

Atkins

Project:

China Huarong Tower

Location:

Hengqinzhèn, Xiàngzhōu,
Zhūhǎi, Guǎngdōng, PRC

Type:

Mixed-use Development

Scheduled Time of**Completion:**

Total Completion is scheduled
for December 2014

Rapid Design Development and Integrated Collaboration



Atkins has been announced to design the China Huarong Tower. After winning the one-month competition, the project was set on a “fast-track”, reducing design development time to only two months for delivering the final scheme design. In order to fully embrace the rapid design development, the BIM workflow, centred on Revit has been adopted. Revit also enabled integrated collaboration with structural and environmental engineers by sharing one 3D design model.



An auspicious design

The Hong Kong architecture studio of Atkins was invited to compete for the design of the China Huarong Tower, a mixed-use development in Zhuhai. After winning the competition, the design team was informed that the final design would be needed in just two months. Dr Stefan Krakhofer, associate

of Atkins Architecture and Urban Design has developed the winning design applying 3D BIM modelling, as it accelerates the design process and increases quality control, leading to a viable design.

During the initial two weeks optioneering stage, nine viable designs were proposed and the client chose 3 favourites. In the following two weeks, the final winning design was presented – which featured an office tower and a hotel tower, sharing a retail Galleria. The architectural language is sculptural, resembling the “Shuang Yu – the symbol of the double fish leaping out of the pond”; an auspicious design, befitting the site located on Zhuhai’s waterfront, facing the Cotai Strip of Macau.

This design presents another successful BIM project by Atkins. The chosen BIM platform is Autodesk Revit, partly as Atkins is pushing BIM globally, and will soon

introduce a global BIM standard to ease communication between disciplines, within Atkins, and with clients and governments. For the team – including Dr Krakhofer, who had previously specialized in parametric design and programming in other 3D design software – the project would prove a learning experience.

BIM helps assess sustainability

“The multidisciplinary environment of Atkins enables an integrated design approach,” says Dr Krakhofer. “Early on architects and engineers team up to achieve a sustainable design solution. We analyse the client’s brief, the local environmental situation and start optioneering. Using BIM, we can not only model everything in 3D, but also automatically retrieve area schedules, component lists, and 2D representations.”

Importantly to Dr Krakhofer, Revit BIM enables collaboration between different software tools that improves the feedback loop between design and analysis; creating a sustainable design workflow. During the design development of the China Huarong Tower, the 3D model was often exchanged (export / import) between Revit, and Project Vasari for rapidly assessing sustainable factors, such as the solar and wind performance.

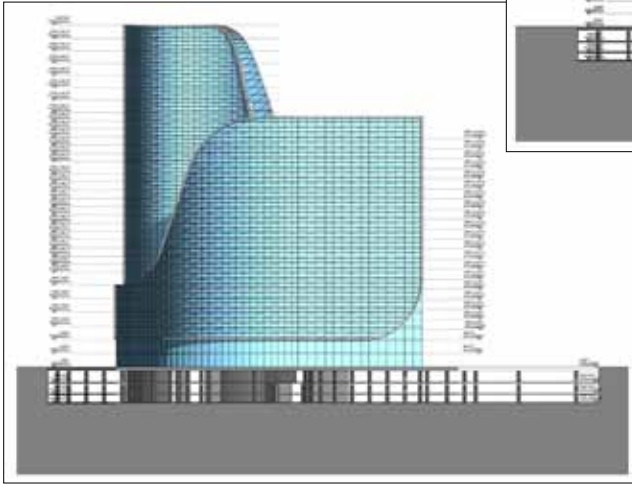
Additionally to the optimized analysis feedback, the 3D Revit model, containing material definitions can be naturally rendered in 3ds max, and exported to build high-class physical models. Importing the Revit model to Navisworks, and using the walkthrough functionality improves tremendously with collaborative design decisions. The Atkins team is also looking into parametric design using Revit’s “Dynamo” plug-in and design automation

using python scripting, allowing more time to be spent on designing.

Constraints Driven Design

“Identifying the constraints (Regulations, cost, climate, structure, MEP, BMU, visual performance, ...) of a project allows you to drive the design more effectively,” says Dr Krakhofer. “The use of 3D BIM helps to address each aspect explicitly and improves quality control – it constructs confidence.”





BIM allows for rapid fine-tuning of the final design. One example during design development was, to adjust the outline of the office tower to accommodate a larger ballroom, requested by the Hotel operator. In the Revit model, the floor area table is updated automatically and the new model could be rapidly analysed for its solar performance. The Atkins team also used BIM for the curtain wall design to ensure efficient panelization with high degree of repetition.

To evaluate the spatial performance of the design, Navisworks' walk-through functionality has been used. "In Navisworks spatial constraints exist, so that one cannot walk through objects (walls) and can navigate up and down stairs," says Dr Krakhofer. "You can

walk your client through the design in the virtual environment." During one of the virtual investigations, the design team encountered an incongruous column configuration. "Let's resolve this!" was the immediate response – together with the structural engineers the columns have been adjusted – the spatial quality has been enhanced.

BIM shifting focus

Reflecting on the project to date, Dr Krakhofer says BIM requires more investment of resources in the beginning, but the process is LEAN overall, with more time designing, less time producing plans. "We might be able to design three projects with the new approach, in the time it would take for two with

traditional methods. Also, the design experience for colleagues working on a 3D object instead of 2D CAD is more exciting and tangible - which is why I moved into 3D.”

The constructive and explicit nature of BIM demands a strong decision making process along with the design. This results – unlike with freeform methods – in a closer reality that is perhaps 95% identical to the completed building. As part of the BIM strategy, Atkins has introduced cross-disciplinary BIM managers that are responsible for maintaining and quality assurance of the 3D BIM models throughout the project lifetimes.

Reflecting on the increasing capability and also acceptance of BIM, Dr Krakhofer says, “Observing the building industry we are finding that many professionals are eager to adopt BIM - ‘Let’s do it in BIM!’.” Atkins has been using BIM successfully on more than 50 projects

worldwide with an estimated construction value exceeding \$1 billion. In the long run, Atkins is expanding 3D BIM to 4D and beyond. “It’s a more integrated approach,” notes Dr Krakhofer.

** All images in this article are provided by Atkins*



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ABOUT ATKINS

Atkins is one of the world's leading design consultancies. We have the breadth and depth of expertise to respond to the most technically challenging and time-critical projects and to facilitate the urgent transition to a low carbon economy. Our vision is to be the world's best design consultant.

Whether it's the architectural concept for a new super-tall tower, the upgrade of a rail network, master planning a new city or the improvement of a management process, we plan, design and enable solutions.

With 75 years of history, 17,700 employees and over 200 offices worldwide, Atkins is the world's 13th largest global design firm (ENR 2011), the largest global architecture firm, the largest multidisciplinary consultancy in Europe and UK's largest engineering consultancy for the last 14 years. Atkins is listed on the London Stock Exchange and is a constituent of the FTSE 250 Index.

In 1994 Atkins established its first Asian office in Hong Kong followed by Singapore in 1996. Today we also have offices in Hong Kong, Beijing, Shanghai, Chengdu, Chongqing and Ho Chi Minh and Sydney, all part of an integrated network that delivers innovative multidisciplinary projects and employs approximately 1,000 staff across the region from China to South East Asia and Australia.