HDB Design for Safety (DfS) Seminar 2017

"Teambuild's Perspective on DfS"



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EHS Manager

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Presentation Outline

- Introduction
- Legal Requirements on Design for Safety
- Teambuild's Efforts in DfS
- Conclusion

Introduction

Founded: 1992

Development Path: From our humble beginnings back in 1992, Teambuild is now an established main contractor with a wide range of projects in both private and public residential projects, public upgrading projects as well as institutional, commercial and industrial projects. Along the way we have also won many accolades and awards for our construction and safety excellence. Teambuild is now in the forefront of pushing for higher productivity through the use of Prefabricated Pre-finished Volumetric Construction (PPVC).

BCA Registration Grade:

CW01 - A1 (General Building)

CW02 - B2 (Civil Engineering)

Milestones:

1996: ISO 9001
2000: ISO 14001 and OSHAS 18001
2009: bizSAFE Enterprise Star and bizSAFE Partner
2010: BCA Green & Gracious Builder - EXCELLENT
2014: BCA Green & Gracious Builder - STAR



Legal Requirements on Design for Safety

WSH (Design for Safety) Regulations 2015

Part 3 Duties of Designers & Contractors

Duties of contractor

10.—(1) The contractor of a structure must, as soon as practicable, inform the person who appointed the contractor of any foreseeable design risk that the contractor knows the structure poses or will pose to an affected person.

(2) The contractor —

(*a*) may appoint a person to design a structure only if the contractor reasonably believes that the person is competent to perform the duties of a designer under these Regulations and any other regulation made under section 65 of the Act; and

(*b*) must provide the designer appointed under sub-paragraph (*a*) all relevant information to enable the designer to perform the duties of a designer under these Regulations and any other regulation made under section 65 of the Act.

(3) The contractor —

(*a*) may appoint a person to be a contractor of a structure (called in this regulation the subcontractor) only if the contractor reasonably believes that the subcontractor is competent to perform the duties of a contractor under these Regulations and any other regulation made under section 65 of the Act; and

(*b*) must provide the subcontractor appointed under sub-paragraph (*a*) all relevant information to enable the subcontractor to perform the duties of a contractor under these Regulations and any other regulation made under section 65 of the Act.

(4) A contractor of a structure must, where required by the developer of the project in which the structure is required, attend a design-for-safety review meeting.

(5) For the purposes of paragraph (4), any reference to the developer includes a reference to the person to whom the developer's duties under regulation 6 has been delegated.

(6) To avoid doubt, any reference to a contractor in this regulation includes a reference to a subcontractor.

Legal Requirements on Design for Safety

Design for Safety (DfS) Guidelines

Part 4 Contractors

4.1 Who are Contractors?

Contractors are persons or companies who have entered into a contract for the purpose of carrying out any construction work. In the WSH (DfS) Regulations, the term "Contractors" refers to both Main-Con and Subcons.

4.2 What must Contractors Do to Comply with their Duties?

• Inform the person who appointed the Contractor of any foreseeable design risk that the structure poses or will pose to an affected person. The person who appoints a Contractor may refer to a Developer, Main Contractor or any other stakeholder who appoints a Contractor. This would require the Developer or Subcontractors to provide their Main Contractors with information on any foreseeable design risks as soon as reasonably possible.

• When engaging a Designer or Subcontractor, a Contractor needs to ensure that the Designer or Subcontractor is competent and able to comply with his or her duties under the WSH (DfS) Regulations. To assess the competency of a person for the job, the Contractor shall check that the person has the relevant training and experience in the scope required and is able to not just fulfil his or her contractual requirements. To assess if a company is capable to do the job, the Contractor shall check that the company has the relevant track records and experienced personnel to adequately fulfil the competency requirements expected of it.

• Provide relevant information to Designers engaged by the Contractor. This includes providing them with any information that the Designers would require to perform their jobs and comply with their duties under the WSH (DfS) Regulations.

• Participate in the DfS Review Process as required by the Developer or the DfS Professional. If the Contractor was appointed by the Developer in the pre-construction phase, the Developer may request for the Contractor to participate in the design review process even though the construction phase may have not started.

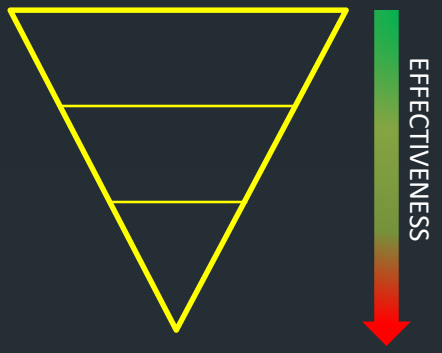
Legal Requirements on Design for Safety

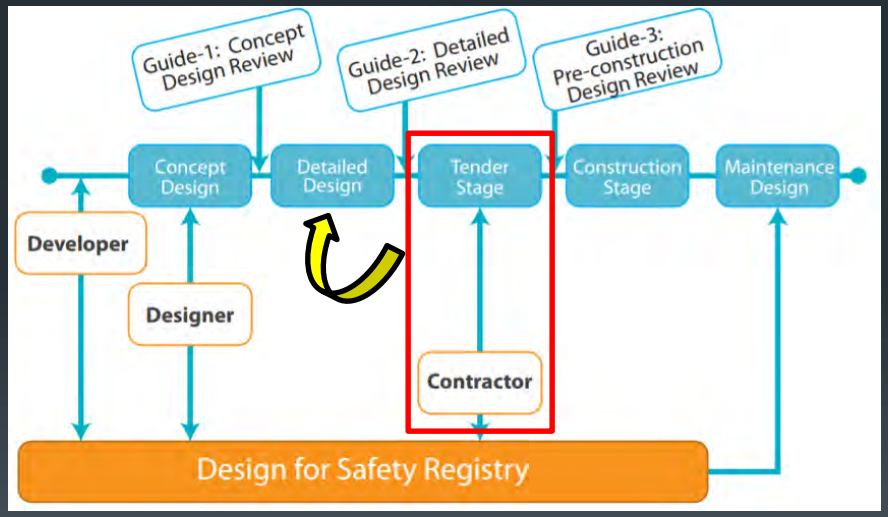
Design for Safety (DfS) Guidelines

Part 6 The GUIDE Process

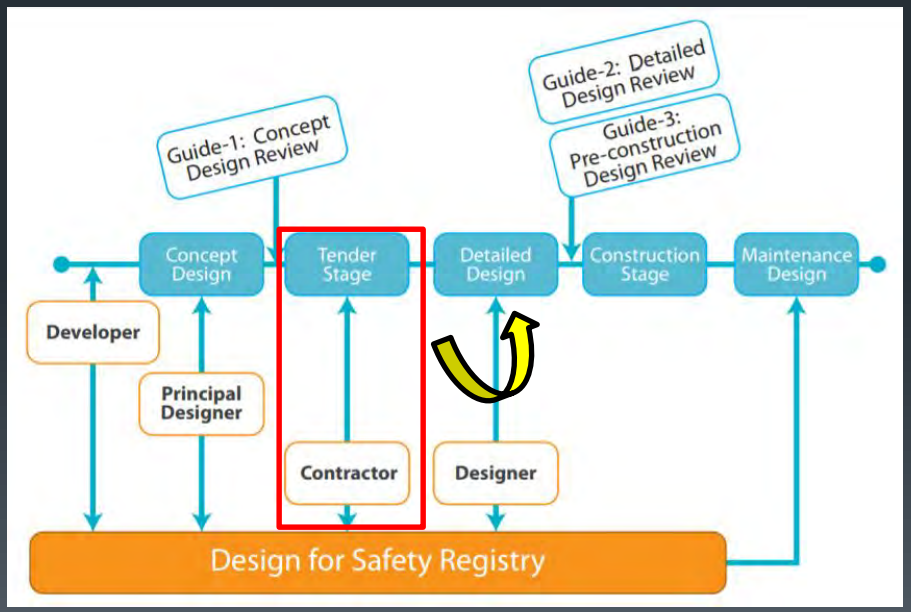
Step 1	G:	Group together a review team consisting of main stakeholders.
Step 2	U:	Understand the full design concept by looking at the drawings and calculations, or have designers elaborate on the design.
Step 3	I:	Identify risks that arise as a result of the design or construction method. The risks should be recorded and analysed to see if they can be eliminated by changing the design.
Step 4	D:	Design around the risks identified to eliminate or to mitigate the risks.
Step 5	E:	Enter all the information including information on vital design change that would affect safety and health or remaining risks to be mitigated into the DfS Register.

- GUIDE-1: Concept Design Review
- GUIDE-2: Detailed Design, Maintenance and Repair Review
- GUIDE-3: Pre-construction Review





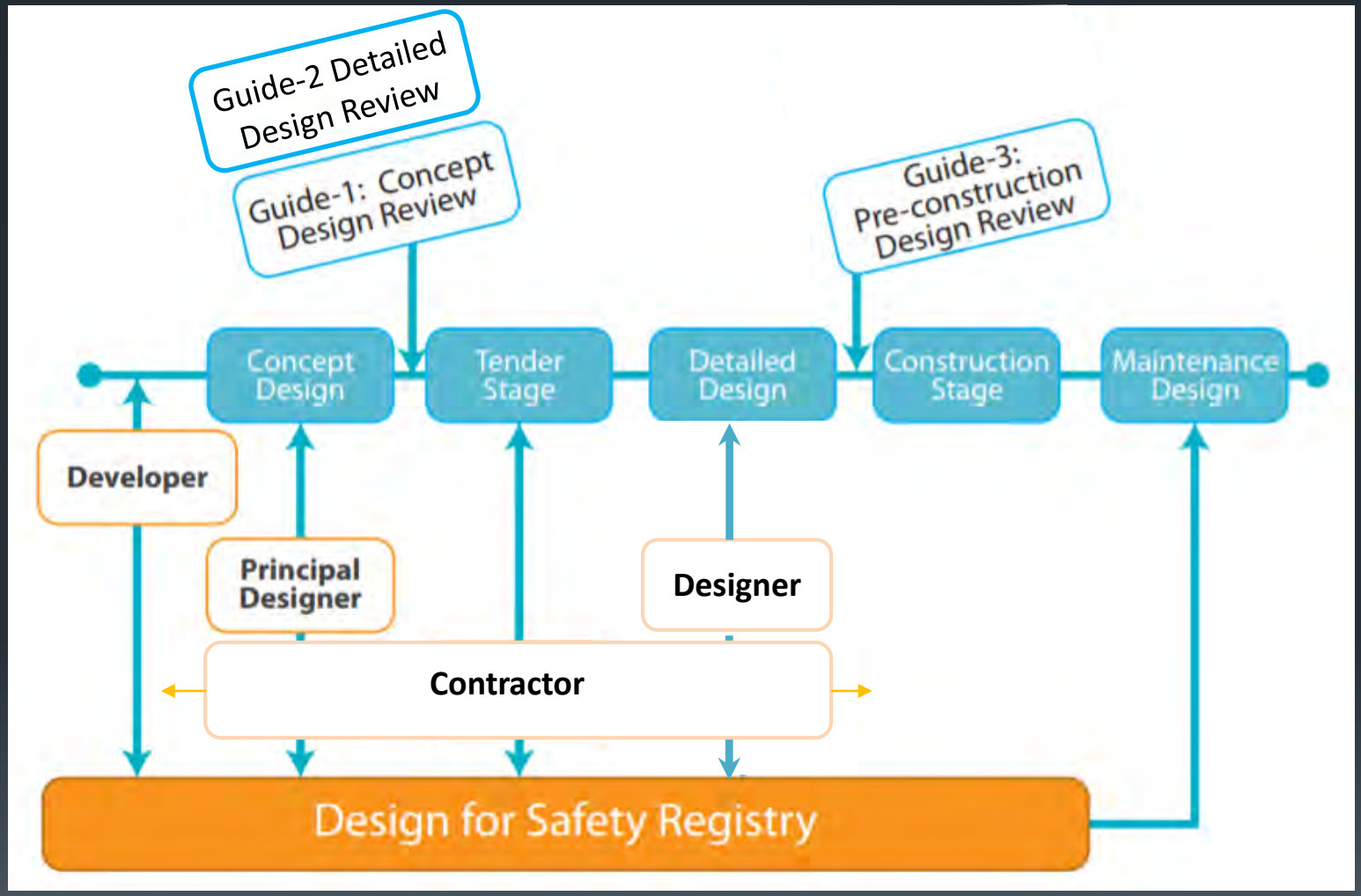
GUIDE Process for Typical Contracts



GUIDE Process for D&B Contracts

Legal Requirements on Design for Safety

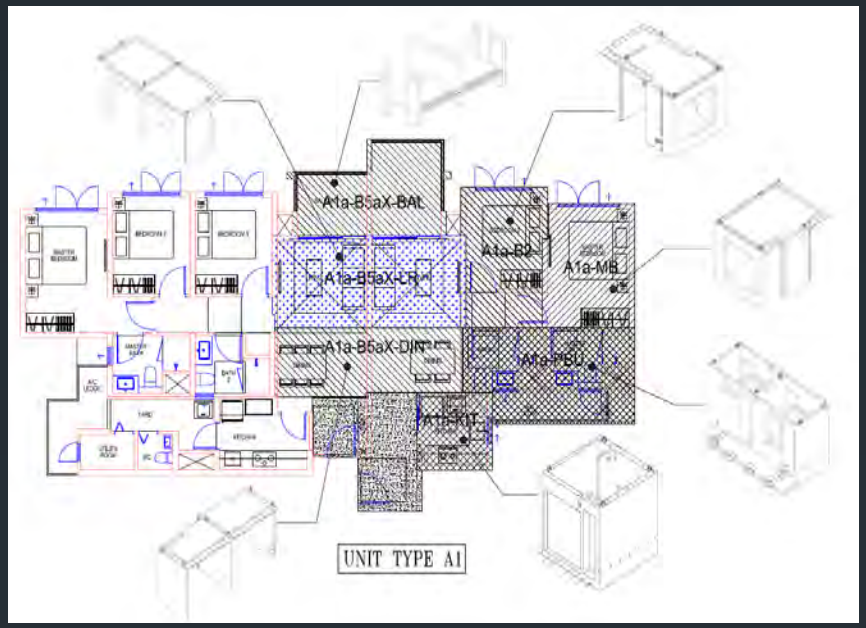
Design for Safety (DfS) Guidelines



GUIDE Process for D&B Contracts (Enhanced version)

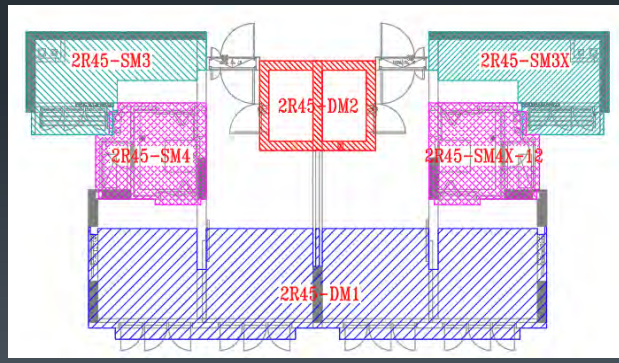
Usage of New Construction Method

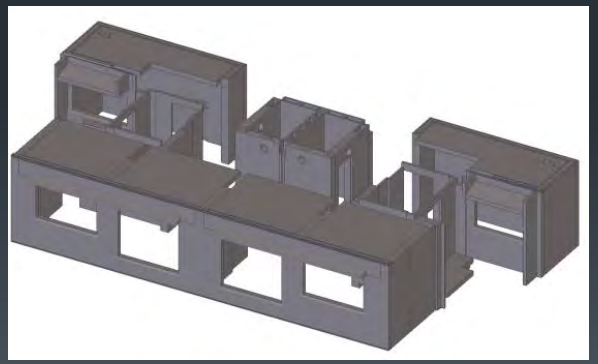
Precast Prefabricated Prefinished Construction (PPVC)







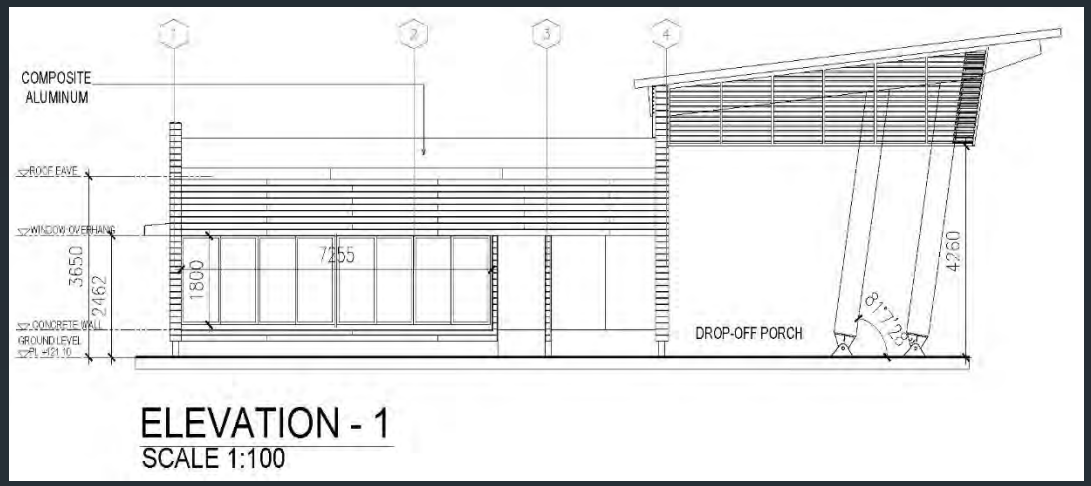




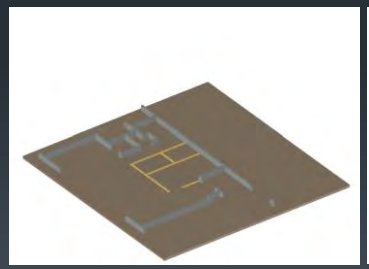
Usage of New Construction Method

Mass Engineering Timber (MET)

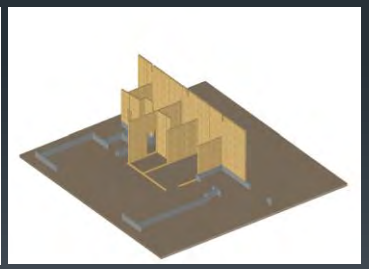
Resident Committee Centre & Drop-off Porch

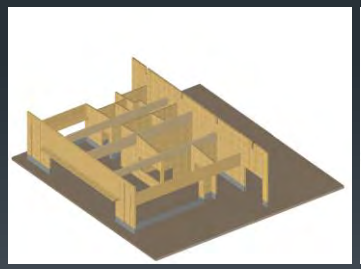




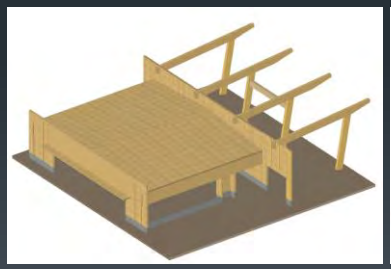


Foundation





Installation

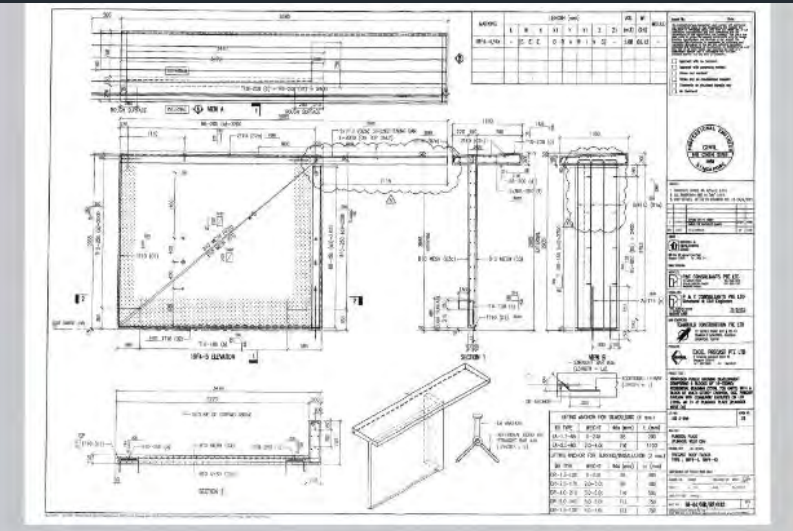




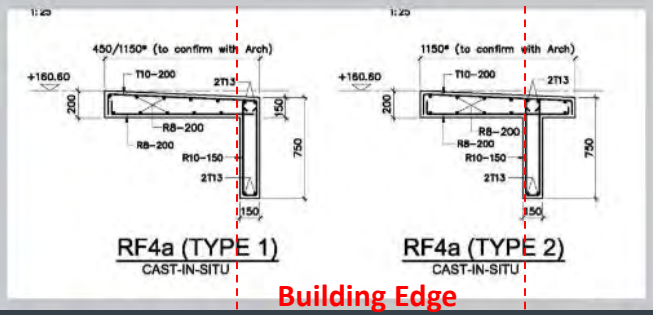
Completed

Alternate Design on Permanent Structure

Counter Propose





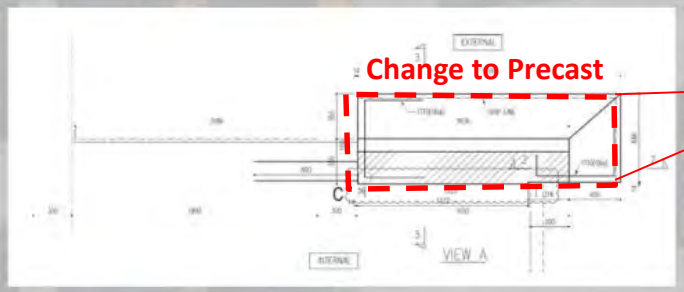


- Eliminate the need for cantilever scaffold
- Reduce the risk of working at the edge of the building
- Speed up roof construction

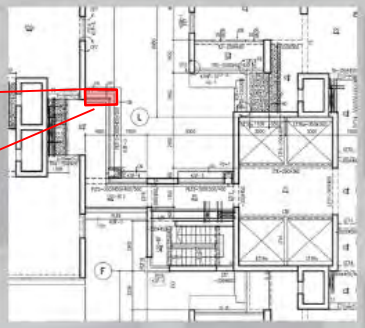
Redesign Cantilever Cast-in-Situ Fascia to Precast

Alternate Design on Permanent Structure

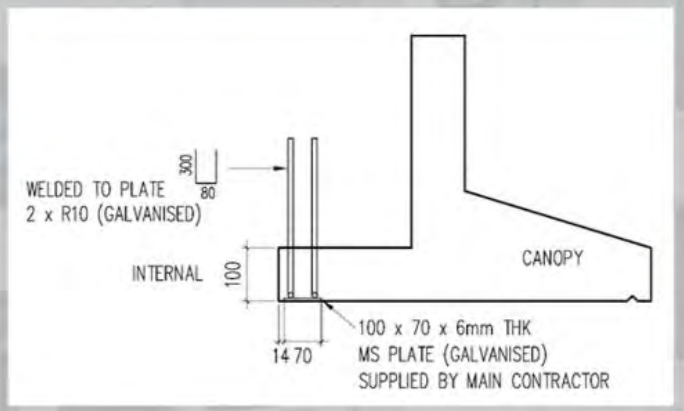
Counter Propose



Blown Up



Plan



Section

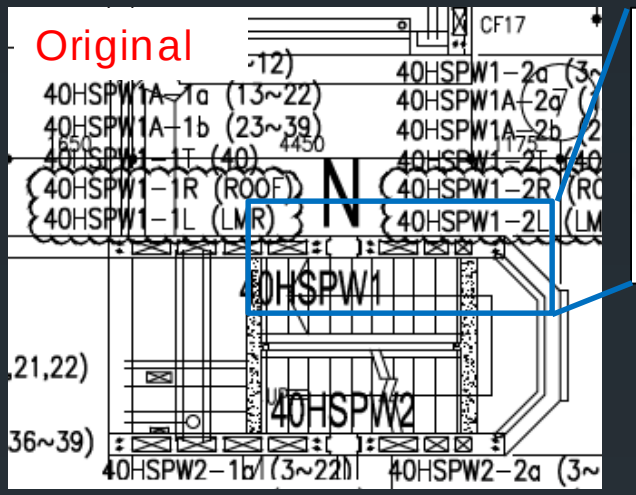


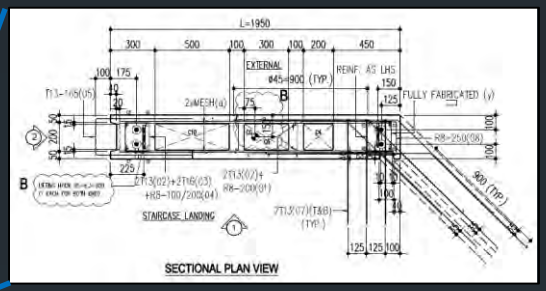
- Eliminate the need of external scaffold to act as formwork support
- Safer for workers during construction
- Mitigate construction processes

Redesign of External Parapet Wall with Cantilever Beam to Precast

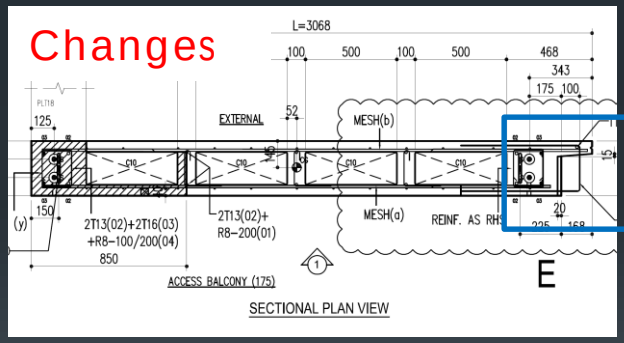
Alternate Design on Permanent Structure

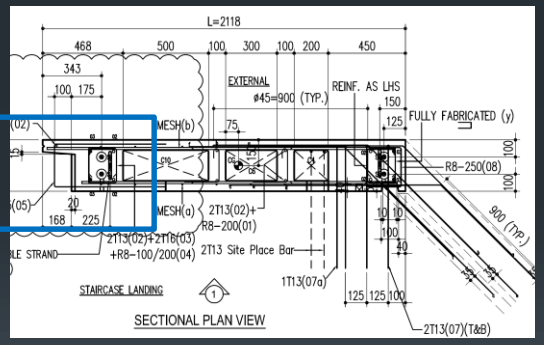
Counter Propose











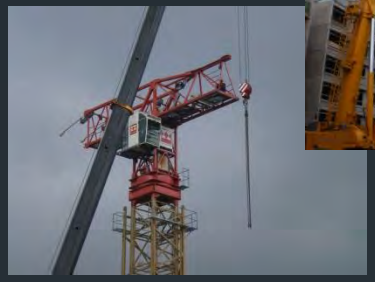
Redesign Cast-in-Situ Hollow Core Staircase Wall

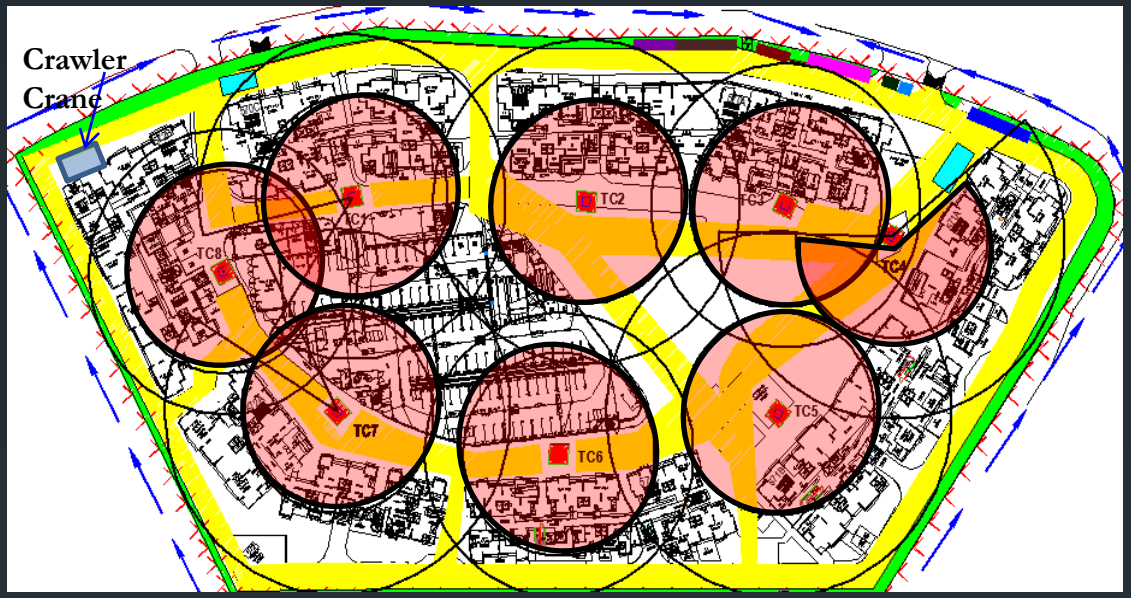
Temporary Structure Design Consideration

Tower Crane Setting

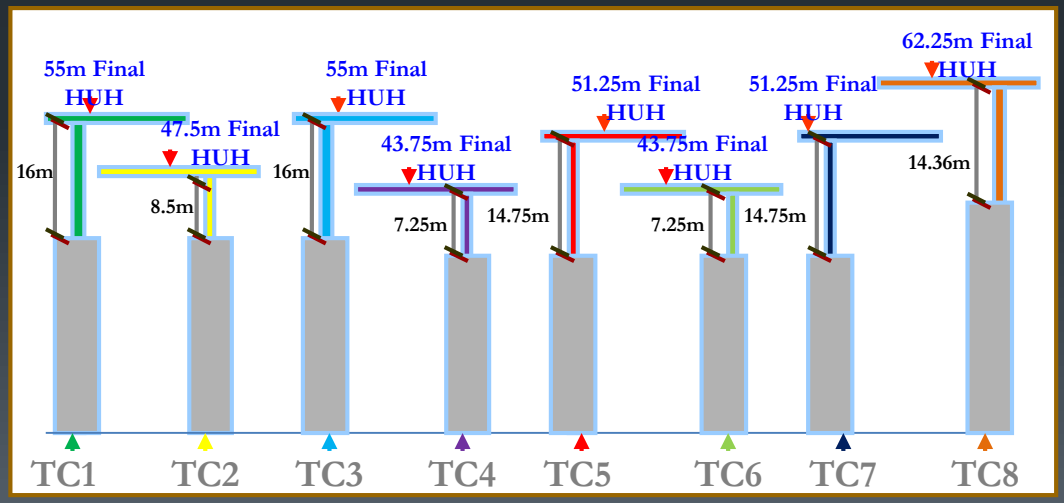










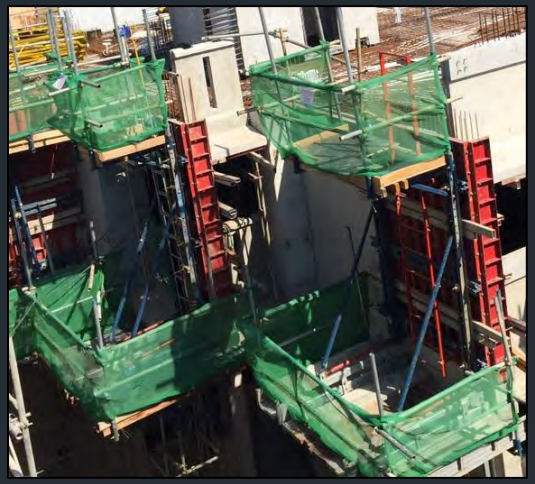


Temporary Structure Design Consideration

Selection of Formwork & Work platform System



Aluminium Formwork



Column System Formwork



Gable End Wall System Formwork



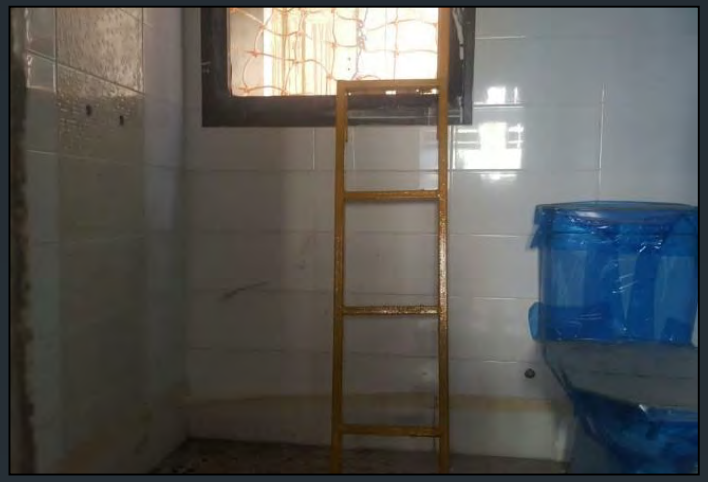
Safety Screen



External Work Platform

Temporary Structure Design Consideration

Safety Provisions



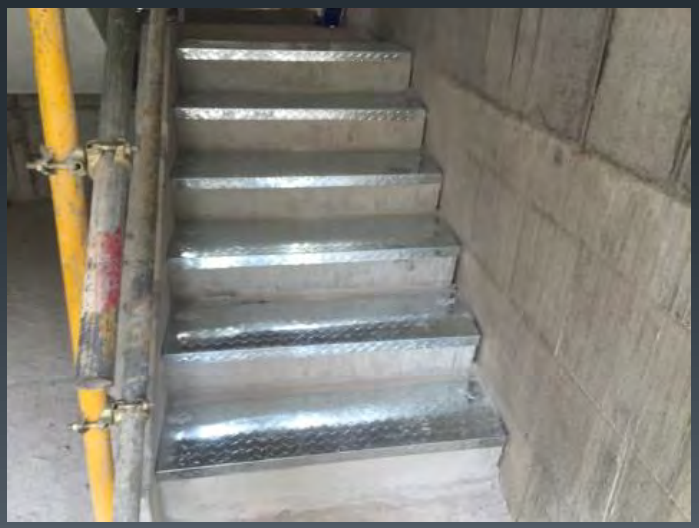
Flexi-ladder
- Improve the accessibility for those uncommon area



Precast Concrete Plank
- Provide a safe, clean & environmental friendly access



Enhanced Parapet Protection System
-Additional measures for working at Corridor



Steel plate installed at stairs nosing
- Additional measures for tripping hazard

Re-design Sequence of Work

Installation at Ground Level



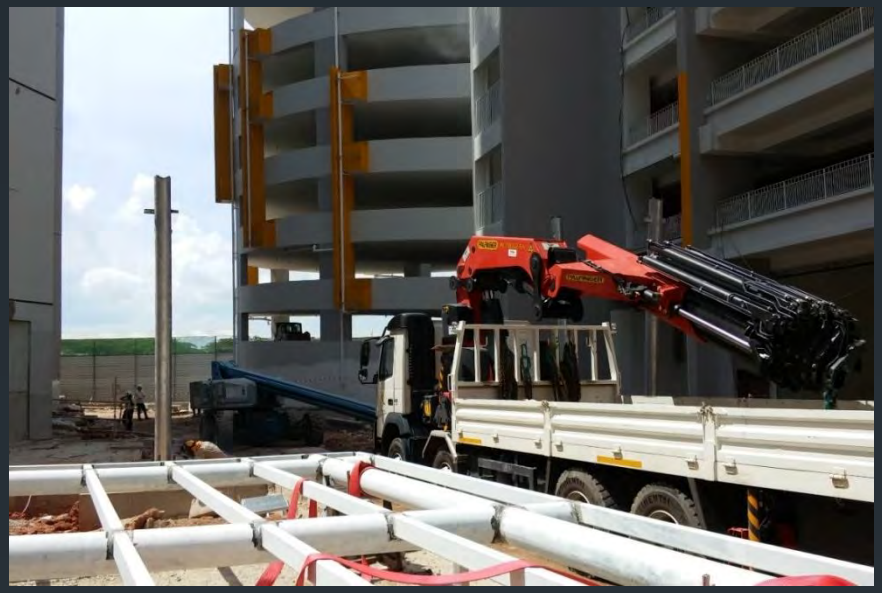
Air-con Ledge Installed on ground level prior to hoist



Safety Provisions installed on ground level prior to hoist

Re-design Sequence of Work

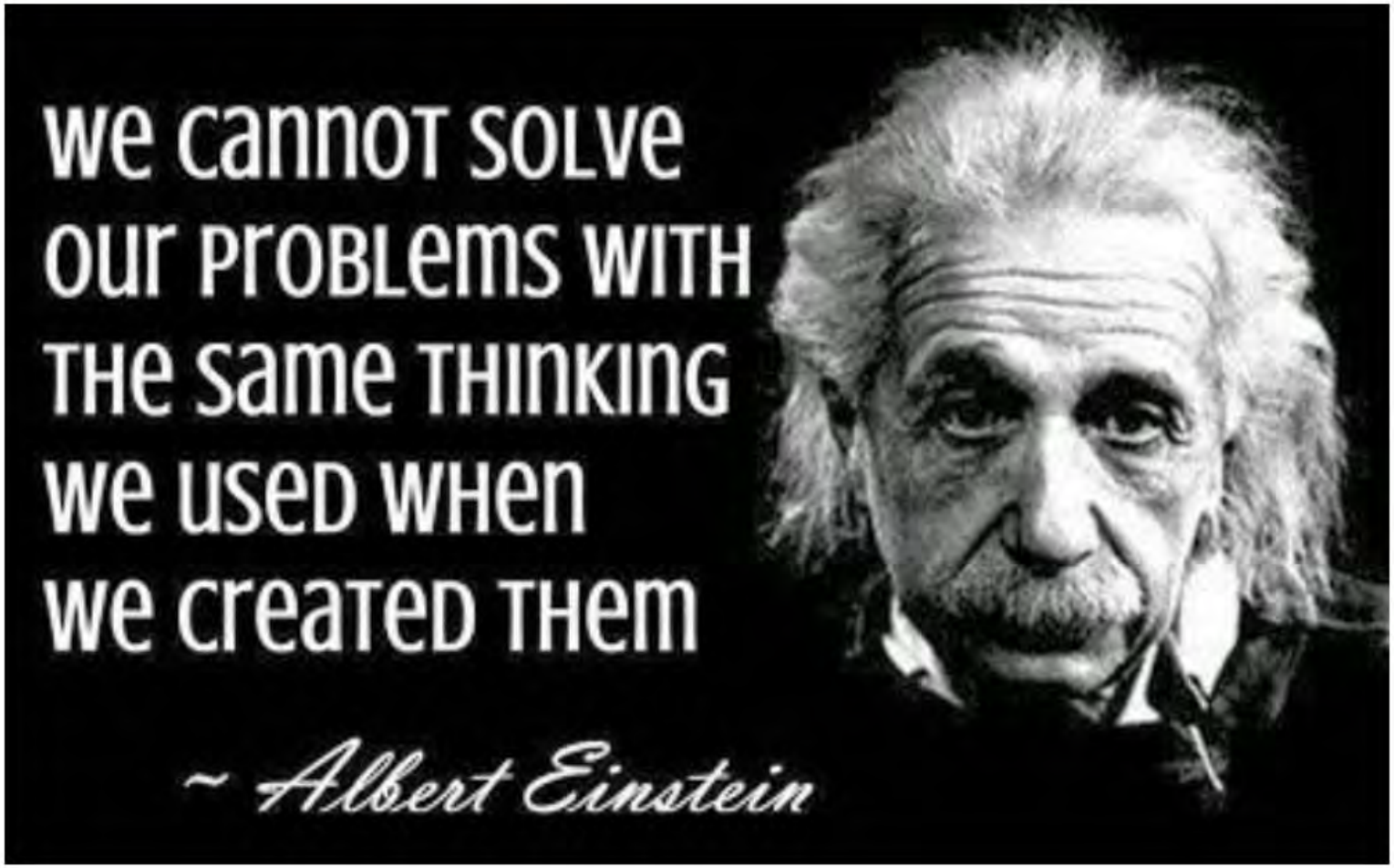
Prefabricated Off Site Assembly





- Detailed Execution to Minimize Closure of Public Carpark
- Use of BIM to simulate drop-off porch/high linkway construction
- Drop-off Porch/high linkway pre-fabricated off site and transported to site for assembly
- Existing road only closed for 1 hour, minimized inconvenience to public, compared to 8 hours for conventional method of hoisting and welding of individual members

CHANGE // WHY IT'S SO HARD



Thank You