

**build**offsite

## BIM: PEOPLE MATTERS 14 QUESTIONS WITH RICHARD ODGEN

*Richard Ogden, Chairman  
of “Buildoffsite”, on working  
for a better built environment,  
the benefits of DFMA, a step  
change in offsite and a love  
of the great outdoors*

**1** Richard can you tell us a little  
about yourself and your background?

It is hard to believe it but this year I will  
have spent 50 years in the construction  
industry working in the UK, Europe and  
Internationally. I started working in the



civil engineering sector on infrastructure projects with Balfour Beatty. Mostly involved in rail, bridges and the electrification of the west coast main line. I moved into building and worked for one of the larger prestige hotel groups as the group's building surveyor.

In 1980 I moved from infrastructure/building into retail working for a little known company called McDonalds! In 1989 I started to explore alternative methods of design and construction and began to think broadly about using offsite techniques. My journey into offsite had started!

I recognised we could build faster, more economically with little or no waste. We set impossible targets and then delivered on them! In the mid-90s we completed a building in the UK in 48 hours. This included all the ground works and services within that time frame. Remember this was in the last century!

Over the last 10 years I have been working as an independent advisor and that is when I started the organisation Buildoffsite. I was asked by BIS (DTI back then) to create an organisation looking at offsite.

Why was this important?

In 1989 I found that I could no longer keep pace with rising costs in construction. Remember that the Channel Tunnel and Canary Wharf were under construction at that time and the industry was working flat out completing these projects as well as completing the more mundane projects. Capacity and price were increasingly challenging issues.

It was then that I started to look at how we could achieve radical change through an alternative to traditional construction.

**2** How did you get involved with off-site working and modern methods of construction?

I started to look seriously at offsite construction in 1989.



*Richard explains that Buildoffsite is a unique organisation for change and delivering client value*

I do not refer to innovative (offsite construction) as mmc, because the word "modern" has a time attached to it and in any event is very much a housing term in the UK. Offsite construction had not been used to any great extent commercially so we were starting with a clean sheet of paper.

I started to work on prototypes in 1990 and looked at the methods available firstly looking at timber frame then concrete and latterly light gauge steel construction. I was interested in 3D construction and the use of the volumetric approach.

I wanted to have +90% building, constructed in a factory allowing little or no work on site, I wanted to control waste, a smart/lean approach to construction.

Over time we perfected a model that was built in sections, fully completed with plug

and play M+E(considered impossible at the time!), type approval and even some very radical foundation solutions involving no muck shifting and no wet concrete. It really was an industrialised solution with over 90% completed in the factory.

**3** What does the "BuildoffSite" organisation do?

Currently works predominantly in the UK. That said, we started an international organisation this year which hopes to attract more global interest. Additionally, we expect to start with partners in India and Australia and New Zealand. So in answer to the question the following bullets outline that very clearly...

- A thinktank
- An advisory body
- Creator of ideas and trends
- Knowledge bank
- Thought leadership

We have been described in many different ways (some unprintable!) but I think the most accurate is "a coalition of the willing"

We have been established nearly 10 years. We engage the whole of the client, design and supply chain exploiting how offsite solutions might be used on building and civil engineering projects - we are unique!



**4** Can BIM help enable more Buildoffsite or design for manufacture and assembly solutions?

Yes!

I believe BIM is a fantastic enabler and it helps link design, manufacture and construction. I totally support both the 2025 Construction Strategy and the BIM initiative level 2 and level 3. Mark Bew and I agree absolutely that the more BIM enabled projects that are completed, the closer you get to component manufacture and offsite delivery. Why would you do it any other way?

BIM and offsite together will help deliver the 2025 strategy of lower costs, faster delivery, lower carbon as well as a potential improvement in exports.

**5** Can you give us an example of where you are seeing this in action?

My first example would be the Skanska 32 storey skyscraper at Atlantic Yards in New York. This involves cutting edge, highly accurate 3D solutions developed by Skanska using UK and US technology.

Another example would be Bryden Wood, who are experts in the imple-



Buildoffsite, an active member of the BIM4 community

mentation in DFMA, lean, offsite and BIM. They have been employed directly by the St Petersburg Corporation to deliver an offsite and DFMA platform that other designers will have to use on subsequent projects. Phase 1 involves the construction of 15,000 apartments.

Closer to home the multi storey offsite manufactured Cheese Grater Building in the City of London also known as 122 Leadenhall Street is a prime example of cutting edge technology being used by the Laing O'Rourke Group.

Factory assembled units travelling to London at night to form a giant lego assembly in the middle of London. Probably the best example to date of

offsite DFMA being applied to deliver a new signature building to the skyline of London.

**6** What other symbiosis' exists between these two methods?

I believe that ultimately the aim should be to deliver smart construction. Offsite, DFMA and Lean using BIM as an enabler. I am a firm believer that if you use all four you will maximise the opportunities for lower cost, higher value solutions. Why? Because these techniques remove waste in labour, materials and capital which is so prominent in traditional construction.

**7** Do you see the Buildoffsite and lean working paradigms being a key to helping achieving the Industrial Strategy's 50% saving in project delivery times?

If you do any studies of waste in construction you will see that we are incredibly inefficient both from a materials perspective and a labour perspective. Using less labour on site and shifting manufacture into a factory environment automatically speeds up delivery because you are working in a controlled factory that allows efficiency. That is why most other manufacturing industries work under a roof! You cannot control waste on a remote site but you can in a factory and for that reason alone it is worthwhile. So I genuinely believe that by doing more component manufacturing offsite in a controlled environment you will make great headway in achieving the 50% savings as called for in the construction strategy.

**8** How can Buildoffsite help local economies?

A frequently asked question!

Buildoffsite (factory built construction) engages the local labour force to become multi-skilled and efficient in assembling component pieces together

that ultimately make a completed building. They do not necessarily need some of the older traditional skills since the techniques and focus are entirely different.

So, instead of using a collection of people brought together on a new construction site (constructing yet another prototype) and meeting and working together for the first time, those involved in offsite manufacture work together in a factory. They understand each other and become multi-skilled and adaptable. They develop the skills required for systems integration and assembly. This factory resource is able to serve a bigger geographical radius and give regular work to the people it employs as opposed to site operatives having to travel around the country as the work demands and then potentially being laid off when a project has been completed.

Laing O'Rourke's Steetley facility is a fantastic example of employing people in a huge factory and giving continuity of work and exemplary right first time quality to customers.

Additionally some people think that a factory has to be in a permanent location. It is possible to use "flying factories" which can take the manufacturing process to the project site and then relocated at the end of that project.

## 9 What about the carbon agenda and neutral codes?

80% reduction by 2025! That is one hell of a target we signed up to.

A few years ago, I was lucky enough to work with the innovation growth team (IGT)- part of Paul Morrell's skunk-works - focused on how we might deal with the reducing carbon initiatives. Some while ago I did a study between a traditionally built building and the same building using offsite. I was amazed at the results. Why? Primarily, because we think lugging big lumps of construction around the country is not very eco-friendly. However, once you see the comparisons and you start adding in all the extra trips for the forgotten items on the traditional site you start to see its worth. I am genuinely convinced that factory produced buildings are more carbon efficient because they fit together to manufactured standards and are not craft built on site. I have seen some good case studies from the housing sector too. They show that a manufactured house that was put together in a controlled environment consumes less energy than a similar house craft built on site.

My view is whether it's a building or a piece of infrastructure an offsite manufactured construction solution will always consume less energy as well as

delivering a better performance in terms of whole life cost.

## 10 Will off site and assembly models have an effect on skilled labour?

I believe that some of the skilled labour we have are very confident in constructing buildings on site. Some of the workforce will be capable of engaging in new skills and become multi-tasked as systems integrators and assemblers. If we look at other industries such as ship building you will see that the new workforce is very multi-skilled compared with the old traditional workforce that it replaced. I believe there will be a different group of skilled labour, possibly younger and possibly a smaller workforce taking these advantages forward. Possibly more women will be engaged in an industry that is less reliant on site based construction.

## 11 Do you foresee the day, perhaps in a level 3 world, where a standard kit of parts can enable a self-procuring model?

Yes. I see no reason why this shouldn't happen. We should distinguish between a single project client and serial project clients.

Both have different needs. Both might see the need of a helping hand from a professional in achieving some required element of customisation within a construction paradigm that is based on maximising the use of standard components and methods of assembly.

There are many professionals who have yet to grasp the impact and opportunities enabled by these techniques. I see this as a great opportunity for them to get engaged and involved.

## 12 Are you seeing any of the big industry players investing in design for manufacture and assembly?

The most well known for investing in DFMA is Laing O'Rourke with their Steetley Explore manufacturing plant.

Other well known industry contractors have smaller facilities and a lot of them are engaged in the M+E side as specialist contractors. This sector is now becoming quite mature in the UK.

I am aware that some of the bigger construction contractors are investigating how offsite and DFMA become an increasing part of their business. If we don't do it, somebody else will!



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### 13 What does the future hold for Buildoffsite?

When I started Buildoffsite 10 years ago I did not expect it to go on for so long. I naively expected the industry to rapidly accept the values of offsite and how its use can cut cost, improve quality and reduce waste as well as delivering more sustainable solutions in a safer way. I was wrong and it is clear that much of the industry is ultra-cautious about change and in particular radical change. We still have a lot of work to do!

I expect to see Buildoffsite both here and abroad develop as a cornerstone of

construction innovation. I suspect that the emphasis will shift from promoting great exemplars of effective use of off-site solutions – which in any case most people will recognise and shift towards the really difficult challenge of engaging with and challenging mindsets and vested interests.

I would like to see more young people engaged in the construction industry. I would like to see them more actively engaged in offsite construction and the broader change agenda. It is their future at the end of the day!

Perhaps at the same time we can address the gender imbalance that exists in construction.

### 14 What do you do away from the world of off-site?

I love to cycle which I do most week-end. I also love to walk - predominantly hill walking. I enjoy holidays around the world and I love to sail. I relax, spending time with my family, travelling, socialising and having fun I love to watch my children's progress and hope they can get as much from life as I have both at work and play.





Brecon mountains, Wales