

Chapter 1 INTRODUCTION

Landed residential developments tend to have the lowest site productivity amongst the different types of developments. In Singapore, these types of developments consistently form a significant proportion of the total number of private residential projects built every year. In the recent years, landed residential projects made up about 80% of the total number of private residential projects awarded per year although landed properties form only about 20% of the total housing supply. This situation will negate measures to improve the overall industry productivity. Hence, it is essential to provide a design solution for small landed residential developments

Landed housing developments comprise terrace houses, semi-detached houses and detached houses. Due to the relatively smaller scale of such developments, designers and developers of such projects have traditionally avoided the use of prefabricated components. This is due to the perception that the use of prefabricated systems will result in inflexible and uninspiring designs, that they are costly and involve unfamiliar construction methods.

A study has been carried out to develop and document a few simple, flexible, innovative and buildable systems suitable for small landed residential developments. The key objectives of the studies were to identify buildable systems that are able to improve site productivity, construction quality, minimize plastering works and minimize wastage due to re-works. These buildable systems are:

- Precast system
- Flat plate system
- Structural steel system
- Light gauge steel frame system

With the use of these buildable systems, especially having some of the components built or cast off-site, wet site works will be reduced, thus leading to improvement in site safety. These buildable systems have proven to be capable of providing significant design flexibility, without significant increase in cost whilst offering early delivery of houses to the homeowners.

Examples of projects constructed using prefabricated systems

81 units of terrace houses & one pair of semi-detached houses at Goldenhill Villas



Designed by S H Lim Architects Pte Ltd and Resources + Planning Design Consultants

Features

- Precast party walls & facade walls
- Precast beams and precast slabs

Benefits

- The use of precast slabs and walls reduces the propping and false work on site



2 storey semi-detached dwelling house with a roof terrace at Seletar Hills Drive



Features

- Structural steel columns, beams with composite steel decking slab
- External precast facade panel with concrete stains

Benefits

- The steel decking for the composite slabs serves as permanent formwork to minimize staging during construction
- Reduce dead load using steel construction leading to a saving on foundation cost

Designed by Look Boon Gee, LOOK Architects



2 storey semi-detached dwelling houses with attic at Tavistock Avenue



Features

- Structural steel columns, beams, metal deck with concrete topping for slabs
- Structural steel roof

Benefits

- The metal decking for the composite slabs serves as permanent formwork to minimize staging during construction
- Reduce dead load using steel construction



Designed by Look Boon Gee, LOOK Architects

2-storey in-fill terrace with pitch roof at Jalan Batai



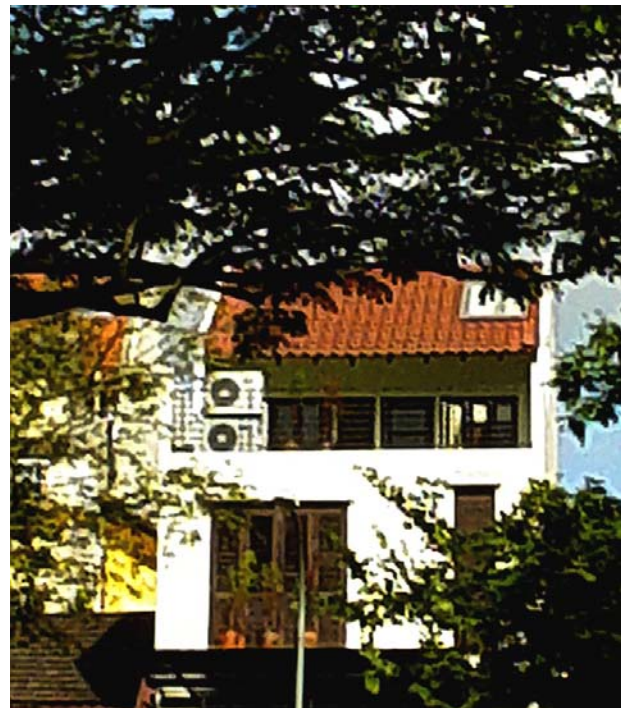
Features

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- Structural steel roof

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*Designed by: Mr Low Cheng Hai, Edmund
Constructed by: Caines Associates*



3 storey semi-detached house with pitch roof at Upper Changi Road East



Designed by A-Alliance

Features

- Light gauge steel frame with fibre cement board for walls and slabs

Benefits

- Reduce construction duration with light gauge steel frames
- Reduce dead load on structures
- Simple with installation of services
- Clean and fast architectural finishing work



Examples of completed projects using prefabricated embellishments

3 storey terrace houses at Lorong Chuan



Features

- Modular precast concrete panel for internal and external walls
- Prefabricated metal roofing sheet
- Prefabricated steel frame for car porch
- Prefabricated staircases
- Glass parapet walls

Benefits

- Reduce construction duration with wall installation and roofing
- Reduce dead load on structures

*Designed by Pan-Indo Architects International
Constructed by Conint Management Services P L*



2 storey detached house with metal roof at Maple Avenue



Designed by WOHA Photograph by Tim Griffith



Features

- Prefabricated metal louvers as facade walls
- Prefabricated steel staircase
- Metal roof

Benefits

- Reduce construction time for roof & louvers
- Maximisation of space at staircase area

2 storey detached house with flat roof at Berrima Road



Designed by WOHA Photograph by Tim Griffith

Features

- Prefabricated metal roof
- Glass facade with steel stiffeners

Benefits

- Quick to assemble
- Greater accuracy
- Achieve clean edges and lightweight appearance



2 storey detached house with flat roof at Victoria Park Road



Designed by WOHA

*Photograph by Tim Griffith & Albert
Lim K S*

Features

- Steel staircase with prefabricated stair treads
- Prefabricated timber louvers facade
- Glass facade with steel stiffeners
- Glass parapet
- Modular size of columns

Benefits

- Easy installation of staircase
- Repeated details created rhythm and harmony
- Speed of installation for prefabricated timber louvers facade



Designed by HYLA

New erection of a 2 storey bungalow at Bowmont Gardens

Features

- Steel structures with metal roof to single storey living pavilion

Benefits

- Reduce construction time for roof installation
- Lightweight, modern architectural expression

New erection of a 2 storey corner terrace dwelling house at Brockhampton Drive

Features

- Steel structure to verandah
- Metal deck roof with exposed steel members

Benefits

- Slender structures for beams and columns
- Improvement in site productivity for roof installation
- Lightweight sun-shading and screen elements attached to steel structure for sun-shading and privacy



Designed by HYLA



Designed by HYLA

Additions & Alterations to a 2 storey end terrace house at Kee Choe Avenue

Features

- Steel structures with concrete infill to columns

Benefits

- Improvement in site productivity with the use of steel structures
- Exposed steel columns at 1st storey terrace echo traditional 'stilt' houses

Additions & Alterations works to a 2 storey bungalow at Arthur Road

Features

- Steel canopy at front elevation

Benefits

- Easy to install
- Access to light and external sun-shading blinds



Designed by HYLA



New erection of a 2 storey semi-detached dwelling house at Jalan Sedap

Features

- Steel staircase with precast concrete treads
- precast slabs to corridor at 2nd and attic level

Benefits

- Lightweight modern architectural expression
- Fast installation

Designed by HYL A