



CONSTRUCTION  
INDUSTRY COUNCIL  
建造業議會

# The Future of Construction Industry Amid The COVID-19 Pandemic

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17 Feb 2021



## CIC Vision

*To drive for unity  
and excellence of  
the construction  
industry of  
Hong Kong*

1US\$ = 7.8HK\$



# The COVID-19: An Unprecedented Public Health Crisis

- COVID-19 Global Pandemic
  - > 106 million confirmed cases
  - > 2.3 million deaths in > 210 countries (WHO as at 10 Feb 2021)
- Economies Hard-hit
  - Global economy -4.4% (IMF)
  - HK economy - 6.1% (HKSAR Government)
- Worked Tirelessly to Adapt to the Pandemic Challenges
  - Initiating and implementing various intervention measures to maintain business continuity
  - Ensuring the health and safety
- Vaccines might start Helping Societies emerge from the Predicament





# CIC: Preventive Measures against COVID-19 for Construction Sites



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生命第一  
LIFE FIRST

## GOOD PRACTICE ON PREVENTIVE MEASURES AGAINST COVID-19 FOR CONSTRUCTION SITES



INTRODUCTION



17/2/2021



# CIC: Preventive Measures against COVID-19 for Construction Sites

## WHEN ENTERING WORK SITE



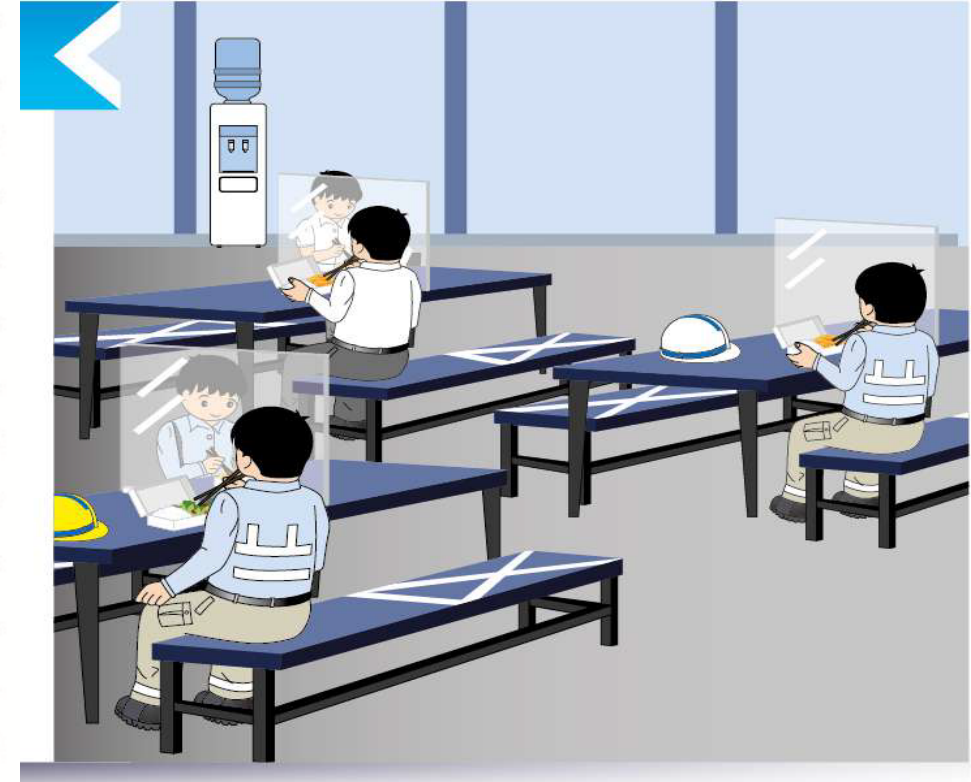
## Using Changing Room



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# CIC: Preventive Measures against COVID-19 for Construction Sites

## Frontline Work Arrangement



## Meals and rest Arrangement





# CIC: Preventive Measures against COVID-19 for Construction Sites

## Inspection on preventive measures



General Hygiene Requirements

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# CIC: Preventive Measures against COVID-19 for Construction Sites



## निर्माण स्थलों के लिए COVID-19 संबंधी निवारक उपायों पर उत्तम कार्य-प्रथाएँ (Hindi 印地文)



### परिचय

निर्माण उद्योग परिषद (Construction Industry Council - CIC) द्वारा COVID-19 महामारी और निर्माण श्रमिकों के समक्ष मौजूद जोखिम की प्रतिक्रिया में यह संदर्भ तैयार किया गया है। उद्योग के सभी हितधारक निर्माण स्थलों में काम करते समय संक्रमित होने की संभावना को कम करने के लिए अनुशंसित निवारक उपायों को अपनाने और लागू करेंगे। उद्योग द्वारा इस संदर्भ का उपयोग स्वास्थ्य सुरक्षा केंद्र द्वारा दी गई नवीनतम जानकारी के साथ किया जाएगा। इसके अलावा, टेकेंटर नवीनतम निबंधन के प्रकाश में समय-समय पर उपयुक्त निबंधन उपायों को तैयार करने और निवारक उपायों की समीक्षा करने के लिए अपने संचालन की आवश्यकताओं पर विचार करेंगे।

### कार्यस्थल में प्रवेश करते समय



- साइट में प्रवेश करने वाले सभी कर्मियों का पंजीकरण किया जाना चाहिए और उनका आवासीय पता, संपर्क विवरण, प्रवेश समय और विनासक युक्त व्यक्तिगत जानकारी दर्ज की जानी चाहिए।
- साइट में प्रवेश करने वाले सभी कर्मियों को स्वास्थ्य घोषणा-पत्र भरे जाने चाहिए, शरीर के तापमान की जांच करवायी होनी चाहिए और सर्विकल मास्क पहनना होगा।
- साइट में प्रवेश करने वाले सभी कर्मियों को साइट पर शुरू किए गए मोबाइल एप्लिकेशन-लीवहोमसेफ "LeaveHomeSafe" का उपयोग करने के लिए प्रोत्साहित किया जाना है।
- गोपनीयता के उपायों को पहचान के उद्देश्य से सुगम बनाने के लिए, श्रमिकों की प्रत्येक टीम की हेल्मेट पर रंगीन स्टिकर लगाए जाने चाहिए।
- महामारी के विकास पर नवीनतम अपडेट और श्रमिकों के लिए प्रामाणिक निबंधन उपायों से संबंधित प्रशिक्षण दिया जाना चाहिए।
- COVID-19 के किसी संदिग्ध और पुष्ट मामलों के प्रक्षेप के लिए संघर्ष तंत्र विकसित किया जाना चाहिए।
- इस संदर्भ में स्वास्थ्य घोषणा पत्र का नमूना दिए गए QR कोड से डाउनलोड किया जा सकता है।

### चेन्जिंग रूम (वस्त्र बदलने का कमरा) का उपयोग



- चेन्जिंग रूम में उपयोगकर्ताओं को अलग करने के लिए पर्याप्त पाटीमान होने चाहिए। अर्थात्, उपयोगकर्ताओं को मास्क पहनना चाहिए और अन्य उपयोगकर्ताओं से 1.5 मीटर की सामाजिक दूरी बनाए रखना चाहिए।
- प्रत्येक सुविधा के आकार के आधार पर, एक ही समय में चेन्जिंग रूम का उपयोग करने वाले श्रमिकों की संख्या को सामाजिक दूरी बनाए रखने की आवश्यकताओं को पूरा करने के लिए निर्दिष्ट किया जाना चाहिए।
- चेन्जिंग रूम को हवादार होना चाहिए और नियमित रूप से उसे साफ़ तथा क्लोरिनेट किया जाना चाहिए।
- परामर्श-संक्रमण के जोखिम को कम करने के लिए प्रत्येक कार्य दल के लिए निर्दिष्ट चेन्जिंग रूम प्रदान किया जाना चाहिए। यदि साइट विभिन्न कार्य-दलों को पर्याप्त संख्या में विभिन्न चेन्जिंग रूम प्रदान नहीं कर सकती है, तो कार्य दलों को कारी-करी से चेन्जिंग रूम का उपयोग करने की प्रक्रिया हेतु प्रत्येक कार्य दल द्वारा उपयोग के बाद कार्य को साफ और कीटाणुनाशित किया जाना चाहिए।

### फ्रंटलाइन कार्यव्यवस्थाएँ



- भीड़-भाड़ और शोरों को कम करने के लिए लचीले कार्य-समय (यदि उपयुक्त हो) को अपनाने।
- निर्धारित कार्य क्षेत्रों और कार्य दलों के लिए सीमा निर्धारित करना।
- सामाजिक कार्य दल केवल निर्दिष्ट कार्य क्षेत्र में काम कर सकता है।
- कार्य क्षेत्रों को स्पष्ट रूप से सीमांकित किया जाना चाहिए। एक ही कार्य क्षेत्र में काम करते समय विभिन्न कार्य दलों को कम से कम 1.5 मीटर की दूरी बनाए रखनी चाहिए।
- परिधान के लिए श्रमिकों की प्रत्येक टीम के हेल्मेट पर रंगीन स्टिकर लगाए।
- अन्य कार्य-स्थलों के साथ परस्पर संक्रमण से बचने के लिए, श्रमिकों के लिए एक ही टीम में काम करने की व्यवस्था की जानी चाहिए।

## Social Inclusion

- Chinese
- English
- Hindi
- Nepali
- Urdu



Construction Industry COVID-19 Testing Service Scheme



Example of Preventive Measures Inspection Form

17/2/2021





# Beyond COVID-19: Crisis or Opportunities for the Construction Industry?

- Support the Industry
  - Anti-epidemic Fund for the industry
  - Construction Industry Caring Campaign
  - Waive the registration fees
  - Provide training subsidies for the unemployed/underemployed
- Risks vs Opportunities
  - To promptly innovate and transform their business processes and operational practices
  - Adoption of advanced technologies such as **digitalization** and **industrialization**...



# HK Construction Industry



- ✍ A driver to promote economic growth
- ✍ An enabler to improve social development
- ✍ A key player to enhance Hong Kong's long term competitiveness





# HK Government will continue to invest in infrastructure and housing

- **2020 HK Policy Address**

- Annual expenditure on infrastructure > \$100 Billion (US\$12.8B)
- 10-year Long Term Housing Strategy 316,000 public housing units
- Increase Land Supply > 100,000 public and private housing units 10 to 15 years
- 15,000 transitional housing units from 2020-21 to 2022-23

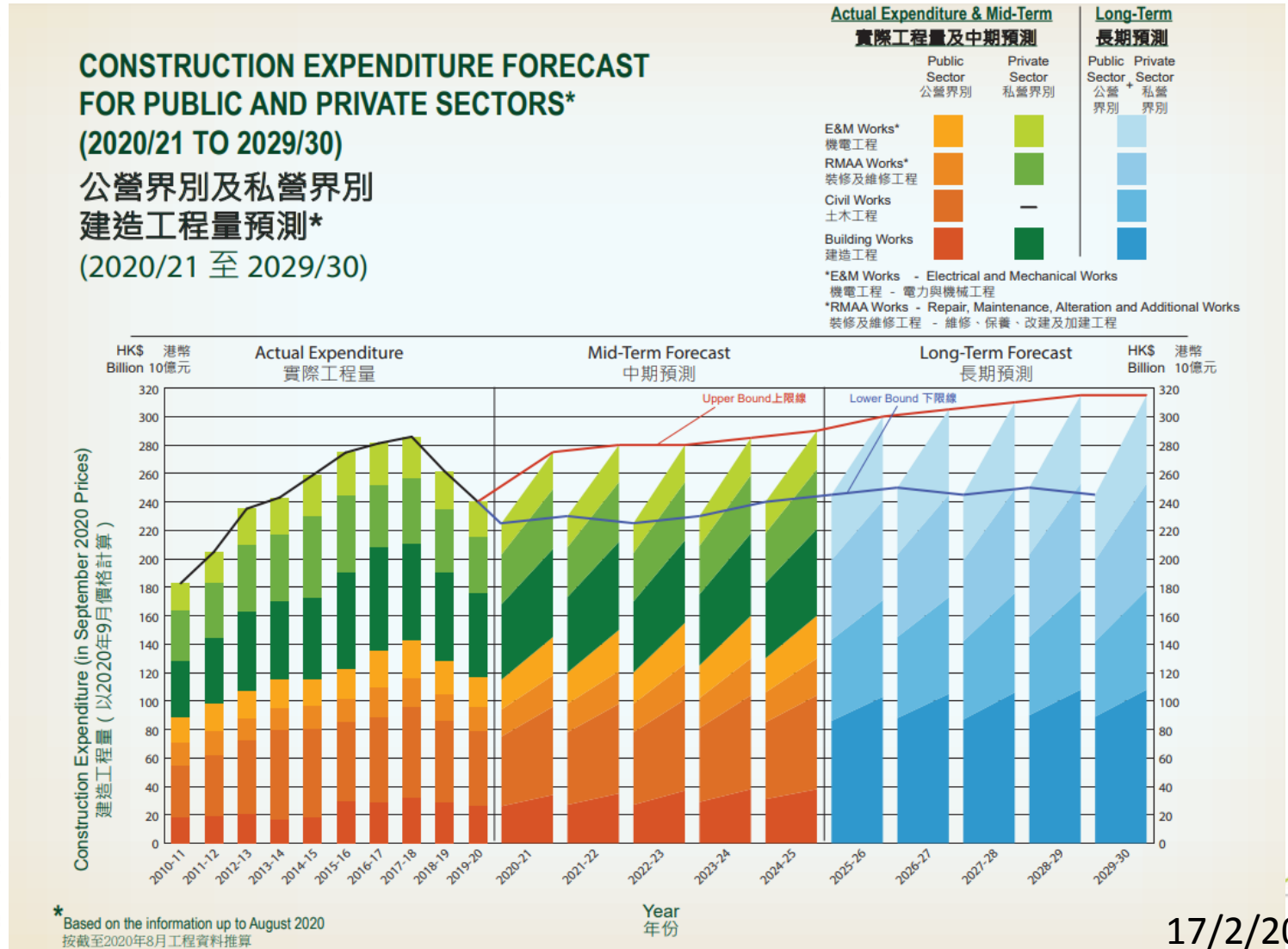


# Construction Industry: Output and Forecast

The actual construction expenditure in 2019/20 was about

**HK\$240 billion**  
contributed to **4.2%** of the Hong Kong GDP.

The construction industry employed about **350,000** persons, which was accounted for about **9%** of the total Hong Kong workforce.



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# Construction Industry: Core Challenges





# Construction Industry: Core Challenges



Significant future construction volumes



High costs



Unsatisfactory mega-project performance



Unsatisfactory site safety performance



Declining productivity



Lack of creativity and innovation

(Source: Construction 2.0 – Time to change)

17/2/2021



# Construction Industry: Core Challenges

## South China Morning Post

Transport

### **MTR Corporation orders contractors to dig up paperwork at every site along Hong Kong's Sha Tin-Central rail link after missing forms scandal**

Another contractor of work along city's costliest rail project says Leighton's case of missing RISC forms is 'outrageous'

Meanwhile, whistle-blower casts doubt on MTR's claims that it did not receive papers



## South China Morning Post

Transport

### **Substandard work on Sha Tin-Central link may have affected a second platform at Hung Hom station, inspection results show**

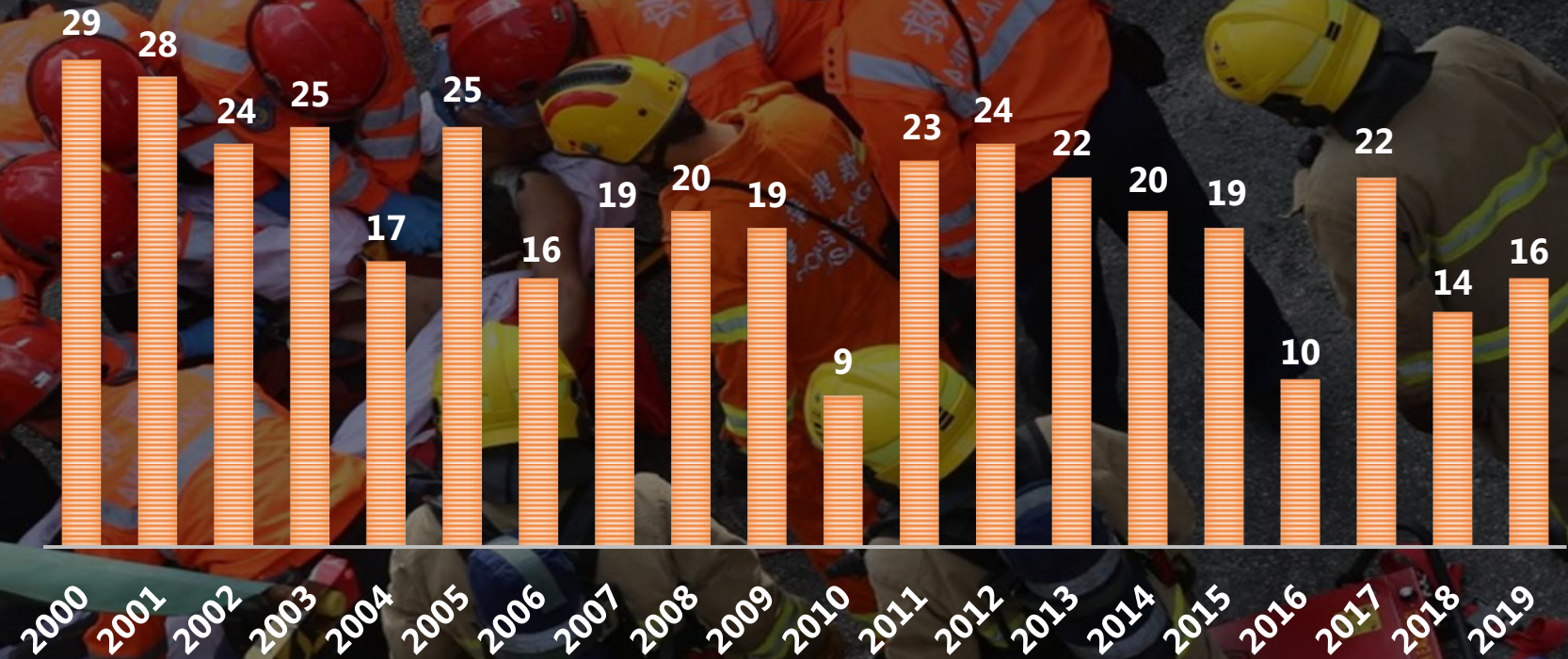
Highways Department released results for inspections of eight new reinforcement bar samples on Friday. MTR Corporation is in the process of breaking open at least 80 sections of the two new platforms at the scandal-plagued station.





# Construction Industry: Core Challenges

**Number of Industrial Fatalities  
in the Hong Kong Construction Industry  
2000 - 2019**





# Industrialization: Off-Site Construction

**INDUSTRY 4.0**  
The fourth industrial revolution \*

**1<sup>st</sup> INDUSTRIAL REVOLUTION**



**Mechanisation driven by water and steam power**  
1780s: first mechanical loom.

**2<sup>nd</sup> INDUSTRIAL REVOLUTION**



**Electricity/mass production**  
1870: first assembly line (Cincinnati slaughter house).

**3<sup>rd</sup> INDUSTRIAL REVOLUTION**



**Computer automation**  
1969: first programmable logic controller.

**4<sup>th</sup> INDUSTRIAL REVOLUTION**



**Cyber physical systems**  
Tomorrow: Internet of Things, connecting everything.



# Modular Integrated Construction (MiC)

- ✍ Innovative Construction Method;
- ✍ Module production in factory followed by site installation;
- ✍ Benefits:
  - ✓ Shorten construction time
  - ✓ Reduce manpower
  - ✓ Increase productivity
  - ✓ Higher construction quality
  - ✓ Better site safety
  - ✓ Reduce material wastage



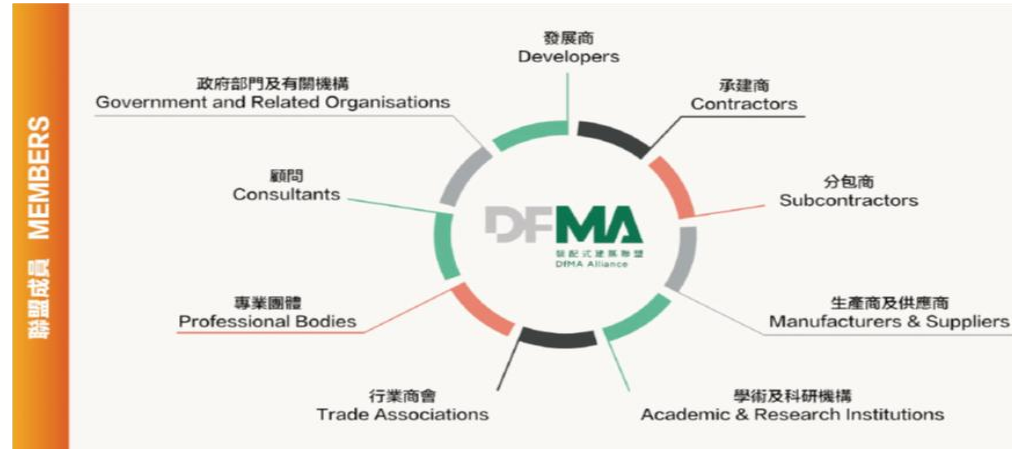


# Design for Manufacturing and Assembly (DfMA)

## CIC - DfMA Alliance - SINCE March 2019

### Benefits:

- ✓ Acting as a Catalyst of Innovation
- ✓ Co-creating Offsite Solutions
- ✓ Acquiring Offsite/DfMA Construction Knowledge
- ✓ Showcasing Technical Capabilities
- ✓ Forging B2B relationships and Business Contacts
- ✓ Enhancing Corporate Image and Reputation



Join Us Now !



[http://www.cic.hk/eng/main/dfma\\_alliance/](http://www.cic.hk/eng/main/dfma_alliance/)  
(852) 2100 9000    dfma@cic.hk

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# CIC Support Model on Construction Innovation





# Construction Innovation and Technology Application Centre (CITAC)



Knowledge Sharing

Collaborative Platform

Innovation Implementation

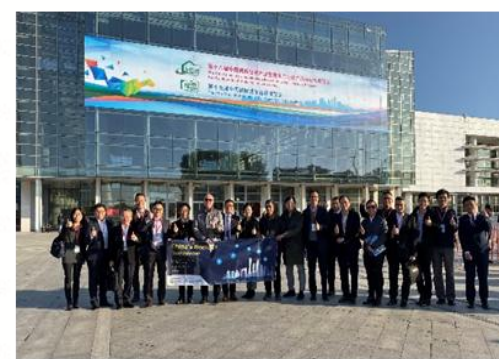
i-Club



[www.citac.cic.hk](http://www.citac.cic.hk)



# Construction Innovation and Technology Application Centre (CITAC)



Conference

B2B Seminar

Overseas Study Tour

Webinar





# Digitalization in Construction



Crossrail the new railway line in the United Kingdom (Source: BIM+)



Digital Twin of Hong Kong International Airport (Source : Open Gov)



InnoCell



Penny Bay Quarantine Centre



Transitional Homes at Nam Cheong Street

MiC Projects



# Digitalization in Construction



## CIC Construction Digitalisation Award 建造業議會數碼化大獎 2021

Recognise outstanding local projects and organisations





# Digitalization in Construction

## INTERNET OF THINGS

### Introduction of Internet of Things



# Digitalization in Construction

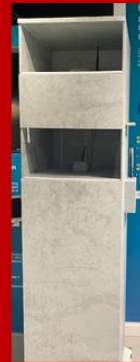
## INTERNET OF THINGS

### IoT Sensors for safety (BeelInventor)



Current exhibit

### IoT Sensors for site monitoring (Digital G)



Current exhibit

### IoT Sensors for machinery (Thinextra & EBSL)



Current exhibit

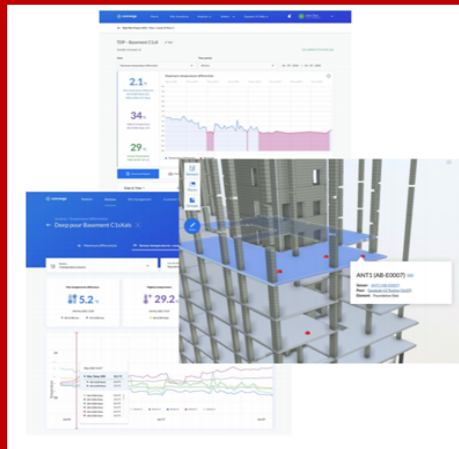




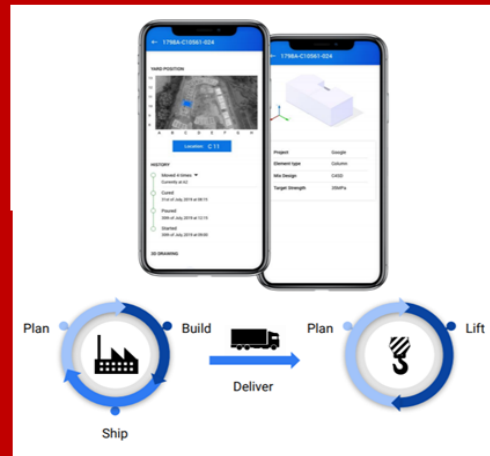
# Digitalization in Construction

## INTERNET OF THINGS

IoT Sensor for concrete maturity and logistics monitoring (Converge)



GeoDNA



LogisticsDNA

Pedestrian / Machinery anti-collision camera (Blaxtair)



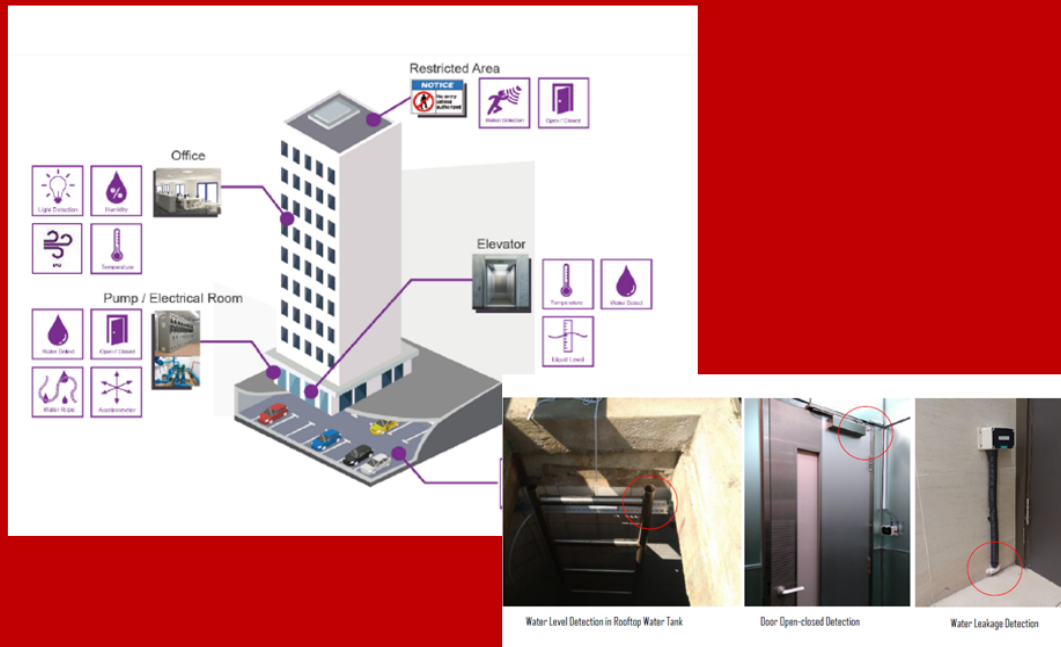
Current exhibit



# Digitalization in Construction

## INTERNET OF THINGS

### IoT Sensors for facility management



An all-in-one package including system connectivity, sensors, gateways, management platforms, applications and analytics.

#### Real-time monitoring

IoT Sensor to detect water leakage detection and indoor air quality.

#### Maintenance management

The solution provides 7x24 monitoring by different kinds of IoT devices, creating work order if incident happened, dispatching work order to technician automatically and managing the works in a centralized platform with dashboard for showing the status in a systematic approach.

### IoT Sensors for IAQ and water leakage monitoring

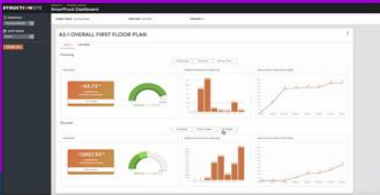
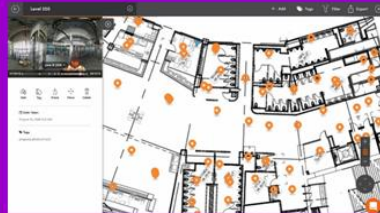
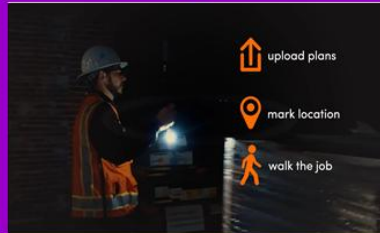




# Digitalization in Construction

## ADVANCED TECHNOLOGY SOLUTION

### Intelligent Project Tracking



VideoWalk® automatically tethers the path to the floor plan on file. The advanced computer vision will automatically track your path and each date-stamped photo will appear in its correct location on the drawing.

SmartTrack® is an automated production tracking tool that makes tracking visible scopes-of-work an organized and seamless process. This powerful tool is uniquely capable of providing insight into planned versus actual production rates.



# Digitalization in Construction

## ADVANCED TECHNOLOGY SOLUTION

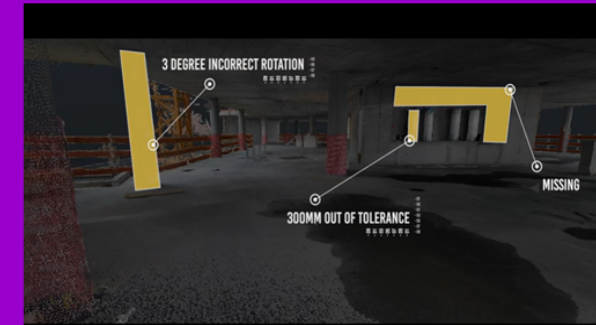
### 3D AI platform for automated progress, quality and predictive risk management



Data acquisition partner regularly captures images and site scans with Lidar.



The 3D machine learning engine automatically analyses progress, performance KPIs and risks.



The analytics platform communicates and visualizes insights and integrates with schedule and BIM.





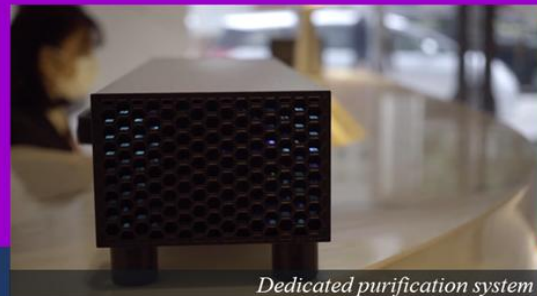
# Digitalization in Construction

## ADVANCED TECHNOLOGY SOLUTION

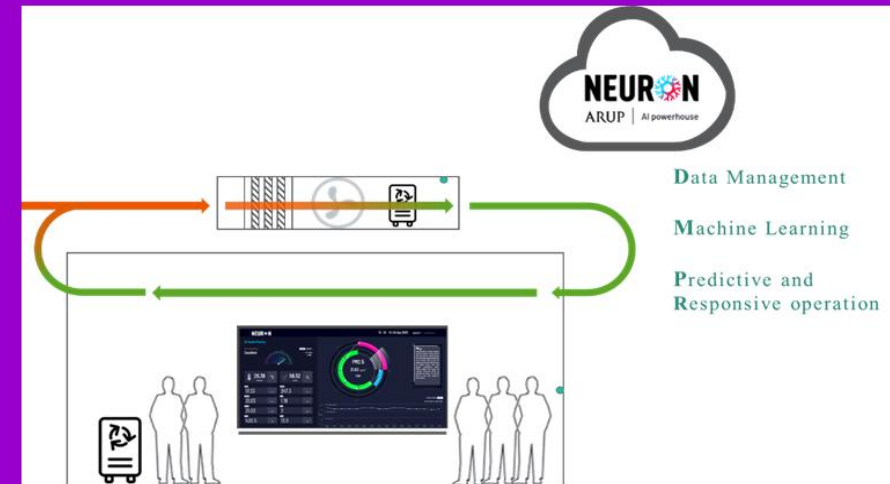
### Neuron Health – Indoor pathogen prediction and control



IoT sensors



Dedicated purification system



# Construction Robotics



**CONSTRUCTION ROBOTS**



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# Construction Robotics

## ADVANCED EQUIPMENT / ROBOTIC

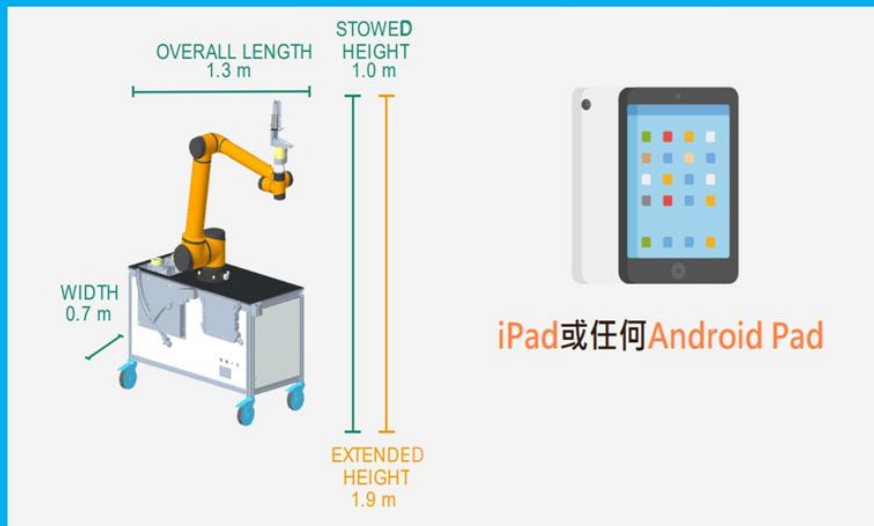
### Autonomy Drilling Robot



# Construction Robotics

## ADVANCED EQUIPMENT / ROBOTIC

### Automatic Drilling & Anchoring Robot



D2-Drillcorpio is an automatic drilling & anchoring robot. The vision system performs automatic target recognition and the robot system aligns to the positions with accurate control. Drilling and anchoring are automatically performed with algorithm dealing with multiple scenarios. D2 eliminates both drilling and anchoring by worker at height.





# Construction Robotics

## ADVANCED EQUIPMENT / ROBOTIC

### Autonomous inspections with drone +UAV



#### AI-powered building façade analysis platform

The technologies turn vast amounts of complex image, video, LiDAR, and other sensor data into intelligent, expert-validated inspection reports as a cloud-based service for asset owners, operators, contractors and financial services companies.

#### Automated Defect Mapping

The proprietary algorithms auto-maps and digitizes any type of anomalies (rust, hot spots, cracks, etc) directly onto elevation diagrams



# Construction Robotics

## ADVANCED EQUIPMENT / ROBOTIC

### UAV based LIDAR system



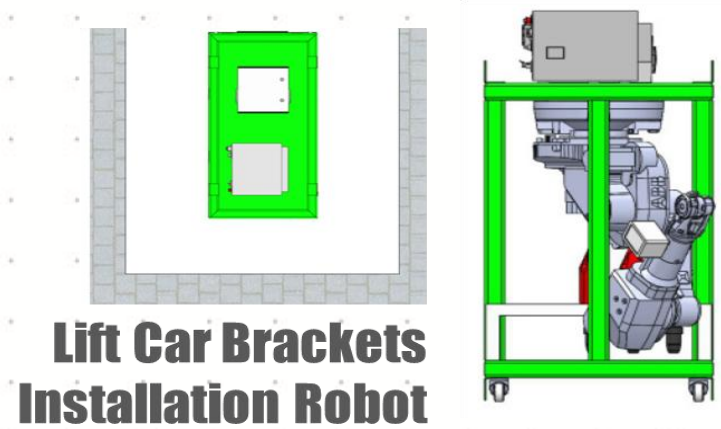
This product is an unmanned aerial vehicle with a built-in laser scanner and inertial measurement unit (IMU) sensor of particularly lightweight in less than 7kg weight. It is capable of traditional photogrammetry surveying and laser scanning surveying.





# Construction Robotics

## ROBOTS UNDER DEVELOPMENT



# Construction Integration

## INTEGRATED LIFE-CYCLE MANAGEMENT

A cloud-based visual collaboration software for project team to communicate their design in a navigable 3D environment



Architecture and Design

Construction

Mechanical, Electrical and Plumbing  
(MEP)

Facility Management

Integration





# Construction Integration

## INTEGRATED LIFE-CYCLE MANAGEMENT

### Intelligent Construction Platform for Construction and Operation



Varadise Twin is a cloud-based digital twin solution, serving as next generation Intelligent Management Platform.

It is a 4D Building Information Building (BIM) platform constantly undergoing real-time project data from designing and planning to operation and maintenance phases, making project management easier for site supervisory staff.

Designed to fully integrate with Digital Works Supervision System (DWSS), providing full transparency and traceability for the project teams to get smart construction better achieved.



# Thank You







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