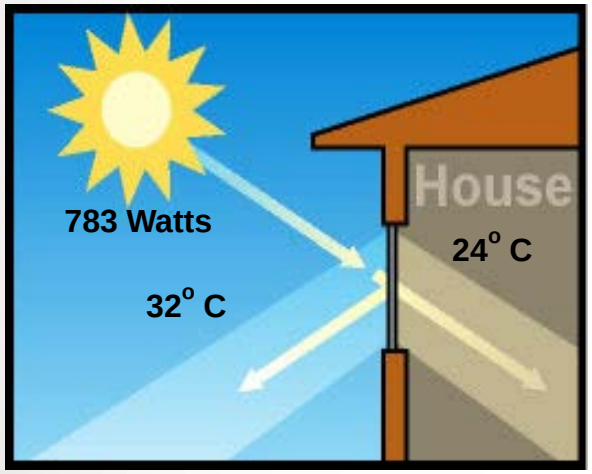
G. James
glass & aluminium

Factors that influence Window & Glass Selection

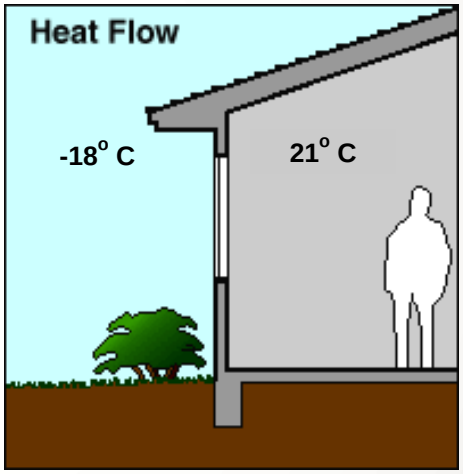
- Building location & use
- Aesthetics
- Acoustics
- Window Sizes
- Structural Requirements
  - Australian Standards
    - Wind loading
    - Safety
- Energy
  - NCC (BCA) Section J
  - Green Star / NABERS

G.James glass & aluminium

Performance Terms



SHGC – Solar Heat Gain Coefficient



U-Value (W/M^2C)

The lower the number the better the performance

G.James glass & aluminium

Performance Data – Glass Only

	SHGC	U-Value
10.38mm Clear Lam	0.72	5.6
10.38mm HL119	0.68	3.6
6/12/6 Clear IGU	0.70	2.7
DLE70 Grey IGU	0.23	1.7

G.James glass & aluminium

Performance Data - Windows

	Glass Only		Window 450/1		Window 650/1 (Structural Glazed)	
	SHGC	**U-Value**	**SHGCw**	**Uw-Value**	**SHGCw**	**Uw-Value**
10.38mm Clear Lam	0.72	5.6	0.66	6.2	0.70	6.3
10.38mm HL119	0.68	3.6	0.55	4.5	0.59	4.1
6/12/6 Clear IGU	0.70	2.7	0.61	3.7	0.69	3.4
DLE70 Grey IGU	0.23	1.7	0.21	3.0	0.25	2.6

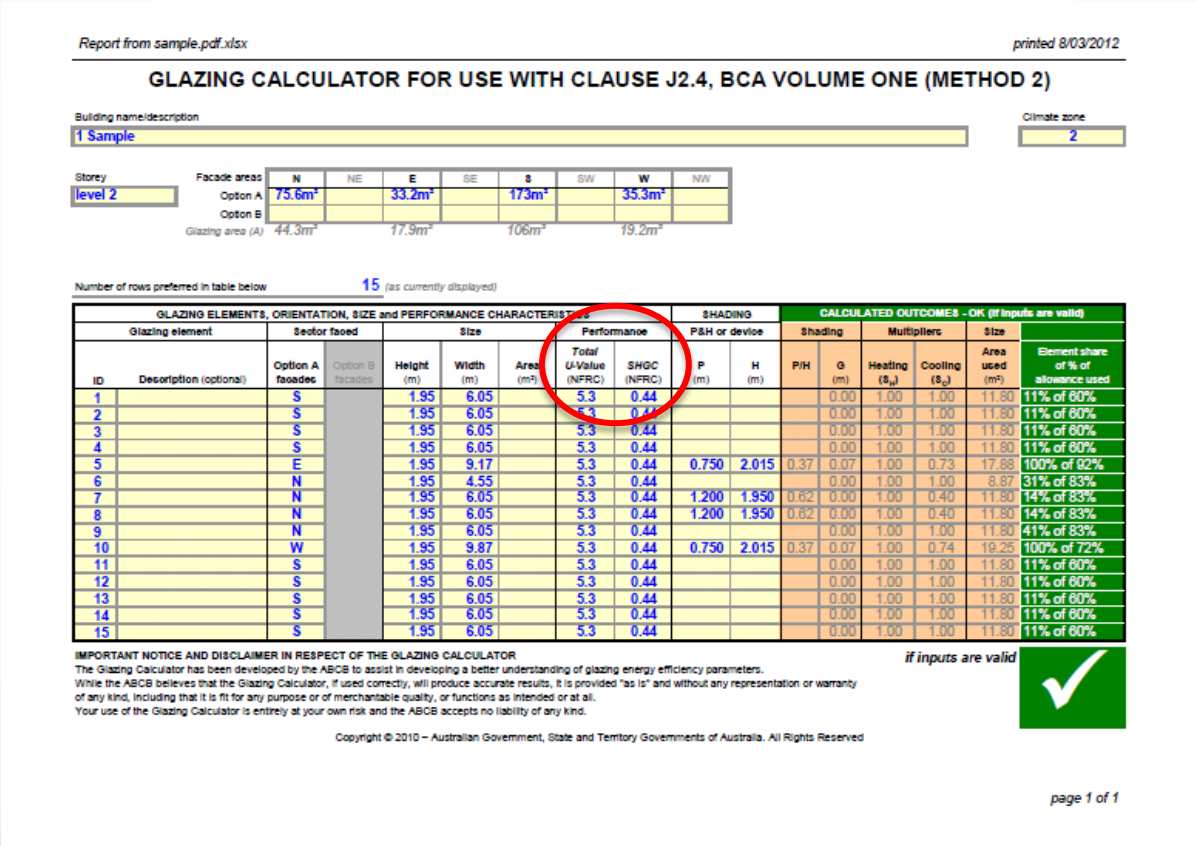
G.James glass & aluminium

Performance Data - Windows

	Glass Only		Window 450/1		Window 650/1 (Structural Glazed)	
	SHGC	**U-Value**	**SHGCw**	**Uw-Value**	**SHGCw**	**Uw-Value**
10.38mm Clear Lam	0.72	5.6	0.66	6.2	0.70	6.3
10.38mm HL119	0.68	3.6	0.55	4.5	0.59	4.1
6/12/6 Clear IGU	0.70	2.7	0.61	3.7	0.69	3.4
DLE70 Grey IGU	0.23	1.7	0.21	3.0	0.25	2.6

G.James glass & aluminium

NCC (BCA) Section J



Report from sample.pdf.xlsx — *printed 8/03/2012*

GLAZING CALCULATOR FOR USE WITH CLAUSE J2.4, BCA VOLUME ONE (METHOD 2)

Building name/description: 1 Sample

Climate zone: 2

Storey: level 2

Facade areas	N	NE	E	SE	S	SW	W	NW
Option A	75.6m²		33.2m²		173m²		35.3m²	
Option B								
Glazing area (A)	44.3m²		17.9m²		106m²		19.2m²	

Number of rows preferred in table below: 15 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION, SIZE and PERFORMANCE CHARACTERISTICS								SHADING		CALCULATED OUTCOMES - OK (if inputs are valid)					
Glazing element		Sector faced		Size			Performance			Shading		Multipliers		Size	
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total U-Value (NFRC)	SHGC (NFRC)	P (m)	H (m)	P/H	G (m)	Heating (S_H)	Cooling (S_C)	Area used (m²)	Element share of % of allowance used
1		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%
2		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%
3		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%
4		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%
5		E		1.95	9.17		5.3	0.44	0.750	2.015	0.37	0.07	1.00	0.73	17.88	100% of 92%
6		N		1.95	4.55		5.3	0.44				0.00	1.00	1.00	8.87	31% of 83%
7		N		1.95	6.05		5.3	0.44	1.200	1.950	0.62	0.00	1.00	0.40	11.80	14% of 83%
8		N		1.95	6.05		5.3	0.44	1.200	1.950	0.62	0.00	1.00	0.40	11.80	14% of 83%
9		N		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	41% of 83%
10		W		1.95	9.87		5.3	0.44	0.750	2.015	0.37	0.07	1.00	0.74	19.25	100% of 72%
11		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%
12		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%
13		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%
14		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%
15		S		1.95	6.05		5.3	0.44				0.00	1.00	1.00	11.80	11% of 60%

IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR

The Glazing Calculator has been developed by the ABCB to assist in developing a better understanding of glazing energy efficiency parameters.
While the ABCB believes that the Glazing Calculator, if used correctly, will produce accurate results, it is provided "as is" and without any representation or warranty of any kind, including that it is fit for any purpose or of merchantable quality, or functions as intended or at all.
Your use of the Glazing Calculator is entirely at your own risk and the ABCB accepts no liability of any kind.

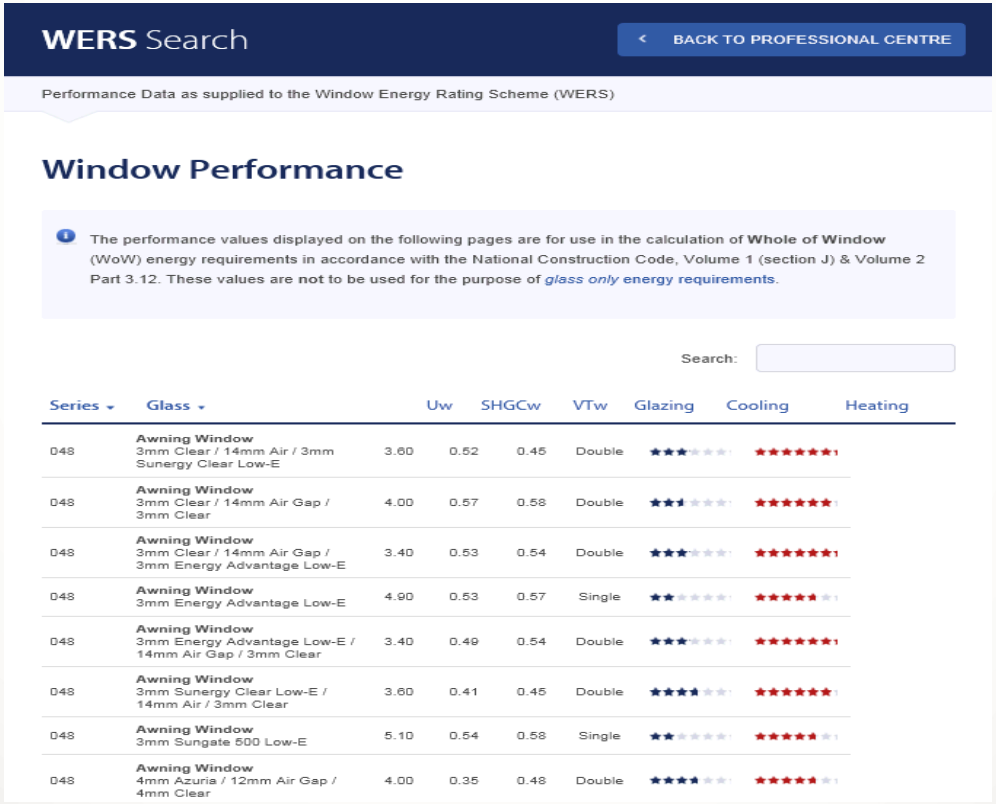
if inputs are valid

page 1 of 1

G.James glass & aluminium

WERS Data Search

http://gjames.com/professional/wers



WERS Search

BACK TO PROFESSIONAL CENTRE

Performance Data as supplied to the Window Energy Rating Scheme (WERS)

Window Performance

The performance values displayed on the following pages are for use in the calculation of **Whole of Window** (WoW) energy requirements in accordance with the National Construction Code, Volume 1 (section J) & Volume 2 Part 3.12. These values are **not** to be used for the purpose of *glass only* energy requirements.

Search:

Series	Glass	Uw	SHGCw	VTw	Glazing	Cooling	Heating
048	**Awning Window** 3mm Clear / 14mm Air / 3mm Sunergy Clear Low-E	3.60	0.52	0.45	Double	★★★☆☆☆	★★★★★★
048	**Awning Window** 3mm Clear / 14mm Air Gap / 3mm Clear	4.00	0.57	0.58	Double	★★★½☆☆	★★★★★★
048	**Awning Window** 3mm Clear / 14mm Air Gap / 3mm Energy Advantage Low-E	3.40	0.53	0.54	Double	★★★☆☆☆	★★★★★★
048	**Awning Window** 3mm Energy Advantage Low-E	4.90	0.53	0.57	Single	★★☆☆☆☆	★★★★★☆
048	**Awning Window** 3mm Energy Advantage Low-E / 14mm Air Gap / 3mm Clear	3.40	0.49	0.54	Double	★★★☆☆☆	★★★★★★
048	**Awning Window** 3mm Sunergy Clear Low-E / 14mm Air / 3mm Clear	3.60	0.41	0.45	Double	★★★★☆☆	★★★★★★
048	**Awning Window** 3mm Sungate 500 Low-E	5.10	0.54	0.58	Single	★★☆☆☆☆	★★★★★☆
048	**Awning Window** 4mm Azuria / 12mm Air Gap / 4mm Clear	4.00	0.35	0.48	Double	★★★★☆☆	★★★★★☆

G.James glass & aluminium

Low Emissivity (Low E) Coatings

Thin metallic coating is applied to the glass surface

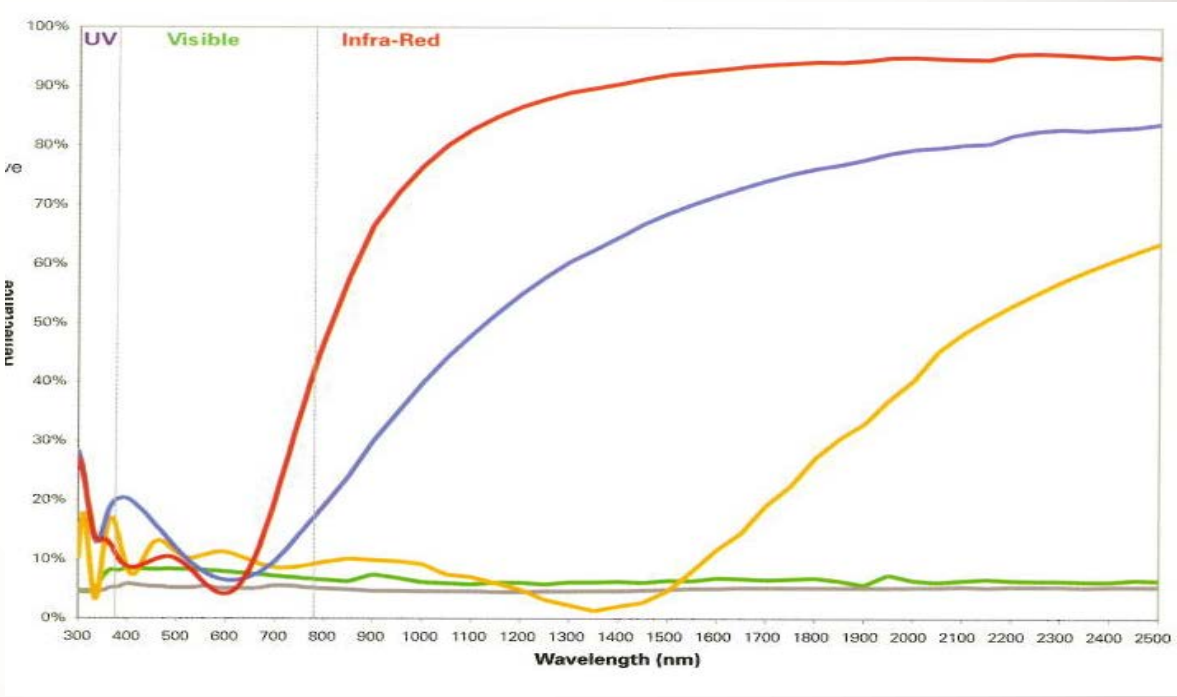
- Online -Float manufacturing process
- Offline – Magnetron sputtering process
- Solect & Optilight Low E Laminates
- Solarplus Low E

G.James glass & aluminium

How do Low E Coatings Work?

Coating reflects infra-red energy:

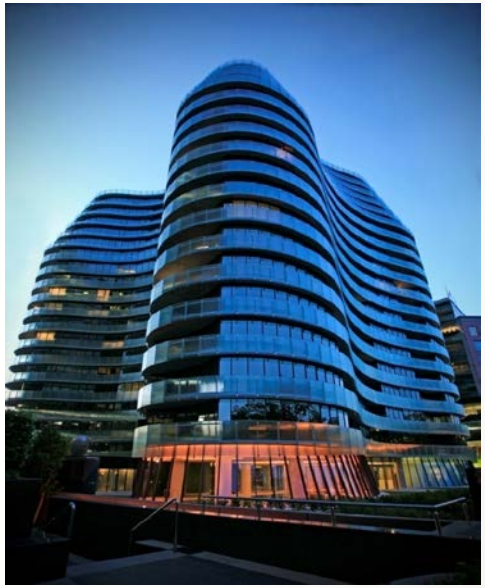
- Outside – Sun's energy
- Inside – Internal Heating



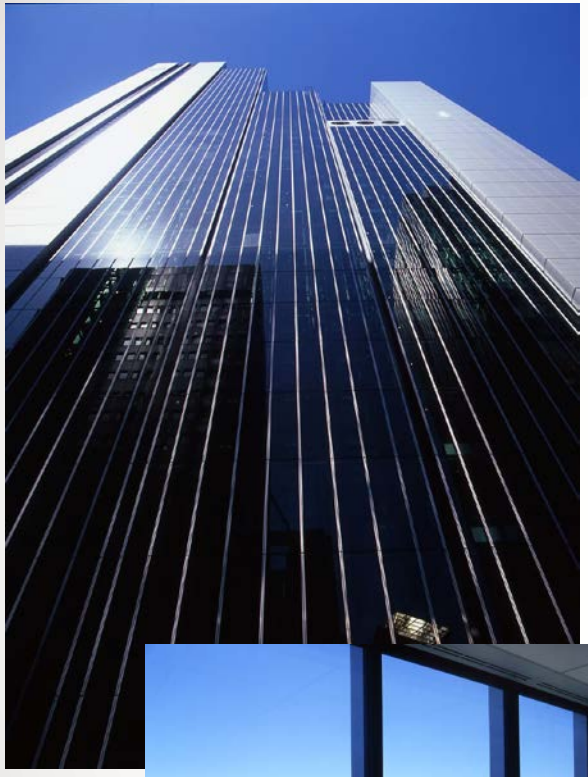
Design Considerations

Consider where we are in the world and…..

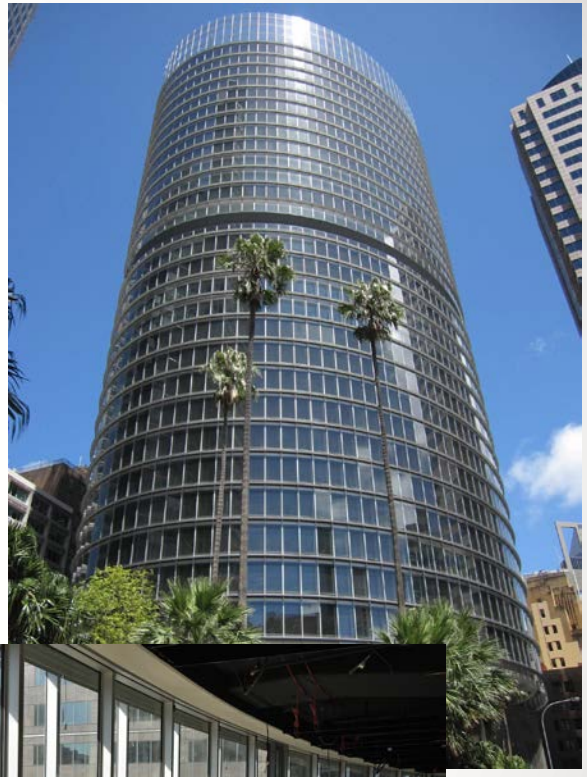
- How the building is to be used
- Building orientation
- Size of windows
- How the glass looks internally
- How to replace damaged glass
- Amount of visible light trans.
- Glare



G.James glass & aluminium



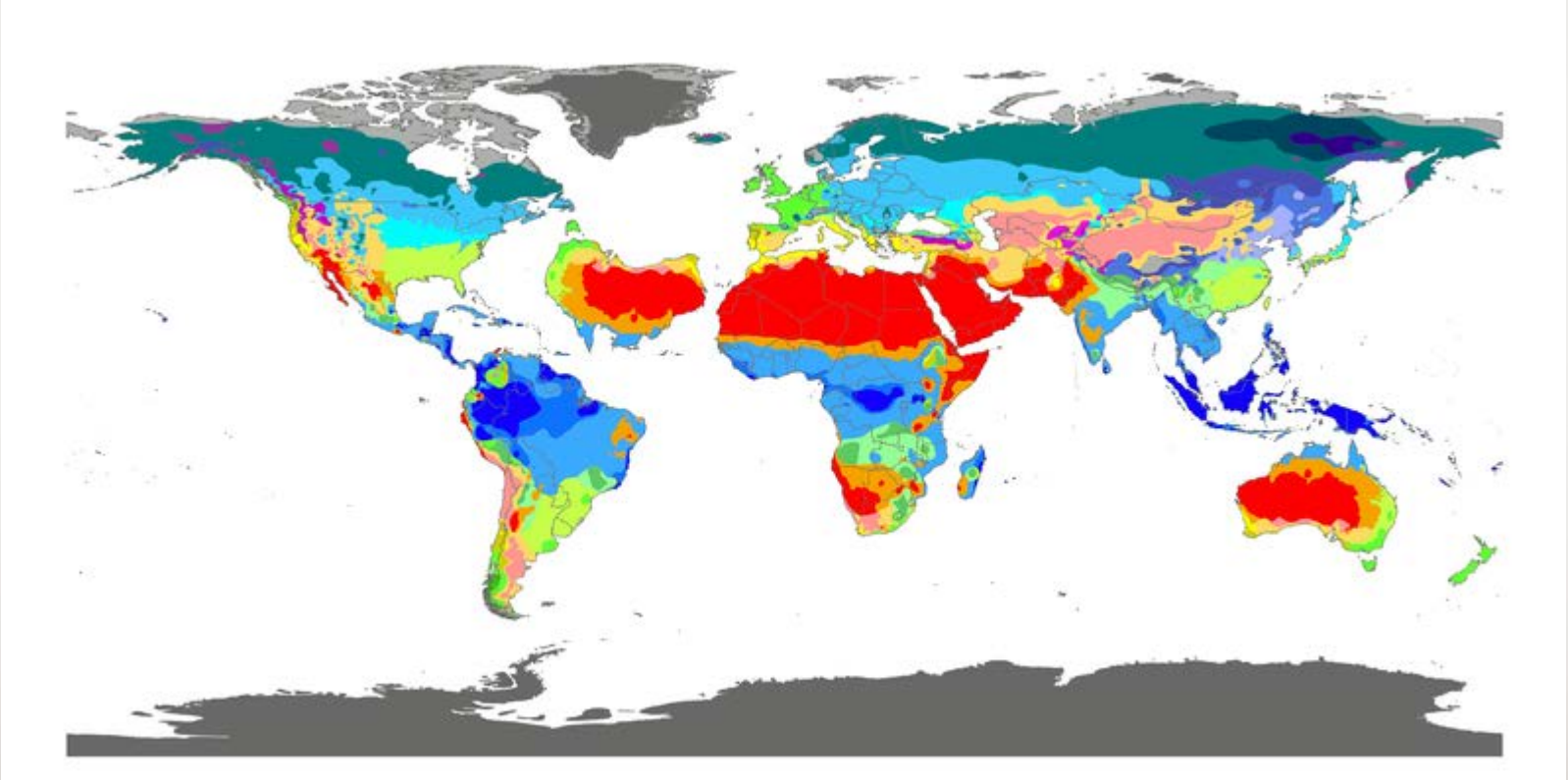
Deutsche Bank,
126 Phillip St,
Sydney



1 Bligh St,
Sydney

G.James
glass & aluminium

Design Considerations



G.James glass & aluminium

Design Considerations

Consider the occupants …….

G.James glass & aluminium

Use Glass to create the LOOK

G.James
glass & aluminium

How do we test glass ??

H:\video\common\glass\Convert\bullet_resistant.wmv

G.James glass & aluminium

We even test full scale facades !

G.James glass & aluminium

Facade Fenestration Testing

- Water Penetration
- Air Infiltration
- Deflection (1 in 20 year wind load)
- Abseiler loads on sunblades
- Proof Load (Typically 1 in 1000 year wind load)

G.James glass & aluminium

Design Considerations

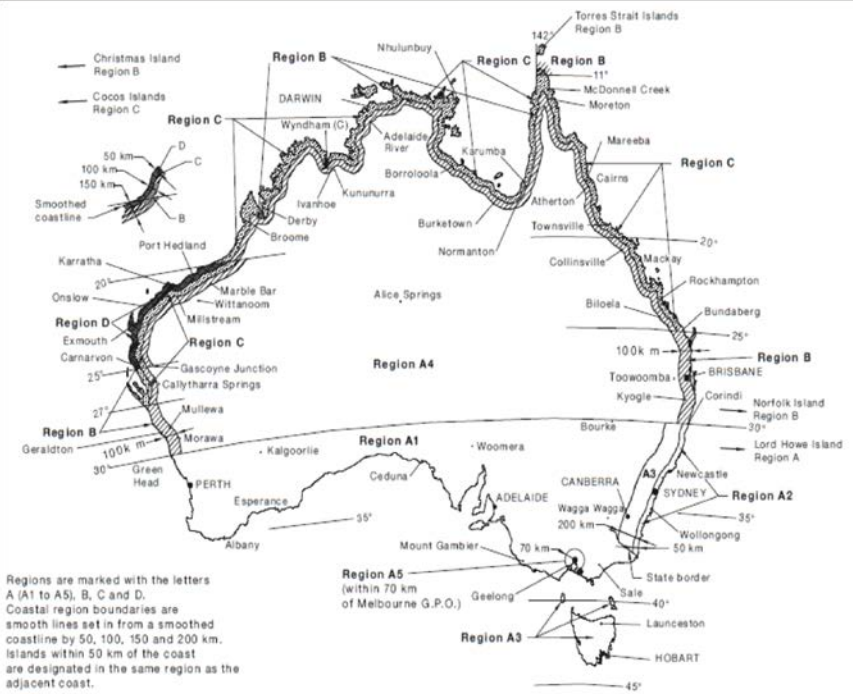


FIGURE 3.1(A) WIND REGIONS

Again… consider the location

- Wind load is typically the critical load that governs facade design for strength.
- Brisbane: approx. 3kPa wind pressure
- Cyclonic Areas: up to 14kPa wind pressure
- In layman's terms; these pressures are equivalent to the weight of how many people standing on the glass?

G.James glass & aluminium

An appreciation of wind pressures

Brisbane:

approx 3kPa wind pressure;

- Equivalent to weight of 4 people/m
- 12 people standing on a typical 2400x1200 sized lite of glass

Cyclonic Areas:

up to 14kPa wind pressure;

- Equivalent to weight of 19 people/m2
- 55 people standing on a typical 2400x1200 sized lite of glass!

G.James glass & aluminium

Facade Framing / Support Systems

If the glass acts as the “skin”, what forms the “bones”?

Aluminium Framed
- Window Wall
- Curtain Wall
- Captive Glazed
- Structurally Glazed




Advanced Structures
- Steel Truss
- Cable Truss
- Cable Net
- Grid Shell

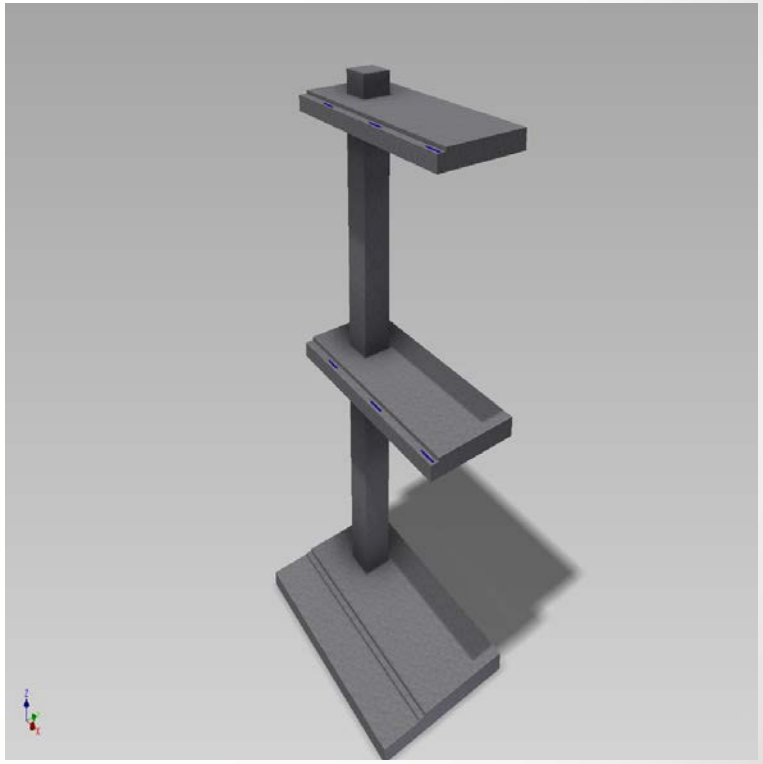



Frameless
- Shopfronts
- Glass Fins
- Structural Glass



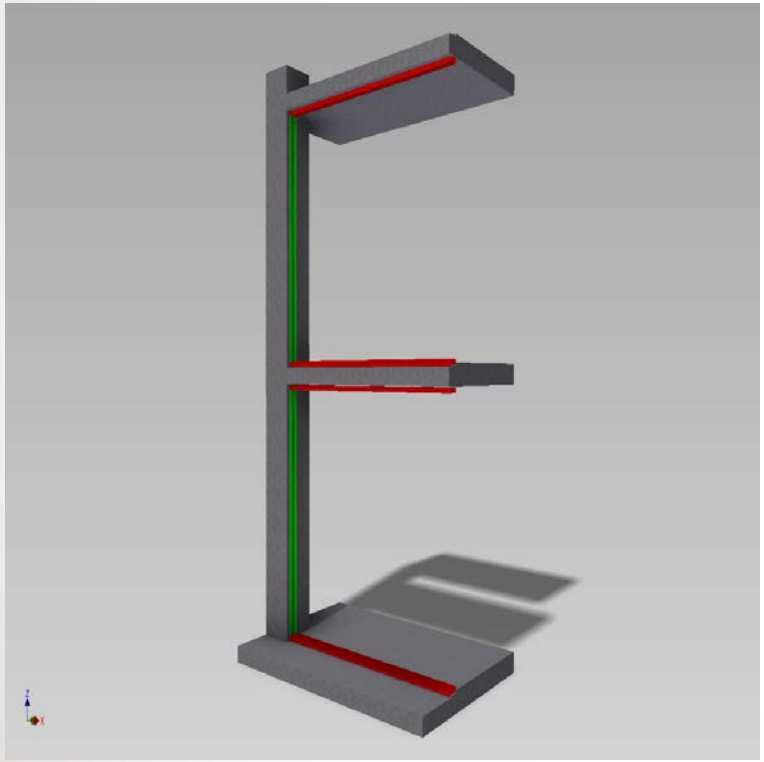

G.James glass & aluminium

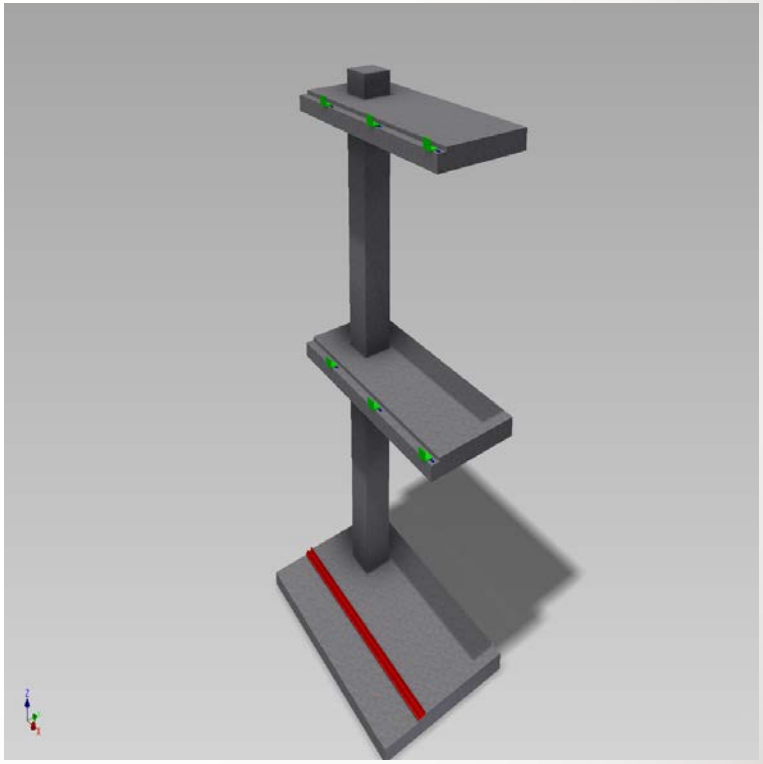
What is Window Wall & Curtain Wall?



G.James glass & aluminium

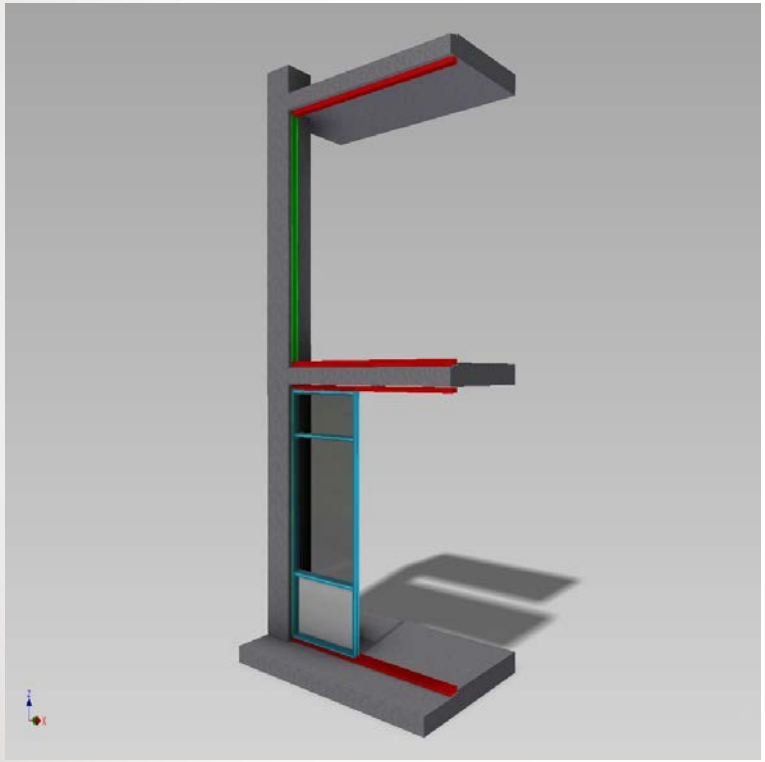
What is Window Wall & Curtain Wall?

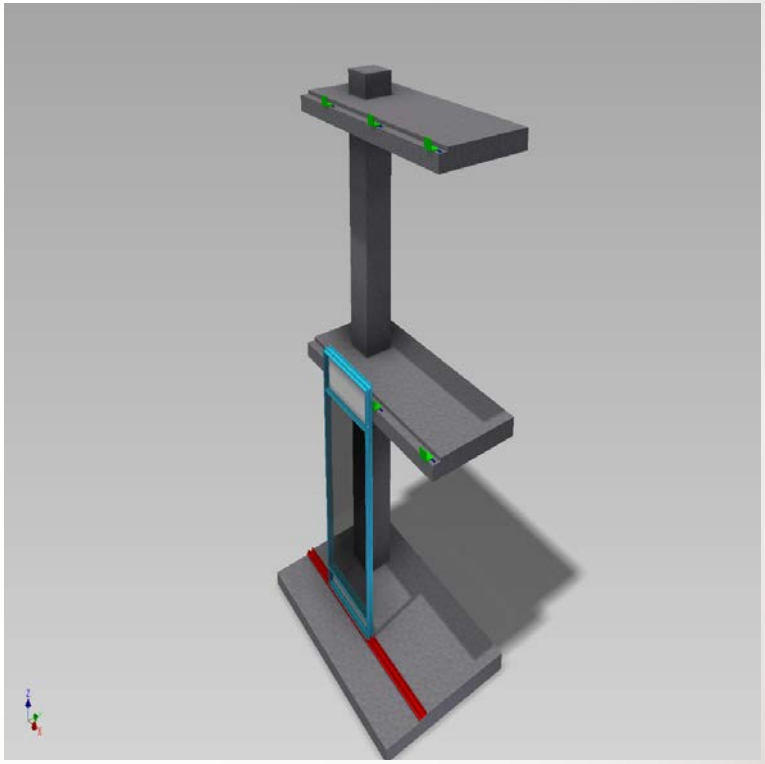




G.James glass & aluminium

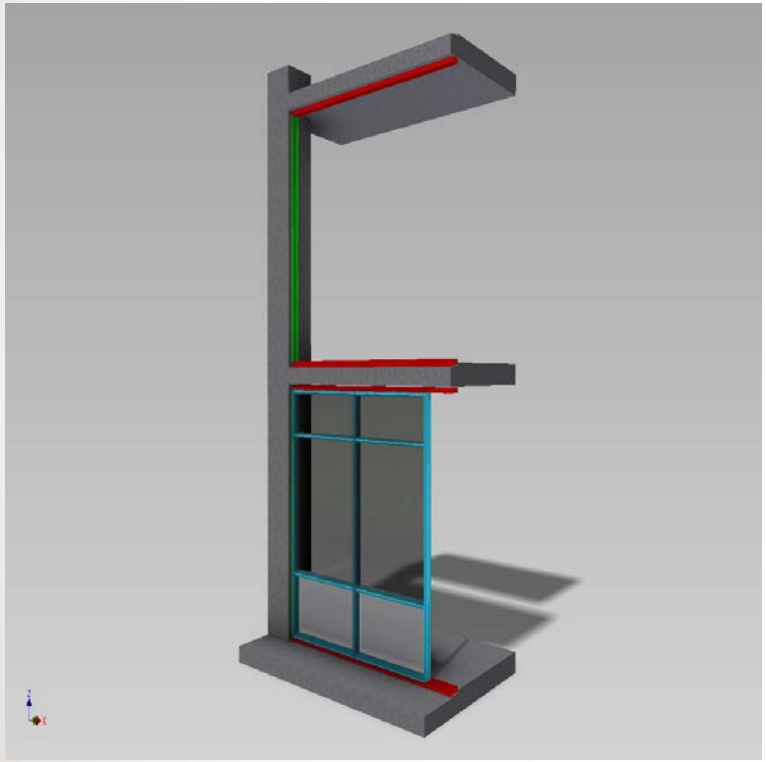
What is Window Wall & Curtain Wall?

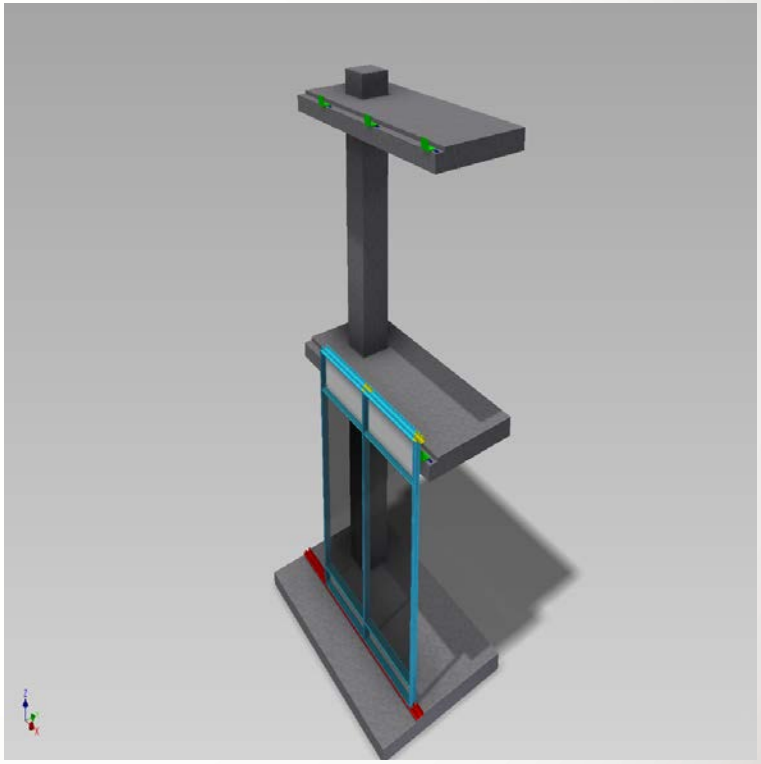




G.James glass & aluminium

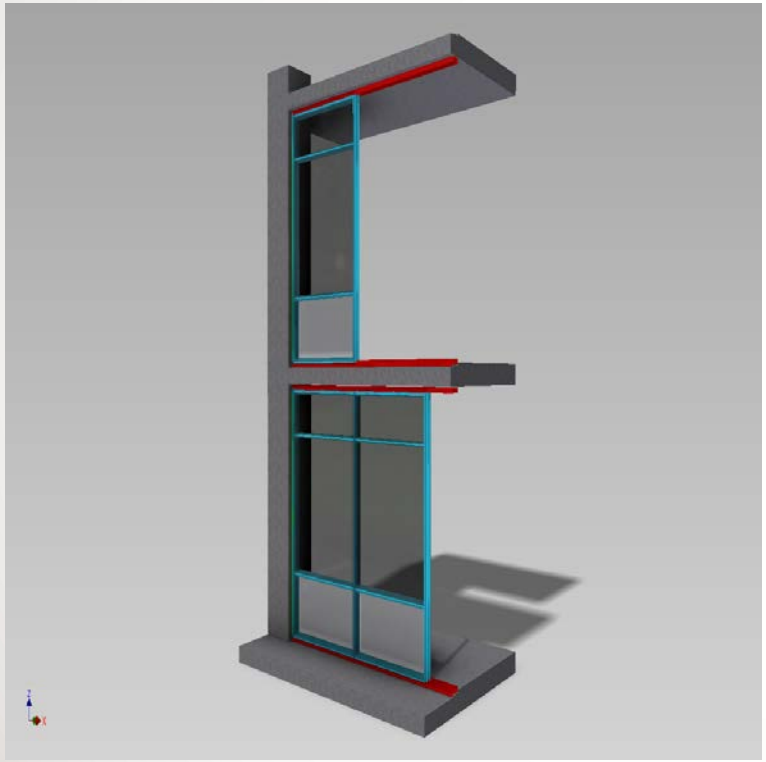
What is Window Wall & Curtain Wall?

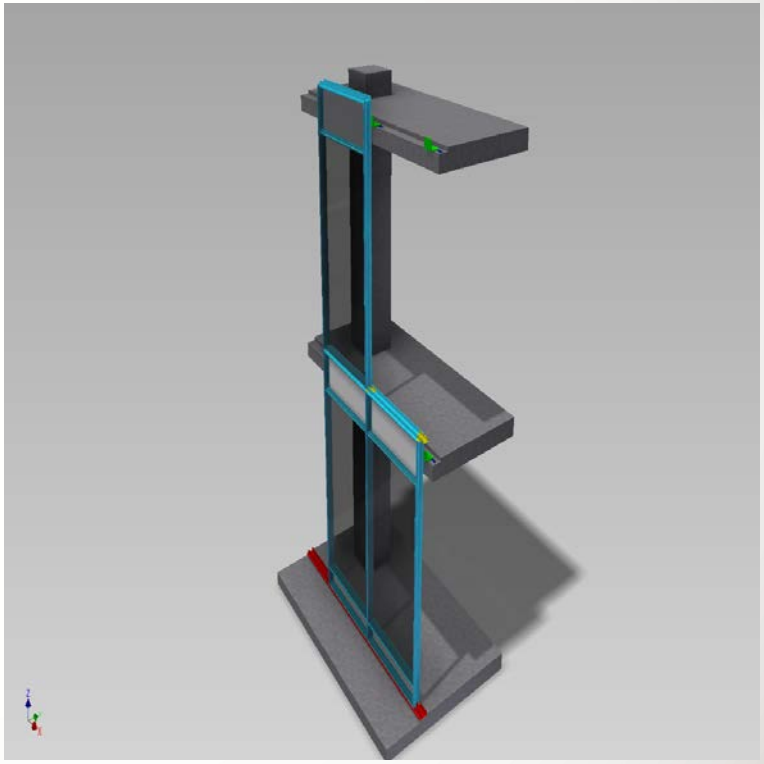




G.James glass & aluminium

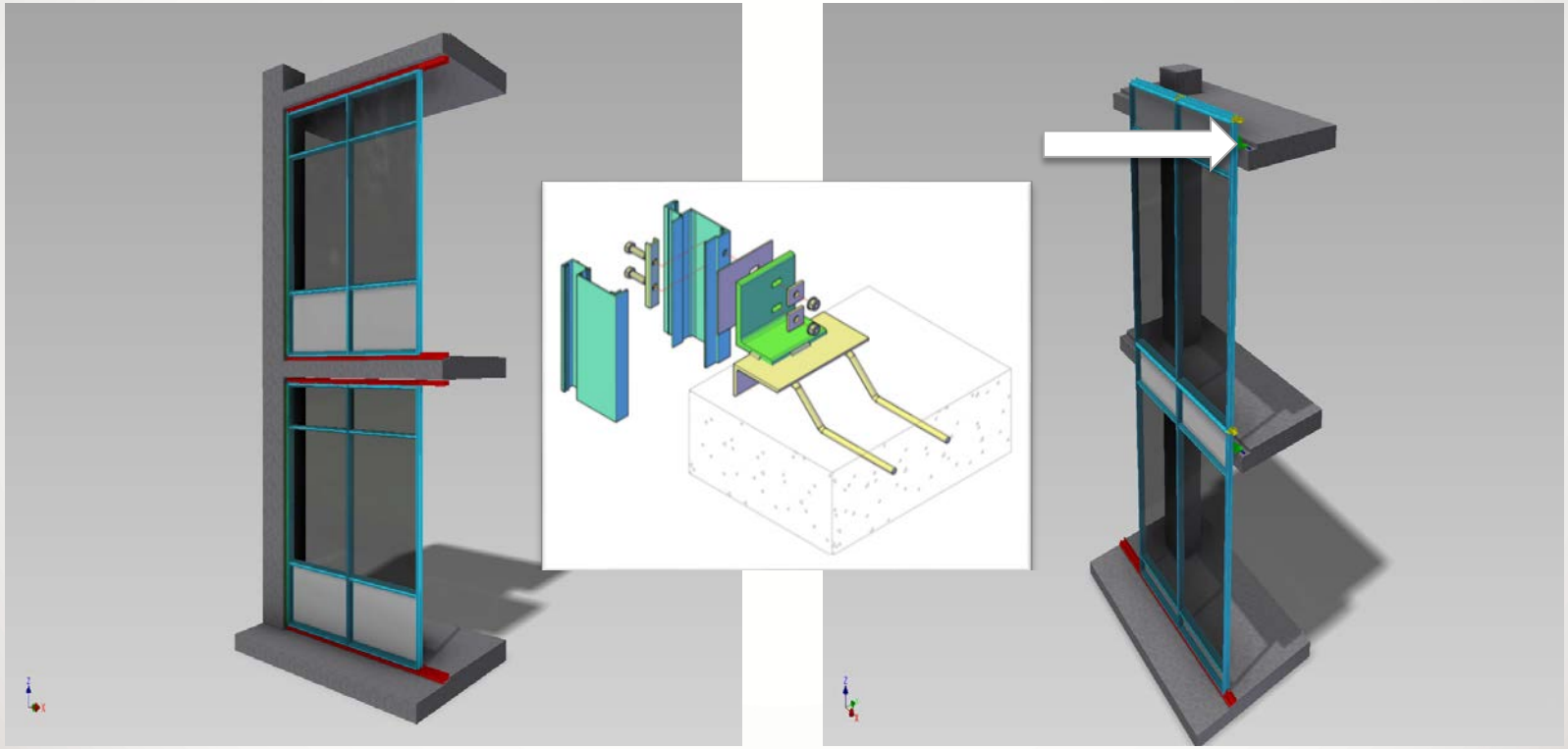
What is Window Wall & Curtain Wall?





G.James glass & aluminium

What is Window Wall & Curtain Wall?



G.James glass & aluminium

Window Wall vs. Curtain Wall Selection

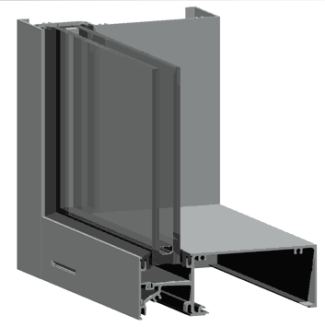
Not only for appearance…..

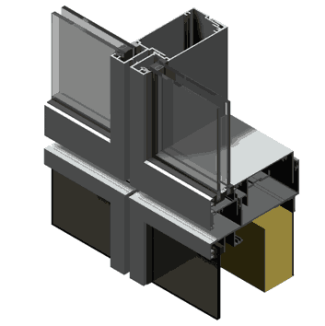
- Window wall is more suitable for structural projections through facades (eg. balconies & concrete ledge sunshades);
- Window wall is more suitable for shorter buildings which are scaffolded during construction;
- There is less area of facade in a window wall so it is more budget oriented;
- Curtain wall is a continuous envelope with no penetrations with subsequent superior weather resistance performance;
- Curtain wall requires no external scaffolding to install, so is more appropriate for tall buildings; there are less items to install, so a curtain wall is erected quicker for tall buildings.

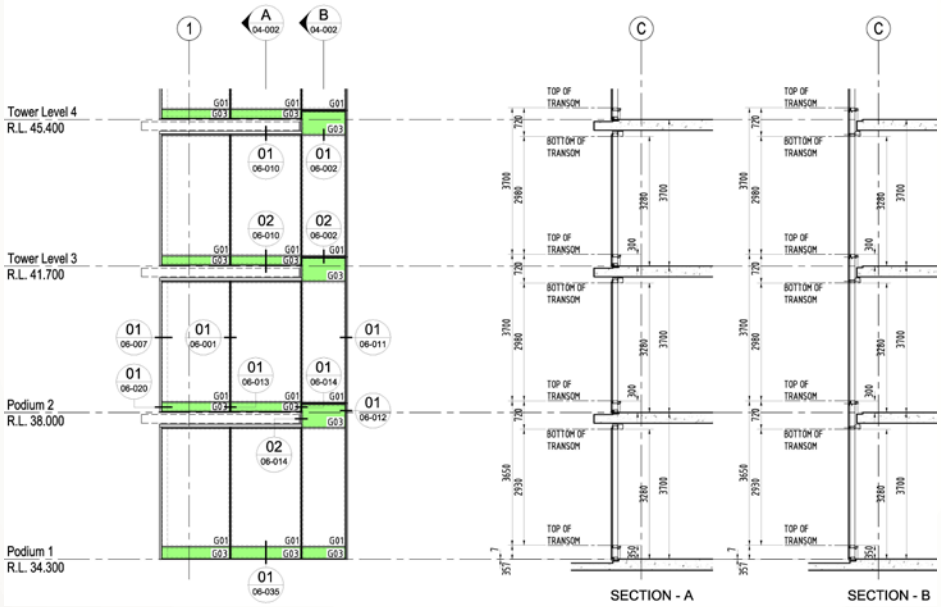
Aluminium Framing Systems

Curtain Wall (refer section – B below)

- Std G.James systems;
- Bespoke extrusion suites custom designed to meet individual project designs.







Window Wall (refer section – A above)

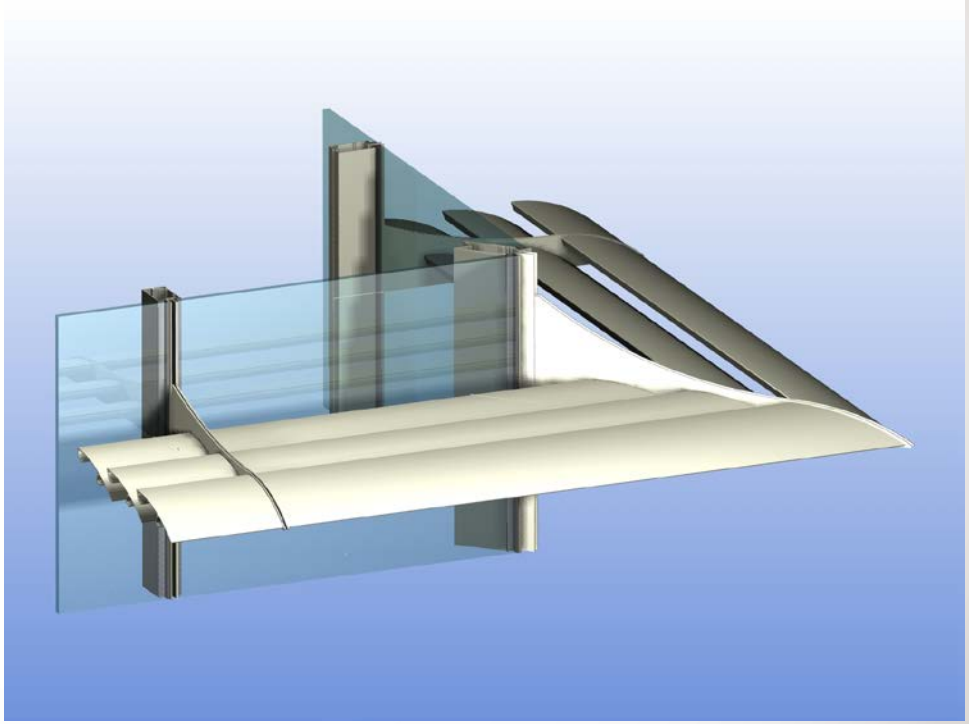
- Std G.James systems of varying look (exposed slab ledges & concealed slab edges, face glazed or centrally pocketed, captive or structurally glazed);
- Std G.James systems of varying structural capacity (eg. 450, 650, 850).

Green Square, Brisbane
Is this window wall or curtain wall?

G.James glass & aluminium

How to achieve energy efficient facades?

- Sunshade devices
- Motorised external venetian blinds
- Double skin facades
- Natural ventilation



G.James glass & aluminium

Sunshade Devices

Design Considerations

- Mitigate pentrations through façade
- Panelised in size for transport
- Factory Fabrication
- Site assembly onto panels prior to panel install
- Light weight
- Minimise Projection

G.James glass & aluminium

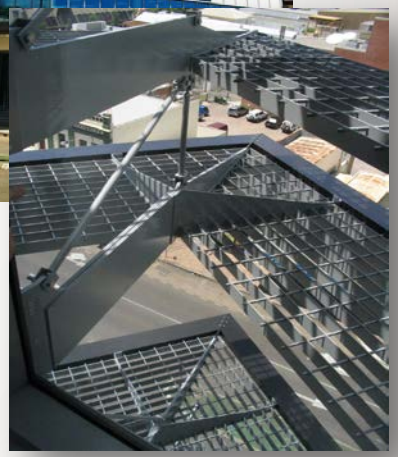
Sunshade Devices

Horizontal Sunblades

Latitude, Sydney

Mossop Building 3, Adelaide

ANZAC Park West, Canberra



Bankwest,Townsville

G.James glass & aluminium

Sunshade Devices

Vertical Fins

Green Square, Brisbane

Wesley House, Brisbane

G.James glass & aluminium

Sunshade Devices

Combined Horizontal Sunblades & Vertical Fins

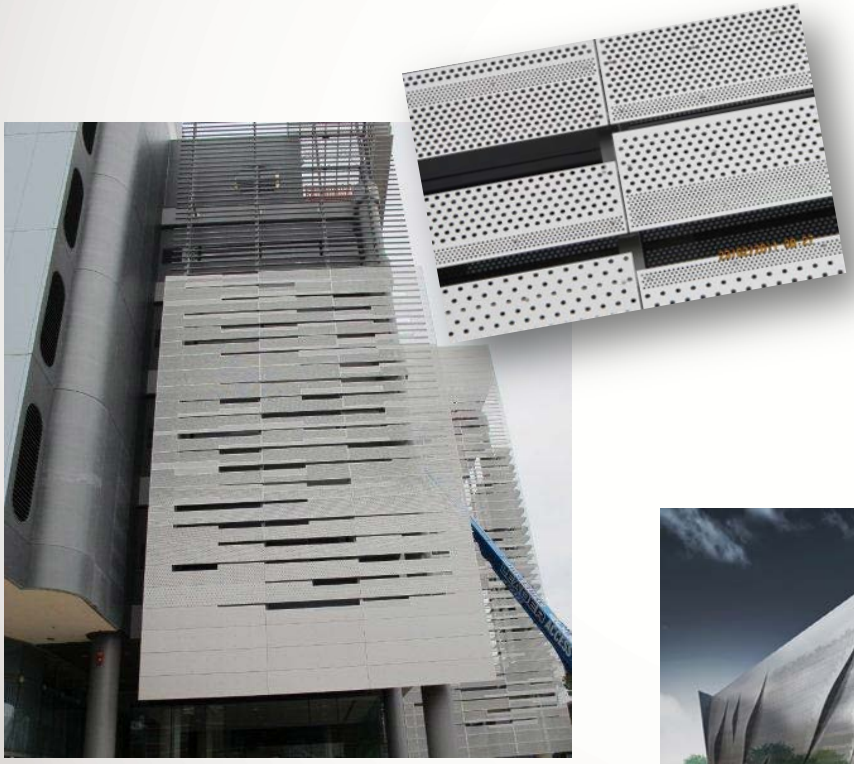
Hamilton Harbour, Brisbane

WEHI, Melbourne

G.James glass & aluminium

Sunshade Devices

Perforated Aluminium Sheet Sunshades



WEHI, Melbourne

UTS Broadway, Sydney

G.James glass & aluminium

Sunshades used for stunning visual effect

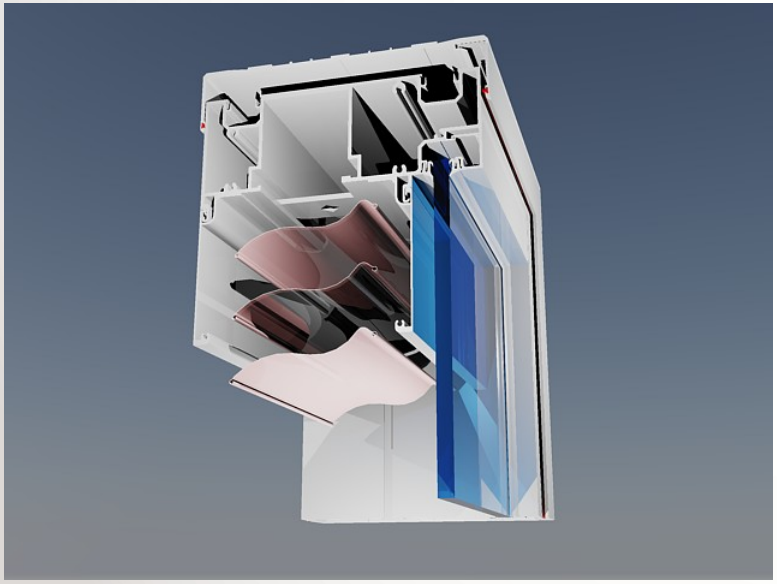
Brisbane Central

Cnr MacLauchlan & Ann Sts, Brisbane

G.James glass & aluminium

Operable External Venitian Blinds

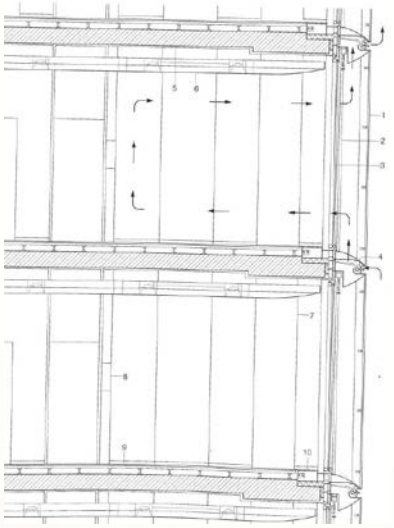
G.James / Liftmaster motorised external venetian blind integrated into window framing system.



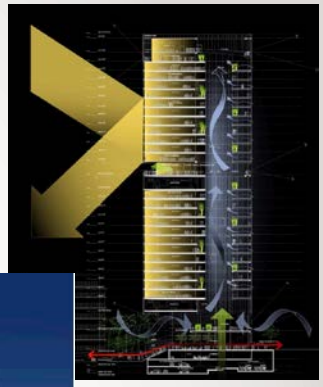
G.James glass & aluminium

Double Skin Facades

Southern Cross, Melbourne



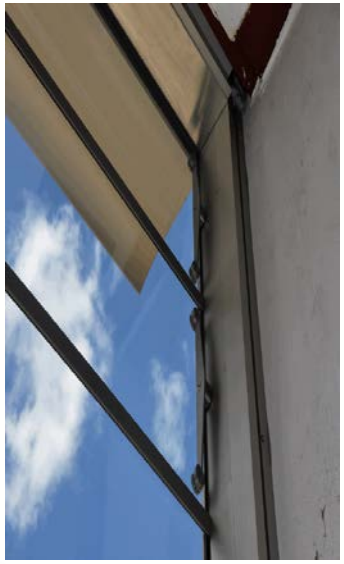
1 Bligh St, Sydney



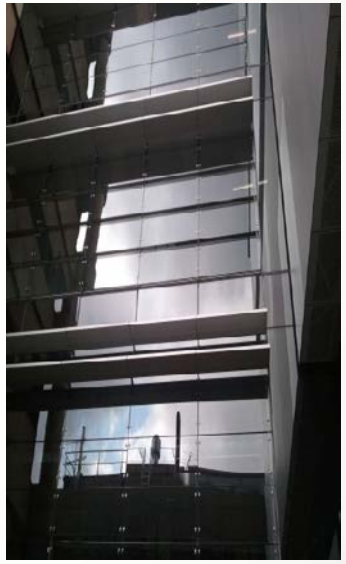
G.James glass & aluminium

Operable Facades and Natural Ventilation

Vertical lift doors, No.1 Bligh St, Sydney



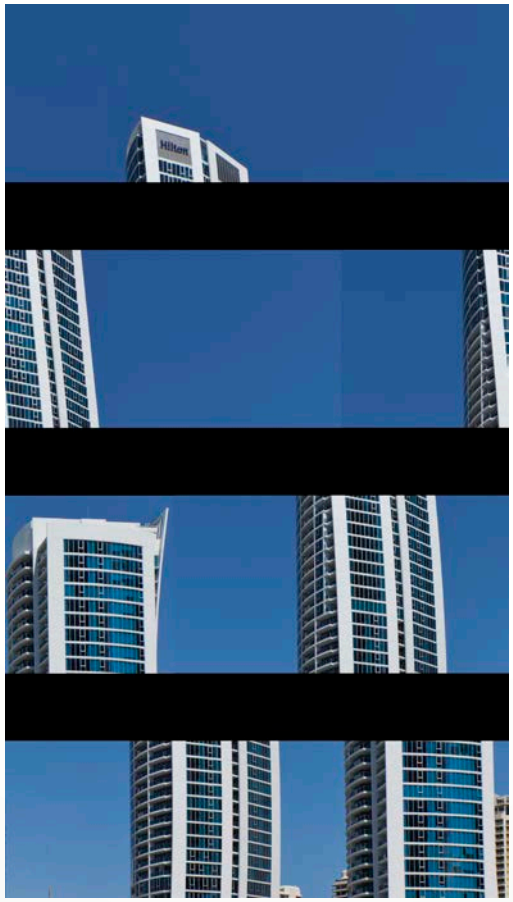
Concealed motorised louvres, No.1 Bligh St, Sydney



Motorised louvres, WEHI, Melbourne

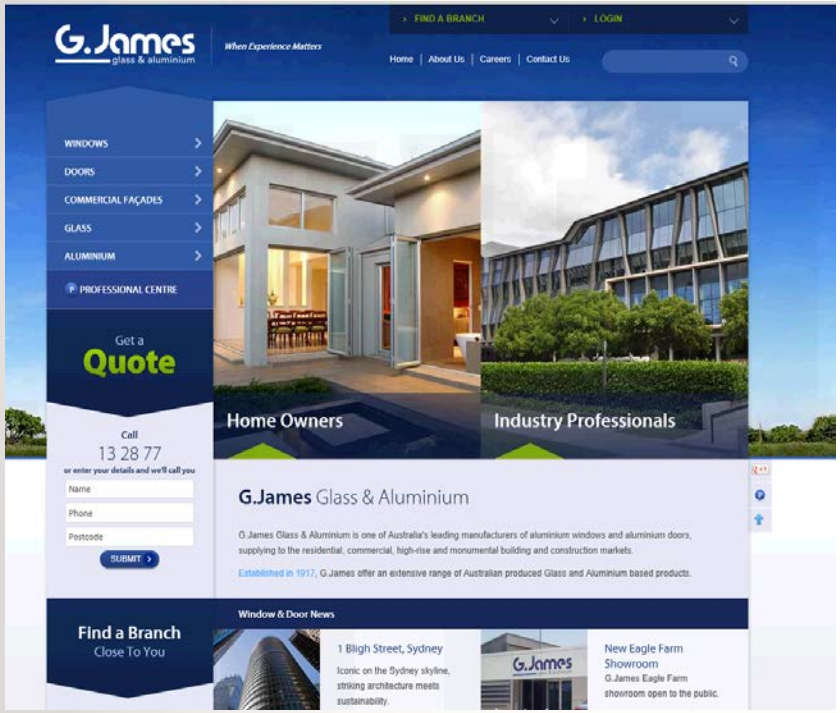
G.James glass & aluminium

G.James makes the difference…



G.James
glass & aluminium

G.James Website & Social Media



www.gjames.com

www.twitter.com/GJamesAU

www.linkedin.com/company/g.james-glass-&-aluminium

www.facebook.com/GJamesAU

www.youtube.com/user/gjamesAU

http://blog.gjames.com

https://plus.google.com/115651397353147925469/posts#115651397353147925469/posts

G.James
glass & aluminium

A day in the life of glass…

H:\video\common\glass\Convert\A Day Made of Glass... Made possible by Corning..wmv

G.James glass & aluminium

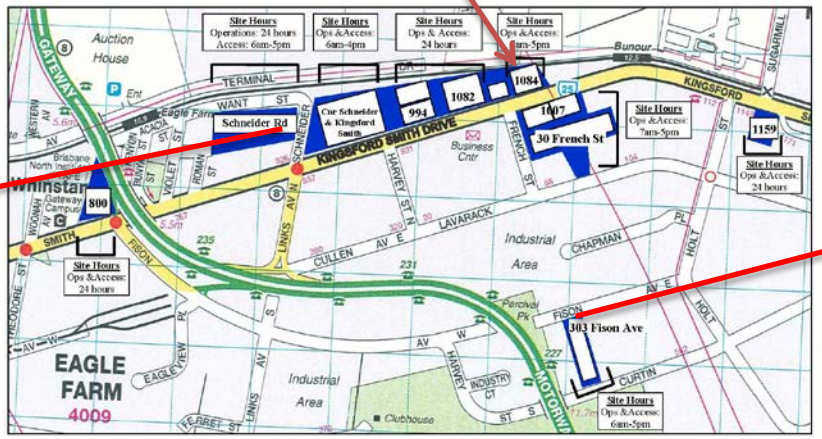
Factory Visits

Glass Laminating

IGU Assembly

Façade test rig.

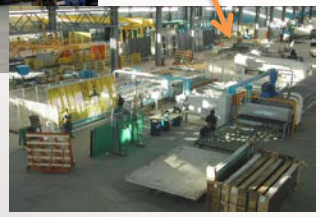
You are here



Schneider Rd Glass Operations Shed 23

Curtain Wall Factory, 303 Fison Ave

Glass Toughening



Glass Cutting & Processing

Tour Guide:
Scott Bartlett
Glass Amin Mgr.

Tour Guides:
Bernie Merrylees &/or Grant Laurens
Commercial Prod. Mgrs

Curtain wall panel assembly, glazing & packing.

Aluminium extrusion, handling, cutting & processing

G.James glass & aluminium

G.James glass & aluminium

When Experience Matters

Thank You