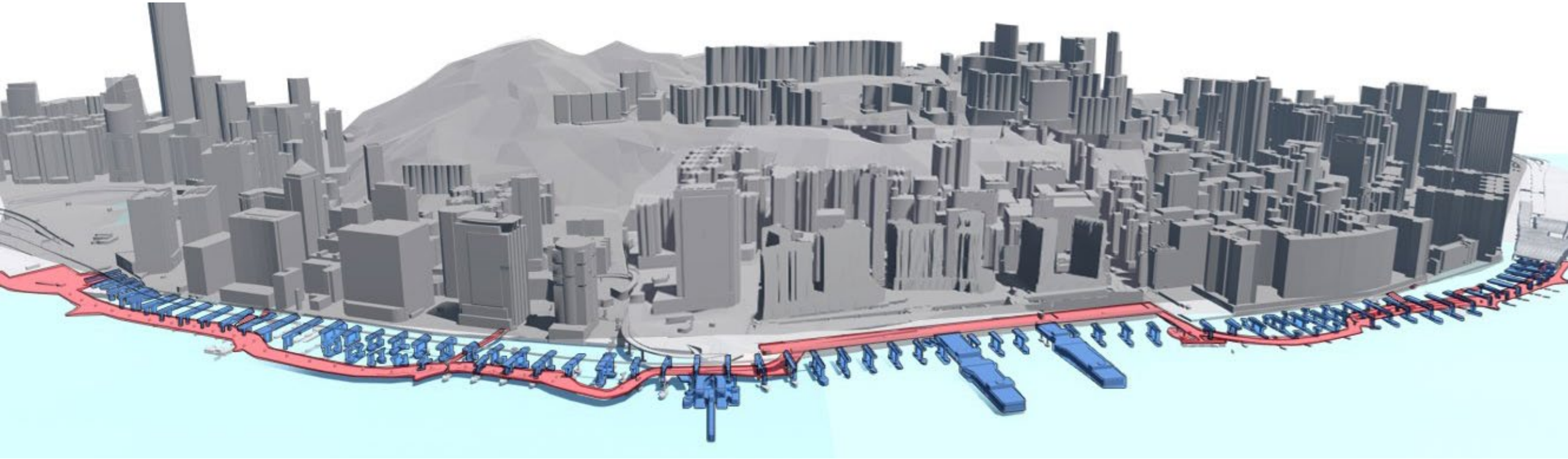


Contract No. SD/2021/02
Boardwalk underneath Island Eastern Corridor
Life First Walk the Talk – Webinar on Temporary Works Safety

17 April 2024

BOARDWALK UNDERNEATH ISLAND EASTERN CORRIDOR

- PROJECT INTRODUCTION
- TEMPORARY WORKS PROCEDURE
- TEMPORARY WORKS EXAMPLES

Project Information	
Contract No.	SD/2021/02
Project Title	Boardwalk underneath Island Eastern Corridor
The *Client*	Civil Engineering and Development Department The Government of the Hong Kong Special Administrative Region CEDD
The *Project Manager*	Meinhardt Infrastructure and Environment Limited MEINHARDT
The *Contractor*	IEC Boardwalk JV IEC Boardwalk JV ▪ Leighton Contractors Asia ▪ Sinohydro Corporation ▪ Sum Kee Construction LEIGHTON SINOHYDRO 森記建築有限公司 SUM KEE CONSTRUCTION LIMITED
Contract Type	NEC4 ECC Option C
Commencement Date	2021 Q4
Completion Date	2025 Q2

- Part of government initiative to provide 34km of promenades on both sides of Victoria Harbour by 2028
- 2.2km long, with shared zone for cycling, jogging, etc
- 3 sections, with 8 themed “design concepts”, including fishing, pets, arts.

WESTERN BOARDWALK

Length :	0.7 km
Boardwalk Span :	31 nos
Link Bridge (Swing) :	1 no.
Movable Bridge	1 no.

NORTH POINT PROMENADE

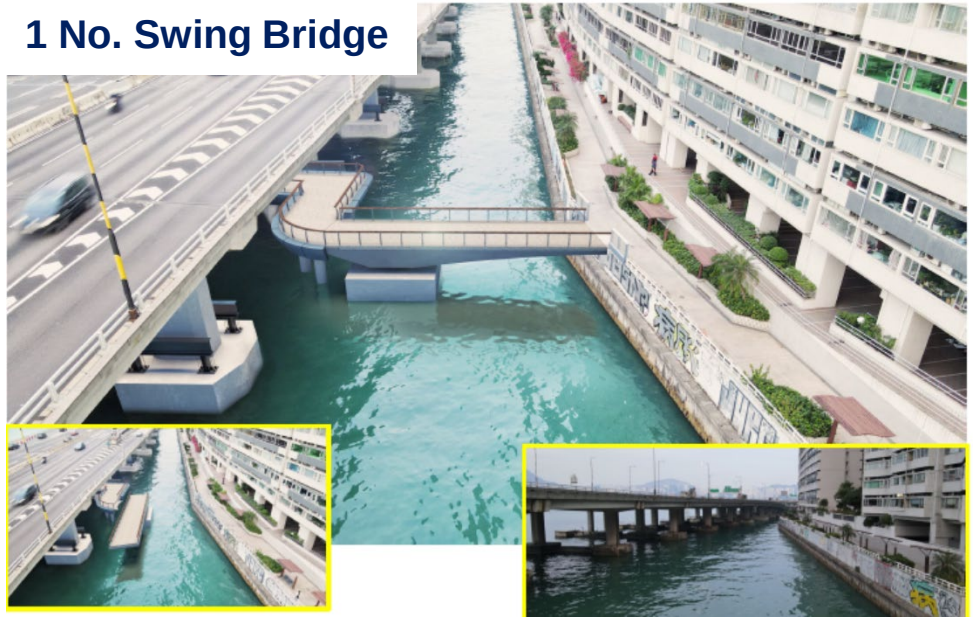
Length : 0.4 km

EASTERN BOARDWALK

Length :	1.1 km
Boardwalk Span :	32 nos
Link Bridge :	2 nos
Movable Bridge	1 no

2 No. Bascule Bridges

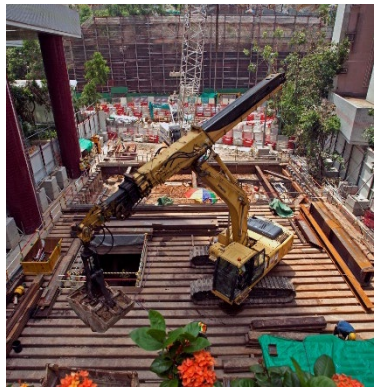
1 No. Swing Bridge



Tong Shui Road Pier
/ Fishing Platform

Temporary Works covers almost everything we do in construction

Falsework ☑



Working Deck ☑

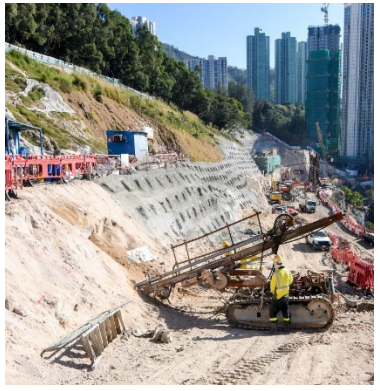
ELS cofferdam ☑

Traffic Deck

Permanent Slope under construction

Structure under demolition ☑

Formwork ☑

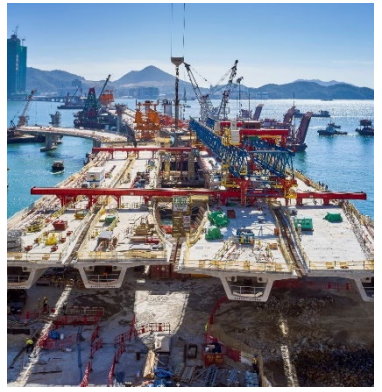


Temporary Slope cutting

Tunnel Support

Tower Crane Base

Completed permanent structure supporting temporary works ☑

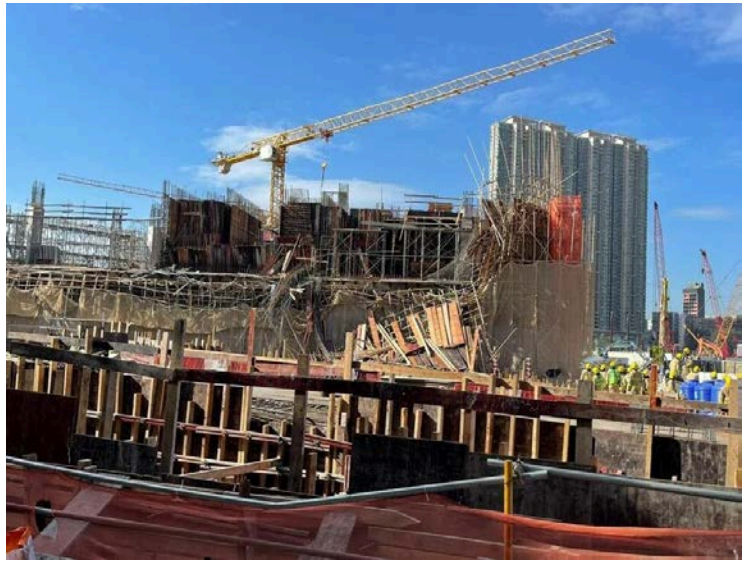


Permanent structure under construction ☑

☑ Temporary Works at Boardwalk

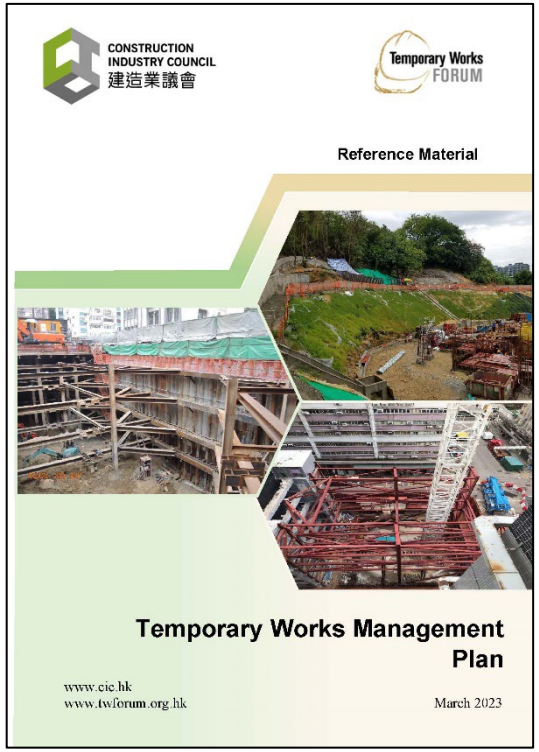
Temporary Works Failures are Preventable

Failures in TW persistently occur in our construction industry causing injury and even death to construction workers



Temporary Works FORUM (HK-TWf) 香港一臨時工程論壇

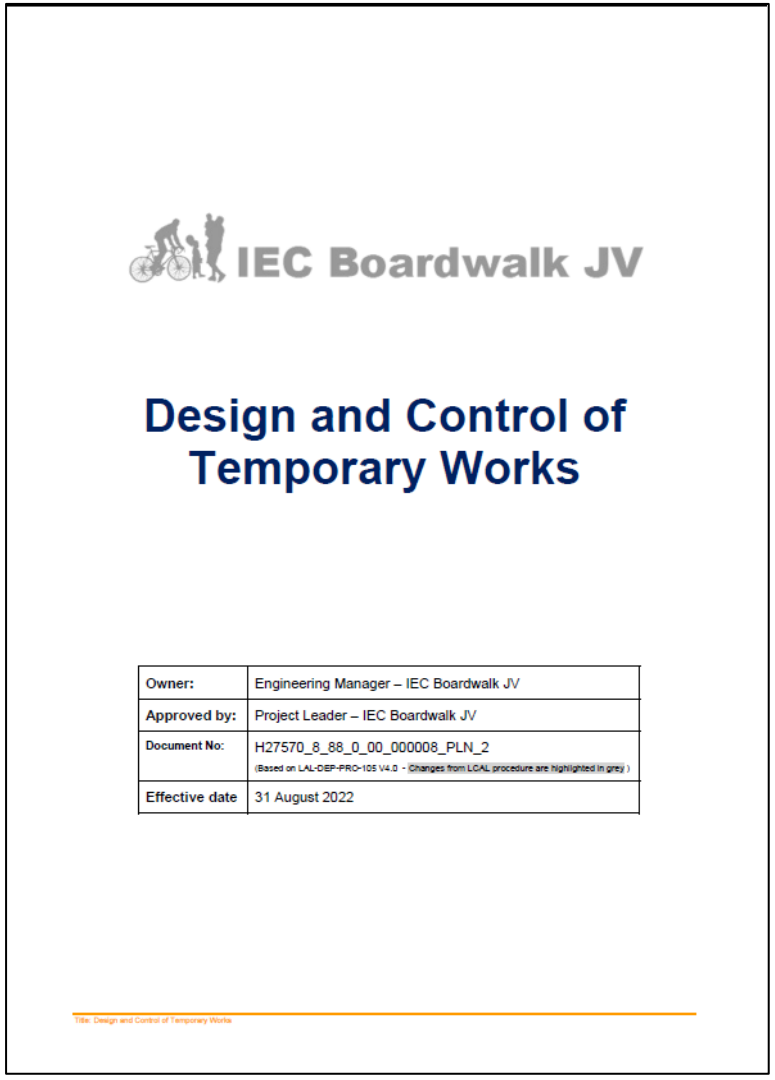
CONSTRUCTION INDUSTRY COUNCIL 建造業議會



The objective is to minimise injuries to workers constructing temporary works in our industry

Temporary Works Forum (Hong Kong) and CIC has published a guide to good practice on "Temporary Works Management Plan"

IEC Boardwalk
TW Management



IEC Boardwalk JV

Design and Control of Temporary Works

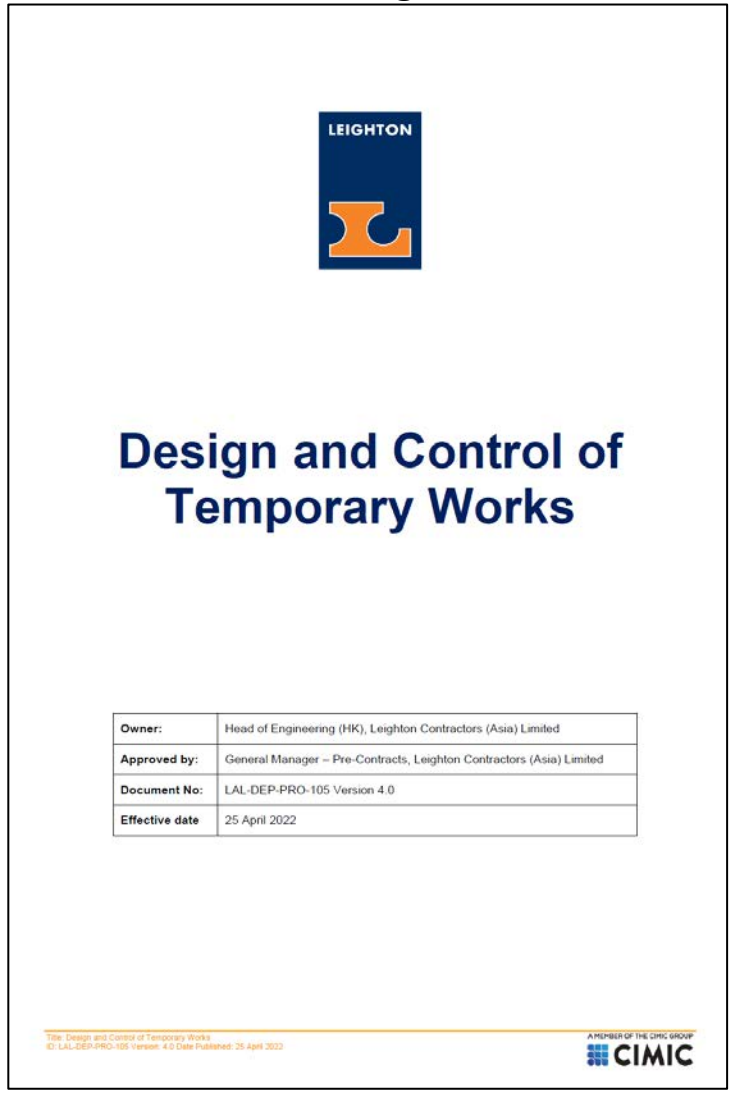
Owner:	Engineering Manager – IEC Boardwalk JV
Approved by:	Project Leader – IEC Boardwalk JV
Document No:	H27570_8_88_0_00_000008_PLN_2 (Based on LAL-DEP-PRO-105 V4.0 - Changes from LCAL procedure are highlighted in grey)
Effective date	31 August 2022

Title: Design and Control of Temporary Works

IEC Boardwalk JV Design and Control of Temporary Works Procedure is based on **Leighton Contractors Asia Limited** template

IEC Boardwalk procedure implemented in 2022, before CIC/TWF document

Leighton Contractors
TW Management



LEIGHTON

Design and Control of Temporary Works

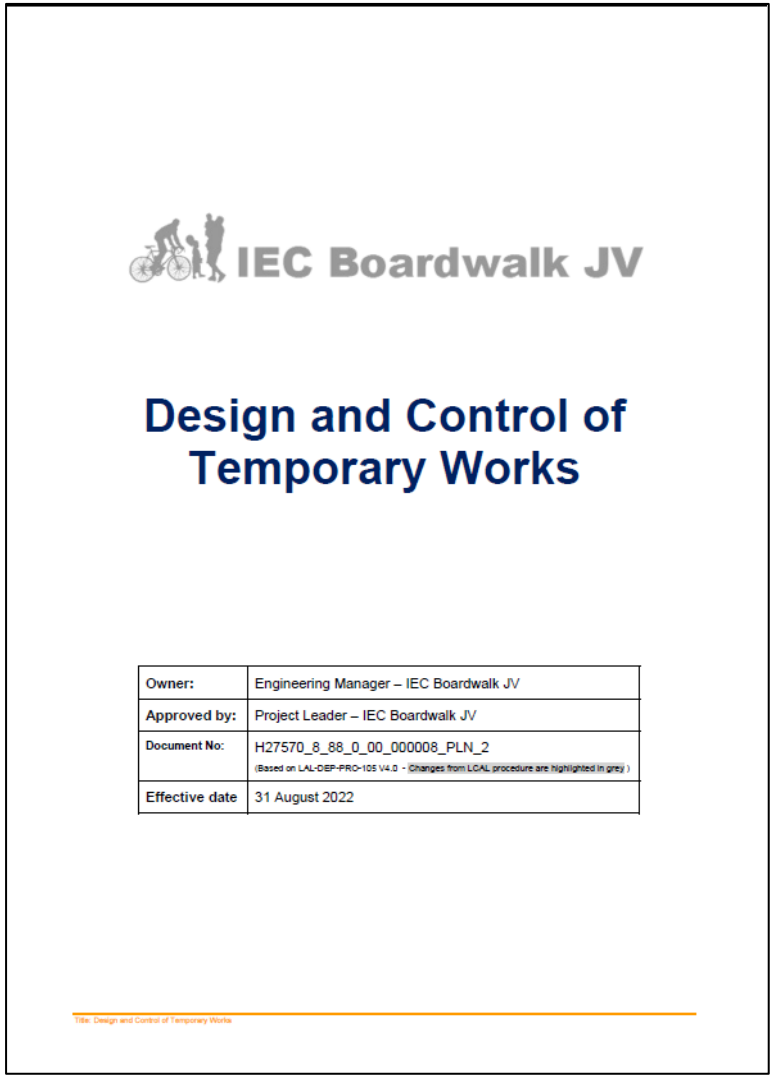
Owner:	Head of Engineering (HK), Leighton Contractors (Asia) Limited
Approved by:	General Manager – Pre-Contracts, Leighton Contractors (Asia) Limited
Document No:	LAL-DEP-PRO-105 Version 4.0
Effective date	25 April 2022

Title: Design and Control of Temporary Works
ID: LAL-DEP-PRO-105 Version: 4.0 Date Published: 25 April 2022

A MEMBER OF THE CIMIC GROUP CIMIC

IEC Boardwalk
TW Management

CIC / TWF
Reference Material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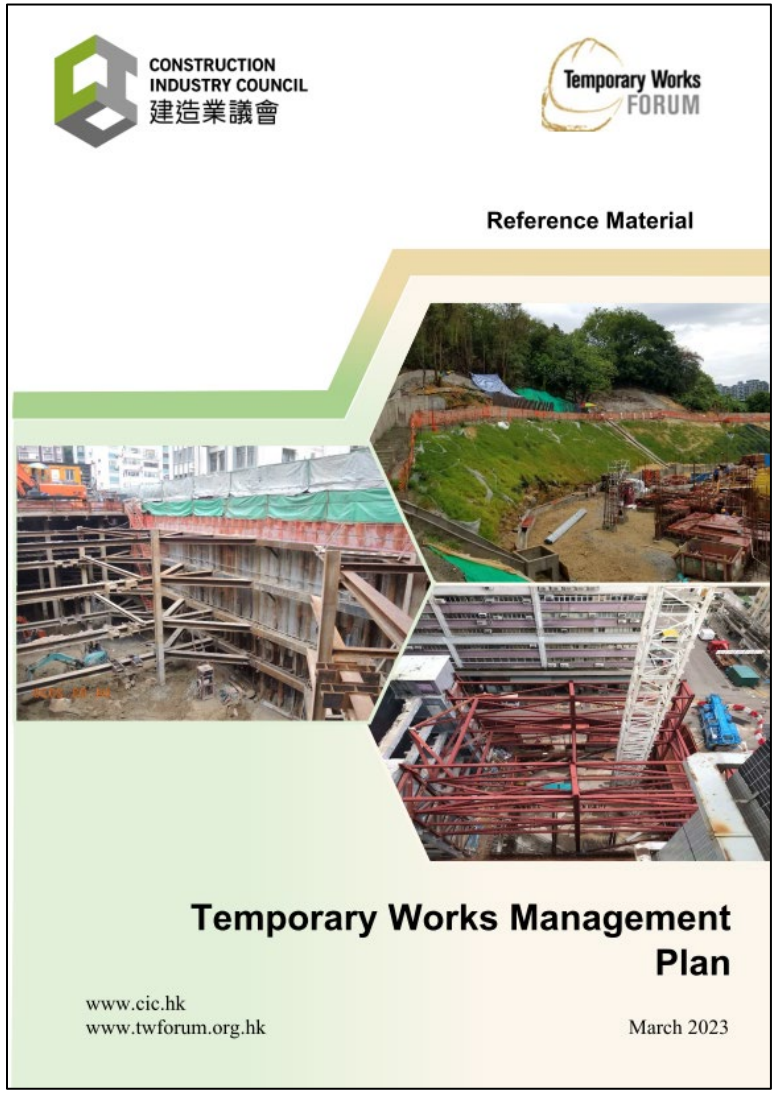
IEC Boardwalk procedure implemented in 2022, before CIC/TWF document

Closely aligned with **CIC/TWF Temporary Works Management Plan** reference, although terminology different.

IEC Boardwalk JV Procedure also includes **Contract specific requirements**


CONSTRUCTION INDUSTRY COUNCIL 建造業議會

Temporary Works FORUM

Reference Material

Temporary Works Management Plan

www.cic.hk
www.twforum.org.hk

March 2023

IEC Boardwalk JV

IEC Boardwalk
TW Management

LEIGHTON

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IEC Boardwalk JV

IEC Boardwalk TW Management

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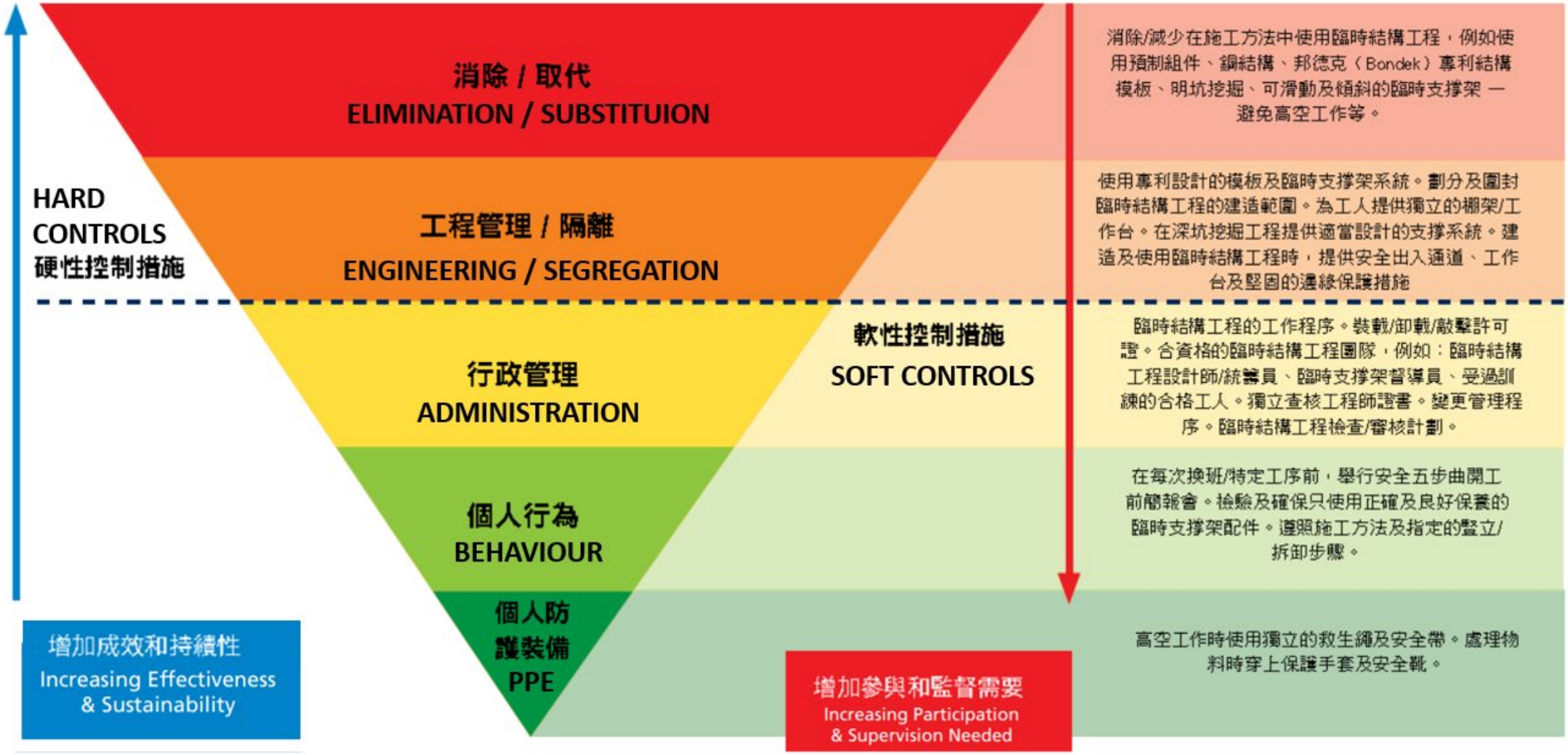
9. **Appendices**

TEMPORARY WORKS DESIGN – HIERACHRY OF CONTROLS



IEC Boardwalk
TW Management

CIC / TWF
Reference Material

Plan TW and Allocate Risk

PLANNING AND RISK ALLOCATION

IEC Boardwalk JV

IEC Boardwalk TW Management

CIC / TWF Reference Material

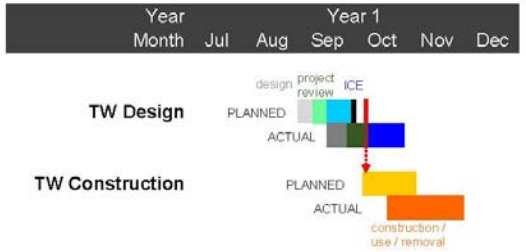
Plan TW and Allocate Risk

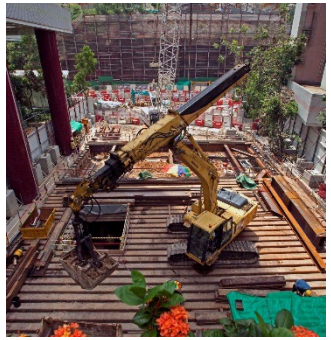
PLANNING AND RISK ALLOCATION

formwork

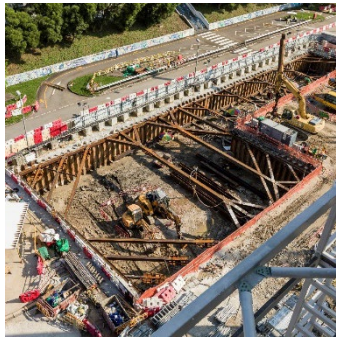
falsework

The **lifecycle duration** for some types of TW **may only span several weeks**



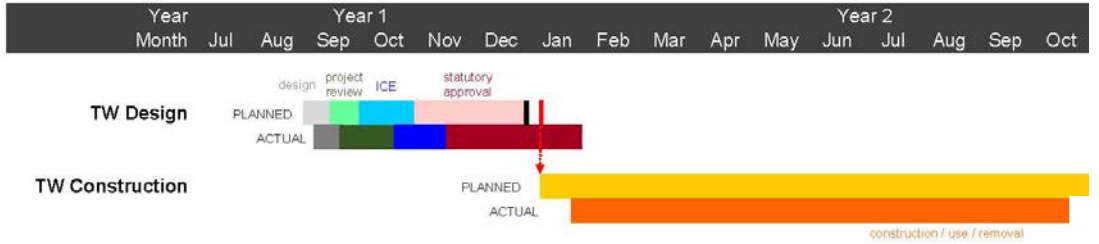


working deck



ELS cofferdam

... whilst other types of TW **can span months or even years**



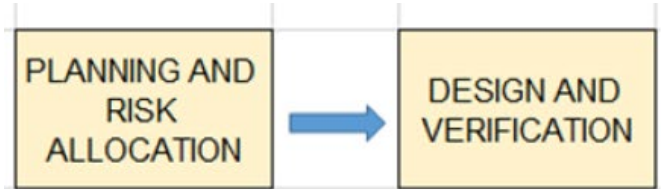
IEC Boardwalk
TW Management

CIC / TWF
Reference Material

Plan TW and Allocate Risk

↓

TW Design and Checking



IEC Boardwalk JV
TW Management

CIC / TWF
Reference Material

Plan TW and Allocate Risk

TW Design and Checking

PLANNING AND RISK ALLOCATION → DESIGN AND VERIFICATION

Appendix H
Permits and Forms

IEC Boardwalk JV

TW1 DESIGN BRIEF

Package No.	T-D06	Design Package	ELS – Box Culvert Diversion	Design Brief No. TW1-0014
Brief Description of the Works to be Designed	Please deliver the ELS design for the box culvert diversion following the tender scheme but with changes as follows: • construction sequence to be amended to suit revised TTM3 sequence (details attached) as well as the revised construction sequence of interfacing contract MRE854 which will now excavate after MRE855 instead of before • designer to review the list of available second hand steel sections as attached and where possible make use of them in the design • change the sheet piles at the eastern area marked in the attached sketch to pipe piles in order to overcome the large boulder encountered in post contract award GI boreholes for the vertical bracing restraint, the designer is required to specifically develop a safe solution to avoid the need for workers to use cherry pickers or scaffold at the upper connection and instead adopt bolted connection which can be accessed by workers from the S1 strut.			

Information Attached to Facilitate the Design

	Documents / Information	Attached	Not Applicable	Remark
A	Construction Method	☒	☐	
B	Risk Information	☐	☒	same as tender
C	Loading Criteria	☐	☒	same as tender
D	Relevant Boreholes / Trial Pits	☒	☐	New GI boreholes attached
E	Other Ground Information	☐	☒	same as tender
F	Survey / Ground Levels	☒	☐	see attached survey
G	Utilities Information	☒	☐	see attached as-built survey
H	Materials	☒	☐	please reuse steel as per attached
I	As-Built Record Drawings	☐	☒	unchanged since tender
J	Other Relevant Drawings	☐	☒	
K	TTM Information	☒	☐	attached updated TTM proposal
L	Re-Use of Existing Stock Material	☐	☒	
M	Key Site Constraints	☐	☒	
N	Are the TW to be lifted	☐	☒	
O	Installation / Removal Method	☐	☒	
P	Others (specify)	☐	☒	

NOTE: All information necessary to enable TWD to produce the design without need to request further details must be included.

Initiated by RSP	Responsible Site Person	Signature	Date
	Rachel Wong		11 Jun 2017

External Parties Review List	ICE ☐ Client ☐ ER ☐ RGE/RSE ☐ BD/GEO ☐ Other ☐			
Temporary Works Risk Category	A ☐ B ☐ C ☒	Design allocated to	Consultant 2	Date Fully Approved ICE Certified Design is Required: 16 Aug 2017
Reviewed by TWC	Temporary Works Coordinator	Signature	Date	
	Tom West		13 Jun 2017	
Reviewed and Issued by EM	Engineering Manager	Signature	Date	
	Anson Tsang		14 Jul 2017	
Task Review Workshop Outcome	Based on the TW1, TWD to prepare available TW options which address competing SBD objectives and TW optimisation objectives and hold a task review workshop with the Contractor's project team. The agreed TW option is as follows:			Task Review Workshop Date: 27 Jul 2017
	It was agreed to adopt Option 2 presented by the TWD (attached for reference)			
Agreed by RSP (or CM)	Responsible Site Person or Construction Manager	Signature	Date	
	Rachel Wong		27 Jul 2017	

The **TW1 Design Brief** conveys the **requirements of the design to the TWD.**

Information provided in the TW1 Design Brief should be **unambiguous** and **as complete as possible** to ensure the TW designs can be completed efficiently and **with minimal need for revisions**.

SAFETY BY DESIGN TASK REVIEW

The objective of Safety by Design is to achieve a balanced decision amongst competing alternative TW options / TW methods / TW schemes with due consideration of time and cost constraints

TEMPORARY WORKS LIFE CYCLE

IEC Boardwalk
TW Management

CIC / TWF
Reference Material

Plan TW and Allocate Risk

↓

TW Design and Checking

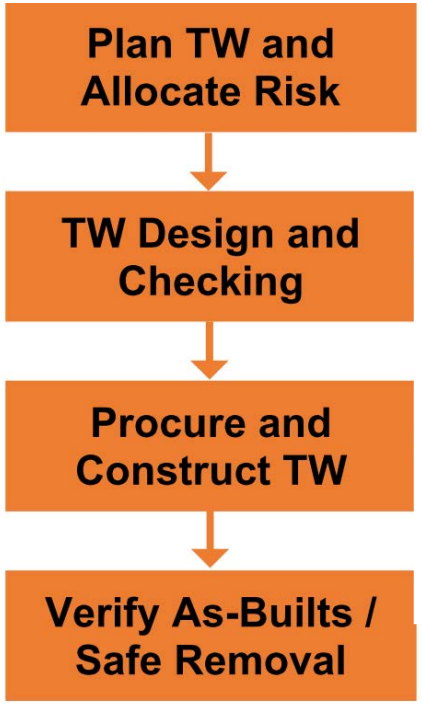
↓

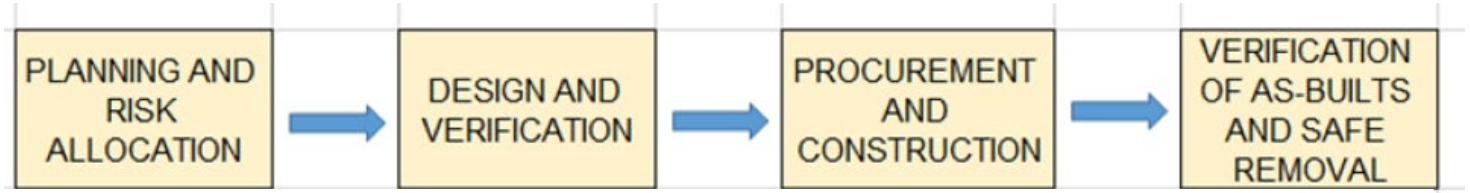
Procure and Construct TW

TEMPORARY WORKS LIFE CYCLE

IEC Boardwalk
TW Management

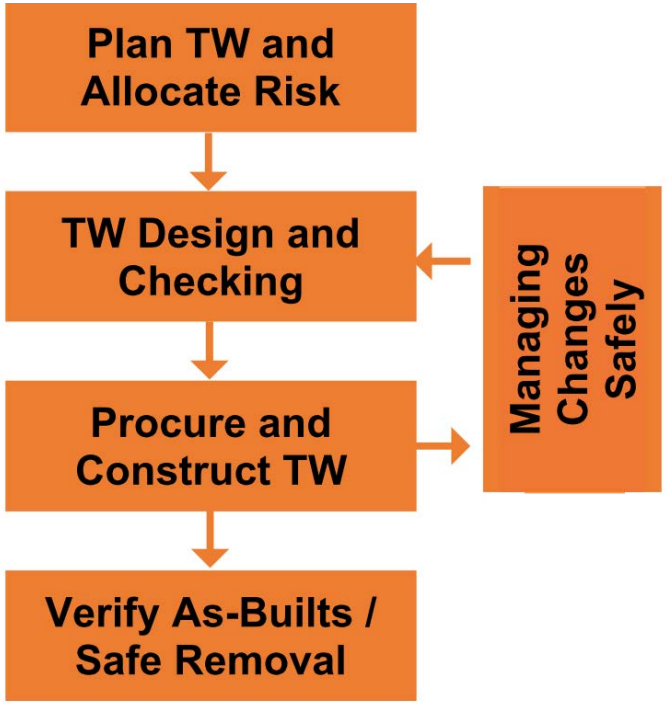
CIC / TWF
Reference Material

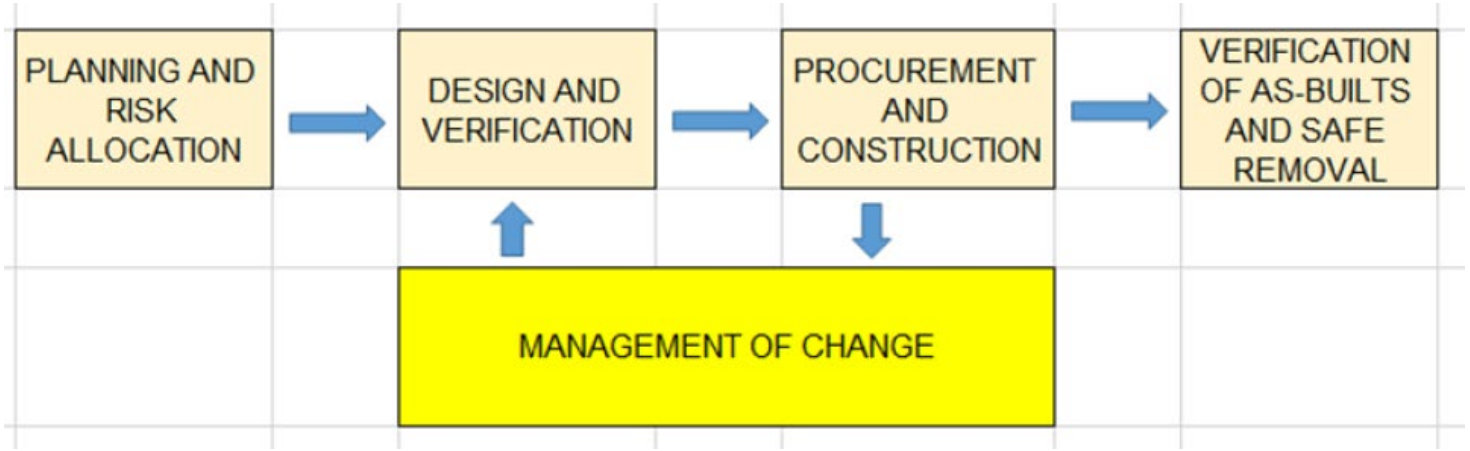




IEC Boardwalk TW Management

CIC / TWF Reference Material





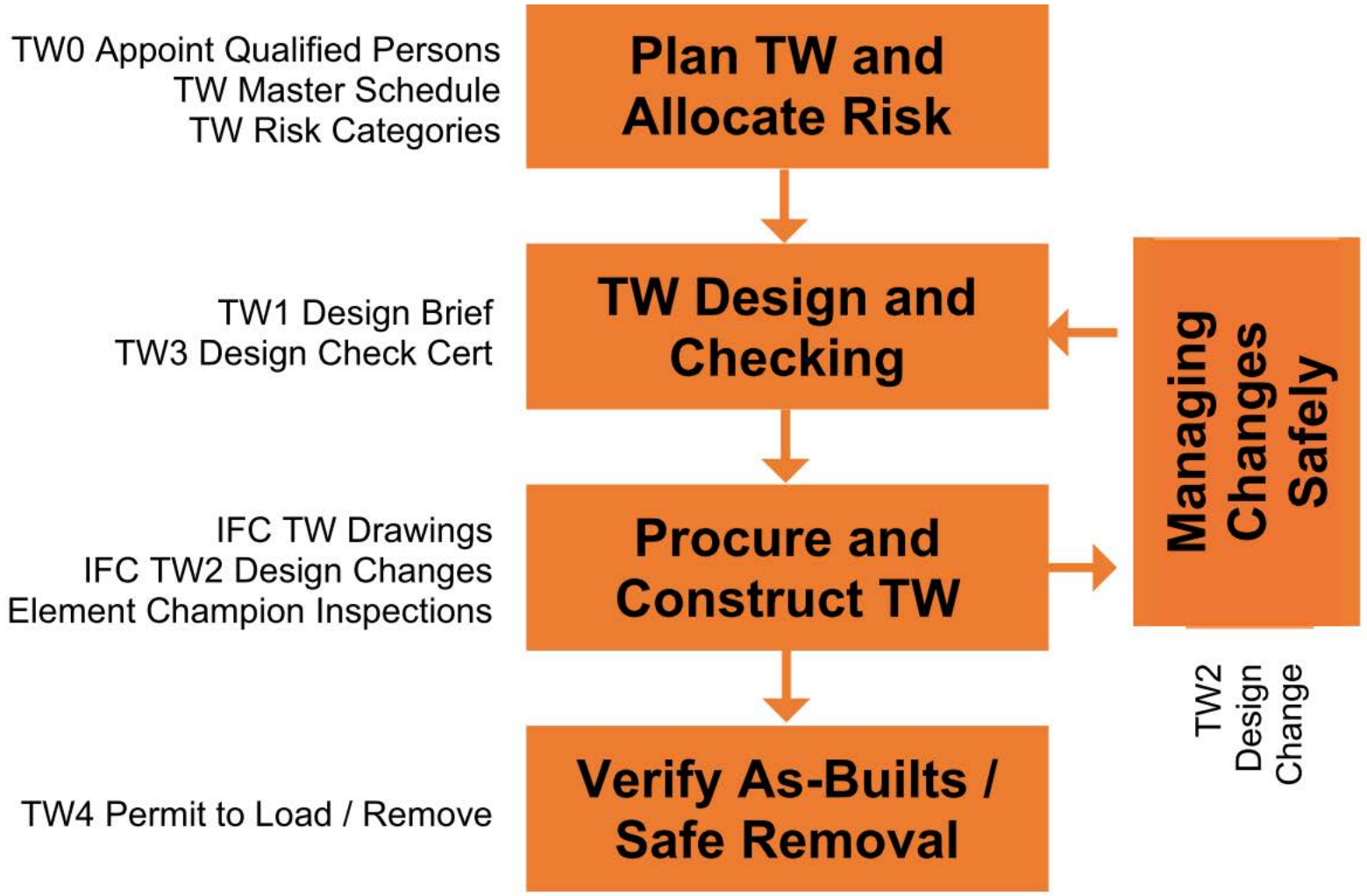
On construction sites, **TW change is inevitable** and may arise due to many reasons.

Common problems :

- Changes not checked by the TWD / ICE
- **Unauthorised changes**
- Insufficient time to process changes
- Undocumented changes

The **TW2 Design Change form** is used to request and record changes in the design or for the TWD to modify designs already issued.

IEC Boardwalk
TW Management



IEC Boardwalk
TW Management

CIC / TWF
Reference Material

PEOPLE

EM = Engineering Manager
TWC = Temporary Works Coordinator
TWD = Temporary Works Designer
RSP = Responsible Site Person
ICE = Independent Checking Engineer

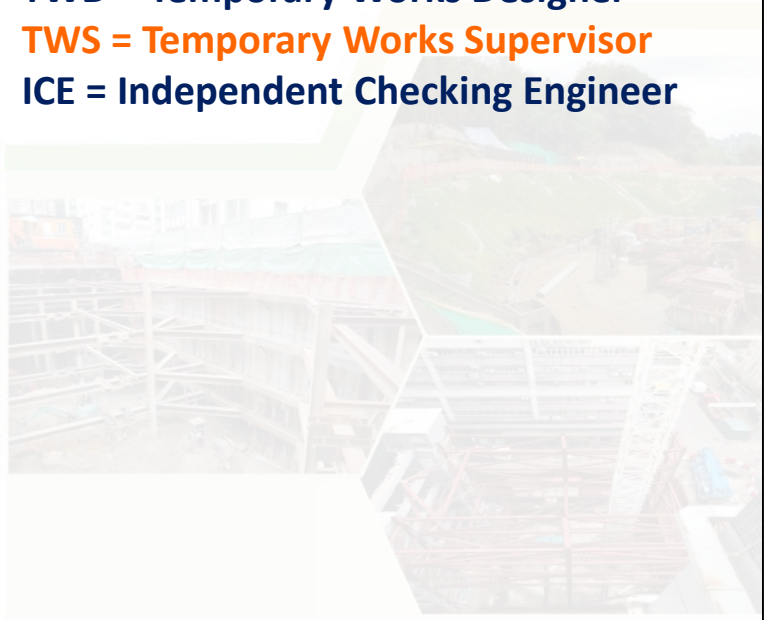
Design and Control of Temporary Works

Owner:	Engineering Manager – IEC Boardwalk JV
Approved by:	Project Leader – IEC Boardwalk JV
Document No:	H27570_8_88_0_00_000008_PLN_2
Effective date	31 August 2022

The D&CTW procedure identifies **persons with clear responsibilities and obligations at different stages** of the TW procedure

PEOPLE

EM = Engineering Manager
TWC = Temporary Works Coordinator
TWD = Temporary Works Designer
TWS = Temporary Works Supervisor
ICE = Independent Checking Engineer



Temporary Works Management Plan

www.cic.hk
www.twforum.org.hk

March 2023

IEC Boardwalk
TW Management

CIC / TWF
Reference Material

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The D&CTW procedure identifies **persons with clear responsibilities and obligations at different stages** of the TW procedure

Temporary Works Coordinator

- Coordinate the planning and design stage of TW life-cycle
- Coordinate between TWD/ICE & construction team
- Monitor the erection, use, maintenance and dismantling of TW

PEOPLE

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TWD = Temporary Works Designer
TWS = Temporary Works Supervisor
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IEC Boardwalk
TW Management

CIC / TWF
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ICE = Independent Checking Engineer

Temporary Works Coordinator

- Coordinate the planning and design stage of TW life-cycle
- Coordinate between TWD/ICE & construction team
- Monitor the erection, use, maintenance and dismantling of TW

RSP / Temporary Works Supervisor

- Responsible for detailed implementation of TW construction
- Is **the responsible person** for the safe delivery of all aspects of TW execution
- Cooperates with TWC during design and planning stage

TEMPORARY WORKS MANAGEMENT - DOCUMENTATION

IEC Boardwalk JV

IEC Boardwalk
TW Management

PEOPLE

EM = Engineering Manager
TWC = Temporary Works Coordinator
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RSP = Responsible Site Person
ICE = Independent Checking Engineer

FORMS

Temporary Works Master Schedule
TW0 = Appointment Form
TW1 = Design Brief
TW2 = Design Change
TW3 = Design Check Certificate
TW4 = Permit to Load / Remove

The D&CTW procedure includes a **TW Master Schedule** and **five TW forms** to facilitate and validate the underlying TW objectives.

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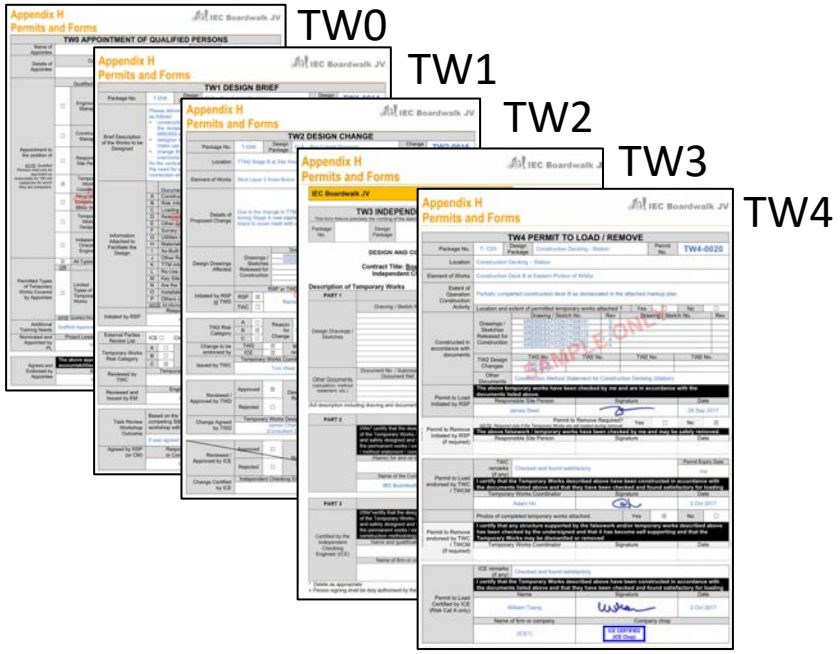
TEMPORARY WORKS MASTER SCHEDULE

Design Package No.	TW Package Description	TW Risk Cat	RSP	TWC	TWCM	TWD	ICE	Date Fully Approved ICE Certified Design is Required	Related TW1	Related TW2	Related TW3	Related TW4
A	Contract Wide TW Packages											
T-A01	TW Geological Drawings	A	Paul Green	Cecilia Singh		Consultant 1	ICE 1	-	n/a	-	-	-
T-A02	Contract Wide ELS General Notes & Details	A	-	Adam Ho		Consultant 1	ICE 1	-	n/a	TW2-0008	TW3-0008	-
T-A03	Instrumentation and Monitoring Drawings	A	Kai Tak Chan	Cecilia Singh		Consultant 1	ICE 1	20 Mar 17	n/a	TW2-0005	TW3-0009	-
B	Site Establishment											
T-B01	Works Area Plans & Site Utilisation Plans	C	Andrew Pang	Cecilia Singh	Kylie Tam	Site Eng Team	CK Hau	13 Mar 17	TW1-0001		TW3-0003	-
T-B02	Project Site Office	B	Andrew Pang	Cecilia Singh		Specialist Subcon 1	ICE 1	13 Mar 17	TW1-0003		TW3-0004	TW4-0001
T-B03	Hoarding / Fencing	C	Andrew Pang	Cecilia Singh		Specialist Subcon 2	ICE 1	20 Mar 17	TW1-0002		TW3-0001	TW4-0002
T-B04	Project Signboard	C	Andrew	Cecilia		Specialist	ICE 1	20 Mar 17	TW1-0005		TW3-0002	TW4-0019



CONSTRUCTION INDUSTRY COUNCIL 建造業議會

CIC / TWF
Reference Material

Temporary Works FORUM (HK-TWF) 香港一臨時工程論壇

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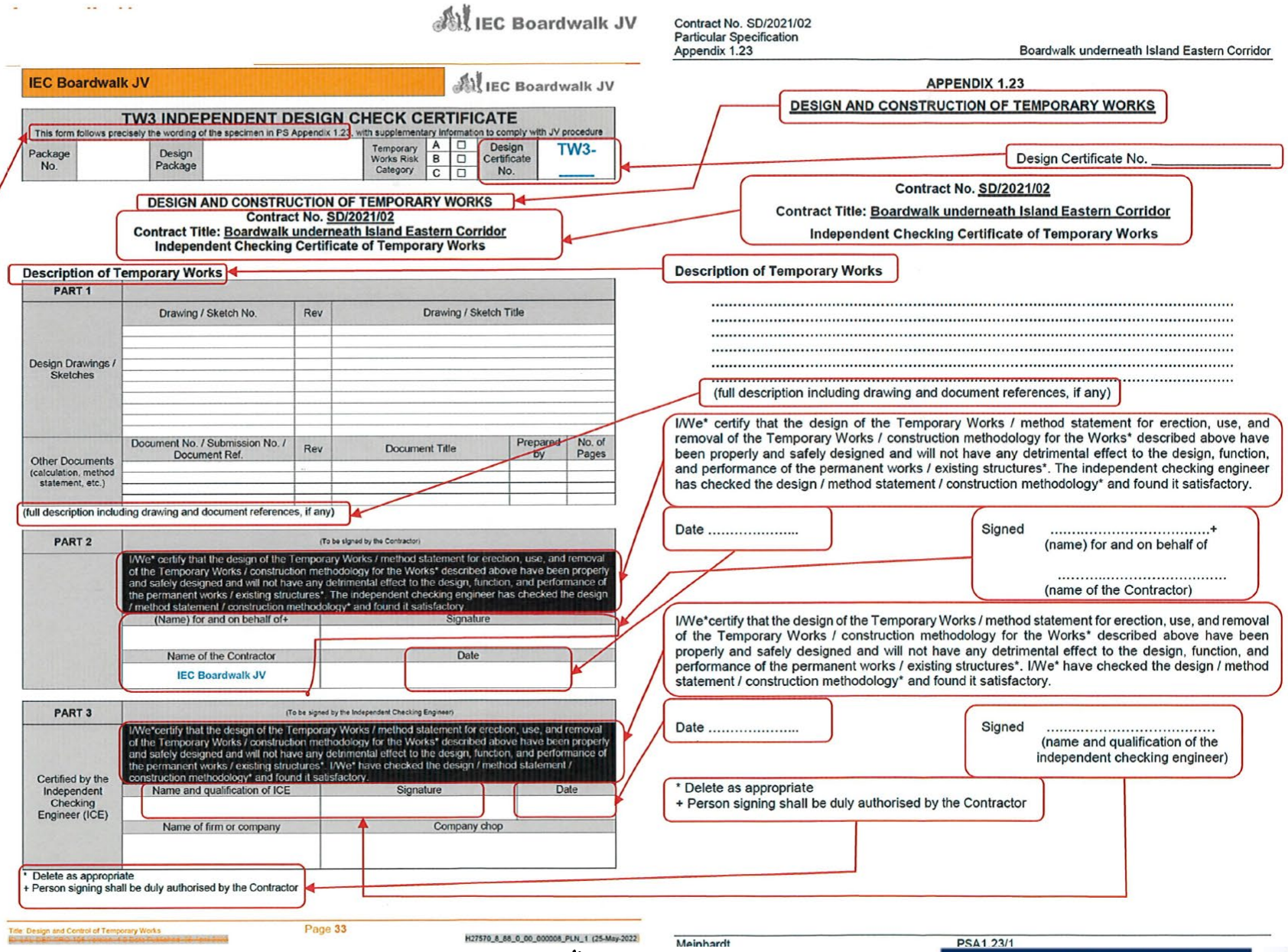
Temporary Works Management Plan

www.cic.hk
www.twforum.org.hk
March 2023

IEC Boardwalk JV | LEIGHTON | SINOHYDRO | 森記建築有限公司 SUM KEE CONSTRUCTION LIMITED

PS1.67

(9) The form of the certificate required by Clause F7 of the *additional conditions of contract* shall follow precisely the wording of the specimens in PS Appendix 1.23.



IEC Boardwalk JV

Contract No. SD/2021/02
Particular Specification
Appendix 1.23
Boardwalk underneath Island Eastern Corridor

IEC Boardwalk JV

TW3 INDEPENDENT DESIGN CHECK CERTIFICATE

This form follows precisely the wording of the specimen in PS Appendix 1.23, with supplementary information to comply with JV procedure

Package No.		Design Package		Temporary Works Risk Category	A ☐ B ☐ C ☐	Design Certificate No.	TW3-____

DESIGN AND CONSTRUCTION OF TEMPORARY WORKS
Contract No. SD/2021/02
Contract Title: Boardwalk underneath Island Eastern Corridor
Independent Checking Certificate of Temporary Works

Description of Temporary Works

PART 1

Design Drawings / Sketches

Drawing / Sketch No.	Rev	Drawing / Sketch Title

Other Documents (calculation, method statement, etc.)

Document No. / Submission No. / Document Ref.	Rev	Document Title	Prepared by	No. of Pages

(full description including drawing and document references, if any)

PART 2 (To be signed by the Contractor)

I/We* certify that the design of the Temporary Works / method statement for erection, use, and removal of the Temporary Works / construction methodology for the Works* described above have been properly and safely designed and will not have any detrimental effect to the design, function, and performance of the permanent works / existing structures*. The independent checking engineer has checked the design / method statement / construction methodology* and found it satisfactory.

(Name) for and on behalf of+	Signature
Name of the Contractor	Date
IEC Boardwalk JV	

PART 3 (To be signed by the Independent Checking Engineer)

Certified by the Independent Checking Engineer (ICE)

I/We*certify that the design of the Temporary Works / method statement for erection, use, and removal of the Temporary Works / construction methodology for the Works* described above have been properly and safely designed and will not have any detrimental effect to the design, function, and performance of the permanent works / existing structures*. I/We* have checked the design / method statement / construction methodology* and found it satisfactory.

Name and qualification of ICE	Signature	Date
Name of firm or company	Company chop	

* Delete as appropriate
+ Person signing shall be duly authorised by the Contractor

Title: Design and Control of Temporary Works — Page 33 — H27570_8_88_0_00_000008_PLN_1 (25-May-2022)

APPENDIX 1.23
DESIGN AND CONSTRUCTION OF TEMPORARY WORKS

Design Certificate No. _____

Contract No. SD/2021/02
Contract Title: Boardwalk underneath Island Eastern Corridor
Independent Checking Certificate of Temporary Works

Description of Temporary Works

.....
.....
.....
.....
.....
.....

(full description including drawing and document references, if any)

I/We* certify that the design of the Temporary Works / method statement for erection, use, and removal of the Temporary Works / construction methodology for the Works* described above have been properly and safely designed and will not have any detrimental effect to the design, function, and performance of the permanent works / existing structures*. The independent checking engineer has checked the design / method statement / construction methodology* and found it satisfactory.

Date .....

Signed .....+
(name) for and on behalf of
.....
(name of the Contractor)

I/We*certify that the design of the Temporary Works / method statement for erection, use, and removal of the Temporary Works / construction methodology for the Works* described above have been properly and safely designed and will not have any detrimental effect to the design, function, and performance of the permanent works / existing structures*. I/We* have checked the design / method statement / construction methodology* and found it satisfactory.

Date .....

Signed .....
(name and qualification of the independent checking engineer)

* Delete as appropriate
+ Person signing shall be duly authorised by the Contractor

Meinhardt — PSA1.23/1

IEC Boardwalk JV *"TW3 Independent Design Check Certificate"* incorporates project specific requirements and additional information required by JV procedure

Example of document mapping undertaken to demonstrate Contract compliance

TEMPORARY WORKS MANAGEMENT – RISK CATEGORIES

IEC Boardwalk JV

IEC Boardwalk JV
TW Management

LEIGHTON

CONSTRUCTION INDUSTRY COUNCIL 建造業議會

CIC / TWF Reference Material

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TW4 = Permit to Load / Remove

RISK CATEGORIES

A = Major / Complex
B = Medium
C = Minor / Simple

Risk category determines the required qualified persons for the design, checking and inspection of TW

Risk Category	Complexity	Examples
A	MAJOR / COMPLEX	▪ tunnel temporary support ▪ micro-tunnelling / pipe jacking ▪ tunnel portals and shafts ▪ ground support schemes > 4.5m deep ▪ strutted excavations > 4.5m deep ▪ heavy lifting and hoisting schemes >25T ▪ jacking or underpinning schemes ▪ working platforms for plant / cranes / piling rigs
B	MEDIUM	▪ ground support schemes 2m - 4.5m deep ▪ strutted excavations 2m - 4.5m deep ▪ open cut excavations >4.5m deep ▪ major temporary support to utilities suspended over excavations ▪ temporary lifting and hoisting systems (5-25T) ▪ double sided formwork >3m high ▪ single sided formwork 3-6m high
C	MINOR / SIMPLE	▪ ground support schemes <2m deep ▪ strutted excavations <2m deep ▪ open cut excavations 1.2m - 4.5m deep ▪ minor temporary support to utilities suspended over excavations ▪ temporary lifting and hoisting systems (<5T) ▪ double sided formwork >0.4m and <3m high ▪ single sided formwork >0.4m and <3m high

Risk Category	Complexity	Temporary Works Designer (TWD)	Independent Checking Engineer (ICE)	Construction Supervision	Site Inspection
A	MAJOR / COMPLEX	▪ Engineering Consultant; or ▪ Specialist Sub-con / Supplier	▪ Engineering Consultant	CM / RSP	ICE & TWC
B	MEDIUM	▪ Engineering Consultant; or ▪ Specialist Sub-con / Supplier	▪ Engineering Consultant	CM / RSP	TWC
C	MINOR / SIMPLE	▪ Engineering Consultant ▪ Specialist Sub-con / Supplier; or ▪ nominated and approved Competent Design Engineer	▪ Engineering Consultant; or ▪ nominated & approved Competent Design Engineer	CM / RSP	TWC / TWCM

PEOPLE

EM = Engineering Manager
TWC = Temporary Works Coordinator
TWD = Temporary Works Designer
TWS = Temporary Works Supervisor
ICE = Independent Checking Engineer

FORMS

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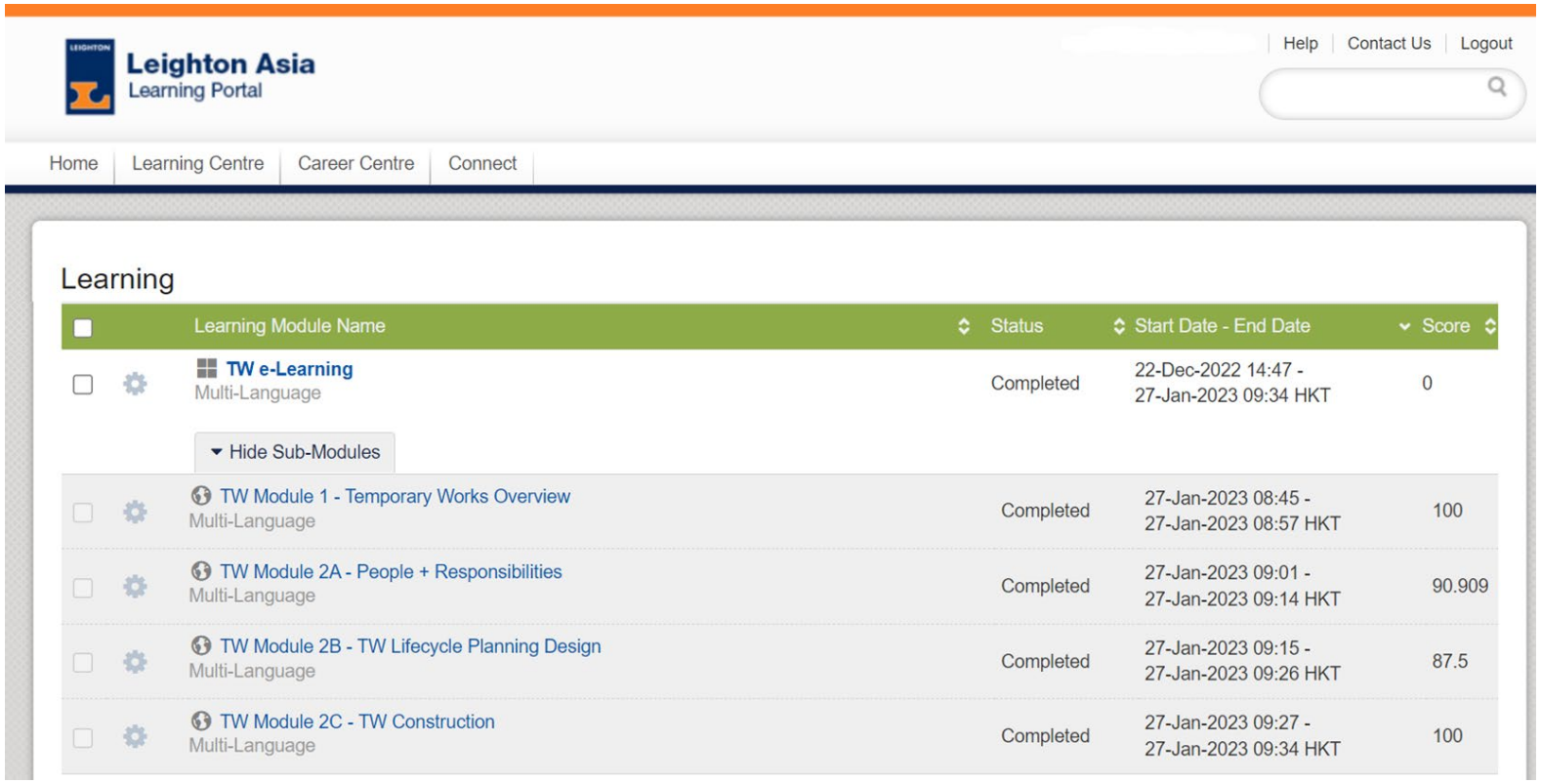
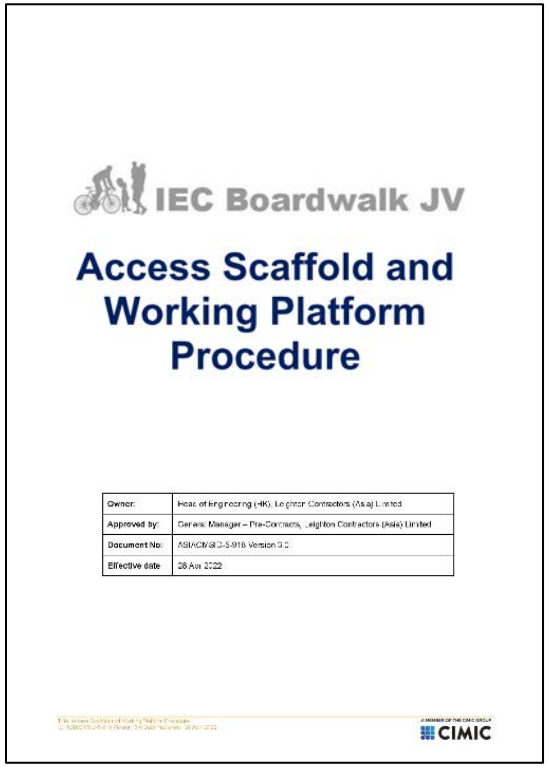
RISK CATEGORIES

A = Major / Complex
B = Medium
C = Minor / Simple

- **Regular Face-to-Face Training / Refresher Sessions**
- **E-Learning Modules**



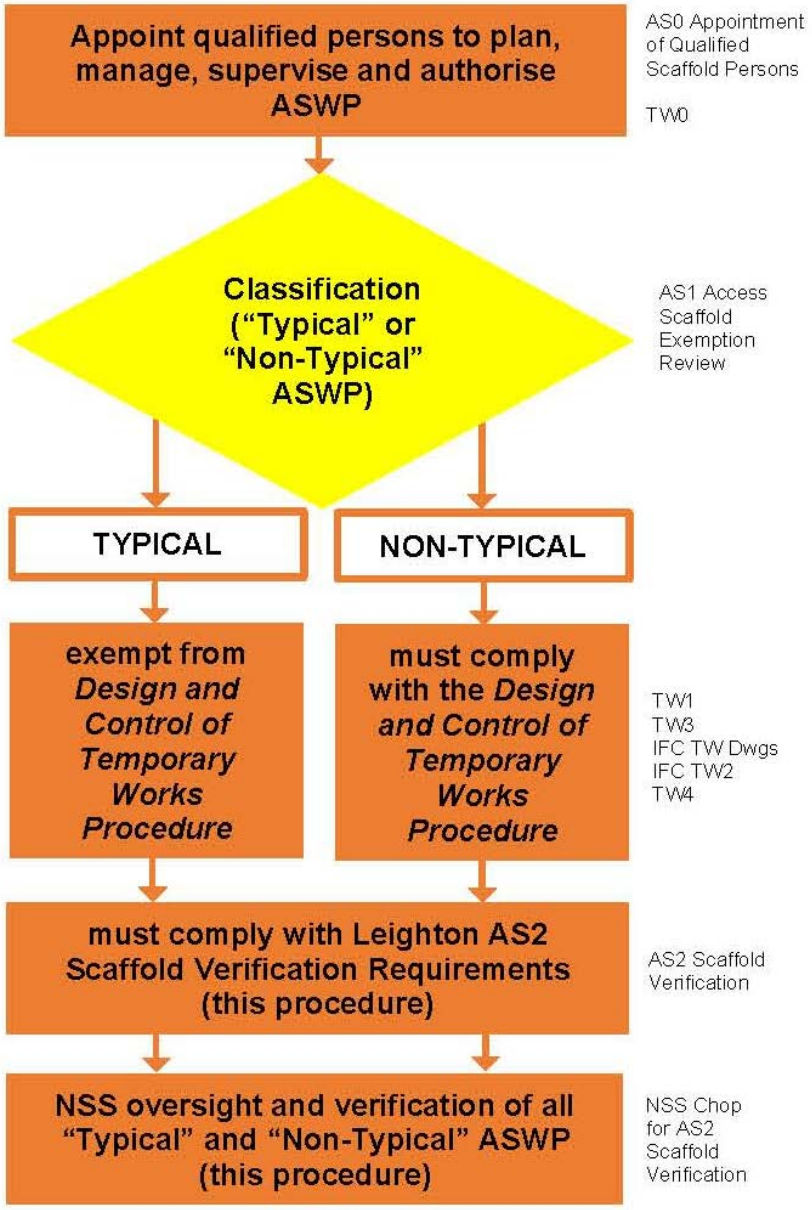


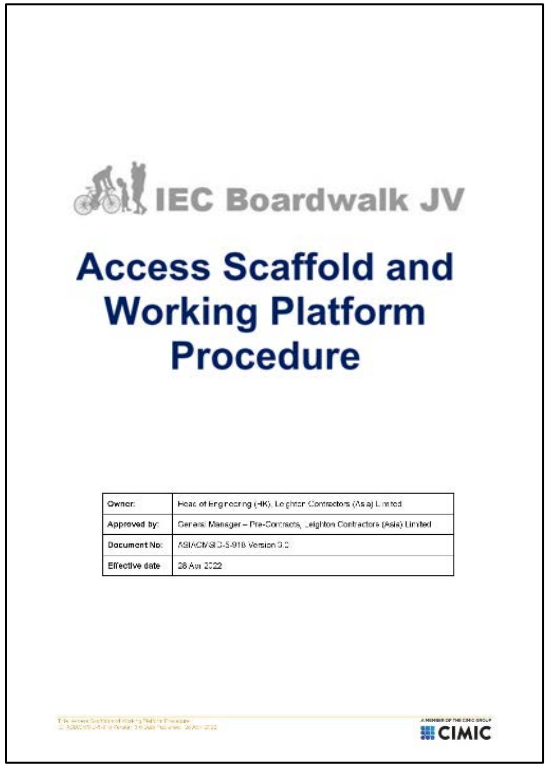
IEC Boardwalk JV

Access Scaffold and Working Platform Procedure

Owner:	Head of Engineering (HK), Leighton Contractors (Asia) Limited
Approved by:	General Manager – Pre-Contracts, Leighton Contractors (Asia) Limited
Document No:	AS/IC/M/GD-5.918 Version 3.0
Effective date	28 Apr 2022

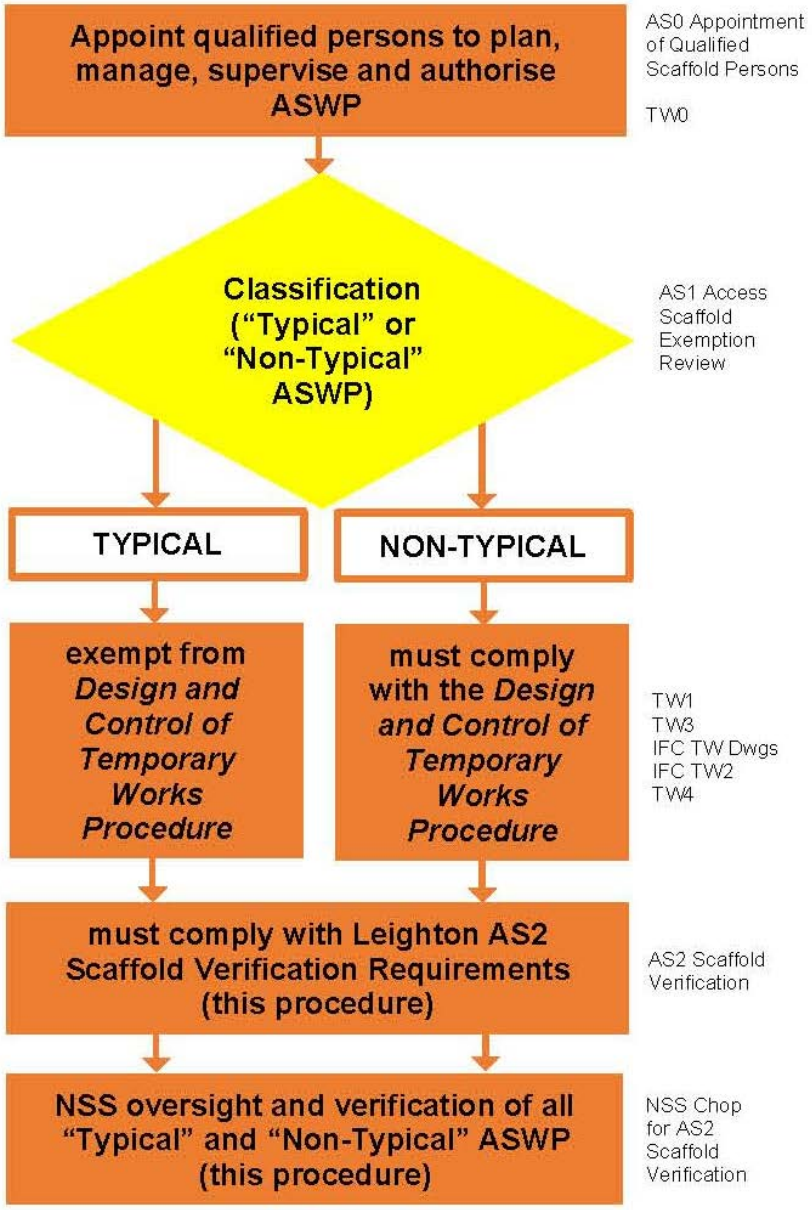
A MEMBER OF THE CIMIC GROUP
CIMIC

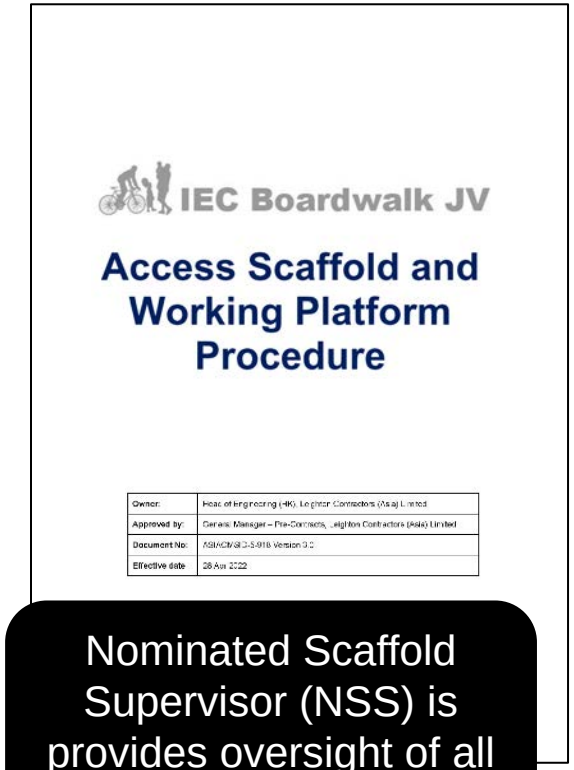

Appoint qualified persons to plan, manage, supervise and authorise ASWP
AS0 Appointment of Qualified Scaffold Persons
TW0
Classification ("Typical" or "Non-Typical" ASWP)
AS1 Access Scaffold Exemption Review
TYPICAL
NON-TYPICAL
exempt from Design and Control of Temporary Works Procedure
must comply with the Design and Control of Temporary Works Procedure
TW1
TW3
IFC TW Dwgs
IFC TW2
TW4
must comply with Leighton AS2 Scaffold Verification Requirements (this procedure)
AS2 Scaffold Verification
NSS oversight and verification of all "Typical" and "Non-Typical" ASWP (this procedure)
NSS Chop for AS2 Scaffold Verification


IEC Boardwalk JV
Access Scaffold and Working Platform Procedure
Owner:
Approved by:
Document No:
Effective date
CIMIC

IEC BOARDWALK JV – ACCESS SCAFFOLD / WORKING PLATFORMS

IEC Boardwalk JV




IEC Boardwalk JV

Access Scaffold and Working Platform Procedure

Owner:	Head of Engineering (HK), Leighton Contractors (Asia) Limited
Approved by:	General Manager – Pre-Contracts, Leighton Contractors (Asia) Limited
Document No:	ASI/CM/GD-5-918 Version 3.0
Effective date	28 Aug 2022

Nominated Scaffold Supervisor (NSS) is provides oversight of all scaffolds on the project

NOMINATED SCAFFOLD SUPERVISOR AS2 SCAFFOLD VERIFICATION CHOP

The working platform elements of this scaffold have undergone additional checks by me and as far as I can ascertain, the arrangement is compliant with the AS2 Scaffold Verification Requirements.

Name of NSS: SINGH, Gupta

(Signature of NSS)	(Date)
	23 Sep 2017

IEC BOARDWALK JV – ACCESS SCAFFOLD / WORKING PLATFORMS

IEC Boardwalk JV

Appoint qualified persons to plan, manage, supervise and authorise ASWP

AS0 Appointment of Qualified Scaffold Persons

TW0

Classification ("Typical" or "Non-Typical" ASWP)

AS1 Access Scaffold Exemption Review

TYPICAL

NON-TYPICAL

exempt from *Design and Control of Temporary Works Procedure*

must comply with the *Design and Control of Temporary Works Procedure*

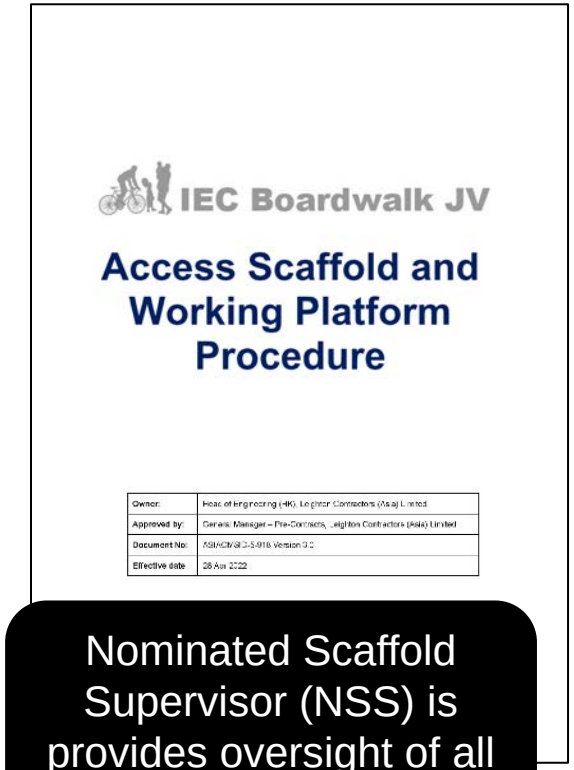
TW1
TW3
IFC TW Dwgs
IFC TW2
TW4

must comply with Leighton AS2 Scaffold Verification Requirements (this procedure)

AS2 Scaffold Verification

NSS oversight and verification of all "Typical" and "Non-Typical" ASWP (this procedure)

NSS Chop for AS2 Scaffold Verification


IEC Boardwalk JV

Access Scaffold and Working Platform Procedure

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Approved by:	General Manager – Pre-Contracts, Leighton Contractors (Asia) Limited
Document No:	AS/WD/GD-5-918 Version 3.0
Effective date	28 Aug 2022

Nominated Scaffold Supervisor (NSS) is provides oversight of all scaffolds on the project

NOMINATED SCAFFOLD SUPERVISOR
AS2 SCAFFOLD VERIFICATION CHOP

The working platform elements of this scaffold have undergone additional checks by me and as far as I can ascertain, the arrangement is compliant with the AS2 Scaffold Verification Requirements.

Name of NSS: SINGH, Gupta

(Signature of NSS) | 23 Sep 2017 (Date)

AS0 to appoint :
- CP
- NSS

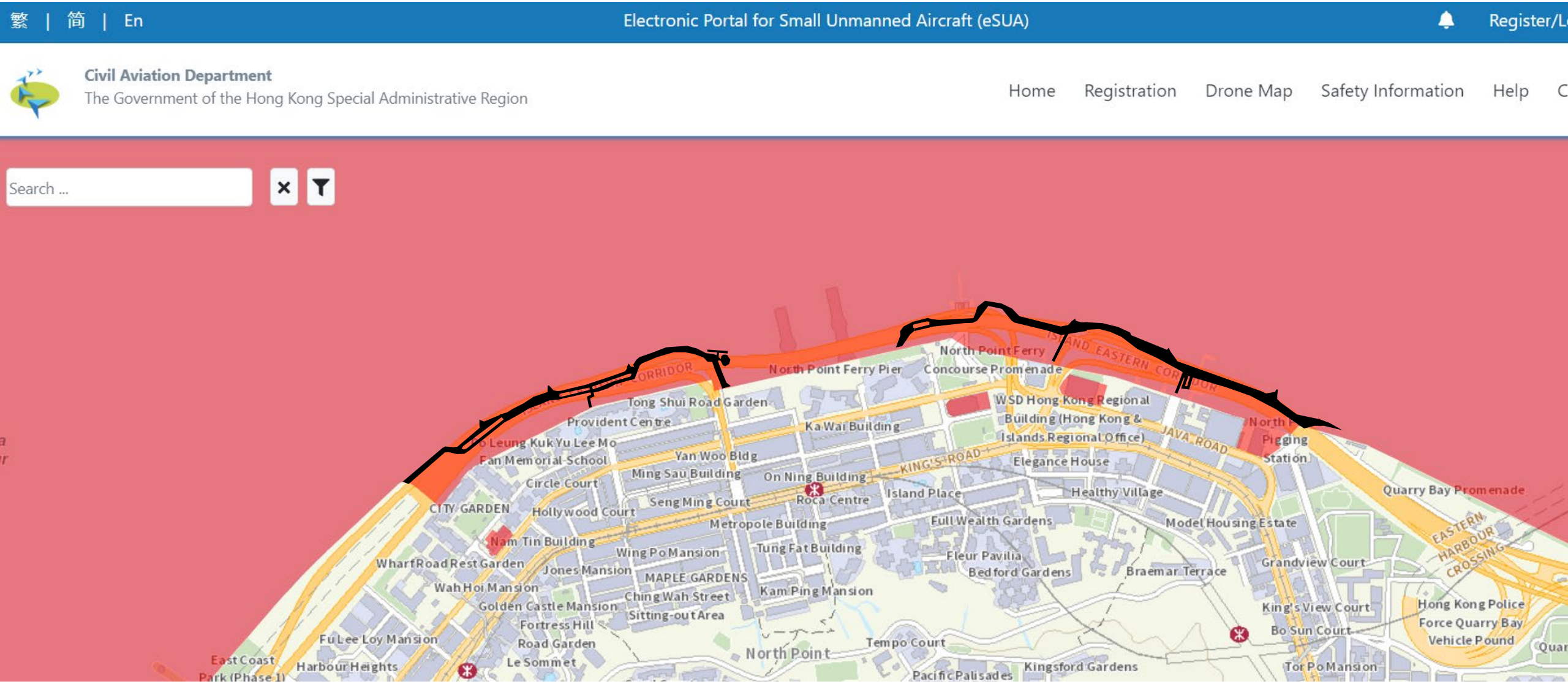
AS1 to determine :
- "Typical" ASWP
- "Non-Typical" ASWP

AS2 for NSS + CP to verify specific scaffold requirements (which may exceed industry standards)

IEC Boardwalk JV | LEIGHTON | SINOHYDRO | 森記建築有限公司 SUM KEE CONSTRUCTION LIMITED

TEMPORARY WORKS AT BOARDWALK UNDERNEATH IEC

Restricted Flying Zone (RFZ) : limits use of aerial drones compare to other projects



GeoSens - Boardwalk

Home
Status
Charts
Maps
Data Entry
Reports
Settings

Map Toolbox

Instrument | Station-Group | Toolbox | Layers

Legend | Geotechnical Test

Category: Western Boardwalk

Station Type: Survey Settlement Group (STMLG)

Stations

Search

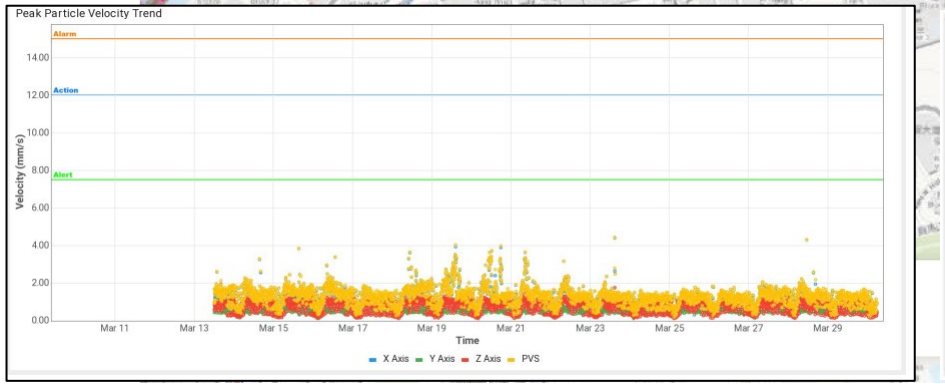
BSTM West Boardwalk
Bored Pile C1-C2 Settlement
Movable Bridge MB1

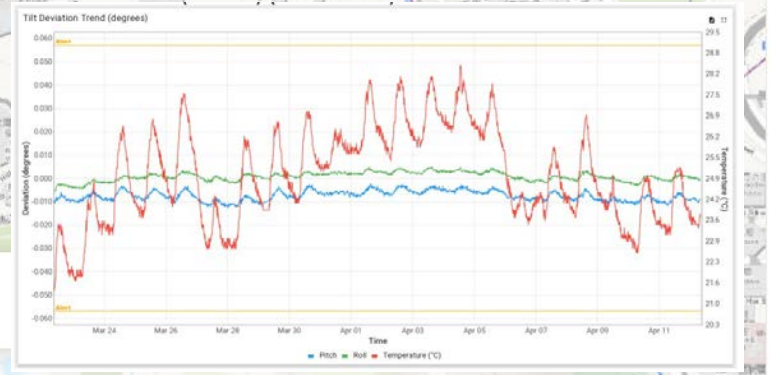
Station Instruments

Search

No instruments found

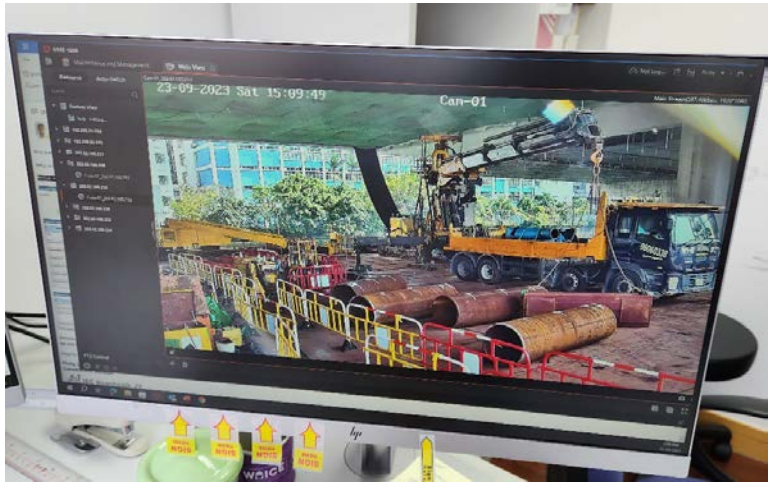
Data





CCTV provides live view of site and allows viewer to see multiple worksfronts at the same time

This can greatly assist in verifying temporary works controls / compliance is in place;
CCTV can be linked to AI functions to enforce TW control items (e.g. plant proximity to seawall)



EXISTING DOLPHIN REMOVAL

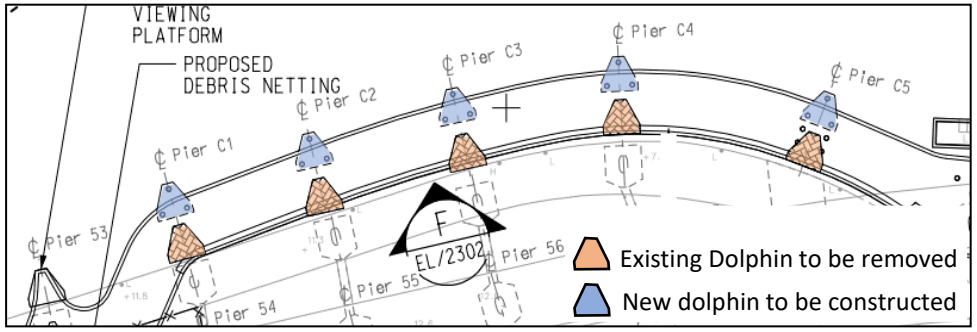
Plan TW and Allocate Risk

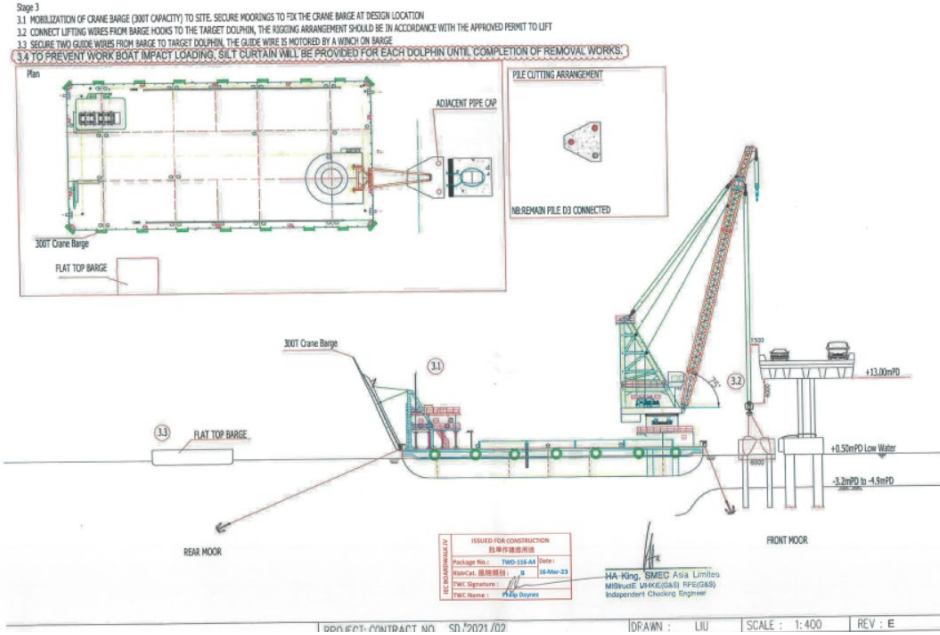
TW Design and Checking

Procure and Construct TW

Verify As-Built / Safe Removal

Managing Changes Safely





Drawings chopped by TWC and ICE
"**Issued for Construction (IFC)**"

Only drawings with "IFC" chop shall be used for construction of temporary works

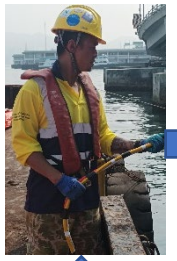
Pre-works planning and method statement development

Diving Team set-up and organization

低壓空氣壓縮機
Low-pressure Compressor

濾芯
Filter

潛水主管
Diving Supervisor



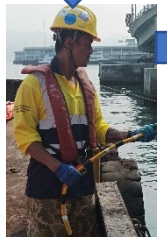
潛水支援員
Diver's Tender

潛水員
Diver

控制版面
Control Panel

獨立供氣管
Independent Umbilical

後備高壓空氣瓶
Back up high-pressure air supply



潛水支援員
Diver's Tender

後備潛水員
Backup Diver

Diving Equipment

設備Equipment	Uses and Inspections
低壓空氣壓縮機 Low-pressure Compressor	• 一般供氧 General air supply • 開始工序前試氣 Conduct air test before commencement of works procedure
後備高壓空氣瓶 Back up high-pressure air supply	• 緊急供氧 Emergency air supply • 根據瓶上檢測日期進行檢測 Test the cylinder according to specified date on the cylinder
濾芯 Filter	• 過濾水分 Filter away air moisture • 開始工序前測試呼吸器具 Pre-use test with Breathing appliances
控制版面 Control Panel	• 使用前測試 Pre-Use Test
獨立供氣管 Independent Umbilical	• 輸送空氣 Convey compressed air • 使用前測試氣壓 Pre-Use Test on air pressure

潛水員必須帶備緊急氧氣瓶 Diver must wear Bailout bottles.

後備高壓空氣瓶啟動時，潛水員必須必須上水。When back up high-pressure air supply is activated, diver must surface.

Underwater Drone "Robo dolphin"

Where possible, used to replace diving works

- Increased Safety
- Increased Productivity
- Lower Cost

Typical Uses

- Silt curtain inspection
- Condition inspections
  - Existing structures
  - Pile removal

DOLPHIN REMOVAL – UNDERWATER DRONE CHECKED FINAL CONDITION

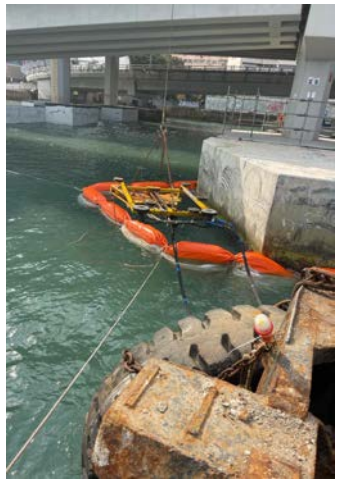
Plan TW and Allocate Risk

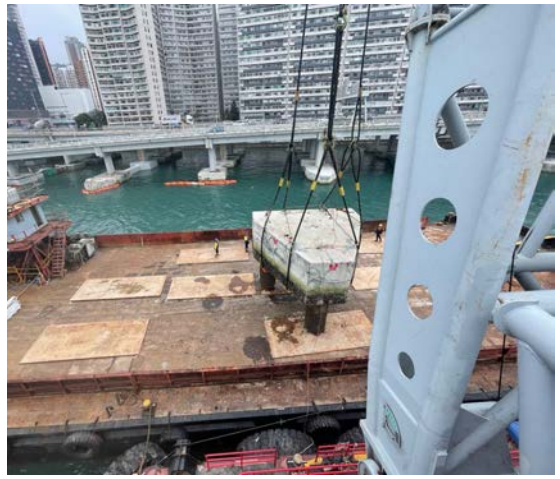
TW Design and Checking

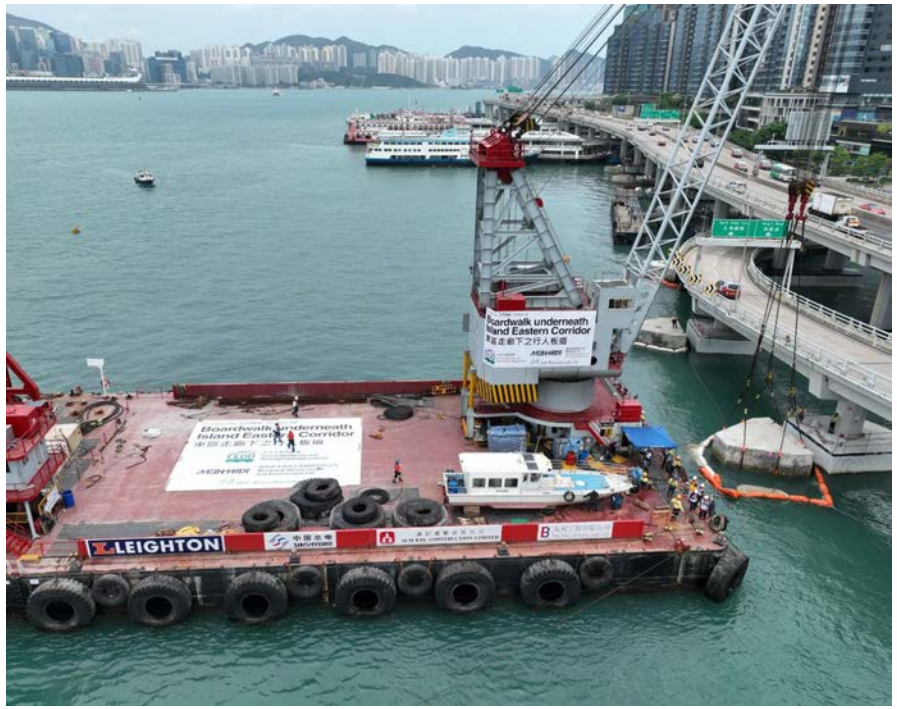
Procure and Construct TW

Verify As-Built / Safe Removal

Managing Changes Safely







EXISTING PILECAP REPAIRS

Before

After

Temporary working platform

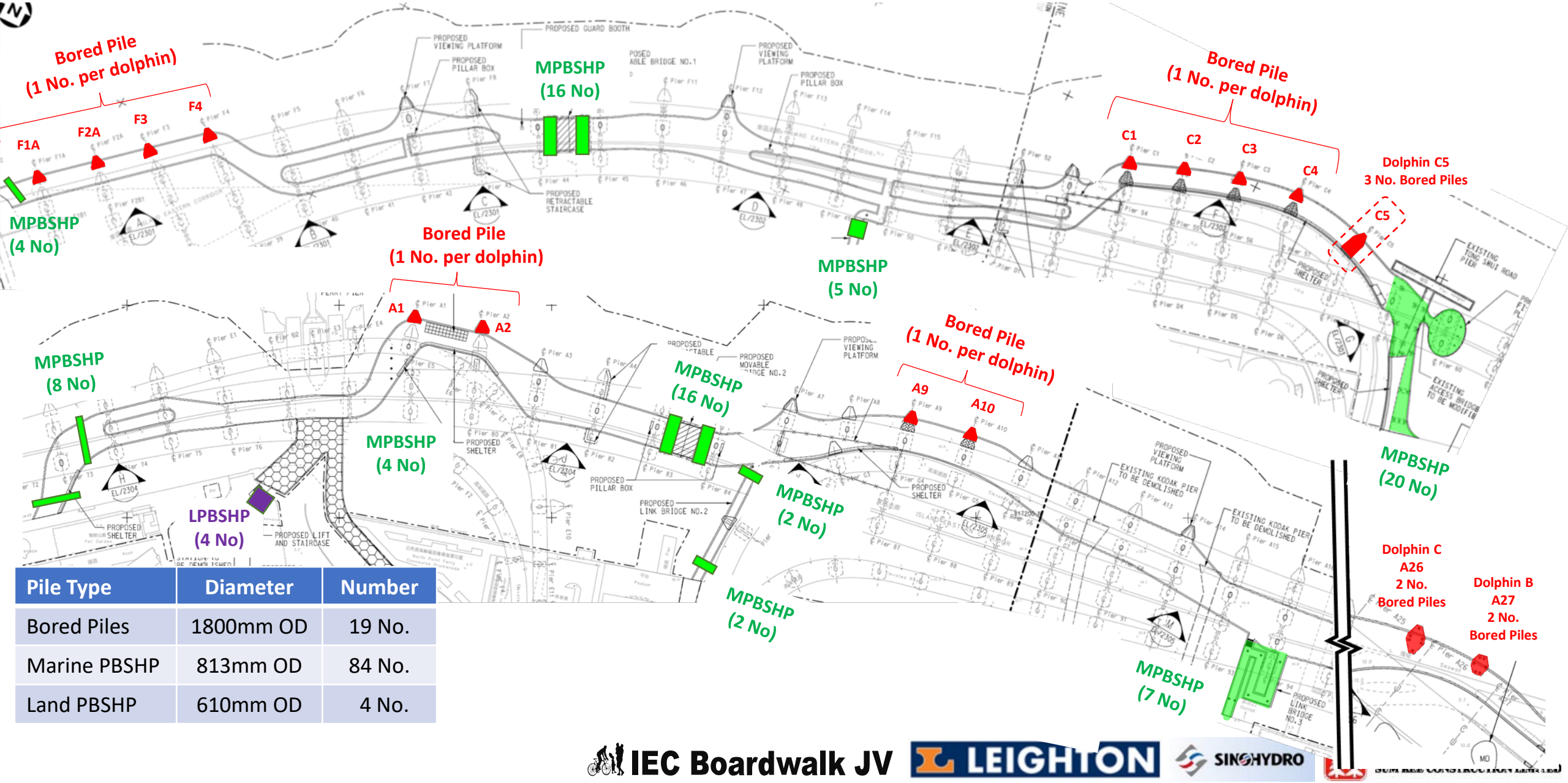
Type A

Type B

MARINE PILING WORKS

MARINE PILING WORKS

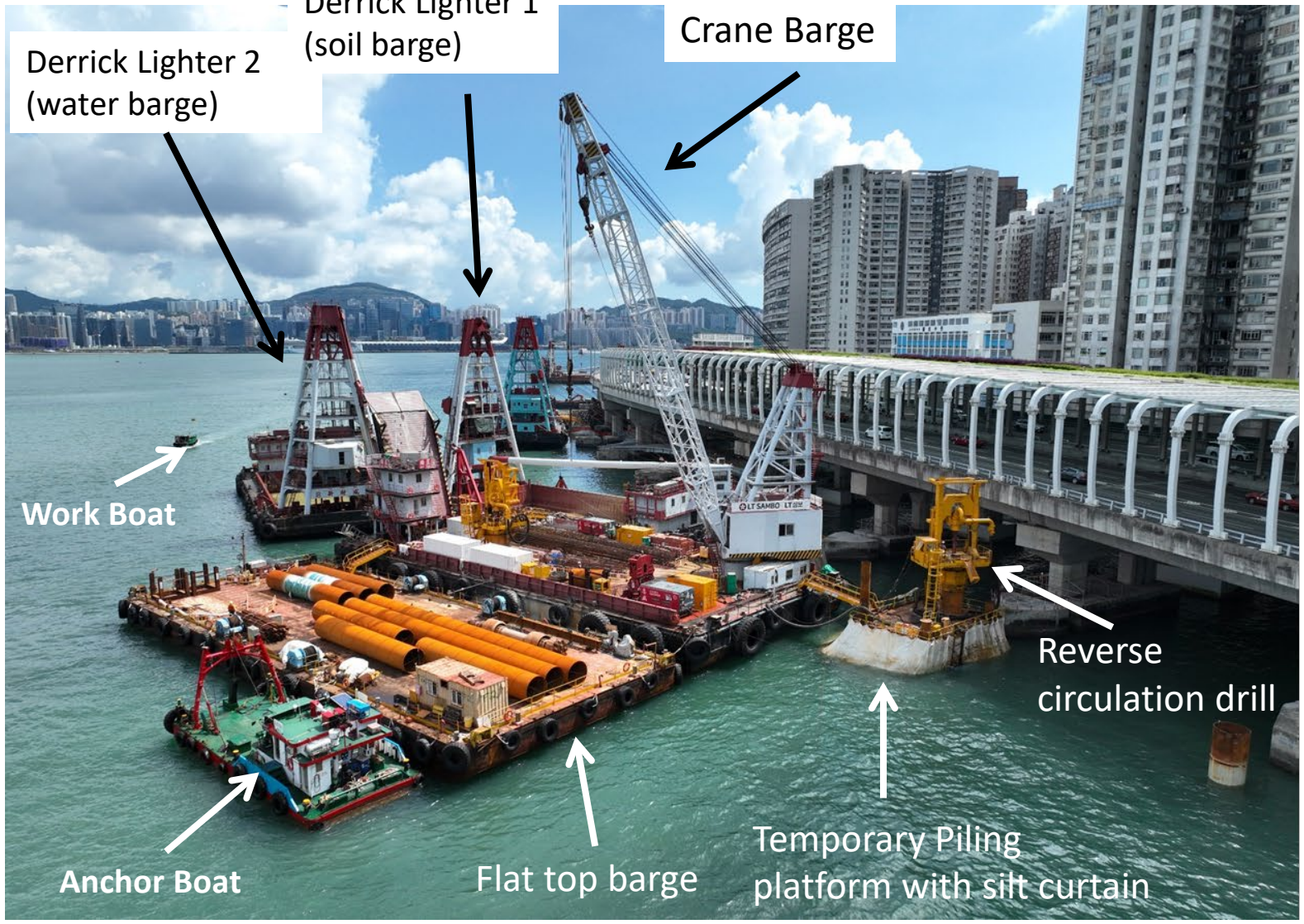
IEC Boardwalk JV

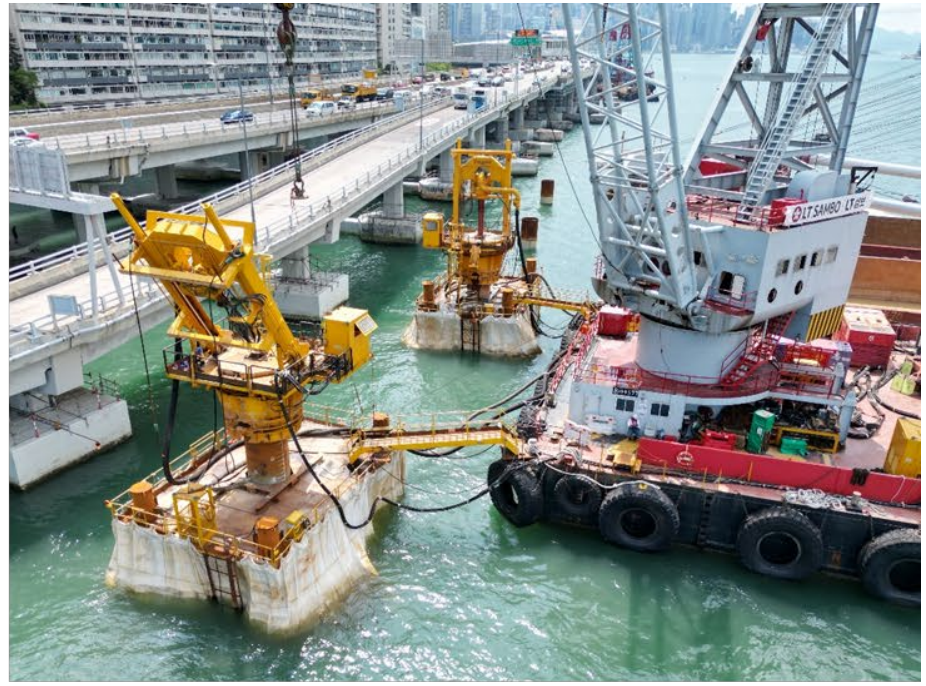


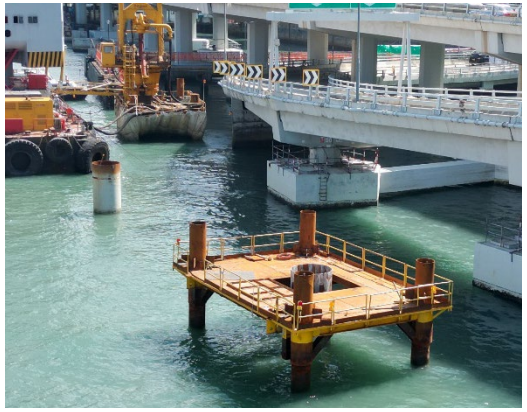
Pile Type	Diameter	Number
Bored Piles	1800mm OD	19 No.
Marine PBSHP	813mm OD	84 No.
Land PBSHP	610mm OD	4 No.

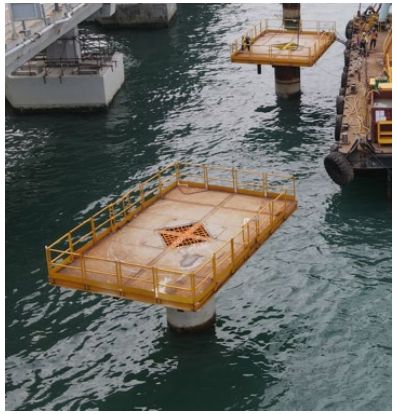

LT SAMBO LT

MARINE PILING – BORED PILING – PLANT & EQUIPMENT



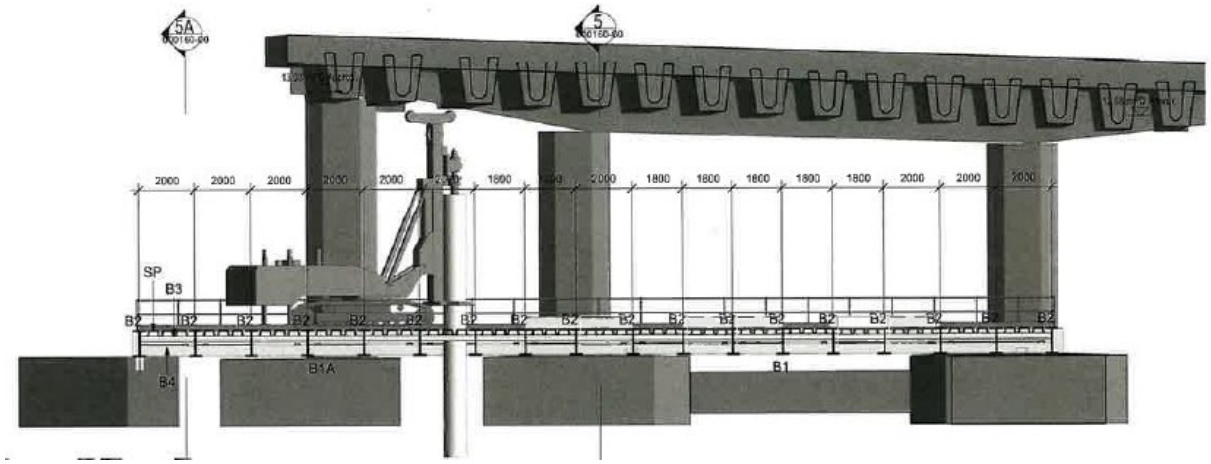


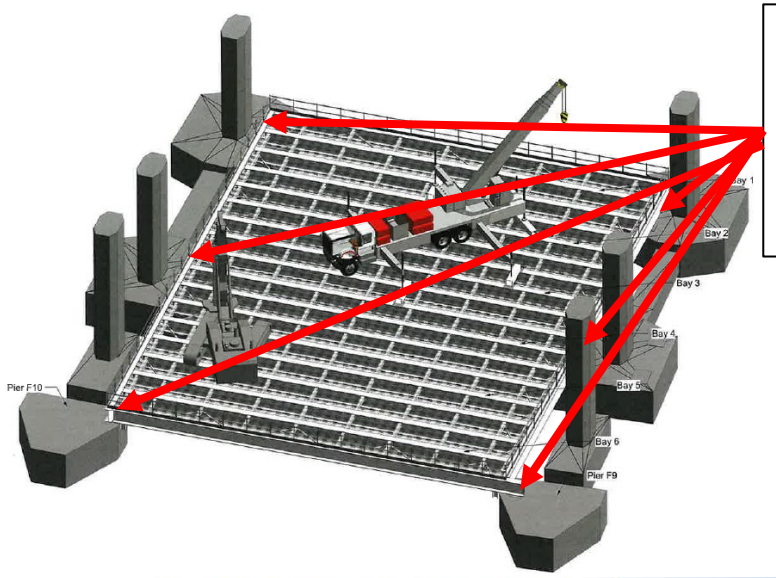




- Construction of piles near shoreline using swing leader
- Seawall stability assessments carried out in advance
- Temporary plant platforms supported on piles

MARINE PILING – TEMPORARY PLATFORMS FOR PBSHP





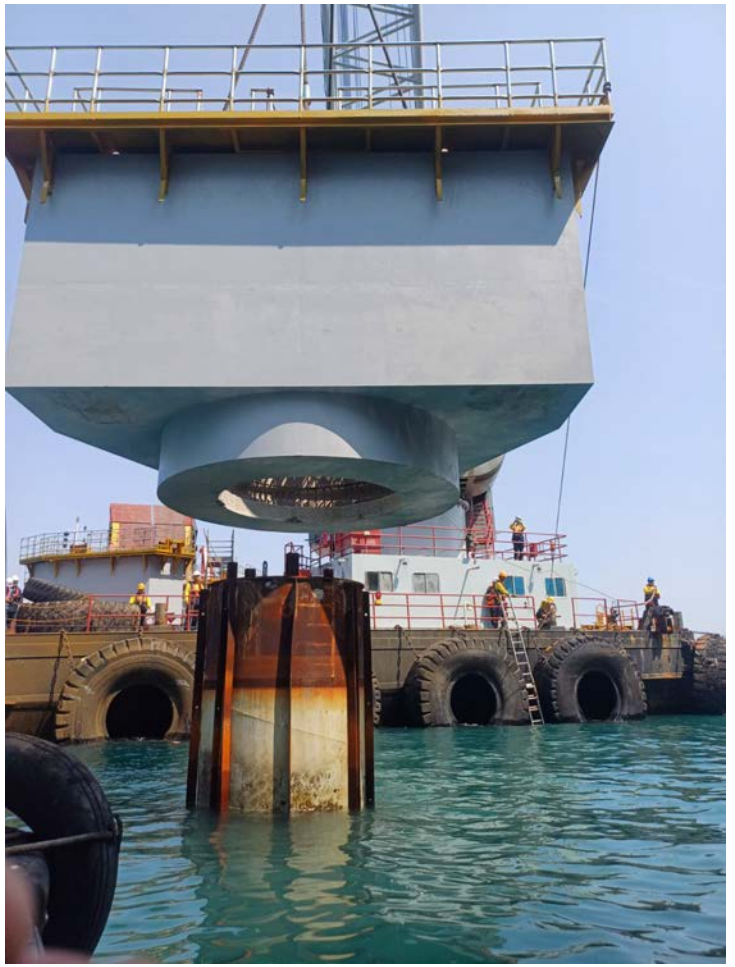
Temporary piling platform sits on existing IEC pile caps

MARINE PILING – TEMPORARY PLATFORMS FOR PBSHP

IEC Boardwalk JV

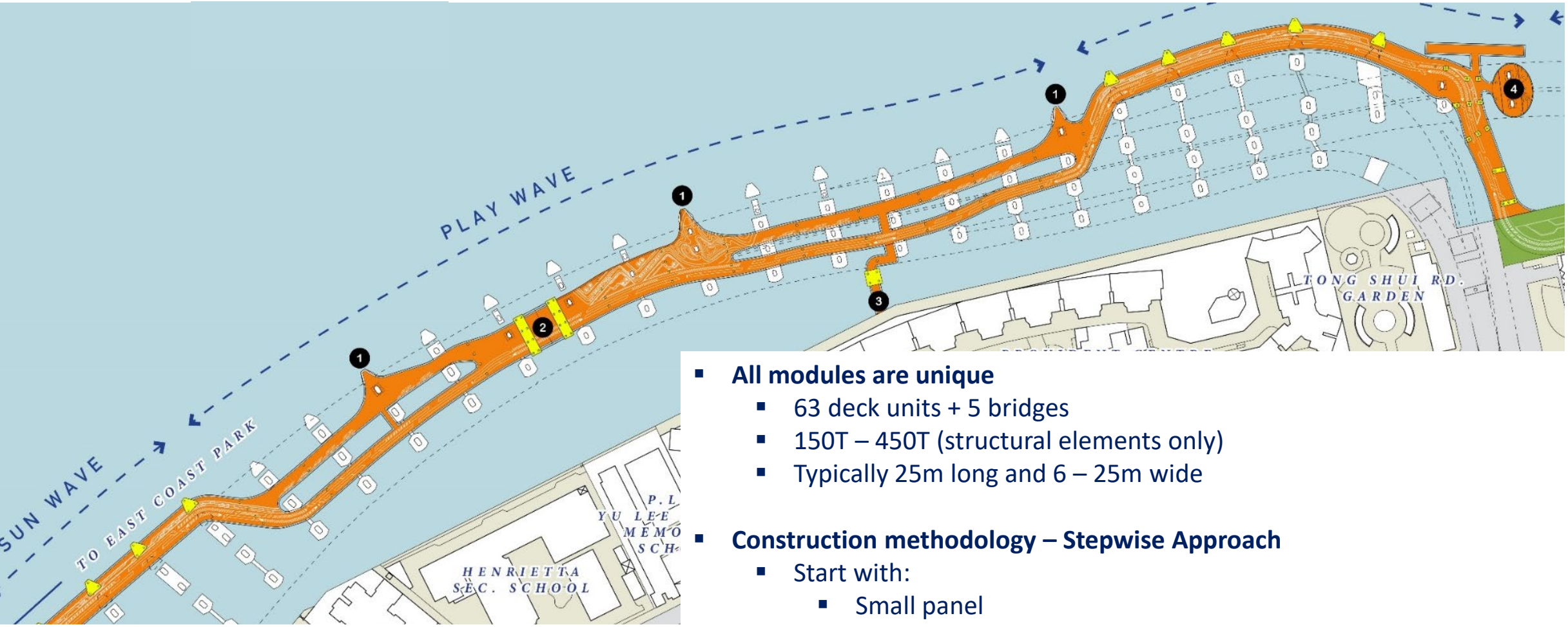
PRECAST PILECAP SHELL

PRECAST SHELL FOR DOLPHIN




BOARDWALK DECK INSTALLATION
正和508
ZHENG HE

BOARDWALK DECK – ALL MODULES UNIQUE

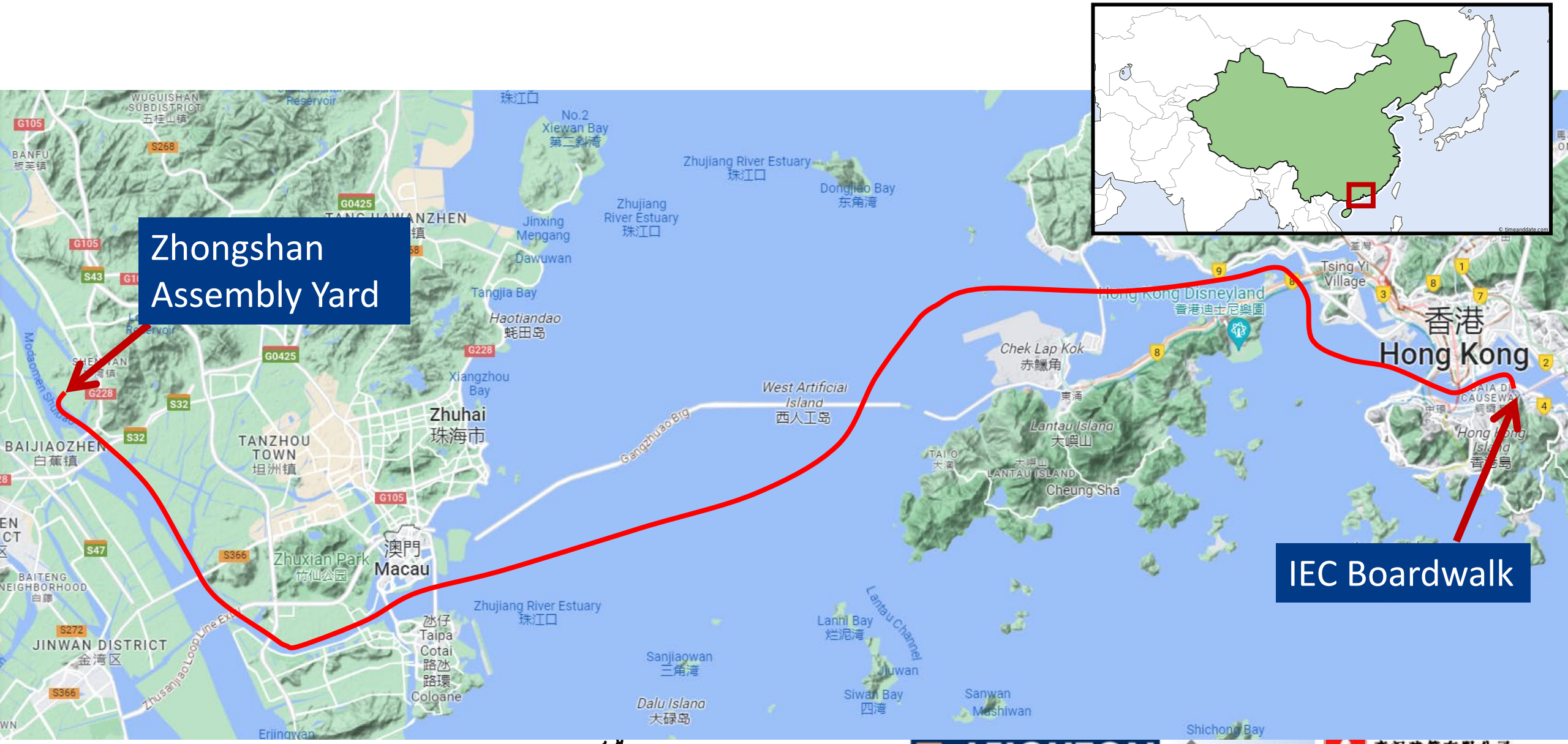


- **All modules are unique**
  - 63 deck units + 5 bridges
  - 150T – 450T (structural elements only)
  - Typically 25m long and 6 – 25m wide

- **Construction methodology – Stepwise Approach**
  - Start with:
    - Small panel
    - Low panel
    - 1 panel per delivery
  - Increasing complexity on later deliveries
  - Initial units as structural elements only. Increasing ABWF content

BOARDWALK DECK – OFF-SITE FABRICATION

IEC Boardwalk JV



Zhongshan Offsite Fabrication Yard

Installation of Columns

Installation of Columns


Contract No. 合約編號: SD/2021/02
Boardwalk underneath Island Eastern Corridor
東區走廊下之行人板道
CEDD
土木工程拓展署
Civil Engineering and Development Department
MEINHARDT
IEC Boardwalk JV
LEIGHTON
中国水电
SINOHYDRO
Sum Kee Construction Ltd.
中建鋼構

BOARDWALK DECK – TRANSPORT TO BARGE

BOARDWALK DECK – LOADING BARGE

BOARDWALK DECK – DELIVERY BY BARGE TO HONG KONG

BOARDWALK DECK – POSITIONING BARGE

BOARDWALK DECK – MOORING

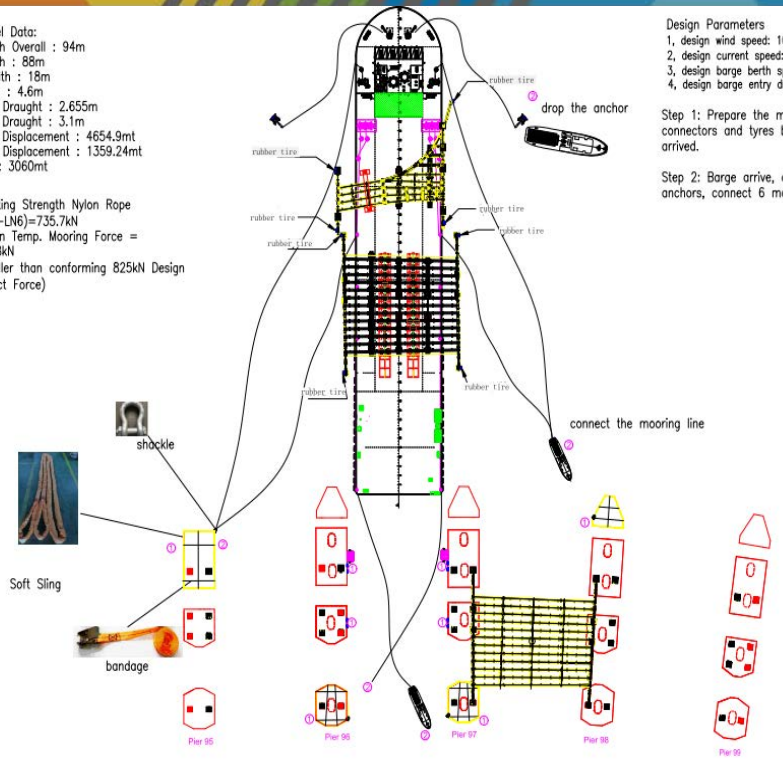
Vessel Data:
Length Overall : 94m
Length : 88m
Breadth : 18m
Depth : 4.6m
Light Draught : 2.655m
Load Draught : 3.1m
Load Displacement : 4654.9mt
Light Displacement : 1359.24mt
DWT : 3060mt

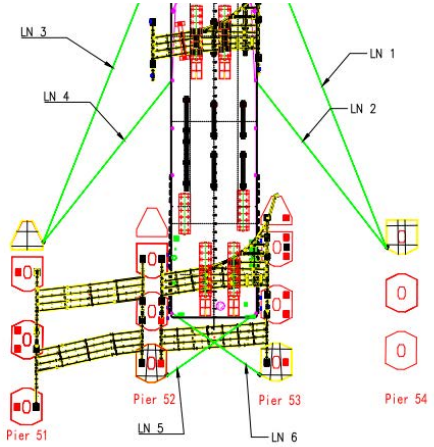
Breaking Strength Nylon Rope
(LN1–LN6)=735.7kN
Design Temp. Mooring Force = 55.18kN
(smaller than conforming 825kN Design Impact Force)

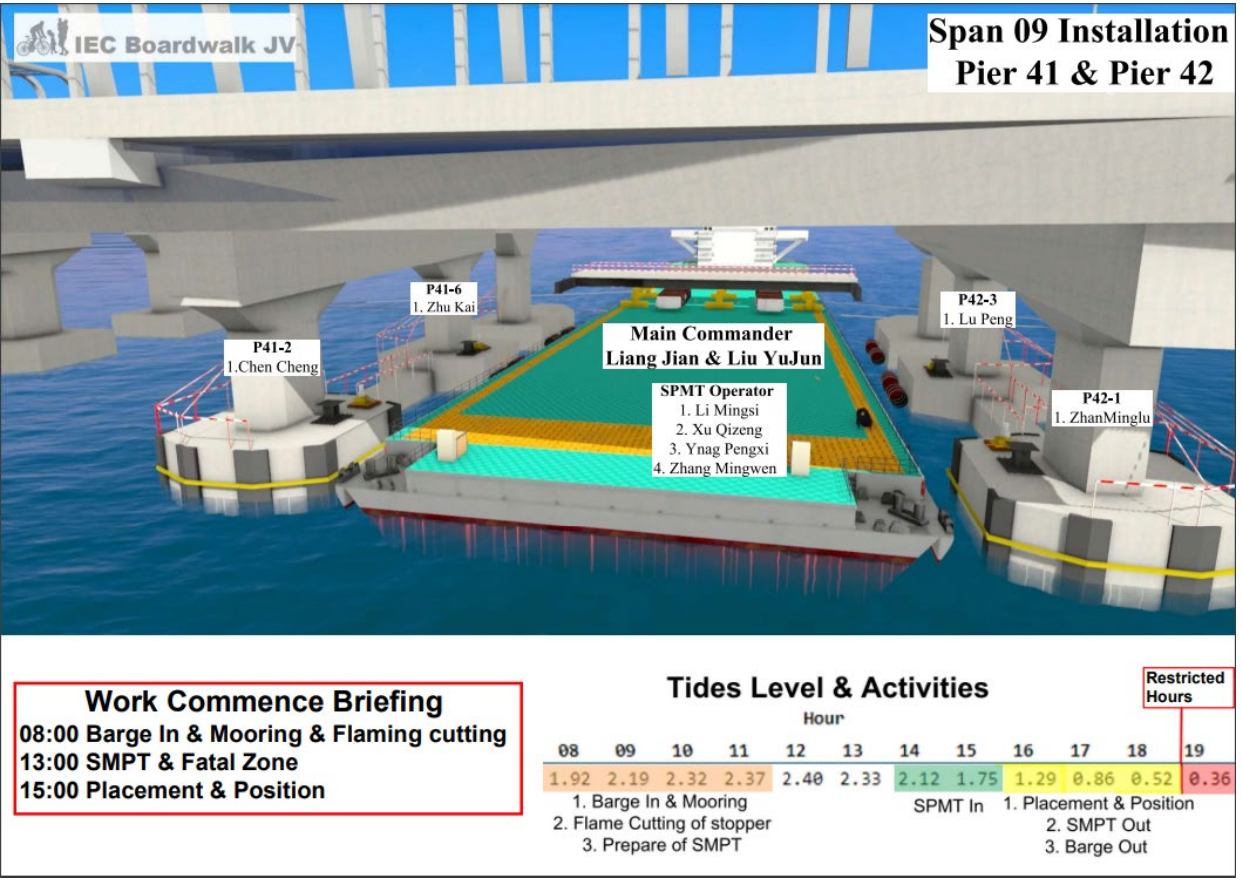
Design Parameters
1, design wind speed: 10m/s
2, design current speed: 1.03m/s
3, design barge berth speed: 0.17m/s
4, design barge entry draft: 2.4m

Step 1: Prepare the mooring connectors and tyres before barge arrived.

Step 2: Barge arrive, drop two anchors, connect 6 mooring lines.







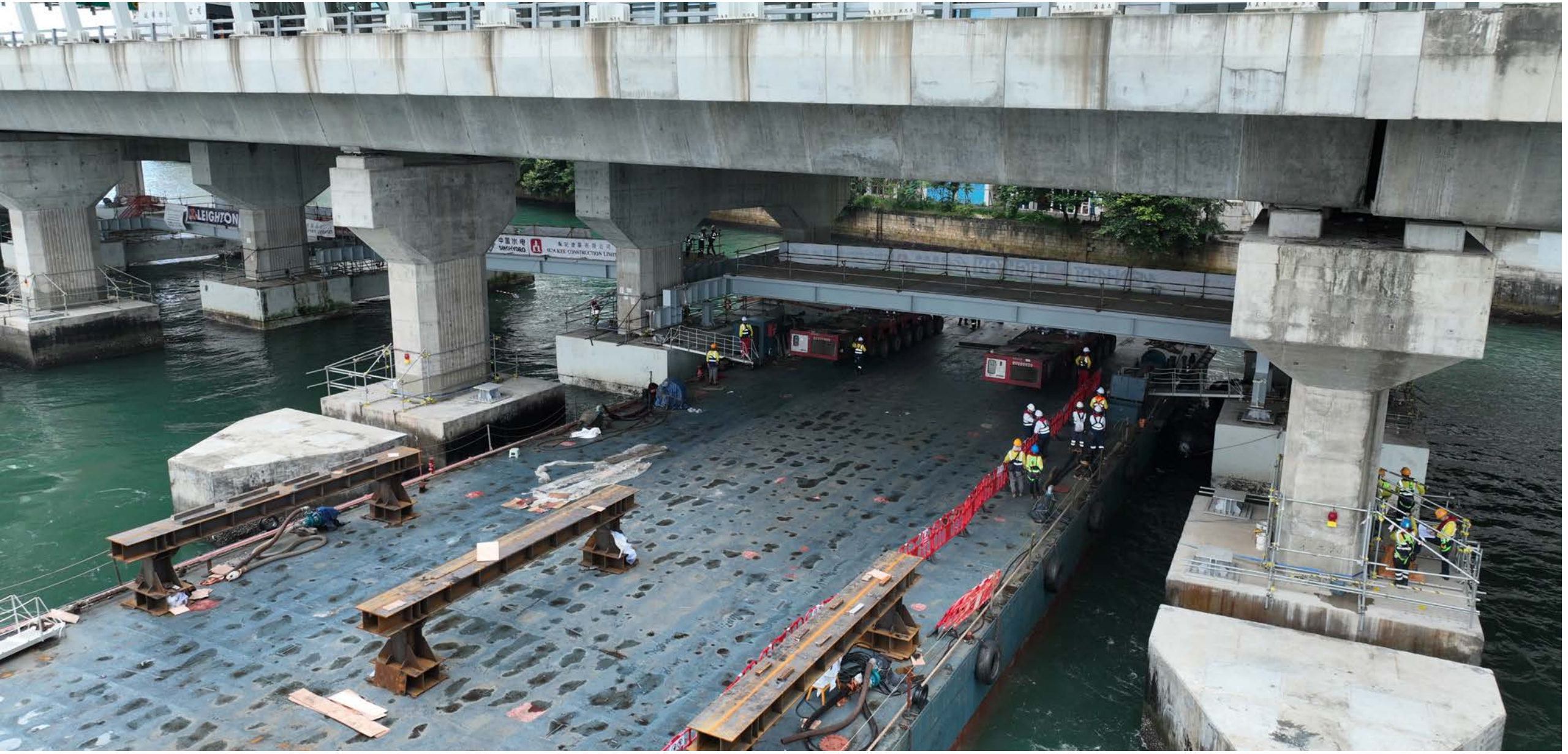
- Unique briefing for each module installed
- Timing of tide levels, working activities, decision making hold points
- Plant operation zones


MEINHARDT
LEIGHTON
中国水电
SINOHYDRO
Sum Kee Construction Ltd.
森記建築有限公司

BOARDWALK DECK INSTALLATION – POSITIONING DECK MODULE BY SPMT

BOARDWALK DECK INSTALLATION – LOWERING DECK MODULE BY SPMT & TIDE

IEC Boardwalk JV



BOARDWALK DECK INSTALLATION – WITH GLASS PARAPET IN PLACE

BOARDWALK DECK INSTALLATION – COMPLETED MODULES

BOARDWALK DECK INSTALLATION – COMPLETED MODULES


Thank You
Life First
Walk the Talk – Safe Production