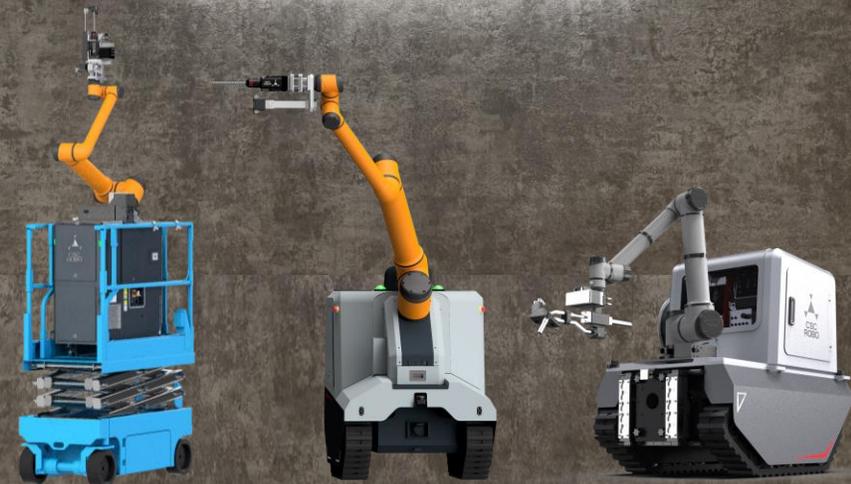


Automation on Site: Boosting Productivity, Safety and Delivery For Modern Contractors

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Construction Has Changed Less Than You Think

If you stand on a construction site today, it probably looks and feels much like it did 40 or 50 years ago.

Despite advances in design and digital coordination, **on-site delivery** remains heavily **manual**, **high-risk**, and **unpredictable**.

Low Productivity

Stagnant 1% globally, lack of automation, site/office disconnect

HSE

Stringent compliance, HAVS, Heights, worker safety etc

Labour Crisis

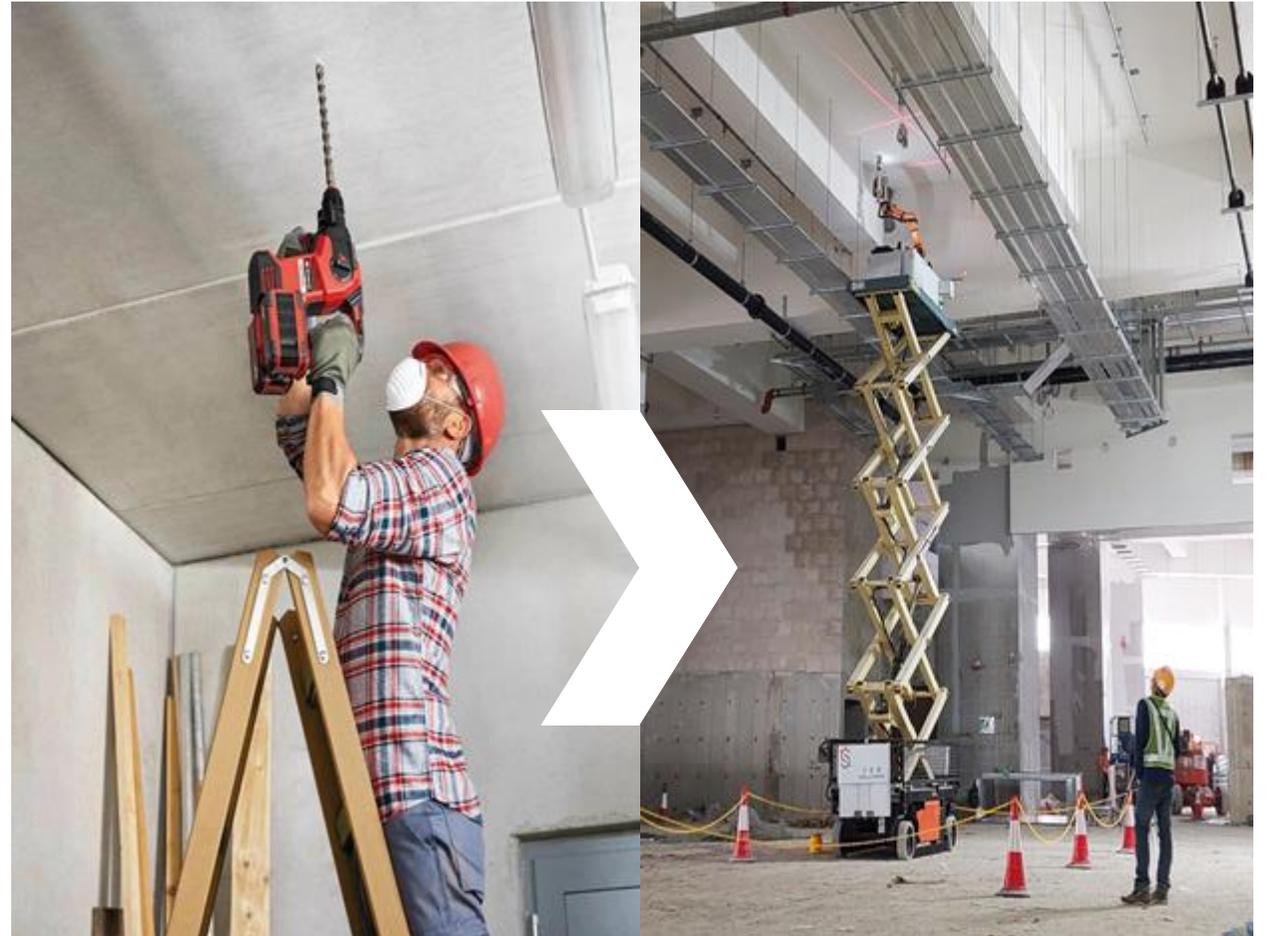
Age, availability and skill all expected to decline by 2027 by further 250k

Unstable Performance

Dependency on manual work; increasing costs, decreasing profits and delayed delivery

Nature of Injury

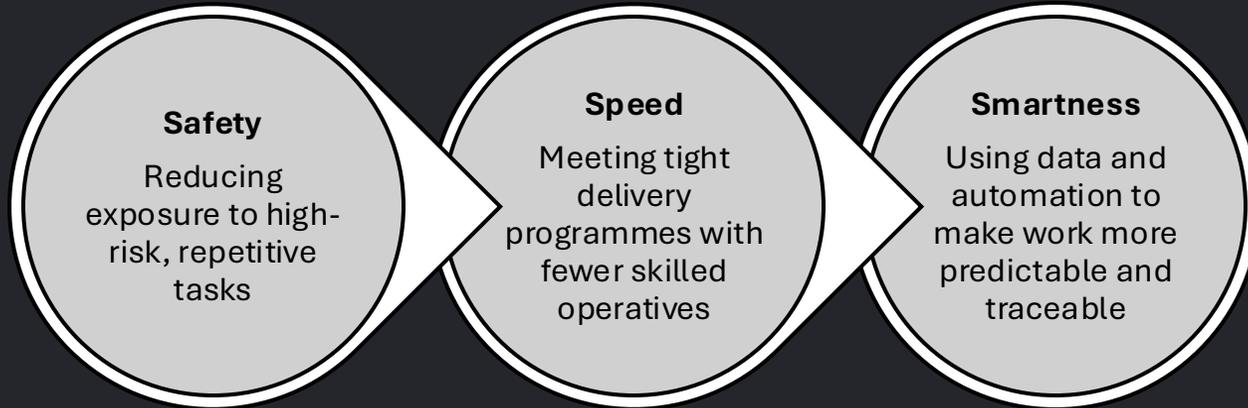
Mostly repetitive movements; manual works, vibration and working at heights



Safer. Faster. Smarter.

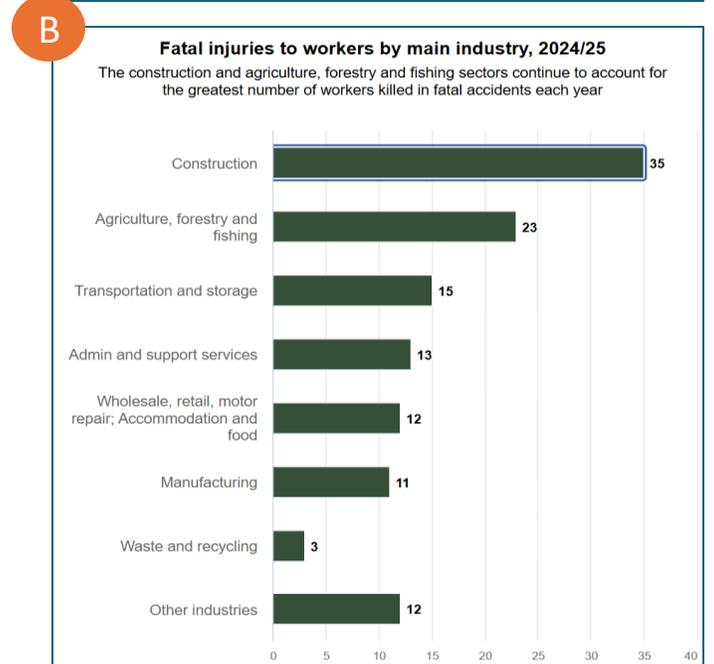
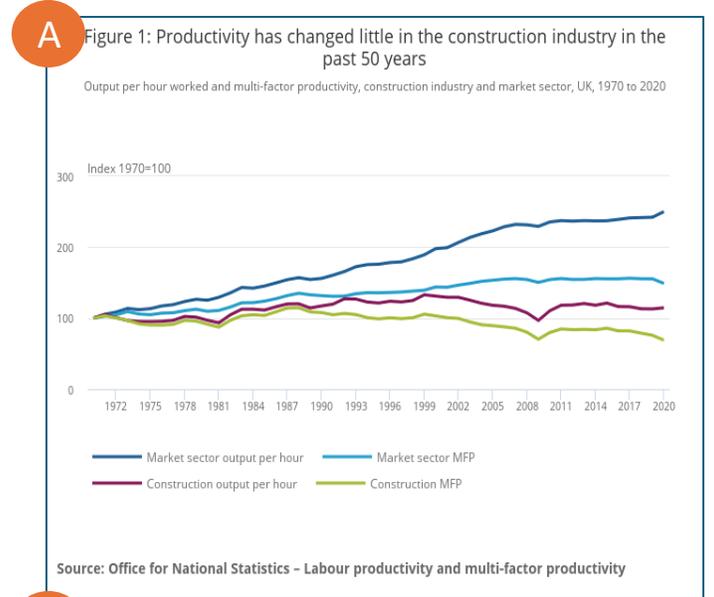
Automation isn't about replacing people, it's about creating safer, more predictable, and data-driven environments.

The industry faces three linked challenges; these are the principles that frame our discussion today.



A) **Flat productivity** in construction vs steady growth in manufacturing and the overall economy since 1997.

B) Shows **rate of fatal injuries by sector**, highlighting construction as the highest.



Why Now: The Industry is Ready

Digital Foundations are in Place — Now Comes Automation

2010s – Digital Foundations

BIM adoption, CDEs, 3D Design



The groundwork of BIM, 3D modelling, cloud collaboration, and data sharing that transformed design into a connected, digital process.

2020s – Data Driven Delivery

Connecting the Project Ecosystem



The construction site is now connected. Real-time data from models, sensors, and supply chains drives every decision — not after the fact, but as it happens.

Data-driven delivery is where construction stops guessing and starts knowing.

Instant insight replaces hindsight — linking design, delivery, and performance into one continuous loop.

2025+ Automation Era

Automation is where digital intelligence meets physical action.



Automation isn't the future of construction — it's the upgrade we've been building toward.

Data made it possible. Robotics will make it real.

What Automation Looks Like On Site

Task-level automation

drilling, welding, fixing, rebar tying, polishing...



Process-level automation

robotic layout, digital QA/QC.



System-level automation

integrated digital twins, autonomous equipment.

 Trimble Connect

 AUTODESK

Tandem

 Bentley®

iTwin
Ventures



Safer | Faster | Smarter



Safer

Automation removes people from harm

- HAVs – Removes exposure to **HAVs** (repetitive drilling)
- Reduces **silica dust** exposure
- Minimises **work at heights** risks
- Automates tasks in **confined spaces**
- Keeps humans clear of **hazardous zones**



Faster

Automation enables continuous, predictable production

- Machines can work overnight, **no fatigue**
- Reduced **rework** due to precision layout and QA automation
- **Predictable cycle** times from data-driven execution
- **Productivity** on Smart Construction projects showing 30–50 % faster earthworks



Smarter

Every action produces data — and that data feeds improvement

- Automatic **data capture** from drones, robots, and machine sensors
- Enables **QA/QC traceability** — “as-built verified continuously”
- Feeds into **BIM and digital twins** to improve *future design*



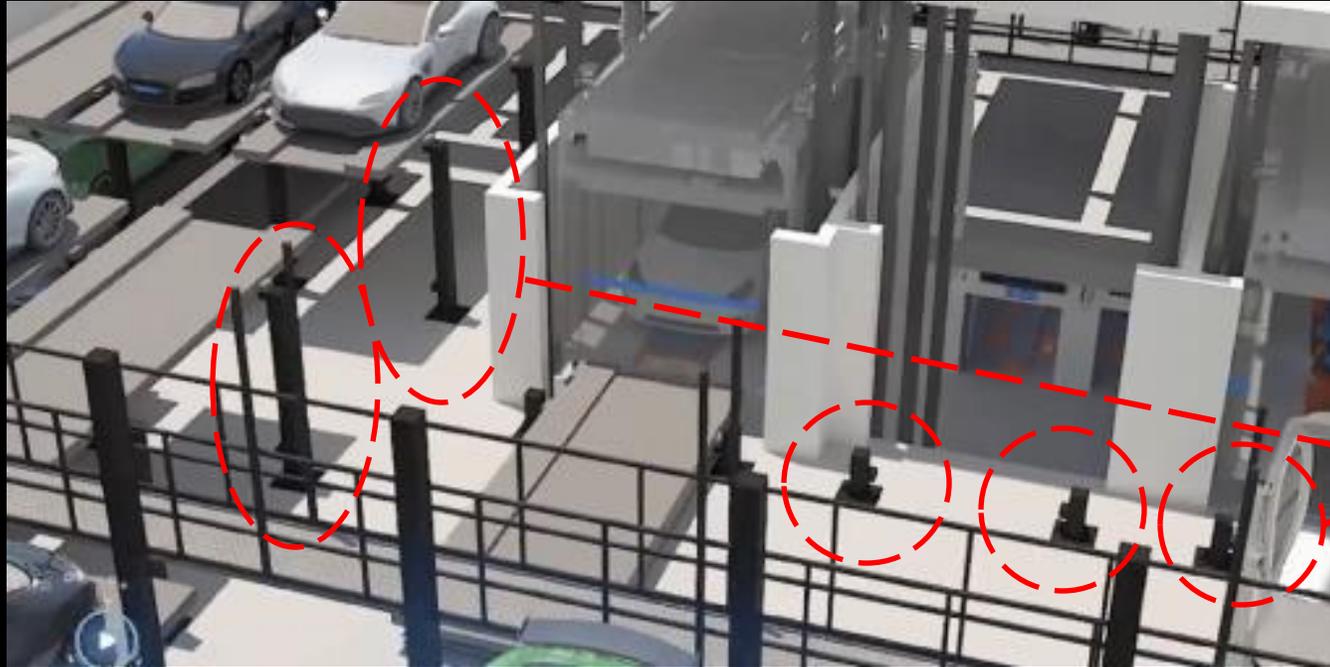
Case Studies

Automated Car Park A at Hong Kong Boundary Crossing Facilities at Hong Kong International Airport

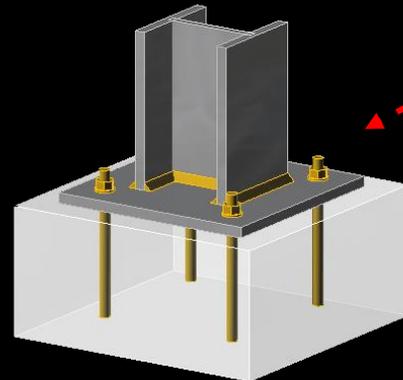


Automated Car Park A at the Hong Kong Boundary Crossing Facilities (HKBCF) at Hong Kong International Airport is designed for vehicles arriving via the Hong Kong-Zhuhai-Macao Bridge (HZMB). It will offer automated parking spaces and facilities for passengers transferring to flights at HKIA, as well as those visiting Airport City attractions. The car park is being commissioned in phases to support the Southbound Travel Scheme and promote tourism. Airport authorities expect the system to handle at least 500 vehicles daily and are currently conducting system tests and finalizing booking and usage arrangements.

Application



To drill holes on concrete floor, for installing columns of automatic car parking racks.



- No. of base plate: 1,500 pcs
- No. of hole drill: 6,000 holes
- Drill Size: \varnothing 24mm, 135mmD

Multistorey Car Park, HK

To drill holes on concrete floor, for installing columns of automatic car parking racks.



Human

Average drilling rate: 3-4 minutes per hole (including marking, positioning, drilling, and minor repositioning).

Robotic

Average drilling rate: 1.5 - 2 minutes per hole (autonomous positioning)

Time Saving Comparison

- **Manual:** 350 Hours (45 Days)
- **DF Robot:** 180-200 Hours (23-25 Days)
- **Time saved:** 45-55% faster

Application

Drillbit Size $\varnothing 24$, 135mmD

No of Holes - >6000

Water Treatment Plant, HK

To drill holes on the floor for water tank reinforcement in a **confined space**.



Application

Drillbit Size \varnothing 14mm, 110mmD

No of Holes - >800

Human

Average drilling rate: 1.5–2 minutes per hole (including marking, positioning, drilling, and minor repositioning).

Robotic

Average drilling rate: 40–50 seconds per hole (autonomous positioning, verticality auto-comp, no manual marking).

Time Saving Comparison

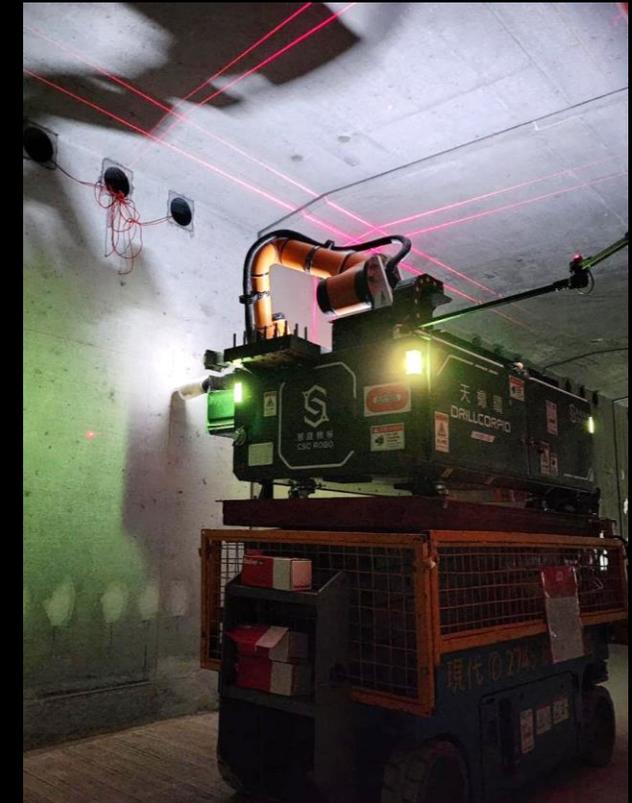
- **Manual:** ~20–26 hours
- **DF Robot:** ~10 hours
- **Time saved:** ~50–60% faster (savings of ~10–16 hours per 800 holes)

Trunk Road T2 Tunnel, HK



#Model D2

Overhead drilling and wedge anchor installation in a service gallery as part of the MiMEP module installation.



Drill Size

No. of Holes



Ø10mm, 57mmD

18,000 holes

Logistic Centre, HK

To drill holes and install flush anchor in the ceiling, and then workers will install the MiMEP Cable Containment.

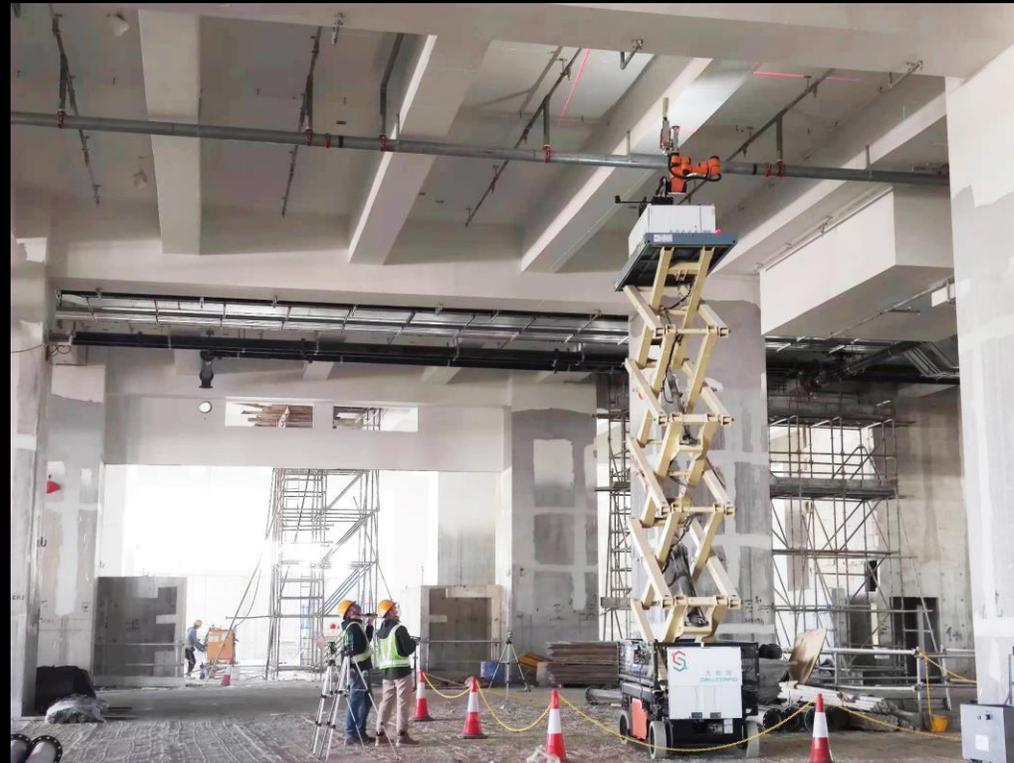
Over 3,000 holes per floor – the D2 robot delivers consistent precision, faster cycle times, and significantly improved safety. Compared with manual drilling, the system reduces on-site hours by nearly half and removes operators from height and vibration exposure.”

Drill Size

No. of Holes

Ø12mm, 72mmD

> 3,000 holes per floor



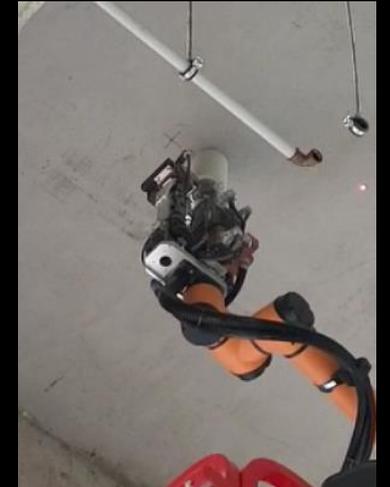
Bulim Square, Singapore



#Model D3



To drill holes and install wedge anchor in the ceiling.



Drill Size

No. of Holes

Ø12mm, 72mmD

> 2,000 holes per floor

With over 2,000 ceiling holes per floor, the D3 robotic system halves drilling time and eliminates work-at-height risks — improving accuracy, productivity, and safety for every installation.

THANK YOU!

Any Questions About Us?



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