



Highways Department

Northern Metropolis Highway – New Territories North New Town Section

Project Profile

TABLE OF CONTENTS

	<u>Page</u>
1 BASIC INFORMATION	1
1.1 Project Title.....	1
1.2 Purpose and Nature of the Project.....	1
1.3 Name of Project Proponent.....	2
1.4 Location and Scale of the Project and History of Site.....	2
1.5 Number and Types of Designated Projects to be covered by the Project Profile ..	2
1.6 Contact Person.....	3
2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME.....	4
2.1 Project Planning and Implementation.....	4
2.2 Project Programme.....	4
2.3 Interactions with other Projects	4
3 POSSIBLE IMPACT ON THE ENVIRONMENT.....	5
3.1 General.....	5
3.2 Construction and Operation Environmental Impact	5
4 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT	10
4.1 Existing and Planned Sensitive Receivers	10
5 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND FURTHER ENVIRONMENTAL IMPLICATIONS	13
5.1 General.....	13
5.2 Measures to Minimise Environmental Impacts	13
5.3 Severity, Distribution and Duration of Environmental Effects	19
5.4 Further Implication	19
6 USE OF PREVIOUSLY APPROVED EIA REPORTS.....	20

Figure

FIGURE 1

Indicative Layout Plan for Northern Metropolis
Highway – New Territories North New Town Section

1 BASIC INFORMATION

1.1 Project Title

- 1.1.1 The title of the Project is “Northern Metropolis Highway – New Territories North New Town Section” (hereafter referred to as the Project).

1.2 Purpose and Nature of the Project

- 1.2.1 The Government promulgated the final report of the “Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030” in October 2021, in which the Northern Metropolis was set out. With the progressive population intakes of the development areas in the Northern Metropolis, it is foreseeable that the existing road network serving these development areas would become overloaded in the future and hence new major road projects are proposed under the “infrastructure-led” and “capacity-creating” approaches to ensure the planning of major transport infrastructure could cater for or even reserve transport and logistic capacity to drive long-term development.
- 1.2.2 Amongst the major transport infrastructure projects announced in the 2022 Policy Address, Northern Metropolis Highway (NMH) is a major road project to facilitate the “east-west” connectivity. NMH is to provide a new strategic route between Tin Shui Wai in the New Territories West and Heung Yuen Wai in the New Territories East, thereby enhancing the east-west connectivity of the Northern Metropolis and alleviating the potential traffic congestion at Yuen Long Highway, San Tin Highway and Fanling Highway.
- 1.2.3 According to the “Hong Kong Major Transport Infrastructure Development Blueprint” (the Blueprint) promulgated by the Government in 2023, the Government will take forward NMH. The Project forms part of the proposed NMH. Other parts of NMH include Tin Shui Wai Section, San Tin Section, as well as Kwu Tung Section.
- 1.2.4 Under the current development plan, with the progressive development of San Tin Technopole and the Ngau Tam Mei area, traffic congestion on San Tin Highway is anticipated during peak hours by 2036. Therefore, the San Tin Section of NMH is scheduled for commissioning in or before 2036. The remaining sections of NMH, which include the Project, are scheduled to complete in phases in about 3 to 4 years after the commissioning of the San Tin Section¹.
- 1.2.5 The objective of the Project is to enhance the connectivity in the New Territories North (NTN) New Town Section between the proposed interchange at Man Kam To Road and the interchange at Heung Yuen Wai Highway to alleviate the future traffic demands generated by the future developments in the concerned locations.

¹ NMH is a mega project and the traffic need of each section of road may be different in relation to the commissioning schedules of the Northern Metropolis New Development Areas. The phased commissioning arrangement is considered more suitable taking into account the traffic needs, all the transport infrastructure projects in the pipeline, including the capacity, overall cost-effectiveness, allocation of public resources, engineering considerations and the required implementation timeframe etc.

1.3 Name of Project Proponent

- 1.3.1 The Project Proponent is Highways Department of the Government of Hong Kong Special Administrative Region (HKSAR).

1.4 Location and Scale of the Project and History of Site

- 1.4.1 The location of the Project is shown on the Figure 1.
- 1.4.2 The alignment of the NTN New Town Section starts from the proposed interchange of NMH Kwu Tung Section near Man Kam To area, passing through Cham Shan and the hilly terrain near Sheung Shan Kai Wat in form of tunnel. It then travels nearby the villages, including Ha Shan Kai Wat, Hung Leng, Tai Tong Wu, and finally connects to the proposed Heung Yuen Wai Highway/Sha Tau Kok Road Interchange.
- 1.4.3 The scope of the Project mainly comprises the following:
- (i) Construction of an approximately 5-kilometre (km) long dual carriageway mainly in the form of at-grade road/tunnel/viaduct, from Man Kam To Area towards Heung Yuen Wai Highway/Sha Tau Kok Road (including 2 tunnel sections of approximately 700 metre (m) and 250 metre (m) length respectively);
 - (ii) Construction of three interchanges at Hung Lung Hang, Ping Che, and Heung Yuen Wai Highway/Sha Tau Kok Road; and
 - (iii) Construction of associated junction modifications and slip roads required for the project, as well as associated civil, geotechnical, landscape, road and drainage works, ancillary buildings, traffic control and surveillance system, toll collection facilities, electrical and mechanical installations, satellite administration building / kiosk and ventilation building (if necessary), reprovisioning of facilities affected by the proposed works, environmental mitigation measures, etc.
- 1.4.4 The proposed works components mentioned above are tentative and subject to review in next detailed design stage and during the course of the Environmental Impact Assessment (EIA) study. There may be refinement of the alignment of the Project, which will be subject to a variety of factors such as planning and engineering considerations, environmental impacts, traffic impacts, land resumption requirements, construction programme and cost, etc.

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

- 1.5.1 The Project comprises the construction and operation of highways and the associated slip roads, which is classified as Designated Project (DP) under the following categories under Part I, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO), subject to more detailed design and planning at later stage:
- Item A.1 A carriageway for motor vehicles that is an expressway, trunk road, primary distributor road or district distributor road.
 - Item K.10 A depot for the storage of, or a manufacturing plant for the manufacture of, explosives (as defined by section 2 of the Dangerous Goods Ordinance (Cap. 295))

1.6 Contact Person

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2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Planning and Implementation

- 2.1.1 The Project will be implemented under a Public Works Programme item. The Project Proponent has appointed consultants to undertake the Investigation study and preliminary design of the Project under Agreement No. CE 4/2024 (HY). Subject to completion of detailed design, contractor(s) will be appointed to carry out the construction works.

2.2 Project Programme

- 2.2.1 The EIA study for the Project is in the pipeline following the San Tin Section. The Project is expected to commission in about 3 to 4 years after the commissioning of the San Tin Section² to alleviate the potential traffic congestion at Fanling Highway to support New Development Areas. The packaging and programme of the Project will be ascertained by the investigation study, taking into account other relevant technical studies.

2.3 Interactions with other Projects

- 2.3.1 Major committed / planned projects that will potentially interface with the Project have been identified and are listed below. Any cumulative impact from the concurrent projects during both construction and operation phases of the Project will be addressed in the EIA stage as appropriate. The list below should be reviewed during the EIA stage to ensure the concurrent projects available with best available information are incorporated.

- NTN New Town New Development Area
- Kwu Tung Section of NMH
- Northern Link Eastern Extension (NOLE)
- Fanling North New Development Area
- Northeast New Territories Line

² The San Tin Section of NMH is scheduled for commissioning in or before 2036.

3 POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 General

3.1.1 Based on the preliminary study, the Project will involve land-based construction works and conceptually be made up of the following elements:

- Construction of tunnel by Drill & Blast / Drill & Break / Tunnel Boring Machine (TBM) methods (subject to further study)
- Construction of associated tunnel portals, ventilation buildings (if necessary), satellite administration building / kiosk, and other ancillary facilities;
- Construction of viaducts / at-grade roads and road widening works; and
- Associated environmental protection and mitigation works, for example, noise enclosures / barriers (if necessary).

3.2 Construction and Operation Environmental Impact

3.2.1 The potential environmental impacts associated with the Project during both construction and operation phases are discussed in the following paragraphs. Detailed impact assessments will be carried out during the EIA study.

Air Quality

3.2.2 The air quality impact assessment will follow the criteria and guidelines for evaluating and assessing air quality impact as stated in Section 1 of Annex 4 and Annex 12 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) respectively.

3.2.3 During construction phase, the potential sources of air quality impact on the air sensitive receivers (ASRs) would be the dust emissions generated from construction activities including site formation, excavation works, mucking out excavated rock and soil from tunnelling works, materials handling, backfilling, wind erosion of open sites and stockpiling area, as well as movement of construction vehicles on unpaved roads, exhaust emissions from construction machinery and construction vehicles. Cumulative impacts from other potential interfacing projects planned in vicinity of the Project will be identified and taken into account in the EIA study.

3.2.4 During operation phase, potential air pollution sources associated with the Project will include vehicular emissions from the proposed open roads sections, tunnel portals and ventilation buildings (if necessary) of the NMH. Cumulative air quality impacts from the background concentration, vehicular emissions from neighbouring existing and planned road networks, and industrial emissions in vicinity of the Project as well as the major emission sources will be identified and taken into account in the EIA study.

Noise

3.2.5 The noise impact assessment will follow the criteria and guidelines for evaluating and assessing noise impact as stated in Annex 5 and Annex 13 of the EIAO-TM. respectively. The EIAO Guidance Note No. 9/2023 "Preparation of Construction Noise Impact Assessment Under the EIAO", EIAO Guidance Note No. 12/2023 "Road Traffic Noise Impact Assessment Under the EIAO", and EIAO Guidance Note No.

16/2023 "Preparation of Fixed Noise Sources Impact Assessment Under the EIAO" will also be taken into consideration.

- 3.2.6 During construction phase, the potential sources of noise impact on the noise sensitive receivers (NSRs) would be associated with the use of powered mechanical equipment (PME) (e.g. breakers, excavators, lorries, mobile cranes, concrete truck mixers, concrete pokers and rollers) for construction activities. The key construction activities of the Project that would create noise impacts include tunnelling, piling for foundations, excavation and concreting, etc. Meanwhile, potential ground-borne noise impacts would be caused mainly by the TBM operation (if necessary) and using PME for rock breaking / drilling. A construction programme should be formulated so that no works will be required in restricted hours, i.e. between 7 p.m. and 7 a.m. or at any time on a general holiday (including Sunday), as far as practicable in the EIA study.
- 3.2.7 During operation phase, the potential sources of noise impact on the NSRs would be associated with the traffic using the new roads and fixed plants (e.g. ventilation building (if necessary) of the NMH). The cumulative noise impacts from neighbouring existing and planned road networks and other fixed noise sources associated with the Project will be identified and considered in the EIA study.

Water Quality

- 3.2.8 The water quality impact assessment will follow the criteria and guidelines for evaluating and assessing water quality impact as stated in Annexes 6 and 14 of the EIAO-TM respectively.
- 3.2.9 During construction phase, potential sources of water quality impacts may be associated with the construction site run-off, fill of ponds (if any) arising from the construction activities of the Project, which may cause blockage of existing drainage channel and the increase in the amounts of pollutants, such as suspended solids, in the nearby water system. Additionally, sewage effluents from construction workforce and the accidental spillage of chemical may also cause water pollution. There may be potential infiltration / drawdown of groundwater from tunnel construction.
- 3.2.10 During operation phase, potential sources of water quality impacts would be associated with the surface runoff from the new roads and wash-off from the buildings proposed under the Project, as well as sewage effluents generated from the staffs working in the satellite administration building / kiosk and ventilation building. The satellite administrative building / kiosk and ventilation building proposed under the Project would be small-scale in nature with very limited workforce, and that the small-scale satellite administrative building / kiosk and ventilation buildings (if necessary) will be properly connected to the public sewerage system.

Ecology

- 3.2.11 The evaluation and assessment of terrestrial and aquatic ecological impact will follow the criteria and guidelines as stated in Annexes 8 and 16 of the EIAO-TM respectively. The EIAO Guidance Note No. 10/2023 "Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys", EIAO Guidance Note No. 7/2023 "Ecological Baseline Survey for Ecological Assessment", EIAO Guidance Note No. 6/2010 "Some Observations on Ecological Assessment from the Environmental Impact Assessment Ordinance Perspective" will also be taken into consideration.

- 3.2.12 Ecological resources are identified in vicinity of the Project. These ecological resources include sites of conservation importance, sensitive habitats, species of conservation importance, and other ecological resources, as presented in **Section 4.1.5**. In addition, the Tan Shan River Ecologically Important Stream is located outside the assessment area of the Project, and the proposed alignment would not encroach onto Tan Shan River. Potential impact on Tan Shan River Ecologically Important Stream due to the construction and operation of the Project is considered minimal.
- 3.2.13 During the construction phase, there may be potential impacts on habitats due to aboveground works. Additionally, sites of conservation importance and other nearby ecological resources along the proposed alignment (e.g., egrettries and associated habitats, fung shui woods) may experience potential ecological impacts (e.g., construction disturbance, obstruction of flight lines). In addition, artificial lighting deployed during the construction stage for basic illumination of the construction sites (if any) would be settled near ground level with a short range that would be confined only to its immediate surroundings to minimize the impact on nearby habitats as far as practicable. Relevant impacts will be addressed comprehensively during EIA study stage.
- 3.2.14 During operation phase, while habitat loss is not anticipated, the increased traffic use may contribute to ecological impacts by affecting surrounding habitats and wildlife through factors such as dust, noise, glare, and surface runoff, etc. To ensure driving safety, the installation of artificial lighting for illumination purpose would be unavoidable during the operation phase of the proposed project. Nevertheless, the incidence angle of lighting would be directed towards areas with necessity of lighting only and the intensity of lighting would be properly controlled to minimize the potential light glare impact on surrounding habitats as far as practicable. Relevant impacts would be addressed comprehensively during EIA study stage.

Fisheries

- 3.2.15 The fisheries impact assessment will follow the criteria and guidelines for evaluating and assessing fisheries impact as stated in Annexes 9 and 17 of the EIAO-TM respectively. The EIAO Guidance Note No. 15/2023 "Methodologies for Fisheries Baseline Surveys" in relation to fishponds will also be taken into consideration.
- 3.2.16 No fishponds were observed in the vicinity of the Project, with only a few abandoned fishponds near Fu Tei Au, Sheung Shan Kai Wat, Ha Shan Kai Wat, and Wang Leng. The closest abandoned fishpond is located at Wang Leng which is approximately 10m away from the project boundary. No other fisheries resources (e.g. other aquaculture, capture fisheries) are identified within the vicinity of the Project. The status of the fishponds would be identified during the fisheries survey.

Landscape and Visual

- 3.2.17 The evaluation and assessment of landscape and visual impacts will follow the criteria and guidelines as stated in Section 1 of Annex 10 and Annex 18 of the EIAO-TM respectively. The EIAO Guidance Note No. 8/2023 "Preparation of Landscape and Visual Impact Assessment under the EIAO" will also be taken into consideration.
- 3.2.18 The major landscape and visual impacts of the Project would be associated with the proposed at-grade / elevated roads, associated tunnel portals, and satellite administration building / kiosk and ventilating buildings (if necessary). Landscape with

distinctive character/resources such as river channels including Ng Tung River and Tan Shan River are found within the assessment area of the Project.

- 3.2.19 During the construction phase, potential landscape impacts would be anticipated from aboveground construction sites, associated slope works and retaining walls, and temporary working areas of the Project, etc. Potential impacts on landscape resources such as impact on hillside vegetation, impact on vegetation in existing villages, impact on roadside amenity, disturbance on watercourses and ponds etc. would also be anticipated. The extent of landscape impacts will be further assessed during the EIA study.
- 3.2.20 During the operation phase, there would be potential landscape impacts due to the affected existing vegetation. The aboveground structures of the Project (e.g. open roads, interchange, viaducts, associated slope works and retaining walls, tunnel portals, satellite administration building / kiosk and ventilation buildings (if necessary), etc.) may lead to potential changes in the visual quality experience for the public viewers, including nearby road users, hikers and other recreational users. The extent of these changes will be further assessed during the EIA Study.

Cultural Heritage

- 3.2.21 The evaluation and assessment of cultural heritage impacts will follow the criteria and guidelines as stated in Section 2 of Annex 10 and Section 2 of Annex 19 of the EIAO-TM respectively.
- 3.2.22 No declared monuments, proposed monument or graded historic building is located within the Project and its 300m assessment area.
- 3.2.23 No government historic site is located within the proposed alignment. However, one government historic site, namely Rain Stone Bearing an Inscription “ God of Rain” (GHS28) is located within the 300m assessment area but outside of the proposed Alignment.
- 3.2.24 One (1) Site of Archaeological Interest (SAI), namely the Hung Leng SAI, is located within the Project and its 300m assessment area, During construction phase, potential impacts on the SAI arising from at-grade construction activities may be anticipated.
- 3.2.25 The Project and its 300m assessment area would encroach onto areas required further archaeological survey identified in the Liantang/Heung Yuen Wai Boundary Control Point (EIA Report No. AEIAR-161/2011). Potential impacts on the concerned areas are anticipated during the construction phase. Since the Liantang/Heung Yuen Wai Boundary Control Point EIA was approved in March 2011, further review on these areas would be required.
- 3.2.26 On the other hand, direct impact on built heritage would not be anticipated during the construction phase. Potential indirect impact due to ground-borne vibration would be anticipated on built heritage located in close vicinity of the Project. This EIA study should include impact assessment to the cultural heritage resources and recommend appropriate measures to mitigate any potential impact(s).
- 3.2.27 During the operational phase, no potential impacts on built heritage and archaeological heritage are anticipated, subject to further review and findings under the EIA study.

Waste Management

- 3.2.28 The evaluation and assessment of waste management implications will follow the criteria and guidelines as stated in Annexes 7 and 15 of the EIAO-TM respectively.
- 3.2.29 During the construction phase, the main activities that would generate waste include excavation, tunnelling, and demolition and construction of structures. Typical waste generated from the above activities includes inert and non-inert construction and demolition (C&D) materials, chemical waste from the maintenance of the plants and equipment, and general refuse from the construction workforce.
- 3.2.30 During the operation phase, the amount of waste generated would be limited, comprising mainly the general refuse from the workforce and chemical wastes from the operation and maintenance. Under the Waste Disposal Ordinance (WDO) (Cap. 354), wastes generated shall be handled and disposed of following the established practices, guidelines and requirements. No adverse waste management implications are anticipated with the recommended mitigation measures implemented.

Land Contamination

- 3.2.31 The evaluation and assessment of potential land contamination issues will follow the guidelines as stated in Sections 3.1 and 3.2 of Annex 19 of the EIAO-TM.
- 3.2.32 Potential land contamination sources in the vicinity of the Project would include construction material storage, container storage, warehouse, and vehicle maintenance workshop at Hung Lung Hang and Ping Che Area. Relevant potential land contamination issue will be assessed comprehensively during EIA study stage.

Hazard to Life

- 3.2.33 The hazard to life assessment will follow the criteria stated in Section 2 of Annex 4 of the EIAO-TM.
- 3.2.34 There are two tunnel sections which might be constructed by the Drill & Blast method / Drill & Break method / TBM method (subject to further study). If the Drill & Blast method is adopted, controlled blasting operations by explosives would take place temporarily. A quantitative risk assessment would be conducted to assess the hazards due to the overnight (subject to further study) storage, transport and use of explosives and ensure appropriate safety measures, if required, to be strictly implemented to safeguard the wellbeing of nearby populations.

4 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1 Existing and Planned Sensitive Receivers

- 4.1.1 The major existing and planned sensitive receivers that may be affected by the Project have been identified and listed out in the following paragraphs. The listed receivers are not exhaustive and are subject to further review in the EIA study.

Air Quality

- 4.1.2 Key potential air sensitive receivers (ASRs) that may be affected by the Project include:

- Village type houses at Sheung Shui Wa Shan Village ;
- Planned air sensitive uses at Fanling North New Development Area;
- Proposed air sensitive uses in the NTN New Town;
- Village type houses at Sheung Shan Kai Wat;
- Village type houses at Ha Shan Kai Wat;
- Village type houses at Hung Leng;
- Village type houses at Wang Shan Keuk San Tsuen;
- Village type houses at Leng Tsai;
- Village type houses at Tai Tong Wu;
- Wo Keng Shan Road Garden;
- Lung Shan Tunnel and Cheung Shan Tunnel Administration Building; and
- Village type houses at Loi Tung.

Noise

- 4.1.3 Key potential noise sensitive receivers (NSRs) that may be affected by the Project include:

- Temple in Wa Shan;
- Planned noise sensitive uses at Fanling North New Development Area;
- Village type houses at Sheung Shui Wa Shan Village;
- Village type houses near Sheung Shan Kai Wat;
- Village type houses near Ha Shan Kai Wat;
- Village type houses at Ko Po North;
- Village type houses at Hung Leng Tsuen;
- Regency Court;
- Village type houses at Leng Tsai;
- Village type houses at Wang Shan Keuk San Tsuen;
- Village type houses at Pak Tin New Village;
- Village type houses at Tai Tong Wu;
- Village type houses at Ma Mei Ha Tsuen;
- Village type houses near Loi Tung; and
- Proposed noise sensitive uses in the NTN New Town .

Water Quality

4.1.4 Key potential water sensitive receivers (WSRs) that may be affected by the Project include:

- Ng Tung River;
- Tan Shan River;
- Watercourses distributed along the proximity of alignment; and
- Ponds distributed along the proximity of the alignment.

Ecology

4.1.5 Key potential ecological sensitive receivers nearby that may be affected by the Project include:

Sites of Conservation Importance:

- Pat Sin Leng Country Park; and
- “Conservation Area” gazetted under Man Uk Pin OZP no. S/NE-MUP/11.

Other Ecologically Sensitive Resources:

- Wooded habitats (e.g. woodland, mixed woodland, shrubland);
- Agricultural land;
- Wetland habitats (e.g. pond, modified and/or natural watercourse, marsh/reedbed, mangrove);
- Species of conservation importance (including mammals, avifauna, herpetofauna, butterflies, odonates, fireflies, freshwater fish and invertebrates)
- Egrettries (Man Kam To Road Egrettry and its satellites, Ping Che egrettry) and associated flight lines;
- Roosting sites (Man Kam To Road Night Roost)
- Existing woodland compensation area (at Cheung Shan);
- Existing compensation site for Man Kam To Egrettry (along Ng Tung River);
- Receptor sites for translocation of Rose Bitterling (*Rhodeus ocellatus*) (along Ng Tung River);
- Existing mitigation plantation and mitigation wetland (along Ng Tung River);
- Fung Shui Wood (Loi Tung Fung Shui Wood);
- Ecologically Important Stream (Man Uk Pin); and
- Ng Tung River.

Fisheries

4.1.6 No fisheries resources (aquaculture such as active and inactive fishponds, nor capture fisheries) were identified within the Assessment Area. No fisheries resources are anticipated to be affected by the Project.

Landscape and Visual

- 4.1.7 Relevant visual resources and public viewing points / viewers will be identified as the Project proceeds with more details in the EIA study. Key potential landscape resources, visual resources and key public viewing points that may be affected by the Project include:

Key Landscape with Distinctive Character/Resources:

- Hillside vegetation in Cham Shan, Wa Shan, Tsung Shan and Cheung Shan etc.; and
- River channels at Ng Tung River and Tan Shan River.

Key Visual Resources:

- Mountain backdrop from Cham Shan, Wa Shan, High Hill, Tsung Shan, Ma Tau Leng (Lamb Hill), Cheung Shan and Princess Hill; and
- River channels at Ng Tung River and Tan Shan River.

Key Public Viewing Points:

- Hikers' view at Cheung Po Tau, Cham Shan and Wa Shan;
- Hikers' view at High Hill, Ma Tau Leng (Lamb Hill) and Tsung Shan;
- Hikers' view at Tai Hom Tuk and Cheung Shan;
- Hikers' view at Wo Keng Shan;
- Hikers' view at Princess Hill;
- View at Tai Tong Wu Sitting-out Area;
- View along Ng Tung River; and
- View along Tan Shan River etc.

Cultural Heritage

- 4.1.8 Hung Leng SAI is located within the Project and its 300m assessment area, which may be potentially impacted by the proposed works.
- 4.1.9 No declared monuments, proposed monument or graded historic building is located within the Project and its 300m assessment area. No government historic site is located within the proposed alignment. However, one government historic site, namely Rain Stone Bearing an Inscription "God of Rain" (GHS28) is located within the 300m assessment area but outside of the proposed Alignment. Any other cultural heritage resources within and in the vicinity of the proposed alignment will be identified and assessed in the EIA study.

Hazard to Life

- 4.1.10 There are various types of sensitive receivers along the proposed alignment of the Project including populated areas, man-made slopes, retaining walls, natural boulders, and potentially unstable terrain etc. Charge weights per delay will be controlled during blasting operations to minimise the hazards in case that Drill & Blast method would be adopted for tunnel construction.

5 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND FURTHER ENVIRONMENTAL IMPLICATIONS

5.1 General

- 5.1.1 The EIA study will investigate those environmental impacts (both cumulative impacts and those arising from the Project) and propose the appropriate mitigation measures with the intention that the Project would be environmentally acceptable and cost-effective. The residual impacts, if any, would be confined to within the allowable limits. Subject to the findings of the EIA study, environmental monitoring and audit of potential impacts that may arise from implementation of the works will be provided during the construction and operation phases. The following mitigation measures would also be incorporated in the design and construction of the Project.

5.2 Measures to Minimise Environmental Impacts

Air Quality

- 5.2.1 During the construction phase, dust emissions from the related construction activities, such as excavation, mucking out of excavated rock and soil, materials handling, and exhaust emissions associated with construction machinery and construction vehicles etc., would be anticipated. Appropriate air quality control measures as stipulated in the Air Pollution Control (Construction Dust) Regulations along with good site practices will be implemented to minimise the air pollutant emissions. Subject to findings of EIA study, possible key mitigation measures, including but not limited to the following, will be considered, if appropriate:
- Regular watering on all exposed and unpaved surface, excavation, and fill materials handling, particularly during dry weather;
 - Covering all excavated or stockpile of dusty materials by impervious sheeting or spraying with water to maintain the entire surface wet;
 - Provision of wheel washing facilities at construction site access;
 - Covering any dusty materials on vehicles before leaving the site;
 - Implementing speed control of vehicles on unpaved haul roads;
 - Erection of screen hoarding along the construction site boundary;
 - Following the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation and Air Pollution Control (Fuel Restriction) Regulations (i.e., using liquid fuel with a sulphur content of less than 0.001% by weight) to control the exhaust emissions from construction equipment;
 - Connecting construction machinery to mains electricity supply and avoiding use of diesel generators and diesel-powered machinery as far as practicable to minimise air quality impact arising from the construction machinery;
 - Provision of blasting door at the portal of tunnel with air treatment system;
 - The areas within 30m of the blasting area should be wetted with water prior to blasting;
 - Blasting shall not be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted;
 - Avoiding the use of exempted Non-road Mobile Machinery (NRMMS);
 - Deploying electrified NRMMS as far as practicable; and
 - Planning the travelling route of construction vehicles on public roads as far as

practicable in a way to minimise the air quality impact on ASRs.

5.2.2 During the operation phase, the major source of air pollutants will be the exhaust gas emissions from the vehicular use of the NMH and associated slip roads. Additionally, the vehicular emissions from the tunnel portals and ventilation buildings (if necessary) will also give impacts on the air quality. Subject to findings of EIA study, possible key mitigation measures, including but not limited to the following, will be considered if appropriate:

- Provision of buffer areas between the sources of emissions and the ASRs;
- Location and orientation of the ventilation buildings (if necessary) and tunnel portals to be away from the nearby ASRs;
- Alternative road alignment / portal exit of the Project for provision of sufficient buffer areas between the sources of air pollutant and the ASRs; and
- Other mitigation measures (e.g. Enclosure of open roads and/or viaducts with installation of pollution control technology) may be necessary subject to air quality assessment during the EIA stage.

Noise

5.2.3 Subject to findings of EIA study, possible key measures to minimise construction noise impacts on nearby NSRs during the construction phase would include:

- Use of quieter PME fitted with silencers/mufflers or alternative quieter construction methods;
- Provision of temporary/movable noise barriers and enclosures where practicable;
- Installation of temporary noise screening structures or barriers along the construction site boundary;
- Adoption of good site practices such as locating the noisy equipment and activities as far away from nearby NSRs as practicable, providing proper maintenance of construction plants and limiting the use and number of equipment operating close to the NSRs;
- Proper planning of travelling route of the construction vehicles;
- Incorporating the noise control requirements stipulated in the "Recommended Pollution Control Clauses for Construction Contracts" of the Environmental Protection Department (EPD) into the construction works contract(s) for the Contractor to follow and implement relevant measures in minimising the construction noise impact; and
- Making reference to the ProPECC Note PN1/24 to plan and implement the project, and the particular specifications shall be imposed in the construction contract(s) to avoid causing adverse construction noise impact on the nearby NSRs.

5.2.4 Subject to findings of EIA study, the following measures will be considered during the operation phase to minimise noise impacts on nearby NSRs:

- Noise barriers / enclosures and low noise road surface materials will be provided for open road sections of the Project where necessary;
- Sound-absorbing materials may be required for tunnel portals where the NSRs are in their vicinity; and

- Suitable mitigation measures (e.g. proper orientation and location away from NSRs, silencers, acoustic louvres and acoustic enclosures, etc.) for the fixed plants of proposed facilities, including ventilation shafts (if necessary), satellite administration building / kiosk and other ancillary buildings (if necessary), should also be reviewed and considered in the EIA study.

Water Quality

5.2.5 Subject to findings of EIA study, the following mitigation measures during the construction phase will be adopted to prevent adverse impacts on nearby WSRs:

- Good site practice in accordance with the ProPECC PN 2/24 “Construction Site Drainage” and “Recommended Pollution Control Clauses for Construction Contracts” issued by Environmental Protection Department (EPD);
- Implementation of recommended pollution control clauses for construction contracts, and guideline under Environment, Transport and Works Bureau Technical Circular (Works) (ETWB TC(W)) No. 5/2005 “Protection of Natural Stream / Rivers from Adverse Impact arising from Construction Works”;
- Construction surface runoffs should be properly collected by silt trap and oil interceptor to remove the oil, lubricants, grease, silt, grit and debris before being discharged to the public stormwater drainage system to ensure compliance with the Water Pollution Control Ordinance;
- Appropriate monitoring and mitigation measures should be developed for groundwater control (e.g. probing ahead and pre-grouting during tunnel construction, and installation of waterproof lining after the formation of the tunnel) to minimise the potential groundwater drawdown / infiltration due to tunnel construction;
- Proper construction techniques should be employed to prevent sediment release during construction. Stringent site sediment control and mitigation measures should be implemented to prevent elevation of suspended solids;
- Flow diversion should be conducted prior to the construction works to prevent water from overflowing into the surrounding area;
- Flow diversion should be conducted in dry season as far as practicable when the flow is low;
- Construction works at the existing ponds should be conducted only after dewatering of these ponds is fully completed;
- Water in existing ponds should be sampled and pre-treated if required before discharging; and
- Proper management of the drained water and sediment should be implemented to prevent release to existing watercourses.

5.2.6 Subject to findings of EIA study, the following measures will be incorporated for the Project to minimise the water quality impacts on nearby WSRs during operation phase:

- Appropriate mitigation measures in accordance with the ProPECC PN1/23 “Drainage Plans subject to Comment by the Environmental Protection Department -Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations” issued by EPD;
- Adopting storm drainage system to collect the surface runoffs from the road via silt trap and oil interceptor to remove silt / grit and oil before discharging;

and

- Adopting sewerage system to collect the wastewater generated from the Project and connecting to the existing sewerage network in the region.

Ecology

5.2.7 Aboveground works of the Project should avoid encroachment onto recognized sites of conservation importance (e.g. Pat Sin Leng Country Park and “Conservation Area”) or important habitats for fauna and flora (e.g. low-lying wetland habitats and agricultural lands, egret and/or avifauna roosts, and compensation habitats) as far as practicable by examining alternative engineering schemes wherever possible. Where loss of natural habitats (e.g. wooded habitats, wetland habitats, and agricultural lands) is inevitable, habitat reinstatement works should be considered as far as practicable, while habitat compensation may also be required. Provision of buffer between recognized sites of conservation importance / important habitats and aboveground works should be duly examined to minimise the potential ecological impacts. To minimise fragmentation of habitat and animal movement corridor, fine-tuning of the alignment may be required to minimise obstruction of flight lines, while wildlife corridor may be required to facilitate animal movement, subject to further investigation.

5.2.8 Subject to findings of EIA study, the following mitigation measures during the construction phase will be considered to avoid, minimise and compensate the ecological impacts:

- Avoid / minimise encroachment on sites of conservation importance and ecologically sensitive habitats;
- Avoid / minimise habitat fragmentation and unnecessary damage / disturbance to the natural habitats;
- Establish buffer area and implement seasonal control on construction activities, where necessary
- Adopt alternative design or construction methods where necessary;
- Carefully plan the placement of equipment and stockpile area in the designated area within existing disturbed lands;
- Compensation for unavoidable loss of sensitive natural habitats, if any (e.g. woodland and wetland habitats such as ponds and natural stream, and agricultural land);
- Translocation / transplantation of unavoidably affected species of conservation importance with low mobility;
- Maintaining flight lines by fine-tuning alignment;
- Maintaining animal movement corridor by inclusion of wildlife corridor / underpass; and
- Good site practices and mitigation measures aiming to reduce impacts from air, noise and water pollution, to minimise the potential groundwater drawdown / infiltration due to tunnel construction (as stated in **Sections 5.2.1, 5.2.3 and 5.2.5**), and to minimise potential impact on the ecological resources.

5.2.9 During the operation phase, subject to findings of EIA study, appropriate measures, including but not limited to traffic noise and water quality control measures as stated in **Sections 5.2.4 and 5.2.6**, and control of direction / intensity of light not spilling into the sensitive areas, should be incorporated into the design of the Project to avoid /

minimise the potential ecological impacts. In addition, potential ground water drawdown / infiltration would not be expected during operation phase.

Fisheries

- 5.2.10 No fisheries resources were identified within the Assessment Area thus impacts on fisheries by the Project are not anticipated. Nevertheless, construction method for NMH should be carefully designed to avoid groundwater drawdown or dewatering of surface settlement. Good site practices for the control of construction site runoff should be fully implemented to minimise impacts on water quality.

Landscape and Visual

- 5.2.11 Mitigation measures to minimise landscape impact during both the construction and operation phases and visual impact during the operation phase should be comprehensively reviewed.
- 5.2.12 The following mitigation measures will be considered during the construction phase subject to the investigation and the findings of EIA study:
- Tree preservation in accordance with Development Bureau DEVB TC(W) No. 4/2020 and TC(W) No. 5/2020;
 - Implementation of good site practices for preservation and protection of the existing natural streams in accordance with ETWB TC(W) No. 5/2005;
 - Minimise disturbance to Ng Tung River, Tan Shan River and watercourses nearby;
 - Erection of decorative screen hoarding or hoarding compatible with the surrounding areas;
 - Management of construction activities and facilities; and
 - Reinstatement of temporarily disturbed landscape areas.
- 5.2.13 The following mitigation measures will be considered during the operation phase subject to the investigation and the findings of EIA study:
- Trees and shrub will be planted to provide adequate greening, screening, and mitigation, and minimise visual impact of the Project, where appropriate;
 - Sensible locations of viaducts alignment, columns and portals to minimise impact on existing trees and adjoining existing, planned and potential developments;
 - Tree transplanting and compensatory planting for compensation of the loss of existing vegetation (including trees and shrubs, etc.). In case loss of vegetation in woodland are unavoidable, compensation in native woodland mix will be provided to mitigate the impact and enhance the biodiversity;
 - Aesthetically pleasing design and responsive design will be adopted for aboveground structures (e.g. tunnel portals and ventilation buildings, if necessary). Buffer planting near portals to reduce their apparent size/scale and to visually screen and soften the structures;
 - Aesthetic design will be adopted for the road structures such as slip roads, viaducts and tunnel portals, and slope associated structures. Road structures will be designed with considerations and suitable measures to minimise the visual impact of the road corridor. Submission to Advisory Committee on the Appearance of Bridges and Associated Structures (ACABAS) in respect of the

aesthetic design of the structures associated with the public highway system in accordance with ETWB TC(W) No. 36/2004 will be made during preliminary design;

- In case the provision of noise mitigation measures is required, alternative design that would avoid or reduce the identified impacts on landscape; and/or visual amenity shall be first thoroughly examined before adopting other mitigation (e.g. noise barrier) or compensatory measures to alleviate the impacts; and
- The visual impact of noise mitigation measures including noise barriers (if necessary), will be mitigated by appropriate design, including use of transparent panels, appropriate colour selection of panels and supporting structures, as well as design of supporting structures to incorporate a high level of quality and aesthetics.

Cultural Heritage

- 5.2.14 A Cultural Heritage Impact Assessment, including the Built Heritage Impact Assessment and Archaeological Impact Assessment, will be conducted during the EIA stage to assess the potential impacts on cultural heritage during the construction and operation phases. Impacts on cultural heritage resources should be avoided as far as practicable. If unavoidable, mitigation measures to minimise the impacts on cultural heritage will be proposed and implemented with prior agreement with the Antiquities and Monuments Office.

Waste Management

- 5.2.15 The waste management hierarchy aims to minimize the waste generation. During construction phase, standard waste management measures shall be implemented to manage the C&D waste generated from the construction works, including sorting and reusing the C&D materials (including excavated soil) on site or other concurrent projects as far as practicable, implementation of trip-ticket system in accordance with the requirements stipulated in DEVB TC(W) No. 6/2010 Trip Ticket System for Disposal of Construction & Demolition Materials. For chemical waste generated during construction stage, appropriate sorting, handling, storage and disposal by registered and licensed waste hauliers will be adopted in accordance with the Waste Disposal Ordinance (Cap. 354) and Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C). Subject to findings of EIA study, a material / waste management plan will be established prior to commencement of excavation and construction work to outline the methods that can be incorporated into the Project for waste minimization, including reuse, recycle, matching disposal with other projects, handling, storage, transportation and disposal of expected waste materials.
- 5.2.16 During the operation phase, waste collectors shall be employed to remove general refuse and chemical waste, if any, generated from satellite administration building / kiosk / ventilation buildings (if necessary) on a regular basis. Reuse and removal of recyclables shall be encouraged, and collection bins for used aluminium cans, wastepaper, plastics, and glass bottles are recommended to be provided at the satellite administration buildings / kiosk. The recyclables shall be collected by a recycler on a regular basis.

Land Contamination

- 5.2.17 Site appraisal should be carried out during the EIA study to identify if there are any potential soil / groundwater contamination within the Project area and any associated

works area. Site investigation and land contamination assessment should be conducted prior to construction works at the concerned area. Based on the findings of site investigation and assessment, appropriate remediation strategies / options should be detailed in a Remediation Action Plan if contamination is identified. Upon completion of the remediation works, if any, a Remediation Report demonstrating that the clean-up works has been adequately carried out should be submitted to EPD for endorsement prior to commencement of any construction / development works.

Hazard to Life

- 5.2.18 Potential hazards associated with the overnight (subject to further study) storage, transport and use of explosives will be assessed. Close liaison with the Mines Division of Civil Engineering and Development Department will be maintained. Necessary safety precautions and control measures will be proposed during the EIA study.

5.3 Severity, Distribution and Duration of Environmental Effects

- 5.3.1 Subject to the findings of assessments, effective control and mitigation measures would be identified to ensure the impacts are kept at acceptable levels. The potential severity, distribution and duration of environmental effects such as beneficial and adverse effects, short-term and long-term effects, secondary and induced effects, cumulative effects and transboundary effects will be considered and addressed in the EIA study, where applicable.

5.4 Further Implication

- 5.4.1 Close co-ordination with relevant authorities, particularly EPD and other interfacing projects will be necessary. Public consultation will be arranged once sufficient information is available.

6 USE OF PREVIOUSLY APPROVED EIA REPORTS

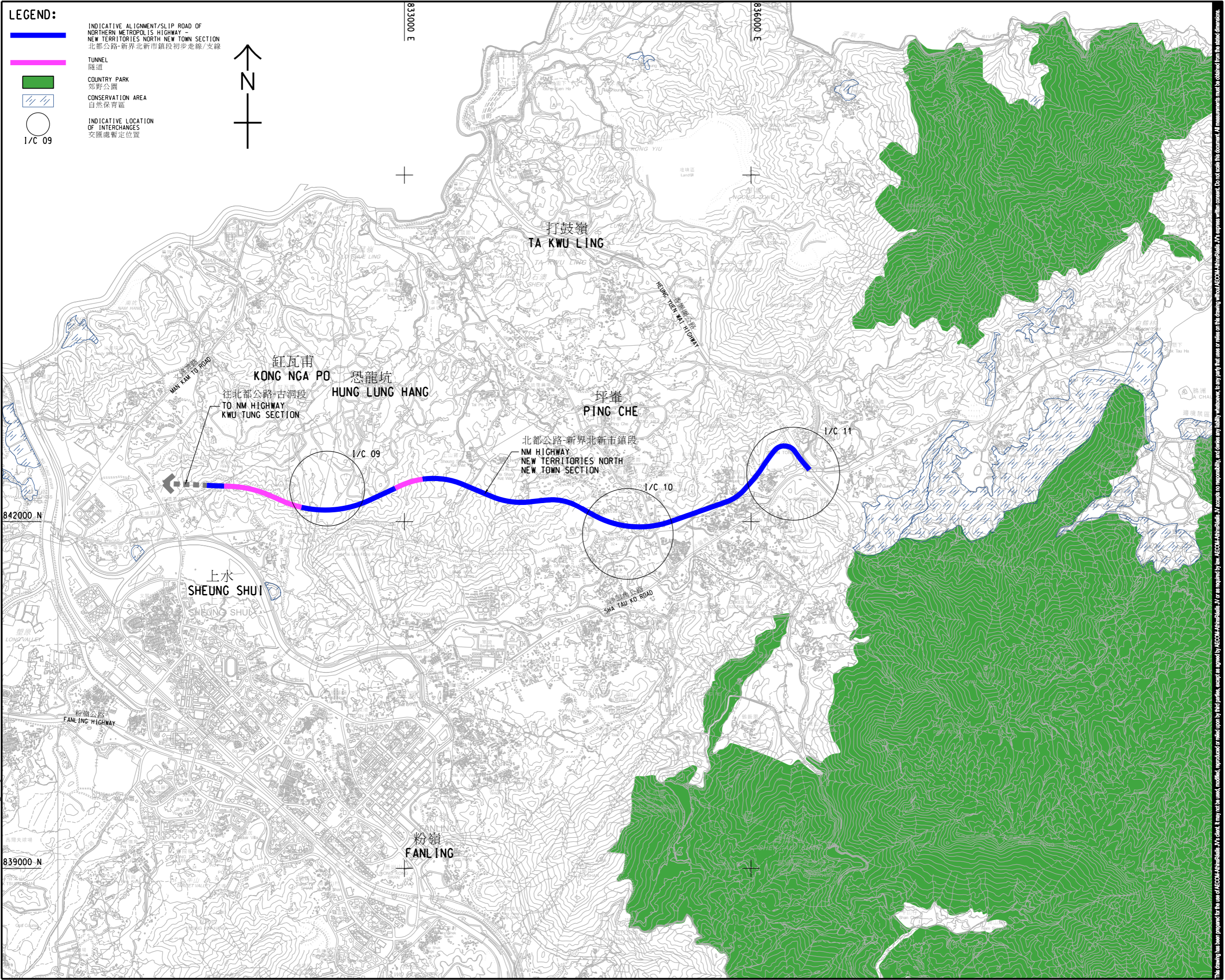
- 6.1.1 There is no previously approved EIA report under EIAO for the Project. Nonetheless, reference may be made to the following previously approved EIA reports and will be referred to in the subsequent EIA study:

Register No.	Title
AEIAR-108/2007	Drainage Improvement in Northern New Territories - Package C
AEIAR-142/2009	Provision of a Poultry Slaughtering Centre in Sheung Shui
AEIAR-161/2011	Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
AEIAR-175/2013	North East New Territories New Development Areas
AEIAR-238/2022	Drainage Improvement Works in Ta Kwu Ling

Figure

*Indicative Layout Plan For Northern Metropolis Highway
– New Territories North New Town Section*

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LEGEND:

INDICATIVE ALIGNMENT/SLIP ROAD OF
NORTHERN METROPOLIS HIGHWAY -
NEW TERRITORIES NORTH NEW TOWN SECTION
北部公路-新界北新市鎮段初步走線/支線

TUNNEL
隧道

COUNTRY PARK
郊野公園

CONSERVATION AREA
自然保育區

INDICATIVE LOCATION
OF INTERCHANGES
交匯處暫定位置

I/C 09

AECOM

AtkinsRéalis

PROJECT

NORTHERN METROPOLIS
HIGHWAY -
INVESTIGATION STAGE
北部公路-勘察研究

CLIENT

路政署
HIGHWAYS
DEPARTMENT

CONSULTANT

AECOM - ATKINSREALIS JOINT VENTURE

SUB-CONSULTANTS

ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK.

STATUS

SCALE

A3 1:30000

DIMENSION UNIT

METRES

KEY PLAN

PROJECT NO.

60750817/R30.4/FIGURE 1

AGREEMENT NO.

CE 4/2024(HY)

SHEET TITLE

INDICATIVE LAYOUT PLAN FOR
NORTHERN METROPOLIS HIGHWAY -
NEW TERRITORIES NORTH
NEW TOWN SECTION
北部公路-新界北新市鎮段暫定位置圖

SHEET NUMBER

60750817/R30.4/圖 1

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