BCA AWARDS 2015
Recognising Excellence in the Built Environment
THE BCA DESIGN & ENGINEERING SAFETY EXCELLENCE AWARDS 2015 give recognition to the Qualified Person for Structural Works [QP(ST)], QP(ST)’s firm and the project team for ingenious design processes and solutions in overcoming project challenges to ensure safety in design, construction and maintenance of building and civil engineering projects locally and overseas.

The Awards aim to:-
- inculcate a strong safety culture among building professionals in developing our built environment
- give recognition to QP(ST)s and their firms for engineering achievements
- provide an avenue through which competition for work excellence can be enhanced.

The Awards will be given out for the following categories:
- Residential
- Commercial
- Institutional and Industrial
- Civil Engineering
- Overseas
**KEY CHALLENGES**

- Presence of the existing 10 m wide PUB water pipeline reserve and 2 circle line MRT tunnels cutting across the site
- Constraints due to the existing steel piles left behind by demolished buildings
- The iconic architectural design of d’Leedon with ‘petal-like’ shape tower blocks and the growing and shrinking units at different levels with cantilever balconies

**SOLUTIONS**

- Underground basement carpark was separated to avoid the water pipeline and the use of strip pile-caps to support basement carpark over the MRT tunnel.
- New piles were installed to avoid the existing piles and capped by thick pile raft.
- Core wall combined with strategically coupled shear walls within the residential units were adopted to enhance lateral stability
KEY CHALLENGES

- Congested site and in close proximity to residential buildings,
- Poor ground conditions with soft marine clay
- Design of the basement and foundation system that can withstand movement in consideration of the effect of future developments near the site.

SOLUTIONS

- Hybrid of open cut and localised sheet pile cofferdam to simplify basement excavation
- 6-day floor cycle through use of modular and repetitive structural system
- Extensive use of precast concrete elements, prefabricated bathroom units and system formwork to enhance constructability, productivity, quality and improve safety
Additions and Alterations to Victoria Theatre and Victoria Concert Hall (Monument)

**KEY CHALLENGES**

- To transform the historical buildings into a performing arts venue fit for the 21st century whilst preserving much of its original architecture.
- Creating new basement under the conserved building

**SOLUTIONS**

- Top-down construction for basement under Old Parliament lane in between The Art House and Victoria Theatre and bottom-up construction for the 2-level basement within the Theatre.
- Composite structural system were adopted for the new top-hung mezzanine floor.
- Controlled demolition, controlled piling and underpinning of the affected footings were carried in stages

**QUALIFIED PERSON**
- Er. Dr. Tan Guan

**C&S Consultant Ltd.**
- T.Y. Lin International Pte. Ltd.

**BUILDER**
- Sato Kogyo (S) Pte. Ltd.

**DEVELOPER**
- National Arts Council

**ARCHITECTURAL CONSULTANT**
- W Architects Pte Ltd
Blossom Residences

DESIGN AND ENGINEERING SAFETY EXCELLENCE AWARD

KEY CHALLENGES

• Limited headroom for transfer beam and M&E services

• Architectural window box protruding from main building facade

SOLUTIONS

• Key transfer beams designed with dedicated space for M&E services

• Precast architectural feature box to remove the requirement for external formwork

Qualified Person          Er. Lauw Su Wee
C&S Consultant          LSW Consulting Engineers Pte Ltd
Builder                  Dragages Singapore Pte Ltd
Developer                City Developments Ltd
Architectural Consultant ADDP Architects LLP
KEY CHALLENGES

- Vertical Garden (Green Wall) up to 24 storeys high
- Three number of high volumetric tree-like supports for Sky Terrace
- Two esthetically outstanding structures, namely the Clubhouse which has a 3D curve roof formed by 12m long span cantilever steel structures and the barrel shaped Gym room with green roof.

SOLUTIONS

- Using modular and repetitive structural steel panels coupled with GFRC planters for the Vertical Garden.
- Use of mix of structural materials to construct the high volumetric Sky Terraces.
- Use of lightweight materials and ferro-cement to construct the 3D roof of the Clubhouse to reduce loadings on the 12m long span cantilever steel structures.
Singapore Institute of Management
Campus Expansion

DESIGN AND ENGINEERING SAFETY EXCELLENCE AWARD

KEY CHALLENGES

- Congested site next to existing campus and in close proximity to Clementi Road and Maju Road
- Large column free floor plates and long span structures
- Short construction period to cater for increasing student intake demand

SOLUTIONS

- Hybrid of cantilevered contiguous bored pile wall and semi-top down enabled unobstructed and strut free excavation across site, and at the same time maintaining uninterrupted fire engine access to existing block
- Use of post-tensioning technology for the interior column free sports hall
- Extensive use of precast concrete components for beams, columns and façade

Qualified Person  Er. Kam Mun Wai
C&S Consultant    Meinhardt (Singapore) Pte Ltd
Builder            Tiong Seng Contractors (Pte Ltd)
Developer Management Singapore Institute of
Architectural Consultant Architects 61 Pte Ltd
### KEY CHALLENGES
- To reuse the existing building structures for the new building.
- To reuse the existing piles.

### SOLUTIONS
- Parametric studies were carried out to derive a scheme for optimal use of the existing structures.
- Detailed engineering studies were carried out for the use of new and existing piles.

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
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<tbody>
<tr>
<td>Qualified Person</td>
<td>Er. Aaron Foong Kit Kuen</td>
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<tr>
<td>C&amp;S Consultant</td>
<td>KTP Consultants Pte Ltd</td>
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<tr>
<td>Builder</td>
<td>Chiu Teng Enterprise Pte Ltd</td>
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<td>Developer</td>
<td>Chiu Teng @ Kallang Pte Ltd</td>
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<tr>
<td>Architectural Consultant</td>
<td>Ong&amp;Ong Pte Ltd</td>
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The Seletar Mall

DESIGN AND ENGINEERING SAFETY EXCELLENCE AWARD

KEY CHALLENGES

- Deep excavation of 22m for 5 basements within LTA Railway Protection Zone.
- Confined site and in close proximity to LRT Station, viaducts, public housing, schools and services
- Short construction period

SOLUTION

- Robust earth retaining and stabilising structure adopting diaphragm wall and ring slabs for top down excavation.
- Full top down method constructing basements and superstructure concurrently
- Use of precast system for productivity and site safety

Qualified Person  | Er. Kam Mun Wai
C&S Consultant    | Meinhardt (Singapore) Pte Ltd
Builder           | Kajima Overseas Asia Pte Ltd
Developer         | The Seletar Mall Pte Ltd
Architectural Consultant | DP Architects Pte Ltd

Merit – Commercial Category
The Metropolis

DESIGN AND ENGINEERING SAFETY EXCELLENCE AWARD

KEY CHALLENGES

- Deep excavation for three basement levels within the LTA MRT 1st Reserve Zone
- Challenging geological ground condition with 10m of soft peaty clay.
- Short construction period

SOLUTIONS

- Full top down method constructing basements and superstructure concurrently
- Comprehensive instrumentation and monitoring scheme comprising of automatic tunnel monitoring system, in-wall inclinometers, settlement markers and load cells were used

Qualified Person: Er. Yeo Choon Chong
C&S Consultant: KTP Consultants Pte Ltd
Builder: Lum Chang Building Contractors
Developer: Ho Bee Land Limited
Architectural Consultant: DCA Architects Pte Ltd

Merit – Commercial Category
Marina Costal Expressway (MCE) C482

DESIGN AND ENGINEERING SAFETY EXCELLENCE AWARD

KEY CHALLENGES

- Deep excavation through poor ground conditions comprising recent reclamation and a thick layer of consolidating soft marine clay in close proximity to the sea with a high water table
- Localised 120m wide irregular shaped excavation at various depth with concerns for overall excavation stability

SOLUTIONS

- Long-short pipe pile walls with Deep Soil Mixing and two levels of struts were adopted for the excavation works.
- Adoption of concrete superbeams in the widest and the most irregular area of excavation to effectively reduce the strut length and improve the stability in the excavation area

Qualified Person: Er. Soon Won Moi
C&S Consultant: Mott MacDonald Singapore Pte Ltd
Builder Co., Ltd: Ssangyong Engineering & Construction
Developer: Land Transport Authority
Architectural Consultant: Parsons Brinckerhoff Pte Ltd
<table>
<thead>
<tr>
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<tr>
<td>d’Leedon</td>
<td>Residential Category</td>
<td>Er. Teoh Eng Sin AECOM Singapore Pte Ltd</td>
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<td>368 Thomson</td>
<td>Residential Category</td>
<td>Er. Kam Mun Wai Meinhardt (Singapore) Pte Ltd</td>
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<td>A&amp;A To Victoria Theatre and Victoria Concert Hall (Monument)</td>
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<td>Er. Dr. Tan Guan T.Y. Lin International Pte. Ltd.</td>
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KTP Consultants (Pte) Ltd  |
| The Seletar Mall             | Commercial    | Er. Kam Mun Wai  
Meinhardt (Singapore) Pte Ltd  |