MEDIA RELEASE

BCA TO UNVEIL SECOND CONSTRUCTION PRODUCTIVITY ROADMAP NEXT YEAR

- CDL first to adopt PPVC for a large-scale residential project in Asia
- Eleven winners receive inaugural Building Information Modelling (BIM) Award

14 Oct 2014 – While progress has been made towards improving productivity in the construction sector, more needs to be done in the next few years to meet the desired productivity target.

2. At the opening of the Singapore Construction Productivity Week (SCPW), Ms Grace Fu, Minister in the Prime Minister’s Office, Second Minister for the Environment and Water Resources and Second Minister for Foreign Affairs, outlined three areas to further transform the sector. These include making prefabrication more prevalent, raising the quality of the construction workforce and promoting greater integration across the construction value chain.

3. The Building and Construction Authority (BCA) is also working on the second Construction Productivity Roadmap to bring the sector’s productivity drive to the next higher level. Details of the roadmap will be released next year.

4. “We have plucked the low-hanging fruits and the next step requires a bigger change in terms of our mindset and the way we work,” said Dr John Keung, CEO of BCA.

5. Dr Keung added that while the adoption of productive construction technologies such as drywall and system formwork has increased, there needs to be a greater push to move the industry towards off-site manufacturing for on-site assembly, or Design for Manufacturing and Assembly (DfMA). The adoption of game-changing technologies such as Prefabricated Pre-finished Volumetric Construction (PPVC) and Cross
Laminated Timber (CLT) is a move in this direction (please refer to Annex A). Such advanced construction technologies yield more significant manpower and time savings. They also bring about intangible benefits such as less noise and dust during construction, safer workplaces and better quality homes.

6. PPVC is being adopted on a smaller scale in three projects in Singapore. These include the City Developments Limited (CDL) Green Gallery at Singapore Botanic Gardens, a student hostel at Nanyang Technological University and an extension to the Crowne Plaza Changi Airport Hotel.

7. CDL will be the first developer in Asia to adopt PPVC for an unprecedented, large-scale residential project – an Executive Condominium (EC) at Canberra Drive. The development which comprises eight 10 to 12-storey blocks with an estimated 636 apartments will be constructed using some 3,300 building modules – likely the largest application of PPVC in the world (please refer to Annex B).

8. “As an established developer committed to innovation and green practices, CDL has continuously explored using sustainable designs and construction technologies to develop buildings in a productive, safer, and eco-friendly manner. The extensive use of PPVC for this EC project is ideal due to its modularity of units which we have embraced from the design stage. Productivity is expected to increase by more than 40% and will save some 55,000 man days, compared to using conventional construction methods. The project should complete four months ahead of schedule with the adoption of this game-changing technology,” said Mr Kwek Leng Joo, Deputy Chairman of CDL.

9. He added that the building design and quality of construction will by no means be less superior to conventional buildings. In fact, stringent quality control in factories ensures uniform and superior quality of prefabricated components, enhancing overall building quality.

10. To continue building up a strong lead demand for game-changing technologies such as PPVC and CLT, selected Government Land Sales sites to be released later this year will be required to adopt such advanced construction technologies. An additional $55 million will also be allocated to the Construction Productivity and Capability Fund (CPCF) which supports firms in technology adoption and workforce
development, bringing the total amount of productivity funding set aside for the construction sector to $335 million.

11. To build up off-site manufacturing capability for prefabrication, BCA will roll out two more Integrated Construction and Precast Hubs (ICPHs) over the coming months. The ICPHs enable automated manufacturing of precast components as well as other construction products such as PPVC modules and prefab bathrooms.

12. Lastly, the BCA Academy will be rolling out new courses to upgrade the workforce to keep pace with technological advancements. These include a five-month Specialist Diploma in Construction Productivity programme and a two-month Advanced Certificate in Construction Productivity to start early next year.

13. The BCA Academy is also partnering Stanford University’s Center for Integrated Facility Engineering (CIFE), a leading research centre for Virtual Design and Construction (VDC), to offer advanced management programmes at the CEO, senior and middle management levels. The programmes aim to help industry practitioners from developers to consultants and contractors to understand the value of VDC and BIM, and take an integrated approach in the design, construction and operation of construction projects.

14. At the opening ceremony, Minister Grace Fu gave out the inaugural BIM Awards to recognise 11 outstanding project teams that have implemented the three-dimensional modelling technology in their projects from the design to construction stages (please refer to Annex C).

**Experts explore ways to further improve Singapore’s construction productivity**

15. Leading up to the SCPW, the third International Panel of Experts (IPE) meeting on Construction Productivity and Prefabrication Technology was held from 9 to 10 October to review Singapore’s Construction Productivity Roadmap. A panel comprising 12 local and 7 overseas experts from developers, consultants, builders, public agencies and the academia explored ways to further improve construction productivity in Singapore (please refer to Annex D).
16. The IPE emphasised the importance of having a mindset change across the entire construction value chain. Given that most productive technologies in Singapore are still in their early adoption stages, effective change management is crucial for the industry to go beyond the inflection point for productivity growth.

17. The industry also needs to fundamentally change its design approach and construction processes, with an emphasis on moving towards Design for Manufacturing and Assembly (DfMA) with as much work done off-site in a controlled manufacturing environment as possible. This will help create a more conducive working environment on and off-site and help change the image of the sector.

18. In order for productive and game-changing technologies to be widely adopted across the industry, the IPE recommended to build an ecosystem to support the adoption of such technologies and incentivise developers and owners to generate demand to create economies of scale. This would also help encourage the industry to make the necessary investments to adopt and supply such technologies here. Adequate incentives would be required especially for first movers, to help address cost concerns, reduce their risk and recover their investments.

19. The IPE also commented that it is possible to achieve cost effectiveness in the adoption of game-changing technologies like PPVC and CLT, by designing for them right from the start and engaging specialist consultants early as part of the project consultancy team. In addition, partnership with overseas firms can help build capabilities for local firms and shorten the learning curve for such processes and technologies.

20. BIM technology was identified as a key enabler in helping to improve integration across the construction value chain, including optimising off-site manufacturing. By involving suppliers and manufacturers in the BIM coordination process, it can reduce waste and improve logistics and value for all stakeholders. As the industry has attained a level of BIM proficiency, the IPE shared that it is timely to carry out more industry-led BIM R&D, including the development of BIM applications relevant to the needs of various local industry stakeholders.

21. Lastly, the IPE commented that industry-led Research, Development and Demonstration (RD&D) supported by the Government and academia is key in driving
technology and process change. The private sector could leverage on the Institutes of Higher Learning (IHLs) to spur applied research and test-bedding of processes, technologies and products that have high impact on construction productivity for commercial use.

Issued by the Building and Construction Authority on 14 Oct 2014

About BCA
The Building and Construction Authority (BCA) of Singapore champions the development of an excellent built environment for Singapore. BCA’s mission is to shape a safe, high quality, sustainable and friendly built environment, as these are four key elements where BCA has a significant influence. In doing so, it aims to differentiate Singapore’s built environment from those of other cities and contribute to a better quality of life for everyone in Singapore. Hence, its vision is to have “a future-ready built environment for Singapore”. Together with its education arm, the BCA Academy of the Built Environment, BCA works closely with its industry partners to develop skills and expertise that help shape a future-ready built environment for Singapore. For more information, visit www.bca.gov.sg.
In Prefabricated Pre-finished Volumetric Construction (PPVC), complete flats or modules made of multiple units complete with internal finishes, fixtures and fittings are manufactured in factories, and are then transported to site for installation in a Lego-like manner.

PPVC can be considered for residential and mixed (residential and commercial) developments, as well as other accommodation type of developments such as hotels and hostels.

**Benefits of PPVC**
- PPVC can help to significantly speed up construction. It can potentially achieve a productivity improvement of up to 50% in terms of manpower and time savings, depending on the complexity of the projects.
- Furthermore, dust and noise pollution can be minimised as more activities are done off-site.
- With the bulk of the installation activities and manpower moved off-site to a factory controlled environment, site safety will also improve.

**PPVC in Singapore**
In terms of regulatory clearance, PPVC has already obtained In-Principle Acceptance from all the technical agencies for use in Singapore.

There are currently five suppliers (Swee Hong / Unitised Building Australia, Moderna Homes, Sembcorp EOSM, Unitised Building Australia / UB RUSH and Teambuild) for PPVC in Singapore.

Nanyang Technological University had awarded the tender to construct their upcoming student hostel project using PPVC to Singapore Piling & Civil Engineering Pte Ltd (part of BBR Holdings (S) Ltd) in partnership with Swee Hong Limited.
Separately, OUE has awarded the tender to develop the extension of the Crowne Plaza Hotel at Changi Airport to Dragages Singapore Pte Ltd. Dragages will be working with Unitised Building as the PPVC supplier.

<table>
<thead>
<tr>
<th>OUE Crowne Plaza Hotel Extension</th>
<th>NTU North Hill Hostel</th>
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</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="OUE Crowne Plaza Hotel Extension" /></td>
<td><img src="image2.png" alt="NTU North Hill Hostel" /></td>
</tr>
</tbody>
</table>
CROSS LAMINATED TIMBER (CLT)

CLT is manufactured from wood harvested from sustainably managed forests and fabricated by binding layers of timber at 90 degrees with structural adhesives to produce a solid timber panel. Unlike sawn timber, CLT can support heavier loads and be applied for structural and non-structural components in buildings. Also, as it is flexible and light (about 500 kg/m³, compared to 2,400 kg/m³ for reinforced concrete), it is usually used for the construction of walls, lift shafts and floors.

Depending on the dimensions of the building elements, the CLT panels can comprise more than three layers of timber and be manufactured in varying sizes, with a maximum length of 18 metres and thickness of 0.5 metres. The CLT panels are also cut in factories for window and door openings before they are assembled on-site.

Besides residential and hotel projects, CLT construction has also been used in other development types overseas, such as healthcare, sports halls and other institutional projects.

Benefits of using CLT for construction
- Reduction of waste on site and positive impact on the surrounding community (via reduced construction noise, truck movements and reduced concrete / general dust emission).
- Faster construction and fewer labour needed on site, compared to conventional construction methods
- Sustainability benefits throughout a building’s lifecycle: timber has the lowest energy and water consumption of any building material and it is a renewable structural building material. Even at time of demolition, CLT is recyclable and can be reused.
- CLT also provides a higher level of thermal performance, reducing heating and cooling costs for occupiers.
CLT in Singapore
In terms of regulatory clearance, CLT has already obtained In-Principle Acceptance from all the technical agencies for use in Singapore. However, its use is subject to certain conditions, such as the building height (generally up to 24 metres, or up 12 metres for healthcare projects) and fire safety design requirements (building to be fully protected by an automatic sprinkler system in accordance to the Code of Practice for automatic fire sprinkler system requirements).

There are currently three suppliers of CLT (Lend Lease, Venturer and CLT Builders). In Singapore, the Nanyang Technological University (NTU) has committed to adopt CLT for their upcoming sports hall.
ANNEX B – INFORMATION ON CDL BEING THE FIRST DEVELOPER IN ASIA TO ADOPT PPVC IN DEVELOPING A LARGE-SCALE RESIDENTIAL DEVELOPMENT – AN EXECUTIVE CONDOMINIUM AT CANBERRA DRIVE

1. HIGHLIGHTS

- CDL is the first developer in Asia to introduce the use of advanced construction technology, Prefabricated Prefinished Volumetric Construction (PPVC), in the development of a large-scale residential development - an Executive Condominium (EC) at Canberra Drive.

- Some 3,300 building modules will be used to build the EC which comprises eight 10 to 12-storey blocks with an estimated 636 units.

- By far, this is likely the largest application of PPVC in a large-scale residential project in the world.
2. **BENEFITS**

- PPVC, as an advanced construction technology, is easy-to-build. Prefabricated modules are hoisted into position, just like putting on Lego blocks.
- The PPVC method yields significantly higher productivity and construction quality.
- The use of PPVC for the EC is expected to increase construction productivity by more than 40% and will save some 55,000 man days, compared to using conventional construction method.
- As a result, the EC is expected to be completed four months ahead of schedule.
- Adopting PPVC also enhances worksite safety as prefabrication of the building modules in factories means fewer workers on site which in turn leads to fewer accidents and less down time.
- In addition, stringent quality control in factories ensures uniform and superior quality of prefabricated components, and reduces wastage of materials on site.
- Prefabrication of the building modules also leads to cleaner worksites by generating less waste.
- CDL’s EC at Canberra Drive is ideal to be constructed using PPVC because of the modularity of units, embraced from the design stage.

3. **PROJECT DATA**

<table>
<thead>
<tr>
<th><strong>Site Area</strong></th>
<th>28,562.5 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plot Ratio</strong></td>
<td>2.1</td>
</tr>
<tr>
<td><strong>Permissible Gross Floor Area</strong></td>
<td>59,981.25 m² (645,638 sq ft)</td>
</tr>
<tr>
<td><strong>Date of award of this GLS site</strong></td>
<td>29 Jan 2014</td>
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<tr>
<td><strong>Expected TOP</strong></td>
<td>2018</td>
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</tbody>
</table>

4. **PROJECT DESCRIPTION**

- No. of blocks: 8
- No. of storeys: 10-12
- No. of apartments: 636 units (estimated)

5. **NUMBER OF MODULES**

- Estimated total: some 3,300
6. CDL’S OTHER PIONEERING INITIATIVES TO ENHANCE CONSTRUCTION PRODUCTIVITY

- CDL’s vision is to conserve as it constructs and this has been its green philosophy since 1995.

- CDL has continuously explored sustainable innovations to construct buildings in a simpler, faster and better way, like putting Lego blocks together.

- Since early 2000’s, CDL has started using drywalls for internal partition walls, and prefabricated bathroom units (PBUs) in its new condominiums.

- Using PBUs can yield productivity improvements of up to 80%, compared to the conventional way of constructing bathrooms onsite which involves many wet trades. To date, CDL has installed over 10,000 PBUs in its condominiums.

- In 2013, CDL pushed buildable designs to new heights by leveraging the latest technology and know-how in prefabrication. For the first time in Singapore, CDL introduced a ground-breaking Prefabricated Modular System for the CDL Green Gallery at the Singapore Botanic Gardens, where six building modules were pieced together onsite in less than 24 hours. This method was not only quick to build, but it also significantly minimized environmental impact onsite.
ANNEX C – INAUGURAL BIM AWARD WINNERS

BCA has introduced the BIM Awards to recognise outstanding project teams that have implemented BIM in their projects from the design to construction stages.

This year, a total of 11 projects out of 17 entries received the BCA BIM Awards.

Key Assessment Criteria

- The extent of project modelled in BIM and involvement of project members.
- The extent of BIM objectives which have been achieved for the project.
- Extent and effect of design and construction collaboration with the use of BIM technology.
- Innovative process re-engineering introduced in the project.
- Innovative tools and add-on used to overcome obstacles faced.
- Any other key benefits and learning points gained from the use of BIM in the project.
- Identifying areas of transformation that the industry should undergo to improve its productivity.

BCA BIM Awards Assessment Panel

Co-Chairmen
Mr Lam Siew Wah  Mr Lee Chuan Seng
Deputy CEO (Industry Development) Emeritus Chairman
BUILDING AND CONSTRUCTION BECA CARTER HOLLINGS & FERNER
AUTHORITY (S.E. ASIA) PTE LTD

Members
Mr Thomas Seow  Mdm Choo Chai Foong
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Mr Joseph Toh  Ms Quek Chay Hoon
MOH HOLDINGS PTE LTD WING TAI PROPERTY MANAGEMENT
PTE LTD

Prof David Chua  Prof Robert Tiong
NATIONAL UNIVERSITY OF NANYANG TECHNOLOGICAL
SINGAPORE UNIVERSITY
Mr Loh Ju-Hon  
RDC ARCHITECTS PTE LTD

Mr Gan Chin Hwi  
PARSONS BRINCKERHOFF PTE LTD

Mr Silas Loh  
RIDER LEVETT BUCKNALL LLP

Mr Choo Tat Jin  
KIMLY CONSTRUCTION PTE LTD

Dr Tan Kee Wee  
BUILDING AND CONSTRUCTION AUTHORITY

**Winners of BCA BIM Awards 2014**

<table>
<thead>
<tr>
<th>No</th>
<th>Project</th>
<th>Award</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Singapore Sports Hub</td>
<td>Platinum</td>
</tr>
<tr>
<td>2</td>
<td>Bedok Mixed Development</td>
<td>Gold(^{PLUS})</td>
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<tr>
<td>3</td>
<td>The Integrated Building</td>
<td>Gold(^{PLUS})</td>
</tr>
<tr>
<td>4</td>
<td>Grace Assembly of God Church</td>
<td>Gold</td>
</tr>
<tr>
<td>5</td>
<td>Jewel@Buangkok</td>
<td>Gold</td>
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<tr>
<td>6</td>
<td>Mixed Development at 15 Cairnhill Road</td>
<td>Gold</td>
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<td>7</td>
<td>Residential Halls at North Hill Nanyang Technological University</td>
<td>Gold</td>
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<tr>
<td>8</td>
<td>Sengkang General and Community Hospitals</td>
<td>Gold</td>
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<tr>
<td>9</td>
<td>SKY VUE</td>
<td>Gold</td>
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<tr>
<td>10</td>
<td>1919 The Black and White Residences</td>
<td>Gold</td>
</tr>
<tr>
<td>11</td>
<td>St Thomas Condominium</td>
<td>Gold</td>
</tr>
</tbody>
</table>
Platinum: Singapore Sports Hub

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<thead>
<tr>
<th>Architectural Consultant</th>
<th>DP Architects Pte Ltd</th>
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<tr>
<td>Structural Consultant</td>
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<td>Sports Venue Design Consultant</td>
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<tr>
<td>Specialist Contractor</td>
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</table>

Key Features

- Extensive use of BIM during the design and construction stages such as visualisation, 3D coordination, analysis, construction, quantity take-off, and fabrication

- Adoption of the Big Room Concept where all key stakeholders were co-located in the same premises to break down traditional communication barriers and silos between project partners
GoldPLUS: Bedok Mixed Development

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<tr>
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<th>DCA Architects Pte Ltd</th>
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<td>Specialist Contractor</td>
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<td>Specialist Contractor</td>
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</tr>
<tr>
<td>Client</td>
<td>CapitaLand Limited</td>
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</tbody>
</table>

Key Features
- The use of BIM to review complex façade design and enable the generation of the final cutting list for the panels
- Extensive involvement of specialist contractors to define and build the BIM models
GoldPLUS: The Integrated Building (Changi General Hospital / St. Andrew’s Community Hospital)

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<th>Architectural Consultant</th>
<th>RDC Architects Pte Ltd</th>
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<td>Specialist Contractor</td>
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<td>Changi General Hospital</td>
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<tr>
<td>Client</td>
<td>St Andrew’s Community Hospital</td>
</tr>
<tr>
<td>Employer Agent</td>
<td>MOH Holdings Pte Ltd</td>
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</table>

Key Features

- Extensive use of BIM during the design and construction stages such as visualisation, 3D coordination, analysis, construction, quantity take-off, and facilities management

- Innovative use of BIM for 3D Roombook where users can be involved in the decision making process with 3D renderings and walk through of the rooms to experience, feel and touch items
Gold: Grace Assembly of God Church

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<tr>
<th>Architectural Consultant</th>
<th>LAUD Architects Pte Ltd</th>
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<td>Structural Consultant</td>
<td>LSW Consulting Engineers Pte Ltd</td>
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<td>Builder</td>
<td>Gammon Construction Pte Ltd</td>
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</tbody>
</table>

**Key Features**
- Innovative use of BIM-based Request for Information (RFI) as a communication media among different stakeholders on building design
- The use of BIM for site verification using smartphones and/or tablets
Gold: Jewel@Buangkok

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<th>Architectural Consultant</th>
<th>DCA Architects Pte Ltd</th>
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<tr>
<td>M&amp;E Consultant</td>
<td>Squire Mech Pte Ltd</td>
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<tr>
<td>Builder</td>
<td>Dragages Singapore Pte Ltd</td>
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<tr>
<td>Client</td>
<td>City Developments Ltd</td>
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</tbody>
</table>

**Key Features**

- The use of BIM to coordinate the alternate design and produce drawings for submission

- The use of BIM in the development of innovative construction techniques for the complex basement areas, precast and prefabricated bathroom units
Gold: Mixed Development at 15 Cairnhill Road

<table>
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<tr>
<th>Architectural Consultant</th>
<th>RSP Architects Planners &amp; Engineers (Pte) Ltd</th>
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<td>Woh Hup (Private) Limited</td>
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<td>Powen Electrical Eng. Pte Ltd</td>
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<tr>
<td>Client</td>
<td>CapitaLand Singapore Limited</td>
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</tbody>
</table>

**Key Features**

- The use of BIM for early detection of design discrepancy and clashes
- 3D virtual mock-up of the unit to enable the client and consultants to quickly analyse design alternatives, and solve design and constructability issues ahead of construction
Gold: Residential Halls at North Hill (Nanyang Technological University)

Architectural Consultant | P&T Consultants Pte Ltd
---|---
Structural Consultant | Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd
Builder | Singapore Piling & Civil Engineering Pte Ltd
Client | Nanyang Technological University

Key Features
- The use of BIM for visualisation, 3D coordination, and production of drawings
- The use of BIM to further enhance productivity in Prefabricated Pre-finished Volumetric Construction (PPVC) design
Gold: Sengkang General and Community Hospitals

Key Features

- Extensive use of BIM to develop models for Air Conditioning and Mechanical Ventilation, Fire systems, Electrical systems, Plumbing & Sanitary systems, Medical Gas systems, Façade, Logistics and Landscape

- The use of BIM to study hospital requirements such as general spatial requirements, key medical room layouts, and the paths of various patients
Gold: Sky Vue

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<tr>
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<td>Builder</td>
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<tr>
<td>Client</td>
<td>CapitaLand Singapore Limited &amp; Mitsubishi Estate Asia Pte Ltd</td>
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**Key Features**

- The use of BIM for coordination between different stakeholders such as client, consultants, and contractors
- Innovative use of BIM for code/standard compliance checking
Gold: 1919 The Black and White Residences

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<tr>
<th>Role</th>
<th>Company Name</th>
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<tr>
<td>Architectural Consultant</td>
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<td>Structural Consultant</td>
<td>KTP Consultants Pte Ltd</td>
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<td>M&amp;E Consultant</td>
<td>Squire Mech Pte Ltd</td>
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<tr>
<td>Builder</td>
<td>Woh Hup (Private) Limited</td>
</tr>
<tr>
<td>Client</td>
<td>Aurum Land (Private) Limited</td>
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</tbody>
</table>

**Key Features**

- The use of BIM to identify and avoid the clashes between building systems
- The use of BIM to improve site constructability
Gold: St Thomas Condominium

<table>
<thead>
<tr>
<th>Builder</th>
<th>Kimly Construction Pte Ltd</th>
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</thead>
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<tr>
<td>Specialist Contractor</td>
<td>Kim Chuan Gas Sanitary &amp; Construction Pte Ltd</td>
</tr>
<tr>
<td>Client</td>
<td>Bukit Sembawang View Pte Ltd</td>
</tr>
</tbody>
</table>

**Key Features**

- The use of BIM for headroom clearance check, visualisation, construction sequencing, and 3D coordination

- The use of BIM for preliminary study of the feasibility and extent of precast.
ANNEX D – PROFILES OF IPE MEMBERS

DR JOHN KEUNG KAM YIN
Chief Executive Officer | Building and Construction Authority
Chairman, IPE

DR JOHN KEUNG KAM YIN is the Chief Executive Officer of Singapore’s Building and Construction Authority (BCA) since June 2006. The Authority’s mission is to shape a safe, high quality, sustainable and friendly built environment. He is also Chairman, BCA International Pte Ltd; Chairman, BCA Centre for Sustainable Buildings Ltd, a collaboration centre with the United Nations Environment Programme; a Board Member of BCA, a member of the Supervisory Board, Solar Energy Research Institute of Singapore (SERIS) and a member of the Singapore-Tianjin Economic & Trade Council.

Prior to his current appointment at BCA, Dr Keung has served as Deputy Chief Executive Officer (Building) of the Housing & Development Board (HDB) overseeing the planning and development of new towns and public housing estates, as Director of Strategic Planning in the Ministry of National Development, as Deputy Chief Planner (Planning Policies) in the Urban Redevelopment Authority and later, as its Deputy Chief Executive Officer (Development Control and Corporate Development).

Dr Keung is an Adjunct Professor in Planning, Department of Architecture, National University of Singapore (NUS) and a member of the School Advisory Committee, School of Civil and Environmental Engineering, Nanyang Technological University (NTU). He graduated from the York University, Canada, in 1978 and subsequently obtained a Master of Science (Town Planning) in 1980 and a Doctorate of Philosophy (Town Planning) from the University of Wales, UK, in 1991. He also completed the Advanced Management Programme (AMP) at INSEAD, France, in 1997.

Dr Keung is a Chartered Town Planner and a Corporate Member of the Royal Town Planning Institute (MRTPI). He is also a Fellow of the Singapore Institute of Planners (FSIP). He was awarded the Public Administration Medal (Gold) by the Singapore Government for his contributions to public administration. Dr Keung was named one of the Top 25 Newsmakers of the Year 2013 by Engineering News-Record, a US-based engineering magazine published by McGraw Hill, for his work guiding Singapore as leader in sustainable design and construction.
MR PEK LIAN GUAN has more than 25 years of experience in project management for building works and civil engineering in Singapore, as well as real estate development activities in China. He graduated from the Loughborough University of Technology, United Kingdom, with a Bachelor of Civil Engineering (First Class Honours) in 1989.

Mr Pek started his career with Tiong Seng Contractors upon his graduation and rose up the ranks to become a Director in 1993, and assumed the role of Managing Director from 1997 onwards. In addition to his Managing Director role, Mr Pek was also appointed the Chief Executive Officer of Tiong Seng Holdings Limited since April 2008. Tiong Seng Holdings Limited was subsequently listed on the Mainboard of the Singapore Exchange in April 2010.

Under his leadership, Tiong Seng has amassed a solid track record and has won numerous quality, safety, innovation and environmental sustainability awards and accolades in both the local and international arena. Most recently, the company won the Singapore Quality Award (SQA), becoming the first construction builder in Singapore to win this prestigious award.

Beyond Tiong Seng, Mr Pek is also actively involved in various private and public sector committees. He is currently a Board member of Singapore’s Building and Construction Authority (BCA), Co-Chairman of BCA’s Construction Productivity Centre Advisory Panel (CPCAP), Board Member of the Singapore Green Building Council (SGBC), Assessment Committee Member of BCA Construction Excellence Awards Committee, Member of BCA Academy Advisory Panel, Member of Ngee Ann Polytechnic Council, Council Member of the Singapore Chinese Chamber of Commerce (SCCCI), Member of Singapore Quality Award Governing Council and Council Member of Singapore Business Federation (SBF). Mr Pek is also serving as the Chairman on the Board of Governance of UOB-SMU Asian Enterprise Institute, Chairman of the BCA Engineering Design Safety Awards Committee and Chairman of the BCA Quality Assurance Advisory Committee.
MR KWEK LENG JOO is the Deputy Chairman of City Developments Limited (CDL). As the President of Singapore Compact for CSR, Mr Kwek has been playing an active role in raising the importance of CSR to the local business community and the youth.

Since 1995, Mr Kwek’s vision to “Conserve as we Construct” has led CDL to be recognised both locally and globally for its firm commitment to sustainability. It is the first developer accorded with the Green Mark Platinum Champion Award and Built Environment Leadership Platinum Award by BCA. To date, CDL has developed over 70 BCA Green Mark properties, including 32 Platinum projects. In addition, CDL received the Channel NewsAsia Green Luminary Award 2012 and was named Asia Pacific Green Builder of the Year 2012 by Frost & Sullivan. In 2013, CDL was the recipient of the inaugural Best Sustainability Practice honour at the IR Magazine Awards – South East Asia. In 2011, Mr Kwek was honoured by the Society of Project Managers as its Honorary Fellow Member in recognition of his pioneering efforts in raising the standards of sustainable practices in the industry.

Internationally, CDL is the first Singapore company listed on three leading sustainability benchmarks – FTSE4Good Index Series (since 2002), Corporate Knights’ Global 100 Most Sustainable Corporations in the World (since 2010) and Dow Jones Sustainability Indices (since 2011). Since December 2012, CDL has been listed on the Euronext Vigeo – World 120 sustainability index and it was named a Regional Sector Leader for Asia in the Global Real Estate Sustainability Benchmark (GRESB) Report in 2013. Over the years, CDL’s innovative green developments have also garnered international acclaim, with 7 & 9 Tampines Grande and 11 Tampines Concourse winning the FIABCI Prix d’Excellence Awards under the Sustainable Development Category in 2011 and 2012 respectively.

Mr Kwek believes in the importance of giving back to the society, and has always made time to serve the country and the community in spite of his heavy work commitments. In 2011, Mr Kwek was conferred the Outstanding Volunteer Award by the Ministry of Community, Youth and Sports. In recognition of his contributions via his various business and civic appointments, Mr Kwek was bestowed the Public Service Medal in 2000 and the Public Service Star in 2005. He was also appointed a Justice of the Peace by the President of the Republic of Singapore in 2013.
MR LIM MING YAN is President and Group Chief Executive Officer of CapitaLand Limited. He is a Director of CapitaLand Limited, as well as Deputy Chairman of CapitaMall Trust Management Limited, CapitaCommercial Trust Management Limited, CapitaRetail China Trust Management Limited and Ascott Residence Trust Management Limited.

Mr Lim is a Board Member of the Building and Construction Authority of Singapore, Director of Business China, an organization that promotes bilingualism and biculturalism between Singapore and China, as well as Board Member of the Singapore Tourism Board.

He was the Chief Operating Officer of CapitaLand from May 2011 to December 2012 and Chief Executive Officer of The Ascott Limited from July 2009 to February 2012. Prior to joining Ascott, Mr Lim was the Chief Executive Officer of CapitaLand China Holdings Pte Ltd from November 2000 to June 2009, responsible for growing CapitaLand into a leading foreign real estate developer in China.

Mr Lim obtained first class honours in Mechanical Engineering and Economics from the University of Birmingham, United Kingdom in 1985. He attended the Advanced Management Program at Harvard Business School in 2002.
MR KARL HEINZ WEISS is currently the Senior Business Development Manager at Lend Lease Corporation. He is passionate about the environment and the use of sustainable materials within the global construction industry. He has been educating new overseas markets to the potential of solid timber and pioneering its use globally, to effect a fundamental change in the specification and use of building materials to provide zero or low cost impact construction solutions. Having been in the industry for many years, he has gained a deep insight and an extensive knowledge and experience of working with timber, including Cross Laminated Timber (CLT), at all scales.

Weiss began his career in the timber and architectural industry in 1993. He was a Consultant at Construction Resources Ltd, London – Britain’s First Ecological Building Centre where he advised on the management of product strategy and introduced new products. His designs were recognized by Red Dot Design Award Germany, Design Award Baden-Württemberg for sustainable design, Germany.

In 2005, Weiss introduced engineered timber products to the UK and created a market within the UK construction industry. He also led and developed the product application from a niche application (single family houses) to a generic building product for the UK construction industry. He had established a global recognition of engineered timber buildings in UK.

In 2012, Weiss took upon the role of Director and Senior Consultant in Timberfirst Ltd – London. He supported the Lend Lease Corporation to develop and deliver their solid timber ambitions especially on engineered timber products. He had also worked with the State Government of Baden-Württemberg, Germany and organizations in Scotland, UK on increasing the “home” markets for and on manufacturing opportunities for “homegrown timber products”.

Ir CONRAD WONG is currently the Vice-Chairman of Yau Lee Group and Managing Director of Yau Lee Construction Co Ltd and Yau Lee Wah Concrete Precast Products Ltd., Vice Chairman of REC Engineering Company Limited as well as Chief Executive Officer of VHSoft Technologies Company Limited. Ir Wong is active in public and community services. He is the Chairman of Occupational Health and Safety Council and Hong Kong Green Building Council, Member of the Construction Industry Council, Member of the Antiquities Advisory Board, Member of the Land and Development Advisory Committee, Member of MPF Industry Schemes Committee, Member of Vocational Training Council, as well as Member of the Panel on Promoting Testing and Certification Services in Construction Materials Trade under the Hong Kong Council for Testing and Certification. In the past, Ir. Wong served as President of the Hong Kong Construction Association from 2005 to 2011, the President of the International Federation of Asia and West Pacific Contractors’ Associations from 2010 to 2011 and the Chairman of Pneumoconiosis Compensation Fund Board.

Ir Wong is very proactive in the implementation of the semi-precast construction system. The construction cycle for a public housing project was speeded up from 8 days per floor (Shek Yam Estate Ph.1, 1986) to 6 days (Choi Fung Court, 1996) and further to 4 days (Tong Ming Court, 1997) while at the same time enhancing the quality and improving safety. In 2005, he developed the volumetric precast bathroom for Hong Kong Housing Authority. After several years of development and improvement, the 3rd generations of volumetric precast bathroom includes a structural wall design are currently being installed in housing development project. Under his guidance, the total performance of Yau Lee Construction has taken a big leap forward by winning the Golden Award for Building Sites (Public Sector) Safety Award Scheme for the Construction industry in 2005 and 2007.

Ir Wong cares about and has contributed his efforts to the sustainable development in Hong Kong. Implementing information technology and green practices are the most essential and important part in Construction industry. He is actively involved in leading the industry to set the industry standards to promote green buildings includes the development of a Hong Kong based Green Building Product Labelling Scheme and use of advance technology such as Building Information Modelling in Hong Kong.
Ir Wong actively shares his professional experiences through his academic contribution as the Adjunct Professor in the Department of Civil Engineering in the University of Hong Kong for a term starting in September 2010, the Chairman of Divisional Advisory Committee for Division of Building Science and Technology of City University of Hong Kong, an Adjunct Professor in the Department of Building and Real Estate of the Hong Kong Polytechnic University as well as the Member of Advisory Committee on Building and Real Estate in the Hong Kong Polytechnic University. He won the "2001 Hong Kong Outstanding Young Digi Persons Award" and the "Bauhinia Cup Outstanding Entrepreneur Award 2002" presented by the Hong Kong Polytechnic University. He is a member of Hong Kong Institute of Engineer, a Fellow member of both of the Chartered Institute of Building and the Institute of Civil Engineers (United Kingdom). In 2009, He has appointed as the Honorary Fellow of Vocational Training Council and Honorary Fellow of University of Central Lancashire.
MR SANDRO BANA is the Chief Executive Officer of Bathsystem S.p.A Group Italy. Having been in the precast industry for more than 30 years, he has gained a deep insight and an extensive knowledge in precast systems, especially Prefabricated Bathroom Units (PBU).

Mr Bana started work in the precast industry since 1980. In 1984, he started exploring the PBU market in Europe as an Assistant General Manager. He also helped to set up a new concrete PBU factory.

In 1993, he was one of the founders of Bathsystem which is a leading company in Europe for the fabrication of lightweight concrete PBU. Under his leadership, Bathsystem has been actively developing different type of PBU systems and raising the quality of PBUs. In 2006, Bathsystem added to his production range a ‘super-light’ steel framed PBU. Today, the company is recognized as a top quality producer of PBUs in ten different countries in Europe.
KAZUMI YAJIMA

General Manager (BIM and Productivity) | Kajima Corporation
Panel Member (International), IPE

MR KAZUMI YAJIMA is the General Manager of Kajima Corporation, in charge of the Building Information Modeling (BIM) and Productivity Improvement Division. Kajima Corporation is a world renowned company and major builder in Japan. He has been with Kajima Corporation for 30 years since April 1984 and was active in promoting BIM and construction productivity.

Mr Yajima has many years of experience in managing projects, including notable major works and large projects such as Department Store in Shibuya, the Headquarter of Japan Tobacco (JT) as well as the Headquarter and Studios for Tokyo Broadcasting System (TBS). His passion for promoting productive construction technology has spurred him from being a Section Chief (2002) in the Technology Development Department to become the Director of Technology Development Department and Director of BIM & Productivity Improvement Division.

Over the years, Mr Yajima has attained several licenses and qualifications, namely, First Class Registered Architect (1990), First Class Registered Construction Manager (1998), Registered Construction Manager for Seismic Isolation Works (2002) and Registered Technical Supervisor (2010).
MR KEVIN CLARKE is currently the Business Development Manager of Caledonian Modular. He has expertise knowledge and experience in all major off-site building solutions including volumetric modular, timber frame, SIPs and bathroom pods.

In 2011, Mr Clarke joined Caledonian and was responsible for the restructuring of its business and succeeded with over 25% growth in the following year. Initiated and driven by Mr Clark, Caledonian started a Bathroom pod division through the part-acquisition of the Gateway pod brand. It produces high quality Prefabricated Bathroom Units (PBUs) which can be tailored to meet the requirements of almost any building design and internal specification.

In 2013, Mr Clarke was tasked with developing business within the low rise residential sector for Caledonian. Today, Caledonian Modular is a leading force in the offsite modular building industry with the expertise and production capability to deliver high quality, cost-effective buildings that meet the current and future needs of their users.
MS AMY MARKS is the President and Owner of XSite Modular Consulting since February 2011. XSite is a Modern Methods of Construction (MMC) consulting firm focused on enabling and optimizing the use of off-site and prefabrication in large, complex, technology-embedded buildings. MMC describes innovative solutions in building products, software, tooling, methods and construction system innovations that increase the levels of safety, productivity, sustainability, building lifespan, construction/operational cost savings and schedule certainty and speed of construction. As a member of the project team, her expertise allows clients to achieve their desired program and design while attaining the maximum benefits of MMC in design, construction, and installation of prefabricated components, subassemblies and modular building systems. The XSite team has some of the largest and most well-known global companies as their clients today.

Ms. Marks and the XSite team have experience with all types of buildings including multi-story/family dwellings (high-rise apartments, student housing, military housing, hotels), healthcare buildings (hospitals, patient rooms, MRI centers), government buildings (military, embassies, schools, offices) and mission critical buildings (data centers, telecommunications, switch stations, power generation). Their experience includes many kinds of structural systems including structural steel, light gauge load-bearing panelized systems, hybrid systems and some precast.

As an MMC Consultant, Ms. Marks works with clients all over the world. She has launched MMC-focused companies producing full volumetric steel and concrete modules as well as subassemblies like mechanical racks and bathroom PODS. She and her team have extensive fabrication and factory start-up experience including factory layout and design, creating standard designs, estimating, production processes, quality control implementation and oversight, capital budgeting, business strategy and sales and marketing analyses, human resources recruiting and training, and global transportation planning and logistics. The XSite team has experience in modular installation on five of the seven continents.

Prior to XSite Modular, Ms. Marks was President & Chief Sales and Marketing Officer at Kullman, which was the oldest and most respected steel and concrete permanent modular building company in the US.
Ms. Marks is a graduate of University of Florida, with a Bachelor of Science in Public Relations and an alumna of the prestigious Harvard Business School. She is often quoted as an industry thought leader and has been featured in several national publications. She has been recognized as one of New Jersey, USA’s Top 40 under 40 by NJ BIZ magazine and Top 50 Most Influential Women in Real Estate. She has published several white papers including Risk Mitigation through Industrialized Construction: Integrating Prefabricated, Modular Cable Landing Stations into Build-Out Programs. Ms. Marks is a member of MBI and a highly sought after speaker for many international conferences on construction.
MR KEVIN JAMES HILL is the Managing Director of Hill Consulting. He is a UK citizen who has resided in Singapore since 1992, whose background is in construction management, before establishing Venturer timberwork in 1995. He managed on behalf of a main contractor several local projects including MRT, JTC and Mindef projects. Mr Hill has consulted on and built an impressive array of award winning and noteworthy timber feature projects.

His numerous innovations include the floating powered water villa and a variety of modular, concealed and engineered approaches to working with timber.

Mr Hill and his team have built several glue laminated structures in Singapore and are poised to build the first CLT structures in the Maldives. He is working closely with stakeholders here in terms of navigating Singapore’s best approach to exploiting the benefits of Glulam and CLT.

In 2008, Mr Hill founded “Double Helix”, a company that has pioneered the use of DNA testing in the timber industry in order to prevent fraud. He was awarded British Entrepreneur of the year in 2009. In 2013, he was named by the ABC carbon publication as one of the top 100 Sustainability leaders worldwide.
MR SNG CHENG KEH is Housing and Development Board's (HDB) Deputy Chief Executive Officer (Building). He oversees the planning and development of HDB new towns, upgrading and redevelopment of older estates to meet the needs of the population, as well as the continual advancement of building technology. He chairs the Management Design Review Panel for all HDB's building projects.

Mr Sng joined HDB in 1978 after graduating from the University Of Singapore, with a Bachelor of Science (Building) degree. He has since held various key appointments in HDB. He was the Director of HDB's Industrial Properties Department from 1991 to 2007. During this time, he was instrumental in establishing and raising the standards for the development and management of HDB's industrial properties. He was subsequently appointed Director (Development & Procurement) before taking on the appointment of DCEO (Building) in Sep 09. Besides his appointments in HDB, Mr Sng is a Director of EM Services Pte Ltd, and a member of the BCA Construction Productivity Centre’s Advisory Panel. He was also previously a Director on the board of CESMA International and Chairman of HDBay Pte Ltd. His strong leadership is exemplified in other commendations such as his appointment as an Honorary Aide-de-camp to the President from 1993 to 1998. Until recently, he has also made significant contribution to Singapore’s Total Defence as Brigade Commander of the Singapore Infantry Regiment.

In recognition of Mr Sng’s significant contribution to the Singapore public service, he was conferred the Public Administration Medal (Silver) in 1999 and Public Administration Medal (Bronze) (Military) in 2005.
MR CHUA CHONG KHENG is the Deputy Chief Executive (Infrastructure & Development) of the Land Transport Authority (LTA). He has close to 30 years of experience in urban land transport infrastructure development and management in Singapore. He was amongst the pioneers involving in the Mass Rapid Transit (MRT) System projects in Singapore. Following the initial phases of MRT System projects, he headed the pilot studies and procurement evaluation of the first Light Rapid Transit (LRT) System in Singapore and managed the Electrical and Mechanical (E&M) Systems procurement and design for the world’s first fully automated and systems integrated North-East Line (NEL) heavy metro system.

In year 2000, Mr Chua was appointed as a Project Director for Stages 1 and 2 of the Circle Line (CCL) Project and the overall Project Director for the E&M Systems for the entire CCL, a fully automated medium capacity rapid transit system. He was subsequently appointed Group Director, with an overall responsibility for the Contracts and Procurement, Cost Control and Project Budgeting, Project Planning and Programming as well as Safety Management functions.

From year 2006 to 2008, Mr Chua was seconded to the Ministry of Transport as Director to set up the International Relations and Security Policy Division, responsible for the International Relations, Security Policy development and Emergency Preparedness aspects of the aviation, maritime and land transport.

Upon returning to LTA in 2008, Mr Chua took on the position of Group Director, Rail, responsible for the implementation of the various enhancement works on the existing MRT lines, extension lines as well as the new Thomson MRT Line (TSL) and Eastern Regional MRT Line (ERL).

In year 2012, Mr Chua was appointed as the Deputy Chief Executive (Infrastructure & Development) of LTA, and his portfolio included overseeing the planning, design, engineering and implementation of all road and rail infrastructure and systems projects such as the Downtown Line, Thomson Line, Eastern Region Line, Marina Coastal Expressway, North South Expressway, etc.

Beside his wide portfolio at LTA, Mr Chua is also a Director of LTA’s subsidiaries, namely the MSI (Global) Pte Ltd, MSI (Shanghai) Engineering Consultancy Pte Ltd and TransitLink Pte Ltd.
MR MURRAY DUNDAS is the Managing Director of McConnell Dowell South East Asia Private Limited, responsible for all aspects of the company operations in Singapore, Malaysia and Indonesia Riau Islands including regional fabrication and plant yard in Batam. He has worked in Asia for over 20 years and has multi-disciplined experiences including marine, civil, mechanical and pipeline projects.

During his time at McConnell Dowell South East Asia, he has overseen many key projects including the Downtown Line stage 2 civil works (C916 Beauty World station and tunnels and C917 SAV and KAP stations and tunnels), Keppel Power Station Phase 2, Jurong Port J1 and J2, Sentosa Cableway expansion and Jurong Island Phase 4 Reclamation.

Before his appointment as the Managing Director, he was the Operation Manager for civil works. He was in charge of Civil Division contracts to ensure that projects were running to schedule and constructed in a timely manner in accordance with each respective project specification and construction programme.

Prior to joining McConnell, Mr Dundas worked in the Port of Melbourne Authority. He was involved in projects including land and marine pile driving, reinforced concrete and timber wharf construction and maintenance to existing wharf structure.
MR PAUL CHAIN SHAU WOO is currently the Chief Executive Officer of NTU Development & Facilities Management which oversees the physical development, operation and maintenance of all NTU facilities and grounds in support of the academic, research and administrative functions of the University. Mr Chain led the department to embark on the development of the NTU Yunnan Campus under the new Master Plan.

Prior to NTU, Mr Chain was the President and CEO of Sembcorp Engineers and Constructors. He was instrumental in shifting the business focus to higher-value civil and infrastructure projects such as rock caverns, deep tunnels, light rails and reclamation as well as the acquisition of Simon-Carves (U.K.) which has upstream engineering capability in petrochemical and agrochemical projects. Sembcorp Engineers and Constructors has become the biggest engineering and construction company in Asean with a turnover of about S$800 million. Besides Asean, the Company has operations in China, India, Middle East and U.K. During this period, as a secondary duty, Mr Chain was also overseeing a building material company - RDC Holdings and a property company - Sembcorp Property within the Sembcorp Group. Total turnover for the two companies was about S$300 million.

Mr Chain has diversified experience, before joining Sembcorp, Mr Chain served as the Managing Director and CEO of Liang Court Holdings and was involved in the development, construction and operations of projects in Singapore, Indonesia, Thailand, U.K., Australia, Vietnam and China. He was the CEO of Singapore Technologies Construction. He also worked in Gammon (Hong Kong) and United Overseas Bank. Mr Chain started his career in the then Public Works Department and was involved in the development of the Changi Airport.
LEE KUT CHEUNG

Managing Director | RSP Architects Planners & Engineers (Pte) Ltd
Local Prominent Professional, IPE

MR LEE KUT CHEUNG is the Managing Director of RSP Architects Planners & Engineers (Pte) Ltd. He is part of the management team charting the strategic directions and business performance of the firm, including leading the architectural division. He has more than 40 years of extensive experience and expertise as a design architect and managing principal. He is the principal architect behind many iconic residential, commercial and institutional projects in Singapore. He is well recognized for the award winning Institute of Technical Education (ITE) regional campuses in the East and Central of Singapore.

Under his guidance, RSP has extended its geographic reach in India, China and Vietnam. Tapping into the firm’s diverse talents and its multidisciplinary expertise, Mr Lee has built up dynamic, integrated teams able to respond to evolving urban challenges and deliver quality designs and solutions for clients.

He has been actively involved in shaping industry practices and standards, serving in committees and boards, from the Building and Construction Authority (BCA) Board, to the Board of Architects and the Urban Redevelopment Authority’s Design Advisory Panel. He is a Registered Architect and a Fellow of the Singapore Institute of Architects, APEC and ASEAN Architect and a corporate member of RIBA, UK. He holds a Bachelor of Architecture from the Hong Kong University and postgraduate diploma from the Architectural Association, London.
MR YAM AH ME is the Managing Director at Sembcorp Design and Construction Pte Ltd. Prior to this appointment, he was the Chief Executive Director of People’s Association. In Mr Yam’s 37-year career in the public sector, he held various portfolios and senior leadership positions, including the Chief Executive of Land Transport Authority, Deputy Secretary at the Ministry of Transport, Dean/Chief Executive Officer of the Civil Service College and Chief of Staff of the Republic of Singapore Air Force.

Mr Yam graduated from the University of New South Wales with a first class Engineering degree on a Singapore Armed Forces Overseas Training Award. He also won the Queen’s Medal Award from the Royal Military College, Duntroon, Australia. Mr Yam obtained his Masters in Business Administration degree from the National University of Singapore. He obtained his Masters of Public Administration degree from Harvard University, Kennedy School of Government where he was conferred the Lucius N Littauer Fellow Award. Mr Yam completed the Advanced Management Programme at the Harvard Business School. He was awarded The Public Administration Medal (Silver) (Military) in 1992 and the Public Administration Medal (Gold) in 2008. He was conferred the Eminent Business Alumni Award by NUS Business School in 2012.
MR PANG YEE EAN is the Chief Executive Officer of Surbana International Consultants Pte Ltd. Surbana is a global multi-disciplinary urbanisation consultancy firm with an engineering and design track record of more than 50 years. It offers full-service urbanisation consultancy solutions, including urban planning, architecture, engineering, quantity surveying, project and construction management, coastal engineering and infrastructure, as well as building technology and city management. Surbana’s expertise has taken it to over 90 cities in 26 countries. Some of its notable projects are Clementi Mixed-use Development in Singapore; Punggol Waterway in Singapore; Botanica integrated township in Chengdu, China; Tianjin Eco-city in Tianjin, China; Bab Al Qasr Hotel and Service Apartments in Abu Dhabi; Kigali City master plan in Rwanda; and redevelopment master plan for Cazenga, Sambizanga and Rangel, Angola.

Prior to Surbana, Mr Pang was in Ascendas Pte Ltd where he held various senior appointments, including Head of North India, Deputy CEO of Ascendas Services and Senior Vice President of Real Estate Funds. Before joining Ascendas, Mr Pang served as the CEO of Abecha Pte Ltd, a joint venture between JTC, Microsoft and SESAMi to provide e-procurement services to JTC’s tenants.

Mr Pang started his career in JTC as an electrical project engineer. An advocate of developing talents and expertise, he believes in inspiring young Singaporeans to build their careers in the engineering profession to contribute in Singapore’s nation building.
DR CALVIN KAM is the Director of Industry Programs and a Consulting Associate Professor at Stanford University’s Center for Integrated Facility Engineering (CIFE), where he specializes in strategic innovation such as Management Scorecards, Building Information Modelling (BIM), Virtual Design and Construction (VDC) and Sustainable Developments. Dr Kam is the Founder of International Building Innovation & bimSCORE – the “GPS Navigator” for any enterprise or project team charting a course for Building Information Modelling.

Since 2003, Dr Kam has been a Co-founder and currently the Senior Program Expert of the National 3D-4D-BIM Program with GSA Public Buildings Service. Since 2012, China National BIM Standards and National BIM Union have appointed Dr. Kam as the only international Honorary Director.

Dr Kam is also a Principal Investigator with Disney Research China. Elected by the Knowledge Leadership Assembly of the American Institute of Architects (AIA), Dr Kam serves on the 2013-15 AIA Board Knowledge Committee. He is the 2011-2014 National Co-Chair of AIA Center for Integrated Practice, and was the 2010 & 2011 National Chair of AIA Technology in Architectural Practice (TAP) Knowledge Community.

A licensed architect and a licensed engineer, Dr Kam was a recipient of various AIA, ASCE, SOM, Stanford University Fellowships as well as Engineering News Record’s “20 under 40” awards.