Dear readers,

With the ramping up of infrastructure projects, this is an opportune moment for the built environment sector to restructure and take bolder, determined steps to reduce our reliance on foreign workers.

New changes to the Buildability and Constructability requirements were announced recently. This is to encourage better coordination across the entire construction value chain through the use of labour-saving methods and technologies.

To provide an impetus for consultancy firms and contractors to introduce and adopt more productive methods in their projects, BCA will be introducing the buildable design and constructability scores as a mandatory quality attribute under the Quality-Fee Selection Method (QFM) and the Price-Quality Method (PQM) framework. It will give tendering advantage to firms that are able to score under these areas.

We are also enhancing the funding level of the Mechanisation Credit (MechC) and Productivity Improvement Project (PIP) scheme. Firms, especially smaller contractors, can now receive higher funding for the purchase or leasing of smaller construction equipment to improve productivity on site.

While BCA is actively reaching out to contractors in the industry, we would still require the help of industry firms, especially those that have tapped into our incentive schemes under the Construction Productivity and Capability Fund (CPCF), to help spread the benefits of these schemes. Thus, we have also rolled out a MechC Referral Programme to allow a contractor to earn an increase in funding amount under the MechC scheme if he successfully refers another firm to tap into the scheme.

Indeed, we recognise that everyone in the construction value chain plays a vital role – from design, and implementation to construction – in improving productivity on site. We hope that with these new measures, we would be able to spur firms to rethink their existing work processes and also attract a new pool of firms to come on board and kick-start their productivity journey.

BCA is committed to working closely with the industry. We will continue to monitor the effectiveness of these new measures and to tackle any potential, adverse impact that they may have on companies – especially the smaller firms – in their productivity journeys.

Dr John Keung
Chief Executive Officer
MECHC AND PIP TO HELP FIRMS GET MORE FUNDING

Enhancements mean firms can now enjoy funding levels of up to 70%

Need a boost to start your firm’s productivity journey? Check out the latest enhancements to the Mechanisation Credit (MechC) and Productivity Improvement Project (PIP) schemes, which include higher funding caps. The aim is to ultimately provide more support for the industry to adopt technology and build capability. The enhancements took effect from 1 April 2013.

ENHANCEMENTS TO THE MECHC SCHEME

Higher Funding Levels and Cap
The funding level of the MechC scheme will increase from 50% to 70% for builders. This enhancement will especially enable smaller subcontractors to receive higher funding for the purchase or leasing of smaller construction equipment. The enhanced MechC scheme will run alongside the current standard MechC scheme.

The funding level of the PIP scheme will increase from 50% to 70% for firms, prefabricators and groups. The funding cap for firm-level projects adopting selected key technologies will also be increased from $100,000 to $300,000 per application. These enhancements are meant to encourage a wider adoption of technologies and reduce firms’ reliance on workers. The enhanced PIP scheme will run alongside the current standard PIP scheme.

Some examples of key productive technologies may include:
- System formwork
- Prefab bathrooms
- Self-compacting concrete
- Precast and steel construction

How to Qualify
For more details on the MechC scheme and MechC Referral Programme, please visit http://www.bca.gov.sg/MechC/mechc.html

ENHANCEMENTS TO THE PIP SCHEME

Higher Funding Levels and Cap
The funding level of the PIP scheme will increase from 50% to 70% for firms, prefabricators and groups. The funding cap for firm-level projects adopting selected key technologies will also be increased from $100,000 to $300,000 per application. These enhancements are meant to encourage a wider adoption of technologies and reduce firms’ reliance on workers. The enhanced PIP scheme will run alongside the current standard PIP scheme.

For more details on the PIP scheme, please visit http://www.bca.gov.sg/PIP/pip.html

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard PIP Scheme</th>
<th>Enhanced PIP Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm</td>
<td>Co-funded up to 50%</td>
<td>Co-funded up to 70%*</td>
</tr>
<tr>
<td></td>
<td>Capped at $100,000 per application</td>
<td>Capped up to $300,000 per application (for selected key technologies)</td>
</tr>
<tr>
<td>Prefabricator</td>
<td>Co-funded up to 50%</td>
<td>Co-funded up to 70%*</td>
</tr>
<tr>
<td></td>
<td>Capped at $500,000 per application generally</td>
<td>Capped up to $500,000 per application</td>
</tr>
<tr>
<td>Group</td>
<td>Co-funded up to 50%</td>
<td>Co-funded up to 70%*</td>
</tr>
<tr>
<td>(At least two unrelated companies)</td>
<td>Capped at $500,000 per application</td>
<td>Capped up to $500,000 per application</td>
</tr>
<tr>
<td>Industry</td>
<td>Co-funded up to 70%</td>
<td>Co-funded up to 70%</td>
</tr>
<tr>
<td>(To be actively led by a public agency with at least two unrelated companies)</td>
<td>Capped at $1 million per application</td>
<td>Capped up to $5 million per application**</td>
</tr>
</tbody>
</table>

* Firms or firms must achieve at least 30% productivity improvement.
** Firms must achieve at least 40% productivity improvement, and technology used must demonstrate a potential to have an impact on the whole industry.

How to Qualify
To qualify for the enhanced PIP scheme, firms will have to achieve higher productivity improvements and provide evidence that they have built or are committed to building capability in areas such as financial standing, human resource development, certifications and awards.

For more details on the PIP scheme, please visit http://www.bca.gov.sg/PIP/pip.html
参与增强机械化奖励计划与生产力建改计划的详情

参与增强机械化奖励计划与生产力建改计划的公司在符合以下任何两个部分中的其中一个条件，即为满足该计划的资格。

A. 财务要求
1. 须有实现目标的财务能力
2. 公司必须在财政年度内
3. 公司在申请补贴前须持有三年的财政年度会员

B. 人才要求
1. 须有技术及管理人才
2. 须有技术及管理人才
3. 须有技术及管理人才
4. 须有技术及管理人才

C. 认证与申请
1. ISO9001:2008或ISO14001或
2. OSHAS18000或
3. SGS-061

参与资格
欲参与增强机械化奖励计划，建筑商需要在申请该计划下购买的设备把生产力提升30%。此外，他们也必须具备相应设备的能力及技术人员。

机械化奖励计划

机械化奖励计划将给予符合条件建筑师的资金扶持，让其提高生产能力。

【现有/增强】

<table>
<thead>
<tr>
<th>设备成本</th>
<th>60%</th>
<th>80%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; $100,000</td>
<td>$20,000</td>
<td>$20,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>$100,000</td>
<td>$25,000</td>
<td>$25,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>&gt; $100,000</td>
<td>$30,000</td>
<td>$30,000</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

增强生产力建改计划

<table>
<thead>
<tr>
<th>现有生产力建改计划</th>
<th>增强生产力建改计划</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>90%</td>
</tr>
<tr>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>20%</td>
<td>40%</td>
</tr>
</tbody>
</table>

生产力建改计划的增强项目

为了鼓励更多地使用科技并减少公司对人力的依赖，生产力建改计划将给予企业。

主要生产科技：
1. 系统模板
2. 预制浴室
3. 自密实混凝土
4. 组合与结构

欲获取更多有关生产力建改计划的详情，请浏览http://www.bca.gov.sg/MechC/mechc.html
To encourage stakeholders to come together early for upstream coordination and integration, the Building and Construction Authority (BCA) will be progressively raising the minimum Buildable Design and Constructability scores.

The minimum score for Buildable Design and Constructability will each be raised by three points in July 2013, and by two more points in July 2014. These new scores will apply to new projects submitting their first planning approvals on or after the effective dates.

With higher buildability requirements, architects and engineers who are upstream in the construction value chain will have to consider the productivity requirements at an earlier stage and ensure that building designs are easier and more efficient to construct. This means that building designs will have to include more productive technologies and a wider adoption of standard components to allow for ease of construction.

For example, designs would have to be based on wider adoption of standard components to allow for ease of construction on site. At the same time, designs involving the use of brickwalls and plastering finishes, which are more labour-intensive, are also strongly discouraged. Instead, dry construction such as the use of prefabricated components such as Prefabricated Bathroom Units (PBUs), drywalls have to be more widely adopted.

In addition, contractors who are downstream in the construction value chain will have to exploit technology and productive methods of construction, as well as improve their work processes to meet the higher constructability requirements.

To set a benchmark for the industry, the government will take the lead by requiring public sector projects to adopt buildability and constructability standards higher than the new minimum requirements.

Developers will also have to meet higher buildability and constructability standards for new private developments on Government Land Sales sites and Industrial Government Land Sales sites. Productivity requirements will also be introduced for existing bonus Gross Floor Area schemes.

BCA is currently also exploring incentives for both consultants and contractors who make the extra efforts to achieve scores that are well beyond the minimum legislated buildability and constructability requirements.

To recognise consultants who are capable of achieving higher buildability in projects, the buildable design score will be introduced as a mandatory quality attribute accounting for 15% of the overall quality point when evaluating tenders under the Quality-Fee Selection Method (QFM) framework. QFM is used to procure consultancy services for public sector’s building and construction projects.

Furthermore, the constructability score will be introduced as a mandatory quality attribute accounting for 15% of the overall quality point when evaluating tenders under the Price-Quality Method (PQM) framework. This will recognise the builder’s adoption of labour-saving construction methods and technologies.

PQM applies to all public sector construction tenders under the BCA Construction Workheads (CW01) and with an Estimated Procurement Value of S$3 million and above.

These are set to take place from 15 July 2013. BCA will continue to monitor the effectiveness of specifying the buildable design and constructability scores as part of the public sector procurement requirement.
Going paperless is no longer a dream but a reality for Resident Engineers (REs) and Resident Technical Officers (RTOs) who are doing inspections on-site.

Thanks to Design-Environment Group (DEG) Architects LLP, engineers and officers are now equipped with the Tablet-based Site Inspection System (TABS), which enables them to carry out assessments on site with ease. The tablet-based system is not only hassle-free but environmentally friendly too.

In the past, the RE and RTO had to carry bulky sets of drawings and documents to the site and record or sketch information on various inspection cards before returning to their offices for filing. But with TABS, everything takes place on a tablet computer and all documents can be filed in a cloud data storage system.

Adopting the compact tablet inspection system also improves transparency and accuracy of the site inspection process. The technology enables the project administrator to log on to it and record every step of the inspection process throughout the construction cycle.

To implement the use of TABS on site, DEG, together with its IT consultant and training provider, conducted workshops to equip site personnel with the technology know-how. After implementing and testing the system in stages, it was officially launched in July 2012. The development of TABS was funded under the Productivity Improvement Project scheme.

With TABS, as much as 12.6 man hours can be saved every week!” revealed Mr Chan Seng Kee, Principal Architect, DEG.

“Besides productivity gains, there has also been a significant reduction in paper usage, resulting in monetary savings and waste cutback.”
TIPS ON MEP AND STRUCTURAL BIM E-SUBMISSION
Towards a smoother and simpler approval process

Updates on Mandatory BIM e-Submission
1. From July 2013, BIM e-Submission for regulatory approval would be made mandatory in three phases. New building projects with a Gross Floor Area (GFA) of more than 20,000 m², which are submitted to the Urban Redevelopment Authority (URA) for planning approval on or after 1 July 2013, are required to submit their architectural plans in BIM format.

2. From 1 July 2014, there will be mandatory structural and Mechanical, Electrical and Plumbing (MEP) BIM e-Submission for all new building projects with GFA of 20,000 m² and above (in 2013 and 2014).

3. 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 2015).

In this issue of Build Smart, we share some tips on structural and MEP BIM e-Submission.

Structural BIM e-Submission | GENERAL REQUIREMENTS CHECKLIST

- Have you submitted correctly to BCA?
  - BIM e-Submission to BCA:
    1) ST submissions to Building Enforcement (BE)
    2) CD submissions to Civil Defence (CD) Shelter
  - File 1: Submission Drawings – sheets for approval only
  - File 2: Reference Documents – 3D BIM model, site plan, architecture drawings and supplementary information
  - Files 1 to 3: Encrypted by Qualified Person (Geotechnical or Structural PE)
  - File 1: Encrypted by Accredited Checker (AC)

- Are your files in the accepted format?
  - Light weight file format published from BIM authoring software:
    1) DWF (.dwf); or
    2) PDF (.pdf)
  - “Checked by” and “Approval” from the regulatory agencies are based on the encrypted “Last Saved Model” and the “Last Saved View” of site plans, floor plans, elevations and sections submitted.

- Follow colour codes as stated in SS CP83 for addition and alteration projects submitted for regulatory approval.

MEP BIM e-Submission | GENERAL REQUIREMENTS CHECKLIST

- Have you submitted to the regulatory agencies?
  - BIM e-Submission to other regulatory agencies:
    1) CBPU;
    2) PUB-WRN;
    3) PUB-WTR;
    4) FSSD;
    5) IDA-TFCC; and
    6) CityGas

- Are your files in the accepted format?
  - A single line-weighted file format, as published from the similar BIM native file*:
    1) DWF (.dwf); or
    2) PDF (.pdf)

  - The respective regulatory agency reserves the right to request for the BIM native file for verification, where necessary.

For more information on the BIM templates and guidelines, please refer to: http://www.corenet.gov.sg/integrated_submission/bim/
For enquiries on BIM e-Submission, please contact:
MEP: Mr Liu Ziwen, E-mail: liu_ziwen@bca.gov.sg
Structural: Mr Sonny Andalis, E-mail: sonny_andalis@bca.gov.sg

*The respective regulatory agency reserves the right to request for the BIM native file for verification, where necessary.
BIM LEADERS IN PROPERTY DEVELOPMENT

Hear from two developers that have adopted BIM successfully, and their plans for the way forward

City Developments Limited and Wing Tai Property Management Pte Ltd are household names in the real estate industry. But how do they fare when it comes to adopting Building Information Modelling to improve their productivity?

Mr Lawrence Leong, Manager in the Projects Division of City Developments Limited, and Ms Quek Chay Hoon, General Manager of Projects in Wing Tai Management, walk us through their company’s BIM implementation process, highlighting the benefits, challenges, and the future of BIM.

Q
How has BIM helped in enhancing the developer aspects of your projects?

A
BIM helped us to deliver better products in an efficient and effective manner, especially since it allows us to be strategic with our resource and time management. It is a powerful tool that has helped us to raise the construction productivity for our projects.

Q
What are some of the initial challenges faced by City Developments Limited when adopting BIM, and how did your company overcome them?

A
As with any new technology, there is a learning curve and the entire project team must be willing to venture and learn. Our challenge was to influence our partners – such as consultants and builders – to be involved in this exploratory process that would help everyone work towards a harmonisation of BIM standards.

Q
Could you share with us some of the critical factors that led to your company’s success in BIM implementation?

A
We developed BIM expertise by getting our project team members to adopt BIM, specifying BIM in our tender specifications, and building capability and capacity to improve construction productivity.

Q
What are the initial challenges faced by Wing Tai Property Management when adopting BIM, and how did your company overcome it?

A
We needed a common collaboration platform, a common set of procedures to model library parameters, and a standard contract to document ownership and responsibility of BIM modelling and the various stages of the construction life cycle. We are trying to work out these challenges through training and developing in-house BIM expertise.

Q
Could you share with us some of the critical factors that led to your company’s success in BIM implementation?

A
We have a dedicated project manager to monitor BIM implementation timelines. The manager also chairs the fortnightly BIM implementation meeting. During the meeting, we monitor the progress of current BIM projects, and resolve issues and clashes. The support of the management and BCA is also crucial for a smooth BIM journey. Moving ahead, we are looking to establish in-house capabilities to manage and implement all future BIM Initiatives, as well as groom our pool of regular consultants and contractors to be competent in BIM.
The hallmark event is set to take place this July and August at Singapore Expo and Max Atria. The Singapore Construction Productivity Week 2013 is the industry’s hallmark event, inspiring productivity improvement, innovation and technology adoption.

From 29 July to 2 August 2013, expect the Singapore Expo and Max Atria to be abuzz with plentiful activities, including the Skilled Builders and BIM Competitions, BuildTech Asia Exhibition, Build Smart Conference and the International Panel of Experts - Building Information Modelling (IPE-BIM) Conference.

The Week offers a great platform for suppliers, developers, architects, consultants and builders to come together and exchange ideas in transforming the construction industry. So don’t miss out on this great opportunity to be engaged in the industry’s biggest productivity conversation of the year!

5 Key Events in 1 Week

<table>
<thead>
<tr>
<th>KEY EVENTS</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIM Competition</td>
<td>29 Jul 2013</td>
</tr>
<tr>
<td>BuildTechAsia2013 Exhibition</td>
<td>31 Jul – 2 Aug 2013</td>
</tr>
<tr>
<td>Build Smart Conference</td>
<td>31 Jul 2013 (Productivity)</td>
</tr>
<tr>
<td>Skilled Builders Competition</td>
<td>31 Jul 2013</td>
</tr>
</tbody>
</table>

For more information, please contact
Ms. Kate Lim
Tel: +65 63255096; Email: Kate_lim@bca.gov.sg
Dr. Leong Chee Lai
Tel: +65 63252099; Email: Leong_chee_lai@bca.gov.sg

For exhibition space at BuildTech Asia2013, please contact Sphere Exhibits:
Ms Oh Li Ling
HP: 97767477; Email: lingoh@sph.com.sg

Skilled Builders Competition 2013
Showcase your skills at the most prestigious productivity event of the year!

Mobile Aerial Platform Operations
Competitors are required to navigate an obstacle using a scissor lift and complete tasks at height using a boom lift.
Prize: $1,000 for Champion, $500 for Runner-up

Trade Skills Events
A. Drywall Installation
The three-men team will compete in a specific drywall project designed to challenge their ability to interpret drawings, plan their time, demonstrate their competency in wall installation, and handling of tools and materials to produce accurate and neat works.
Prize: $3,000 for Champion, $1,000 for Runner-up

B. Plumbing Installation
The two-men team will be tested on their ability to understand drawings, plan their time, and should be able to demonstrate competence in the installation of PEX pipes, as well as in the handling of tools and materials to accurately and neatly complete their tasks.
Prize: $2,000 for Champion, $1,000 for Runner-up

C. Timber Floor Installation
The two-men team will complete a project designed to challenge their ability to interpret drawings and lay engineered timber flooring. The team has to plan their time, demonstrate competence in laying the flooring, and handle the tools and materials well to produce accurate and neat works.
Prize: $2,000 for Champion, $1,000 for Runner-up

To register, please contact Ms Tan Mui Kheng
(Tel: 63255067; Email: Tan_mui_kheng@bca.gov.sg)
Closing date: 28 June 2013

For more details on the registration and deployment requirements, please download the latest CoreTrade Guidebook (version 2012) at:

**IMPORTANT!**
Construction projects that have been permitted to commence structural work from 1 April 2013 are required to deploy CoreTrade Supervisors in their projects.

The Construction Registration of Tradesmen, or CoreTrade, is a registration scheme administered by the Building and Construction Authority (BCA) for skilled and experienced construction personnel.

In April 2012, BCA introduced a new registration class of CoreTrade Supervisors. This extends the career progression path of CoreTrade personnel from Tradesmen and Foremen to Supervisors. CoreTrade Supervisors can be registered under three types of works: Structural Works, Architectural Works and Mechanical & Electrical Works.

Besides meeting the minimum qualification and experience requirements, applicants who want to be registered as CoreTrade Supervisors will also need to attend a training course and pass an end-of-course test to ensure that they possess the relevant knowledge to carry out their supervisory roles effectively.

The Skilled Builders and BIM Competitions, BuildTech Asia Exhibition, Build Smart Conference and the International Panel of Experts - Building Information Modelling (IPE-BIM) Conference.
## BACHELOR OF CONSTRUCTION MANAGEMENT (Building)

The construction industry is the industry of the future. Every construction project combines a variety of complex challenges. Construction managers coordinate the delivery of these projects, which require a combination of technical understanding of construction processes and resource management, as well as managing financial aspects. The Bachelor of Construction Management (Building) launched by BCA Academy, in collaboration with University of Newcastle, will provide you with the skills and knowledge to carry out opportunities both in Singapore and across the world.

The new Bachelor of Construction Management (Building) programme incorporates substantial Building Information Modelling (BIM) teaching and projects which offer a niche specialty beyond the construction management discipline. Such degree programmes with dual specialty in BIM and construction management will be the first of its kind in Asia-Pacific region and paves the way for wide and exciting career opportunities as BIM Managers, Project Managers, Quantity Surveyors and Facility Managers.

The Bachelor of Construction Management (Building) programme is conceptualized to be a problem-based learning pedagogy to train students to solve real-world challenges, develop holistic understanding of construction project environment and portable life-long learning skills. To offer an accelerated pathway, an advanced standing articulation would be eligible for students with relevant diploma qualifications for full-time studies. In addition, a part-time programme would be available for working adults.

### UNIVERSITY OF NEWCASTLE

The University of Newcastle in Australia, established in 1965, is recognized as a world-class institution that delivers quality in education and innovation in research. Internationally, the Academic Ranking of World Universities places Newcastle in the top four per cent of universities in the world, and the Times Higher Education World University Rankings and QS World University Rankings place Newcastle in the top three per cent. Both the Times Higher Education and QS also rank Newcastle in the top 50 universities in the world under the age of 50.

Educating first-rate graduates is the University’s most important role. The degrees from University of Newcastle are designed to ensure that its graduates will be globally competitive and career ready in their fields.

The School of Architecture and Built Environment has an international reputation for pioneering problem-based teaching, research-led teaching, and online and blended teaching in both undergraduate and postgraduate built environment programs. There are more than 1,000 undergraduate and postgraduate students studying architecture, construction management, industrial design, property economics, project and disaster management. Importantly, the school has supported many international students to achieve academic successes over the last 40 years and has a distinguished record in teaching innovation and partnerships with industry.

The school enjoys the highest level of professional accreditation and its graduates are well regarded by industry and employer groups. The School is home to the Centre for Interdisciplinary Built Environment Research which complements the school’s research strengths in creative endeavour; an approach which results in state and national exhibitions, design awards and citations.

### A PROFESSIONALLY ACCREDITED PROGRAMME

The programme is fully endorsed by professional bodies and is recognised internationally. It currently holds accreditation from:

- AIB – The Australian Institute of Building
- AIQIS – The Australian Institute of Quantity Surveyors
- CBIO – The Chartered Institute of Building
- RCS – The Royal Institute of Chartered Surveyors
- SIAV – The Singapore Institute of Architects and Valuers

For further details, please contact:

**MR PAUL JUWONO**
Tel: 6246 9916
Email: paul.juwono@bca.gov.sg

**MS NURBADHINAH OSMAN**
Tel: 6730 4503
Email: nurbadhina_osman@bca.gov.sg

CONSTRUCTION PRODUCTIVITY AND CAPABILITY FUND (CPCF)

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.

*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