Full-height blade stanchions with glass on patch fittings
**H8**

**Full-height blade stanchions with glass on patch fittings**

**design**

Combining full height stainless steel stanchions with structural toughened glass, the H8 system represents a striking and elegant balustrade design.

Twin blade stanchions per panel rising to a custom selected handrail create a sharp and minimal profile. Modern structural glass panels may be specified to handle large spans, creating an open and uncluttered effect. Arden A50 / A38 Arden system ‘A’ patch fittings (see technical data sheet A.3) continue the refined feel.

Arden usually recommends positioning the handrail vertically above the stanchions (with glass facing out), but for face-fixed applications (with glass facing in), the H8 may support the handrail via the through-glass patch fittings. Because the H8 is both highly transparent and a feature in its own right, it is at home in sophisticated surrounds, and is best combined with feature staircase designs.

---

© indicated on dimensions denotes a nominal dimension that typically varies according to specific application, engineering requirements or client preferences.
Chemical anchors size and edge clearance dependent upon design loads and chemical anchor manufacturers’ specifications.

Typically M12-M16 chemical anchors dependent upon spacing and AS1170 loads.

Figure 1. Face-fixed H8 void-edge balustrade.

1A. Front view showing equally spaced stanchions. Stanchions may also be located at a fixed distance to the side of glass.

1B. Side elevation. Stanchions are set off from the bulk-head via cylindrical stainless steel off-stands. Alternatively, the stanchion blades may sit flush with, or be partially enclosed by the bulk-head, with non-visual off-stand and fixing assemblies.

1C. Typical thick slab fixing detail of face-fixed H8 version. A pair of chem-set M12 rods are the preferred fixing method in this case.
technical

Each glass panel is supported by a total of four through-glass A50 / A38 patch fittings. A38 diameter fittings are preferred for aesthetic effect, and A50 diameter fittings would only be specified for special high design load installations. Typically 304/316 stainless steel with a 16x65 profile is specified for the blade stanchions. However, larger profile blades are also possible.

Minimum 12mm toughened glass infill panels with polished edges and tipped or rounded corners.

Continuous interlinking handrail terminated on a structure is used as required by AS1288. Typically either 38.1 diameter stainless steel handrails or timber dowel on ribbon plate is specified.

The handrail is typically either mounted on a custom triangular mount and pin section at the top of each stanchion, or else via the through-glass patch fitting. Alternatively, it may be mounted via a horizontal bar off-stand (with glass mounted towards the void).

infill glass panels

This table shows the recommended maximum glass span between patch fittings (mm).

<table>
<thead>
<tr>
<th>Design load</th>
<th>Toughened monolithic safety glass (mm)</th>
<th>Toughened laminated safety glass (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Domestic/Residential</td>
<td>1640</td>
<td>2000</td>
</tr>
<tr>
<td>Offices/Commercial stairs</td>
<td>1070</td>
<td>1650</td>
</tr>
<tr>
<td>Retail/Restaurant</td>
<td>1140</td>
<td>1430</td>
</tr>
<tr>
<td>C5 high loads</td>
<td>Special glass engineering; designed as required</td>
<td></td>
</tr>
</tbody>
</table>

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.
1D. Typical thin slab fixing detail of face-fixed H8 version. Under-slab brackets provide satisfactory separation between fixing points, and can be configured to handle most slab types. Vertical M12 fixings are offset laterally so as not to interfere with the horizontal fixing.

1E. Typical LVL or bearer fixing detail of face-fixed H8 version.

1F. Slab fixing using off-stand bar rather than cylindrical bodies.

Typically > 60

150x8mm offstand bar

10-16mm steel fixing plate

Non-shrink grout

Typically > 60

1 M12-M16 chemset threaded rods dependent upon spacing and AS1170 loads.

Typically > 60

150x8mm offstand bar

(1) indicated on dimensions denotes a nominal dimension that typically varies according to specific application, engineering requirements or client preferences.
Figure 2. Floor-fixed H8 void-edge balustrade.

2A. Front view of floor-fixed H8 void-edge balustrade showing equally spaced stanchions. Stanchions may also be located at a fixed distance to the side of glass.

2B. Side elevation of floor-fixed H8 void-edge balustrade. Stanchions are set off from the bulk-head via cylindrical stainless steel off-stands. Alternatively, the stanchion blades may sit flush with, or be partially enclosed by the bulk-head, with non-visual off-stand and fixing assemblies.

2C. Typical floor fixing of H8 using stainless steel visual components. Exact dimensions of base-plate and specification grade will vary according to design load requirements.

*Indicated on dimensions denotes a nominal dimension that typically varies according to specific application, engineering requirements or client preferences.
Full-height blade stanchions with glass on patch fittings

- Handrail welded on top of stanchion pin (AS1288:2006 compliant) typically stainless steel CHS or timber over ribbon plate (For more detail refer to technical data sheet A.4 'Handrail profiles').

- 50-100mm dependent upon spacing and AS1170 design Load

- Line of toughened or toughened laminated glass panel

- Line of stanchions

- A50D or A38D series patch fittings (Refer to Arden technical data sheet A.1 for detail)

- Optional void edge trim

- Floor coverings (carpet/other)

- Structural floor surface

- Void bulkhead

- Plasterboard ceiling on battens

- Min 50mm clear (AS1428.1 compliant)

- Stainless steel visual dome nuts

- M10-M16 threaded rod chemset fixings. Depth of fixing dependent upon AS1170 load and spacing.

- Top of baseplate may finish flush, above or below line of floor cover depending on floor covering thickness and/or client discretion.

- Actual position of stanchion relative to bulkhead face, may depend on interface between void-edge balustrade and staircase flight.
Handrail (Typically stainless steel CHS or timber over ribbon plate) Positioned over stanchions with common centre-line

Glass panels supported by patch fittings

Optional large diameter corner rounds on glass

Landing

Floor coverings (carpet/other)

Stanchions fixed to structural steel core of tread assembly

Nosing line

12-15mm toughened or 12.76-17.52 toughened laminated glass depending on AS1170 design load, span and glass location

A50D or A38D series patch fittings (Refer to System A patch fittings technical data sheet for detail)

Landing handrail welded on top of the stanchion pin (Typically stainless steel CHS or timber over ribbon plate)

A-A

Full-height blade stanchions with glass on patch fittings

Optional handrail end-detail with dowel plunging to finish floor
3. Example of a typical H8 layout on a U-shaped landing. Large diameter rounds on glass corners and a suitable handrail termination detail have been specified.

4. Isometric front elevation cut-away of H8 stanchion, handrail, and glass panel. Specialised fixing methods directly to landing structure are used so that attachment details are completely hidden.

5. Side elevation illustrating the specification of H8 balustrade on a raking flight. Simple tipped glass corners are specified.

6. Front elevation of floor-fixed H8 void-edge balustrade with concealed fixings. Stanchions are located at a fixed distance to the side of glass.

7. Top glass fixing and handrail detail. An inset steel ribbon is used to strength the dowel handrail.

8. Raking flight termination detail with plunging handrail.

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

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

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.
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 H8 system, this table shows compliance with relevant codes and standards.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA</td>
<td>The Building Code of Australia</td>
<td></td>
</tr>
<tr>
<td>AS NZS 1170.1-2002</td>
<td>Structural Design Actions – Permanent, imposed and other actions</td>
<td></td>
</tr>
<tr>
<td>AS NZS 1554.1-2004</td>
<td>Structural steel welding - Welding of steel structures</td>
<td></td>
</tr>
<tr>
<td>AS 1554.6-1994</td>
<td>Welding stainless steels for structural purposes</td>
<td></td>
</tr>
<tr>
<td>AS NZS 4586-2004</td>
<td>Slip resistance classification of new pedestrian surface materials</td>
<td></td>
</tr>
<tr>
<td>AS 1428.1-2009</td>
<td>Design for access and mobility</td>
<td></td>
</tr>
</tbody>
</table>

Key

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

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.