

ANNEX B

CPA – Projects

The CPA – Projects is awarded to project teams that have demonstrated productivity in their projects from the design to the end of construction. The award aims to:

- Encourage designers to come up with labour-efficient designs;
- Encourage the adoption of labour-efficient construction methods; and
- Recognise project teams for their excellent project planning and coordination in enhancing productivity.

The award has nine sub-categories:

- Residential Landed Buildings
- Residential Non-landed Buildings (for projects with Gross Floor Area of less than 25,000m²)
- Residential Non-landed Buildings (for projects with Gross Floor Area of more than or equal to 25,000m²)
- Commercial and Office Buildings
- Institutional Buildings
- Industrial Buildings
- Mixed Development Buildings
- Additions & Alterations / Upgrading Buildings
- Civil Engineering Projects

Assessment Criteria

Building projects are assessed based on their buildable design score, constructability score, simplicity of construction, integration of design and construction, and aesthetics.

Civil engineering projects are assessed based on design for ease of construction, the use of construction technology, site management, integration of design and construction, and the adoption of innovative designs and products.

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Punggol East Contract 33 (Punggol Breeze)

Platinum Award

(Residential Non-Landed Buildings Category $\geq 25,000 \text{ m}^2$)



Developer	Housing & Development Board
Architectural, Structural and M & E Consultant	Surbana International Consultants Pte Ltd
Builder	Qingjian International (South Pacific) Group Development Co., Pte Ltd
Construction Cost	\$ 154,300,000.00
Gross Floor Area	122,236.72 m2

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Punggol Breeze is located at the junction of Punggol Drive and Edgefield Plains. The HDB project consists twelve 15/17-storey residential blocks with 964 units of 4/5-rooms, a multi-storey carpark with roof garden, 2 electrical sub-stations, 2 precinct pavilions and a common green.

Key Features:

- Adopted extensive use of precast and prefabricated components for the construction of the structural elements. Most of the structural vertical columns and walls for the project were designed as precast solid components. Through the use of a full precast construction system and prefabricated wire mesh and beam/column cages, coupled with the standardisation of precast installation methods, the reliance on labour intensive and time consuming erection of external scaffold, external formwork, and platform system were eliminated.
- Precast ring water tanks, being much lighter than the standard water tanks, were adopted to allow hoisting in ring forms by site tower cranes instead of high capacity mobile cranes, resulting in productivity savings.
- Scaffold-less construction is achieved using precast concrete skin for precast columns, eliminating external formwork and external climbing scaffolding.
- Structural steel design was opted for in contrast to conventional reinforced concrete design for the crash barrier for multi-storey carpark, the construction of site structures and use of composite roofing panels.
- The use of spray painting increased productivity and helped to achieve consistent and uniform surface texture with less material wastage.
- Bioswales Stormwater Retention System was utilised to replace conventional stormwater drainage system, through retention, filtration and biological uptake. This minimized the manpower required for construction, and achieved an aesthetically pleasing design.

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Clementi Neighbourhood 4 Contract 8 (Casa Clementi)

Platinum Award

(Residential Non-Landed Buildings Category $\geq 25,000 \text{ m}^2$)



Developer	Housing & Development Board
Architectural, Structural and M & E Consultant	Surbana International Consultants Pte Ltd
Builder	Straits Construction Singapore Pte Ltd
Construction Cost	\$ 370,659,000
Gross Floor Area	221,959.50 m2

Clementi N4 C8, also known as Casa Clementi, is the largest public housing project in Singapore, in terms of the number of dwelling units and contract value. The multi-storey carpark is also the largest of its kind in Singapore, in terms of floor area.

Key Features:

- Extensive use of precast technology for the construction of the structure was adopted, which helped to increase site productivity.
- Standardisation of the facade layout for the external wall and the floor height of the buildings enhanced the buildability of the project substantially.
- Identical unit and facade layout for elevation helped to ease construction.
- Replication for all residential building blocks minimised the number of precast moulds and the manpower and time to coordinate the installation of precast components.

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NV Residences

Platinum Award

(Residential Non-Landed Buildings Category $\geq 25,000 \text{ m}^2$)



Developer	City Developments Limited / Hong Realty (Pte) Ltd / Hong Leong Holdings Ltd
Architectural Consultant	Architects 61 Pte Ltd
Structural Consultant	TEP Consultants Pte Ltd
M & E Consultant	Meinhardt (Singapore) Pte Ltd
Design and Build Contractor	Hyundai Engineering & Construction Co. Ltd
Construction Cost	\$ 178,800,000
Gross Floor Area	64,036.00 m2

NV Residences is a condominium comprising 8 blocks of varying heights of 12, 14 and 15-storey residential apartments totalling 642 units, with a two-level basement car park and a rain garden nature reserve.

Key Features:

- Precast concrete facade system was integrated with the system formwork horizontal in-situ concrete slab. Precast concrete panels were carefully designed to minimise the variations in panel size, while ensuring that the architectural aesthetics were not compromised. This approach enhanced the ease of construction, and removed the usage of external scaffolding, which contributed to savings in manpower, and led to a clean site and the elimination of tedious housekeeping.
- Strut free excavation method was employed, by using Contiguous Bored Piles (CBP), and a value engineering approach, to optimise working space and increase productivity.
- System formwork was adopted for the slab construction. This allowed the construction time and manpower to be reduced.
- Drywall partition was used for most internal walls. Drywall partition can easily be installed, hence requiring less labour.
- Prefabricated Bathroom Units (PBU) were adopted which helped to reduce the construction time.

Hundred Trees

Platinum Award

(Residential Non-Landed Buildings Category $\geq 25,000 \text{ m}^2$)



Developer	City Developments Limited
Architectural Consultant	Ong&Ong Pte Ltd
Structural Consultant	KTP Consultants Pte Ltd
M & E Consultant	Squire Mech Pte Ltd
Design and Build Contractor	Tiong Seng Contractors Pte Ltd
Construction Cost	\$ 121,355,000
Gross Floor Area	43,729.65 m2

The Hundred Trees condominium was the result of a concerted effort by all stakeholders' i.e developer, architect, consultants and the builder, to create a green and desirable living space for home owners. In the construction phase, the key driving factor was to achieve efficiency and productivity. Labour-efficient design and productive construction methods were employed to speed up the construction process. The team paid special attention to designing the precast components and prefabricated bathroom units to ease installation and speed up the construction process.

Key Features:

- Extensive use of precast elements.
- Efficient block layout with maximisation on repetition in unit layout.
- Repetition in floor height and facade design features such as refuse chute, air-con ledge, long bay-window and balcony.
- Standardisation of components such as window and door sizes.
- Prefabricated Bathroom Units (PBUs) for all the dwelling units and use of drywall for greater productivity.
- Screed-less floor system to allow direct installation of marble or tile.
- Flexible water pipes which required fewer joints as compared to conventional copper pipes.
- System formwork and mechanisation widely adopted during construction.

Jetty of Singapore LNG Terminal Project at Meranti Crescent, Jurong Island

Gold Award

(Civil Engineering Projects Category)



Developer	Singapore LNG Corporation Pte Ltd
Structural Consultant	Steen Consultants Pte Ltd
Design and Build Contractor	Antara Koh Private Limited
Construction Cost	\$ 21,560,000
Statistical Gross Floor Area	4,333.5 m2

Located on a 40-hectare plot at the Meranti seafront on Jurong Island, Singapore LNG terminal is the first LNG terminal in Asia capable of importing and re-exporting LNG from multiple suppliers. This LNG terminal is the core infrastructure that will support Singapore's energy diversification strategy and also make Singapore a LNG trading hub.

Key Features:

- Value engineering approach through redesigning from the beginning.
- Reduction in concrete and steel required in construction thereby saving manpower and time.
- Use of Down the Hole (DTH) hammer drilling tool instead of conventional drill hammer thereby increasing productivity. The DTH drilling rate can achieve 1m to 3m of drilling per hour in comparison with 0.2m to 0.5m of drilling by using the conventional drilling tool.
- The design requires less material which resulted in the use of less energy and labour, leading to a more productive and greener project, especially from the reduced number of piles needed and the savings in concrete.

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Conservatory Complex at Gardens by the Bay

Gold Award

(Institutional Buildings Category)



Developer	National Parks Board/Gardens by the Bay
Architectural Consultant	CPG Consultants Pte Ltd and Wilkinson Eyre Architects
Structural Consultant	Meinhardt Infrastructure Pte Ltd and Atelier One
M & E Consultant	CPG Consultants Pte Ltd and Atelier Ten
Builder	Woh Hup (Private) Ltd
Construction Cost	\$ 382,530,033.16
Gross Floor Area	45,875.00 m ²

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The project is located at Marina Boulevard (Marina South Planning Area). The conservatory complex comprises two biomes - Cool Dry and Cool Moist - and is enveloped by glass facade supported by arches and grid-shell. In addition, it also comprises a 200m long service tunnel, a visitors' hub and 3 Supertrees.

Key Features:

- Use of Building Information Modelling (BIM) to detect clashes early.
- Extensive use of prefabricated structural steel frames and curtain walls.
- Replaced the use of conventional slab to post tensioned slab.
- Adopted prefabricated air-con ducts and prefabricated segmented arches.
- System formwork adopted for lift core wall.
- Scissor lift/ boom lift in lieu of scaffolding for all internal and external works.

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Lush on Holland Hill

Gold Award

(Residential Non-Landed Buildings Category < 25,000 m²)



Developer	SP Holland Hill Pte Ltd
Architectural Consultant	Liu & Wo Architects Pte Ltd
Structural Consultant	Fong Consult Pte Ltd
M & E Consultant	Rankine & Hill (S) Pte Ltd
Design and Build Contractor	Singa Development Pte Ltd
Construction Cost	\$ 34,026,000
Gross Floor Area	8,675.41 m2

Lush on Holland Hill project is a condominium with two blocks of 12-storey residential flats with an attic, sky terrace at the 3rd storey, 2 basement car parks, swimming pools and communal facilities.

Key Features:

- Use of self-compacting concrete.
- Use of system formworks for vertical and horizontal structural components such as climbing form and table form.
- Use of precast components such as refuse chute, planter box, bay window.
- Drywall and prefabricated air-con ducting were adopted to increase the productivity of the whole project.

Bukit Merah RC23 (Havelock View)

Gold Award

(Residential Non-Landed Buildings Category $\geq 25,000 \text{ m}^2$)



Developer	Housing and Development Board
Architectural, Structural and M & E Consultant	Surbana International Consultants Pte Ltd
Builder	China Construction (SP) Dev Co P/L
Construction Cost	\$ 166,888,000.00
Gross Floor Area	139,700.00 m2

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Bukit Merah RC 23 or Havelock View is a high density public housing development with commercial and communal facilities. There are a total of 7 high-rise residential blocks and a multi-storey carpark which includes one eating house and 5 shops.

Key Features:

- Extensive use of precast and prefabricated components for the construction of the structural elements.
- Standardisation of door and window sizes for better quality and less wastage in production.
- Use of external climbing platform for improved productivity.
- Use of structural steel for precinct pavilion roofs, linkways and shelter walkways and drop-off porch.

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NUS Kent Vale II Staff Housing Development

Gold Award

(Residential Non-Landed Buildings Category $\geq 25,000 \text{ m}^2$)



Developer	National University of Singapore - Office of Estate Development
Architectural Consultant	MKPL Architects Pte Ltd
Structural Consultant	KTP Consultants Pte Ltd
Builder	Tiong Seng Contractors Pte Ltd
Construction Cost	\$ 149,688,000
Gross Floor Area	54,300.00 m2

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NUS Kent Vale II comprises a proposed covered link way on the 1st storey, two 24-storey blocks, one 25-storey residential building, one 3-storey communal Block A with a swimming pool, one single storey communal Block B with swimming pool to existing Kent Vale staff housing.

Key Features:

- Extensive use of precast components for faster installation on site.
- Use of structural steel for roof top, sky garden and communal block verandah.
- Advanced system formwork was used for both vertical and horizontal components.
- Off-form finishes for the facade was adopted which did not require any plastering and painting works.
- Use of climbing formwork systems and concrete placing boom to increase productivity on site.

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