

# Expansion of Hong Kong International Airport into a Three-Runway System

## 11<sup>th</sup> Professional Liaison Group Meeting

27 April 2023



# Agenda

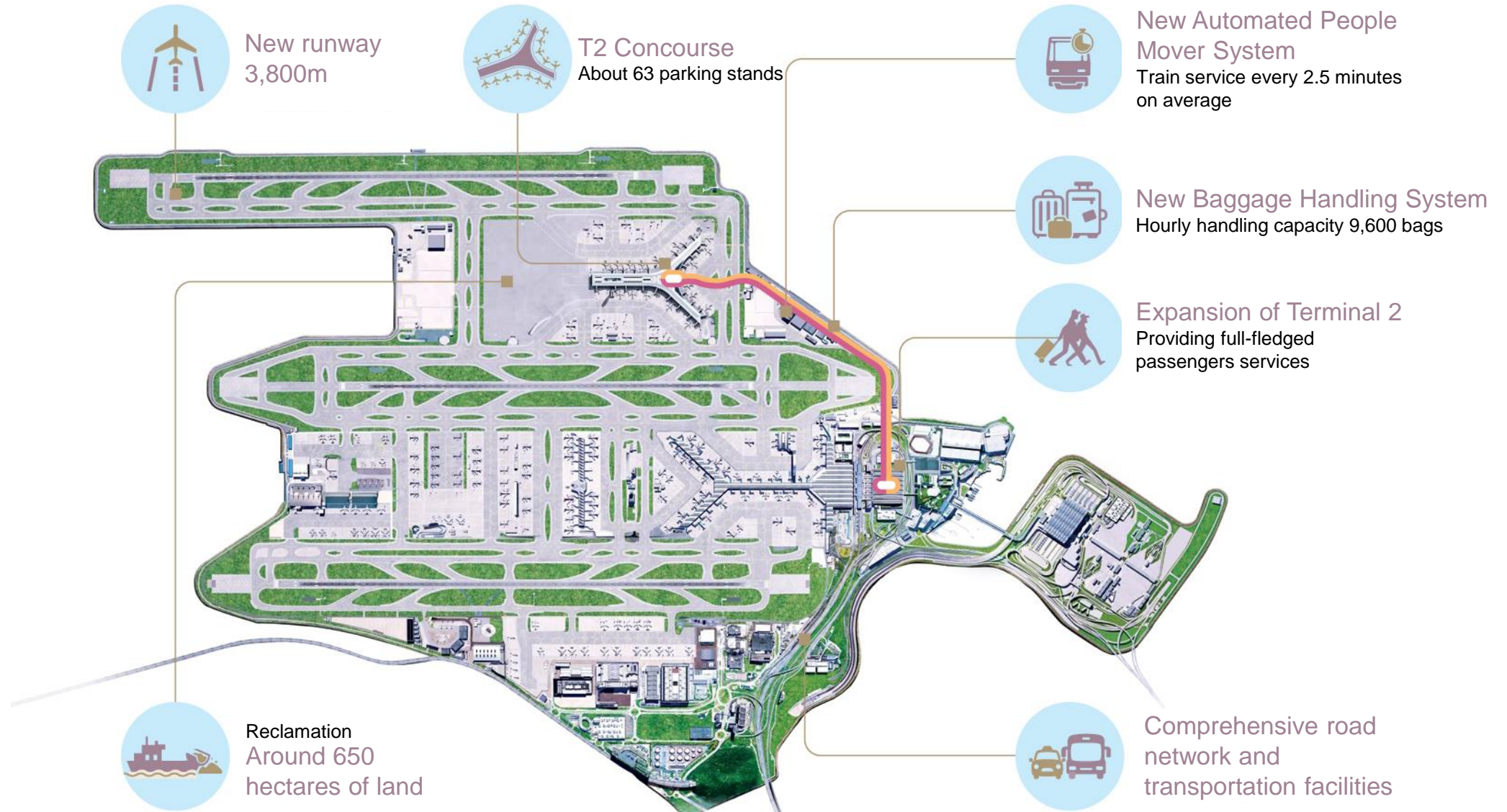
1. Update on 3RS Project and Other Airport Development
2. EM&A Updates
3. Marine Ecology and Fisheries Enhancement Strategy
4. Carbon Management
5. Green Airport Design and Sustainable Construction
6. ESG Assessment



# Update on 3RS Project and Other Airport Development

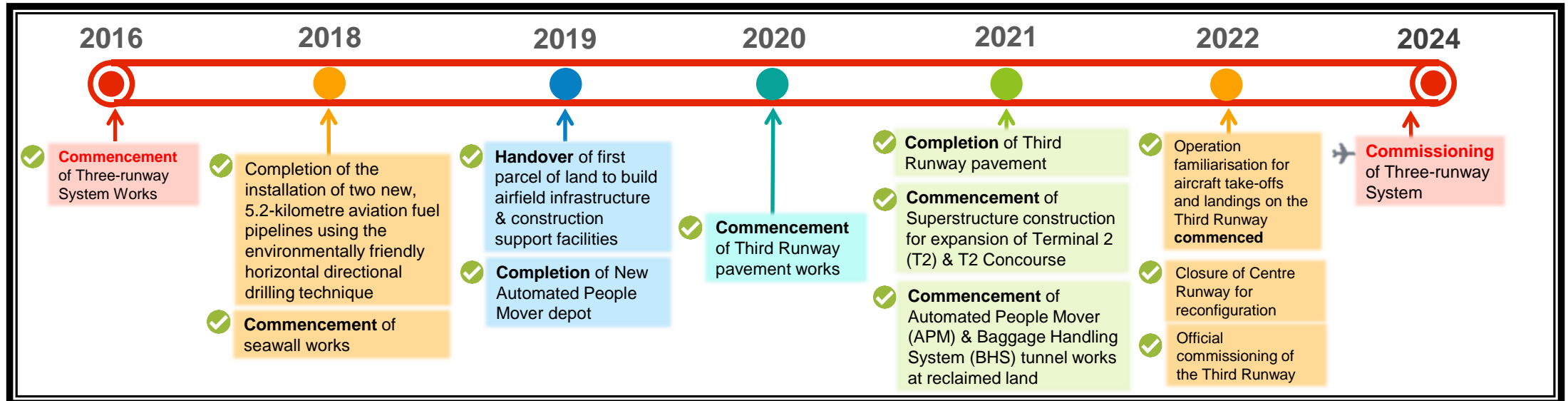


# Three-Runway System (3RS)

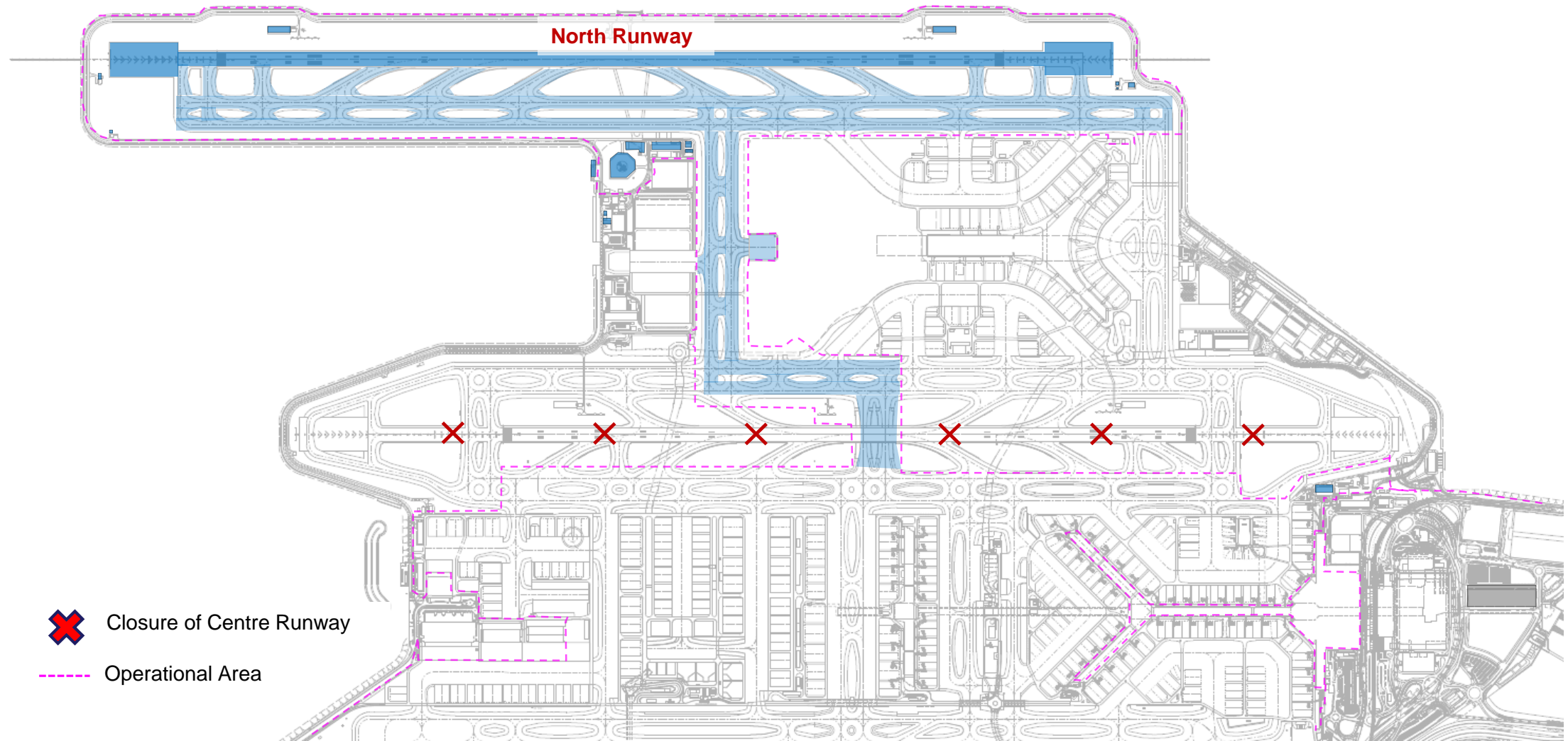




# 3RS Works Progress

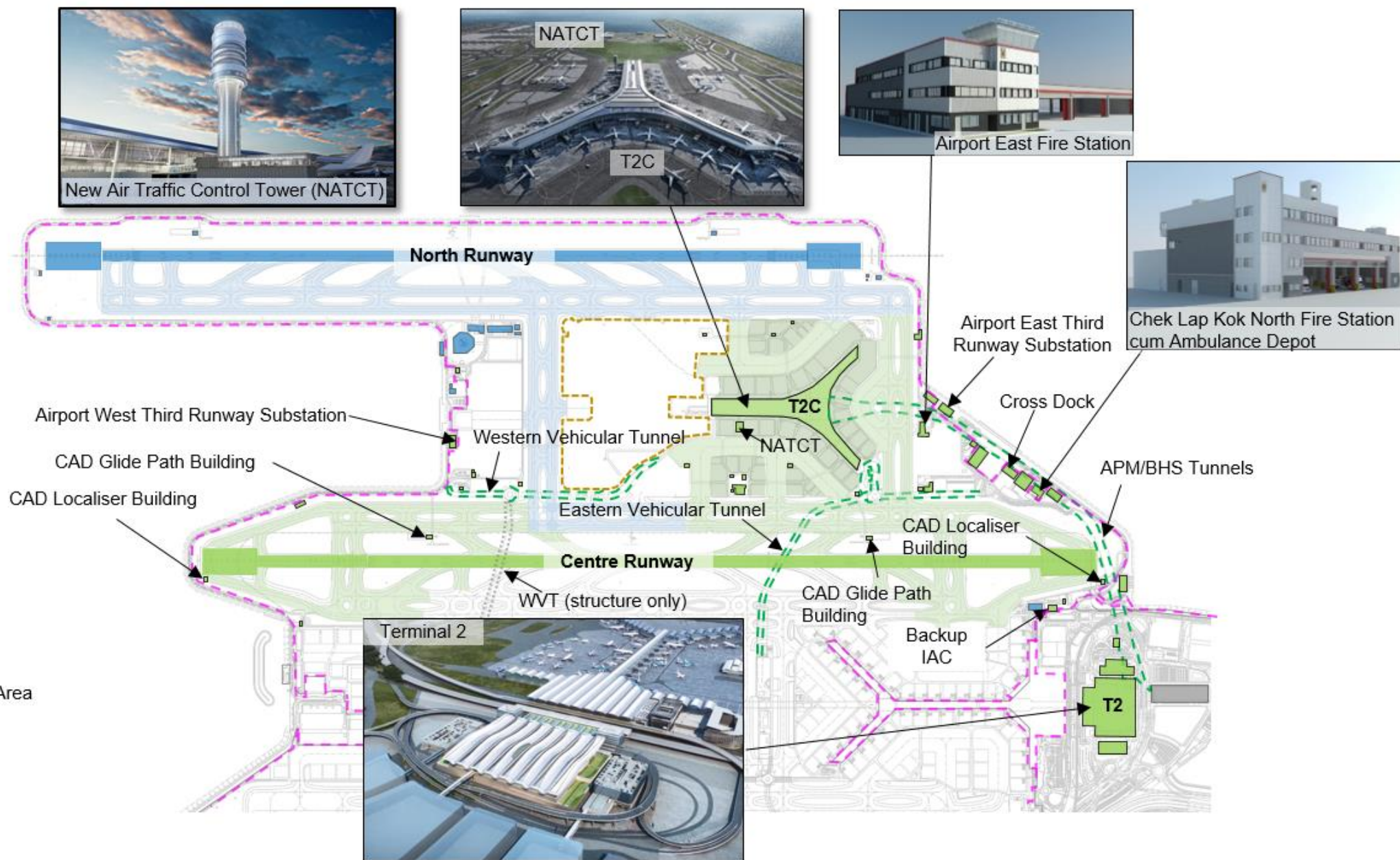


# Interim Two-Runway System



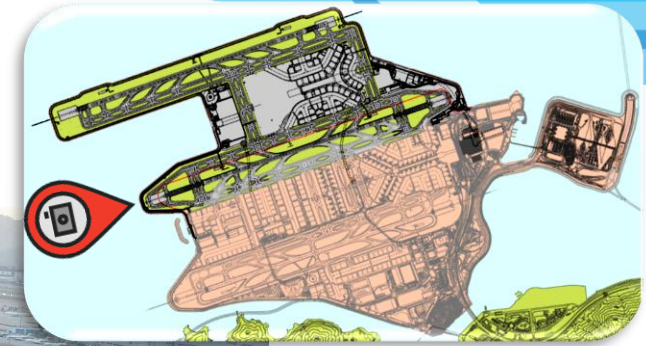


# On-going Works for 3RS





# Reclamation



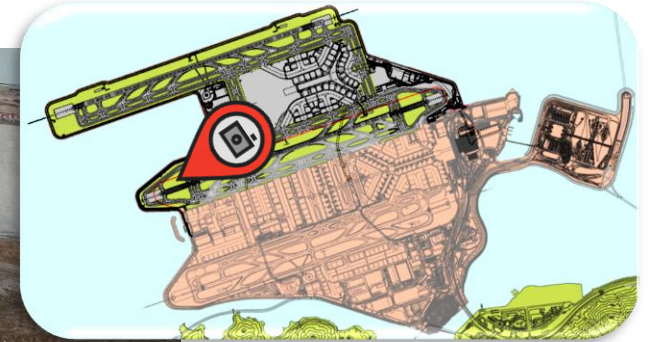


# Centre Runway Pavement Works



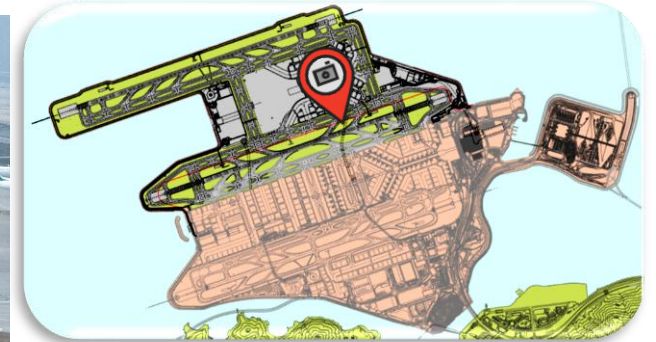


# Airfield Ground Lighting Installation Works (on Centre Runway)





# Eastern Vehicular Tunnel (under Centre Runway)





# Eastern Vehicular Tunnel (on Reclaimed Land)



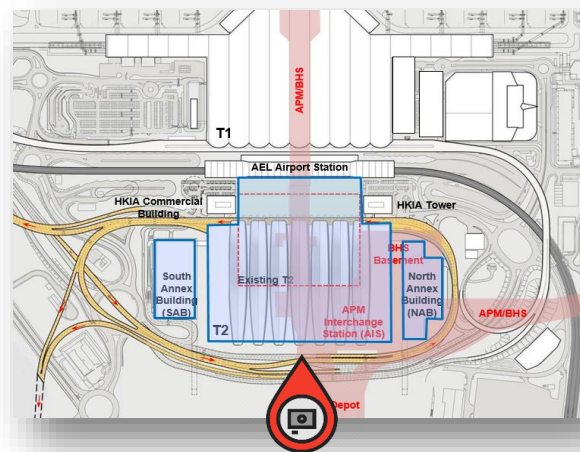


# Western Vehicular Tunnel (under Centre Runway)

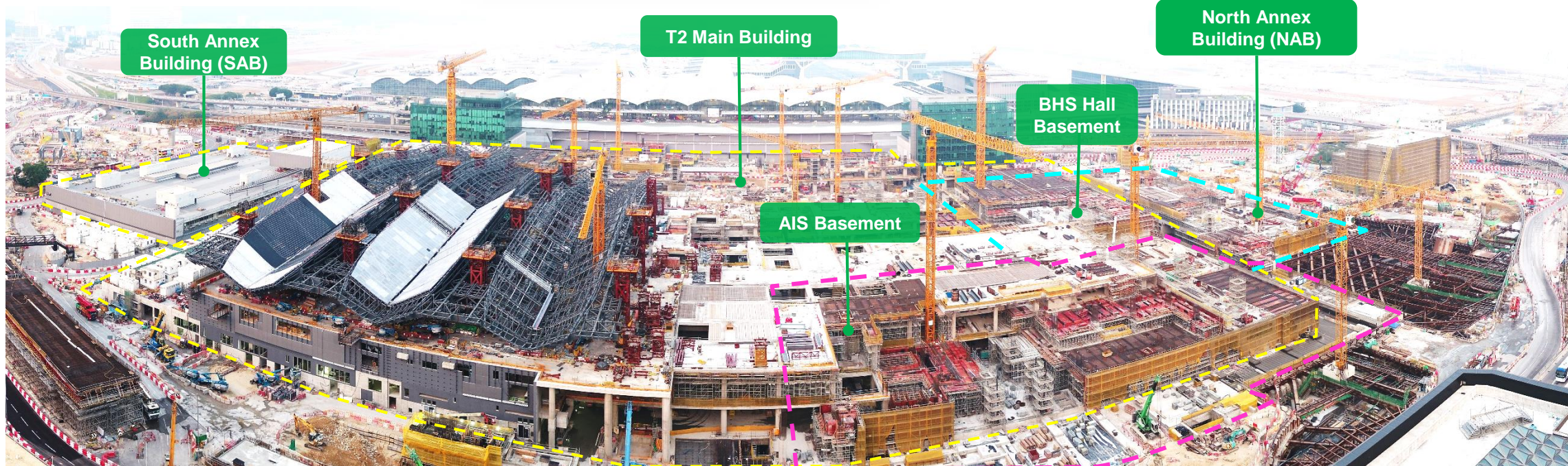
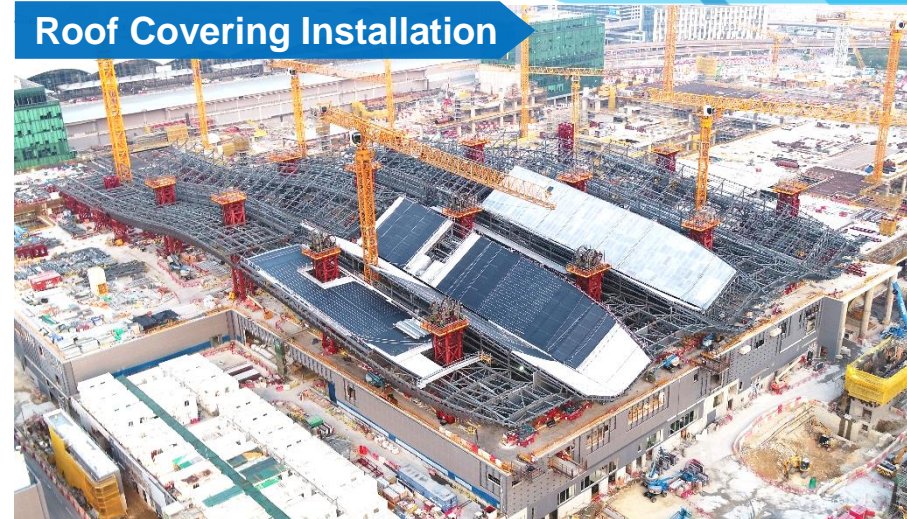




# T2 Expansion

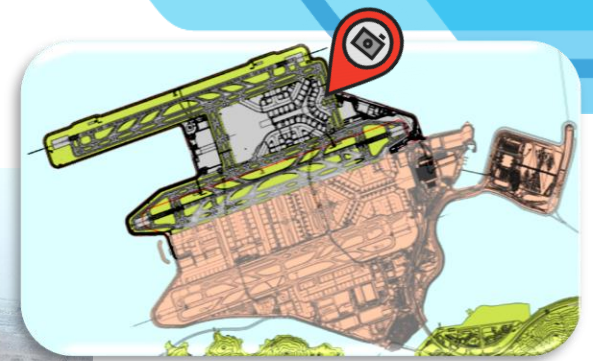


## Roof Covering Installation





# Terminal 2 Concourse (T2C)



T2C Main Concourse

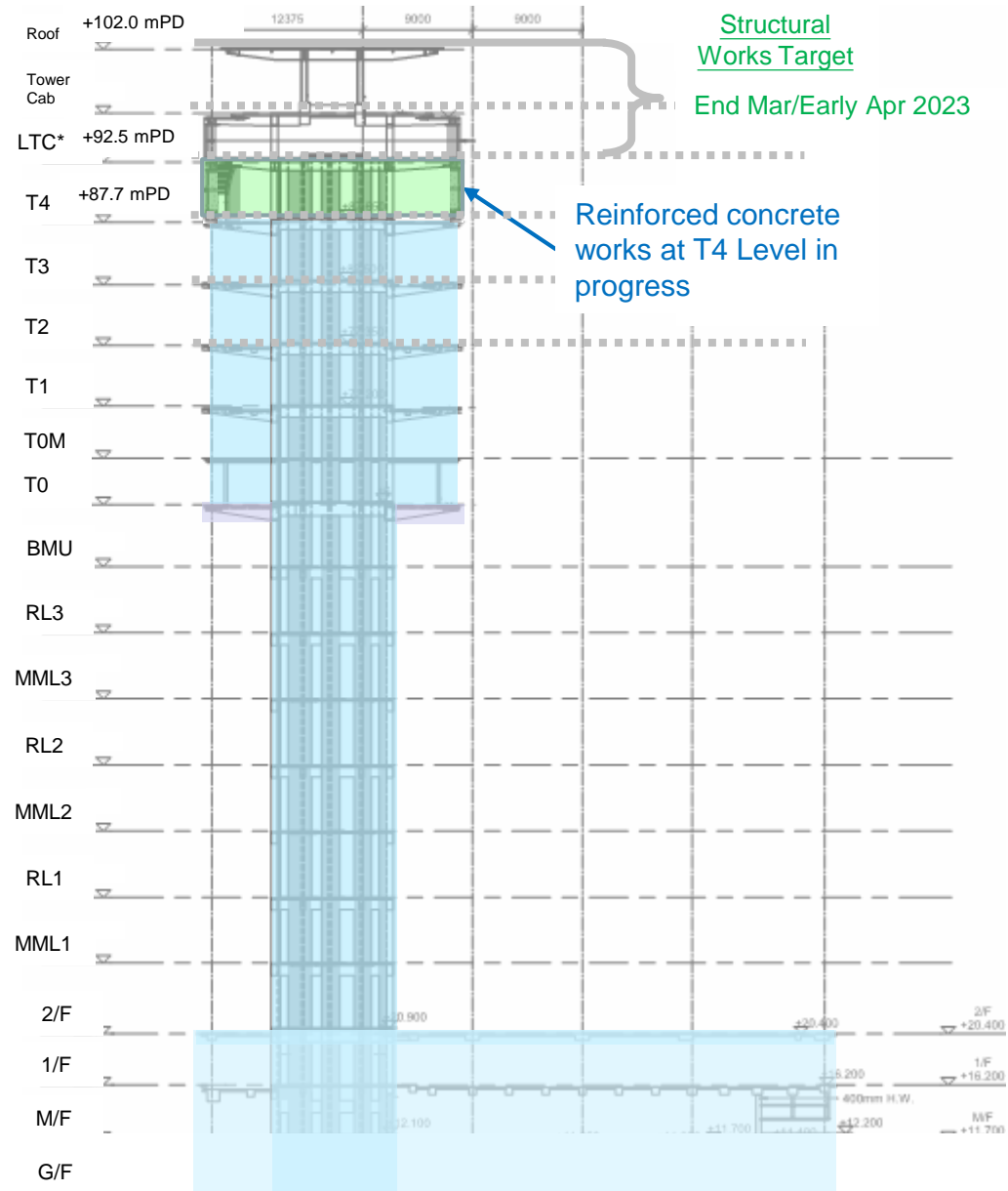
T2C Node Area

APM & BHS Tunnels



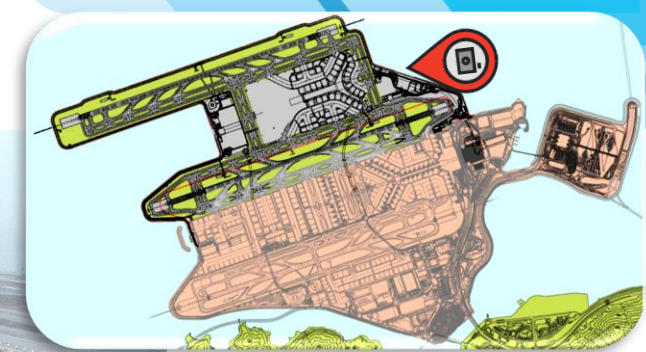
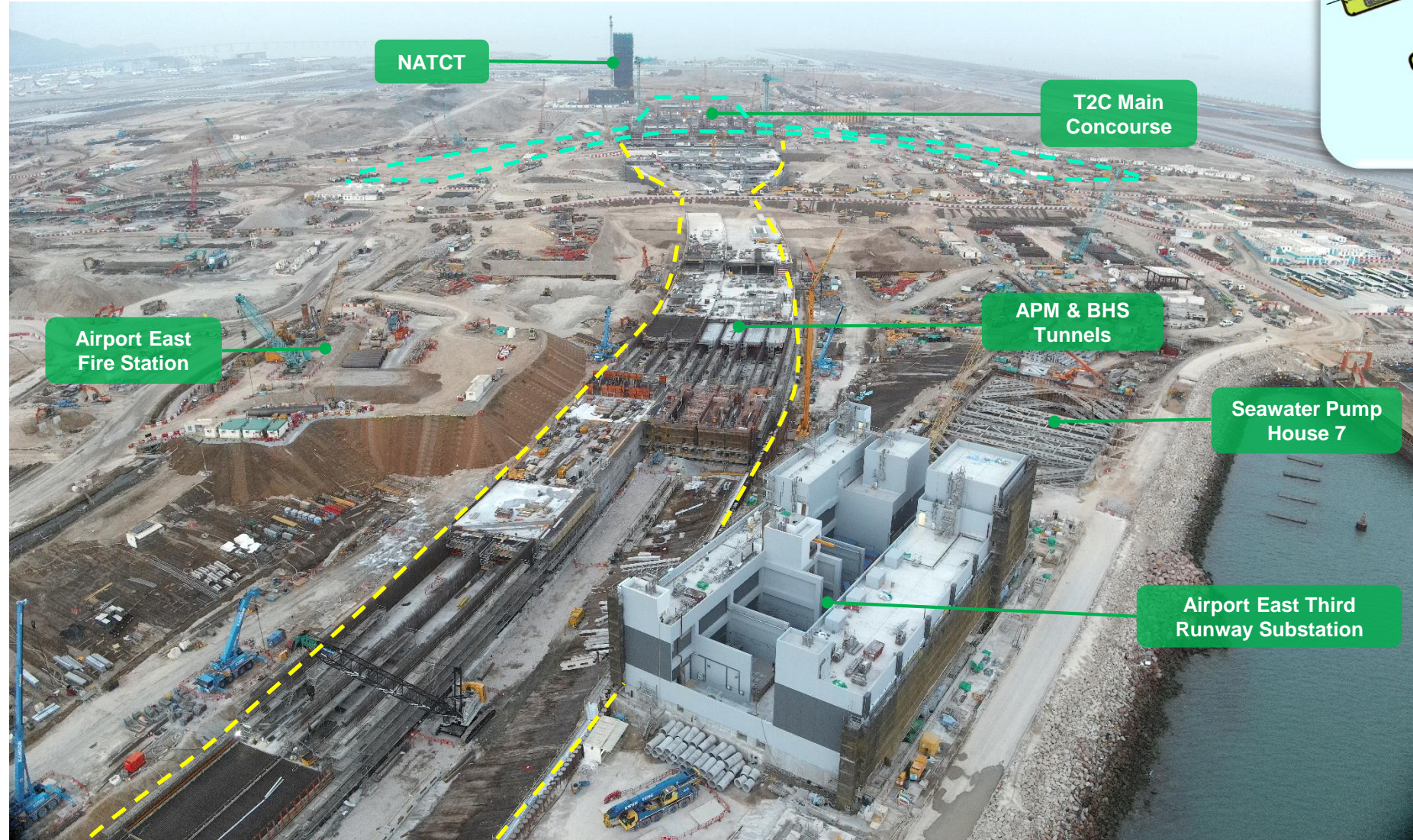


# New Air Traffic Control Tower (NATCT)



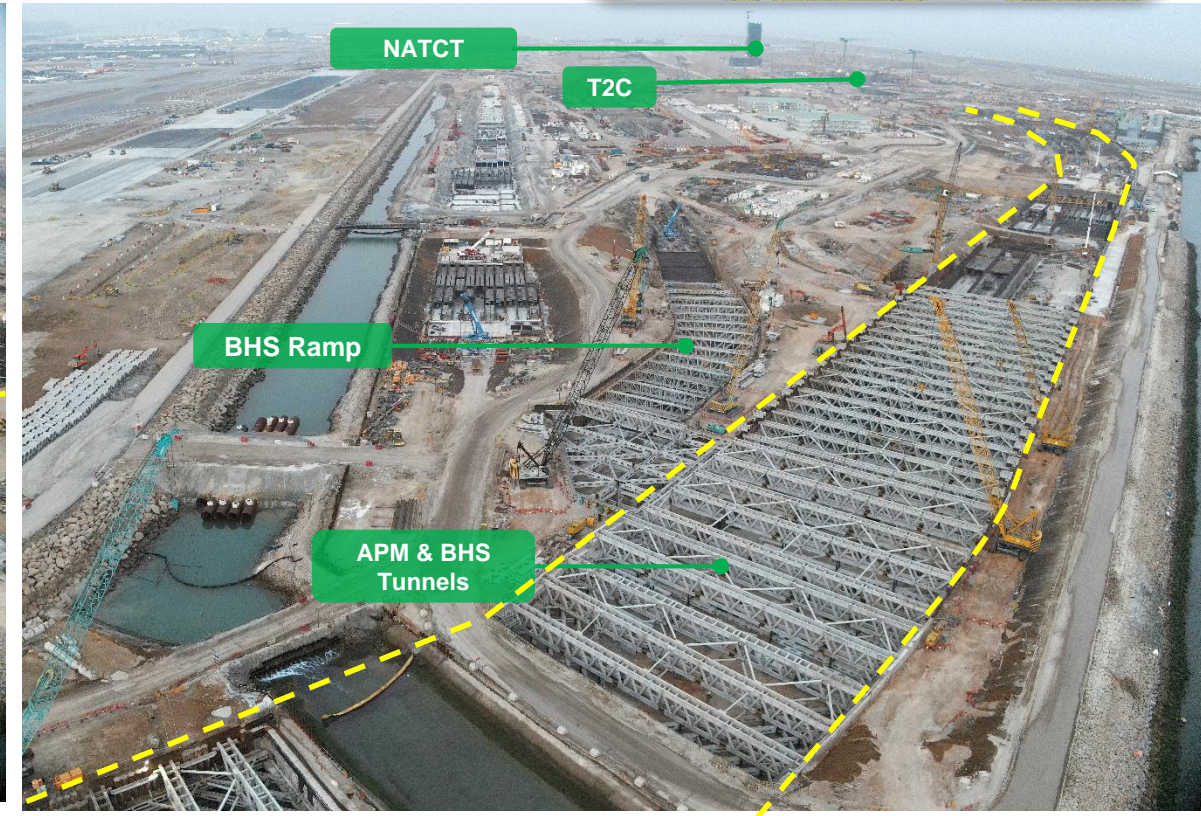
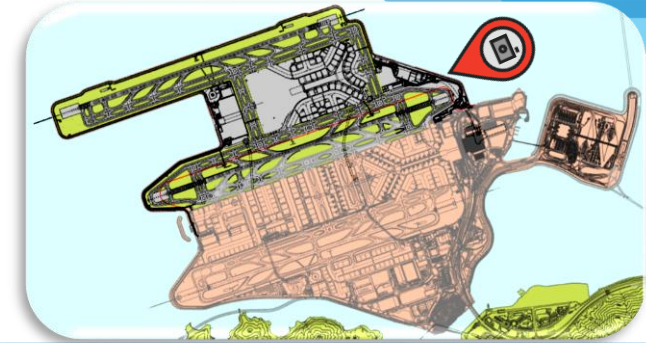


# APM and BHS Tunnels (1)





# APM and BHS Tunnels (2)





# 3RS Progress Video (March 2023)



*Hong Kong International Airport*

## THREE-RUNWAY SYSTEM PROJECT PROGRESS

Mar 2023





# HKIA Future Developments (video)



# EM&A Updates





# EM&A Monitoring Status (Aug 2022 – Mar 2023) (1)

## Air Quality (2 stations) & Noise Monitoring (4 stations)

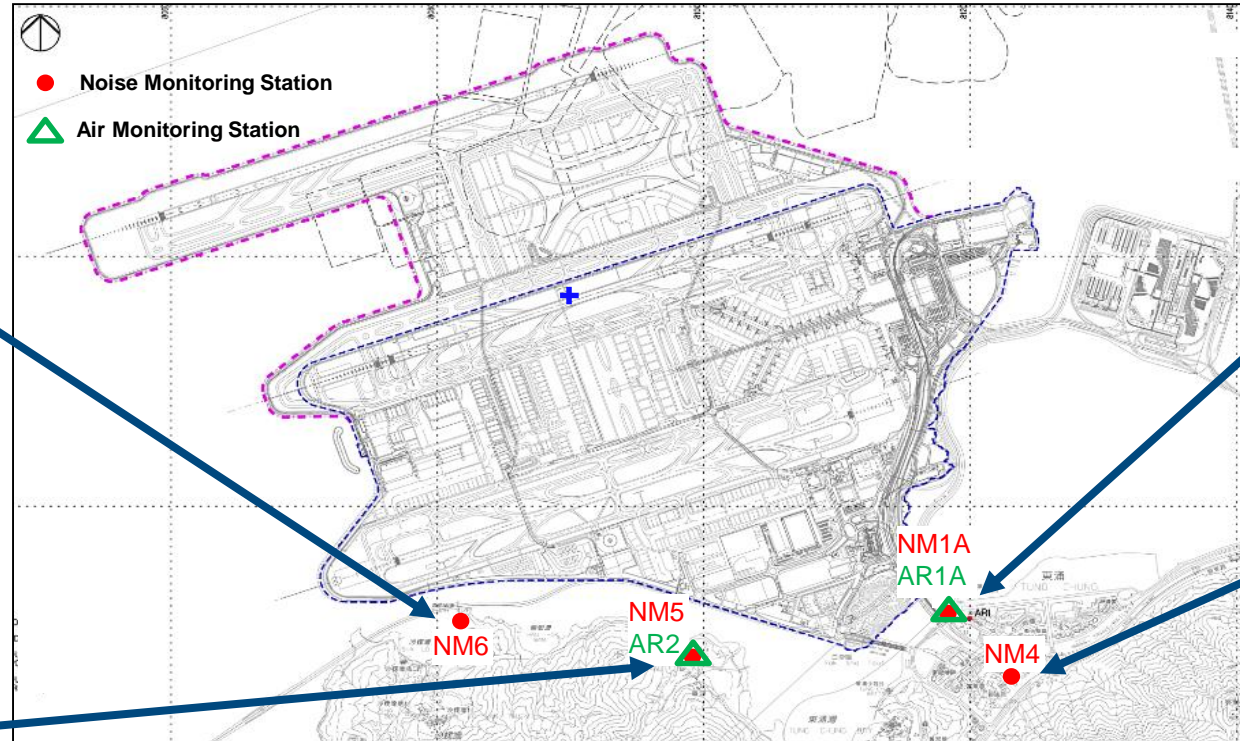
- No exceedance of project-related Action / Limit Level was recorded



Noise Monitoring Station (NM6)



Air Quality Monitoring Station (AR2)  
Noise Monitoring Station (NM5)



Air Quality Monitoring Station (AR1)  
Noise Monitoring Station (NM1A)



Noise Monitoring Station (NM4)

	Aug 2022 – Mar 2023
Air Quality Monitoring Events	252
Noise Monitoring Events	140





# EM&A Monitoring Status (Aug 2022 – Mar 2023) (2)

## Water Quality Monitoring (14 stations)

	Aug 2022 – Mar 2023
Water Quality Monitoring Events	99

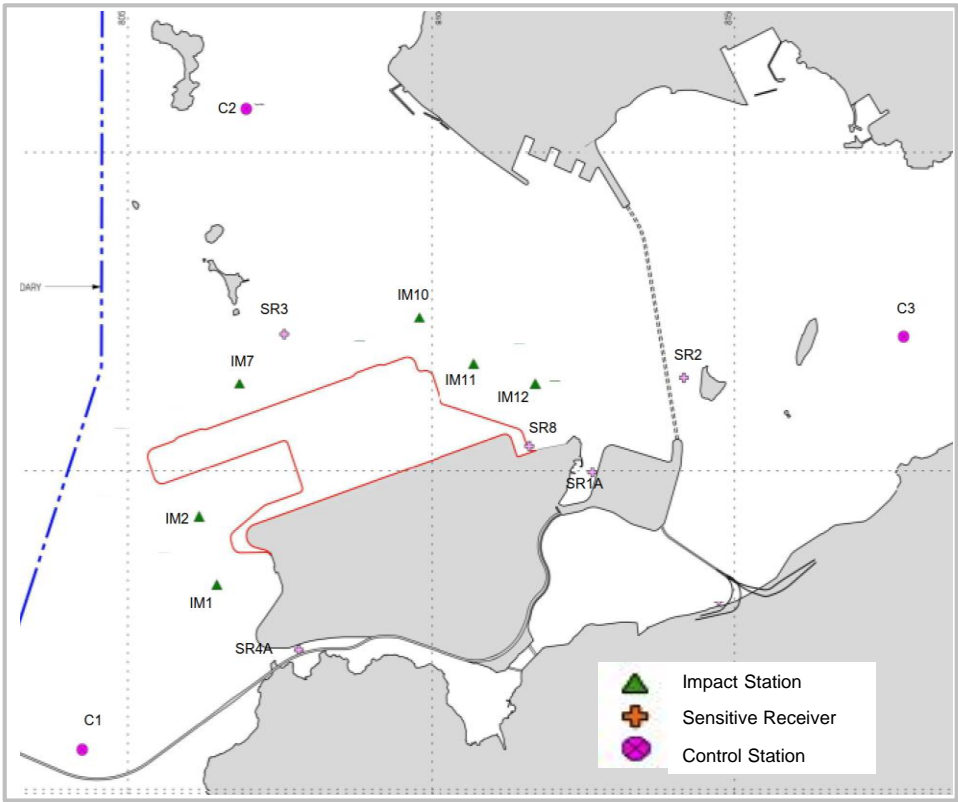
- No exceedance of project-related Action / Limit Level was recorded



Water quality monitoring sampling



Real time water quality monitoring



# EM&A Implementation (Aug 2022 – Mar 2023) (1)

## Air Quality Mitigation Measures



Regular water spraying to reduce generation of fugitive dust: water trucks, mist cannons, automatic water sprinklers



When segregating construction materials, provide water spraying to reduce generation of fugitive dust



Compress main haul roads by using roller machine to reduce generation of fugitive dust



Paving asphalt on main haul roads to reduce generation of fugitive dust



Vehicles transporting dusty materials must be properly covered by mechanical cover or tarpaulin sheets before leaving the site





# EM&A Implementation (Aug 2022 – Mar 2023) (2)

## Water Quality Mitigation Measures



Sandbags were positioned underneath the water-filled barriers to prevent muddy water seepage out of the site boundaries



Setting up of sedimentation tanks for wastewater treatment facilities to increase the effectiveness of wastewater treatment



Conduct regular water sampling to check and ensure the wastewater treatment facilities are functioning properly



# EM&A Implementation (Aug 2022 – Mar 2023) (3)

## Waste Management Measures



Excavated marine sediment is properly treated and reused as backfilling materials on site



Concrete and excavated materials are properly segregated and stockpiled for reuse in land formation works



Maximise the intake of Government's public fill for backfilling works on site





# EM&A Implementation (Aug 2022 – Mar 2023) (4)

## Environmental Recognition Scheme & Pay for Environmental Scheme

- Environmental Recognition Scheme – since the launch in 2018, 31 awards were presented to 22 contractors to commend their outstanding environmental initiatives and innovative practices
- Pay for Environmental Scheme – launched in 2019 to recognise contractors' environmental awareness, measures and performances



Use of renewable energy – use of battery energy storage for construction machines



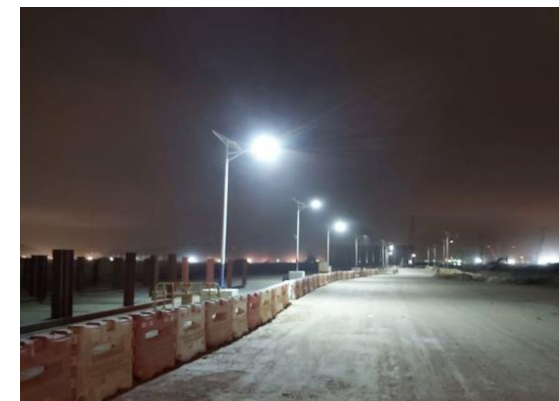
Use of Seawater Desalination Reverse Osmosis System to generate freshwater for water spraying to reduce generation of fugitive dust



Use of renewable energy – solar lighting at mobile toilets



Use of renewable energy – solar power CCTV



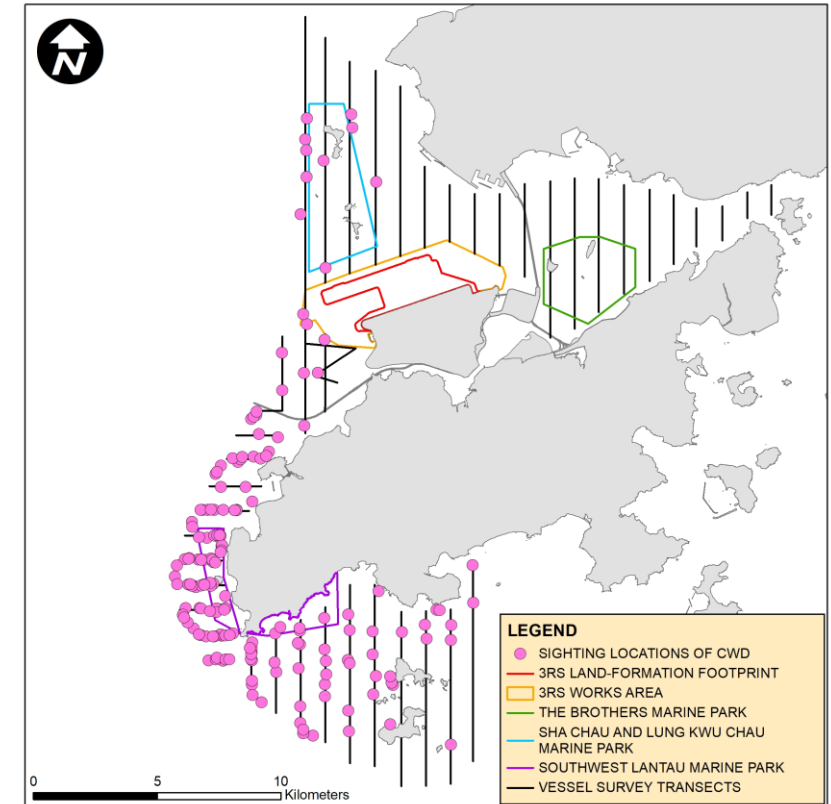
Use of renewable energy – solar lighting at main haul roads



# CWD Monitoring Results for 2022

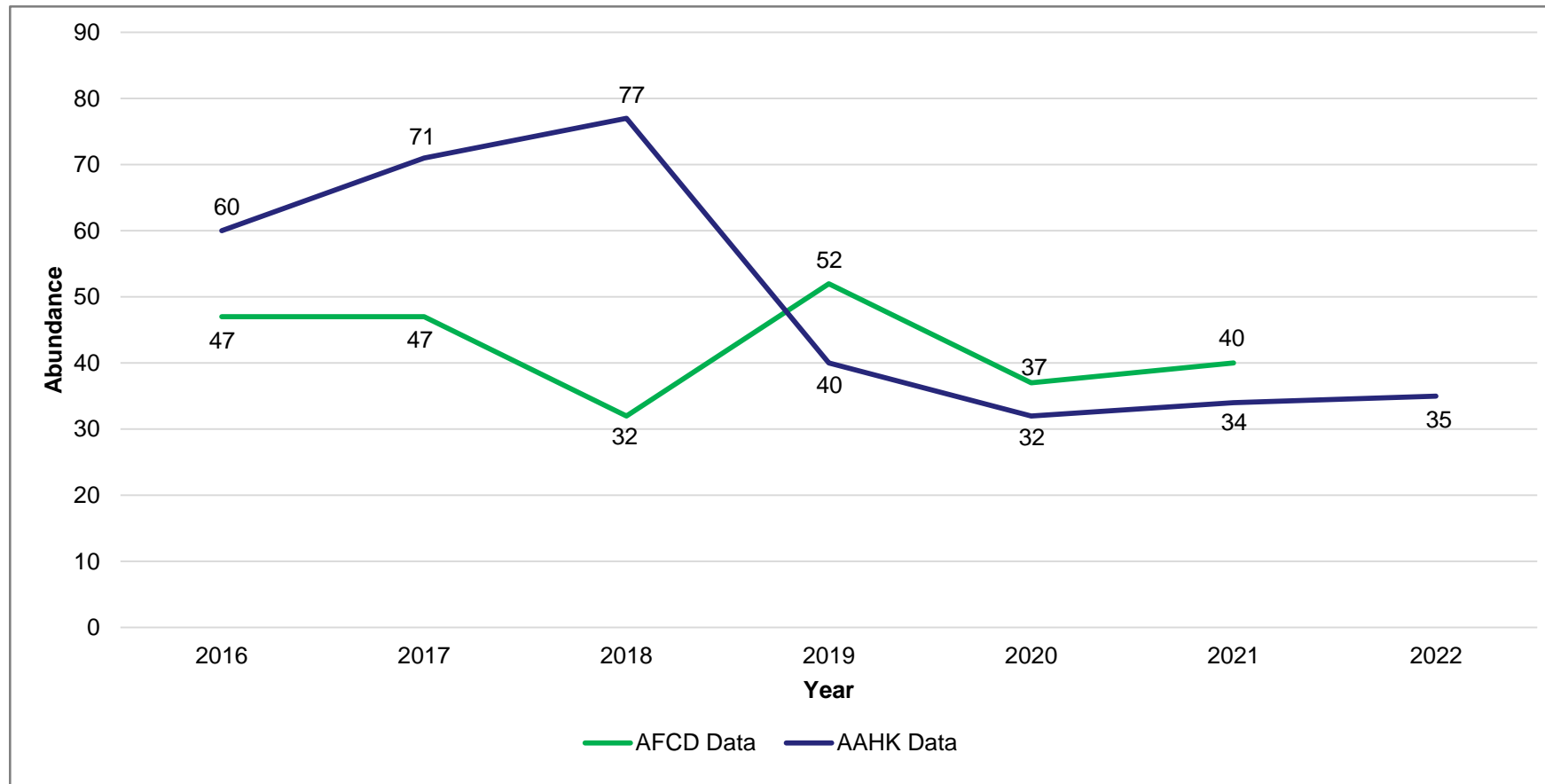
## – Vessel Line Transect Survey

- In total 172 CWD sightings with 594 dolphins
- 31 sightings with mother-and-unspotted calf and/or mother-and-unspotted juvenile pair(s) observed
- Average group size was 3.45 dolphins per group
- Overall abundance estimated for 2022 was 35 CWDs
- WL has the highest abundance and density (N = 22)
- No sightings recorded in NEL
- In term of seasonal analysis, summer estimate was the highest (N = 56)





# CWD Estimated Abundance in the four survey areas of Lantau waters (2016 – 2022)



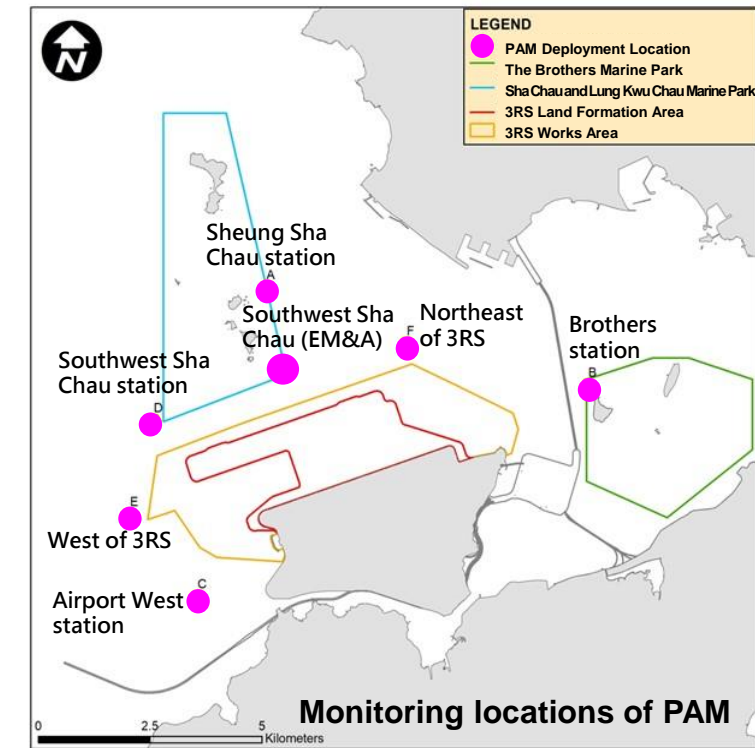
*Note: AFCD has not yet published the estimated abundance of CWD of 2022 at the moment*



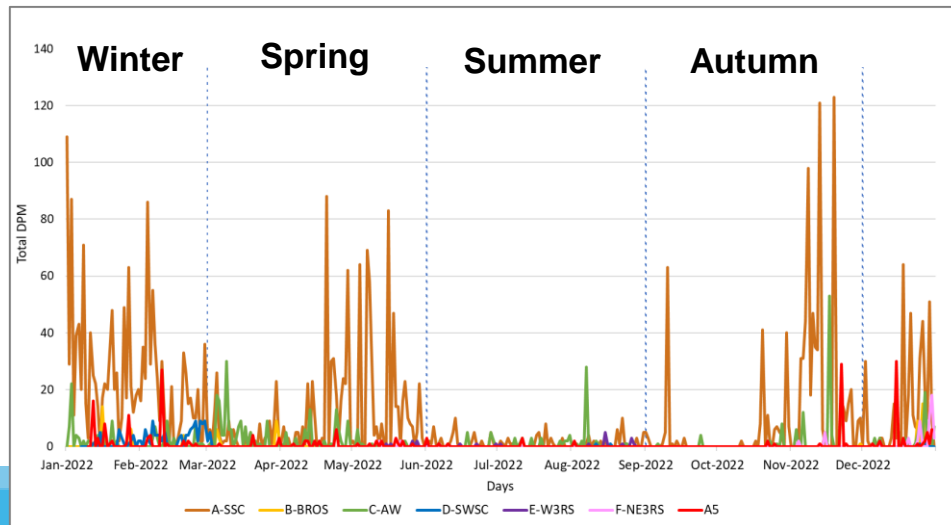
# CWD Monitoring Results for 2022

## – Passive Acoustic Monitoring

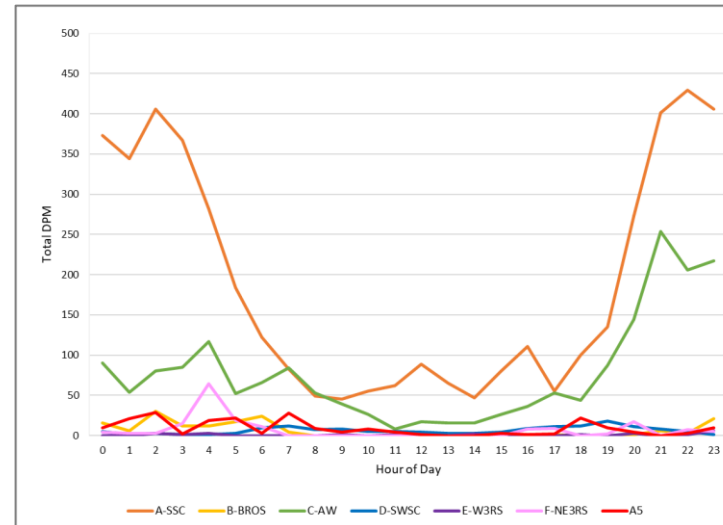
- 7 monitoring stations deployed – 1 for EM&A monitoring, 4 more since March 2020 & 2 more since May 2022
- Detections: 21.8% days with CWD presence (453 out of 2,074 logged days)
- Seasonal pattern: high detection rate in winter & spring, very low in summer
- Diel pattern: higher detection rate during night-time
- Results indicated CWDs continue to use north Lantau area, including the Brothers Islands, especially in winter and primarily during night-time



Detections across seasons, Jan-Dec 2022



Detections per hour of the day, Jan-Dec 2022



F-POD retrieved for maintenance

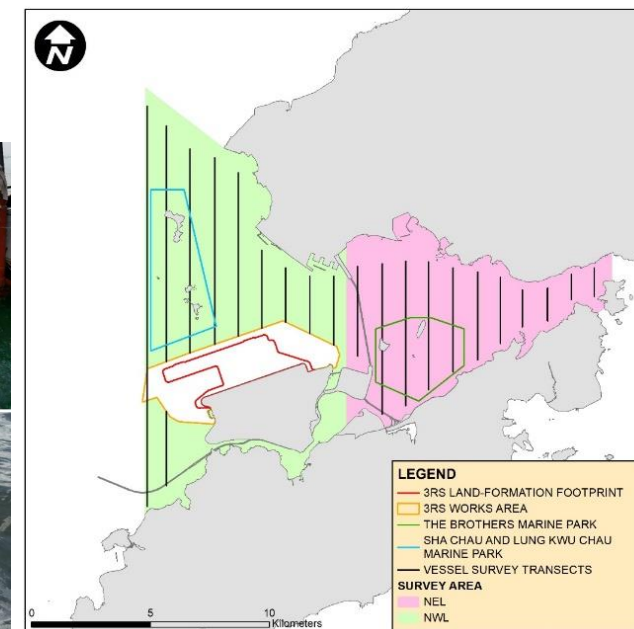


# Night-time Hydrophone Survey

- To further explore CWDs' habitat use patterns, additional night-time hydrophone surveys were deployed
- Monthly night-time hydrophone surveys at NWL and NEL
- 9 on-effort CWD detections at NWL from May 2022 to March 2023
- Results indicated CWDs were using waters around SCLKCMP and to the west of HKIA, similar to the pattern observed during daytime vessel surveys

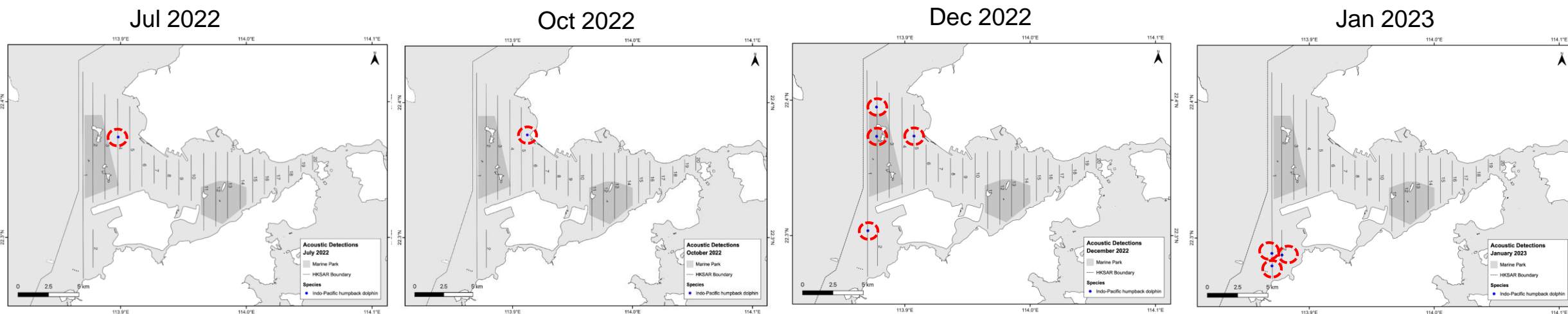


Coastal Acoustic Buoy



Monitoring line transects at NWL & NEL

## Detections



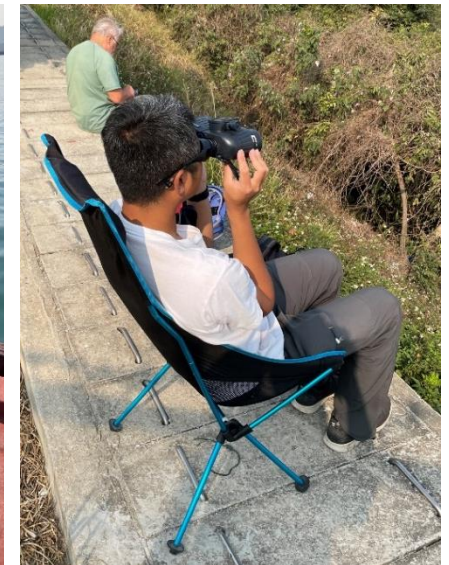


# Dolphin Experts Audits on CWD Monitoring in March 2023

- Dr. Thomas Jefferson and Professor Bernd Würsig conducted in-person audits on CWD monitoring in March 2023
- Vessel line transect survey – audited by Dr. Thomas Jefferson on 1, 2 and 3 March 2023
- Land based survey and deployment of F-POD for PAM – audited by Professor Bernd Würsig on 1 March 2023



Audits on vessel survey



Audits on PAM and land-based surveys





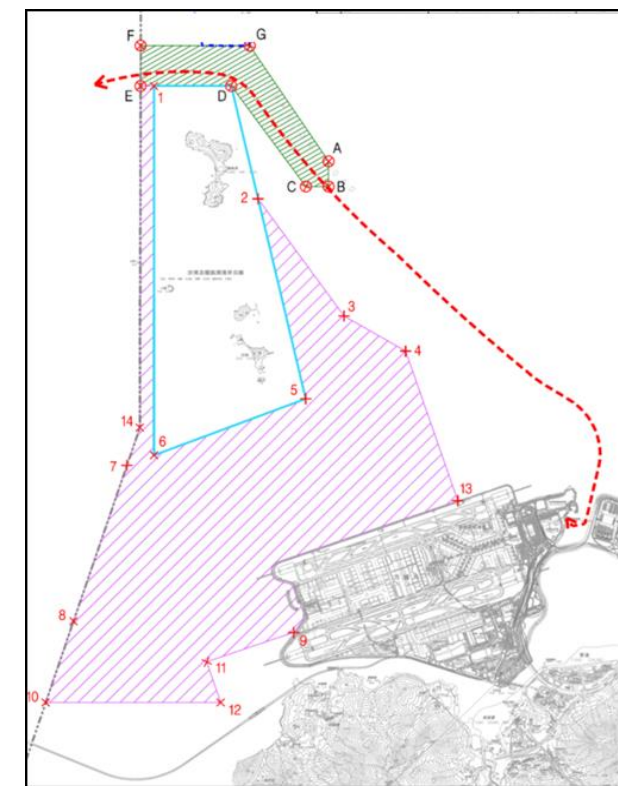
# Implementation of Marine Traffic Route & Management Plan for High Speed Ferries of SkyPier (SkyPier Plan) (Aug 2022 – Mar 2023)

- No diverted SkyPier HSF travel through the speed control zone (SCZ) over 15 knots and not travel through the SCZ was recorded

	Aug 2022 – Mar 2023 #
Total number of diverted HSF trips*	58
Diverted SkyPier HSF trips* with average speed within 15 knots	100%
Maximum daily no. of SkyPier HSF movement (within the maximum daily cap of 125 movements)	29

\* Ferry service to/from between Hong Kong International Airport and Macau/Zhuhai

# The non-diverted SkyPier HSF provided limited service from 28 October 2020 to December 2022, and regular service between Hong Kong International Airport and Macau resumed in December 2022 after the pandemic.



LEGEND:

 Marine Prohibited Zone for SkyPier High Speed Ferries





# Complaints and Enquiries Handling

	2015 (From 28 Dec)	2016	2017	2018	2019	2020	2021	2022	2023 (Jan – Mar)
Complaint	0	1	7	8	1	10	21	11	0
Enquiry	0	25	16	19	20	9	13	2	1
Total	0	26	23	27	21	19	34	13	1



# Marine Ecology and Fisheries Enhancement Strategy





# Marine Ecology and Fisheries Enhancement

- Marine ecology and fisheries enhancement measures in Lantau waters

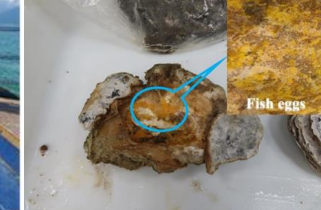
## Rock pools (vertical seawall)

Monitoring completed.  
Demonstrated benefit in enhancing the biodiversity on the



## Eco-enhanced concrete blocks (sloping seawall)

Monitoring in progress



## Shellfish reef deployment pilot study

Monitoring completed.  
Shellfish reefs were successful in enhancing species diversity and density.



## Eco-enhanced concrete blocks (vertical seawall)

Monitoring completed.  
Demonstrated benefit in enhancing the biodiversity on the newly built seawalls.

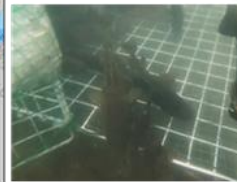
## Rock pools (sloping seawall)

Installation substantially completed



## Fish restocking pilot test

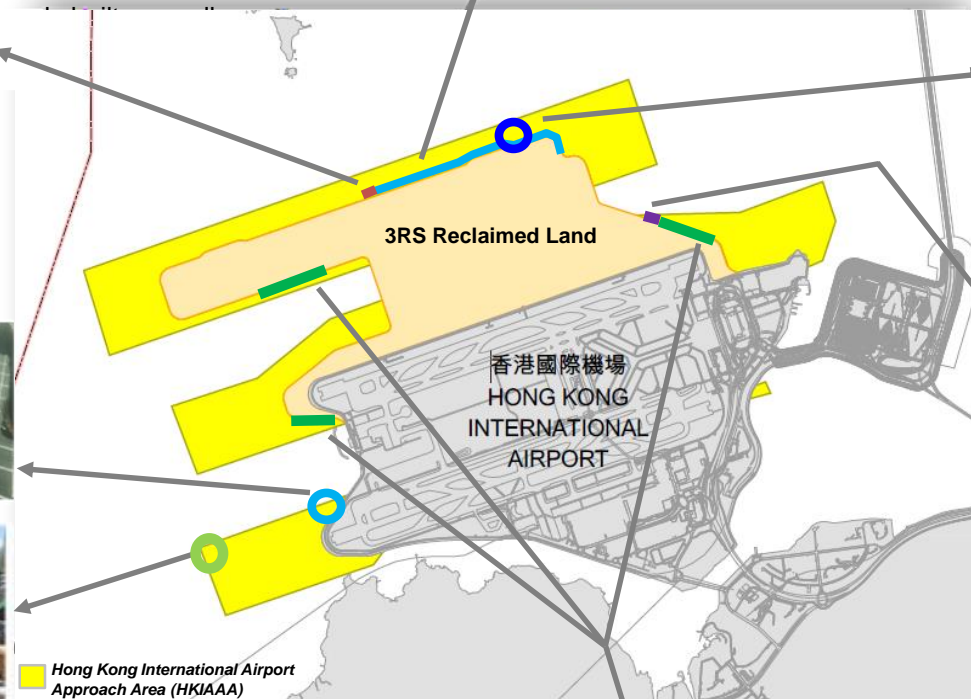
Monitoring completed.



## Artificial reef deployment pilot test

Monitoring completed.  
Artificial reefs encouraged an increase in species colonisation.

Hong Kong International Airport Approach Area (HKIAAA)



# Fish Fry Release Pilot – Phase 2

- Artificial Reefs were deployed in mid-2021 – expected to provide suitable habitat for fish fry
- Planned to launch Phase 2 in mid-2023
  - Planned release of ~20,000 fish fry, including black seabream, yellowfin seabream, green grouper and white flower croaker



Black seabream



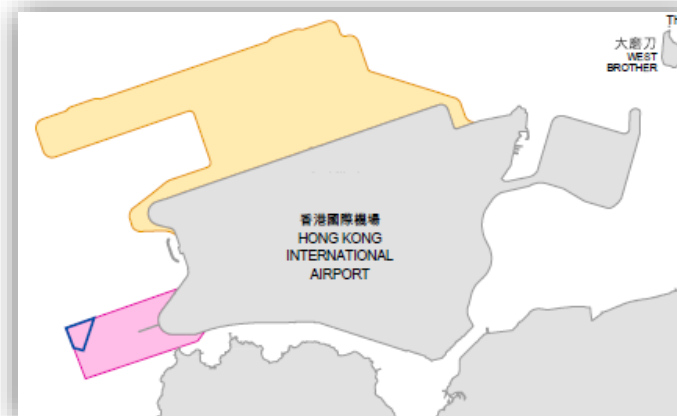
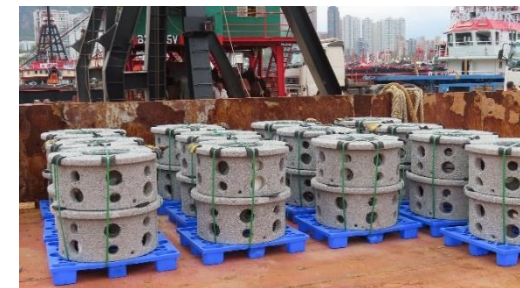
Yellowfin seabream



Green grouper



White flower croaker

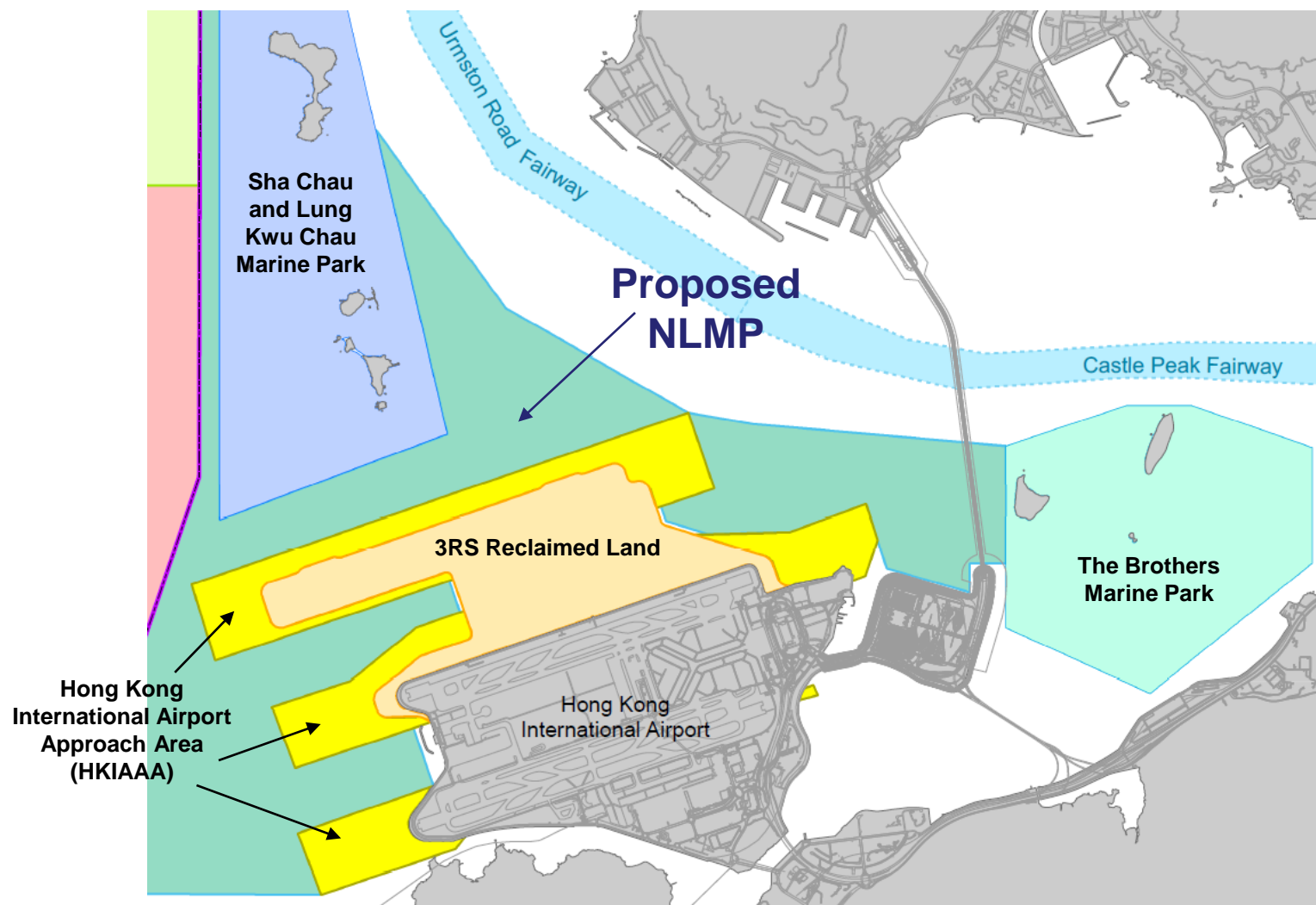


- Artificial Reefs Deployment Area
- HKIA Approach Area No. 1
- 3RS Reclaimed Land





# Proposed North Lantau Marine Park (NLMP)

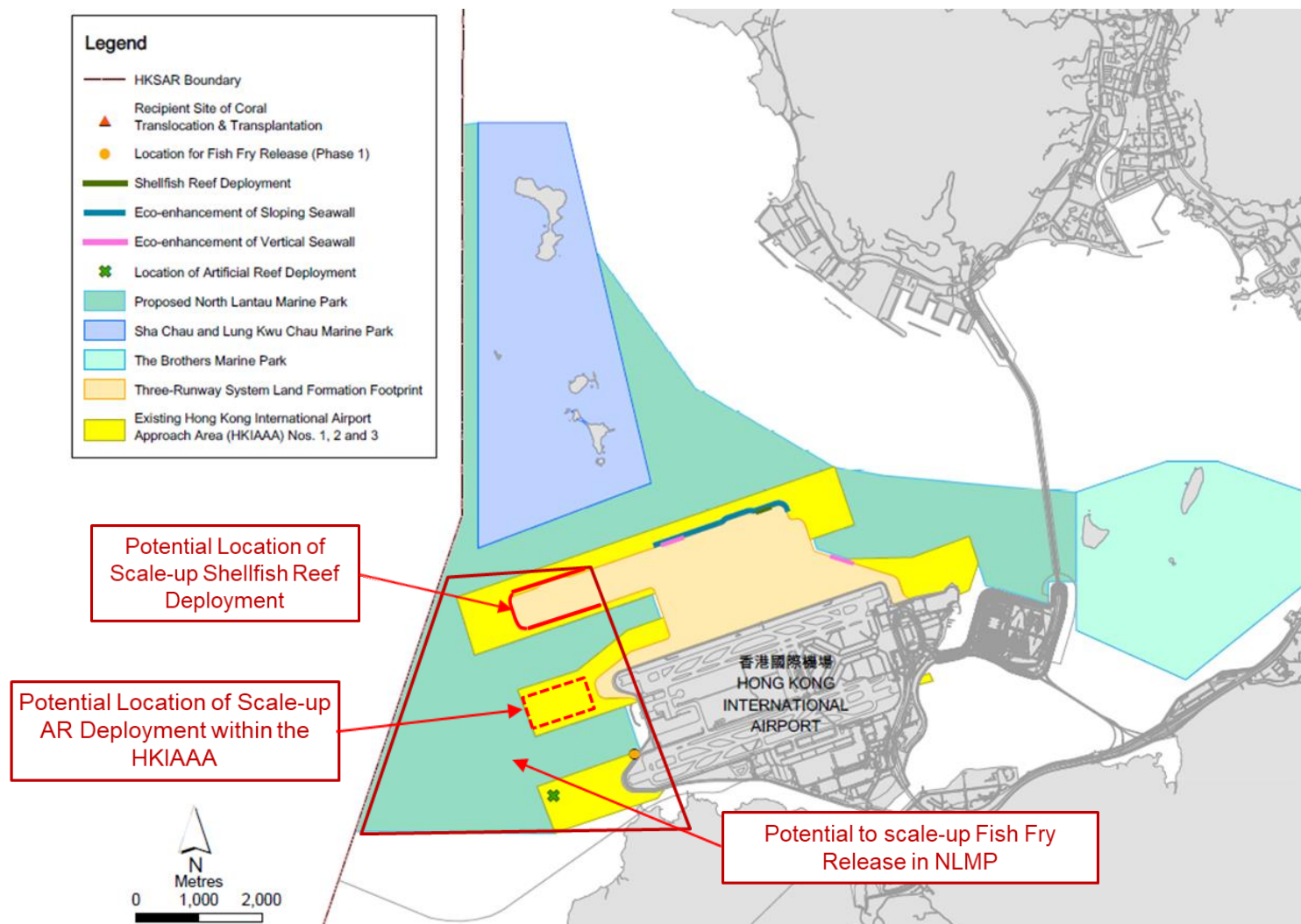


- In February 2023, AAHK joined AFCD to consult the Country and Marine Parks Board (CMPB)
- Draft map of the proposed NLMP was gazetted by the Government on 3 March 2023 for 60-day public inspection



# Proposed Scale-up of Marine Enhancement Measures

- Three enhancement pilots are proposed to be scaled up in phases in 2023/24
- At Airport West area of the NLMP and HKIAAA
  - Shellfish Reefs, ~1 km
  - Artificial Reefs, ~400 m<sup>3</sup> of reefs
  - Fish Fry / Shrimp Releases





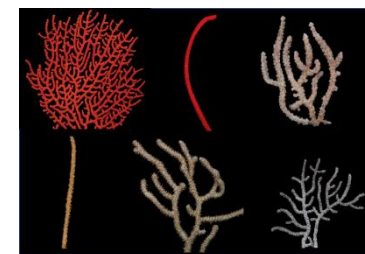
# Marine Ecology Enhancement Fund (MEEF)

- A total of 30 projects have been approved with a total funding amount of approximately HK\$34.76 million since 2017

No. of Funded Projects & Total Funded Amount	Approved MEEF projects in Year 2022/23 (July 2022 – June 2023)
7 numbers ~ HK\$4.79M	<p><i>Dolphin related projects</i></p> <ul style="list-style-type: none"> <li>Eyes in the Sky Keep Flying: Expanding UAV Surveys and the Development of a Longer Endurance Automated Platform to Monitor Hong Kong Marine Mammals</li> <li>Tracing a Novel Group of E-Waste Contaminants - Liquid Crystal Monomers - in the Chinese White Dolphins*</li> </ul>
	<p><i>Other projects</i></p> <ul style="list-style-type: none"> <li>Genetic connectivity of octocoral populations in South and Western Hong Kong water: implications to conservation management of deep-water community</li> <li>Population structure and Further Studies on Reproductive Biology of the Octocoral <i>Guaiaagorgia</i> in Hong Kong Western Waters</li> <li>Shells for understanding Lantau subtidal ecosystem history: Part 2. Hong Kong wide comparison</li> <li>Shore up with shells: enhancing marine biodiversity on artificial rip-rap seawalls with a nature-based approach</li> <li>Save Our Shells: Repurposing Shells to Reduce Landfill Waste and Restore Marine Habitats*</li> </ul>



Underwater photographs of *Echinomuricea spinifera*



Laboratory photographs of some octocorals collected from Round Island



Save Our Shells: Repurposing Shells to Reduce Landfill Waste and Restore Marine Habitats

\* 2<sup>nd</sup> phase of the project



# Fisheries Enhancement Fund (FEF)

- A total of 21 projects have been approved with a total funding amount of approximately HK\$35.95 million since 2017

No. of Funded Projects & Total Funded Amount	Approved FEF projects in Year 2022/23 (July 2022 – June 2023)
6 numbers ~ HK\$10.03M	<ul style="list-style-type: none"> <li>Fishermen Fisheries In-depth Tour Project</li> <li>Study on Antioxidant Function of Hong Kong Pearl Oyster (<i>Pinctada imbricata</i>) Powder</li> <li>Pioneer Scheme to Enhance Occupational Safety and Health for Local Fishermen</li> <li>Pilot Test for GPS and Beidou Dual Satellite Receiver System with Nautical Charts, Fish Finder and Automatic Identification System</li> <li>Tai O Fishing Village Tourism Project</li> <li>Pilot Project for the Sustainable Aquaculture of Tropical Sea Cucumbers (<i>Holothuria scabra</i>) in Hong Kong*</li> </ul>



Fishermen Fisheries In-depth Tour Project



Tai O Fishing Village Tourism Project

\* 2<sup>nd</sup> phase of the project





# Carbon Management



# HKIA's Carbon Reduction Target

2035

Carbon absolute  
reduction  
**55%**

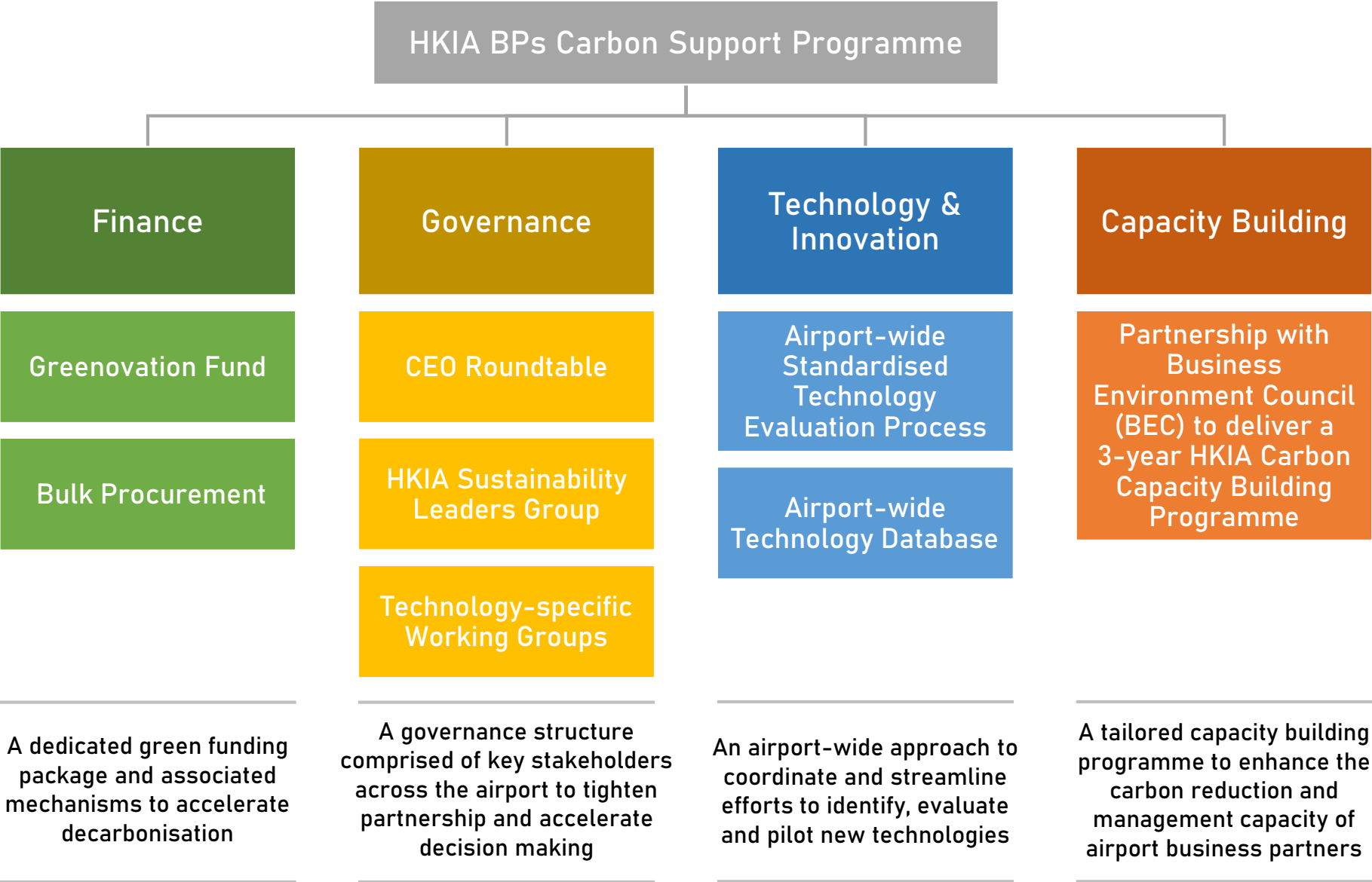
2050

Net zero  
carbon  
emissions



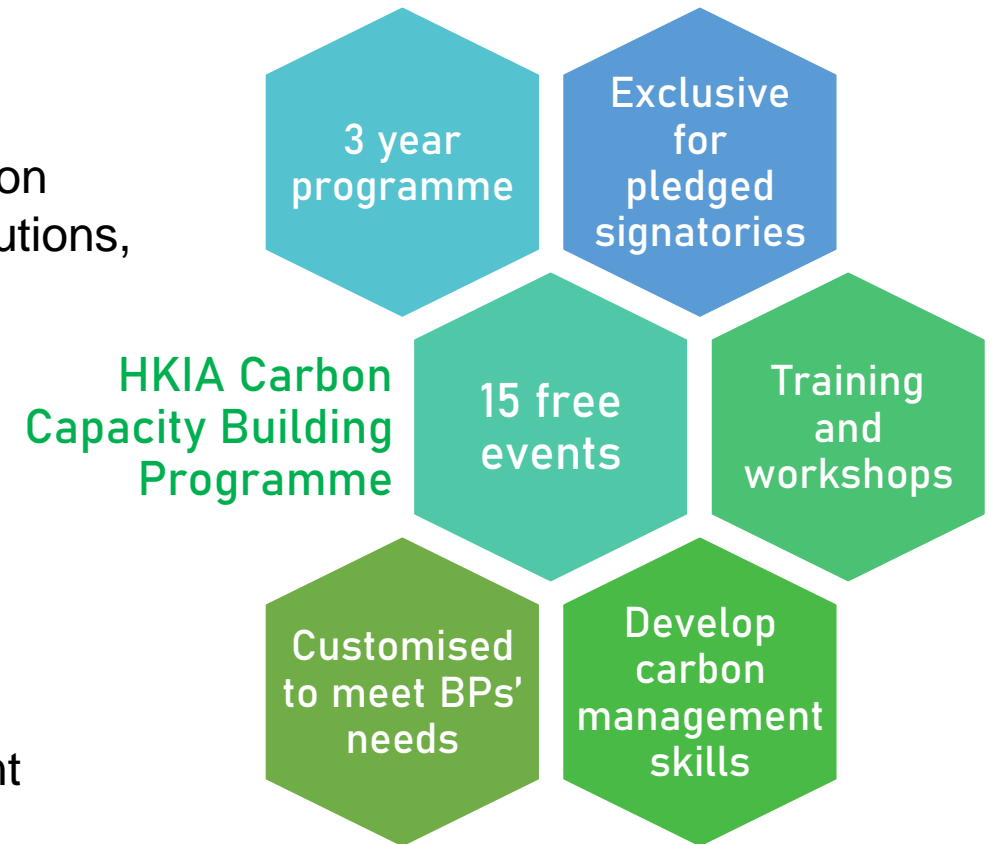


# HKIA Business Partners Carbon Support Programme



# HKIA Carbon Capacity Building Programme

- A 3-year programme tailored to the needs of Business Partners
- Partnership with Business Environment Council (BEC)
- Topics covered: training on carbon management & reduction solutions, corporate decarbonisation & energy efficient solutions, trajectory tool training, carbon audit & reporting
- Upcoming topics:
  - Understanding SBTi
  - Climate Change and Aviation
  - Value Chain Management and Scope 3 Mapping
  - Policy and Strategies, Communication and Engagement





# HKIA Greenovation Fund

- Launched in October 2022, \$20M funding injection
- Eligibility: Business Partners who had joined the “HKIA 2050 Net Zero Carbon Pledge”



Provide BPs with financial support in piloting green sustainable and innovative technologies



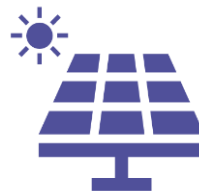
Fund carbon reduction initiatives relating to airport operations



Pilot technologies that have the potential to be scaled up across the airport community



Innovative energy efficient technology



Innovative renewable energy



Innovative alternative fuel



# HKIA Onsite Solar Study

- Feasibility study to identify pragmatic opportunities to enhance solar generation on the airport island, including on premises and spaces, is underway
- Solar target with roadmap for solar projects would be developed to complement the “HKIA 2050 Net Zero Carbon Pledge”





# Airside Vehicles Electrification

- Phase 1 completed – all saloon cars replaced with electric vehicles (EVs) since 2017
- Phase 2 – began in 2019, replace all airside private vehicles\* with electric models by end 2023
- Subject to market availability – commence transition of airside vans, minibuses and buses to electric type in 2024
- EV Chargers Network on airside apron – over 650 chargers in 2022
- By 2030 – target to increase EVs to >3,000 and provide >1,320 charging points



\* gross weight less than 3 tonnes



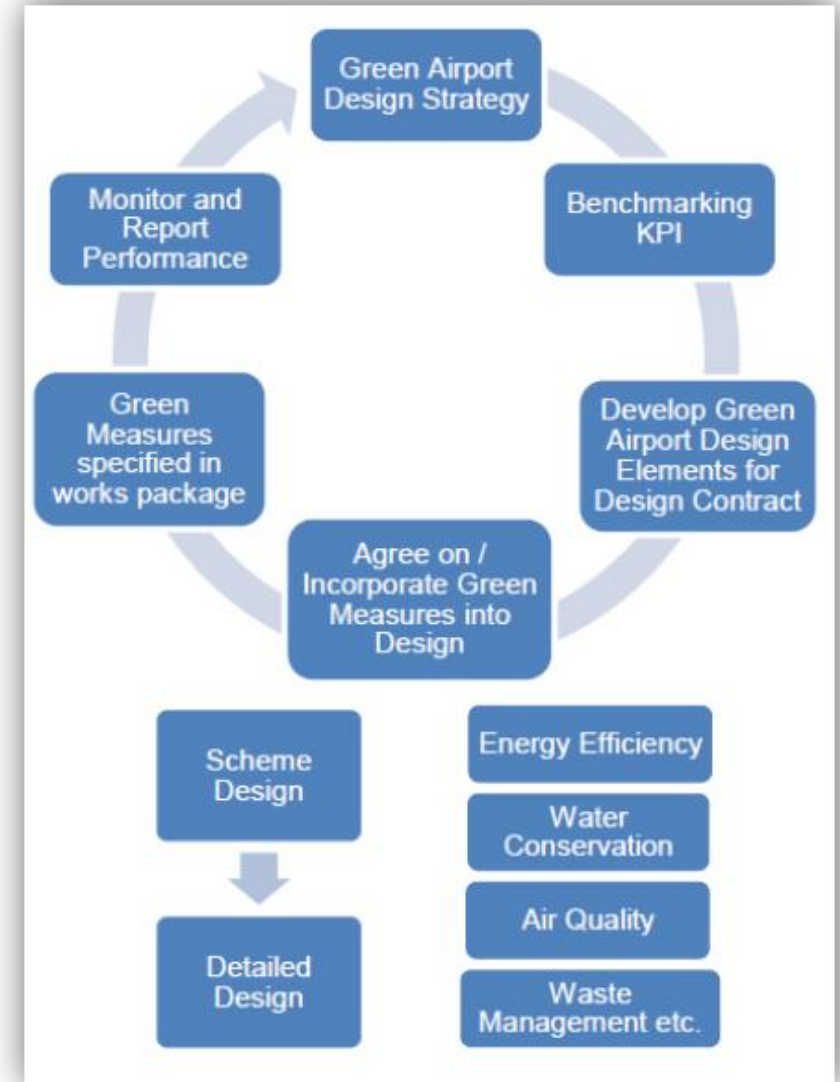
# Green Airport Design and Sustainable Construction





# Green Airport Design & Construction (GADC) Strategy

- Provides a consistent approach for embedding green design and sustainable construction considerations in building and non-building infrastructure projects at HKIA
- Helps ensure high importance will be put on environmental and green design elements from design to construction stages
- “Climate Resilience Guidance Note” and “Guidelines on Energy Efficiency of New Building Design” embedded and implemented as part of the GADC Strategy



# Awards and Recognitions



## T1 Midfield Concourse

- **Grand Award** - Green Building Award 2016, New Buildings Category, Completed Projects, Institutional Building



## 3RS Aviation Fuel Pipeline Diversion

- **Excellent Award & Outstanding Award** - CIC Sustainable Construction Award, Industry Practitioners Category
- **Merit Award** - CIC Sustainable Construction Award, Organisation Category



## 3RS Deep Cement Mixing Works

- **Excellent Award** - CIC Sustainable Construction Award, Industry Practitioners Category
- **Silver Award** - CIC Sustainable Construction Award, Organisation Category

## HKIA Tower Two

- **Gold Rating** - HKGBC, BEAM Plus Provisional Assessment, New Building Category



Nov 2016

May 2017

Oct 2018

Apr 2020

Nov 2020

Dec 2020

Aug 2021

Feb 2022

## T1 Midfield Concourse

- **Gold Rating** - HKGBC, BEAM Plus Final Assessment



## 3RS Third Runway & Associated Works

- **Excellent Rating** - CEEQUAL, Sustainability Performance Assessment for Interim Client and Design Award

84.8



## Expansion of T2

- **Platinum Rating** - HKGBC, BEAM Plus Provisional Assessment, New Building Category

91.7



## Sky Bridge

- **Gold Rating** - HKGBC, BEAM Plus Provisional Assessment, New Building Category



## Terminal 2 Concourse and Air Traffic Control Tower

- **Platinum Rating** - HKGBC, BEAM Plus Provisional Assessment, New Building Category

91.8





# Sky Bridge



Project name	Sky Bridge
Bond proceeds allocated	HK\$450 million
Completion date	2022
Project status	Completed
Green building certification	<ul style="list-style-type: none"> <li>Provisional Gold achieved under BEAM Plus New Buildings Version 1.2 (certified December 2020)</li> </ul>
Key environmental features	<ul style="list-style-type: none"> <li>Energy-saving automatic speed reduction travelators</li> <li>Energy-efficient lifts and escalators</li> <li>Construction materials from sustainable sources</li> <li>Low-flow sanitary fittings, including aerators and dual flush toilets, to reduce unnecessary water consumption</li> </ul>
Estimated key environmental impacts	<ul style="list-style-type: none"> <li>2,085 MWh annual energy savings</li> <li>813 tonnes of CO<sub>2</sub>e avoided annually</li> <li>22.9% annual energy savings compared to EMSD Building Energy Codes 2018</li> </ul>



# HKIA Tower Two



Project name	HKIA Tower Two
Bond proceeds allocated	HK\$567 million
Completion date	2022
Project status	Completed
Green building certification	<ul style="list-style-type: none"> <li>Provisional Gold achieved under BEAM Plus New Buildings Version 1.2 (certified August 2021)</li> </ul>
Key environmental features	<ul style="list-style-type: none"> <li>Approximately 35% of the tower's roof area is covered by a green roof, helping to lower the urban heat island effect and thus enhance human comfort</li> <li>A 1.5-metre-wide open staircase connecting all floors is provided to encourage staff to use the lift less often, for improved health and reduced energy consumption</li> <li>Combining natural light and an artificial lighting system to reduce overall energy consumption, the tower features a 70m<sup>2</sup> skylight centrally located above the public atrium, as well as daylight sensors installed throughout the office area</li> <li>To minimise solar heat gain and the transmission of traffic noise, the eastern and western facades of the building incorporate aluminium vertical cladding, projected approximately two metres from the curtain wall</li> </ul>
Estimated key environmental impacts	<ul style="list-style-type: none"> <li>460 MWh annual energy savings</li> <li>179 tonnes of CO<sub>2</sub>e avoided annually</li> <li>21.7% annual energy savings compared to EMSD Building Energy Codes 2018</li> </ul>

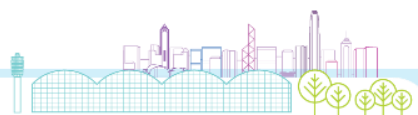




# Terminal 2 Concourse



Project name	Terminal 2 Concourse
Bond proceeds allocated	HK\$2,433 million
Targeted completion date	2024
Project status	In progress
Green building certification	<ul style="list-style-type: none"> <li>Provisional Platinum achieved for the T2C and Air Traffic Control Tower under BEAM Plus New Buildings Version 1.2 (certified February 2022)</li> </ul>
Key environmental features	<ul style="list-style-type: none"> <li>Climate-responsive building design including high-energy-performance glazing, optimal spatial planning and maximised access to natural light</li> <li>Installation of photovoltaic (PV) panels covering a total area of approximately 4,000m<sup>2</sup> for on-site energy generation</li> <li>Energy-efficient lighting design and high-efficiency chiller system design</li> <li>Demand-controlled ventilation, heat recovery and free cooling to reduce energy consumption</li> <li>Over 60% of construction waste to be recycled and at least 10% of recycled building materials to be used for exterior and interior components</li> </ul>
Estimated key environmental impacts	<ul style="list-style-type: none"> <li>45,000 MWh total annual energy savings</li> <li>17,500 tonnes of CO<sub>2</sub>e avoided annually</li> <li>Of this, PV panels expected to produce approximately 690 MWh of renewable energy per year, leading to 269 tonnes of CO<sub>2</sub>e avoided annually</li> <li>Up to 29% annual energy savings compared to EMSD Building Energy Codes 2018</li> </ul>



# ESG Assessment





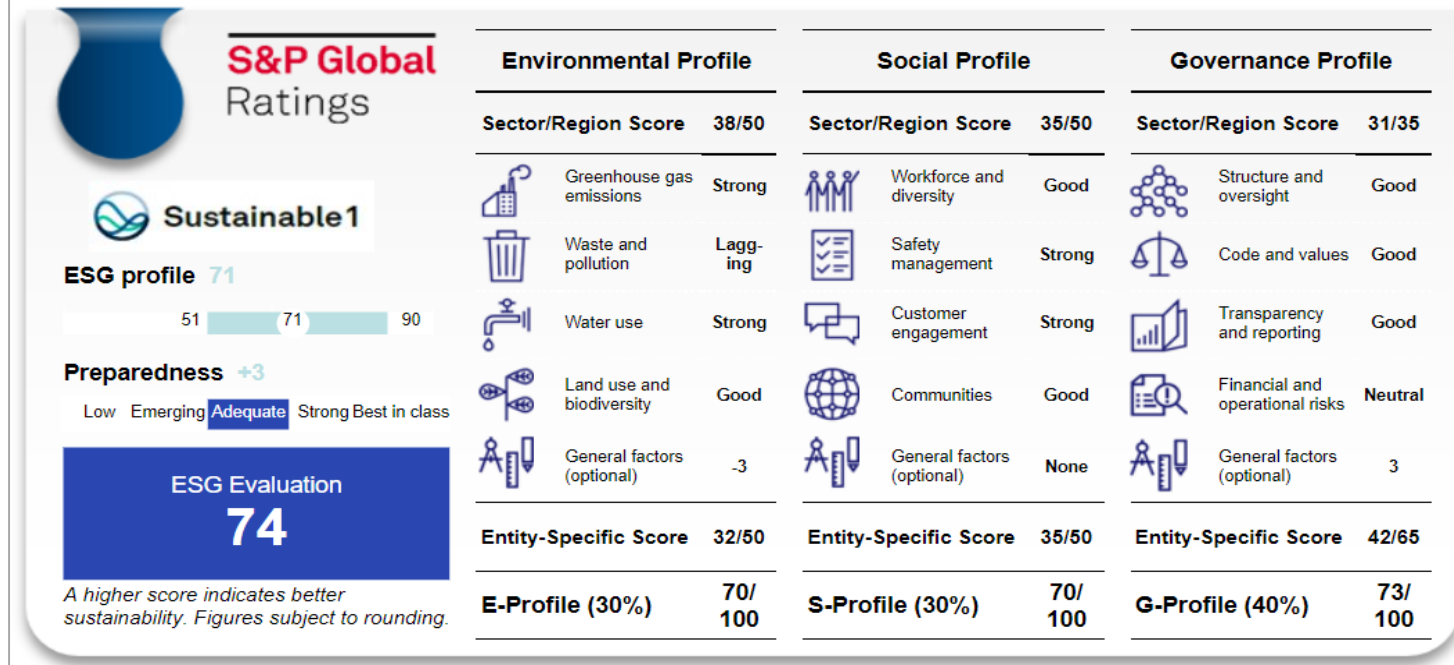
# ESG Rating and Outcomes (1)

- **ESG** = Environmental, Social and Governance
- Reflects how well the company proactively manages ESG issues that are most material to its business
- Two assessments conducted by global agencies in 2022

## S&P ESG evaluation

- AA received a rating of 74 out of 100
- Higher than the Asia-Pacific average of 60
- Higher than and global average of 65
- HKIA – the first airport to have its ESG rating publicised by S&P globally

### S&P ESG evaluation score



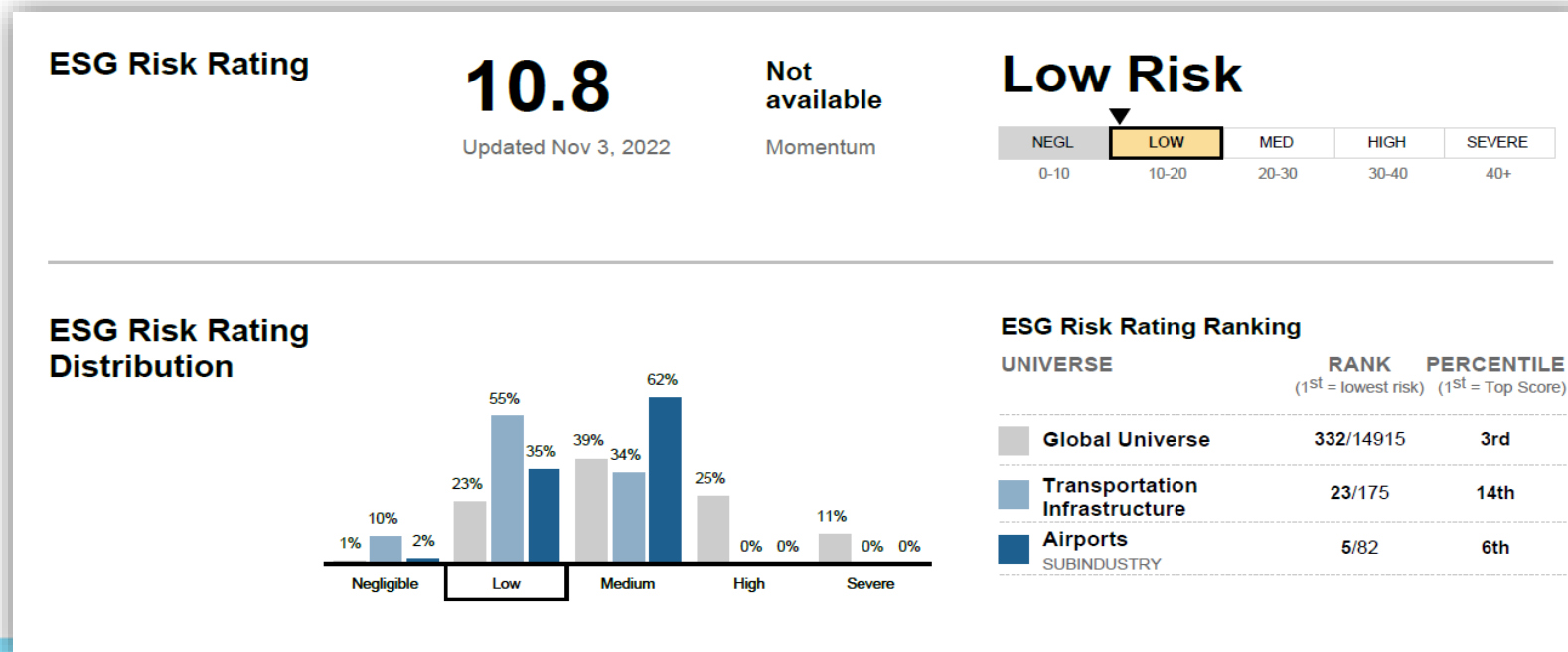
*“AA has good capabilities to address its moderate yet growing environmental and social exposure, and focus on maintaining its capacity to navigate potential disruptions”. - S&P Global Ratings*



# ESG Rating and Outcomes (2)

## Sustainalytics ESG risk rating

- AA obtained a “low risk” ESG rating with a score of 10.8
- AA ranks 5<sup>th</sup> in the airport sector, out of the 82 evaluated airports
- In the top 3<sup>rd</sup> percentile globally in terms of ESG performance
- Included in Sustainalytics’ “2023 Top-Rated ESG Companies List” for its outstanding environmental, social and governance (ESG) performance





# Thank you

