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WHAT MAKES A COMPLIANT AND NON-COMPLIANT BALUSTRADE / BARRIER DESIGN?

THIS BLOG AIMS TO HELP YOU TO UNDERSTAND & THEN SPECIFY DIFFERENT GLASS CONFIGURATIONS IN BALUSTRADES.

THE BASICS:

A Balustrade is a multiple of balusters / posts. Its purpose is to prevent fall or cordon off an area. Balustrades are typically used in places such as Houses / Units, on High Rises, as Pool Fences, in Hospitals, in Schools and Shopping Centres

QUESTIONS:

- Do you feel safe on a balcony?
- Do you let your kids play on a balcony that's 40 storeys in the air?
- Would you lean over a balustrade to take in the view?

Did you know that NCC (The Australian Building Codes Board) have conditions you need to meet in order to be allowed to design and specify a compliant balustrade.

NCC sets performance requirements, then gives 2 options to meet these requirements:

1. Deemed to Satisfy (DTS)
2. Alternative Solution

The Balustrade solution must meet the Deemed to satisfy provisions otherwise, an alternative solution must be sought.

In a nutshell the performance requirements that NCC stipulate include:

- Where people could fall 1m or more, a barrier must be provided which must be continuous and of a height to protect people accidentally falling
- The balustrade must be constructed to prevent people from falling through the barrier



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- The balustrade must be capable of restricting the passage of children
- The balustrade must be of suitable strength to withstand foreseeable impact of people and static pressure pressing against it

So bearing that in mind, let's think about all of the imposed actions and load of the balustrade

If we look at the AS1170.1 Section 3.6 Table 3.3 typically balustrades are categorised as C3, which means that the type of occupancy for the building or structure that we need to pay attention to for balustrades are the areas that people will congregate such as stairs, landings, external balconies, edge of roof. Sometimes we are required to consider C5 Areas that are susceptible to overcrowding such as pool rooftop areas and grandstands etc.

Glass installations that are at risk of being impacted must:

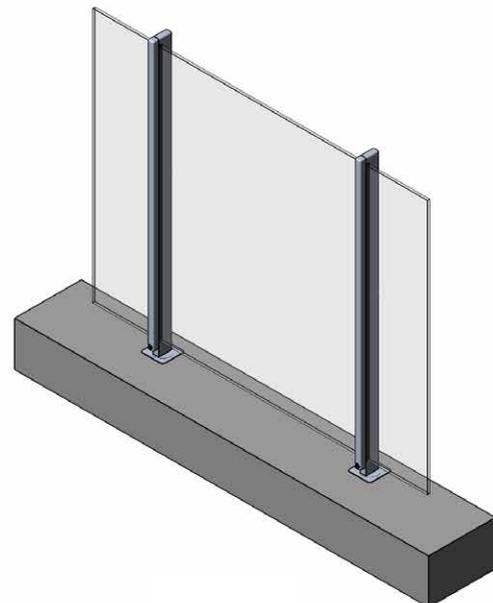
- Break in a way that is not likely to cause injury to people
- Resist a reasonably foreseeable human impact without breaking
- Is protected or marked in a way that will reduce the likelihood of human impact

We have developed a new product that exceeds these requirements.

Below is the Summarised DTS we must meet for balconies / walkways

Our balustrade solutions must have a:

- Min 1000mm high (865mm on stairs)
- Max 125mm sphere through gap / opening
- For floors more than 4m above the surface beneath, elements between 150mm & 760mm must not facilitate climbing
- Glazing used in balustrades must comply with AS1288





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Some common issues with passing the “Deemed-To-Satisfy” requirement opens the question of why is there a separate standard for pool fence VS balustrade? They both have the same intention / purpose of preventing access.

AMAU think that 1000mm FFL height is too low. In America and Canada their standard is 1070mm min, in the UK there standard is 1100mm from “Datum” (datum could be furniture or anything climbable).

This means that our Australian requirements are more dangerous than any other country. Our aim is to increase this height to align with pool fencing 1200mm.

Do you know about the Australian Standard for Glass in Balustrades? - AS1288

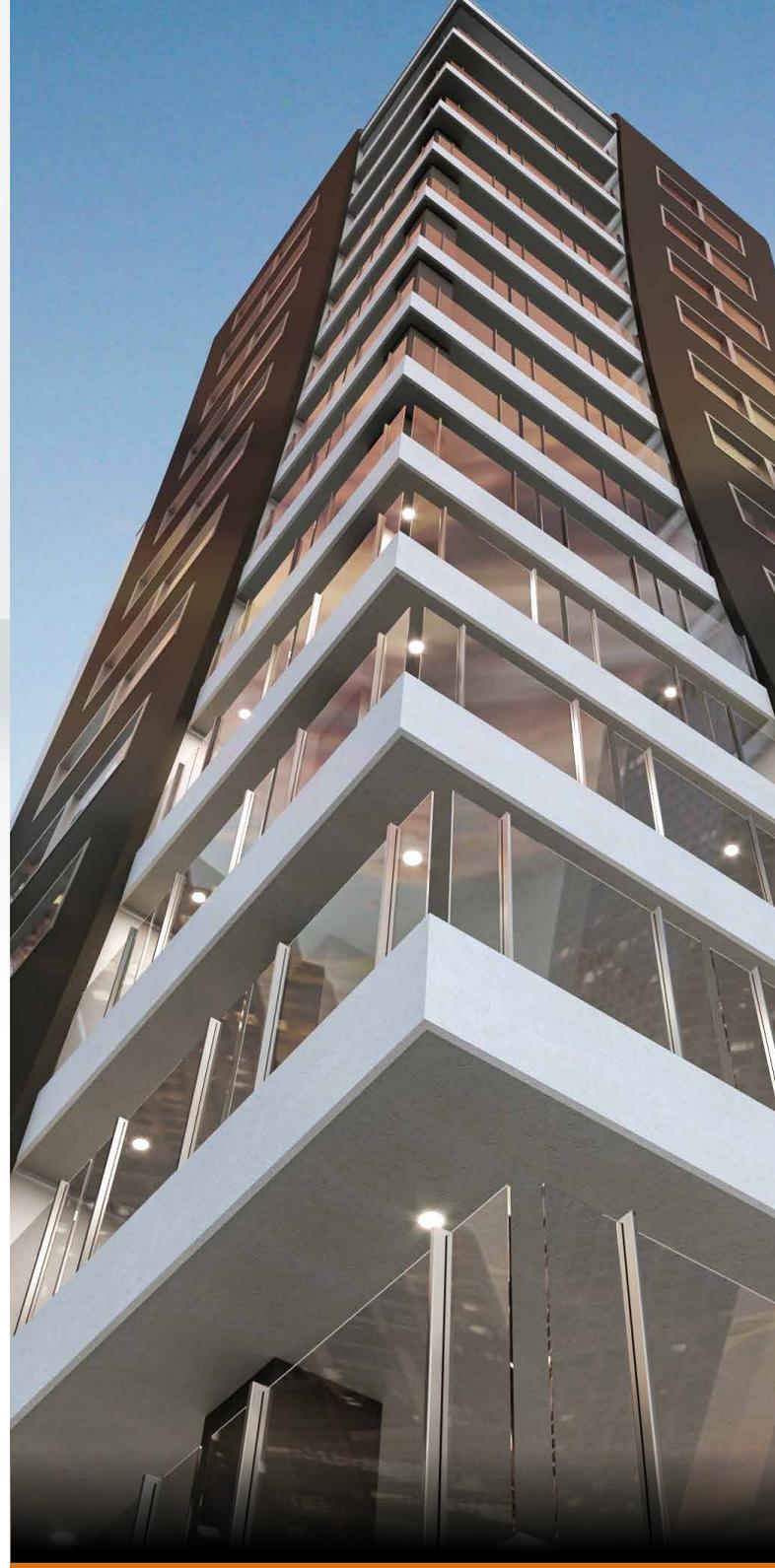
The Standard states that Grade A Safety Glass shall be used (Toughened monolithic or Laminated) and that the Min Thickness of glass derived from wind loads, but is typically 10mm for infill panels and 15mm for frameless.

There are 3 main glass treatments that we should consider:- Annealed, Heat Strengthened, and Tempered (Toughened)

The standard states that with Interlinking Handrail required. If any one panel fails, then the remaining panels and handrail shall be capable of resisting the loads required

So what's the difference between: Toughened Monolithic VS Toughened Laminate

- Monolithic is far cheaper to manufacture than laminated
- Consideration for post breakage must be considered
- Monolithic shatters into tiny pieces evacuating the opening
- Laminate holds together, but may fall out like a “wet blanket”



- If spontaneous combustion occurs (rare) due to nickel sulphide inclusions, laminated glass is advantageous as it stays in place

Neither option in a typical framed balustrade is ideal, as they both have the potential to fall out leaving an exposed opening. Laminate would be considered slightly safer than toughened monolithic (as long as it does not evacuate the opening) In AS1288 the only reference to frameless glass balustrades that can be used over 1000mm to protect a fall is section 7.3.5. This states that the standard allows the use of structural

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The logo for Structglass Railing Balustrade (SG) features the letters 'SG' in a bold, white, sans-serif font, centered within a black square that is flanked by two vertical black bars.

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frameless glass balustrades (with interlinking handrail) as long as “the bottom of the panels to be fully and rigidly fixed for the full length of the panel, usually into a grouted channel”.

There is no reference to pin fixings or spigots in the standard – **which means any balustrade with spigots or pin fixings are not compliant to AS1288.**

So if a supplier tells you their spigotted glass balustrade system complies with AS1288, ask them to prove it as most systems would be non-compliant.

Spigots and pin fixings are not covered under AS1288, the balustrade does not meet the DTS Provisions. Therefore the only way they comply is via an alternative solution.

Spigots / Pin Fixings require glass engineering and reports to be submitted to the certifier for approval.

OTHER COMPLIANCE THOUGHTS

Balustrades aren't required to have re-inspections or continuous testing such as harness points, yet they provide the same life saving protection.

Balustrades only require an engineer certificate for approval, and not physical testing such as a NATA approved testing facility

There isn't an Australian balustrade testing methodology for glass balustrades.

Balustrades rely on the interlinking handrail to save your life if the glass breaks which is at 900mm high. So ask yourself – how tall is your child?

Canada will only accept laminated glass balustrades in an attempt to increase the safety after the glass breaks. Single pane monolithic is outlawed. USA are looking to follow.

AMA have designed a first to world concept – Australia's safest structural glass balustrade system that offers an uninterrupted view and no interlinking handrails.

TO FIND OUT MORE ABOUT THIS SYSTEM GO TO:
WWW.STRUCTGLASS.COM.AU