



Construction Safety Week 2019 Conference

Safety Measures on Working at Height - the Hong Kong Housing Authority's Experience

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1. Introduction
2. 3-Pronged Approach
3. Safety of Working at Height for Construction Personnel
4. Safety of Working at Height for Maintenance Personnel
5. Conclusion

1. Introduction



HA's Vision, Mission & Core Values



People-centric approach

To help low-income and middle-income families with housing needs to gain access to affordable housing

For the **Mission** of maintaining a competent team, we build **Partnership with Contractors** towards a Common Project Goal

Core Values : 4C

Caring, Customer-focused, Committed, Creative

We are committed to **providing a safe and healthy working environment** in public housing development



- Caring • Customer-focused • Committed • Creative

1. Introduction



Safety Pledge

We aim high for safety and health in our living and working environment



- No fatal accident



- Accident rate per 1000 workers : ≤ 9 accidents



- Zero Incident

Vision Zero

No occupational accidents and work-related disease



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2. 3-Pronged Approach



1) Procurement Strategy and Performance Monitoring Mechanisms with Incentives and Sanctions

- **Listing management of contractors**
 - Certification of OHSAS 18001
 - ISO 45001 [before 12 March 2021]
 - Regulatory action on contractors for poor safety performance
- **Tender assessment**
 - Safety performance (accountable up to 7% of the total score in building tender document)
- **Performance monitoring mechanisms**
 - Performance Assessment Scoring System (PASS), safety audit, surprise safety inspection

2. 3-Pronged Approach



2) Strengthening Contract Requirements and Administration

Ensure Safety and Health in Workplace

Promoting best practices, **over and above** legal requirements

Enhance safety awareness
提升行業的安全意識

Improve physical conditions on site
優化工地的工作環境

Strengthen site and safety management
鞏固工地的安全管理

2. 3-Pronged Approach



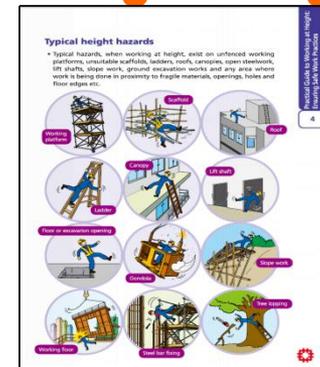
3) Research, training and promotion

- Adoption of more prefabrication and studies on MiC



- Safety seminars, forums, training
- Publications, HA Site Safety Website to promote safety awareness, e.g. **Practical Guide for working at height** can be downloaded from

<http://www.housingauthority.gov.hk/sitesafety>



3. Safety of Working at Height for Construction Personnel

To achieve **TOTAL SAFETY MANAGEMENT**, we have to

- 1) **Understand risks**
- 2) **Minimise risks through design and specifications**
- 3) **Enhance safe operations and provisions**



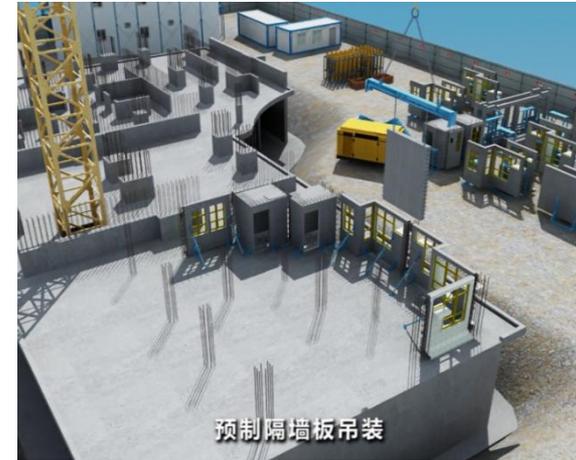
3. Safety of Working at Height for Construction Personnel



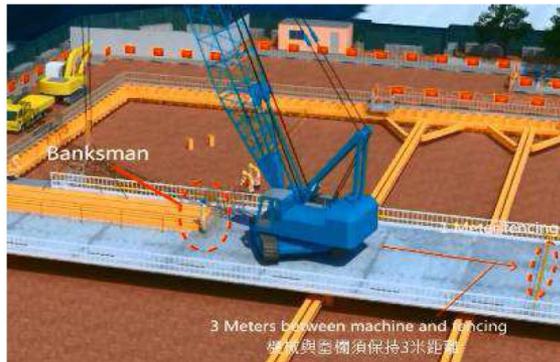
1) Understand risks

Building Information Modelling –

- Better understanding of related **working procedures**, e.g. demonstration of precast element storage, lifting and installation of various types of precast units
- Facilitate communication, effective way of explanation of **method statement** and foreseeable **risk and hazard**



Picture.5



Picture.6



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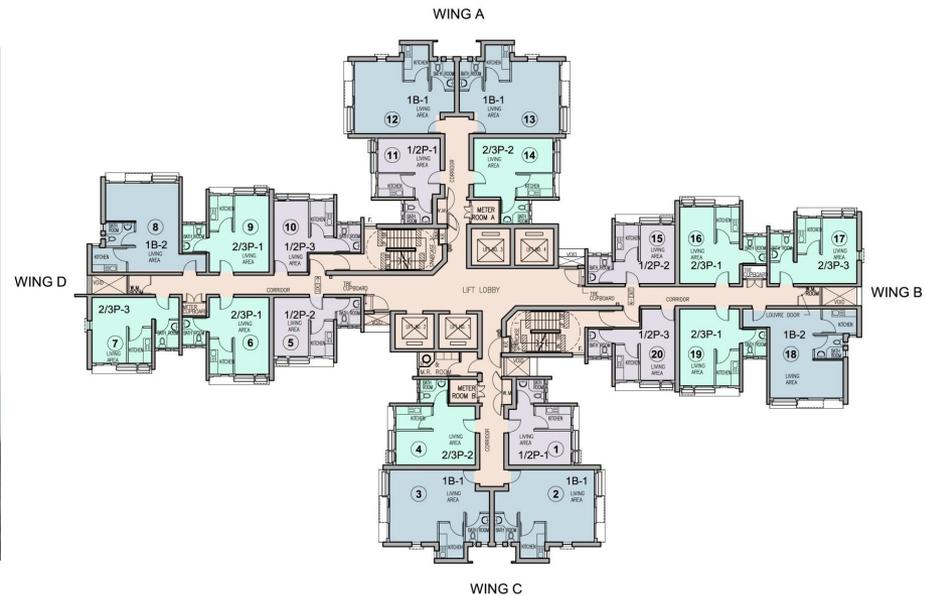
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3. Safety of Working at Height for Construction Personnel

2) Minimise Risks through Design and Specifications

2.1 Mechanisation and Rotational Symmetry

- **Reduction of on-site processes**
- **Rotational symmetry** in building design reduces the need to ground **large panel formwork** and the amount of lifting operations, hence improves safety.



3. Safety of Working at Height for Construction Personnel

2) Minimise Risks through Design and Specifications

2.2 Prefabrication

Precast element

- reduce on-site work process
- improve housekeeping
- reduce working at height



3. Safety of Working at Height for Construction Personnel

2) Minimise Risks through Design and Specifications

2.3 Modular Construction

Continual exploration of increasing the percentage of precasting



Explore use of precast structural wall, lift shaft, MiC

2011 - use of precast element on roof, precast bathroom, precast element reaching **35%** of total concrete volume

2008 - use of planar precast element at domestic flat, precast element reaching **20%** of total concrete volume

90s - Standard domestic block used planar precast element, at **18%** of total concrete volume

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3. Safety of Working at Height for Construction Personnel

3) Enhance Safe Operations and Provisions

3.1 Use of Information Technology for Operation and Access

- Enhance **safe operation of plant or equipment**
e.g. RFID card to authenticate authorised operation of mobile working platform



- Enhance **access control and recording**
e.g. RFID card monitoring for high risk area at lift shaft



3. Safety of Working at Height for Construction Personnel

3) Enhance Safe Operations and Provisions

3.2 Safe Access and Working Platform

a) Staircase, ladder and working platform to large panel formwork and precast facade



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3. Safety of Working at Height for Construction Personnel



3) Enhance Safe Operations and Provisions

3.2 Safe Access and Working Platform

b) Staircase, ladder and working platform to work at 2m above ground above ground

Hop-up platform



Step platform Working platform Access ladder



c) Mobile elevating working platform with the following measures :

- statutory form
- operated by trained personnel
- safety harness to anchor point
- fence off working area



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3. Safety of Working at Height for Construction Personnel

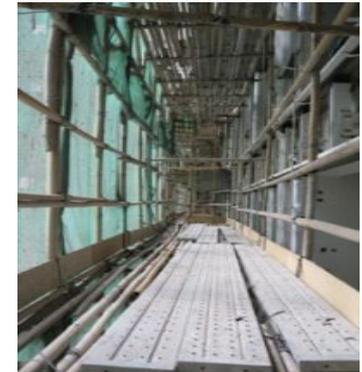


3) Enhance Safe Operations and Provisions

3.2 Safe Access and Working Platform

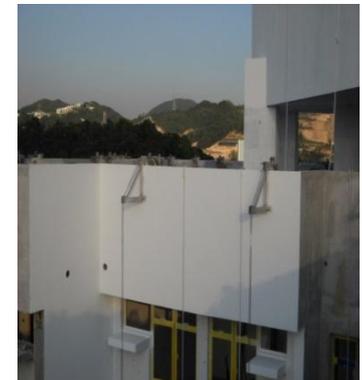
d) Bamboo scaffold working platform

- Contractor to follow **CIC's Guidelines on Planking Arrangement for Providing Working Platforms on Bamboo Scaffolds** by use of **closely spaced bamboo scaffold** or provision of **planking for all working levels**
- Small and medium bamboo scaffolding companies **certified under OSH Star Enterprise – RMAA Safety Accreditation Scheme**



e) Gondola

- **Roof parapet** has adequate **structural strength**
- **Safe access** to parapet for installation of gondola



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3. Safety of Working at Height for Construction Personnel



3) Safe Operations and Provisions

3.3 Barrier to opening – floor opening

a) Cover to floor opening

- solid cover securely fixed in position
- boldly marked to show its purpose



b) Railing to floor opening

- railings, toe board with safety net



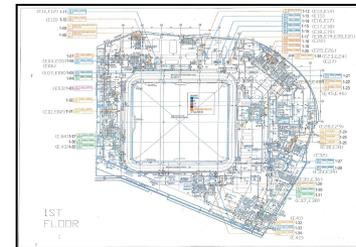
c) Safety net for openings with considerable risk

- to catch falling persons and debris



d) Monitoring system

- checking plan and schedule



e) Fall arrest system

- required when guard-rails or coverings to floor opening is impracticable



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3. Safety of Working at Height for Construction Personnel



3) Safe Operations and Provisions

3.4 For Specific Trade – lift works

a) **Barrier** to lift shaft opening securely locked with graphical instruction



b) **Work permit** for works in lift shaft

c) **Proper access**



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3. Safety of Working at Height for Construction Personnel



3) Safe Operations and Provisions

3.4 For Specific Trade – lift works

d) **Safety harness** attached to anchor point outside lift opening & lifeline inside lift shaft



e) **Railing and toe board** to working platform on lift car top

f) **Cover to floor openings** securely fixed with warning notice in lift machine room



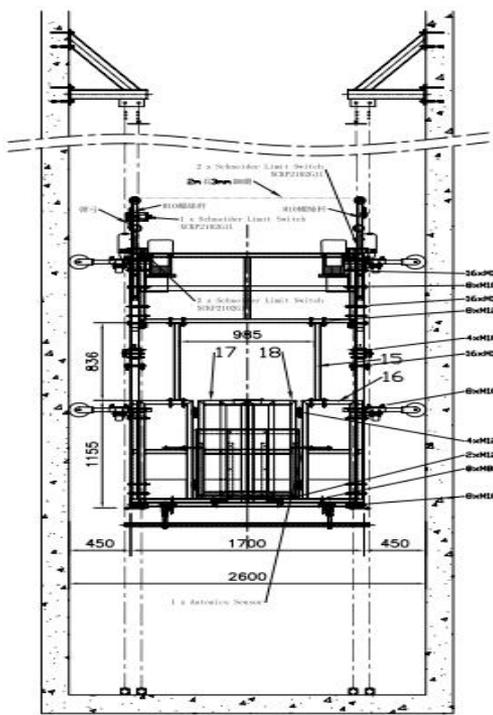
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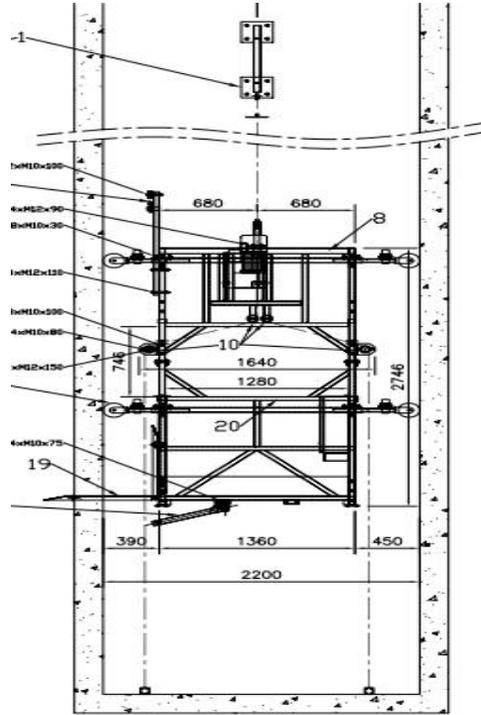
3) Safe Operations and Provisions

3.4 For Specific Trade – lift works

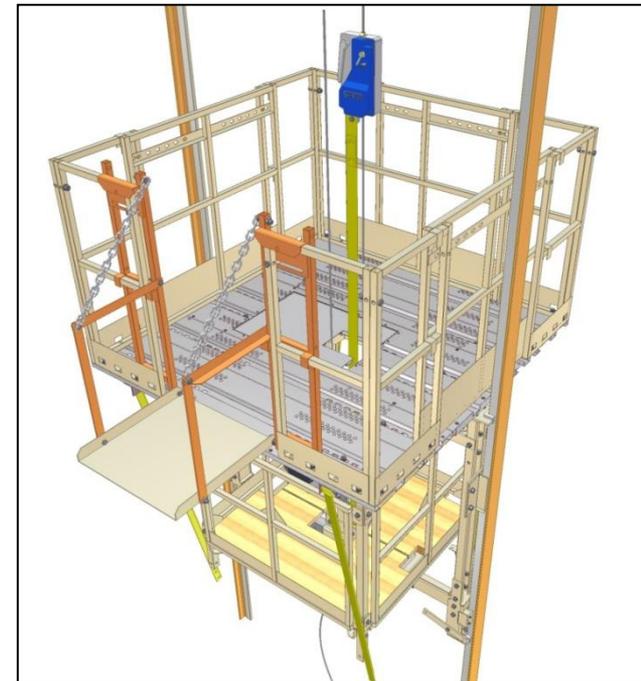
g) Guided gondola provides a safe alternative to metal scaffold for lift works in lift shaft. The risk of missing working platform on metal scaffold is eliminated.



Front View



Side View



3. Safety of Working at Height for Construction Personnel

3) Safe Operations and Provisions

3.5 For Specific Trade – lifting of H-piles

Double lock **ground release shackle** for lifting of H piles
– no need for mancrage



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4. Safety of Working at Height for Maintenance Personnel

To achieve **TOTAL SAFETY MANAGEMENT**, we have to

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- 2) **Enhance safe operations and provisions**



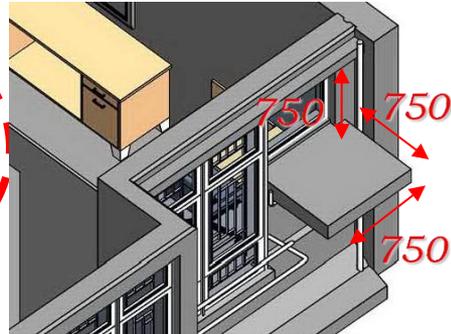
4. Safety of Working at Height for Maintenance Personnel



1) Minimise Risks through Design and Specifications

1.1 Enlarged window for A/C installation from inside flats

- Enlarge A/C window and A/C hood to allow choice of units (window type or split type);
- Condensation pipe accessible from openable window
- Glazing from inside



1.2 Automatic Irrigation to Green Roof



Reducing working at height

- Plant with low maintenance species, e.g. drought tolerant type
- Automatic irrigation system
- Metal scaffolding
- Fall arrest system

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4. Safety of Working at Height for Maintenance Personnel

2) Enhance Safe Operations and Provisions

2.1 Safe access and working platform

Provide **staircase, ladder, suspended steel platform** and **gondola** for access to services for operation and maintenance of the services



2.2 Barriers to floor edge

Railing to canopies, top of cover walkway and footbridge



4. Safety of Working at Height for Maintenance Personnel

2) Enhance Safe Operations and Provisions

2.3 For Specific Trades – lift works

- Use of **safety harness** and **fall arrest system**



Provision of a **permanent anchorage** to secure the Lift Workers to get access to the lift pit
Reference: **CIC Guidelines on Safety of Lift Shaft Works**



- **Ladder** and **emergency button**

Provision of an **emergency button** at the lowest landing level next to the landing door for emergency stop of the lift car



Provision of a **permanent ladder** for lift workers to get access to the lift pit in a safe manner



Quality, Safety and Health and Productivity go hand in hand

- We deliver quality housing, create safety and healthy working environment for site workers, management and maintenance personnel.
- We manage risks of housing development projects.
- We drive safety innovation and utilize information technology for enhancing safe working environment for construction workers.

Thank You!