BIM in Building Projects

Barts and The Royal London Hospital

London, United Kingdom

Image: HOK Architects

"I don't want pretty pictures or drawings. I may ask for them, but what I want is data I can interrogate in different ways – for quantities and room areas – and yes, maybe some drawings too! But seriously, we have learned on the Barts & London project that if the designers concentrate on getting the design data right, then a variety of views – drawings, 3-D models, spreadsheets and databases – can be generated or extracted as appropriate."

David Throssell
BIM Technical Manager, Skanska UK

The 3-D coordinated model on the Barts & London project is not the innovation, rather the unlocking of the value of the 3-D objects that make up the combined models. The project team realized that in addition to clash and fit, interactive models can be used to check for safe access for operation and maintenance, confirm major plant and medical equipment installation/removal strategies, link to construction programs and monitor progress using tablet PC's on site.

Barts and The Royal London Hospital	
The Royal London Hospital	746 beds, 4,800 staff
St Bartholomew's Hospital	290 beds, 2,200 staff
Total area	270,000m² (2,900,000sf)

Furthermore, the CAD objects can be interrogated to swiftly and accurately extract quantities and material lists. This was used to re-inform the cost plan, challenge trade contractor tender prices and enable the environment team to set ambitious waste targets on the basis of robust data. Another use of the data was to link design information directly to trade contractors estimating software, thus saving time on the tender program. Finally, the building services model has been a key driver in the decision to use modular services in the corridors, which led to significant program saving.

The design, construction and maintenance teams met weekly to walk through parts of the model to check for safe access, usability and maintainability. Early decisions were made on valve and rodding eye positions, trip hazards were identified and mitigation agreed, platform and access ladder requirements were confirmed. Particular weekly model walk round meetings successes have resulted in the elimination of mansafe roof restraints and the minimization of confined spaces by identifying and rerouting services in the finished building.

The ability to move objects around the virtual world and check for clashes has been used to confirm the installation and removal strategies for all the large pieces of plant and medical equipment. For example, increasing the size of three doors and reducing the depth of a downstand beam at the design stage has saved GBP 120,000 (USD 187,000). This dynamic clash checking has been particularly important for verifying the medical equipment installations. The kit is typically delivered just in time and therefore needs to fit first time. The team were able to change door sizes and corridor widths to ensure the installation of the equipment without demolishing completed rooms.

The model has been used to provide quantities for virtually all the building elements. A particular success has been the use of these quantities by the environmental team who have used the data to set and meet an ambitious 10 percent waste target for subcontractors.

So, as far as the Barts & London project is concerned, the 3-D model started as a method of ensuring spatial coordination but turned out to be a tool to improve quality, reduce costs and waste, save time and improve health and safety for the end user.

Finally, as part of an industry leading development the combined 3-D model was taken out onto site on tablet PC's and became the hub of the BIM system by providing a route map to other databases and data sources stored on the tablets. The system was used for monitoring the progress, compliance and completion of the delivery of some 5,000 rooms, provide access to the latest drawings and room data sheets via a link to the document management system and the recording of snags (Punch list items) at source on site.