

MEDIA RELEASE

BCA PARTNERS INDUSTRY AND UNIVERSITIES TO GROOM LEADERS TO DRIVE SUSTAINED TRANSFORMATION IN THE BUILT ENVIRONMENT SECTOR

- *BCA also pilots new voluntary Maintainable Design Appraisal System to assess building designs' degree of maintainability*

29 May 2019, Singapore – The Building and Construction Authority (BCA) has partnered the built environment industry and academia to develop a new **iBuildSG Leadership Engagement and Development (LEAD)** framework to support leadership development within the sector. BCA is also working with the industry to pilot a new, voluntary **Maintainable Design Appraisal System** (or MiDAS in short) from May this year. These were announced at the BCA Awards 2019 ceremony by Minister of State for National Development and Manpower, Mr Zaqy Mohamad. More than 2,000 industry guests were present to celebrate the built environment sector's achievements.

iBuildSG Leadership Engagement and Development (LEAD) Framework

2 The iBuildSG LEAD framework is an initiative under the Construction Industry Transformation Map to develop leaders within the workforce who can drive sustained industry transformation efforts. Targeted at young emerging leaders, to potential and existing C-suite leaders, the framework aims to build leadership capability and capacity at various levels:

- At the industry level, the framework builds collective stewardship and develops networks for leaders to foster strong collaboration across the construction value chain.
- At the firm level, the framework supports firms in developing talent and growing their leadership pipeline so each firm has the bench strength to grow domestically and abroad.

- iii) At individual level, the framework helps industry practitioners build up their competencies to advance the sector, and recognises those with outstanding contributions.

3 There will be three leadership building platforms within the framework, anchored by two bespoke structured programmes, **LEAD Horizon Programme** and **LEAD Milestone Programme** (see [Annex A](#) for details on each platform). BCA will partner the **Singapore Management University** (SMU) as the anchor institution for both the Horizon and Milestone Training Programmes. SMU's strengths in industry collaboration and management skills will enhance the participants' leadership competencies in these areas. In addition, BCA will collaborate with the **Singapore University of Technology and Design** (SUTD) on a technical track within the LEAD Horizon Programme to run an innovation bootcamp. To complement the above, a third platform, **Insights@LEAD** comprising a series of events and initiatives will further thought leadership and provide opportunities for co-creation through alignment and collaboration across the LEAD community.

4 "SMU is delighted to partner BCA to launch two bespoke structured training programmes under the new iBuildSG LEAD framework. These Programmes aimed at the middle level leaders and enterprise leaders in the Built Environment sector represent a fusion of experiential and interactive learning, facilitated by experienced SMU faculty and industry leaders. We are confident that our programme participants will value the many real-life case studies, practice-driven approach to teaching and networking opportunities. With expertise in delivering tailored and industry-specific programmes, SMU's Executive Development presents a robust offering that will well address the needs of leaders and senior executives who are tackling today's challenges," said SMU President, Professor Lily Kong.

5 "SUTD is pleased to promote leadership in innovation by design in partnership with BCA through the new iBuildSG LEAD Framework. Leveraging SUTD's unique strength in design innovation and active learning pedagogy, we look forward to equipping the participants with essential knowledge and skills to take on tomorrow's challenges and stay future-ready. The training programme designed for BCA can be incorporated into SUTD Academy's ModularMaster programmes, which can in turn lead to Master's

programmes, thereby providing a pathway for participants to up-skill themselves as desired,” said Professor Chong Tow Chong, SUTD President.

Maintainable Design Appraisal System

6 As part of the initiatives to uplift the Facilities Management (FM) sector – a key focus under the Real Estate Industry Transformation Map – BCA brought together the industry, unions, and other public agencies to form a Tripartite FM Implementation Committee (FMIC) to develop, oversee, and review the implementation of the sector’s transformation plans. FMIC identified Design for Maintainability (DfM) as a key pillar in transforming the FM sector. DfM is the practice of integrating operations & maintenance considerations into project planning and design to achieve effectiveness, safety, and economy of maintenance tasks.

7 BCA has worked with the industry and two tertiary institutions - SUTD and the Nanyang Technological University (NTU) - on a new, voluntary **Maintainable Design Appraisal System** (MiDAS), which assesses the degree of maintainability of building designs from the lens of labour efficiency and cost-effectiveness of downstream maintenance regimes. Through MiDAS, BCA aims to:

- i) Foster greater collaboration among designers, developers, and FM practitioners to deliver better and more maintainable designs;
- ii) Promote holistic sustainability by considering not only environmental aspects but also economic and social through reducing costs and reliance on manual labour for building maintenance;
- iii) Enable designers and developers to make more informed design decisions upfront and take a life-cycle view of the development – including considerations for not only initial capital expenditure but also operating expenses.

MiDAS will be piloted in about 10 public and private projects including the new Surbana Jurong Campus, Ascendas Singbridge’s integrated development, Ascent, and PSA’s new office building at Pasir Panjang.

8 To raise awareness of the importance of DfM and help the industry keep abreast of good DfM practices – including safe maintenance access, use of appropriate building materials and adoption of technology – to enable efficient maintenance activities downstream, BCA collaborated with industry stakeholders and government agencies to

put together a set of DfM guides. The guides, which are available on BCA's website, are customised to different building types, specifically residential buildings, non-residential buildings and municipal infrastructure (see [Annex B](#) for more details).

Built Environment Leadership Award

9 At this year's BCA Awards, local builder, **Tiong Seng Contractors (Private) Limited**, emerged as the top winner of the **Built Environment Leadership Award** – clinching the pinnacle **Platinum Star**. Tiong Seng has maintained the Platinum status for the past five years, demonstrating their strong leadership, excellence and innovation in Singapore's Built Environment industry. They have continued to push the boundaries for building innovations, their latest being the in-house developed and patented Prefabricated Prefinished Volumetric Construction solutions which incorporate advanced ultra-high performance ductile concrete (UHpDC). UHpDC has up to five times the compressive strength of normal concrete, making robust yet slimmer concrete panels for efficient transportation, construction lifting and installation works.

10 Mr Hugh Lim, BCA CEO said, "Over the past twenty years, BCA has worked with our partners to develop the industry and shape the Singapore skyline. The industry has built up much expertise and some have even brought the strong Singapore brand representing quality and sustainability beyond our shores. I congratulate all the award winners for their outstanding achievements and look forward to continue our work with the industry to transform our sector, offer good jobs for Singaporeans and change the way we build Singapore."

11 This year's BCA Awards saw 536 accolades given out to project teams, developers and practitioners for their outstanding achievements in delivering exemplary projects and upholding best practices in areas of safety, quality, sustainability, productivity and universal design.

Issued by the Building and Construction Authority on 29 May 2019

Enclosed:

Annex A: Factsheet on the iBuildSG LEAD framework

Annex B: Factsheet on DfM and MiDAS

Annex C: Factsheet on Built Environment Leadership Award

About BCA

The Building and Construction Authority (BCA) of Singapore champions the development of an excellent built environment for Singapore. BCA's mission is to shape a safe, high quality, sustainable and friendly built environment, as these are four key elements where BCA has 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.

Annex A: Factsheet on the iBuildSG LEAD framework

Background

To achieve the outcomes of the Construction Industry Transformation Map (ITM), workforce development plays a crucial role in supporting and catalysing industry transformation. BCA has undertaken various initiatives to build a skilled and competent workforce. These initiatives include:

- (i) Implementation of strategies to attract and retain BE personnel, develop skills and competencies, and uplift jobs.
- (ii) Development of a skills framework to identify skills and competencies for progression within the sector
- (ii) Development of a leadership framework to groom a core group of industry leaders

To support leadership development for the sector, BCA has partnered the industry to develop a new **iBuildSG Leadership Engagement and Development (LEAD) framework**.

The iBuildSG LEAD framework will complement the Skills framework in developing horizontal skills to coordinate efforts and cultivate a collaborative environment to achieve ITM goals. Whilst the Skills Framework currently being developed with the respective TACs aims to chart vertical skills, a robust leadership development framework will develop the cross-cutting skills required to drive and sustain industry wide transformation through collaboration.

Participation in the programmes is via partnership with industry firms.

Objectives & Outcomes

The objective of the iBuildSG LEAD framework is to nurture a core group of committed and forward thinking industry leaders to drive sustained industry transformation efforts. The framework builds leadership capacity at various levels:

- i) At the industry level, the framework builds collective stewardship and develops networks for leaders to foster strong collaboration across the construction value chain.
- ii) At the firm level, the framework supports firms in developing talent and growing their leadership pipeline so each firm has the bench strength to grow domestically and abroad.
- iii) At individual level, the framework helps industry practitioners build up their competencies to advance the sector, and recognises those with outstanding contributions.

Programme Partners

The iBuildSG LEAD framework is co-owned by industry and developed in consultation with key **Trade Associations and Chambers (TAC)s**, supported by the **Professional**

Boards. Structured training programmes within the framework are anchored by **SMU** and **SUTD** as academic partners, with recognition from the Singapore Economic Development Board (**EDB**) and **SkillsFuture Singapore (SSG)** under the national SkillsFuture Leadership Development Initiative (LDI) for the Built Environment Sector.

To augment the local training programmes, and to build international networks, BCA will also partner leading global universities/organisations to organise overseas immersion programmes and learning journeys.

In addition, the iBuildSG LEAD framework will cross recognise existing leadership programmes offered by the industry and synergise efforts with professional development bodies in alignment with professional progression pathways and the national skillsfuture leadership development framework.

Structure of the Framework

The structured framework is a joint effort with industry to build up impactful, collective leadership through both structured and informal programmes. The framework consists of three key leadership building platforms, which includes two bespoke structured training programmes, LEAD Horizon Programme and LEAD Milestone Programme and Insights@LEAD

i) LEAD Horizon Programme

Designed for *young emerging leaders* nominated by firms for leadership pipeline, the **LEAD Horizon Programme** aims to cultivate better commercial awareness and a more innovative mindset open to new ideas and technologies; build personal effectiveness; and convey the importance of integration and collaboration across different disciplines. The programme comprises an 8-day Executive Development Programme conducted by SMU, complemented by a 3-day workshop-based Innovation Bootcamp conducted by Singapore University of Technology and Design (SUTD) to lead competency building in innovation. There will also be out-of-classroom project work to allow participants to put into practise what they have learnt from the workshop. The entire training programme provided by SUTD carries subject credits stackable towards SUTD's ModularMaster programmes, which can in turn lead to Master's programmes and facilitate the prospective further up-skilling of the participants.

ii) LEAD Milestone Programme

Designed for *enterprise-level leaders* who are part of the C-suite team within their organisations, the LEAD Milestone Programme focuses on the development of cohesive and progressive enterprises through fostering stronger collaboration to catalyse industry transformation. This programme is intended to support senior leadership succession in firms and TACs and provide an important opportunity to foster cohesion amongst the future leaders of industry. It will also offer an important touchpoint to build shared perspectives for industry transformation. The programme comprises a 6-day Advanced Management Programme conducted by SMU and a 9-day Overseas Immersion

that includes collaboration with Imperial College London as well as best-in-class visits targeting high growth regions such as in China and India

iii) Insights@LEAD

The Insights@LEAD platform aims to provide opportunities for long-term engagement, alignment and recognition of all built environment leaders in the LEAD community.

- **iBuildSG LEAD Summit:** Annual Event to bring together all leaders on the LEAD framework together for learning through keynote sessions with thought leaders, networking luncheons and dialogue sessions with Political Office Holders or Public Sector senior leadership, for insights into policies, trends and directions.
- **LEAD Case Development Initiative:** Initiative facilitating knowledge building via the formation of case study teams and iBuildSG study teams. Case study teams comprise younger members on the framework grouped with senior leaders and relevant resource persons from the industry to support the gathering of the collective wisdom of the industry into case studies for sharing. iBuildSG study teams consist of younger members on the framework, researching and addressing built environment topics requiring industry perspectives, as part of leadership development under the LEAD Horizon structured training programme.
- **Learning Journeys:** Tailored for members of the LEAD Framework, to build capability via experiential learning. Includes local and overseas learning journeys in areas of enterprise leadership, internationalisation, innovation leadership etc.

Target Audience	young emerging leaders nominated by firms for leadership pipeline.	enterprise-level leaders who are part of the C-suite team within the organisations
Programmes	<i>LEAD Horizon Programme for young emerging leaders</i> Covering the following areas: <ul style="list-style-type: none"> • Innovative Mindset & Agility • Commercial Awareness • Personal Effectiveness • Core Technical Competencies 	<i>LEAD Milestone Programme for enterprise-level leaders</i> Covering the following areas: <ul style="list-style-type: none"> • Strategic Leadership • Sustainable Enterprise Growth • Harnessing Transformation • Accelerating Growth
	Insights@LEAD <ul style="list-style-type: none"> • iBuildSG LEAD Summit • Case Study Teams • Learning Journeys 	

Annex B: Factsheet on DfM and MiDAS

Background

Traditionally, maintenance operations and requirements are often only considered when the building is handed over to the Facility Management (FM) service providers. This could result in the FM personnel having difficulties in carrying out maintenance activities efficiently and cost-effectively. For example, if a high-rise building's façade is not designed to be easily accessible for cleaning, temporary measures such as scaffoldings would have to be erected to enable workers to access and maintain the facade. This typically would lead to additional time and costs needed for maintenance, could cause inconvenience to building occupants or disruption to businesses, and could pose safety risks to the maintenance workers. The concept of Design for Maintainability is to integrate operations and maintenance considerations during the upstream planning and design stage of the project, so as to enable safe and efficient downstream maintenance operations.

Benefits of DfM

A. Building Owners

- i. **Cost Savings.** About 60 - 80% of a building's total costs is attributed to the operation and maintenance needs over the building's lifespan¹. If the design of a building takes into account its Operation & Maintenance (O&M) needs, it can result in significant amount of savings through more cost-effective, labour efficient, and smarter (tech-enabled) maintenance regimes, in the long run.
- ii. **Holistic sustainability.** DfM provides a systematic framework for consultants to reduce lifecycle costs and manpower need for maintenance while contributing to environmental sustainability.

B. Building Owners & Maintenance workers

- i. **Maintainable designs facilitate safe maintenance.** Many maintenance activities involve working at height, in confined spaces, and manual handling, etc. Therefore, minimising the need and frequency of maintenance through DfM reduces the risks to maintenance workers and potential liabilities to building owners. As such, DfM and Design for Safety (DfS) work hand in hand.

¹ Source - <https://www.wbdg.org/facilities-operations-maintenance/operation-maintenance-planning>

C. Developer and Designers

- i. **Competitive advantage at home and abroad.** The designer's ability to incorporate DfM right upfront represents a unique value proposition and advantage for our designers, whilst developers and building owners would be confident of a building which retains its value over time.

Taking DfM forward through FM transformation

BCA has brought together industry, unions, and the government in a Tripartite FM Implementation Committee (FMIC) to formulate, oversee, and review the implementation of the transformation plans for the FM sector.

DfM was identified as a key pillar to support the FMIC's endeavours. A DfM Taskforce was set up to provide oversight on the (i) review and enhancement of the DfM Guide and (ii) development of the new voluntary Maintainable Design Appraisal System (MiDAS).

- Enhancement of DfM Guide. With inputs from developers and FM practitioners, the existing DfM checklist has been enhanced with new content – including Smart FM and design considerations promoting building automation. With greater emphasis on designing buildings to be digitally ready upfront to facilitate the adoption of smart technologies, downstream FM activities would in turn be made more efficient. The guide was also streamlined according to different building types to facilitate ease of use and adoption by industry practitioners.
 - New additions include a new section on Smart FM on “Digital readiness and automation”. Some design considerations that would be assessed are:
 - i. Remote web-based monitoring of Building Management System (BMS);
 - ii. Common or non-proprietary protocol for the network backbone of BMS;
 - iii. Use of sensors; and
 - iv. Provisions for future smart FM features.
 - The innovation section has been expanded with additional proven technologies and automation that could require design intervention. Examples include:
 - i. Smart bin;
 - ii. Smart toilet;
 - iii. Digital pest control;
 - iv. Autonomous Cleaning and
 - v. Mobile incident reporting management.
- DfM Guide on Municipal Infrastructure. BCA, MSO, NEA, PUB, LTA and NParks, in consultation with industry stakeholders, have come up with a new dedicated DfM Guide for Municipal Infrastructure. This is part of an interagency

collaboration to look at harmonising upstream design of public infrastructure to facilitate downstream cleaning and maintenance. It puts together agencies' relevant design guidelines and industry's best practices. The recommendations in the DfM Guide for Municipal Infrastructure are applicable to public facilities such as benches, linkways and street plantings as well as common spaces and amenities within private development projects

- *Develop the Maintainable Design Appraisal System (MiDAS)*

MiDAS assesses the **degree of maintainability of building designs** from the **lens of labour efficiency and cost-effectiveness of downstream maintenance regimes**.

- MiDAS identifies **critical (cost and labour intensive) maintenance items** that are **influenceable by design and presents a set of design strategies and best practices to address them**; thereby enhancing efficiency of maintenance tasks downstream. The scoring framework covers the key disciplines – **architectural, mechanical, electrical, and landscape** – and also comprises an innovation section to promote adoption of technologies.
- **Benefits of MiDAS**
 - i. Fosters **greater collaboration among designers, developer, and FM practitioners** to deliver better and more maintainable designs
 - ii. Promotes **holistic sustainability by considering not only environmental aspects but also economic and social** through greater cost savings and reduced reliance on manual labour;
 - iii. Enables **designers and developers, through the MiDAS score, to make more informed design decisions upfront and take a life cycle view of the development**, i.e. considering not only initial capital expenditure but also operating expenses.

Annex C: Factsheet on 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 building 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 in 2018, the Platinum Star, for applicants that fulfilled the following criteria:
 - Meet all requirements of a Platinum award; and
 - Held the Platinum award for at least five years

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

BCA BUILT ENVIRONMENT LEADERSHIP AWARD 2019 WINNERS

Award Type	Company	Category
Platinum Star	Tiong Seng Contractors (Private) Limited	Builder
Gold ^{PLUS}	KTP Consultants Pte Ltd	Structural Consultant
Gold ^{PLUS}	Meinhardt (Singapore) Pte Ltd	Multi-Disciplinary (Structural and M&E Consultants)
Gold ^{PLUS}	Squire Mech Private Limited	M&E Consultant
Gold ^{PLUS}	Straits Construction Singapore Pte Ltd	Builder
Gold ^{PLUS}	Surbana Jurong Consultants Pte Ltd	Multi-Disciplinary (Architectural, Structural and M&E Consultants)
Gold ^{PLUS}	WSP Consultancy Pte. Ltd.	Multi-Disciplinary (Architectural, Structural and M&E Consultants)

KEY ACHIEVEMENTS (2016-2018)

System

Innovation Class, People Developer, ISO 9000 Quality Management System, ISO 14000 Environmental Management System and OHSAS 18000 Occupational Health and Safety Management System.

Result

- **BCA Awards**

Construction Productivity Awards, Construction Excellence Awards, Building Information Modelling (BIM) Awards, Green Mark Awards, Green & Gracious Builder Award, Design & Engineering Safety Excellence Awards, etc.

- **Other Local Awards**

Singapore International Chamber of Commerce (SICC) – Most Scalable Collaboration Award, SCAL Productivity and Innovation Award.

- **Innovations**

(a) Design for Manufacturing & Assembly (DfMA) – successfully developed its very own PPVC solution (patented) and PBU solution, incorporating advanced ultra-high performance ductile concrete.

(b) Integrated Digital Delivery (IDD) – leverages on its in-house developed digital capability to further embrace IDD, including successfully developed an innovative platform enabling ordering of steel rebar and real-time updating on progress of workflow through BIM.

(c) Innovative Construction equipment and methods – piloted many innovative construction equipment and methods in its projects.

- **International Awards**

RoSPA Occupational Health and Safety Awards, building SMART (Hong Kong) BIM Award, buildingSMART International Award, etc.



Member of the Surbana Jurong Group

KEY ACHIEVEMENTS (2015-2018)

System

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

Result

- **BCA Awards**
Design and Engineering Safety Excellence Award, Construction Excellence Awards, Green Mark Awards, Construction Productivity Awards, Building Information Modelling (BIM) Awards, etc.
- **Other Local Awards**
President's Design Award, SIA Architectural Design Awards, NParks Skyrise Greenery Awards, HDB Awards, etc.
- **Innovations**
 - (a) Adoption of deep seated Innovative Building Information technology employing Virtual Design & Construction and delivery of BIM projects allowing seamless and high productivity DfMA continuation from design to construction of projects.
 - (b) Achieving the tallest steel PPVC Construction in Singapore on the Nanyang Crescent Hall of Residences NTU at the time of completion in 2017. This is a ground breaking technology in the built environment sector that is sustainable and productive on a large scale basis.
 - (c) Innovative, cost effective and robust transfer structures incorporating redundancy and seismic design in high-rise tall buildings in multiple award winning iconic projects (E.g. The Scotts Tower and the Oasia Downtown Hotel).
- **International Awards**
FIABCI PRIX d'Excellence Award, Council on Tall Buildings and Urban Habitat (CTBUH) Award, etc.



KEY ACHIEVEMENTS (2016-2018)

System

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

Result

- **BCA Awards**

Design and Engineering Safety Excellence Awards, Construction Excellence Awards, Construction Productivity Awards, Green Mark Awards, etc.

- **Other Local Awards**

Singapore Apex Corporate Sustainability Awards, IStructE Singapore Structural Awards, etc.

- **Innovations**

(a) A new Innovative hybrid steel-concrete system, namely Form-Prefabricated Steel Reinforced Concrete (F-PSRC) columns & Thin Steel-plate Composite (TSC) Beams adopted at JTC Logistics Hub project.

(b) Mass Engineered Timber (MET) Steel composite structure implemented at SMU-X project.

(c) Smart buildings – Operation Centric Smart Control implemented at SMU-X project.

- **International Awards**

ACES Awards for Asia's Most Influential Companies, Singapore Apex Corporate Sustainability Awards, etc.



KEY ACHIEVEMENTS (2014-2018)

System

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

Result

- **BCA Awards**
Construction Excellence Awards, Construction Productivity Awards, Green Mark Awards, Building Information Modelling (BIM) Awards, SGBC-BCA Sustainability Leadership Awards, etc.

- **Other Local Awards**
FISAC Fire Safety Design Excellence Award, etc.

- **Innovations**
 - (a) Kinetic Wireless Switch – battery free and eliminates wiring and conduits for lighting switches.
 - (b) Lab Demand Control Ventilation (DCV) – vary the air change according to the chemical level in the laboratory.
 - (c) BIM-centric HVAC ETTV & SpHA Sprinkler full hydraulic systems – perform M&E designs and calculations in accordance to Singapore’s Code of Practices.

- **International Awards**
ASEAN Energy awards, Asia Green Building Awards, MIPIM Asia Award, CTBUH Best Tall Building Award, etc.

GOLD^{PLUS}



KEY ACHIEVEMENTS (2016-2018)

System

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

Result

- **BCA Awards**

Quality Excellence Awards, Construction Excellence Awards, Green Mark Award, Construction Productivity Awards, Green Mark Awards, Green & Gracious Builder Awards – Star, BIM Awards, etc.

- **Other Local Awards**

SCAL- Productivity and Innovation Awards, MOM Dormitory Award, etc.

- **Innovations**

(a) Defect Inspection and Rectification Management (DIRM) - adopted for unit inspection, during the Defects Liability Period (DLP) and post DLP phase.

It is a cloud based solution where all key stakeholders on the project could access information, lodge defects and check the status of the defects real-time.

(b) Lean Construction Management (LCM) - use of Lean PlanDo tool from Lean Station. It is currently being implemented at several projects i.e. JTC Furniture Hub (JTCFH), Yio Chu Kang EC, Anchorvale EC and Nexus International School (NISS).

(c) Creative application of Virtual Design and Construction (VDC) - the VDC framework consists of Integrated Concurrent Engineering (ICE), Project Production Management (PPM), Building Information Modelling (BIM) and Metrics.

- **International Awards**

RoSPA Occupational Health & Safety Awards.



KEY ACHIEVEMENTS (2016-2018)

System

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

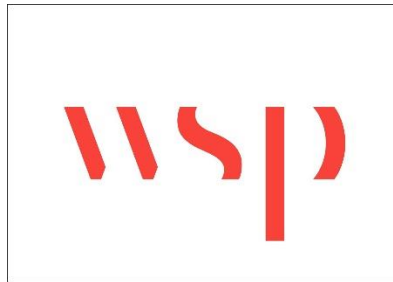
Result

- **BCA Awards**
Design and Engineering Safety Excellence Awards, Construction Excellence Awards, Construction Productivity Awards, Universal Design Mark Awards, Green Mark Awards, etc.

- **Other Local Awards**
HDB Design Awards, HDB Engineering Awards, HDB Innovative Engineering Awards, LEAF Awards, SILA Awards, MND Minister Award (Team), etc.

- **Innovations**
 - (a) Housing Configurator – the use of computational BIM to carry out manual process and design work.
 - (b) Interactive Immersive Virtual Reality System (IVRS) - bringing Virtual Reality to the next stage.
 - (c) Digital Facilities Management- integration of BIM and SMART FM technologies.

- **International Awards**
BCI Asia Top 10 Architects, Malaysia Landscape Architecture Awards, etc.



KEY ACHIEVEMENTS (2016-2018)

System

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

Result

- **BCA Awards**
Construction Excellence Awards, Construction Productivity Awards, Green Mark Awards, BCA BIM Award, etc.

- **Other Local Awards**
URA Architectural Heritage Award, ACES Design Excellence Awards, LEAF Award, FuturARC Green Leadership Award, etc.

- **Innovations**
 - (a) Leveraging on DfMA for higher quality and productivity – designed MEP modules.
 - (b) Energy efficient ACMV systems - Dual function air-con ducts, jet slots diffusers, free cooling from heat pumps, etc.
 - (c) Enhanced Safety and user friendly designs – Smart nurse call system for healthcare facilities, smart carpark system integrated with interactive carpark kiosks, etc.

- **International Awards**
Building Better Healthcare Award (UK).

- **International Awards**
Building Better Healthcare Award (UK).