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**Expansion of Hong Kong International Airport into a
Three-Runway System (“3RS”)**

**Update on the Implementation of Environmental Mitigation and
Enhancement Measures in association with the 3RS Project**

This paper encloses an information paper prepared by the Airport Authority Hong Kong to the ACE providing an update on the implementation of environmental mitigation and enhancement measures related to the 3RS Project.

ACE Secretariat
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Expansion of Hong Kong International Airport into a Three-Runway System (“3RS”)

Update on the Implementation of Environmental Mitigation and Enhancement Measures in association with the 3RS Project

PURPOSE

This paper provides an update to Members on the implementation of environmental mitigation and enhancement measures related to the 3RS Project.

BACKGROUND

2. This paper covers: (a) overall progress of the 3RS construction works; (b) environmental monitoring and audit (“EM&A”) programme; (c) progress on the implementation of marine ecology and fisheries enhancement measures; (d) green building design and sustainable construction; and (e) stakeholder engagement related to the 3RS Project.

OVERALL PROGRESS OF 3RS CONSTRUCTION WORKS

3. The construction of the 3RS at Hong Kong International Airport (“HKIA”) comprises different components, including the formation of about 650 hectares of land; expansion of the existing Terminal 2 (“T2”); construction of the Third Runway, taxiways and aprons, and the T2 Concourse (“T2C”)¹; provision of a new automated people mover (“APM”) system and a high-speed baggage handling system (“BHS”); reconfiguration of the Centre Runway² and construction of airport support infrastructure, utilities and facilities.
4. Notwithstanding the challenges associated with the intensifying impact of the Coronavirus Disease (“COVID-19”), the Airport Authority Hong Kong (“AAHK”) has been maintaining the progress of the 3RS construction and timely completed the essential works to support the flight check for the Third Runway, which was satisfactorily completed in April 2022. Operation familiarisation for aircraft taking-off and landing on the Third Runway was also conducted from 8 July 2022 onwards to allow local and overseas

¹ Formerly known as the Third Runway Concourse in the 3RS Environmental Impact Assessment (“EIA”) Report.

² The former North Runway was re-designated as the Centre Runway in December 2021 while the Third Runway was designated as the North Runway in February 2022.

stakeholders of the aviation community to familiarise with the related operating procedures and collaborative arrangements in an orderly manner.

5. As reported to the Panel on Economic Development of the Legislative Council on 23 May 2022, although there remains various challenges to the 3RS Project, AAHK will keep monitoring and assessing the situation and endeavours to minimise the impacts on the 3RS Project with a view to completing the project in 2024 according to plan.

EM&A PROGRAMME FOR 3RS PROJECT

6. The implementation of the EM&A programme for the 3RS Project is ongoing. All EM&A information, including monitoring results, implementation status of mitigation measures, events of non-compliance and the corresponding follow-up actions, etc. are reported on a monthly basis. The submission required under the Environmental Permit (“EP”) for the operation of the Third Runway³ has been approved by the Director of Environmental Protection in March 2022 according to the requirements specified in the EP. The EM&A information together with the finalised EP submissions are publicly available on a dedicated website⁴. The EM&A programme and all the required environmental mitigation measures for the 3RS Project have been properly implemented since the commencement of construction.
7. Chinese White Dolphin (“CWD”) monitoring has continued as part of the 3RS EM&A programme. For year 2021, the monitoring results indicated a slight increase in dolphin usage of Northwest Lantau waters as compared to 2020, with the estimate of overall dolphin abundance in Hong Kong waters recorded at 34 in 2021, against 32 in 2020. Although this remains a lower estimate of total dolphin abundance compared with the past decade, as predicted in the 3RS EIA Report, dolphins may shift their habitats away from North Lantau waters during the construction period of the 3RS Project and other concurrent projects (e.g. Tung Chung New Town Extension project) in the vicinity. The monitoring results have shown that dolphins continue to use the western waters of Hong Kong (primarily West Lantau waters) for important ecological activities including foraging and socialising with mother-calf pairs.
8. Vessel-based line-transect monitoring results showed that West Lantau waters continue to be the most important CWD habitat in Hong Kong, while an apparent increase of CWD abundance in Northwest Lantau waters is

³ EP Condition 2.21 – Submission of Procedures for Mitigation of Aircraft Noise.

⁴ Dedicated 3RS Project webpage for environmental-related issues:

<http://env.threerunwaysystem.com/en/index.html>

observed in 2021. With the substantial completion of reclamation and marine works, the impact on the habitat of CWDs is expected to continue to gradually subside with dolphin usage expected to recover in the long run.

9. Apart from the vessel-based line-transect monitoring results, the passive acoustic monitoring provided evidence that dolphins continue to use the waters around south of Sha Chau throughout the year. As an initiative beyond the EM&A requirements, AAHK has deployed four F-PODs⁵ in North Lantau waters since early 2020. The F-POD monitoring results have provided useful information about dolphin usage in North Lantau waters before and after completion of the 3RS reclamation works, identifying higher detections during night-time and in winter. Two additional F-PODs have been deployed since May 2022 to obtain more information on dolphin usage in North Lantau waters to facilitate better analysis of any rebound / changes of CWDs using the waters around the area.

MARINE ECOLOGY AND FISHERIES ENHANCEMENT MEASURES

10. AAHK continues to fulfil its commitments to enhance the marine environment for the benefit of marine ecology (including CWD habitats) and fisheries resources in the vicinity of the 3RS Project area. Since the setting up of a Marine Ecology Enhancement Fund (“MEEF”) and a Fisheries Enhancement Fund (“FEF”) with a total budget of HKD400 million from AAHK in late 2016, over HKD69 million was granted from the MEEF and FEF to 50 projects since FY2017/18. Details of the MEEF and FEF funded projects, including the reports of those completed projects, are posted on dedicated websites⁶. These projects are managed and conducted by various organisations including universities, research groups, and fisheries industry associations. The second joint sharing session was held in November 2021 to share findings and achievements of various funded projects, which was attended by academics, representatives from the fishery sector, Government departments, professional bodies and non-governmental organisations.
11. In addition, other than operating the two funds, AAHK continues to explore and/or implement a host of marine ecology and fisheries enhancement measures in Lantau waters beyond the EP requirements. These include:

⁵ A passive acoustic monitoring device for marine mammal monitoring.

⁶ Marine Ecology Enhancement Fund webpage:
<http://env.threerunwaysystem.com/en/meef/index.html>
Fisheries Enhancement Fund webpage:
<http://env.threerunwaysystem.com/en/fef/index.html>

(a) Eco-enhancement of seawall designs

The eco-enhanced seawall blocks and panels for installation at the new seawall were moulded with rough surfaces, pits, holes and rock pool features to facilitate and promote colonisation of epifauna and to increase microhabitat complexity as well as to provide refuge for marine organisms.

The installation of eco-enhanced vertical seawall blocks, distributed over 100m and 330m length of seawall sections along the north and northeast of the reclamation area respectively, was completed in early 2020. The post-installation monitoring for the eco-enhanced vertical seawall sections were conducted from Q4 2020 to mid-2022. The number of species found on the eco-blocks installed at the above two vertical seawall sections was higher than that on typical vertical artificial seawall, with higher abundance of gastropods (such as limpets and snails) and crustaceans (such as crabs and isopods) recorded on the eco-enhanced features (**Photos A to D** in Annex). Lower surface temperature was observed on the eco-enhanced features during wet season, providing microhabitats with less heat and desiccation stress that are favourable for the settlement of intertidal species.

Eco-blocks were also deployed and distributed over 2,200m length of sloping seawall at the north of the reclamation area. The deployment works was substantially completed in Q4 2021. The first post-deployment monitoring survey was conducted in Q2 2022. In addition, more eco-enhanced blocks are being installed at various sections of sloping seawall at the west and northeast of the reclamation area, target to finish by end-2022 with post-deployment monitoring works to follow. AAHK will review the results and assess the ecological performance of the seawalls with and without eco-enhancement as well as between different types of eco-enhanced features.

(b) Shellfish reef deployment pilot study

In 2020, AAHK engaged a team of marine ecology specialists to undertake a 20-month shellfish reef deployment pilot study along the subtidal sections of a newly formed seawall. This pilot study investigates the feasibility of using a low-cost and nature-based solution (i.e. shellfish reef restoration) to promote colonisation of shellfish and other associated marine fauna to enhance biodiversity along the artificial shoreline.

The deployment of the shellfish reefs along a section of the newly completed seawall to the north of the Third Runway was completed in early July 2021 and all post-deployment monitoring surveys have been completed in May 2022. Preliminary survey findings and visual observations indicated that the shellfish reefs have attracted reef-building bivalves, and associated flora and fauna on the deployed substrates (**Photos E & F** in Annex). Detailed analysis on the survey findings is underway to further confirm the diversity and richness of the recruited shellfish reef species.

(c) Artificial reef deployment pilot test

AAHK also deployed two types of artificial reef (“AR”) units (i.e. AR units with or without oyster) in clusters within the vessel-restricted Hong Kong International Airport Approach Area in June 2021. This trial study aimed at evaluating the effectiveness of the ARs in enhancing marine biodiversity, promoting fisheries resources as well as studying the differences between the two types of AR units.

Post-deployment monitoring surveys were conducted for ten months since August 2021 by dive and fisheries surveys. The results demonstrated that the deployment of ARs is able to promote the growth of colonisation species, such as goby fish (*Tridentiger trigonocephalus*), barnacle species (*Balanus amphitrite*), bryozoan species (*Bugula neritina*), oysters, corals, sponges and hydroid species, by providing habitats and food resources. Ahermatypic hard coral species (*Balanophyllia* sp.) and several commercial fish species (such as *Scatophagus argus*, *Monacanthus chinensis* and *Acanthopagrus schlegelii*) were also observed inhabiting at the AR units (**Photos G to K** in Annex).

Multi-beam echo sounder surveys (“MBES”) were also conducted within the pilot test area before and after deployment of the AR units to monitor the changes in seabed conditions and detect any movement / subsidence of deployed AR units over time. MBES provides clear 3D visualisation of the deployed AR units and seabed conditions, allowing accurate detection of changes over time (**Photo L** in Annex). The post-deployment monitoring surveys are ongoing to further assess the effectiveness of ARs in enhancing the ecological value of North Lantau waters.

If the post-monitoring survey results indicate shellfish reefs or ARs are effective in enhancing the ecological value of nearby waters, AAHK may consider scaling up these initiatives to help promote ecological

richness and diversity in the proposed North Lantau Marine Park (“NLMP”) and/or its surrounding waters.

12. As recommended in the approved 3RS EIA Report, a new marine park (i.e. the proposed NLMP) comprising an area of approximately 2,400 hectares in North Lantau waters will be designated before the operation of the 3RS Project in 2024. The Agriculture, Fisheries and Conservation Department will take forward the relevant statutory procedures in accordance with the Marine Parks Ordinance (Cap. 476) with a view to completing the designation of the proposed NLMP in 2024.

GREEN BUILDING DESIGN AND SUSTAINABLE CONSTRUCTION

13. AAHK continues to pursue excellence in green building design and sustainable construction. To fulfil HKIA’s pledge to be the world’s greenest airport, the design of both the T2C and the T2 Expansion have considered and incorporated various green design initiatives. Subsequent to obtaining the highest Platinum rating in the BEAM Plus⁷ Provisional Assessment for the T2 Expansion Works in 2020, AAHK received the Provisional Platinum rating under BEAM Plus in the same independent assessment of building sustainability performance completed for the T2C in 2022.
14. Meanwhile, after obtaining an “Excellent” rating under the Interim Client and Design Award of the Civil Engineering Environmental Quality Assessment and Award Scheme (CEEQUAL)⁸ for the Third Runway and associated works in 2021, AAHK is going further and working on the Whole Team Award related final assessment under CEEQUAL for the same works. The assessment is expected to be completed in late 2022.

STAKEHOLDER ENGAGEMENT

15. To enhance transparency and communication with the community in a proactive way, AAHK continues to engage stakeholders with the Professional Liaison Group (“PLG”) and the Community Liaison Groups (“CLGs”), with a view to facilitating communications, enquiries and complaints handling on environmental issues related to the 3RS Project. During the pandemic period, AAHK has kept the PLG and CLGs members

⁷ BEAM Plus, being recognized and certified by the Hong Kong Green Building Council Limited, offers a comprehensive set of performance criteria for a wide range of sustainability issues relating to the planning, design, construction, commissioning, management, operation and maintenance of a building.

⁸ CEEQUAL is an international evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and public realm projects.

posted on the 3RS Project development covering updates on construction works and also environment-related matters through paper circulation. The next round of PLG and CLGs briefings is being planned for the second half of 2022, subject to the pandemic situation.

16. AAHK strives to be highly transparent in its works. The dedicated 3RS Project website provides the general public with up-to-date information on the 3RS Project, including EM&A data and results, updated plans and submissions in accordance with requirements in the EP, presentation materials of the liaison group meetings, as well as information on the status and operation of the MEEF and FEF. Flyers introducing the environmental initiatives of the 3RS Project and short videos on selected MEEF- and FEF-funded projects are also available on the website for the general public's information and viewing.

WAY FORWARD

17. AAHK will continue to implement all environmental mitigation and enhancement measures, as well as proactively engage with relevant stakeholders on environmental matters for the 3RS Project through the established engagement platforms.
18. Members are invited to note the above and advise.

Airport Authority Hong Kong
July 2022

Annex

Eco-enhancement of seawall designs



Photo A



Photo B



Photo C



Photo D

Photos A to D: Relatively high percentage cover of sessile organisms such as barnacles and mussels, snails and crabs were observed on the installed eco-seawall blocks

Shellfish reef deployment pilot study



Photo E



Photo F

Photos E & F: Fish eggs were laid under oyster shells and high density of oyster spat recruitment on the oyster shells

Artificial reef deployment pilot test

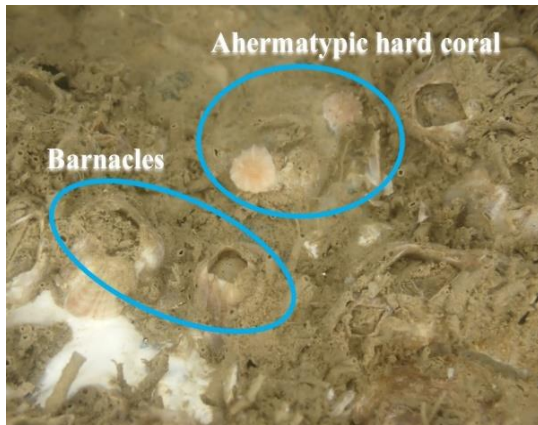


Photo G



Photo H: *Bugula neritina*



Photo I: *Balanus amphitrite*



Photo J: *Tridentiger trignocephalus*



Photo K: *Scatophagus argus*

Photos G to K: Marine fauna including hard coral, barnacles, fishes and bryozoans recorded during dive monitoring surveys

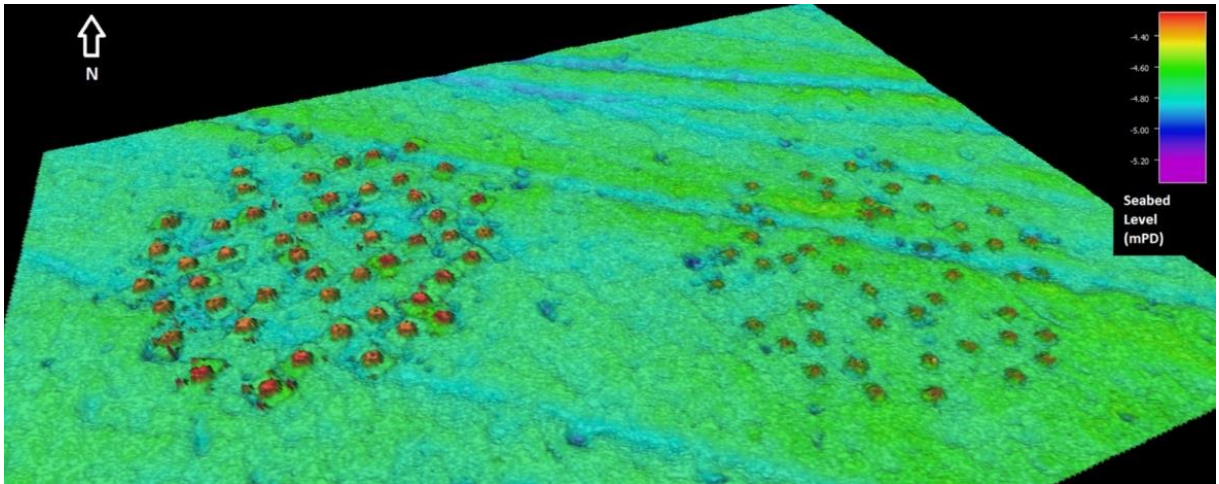


Photo L: 3D visualisation of the deployed AR units by MBES