

Autodesk®

Better by Design

**Autodesk Hong Kong
BIM Awards 2010**



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Acknowledgement

Sincere thanks to the six awarded organizations, Aedas Limited, Gammon Construction Limited, Hong Kong Housing Authority, The Luk Hoi Tong Co., Limited, MTR Corporation Limited and Scott Wilson Limited, in providing such valuable information and pictures of their projects. Besides, we are extremely grateful to the contribution of the AIAB committee and members, Mr. Marcin Klocek, Prof. Marc Aurel Schnabel, Ir. Ronan Collins, Mr. Elvis Li, Mr. David Fung and Ir. Francis Leung, who are profiled in this booklet.

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Preface

In 2002, Autodesk introduced the Building Information Modeling (BIM) concept to Hong Kong. BIM is an integrated process that allows architects, engineers, builders, owners and other design professionals to represent the building process digitally. It has gained widespread support ever since.

Autodesk has been enabling BIM to stay ahead of the trend by constantly updating and improving our innovative design interface over the years. Autodesk has developed the broadest portfolio of state-of-the-art software to help customers experience their ideas visually. In turn, BIM models representations of the actual parts and pieces being used to build a building and therefore bridges the gap between planning and production seamlessly.

More precisely, BIM helps you “get more of what you want and less of what you don’t”. It aids the prediction of building performance by visualizing the impact of design changes before building. This can minimize costly errors during construction and preview the materials required off site. As a result of that, the cost estimates for construction and operation can be calculated more accurately.

Besides, BIM helps create a more sustainable environment. How do we do that? With more accurate figures, waste can be minimized. Graphic plans are done electronically so a variety of models can be created. On the other hand, the changes made due to environmental concerns can be amended easily. Different factors can now be taken into considerations before the construction takes place. Newly added features in our software also promote energy-efficient building practices.



The Autodesk Hong Kong BIM Awards celebrate building industry professionals and educators in Hong Kong with extraordinary designs and concepts. Together with Autodesk, they are definitely one of the most important participants to kick start the transformation of the building and construction industry through the innovative BIM technology.

On behalf of the Autodesk team, I would like to congratulate all the award winning organizations and thank you all for supporting today's event. I am sure that all of you are excited to find out how the software can capture and fine tune our winners' design. Read on to find out more about how these companies make the most out of our BIM technology and start to explore what our products can do for you.

A handwritten signature in white ink, appearing to read 'Patrick Williams', with a long horizontal flourish extending to the right.

Patrick Williams

Senior Vice President, APAC, Autodesk

Preface



Renowned for its magnificent skyline, Hong Kong has always been crowned as one of the busiest cities in the world filled with magnificent skyscrapers. In recent years, Macau has also been catching up as new casinos, hotels and other tourist attractions are being built. I am excited to see the growing popularity of Building Information Modeling (BIM) in Hong Kong and Macau in many of the major building projects. In over 185 countries in the world, more than 10 million professionals are already using Autodesk products to save time and money, gain competitive advantage, and change the way ideas are brought to life.

BIM is the process of generating and managing building data by using three dimensional and dynamic computer models to better showcase their ideas and deliver these ideas faster while minimizing environmental impact in the building design and construction process. As one of the leading companies in the world with BIM technology, Autodesk enables users to visualize their projects before they are even built. This greatly increases the efficiency of communication and consistency between architects, engineers, construction professionals and facility owners.

In 2010, winners of the Autodesk HK BIM Awards have demonstrated how BIM can channel brilliant ideas into these world-class designs. BIM is one of the important contributing factors in raising productivity and lowering production costs to assist our clients to stay ahead of the business. Autodesk will continue to help architects, designers, engineers, manufacturers, and artists to enhance their designs by enabling them to experience their ideas virtually — as stated in this year's theme — Better By Design.

I wish to congratulate, once again, to all the winners of the awards: Aedas Limited, Gammon Construction Limited, Hong Kong Housing Authority, The Luk Hoi Tong Co., Limited, MTR Corporation Limited and Scott Wilson Limited. I am also grateful to contribution of all the supporting organizations: The American Institute of Architects Hong Kong Chapter, Chartered Institute of Architectural Technologists (Hong Kong Centre), The Chartered Institute of Building (Hong Kong), The Hong Kong Institute of Architects, The Hong Kong Institute of Building Information Modelling, Hong Kong Information Technology Joint Council. The success in implementing the Autodesk BIM software is not limited to the six winners of the awards. Experience by yourself and discover what BIM could possibly bring into your business!

A handwritten signature in black ink, appearing to read 'Wendy Lee', with a stylized flourish at the end.

Wendy Lee

Branch Manager, Hong Kong and Macau
Autodesk

Project:

Express Rail Link- West
Kowloon Terminus
Building

Location:

West Kowloon District,
Hong Kong

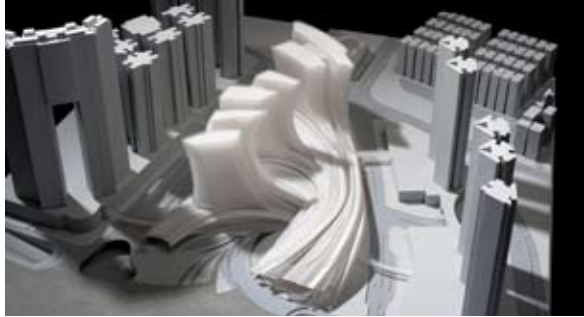
Type:

Railway/ Commercial

**Scheduled Time of
Completion:**

2015

With BIM Everything Possible



The state-of-art WKT entrance building design.

Linking up Hong Kong, Shenzhen and Guangzhou, the express rail (XRL) is going to shorten the journey time between Hong Kong and Guangzhou significantly from about 100 minutes to 48 minutes. As the southern terminus of the XRL and the only station in the Hong Kong section, the West Kowloon Terminus (WKT) will be the world's largest underground station at a depth of over 20m with a total of 9 long hauls, 6 shuttle platforms and 15 tracks. The two terminus entrances will be provided at various levels to match with adjacent developments. Its strategic location at the north of the West Kowloon Cultural District (WKCD), between the Airport Railway Kowloon Station on the West and the West Rail Austin Station (AUS) on the East had heightened the public and political attention to the project.

As the connection between Hong Kong and China becomes more and more lucid, it is obvious that the West Kowloon Terminus of the XRL will function as an important exchange gateway into China and Hong Kong. Andrew Bromberg, the chief designer of the project, has visualized West Kowloon Terminus (WKT) to function more like an international airport that channels large amount of population flow between Hong Kong and China rather than a regular station. The facility needs to have both customs and immigration controls for departing and arriving passengers. Contrasted to how immigration typically works in an international airport, what is highly unusual about this facility is that WKT will have immigration domain for both Hong Kong and China in the same facility.

An Unconventional Underground Station

While working on this 430,000 square meters facility, Bromberg designed with civic demand in mind. Traditional underground rail stations always give people the similar feeling of enclosure and being under the surface. The WKT, however, is different from any conventional underground train station. “I don’t want passengers to feel that they are underground when they arrive. They should feel like they are in Hong Kong when they get to the station,” said Bromberg. Making use of the BIM technology, significant space had been introduced inside the terminus design. That allows natural daylight into the interior as well as improves the way-finding for the passengers.



“Park in the sky” design concept.

Attention to the Detail: Improving the Flow of Traffic

The underground terminus composes of 4 floor levels which accommodates Customs facilities, Immigration and Quarantine (CIQ) facilities, underground track area and platforms, passenger arrival and departure halls, shops and loading facilities. To withstand a high volume of travelers, the Aedas team decided to put both HK and PRC immigration arrivals facilities on the same floor and all departure facilities on another.

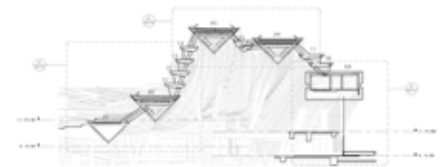
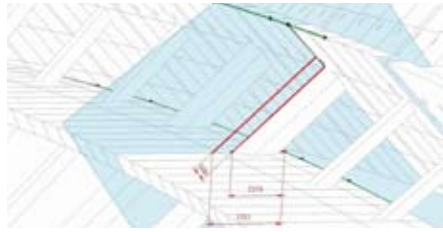
Outside, the pedestrian flow can access almost the entire roof top which is a vegetated sculpture garden. The idea behind that is to build “a park in the sky” where every user is entitled to the amazing harbor view of Hong Kong. All these magnificent design sketches are done via the BIM platform.

BIM Application in the Design

Renowned for his state-of-art curvilinear designs, Bromberg’s sensually shaped WKT building design has an extremely complex structure. With the complexity of the architectural design and a tight timeframe, Aedas turned to digital modelling. The modelling process was divided into a few different stages. This included conceptual modelling in Rhino, optimizing the cladding panels and glazing sizes by an external program, modelling in Revit and finally scheduling the cladding panels. Several methods and measures were incorporated to escalate the result in these five main stages.

i. Optimizing the Design

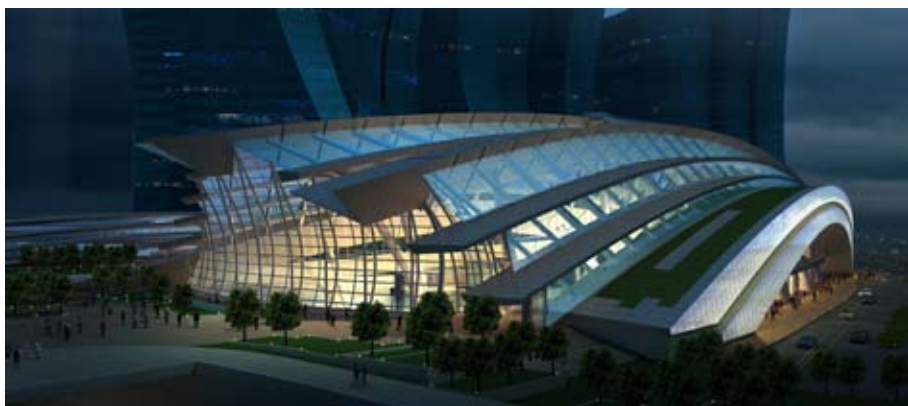
In the first stage, the architectural team from Aedas and structural teams from Buro Happold coordinated to create sets of



“Revit is a powerful and amazing product; it handles a vast database that is not seen in other software.”

geometrical rules to control the modelling of the roof elements. Geometrical rules were then applied to a Rhino model. From Rhino the cladding panels were exported as coordinates and optimized by an external, custom written program. The complex geometry of the roof was then transferred to Revit with help of Revit API interface so that the cladding panels could be calculated and placed precisely in virtual space.

For this purpose, a parametric family was developed to read the sizing and location information of every panel. After that, all the cladding panels were created in Revit automatically with accurate dimension and location. The time to recalculate the geometry of the roof and resize all the panels is reduced. “BIM makes things possible in an organic design”, said Marcin Klocek, the senior project manager of the WKT project. With curves running freely in space seen everywhere in the design, Revit made modelling the mega structure feasible. Curved splines could be divided into standardized pieces so the cost



“–A breakthrough project.”

of materials was lowered. The Architectural team could locate panels with cutouts as well as find out precise shapes of the cutouts by intersecting those panels with the steel and concrete structures coordinated with the Structural team. All these things would be virtually impossible without Revit. The project moved swiftly into the last stage, where tabular schedules of cladding panels were directly from Revit.

ii. Increasing Productivity

Aedas was no stranger to Autodesk Building Information Modelling technology. Bromberg's team had already started to employ BIM in their 2006 Dubai project. That included the 310m Ocean Heights One tower, the 460m Damac Heights and a 238m tower for Empire Holdings. BIM was helping to shape the Dubai skyline in one of the most dramatic urban transformations ever undertaken. But it wasn't until the WKT project that BIM was so extensively used. “The WKT project is definitely a breakthrough project”, said Bromberg. Drawings, images, schedules and coordination reports were produced directly from the BIM and dispatched to other parties.

The results showed that Autodesk Revit Architecture suite could increase productivity by up to 50 per cent, and also ensure that data remained accurate and reliable throughout the design phase of the projects.

iii. Improving Coordination and Reducing Waste

“We not only aimed to build beautifully, careful studies are done beforehand to assess the environmental impact,” said Sam Cho, the main parametric modeler of the project. Throughout the design process, 2D and 3D information were combined to reduce rework and double handling of design data. Coordination between different E&M sub-contractors was enhanced and the constructability issues were identified in advance to avoid abortive works, hence reducing construction waste. In the WKT's case, 30,000 panel types were cut down to 3,000 types with the help of BIM. This reduction was enormous. To Bromberg and his team members, sustainability has always been a part of their design, “it has never been a trend to me; a building should be designed to last in time.”

iv. Gaining Client's Satisfaction

Cutting down extra material not only benefited the environment, but also decreased cost significantly. The BIM helped to enhance a safer and neater construction site, while the quality of the final project was boosted at the same time. In addition to a decreased cost, a concise 4D construction simulation boosted the client's confidence. The Request for Information process (RFI) was greatly enhanced, conflicts and constructability issues could be resolved effortlessly.

Bromberg, Cho and Klocek all agreed that BIM has a huge potential to grow. Cho said, "I still remembered that 2D drawings were used in my first year at school and I am for sure seeing the changes in technology within the decade."

At the moment, a huge portion of industry had already started using 3D computer models and the trend has no sign of deterioration. As compared to Europe and the U.S., Bromberg thinks that Asia is moving at a much faster pace. Thus, he predicted a quick spread of BIM usage in Asia. "I wouldn't be surprised to see 1:1 3D digital model projected at the construction site in the coming future. BIM is for sure the way to go and it is bringing possibility to the next level", suggested Klocek, putting a nice conclusion to the future of BIM.



"BIM is taking things to the next level." said Klocek



ABOUT AEDAS LIMITED

Aedas was established in 2002 with the partnership of LPT Architects in Hong Kong and Abbey Holford Rowe in the UK to become Aedas LPT and Aedas AHR respectively. Following a merger with TCN Architects of Birmingham in 2003, the name Aedas was adopted for all areas of the practice with the LPT and AHR being dropped from the Hong Kong and UK practice names later in 2003. In 2006, Davis Brody Bond became owners in Aedas, it is an award-winning American architectural firm with headquarters in New York. In 2008, Aedas set up its new offices in Karachi with Aedas Ali Naqvi, and in Turin through a partnership with Marco Visconti, chief designer of a number of Fiat and Ferrari buildings in Italy.

The Aedas global network provides consultancy services in architecture, interior design, masterplanning, landscape, urban design and building consultancy in Asia, the Middle East, Europe and the Americas with over 38 offices around the globe. Aedas employs over 1,000 staff in the Asia region. Hong Kong is the largest centre in the Aedas Group and leads the practice's Asia offices. Aedas Asia is reputed for its masterplanning and mega-scale mixed-use designs, particularly in Singapore and the People's Republic of China. Their Hong Kong office have just celebrated the opening of the North Satellite Concourse of the HK International Airport while the rail teams are working on a number of new station designs with MTRC which includes the West Kowloon Terminus of the Express Rail Link.

Employing a skilled team of architects, urban planners, landscape designers and interior designers, Aedas provides international expertise with innate knowledge and understanding of local cultures. The Company has established a reputation for its cutting-edge designs in numerous market sectors including civic, cultural and community, commercial and mixed-use, residential, retail, education, hospitality and leisure, sports, technology and labs, transportation and healthcare. Their designers have a holistic approach to sustainability which shows our care not only for the built environment but also for the people they work with and the societies we live and work within.

Gammon Construction Limited

Project:

Redevelopment of
Hennessy Centre

Location:

Causeway Bay, Hong Kong

Type:

Commercial

**Scheduled Time of
Completion:**

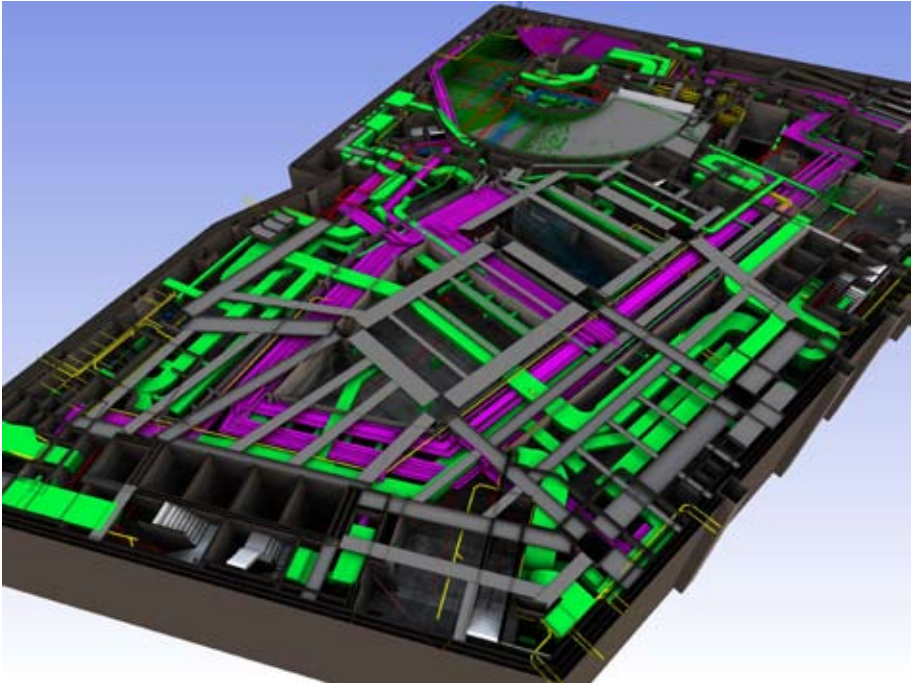
2012

Lean Practice – BIM Integrated Construction



The Hennessy Centre redevelopment project created with BIM.

In the Hennessy Centre redevelopment project, the Gammon team is constructing a 40-storey retail/office building comprising a concrete basement for retail stores and parking facilities, a retail podium and a 20-level steel Beam and Deck System Structure office tower. To coordinate between different disciplines under a tight timeline, the client, Hysan Development Company Limited, initiated the use of Building Information Modelling (BIM) for the project.



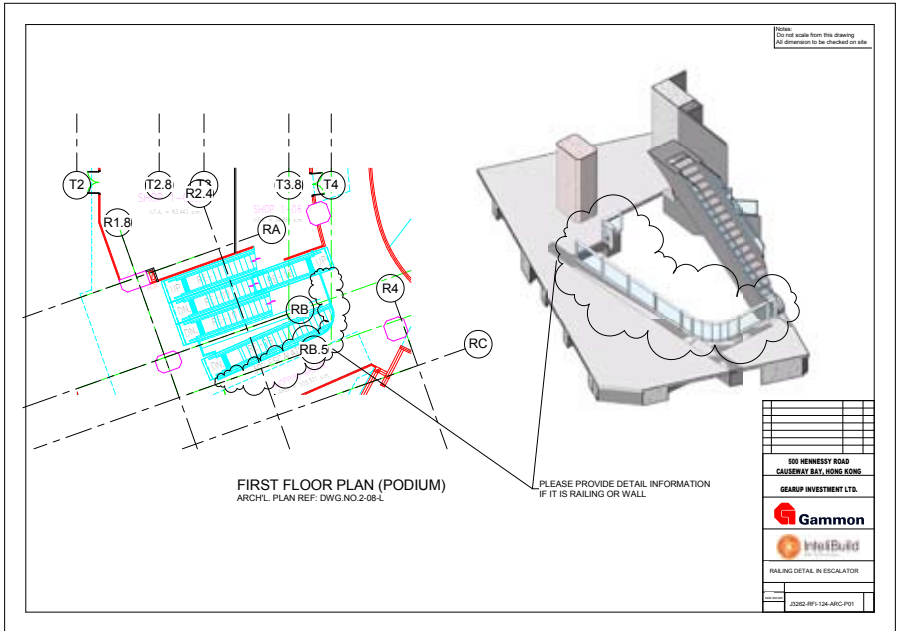
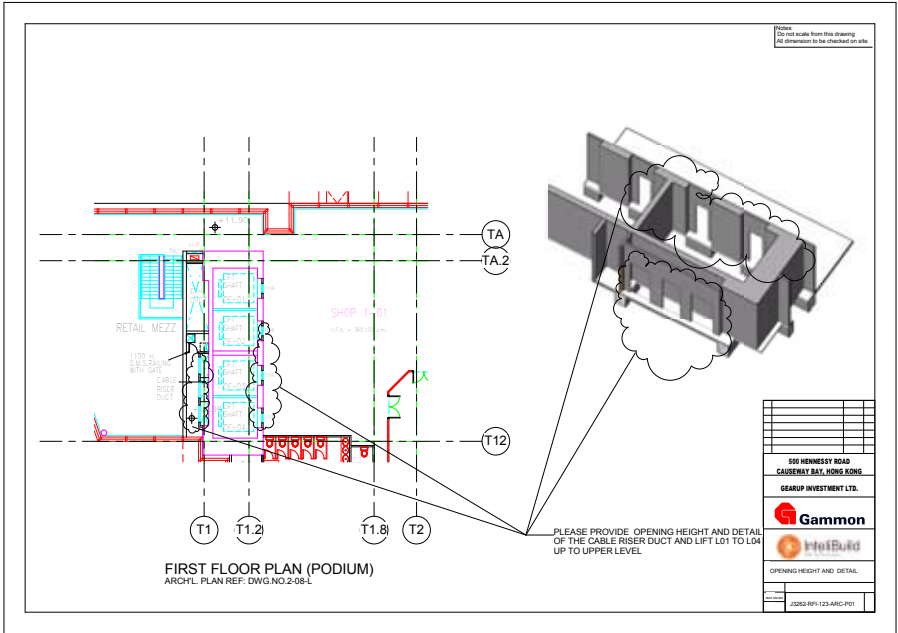
The base elements can be presented clearly with a 3D model.

Gaining the Client's Confidence

The client's confidence towards the safety planning for the main structure construction was gained through a virtual environment simulated with BIM. The project team used BIM to create drawings, images, schedules and coordination reports directly so that information could be dispatched to team members, business partners and the client without any need to transfer the data format among different software platforms. The BIM platform deployed in this project also allowed the team to filter out copyright related and sensitive information easily.

Ensuring a Safe Construction Site

"Safety is always placed as the topmost priority in our construction site." said Mr. Derek So, Director of Gammon. The importance to eliminate fatalities and injuries as well as possible risks is strongly emphasized in Gammon's construction environment. "BIM is one of our tools to achieve that goal," continued So. He also explained that the BIM model gave the construction workers an opportunity to preview and rehearse the construction method beforehand. Furthermore, the emergency evacuation drill could also be simulated virtually. This way the workers could better plan the workflow and



The podium floor plans.

ensure they could circulate in the site more safely and efficiently. With advanced planning on the prefabricated E&M modular systems and construction sequencing, a safer and neater construction site could be maintained.

Committing to a Sustainable Environment

Besides safety concerns, Gammon is also committed to build a quality living environment in a sustainable manner. "Even when we are not directly responsible for the design, we are still able to offer sustainable alternatives and to improve our own environmental performance with BIM." BIM software played a critical role in influencing design and construction planning work. BIM gave the team a virtual construction site within which they could manipulate to understand the impact and synergy of a broad variety of sustainable options. BIM was used to enhance the way the project team used materials, energy and other resources. For example, BIM can be used to visualize a complex construction sequence by a 4D simulation so that the team can identify and remove potential conflicts and hazards. In addition, BIM can also be used to measure the quantity of materials required and – by refining design strategies – reduce the usage of materials.

Gammon is likely to be the first major contractor in Hong Kong to use BIM technology in such a comprehensive scale. This Hennessy Centre redevelopment was not the first project where BIM was employed. BIM tool had demonstrated its capability in a number of key civil and building projects. The team believed that it is only a matter of time before all design work can be conducted in a

virtual environment. Gammon has targeted to implement BIM in most of the construction projects by 2012.

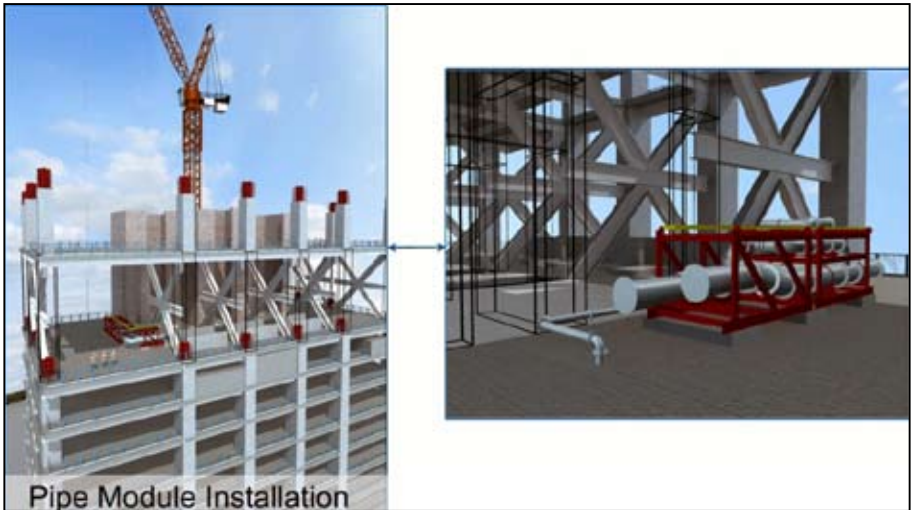
Enhancing the RFI Process

Request for Information (RFI) is a widely adopted procedure for design information communication between design team and construction team. With the introduction of BIM, the RFI process was speeded up through the expedite conduction of 3D workshop. As the BIM platform is compatible with traditional digital 2D drawing, re-working and double handling of design data were greatly reduced. Production process was enhanced as a result of good combination of RFI and BIM. Coordination between different E&M sub-contractors was hugely enhanced and the constructability issues were identified in advance to avoid abortive works. Design conflicts and constructability issues were quickly resolved because of the good coordination.

So believes that BIM technology, especially Revit, is becoming the dominating trend in the industry. He predicts that the BIM technology will become more and more mature in the coming decade. "Revit is definitely a user-friendly platform. With the accuracy that it provides, BIM will definitely be a part of our future projects. We look forward to the coming of more successful projects in the future." So added.

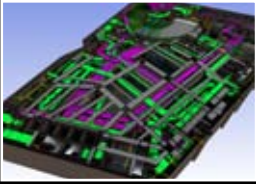


Pipe Rack Units



Pipe Module Installation

Detailed models are created in BIM to assist the building process.



ABOUT GAMMON

Gammon has been building a wide range of construction projects in Southeast Asia for over 50 years. With an annual turnover of more than US\$1billion, Gammon employs 3,000 full-time staff, giving them one of the strongest technical teams in Southeast Asia. They are a private company jointly owned by Jardine Matheson, an Asian-based conglomerate with extensive experience in the Region and Balfour Beatty, a world-class engineering, construction and services group. As stated in their slogan “with local presence, but global strength”, Gammon is the market leading construction contractor in Hong Kong, where they are headquartered, and also operate in China and Southeast Asia.

Gammon focuses on customers' needs by developing innovative and sustainable solutions and managing risk. Gammon aimed to work “with” rather than just “for” their customers and pride themselves on the imagination, skill and high standards that they applied to all the projects.

Hong Kong Housing Authority

Project:

Transforming Business Practice in the Delivery of Public Housing as evinced by the project Tung Tau Cottage East (TTCAE)

Location:

Hong Kong

Type:

Public Rental Housing Development

Scheduled Time of Completion:

2014-15

Transforming the Whole Delivery Practice



HA sets up infrastructure to drive BIM

Transforming Business Practice in the Delivery of Public Housing

There is a transformation of business practice within HA involving in-house staff as well as stakeholders in the building industry through the use of Building Information Modelling (BIM) in the delivery of public housing.

HA's vision is to implement BIM in all projects, having seen some fruits of success in enhancing design efficiency and cost-effectiveness as evinced by the project at Tung Tau Cottage Area East (TTCAE).



HA motivates external business partners to use BIM

To support the vision, HA has formed a dedicated BIM Service Team, comprising Architects, Structural Engineers, Building Services Engineers and technical officers. The Team provides BIM modelling services to all project teams, sets up Standards and Guidelines, carries out BIM related Research and Development works and develops in-house libraries. Also, the establishment of a BIM Centre with training facilities and 20 more sophisticated workstations has facilitated users' interaction. BIM users could discuss design using Smartboard and resolve design conflict instantaneously.

With committed efforts in the use of BIM, the business practice of the HA was revamped to bring forth the whole detailed design process. The benefits are evinced in the project TTCAE where a new culture of collaborative design has been successfully implemented.

HA believed that BIM required strong teamwork and partnership. A number of seminars were conducted to share their vision and experience with academia, services providers, consultants and contractors so that all members can get ready to work using BIM, while the academia could train our next generations to be "BIM-literate".



A successful BIM pioneer - Tung Tau Cottage Area East

The Tung Tau Cottage Area East (TTCAE) project

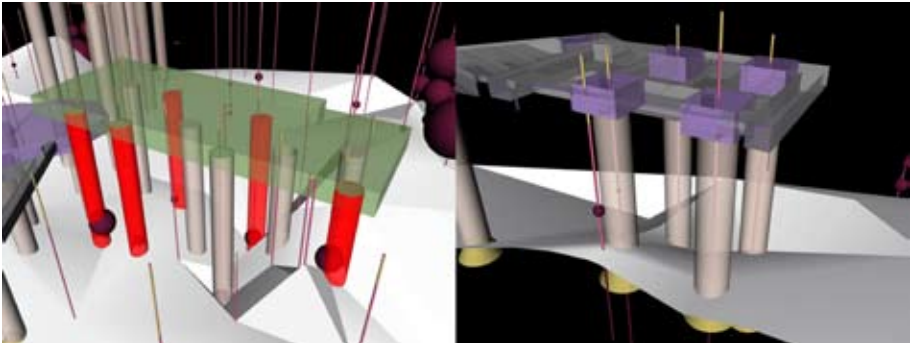
Tung Tau Cottage Area East (TTCAE) was among one of the projects that had been utilizing the BIM technology extensively. The technology was employed in feasibility study, scheme design and detailed design, and would be carried onto construction stage.

TTCAE comprises one 34-storey domestic building. It provides 990 flats, an open car-

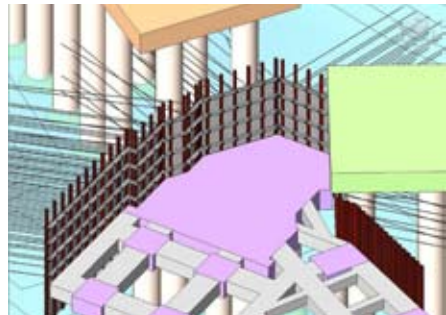
parking and an Estate Management Office, built on complex topography comprising three relatively small platforms with huge level differences requiring extensive site formation works.

i. Refining the Design Decision

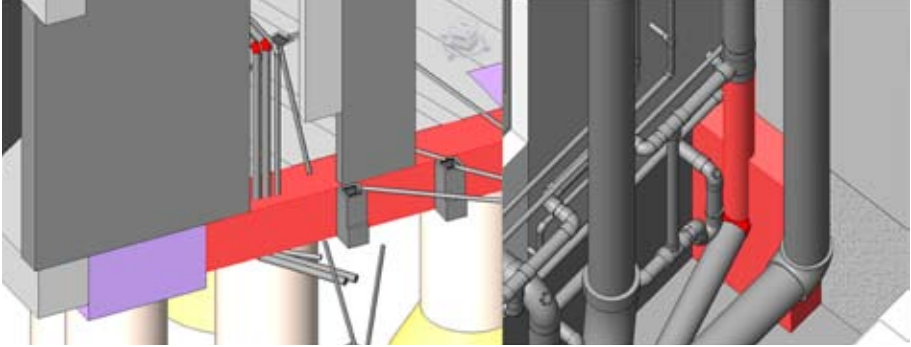
With BIM technology, the HA team was able to generate numerous design options in Revit so that they could select the best design solution.



One example is the use of 'dynamic sectioning' through the site which enabled engineers to visualize the site and the bedrock profiles more thoroughly and designed the most effective foundation system. The HA team carried out studies on various temporary lateral support options for the major excavation for pile cap construction with BIM models. The model helped them to check the viability of installing soil nails through congested pile group.



ii. Enhancing the Coordination between different systems



With BIM at design stage, architects and engineers could understand and resolve design issues without delay. Better co-ordination

eliminated design clashes between different building systems and optimized the design.

iii. Improving Constructability



A detailed 4D virtual construction simulation was created to plan the construction sequence more thoroughly. Not only for the main building, a 4D virtual construction simulation was also created for the site formation and foundation system to ensure that the workflow is accurately planned.

iv. Creating a More Sustainable Design

In TTCAE, the HA team analyzed the performance of different design options using BIM. One example was the making use of the site parametric model developed in Civil 3D to calculate the soil volume, while the team adjusted the site terrain levels, the software automatically calculate the cut and fill of the soil so that the engineers can minimize the soil remove from the site.

v. A Paradigm Shift of the Industry Practice

Before the emergence of BIM, each step of the building process is done sequentially and separately. Nowadays, architects and engineers can collaborate closely at the early feasibility stage with BIM models as common design idea exchange platform instead of sequential steps as observed in the traditional design process. Every project team members could visualize and resolve design issues promptly and comprehensively. As a result, BIM helped the project team to make decisions effectively, eliminate design clashes, co-ordinate better and shorten the drawing production time. Furthermore, they could avoid re-work on site, and thus reduce delay and construction waste during construction stage.

As a large government department, HA is gradually adapting to this new technology. Rather than applying it to a single project, the HA is introducing BIM as a standard to all other projects strategically. From hand drawings to AutoCAD and now 3D building information modelling, HA is moving forward as the technology advances. The construction industry is definitely facing another big shift. It's not just a change from hand drawings to electronic representations. BIM shifted the whole industry practice by pooling professional knowledge right from the start of the design process. In the near future, there will be stronger participation of various building stakeholders in BIM in Hong Kong. HA will continue to play an active role in advocating the use of BIM for a better design and a more efficient output.



ABOUT HONG KONG HOUSING AUTHORITY

The Hong Kong Housing Authority (HA) develops and implements a public housing programme which seeks to achieve the Government's policy objective of meeting the housing needs of people who cannot afford private rental housing. Approximately 30% of the Hong Kong population is now living in public rental housing units.

The HA plans, builds, manages and maintains different types of public housing, including rental housing estates, interim housing estates, and transit centres. In addition, the HA owns and operates some flatted factories and ancillary commercial and other non-domestic facilities.

The Housing Department (HD) acts as the executive arm of the HA to help the Government achieve its policy objective on public housing.

The Luk Hoi Tong Co., Limited

Office:

Proposed Office
Redevelopment of 31 Queen's Road Central

Location:

Central, Hong Kong

Type:

Commercial

Scheduled Time of Completion:

2011

A Design Dress Rehearsal Before Building



The exquisite exterior of the new building created in BIM.

Located in a highly visible and centrally located spot in Hong Kong, the LHT project team wished to create a more iconic building by remodelling the older office building. As a property developer, LHT has a strong interest in how BIM can improve and speed up the development process. BIM represents a revolutionary new way of working in the building industry that has the potential to improve the design and construction processes very significantly. To be able to use BIM effectively on the 31 Queen's Road Central project signifies the company is a participant in the forefront of this innovative process.

The Combination of the Ancient and the Advanced

Inspiration for the new building design is drawn from the site and its unique cinematic history and physical characteristics. Situated at a prominent corner next to the pedestrian Theatre Lane, the sculptural form of the building façade is derived from the metaphor of a theatre curtain opening to reveal the office and retail programs within. The openness and transparency of the building façade frames a new dynamic and engaging street environment for Theatre Lane. Main concerns included the complexity of the exterior curtain wall and complex roof system and the numerous site constraints imposed on their construction process in the constantly busy part of Central. To achieve this complex design, BIM technology comes in handy.

The team favoured Autodesk's software versatility and compatibility with different software platforms, in that most consultants that they worked with are familiar with the software. The design team from Rocco Design Architects Limited successfully executed the challenging design with the aid of BIM as a powerful visualization and design tool.

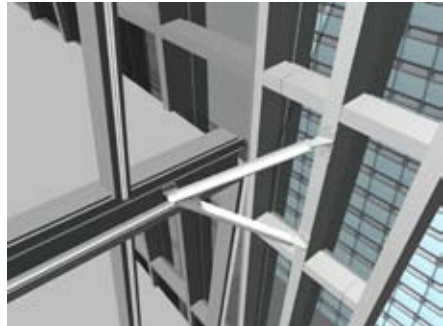
Visualization at an Early Stage

The project team was able to meet their very challenging timeline with the aid of AutoCAD, Autodesk Revit, Autodesk Navisworks. Because they were able to model and then visualize design proposals in a very realistic way quickly, the team in turn was able to modify and confirm their design decisions in a very fast manner. BIM allowed them to visualize, the design very realistically at an early stage so that they were able to evaluate and resolve problems and make design revisions early on.

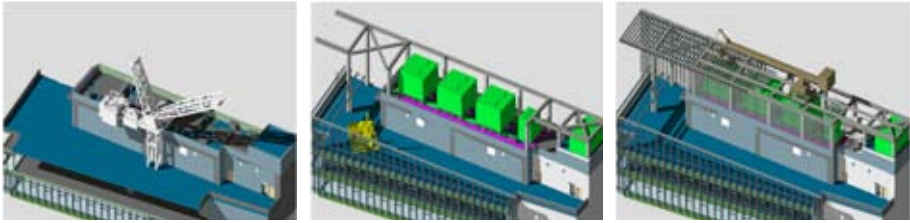
Throughout the design and construction process, the team had used BIM as an intense in-depth visualization tool. The key to its effectiveness was that it allowed them evaluate and analyze their product from multiple perspectives. They traditionally use a third person perspective to analyze building systems and details, but BIM also allowed them to easily use a first person perspective to



The curtain wall views from the inside.



Bracing details of the new building.



The construction sequence of the roof feature.

evaluate the experiential qualitative aspects of the building spaces. Overall BIM was able to improve and enhance their building design in the following areas:

i. Exterior Design of the Building

The team was able to visualize the exterior design in a very realistic surrounding context from multiple perspectives, allowing them to fine tune the aesthetics of the design based on their clear understanding of how the design would look and feel from different vantage points. The LHT team used BIM to study the sculptural nature of their curtain wall facing Theatre Lane and how it impacts the street environment. This is very different from the 3D images in the old days where they are just mere representations of the artists. With BIM, the project team recognized the images generated were accurate representation of the design and the same set of information is going to be used in the construction.

ii. Curtain Wall

The team created virtual mockups of the architectural details of their complex curtain wall design, which observed from the vantage point of both inside and outside the building, allowed them to analyze and refine the details' aesthetics and structural capacities. Ultimately, they made revisions to create more elegant and more structurally efficient curtain wall details. An example is a bracing

detail supporting a cantilevered portion of the curtain wall.

iii. Roof Design

BIM helped the team coordinated and combined the mechanical area of the design and construction sequencing of their complex roof design feature which is important to the aesthetics of the building, but at the same time had to incorporate the building's mechanical and building maintenance unit equipments. This was a very challenging task as they had many functional requirements that must be incorporated within various structural, spatial, and constructability limitations. BIM allowed their contractors to successfully coordinate the construction sequence of these structural and mechanical elements.

Resolving Design Conflict

Virtual overlay of their building's structural and M&E systems allowed them to detect conflicts and clashes at an early stage, so that the team was able to resolve these problems without delay, while as part of the same analytical process they were able to improve the overall mechanical layouts at each floor. As well, necessary adjustments were made early to avoid construction errors.

Our contractor used BIM as an analytical tool at the very beginning of the process to understand the design better, allowing

for more efficient construction sequencing, resulting in construction cost savings in time and materials. This helped to make sure the project can be completed on time according to the project schedule.

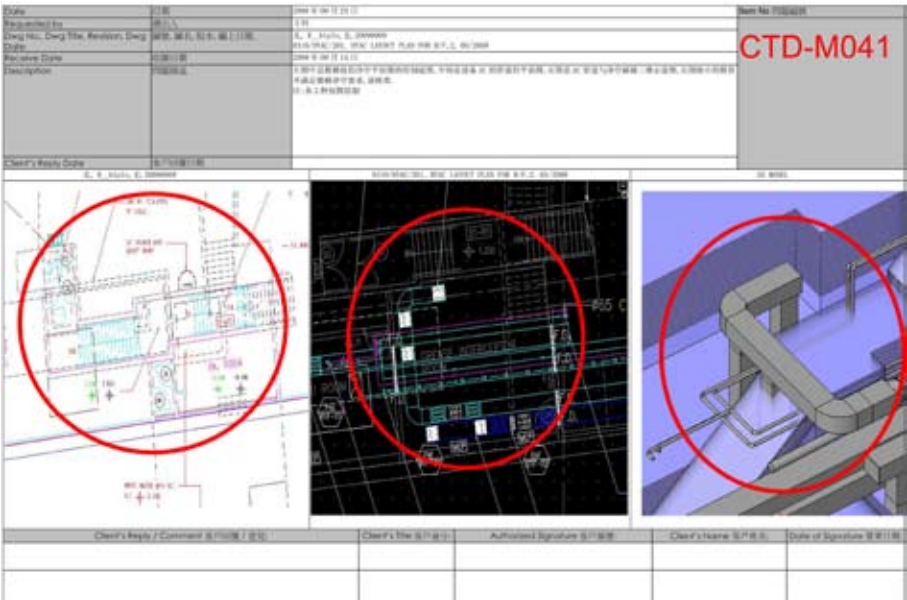
Refining Construction Details

This was the first time the LHT company has used BIM comprehensively. Our design teams have traditionally used AutoCAD for past projects. BIM software is a much more efficient and powerful design and documentation tool as compared to traditional 2D-based design and documentation tools such as AutoCAD. With BIM, the team can design, visualize, perform analyses, and generate documentation all in the same virtual environment. Conflict or clash detection can be performed quite automatically. Moreover, with its capability for accuracy and precision, BIM is a valuable design tool for the refinement of construction details.

By using BIM as an analytical tool, the team was able to study the architectural and M&E layouts of the building quite easily in 3D, allowing them to quickly evaluate and make design revisions that ultimately improved our building efficiency, thus yielding them higher building productivity. For example, one result was that they were able to improve the mechanical layout inside the ceiling spaces and generate higher headroom clearances for our building’s commercial lettable spaces.

Creating a More Sustainable Building at a Lower Construction Cost

BIM had helped the LHT contractors built in a more sustainable manner. They were able to estimate material quantities much more accurately. Thus, building materials could be saved. With better preparation for construction sequencing, contractors could plan to work more efficiently and save time, thus reducing the embodied energy associated





M&E and structural systems analysis.

with a typically longer construction timeline. This translates to savings in construction costs. Also, because the team could visualize the product at the early design stage, they could evaluate and make design changes early, to avoid costs involved with making design changes during or after construction.

In the future, LHT hopes that all parties can use BIM effectively. For example, for design consultants, the LHT thinks that it would be in the client's best interest if the design consultants can spend more time working on design issues and improving the quality of a design product rather than on dealing with documentation coordination, drawing management, and conflict detection. BIM takes care of all these things to allow the designers to focus on design. Cities like Hong Kong are perfect settings for the application of BIM, because of its density and limited space which creates a lot of complexity and restrictions for the development process. BIM is a comprehensive tool that can help developers and designers visualize and understand the nature of this complexity in a quick and clear manner. Darrell Chan, an Executive Director

of LHT further commented that, "Overall the design process was truly enhanced by our ability to experience numerous realistic virtual mockups. In this sense, much like a director of a theatrical production, the design team had the benefit of a true Design Dress Rehearsal for our project at Theatre Lane."



ABOUT THE LUK HOI TONG CO., LIMITED

The Luk Hoi Tong Co., Ltd. (LHT) is a privately owned development company in Hong Kong founded in 1926. LHT has over the years developed various residential and commercial properties throughout the Hong Kong Region. The company currently holds a property portfolio that includes retail and commercial office properties such as the one being developed at 31 Queen's Road Central.

At 31 Queen's Road Central, the company had operated the historic Queen's Theatre for over 80 years prior to the site's redevelopment in 2008. The new development will be a premium mixed-use commercial building. LHT is strongly committed to high-quality sustainable development and the continual betterment of urban settings that surround its building projects.

In addition, the company also currently operates the Luk Kwok Hotel in Wanchai, the Nathan Hotel on Nathan Road in Kowloon, and the Dragon Inn Seafood Restaurant in the New Territories.

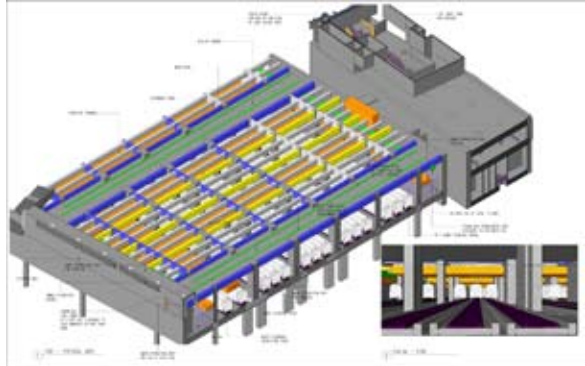
MTR Corporation Limited

Project:
Shatin to Central Link,
Preliminary Design

Location:
Shatin to Central,
Hong Kong

Type:
Railway/ Infrastructure

Standardization Using BIM

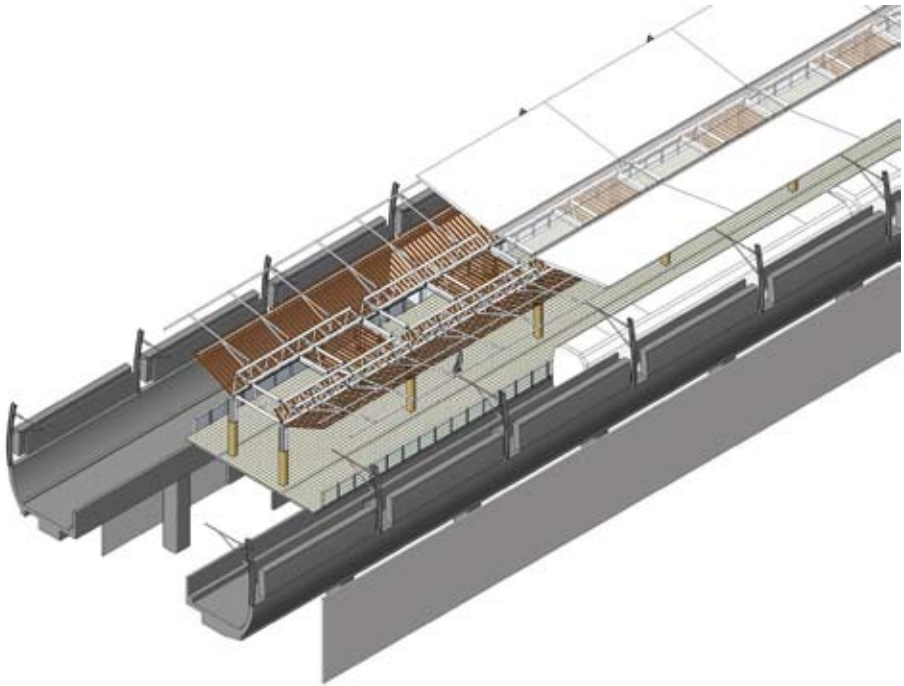


Different components are well-coordinated in the stabling sidings.

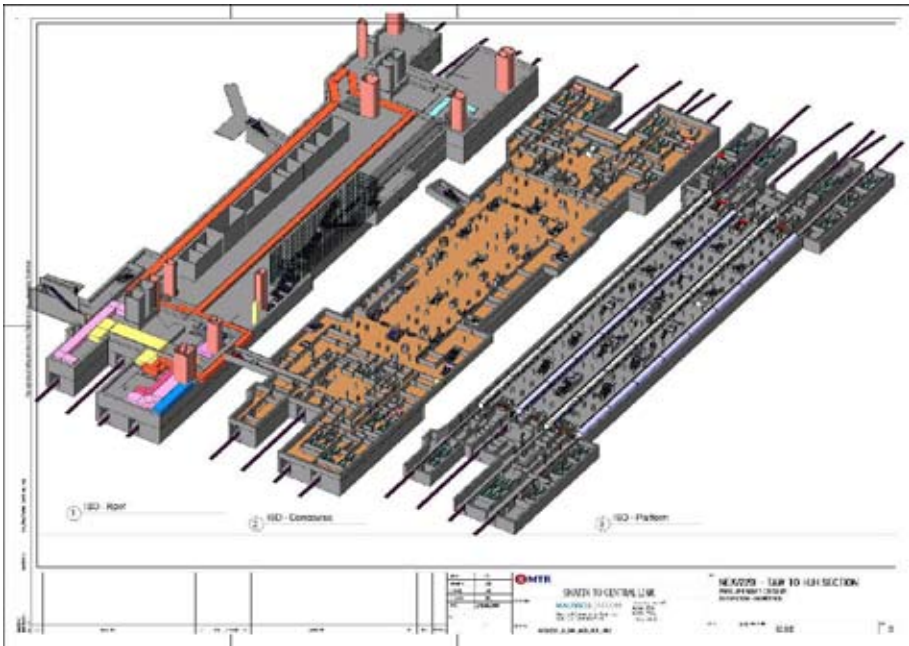
The preliminary design of the Shatin to Central Link (SCL) involves the design of different underground and above ground stations and a stabling sidings. Each of which comes with different design options. The MTR Corporation design team made good use of BIM technology to assist in the design of such a large-scale project.

The MTR Corporation Limited welcomes the Government's decision for the Corporation to proceed with further planning and design for the Shatin to Central Link. The 17-km Shatin to Central Link will have two components. Firstly, the section from Tai Wai to Hung Hom is an 11-km extension of the Ma On Shan Line. It will extend from Tai Wai Station, through new stations at Hin Keng, Diamond Hill, Kai Tak, To Kwa Wan, Ma Tau Wai, Ho Man Tin connecting to the West Rail Line at the Hung Hom Station to form the east-west rail corridor. Secondly, the cross harbour section, a 6-km extension

from the Hung Hom Station of the East Rail Line, will be extended across the harbour to the new stations at the Exhibition and Admiralty and form the north-south corridor. This rail line will benefit not only the residents in the areas along the alignments, they will also add on to the existing network providing more convenient rail services to the people of Hong Kong.



The components can be standardized in BIM.



Working drawings created directly from BIM

Simplifying Complex Procedures

Building a new rail line is never an easy task. With every new station, the MTR Corporation needs to balance between engineering design, public demand as well as environmental impact. “With a total of 10 stations in our new line, the BIM system helped us produce consistent layouts with same levels of details in a timely manner,” said Jason Wong, the Design Manager of the project. He added, “We used BIM in project scheduling, preliminary design, drawings productions and it also helps to interface with Civil Engineering information.” BIM

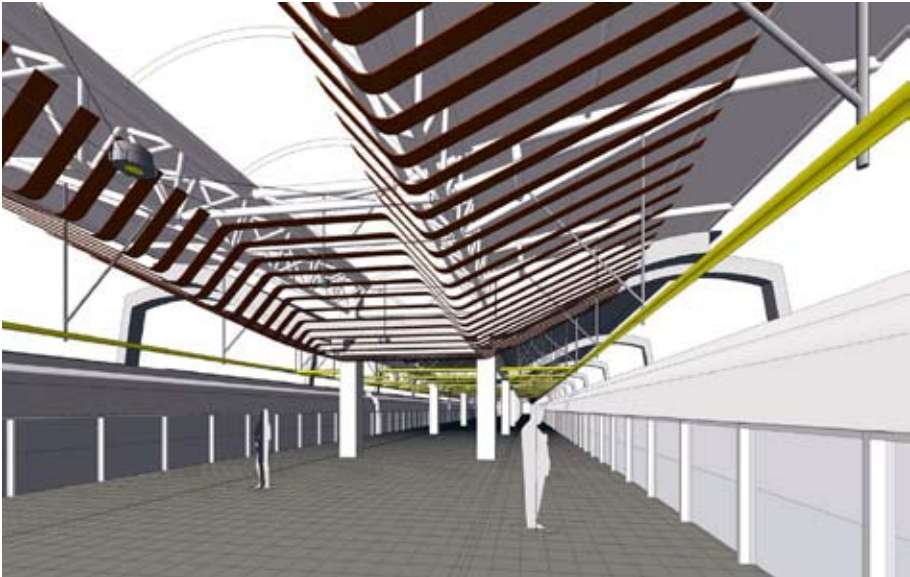
improved the communication between different design disciplines by providing accurate information and 3D model so that different designers can coordinate better. Moreover, the ability to coordinate between 2D information and 3D information is particularly useful for coordinating services such as the complex ducting system within the ceiling voids of the stations.

Standardizing the Components

During the preliminary design stage, the design team needed to study different design options for the new railway stations. Since there are 10 stations being designed at the same time, multiple BIM models were used to represent the design of each station. To maintain good communication and the same level of details, the design team had developed object libraries, a collection of architectural and mechanical components. These object libraries were shared among different stations' design teams. This ensured the consistency of the stations and at the same time helped to maintain design quality.

Improving Design Quality and Presentation Style

Design options could also be obtained in the same BIM model effectively. 2D and 3D presentation drawings were produced quickly and with similar presentation style. Further, information was well coordinated within the BIM model. Therefore, project team could test out more design possibilities within the same amount of time. Since drawing conventions such as line weight, annotation style, level of detail could be pre-set in BIM; the setting could be transferred and shared instantaneously among different design teams. Therefore, the project team could produce drawings for different stations with same quality in a much shorter time.

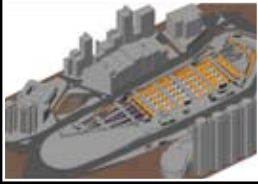


A more energy-efficient design.

Optimizing Environmental Conservation

Besides a better presentation, a good design also includes minimizing the harm to the environment. In the SCL, close attention was paid to minimize the harm to the surroundings as early as in the design stage. Hin Keng Station is a good example to illustrate the point. Hin Keng Station is going to be built above ground, thus the project team made use of the solar analysis feature in Revit to simulate how direct sunlight casted onto the station. That helps to design sun shading devices and to achieve energy efficiency.

As a growing number of projects are making use of the BIM technology, MTR is setting up a BIM standard as a guideline for future projects. Wong added, “We think that BIM usage is becoming more and more prevalent, currently we are not only using in the design stage but also in the station operation and maintenance; we will definitely see more of its application in the near future.”



ABOUT MTR CORPORATION LIMITED

Carrying an average of 3.9 million passengers every weekday, the MTR is regarded as one of the world's leading railways for safety, reliability, customer service and cost efficiency.

The MTR Corporation was established in 1975 as the Mass Transit Railway Corporation with a mission to construct and operate, under prudent commercial principles, an urban metro system to help meet Hong Kong's public transport requirements. The Company was re-established as the MTR Corporation Limited in 2000 after the Hong Kong SAR Government sold 23% of its issued share capital to private investors in an Initial Public Offering. MTR Corporation shares were listed on the Stock Exchange of Hong Kong on 5 October 2000. It marked another major milestone on 2 December 2007 when the operations of the other Government-owned rail operator, the Kowloon-Canton Railway Corporation, were merged with the MTR Corporation, heralding a new era in the Hong Kong railway development.

The merged rail network comprises nine railway lines serving Hong Kong Island, Kowloon and the New Territories. In addition, a Light Rail network serves the local communities of Tuen Mun and Yuen Long in the New Territories while a fleet of buses provide convenient feeder services.

The Corporation also operates the Airport Express, a dedicated high-speed link providing the fastest connections to Hong Kong International Airport and the city's newest exhibition and conference centre, AsiaWorld-Expo.

Scott Wilson Limited

Project:

Kai Tak Nullah Improvement Works at Prince Edward Road East

Location:

Hong Kong

Type:

Urban Drainage

Scheduled Time of Completion:

2012

Design Smarter and Faster with BIM



Construction of the culvert under Prince Edward Road East.

The Kai Tai Nullah is a watercourse starts from the south of Diamond Hill, winds through the existing urban districts of Wong Tai Sin, San Po Kong and Kowloon City, and then runs straight through the former Kai Tak Airport before discharging into Kai Tak Approach Channel. The primary role of the nullah is for flood protection purpose in Eastern Kowloon serving Wong Tai Sin, Diamond Hill, Lok Fu, San Po Kong, Kowloon City and part of new Kai Tak Development Area. However, flood events in recent years indicated that the drainage capacity of certain sections of the nullah is not adequate to meet the current flood protection standard. Thus, the flood relief functions of the nullah must be improved.

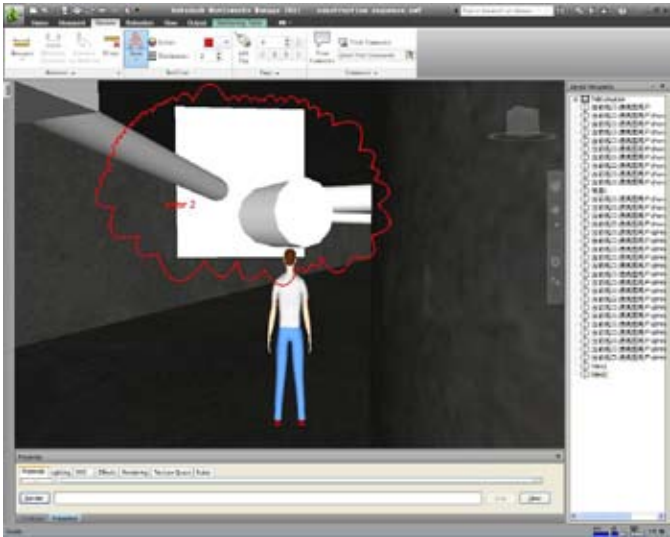
Scott Wilson was commissioned by Drainage Services Department to design solutions that would enhance the nullah's performance to minimize flood risk, extend its service life, and to provide landscape/amenity area for public use. As part of the assignment, Scott Wilson is designing the box culvert below Prince Edward Road East (PERE). Scott Wilson is using BIM technology for box culvert design, utility diversion planning and presentation of construction sequence. The same technology will be applied to the design of the remaining 600m of the nullah upstream to be implemented at a later stage.

The site is in a congested area of Kowloon with a health centre, schools, urban infrastructure and heavily-trafficked roads. In addition, there is also an existing nullah with a decked section underneath the road. Underground utilities and bridge foundations add to the

complexity of the project. To tackle the problem, Scott Wilson used BIM software to build a 3D information model to show the complex connections of the above-ground and underground networks. With BIM, the site context was clarified and site constraints were better understood which helped Scott Wilson to optimise the placement of the box culvert and utility diversion.

Using BIM for Real-Time Navigation

Traditionally, thousands of 2D technical drawings are produced for a complicated project. These 2D drawings demand expert knowledge and analytical skills to decode and the images can be difficult to understand. "After switching to the BIM model, our project team could visually experience the design and influence it in a more intuitive way", said the Scott Wilson Project Engineer, Wei Qi Jin.



Autodesk Navisworks delivered 3D coordination, 4D planning, photorealistic visualization, dynamic simulation and accurate analysis.

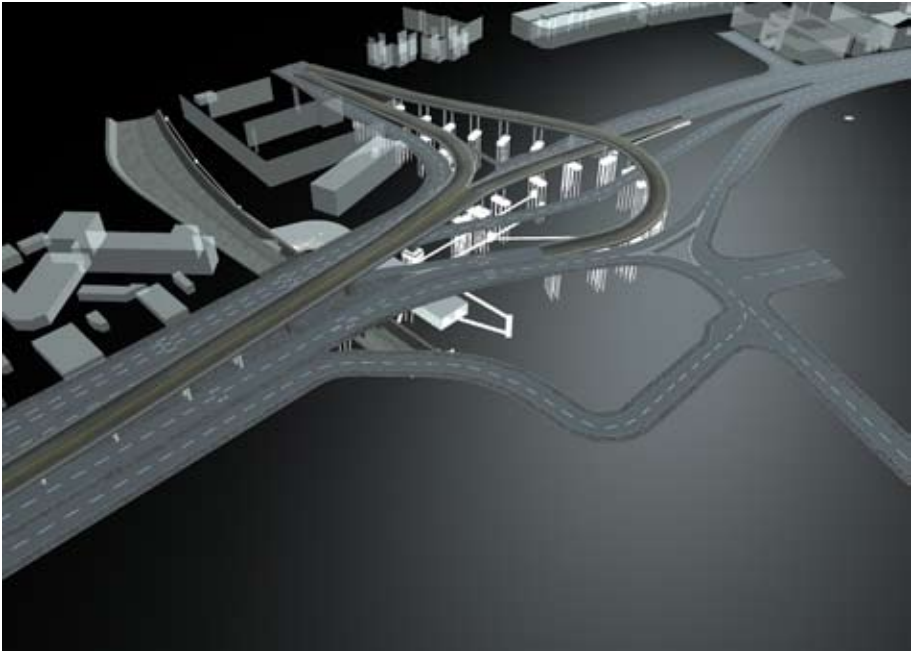
Presenting proposed design solutions was much simpler and clearer. No longer needing to flip through hundreds of pages to illustrate their design, the project team referred to all the details represented in one single model.

Using BIM for Clash Detections

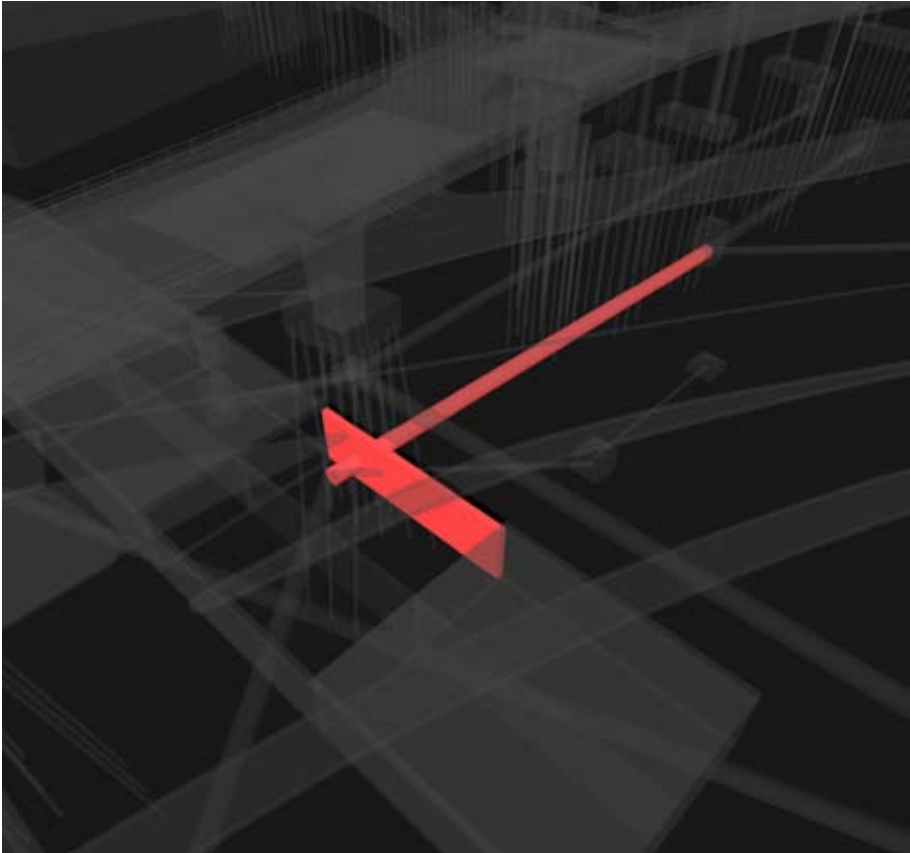
“The site constraints were extremely complicated, and a lot of time would be needed for careful design planning if we were still using the traditional methods,” said Jin. With BIM though, the Scott Wilson team was able to build the BIM models of all existing infrastructure first and then combine it with

the new culvert design to identify clashes. Jin commented, “In the past, we checked for interference between different systems on the 2D and then we had to examine the line and alignment one by one to avoid clashes. This was a time-consuming and painful process. With AutoCAD Civil 3D, however, the check was done automatically and we implemented changes efficiently. Time was saved and the process became fun!”

The following is an integration of all BIM models which includes existing utilities, foundation, terrain and proposed box culvert of this area:



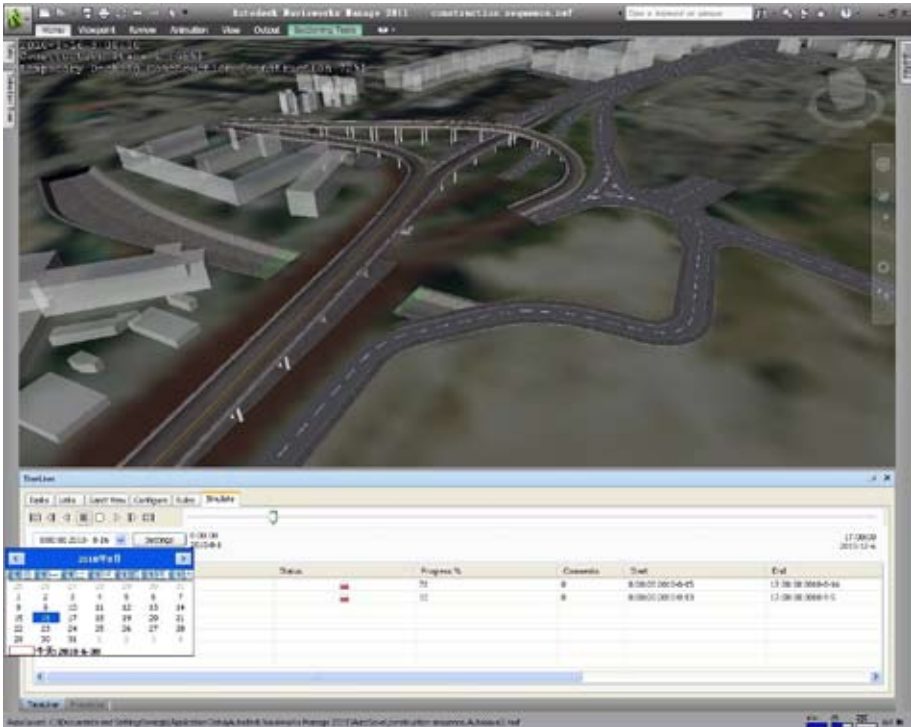
Clashes could be identified in a combined BIM model:



Using BIM for 4D Construction Phasing

Given the success of BIM during design, the project team used building information models for construction planning. By adding schedule dates to a 3D model, Scott Wilson created a 4D building information model, which

enabled the team to review and respond to construction sequencing. This 4D model could be utilized for presentations to the public and government stakeholders.



BIM was used in construction phasing.

The results proved that using BIM technology was cost effective, efficient and could identify and solve potential problems and clashes well before construction started. Images and illustrations produced will also facilitate promotion of the project among stakeholders and the public.

Scott Wilson has also employed BIM technology on other projects. In a previous site analysis study, we used the Water Drop Analysis tool in AutoCAD Civil 3D to determine the possibility of flooding. On another project, Autodesk Ecotect Analysis was used to analyse the sunlight distribution in a retail shopping mall. Can Leung, the

project's Senior System Analyst said, "We never thought the application of BIM could be so broad. Since we began using this new technology, we have seen great benefits on a wide range of projects at Scott Wilson."

"Using the BIM software", Jin concluded, "can significantly increase the project productivity. I am really looking forward to applying more of the software's functions on different project elements. There are still many possibilities to be explored!"

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Scott+
Wilson



ABOUT SCOTT WILSON LIMITED

Scott Wilson Group is a global integrated design and engineering consultancy for the built and natural environments with a worldwide network of 80 offices and 6,000 employees. Scott Wilson offers Strategic Consultancy and multi-disciplinary professional services in the Railways, Buildings & Infrastructure, Environment and Natural Resources and Roads Sectors.

Actively present in Hong Kong since 1952, Scott Wilson offers core strengths in the planning, design and construction supervision of large-scale transport and urban infrastructure, buildings for property developers, Government clients and contractors. Scott Wilson's key regions are UK, Asia-Pacific, Europe, India and the Middle East, with regional centres in London, Hong Kong, Warsaw, New Delhi and Bahrain/Dubai.

In China, Scott Wilson has over 850 staff in 10 offices in Hong Kong, Beijing, Tianjin, Shanghai, Nanjing, Wuxi, Chongqing, Qingdao, Guangzhou and Shenzhen.

Advisors' Comments

Introduction

This year, we are extremely honored to receive the invaluable support from the local supporting organizations and overseas BIM advisors. An advisory panel was formed by the representatives of local supporting organizations to discuss and review the selected projects, and their comments were consolidated and recorded. In addition to the comments of the selected projects, the overseas advisors also shared with us about the BIM development in other parts of the world.

Supporting Organizations

- The American Institute of Architects, Hong Kong Chapter (AIA HK)
- Chartered Institute of Architectural Technologists, Hong Kong Centre (CIAT HK)
- The Chartered Institute of Building, Hong Kong (CIOB HK)
- The Hong Kong Institute of Architects (HKIA)
- The Hong Kong Institute of Building Information Modelling (HKIBIM)
- Hong Kong Information Technology Joint Council (HKITJC)

Advisory Panel -Representatives of Supporting Organizations



Mr. Bernard Chang, *Senior Associate Principal*
The American Institute of Architects, Hong Kong Chapter



Mr. Hermann Fong, *Chairman*
Chartered Institute of Architectural Technologists, Hong Kong Centre



Mr. HF Wong, *Vice President*
The Chartered Institute of Building, Hong Kong



Mr. KS Wong, *Vice President*
The Hong Kong Institute of Architects



Mr. William Poon, *Member*
Hong Kong Information Technology Joint Council



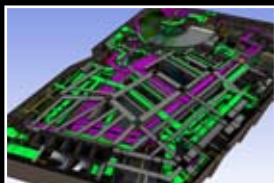
Mr. Y. Y. Yip, *Board Member*
The Hong Kong Institute of Building Information Modelling

Advisors' Comments from Supporting Organizations



Aedas Limited

The project team has managed to use BIM technology from form creation, design information coordination to accurate modelling in a systematic and creative way. The Application Programming Interface (API) usage can help integrate data in different BIM software efficiently. Procedures are simplified and the design workflow is well organized. We look forward to seeing the usage of the information in the next stage of project development and in the construction process where the BIM data may be reused to speed up the process.



Gammon Construction Limited

The project team has done a good job in combining the information in the construction programme with BIM. This has advanced the usage of information and facilitated the construction sequence decision which improves in the pre-fabrication practice. Also, the enhanced RFI process helps to clarify the construction details and reduce abortive work. More efficient usage of building material in turn helps in protecting environment.



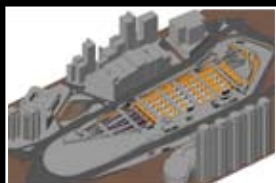
Hong Kong Housing Authority

The effort and resources input into the usage of BIM to enhance the existing workflow as well as the existing business practice are appreciated. BIM usage can also be seen in the design checking process. Moreover, by integrating with environmental performance analysis, the sustainability of building design can be improved. More sharing in this kind of sustainable design integration is highly encouraged.



The Luk Hoi Tong Co., Limited

The BIM technology is implemented at an early stage to assist in decision making. The BIM model created in the design stage can be extremely useful in the construction phase. The comprehensive usage of BIM can present a real environment to the stakeholders. This improves the communication between different parties. We also appreciate the effort put in to develop real-time walkthrough where details are provided precisely.



MTR Corporation Limited

The adoption of the object library and project standard transfer technology makes it possible to deliver consistent BIM data between different stations, it also enables the data sharing amount different software. Consistent drawing standard and station design can assure the quality.

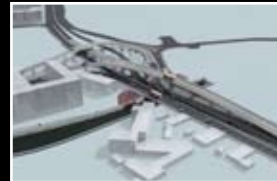
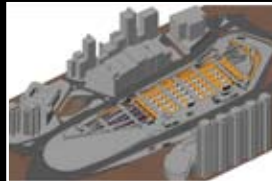
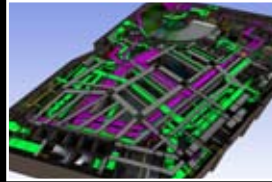


Scott Wilson Limited

The project team cleverly integrates the existing environment with the new design in the same BIM, so that the team can make advance and accurate decisions. Design information can be visualized in 3D at an early stage to reduce the possible delay and construction nuisance to public. The initiative to creatively use BIM to fulfill their clients' requirements is also appreciated.

Advisors' Comments

Dr. Calvin Kam



Congratulations to Hong Kong for holding the 4th Annual BIM Award! This year, I am excited to see a well-balanced representation of BIM showcases from visionary owners, innovative designers, and thoughtful contractors. The spectrum of project and program types is promising. As the National Chairman of AIA Technology in Architectural Practice Community, I can attest to the value of BIM Award Programs in catalyzing the advances of building industry.

BIM has empowered Aedas with design freedom. Aedas has embraced the power of parametric modelling to aid in their rationalization of organic forms for the West Kowloon Terminus Entrance Building. While BIM has enhanced project documentation, communications and review, there is a good opportunity for the project team to explore direct fabrication from computational numerically-controlled models and continue to leverage the power of BIM during the fabrication, assembly and installation processes.

Gammon utilized BIM in construction planning and coordination. The visualization power of BIM played an important role in the communications of the Hennessy Centre Redevelopment Project. 4D model and 3D-based simulations added value to the high-rise construction in a tight urban jobsite. I would encourage the team to explore the incorporation of BIM-based cost estimation and scheduling as the logical next steps.

Scott Wilson illustrated that BIM was about virtual design and construction, not necessarily referring to “building” as a fixed subject, but could also refer to BIM in civil and infrastructure projects. I would encourage the project team to document and quantify the impacts of BIM-enabled design as opposed to conventional practice.

Luk Hoi Tong Company integrated BIM into their design iterations and construction planning. Design rehearsal, construction documentation and quantity survey were the benefits reported by the project team. Similarly, I advise the team to further advance their BIMs in areas such as fabrication and cost estimation.

We shall credit the Hong Kong Housing Authority and the HK Mass Transit Railway Corporation for two significant levels of contributions to the industry. First, they demonstrated the value of BIM on their respective projects in Tung Tau and in Shatin-Central Link. More importantly, HKHA and MTRC are demanding BIM across their project portfolios and thus, they are setting an irrevocable course for the building industry to follow. As a founder and senior expert of GSA's National BIM Program, I can appreciate the organizational culture, training program, procurement changes and industry engagement that are necessary to establish and sustain a sound BIM adoption.

At Stanford University, we advocate the development of metrics and comparison between BIM practice and conventional performance. I would encourage Hong Kong industry leaders to quantify the added value of BIM. While with the 2010 AIA BIM Awards in the United States, we have seen project organizations with significant business transformation and process change that were empowered by BIM, while we have also seen a good spectrum of BIM applications from documentation, fabrication, energy simulation and more. I hope that Hong Kong professionals and leaders will be active citizens of the global BIM movement, commit to sharing, to learning and to collaborating with the global community in advancing the vision of excellence in design, construction and operation.

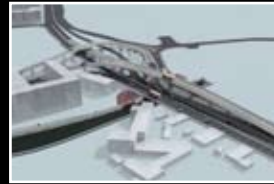
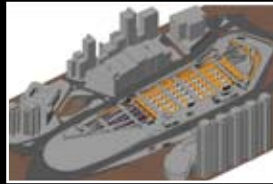
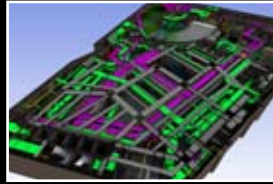


Dr. Calvin Kam *PhD, AIA, PE, LEED AP*

Dr. Calvin Kam is the Director of Industry Programs and a Consulting Assistant Professor at Stanford University's Centre for Integrated Facility Engineering (CIFE), where he works with CIFE global members on strategic and innovative programs in areas such as BIM, Virtual Design and Construction and sustainable developments. He is the 2010 & 2011 Chairman of the AIA Technology in Architectural Practice National Knowledge Community in the U.S. He is the founder and currently a Senior Program Expert with GSA's National 3D-4D-BIM Program. Under Calvin's management, GSA has required BIM submission in its multi-billion capital program; published the GSA BIM Guide Series; successfully influenced multiple BIM software vendors to incorporate open standard according to GSA business rules; formalized international agreements with public owners in Finland, Norway, Netherlands and Denmark; while earning a number of national and international awards from AIA, BuildingSMART, CoreNet Global, FIATECH, IAI, NIBS, and the U.S. government.

Advisors' Comments

Mr. Philip G. Bernstein



The 2010 Hong Kong BIM Awards is a strong indication that Hong Kong is rapidly becoming a major centre of world-wide innovation in the use of digital design and construction technology. The breadth, complexity and technical sophistication shown by all six of this year's winners suggest that advanced design and construction methodologies, supported by BIM technology, will soon become typical of projects in Hong Kong. The portfolio can only lead one to conclude that Hong Kong is now setting an example for the entire industry in the implementation of BIM for advanced urban projects of all scales.

Of particular interest is the breadth of BIM implementers represented by this year's awards, and the correlation of those firms' core business interests with the capabilities of the tools they have mastered so well. The range of projects—from office buildings to rail terminals to roadways—and the critical process improvements achieved—complex geometric design, establishment of new building standards, construction sequencing, sustainable outcomes—supports the idea that technology can truly transform not just the process of building but its results. From the beautiful sweeping curves of AEDAS's Kowloon Terminal Design—an idea that would not have been possible without their great skill with both design and design technology—to the pilot projects of the Hong Kong Housing Authority—where business practice of this critical

public owner and operator are being literally transformed by BIM—Hong Kong’s owners, designers and builders have each embraced the fundamental value proposition of BIM itself. The value of the “I” in BIM (“Information”) makes innovation in the service of great results not just possible, but likely.

I salute the designers, builders and owners represented by this year’s BIM winners—AEDAS, Gammon, HKHA, Luk Hoi Tong, MTRC and Scott Wilson—as representatives of the newest, most innovative practitioners in our industry, and look forward to seeing even more exciting results from their work in the future.



Mr. Phillip G. Bernstein FAIA, RIBA, LEED AP

*Vice President, Industry Strategy and Relations, AEC Solutions, Autodesk, Inc.
Lecturer, School of Architecture, Yale University*

Phil Bernstein is the Vice President of AEC Industry Strategy and Relations for Autodesk, Inc. With a Masters degree in architecture from Yale University, he is also an adjunct professor at the Yale School of Architecture. He was formerly an associate principal at Pelli Clarke Pelli Architect. He is a Fellow of the AIA (The American Institute of Architects) and a LEED (Leadership in Energy and Environmental Design) Accredited Professional.

Advisors' Comments

Mr. Emmanuel Samuel

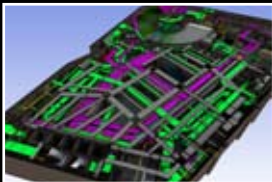
BIM is going through a lifecycle in Asia Pacific. The acronym got head turns only about 5 years ago. Productivity, ease of use and the ever increasing awareness around “Green” and “Sustainable Designs” has pushed the use of BIM within the built environment. Companies are looking for ways to fast forward the adoption of BIM tools. In the US, companies are constantly moving the capabilities of BIM towards Lean Construction, Integrated Project Delivery and so on. In Asia, the move comes from commercial companies wanting to create competitive advantage as well as government’s renewed interest to drive productivity. In Japan, the effects of BIM being felt by pressure coming from abroad as well as recent Japanese Sustainable Building Council’s collaboration with Autodesk to connect Revit with CASBEE green assessment tool. In Singapore, the construction authority has seen the benefits of using BIM and thus has gone live with the BIM implementation funding to entice local firms. In China, the owner of Shanghai Tower has openly embraced the use of BIM and is evangelizing BIM to the entire built environment.

Some of the best commercial and governmental visionaries in Hong Kong are constantly stretching the capabilities of BIM. The winners of this year’s BIM awards are the true pioneers. It is a celebration and pleasure to honour this year’s winners.



Aedas Limited

An interesting and complex project, the West Kowloon Terminus (WKT) is the underground terminus of the Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL) is constantly on the lime-light. What can’t be done using vanilla Revit was materialized using API, keeping all the rest of the components coordinated. The benefit gained is a best practice and is extremely commendable.



Gammon Construction Limited

Hennessy Centre, Causeway Bay is already a heavily built up area. Thus not to our surprise, congestions and sustainable targets, are clearly mentioned as key challenges. Gammon has used BIM technology to drive 4D simulation with the help of parametric Revit families to handle design changes while complying to the constrain. This could only be possible with Revit and BIM approach.



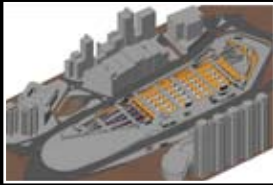
Hong Kong Housing Authority

HKHA not only uses BIM for design but is poised to transform business practices, motivates external parties as well as educated the build community to adopt BIM. The building teams collaborate and interrogate designs using technology enables best practices which can further be leverages in future projects. It is what we call “reusable knowledge” which will build a BIM culture within HKHA design teams.



The Luk Hoi Tong Co., Limited

Looking at the project details, Luk Hoi Tong has applied BIM approach well. One thing I like to highlight here is how they are meeting timelines. Luk Hoi Tong has used the BIM model as a collaborative platform by which all stakeholders are involved from the beginning of the design process. This is allowing them to spend less time fixing things and more time on design and delivery for construction.



MTR Corporation Limited

The designing of both underground and above ground structures and to keep it all constant is not an easy task. MTRC again has used the power of BIM in design options, scheduling, preliminary design drawings and the collaboration with civil engineering which is paramount in this type of work. By applying the power of BIM, MTRC is able to maintain high standards, consistent design information and save precious time.



Scott Wilson Limited

The nullah was constructed in the early 1960's to alleviate flooding. Many studies have gone on regarding drainage capacity, food protection, etc. Local residents have increasingly requested the rehabilitation. We are glad to see that one of our prominent customers is part of this special and important project. Scott Wilson has used BIM exactly the way it should be to help design this 600m section.



Mr. Emmanuel Samuel

*Sales Development Director, Architecture, Engineering and Construction (AEC)
Autodesk Asia Pacific*

Emmanuel Samuel is Sales Development Director for Building Solutions Division, Autodesk Asia-Pacific. He is responsible for driving the Architecture Engineering and Construction Business in Asia Pacific.

With more than 18 years experience in the information technology industry, Emmanuel has worked with a range of multinational IT companies such as IBM, and enterprise asset management companies such as Datastream Systems.

About AIAB

AIAB (Autodesk Industry Advisory Board) is formed by a group of experts who are willing to share their valuable experience in BIM (Building Information Modelling) to the public. We currently have members from Hong Kong and Macau regions.



Mission

Autodesk Industry Advisory Board (AIAB) is an informal and non-profit making interest group that acts as a bridge between the industry and Autodesk for solid and bi-directional communications. AIAB, as its title suggests, has an advisory role. Its main objectives include, but not limited to:

- Act as a platform for technology exchange and experience sharing
- Advance the professional standards on Autodesk products
- Express and share opinions and views on CAD/CAE/BIM technology development
- Promote the development, usage and awareness of CAD/CAM/BIM design technology in HK, China and Macau
- Provide cross-border technology exchange/visit
- Provide latest technology update (e.g. Building Information Management)

Want to know more about AIAB?

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Joshua So, AIAB Supervisor

Email: joshua_so@cn.synnex-grp.com

AIAB web site: <http://www.aiab.org>

**A****B****C**

BIM – On the Way to Success

BIM is present in the architectural profession probably longer than most of architects think. It has been 23 years since the unknown company from Hungary launched the first 3D software for architects. Many of our colleagues loved it instantly, as it could harness, for the first time in architectural industry, the power of computers to truly support the design, not just the drafting process. For me – the interest in this area was natural as it could make use of programming and mathematical thinking, which I always believed was necessary for architecture.

And for many architects this love for technology continues. The feeling is now more mature as we and our partners in the investment process start to see real benefits behind pure fascination and often have no choice but to “go BIM”. Clients now require it, building departments of governments (like Hong Kong) gradually make it a tool of choice.

There are also times when my relations with BIM become a bit strained due to the enormous challenges that the technology still faces. Modern computers within the budget of architectural companies continue to have problems with processing such huge amounts of data, which the full BIM model of a building requires. The architectural forms become increasingly complex and difficult to rationalize. Those challenges from architects however are a sign of a very right and healthy situation – they show that design will always be ahead of technology and Architecture will remain this unique blend of skills with creativity as a driving force. It will only help make our BIM applications better and so natural to use as once pen and paper was.

A Dubai Park Tower, Design–Andrew Bromberg, Aedas Limited

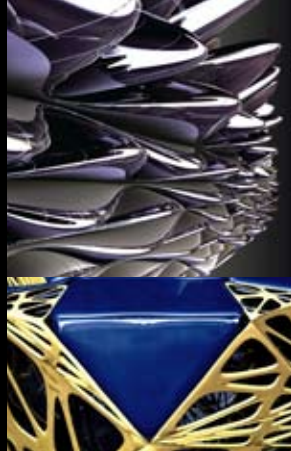
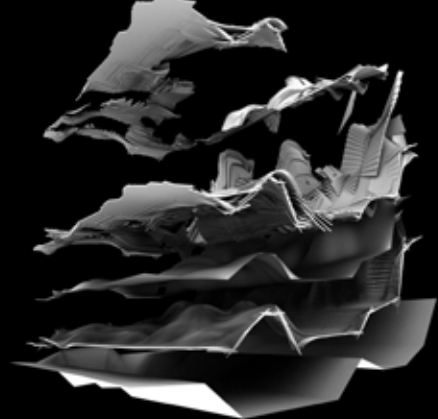
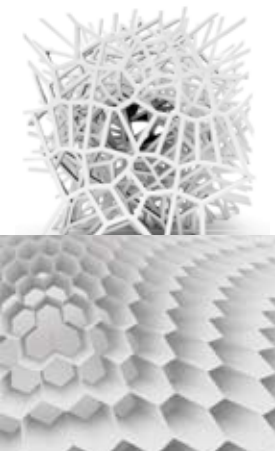
B & C BIM can handle more and more unique and organic forms.



Mr. Marcin Klocek

Msc Arch, MHKIBIM

Marcin has been working with BIM technology for all of his professional lifetime, starting with ArchiCAD just after graduation from the university in Warsaw, Poland. He also studied computer engineering and programming to supplement and broaden his BIM knowledge from the technical side. After moving to Hong Kong and joining one of the major architectural practices here, he switched to Revit and helped to implement BIM technology for some of the most geometrically complex commercial and office projects in Dubai, Singapore and Hong Kong. His BIM team won the 2010 Autodesk HK BIM Award for the West Kowloon Terminus project in Hong Kong. Marcin currently runs his own two-semester BIM course at the Faculty of Architecture of Hong Kong University for the Master of Architecture program.



BIM as Design Experience

Architectural design studios are the essential learning experience for architectural students. Studios go beyond pure skill training and require reflection upon, and the creation of, knowledge. The integration of BIM into design studio curricula offer the opportunity to merge conventional architectural design with the aspects of computational instruments, BIM, and digital fabrication from the very beginning of the studio. Hereby students focus on their design intents and their overarching objectives of their design tasks. They are inspired by rich and informative sets of their own experiences and are led to the design thinking that are connected with underlining BIM methodologies. They develop their design by basing their concepts on architectural parameters that relate to intelligent multi-dimensional modelling, develop an expertise in BIM principles and engage creatively

in employing parameters to define their own architectural language. Subsequently students can efficiently employ their digital media skills to expand on their understanding of design issues.

We base our studios around BIM to reframe the design question fundamentally different. Hence we propose new pedagogies of learning and design thinking and therefore, couple knowledge building of parametric methodologies with the creation of architectural design; thus enable students solving design tasks by focusing on higher decision making and thinking with their definitions of rules and dependencies of spatial relationships, perceptions, fabrications, form findings and functions. Their explorations and exchanges of ideas follow rules that place their overall objective of the design at its centre, while taking full advantage of available intelligent BIM technologies to explore and learn about their design developments.



Prof. Marc Aurel Schnabel

PhD (HK), Dipl Ing (UdK), Cand. MEd (USyd), BAB President CAADRIA, MHKIBIM, Associate Professor

Prof. Marc Aurel Schnabel is teaching and researching at the School of Architecture, Chinese University of Hong Kong. He worked at international architectural practices and taught in Germany, Australia and Hong Kong for over fifteen years. His expertise stretches from Computational Architectural Design, BIM, to Virtual & Augmented Environments, Design Learning & Generative Architecture. He publishes extensively in international journals about architectural parametric design. He is a passionate educator who encourages emerging architects to communicate three-dimensional space using unconventional methods of design creations.



BIM Project Specification – “Why do I need one?”

Quite often I am going on a quick trip and sometimes I get a chance to go on a long journey. Every time, I consider three simple questions before I set off. I like to know where I am going, I need to know how I will get there and I want to know who is going to lead me there.

We can apply the same logic to Building Information Modelling projects.

First, I work out a clearly defined outcome for a project, the destination. It could be simply to create a Revit model for an architect or it could be to implement BIM for all of the design consultants and contractors on a project to co-ordinate the overall design.

Then, I plan all of the procedures, methods and details for implementing the BIM process. This

includes the level of detail in the model, the co-ordinates, clash analysis, drawing production schedule, the deliverables from the BIM database and many other important items.

Finally, I appoint someone to manage the BIM team. The BIM Project Manager will lead the project team to reach our goal and they will follow the directions laid out in the plan for the project.

The entire journey is planned and documented in a BIM Project Specification. I use the new standards published by the HKIBIM to plan my projects. We know this is the best way to co-ordinate the design for commercial buildings, airports, railway stations and residential developments.

Have you implemented the HKIBIM BIM Project Specification on your project?

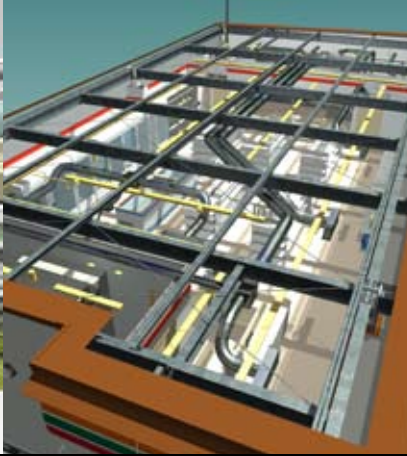


Ir. Ronan Collins

*Managing Director, InteliBuild Technyx Asia Ltd
Chartered Structural Engineer, MHKIE, RPE CEng,
MHKIBIM, BIM Project Manager, HKIBIM Honourary Treasurer
Social Secretary, The Lighthouse Club construction Charity*

Ir. Collins is an experienced BIM Project Director and specialises in the management and production of detailed and accurate BIM models for the purpose of design and construction co-ordination. He is responsible for planning and implementing the BIM projects in direct collaboration with clients, consultants and contractors.

By combining structural engineering knowledge and skills, leadership and management talents and the latest BIM processes, Ir. Collins leads a specialised and focused consultancy business based in Hong Kong as part of the international Canam Group.



BIM – Building Information On Demand

When people lack good information, they will invent some information themselves. When they don't know how well their project is doing, they will try to guess. When they don't know how other teams are performing, they will make assumptions. When they don't understand what their colleagues contribute to the organization, they will invent their own reasons. And when they don't know about their manager's personal life, they will gossip about it. Jurgen Appelo.

BIM is replacing conventional AEC graphical jargon by a simple and easily understanding 3D way. The BIM seems can greatly improve our information quality and quantity. But for communication purpose, the real BIM must be ubiquitous and easy, like email, google or iphone that we can get the reliable information on demand.



Mr. Elvis Li

CEO isBIM Limited

Mr. Li is the CEO and Director of isBIM Limited, the leading building information modelling consultant in Hong Kong and China. With his 8 years experience in property development and over 7 years experience of planning and implementing BIM and BLM project, he has successfully created a series of value added services for building industry from feasibility study to facility maintenance phase for over 60 BIM projects in Hong Kong, Shanghai, Beijing, Tokyo and Mumbai. He is the member of BIM Expert Committee of China Commercial Real Estate Association and founding member of Hong Kong Institute of Building Information Modeling.



BIM Further Ahead

Having stepped into the 5th year of Autodesk's Hong Kong BIM Award, the impact of the BIM across different professionals across the building industry has been explored.

Not only the traditional design professionals such as architects, structural engineers and building services engineers are enthusiastic about the changes and experienced the efficiency, better co-ordination and accuracy that BIM brings along, the ripple has further extended to:

- Clients who understand the immediate cost benefit to the project;
- Contractors who benefit from the avoidance of abortive operations;
- Facility Managers who benefit from the centralized management of built assets;
- Educational institutions and universities gear up for the new generation of BIM literate professionals;

- Authorities realized the consistency of building information;
- BIM Consultants has explored new form of business models in BIM applications;
- The establishment of the Hong Kong Institute of BIM (HKIBIM) promotes the professional qualification and status of BIM practitioners.

As BIM intends to unify the different building sectors and produce a productive project delivery. Communication across different BIM enthusiasts is now becoming the uttermost urgency issue. A common communicable channel is required to ensure the BIM data can be passed from one discipline to another to facilitate accurate information transfer. Thus, it is now time for all BIM participants to have collaborative effort to produce a BIM standard which caters for most of the industry needs. I believe only through this common high standard can Hong Kong BIM development to take fly and escalate to a new horizon.



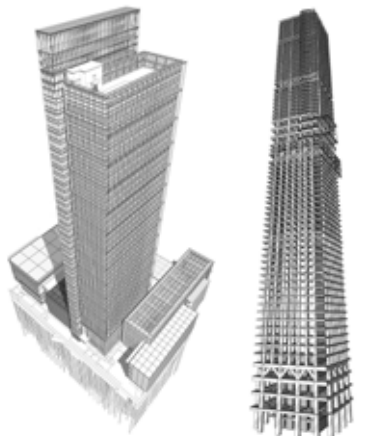
Mr. David Fung

B. Arch. (Hons) M. Proj. Mgmt

HKIA RAI A MHKIBIM

Building @ Architectural Engineering Manager

David is a Hong Kong Registered Architect. BIM has been the main design and documentation tools for his works for over 11 years. The BIM projects included residential towers, houses, offices, shopping centres, churches, universities, logistic centre, train stations. He had won the Hong Kong BIM and International Revit Experience Award in 2007. He teaches BIM technology in different universities in Hong Kong and overseas such as HKU, POLYU, HKUSPACE, TsingHua University. Mr. David Fung was also the speaker for various BIM forums and conferences to different professional institutions in Hong Kong, Shanghai, Beijing, Tianjin, Tokyo and Seoul. Currently, David is also the Chairman of Autodesk Industry Advisory Board and the Vice Chairman of HK Institute of BIM aiming also at promoting the BIM technology and developing the Hong Kong BIM standard.



Two Hours In Revit

Revit is now applied in bigger and more complex projects. It is also taking a more and more important role to assist in different aspects in a project. However, I just worry that BIM is moving away from our professionals.

In fact, from my 5 years experience in Revit, we can always just spend two hours in BIM to solve some little problems and eventually get bonus after that. Here are some examples.

My architect friend spends two hours to build and play around the building massing. From the model, he knows how the building looks like. He knows how much GFA is in the massing. He was happy with the form and the GFA. He does his job and the massing becomes the master information

of the rest of the design. He knows Massing only and nothing else.

My engineer spends two hours to build a small structural model just for the extensive box projection at the 40/F. He understands the space requirement from the model. He sees the impact of his structure to the space. He moves the members around and adjusted the size. He is satisfied with the design in both the structural requirement, appearance and implication to other disciplines. He does his job and passes the design to others for the rest of the design. He knows how to add beams, bracing and nothing else.

It is not so scary to play around with this big elephant. We are using BIM in our ways.




Ir. Francis Leung

*BSc (Eng) CEng, RPE MHKIE, MStructE,
RPE, RSE(HK), rSE-PRC, MHKIBIM*

Ir. Francis Leung is the Director and Head of BIM of an engineering practice for the offices in Asia region including Hong Kong, Shenzhen, Shanghai, Beijing and Manila. Francis has hand-on knowledge and experience in BIM projects. He starts using BIM technology in his projects since 2005, and is now extending from structural practice to MEP to enhance the E&M design, coordination, drawing production and documentation. He was also speakers for various BIM conferences and seminars to different professional institutions in Hong Kong, Shanghai, Beijing, and the US. He is also the Founding Chairman of Autodesk Industry Advisory Board aiming also at promoting the BIM technology.

IVE Construction 建造工程



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Course Contents 課程內容

1. Introduction to Building Information Modelling
 - What is BIM – Building Information Modelling. Current trend in BIM and its future.
2. Creating building design using Revit Architecture
 - Creating and editing parametric building components. Design Constraints: Levels and Grids. The concept of Components design with “Families”.
3. Design Analysis
 - Shadows and Solar Studies. Walkthroughs. Schedules. Area Analysis.
4. Construction Documentation
 - Design Visualization. Tags. Detailing.

Time of Classes 上課時間

Class 1: 31 Jul 2010 (9:30 – 13:30, 14:30 – 17:30)
Class 2: 21 Aug 2010 (9:30 – 13:30, 14:30 – 17:30)
Class 3: 11 Sep 2010 (9:30 – 13:30, 14:30 – 17:30)

Enquiry 查詢

電話：9081 5283 / 2436 8505
電郵：EDIT@vtc.edu.hk
網站：EDIT.vtc.edu.hk

Class Venue 上課地點

BIM Centre, IVE (Morrison Hill)
香港專業教育學院(摩理臣山)
香港灣仔愛群道六號

Duration 修業期

2節, 3小時一節, 共6小時

Fee 學費

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Closing Dated of Application

截止報名日期

Class 1: 24 Jul 2010
Class 2: 14 Aug 2010
Class 3: 04 Sep 2010



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Course For: Autodesk® Revit® Architecture

Level: Basic

Day 1 Conceptual Design in Revit

- Building Information Modeling
- Working with Building® Elements
- Using Building Maker for Conceptual Design
- Working with Levels
- Working with Family

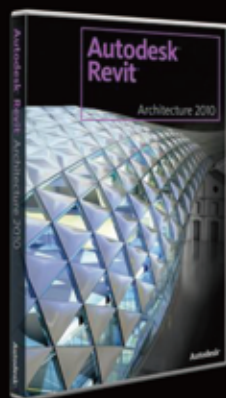
Day 2 BIM in Architectural Components

- Working with Column Grids
- Getting and Working with Walls
- Working with Doors and Windows
- Working with Dimensions and Constraints
- Creating Curtain Walls
- Creating and Modifying Floors, Ceilings and Roofs
- Working with Stairs and Railings
- Loading and Modifying Component Families

Day 3 Documentation and Data Management

- Working with Materials and Schedules
- Creating Details and Views
- Working with Section Views
- Working with Drawing Sheets
- Working with Title Blocks
- Controlling Object Visibility
- Importing Content
- Exporting Content
- Working with Project Templates

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Student's Artwork from Mr. Ivo Sai Min, after attend course BIM Design with Autodesk Revit

“BIM...您不使用它就無法學習它,而您不學習它就無法使用它。”

Stubbins公司訊息通訊技術主管Jeff Millett

天行電腦自03年為Autodesk進階授權培訓中心,更於07年獲頒Autodesk Best Authorized Training Center,一直為業界提供全方位的BIM培訓/認證服務。

最好的您已選用最好的技術:BIM。我們明白要過渡至BIM環境,關鍵是合適的培訓。我們已為不同客戶量身訂製不同形式的培訓,務求裝備設計團隊應付當前BIM環境的挑戰。您又如何?最好當然揀最好。

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CEF認可課程 - Certificate in Dynamic 3D Computer-aided Design with Autodesk Civil 3D 動態三維土木設計證書
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FlexScan S2243W

Typical 24.1" monitor



FlexScan S2243W



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Autodesk Hong Kong office has been established since 1992.
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