MEDIA RELEASE

BUILDSG TO PARTNER INDUSTRY IN IMPLEMENTING CONSTRUCTION INDUSTRY TRANSFORMATION THROUGH ITS THREE CENTRES

-BuildSG comprises three centres to level up areas in workforce capability (iBuildSG), industry transformation (weBuildSG), and internationalisation (SGBuilds)
- Built Environment SkillsFuture Tripartite Taskforce proposes recommendations to support attracting and developing a pipeline of talent for the industry
- City Developments Limited (CDL) and Housing & Development Board (HDB) win the apex Built Environment Leadership (Platinum Star) Award

Singapore, 22 May 2018 – At the Building and Construction Authority (BCA) Awards ceremony, Minister for Social and Family Development and Second Minister for National Development, Mr. Desmond Lee, revealed more details about BuildSG, the transformation office for the built environment. He said BuildSG will comprise three centres – **iBuildSG, weBuildSG** and **SGBuilds**.

BuildSG - Transforming the way we Build Singapore

2. Minister Lee, together with Minister of State for National Development and Manpower, Mr Zaqy Mohamad; members of the Construction Industry Joint Committee including its president, Er. Edwin Khew; Mr Zainal Sapari, Assistant Secretary General of National Trades Union Congress (NTUC); Mr Lee Fook Sun, BCA Chairman; and Mr Hugh Lim, BCA CEO also unveiled the official BuildSG logo to an audience of more than 2,000 industry guests, stakeholders and partners at Resorts World Sentosa. The joint unveiling signifies the tripartite approach towards industry transformation, and is a wider call for all stakeholders to participate in a national movement to build a Singapore of the future.

Collaboration to transform the sector at three levels

3. **iBuildSG** - the workforce is at the heart of our industry transformation. The centre will work with Trade Associations and Chambers (TACs) and key firms to uplift the perception and practices in the sector to attract, develop and retain more talent and provide better jobs for Singaporeans, especially at the professional, managerial, executive and technical

(PMET) levels. It will also function as a career office and provide support for interested individuals and those already in the built environment sector.

4 **weBuildSG** will be the go-to centre for *firms and TACs,* as they work on translating the ITM into detailed action plans. Their current goal is to build up expertise in the transformation areas identified under the Construction ITM, namely Design for Manufacturing and Assembly (DfMA), Integrated Digital Delivery (IDD) and green buildings. Through various initiatives and government support schemes, weBuildSG will work with firms to build up capacity and capability to meet Singapore's domestic needs and grow to offer their services internationally.

5. **SGBuilds** seeks to bring firms together to collaborate in bringing the *Singapore brand* of development and construction overseas. This centre will support firms in their internationalisation efforts through building stronger networks and cultivating deeper ties in overseas markets, sharing knowledge on overseas opportunities, and facilitating formation of cluster-level consortiums for projects of interest. More details about BuildSG and its centres can be found in Annex A.

6. The centres have begun reaching out to industry on the new initiatives that TACs, IHLs and various stakeholders could work on jointly to build capacity and capabilities. One such initiative is the development and implementation of the Built Environment SkillsFuture Tripartite (BEST) Taskforce recommendations.

Attracting and developing a pipeline of talent for the Built Environment

7. One ITM initiative to build key competencies in the built environment sector was the setting up of the BEST Taskforce. Since August 2017, the BEST Taskforce comprising members from TACs, professional boards, IHLs and BCA have met to deliberate on the needs of the industry and how each stakeholder can play its part in equipping our workforce with the necessary skills and competencies across pre-employment education and training (PET), structured internship, and continuing education and training (CET). This has culminated in a set of recommendations to build up the manpower capabilities to support industry transformation.

8. Firstly, students can look forward to an **updated curriculum of built environment related courses infused with the new industry transformation areas**. The Taskforce recommends the updating of IHLs' curricula with enhanced core modules, new electives and supplementary curricula, e.g. learning journeys, project site visits or sharing sessions on the

key transformation areas. This will be supported by TACs, industry firms and iBuildSG which can provide training resources to make the curriculum more relevant to industry's needs.

9. Second, the Taskforce recommends enhancing internship by moving towards **6-month structured internships** with pre-defined learning outcomes and good industry mentorship. Relevant guidelines are being developed to help firms with lesser experience in structured internships. The Taskforce is also looking into pre-internship engagement with students which aims to inspire them to take up built environment careers and impart knowledge on the key areas of transformation. With such enhancement, students can look forward to more enriching internship experience in the built environment sector.

10. Third, to give students early exposure to real work settings where collaboration across disciplines is paramount, the taskforce also recommends IHLs to offer **inter-disciplinary projects and competitions**, supported by the TACs. This gives students from various disciplines (e.g. architecture, engineering, quantity surveying) an opportunity to come together to work as a project team to create more innovative solutions, just as they would in real-life projects.

11. Existing workforce in the sector can look forward to **a stronger collaboration between IHLs, BCA, and TACs for CET provision**. The taskforce also recommends the **professional boards (Professional Engineers Board and Board of Architects) to infuse transformation areas into pre-registration training**.

12. Er. Edwin Khew, President of the Construction Industry Joint Committee (CIJC) and co-chairperson of the BEST Taskforce, said "I would like to thank all members of the taskforce for putting in time and effort in developing action plans to equip the built environment workforce with the necessary skillsets for the future of construction. In our ITM, we have collectively envisioned an outcome of creating good jobs for Singaporeans. Firms also stand to benefit from a more competent workforce. In order to make this happen, all industry stakeholders should carry an open mindset and provide strong support."

13. More details on the BEST Taskforce recommendations can be found in Annex B. iBuildSG and industry stakeholders will continue their collaboration in the next phase of implementing the BEST taskforce recommendations, and expansion of the scope to Facilities Management to support Real Estate ITM.

Inaugural Built Environment Leadership Platinum Star Award

14. Winning big at the BCA Awards ceremony this year are City Developments Limited (CDL) and the Housing & Development Board (HDB). CDL and HDB will be the first

recipients of the Built Environment Leadership Platinum Star Award[1]. This is an apex award that recognises a company's commitment to excellence in the areas of safety, quality, sustainability, user-friendliness and productivity and capability building. More details on this award and the winners can be found in Annex D.

15. "My heartiest congratulations to all winners this year. We can all be proud of the many notable achievements attained by our industry. Be it productivity gains, safety, quality, sustainability or user-friendliness - all these qualities have built a strong Singapore brand which is recognised here. But this is also something firms can take beyond our shores. We look forward to working with innovative and progressive firms and the TACs in advancing our transformation efforts. In turn, these will provide a better working environment and create new and exciting career opportunities for Singaporeans," said Mr Hugh Lim, BCA CEO.

16. A record total of 540 awards were given out by BCA this year. The Awards recognise excellence achieved by firms in all facets of the building sector – development work, architecture, engineering, design and construction.

Issued by the Building and Construction Authority on 22 May 2018

About Building and Construction Authority (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, 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.

About BuildSG
BuildSG is a newly set up outfit which seeks to partner stakeholders closely to co-implement the Construction ITM. Its name reflects our shared mission to build Singapore for the future, and the industry we need to achieve this. BuildSG will be laying the groundwork for closer collaboration with the Trade Associations and Chambers (TACs), firms, institutes of higher learning (IHLs) and unions to realise the outcomes of the ITM. BuildSG started its operations in April 2018 and comprises three centres namely – **iBuildSG, weBuildSG, and SGBuilds,**

[1] The Built Environment Leadership Platinum Star Award is accorded to organisations that are past Built Environment Leadership (Platinum) award winners and have held the award for at least five years with sustained Platinum performance.

About the BuildSG logo

Positioned with an industry leadership focus, the logo encapsulates the aspiration to drive the built environment's growth with the implementation of forward-pointing arrows. The arrows are placed upon a strong font-type, representing a solid foundation that this initiative is built on. The subtle use of the colours which represent BCA's pillars on the arrows shows continuity with BCA as the champion for the transformation of the industry, with a larger emphasis on the bold and capitalised 'SG' further reiterating the importance of this national movement for the built environment and the country. It can be placed alongside corporate logos of industry partners, trade associations, unions and IHLs to brand the initiatives that are rolled out as part of the industry transformation.

ANNOUNCEMENTS AT BCA AWARDS 2018, 22 MAY 2018

MEDIA FACTSHEETS

Annex A: BuildSG

Annex B: BEST taskforce recommendations + infographic

Annex C: Featured individual profiles

Annex D: BCA Built Environment Leadership Award 2018

Annex E: R&D initiatives / grant calls (mentioned in BCA chairman's speech)

Annex F: Collaborative bidding

Issued by the Building and Construction Authority on 22 May 2018

About BCA

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Annex A

BUILDSG

BACKGROUND

Following the launch of the Construction Industry Transformation Map (ITM) in October 2017, it was announced that a new transformation office would be set up to drive the implementation of the ITM strategies in collaboration with tripartite partners including trade associations and chambers, Institutes of Higher Learning, and unions.

2 The name of the new office, BuildSG, was unveiled by Second Minister for National Development Desmond Lee at the Budget debate in March 2018. Its name reflects our shared mission to build Singapore for the future, and the industry we need to achieve this.

3 BuildSG will be laying the groundwork for closer collaboration with the Trade Associations and Chambers (TACs), firms, institutes of higher learning (IHLs) and unions to realise the outcomes of the ITM. BuildSG will also seek to identify synergies from the different ITMs in the Built Environment (BE) cluster.

4 BuildSG started operations in April 2018 and comprises three centres namely – **iBuildSG, weBuildSG, and SGBuilds,**

THE THREE CENTRES & THEIR FUNCTIONS

5 **iBuildSG** will collaborate closely with stakeholders to attract and develop the workforce required for transformation. At the industry level, iBuildSG will work with TACs and key firms to uplift the perception and practices in the sector to attract, develop and retain more talents and provide better jobs for Singaporeans. This will also ensure that firms have the talent pipeline they need to grow. It will also function as a career office for individuals interested in the Built Environment sector to find out more about careers, progression pathways and support for individuals to join and develop their skills in the sector, including the administration of funding incentives and programmes such as the BCA-Industry Built Environment Scholarship and Sponsorship Programmes and the Workforce Training and Upgrading Scheme. iBuildSG will also work with the IHLs, associations, professional boards to support the BEST taskforce and its implementation.

6 **weBuildSG** will actively engage TACs and firms to translate the ITM into action plans for firms and individuals. It will focus on building collective capacity in our industry with an emphasis on teamwork and collaboration. Specifically, the Centre will work with industry to offer cross-functional and firm-specific advice on transformation, as well as available funding support to assist in their development of business plans. It will also work closely with relevant public agencies to explore and facilitate opportunities for capability development and growth.

7 **SGBuilds** will support firms in their internationalisation efforts through building stronger networks and cultivating deeper ties with key stakeholders in overseas markets, and sharing market knowledge of overseas opportunities. It will facilitate formation of cluster-level consortiums for projects of interest, such as G-to-G programmes like Amaravati in India's Andhra Pradesh. The Centre will also work closely with other public agencies as well as TACs, to support our firms in their internationalization plans.

Annex B

BEST TASKFORCE RECOMMENDATIONS + INFOGRAPHICS

BACKGROUND

Under the Construction Industry Transformation Map (ITM), green buildings, Design-for-Manufacturing-and-Assembly (DfMA), and Integrated Digital Delivery (IDD) are identified as key transformation areas for the Built Environment (BE) sector. They will significantly transform the sector, resulting in better working environment, more competitive pay and new opportunities for Singaporeans. To support industry transformation, we need to ensure a pipeline of talent and equip our workforce with the necessary competencies.

2 The Built Environment SkillsFuture Tripartite (BEST) Taskforce was set up as a key recommendation of the Construction ITM in August 2017 to look into competency building for the BE sector. It seeks to establish a structured professional development pathway across pre-employment training (PET), internship and early job training, and continuing education and training (CET).

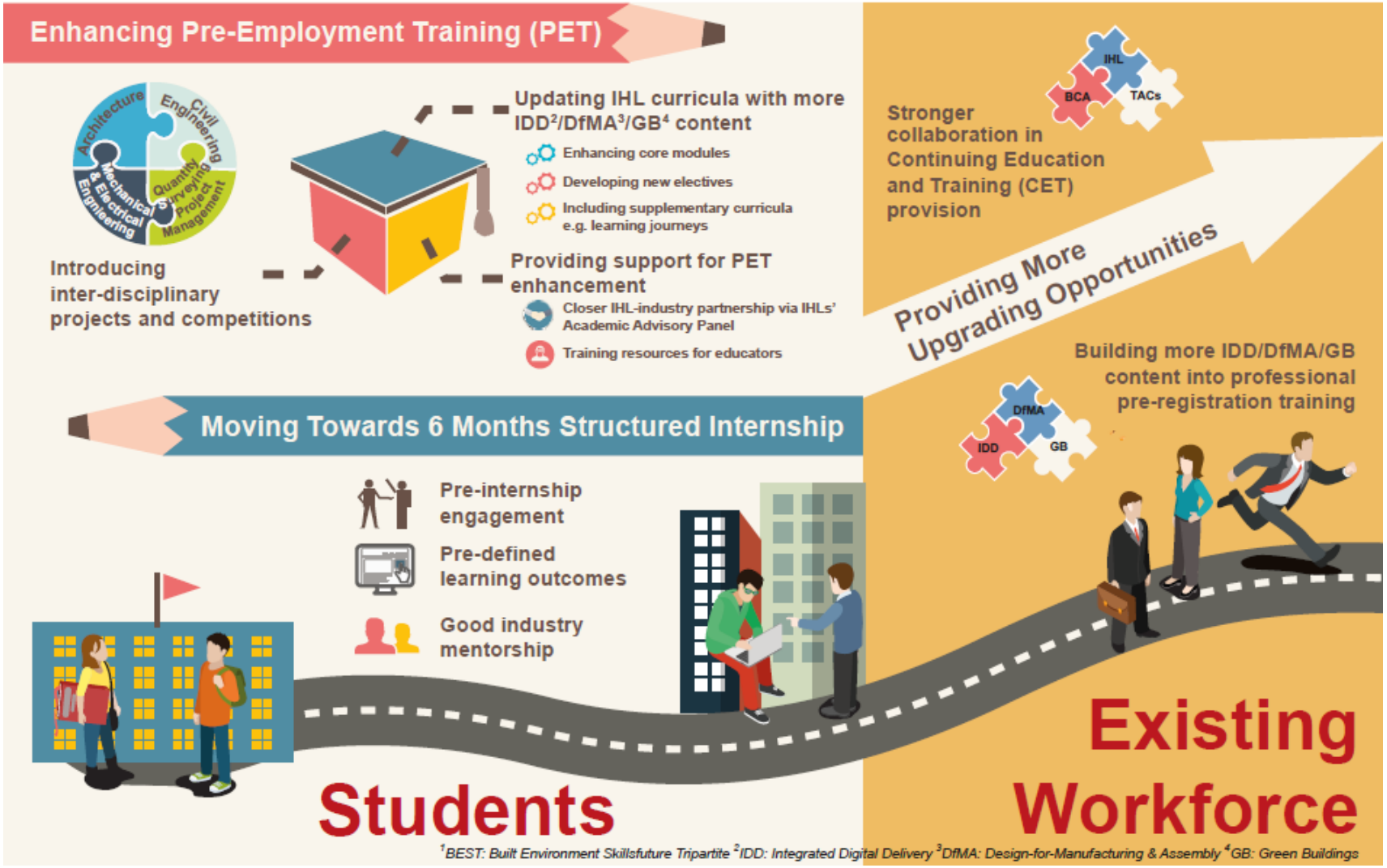
3 The Taskforce is co-chaired by BCA Deputy CEO Mr Neo Choon Keong and Construction Industry Joint Committee (CIJC) Chairman Er. Edwin Khew, with 21 other members from Institutes of Higher Learning (IHLs), trade associations, and professional boards. Stakeholders came together under this tripartite platform to jointly deliberate on the needs of the industry and how each member can play its part in equipping our workforce with the necessary skills and competencies.

4 The Taskforce has developed its recommendations for the Architecture, Civil Engineering, Mechanical and Electrical Engineering, and Quantity Surveying and Project Management disciplines, and it will be carrying out a similar review in the area of facilities management in 2H2018 in support of the Real Estate ITM. The BEST Taskforce recommendations are as summarised in the infographics.

RECOMMENDATIONS

<< see infographics >>

BEST[1] Taskforce Recommendations



Annex C

FEATURED INDIVIDUAL PROFILES

Fong Yew Chung Alvin, 40 years old

- 2017 BCA-Kimly Built Environment Diploma Sponsorship (Part-time)
- Diploma in Construction Engineering (BCA Academy)
- Employer: Kimly Construction Pte Ltd
- Contact email: alvinfong@kimly.com.sg
- Agreeable for media interview: Yes (email)

- **Description of job scope in specialisation area (BIM)**

Alvin is a strong believer in lifelong learning and feels that everyone should upgrade themselves whenever possible. Seeing how the built environment sector has grown and progressed through the years, it has given him the drive to improve his knowledge and skill beyond his scope of work.

Throughout his 18-year career in consultancy and contractor firms, he has been working on projects of differing scope. He strongly felt the need to expand his construction related knowledge by pursuing higher education to complement his work experiences and has continuously upgraded himself through different built environment related courses such as Building Information Modelling (BIM) and Virtual Design & Construction (VDC).

As an Assistant BIM Manager with Kimly Construction since 2016, he is tasked to implement VDC at both project and company level. The knowledge gained from the upgrading courses have certainly helped him to be better equipped to handle projects.

- **An example of how his / her job scope in BIM is different from the usual jobs in the built environment sector**

BIM and VDC utilises multi-disciplinary virtual building models through cooperative participation by all stakeholder to achieve holistic design solution. This effectively helps to achieve time and cost saving in most projects. Presently, he is using BIM and VDC in the ongoing multi-tenanted JTC Logistic Hub @ Gul project. Such game-changing technology enables him to identify problems virtually and to find an effective solution together with stakeholders of the project instantly before construction begins on-site. This is unlike conventional construction where it might take days to identify problems on-site, leading to unproductive re-work. Jobs in BIM specialisation area will appeal to the younger generation who are more tech-savvy, especially with the improved working environment that comes with it.

Dawn Neo, 36 years old

- Designation: Deputy Technical Manager, Moderna Homes Pte Ltd (Subsidiary of BBR Holdings (S) Ltd)
- Specialisation: **DfMA** / **IDD** / Green buildings
- Contact email: dawn.neo@homesmoderna.com
- Agreeable for media interview: Yes (email, phone, face to face)

"We worked closely with the developer and consultant team on The Wisteria & Wisteria Mall, from conceptual architectural layout stage to zoning of the layout into modular units. BIM was used to model the PPVC modules and we subsequently developed the details for project coordination and fabrication, resulting in time and manpower savings."

- **Description of job scope in specialisation area (DfMA / IDD)**

Her maiden experience with a DfMA project was at the NTU Residential Halls at Nanyang Crescent. Although she was new to DfMA then, her boss and mentor, Moderna's MD Mr John Mo, saw the potential in her as a young, innovative and resourceful person. The firm was willing to provide opportunities and groom the next generation of engineers. She has also just completed her second DfMA project, The Wisteria & Wisteria Mall. Dawn and her team designed each residential unit to be made up of a few 'modules', fabricated off-site in factory controlled condition, which comes complete with internal finishes, fixtures and fitting for walls, floors & ceilings. These modules are then transported to site for installation, similar to a "Lego-like" assembly. Virtual Design and Construction (VDC) was also carried out in this project, where various decision-makers representing different project stakeholders gather physically in one room to carry out design and construction coordination. This "Big Room" collaboration, supported by the use of BIM technology, helps identify and resolve potential conflicts to reduce abortive works on site.

- **An example of how his / her job scope in DfMA and IDD is different from the usual jobs in the built environment sector**

This whole collaborative approach, from design to fabrication off-site and assembly on-site, or DfMA, can achieve better quality homes delivered in a shorter time frame while reducing

disamenities to the surrounding neighbourhood. For those working in the BE sector, it also means a conducive, safer and cleaner working environment. Dawn's experience at these 2 DfMA projects have helped the firm build up the DfMA capability of the workforce, providing them with a competitive edge in DfMA projects.

Ong Yan Xiang, 34 years old

- Designation: Senior Principal Engineer, CPG Consultants Pte Ltd
- Specialisation: DfMA / IDD / **Green buildings**
- Contact email: ong.yan.xiang@cpgcorp.com.sg
- Agreeable for media interview: Yes (email)

"I was actively involved in the contract administration and electrical works for the Tahir Foundation Building, a structure so green it saves enough energy to power up 845 units of HDB 5-room flats in a year. Located at the NUS Yong Loo Lin School of Medicine, this building and one of its laboratories have been awarded Platinum rating under BCA Green Mark for Non-Residential Buildings and BCA Green Mark for Laboratories schemes respectively."

- **Description of job scope in specialisation area (Green Buildings)**

The Tahir Foundation Building houses many labs and such buildings generally consume at least 30 percent more power than regular office buildings. Hence, it was essential to include green considerations as a core element of its design apart from research facilities. The consultants and contractors worked closely with NUS to study ways to maximize energy saving potential, be it in the choice of façade in relation to sun-shading, use of centralized chillers to service a number of surrounding buildings or the procurement of energy-saving lab equipment.

- **An example of how his / her job scope in Green buildings is different from the usual jobs in the built environment sector**

Green buildings enable communities to be environmentally and socially responsible while improving the quality of life of its building occupants. As a Green Mark Manager, besides my core electrical works, I have to work closely with other disciplines, e.g. architects, to assess how external parameters can affect electrical design. For example, we have to consider how daylighting affects artificial lighting and how sensors can help dim artificial lighting where there is ample daylight. Upon completion of installation/ construction, it is important to ensure the systems' data were properly documented and handed over to Facilities managers so that the design intent is known and maintenance can be carried out to ensure systems' operations. Being part of a green engineering team enables me to make a difference to the environment. I feel that this makes my job very meaningful.

Chea Pui Yee, 24 years old

- 2016 BCA-Arcadis Singapore Built Environment Undergraduate Scholar
- Bachelor of Science (Project & Facilities Management), National University of Singapore
- Started serving bond with Arcadis Singapore Pte Ltd (formerly known as Langdon & Seah) on 1 March 2018 as Quantity Surveyor
- Contact email: peiyi.jxie@gmail.com
- Agreeable for media interview: Yes (email)

Making a Switch to Building and Construction - Validating her Career Choice in the Built Environment Sector with a Rewarding Internship Experience

During her Diploma studies in Tourism & Resort Management, Pui Yee was exposed to key iconic buildings such as Marina Bay Sands and Resorts World Sentosa. This spurred her curiosity to learn more about the built environment sector and acquire professional knowledge on building and construction. Coupled with the opportunities in the sector, she made the decision to enrol in the Project & Facilities Management (PFM) course at National University of Singapore (NUS).

During her studies in NUS, Pui Yee found her interest to specialise in Quantity Surveying. She applied for an internship through NUS PFM Practical Training Scheme (PTS) at Arcadis Singapore Pte Ltd (formerly known as Langdon & Seah Pte Ltd) in 2016, which proved to be a fulfilling and enriching experience for her. During her stint there, she was given the opportunity to be involved in cost planning for a few projects, such as the construction of the new Outram Community Hospital. The rewarding internship experience had also helped Pui Yee validate her career choice as a Quantity Surveyor. Sharing her experience at Arcadis, she said “fast-paced, structured and consistent are words I would use to describe this job and myself”. Satisfied with Pui Yee’s internship performance and perceiving her as a good match for the firm, Arcadis Singapore partnered BCA to award her the Built Environment Undergraduate Scholarship in 2016.

With an outgoing character, Pui Yee is actively involved in sports and working in construction sites has never deterred her from joining the built environment sector. Positive on the future of the built environment sector, she is excited to embark her career in this sector.

Recently in March 2018, she returned to Arcadis Singapore Pte Ltd as a full-time Quantity Surveyor. With the prior exposure in managing contracts and providing cost consultancy during her internship, it has given her an advantage in adapting back to her familiar environment faster and easier. Apart from the company operating system which has remained mostly unchanged, being fully aware of the responsibilities of a Quantity Surveyor has also helped her in fulfilling and managing the company expectations of her.

Given her humble family background, Pui Yee had to support her Diploma and Undergraduate studies on her own. She is grateful that the internship helped ignite her interest in the sector and subsequently, the scholarship helped her to lighten her financial burden so that she could focus on her studies. She is excited to be given the opportunity to work at one of the leading cost and project management consultancy firms in Asia, and believes that Arcadis Singapore would be able to provide her with many career progression opportunities as she hopes to grow in the firm.

Annex D

BCA BUILT ENVIRONMENT LEADERSHIP AWARD

The Award

The BCA Built Environment Leadership Award was introduced in 2009 to recognise outstanding industry organisations such as developers, consultants (Architectural, Structural and M&E) and builders, which have demonstrated excellence and leadership in shaping a safe, high quality, sustainable, friendly and productive built environment in Singapore. It also aims to serve as a comprehensive roadmap for the building and construction industry to level up and spur these organisations towards higher degree of professionalism with enhanced capabilities and competitiveness.

Award Categories

The Awards will be given out for the following six categories:

1. Developer / Owner
2. Architectural Consultant
3. Structural Consultant
4. M&E Consultant
5. Multi-Disciplinary Consultant
6. Builder

Assessment Criteria

Applicants must meet the following eligibility criteria to be considered for the Awards:

1. Achieve an overall score of at least 70 points (Gold), 80 points (Gold Plus) or 90 points (Platinum) based on the evaluation criteria established for the Awards. BCA also introduced a higher award, the Platinum Star, for applicants that fulfilled the following criteria:
    - Meet all requirements of a Platinum award; and
    - Are past Built Environment Leadership (Platinum) award winners and held the award for at least five years with sustained Platinum performance

2. Applicants MUST NOT have any significant issues arising from their business / activities in the areas of safety, quality, sustainability and user-friendliness that could lead to adverse publicity or tarnish the Awards' reputation.

Applicants will be judged based on two main scoring elements, namely ***Structured Element***, and ***Non-structured Element***. The weightages for the ***Structured*** and ***Non-structured*** elements are **60%** and **40%** respectively. The assessment criteria are shown below.

STRUCTURED ELEMENT (60%)

SYSTEMS (20 POINTS)
This component assesses applicant's attainment of international management system and business excellence certifications: *1. Business Excellence Certification* a) Singapore Quality Class (SQC) b) Innovation Class (I-Class) c) People Developer (PD) *Note: Organisations with the Singapore Quality Award (SQA) will be accorded 10 bonus points under this section.*
2. Management System Certification a) Quality Management System (ISO 9000) b) Environmental Management System (ISO 14000) c) Occupational Health & Safety Management System (OHSAS 18000)

RESULTS (80 POINTS)
This component assesses applicant's performance and achievement under the applicable BCA's five pillars of excellence through the number of BCA Awards/recognitions and relevant awards bestowed by other public agencies: ***1. Safety*** a) BCA Design & Engineering Safety Excellence Award b) Awards from other public agencies ***2. Quality*** a) BCA Construction Excellence Award b) BCA Quality Excellence Award c) Awards from other public agencies ***3. Sustainability*** a) i) BCA Green Mark Award and ii) BCA-SGBC Green Building Individual Award b) BCA Green Mark Champion Award c) BCA Green and Gracious Builder Award d) Awards from other public agencies ***4. User-Friendliness*** a) BCA Universal Design Mark Award b) Awards from other public agencies ***5. Productivity*** a) BCA Construction Productivity Awards b) B-score (derive from projects with high buildable design scores) c) C-score (derive from projects with high constructability scores) d) Awards from other public agencies

NON-STRUCTURED ELEMENT (40%)

Organisations' embracement/adoption of innovations and local/international awards not covered under the above structured element scoring, which have led to significant positive impact to the built environment would be evaluated under this element.

Part A – Innovations (Maximum 40 Points)

Innovation Category	Aspect of Innovations	Points Allocation
(a) Innovations adopted for the 1st time by the organisation.	Innovative Products and Services	7 Points (Maximum)
	Innovative Culture	8 Points (Maximum)
	Overcoming Challenges and Impact of Innovations	15 Points (Maximum)
(b)Influence of Innovation adopted by organisation to the industry.	Impact of innovation to the industry	10 Points (Maximum)

Part B – Local and international awards and other noteworthy innovations (10 Bonus Points)

Local and international Awards won by the organisation that were not covered under the "Structured Element Scoring"	5 Points (Maximum)
Other noteworthy innovations	5 Points (Maximum)

Assessment Committee

Committee	Designation	Organization
Mr. Han Fook Kwang (Chairman)	Editor-At-Large, The Straits Times	Singapore Press Holdings Ltd Co.
Ms Kala Anandarajah (Deputy Chairman)	Head, Competition & Antitrust and Trade	Rajah & Tann Singapore LLP
Mr. Neo Choon Keong (Deputy Chairman)	Deputy CEO Industry Development	Building and Construction Authority
Mr. Fong Chun Wah	Deputy CEO (Building)	Housing and Development Board
Mr. Seah Chee Huang	Director	DP Architects Pte Ltd
Er. Dr. Tan Teng Hooi	Head of Programme, Building and Project Management	Singapore University of Social Sciences
Mr Yong Mee Him	Executive Director	Woh Hup Pte Ltd
Er Kam Mun Wai	Senior Executive Director	Meinhardt (Singapore) Pte Ltd
Er Koh Kin Teng	Director	Squire Mech Pte Ltd
Mr Ang Lian Aik	Group Director, Construction and Productivity Group	Building and Construction Authority

Mr Ang Kian Seng	Group Director, Environmental Sustainability Group	Building and Construction Authority
Mr Teo Orh Hai	Group Director, Electrical and Mechanical Engineering Group	Building and Construction Authority
Er Chan Bee Bee	Deputy Group Director, Building Engineering Group	Building and Construction Authority
Mr Allen Ang	General Manager, Project Management and Sustainable Design	Keppel Land Limited

BCA BUILT ENVIRONMENT LEADERSHIP AWARD 2018 WINNERS

Award Type	**Company**	**Category**
Platinum Star	City Developments Limited	Developer
Platinum Star	Housing & Development Board	Developer
Gold ^{Plus}	T.Y.Lin International Pte Ltd	Structural Consultant

BCA BUILT ENVIRONMENT LEADERSHIP AWARD 2018 WINNERS

PLATINUM STAR

CITY DEVELOPMENTS LIMITED

KEY ACHIEVEMENTS (2015-2017)

System

Singapore Quality Class STAR, ISO 9000 Quality Management System, ISO 14000 Environmental Management System and OHSAS 18000 Occupational Health and Safety Management.

Result

- **BCA Awards**
  Quality Excellence Awards - Quality Champion Platinum, Construction Excellence Awards, Universal Design Awards, Green Mark Champion Award, Construction Productivity Advocates Award etc.
- **Other Local Awards**
  NParks LEAF Awards, SGBC_BCA Sustainability Leadership Award, etc.
- **Innovations**
  (a) The Brownstone Executive Condominium – Various methods were deployed to increase construction productivity. It is the first and largest private residential development utilizing Prefabricated Prefinished Volumetric Construction (PPVC) construction method. Design for Manufacturing and Assembly (DfMA), early contractor involvement, and extensive use of Building Information Modelling (BIM) were being implemented successfully for the project.
  (b) Singapore Sustainability Academy – Zero carbon footprint building. DfMA construction using PPVC and sustainable cross laminated timber (CLT) as main structural construction material.

- **International Awards**

  RoSPA Occupational Health and Safety Awards, BCI Asia Awards, Fiabci Prix D’Excellence Award, etc.

PLATINUM STAR

HOUSING & DEVELOPMENT BOARD

KEY ACHIEVEMENTS (2015-2017)

System

Singapore Quality Award, Singapore Quality Class, ISO 9000 Quality Management System.

Result

- **BCA Awards**
  Design and Engineering Safety Excellence Award, Construction Excellence Awards, Green Mark Platinum and Gold^{PLUS} Awards, Universal Design Awards, etc.
- **Other Local Awards**
  SCDF Strategic Partner Award, Singapore Concrete Institute Excellence Awards, SGBC-BCA Sustainability Leadership Award, Energy Globe Award, NParks LEAF Awards, etc.
- **Innovations**
  Using modelling tools such as GIS for Integrated Planning and Analysis for town planning. Biophilic framework for the design of the Punggol Northshore District and patented prefabricated extensive green (PEG) roof modules. HDB BIM guide for industry, Virtual Design and Construction (VDC) with BIM, mobile applications for construction and defects management, use of robotics and drones for building inspection, etc.
- **International Awards**
  ESRI Special Achievements in GIS (SAG) Awards, RoSPA Occupational Health and Safety Awards, BCI Asia Awards, American Sustainability Honour Award, etc.

GOLD PLUS

T·Y·LIN INTERNATIONAL PTE. LTD.

KEY ACHIEVEMENTS (2015-2017)

System

ISO 9000 Quality Management System, ISO 14000 Quality Management System.

Result

- **BCA Awards**
  Design and Engineering Safety Excellence Awards, Construction Excellence Award, Construction Productivity platinum Awards, Green Mark Platinum and Gold^{PLUS} Awards, Construction Productivity Awards, etc.
- **Other Local Awards**
  SCDF Fire Safety Design Excellence Award, SSSS Structural Steel Excellence Merit Award, IStructE Structural Heritage Award, IES Top 50 Engineering Feats @ IES-SG50 Awards, ACES Design Excellence Award, etc.
- **Innovations**
  First local Mass Engineered Timber (MET) project (NTU's Wave). Successful implementation of advance Building Information Modelling (BIM) applications (Civil and Infrastructure Information Modelling in Kim Chuan Depot Expansion project, and Bridge Information Modelling in Ulu Pandan Depot Expansion project). Underpinning works with column encasements to conserve existing highly sensitive masonry façade of heritage preservation projects (Victoria Theatre and Victoria Concert Hall). Other innovative structural designs include the Interlace, Marina Bay Sands, LKC NH Museum, etc.
- **International Awards**
  Asean Federation of Engineering Organisations – Outstanding Engineering Achievement Award, CTBUH Inaugural Urban Habitat Award, etc.

Annex E

R&D INITIATIVES / GRANT CALLS

(MENTIONED IN BCA CHAIRMAN'S SPEECH)

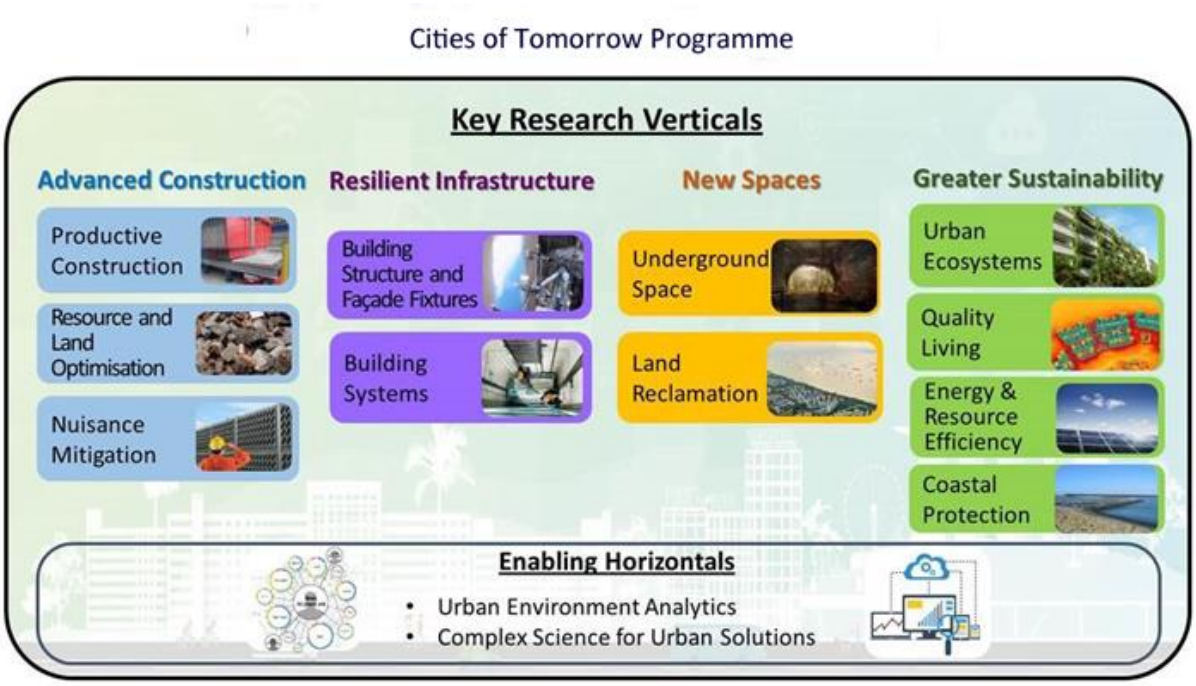
R&D GRANT CALLS FOR DFMA SOLUTIONS UNDER THE $150 MILLION CITIES OF TOMORROW (COT) R&D PROGRAMME

I. BACKGROUND - ABOUT THE CoT R&D PROGRAMME

The Cities of Tomorrow (CoT) R&D programme is a multi-agency effort, led by MND, that recognises the challenges that cities face and seeks to leverage R&D to address these challenges. A total of S$150 million has been approved to fund CoT. The funding will be set aside from the S$900 million allocated to the Urban Solutions and Sustainability (USS) domain under the Research, Innovation and Enterprise 2020 (RIE2020)

The vision of CoT is to establish Singapore as a highly liveable, sustainable and resilient city of the future, and as a vibrant urban solutions hub – a living model which features cutting-edge urban solutions. This will be achieved through the integrated development of R&D in 4 key verticals and 2 horizontals:

- Vertical 1: Advanced Construction
- Vertical 2: Resilient Infrastructure
- Vertical 3: New Spaces
- Vertical 4: Greater Sustainability
- Horizontal 1: Urban Environmental Analytics
- Horizontal 2: Complexity Science for Urban Solutions



The vision and research focus areas for each of the verticals and horizontals are as follows:

Vertical 1 - Advanced Construction

Vision: To build a highly productive, integrated and technologically advanced construction sector

Key Research Focus Areas:

- *Productive Construction* – Develop an integrated, intelligent, digitally-enabled construction environment that is highly productive and cost effective.
- *Resource and Land Optimisation* – Reduce and reuse resources required in construction, and intensify land use for off-site production.
- *Nuisance Mitigation* – Reduce the environmental impact of construction activities.

Vertical 2 - Resilient Infrastructure

Vision: To create a robust, flexible and well-maintained city that has reliable and cost-efficient infrastructure

Key Research Themes:

- *Building Structure and Façade Fixtures* – Minimise building defects and enhance building inspection processes, as well as to reduce the cost and manpower needs for maintenance.
- *Building Systems* – Enhance the performance and reliability of key Mechanical and Electrical services.

Vertical 3 - New Spaces

Vision: To ensure sufficient space capacity to support Singapore's growth, yet maintain a liveable environment

Key Research Themes:

- *Underground Space* – Enhance underground mapping accuracy and reduce cost of underground development
- *Land Reclamation* – Reduce material usage, cost, and environmental impact of land reclamation

Vertical 4 - Greater Sustainability

Vision: To create a high quality living environment that is inclusive, resource efficient and adaptive to climate change

Key Research Themes:

- *Urban Ecosystems* – Create sustainable, resilient and green cities through applying an ecosystem approach to urban planning, development and management.
- *Quality Living* – Create a comfortable and pleasant living environment for residents.
- *Energy and Resource-Efficiency* - Enhance the energy and resource efficiency of towns, estates and buildings to reduce the environmental impact of operations.
- *Coastal Protection* - Future-ready coastal protection for sea level rise.

Horizontal 1 - Urban Environment Analytics

Vision: To achieve responsive and targeted service delivery as well as resource efficiency in municipal services and urban planning

Key Research Themes:

- *Data Analytics, Sensing and Predictive Diagnosis* – Provide targeted services, anticipate emerging trends for better response, and prioritise resources to optimise output
- *Mapping, Modelling & Simulation* – Assess the impact of climate change on the natural and built environment, and to incorporate mitigating measures in planning processes
- *Intelligent Systems* - Improve industry productivity through automation, as well as to improve reliability and consistency of compliance checks

Horizontal 2 – Complexity Science for Urban Solutions

Vision: Applying complexity science to solve dynamic urban problems, by finding hidden regularities and parameters that affect urban planning

Key Research Themes:

- *Improving Liveability in Singapore* – Use complexity science to create decision support tools for urban planning, so as to better plan for a dense and liveable Singapore

More information about the CoT R&D programme can be found at: https://www.mnd.gov.sg/urbansustainability/cities-of-tomorrow.html

II. ABOUT THE R&D GRANT CALLS FOR DFMA SOLUTIONS

Objective

The research will focus on developing more advanced and integrated DfMA solutions to push the boundaries of current best practices and construction technologies. The integration will look into combining structural systems with mechanical and electrical services and some architectural elements as well.

Benefits

By participating in this DfMA R&D, industry players can build-up their own capabilities and competencies by gaining new skills and experience through the R&D stages, as well as through new partnerships with institutions of higher learning (IHLs), Research Institutions (RI) or leading experts.

Timeline

The first wave of grant calls will be launched before end of May 2018. Progressively, BCA will jointly launch more grant calls with HDB at regular intervals.

Eligibility

This call for proposals is open to Principal Investigators (PIs) from all Singapore-based IHLs, public sector agencies and not-for profit research laboratories as well as companies and company-affiliated research laboratories/institutions.

Grant applicants are strongly encouraged to collaborate with industry and development agencies to develop innovative solutions that can address the call objectives and demonstrate strong potential for real-world application within Singapore.

Expected Outcomes

The developed solutions are expected to have high potential for practical implementation and commercialisation that will half the construction floor cycle time and also shorten overall construction time.

GREEN BUILDINGS INNOVATION CLUSTER (GBIC) INNOVATION CHALLENGE CALL FOR ADVANCING NET ZERO THROUGH SMART BUILDING TECHNOLOGIES

BACKGROUND

1. To support the national target of reducing greenhouse gas (GHG) emissions intensities, BCA has set aspiration of achieving positive energy, zero energy and super low energy buildings in the tropics. A dedicated technology development roadmap has been introduced to guide the implementation of research and innovation.

2. One of the most fast-growing and dynamic areas is smart building technology. Through tapping on Internet of Things (IoT), advanced sensors, data analytics, the smart technologies have shown a potential of saving an estimated 8-18% of total building energy consumption and providing a host of non-energy benefits, according to a recent report published by US ACEEE.

3. On 14 May 2018, BCA launched an Innovation Challenge Call for Advancing Net Zero through Smart Building Technologies. The challenge call aims to develop and test-bed innovative smart building solutions to advance the agenda for zero or super-low energy. Funded by National Research Foundation (NRF) under the Green Buildings Innovation Cluster (GBIC) programme, this call will provide opportunities for the industry to collaborate with researchers and building owners to co-innovate solutions and help them develop competitive advantage through embracing innovation in smart technologies.

KEY FEATURES

- A great emphasis is placed on novel technologies that are close to market adoption. Industry's participation in co-innovation and playing a leading role in commercialisation are strongly encouraged.
- Partnership with building owners and potential technology adopter is required to guide the technology development towards market-ready solutions.
- Technologies developed would be test bedded and demonstrated in an operational environment in actual buildings.
- The technologies supported are expected to achieve significant energy savings, addressing the challenge of net zero energy through maximizing the potential of smart technologies.

More information about the challenge call can be found at:
https://www.bca.gov.sg/ResearchInnovation/gbic.html

Annex F

COLLABORATIVE BIDDING UNDER PUBLIC SECTOR PANELS OF CONSULTANTS (PSPC)

BACKGROUND

Currently, government agencies invite firms listed under the Public Sector Panels of Consultants (PSPC) to participate in public sector tenders for consultancy services. The PSPC lists registered firms providing consultancy services under the five areas of discipline: Architecture (AR), Civil & Structural Engineering (CS), Mechanical & Electrical Engineering (ME), Quantity Surveying (QS) and Project Management (PM). Firms are separated into four panels within each discipline according to their size, experience and competencies.

2 Established in 2004, the PSPC serves as a first round of screening to ensure that firms tendering for public sector consultancy services are equipped with relevant experiences and resources to manage the projects. The PSPC aims to (a) improve resource efficiency in tender preparation and evaluation for both government agencies and consultancy firms; and (b) provide a level playing field for firms within the panel so bigger firms with more resources cannot tender for smaller projects.

3 The panel system is open and merit-based system. Hence, any firm that fulfils the PSPC registration requirements listed in Appendix A can apply to be listed in a panel. Firms are able to bid for projects within the tendering limits of their panel listed in Appendix B. Generally, registration at a higher PSPC panel would require firms to have more experience and resources as the registration would allow the firm to participate in tenders of higher value that could be more complex in nature.

4 Under the Construction Industry Transformation Map (ITM) launched in October 2017, BCA has begun a series of reviews on the public sector construction procurement practices to facilitate the transformation of the industry by building strong and capable firms, and helping them develop niche areas to export their services to overseas market.

INTRODUCTION OF COLLABORATIVE BIDDING

5 In line with the Construction ITM, BCA will introduce collaborative bidding under the PSPC to (a) ***help firms build up their capability and niche areas****; and (b)* ***encourage collaboration between firms with complementary competencies to create a wider pool of competent firms in the sector.***

6 Under the existing PSPC, smaller firms listed in the lower-tier panels (e.g. Panel 3 and 4) would not be able to tender for projects beyond the allowable tendering limits within their panels. For example, two Panel 3 architectural firms can collaborate but they can only bid for tenders that are open to Panel 3, but not Panel 1 and 2.

7 With the enhancement to allow collaborative bidding, firms may pool their resources to be eligible to tender for projects beyond their panels' allowable tendering limits. The consortium would have to meet the requirements of the PSPC panel (i.e. track record, personnel, training requirements, etc.) that the tender is open to.

8 BCA will continue to engage industry members to fine-tune the implementation details. An advisory note will be issued prior to the implementation.

Appendix A: Registration Requirements under Public Sector Panels of Consultants

ARCHITECTURAL (AR) CONSULTANCY FIRMS

Panel	Personnel[2]	Firm's Track Record (at least 1 such project completed within past five years)	Training Course Requirements[3]					ISO Certification[4] (in the AR discipline)		Professional Indemnity Insurance (PII)
			Code of Practice on Buildable Design	Green Mark Manager (GMM) or Green Mark Facilities Manager (GMFM)	Green Mark Professional (GMP)	Green Mark Facilities Professional (GMFP)	Universal Design (UD) Assessor	ISO 9001:2008 Quality Management	ISO 14001:2004 Environmental Management	
AR01	4 QP + 4 Sp	≥S$15mil	Yes	2 staff	1 staff	1 staff	Yes	Yes	Yes	S$0.5M
AR02	3 QP + 3 Sp	≥S$5mil	Yes	2 staff	-	-	Yes	Yes	-	-
AR03	2 QP + 2 Sp	≥S$1.5mil	Yes	1 staff	-	-	-	-	-	-
AR04	1 QP + 1 Sp	-	-	-	-	-	-	-	-	-

MECHANICAL & ELECTRICAL (ME) ENGINEERING CONSULTANCY FIRMS

Panel	Personnel[5]	Firm's Track Record (at least 1 such project completed within past five years)	Training Course Requirements[2]			ISO Certification (in the ME Engineering discipline)		Professional Indemnity Insurance (PII)
			GMM or GMFM	GMP	GMFP	ISO 9001:2008 Quality Management	ISO 14001:2004 Environmental Management	
ME01	4 QP + 4 Sp	≥S$15mil	2 staff	1 staff	1 staff	Yes	Yes	S$0.5mil
ME02	3 QP + 3 Sp	≥S$5mil	2 staff	-	-	Yes	-	-
ME03	2 QP + 2 Sp	≥S$1.5mil	1 staff	-	-	-	-	-
ME04	1 QP + 1 Sp	-	-	-	-	-	-	-

[2] *The supporting professional(s) should have a relevant recognised degree in Architecture referenced from the BOA.*

[3] *These training requirements ensure that firms managing projects are equipped with relevant skillset to design projects that consider buildability, sustainability, and universal design. For firms that do not satisfy this requirement, the firms are to submit a confirmation letter on successful placement for the course. The "Certificate of Successful Completion" (GMM, GMFM, GMP and GMFP) is to be furnished upon successful completion of the course.*

[4] *ISO certification is required for the two higher bandings to ensure that the firms handling the bigger projects have a better management system.*

[5] *The supporting professional(s) should have a relevant recognised degree in Mechanical/Electrical Engineering referenced from the PEB.*

QUANTITY SURVEYING (QS) CONSULTANCY FIRMS

Panel	Personnel[6]	Firm's Track Record (at least 1 such project completed within past 5 years)	ISO Certification (in the QS discipline)	
		Firm and 1 PSPC-Recognised QS completed as Project QS	ISO 9001:2008 Quality Management	ISO 14001:2004 Environmental Management
QS01	4 PSPC-Recognised QS + 4 Sp	≥S$15mil	Yes	Yes
QS02	3 PSPC-Recognised QS + 3 Sp	≥S$5mil	Yes	-
QS03	2 PSPC-Recognised QS + 2 Sp	≥S$1.5mil	-	-
QS04	1 PSPC-Recognised QS + 1 Sp	-	-	-

CIVIL & STRUCTURAL (CS) ENGINEERING CONSULTANCY FIRMS

Panel	Personnel[7]	Firm's Track Record (at least 1 such project completed within past five years)	Training Course Requirements	ISO Certification (in the CS Engineering discipline)		Professional Indemnity Insurance (PII)
			Code of Practice on Buildable Design[8]	ISO 9001:2008 Quality Management	ISO 14001:2004 Environmental Management	
CS01	4 QP + 4 Sp	≥S$15mil	Yes	Yes	Yes	S$0.5mil
CS02	3 QP + 3 Sp	≥S$5mil	Yes	Yes	-	-
CS03	2 QP + 2 Sp	≥S$1.5mil	Yes	-	-	-
CS04	1 QP + 1 Sp	-	-	-	-	-

[6] *PSPC-Recognised QS refers to a personnel with a recognised QS-related degree and two years of relevant work experience. The list of recognised QS-related degrees can be found on: https://www.bca.gov.sg/PanelsConsultants/others/PSPC_AppB.pdf. Supporting professional(s) who is at least a degree holder in Architecture, Building, Construction-related Engineering or equivalent*

[7] *The supporting professional(s) should have a relevant recognised degree in Civil/Structural Engineering referenced from the PEB.*

[8] *For firms that do not satisfy this requirement, the firms are to submit a confirmation letter on successful placement for the course. The "Certificate of Accomplishment" (Code of Practice on Buildable Design) is to be furnished upon successful completion of the course.*

PROJECT MANAGEMENT[9] (PM) CONSULTANCY FIRMS

Panel	Personnel[10]	Firm's Track Record (No. of projects completed within past 5 years)		Training Course Requirements[11]					ISO Certification (in the PM discipline)	
		Firm	Degree Holder(s) completed as PM before[14]	Code of Practice on Buildable Design	GMM or GMFM	GMP	GMFP	UD Assessor	ISO 9001:2008 Quality Management	ISO 14001:2004 Environmental Management
PM01	4 PSPC-Recognised Deg + 4 Sp	3x ≥S$65mil	2x ≥S$65mil	Yes	2 staff	1 staff	1 staff	Yes	Yes	Yes
PM02	3 PSPC-Recognised Deg + 3 Sp	3x ≥S$30mil	1x ≥S$30mil	Yes	2 staff	-	-	Yes	Yes	Yes
PM03	2 PSPC-Recognised Deg + 2 Sp	3x ≥S$10mil	1x ≥S$10mil	Yes	1 staff	-	-	-	Yes	-
PM04	1 PSPC-Recognised Deg + 1 Sp	-	1x ≥S$3mil	-	-	-	-	-	-	-

[9] *Project PM refers to appointment by client/developer to provide solely project management services*
[10] *Degree holder with a relevant recognised degree referenced from the BOA, PEB or from the list of recognised QS-related degrees found in PSPC Terms of Listing (https://www.bca.gov.sg/PanelsConsultants/others/PSPC_AppB.pdf)*
Supporting professional(s) who is at least a degree holder in Architecture, Building, Construction-related Engineering or equivalent
[11] *For firms that do not satisfy this requirement, the firms are to submit a confirmation letter on successful placement for the course. The relevant "Certificate of Accomplishment" (Code of Practice on Buildable Design) / "Certificate of Successful Completion" (UD Assessor, GMM, GMFM, GMP and GMFP) is to be furnished upon successful completion of the course*

Appendix B: Tendering Limits

Tendering limits for AR, CS, ME and QS				
Panel 1		> $13mil to $85mil		> $85M
Panel 2	> $4mil to $40mil			> $85M
Panel 3	Up to $13mil			> $85M
Panel 4	Up to $4mil			> $85M
Project value	**4M**	**13M**	**40M**	**85M**

Tendering limits for PM				
Panel 1			> $40M	
Panel 2		> $13mil to $85mil		
Panel 3	Up to $40mil			
Panel 4	Up to $13mil			
Project value		**13M**	**40M**	**85M**