



**CHAIN**

Technology Development Co. Ltd

# DIGITAL TWINS TECHNOLOGIES & APPLICATIONS

**JACKIE WONG**

Head of Business Development





# Chain Technology – Company Introduction

- **1<sup>st</sup> local Digital Twin technology startup**, successfully adopted iconic Digital Twin projects to different Government entities
- World-class technology in the rapidly growing "ConTech" & "PropTech" sector that has been evaluated and endorsed by industry experts
- Outstanding development team of **around 50 local professionals** with intensive Digital Twin solution implementation experience
- Strong market penetration with blue chip client base of property developers, owners, construction, civil engineering and consultation firms



# Disruptive Digital Twin Solution



Smart  
Planning &  
Design

Smart  
Construction



**One-Stop  
Digital Twin  
Solution**

Smart  
Living

Smart Building  
Management







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# HYBRID REALITY PLATFORM

## “See the Unseen”

Award-winning Digital Twin Solution  
for every Construction Projects



HSBC x HKET  
Innovative  
Business Award



**10** Technology **Fast 10**  
2021 Hong Kong  
Deloitte.



 **CITF** 建造業  
創科基金  
CITF Pre-approved Product



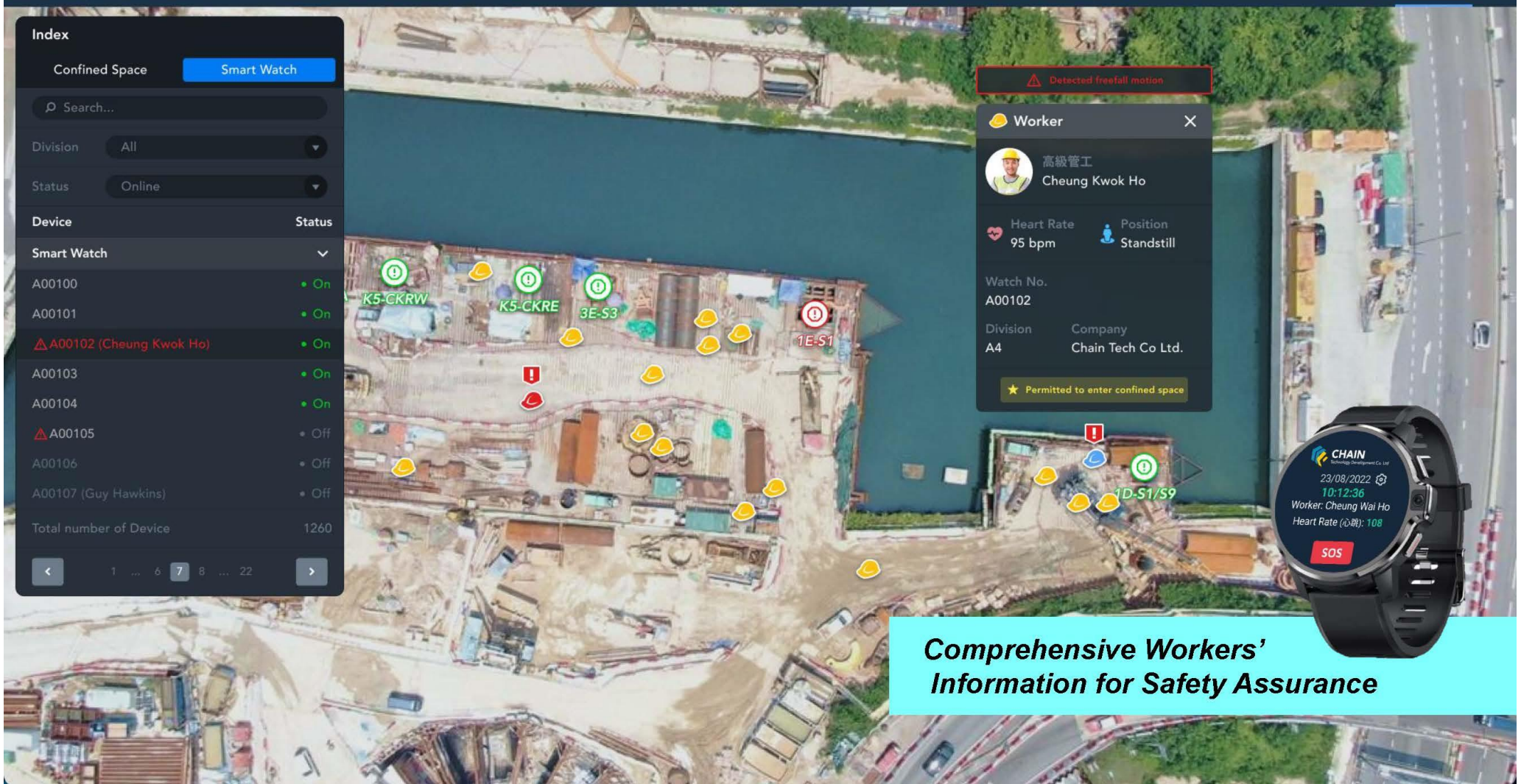
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# Site Safety Management

(Advanced Module)





**Index**

Confined Space Smart Watch

Search...

Division All

Status Online

Device	Status
Smart Watch	▼
A00100	● On
A00101	● On
▲ A00102 (Cheung Kwok Ho)	● On
A00103	● On
A00104	● On
▲ A00105	● Off
A00106	● Off
A00107 (Guy Hawkins)	● Off
Total number of Device	1260

1 ... 6 **7** 8 ... 22

▲ Detected freefall motion

**Worker** ✕

 高級管工  
Cheung Kwok Ho

Heart Rate 95 bpm    Position Standstill

Watch No. A00102

Division A4    Company Chain Tech Co Ltd.

★ Permitted to enter confined space



**Comprehensive Workers' Information for Safety Assurance**

### Smart Watch

Generate Report

#### Index

Confined Space **Smart Watch**

Search...

Division All

Status Online

Device Status

Smart Watch

A00100 On

A00101 On

**A00102 (Cheung Kwok Ho)** On

A00103 On

A00104 On

**A00105** Off

A00106 Off

A00107 (Guy Hawkins) Off

Total number of Device 1260

1 ... 6 **7** 8 ... 22

#### Worker's Profile



高級管工  
Cheung Kwok Ho

Watch No.  
A00102

Division  
A4

Company  
Chain Tech Co. Ltd.

Heart Rate  
**110 bpm**

Last Update: 2021/01/01 13:30

Location  
**Works Area 1a**

Last Update: 2021/01/01 13:30

Position  
**Stand Still**

Last Update: 2021/01/01 13:30

#### Data Log

2021-12-01 to 2021-12-01 Search...

Date & Time	Alert Type	Alert Response
2021-12-01 18:45	Heart rate too high: 154	False Alarm
2021-11-31 18:45	Abnormal Heart Rate	Follow-up
2021-11-15 11:45	Free Fall	Follow-up
2021-10-31 10:45	Standstill	Follow-up
2021-09-15 22:45	Standstill	Follow-up
2021-09-01 01:45	Standstill	Follow-up
2021-08-03 02:45	Standstill	False Alarm
2021-07-13 18:45	Heart rate too low: 50	False Alarm

**Regular Monitor of Workers' Health and Body Condition**

# AI CCTV

## Index

CCTV AI CCTV

Search...

Status Online

### Sensor

### Status

- AI-CCTV-01 • Live
- AI-CCTV-02** • Alert
- AI-CCTV-03 • Live
- AI-CCTV-04 • Live
- AI-CCTV-05 • Live
- AI-CCTV-06 • Live
- AI-CCTV-07 • Live
- AI-CCTV-08 • Live
- AI-CCTV-09 • Live
- AI-CCTV-10 • Live

Total number of Device 1260

1 ... 6 7 8 ... 22

AI-CCTV-02 Live



AI-CCTV-04 Live



## AI-CCTV-02 - Data Log

2021-12-01 to 2021-12-01 Search...

Date & Time	Alert Type
2021-12-01 09:00	Detected worker entering restricted zone
2021-12-01 10:31	Detected worker entering restricted zone
2021-12-01 11:06	Detected worker entering restricted zone
2021-12-01 14:29	Detected worker entering restricted zone
2021-12-01 18:45	Detected worker entering restricted zone
2021-12-01 18:45	Detected worker entering restricted zone
2021-12-01 18:45	Detected worker entering restricted zone

## Notifications (110)

Unread (10) [Mark all as read](#)

Project: A1219238 (A3) 30 mins ago

Module: OVDS  
Over-height Vehicle Detected: LinCR NB Underpass Left

• Alert

Project: N2399823 (Q2) 30 mins ago

Module: AI CCTV  
Detected movement of marine vessels in to designated restricted zone

• Alert

Project: N2399823 (Q2) 30 mins ago

Module: CCTV  
Detected movement of marine vessels in to designated restricted zone

• Alert

Project: B23123 (H1) 30 mins ago

Module: Smart Door Lock  
Low Power (battery lower than 30%)

• Alert

Project: B23123 (H1) 30 mins ago

Module: Flooding Monitoring  
Water Leakage Detected: Downstream Box culvert A +3.0 mPD

**Overview of Critical Area Supported by Instant Alert & Notification Mechanism**

[Play Video](#) False Alarm

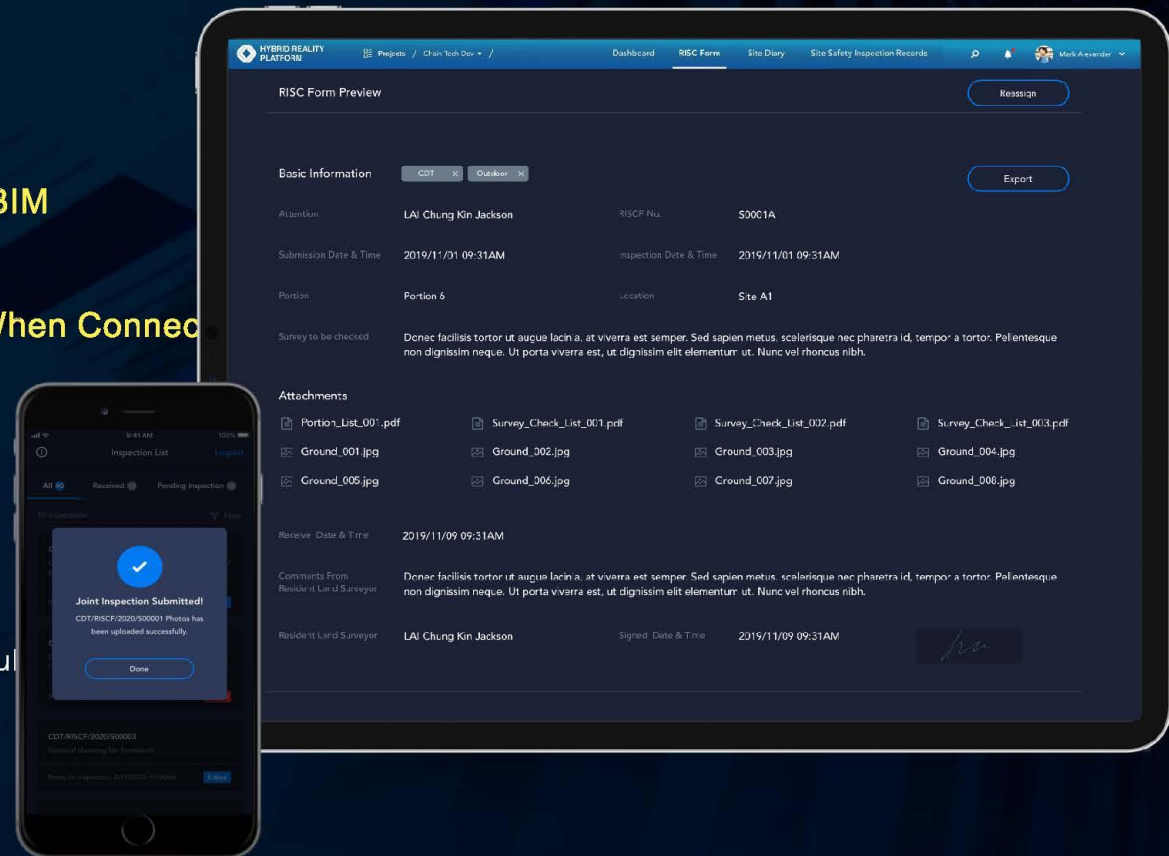


# HRP Module – Digital Works Supervision System (DWSS)

## Inspection Anytime & Anywhere

(Android/iOS Mobile Application)

- Automatically Geotag to 3D Model/Layout/BIM
- Tailor for Weak Network Condition Site:  
Offline Storage & Automatically Upload When Connected
- Tailor Made
- Chinese/English Version
- 1-Click Easy Upload
- Two-way Authentication  
(Fingerprints, Facial Recognition of Mobile)
- Tracking of Pass, Pass with Comments, Fail Result
- Dashboard and Analysis
- In-app Notification



Inspection List Logout

All 70 Received 10 Pending Inspection 10

Survey Filter

10 inspections

CDT/RISCF/2020/S00001  
General cleaning for formwork at 11F at GL P8-P12 / EPA-EPB & 12F at GL P1-P2  
Ready for inspection: Today 10:30AM 5 days

CDT/RISCF/2020/S00002  
Demolition of Air Duct in T1 for Ductwork Diversion (1) at 11F at GL P8-P12  
Ready for inspection: 2019/02/25 10:30AM 10 days

CDT/RISCF/2020/S00003  
General cleaning for formwork

Create New Form

**Forms Summary**  
(With Overdue Days, Pass, Pass with Comments, Fail Indication)

Create New RISC Form

Basic Information

Attn  
Name

Tag  
Outdoor CDT

Inspection Date & Time  
YY/MM/DD  
Time

Portion  
Portion 6

Location  
Location

Survey to be checked

Attachments Add

Advertising Board Ground\_0003.png 2mins Upload failed

Advertising Board Ground\_0001.png 2mins 25%

Advertising Board Ground\_0001.png 2mins

Submit

**New Forms Creation**  
(Automatically Filled In GPS Location, Remarks, Sub-Disciplines, Auto-Fill Function)

Upload Photo

Take Photo Album

Attn  
Name

Location  
Site A1

Portion  
Portion 6

Selected Photos (6)

Advertising Board Ground\_0003.png 2mins Upload failed

Advertising Board Ground\_0001.png 25%

Discard Submit

Selected photos(6) Done



**Instant Photo Taking / From Album**  
(Automatically Re-upload when Network Resumes)

RISC Form Review

Basic Information Result

RISC Form No.  
CDT/RISCF/2020/S00001

Attention  
LAI Chung Kin Jackson

Tag  
Outdoor CDT

Submission Time & Date  
2019/11/01 09:31AM

Inspection Time & Date  
2019/11/01 09:31AM

Portion & Location  
Portion 6 Site A1

Survey to be checked  
Donec facilisis tortor ut augue lacinia, at viverra est semper. Sed sapien metus, scelerisque nec pharetra id, tempor a tuto.

Attachment (10)

**Submitted Record Review**  
(With Comments, Remarks & Digital Signature for Approval)

Portion II Rebuilding Survey\_Check\_List\_001.pdf  
2019/04/25 12:32

Portion II Rebuilding Survey\_Check\_List\_002.pdf  
2019/04/25 12:32

Portion II Rebuilding Survey\_Check\_List\_003.pdf  
2019/04/25 12:32

Portion II Rebuilding Survey\_Check\_List\_004.pdf  
2019/04/25 12:32

LC Chan - Contrator Surveyor  
Signature Time : 2019/11/09 09:31AM

LC Chan - Resident Land Surveyor  
Signature Time : 2019/11/09 09:31AM

Sam - Senior Survey Officer(Engineering)  
Signature Time : 2019/11/09 09:31AM

Back Sign



**Layers**

Search

- Earth Map
- Default
  - Reality
  - Road
  - Drainage System
  - Noise Barrier
- Tunnel
  - Tunnel
  - Point Cloud
- Bim
  - Boundary
  - BoxCulwert
  - Building
  - BusStop
  - Catchpit
  - Lake

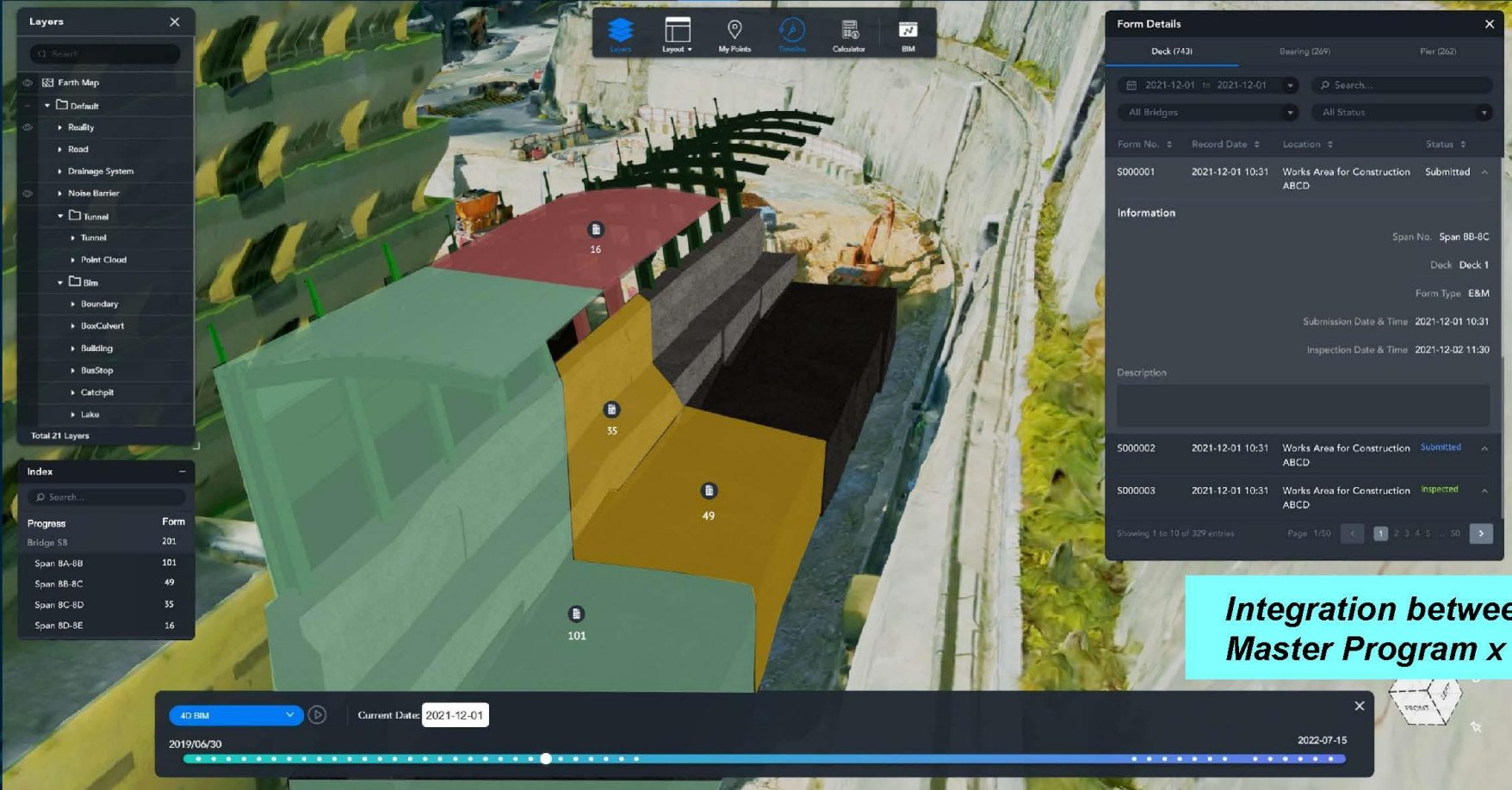
Total 21 Layers

**Index**

Search

Progress	Form
Bridge S8	201
Span BA-8B	101
Span BB-8C	49
Span BC-8D	35
Span BD-8E	16

Layers Layout My Points Timeline Calculator BIM



**Form Details**

Deck (743) Bearing (269) Pier (262)

2021-12-01 to 2021-12-01 Search...

All Bridges All Status

Form No.	Record Date	Location	Status
S000001	2021-12-01 10:31	Works Area for Construction ABCD	Submitted

**Information**

Span No. Span 8B-8C  
Deck Deck 1  
Form Type E&M  
Submission Date & Time 2021-12-01 10:31  
Inspection Date & Time 2021-12-02 11:30

Description

S000002	2021-12-01 10:31	Works Area for Construction ABCD	Submitted
S000003	2021-12-01 10:31	Works Area for Construction ABCD	Inspected

Showing 1 to 10 of 329 entries Page 1/50

**Integration between  
Master Program x DWSS x BIM**

4D BIM Current Date: 2021-12-01

2019/06/30 2022-07-15

**Layers**

Search

- Earth Map
- Default
- Reality
- Road
- Drainage System
- Noise Barrier
- Tunnel
- Point Cloud
- Bim
- Boundary
- BoxCulvert
- Building
- BusStop
- Catchpit
- Laka

Total 21 Layers

---

**Index**

Search

Comparison	Completion
Bridge SB	50%
Span BA-8B	88%
Span BB-8C	47%
Span BC-8D	17%

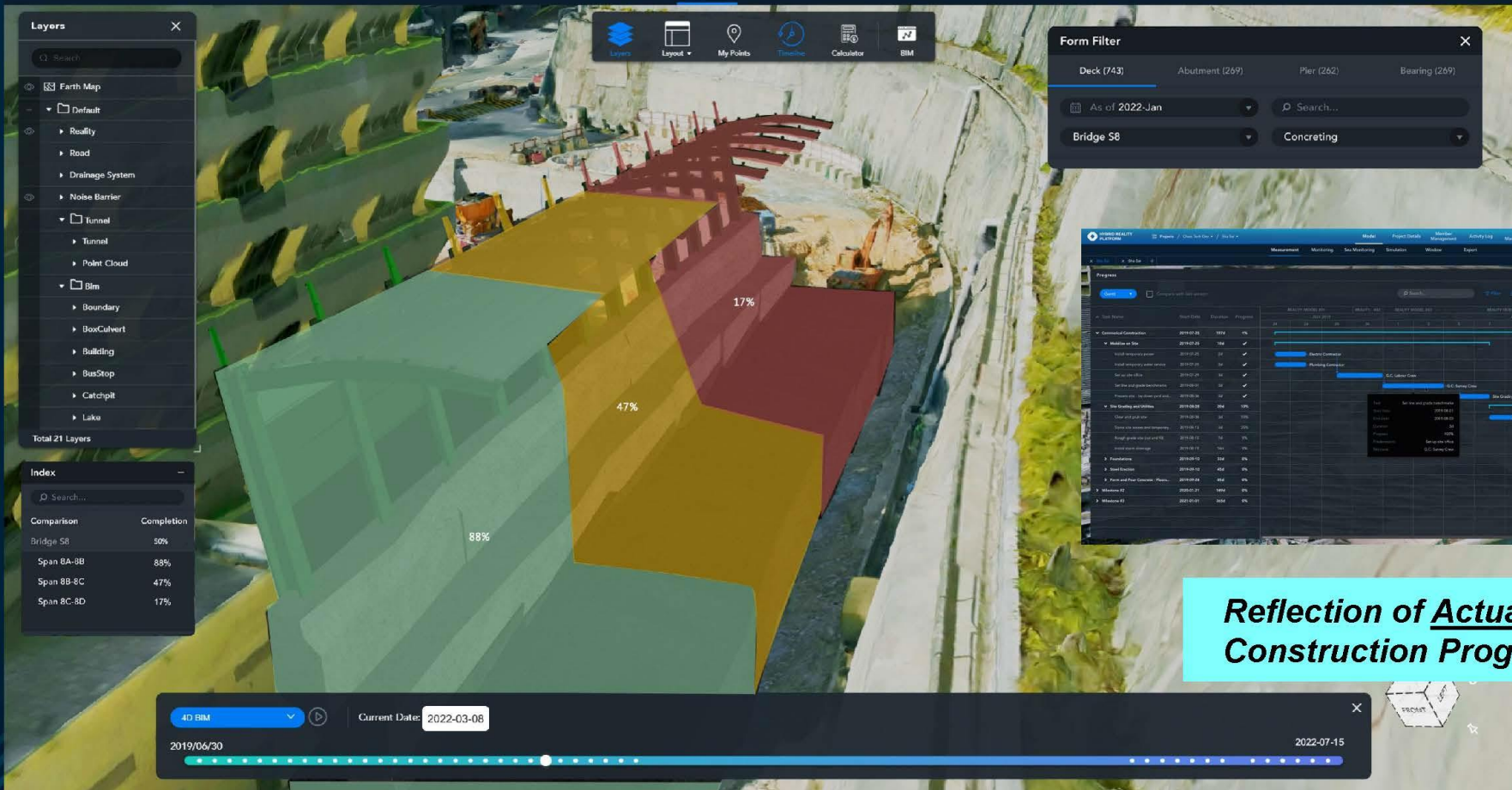
Layers Layout My Points Timeline Calculator BIM

**Form Filter**

Deck (743) Abutment (269) Pier (262) Bearing (269)

As of 2022-Jan Search

Bridge SB Concreting



HYBRID REALITY PLATFORM

Progress

Task Name	Start Date	Duration	Progress
Completed Construction	2019-07-25	182d	100%
Modeling on Site	2019-07-25	15d	100%
Install temporary water service	2019-07-25	1d	100%
Site surveying	2019-07-25	1d	100%
Set the end point measurements	2019-08-01	1d	100%
Provide the location and area	2019-08-06	1d	100%
Site Quality and Utilities	2019-08-28	15d	100%
Clear and grade	2019-09-06	1d	100%
Install the ground measurement	2019-08-12	1d	100%
Install ground level	2019-08-12	1d	100%
Install point coverage	2019-08-12	1d	100%
Foundation	2019-09-10	15d	0%
Earth Retention	2019-09-10	60d	0%
Form and Pour Concrete - Piers	2019-09-29	60d	0%
Wallwork #1	2020-01-21	160d	0%
Wallwork #2	2020-01-21	160d	0%

**Reflection of Actual and True Construction Progress**

4D BIM Current Date: 2022-03-08

2019/06/30 2022-07-15





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# DIGITAL TWIN FOR SMART BUILDING

# Smart Building Management

## BMS Integration

BIM + IoT + BS System





# Smart Building Management

## Energy Consumption Monitoring with Automatic Adjustment

Energy-saving

### 7/F ENERGY SAVING

TOTAL CONSUMPTION  
**1,306k Wh** -1.5%

AVG. CONSUMPTION  
**589 Wh**

AVG. CONSUMPTION TIME  
**1:22:05**

#### CONSUMPTION DISTRIBUTION

AIR CONDITIONER

320 Wh

PLUG

320 Wh

LIGHTING

320 Wh


#### TOP 6 ROOM CONSUMPTION

ROOM 7001	80.5k
ROOM 7012	62.8k
ROOM 7006	55.3k
ROOM 7011	42.8k
ROOM 7004	22.3k
ROOM 7005	18.8k

#### ROOM STATUS

[View All](#)

ROOM 0701	<span style="color: green;">●</span> AIR CON	In Use	Ray Wong Wed, Oct 10, 12:30 - 14:30
ROOM 0702	<span style="color: green;">●</span> AIR CON	In Use	Peter Lee Wed, Oct 10, 11:30 - 16:30
ROOM 0703	<span style="color: yellow;">●</span> AIR CON	Available	



**ROOM 0701** 25.5°C 29%

● IN USE

Next Meeting  
Robbie Hoffman Wed, Oct 10, 12:30 - 14:30

**ROOM 0704** 25.5°C 29%

● AVAILABLE

Aircon will be closed in 00:02:25

L10

L9

L8

**L7 OFFICE AREA**

L6

L5

L4

L3

# Smart Building Management

## Fire Alarm System Integration – Spot the Incident Location Quickly

Faster Reaction



**FIRE ALARM SYSTEM**

**RECENT ALARMS** [View All](#)

Time	Event
09:00-11:00 8 APRIL	Fire Alarm Testing (All Alarms)
12:15 8 APRIL	False Alarm (L5-0507A)
17:30-18:30 8 APRIL	Residents Overcooked (L2-0208D)
14:00-14:30 9 APRIL	False Alarm (L4-0402D)

**0701B** **ALARM**  
14:28 00:01:14  
ALARM: STEEP #321410 WAS SENT FOR INSPECTION AT 14:29

**ROOM 0701** **ALARM**

- ROOM 0702
- ROOM 0703
- ROOM 0704
- ROOM 0705
- ROOM 0706

**L7**  
OFFICE AREA

L11  
L10  
L9  
L8  
L7  
L6  
L5  
L4  
L3





### Genset Index

Today

Show All Status

9/F +

8/F -

Chiller Status

Chiller-3-01 • Error

Chiller-3-02 Chiller-3-02 • Activate

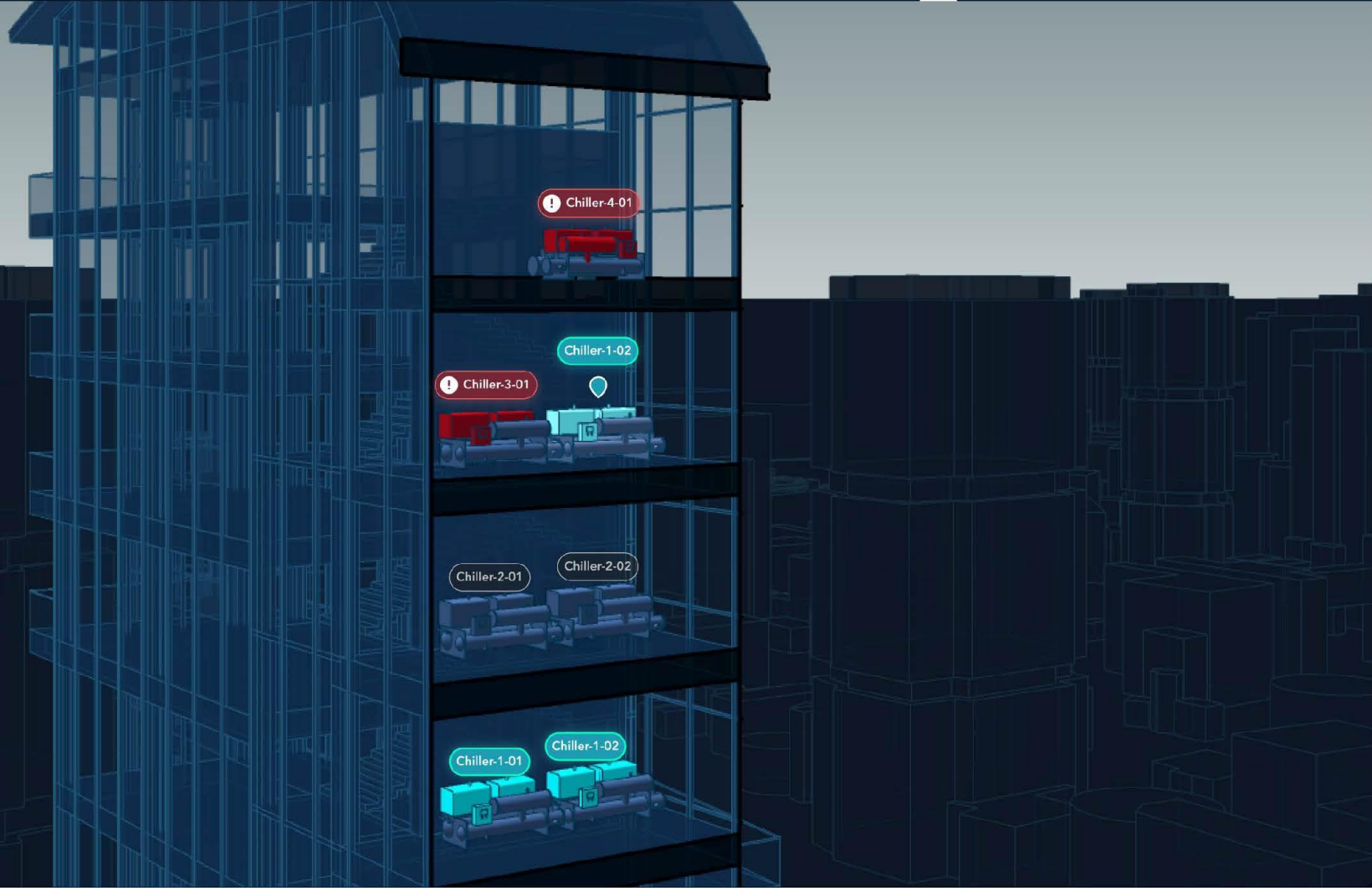
7/F -

Chiller Status

Chiller-2-01 • Off

Chiller-2-02 • Off

6/F +



# Visualization Device

## 4D IMMERSIVE CAVE

- Human-centric Visualization
- Hassle-free Design
- IoT Integration enabled
- **Real-time Streaming**
- **Remote Inspection**
- Interactive Experience
  - App Control
  - Interactive Wall
  - Sensor Devices





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## Site Safety Education



## Public Engagement



## CYCLING



Many more...





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**THANK YOU !**

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