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Highways Department

Agreement No. CE 78/2022 (HY)

# Tsing Yi – Lantau Link – Investigation, Design and Construction

Environmental Impact Assessment Report –

Executive Summary

September 2025

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Prepared and Checked by: \_\_\_\_\_ 15 September 2025

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## **1. INTRODUCTION**

### **1.1 Project Background**

- 1.1.1 The title of the Project is “Tsing Yi – Lantau Link” (TYLL) (hereinafter referred to as the Project).
- 1.1.2 The objective of the Project is to enhance the connectivity between Tsing Yi and North Lantau to meet the future traffic demands generated by future developments in North Lantau and the Northwest New Territories. The Project will provide additional traffic capacity between Lantau and urban areas for the long-term planning horizon.
- 1.1.3 The Project connects North Lantau Highway, the proposed Route 11 and the proposed Hong Kong Island West – Northeast Lantau Link (HKIW-NEL Link) at North Lantau, crosses Kap Shui Mun Fairway (KSMF) and Ma Wan Fairway (MWF), and connects with Tsing Sha Highway on the west of Nam Wan Tunnel after landing at Tsing Yi.
- 1.1.4 HyD commissioned Agreement No. CE78/2022 (HY) Tsing Yi - Lantau Link – Investigation, Design and Construction in May 2023, to review the findings of “Feasibility Review of Tsing Yi - Lantau Link – Feasibility Study” (hereinafter referred to as “TYLL FS”) under Agreement No. CE 50/2020 (HY), recommend the preferred alignment, conduct impact assessments on environment, traffic, marine, land and other related aspects, and carry out site investigation, detail design and supervision on construction works for TYLL.
- 1.1.5 The Project is a Designated Project under the Environmental Impact Assessment Ordinance (EIAO), hence an Environmental Impact Assessment (EIA) Study was in accordance with the EIA Study Brief (No. ESB-359/2023) and the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM).
- 1.1.6 This EIA report has included locations of works areas and other related facilities for supporting the construction and operation of the Project based on the latest information at the time of writing.

### **1.2 Purpose of this Executive Summary**

- 1.2.1 This Executive Summary (ES) summarises the key findings, recommendations and conclusions of the EIA Report for the Project. The ES contains the following information:
- Section 2 presents the purpose and nature of the Project, consideration of alternative options and construction methods for the Project;
  - Section 3 presents the key findings of the environmental impact assessment;
  - Section 4 describes the proposed environmental monitoring and audit programme for the Project; and
  - Section 5 presents the conclusions.

## 2. PROJECT DESCRIPTION

### 2.1 Objective and Scope of Project

2.1.1 The objective of the Project is to provide a new road connecting Route 11 on Lantau Island and Tsing Sha Highway at Tsing Yi, thus serving as an alternative route to Lantau Link for the vehicles commuting between Northwest New Territories (NWNT) and urban areas, which in turn improving the traffic condition of Lantau Link which is the vital road connection between developments / infrastructures (including the Hong Kong International Airport (the airport) and Hong Kong-Zhuhai-Macao Bridge (HZMB)) on Lantau Island and the urban areas. The general layout plan of the Project is shown in **Figure 2.1**.

2.1.2 The scope of the Project comprises the following:

- (a) construction of the cable-supported bridges crossing the MWF and KSMF (hereinafter referred to as the “Main Bridges”) including:
  - (i) a dual three-lane 3-span continuous and earth-anchored suspension bridge crossing the MWF between Ma Wan and Tsing Yi with a main span of about 1400 m;
  - (ii) a dual three-lane earth-anchored single-tower suspension bridge crossing the KSMF between North Lantau and Ma Wan with a main span of about 500 m;
- (b) construction of North Lantau Interchange, consisting of slip roads, tunnel and viaducts at North Lantau to connect the cable-supported bridge crossing the KSMF to North Lantau Highway, the proposed Tsing Lung Bridge under Route 11 and the proposed Hong Kong Island West – Northeast Lantau Link (HKIW-NEL Link);
- (c) construction of Tsing Yi Connection, consisting of extension of the TYLL mainline from the proposed cable-supported bridge crossing the MWF to connect with the Tsing Sha Highway at the west of Nam Wan Tunnel and provision of slip roads and viaducts to connect with the local roads in Tsing Yi;
- (d) construction of viaduct at Ma Wan South to connect the Main Bridges;
- (e) modification / realignment of Tsing Sha Highway and Cheung Tsing Highway; and
- (f) associated works including civil, marine, drainage, sewerage, road works, traffic aids, street lighting, traffic control and surveillance system (TCSS), toll collection facilities, bridge facilities, fire services works, electrical and mechanical (E&M) works, re-provisioning of facilities affected and utility diversion, environmental mitigation works, landscaping works, site clearance and demolition, earth works, slope works, geotechnical works, natural terrain hazard mitigation works, reclamation works, etc.

## 2.2 Designated Projects under Environmental Impact Assessment Ordinance

2.2.1 The Project comprises the following elements which are classified as Designated Projects (DPs) as per Schedule 2, Part I of the EIAO. The DPs elements of this Project are summarised in **Table 2.1** and illustrated in **Figure 2.2**.

**Table 2.1 Schedule 2 Designated Projects in this Project**

Schedule 2 Designated Project <sup>(1)</sup>		Designated Project Element under the Project
Item A.1	A carriageway for motor vehicles that is an expressway, trunk road, primary distributor road or district distributor road.	TYLL, comprising Main Bridges, North Lantau Interchange and Tsing Yi Connection, is proposed as trunk road.
Item A.8	A carriageway bridge for motor vehicles, or a railway bridge, the length between abutments for which is more than 100 m, with bridge piers over the sea supporting the bridge.	<ul style="list-style-type: none"> <li>• A 3-span continuous and earth-anchored suspension bridge crossing the MWF between Ma Wan and Tsing Yi with a main span of about 1400 m.</li> <li>• A single-tower suspension bridge crossing KSMF between North Lantau and Ma Wan with a main span of about 500 m.</li> </ul>
Item C.1	Reclamation works (including associated dredging works) more than 5 ha in size.	<ul style="list-style-type: none"> <li>• Tsing Yi Tower Island: approximately 6.0 ha in size.</li> <li>• Ma Wan South Tower Island: approximately 7.9 ha in size.</li> <li>• Ma Wan South Anchorage Island: Approximately 4.7 ha in size.</li> <li>• Kap Shui Mun Tower Island: approximately 1.2 ha in size.</li> <li>• Total reclamation area: 19.8 ha.</li> </ul>
Item C.2	Reclamation works (including associated dredging works) more than 1 ha in size and a boundary of which is less than 500 m from the nearest boundary of an existing or planned specified area <sup>(2)</sup> that is wholly or partly situated on or over any foreshore and sea-bed <sup>(3)</sup> .	<ul style="list-style-type: none"> <li>• The nearest boundary of Ma Wan Tung Wan Beach is located within 500m from the boundary of reclamation works for the Ma Wan South Anchorage Island.</li> </ul>
Item C.12	A dredging operation that is less than 500m from the nearest boundary of an existing or planned specified area <sup>(2)</sup> that is wholly or partly situated on or over any foreshore and sea-bed <sup>(3)</sup> .	<ul style="list-style-type: none"> <li>• The nearest boundary of Ma Wan Tung Wan Beach is located within 500m from the dredging operation for the Ma Wan South Anchorage Island.</li> </ul>

Notes:

(1) Refer to the amended Schedule 2, Part I of EIAO (effective since 30 June 2023).

(2) For this Project under Items C.2 and C.12, specified area refers to bathing beach.

(3) Foreshore and sea-bed has the meaning given by section 2 of the Foreshore and Sea-bed (Reclamations) Ordinance (Cap. 127).

## **2.3 Need of the Project**

- 2.3.1 To meet the traffic demands arising from developments in the NWNT (including the Hung Shui Kiu / Ha Tsuen New Development Area (NDA) and the Yuen Long South Development), a group of major roads are earmarked for future developments, which comprises Route 11 (section between Yuen Long and North Lantau), Tuen Mun Bypass, TYLL and Widening of Yuen Long Highway (section between Lam Tei and Tong Yan San Tsuen).
- 2.3.2 According to the traffic impact assessment carried out as part of the TYLL FS, the traffic capacity of the Lantau Link will not be able to cope with the additional traffic commuting between the NWNT/ Lantau and the urban areas via Route 11 and Lantau Island after the completion of Route 11. Hence, TYLL is required to ameliorate future traffic conditions on Lantau Link.
- 2.3.3 The Project serves as a major carriageway connecting North Lantau, the proposed Route 11 (section between Yuen Long and North Lantau), and Tsing Yi. It is expected the Project will greatly improve the traffic conditions on Lantau Link which is the vital road connection between developments / infrastructures (including the airport and HZMB) on Lantau Island and the urban areas.
- 2.3.4 Furthermore, the Project can serve as an alternative route to the existing Lantau Link for vehicles commuting between Lantau Island and the urban areas. This will improve the resilience of the NWNT traffic network in the event of traffic incidents or emergencies in major roads. By providing multiple access points and connections to major roads in NWNT, the Project and Route 11 will serve as a reliable pathway for redirecting traffic towards urban areas during such events. Moreover, the Project and Route 11 will act as a strategic route connecting NWNT and urban areas to Lantau, thereby enhancing the overall resilience of the road network connecting to the airport and HZMB.

## **2.4 Consideration of “With” and “Without” Project Scenarios**

### Consideration of “Without” Project Scenario

- 2.4.1 Without the implementation of the Project, substantial amount of traffic load from new and existing developments in NWNT heading towards Tsuen Wan, West Kowloon, Lantau Island and Hong Kong Island, etc. would have to rely on the existing Tuen Mun Road or Lantau Link. The traffic impact assessment indicates that the Tuen Mun Road and Lantau Link would not have sufficient capacity to handle the future traffic demand, resulting in traffic congestion anticipated during peak hours, consequently leading to higher vehicular emissions from decreased traffic speeds.

### Consideration of “With” Project Scenario

- 2.4.2 Upon completion of the Project, TYLL is expected to ameliorate the forecast traffic condition on Lantau Link and major roads connecting the NWNT and the urban areas, the increase route choices will also strengthen the resilience of the entire road network. Together with other road projects that are currently under implementation, TYLL is also expected to help create traffic capacity to effectively unleash the development potential of the NWNT and Lantau Island effectively.
- 2.4.3 The implementation of the Project results in a significant improvement in the traffic conditions between NWNT and urban areas, including Tsing Yi, NWNT and Lantau Island. Additionally, it brings benefits to the overall transport system by introducing

alternative route choices for commuting traffic and ameliorating the traffic condition of Lantau Link. Through the optimisation of the Project's alignment, it achieves more than just reducing travel time for road users; it also effectively reduces energy consumption and minimises environmental impacts on the neighbourhood.

## **2.5 Environmental Benefits of the Project**

2.5.1 As mentioned in the above sections, the existing major roads such as Tuen Mun Road and Lantau Link would experience traffic congestion during peak hours. The Project would ameliorate the traffic conditions on these major roads and reduce the potential air quality and noise impacts to the neighbouring sensitive receivers.

2.5.2 Furthermore, eco-shoreline features would also be incorporated into newly established coastal structures and shorelines. It is expected that these features will facilitate the recruitment, settlement and colonisation of marine benthos, thereby enhancing the overall quality and diversity of associated marine ecosystems in the vicinity.

## **2.6 Design Changes to the Project**

Exclusion of Tsing Yi Road West Connection Viaduct (TYRWV)

2.6.1 Under the original planning of the Project in the TYLL FS, a slip road in the form of a viaduct, i.e. TYRWV, was proposed to connect the mainline of the Project with Tsing Yi Road West. The construction of this around 1.7km long TYRWV abutting Sai Tso Wan Road will require slope works/retaining structures and temporary works, which will generate construction and demolition materials and cause impact to nearby sensitive receivers. In this design development, it was found that this TYRWV could be excluded while maintaining necessary connection with minor adjustment to the interchange.

2.6.2 This arrangement will also increase the horizontal distance between the proposed road under the Project and the sensitive receivers along Sai Tso Wan Road. To illustrate this point, the closest distance between the proposed roads and the existing Potentially Hazardous Installation (PHI), namely Shell Tsing Yi Installation, will increase from 20m in the Project Profile to 60m in the current scheme. This would not only reduce the risk to road users but also minimise the environmental impacts such as air quality impact in both construction stage and operation stage.

Reduction in Total Reclamation Area

2.6.3 Earlier design of the Project as shown in the Project Profile included reclamations in North Lantau, Ma Wan and Tsing Yi to accommodate the towers and anchorages of long span bridges. Subsequently, the alignment has been refined, and the bridge form has been changed, the extent of the proposed reclamation works has also been reviewed with due consideration to the engineering, environmental and marine operation aspects. As a result, the footprints of the proposed reclamations are reduced. One of the refinements include the avoidance of reclamation at North Lantau by adopting a pile-supported Vessels Impact Protection System (VIPS) at the existing shoreline at North Lantau. The VIPS provides protection to the bridge pier against vessel impact, hence eliminating the need for reclamation. As a result, the total reclamation area in the current scheme (about 19.8 hectares) is reduced by about 4.1 hectares (17%) when compared with the original scheme in the Project Profile (about 23.9 hectares).

Rearrangement of the slip road tunnel connecting to the proposed HKIW-NEL Link to separate tunnel tubes and confirmed layout of slip roads connecting to North Lantau Highway

- 2.6.4 The scope of the Project includes the construction of slip roads, viaducts and a road tunnel at North Lantau connecting the mainline of the Project to the proposed HKIW-NEL Link and North Lantau Highway. During the preparation of the Project Profile, the planning and design of the proposed HKIW-NEL Link and the road alignment of the Project were still at a very preliminary stage. Therefore, we could only include an indicative arrangement of such connection in the Project Profile.
- 2.6.5 Further to the preliminary design of the Project, rearrangement of the slip road tunnel as two distinct tunnel tubes (one for each traffic bound) less than 800 m in length between portals was found to be required in order to maintain sufficient vertical clearance from the mainlines of the Project and the HKIW-NEL Link. Nevertheless, the tunnel portals at both ends would stay at a similar location.
- 2.6.6 The current scheme of the road alignment design also includes two slip roads connecting to North Lantau Highway (eastbound and westbound). In this design, the routing and elevation were adjusted to minimise the required slope cutting works.
- 2.6.7 Similar ecological profile, habitat compositions and conditions to the original scheme are observed in the concerned areas (such as shrubland of low to moderate value, developed area and plantation of low ecological value). The scope of key environmental issues such as noise impact, air quality impact, terrestrial ecological impact, etc. need to be assessed as identified in the Project Profile are still covered in the current scheme. While the assessment area of the applicable impact assessments in the EIA study had been adjusted according to the revised boundary of the revised road and tunnel alignment, there is no additional environmental issue associated with the proposed changes presented in the current scheme.

## 2.7 Consideration of Alignment Options

- 2.7.1 Having thoroughly reviewed the possible alignment options of the TYLL mainline investigated in the TYLL FS, recommendations from the public, and other alternative options, the recommended alignment option (**Figure 2.1** refers) is still considered as the most cost effective and environmentally friendly alignment option of the TYLL mainline for connecting North Lantau and Tsing Yi. It was therefore selected based on various engineering and environmental factors and will be taken forward for design and construction of the Project.
- 2.7.2 A summary of the key considerations for options on the alignment, design, and construction methodology of the Project is given in **Tables 2.2, 2.3, 2.4** below and in **Figure 2.3**.

**Table 2.2 Summary of Landing Options**

Alignment Option	Pros	Cons	Recommended Option (Y/N)
Recommended Alignment	<ul style="list-style-type: none"> <li>• Connection to the Tsing Yi North Coastal Road Cheung Tsing Highway and Tsing Sha Highway.</li> <li>• Adequate separation between TYLL and Tsing Ma Bridge to prevent aerodynamic interference.</li> </ul>	/	Y

Alignment Option	Pros	Cons	Recommended Option (Y/N)
	<ul style="list-style-type: none"> <li>Minimised the proportion and extent of slope work, and at-grade roads were minimised and strategically positioned along the existing developed area.</li> <li>Smaller reclamation extent compared to Alternative Landing Options 1 and 2.</li> </ul>		
Alternative Landing Option 1	/	<ul style="list-style-type: none"> <li>No connection to the Tsing Yi North Coastal Road.</li> <li>Travelling distance is about 40% longer than the Recommended Alignment</li> <li>Additional reclamation works and considerable amount of cut slopes and tunnelling works associated with the proposed slip roads in Tsing Yi west would be required</li> <li>Generate large amount of C&amp;D materials</li> </ul>	N
Alternative Landing Option 2	/	<ul style="list-style-type: none"> <li>Aerodynamic interference of two closely spaced long-span bridges would cause road safety concerns on both Tsing Ma Bridge and TYLL.</li> <li>Additional reclamation works and realignment of Ma Wan Fairway would be required</li> <li>Proposed alignment and its associated reclamation would be very close to the existing residential blocks of Ma Wan and Ma Wan Tung Wan beach, resulting in significant visual and environmental impacts.</li> </ul>	N
Alternative Landing Option 3	/	<ul style="list-style-type: none"> <li>Inadequate space and headroom for proposed slip road connection to Cheung Tsing Highway and Tsing Sha Highway due to the presence of several layers of existing viaducts at merging / diverging points.</li> <li>Proposed alignment is close to the existing oil depot and there might not be adequate space for constructing hazard mitigation measures.</li> </ul>	N

**Table 2.3 Summary of Alignment Options for Tsing Yi Connection**

Alignment Option	Pros	Cons	Recommended Option (Y/N)
Tsing Yi Option 1	<ul style="list-style-type: none"> <li>• Direct connection to Tsing Yi Road West.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction of viaduct TYRWV requires land adjacent to Sai Tso Wan Road.</li> <li>• No direct connection between TYLL and Cheung Tsing Tunnel (CTT).</li> <li>• Large temporary working platforms are anticipated for the construction of bored pile wall along existing slopes.</li> <li>• Affect large number of trees (~909 nos. of trees) at existing slope.</li> <li>• Closer to the two existing PHIs (~20m) and air sensitive receivers (ASRs) at Sai Tso Wan.</li> <li>• Large construction area would impose greater environmental implication.</li> </ul>	N
Tsing Yi Option 2	<ul style="list-style-type: none"> <li>• Retaining wall construction would not be required.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction of TYRWV requires land adjacent to Sai Tso Wan Road.</li> <li>• Appropriate widening of the marginal strips or hard shoulders to satisfy adequate forward visibility distance.</li> <li>• No direct connection between TYLL and CTT.</li> <li>• Affect large number of trees (~909 nos. of trees) at existing slope.</li> <li>• Closer to the two existing PHIs (~10m) and ASRs at Sai Tso Wan.</li> <li>• Large construction area would impose greater environmental implication and generate higher amount of construction waste.</li> </ul>	N
Tsing Yi Option 3 (Recommended)	<ul style="list-style-type: none"> <li>• The amount of retaining structures is less than Tsing Yi Option 1 and 2.</li> <li>• The modification of existing road is less than Tsing Yi Option 2 by approximately 4.3km.</li> <li>• Direct connection of TYLL westbound and Cheung Tsing Tunnel westbound.</li> <li>• TYRWV incorporated into Tsing Sha Highway.</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate widening of the marginal strips or hard shoulders to satisfy adequate forward visibility distance.</li> <li>• Large temporary working platforms are anticipated for the construction of bored pile wall along existing slopes.</li> </ul>	Y

Alignment Option	Pros	Cons	Recommended Option (Y/N)
	<ul style="list-style-type: none"> <li>• Omission of TYRWV leads to smaller construction works area and minimise landscape and visual impacts.</li> <li>• Affect smaller number of trees (~461 nos. of trees) at existing slope.</li> <li>• Further away from the existing PHIs (~60m); relatively fewer air sensitive receivers and no noise sensitive receivers to be affected.</li> <li>• The works area is reduced by 15ha. as compared with Tsing Yi Option 1 and 2</li> </ul>		

**Table 2.4 Summary of Alignment Options for Main Bridges cum North Lantau Interchange**

Alignment Option	Pros	Cons	Recommended Option (Y/N)
Main Bridges cum North Lantau Option 1	<ul style="list-style-type: none"> <li>• Full closure to KSMF is not required for cable-stayed bridge construction.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased deck width of Lantau side span is required to cater for the merging/diverging length.</li> <li>• Significant increase on site-formation and tunnelling works required on North Lantau Island.</li> <li>• Require reclamation at North Lantau and larger reclamation area in Ma Wan. The total reclamation area is approximately 26.3ha.</li> <li>• Generate large amount of marine sediment.</li> <li>• An approximately 2,420 of trees would be affected.</li> </ul>	N
Main Bridges cum North Lantau Option 2 (Recommended)	<ul style="list-style-type: none"> <li>• Curved alignment beginning at Lantau Shore with reduced site formation works.</li> <li>• Reclamation at North Lantau is not required.</li> <li>• The total reclamation area is approximately 19.8ha., which reduced the overall area of reclamation by approximately 6.5 ha as compared with Main</li> </ul>	<ul style="list-style-type: none"> <li>• One-off short duration of full closure at KSMF is required.</li> </ul>	Y

Alignment Option	Pros	Cons	Recommended Option (Y/N)
	Bridges cum North Lantau Option 1. <ul style="list-style-type: none"> <li>Minimise slope cutting at North Lantau hence preserve the natural features of the area to minimise ecological impacts and tree felling.</li> <li>An approximately 1,920 of trees would be affected.</li> </ul>		

### Summary of Alternative Mitigation Measures

2.7.3 Due consideration has been given to address the environmental challenges encountered in the design of the Project. Environmental protection has been prioritised and fulfilled to the greatest extent possible. Various key actions have been implemented to address the environmental challenges and summarised in **Table 2.5**.

**Table 2.5 Summary of Alternative Mitigation Measures**

Alternative Mitigation Measures	Details	Environmental Benefits	Environmental / Engineering Disbenefits
Reduce and reuse inert C&D Materials	<ul style="list-style-type: none"> <li>Minimise slope works in North Lantau and Tsing Yi to reduce generation of excavated soil and yard waste; and</li> <li>On-site reuse of inert C&amp;D materials like reclamation filling.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce total amount of inert C&amp;D materials for disposal; and</li> <li>Minimise transporting of C&amp;D materials to Public Fill Reception Facilities (PFRFs) thus reducing potential air quality and noise impacts arising from the transportation vehicles / vessels.</li> </ul>	<ul style="list-style-type: none"> <li>NIL</li> </ul>
Encourage recycling of yard waste	<ul style="list-style-type: none"> <li>Yard waste is encouraged to be sent to the Yard Waste Recycling Centre in Y-Park for recycling prior to disposal at the designated landfill site.</li> </ul>	<ul style="list-style-type: none"> <li>Generate new products from yard waste; and</li> <li>Indirectly increasing the lifespan of existing landfill.</li> </ul>	<ul style="list-style-type: none"> <li>Yard waste might need to be stored on-site for a period; and</li> <li>Increase in administration cost.</li> </ul>
Adopting GPS or equivalent system	<ul style="list-style-type: none"> <li>Tracking and monitoring of all dump trucks to prohibit illegal dumping and landfilling of C&amp;D materials.</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit illegal dumping.</li> </ul>	<ul style="list-style-type: none"> <li>NIL</li> </ul>
Disposal / treatment methods for marine sediment	<ul style="list-style-type: none"> <li>Adoption of deep cement mixing (DCM) as a primary ground treatment method for reclamation.</li> </ul>	<ul style="list-style-type: none"> <li>Avoid the need for disposal of thick marine deposits; and</li> <li>Reduce disposal and transportation of marine sediment.</li> </ul>	<ul style="list-style-type: none"> <li>Ineffective in areas with shallow depth of marine deposits; and</li> <li>May involve specialised equipment, materials, and expertise, leading to higher</li> </ul>

Alternative Mitigation Measures	Details	Environmental Benefits	Environmental / Engineering Disbenefits
			upfront costs compared to traditional dredging.
Adopt pile-supported VIPs in the area of existing shoreline	<ul style="list-style-type: none"> <li>• Avoidance of reclamation at North Lantau shoreline; and</li> <li>• Protect the deflection pier at North Lantau from vessel impact.</li> </ul>	<ul style="list-style-type: none"> <li>• Reclamation is no longer required at North Lantau, which benefit the preservation of the intertidal zone and ecosystem along the shoreline; and</li> <li>• Alleviate the water pollution caused by the construction of reclamation land.</li> </ul>	<ul style="list-style-type: none"> <li>• The VIPs and other pile-supported structures require ongoing maintenance to ensure their structural integrity, especially in a harsh marine environment.</li> </ul>
Adoption of Eco-shoreline	<ul style="list-style-type: none"> <li>• Incorporation of eco-shoreline design in the future coastal structures such as seawalls on the reclaimed land as well as surfaces and supporting structures on the pile-supported VIPs; and</li> <li>• Incorporation of elements that diversify microhabitats and enhance the quality of settlement substrates.</li> </ul>	<ul style="list-style-type: none"> <li>• Present new opportunities for the recruitment, settlement and colonisation of marine benthos, thereby enhancing the overall quality of associated marine ecosystems in the vicinity;</li> <li>• Encourage recruitment and settlement of corals and other benthos; and</li> <li>• Provide sheltering habitats for marine wildlife.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in construction cost and maintenance cost.</li> </ul>

## 2.8 Construction Methodologies

2.8.1 The key construction elements of the Project include tunnels, cable supported bridges crossing MWF and KSMF, reclamation areas for the proposed bridge towers and anchorage, viaducts and at-grade roads.

2.8.2 Possible construction methods which have been investigated for the construction of the Project and the reasons for selection are summarised in **Table 2.6**.

**Table 2.6 Summary of Possible Construction Methods for the Project**

Section	Possible Construction Method	Selection Reason
Tunnel	Drill-and-blast	<ul style="list-style-type: none"> <li>• Significantly decrease and limit potential environmental impacts, specifically concerning noise, dust, and visual disturbances to areas in close proximity to the portals</li> <li>• More effective for rock tunnel excavation than mechanical breaking methods, which significantly reduces</li> </ul>

Section	Possible Construction Method	Selection Reason
		the construction period, providing both financial benefits and faster project commissioning
<b>Reclamation</b>	DCM (primary ground treatment method)	<ul style="list-style-type: none"> <li>• Considered as the most robust option with the least shortcomings when compared with other ground treatment schemes given the Project's needs</li> <li>• Avoid the need for disposal of thick marine deposits</li> </ul>
	Fully dredged method (for areas where DCM is ineffective)	<ul style="list-style-type: none"> <li>• For areas with soft marine deposits where DCM is ineffective, it is technically required to dredge the whole layer of marine deposits and replace it with firm materials for controlling the settlement of the reclaimed islands and to ensure stability of the seawall structures</li> </ul>
<b>Pile-supported VIPS</b>	Bored pile	<ul style="list-style-type: none"> <li>• The bored piles would be used for supporting the VIPS. It aims to provide the protection to bridge structures.</li> <li>• Reduction in vibration and noise generation during piling process as compared with other piling methods.</li> </ul>
<b>Main Bridges (Foundation)</b>	Large diameter bored pile foundations for tower support	<ul style="list-style-type: none"> <li>• Accelerate construction</li> <li>• Reduce noise and minimising vibrations</li> </ul>
<b>Main Bridges (Tower)</b>	Jump form or slip form methods for tower construction	<ul style="list-style-type: none"> <li>• Considered as the most robust option taking account into the construction time, cost, durability, and maintenance requirements</li> <li>• Less C&amp;D materials / waste generated</li> </ul>
<b>Viaducts</b>	Precast concrete segmental method	<ul style="list-style-type: none"> <li>• Better control of quality and workmanship for works in fabrication yard</li> <li>• Minimise the need for on-site concrete casting</li> <li>• Use of steel mould as formwork in the fabrication yard can reduce the generation of C&amp;D waste / materials on site</li> <li>• More efficient construction works as the deck segments can be cast concurrently with superstructure works</li> </ul>
<b>Rock Cuttings</b>	Open blasting (Recommended for Lantau side)	<ul style="list-style-type: none"> <li>• Optimise cost and time efficiency for hard rock slopes</li> <li>• Noise only generated at specific times</li> </ul>
	Hydraulic excavation (Recommended for Tsing Yi side)	<ul style="list-style-type: none"> <li>• Explosives not required, thus reducing risk to the two PHIs at Tsing Yi.</li> </ul>

2.8.3 The actual construction sequences and processes of the reclamation filling shall be further developed by the contractor, but the envisaged construction processes of the adopted reclamation summarised as below: -

1. Installation of silt curtain;
2. Dredging for seawall and four main reclamation area simultaneously (Approx. 12 numbers of dredgers);
3. Installation of geotextile, sand blanket and primary silt curtain;
4. Carry out DCM (approx. 50%) for main reclamation area;
5. Backfilling of fully dredged zone;
6. Installation of rockfill; and
7. Reclamation filling to formation level.

2.8.4 Regarding habitat preservation and waterflow retention, the following measures are envisaged: –

- In order to preserve the headwater of the north-branching tributary in watercourse at North Lantau, it is proposed to replace the intersecting section with a box culvert and relocating the permanent structures to avoid encroachment;
- Implement temporary stream diversions to maintain waterflow; and
- Establish work exclusion zones around watercourses and use elevated platforms to minimise impact on banks and stream beds.

## 2.9 Implementation Programme

2.9.1 The construction phase of the Project, which involves activities such as tunnelling, reclamation works, road works, viaduct construction and site formation, is tentatively scheduled to begin in 2027 Q1 and complete in 2033 Q2. The project implementation, including construction and operation of the TYLL, will involve land resumption under prevailing mechanism before commencement of construction of the TYLL. The road scheme for the project will be gazetted under Roads (Works, Use and Compensation) Ordinance (Cap. 370) and the construction works will commence only after the road scheme has been authorised and the land resumption under Cap. 370.

2.9.2 The sequence of works will be refined during the detailed design and construction stages of the project. The sequence of works will be carefully planned such that the environmental impacts would be kept to a minimum and within acceptable limits. Collaboration with the nearby concurrent projects (e.g. Route 11 and Road P1, etc.) is required to reduce the potential cumulative environmental impacts. The sequence followings are the measures recommended to be taken during construction:

- Close liaison with the contractors of other concurrent projects in order to avoid overlapping of construction activities and allow sufficient buffer for works at project interface due to potential delays in the programme so that the cumulative effects of environmental impacts could be minimised.

### Land Based Works

- Temporary stream diversion to maintain the downstream water flow, works exclusion zones and elevated platforms will also be implemented before construction works around watercourses where required to minimise the ecological impact. As the impact on amphibians and other aquatic species of conservation interest are mitigated through translocation works (if applicable) after pre-construction survey, the environmental impact has been minimised such that a specific sequence of land-based works is not considered necessary.

- Blast cages or roof-over protective cover would be provided before the commencement of open blasting works to minimise the air and noise impacts of blasting. During the construction of drill and blast tunnels, a blast door will be installed in the tunnel openings to prevent the escape of fugitive dust from blasting before further blasting works within the tunnels. Therefore, the air and noise impacts are minimised for most periods of the tunnel construction through the blast door. With these mitigation measures, the carrying out of the construction of the two tunnels and slip roads concurrently would result in a similar environmental impact and is assumed in conducting the assessment in lieu of a specific construction sequence.

#### Marine Works

- Silt curtains will be installed before reclamation works to minimise the marine water quality, marine ecology and fisheries impacts of the works. The worst-case scenario has been considered for the water quality impacts of the reclamation works based on a tentative construction sequence.
- The use of VIPS for vessel protection of the deflection pier at North Lantau reduces the time required for the construction works there when compared to using reclamation for vessel protection, requiring only about 10 months to complete the piling works. This further minimises the marine water quality, marine ecology and fisheries impacts of the works. The sediment release rate for VIPS is minuscule, being less than 1% of the sediment release rate of the reclamation works. Therefore, it is considered that a specific sequence of works for VIPS is not necessary.

### **3. KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT**

#### **3.1 Approach to the EIA**

3.1.1 The EIA process provides a means of identifying, assessing and reporting the environmental impacts associated with the construction and operation of the Project based on the engineering design information available at this stage. Throughout the EIA process the potential environmental effects of various design options and develop alternatives as well as mitigation measures to be incorporated into the design, construction and operation of the Project are identified. Mitigation measures have been recommended to avoid some potential environmental impacts, or to minimise/mitigate impacts to acceptable levels.

3.1.2 The findings of this EIA Study have determined the likely nature and extent of the following environmental impacts predicted to arise from the construction and operation of the Project:

- Air Quality Impact
- Noise Impact
- Water Quality Impact
- Waste Management Implications
- Land Contamination
- Ecological Impact
- Fisheries Impact
- Landscape and Visual Impact
- Cultural Heritage Impact
- Hazard to Life

#### **3.2 Air Quality Impact**

3.2.1 Potential air quality impacts associated with the construction and operational phases of the Project have been assessed in accordance with the requirements given in Clause 3.4.4 and Appendix B of the EIA Study Brief, as well as the criteria and guidelines as stated in Annexes 4 and 12 of EIAO-TM. The assessment area for air quality impact assessment is defined by a distance of 500 m from the boundary of the Project.

3.2.2 Potential air quality impact from the construction works of the Project would mainly be related to construction dust from site formation, site clearance, excavation, reclamation, tunnelling, foundation works, handling and stockpiling of dusty materials, wind erosion of exposed area and operation of barging points, as well as air pollutant emissions from on-site machinery, construction vehicles and construction vessels. Potential air quality impact would also be expected from operation of a potential temporary concrete batching plant (CBP).

3.2.3 Construction activities of the concurrent projects within 500 m assessment area would also contribute to cumulative air quality impact. With the implementation of mitigation measures specified in the *Air Pollution Control (Construction Dust) Regulation*, together with the recommended control measures including frequent watering on active works areas, exposed areas and unpaved haul roads and other site

management measures such as good site practices, covering and proper storage of dredged materials, use of electric vehicles and Environmental Monitoring and Audit (EM&A) programme, as well as proper implementation of dust suppression measures according to *BPM 3/2 (2025) – A Guidance Note on the Best Practicable Means for Specified Process – Cement Works (Concrete Batching Plant)* at the temporary CBP, no adverse air quality impact on air sensitive receivers (ASRs) in the vicinity of the work sites would be anticipated during the construction stage.

- 3.2.4 Potential odour impact from dredged materials would be minimised with the implementation of mitigation measures, such as covering of dredged materials during transportation and temporary storage, controlled loading of materials to avoid splashing, transportation of materials away from Project site within 24 hours, etc.
- 3.2.5 Cumulative air quality impacts during the operational phase of the Project were assessed by considering the project-induced emissions, all relevant emission sources in the immediate vicinity of the Project site and within the 500 m assessment area, as well as background contributions. The quantitative modelling prediction results concluded that the cumulative NO<sub>2</sub>, RSP and FSP concentrations at all existing and planned ASRs would comply with the prevailing Air Quality Objectives (AQOs). Thus, no adverse air quality impact during the operation phase of the project on the existing and planned ASRs would be anticipated.

### **3.3 Noise Impact**

- 3.3.1 Potential noise impacts associated with the construction and operational phases of the Project have been assessed in accordance with the requirements given in Clause 3.4.5 and Appendix C of the EIA Study Brief, as well as the criteria and guidelines as stated in Annexes 5 and 13 of the EIAO-TM. The assessment area for noise impact assessment is defined by a distance of 300 m from the boundary of the Project. No committed nor planned noise sensitive receivers (NSRs) with concrete implementation programme were identified.
- 3.3.2 With the adoption of proposed noise mitigation measures, including use of Quality Powered Mechanical Equipment (QPME), use of quieter equipment / method, use of higher surface density site-hoarding, use of noise barrier / enclosure, etc., adverse noise impact arising from construction works of the Project is not anticipated. Nevertheless, a Construction Noise Management Plan (CNMP), which contains a quantitative construction noise impact assessment, mitigation measures and monitoring and audit programme, will be submitted before the tender invitation and commencement of construction works. Cumulative construction noise impact from the concurrent projects, if any, should be considered and evaluated in the CNMP.
- 3.3.3 Quantitative road traffic noise impact assessment has been conducted according to the requirements in EIA Study Brief. According to the modelling results, no adverse road traffic noise impact would be anticipated for all representative noise sensitive receivers (NSRs).
- 3.3.4 As there are no planned fixed noise sources under the Project identified at this stage, fixed noise sources impact assessment was not carried out under this EIA. If the individual ventilation building is confirmed to be constructed and operated under the TYLL project, a Fixed Noise Source Management Plan (FNMP) will be prepared. The FNMP will include the prevailing background noise survey, the quantitative fixed noise source impact assessment, noise mitigation measures and monitoring and audit programme, and will be submitted to EPD before commencement of construction of the Project.

### **3.4 Water Quality Impact**

- 3.4.1 The water quality impact assessment (WQIA) was conducted in accordance with the requirements given in Clause 3.4.6 and Appendix D of the EIA Study Brief as well as the criteria and guidelines as stated in Annexes 6 and 14 of the EIAO-TM. The assessment area for this water quality impact assessment includes areas within 500 m from the boundary of the Project and covers Western Buffer Water Control Zone (WCZ) and the North Western WCZ as designated under the Water Pollution Control Ordinance (WPCO).
- 3.4.2 During dredging activities of the construction phase, the sediment plume resulting from dredging is expected to be confined to the dredging area, and no exceedance is anticipated at any of the water sensitive receivers (WSRs). Simulation results indicate that even without implementing mitigation measures such as silt curtains, the relatively low sediment release load from dredging is unlikely to cause exceedances at nearby WSRs.
- 3.4.3 In the scenario involving reclamation filling activities relatively high sedimentation rate are projected at the observation point WM4 if no mitigation measures are implemented. With the deployment of silt curtain, the sediment plume is further reduced. Furthermore, transient DO depletion resulting from the Project activities would be minimal. Overall, no adverse water quality impacts are expected.
- 3.4.4 The key sources of water pollution of the land-based construction work include wastewater generated from general construction activities, construction site run-off, sewage from construction workforce, accidental spillage of chemicals. The potential water quality impacts could be mitigated and controlled by implementing the recommended mitigation measures such as Best Management Practices (BMPs) and water control strategies during construction, adverse water quality impacts are not anticipated during construction phase. It is recommended that regular site inspections be undertaken routinely to ensure that the recommended mitigation measures are properly implemented.
- 3.4.5 Potential hydrodynamic changes resulting from the proposed reclamation have been evaluated through computational modelling. The hydrodynamic modelling results indicate that the changes will be insignificant with negligible differences being observed in water level, salinity, flow velocities, flow rates, and flow fields between the pre-construction and post-construction scenarios. Adverse water quality impacts are not anticipated during the operational phase of the Project.

### **3.5 Waste Management Implications**

- 3.5.1 The waste impact assessment was conducted in accordance with the requirements given in Clause 3.4.7 and Appendix E of the EIA Study Brief, as well as the criteria and guidelines as stated in Annexes 7 and 15 of the EIAO-TM.
- 3.5.2 During construction, waste generated from the Project includes C&D materials from construction activities, chemical wastes from maintenance and servicing of construction plants and vehicles, general refuse from workforce, floating refuse and sediments. Improper handling, collection, transportation and re-use / disposal of the wastes will result in hygiene problems and adverse environmental impacts, e.g. odour nuisance, and pollution of nearby water bodies. It is recommended that these wastes be handled, transported and disposed of according to the recommended good site practices and measures, including proper handling and storage of waste by means of covers and water spraying system to prevent materials from being blown or washed

away, adopting GPS or equivalent system for tracking and monitoring of all dump trucks for the Project to prohibit illegal dumping and landfilling of C&D materials, etc. With the implementation of these measures, no adverse environmental impacts (including potential hazard, air and odour emissions, noise and wastewater discharges) would be anticipated during the construction phase.

- 3.5.3 Reduction measures have been recommended to minimise the amount of materials generated by the Project by reusing C&D materials before off-site disposal. Approximately 2,227,500 m<sup>3</sup> of inert C&D material would be generated during the construction phase, in which approximately 1,773,980 m<sup>3</sup> would be reused on-site as backfill material and around 453,520 m<sup>3</sup> would be delivered off-site to Public Fill Reception Facility. Moreover, approximately 139,000 m<sup>3</sup> of non-inert C&D material would be generated during the construction phase. Opportunities in minimisation of generation and maximisation of reuse would be continually investigated during the detailed design and construction phases. The other materials that cannot be reused or recycled would be disposed of at designated outlets.
- 3.5.4 The total volume of dredged sediment generated from the Project is estimated to be approximately 196,485 m<sup>3</sup>. Based on the current estimation and sediment samplings laboratory testing results, approximately 140,279 m<sup>3</sup> (Category L) of sediment is suitable for Type 1 – Open Sea Disposal and 56,206 m<sup>3</sup> (Category M and H) of sediment is required for Type 2 – Confined Marine Disposal at disposal site(s) in accordance with *paragraph 4.2.1 of Chapter 4 of the Project Administration Handbook for Civil Engineering Works (PAH)*. With the implementation of the recommended mitigation measures and in accordance with the requirements of prevailing guidelines/circulars, no adverse environment impacts would be expected from dredging, transportation and disposal of marine sediment.
- 3.5.5 The main types of waste generated from the operation of the Project are floating refuse and chemical waste. In accordance with existing practice, floating refuse will be collected by regular operation of Marine Department's contractor, no adverse environmental impact would be anticipated.

### **3.6 Land Contamination**

- 3.6.1 The land contamination assessment is conducted in accordance with the requirements given in Clause 3.4.8 and Appendix F of the EIA Study Brief, as well as the criteria and guidelines as stated in Annex 19 of the EIAO-TM.
- 3.6.2 A site appraisal, in the form of desktop review and site walkover, was conducted from May 2023 to January 2025 to identify any current/historical potentially contaminating land uses. Based on the site appraisal, three potentially contaminated sites were identified.
- 3.6.3 Due to actual site conditions, site investigation (SI) works for these potentially contaminated sites are considered not feasible to be carried out under the EIA Study, especially for sites which are still in operation. The on-going activities would cause further contamination issues and make the assessment obsolete. As such, further site appraisal would be carried out for these sites when site operation has ceased / after site handover in order to assess the latest site conditions and to identify the presence of any potential land contamination sources. Any necessary SI works and remediation action would be recommended to be carried out after the site operation has ceased / decommissioning of the facility prior to the commencement of construction works at the concerned sites / areas.

3.6.4 The recommended further assessment and remediation works, including the submission of CAP(s), Contamination Assessment Report(s) (CAR(s)) / Remediation Action Plan(s) (RAP(s)) and Remediation Report(s) (RR(s)) should follow relevant Guidance Manual, Guidance Note and Practice Guide such as Guidance Note for Contaminated Land Assessment and Remediation (EPD, April, 2023), Practice Guide for Investigation and Remediation of Contaminated Land (EPD, April 2023) and Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management (EPD, April 2023).

### 3.7 Terrestrial and Marine Ecological Impact

3.7.1 The ecological impact assessment is conducted in accordance with the relevant requirements as specified in Clause 3.4.9 and Appendix G of the EIA Study Brief, as well as the criteria and guidelines as stated in Annexes 8 and 16 of the EIAO-TM. The assessment area for terrestrial ecological impact assessment includes areas within 500 m of the Project boundary. The assessment area for marine ecological impact assessment follows that for water quality impact assessment, which includes the areas within 500 m distance from the boundary of the Project, the Western Buffer WCZ and other affected WCZs as designated under the WPCO (Cap. 358), as well as other areas likely to be impacted by the Project.

3.7.2 A literature review and ecological field surveys were conducted for the purpose of this ecological impact assessment for the Project. A total of nine habitat types, including woodland, plantation, shrubland/grassland, watercourse, developed areas, wasteland, agricultural land, intertidal zone and sea were recorded within the 500 m assessment area. The Project area was largely comprised of sea, developed areas, shrubland/grassland and plantations which were of low or low to moderate ecological value. The conditions of the Project area were found to be largely disturbed and man-made particular in Tsing Yi and Ma Wan, while relatively more natural habitats (e.g. shrubland/grassland) were more prominent in North Lantau. The flora and fauna communities recorded were mostly of low or low to moderate diversity and abundance and generally consisted of those that are locally common and widespread and/or are generalist species which possess high tolerance and adaptability to disturbance and environmental changes.

3.7.3 During the early stage of planning, exhaustive effort was made to ensure the alignment and design of the TYLL would avoid direct encroachment onto any recognised sites of conservation importance and ecologically sensitive sites, while several adjustments and engineering options were made to avoid or minimise direct and indirect ecological impacts arising from the Project. As a result, the impact significance on habitats, species of conservation importance and other assessed ecological elements were kept to between low and low to moderate without mitigations. Mitigation measures were recommended to further minimise and compensate for any identified ecological impacts rated with an impact severity of low to moderate, including providing works exclusion zone at watercourses, pre-construction survey for *Romer's Tree Frog* and *Caridina serrata*, coral translocation, etc. Some recommendations for precautionary measures and enhancement opportunities were also provided to address any potential ecological impacts and promote the ecological benefits of the Project. With full implementation of the recommended mitigation measures, no unacceptable adverse residual impacts are expected to arise from the Project.

3.7.4 Regular inspection and monitoring of the implementation of mitigation measures have been recommended as part of the ecological monitoring programme. Procedures and

requirements for the implementation of measures for impacts on species of conservation importance were described.

### 3.8 Fisheries Impact

- 3.8.1 Potential impacts on fisheries have been assessed in accordance with the requirements given in Clause 3.4.10 and Appendix H of the EIA Study Brief as well as the criteria and guidelines as stated in Annexes 9 and 17 of the EIAO-TM.
- 3.8.2 The fisheries impact assessment has been conducted based on the information gathered from literature review and field surveys. The results showed that the assessment area is utilised by moderate number of fishing vessels, predominantly sampans, with fisheries production at moderate level. The production mainly comprises non-commercially targeted and low-valued species. The nearest spawning ground of commercial fisheries resources located in the Northeast Lantau and Artificial Reef (AR) deployment site at Brothers Marine Park (BMP) are situated far away (about 4.5 km) from the Project, while the Ma Wan Fish Culture Zone (FCZ), which is 450m from the project area, was identified within the assessment area.
- 3.8.3 The proposed reclamation works and pile-supported VIPs for the Project would result in permanent loss of about 19.9 ha and temporary loss of about 62 ha of fishing ground and fisheries habitat. Since the loss only constitute a minor proportion of the marine waters in Hong Kong available for fishing, impacts to capture fisheries due to loss of fishing ground and disruption of fisheries operation are expected to be minor. No direct impact to Ma Wan FCZ is anticipated since the works area will be kept at a distance from the FCZ. Potential impacts of elevated levels of underwater sound as a result of construction activities are not expected to be unacceptable. The Project would not significantly alter the local hydrodynamics regime and hence the change in hydrodynamics is considered to be insignificant. Furthermore, no unacceptable water quality impacts to fisheries resources and fisheries sensitive receivers (including Ma Wan FCZ) during the construction and operational phases are expected with adoption of non-dredged reclamation such as DCM for most of the reclamation works except in localised areas with thin marine deposits where dredging is recommended, in addition to the provision of adequate water quality mitigation measures such as installation of silt curtain and good site practices during construction phase and provision of proper drainage system during operational phase, and implementation of water quality monitoring during construction phase, it is expected that no adverse residual impacts associated with change of water quality would arise and hence no fisheries-specific monitoring is necessary.

### 3.9 Landscape and Visual Impacts

- 3.9.1 A landscape and visual impacts assessment has been carried out in accordance with the requirements given in Clause 3.4.11 and Appendix I of the EIA Study Brief, as well as the criteria and guidelines as stated in Annexes 10 and 18 of the EIAO-TM, and EIAO Guidance Note (GN) No.8/2023. The assessment area for the landscape impact assessment includes all areas within 100 m from the Project boundary while the assessment area for the visual impact assessment is defined by the visual envelope of the Project.
- 3.9.2 Due to the proposed works, a portion of vegetation areas would be unavoidably affected. Approximately 28,010 existing trees were identified within the works area. Of these, approx. 25,630 nos. would be retained hence not be affected by the proposed works. Approx. 2,380 nos. of trees, including approx. 130 undesirable species (i.e. *Leucaena leucocephala*) would be directly affected by the proposed

works and would be either removed or transplanted as far as practicable. Tree compensation within the site in form of light standard tree planting at the toe planter or heavy standard tree planting in amenity areas would be explored. It is recommended that tree compensation requirement of 1:1 in terms of number, i.e. minimum 2,250 nos. of trees, should be carried out as far as practicable. Exact number of trees to be retained, transplanted and removed to be determined under the *Tree Preservation and Removal Proposals* (TPRPs) in accordance with DEVB TC(W) – No. 4/2020.

- 3.9.3 Under this Project, the existing landscape resources, including vegetation, natural rocky and sandy shoreline and waterbody, would be affected in various magnitudes subject to the proposed works. Vegetation found within the landscape resources (LRs) and landscape characters areas (LCAs) would either be temporarily or permanently lost. After the completion of works, landscape mitigation measures such as tree compensation at available space, reinstatement of affected landscaping area in like-for-like basis and provision of buffer screen planting would be implemented. With the implementation of these mitigation measures, it is considered that residual impacts of most of the LR and LCAs would be maintained as *Moderate* to *Slight* in Day 1 and *Slight* to *Negligible* in Year 10 of the operation.
- 3.9.4 In terms of the visual impact, considering that the proposed works would have similar structural mass, height and design characteristics as the existing infrastructures (i.e. Tsing Ma Bridge and Kap Shui Mun Bridge), the unmitigated visual impact to the identified key public vantage be ranging from *Moderate* to *Negligible*.
- 3.9.5 For viewpoints (VPs) viewing at relatively short distance (i.e. VP-P1), the proposed works would be considered as new visual elements to the existing view and would partially block the existing view toward the natural resources. However, due to the slender and airy structural design of the proposed Main Bridges, the visual permeability would only be slightly reduced. The anticipated residual visual impact for both Day 1 and Year 10 of the operational phase would be *Moderate* respectively.
- 3.9.6 For VPs viewing at medium distance (i.e. VP-A3, VP-A4, VP-B3, VP-B4 and VP-B5), with the mitigation measures such as adaptation of aesthetic pleasing design and provision of greenery on the reclamation islands and roadside area, it is anticipated that the residual visual impacts would be reduced to *Slight* for both Day 1 and Year 10 of operational phase.
- 3.9.7 For VPs viewing at relatively long distances (i.e. VP-A2, VP-A5 and VP-T1), the proposed works would not be noticeable by viewers, or that there would not be significant visual blockages to existing visual elements. Hence, the anticipated residual visual impact for both Day 1 and Year 10 of operational phase would be *Negligible*.
- 3.9.8 Considering the scale and nature of the Project, it would inevitably result in certain levels of residual landscape and visual impacts in relation to the loss to hillside vegetation, loss of waterbody, loss of natural shorelines, and the views from hilltop and from ground level. Nevertheless, the residual landscape impacts are localised and limited to the bridge construction and associated works extent, and reclamation extent only without affecting existing community. Meanwhile the residual visual impacts are confined within the visual envelope either involving few numbers of public viewers along hiking trail and visitor / exhibition centres, or relatively large numbers of public viewers at the beach in medium viewing distance but to whom the Project is only partially visible due to the blockage by existing visual elements. With the implementation of the appropriate mitigation measures, it is considered that the overall

residual landscape impacts are minimised to *Slight to Negligible*, and the overall residual visual impacts are minimised to *Moderate to Negligible* in Year 10 of the operation.

- 3.9.9 The design, construction and operation of the TYLL would also fully comply with relevant ordinances, regulations, standards and guidelines. Hence, with full implementation of the recommended mitigation measures, unacceptable adverse residual landscape and visual impacts are not expected, as evaluated based on the factors in Section 4.4.3 of the EIAO-TM.

### **3.10 Cultural Heritage Impact**

- 3.10.1 The cultural heritage impact assessment (CHIA) has been conducted in accordance with the relevant requirements as specified in Clause 3.4.12 and Appendix J of the EIA Study Brief, as well as the criteria and guidelines as stated in Annexes 10 and 19 of the EIAO-TM. The assessment area for the CHIA of this EIA Study covers the area within 300 m from the Project boundary.
- 3.10.2 One declared monument and four buildings/structures with no status are identified within the assessment area.
- 3.10.3 No direct and indirect impact is anticipated on the declared monument, Tang Lung Chau Lighthouse, which is located outside the Project boundary.
- 3.10.4 Four other items with no status are identified within the assessment area, namely the abandoned house close to the Tang Lung Chau Lighthouse, the small structure close to Tang Lung Chau Lighthouse, the old pier at Tang Lung Chau West, and the inscribed stone pillar at *Yi Chuen*. No direct nor indirect impacts are anticipated during the construction and operational stages.
- 3.10.5 As the works area will not encroach on any site of archaeological interest (SAI) or areas with archaeological potential, no terrestrial archaeological impact is anticipated. As a precautionary measure and pursuant to the Antiquities and Monuments Ordinance (Cap. 53), the project proponent is required to inform Antiquities and Monuments Office (AMO) immediately in case of discovery of antiquities or supposed antiquities in the course of construction of the works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with and to the satisfaction of AMO.
- 3.10.6 There has been no previous Marine Archaeological Investigation (MAI) or seabed investigation within the assessment area. Historical marine charts were reviewed and none of them show any known wreck sites within the assessment area. A MAI was conducted for the Project. The diver survey results show that none of the 33 anomalies identified for seabed investigation was considered to be of archaeological potential and no further investigations are required.
- 3.10.7 One target (A4-SC003) and the area of systematic survey in the close vicinity of the Hongkong United Dockyards (HUD) were excluded from the survey owing to diver safety concerns. Based on the analysis of a series of historic maps and aerial photographs from 1962 to 2000, there has been extensive industrialisation of the area since the late 1970s, including land reclamation associated with the construction of the docks and the concrete batching plant. As such, the marine archaeological potential of this area is considered low, and therefore no further investigation is deemed necessary.

3.10.8 No impact on marine archaeology is anticipated from the construction and operation of the Project. As a precautionary measure and pursuant to the Antiquities and Monuments Ordinance (Cap. 53), the project proponent is required to inform AMO immediately in case of discovery of antiquities or supposed antiquities in the course of construction of the works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with and to the satisfaction of AMO.

### **3.11 Hazard to Life**

3.11.1 The hazard assessment has been conducted in accordance with the relevant requirements as specified in Clause 3.4.13 and Appendix K of the EIA Study Brief, as well as the criteria and guidelines as stated in Annex 4 of the EIAO-TM.

3.11.2 Risks associated with the terminals' operation (i.e. Chevron Terminal and Assessment for Shell Tsing Yi Installations (STYI)) during the construction and operational phases of the Project as well as on-site transport and use of explosives during the construction phase of the Project were assessed.

#### Terminals' Operation (Chevron Terminal and STYI)

3.11.3 For both terminals, the individual risks and societal risks results taking into account the population induced during both construction and operation phases by the Project, were found to be in compliance with the risk criteria stipulated in Annex 4 of the EIAO-TM. Risk mitigation measures are therefore not required. The proposed "Good Practices" for implementation during construction phase of the Project recommended in the EIA report should be considered to limit the number of casualties and/or fatalities.

#### Explosives

3.11.4 For the risk related to on-site transport and use of explosives including tunnel blasting and surface blasting, the geotechnical features near the tunnel section and surface blasting of the Project, as well as the populations near the blasting sites and transport route have been assessed. The assessment results show that the societal risk lies within the "Acceptable" region. The risks of the on-site transport and use of explosives comply with both the individual risk and societal risk criteria outlined in Annex 4 of the EIAO-TM.

3.11.5 Nevertheless, recommendations suggested in the EIA Report specific to the on-site transport and use of explosives during construction of the Project, such as development of emergency plan and working guideline, separate transport for detonators from other explosives and secure refuge areas for workers, should be implemented to further minimise the risks with the best practices.

#### **4. ENVIRONMENTAL MONITORING AND AUDIT (EM&A)**

- 4.1.1 The EIA Study of the Project has demonstrated its compliance with the EIAO-TM requirements. Actual impacts during the construction and operational phases of the Project 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 and detail the recommended mitigation measures 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. SUMMARY OF ENVIRONMENTAL OUTCOMES

5.1.1 The EIA has provided an assessment of the potential environmental impacts associated with the construction and operation of the Project, based on the engineering design information available at this stage. The key outcomes are summarised in **Table 5.1**.

**Table 5.1 Summary of Key Environmental Problems Avoided and Sensitive Areas Protected**

Design Approach	Environmental Problems Avoided and Sensitive Areas Protected
Optimised the alignment	<ul style="list-style-type: none"> <li>The current alignment avoided direct impact on residential development at Ma Wan and indirect impact on Ma Wan Egrety, as well as direct or indirect impacts on Tung Lung Chau Lighthouse which is a declared monument.</li> </ul>
Adoption of environmentally friendly construction methods	<ul style="list-style-type: none"> <li>Adoption of off-site precast structures / modular integrated construction method to minimise the impacts on air quality, noise, water quality and waste during construction.</li> </ul>
Minimisation of extensive retaining structures on existing geotechnical features at Tsing Yi	<ul style="list-style-type: none"> <li>The refined alignment design reduced slope works and land resumption at Tsing Yi;</li> <li>No. of affected air and noise sensitive receivers have been reduced; and</li> <li>The landscape and visual impacts at the Tsing Yi Connection has been minimised.</li> </ul>
Avoidance of Reclamation at North Lantau Shoreline	<ul style="list-style-type: none"> <li>The avoidance of reclamation at North Lantau would benefit the preservation of the intertidal zone and ecosystem along the shoreline, including six species of conservation importance at the intertidal zone.</li> </ul>
Minimisation of reclamation and dredging extents for the reclamation in Ma Wan and Tsing Yi	<ul style="list-style-type: none"> <li>The total amount for dredged sediments has been reduced, hence reducing the associated water quality impacts during construction phase</li> <li>The extent of channel narrowing at both MWF and KSMF has been reduced, hence reducing the change in hydrodynamic regime under operation phase.</li> <li>The total reclamation area has been reduced by about 17 %.</li> </ul>
Minimisation of slope cutting	<ul style="list-style-type: none"> <li>Minimised disruption to the landscape resources and characters</li> <li>Minimised potential impacts to the natural habitats and associated ecology</li> <li>Minimised the amount excavation spoil and generation of C&amp;D materials.</li> </ul>
Avoidance of direct impact to ecological sensitive area	<ul style="list-style-type: none"> <li>The current alignment avoided potential direct and indirect impacts on recognised sites of conservation importance and other ecologically sensitive areas, such as the Ma Wan Egrety and Night Roost located on the Project's northern side</li> </ul>

Design Approach	Environmental Problems Avoided and Sensitive Areas Protected
Minimisation of Habitat Loss	<ul style="list-style-type: none"> <li>• To minimise the extent of habitat loss and its impact on the ecology in this area, the proportion and extent of slope works and at-grade roads were minimised and strategically positioned along existing developed area.</li> <li>• Some road sections in North Lantau have opted for tunnel or viaduct form to minimise the footprint of at-grade works and to avoid ecological impact, i.e. the viaduct section at Yi Chuen and tunnel connecting HKIW-NEL Link, which avoid impact on concerned watercourse.</li> </ul>
Avoidance of illegal dumping	<ul style="list-style-type: none"> <li>• The recommended preventive measures would avoid / minimise the chance of illegal dumping.</li> </ul>
Implementation of Environmental Monitoring and Auditing System	<ul style="list-style-type: none"> <li>• Ensure all the recommended measures are properly in place and their effectiveness.</li> </ul>

## **6. CONCLUSION**

- 6.1.1 The findings of the EIA provided information on the nature and extent of the environmental impacts likely to arise from the construction and operation of the Project. The EIA has, where appropriate, identified mitigation measures to ensure compliance with environmental legislation and standards. The summary of the environmental impacts arising from the Project is presented in **Table 6.1**.
- 6.1.2 Overall, the EIA concluded that the Project would comply with the requirements of the EIA Study Brief and EIAO-TM with the implementation of the proposed mitigation measures during the construction and operational phases. The schedule of implementation of the proposed mitigation measures has been provided in the EIA Report. An EM&A programme has also been recommended to check the effectiveness of the proposed mitigation measures.

**Table 6.1 Summary of Environmental Impacts**

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<b>Air Quality Impact</b>					
<b>Construction Impact</b>					
Representative existing residential, commercial developments and government uses within 500m from the boundary of the Project site.	<ul style="list-style-type: none"> <li>Potential air quality impact from the construction works of the Project would mainly be related to construction dust from site formation, site clearance, excavation, reclamation, tunnelling, foundation works, handling and stockpiling of dusty materials, wind erosion of exposed area and operation of barging points, use of on-site mechanical machineries, and gaseous emissions from construction vehicles and construction vessels.</li> <li>Potential air quality impact would also be expected from operation of a potential temporary concrete batching plant.</li> <li>Potential odour impact from dredged sediment.</li> <li>The cumulative air quality impacts from concurrent projects within the 500 m assessment area have been assessed.</li> </ul>	<ul style="list-style-type: none"> <li>Annexes 4 and 12 of the EIAO-TM</li> <li>Air Quality Objectives (AQOs)</li> </ul>	N/A	Control measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices listed below shall be carried out to further minimise construction air quality impact: <ul style="list-style-type: none"> <li>Use of regular watering to reduce dust emissions from blasting, exposed site surfaces and unpaved roads, particularly during dry weather;</li> <li>Use of frequent watering for particularly dusty construction areas and areas close to ASRs;</li> <li>Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines;</li> <li>For the work sites close to the ASRs with a separation distance less than 10 m, provide hoardings of not less than 3.5 m high from ground level along the site boundary; for the other work sites in general, provide hoarding not less than 2.4 m high from ground level along site boundary except for site entrance or exit;</li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impacts anticipated.</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				<ul style="list-style-type: none"> <li>• Avoid position of material stockpiling areas, major haul roads and dusty works within the construction site close to concerned ASRs;</li> <li>• Avoid unnecessary exposed earth;</li> <li>• Locate all the dusty activities away from any nearby ASRs as far as practicable;</li> <li>• Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs;</li> <li>• Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations;</li> <li>• Establish and make use of vehicle wheel and body washing facilities at the exit points of the site;</li> <li>• Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;</li> <li>• Imposition of speed controls for vehicles on site haul roads;</li> <li>• The Contractor shall observe and comply with Air Pollution Control Ordinance (APCO) and its subsidiary regulation, particularly the Air Pollution Control (Construction Dust) Regulation;</li> <li>• The Contractor shall undertake at all times to prevent air nuisance as a result of the construction activities;</li> </ul>	

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				<ul style="list-style-type: none"> <li>• The Contractor shall ensure that there will be adequate water supply / storage for dust suppression;</li> <li>• The Contractor shall devise and arrange methods of working and carrying out the works in such a manner so as to minimise air quality impact on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented properly;</li> <li>• Before the commencement of any work, the Contractor may be required to submit the methods of working, plant, equipment and air pollution control system to be used on the site for the Project Manager's inspection and approval</li> <li>• For the tunnelling works by drill-and-blast, in addition to the regular watering at spoiling handling and unpaved / paved haul roads, a blast door should be installed at the opening to avoid the escape of fugitive dust from the blasting. The blast door should remain closed and ventilation with dust filter with dust removal efficiency of at least 80% at exhaust should remain stopped during blasting. Water spaying should be applied to facilitate dust settlement. The areas within 30m from the blasting area should be wetted with water prior to blasting and blasting shall not be carried out when the strong wind signal</li> </ul>	

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				<p>or tropical cyclone warning signal No. 3 or higher is hoisted;</p> <ul style="list-style-type: none"> <li>• For open blasting activities, blast cages or roof-over protective cover should be provided, water spray should be provided before blasting and on blasted material prior to transportation, and at the mucking out locations, as well as regular watering at unloading points of spoils. Blasting shall not be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted; and</li> <li>• Dust control measures will be implemented in the potential CBP as required in <i>A Guidance Note on the Technical, Management and Monitoring Requirements for Specified Process – Cement Works (Concrete Batching Plant)</i> (BPM 3/2 (2025)).</li> </ul> <p>Control measures to mitigate potential exhaust emission from non-road mobile machineries (NRMMS) during construction phase:</p> <ul style="list-style-type: none"> <li>• Connect construction plant and equipment to main electricity supply and avoid use of diesel generators and diesel-powered equipment;</li> <li>• Avoid exempted NRMMS as far as practicable; and</li> <li>• Deploy electrified NRMMS as far as practicable</li> </ul>	

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				<p>Control measures to mitigate potential odour impact:</p> <ul style="list-style-type: none"> <li>• Tarpaulin covering of dredged materials during transportation and temporary storage, etc. as far as practicable;</li> <li>• Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if any air quality issues arise;</li> <li>• Barges would be equipped with tight fitting seals to ensure dredged materials are well confined;</li> <li>• Loading of dredged materials would be controlled to avoid splashing; and</li> <li>• Any odorous materials shall be transported away from the Project site within 24 hours.</li> </ul> <p>Control measures to mitigate potential air quality impact from construction vessels:</p> <ul style="list-style-type: none"> <li>• Switch off vessel engines during hotelling and utilise land-based electricity as far as practical;</li> <li>• Use fuel that fulfil requirements stated in the <i>Air Pollution Control (Fuel for Vessels) Regulation and Air Pollution Control (Marine Light Diesel) Regulation</i>;</li> <li>• Maintain navigation routes farthest away from ASRs as practicable;</li> </ul>	

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				<ul style="list-style-type: none"> <li>The barging points should be provided with 1) tipping hall enclosed by 3-side screen with top; and 2) water spraying and flexible dust curtains; and</li> <li>At the detailed design stage, project team should timely apply for the temporary electricity with a target that the necessary cables laying works could be completed before the commencement of the works contract. In addition, timely provision of electricity to construction sites can facilitate the use of Electric Vehicles (EVs) in public works contracts. The project team should specify the use of EV(s) as well as the installation of designated medium-speed charger for each EV as a standard provision at the site accommodation in each public works contract.</li> </ul>	
<b>Operation Impact</b>					
Existing and planned residential, commercial developments and government uses within 500m from the boundary of the Project site.	<b>Air Quality Impact</b> <u>NO<sub>2</sub></u> <ul style="list-style-type: none"> <li>19<sup>th</sup> highest 1-hr average conc.: 100 – 124 µg/m<sup>3</sup></li> <li>10<sup>th</sup> highest 24-hr average conc.: 48 – 66 µg/m<sup>3</sup></li> <li>Annual average conc.: 25 – 38 µg/m<sup>3</sup></li> </ul>	<b>Prevailing AQO</b> <u>NO<sub>2</sub></u> <ul style="list-style-type: none"> <li>1-hr average conc.: 200 µg/m<sup>3</sup> (Number of exceedances allowed: 18).</li> <li>24-hr average conc.: 120 µg/m<sup>3</sup> (Number of exceedances allowed: 9).</li> <li>Annual average conc.: 40</li> </ul>	N/A	<ul style="list-style-type: none"> <li>No adverse air quality impact is anticipated during the operational phase of the Project, thus mitigation measure is deemed not necessary.</li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impacts anticipated.</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	<p><u>RSP</u></p> <ul style="list-style-type: none"> <li>10<sup>th</sup> highest 24-hr average conc.: 51 – 56 µg/m<sup>3</sup></li> <li>Annual average: 19 – 22 µg/m<sup>3</sup></li> </ul> <p><u>FSP</u></p> <ul style="list-style-type: none"> <li>19<sup>th</sup> highest 24-hr average conc.: 28 – 30 µg/m<sup>3</sup></li> <li>Annual average: 12 – 14 µg/m<sup>3</sup></li> </ul>	<p>µg/m<sup>3</sup>.</p> <p><u>RSP</u></p> <ul style="list-style-type: none"> <li>24-hr average conc.: 75 µg/m<sup>3</sup> (Number of exceedances allowed: 9).</li> <li>Annual average conc.: 30 µg/m<sup>3</sup>.</li> </ul> <p><u>FSP</u></p> <ul style="list-style-type: none"> <li>24-hr average conc.: 37.5 µg/m<sup>3</sup> (Number of exceedances allowed: 18).</li> <li>Annual average conc.: 15 µg/m<sup>3</sup>.</li> </ul>			
<b>Noise Impact</b>					
<b>Construction Impact</b>					
Existing, planned and committed NSRs.	<ul style="list-style-type: none"> <li>Adverse air-borne and ground-borne construction noise impacts are not anticipated with proper implementation of good control measures and environmental monitoring and audit.</li> <li>The Contractor will also be required to prepare a CNMP.</li> </ul>	<ul style="list-style-type: none"> <li>Annexes 5 and 13 of the EIAO-TM</li> </ul>	N/A	<p>Good control measures are recommended to minimise the construction noise impact as far as practical:</p> <ul style="list-style-type: none"> <li>Good site practices to limit noise emissions at source;</li> <li>Use of QPMEs and quieter construction methods;</li> <li>Use of temporary noise barriers, movable noise barrier, noise enclosure noise insulating fabric, silencer, etc., to screen noise from construction equipment;</li> <li>Install acoustic tunnel door or enclosure at tunnel portals for construction</li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impacts anticipated.</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				activities to be carried out inside tunnel during restricted hours; <ul style="list-style-type: none"> <li>Alternative use of plant items within one worksite, wherever practicable; and</li> <li>Providing sufficient separation distance between NSRs and items of PME.</li> </ul>	
<b>Operation Impact (Road Traffic Noise)</b>					
Existing, planned and committed NSRs within 300m from the Project Boundary	<u>Existing NSRs</u> <ul style="list-style-type: none"> <li>Predicted overall noise levels ranged from 61 – 62 dB(A) under unmitigated scenario.</li> <li>No noise exceedance is expected for all existing NSRs.</li> </ul> <u>Planned and committed NSRs</u> <ul style="list-style-type: none"> <li>No identified committed / planned NSRs with programme during preparing the EIA study so that no planned NSRs in this assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Annexes 5 and 13 of the EIAO-TM</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Provision of low noise road surfacing on “Project Roads” with design speed of 80 km/hr or above under unmitigated scenario.</li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impacts anticipated.</li> </ul>
<b>Operation Impact (Fixed Noise)</b>					
Existing, planned and committed NSRs.	<ul style="list-style-type: none"> <li>No adverse impact arising from the Project is anticipated as no fixed noise sources would be proposed under the Project.</li> </ul>	<ul style="list-style-type: none"> <li>EIAO-TM Annex 5 and Annex 13, and IND-TM</li> </ul>	N/A	N/A	N/A

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<b>Water Quality Impact</b>					
<b>Construction Impact</b>					
Representative WSRs within 500m from the boundary of the Project site	The potential sources of water quality impact associated with the construction works include: <ul style="list-style-type: none"> <li>• Reclamation at different locations between North Lantau and Tsing Yi Island;</li> <li>• Potential dredging when it is unavoidable due to the presence of thin layer and soft marine deposits, or when the soils beneath the marine clay are excessively stiff, making it challenging or impractical to achieve the desired embedment condition using the DCM method;</li> <li>• Construction site run-off;</li> <li>• Wastewater discharges from general construction activities;</li> <li>• Accidental spillage of chemical; and</li> <li>• Sewage effluent produced by on-site workforce.</li> </ul>	<ul style="list-style-type: none"> <li>• Annexes 6 and 14 of the EIAO-TM</li> <li>• WPCO (Cap. 358)</li> <li>• Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS)</li> <li>• Practical Note for Professional Persons (ProPECC) PN 2/24</li> <li>• Water Supplies Department (WSD) Water Quality Criteria (for flushing water intake)</li> </ul>	<ul style="list-style-type: none"> <li>• The reclamation filling activities would result in short-duration exceedances observed during the wet season at WM4.</li> </ul>	<ul style="list-style-type: none"> <li>• Deployment of silt-curtain;</li> <li>• Mitigation measures and good site practices in ProPECC PN 2/24 "Construction Site Drainage;</li> <li>• Practices in ETWB TC (Works) No. 5/2005 "Protection of natural streams / rivers from adverse impacts arising from construction works";</li> <li>• Waste Disposal Regulation; and</li> <li>• Provision of interim treatment facilities, such as chemical toilets, for construction workforce.</li> </ul>	<ul style="list-style-type: none"> <li>• No adverse residual impacts anticipated</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<b>Operation Impact</b>					
Representative WSRs within 500m from the boundary of the Project site	Potential water quality impacts associated with the operational phase include: <ul style="list-style-type: none"> <li>• Change in hydrodynamic regime and local flow pattern in the vicinity of reclamation areas at Tsing Yi, Ma Wan and North Lantau; and</li> <li>• Surface run-off from paved areas of the Project.</li> </ul>	<ul style="list-style-type: none"> <li>• Annexes 6 and 14 of the EIAO-TM</li> <li>• WPCO (Cap. 358)</li> <li>• TM-DSS</li> <li>• ProPECC PN 1/23</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• Adequate design in silt trap for the new road drainage which take into account the guidelines in ProPECC PN 1/23; and</li> <li>• Best Storm Water Management Practices and Storm Water Pollution Control Plan to reduce non-point source pollution.</li> </ul>	<ul style="list-style-type: none"> <li>• No adverse residual impacts anticipated</li> </ul>
<b>Waste Management Implications</b>					
<b>Construction Impact</b>					
C&D materials, sediment, chemical wastes, general refuse and floating refuse	<ul style="list-style-type: none"> <li>• Around 2,227,500 m<sup>3</sup> of Inert C&amp;D materials would be generated during construction phase, while about 1,773,980 m<sup>3</sup> would be reused on Site and 453,520 m<sup>3</sup> would be deliver to Public Fill Reception Facilities;</li> <li>• Around 139,000 m<sup>3</sup> of non-inert C&amp;D materials will be generated;</li> <li>• Expected certain amount (about 140,279 m<sup>3</sup> of category L and 56,206 m<sup>3</sup> of Category M and H (equal to or not exceeding 10x LCEL)) of excavated / dredged sediment would be generated during reclamation and piling works;</li> </ul>	<ul style="list-style-type: none"> <li>• Annexes 7 and 15 of the EIAO-TM</li> <li>• Waste Disposal Ordinance (Cap. 354)</li> <li>• Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)</li> <li>• Land (Miscellaneous Provisions) Ordinance (Cap. 28)</li> <li>• Public Health and Municipal Services Ordinance – Public Cleansing and Prevention of Nuisances Regulation (Cap. 132BK)</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• Implementation of good site practices, waste reduction measures and proper storage, collection and transportation of waste.</li> </ul>	<ul style="list-style-type: none"> <li>• No adverse residual impact anticipated</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	<ul style="list-style-type: none"> <li>• Small quantity of chemical wastes in the order of few hundred litres per month;</li> <li>• Around 369 tonnes of general refuse will be generated from construction works and on-site staff and workers; and</li> <li>• Estimated only around 5m<sup>3</sup> of trapped floating refuse per year would be collected from the newly constructed seawall.</li> </ul>	<ul style="list-style-type: none"> <li>• Dumping at Sea Ordinance (DASO) (Cap.466)</li> <li>• Project Administration Handbook for Civil Engineering Works (PAH)</li> </ul>			
<b>Operation Impact</b>					
N/A	<ul style="list-style-type: none"> <li>• Only few hundred litres per month in maximum of chemical waste would be generated during regular maintenance activities; and</li> <li>• Estimated only around 5m<sup>3</sup> of trapped floating refuse per year would be collected from the newly constructed seawall.</li> </ul>	<ul style="list-style-type: none"> <li>• Waste Disposal Ordinance (Cap. 354)</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• Implementation of good site practices, waste reduction measures and proper storage, collection and transportation of waste.</li> </ul>	<ul style="list-style-type: none"> <li>• No adverse residual impact anticipated</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<b>Land Contamination</b>					
Onsite construction workers and future occupants	<ul style="list-style-type: none"> <li>Three potentially contaminated sites have been identified. When site access is available, SI will be carried out to determine the extent of the contamination, if any.</li> </ul>	<ul style="list-style-type: none"> <li>Annex 19 of the EIAO-TM</li> <li>Guidance Note for Contaminated Land Assessment and Remediation (EPD, April 2023)</li> <li>Practice Guide for Investigation and Remediation of Contaminated Land (EPD, April 2023)</li> <li>Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management (EPD, April 2023)</li> </ul>	N/A	<ul style="list-style-type: none"> <li>Sampling and testing plans had been proposed for the potentially contaminated sites;</li> <li>Further site appraisal should be carried out within the Proposed Clearance Limit and off-site facilities / works areas at a later stage of the Project in order to confirm / update the land uses / activities and to identify the presence of on-site and off-site potential contamination sources;</li> <li>In addition, should there be any expansion of the Proposed Clearance Limit, further site appraisal would also be required to be carried out within the expanded area;</li> <li>CAP(s), presenting the findings of the further site appraisal, the latest site conditions of the concerned sites, updated sampling strategy and testing protocol, should be submitted to EPD for approval; and</li> <li>The recommended further assessment and remediation works, including the submission of CAP(s), CAR(s) / (RAP(s) and RR(s) should follow relevant Guidance Manual, Guidance Note and Practice Guide.</li> </ul>	<ul style="list-style-type: none"> <li>No residual impact is anticipated</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<b>Ecological Impact</b>					
<b>Construction Impact</b>					
Ecological resources likely to be impacted by the Project	<ul style="list-style-type: none"> <li>• Impact of permanent and temporary loss of developed area, plantation, shrubland / grassland, watercourses W1 and intertidal zone is considered low; while that on watercourses W2 and W3, and the sea is considered low to moderate;</li> <li>• Impact of loss, injuries or mortalities of species of conservation importance with high mobility, flight ability and/or with low site fidelity, e.g. avifauna, mammals, butterflies and reptiles is considered low;</li> <li>• Impact of loss, injuries or mortalities of species of conservation importance with lower mobility, or with restricted habitat niche is considered:-                         <ul style="list-style-type: none"> <li>- Low to moderate for plants and corals;</li> <li>- Low to moderate for Romer's Tree Frog; and</li> <li>- Low for amphioxus.</li> </ul> </li> <li>• Impact of habitat fragmentation and wildlife movement is considered low to moderate;</li> <li>• Impact of construction disturbance</li> </ul>	<ul style="list-style-type: none"> <li>• Annex 8 and Annex 16 of EIAO-TM</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• Minimising and localising at-grade works to lower quality habitats such as developed area and plantation;</li> <li>• Minimising the extent of loss of more natural habitats such as watercourses and shrubland / grassland by opting for tunnel and viaduct sections;</li> <li>• Minimising the land required for temporary works to the necessary minimum for the proposed works;</li> <li>• Minimising the extent of permanent loss, retaining waterflow of W2 through avoiding works at its upper tributary and constructing box culvert at section coinciding with at-grade road section;</li> <li>• Optimising tunnel length and level to avoid and minimise the extent of loss of W3;</li> <li>• Where no actual construction works are required, vegetation clearance along watercourses should be avoided, adoption of work exclusion zone and elevated temporary works platform atop watercourses should be implemented to avoid and minimise impact on watercourse;</li> <li>• Minimising overall reclamation extent by opting for pile-supported VIPS at North Lantau, the construction for which would be of much smaller scale and extent, and</li> </ul>	<ul style="list-style-type: none"> <li>• No significant residual impact from the project is expected with implementation of recommended mitigation measures and adoption of precautionary and enhancement measures</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	<p>on adjacent habitats, species of conservation importance and associated flora and fauna is considered low; and</p> <ul style="list-style-type: none"> <li>• Impact of changes in water qualities, hydrodynamic properties and sedimentation hydrology due to run-off, discharge and reclamation on aquatic-associated species is considered: -                             <ul style="list-style-type: none"> <li>- Low on watercourses, marine habitats and associated fauna;</li> <li>- Low to moderate on Romer's Tree Frog and <i>Caridina serrata</i>; and</li> <li>- Low on marine habitats and associated fauna</li> </ul> </li> </ul>			<p>reclamation at Yi Chuen is avoided;</p> <ul style="list-style-type: none"> <li>• Conduct detailed pre-construction survey to identify individuals of plant, coral and amphibian species of conservation importance to be affected by works;</li> <li>• Carry out in-situ preservation, transplantation / translocation or compensation planting where appropriate to avoid and minimise direct impact on plant, coral and amphibian species of conservation importance;</li> <li>• Leverage enhancement opportunities presented by newly established coastal structures/shorelines to incorporate eco-shoreline features/elements;</li> <li>• Implementation of construction phasing and habitat reinstatement following completion of temporary works to minimise the impact of habitat fragmentation and wildlife movement impediment;</li> <li>• Implementation of precautionary measures and good site practice to minimise construction disturbance on adjacent habitats, species of conservation importance and associated flora and fauna;</li> <li>• Temporary stream diversion to retain waterflow and avoid run-off of construction materials into watercourses in accordance to guidelines specified in ETWB TC(W) No. 5/2005 <i>Protection of</i></li> </ul>	

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				<p><i>Natural Streams/Rivers from Adverse Impacts Arising from Construction Works</i> (ETWB, 2005);</p> <ul style="list-style-type: none"> <li>Implementation of water quality specific mitigation measures recommended in the WQIA and best management practices as stipulated in ProPECC PN 2/24 “Construction Site Drainage” and ETWB TC(W) No. 5/2005 “Protection of natural streams/rivers from adverse impacts arising from construction works” to reduce the impact of water quality deterioration due to run-off, discharge and reclamation on waterbodies and aquatic-associated species; and</li> <li>Deployment of silt curtains during reclamation and other marine works.</li> </ul>	
<b>Operation Impact</b>					
Ecological resources likely to be impacted by the Project	<ul style="list-style-type: none"> <li>Low direct impact on habitat loss due to occupation by permanent structures;</li> <li>Low to moderate impact from injuries or mortalities of wildlife due to roadkill and collision;</li> <li>Impact of habitat fragmentation and wildlife movement is considered low;</li> <li>Very low impacts from operation disturbance on adjacent habitats, species of conservation importance and associated flora</li> </ul>	<ul style="list-style-type: none"> <li>Annex 8 and Annex 16 of EIAO-TM</li> </ul>	N/A	<ul style="list-style-type: none"> <li>Incorporation of fencing, u-shaped channels, hedge planting of dense vegetation to prevent access by and guide wildlife away from the at-grade road structures and lead them towards the passageways under the viaduct sections to minimise the likelihood of wildlife injuries and mortalities due to roadkill and collision.</li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impact is anticipated</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	and fauna; <ul style="list-style-type: none"> <li>• Very low water quality impact from road run-off on adjacent watercourses and associated aquatic fauna; and</li> <li>• Very low impact from changes in hydrodynamic properties and sedimentation hydrology in nearby waters.</li> </ul>				
<b>Fisheries</b>					
<b>Construction Impact</b>					
Fisheries resources and habitats likely to be impacted by the Project	<ul style="list-style-type: none"> <li>• Minor impacts from loss of fishing grounds and habitat due to reclamation and piling works, and works area for construction;</li> <li>• Insignificant impact from disruption of fish culture activity;</li> <li>• Insignificant impact from deterioration of water quality due to marine works; and</li> <li>• Insignificant impact from underwater sound generated during marine works.</li> </ul>	<ul style="list-style-type: none"> <li>• Annex 9 and Annex 17 of EIAO-TM</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• Follow mitigation measures, good practices and guidelines to minimise water quality impacts.</li> </ul>	<ul style="list-style-type: none"> <li>• No adverse residual impact is anticipated</li> </ul>
<b>Operation Impact</b>					
Fisheries resources and habitats likely to be impacted by the Project	<ul style="list-style-type: none"> <li>• Minor impact from loss of fishing grounds and fisheries habitat due to reclamation and piling works;</li> <li>• Insignificant impact from change in hydrodynamics induced by the</li> </ul>	<ul style="list-style-type: none"> <li>• Annex 9 and Annex 17 of EIAO-TM</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• No specific mitigation measure is required.</li> </ul>	N/A

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	footprint of the superstructures; and • Insignificant impact from deterioration of water quality due to surface run-off.				
<b>Landscape and Visual</b>					
<b>Construction Impact</b>					
Existing LRs and LCAs within the assessment area	<ul style="list-style-type: none"> <li>• Key affected LRs:                             <ul style="list-style-type: none"> <li>- <u>Negligible</u> LR1.7, LR1.8, LR1.9, LR2.4, LR2.5 and LR2.6;</li> <li>- <u>Slight</u> LR1.2, LR1.6, LR2.2 and LR2.7; and</li> <li>- <u>Moderate</u> LR1.1, LR1.3, LR1.4, LR1.5, LR2.1 and LR2.3.</li> </ul> </li> <li>• Key affected LCAs:                             <ul style="list-style-type: none"> <li>- <u>Negligible</u> LCA1.5, LCA2.1 and LCA2.3;</li> <li>- <u>Slight</u> LCA1.3, LCA1.4 and LCA2.4; and</li> <li>- <u>Moderate</u> LCA1.1, LCA1.2 and LCA2.2.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Annexes 10 and 18 of the EIAO-TM</li> <li>• Environmental Impact Ordinance Guidance Note No. 8/2023</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• CM1 - Trees without impact from the proposed works should be retained and any existing trees unavoidably affected by the works should be transplanted as far as possible in accordance with DEVB TC(W) – No. 4/2020;</li> <li>• CM2 - Erection of decorative screen hoarding with advance planting or hoarding compatible with the surrounding setting;</li> <li>• CM3 - Construction facilities and activities on work sites and areas should be carefully managed and controlled, including height and disposition / arrangement, to minimise any potential adverse landscape impacts; and</li> <li>• CM4 - Reinstatement of the temporarily affected landscaped area within assessment area in like-for-like basis would be implemented to restore the existing natural environment as far as possible.</li> </ul>	<ul style="list-style-type: none"> <li>• Key affected LRs:                             <ul style="list-style-type: none"> <li>- <u>Negligible</u> LR1.7, LR1.8, LR1.9, LR2.4, LR2.5 and LR2.6;</li> <li>- <u>Slight</u> LR1.2, LR1.6, LR2.2 and LR2.7; and</li> <li>- <u>Moderate</u> LR1.1, LR1.3, LR1.4, LR1.5, LR2.1 and LR2.3.</li> </ul> </li> <li>• Key affected LCAs:                             <ul style="list-style-type: none"> <li>- <u>Negligible</u> LCA1.5, LCA2.1 and LCA2.3;</li> <li>- <u>Slight</u> LCA1.3, LCA1.4 and LCA2.4; and</li> <li>- <u>Moderate</u> LCA1.1, LCA1.2 and LCA2.2.</li> </ul> </li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<b>Operation Impact</b>					
Existing LRs and LCAs and Key Public Viewers / VPs within the assessment area	<ul style="list-style-type: none"> <li>• Key affected LRs:                             <ul style="list-style-type: none"> <li>- <u>Negligible</u> LR1.7, LR1.8, LR1.9, LR2.4, LR2.5 and LR2.6;</li> <li>- <u>Slight</u> LR1.2, LR1.6, LR2.2 and LR2.7; and</li> <li>- <u>Moderate</u> LR1.1, LR1.3, LR1.4, LR1.5, LR2.1 and LR2.3.</li> </ul> </li> <li>• Key affected LCAs:                             <ul style="list-style-type: none"> <li>- <u>Negligible</u> LCA1.5, LCA2.1 and LCA2.3;</li> <li>- <u>Slight</u> LCA1.3, LCA1.4 and LCA2.4; and</li> <li>- <u>Moderate</u> LCA1.1, LCA1.2 and LCA2.2.</li> </ul> </li> <li>• Key affected VPs:                             <ul style="list-style-type: none"> <li>- <u>Negligible</u> VP-A2;</li> <li>- <u>Slight</u> VP-B5, VP-A5 and VP-T1; and</li> <li>- <u>Moderate</u> VP-A3, VP-A4, VP-B3, VP-B4 and VP-P1.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Annexes 10 and 18 of the EIAO-TM</li> <li>• Environmental Impact Ordinance Guidance Note No. 8/2023</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• OM1 - Aesthetically pleasing design as regard to the form, material and finishes should be incorporated to bridges, ancillary buildings and other associated engineering facilities so as to blend in the structures with the adjacent landscape and visual context;</li> <li>• OM2 - Buffer screen planting, including shrubs, to provide screening if space is available;</li> <li>• OM3 - As far as practicable, compensatory tree planting requirement of 1:1 in terms of number in accordance with DEVB TC(W) No. 4/2020 for compensation of felled trees subject to the availability of space and agreement made with relevant departmental parties; and</li> <li>• OM4 - Landscape treatments on slope or retaining structure should be adopted in accordance with GEO Publication No. 1/2011 – Technical Guidelines on Landscape Treatment for Slopes, subject to the availability of space and agreement made with relevant departmental parties.</li> </ul>	<ul style="list-style-type: none"> <li>• Key affected LRs:                             <ul style="list-style-type: none"> <li>- <u>Negligible residual impact on Day 1 and in Year 10 of Operation</u> LR1.7, LR1.8, LR1.9, LR2.4, LR2.5 and LR2.6;</li> <li>- <u>Slight residual impact on Day 1 and reduced to Negligible in Year 10 of Operation</u> LR1.2, LR1.6, LR2.2 and LR2.7; and</li> <li>- <u>Moderate residual impact on Day 1 and reduced to Slight in Year 10 of Operation</u> LR1.1, LR1.3, LR1.4, LR1.5, LR2.1 and LR2.3.</li> </ul> </li> <li>• Key affected LCAs                             <ul style="list-style-type: none"> <li>- <u>Negligible residual impact on Day 1 and in Year 10 of Operation</u> LCA1.5, LCA2.1 and LCA2.3;</li> </ul> </li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
					<ul style="list-style-type: none"> <li>- <u>Slight residual impact on Day 1 and reduced to Negligible in Year 10 of Operation</u> LCA1.3, LCA1.4 and LCA2.4; and</li> <li>- <u>Moderate residual impact on Day 1 and reduced to Slight in Year 10 of Operation</u> LCA1.1, LCA1.2, and LCA2.2.</li> <li>• Key affected VPs:                             <ul style="list-style-type: none"> <li>- <u>Negligible residual impact on Day 1 and in Year 10 of Operation</u> VP-A2, VP-A5, VP-T1; and</li> <li>- <u>Slight residual impact on Day 1 and in Year 10 of Operation</u> VP-A3, VP-A4, VP-B3, VP-B4 and VP-B5; and</li> <li>- <u>Moderate residual impact on Day 1 and in Year 10 of Operation</u> VP-P1</li> </ul> </li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
<b>Impact on Cultural Heritage</b>					
<b>Construction Impact</b>					
Terrestrial archaeology	<ul style="list-style-type: none"> <li>No site of archaeological interest or area with archaeological potential is encroached by the works areas; and</li> <li>No terrestrial archaeological impact is anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>Antiquities and Monuments Ordinance (Cap.53);</li> <li>EIAO (Cap.499) and EIAO-TM Annexes 10 and 19.</li> </ul>	N/A	<ul style="list-style-type: none"> <li>No impact on archaeology is anticipated; and</li> <li>As a precautionary measure and pursuant to the Antiquities and Monuments Ordinance (Cap. 53), the project proponent and his contractor(s) are required to inform AMO immediately when antiquities or supposed antiquities are discovered in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with and to the satisfaction of AMO.</li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impact anticipated</li> </ul>
Built heritage	<ul style="list-style-type: none"> <li>No direct or indirect impact is anticipated on the built heritage identified.</li> </ul>	<ul style="list-style-type: none"> <li>Antiquities and Monuments Ordinance (Cap.53);</li> <li>Environmental Impact Assessment Ordinance (EIAO) (Cap.499) and EIAO-TM Annexes 10 and 19.</li> </ul>	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Marine archaeology	<ul style="list-style-type: none"> <li>Diver survey was conducted to establish the archaeological potential of 11 side scan sonar contacts and 22 magnetic contacts located within 100m from potential area of dredging and determine whether further mitigation or action is required. No</li> </ul>	<ul style="list-style-type: none"> <li>Guidelines for MAI.</li> </ul>	N/A	<ul style="list-style-type: none"> <li>No impact on marine archaeology is anticipate; and</li> <li>As a precautionary measure and pursuant to the Antiquities and Monuments Ordinance (Cap. 53), the project proponent and his contractor(s) are required to inform AMO immediately when antiquities or supposed antiquities</li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impact anticipated.</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
	impact on marine archaeology is anticipated.			are discovered in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with and to the satisfaction of AMO.	
<b>Operation Impact</b>					
Terrestrial archaeology, built heritage and marine archaeology	<ul style="list-style-type: none"> <li>No impact would be anticipated during the operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>Antiquities and Monuments Ordinance (Cap. 53);</li> <li>EIAO including EIAO-TM; and</li> <li>Guidelines for MAI.</li> </ul>	N/A	<ul style="list-style-type: none"> <li>No mitigation measure would be required.</li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impact anticipated</li> </ul>
<b>Hazard to Life</b>					
Existing, committed and planned population in the vicinity of the PHIs (i.e. Chevron Terminal and Shell Tsing Yi Installations (STYI)), on-site transport and use of explosives of the Project	<p><u>Chevron Terminal and STYI</u></p> <ul style="list-style-type: none"> <li>For both PHIs, the off-site individual risk level of <math>1 \times 10^{-5}</math> per year does not encroach to nearby land population and the societal risk falls into the "ALARP" region.</li> </ul> <p><u>On-site Transport / Use of Explosives</u></p> <ul style="list-style-type: none"> <li>Both individual risk and societal risk comply with the criteria outlined in Annex 4 of the EIAO-TM.</li> </ul>	<ul style="list-style-type: none"> <li>Annex 4 of the EIAO-TM</li> </ul>	N/A	<p><u>Chevron Terminal and STYI</u></p> <ul style="list-style-type: none"> <li>No adverse impact is anticipated. Nonetheless, implementation of good safety practices during construction phase are recommended. These include:                             <ul style="list-style-type: none"> <li>- Establishment of emergency response / evacuation plans;</li> <li>- Safety / emergency response training and drills for all personnel;</li> <li>- Maintain the number of construction workers on-site to a minimum;</li> <li>- Shielding provision such as mesh fencing to be installed along the slip road between the proposed works areas and the terminal; and</li> <li>- Risk assessment should be undertaken and method statement with lifting plan</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No adverse residual impact anticipated</li> </ul>

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				<p>should be formulated by the Contractor prior commencement of lifting works.</p> <p><u>On-site Transport/ Use of Explosives</u></p> <ul style="list-style-type: none"> <li>• No adverse impact is anticipated. Nevertheless, the following recommendations should be implemented:</li> </ul> <p><u>For the on-site transport of explosives:</u></p> <ul style="list-style-type: none"> <li>- Emergency plan should be developed to address uncontrolled fire during transport. Case of fire near an explosive carrying vehicle in jammed traffic should be included in the plan. Activation of fuel and battery isolation switches on vehicle when fire breaks out should also be included in the emergency plan to reduce likelihood of prolonged fire leading to explosion;</li> <li>- Working guideline should be developed to define procedure for explosives transport during adverse weather such as thunderstorm;</li> <li>- Detonators should be transported separately from other Class 1 explosives. Separation of vehicles should also be maintained through the trip;</li> <li>- Develop procedure to ensure the availability of parking space on site for the explosives carrying vehicle. Delivery should not be commenced if parking space on site is not secured;</li> </ul>	

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				<ul style="list-style-type: none"> <li>- Hot work should be suspended during passage of the diesel vehicle truck and bulk emulsion truck in the tunnels;</li> <li>- Speed limit for the diesel vehicle truck and bulk emulsion truck in the tunnels should be imposed. The truck may be escorted while underground to ensure route is clear from hazards and obstructions;</li> <li>- Fire screen should be used between cabin and the load on the vehicle;</li> <li>- Lining should be provided within the transportation box on the vehicle;</li> <li>- Ensure packaging of detonators remains intact until handed over at blasting site;</li> <li>- Ensure that cartridged emulsion packages are not damaged before every trip; and</li> <li>- Use experienced driver with good safety record.</li> </ul> <p><i>For the safe use of explosives:</i></p> <ul style="list-style-type: none"> <li>- Blast Charge Weight should be within Maximum Instantaneous Charge (MIC) as specified for the given blast face;</li> <li>- Temporary mitigation measures such as blast doors or heavy duty blast curtains should be installed at the portals at suitable locations underground to prevent flyrock and control the air overpressure;</li> <li>- Secure refuge areas to workers within the construction sites should be</li> </ul>	

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				identified for their temporary shelter during blasting; - A Chief Shotfirer and a Blasting Engineer shall be employed in addition to the normal blasting personnel to ensure that the works are safe and coordinated between blasting areas; - Shotfirer to be provided with a lightning detector, and appropriate control measures should be in place; - A boulder survey should be undertaken based on the likely Peak Particle Velocity (PPV) values that would result from the blasting process. Those boulders subject to the vibration higher than the allowable limit should be strengthened, removed, or constructed with boulder fence, prior to the commencement of blasting; - Establishment of no-blast zones for areas of high sensitivity/risk; - The surface blasting benches will be covered with blasting cages, blast mats and blasting screens to limit flyrock potential; - All hiking paths/ footpaths located within the 200m assessment area will be temporarily closed during blasting/explosives delivery from the barging point to the blasting sites; - Drill bits larger than 64mm should not be brought to the sites to avoid drilling a larger blasthole by accident; and	

Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures / Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
				- The Contractor will place warning signs at the concerned area (i.e. Yi Chuen) to let the residents know the blasting schedule at the surface blasting site S01 so that they have to be evacuated or stay indoor away from windows. Before the commencement of blasting, the contractor will also strike a gong to alert the residents and notify the residents in person to ensure all potentially affected personnel are fully aware of the surface blasting.	

