Corrosion

Corrosion is the most common problem with external balustrades which is why we create fully integrated designs in aluminium or stainless steel, combining stunning appearance with maximum resistance to corrosion and discolouration. Our handrails and balustrades have a long working life, retain their good looks and are offered with a 12 Year Warranty.

We can provide durable design solutions for exterior environments, and also for interiors where moisture and condensation are present, such as swimming pools. Sapphire fully understand the importance of putting quality of products foremost and design all elements of our systems to be corrosion resistant whether components are fully exposed or completely hidden.

Example of external corroded balustrade

External considerations

Mild steel

This is probably one of the most cost effective materials to make a balustrade in, but it has it's pitfalls. Mild steel is typically finished with a powder coated or basic paint finish. Galvanised finishes are used to provide some level of corrosion resistance.

Even if you are using a galvanised finish externally there is risk of corrosion. Hot dip galvanising is carried out by dipping the balustrade into a molten zinc tank. The balustrade is then lifted out and the excess coating is allowed to drip off. These droplets form surface imperfections which are sometimes sharp. Sharp edges are normally linished, however without good skill and care the galvanised coating can be taken off completely so you are back to an unprotected mild steel core. This can allow rust to kick in very fast which downgrades the building appearance and can impair the structural integrity of the balustrade.

Stainless Steel

There are two common grades of stainless steel and using the wrong grade in the wrong location can have disastrous effects to the finish so here is the right way to specify this.

> Internal balustrades are protected from weather conditions and therefore 304 grade stainless steel is best suited.

> Externally avoid 304 grade and make sure you use 316 marine grade stainless steel. 304 grade has potential to discolour. This discolouration often appears to be rust, and is perceived as unsightly; it will require regular maintenance. Sapphire always recommends 316 grade externally.

> To swimming pools and costal areas make sure you use 316 marine grade stainless steel, you may also choose to use a bright polished finish in lieu of a brushed finish which gives a higher resistance to corrosion.

Some people prefer to use 304 grade externally to keep prices low. This substandard practise leads to poor product performance and aesthetics.

To ensure longevity, balustrades should always be made in 316 grade. This applies to the tube, all components and even the welding wire.

Aluminium

Aluminium balustrades are typically made of extrusions. Extrusions are not like a tube and cannot easily be bent to a tight radius in a bending machine therefore it is best to avoid aluminium handrails on stairs. Balconies and other level areas are ideal.

Aluminium is not as strong a material as stainless or mild steel so it is not generally used in areas that have a higher than a 0.74kN/m loading.

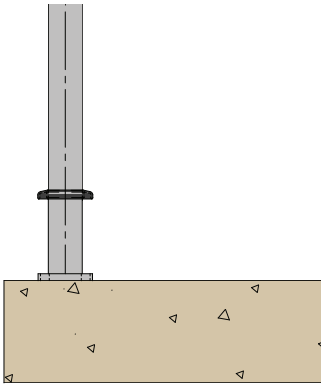
We recommend aluminium is coated to avoid oxidising which can bring a dusty white colour to the surface. Aluminium is normally powder coated to a RAL colour or alternatively anodized. Anodizing does not offer such great scratch resistance, and where it is scratched it is harder to repair. For these reasons Sapphire recommends powder coating.

A benefit of aluminium is that it has a guaranteed rust free life.

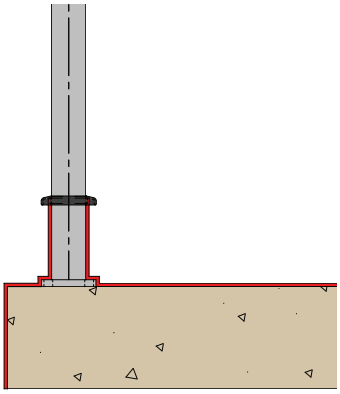
It is also a cost effective competitor to mild steel products.

Water proofing > Framed Balustrade

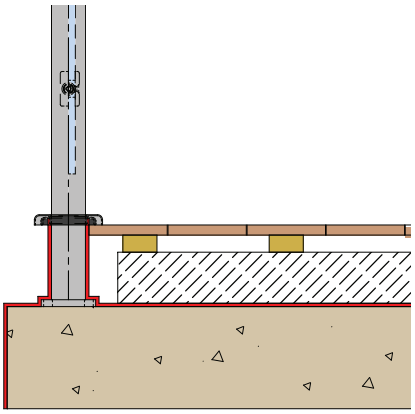
The preferred method of achieving a water tight roof most cost effectively is a 2 stage installation. This means the balustrade subcontractor fits all the balustrade posts complete with a weathering cowl before the waterproofing and insulation is installed. The insulation and waterproofing membrane is then installed and made water tight by dressing up underneath the cowl on the balustrade posts. The balustrade infill panels can then be installed as can the floor finishes.



Step 1 Baluster installed



Step 2 Waterproofing installed



Step 3 Final finishes added

Water proofing > Frameless Balustrade

These illustrations all show fixing into concrete as brickwork is a very weak fixing and if possible we recommend this is avoided.

The red line indicates the waterproofing membrane. As you can see it is not possible just to waterproof up to the edge of channel so we recommend that it is raised up to allow waterproofing.

We do not recommend aluminium waterproofing copings tucking into the channel as this can be a very tricky detail to fit and ensure water tightness. If you want to conceal the channel after waterproofing a decorative trim can be added.

In all these situations the finished floor level may be considerably higher than the fixing point, so you should calculate the balustrade height to ensure that the handrail is at a suitable height above the finished floor level.