

Durability of galvanised light steel framing



Galvanised light steel has been used successfully in construction for over 20 years in the UK housing sector and offers many advantages both during construction and in service. However, durability of galvanised light steel framing is sometimes considered an issue. SCI has recently completed a project that proves long-term durability of galvanised light steel.

Pre- and post-war steel-frame houses were constructed from painted hot-rolled steel components, were poorly detailed to prevent condensation and moisture penetration, and were not thermally insulated as modern regulations require. Modern light steel framing systems use sections formed from pre-galvanised (zinc-coated) strip steel.

The zinc coating is able to protect the steel much more reliably than paint coatings because it protects the steel in two ways. Firstly, the zinc coating acts as a physical barrier between a potentially corrosive environment and the steel core. Secondly, protection is provided through galvanic or sacrificial protection at cut edges and scratches. Modern light steel framing uses 'warm frame' construction where all the light steel framing is in a warm, dry environment hence the risk of moisture within the building envelope is largely eliminated.

Over the last 15 years, the SCI has been collecting durability data for galvanised light steel *in situ* on various buildings throughout

the UK. The SCI has analysed all the collected data and used it to predict the design life of the galvanised coating in different conditions experienced by the steel in different applications. The detailed findings of the research are presented in SCI Publication P262, Second edition. The project was funded by Corus Strip Products UK.

A conservative approach to predicting the



Galvanised steel decking forming the underside of a ground floor slab after 10 years

design life was adopted. The calculation is based on a 95% probability level of 50% of the galvanising being lost and it also assumes that the loss of galvanising is linear for the remaining life of the structure, whereas in practice the loss of galvanising reduces overtime for constant environmental conditions.

All the values are for Z275 galvanising which has a total weight of zinc coating of 275 g/m². A summary of the design life predictions are:

- no risk of water ingress or condensation – 250 years;
- low risk of condensation – 200 years;
- low risk of water ingress and some risk of condensation – 100 years;
- low risk of water ingress and higher risk of condensation – 50 years.

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