INNOVATIVE ENGINEERING AWARD (DESIGN) | TO-BE-BUILT BUILDING

Central Weave @ AMK

Project Overview

Central Weave @ AMK comprises 5 residential blocks ranging from 21 to 32 storeys. This project consists of unit types ranging from 2-room Flexi, 4-, 5-room, and 3Gen flats. The residential blocks of Central Weave @ AMK are arranged in rows, interweaving with the surrounding landscape to form a grid-like pattern from an aerial view. Central Weave @ AMK takes its name from this design approach, reinforced by a weaving pattern of vertical stripes on its façade.

The core theme driving the design of this project is construction productivity and resilience. The main goal was to develop a modularised design that can help to improve construction productivity and viability of local precast production, while ensuring that the aesthetics and needs of the residents and all stakeholders are met.

Project Achievements

- Optimising living space design and functionality through innovative engineering design and solutions
- Advancing production efficiency through modularisation and design standardisation
  - Many structural and architectural elements, such as façade, structural members, pre-fabricated bathroom units and household shelter are shared by over 80% of the units
  - One single smart mould type to produce all the precast roof feature panels
- Simplification in works across entire construction lifecycle, including design, precast, construction and logistics

Leveraging Advanced Prefabrication Technology to Achieve Façade Dynamism

Modularised Façade Design with Smart and Flexible Mould Solution

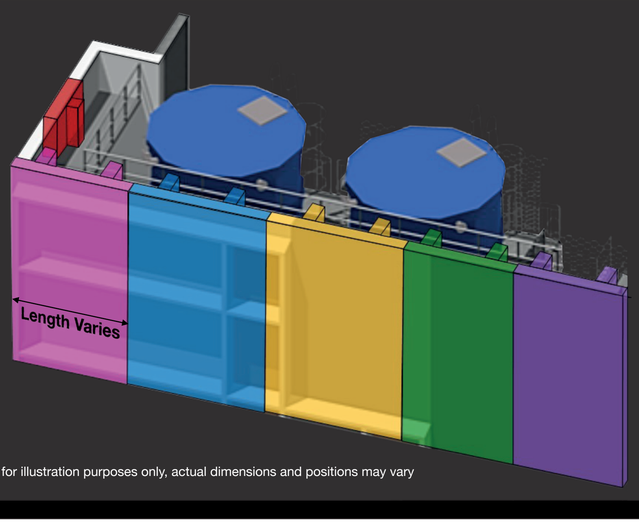
- Minimal variation in protrusions needed by adopting a combination of darker and lighter colours to give an illusion of depth
- Smart moulds were utilised to omit casting of façade fins where they were not needed, reducing the need for unique mould types
- Overall reduction in unique façade components without compromising on aesthetics

Modularisation of Roof Feature Panels

- Precast roof feature panels are designed with standard width between the ribs
- Adjustable side moulds for different panel lengths
- Increase precast repetitions using single reusable smart mould
- Improve production efficiency and productivity

One Standard Smart Mould

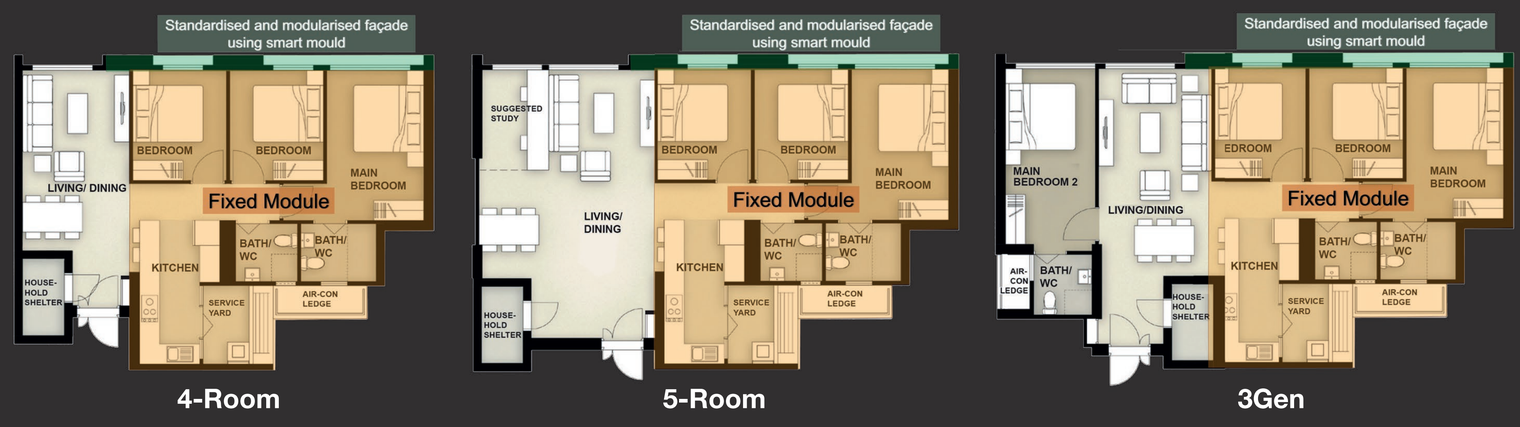
Different Panels Assembled to form Roof Feature



Note: All images for illustration purposes only, actual dimensions and positions may vary

Pilot Project for Unit Modularisation

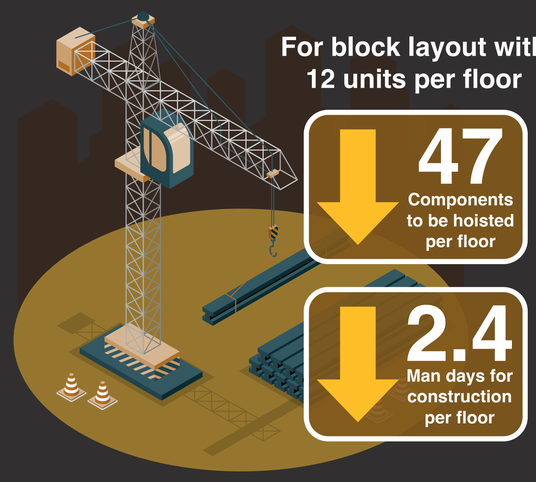
- Developed as a base engineering solution for replication across projects
- Achieved design flexibility with fixed and flexible modules; fixed modules of the bedrooms, toilet and kitchen can be shared across the 4R, 5R and 3Gen units
- Enhanced supply resilience by allowing common precast components and precast moulds across projects



Integrated Components

Estimated Hoisting Time Savings per Floor		
	Before Integration	After Integration
No. Component per floor for 12 units	303	256
Hoisting time per floor [working days]	15.2	12.8

Notes: Timing estimated for one block (12 units).
Assumptions: 30 min hoisting time per component; 10 hour work days



For block layout with 12 units per floor

47 Components to be hoisted per floor

2.4 Man days for construction per floor

- Larger integrated components (façade + beam + wall) reduced number of components and time for hoisting
- Reduced number of unique moulds and types of precast components
- Improved efficiency in precasting and installation
- Increased precast supply resiliency with diversified supply sources

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