MEDIA RELEASE

BCA Design and Engineering Safety Award Recognises Innovation and Safety in Singapore's Built Environment

- **Six Professional Engineers honoured by BCA for Design and Engineering Safety**
- **TEL Orchard Station among six projects to win BCA Design and Engineering Safety Award**

Singapore, 28 July 2024 – Our built environment doesn't happen by chance; it is through the hard work of the dedicated in the sector, especially the engineers who are constantly challenged to devise innovative engineering solutions to ensure safety and shape our city's landscape. In recognition of these efforts, the Building and Construction Authority (BCA) is honouring six distinguished Professional Engineers with the BCA Design and Engineering Safety Award (DESA) this year. Since its inception in 2008, the Award has celebrated the remarkable contributions of engineers and their teams to Singapore's built environment.

Engineer Lim Soon Hui – Construction of TEL Orchard Station and Additions & Alterations to NSL Orchard Station

2. Engineer Lim Soon Hui, Executive Director of AECOM Singapore Pte Ltd, has dedicated close to 40 years of his working life contributing to Singapore's built environment. "There is never a dull moment in this job as every construction project brings its unique challenges, making it dynamic and engaging", he said. The TEL (Thomson-East Coast Line) Orchard Station construction project, which earned him this engineering award, is a prime example of his expertise and dedication. With the closest point of construction just 3 metres away from the existing NSL (North-South Line) tunnel, running almost parallel to it, Er. Lim and his team have to maintain structural integrity and ensure safety while minimising disruption to businesses and commuters in the densely built Orchard area.

3. To safely excavate beneath Orchard Boulevard for the deep platform link, the team constructed a canopy roof using 1200mm diameter pipes and a retractable micro-tunnel boring machine (M-TBM) with steel frames, ensuring minimal disruption to traffic. Er. Lim also utilised custom steel pipe micro-piles with double flat jacks to support the existing NSL tunnel floor during underpinning and mining operations. Additionally, a specialised low headroom piling machine was employed to drill into hard rock, facilitating efficient installation of reinforcement and grouting materials.

4. The result was a walkway linking the TEL Orchard MRT station and NSL station beneath the NSL Orchard MRT station. Er. Lim meticulously thought through every step of the engineering design to build this Paid-to-Paid Platform Link, which allows commuters to seamlessly transfer between lines without exiting the station, enhancing connectivity and convenience for users.

Engineer Aaron Foong Kit Kuen - Rivière and Surbana Jurong Campus

5. Seventh-time winner, Engineer Aaron Foong, Managing Director of KTP Consultants Pte Ltd, and Executive Director, Civil, Structure and Construction Engineering (Asia), Surbana Jurong, is once again recognised for his contributions to the field of engineering. This year, he receives the award for his work on two projects: Rivière and Surbana Jurong Campus. For his outstanding work on Rivière, a residential development along Singapore River, Er. Foong is lauded for his engineering-led approach that ensured productivity, robustness and a feasible solution despite challenging geological conditions.

6. The Rivière project encountered significant engineering challenges, beginning with the site's complex geology with thick layers of soft marine clay. Additionally, there was uneven lateral pressure on the underground structures towards the Singapore River, further complicating the construction process. The site also presented substantial space constraints. Building three levels of basement with two towers on a compact site with just one entrance, surrounded by existing buildings, a conserved building and the river at the site boundary, required efficient construction both on-site and off-site.

7. Er. Foong introduced a unique and innovative solution: a circular earth retaining structures without the need for struts. This method, using diaphragm wall panels for the basements, effectively enabled by comprehensive engineering design, ensured fast and watertight construction even with difficult ground conditions. Typically, the construction of an underground structure requires struts as reinforcement to ensure that the earth retaining structure is safe and stable. However, Er. Foong's circular earth retaining structure eliminated the need for struts, which not only freed up headroom space for construction machineries and equipment, but also streamlined the construction process.

8. For the design of the two tower buildings, he integrated various methods of computer modelling analysis with physical laboratory testing outcomes in the design of PPVC wall structures. This ensured safe and effective installation for the tall building structures of the project. "The engineering practice in the built environment has given me the privilege to make a real impact on people's lives." said Er. Foong, "It has instilled in me courage and collaborative leadership, focusing on safety and

sustainable outcomes through the practical application of scientific principles and advanced technology.”

Engineer Yiong Hoi Liong - CapitaSky

9. Second time award winner Engineer Yiong Hoi Liong, Director of P&T Consultants Pte Ltd, takes pride in his groundbreaking work on CapitaSky - the first redevelopment commercial project in Singapore's CBD to achieve 100% reuse of existing bored piles. This engineering feat saved 8,400 tonnes of concrete contributing to a 37% reduction in carbon emissions, marking a milestone in sustainable construction.

10. With only 42 new bored piles added, this achievement demonstrates advanced engineering and sustainable design. The former CPF building, which sat on 186 bored piles and a substantial cellular raft foundation supporting two deep basements, presented challenges due to its location near other skyscrapers and underground railway tunnels along Robinson Road. Additionally, being partially within the LTA Railway 1st Reserve required special clearance for engineering tasks.

11. Er. Yiong and the project team ensured the safety and reliability of reusing the piles through meticulous site investigations. These investigations included confirming the depth of the piles compared to original plans, checking the size and strength of existing piles, and monitoring the performance of the piles that support the new development. He also used Design for Manufacturing and Assembly (DfMA) and Integrated Digital Delivery (IDD) to simplify the design and construction processes, ensuring efficiency and precision.

12. "Each challenge in engineering pushes us to innovate and elevate our standards, making the journey both demanding and rewarding," Er. Yiong said. "That’s why my passion for this field never wavers; every project ignites a fresh drive to achieve more."

13. Commenting on the significance of the engineers’ contributions in the built environment, BCA Group Director of Building Engineering, Engineer Tan Chun Yong said, "Amidst the complexities of our built environment, the contributions by Professional Engineers have not only adeptly tackled challenging conditions but have also exemplified the highest standards of safety and structural integrity. They set the benchmark for projects across Singapore, showcasing the innovative spirit and dedication of our engineering professionals. We hope our young minds will be inspired to pursue careers in engineering, driving forward sustainable solutions and shaping the future of our nation."

14. For a complete listing of the winners and their projects, please refer to our website.

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About BCA

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