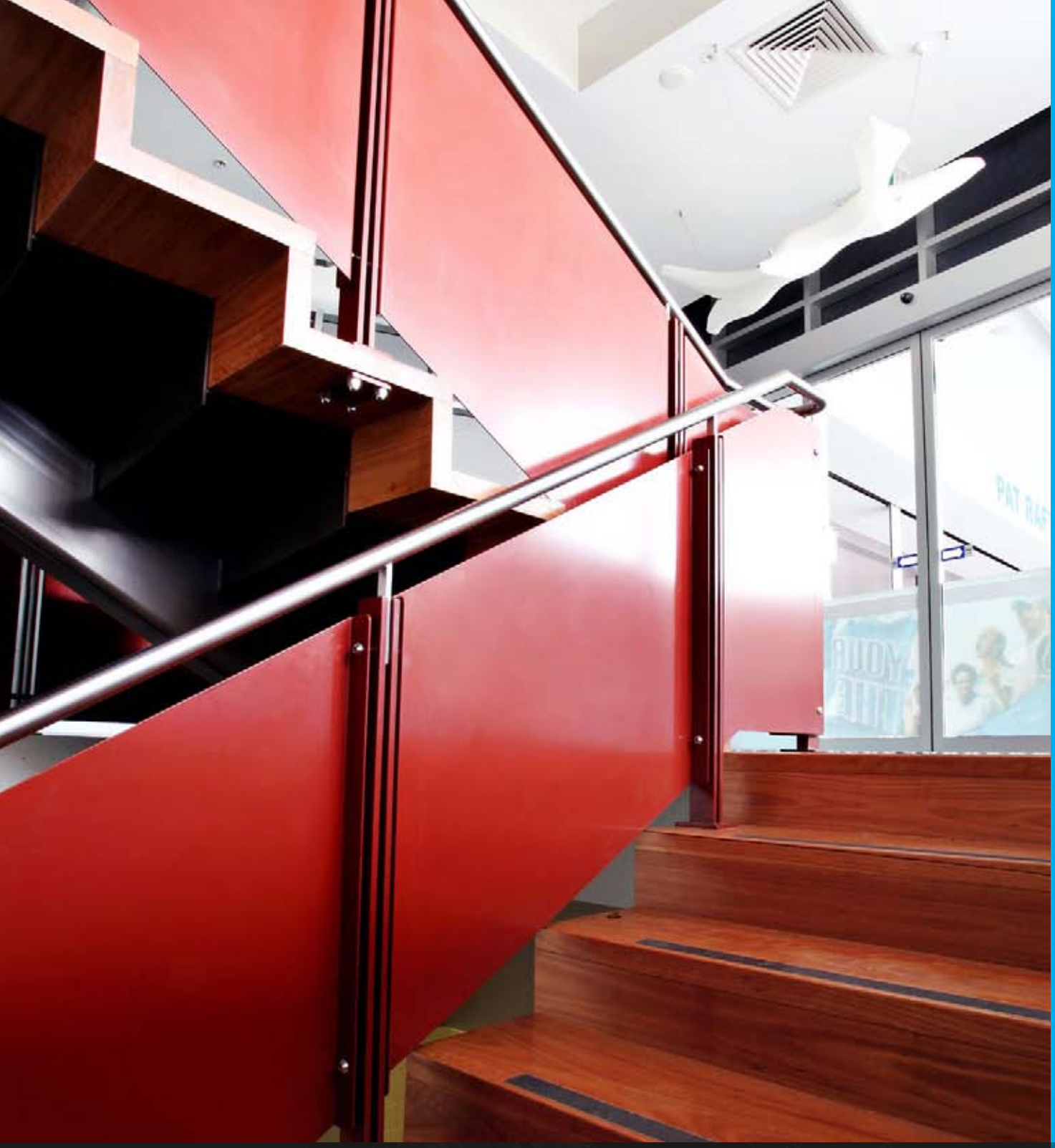


Twin plate stanchions supporting folded metal panels

design elements

S1

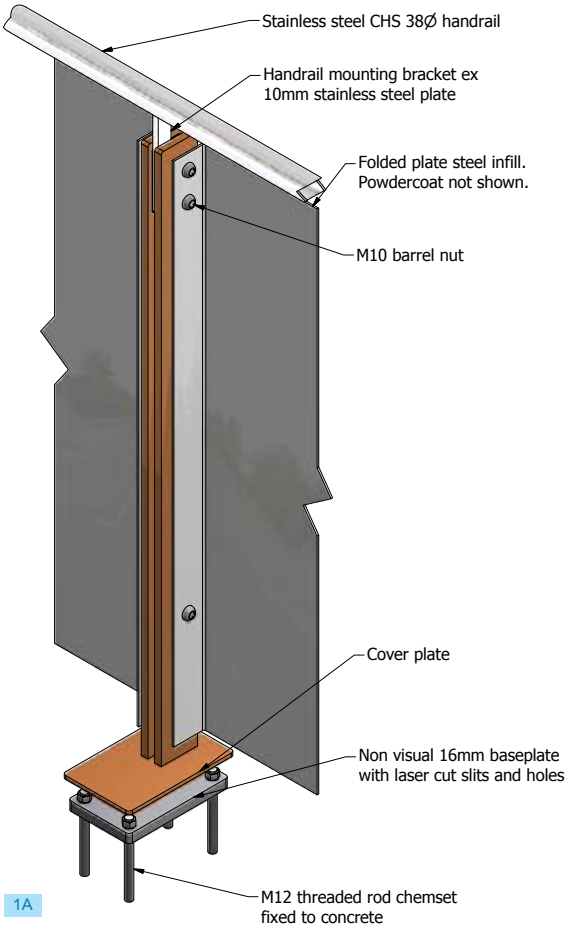
arden
ARCHITECTURAL STAIRCASES

design

Utilising folded plate as balustrade infill rather than the more common glass panel provides an opportunity to showcase the potential elegance of powder-coated or painted mild steel. Pre-finished panels provide the opportunity to select a colour that either strikes a design note, or to provide a visual link to surrounding features.

The ability to specify solid colour infill highlights the role of the S1 as a feature balustrade that is designed to capture the attention.

As an alternative to glass panel infill, steel sheet is naturally more durable, and therefore the S1 is particularly appropriate in unsecured public spaces such as train stations. Where a balustrade represents a potential overhead fall risk, this can only be addressed by relatively expensive glazing systems. The S1 eliminates this issue.



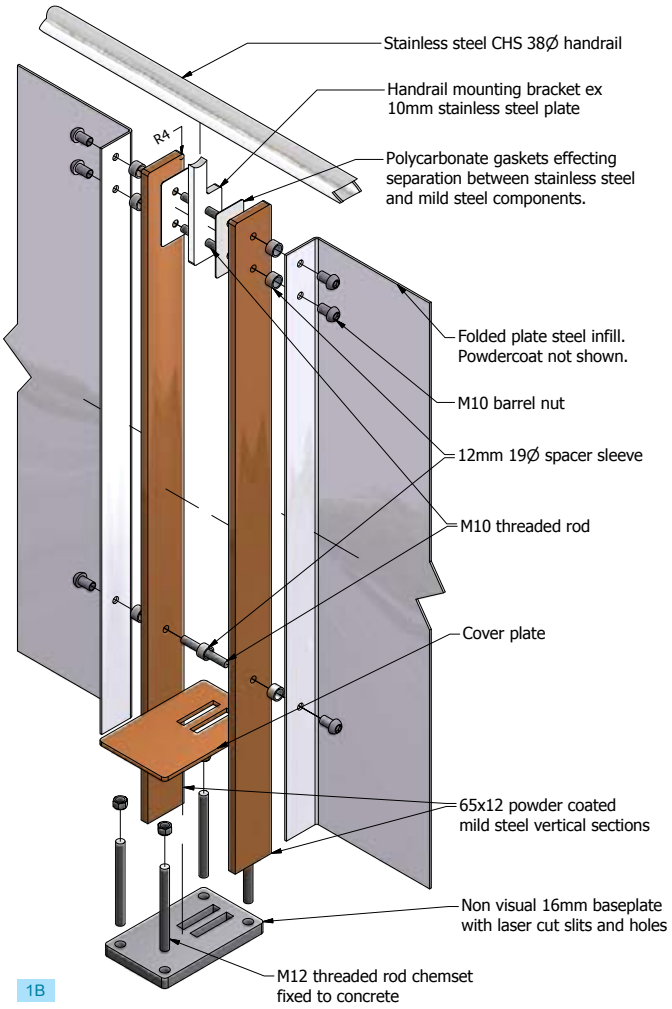


Figure 1. S1 Balustrade assembly.

1A. Isometric.

1B. Exploded

Twin plate stanchions supporting folded metal panels

S1

At the stanchions, the combination of folded sheet and twin sandwich stanchion blades create a sequence of vertical shadow-lines (stepped in the case of a raking balustrade) that create interest as perspective changes. Rounded corners relieve any potential harshness created by the preponderance of steel components. The softening effect can be increased further by the selection of perforated, rather than solid metal panels. Laser-cutting technology allows for virtually any perforation design to be applied.

The overall effect of the S1 is at once robust and elegant, providing a strong and durable impression in commercial, public or industrial contexts.

As with all open staircases, the BCA rule on a gap of less than 125mm being required between the top of a tread and the underside of the tread above. Most modern staircases have a rise per tread of between 170mm and 190mm, thereby requiring a functional tread thickness of between 45mm and 65mm.

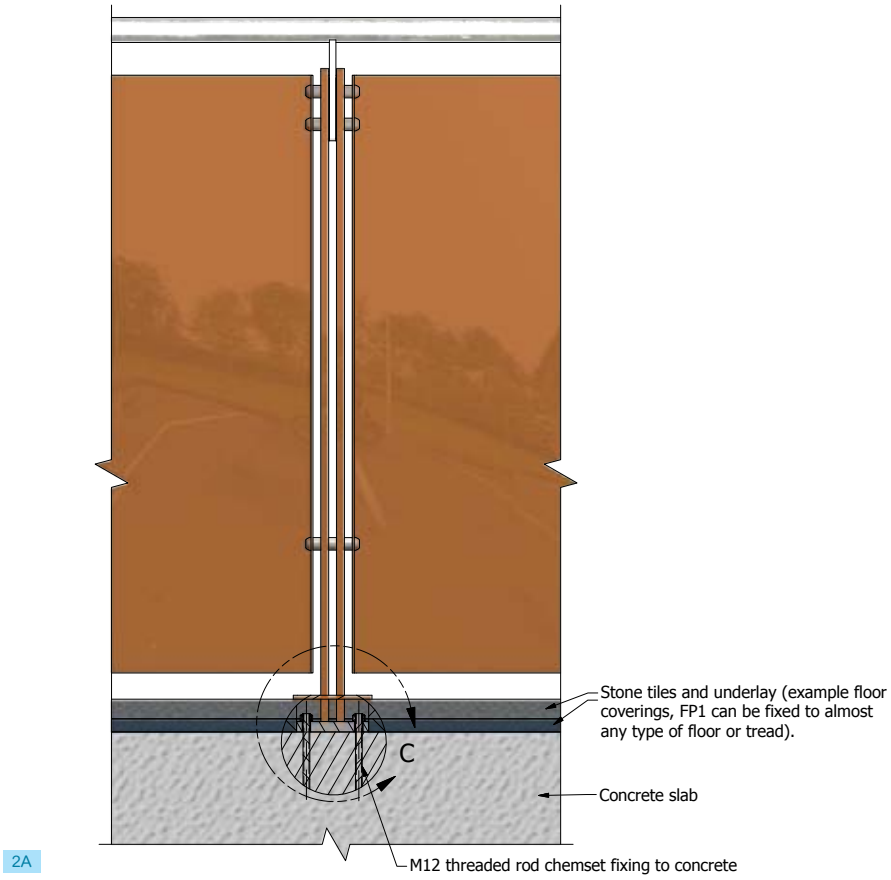
The tread solutions for open staircases applicable to the S1 are provided in Arden technical data sheet 'A.3 Treads'. The details illustrated draw upon these tread solutions.

technical

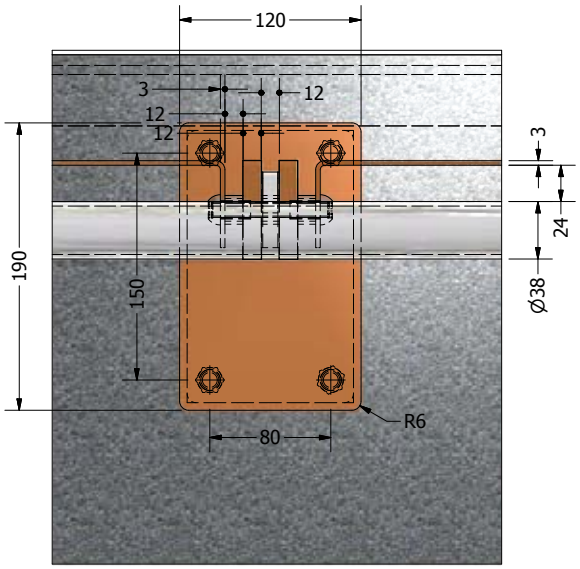
S1 balustrade is suitable for a variety of stair case types, and for virtually any floor covering on level sections, in either visual or concealed base-plate versions.

On flights, the stanchions may be mounted via a sandwich style fixing as illustrated, or alternatively in a more standard floor fixing. Twin heavy duty blades provide the structural support in stanchions, are separated by spacers and other components, and bound together by barrel nuts on M10 rod. These are fixed with an extra-thick (16mm) laser-cut base-plate.

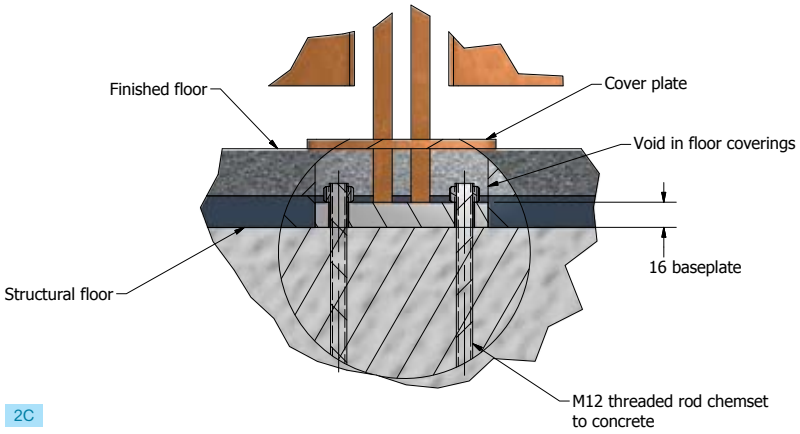
With the materials and fixing methods detailed, the FP1 is capable of being specified to very high design loads.



2A



2B



2C

Figure 2. S1 as void edge balustrade with concealed floor fixing.

2A. Front elevation

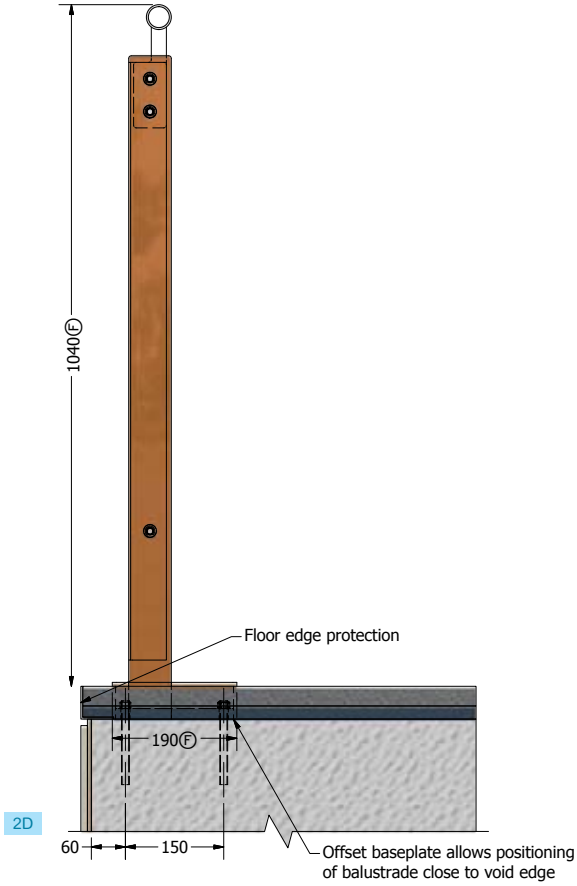
2B. Plan

2C. Concealed fixing plate detail

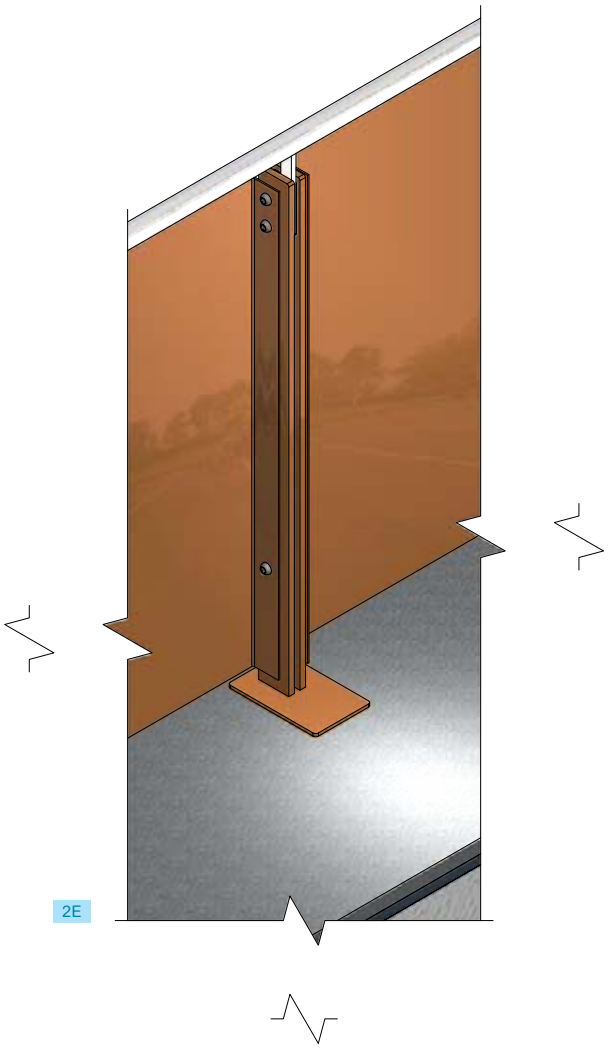
2D. Side elevation

2E. Rear isometric

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


1040Ⓕ
Floor edge protection
190Ⓕ
60
150
Offset baseplate allows positioning
of balustrade close to void edge

2D



2E

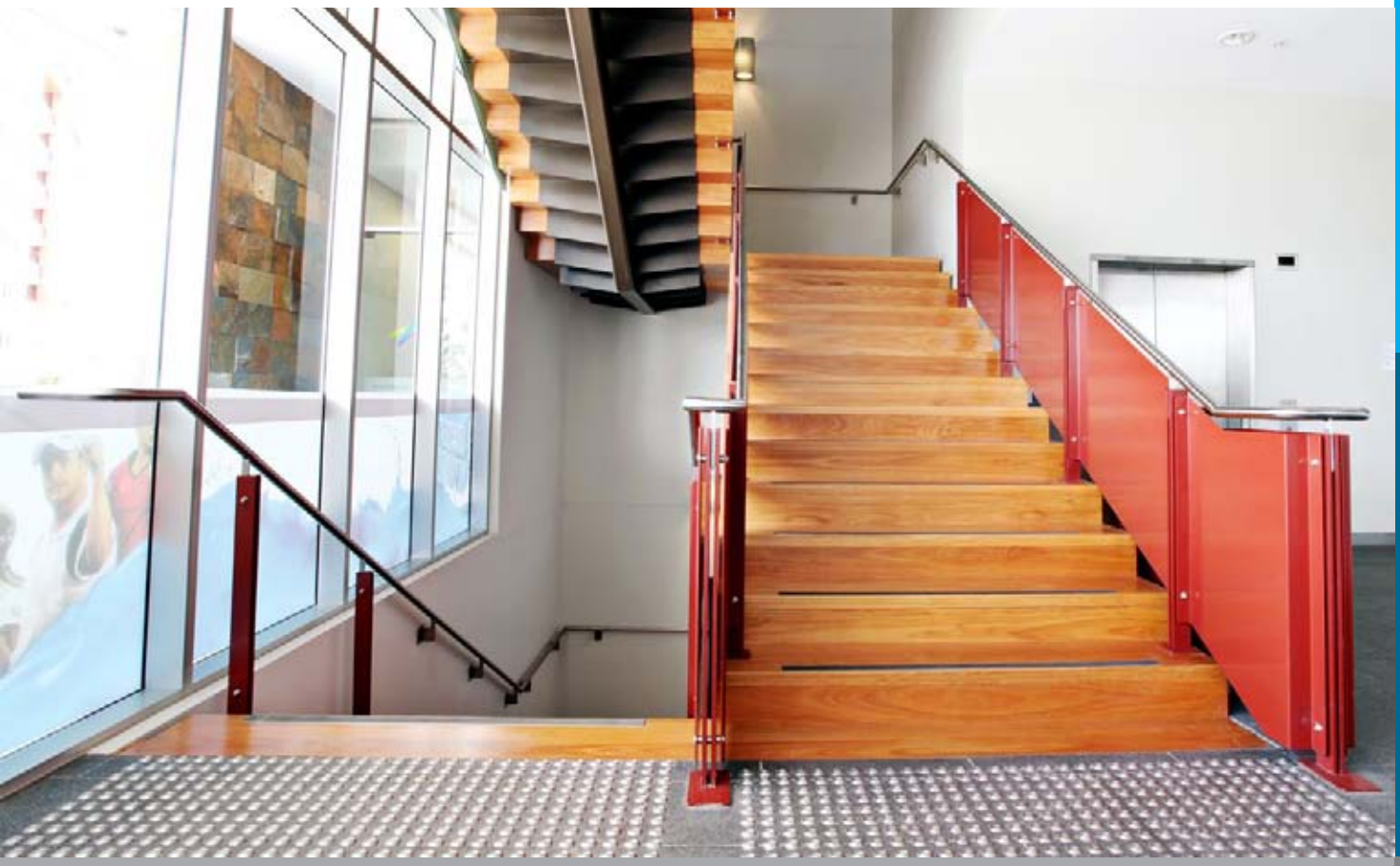
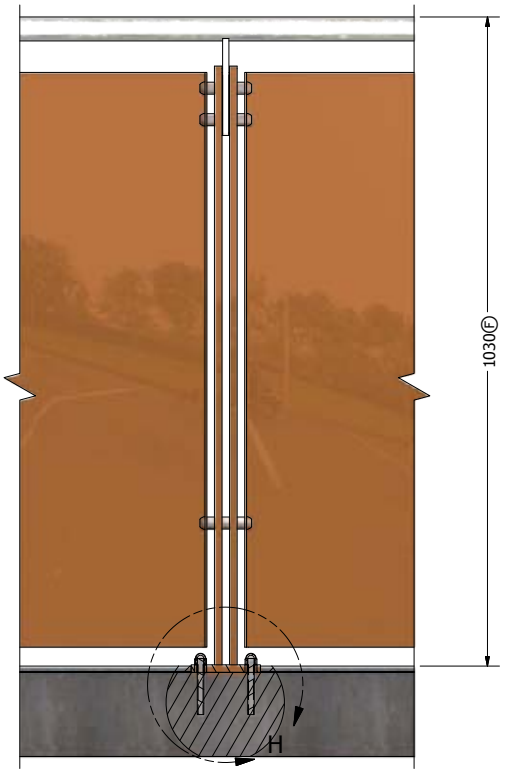


Figure 3. S1 as void edge balustrade with visual floor fixing.

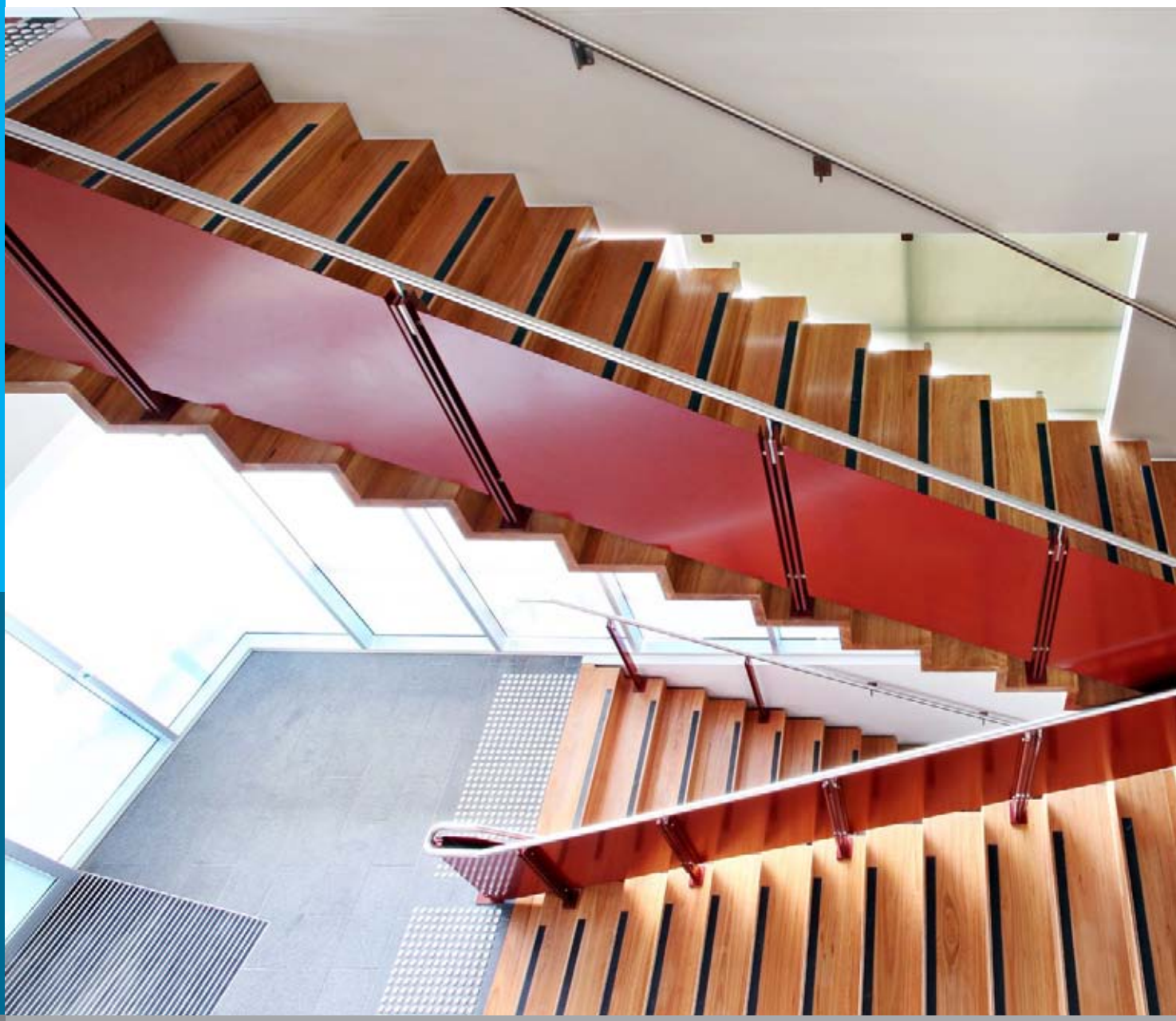
3A. Front elevation

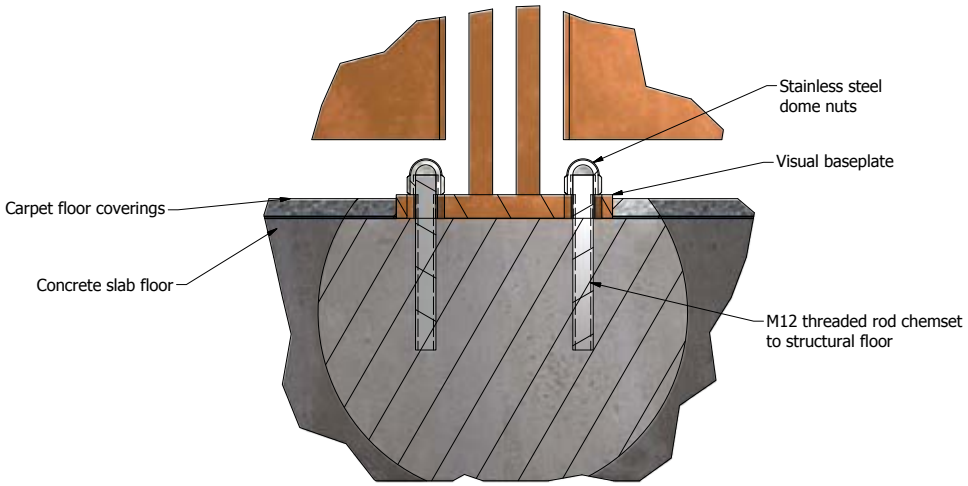
3B. Floor fixing detail

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



3A




Stainless steel
dome nuts
Visual baseplate
Carpet floor coverings
Concrete slab floor
M12 threaded rod chemset
to structural floor

3B

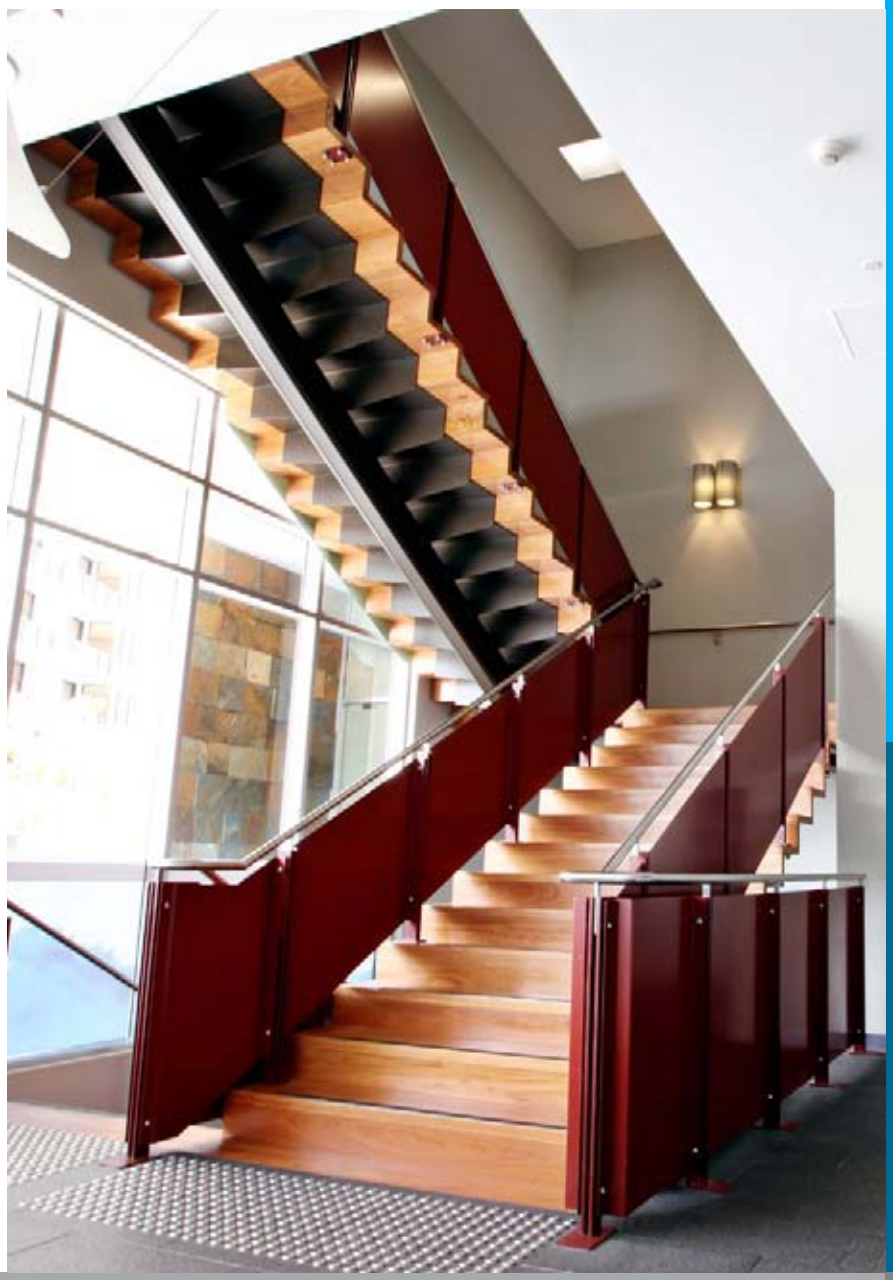


Figure 4. S1 as raking balustrade with sandwich plate tread fixing and perforated metal / stainless steel style.

4A. Isometric

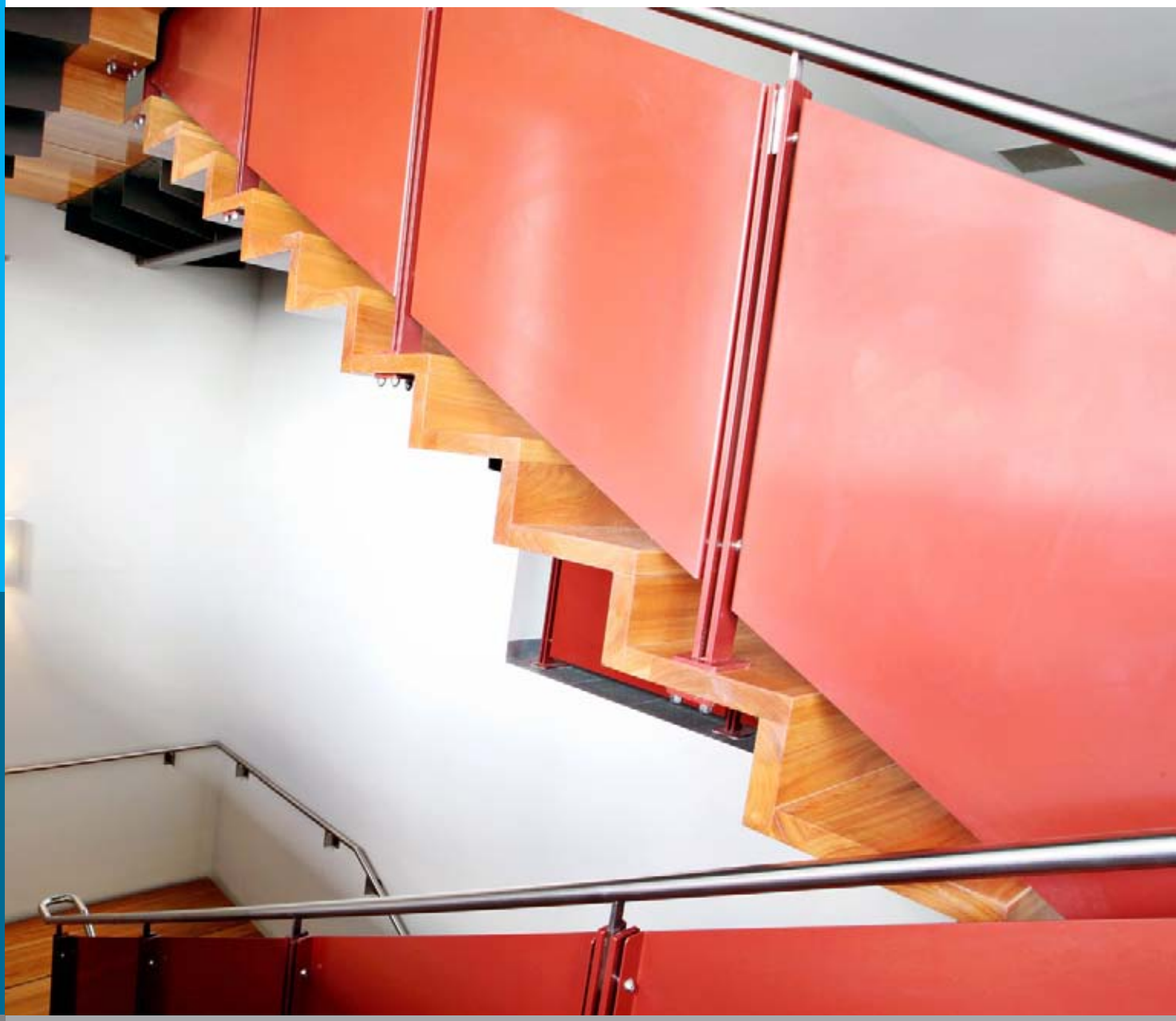
4B. Side elevation

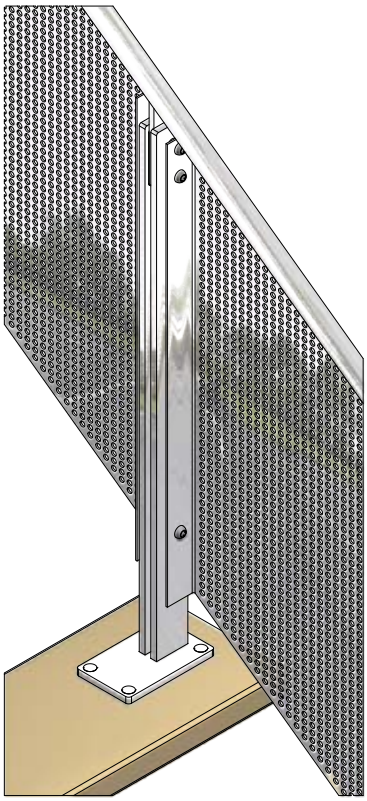
4C. Upper handrail and panel fixing detail

4D. Thru-tread sandwich fixing detail

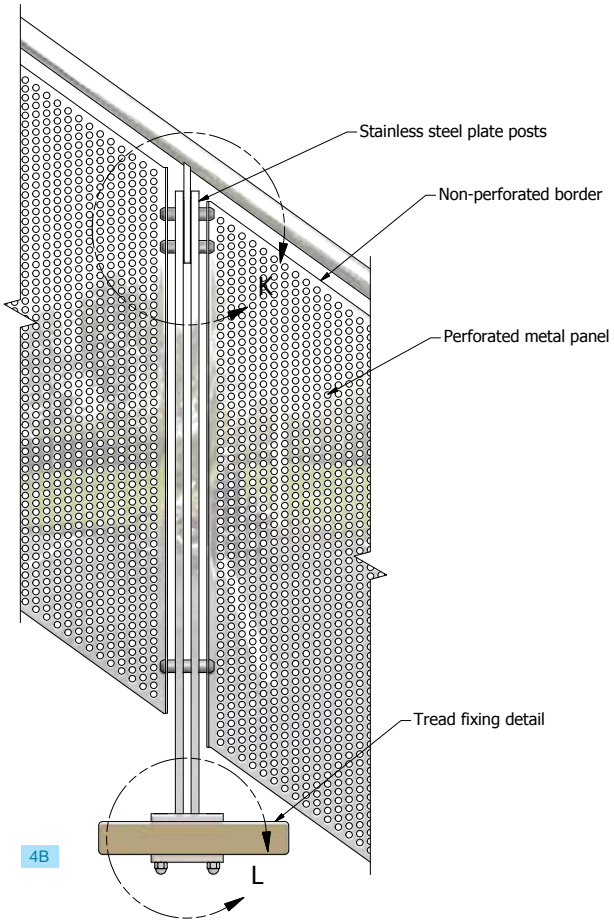
Figure 5. S1 as raking balustrade with sandwich plate tread in solid powder-coated folded plate style.

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

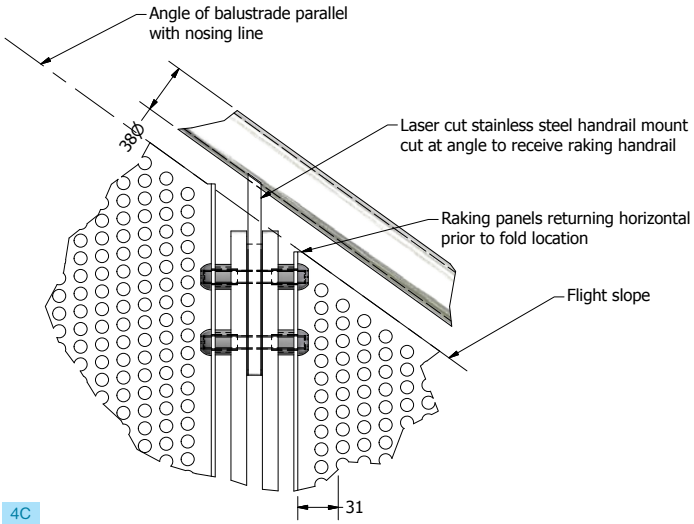




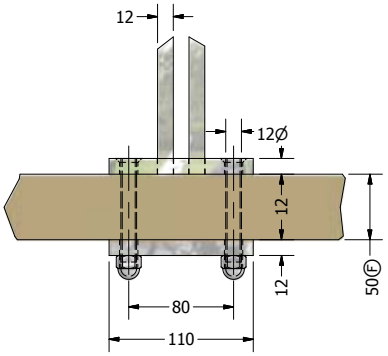
4A


Stainless steel plate posts
Non-perforated border
K
Perforated metal panel
Tread fixing detail
L

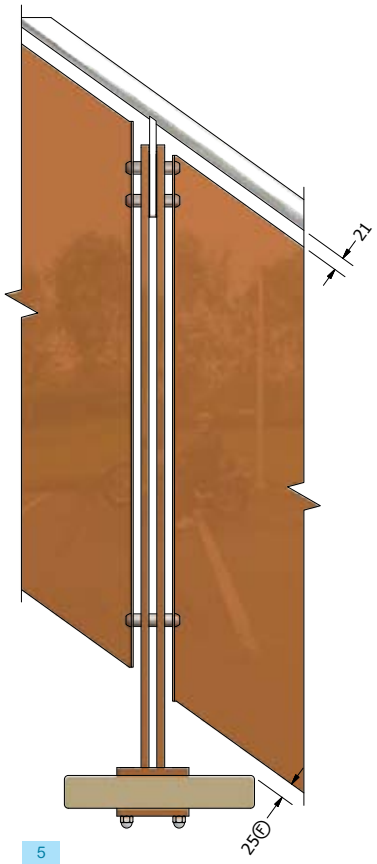
4B


Angle of balustrade parallel with nosing line
38Ø
Laser cut stainless steel handrail mount cut at angle to receive raking handrail
Raking panels returning horizontal prior to fold location
Flight slope
31

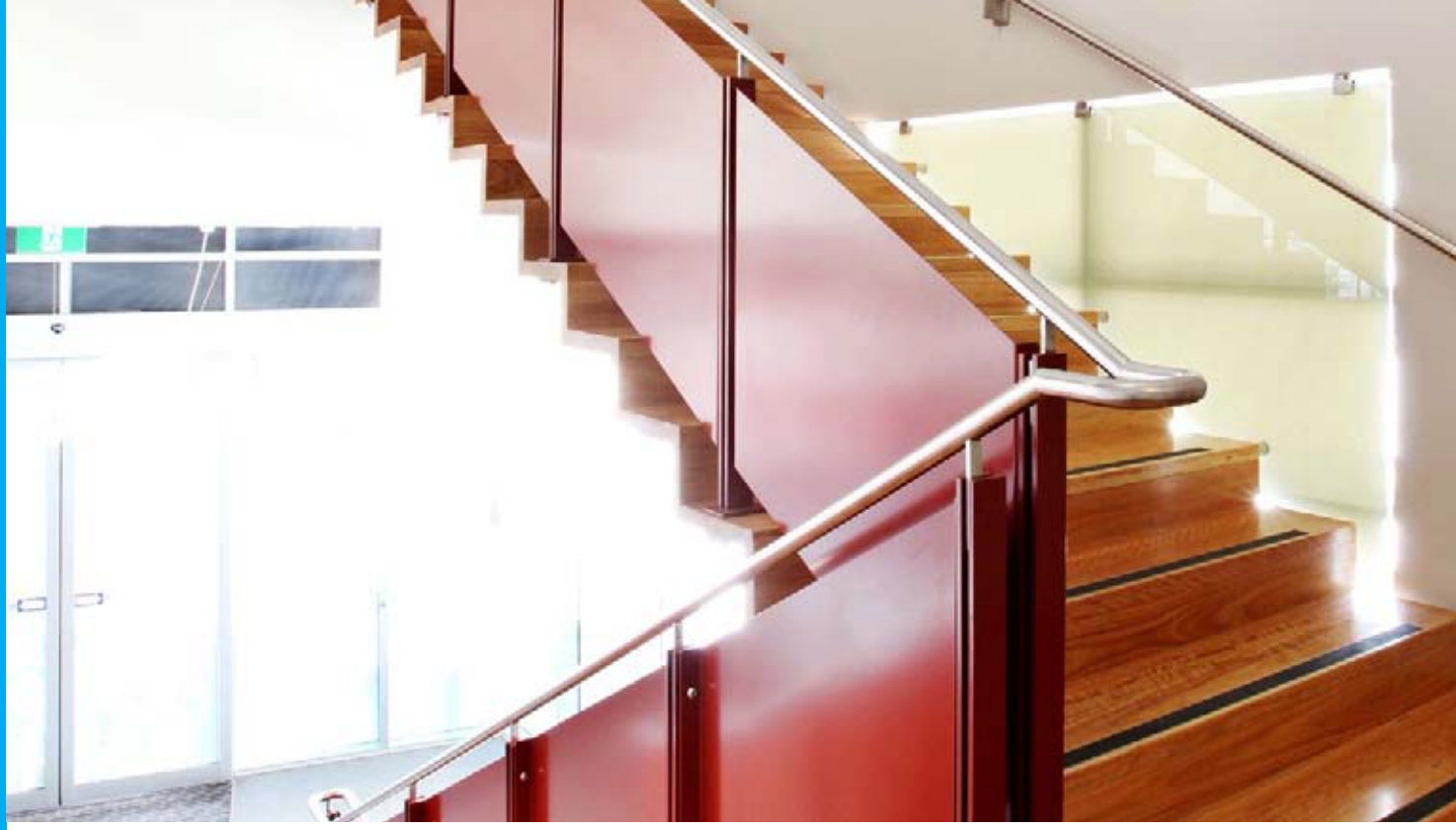
4C

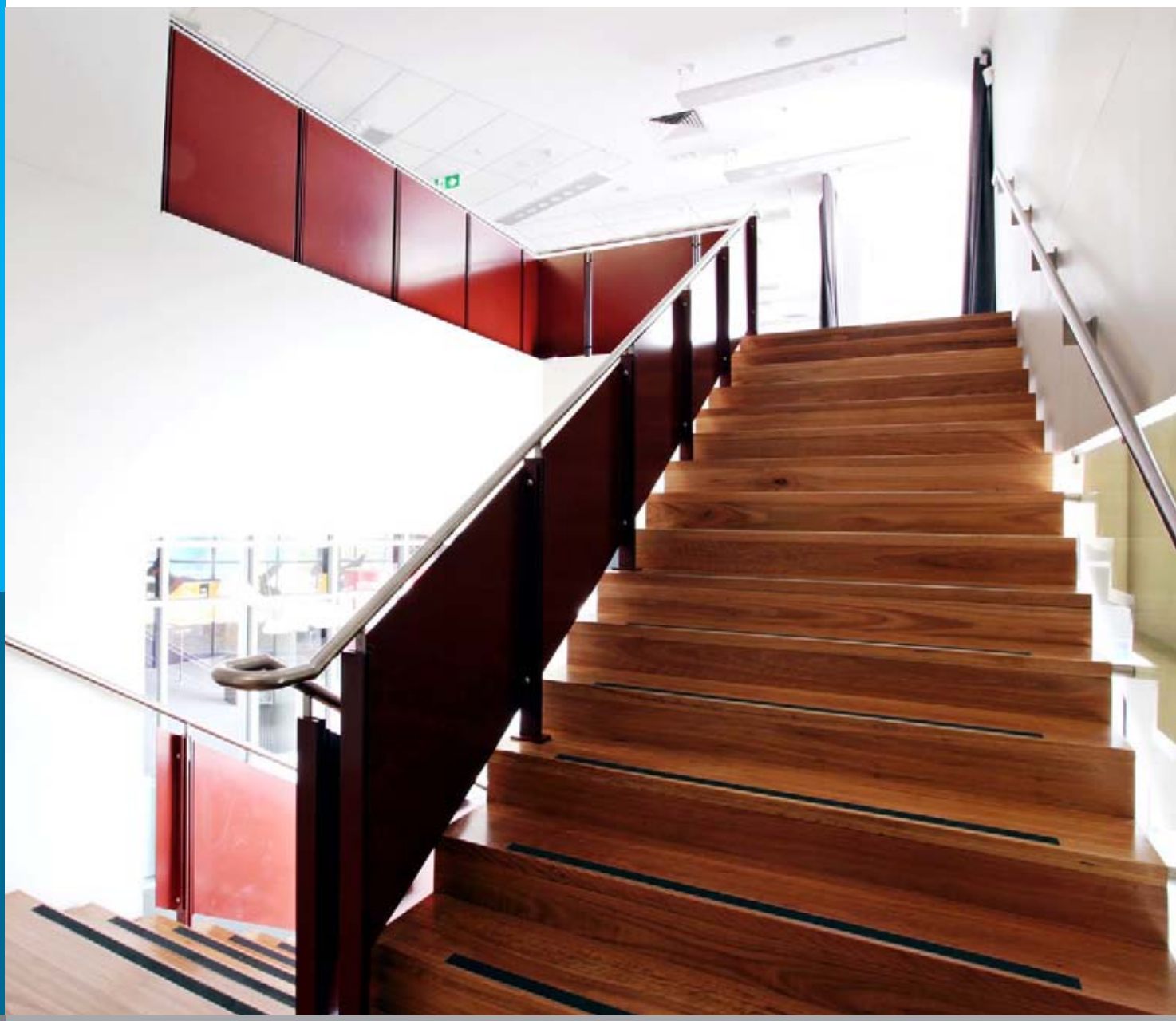

12
12Ø
12
12
50Ⓕ
80
110

4D


21
25Ⓕ

5





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 S1 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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