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MODULAR BUILDINGS: WHAT ARE THE REAL CONSIDERATIONS

What housing associations and Councils need to consider for off-site construction.

MODULAR BUILDINGS: WHAT ARE THE REAL CONSIDERATIONS

Modular construction is often heralded as the saviour for the construction industry. The UK's current modular capacity is around 3,300 modular homes; however, when this is compared to Sweden and Japan it seems a little small 45% of all new homes are built offsite in Sweden and c150,000-180,000 modular homes are built in Japan each year.

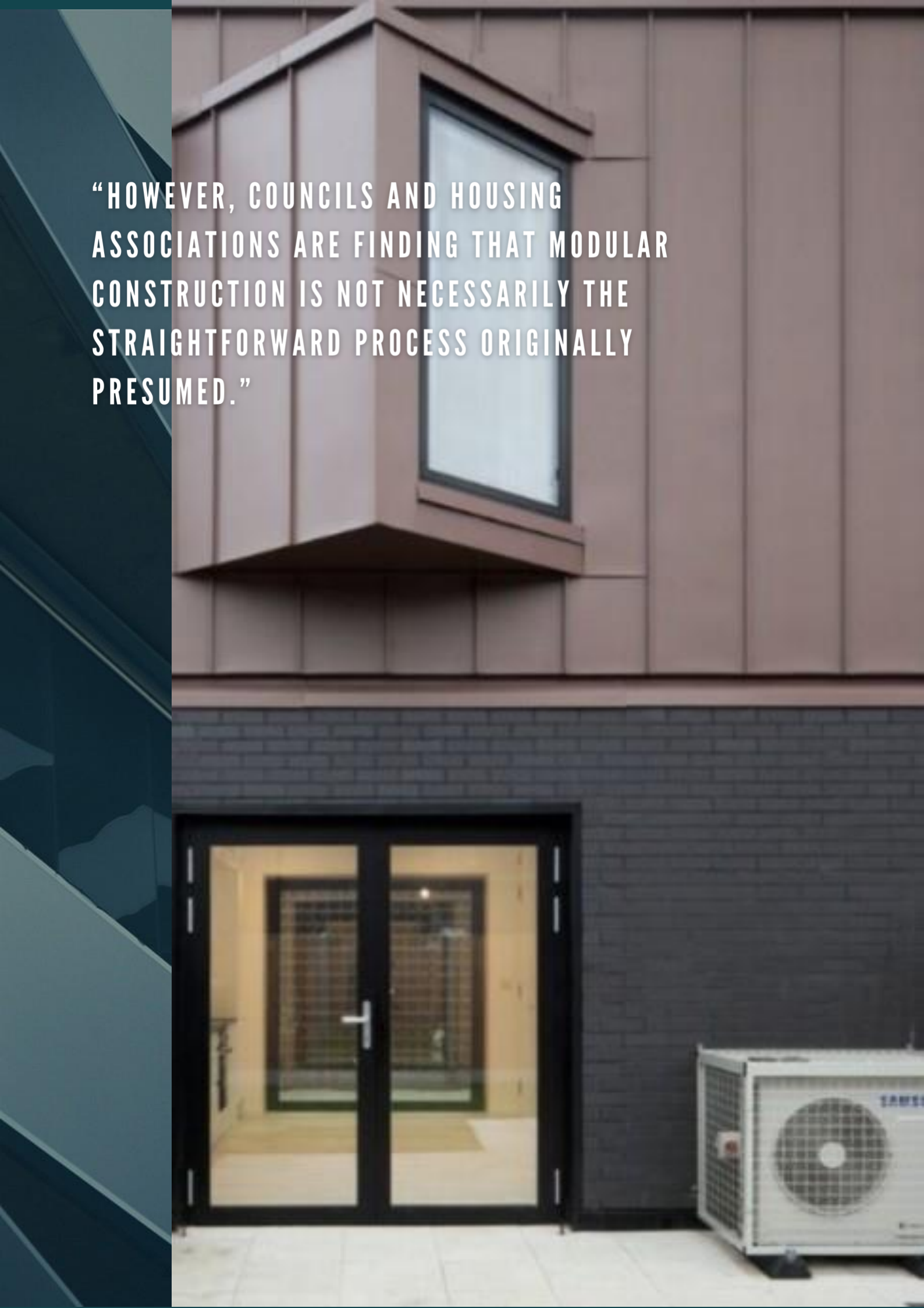
For Councils and Housing Associations, modular homes can provide an attractive solution on the face of it; as well as being built offsite it provides an easier route to achieving net zero than traditional construction methods.

This is one of the reasons central Government are pushing the modular concept – it is seen as achieving better results when you look at speed, time and cost of delivery. Afterall, when all of the construction is taking place within a controlled environment within the factory, there aren't delays due to adverse weather conditions.

There is a general belief within the industry that modular is a good thing; it allows the sector to work more efficiently, creating more jobs and being able to run more projects within a year. All of which help to stimulate the UK economy.

There is also a wave of architects and design teams who are specialising in the modular approach, carving out a niche market and using it as their unique selling point. Each has their own concepts and preferred suppliers, which means that they are aware of the design opportunities and limitations for that manufacturer.

However, Councils and Housing Associations are finding that modular construction is not necessarily the straightforward process originally presumed. There are seven considerations that need to be taken into account when considering modular construction for social housing projects.



"HOWEVER, COUNCILS AND HOUSING ASSOCIATIONS ARE FINDING THAT MODULAR CONSTRUCTION IS NOT NECESSARILY THE STRAIGHTFORWARD PROCESS ORIGINALLY PRESUMED."

SEVEN KEY CONSIDERATIONS:

1. Complexity

Clients need to remember that the modular systems are in essence created within a factory environment; while this means they are resilient against weather there are other considerations.

The skillsets are different to those on site, there will be jobbing- trades merely installing plumbing, utilities or electric elements – they aren't the skilled plumbers or electricians who would usually be present on a traditional build.

If your scheme has particularly complex requirements then clearly establishing how these will be handled by the assembly team is important, and may have an increased cost.

2. Costing

The pricing is also different; modular production has to be considered as a manufacturing approach, which means that suppliers have the upfront investment, set-up costs and ongoing overheads which need to be reflected in their pricing. These influence the selling price which means for smaller size projects it just isn't cost effective to use modular.

There is also the need to pay up-front, rather than payment based on status, which means that the funding streams have to be adapted. For the project it means close management of risk, as any delay to assembly or issues with manufacturers has a direct negative impact on the project.

From a contractor perspective it also means there isn't an opportunity for value engineering to make the scheme more cost effective or resource-light. The original requirements need to be retained as any change is costly both in budget and time.

3. Location

For those with social housing projects in and around large established urban conurbations, where developments are on brownfield sites or under-utlised lands, the shape and access of the site will determine whether a modular scheme is feasible.

“We work closely with clients who are keen to utilise the opportunities of modular construction,” Stuart Smith, Surveyor at Blakeney Leigh explained. “We initially carry out a feasibility study to show how the client can get the best use of the site. This will look at options and what’s practical, to ensure it fulfils a client’s requirements.

“We also look at the street-scene and understand the planning conditions, particularly in areas of historical interest, to evaluate whether modular is suitable. In essence you are buying an off-the-shelf product which means customisation and adaption is limited and expensive.

“We are working with a number of Councils and housing associations on modular projects, and while it brings a number of benefits, it isn’t always the solution.”

4. Informed decisions

The benefit of modular build is the speed it brings; however, once the project starts there is a strict timeframe that has to be adhered to. There is no allowance for procrastination or to make changes, so clients have to be realistic on whether the decision making is robust enough to allow for this.

“We have seen clients who were given parameters but decided to make last minute changes,” Stuart said. “The delay resulted in the loss of the booked slot and meant the whole project was then adversely affected.”

5. Agility

In addition to the location, the accessibility of the site is also important in determining whether modular construction is suitable. In large towns and cities, this means looking at how the panels will arrive on site and clients need to establish key logistical aspects:

- whether the transport vehicles can get to the site easily
- can the large cranes get access onto the site
- are there any neighbouring homes that will be under the arm of the crane as panels are moved, as this will need additional health & safety and welfare considerations
- can the lorries park up without blocking roads while they wait for the modules to be unloaded.

6. Unexpected costs

There are several unexpected costs, compared to traditional construction, which often arise in modular projects.

- While the elements don't delay construction of the panels, they can add costs to bringing them on site. If there are severe local weather microcosms, or ongoing wind and rain then the crane is prevented from being used and work stops.
- Consider how many modules you are looking to move in one day – there is a maximum of six modules which means that larger schemes need to be carefully scheduled in over a longer time-period.
- The modules are transported on large lorries that are often categorised as wide-loads.This means the movement is and restricted. Within London this is through the London Lorry Control scheme which restricts use of certain roads to minimise noise pollution in residential areas during unsociable hours. This may mean delivery of the panels is outside of the usual site working hours.
- In London the Movement Order for abnormal loads requires a police escort from the Metropolitan Police. While this ensures a quicker delivery to site it does increase the expense.
- Finishing off and landscaping - each site needs some tolerance to allow the crane to position the modules. This means there is always space either side that has be carefully considered so that it doesn't create unnecessary gaps or walls.

7. Optimising the modular benefits

The time, cost and delivery benefits of a modular site provide the construction industry with an obvious way to help deliver projects effectively and efficiently. The ideal site to realise the benefits includes:

- A stand-alone site that can create its own identity where there is no existing street-scene. This alleviates the issue of complying with planners who either want the development to fit in or stand out.
- Regular square or rectangular plots which can be built up from existing off-the-shelf panel designs.
- Installing the infrastructure at the beginning of the project, as they do in Spain, so that roads, water and utilities are in place before access is required by the transporting lorries.
- Good access to the site, such as by the side of a motorway or a major road.
- Being able to build vertically. Modular construction is highly suited for tall buildings, such as the 50 storey 101 George Street tower in Croydon.

Working with Royal Borough of Greenwich

This is part of the Royal Borough of Greenwich Term Alliance Contract, which promises to deliver an ambitious number of 750 new council homes on brownfield and back land sites.

Pultney Mews provides a total of 6 houses, 4 no. three bedroom houses and 2 no. two bed-room houses built on a site of disused garages. These houses were largely constructed offsite in a factory before being delivered to site and assembled.

Conclusion

There is recognition that the construction industry needs to become efficient in the way that it delivers the built environment. The use of modular or off-site construction for social housing is an obvious way to support this. According to Glenigan data 7% of new-build projects started during the first nine months of last year were off-site construction. When this is considered against the proportion of other new starts that included off-site elements for industrial (29%), education (15%) and hotel and leisure (11%) there is an obvious trend.

For those wanting to harness the benefits of modular construction though it does require clarity right at the start as to whether the site is suitable, the business financials allow up-front payments and the decision-making disciplined enough to ensure that the timings can be adhered to without changes or alteration.

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