

Constructing in a more sustainable way shaves the programme and cuts the budget

We are now facing unparalleled challenges and opportunities as we start to recover from the pandemic in this post-Brexit economy. Hikes in material prices coupled with labour shortages are stressing the viability of construction projects. To tip the scale, our environmental impact is under greater scrutiny following the new climate law which commits Ireland to net zero carbon emissions by 2050. In the short term this law sets out a framework to reduce our greenhouse gas emissions on average by 7% per annum over the next ten years. So how do we overcome these challenges using sustainability as our tool?

We are now mastering the ability to produce energy efficient buildings that significantly reduce our carbon footprint from the reduction in running costs with the implementation of nZEB, but are we focusing equal efforts on reducing our carbon footprint during the construction phase? There is certainly ambition within the industry to change practices, but put your hands up if constructing in a more sustainable way is the number one priority when moving that concept design into detailed construction drawings? Is it at the forefront in those design team meetings? It will be if it's not already.

Sustainability has been gathering momentum

over the last ten years and now extreme pace is being gathered with the realisation that future business performance and survival will rest on the ability to develop more sustainable practices to increase productivity, reduce waste and increase efficiencies.

Let's look at one example of constructing more sustainably.

Cross Laminated Timber (CLT)... why are we not using it?

There are many sustainable practices that we can adopt during the design and construction phase, BIM and modular construction being the most prominent. In this article, we will look at Cross Laminated Timber (CLT) as I have personally used it with my involvement in the Kensington Primary Academy in London. I have stood in a CLT manufacturing plant in Austria and witnessed first-hand the collaboration of designers and contractors working more efficiently.

CLT panel construction is an engineered timber product (from sustainably managed forests) using multiple layers of spruce slats, placed cross-wise to each other and glued together under pressure with formaldehyde-free adhesives to form large format building elements.

It is typically 80% lighter than reinforced concrete and can be used for multi-storey buildings. CLT is fully compatible with other construction materials and can be used for external walls, internal walls, floor slabs, stairs, balustrades and roofs. Due to the cross-wise structure, wood expansion and shrinkage is reduced to an insignificant minimum.

All openings and service penetrations are pre-cut at the manufacturing facility which focuses greater collaboration between the design team and contractors to resolve all design co-ordination issues at an early stage. Any on-site openings can also be accommodated if required due to changes or clashes.

The CLT system improves the air tightness, providing excellent acoustic and thermal performance. From a health and safety perspective, the on-site labour count is reduced providing a safer method of construction.

Fire... I know, it's on everyone's minds when we think timber. When the timber chars it protects the material beneath maintaining its structural integrity. The CLT panels can achieve up to 60 minutes' fire resistance and additional fire resistant boards are applied to achieve the necessary fire rating.



Kensington Primary Academy... so let's take a look at my own experience with the product

The school has a GIA of 4,441m² with six floors including a double storey basement. The basement was constructed with a sheet piled perimeter, CFA piled foundation, reinforced concrete frame with a post tensioned podium slab. Due to additional piles being introduced into the design we looked at various ways of value engineering the project to reduce the programme and to mitigate the additional substructure costs.

On the back of initial advice, we investigated the use of CLT not just for the frame but for every internal wall, floor, the roof, parapet walls, lift shafts and staircases to be constructed with the product from podium to roof. As a team it was our first exposure to the product and naturally we were cautious; actually I would say dubious of this timber product as we would be stepping away from concrete and steel, the tried and tested methods. It is difficult to move away from what we know.

We visited KLH CLT factory in Austria, visited multiple live CLT projects in London and technically and commercially analysed it with steel and RC frame options. The facts were hard to refute: technically the product had

strong advantages over traditional methods, was less expensive on a like-for-like frame analysis and with a reduced programme further savings were sought from the preliminaries. The savings on the programme were key for us; they enabled us to bring follow on trades in at an earlier stage, we were able to reduce the finishes specification, the M&E install was quicker not only because routes were pre formed but they were fixing into timber not concrete! Actually the majority of trades on average were 30% quicker. It was a success. We took the leap and it paid off.

To sum up... or shall we say sum down

CLT is used extensively across the world, particularly in Europe, USA, Canada and Australia on a wide variety of projects from terraced housing to large multi-storey buildings. Over the last 15 years the UK has also been increasing its use of CLT on both public and private projects e.g. Open Academy in Norwich, the Mayfield School in Ilford, Tower of Love in Blackpool and The Royal United Hospital in Bath. In fact a number of schools have been constructed with the product.

CLT provides a more comfortable energy efficient building than traditional methods with a reduced carbon footprint: it is truly

the only sustainable building material.

Yet when it comes to Ireland, there are only a handful of projects where pure CLT has been used. We are certainly very much behind our UK and European neighbours. Has it just not caught on or are we reluctant to change?

Constructing in a sustainable way requires a collective approach from all stake holders, so either get on board or stay behind. For in order to gain that commercial edge over competitors, business leaders will now be focusing harder on how their next project can be constructed in a more sustainable way as it saves time and money.

We now know what a crisis feels like. We need to sharpen our focus to address the financial impact using sustainability as our tool from efficient design processes, to speed of construction.

At CARLIN we are continually looking at innovative ways to achieve the same end result that reduces risk and ultimately costs. We have a proven record of delivering successful projects built around our commitment and expertise, together with our ability to develop strong working relationships with clients, designers and contractors.

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Written by Andrew Carlin MCSI MRICS

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