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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 with a view to providing an update to Members on the implementation of environmental mitigation and enhancement measures related to the 3RS Project.

**ACE Secretariat**  
**August 2021**

# **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 (“ha”) of land; the construction of the Third Runway, taxiways and aprons, and the Terminal 2 Concourse (“T2C”) (formerly known as Third Runway Passenger Building); expansion of the existing Terminal 2 (“T2”); provisions of a new automated people mover (“APM”) system and a high-speed baggage handling system (“BHS”); modification of the existing North Runway; and the construction of airport support infrastructure, utilities and facilities.

4. Notwithstanding the challenges associated with reclamation works and impact of the Coronavirus Disease 2019 (“COVID-19”), the Airport Authority Hong Kong (“AAHK”) has been maintaining the progress of the 3RS construction with a view to commissioning the Third Runway in 2022 and the 3RS in 2024.

5. As reported to the Panel on Economic Development of the Legislative Council on 26 April 2021, substantial progress on filling operations of the reclamation works has been achieved; the marine-based Deep Cement Mixing (“DCM”) works were completed in 2020; reclamation works were approximately 95% complete with those required for commissioning of the Third Runway in 2022 fully completed.

## 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 EM&A information together with the finalised Environmental Permit (“EP”) submissions are publicly available on a dedicated website<sup>1</sup>. The EM&A programme and all the required environmental mitigation measures for the 3RS Project have been properly implemented since commencement of construction.

7. Chinese White Dolphin (“CWD”) monitoring has continued as part of the 3RS EM&A programme. For year 2020, the monitoring results indicated a decline in dolphin usage of Northwest Lantau area within Hong Kong waters as compared to 2019, with the estimate of overall dolphin abundance recorded at 32 in 2020, against 40 in 2019. A lower estimate of total dolphin abundance in Hong Kong waters was predicted in the 3RS Environmental Impact Assessment (“EIA”) Report, which anticipated that 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. Nevertheless, monitoring results have shown that dolphins continue to use the western waters of Hong Kong (primarily Southwest Lantau waters and West Lantau waters) for important ecological activities like feeding and resting.

8. Vessel-based line-transect monitoring results confirmed that West Lantau waters continue to be the most important CWD habitat in Hong Kong, while an apparent shift in areas used by CWDs away from Northwest Lantau area to Western and Southwest Lantau waters has been observed, in particular, the decline in dolphin usage of North Lantau waters has continued since 2019. Likewise, this temporary shift in habitat use away from North Lantau waters was predicted in the 3RS EIA Report and is a response to intensive reclamation and marine construction activities. With the substantial completion of reclamation and marine works, the impact on the habitat of CWDs is expected to subside gradually.

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. Therefore, as an initiative beyond the EM&A requirements, AAHK has voluntarily deployed four F-PODs<sup>2</sup> in North Lantau waters since early 2020. It is anticipated that the F-POD monitoring results could provide useful information about the dolphin usage of North Lantau waters during daytime and night-time, as well as before and after completion of the 3RS reclamation works for better analysis of any rebound/changes of CWD using the waters around the area.

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<sup>1</sup> Dedicated 3RS webpage for environmental-related issues:  
<http://env.threerunwaysystem.com/en/index.html>

<sup>2</sup> A passive acoustic monitoring device for marine mammal monitoring

## MARINE ECOLOGY AND FISHERIES ENHANCEMENT MEASURES

10. AAHK continues to fulfil its commitments to enhance marine environment for the benefits 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 HKD55 million was granted from the MEEF and FEF to 40 projects since FY2017/18. Details of the funded projects for the MEEF and FEF, including the reports of those completed projects, can be found on the dedicated websites<sup>3</sup>. These projects are managed and conducted by universities, research groups, or associations from the fisheries industry.

11. Meanwhile, other than the above two funds, AAHK continues to explore and/or implement several marine ecology and fisheries enhancement measures in Lantau waters beyond the EP requirements. These include:

(a) Eco-enhancement of seawall designs

The eco-enhanced seawall blocks and panels 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 provide refuge for marine organisms. The installation of eco-enhanced vertical seawall panels, including an approximately 100m length along the north of the reclamation area and an approximately 330m length along the northeast of the reclamation area, was completed in early 2020. The installation of the remaining eco-enhanced seawall blocks along sloping seawalls is in progress. The first post-installation monitoring conducted in Q4 2020 recorded a relatively high percentage cover of sessile organisms such as barnacles and mussels on the installed eco-seawall panels at two vertical seawall sections (see Photos A to D at **Annex**). Post-installation monitoring will continue to further assess the effectiveness of the eco-enhanced seawalls.

(b) Shellfish reef deployment pilot study

AAHK introduced another new initiative on marine ecology and fisheries enhancement in Lantau waters in 2020. AAHK engaged a team of marine ecology specialists to undertake a 20-month Shellfish Reef Deployment Pilot Study at selected locations along the subtidal sections of the newly formed seawalls. This pilot study investigates the feasibility of using a nature-based and low-cost solution (i.e. shellfish reef restoration) to promote colonisation of shellfish and other associated marine fauna, and hence enhancing biodiversity along the artificial

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<sup>3</sup> 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>

shoreline of the 3RS reclamation area. 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 (see Photos E & F at **Annex**). Ecological monitoring will be conducted during the pilot study period to assess the effectiveness of the shellfish reefs.

(c) Artificial reef (“AR”) deployment pilot test

With the authorisation under the Foreshore and Sea-bed (Reclamations) Ordinance (Cap. 127), the AR deployment works have commenced at the marine exclusion zone to the west of the Airport Island in June 2021 (see Photos G & H at **Annex**). Post-deployment monitoring will be conducted as part of the pilot test to assess the ecological value of the deployed ARs in North Lantau waters. Once the ARs are established, the second round fish release exercise<sup>4</sup> in the vicinity of the deployed ARs will be conducted and the associated post-release monitoring would follow.

12. As recommended in the approved 3RS EIA Report, a new marine park (i.e. the proposed North Lantau Marine Park (“NLMP”)) comprising an area of approximately 2,400 ha will be designated in North Lantau waters before the operation of the 3RS Project in 2024. AAHK has consulted various stakeholders in the past few years and obtained the in-principle support of the Country and Marine Parks Board in October 2020 on the designation proposal. The Agriculture, Fisheries and Conservation Department (“AFCD”) is seeking to take forward the statutory procedures in accordance with the Marine Parks Ordinance (Cap. 476) for the designation of the proposed NLMP to dovetail with the commissioning of the 3RS Project.

13. Besides, in consultation with stakeholders, a multi-pronged management plan and a set of SMART<sup>5</sup> goals have been developed to support the effective management of the proposed NLMP. AAHK will continue to work with AFCD on the designation of the NLMP. To facilitate liaison on the future management of the NLMP, a liaison group involving AAHK and AFCD has been established.

## **GREEN BUILDING DESIGN AND SUSTAINABLE CONSTRUCTION**

14. 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 Terminal 2 Expansion has considered various green design initiatives in different stages. During the scheme design stage, benchmarking studies have been carried out to review the existing green design practices at HKIA and overseas airports, with thorough evaluation of possible sustainable design initiatives. These initiatives were then further studied during the detailed design stage of the 3RS Project with an aim to identifying suitable measures for

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<sup>4</sup> The first round fish release exercise with over 8,000 black seabream, yellowfin seabream and green grouper fingerlings was conducted in Q2/Q3 2019.

<sup>5</sup> SMART refers to the five principles of specific, measurable, achievable, results-focused and time-bound.

implementation during both the construction and operation phases of the Project. With all these efforts, the Terminal 2 Expansion Works of the 3RS Project has achieved Provision Platinum rating under BEAM Plus<sup>6</sup>, which is the highest rating under the green buildings assessment scheme. Meanwhile, the Third Runway and associated works also obtained an “Excellent” rating under the Interim Client and Design Award of the Civil Engineering Environmental Quality Assessment and Award Scheme (CEEQUAL)<sup>7</sup>.

15. Two construction components of the 3RS Project were also recognised in the Sustainable Construction Awards organised by the Construction Industry Council in 2018 and 2020. These include a Merit Award in 2018 for the 3RS Aviation Fuel Pipeline Diversion Works, which involve the construction of two new 5.2km long aviation fuel pipelines connecting the Aviation Fuel Receiving Facility at Sha Chau with HKIA. This was the world’s longest pipeline installation using the environmentally-friendly horizontal directional drilling method through bedrock below the seabed, avoiding any construction impact to the marine environment.

16. The second award is a Silver Award granted in 2020 for the DCM Works for the site formation of the 3RS reclamation. The 3RS Project involves forming 650 ha of land at north of the existing airport island, of which 40% is located on contaminated mud pits (“CMPs”). Within the CMPs, AAHK introduced the use of DCM as an environmentally preferred solution for ground improvement. The DCM method has also been applied outside the CMP areas and proven to be a reliable and sustainable construction technique. DCM has now been established as a new non-dredged ground improvement method for reclamation works in Hong Kong.

## **STAKEHOLDER ENGAGEMENT**

17. To enhance transparency and communication with the community in a proactive way, AAHK continues to engage its 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. The next round of PLG and CLGs briefings is being planned for the second half of the 2021, subject to the pandemic situation.

18. 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

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<sup>6</sup> BEAM Plus, being recognised 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.

<sup>7</sup> CEEQUAL is an international evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and public realm projects.

group meetings, as well as information on the status and operation of the MEEF and FEF. Flyers introducing 3RS environmental initiatives 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**

19. 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.

20. Members are invited to note the above and advise.

**Airport Authority Hong Kong**  
**July 2021**

**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 on the installed eco-seawall blocks at two vertical seawall sections

**Shellfish reef deployment pilot study**



Photo E



Photo F

**Photos E & F:** Bags of oyster shells and the deployment by divers along a section of newly completed seawall



**Artificial reef (“AR”) deployment pilot test**



Photo G



Photo H

**Photos G & H:** AR deployment in progress