



# Construction Safety Week 2024 – Conference

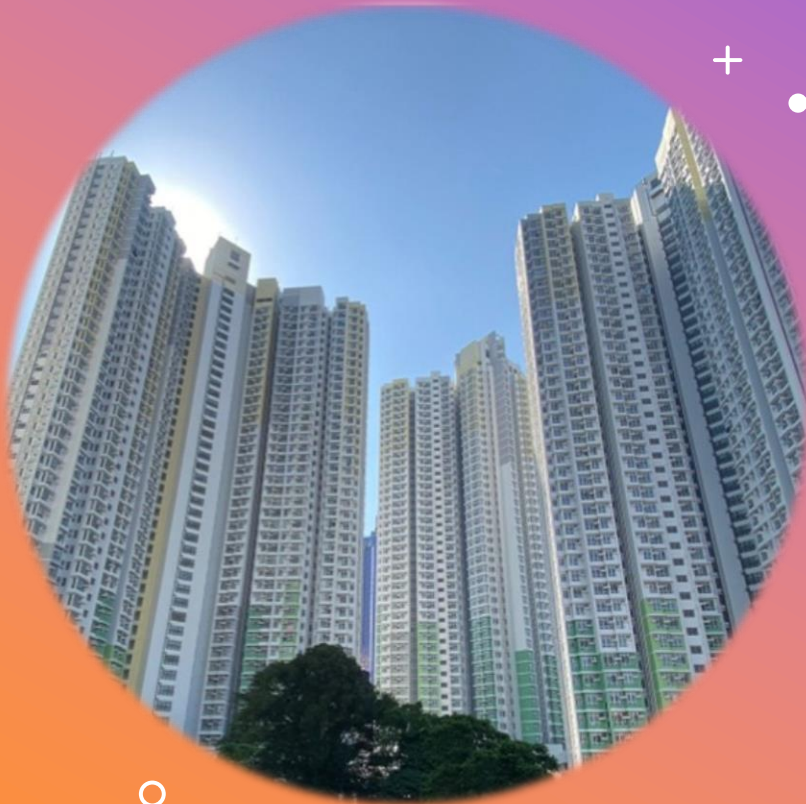
## Safety for All, 4S stands Tall

### Hong Kong Housing Authority's Safety Measures Using Technologies in Controlling Risks

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# ASPECTS



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Risks in Construction Industry

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Values and Safety Targets

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Safety Management System

- Procurement Strategy and Performance Monitoring
- Contract Provisions
- Research, Training and Promotion

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Strategy and Measures for Safety

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Way Forward



# Risks in Construction Industry



## 奪命意外

2024年7月

荔崗街奪命意外 - 司機被夾困泥頭車與挖泥機之間

2024年5月

啟德體育場園 - 一名工人操作動力升降工作台時，被夾斃

2024年4月

沙田奪命意外 - 兩工人沙井吸入沼氣亡

2024年2月

啟德採棚意外 - 兩死三傷



## Issues in Construction Industry

### Major factors leading to site accidents

- High risk working environment
  - Complex working processes
    - Lack of safety consideration in procedure
      - Insufficient dynamic risk assessment
        - Weak safety awareness of employers, contractors, subcontractors and workers



## Risk Management

### Hazard Identification & Risk Assessment

#### HA New Works Contracts in 2023

Major Accident Categories	%
Trip / Slip / Fall	33
Manual Handling	14
Hitting Stationary Object	14
Hitting Moving Object	11
Fall from Height	7
Falling Object	7





# Values and Safety Targets



## HA's Vision, Mission & Core Values

Core Values : 4C **Caring**, Customer-focused, Committed, Creative  
to provide a safe and healthy working environment



## Safety Target

- **No fatal** accident

- Accident rate per 1000 workers :  $\leq$  **8 accidents**



# Safety Management System

- Procurement Strategy and Performance Monitoring
  - Contract Provisions
  - Research, Training and Promotion





## Action of the Management

- **Procurement Strategy** with sanction and incentives & Performance Monitoring
- **Contract Provisions**
- **Research, Training and Promotion** for fostering safety awareness





## *Selecting Competent Contractor for HA Works*

### *Innovative Proposal*



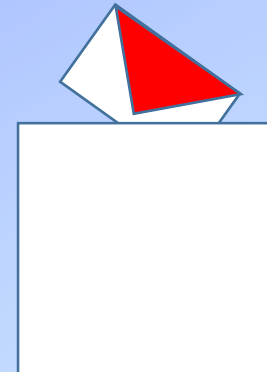
#### **Incentive**

**Tender Opportunity &  
Capping Limit**



#### **Sanction**

**Tender  
affected**







## *Proactive* Safety Performance Monitoring

Performance Assessment  
Scoring System (PASS)



Safety Auditing System  
(HASAS)



Surprise Safety  
Inspection Programme



Site visits by HA senior  
management, project team





**Above legal  
requirement**

***Reinforcing Safety  
Management***

***Enhancing Work  
Environment***

***Fostering Safety  
Awareness***

**Pay for Safety**

***Incentive to contractor for  
achieving safety goals***





# Strategy and measures for Safety



Using BIM in Design Stage



MiC2.0



MiMEP



Reviewing Site Safety with BIM



o  
incident

 Hong Kong Housing Authority

## PICTORIAL GUIDE TO Planning and Design for Safety

New edition in  
2025





## Innovative Technology - Reducing Site Process

### Risk

- Trip / Slip / Fall



- Manual Handling



- Heat Stress / Extreme Weather



### Measures



Work in Factory

Off Site Pre-casting



Modular Integrated Construction



## Risk

- Fall From Height



- Falling Object



- Manual Handling



## Measures



Strengthening  
Temporary Works  
Management



Guided Suspended  
Working Platform  
for Lift Installation



Use of Metal  
Scaffolding





## Smart Site Safety System

### Risk

#### Hazardous areas



#### Cranes/ mobile plants



### Measures

#### E-lock and key

- Access control to hazardous areas, e.g. lift shaft, restricted zone, floor opening, electrical distribution board
- Alarm if tampered

#### Alert for unsafe conditions

- Detecting workers entering danger zone
- Real time alert triggered to crane / plant operator, worker & supervisor

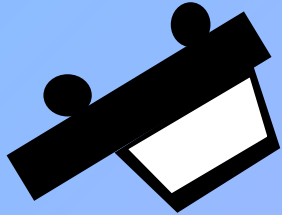




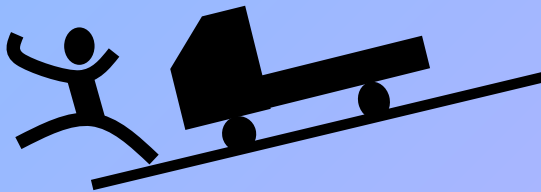
## Smart Site Safety System

### Risk

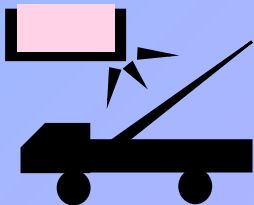
Plant operator



Vehicle skidding



Vehicle height



### Measures

Authentication of operator

- Radio frequency identification (RFID) / facial recognition

Handbrake detector

- Alarm triggered when handbrake not applied

Vehicle height detector

- Alarm triggered when height exceeds limit set at site entrance







## Smart Site Safety System

### Risk

#### Heat Stress



#### Unsafe practice



### Measures

#### Smart helmets / devices

- Real time monitoring body temperature, heartbeat & blood pressure
- Real time alert triggered to supervisor

#### Safety monitoring with AI

- Artificial intelligence to identify unsafe acts / conditions
- Real time alert triggered to worker and supervisor





## Smart Site Safety System

### Risk

#### Certificate overdue



#### Permit for High Risk Work



### Measures

#### Digitalised Tracking system

- On-site instant checking the qualification and training record of personnel, certificates of plant and tools

#### E-permit

- Work in lift shaft, hot work, electrical work, heavy machinery, and confined space,







## Smart Site Safety System

### Risk

#### Confined space



#### High risk activities



### Measures

#### Confined space monitoring

- Risk assessment
- Real time location tracking
- Continuous gas monitoring
- Alarm triggered for abnormality to worker and supervisor



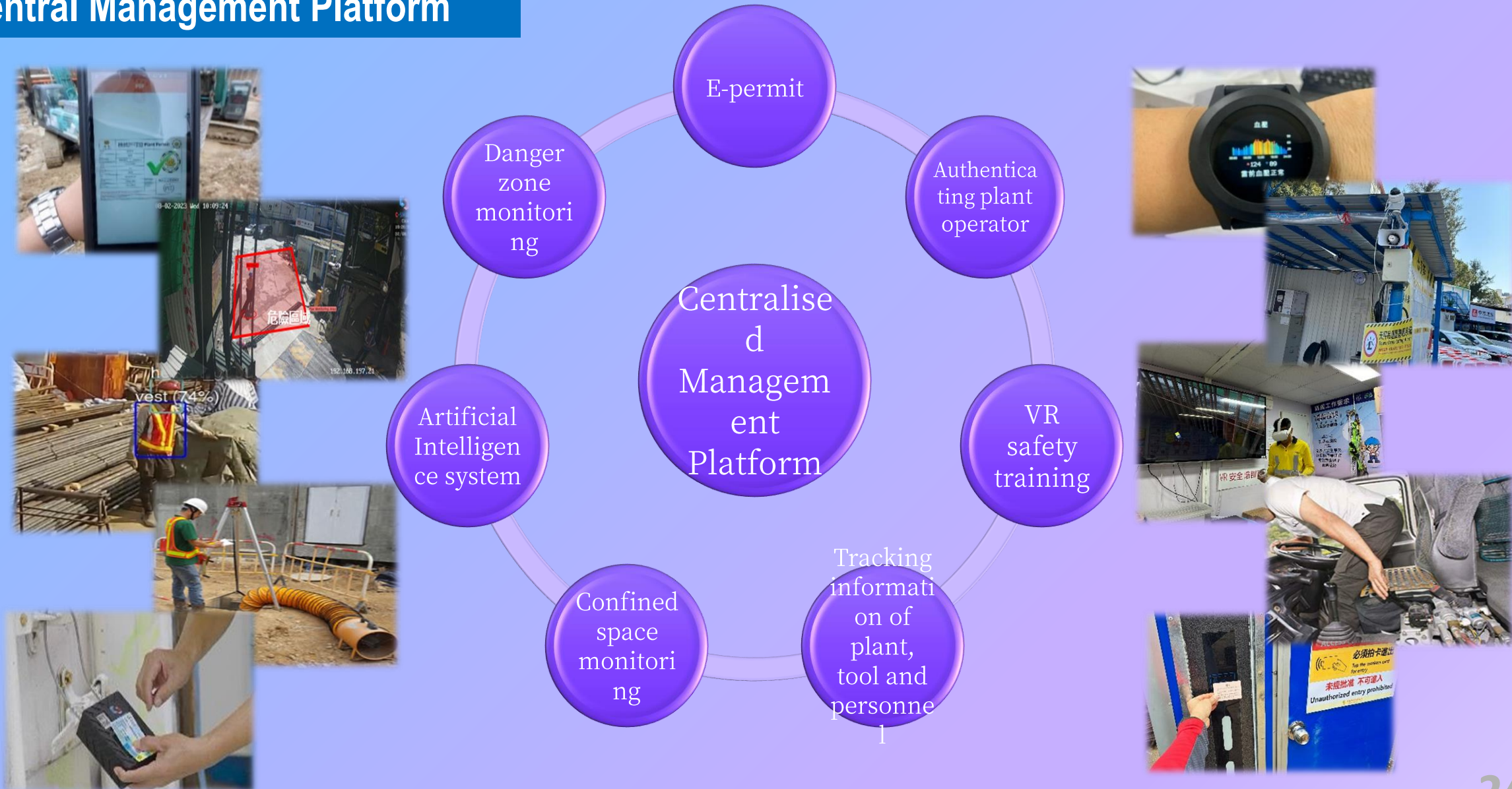
#### Training with virtual reality

- Conversant with working procedures in simulated environment
- Working at height, lifting, electrical work





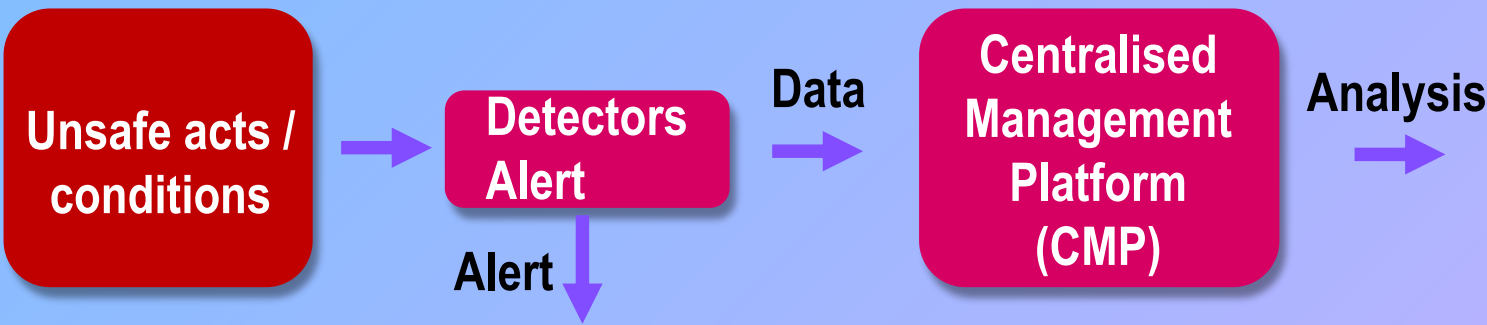
## Central Management Platform



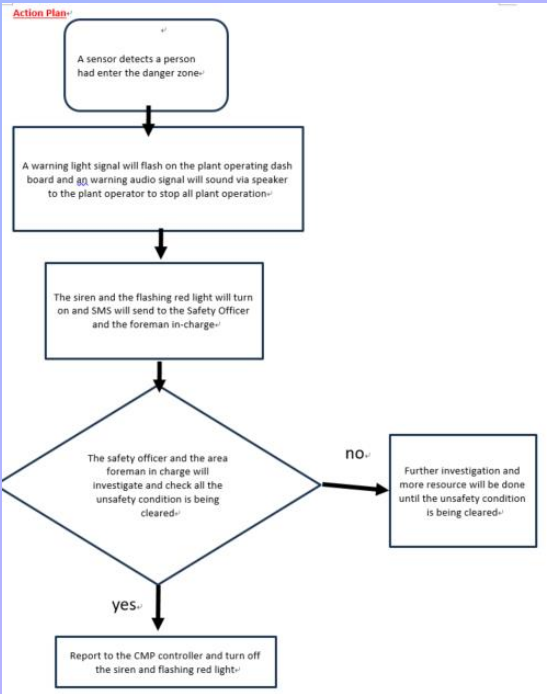




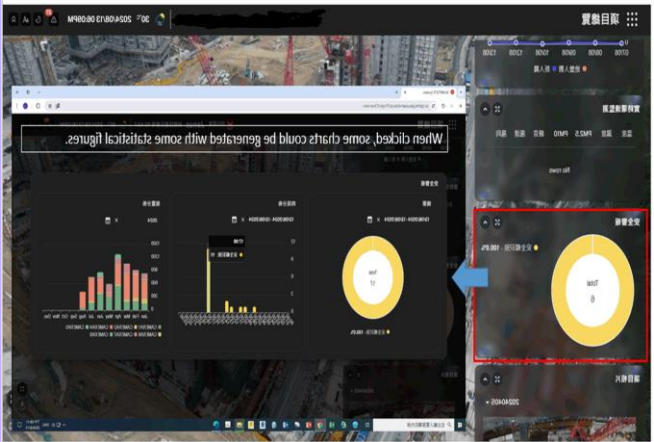
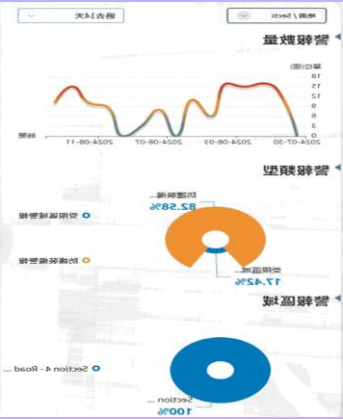
Action Plan & Data Analysis



worker & supervisor to rectify unsafe condition



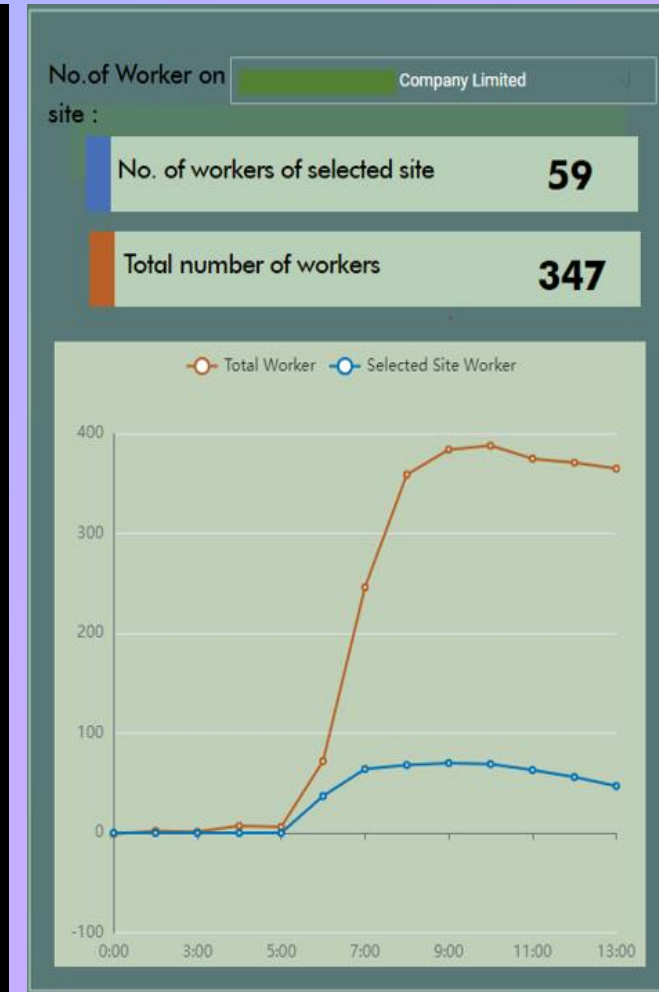
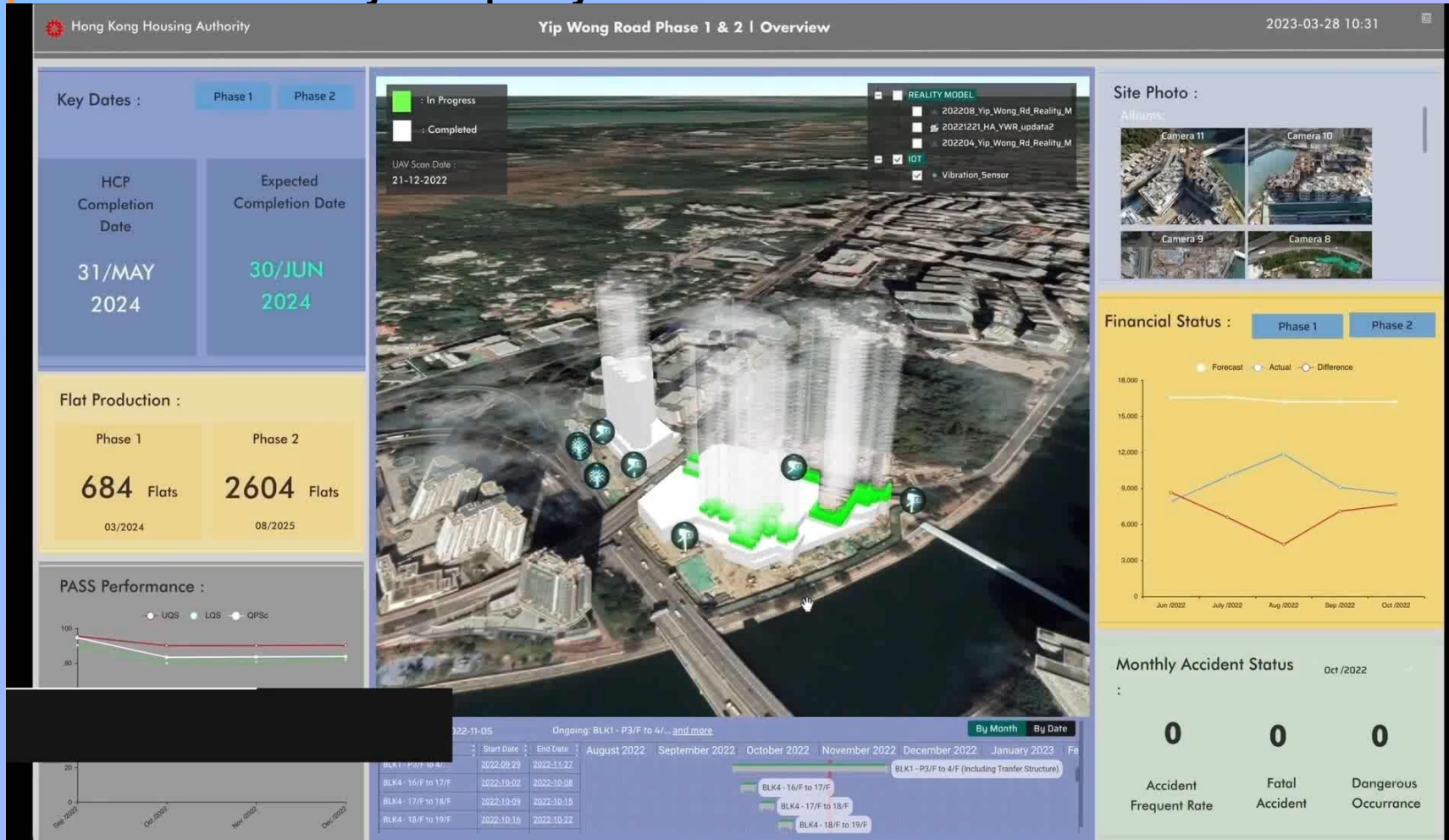
Project team formulating better safety measures





## HA-Project Information Management and Analytic Platform (HA-PIMAP)

- Collect data from CMP for visualizing project information
- Boost safety and quality control







## Risk

Work at height



Flame cutting

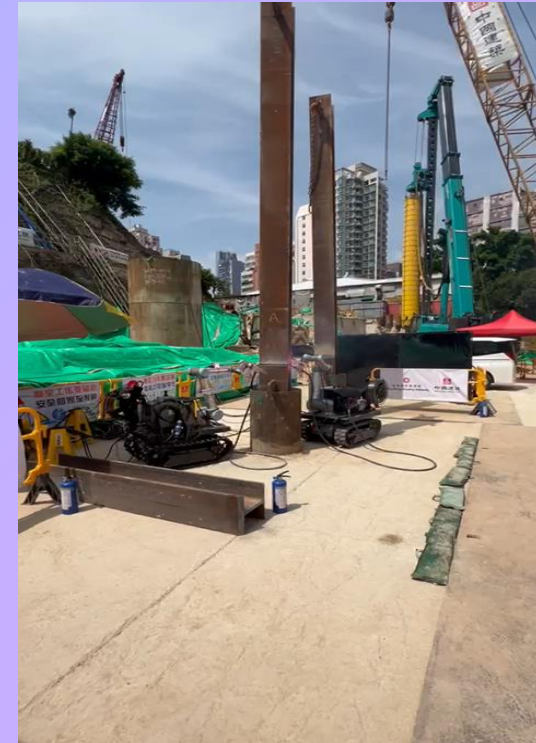


## Measures

Painting robots



Welding robot



Drone

## P&N Label

### P-label worker

- New to construction industry



### N-label worker

- Experienced but new to a site



## Site Facilities

- anti-heat stress facilities
- rest area
- drinking water
- washroom
- changing room
- shower facility



## Health Care

- Health plan
- health check station
- smart health monitoring



# Challenging on Risk Management and Using Technology for Safety





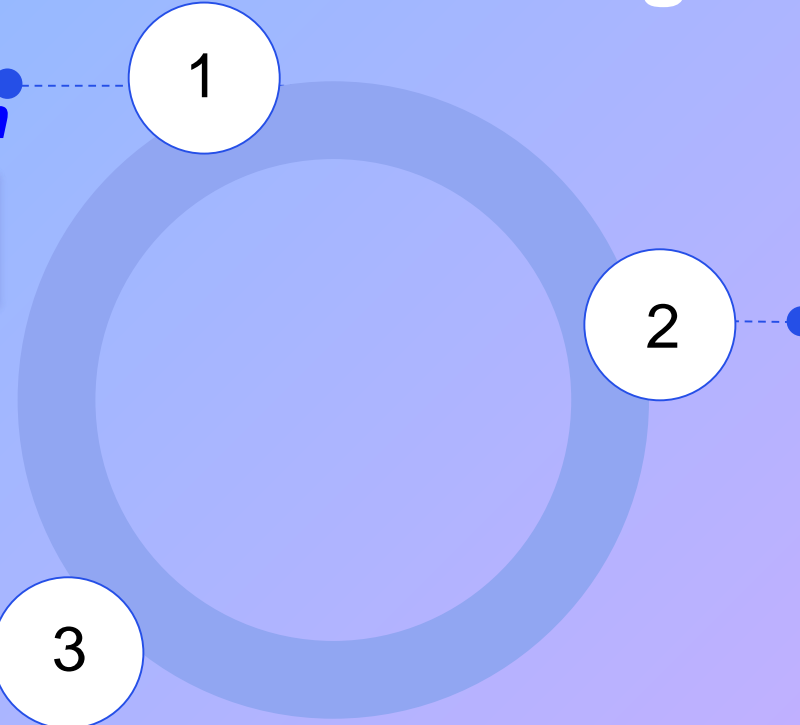
## Challenges of Innovative Technologies

### *Issues of interfacing technologies and application*

- Keeping on innovation and enhancing technologies

### *Data Privacy and Security*

- Protecting Data Privacy



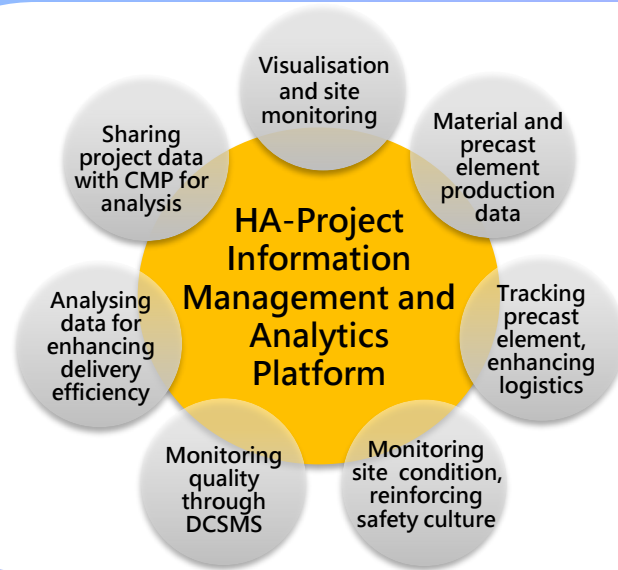
### *Acceptance by workforce and training*

- Ensuring effective coordination of safety strategy and technology application

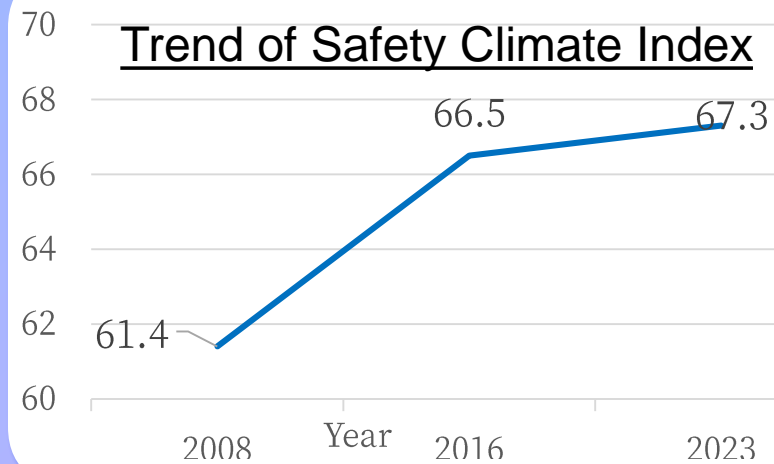




## Smart Site Management



## Safety Culture Change



## Enhancing Risk Control of Management Level



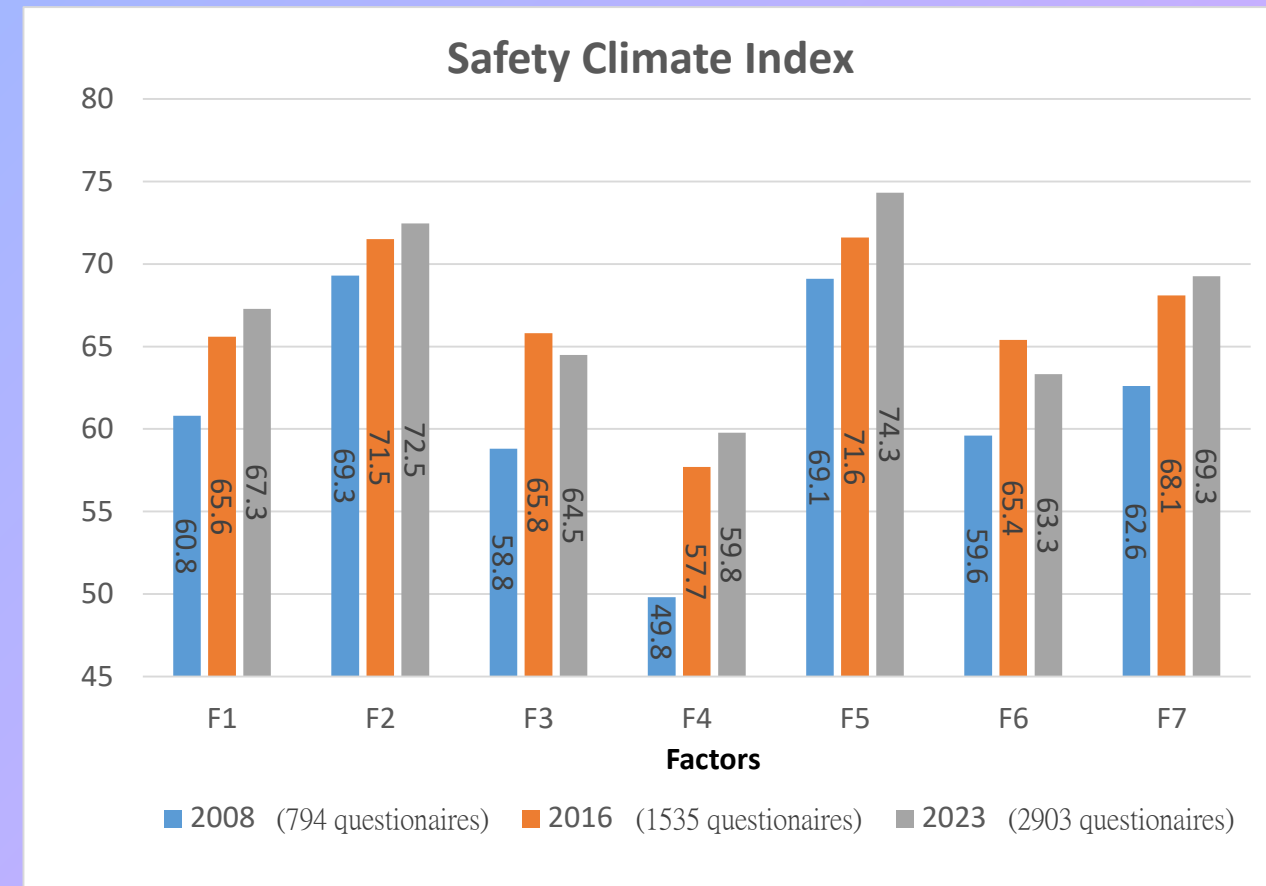


## Change of Safety Culture

### Safety Climate Index Survey: 2023 vs 2008

All Indexes in 2023 higher than 2008 -

- **Factor 1** Corporate and Management Commitment
- **Factor 2** Safety Resources and Support
- **Factor 3** Awareness of Risk-taking Behaviour and Hazards
- **Factor 4** Perception of Safety Rules and Procedures
- **Factor 5** Personal Involvement in Safety and Health
- **Factor 6** Safe Working Attitude
- **Factor 7** Safety Promotion and Communication







Partnership with  
industry  
stakeholders



Tenderers to  
include innovative  
technologies in  
tenders



Incentive in pay  
for safety scheme  
for contractors to  
implement  
innovative safety  
measures

- Safety First
- Safety is Everybody's Business



連繫

CONNECTIVITY

Community

社區

AI

左鄰右里

公屋暖

Mi<sup>∞</sup>

Smart Facility Management

綠色

Integration

開開心心上班去  
快快樂樂回家來

健康

Vitality

感

居MIC

Elderly-friendly

..IS WHAT WE ARE STRIVING FOR

Housing Authority Site Safety Website:  
<https://www.housingauthority.gov.hk/sitesafety>

風險管理保平安，善用科技守職安

Harnessing Risk Management and Technologies Safeguarding Occupational Safety and Health

