

## Corrosion

A.1 NHBC standard for external railings galvanised 460g/m<sup>2</sup> and powder coated to a suitable decorative finish.

A.2 Reinforced steel will need to be encased in concrete, the mix of the concrete should be a designed mix suitable (BS8500) for reinforcing with steel.

This mix will have a high cement content and installed using a vibrating poker to remove air pockets and excess water allowing the concrete to become denser.

The steel will need to be covered and encased by a minimum thickness of concrete at the edges, so moisture by capillary action cannot oxidise (rust) the steel.

This 'cover' depends where the steel is located within the concrete, 40mm minimum where protected by DPM or 75mm minimum if not, others as specified by an engineer.

A.3 An anode would be used in a water system, the anode would be sacrificial within the system.

Corrosion is caused by the complex electro-chemical action using water as an electrolyte, where dissimilar metals are used within a system.

For example, copper filings cause corrosion of zinc, the use of a combination of plastic in a system may make the earthing system ineffective, therefore the introduction of an anode will stop or reduce the corrosion as the anode will corrode protecting the zinc plating of a steel tank etc.

A.4 The linking of ferrous and non-ferrous is corrosion by electro-chemical action.

One metal will corrode another, minute particles of steel for example from filings, will corrode a copper cylinder, most manufactures install an anode in a copper cylinder to stop / reduce this corrosion and the introduction of inhibitors in the heating system help further.

A.5 Frost will cause corrosion by particles of water freezing, expanding the surface of stone or masonry, particles or grains of sand or clay become detached and the next rain are washed away.

This process carries on until the material is destroyed. In exposed areas good quality materials need to be specified in bricks this would be FL quality or better.

A.6 *Seuplula lacrymans* is dry rot. A fungus that attacks wood, when the timber reaches a moisture content of around 30-40% dry and wet rot can attack the timber.

If the moisture content is very high dry rot cannot infect the timber. Dry rot needs a constant and stable environment to survive, this is normally inside a structure, and it likes to grow in temperatures between 3°C and 23°C. The student should investigate further.

A.7 Highland and moorland waters can be very high in acid or salts most water authorities try to remove this impurity, some times this is shown as a green stain on ceramic fittings, only in lead piping is this a health hazard. This is very mild corrosion.

A.8 Cathode protection, the anode used to protect differential metals in the same system. The anode protects the cathode. The cathode would be the tank or cylinder.

A.9 Sacrificial lead would be used to protect a lead valley or gutter or other areas where for example a rain water down pipe may discharge, This lead could be easily replaced at minimal cost. This lead is usually of a higher grade than the base material as it does not have to be worked as much.

A.10 What happens to masonry if wall ties have corroded? The bed joints in brickwork or masonry will lift, exposing cracks allowing the ingress of water. The bed joints lift because the steel wall ties expand when they corrode.