

## 2007 Third Annual BIM Awards, Part 2

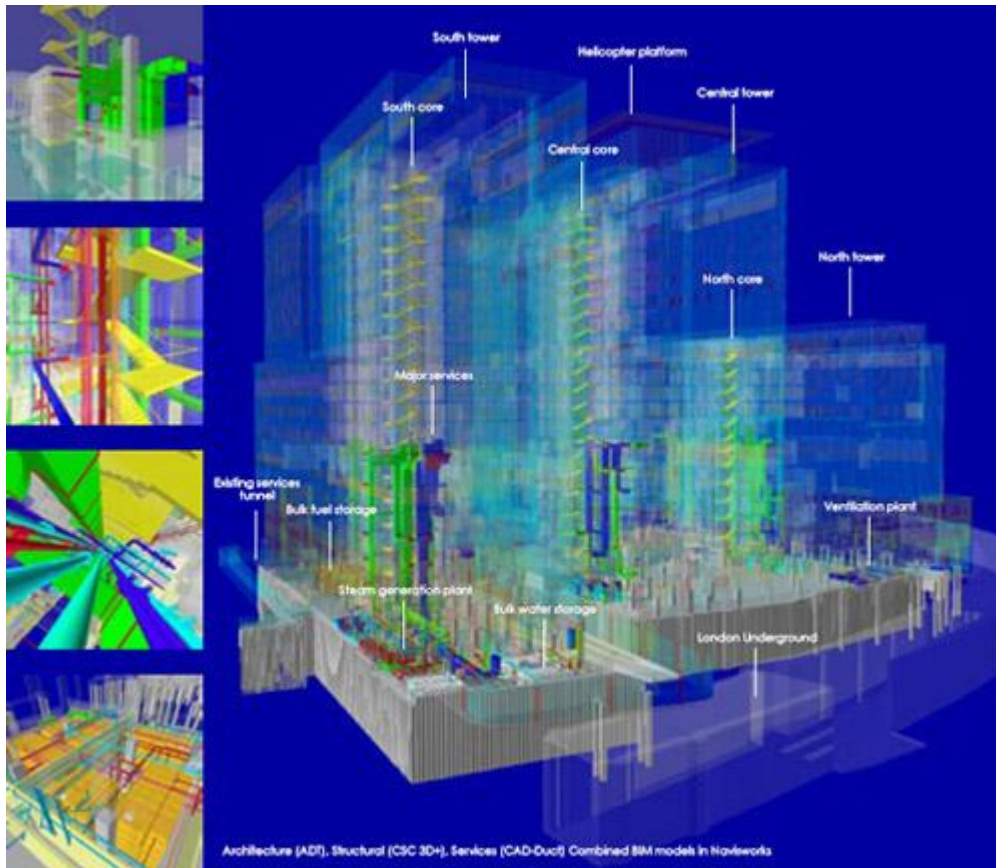
This AECbytes "Building the Future" article discusses the remaining projects that won BIM Award citations, along with some of the jury's thoughts and deliberations on the entries that were submitted. A complete list of award winners and honorable mentions can be found in [Part 1](#) of the article.

### Royal London Hospital

A large and enormously complex project, the Royal London Hospital's new building is a 905-bed facility that will provide London's principal trauma and emergency centre and the city's second largest pediatric unit, as well as 100 other specialist medical departments. It is configured as a pair of 20 storey towers containing 6,225 rooms across 1.2 million sq ft of floor space, and has a total construction cost of \$ 1.2 billion. Currently under construction with an estimated completion date of 2012, it will become the largest new hospital in the UK and is expected to have a significant impact on the landscape of east London where it is located. It is being built under the UK's "private finance initiative" in which the principal contractor, Skanska, will not only undertake the design and construction of the hospital but also its operation and maintenance for 35 years. This led the contractor to take a special interest in the technology used to execute the project. HOK was appointed to the delivery team after winning a design competition and realized early on that the demands of the project could be met only by adopting a highly-coordinated BIM approach. This was also welcomed by the contractor, as the data-rich model would not only help to optimize design and construction but also continue to provide useful information for its future facilities management tasks. HOK worked closely with Skanska to develop the BIM strategy for the whole design and delivery team and continues to play a leading role in the "3D CAD and Data Management Group" that has been convened to manage file generation and exchange.

The BIM strategy was centered around using Autodesk Architectural Desktop (ADT), now called AutoCAD Architecture (see Figure 1). Interestingly, even Autodesk no longer markets this as a BIM application, but the project team for the Royal London Hospital made full use of ADT's object-based capabilities to achieve BIM-like benefits. All programs used by the key team members as well as sub-contractors are ADT compatible, and the different project participants (architects, engineers, contractor, FM team and client) have agreed to feed into, and off, a single portal set up and managed by the central 3D CAD and Data Management Group. All design work is conducted in 3D, and any 2D drawings required by contractors (largely those in MEP) are extracted from the central model. Traditional 2D CAD applications are not being used at all. Even medical planners, who prefer to work in plan, operate within the 2D mode of ADT. Their designs, therefore, are generated in a manner which is suited to their way of working

while their drawings are rich in data and can be assimilated into the central model.



[Larger image](#)

**Figure 1.** The BIM strategy for the Royal London Hospital project was centered around using ADT and compatible programs. (Courtesy: HOK and Skanska)

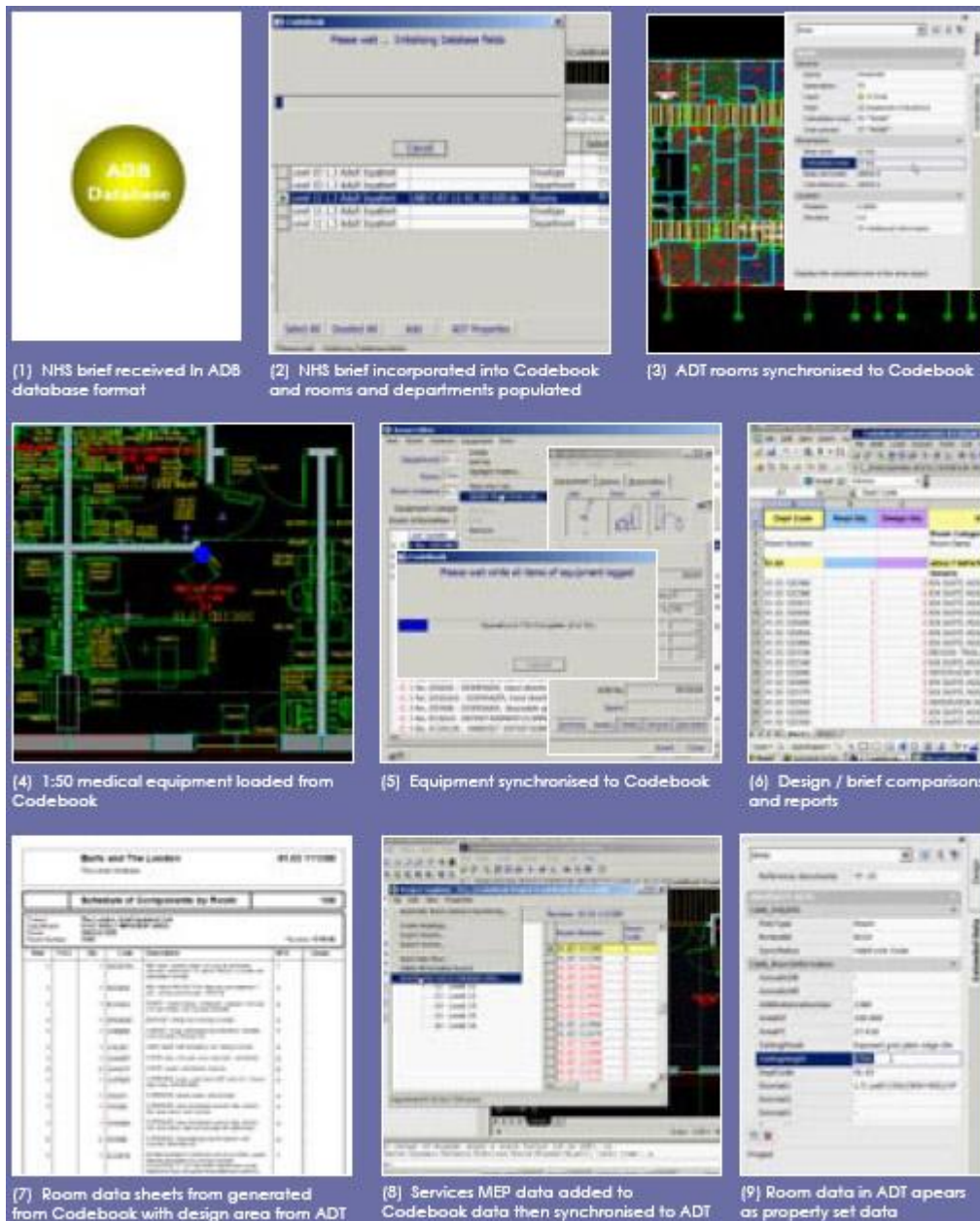
The architectural, structural, and MEP models are regularly combined through Navisworks for coordination checking, clash prevention, and construction rehearsal. This has allowed the coordination of a dizzying number of mechanical, electrical, plumbing, and medical systems. It has already highlighted a number of issues and uncovered potential safety "blackspots," especially for maintenance personnel, which would have been difficult and expensive to resolve once the construction was complete (see Figure 2). The models are also being used for a wide variety of analyses including lighting and acoustic studies, analysis of structures and cladding systems, verified views for planning and other approvals, and mapping out of services. Considerable efforts have gone into making the central models easily navigable by individual members of the design team. Through the project extranet, the hospital complex can be viewed as a series of images on a storey-by-storey basis—each image contains hyperlinks to the approved Navisworks model, key documentation and the latest drawing revisions.



[Larger image](#)

**Figure 2.** Some of the constructability issues detected by combining the individual disciplinary models in Navisworks. (Courtesy: HOK and Skanska)

While all these BIM implementation strategies and the benefits realized through them are undoubtedly impressive, what was really unique about the Royal London Hospital project was the integration of a software called Codebook, which encapsulates key government-sanctioned medical information and requirements. This software is linked to the principal ADT models, allowing the designers to constantly check that room layouts and services fulfill the requirements of medical need (see Figure 3). It is this integration of the program requirements into the design process, facilitated through BIM, that won the Royal London Hospital project the BIM Award for the category of *Support for Human Use and Innovative Program Requirements Using BIM*, which requires evidence of the application of user or occupant-based rules to developing and refining a design.



**Figure 3.** Integration of medical information and requirements captured through Codebook into the design process in ADT. (Courtesy: HOK and Skanska)

As a combination of design/construction and medical information, the BIM model of the Royal London Hospital will provide a powerful resource for its facilities management teams once the hospital is functioning. For example, a patient receiving oxygen will be participating in the same information system as the person who installed the oxygen delivery mechanism. The project team is also looking at RFID (Radio frequency identification devices) and the embedding of IFCs within a central database to boost the value and "data life" of the BIM model to the hospital managers of the future.

## Some Thoughts from the Jury

The choice of award winners for the remaining categories was not so straightforward and unanimous and involved a lot of deliberations among the jury. None of the entries that were submitted in the *Support for Human Use and Innovative Program Requirements Using BIM* category really showed evidence of the application of user or occupant-based rules to developing and refining the design. The only project that came close was the Royal London Hospital, but this had not even been submitted for this category. The jury finally decided to disregard its mis-categorization and award the citation for *Support for Human Use and Innovative Program Requirements Using BIM* category to the Royal London Hospital, as it really hit the nail on the head by using Codebook to integrate the government sanctioned database of medical codes and protocols into the design process.

## Acknowledgements

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## About the Author

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