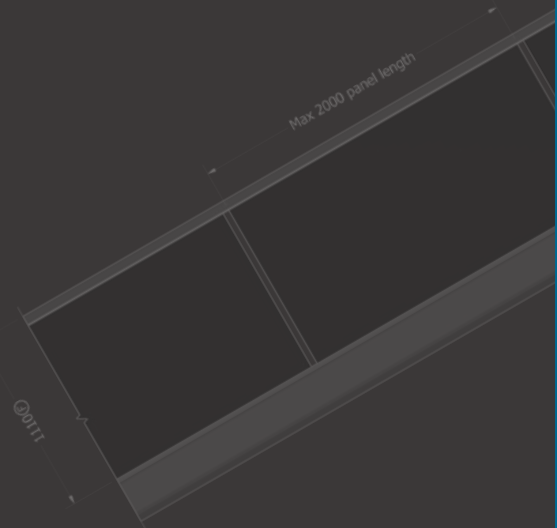




design elements

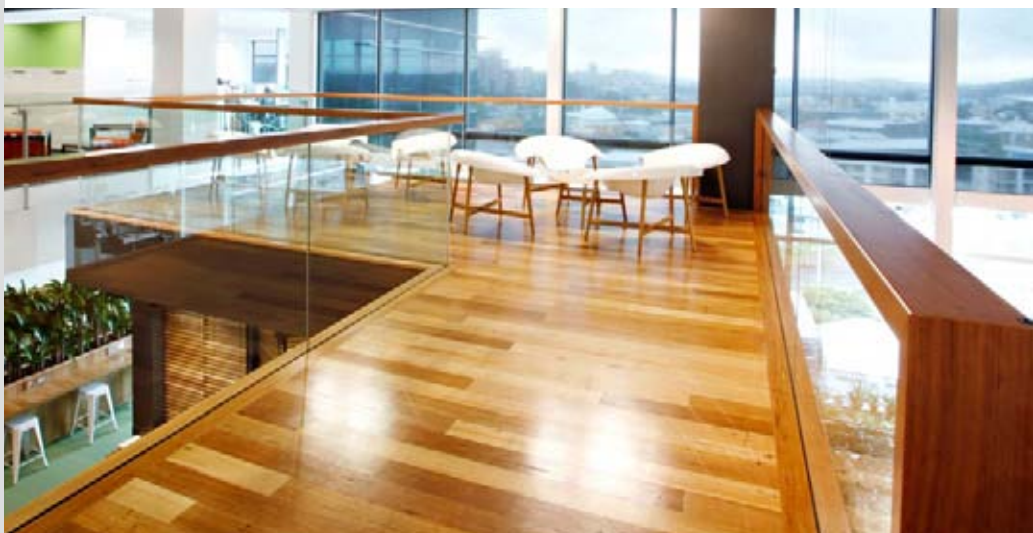


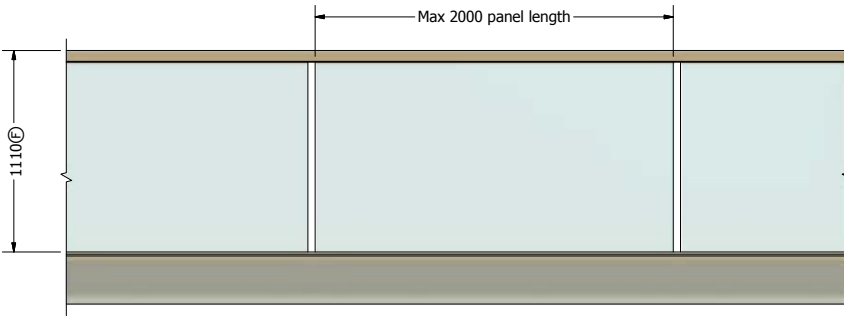
design

The F0 cantilevered glass design allows boundaries to be defined with minimal interruption to the visual aesthetics of a build. Because the design does not incorporate vertical stanchion components, the strong horizontal lines of the handrail are emphasised, often increasing the sense of perspective and space.

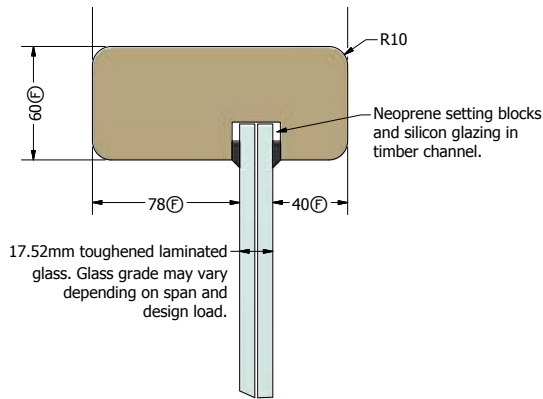
The F0 is framed only by a bottom structural glazing channel, and cantilevers vertically to support a handrail. Most handrail profiles can work with the F0, and may be supported by through-glass patch fittings or directly by the top edge of the glass. However, in most projects, a timber rectangular or circular profile handrail supported by the top edge of the glass generally provides the most effective visual impact.

To achieve a supported interlinking handrail for F0, stanchions are sometimes required at the termination of balustrade runs. A variety of stanchion designs can be applied, but a continuation of the handrail itself via a 90 degree turn often provides the most satisfactory result.

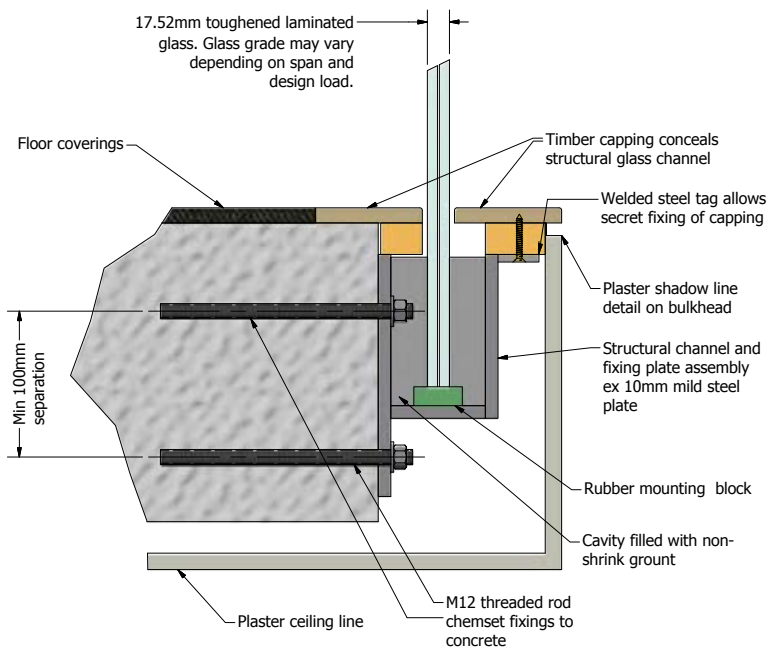




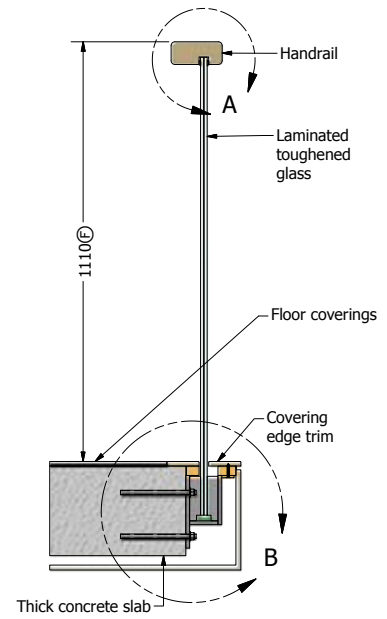
1



3



4



2

Figure 1. Void edge balustrade front elevation. F0 presents an extremely clean and minimal front aspect, making it suitable for situations when it is desired to reduce distraction to surrounding elements or to maximise the sense of space and light.

Figure 2. Side elevation incorporating fixing to suit a thick concrete slab and heavy rectangular handrail detail.

Figure 3. Heavy rectangular handrail detail. A heavy timber handrail profile often works well with large scale cantilevered glass panels.

Figure 4. Typical fixing detail to thick concrete slab. Appropriate engineering of cantilevered glass support is critical to ensure that specified design loads are met. Arden may vary fixing details to address specific site properties.

Max 2000 panel length

Ⓢ indicated on dimensions denotes a nominal dimension that typically varies according to specific application, engineering requirements or client preferences.

technical

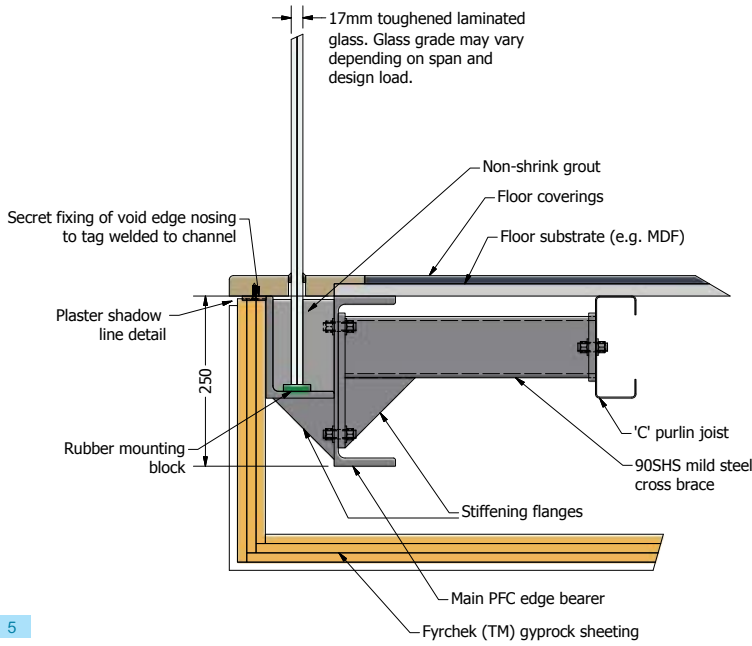
Cantilevered glass using channel and grout to form the cantilever is a neat alternative to patch fittings and provides some clear advantages over patch fittings.

The advantages include:

- a) A continuous support to the base of the glass panel (as opposed to a point load as is the case when using patch fittings)
- b) Saving in overall depth required to form the cantilever – patch fittings require edge clearances to the bottom of the glass as well as sufficient separation to form the cantilever. Typically a grouted cantilever requires less vertical space
- c) The structural installation or formation of the grouting channel typically requires a lesser accuracy for install, with the final glass installation then fine-tuned to an exact position during the grouting process.
- d) Most grouted applications allow for the channel and grout to be hidden behind other finishes (e.g. floor tiles, capping, etc) and results in the design effect of the glass simply rising out of the structure, providing a finished, clean and un-cluttered look.

It should be noted that effective design of the channel and grout cantilevered glass involves due consideration being made for the finishes that cover the grouted channel and finish against the glass.

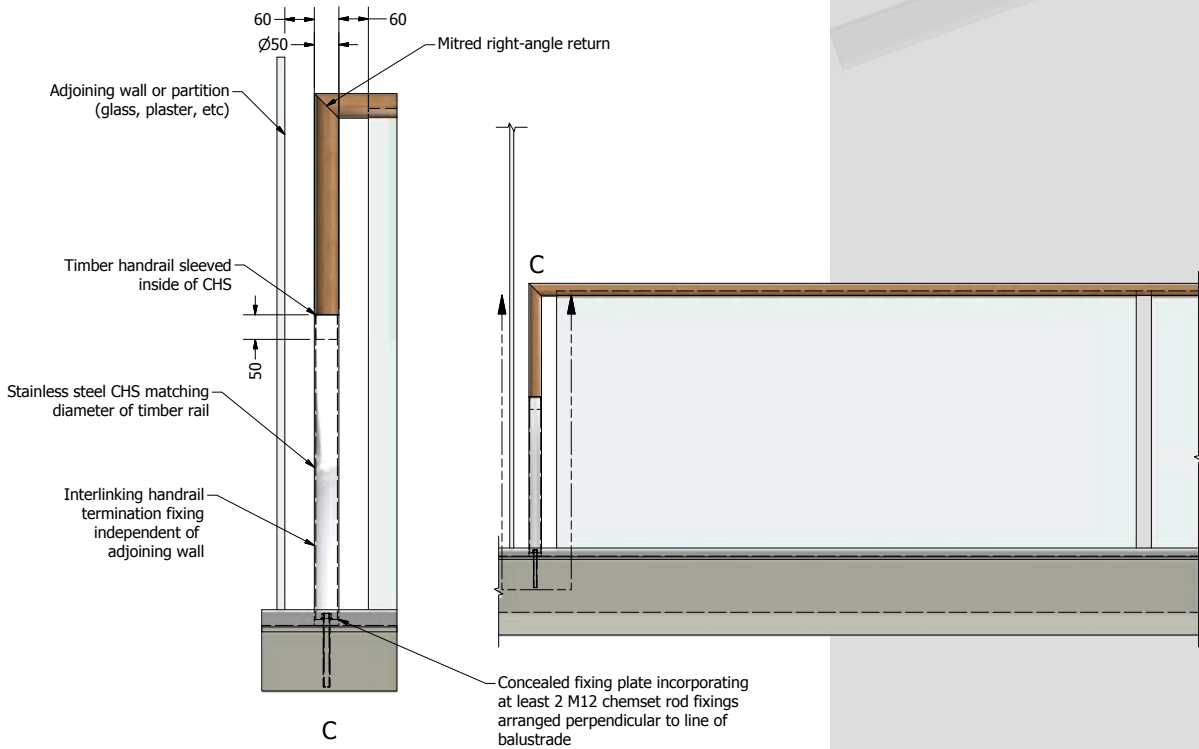




5

Figure 5. Side elevation detail showing fixing to landing with structural steel member and purlin construction.

Figure 6. Void edge balustrade front elevation terminating to adjoining wall or partition. 50mm diameter solid timber round handrail design option shown, with transition to 50 diameter stainless steel CHS on vertical section for load bearing capacity.



6

structural glass panels

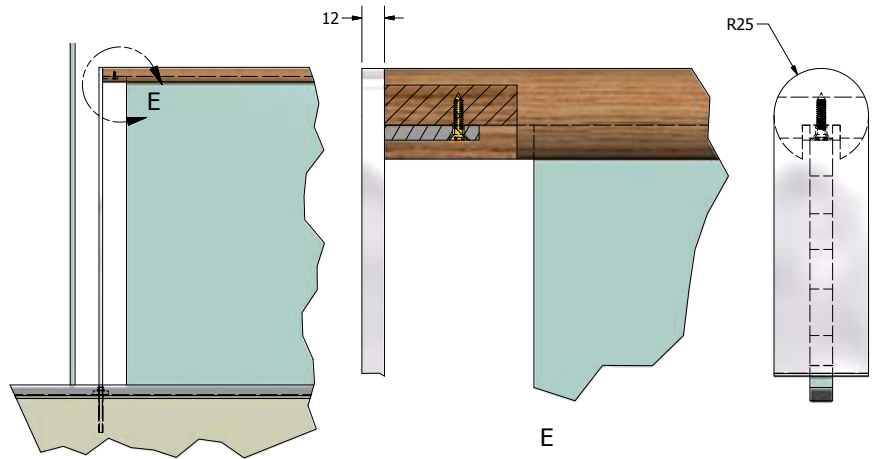
This table shows typical glass specifications (for nominal handrail height of 1m) depending on design load.

Design load	Toughened monolithic safety glass (mm)			Toughened laminated safety glass (mm)		
	12	15	19	12	16	20
Domestic/Residential	Std	On request	On request	Std	On request	On request
Offices/Commercial stairs	Min	Std	On request	Min	Std	On request
Retail/Restaurant	N/A	Std	On request	N/A	Std	On request
C5 high loads	N/A	N/A	N/A	N/A	N/A	N/A

Notes

1. These tables are to be used as a general design guide only.
2. Individual project requirements will dictate final glass specification and thickness.
3. All spans nominated are indicative of normal internal conditions. In some exposed situations, wind loads may exceed design load and thicker glass or smaller spans may be required.

Figure 7. Alternative termination detail for 50mm round handrail version. Round handrail is connected to custom full height stainless steel stanchion ex 50x12 flat-bar. Both termination styles (as shown in this diagram and the one preceding) present a very elegant and refined finish.



7

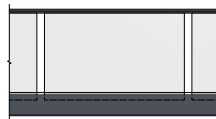
design standards for glass panels

Glass balustrade panels must satisfy engineering requirements as specified in AS1288, and the Arden balustrade styles shown here are defined and specified with regard to the relevant design standards.

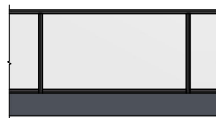
Of particular importance in the initial design stage, it is critical to maintain an awareness of the designation of glass panels as structural or infill, and the classification of handrail as load-supporting, non-load-supporting, or interlinking. Combined with other considerations (e.g. whether or not mechanical point-fixings are specified, span is cantilevered or supported on both sides), this determines the grade of glass (e.g. laminated annealed, toughened safety, laminated toughened) and type of handrail that satisfies the code.

As in other aspects of stair and balustrade design, Arden will advise with respect to the practicability of preliminary designs with respect to Australian standards.

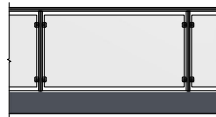
glass balustrade styles



Cantilevered structural. Glass panels supporting an interlinking handrail cantilever from an appropriate floor fixing.



Fully framed. Glass panels are provided with four-edge support and are therefore rated as infill only.



Two-edge clasp. Glass panels are supported on two opposite edges by clasp-style mechanical fixings. The bearing of point loads influence the required grade of glass.



Semi-framed vertical channel. Glass panels are fixed via proprietary or custom channel system on each side.



Two-side patch-fitting. Glass panels are supported on two opposite sides by through-glass mechanical fixings. The bearing of point loads influence the required grade of glass. Stanchions may be located between, or at intermediate locations within, each panel span.



Semi-framed lateral channel. Glass panels are fixed via proprietary or custom channel system on the bottom rail and underside of handrail.



Hybrid. Glass panels are provided with a combination of the above methods so as to comply with safety requirements.



About this document

Intellectual property is copyright © Archstairs Pty Ltd unless otherwise agreed in writing. All rights to the document are retained. Any use of the document by clients or third parties, unless specifically authorised by Archstairs Pty Ltd, are at their own risk and the user releases and indemnifies Archstairs Pty Ltd from and against all loss or damage arising from such use.

compliance

Arden is a BSA licensed contractor for carpentry, joinery, glass, glazing and aluminium as well as structural metal fabrication and erection. Arden supplies a Form 16 (Licensed Contractor) on all projects. In design and construct contracts, a Form 15 (Design Engineer) certification is supplied upon request. For products and services incorporating the F0 system, this table shows compliance with relevant codes and standards.

Key

- full compliance with the code
- not applicable to this element

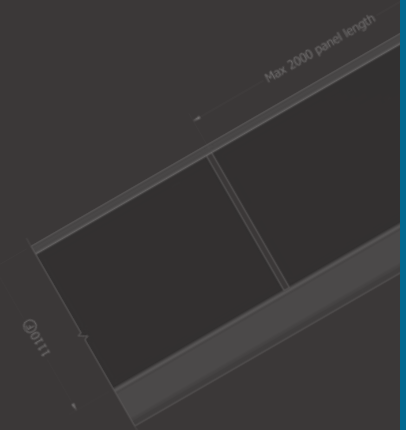
Code	Title	Applicability
BCA	The Building Code of Australia	●
AS NZS 1170.1-2002	Structural Design Actions – Permanent, imposed and other actions	●
AS 1288-2006	Glass in Buildings. Selection and installation.	●
AS NZS 1554.1-2004	Structural steel welding - Welding of steel structures	●
AS 1554.6-1994	Welding stainless steels for structural purposes	●
AS NZS 4586-2004	Slip resistance classification of new pedestrian surface materials	○
AS 1428.1-2009	Design for access and mobility	●
AS 1657-1992	Fixed platforms, walkways, stairways & ladders. Design, construction and installation	●

design note

For all commercial applications, it is important that sufficient space for the stairwell cavity be allowed to satisfy Australian Standards and BCA requirements.

The footprint is primarily driven by the floor to floor rise, as well as the staircase configuration chosen. However, stringer and balustrade style design may increase the amount of space required. Allowing too small a cavity can restrict the design options of the staircase. Also, points at where the staircase interacts with other structures are best addressed early in the design cycle.

Consultation with Arden early on will help ensure that these design issues can be addressed in a cost-effective manner.



www.arden.net.au

phone (07) 3267 6100 | fax (07) 3267 6500 | email admin@arden.net.au

Office & factory: 46 Radley Street Virginia Qld 4014 Australia Postal address: PO Box 317 Virginia Qld 4014 Australia

Version 1.0. Design by www.cazazz.com

