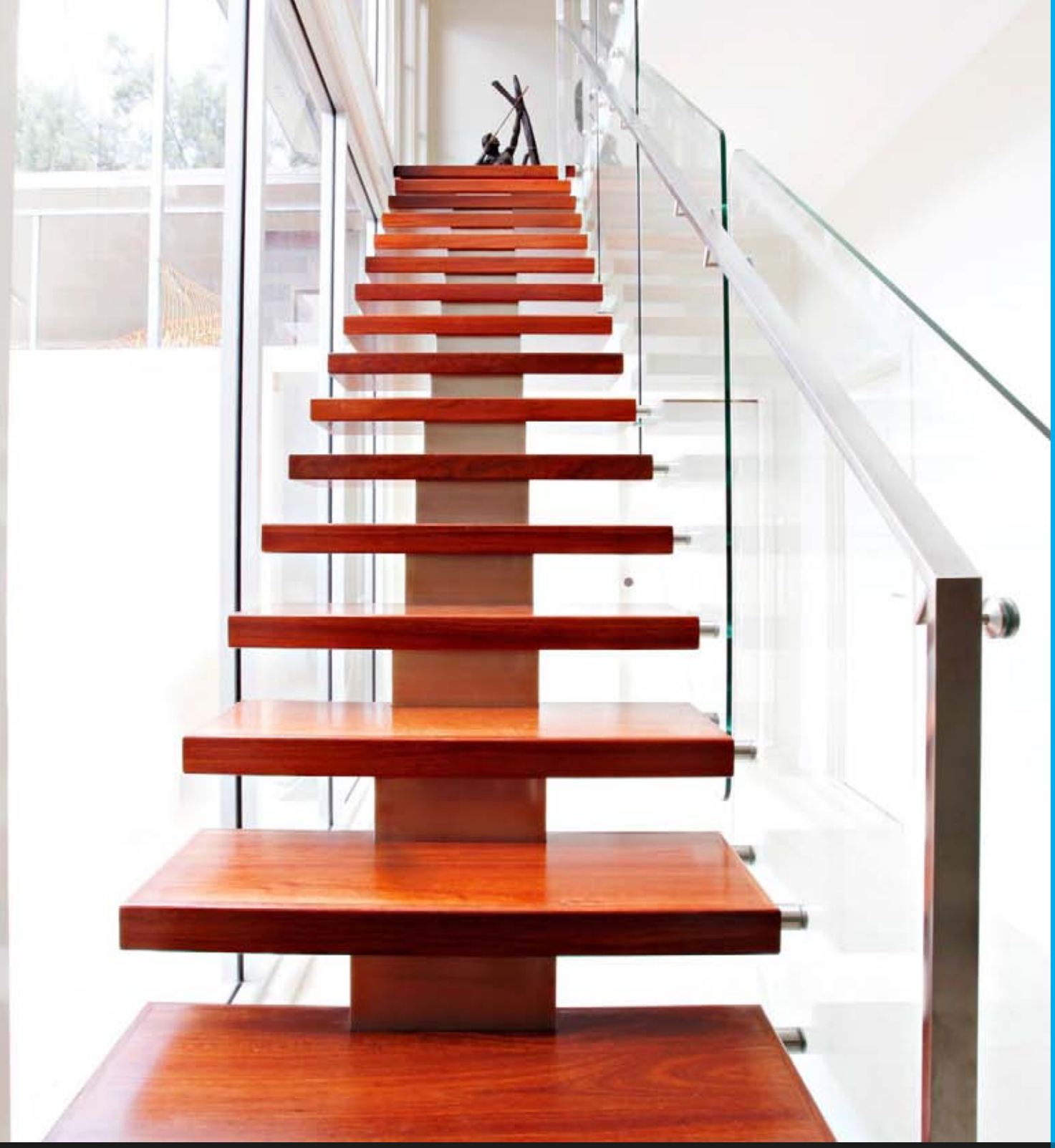


Zigzag mono-stringer

design elements

Z2

arden
ARCHITECTURAL STAIRCASES

Chosen dress wood species composite treads

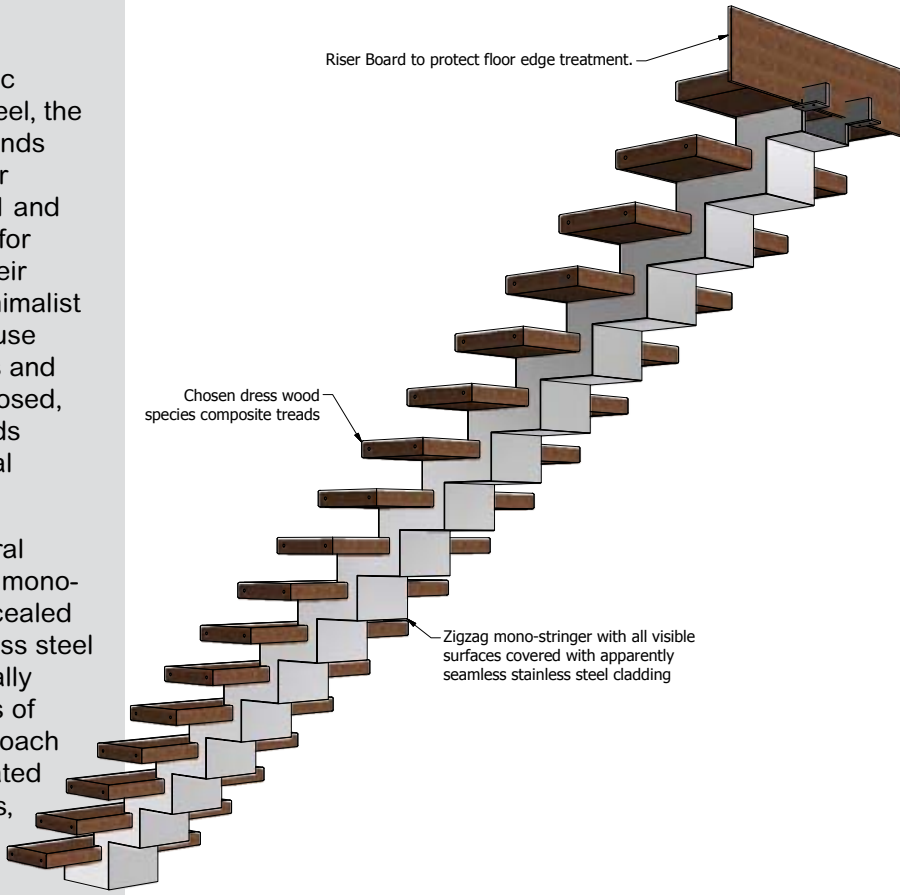
Zigzag mono-stringer wi surfaces covered with ap seamless stainless steel c

design

A shimmering geometric monolith in stainless steel, the Z2 immediately commands attention. Mono-stringer designs such as the M1 and M2 are an ideal option for many situations with their open structure and minimalist design. However, because the structural members and support plates are exposed, they have a bias towards a functional or industrial presentation.

In contrast, the structural frame of the Z2 zigzag mono-stringer is entirely concealed behind polished stainless steel zigzag plate. It essentially combines the strengths of the mono-stringer approach with a highly sophisticated and elegant finish. Thus, the Z2 is particularly suitable for modern prestige residences.

By cladding the mono-stringer support structure in a seamless stainless steel shell, the staircase gives the impression that it has been sculpted from a single solid billet of metal. This inspires a feeling of solidity and substance without diminishing the airiness of the mono-stringer design. The highly reflective surfaces in fact add to the translucent qualities of this staircase.



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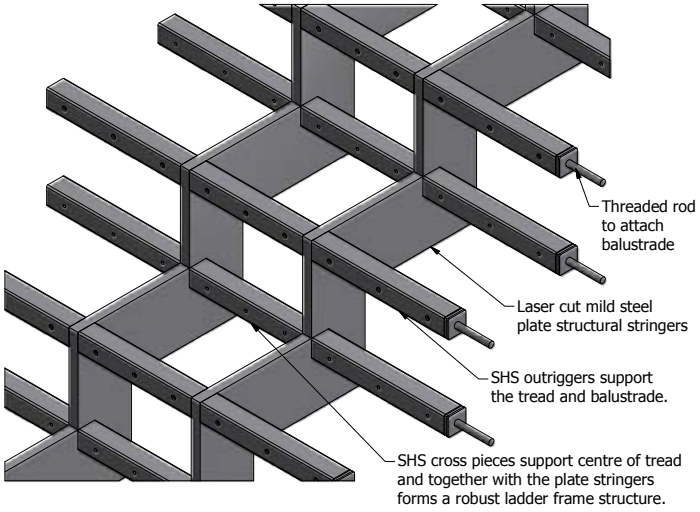

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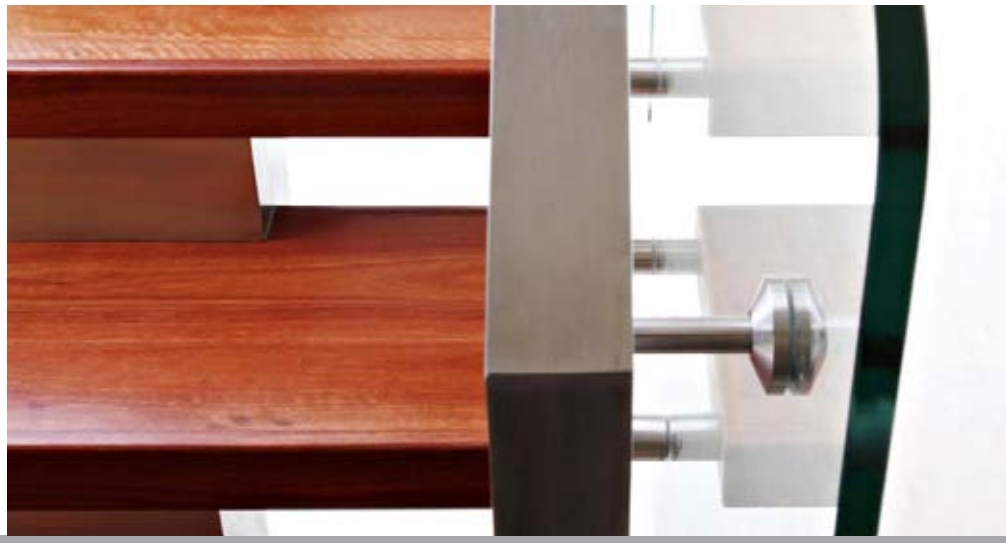
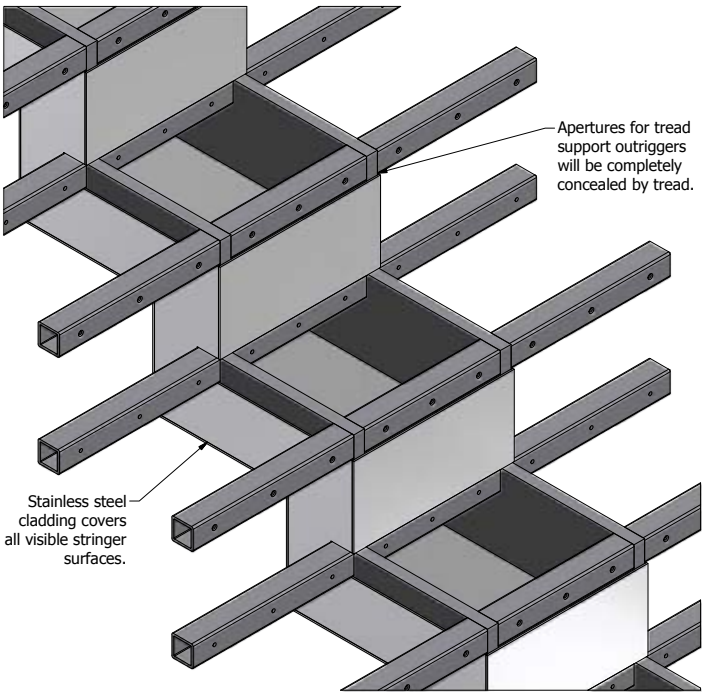


Figure 1. Design elements of the Z2

Figure 2. Core structure detail

Figure 3. Mono-stringer core with cladding fitted - Top



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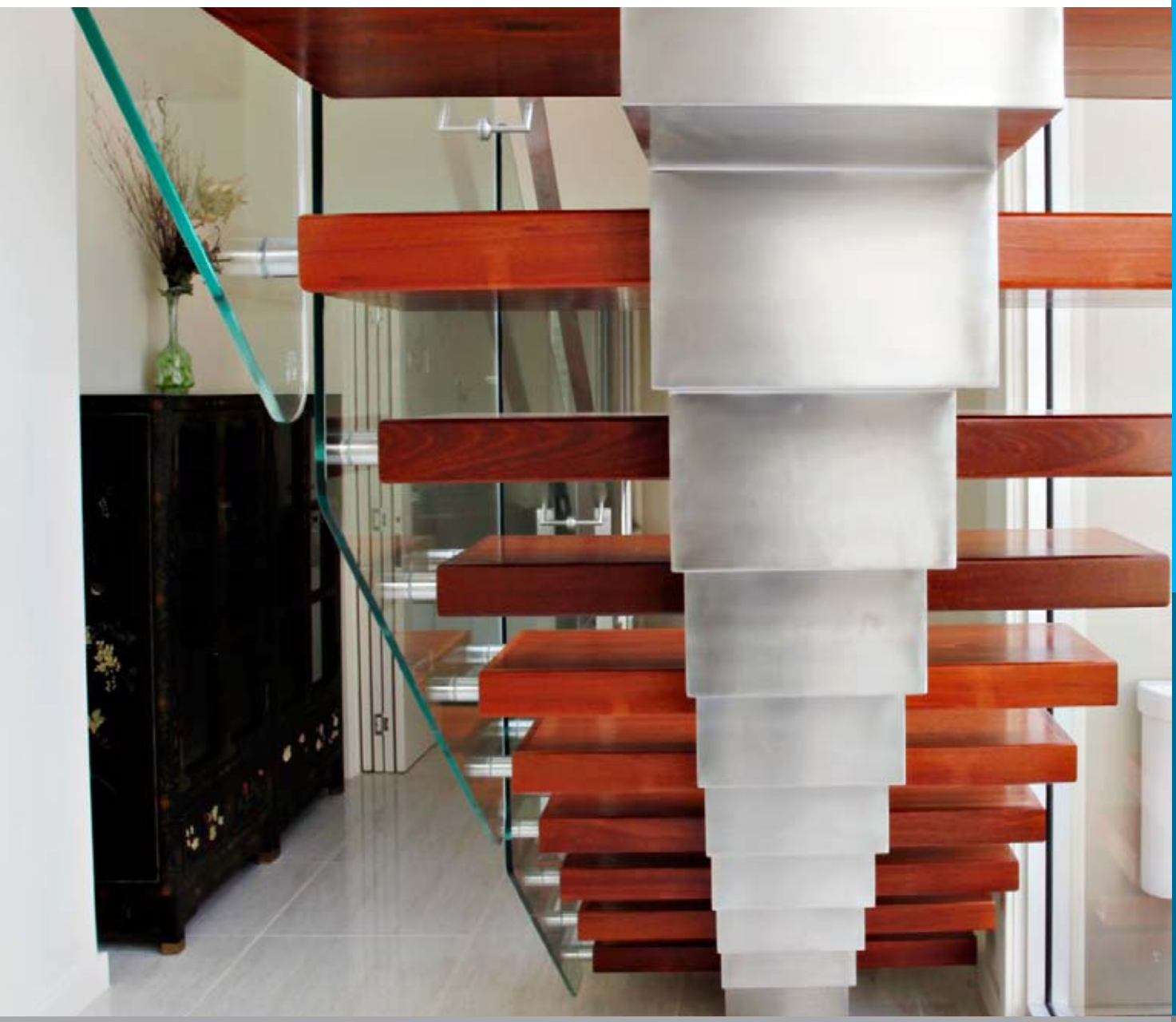
The Z2 combines particularly effectively with a frameless glass or face-fixed balustrade systems, enhancing transparency and emphasising the zigzag stringer feature.

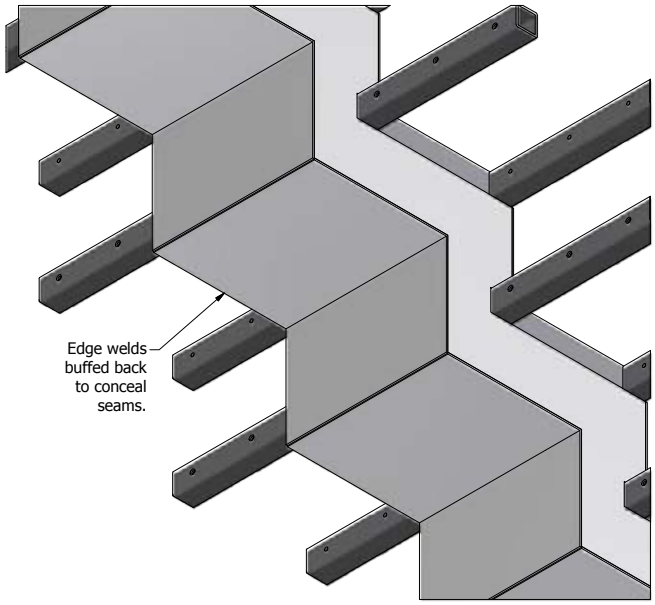
The Z2 zigzag stringer looks particularly good when contrasted with tread and riser assembly that also emphasises the stepped pattern. The stepped effect can be maximised when a stepped soffit is added that mirrors the stepped pattern of the treads, thus fully realising the zigzag concept.



technical

The Z2 is built around two laser cut mild steel core stringers. These are bound together with short lengths of square hollow section steel to form a ladder frame. More lengths of SHS are added to each side of the frame to anchor and support the treads. The core is then clad with 3mm plate stainless steel with all welds ground flush and polished to give a seamless finish.

Once the stringer is installed the steps are constructed by screwing blocks of ply between the SHS outriggers and centre sections. The dress wood veneers and nosings are then bonded to these ply cores.



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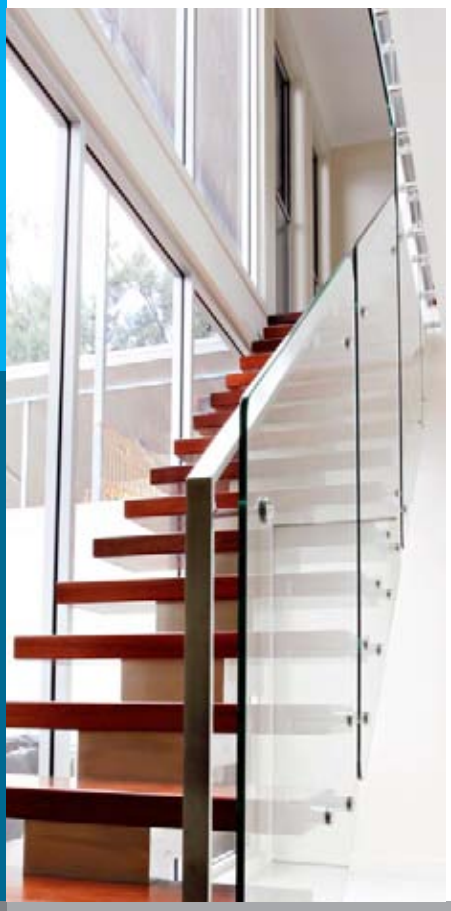

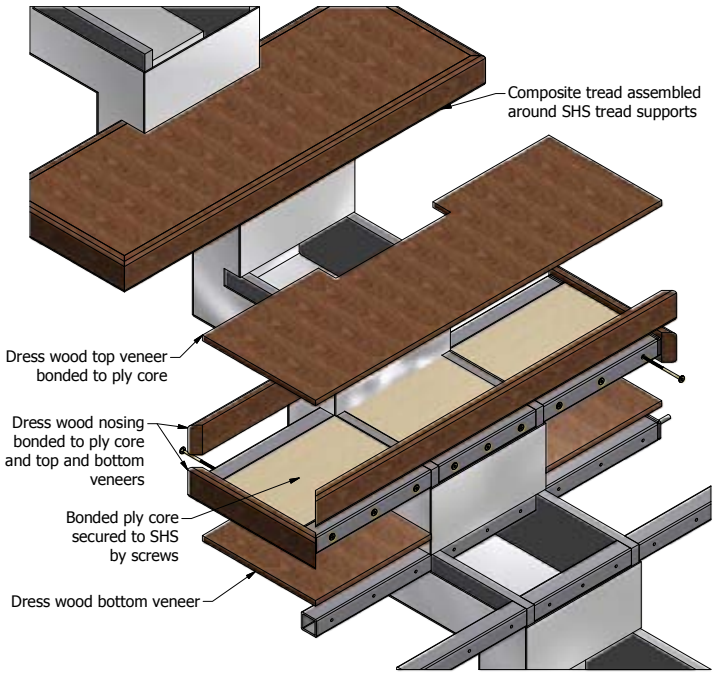

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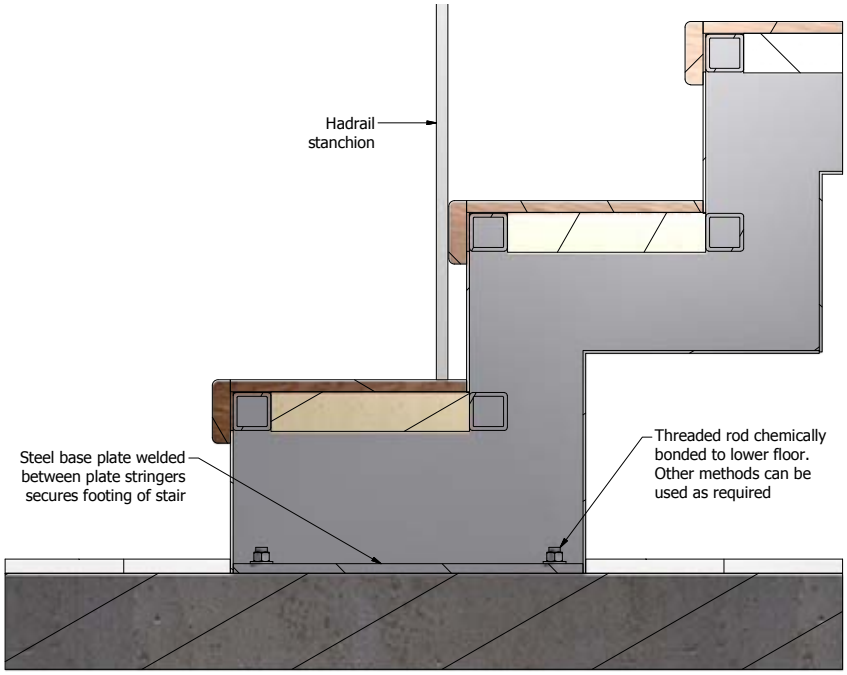

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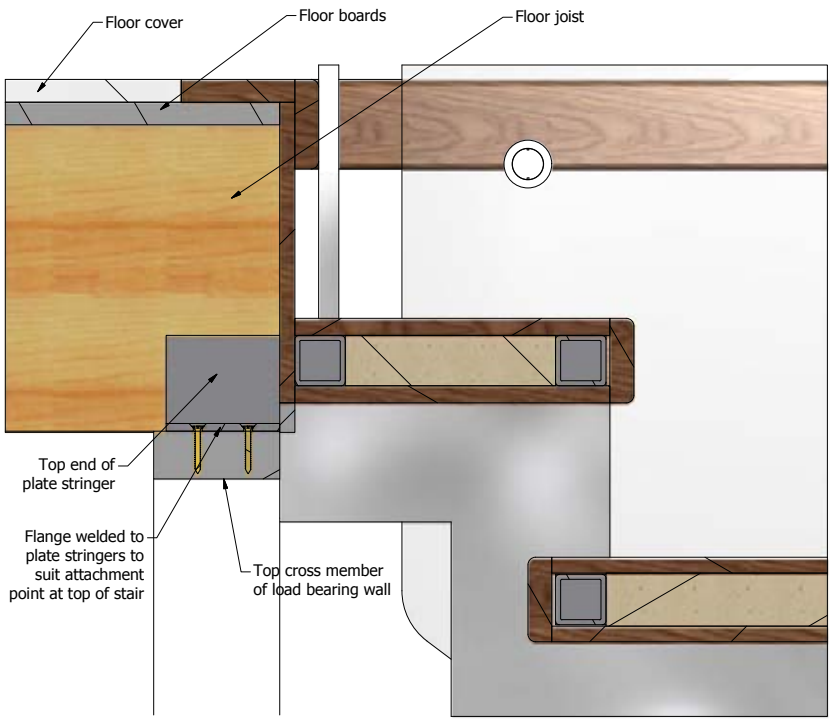
Figure 4. Mono-stringer core with cladding fitted - Bottom

Figure 5. Tread construction method. The core is formed by placing blocks of ply between the SHS supports and securing them with long deck screws. The top and bottom veneers and side nosings are boned to the ply core. The front and rear nosings are bonded to the veneers and side nosings.

Figure 6. Cross section of the foot of the stair. A steel plate is welded between the two mild steel core stringers and through bolted to the lower floor structure. Displayed method uses threaded rods chemically bonded into a concrete slab floor.

Figure 7. Cross section of the top of the stair. A steel plate tag is welded to each of the mild steel core stringers and then screwed to the upper floor support structure. Displayed method shows the stringer resting on the top member of a load bearing wall and secured by screws.

Figure 8. Balustrade attachment method. The mono stringer's position at the centre of the staircase makes it difficult to attach balustrading directly to the support structure. On the ms3 we solve this by using securing it to the ends of the SHS tread supports. Displayed is a frameless cantilevered glass balustrade system. If desired the same method can be used to secure a stanchion secured balustrading system.



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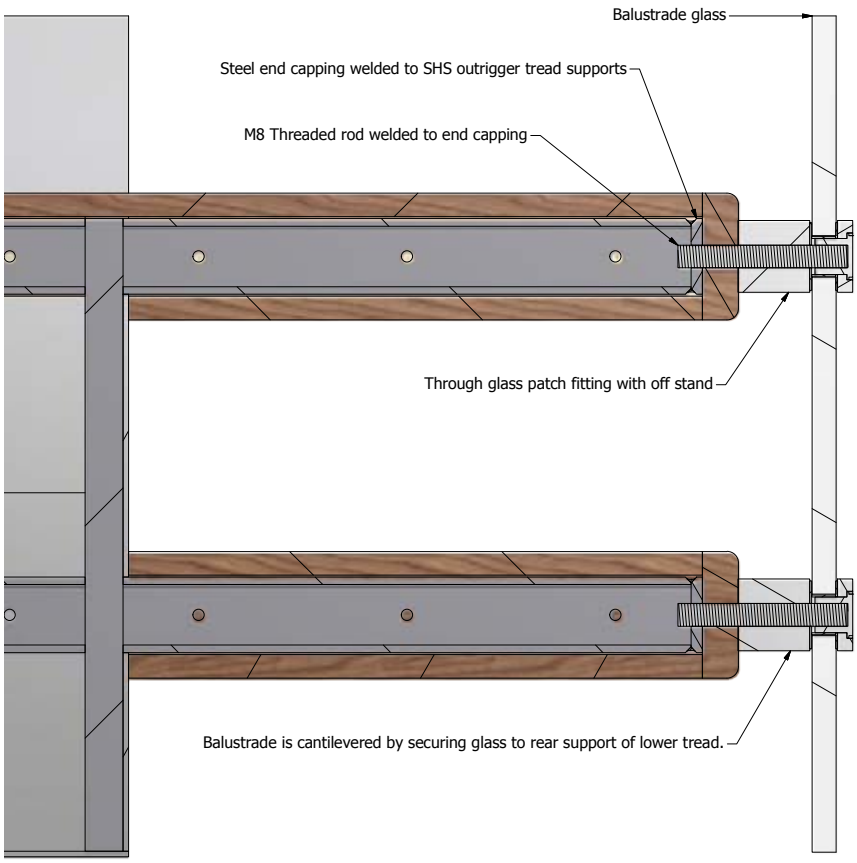

8

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 Z2 system, this table shows compliance with relevant codes and standards.

Key

- ● full compliance with the code
- ◑ can comply (see note for details)
- ○ 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	◑ [1]
AS 1657-1992	Fixed platforms, walkways, stairways & ladders. Design, construction and installation	●

1. Code 1428.1 requires opaque riser boards be added which is generally considered visually unsuitable for this form of stringer

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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