The Award

The Construction Productivity Award (CPA) provides recognition to outstanding firms and industry practitioners for going the extra mile to achieve construction productivity improvements.

The Award:
- Recognises built-environment professionals, consultants and builders for their achievements in improving productivity;
- Promotes productivity in the industry; and
- Serves as a platform to measure productivity in the industry

Award Categories
- CPA – Advocates
- CPA – Projects

CPA – ADVOCATES

is a new award category introduced in 2013. It recognises outstanding developers, consultants and builders for their achievements in improving productivity at the firm level. It is a combination of the previous CPA – Best Practices and Innovations and the CPA – VAP to give more focus and better recognise the contributions of the various stakeholders. Developers, consultants and builders are awarded for the adoption of designs, construction methods, processes and/or technologies that have significant productivity impact on their projects.

CPA – PROJECTS

is awarded to project teams that have demonstrated productivity in their construction development 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.
Assessment Committee

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City Developments Limited
Developer Category

City Developments Ltd (CDL) is a leading developer and long-standing advocate for sustainability and high construction productivity in Singapore. Their recently completed developments include W Hotel, Quayside Isle and Volari. CDL has been working with their consultants and builders to adopt sustainable, easy and safe to build best practices in their projects to raise the construction productivity.

Key Productivity Initiatives:

- The adoption of the prefabricated bathroom units (PBU) in CDL’s residential developments is one of their key productivity initiatives. The use of PBU improved construction productivity by about 77%. It also reduced construction waste while improving water tightness of the bathrooms. To date, CDL has installed close to 8,000 PBU in their residential developments.

- CDL has pioneered the adoption of drywalls since 2000. Drywalls are easier to install, less labour intensive and provide a better quality finish when compared to the traditional brick wall. To date, CDL has constructed and handed over more than 7,000 residential units with drywalls.

- Since 2011, CDL has kickstarted the adoption of Building Information Model (BIM) during the planning and construction phase of their projects. The use of BIM helped facilitate better teamwork among the consultants and builders to improve the overall productivity, safety and quality of the projects. The Quayside Isle was the first project by CDL that was designed using BIM. Since then, all new projects by CDL have adopted BIM in their design and construction phase.

- CDL has also inculcated productive construction methods in their builders. These include the “No external scaffold” and “No struts to basement” methods, which are more labour efficient, easier to construct and provide a better quality finish.
Housing & Development Board
Developer Category

Housing & Development Board (HDB) is the largest housing developer in Singapore providing homes to more than 80% of Singaporeans. To meet the high demand for flats, HDB aims to improve the construction productivity for its projects to ensure that the flats are delivered on time without compromising on quality. In line with the national productivity target set by the National Productivity and Continuing Education Council, HDB targets to raise construction productivity of public housing by up to 25% by 2020.

Key Productivity Initiatives:

- The HDB Construction Productivity Framework is a three-stage approach to drive productivity at pre-construction, construction and post-construction stages.
  - One initiative during the pre-construction stage is the use of Building Information Modelling (BIM). It allows all parties of a project to communicate via a common platform, thus reducing construction conflicts upfront during the design stage.
  - At the construction stage, HDB requires their contractors to make use of more productive equipment.
  - During the post-construction stage, HDB reviews design guidelines, materials, construction details and methods based on feedback from residents. Lessons learnt will be used to improve the design and construction of future projects.

- HDB has advocated the use of precast technology since the 1980s. Examples of precast building components include precast façade with cast-in windows, columns, floor slabs, staircases and refuse chutes. In recent years, HDB further optimised the use of precast components coupled with large panel system formwork. The optimisation enabled them to achieve higher productivity gains.

- Under the Lift Upgrading Programme (LUP), the use of steel structure with aluminium cladding for the lift shafts was introduced in 2007. As the steel lift shafts weighed only a fraction of the conventional RC shafts, a longer section of the shaft could be hoisted each time, thus improving the efficiency of the hoisting operation. In addition, the use of steel shafts eliminated the need to grout different sections of the lift shafts thereby saving time and manpower. Machine roomless lifts were also designed such that most of the components could be placed within the shaft containing the lift car. As no machine room was required, there was a reduction in construction time and cost.
Chip Eng Seng Contractors (1988) Pte Ltd
Builder (Open) Category

Chip Eng Seng Contractors (1988) Pte Ltd places strong emphasis on sound project planning and harnesses productive construction methods and technology to improve productivity. The constructability score for their recently completed projects were above the minimum legislated score of 50.

Key Productivity Initiatives:

• Chip Eng Seng Contractors advocates the use of precast concrete components extensively in their projects. This would minimise the in-situ structural works on site and reduce the reliance on foreign workers. The firm has even set up their own precast yard to produce a wide range of precast components. The first precast yard was set up in Tampines in 2003 while a second yard was set up in Senai, Malaysia in 2010.

• Since 2007, the firm has adopted the use of system formwork including table form, jump form and aluminium form in their projects to improve productivity.
ADDP Architects LLP
Consultant Category

ADDP Architects has been advocating buildable design and constructability that contributes to construction efficiency and productivity in their private and public residential projects. Their recently completed projects, Parc Emily, Wilkie Studio and Cliveden @ Grange, have won the BCA Construction Productivity – Projects Platinum awards in 2011 and 2012.

Key Productivity Initiatives:

- ADDP Architects is equipped with the experience and knowledge in designing buildable systems such as the prefabricated bathroom units (PBU) and drywalls in their residential projects. The buildable design score for projects like Parc Emily, Wilkie Studio and Cliveden @ Grange were 88, 84 and 86 respectively.

- The firm also actively shares knowledge with the industry through seminars and contributes articles to different publications.
Kimly Construction advocates the use of precast technology in their projects to improve productivity. The firm also utilises Building Information Modelling (BIM), system formwork, productive plant and equipment for construction works.

Key Productivity Initiatives:

- The on-site precast yard was strategically set up in the Sengkang N4 C16 project to eliminate the transportation of precast components from the factory to the site. Approximately 30% of the precast elements were cast in the on-site precast yard. The just-in-time approach was used during the installation process to minimise the storage space of the precast components.

- The firm also adopted BIM in the Tresalveo project to simulate the construction schedules and detect clashes between mechanical and electrical (M&E) services. This reduced the number of re-works and improved the productivity on site.
DLE M&E Pte Ltd
Builder (Prime) Category

DLE M&E Pte Ltd is a one-stop integrated contractor for M&E services. The firm is committed to improving productivity through detailed site planning, optimising the use of mechanisation and having a strong focus on training to upgrade the skills of their workers.

Key Productivity Initiatives:

- With co-funding from the Mechanisation Credit (MechC) Scheme, DLE purchased scissor lifts to improve the efficiency of electrical conduit installation. This method has since replaced the traditional method of erecting scaffolds which is highly labour intensive.

- DLE also placed great emphasis on training and upgrading the skills of their workers. The firm has successfully utilised the Construction Productivity & Capability Fund (CPCF) to help subsidise the training cost.
Tiong Seng Prefab Hub
Industrial Buildings Category

Architectural Consultant
Look Architects Pte Ltd

Structural Consultant
LSW Consulting Engineers Pte Ltd

Builder
Tiong Seng Contractors Pte Ltd

Client
Robin Village Development Pte Ltd

Construction Cost
$12,000,000

Gross Floor Area
19,813.11 m²

Tiong Seng Prefab Hub is a 5-storey single-user general industrial building (Precast Factory) with auxiliary concrete batching plant and temporary workers’ dormitory at 63 Tuas South Avenue 1 (Tuas Planning Area).

Key Features

• High volume of precast was incorporated in the construction, hence reducing in-situ casting and increasing productivity. Double tee slab was used at every level instead of in-situ slab, which helped in reducing manpower, time, cost and risk of working at height.

• ST100 shoring system was used to support main beams weighing 32 tons. This eliminates the need to dismantle and re-erect traditional scaffolding if there is a change in location, hence reducing manpower and improving productivity.

• Peri’s RCS Climbing System was used for all staircases and lift shafts. This sped up processes and helped to achieve better quality off-form finishes.

• Scan Fibre Reinforcement Slab was used instead of welded mesh in the construction of the external driveway. This helped to reduce manpower, time and cost.

• Precast elements and advanced formwork system were used to achieve off-form finishes. The project also used dust free grinder, which is handy and easy to use, to achieve better productivity and quality.
ITE Headquarters and ITE College Central @ Ang Mo Kio
Institutional Buildings Category

Architectural Consultant
RSP Architects Planners & Engineers (Pte) Ltd

Structural Consultant
RSP Architects Planners & Engineers (Pte) Ltd

M&E Consultant
Squire Mech Pte Ltd

Builder
Kajima Overseas Asia Pte Ltd

Client
Institute of Technical Education

Construction Cost
$394,050,000

Gross Floor Area
192,820 m²

Key Features

• Extensive use of precast and prefabricated elements helped the project achieve high construction productivity. There was minimal use of labour which resulted in reduction of labour cost. Elimination of formwork and staging also resulted in a clean and safe working environment.

• Drywall construction was adopted to achieve faster construction timeline and superior quality control. The minimal wet trades on site resulted in on-site energy conservation and less wastage.

• The use of system formwork greatly reduced the time and manual labour involved in setting and striking the formwork. Large areas of slab were simpler, faster and safer to form.

• Modular system comprising steel lintels and stiffeners replaced the traditional use of reinforced concrete stiffeners which resulted in the easier installation. This saved time and manpower.

The 8-Storey ITE College Central and Headquarters comprise an administration block, four school blocks, three workshop blocks, an aerospace block and a sports block.
VoLaRi
Residential Non-Landed Buildings Category
< 25,000 m²

VoLaRi is a condominium housing development comprising one block of 12-storey residential units with a basement carpark, swimming pool and communal facilities.

Architectural Consultant
Architects 61 Pte Ltd

Structural Consultant
KTP Consultants Pte Ltd

M&E Consultant
Squire Mech Pte Ltd

Builder
Tiong Seng Contractors Pte Ltd

Client
City Developments Limited

Construction Cost
$65,000,000

Gross Floor Area
16,675.80 m²

Key Features

• Improved productivity was achieved by using full precast envelop system. The external walls with full precast components eliminated the need for scaffolding which was time consuming and laborious.

• The project was able to achieve a 7-day per floor cycle consistently hence easing space constraint on site in having to stock up materials required for conventional wet work. This also helped to keep the site tidy and clean.

• An advanced System Formwork, Peri's Skydeck system, was used for slab construction and Peri's SRS Steel Formwork system was used for the vertical components. This cut down on construction time and reduced manpower.

• Dry wall partition was used for most internal walls. They can be easily installed, hence required less labour.

• Prefabricated bathroom units (PBU) were installed in this development resulting in a reduction in construction time.

• Conversion of common reinforced concrete staircase to steel staircase allows for modular production prior to the construction of RC structural wall. This helped to shorten the time needed to construct the structure and eased the carpentry manpower for precast yard.

• The “one push-press fitting technology” was adopted in this project. This system does not require any tools during installation. It only requires a press-to-fit action to secure the pipes, thus reducing manpower. Lesser space was also needed for storage.
Replacement of 14 Numbers of Fixed Gangway at Terminal 2, Changi Airport
Additions & Alterations / Upgrading Buildings Category

Architectural Consultant
RSP Architects Planners & Engineers (Pte) Ltd

Structural Consultant
RSP Architects Planners & Engineers (Pte) Ltd

M&E Consultant
Squire Mech Pte Ltd

Builder
Takenaka Corporation

Client
Changi Airport Group (Singapore) Pte Ltd

Construction Cost
$23,925,716

Gross Floor Area
1,700 m²

Key Features

- Repetition of design module and modularisation of steel truss enabled standardisation of member size, length and connection details. Standardisation streamlined coordination, fabrication and reduced wastage. It also improved the speed of construction.

- Extensive prefabricated was adopted in this project. Prefabricated at the off-site yard helped to achieve better coordination control to meet tight construction schedule.

- Steel members were assembled at an off-site yard and this allowed only simplified construction on-site that substantially reduced the use of material as well as temporary works and manpower needed. Minimised on-site installation and temporary works also reduced the disruption of airport operation.

Fixed gangways are bridge buildings that connect the terminal building and docking aircrafts at the second storey. This project involves the replacement of 14 fixed gangways with dimensions of approximately 32m (L) x 3.15m (W) x 2.8m (H).
Punggol Green Primary School
Institutional Buildings Category

Architectural Consultant
ID Architects Pte Ltd

Structural Consultant
DE Consultants (S) Pte Ltd

M&E Consultant
AECOM Singapore Pte Ltd

Builder
Lian Soon Construction Pte Ltd

Client
Ministry of Education, Singapore

Construction Cost
$24,966,500

Gross Floor Area
19,984.36 m²

Punggol Primary school is a new primary school commissioned by the Ministry of Education, comprising two blocks of 5-storey teaching facilities, one block of multi-purpose hall and one block of indoor sports hall with canteen at Punggol Field/Punggol Walk.

Key Features

• The project adopted the modular concept, repeats in its structural grids, opening and services core. This concept allowed systematic repetition of a typical layout from floor to floor. Modular size was adopted for ease of construction, thus resulting in savings in time and manpower.

• Extensive use of precast concrete was adopted to hasten the construction speed and enhance its buildability. The classroom blocks were fully precast including the first storey and roof. The extensive use of precast elements such as precast columns, beams, hollow core slab, planks and staircases resulted in less labour requirement, improved safety, quality and productivity.

• The use of precast external facade walls instead of brick wall system helped to reduce the construction cycle and improve the water tightness of the building envelope.

• Internal drywall system in lieu of conventional brick wall helped to ease construction and reduce wet trades on site, thereby increasing the efficiency and speed of construction. This also resulted in higher quality finish, faster installation and better housekeeping.

• Building Information Modelling (BIM) was adopted in this project to better visualise building details and detect clashes to avoid abortive work. The team had a clearer overall vision of the project and was able to firm up decisions quickly.
Punggol East Contract 21 (Punggol Spring)
Residential Non-Landed Buildings Category
> 25,000 m²

Architectural Consultant
Surbana International Consultants Pte Ltd

Structural Consultant
Surbana International Consultants Pte Ltd

M&E Consultant
Surbana International Consultants Pte Ltd

Builder
Qingjian International (South Pacific) Group Development Co., Pte Ltd

Client
Housing & Development Board

Construction Cost
$99,960,000

Gross Floor Area
61,964.50 m²

Key Features

• The full precast system simplified the construction as it provided standardisation and repetition of precast components for every storey. Thus, lesser manpower was needed resulting in an increase in productivity. The off-site production of precast components also resulted in better quality finishes.

• Steel lift frames and aluminium cladding system were used for the construction of lift shafts. The steel frames were fabricated off-site and pre-assembled to 2-cores steel frames before being delivered to site. The installation of steel lift frames in 2-storey duplex modular section by means of bolts, nuts and welding reduced the construction time on site. It also contributed to the ease of construction and improved productivity.

• The Bioswales system, an environmentally friendly system, was adopted in the project. It takes on the cleansing function by treating storm water through fine filtration and improve water quality. It is a self sustaining system that requires minimal maintenance.
The Peak @ Toa Payoh
Residential Non-Landed Buildings Category
≥ 25,000 m²

Architectural Consultant
JGP Architecture (S) Pte Ltd

Structural Consultant
BC Koh & Partners LLP

M&E Consultant
J Roger Preston (S) Pte Ltd

Builder
Straits Construction
Singapore Pte Ltd

Client
Hoi Hup Sunway J.V. Pte Ltd

Construction Cost
$293,587,318

Gross Floor Area
126,931.12 m²

The Peak @ Toa Payoh is a public housing development comprising two blocks of 42-storey residential flats with sky terrace at the 22nd storey and three blocks of 40-storey residential flats. It is located at Lorong 1A Toa Payoh.

Key Features

- Extensive use of precast components were cast off-site and delivered to the worksite prior to installation. The extensive use of precast planks enabled the slabs to be cast with minimal formwork, saving considerable time in the construction of the superstructure.

- An identical and mirror image unit layout was adopted for the entire elevation of each building block. Due to the simplified design, the types of precast moulds and material required for the fabrication of mould were also reduced. Moreover, manpower and potential errors during construction were also minimised.

- Precast internal partition walls were used in this project instead of the conventional brick walls. The method of installation of the precast partition walls is a cleaner and faster alternative that requires only bedding material and welding works for the connection joints. Manual transportation of bricks to the units was thus eliminated, resulting in reduced labour cost and time.
Woodlands N2C12 (Straits Vista)

Residential Non-Landed Buildings Category

Woodlands N2C12 (Straits Vista) is located in Woodlands, fronting Marsiling Lane. The development comprises two 30-storeys and one 26-storey residential blocks with 382 units of 3 and 4-room flats, complemented by a generous central green space filled with varied amenities and a 4-storey multi-storey car park.

Architectural Consultant
Surbana International Consultants Pte Ltd

Structural Consultant
Surbana International Consultants Pte Ltd

M&E Consultant
Surbana International Consultants Pte Ltd

Builder
Ho Lee Construction Pte Ltd

Client
Housing & Development Board

Construction Cost
$63,970,000

Gross Floor Area
53,437.36 m²

Key Features

- Most of the structural vertical columns and walls for the project were designed as precast solid components which eliminated the reliance on labour intensive and time-consuming erection of external scaffold, external formwork and platform system.

- Part of the main water pipe was fitted with stainless steel press-fit fittings to prevent leakage at the joints. Press-fit fittings use clamping technology, thus are easier to install.

- Ferrolite lightweight partition panels were used in most areas, except wet areas, to increase productivity due to its fast, easy and economical installation without compromising integrity and insulation performance.