

MEDIA RELEASE

For Immediate Release

THREE PROFESSIONAL ENGINEERS CONFERRED BCA AWARDS FOR ENGINEERING ACHIEVEMENTS

Singapore, 07 October 2021 – The Building and Construction Authority (BCA) is awarding three Professional Engineers with the BCA Design and Engineering Safety ‘Excellence’ awards this year. The Award recognises Professional Engineers and their teams for their innovative designs and engineering solutions to some of Singapore’s most challenging projects.

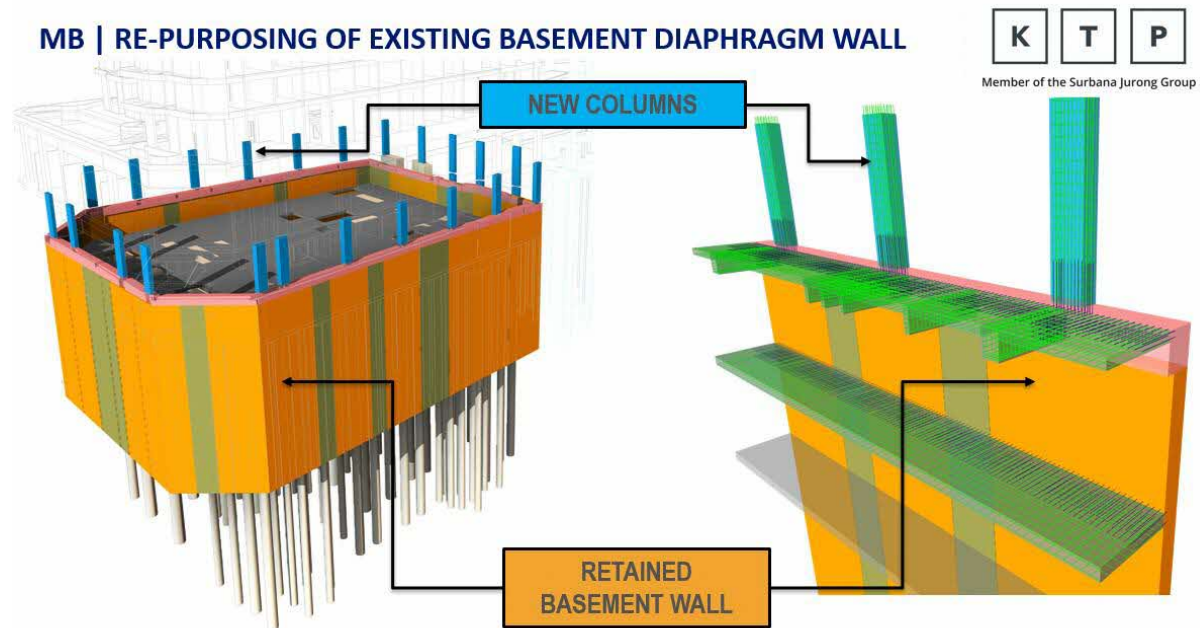
Building sustainably through innovation

2 Fourth time award winner Engineer (Er.) Aaron Foong, KTP Consultants Pte Ltd (member of Surbana Jurong) is a familiar face for this engineering award. This time, he has won the award for overcoming challenges of a delicate building project – the redevelopment of **Tekka Place**, an existing building with two basements seated on soft marine clay located within the LTA Railway Protection Zone and hemmed in by conserved shophouses.

3 To build sustainably, Er. Foong re-engineered the existing basement diaphragm wall to have a dual function of supporting both the construction works of new substructures (below ground) and the increased loading from new superstructures (above ground) in the redeveloped Main Block. With this innovative re-engineering approach, there was no need to build new conventional periphery basement earth retaining walls and the accompanying foundation piles, saving 3,400 cubic metres concrete and 400 tonnes of reinforcement steel. This savings was substantial – it is the same as the amount of concrete and steel that is used for *all* the concrete structures supporting the *entire* 320-room Citadines Rochor serviced

residences above the Tekka mall. Beyond savings in cost and carbon footprint, this innovative structural engineering design enabled the construction period of the project to be reduced by six months without compromising safety standards, reducing disamenities to surrounding residents and traffic flow along Sungei and Serangoon Roads. (see *Annex B* for more details of the project).

Illustration A: Re-purposing of existing basement diaphragm wall capacity



Credit: illustration from KTP Consultants Pte Ltd

Turning a challenge into a solution

4 Er. Loh Kar Kheng, CPG Consultants Pte Ltd, was presented with an Excellence award for his engineering solutions in the construction of the iconic **State Courts**. Due to the narrow open space between the Court and Office Towers, a wind tunnel study was conducted to understand the effect wind would have on the towers and link bridges of the project which would affect the building's deflection as well as human comfort.

5 To overcome the challenge of constructing the slender Office Tower, 39 link bridges were planned to span the circulation space linking the Office Tower to the stockier Court Tower. These link bridges in turn provided lateral stability to the Office Tower. Each link bridge was also prefabricated and delivered to site as one unit before

being hoisted and placed in position on temporary supporting corbels before final connections were made safely. This allowed the project to be constructed within a constrained space, reducing disamenities and minimised the need for working at height, improving the safety for those on site.

Illustration B: Link Bridge Erection



Credit: illustration from Er. Loh

Using prefabrication in an inventive way

6 Another winner, Er. Joanne Ee, formerly from CPG Consultants Pte Ltd but now with BCA, was recognised for her innovative engineering solutions in the construction of **Eunoia Junior College (EJC)**. EJC is the first project in Singapore to integrate Mass Engineered Timber (MET) with concrete for a high-rise building in Singapore. The project implemented the use of a prefabricated hybrid Timber-Concrete Slab System (CREE) for slab construction and a Unitized façade system with internal Cross Laminated Timber (CLT) panels for external walls. As CLT panels have a lower carbon footprint compared to steel or concrete, the project's environmental friendliness was enhanced.

7 In addition, with 70% of the project being prefabricated prior to installation, productivity was increased by 55%, reducing the overall construction period. By relying on prefabrication with work done off-site, there was a reduction in dis-amenities in the form of reduced disturbance to the project's surroundings, including the nearby Bishan-Ang Mo Kio Park. The prefabricated components were installed on-site with simple connections and were extremely lightweight, environmentally sustainable and met all requirements for strength, fire, waterproofing and durability (see *Annex B* for more details of the project).

CONCRETE SLAB

4 NOS. OF GLULAM BEAMS

80 mm THK CONCRETE

WIDTH = 2600mm

LENGTH = 7060mm

240 mm (w) x 320 mm (d) GLULAM BEAMS

GROUT
REINFORCEMENT
SEAL

CREE PANEL

RC BEAM

RC SLAB

- Consists of Glued Laminated Timber (Glulam) beams and concrete slab prefabricated off-site. It behaves like a composite slab.
- Panel size: 2.6 m wide x 7.06 m long
- Each Panel: 4 nos. of glulam beams with 80mm thick concrete slab

CREE Panel – Design Basis

Credit: illustration from Er. Ee

Annex A: About the BCA Design Engineering and Safety Awards 2021

Annex B: BCA Design Engineering and Safety Awards winners

The Building and Construction Authority (BCA) champions the development and transformation of the built environment sector, in order to improve Singapore's living environment. BCA oversees areas such as safety, quality, inclusiveness, sustainability and productivity, all of which, together with our stakeholders and industry partners, help to achieve our mission to transform the Built Environment sector and shape a liveable and smart built environment for Singapore. For more information, visit www1.bca.gov.sg.