



Artist's impression – City of Dreams

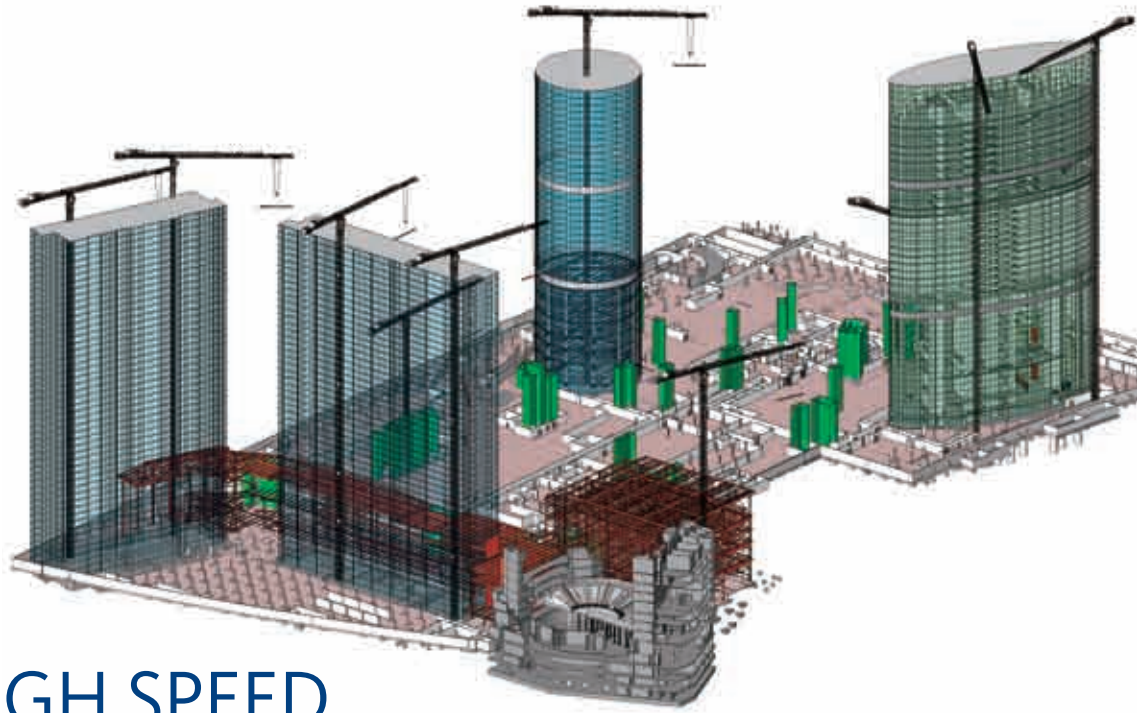


Melco Crown Entertainment
新濠博亞娛樂

“ Without a platform like BIM, it would be very difficult to coordinate everything – we needed to pull designs together, check whether there are any conflicts and resolve problems before construction commences.

The BIM model saved a lot of time in construction and in return, money is saved in overhead. ”

Ir. Samuel Lo, Senior Project Manager (Coordination),
Melco Crown Entertainment



HIGH SPEED, COMPLEX CONSTRUCTION

Project: City of Dreams

Location: Cotai, Macau

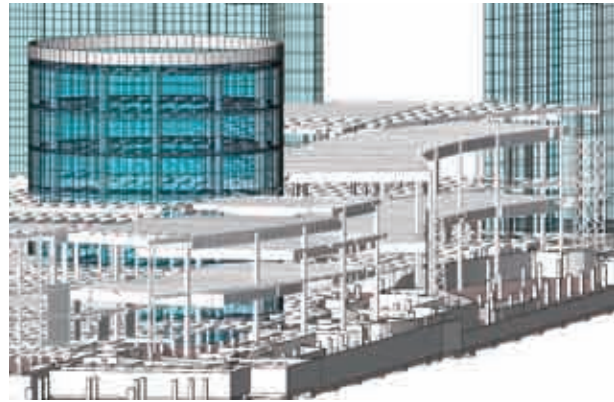
Type: Entertainment Resort

Scheduled for completion:

First phase in first half of 2009

Even among the new structures that have been built in Macau in recent years, City of Dreams that is taking shape in Cotai is decidedly ambitious. Blending a grand podium with four hotel towers and an apartment hotel building, it is being built at high speed, by an experienced project team including an array of contractors.

From the beginning, Autodesk Revit has been used for the project. "Without a platform like BIM, it would be very difficult to coordinate everything - we needed to pull designs together, check whether there are any conflicts and resolve problems before construction commences," says Senior Project Manager (Coordination) for Melco Crown Entertainment, Ir. Samuel Lo.



An Integrated Resort

City of Dreams will be a must-see integrated urban entertainment resort that will combine electrifying entertainment, stylish nightclubs, an amazing array of accommodation options, numerous restaurants, world-class shopping as well as a 420,000 square-foot casino. The different styles of accommodation include Crown Towers Hotel, Hard Rock Hotel, the Grand Hyatt's twin towers and the apartment hotel complex, which, in aggregate, will deliver a diverse mix of approximately 2,200 guest rooms, suites and villas.

All the hotels would rise from – and would closely interconnect with – a multi-storey podium that would hold the casino, together with a dome-shaped iconic attraction, and containing a theatre centred on a large pool of water. Unusually for Macau, plans called for the podium to be built from steelwork – enabling cleaner and faster construction than reinforced concrete.

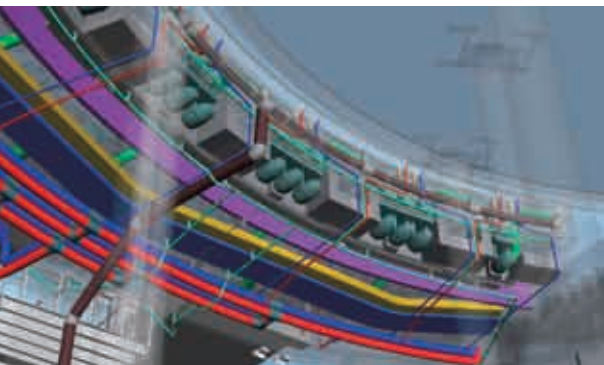
With specialist teams called in for project components such as the theatre, the casino, and each of the hotels, as well as for structural elements such as extensive steelwork, City of Dreams was to employ almost enough consultants and contractors for a small city: to date, over 250 contractors of different trades

have been involved in the project. Plus, while some consultants and architects worked in Macau, others were based in Hong Kong, Australia, Europe, and Las Vegas in the US.

Adding to the challenges for the project team: design work began in 2006, construction commenced in September that year, and already construction of the first phase is in the final phase, with attractions scheduled to open in the first half of 2009.

BIM Essential for coordinating designs and finding problems

The Construction Management Contractor drove the use of BIM with City of Dreams – partly as they viewed it as essential for coordinating designs and finding problems, and so helping smooth construction work, to meet the fast track construction schedule. “The Construction Management Contractor had to be proactive,” Ir. Lo says. “To pull the project together was not easy – there was a need to put information into the model, so we could look, discuss problems, and respond to our designers.”



Podium façade potentially tough without BIM

Much of the podium has a glass façade, which proved among the more challenging aspects of the project, requiring detail in the BIM model. “The façade is three dimensional, with a lot of structural elements,” says Ir. Lo. “It’s shaped like the bow of a ship – and without a good BIM system, it would not be easy to resolve all the conflicts.” With flat glass panels used to build the curving façade, there were stringent demands for tolerances with the steelwork. Conflicts were identified and resolved in the BIM model, greatly easing construction of the façade.

Varying details into BIM model

“We chose to use Autodesk for BIM because of technical resources,” says K C Chan, Manager (CAD) of Melco Crown Entertainment. “We had the right CAD specialities. Without the right technical resources, no matter how good the software is, you can’t use it.”

Mr Chan also explains that BIM was required as the project components are too closely integrated to allow a modular approach. Plus, rather than inputting everything into the BIM model, the design and construction management teams decided to limit the information in the model, so there would be just enough for it to be really useful. The more complex part of the project was, the more details were input to the model.

Off to a flying start

The BIM model was also important in helping get construction off to a flying start. “We wanted to order the structural steel for the podium (material delivery is normally a long lead time) and have it cut to size, and then start piling, and start construction,” says Ir. Lo. With the BIM model, sizes of steelwork were ordered after the BIM model was used to check there would be no conflicts, including with service pipes and ducts that had to pass through the steelwork.

When there were design changes, the model was used to see if there were any conflicts.

No conflicts for cranes

“We also used the BIM model for temporary works and temporary construction planning,” says Ir. Lo. “We showed hotel blocks, together with locations of hoists and cranes. Using these, we could work out which area was not covered by a tower crane, and the best possible locations for hoists for loading and unloading goods. We also planned vehicle access to hoists, ensuring there was enough headroom, and turning circles were adequate.”

Using the model, the project team assessed whether there were potential conflicts with tower cranes, and made adjustments to plans in order to resolve potential problems. “So far, there have been no such incidents,” says Ir. Lo.

Visualising construction

The BIM model helped with visualising progress with construction works. This was a boon with senior management staff instead of viewing all the diagrams and plans, typical of construction projects. Senior management teams also viewed the BIM model on portable PCs or via projectors. “They love to see this rather than all these drawings,” says Ir. Lo.

Minimal requests for information

During construction, the BIM model has allowed site verification of drawings issued “for construction” in a timely manner, and production of “as constructed records” for the design team. Requests for information – from contractors finding potential errors or clarifications in designs – have been minimised.

BIM model may produce as-built information

“We are now in the final stage of construction, and thinking to use the BIM model to produce all the as-built information,” says Ir. Lo. “It will be useful for future operators. For example, if there’s a need to change the use of a room – the operators can find information such as the headroom. For a large project like this, finding a drawing for a particular room is otherwise very hard. Also, the model can help with addition and alternation work, and with property management.”





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ABOUT MELCO CROWN ENTERTAINMENT LIMITED



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Melco Crown Entertainment Limited (“**MPEL**”), listed on Nasdaq, is a developer, owner and, through its sub-concession holding company, an operator of casino gaming and entertainment casino resort facilities in Macau. Its first property, Crown Macau (www.crown-macau.com), opened in 2007. Other development projects include City of Dreams, an integrated urban casino resort located in Cotai, Macau. MPEL's business also includes the Mocha Clubs (www.mochaclubs.com), which feature a total of approximately 1,100 gaming machines in seven locations and comprise the largest non-casino based operations of electronic gaming machines in Macau. MPEL has entered into an agreement, subject to certain conditions, to acquire a third development site on the Macau Peninsula. For more information about MPEL, please visit www.melco-crown.com.

MPEL has strong support from both of its major shareholders, Melco International Development Limited (“**Melco**”) and Crown Limited (“**Crown**”). Melco is a listed company on the Hong Kong Stock Exchange and is substantially owned and led by Mr. Lawrence Ho, who is Co-Chairman and the CEO of MPEL. Crown is a top-50 company listed on the Australian Stock Exchange and led by Executive Chairman James Packer, who is also Co-Chairman and a Director of MPEL.