



UNITED TEC

CONSTRUCTION PTE LTD

聯毅建設工程私人有限公司

Challenging Limits of Modular Construction: The Journey of Avenue South Residence

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Project Info

Client: United Venture Development (UOL)
Contract: Design & Build Contract
Project Value: USD 206m
Total GFA: 92,876 sq.m.
Site Area: 22,851 sq.m.

Project Scope

- 2 PPVC Towers, 56 storeys
- 5 Conservation Blocks
- Communal Parks
- 1,074 Apartment Units & 1 Childcare Center
- 2 Basement & 3 MSCP



5 Conservation Blocks

Kampung Bahru
Road Widening and
Communal Park



Future Rail Corridor

Project Challenges

1. Design
2. Construction
3. Covid-19

Design Challenges



- 56 storeys PPVC tower – unprecedented height
 - Thicker shear wall
 - High wind pressures – wind tunnel test
 - 2 refuge floors
- 36th storey sky garden & 16 pocket gardens
 - Soft floors
 - GFA exemption
- Space constraints due to conservation trees and blocks
 - Reduced tower footprint
- Car park requirements

Construction Challenges

PPVC



- Unprecedented tower height & RC module weight
 - From 40 to 56 storeys
 - From 30t to 35t modules
- Crane suitability
- Operator skill
- Lifting at height

Construction Challenges

PPVC

- Large PPVC module quantity (3,034 modules)
- Adopted 3D (6 sided module) precast for productivity, precision & quality
- Custom built fit out factory in Tuas for this project

2D PPVC Carcass Factory



3D PPVC Carcass Factory



Construction Challenges

- a. Working around conservation trees & blocks



High ground (HDB side)

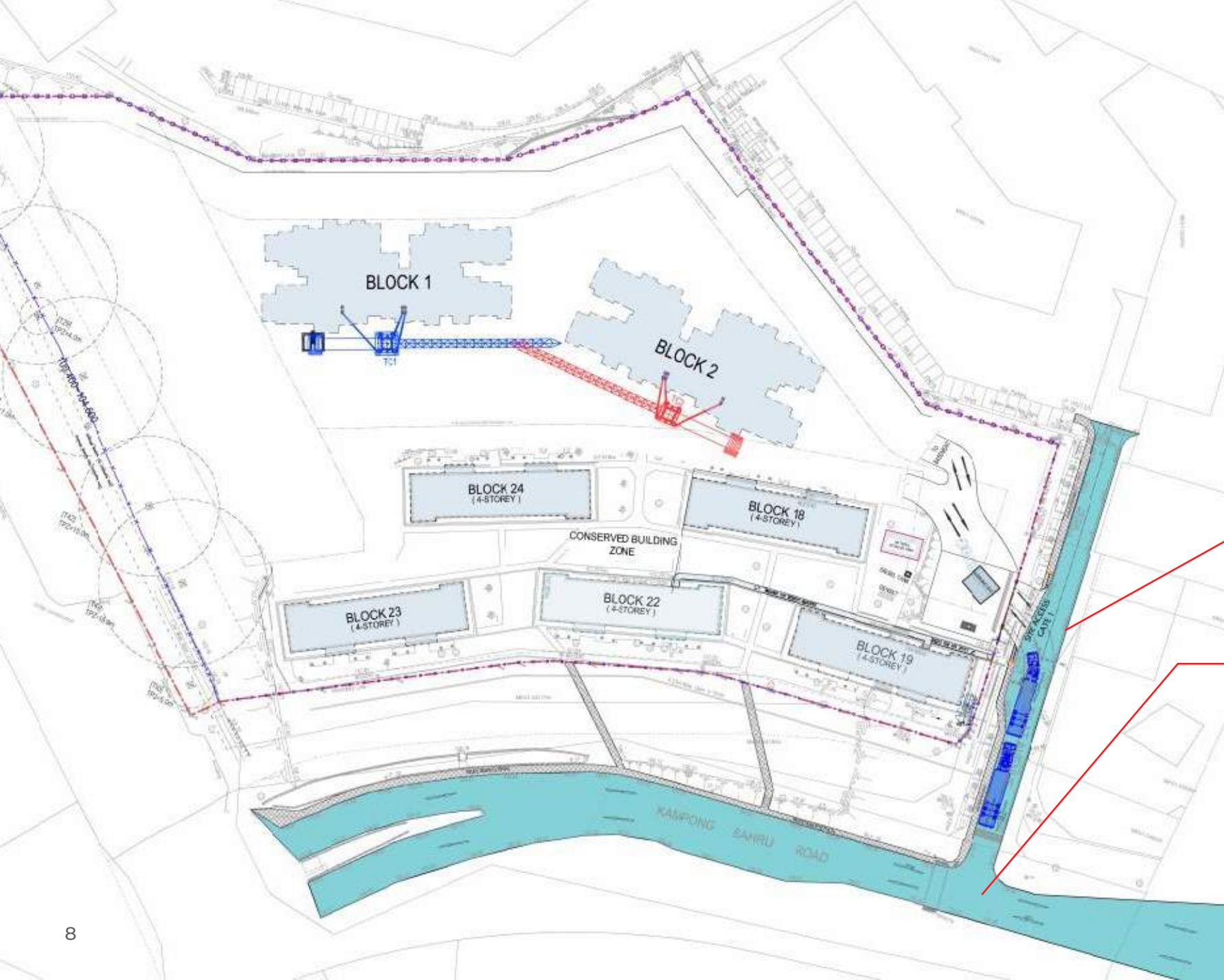
Construction Challenges

b. Narrow, single road access

Narrow Site entrance at Silat Avenue



Narrow junction



Construction Challenges

BLK 2 PPVC storage area

- c. Traffic mitigating measures
- d. PPVC transport & storage

Exit within site boundary avoiding Silat Avenue

BLK 1 PPVC storage area

New site entrance at Kampong Bahru (TOL Land)

PPVC Heavy Vehicle Traffic Layout

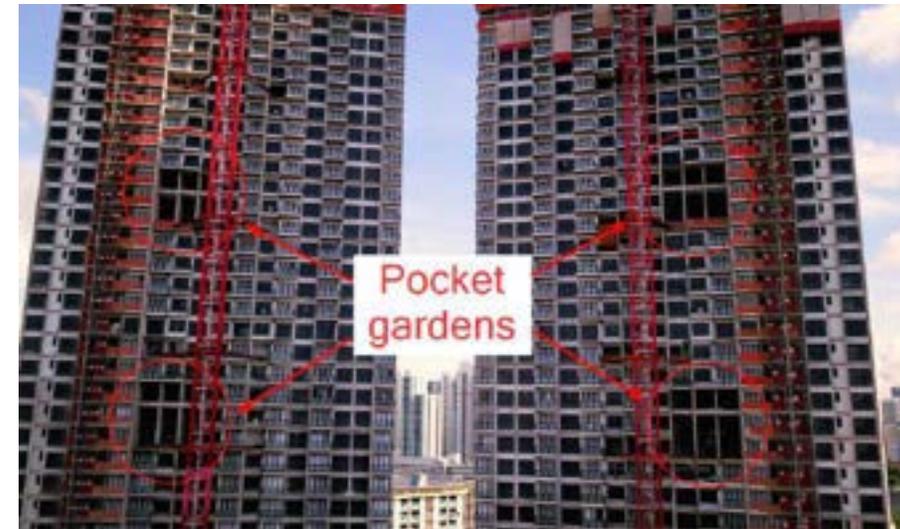
Construction Challenges

In situ works: 36th storey sky garden & 16 pocket gardens

- Disruption to PPVC manufacturing & installation
- Unnecessary pile up of modules in factory
- Cost increase
- Productivity & progress loss



36th storey sky garden



Pocket gardens

COVID-19 Challenges

- **Feb 2020**
China lockdown – short of workers & materials
 - **March 2020**
Malaysia MCO – Materials & PPVC Supply Chain
 - **April 2020**
Singapore Circuit Breaker – construction suspended
- Post Circuit Breaker
(July 2020 – present)**
- a) Workers at dorms still under restrictions
 - b) Worker shortage
 - c) Safe management measures & swab tests
 - d) Tightened border control
 - e) Extended Malaysian Lockdown
 - f) Heightened Alert, Singapore



Project Progress

Where we are to date

2,700+ RC module carcasses cast

PPVC installation completion by

Tower 1 – December 2021

Tower 2 – January 2022

September
2021

45th Floor

56 Floors, 2 Towers

2,500 installed

3,034 total modules

Feb 2023

Completion
Date



Challenges can be Overcome

56 storeys - new challenges in design,
construction & logistics on top of Covid19

RC PPVC method tested to new limits

It is possible to move from 2D to 3D modules

Success can be achieved with a young team

Client's trust and confidence in us has been
critical to our success so far

Stakeholder partnership is critical to success

Confident to build on our current success



THANK
YOU