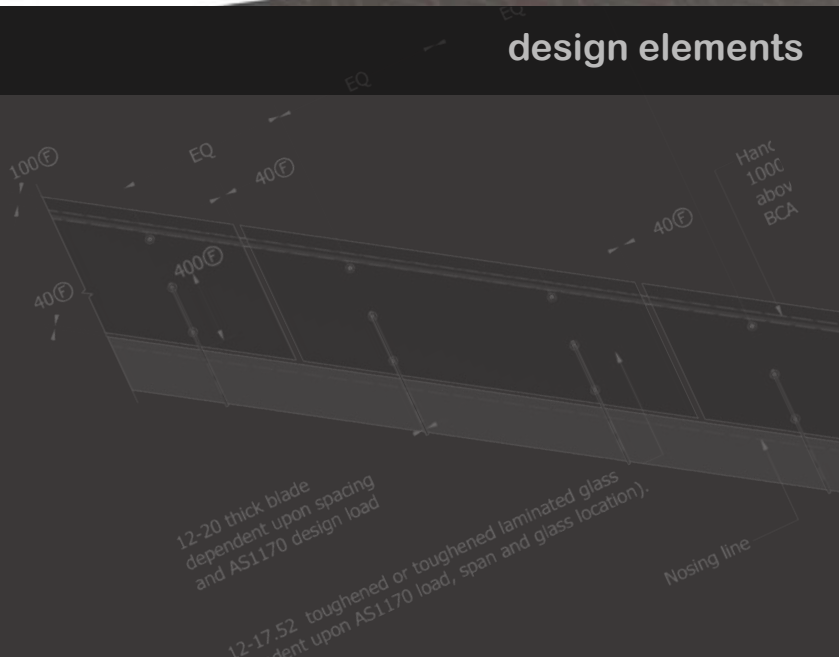




design elements



design

Combining stainless steel half-height stanchions with structural toughened glass, the H6 system represents a strikingly modern balustrade design. Blade stanchions rising to approximately half the height of the glass panel present a minimal profile, but have the strength to be specified to commercial loads.

The H6 system uses two blades per panel and equal spacings between blades (with glass cantilevered at each side). Two Arden System A patch fittings are located on each stanchion. The handrail is supported directly from the glass panel, with System A handrail patch fittings located above each stanchion. Thus, each panel incorporates a total of six patch fittings. Blades may be specified as either stainless steel or powder-coated mild steel.

For architects and designers, the primary attraction of the H6 system is the ability to specify a sharp and minimalist balustrade in a commercial (high potential load) context. The neutral tones of stainless steel and glass entail that the H6 can sit well with other materials, and in a variety of styles of interior decor.

Figure 1. Face fixed void-edge balustrade stanchion for structural floor.

1A. Front elevation

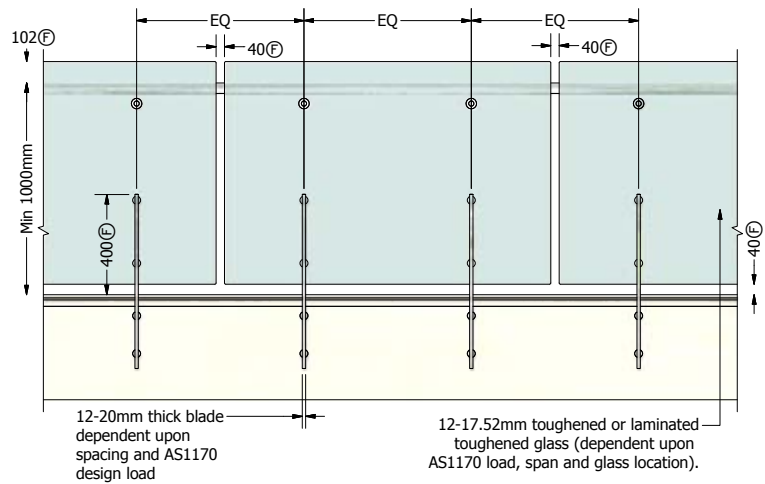
1B. Side elevation

1C. Detail C: Typical fixing detail. Fixing to structural concrete floors with depths exceeding 250mm

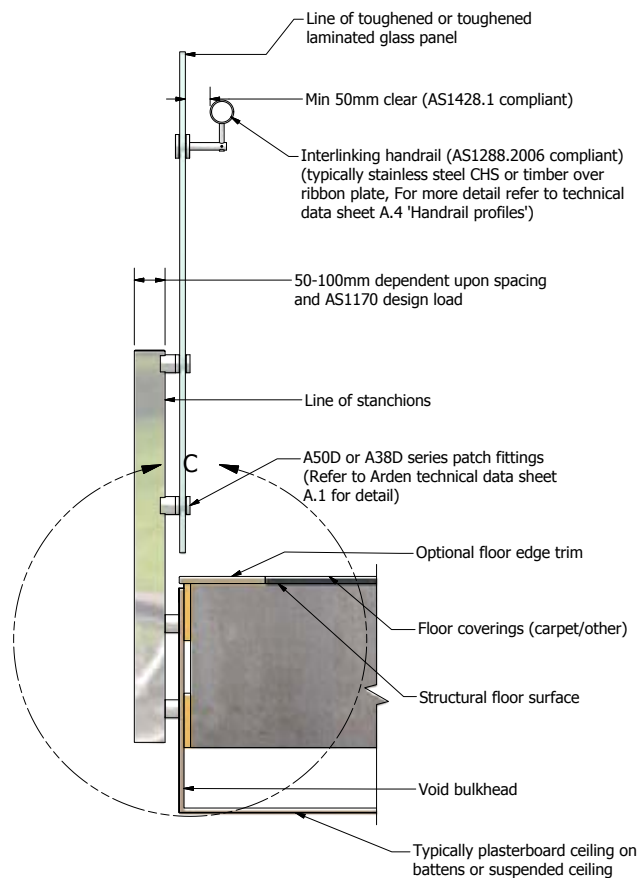
1D. Typical fixing detail for structural concrete floors with depths less than 250mm using under-slab bracket

1E. Typical fixing detail to void-edge LVL (typical domestic applications)

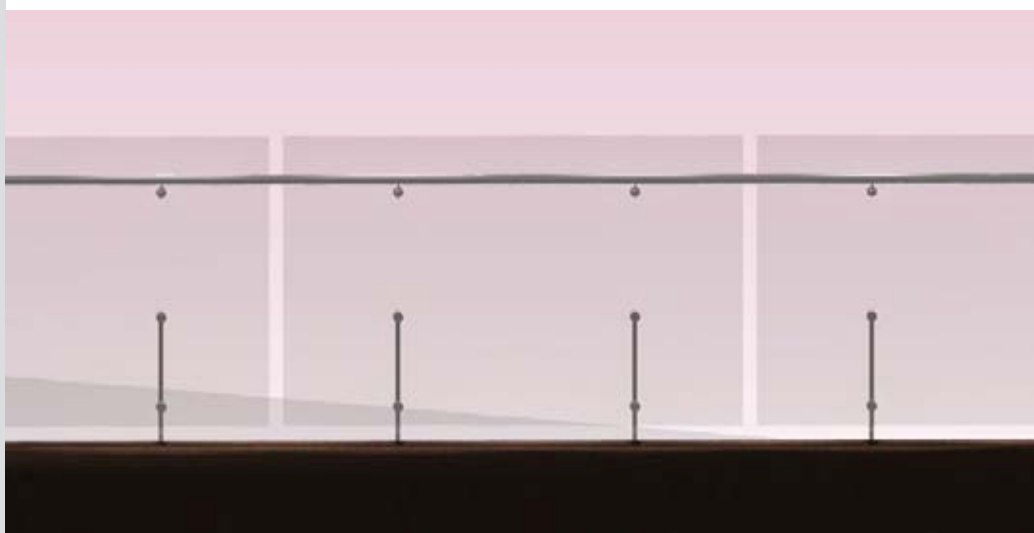
1F. Typical fixing detail for concrete with depths exceeding 250mm using face-fixed plate assembly (for higher design-loads)

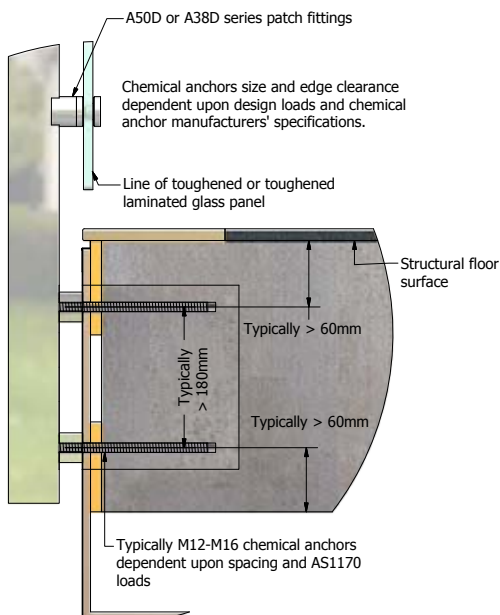


1A

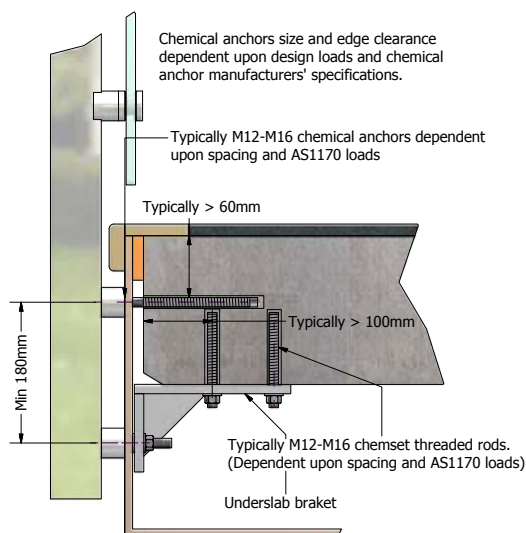


1B

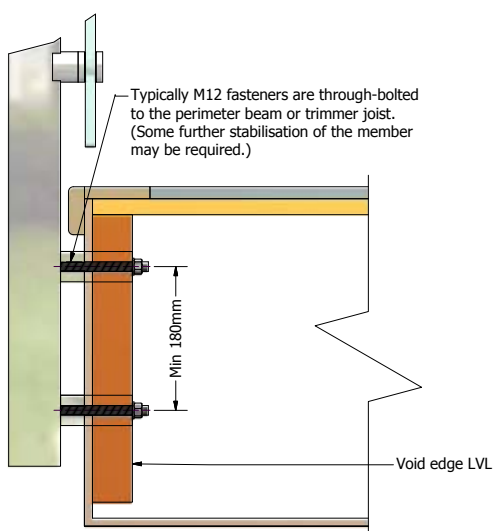




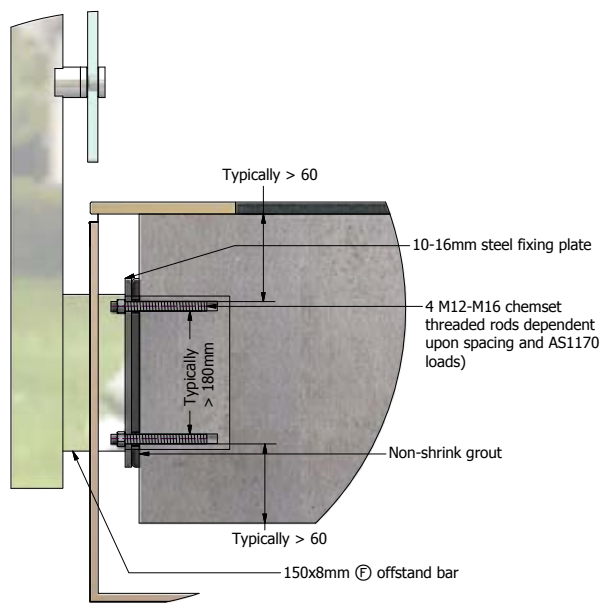
1C



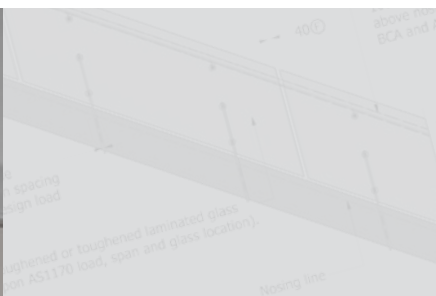
1D



1E



1F



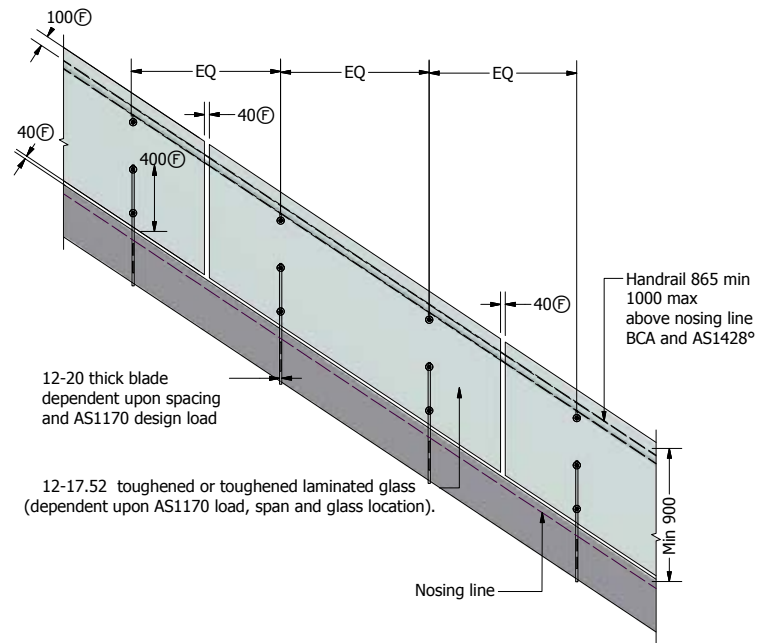
(E) indicated on dimensions denotes a nominal dimension that typically varies according to specific application, engineering requirements or client preferences.

technical

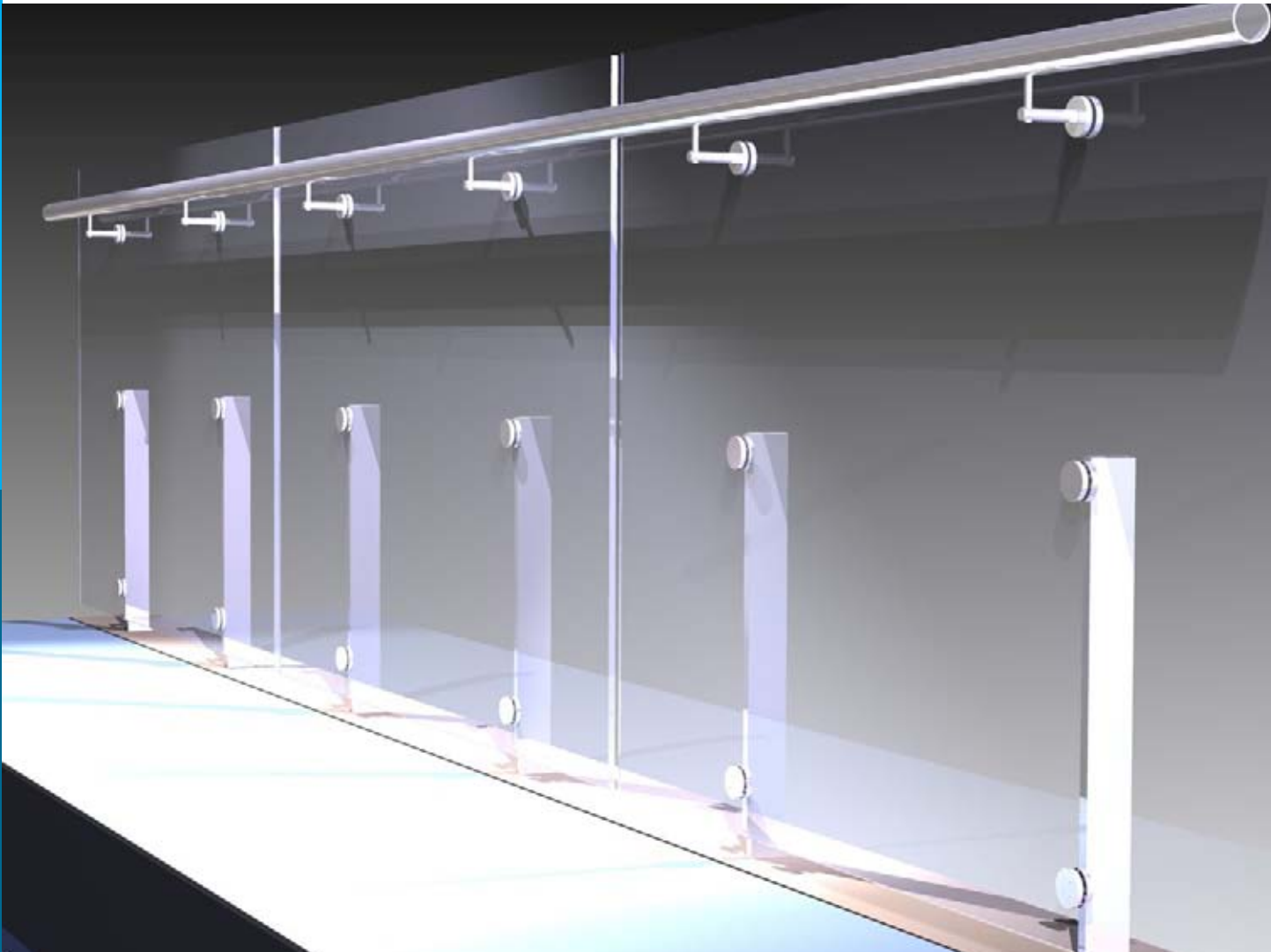
Typically 304/316 stainless steel or mild steel stanchions with a 16x65 profile is specified. However, depending on design loads or design considerations, heavier grade stanchions can be specified. Engineered high performance patch fittings are welded in factory to the stanchions.

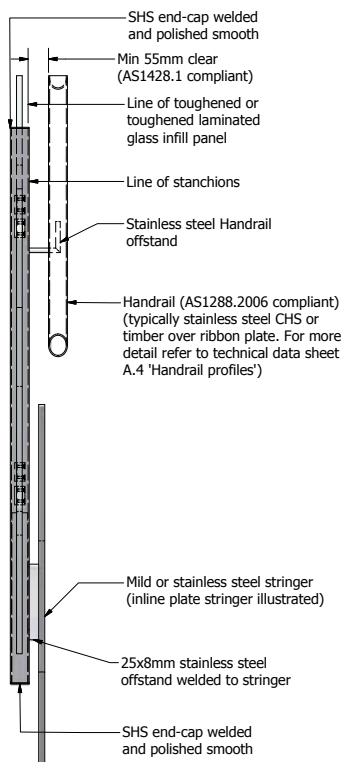
Minimum 12mm toughened glass infill panels with polished edges and tipped or rounded corners are used. Typically 38.1 diameter stainless steel handrails mounted on custom System A stainless offset brackets are specified. However, a wide variety of handrail profiles and materials can be used.

Continuous interlinking handrail terminated on a structure is used as required by AS1288. Where a timber handrail is required, it is strengthened by a recessed structural steel bar.

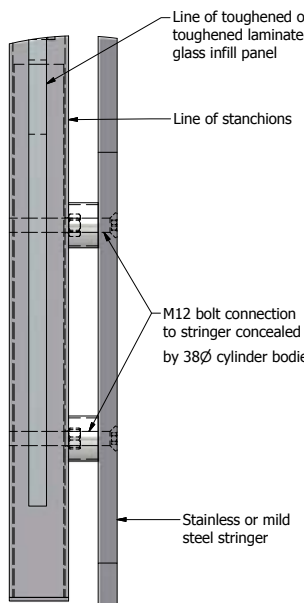


2A





2B



3A

Figure 2. Staircase stringer fixing method utilising 25x8mm stainless steel offstand bar (welded to stringer), suitable for most metal stringer types.

2A. Staircase side elevation

2B. Staircase front elevation

Figure 3. Bolt / sleeve method, appropriate for a variety of stringer types. In each case, M12 bolts are typically used. Face-fixed staircase flight stanchion fixed to stringer with CSK bolts or plug-welded thread with SS CHS sleeves.

3A. Front elevation

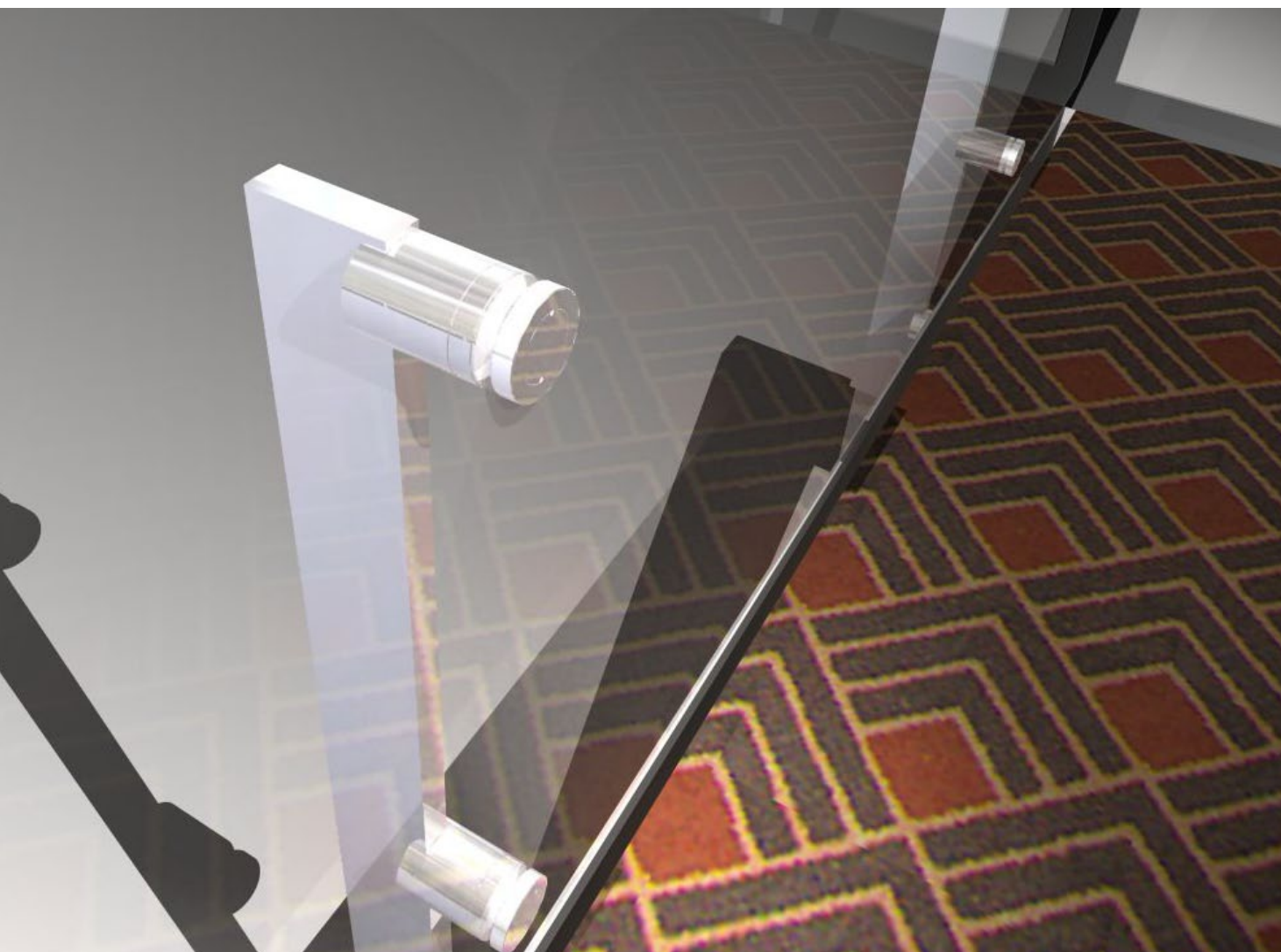
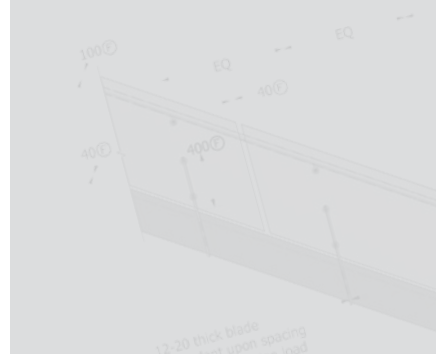
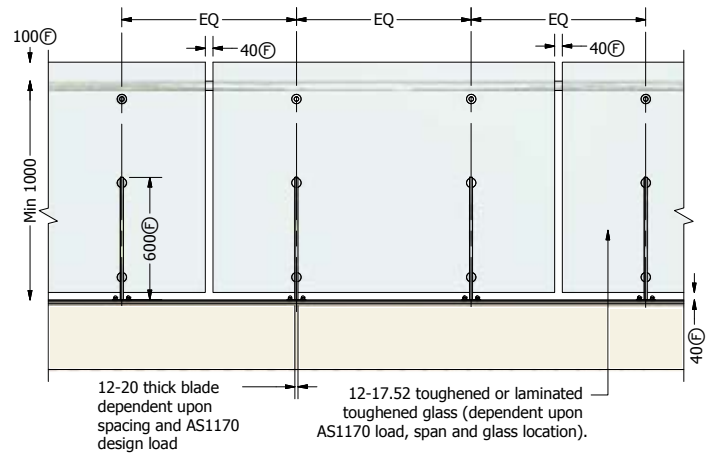


Figure 4. Floor-fixed stanchions with visual baseplate.

4A. Front elevation

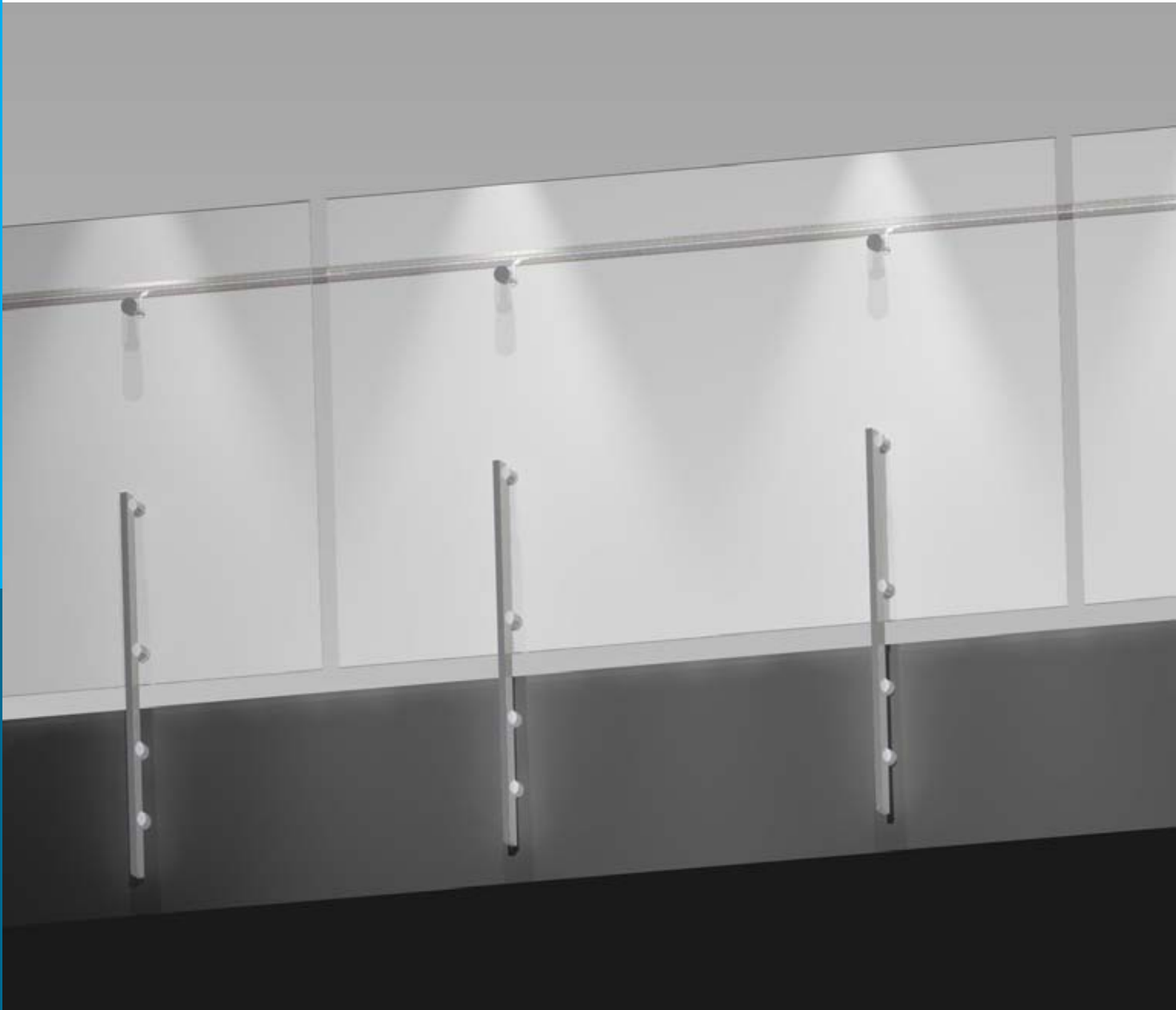
4B. Side elevation

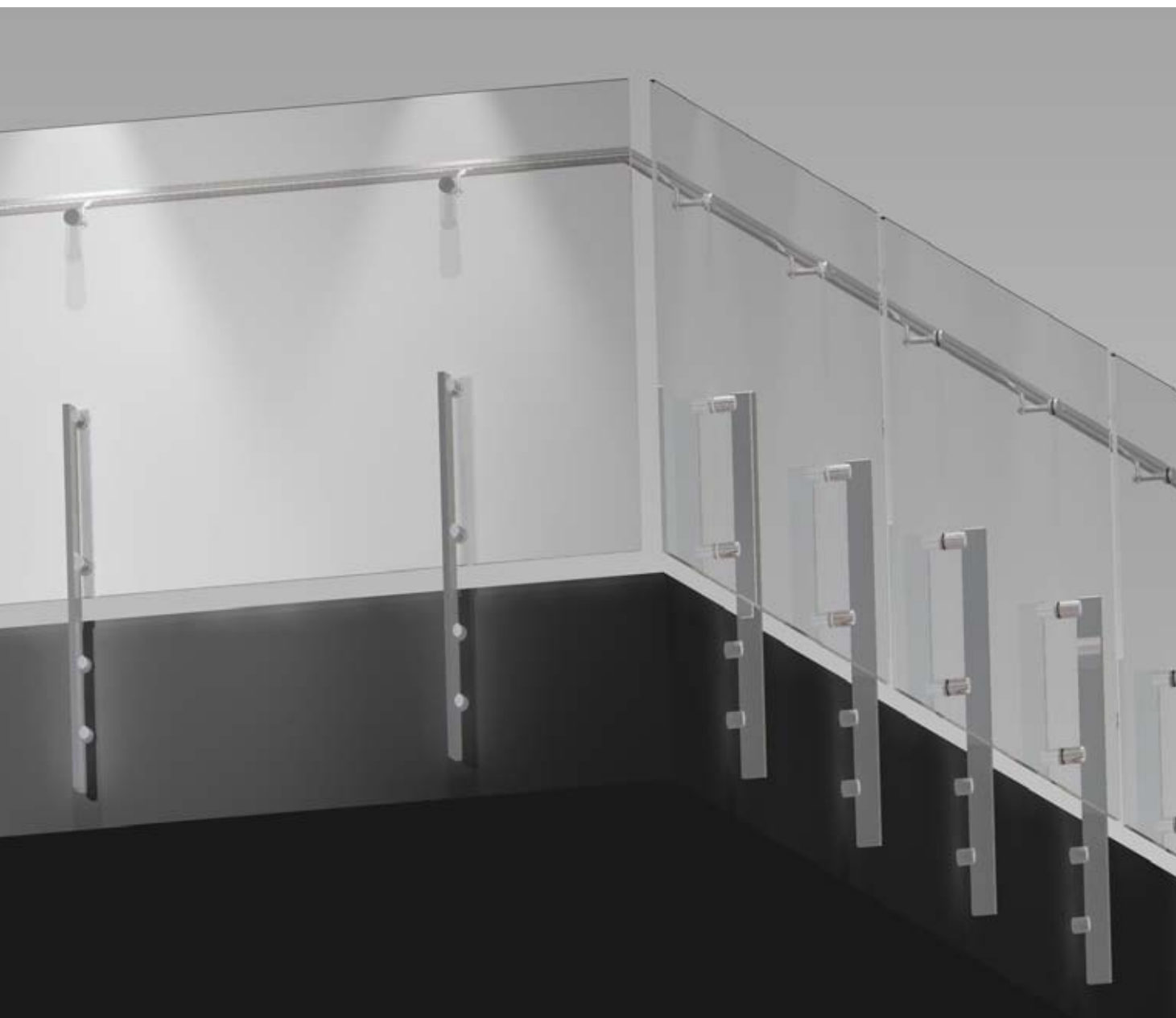
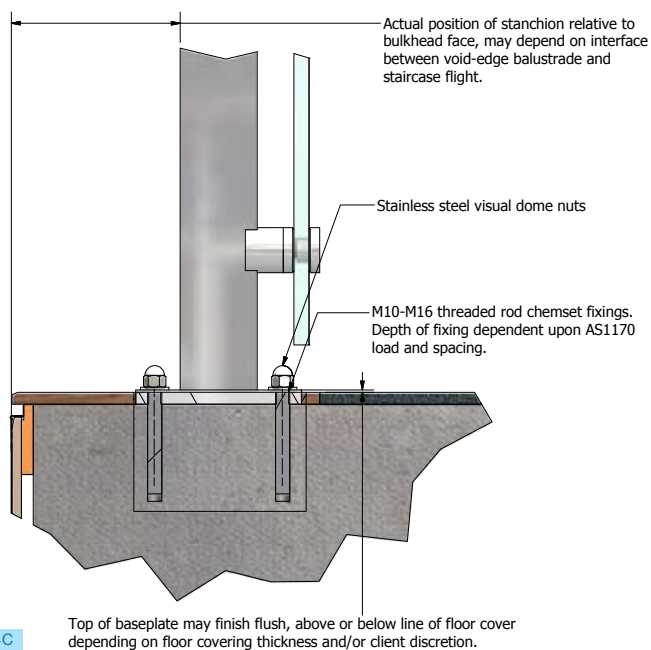
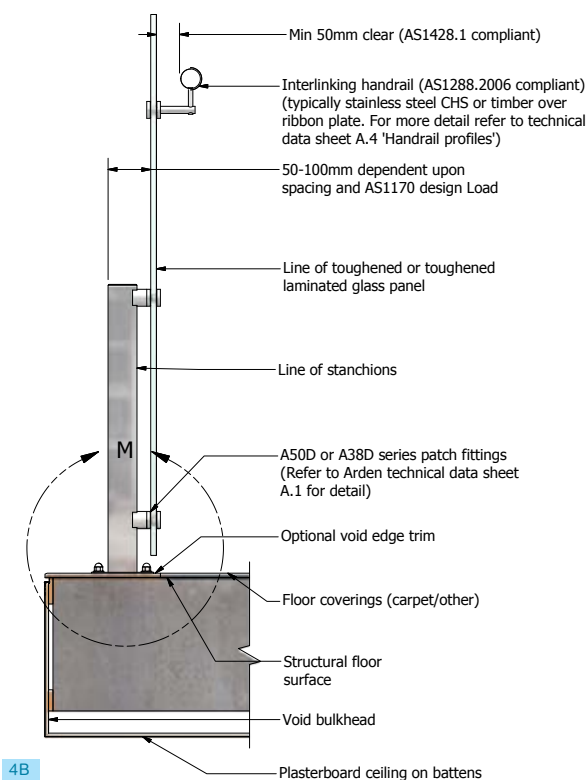
4C. Detail M: Fixing detail



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

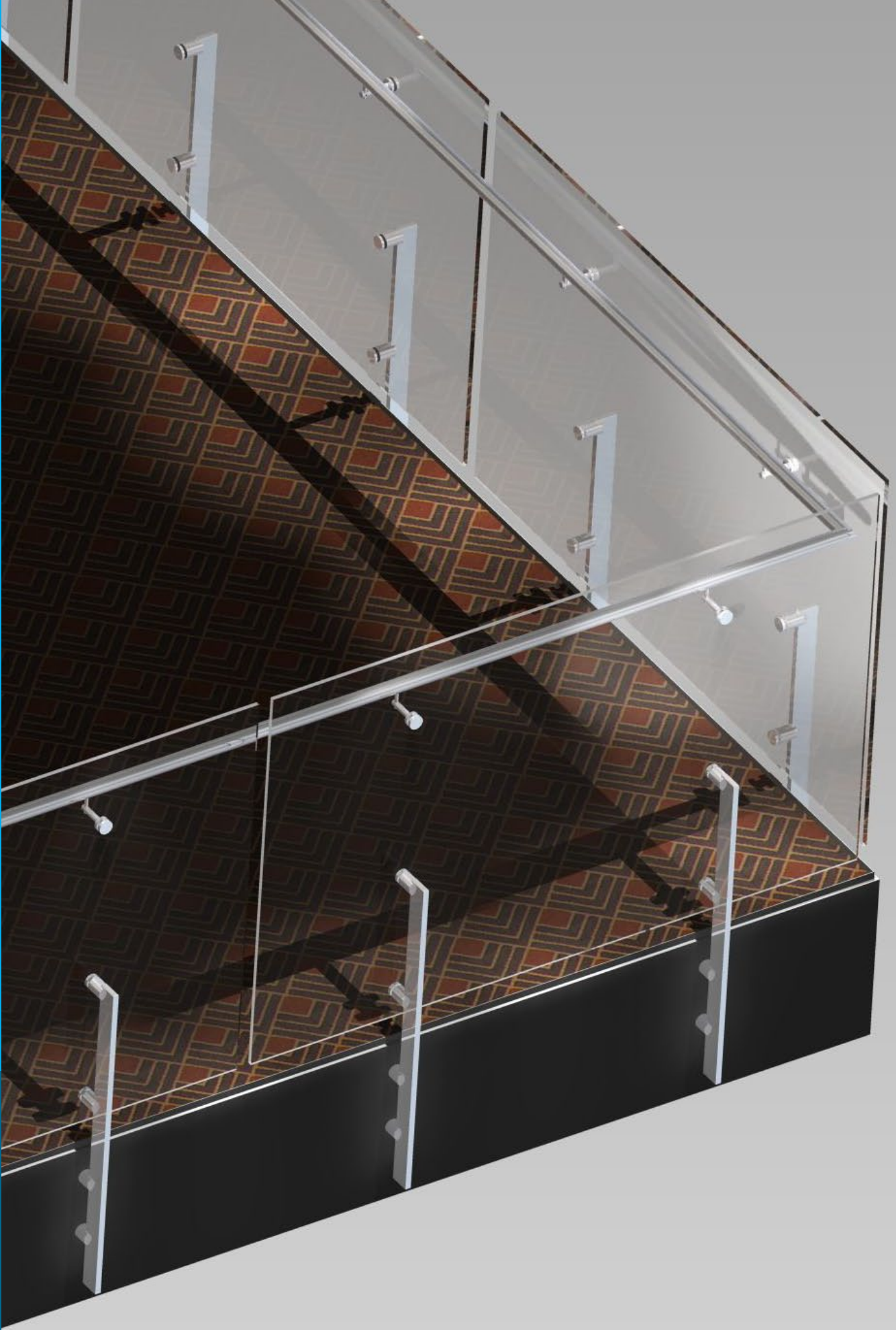
4A

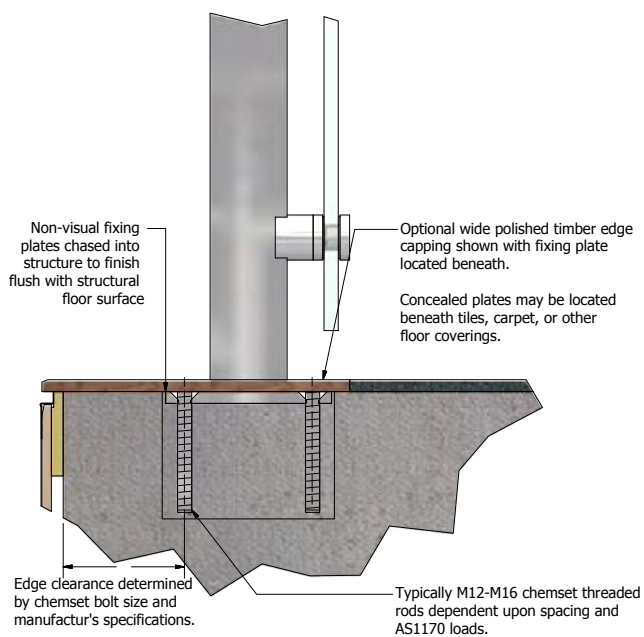




Balustrade System – Stainless half-height blade stanchions and toughened glass

H6





5A

Figure 5. An alternative concealed-baseplate floor fixing method, which is preferred in most modern office designs. A concealed baseplate is also more appropriate when higher design loads are specified.

5A. Floor-fixed con length stanchion with concealed baseplate: Fixing detail



glass panels

This table shows typical glass specifications based on handrail 500mm above top patch fitting.

Design load	Toughened monolithic safety glass (mm)				Toughened laminated safety glass (mm)			
	10	12	15	19	10	12	16	20
Domestic/Residential	Std	On request	On request	On request	Std	On request	On request	On request
Offices/Commercial stairs	Min	Std	Std	On request	Min	Std	On request	On request
Retail/Restaurant	N/A	Min	Std	On request	N/A	Min	Std	On request
C5 high loads	N/A	N/A	Min	Std	N/A	N/A	Min	Std

Notes

- These tables are to be used as a general design guide only.
- Individual project requirements will dictate final glass specification and thickness.
- 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.



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.

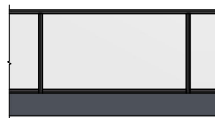
Of particular importance in the initial design stage, it is critical to maintain an awareness of the designation of glass panels as structural or infill, and the classification of handrail as load-supporting, non-load-supporting, or interlinking. Combined with other considerations (e.g. whether or not 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.

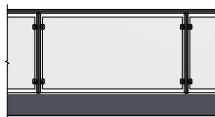
glass balustrade styles



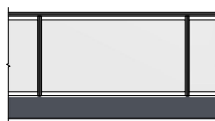
Cantilevered structural. Glass panels supporting an interlinking handrail cantilever from an appropriate floor fixing.



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



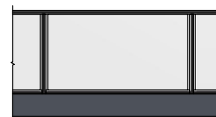
Two-edge clasp. Glass panels are supported on two opposite edges by clasp-style mechanical fixings. The bearing of point loads influence the required grade of glass.



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.

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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 H6 system, this table shows compliance with relevant codes and standards.

Key

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

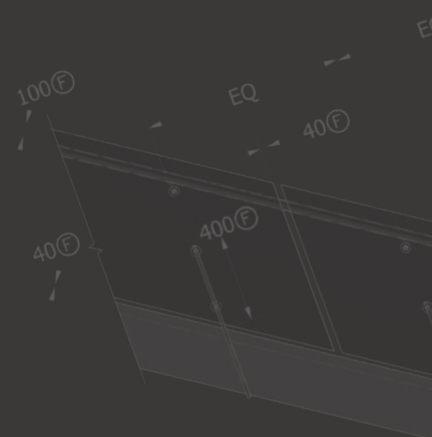
Code	Title	Applicability
BCA	The Building Code of Australia	●
AS NZS 1170.1-2002	Structural Design Actions – Permanent, imposed and other actions	●
AS 1288-2006	Glass in Buildings. Selection and installation.	●
AS NZS 1554.1-2004	Structural steel welding - Welding of steel structures	●
AS 1554.6-1994	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.



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