

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

IMPROVEMENT TO SO KWUN PO INTERCHANGE

ENVIRONMENTAL IMPACT ASSESSMENT

EXECUTIVE SUMMARY





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Environmental Impact Assessment

Executive Summary

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1 INTRODUCTION

1.1 BACKGROUND

- 1.1.1 The So Kwun Po Interchange (SKPIC) is one of the three major interchanges in the North District connecting the northern and southern parts of Fanling and Sheung Shui. The SKPIC has been operating close to its capacity. The SKPIC was allegedly one of the causes of several numbers of serious traffic gridlocks in the North District in the past few years. The paralysed and stranded traffic that appeared within the past few years highlighted the fragility and deficiencies of the existing transport infrastructure at some locations in the District where upgrading and/or improvement works are considered necessary to rectify the situation. The North District Council (NDC) had made requests to the Government for its improvements on various occasions. With the anticipated population increase in the North District following the completion of public and private housing developments which are under planning, the traffic condition at the SKPIC is expected to deteriorate further.
- 1.1.2 In order to meet the anticipated traffic needs and to address public demands, a new road link and junction modification works would be carried out to improve the existing SKPIC. The Traffic and Transport Committee (T&TC) of the NDC has earlier proposed a new North to South Link in an attempt to mitigate the current traffic situation.
- 1.1.3 The Project Profile of the Project No. PP-616/2021 was submitted to the EPD on 6 January 2021 for application for an EIA Study Brief under Section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO). The EIA Study Brief No. ESB-338/2021 for the Project was issued on 2 February 2021 under the EIAO.
- 1.1.4 The purpose of this EIA Study is to address potential environmental impacts arising from the construction and operation of the Project and propose mitigation measures to mitigate against adverse environmental consequences, wherever practicable.

1.2 DESIGNATED PROJECTS UNDER EIAO

- 1.2.1 The Project comprises the following element (see **Table 1.1**) which is classified as a Designated Project (DP) under Schedule 2 of the EIAO.

Table 1.1 Elements of Designated Project in this Project

Schedule 2 of the EIAO		Designated Project Element under the Project
Item A.1, Part I	<i>“A carriageway for motor vehicles that is an expressway, trunk road, primary distributor road or district distributor road.”</i>	<p>The proposed roads listed below under the Project comprise primary distributor (PD) roads and district distributor (DD) roads.</p> <p><u>Proposed roads classified as PD:</u></p> <ul style="list-style-type: none"> • A single 2-lane flyover (main ramp) and a single 1-lane flyover (side ramp) across Kai Leng Roundabout; and • A single 2-lane underpass underneath So Kwun Po Road.

Schedule 2 of the EIAO		Designated Project Element under the Project
		<p><u>Proposed roads classified as DD:</u></p> <ul style="list-style-type: none"> • An at-grade road connecting San Wan Road and the proposed flyover; and • An at-grade road connecting the proposed flyover and Pak Wo Road.

1.3 OBJECTIVES AND APPROACH TO THE EIA STUDY

- 1.3.1 The objectives of this EIA Study are to provide information on the nature and extent of environmental impacts arising from the Project; to recommend appropriate mitigation measures to control the potential environmental impacts so that it complies with the requirements of the *Technical Memorandum on Environmental Impact Assessment Process* of the EIAO (EIAO-TM); and to confirm the environmental acceptability of the Project. Key environmental issues identified in the EIA Study Brief include air quality, noise, water quality, waste management, land contamination, ecology, landscape and visual impacts and cultural heritage.
- 1.3.2 The EIA was conducted in accordance with the guidelines on assessment methodologies provided in the EIAO-TM. The general approach for the assessment includes a description of baseline environmental conditions for the impact assessment, identification and evaluation of potential impacts and recommendation of mitigation measures, and an environmental monitoring and audit programme. The assessments in this EIA Study are conducted using well-proven and internationally accepted methods based on reasonable worst-case conditions.
- 1.3.3 Alternative construction methods and sequences of works have been considered and environmentally friendly construction methods have been adopted to avoid and/or minimise impacts to the surrounding sensitive receivers, where appropriate and practicable.

1.4 STRUCTURE OF THE EXECUTIVE SUMMARY

- 1.4.1 This Executive Summary (ES) summarizes the findings, recommendations and conclusions of the EIA Report for the Project. The remaining sections of this ES are outlined as follows:
- Section 2 – Project Description;
 - Section 3 – Key Findings of the Environmental Impact Assessment;
 - Section 4 – Environmental Monitoring and Audit (EM&A); and
 - Section 5 – Conclusion.

2 PROJECT DESCRIPTION

2.1 OBJECTIVE OF THE PROJECT

- 2.1.1 The objective of this Project is to improve the traffic congestion issues at SKPIC by:
- (i) Providing a new direct road link, referred to as So Kwun Po Link (SKPL), which comprises an at-grade road, an underpass, a single 2-lane flyover (main ramp) and a single 1-lane flyover (side ramp) connecting San Wan Road on the north side and Pak Wo Road on the south side of the SKPIC;
 - (ii) Realigning So Kwun Po Road between So Kwun Po Interchange (SKPIC) and Pak Wo Road;
 - (iii) Carrying out junction modification works at San Wan Road and Pak Wo Road;
 - (iv) Re-provisioning of the affected footpaths, cycle tracks and staircases; and
 - (v) Carrying out the associated roadworks, geotechnical works, landscape works, drainage works, utility works, traffic aids installation, traffic signal modification works, environmental mitigation measures, street lighting, street furniture and other ancillary works.
- 2.1.2 A new direct carriageway, i.e. the proposed SKPL, linking San Wan Road and Pak Wo Road will be constructed under this Project. It would improve the traffic capacity of the SKPIC and serve as an alternative route for the case of traffic incidents at the SKPIC, such that smooth traffic for accessing the northern and southern sides of Fanling Highway during contingency can be maintained.
- 2.1.3 The location of the Project and the detailed Project layout are shown in **Figures 2.1** and **2.2**, respectively.
-

2.2 SCOPE OF THE PROJECT

- 2.2.1 The scope of the Project comprises:
- (a) construction of north-south link road of about 700m connecting Pak Wo Road and San Wan Road;
 - (b) reconstruction of sections of So Kwun Po Road near North District Park;
 - (c) widening of the north-western slip road from So Kwun Po Road to San Wan Road;
 - (d) reconstruction/realignment of So Kwun Po Road between Kai Leng Roundabout and Pak Wo Road;
 - (e) improvement works at the junction of San Wan Road and the proposed north-south link road;
 - (f) improvement works at the junction of Pak Wo Road and So Kwun Po Road;
 - (g) modification of the existing pedestrian subway connecting North District Park underneath So Kwun Po Road;
 - (h) construction of a lift and a staircase linking San Wan Road and elevated So Kwun Po Road;
 - (i) construction of a pedestrian subway across So Kwun Po Road near Pak Wo Road;
 - (j) re-provision of the skating rink within North District Park affected by the road works; and

- (k) associated works including geotechnical, landscape, drainage, water, electrical and mechanical, environmental mitigations, street lighting and utilities works, as well as installation of street furniture and traffic aids.
-

2.3 THE NEED FOR THE PROJECT

- 2.3.1 Currently, there is an indirect link connecting San Wan Road and Pak Wo Road via the existing SKPIC. Traffic coming from Fanling Highway westbound and Fanling Highway eastbound and access to either San Wan Road or Pak Wo Road shall be via the existing SKPIC. The proposed new direct link, i.e. the SKPL, provides an alternative route between San Wan Road and Pak Wo Road. Upon commissioning of the proposed SKPL under this project, a portion of traffic between Pak Wo Road and San Wan Road via the existing SKPIC would be diverted to the new SKPL, thereby enhancing the accessibility between the northern and southern parts of Fanling. In addition, connectivity of Fanling / Sheung Shui via SKPL will also be enhanced with the completion of this new SKPL. With the new SKPL serving as the bypass of the existing SKPIC for traffic to and from San Wan Road / Pak Wo Road, the traffic flow of SKPIC will also be reduced.
-

2.4 SCENARIO “WITH” AND “WITHOUT” PROJECT

Scenario “without” Project

- 2.4.1 The SKPIC has been operating to its capacity. With the anticipated population growth in the North District following the completion of public and private housing developments, the traffic condition at SKPIC is anticipated to deteriorate further. Moreover, if the Project could not proceed, some of the major road links and road junctions in Fanling and Sheung Shui would also experience capacity problems, such as longer traffic queues at Fanling Highway, San Wan Road and Pak Wo Road would be anticipated, especially during peak hours.

Scenario “with” Project

- 2.4.2 As the Project will provide an alternative link for traffic to and from northern and southern Fanling, a decrease in the traffic volume of SKPIC and the adjacent road links is expected. Also, modification of the So Kwun Po Road downstream of SKPL near Pak Wo Road could enhance its capacity of the heavily trafficked road between SKPIC and Fanling South and relieve traffic demand, thereby leading to smoother traffic flows and potential reduction in congestion of SKPIC. As a result, the capacity problem of the critical section of SKPIC would be alleviated and the capacity of some road junctions would also be improved during peak hours. If the Project could be completed and operated by Year 2031, the capacity problem on traffic flow of the major road links and junctions in Fanling and Sheung Shui would be relieved or even resolved.
-

2.5 CONSIDERATION OF ALIGNMENT OPTIONS

- 2.5.1 The project alignment options have considered the following primary criteria, such as providing a direct connection between San Wan Road and Pak Wo Road, relieving the anticipated traffic congestion problems of the SKPIC and bypassing the heavily trafficked road links in the Fanling and Sheung Shui area. In addition, throughout the evaluation process of the alignment options for the Project, environmental considerations including air quality, noise, water, waste, land contamination, ecological, landscape and visual and cultural heritage during the construction and operation phases have been thoroughly reviewed and evaluated. Apart from the environmental considerations, other engineering aspects such as land requirement,

engineering feasibility as well as public perception, construction time and cost, and maintenance requirements have also been taken into consideration.

- 2.5.2 Striking the balance among different aspects, a Developed Scheme (see **Figure 2.2**) is formulated to overcome the technical issues and tackle the engineering constraints of the Base Scheme, which was formulated under Agreement No. CE4/2018 – “North-South Link(s) as Alternative to So Kwun Po (Kai Leng) Roundabouts in North District – Feasibility Study (FS)”.

2.6 CONSTRUCTION METHODOLOGY

- 2.6.1 The methodology for the construction of the Project has been conducted with due consideration for overcoming the difficult site conditions and/or site constraints as well as the complexity of the road alignment.
- 2.6.2 Possible construction methods which have been investigated for the construction of the Project and the reasons for selection are summarised below.
- 2.6.3 The SKPL connecting San Wan Road and Pak Wo Road will be in the form of prestressed concrete viaducts. Various methods for the construction of deck structures, including the precast method or cast-in-situ method have been considered. The cast-in-situ method is recommended taking into account the engineering feasibility and environmental impact of the various methods. Permanent formworks, e.g. formwork made of fibre-reinforced plastic (FRP), would be used to construct the cast-in-situ slab.
- 2.6.4 The deck structure can be constructed by cast-in-situ on suspended travelling formworks or cast-in-situ on ground-supported falseworks. Cast-in-situ on ground-supported falseworks is considered a more favourable construction method due to the much shorter duration of works compared with cast-in-situ on suspended travelling formwork. Expediting the works is an effective means to minimise the environmental and traffic impacts during the construction phase.
- 2.6.5 Cast-in-situ using cantilevered travelling formworks is recommended for the construction of the concrete box girder across the East Rail Line. By adopting the cast-in-situ method using travelling formworks, the segments shall be constructed based on a balanced cantilever. The cantilevered formworks will be erected at the piers on both sides of East Rail Line, which are all accessible by mobile crane. The cantilevered formworks will be launched forward by jacking during non-train hours upon each cantilevered segment is completed. Repositioning of the formworks by mobile crane will not be required. After construction of the last cantilever segment on each side, the cantilever formworks above East Rail Line will be removed during non-train hours by mobile crane setting up in San Wan Road.
- 2.6.6 The underpass under So Kwun Po Road (north section) can be constructed using various tunnelling methods such as the cut-and-cover construction method, and drill-and-break/ drill-and-blast method. In view of the extent and geometry of the SKPL alignment, the cut-and-cover construction method is considered a more reliable and controllable approach and is recommended to be adopted. So Kwun Po Road will be reconstructed based on the designed level in conjunction with the construction of the underpass.

2.7 WORK PROGRAMME

- 2.7.1 The construction of the Project is tentatively scheduled to commence in Year 2025 and to be completed before the end of Year 2030. The tentative schedule of the major construction works for the Project is outlined in **Table 2.1**.

Table 2.1 Tentative Phasing of Major Construction Works

Major Works	Tentative Schedules
At-grade Road Construction (Southern Portion)	Nov 2025 to Jul 2030
At-grade Road Construction (Northern Portion)	May 2026 to Dec 2028
So Kwun Po Link (SKPL) (Bridge Portion)	Jun 2026 to Dec 2029

2.8 CONCURRENT PROJECTS

2.8.1 Concurrent projects in the vicinity of the Project site are identified. The key details of these identified planned / committed projects are summarised in **Table 2.2**. Potential cumulative impacts from these concurrent projects have been considered in this EIA Study as appropriate.

Table 2.2 Summary of Concurrent Projects

Project	Project Proponent	Construction Period
Housing Development in Ching Hiu Road	Civil Engineering and Development Department (CEDD) / Housing Department (HD)	2022 to 2030
Housing Development in Fanling Area 17	CEDD / HD	2023 to 2031
Expansion of North District Hospital	Architecture Service Department (ArchSD) / Hospital Authority (HA)	2021 to 2028
Utilities Works and Junction Improvement Works for Partial Development of Fanling Golf Course Site	CEDD	2024 to 2029
Reclaimed Water Supply to Sheung Shui and Fanling	Water Supplies Department (WSD)	2021 to 2026

2.9 PUBLIC CONCERNS

- 2.9.1 Consultation activity for the Project has been carried out during the application of the EIA Study Brief under EIAO. The Project Profile was exhibited for public inspection between 7 January 2021 and 20 January 2021. During this period, public comments on the Project Profile were received and mainly focused on observations on the existing traffic conditions, suggestions on additional traffic aids or modifications to alleviate the situation, nuisance of noise, construction impacts to the egret at a pond in North District Park and surrounding environments, extent of tree felling, and preservation of the habitat. The construction programme has been optimised based on the suggestions received during the public inspection, such as the minimisation of heavy construction works near North District Park during ardeids' breeding season and implementation of practical mitigation measures to reduce the construction impacts as well as the likelihood of bird collision. The aforementioned potential impacts have been addressed in the EIA study and discussed in the EIA Report.
- 2.9.2 After the issue of EIA Study Brief in February 2021, views for consideration in the design of So Kwun Po Link had been obtained from various consultations with stakeholders and considered. A briefing session with the representative green groups including Kardoorie Farm & Botanic Garden (KFBG) and Hong Kong Bird Watching Society (HKBWS) was made on 16 June 2023



and their suggestions raised in the session were incorporated in the EIA study and discussed in the EIA Report.

- 2.9.3 A consultation with NDC was conducted on 9 November 2020. A further consultation with the NDC T&TC had been held on 8 May 2023. The proposal has obtained preliminary support from members of the NDC.

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. It is an iterative process that has been followed in parallel with the design process to identify the potential environmental issues of various design options and develop alternatives as well as appropriate mitigation measures to be incorporated into the design, construction and operation of the Project. Public views will also be considered and incorporated into the design and EIA process where appropriate. Mitigation measures have been recommended to avoid some potential environmental impacts, while others are minimized or mitigated 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;
 - Noise;
 - Water Quality;
 - Waste Management;
 - Land Contamination;
 - Ecology;
 - Landscape and Visual; and
 - Cultural Heritage.
-

3.2 AIR QUALITY

- 3.2.1 Potential air quality impacts associated with the construction and operation phases of the Project have been assessed in accordance with Annex 12 of EIAO-TM, as well as Clause 3.4.4 of the Study Brief. The assessment area for air quality impact assessment is within 500m from the boundary of the Project Site and the work areas 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 clearance, slope works, piling works and superstructure works which involve excavation and handling of excavated materials. The key air pollutants of concern arising from the construction of the Project include Total Suspended Particulates (TSP), Respirable Suspended Particulates (RSP) and Fine Suspended Particulates (FSP). Considering the minor excavation works with limited extent of the excavation areas at any one time, no adverse dust and air quality impact arising from the construction activities of the Project is anticipated with the implementation of mitigation measures specified in the *Air Pollution Control (Construction Dust) Regulation* together with the recommended dust suppression measures and good construction site practices, including establishment and use of vehicle wheel and body washing facilities at exit points of the works site, keeping all exposed areas wet or covering by impervious sheets at all times, and spraying all dusty materials with water/dust suppression chemical immediately prior to any loading, unloading or transfer operation,

and regular dust monitoring to ensure the relevant legal requirements and standards are complied with during construction phase of the Project.

- 3.2.3 During the operation of the Project, vehicular emissions from the new roads of the Project have the potential to cause air quality impacts to the nearby air sensitive receivers (ASRs). The key air pollutants of concern due to the operation of the Project are from vehicular emissions, including Nitrogen Dioxide (NO₂), Respirable Suspended Particulates (RSP) and Fine Suspended Particulates (FSP). A quantitative assessment has been conducted taking into account vehicular emissions from the new roads of the Project and existing road networks within the 500m Study Area, other adjacent emission sources (including industrial emissions) within the 500m Study Area, as well as the background air quality. The prediction indicated the cumulative NO₂, RSP and FSP impacts at all identified ASRs would comply with the prevailing Air Quality Objectives (AQOs). Adverse air quality impact arising from the operation of the Project is thus not anticipated.

3.3 NOISE

- 3.3.1 The potential noise impacts associated with the construction and operation of the Project have been conducted in accordance with the requirements of Annex 5 and Annex 13 of EIAO-TM as well as the requirements set out under Clause 3.4.5 and Appendix C of the Study Brief. The assessment area for noise impact assessment is defined by a distance of 300m from the boundary of the Project site and the works of the Project.
- 3.3.2 Potential construction noise impacts would mainly be due to the use of powered mechanical equipment (PME) from road works construction. The key construction works include site clearance, slope works, piling works and superstructure works. The assessment results indicated that the predicted noise levels are in the range of 69 dB(A) to 99 dB(A). With the implementation of the recommended noise mitigation measures, such as Quieter Construction Methods, Quality Powered Mechanical Equipment (QPME), provision of temporary movable noise barriers/ enclosures and noise insulating fabric, and proper scheduling of works, the mitigated construction noise levels arising from the Project at the identified noise sensitive receivers (NSRs) would be in the range of 53 dB(A) to 75 dB(A) which comply with the EIAO-TM construction noise criteria (excluding examination period for schools).
- 3.3.3 It is recommended that the Contractor shall liaise with the school's management for the schedule of construction works, to avoid carrying out noisy construction activities during the examination period.
- 3.3.4 The potential road traffic noise impacts have been assessed based on the Year 2041 ⁽¹⁾ traffic forecast, which is the maximum projected traffic level within 15 years upon operation of the Project. With the provision of the recommended noise mitigation measures, including low-noise road surfacing (LNRS) and noise barriers along the proposed SKPL and the realigned So Kwun Po Road (south section), the noise levels at NSRs would comply with the noise standards, or the noise contribution from Project roads to the overall noise levels at all representative NSRs would be less than 1.0dB(A). Adverse noise impact arising from the operation of the Project is thus not anticipated.

(1) As Year 2041 would be the peak traffic forecast year within 15 years (Year 2030 to Year 2045) upon the completion year with reference to the population projection data in "Hong Kong Population Projections 2020-2069" published by Census and Statistics Department (C&SD), assessment year in 2041 has been adopted for the traffic noise impact assessment to represent the worst-case scenario.

3.4 WATER QUALITY

- 3.4.1 The potential water quality impacts associated with the construction and operation of the Project have been conducted in accordance with the requirements of Annex 6 and Annex 14 of EIAO-TM as well as the requirements set out under Clause 3.4.6 and Appendix D of the Study Brief.
- 3.4.2 Potential sources of water quality impact associated with the Project include site runoff, discharges from construction activities, diversion/ modification of box culvert and sewage effluents from the on-site workforce. Chemical wastes would also be produced from the use of chemicals and accidental spillage of chemicals/ chemical wastes during construction. With the implementation of the recommended management and mitigation measures, including surface control measures stipulated in *ProPECC PN1/94* and regular cleansing and maintenance of the chemical toilets, no unacceptable water quality impact is expected from the land-based construction activities.
- 3.4.3 Potential water quality impacts associated with the operation phase were identified as surface runoff generated from the proposed roads. Such runoff typically contains elevated levels of suspended solids, grits, trace amounts of oil and grease from vehicles, which could affect the water quality of the receiving waters. A road drainage system with appropriate silt or grit traps will be provided to collect runoff from the road surface during periods of rain. With the implementation of proposed mitigation measures and management practices, no adverse water quality impact during the operation phase is anticipated.
- 3.4.4 The modification and realignment of box culvert sections under this Project is not expected to adversely affect the hydraulic capacity of the drainage system or any surface water features. No unacceptable impact on the hydrology of the area is expected.

3.5 WASTE MANAGEMENT IMPLICATIONS

- 3.5.1 The assessment of potential waste management implications associated with the Project has been conducted in accordance with the requirements of Annex 7 and Annex 15 of EIAO-TM as well as the requirements set out under Clause 3.4.7 and Appendix E of the Study Brief.
- 3.5.2 Wastes generated by the construction activities including site clearance, minor slope and excavation works, as well as piling and superstructure works, are likely to include construction and demolition (C&D) materials from the construction works, general refuse from the workforce and chemical waste from any maintenance of the construction plant and equipment. Provided that these identified waste arising are handled, transported and disposed of using approved methods and that the recommended good site practices are strictly followed, adverse environmental impacts related to waste management are not anticipated during the construction works.
- 3.5.3 Reduction measures have been recommended to minimise the amount of materials generated from the Project requiring off-site disposal. Based on the latest construction scheme, it is estimated that a total of 53,688m³ of inert C&D materials will be generated during the construction phase, 25,360m³ would be reused on site as far as practicable, while the remaining 28,328m³ will be disposed of at the public fill reception facilities (i.e. Tuen Mun Area 38 Fill Bank). For non-inert C&D materials, it is estimated a total of 5,690m³ will be generated during the construction phase, where the recyclables such as plastics and packaging materials will be segregated on site as far as practicable for recycling. The non-inert C&D materials that cannot be recycled will be delivered to the landfills (i.e. North East New Territories Landfill (NENT) or the proposed NENT extension) for disposal.

- 3.5.4 No waste is expected to be generated during the operation phase of the Project. There would be no adverse environmental impacts related to waste management during the operation phase.

3.6 LAND CONTAMINATION

- 3.6.1 The assessment of potential land contamination issues associated with the Project has been conducted in accordance with the requirements of Section 3.1 of Annex 19 of EIAO-TM as well as the requirements set out under Clause 3.4.8 and Appendix F of the Study Brief.
- 3.6.2 Based on the findings of historical/current land uses, desktop review, site visits, site inspections and other relevant information from related government departments, no potential land contamination issue is identified within the Project Site. Potentially contaminating activities or land uses under the Project are also not anticipated.

3.7 ECOLOGY

- 3.7.1 Ecological impact assessment for the Project was conducted following the EIA Study Brief and the guidelines in Annexes 8 and 16 of the EIAO-TM. Terrestrial and aquatic habitats identified within the 500m assessment area include agricultural land, channel, developed area, mixed woodland, orchard, plantation, pond and shrubland/grassland. In general, the habitats within the Project site and assessment area are of low ecological value as most of them are within or adjacent to the highly urbanized area that receives human disturbance.
- 3.7.2 The North District Park Egretty and Day Roost (NDPEDR), where both roosting and breeding activities of Black-crowned Night Heron are found, is located near the Project site boundary. In order to mitigate the disturbance to it during the construction phase, the following specific mitigation measures and monitoring are proposed:
- Strictly use of non-percussive piling method within the 100m area of NDPEDR for all year around, other noisy construction works within 100m area of NDPEDR should also be avoided in breeding season as far as practicable;
 - A pre-construction ecological survey that covering the whole breeding season (March to August) to find out the peak month(s) of the breeding season and to verify and update the location of NDPEDR. Accordingly, works programme shall be scheduled to minimize construction impacts to NDPEDR during peak month(s) of breeding season. If possible, the works to be done within 100m area of NDPEDR will also be arranged as far from NDPEDR as practicable;
 - A Construction Noise Management Plan (CNMP) shall be prepared before implementation of any construction works within 100m area of NDPEDR during breeding season;
 - Mitigation measures for reducing construction noise, such as the use of Quality Powered Mechanical Equipment (QPME), movable noise barrier and non-percussive piling method, and implementation of good site practice; and
 - Regular monitoring of the ardeid day roosting and breeding activities within 100m of the NDPEDR during the course of construction phase and operation phase.
- 3.7.3 However, the potential impact due to flight-line fragmentation of breeding and roosting ardeids at NDPEDR is considered minor, because only an insignificant number of flight paths will be affected. Besides, a minor potential disturbance impact is also anticipated for the operational disturbance to NDPEDR, as there is an existing disturbance that the ardeids might have already accommodated human disturbance, and there will be insignificant noise level contribution from the Project to the NDPEDR. No specific mitigation is needed for these potential impacts.

- 3.7.4 Potential bird collision during the operation phase due to the newly constructed noise barriers is another key potential impact arising from the Project. However, it is anticipated that bird collision may mainly occur for small birds rather than ardeids, as small birds usually fly faster, and the NDPEDR is located far away from the new noise barriers. To mitigate this, bird-friendly design should be adopted for these noise barriers when transparent panels are used.
- 3.7.5 With the implementation of the above mitigation measures, no unacceptable ecological impacts are anticipated to arise from the construction and operation of the Project.

3.8 LANDSCAPE AND VISUAL

- 3.8.1 Potential landscape and visual impacts associated with the Project during the construction and operation phases would primarily result from the interruption of existing roadside landscapes and landscapes in North District Park and modification of the slope (Vegetated). In addition, there would be a loss of visual amenity due to the removal of landscape features and visual hindrance to the surrounding due to the construction of the flyover carriageway and its associated structures and the removal of landscape features.

Landscape Impacts

- 3.8.2 The assessment area includes all areas within a 500m distance from the Project site boundary, within which 21 Landscape Resources (LRs) and 5 Landscape Character Areas (LCAs) are identified.
- 3.8.3 A total of 178 nos. of trees were identified as Tree of Particular Interest (TPI), amongst which 172 nos. belong to tree species protected under Hong Kong legislation while 6 nos. of them are trees with DBH over 1m. 121 nos. of TPIs are to be retained in situ, 14 nos. proposed for transplanting, and 43 nos. of them are proposed for removal.
- 3.8.4 A total of 1,971 nos. of trees, including 1,937 nos. individually surveyed trees and approximately 34 nos. trees in tree group survey, are proposed for retention in situ. A total of 29 nos. of trees are proposed for transplantation, all of which are proposed to be transplanted within the Site. A total of 755 nos. of surveyed trees, including 725 nos. individually surveyed trees and approximately 30 nos. in tree groups, are proposed to be removed. Amongst these 15 nos. are *Leucaena leucocephala*. 740 nos. trees shall be compensated.
- 3.8.5 To compensate for the loss of trees and mitigate the loss of greenery, A total of no less than 740 trees would be proposed for planting, which includes approximately 177 nos. of standard trees and a total area of approximately 4,800 sq.m on slopes with gradient at or less than 35 degrees for whip tree planting, and the compensation ratio in terms of quantity is 1:1. Detailed planting scheme is subject to further liaison with relevant departments and should be provided in Tree Preservation and Removal Proposal (TPRP).
- 3.8.6 The preliminary planting proposals for the proposed works utilise a combination of standard to heavy standard-sized trees and whip trees within the Project site boundary and at agreed offsite locations. The planting proposals also form part of compensatory planting proposals for the loss of landscape resources, which will be compensated with appropriate visual enhancement/ greening measures for the benefit of the future landscape within the Project site boundary and at agreed offsite locations.

Visual Impacts

- 3.8.7 Within the Visual Envelope of the Project, four major types of Visually Sensitive Receivers (VSRs) were identified during the construction and operation phases, namely Residential VSRs, Occupational VSRs, Recreational VSRs and Travelling VSRs.
- 3.8.8 Appropriate landscape and visual mitigation measures are proposed during the construction phase, including preservation of existing vegetation, transplanting of affected trees, control of

night-time lighting glare, good site practice and erection of decorative screen hoarding. During the operation phase, including compensatory tree planting for loss of existing trees, provision of roadside planting, provision of aesthetic pleasing treatment on noise barriers and aesthetically pleasing design for carriageways and other highways structures (e.g. columns, retaining structures), cycle paths and carriageways shall be sensitively designed in the regard of form, tonal colour and texture in order to minimise any potential adverse landscape and visual impact and to coherent with the surrounding environment.

- 3.8.9 Regarding mitigated visual impact, it is predicted that there would be slight to moderate residual impact on most of the VSRs during construction and would be insubstantial to moderate on day 1 of operation and be further reduced to insubstantial to slight when the proposed tree planting becomes mature in year 10 of operation. The residual impact on several VSRs, such as Residents in Ka Shing Court Ka Ming House, Residents in Green Park Villa, Residents in Eden Garden, Residents in Ching Ho Estate, Residents in Royal Green, Residents in Sheung Shui Centre, Residents in Sheung Shui Town Centre, Residents in Tin Ping Estate would maintain as slight in year 10 of operation. There would be negligible residual impact on other VSRs within the visual envelope during the construction and operation of the Project.
- 3.8.10 Overall, it is considered that the residual landscape and visual impacts of the project are acceptable with mitigation measures implemented during the construction and operational phases.

3.9 CULTURAL HERITAGE

- 3.9.1 The potential cultural heritage impacts associated with the construction and operation of the Project have been assessed in accordance with the requirements of Annex 10 and Annex 19 of EIAO-TM as well as the requirements set out under Clause 3.4.11 and Appendix I of the Study Brief. The assessment area covers 500m from the boundary of the Project Site and the work areas of the Project.
- 3.9.2 A part of the Po Leng Site of Archaeological Interest (SAI) is located within the Cultural Heritage Assessment Area (CHAA), at a distance of about 450m from the proposed boundary of the work areas of the Project. No excavation works of the project will exist in or adjacent to the SAI. Therefore, no adverse archaeological impact due to the proposed development is anticipated. No mitigation measure is required.
- 3.9.3 No archaeological potential area has been identified in the proposed boundary of the Works Area of the Project. No archaeological impact is anticipated and thus no mitigation measures are required. However, in case of a change in the work areas of the Project, the project proponent should inform the Antiquities and Monuments Office (AMO), evaluate the archaeological potential of the additional area that was not covered in this assessment and recommend the need for further archaeological action.
- 3.9.4 As a precautionary measure, the project proponent and his/her contractor are required to inform AMO immediately when any antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (CAP.53) are discovered during the course of works.
- 3.9.5 Based on the desktop review supplemented by the built heritage survey, there are no declared or proposed monuments and government historic sites identified by AMO in the CHAA. Thus no mitigation measures are required. Eight graded historic buildings have been identified in the CHAA. Due to sufficient separation distance between the proposed boundary of the work areas of the Project and the graded historic buildings, no direct impact is anticipated and thus no mitigation measure is required.

- 3.9.6 Potential direct impact to no grading built heritage (BH) items, namely Village House No. 11, Kai Leng (BH-02⁽²⁾), Cheung Ancestral Hall, Kai Leng (BH-03⁽²⁾) and Fanling Wai Site (BH-04⁽²⁾), identified is not anticipated due to considerable separation distance (over 180m) between the boundary of the work areas of the Project and the built heritage items. No mitigation measure is required.
- 3.9.7 Although the Shrine in So Kwun Po Tsuen (BH-01⁽²⁾) is located relatively closer (20m) to the boundary of the work areas of the Project, potential direct and vibration impacts are not anticipated as the closest major underground construction works like piling and piling cap construction are located around 300m away.
- 3.9.8 No indirect impact from construction vibration to the mentioned graded historic buildings is anticipated due to the considerable separation distance (over 110m) from the boundary of the work areas of the Project, piling and pile cap construction, vibrations caused by construction (e.g. piling works) and the possible impact would be insignificant. Moreover, the proposed road modification works are considered minor. However, it is recommended to monitor any vibration and building movement induced by the proposed works on the graded historic buildings, i.e. No.5 Ng Uk Tsuen (GB-03⁽³⁾), which is closest to the boundary of the Works Area, as well as on the Grade 1 historic building, i.e. Pang Ancestral Hall (GB-01⁽³⁾). This will ensure that there are no negative impacts from vibration on the graded historic buildings and will also provide relevant reference data for impact assessment.
- 3.9.9 As the operation phase of the Project involves no excavation works, no cultural heritage impact from the Project is anticipated during the operation phase. Thus, no mitigation measure is required during the operation phase.

(2) Site Code in Table 10.2 of Chapter 10 of the EIA Report.
(3) Site Code in Table 10.1 of Chapter 10 of the EIA Report.



4 ENVIRONMENTAL MONITORING AND AUDIT (EM&A)

- 4.1.1 The EIA study of the Project has evaluated impacts related to air quality, noise, water quality, waste management, land contamination, ecology, landscape and visual, as well as cultural heritage arising from the Project, and has demonstrated to comply with the EIAO-TM requirements with the implementation of recommended mitigation measures and good site practices. Actual impacts during the construction works will be monitored through a detailed EM&A programme involving regular environmental site inspections and audits to ensure that the recommended mitigation measures and good site practices are properly implemented and are effective. The EM&A requirements under construction and operation phases are specified and detailed in the EM&A Manual associated with the EIA Report. The EM&A Manual will provide management actions and supplemental mitigation measures to be employed should any impacts arise, thereby ensuring the environmental acceptability of the construction and operation of the Project.

5 CONCLUSION

- 5.1.1 The EIA study has critically assessed the overall acceptability of the environmental impacts likely to arise as a result of the construction and operation of the Project in accordance with the Study Brief, EIAO-TM and other relevant guidelines and criteria. It has demonstrated the acceptability of any residual impacts from the Project and the protection of the population and environmentally sensitive resources.
- 5.1.2 The EIA study concluded that, with the implementation of the recommended mitigation measures, the Project would be environmentally acceptable and in compliance with the relevant assessment standards/criteria of the EIA Study Brief and the *EIAO-TM*. The summary of the environmental impacts arising from the Project is presented in **Table 5.1**.
- 5.1.3 Where appropriate, EM&A mechanisms have been recommended to verify the accuracy of the EIA predictions to ensure the effectiveness of the recommended mitigation measures. The schedule of implementation of the proposed mitigation measures has been recommended and provided in the EM&A Manual.



Table 5.1 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)
Air Quality					
Construction Phase					
Representative ASRs within 500m from the boundary of the Project Site	The potential sources of air quality impact associated with the construction works include dust generated from construction sites.	<ul style="list-style-type: none"> Annexes 4 and 12 of the EIAO-TM 	Not Applicable	Appropriate dust control measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices will be incorporated into the Contract Specifications and implemented throughout the construction phase. Regular dust monitoring (also incorporated into the Contract Specifications) will be conducted to ensure the relevant legal requirements and standards are complied with during the construction phase of the Project.	No adverse residual impact is anticipated.
Operation Phase					
Representative ASRs (including existing and planned) within 500m from the boundary of the Project Site	Predicted cumulative air pollutant concentrations (NO ₂ , RSP, FSP) at ASRs with Project operation comply with the prevailing AQOs.	<ul style="list-style-type: none"> Annexes 4 and 12 of the EIAO-TM Prevailing AQOs 	N/A	No adverse air quality impact is anticipated during the operation phase of the Project, thus mitigation measure is deemed not necessary.	No adverse residual impact is anticipated.



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)
Noise					
Construction Phase					
Representative NSRs within 300m from the boundary of the Project Site	69dB(A) to 99dB(A)	<ul style="list-style-type: none"> Annexes 5 and 13 of the EIAO-TM Leq_(30-min) 75dB(A) at 1m from the façade of residential dwellings Leq_(30-min) 70dB(A) at 1m from the façade of educational institutions (including kindergartens and nurseries) (Leq_(30-min) 65dB(A) during examinations). Leq_(30-min) 70dB(A) at 1m from the façade of places of public worship, courts of law, and hospitals and medical clinics 	Up to 24dB(A)	Implementation of recommended noise mitigation measures including: <ul style="list-style-type: none"> Quality PME prescribed in EPD's Quality Powered Mechanical Equipment (QPME) database. Temporary movable noise barriers, full enclosure for PME. Scheduling of construction activities. Liaise with the school's management for the schedule of construction works to avoid carrying out noisy construction activities during the examination period. Good site practices. 	No adverse residual impact is anticipated.
Operation Phase					
Representative NSRs (including existing and planned) within 300m from the	<ul style="list-style-type: none"> Predicted overall noise levels: 52dB(A) to 79dB(A) 	<ul style="list-style-type: none"> Annexes 5 and 13 of the EIAO-TM L_{10(1-hour)} 70dB(A) at 1m from the façade of residential dwellings. 	<ul style="list-style-type: none"> Exceedance of the noise criteria by up to 11dB(A). 	<ul style="list-style-type: none"> Low Noise Road Surfacing (LNRS) of - <ul style="list-style-type: none"> approximately 330m in length along the new southbound slip road connecting to Pak Wo Road; 	No adverse residual impact is anticipated.

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)
boundary of the Project Site	<ul style="list-style-type: none"> • Predicted noise levels of the Project roads: 38dB(A) to 74dB(A) • Maximum Contribution from Project roads: 2.9dB(A) 	<ul style="list-style-type: none"> • 65 dB(A) at 1m from the external façades of educational institutions (including kindergartens and nurseries), places of public worship and courts of law. • 55dB(A) at 1m from the external façades of hospitals and clinics. 	<ul style="list-style-type: none"> • Maximum noise contribution by Project Roads at 2.9 dB(A) 	<ul style="list-style-type: none"> - approximately 350m in length along the new northbound and southbound slip roads connecting to the new flyover; and - approximately 110m in length along the realigned So Kwun Po Road between the SKPIC and Pak Wo Road; • Cantilever barrier (5m high with 2.5m at $\angle 45^\circ$ cantilever) of about 80m in length along the eastern roadside of the new southbound slip road connecting to Pak Wo Road; • Cantilever barrier (5m high with 2.5m at $\angle 45^\circ$ cantilever) of about 170m in length along the eastern roadside of the new northbound and southbound slip road connecting to the new flyover; • 3m and 5m high vertical barrier of about 100m and 90m respectively in length along the western roadside of the new northbound slip road connecting to the new flyover; • 3m and 5m high vertical barriers of about 100m and 50m respectively in length along the western roadside of the realigned So Kwun Po Road between the SKPIC and Pak Wo Road; 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)
				<ul style="list-style-type: none"> • 3m high vertical barrier of about 80m in length along the northern roadside of the new So Kwun Po Link connecting to San Wan Road. 	
Water Quality					
Construction Phase					
Representative Water Sensitive Receivers (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"> • Wastewater from general construction activities; • Diversion/ modification of box culvert; • Construction site run-off; • Sewage from the construction workforce; and • Accidental spillage of chemicals 	<ul style="list-style-type: none"> • Annexes 6 and 14 of the EIAO-TM • Water Quality Objectives for Deep Bay Water Control Zone • Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS) • Practice Note for Professional Persons (ProPECC) PN1/94 	Not Applicable	<ul style="list-style-type: none"> • Mitigation measures and good site practices in ProPECC PN 1/94 “<i>Construction Site Drainage</i>”. • Guidelines in DSD Technical Circular No. 1/2017 “<i>Temporary Flow Diversions and Temporary Works Affecting Capacity in Stormwater Drainage Systems</i>”. • Practices in <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i> • Provision of interim treatment facilities, such as chemical toilets, for the construction workforce. 	No adverse residual impact is anticipated.



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)
Operation Phase					
Representative WSRs within 500m from the boundary of the Project Site.	Potential water quality impacts associated with the operation phase include surface run-off from new roads	<ul style="list-style-type: none"> Annexes 6 and 14 of the EIAO-TM Water Quality Objectives for Deep Bay Water Control Zone Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS) Practice Note for Professional Persons (ProPECC) PN5/93 	Not Applicable	<ul style="list-style-type: none"> Adequate design in silt trap for the new road drainage which takes into account the guidelines in ProPECC PN5/93. Best Storm Water Management Practices and Storm Water Pollution Control Plan to reduce non-point source pollution. 	No adverse residual impact is anticipated.
Waste Management Implications					
Construction Phase					
C&D materials, chemical wastes and general refuse	<ul style="list-style-type: none"> Around 5,690m³ of non-inert C&D materials and 53,688m³ of inert C&D materials will be generated 	<ul style="list-style-type: none"> Annexes 7 and 15 of the EIAO-TM Waste Disposal Ordinance (Cap. 354) Waste Disposal (Chemical Waste) 	Not Applicable	<ul style="list-style-type: none"> Implementation of good site practices, waste reduction measures, Waste Management Plan (WMP) and proper storage, collection and transport of waste. 	No adverse residual impact is anticipated.



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>from different construction works of the Project, including site clearance, minor slope and excavation works, as well as piling and superstructure works.</p> <ul style="list-style-type: none"> • A small quantity of chemical waste in the order of a few hundred litres per month. • Around 227.5kg per day of general refuse will be generated from construction works and on-site staff and workers. 	<p>(General) Regulation (Cap. 354C);</p> <ul style="list-style-type: none"> • Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N) • Land (Miscellaneous Provisions) Ordinance (Cap. 28) • Public Health and Municipal Services Ordinance – Public Cleansing and Prevention of Nuisances Regulation (Cap. 132BK) 			
Operation Phase					
Not Applicable	It is expected that no waste will be generated during	Not Applicable	Not Applicable	No mitigation measure is provided as the Project would not cause adverse impacts.	No adverse residual impact is anticipated.



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 operation phase of the Project.				
Land Contamination					
Onsite construction workers and future occupants	Adverse land contamination impact arising from the Project is not anticipated.	<ul style="list-style-type: none"> • Annex 19 of the EIAO-TM • Guidance Note for Contaminated Land Assessment and Remediation (EPD, 2007) • Practice Guide for Investigation and Remediation of Contaminated Land (EPD, 2011) • Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management (EPD, 2007) 	Not Applicable	As no adverse land contamination impact arising from the Project is anticipated, no mitigation measures were considered necessary.	No adverse residual impact is anticipated.
Ecology					
Construction Phase					



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>Representative Ecological Sensitive Receivers within 500m from the boundary of the Project Site</p>	<ul style="list-style-type: none"> • Temporary habitat loss of 0.095 ha developed area and 0.056 ha of plantation that is considered of insignificant potential impact. • Potential fragmentation of ardeid flight-lines that are considered as minor potential impact. • Indirect impact due to disturbance generated during construction to the NDPEDR that is considered as minor to moderate for the roosting activity; 	<p>Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) Annexes 8 and 16</p>	<p>Not applicable</p>	<ul style="list-style-type: none"> • Strictly use of non-percussive piling method within the 100m are of NDPEDR for all year around. Other noisy construction works within 100m area of the NDPEDR should also be avoided in breeding season as far as practicable • Works programme to be scheduled to minimize construction impacts to NDPEDR during peak month(s) of breeding season • A Construction Noise Management Plan shall be prepared before implementation of any construction works within 100m area of the NDPEDR during breeding season • Follow mitigation measures stated in Chapter 4 - Noise • Mitigation for reducing night-time light glare from reaching the NDPEDR • Regular monitoring of the ardeid day roosting and breeding activities at the NDPEDR. • Follow mitigation measures stated in Chapter 5 – Water Quality • Good site practice 	<p>No adverse residual impact is anticipated.</p>



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>moderate for the breeding activity.</p> <ul style="list-style-type: none"> • Indirect impact due to disturbance generated during construction on habitats and wildlife nearby other than the NDPEDR that is considered as insignificant. • Indirect impacts on the channelized section of Shek Sheung River due to surface runoff from works area that is considered as minor to moderate. 				
Operation Phase					
Representative Ecological	<ul style="list-style-type: none"> • Permanent habitat loss of 	Technical Memorandum on Environmental Impact	Not applicable	<ul style="list-style-type: none"> • Adopting bird-friendly design. 	Permanent loss of 0.46 ha of plantation which is



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)
Sensitive Receivers within 500m from the boundary of the Project Site	0.19 ha developed area and 0.46 ha of plantation that is considered of insignificant potential impact. <ul style="list-style-type: none"> • Indirect impact to habitat that is considered of insignificant potential impact. • Indirect impact due to disturbance generated from the operation to the nearby habitats and wildlife that is considered of minor. • Potential bird collision that is considered of minor to 	Assessment Process (EIAO-TM) Annexes 8 and 16		<ul style="list-style-type: none"> • Regular monitoring of the ardeid day roosting and breeding activities at the NDPEDR. 	considered of insignificant potential impact, the residual impact is considered acceptable.

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)
	moderate potential impact. <ul style="list-style-type: none"> • Potential direct mortality of fauna that is considered of insignificant potential impact. • Indirect impacts on the channelized section of Shek Sheung River due to surface runoff during operation that is considered as insignificant. 				
Landscape and Visual					
Note: Individual landscape resources/character areas and visual sensitive receivers shall refer to Chapter 9 – LVIA of the EIA report.					
Construction Phase					
Landscape Resources (LRs)	<ul style="list-style-type: none"> • Moderate landscape Impact on LR2.1 & LR3.1 • Slight landscape Impact on LR3.2 	<ul style="list-style-type: none"> • Annexes 10 and 18 of the EIAO-TM • EIAO-GN 8/2010 (Preparation of LVIA under the Environmental Impact 	Not Applicable	<ul style="list-style-type: none"> • Re-provisioned Cycle Track and Footpath • Preservation of Existing Vegetation • Transplanting of Affected Trees • Good Site Practice 	<ul style="list-style-type: none"> • Moderate residual landscape impact on LR3.1 • Slight residual landscape Impact on LR2.1 & LR3.2



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"> Negligible landscape impact on other LRs 	Assessment Ordinance)		<ul style="list-style-type: none"> Reinstatement of Temporarily Disturbed Landscape Areas 	<ul style="list-style-type: none"> Negligible residual landscape impact on other LRs
Landscape Character Areas (LCAs)	<ul style="list-style-type: none"> Moderate landscape Impact on LCA2 Slight landscape impact on LCA1 & LCA3 Negligible landscape impact on other LCAs 	<ul style="list-style-type: none"> Annexes 10 and 18 of the EIAO-TM EIAO-GN 8/2010 (Preparation of LVIA under the Environmental Impact Assessment Ordinance) 	Not Applicable	<ul style="list-style-type: none"> Re-provisioned Cycle Track and Footpath Preservation of Existing Vegetation Transplanting of Affected Trees Good Site Practice Reinstatement of Temporarily Disturbed Landscape Areas 	<ul style="list-style-type: none"> Slight residual landscape impact on LCA1, LCA2 & LCA3 Negligible residual landscape impact on other LCAs
Visually Sensitive Receivers (VSRs)	<ul style="list-style-type: none"> Substantial Impact on VSR5, VSR15, VSR24 Moderate Impact on VSR1, VSR2, VSR3, VSR4, VSR6, VSR7, VSR8, VSR9, VSR10, VSR11, VSR12, VSR13, VSR14, VSR16, VSR17, VSR18, VSR19, VSR20, VSR21, VSR23, VSR25, VSR26, 	<ul style="list-style-type: none"> Annexes 10 and 18 of the EIAO-TM EIAO-GN 8/2010 (Preparation of LVIA under the Environmental Impact Assessment Ordinance) 	Not Applicable	<ul style="list-style-type: none"> Re-provisioned Cycle Track and Footpath Preservation of Existing Vegetation Transplanting of Affected Trees Control of Night-time Lighting Glare Good Site Practice Erection of Decorative Screen Hoarding Reinstatement of Temporarily Disturbed Landscape Areas 	<ul style="list-style-type: none"> Moderate residual visual impact on VSR1, VSR2, VSR3, VSR4, VSR5, VSR6, VSR7, VSR8, VSR9, VSR12, VSR15, VSR21, VSR23, VSR24, VSR25, VSR26, VSR28, Slight residual visual impact on VSR10, VSR11, VSR13, VSR14, VSR16, VSR17, VSR18, VSR19, VSR20, VSR27, VSR29, VSR30 Negligible residual visual impact during day 1 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)
	VSR27, VSR28, VSR30 <ul style="list-style-type: none"> Slight Impact on VSR29 Negligible visual impact on other VSRs 				year 10 of operation on other VSRs.
Operation Phase					
Landscape Resources (LRs)	<ul style="list-style-type: none"> Moderate landscape Impact on LR2.1 & LR3.1 Negligible landscape impact on other LRs 	<ul style="list-style-type: none"> Annexes 10 and 18 of the EIAO-TM EIAO-GN 8/2010 (Preparation of LVIA under the Environmental Impact Assessment Ordinance) 	Not Applicable	<ul style="list-style-type: none"> Compensatory Tree Planting Roadside Planting Provision of Aesthetic Pleasing Treatment on Noise Barriers Aesthetically pleasing design for carriageways and other highways structures 	<ul style="list-style-type: none"> Slight residual impact during day 1 of operation and remain slight residual impact during year 10 of operation on LR3.1 Slight residual impact during day 1 of operation and insubstantial residual impact during year 10 of operation on LR2.1 Negligible residual impact during day 1 and year 10 of operation on other LRs
Landscape Character Areas (LCAs)	<ul style="list-style-type: none"> Moderate landscape Impact on LCA2 Negligible landscape impact on other LRs 	<ul style="list-style-type: none"> Annexes 10 and 18 of the EIAO-TM EIAO-GN 8/2010 (Preparation of LVIA under the Environmental Impact 	Not Applicable	<ul style="list-style-type: none"> Compensatory Tree Planting Roadside Planting Provision of Aesthetic Pleasing Treatment on Noise Barriers 	<ul style="list-style-type: none"> Slight residual impact during day 1 of operation and remain slight residual impact during year 10 of operation on LCA2



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)
		Assessment Ordinance)		<ul style="list-style-type: none"> • Aesthetically pleasing design for carriageways and other highways structures 	<ul style="list-style-type: none"> • Negligible residual impact during day 1 and year 10 of operation on other LCAs
Visually Sensitive Receivers (VSRs)	<ul style="list-style-type: none"> • Substantial visual impact on VSR5, VSR15, VSR24 • Moderate visual impact on VSR1, VSR2, VSR3, VSR4, VSR6, VSR7, VSR8, VSR9, VSR10, VSR11, VSR12, VSR13, VSR14, VSR16, VSR17, VSR18, VSR19, VSR20, VSR21, VSR23, VSR25, VSR26, VSR27, VSR28, VSR30 • Slight visual impact on VSR29 	<ul style="list-style-type: none"> • Annexes 10 and 18 of the EIAO-TM • EIAO-GN 8/2010 (Preparation of LVIA under the Environmental Impact Assessment Ordinance) 	Not Applicable	<ul style="list-style-type: none"> • Compensatory Tree Planting • Roadside Planting • Provision of Aesthetic Pleasing Treatment on Noise Barriers • Aesthetically pleasing design for carriageways and other highways structures 	<ul style="list-style-type: none"> • Moderate residual impact during day 1 of operation and slight residual impact during year 10 of operation on VSR4, VSR5, VSR15, VSR25, VSR26. • Slight residual impact during day 1 of operation and during year 10 of operation on VSR1, VSR2, VSR6, VSR8, VSR9, VSR21, VSR23, VSR24. • Slight residual impact during day 1 of operation and insubstantial residual impact during year 10 of operation on VSR11, VSR12, VSR13, VSR28 • Negligible residual visual impact during day 1 and year 10 of operation on other VSRs.
Cultural Heritage					
Construction Phase					

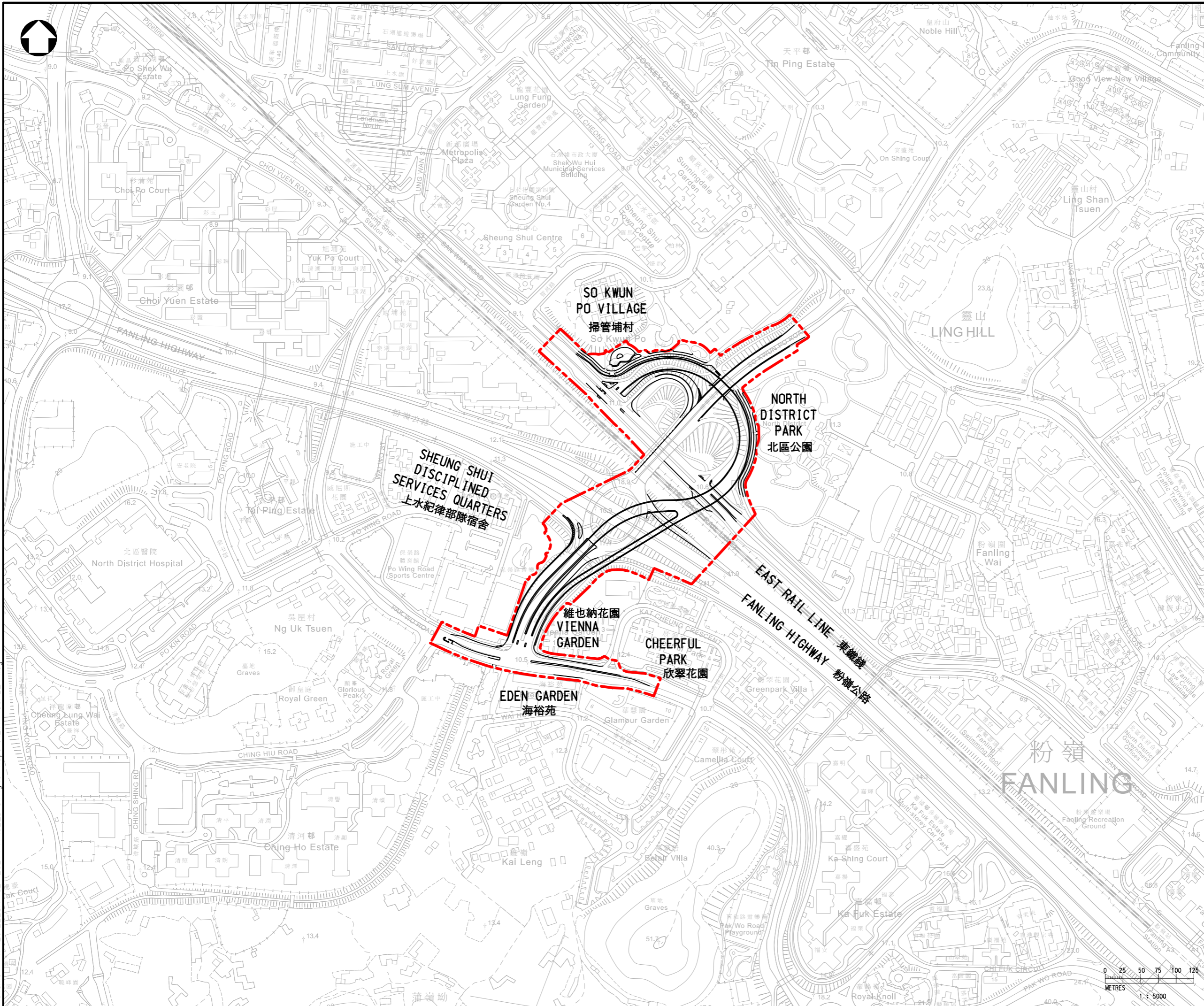
Sensitive Receivers / Assessment Points	Impact Prediction Results (Without Mitigation)	Key Relevant Standards/Criteria	Extents of Exceedance (Without Mitigation)	Impact Avoidance Measures/ Mitigation Measures	Residual Impacts (After Implementation of Mitigation Measures)
Cultural heritage resources	The proposed works areas of the Project are located in an area with no archaeological potential. No archaeological survey is required. The potential impact on archaeological resources is not anticipated.	<ul style="list-style-type: none"> • Annexes 10 and 19 of the EIAO-TM • Antiquities and Monuments Ordinance • Hong Kong Planning Standards and Guidelines (HKPSG) • Guidelines for Cultural Heritage Impact Assessment 	Not Applicable	<ul style="list-style-type: none"> • As no declared or proposed monuments and government historic sites identified by the Antiquities and Monuments Office (AMO) have been identified, no impact on these cultural heritage resources is anticipated. Also, there are sufficient separation distances between the Project site and the built heritage items. Therefore, no mitigation measures were considered necessary. • The project proponent and his/her contractor are required to inform AMO immediately when any antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (CAP.53) are discovered during the course of works. 	No adverse residual impact is anticipated.
Operation Phase					
Cultural heritage resources	No impact would be anticipated during the operation phase.	<ul style="list-style-type: none"> • Annexes 10 and 19 of the EIAO-TM • Antiquities and Monuments Ordinance • Hong Kong Planning Standards and Guidelines (HKPSG) 	Not Applicable	No mitigation measure would be required.	Not Applicable



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">Guidelines for Cultural Heritage Impact Assessment			



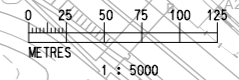
- LEGEND :**
- - - SITE LIMIT
 - SO KWUN PO LINK (SKPL)



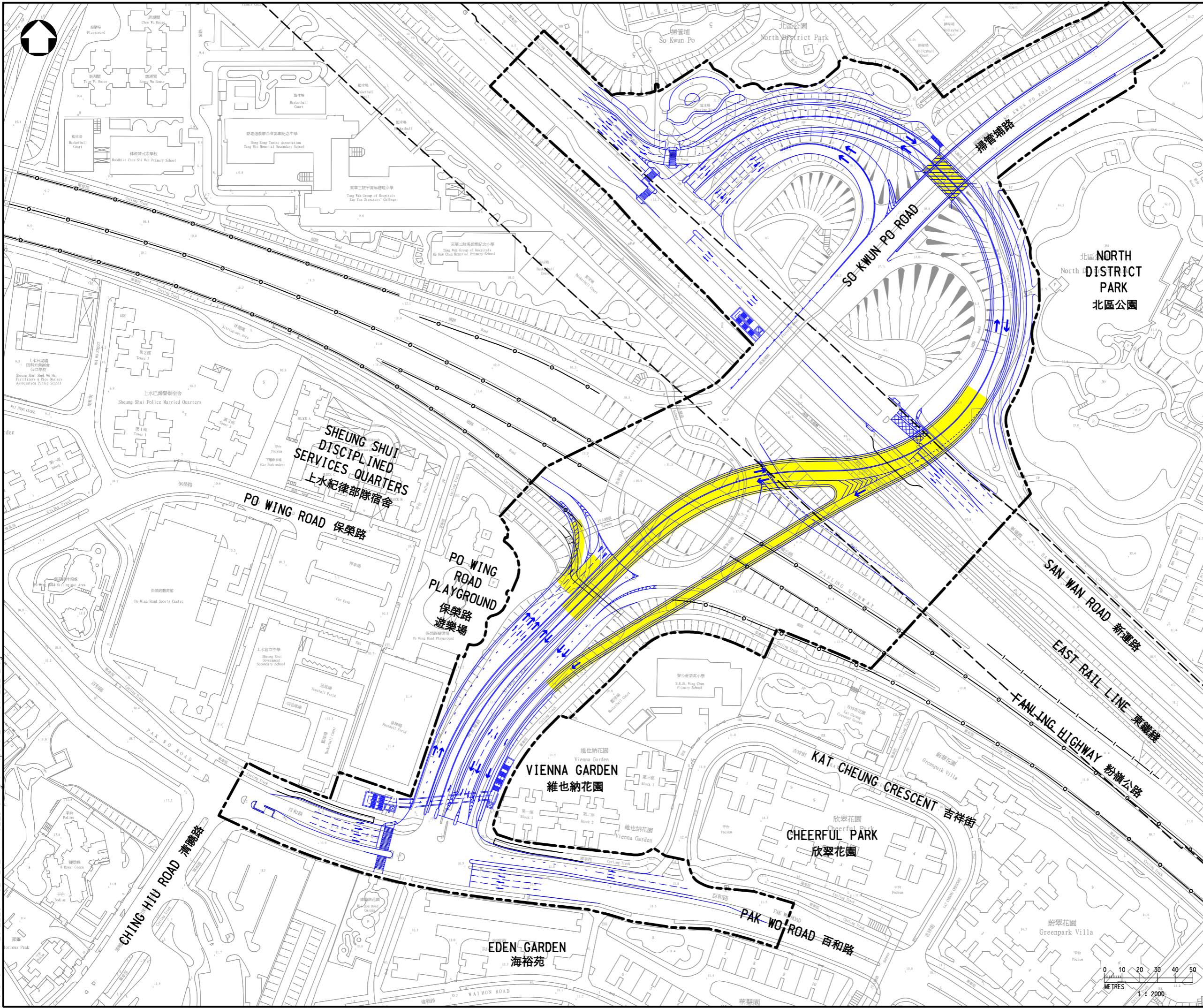
Rev	Description	By	Date
Consultant			
Project title			
AGREEMENT NO. CE 1/2021(HY)			
IMPROVEMENT TO SO KWUN PO INTERCHANGE - INVESTIGATION, DESIGN AND CONSTRUCTION			
Drawing title			
LOCATION OF THE PROJECT			
Drawing no.			Rev.
FIGURE 2.1			-
Drawn	Date	Checked	Approved
CADD	09/21	-	-
Scale	1:5000 (A3)		Status
			REPORT

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CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT
北拓展處 / 北發展部(1)
NORTH DEVELOPMENT OFFICE /
NORTH DIVISION (1)



Date : 7/20/2023
Filename : X:\2512228A (CEI-2021-HY)\02_Drawing\01-Report\EIA\FIGURE_1-1.dgn



- LEGEND :**
- DEVELOPED SCHEME
 - DEVELOPED SCHEME - VIADUCT
 - DEVELOPED SCHEME - UNDERPASS
 - PROPOSED LIFT SHAFT
 - ← DIRECTION OF TRAFFIC (NOS. OF ARROW = NOS. OF TRAFFIC LANE)
 - EXISTING CANTILEVERED NOISE BARRIER
 - EXISTING VERTICAL NOISE BARRIER
 - SITE LIMIT
 - RAILWAY PROTECTION BOUNDARY

Rev	Description	By	Date
Consultant			
Project title			
AGREEMENT NO. CE 1/2021(HY)			
IMPROVEMENT TO SO KWUN PO INTERCHANGE - INVESTIGATION, DESIGN AND CONSTRUCTION			
Drawing title			
LAYOUT OF DEVELOPED SCHEME			
Drawing no.		Rev.	
FIGURE 2.2		-	
Drawn	Date	Checked	Approved
CADD	09/21	-	-
Scale	Status		REPORT
1 : 2000 (A3)			
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