Construction CN News

Call for the specialists

17 July, 2015 | By Will Mann

Construction specialists face major resourcing challenges with BIM - but the reward could be greater influence.

A recent survey by law firm Pinsent Masons revealed that a third of contractors and consultants blamed the supply chain for slow progress on BIM, with a lack of understanding cited as the biggest barrier to hitting Level 2 targets.

And yet, for construction specialists it represents a big opportunity - a chance to provide much more positive influence on a project from the outset.

"It is no secret that the key to successful BIM is collaborative communication and open sharing between individuals and across organisations," says Duncan Reed, digital construction process manager at software developer Tekla.

"The early involvement of an integrated design team - that includes key specialist subcontractors and engineers - throughout the entire process, is essential for an effective BIM project.

"Good design uses specialist knowledge, adding value and therefore surety of price, so the need to start thinking downstream when designing is very important."

Rare collaboration

He adds that projects frequently encounter fundamental problems that have to be rectified on site - at considerable time and expense to the contractor and client - due to the initial design not being 100 per cent accurate.

"Unfortunately, the much-needed early collaboration with all parties rarely happens in practice because the construction industry does not routinely
put a value on manufacturing design and investment in that upfront resource cost at the start," Mr Reed says.

"This results in specialist contractors facing a difficult challenge in adopting BIM early enough to add value to a project."

Steelwork contractor Caunton Engineering is one specialist that has made considerable investment in BIM.

Robert Berry, director of engineering and innovation at the Nottingham-based firm, says: "Since we started 3D modelling in 1987, we have invested steadily in people, software, hardware and training to develop and expand our capabilities in 3D modelling, structural analysis modelling, digital engineering and, more recently, BIM.

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"This included the big decision at the end of 2011 to migrate all of our 3D modelling staff - 30 of them - from the system we had used successfully for 20 years, over to Tekla Structures.

"This was driven by the fact we had to be able to deliver BIM and our old software was not capable of doing so."

Caunton has used BIM on a diverse range of projects, from supermarkets to rail depots to energy-from-waste plants. But Mr Berry feels BIM adoption in the wider supply chain is still "patchy" in his experience.

"Certain specialists - steel-frame contractors and some building services contractors - have been creating 3D models for many years, but the majority of other envelope contractors are still working in 2D," he says.

"We're beginning to see more enlightened envelope contractors starting to adopt 3D modelling as part of a BIM process, but they have a lot of catching up to do - only the top 25 per cent will be able to deliver accurate BIM models by 2016.

"Invariably, this means their lack of 3D modelling capability can become a blockage to integrated design on a project."

Manufacturing crucial

Mr Berry believes the key driver to BIM adoption is manufacturing.

"Organisations that make and supply products need to create 3D models to produce CNC (computerised numerical control) data for their production machinery," he argues.

"On the other hand, trade contractors that schedule and order materials from third parties do not require CNC data, so they don't see a need for 3D modelling - the perception can be that they won't get anything out of it."

The growth and development of BIM and the inherent data generated has put great emphasis on collaboration within the supply chain.

A future BIM-enabled built environment will demand transparent, collaborative working not only between project teams in its application, but also with other stakeholders to co-create construction solutions we cannot envisage today.

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"The industry needs better design and BIM can help us deliver it," Mr Berry says.

"However, we must start the design process much earlier in the project timeline to allow it to be done properly before work starts on site and spend this very small percentage of project costs earlier.

"Having a BIM model allows our structural engineers to very quickly understand the building and produce a compliant design in less time.

"We believe there could be as much as a 25 per cent time saving in doing a tender design when a good quality BIM model is available.

"Whereas on a project that does not adopt BIM, our experience is that around 70 per cent of the time is spent explaining problems to design team members and only 30 per cent spent agreeing solutions."

Tangible savings

Mr Berry says that the amount of money that is lost as a direct result of badly co-ordinated work on site is not well recorded, so it is hard to put a figure on how much BIM can save by getting it right.

"What we do know though is that if one of our installation crews has to stand still for an hour while an alternative plan is put in place it will cost us at least £300 - and the main contractor will not want to pay," he says.

Caunton has found that one of the biggest hurdles to BIM adoption is interoperability - where the transfer of data from one modelling system to another can proceed smoothly.

The firm uses Tekla software for its BIM work and Mr Berry says it has no problems importing data from Tekla into other software.

But in terms of the wider industry, he adds: "Interoperability is a fundamental part of the success of BIM, and software companies must find the solution to known interoperability problems to deliver software that works properly and provides their customers with what they need."

Investing in 3D modelling software and introducing BIM methodologies and processes into all operations across a business does not come cheap, as Mr Berry acknowledges. But Caunton is playing the long game.

"We are a second generation family business, so we're in this for the long run," he says.

"We have devoted a lot of time and resource to adopt a BIM approach across projects. In terms of the software, we recognise the business benefits an efficient 3D modelling system can bring."