

Mill Technology reduces building services design and co-ordination time thanks to Revit MEP

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Chris Milford, Mill Technology, CEO

When Mill Technology first came across Revit 3D design software from Autodesk, they saw such potential in the technology that it set up a separate business Broutek Ltd to design content for it.

Mill Technology is a provider of 3D modelling, draughting services and building services co-ordination. They specialise in large, high profile commercial developments, which, by their very nature, demand fast, efficient and accurate co-ordination of building services and preparation of single-service installation drawings.

For maximum efficiency and accuracy, the firm makes extensive use of 3D object libraries and viewers to draw, visualise, check and programme the installation of the building services to make sure these are rolled out without service clashes.

Mill Technology has been in business since 1995, over which time its projects have included high-profile redevelopments at Ascot Racecourse, New Street Square, St. Bartholomew’s Hospital, the various terminals and car parks of Heathrow Airport, and London’s Millennium Dome (now the O2 Arena).

Working in parallel

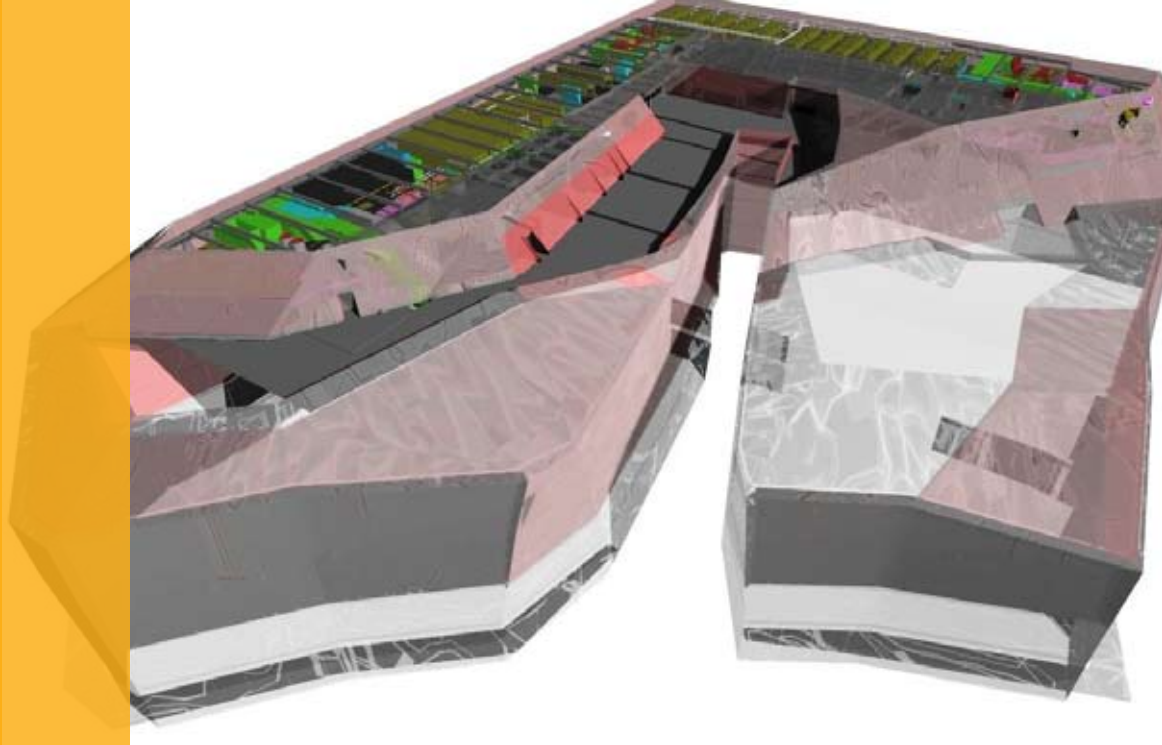
Before Autodesk launched Revit MEP in mid 2007, Mill Technology used a specialist design package called CAD-Duct Solids/MAP; when Revit MEP came onto the market, the firm made a commitment to the product, and are commencing rolling out of the software on all future projects.

“The architects and structural engineers we work with were already using Revit software [Revit Architecture and Revit Structure]; now there is Revit MEP for the coordination of mechanical/engineering/public health building services, we can all collaborate more easily using the same functionality,” explains Chris Milford, Mill Technology’s CEO.

“The benefit is that we’re all interrogating and reviewing the same 3D model, which improves efficiency and accuracy, and enables closer collaboration. This reduces the time it takes to design and coordinate building services installations, as we no longer have to take 2D files and convert them to 3D; with Revit, this is all done at the design stage. Using the same software platform, we can work in parallel, becoming more closely aligned; the process isn’t disjointed any more.”

Revit MEP is an intuitive design tool that works the way engineers think, allowing them to visualise their designs in a real-time 3D model, rather than as series of flat, two-dimensional layout drawings. This advantage that has been available to architects and structural engineers for some time, and has now been extended to engineers in the mechanical, electrical, and plumbing (MEP) engineering design field.

The ability to work on essentially the same software as architects and structural engineers enables efficient, concurrent working, minimising the potential for co-ordination errors. This is because all members of the extended team now share a single software platform and the same building information modelling



(BIM) workflows. This aids decision-making and provides superior building performance analysis support for engineers, facilitating sustainable design.

Intelligent objects

Not only does Revit present data in a real-world digital 3D format – ie a virtual model of how the finished design will look and feel – the data this is based on is very sophisticated. Every 'object' in the design has associated information about its properties and behaviour. This dictates what can be done with it, and what impact one facet of the design will have on another. Data only has to be input or changed once, as it is linked dynamically throughout the design and related applications, a single change made to one aspect of the design will ripple automatically across the entire software system; its impact on other aspects of the model is calculated and the model updates accordingly.

"We can now add a design change to a specific pump in a system, and the software automatically updates the model with the new data," Milford explains. "Revit really is a very, very clever product. If you draw steel pipework and then want to see how it would work in copper, you can do this virtually with the click of the mouse – the design changes the selected system to copper, and all of the new properties are assigned automatically."

The ability to model buildings and how they behave and change over time is crucial, too, he notes, especially in the business of managing and maintaining services.

Supporting sustainability

"In our business, the lifecycle starts with design and never ends, and Revit is geared to that," he adds. "Revit MEP will have the facility to align with the building BMS infrastructure, which can analyse power usage and Revit will provide a complete inventory of the building, including every tap and door handle, all with their associated attributes and schedules. So, if we later want to replace all the door handles, we just enter this information and the software immediately works out all the implications so you immediately have the associated bill of materials and so on. Everything is measurable in Revit!

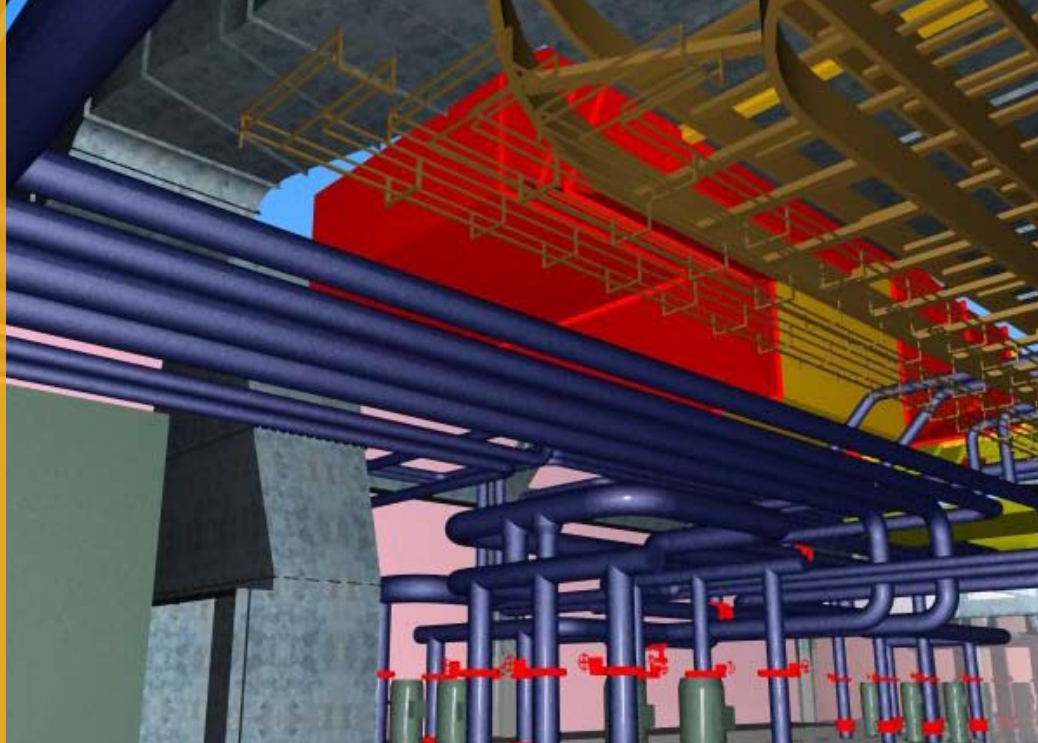
"This is huge from an architecture perspective," he continues, pointing as an example to curtain walling. "If a building facet or feature is one shape on the ground floor but changes shape and dimension as it moves up, the Revit software can make all the necessary calculations just once. You only need to draw one object and schedule the relevant data at each level and Revit will automatically adjust the object as it is introduced into the building design at subsequent levels. This gives huge time-savings and flexibility.

"Buildings are built a lot faster today, and we need this software support in order to maintain the momentum required with the construction industry to complete projects on time and on budget," Milford notes. "We can also deal with changes very quickly as clients change their minds, which can happen a lot over the course of a project."

Ticking the green box

The ability to measure and influence a building's environmental impact is another clear advantage of the Revit software, and something that will become even more important over time, Milford says. "Autodesk has joined forces with a company called IES whose Virtual Environment software can analyse a Revit model and calculate the required heating and cooling loads," he explains. "For example, you can rotate a building 10 degrees at a time to find the optimal position for heat gains and losses."

Milford believes such capabilities will become essential as planners begin to specify 'green' criteria over 'lowest price'. "I heard a talk by a Chinese company at the Autodesk University in November, about a marking system they have when tendering for building work," Milford says. "The company with the most points is normally awarded to contract, and only a small part of this is based on price. The IES package in Revit is seen as a key driver in the analysis of energy consumption, as construction managers and contractors can prove to developers and government institutions that their buildings are as green as possible. Although the UK is a way behind on this, it's only a matter of time before the industry is subjected to the same pressures, and a software tool like Revit provides a definite advantage."



Although Revit MEP is relatively new to Mill Technology's toolkit, Milford is very excited about its potential. "We've just won a contract as the lead co-ordinator for developing 3D building services for the One New Change development behind St Paul's in London, and we are developing the mechanical pipework services in Revit," he says.

The seven-storey, mixed office and retail redevelopment will see Milltechnology join forces with structural engineers Arup who are using Revit Structure and MEP consultants Hoare Lea, to developing the design for installation by the relative trade contractors.

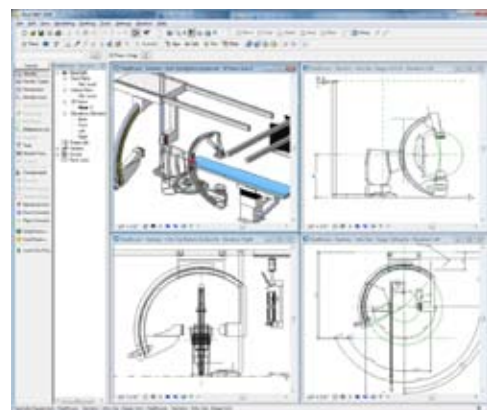
"Arup has drawn all of the steelwork in Revit, so we will now take the architectural structures and model these in Revit Architecture and utilise Revit MEP for the mechanical pipework services," Milford explains. "This will give us a lot of flexibility and increase efficiencies. We'll then be able to deliver spool piece drawings, with dimensions and details, so that these can be pre-fabricated off site, which is very important in a busy city environment. Here, the objective is to minimise the work needed on location, and deliver projects cost-effectively and efficiently. Revit really plays to this need. The logistics of using traditional building methods would be extremely difficult in London for a project of this magnitude."

We believe that Revit MEP is our future, so we set up a company to make it work for us

Milford has been so impressed by the potential of Revit that he has now established a separate business – Broutek - with the sole purpose of developing specific content for Revit MEP and Revit Architecture, from which architectural and engineering companies can buy specific content to drop into their designs. "If a company is designing a building but doesn't have the exact furnishings the client wants, they'll contact us and we'll model it and send it to them," he explains. "We'll also develop models for pumps, cooling towers, generators and the entire MEP industry."

"We have a team of modellers who create and model these components using Revit, to sit in the 3D environment. It's extremely fast. The key is re-use and the potential is so enormous that this has become a separate business. We've been going a year and a half now and we're way ahead of the game; business is really picking up now. Revit MEP is new, but we are incredibly enthusiastic and are rapidly building up a stock of content."

We recently received a request to model the Artis Zee Biplane System, and quickly discovered this was not your run of the mill Revit family. Made by Siemens, the Artis Zee Biplane is a cutting-edge, robotic, medical diagnostic device consisting of a bed, a display arm, a ceiling mounted C-arm, and a base C-arm. The arms, or Zees, as Siemens calls them, are each made up of multiple pieces that rotate or spin along different axes, which allows for tremendous freedom of movement. The bed can also rotate around three axes. And of course our client wanted the ability to freely arrange each element's position. So we're talking parameters, parameters, and...more parameters.



For more information

To learn more visit us on the web at www.autodesk.co.uk/revitmepe