AIR-CONDITIONING WORKS GET A PRODUCTIVITY BOOST

MECHC: GOING THE EXTRA MILE TO ASSIST BUILDERS

TIPS ON ARCHITECTURAL BIM E-SUBMISSION

TECHNOLOGY KNOWS NO BOUNDS

PG 10
We would love to hear from you if you would like to share any best practices and latest technologies that could improve construction productivity. Please email us at bca_enquiry@bca.gov.sg

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CLARIFICATION
On page 2 of Build Smart December 2012 issue “Kick-start Productivity With MechC”, the Construction Productivity and Capability Fund (CPCF) was introduced in June 2010 instead of June 2012.
Dear readers,

In his recent Committee of Supply (COS) speech, Senior Minister of State Lee Yi Shyan stressed that the next three years would be a crucial transition period for the built environment sector. Construction firms will have to adapt to the tightened labour supply while seizing all opportunities to mechanise, automate and streamline workflow for higher productivity.

The natural question is: How can firms take the first step to make the switch towards higher productivity?

First, it is important to adopt a productivity mindset. This is one of the critical success factors in embracing and integrating new efficient methods or technologies into existing work processes. In this issue, discover how local engineering companies AECOM and Ronnie & Koh Consultants managed to succeed in harnessing BIM technology for their projects with buy-in from their entire organisation.

Next, companies need to assess their business models and tradeoffs when they continue to operate at low productivity levels. With manpower tightening measures such as the increase in foreign work levies and reduction in MYE quota, firms will have to rethink their use of labour and make investments in equipment, new technologies and training a priority.

In the longer term, the built environment sector will face increasing manpower supply constraints. Fewer workers from source countries like China and India are coming to Singapore because developments in these countries are catching up. Hence, we cannot continue relying on cheap foreign workers in big numbers. We must act now before it is too late.

Lastly, construction firms can tap on BCA’s schemes and programmes to kick-start their productivity journey. The new Basic Concept in Construction Productivity Enhancement course by BCA will help educate builders on the foundations of productivity. BCA will also introduce a MechC Free Trial Programme to enable small contractors to try new equipment without incurring any costs. With these additional schemes and support in place, now is the time to act.

Dr John Keung
Chief Executive Officer
PRODUCTIVITY IN MIND AND ACTION

Sunteq Construction’s quest for new technologies and equipment gets the support from MechC

Formerly known as Lifa Engineering Pte Ltd, Sunteq Construction Pte Ltd did not let the lean structure of its team hamper its ambitions of working on a wide range of landed housing and condominium projects.

It is one of many small and medium enterprises (SMEs) that taps into the Building and Construction Authority’s (BCA) Mechanisation Credit (MechC) scheme.

MechC defrays the costs of technology adoption, encouraging local SMEs to reduce manpower by being more productive.

Sunteq Construction has always believed in investing in equipment because they help to improve productivity and yield good quality work. In the long run, it also translates to business profitability.

Managing Director Khoo Boo Sun said, “This is why I’m constantly on the lookout for productive equipment and technologies.”

Mr Khoo regularly observes equipment at work and studies how they could help to improve on-site productivity. He diligently takes down the details of the equipment and calls suppliers for enquiries and demonstrations.

With funding from MechC, Sunteq Construction purchased three concrete screed levellers and two power trowels. These equipment help workers achieve flat and smooth concrete floors quickly. Workers also no longer need to use trowel tools to manually compact the concrete or smoothen the floor surface.

Sunteq Construction also sought the assistance of MechC for a project at Nathan Road. The company wanted to convert the partially constructed swimming pool into a temporary precast yard, where the prefabrication of precast components could take place on site. This would help cut down transportation time between the precast factory and site, ensure better quality control and reduce the number of workers needed for the construction process. To convert the site space for the production of precast components quickly and efficiently, Sunteq Construction bought a gantry crane with the funding support from MechC.

Mr Khoo said, “Hopefully, sharing about the capabilities of these equipment would help spur more local companies to explore new technologies, which is absolutely crucial for a company to become more productive and profitable.”

<table>
<thead>
<tr>
<th>Builder:</th>
<th>Sunteq Construction Pte Ltd</th>
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<tbody>
<tr>
<td>Business:</td>
<td>Building construction and civil engineering contractor</td>
</tr>
</tbody>
</table>
| Equipment purchased with MechC: | • 3 concrete screed levellers  
• 2 concrete power trowels  
• 3 sanding machines with vacuums  
• 2 total stations  
• 2 scissor lifts  
• 1 builder’s hoist  
• 1 gantry crane |
| Benefits: | • Reduced manpower  
• Improved floor finishing quality  
• Improved concrete finishing quality  
• Increased productivity |

Turn to page 14 to find out more about the new MechC Free Trial Programme. For more information on MechC, please visit [www.bca.gov.sg/MechC/mechc.html](http://www.bca.gov.sg/MechC/mechc.html).
心理及行动上的生产力

升德建筑探讨新科技，并且在机械化奖励计划 (MechC) 的资助下购买了一系列工作器材。

前为Lifa工程私人有限公司的升德建筑私人有限公司并没有因为较小的工作队伍而阻碍公司承接不同种类的私人住宅及公寓项目。

升德是许多利用新加坡建设局机械化奖励计划 (MechC) 的其中一家中小型企业。

机械化奖励计划为企业支付，采用科技的部分成本而鼓励本地的中小型企业提高生产力以减少人力。

升德建筑一向坚持投资工作器材与设备，因为这不但有助于生产力，也同时能提升工艺的素质。长期来说，这也将增加公司的利润。

升德建筑总经理邱武山说：“这就是为什么我时刻在寻找能够提高生产力的器材与科技。”

邱先生经常在工作时观察各种器材，研究如何运用它们来提高工地上的生产力。他细心地记录每个器材的详细资料，以便联络供应商洽谈并要求他们示范如何正确使用器材。

有了机械化奖励计划的资助，升德建筑购买了三架混凝土整平机和两架动力抹刀。这些科技帮助工人们快速地铺设平滑的混凝土地板。有了这些器材，工人们再也不需要亲手用抹刀将混凝土压紧或将地板整平。

升德建筑也为在纳丹路 (Nathan Road) 的一个项目寻求了机械化奖励计划的协助。公司想要把一个局部建好的游泳池转为一个可在工地上制造预制部件的临时预制场。这将有助于减少来往工厂和工地之间的运载次数、确保更好的品质管理以及减少建设过程中所需要的工人。为了让这个空间的转变更具生产力，升德建筑通过机械化奖励计划的资助购买了一架门式起重机。

邱先生说：“我希望通过分享这些器材的功能，促使更多的本地企业探索新的科技。这绝对是帮助一家公司提高生产力和利润的关键。”

建筑商： 升德建筑私人有限公司

生意范围： 建筑与土木工程承包商

通过机械化奖励计划所采购的器材：

- 3架混凝土整平机
- 2架动力抹刀
- 3架带吸尘器的砂轮机
- 2架全站式测量仪
- 2架剪叉式升降机
- 1架施工卷扬机
- 1架门式起重机

效益：

- 人工减少
- 改善地板抛光质量
- 改善混凝土抛光质量
- 生产力提高

欲知更多有关新机械化奖励计划-免费试用计划的详情，请参阅第14页。欲知更多有关新机械化奖励计划的详情，请浏览www.bca.gov.sg/MechC/mechc.html。

From left: Mr Zulkefle Bin Abdullah, Director, and Mr Khoo Boo Sun, Managing Director, Sunteq Construction Pte Ltd.

左起：升德建筑私人有限公司的董事长Zulkefle Bin Abdullah先生和总经理邱武山先生。
In air-conditioning and mechanical ventilation (ACMV) systems, air is commonly conveyed via conventional metal ducts and discharged through grilles or diffusers. The assembly and insulation of the galvanised iron steel ducts are usually done on site and the work process is tedious and labour intensive.

With financial assistance from the Building and Construction Authority’s (BCA) Productivity Improvement Project (PIP) scheme, Kenyon Pte Ltd, a contractor specialising in ACMV works, decided to take up the challenge of re-engineering the air-conditioning ducting process with fabric ducting.

Prefabricated and insulated in the factory, the lightweight and easy-to-handle fabric duct arrives on site ready to be assembled and installed easily and quickly.

Each prefabricated fabric duct is also tagged, allowing workers to easily identify and assemble them on site in the correct sequence. Segments of the fabric ducts are then joined together using a zipper after being slotted into the Flexrail support system.

The fabric duct allows air to enter an area through diffusion along the permeable fabric, thereby achieving better air distribution and energy efficiency. As air is being distributed through the fabric, accessories such as diffusers and grilles are not required, simplifying the installation process even further.

For cleaning purposes, the fabric duct can also be easily removed and is washable, which is another key feature of the fabric ducting technology.

With technical support provided by their supplier, LGM Group Pte Ltd, Kenyon successfully installed the fabric ducting for the first time at Dyson Operations Pte Ltd Singapore’s manufacturing unit, which is located at Pioneer Crescent.

The adoption of this innovative work method enables Kenyon to reduce the time needed for the work process to just one-fifth of the original duration. Overall, they achieved a productivity improvement of more than 250%.

Project Engineer of Kenyon Pte Ltd, Mr Lin Fangru, was delighted with the productivity results. He said, “Fabric ducting has indeed enhanced Kenyon’s growth by cutting costs, improving productivity and reducing turnaround time. It has increased Kenyon’s competitive edge and enhanced our employees’ skills set. We could not have achieved this without BCA’s funding support and our supplier’s collaborative efforts. We plan to embark on other productivity projects soon, to further improve our work processes.”
提高冷气工程的生产力

坚永有限公司以布料导管重新设计冷气导管过程。

在冷气空调(ACMV)系统中，空气一般是以传统方式通过金属管道输送的，并且是通过铁栅或扩散器排放的。镀锌钢铁导管的装配及绝缘通常是在工地上进行的，而整个工作过程相当冗长及耗劳力。

在新加坡建设局(BCA)生产力改进计划(PIP)的资助下，冷却机械空调承包商坚永有限公司决定以布料导管接下重新设计冷气导管过程的挑战。

装置及装配布料导管过程相当简单快速。在工厂预制并进行绝缘、既轻巧又易于处理的布料导管在送达工地时已可以直接被装配并安装了。

每个预制的布料导管也被贴上标签以方便工人更轻易识别各个导管，并且在工地上以正确的次序将它们装配。布料导管的分段在被插入Flexrail支撑系统之后再以拉链连接在一起便完成。

布料导管能让空气通过可渗透布料扩散到一个空间，从而达到更佳的空气散布及能源效益。因为空气是通过布料被扩散的，所以就不再需要扩散器和铁栅等配件了。这也进一步地简化了装置的过程。

布料导管也容易拆除，并易于清洗。这也是布料导管科技的另一个主要特点。

在供应商LGM集团私人有限公司所提供的技术引导下，坚永有限公司成功地首次在戴森科技私人有限公司位于先驱弯（Pioneer Crescent）的新加坡制造厂装置了布料导管。这种创新工作方式的采用让坚永有限公司能够在工作过程中从原本所需要的时间减少到现需五分之一。总的来说，他们因生产方面提高了超过250%。

坚永有限公司的项目工程师林舫如先生对该生产力结果感到非常满意。他说：“布料导管是通过了减低成本及提高生产力方面增强了坚永有限公司的发展，提升了坚永有限公司的竞争力，并且增强了我们员工的技能。如果不是因为有新加坡建设局的资助以及我们供应商的配合，我们是无法达到这样的成果的。”

坚持接下来继续开展其他的生产力项目，以更进一步改进我们的工作过程。”

Mr Lin Fangru
Project Engineer of Kenyon Pte Ltd
林舫如先生
坚永有限公司的项目
工程师
BIM LEADERS IN STRUCTURAL ENGINEERING
Hear from two companies in Singapore that are leading the way in harnessing BIM technology

Build Smart speaks to two local engineering companies on how they have successfully implemented Building Information Modelling (BIM), and on how the technology has benefited their work processes and productivity.

AECOM is a Public Sector Panels of Consultants (PSPC) Panel 1 firm for both Civil and Structural (C&S) and Mechanical and Electrical (M&E) services. In its worldwide offices, AECOM has a considerable number of staff trained and experienced in using BIM technology.

Q How has BIM helped in enhancing the engineering aspects of your projects?
A Our multi-disciplinary engineering team is now able to work on a single 3D model. This enables structural interface issues to be identified and resolved early, eliminating the cost and time impact of a redesign. Designers can also further optimise the structural design by applying appropriate loadings and boundary conditions that resemble real-life settings. This enables us to provide our clients with more cost-effective solutions.

Q What is your company doing to build up BIM expertise?
A AECOM established a BIM framework within the company. A BIM committee was also set up, comprising staff from various positions and disciplines. This committee is responsible for maintaining local BIM standards and quality control company-wide. A BIM application engineer has also been nominated to manage the implementation of BIM and update related technologies.

Q What are the initial challenges faced when adopting BIM, and how did your company overcome it?
A The first hurdle was the lack of knowledge for both engineers and drafters in using BIM software. We recruited an experienced BIM manager to look into the training and hardware and software requirements.

Due to the lack of resources, BIM implementation was carried out in phases. In the initial stage, staff attended courses conducted externally. Now, with a BIM manager on board and a structured training programme in place, we conduct in-house project-based training. We built up a BIM team and expanded on our BIM skills in phases from one project to another. The BCA BIM fund also helped finance our BIM adoption costs.

Q Do share with us some of the critical factors that led to your company’s success in BIM implementation.
A One of the critical factors for success in BIM implementation is the management’s full support of allocating resources and time for staff to be trained in-house and externally, and the upgrading of the hardware and software.

Q What are AECOM’s future plans with regards to BIM?
A Moving forward, the target is to embark on BIM for all new projects. We will continue to upgrade BIM capabilities across teams. We also intend to take BIM beyond 3D geometrical components and towards full parametric modeling and engineering analysis.

Notable BIM Project – AECOM | Proposed Bedok Mixed Development

“To date, the proposed Bedok Mixed Development is the most significant project in our quest for BIM implementation. The project is significant because it presents various challenges. One challenge is the limitations in transferable data and information between engineering and BIM software. Consultants and contractors have varying BIM skill levels as well. There is also a lack of project-specific library contents, in particular for Mechanical, Electrical and Plumbing (MEP) engineering. But we are pressing on!”

– Er Teoh
Ronnie & Koh Consultants is a PSPC Panel 1 firm for C&S services. Although the company is new to BIM, the firm is working towards ensuring all projects are BIM-ready by 2014 – beginning with staff training.

Q: How has BIM helped in enhancing the engineering aspects of your projects?
A: BIM has improved the coordination process between the architect and engineer. This leads to a better understanding of the architectural intention before detailed engineering analysis and design are being carried out.

Q: What are the initial challenges faced when adopting BIM, and how did your company overcome it?
A: One challenge faced was the transition of 2D drawing to 3D BIM. This involved training and investment in both hardware and software, which Ronnie & Koh Consultants embarked on. While the initial training and familiarisation on BIM increased the man-hours required to complete the drawing production and had disrupted workflows, these are inevitable as with all other system changes.

Q: What is your company doing to build up BIM expertise?
A: We have sent our staff for fundamental training and our in-house BIM coordinator has successfully completed the BCA Academy’s Specialist Diploma in BIM. We are in the process of engaging an external trainer to conduct advanced BIM training for all our CAD Specialists in the first quarter of this year.

Q: What are Ronnie & Koh Consultants’ future plans with regards to BIM?
A: We want to align our company to BCA’s BIM requirements, which is to have all project submissions be BIM-ready by 2014. We are also targeting to get all our CAD Specialists to be trained and proficient in BIM by the third quarter of this year. The company is also in the process of upgrading the relevant software and hardware for the implementation of BIM on a full-scale basis.

Notable BIM Project – Ronnie & Koh Consultants | Ardmore Park Apartment

“One of the significant projects that we are currently working on is a 15-storey apartment with two basements at Ardmore Park. We are working on this with WOHA Architects. The project has undergone quite a number of design changes in the design phase. There were a lot of discrepancies between the architect’s model and our model, and this led to a lot of brainstorming sessions and BIM coordination meetings. However, this experience has provided us with a good learning curve. Now, we have a better understanding of how to enhance our BIM processes for future projects.”

– Er Low
TIPS ON ARCHITECTURAL BIM E-SUBMISSION

Get quick tips on the submission process for architectural plans

About BIM e-Submission

To encourage the adoption of BIM technology, the Building and Construction Authority (BCA) facilitated the transition from 2D Computer Aided Design (CAD) to BIM through the BIM e-Submission system since 2009. BIM e-Submission in Singapore is by far the first in the world, allowing industry professionals to prepare and maintain one building model for multi-agency regulatory approvals.

In 2012, more than 170 firms have successfully embraced BIM for regulatory submission, where 600 projects with more than 2,000 BIM e-Submission records were made to the building regulatory agencies in Singapore.

Starting July 2013, BIM electronic-Submission (e-Submission) for regulatory approval would be made mandatory in three phases, to propel the productivity drive in the built environment industry.

New building projects with a Gross Floor Area (GFA) of 20,000 m² and above, which are submitted to URA for planning approval on or after 1 July 2013, are required to submit their architectural plans in the BIM format. There will also be mandatory structural and Mechanical, Electrical and Plumbing (MEP) BIM e-Submissions for all new building projects with GFA of 20,000 m² and above starting 1 July 2014.

From 1 July 2015, companies are also required to make architectural, structural and MEP BIM e-Submissions for all new building projects with a GFA of 5,000 m² and above.

In this issue of Build Smart, we will showcase some tips on architectural BIM e-Submission.

General Requirements for Architectural BIM e-Submission

Ensure that submitted files comply with required format.

**File format (URA):**
DWF/PDF file; and
BIM native file

**File format (other agencies):**
DWF/PDF file

Encrypt all files submitted using Netrust Digital Signer before submission.

**Indicate BIM e-Submission on XFD forms to BCA**

Follow the naming convention for files and drawings.

**Submit 2D and 3D models in one file**

Follow colour codes as stated in SS CP83 for addition and alteration projects, re-submissions to URA and other amendments

For a complete guide, please refer to the architectural BIM e-Submission guideline from the CORENET website at [http://www.corenet.gov.sg/](http://www.corenet.gov.sg/)

For further enquiries on architectural BIM e-Submission, please contact:
Ms Soon Lay Kuan
Email: soon_lay_kuan@bca.gov.sg
PUSH THE BOUNDARIES OF BIM

BIM Competition 2013

For the third consecutive year, the Building and Construction Authority (BCA) will be organising the online Building Information Modelling (BIM) Competition in conjunction with the Singapore Construction Productivity Week 2013.

The 48-hour BIM Competition 2013 will commence on 1 July 2013, 9 a.m. and end on 3 July 2013, 9 a.m. in Singapore Standard Time.

For the first time, the multi-disciplinary collaboration sub-categories under ‘Industry’ and ‘Education’ will be open for international participation.

Since the introduction of the BIM competition in 2011, it has received much attention and support from the built environment industry. Last year, a total of 44 teams signed up, with more than 330 participants from over 32 professional firms and institutes of higher learning.

BIM Mobile Apps Challenge 2013

With the current pervasive use of gadgets such as smartphones, tablet computers and other mobile devices, the development of mobile applications has become more and more important. Creative mobile applications could support businesses and pave the way for the construction sites of tomorrow.

While there are many mobile applications in the market today, few are related to BIM and construction. The objective of the inaugural BIM Mobile Apps Challenge 2013 is to gather innovative ideas on mobile applications that can help architects, engineers, contractors, quantity surveyors and building owners collaborate better with BIM, from the design to construction stage.

The BIM Mobile Apps Challenge 2013 will commence on 6 May 2013, 9 a.m. and end on 28 June 2013, 9 a.m. in Singapore Standard Time.

To find out more about the competitions, visit: http://sgbimcompetition.com/ or scan the QR code to register, visit: http://sgbimcompetition.com/registration/

Also, do subscribe to the official Singapore BIM Competition 2013 and BIM Mobile Apps Challenge 2013 YouTube channel at https://www.youtube.com/user/OnSGBIM2013 to view ‘live’ submissions during the competitions and support your favourite teams!
Minister Khaw on contour crafting, Cross Laminated Timber and the Unitised Building System

In a recent post on the Housing Matters blog, Minister for National Development Khaw Boon Wan shared some of the advanced construction technologies currently being tested and implemented around the world. He believes that if applied in Singapore, these technologies could significantly boost the industry’s construction productivity. Build Smart publishes his insights here.

“We are pushing our construction industry to up its productivity and to reduce reliance on unskilled foreign construction workers. We need a quantum leap, not just incremental improvements. Technology is key to this.

Sophisticated IT and its greater use is one approach. Locally, architects, engineers and builders are using Building Information Modelling (BIM) technology more frequently. BCA is pushing this with a view to make BIM an essential tool in every designer’s office.

But it is not just BIM that will drive productivity to greater heights.

There are a number of other advanced construction technologies and systems that are being tested and implemented around the world. We are encouraged that some of our more enlightened local developers and construction firms have already begun searching for such new technologies to improve the way they build and push for higher productivity.

In this post, I would like to introduce three specific technologies: contour crafting, Cross Laminated Timber and the Unitised Building System. These can significantly boost construction productivity if successfully applied in Singapore.

Contour Crafting

Contour crafting is still in development. It is similar to 3D printing but is applied to buildings. Instead of transforming digital models into 3D objects using ink, an entire building can be “printed” rapidly and efficiently using layers of concrete. In other words, a 2,500 sq ft house can be built, complete with electrical and plumbing fittings, in less than 24 hours! A simple house in 24 hours, can you imagine that?

A building being constructed using panels of CLT, which are assembled like Lego on-site (Photo credit: Lend Lease)

In contour crafting, a building is constructed by depositing concrete layer by layer. In the process, other works can be done, including automatic reinforcement and plumbing.

Robotic fabrication machines at Future Cities Laboratory (Photo credit: Bas Princen)
Through the use of CLT, The Forte, a 10-storey residential development in Melbourne, was completed in 11 months instead of 14 months with only four workers, two crane crews and one supervisor on-site. CLT cuts construction time by about 30%.

Unitised Building System

Finally, the Unitised Building (UB) System is a modular system where room-sized 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. This is a great solution as prefabricating the UB modules in factories away from residential areas means reduced construction noise and dust pollution, besides cutting out labour intensive wet trades on-site. The typical UB system cuts down construction time by 50%, and has been applied to a wide variety of buildings including hotels, residential developments and student hostels.

BCA will continue to assist firms in introducing new construction technologies into Singapore by facilitating approval processes among the various local building regulatory agencies. The future is already here. This is evident in several parts of the world. Let’s make sure Singapore is not left out.”

First published on 17 January 2013 on the Housing Matters blog: http://mndsingapore.wordpress.com/2013/01/17/technology-knows-no-bounds/

Cross Laminated Timber

Another notable technology is the use of Cross Laminated Timber (CLT). This is already being used in Australia, the U.K., and many parts of Europe. Essentially, CLT is manufactured by binding layers of timber to produce a solid timber panel, which can then support heavy loads like the structural and non-structural components in buildings. They are prefabricated in factories and assembled on-site, leading to productivity gain and time savings.

Do you know?

At the Future Cities Laboratory run by the Singapore ETH Centre, Professors Fabio Gramazio and Matthias Kohler, who lead the Architecture and Digital Fabrication research module, have established a unique laboratory investigating the potential of robotic processes in architecture. The team aims to develop concrete scenarios for large scale application to the design and construction of high-rise buildings in Singapore. The two professors pioneered this field when they built the first robotic laboratory for architectural research at ETH Zurich in 2005; some of their best known projects involve innovative brick assembly by robots.
A BRIGHT FUTURE
Industry outlook, productivity and capability building are key topics at the BCA-REDAS Built Environment and Property Prospects Seminar 2013

The growth momentum of the built environment sector in 2012 is likely to be sustained through 2013, with a projected construction demand of S$26 billion to S$32 billion. Looking ahead, the Building and Construction Authority (BCA) also estimated a range of S$20 billion to S$28 billion worth of contracts to be awarded annually in 2014 and 2015.

These projections were revealed at the BCA-REDAS Built Environment and Property Prospects Seminar 2013, held on 16 January 2013. The annual seminar provides an update and outlook of the construction and real estate industries.

Technology and Overseas Business Opportunities

In his opening address, Senior Minister of State for National Development and Trade & Industry, Mr Lee Yi Shyan, welcomed the prospect of a stable and sustainable construction demand and highlighted that companies need to continually restructure to be more productive.

At the industry level, companies need to consider how stakeholders in the construction value chain can better integrate with one another to achieve greater efficiency and cost effectiveness. At firm levels, employers need to consider if they need to upgrade the skills of their workers, or if there are better technologies, innovative methods and international best practices to reduce non-productive man-hours on site and speed up construction time.

Noting that manpower crunch remains a key concern of many local firms, SMS Lee reminded companies not to rely on an infinite supply of foreign workers. Infrastructure capacity, social constraints and supply constraints from source countries are critical considerations for companies to adopt productivity improvements and explore ways of doing things differently to cut down manpower needs.

SMS Lee highlighted that there are also overseas opportunities for business as Asia is undergoing rapid urbanisation.

Singapore’s domestic constraints and high demand will continue to drive the industry’s restructuring and growth. Firms that innovate and adopt productivity improvements would be best positioned to enjoy strong and sustainable growth, locally and internationally.

Incentive Schemes and Talent Building

CEO of BCA Dr John Keung also reiterated the importance of having a productivity mindset given that the tightening of foreign labour is here to stay. Capability building will thus play a key role.

Intensifying restructuring efforts, BCA expanded its suite of manpower development programmes to increase the depth of local talent pool for the industry. The Undergraduate Sponsorship Programme and the ITE Scholarship Programme were introduced to attract, engage and upgrade present and future built environment professionals.

The panel of distinguished speakers shared positive views on the exciting and bright prospects of the built environment industry in the coming years. They also agreed that it is in the interest of employers to upgrade their workforce and enhance work productivity to remain competitive at home and abroad. Lastly, the panel highlighted that the rich pipeline of projects will not last forever, and companies that are more productive should brace and steer themselves more readily during economic downturns.
What is productivity all about? What does productivity entail? To equip the industry with the foundations of productivity, the Building and Construction Authority (BCA) will be conducting the Basic Concept in Construction Productivity Enhancement (BCCPE) - a new hassle-free half-day course.

BCCPE is for companies registered under BCA’s Contractors Registration System (CRS) in selected categories and specific grades. It will educate builders – especially the small and medium construction firms – on the ways in which overall productivity can be achieved. Successful case studies on productivity improvement will be shared and key areas such as the definition and measurement of productivity, strategies to improve productivity and the ways to utilise the Construction Productivity and Capability Fund (CPCF) will be explained.

By 1 July 2013, CRS contractors registered under the categories CW, CR, ME, MW, TR, SY04 and SY08 with grades B2 to C3, L5 to L1 and Single Grades must in its application to CRS, nominate at least one of their Technical Personnel (TP) to attend the half-day BCCPE course.

For more information, please call the BCA Academy at 6248 9999. You can also email us at bca_academy@bca.gov.sg.

Basic Concept in Construction Productivity Enhancement (BCCPE) Course Details

Course schedule:
This is a half-day course conducted twice a day (morning and afternoon sessions) from 18 to 22 March 2013 and from 27 to 31 May 2013 (a total of 20 sessions).

Morning Session: 9.00 am to 12.30 pm
Afternoon Session: 2.00 pm to 5.30 pm

Topics to be covered:
- Definition and measurement of productivity
- Improvement in construction productivity during planning, design and construction stage
- Use of the CPCF to enhance productivity
- Site layout, deployment planning and site coordination
- Good management practices and quality control
MECHC: GOING THE EXTRA MILE TO ASSIST BUILDERS

A new free trial programme under the MechC scheme aims to further assist builders having financial constraints in adopting new technologies

Since the launch of the Mechanisation Credit (MechC) scheme under the Construction Productivity and Capability Fund (CPCF), more than 410 firms have benefited from the funding.

To provide further assistance to firms having financial constraints in adopting new technologies, the Building and Construction Authority (BCA) will be launching a new free trial programme under the MechC framework.

The free trial is a 10-day programme that encourages builders, especially the smaller and specialised contractors to try out new equipment and tools without worrying about the costs incurred in trying out the new technology.

Builders can utilise up to $3,000 of MechC funding to lease pre-approved equipment from suppliers participating in the programme. The costs of these trials will be borne equally by BCA and the participating suppliers.

To find out more about the MechC Free Trial Programme, please visit http://www.bca.gov.sg/MechC/mechc_free_trial.html.

Who Can Apply
To be eligible for the MechC Free Trial Programme, builders or subcontractors must satisfy the following conditions:
1. Be a Singapore-registered business enterprise
2. Equipment must be used in construction projects in Singapore
3. Must achieve at least 20% improvement in on-site productivity, in the particular area of work in which the equipment was used
4. Each builder is only eligible to apply for the same equipment once.

How to Apply

Builder submits MechC form to BCA

BCA approves application

BCA issues voucher to builder

Builder exchanges voucher for equipment with participating suppliers

Builder returns equipment and submits report to participating supplier

Types of Equipment
- Small construction equipment and hand tools operable by one man
- Examples include (but are not limited to): gas actuated tools, electrical crimping tools, cable puller systems and piping system installation tools
- Commonly available equipment would not be considered as they are already widely used in the industry
机械化奖励计划：
为协助建筑商不遗余力

机械化奖励计划下的一项全新免费试用项目希望进一步协助在经济上有需要的建筑商采用新科技

自建设局建筑生产力和能力基金（CPCF）机械化奖励计划（MechC）的推出以来，已有超过410家公司受益于这项基金。

新加坡建设局（BCA）将在机械化奖励计划的框架下推出一项新的免费试用项目，主要是缓解建筑公司在采用新科技方面可能面临的经济问题。

这项为期10天的免费试用计划是为了鼓励较小型的建筑商在无需担心采用新科技所需成本的情况下，试用适当的器材与工具。

建筑商可动用高达$3,000的机械化奖励计划基金以租用参与此计划的供应商预先被批准的器材。建设局及参与项目的供应商将支付这些试用的成本。

欲了解更多有关机械化奖励计划的免费试用项目，请浏览http://www.bca.gov.sg/MechC/mechc_free_trial.html。

申请资格

建筑商或转包商须符合以下条件以便享有申请资格：
1. 新加坡注册的商业企业
2. 器材必须用于在新加坡的建筑工程
3. 须在工地生产力方面，尤其是在器材被用于的具体工作上达到至少20％的改进。
4. 各建筑商将只能够同一种器材提交一次申请。

申请程序

- 建筑商呈交机械化奖励计划表格给建设局
- 建设局批准申请
- 建设局颁发票券给建筑商
- 建筑商以票券向参与的供应商换取器材
- 建筑商将器材归还给参与的供应商，并向他们提交报告

器材种类

- 小型建筑器材以及可以一人操作的手工具
- 例子包括（但不限于）：以气推动工具、电动卷曲工具、电线铺设系统以及管道系统装置工具
- 一般市面上广泛的工具将不被列入考虑，因为这些工具已在业内被普遍使用
<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Event Name</th>
<th>Venue / Organiser</th>
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<tr>
<td>14 Mar 2013, 4 Jul 2013, 3:00pm–5:00pm</td>
<td>Smart Builders Leadership Series</td>
<td>9 Maxwell Road, MND Complex Annex A BCA</td>
<td>Name: Ms Ezrin Raof Tel: 6325 5093 Email: <a href="mailto:ezrin_raof@bca.gov.sg">ezrin_raof@bca.gov.sg</a></td>
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<tr>
<td>1 Mar 2013, 5 Apr 2013, 3 May 2013, 9:00am–12:00pm</td>
<td>BCA Productivity Clinic</td>
<td>5 Maxwell Road, #12-02, MND Complex, Tower Block, Singapore 069110 BCA</td>
<td>Name: Ms Ezrin Raof Tel: 6325 5093 Email: <a href="mailto:ezrin_raof@bca.gov.sg">ezrin_raof@bca.gov.sg</a></td>
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<tr>
<td>25 &amp; 26 Mar 2013 9:00am–12:00pm</td>
<td>2-Day BIM Planning Course (Building Developers and Facility Managers) (4th Run)</td>
<td>BCA Academy 200 Braddell Road Singapore 579700 BCA Academy</td>
<td>Marketing &amp; Business Development Unit Tel: 62489843 / 824 Email: <a href="mailto:bca_academy@bca.gov.sg">bca_academy@bca.gov.sg</a></td>
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<tr>
<td>4, 7 &amp; 11 Mar 2013 6.30pm–9.30pm (3 evenings)</td>
<td>Workshop on Site Management of Precast Concrete (9th Run)</td>
<td>BCA Academy 200 Braddell Road Singapore 579700 BCA Academy</td>
<td>Marketing &amp; Business Development Unit Tel: 62489843 / 824 Email: <a href="mailto:bca_academy@bca.gov.sg">bca_academy@bca.gov.sg</a></td>
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<tr>
<td>2 Apr–23 May 2013 6.30pm–9.30pm (13 evenings)</td>
<td>Design of Precast Concrete Structures for Engineers (5th Run)</td>
<td>BCA Academy 200 Braddell Road Singapore 579700 BCA Academy</td>
<td>Marketing &amp; Business Development Unit Tel: 62489843 / 824 Email: <a href="mailto:bca_academy@bca.gov.sg">bca_academy@bca.gov.sg</a></td>
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<tr>
<td>8 Mar 2013, 7 Jun 2013 2.30pm–5.30pm</td>
<td>Architectural BIM e-Submission Briefing</td>
<td>MND Auditorium, MND Complex (Annex A), Maxwell Road BCA</td>
<td>Name: Ms Soon Lay Kuan Tel: 6325 1102 Email: <a href="mailto:soon_lay_kuan@bca.gov.sg">soon_lay_kuan@bca.gov.sg</a></td>
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<tr>
<td>8 Mar 2013 12 Apr 2013, 10 May 2013, 21 Jun 2013 9.00am–11.30am</td>
<td>MEP BIM e-Submission Briefing</td>
<td>BCA Academy, Blk B, Level 2, IT Lab 3 BCA</td>
<td>Name: Mr Liu Ziwen Tel: 6730 4527 Email: <a href="mailto:liu_ziwen@bca.gov.sg">liu_ziwen@bca.gov.sg</a></td>
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<td>8 Mar 2013, 12 Apr 2013, 10 May 2013, 21 Jun 2013 3.00pm–6.00pm</td>
<td>Structural BIM e-Submission Briefing</td>
<td>BCA Academy, Blk B, Level 2, IT Lab 3 BCA</td>
<td>Name: Mr Sonny Andalis Tel: 6730 4438 Email: <a href="mailto:sonny_andalis@bca.gov.sg">sonny_andalis@bca.gov.sg</a></td>
</tr>
<tr>
<td>29 Jul 2013 to 2 Aug 2013</td>
<td>Singapore Construction Productivity Week 2013</td>
<td>Singapore Expo BCA / Sphere Exhibits Pte Ltd</td>
<td>Name: Ms Kate Lim Tel: 6325 5096 Email: <a href="mailto:kate_lim@bca.gov.sg">kate_lim@bca.gov.sg</a></td>
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</table>
RIDE ON THE PRODUCTIVITY WAVE
BY SIGNING UP FOR THESE COURSES

CONSTRUCTION PRODUCTIVITY AND CAPABILITY FUND (CPCF) COURSES

> Certificate in Interior Finishing Coordination
> Certificate in Pavement Construction and Maintenance
> Certificate in Precast Concrete Construction Supervision
> Certificate in Waterproofing Supervision
> Certificate in Building Measurement
> Certificate in Geotechnical Instrumentation for Supervisors
> Certificate in Levelling and Setting Out
> Certificate Course for Structural Steel Supervisors
> NBQ in Project Supervision
> Higher NBQ in Project Supervision
> Advanced NBQ in Project Supervision
> NBQ in Supervision and Coordination of M&E Works
> Higher NBQ in Supervision and Coordination of M&E Works
> Advanced NBQ in Supervision and Coordination of M&E Works
> NBQ in Operation & Maintenance
> Higher NBQ in Operation & Maintenance
> Advanced NBQ in Operation & Maintenance

16 NEW COURSES ARE NOW AVAILABLE.
UP TO 50% TO 80% OF THE TRAINING COST CAN BE SUBSIDISED UNDER THE CPCF SCHEME.

The additional courses are:

Certificate courses (PMETs)
> Certificate course in BIM Modelling
> Certificate course in BIM Management
> Project Management for Professionals in the Building and Construction Industry (in collaboration with SPM)
> Construction Productivity Management (in collaboration with SCAL)
> Design of Precast Concrete Structures for Engineers
> Workshop on Site Management of Precast Concrete Construction

Trade Diplomas (Foremen / Supervisors)
> Structural Steel Supervision
> Reinforced Concrete Supervision
> Plumbing Technology
> Electrical Technology

Certificate courses (Tradesmen / Foremen)
> Builders Cert in Plumbing and Pipefitting
> SEC(K) in Precast Concrete Components Erection
> SEC(K) in Structural Steel Fitting
> SEC(K) in Interior Drywall Installation
> System Formwork Training
> Mechanical Elevated Work Platform

FOR ENQUIRIES, PLEASE CONTACT:

BCA ACADEMY
TEL: 6248 9999 EMAIL: bca_academy@bca.gov.sg
TECHNOLOGY ADOPTION

MECHANISATION CREDIT (MECHC) SCHEME
Provides assistance to companies to defray up to 70% of equipment cost.*

PRODUCTIVITY IMPROVEMENT PROJECT (PIP) SCHEME
Provides assistance to companies to defray up to 70% of the cost for adopting more productive work processes.*

BUILDING INFORMATION MODELLING (BIM) FUND
Provides assistance to companies to defray up to 50% of the cost of incorporating BIM into their work processes. The assistance is capped at S$20,000 for firm level scheme and S$35,000 for project collaboration scheme per application. Each company can submit up to a total of 6 applications.

*These enhancements will take effect from 1 April 2013. Terms and conditions apply.

For more information, please call the CPCF toll-free hotline at 1800-325 5050 or visit http://www.bca.gov.sg/CPCF/cpcf.html