Civil Engineering and Development Department

Reclamation for Kau Yi Chau Artificial Islands

Project Profile

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1 Basic Information

1.1 Project Title

1.1.1 Reclamation for Kau Yi Chau Artificial Islands (hereinafter named as the Project).

1.2 Purpose and Nature of the Project

1.2.1 The study of "Enhancing Land Supply Strategy: Reclamation Outside Victoria Harbour and Rock Cavern Development" (ELSS), commenced in 2011, assessed the feasibility of enhancing land supply through two land supply options: reclamation outside Victoria Harbour and rock cavern development. It was identified that, apart from five near-shore reclamation sites, the Central Waters have good potential for artificial island development, and sizeable reclaimed land could be supplied for comprehensive land use planning. Taking on board the findings of the ELSS, the 2014 Policy Address announced the initiative to explore ways to further develop the eastern waters off Lantau Island and neighbouring areas, with a view to developing an East Lantau Metropolis (ELM) for accommodating new population and a core business district (CBD) in addition to Central and Kowloon East for promoting economic development and providing job opportunities in Hong Kong.

1.2.2 The public engagement booklet “Hong Kong 2030+ Towards a Planning Vision and Strategy Transcending 2030”, promulgated in October 2016, has proposed a conceptual spatial framework to optimise the locational advantage for different sectors/economies, including the development of ELM that covers also the Kau Yi Chau (KYC) area, providing about 1,000 ha of land for development as a strategic growth area (SGA) with a capacity of accommodating a population of about 400,000 to 700,000 and the development of a third Core Business District (CBD3) generating a total of 200,000 employment opportunities as a new and smart financial and producer services hub.

1.2.3 The Sustainable Lantau Blueprint, published in 2017, proposed developing ELM as a potential long-term SGA under the principle of balancing between development and conservation and stipulating the future direction of "Development in the North, Conservation for the South" for Lantau.

1.2.4 In the 2018 Policy Address, the Chief Executive announced the “Lantau Tomorrow Vision” (LTV) to provide a sizeable developable land to meet the long-term development needs of Hong Kong. LTV covers various development components around Lantau, and at its centre is to study the phased formation of artificial islands in the Central Waters around KYC and Hei Ling Chau which will be supported by a set of new strategic road and railway networks linking up the artificial islands with the Hong Kong Island, Lantau and the coastal areas of Tuen Mun. The first phase will focus on studying the KYC Artificial Islands (KYCAI), with a total reclaimed area of about 1,000 ha accommodating a population of 400,000 to 700,000. It is estimated that the KYCAI are capable of providing about 150,000 to 260,000 housing units and will also support the development of the CBD3 providing some 200,000 diversified employment opportunities.

1.2.5 In June 2021, the Civil Engineering and Development Department (CEDD) and Planning Department (PlanD) jointly commenced a consultancy agreement

"Artificial Islands in the Central Waters - Investigation" (the CW Study). The Study is expected to be completed within 42 months. The KYCAI is about 1,000 ha in size and will provide housing for 400,000 to 700,000 population, together with about 200,000 employments upon full development. The KYCAI development is targeted for the first population intake in year 2033/34.

1.2.6 Transport infrastructures connecting the KYCAI to other parts of the territory will be provided. These transport infrastructures include a priority road link between Hong Kong Island (HKI) and Northeast Lantau (NEL), via KYCAI and a rail link connecting KYCAI to other parts of Hong Kong which will be further studied. This priority road link is referred to as HKI-NEL Link, which comprises two sections. The first section connects between HKI and KYCAI (HKI-KYC Link), and the second section connects between KYCAI and NEL (KYC-NEL Link).

1.2.7 In view of the large scale and extent of the aforementioned development and infrastructure under the CW Study, three Environmental Impact Assessment (EIA) studies will be carried out according to their distinctive natures to facilitate more focused discussions individually on the associated environmental impacts, mitigations, etc. Therefore, three associated Project Profiles (PPs) have been prepared based on the nature of the works involved:

- Item (A) – Reclamation for Kau Yi Chau Artificial Islands;
- Item (B) – Kau Yi Chau Artificial Islands Development; and
- Item (C) – Hong Kong Island – Northeast Lantau (HKI-NEL) Link.

1.2.8 **Item (A)** focuses on the potential environmental impacts and corresponding mitigation measures in relation to the reclamation works for the formation of the KYCAI, including but not limited to those on marine ecology, fisheries, water quality, etc.; **Item (B)** focuses on the potential environmental impacts and corresponding mitigation measures in relation to the development upon the reclaimed KYCAI, including but not limited to those on planned sensitive receivers on KYCAI as well as existing sensitive receivers near KYC during construction and operation stage; **Item (C)** 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.

1.2.9 The rail link as one of the infrastructures connecting KYCAI to other parts of Hong Kong will require another separate EIA, which will be carried out by the respective project proponent separately.

1.2.10 This PP covers Item (A) “Reclamation for Kau Yi Chau Artificial Islands” (i.e. the Project) and is prepared to provide the Director of Environmental Protection (DEP) with sufficient information in determining the scope of the EIA study together with the technical and procedural requirements that the EIA study for Item (A) shall meet.

1.3 Name of Project Proponent

1.3.1 The Project Proponent is the Sustainable Lantau Office, the Civil Engineering and Development Department (CEDD) of the Government of the Hong Kong Special Administrative Region.

1.4 Location and Scale of Project and History of the Site

1.4.1 As discussed in **Section 1.2**, the Project consists of the reclamation for the KYCAI only (i.e. Item (A)). Other elements of the KYCAI, including Item (B) "Kau Yi Chau Artificial Islands Development" and Item (C) "Hong Kong Island – Northeast Lantau Link", are covered by separate PPs and EIA studies.

1.4.2 The tentative reclamation area of the KYCAI development is about 1,000 hectares. In order to minimize impacts on water quality, ecology and fisheries, non-dredged reclamation method will be adopted. The approximate location of the proposed reclamation and the alignment of the associated construction access of the Project are shown in **Figure 1.1**, which are tentative and indicative only and subject to design developments under the CW Study and the outcomes of the EIA study. Nevertheless, the reclamation will not encroach upon any existing islands, including KYC, Siu KYC, Peng Chau and Sunshine Island. The reclamation will be conducted in phases and hence requires coordinated planning to interface with the planned developments within the KYCAI and the HKI-NEL Link. Since the reclamation may encroach upon some of the existing anchorages, rearrangement of anchorages will be required, which may involve certain dredging operation in Kellett Bank as shown in **Figure 1.1**. The exact location of the rearrangement of anchorages are to be determined during the CW study.

1.4.3 Subject to further investigation, the construction access would have a width of about 7m and would include an at-grade road section next to the existing Fantasy Road and Penny's Bay Quarantine Centre (approximately 2.5km in length); and a sea viaduct section between Penny's Bay and the reclamation area of the KYCAI (approximately 2km in length). The sea viaduct section would require marine bored piles to be constructed. Only construction vehicles would be allowed to use this construction access.

1.4.4 In order to minimise the construction waste to be generated, certain portion of the construction access such as the piles or deck structures could be considered to be retained and transformed after the construction phase to form part of the permanent structure for the HKI-NEL Link. The extent of demolition of the construction access, if not fully retained, would need to be further reviewed during the EIA Study of the Project.

1.4.5 Part of the KYCAI and the associated construction access fall within the boundaries of the NEL OZP No. S/I-NEL/12 and the areas zoned as "Other Specified Uses", which was previously identified as the primary area of Hong Kong's Port Facilities, and the whole KYC, except the hilltop which is occupied by an existing radar station, is zoned as "Conservation Area". According to the Explanatory Statement of the NEL OZP, the "Conservation Area" zone is intended to conserve the existing natural landscape and character of KYC and to protect the area from encroachment by the adjacent development.

1.5 Number and Types of Designated Projects to be Covered by the Project Profile

1.5.1 The Project would consist of various Schedule 2 DPs as listed in **Table 1.1** under the Environmental Impact Assessment Ordinance (EIAO) that may be updated in the course of the EIA study.

Table 1.1 List of designated projects

Item No.	Designated Project	Remarks
Schedule 2 of the EIAO		
C.1	Reclamation works (including associated dredging works) more than 5 ha in size	- Tentative reclamation extent of the Project is approximately 1000ha in size and hence more than 5 ha in size
C.2	Reclamation works (including associated dredging works) more than 1 ha in size and a boundary of which--- (a) is less than 500 m from the nearest boundary of an existing or planned--- (i) site of special scientific interest; (ii) site of cultural heritage; (iii) bathing beach; (iv) marine park or marine reserve; (v) fish culture zone; (vi) wild animal protection area; (vii) coastal protection area; (viii) conservation area; (ix) country park; or (x) special area; (b) is less than 100 m from a seawater intake point; or (c) is less than 100 m from an existing residential area.	- Tentative reclamation extent of the Project is approximately 1000ha in size and hence more than 1 ha in size - The reclamation would be less than 500m from the coastal protection area at Peng Chau, conservation area at KYC, etc.
C.3	Reclamation works (a) resulting in 5% decrease in cross sectional area calculated on the basis of 0.0 mPD in a sea channel or (b) occupying an area on plan in excess of 10% of any enclosed or semi-enclosed waterbody	- Tentative reclamation extent of 1000 ha in size would result in more than 5% decrease in cross sectional area across the Adamasta Channel
C.12	Possible dredging operation exceeding 500,000m^3 or a dredging operation which (a) is less than 500m from the nearest boundary of an existing or planned--- (i) site of special scientific interest; (ii) site of cultural heritage; (iii) bathing beach; (iv) marine park or marine reserve; (v) fish culture zone; (vi) wild animal protection area; (vii) coastal protection area; or (viii) conservation area; or (b) is less than 100m from a seawater intake point.	- The rearrangement of anchorages as discussed in **Section 1.4** would need dredging operation of more than 500,000m^3.

Note:
1. The Schedule 2 and Schedule 3 DPs under Item (B) and Item (C) are to be covered in separate PPs as discussed in **Section 1.2**. They will be submitted to Director of Environmental Protection to apply for the respective EIA Study Briefs.

1.6 Name and Telephone Number of Contact Person

1.6.1 All enquiries regarding the Project can be addressed to:

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Sustainable Lantau Office
Civil Engineering and Development Department
13/F, North Point Government Offices,
333 Java Road
North Point, Hong Kong
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2 Outline of Planning and Implementation Programme

2.1 Project Implementation

2.1.1 The Project Proponent, subject to the final recommendation of the CW Study, will be responsible for implementing the proposed reclamation works and associated construction access, together with all the environmental mitigation measures, the environmental monitoring and audit requirements as specified in the EIA Report of the Project.

2.1.2 The Consultants of the CW Study are responsible for undertaking the EIA study according to the Study Brief to be issued by DEP and responding on behalf of the Project Proponent to issues related to the EIA.

2.1.3 The construction works of the proposed reclamation for the KYCAI and the associated construction access will be carried out in phases by contractors to be appointed under various works contracts.

2.2 Project Timetable

2.2.1 Subject to the necessary statutory procedures, the reclamation works and the associated construction access of the Project are planned to commence tentatively in year 2026/2027. The first phase of reclamation will tentatively be completed in year 2029/2030 with first population intake targeted for year 2033/2034. It is anticipated that the reclamation works will be carried out in phases and will continue beyond the first population intake.

2.2.2 The implementation programme of the development of the KYCAI (i.e. Item (B)) and HKI-NEL Link (i.e. Item (C)) will be included in separate PPs.

2.3 Interactions with Other Projects

2.3.1 Potential projects that would have interface with the Project have been identified and are listed below. Some of these projects are under planning or the implementation of which has yet to be approved. This list should be revisited during the subject EIA study to ensure all the latest projects available from the respective stakeholders are incorporated.

(1) Kau Yi Chau Artificial Islands Development (see Item (B) in **Section 1.2**)

(2) Hong Kong Island – Northeast Lantau Link (see Item (C) in **Section 1.2**)

(3) Route 11 (Section between Yuen Long and North Lantau)

(4) Sunny Bay Reclamation

(5) Road P1 (Tai Ho – Sunny Bay Section)

(6) Dredging, Management and Capping of Contaminated Sediment Disposal Facility at the west of Lamma Island

(7) Hong Kong Disneyland Expansion

(8) Tsing Yi – Lantau Link

(9) Tung Chung New Town Extension (East) – Design and Construction

(10) New Contaminated Sediment Disposal Facility to the West of Lamma Island

3 Possible Impacts On The Environment

3.1 General

3.1.1 All the prevailing legislative requirements would be considered in the EIA to assess the possible environmental impacts.

3.1.2 This EIA would only assess the environmental impacts on the existing environmental sensitive receivers during different construction phases of the reclamation works and the construction access. As the reclaimed land would have minimal impacts on the planned environmental sensitive receivers on KYCAI at the post-construction stage, the key environmental concerns in the Project will relate to the construction works only. Nevertheless, the environmental impacts caused by the reclamation and construction of construction access, together with those caused by the construction of the KYCAI Development and the HKI-NEL Link, on future landuses and planned environmental sensitive receivers on KYCAI would be addressed in another two subsequent EIAs for KYCAI Development (i.e. Item (B)) and HKI – NEL Link (i.e. Item (C)).

3.2 Air Quality

Construction Impacts

Marine-based Works

3.2.1 The dust generation from marine activities (such as dredging and filling, marine piling, etc.) for reclamation, and rearrangement of anchorages would not be significant.

3.2.2 The construction of the marine section of the construction access would require marine piling and installation of decks would generate relatively less construction dust. However, the marine traffic would generate some emissions. Demolition, if required, of the sea viaduct section of the construction access may also generate some construction dust.

3.2.3 The rearrangement of anchorages and construction of the piers and abutments for the construction access may involve dredging operation. The sediment dredged for the rearrangement of anchorages and construction of the piers and abutments for the construction access will be loaded onto barges and be transported away or if contaminated, treated on vessels or at temporary locations within or in the vicinity of the reclaimed land of KYCAI as soon as practicable, and hence there would not be any adverse odour impacts for the rearrangement of anchorages and construction of the piers and abutments for the construction access. However, some emission would be generated due to the marine traffic.

3.2.4 The rearrangement of some anchorages may cause changes in air quality in the vicinity. Thus, the impact from the rearranged anchorages to the nearby Air Sensitive Receivers (ASRs) would be investigated.

Land-based Works

3.2.5 While marine works would not generate excessive dust, construction activities associated with reclamation above sea level would inevitably generate construction dust. These construction activities include excavation works, backfilling, wind

erosion of exposed areas, temporary storage of spoil on site, transportation, handling of spoil and concrete batching etc., as well as emissions from constructional plants and land-based traffic etc.

3.2.6 Construction dust would also be generated during the construction of the at-grade section of the construction access due to excavation, backfilling, wind erosion of exposed areas, land-based traffic etc. Demolition, if required, of the at-grade section of the construction access may also generate some construction dust.

Post-Construction Impacts

3.2.7 After completion of all the reclamation works, the reclaimed land would have minimal impact on the sensitive receivers.

3.3 Noise

Construction Impacts

Marine-based Works

3.3.1 During reclamation for the artificial islands, rearrangement of anchorages and construction of the piles and abutments for the construction access, various construction activities such as dredging and filling etc. will generate intermittent and transient noise. The construction of the marine section of the construction access would also require marine bored piling and installation of decks, which would generate relatively less construction noise. Demolition of part of the construction access may also generate some construction noise.

3.3.2 The rearrangement of some anchorages may cause changes in noise environment in the vicinity. Thus, the impact from the rearranged anchorages to the nearby Noise Sensitive Receivers (NSRs) would be investigated.

Land-based Works

3.3.3 When the reclamation works reach above sea level, land-based construction activities include excavation works, backfilling, and concrete batching etc., would also generate construction noise.

3.3.4 The construction of the at-grade section of the construction access would also require excavation, backfilling, etc. Demolition of part of the construction access may also generate some construction noise.

Post-Construction Impacts

3.3.5 After completion of all the reclamation works, the reclaimed land would not cause any noise impacts on the existing and planned NSRs.

3.4 Water Quality

Construction Impacts

Marine-based Works

3.4.1 Non-dredged method would be adopted for the reclamation of the artificial islands. Laying of sand blanket, seawall construction and underwater filling with sufficient length of leading seawall are the major marine-based works for reclamation.

Construction of the piles and abutments for the construction access would also involve marine works. Besides, the rearrangement of anchorages in the vicinity of Kellett Bank may require dredging of the seabed to provide sufficient water depth for vessels. All these would cause certain water quality impacts. Depending on the construction methodology, demolition of the sea viaduct section of the construction access would also cause certain water quality impacts.

3.4.2 Release and suspension of sediments and backfilling materials may occur during these marine works. The supply of filling materials for the reclamation is currently under investigation and can possibly be provided from areas outside Hong Kong. During these marine works, contaminants and nutrients bound inside the sediments may be released into the nearby water bodies. To control the potential water quality impacts on the nearby Water Sensitive Receivers (WSRs), provision of adequate mitigation measures, such as the adoption of non-dredged reclamation methods for the reclaimed land, optimisation of construction phasing, etc., and environmental monitoring programme, would be considered and implemented as far as practicable. Sewage arising from on-site construction workforce as well as accidental spillage may also cause water pollution if directly discharged into adjacent water bodies without suitable mitigation measures.

Land-based Works

3.4.3 For land-based works that may be required for the construction access, the construction site runoff as well as other wastewater generated by the construction activities may cause blockage of drainage channels and increase the suspended solid levels. Sewage arising from on-site construction workforce as well as accidental spillage may also cause water pollution if directly discharged into adjacent water bodies without suitable mitigation measures.

3.4.4 The aforementioned impacts arising from the construction of the Project will be assessed and studied in the EIA study and appropriate mitigation measures will be recommended.

Post-Construction Impacts

3.4.5 After the completion of the reclamation, the water flow pattern in the vicinity of the reclaimed land, piles for sea viaduct and the rearranged anchorages area would be permanently altered. It is anticipated that some areas would experience hydrodynamic and water quality impacts.

3.4.6 The aforementioned impacts arising from the Project will be assessed and studied in the EIA study and appropriate mitigation measures will be recommended.

3.5 Waste Management

Construction Impacts

Marine-based Works

3.5.1 With the adoption of non-dredged reclamation method, no marine sediments would be dredged arising from marine operation. Nevertheless, marine sediments would inevitably be dredged for piles for sea viaduct section of the construction access and the rearrangement of anchorages. As the area near KYC was previously used as a spoil ground, due consideration shall be given to ascertain the contaminated level of the marine sediment.

General Construction Works

3.5.2 Construction and demolition (C&D) materials will be generated from the construction activities for reclamation activities and construction access as well as the demolition of the construction access.

3.5.3 Chemical waste generated during construction without careful and proper handling may pose environmental, health and safety hazards.

3.5.4 The construction workforce will generate general refuse comprising food scraps, waste paper, empty containers etc. The general refuse may give arise to adverse environmental impacts e.g. odour generation, windblown litter, vermin, if the waste storage areas are not properly maintained and regularly cleared.

Post-Construction Impacts

3.5.5 The reclaimed land would not cause any waste management implication during the post-construction stage.

3.6 Land Contamination

Marine-based Works

3.6.1 The location of the proposed reclaimed land, piles for sea viaduct section of construction access and the rearrangement of anchorages are currently open sea, and hence there is no land contamination potential.

Land-based Works

3.6.2 For land-based section of construction access, a site appraisal would be conducted to justify whether there would be any land contamination concern within the construction works.

3.7 Ecology

3.7.1 The proposed reclamation would not encroach into any existing islands and thus direct impacts to the terrestrial ecological resources at the outlying islands, including KYC, Siu KYC, Peng Chau, Sunshine Island and Hei Ling Chau, are not anticipated. However, indirect impact to the terrestrial ecological resources would be anticipated.

3.7.2 Depending on the alignment of the associated construction access that connects to NEL, potential direct impacts to the natural habitats may arise.

3.7.3 The potential terrestrial and marine ecological impacts in the vicinity of the proposed reclamation and construction access will be associated with:

Construction Impacts

- Temporary habitat loss, habitat degradation and habitat fragmentation induced during the construction phase;
- Disturbance to nearby habitats and associated wildlife due to possible air pollution, water pollution, noise and glare, reclamation activities/related vessel

traffic, especially the ecological sensitive receivers (e.g. intertidal, subtidal and benthic habitats and Sunshine Island Site of Special Scientific Interest);

- Impact to flora and fauna species of conservation importance, e.g. coral communities including seapen, horseshoe crabs, marine mammals, Bogadek's Burrowing Lizard and White-bellied Sea Eagle;
- Increased sediment load; and
- Toxic pollutants from construction.

Post-Construction Impacts

- Permanent habitat loss and habitat fragmentation, gradually accumulated since the commencement of reclamation; and
- Potential impacts arising from change of water flow hydrodynamic regime, water quality, erosion and sedimentation patterns due to reclamation and the consequential impacts to ecological sensitive receivers.

3.8 Fisheries

Construction Impacts

3.8.1 Reclamation works, dredging of seabed for rearrangement of anchorages and the piles for construction access may lead to potential temporary and permanent loss and/ or disturbance of fishing ground, important spawning grounds and nursery areas of commercial fisheries resources and nearby fish culture zone(s). The reclamation works and other marine construction activities may also cause impacts to water quality and hence fisheries due to potential increase in suspended solids concentration and deterioration of water quality. In the vicinity of the Project site, the increase in marine traffic of working vessels during construction may affect the fishes in nearby waters as well as the fishing operations. There may also be potential risk of accidental chemical spillage to the surrounding water during marine construction, which may affect fisheries resources and aquaculture sites near the Project site. Potential impact on fisheries due to the Project and the related changes in water quality or hydrodynamics regime near the proposed Project site will be assessed in the EIA study.

Post-Construction Impacts

3.8.2 During post-construction stage, the proposed reclamation and the piles for the construction access would lead to a direct loss of fishing grounds which may affect fisheries resources/ production and fishing operations within and adjacent to the proposed reclamation area. Also, there may be disturbance to fisheries resources and fishing operations arising from possible water pollution from the KYCAI development.

3.8.3 The proposed reclamation may also change the local hydrodynamic regime and affect fisheries resources, important spawning grounds or nursery areas and aquaculture sites. Potential impact on fisheries will be assessed in the EIA study.

3.9 Landscape and Visual

3.9.1 The key visual elements/ setting is characterized by the ridgelines of Tuen Mun to the north, the urban landscape at Kennedy Town at the east, the open seascape at the south and the natural hillside woodland of Lantau Island at the west. The detail of visual envelope and visual receptors will be identified and further elaborated during the EIA study.

3.9.2 The expected sources of landscape and visual impacts arising from the Project would include, but not limited to, the following:

Construction Impacts

- Loss of existing landscape elements, e.g. coastal water and natural coastline and the plantation along Fantasy Road and Magic Road in Disneyland;
- Land reclamation works and associated construction access will lead to an irreversible change to the existing Landscape Character Areas, e.g. Strait Landscape and Inshore Water Landscape and the Theme Park Landscape);
- Loss of visual amenity due to the irreversible change of the existing seascape setting, removal of existing landscape elements and the associated construction access in Disneyland;
- Visual appearance of any temporary uses to support the construction works;
- Construction activities on the existing available land and the land to be reclaimed;
- Obstruction of or intrusion into views by the new reclaimed land and the associated construction access; and
- Land reclamation works and associated activities at the sea.

Post-Construction Impacts

- Visual quality, intrusion and obstruction created by the reclaimed land and the associated construction access;
- Landscape impact arising from the reclaimed land and the associated construction access;
- Permanent loss of landscape and visual amenity of the sea and natural environment due to the reclaimed land and associated construction access; and
- Narrowing the sea in the central waters due to reclamation.

3.10 Cultural Heritage

Terrestrial Archaeology & Built Heritage

Marine-based Works

3.10.1 The reclamation would be located at open sea and hence would not have any impacts on terrestrial archaeology, monuments and built heritage.

Land-based Works

3.10.2 The construction access would need to avoid Pa Tau Kwu Site of Archaeological Interest (SAI) and Pa Tau Kwu Pak Wan SAI. Indirect impacts such as visual and vibration intrusion on the setting and amenity of archaeological resources would be studied during the EIA study.

3.10.3 Impacts on terrestrial archaeology, monuments, built heritage, SAIs during post-construction stage is not expected.

Marine Archaeology

3.10.4 There is an identified shipwreck at the eastern coast of KYC. A marine archaeological investigation (MAI) will be conducted to identify the archaeological potential of the affected seabed and to ascertain the archaeological value on the areas. Subject to the findings of the MAI, the works affecting this shipwreck would need to be avoided.

3.10.5 Marine archaeology impact during post-construction stage is not expected.

3.11 Potential Hazard

3.11.1 The reclamation and construction access would not run close to neither Potential Hazardous Installations (PHI) nor dangerous goods (DG) store.

4 Major Elements of the Surrounding Environment

4.1 General

4.1.1 The major existing and planned sensitive receivers and sensitive parts of the natural environment relating to respective environmental aspects that may be affected by the Project are shown below. The existing and planned sensitive receivers would be further studied and updated during the EIA study.

Air Sensitive Receivers

- Existing and planned developments at Peng Chau, Hei Ling Chau, NEL, Hong Kong Disneyland Resort, Penny's Bay
- Existing and planned developments at the areas near to the rearranged anchorages

Noise Sensitive Receivers

- Existing and planned developments Peng Chau and Hei Ling Chau
- Existing and planned developments at the areas near to the rearranged anchorages

Water Sensitive Receivers

- KYC Conservation Area
- Hei Ling Chau Typhoon Shelter
- Gazetted and non-gazetted beaches in Ma Wan, NEL, Cheung Chau, Lamma Island
- Water abstraction for cooling, flushing and other industrial purposes along western HKI and NEL
- Existing and planned Marine Parks (e.g. Sha Chau & Lung Kwu Chau Marine Park, the Brothers Marine Park, North Lantau Marine Park)
- Coral communities in northern Hei Ling Chau, southern Peng Chau, Green Island and other parts of the central waters including KYC and Siu KYC
- Ma Wan, Cheung Sha Wan, Lo Tik Wan and Sok Kwu Wan Fish Culture Zones and the important fisheries spawning ground, and nursery areas of commercial fisheries resources and fishing grounds in the central waters
- Existing coastal protection areas at Peng Chau and Discovery Bay
- Sunshine Island Site of Special Scientific Interest

Waste-related Environment

- Disused spoil ground at the waters near KYC

Ecological Sensitive Receivers

- KYC Conservation Area
- Sunshine Island Site of Special Scientific Interest
- Existing natural shorelines
- Nesting sites of the White-bellied Sea Eagle in the central waters, such as Pa Tau Kwu in Lantau, Sunshine Island and Green Island
- Coral communities in northern Hei Ling Chau, southern Peng Chau, Green Island and other parts of the central waters including KYC and Siu KYC
- Seapen at the seabed in the vicinity of reclamation site
- Horseshoe crab in the eastern of Peng Chau
- Marine mammal in the central waters

Fisheries Sensitive Receivers

- Ma Wan, Cheung Sha Wan, Lo Tik Wan and Sok Kwu Wan Fish Culture Zones and the important fisheries spawning ground, and nursery areas of commercial fisheries resources and fishing grounds in the central waters

Terrestrial Cultural Heritage Elements

- Built heritage and SAI at Peng Chau
- SAI at NEL

Marine Archaeology Elements

- Shipwreck at the water near KYC

Landscape and Visual Sensitive Receivers

- Existing and planned developments at Peng Chau, Hei Ling Chau, NEL, Hong Kong Disneyland Resort, Penny's Bay, Tsing Yi, western HKI, Lamma Island and Cheung Chau
- Existing and planned developments at the areas near to the rearranged anchorages
- KYC Conservation Area
- Sunshine Island Site of Special Scientific Interest
- Existing natural shorelines

5 Environmental Protection Measures to be Incorporated in the Design and Further Environmental Implications

5.1 General

5.1.1 The EIA study will determine the significance of environmental impacts (both cumulative impacts and those arising from the Project) and any avoidance or mitigation measures to ensure that all development and infrastructure proposals recommended by the Project would be environmentally acceptable. Reference would be made to the relevant legislation and other requirements including but not limited to the EIAO, Hong Kong Planning Standards and Guidelines (HKPSG) etc. Environmental monitoring and auditing of potential impacts that may arise from implementation of the works proposed by the Project will be provided for the construction and post-construction stages. Subject to the findings of the EIA study, the following mitigation measures would be incorporated in the design and construction of the Project.

5.2 Air Quality

Construction Impacts

5.2.1 *General Construction Works*

5.2.2 In order to prevent adverse impacts on air quality, the control measures stipulated in the Air Pollution Control (Construction Dust) Regulations should be implemented, wherever applicable, to limit the dust emissions from the site. Subject to investigation, the following mitigation measures, which are not exhaustive, will be considered during construction period to minimize impacts on air quality on nearby ASRs.

- Any vehicles/marine vessels with an open load compartment used for transferring dusty materials off-site will be properly fitted with side and tail boards and cover;
- Stockpiles of sand and aggregate will be enclosed on three sides and water sprays will be used to dampen stored materials and when receiving raw material;
- The site/ construction access will be frequently cleaned and watered to minimise fugitive dust emissions;
- In the process of material handling, any material which has the potential to create dust will be treated with water or sprayed with a wetting agent where practicable;
- Implementation of wheel washing facilities at access roads into and out of construction sites;
- Speed control of vehicles on-site/ construction access;

- Optimize slope cutting for the construction access;
- Sufficient dust suppression measures for batching facilities;
- Control routing of marine vessels;
- Minimize the number of trips of marine vessels; and
- Use clean fuel for marine vessels as far as practicable, etc.

5.2.3 To minimize the exhaust emissions from Non-road Mobile Machinery (NRMM), the following mitigation measures, which are not exhaustive, will be considered during construction period to minimize impacts on air quality on nearby ASRs.

- Connect construction plant and equipment to main electric supply and avoid use of diesel generators and diesel-powered equipment as far as practicable;
- Consider to restrict the use of exempted NRMMs; and
- Deploy electrified NRMMs as far as practicable.

5.2.4 Given that the potential sediment to be dredged would be delivered to barges and covered by tarpaulin or impervious sheets at all times, odour impact would not be anticipated.

5.2.5 Regarding the rearrangement of anchorages, design measures such as arrangement of marine vessels and setback distance would be explored.

Post-Construction Impacts

5.2.6 Given the reclaimed land does not induce significant impact to the sensitive receivers, no mitigation measures are required.

5.3 Noise

Construction Impacts

5.3.1 *General Construction Works*

5.3.2 Subject to EIA findings, the following measures will be considered during construction period to minimize construction noise impacts on nearby NSRs.

- Use of quieter powered mechanical equipment and plant, and/or fitted with muffler/ silencers/ sound reduction devices;
- Provision of temporary noise barriers and enclosures, where practicable;
- Noise screening structures or purpose-built noise barriers will be provided along the site boundary to provide additional protection to NSRs nearby;
- Good site practices will be implemented as effective noise mitigation measures. These will include, but not limited to, locating noisy equipment and activities as far from NSRs as practical, scheduling noisy activities to minimise exposure of nearby NSRs to high levels of construction noise, limiting the use and number of equipment operating close to the NSRs, proper maintenance of

construction plant and devising methods of working to minimise noise impacts on the surrounding environment; and

- Travelling route of the construction vehicles on public roads/ construction access should be planned as far as practicable in a way to minimize the noise impacts to NSRs.
- Regarding the rearrangement of anchorages, design measures such as arrangement of marine vessels and setback distance would be explored.

Post-Construction Impacts

5.3.3 Given the reclaimed land does not induce significant impact to the sensitive receivers, no mitigation measures are required.

5.4 Water Quality

Construction Impacts

5.4.1 In order to prevent adverse impacts on water quality, the following general mitigation measures would be put in place where appropriate.

5.4.2 *General Construction Works*

- Provision of adequate construction site drainage according to the established good practices;
- Open stockpiles of materials on site will be avoided or where unavoidable covered with tarpaulin or similar fabric during rainstorms;
- All runoffs arising from the construction site should be properly collected and treated to ensure the effluent comply with Water Pollution Control Ordinance. Silt trap and oil interceptor will be provided to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before being pumped to the public stormwater drainage system. The silt traps and oil interceptors will be cleaned and maintained regularly;
- Minimisation of the impacts of concrete washings, use of infiltration/ sedimentation pits to settle out the washings before treatment/ re-use/ discharge, and adoption of treatment units with pH adjustment if necessary;
- Oil interceptors will be provided and properly maintained for collecting spillage or leakages from site workshops. The waste oil removed will be collected by licensed collectors;
- Mobile toilets or other appropriate means will be provided to store sewage before disposal through licensed collection agent or discharging to main sewerage system;
- For bore piling operations, the resulting suspension will be settled in sedimentation/ infiltration pit until supernatant is clear and the bentonite solids will be disposed appropriately;

5.4.3 *Marine-based Works*

- Non-dredged reclamation method for the reclaimed land would be adopted. However, dredging for rearrangement of anchorages and piles and abutments for the construction access is required, installation of silt curtain would be considered to control the dispersion of suspended solids;

5.4.4 *Land-based Works*

- Where possible, works entailing soil excavation will be minimised during the rainy season; and
- Good site practice in accordance with the ProPECC PN 1/94 "Construction Site Drainage" and "Recommended Pollution Control Clauses for Construction Contracts" issued by EPD and the procedures in the Environment, Transport and Works Bureau (ETWB) Technical Circular (Works) TCW No. 5/2005 "Protection of Natural Stream/ Rivers from adverse impact arising from construction works".

Post-Construction Impacts

5.4.5 Subject to EIA findings, mitigation measures such as proper rearrangement of anchorage area, proper design on the shape of the reclaimed land and marine based piers to minimize potential hydrodynamic and water quality impacts would be studied.

5.5 Waste Management

Construction Impacts

5.5.1 The following mitigation measures will be considered during the construction stage to minimize waste generation and provide good control on waste management.

General Construction Works

- Good site practice and implementation of Waste Management Plan will be adopted to minimize any potential waste impacts;
- Careful design, planning and good site management to encourage on-site sorting of C&D materials and minimize their generation during the course of construction;
- Chemical waste will be properly stored and transported off-site for treatment by a licensed collector;
- Refuse will need to be stored in enclosed bins and reputable waste collector should be employed to remove the generated refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts;
- A recording system for the amount of wastes generated, recycled and disposed;
- A Waste Management Plan (WMP) shall be prepared and this WMP shall be submitted to the Engineer for approval;
- Use of reusable non-timber formwork to reduce the amount of C&D material;

- Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and

Marine-based Works

- Different reclamation fill options will be examined with a view to promoting beneficial reuse of public fill.

Post-Construction Impacts

5.5.2 Subject to EIA findings, mitigation measure may not be required.

5.6 Land Contamination

5.6.1 Subject to EIA findings, the following mitigation measures will be considered during the construction stage of the construction access to minimise any potential exposure to contaminated soils or groundwater:

- Site workers should wear gloves, masks and other protective clothing where exposure to vapour or contaminated soil may be encountered.
- Contaminated materials should be removed with bulk earth movers to prevent human contact.
- Adequate washing facilities should be provided and smoking/eating should be prohibited in the area.
- Any contaminated sediments that may need stockpiling or need to be transported should be covered with tarpaulin.
- Leakage of pollutants or leaching from excavated soil should be prevented by storing on an impermeable surface.
- Only licensed waste hauliers should be used to collect and transport any contaminated material to an appropriate disposal site and procedures should be developed to ensure that illegal disposal of wastes will not occur.
- The necessary waste disposal permits should be obtained, as required, from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354C), as required.
- Land use planning to avoid putting sensitive uses on contamination hotspots, on-site or off-site treatment of the contaminated soil shall also be considered.

5.7 Ecology

Construction Impacts

5.7.1 The mitigation measures that are to be implemented to minimize the impacts on air quality, noise and water quality will also help to minimize any impacts on ecological resources.

5.7.2 As regards ecological impact, the best mitigation is avoidance and will be used wherever possible. For impact which is considered unavoidable, mitigation measures will be adopted to minimize such impact, e.g. translocation of important species, confining works in specific area/season, minimizing reclamation size, avoiding percussive piling, alternative design/construction methods such as non-dredged reclamation, good site practices etc.

Post-Construction Impacts

5.7.3 Subject to investigation, effective and feasible mitigation measures to address the permanent loss of habitats due to reclamation, including compensation measures, will be developed and implemented.

5.8 Fisheries

Construction Impacts

5.8.1 Subject to investigation, the mitigation measures on water quality impact proposed in **Section 5.4.1** will be considered to minimise the impact on fisheries. Other possible mitigation measures will also be implemented if considered necessary.

Post-Construction Impacts

5.8.2 Subject to investigation, the loss of seabed could be compensated through the provision of ecologically-friendly designed seawalls, such as eco-shorelines, which may increase habitat diversity and quality for juveniles of fisheries species. Other possible mitigation measures, if necessary, for enhancement of fisheries resources will be studied in the EIA.

5.9 Landscape and Visual

5.9.1 Subject to investigation, the following measures will be considered to minimize landscape impacts on existing landscape resources and visual impacts on nearby sensitive receivers.

5.9.2 **Construction Impacts**

- Optimization of reclamation area, construction area and contractor's temporary works areas to be minimised to avoid impacts on adjacent landscape;
- Screening of works areas/ construction access with hoardings with appropriate colours compatible with the surrounding area;
- Control of night-time lighting by hooding all lights and through minimisation of night working periods; and
- Reduction of construction period to minimum and introduction of phasing of the construction stage;
- Construction traffic should be kept to a minimum;
- Optimising the sizes and spacings of the viaduct columns; and
- Fine-tuning the location of the viaduct columns to avoid visually-sensitive locations

5.9.3 **Post-Construction Impacts**

- Temporary greening treatment on bare soil surface before construction works of structures take place;
- Compensatory planning for the loss of existing vegetations (including trees, shrubs and groundcovers); and
- Sensitive landscape design of reclamation edge with attractive landscape treatments and incorporation of coastal vegetation into seawalls to improve the compatibility of the new reclamation land with the existing environment;
- Aesthetic design of the bridge form and its structural elements; and
- Roadside planting.

5.10 Cultural Heritage

5.10.1 An Archaeological Impact Assessment (AIA) and Built Heritage Impact Assessment (BHIA) will be conducted by qualified archaeologists to identify any archaeological sites and built heritage respectively within the land-based section of the Project. The investigation will include field walking, augering and test trenching as necessary.

5.10.2 Marine Archaeological Investigation (MAI) will be conducted by qualified marine archaeologist to ascertain the archaeological value of the seabed affected by the reclamation and the marine section of the construction access as well as the rearrangement of anchorages. The investigation where necessary will include geophysical survey and diver inspection as necessary.

5.10.3 The potential impact on area of archaeological potential and terrestrial archaeological heritage, built heritage as well as marine archaeology caused by the Project will be assessed during the EIA. For terrestrial archaeology and built heritage as well as marine archaeology, preservation in-situ should be considered to avoid the impact as far as practicable. If unavoidable, appropriate mitigation measures will be designed and implemented.

5.11 Potential Hazard

5.11.1 Potential risk due to the Project is not anticipated. However, the need for mitigation measures, if necessary would need to be reviewed during the EIA.

5.12 Severity, Distribution and Duration of Environmental Effects and Further Implications

5.12.1 Subject to the findings of assessments, effective control and mitigation measures will be identified to ensure the impacts are within acceptable levels. The possible severity, distribution and duration of environmental effects such as beneficial and adverse effects; short and long term effects; secondary and induced effects; cumulative effects and transboundary effects will be considered and addressed in the EIA, where applicable. The key results from public consultation should also be documented in the EIA.

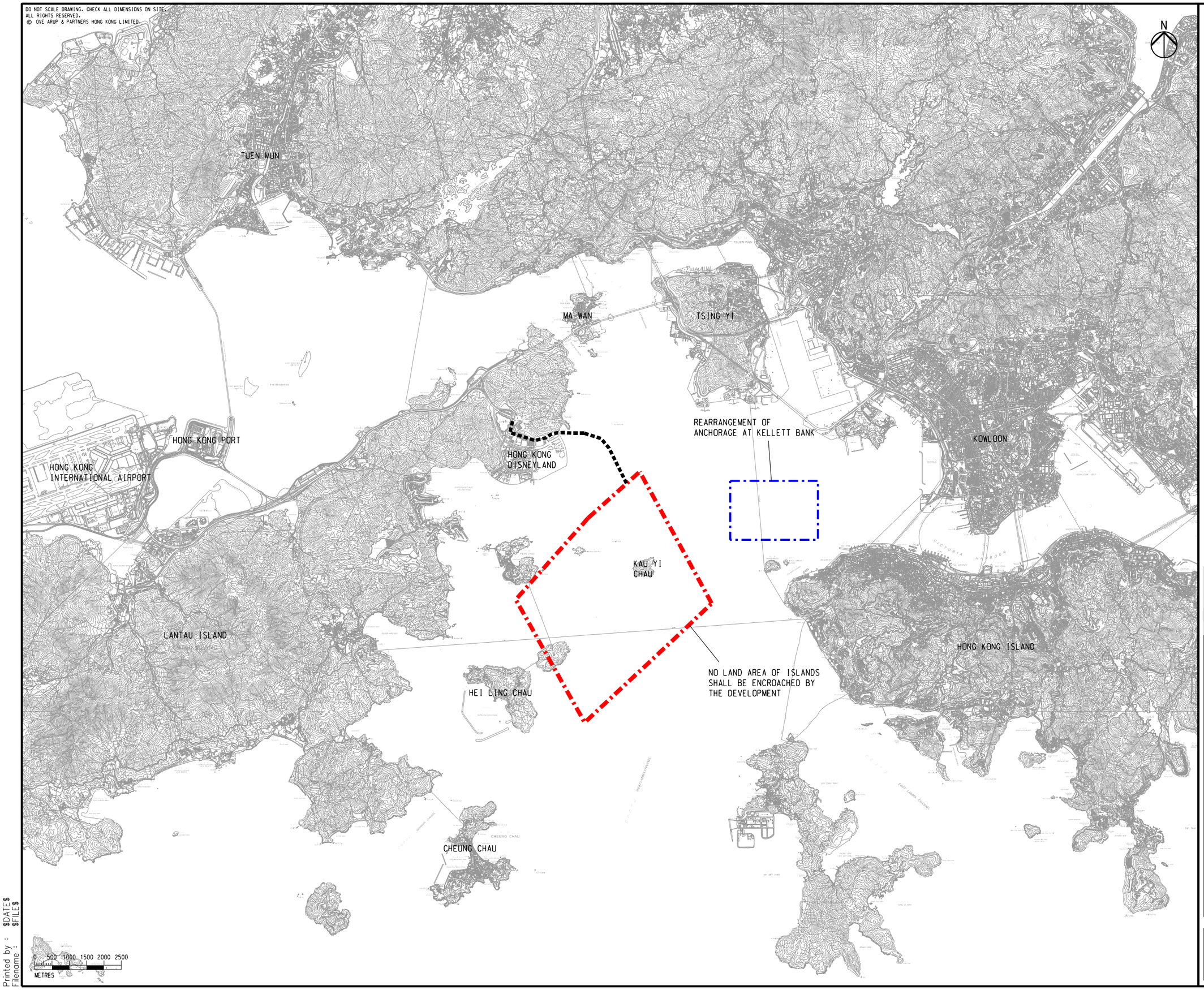
6 Use of Previously Approved EIA Reports

6.1.1 There are no relevant EIA reports already approved under the EIA Ordinance. However, the following studies are relevant and will be referred to in the subsequent EIA study:

Table 6.1 List of previously approved EIA reports for reference

Item	Application No./ Register No.	Title
(i)	-	Increasing Land Supply through Reclamation outside Victoria Harbour, in particular the identified potential near shore reclamation sites (2014)
(ii)	AEIAR-121/2008	Harbour Area Treatment Scheme (HATS) Stage 2A
(iii)	AEIAR-185/2014	Expansion of Hong Kong International Airport into a Three-Runway System
(iv)	AEIAR-196/2016	Tung Chung New Town Extension
(v)	AEIAR-212/2017	Improvement Dredging for Lamma Power Station Navigation Channel

Figures



LEGEND

- TENTATIVE POSSIBLE RECLAMATION EXTENT (BOUNDARY IS INDICATIVE ONLY)
- TENTATIVE ALIGNMENT OF THE ASSOCIATED CONSTRUCTION ACCESS
- REARRANGEMENT OF ANCHORAGE AT KELLETT BANK

Rev	Description	By	Date
A	FIRST ISSUE	GL	11/21

Consultant

ARUP

Contract No. and Title

Reclamation for Kau Yi Chau
Artificial Islands

Drawing title

LOCATION OF THE PROJECT

Drawing no.			Rev.
FIGURE 1.1			A
Drawn: GL	Date: 11/21	Checked: RC	Approved: FC
Scale: 1 : 100000 @A3		Status:	

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