

Henderson Land Development Company Limited

Project:
Proposed Office Development at 14-30 King Wah Road

Location:
14-30 King Wah Road, North Point, Hong Kong

Type:
Office

Scheduled Time of Completion:
End of 2016

Enhancing Building Quality With 6D BIM

From designing, through coordination support to maximising views and minimising solar penetration, Henderson Land reaps innovative benefits of BIM

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Kevin Ng,
Senior Deputy General Manager
Project Management (2) Department,
Henderson Land

“Our management supports use of BIM, as it helps achieve better quality.”

BIM Partners Involved:

Project Architect:
Dennis Lau & Ng Chun Man
Architects & Engineers (HK)
Limited

Design Architect:
Pelli Clarke Pelli Architects

BIM Consultant:
isBIM Limited

Sustainable Consultant:
ARUP

MEP Engineer:
P&T (M&E) Limited

Structural Engineer:
Stephen Cheng Consulting
Engineers Limited

Quantity Surveyor:
WT Partnership (HK) Limited



Image courtesy of Henderson Land Development Company Limited

Even once substructure works had commenced for an office tower at 14-30 King Wah Road, North Point, Hong Kong, Henderson Land Development Company aimed to enhance the superstructure. The design changes were to maximise sea views, boost building performance, and reduce the building's carbon footprint.

“It's a really grand site, with wide open sea views,” says Kevin Ng, Senior Deputy General Manager, Project Management (2)



Image courtesy of Henderson Land Development Company Limited

Department, Henderson Land. “Yet the best view – to Central – is also the worst for heat gain. We asked: ‘How to correct this?’” The solution would involve shading, and changing the building façade a little so it will have a curved façade. “We want it to look iconic, as it’s next to the harbour front,” added Mr Ng. The Design Team opted to use BIM for the changes, as it would enable faster decision making. Henderson Land had begun using BIM since the World Financial Centre (WFC) at Beijing in the late 2000’s, initially testing some of its capabilities, and since taking further steps to make better use of available technologies. “The world is changing, and customers expectations are rising higher and higher,” says Mr Ng. “Our management supports use of BIM, as it helps achieve better quality.”

Realistic picture

As typical with BIM, the Design Team employed the 3D model to carry out spatial coordination between structural design,

building services and green features. The Design Architect, Pelli Clarke Pelli Architects, led by founder Cesar Pelli, was among Project Team members who were generally well-versed with BIM, and was impressed to see the design realised in a virtual environment.

The BIM model became the common platform for communications, facilitating information sharing and corporate level collaboration among the various disciplines involved in the project. For Henderson Land, one of the key benefits of the 3D model in residential projects was that it gave a realistic picture of the size of apartments, with the key building components truly reflected, whilst previously this would have been judged by educated guesses based on 2D drawings. Accurate information relating to the building plan for residential properties under presales has become especially important, as they are required by the recently introduced Residential Properties (First-hand Sales) Ordinance.

But BIM can do more than simply deal with static 3D models.

Beyond 3D

“We talked about using 4D BIM, with the time dimension,” says Mr Ng. “Then 5D, adding a cost element. Someone asked: ‘Why don’t we make one step further and try 6D, with quality as well?’ After all, ‘time, cost and quality’ are the three main pillars for project management. Nevertheless, it is difficult to quantify quality which is thought to be subjective, but the Sustainability and BIM Consultants said we could try, using KPIs – Key Performance Indicators.”

A 4D BIM model will be incorporated into the tender for construction. The time element will help to visualise the sequence of work, and reshuffle the site logistics if required.

“We’ll be able to see what’s in the critical path, as the model will allow virtual construction,” says Mr Ng. “The Main Contractor may put the tower cranes, hoists etc in the model, and other temporary construction facilities to reflect the reality during the construction stage. They can decide which part of the work should go first, and which could be delayed. We are trying to make quicker decisions on changes – improving change management.”

Usually, quantities are discussed in terms of “trades”. For instance, assessing the cost of a column may involve three trade quantities: formwork, concrete, and steel reinforcement. However, Mr Ng says these can be combined in a BIM model, providing a result in terms of “elements” that’s easier to use, as figures are more readily understood. With BIM, designers can change an element and immediately see



Image courtesy of Henderson Land Development Company Limited



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data on its size change and the impact on cost.

“Cost is a key consideration for us,” says Mr Ng. “BIM makes it easy to do before and after comparisons. While we can still coordinate by 2D drawings, BIM is a catalyst to speed things up. I think it’s good management if you can make a decision at the right juncture – it helps everybody.”

Helping make quality-based design decisions

The KPIs for quality in the 6D BIM models were employed for comparing design options. They included time and cost, and helped the Project Team with decisions such as opting for Y-shaped columns rather than straight columns in the King Wah Road Office development,

and choosing a glass wall instead of a tension truss in the main lobby.

The 6D models proved most important for helping determine how best to minimise solar penetration whilst maximising views. “We created models with and without shading fins, and visualized the differences,” says Mr Ng. With the help of BIM, the team designed a solar responsive façade; the fins are just above room windows, and tilted downwards a little so they provide shade whilst views remain expansive.

“The whole team is excited about this,” says Mr Ng. “We can use the sustainability concept to shape the building. This was presented to and accepted by the Building Authority after a lengthy presentation, adopting a scientific approach.”



Image courtesy of Henderson Land Development Company Limited

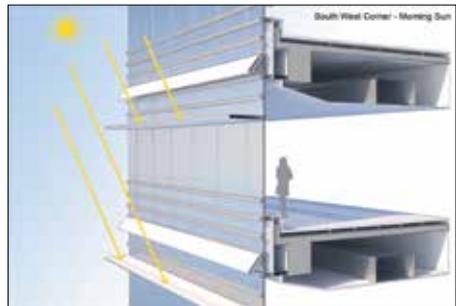


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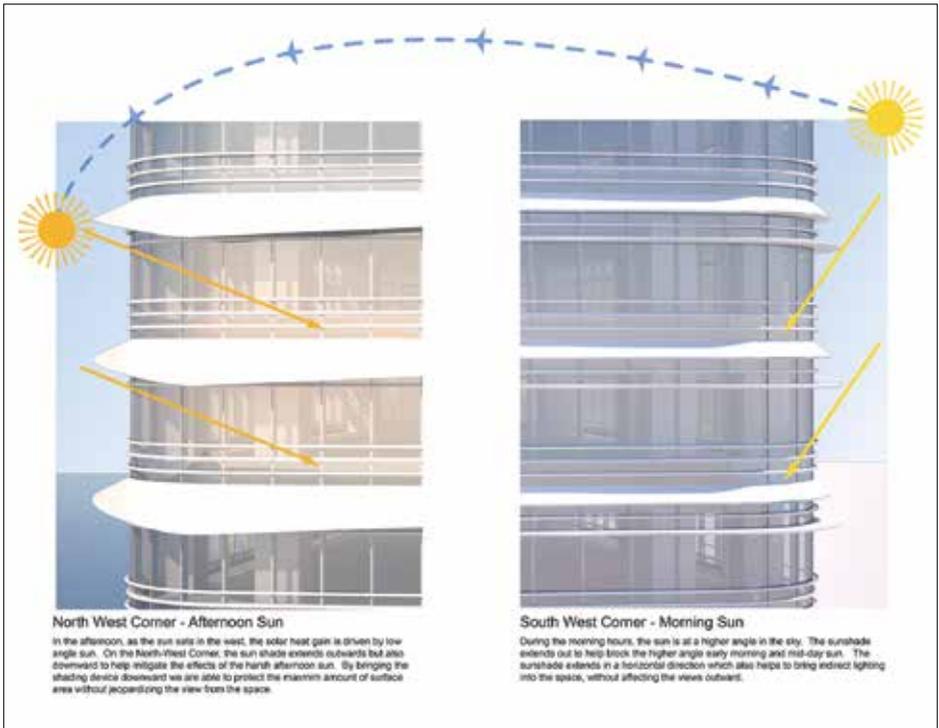


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The Henderson Land project management team is still testing such pioneering deployments of BIM, and hopes to gain more experience with models beyond 3D, using them in other projects.

Like a round table that helps with innovation

“BIM is not a conventional hierarchical system,” observes Mr Ng. “Everyone has the same message platform – it’s like a round table. BIM can help with innovation; we can explore new ideas collaboratively.”

14-30 King Wah Road is scheduled for completion by the end of 2016. Henderson Land aims for the Main Contractor to take on

and further develop the BIM model, which can then be given to the Facilities Manager for post-completion operations.

“Our task is to make things simple,” says Mr Ng. “The Facilities Manager can have an as-built BIM model, including machinery and building services.” This can prove user-friendly in various ways, such as clearly showing when items like fluorescent tubes should be replaced or when filters be cleaned for preventive maintenance.

Mr Ng envisages the facilities management technicians will find the BIM model simplifies and modernises their daily work in another way: “They’ll just need an iPad, rather than a pile of drawings.”



恒基兆業地產集團
HENDERSON LAND GROUP



Image courtesy of Henderson Land Development Company Limited

About Henderson Land Group

Listed in Hong Kong since 1981, Henderson Land is a leading property developer with businesses in Hong Kong and throughout mainland China.

We create award-winning high quality new homes and commercial developments, ranging from city landmarks such as the International Finance Centre complex in Hong Kong and World Financial Centre in Beijing, to exceptional residential properties such as 39 Conduit Road, Grand Promenade, The Beverly Hills, The Gloucester and Double Cove.

In addition to our core businesses of property development and property investment, Henderson Land also holds strategic investments in a listed subsidiary, Henderson Investment Limited, and 3 listed associates, including The Hong Kong and China Gas Company Limited (which in turn has equity stakes in a listed subsidiary, Towngas China Company Limited), Hong Kong Ferry (Holdings) Company Limited, and Miramar Hotel and Investment Company, Limited. This portfolio provides significant shared synergies.

Founded in 1976 by its current Chairman, Dr. The Honourable Lee Shau Kee, GBM, Henderson Land is one of the largest business entities in Hong Kong, employing approximately 8,300

staff. We have the largest agricultural land holding among all property developers in Hong Kong and an extensive land bank in mainland China.

The vision and values of Dr. Lee, an innovator and industry veteran, continue to drive our operations today. Our aim is to add value for our shareholders, customers and the community through a commitment to excellence in product quality and service delivery as well as a continuous focus on sustainability and the environment.

Our projects are the result of close collaboration with some of the world's foremost architects and professionals to ensure we deliver contemporary designs that are appropriate to their context. Our operations are vertically integrated, enabling the design, development, construction and management of all projects in a very efficient and consistent manner.

As we continue to build our business concurrently in Hong Kong and mainland China, we will introduce further iconic commercial and residential development projects, utilizing the same mix of innovative designs, high quality construction and property management and community commitment that have helped us to earn a solid reputation to-date.