香港國際機場 HONG KONG INTERNATIONAL AIRPORT

Contract C21C04

Airport Tung Chung Link Project

Environmental Impact Assessment -Executive Summary

August 2023

MEINHARDT

in association with

OTC

ERM

91788

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 Project Background

1.1.1.1 Airport Authority Hong Kong (AAHK) first put forward its vision to transform Hong Kong International Airport (HKIA) into an Airport City in the "*From City Airport to Airport City*" report published in 2019. The Airport City vision envisages growing HKIA's position as the preeminent international aviation hub in Asia Pacific, while transforming HKIA into a new landmark and one of the key economic growth engines for Hong Kong. To realise the Airport City vision, AAHK has adopted a strategy to fully capitalise on the unique geographical advantage of HKIA and capture opportunities arising from the new infrastructures connected to the airport, such as the Hong Kong-Zhuhai-Macao Bridge (HZMB).

1.1.1.2 The commissioning of the HZMB in 2018 has greatly improved the connectivity between Hong Kong and cities in the Greater Bay Area (GBA), and further expand the catchment area of HKIA as the region's leading international aviation hub. To meet the growing demand and extend the airport's reach, AAHK will continue to strengthen HKIA's capacity for passenger and cargo service, through the expansion into a Three-runway System (3RS) and other capacity enhancement plans. In addition, AAHK is introducing a growing cluster of functional enhancements with a view to transforming the airport into a new landmark and attracting more visitors to the Airport City from within Hong Kong, the GBA and other parts of Asia. Such functional enhancements include SKYCITY, a major integrated development that comprises retail complexes, dining areas, hotels, leisure and entertainment facilities, as well as AsiaWorld-Expo (AWE) future developments and other related plans, with complementary infrastructural support and technological innovations.

1.1.1.3 The infrastructural support to the airport's capacity and functional enhancements includes, among others, a series of AAHK's recommendations for land uses on the Hong Kong Port (HKP) (formerly known as Hong Kong Boundary Crossing Facilities) Island of HZMB. The key project items include the building of automated car parks for transit air passengers and visitors travelling via HZMB, and the Airportcity Link, a vehicular and pedestrian bridge, on which the AAHK operates an autonomous transportation system to connect HKP Island and SKYCITY, and plans to extend such system to Tung Chung Town Centre. In addition, land parcels on the HKP Island have been reserved for the development of air cargo logistics. As announced in the Chief Executive's 2020 Policy Address, the HKSAR Government has accepted these proposals. It is also noted in the 2020 Policy Address that optimising the use of the land adjacent to the airport will not only provide more job opportunities and a better living environment for the expanding Tung Chung community, but also inject new development elements and economic impetus into the whole North Lantau.

1.1.1.4 Under the strategic context as discussed above, the Airport Tung Chung Link Project (hereafter referred to as the "Project") is proposed. The Project involves the construction and operation of (i) a proposed Airport Tung Chung Link (hereafter referred to as ATCL) to connect HKP Island, Airport Island and Tung Chung Town Centre via a

dedicated road link, with the use of an autonomous transportation system (supported by zero emission vehicles); and (ii) marine facilities in the waters between Airport Island and HKP Island, including a pier and berthing facilities to serve pleasure vessels and to provide marine transport services associated with tourism.

1.1.1.5 The ATCL alignment is shown in **Figure 1.1** and the layout of proposed marine facilities is shown in **Figure 1.2**.

1.1.1.6 A Project Profile (No. PP-623/2021) for the Project was submitted to Environmental Protection Department (EPD) for application of an EIA Study Brief, which was subsequently issued on 26 July 2021 (No. ESB-342/2021).

1.2 Scope of Project

1.2.1.1 The Project involves the construction and operation of (i) a proposed Airport Tung Chung Link (ATCL) to connect HKP Island, Airport Island and Tung Chung Town Centre via a dedicated road link as shown in **Figure 1.1**; and (ii) marine facilities in the waters between Airport Island and HKP Island as shown in **Figure 1.2**. The Project scope of works consists of:

ATCL

i. Construction of about 5km long road with approximately 2,660m at-grade section, 880m land viaduct and 230m marine viaduct, and a provision spur line of an approximate 980m long connecting the planned Aviation Academy for future extension;

ii. Construction of 4 at-grade and 1 elevated ATCL stations;

iii. Construction of a depot; and

iv. Realignment/ Reprovision of affected facilities and construction of ancillary facilities such as walkways, footbridges and plant room(s);

Marine Facilities

v. Construction of a pier and berthing facilities with about 73 berths;

vi. Construction of ancillary facilities including floating platforms, wave attenuator, gangway, guide piles, etc; and

vii. Maintenance dredging for the marine facilities.

1.2.1.2 The Project will comprise the following Designated Projects (DPs) under Part I, Schedule 2 of the EIA Ordinance (EIAO):

- Item A.6(c) – A transport depot located less than 200m from the nearest boundary of an existing or planned educational institution;

- Item A.8 – A road or railway bridge more than 100m in length between abutments;
- Item C.3(a) – Reclamation works resulting in 5% decrease in cross sectional area calculated on the basis of 0.0mPD in a sea channel;
- Item C.12(b) – A dredging operation exceeding 500,000m^3 or a dredging operation which is less than 100m from a seawater intake point; and
- Item O.2 – A marina designed to provide moorings or dry storage for not less than 30 vessels used primarily for pleasure or recreation.

1.3 Environmental Impact Assessment Study

1.3.1.1 An environmental impact assessment (EIA) study was conducted for the Project in accordance with the requirements of the EIA Study Brief (ESB-342/2021) and the *Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM)*. The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the Project and associated works that will take place concurrently. This information will contribute to decisions by the Director of Environmental Protection on:

i. the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;

ii. the conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences wherever practicable; and

iii. the acceptability of residual impacts after the proposed mitigation measures are implemented.

1.4 Purpose of this Executive Summary

1.4.1.1 This Executive Summary (ES) highlights the key information and findings of the ATCL Project EIA study.

2 PROJECT DESCRIPTION

2.1 Purpose and Objectives of the Project

2.1.1.1 The purposes and objectives of the Project are to enhance connectivity between Tung Chung, Airport Island and HKP Island and provide an alternative transportation option served by autonomous transportation system with zero emission vehicles. The Project also provides marine facilities including the SKYCITY Pier and berthing facilities to serve pleasure vessels and to provide marine transport services associated with tourism.

2.2 Need of the Project

Enhancement of Connectivity

Airport Tung Chung Link – Autonomous Transportation System connecting Tung Chung

2.2.1.1 The Airport City Link (ACL) project, being developed by AAHK, is a purpose-built bridge on which a vehicular road and a pedestrian walkway will be provided to connect the HKP Island and SKYCITY. As an environmental initiative, ACL will only be served exclusively by AAHK's electric vehicles, such that there is no air pollutant emission during its operation. Non-AAHK vehicles are restricted from accessing the ACL. In the longer term, ACL will be served by AAHK's autonomous transportation system. As the next step, ATCL, as an extension of the ACL's autonomous transportation system being planned and operated by AAHK, will run along the road on the eastern coast of the Airport Island to connect to Tung Chung Town Centre. With the use of zero emission vehicles (e.g. electric vehicles), and ultimately an autonomous transportation system (supported by zero emission autonomous vehicles) for the ATCL, the Airport Island will be seamlessly connected with the HKP Island and Tung Chung Town Centre in an environmentally-friendly manner.

Marine Facilities – SKYCITY Pier and Berthing Facilities

2.2.1.2 To the east of the Airport Island along the coast of SKYCITY, marine facilities will be provided in the area including a pier and berthing facilities. World international airports today are placing a stronger emphasis on multi-modal connectivity with neighbourhood destinations. Marine connectivity of yachts and ferries have been increasingly common to diversify leisure and tourism opportunities and foster an attractive lifestyle destination. The proposed marine facilities could maintain and strengthen HKIA's position as an international aviation hub, bringing up with competition amongst other major international airports to deliver the best experience for visitors and travellers.

2.3 Benefits of the Project

2.3.1 General

2.3.1.1 The Project offers numerous benefits to the neighbourhood and environment through the planning design. These benefits include additional transport option - zero emission transport, mitigating emissions from increased passenger inflow and greater connectivity and socio-economic growth. The details of the benefits are further discussed in the below sections.

2.3.2 Additional Transport Option- Zero Emission Transport

2.3.2.1 The increased number of people visiting the Airport Island as induced by the SKYCITY and Tung Chung Town Centre developments may cause greater demands on other transport services available in the areas, especially in a post-pandemic scenario. The ATCL in this respect will provide an additional land transportation option between HKP Island, SKYCITY and Tung Chung Town Centre. With the use of zero emission vehicles, it will provide a greener mode of transport for the area than other modes of transport (e.g. buses, taxis, private cars). ATCL can also shorten the travelling distance and time, and provide a developed integrated system interconnectivity. As such, this attractive alternative will alleviate the pressure on general transport services and provide a more comfortable and environmental-friendly travel experience for passengers.

2.3.2.2 Furthermore, the marine facilities including a pier and berthing facilities that proposed in this Project will also provide an additional marine transportation option for the area. The pier will be equipped to provide marine transport services associated with tourism. Zero emission vessel is a competitive solution for decarbonisation and is currently under active development. The proposed pier will allow the future use of zero emission vessels, when these become commercially available in the market. In addition, an electricity pedestal will be installed at each berthing facility to provide on-shore power supply to vessels for reducing marine emissions at berth.

2.3.2.3 In the event of traffic accidents that might occur on the existing key commuting lanes to/from the HKIA, the Project would provide alternative land and marine transport options for commuters and thus maintain the transportation services to/from the Airport Island.

2.3.3 Mitigation of Emission from Increased Passenger Inflow

2.3.3.1 As a green airport, a sustainable strategy is adopted to achieve carbon emission reduction and sustainable living, as far as practicable. Since the ATCL incorporates environmental protection measures such as 100% adoption of zero emission vehicles, there will be no vehicular air pollutant emissions coming from the vehicles on the whole of the ATCL route. Thus, the ATCL may help mitigate such increases in vehicular emissions brought about by the expected increases in traffic to and from the Airport Island area as it provides an additional greener mode of transport using the zero emission vehicles between Tung Chung, Airport Island and HKP Island.

2.3.3.2 The ATCL may help achieve a reduction of emissions that would have otherwise been emitted through travellers utilizing other emissive modes of transport.

2.3.4 Greater Connectivity and Socio-Economic Growth

2.3.4.1 Upon the commencement of the Three-Runway System (3RS) operation, it is estimated that 123,000 direct employments will be created at HKIA. The Project, in conjunction with the 3RS, the HZMB and the developments in SKYCITY, could bring further economic opportunities for Hong Kong and the GBA region. The Project will enhance connectivity and the attractiveness of the leisure and entertainment related facilities planned for the SKYCITY at HKIA, and catalyse a greater socio-economic growth for the Airport Island

and the wider Tung Chung community, as the Project provides greater accessibility to job opportunities and stimulates economic impetus into the North Lantau area.

2.4 "Without Project" Scenario

2.4.1.1 Without the Project, the increase in patronage arising from traffic resumption and new developments (e.g. East Coast Support Area (ECSA) commercial developments, SKYCITY developments and HKP developments) may induce an overall additional transport demands and the associated vehicular emission in the area.

2.4.1.2 A greater burden may also be put onto public transport services at the HKIA in light of the 3RS operation as well as other developments. This may cause crowding and capacity issue for certain transport services such as the public franchised buses if adaptions are not made to accommodate an increase in commuters to and from the HKIA area.

2.4.1.3 Without the marine facilities, local residents and visitors would be limited to transport between HKIA, HZMB, SKYCITY developments and tourist attractions in Hong Kong via land-based transportation.

2.5 Alternative Options of the Project

2.5.1.1 Due considerations have been given in formulating options to address the environmental challenges in this Project. The hierarchy of "Avoid, Minimize and Mitigate" has been fully adopted in the process to protect the environment as much as practicable. A summary of the key considerations for options on the alignments, siting of the stations, depot, marine facilities, construction methods and sequence of construction works is given in **Section 2.5**.

2.5.2 Consideration of ATCL Alignment Option

2.5.2.1 Alignment of Option 1 runs inland after crossing Tung Chung Navigation Channel, and turns to run along seaside after passing Hong Kong Airlines (HKA) Training Academy, with northern connections at ACL SKYCITY Station and HKP Station. Similar to Option 1, Option 2 adopts a similar alignment with Option 1 but runs inland after passing HKA Training Academy, with northern connections at ACL SKYCITY Station and HKP Station. Alignment of Option 3 runs along seaside after crossing Tung Chung Navigation Channel, and joins the elevated ACL which provides connection with ACL SKYCITY Station and HKP Station. The options for ATCL alignment are shown in **Figure 2.1**.

2.5.2.2 Amongst the three options, Option 1 may require land reclamation of about 5,000m^2 to avoid a relatively sharp turn and enable the ATCL carriageway alignment to connect to SkyCity Station via East Coast Road. In long term, land reclamation near the culverts (at the existing seawall on the southern side of the proposed marine facilities) would potentially block water circulation via box culverts and this may lead in the change of hydrodynamic regime. In short term, contaminant release due to dredging works for land reclamation may deteriorate the water quality near the proposed seawater intake at SkyPier and habitat loss of the marine ecology and fisheries. Hence, Option 1 is less preferable.

2.5.2.3 Amongst the three options, Option 1 and Option 2 may require excavation works at Scenic Hill for the ATCL alignment which may affect the watercourse/waterbody and the adjoining vegetated area, hence result in loss of habitat of Romer's Tree Frog and impose potential impacts to the known breeding site of Romer's Tree Frog. Option 3 has avoided the encroaching to the Scenic Hill and avoided the direct and indirect impacts to the ecologically sensitive habitats.

2.5.2.4 Option 1 and Option 2 require additional structures for flyover/viaduct, hence bored piles, excavation works at Scenic Hill for the ATCL alignment. Option 3 only requires modifying the existing road to maximise the use of at-grade roads instead of elevated roads to suit with the ATCL alignment. Thus, comparatively small scale of construction activities (e.g. construction of piles) will be involved and less amount of estimated construction wastes would be generated. Hence, Option 3 is preferable.

2.5.3 Siting of Station

2.5.3.1 TCC Station is the main hub of the ATCL. It acts as the intermodal gateway to the entire autonomous transportation system, with links to public transport system provided at the Tung Chung Town Centre area. Two location options for TCC Station have been considered. Option S1 is located near Citygate and Tat Tung Road, whereas Option S2 is located near the Tung Chung Crescent Block 5, as shown in **Figure 2.1**.

2.5.3.2 Both options are connected to the Citygate in view of the connectivity. Option S1 is situated next to the planned visitation church development with priests' quarters. In comparison, Option S2 is located in close proximity to Tung Chung Crescent and more construction noise and dust impact to the nearby sensitive receivers would be anticipated. Moreover, a sharp turn is required for approaching and leaving the Options S2, it is not desirable for autonomous vehicle. Therefore, Option S1 is preferable.

2.5.3.3 Locations of other stations (besides TCC Station) for the ATCL alignment options are shown in **Figure 2.1**. ECSA-S Station and ECSA-N Station of Option 3, and CAX Station and CNA Station of Option 1 or Option 2 are mainly serving ECSA developments, while Approach Lights (AL) Station of Option 3 and SKYCITY Station of Option 1 or Option 2 is intended to connect the future developments in SkyCity. Option 3 is the only option to connect Academy Station which supports the transport system of Aviation Academy and other topside developments in HKP Island. Therefore, Option 3 is preferable.

2.5.3.4 A summary of the key considerations for alignment options are shown in **Table 2.1**.

Table 2.1 Summary of ATCL Alignment Options Considered

ATCL Alignment Options (see **Figure 2.1**)	**Benefits**	**Dis-benefits**	**Preferred Option (Y/N)**
Option 1 – Alignment runs inland after crossing Tung Chung Navigation Channel, and turns to run along seaside after passing Hong Kong Airlines (HKA) Training Academy, with northern connections at ACL SKYCITY Station and HKP Station	• Nil	• Require land reclamation of about 5,000m^2 causing a potential loss of habitats for marine ecology and fisheries • Land reclamation is close to the existing culverts that allow water circulation between the bay area and Tung Chung, thus inducing water quality and ecological issue in short term and resulting in the change of the hydrodynamic regime in long term • Require excavation works at Scenic Hill for the ATCL alignment which results in loss of habitat of Romer's Tree frog and generates higher volume (approximate over 5,500m^3) of excavated materials • More waste generation from the additional structures for flyover/viaduct, such as bored piles, excavation works at Scenic Hill, and land reclamation works • Not able to support the population commuting to the planned Aviation Academy and other topside developments on HKP Islands	**N**
Option 2 – Similar to Option 1 but continues to run inland after passing HKA Training Academy, with northern connections at ACL	• Avoidance of land reclamation to minimise potential habitat loss of the marine ecology and fisheries, water quality impact and waste generation	• Require excavation works at Scenic Hill for the ATCL alignment which results in loss of habitat of Romer's Tree frog and generates higher volume (approximate over 5,500m^3) of excavated materials	**N**

ATCL Alignment Options (see **Figure 2.1**)	**Benefits**	**Dis-benefits**	**Preferred Option (Y/N)**
SKYCITY Station and HKP Station		• More waste generation from the additional structures for flyover/viaduct, such as bored piles and excavation works at Scenic Hill • Not able to support the population commuting to the planned Aviation Academy and other topside developments on HKP Islands	
Option 3 – Alignment runs along seaside after crossing Tung Chung Navigation Channel, and joins the elevated ACL which provides connection with ACL SKYCITY Station and HKP Station	• Avoidance of land reclamation to minimise potential habitat loss of the marine ecology and fisheries, water quality impact and waste generation • Avoidance of excavation works at Scenic Hill to minimise the loss of habitat of Romer's Tree frog, and waste generation • Maximise the at-grade section as compared to Options 1 & 2 and thus, less waste generation from the additional structures for flyover/viaduct such as bored piles • Academy Station (in Option 3 only) supports the transport system of Aviation Academy and also other topside developments in HKP Island • Passenger reaches all stations along ATCL/ACL directly with no passenger interchange is required	• Nil	**Y**

2.5.4 Consideration of Depot Location

2.5.4.1 Considering the ease of access and land availability, two potential locations have been considered for the depot along ATCL. Option D1 is located at the land near the Academy Station at the south of HKP Island and Option D2 is located near the Scenic Hill Tunnel.

2.5.4.2 The depot shall provide essential regular maintenance servicing for autonomous vehicles employed for the ATCL. Major servicing shall be carried out off-site by the AV supplier specialist services. The depot consists of a plant room and depot area. The plant room is designed to be maximum approximately 7-10m high single-storey building. Considering the implication on various environmental aspects and its accessibility, two potential locations (Option D1 and Option D2 as shown in **Figure 2.2**) have been considered for the depot along ATCL.

2.5.4.3 The proposed depot is small-scaled and does not involve polluting process such as paint spraying and dry polishing activities. Electrified equipment will be used for maintenance works and exhaust emission of Non-road Mobile Machinery (NRMMs) adopted are expected to be limited. Thus, adverse air quality impact associated with the associated maintenance works at the depot is not anticipated. On the other hand, Option D1 and Option D2 will be located at over 1.5km and about 600m from the nearest noise assessment point (i.e. Seaview Crescent) respectively. Moreover, air-conditioning would be provided for the planned Aviation Academy and HKA Training Academy located near Option D1 and Option D2 respectively. No adverse environmental impact will be expected for both options during the construction and operational phase.

2.5.4.4 As Option D1 is located within the Closed Area, permit is required to access the site of Option D1. In comparison, Option D2 is connected to the public road network (e.g. Kwo Lo Wan Road), which provides easier access for stakeholders during both the construction and operational phases.

2.5.4.5 Considering the environmental considerations and site accessibility, Option D2 is preferred.

2.5.5 Consideration of Marine Facilities Location

2.5.5.1 Considering the integration to the Airport City concept, there are two potential location options for the proposed marine facilities. The locations are at the north of Chek Lap Kok, waterspaces near the AsiaWorld – Expo (Option MF-A) and waterspaces between Airport Island and HKP Island (Option MF-B) have been taken into considerations. Options for the proposed marine facilities are shown in **Figure 2.3**.

2.5.5.2 Option MF-A is located near the Proposed North Lantau Marine Park (NLMP) and ecologically sensitive area (e.g. the artificial reef at the Chek Lap Kok Marine Exclusion Zone). Option MF-B is located within the SkyPier basin where is further away from the proposed NLMP and ecologically sensitive area, and no open sea dredging works is required due to sufficient water depth. Thus, it is considered less impact on the water quality and marine ecology on Option MF-B than Option MF-A.

2.5.5.3 Moreover, the wave attenuator for the proposed marine facilities of Option MF-A will provide a relatively sharp turn and cause additional floating refuse easily trapped or

accumulated. Option MF-B is located between Airport Island and HKP Island. Floating refuse potentially trapped or accumulated will be similar to the existing condition. Therefore, Option MF-B is preferable.

Table 2.2 Summary of Marine Facilities Location Options Considered

Marine Facilities Location Option (see **Figure 2.3**)	**Benefits**	**Dis-benefits**	**Constraint Descriptions**	**Preferred Option (Y/N)**
Option MF-A – Near AsiaWorld – Expo to the north of Chek Lap Kok	• The closest location to the existing airport facility	• Open sea dredging may be required during construction phase due to insufficient water depth. Marine maintenance dredging is required to allow the vessels access berthing facilities during operation phase. Open sea dredging during both construction and operation phases would impose potential impacts on waste management, fisheries, marine ecology and water quality • Potential impact on water quality and marine ecology would be imposed to the Proposed North Lantau Marine Park and the artificial reef at the Chek Lap Kok Marine Exclusion Zone • The installation of wave attenuator will provide a relatively sharp turn and cause additional floating refuse easily trapped or accumulated	• It is located at the approach light area of the existing north runway (future Centre Runway) and also located within Hong Kong International Airport Approach Areas (HKIAAA) no.3, which no vessel shall pass or enter. As a result, this option is not feasible	**N**

Marine Facilities Location Option (see **Figure 2.3**)	**Benefits**	**Dis-benefits**	**Constraint Descriptions**	**Preferred Option (Y/N)**
Option MF-B– Located between Airport Island and HKP Island	• Most convenient location near the Airport City development and ATCL alignment • Locating the marine facilities away from the existing and planned marine parks, any potential water quality and ecological and fisheries impacts would be considered less as compared to Option MF-A • Only marine maintenance dredging is required, less marine sediment would be generated • The floating refuse potentially trapped or accumulated will be similar to the existing condition	• Management of mooring area and vessel height specific arrangement shall be imposed • Marine maintenance dredging is required to allow the vessels access berthing facilities, which would impose potential impacts on waste management, fisheries, marine ecology and water quality	• It is located within the SkyPier Basin, which considered to be the most sheltered area near Airport City development. The south of the basin is within HKIAAA no.5, which no vessel with height exceeding 15m shall pass or enter	**Y**

2.5.6 Consideration for the Design Layout of Marine Facilities

2.5.6.1 Marine facilities would provide services to general public travelling to the Airport or HKP Island. Reference has been made to other international airports such as Singapore Changi Airport, where similar sea access facilities are provided near the airport for leisure and tourism, and transport where necessary.

2.5.6.2 The design of the marine facilities has accounted for the anticipated number of usages by travellers and the required mix of berth type in different sizes to optimise the configuration and number of berths required. As shown in **Figure 1.2**, the marine facilities consist of 73 berths for majority of medium-sized to small-sized vessels. By making reference to local marinas (e.g. Aberdeen Marina Club, Gold Coast Yacht and Country Club and Lantau Yacht Club), around 86% of berths are provided for boat length from 11-20m, around 8% of berths are provided for boat length equal to or less than 10m and around 6% of berths are provided for boat length from 21-35m. A relative high number of berths for medium-sized vessel in the proposed design allows flexibility for the use by smaller vessels as most common sizes of vessel found in Hong Kong range from 6m-35m with majority less than 20 m. The proposed design is considered as the most efficient and cost-effective configuration which optimizes the safe manoeuvrability for vessels while accommodating the essential berthing and associated facilities.

2.5.7 Consideration of Construction Method

2.5.7.1 Potential environmental impacts have been duly considered and assessed throughout the EIA stage to avoid the adverse environmental impacts of the Project. As such, environmentally conscious construction methodologies have been adopted to avoid, minimise and mitigate environmental impact from the Project as far as practicable. The consideration of different construction methods are summarised in **Table 2.3** below.

2.5.7.2 In comparison with percussive piling, bored piling construction generates less noise and vibration. To minimise the construction noise impact generated from the Project to Chinese White Dolphins, bored pile foundation will be adopted for marine viaduct and land viaduct for ATCL, and SKYCITY Pier and berthing facilities in marine facilities.

2.5.7.3 For the pier columns/bridge deck construction, either precast method or in-situ method will be adopted. Potential environmental impacts of the both construction methods of cast in-situ and precast concrete for pier columns /bridge decks have been assessed in this EIA report and are considered mitigatable.

Table 2.3 Advantages and Disadvantages of Different Construction Methods

Method	Advantages	Disadvantages
Piling Construction		
Percussive Piling Method	• Piles can be precast to the required specifications	• The vibration/ underwater noise from the equipment and plants might affect the marine ecology, soil condition and adjacent structures

Method	Advantages	Disadvantages
	• Require shorter construction time, reduce the duration of potential environmental impacts	• Relatively higher noise impact from the percussive piling method • Higher headroom required
Bored Piling Method	• Relatively lower noise and vibration than using percussive piling method. Hence, less disturbance to Chinese White Dolphins (CWDs) and marine species, less disruption to soil condition and adjacent structure • Less headroom restriction	• More expensive, comparing with percussive piling method • Longer construction time, relatively
Pier Column / Bridge Deck Construction		
Precast Method	• Pre-casting activities are carried out off site in a fabrication yard. Hence, better control on workmanship and construction quality. • As the casting carried out off site, the impact on-site for air quality, noise, water quality, waste management during construction phase will be minimised. • Require Less construction equipment on site, the noise impact will also be minimised. • Less site constraint due to erection of temporary falsework	• Since the structure for this Project are not modular in design, the tailor-made precast units for construction of mould takes longer construction time and generate more waste than in-situ method • The shipping of the precast unit will be constrained by the height limit of the airport • Require more plant and equipment to erect the precast segments • Reduce design flexibility as the mould for fabrication is fixed
In-situ Method	• Post-tensioning is possible • Longer service time period and minimal maintenance • Require relatively less special skilled workers • Steel formworks will be used instead of timber to maximize the reuse of formwork, and minimize the waste generation	• Require large area for erection of temporary falsework • Workmanship and construction quality are difficult to control

Method	Advantages	Disadvantages
	• More flexibility to deal with design changes	

2.5.8 Consideration of Construction Works Sequence

2.5.8.1 From the baseline information, while Chinese White Dolphins (CWDs) utilise waters in the Assessment Area, the likelihood of the areas within and in the vicinity of the Project site as important habitat for CWDs is low and the said areas are not considered as unique and important habitats for CWDs. Also, the marine works area involving piling during the construction stage is relatively small. Unacceptable impacts from the Project to water quality and CWDs are not expected with the implementation of appropriate preventive and mitigation measures recommended in the EIA report. Therefore, no specific construction works sequence would be required with respect to water quality and CWDs.

2.5.8.2 To optimize construction works sequence with the least potential impacts to the surroundings, at most two marine piles will be installed / constructed concurrently at the proposed marine facilities works area and the marine viaduct works area across Tung Chung Navigation Channel, respectively, during construction phase. In addition, the piling works will only be conducted after setting up temporary working platform within the active marine works areas surrounded by silt curtain.

2.6 Description of the Preferred Option

2.6.1 ATCL and Marine Facilities

2.6.1.1 Considering all the environmental constraints identified and engineering/operational requirements, the design team has developed the preliminary design for the Project, with the key elements summarized in **Table 2.4**. **Figure 1.1** shows all the key elements for the Project.

Table 2.4 Key Elements of the Project

Key Elements	Descriptions
1. ATCL alignment (in total approx. 5km) [Option 3]	• At-grade sections: 2,660m (approx.) • Land viaduct sections: 880m (approx.) • Marine viaduct section: 230m (approx.) • The spur line of approximately 980m connecting to the Academy Station
2. Stations of ATCL [Option S1]	• Tung Chung Central (TCC) Station (elevated) • ECSA-N Station (at-grade) • ECSA-S Station (at-grade) • AL Station (at-grade) • Academy Station (at-grade) • With provision of lavatories

3. Other associated works [Option D2]	• Connecting works to planned ACL • Walkway and footbridges at ECSA-N Station, ECSA-S Station, and connection with at-grade road section and land viaduct section near ACL • Depot for maintenance, storage, charging and cleaning of zero emission vehicles • Reprovision/realignment of the affected facilities, such as bus stop, cycling track, footpath, etc. • Diversion/reprovision of affected utilities • Plant room(s)
4. Marine Facilities [Option MF-B]	• SKYCITY Pier • Berthing facilities • Maintenance Dredging

2.7 Construction Methods and Engineering Requirements

2.7.1.1 The construction methods proposed are based on environmental and engineering feasibility of the Project. Bored piling method, in-situ method and precast method have been considered for the construction of marine viaduct and land viaduct, while in-situ concreting and open cut excavation have been considered for the construction of the at-grade road and depot. For the construction of marine facilities, socketed H-piles have been taken into account for the construction of SKYCITY Pier along with the wave attenuator, while guide piles have been considered for the construction of floating pontoon.

2.8 Summary of Environmental Benefits and Environmental Achievements of the Project

2.8.1.1 As described in **Section 2.5**, avoidance or minimization of the environmental impacts have been one of the key considerations throughout the design of the Project. The key design considerations and the associated environmental benefits for different design approaches achieved by selecting the preferred options and brought by the Project are listed in **Table 2.5** below.

Table 2.5 Key Design Considerations and the Associated Environmental Benefits

Design Approach	Key Design Considerations and the Associated Environmental Benefits
Minimisation of the need for land reclamation	• During the planning and design stage, the ATCL alignment is designed to minimise land reclamation works • Minimising the need for land reclamation while maximise the ATCL at-grade section.
Avoidance of excavation works at Scenic Hill for the ATCL alignment	• No excavation works at Scenic Hill for the ATCL alignment is required to avoid the loss of habitat of Romer's Tree Frog. • Minimising the waste generation from excavated materials.
Minimisation of waste generation	• Maximising the use of at-grade roads instead of elevated roads to minimize the waste generated from the construction of additional structures for elevated road.

Design Approach	Key Design Considerations and the Associated Environmental Benefits
Avoidance of encroaching into the marine park and ecological sensitive area	• Locating the marine facilities away from the Proposed North Lantau Marine Park and ecologically sensitive area (e.g. the artificial reef at the Chek Lap Kok Marine Exclusion Zone).
Avoidance of open sea dredging works during construction	• No open sea dredging works is required for the Project by strategically locating the marine facilities between the Airport Island and HKP Island. • Avoid direct impacts on the marine ecological resources and fisheries impact.
Adoption of environmentally friendly construction method	• Minimisation of construction noise and vibration impact to the nearby Chinese White Dolphins and marine species for the pile construction through the quieter piling method (e.g. bored piling method).
Promote the use of environmentally friendly vehicle system	• The use of zero emission vehicles during operational phase can help improve roadside air quality.

2.9 Work Programme

2.9.1.1 The construction works of the Project will be tentatively commenced in Q4 2025 and be completed in 2027/2028. A summary of the key construction works period is listed below.

- ATCL (including ATCL alignment, stations and other associated works)
  Tentative construction period: Q4 2025 to Q1 2028
  Tentative commissioning year: 2028

- Marine Facilities (including SKYCITY Pier and berthing facilities)
  Tentative construction period: Q2 2026 to Q4 2027
  Tentative commissioning year: 2028

2.10 Public Consultation

2.10.1.1 The Project Profile was submitted to the EPD on 15 Jun 2021. During the public consultation period, 5 written comments, concerning the needs of the Project and its potential impacts in water quality, waste management, ecology and fisheries, were received. The concerned impacts have been assessed in this EIA study and summarized in Sections 3.3, 3.4, 3.5 and 3.6, and no adverse impacts are anticipated from this Project.

2.10.1.2 During the course of the EIA study, AAHK reached out to different stakeholders through meetings, briefings-cum-airport visits and webinars, including community groups, members of District Councils in the airport's five neighbouring districts, business chambers, professional groups, unions and youth organisations. AAHK introduced the

Airport City strategy, including the ATCL Project, to the stakeholders and sought their feedback on the Project. No environmental issue in relation to the ATCL Project was raised during the outreach. On 27 July 2021, AAHK briefed Islands District Council members on Airport City developments including the ATCL Project, receiving positive views from the members, who opined that the ATCL Project would provide a convenient and environmentally friendly means of transport to the Lantau District.

3 SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT

3.1 Air Quality

3.1.1 Construction Phase

3.1.1.1 During construction phase, site clearance, utilities protection and diversion works, slope work, excavation, piling and roadworks, site formation, etc. could generate construction dust, a quantitative construction dust impact assessment has been carried out, taking into account the cumulative impacts from other major pollution emissions in the immediate neighbourhood as well as the concurrent construction projects in the vicinity. The assessment for construction dust impact is within 500m study area from the Project boundary. With the implementation of the mitigation measures as stipulated in the Air Pollution Control (Construction Dust) Regulation, dust control measures (e.g. watering once every two hours for all exposed site surfaces with dust emission and unpaved roads) and good site practices, the predicted results concluded that the cumulative Total Suspended Particulate (TSP), Respirable Suspended Particulate (RSP) and Fine Suspended Particulate (FSP) concentrations at all air sensitive receivers (ASRs) would comply with the relevant Air Quality Objectives (AQOs). Hence, adverse air quality impact during the construction phase is not anticipated.

3.1.1.2 By following Air Pollution Control (Fuel Restriction) Regulation, Air Pollution Control (Marine Light Diesel) Regulation, Air Pollution Control (NRMM) (Emission) Regulation and good site practices (e.g. avoidance of exempted NRMMs where practicable), the gaseous emissions from construction plants, equipment and vessels are considered to be minimal and adverse air quality impact is not anticipated.

3.1.2 Operational Phase

3.1.2.1 Given that zero emission vehicles will be adopted for autonomous transportation system of the Project, no air quality impact is expected from the zero emission vehicles on the entire ATCL and station during normal operation. The proposed depot will provide essential regular maintenance servicing for zero emission vehicles employed for the ATCL. Electrified equipment would be provided, hence, no gaseous and particulate emissions generated from exhaust emissions of the electrified equipment used for maintenance operations are expected. There will be NRMMs in the proposed depot. Air Pollution Control (NRMMs) (Emission) Regulation and Air Pollution Control (Fuel Restriction) Regulation will be followed to control the fuel combustion emission from NRMMs. Exhaust emissions of NRMMs adopted for maintenance operations are expected to be limited. Thus, adverse air quality impact associated with any required maintenance works of zero emission vehicles at the depot is not anticipated. There will be no adverse air quality impact from the vehicles on the entire ATCL, the proposed depots and stations.

3.1.2.2 As the potential air quality impacts from marine vessel emission at the proposed marine facilities are anticipated, a quantitative operational air quality impact assessment has been carried out, taking into account the cumulative impacts from other major pollution emissions in the immediate neighbourhood. An assessment area for operational air quality impact assessment is defined as by a distance of 500m from the boundary of proposed marine facilities. The predicted cumulative concentration of RSP, FSP,

Nitrogen Dioxide and Sulphur Dioxide at all ASRs would comply with the relevant AQOs. Adverse air quality impact is not anticipated during operation of the Project.

3.2 Noise Impact

3.2.1 Construction Phase

3.2.1.1 Construction noise impact assessment has been conducted. During the construction phase, Powered Mechanical Equipment (PME) to be used for the construction works will be the primary noise source. The construction of ATCL alignment is one of the major noise sources.

3.2.1.2 Without the implementation of mitigation measures, the predicted maximum unmitigated construction noise levels at the representative noise sensitive receivers (NSRs) would be 57 - 97 dB(A). With the implementation of mitigation measures including quieter construction methods, use of quieter PME, use of noise barrier, noise enclosure and noise insulating fabric, the predicted mitigated construction noise levels at the NSRs would be 50 - 75 dB(A). Hence, the mitigated construction noise levels at all the representative NSRs would comply with the EIAO-TM, and hence adverse construction noise impacts from the Project are not anticipated.

3.2.2 Operational Phase

3.2.2.1 Operational noise impact assessment has also been conducted. The distances from marine facilities, depot, and plant room to the nearest NSR are outside 300m, which is ranged from approximately 500m to 2.3km. Given the large separation distances from the operation noise sources, adverse operational noise impact from the proposed facilities are not anticipated. Natural ventilation will be adopted for the proposed stations, and hence noise impact from mechanical ventilation is not expected. There are no other fixed plant at the proposed stations.

3.2.2.2 For the operational noise from zero emission vehicle (e.g. electric vehicle), the Airport Authority Hong Kong (AAHK) is committed to acquire zero emission vehicles with a maximum Sound Power Level (SWL) of 100 dB(A) or below, and confirmed that the said vehicles are available in the market today. With the proper selection of zero emission vehicle, the operational noise levels would comply with the EIAO-TM, and hence adverse operational noise impacts from the Project are not anticipated. Notwithstanding this, noise commissioning test for zero emission vehicle will be conducted prior to operation of ATCL to check the compliance of the noise criteria.

3.3 Water Quality

3.3.1 Construction Phase

3.3.1.1 Based on the selected construction method, no open sea dredging works for the Project is required. Potential water quality impact from marine-based and land-based construction works, the generation of wastewater, and the sewage from workforce under the Project have been assessed. Silt curtain would be set up to enclose the entire active work area before the commencement of piling works for marine facilities and marine viaduct to control sediment dispersion. At most two marine piles will be

installed / constructed concurrently at the proposed marine facilities work area and the viaduct works area across Tung Chung Navigation Channel, respectively during construction phase. Good site practices, such as adopting clean ballast system, sufficient vessel clearance from seabed, etc, are recommended to minimise the potential water quality impact from marine construction works. With the implementation of the recommended mitigation measures, adverse water quality impact from the Project during the construction phase is not anticipated.

3.3.2 Operational Phase

3.3.2.1 The potential water quality impact arising from the operation of the Project has been assessed. This impact is associated with the change in flow regime from the presence of the Project facilities, maintenance dredging, sewage and wastewater generated from workforce, depot operation, and potential oil spillage from the operation of the marine vessels. Modelling assessment indicated change in flow regime due to the presence of the Project facilities (1) would be localized within the embayment area between the Airport Island and the Hong Kong Port and have no noticeable impact beyond and (2) would not affect the identified beneficial uses within the embayment, and thus will not result in unacceptable water quality impact.

3.3.2.2 Maintenance dredging will be carried out to allow vessels to access the marine facilities at low tide and to enhance navigational safety. Cage type silt curtain will be provided during maintenance dredging for the marine facilities and the maximum allowable rate of dredging would be limited to 40 m^3/hr. No unacceptable change in water quality from maintenance dredging would be expected with the above mitigation measures. Other mitigation measures, including no direct discharge of untreated sewage, regular cleaning and removal of floating refuse, no new drainage outfall in marine facilities, provision of adequately designed pollution removal devices to new drainage will be implemented. With the implementation of the recommended mitigation measures, adverse water quality impact from the Project during the operational phase is not anticipated.

3.4 Waste Management Implications

3.4.1 Construction Phase

3.4.1.1 Potential waste management implications from the generation of waste during the construction phase have been evaluated. The waste types generated from the Project would include C&D materials, marine sediment, chemical wastes from maintenance of construction plant and equipment, general refuse from the workforce, and floating refuse. It has been estimated that 21,379m^3 of inert C&D materials, 1,950 m^3 of non-inert C&D materials, 2,803m^3 of land-based and marine-based sediment, less than 100 litres per month of chemical waste, 198 tonnes of general refuse, as well as 3m^3 per year of floating refuse.

3.4.1.2 In order to reduce the disposal quantity of waste, waste re-use and recycling on-site would be implemented. The amounts of waste to be backfilled on-site include 5,963 m^3 of inert C&D material and 375 m^3 of land-based sediment while the waste to be recycled

include 450 m^3 of non-inert C&D material, 9 tonnes of general refuse and 1 m^3 per year of floating refuse.

3.4.1.3 With proper implementation of the mitigation measures such as good site practices, waste reduction through good management and control, proper storage, collection and transportation of waste, all dump trucks engaged on site for delivery of C&D materials from the site to designated locations equipped with Global Positioning System (GPS) or equivalent system Automatic Identification System (AIS) for real time tracking and monitoring of their travel routings and parking locations in order to avoid illegal dumping or landfilling of C&D materials etc., adverse environmental impacts from waste management during construction phase are not anticipated.

3.4.1.4 1,895m^3 and 533m^3 of land-based and marine-based sediment will be disposed of for Type 1 – Open Sea Disposal and Type 1 – Open Seas Disposal (Dedicated Sites) respectively. With implementation of the recommended mitigation measures and the requirements of Practice Note for Authorized Persons and Registered Structural Engineers on Management Framework for Disposal of Dredged/Excavated Sediment (PNAP ADV-21), adverse environmental impacts arising from the excavation, treatment, transportation and disposal of marine sediment are not anticipated.

3.4.2 Operational Phase

3.4.2.1 Potential waste management implications from the generation of waste during the operational phase have been evaluated. The main waste types include chemical waste, municipal solid waste from maintenance activities and staff and passengers, floating refuse and marine sediments from maintenance dredging at marine facilities. It has been estimated that maximum 35,000m^3 of marine sediment from maintenance dredging in every two years, less than 100 litres of chemical waste per month, 11 tonnes of general refuse per year and 3m^3 of floating refuse per year will be generated during operational phase, with the implementation of the recommended mitigation measures and the requirements of PNAP ADV-21 for excavation, treatment, handling, transportation and disposal.

3.5 Ecology

3.5.1 Construction Phase

Terrestrial Ecology

3.5.1.1 Due consideration on impact avoidance and impact minimisation have been taken in the Project. The construction activities for the proposed ATCL and marine facilities largely fell within the existing developed area (about 98% of the whole Project site) where is already subject to extensive human disturbance. Impacts arising from the Project mainly include the habitat loss within the Project site (i.e. including habitat loss of 0.31 ha of the mixed woodland (largely restricted to urbanized developed area) at Scenic Hill), potential direct impacts on species of conservation importance and indirect disturbances to surrounding habitats and associated wildlife during the construction phase.

3.5.1.2 It should be noted that all of the identified individuals of flora species of conservation importance are located outside the Project site, and thus, no direct impact on flora species of conservation importance is expected. Fauna species of conservation importance recorded within the Project site are of relatively high mobility such as avifauna, bat and butterfly, and therefore, these species are not subject to direct impact from the Project. The recorded breeding sites for Romer's Tree Frog comprise watercourse/waterbody and the adjoining vegetated area. These sites are located at the west of the Scenic Hill and of some distance to the Project site. Thus, the recorded Romer's Tree Frog would not be directly affected.

3.5.1.3 Given the road/ paved surface and road edge vegetated areas are not preferred habitats for fauna species of conservation importance, direct impact on wildlife (esp. fauna species of conservation importance) due to the Project is considered to be negligible.

Marine Ecology

3.5.1.4 The construction works is of temporary nature, which includes piling works for the marine viaduct (to be completed within 2 years) and construction activities for the proposed marine facilities (to be completed within 10 months), with small extent of area affected (i.e. ~0. 67ha of seabed and temporary habitat disturbance of ~8.33ha of water column and intertidal habitat), and the benthic communities, subtidal and intertidal habitats as well as coral communities found within and in the vicinity of the Project site are of low ecological importance. With the implementation of standard site management practices and water quality mitigation measures (e,g, deployment of silt curtain), adverse marine ecological impacts on the benthic communities, subtidal and intertidal habitats and coral communities due to the construction of the Project are not anticipated.

3.5.1.5 The Project will result in the temporary disturbance of approximately 9ha of marine habitat for Chinese White Dolphins (CWDs). Based on the literature review and the results of Passive Acoustic Monitoring survey (i.e. very low acoustic detections recorded during 4-month monitoring period), while CWDs utilise waters in the Assessment Area, CWD usage of marine habitat in the vicinity of the Project site is low and the areas within and in the vicinity of the Project site are not considered as unique and important habitats for CWDs. Given the slow-moving works vessels involved (i.e. about 12-16 vessel movements, including barges, tug boats/supporting vessels, per day at each work area) and the existing marine traffic in North Lantau waters, adverse impact on CWDs and the functionality of Brothers Marine Park (BMP) and the proposed North Lantau Marine Park (NLMP) due to the increased marine traffic are not anticipated. To mitigate the potential underwater noise impacts generated from the marine works, bored piling and vibratory piling methods with the low frequency range over soft marine deposit of the seabed will be adopted. Adverse impacts to CWDs and the functionality of BMP and the proposed NLMP due to the construction of the Project are not anticipated.

3.5.2 Operational Phase

Terrestrial Ecology

3.5.2.1 Considering the degraded nature and involved small-scaled loss of 0.31ha mixed woodland, and the area would likely be developed into a landscape feature with

vegetation planting, adverse terrestrial ecological impact due to loss of mixed woodland is not anticipated. The rest of the Project site was developed area of low ecological value, and hence, indirect disturbance to surrounding habitats and associated wildlife during operational phase is considered to be minor.

Marine Ecology

3.5.2.2 During operation of the proposed marine facilities and marine viaduct, permanent loss of less than 0.01ha of benthic habitat and disturbance of approximately 8.33ha of marine ecological habitat are expected. As mentioned in **Section 3.5.1.5**, the areas within and in the vicinity of the Project site is not considered as unique and important habitats for CWDs. Compared with the existing marine traffic in North Lantau waters, the increase in slow-moving vessels due to the operation of the proposed marine facilities and the maintenance dredging is considered to be minor. With the control over marine transportation (e.g. use of designated fairways, speed restriction when approaching existing and proposed marine parks, avoidance of anchoring within existing and proposed marine parks), the potential risk of vessel collision with CWDs and impact to CWDs due to the increase in underwater sound during operation of the proposed marine facilities is not anticipated. Based on the findings of the water quality impact assessment, the change in water quality from maintenance dredging and the change in hydrodynamic properties due to the Project are also expected to be minor. With the implementation of abovementioned mitigation measures, adverse marine ecological impacts during the operation of the Project are therefore not anticipated.

3.6 Fisheries

3.6.1 Construction Phase

3.6.1.1 During the construction phase of the Project, temporary disturbance to fisheries habitats and loss of access to fishing ground with an area of ~9 ha is expected. Given that the small scale of the area is of low fisheries operation and low to moderate fisheries production, and the low commercial value of fisheries resources, impacts on fisheries are considered to be minor. Impact of elevated levels of underwater sound as a result of construction activities and the vessel operation of marine facilities are also considered to be minor.

3.6.2 Operational Phase

3.6.2.1 During operation phase of the marine facilities and marine viaduct, permanent loss of fishing ground of less than 0.01 ha for pile structures of marine viaduct section and loss of access to approximately 8.33 ha of fishing ground are expected. However, the affected area is considered to very small compared to the availability of fishing grounds elsewhere in Northern Lantau waters available for fishing activities. Hence, impacts on fisheries are considered to be minor. Underwater sound due to vessel operation is considered to be minor to fisheries resources. Indirect impacts to fisheries resources related to perturbations to key water quality parameters from maintenance dredging are expected to be minor as the predicted changes in water quality are localised to immediate vicinity of the Project. No unacceptable change in water quality would be expected. Hence, no adverse fisheries impacts arising from the operation of the Project are anticipated.

3.7 Cultural Heritage

3.7.1 Construction Phase

Terrestrial Archaeology

3.7.1.1 Ha Law Wan Site of Archaeological Interest (SAI) is partly located within the Assessment Area with large separation distance (~295m) from the Project site. With its considerable distance from the works area, neither direct nor indirect impact is anticipated during the construction of the Project. No other cultural heritage resources were identified within the Project site.

Marine Archaeology

3.7.1.2 Supplementary geophysical surveys were conducted in the Marine Facilities Survey Area (MF Site) and eight sonar contacts were identified which are interpreted as modern debris, dumped materials, and navigation buoys, while five magnetic anomalies found in ATCL Site are interpreted as debris. They are considered to have no marine archaeological potential. Furthermore, the seabed in MF Site has been highly disturbed with deep scars from anchoring and seabed disturbance works in the past for many years with very low marine archaeological potential, the potential impact is considered minimal.

3.7.1.3 As sonar contacts and magnetic anomalies identified from geophysical surveys are of no marine archaeological potential, no marine archaeological impact is anticipated and therefore no mitigation measures and further MAI are required.

3.7.1.4 As a precautionary measure, the project proponent and his/her contractor are required to inform AMO immediately when any antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered during the seabed disturbance works in the MF Site and the ATCL Site.

3.7.2 Operational Phase

Terrestrial Archaeology

3.7.2.1 Given the considerable distance from Ha Law Wan SAI, adverse cultural heritage impact is not anticipated during operational phase of the Project.

Marine Archaeology

3.7.2.2 As no adverse cultural heritage/marine archaeological impact is anticipated in operational phase of the Project, no mitigation measure is required.

3.8 Landscape and Visual

3.8.1.1 A few Landscape Character Areas (LCAs) and Landscape Resources (LRs) are identified within the Project site. With the implementation of proper mitigation measures during construction phase and operation phase (e.g. tree preservation, compensation/transplanting for affected trees, provision of amenity planting and landscape features), residual landscape impacts are 'Slight' / 'Insubstantial' on most of the LRs and LCAs. However, 'Moderate' residual impacts are anticipated only on LR5 (Amenity Landscape Areas along Airport Road and Chek Lap Kok Road) and LCA1 (Transport Corridor Landscape) during the construction and operation phases.

3.8.1.2 Approximately 985 nos. of existing trees and 141 nos. of planned trees were identified within 5m of the proposed ATCL alignment, of which approx. 385 to 435 nos. of existing trees that would not be affected by the proposed works will be retained, while 690 to 740 nos. of trees that would be directly affected by the proposed works will be proposed to be removed or transplanted as far as practicable. There is no Old and Valuable Trees (OVT) in accordance with DEVB TC(W) NO. 5/2020 is identified within the Project boundary. Approximately 535 nos. of trees are proposed to be compensated / transplanted within the proposed works area. Under the proposed scheme for the Project, opportunities for tree compensation within the Project boundary has been fully explored and incorporated in the proposed mitigation measures as much as practicable. To further mitigate the visual and landscape impact of the Project, approximately 155 to 205 nos. of the trees would be compensated off-site within the Airport Island and HKP Island.

3.8.1.3 The visual impacts on Visual Sensitive Receivers (VSRs) such as the VSR1 (Residents of Tung Chung Crescent), VSR2 (Residents of Fu Tung Estate), VSR3 (Residents of Seaview Crescent), VSR8 (Residents of Visitation Church), VSR9 (Workers of Visitation Church), VSR10 (Residents of Campus and Dormitory of the Hong Kong International Aviation Academy), VSR12 (Users of Tung Chung Development Pier) and VSR29 (Users of Tung Chung Town Centre Waterfront Promenade) are anticipated to be moderate without the provision of mitigation measures during construction phase. However, with the implementation of recommended mitigation measures such as the provision of amenity planting, aesthetically pleasing design, the residual visual impacts would be reduced to 'Slight' / 'Insubstantial' by operation day 1 and 'Insubstantial' by operation year 10 when the mitigation measures have matured and taken effect. Hence, the visual impacts are considered acceptable with the mitigation measures.

3.8.1.4 In view of the above, it is considered that the overall landscape and visual impact associated with the construction and operation of the Project are acceptable with the implementation of the recommended mitigation measures.

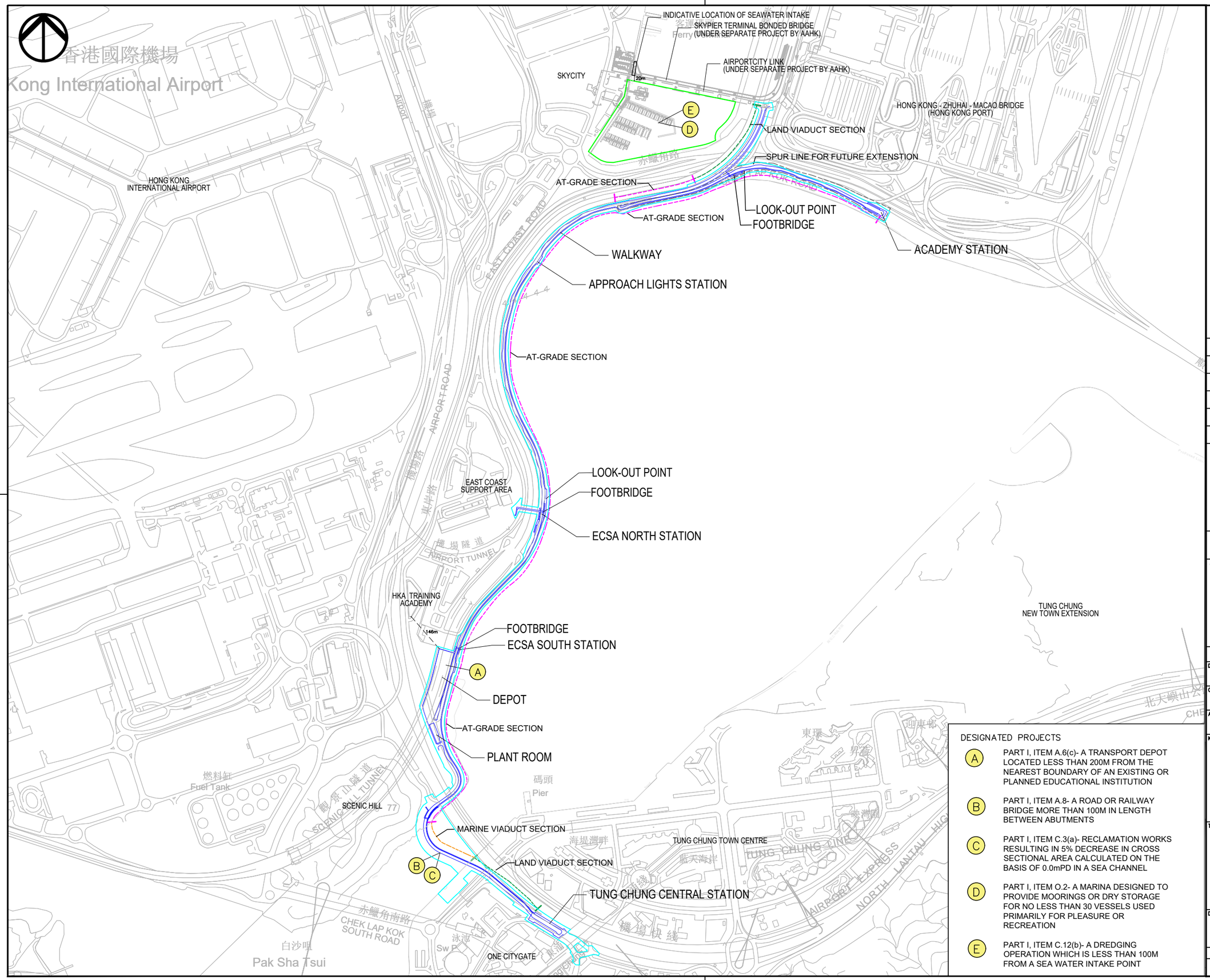
4 ENVIRONMENTAL MONITORING AND AUDIT

4.1.1.1 The EIA study of the Project has demonstrated its compliance with the EIA Study Brief and EIAO-TM requirements. Actual impacts during the construction works will be monitored through a detailed EM&A programme. Full details of the programme are presented in a separate EM&A Manual associated with the EIA Report. The EM&A programme will provide management actions to check the effectiveness of the recommended mitigation measures and compliance with relevant statutory criteria, thereby ensuring the environmental acceptability of the construction and operation of the Project.

5 CONCLUSION

5.1.1.1 This EIA study assessed the overall acceptability of the environmental impacts arising from the construction and operation of the Project, in accordance with the EIA Study Brief (No. ESB-342/2021), EIAO-TM and other relevant guidelines and criteria. The findings of EIA study indicated that, with the implementation of the recommended mitigation measures, the Project would be environmentally acceptable. An EM&A programme has been recommended to check the effectiveness of the recommended mitigation measures.

FIGURES



LEGEND

- PROPOSED ALIGNMENT OF AIRPORT TUNG CHUNG LINK
- PROPOSED MARINE FACILITIES
- CONSTRUCTION SITE BOUNDARY
- LAND VIADUCT SECTION
- MARINE VIADUCT SECTION
- AT-GRADE SECTION
- SPUR LINE

Rev	Date	Descriptions	Check

DESIGNATED PROJECTS

(A) PART I, ITEM A.6(c)- A TRANSPORT DEPOT LOCATED LESS THAN 200M FROM THE NEAREST BOUNDARY OF AN EXISTING OR PLANNED EDUCATIONAL INSTITUTION

(B) PART I, ITEM A.8- A ROAD OR RAILWAY BRIDGE MORE THAN 100M IN LENGTH BETWEEN ABUTMENTS

(C) PART I, ITEM C.3(a)- RECLAMATION WORKS RESULTING IN 5% DECREASE IN CROSS SECTIONAL AREA CALCULATED ON THE BASIS OF 0.0mPD IN A SEA CHANNEL

(D) PART I, ITEM O.2- A MARINA DESIGNED TO PROVIDE MOORINGS OR DRY STORAGE FOR NO LESS THAN 30 VESSELS USED PRIMARILY FOR PLEASURE OR RECREATION

(E) PART I, ITEM C.12(b)- A DREDGING OPERATION WHICH IS LESS THAN 100M FROM A SEA WATER INTAKE POINT

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

HONG KONG INTERNATIONAL AIRPORT

Consultant

MEINHARDT in association with OTC ERM

Consultant's Signatures for Approval	Date
Design Supervisor	
Checkers	
Authorised Representative	

Key Plan

Title

AIRPORT TUNG CHUNG LINK PROJECT

PROJECT LOCATION

Drawing No.

FIGURE 1.1

Originator	Location	Discipline	Typo	Dwg Sequence No.

Status	Scale	Rev
DESIGN	1 : 2000 (A3)	DESIGN

Ferry Terminal

SKYPIER TERMINAL

SKYPIER TERMINAL BONDED BRIDGE
(UNDER SEPARATE PROJECT BY AAHK)

AIRPORTCITY LINK
(UNDER SEPARATE PROJECT BY AAHK)

GANGWAY

BLOCK FOR SKYCITY PIER

BLOCK FOR BERTHING FACILITIES

BUS WAITING AREA

SECURITY GATE

KIOSK AREA

WAVE ATTENUATOR

FLOATING PONTOONS

赤鱲角路

CHEK LA

0 20 50 100m

LEGEND

PROPOSED MARINE FACILITIES

Rev	Date	Descriptions	Check

香港國際機場 | HONG KONG INTERNATIONAL AIRPORT

HONG KONG INTERNATIONAL AIRPORT

Consultant

MEINHARDT
in association with
OTC
ERM

Consultant's Signatures for Approval	Date
Design Supervisor	
Checkers	
Authorised Representative	

Key Plan

Title

AIRPORT TUNG CHUNG LINK PROJECT

LAYOUT OF PROPOSED
MARINE FACILITIES

Drawing No.

FIGURE 1.2

Originator	Location	Discipline	Typo	Dwg Sequence No.

Status	Scale	Rev
DESIGN	AS SHOWN	DESIGN

香港國際機場
Kong International Airport

SKYPIER TERMINAL BONDED BRIDGE
(UNDER SEPARATE PROJECT BY AAHK)

SKYCITY STATION
(OPTION 1,2)

SKYCITY

AIRPORTCITY LINK
(UNDER SEPARATE PROJECT BY AAHK)

HKP STATION
(OPTION 1,2)

HONG KONG - ZHUHAI - MACAO BRIDGE
(HONG KONG PORT)

HONG KONG
INTERNATIONAL AIRPORT

OPTION 3/ PREFERRED OPTION

LOOK-OUT POINT
FOOTBRIDGE

ACADEMY STATION (OPTION 3)

WALKWAY

APPROACH LIGHTS STATION (OPTION 3)

OPTION 2

EAST COAST
SUPPORT AREA

CNA STATION (OPTION 2)

CAD HQ FACILITIES
BUILDINGS

CAD HQ

LOOK-OUT POINT

FOOTBRIDGE

CNAC
HEADQUARTERS

ECSA NORTH STATION (OPTION 3)

OPTION 1

CNA STATION (OPTION 1)

HKA TRAINING
ACADEMY

FOOTBRIDGE

ECSA SOUTH STATION (OPTION 3)

CAX STATION
(OPTION 1,2)

DEPOT

PLANT ROOM

TUNG CHUNG
NEW TOWN EXTENSION

TUNG CHUNG TOWN CENTRE

TUNG CHUNG CENTRAL STATION

ONE CITYGATE

OPTION S1/ PREFERRED OPTION

OPTION S2

0 100 300 600m

LEGEND

- ATCL ALIGNMENT OPTION 1
- ATCL ALIGNMENT OPTION 2
- ATCL ALIGNMENT OPTION 3 / PREFERRED OPTION
- ATCL ALIGNMENT OPTION 1 - PROPOSED LAND RECLAMATION AREA
- PROPOSED MARINE FACILITIES
- TCC STATION OPTION S1/ PREFERRED OPTION
- TCC STATION OPTION S2
- SECTION OF ALIGNMENT TO OPTION S2

Rev	Date	Descriptions	Check

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

HONG KONG INTERNATIONAL AIRPORT

Consultant

MEINHARDT in association with OTC ERM

Consultant's Signatures for Approval	Date
Design Supervisor	
Checkers	
Authorised Representative	

Key Plan

N

Title

AIRPORT TUNG CHUNG LINK PROJECT

ALTERNATIVE ATCL ALIGNMENT AND TCC STATION SITING OPTIONS

Drawing No.

FIGURE 2.1

Originator	Location	Discipline	Typo	Dwg Sequence No.
Status DESIGN		Scale 1 : 2000 (A3)		Rev DESIGN

香港國際機場
Kong International Airport

SKYPIER TERMINAL BONDED BRIDGE
(UNDER SEPARATE PROJECT BY AAHK)

AIRPORTCITY LINK
(UNDER SEPARATE PROJECT BY AAHK)

SKYCITY

HONG KONG - ZHUHAI - MACAO BRIDGE
(HONG KONG PORT)

HONG KONG
INTERNATIONAL AIRPORT

CHEK LAP KOK ROAD

LOOK-OUT POINT
FOOTBRIDGE

WALKWAY

APPROACH LIGHTS STATION

DEPOT (OPTION D1)

ACADEMY STATION

EAST COAST ROAD

AIRPORT ROAD

LOOK-OUT POINT
FOOTBRIDGE

ECSA NORTH STATION

EAST COAST
SUPPORT AREA

AIRPORT TUNNEL

HKA TRAINING
ACADEMY

FOOTBRIDGE
ECSA SOUTH STATION

DEPOT (OPTION D2) /
PREFERRED OPTION

PLANT ROOM

TUNG CHUNG
NEW TOWN EXTENSION

SCENIC HILL

SCENIC HILL TUNNEL

TUNG CHUNG TOWN CENTRE

TUNG CHUNG LINE

AIRPORT EXPRESS

NORTH LANTAU HIGHWAY

TUNG CHUNG CENTRAL STATION

CHEK LAP KOK
SOUTH ROAD

ONE CITYGATE

Pak Sha Tsui

0 100 300 600m

LEGEND

- PROPOSED ALIGNMENT OF AIRPORT TUNG CHUNG LINK
- PROPOSED MARINE FACILITIES
- DEPOT OPTION D1
- DEPOT OPTION D2/ PREFERRED OPTION

Rev	Date	Descriptions	Check

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

HONG KONG INTERNATIONAL AIRPORT

Consultant

MEINHARDT
in association with
OTC
ERM

Consultant's Signatures for Approval	Date
Design Supervisor	
Checkers	
Authorised Representative	

Key Plan

N

Title

AIRPORT TUNG CHUNG LINK PROJECT

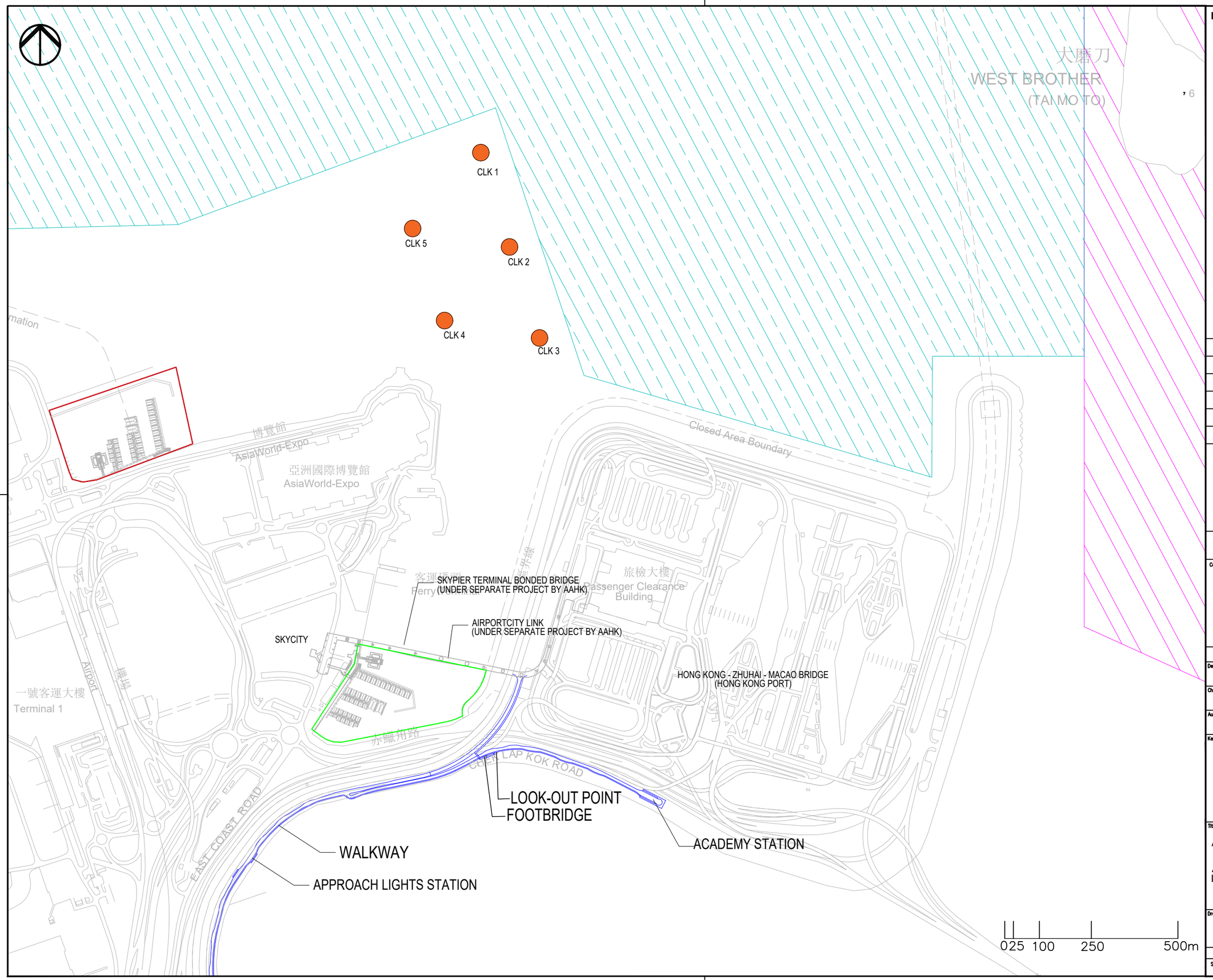
ALTERNATIVE DEPOT LOCATION OPTIONS

Drawing No.

FIGURE 2.2

Originator	Location	Discipline	Typo	Dwg Sequence No.

Status	Scale	Rev.
DESIGN	AS SHOWN	DESIGN



LEGEND

- PROPOSED ALIGNMENT OF AIRPORT TUNG CHUNG LINK
- PROPOSED MARINE FACILITIES LOCATION-OPTION MF-A
- PROPOSED MARINE FACILITIES LOCATION-OPTION MF-B / PREFERRED OPTION
- PROPOSED NORTH LANTAU MARINE PARK
- THE BROTHERS MARINE PARK
- ARTIFICIAL REEF AT THE CHEK LAP KOK MARINE EXCLUSION ZONE

Rev	Date	Descriptions	Check

香港國際機場 | HONG KONG INTERNATIONAL AIRPORT

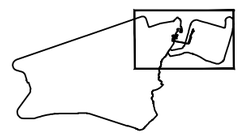
HONG KONG INTERNATIONAL AIRPORT

Consultant

MEINHARDT in association with OTC ERM

Consultant's Signatures for Approval	Date
Design Supervisor	
Checkers	
Authorised Representative	

Key Plan



Title

AIRPORT TUNG CHUNG LINK PROJECT

ALTERNATIVE MARINE FACILITIES LOCATION OPTIONS

Drawing No.

FIGURE 2.3

Originator	Location	Discipline	Typo	Dwg Sequence No.
Status DESIGN		Scale AS SHOWN		Rev DESIGN

MEINHARDT

Consulting Engineers · Planners · Managers

工程設計 · 策劃 · 統籌

Meinhardt (Hong Kong) Ltd

邁進(香港)有限公司

10/F GENESIS 33-35 WONG CHUK HANG ROAD HONG KONG

香港黃竹坑道33-35號創協坊10樓

+852 2858 0738 | **FAX** +852 2540 1580

mail@meinhardt.com.hk

www.meinhardt-china.com | www.meinhardtgroup.com