Airport Authority Hong Kong

Airport City Link

Project Profile

271089 – D5.4

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Job number 271089

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1 Basic Information

1.1 Project Title

1.1.1 Airport City Link (hereinafter referred to as the "Project")

1.2 Purpose and Nature of the Project

1.2.1 As one of the world's leading airports, Hong Kong International Airport (HKIA) is undergoing a transformation from a city airport into an Airport City. As a core element in the HKIA Airport City, SKYCITY (previously named as North Commercial District) is to create a new destination that aims to capture broad opportunities in tourism and business, while also providing a dynamic lifestyle and family entertainment hub for Hong Kong citizens, tourists from Pearl River Delta (PRD) region and worldwide.

1.2.2 With the opening of the Hong Kong-Zhuhai-Macao Bridge (HZMB) and the Hong Kong Port (HKP), it becomes more accessible for tourists from PRD region to the HKIA and SKYCITY.

1.2.3 To capitalize on the tourists and local citizens travel via the HZMB, the Tuen Mun – Chek Lap Kok Link (TMCLKL) and Tsing Ma Bridge, Airport Authority Hong Kong (AAHK) is planning to enhance the accessibility between SKYCITY and the HKP by providing a connection bridge (i.e. Airport City Link) to link the SKYCITY with the HKP Passenger Clearance Building (PCB) directly, with provision of shuttle services and pedestrian pathway. The Project scale is anticipated to be small, approximately 400m long marine section and 450m long land section of the bridge. In view of the environmental friendly initiatives by using electric vehicles only for the shuttle services, there is no air pollutant emission during its operation.

1.2.4 This Project Profile (PP) is prepared to establish the environmental acceptability of the Project, and to seek permission from the Director of Environmental Protection (DEP) to apply directly for an Environmental Permit (EP) for the construction and operation of the Project under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499).

1.3 Background Information

1.3.1 In 2015, Civil Engineering and Development Department (CEDD) commenced "Planning, Engineering and Architectural Study for Topside Development at Hong Kong Boundary Crossing Facilities Island of Hong Kong-Zhuhai-Macao Bridge".

1.3.2 In October 2018, it was announced in the 2018 Policy Address that the Government would invite AAHK to submit a proposal for the Topside Development of HKP with a view to create an Aerotropolis, by coupling with the Three-runway System, high value-added logistic centre at the South Cargo Precinct, the SKYCITY project, as well as the AsiaWorld Expo, to connect the Guangzhou-HK-Macao Greater Bay Area and the world, thereby strengthening

and enhancing Hong Kong's position as an international business centre. To enhance people flow and pedestrian mobility between HKP Island and SKYCITY, yet minimising vehicular traffic to a practicable extent, AAHK proposes to construct a connection bridge (i.e. the Airport City Link) which provides shuttle services and pedestrian pathway, while other vehicles are restricted from accessing the Airport City Link.

1.3.3 In 2017, AAHK had already planned to construct an Intermodal Transfer Terminal (ITT) adjacent to the SkyPier and the associated ITT Bonded Vehicular Bridge (ITT-BVB) to provide the necessary direct and effective connection between the ITT and the HKP. An Environmental Impact Assessment (EIA) has been conducted for the project of "Intermodal Transfer Terminal – Bonded Vehicular Bridge and Associated Roads" and the EIA Report has been approved by Environmental Protection Department (EPD) on 23 August 2018 (Register No.: AEIAR-216/2018). AAHK has also obtained the Environmental Permit (EP) (No. EP-560/2018) issued by EPD on 24 August 2018. During the period, Topside Development of HKP and the idea / proposal for the Airport City Link has not been come up.

1.3.4 The Airport City Link will serve both the tourists and local visitors, which is publicly accessible. In contrast, the ITT-BVB will only serve the air transit passengers from the PRD area to HKIA and vice versa via a hassle-free bonded vehicular bridge from HKP to SkyPier, which is similar to the bonded ferry services between the SkyPier and nine ports in the PRD. As only air transit passengers by bonded vehicles will be permitted to access the area, and no public vehicle will be allowed to access the ITT-BVB, it will be segregated from public use and cannot be shared with the Airport City Link users. Therefore, the ITT-BVB is functionally independent from the Airport City Link.

1.3.5 The potential impact of the Airport City Link together with the cumulative environmental impact with the ITT-BVB shall be assessed and reviewed in this PP. As further explained in the subsequent sections, the alignment of the marine section of the Project would run along the immediate south of the ITT-BVB. Besides, the span, size and alignment for piles and pile caps would be very similar to those of the ITT-BVB. Together with the duly planned construction methodology and no concurrent marine construction activities below sea water level to be conducted for the ITT-BVB and Airport City Link, these would help avoid and minimise any adverse cumulative environmental impacts.

1.3.6 Furthermore, due to the proximity and similarity of the Airport City Link and ITT-BVB in terms of nature, alignment, design parameters and construction method, the findings from the approved ITT-BVB EIA are considered relevant and valid, thus could provide sufficient information to evaluate the potential environmental impacts bought by the construction and operation of Airport City Link. As concluded in the approved ITT-BVB EIA, the ITT-BVB would be environmentally acceptable with no unacceptable residual impacts with proper implementation of mitigation measures. The environmental impact of the Project is unlikely to be adverse with proper mitigation measures in place. Given that the effectiveness of the required mitigation measures (details refer to the subsequent sections) have been demonstrated in many real examples, it would be beyond doubt that the environmental impact of the Project falls well within the guidelines and criteria laid down in the Technical Memorandum on Environmental Impact

Assessment Process (TM-EIAO). Therefore, application for permission to apply directly for an EP is proposed.

1.4 Name of Project Proponent

1.4.1 The Project Proponent is the Airport Authority Hong Kong.

1.5 Location and Scale of Project and History of Site

1.5.1 The Project is situated between the Airport Island and HKP Island, at the south of the existing SkyPier on the Airport Island. The Airport Island was put into service in 1998, while the HKP Island was in 2018. The western section of the Project will be ended adjacent to the SKYCITY on the Airport Island, of which the construction works has commenced and will be completed in phases from 2023 to 2027. The western elevated platform is currently occupied by the construction site of the SKYCITY, which was partially formed by reclamation and was a golf course between 2007 to 2015. The eastern section of the Project will be ended adjacent to the HKP PCB, which has commenced operation since 2018. The eastern elevated platform is currently occupied by paved road, while it was a reclaimed land in the past.

1.5.2 The Project scale is anticipated to be small. An approximately 850m-long viaduct, of which an approximately 400m-long section will span over the marine channel between the Airport Island and HKP Island. Elevated platforms for dropoff and pickup of passengers are provided at the western and eastern ends of the viaduct.

1.5.3 For the marine section, the viaduct will run in parallel and along the immediate south of the planned ITT-BVB, with its span length and pile cap arrangement same as that of ITT-BVB. The proposed bridge piers will be situated next to the bridge piers of ITT-BVB and the piles will be aligned with the ITT-BVB. The deck level will also be in-line with the ITT-BVB. The pier shape of the marine section will be designed in a similar form of the ITT-BVB to provide a consistent outlook between the two bridges. The purpose of adopting this alignment for this marine section viaduct is to avoid and minimise any adverse cumulative environmental impacts (such as water quality, marine ecology and visual) on the water channel between the Airport Island and HKP Island.

1.5.4 After the marine section approaches to the western side of the HKP Island, the viaduct will overpass the HZMB viaduct as well as the CLP power substation. The alignment will then turn northwards to connect with the proposed elevated drop-off and pick-up platform at the western side adjacent to the HKP PCB; the platform will be elevated at about +14.5mPD and measure approximately 80m (L) and 75m (W). For the western end of the land section, the viaduct will connect with an elevated platform adjacent to the SKYCITY; the platform will be elevated at about +17mPD and measure approximately 100m (L) and 30m (W). The pier shape design for the land section will adopt the same as the marine section for a consistent appearance of the whole viaduct.

1.5.5 To facilitate the operations on Airport City Link, an at-grade plant room will be provided. There are currently two plant room locations under consideration, pending further discussion with Highways Department. Option 1 is located to the north of the elevated platform at the HKP Island and Option 2 is located to the southern side of the HKP Island (see **Figure 1.1**). Both plant room options measure approximately 24m (L) and 16m (W). As the proposed plant room is relatively small, very limited excavation and no piling works would be required for its construction, thus very limited amount of construction and demolition (C&D) materials would be generated. In addition, both plant room options are located on the landscape area of the HKP Island, which is a reclaimed land. Therefore, land contamination potential is not anticipated. Due to the nature and small scale of the proposed plant room, it is unlikely to cause adverse environmental impacts during construction and operational phases. However, there would be some existing and planned trees being affected by the proposed plant room (Option 1). Its potential landscape impact and mitigation measures will be discussed in **Section 5.6** and **Section 6.6** respectively.

1.5.6 The location and general layout of the Project are shown in **Figure 1.1**.

1.6 Construction Method

1.6.1 Minimisation of environmental impacts is one of the considerations in devising the construction methodology for the Project. Key environmental issues during the construction including water quality and marine ecology are in consideration for the marine section of the Project.

1.6.2 Construction of the marine viaduct's foundation will generally involve the use of in-situ bored piles founded on bedrock. Piling equipment will be set up on a barge platform after installation of silt curtain in the surrounding of the active marine works area. The schematic diagram for cofferdam and pile casing with silt curtain is provided in **Appendix 1.1**.

1.6.3 The pile construction will be carried out through placing a steel pile casing at the pier site within the silt curtain, in which the seawater will be trapped inside the casing. A funnel would be placed at the top of pile casing during excavation. This construction method would create a confined environment for excavation, which could minimise the release of suspended solids into the water column and reduce the risk of disturbance to the seabed and the adjacent marine environment. Mechanical Grab and Reverse Circulation Drill will be used for excavation of soil and rock socket respectively. Pre-fixed steel reinforcement cage with permanent casing will be installed for concreting. Concrete from existing batching plants will be delivered to the piling site by concrete trucks via marine route using ro-ro barge for concreting the marine piles. No open dredging of seabed will be involved.

1.6.4 The marine pile caps above high-tide level will be installed through construction of cofferdams, which consist of using permanent precast panels. The seawater inside the cofferdam will be pumped out to create a dry working environment throughout the construction process of pile cap. The bridge pier will be constructed by traditional means with formworks and falseworks on pile caps. There are 6 marine bridge piers under the Project. Their marine foundation works will be constructed by two phases (i.e. marine foundation works for 3 – 4 marine bridge piers under each phase).

1.6.5 Similar to the marine section, cast in-situ bored piles will be adopted for the foundation of the land viaduct and the elevated platform deck. The land pile caps will be embedded below ground level. Cofferdam will be installed for the construction of the pile caps. Concrete from existing batching plants will be delivered to the site by concrete trucks via land route.

1.6.6 For the construction of the viaduct deck, precast construction method will be adopted as far as practicable. The deck segments will be precast in off-site casting yard (anticipated in the Mainland China). The precast deck segments will then be transported to the site and erected by balanced cantilever method or span-by-span method. However, in-situ construction method will also be considered where necessary due to site constraints such as delivery and erection of the precast deck segments, and also the risk to existing traffic and operation of the HKP.

1.6.7 For in-situ construction method, the deck segments will be cast within form-travellers and constructed by the balanced cantilever method. Concrete will be pumped or lifted inside an enclosed container for concreting the deck. Tarpaulin plastic sheet will be mounted at the bottom of the temporary working platform for concreting to prevent concrete from falling down to the sea during concreting. No concrete batching activity will be carried out on site. Therefore, the in-situ construction method could achieve comparable environmental performance as precast construction method with general good site practices and mitigation measures in place.

1.6.8 Similar to the bridge deck, the elevated platform for drop-off and pick up will be construction by precast construction method as far as practicable. In-situ construction method will also be considered where precast construction method is not feasible due to site constraints.

1.6.9 To avoid and minimise any adverse cumulative environmental impacts brought by marine works in the proximity, the marine works for the Project would be proactively planned and coordinated to avoid any concurrent marine works below sea water level, especially those marine works for the ITT-BVB.

1.6.10 A maximum 4 marine construction vessels (including barges, tug boats, etc.) per day would be required during the construction period. Each marine vessels would manoeuvre around 4 times per day for material transport and construction means.

1.6.11 Throughout all the marine works, silt curtains will be installed around the works area. Water quality monitoring would also be conducted at selected water sensitive locations to ensure no adverse water quality impacts during construction. More details of the good practices, monitoring and auditing requirements for water quality are given in **Section 6.3**.

1.7 Type of Designated Projects

1.7.1 The Project is classified as the following Designated Projects (DPs) under Part I, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO):

- *Part I, Item A.8 – A road bridge more than 100m in length between abutments, and*

- *Part I, Item C.3(a) – Reclamation works resulting in 5% decrease in cross sectional area calculated on the basis of 0.0mPD in sea channel.*

1.8 Name and Telephone Number of Contact Person

1.8.1 All enquiries regarding the Project can be addressed to:

HKIA Tower, 1 Sky Plaza Road,
Hong Kong International Airport
Lantau, Hong Kong

Mr. Collin Chan [Authority's Representatives]
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2 Outline of Planning and Implementation Programme

2.1 Planning and Implementation

2.1.1 The Project Proponent has engaged the Consultant to undertake the application for approval for direct application of EP for the Project under Section 5(1)(b) and Section 5(9) of the EIAO and the Project will be carried out by qualified contractors to be appointed under various works contracts.

2.2 Project Timetable

2.2.1 The construction works of the Project will tentatively commence in end-2021 while for completion in end-2023/early-2024. The tentative commissioning of the Airport City Link is by 2024.

2.3 Potential Interface with Other Projects

2.3.1 There are several concurrent projects on Lantau that may have potential interface with the Project as listed in **Table 2.1**. Locations of these concurrent projects are shown in **Figure 2.1**. The cumulative impacts from these concurrent projects have been assessed in the following sections in this PP.

Table 2.1 Concurrent projects with potential interface with the Project

Project/ Study	Project Proponent	Construction Programme		Potential Cumulative Impact	
		Start	Complete	Construction	Operation
Expansion of Hong Kong International Airport into a Three-Runway System (3RS)	Airport Authority Hong Kong	August 2016	End 2024[1]	✓	✓
Tung Chung New Town Extension	Civil Engineering and Development Department	Mid 2017	End 2030[2]	✓	✓
Tuen Mun-Chek Lap Kok Link (TMCLKL)	Highways Department	November 2011	2020[3]	-	✓
Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities (HZMB HKBCF)	Highways Department	November 2011	End 2018[4]	-	✓
Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road (HZMB HKLR)	Highways Department	May 2012	End 2018[5]	-	✓
SKYCITY	Airport Authority Hong Kong	2017	2027[6]	✓	✓
Intermodal Transfer Terminal	Airport Authority Hong Kong	2020[6]	End 2021[6]	✓	✓

Project/ Study	Project Proponent	Construction Programme		Potential Cumulative Impact	
		Start	Complete	Construction	Operation
Intermodal Transfer Terminal - Bonded Vehicular Bridge and Associated Roads	Airport Authority Hong Kong	2020[7]	2022[7]	✓	✓

Notes:

[1] Source: Hong Kong International Airport Media Center Press Release (https://www.hongkongairport.com/en/media-centre/press-release/)

[2] Source: Approved Tung Chung New Town Extension EIA Report (Register No.: AEIAR-196/2016)

[3] Source: Highway Department's website at (https://www.hyd.gov.hk/en/road_and_railway/hzmb_projects/tmclkl/index.html)

[4] Source: Highway Department's HZMB website at (http://hzmb.hk/eng/index.html)

[5] Source: Highway Department's HZMB website at (http://hzmb.hk/eng/index.html)

[6] Source: Information provided by AAHK

[7] Source: Approved Intermodal Transfer Terminal – Bonded Vehicular Bridge and Associated Roads EIA Report (Register No.: AEIAR-216/2018)

3 Use of Previously Approved EIA Reports/ Direct EP Applications

3.1.1 Due to the proximity to the ITT-BVB, the findings of the approved EIA Report for "Intermodal Transfer Terminal – Bonded Vehicular Bridge and Associated Roads" (Register No. AEIAR-216/2018), which was approved on 23 August 2018, have been reviewed for the preparation of this PP. The ITT-BVB Project involves the construction and operation of a 570m long vehicular bridge connecting the ITT of HKIA and HKP Island. Its marine section is approximately 360m in length, supported by bridge concrete piers, which constitutes the below Schedule 2 DPs:

- *Part I, Item A.8 - A road bridge more than 100m in length between abutments, and*
- *Part I, Item C.3(a) - Reclamation works resulting in 5% decrease in cross sectional area calculated on the basis of 0.0mPD in sea channel*

3.1.2 As the Project is similar to the ITT-BVB in terms of locality, scale, construction method and nature of operation, while the ITT-BVB EIA Report was approved on 23 August 2018, it is considered that the information and findings of the approved ITT-BVB EIA Report are still relevant and valid.

4 Major Elements of the Surrounding Environment

4.1 General

4.1.1 The Project is situated between the Airport Island and HKP Island. The marine section is running in parallel and to the immediate south of the ITT-BVB. Since the approval of the ITT-BVB EIA Report in 2018, there is no major setting changes in the surrounding environment. Therefore, the same set of representative sensitive receivers on various aspects as identified in the approved ITT-BVB EIA Report are still valid.

4.1.2 Section 9.7 of the approved ITT-BVB EIA Report assessed the potential cultural heritage impact along the ITT-BVB alignment and its vicinity. Since there are neither terrestrial archaeological potential, marine archaeological potential nor built heritage resources within the Project area, no impact of cultural heritage is anticipated during both construction and operational phases.

4.1.3 No sites of fisheries importance are located within the assessment area. The nearest site of fisheries importance, the southern boundary of recognised spawning grounds of commercial fisheries resources, is located about 700m to the north of the Project. Considering the minor nature of the pier installation works at the water channel between the HKIA and HKP Island, minor permanent loss of fishing ground is expected at the six proposed bridge piers and thus no adverse impact on fisheries resources is anticipated.

4.1.4 Also, the nearest Potentially Hazardous Installation (PHI) is the Aviation Fuel Tank Farm operated by AFSC, which is located more than 2.5km to the southwest of the Project. Therefore, potential risk from the PHI on the future Airport City Link users and workers is not anticipated.

4.1.5 The land section of the Project is located on reclaimed lands of the Airport Island and HKP Island, which is currently occupied by construction sites, site offices, seawall, landscape area and paved roads. AAHK confirmed that the Project works area on the Airport Island was occupied by projects site offices and paved roads in the past, which did not involve potentially land contamination activities, except the area of the western elevated platform. As mentioned in **Section 1.5.1**, the western elevated platform is located at former golf course between 2007 to 2015. With reference to Section 3.10 and Section A.10 of the Approved Project Profile for “Development of SkyCity Golf Course” (PP-256/2005), land contamination potential was not anticipated during its construction, operational and decommissioning phases with proper implementation of mitigation measures. In addition, the Soil Contamination Assessment Report / Post-operation Monitoring Report of the “Development of SkyCity Golf Course” project has concluded no land contamination issue and thus no remediation would be required. Therefore, potential land contamination issue due to the operation of golf course is not anticipated. For the Project works area on the HKP Island, it is on reclaimed land and the land uses remain unchanged since its operation (i.e. landscape area and paved roads) since the opening of HKP in 2018. In addition, the piers will not land within the site boundary of the CLP Power Substation thus land contamination issue associated with the operation of the substation is not anticipated (see **Figure 4.1**). The potential land contamination due to the past

land uses is unlikely. Therefore, potential land contamination issue is not anticipated.

4.1.6 As potential impacts on cultural heritage, fisheries, hazard and land contamination are not anticipated, these potential impacts will not be further discussed in this PP.

4.2 Air Quality Impact

4.2.1 With reference to the approved ITT-BVB EIA Report, representative Air Sensitive Receivers (ASRs) within the 500m assessment area that may be affected by the Project have been reviewed and are listed in **Table 4.1** and presented in **Figure 4.2**.

Table 4.1 Representative air sensitive receivers

ASR	Description	Uses [1]	Existing / Planned	Nearest distance from the Project
1	Offices at SkyPier	O	Existing	~75m
2	Hong Kong SkyCity Marriott Hotel	H	Existing	~195m
3	Offices at Passenger Clearance Building of HKP	O	Existing	~5m
4	East Sea Rescue Berth Airport Fire Contingent	O	Existing	~450m
5	AsiaWorld-Expo	C	Existing	~340m
6	Planned Hotel at SKYCITY	H	Planned [2]	~230m
7	Offices at Planned Intermodal Transfer Terminal	O	Planned [2]	<5m

Notes:
[1] O – Other Specific Use, C – Commercial, H – Hotel
[2] The planned hotel at SKYCITY will be in operation in 2021, while the planned ITT will be in operation in 2022. Both would have been occupied during the construction phase of the Project.

4.3 Noise Impact

4.3.1 With reference to the approved ITT-BVB EIA Report, representative Noise Sensitive Receivers (NSRs) within the 300m assessment area that may be affected by the Project have been reviewed and are listed in **Table 4.2** and presented in **Figure 4.3**.

Table 4.2 Representative noise sensitive receivers

NSR	Description	Uses [1]	Existing / Planned	Rely on Opened Window for Ventilation [Y/N]
1	Offices at SkyPier	O	Existing	N
2	Hong Kong SkyCity Marriott Hotel	H	Existing	N
3	Offices at Passenger Clearance Building of HKP	O	Existing	N

NSR	Description	Uses [1]	Existing / Planned	Rely on Opened Window for Ventilation [Y/N]
4	Offices at Planned Intermodal Transfer Terminal	O	Planned	N
5	Planned Hotel at SKYCITY	H	Planned	N

Notes:
[1] O – Other Specific Use, H – Hotel
[2] All identified NSRs do not rely on opened windows for ventilation

4.3.2 According to latest information available, there are neither existing nor planned NSRs which rely on opened windows for ventilation identified within the 300m assessment area of the Project.

4.4 Water Quality Impact

4.4.1 With reference to the approved ITT-BVB EIA Report, representative Water Sensitive Receivers (WSRs) that may be affected by the Project have been reviewed and are listed in **Table 4.3** and presented in **Figure 4.4**.

Table 4.3 Representative water sensitive receivers

WSR	Description
Bathing Beaches	
B01	Butterfly Beach
B02	Gazetted Beaches at Tuen Mun (Castle Peak Beach, Kadoorie Beach, Cafeteria Old Beach, Cafeteria New Beach)
B03	Golden Beach
B04	Lung Kwu Sheung Tan (Non-gazetted Beach)
B05	Lung Kwu Tan (Non-gazetted Beach)
Typhoon Shelter	
T01	Tuen Mun Typhoon Shelter
Marina	
M01	Proposed Marina at Tung Chung East Reclamation
Cooling Water Intakes	
C03	Castle Peak Power Station
C04	Shiu Wing Steel Mills
C07	Future Airport (East)
C08	Airport (North)
C09	Airport (South)
C10	Hong Kong Port
C12	Future Tung Chung East
C13	Future Siu Ho Wan Development [1]
C14	Proposed Ta Pang Po Pumping Station
C15	Future Sunny Bay Development

WSR	Description
C17	Future Lung Kwu Tan Development
C18	China Cement Plant
Flushing Water Intakes	
C05	Tuen Mun (WSD)
C06	Lok On Pai Salt Water Pumping Station
C11	Tung Chung
C16	Hong Kong Garden
C19	Near Butterfly Beach
C20	Near LRT Terminus
Ecological Resources	
E02	Yam O Wan (Mangrove, Seagrass & Horseshoe Crab Habitat)
E03	Sham Shui Kok (Coral Habitat)
E04	The Brothers Marine Park (Coral Habitat)
E05	Tai Ho Wan and Tai Ho Stream Site of Special Scientific Interest (SSSI) (Mangrove, Seagrass & Horseshoe Crab Habitat)
E07	Tung Chung (Coral Habitat)
E08	Tung Chung Wan and San Tau Beach SSSI
E09	Hau Hok Wan (Horseshoe Crab Habitat)
E16	Sha Lo Wan (Horseshoe Crab Habitat)
E19	Sha Chau and Lung Kwu Chau Marine Park (Artificial Reefs)
E20	Sham Wat Wan (Mangrove & Horsehoe Crab Habitat)
E21	Proposed Marine Park under Hong Kong International Airport Three Runway System (3RS) [2]
Marine Parks	
-	The Brothers Marine Park
-	Sha Chau and Lung Kwu Chau Marine Park
-	Proposed Marine Park under 3RS

Notes:
[1] There is currently no confirmed programme for the Proposed Reclamation Site at Siu Ho Wan.
[2] The Proposed Marine Park under 3RS are likely to be gazetted after the construction phase of the Project. For a conservative consideration, this WSR is included in this PP.

4.5 Marine Ecological Impact

4.5.1 The nearest site of conservation importance is the Proposed Marine Park for the 3RS which is about 1km to the northeast of the proposed Airport City Link.

4.5.2 Coral surveys had been conducted in May 2017 for the approved ITT-BVB EIA Report. The spot check dive and Rapid Ecological Assessment (REA) survey transects had covered the current Project footprint due to the close proximity of two projects. A sparse coverage, i.e. less than 5%, of coral communities including

Guaiagorgia sp. (67 colonies) and *Oulastrea crispata* (13 colonies) was identified. The records were along the coast of the Airport Island and HKP Island.

4.5.3 The ITT-BVB EIA Report was approved on 23 August 2018. Under the ITT-BVB project, a coral translocation exercise had been conducted in February 2020 to translocate the potentially affected coral colonies i.e. 76 colonies of *Guaiagorgia* sp. along REA 2 (**Figure 4.5** refers), from the landing point at the Airport Island side to a recipient site in Yam Tsai Wan. After the translocation exercise, the remaining coral coverage at the landing point at the Airport Island side, where is also the landing point for the current Project, is considered to be negligible. Therefore, additional coral dive survey is not necessary.

4.5.4 Benthic survey was conducted in March 2017 for the approved ITT-BVB EIA Report. Moderate diversity and abundance of benthic fauna, dominated by polychaetes, were reported in the approved ITT-BVB EIA Report. The survey recorded no benthic species of conservation importance at all the four sampling locations within the assessment area. Two of the sampling locations were in close proximity of the proposed bridge alignment of the Project. The other two were at the bay area on both sides of the proposed alignment which are outside of the Project footprint. All the recorded species are common in Hong Kong, no rare species were found. A total of 235 benthos fauna were collected. They were identified to 44 taxa, while 41 taxa were identified to genus or species levels.

4.5.5 The marine benthic community was spatially divided into four groups in Hong Kong waters (Tolo Harbour, Eastern and Southern waters, Victoria Harbour, Deep Bay) (Shin *et al*., 2004) according to a territory-wide survey conducted by AFCD (2002)[1]. The diversity index (H') and species evenness (J) values of the samples collected in approved ITT-BVB EIA Report were similar to unpolluted 'Eastern and Southern waters' group, reflecting that the soft bottom benthic community in the bay area is in healthy conditions.

4.5.6 Intertidal community survey including qualitative walk through and quantitative surveys had been conducted at four locations for the approved ITT-BVB EIA Report. The intertidal habitats within the assessment area were artificial sloping boulders and vertical seawall which were of low ecological value. A total of 25 species were recorded from the walk-through survey. All the recorded species are locally common and none of which is of conservation importance.

4.5.7 Chinese White Dolphins occur in the Pearl River Estuary and are mostly found in the western waters of Hong Kong. Finless Porpoises are mostly found in more oceanic environment including southern and eastern waters. The density of both species is 0 per km^2 within the assessment area (AFCD, 2019)[2] suggesting that the assessment area is not a preferred habitat of both Chinese White Dolphins and Finless Porpoises.

4.5.8 A total of four types of marine habitat were identified within the assessment area including marine waters, subtidal hard bottom, subtidal soft bottom and intertidal habitat. The four habitats are considered as of low ecological value. For subtidal hard bottom and intertidal habitats, the ecological value is mainly limited by the

[1] Agriculture, Fisheries and Conservation Department (AFCD) (2002). Consultancy Study on Marine Benthic Communities in Hong Kong.
[2] AFCD (2019). Monitoring of Marine Mammals in Hong Kong Waters (2018 – 2019) Final Report (1 April 2018 to 31 March 2019)

low naturalness i.e. artificial sloping boulders and vertical seawall, and the low diversity of the fauna communities. For subtidal soft bottom habitat, the ecological value is limited by effects of reclamation and coastal modification, the lack of species of conservation importance and relatively low potential value in a long term. For marine waters, the ecological value is mainly limited by the low wildlife diversity and abundance within the water body.

4.5.9 Given the close proximity of the two projects, and the survey findings of the approved ITT-BVB EIA Report are relatively recent, no information gaps were identified thus ecological surveys are considered to be not necessary.

4.6 Landscape and Visual Impacts

4.6.1 The landscape resources (LRs) around the proposed works are mainly open waters and vegetation on top of a reclaimed land (Refer to **Figure 4.7**). Visually sensitive receivers are identified (Refer to **Figure 4.6**) within the visual envelope, and as summarised in **Table 4.4**, their locations are also shown in **Figure 4.6**. Images regarding the existing condition nearby the Airport City Link taken from the viewpoints shown in **Figure 4.6** are also shown in **Figure 4.9**

4.6.2 Residents in the existing Tung Chung (**R1**) and Planned Tung Chung New Town Extension (**R2**) will have distance views to the proposed Airport City Link. Recreational users located in the planned promenade at Tung Chung New Town Extension (**RE4**) and at Scenic Hill (**RE5**) would have a good view quality and enjoy the good sea view / environs, and the distance of these VSRs are approximately 2500-3000m away from the proposed Airport City Link. Overall, **RE4** and **RE5** would have high sensitivity. Works in the HKP and Airport Island (**O1-O6**) would have close and direct view to the proposed Airport City Link. However, frequency of the view to the proposed works is anticipated to be occasional, and views will more likely be dominant by the iconic building HKP crossing facilities. Overall, this VSR group is considered to have low sensitivity.

Table 4.4 Baseline visually sensitive receivers (VSRs) and their sensitivity to change

VSR	Description	Frequency of view (frequent/ occasional / rare)	Duration of view (long/medium/ short)	Sensitivity (high / medium / low)
R1	Tung Chung Town	Frequent	Long	Medium
R2	Tung Chung New Town Extension	Frequent	Long	Medium
RE1	Visitors at AsiaWorld-Expo	Occasional	Short	Medium
RE2	Visitors at Hong Kong SkyCity Marriott Hotel	Occasional	Medium	Medium
RE3	Visitors to SKYCITY	Occasional	Medium	Medium
RE4	Recreational users along promenade at Tung Chung New Town Extension	Occasional	Medium	High
RE5	Recreational users at Scenic Hill	Occasional	Medium	High
O1	Workers at AsiaWorld-Expo	Occasional	Short	Low

VSR	Description	Frequency of view (frequent/ occasional / rare)	Duration of view (long/medium/ short)	Sensitivity (high / medium / low)
O2	Workers at Hong Kong SkyCity Marriott Hotel	Occasional	Medium	Low
O3	Workers at SKYCITY	Occasional	Medium	Low
O4	Workers at Civil Aviation Department Headquarters Office Building	Occasional	Medium	Low
O5	Workers at Tung Chung New Town Extension	Occasional	Medium	Low
O6	Workers at HKP	Occasional	Medium	Low
T1	Visitors at HKP	Occasional	Short	Low
T2	Sea Travellers	Occasional	Short	Medium
T3	North Lantau Highway	Occasional	Short	low

4.6.3 The baseline Landscape Character Areas (LCAs) that would be affected during the construction and operational phases are described in **Table 4.5**. The locations of the LCAs are shown in **Figure 4.8**.

Table 4.5 Summary of landscape character area

LCAs	Destinations	Sensitivity
LCA1	**Inshore Water Landscape** This water body is mainly bounded by the Airport Island and HKP. It is sensitive to reclamation. The extent of seascape is part of the open seascape locally. The sensitivity of this natural area is considered as medium.	**Medium**
LCA2	**Reclaimed HKIA and HKP** This LCA is characterised by flat and extensive coverage of runways, traffic corridors, large footprint of low-rise buildings and associated infrastructure from the Airport and HKP. Amenity planting can be found on the roadside or around periphery of buildings. The ability to accommodate change is medium to high. The general landscape quality and value of the character area is medium.	**Medium**

5 Possible Impacts on the Environment

5.1 Air Quality Impact

Construction Phase

5.1.1 Section 3.6.1 and Section 3.6.2 of the approved ITT-BVB EIA Report assessed the cumulative air quality impacts during the construction phase and concluded that no adverse air quality impact is anticipated with proper implementation of mitigation measures. As mentioned in **Section 1.6.6**, precast construction method will be adopted for the construction of bridge deck as far as practicable, while in-situ construction method will also be considered where necessary due to site constraints. For precast construction method, the deck segments will be pre-cast in offsite yard (anticipated in the Mainland China). The precast deck segments will then be transported to the site and erected by the balanced cantilever method or span-by-span method. For in-situ construction method, the deck segments will be cast within form-travellers and constructed by the balanced cantilever method. No concrete batching activity will be carried out on site. Therefore, adverse construction dust impact is not anticipated from both precast and in-situ construction methods.

5.1.2 In addition, the above-mentioned construction works will be of small-scale and confined within small works area, works area with dusty activities would be less than 100m^2, and that construction activities will not take place at the entire construction work site at the same time, but to be undertaken at multiple work fronts at different construction periods. The construction activities at different work fronts will not take place concurrently. Therefore, potential construction dust impact from these activities is minimised.

5.1.3 Fuel combustion from the use of powered mechanical equipment (PME) during construction works could be a source of NO_2, SO_2 and CO. To improve air quality and protect public health, EPD has introduced the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, with effect from 1 June 2015, to regulate emissions from machines and non-road vehicles. Starting from 1 December 2015, only approved or exempted non-road mobile machinery are allowed to be used in construction sites. These machineries would have emission limit values of air pollutants including particulate pollutants. Also, given that the scale of the Project is relatively small, limited amount of PMEs are required on site. With the effect of the Regulation, the emissions from PMEs are considered relatively small and will not cause adverse air quality impact.

5.1.4 The marine-based works would require the use of construction vessels (including work barges, tug boats, etc.). As mentioned in **Section 1.6.10**, a maximum 4 marine construction vessels per day would be required and they would manoeuvre around 4 times per day. Also, most of the construction vessels are transient in nature. Therefore, the emissions from these construction vessels are considered relatively small. In addition, all of the construction vessels will not concentrate at one place at the same time, but spread out at different marine-based work fronts, of which the separation distance between the nearest ASR (i.e. Offices at Planned Intermodal Transfer Terminal) and the marine-based work fronts ranges from approximately 40m to 360m. The marine works at these marine-based works

fronts will be undertaken at different construction periods. To further minimise the potential impact on the nearest ASR (i.e. Offices at Planned Intermodal Transfer Terminal), a maximum 2 marine construction vessels would be allowed within 50m from the seawall of the Airport Island. Thus, adverse air quality impact is not anticipated.

5.1.5 The construction period of the Project will overlap with the concurrent projects identified in **Table 2.1**. However, the construction sites of Tung Chung New Town Extension as well as 3RS projects are located more than 500m from the Project. Therefore, cumulative dust impact is not anticipated from these projects.

5.1.6 For SKYCITY and ITT, their construction works has commenced since 2017 and 2019 respectively. The dusty construction activities such as excavation works and foundation works of these projects would be likely completed by mid-2021 and therefore would unlikely overlap with the dusty construction activities of the Project. In addition, the scale of dusty construction, such as piling works and construction of bridge deck, would be small. Therefore, cumulative dust impact is not anticipated from these projects.

5.1.7 For the ITT-BVB project, the construction works will commence in 2020. Its land-based work would only be undertaken on HKP Island and the scale of dusty construction would be small, with proper implementation of mitigation measures proposed in the approved ITT-BVB EIA Report. With proper implementation of mitigation measure, cumulative dust impact is not anticipated from this project.

Operational Phase

5.1.8 As discussed in **Section 1.2**, shuttle services will be provided on the Airport City Link. As confirmed by AAHK, only electric vehicle will be used for the shuttle services and thus there will be no air pollutants emission during the operational phase. Hence, adverse air quality impact is not anticipated.

5.2 Noise Impact

5.2.1 Since there is neither existing nor planned Noise Sensitive Receivers (NSRs) which rely on opened windows for ventilation identified within the 300m assessment area of the Project, adverse noise impacts during construction and operational phases are not anticipated.

5.3 Water Quality Impact

Construction Phase

5.3.1 Section 5.7.1 to Section 5.7.3 of the approved ITT-BVB EIA Report assessed the potential water quality impact due to construction of marine viaduct section and concluded that no adverse water quality impact is anticipated with proper implementation of mitigation measures. The construction method as discussed in **Section 1.6** has proactively designed to minimise the potential water quality impact. As discussed in **Section 1.6.6**, precast construction method will be adopted for the construction of bridge deck as far as practicable, while in-situ construction method will also be considered where necessary due to site constraints. For the precast sections of the deck will be precast in offsite yard (anticipated in the Mainland China), and thus potential water quality impact due

to precast construction of bridge deck is not anticipated. For the in-situ construction method, no concrete batching activity will be carried out on site. In addition, the deck segments will be cast within form-travellers and constructed by the balanced cantilever method. Concrete will be pumped or lifted inside an enclosed container for concreting the deck. Tarpaulin plastic sheet will be mounted to the bottom of the temporary working platform for concreting to prevent concrete from falling to the sea during concreting. Therefore, leakage of concrete is unlikely for in-situ construction method and thus potential water quality impact due to in-situ construction of bridge deck is not anticipated with proposed mitigation measures in place. Also, no open dredging would be adopted under the Project. Moreover, the marine works of the Project would be proactively planned and coordinated to avoid any concurrent marine works below seawater level with those of ITT-BVB. Adverse cumulative water quality impact is not anticipated with proper implementation of mitigation measures.

5.3.2 Section 5.7.4 to Section 5.7.13 of the approved ITT-BVB EIA Report assessed the water quality impact due to general construction activities, drainage and construction site runoff, sewage effluent from construction workforce and accidental spillage of chemicals during construction phase and adverse water quality impact is not anticipated with proper implementation of mitigation measures. In view of the similar nature, construction method and scale of the Project with ITT-BVB, no adverse water quality impact is anticipated with proper implementation of mitigation measures.

5.3.3 In addition, the construction of the Project will potentially overlap with the construction of nearby concurrent projects as identified in **Table 2.1**. However, the construction sites of Tung Chung New Town Extension and 3RS projects are located more than 500m from the Project. Therefore, cumulative water quality impact is not anticipated from these projects with incorporation of the recommended mitigation measures.

5.3.4 For ITT-BVB, while concurrent marine construction activities below sea water level would be proactively avoided, its marine construction activities above sea water level and land-based construction works would be carried out with proper implementation of mitigation measures. For SKYCITY and ITT, only land-based construction works would be involved. Potential water quality impact from these projects would be insignificant with proper implementation of mitigation measures, thus cumulative water quality impact is not anticipated.

Operational Phase

5.3.5 Section 5.7.14 to Section 5.7.17 of the approved ITT-BVB EIA Report assessed the potential hydrodynamic impact during the operational phase. According to the hydrodynamic modelling results of the approved ITT-BVB EIA Report, there is no significant change in flow regime arising from the marine bridge piles and pile caps of ITT-BVB. Given that the location, number and size of the marine bridge piles and pile caps of the Project would be similar to / close to that of the ITT-BVB, it is anticipated that the proposed marine bridge piles and pile caps of the Project alone would not cause significant impact on the flow regime, with comparable hydrodynamic impact as of the ITT-BVB.

5.3.6 In order to avoid additional adverse hydrodynamic impacts on top of the ITT-BVB, the following features and good practices have been proactively adopted in the design:

- The pier shape of the marine section will be designed in a similar form of the ITT-BVB,
- All the proposed bridge piers will be situated next to that of ITT-BVB and marine bridge piles and pile caps will be aligned with the ITT-BVB (see **Figure 1.1**), and
- The number and size of the proposed marine bridge piles and pile caps will be similar to that of ITT-BVB (see **Figure 1.1**).

5.3.7 Appendix 5.4 of the approved ITT-BVB EIA Report showed that the prevailing flow would be in north-south direction. With the above proposed practices, every proposed marine bridge piles and pile caps will form a single row with the corresponding marine bridge piles and pile caps of the ITT-BVB in north-south direction. This could minimise the surface facing to the prevailing tidal flow and reduce the obstruction to the tidal flow. In some tidal conditions when the tidal flow is not in the prevailing north-south direction, the surface facing to those tidal flows would increase. The worst case would be the tidal flow in east-west direction where the surface facing toward the flow between with and without project scenarios could be double. However, these tidal conditions would be short and intermittent and only cause very localised impact. The flow regime further away the marine bridge piles and pile caps would mainly be affected by the prevailing flow, which has been addressed in the approved ITT-BVB EIA Report. Therefore, no adverse cumulative hydrodynamic impact is anticipated from the Project.

5.3.8 Section 5.7.18 to Section 5.7.21 of the approved ITT-BVB EIA Report assessed the potential water quality impact due to runoff from road surfaces during the operational phase and no adverse water quality impact is anticipated with proper implementation of mitigation measures. In view of the similar nature and scale of the Project with the ITT-BVB, the generation of runoff from the road surface and elevated platform would be insignificant. Adverse impact is not anticipated with proper implementation of mitigation measures.

5.3.9 Section 5.8 of the approved ITT-BVB EIA Report assessed the cumulative water quality impacts with other concurrent projects and concluded that no adverse cumulative water quality impacts would be expected, with incorporation of the recommended mitigation measures on this Project as mentioned above, overall cumulative water quality impacts would not be expected.

5.4 Waste Management Implications

Construction Phase

5.4.1 Section 6.4.2 to Section 6.4.12, and Section 6.4.30 to Section 6.4.32 of the approved ITT-BVB EIA Report assessed the waste management implications due to construction and demolition (C&D) materials, general refuse, chemical waste, floating refuse and transportation arrangement for waste disposal during the construction phase and no adverse impact is anticipated with proper implementation of mitigation measures. In view of the similar nature, construction method and scale of the Project with the ITT-BVB, the types and quantity of waste generated would be similar. Based on the preliminary design, the quantity of C&D materials generated during construction phase is estimated and summarised in **Table 5.1**.

Table 5.1 Summary of C&D materials quantities generated

Waste Types	Total Generated (m^3)	Handling Methods / Reuse	Destinations
Inert C&D Materials [1]	15,000	• Segregation from non-inert C&D materials during stockpiling and transportation • Stockpile area, if required, should be well managed with covers and/or water spraying system • Reuse on-site as far as practicable subject to detailed design stage before exported off-site for reuse at other concurrent projects • Delivered to other concurrent projects or to Public Fill Reception Facilities for beneficial use in other projects	Public Fill Reception Facilities
Non-inert C&D Materials [2]	1,500	• Upon exhaustion of reuse/ recycling effort, the remaining non-inert C&D materials will be delivered to landfills • Segregation from inert C&D materials during stockpiling and transportation • Reusable materials should be separated and recycled as far as practicable	Landfills

Notes:
[1] "Inert C&D materials" include, but not limited to, soft public fill (topsoil), public fill, broken concrete and asphalt, etc.
[2] "Non-inert C&D materials" include, but not limited to, timber, papers and plastics, etc.

5.4.2 With reference to the approved ITT-BVB EIA Report, it is estimated that the entire Project would generate about 19 – 26kg/day of general refuse, limited to a few hundred litres of chemical waste per month, and limited to a few kilograms of potential floating refuse per month. Adverse impact is not anticipated with proper implementation of mitigation measures.

5.4.3 Section 6.4.13 to Section 6.4.32 of the approved ITT-BVB EIA Report assessed the waste management implications due to both land-based and marine-based excavated sediment. A Sediment Sampling and Testing Plan (SSTP) has been prepared under the approved ITT-BVB EIA Report. In view of the close proximity of the Project to the ITT-BVB, the findings from this SSTP is considered relevant and valid for the Project. Based on the latest design, the volume of marine-based sediment generated would be approximately $870m^3$. With reference to the testing result in the approved ITT-BVB EIA Report, the estimated quantities for each disposal option and corresponding possible disposal outlets area presented in **Table 5.2**.

5.4.4 Similar to the marine section of viaduct's foundation, the foundation of land section of viaduct and elevated platform decks will also involve the use of in-situ bored piles. Land-based sediment within these bored piles will be excavated.

5.4.5 The eastern section of the Project is currently occupied by Highways Department. The approved ITT-BVB EIA Report has reviewed the previous testing result under the approved EIA Report for the Hong Kong - Zhuhai - Macao Bridge Hong Kong Boundary Crossing Facilities (HZMB HKBCF) (Register No.

AEIAR-145/2009). It is estimated that most of the land-based sediment to be excavated under the Project is likely to be uncontaminated Category L sediment, while some Category M sediment, with elevated arsenic/ lead levels, may be presented.

5.4.6 The western section of the Project is located on the Airport Island. Based on AAHK's previous ground investigation records and site investigation report, there is no marine sediment identified under the footprint of the Airport Island in the vicinity of the Project.

5.4.7 The estimated quantity of the marine-based sediment and handling method, with reference to the recommendation in Section 6.4.29 and Table 6.5 of the approved ITT-BVB EIA Report, are shown in **Table 5.2**. As the number of land piers of the Project is more than that of ITT-BVB, it is anticipated that more land-based sediment would be excavated, and the estimated quantity of the land-based sediment and handling method are shown in **Table 5.2**. The areas of proposed excavated land-based and marine-based sediment are shown in **Figure 5.1**.

Table 5.2 Summary of sediment quantities generated and recommended handling methods

Materials Generated	Category	Estimated In-situ Quantity [1]	Handling Methods/ Reuse [2]	Destination
Marie-based sediment	Category L	635m^3	Type 1	Final disposal site shall be determined by Marine Fill Committee (MFC); typically South Cheung Chau / East of Ninepin
	Category M (passed the Tier III biological screening)	235m^3	Type 1*	Final disposal site shall be determined by MFC, typically East Sha Chau
	Category M (failed the Tier III biological screening)	Nil	-	-
Land-based sediment	N/A	2850m^3	Treatment by stabilization / solidification (S/S) technique to treatment standards [3] and reuse	Reuse in other AAHK's projects
Total:		3720m^3		

Notes:
[1] The quantities shown in the table are estimates only and will be subject to further review during the later stage of the Project (e.g. detailed design or construction stages).
[2] Type 1 – open sea disposal at disposal site(s) allocated by the MFC
Type 1* - open sea disposal in dedicated site at disposal site(s) allocated by the MFC
[3] The treated sediment will be tested for the Toxicity Characteristic Leaching Procedure (TCLP) and Unconfined Compressive Strength (UCS) and should meet the Universal Treatment Standards (UTS) with reference to EPD's Practice Guide for Investigation and Remediation of Contaminated Land and the UCS standard prior to reuse.

5.4.8 As limited amount of soil would be excavated under the Project, the potential of reusing the excavated sediment (both land-based and marine-based) on site is

limited. Yet, reusing on-site will be considered as far as practicable prior to other handling methods. If necessary, there is great potential of other AAHK's projects to accept the excavated sediment. As the excavated sediment will be directly transported to off-site treatment areas under other AAHK projects for treatment prior to reuse and therefore only temporary stockpiling area will be required. Section 6.4.28 of approved ITT-BVB EIA Report recommended the sediment treatment methods prior to reuse.

5.4.9 With proper implementation of mitigation measures detailed in **Section 6.4**, adverse environmental impacts due to handling, treatment and disposal of excavated sediment are not anticipated.

Operational Phase

5.4.10 Section 6.4.34 to Section 6.4.38 of the approved ITT-BVB EIA Report assessed the waste management implications due to chemical waste and municipal solid waste (MSW) during the operational phase and no adverse impact is anticipated with proper implementation of mitigation measures. In view of the similar nature and scale of the Project with the ITT-BVB, the types and quantity of waste generated would be similar. Adverse impact is not anticipated with proper implementation of mitigation measures.

5.5 Marine Ecological Impact

Construction Phase

5.5.1 The nature of the potential ecological impacts of the Project is very similar to the ITT-BVB project which are both bridges across sea channel, in parallel and adjacent to each other. Section 7.6.1 to Section 7.6.15 of the approved ITT-BVB EIA Report assessed the construction phase ecological impact of the ITT-BVB. Construction phase ecological impacts include loss of marine habitats at the six proposed bridge piers, potential direct injury / mortality of wildlife (i.e. Chinese White Dolphin and corals), potential disturbance to site of conservation importance, construction disturbances to Chinese White Dolphins (CWD) and construction water quality impacts. According to the approved ITT-BVB EIA Report, the proposed bridge marine section would affect 0.009ha subtidal hard and soft bottom habitats and marine waters, which have low ecological value. Pile precasting would also result in minor temporary loss of 0.0087ha subtidal hard and soft bottom habitats and marine waters. The scale and habitat loss due to the Airport City Link would be similar to the ITT-BVB. Given the small size and low ecological values of the affected habitats without any rare species or marine species of conservation importance apart from some common corals, the impacts on marine wildlife (such as recorded coral and CWDs) are anticipated to be minor. Thus, no specific mitigation measure for marine habitat loss is required.

5.5.2 For the mortality of corals, the potentially affected coral colonies, i.e. all belongs to *Guaiagorgia* sp., under the Project has been translocated into a recipient site in Yam Tsai Wan under the ITT-BVB project before the construction of the Project. The translocation exercise for ITT-BVB had been completed in Feb 2020. The donor site, i.e. REA 2 in **Figure 4.5**, also covered the footprint of the Airport City Link. A total of 76 colonies of *Guaiagorgia* sp. were translocated. The remaining coral colonies within the footprint of the Airport City Link is thus negligible. Therefore, the impact to corals due to the Project are negligible. For

the direct injury to CWD, based on the approved ITT-BVB EIA Report findings, the works area is not a frequent area utilized by this species. It is suggested to impose a speed limit of 10 knots for the construction vessels similar to the recommendation in the ITT-BVB EIA Report to further reduce the risk. The impact is thus considered to be minor. Similar to the approved ITT-BVB EIA Report recommendations, bore piling instead of percussive piling and acoustic decoupling on the construction vessels will be implemented. With these measures, the potential underwater noise impact to CWD could be reduced into negligible level. The nearest marine site of conservation importance is the Proposed Marine Park under the 3RS which is about 1km to the northeast of the Project which is similar to the separation from ITT-BVB and the marine park. The potential disturbance to the Marine Park would be minor, as similar to the approved ITT-BVB EIA Report prediction, given the large separating distance. Standard precautionary measures including silt curtain, steel pile casing would be used to confine the loss of fill materials within piling works stations to avoid leakage into the open sea. Potential water quality impact to the marine environment and the coral communities within the assessment area would be minor.

Operational Phase

5.5.3 Section 7.6.16 to Section 7.6.20 of the approved ITT-BVB EIA Report assessed the operational phase ecological impact of the ITT-BVB. The operational phase ecological impacts include permanent habitat loss, change of hydrological regime due to the additional bridge piers standing on the sea bed, and operational phase disturbance to marine habitats and wildlife. The estimated permanent habitat loss in the approved ITT-BVB EIA is approximately 0.009ha which is minor. The Airport City Link would have similar scale of permanent habitat loss which is also minor. The level of operational phase ecological impacts for the Airport City Link would be minor. No specific mitigation measures are required.

Cumulative Impacts

5.5.4 Section 7.7.1 to Section 7.7.8 of the approved ITT-BVB EIA Report assessed the cumulative ecological impact due to the ITT-BVB and other concurrent projects including 3RS, TMCLKL, HZMB HKBCF, HZMB HKLR, SKYCITY (**Section 2.3** refers). The cumulative impacts include cumulative permanent habitat loss, underwater acoustic disturbance and dolphin injury risk. For cumulative permanent habitat loss, the additional permanent habitat loss due to Airport City Link which is similar to that of ITT-BVB, i.e. 0.009ha, would be insignificant comparing with the size of the Proposed Marine Park for the 3RS (approximately 2,400ha) which would be connecting the existing Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP), The Brother Marine Park (BMP), Pearl River Estuary CWD national nature reserve and the future extension of Hong Kong International Airport Approach Area (HKIAAA). The assessment area of the Airport City Link is not a habitat utilised by CWD, so the cumulative injury risk is negligible. Also, bore piling and acoustic decoupling would be implemented, the Airport City Link Project would not worsen the current underwater acoustic environment and therefore underwater noise impact. No adverse cumulative ecological impact is identified.

5.6 Landscape and Visual Impacts

Construction Phase

5.6.1 Potential landscape impacts during construction phase are similar to the impacts of the ITT-BVB which would be mainly on the coastal waters of North Lantau Island and Inshore Water landscape. With the presence of passengers, workers and visitors at HKP and HKIA, it is expected for the construction works to have a slight-moderate visual impact due to the short viewing distance. Limited visual impact is anticipated for residential Visually Sensitive Receivers (VSRs) from Tung Chung Town at distant.

5.6.2 It is anticipated that 3 nos. of existing trees will be affected by the proposed plant room option located to the north of elevated platform at HKP Island (i.e. Option 1). Location and schedule of the three affected trees can be found in **Figure 5.2**. Tree removal application and relevant tree compensation proposal will be submitted to relevant departments prior to the tree removal in accordance with Lands Administration Office Practice Note (LAO PN) No. 2/2020 - Tree Preservation and Removal Proposal for Building Development in Private Projects-Compliance of Tree Preservation Clause under Lease and DevB TC(W) No. 4/2020 - Tree Preservation.

5.6.3 Based on information provided in the Landscape and Visual Plan under Agreement No. CE13/2020 (CE) available online, there are approximately 18 nos. of planned trees to be planted at HKP Island which falls within the boundary of Airport City Link (refer to **Figure 5.3** for their indicative locations). Subject to the tree survey carried out in the detailed design stage development, where trees to be affected will be considered for transplanting in accordance with the Tree Transplanting Guidelines issued by Greening, Landscape and Tree Management (GLTM) Section of DevB.

Operational Phase

5.6.4 The sources of visual impacts of the Project during operational phase would include:

- Presence of permanent Airport City Link bridge,
- Night lighting at operating of Airport City Link, and
- Proposed man-made structures, including fence, plant room etc. It should be noted the location of the plant room has been identified at HKP. The location will be determined in the next design stage.

5.6.5 The locations and development details of permanent man-made structures that would cause potential visual impact are summarised in **Table 5.3**.

Table 5.3 Locations and development details of permanent man-made structures

Location	Approximate Height and Level (mPD) of the structure [1]	Approximate Coverage (m) [1]
Airport City Link (marine section)	23.6mPD at top level, 20.2m above ESL at 3.4mPD	445m (L) x 14m (W)
Airport City Link (on land section)	22.7mPD at top level, 16.2m above ground	345m (L) x 14m (W)

Location	Approximate Height and Level (mPD) of the structure [1]	Approximate Coverage (m) [1]
Elevated Platform (Airport Island Side)	RL: 17mPD, 10.5m above ground Cover: 20mPD, 13.5m above ground	98m (L) x 26m (W)
Elevated Platform (HKP Side)	RL: 14.5mPD, 8m above ground Cover: 17.5mPD, 11m above ground	89m (L) x 72m (W)
Connection Footbridge to HKIA SkyCity (Airport Island Side)	17mPD, 10m above ground	27m (L) x 16m (W)
Connection Footbridge to the east of Elevated Platform (Airport Island Side)	17mPD, 10m above ground	12m (L) x 6m (W)

Note:
[1] The dimension shown in the table are estimates only and will be subject to further review during the later stage of the Project (e.g. detailed design or construction stages).

5.6.6 The design of the Airport City Link and associated civil and structural provisions will be visually compatible with the ITT-BVB and with similar impacts. The marine section for both the Project and ITT-BVB will have the same road level (maximum level of +25mPD), deck thickness (approx. 4m), and pier arrangements. The land sections of the bridge will also be completely elevated with no construction of at-grade structures (excluding piers/columns). The design of Airport City Link shall follow relevant aesthetic design guidelines and requirements in Hong Kong and shall ensure visual compatibility with the ITT-BVB. Impacts to the VSRs close to the development (i.e. passengers, workers and visitors at HKP and SKYCITY) will be considered as minimal and similar to the impacts of the ITT-BVB. Airport City Link design approach is to ensure visual compatibility with the ITT-BVB.

5.6.7 Section 8.7 of the approved ITT-BVB EIA Report assessed the landscape impact significance before mitigation during the construction and operational phases to be insubstantial-moderate. In view of the similar nature and scale of the Project with the ITT-BVB, the landscape impacts would be similar. With proper implementation of mitigation measures, it is anticipated that the landscape impact significance during construction and operational phases will be similar to the findings presented in Table 8.11 of the approved ITT-BVB EIA Report which will be improved from insubstantial-moderate to insubstantial-slight.

5.6.8 Section 8.8 of the approved ITT-BVB EIA Report assessed the visual impact significance before mitigation during the construction phase to be slight-moderate while during the operational phase to be insubstantial-moderate. As mentioned in Section 8.10.13 of the approved ITT-BVB EIA Report, the proposed mitigation measures would not be sufficient to alleviate the potential blockage of view due to the construction works, and residual impact significance for the majority of VSRs would remain the same under mitigated conditions. In view of the similar nature and scale of the Project with the ITT-BVB, the visual impact significance would be similar, which will be slight-moderate. During the operational phase, with proper implementation of mitigation measures, it is anticipated that the visual impact significance will be similar to the findings presented in Table 8.12 of the approved ITT-BVB EIA Report which will be improved from insubstantial-moderate to insubstantial-slight.

5.6.9 With reference to **Section 5.6.8** and **Figure 6.3**, under unmitigated conditions, the resultant residual impact significance on the identified LRs and LCAs would be

insubstantial-moderate for both construction and operational phases. After implementation of the proposed mitigation measures outlined in **Section 6.6.1**, the residual impact significance on the identified LRs and LCAs would be improved to insubstantial-slight. As the conditions and proposed mitigation measures are consistent with the ITT-BVB, it is considered that the residual impact significance on the identified LRs and LCAs with implementation of the landscape mitigation measures are considered acceptable.

5.6.10 As mentioned in **Section 5.6.6**, both ITT BVB and Airport City Link will both have a consistent design approach to ensure visual compatibility such as having maximum height of +25mPD, hence, the cumulative visual impacts will be limited, which is similar to the findings presented in Section 8.11 of the approved ITT-BVB EIA Report.

5.6.11 Based on the assessment under **Section 5.6,** it is considered that the residual landscape and visual impact significance would be acceptable with mitigation measures implemented during construction and operational phases, which is consistent with the findings of Section 8.13 of the approved ITT-BVB EIA Report.

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

6.1 Air Quality Impact

Construction Phase

6.1.1 Section 3.7.1 of the approved ITT-BVB EIA Report recommended the implementation of proper dust suppression measures in the Air Pollution Control (Construction Dust) Regulation, as follows:

- Skip hoist for material transport should be totally enclosed by impervious sheeting,
- All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet,
- All stockpiles of aggregate or spoil should be covered and/or water applied,
- The height from which excavated materials are dropped should be controlled to a minimum practical height to limit fugitive dust generation from unloading,
- Immediately before leaving a construction site, every vehicle shall be washed to remove any dusty materials from its body and wheels, and
- The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak form the vehicle.

6.1.2 In view of the similar nature, construction method and scale of the Project, these recommended mitigation measures are also applicable to the Project. In addition, as a proactive control measure to prevent fugitive dust emission from concrete batching activity for in-situ construction method, the concrete will be delivered from existing concrete batching plants off-site. Thus, fugitive dust emission due to in-situ construction is minimized. In addition, a maximum 2 marine construction vessels would be allowed within 50m from the seawall of the Airport Island, thus the potential impact due to emission from construction vessels could be further minimized. With proper implementation of dust suppression measures, adverse construction dust impact is not anticipated.

Operational Phase

6.1.3 As there will be no air pollutants emission during the operational phase, adverse air quality impact is not anticipated. Therefore, no mitigation measure is required during the operational phase.

6.2 Noise Impact

Construction Phase

6.2.1 There are neither existing nor planned NSRs which rely on opened windows for ventilation identified within the 300m assessment area of the Project, no adverse

noise impact during construction phase is anticipated. Nevertheless, Section 4.5.2 of the approved ITT-BVB EIA Report recommended a list of good site practices, which are also applicable to the Project

Operational Phase

6.2.2 Since there is no existing nor planned NSRs which rely on opened windows for ventilation identified within the 300m assessment area of the Project, no adverse noise impact during operational phase is anticipated and mitigation measure is not required.

6.3 Water Quality Impact

Construction Phase

6.3.1 Section 5.9.1 to Section 5.9.20 of the approved ITT-BVB EIA Report recommended the mitigation measures to minimise potential water quality impact during the construction phase, such as installation of silt curtain and adoption of good site practices outlined in ProPECC PN 1/94 "Construction Site Drainage". Silt curtains should be deployed in the surrounding of the active marine works area prior to installation of steel piling casing. Silt curtains should only be removed after completion of pile caps and piers. In view of the similar nature, construction method and scale of the Project, these recommended mitigation measures are also applicable to the Project. For in-situ construction method being considered where necessary, concrete will be delivered from existing concrete batching plants off-site to avoid on site concrete batching activity. During the in-situ bridge deck concreting, the concrete will be pumped or lifted inside an enclosed container for concreting the deck. Tarpaulin plastic sheet will be mounted at the bottom of the temporary working platform for concreting to prevent concrete from falling to the sea. Therefore, the in-situ construction method could achieve comparable environmental performance as precast construction method with general good site practices and mitigation measures in place. With proper implementation of mitigation measures, adverse water quality impact is not anticipated.

6.3.2 Relevant clauses of mitigation measures will be incorporated into the contract documents. In addition, the Contractor should be responsible for the design, installation and maintenance of the silt curtains to minimise the water quality impact. The design and specification of the silt curtains should be submitted by the Contractor to the Project Manager of AAHK for approval.

6.3.3 As mentioned in **Section 5.3.1**, the marine works of the Project would be proactively planned and coordinated to avoid any concurrent marine works below seawater level with those of ITT-BVB to minimise cumulative water quality impact during construction phase.

6.3.4 Section 10.4.1 of the approved ITT-BVB EIA Report also recommended environmental monitoring and audit (EM&A) for water quality to ensure that all the recommended mitigation measures are properly implemented. The monitoring details, such as monitoring parameters, monitoring schedule and stations as well as monitoring requirements for the Project shall be referred to the latest EM&A Manual for ITT-BVB. In addition, Environmental Team (ET) and Independent Environmental Checker (IEC) will be designated to ensure implementation of all

mitigation measures recommended in the PP to avoid any potential environmental impacts.

Operational Phase

6.3.5 Section 5.9.22 to Section 5.9.29 of the approved ITT-BVB EIA Report recommended mitigation measures to minimise potential water quality impact due to surface runoff during operational phase. The design of the operational phase mitigation measures for the road works shall take into account the guidelines published in ProPECC PN 5/93 "Drainage Plans subject to Comment by the EPD". In view of the similar nature and scale of the Project, these recommended mitigation measures are applicable to the Project.

6.3.6 No adverse hydrodynamic impact is anticipated with the design features and good practices listed in **Section 5.3.6** proactively adopted. As such, no mitigation measure is recommended.

6.4 Waste Management Implications

Construction Phase

6.4.1 Section 6.5.1 to Section 6.5.24 of the approved ITT-BVB EIA Report recommended waste management measures to minimise potential environmental impacts during handling, transportation and disposal of wastes, such as good site practices and waste reduction measures. In view of the similar nature, construction method and scale of the Project, these recommended mitigation measures are also applicable to the Project. With proper implementation of mitigation measures, adverse environmental impacts during handling, transportation and disposal of wastes are not anticipated.

6.4.2 The Contractor shall be responsible to prepare the Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in reference to the measures introduced in Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers No. 243 ADV-19 (PNAP No. 243 (ADV-19) - Construction and Demolition Waste. Trip ticket system shall be implemented to prevent illegal dumping in accordance with the Development Bureaus (DevB) Technical Circular (Works) TC(W) No. 6/2010 'Trip Ticket System for Disposal of Construction and Demolition Materials'.

6.4.3 In addition, relevant ordinances (such as Waste Disposal Ordinance, Air Pollution Ordinance (Construction Dust) Regulation and Water Pollution Control Ordinance) shall be complied with during the excavation and handling of the sediment. As the excavated sediment will be delivered to the off-site treatment area for treatment, only temporary stockpiling area will be required. The temporary stockpiling area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and surrounding water bodies. The temporary stockpiling area should be completely paved in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected, treated and discharged according to the Water Pollution Control Ordinance. In order to minimize the exposure to contaminated materials, workers shall, if necessary, wear appropriate personal protective equipment (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities shall also be

provided on site. In addition, a separate submission, such as Sediment Sampling and Testing Plan and Sediment Quality Report, should be submitted to the Dumping at Sea Ordinance (DASO) team or EPD for the application for dumping permit under DASO as necessary.

Operational Phase

6.4.4 Section 6.5.25 to Section 6.5.27 of the approved ITT-BVB EIA Report recommended the waste management measures to minimise the environmental impact due to generation of chemical wastes and municipal solid waste during the operational phase, such as proper storage and disposal of chemical wastes and municipal solid wastes. In view of the similar nature and scale of the Project, these recommended mitigation measures are applicable to the Project.

6.5 Marine Ecological Impact

6.5.1 Section 7.8.1 to Section 7.8.10 of the approved ITT-BVB EIA Report recommended mitigation and precautionary measures. Key measures include the avoidance of open dredging, use of bore piling and pile casing, translocation of affected coral colonies (the coral translocation had been undertaken in Feb 2020, all the potentially directly affected coral colonies i.e. *Guaiagorgia* sp. within the footprint of the ITT-BVB and the Airport City Link had been translocated into the recipient site in Yam Tsai Wan). In view of the similar nature, construction method and scale of the Project, these recommended mitigation measures are also applicable to the Project. With proper implementation of precautionary measures as suggested in **Section 6.3**, adverse impact upon marine ecology is not anticipated.

6.6 Landscape and Visual Impacts

6.6.1 Possible key measures to reduce potential landscape and visual impacts include:

Construction Phase

- Minimising disturbance to significant landscape resources as part of the design,
- Optimising construction activities, e.g. minimising extent of temporary works area, installing site hoardings and minimising illumination on non-target areas,
- Minimise construction periods where possible,
- Early establishment of planting areas as far as appropriate,
- Erection of decorative mesh screen or construction hoardings,
- Control of night-time lighting,
- Temporary vertical greening, screen / buffer at-grade planting to soften the engineering structure of construction works,
- Chromatic design in colour tone, finishes and treatments of engineering structures should be visually unobtrusive, non-reflective, and compatible with surrounding context,

- Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS) submission upon completion of conceptual design should be in accordance with ETWB TCW No. 36/2004,
- Affected trees to be transplanted at HKP Island or Airport Island where applicable. Transplanting location will require further discussion with relevant departments in the next detailed design stage,
- Tree preservation in accordance with Development Bureau Technical Circular (Works) No. 4/2020 (ref: DEVB(GLTM) 200/2/1/1), and
- Proposed tree felling / tree compensation.

Operational Phase

- Provision of greening, aesthetic architectural design of aboveground structures to enhance landscape and visual aesthetic of the area in proximity,
- Sensitive lighting design and installation to minimise night-time glare, and
- Tree maintenance in accordance with Guidelines on Tree Risk Assessment and Management Arrangement by DevB (latest version) for compensatory trees.

6.6.2 As mentioned in **Sections 5.6.2** and **5.6.3**, the Project with either Option 1 or 2 of the proposed plant room will require transplanting for both existing and planned trees. Further to these measures, the plant room shall be designed with an aesthetically pleasing design to blend in with the surrounding landscape and visual context. Vertical greening shall also be provided to soften the plant room on HKP Island as far as appropriate.

6.6.3 The locations of the above measures are shown on the Landscape and Visual Mitigation Plan (refer to **Figure 6.1 and 6.2**). A photomontage for viewpoint 2 with mitigation measures is shown in **Figure 6.3**.

6.6.4 With the implementation of the mitigation measures presented in **Section 6.6.1**, it is expected for the overall landscape aesthetic to be enhanced during the operational phase, and the residual impacts on the identified LRs and LCAs will be improved to slight-insubstantial, which is similar to the ITT-BVB and considered acceptable.

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

6.7.1 In view of the nature of the Project, the associated environmental impacts would be small scale, localised and short-term. With the implementation of the recommended mitigation measures and good site practices, no adverse residual impact would be anticipated.

7 Conclusion

7.1.1 Due to the proximity and similarity of the Airport City Link and ITT-BVB in terms of nature, alignment, design parameters and construction method, the findings from the approved ITT-BVB EIA Report are considered relevant and valid, and therefore could provide sufficient information to evaluate the potential environmental impacts from the Project.

7.1.2 The predicted environmental impacts from the Project are unlikely to be adverse with proper implementation of mitigation measures/ good site practices / precautionary measures described in this PP and meeting the requirements of the TM-EIAO. Given that the effectiveness of the required mitigation measures (details refer to **Section 6**) have been demonstrated in many real examples, it would be beyond doubt that the environmental impact of the Project falls well within the guidelines and criteria laid down in the TM-EIAO. As the Project is similar to the ITT-BVB in terms of locality, scale, construction method and nature of operation, while the ITT-BVB EIA Report was approved on 23 August 2018, it is considered that the information and findings of the approved ITT-BVB EIA Report are still relevant and valid. Therefore, this PP has been prepared to seek permission from the Director of Environmental Protection under Section 5(1)(b) and Section 5(9) of the EIAO to apply directly for an Environmental Permit.