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BIM AND THE SMALLER ARCHITECTURAL PRACTICE

For architects working on smaller projects, BIM can be seen as expensive and unnecessary, but plenty are finding its capabilities increasingly vital, writes **Felix Mara**

This month's Overview focuses on the timely area of BIM; timely because we've passed the April 2016 threshold beyond which centrally procured projects must be executed in Level 2 BIM using federated information models. There is now a new target, from October, to firm up on the quality of Level 2 practice and information, and much of the talk is now about Level 3, which some consider to be BIM proper.

It has often been said that smaller practices are the losers in the drive towards BIM and, as the examples below suggest, many such firms are somewhere between Levels 1 and 2 and more attuned to BIM's 3D capabilities than its emphasis on information exchange.

Some might argue this reflects the limitations of the software available to smaller practices, although I've worked in a few that have invested in the more expensive packages on the market. As these examples suggest, the way smaller practices use BIM reflects the types of project they do, as well as the consultants, builders and other construction industry specialists they are involved with.

Although it's axiomatic that 3D design is architects' core skill, and that it must be an integral part of any concept of a holistic information model, it's incorrect to say that all smaller practices are exclusively focused on 3D BIM. Designscape Architects, a small practice based in Bath, which was an early BIM adopter, uses it on every project as the foundation for all contract management services it offers clients, allowing it to manage small jobs directly and provide a more seamless project management service. Interestingly, Phillips Tracey Architects, a small Richmond practice that has used BIM for some time on larger projects, has now rolled it out on smaller-scale domestic work.

Hudson Architects
We first tentatively implemented BIM in 2011 with two Revit installations. Our first BIM project was a contemporary Cor-ten-clad house, by the beach in Jersey. The QS was initially bowled over by our ability to generate live schedules of walls, floors, roof areas and materials and it, too, joined the BIM party, using

Chilliswood, a four-bedroom house near Bath. Designscape Architects used BIM modelling to generate both 3D images and construction information for the project

'We started choosing the consultants we worked with on the basis of their ability to use Revit'

CATO's early BIM functionality. Unfortunately it quickly lost its nerve and reverted to tape measures and abacuses!

On the back of that first project we experimented with refurbishment projects for cottages and listed buildings and, although it took much more time (and pain) than our normal Vectorworks flat views, we cut our digital teeth on the complex adaptations that real building projects inevitably throw up.

With an eye to 2016, we frequently spouted BIM jargon at each other, mentioning Level 1 and Level 2, etc. If nothing else, this meant we started choosing other consultants on the basis of their ability to use Revit, and our early collaboration on small projects with structural engineers was remarkably successful. We have now switched to ArchiCAD, and wouldn't dream of starting any significant project without BIM. Like it or not, it's here to stay.
Philip Durban, associate, Hudson Architects

Phillips Tracey Architects

We have used Vectorworks in 3D for a number of years in lieu of other 3D software. We find the simple ability to derive accurate traditional drawings and component and area schedules directly from the model incredibly straightforward and efficient compared with previous workflows, where we had to manage both 2D and 3D, usually in separate applications and sometimes on differing computer platforms.

We can generate fully rendered 2D sections and elevations directly from the model with accurate shadows, as well as 3D views. This greatly enhances our 2D output, where traditionally we would have had to use a mixture of CAD and Photoshop. Having a unified 2D and 3D environment means we can quickly change the design and see all views of the model change. This is very useful when discussing options with a client, and has been key to a number of successful bids. As a project progresses, the 3D model continues to be developed and forms the basis of all our technical drawing output.

While we have been successful in sharing 3D data with consultants on some of our larger projects, the scale of most of our projects to date tends to restrict the number of consultants working in 3D.

BIM has given us confidence that our output is fully co-ordinated. We still, however, have some workflow restrictions with software and cross-platform compatibilities, particularly specifications, which we hope will be resolved

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by software developers through further use of the Cloud. We have enlisted the help of BIM expert Steven Shorter to streamline our 2D and 3D workflows, and we are now ready for Level 2 BIM, having found Level 1 extremely successful.
Brendan Tracey, director, Phillips Tracey Architects

Designscape Architects

We enjoy using new technology where this can benefit our buildings and their users. We are currently working between BIM Level 1 and 2 depending on the individual project requirements; BIM is clearly here to stay and we see its implementation as essential to stay in the game in the long term.

Our primary software is Vectorworks, increasingly using its 3D tools and processes. We have been using it since 2004 and have been developing the 3D/BIM office standards for nearly five years. We also use Photoshop and InDesign to explore concepts on a more abstract and holistic level, before we begin to focus on technical detail.

We believe the benefits of BIM and 3D Vectorworks really become apparent at the post-planning stage, where we are producing drawings for technical and construction information. We still feel design solutions are best initially developed through site analysis and investigations using hand sketches, research and photography, combined with 3D models developed in SketchUp. But we often produce 2D Vectorworks plans as a base for this modelling, with a Vectorworks 3D-generated terrain model imported into SketchUp. This complementary use of software allows us to quickly and effectively explore our designs and express them to clients and stakeholders, without having to prematurely develop the detailed design using Vectorworks 3D.

We have invested considerable time in setting up workflows and office standards for producing our drawings. We use a series of bespoke templates with separate model and sheet files to create a consistency in terms of output. This enables multiple users to work on one project without continually reinventing the wheel. This uses a clear tested system of classes, layer naming, parametric objects, libraries, tools and

referencing developed over the past few years.

To ensure accurate production information is generated efficiently we combine the use of section viewports through the 3D model with an overlay of detailed 2D information at the critical junctions. This requires us to use a strict workflow throughout the modelling process, and the steps we use to generate our final drawing sheets.

We have found that the 3D model really begins to save time during the detailed and technical design stages using the 3D modelling components and tools including generating wall types, views, sections and benefiting from the use of parametric objects. Schedules and design information are produced directly from components within the model, for example the timber cutting schedule, steel schedule, 3D drawings for setting out of beam and block floors and component drawings.

BIM and 3D modelling are not only useful for producing building information, but also in terms of terrain modelling. We have developed methods to import a range of 2D and 3D data into Vectorworks to create terrain models and generate accurate areas and volumes to be cut and filled on site. We also often export these terrain models for use in other software such as SketchUp for accurate but very quick concept modelling.

We have had to customise the technology to suit our practice's approach to generating information. It has taken a long time but Vectorworks has now evolved into a package with file referencing capability although, compared with other packages, this is still slow and cumbersome. We therefore use our specific workflows, standards, file referencing, file naming, classes and templates to allow this.

In the small projects world, engineer's information tends to be minimal, often just mark-ups of our drawings. The scale of the project and fee will reflect the amount of information that other consultants will produce and, below a certain scale, it is quicker and more efficient for us to draw their elements in our model.

Currently we find that integrating this information into our 3D models is the most effective method, whether through importing a survey or translating structural sketches and calculations to model the structural components. This enables us to continue to work with familiar but 'un-BIM-friendly' consultants, and allows us to maintain control of a model, detect conflicts in the information and assure

This image Cringleford Hall, Norfolk, by Hudson Architects
Below Waitrose, Bagshot, Surrey, by Phillips Tracey Architects