



G.JAMES

Defining
Spaces.



G.JAMES

Worlds Tallest Buildings.....



G.JAMES

Abedian School of Architecture

Bond University Presentation

Presenters:

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

G.James bring Architect's dreams to reality....



One Central Park, Sydney

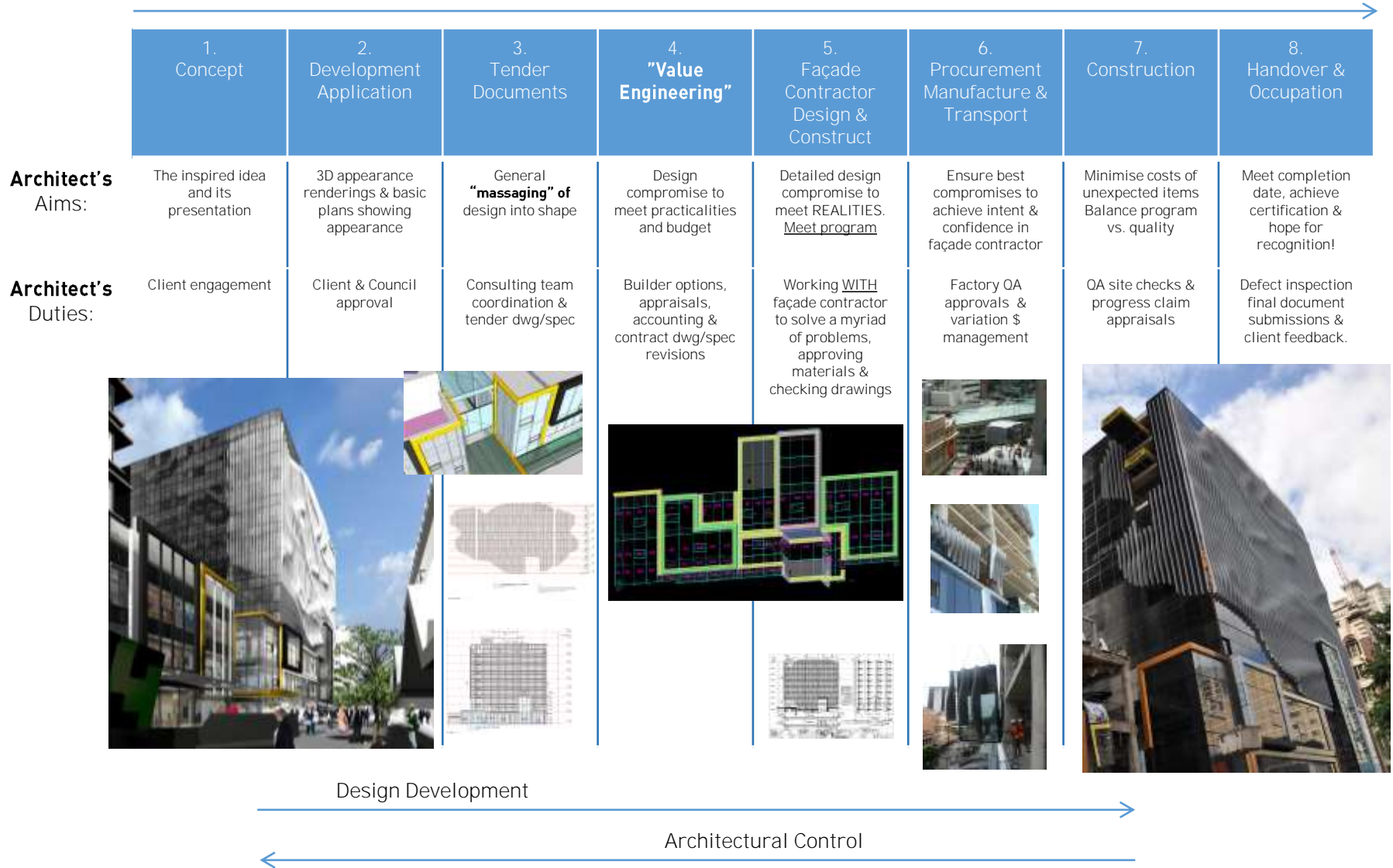
CTBUH Annual Awards - Best Tall Building Worldwide 2014

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



Sir Samuel Griffith Centre, Gold Coast

The Journey from Concept to Reality ...



... Compromise is Needed for Optimum Results

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

Safely withstand actions of:

- Wind
- Rain
- Sunlight
- Heat & Cold

Control the passage of:

- Heat
- Air
- Light
- Sound

Consider practicalities of:

- Materials
- Longevity
- Manufacture
- Transport
- Installation



Abedian School of Architecture, Bond University, Gold Coast
Architect: Cook Robotham Architectural Bureau (CRAB) – Sir Peter Cook

Consider the Options...

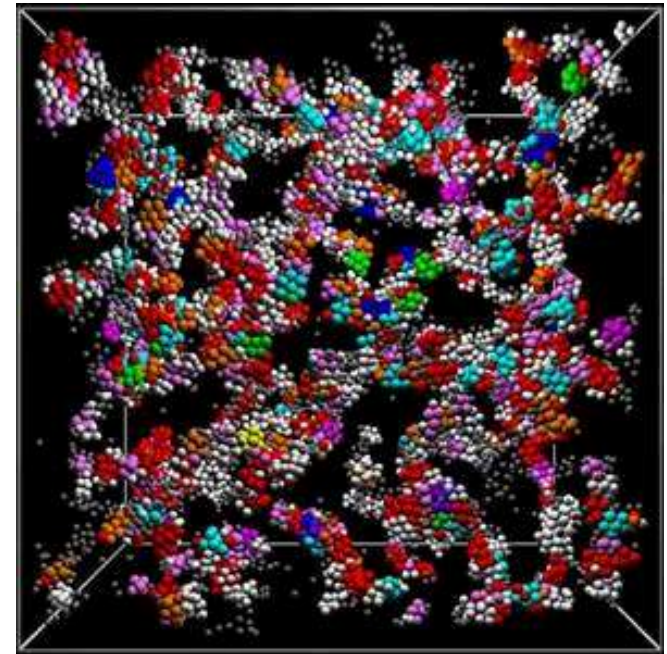


Riverside Centre vs. Riparian Plaza

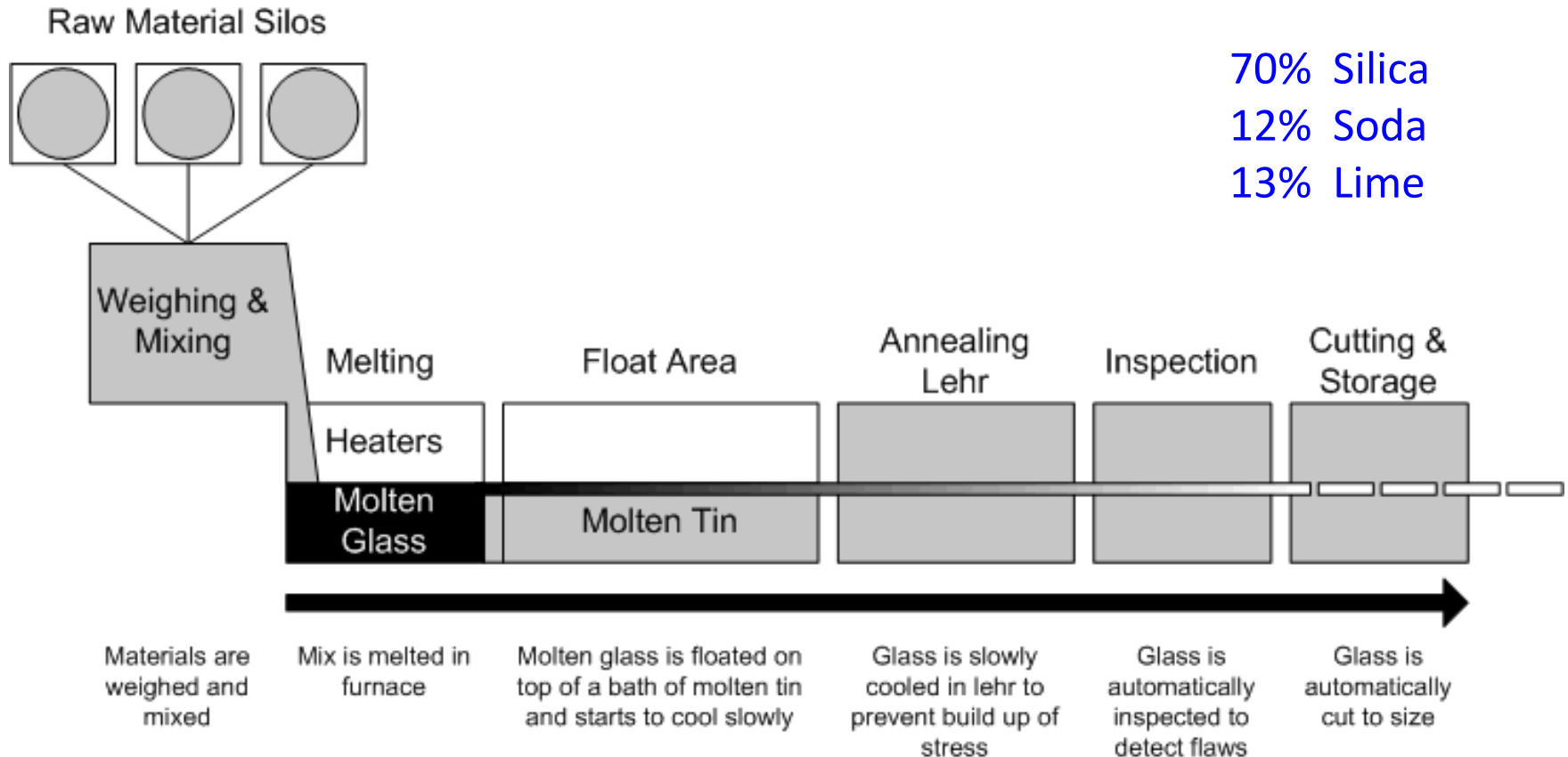
"Good design doesn't date" - Harry Siedler

What is Glass?

- It is a non crystalline solid
- 5000 B.C. first glass is made
- 17th century – first window glass
- If glass could be made without surface flaws it would be 4 times stronger than steel.
- No other product can provide:
 - Daylight
 - Views
 - Protection from the elements
 - Performance
- What you can do with glass is up to your imagination



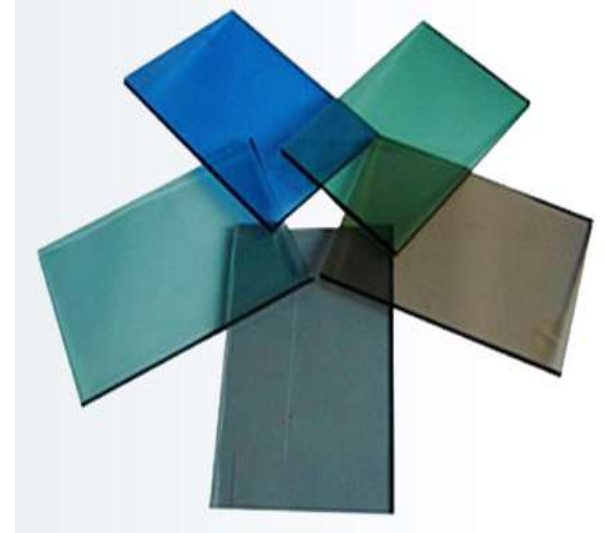
The Float Glass Process



<http://educationcenter.ppg.com/>

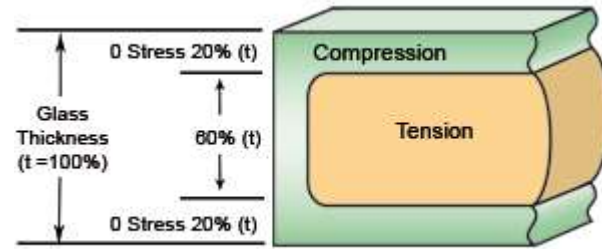
What are the options in Glass?

- Clear
- Low Iron
- Body Tinted (Grey, Green, Blue, Bronze, SuperGreen, SuperBlue, SuperGrey)
- Patterned Glass



What can we do with this Glass ?

- Annealed (Normal)
- Furnace
 - Toughened
 - Toughened Heat Soaked
 - Heat Strengthened
- Laminate
- Coated
 - Offline (Reflective, Low E)
 - Online (Reflective, Low E)
- Curve Glass



Is all “safety” glass safe?



In applications of:

- Shear walls;
- Overhead;
- Balustrades



Is all “safety” glass safe?

In applications of:

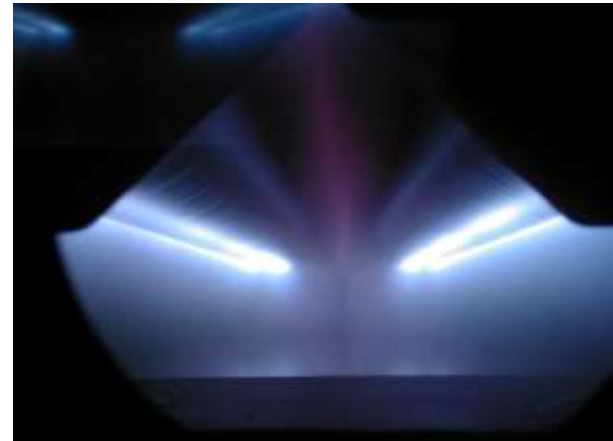
- Shear walls;
- Overhead;
- Balustrades



Beware of the post-breakage risks associated with toughened and toughened laminated glass! G.James internal policy is decades ahead of legislation around the world, which is only now catching up – Singapore: recently; Canada: soon; USA: debating; Australia- ???

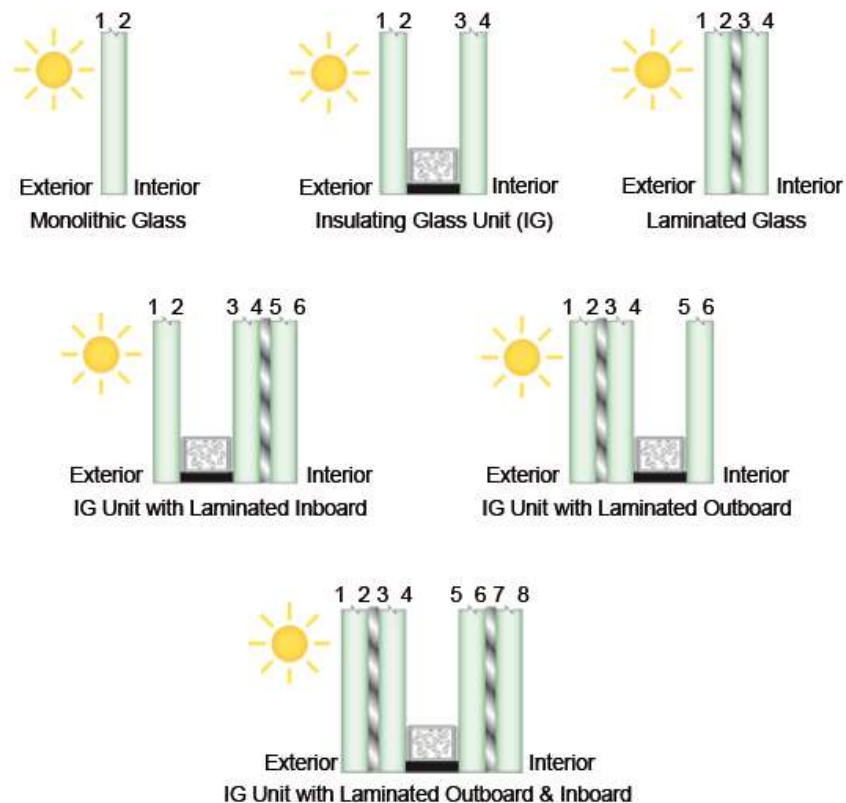
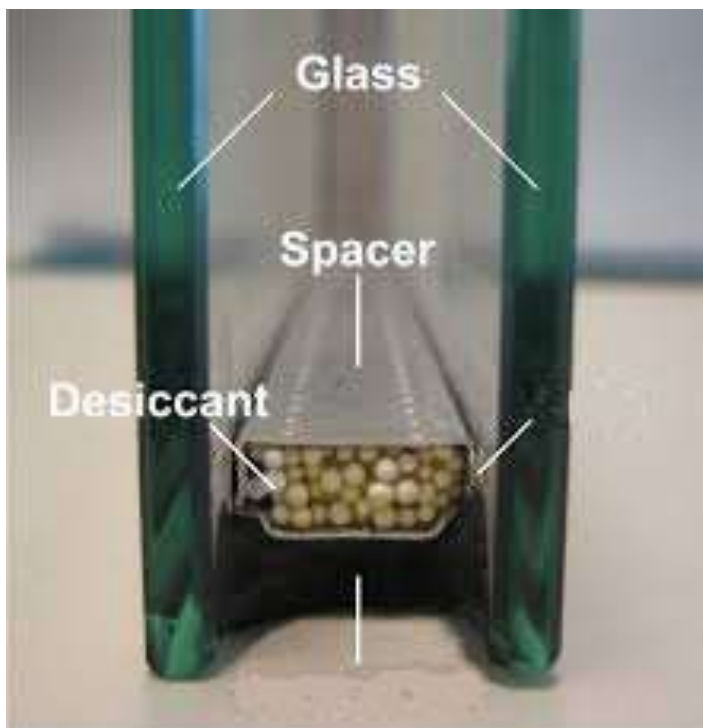
What can we do with this Glass ?

- Coated
 - Offline (Reflective, Low E)
 - Online (Reflective, Low E)
- Curve Glass



What can we do with this Glass ?

- Double Glaze, also called
“Insulated Glaze Unit” (IGU)



Glass surface number terminology

What can we do with this Glass ?

- Ceramic Paint
 - Ceramic Frit
 - Two Pak



Use Glass to create the “LOOK”





Facade Framing / Support Systems

If 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
- Grid Shell
- Cable Net



Frameless

- Shopfronts
- Glass Fins
- Structural Glass





"I need 6m tall x 3m wide glazed pivot doors. What's G.James standard product for this? And if you don't have a standard product, why not!"

"...well, there aren't too many 6m tall people around, so there hasn't been much demand for doors of this height. Lets first see if there is an economic solution amongst G.James standard product range?"

Indicative Commercial fixed glazing sizes:

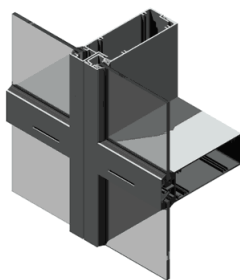
Cost effective mullion ctrs

are between 1200 to 1800

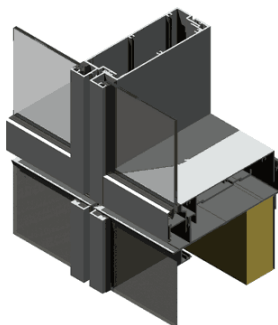
- **450 Series** (nom. 100 deep)
~ 3000 max. frame height



- **650 Series** (nom. 150 deep)
~ 3500 max. frame height



- **850 Series** (nom. 200 deep)
~ 4500 max. frame height



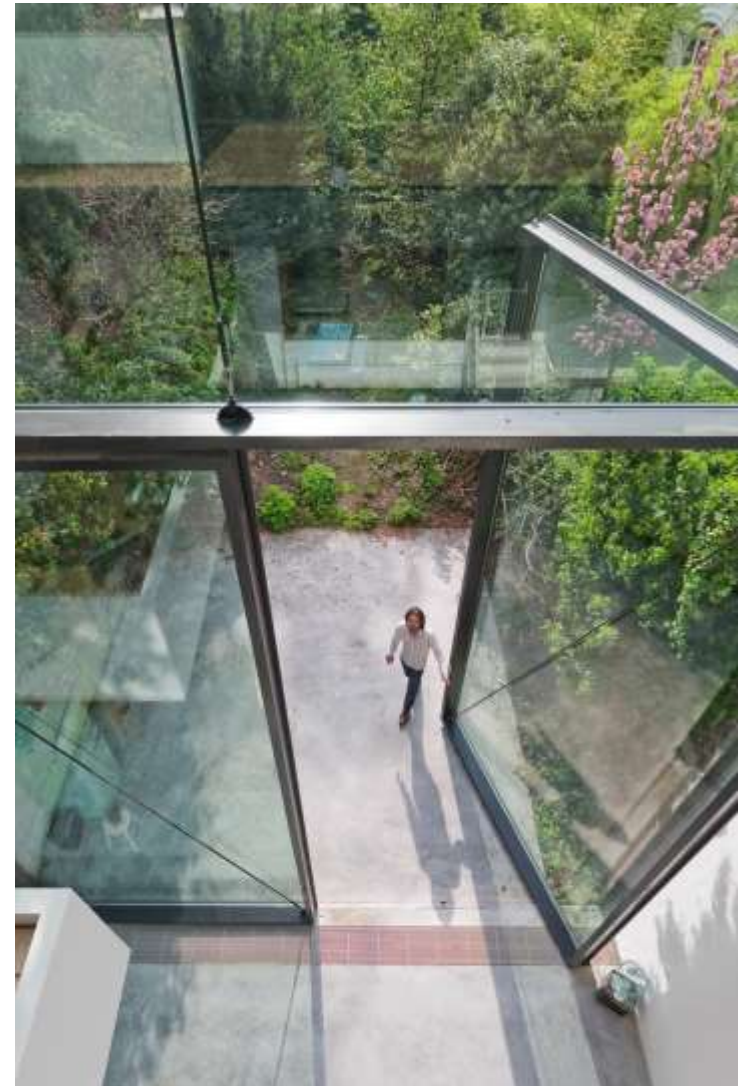
General Commercial Product Limitations on sizing of Operable Door/Window Sashes

Product/Series/Type	Max. Sizes - Ht & Wd (mm)	Hardware Limitation
<ul style="list-style-type: none"> • 150 Series T.H.I.S. - Single and double glazed 	1800 x 1500	24 kg @ 90° opening 100 kg @ 20° opening
Awning - Single glazed only	1500 x 1200	24 kg @ 90° opening 100 kg @ 20° opening
Casement - Single glazed only	1500 x 800	52 kg
<ul style="list-style-type: none"> • 165 Series Sliding windows 	1600 x 1200	48 kg per sash (4 rollers)
<ul style="list-style-type: none"> • 245 Series Commercial Sliding *Upgraded design version 	2400 x 1200 2600 x 1200	200 kg per sash 200 kg per sash
<ul style="list-style-type: none"> • 265-660 Series Awning – Single glazed only 	1500 x 1200	24 kg @ 90° opening 100 kg @ 20° opening
Casement – Single glazed only	1500 x 800	52 kg
<ul style="list-style-type: none"> • 445 Standard Sliding Door *Custom design version 	2700 x 1500 2800 x 2200	200 kg per sash 450 kg per sash
<ul style="list-style-type: none"> • 475/476 Series Hinged Doors 475/476-200 	2400 x 1000 2400 x 1200 2400 x 1800	Hinged Pivot Sliding (Please check auto-door usage)
475-300	2700 x 1000 2700 x 1200 2700 x 1500	Hinged Pivot Sliding (Please check auto-door usage)
<ul style="list-style-type: none"> • 477 Series Bi-Fold *477-220 minimum sash width 700 mm and 477-300 minimum sash width 750 mm* 		
477-100 (E2) Bottom rolling	1500 x 1200	40 kg per sash (E2)
477-220 (E2) Even Leaves	2400 x 1100	40 kg per sash (E2)
477-220 (E2) 3 Un-Even	2400 x 950	40 kg per sash (E2)
477-300 (E3)	3000 x 1200	80 kg per sash (E3)

“But man has set foot on the moon!
Why can't G.James give me a 6m tall x 3m wide glazed pivot door?”

“... sure, if you have the budget and timeframe of NASA, G.James will gladly assist in lightening that load on your hip pocket...”





Are these the largest glass pivoting doors in the world? – Antwerp residence

Caution is needed...

Beware! As a professional, you have a duty of care to ensure public safety.

How to
minimise the
risk?

Apple Store Shopper Crushed Under 800 Pound Glass Door

Thursday, December 26, 2013, by Leslie Price



APPLE
BETHESDA
TODAY IN HORRIFY
COMMENTS

Photo via Reddit.

An **Apple store shopper** in **Bethesda, MD** was seriously hurt on Monday when one of the store's massive glass doors came **unhinged and fell on him**.

According to blog Bethesda Now, "the adult male patient was taken to a local hospital with serious, believed to be non-life threatening injuries." The store remained open afterward. Someone claiming to be a friend of the injured party took to [Reddit](#) to post a photo of the incident, saying that the man's pelvis was crushed by the door and that Apple "hasn't made any attempts to get in touch with him." That was yesterday.

Through
prototype
testing.

How do we test glass ??

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

G.James test full scale facades.

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



Some people accidentally test full buildings to destruction!



Design Considerations: Wind Loads

... 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?



An appreciation of wind pressures



Brisbane:

approx 3kPa wind pressure;

- This is equivalent to how many people (~75kg ea) standing on a typical 2400x1200 sized lite of glass?

Cyclonic Areas:

up to 14kPa wind pressure;

- This is equivalent of how many people (~75kg ea) standing on a typical 2400x1200 sized lite of glass?

An appreciation of wind pressures



Brisbane:

approx 3kPa wind pressure;

- Equivalent to weight of 4 people/m²
- That's a total of 12 people standing on a typical 2400x1200 sized lite of glass

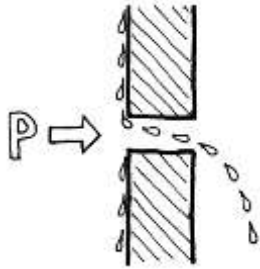
Cyclonic Areas:

up to 14kPa wind pressure;

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

Design Considerations: Weather Resistance

For leaks to occur you need: Water + Hole + Force to drive water through hole



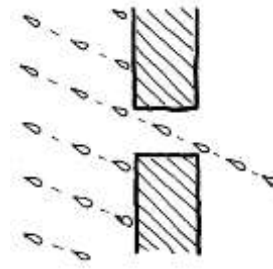
Forces: Pressure

or



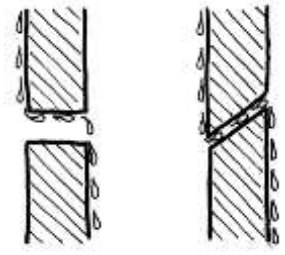
Gravity

or

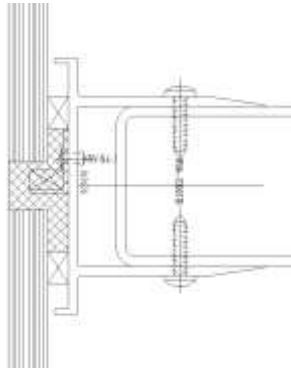


Kinetic energy

or

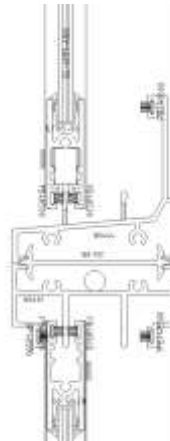


Surface tension



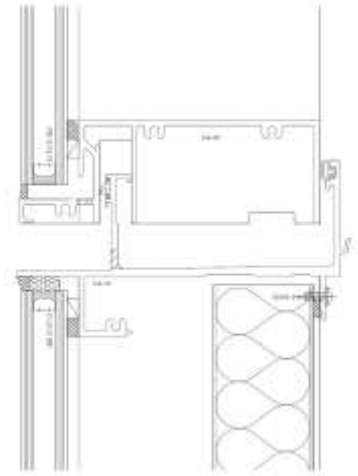
Types: Face Sealed

or



Water Head

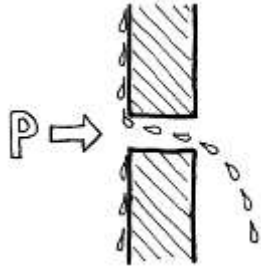
or



Pressure Equalised

Weatherproofing Principles

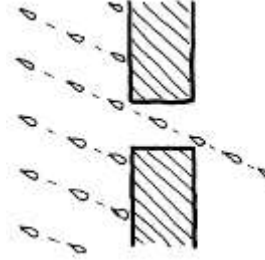
For leaks to occur you need: **Water** + ~~Hole~~ + **Force to drive water through hole**



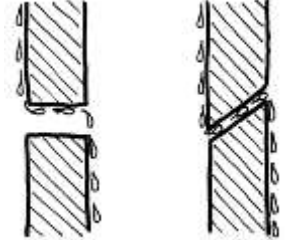
Forces: Pressure



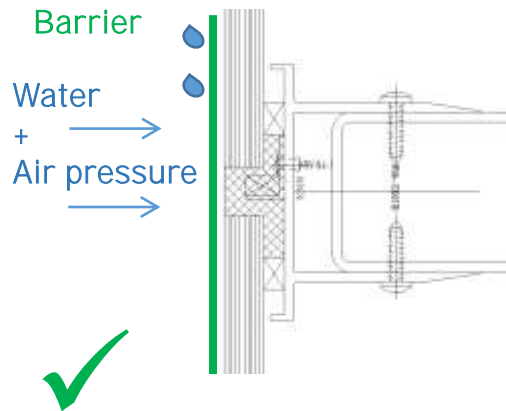
or Gravity



or Kinetic energy



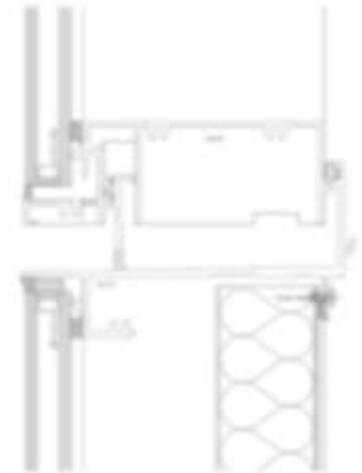
or Surface tension



Types: **Face Sealed**



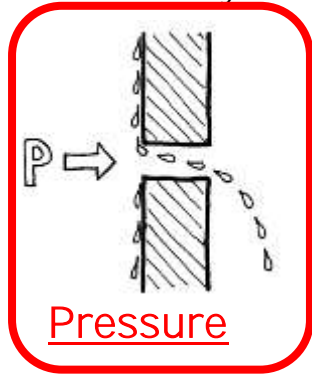
or Water Head



or Pressure Equalised

Weatherproofing Principles

For leaks to occur you need: **Water** + **Hole** + **Force to drive water through hole**



Forces: Pressure

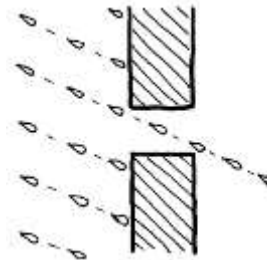
or

Gravity



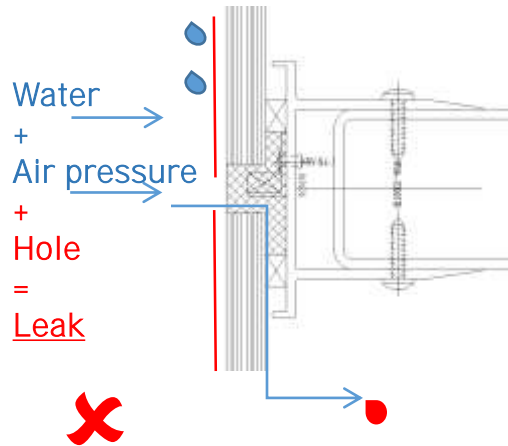
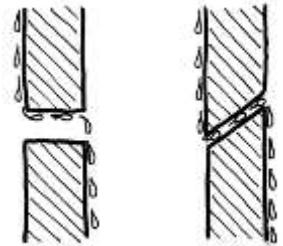
or

Kinetic energy



or

Surface tension



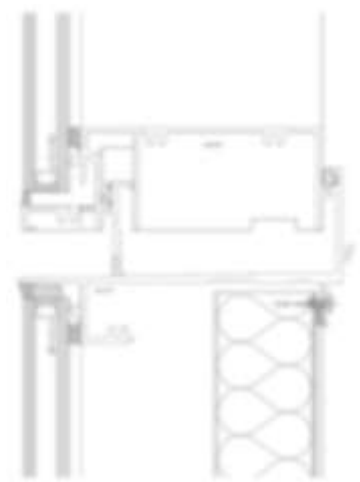
Types: **Face Sealed**

or

Water Head

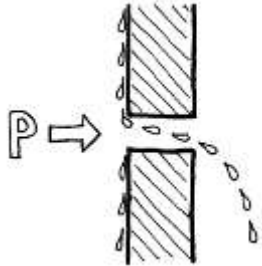
or

Pressure Equalised



Weatherproofing Principles

For leaks to occur you need: **Water** + **Hole** + **Force to drive water through hole**



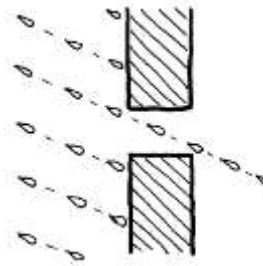
Forces: Pressure

or



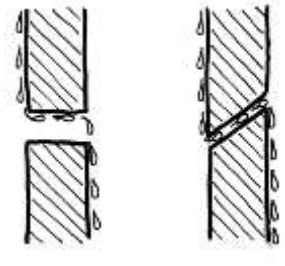
Gravity

or

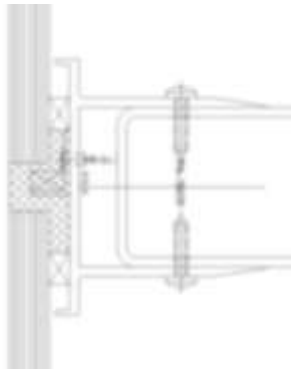


Kinetic energy

or

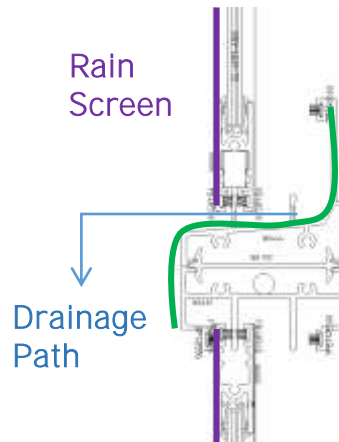


Surface tension



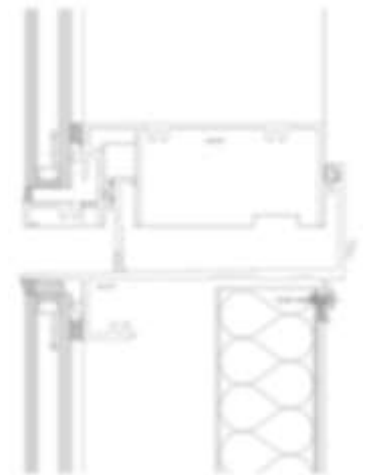
Types: Face Sealed

or



Water Head

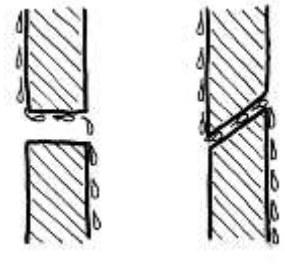
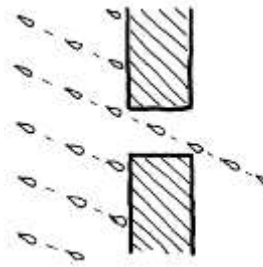
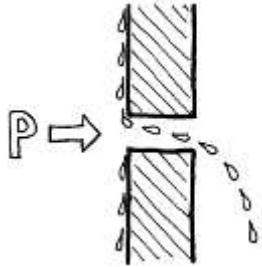
or



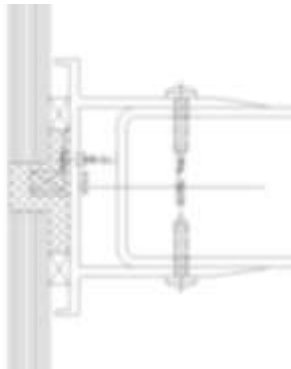
Pressure Equalised

Weatherproofing Principles

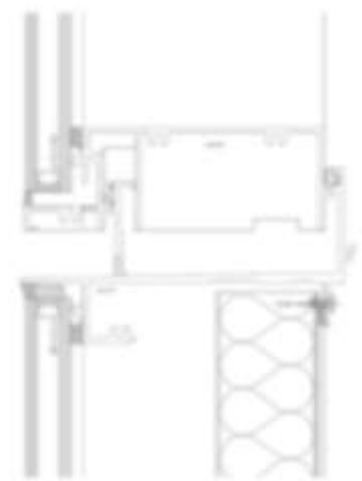
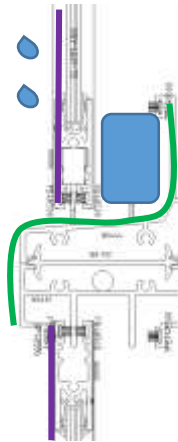
For leaks to occur you need: **Water** + **Hole** + ~~Force to drive water through hole~~



~~Forces: Pressure or Gravity or Kinetic energy or Surface tension~~



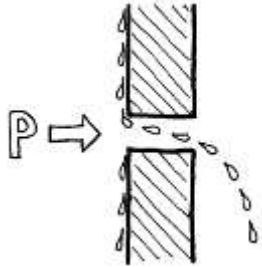
Water
+
Air pressure
=
Balancing force
of head of
water



Types: Face Sealed or **Water Head** or Pressure Equalised

Weatherproofing Principles

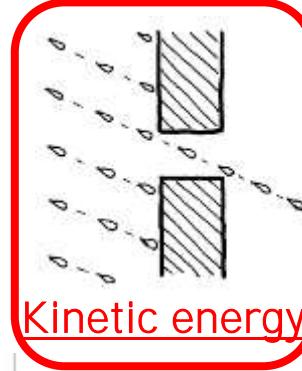
For leaks to occur you need: **Water** + **Hole** + **Force to drive water through hole**



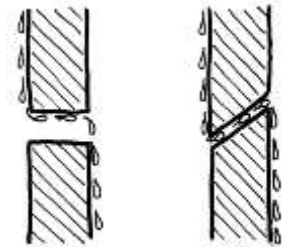
Forces: Pressure



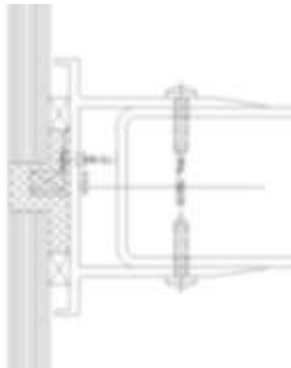
or Gravity



or **Kinetic energy**



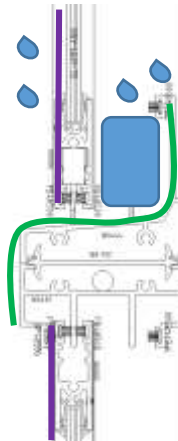
or Surface tension



Types: Face Sealed



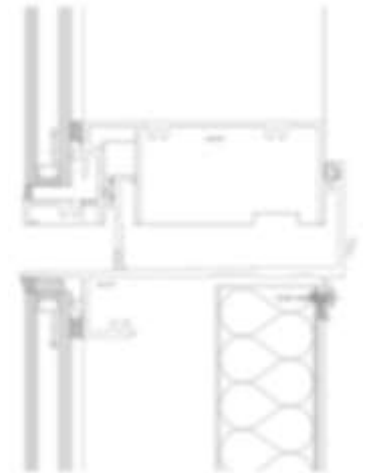
= Sloshing of head of water



Water Head



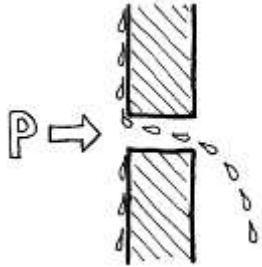
or



Pressure Equalised

Weatherproofing Principles

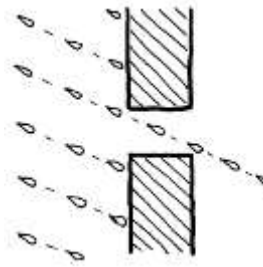
For leaks to occur you need: Water + Hole + Force to drive water through hole



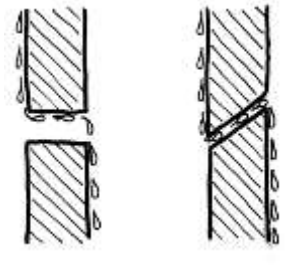
Forces: Pressure



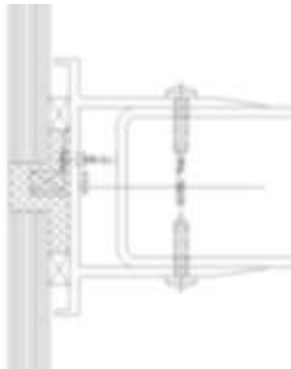
or Gravity



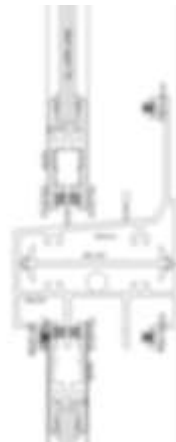
or Kinetic energy



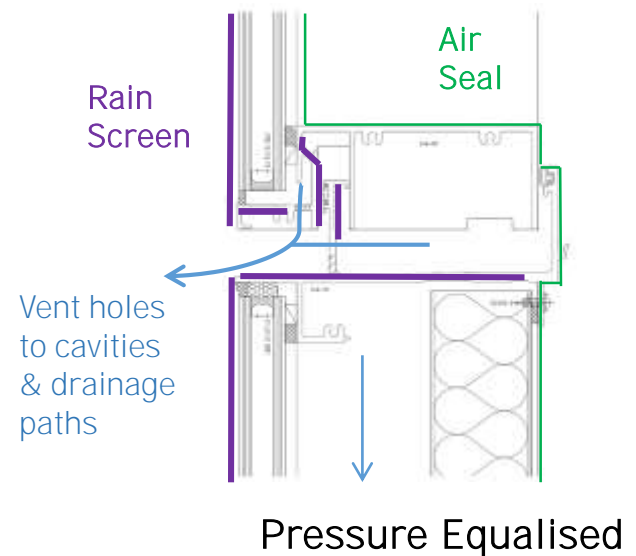
or Surface tension



Types: Face Sealed



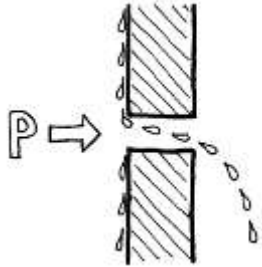
or Water Head



or Pressure Equalised

Weatherproofing Principles

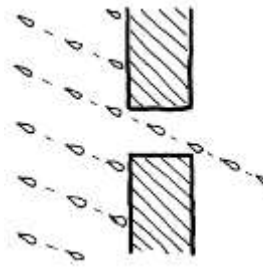
For leaks to occur you need: Water + **Hole** + Force to drive water through hole



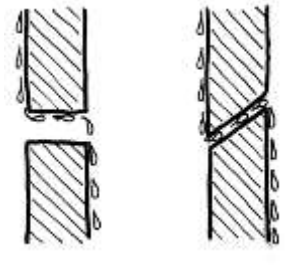
Forces: Pressure



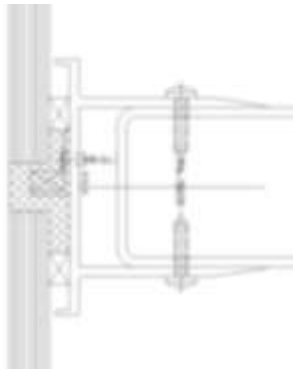
or Gravity



or Kinetic energy



or Surface tension

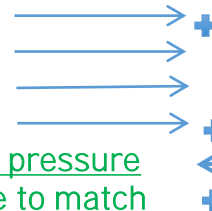


Types: Face Sealed

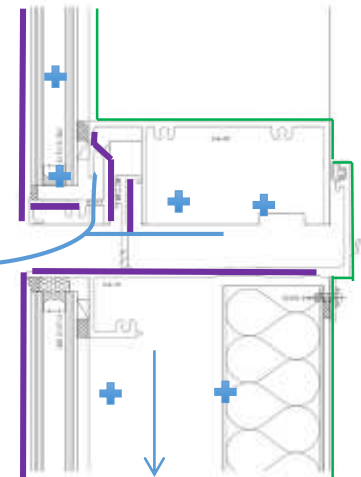


or Water Head

Wind Gusting



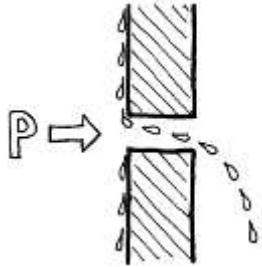
=
Cavities pressure
equalise to match
outside wind pressure



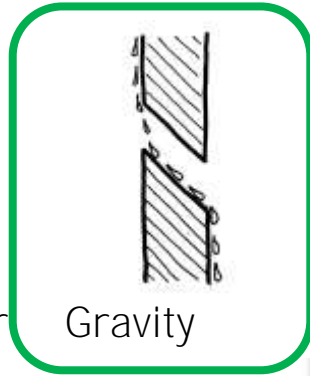
Pressure Equalised

Weatherproofing Principles

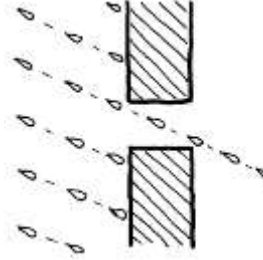
For leaks to occur you need: ~~Water~~ + **Hole** + ~~Force to drive water through hole~~



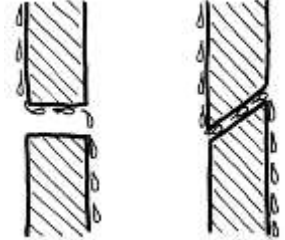
Forces: Pressure



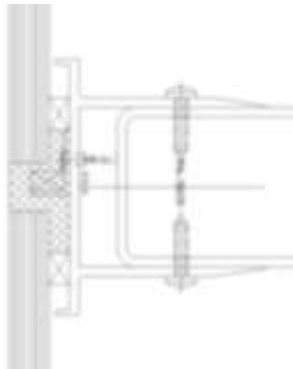
or Gravity



or Kinetic energy



or Surface tension



Types: Face Sealed



or Water Head

Wind Gusting
+
Water
=
Cavities pressure
equalise to outside =>
Gravity is only force
acting on water
entering cavities so it
drops to bottom &
drains outside.



Pressure Equalised

Pressure equalisation is not new

insight—out

Insight Drainage, Holes and Moderation

An edited version of this insight first appeared in the ASHRAE Journal.

By Joseph W. Lstiburek, Ph.D., P.Eng., Fellow ASHRAE

Ever wonder how we can build a 50 story glass tower that doesn't leak, but we can't seem to build a two-story house that doesn't leak? The answer is a little bit of counter intuitive thinking.

We have learned to add holes and drainage in tall buildings in order for them to work. The lesson learned in tall buildings is that we can't keep the rain out so we drain it out after it has entered. We can reduce the amount that enters but we can never completely keep it all out. Drainage and holes are key. These are regularly installed in tall buildings but not in short buildings. Until we add holes and drainage to small buildings they will continue to leak. This is so counter-intuitive that it borders on magic.

This story all begins with a cup in the rain (Figure 1). It is a plain ordinary cup, nothing magical about it yet. It is oriented parallel to the ground. Rain falls out of the sky due to something called gravity. The raindrops have momentum ("kinetic energy") associated with them. There is no wind in this simple story of a cup in the rain so far. Sometimes the raindrops don't fall completely straight down and so they will occasionally fall into the cup. But so and

* We don't need to ask why they don't always fall straight down – we just need to accept the fact that they don't always fall straight down. Yes, I know about this wind thing... but I don't want to consider wind yet. It sometimes helps to think of this momentum thing using a baseball analogy. Think of a softball that someone throws through an open window on a day without wind. The momentum associated with the softball carries it through the open window – wind does not carry it. In solving the rain problem we need to consider momentum independent of wind even though wind gives raindrops momentum – as does gravity. The engineers solve the complex wind driven rain problem into three simple concepts: gravity, momentum and air pressure differences. This is not strictly true, but it is close enough – remember we are engineers and not physicists. If someone mentions the Coriolis force here I am going to smack them.

May 2008

www.buildingscience.com

Drainage, Holes and Moderation

behold, even though some raindrops enter the cup the rainwater can drain out of the cup due to the slope of the cup with a little help from gravity. Drainage at work.

Let's make it a bit more complicated. Let's add wind (Figure 2). Wind enters the cup and pressurizes it. If the wind can't get out the back of the cup (assume the cup has no holes) no more wind can enter into the front of the cup. Presto—no wind entry into the cup therefore no wind driven rain entry into the cup. That pesky momentum thing is still happening with the raindrops, but no matter we drain those suckers back to the outside as before. There's that drainage thing again.

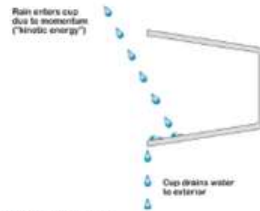


Figure 1: Cup in the Rain
Occasionally raindrops enter cup due to momentum and drain back to exterior via gravity and slope of cup. Did I mention drainage?

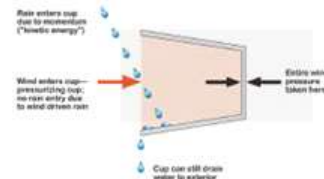


Figure 2: Cup in the Wind
Wind pressurizes cup so that wind driven rain cannot enter. Rain still enters cup due to momentum but this rainwater drains back to exterior. Note the drainage thing.

A M E R I C A N A R C H I T E C T U R A L

AAMA CW-RS-1-04

Editorially Revised: 11/04

The Rain Screen Principle
and Pressure-Equalized
Wall Design



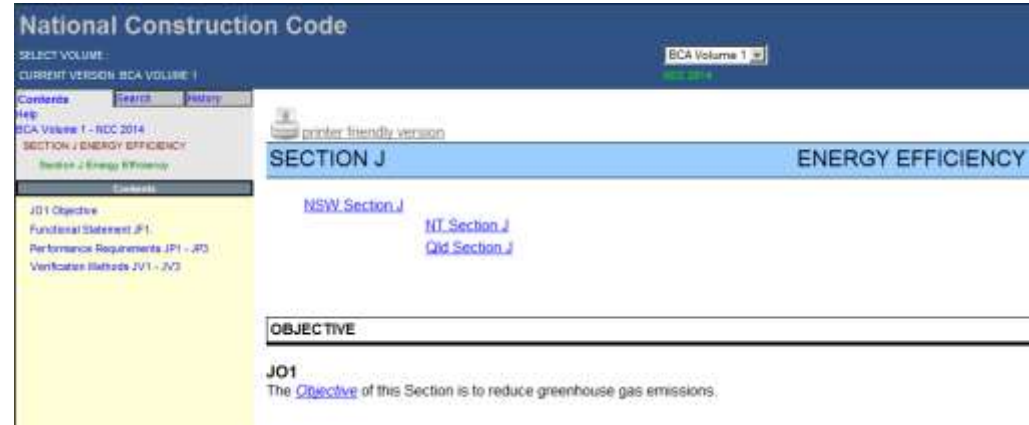
M A N U F A C T U R E R S A S S O C I A T I O N



G.JAMES

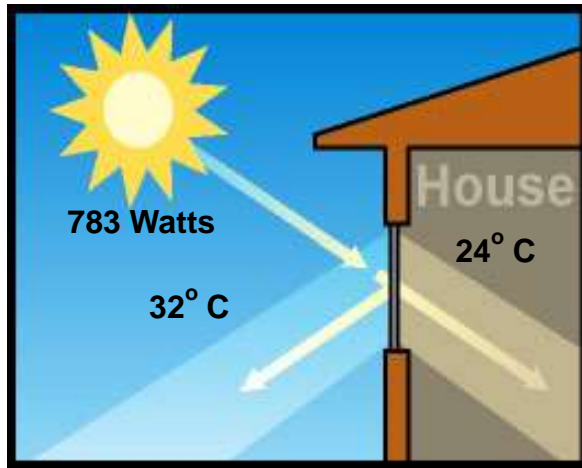
Defining
Spaces.

Design Considerations: Saving the planet

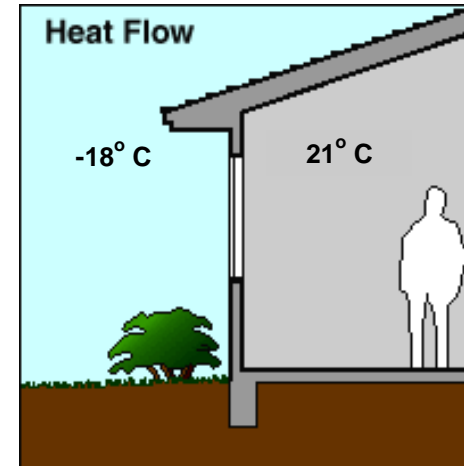


- Government legislation dictates that we reduce greenhouse gas emissions through better thermal performance of building facades.

How do we measure Window Thermal Performance ?



SHGC – Solar Heat Gain Coefficient



U-Value (W/M²C)

The lower the number the better the performance

NCC (BCA) Section J

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		P&H or device		Shading		Multipliers		Size	Element share of % of allowance used		
ID	Description (optional)	Option A façades	Option B façades	Height (m)	Width (m)	Area (m²)	Total U-Value (NFRG)	SHGC (NFRG)	P (m)	H (m)	P/H	G (m)	Heating (\$ _h)	Cooling (\$ _c)	Area used (m²)			
1		S	Option B façades	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	0.82	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	0.82	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



Copyright © 2010 – Australian Government, State and Territory Governments of Australia. All Rights Reserved

page 1 of 1

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

i 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.




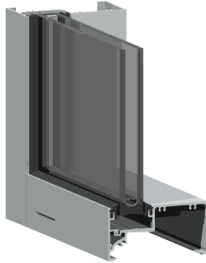
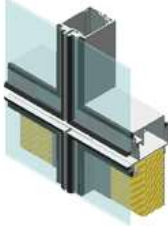
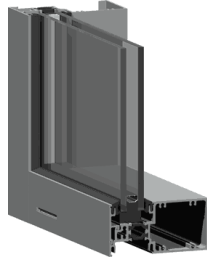
Search:

Series	Glass	Uw	SHGCw	VTw	Glazing	Cooling	Heating
048	Awning Window 3mm Clear / 14mm Air / 3mm Sunergy Clear Low-E	3.60	0.62	0.46	Double	★★★★	★★★★★1
048	Awning Window 3mm Clear / 14mm Air Gap / 3mm Clear	4.00	0.57	0.58	Double	★★★	★★★★★
048	Awning Window 3mm Clear / 14mm Air Gap / 3mm Energy Advantage Low-E	3.40	0.63	0.54	Double	★★★★	★★★★★1
048	Awning Window 3mm Energy Advantage Low-E	4.90	0.53	0.57	Single	★★	★★★★★1
048	Awning Window 3mm Energy Advantage Low-E / 14mm Air Gap / 3mm Clear	3.40	0.49	0.54	Double	★★★★	★★★★★1
048	Awning Window 3mm Sunergy Clear Low-E / 14mm Air / 3mm Clear	3.60	0.41	0.46	Double	★★★★	★★★★★
048	Awning Window 3mm Sungate 500 Low-E	5.10	0.54	0.58	Single	★★	★★★★★1
048	Awning Window 4mm Azura / 12mm Air Gap / 4mm Clear	4.00	0.95	0.48	Double	★★★★	★★★★★1

Glass/Frame System Matrix

Framing Type - Thermal Improvement →

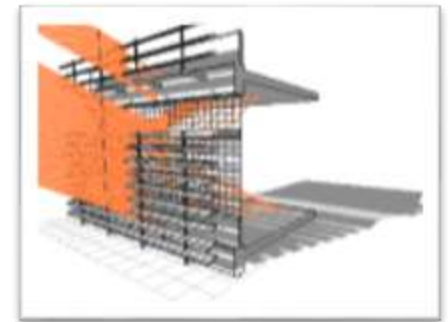
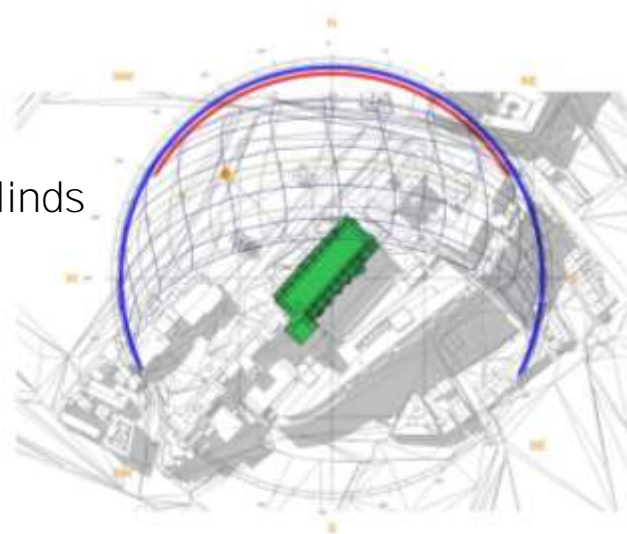
↓ Glass Type - Thermal Improvement

1. Centre Pocket	2. Captive Face Glazed	3. Structurally Glazed	4. Captive Thermally Broken
 <p>1. Single Glazed</p>  <p>2. Double Glazed 3. Deep Cavity IGU 4. Triple Glazed 5. IGU with Interstitial Blinds</p>	 <p>1. Single Glazed</p>  <p>2. Double Glazed 3. Deep Cavity IGU 4. Triple Glazed 5. IGU with Interstitial Blinds</p>	 <p>1. Single Glazed</p> <p>2. Double Glazed 3. Deep Cavity IGU 4. Triple Glazed 5. IGU with Interstitial Blinds</p>	<p>1. Single Glazed</p>  <p>2. Double Glazed 3. Deep Cavity IGU 4. Triple Glazed 5. IGU with Interstitial Blinds</p>

Energy Efficiency in Facades

Besides glass and aluminium framing options, how else can we improve energy efficiency in facades?

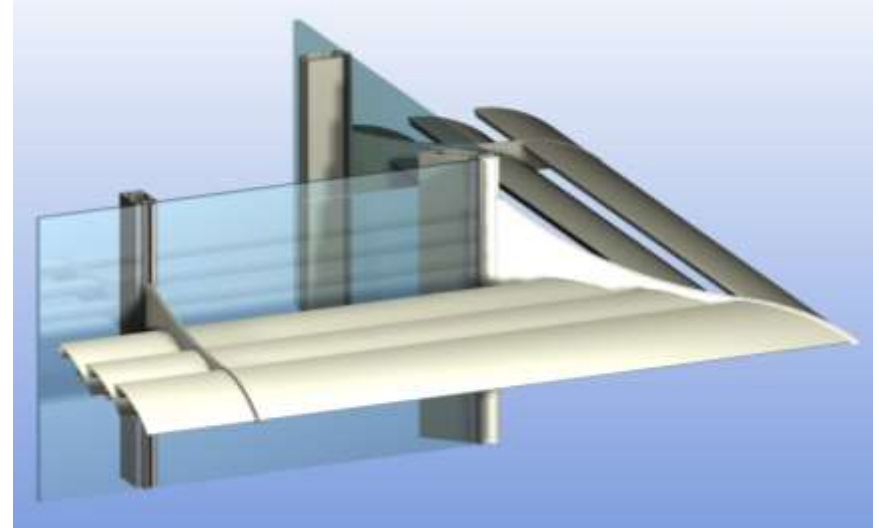
- Sunshade devices
- Motorised external venetian blinds
- Double skin facades
- Natural ventilation



Sunshade Devices

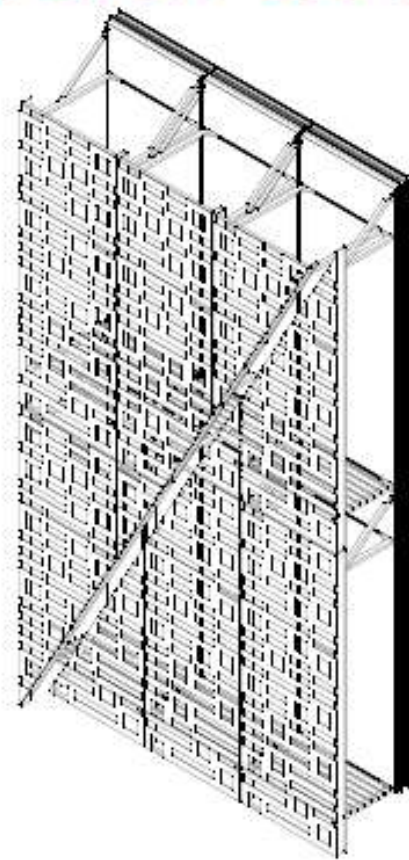
Design Considerations

- Minimise projections as sunshades catch wind loads like spinnakers!
- Mitigate penetrations through façade (potential water leaks)
- Factory fabrication for quality control & economic labour
- Panelised in size for economic transport , lifting & installation
- For safety - site assembly onto glazing panels on the floor prior to panel install
- Light weight



ARCHITECTURAL SHADING SYSTEMS

March 2016



An ideal solution to any external feature will protect against the weather while attached to the outside of the facade, mitigating penetrations through the facade. G.James use light weight, corrosion resistant panelized systems that are pre assembled in the factory. They are designed to easily attach to framing on site prior to facade panel install. Consideration is given to safe handling, transportation and quick fixing methods that include removal for replacement or reglazing purposes of the panel it attaches to.

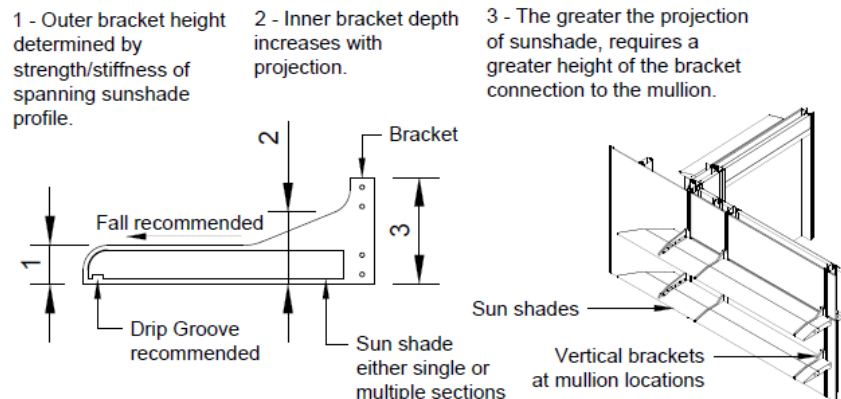
There are 3 types of solar control systems:

- 1) Horizontal Projecting Sun Shades provide the best shading for high sun (eg on the North elevation of a building).
- 2) Vertical Projecting Sun Blades provide best shading for low sun (eg on the East or West elevation of a building).
- 3) Vertical Screens oriented parallel to the building facade are used for intensive shading or as an architectural feature.

Design Considerations

Horizontal Projecting Sun Shades

- Typically the critical design load is incidental maintenance worker load of 1.1kN (~110kg) x 1.5 ultimate state limit load factor acting at worst location (outermost mid width and corner load conditions). In cyclonic regions, wind load can become the critical load as projections approach / exceed an overhang of ~600mm.
- Typical fixing condition is profiled aluminium brackets connected to the mullions:



See table for limitations.

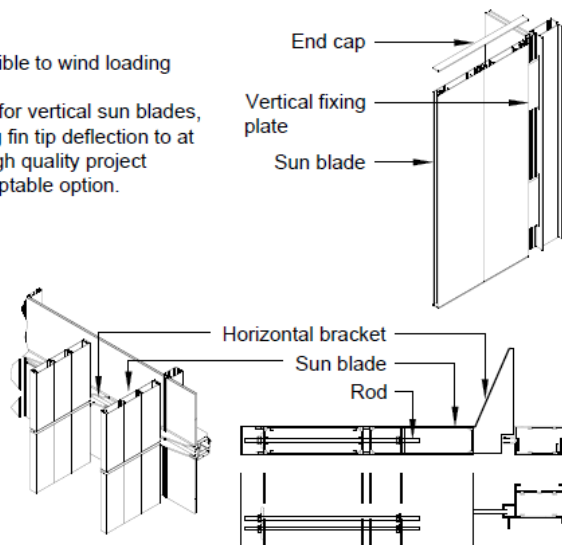
Vertical Projecting Sun Blades

- Vertical sun blade (more susceptible to wind loading than horizontal sun shades).
- There is no formal loading guide for vertical sun blades, but G.James recommends limiting fin tip deflection to at least cantilever span/30, but for high quality project scenarios, span/45 is a more acceptable option.

There are two options to fit vertical sun blades;

- Vertical plates fix the blades back to special torsionally resistant mullions.
- Horizontal brackets fitted to sills and transoms.

Note: a benefit of this system is that the vertical sun blades do not necessarily have to align with the mullions.

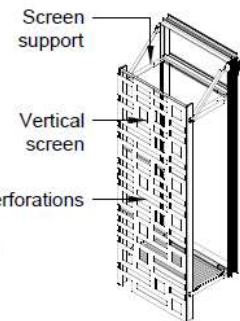


See table for limitations.

© This drawing is the property of G.James Australia Pty Ltd. It must not be loaned, copied, reproduced or shown to third parties without authority and written consent of G.James Australia Pty Ltd.
Issue c Miso-sect-001-border.dwg, Mar 10, 2016 - 2:27pm by Larissa Mocollin NOT TO SCALE

Vertical Parallel Screens

Typically constructed with a perforated aluminium screen, this type of shading system can provide significant privacy or shading from sunlight in all directions. Used intelligently, they take advantage of daylight to provide heavy visual massing to the building exterior, appearing almost solid, yet can have surprisingly minimal disruption to views from the building interior. Innovative use of these screens can create striking architectural features to buildings. Typically these vertical parallel screens incorporate a maintenance walkway, generally 600mm wide between the façade and screen. This dictates the critical consideration for the design of its minimalist supporting structure. The designs of these screens are generally bespoke to suit individual projects.



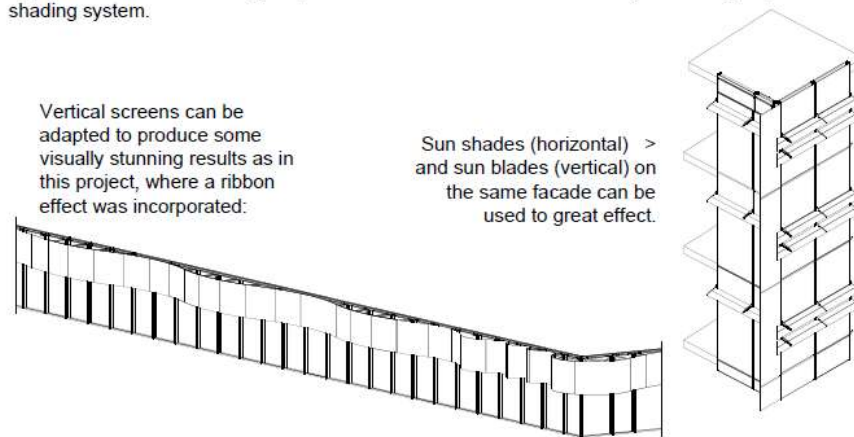
Shading Systems' Indicative Projection Limitations			
	Wind loading regions of Australia		
	A. non-cyclonic (eg. Sydney/Melbourne)	B. weakened-cyclonic (eg. Brisbane)	C. & D. cyclonic (eg. Townsville/Cairns)
Horizontal Projecting Sunshades			
Free cantilevering	1200 max.	900 max.	600 max.
Diagonally braced/trussed	1800 max.	1500 max.	900 max.
Vertical Projecting Sunblades			
Vertical fixing plates into std sized mullions	600 max.	450 max.	300 max.
Vertical fixing plates into wider mullions	750 max.	600 max.	400 max.
Horizontal profiled fixing brackets into transoms	1200 max.	900 max.	600 max.
Vertical Parallel Screens	* Typically these vertical screens require a 600 wide maintenance walkway and the subsequent structural as well as aesthetic considerations require bespoke design.		

Note: These are indicative values for general guidance. Project specific wind loads and geometry may vary from these values.

Please contact G.James Commercial Contracting division to take benefit of G.James extensive experience and custom design expertise for a successful outcome with your building's specific shading system.

Vertical screens can be adapted to produce some visually stunning results as in this project, where a ribbon effect was incorporated:

Sun shades (horizontal) > and sun blades (vertical) on the same facade can be used to great effect.



© This drawing is the property of G.James Australia Pty Ltd. It must not be loaned, copied, reproduced or shown to third parties without authority and written consent of G.James Australia Pty Ltd.
Issue C Miso-sect-001-border.dwg, Mar 10, 2016 - 2:28pm by Larissa Mocollin NOT TO SCALE

Sunshade Devices

Horizontal Sunblades

Best for shading when sunlight is near vertical –
ie. north elevation



Latitude, Sydney



Mossop Building 3, Adelaide



ANZAC Park West, Canberra



Bankwest, Townsville

Sunshade Devices

Vertical Fins

Best for shading when sunlight is near horizontal – ie. east/west elevations



Green Square, Brisbane



Bcec, Brisbane

Sunshade Devices

Combined Horizontal Sunblades & Vertical Fins



KSD1 Hamilton Harbour, Brisbane



WEHI, Melbourne

Sunshade Devices

Perforated Aluminium Sheet Sunshade Screens



WEHI, Melbourne
(DNA pattern to genetic research facility)



UTS Broadway, Sydney
(Binary pattern to IT & Engineering building)

Sunshades used for stunning visual effect



Brisbane Central



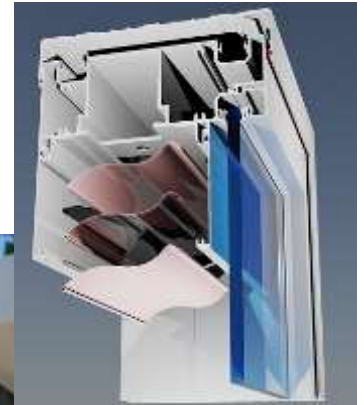
M&A, Cnr MacLauchlan & Ann St, Fortitude Valley

Operable External Venetian Blinds



QUT CIP2, Kelvin Grove (rendering)

Horizontal motorised external venetian blinds mounted onto G.James custom curtain wall.



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

Double Skin Facades



Southern Cross,
Melbourne



1 Bligh St,
Sydney



Operable Facades and Natural Ventilation



Vertical lift doors,
1 Bligh St, Sydney



Concealed motorised
louvres,
1 Bligh St, Sydney



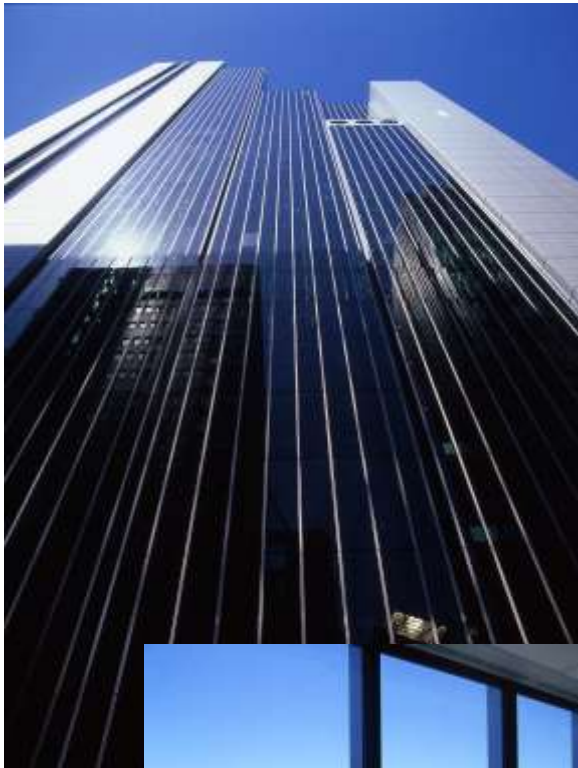
Vertical pivot glass louvres with concealed
motor
Sydney Residence

Other Design Considerations

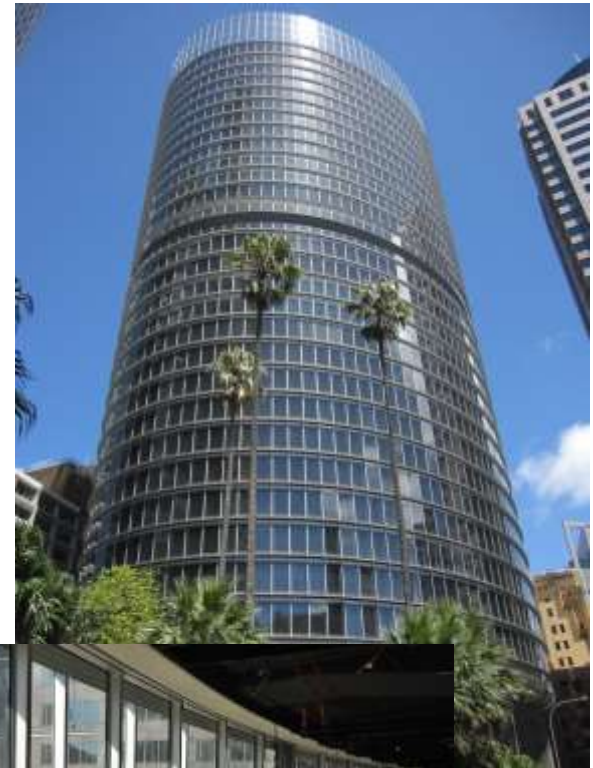
Consider where we are in the world and.....

- 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





Deutsche Bank,
126 Phillip St
Sydney

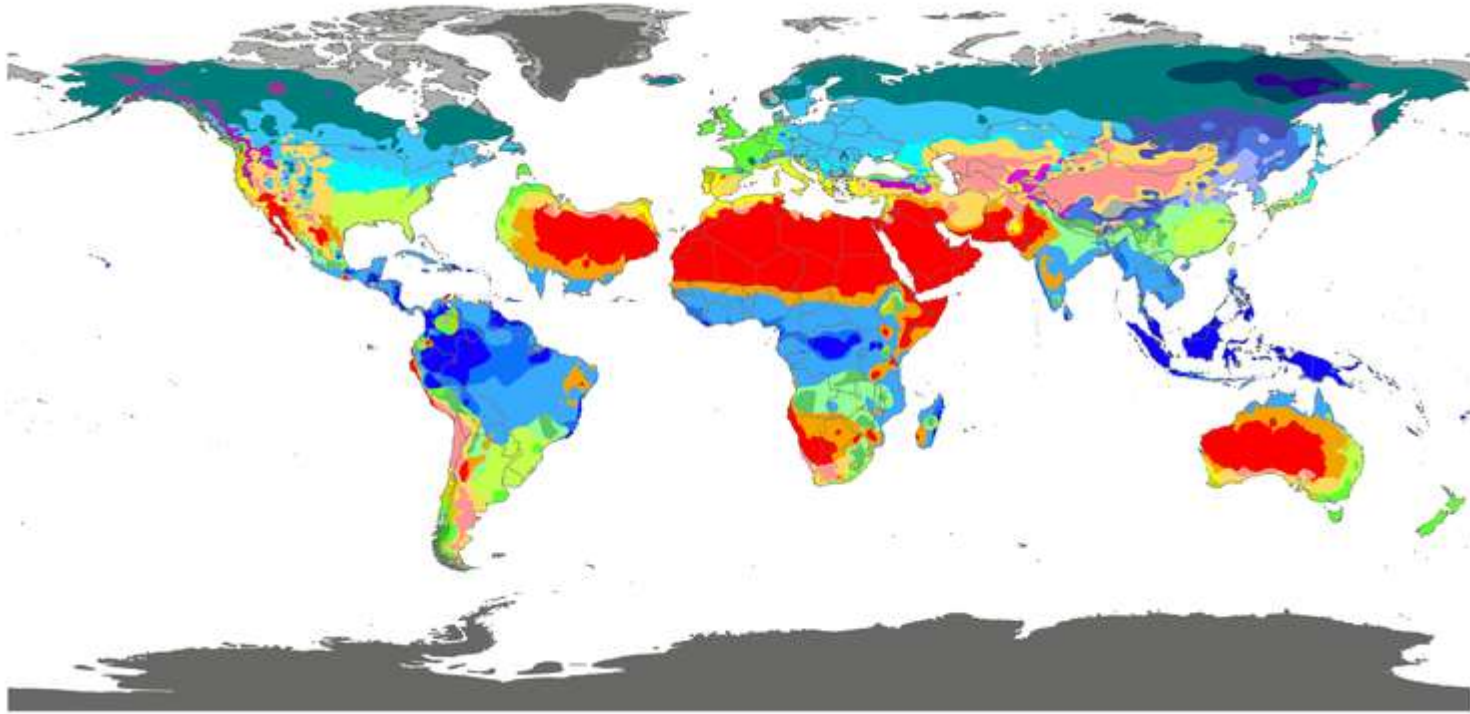


1 Bligh St,
Sydney



Design Considerations

...again consider the location



Design Considerations



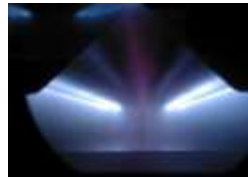
Consider the occupants

If there is just one thing you get out of today.....

[H:\video\common\glass\Convert\Forming a successful relationship_shorter.wmv](#)

Forming a successful relationship with G.James.

- 99yrs of operation with impressive project references including working relationships on buildings by renowned architects: Norman Foster, Harry Seidler, Ingenhoven, James Carpenter, etc.
- Wealth of experience with in-house scientists driving an extensive R&D division
- In-house design office, engineering team & NATA Test Rig
- Manufactured locally
- Fully integrated design, manufacture and installation from float glass & raw aluminium billets to finished facades of monumental skyscrapers.



G.James makes the difference...



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>

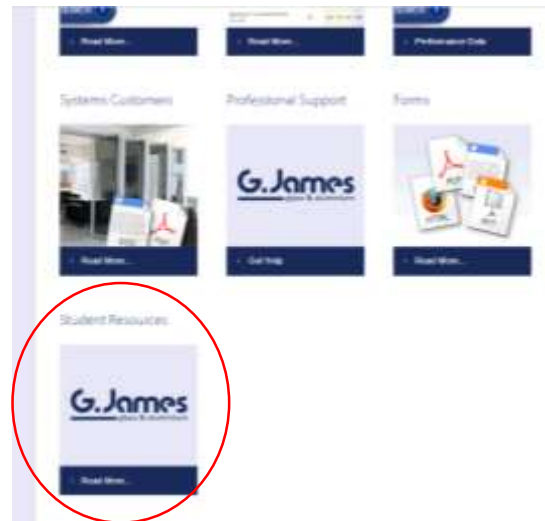
<https://plus.google.com/115651397353147925469/posts#115651397353147925469/posts>

How to download today's presentation slides?

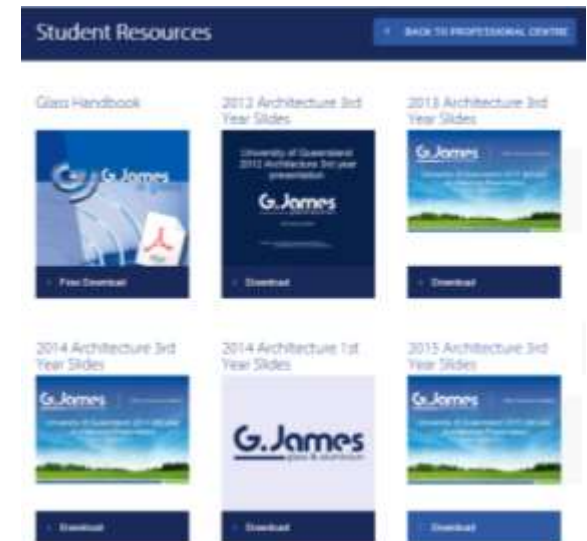
Go to www.gjames.com :



Click on the **Professional Centre** tab



Click on the **Student Resources** tab



Click on the **2016** Presentation

Factory Visits

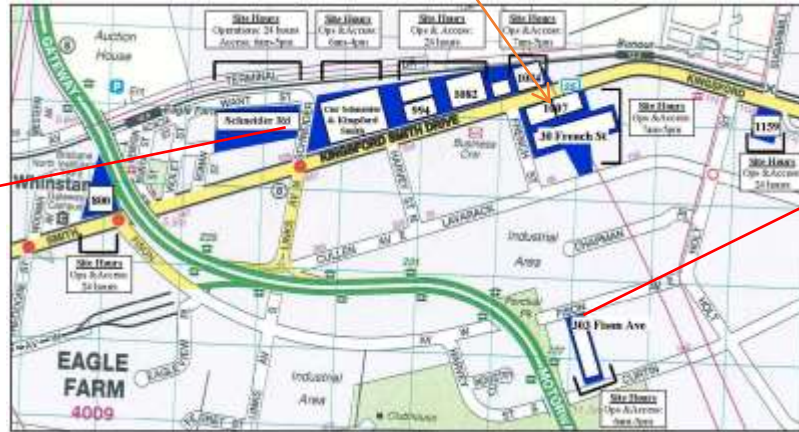


IGU Assembly



Façade test rig.

You are here



Glass Laminating



Schneider Rd Glass Operations Shed 23



Curtain Wall Factory, 303 Fison Ave



Glass Toughening



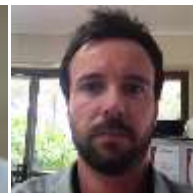
Glass Cutting & Processing



Tour Guide:
Jason Sewell
(Glass Customer
Service Officer)



Tour Guide:
Bernie Merrylees &/or Sam McDonough
Production Manager Factory Manager



Curtain wall panel
assembly, glazing
& packing.



Aluminium extrusion, handling, cutting
& processing



G.JAMES

Thank You

Defining
Spaces.

Slideshow

- Doctors bury their mistakes.....

..... Architect's cover them in ivy!

+ amazing [facades](#) around the world