



33/F, Revenue Tower, 5 Gloucester Road, Wan Chai, Hong Kong
香港灣仔告士打道5號稅務大樓33樓

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Study on the Artificial Islands in the Central Waters

PURPOSE

This paper briefs Members on the artificial islands in the Central Waters including the statutory environmental impact assessment (EIA) under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO).

BACKGROUND

2. The Chief Executive (CE) announced the Lantau Tomorrow Vision (the Vision) in the 2018 Policy Address to meet the long-term development needs of Hong Kong. One of the key initiatives of the Vision is to undertake studies on reclamation for the formation of artificial islands in the Central Waters. Preliminarily, the artificial islands will be supported by a comprehensive network of strategic roads and rails that connects the Hong Kong Island (HKI), Lantau and the coastal areas of Tuen Mun, benefiting not only the artificial islands but also the Northwest New Territories as well as the territory.

3. In June 2021, the Civil Engineering and Development Department and the Planning Department jointly commenced a consultancy agreement “Artificial Islands in the Central Waters – Investigation” (the Study) by engaging Ove Arup & Partners Hong Kong Ltd as the Consultants. The Study is expected to be completed within 42 months.

STUDY SCOPE

4. A location plan for the Study is at **Annex A**. The scope of the Study covers:

- (a) Planning and Engineering Study (P&E Study) for the Kau Yi Chau Artificial Islands (KYC Artificial Islands) – to determine the extent and numbers of KYC Artificial Islands of about 1,000 hectares to be reclaimed and to prepare a Recommended Outline Development Plan (RODP) supported by financial and technical assessments (including statutory EIA) and proposed financial arrangement;
- (b) Transport Infrastructure Study – to identify priority road and railway links (PRRLs) to connect the KYC Artificial Islands with HKI, Northeast Lantau and the coastal areas of Tuen Mun, and to undertake engineering and investigation studies on some of the proposals¹; and
- (c) Collection of information on waters within and in vicinity of the possible artificial islands near Hei Ling Chau and Cheung Chau South on ecology, environment and geological condition for future reference in the longer term planning.

VISION AND GUIDING PRINCIPLES

5. With Hong Kong’s strategic position as one of the core cities in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) under the National 14th Five-Year Plan and the Outline Development Plan for the GBA and Lantau’s role as the “Double Gateway” to connect Hong Kong to the world and other cities in GBA, the KYC Artificial Islands will become part of the expanded Harbour Metropolis for supporting Hong Kong’s status of an international financial centre as initiated in CE’s 2021 Policy Address. According to the final recommendations of Hong Kong 2030+, the KYC Artificial Islands would not only be one of the solution spaces for meeting the long-term territorial land shortfall of 2,600 to 3,000 hectares by 2048, but also provide decanting space to enable stepped-up redevelopment for retrofitting the dense urban core.

6. The vision of the Study is to plan the KYC Artificial Islands to become a tomorrow metropolis which is metropolitan, liveable and future-ready.

- (a) **Metropolitan** – the KYC Artificial Islands will become an extension of the prosperous metropolitan area for raising Hong Kong’s international competitiveness and regional significance and contributing to the long-term economic growth.

¹ Including (i) an engineering study on the feasibility of the priority road link between HKI and Northeast Lantau via KYC Artificial Islands (HKI-NEL Link) and the priority rail link between HKI and the coastal areas of Tuen Mun via KYC Artificial Islands; and (ii) an investigation study on the priority road link between HKI and KYC Artificial Islands.

*By adopting a capacity-creating planning approach, it is targeted to develop the KYC Artificial Islands into a **versatile community** and an **economic engine**. The former will offer different housing options for the society, while the latter will include an attractive new Core Business District (CBD) and other economic uses providing a variety of jobs. Through quality urban and landscape designs and place-making, the KYC Artificial Islands are expected to have a **unique spatial character and experience**.*

- (b) **Liveable** – accessible communities will be created on the KYC Artificial Islands for meeting existing and future needs and aspirations with due consideration to environmental quality for achieving overall sustainability.

*The targets are to plan **supportive and inclusive communities** with **sybiotic urban-natural habitat** (comprising biodiversity, urban forestry, blue-green infrastructure, etc.) and **intelligent connectivity and seamless mobility** (including road and rail network, infrastructure-ready development, smart mobility, etc.).*

- (c) **Future-ready** – the KYC Artificial Islands will become an exemplar of urban innovations to pioneer the realisation of a 21st century smart, green and resilient city and embrace global and regional changes.

*Emphases will be put on **smart champion** (by using smart and information and communications technology infrastructure), **carbon neutral exemplar** (to showcase carbon neutrality, energy efficiency and resource optimisation), and **resilient pioneer** (with resilient design and management, emergency preparedness, flexibility and future-proofing).*

PLANNING AND URBAN DESIGN CONCEPTS

7. Subject to the detailed study on the reclamation extent, the KYC Artificial Islands will have a total reclaimed area of about 1,000 hectares. Based on a public-to-private housing ratio of 70:30, several options with housing units ranging between 150,000 and 260,000 will be explored and investigated for accommodating a population of 400,000 to 700,000. Besides, the KYC Artificial Islands will support the development of the third CBD (CBD3) with some 200,000 diversified employment opportunities complementing CBD1 in Central and CBD2 in Kowloon East.

8. As a group of brand-new islands with sizeable land, the KYC Artificial Islands will face less planning constraints as compared to the existing built-up areas and the new development areas. They will have huge potentials for adopting an array of the following visionary planning and urban design concepts for not only meeting existing people's needs, but also society's future aspirations:

- (a) **Enhanced home space** – to fulfill the aspiration for a more spacious living environment, the planning of the housing land on the KYC Artificial Islands will make reference to the assumptions of the updated land requirement and supply assessment of Hong Kong 2030+ with average flat sizes 10% and 20% larger than the assumptions of 50m² (public housing) / 75m² (private housing) (in gross floor area) adopted in the previous assessment undertaken in 2016;
- (b) **Enhanced government, institution and community (GIC) and open space provisions** – to help achieve the growing aspirations for a more age-friendly, family-friendly and liveable city, an enhanced land per person ratio of 3.5m² each for GIC facilities and open space as suggested in the final recommendations of Hong Kong 2030+ would be assumed in the planning of the KYC Artificial Islands;
- (c) **15-minute neighbourhood** – the planning of residential communities on the KYC Artificial Islands will adopt the concept of 15-minute neighbourhood. Based on a 500m catchment around a node (which may be a railway station, a commercial hub or a community civic centre), each neighbourhood would cover an area of about 80 to 100 hectares with relevant community facilities and open space serving the residents living therein within 15-minute walking or cycling distance from their homes. Besides, the underground space in each neighbourhood will be optimised for allowing more space at the ground level for public use and active mobility;
- (d) **Urban forestry and biodiversity** – in order to enhance the sustainability and the health and well-being of the future residents, a comprehensive blue-green infrastructure network comprising different scale of urban greening (including water channels) ranging from balcony gardens/communal green roofs to regional parks/forested areas will be planned for the KYC Artificial Islands. Together with appropriate use of eco-shorelines, different habitats will be created for enhancing biodiversity; and
- (e) **Smart, green and resilient (SGR) and carbon neutrality** – a comprehensive SGR framework will be formulated for the KYC Artificial Islands. Apart from using smart, information and

communications technology infrastructure, climate-responsive planning and urban design will be adopted to help determine the land uses, layout, building heights and orientations, etc. of the future developments taking into account the prevailing annual and summer wind directions. Besides, under the target to achieve carbon neutrality before 2050 announced in CE's 2020 Policy Address and the decarbonisation strategies and actions suggested in the Hong Kong's Climate Action Plan 2050, a wider use of renewable energy, energy efficient design and technologies, more advanced recycling and waste management measures, etc. will be explored for the KYC Artificial Islands.

9. In order to ensure that the above planning and urban design concepts for KYC Artificial Islands will be thoroughly considered in the Study and further taken forward at the design and implementation stages, a set of measurable key performance indicators will be formulated under the P&E Study to guide the preparation of the Preliminary Outline Development Plan (PODP) and RODP.

ENGINEERING AND INFRASTRUCTURES

10. The exact number, extent and configuration of the KYC Artificial Islands will need to take into account a number of factors. The major ones include hydrodynamic regime, water depth, major fairways, and the restrictions specified under the Deed of Restrictive Covenant signed between the Government and Hong Kong International Theme Parks Limited in 2000². In order to address all these constraints, technical assessments will be conducted under the Study to demonstrate the suitability, technical feasibility and environmental acceptability of the proposed KYC Artificial Islands.

Fill Materials

11. An appraisal of the fill materials supply situation in Hong Kong, Mainland and overseas countries will be undertaken with a view to safeguarding a steady supply for the reclamation. The land formation levels of the future KYC Artificial Islands will be carefully examined to minimise the fill demand and expedite the construction programme, in particular for proposed developments involving construction of underground structures.

² The Deed is intended to protect the Hong Kong Disneyland Resort against visual intrusion, i.e. people outside the Resort not be able to see in, and those inside not be able to see the "real world" outside, so as to maintain the aura of fantasy. Two restrictions relevant to the planning of KYC Artificial Islands include (i) a visual buffer zone to the immediate south of the Resort and its reserved Phase 2 site, and (ii) building height restrictions to further south covering part of potential reclamation area in the Central Waters.

Drainage

12. A climate resilient stormwater drainage system will be planned and designed to serve the KYC Artificial Islands from its first population intake to full development. The major drainage proposals will holistically consider site formation levels, land use proposals, flood protection and potential climate change impacts. Their design may include a combination of the conventional drainage systems (such as channels and storm drains) as well as sponge city and blue-green infrastructures (such as sustainable drainage system, permeable paving, river corridor, retention/detention lakes, green roofs, rainwater harvesting, etc.).

Sewage Treatment, Water Supply, Power Supply and Waste Management

13. The KYC Artificial Islands are expected to generate a large demand for sewage treatment, water supply, power supply and waste management. The need for providing new infrastructures or utilising/upgrading existing facilities will be carefully examined in consultation with relevant departments and parties. Amongst which, particular attention will be given to some potential design strategies including the production of treated effluent for non-potable uses (e.g. for district cooling and irrigation purposes), the provision of reliable multiple sources of potable and non-potable water supply (e.g. using desalination plant to meet the water demand), and the introduction of energy-efficient and waste-to-energy facilities (e.g. district cooling systems, central processing waste facilities and organic resources recovery centre).

Transport

14. As explained in paragraph 4(b) above, the KYC Artificial Islands will be supported by PRRLs linking up HKI, Northeast Lantau and the coastal areas of Tuen Mun. The PRRLs will also help to relieve the existing traffic pressure of the Northwest New Territories, and enhance the resilience of the transport network in Hong Kong. In order to evaluate the traffic impact on existing transport network and optimise the planning of the strategic transport network, the Study will conduct an area-wide transport study covering the PRRLs as well as the possible road and rail links in the longer term.

15. The HKI-NEL Link, connecting HKI and Northeast Lantau via KYC Artificial Islands, is targeted to be completed before the first population intake of the KYC Artificial Islands in 2033/2034. Subject to the detailed assessments, the road link will be connected to the existing Penny's Bay Highway and the Route 11 and Tsing Yi- Lantau Link under planning. The connection at the south will be located at the Western District of HKI.

16. The rail network includes a priority rail link between HKI and the coastal areas of Tuen Mun via KYC Artificial Islands with possible interchange with existing Island Line and Tung Chung Line, and future connection with Tuen Ma Line. A recommended rail scheme for the priority rail link, with details including the number of stations, alignment, number and location of rail depot(s), and interchange arrangements will be developed in the Study. The future rail operator will proceed with the design and statutory EIA of the priority rail link under separate studies.

17. Smart mobility will be an important cornerstone of the KYC Artificial Islands. The primary aim is to embrace mobility innovation to support people-first outcomes with railway as the backbone. Capitalised on fast technological advancements, the KYC Artificial Islands are ideal places for extensive adoption of new technologies. Hence, the transport plan needs to be forward-looking with built-in flexibility allowing for future transition as technologies mature. Tentatively, the Study will recommend relevant designs for the integrated transport hub, major roads to be placed underground, integrated basement for underground facilities, car-free/car-lite and pedestrian priority zones, and cyclist friendly cycle track network.

Environmental Impact Assessment

18. In view of its large scale, the statutory EIA for the whole project will be divided into three EIA studies according to their distinctive natures as listed below so as to facilitate more focused discussions individually on the associated environmental impacts, mitigation measures, etc.:

- (a) the reclamation for KYC Artificial Islands under Schedule 2 of the EIAO focuses on the potential environmental impacts and corresponding mitigation measures in relation to the reclamation works for the formation of the KYC Artificial Islands, including but not limited to those on marine ecology, fisheries, water quality, etc.;
- (b) the road link between HKI and Northeast Lantau under Schedule 2 of the EIAO focuses on the potential environmental impacts and corresponding mitigation measures in relation to the construction and operation of the road link concerned, including but not limited to air quality and noise impact on the existing sensitive receivers on HKI; and
- (c) KYC Artificial Islands development under Schedule 3 of the EIAO focuses on the potential environmental impacts and corresponding mitigation measures in relation to the development upon the reclaimed KYC Artificial Islands, including but not limited to those on planned sensitive receivers on KYC Artificial Islands as well as existing sensitive receivers near KYC during construction and operation stage.

19. It is targeted to submit the project profiles of all the three designated projects for application of the EIA study briefs in November 2021. The EIA studies will be carried out with due consideration of the cumulative environmental impacts arising from the proposed works. Key environmental issues including, but not limited to, air quality, water quality, ecology, fisheries, cultural heritage, noise, waste management, landscape and visual impact will be assessed. During the planning process, alternatives will also be proactively considered to avoid and minimise possible environmental impacts, and mitigation measures will be proposed to reduce the impacts to an acceptable level. In order to effectively assess the environmental impacts of various proposals and plans during the planning of the KYC Artificial Islands, we have commenced the associated baseline surveys (including ecological and fisheries) so as to ensure compliance with the standards and technical requirements stipulated in the EIAO through iterative review and adjustments.

FINANCIAL ASSESSMENT AND ARRANGEMENT

20. Given the significant scale of funding requirements for the project, there is a need to carefully consider and work out the project financial arrangement and implementation strategy with a view to reducing the burden on public finances and assuring financial sustainability. The Study will update the estimates of construction cost, land sale revenue and economic benefits; carry out preliminary cash flow analysis; and recommend the financial arrangement and implementation strategy for the development and infrastructures on KYC Artificial Islands. Besides, financial arrangement including evaluations of various financing options (such as build-operate-transfer, rail plus property development model, selling of development rights, pre-sale of land parcels and issuance of bonds) will be explored. The need or otherwise for implementing the project through a special purpose vehicle will also be examined.

PUBLIC ENGAGEMENT

21. We will continuously engage stakeholders throughout the study process. Tentatively, a public engagement exercise including design competitions on the proposals under the PODP will be held next year to consult the public on the PODP with a view to fostering public support and soliciting views for developing the draft RODP.

22. As part of the continuous engagement, we will adopt a proactive approach to engage green groups on the progress and latest findings throughout the EIA study process. We welcome opinions and suggestions from these stakeholders, not only in relation to the EIA studies but also other initiatives for the development of the KYC Artificial Islands.

ADVICE SOUGHT

23. Members are invited to note and offer views on the Study and the proposed EIA as explained in paragraphs 4 to 22 above.

**Civil Engineering and Development Department
Planning Department
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