Steel Homes Group chair Dr Bassam Burgan explains why off-site construction can prove to be a long-term financial steel.

Recent data comparing the cost of commercial properties built using different structural materials show that around £32 per square metre[1] can be saved by opting for a steel rather than a concrete frame. Crucially this work identifies key factors to consider when comparing the cost of using different materials. Those factors are just as important in residential buildings as they are in commercial buildings.

Perhaps most notable is the difference in construction time, with steel-framing highlighted as being 25 per cent quicker. As the old saying goes, time is money, and that is certainly true of the construction sector; while the cost of the raw materials will always be a significant consideration in a construction project's budget, it will often come second to the cost of labour and, in the current climate of a "credit crunch", the financing costs are ever more important. This is where the speed of steel construction gives substantial savings as is reflected in the published study. It shows the overall building cost to be significantly less for the steel building – five per cent for a total floor area of around 2,600m^2.

Of course, these figures are for commercial buildings - a specific comparison for an apartment building would offer more specific detail, taking into consideration the lighter steel used in this type of construction and a greater degree of offsite pre-assembly. But the upfront cost is only part of the story. The owner must obtain a mortgage, take out insurance, pay utility bills and keep the building in good repair. All these factors cost money, and some of them can be significantly influenced by the choice of construction materials and the initial build quality.

As a look at any national newspaper during the credit crunch readily reveals, it is banks that hold all the cards in the residential market. Few people can buy a property without a bank's financial backing, in the form of a mortgage, and indeed most major construction sites are underpinned by finance provided by banks. With this in mind, if the banks have a preference on the structural material used, then this could be a very significant market differentiator.

But they have no preference per se. Banks will lend provided the mortgagee can make the repayments, the property will provide adequate security and insurers are willing to accept the risk. Of those three factors, only the latter can be influenced by the method and materials of construction.

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Insurance companies want to be satisfied as to the build quality, and that is why all of the Steel Homes Group's members have certified systems. Certification means that insurance is both easy to come by and competitive.

Terry Mundy is Business Development Manager for one such scheme – Lloyds Build*Offsite* scheme has proven popular with both the construction and insurance industries. He believes that certification has been quick to adapt to the increased popularity of steel:

"The Build*Offsite* Registration Scheme is the first offsite sector scheme that focuses on the safe and competent delivery of service or product. It represents a risk based approach to assessment that will support the more rapid introduction of innovative offsite construction solutions.

"It provides confidence to client organisations, end users, insurers and other stakeholders that best practice has been adopted in designing and constructing assets."

Terrapin, a Steel Homes Group member was the first company to receive the Lloyds Build*Offsite* certification.

Indeed, many insurance companies are very positive about steel. Outside of the proven strength and durability benefits, steel construction drastically reduces costs in the event of flooding. Here the absence of a material that needs drying out reduces the otherwise considerable displacement costs (see Underwater World, p37, OSC Winter 07). A combination of the increasingly unpredictable British weather and the need for new land to develop pushing sites ever nearer to potential flood plains means this issue is more pertinent than ever.

Using steel framing in combination with modern insulation materials means that higher insulation values can be achieved with smaller wall thickness than with traditional construction material, giving more net space – a benefit to both the developer and the building user. However, whilst a developer might be primarily concerned with initial build costs, the building user must take into account the running costs; both heating and maintenance costs are impacted by the way buildings are constructed.

Build quality plays an important role in a building's energy efficiency. Dimensionally accurate factory built units ensure that air leakage is reduced (referred to as "air-tightness of a building) leading to reduced heating bills. It is therefore no wonder that the next revision to Part L of the Building Regulations which will come into force in 2010 is looking to give credit to build quality (in the form of accredited details or prefabrication) in the evaluation of a building's thermal performance.

There has also been much written about the role thermal mass plays in preventing buildings from overheating on hot summer days. The real issue is thermal comfort not mass. A thermally responsive home can be heated quickly in winter and will cool down fast in summer. Excessive mass slows down this process. A building that has greater mass needs more energy to heat (leading to larger energy bills). It will also take longer to cool down which can mean uncomfortable hot summer nights.

The owner of a property is also concerned with ease of maintenance. A common misconception of steel frames in the residential market is that they are not as easy to repair as traditional masonry or timber

construction. The basis for this is understandable, given the prominence of bricklayers and carpenters in the UK construction workforce, but it is in fact incorrect. Apart from not being as prone to damage as traditional materials in the first place, steel components are readily available and can be easily replaced.

Indeed, a recent construction on Oxford's riverside proved this, when an architect chose steel for his own home. Adrian James was drawn to the material's versatility, accuracy and speed of construction, but had contracted a local builder who had not used steel before. The result? The property went up without delays, and was impressive enough to earn the accolades of the Oxford Civic Society.