Construction Excellence Awards 2000

Award Winners

- **Commercial Buildings**
  Centennial Tower
  Hotel Rendezvous
  Guthrie House
  The URA Centre

- **Industrial Buildings**
  Fritz Logistics Warehouse
  Ang Mo Kio Autopoint

- **Institutional Buildings**
  Institute of Molecular Agrobiology

- **Residential Buildings ($1000/m^2 & above)**
  Shangri-La Apartments
  Peirce Villas
  Parc Vista Condominium
  Signature Park Condominium Ph 1 & 2
  Signature Park Condominium Ph 3
  Costa Rhu Condominium

- **Civil Engineering Projects**
  Bridge at Marina Bay

Certificate Of Merit

- **Commercial Buildings**
  UE Square
  Capital Square
  Commerce Point
  West Mall

- **Industrial Buildings**
  ST Assembly Test Services Factory

- **Institutional Buildings**
  Rebuilding of Outram Secondary School at York Hill
  Redevelopment at Jurong Camp I

- **Residential Buildings ($1000/m^2 & above)**
  Fifth Avenue Condominium
  Aspen Heights Condominium
  Palm Mansions

Summerlea Green

- **Residential Buildings (below $1000/m^2)**
  Woodlands N5 C4

- **Civil Engineering Projects**
  Holland Road/Farrer Road/Queensway Interchange

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Construction Excellence Awards 2000

Award Winners - Commercial Buildings

CENTENNIAL TOWER

Client:	Pontiac Marina Pte Ltd
Main Contractor:	Dragages Singapore Pte Ltd
Principal Consultant:	DP Architects Pte Ltd
Structural Consultant:	Meinhardt (S) Pte Ltd
Concept Architect:	Kevin Roche John Dinkeloo And Associates
M & E Consultant:	Meinhardt (S) Pte Ltd
Quantity Surveyor:	Davis Langdon & Seah Singapore Pte Ltc
Construction Cost:	S$149 Million
Construction Period:	23 mths

Centennial Tower consists of a 37-storey office building with a 2-storey basem building was structurally designed for future extension to 52 storey.

Architectural Features

The facade was cladded with a mixture of granite and curved curtain walls. Dis

include a 14m high lobby with full height lighted circular laminated glass co
designed in Canada.

Key Construction Features

The contractor proposed structural steel to replace the originally designed co
This helps to reduce the construction time, achieve better accuracy and
extension. Early involvement in the project design allows the contractor to r
ratio and incorporate construction methods that improve buildability and produc

System formwork was used for all walls to provide good accuracy for cast-in-
external facade and a smooth internal finish that eliminated the need for plaste
precast beams, slabs, staircases and tableforms greatly enhanced the product
Templates were used for prefabricating rebars on the ground to ensure c
operation.

Despite the space and time constraint, the contractor's adoption of innovativ
buildability concept enabled the project to be handed over on time with exce
safety performance. This project was one of the BCA Best Buildable Design A
1999.

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INFO FOR

Info On Built Environment

- Safe
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Info For

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Construction Excellence Awards 2000

Award Winners - Commercial Buildings

HOTEL RENDEZVOUS

Client:	Hotel Rendezvous Pte Ltd
Project Manager:	Straits Developments Pte Ltd
Main Contractor:	Obayashi Corporation
Principal Consultant:	SAA Partnership Pte Ltd
Structural Consultant:	Tan Ee Ping & Partners
M & E Consultant:	Beca Carter Hollings & Ferner (S E Asia) I Ltd
Quantity Surveyor:	Davis Langdon & Seah Singapore Pte Ltd
Construction Cost:	S$89 Million
Construction Period:	32 mths

Hotel Rendezvous is a four-star hotel located at the junction of Bras Basah R Street. This 300-room hotel features a series of comprehensive facilities, 2 carpark and an internal open landscaped courtyard. The project also includec and adaptive re-use of the surrounding conservation shophouses.

Architectural Features

The façade of the hotel was designed and detailed to respect and harn architectural features of the surrounding conservation shophouses. A distinctiv posed as a landmark feature. A space frame dome structure that crowned tl landscaped courtyard was introduced to resemble and assimilate the past hist

Comprehensive façade lighting enhanced the architectural features of th shophouses and the new buildings, projecting a magnificent night scene.

Key Construction Features

The site was constrained on three sides by roads with heavy traffic and con presence of poor soil condition. This posed a challenge during the con basements using bored piles and diaphragm walls. Detail planning and measures were taken to accommodate existing old buildings which were built pad foundations. Extensive investigation on the conservation shophouses' footings were conducted prior to reinforcing and strengthening of existing footin

Advanced strengthening technique using hybrid woven fabric was intro restoration of structural components of the conservation shophouses. painstaking efforts were done to record and reproduce the decorative façad historical shophouses as well as to restore the damaged features and moulding

The project, a blending of new and existing buildings with features and facili towards architectural and urban vitality of the neighbourhood, truly serves as as the name "Rendezvous" suggests. This project was timely handed over phases to a satisfied owner in accordance to the hotel's opening schedule.

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Award Winners - Commercial Buildings

GUTHRIE HOUSE

Client:	Guthrie Properties (S) Pte Ltd
Main Contractor:	Woh Hup (Pte) Ltd
Principal Consultant:	RSP Architects Planners & Engineers (Pte Ltd
Structural Consultant:	SCE Consultants (Pte)
M & E Consultant:	Belmacs Consulting Engineers
Quantity Surveyor:	KPK Quantity Surveyor (1995) Singapore Pte Ltd
Construction Cost:	S$20 Million
Construction Period:	20 mths

Guthrie House comprises a 4-storey office block with one basement carpark a Fifth and Sixth Avenue.

Architectural Features

The façade is cladded with granite columns with glass panels for the cu windows. Distinctive features of the building include arc copings above the cornice walls, a space frame canopy at the pick-up point and warmly designe from skylight over the circular entrance lobby at night.

Key Construction Features

The basement construction was within 3m of the large diameter main wa

pipelines that were connected from Johor, Malaysia to the reservoirs of Singap possible subsidence to the PUB pipeline supports, the contractor used she grouting to consolidate the ground for the construction of the undergro Continuous monitoring were carried out along the main PUB pipelines an footing to ensure that vibration levels are within tolerances, and there is n services. To avoid the potential risk of damaging the pipelines during extract piles, 67m of temporary works were left in the ground after the completion o construction.

The roof skylight was designed and constructed as a modular assembly, whic of installation over the circular lobby and timely sealing of glazing units. Th installation of marble features in the main atrium floor. Grid surveys were als the cladding system to improve façade alignment. In addition, the designed g the curtain walls and windows provide efficient lighting and cooling.

Despite the site constraints, the contractor was able to demonstrate a good sa deliver this high quality finished project to a satisfied owner on time.

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Construction Excellence Awards 2000

Award Winners - Commercial Buildings

THE URA CENTRE

Client:	Urban Redevelopment Authority
Main Contractor:	Kajima Overseas Asia Pte Ltd
Concept Architect:	Urban Redevelopment Authority
Project Architect:	D'Exodus Architects Planners
Design Consultant:	Kenzo Tange Associates / Kajima Design As Pte Ltd
Structural Consultant:	RSP Architects Planners & Engineers (Pte) L
M & E Consultant:	Squire Mech Pte Ltd
Quantity Surveyor:	Urban Redevelopment Authority
Construction Cost:	S$118.9 Million
Construction Period:	27 mths

The URA Centre comprises a 16-storey office block and a 5-storey podium basement carpark. The new building is linked to the existing URA Centre conditioned glass link bridge and to the MND building by a glass covered walkv

Architectural Features

The building facade featured distinctive lourved curtain walls and a 5-storey steel atrium constructed from an innovative tension cable truss system of canopy. Trellises at the 5th and 16th storey terraces maintain the clean line window lourves and double as sunscreens, shielding off direct sunlight from height glass screens fronting the terraces. Two tension ponds at the 1st store soften the atmosphere and create the effect of a smooth skin of water draped c sculpture. At the roof of the podium block, there is a landscaped water gard nestled at the centre which offers a retreat to nature from the internal built up e

Key Construction Features

The close proximity to the MND Building and main roads required constant soil movements during the construction of the substructure. Hoisting of concreting works were allowed only after office hours and weekend. The formwork and precast hollow core slabs greatly enhanced the productivity duri The building is the first to adopt an integrated Building Management System control the M & E functions. This simplifies and enhances the overall maint building. This is also the first project that adopted a lift transportation system th registering intelligent feature to provide faster and more efficient operations for

Through careful design, proper co-ordination and integration of the structural, a M & E works, the contractor has not only satisfied URA's Total Buildir requirements but also successfully handed over the building on time with excel

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Award Winners - Industrial Buildings

FRITZ LOGISTICS WAREHOUSE

Client:	Fritz Logistices (S) Pte Ltd
Main Contractor:	SembCorp Construction Pte Ltd
Principal Consultant:	ST Architects & Engineers Pte Ltd
Structural Consultant:	ST Architects & Engineers Pte Ltd
M & E Consultant:	ST Architects & Engineers Pte Ltd
Quantity Surveyor:	ST Architects & Engineers Pte Ltd
Construction Cost:	S$15 Million
Construction Period:	14 mths

Fritz Logistics is a 4-storey warehouse located along Changi South Lane Automated Storage and Retrieval System (ASRS).

Key Construction Features

The temporary access to the site ran close to the edge of the Bedok Canal, wh contractor to continuously monitor subsidence during construction. The hi height and the 32m high-bay columns to cater for the ASRS posed a challe operation and safety. Stringent checks and co-ordination were conducted to operation ran smoothly. The early handover of the ASRS floor to the specialist months after commencement of work also created some constraint on the reso

The contractor's adoption of precast elements in replacement of cast-i minimised labour usage and eliminated the need for erection of formwor provided better finished product. This includes the ground pre-casting of 52 beams, introduction of precast hang-down walls and 18 numbers of precast do

Wall erection was further speeded up through the use of hollow steel stiffeners in-situ stiffeners. Tableform was used to support the heavy crossbeam dur which eliminated the need to dismantle and re-erect the formwork from on another and hence, improved productivity. Adjustable and re-usable stee extensively used for the construction of structural columns. This enhanced the as well as sped up the construction process.

The contractor's use of innovative construction methods, the employment logistics management, and effective co-ordination ensured the satisfactory han fast track project to the owner with exemplary safety performance and excellen

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Construction Excellence Awards 2000

Award Winners - Industrial Buildings

ANG MO KIO AUTOPOINT

Client:	Housing and Development Board
Main Contractor:	Ho Lee Construction Pte Ltd
Principal Consultant:	CESMA International Pte Ltd
Structural Consultant:	Housing and Development Board
M & E Consultant:	Housing and Development Board
Quantity Surveyor:	Housing and Development Board
Construction Cost:	S$43.8 Million
Construction Period:	26 mths

Ang Mo Kio Autopoint is a modern 5-storey vehicle repair complex located al Industrial Park 2A, which accommodates 112 motor workshops, an informati cafeteria.

Architectural Features

The 5-storey complex is accessible by an external 2-way ramp and internal driv all the motor workshops. The carpark located at the rooftop and 1st store accommodating up to 1,000 vehicles.

Key Construction Features

The access to the site is limited by the close proximity to a big canal. The e precast structural components such as pre-stressed planks, integrated precast staircases and ramps entails careful planning in the early stage to ensure the highly mechanised construction method.

A specially designed and sized modulated circular metal form was fab

construction of the 30m high by 1.2m diameter columns which eliminate additional external bracing and thus reduced the construction time. Numerous were conducted on the structures prior to erection of precast components to incidental construction loads induced by different sequence of installation do specified design load. Just-in-time principle was adopted for the delivery and i precast beams to resolve the problem of space constraint at site.

The pro-active approach taken by the contractor and the concerted efforts c involved in the project contributed to the successful completion of this aesth industrial building.

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Award Winners - Institutional Buildings

INSTITUTE OF MOLECULAR AGROBIOLOGY

Client:	National University of Singapore
Main Contractor:	Wee Hur Construction Pte Ltd
Principal Consultant:	RSP Architects Planners & Engineers (Pt Ltd
Structural Consultant:	RSP Architects Planners & Engineers (Pt Ltd
M & E Consultant:	Parsons Brinckerhoff Consultants Pte Ltd
Quantity Surveyor:	Davis Langdon & Seah Singapore PL
Construction Cost:	S$29.5 Million
Construction Period:	14 mths

The Institute located at NUS is a 5-storey building with lower ground floor resea cum ancillary offices, one 2-storey animal outhouse/aquarium and one 2-storey

Architectural Features

The external façades are cladded with aluminium curtain wall spanning 5-st feature wall covered with slate tiles standing at a height of 25m. Visitors to the greeted with a 5-storey high lobby at the entrance and stainless steel fe leading to every floor.

Key Construction Features

The main challenge was to complete the project within the short contract peric As the building was built on platform cut-out from a hill, proper sequence of c

to be followed to ensure the stability and integrity of the existing slopes and c
pile walls. Having only one access coupled with the existing hard ground at
the construction of the project.

Due to the high content of M & E services and Architectural works, the entire R
completed within nine months. This is to facilitate the installation of lift, M
services, aluminium cladding and external works. The wet work and floor fin
completed 3 months before the completion date to accommodate the high vol
laboratory equipment and furniture. To ensure the delivery of high quality wor
supervision and planning was expended on the wet trades which include br
plastering, tiling, epoxy and vinyl flooring.

The close co-operation between the contractor and the consultants together v
site management team has ensured the timely completion of the project with ex

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Construction Excellence Awards 2000

Award Winners - Residential Buildings ($1000/m^2 & above)

SHANGRI-LA APARTMENTS

Client:	Shangri-La Hotel Ltd
Main Contractor:	Woh Hup (Pte) Ltd
Project Manager:	LEO Property Management Pte Ltd
Principal Consultant:	Chao Tse Ann & Partners Pte Ltd
Structural Consultant:	HCE Engineers Partnership
M & E Consultant:	Squire Mech Pte Ltd
Quantity Surveyor:	KPK Quantity Surveyor (1995) Singapore Pte Ltd
Construction Cost:	S$37.9 Million
Construction Period:	24 mths

Shangri-La Apartments is a 10-storey luxurious service apartment developme 127 units with a 2-level basement carpark, swimming pool, tennis courts, cor and external works comprising pavilions, retaining walls, landscaping, driveways.

Architectural Features

The external façade, evenly sprayed with paint of light colour texture dimensional curved precast planter boxes which are replicated on every fl concrete trellises on the roof. Other distinctive external features include the hi windows and the extensive use of greenery, which emphasizes the tropic

internal works were luxuriously finished with extensive use of marble and mirrc glass panels that enable guests to better enjoy the tropical landscaping anc detailing to column.

Key Construction Features

Being situated at prime area, space constraint and the site's proximity to ad coupled with the existence of high-tension electric cables across the site pos problems during construction. Silent piling techniques was used to overcome noise problems. Re-charging wells were deployed to minimise the lowering of t

To ensure good quality works, the construction team proposed an altern construct the planter boxes in precast units. Special lightweight fibreglass fc was designed such that the precast sections of different lengths and widths cc from the same system. Great emphasis was placed on checking the compatil with other composite materials used in the construction. In addition, efforts spe of completed works helps to eliminate reworks.

The contractor's use of innovative precast designs and the adoption of bes systematic quality controls resulted in successful completion of the projec quality and safety performance. This project is also one of the 1999 BCA Design Award winners.

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Construction Excellence Awards 2000

Award Winners - Residential Buildings ($1000/m^2 & above)

PEIRCE VILLAS

Client:	City Developments Ltd
Main Contractor:	Ssangyong Engineering & Construction C Ltd
Principal Consultant:	Team Design Architects
Structural Consultant:	T.Y. Lin (SEA) Pte Ltd
M & E Consultant:	Squire Mech Pte Ltd
Quantity Surveyor:	Rider Hunt Levett & Bailey
Construction Cost:	S$78.6 Million
Construction Period:	40 mths

Pierce Villas comprise 29 units of luxurious 2-storey bungalow and 1 un bungalow located along Peirce Road, each complete with a garden, lanc swimming pool.

Architectural Features

This cluster of 30 prominent custom designed bungalows, each exuding a diffe different individual design and material is located in a prime district with lush gı tropical foliage. The swimming pool in each bungalow comes in different desiç The patterns were designed in Italy using computers to generate random m glass mosaic tiles, within the motifs and also the surrounding walls and floors o

High quality glazed roof tiles from Heisterholtz of Germany were used for al except for the conserved house. Driveways and garage were finished ı

pebbles, slates, granite and engineering bricks, which were laid to patterns.

Internally, each house is furnished with a large range of luxurious interna ranging from marbles from Italy, good quality teak and maple timbers from America, sanitary fittings from France and kitchen appliances from Germany.

Key Construction Features

The hard ground conditions encountered at some of the areas at site forced t switch from the originally designed bore piling foundation for the retaining wa shorter piles/micro-piles as toe pins and raft foundations. The hilly site and over protected trees in the vicinity of the site further complicated and delayed process. One major difficulty encountered for the project was to deal promp with the late requests for changes put forward by the owners. This freque abortive works and delays that affected the overall quality of the project.

Despite the various problems highlighted above coupled with the time and n imposed for the surrounding private residential area, the contractor was able satisfied client a well finished project.

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Award Winners - Residential Buildings ($1000/m^2 & above)

PARC VISTA CONDOMINIUM

Client:	Far East Organisation & Pidemco Land Ltc
Main Contractor:	Keong Hong Construction Pte Ltd
Principal Consultant:	DP Architects Pte Ltd
Structural Consultant:	KTP Consultants Pte Ltd
M & E Consultant:	J Roger Preston (S) Pte Ltd
Quantity Surveyor:	KPK Quantity Surveyors (1995) Singapore Pte Ltd
Construction Cost:	S$125 Million
Construction Period:	36 mths

Parc Vista located at the junction of Corporation Road and Boon Lay Way co storey and three 16-storey apartment blocks with a total of 638 units.

Architectural Features

The seven towers of neo-classical architectural design, are arranged to courtyard to accommodate a swimming pool, lap pool, clubhouse, barbecu sunken tennis court with covered linkways connected to all the towers.

Key Construction Features

The site is sandwiched between the MRT line and HDB blocks on the s respectively. Thorough hazard analysis, safety measure proposals and logisti carried out at pre-construction stage to ensure that there is no compromise on public.

In the midst of construction, LTA imposed a new requirement that the boom the Tower Cranes has to be shortened by 10m resulting in the crane being u one-quarter of the Tower, which it was servicing. The contractor had to rev construction plan, which included re-allocation of resources and logistic a overcome this potential setback.

High water table level encountered at the high basement retaining walls tha MRT lines and HDB estates and the 6-storey high temporary staging requirec construction of the links for 4 Towers further complicated the construction. Al Hydratite integral waterproofing system for the basement slab environm replacement of the originally specified Caltite waterproofing resulted in a cos million dollars.

The extensive use of prefabricated BRC cages for beams, columns, lift wal walls coupled with the use of lightweight structural steel frames in lieu of reir for all the first storey decorative entrance arches resulted in improved productiv

Despite the site constraints, the project was successfully completed within the c with excellent quality and safety performance.

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Award Winners - Residential Buildings ($1000/m^2 & above)

SIGNATURE PARK CONDOMINIUM PHASE 1 & 2

Client:	City Developments Ltd
Main Contractor:	Hyundai Engineering & Construction Co. L
Principal Consultant:	APCO Architects & Town Planners Collaborative
Structural Consultant:	KTP Consultants Pte Ltd
M & E Consultant:	Parsons Brinckerhoff Consultants Pte Ltd
Quantity Surveyor:	KPK Quantity Surveyors (1995) Singapore Pte Ltd
Construction Cost:	S$158 Million
Construction Period:	30 mths

Signature Park Phases 1 & 2 located between Jalan Jurong Kechil and comprises six 10-storey blocks with a total of 640 units including a basement courts and a free form swimming pool. The project is part of a 928 development.

Architectural Features

The overall site is undulating, rising from Jalan Jurong Kechil to the high poi 10m at the interface of Phase 2 and Phase 3. The apartment blocks were construction in clusters of two and three cores in a sweeping curve on either si

recreation area.

Key Construction Features

The basement carpark, which is a major feature of the project, followed the ge the undulating site. A double slab concept that was successfully used over the the exception of the tennis court resolved the waterproofing and envirc problems.

Parapet walls at varying heights and orientation were built above the carpark r attractive landscape. Since the entire development comprises three phases contractors working adjacent to each other, construction works at the interface co-ordination and was very much dependent on the progress at the other site.

The effective and efficient site management as well as good team work co timely completion of this quality project.

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Construction Excellence Awards 2000

Award Winners - Residential Buildings ($1000/m^2 & above)

SIGNATURE PARK CONDOMINIUM PHASE 1 & 2

Client:	City Developments Ltd
Main Contractor:	Hyundai Engineering & Construction Co. L
Principal Consultant:	APCO Architects & Town Planners Collaborative
Structural Consultant:	KTP Consultants Pte Ltd
M & E Consultant:	Parsons Brinckerhoff Consultants Pte Ltd
Quantity Surveyor:	KPK Quantity Surveyors (1995) Singapore Pte Ltd
Construction Cost:	S$158 Million
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The effective and efficient site management as well as good team work co timely completion of this quality project.

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Award Winners - Residential Buildings ($1000/m^2 & above)

SIGNATURE PARK CONDOMINIUM PHASE 3

Client:	City Developments Ltd
Main Contractor:	Hytech Builders Pte Ltd
Principal Consultant:	APCO Architects & Town Planners Collaborative
Structural Consultant:	KTP Consultants Pte Ltd
M & E Consultant:	Parsons Brinckerhoff Consultants Pte Ltd
Quantity Surveyor:	KPK Quantity Surveyors (1995) Singapore Pte Ltd
Construction Cost:	S$81.9 Million
Construction Period:	31 mths

Signature Park Phase 3 comprises the remaining 288 units of the e condominium development that is housed in four 8-storey blocks includ clubhouse, swimming pool, wading pool and jacuzzi, children's playgrou chipping greens, fitness corners and substation.

Architectural Features

The swimming pool, wading pool and jacuzzi are integrated with the water f landscaping around the pool deck to create a resort style retreat. Terrace l facilities are centrally located between the blocks. Elevation treatment was blocks through the use of full height bay windows and striking roof trellis.

Key Construction Features

The site was only accessible through Phases 1& 2 for the initial first six month Tuck Road entrance was used for show flat and marketing. Sharp drops in Phase 3 and Phase 1 & 2 occurring at the interface line required close co rapport between the two contractors on the timing and sequencing of works.

With Phase 3 higher than Phase 1 & 2, site drainage was carefully planned dur to ensure that minimal surface water would flow to the adjacent site through a drains at the interface. Another problem was to maintain a headroom of 2 carpark as there was substantial amount of M & E services above it. A great d co-ordination and monitoring of M & E works in progress was carried out to 2,200mm headroom was achieved.

Despite the fact that the site was surrounded by private residential properties on noise level and working hours coupled with limited access and construction project was delivered to a satisfied client with high quality of workmanship a record.

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Award Winners - Residential Buildings ($1000/m^2 & above)

COSTA RHU CONDOMINIUM

Client:	AFP Gardens (Tanjong Rhu) PL
Main Contractor:	Shimizu Corporation
Principal Consultant:	RSP Architects Planners & Engineers (Pt Ltd
Structural Consultant:	RSP Architects Planners & Engineers (Pt Ltd
M & E Consultant:	Squire Mech Pte Ltd
Quantity Surveyor:	Davis Langdon & Seah S'pore P L
Construction Cost:	S$244.5 Million
Construction Period:	36 mths

Costa Rhu Condominium comprises two 18-storey and two 15-storey accommodates 737 units complete with 79 lifts including a clubhouse, bas swimming pool and environmental deck.

Architectural Features

The main distinctive features of the project are the clay roof tile structure multitude of "tiny little" roofs at different levels and the large twin dolphin sh pool within the centre of the development.

Key Construction Features

Some of the construction challenges that the contractor faced include
encountered in the construction of the basement due to the presence of ma
formation level. Foundation construction was carried out in various plots in
excessive soil movements that may lead to excessive pile movement or damag

Limitations set by the authorities regarding the movement of the adjacent sea
for the tied-back sheet pile wall and 25mm for the pre-cast L-block. Finite elen
well as daily monitoring on the movement of the sea wall was done to achie
tolerances.

System formwork was adopted for all the lift core walls to ensure the timely c
79 vertical lifts with the desired quality of finish. The contractor's proposal
support for the clay roof tiles, from the originally designed concrete structure t
with pre-formed steel roofing supporting the clay tiles, helped to reduce the con

Lightweight aerated concrete blocks were used for all the external and internal
lieu of the proposed solid cement blocks and common clay bricks, which
enhanced the quality of finish but also resulted in some savings on time and co

The contractor's adoption of alternative innovative solutions coupled with effec
methods enabled the timely completion of an aesthetically pleasing condominiu

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Award Winners - Civil Engineering Projects

BRIDGE AT MARINA BAY

Client:	Land Transport Authority
Main Contractor:	Obayashi Corporation
Principal Consultant:	Land Transport Authority
Structural Consultant:	Land Transport Authority
M & E Consultant :	PWD Consultants Pte Ltd
Quantity Surveyor:	Land Transport Authority
Construction Cost	S$46.7 Million
Construction Period	40 mths

Bridge At Marina Bay, also known as the Esplanade Bridge, is a 280m long
dual carriageway with pedestrian footpath on both sides that span across the M

Key Construction Features

The contractor's scope of work includes the construction of the substructure and ancillary works. A total of 412 bored piles of varying sizes ranging 1,300mm were installed for the construction of the substructure works.

Superstructure work comprises two rows of seven span of continuous precast having a length of 38m with two 7m span at both ends. The 3-dimensiona features required for the bridge spanning between the piers demand cast-in- method to be adopted, which made the formwork design very difficult a

Reinforcement design and detailing were extremely complex as every rebar a
3-dimensional curved span is of different length, curvature, sizes and placemer

The reinforcement to concrete ratio of 7000 kg/m^3 made the concreting proc
costly. Extensive and intense supervision and inspection on site was carried
designed low clearance under the bridge, there is a need to ensure that v
during construction is not disrupted. Extensive studies into the use of pre
construction was initially made but was rendered unsuitable due to the res
conditions imposed by other structures in the proximity such as the Benjamin S

Meticulous co-ordination of bridge construction works with ancillary works,
installations, decorative street lamps including landscaping in the final phas
ensured the timely opening of an aesthetically pleasing bridge.

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Certificate Of Merit - Commercial Buildings

UE SQUARE

Client:	United Engineers Ltd
Main Contractor:	Kajima Overseas Asia Pte Ltd
Principal Consultant:	Architects 61 Pte Ltd
Structural Consultant:	HCE Engineers Pte Ltd
M & E Consultant:	United Engineers Ltd
Quantity Surveyor:	Davis Langdon & Seah S'pore Pte Ltd
Construction Cost:	S$247.5 Million
Construction Period:	28 mths

UE Square is a mixed development comprising an 18-storey office block, 1 apartments and 19-storey residential apartments with a 3-storey basemer located at the junction of River Valley Road and Clemenceau Avenue.

Architectural Features

Externally, the office block is cladded with fluorocarbon glass curtain wall a service and residential apartments are cladded with granite and elegant st sashed glazing windows are installed for all the blocks.

Key Construction Features

The use of steel reinforced concrete columns and bondek formwork for the allowed rapid progress on the structure. Adoption of steel truss suspended glas office tower and serviced apartments greatly enhanced the space that it enclos

The extensive use of simulated stone texture coating at the higher levels of the simplified and speed up the site work without any noticeable compromise to th value of the design.

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Certificate Of Merit - Commercial Buildings

CAPITAL SQUARE

Client:	Capital Square Pte Ltd
Main Contractor:	Ssangyong Engineering & Construction Co Ltd
Principal Consultant:	Architects 61 Pte Ltd
Structural Consultant:	Meinhardt (S) Pte Ltd
M & E Consultant:	Beca Carter Hollings & Ferner
Quantity Surveyor:	Rider Hunt Levett & Bailey
Construction Cost:	S$91.9 Million
Construction Period:	23 mths

Capital Square comprises a 16-storey Office Tower, with 7 levels of podium banking hall including the conservation and reconstruction of 19 units of exist along Pekin and China Street for adaptive re-use as boutique offices, shops an

Architectural Features

The external curtain wall system consists of a mixture of handset granite and wall system which doubled as a watertight rain screen for the exterior face seal for the interior. Another special feature for the project is the sloping wate near the building façade that was created with granite aggregates embedde panels using epoxy.

Key Construction Features

This congested site is situated in the heart of Shenton Way with difficult site with the presence of soft marine clay and high water table. An innovative syst cable trussed glass façade was designed and installed for the main lobby a which maximises the intended see-through effect.

The end product is a high quality finished building that incorporated the lates technologies, which catered for the future demands of such developments.

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Construction Excellence Awards 2000

Certificate Of Merit - Commercial Buildings

COMMERCE POINT

Client:	City Developments Ltd
Main Contractor:	Obayashi Corporation
Principal Consultant:	DP Architects Pte Ltd
Structural Consultant:	RSP Architects Planners & Engineers (Pt Ltd
M & E Consultant:	Squire Mech Pte Ltd
Quantity Surveyor:	Davis Langdon & Seah S'pore P L
Construction Cost:	S$28.6 Million
Construction Period:	24 mths

Commerce Point comprises a 19-storey office building with the offices locate onwards and carparking facility between 3rd and 6th storey being serviced by 1st and 2nd floor reserved for retail area. This design-and-build project, loca Street, is sandwiched between Lippo Building and Tan Ean Kiam Building.

Key Construction Features

Because the site is situated within the Central Business District, restricted acce congestion entailed the adoption of precast post-tensioned beams and stairca slabs and the use of self-climbing jump form system for the core wall construc any inconveniences to the public.

There were several changes made by the owner during the substructure an works, which included redesign to cater for an additional floor, and the chang façade from originally designed stone cladding to aluminium curtain wall. changes, the contractor was able to deliver the project on time with workmanship and safety performance.

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Certificate Of Merit - Commercial Buildings

WEST MALL

Client:	Alprop Pte Ltd
Main Contractor:	Kumagai Gumi Co. Ltd
Principal Consultant:	P & T Consultants Pte Ltd
Structural Consultant:	P & T Consultants Pte Ltd
M & E Consultant:	Alpha Engineering Consultant
Quantity Surveyor:	WT Partnership
Construction Cost:	S$71.4 Million
Construction Period:	27 mths

West Mall comprises a 5-storey commercial cum entertainment complex basement carpark and is located next to the Bukit Batok MRT station.

Key Construction Features

The soil formation found at the site is largely made up of firm to hard clay si technical challenge to the contractor. The skilful use of the devised effici method that involved a combination of soil nail and sheet piles greatly buildability of the project.

The adoption of partial top-down method for the construction of the basen considerable cost and time saving. Environmental friendly methods of construc

use of high pressure water jets for the driving of sheet piles coupled with the
of silent piling for extraction of these driven sheet piles vastly reduced vibration

The use of prefabricated structural steel roof and metal roofing incorporate
curtain walling system comprising aluminium and tampered glass and precas
the construction of the multiple stepped cinema floor greatly enhanced the
provided a safer construction environment.

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Certificate Of Merit - Industrial Buildings

ST ASSEMBLY TEST SERVICES FACTORY

Client:	ST Assembly Test Services Factory
Main Contractor:	SembCorp Construction Pte Ltd
Principal Consultant:	ST Architects & Engineers Pte Ltd
Structural Consultant:	ST Architects & Engineers Pte Ltd
M & E Consultant:	ST Architects & Engineers Pte Ltd
Quantity Surveyor:	ST Architects & Engineers Pte Ltd
Construction Cost:	S$54.3 Million
Construction Period:	16 mths

ST Assembly Test Services Factory situated in Yishun Street 23 is a 5 and with related ancillary facilities.

Key Construction Features

The tight contract duration of 16.5 months was complicated by the vibration l the immediate neighbouring Compaq Computer Company whose manufacturi extremely sensitive to vibrations caused during the piling stage. Careful sequ activities coupled with selective piling of pile groups that were in close proxim premises help to overcome this constraints.

The contractor's proposed change in the design of the precast beams from t span in the longitudinal direction to the transverse 10m span helped to reduc lifting and at the same time eliminated the split-beam concept arising from the The use of hollow core slab was also changed from 10m to 12m length to sp without significant increase in weight. These two changes considerably mir

operation and resulted in savings from manufacturing and transportation cost.

The tripartite consultative approach coupled with the adoption of extensive prec
and good logistic management enabled this high quality project to be delivered
of the contractual completion time.

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Certificate Of Merit - Institutional Buildings

REBUILDING OF OUTRAM SECONDARY SCHOOL AT YORK HILL

Client:	Ministry of Education
Main Contractor:	Evan Lim & Co Pte Ltd
Principal Consultant:	Evan Lim & Co Pte Ltd
Structural Consultant:	SCE Consultants (Pte)
M & E Consultant:	PWD Consultants Pte Ltd
Quantity Surveyor:	PWD Consultants Pte Ltd
Construction Cost:	S$28.1 Million
Construction Period:	21 mths

The Rebuilding of Outram Secondary School at York Hill involves the design o drainage, sanitary and plumbing system for one 4-storey block, two 5-storey b 6-storey blocks. The project also includes additions and alterations to one e block.

Key Construction Features

The project is flanked by the existing retaining structure for the ever-busy CTE existing school building and swimming pool complex, resulting in limited s working space.

The most challenging part of the project was the construction of the external dr located along a narrow, winding and steep gradient running parallel to the exist

The contractor successfully proposed and constructed an elevated driveway t on columns instead of the originally proposed high retaining wall, which uniqueness of the entire project. This generated additional covered space und

exuding a feeling of openness.

The contractor also proposed an alternative pre-stressing system for the beam
Aluma table form system in replacement of the originally proposed hollow c
that required a large operating space. This alternative was successfully implem
only overcome the space constraints but also enabled the achievement
schedule while maintaining the Buildable Score.

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Certificate Of Merit - Institutional Buildings

REDEVELOPMENT AT JURONG CAMP I

Client:	Ministry of Defence
Main Contractor:	Deenn Engineering Pte Ltd
Principal Consultant:	Lands & Estates Organisation
Structural Consultant:	CH & Associates Consulting Engineers (Pte)
M & E Consultant:	Lands & Estates Organisation
Quantity Surveyor:	Lands & Estates Organisation
Construction Cost:	S$25.3 Million
Construction Period:	18 mths

Redevelopment of Jurong Camp I comprises the construction of one 5-s headquarter block attached with 3 wing blocks of accommodation with a auditorium, one double storey multi-purpose building block and a double sto with detention cells.

Key Construction Features

To minimise noise and dust pollution to the daily military operation and mobili of the surrounding camps, extensive precast concrete structures such as columns and hollow core slabs were chosen for the key structures.

Drywall partitions were extensively used to allow more flexibility to change services of the various users and hence increase construction speed. Framing meticulously planned with the camp users to integrate the complex prov

infrastructures for communications, office automation, security and operational

Efficient and effective co-ordination with all parties involved in the project c close co-operation accorded by all levels of the project management team timely delivery of this aesthetically pleasing camp.

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Construction Excellence Awards 2000

Certificate Of Merit - Residential Buildings ($1000/m^2 & above)

FIFTH AVENUE CONDOMINIUM

Client:	Guthrie Properties (S) Pte Ltd
Main Contractor:	Woh Hup (Pte) Ltd
Principal Consultant:	RSP Architects Planners & Engineers (Pte Ltd
Structural Consultant:	SCE Consultants (Pte)
M & E Consultant:	Belmacs Consulting Engineers
Quantity Surveyor:	KPK Quantity Surveyor (1995) Singapore Pte Ltd
Construction Cost:	S$30.7 Million
Construction Period:	24 mths

Fifth Avenue Condominium consists of two 4-storey buildings, which housed 7 including a single basement carpark.

Architectural Features

Exotic horticulture landscaping, Balinese artifacts, and water features development.

Key Construction Features

The site is situated in a sensitive residential area with only one access pl conditions with wet peat in many areas. The soil around the basement wa consolidate the soft ground condition instead of the usual temporary sheet p

have consumed more time in insertion and extraction.

Strict control tolerance on the brickwork and plaster setting out was impleme
the intended standardised installation of the imported kitchen cabinet assemb
the works was planned and interfaced just-in-time with the completion of the w
site storage of joinery materials could be minimised.

The project team solved the potential hollowness and delamination problem
the use of green marble by conducting studies jointly with material sup
academics in order to meet the client's requirements.

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Construction Excellence Awards 2000

Certificate Of Merit - Residential Buildings ($1000/m^2 & above)

ASPEN HEIGHTS CONDOMINIUM

Client:	DBS Realty Pte Ltd
Main Contractor:	Kumagai Gumi Co. Ltd
Principal Consultant:	APCO Architects and Town Planners Collaborative
Structural Consultant:	T.Y. Lin (SEA) Pte Ltd
M & E Consultant:	J Roger Preston (S) Pte Ltd
Quantity Surveyor:	KPK Quantity Surveyor (1995) Singapore F Ltd
Construction Cost:	S$159 Million
Construction Period:	39 mths

Aspen Heights Condominium comprises 606 units of luxurious apartments, blocks each consisting of eight towerettes with heights varying from 5 to 17 sto

Architectural Features

Visitors to the condominium are greeted by a touch of sophistication introdu integration of sculptures of Ballerina with the water features of the project. Th Towers, sitting on a hilltop were designed such that the higher towerettes ar centre with the lower towerettes on the periphery to enhance the "hill" effect.

Key Construction Features

The two Y-shaped Towers introduced a measure of complexity to the tower co the Towerettes were all of different levels with no cross link for circulation. carpark was on split levels to accommodate the sloping nature of the site, structural system to the towers. This required a 2-way transfer structure combination with the stepping levels of the towerettes.

The contractor adopted the use of precast element such as precast staircases and prefabricated subframe system for doors wherever possible to maximize process and improve the quality of finish.

A high level of co-operative planning between the contractor and the various pa the project enabled the efficient resolution of the construction complexity and high quality finished condominium.

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Certificate Of Merit - Residential Buildings ($1000/m^2 & above)

PALM MANSIONS

Client:	Far East Organization
Main Contractor:	Seah Kim Cheok Constr Co Pte Ltd
Principal Consultant:	Designpoint Architect
Structural Consultant:	Brown & Root (S) Pte Ltd
M & E Consultant:	Brown & Root (S) Pte Ltd
Quantity Surveyor:	KPK Quantity Surveyors (1995) Singapore Pte Ltd
Construction Cost:	S$9 Million
Construction Period:	23 mths

Palm Mansions comprises a 4-storey block with 30 premium quality residential basement carpark and swimming pool.

Key Construction Features

Residential houses and a church surround the site. This makes accessib maneuvering around the site very difficult. The presence of marine clay and an at the site that is linked to the sea further complicated the construction proc BRC mesh with concrete lining on open cut embankments in lieu of sheet extraction difficulties as a result of the site constraint.

The adoption of ventonite skim coating for all the ceiling slab soffits resulted savings in both time and costs. High quality of finish and speedier constructio through the utilisation of prefabricated GRC window hoods.

The use of alternative flat slab design in lieu of traditional beam and slab enab to have a much neater ceiling without unsightly reinforced concrete beams easier routing of air-condition piping.

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Construction Excellence Awards 2000

Certificate Of Merit - Residential Buildings ($1000/m^2 & above)

SUMMERLEA GREEN

Client:	Kismis Properties Pte Ltd
Main Contractor:	Keong Hong Construction Pte Ltd
Principal Consultant:	SAA Partnership Pte Ltd
Structural Consultant:	R. J. Crocker Consultants Pte
M & E Consultant:	Belmacs Consulting Engineers
Quantity Surveyor:	KPK Quantity Surveyors
Construction Cost:	S$19 Million
Construction Period:	19 mths

Summerlea Green comprises 6 blocks of 3-storey terrace houses with a tot located at the junction of Kismis Road and Kismis Avenue.

Architectural Features

A distinctive feature of this project is the dormer window, made of power co frame with tinted glass which let in natural light creating a cosy ambience bedroom and internal staircase. The roof beams designs, roof trusses includin were re-engineered for greater efficiency and simplicity which resulted in saving.

Key Construction Features

One of the complex tasks encountered by the contractor was the constructic sewer that is sited just adjacent to an existing 4m tall rubble wall and direct bungalow. Through progressive construction of the sewer drain by an interval coupled with daily monitoring of wall movement, the sewer was successfully maintaining the integrity of the rubble wall.

The site was also encumbered by an existing sewer line running under anothe was serving two houses on the north side of the site. The successful diversion sewer together with the early completion of the new sewer allowed smooth construction of these 2 blocks that would otherwise have held up the project.

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Construction Excellence Awards 2000

Certificate Of Merit - Residential Buildings (below $1000/m^2)

WOODLANDS N5 C4

Client:	Housing and Development Board
Main Contractor:	Sim Lian Construction Co (Pte) Ltd
Principal Consultant:	Design Link Architects
Structural Consultant:	Engineers Partnership Civil & Structural Consultants
M & E Consultant:	Beca Carter Hollings & Ferner (S E Asia) Pt Ltd
Quantity Surveyor:	Housing and Development Board
Construction Cost:	S$76.5 Million
Construction Period:	30 mths

Woodlands N5 C4 consists of 10 blocks of 12-storey public housing apartmen 676 units including 2 blocks of multi-storey carpark with electrical sub-static games courts and 1 children playground.

Architectural Features

A distinctive feature associated with this project is the modularised perfor sunbreakers which not only alleviate future maintenance problem but also yiel distinct façade appearance. In addition, the full height aluminium windows on tl provided an aesthetically finished façade. A well-defined entry was designed sense of arrival to this precinct with the central garden provided with landsca pergolas, playgrounds and hardcourts.

Key Construction Features

The contractor's extensive use of precast and prefabricated components such
steel caging and weldmesh, precast refuse chutes, staircases and watertanks
adoption of standard dimensions for main structural and architectural compo
increase the productivity of the project. Buildability of the project was impro
introduction of prestressed beam and slab system for the multi-storey carpark.

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Certificate Of Merit - Civil Engineering Projects

HOLLAND ROAD/FARRER ROAD/QUEENSWAY INTERCHANGE

Client:	Land Transport Authority
Main Contractor:	Koh Brothers Building & Civil Engineering Contractor (Pte) Ltd
Principal Consultant:	Land Transport Authority
Structural Consultant:	Land Transport Authority
M & E Consultant:	PWD Consultants Pte Ltd
Quantity Surveyor:	Land Transport Authority
Construction Cost:	S$44 Million
Construction Period:	50 mths

The Holland Road/Farrer Road/Queensway Interchange is a 3-lane dual car for Holland Road traffic and a 3-lane dual carriageway underpass at Queensw interface including the widening of the existing roads leading to and away from

Key Construction Features

The site is a heavily used road junction that is usually congested during t evening peak hours with many condominiums and apartments abutting the roa widened. This requires detailed planning and effective traffic diversion to minim traffic flow.

The existing road junction was raised by approximately 3m to level with the
which required all existing public utility services at the road junction to be dive
depressed road and underpass during the construction stage and re-laid after
contractor also contributed towards the design and construction of the sewer d
for the affected sewerage system serving the condominiums and apartments in

Incremental Launching Method was adopted for the construction of the flyover
across the road junction, which eliminated the need for temporary closure of t
if the conventional method of using a crane to install the precast beams is a
This method also allowed the simultaneous construction of the underpass belo

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