

WHITEPAPER:

The ups and downs of open-tread staircases

A feature of many contemporary and industrial-style homes, the open-tread staircase has become something of a design statement. From the natural tones of timber treads, to the bold use of steel, stone or even glass underfoot, an open-tread staircase will also bring a sense of openness and volume to a room. The minimalist 'floating' effect that is created – and the fact that floor space is freed up below – makes this style of staircase an especially popular choice for two-storey narrow-lot homes where space is often at a premium and an added sense of volume is needed.

In simple terms, an open-tread staircase has only treads attached to a central steel spine or to side rails, known as stringers. The vertical sections of the steps – known as the risers – have been left out, leaving an open space between each tread. The treads are typically fixed to steel plates attached to the stringers or spine, depending on the design and the materials being used. An open-tread staircase is usually manufactured off site, unlike a regular staircase, which is formed from concrete when the suspended slab for the upper floor is poured.

There are 'off the shelf' options, but more often than not an open-tread staircase is custom designed to suit. The design will usually take into account the type of balustrading you wish to use and how it will be fixed to the staircase. The balustrade can be fixed to the top or to the side of the treads, depending on the materials you choose.

Getting technical

Australian Standards and the NCC 2016 Building Code of Australia (BCA) – Volume Two, Part 3.9.1 provide strict rules regarding the construction of staircases to what are referred to as "habitable rooms". They not only specify the acceptable construction practice and appropriate performance requirements, but they also govern specific dimensions, such as the height, width and depth of the stairs depending on the design. When it comes to an open-tread staircase, the BCA

stipulates that the riser opening must not allow a 125mm sphere to pass through between the treads. Neither must a 125mm sphere be able to pass through any opening in the balustrade.

Once designed, an open-tread staircase must be carefully engineered to ensure it meets all safety requirements. Given the exacting specifications, the design complexity and the level of engineering required, an open-tread staircase has the potential to be considerably more expensive than a standard staircase formed from concrete.

Materials and more

The central spine or stringers are generally manufactured from steel because they need to be engineered to bear significant weight. Remember, there is no concrete involved in the construction of an open-tread staircase, so it's crucial that the design and engineering specifications are spot-on.

When it comes to the treads, timber is a popular choice. Not only does it look beautiful, but it is also one of the easiest materials to attach a balustrade to. Stone and glass are also options, but both can be extremely costly to use if only because they add extra weight to the staircase, which means the steel structure has to be stronger – and maybe bigger and bulkier – to compensate for the additional load. There is also a high risk of breakage when attaching a balustrade to stone or glass treads, making this type of design particularly challenging.



Handy to know

Noise

A well-designed, well-manufactured open-tread staircase should not be any noisier to walk up or down than a standard staircase. Generally speaking, any extra noise associated with an open-tread staircase is because there is no physical barrier between the upper and lower floors. Instead of having a continuous stretch of concrete steps to stop the transfer of noise in a two-storey void, the area is far more open.

Slip resistance

Both Australian Standards and the BCA require staircase treads to have either a suitable non-skid strip near the edge of the stair nosing or an approved slip-resistant finish. Slip-resistance classifications, when tested in accordance with AS4586, are provided in the BCA. Special sealants, such as Bona Traffic Anti Slip, will not only give timber treads shine, but they will also ensure they comply with slip-resistance requirements. The same type of sealant is required if the staircase treads are to be made from stone.

Position

Open-tread designs are generally not recommended for areas where people can easily look up through the staircase, such as in living areas where furniture is likely to be positioned close by or people have to walk beneath the staircase.

Balustrade

If you've visited websites such as Houzz and Pinterest and spotted images of an open-tread staircase without a balustrade, be aware that they are probably pictures of homes in America or Europe where different safety standards and building codes apply. In Australia, a staircase to a height of 1m or more must include a balustrade if it is not bounded on either side by a wall.

Installation

A specialist staircase supplier will take precise measurements on site for an open-tread staircase before manufacturing the components off site and then returning to install the staircase. This is more expensive than having a concrete staircase poured as part of the suspended slab.

Temporary access

An open-tread staircase will be installed at the end of construction so that it is not damaged while the house is being built. Construction trades, however, will still need to access the first floor of the home and this means a temporary staircase or additional scaffolding will be required, usually at additional cost. Sometimes the steel spine is installed and temporary treads are used until the build is complete.

Oswald Homes works closely with a number of staircase suppliers so you can be sure the relevant standards and requirements are met without compromising the design or function of your open-tread staircase.