

MEDIA RELEASE

BCA ADDS WOW FACTOR TO INDUSTRY WITH 3D EXPERENTIAL TECHNOLOGY

- *First-of-its-kind large-scale immersive and experiential facility for Building Information Modelling (BIM), Virtual Design and Construction (VDC) and Lean Construction to enhance communication and collaboration between all stakeholders in a project to improve productivity.*
- *Industry firms and Institutes of Higher Learning (IHLs) can now utilise the Centre, for training and experiential learning purposes.*

Singapore, 21 December 2015 – BCA is championing for drastic change in the way we build. All built environment professionals and stakeholders such as owners, designers, main contractors, specialist contractors and sub-contractors of a building project can now fully immerse themselves to walk through virtual 3D buildings. They can simulate the construction process in a 3D virtual environment before buildings are physically built on site, as opposed to viewing conventional drawings and models on paper and screen.

2 This feature is part of the Centre for Lean & Virtual Construction, a new million-dollar facility to further enhance communication, work effectiveness and efficiency among all stakeholders in a construction project. Developed by BCA, the Centre is first of its kind in Singapore for the built environment sector, and is equipped with an array of latest 3D immersive technologies and Building Information Modelling (BIM) software for Virtual Design and Construction (VDC) with a special focus on Lean Construction. It aims to gear the industry towards both mind-set change and process change based on the concepts of Lean & Virtual Construction, leading to drastic improvement in construction productivity. It is also the first large-scale fully immersive and experiential learning facility for VDC in Southeast Asia, with industry firms sponsoring most of the software components.

3 The Centre facilitates the VDC process, where stakeholders of the entire construction value chain can converge and bring their respective designs to life before anything is built physically. The VDC process integrates the design, prefabrication and construction phases of a project, allowing all stakeholders to collaborate and identify upstream design clashes, plan for the prefabrication process, and simulate the downstream construction workflow virtually with process and production improvements in mind through Lean Construction principles. This is effectively a full-dress rehearsal before actual construction works start on site. This will lead to a quantum shift in work processes as compared with conventional methods of construction, with reported productivity improvements averaging more than 20%.

4 Mr Desmond Lee, Senior Minister of State for Home Affairs and National Development, said, “Technology and innovation will drive transformative change in the built environment sector. It is now possible to virtually walk through building plans before actual construction begins – this will enable firms to build faster and more effectively. Technologies such as BIM and VDC are key enablers in the push for greater productivity in the sector. We are changing the way we build and this presents exciting opportunities for young, talented Singaporeans. Students will now need to acquire higher levels of knowledge and skills as the sector evolves and becomes more technologically driven. I hope that more young Singaporeans will take a closer look at exciting courses and careers in the built environment sector.”

5 The Centre is open for industry and academia users to try out the concepts, technologies and tools, without having to expense the associated large initial outlays. With advancements in technology, the Centre will continually import, showcase and experiment with state-of-the-art solutions and tools, through partnerships and sponsorships.

6 Mdm Vivien Heng, Director at RSP Architects Planners & Engineers said, “It is a privilege to be involved in the opening of the Centre for Lean & Virtual Construction. There are no other similar set ups like this in Singapore that integrates in one venue, the many possibilities of construction IT and of virtual design & construction processes. In this Centre, firms like ours can sharpen our skills while keeping updated on the latest technologies. The Centre will certainly be useful to all in our industry who are keen to explore the huge potential of VDC.”

7 Dr John Keung, CEO of BCA said, “The Centre is a metaphor of the exciting prospects of construction IT in the built environment sector, demonstrating the power of VDC, BIM and Lean Construction on the design, construction and delivery of construction projects. However, investing in such technology may not be the priority for the average industry firms, due to the relatively high investment costs. With the opening of this one-stop Centre, we hope industry firms of all sizes could come forward to take the first step in transforming their processes. They will be able to experience for themselves how powerful and useful these technologies, lean principles and tools can be, and when that happens, equipping themselves with such tools to stay ahead of the competition will be the next natural thing to do.”

8 To gear up competency in the sector, the BCA Academy will launch three new Specialist Diploma programmes in DfMA (Design for Manufacture & Assembly), Lean Construction and VDC next year.

Enclosed:

Annex A – Factsheet on Centre for Lean & Virtual Construction

Annex B – Factsheet on Singapore’s Journey in BIM and VDC

Issued by the Building and Construction Authority on 21 December 2015

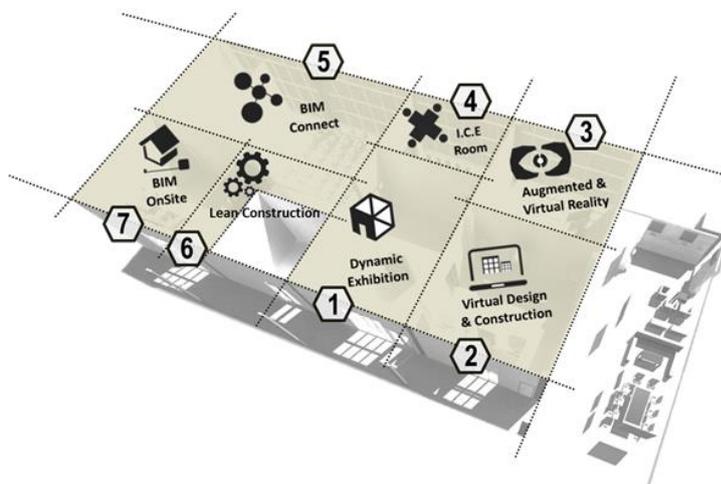
About Building and Construction Authority

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, 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.

Factsheet on the Centre for Lean & Virtual Construction

Address	Level 2, Block A (Zero Energy Building) BCA Academy 200 Braddell Rd Singapore 579700
Some Key Sponsors	Archibus (SnL Nexus), Autodesk, Bentley System, Crown Systems, FM Systems, Fraunhofer, Glodon, Graphisoft, Leica, Newforma, novaCITYNETS, Redstack, RoyceMedia Technologies, Tekla, Topcon, Trimble

Zones



<p>Zone 1 Dynamic Exhibition</p> <ul style="list-style-type: none"> Objectives, capability and setup of the Centre 	<p>Zone 5 BIM Connect</p> <ul style="list-style-type: none"> Live experience of immersive virtual reality on big screen with 3D glasses Live demonstration by DCA Architects
<p>Zone 2 Virtual Design and Construction (VDC)</p> <ul style="list-style-type: none"> VDC, BIG Room concept, scenario-based training Live demonstration by Surbana Jurong and Straits Construction 	<p>Zone 6 Lean Construction</p> <ul style="list-style-type: none"> Importance and benefits of Lean Construction
<p>Zone 3 Augmented Reality/Virtual Reality (AR/VR)</p> <ul style="list-style-type: none"> Hands-on experience of AR/VR tools Live demonstration by Shimizu Corporation 	<p>Zone 7 BIM Onsite</p> <ul style="list-style-type: none"> Simulated on-site setting for "BIM to Field" and "Field to BIM" Case examples in Singapore Live demonstration by Hydronav-Trimble
<p>Zone 4 Integrated Concurrent Engineering (ICE)</p> <ul style="list-style-type: none"> Concept of ICE Live demonstration by RSP Architects Planners & Engineers 	

Factsheet on Singapore's Journey in BIM and VDC

1 In line with the drive to raise productivity for sustained economic growth, the Building and Construction Authority (BCA) launched the 1st Construction Productivity Roadmap in 2010 to transform the construction industry and raise its productivity in the long term. Prior, in 2008, BCA had already begun pushing for the use of building information modelling (BIM) technology to transform the construction industry. With BIM identified as one of the initiatives under the Construction Productivity Roadmap, the first Singapore BIM Roadmap was birthed in late 2010, with the aim that 80% of the construction industry will use BIM by 2015.

2 In early 2015, the 2nd Construction Productivity Roadmap was launched, with the aim to drive the sector towards achieving more aggressive productivity gains over the next 5-year period to meet the national productivity target of average 2-3% improvement per annum from 2011 to 2020. This would require a strong productivity mindset among key stakeholders in the entire value chain to design and construct buildings with less manpower. One of the three focus areas is for a better integrated construction value chain:

a. We need to **enhance the collaboration among the various stakeholders through the Virtual Design and Construction (VDC)**. The VDC process helps integrate design, prefabrication and construction, to identify upstream design clashes and simulate downstream construction workflow. It allows construction to occur twice – first in the virtual environment, almost like a full-dress rehearsal, before the actual on-site construction.

b. The **use of Building Information Modelling (BIM) technology is integral to the VDC process**, to surface problems and clashes before actual construction begins. In addition, BIM also supports the integrated DfMA approach where the digital model is used to drive production planning and automation. To reap the full potential of BIM, we have to get all the parties across the value chain to leverage on BIM technology.

c. To promote an environment for collaboration among developers, consultants, builders and suppliers in the built environment sector, **BCA provides funding for projects that adopt Virtual Design and Construction (VDC) under the Construction Productivity and Capability Fund (CPCF)**.

d. In addition, the **BCA Academy has a suite of training programmes for senior, middle management and also technicians to equip the industry with the necessary knowledge and skills in the area of VDC**. These training will be conducted in partnership with the renowned Centre for Integrated Facility Engineering (CIFE) of Stanford University.

3 In October 2015, an **International Panel of Experts (IPE) session on BIM** convened to discuss how Singapore's built environment sector can further leverage on the technology to drive higher productivity. This was the third IPE session with a panel comprising six overseas experts and fifteen local prominent professionals from the industry, academia and the public sector. The recommendations by the IPE would serve as inputs for BCA to formulate the 2nd BIM Roadmap.

a. A key recommendation by the IPE included **having more stakeholders involved early during the planning stage of construction and adopting VDC**. For instance, the adoption of early contractor involvement in the project enables the consultant and contractor to work together to design for labour-efficient construction and resolve any constructability issues on the building's design as early as possible. With the involvement of facilities management professionals at the onset of the design process, they can also help assess the cost implications of various design options and ensure ease of maintenance throughout the lifecycle of the building.

b. Furthermore, **engaging project stakeholders through the use of BIM is important in understanding their needs early and helping them see the impact of design changes upfront**. The panel also commented how BIM and VDC can support more streamlined and lean construction methods through proper planning and control of work sequences.

c. Lastly, the IPE recommended that **BIM related trainings should focus on cross discipline process integration and transformation**. Singapore should also scan the horizon, assess our strategic strengths and focus its R&D in areas where Singapore has strategic strengths and potential opportunities.

4 The Centre for Lean & Virtual Construction is the latest initiative that allow industry and academia users to come on board to trial the concepts, technologies and tools available, without having to expense large initial outlays. It aims to gear the industry towards a mind-set and process change based on the concepts of Lean & Virtual Construction, leading to sustained productivity.

5 The adoption rate for BIM in the industry has gone up from 20% in 2009 to more than 80% today for most design consultants and bigger contractors.

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