

Safety Technology

**Presented by Tony Small
Gammon Construction Limited**

24th August 2026

Construction Safety Innovations

1. **Fall restraint and Fall arrest systems:** Self-retracting lifelines (SRLs), horizontal lifeline systems, engineered anchors, and shock-absorbing lanyards that limit fall.
2. **Smart PPE and wearables:** Safety helmets and watches with sensors that detect falls, impacts, location (geofencing), heart rate, or fatigue and alerts in real time.
3. **Drones and remote inspection:** Used for surveying and inspection allowing better overview of locations.
4. **AI cameras and monitoring:** Systems that detect proximity to plant or unsafe behaviors.
5. **Robotics and automation:** Remote-controlled or semi-autonomous equipment for demolition, excavation, welding.
6. **Machine control and telematics:** Remote controlled tower cranes and other plant that reduce operator error; fleet monitoring that tracks proximity, fatigue, and maintenance needs.

Golden Gate Bridge

Chief Engineer Joseph Strauss

spent \$130,000 to install an under-deck safety net during the Golden Gate Bridge construction (1933–1937)

Made of manila rope, it extended 10 feet past the sides of the workspace. The net saved 19 men, who formed the "Halfway to Hell Club".

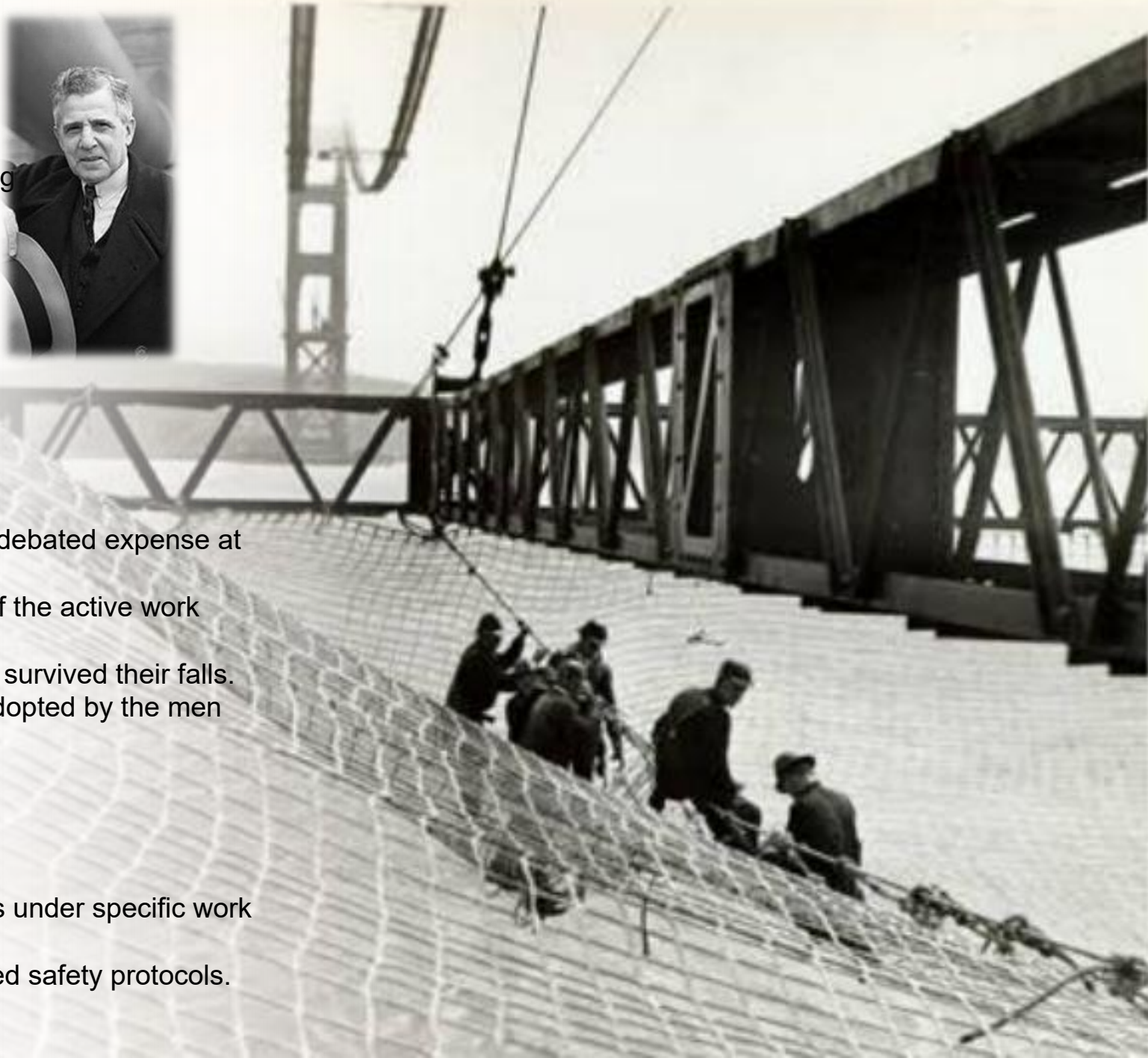


Net Details and Impact

- **Cost:** \$130,000, which was a massive and heavily debated expense at the time.
- **Design:** Suspended underneath the entire length of the active work area and extended 10 feet out on all sides.
- **Lives Saved:** 19 workers bounced into the net and survived their falls.
- **The "Halfway to Hell Club":** The informal name adopted by the men whose lives were spared by the netting.

Other Safety Rules Enforced

- Mandatory use of specialized hard hats.
- Required use of glare-proof goggles and respirators under specific work conditions.
- A strict zero-tolerance policy for workers who ignored safety protocols.





Technology
supported Safety





Smart XR

AI-Powered Safety Intelligence
for Inspection



SMART XR transforms safety operations by automating inspections, standardizing knowledge, and empowering every worker with accessible safety intelligence



Automate Report Generation

Automatically converts site-walk footage into structured inspection reports — eliminating manual documentation.

Save hours of officer time



Safety Golden Database

A centralized knowledge hub combining internal records and industry standards to power consistent, source-linked safety reports.

Standardized & traceable reports



Self-Learning AI Engine

Learns from user feedback and rejected findings to sharpen future detections — compounding safety intelligence over time.

Smarter with every inspection



Minimal Workflow Design

Any worker with a camera can contribute to site safety — a simple record-to-report process that eases labour shortages.

Accessible to every worker

Beyond human-led inspections, SMART XR envisions robotics playing a major role in the future of site safety

1 A 360 camera attached onto a drone to capture video on site



2 AI identifies risks, level of risk, and suggest a list of follow-up actions on safety reports

Report Summary

Report Name: Safety Inspection Report
Inspection Date: Nov 19, 2025
Inspection Time: 13:31
Location:
Conducted by: Leslie Lo
Risk Identified: 5



AI generated

Identified Risk

Material and Waste Storage Obstruction: Construction materials, debris, or waste are stored in an open but barricaded section, creating potential tripping, collision, or obstruction hazards if the barriers are bypassed or improperly secured.

Risk Level

Medium: The risk is controlled by visible barrier fencing, but the presence of loose materials and clutter behind the barriers raises concerns for slips, trips, and blocked access in a working construction area.

Action Item

- Keep all barriers firmly in place and frequently inspected to prevent accidental entry.
- Conduct periodic site inspections to ensure compliance with site housekeeping and barrier maintenance standards.



AI generated

Identified Risk

The wire or hose seen lying on the ground presents a tripping hazard and possible electrical risk (if it's a live electrical cable).

Risk Level

Medium: Unsecured wires in active construction zones are a frequent cause of tripping incidents, especially when combined with wet or muddy conditions.

Action Item

- Immediately secure or reroute the wire off walkways and work paths, using cable protectors or overhead supports.
- Check the cable for any damage or exposure and ensure it is certified for use in wet environments, if applicable.
- Mark or highlight all cables with warning tags or bright coverings.

Use Case 1: 360-camera attached to drones / robotic dogs, and generate a safety report with the footages using AI

Description: As robotics becomes increasingly integrated into construction operations, Smart XR is preparing for a future where robots can assist in tasks such as safety inspections. By enabling human–robot collaboration, the platform paves the way for smarter, more efficient site operations.

Benefits: This approach significantly reduces the time spent on on-site safety inspections and manual documentation, allowing teams to focus their effort on addressing high-risk items and improving overall site safety performance.

Lesson Learn: The physical and regulatory environment in Hong Kong still makes it hard to deploy robotics at scale, especially drones, so we need new ways of working with regulators and safety bodies to enable seamless human–robot collaboration.



Report Summary	
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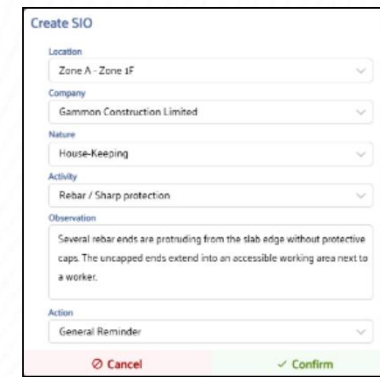
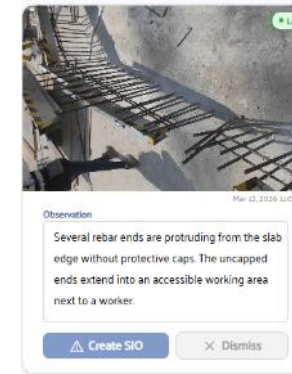
	### AI generated Identified Risk Material and Waste Storage Obstruction: Construction materials, debris, or waste are stored in an open but barricaded section, creating potential tripping, collision, or obstruction hazards if the barriers are bypassed or improperly secured. Risk Level Medium: The risk is controlled by visible barrier fencing, but the presence of loose materials and clutter behind the barriers raises concerns for slips, trips, and blocked access in a working construction area. Action Item - Keep all barriers firmly in place and frequently inspected to prevent accidental entry. - Conduct periodic site inspections to ensure compliance with site housekeeping and barrier maintenance standards.
	### AI generated Identified Risk The wire or hose seen lying on the ground presents a tripping hazard and possible electrical risk (if it's a live electrical cable). Risk Level Medium: Unsecured wires in active construction zones are a frequent cause of tripping incidents, especially when combined with wet or muddy conditions. Action Item - Immediately secure or reroute the wire off walkways and work paths, using cable protectors or overhead supports. - Check the cable for any damage or exposure and ensure it is certified for use in wet environments, if applicable. - Mark or highlight all cables with warning tags or bright coverings.

2: Smart XR uses Gammon's AI model to analyze video footage, detect safety risk, and generate reports

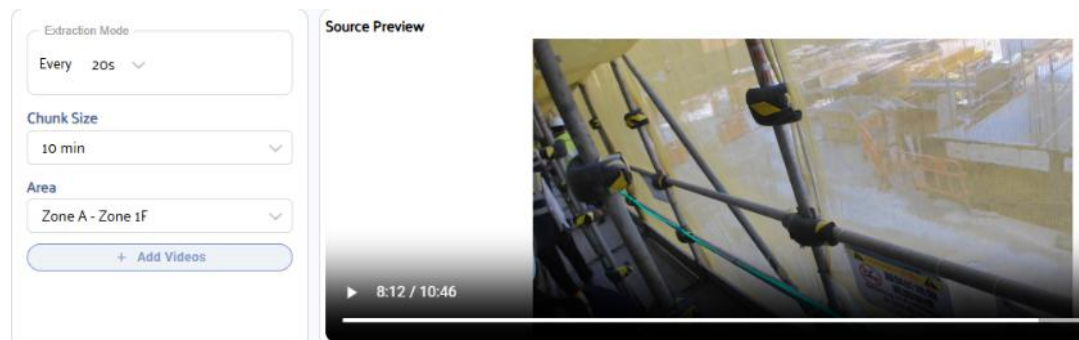
- 1 Frontline worker records side-walk video with a head-mount camera attached to the helmet



- 3 Safety professionals review AI-detected risks before report creation



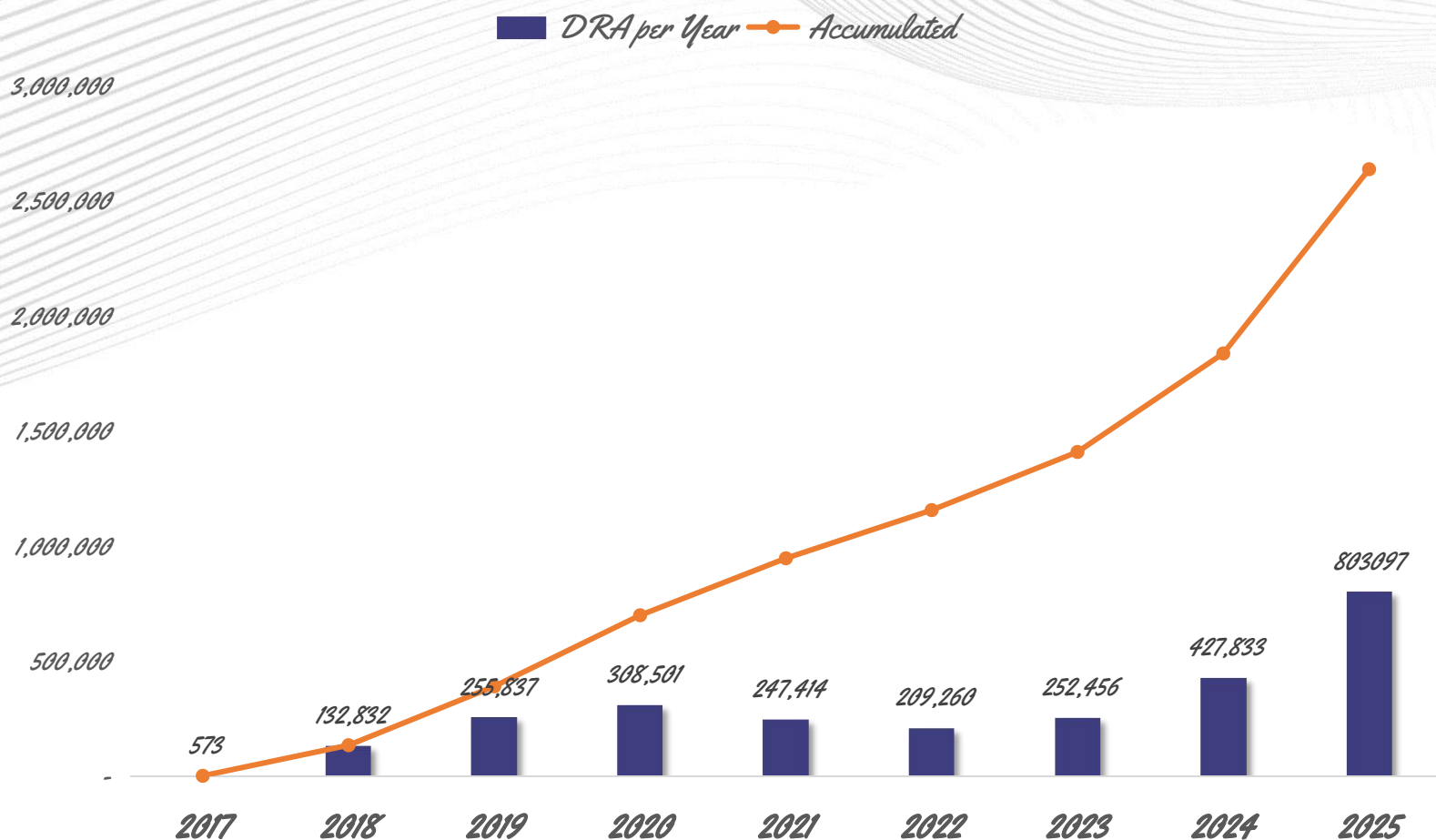
- 2 Video being uploaded to Gambot (internal system) for AI processing



- 4 Safety observation reports contains **description** and **follow-up actions** suggested generated on Gambot



From Manual to Digital to Intelligent: The Dynamic Risk Assessment Journey



Ver 1

Ver 2



Digitized, But Not Yet Transformed



AI Scoring Criteria

Scoring criteria refined:

- Prioritizing DRA with **site-specific details** and **foreseeable risks**; **People, Equipment, Materials, Environment**
- Low score for record contents that are **AI generated**
- Low score for records that are **copied** - DRA content can only be repeated within 14 days
- Higher score for task specific - Lower score for focus solely on PPE and Housekeeping .



Sample – Scored 4 DRA with site specific information and measurement

Scored: 4

Description: 升降台安裝鋁板背骨工作安全簡報

People: 員工有人體下墮風險，各人必須齊備個人防護裝備，全身式安全帶配有雙尾扣，在安全工作環境下進行，遇上不安全情況下，即通知管工協調解決!

Equipment: 升降台由合資格人士簽核表格一，員工使用前必須接受過操作訓練，**升降台限載2人，負重250kgs.**，員工操作時遇有機件故障，即通知供應商派員維修!

Material: 鋁骨料約重20kgs，**全部手工具必須配有手繩，小五金配件用膠桶盛載**，防止有物件跌下風險!

Environment: 高空工作，員工穩扣雙尾扣在牢固點，**避免上下交叉作業**，圍封好工作位置，天氣酷熱，員工飲用適量水份，防止中暑!

Description: Safety Briefing for Aluminium Panel Subframe Installation on Lifting Platform

People:

There is a risk of workers falling from height. All personnel must be equipped with personal protective equipment, including a full-body safety harness with double lanyards. Work must be carried out in a safe environment. If any unsafe condition is encountered, immediately inform the supervisor to coordinate a solution.

Equipment:

The lifting platform must be approved by a qualified person using Form 1. Workers must have received operation training before use. **The lifting platform is limited to 2 persons and a maximum load of 250 kg.** If there is any mechanical failure during use, immediately notify the supplier for repair.

Material:

The aluminum subframe weighs approximately 20 kg. **All hand tools must be secured with lanyards. Small hardware components should be carried in plastic containers** to prevent the risk of falling objects.

Environment:

As this is high-level work, workers must securely attach both lanyards to a firm anchorage point. **Avoid overlapping operations above and below.** The work area must be properly cordoned off. In hot weather, workers should drink sufficient water to prevent heatstroke.

Sample

Scored 1: Lacks meaningful and site specific information

Scored: 1

Description: Ceiling

Briefed Staff: 3

Something might go wrong for:

People: N/A

Equipment: N/A

Material: N/A

Environment: N/A

Work nature: PPE

Work Activity: Full body safety harness with double lanyard



Scored: 5→1

2025-04-11`

Description: Rectification of **strut beam** defects

People: Cherry Picker Use – People: Ensure cherry picker operations are conducted by trained and licensed personnel. Conduct a pre-task briefing to highlight risks such as falls from height, entrapment, and collision, and to review all precautionary measures. Equipment: Cherry Picker Use –

Equipment: Before use, inspect the cherry picker to ensure it is in good working condition, with valid plant permit and F&IU forms certified by a Registered Professional Engineer (RPE). Check that emergency stop controls, guardrails, harness anchor points, and stability systems function correctly.

Material: Cherry Picker Use – Material: Ensure that the load (personnel and tools) in the basket does not exceed the safe working load (SWL). Secure tools to prevent falling objects and avoid carrying bulky or unstable items while elevated.

Environment: Cherry Picker Use – Environment: Inspect the work site for overhead obstructions, power lines, uneven ground, or unstable surfaces. Implement a fatal zone, barricade the area, and post warning signs. In windy or poor weather conditions, cease operations to prevent tip-overs or loss of control.

2025-04-25

Description: Rectification of **roof beams** defects

People: Cherry Picker Use – People: Ensure cherry picker operations are conducted by trained and licensed personnel. Conduct a pre-task briefing to highlight risks such as falls from height, entrapment, and collision, and to review all precautionary measures. Equipment: Cherry Picker Use –

Equipment: Before use, inspect the cherry picker to ensure it is in good working condition, with valid plant permit and F&IU forms certified by a Registered Professional Engineer (RPE). Check that emergency stop controls, guardrails, harness anchor points, and stability systems function correctly.

Material: Cherry Picker Use – Material: Ensure that the load (personnel and tools) in the basket does not exceed the safe working load (SWL). Secure tools to prevent falling objects and avoid carrying bulky or unstable items while elevated.

Environment: Cherry Picker Use – Environment: Inspect the work site for overhead obstructions, power lines, uneven ground, or unstable surfaces. Implement a fatal zone, barricade the area, and post warning signs. In windy or poor weather conditions, cease operations to prevent tip-overs or loss of control. '

Scored: 2 (Not classified as copied)

2025-04-01

Description: GTC roofing works (**Morning pre work briefing**)

People: risk of workers fall from height or tripping hazards or fall from edge

Equipment: **Inadequate maintenance**

Material: Dimension / weight / centre of gravity

Environment: **Working at height**

2025-04-22

Description: GTC roofing works **/working at height**

People: risk of workers fall from height or tripping hazards or fall from edge

Equipment: **Damaged / faulty equipment**

Material: Dimension / weight / centre of gravity

Environment: **Concurrent work**

Sample

Scored 1: Use same photo for two reporting date

2025-06-06 15:51



Description: 安裝電器線架

Briefed Staff: 2

Something might go wrong for:

People: 天氣非常熱和焗，提醒工友要多飲水，並要加上寬路華通風。如工友身體不適，要停止工作 並向管工匯報

Equipment: N/A

Material: U槽

Environment: Temperature

Work nature: PPE

Work Activity: Anti-cut hand gloves

2025-06-07 17:40



Description: 安裝消架

Briefed Staff: 2

Something might go wrong for:

People: 提醒工友，施工時使用合適工作枱，並將物料穩固，才可以進行安裝

Equipment: N/A

Material: U槽

Environment: Lighting

Work nature: House-Keeping

Work Activity: Ventilation

Sample

Scored 1: Photos of different angles reused for two reporting date

2025-06-09 17:39



Description: Pre work briefing of terrazzo seat wall

Briefed Staff: 1

Something might go wrong for:

People: Mind the finger, use the tools for heavy material transportation

Equipment: Damaged / faulty equipment

Material: Dimension / weight / centre of gravity

Environment: Concurrent work

Work nature: House-Keeping

Work Activity: Material Stacking & Storage

2025-06-10 17:28



Description: pre work briefing of terrazzo seat wall installation

Briefed Staff: 1

Something might go wrong for:

People: Mind the fingers. Use the machine for lifting the heavy materials

Equipment: Damaged / faulty equipment

Material: Dimension / weight / centre of gravity

Environment: Concurrent work

Work nature: PPE

Work Activity: Anti-cut hand gloves

Sample

DRA generated by AI without site specific information (Score: 5->1)

By AI without site specific info

utilizing a scissor lift for the installation of a ceiling

People: It is essential to ensure that operators have received professional training on the scissor lift, comprehending the correct operational procedures and safety protocols. The use of appropriate personal protective equipment (PPE) is mandatory, including hard hats, safety goggles, gloves, and non-slip footwear. Operators must maintain optimal health and refrain from working when fatigued or unwell. Furthermore, effective communication with fellow workers is crucial to ensure seamless coordination and safety throughout the operation.

Equipment: Prior to use, the scissor lift should be meticulously inspected to confirm that it is functioning correctly and free from any damage or defects. Operators must adhere strictly to the user manual to ensure proper usage, thereby avoiding accidents arising from improper operation. It is vital to comply with the lift's load limits to prevent overloading. When not in operation, the lift should be securely shut off, with the power supply disconnected.

Material: Before installation, it is important to examine the ceiling materials to ensure they are undamaged and meet the requisite installation standards. All materials should be firmly secured during the installation process to prevent any risk of falling. Suitable accessories, such as screws or expansion bolts, should be employed to guarantee the stability of the ceiling. Additionally, heavy or hazardous materials should be clearly labeled to alert all personnel involved.

Environment: The work area must be maintained in a tidy manner, with any clutter removed to ensure unobstructed access. An inspection of the surrounding environment should be conducted prior to the commencement of work to ensure that no individuals or obstacles enter the designated area. Attention should be paid to weather conditions, **thereby avoiding outdoor work during adverse weather such as high winds or heavy rain**. Lastly, a clear emergency response plan should be established, complete with designated emergency access routes and evacuation pathways in close proximity to the work area.

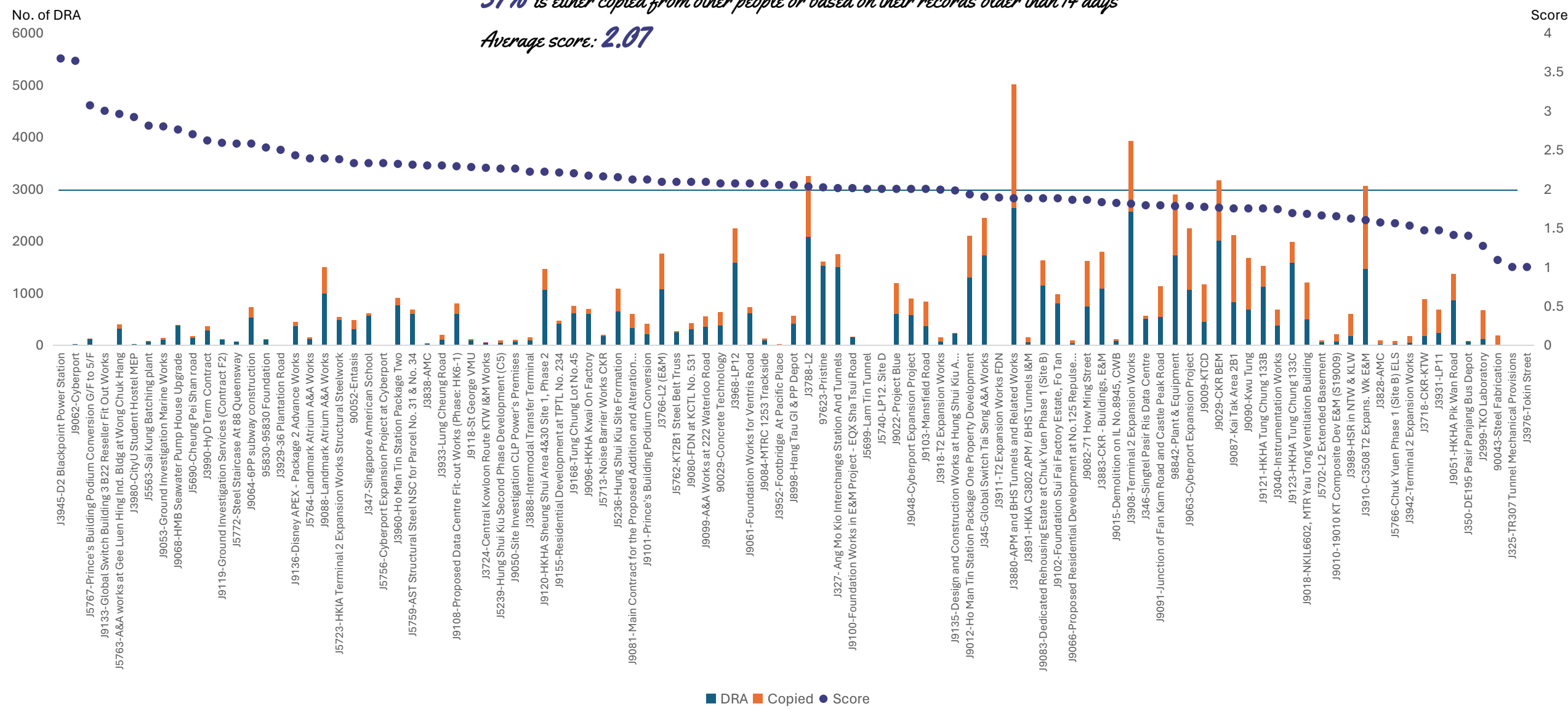
Reason by AI: The content is highly structured, formal, and comprehensive, resembling instructional or procedural text often found in manuals, textbooks, or online resources. It lacks personal anecdotes, conversational tone, or subjective insights that are typical of human-authored content. The systematic breakdown into categories (People, Equipment, Material, Environment) and the precise, technical language suggest it was likely generated by AI or copied from a professional guide or reference material.

DRA Score by Project (2025 June)

123 of 80748 records were AI-generated

37% is either copied from other people or based on their records older than 14 days

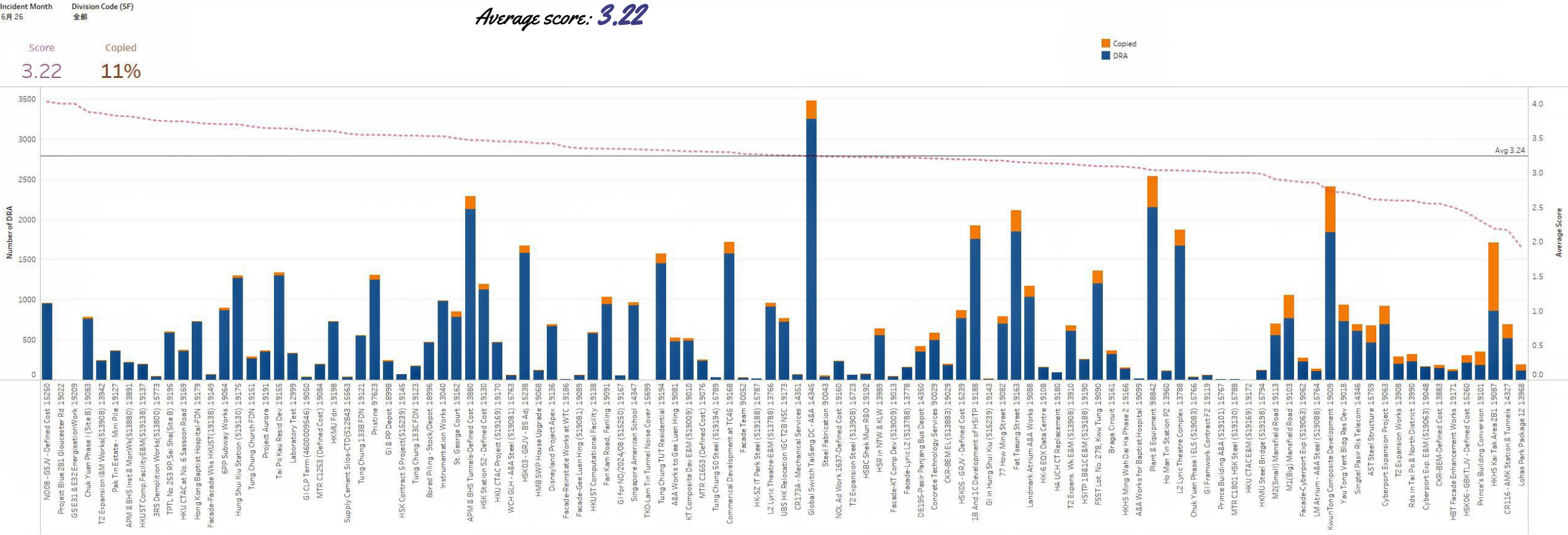
Average score: 2.07



DRA Score by Project (2026 June)

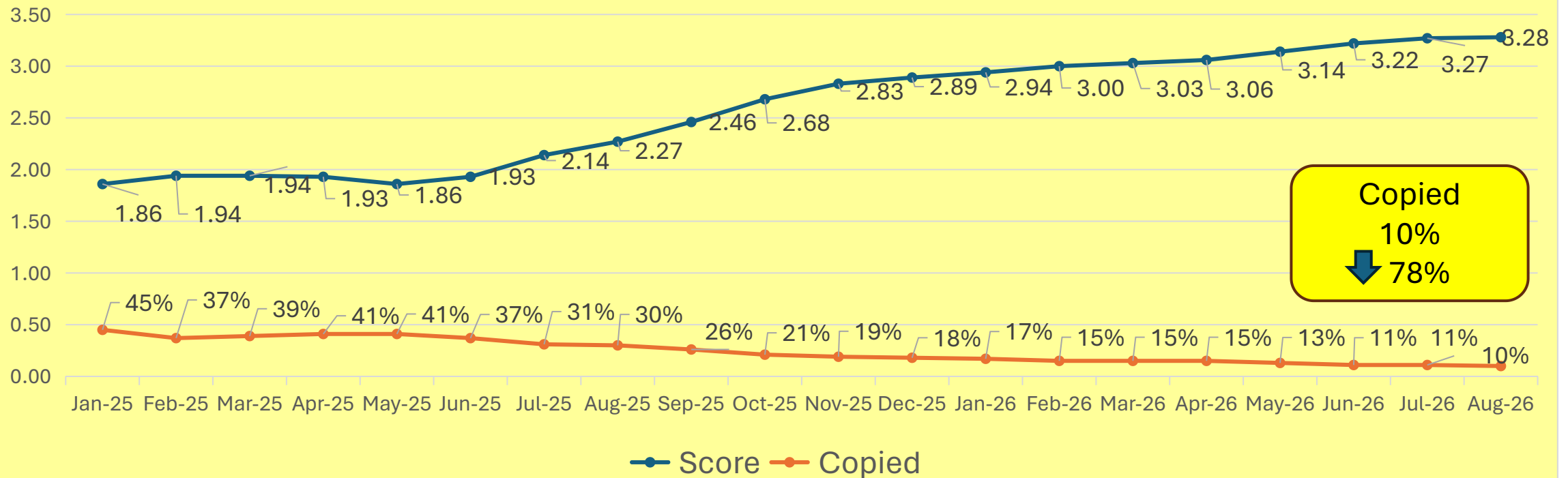
11% is either copied from other people or based on their records older than 14 days

Average score: 3.22



Is Culture Starting to Change?

iDRA Score Group Performance



DRA
SCORE
<2

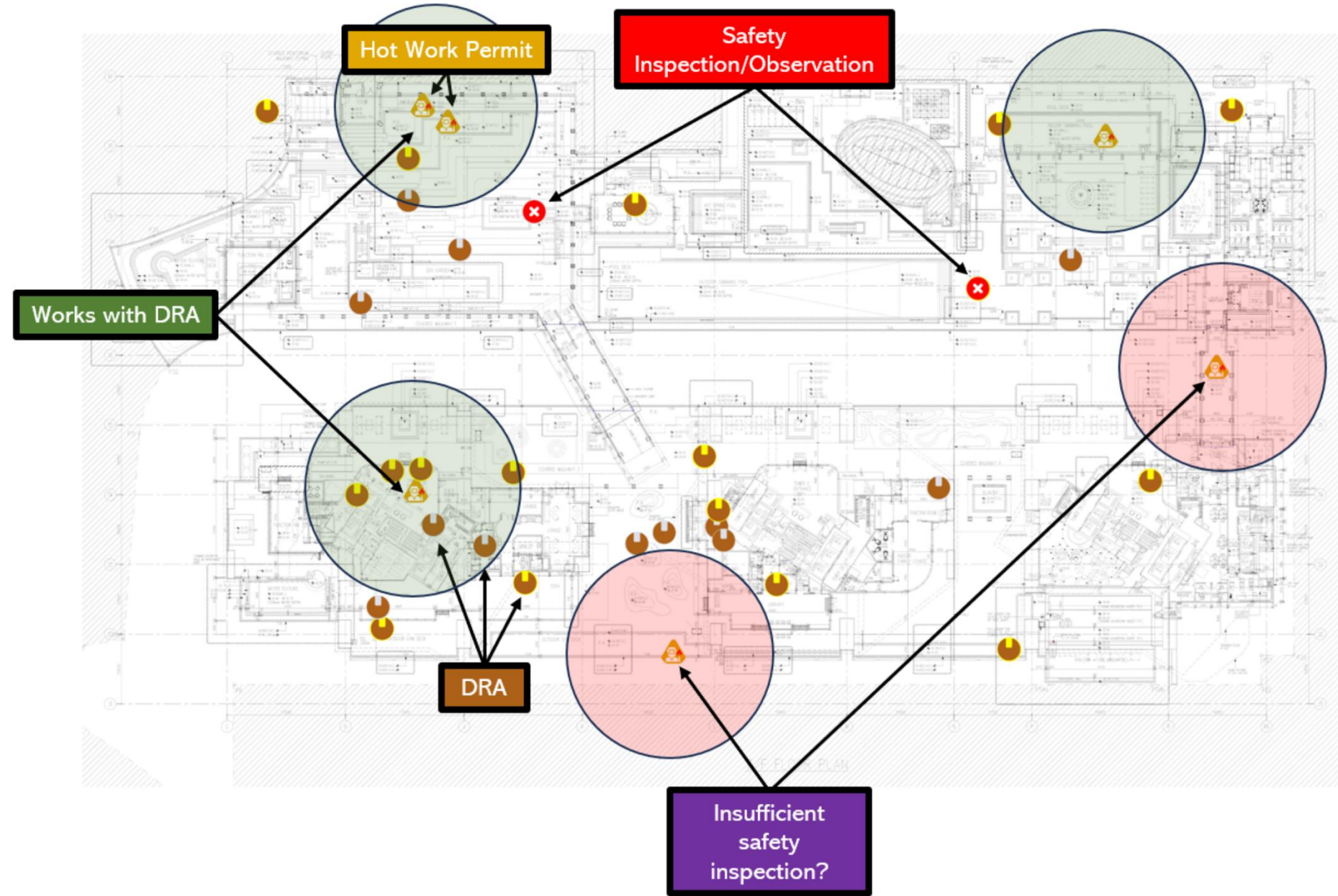
=

Reflect underlying safety issues:

- *Weak safety culture*
- *Poor hazard awareness*
- *Ineffective site supervision*

All Scoring target to act as a leading indicator

provide early signal of weak safety culture



Smart Fire Intelligence



Existing controls establish guideline for prevention and emergency response measures, though lack real-time monitor on site condition

Fire Control

WHAT 3 Things

1. Hot Work
2. Smoking
3. Substandard Storage & Equipment

**RISK OWNER:**
Leung Cheuk Ki (20 yrs)
Sub Agent

Thermal Camera - AI Detection of Temperature

Fire Detecion System

- Setup at Basement ELS works, G/F Storage area
- With the technology of thermal imaging

FIRE FIGHTING FACILITIES AT ELS AREA

PRECAUTIONARY MEASURE FOR FIRE (STORAGE & EQUIPMENT)

- ✓ AI thermal camera for instant monitoring
- ✓ Charging station with timer for power cut-off
- ✓ No Gas cylinder / Flammable material store at basement
- ✓ Setup a DG Store for gas cylinder storage
- ✓ Power cut-off for subcontractor offices at 7:00 p.m. to prevent overnight charging

CHARGING STATION

FIRE BALL & SMOKING DETECTOR

FIRE ALARM, FIRE HOSE AT EVERY FLOOR

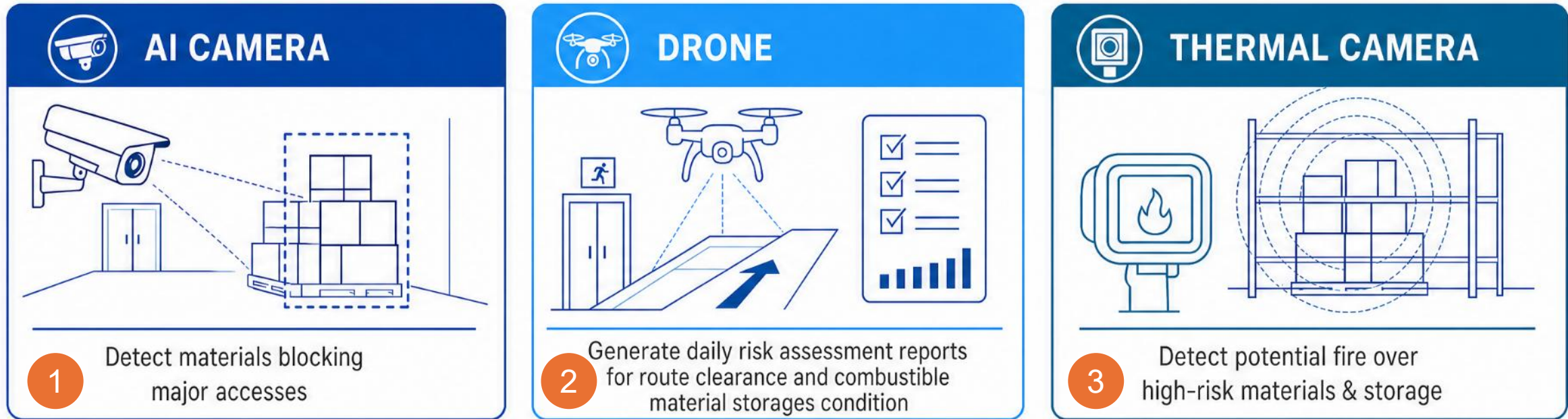
DG STORE

Smart Fire Intelligence adds an assurance layer to verify that those controls remain effective in a dynamic construction environment

PROJECT OBJECTIVES



OUR THREE LAYERS APPROACH



Our Approach to Chuk Yuen project

Layer	1 AI Camera	2 Drone Inspections	3 Thermal Camera
Deployment	Staircases as access between basement and ground level	Regular manual flights over fire escape path, basement, and site perimeter	Combustible-material storage, DC storage, and site perimeter
Tech Capability	Detect obstructed accesses	Monitor route clearance, detect accumulated combustible materials, and distance of stacks of materials	Detect abnormal heating trends and persistent hotspots
Tool	Edge AI box	LLM through BytePlus	Built-in features in the camera
Primary Output	Real-time route-blockage alert	AI-generated inspection report that includes risk score, list of risk items, and suggested action	Real-time hotspot alert plus daily temperature-trend report

Fire Safety Commend Center on Smart XR will be used to managed all alerts and reports

1 Fire Safety Score

2 AI-generated fire safety report

3 Risk map

4 Real-time alert

5 AI-generated recommended actions

6 Evidence captured

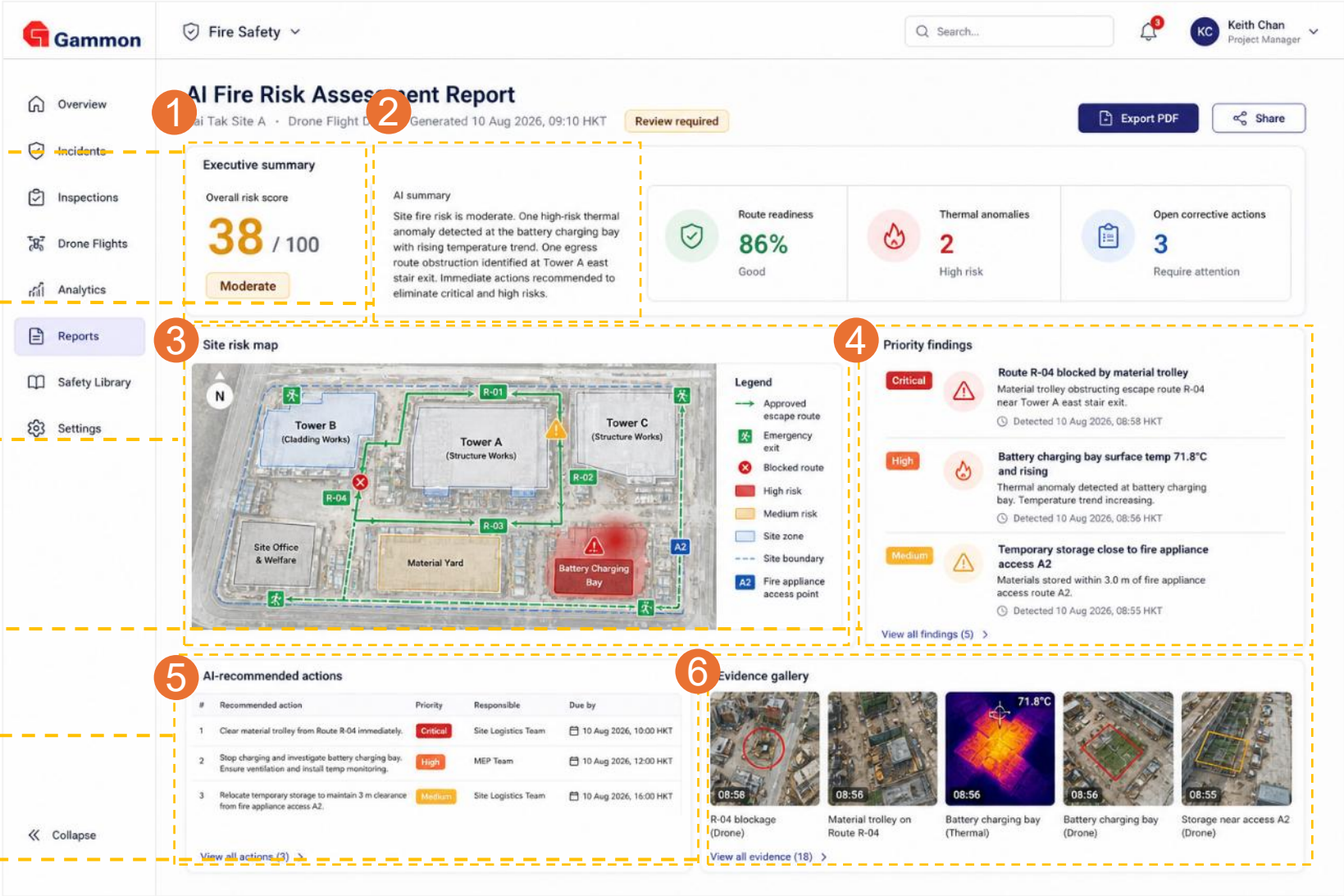


Image. Prototype of Fire Safety Command Center on Smart XR

Fire Emergency Response

根據有線新聞報導，消防及無人受傷。兩台 (2018) 晚上10時許，該兩輛停泊在豐源城第四層停車場的電動單車，突然冒起大量黑煙，消防接報後迅速趕到現場，消防員在現場將火勢撲滅，無人受傷。



Lesson Learnt from Fireman in EV Fire Fighting in Kwan Tong Fire Incident



BS EN 1869:1997



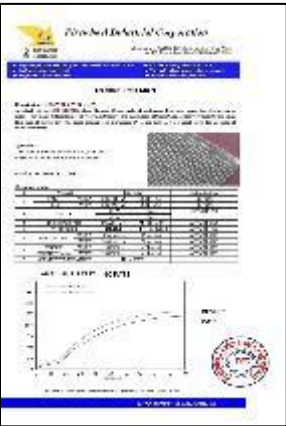
名稱	左側拉或右側拉式	規格	AST D60
顏色	左側	重量	550g/m ²
材料	雙面矽膠塗層	規格	1.6mm
厚度	2.0mm	厚度	800mm
厚度	1.6mm	厚度	800mm



6m x 8m Double sided silicon coating

Fire Blanket in TKO Vehicle Workshop & Batching Plant

Fire Fighting Exercise and Evacuation Drill in Pristine



On-site self sample test on every delivery

Certified Fire Retardant Canvas setup mandatory used for covering whole welding position to prevent unintended ignition by flying sparks

4S Centralized Platform



Smart Site Safety System



Gambot 2.0

Digitized tracking system

Application Location:

- Moving Plant / Welding Machine / Ladder

Permit-to-work system for high-risk activities

Application Location:

- Hot work Permit / Ladder Permit / Plant Permit / Lift shaft Permit / Access control Permit



G Lock

Application Location:

- Restricted area (Public Area hoarding/ demolition area hoarding)

Gtwin



- 1 中央管理平台
Centralised Management Platform
- 2 數碼化追蹤系統 (工地機械、電動工具及梯架)
Digitised tracking system for site plants, powered tools and ladders
- 3 數碼化工作許可系統 (高風險工作)
Digitalised permit-to-work system for high risk activities
- 4 危險區域進出管制 (電子鎖系統)
Hazardous areas access control by electronic lock and key system
- 5 移動設備操作區域的不安全行為/危險情況警報
Unsafe acts / dangerous situation alert for mobile plant operation danger zone



- 6 天秤吊運區域的不安全行為/危險情況警報
Unsafe acts / dangerous situation alert for tower crane lifting zone
- 7 前線工人智能監控設備
Smart monitoring devices for workers and frontline site personnel
- 8 人工智能安全監察系統
Safety Monitoring System using Artificial Intelligence
- 9 密閉空間監控系統
Confined Space Monitoring System
- 10 虛擬實境安全培訓
Safety Training with Virtual Reality Technology



Proximity Sensor System

Application Location:

- Spider Crane



VR Training

Application Location:

- All worker



Smart Watch

Application Location:

- 60 years old / potential health risks worker identified by site nurse

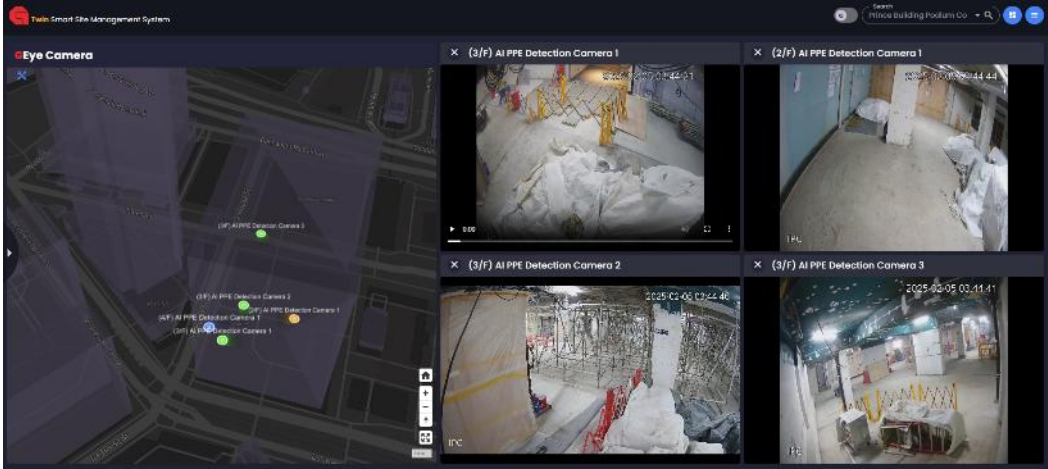
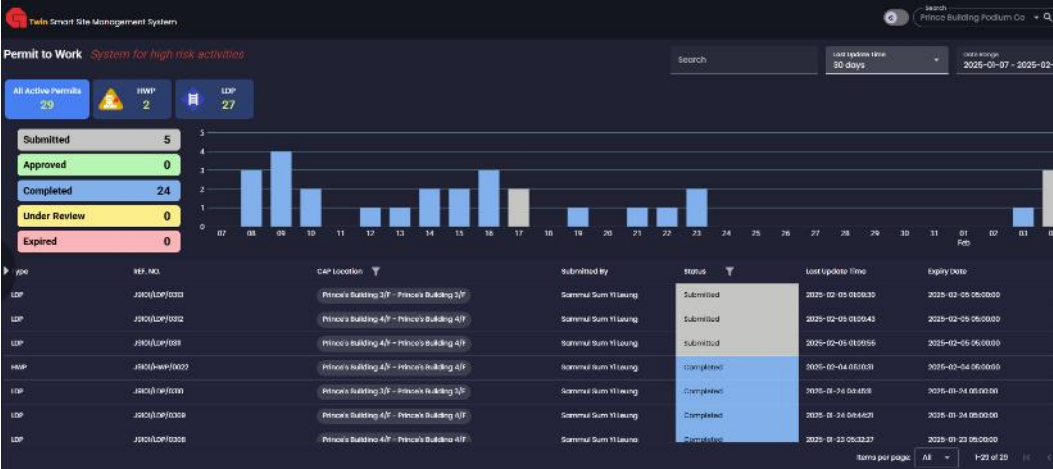
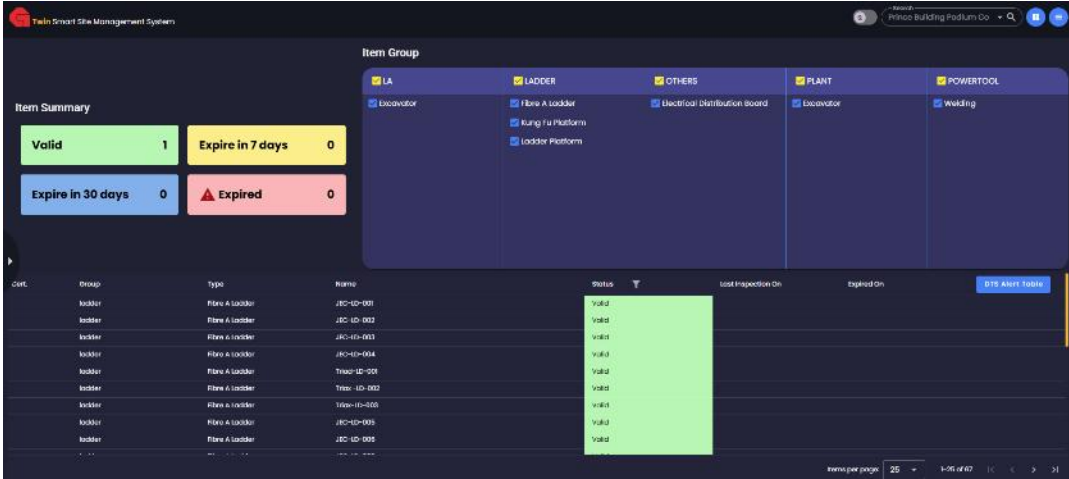
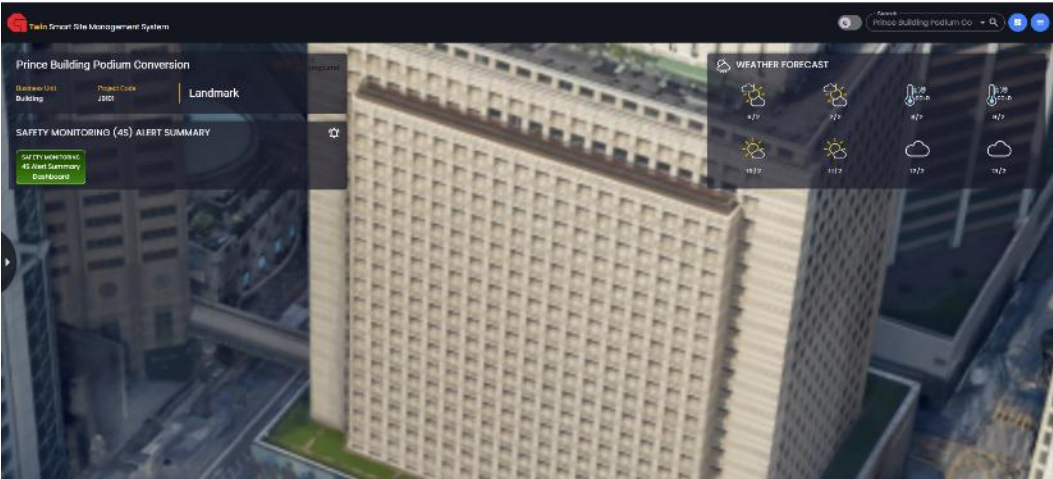


G-Eye - AI

Application Location:

- Safety helmet checking at site entrance
- Heat sensor at high fire load storage area

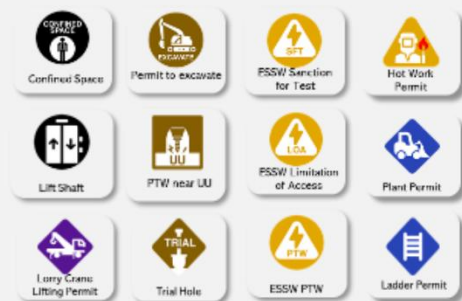
4S - Centralised Management Platform - GTwin



Digital Permit to Work

4S Compliance:

Digital PTW Use Case:



GPTW Features:

- Fully complies with the 4S requirements
- Easy to use mobile device enabled **Gambot** AI Chatbot for data entry and local viewing of PTW details
- GPTW** via **Gambot** interface can work together with **GLock**, digital E-lock and Key system as an integrated solution
- UI/UX dashboards displayed in GTwin platform provides status of all in-process and active PTW



Hard Copy Printout

Capability to print out hard copy of PTW to suit statutory requirements e.g. confined space



Digital E-ink board

Local digital display panel for PTW details and QR code link to full permit details



Portable Printer

Portable printer to print off PTW label with QR code link to full permit details



NFC Tag

Mobile device can read NFC tag and via **Gambot** automatically call up and display the approved PTW document



Integration with GLock

Capability for **GPTW** to interface with the **GLock** digital E-lock and key system

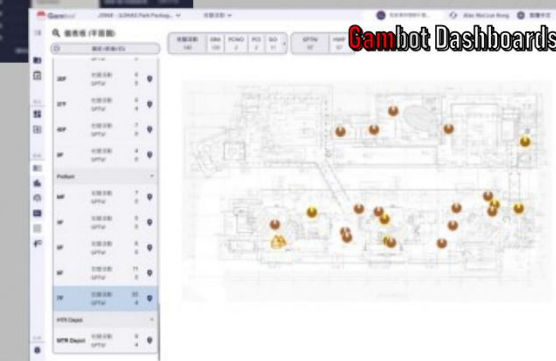


GTwin and Gambot Dashboards for viewing PTW data



GTwin can display full detailed PTW form and location plan for each active permit

GPTW has the capability to display data on permit status and locations through both the **GTwin** centralised 4S management platform and/or within the **Gambot** mobile device and desktop UX/UI interface



A photograph showing two male workers in a utility or industrial setting. They are both wearing white hard hats and high-visibility safety vests. The worker on the left is wearing a white polo shirt with 'SAFETY' and 'ELECTRIC' printed on it, and dark trousers. The worker on the right is wearing a dark blue polo shirt with a yellow safety vest over it, and dark trousers. They are standing on a red and silver step ladder. The worker on the left is holding a clipboard and looking at it, while the worker on the right is holding a small electronic device or tablet and looking at it. In the background, there are large electrical cabinets or transformers, some with yellow and green safety markings. The floor is concrete and there are some cables or pipes visible on the ceiling.

[illegible]

		Hot Work Permit (General)	HWP Rev 2.0.0
		Hot Work Permit Ref. No.: 00089/HWP/0044	
Part 1: Basic Information (To be completed by the person in charge of this Hot Work Permit)			
Sub-contractor / Operation Unit		Jin Win Engineering Ltd	
Location of Work		Building: 4/F	
Type of Hot Work		☐ Arc welding ☒ Gas welding ☐ Flame cutting ☐ Others (specify) _____	
Date & Time to Start Hot Work		Fr, 27 September 2024 at 24:00	
Date & Time of Expiry of Certificate		Fr, 27 September 2024 at 23:59	
In charge of this Hot Work Permit:			
Name: Chan Pak On		Position: _____	
Workers Assigned to this Work		Training Certificate No. _____	
(Total 1 Workers)		Training _____	
Name of the Approver or his delegate		Name: Cecily Man Kwong	
		Position: _____	
Part 2: Safety Precautions and Measures (Completed by the person in-charge of this Permit)			
(a) Variation arrangements: ☐ Manual or movement ☐ Forced ventilation is required (specify) _____			
(b) Combustible, flammable materials in the working vicinity or its vicinity: ☐ Not found ☐ Removed ☐ Covered by non-combustible or flame resistant materials.			
(c) Safety facilities for equipment:			
Arc welding ☒ Disconnecting switch ☐ MCO ☐ Shock preventer or voltage reducing unit ☒ Proper earthing ☒ Warning signs		Gas welding & flame cutting ☐ Non return valve ☐ Pressure indicator ☐ Pressure regulator ☐ Pressure gauge ☐ Cylinder valve ☐ Different colour for cylinders ☒ Warning signs ☐ Lifting capex or whasulid tray	
(d) Fire fighting equipment ☐ A fire extinguisher of powder type is in place. ☐ Others (Specify) _____			
(e) Other remarks and limitations: _____			
PPE		Requirement / Model	
☐ Hip top boots			
☐ Welders face shield			
☐ Welders goggles			
☐ Welders mask / respirator			
☐ Leather gloves for welding			
☒ Welders arm covering			
☐ Welders body coveralls / apron			



SP2023_F208_Hot Work Permit.docx

Page 1 of 1

Today

Status	Count
Under Review	0
Pending	0
Valid	2
Expired	0
Completed	0

Below the status boxes, there are five icons representing different categories:

- Blue diamond icon with a ladder (2)
- Black circle icon with 'CONFINED SPACE' and a person icon
- Yellow triangle icon with a person and a flame
- Black circle icon with a person and a flame
- Purple triangle icon with a person and a flame

ALL

Need Actions

 **J9101/LDP/0003**

Valid

 Hutchison Telecommunications (I

 Prince's Building 3/F - Prince's Bu

 17/10/24 22:00 - 18/10/24 05:00

 Jacky Cheuk Fan Li

submitted at 18/10/24 01:30

 **J9101/LDP/0002**

Valid

 The Jardine Engineering Corporat

 Prince's Building 3/F - Prince's Bu

 17/10/24 22:00 - 18/10/24 05:00

 Jacky Cheuk Fan Li

submitted at 18/10/24 01:28

Five stages for How Work ePTW



Warning System for Plant and PPE non-compliance

4S Compliance:



Plant People
Separation



Plant Fatal
Zone

IoT and/or Eye (Edge AI Cloud) Solution Use Case:

- Fully complies with the 4S with following capabilities:
 - Automated warning system on mobile plant (e.g. excavator, mobile & crawler cranes etc) to alert and unsafe situation of site personnel encroaching on mobile plant operation zone.
- Beeinventor and Kong Chun have been selected as preferred suppliers for use on Gammon owned mobile plant automated warning system. We have jointly developed an IoT data integration API to allow real-time data and alerts from Beeinventor IoT platform to be transmitted to GTwin and Gambot mobile APP's.

Gammon IoT and AI solutions API connectivity with specialist vendor solutions for Mobile Plant Unsafe Acts / Dangerous Situation Alert Monitoring

Beeinventor UWB Proximity Tag solution

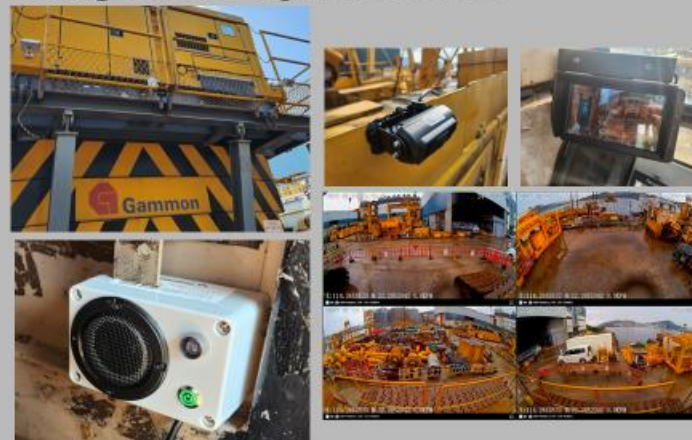
Mobile Plant Working Zone Alert System Interface with smart helmets- provides alerts for workers entering restricted zone



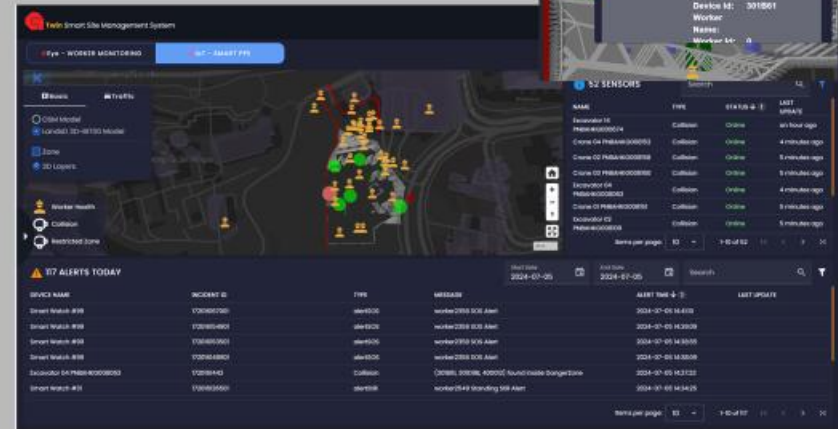
Distrack- Tracking and Collision Accident Prevention
Ultra Wide Band (UWB) technology collision warning function and tracking of machines locations in both outdoor and indoor environments.
Once workers enter the preset working perimeter of mobile plant, alarm system will alert the operator and workers to avoid potential collision.



Kong Chun Edge AI solution



API Integration with GTwin 4S dashboards to display Worker Smart PPE status & alerts



API Integration with Gambot mobile APP to send SMS alerts generated by Smart Helmet and/or proximity sensors



Smart Site Safety System (4S)



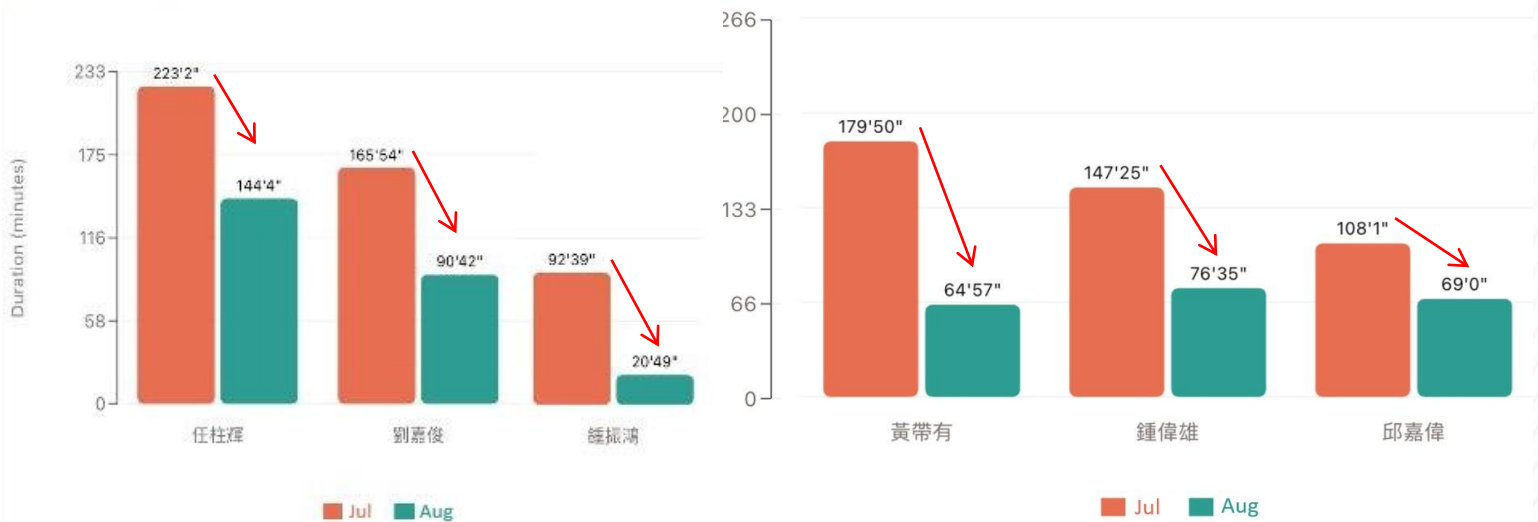
安全智慧工地系統標籤計劃
SMART SITE SAFETY SYSTEM
LABELLING SCHEME

Fatal Zone Sensor



Fatal Zone Alert Duration

Worker Alert Durations



Further safety training

DASHBOARD

J9195 Cross Project

< 1/2 > [Icons]

Fatal Zone Alert Duration

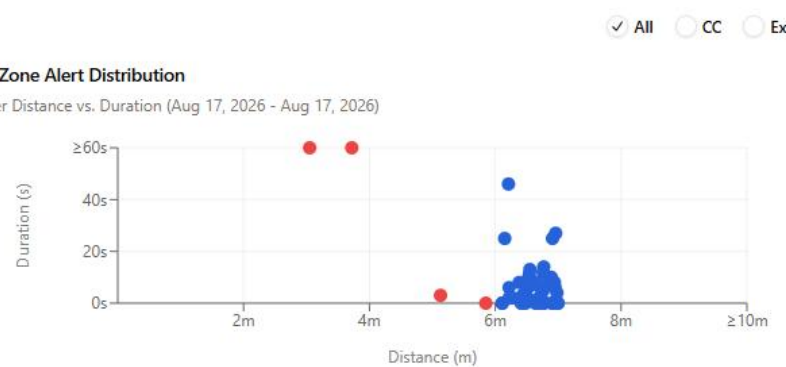
Worker Alert Durations (Aug 17, 2026 - Aug 17, 2026)



Showing total alert durations for each worker

Fatal Zone Alert Distribution

Worker Distance vs. Duration (Aug 17, 2026 - Aug 17, 2026)



Distribution of worker alerts (danger in red: ≤6m CC, ≤4m Ex). Showing 52 alert points.

Worker Average Distance

Average Distance per Worker (Aug 17, 2026 - Aug 17, 2026)



Showing average distances for all workers

Daily Total Fatal Zone Alerts

Aug 11, 2026 - Aug 15, 2026



11/08 12/08 13/08 14/08 15/08

5-Day Trend

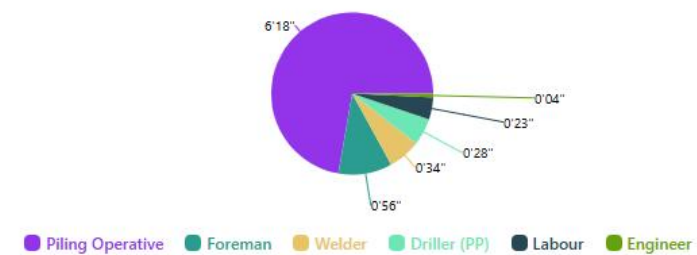
-54.0%

Day-over-Day Changes

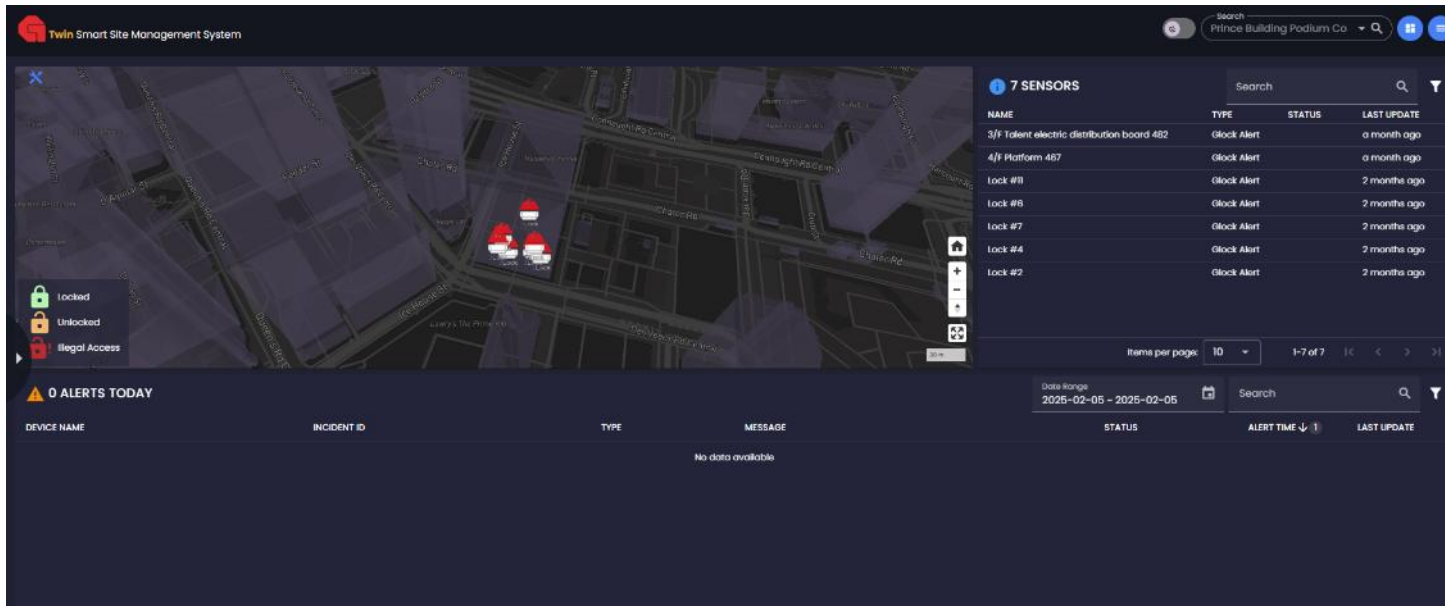
12/08 -12.1%
13/08 -34.6%
14/08 -17.0%
15/08 -3.6%

Daily Fatal Zone Alert Duration

Position Group Alert Durations - Aug 16, 2026



4S - Area Access Control



Applicable Area:

- External hoarding doors
- Lift shaft access

4S - Smart Monitoring System – AI Cam



Applicable Area:

- Site Entrance
- Internal floor works area

Twin Smart Site Management System

Search Prince Building Podium Co

Eye Camera

× (3/F) AI PPE Detection Camera 1

× (4/F) AI PPE Detection Camera 1

× (3/F) AI PPE Detection Camera 3

Twin Smart Site Management System

Search Prince Building Podium Co

PPE Monitoring

× (2/F) AI PPE Detection Camera 1

× (3/F) AI PPE Detection Camera 1

12 ALERTS 2025-02-03 to 2025-02-04

ALERT TIME ↓	DEVICE NAME	INCIDENT ID	MESSAGE	MEDIA	STATUS
2025-01-27 10:57:03	(4/F) AI PPE Detection Camera 1	6799f6093912820270780d54	No PPE detected at 2025-01-27 10:57		Ack
2025-01-27 08:31:15	(4/F) AI PPE Detection Camera 1	6798b7bc3912820270789b6f	No PPE detected at 2025-01-27 08:31		Ack
2025-01-25 14:20:14	(3/F) AI PPE Detection Camera 1	679482a639128202707849ff	No PPE detected at 2025-01-25 14:20		Ack
2025-01-25 11:35:30	(2/F) AI PPE Detection Camera 1	67945b4639128202707837fc	No PPE detected at 2025-01-25 11:35		Ack
2025-01-25 00:07:18	(3/F) AI PPE Detection Camera 1	6793bbdb3912820270781e21	No PPE detected at 2025-01-25 00:07		Ack

4S - Smart Monitoring Devices

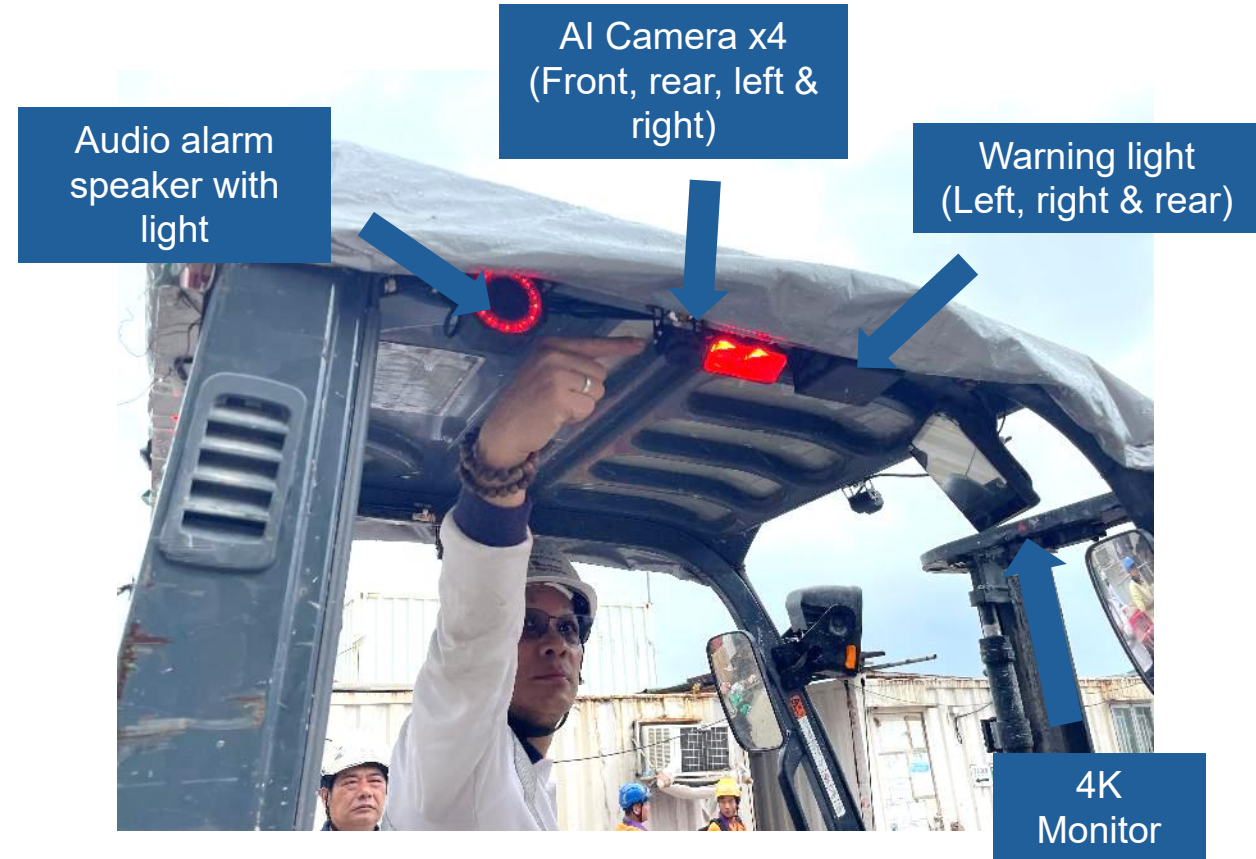


- 60 years old above
- Tower Crane Operators
- potential health risks worker identified by site nurse

- Description:
- Heart rate
- Blood pressure
- Blood oxygen
- Body temperature
- Standing still alert
- SOS



Trialing technologies – getting involved



AI Smart Forklift System is deployed in our projects to ensure

1. **Pedestrian-approach warning:** Alerts forklift drivers when pedestrians are detected within the vehicle's operating zone
2. **Moving-vehicle warning:** Provides audible and visual warnings to nearby personnel when a forklift is moving or approaching

Tech on Concrete Delivery Truck

- ❑ Align the Standard between Gammon and Service Suppliers Concrete Delivery Truck



	Front Car Camera	Digital Fleet	Handbrake Alarm	Reversing Video Device	Wheet-nut Indicator	Unfoldable discharge chute or hand entrapment prevention
Gammon	100% (14 nos.)	100% (14 nos.)	100% (14 nos.)	100% (14 nos.)	100% (14 nos.)	100% (14 nos.)
All Service Suppliers	100% (49 nos.)	100% (49 nos.)	100% (49 nos.)	100% (49 nos.)	100% (49 nos.)	100% (49 nos.)

Working At Height Technology



Innovative devices / application

Scaffolding Sensor



Provide 24/7 AI-powered scaffolding safety monitoring with real-time alerts for structural abnormalities and safety risks.

- Trial at Project Aurora

Vibration & Displacement Monitoring
震動與位移監測

Cloud-Based Incident Reporting
雲端事件回報

Automated Safety Insights
智能安全洞察

Wireless Alert Activation
無線警報聯動



- Trial at TUT

太陽能充電
Solar Charging

脫離報警 Detachment Alarm
棚架橫軸與豎軸脫離即報警
Triggers immediately upon detachment of the bamboo scaffold's horizontal and vertical axes.

溫度報警 Temperature Alarm
預設值: 50°C / 80°C / 100°C
Default Value: 50°C / 80°C / 100°C



> 3年電池續航力
(採用 Sigfox 技術,不需要基站)
> 3Years Battery Life
(OG Sigfox Technology, no base station required)

距離改變 Distance Change
雲端物理AI
根據拉線長度變化進行結構健康分析及報警
Cloud-based Physical AI
Intelligently performs structural health analysis and issues alerts based on changes in cable length.

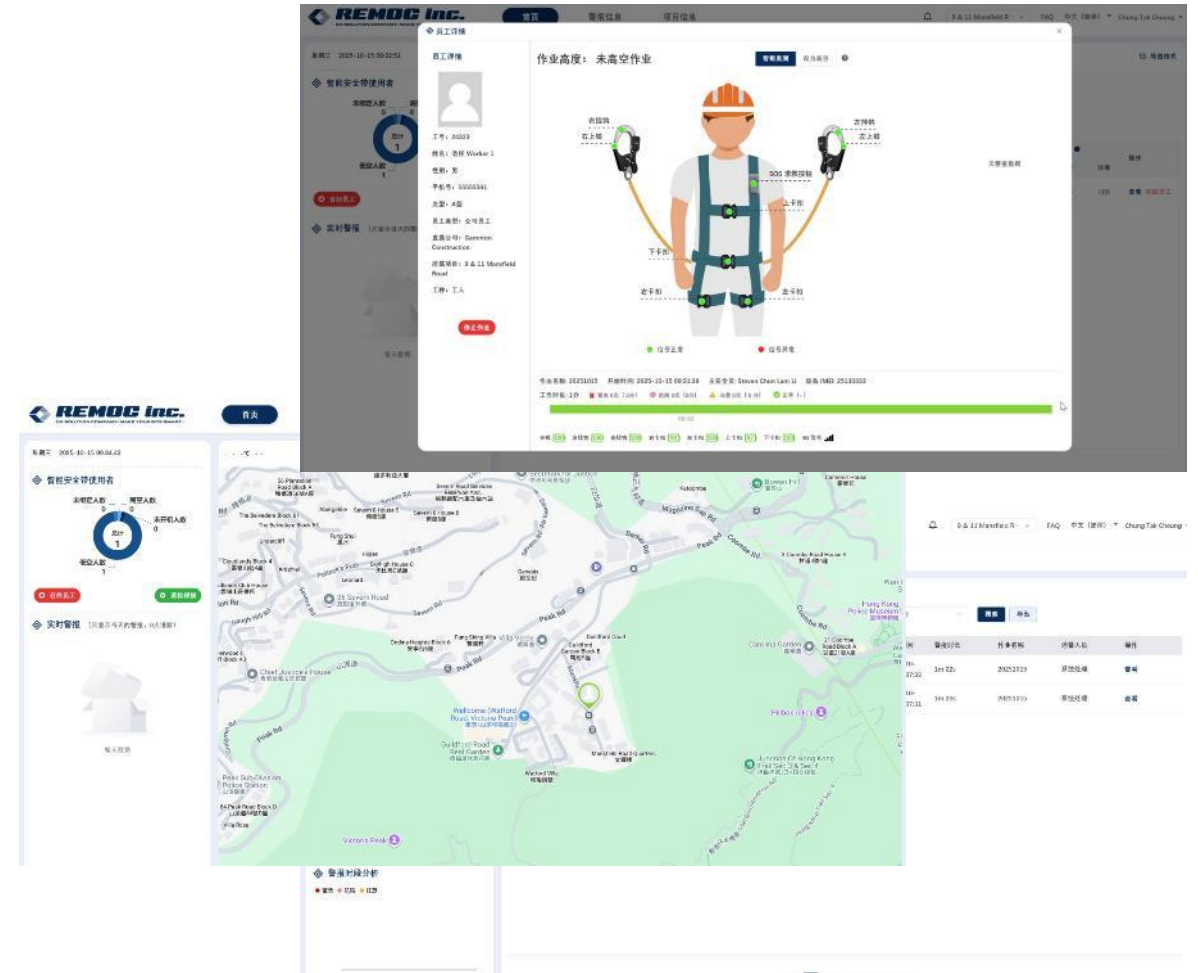
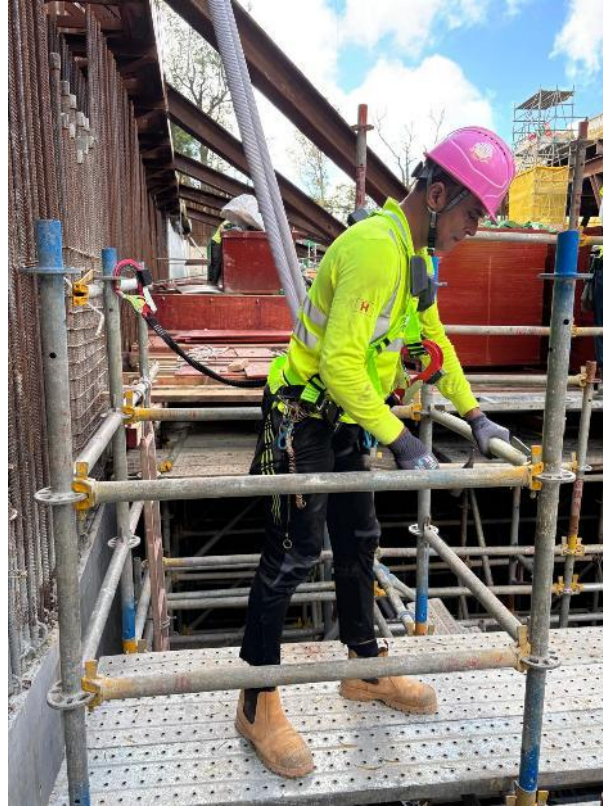
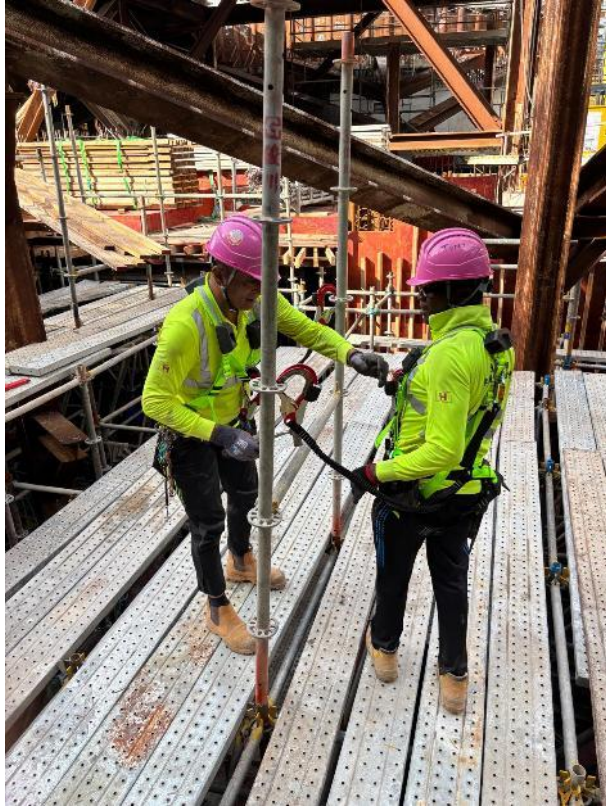
傾角報警 Tilt Angle Alarm
雲端物理AI
根據傾角變化智能報警
Cloud-based Physical AI
Intelligently issues alerts based on changes in inclination angle.

Real-time Scaffold titling sensor

1. **Early warning of instability:** Continuously monitors scaffold tilt and identifies movement beyond the defined safe threshold.
2. **Enablement of preventive action:** Sends real-time alerts so the team can inspect, reinforce, restrict access or evacuate the affected area promptly



We trial technologies





Advanced Guard Rail System
扶手先行系統

Plant, Equipment and Tools



Innovative devices / application

Unmanned Tower Crane (UMTC) System

Solving Tower Crane Operation Pain Points

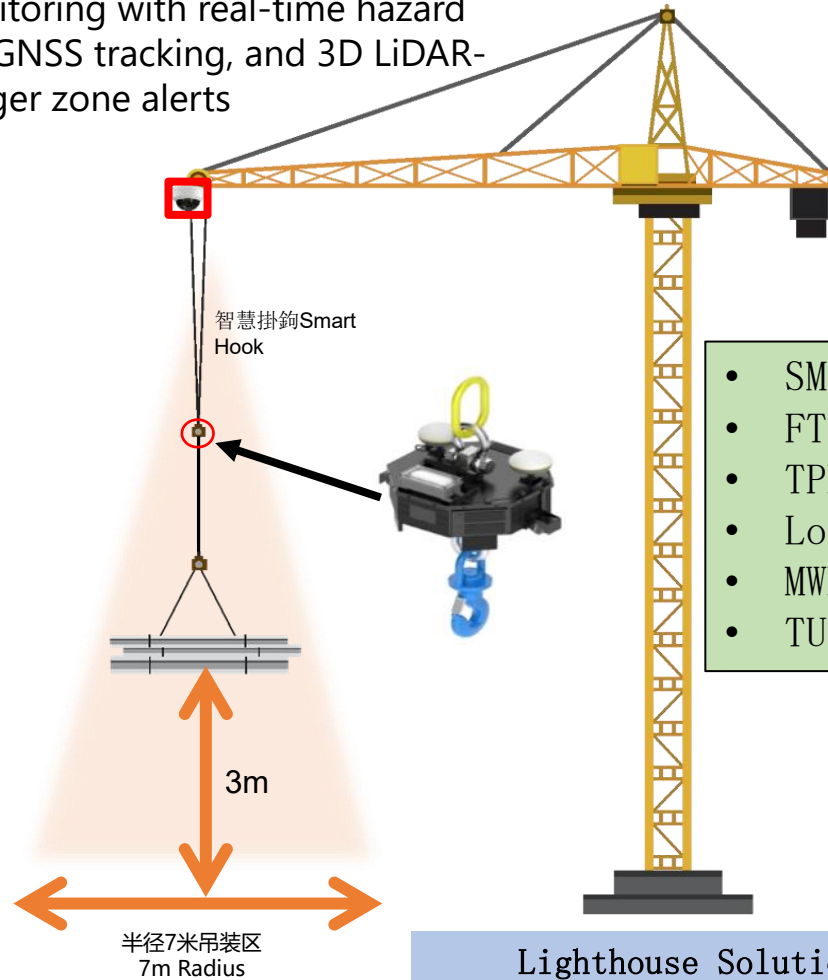
- **Improve the tower crane operating environment**
Move tower crane operation to a safe ground control room, allowing operators to handle the crane without being exposed to wind and sun in a confined space.
- **Reduce labor shortages in construction trades**
The new work mode better matches the expectations of the younger generation for the work environment, significantly increasing their willingness to enter the industry.
- **Improve tower crane efficiency**
The hoisting analysis platform provides 3D crane models and data charts for in-depth analysis of hoisting progress and efficiency.
- **Comprehensively improve construction site safety**
The smart system automatically detects dangerous conditions in the hoisting area; using the original tower-body sensors, it identifies potential risks during tower crane operation.



Innovative devices / application

3-3-3 lifting Monitoring Solution

Provide AI-powered tower crane lifting safety monitoring with real-time hazard detection, GNSS tracking, and 3D LiDAR-based danger zone alerts



- SMFR
- FTS
- TPK
- Loop
- MWDH
- TUT

Lighthouse Solution
AI-Lift (PA24-085)



- FTS



Antron TC Solution V2
Targa

2026-06-12 14:43:39

鏡頭出 畫面放大

鏡頭入 畫面縮小

3m

當前放大倍數: 3.1x

建議放大倍數: 0.8x

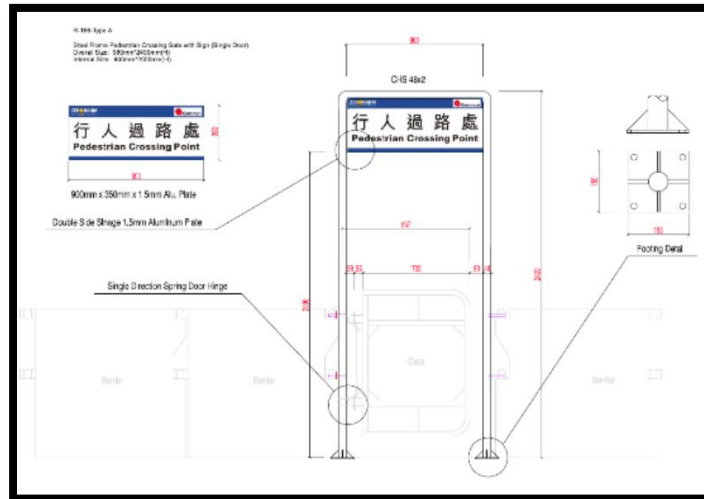
RTK: 16.30 吊鉤高度: 12.20 吊鉤高度: 0.00 吊物半徑: 0.97 吊物重量: 620.00

Site Logistics

Access Gate gantry



Standard design for
Single Door access
gate & Gantry



AI cam with
flashing red
light



Phase 1

- Alert pedestrians with a Red flashing light when vehicles were approaching

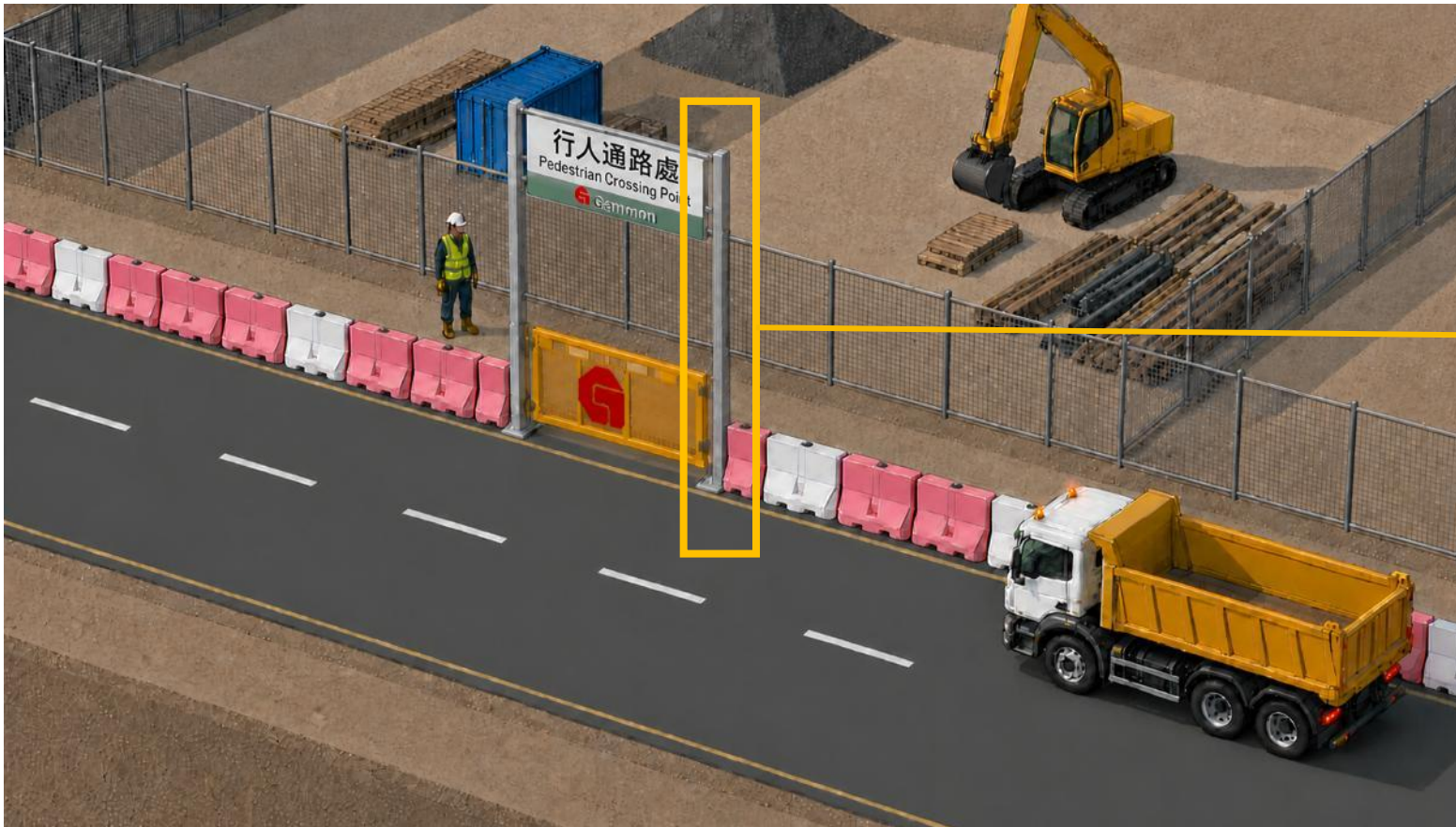
Phase 2 features will include

- AI camera for vehicle and human detection
- Traffic light alerts (green and red)
- Sound alerts

Smart Pedestrian Crossing System

Provide an automated, highly visible warning at the crossing point whenever a vehicle approaches from either direction

- Trial at TCBH
- To be implemented in all Building projects

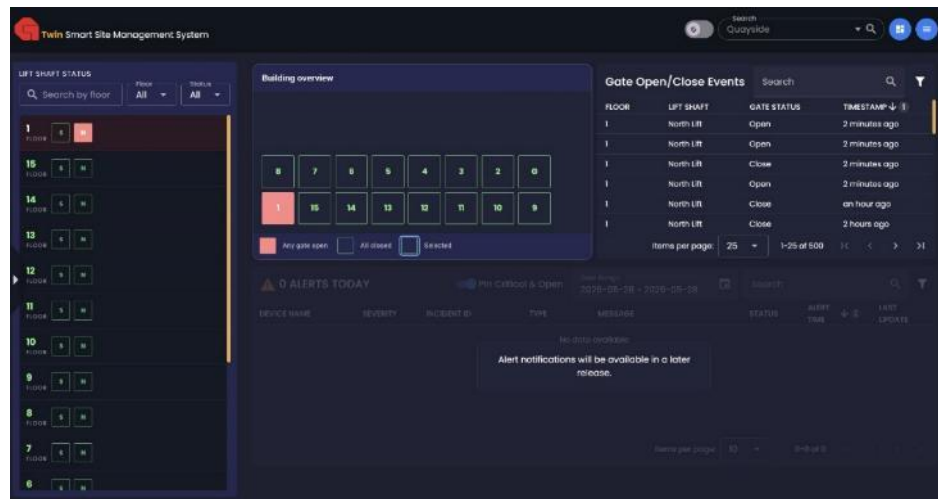


Innovative devices / application

Temporary Door Sensor



- Provides an early warning if the temporary door is left open, damaged or bypassed.
- Supports safer site operations where people may be moving materials and not paying close attention.
- Interlinkage with the permit to work and smart lock system to improve the lift shaft safety management
- Potential to monitor other openings and door



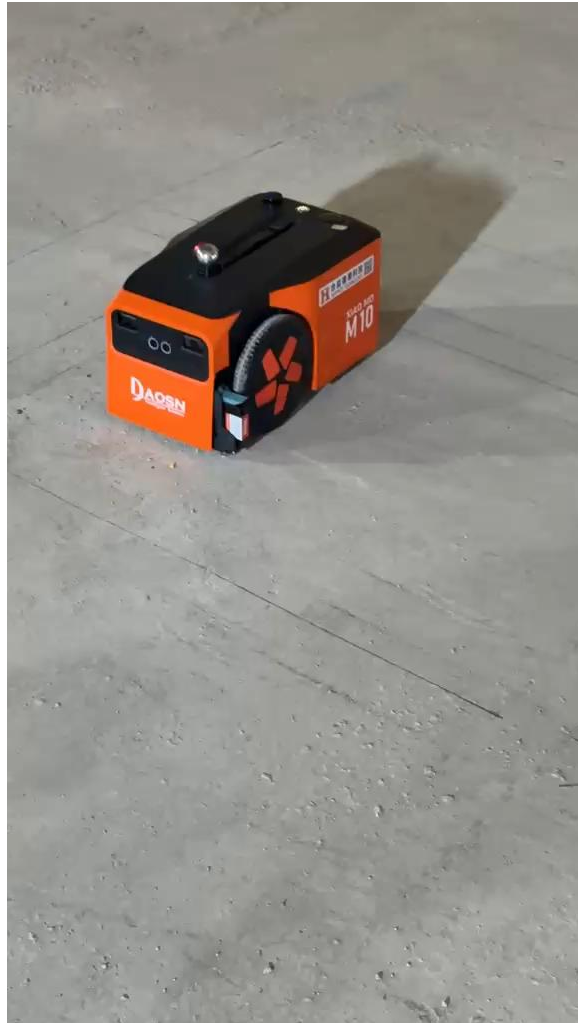
- Trial at KTCD



LED Light installed in the lift shaft

Innovative devices / application

Setting out Robot



- 2 mm accuracy
- Able to 借線
- One person can complete line-marking tasks with a handheld tablet
- Suitable for floor graphics, car-parking lines and road mark, and complex geometric tasks such as floor curving and circular markings

- Trial at FTS and TCBH



Secondary Guarding

Smart Monitoring System for Mobile Elevating Work Platform (MEWP)



紅外測距感測器
infrared distance sensor



推桿直流電磁鐵
Push-rod DC solenoid

- To be tested at FTS and TUT

- Infrared distance sensors for real-time obstacle detection around the scissor lift
- Automatic safety protection to prevent collision with nearby structures or overhead hazards
- Enhanced operator safety through continuous monitoring and warning alerts

**Demolition using
Ultra Long Arm Excavator**



Demolition using Ultra Long Arm Excavator



Roof Beam Removal after Rood Slab have been demolished and crushed

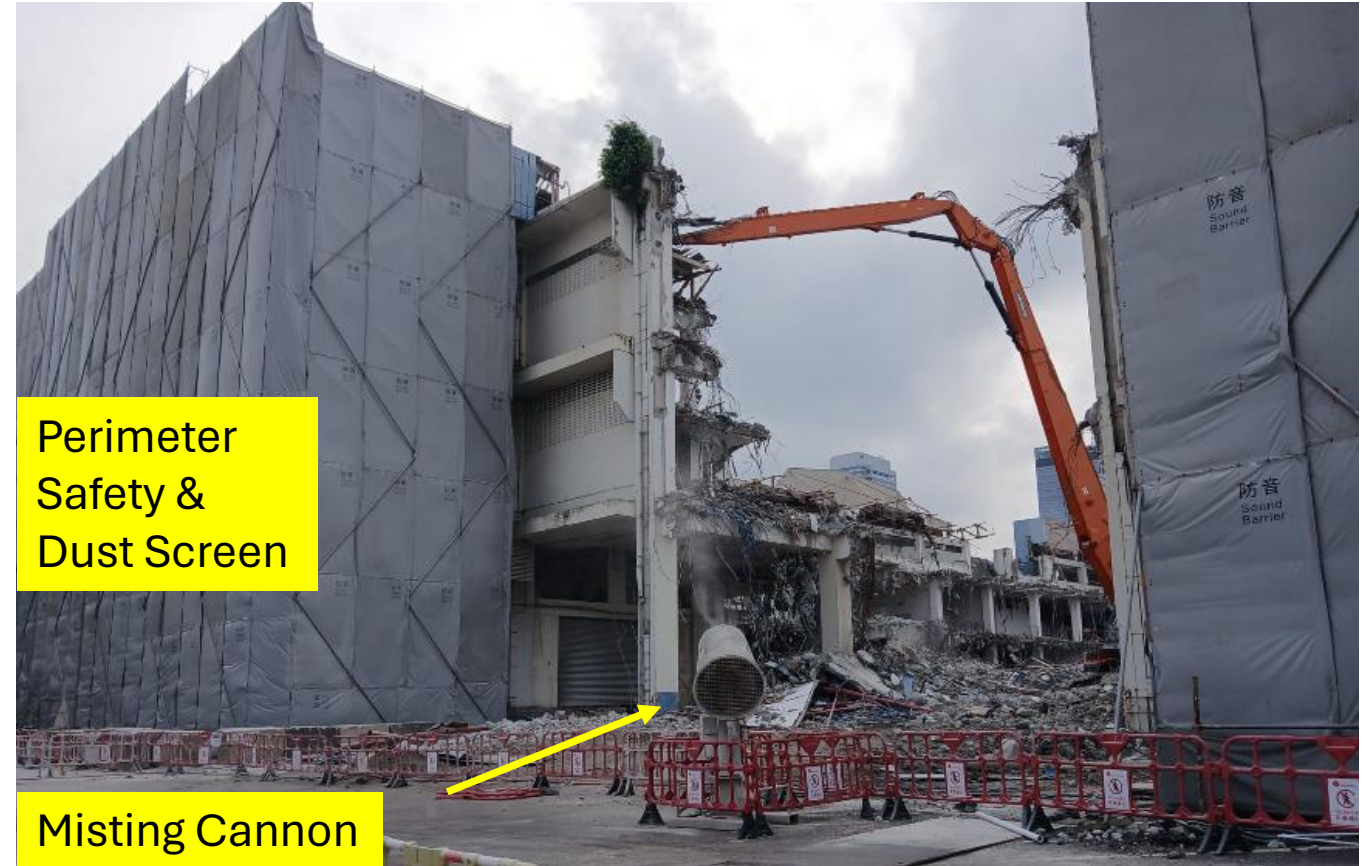


Removal of Roofing sheet and purlins

Demolition using Ultra Long Arm Excavator



Gable End removal of Façade using 2 ultra long arm excavator.



Perimeter Safety & Dust Screen

Misting Cannon

Demolition using Ultra Long Arm Excavator



Roof Beam/Slab removal based on the PT and load transfer distribution study prior to execution on site

Demolition using Ultra Long Arm Excavator



Roof Beam/Slab removal based on the PT and load transfer distribution study prior to execution on site

Technology supported Safety

Gammon Pte limited
Gammon Construction and Engineering Pte Ltd



Digital Construction Rehearsal

We've moved beyond static planning. We don't just 'plan' construction; we are positioning ourselves to be able to rehearse it. By integrating SketchUp, Lumion, and Fuzor—powered by the Meta Quest 3—we have built a 'Digital Construction Rehearsal' pipeline that ensures every person on-site has experienced the project before they enter the site. The first project this will be implemented is will be DE 195



Technology supported Safety

Gammon Pte limited
Gammon Construction and Engineering Pte Ltd



Digital Construction Rehearsal – For Site workers, Subcontractors & Engineers



Zero-Harm Culture: Identifying risks in a Meta Quest 3 headset before they exist in reality can actively prevent accidents

Technology supported Safety



Lumion: The Pictorial Method Statement (PMS)

Visual Sequence Validation: We use Lumion to create step-by-step 3D snapshots and animations that narrate the construction process. It allows our subcontractors and site teams to see the sequence of work, eliminating the 'interpretation gap' that often leads to errors on-site.

MAJOR SCOPE OF WORKS (INSTALLATION OF PRECAST WALL PANEL)			
WBS 1.0 – HOISTING OF PRECAST WALL PANEL FROM STORAGE AREA			
STEP	ACTIVITY	ILLUSTRATIONS	NOTE(S)
1.1	Hoisting of precast wall panel from storage area for installation 1. Provide working platform of hand level ground with provision of steel plates for crawler crane stability during lifting operation. 2. Clear the storage area of precast panels unobstructed of any unwanted materials and keep access passable at all times. 3. Ensure later zone enclosure is well maintained to prevent unauthorized entry of personnel in the work area. 4. Prepare and lay down stopper i.e. wheel tyre below the wall base prior to lift to prevent slips and side sway movement of the wall panel		1. Ensure that crawler crane is positioned at permissible radius and boom angle with sufficient capacity to lift the load 2. Keep away from lifting zone and never stand under suspended load 3. Ensure all lifting gears are properly checked, free of defects and in good working condition prior to use. 4. Standing supervision by lifting supervisor throughout the whole duration of lifting operation 5. Provide minimum two (2) taglines to control side sway movement of precast wall panel when lifted up 6. Lifting plan to be prepared and duly approved prior to commence hoisting operation 7. Only qualified and appointed lifting crews allowed to perform lifting operation Hold Point Lifting Supervisor to check that lifting points comply with design requirement. Lifting Supervisor to ensure that lifting zone are cleared of personnel under suspended load and all these points are in good working condition prior to lift. Check list • Lifting Plan approved • PTW permit approved

MAJOR SCOPE OF WORKS (INSTALLATION OF PRECAST WALL PANEL)			
WBS 2.0 – INSTALLATION OF PRECAST WALL PANEL			
STEP	ACTIVITY	ILLUSTRATIONS	NOTE(S)
2.1	Setting out 1. Set reference line and offset line to determine the position of precast wall to correct symmetry and alignment 2. Mark the precast wall location on the kerb and determine the level of the in-situ concrete 3. Provide level pads or shim plates on top of the kerb for setting the level of the wall. Set the level pads in position using non-shrink mortar 4. Check the position of wall starter bars to ensure it is vertically aligned with cast-in corrugated ducts to receive the compression lap bars		1. Keep area clear of unwanted materials or tools to prevent slips, trips and falls in the work area 2. Use appropriate and correct hand tools when carrying out the works 3. Position self in correct posture to prevent being caught in pinch point 4. Check the accessibility of work area to ease difficulty of installation Residual Risk Maintain proper housekeeping and keep access open at all times to prevent tripping hazards

MAJOR SCOPE OF WORKS (INSTALLATION OF PRECAST WALL PANEL)			
WBS 2.0 – INSTALLATION OF PRECAST WALL PANEL			
STEP	ACTIVITY	ILLUSTRATIONS	NOTE(S)
2.2	Lifting and installation 1. Check that all lifting gears are free of defects and in good working condition prior to use 2. Lift the wall panel to its designated location by use of a wire rope with suitable lifting gears of sufficient capacity 3. Ensure that the operating radius of the crane is clear of obstruction and nobody allowed to stay under suspended load while lifting operation is on-going 4. Cordon off the work area if necessary to prevent unauthorized entry of personnel to avoid being hit by suspended load due to accidental dislodge of the panel		1. Avoid impact loading caused by sudden jerking during lifting and lowering. Take up slack on the sling gradually 2. Begin a lift by raising the load gradually to ensure that the load is free and that slings are in full tension taking the load 3. Ensure to provide minimum of two (2) taglines to control wall panel movement 4. Keep hands away from pinch points as slack is being taken up 5. Wear proper hand gloves when handling wire rope during lifting operation Hold Point Lifting Supervisor to lower mandatorily supervision throughout the course of the lifting operation. Check that lifting plan is properly addressed and complied with associated safe work procedures for lifting and installation of precast elements Check list • PTW permit approved • Checks on lifting gears • All personnel out of lifting zone

MAJOR SCOPE OF WORKS (INSTALLATION OF PRECAST ELEMENTS)			
WBS 3.0 – INSTALLATION OF DIAGONAL PROPS FOR WALL PANEL			
STEP	ACTIVITY	ILLUSTRATIONS	NOTE(S)
3.2	Release of lifting gears on top of the wall panel 1. Refer to T4 HOLD POINT 2. Use of scissor lift as means of access to remove the lifting gears attached at lifting points 3. Ensure wall propping is well secured prior to release the lifting gears hooked at lifting points 4. Wear body harness attached to a rigid anchor point when working at height 5. Rigor removed the lifting gears attached at lifting points		1. Only trained, competent and appointed SRP can raise T4. 2. TWC must approve T4 to release lifting gears hooked to lifting points 3. Only trained, competent and appointed scissor lift operator can operate the machine T4 Hold Point SRP to check all props have been installed. Site Supervisor to confirm veracity of the wall panel (so further adjustment) and SRP to raise T4 for approval by TWC to release the lifting gears attached at the wall panel Check list • T4 Permit to release lifting gears • Checking of wall propping security



When we present a PMS in Lumion, we aren't just showing a schedule; we're showing a professional, photorealistic vision of our logistics.

Tools and Workbench



Pudwill Leadership Center



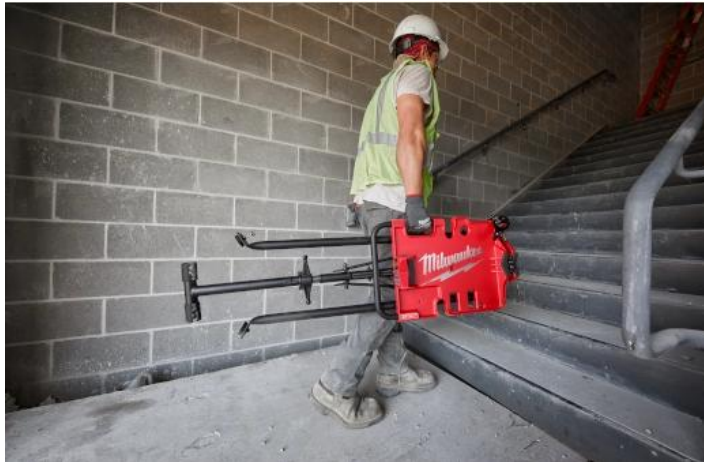
Pudwill
Leadership
Center



Milwaukee

Milwaukee
Factory
Visit

6" LEVELING TRIPOD CHAIN VISE



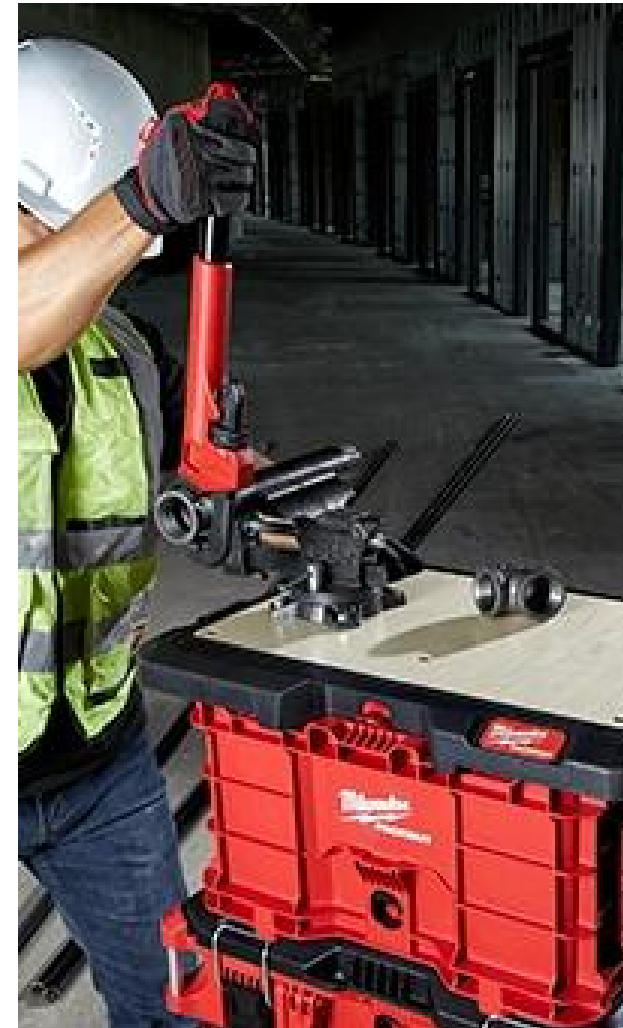
- **Pipe Diameter Range:** Up to 6 inches Pipe diameter
- Quickest, Painless Set-Up
- Capacity 480kg
- Adjustable Leg for Level Alignments



PACKOUT™ Customizable Work Top

48-22-8488

- 13mm Thick marine grade plywood
- Clear coat finish provides a smooth work surface
- Replaceable wood top



Illustration



Over 40S
With Spark

- M18 FSX | M18 FUEL™ SUPER SAWZALL™**
- 3000 SPM with a 32 mm stroke length delivers fast and effortless cutting in a wide range of materials
 - 5 variable speed settings from 1500 SPM to 3000 SPM to allow the correct speed to be set for the material being cut
 - FIXTEC™ blade clamp for fast and easy blade changes without any key
 - 32mm Stroke length removes more material with each stroke
 - Orbital action allows the saw to clear the cut of debris giving a faster cut in wood materials



Super SawZall
8 Second
Cold Cut
No Re-bar Size limit

- M18 FRBCO32 | M18 FUEL™ Rebar Cutter**
- M18 FUEL Rebar Cutter provides 2 second cuts through Y16 bar, delivers up to 240 cuts in Y16 rebar with M18 FB6
 - Cut-Brake: When selected, blade will automatically stop after cutting to avoid injuries caused by accidental contact with operating accessories
 - RAPIDSTOP™ Braking provides stop times under 1 seconds
 - Exclusively compatible with Rebar Cutting Blade, which uses carbide teeth to cut faster and providing cold cutting with less sparks than an abrasive wheel



Rebar Cutter
3 Second
Cold Cut
90 Degree Sharp Cut
Auto-Stop
Up to Y32

- M18 FBS125 | M18 FUEL™ 125mm Deep Cut Bandsaw**
- Cut-Brake: When selected, blade will automatically stop after cutting to avoid injuries caused by accidental contact with operating accessories
 - Three variable speed mode select to optimize RPM across applications
 - A tool-free adjustable shoe, to help guide the user through a straighter cut
 - LED work light to illuminate the work piece
 - Up to 78 cuts per charge for 5.0Ah in 41mm Unistrut



Deep Cut Band Saw
8 Second
Cold Cut
No Re-bar Size limit
Auto Stop



Nothing but **HEAVY DUTY.**

M18 FPCS | M18 FUEL™ Steel Pipe Cutter



- Delivers the easiest, consistent, clean cuts on 12-34mm steel pipe
- Delivering square cuts with minimal burrs, Steel Pipe Cutter offers the fastest process for cutting steel pipe for press and threading installs
- Needing as little as 2.5" of clearance, the tool delivers controlled cuts on installed pipe, preventing the risk of overcuts
- The tool's foldable cut fence allows you to make controlled cuts on new pipe without the need for fixturing
- Sliding mechanism keeps blade guarded throughout cut prevent accidental contact with the blade



Steel Pipe Cutter

2 Second
Cold Cut
90 Degree Sharp Cut
Up to 34mm

M12 FBS64 | M12 FUEL™ Compact Band Saw



- Fastest Cutting Band Saw with 64 mm x 64 mm Cut Capacity in Unistrut
- Over 2X as fast as the M12™ Sub-Compact Band Saw in Unistrut
- Lightest Compact Bandsaw - Less fatigue, Comfortable overhead use
- Integrated Blade Covers to allow for One-Handed Use
- Proprietary blade size 776.3 mm in length – only compatible with the M12™ FUEL Compact Band Saw



Compact Band Saw

4 Second
Cold Cut
No Size limit





Concrete Vibrator

M18 Fuel™ Concrete Needle Vibrator - 1.2m

M18 FCVN12-0

- The M18 FUEL Needle Concrete Vibrator is a no setup solution, making consolidating concrete hassle free
- The POWERSTATE Brushless Motor generates 1.8 Peak HP and 12,500 CPM for optimal consolidation with a variable speed trigger
- The M18 FUEL Needle Concrete Vibrator is a critical installation tool and joins 200+ tools in the M18 System

HEAVY DUTY



M18™ Brushless Threaded Rod Cutter

M18 BLTRC-0C

- M18™ brushless threaded rod cutter delivers a fast and effortless solution for cutting threaded rods
- Integrated brushless motor provides the user the power to cut through 1/4", 3/8" and 1/2" mild steel or 1/4", 3/8" stainless steel threaded rod, with a run time of up to 400+ cuts with a 2.0 Ah battery
- Included cutting dies cover the most common sizes of threaded rod: 1/4", 3/8" and 1/2", which can be changed by rotating the dies



Ceiling Rod Cutter

FASTEST NUT RUNNING

RUN AND FASTEN FOR QUICK ASSEMBLY

For use with standard 3/8" hex nuts, 9/16" wrench

UP TO 9X FASTER THAN HAND SPINNING

COMPATIBLE WITH 3/8" threaded rod



MOST DURABLE, SHOCKZONE™
Shank absorbs peak torque

SIDE ACCESS For easy adjustments

FOR USE WITH IMPACT DRIVERS ONLY

SHOCKWAVE
IMPACT DUTY



Rod Nut Runner-M8 Threaded rod

The LOOP – Flying Factory



Improving mobility and reducing downtime



Movable and customizable Packout / Chain Vise & for balanced storage / usage needs



Trade specific tools | Matching the right tools

1. Generic and **TRADE SPECIFIC** tools are recommended for each of the main 4 trade groups
2. Each group of tools are stored in 4 different Packout customized containers respectively
3. Chain Vise(s) or/and Packout Mobile Work Top Set(s) could be used in front of the containers (storage indoor after use)

TOP VIEW



PERSPECTIVE



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Trade specific tools | Matching the right tools

		HVAC	FIRE P	PLUMBING	ELECTRICIAN
Workstation/bench	Chain Vise	●	●	●	●
Metal Working	Dual Trigger Safety Grinder	●	●	●	●
Concrete (w dust mgt)	Overhead hammer	●	●	●	●
Drilling & Fastening	Hydraulic Driver Nut Runner	●	●	●	●
Cold Cutting	Impact Wrench 3/8" - 1" (M18 - M42) Generic cold cutting Special Cold Cutting	●	●	●	●
Cable Cut & Crimp		●	●	●	●
Special Tools		●	●	●	●
Accessories		●	●	●	●
PPE, Batt & Chargers	Anti-Cut Cooling Sleeve	●	●	●	●

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Standardized Hand Tool and Equipment Deployment



1. Armor Cable Cutter



2. Cold Cut to Unistrut



3. Cordless Driller with dust extraction



4. Threaded Rod Cutter



5. Cordless Fan



6. Driver with ADT module



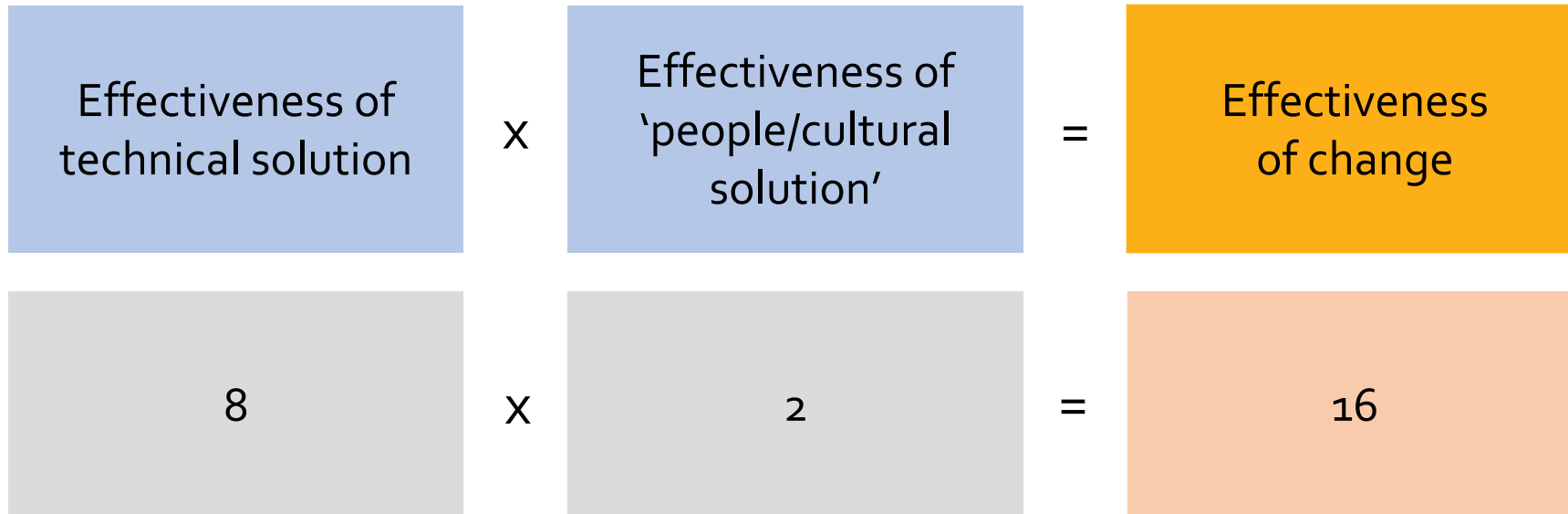
7. Charging Station



8. Mobile Power Station



GE change acceleration process



What approaches can improve the **'people / cultural solution'**?

Nils Bohlin

invented the modern three-point seat belt in 1959 while working for Volvo to solve the severe dangers of simple lap belts, which often caused internal abdominal injuries during crashes. His goal was to safely restrain both the upper and lower body during high-speed deceleration using a comfortable, single-handed design.



Thank you

