






Hung Shui Kiu Station
Consultancy Agreement No. C1801
Design Services for Hung Shui Kiu Station

Environmental Review Report

November 2022

Project Title	Hung Shui Kiu Station Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station		
Report Title	Environmental Review Report		
Report No.	C1801-S-HSK-AWJ-510-000004	Corres No.	
Copy No.		Issue Date	4 November 2022

Date	Status	Rev No.	Prepared by		Checked by		Approved by	
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1 INTRODUCTION

1.1 Background

- 1.1.1 The Railway Development Strategy 2014 was announced in September 2014 which provided a framework for planning the future expansion of Hong Kong's railway network up to 2031. Hung Shui Kiu (HSK) Station (the Project) was proposed as a new railway station on the West Rail Line (WRL, which has formed part of Tuen Ma Line (TML)). The Project is a proposed new railway station located between Tin Shui Wai (TIS) Station and Siu Hong (SIH) Station to serve the future Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA).
- 1.1.2 The “West Rail – Final Assessment Report West Kowloon to Tuen Mun Centre – Environmental Impact Assessment” (Ref No.: EIA-149/BC) (“the approved EIA for WRL”) was approved by the Environmental Protection Department (EPD) in February 1998 prior to the enactment of the Environmental Impact Assessment (EIA) Ordinance (EIAO) on 1 April 1998 which addressed the environmental impacts caused by the WRL. The existing WRL is operating under EP No. FEP-24/004/1998/J held by MTR Corporation Limited (MTRCL).
- 1.1.3 Subsequently, the Civil Engineering and Development Department (CEDD) and Planning Department (PlanD) conducted an EIA study for “Hung Shui Kiu New Development Area” (Register No.: AEIAR-203/2016) (“the approved EIA for HSK/HT NDA”) which was approved in December 2016. This EIA proposed the new development in the vicinity of the Project, which had also addressed the environmental impacts caused by the Project. The CEDD is currently planning and implementing the advance works of HSK/HT NDA.
- 1.1.4 In May 2021, MTRCL was invited by the HKSAR Government to proceed with the detailed planning and design of the Project. The Project integrates with HSK/HT NDA to optimise rail connectivity, interchange availability, station accessibility and district “walkability” to enhance the level of convenience for passengers.

1.2 Description of the Project

- 1.2.1 The existing WRL would need to be modified to accommodate the construction of Project. The Project is envisaged to be a two-level station with at-grade concourse and elevated side-platforms for 8-car train sets. The station entrances are currently anticipated with passenger lifts, escalators and staircases to connect the two levels. Station concessions would be provided to enhance services to passengers. Back of house staff accommodation and plant rooms would be provided to cope with railway operation and maintenance requirements. The internal ring road abutting and around the station will be provided for vehicular access of Emergency Vehicular Access (EVA), refuse collection, delivery and maintenance.

1.3 EIAO Implications

- 1.3.1 The construction and operation of WRL constitute to Item A.2 Designated Project (DP) “A railway and its associated stations”, under Part I Schedule 2 of the EIAO. Since 1998, Kowloon-Canton Railway Corporation (KCRC) has applied for and has been granted numbers of Environmental Permits (EPs) (EP No. EP-004/1998/I) for its construction and operation of WRL. Also, MTRCL has been granted a Further Environmental Permit (FEP) (Environmental Permit No. FEP-24/004/1998/J) for the construction and operation of a railway and its associated stations on the WRL in 2013.
- 1.3.2 To facilitate the implementation of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA), the new HSK station will be constructed and operated to cater for the population intake of the NDA, which will involve key modifications of the viaduct of West Rail including foundation and piers works; installation of station modules; relocation of overhead line (OHL) cantilever, construction of concourse, platform areas and back-of-house areas. There would be no change to the existing noise mitigation measures on the viaduct of West Rail, except the section to be replaced with the proposed HSK station, therefore, the need for variation of the conditions of MTRCL’s FEP (Environmental Permit No. FEP-24/004/1998/J) arises and a VEP is required. As there would be no implication on the KCRC’s EP (EP-004/1998/I) with respect to the environmental performance due to the provision of HSK station, it is proposed the EP held by KCRC remains untouched.

1.4 Construction Methodology and Tentative Programme

- 1.4.1 The Project would be built around an existing operational elevated WRL railway which must remain fully operational throughout the entire station construction period. The general construction works would be carried out during daytime, whilst the works above or near the operational railway that would potentially disrupt the existing railway operation must be undertaken during non-traffic hours (NTH). The location of HSK Station and Project Site Boundary are indicated in **Figure 1.1**. Works sites are defined as areas where construction activities would be carried out, including casting yards, prefabrication works at prefabrication yards, and areas where in-situ construction or excavation works would be required. Works areas are areas mainly used as site office, carparking and storage areas.
- 1.4.2 The major construction activities would include site mobilisation, site clearance and erection of hoarding, minor excavation works for the potential temporary drainage diversion, resurfacing, viaduct modification, foundation of station, and assembly and casting of structural elements. Any activities that would lead to amendments of the FEP (EP No.: FEP-24/004/1998/J) held by MTRCL are further detailed in **Section 2**. The tentative key construction methodology is summarised as follows:
- Minor excavation works to depth ranging from 3m to 5m and width of no more than 5m would be conducted for the temporary drainage diversion (about 450m in length) by installation of sheet piles using hydraulic press-in method;
 - Other small-scale excavation for station foundation and resurfacing works, and backfilling for the existing drainage channel, etc. would be performed;
 - The aboveground superstructure works for the two-level station with at-grade concourse and elevated side-platforms would primarily be constructed with precast / prefabrication. No extensive excavation would be required;

- Installation of precast segments would adopt a Design for Manufacture and Assembly (DfMA) approach where mainly assembly works for modularised items would be carried out; and
- Other general construction works would mainly involve the delivery, storage, and assembly of precast modules to form the station structure.

1.4.3 At the commencement of work, a site office will initially be set up along a strip of land north of the planned HSK Station and under the existing Tuen Ma Line (TML) viaduct. Due to the limited availability of this land however, the site office will be relocated to another area to the south of the planned HSK Station in Q2 2026, comprising of a section under the existing TML viaduct and Area 26 as shown in **Figure 1.1**. Site formation works for Area 26 will be completed by CEDD prior to use for this Project.

1.4.4 The tentative construction programme of the HSK Station is as follows:

- Site clearance, mobilisation and minor resurfacing works for site preparation: 2024 to 2025
- Foundation and piers works: 2025 to 2027
- Temporary Drainage Diversion: 2025 to 2026
- Station Structure 2026 to 2028
- Fitting Out and External Works 2027 to 2029
- Testing and Commissioning: 2029 to 2030

1.5 Concurrent Projects

1.5.1 During the construction phase of the Project, there would be construction activities from other concurrent projects to be carried out from Year 2025 to 2030. These concurrent projects will include the construction activities of HSK/HT NDA works as shown in **Figure 1.2** according to the best available information from the approved EIA for HSK/HT NDA. The concurrent projects that fall within the 500m assessment area of this Environmental Review Report (ERR) would include the following:

- Construction of new distributor roads: Roads D6, D7 and D8 (Project Proponent: CEDD);
- Construction of partly depressed and partly decked-over roads located at Road D6 (Project Proponent: CEDD);
- Construction of new Sewage Pumping Stations (Project Proponent: CEDD); and
- Other construction activities of HSK/HT NDA.

1.6 Purpose of this Environmental Review Report

1.6.1 As described above, some modification to the existing WRL viaduct and construction works of the Project would be proposed to be carried out to transform it to a functional railway station to serve the HSK/HT NDA. This ERR provides the information to identify and describe the potential impacts on the environment and the communities due to the Project, to evaluate the potential impact, and to confirm the compliance of relevant

environmental standards. The information presented in this ERR will form part of the submission to the EPD for the application for the Variation of Environmental Permit (VEP). The purpose of this ERR is to demonstrate that no unacceptable impacts will be resulted from the Project. In addition, it will demonstrate no exceedance or violation of the environmental performance requirement as set out in the approved EIA for WRL, hence a VEP can be granted.

1.7 Structure of the Report

1.7.1 The ERR comprises the following elements:

- Section 1** Introduces the project background, purpose and objective of this supporting document; describes the reason of the proposed amendment.
- Section 2** Describes the detail of the amendment and the proposed variation to EP conditions.
- Section 3** Identifies and reviews the relevant environmental impact arising from the proposed amendment, including air quality, noise, water quality, waste management, land contamination, ecology, landscape and visual, cultural heritage, hazard to life, and environmental monitoring and audit.
- Section 4** Identifies and reviews the air quality impact arising from the proposed amendment during construction and operation phases.
- Section 5** Identifies and reviews the noise impact arising from the proposed amendment during construction and operation phases.
- Section 6** Identifies and reviews the water quality impact arising from the proposed amendment during construction and operation phases.
- Section 7** Identifies and reviews the waste management implication arising from the proposed amendment during construction and operation phases.
- Section 8** Identifies and reviews the land contamination impact arising from the proposed amendment during construction and operation phases.
- Section 9** Identifies and reviews the ecological impact arising from the proposed amendment during construction and operation phases.
- Section 10** Identifies and reviews the landscape and visual impact arising from the proposed amendment during construction and operation phases.
- Section 11** Identifies and reviews the cultural heritage impact arising from the proposed amendment during construction and operation phases.
- Section 12** Identifies and reviews the hazard to life impact arising from the proposed amendment during construction and operation phases.
- Section 13** Identifies and reviews the changes in the environmental monitoring and auditing scope arising from the proposed amendment during construction and operation phases.
- Section 14** Reviews and justifies whether there are any material changes to this Designated Project.
- Section 15** Summarises and concludes the findings.

2 PROPOSED AMENDMENT

2.1 Proposed Amendment

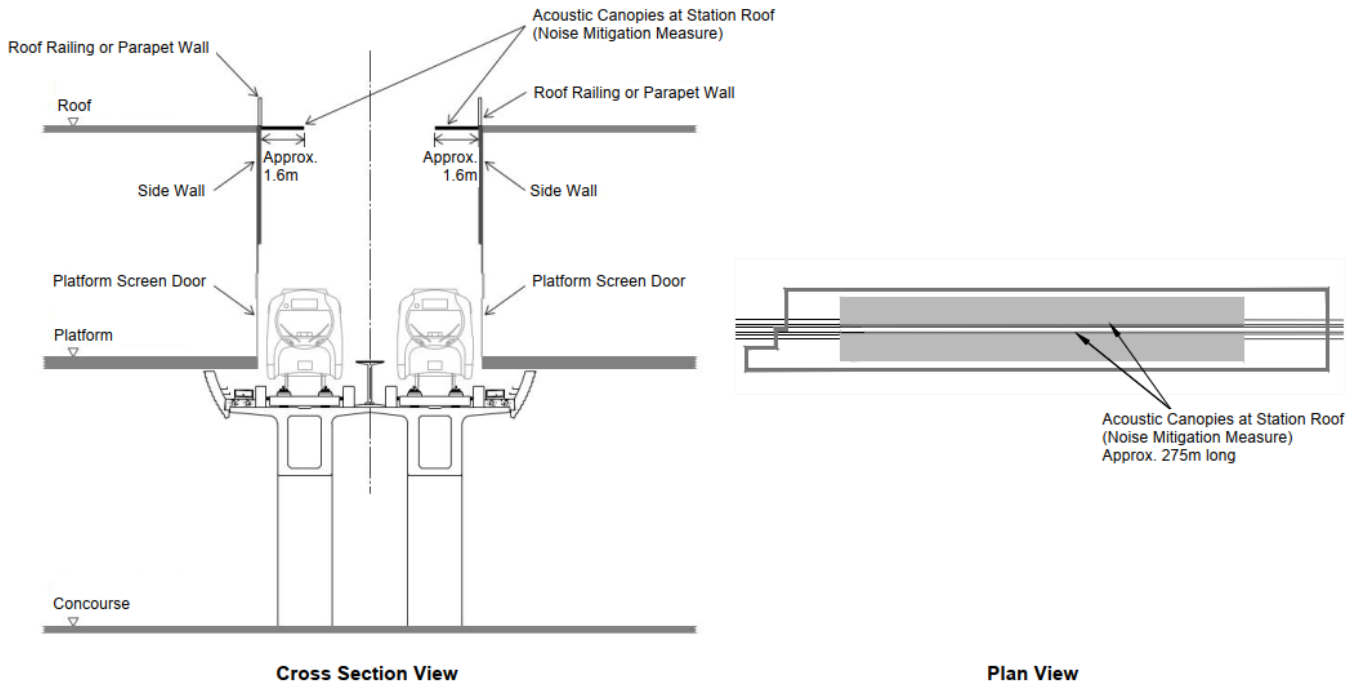
2.1.1 The amendment to the existing FEP (EP No.: FEP-24/004/1998/J) held by MTRCL would be required, including the construction and operation of the Project. Such proposed amendment is summarised in **Table 2.1**.

Table 2.1: Proposed Amendment Items in FEP

PROPOSED AMENDMENTS:		
<ul style="list-style-type: none"> - Construction of railway station at HSK, with key modifications required as follows: <ul style="list-style-type: none"> - Foundation and piers works - Installation of station modules - Relocation of OHL cantilever - Construction of concourse, platform area and back-of-house areas - Operation of railway station at HSK 		
No. / Ref.	Description of Condition	Relevant Figures/Tables/ Conditions to be Varied
PART B (DESCRIPTIONS OF DESIGNATED PROJECT) Location of Designated Project	<i>“Kowloon to Tuen Mun (The location and alignment of the Project is shown in Figure 1, 2 and 3 of this Environmental Permit).”</i>	The Project location will be shown by a new Figure 3A to the FEP which shown in Figure 2.1 in this ERR.
PART B (DESCRIPTIONS OF DESIGNATED PROJECT) Scale and Scope of Designated Project	<i>“Western Section This Section of the alignment extends generally westward from Yuen Long Station (YUL) before heading south to the proposed Tuen Mun Centre (TMC) Station. The Western Section includes intermediate stations at Long Ping (LOP), Tin Shui Wai and Tuen Mun North (TMN).”</i>	The railway station at HSK will need to be added to Scale and Scope of Designated Project(s) under Part B of FEP.
PART C (PERMIT CONDITIONS)	Propose to include <i>“Before the commencement of the construction of Hung Shui Kiu Station in Western Section, the Permit Holder shall submit a Construction Noise Management Plan (CNMP) as recommended in the ERR.”.</i>	The submission of Construction Noise Management Plan (CNMP) of HSK Station will be included as a new condition in Part C.
PART C (PERMIT CONDITIONS)	Propose to include <i>“All measures specified in Table D in Schedule 1 shall be implemented in accordance with the information contained in the Application for Variation, and the details and the time frame specified in the Schedule 1 of this Permit.”</i> , where	Railway noise mitigation measures for the Project will be incorporated into a new condition in Part C, a new Table D in Schedule 1 and a new Figure 17 as shown in Image 2.1 .

	the Application for Variation details will be provided in due course.	
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Image 2.1 Noise Mitigation Measures in the Project



3 ENVIRONMENTAL CHANGES ARISING FROM THE PROPOSED AMENDMENT

3.1 Air Quality

3.1.1 This ERR identified and reviewed any potential air quality impacts that would be generated by the Project at the representative Air Sensitive Receivers (ASRs) located in the close vicinity of the Project during construction and operation phases. The details on air quality impact review are presented in **Section 4**.

3.2 Noise

3.2.1 This ERR reviewed the noise impact at the representative Noise Sensitive Receivers (NSRs) at HSK during construction and operation phases. In accordance with the approved Hung Shui Kiu and Ha Tsuen Outline Zoning Plan (HSK/HT OZP, No. S/HSK/2, approved October 2018), the location of some planned NSRs as identified in the approved EIA for HSK/HT NDA has been updated. In consideration of the proposed amendments, further review of noise impacts at the revised NSRs is provided in **Section 5**.

3.3 Water Quality

3.3.1 This ERR reviewed the water quality impact at the representative Water Sensitive Receivers (WSRs) at HSK during construction phase and operation phase. Further review of the water quality impacts is provided in **Section 6**.

3.4 Waste Management

3.4.1 This ERR reviewed the waste management during construction phase and operation phase. Adverse impacts would not be anticipated if appropriate mitigation measures are implemented. Further review of the waste management is provided in **Section 7**.

3.5 Land Contamination

3.5.1 This ERR reviewed the potential impacts from contaminated land, based on the approved EIA for HSK/HT NDA, field observations and other relevant background information. Portions of the Project with potential contamination issues will require environmental ground investigations to verify. Further details of this review are provided in **Section 8**.

3.6 Ecology

3.6.1 This ERR reviewed the potential ecological impacts covering the habitat, vegetation and all major fauna groups in the Project Site Boundary and its vicinities based on literature review, comparison of historic aerial photographs, and reconnaissance ecological site visits. The review of the ecological impacts is provided in **Section 9**.

3.7 Landscape and Visual

- 3.7.1 This ERR reviewed the impacts to Landscape Resources (LRs), Landscape Characters (LCAs) and Visually Sensitive Receivers (VSRs) at the vicinity of HSK Station. Based on the approved EIA for HSK/HT NDA, such impacts were assessed as negligible to slightly adverse only. The review on landscape and visual impacts for this Project during construction phase and operation phase is provided in **Section 10**.

3.8 Cultural Heritage

- 3.8.1 Cultural Heritage Impact Assessment was conducted in the approved EIA for HSK/HT NDA. Neither built heritage nor site of archaeological interests is discovered in the assessment area. As such, the impact on cultural heritage should be minimal. Built heritage and site of archaeology within the assessment area will be provided in **Section 11**.

3.9 Hazard to Life

- 3.9.1 Further details regarding the Hazard to Life assessment is provided in **Section 12** but it is noted that no Consultation Zones for any Potentially Hazardous Installations (PHI) are present within the Project Site Boundary.

4 REVIEW OF AIR QUALITY

4.1 Review of Approved EIA

- 4.1.1 The approved EIA for WRL assessed the potential air quality impacts arising from the construction and operation phases of WRL. The Project is a new railway station to be located between the existing TIS Station and SIH Station along the existing WRL. The approved EIA for HSK/HT NDA in 2016 is considered as the most updated and best available information for review, as it contained the EIA of the work sites and work areas of the Project covering its construction periods.
- 4.1.2 The construction works of HSK/HT NDA covers a large piece of area in Hung Shui Kiu and Ha Tsuen. The existing and planned representative ASRs were identified in the approved EIA for HSK/HT NDA, and the cumulative air quality impacts arising from HSK/HT NDA were assessed. The corresponding proposed mitigation measures to minimise the potential dust impacts generated from the construction works were recommended in the approved EIA for HSK/HT NDA.
- 4.1.3 This section reviewed if there are any adverse impacts that would be generated by the Project's construction works as compared with the conclusions made in the approved EIA for HSK/HT NDA.

4.2 Environmental Legislation, Standards and Guidelines

- 4.2.1 The criteria and guidelines for the air quality impact assessment were based on Annex 4 and Annex 12 of the Technical Memorandum on EIA Process (EIAO-TM) and Air Pollution Control Ordinance (APCO). The Hong Kong Air Quality Objectives (AQOs) stipulating the maximum allowable concentrations over specific periods for typical pollutants shall be met. The principal legislation for the management of air quality is the APCO. It stipulates the statutory limits of seven air pollutants and the maximum allowable numbers of exceedance over specific periods. The prevailing AQOs enacted on 1 January 2022 are listed in **Table 4.1** below. In accordance with Annex 4 of EIAO-TM, it stipulates that the hourly TSP level should not exceed $500\mu\text{g}/\text{m}^3$ (measured at 25°C and one atmosphere) for construction dust impact assessment.

Table 4.1: Air Quality Objectives

Pollutant	Averaging Time	AQO Concentration ^[i] ($\mu\text{g}/\text{m}^3$)	Allowable Number of Exceedance
Respirable Suspended Particulates (PM ₁₀) ^[ii]	24-hour	100	9
	Annual	50	Not Applicable
Fine Suspended Particulates (PM _{2.5}) ^[iii]	24-hour	50	35
	Annual	25	Not Applicable

Pollutant	Averaging Time	AQO Concentration [i] ($\mu\text{g}/\text{m}^3$)	Allowable Number of Exceedance
Nitrogen Dioxide (NO_2)	1-hour	200	18
	Annual	40	Not Applicable
Sulphur Dioxide (SO_2)	10-minute	500	3
	24-hour	50	3
Carbon Monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
Ozone (O_3)	8-hour	160	9
Lead	Annual	0.5	Not Applicable

Note:

[i] All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293Kelvin and a reference pressure of 101.325kPa.

[ii] Respirable suspended particulates mean suspended particles in air with a nominal aerodynamic diameter of $10\mu\text{m}$ or less.

[iii] Fine suspended particulates mean suspended particles in air with a nominal aerodynamic diameter of $2.5\mu\text{m}$ or less.

4.3 Existing Ambient Air Quality Condition

4.3.1 The nearest Air Quality Monitoring Station (AQMS) operated by the EPD to the Project is Yuen Long AQMS. As such, the latest 5 years of air quality monitoring data (i.e. 2017 - 2021) in Yuen Long AQMS are extracted and listed in **Table 4.2** below to demonstrate the background air quality condition of the Project Site.

Table 4.2: The Latest 5-years of Background Air Quality Monitoring Records in Yuen Long Station (2017 – 2021)

Pollutants [1]	Parameter	2017	2018	2019	2020	2021	5-Year Average [3]	AQOs ($\mu\text{g}/\text{m}^3$) [4]
RSP	10 th highest 24-hour	87	75	83	77	73	79 [79%]	100 (9)
RSP	Annual	40	37	37	30	30	35[70%]	50
FSP	36 th highest 24-hour	39	34	34	28	31	33 [66%] [2]	50 (35)
FSP	Annual	22	20	20	16	17	19 [76%]	25

1. As RSP and FSP are the major pollutant emissions during the construction phase of the Project, therefore only RSP and FSP monitoring data are presented.

2. No information of the 36th highest daily FSP is available in Annual Air Quality Reports from 2017 – 2021, the 36th highest daily FSP were obtained from the Environmental Protection Interactive Center (<https://cd.epic.epd.gov.hk/EPICDI/air/?lang=en>).

3. The average percentage compared to the AQO is shown inside the bracket [].

4. Frequency of exceedance allowed for daily average of pollutants are shown inside the bracket ()

4.3.2 The 5-year average of pollutant background concentrations revealed that the daily and annual average RSP and FSP concentrations have gradually decreased from 2017 to

2021, except the 10th highest daily RSP which indicated a slight rise of average concentration in 2019, but it decreased again in 2020 to 2021. No exceedance was found for the 10th highest daily RSP and the 36th highest daily FSP, or annual averages for RSP and FSP as compared with the prevailing AQO criteria.

4.4 Projected Air Quality Background Concentration from EPD PATH V2.1

4.4.1 Background pollutant concentrations as predicted by EPD’s PATH V2.1 were reviewed. PATH V2.1’s concentrations of pollutants predicted for 2025, which are the nearest available year from EPD’s website to the tentative commencement of construction period in 2025, were adopted as the background concentration. The major PATH V2.1 grids that fall within the 500m assessment area include Grids (21, 45), (21, 46), (22, 45), and (22, 46). The projected background concentrations of pollutants extracted from these PATH V2.1 grids are shown in **Table 4.3**. The projected background concentrations of daily and annual averages for RSP and FSP indicated that there is still buffer before reaching their corresponding AQO limits.

Table 4.3: Background Concentrations of Pollutants Predicted from PATH V2.1 in 2025

Pollutant	Averaging Time	Conc. Limits (µg/m ³) [1]	Grid (21, 45)	Grid (21, 46)	Grid (22, 45)	Grid (22, 46)
			Concentration (µg/m ³)			
Respirable Suspended Particulates (PM ₁₀)	The 10 th highest Daily 24-hour	100 (9)	72 [72%]	76 [76%]	71 [71%]	73 [73%]
	Annual	50	28 [56%]	29 [58%]	28 [56%]	28 [56%]
Fine Suspended Particulates (PM _{2.5})	The 36 th highest Daily 24-hour	50 (35)	27 [54%]	29 [58%]	26 [52%]	27 [54%]
	Annual	25	16 [64%]	17 [68%]	16 [64%]	16 [64%]

Note:

[i] The numbers inside the bracket are the allowed frequency of exceedances per year.

[ii] The average percentage compared to the AQO is shown inside the bracket [].

4.5 Construction Programme

- 4.5.1 Major construction works including foundation works, temporary drainage diversion, etc. would be conducted between 2025 to 2027. The construction of station structure which is not considered dusty works would be carried out from 2026 to 2028. The remaining works would only include fitting out and external building works, testing and commissioning, etc in around 2029 to 2030, where potential dust impacts are considered minor. The major construction activities for the Project would include site mobilisation, site clearance and erection of hoarding, minor excavation works for temporary drainage diversion, resurfacing, foundation of station, assembly and limited casting of structural elements, piling, piers works, station modules installation (up track and down track), and OHL cantilever relocation, etc.
- 4.5.2 To facilitate the Project works, the use of work sites and works areas would be required. Works sites are defined as areas where casting yard, prefabrication works at prefabrication yard, *in-situ* construction or some excavation works would be required. On the other hand, works areas are those for the use as site office, carparking and storage areas (which is further elaborated below). The Project Site Boundary, works sites and works areas are shown in **Figure 4.1**.

4.6 Representative Air Sensitive Receivers

- 4.6.1 According to Annex 12 of EIAO-TM, any domestic premises, hotel, hostel, hospital, clinic, nursery, temporary housing accommodation, school, education institution, office, factory, shop, shopping centre, place of public worship, library, court of law, sports stadium or performing arts centre are considered as ASRs. In addition, any other premises or place with which, in terms of duration or number of people affected, have a similar sensitivity to air pollutants as the afore-listed premises and places shall also be considered as ASRs.

Existing ASRs

- 4.6.2 Existing ASRs were identified in the approved EIA for HSK/HT NDA within the 500m assessment area. As this ERR only involves the Project, the existing representative ASRs located in close vicinity of the Project as identified in the approved EIA for HSK/HT NDA were reviewed and identified as the existing representative ASRs. There are some existing village houses located to the immediate east and west of the Project. As shown in **Figure 4.2**, the areas situated to the east and west of the Project as highlighted in pink are mainly private lots and land resumption of these areas would be tentatively completed by the end of 2024. As the construction phase of the Project would commence in 2025, these ASRs in these land resumption areas would unlikely exist. According to the desktop review of the latest survey maps and the site visit conducted on 18 May 2022, the identified existing representative ASRs are listed in **Table 4.4** and shown in **Figure 4.1**.

Table 4.4: Existing Representative ASRs

Existing ASRs ID	Descriptions	Use	Approximate Distance from Project Site Boundary(m)	Exist within the Construction Period from 2025 - 2030
A112	Ling Sun Kindergarten	Education	513	Yes
A201	Nai Wai	Village	449	Yes

Existing ASRs ID	Descriptions	Use	Approximate Distance from Project Site Boundary(m)	Exist within the Construction Period from 2025 - 2030
A202	Full Park	Village	408	Yes
A203	Good Rich Garden	Village	415	Yes
A204	Kam Cheong Garden	Village	325	Yes
A205	Sun Fung Wai	Village	230	Yes
A206	Yonking Garden	Village	436	Yes
A208	Oaklands Court	Village	410	Yes
A209	Ling Liang Church Primary School	Education	176	Yes
A303	The Matas Lodge	Village	501	Yes
A304	Sun Fung Wai Sun Tsuen	Village	315	Yes
A306	Chung Uk Tsuen	Village	313	Yes
A310	Tin Ha Road Playground	Recreational	389	Yes
A311	Bauhinia Garden	Residential	523	Yes
A314	The Church of Jesus Christ of Latter-day Saints	Institution or Community	445	Yes
A401	Casa De Oro	Residential	420	Yes
A406	Tin Sam Tsuen	Village	218	Yes
A407	Bellevue Court	Residential	493	Yes
A408	San Lee Uk Tsuen	Village	293	Yes
A410	Galore Garden	Village	405	Yes
A415	Tin Sam Tsuen	Village	37 ^[1]	Yes
A417	Premises to the Northeast of Proposed HSK Station Boundary	Residential	16 ^[2]	Yes
A418	Village House No. 143, Tin Sam Tsuen	Residential	27 ^[3]	Yes

Note:

1. The shortest separation between A415 and the nearest dusty works of the Project is about 148m.
2. The shortest separation between A417 and the nearest dusty works of the Project is about 26m.
3. The shortest separation between A418 and the nearest dusty works of the Project is about 58m.

4.6.3 The extent of the works site and works areas should refer to **Figure 4.1**. The works areas would mainly be used for site office accommodation, storage and car parking, while construction activities would be carried out within works sites, including casting works at casting yard, prefabrication works at prefabrication yard and in-situ construction. As indicated in **Table 4.4** above, all identified existing ASRs are located away from Project Site Boundary with separation ranging from 16m to 523m, with the nearest ASR being at about 16m away (ASR A417) as shown on **Figure 4.1**. Nevertheless, the dusty works carried out during the construction phase would be mainly situated at the centre of the Project Site, i.e excavation and resurfacing works. The distance between the dusty works and the nearest identified ASRs (i.e. A417) is approximately 26m. The locations of the identified dusty works and the ASRs locations are shown on **Figure 4.3**. Furthermore, the excavation and resurfacing works would be conducted in different phases (as further detailed in Section 4.7.2), which would commence from the northern part and then would gradually be moved toward the southern part of the Project Site. Hence, the potential dust impacts on the nearest ASR identified to the north of the Site would be reduced gradually at later stage of the construction works when the associated dusty works are shifting to the south. Mitigation measure such as erection of not less than 2.4 m high hoarding from

ground level along site boundary would be provided to minimise the potential dust impact on the nearby ASRs.

Planned ASRs

4.6.4 The planned ASRs in close vicinity to the Project Site were identified in the approved EIA for HSK/HT NDA based on the Revised Recommended Outline Development Plan (RODP), the latest Outline Zoning Plans (OZPs), Layout Plan, Outline Development Plans, Layout Plans and other relevant published land use plans. These planned ASRs within the above mentioned EPD's PATH grids for 2025 to 2030 are listed in **Table 4.5** below and their locations are shown in **Figure 4.1**.

Table 4.5: Planned Representative ASRs

Planned ASRs ID	Descriptions	Use	Approximate Distance from Project Site Boundary (m)	Intake Year	Affected by the Construction of the Project
P215	Planned Industrial Uses	Industrial	520	2030	No
P239	Planned Village Resite	Rural Residential Density Zone 4 (RR4)	222	2026	Yes
P240	Planned Village Resite	Rural Residential Density Zone 4 (RR4)	256	2026	Yes
P241	Planned Village Resite	Rural Residential Density Zone 4 (RR4)	119	2026	Yes
P246	Planned Public Rental Housing	Residential	260	2030	No
P247	Planned Public Rental Housing	Residential	181	2030	No
P248	Planned Public Rental Housing	Residential	178	2030	No
P249	Planned Public Rental Housing	Residential	53 ^[1]	2030	No
P250	Planned Public Rental Housing	Residential	105	2030	No
P310	Planned Public Rental Housing	Residential	188	2030	No
P311	Planned Public Rental Housing	Residential	227	2030	No
P312	Planned Public Rental Housing	Residential	165	2030	No
P1621	Planned Industrial Uses	Industrial	563	2030	No
P1628	Planned Industrial Uses	Industrial	506	2030	No

Planned ASRs ID	Descriptions	Use	Approximate Distance from Project Site Boundary (m)	Intake Year	Affected by the Construction of the Project
P1629	Planned Industrial Uses	Industrial	474	2030	No
P1630	Planned Industrial Uses	Industrial	531	2030	No
P1631	Planned Industrial Uses	Industrial	475	2030	No

Note:

1. The shortest separation between P249 and the nearest dusty works of the Project is about 422m.

4.6.5 As most of these planned ASRs would have population intake in 2030 (as referenced from the approved EIA for HSK/HT NDA), and only T&C and Inspection would be carried out for the Project during this period without any major construction works, these planned ASRs are considered not affected by the construction stage of the Project. On the other hand, only planned ASRs P239, P240 and P241 would be affected by the construction activities of the Project and therefore be included in the subsequent assessment.

4.7 Review of Construction Phase Impact

Dust Emissions Arising from Construction Works of the Project

- 4.7.1 As mentioned above, the major construction period of the Project would be tentatively covering the period from 2025 to 2027. The building structure of the Project would comprise a two-level station with at-grade concourse and elevated side-platforms for 8-car train sets.
- 4.7.2 Only minor excavation works with depth ranging from 3m to 5m and width of no more than 5m would be required for the temporary drainage diversion (about 450m in length) during the construction phase. Other minor works would include small-scale excavation for station foundation and resurfacing works, and backfilling for the existing drainage channel, etc. According to the construction programme, all the excavation works would be conducted prior to the resurfacing works. The excavation work would be carried out in six different phases and the maximum area of excavation works be approximately 1,800m² at each time. On the other hand, the resurfacing works would be carried out in eight different phases. The maximum area of resurfacing works that would be carried out each time would approximately be 4,900m². Given these activities would be carried out in sequenced phases and are of small-scale, with the implementation of standard dust suppression measures as stipulated in Air Pollution Control (Construction Dust) Regulation and good site practices (including but not limited to water spraying and covering stockpile with impervious sheets etc.), dust impacts generated from these activities would not be significant.
- 4.7.3 A two-level station with at-grade concourse and elevated side-platforms would be constructed, where the majority of the aboveground superstructure works would be performed with precast / prefabrication. No extensive excavation would be required. Moreover, the general construction works for the Project would mainly involve the delivery, storage, and assembly of precast modules to form the station structure, so any dust potentially generated from the works of foundation, floor slab and station structure would

be kept to a minimum. Furthermore, the pier columns would mainly be precast elements before they are assembled in the works area, so dust generation from the handling of these precast elements can be further reduced.

- 4.7.4 Installation of precast segments would adopt Design for Manufacture and Assembly (DfMA) approach where mainly assembly works for modularised items would be carried out. This approach is widely considered more environmentally friendly than traditional construction methods. Only ready-mix concrete would be delivered by concrete truck to the casting yard, and no in-situ concreting would be carried out within the casting yard. The casting yard for fabrication of precast concrete elements and the assembly yard for assembling station modules would be provided with dust mitigation measures including semi-enclosure, water spraying, wheel washing facilities, etc. Given those precast elements would be used to ensure a less dusty environment than other traditional heavy construction practices, potential dust impacts arising from these casting and assembly processes is considered minimal, with the properly implementation of dust mitigation measures.
- 4.7.5 Particulate emissions (e.g. RSP/FSP) are generated from road traffic but the contribution is expected to be small since it is estimated that only about 3 round trips/hour will travel in and out on-site for the delivery of precast modules during the construction phase assuming that the access road is two-way road. As such, potential air quality impact due to vehicular emissions induced by the Project would be anticipated minimal as the overall construction traffic flow arising from the Project would be considered insignificant. Since approved Non-Road Mobile Machinery (NRMMs) with a proper label as governed by Air Pollution (NRMM) (Emission) Regulation would be used within the construction sites and exempted NRMM would be avoided as far as practicable, together with the use Ultra Low Sulphur Dioxide (ULSD) diesel-operated construction plants and the recommendation of using electric powered PME during construction phase as far as practical, the emissions generated from diesel-powered plant and equipment would be properly controlled and the potential impacts generated are anticipated to be minimal.
- 4.7.6 Given that the Project mainly involves relatively small scale excavation and less dusty/more environmental friendly construction methods, dust impacts generated from the Project can be considered not significant with implementation of proper dust mitigation measures.

Dust Emissions Arising from Construction Works of Concurrent Projects

- 4.7.7 Based on the best available information of the approved EIA for HST/HT NDA, there is no change in the construction programme of HSK/HT NDA as assessed in the approved EIA report and there is no additional concurrent project within 500 m from the project site boundary. During the construction phase of the Project, there would be construction activities from other concurrent projects to be carried out from 2025 to 2030, including HSK/HT NDA site formation works and some DPs according to the approved EIA for HSK/HT NDA. The dust impact assessment of these concurrent projects were covered in the approved HSK/HT NDA EIA report. The concurrent projects that fall within the 500m Assessment Area of this ERR would include the following, and their locations could be referred to in **Figure 1.2**:
- Construction of new distributor roads: Roads D6, D7 and D8 (Project Proponent: CEDD), which are located at approximately 7m, 195m, and 125m, respectively away from the Project Site Boundary;

- Construction of partly depressed and partly decked-over roads located at Road D6 (Project Proponent: CEDD), which is located at about 18m away from the Project Site Boundary; and
- Construction of new Sewage Pumping Stations (Project Proponent: CEDD), which are located at about 242m and 31m away from the Project Site Boundary for the SPS to the north and to the south of the Project, respectively.

4.7.8 The Project Site Boundary, which is located within the HSK/HT NDA works area, therefore was covered in the approved EIA for HSK/HT NDA. The coverage of construction works sites, duration of construction works, and the nearest ASRs at close vicinity of the Project are reviewed and identified.

4.7.9 With reference to the approved EIA for HSK/HT NDA, there were no industrial emission sources identified within 500m of the Project. Based on recent site survey in January 2022, no additional industrial emission source is identified within the 500m assessment area as compared to that mentioned in the approved EIA for HSK/HT NDA.

Cumulative Construction Dust Impacts

4.7.10 The cumulative assessment of construction dust impact was conducted in the approved EIA for HSK/HT NDA. The assessment results of the hourly TSP, daily and annual RSP, daily and annual FSP from the approved EIA report demonstrated that all the identified ASRs within the assessment area of the Project would not exceed the criteria (at the time of the HSK/HT NDA EIA assessment) of respective PM levels with the implementation of specific mitigation measures. It is also confirmed that the PM levels at the two newly identified ASRs A417 and A418, would not exceed the respective PM limit values.

4.8 Mitigation Measures

4.8.1 Dust control measures as recommended in Air Pollution Control (Construction Dust) Regulation and good site practice would be included in the contract specifications and implemented to minimise any potential dust impacts as far as practicable. These would include:

- The works area with exposed surface or with any excavation works would be sprayed with water frequently to maintain the entire surface wet;
- The unloading process would be undertaken within a 3-sided screen with top tipping hall;
- Where practicable, vehicles washing facilities would be provided at every discernible or designated vehicle exit point and all vehicles would be washed to remove any dusty materials from its wheels before leaving a construction site. The area where vehicle washing takes place and the road section between washing facilities and exit point would be paved with concrete, bituminous materials or hardcores;
- All road surfaces within the construction sites would be paved and watering frequently along the haul road during the working hours;
- Where a vehicle leaving a construction site is carrying a load of dusty materials, the load would be covered by mechanical cover to ensure that the dusty materials do not leak from the vehicle;

- Travelling speeds of vehicles within the construction site would be controlled to reduce traffic induced dust dispersion and re-suspension within the works sites from the operating trucks;
- Any stockpile of dusty materials would be covered entirely by impervious sheeting; and/or placed in an area sheltered on the top and the 3 sides; or sprayed with water so as to maintain the entire surface wet;
- All dusty materials would be sprayed with water immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet;
- Only approved or exempted NRMMS with a proper label are allowed to be used in specified activities and locations including construction sites; and
- Concurrent dusty construction works near ASRs would be avoided as far as practicable through the control of timing and locations of different construction activities.
- Provision of not less than 2.4m high hoarding from ground level along site boundary that adjoins roads, streets or other accessible areas to the public, except for the site entrance or exit. Good site practice shall also be adopted by the contractor to ensure the conditions of hoardings are properly maintained throughout the construction period.
- Every stock of more than 20 bags of cement or dry pulverised fuel (PFA), if present on-site, should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the three sides.
- The electric power supply shall be provided for on-site machinery as far as practicable and diesel generators shall be avoided to minimize the gaseous and PM emissions.
- Locate all the dusty activities away from any nearby ASRs as far as practicable.
- Locate the haul road (if any) away from those concerned ASRs.
- Use of extended noise barrier above site hoarding, e.g. built temporary noise barrier above hoarding located on the site boundaries between dusty/noisy construction activities and ASRs or Noise Sensitive Receivers (NSRs) in immediate proximity to the project site boundary.
- The project proponent/consultant and also contractors shall closely liaise with the relevant parties in due course to avoid any heavy dusty activities of the concurrent projects to be conducted at the same time, as far as practicable.

4.8.2 According to the Tier 2 assessment in the approved EIA report, additional mitigation measures, i.e. enhanced hoarding (with combined height of up to 3 m) will be erected in the vicinity of the most affected ASRs identified within the assessment area of this Project, i.e. A415, A417, A418. Subject to site constraints and interfacing arrangements, mitigation measures will be implemented as far as practicable.

4.8.3 According to the Tier 3 assessment conducted for A208, A209, A310 and P240, size of the active work area of the work contract which is closest to these ASRs shall be further limited to one third of monthly average work area of the work contract in addition to the erection of 3 m hoarding at the site boundary adjacent to the ASRs. Considering the long separation distances between the project site and these four ASRs (170 – 400 m) and the small scale of construction works of the Project, no significant dust impact due to the construction works of the Project would be anticipated with the implementation of on-site

dust control measures and good site practices. Nevertheless, as a good practice, it is still recommended to erect 3 m hoarding instead of standard hoarding along the project site adjacent to those ASRs and dust monitoring will be conducted at ASRs which are in close proximity to the project site. In addition, the active work area of this project will be limited to a scale of 100m x 100m at a time, which is based on the assumptions made in the Tier 3 assessment in the approved HSK/HT NDA EIA report and is therefore equivalent to the mitigation measures considered in the approved EIA. Subject to site constraints and interfacing arrangements, mitigation measures will be implemented as far as practicable.

- 4.8.4 With the implementation of standard dust suppression measures as stipulated in Air Pollution Control (Construction Dust) Regulation, Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, Air Pollution Control (Fuel Restriction) Regulations, and recommendation for use of electric powered PME as far as practicable and good site practices, no adverse construction dust impacts would be anticipated.
- 4.8.5 An Environmental Monitoring and Audit (EM&A) programme would be required to monitor and manage the dust impact arising from the construction activities associated with the Project. Details of monitoring station and frequency would be described in **Section 13** of this ERR.

4.9 Review of Operation Phase Impact

- 4.9.1 Trains to be operated in the Project are electrified and no emergency generator be adopted on-site. There would be no air emission during operation of the Project.

4.10 Conclusion

- 4.10.1 Air quality impacts arising from the Project were reviewed. The major construction dust sources during the construction phase of the Project would mainly arise from construction activities such as minor excavation works for temporary drainage diversion, small-scale excavation for station foundation and resurfacing works, and backfilling for the existing drainage channel, etc. Due to the small-scale construction works, and less dusty construction methods, the air quality impact during the construction phase of the Project would not be adverse with implementation of the recommended mitigation measures.
- 4.10.2 As trains operating in the Project would be electric powered and air emission free during operation, adverse air quality impact arising from the operation phase of the Project would not be anticipated.

5 REVIEW OF NOISE

5.1 Review of Approved EIA and Noise Assessment

- 5.1.1 As stated in the approved EIA for WRL, the report reviewed the construction noise impact of the major construction works for WRL, railway noise and fixed plant noise impacts during the operation phase.
- 5.1.2 Subsequently, as part of the Shatin to Central Link Project, the number of train cars was proposed to be operated in 8 cars with an increased daytime train frequency (from 20 trains to 28 trains per hour per direction). To address the proposed changes of operational parameters, noise assessment was conducted and presented in "West Rail Operational Train Noise Assessment Report" (July 2015) which was approved by EPD in August 2015.
- 5.1.3 The approved EIA for HSK/HT NDA conducted by CEDD and PlanD in 2016 identified the planned representative Noise Sensitive Receivers (NSRs) of the proposed NDA and proposed mitigation measures to minimise the potential railway noise impacts.

5.2 Representative NSRs

- 5.2.1 With reference to Annex 13 of the EIAO-TM, NSRs include residential uses (all domestic premises including temporary housing), institutional uses (educational institutions including kindergarten and nurseries), hospitals, medical clinics, homes for the aged, convalescent homes, places of public worship, libraries, courts of law, performing arts centres, auditoria and amphitheatres, country parks and others.
- 5.2.2 Representative NSRs within 300m from the Project Site have been reviewed and identified with the first layer of NSRs selected for assessment in both construction phase and operation phase. The locations of the representative existing and planned NSRs are summarised in **Table 5.1**. Existing NSRs are identified by means of reviewing topographic maps, aerial photos, building plans, the approved EIA for HSK NDA, and verified by site visits.

Table 5.1: Representative NSRs for Noise Impact Assessment

NSR ID ^{[1][3]}	Description	Considered in	
		Construction Phase	Operation Phase
Existing NSRs			
N2	Premises to the East of Proposed HSK Station Boundary	[2]	
N3 ^[1]	Premises to the Northeast of Proposed HSK Station Boundary	✓	✓
N4 ^[1]	Village House No. 143, Tin Sam Tsuen	✓	✓
N5	Premises to the Northwest of Proposed HSK Station Boundary (north of channel)	[2]	
N6	Premises to the Northwest of Proposed HSK Station Boundary (south of channel)	[2]	

NSR ID [1][3]	Description	Considered in	
		Construction Phase	Operation Phase
Planned NSRs			
PN2	Planned School in Area 34C		✓
PN3	Planned Residential Development in Area 34B		✓
PN4-1	Planned Residential Development in Area 28B		✓
PN4-2			✓
PN4-3			✓
PN4-4			✓
PN5-1	Planned Residential Development in Area 28A		✓
PN5-2			✓
PN6	Planned Student Hostel in Area 31A		✓

Note:

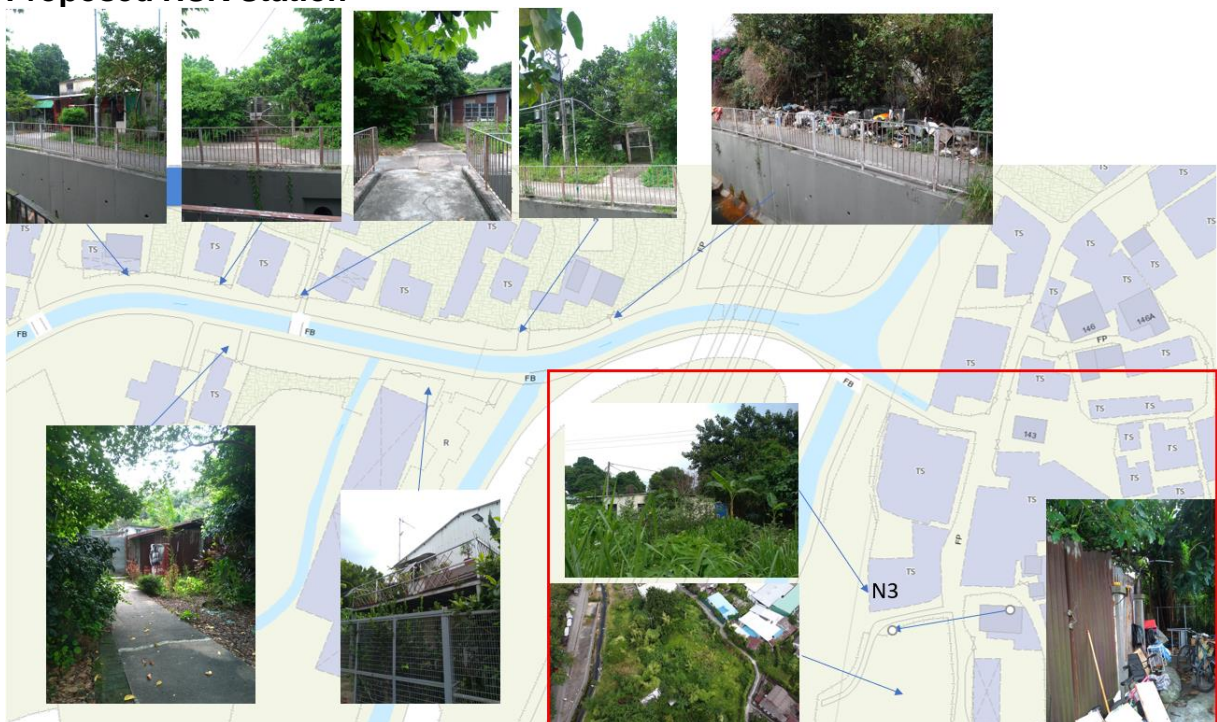
[1] According to the HSK/HT NDA, N4 is assessed in construction phase while N3 is assessed in operation phase. Both NSRs are considered and assessed in this ERR.

[2] Assuming land resumption programme will be completed in 2024 before commencement of the construction works of the Project, construction noise impact for N2, N5 and N6 would not be assessed.

[3] The list of representative NSRs for the construction noise assessment will be further reviewed in the future construction noise management plan (CNMP) stages.

5.2.3 According to recent site visits, the premises to the northwest of proposed HSK Station boundary were identified to be abandoned, as shown in **Image 5.1**. As such, N5, N6 and the premises to the north of N6 are not further considered in the construction noise and operational noise assessment. The closest NSR is N3, which is the premises to the Northeast of Proposed HSK Station Boundary.

Image 5.1: The closest NSR and the abandoned Premises to the Northwest of Proposed HSK Station



5.3 Construction Phase

Representative NSRs

5.3.1 Representative NSRs within 300m from the Project Site in construction phase are summarised in **Table 5.2** and shown in **Figure 5.1**. It is noted that some existing NSRs fall within the Project Site Boundary of HSK Station. Based on the latest land resumption schedule provided by the Lands Department (LandsD) as shown in **Image 5.2** below, land resumption for the remaining areas within the Project Site Boundary will be conducted by phases and completed before the construction of the Project. As such, the existing NSRs, N3 and N4 would have noise sensitive uses during the major construction works.

Image 5.2: The latest Land Resumption Schedule provided by LandsD

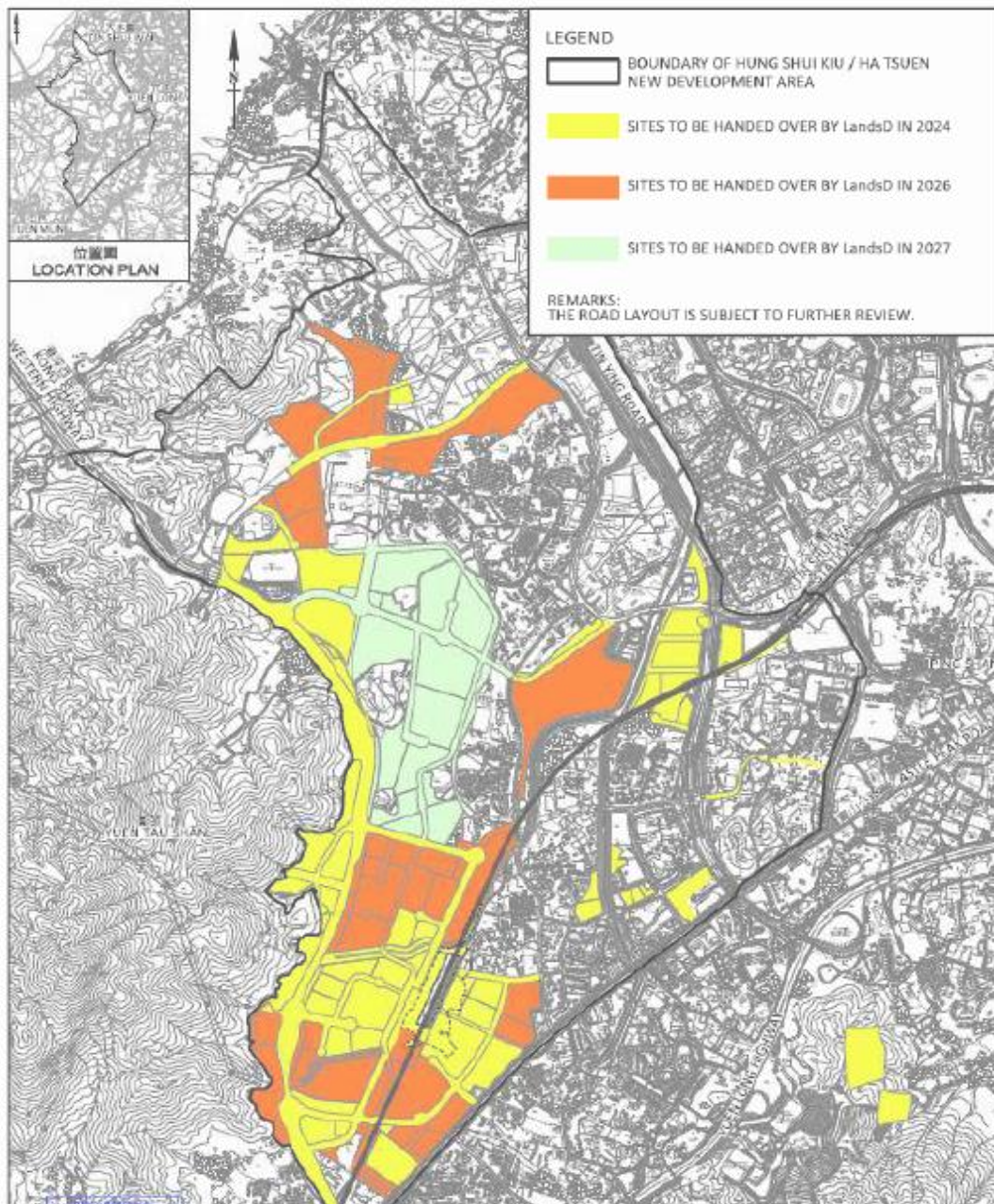


Table 5.2: Representative NSRs for Construction Noise Impact Assessment

NSR ID [2]	Description	Use [1]	Approximate Distance (m)	
			From the Project Site	From the Boundary of Major Construction Works
N3	Premises to the Northeast of Proposed HSK Station Boundary	R	16	26
N4	Village House No. 143, Tin Sam Tsuen	R	27	48

Note:

[1] R- Residential premises

[2] The list of representative NSRs for the construction noise assessment will be further reviewed in the future construction noise management plan (CNMP) stages.

Construction Programme

- 5.3.2 As discussed in **Section 1.4**, site clearance, site mobilisation and minor resurfacing works for site preparation will take place in 2024 to 2025. Major construction works including foundation and piers works, temporary drainage diversion etc would be undertaken in 2025 to 2027. The remaining works would only include station structure, site fitting out and external works, testing and commissioning from 2026 to 2030. The locations of Works Sites (i.e. HSK Station Work Site, Temporary Storage, Casting Yards and Fabrication Yard) are shown in **Figure 5.1**.
- 5.3.3 To avoid affecting the normal train operation, construction works using Powered Mechanical Equipment (PME) during restricted hours (i.e. the hours of 1900 to 0700 hours or any time on Sundays or general holiday) may be required such as relocation of overhead line cantilever and viaduct modification. Construction works (i.e. use of PME and carrying out of Prescribed Construction Work) under restricted hours require a Construction Noise Permit (CNP) in order to carry out such work. As the issuance of a CNP by the Noise Control Authority would depend on the compliance of construction noise impact with the limits set out within the Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM)/Technical Memorandum on Noise from Construction Work in Designated Areas (DA-TM), the assessment of this type of noise would be addressed in the CNP application under Noise Control Ordinance.

Noise Sources

- 5.3.4 Potential construction noise impacts would arise from the use of PME during the construction works of the Project. The activities during construction phase include site mobilisation (e.g. site foundation works, setting up of site office, loading, unloading and transportation of construction materials, erection of site hoarding), temporary drainage diversion and piling works, superstructure, E&M Installation and Architectural Builders Works and Finishes (ABWF) etc. The construction plant inventory and utilization rate have been verified by the Project Engineer to be realistic, adequate and practical for completing the construction works within the intended schedule and sound power levels of various PME are presented in **Appendix 5.1**.

5.4 Review of Construction Phase Impact

Identification and Evaluation of Impact

- 5.4.1 Potential construction noise impact would arise from the use of PME during the construction works of the Project. No percussive piling work is required for the construction of the Project. The construction activities of the Project have been identified and summarized in **Section 1.4**.
- 5.4.2 Only minor excavation works with depth ranging from 3m to 5m and width of no more than 5m would be required for the temporary drainage diversion (about 450m in length) during the construction phase. For sheet piles installation, “Press-in” method will be adopted rather than the use of traditional vibratory hammer due to lesser noise and vibration impact generated. According to the EPD web page, the noise emission of “Press-in” method is 70 dB(A) at 7 m from the silent piler, which is more than 20 dB(A) quieter than the vibratory hammer.
- 5.4.3 A two-level station with at-grade concourse and elevated side-platforms would be constructed, where the majority of the aboveground superstructure works would be performed with precast / prefabrication. The general construction works for the Project would mainly involve the delivery, storage, and assembly of precast modules to form the station structure. Installation of precast segments would adopt Design for Manufacture and Assembly (DfMA) approach where mainly assembly works for modularised items would be carried out. This approach is widely considered more environmentally friendly than traditional construction methods. Only ready-mix concrete would be delivered by concrete truck to the casting yard, and no in-situ concreting would be carried out within the casting yard. Minimal PME, such as mobile crane and lorry will be required.
- 5.4.4 Construction Noise Management Plan (CNMP) will be submitted to the Director in the later tendering, design and construction stages. In addition to the works stated in **Section 5.4.1** above, the potential noise impacts arising from the construction activities at the Works Areas (e.g. setting up of site office, loading/unloading/transportation of construction materials) should also be thoroughly considered and addressed in the construction noise assessment. The CNMP will include quantitative construction noise impact assessment, the adopted quieter construction method and equipment, noise mitigation measures and the construction noise impact monitoring and audit programme, with reference to the updated and identified noise mitigation measures and/or plant inventory once available and in any case before the tender invitation, and if there is any change to the recommended mitigation measures and/or plant inventory, before the commencement of construction. Technical constraint that would hinder the use of the quieter construction method and equipment will be evaluated and recorded in the CNMP.

Concurrent Projects

- 5.4.5 The construction of the Project would be carried out concurrently with the project under HSK/HT NDA that may induce cumulative environment impacts. The concurrent projects are listed in **Section 1.5.1**.

5.5 Mitigation Measures for Construction Phase Impact

5.5.1 To minimize construction phase impact, various mitigation options listed below would be considered:

- Good site practices to limit noise emissions at the sources;
- Use of extended noise barrier above site hoarding as noise barrier to screen noise at ground levels of NSRs;
- Use of quality PME with lower sound power level (SWL);
- Use of movable noise barriers and noise enclosures (where appropriate) to screen noise from relatively static PME; and
- Use of quiet construction methods.

5.5.2 The above mitigation measures would be implemented in work sites as good practices where appropriate. Detailed descriptions of these mitigation measures are given in the following sections.

Good Site Practice

5.5.3 Although the noise mitigation effects are not easily quantifiable and the benefits may vary with site conditions and operating conditions, good site practices would be easy to implement and do not impact upon the works schedule. The site practices listed below would be followed during construction works:

- (1) Only well-maintained plant would be operated on-site and would be serviced regularly during the construction period;
- (2) Silencers or mufflers on construction equipment would be utilised and properly maintained during the construction period as practicable;
- (3) Mobile plant would be sited as far from NSRs as possible;
- (4) Machines and plant (such as trucks) that may be in intermittent use would be shut down between work periods or would be throttled down to a minimum;
- (5) Plant known to emit noise strongly in one direction would, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and
- (6) Material stockpiles and other structures would be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

5.5.4 To reduce the noise impacts at the affected NSRs during normal daytime working hours, mitigation measure such as adopting quality PME (QPME) is recommended. The type of QPME adopted in this assessment is for reference only. Future contractors may adopt alternative QPME as long as it can be demonstrated that they would not result in construction noise impacts worse than those predicted in this assessment.

Use of Extended Noise Barrier Above Site Hoarding

5.5.5 Purpose built temporary noise barriers above hoarding located on the site boundaries between noisy construction activities and NSRs could generally reduce noise levels at low-level zone of NSRs through partial screening. It would be possible to provide these in the form of site hoarding to achieve this attenuation effect, provided that they have no openings or gaps and have a superficial surface density of at least 3kg/m². Good site

practice shall also be adopted to ensure the conditions of the hoardings are properly maintained throughout the construction period.

Adoption of Quality PME

5.5.6 For the use of quality plants associated with the construction works, reference has been made to QPME list available on the Environmental Protection Department (EPD) website, which contains the SWLs for specific QPME. The proposed QPMEs have been confirmed by the Project Engineer to be technical feasible and practical to replace the original PMEs for completing the construction works within the intended schedule. The respective SWLs are presented in **Table 5.3** below.

Table 5.3 Recommended List of QPME and their Sound Power Levels

Regular PME	Equipment	SWL, dB(A)	QPME ID	Description	SWL, dB(A)
CNP 001	Air compressor, air flow $\leq 10\text{m}^3/\text{min}$	100	EPD-10517	Air Compressor, DENYO CO LTD / DENYO, Model: DAS180LB	94
CNP 024	Breaker, hand-held, mass $>10\text{kg}$ and $<20\text{kg}$	108	EPD-12751	Hand-held Percussive Breaker, HILTI, Model: TE1000-AVR	99
CNP 048	Crane, mobile/ barge mounted (diesel)	112	EPD-10768	Crane, Mobile, SENNEBOGEN, Model:653	101
CNP 048	Crane, mobile/ barge mounted (diesel)	112	EPD-10143	Crane, mobile Sunward - Cummins, Model: SWTC10	100
CNP 048	Crane, mobile/ barge mounted (diesel)	112	EPD-05797	Crane, mobile Maeda, Model: CC985S-1	91
CNP 103	Generator, super silenced, 70 dB(A) at 7 m	95	EPD-10735	Generator, DENYO Model: DCA-45LSK	87
CNP 081	Excavator/ loader, wheeled/ tracked	112	EPD-12196	Excavator, KOMATSU, Model:PC78US-8	95

Regular PME	Equipment	SWL, dB(A)	QPME ID	Description	SWL, dB(A)
CNP 186	Roller, vibratory	108	EPD-11837	Roller, vibratory, Bomag, Model: BW135 AD-5	106

Use of Movable Barriers

- 5.5.7 Use of movable noise barriers at the PME are recommended. The barriers would be placed as close to the PME as possible and at a location intercepting the line of sight between the NSRs and PME. To ensure the effectiveness, the movable noise barriers should have sufficient height (i.e. tall enough to screen the noise source from the NSRs) and width (i.e. at least five times greater than its height or be bent around the noise sources, if practicable), and have no gaps or openings at joints in the barrier materials. They should also be lined with suitable absorptive material(s) to prevent potential noise reflections. To minimize the noise leakage, they would also have a minimum surface density of 10 kg/m² (or equivalent noise performance) and be moved concurrently with the PME along the work sites. A cantilevered top cover would be used for noise screening for upper floors of NSRs to achieve screening benefits. According to the Guidance Note on Preparation of Construction Noise Impact Assessment GN No.9/2010, noise reduction of 5dB(A) and 10dB(A) can be achieved by direct application of the noise barriers to movable and stationary plant, respectively. The schematic diagram for typical construction noise barrier is provided in **Appendix 5.2**. The application of movable noise barriers for PME and their respective reductions in noise levels are summarised in **Table 5.4**.

Table 5.4 Summary of Movable Noise Barrier Adopted for PMEs

PME	Noise Mitigation Measures	Attenuation, dB(A)
Compactor, vibratory	Noise Barrier	-5
Concrete lorry mixer	Noise Barrier	-5
Concrete pump, stationary/ lorry mounted	Noise Barrier	-5
Crane, mobile/ barge mounted (diesel)	Noise Barrier	-5
Drill rig, rotary type (diesel)	Noise Barrier	-5
Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne	Noise Barrier	-5
Grout pump	Noise Barrier	-5
Lorry, with crane/grab, 5.5 tonne < gross vehicle weight ≤ 38 tonne	Noise Barrier	-5
Piling, large diameter bored, oscillator	Noise Barrier	-5
Poker, vibratory, hand-held (electric)	Noise Barrier	-5

Saw, chain, hand-held	Noise Barrier	-5
Self-Propelled Modular Transporter ^[1]	Noise Barrier	-5
Water pump, submersible (electric)	Noise Barrier	-5

Note:

[1] The sound power level of the self-propelled modular transporter shall be verified by using a more comprehensive measurement method in the later CNMP stages.

Use of Quiet Construction Methods

- 5.5.8 For sheet piles installation, “Press-in” method is more preferable than the use of traditional vibratory hammer due to lesser noise and vibration impact generated. According to the EPD web page, the noise emission of “Press-in” method is 70 dB(A) at 7 m from the silent piler, which is more than 20 dB(A) quieter than the vibratory hammer. The Contractor should prioritise the use of “Press-in” method over the traditional method if site conditions allow. However, “Press-in” method would also have its own limitations and thus it should not restrict Contractor to fully adopt the “Press-in” as long as the Contractor can demonstrate the full compliance of daytime noise criteria by using vibratory hammer with proper mitigation measures.
- 5.5.9 The majority of the aboveground superstructure works would be performed with precast / prefabrication. The general construction works for the Project would mainly involve the delivery, storage, and assembly of precast modules to form the station structure. The use of precasting and prefabrication technology to replace the in-situ construction has also reduced the amount of mechanical equipment used on site and therefore the cumulative noise impact.
- 5.5.10 To reduce the construction noise impact, self-compacting concrete, in the form of tremie concrete for bored pile, will also be adopted instead of using concrete poker for compacting as far as practicable and subject to detailed design.
- 5.5.11 Other quieter construction methods or technologies shall also be considered to reduce the noise at its source if they are technically feasible and applicable for the proposed construction works, for example, hand-held concrete crusher, quieter type blade saw/wire saw and hydraulic crusher. The implementation of these quieter construction methods/equipment (QCM/E) should be reviewed and carried out during the design, tendering and implementation stage of the construction works as far as practicable.

5.6 Operation Phase

Railway Noise

Representative NSRs

- 5.6.1 The assessment area for railway noise impact assessment covers an area within 300m from the Project Site Boundary. The first layer (i.e. nearest) of existing and planned NSRs from the WRL tracks are identified as representative NSRs for railway noise prediction as it would provide noise shielding to those NSRs at further distance behind.

5.6.2 Representative existing and planned NSRs are shown in **Table 5.5** and **Figure 5.2**. These representative NSRs are identified based on the latest maps and the approved Hung Shui Kiu and Ha Tsuen Outline Zoning Plan (No. S/HSK/2). As stipulated in the EIAO-TM, the adopted noise criteria are the Acceptable Noise Levels (ANLs) shown in the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM). The EIAO-TM also specifies the noise limit of L_{max} 85 dB(A) during night-time (2300-0700 hours).

Table 5.5: Representative NSRs for Railway Noise Impact Assessment

NSR ID	Description	Use	ASR	Noise Criteria ($L_{eq,30min}$, dB(A))		Remark
				Day and Evening Time	Night-Time	
Existing NSRs						
N3	Premises to the Northeast of Proposed HSK Station Boundary	Residential	A ^[1]	60	50	See [2]
N4	Village House No. 143, Tin Sam Tsuen	Residential	A ^[1]	60	50	-
Planned NSRs						
PN2	Planned School in Area 34C	Educational	B ^[3]	65	N/A	See [4]
PN3	Planned Residential Development in Area 34B	Residential	B ^[3]	65	55	See [5]
PN4-1	Planned Residential Development in Area 28B	Residential	B ^[3]	65	55	See [6]
PN4-2						
PN4-3						
PN4-4						
PN5-1	Planned Residential Development in Area 28A	Residential	B ^[3]	65	55	See [7]
PN5-2						
PN6	Planned Student Hostel in Area 31A	Residential	B ^[3]	65	55	-

Note:

- [1] These NSRs are located in a “rural area, including country parks or village type development” and not affected by an Influencing Factor (IF).
- [2] N3 corresponds to the NSR 114a in the approved EIA for WRL, and the Noise Assessment Point WR-E3 (NSR E4-IA) from the approved EIA for HSK/HT NDA.
- [3] These planned NSRs are anticipated to be located in an “urban area” containing high-rise buildings with a mixture of residential premises, commercial activities and governmental institutions, etc., and not affected by an Influencing Factor (IF).
- [4] PN2 corresponds to NSR P4-08 and Noise Assessment Point WR-P2 from the approved EIA for HSK/HT NDA.
- [5] PN3 corresponds to NSR P4-10 and Noise Assessment Point WR-P3 from the approved EIA for HSK/HT NDA.
- [6] PN4-1, PN4-2 and PN4-3 correspond to Noise Assessment Points WR-P6c, WR-P6b & WR-P6a (NSR P4-25) from the approved EIA for HSK/HT NDA.
- [7] Locations of PN5-1 and PN5-2 are incorporated with the required setback in the HSK/HA OZP.

5.6.3 The operation parameters related to the railway noise performance of WRL (e.g. train frequency, speed profile, source terms, etc.) will not be affected by the Project except that the speed profile of train when approaching/leaving the station would be reduced, which would even lead to a better noise performance. As such, the operational railway noise impact assessed in the approved “West Rail Operational Train Noise Assessment Report” in 2015 are still valid.

- 5.6.4 The majority of existing NSRs within the assessment area (e.g. Yick Yuen Tsuen, premises to the north of Yick Yuen Tsuen, premises to the north of Wing Fat Fishery, premises to the west of Tin Sam, etc.) that have been identified in the approved EIA for WRL and the approved “West Rail Operational Train Noise Assessment Report” are located within the HSK/HT NDA and are planned to be redeveloped. According to the latest tentative programme of HSK/HT NDA and land resumption schedule, those areas will be resumed in 2024 and 2026. By the time of the Project’s operation phase commencement in 2030, these NSRs would have been demolished to facilitate the development of HSK/HT NDA. It is highly unlikely that those existing NSRs would still remain despite any potential slippage in the land resumption schedule. Among the existing NSRs that would be retained in HSK/HT NDA, a representative NSR N3 in premises to the northwest of Proposed HSK Station, which corresponds to NSR 114a in the approved EIA for WRL and NSR E4-IA (Noise Assessment Point WR-E3) in the approved EIA for HSK/HT NDA, was identified for the assessment of any potential noise impact induced by the Project.
- 5.6.5 In Section 4.8 of the approved EIA for HSK/HT NDA, a layout setback of 70m from the railway tracks was recommended as the railway noise mitigation measure for the planned residential development at Area 28A (referred as Site 4-29 in the approved EIA for HSK/HT NDA). From the HSK/HT OZP, a layout setback of “more than 90m from the railway tracks” would be planned for residential development at Area 28A. Any potential railway noise impact would be further reduced. This setback distance specified in HSK/HT OZP has been incorporated in the locations of the representative NSRs PN5-1 and PN5-2 for assessment.
- 5.6.6 From the HSK/HT OZP, Area 31A to the southwest of the Project would be planned for post-secondary education use for the purpose of providing academic facilities, student hostels and/or other related ancillary facilities depending on the prevailing needs and requirements by the Education Bureau. Referring to the approved EIA for HSK/HT NDA, academic facilities for tertiary education were anticipated to be provided with central air conditioning and therefore not considered as representative points for noise impact assessment, while a representative Noise Assessment Point PN6 was identified for the assessment for the potential student hostel development in Area 31A.
- 5.6.7 Also, from the HSK/HT OZP, Area 26A to the south of the Project would be planned for a Regional Government Complex. The approved EIA for HSK/HT NDA recommended the future development proponents “to conduct a stand-alone Railway Noise Impact Assessment (RNIA) to assess the potential noise impacts from rail operations on future occupants and implement the aforesaid or other specific design noise mitigation measurement at their respective development sites to the satisfaction of EPD, to ensure full compliance with the statutory noise limits.” This site is located in the vicinity of the existing WRL viaduct but at least 120m away from the Project. Potential noise impacts from railway operations would be mainly from the existing WRL viaduct and any noise impacts due to the Project would be insignificant. Careful planning of areas of noise sensitive uses and insensitive uses within the premises would likely be required by the future development proponent.

Railway Noise Assessment Methodology

- 5.6.8 From the train operation along WRL, three key noise sources of train-induced airborne noise were identified: (i) rolling noise from wheel/rail interaction; (ii) noise from air-conditioning units on top of trains; and (iii) viaduct re-radiated noise.

5.6.9 The assessment of airborne train noise is carried out based on the methodology specified in the “Calculation of Railway Noise (1995)” (CRN) by the UK Department of Transport, and the measured railway noise source terms of WRL train from the “West Rail Operational Train Noise Assessment Report” prepared by MTRCL. A computational model using CadnaA (version 2022 MR 2), which is a modelling software developed by Datakustik GmbH from Germany, has been constructed to predict and assess the propagation of the airborne railway noise. A summary of the train noise parameters and correction factors is shown in **Table 5.6**. The assumptions and calculation methodology are included in **Appendix 5.3**.

Table 5.6: Train Noise Parameters and Correction Factors

Parameter	Assumption / Remark
Train Type	Electric Multiple Unit (EMU) train, train length 200m for 8-car train
Train Noise Source Term for 8-car train at 130 km/h at 25 m	<ul style="list-style-type: none"> • Rolling Noise Sound Exposure Level (SEL): 81.4 dB(A) ^[1,2] • Air-Conditioning Noise <ul style="list-style-type: none"> ♦ For running train, L_{max} at viaduct: 48.8 dB(A) ^[1,2] L_{max} at station: 54.8 dB(A) ^[1,2] ♦ For each air-conditioning unit of stationary train, Sound Power Level (SWL): 83.5 dB(A) ^[1,2] • Viaduct Re-radiated Noise $L_{eq,30min}$: 40.6 dB(A) (typical viaduct – plain track) ^[1,2]
Track and Rolling Stock Condition Deterioration Correction	+3.0 dB(A) ^[1]
Train Speed Correction	+20 log(V/V_{ref}) dB(A), where V_{ref} is the reference train speed 130 km/h and V is the train speed in km/h
Train Frequency Correction	+10 log(N) dB(A), where N is the number of trains per 30 minutes per direction $N = 14$ during day and evening time ^[1,2] $N = 10$ during night-time ^[1,2]
Distance Correction	-10 log(d'/d_{ref}) dB(A), where d' is the slant distance (in metre) from track to NSR and d_{ref} is the reference distance 25 m
Air Absorption Correction	+(0.2 - 0.008 d') dB(A), where d' is the slant distance (in metre) from track to NSR
Angle of View Correction	+ (10 log($\frac{\pi\theta}{180} - \cos 2\alpha \sin \theta$) - 5) dB(A), where θ is the angle of view, and α is the acute angle between the line drawn parallel to the track through the NSR and the line bisecting θ
Reflection Correction	+1.5 ($\frac{\theta'}{\theta}$) dB(A), where θ' is the sum of the angles subtended by all reflecting façades on the opposite side of the railway facing the receiver point, and θ is the total angle subtended by the source line at the reception point, +1.5 dB(A) for maximum correction
Barrier Correction	As per CRN Chart 6(a)
Façade Correction	+2.5 dB(A)
Conversion of SEL to $L_{eq,30min}$	-10 log(1800) dB(A)

Parameter	Assumption / Remark
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Note:

[1] Referring to the “West Rail Operational Train Noise Assessment Report” prepared by MTRCL in July 2015.

[2] Referring Referring to Appendix 4.15A of the approved Tuen Mun South Extension EIA.

- 5.6.10 Chapter 9 of Hong Kong Planning Standards and Guidelines (HKPSG) specifies a noise limit of 65 dB(A) for railway noise. Based on a conservative evaluation of $L_{eq,24hr}$ noise level adopting the noise level of the noisiest 30 minutes during day and evening time ($L_{eq,30min,day}$) to all 32 intervals during day and evening time (i.e. from 0700 to 2300 hours) and the noise level of the noisiest 30 minutes during night-time ($L_{eq,30min,night}$) to all 16 intervals during night-time (i.e. from 2300 to 0700 hours), the $L_{eq,24hr}$ noise level can be expressed as an energy-weighted average of $L_{eq,30min,day}$ and $L_{eq,30min,night}$:

$$L_{eq,24hr} = 10 \log \left(\frac{32}{32 + 16} \times 10^{\left(\frac{L_{eq,30min,day}}{10}\right)} + \frac{16}{32 + 16} \times 10^{\left(\frac{L_{eq,30min,night}}{10}\right)} \right)$$

Given that the maximum train frequency during night-time is lower than that during day and evening time, and other parameters remain unchanged, the $L_{eq,30min}$ noise level during night-time is lower than that during day and evening time. The $L_{eq,24hr}$ noise level, as an energy-weighted-average, is inherited as a value in between, and thus lower than the $L_{eq,30min}$ noise level during day and evening time, i.e.:

$$L_{eq,24hr} < L_{eq,30min,day}$$

As long as the $L_{eq,30min}$ noise level during day and evening time is within 65 dB(A) (i.e. the noise criteria for NSRs with ASR B under IND-TM), exceedance of $L_{eq,24hr}$ 65 dB(A) is not anticipated.

- 5.6.11 EIAO-TM specifies a noise limit of L_{max} 85 dB(A) for railway noise during night-time. According to Section 5.2 of “West Rail Operation Noise Assessment Report”, based on 8-car train running at a train speed of 130 km/h, the minimum buffer distance for the compliance of night-time L_{max} noise level of 85 dB(A) was evaluated to be approximately 4 m. Given that the same number of cars would be used, the maximum speed would not exceed 130 km/h and the separation distance between the NSRs and TML would be larger than 4 m, exceedance of L_{max} 85 dB(A) is not anticipated.

Fixed Noise

- 5.6.12 The first layer representative NSRs are identified in accordance with the approved EIA for HSK/HT NDA and the approved HSK/HT OZP. The summary of first layer representative NSRs are listed in **Table 5.7** below. The locations of the identified NSRs are presented in **Figure 5.3**.
- 5.6.13 The prevailing background noise measurement was conducted at a single location near Tin Sam Tsuen on 8 April 2022 and 9 April 2022, which was intended to represent both the existing NSR N3 and N4 locations. As mentioned in **Section 5.6.4**, NSR N3 would be retained under HSK/HT NDA. For other planned NSRs, the prevailing background noise measured would not be representative given that the surrounding environment would change drastically upon the completion of the planned developments. Thus, the prevailing background noise measurement at planned NSRs is omitted. The measurement report was incorporated in **Appendix 5.4**. The prevailing background noise level including façade correction is 50 dB(A) for day/evening period and 48 dB(A) for night-time period.

Table 5.7: Representative Noise Sensitive Receivers for Fixed Noise Impact Assessment

NSR ID	Description	Use ^[1]	ASR ^[3]	Noise Criterion for Planned Fixed Noise Source, dB(A)		Noise Criterion for Cumulative Noise (Fixed Noise + Railway Noise), dB(A)	
				Day and Evening Time	Night-Time	Day and Evening Time	Night-Time
Existing NSRs							
N3	Premises to the Northeast of Proposed HSK Station Boundary	R	A	50	45	60	50
N4	Village House No. 143, Tin Sam Tsuen	R	A	50	45	60	50
Planned NSRs							
PN2	Planned School in Area 34C	E	B	60	N/A ^[2]	65	N/A ^[2]
PN3	Planned Residential Development in Area 34B	R		60	50	65	55
PN4-1	Planned Residential Development in Area 28B	R		60	50	65	55
PN4-2				60	50	65	55
PN4-3				60	50	65	55
PN4-4				60	50	65	55
PN5-1	Planned Residential Development in Area 28A	R		60	50	65	55
PN5-2			60	50	65	55	
PN6	Planned Student Hostel in Area 31A	R	60	50	65	55	

Note:

[1] R - Residential premises; E - Education

[2] Educational use is not considered to operate during night-time period.

[3] ASR of the representative NSRs is referenced to Table 4.36 of the approved EIA for HSK/HT NDA

5.6.14 Quantitative estimation of maximum allowable sound power levels (SWLs) of the planned fixed noise sources of the Project (i.e., HSK-1 to HSK-8) would be conducted in detailed design stage later with finalised plantroom layout and design of planned NSRs nearby. The planned fixed noise sources of the Project include side louvers (i.e. HSK-1 to HSK-4) and rooftop plant (i.e. HSK-5 to HSK-8). Corrections of tonality, intermittency or impulsiveness are not included owing to the lack of design/supplier information at this stage. If the noise exhibits any of these characteristics during detailed design or procurement stage, the max. SWLs of the plants should be reduced in accordance with the recommendation given in IND-TM. The design of the fixed plant noise sources associated with the operation of the Project shall comply with the requirements in EIAO-TM having due regard to the characteristics of tonality, impulsiveness and intermittency. Other planned fixed noise sources near the Project would include sewage pumping station, public transport interchange and electricity substation as stated in **Table 5.8**

below. Location of the planned fixed noise sources is presented in **Figure 5.3**.

Table 5.8: Summary of Planned Fixed Noise Sources of the Project and other Planned Fixed Noise Sources

Planned Noise Source	Description	Maximum Allowable SWL, dB(A)	
		Day and Evening Time	Night-Time
HSK-1 ^[1]	Side Louver	90	86
HSK-2 ^[1]	Side Louver	82	77
HSK-3 ^[1]	Side Louver	95	90
HSK-4 ^[1]	Side Louver	90	85
HSK-5 ^[1]	Roof Plant	90	86
HSK-6 ^[1]	Roof Plant	83	78
HSK-7 ^[1]	Roof Plant	95	86
HSK-8 ^[1]	Roof Plant	95	87
3-41 ^[2]	Planned Sewage Pumping Station	95	85
4-13a ^{[2][3]}	Public Transport Interchange (PTI)	99	89
4-23 ^[2]	Planned Electricity Substation	89	79
4-29 ^{[2][3]}	Public Transport Interchange (PTI)	96	86

Note:

[1] Planned fixed noise sources within Project Site. Location of HSK-1 to HSK-8 is based on latest design information.

[2] Planned fixed noise sources outside Project Site, as referenced to the approved EIA for HSK/HT NDA.

[3] The location of 4-13a and 4-29 is referenced to latest PTI layout received from CEDD in April 2022.

5.6.15 Preliminary estimation of the maximum allowable SWLs of the planned fixed noise sources of the Project (i.e., HSK-1 to HSK-8) is based on best available information. Other planned fixed noise sources in the vicinity of the Project site are referenced from the approved EIA for HSK/HT NDA and latest information on planned PTI received from CEDD in April 2022.

5.7 Review of Operation Phase Impact

Prediction and Evaluation of Railway Noise Impacts

5.7.1 The predicted railway noise levels for the unmitigated scenario are summarised in **Table 5.9** and the predicted railway noise levels at individual floors are included in **Appendix 5.5**. The predicted railway noise levels at PN4-2, PN4-4 and PN5-2 exceeded the night-time noise criteria by 1 to 2 dB(A).

5.7.2 The predicted noise exceedance was proposed to be mitigated by acoustic canopies of 1.6 m width at the roof level as shown in **Image 2.1** in **Section 2**. The acoustic canopies have noise absorptive surface at their underside facing tracks, and their locations are shown in **Figure 5.4**.

5.7.3 The predicted railway noise levels for the mitigated scenario are summarised in **Table 5.10** and the predicted railway noise levels at individual floors are provided in **Appendix 5.5**. With the acoustic canopies, the predicted railway noise levels at all representative

NSRs complied with the relevant noise criteria.

Table 5.9: Summary of Predicted Railway Noise Levels – Unmitigated Scenario

NSR ID	Description	Floor Level, mPD	Noise Criteria, dB(A)		Predicted Railway Noise Levels ^[1] , dB(A)	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
Existing NSRs						
N3	Premises to the Northeast of Proposed HSK Station Boundary	7.7	60	50	49	47
N4	Village House No. 143, Tin Sam Tsuen	7.9 – 12.4	60	50	49 – 50	47 – 48
Planned NSRs						
PN2	Planned School in Area 34C	11 – 47	65	N/A	44 – 50	N/A
PN3	Planned Residential Development in Area 34B	11 – 176	65	55	46 – 54	44 – 53
PN4-1	Planned Residential Development in Area 28B	12 – 178	65	55	46 – 54	45 – 52
PN4-2			65	55	50 – 59	49 – 57
PN4-3			65	55	48 – 57	46 – 55
PN4-4			65	55	48 – 57	47 – 56
PN5-1	Planned Residential Development in Area 28A	13 – 178	65	55	48 – 56	46 – 55
PN5-2			65	55	49 – 57	47 – 56
PN6	Planned Student Hostel in Area 31A	13 - 77	65	55	47 – 55	45 – 53

Note:

[1] Figures in bold indicate predicted noise exceedances of noise criteria.

Table 5.10: Summary of Predicted Railway Noise Levels – Mitigated Scenario

NSR ID	Description	Floor Level, mPD	Noise Criteria, dB(A)		Predicted Railway Noise Levels, dB(A)	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
Existing NSRs						
N3	Premises to the Northeast of Proposed HSK Station Boundary	7.7	60	50	49	47
N4	Village House No. 143, Tin Sam Tsuen	7.9 – 12.4	60	50	49	47– 48

NSR ID	Description	Floor Level, mPD	Noise Criteria, dB(A)		Predicted Railway Noise Levels, dB(A)	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
Planned NSRs						
PN2	Planned School in Area 34C	11 – 47	65	N/A	44 – 49	N/A
PN3	Planned Residential Development in Area 34B	11 – 176	65	55	45 – 54	44 – 53
PN4-1	Planned Residential Development in Area 28B	12 – 178	65	55	45 – 51	44 – 50
PN4-2			65	55	49 – 55	47 – 53
PN4-3			65	55	45 – 53	44 – 52
PN4-4			65	55	46 – 53	44 – 51
PN5-1	Planned Residential Development in Area 28A	13 – 178	65	55	47 – 55	46 – 53
PN5-2			65	55	48 – 57	47 – 55
PN6	Planned Student Hostel in Area 31A	13 - 77	65	55	46 – 55	45 – 53

Potential Cumulative Railway Noise Impact with other Concurrent Projects

- 5.7.4 At the time of the preparation of this ERR, the study by CEDD on the Environmentally Friendly Transport Services (EFTS) under the HSK/HT NDA was still in the early planning stage. According to the approved EIA for HSK/HT NDA, the modes of the proposed EFTS could be in form of rail-based or road-based. If the EFTS is confirmed to be rail-based, it is anticipated that the associated environmental impact would be addressed in a separate EIA study to be submitted by the project proponent of the EFTS.

Prediction and Evaluation of Fixed Noise Impacts

- 5.7.5 Typical fixed plant including transformer, pumps, ventilation fans, smoke extraction fans, small power outdoor A/C units etc are expected within the Project. The majority of these noise sources (e.g., transformers and pumps) would be enclosed within plant rooms with fresh air louvres, exhaust air louvres etc while some of them would be located on the rooftop of the Project. **Table 5.8** and **Appendix 5.6** summarises the list of proposed fixed noise sources of the Project and other planned fixed noise sources in the vicinity of NSRs within the 300m assessment area of the Project.

Cumulative Noise Impact with Railway Noise

- 5.7.6 There would be cumulative noise impact at the representative NSRs due to planned fixed noise source and railway noise. Based on current design, NSRs located at lower floor levels would be mainly affected by fixed noise sources, but lesser impact from railway noise due to the screening effect by the viaduct. Alternatively, the NSRs located at higher floor levels would be mainly affected by railway noise, but lesser impact from fixed noise impact due to the distance attenuation. The result of cumulative operational noise impact at representative NSRs is shown in **Table 5.11** and **Appendix 5.6**. The cumulative operational noise level would comply with the noise criteria (i.e., Leq (30 min) for both day/evening time and night-time) given that maximum allowable SWL is achieved.

Table 5.11: Summary of Predicted Cumulative Operational Noise Levels

NSR ID	Description	Floor Level, mPD	Noise Criteria, dB(A)		Max. Cumulative Impact, (Planned Fixed Noise + Railway Noise), dB(A)	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
Existing NSRs						
N3	Premises to the Northeast of Proposed HSK Station Boundary	7.7	60	50	53	49
N4	Village House No. 143, Tin Sam Tsuen	7.9 – 12.4	60	50	50	48
Planned NSRs						
PN2	Planned School in Area 34C	11 – 47	65	N/A	52	N/A
PN3	Planned Residential Development in Area 34B	11 – 178	65	55	55	53
PN4-1	Planned Residential Development in Area 28B	12 – 178	65	55	53	51
PN4-2			65	55	57	54
PN4-3			65	55	59	54
PN4-4			65	55	58	53
PN5-1	Planned Residential Development in Area 28A	13 – 178	65	55	57	54
PN5-2			65	55	58	55
PN6	Planned Student Hostel in Area 31A	13 - 77	65	55	56	53

5.8 Mitigation Measures for Operation Phase Impact

- 5.8.1 The railway noise mitigations were proposed in form of providing acoustic canopies at station as shown in **Image 2.1** in **Section 2** of this ERR and as described above. The predicted railway noise levels at all representative NSRs complied with the relevant noise criteria.
- 5.8.2 The proper noise mitigation measures were proposed to ensure that fixed noise impact resulting from the planned fixed noise sources of the Project would be minimised. With the proper implementation of noise mitigation measures, the maximum allowable SWL of planned fixed noise sources of the Project would be achieved.
- 5.8.3 Given that the Project would be in proximity to existing and planned residential uses, noisy equipment and direction of louvers shall be designed in accordance with “Good Practices on Ventilation System Noise Control” issued by EPD as stated below:
- Equipment would be placed in a plant room with thick walls or at a much greater distance from the receiver or behind some large enough obstruction (e.g. a building or a barrier) as far as practicable;

- Quieter plant would be chosen as far as practicable;
- Noise levels specification would be included when ordering new plant items;
- All openings, including louvers for ventilation and machine room doors would be oriented away from the NSRs as far as practicable;
- Silencers, acoustic louvers or acoustic door would be used where necessary; and
- Regularly scheduled plant maintenance programme would be developed and implemented such that plant items are properly operated and serviced in order to maintain controlled level of noise and vibration.

5.8.4 Given that the abovementioned good practices are well implemented, no adverse noise impact from the planned fixed noise sources associated with the Project would be anticipated.

5.9 Environmental Monitoring and Audit Requirement

Construction Phase

5.9.1 Noise monitoring is recommended as part of the environmental monitoring and audit (EM&A) programme for the construction phase of the Project to check the compliance of the daytime construction noise criteria. Please refer to **Section 13** for details of the environmental monitoring and audit schedule.

Operational Phase

5.9.2 Before the commissioning of the Project, compliance check on railway noise against the NCO criteria should be conducted. Furthermore, Fixed Noise Audit Report (FNAR) should be prepared, while verification of the noise performance of the fixed plants should be conducted during the testing and commissioning stage. Please refer to **Section 13** for details of the environmental monitoring and audit schedule.

5.10 Conclusion

Construction Phase

5.10.1 Construction noise associated with the use of PME for different phases of construction has been conducted. With the implementation of practical mitigation measures including good site management practices, use of “quiet” plant, use of movable noise barrier and use of quieter construction method, construction noise impacts on all representative NSRs would comply with the relevant criteria.

Operational Phase

5.10.2 It is not expected that the operation parameters related to the railway noise performance of WRL would be affected by the Project except that the speed profile of train when approaching/leaving the station would be reduced, which would even lead to a better noise performance. The operational railway noise impact assessed in the approved EIA

for WRL and the approved “West Rail Operational Train Noise Assessment Report” in 2015 are still valid. In view of the HSK/HT NDA in the vicinity of the Project, a railway noise impact assessment for planned developments was also conducted. Railway noise impacts on all representative NSRs would comply with the relevant criteria with the provision of acoustic canopies and sound absorbing material at the station.

- 5.10.3 For fixed noise impact, planned fixed noise sources of the Project were identified. With proper implementation of the proposed mitigation measures and good practice, adverse fixed noise impact at existing and planned NSRs is not anticipated. As such, cumulative fixed noise impact and cumulative operational noise impact on representative NSRs would be expected to be insignificant.

6 REVIEW OF WATER

6.1 Review of Approved EIA

6.1.1 The approved EIA for WRL was reviewed and reference to the approved EIA for HSK/HT NDA was made in the review of water quality impacts during construction and operation of the Project. All sewage effluent, wastewater and washed water generated from the Project would be discharged to the public sewerage system and no wastewater would be discharged to the nearby water bodies during operation phase.

6.2 Baseline Condition

6.2.1 The water quality of Tin Shui Wai Main Channel and its tributaries is routinely monitored by EPD. According to the River Water Quality in Hong Kong in 2020 (the latest information available), Tin Shui Wai Nullah had an overall Water Quality Objectives (WQO) compliance of 86% in 2020. The upstream monitoring station (TSR2) and downstream station (TSR1) maintained “Good” and “Fair” Water Quality Index (WQI) respectively in 2020. The water quality at these two EPD monitoring stations in the TSW Catchment is summarised in **Table 6.1**.

Table 6.1: Summary of River Water Quality Data at Tin Shui Wai Nullah in 2020

Parameters	EPD Stations		WPCO WQO
	TSR1	TSR2	
Dissolved oxygen (DO) (mg/L)	5.9 (2.5 – 7.2)	9.2 (8.1 – 10.3)	Waste discharges shall not cause the level of dissolved oxygen to be less than 4 mg/L
pH	7.6 (6.9 – 8.2)	8.5 (7.5 – 9.0)	The pH of the water should be within the range of 6.0-9.0
Suspended solids (SS) (mg/L)	9.7 (2.0 – 28.0)	5.4 (2.5 -250.0)	Waste discharges shall not cause the annual median of suspended solids to exceed 20mg/L
5-day Biochemical Oxygen Demand (BOD) (mg/L)	5.6 (4.5 – 21.0)	2.0 (1.6 – 2.7)	Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 5mg/L
Chemical Oxygen Demand (COD) (mg/L)	15 (9 - 41)	6 (3 - 14)	Waste discharges shall not cause the chemical oxygen demand to exceed 30mg/L
Oil & grease (mg/L)	<0.5 (<0.5 - <0.5)	<0.5 (<0.5 - <0.5)	Not available
Faecal coliforms (cfu/100 mL)	260,000 (26,000 - 3,600,000)	21,000 (5,500 - 91,000)	Not available
<i>E. coli</i> (cfu/100mL)	480,000 (77,000 – 4,100,000)	49,000 (20,000 – 170,000)	Not exceed 1,000 per 100 ml, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days

Parameters	EPD Stations		WPCO WQO
	TSR1	TSR2	
Ammonia-nitrogen (mg/L)	2.60 (0.97 – 5.00)	0.56 (0.23 – 1.80)	Not available
Nitrate-nitrogen (mg/L)	0.62 (0.006 - 1.20)	0.75 (0.65 – 2.20)	
Total Kjeldahl nitrogen (mg/L)	3.10 (1.70 – 6.00)	1.30 (0.38 – 2.50)	Not available
Ortho-phosphate (mg/L)	0.14 (0.015 - 0.37)	0.057 (0.009 - 0.120)	
Total phosphorus (mg/L)	0.31 (0.22 - 0.65)	0.10 (0.04 – 0.23)	Not available
Sulphide (mg/L)	<0.02 (<0.02 - 0.06)	<0.02 (<0.02 - <0.02)	
Aluminium (µg/L)	71 (<50 - 125)	141 (<50 - 421)	Not available
Cadmium (µg/L)	<0.1 (<0.1 - <0.1)	<0.1 (<0.1 - <0.1)	
Chromium (µg/L)	<1 (<1 - <1)	<1 (<1 - <1)	Not available
Copper (µg/L)	5 (2 - 10)	<1 (<1 - 1)	
Lead (µg/L)	<1 (<1 - <1)	<1 (<1 - <1)	Not available
Zinc (µg/L)	<10 (<10 - 25)	<10 (<10 - 19)	
Flow (m ³ /s)	Not Measured	0.108 (0.05 – 0.37)	Not available

Note:

- (1) Data source: River Water Quality in Hong Kong in 2020 (EPD).
- (2) Data presented are annual medians of monthly samples except for *E. coli* and faecal coliforms that are annual geometric means.
- (3) Data in brackets indicate the ranges.
- (4) Equal values for annual medians (or geometric means) and ranges indicate that all data are the same as or below laboratory reporting limits.

6.3 Representative Water Sensitive Receivers

6.3.1 The Water Sensitive Receivers (WSRs) in the vicinity (i.e. within 500m) from the Project Site were reviewed and identified in **Table 6.2** and shown in **Figure 6.1**.

Table 6.2: WSRs Identified within 500m from the Project Site

WSR	Description	Status
W1	Tin Shui Wai Nullah	Drainage channel
W2	Watercourse at South of San Sang San Tsuen	Drainage channel
W3	Western nullah of Tin Sam Channel Tributaries at West of WRL	Drainage channel

WSR	Description	Status
W4	Western nullah of Tin Sam Channel Tributaries at West of WRL	Drainage channel
W5	Tin Sam Channel	Drainage channel
W6	Eastern nullah of Tin Sam Channel Tributaries at East of WRL	Drainage channel
W7	Water Pond at West of the WRL	Abandoned pond
W8	Water Pond at West of the WRL	Abandoned pond
W9	Watercourse at Tsing Yick Road (upstream tributaries of Tuen Mun River	Drainage channel

6.4 Review of Construction Phase Impact

Potential Impacts on Water Quality

6.4.1 The Project would be bounded by a drainage channel (i.e., W5 as shown in **Figure 6.1**) along the east of the existing railway and a drainage channel (i.e., W4) along the west of the existing railway. Existing drainage channel W5 would conflict with the works area for the construction of the Project and a temporary drainage channel approximately 45 m to the east of existing drainage channel W5 would be constructed to maintain the drainage flow path of the Tin Sam Channel. Potential water impacts are mainly induced from land-based construction activities of the Project. The potential impacts may include:

- Construction of temporary drainage channel diversion;
- General construction activities;
- Construction site runoff;
- Sewage effluent from the construction workforce; and
- Accidental spillage

Construction of Temporary Drainage Channel Diversion

6.4.2 A temporary drainage channel would be constructed to maintain the drainage flow path of the Tin Sam Channel. Construction of temporary drainage channel would involve minor excavation, which may lead to temporary increase of suspended solids (SS) level and turbidity. Construction works may cause run-off and release of pollutants into the channels. No excavation would be anticipated for the backfilling of the existing drainage channel (besides the clearing of leaves and general debris).

6.4.3 The construction sequence for the drainage diversion works is described below and **Figure 1.2** shows the layout plan of the temporary drainage diversion scheme. A 4.5 m temporary open channel which is connected by two twin 2.2 m underground steel casing to existing drainage channel will be constructed for the drainage channel diversion.

Stage 1

- i. Mobilization of plants for the drainage diversion works.
- ii. Install sheet piles to the required depths.

Stage 2

- iii. Excavate to the formation level of the channel and pipe laying works. Suitable excavated soils should be stored temporarily at the designated areas on site with protective measures for future backfilling works.
- iv. Deliver precast concrete channel sections and pipe sections to site.
- v. Place and connect channel sections and pipe sections along the proposed drainage line.

Stage 3

- vi. Partial demolish the existing nullah walls and divert water from existing drainage to the proposed drainage line by concrete blocks

Stage 4

- vii. Backfill gaps and extract sheet piles to reinstate the area ground level.

General Construction Activities

- 6.4.4 Various types of construction activities that may generate wastewater including piling, general construction site cleaning and polishing, vehicle wheel and equipment washing, dust suppression and equipment installation, would be primarily land-based and may have the potential to cause water pollution. These types of wastewater may contain a high concentration of SS. Uncontrolled effluent could lead to deterioration in water quality.

Construction Site Run-Off

- 6.4.5 Construction site run-off would cause potential water quality impacts. Potential pollution sources of site run-off may include:
- Run-off and erosion of exposed bare soil and earth, drainage channel, earth working area and stockpiles;
 - Wastewater from dust suppression sprays and wheel washing facilities;
 - Fuel, oil and lubricants from maintenance of construction vehicles and equipment; and
 - Effluents from dewatering associated with grouting and cement washing.
- 6.4.6 During rainstorms, site run-off would wash away the soil particles on unpaved lands and areas with the exposed topsoil. The run-off would be generally characterised with a high concentration of SS. Discharge of uncontrolled site run-off would increase the SS levels and turbidity in the nearby water environment. Site run-off may also wash away contaminated soil particles (if present) and therefore cause water pollution.

Sewage Effluent from the Construction Workforce

- 6.4.7 There would be sewage generation from temporary sanitary facilities for on-site construction workforce and staff. The characteristics of the sewage may include high levels of BOD₅, ammonia and *E. Coli*.

Accidental Spillage of Chemicals

- 6.4.8 Some limited quantities of chemicals may be used during construction activities. These

chemicals may include petroleum products, adhesives, lubrication oil, grease and mineral oil, acid and alkaline solutions/solvent, paints and other chemicals. Accidental spillage of chemicals in the works areas may spread on road surface and contaminate the surface soils. The contaminated soil particles may be washed away by site run-off and entered the stormwater drainage which subsequently causes water pollution.

6.5 Mitigation Measures for Construction Phase Impact

Construction of Temporary Drainage Channel Diversion

- 6.5.1 The construction activities of temporary drainage channel would be land-based and potential water quality would be limited to construction site runoff. The temporary channel would be retained until completion of permanent drainage channel diversion works to be undertaken by others.
- 6.5.2 Excavation works and diverting water from existing channel to temporary drainage channel which would require blockage of the drainage channel should be carried out during dry season as far as practicable.
- 6.5.3 During demolition of the existing nullah walls to connect to the proposed drainage line, water flow at the existing culvert will be temporarily diverted by sand bags and the collected water will be pumped and properly discharged. Therefore, works area will be isolated from the existing water flow to avoid any contamination on the stream.
- 6.5.4 During the reinstatement of the drainage channel, the temporary drainage channel should be cleaned to prevent the washing away of soil, silts or debris into the drainage system.
- 6.5.5 Temporary drainage systems such as perimeter cut-off drains, pumping and sedimentation control would be established for proper discharge of the collected runoff to the designated discharge points approved by EPD. Wastewater with a high level of SS would be treated before discharge. In addition, mitigation measures for construction runoff from general site operation would also be applied.

General Construction Activities

- 6.5.6 Best Management Practices (BMPs) would be implemented at the construction site, including proper handling, sorting and storage of construction solid waste, debris and refuse generated on-site prior to disposal. General refuse and recyclable materials would be collected separately and stored in appropriately labelled bins and removed regularly to minimise the risk of windblown waste / debris discharging into the drainage and box culvert.
- 6.5.7 Wastewater generated from construction activity, including construction site runoff, would be properly collected and treated prior to discharging into storm drains accordance with WPCO and ProPECC PN 1/94, such that there would be no adverse water quality impact on the WSRs. A discharge licence issued under the WPCO would be obtained for discharge of effluent from the construction sites, and all the construction site runoff and wastewater generated from the work areas would be treated to satisfy all the conditions stipulated in the discharge licence.

Construction Site Run-Off

6.5.8 To minimise the potential water quality impact due to the construction activities of the Project, the following good site practices in accordance with ProPECC PN 1/94 would be implemented as far as practicable:

- Surface runoff from construction sites would be discharged into stormwater drains or water bodies via adequately designed silt removal facilities such as sand traps, silt traps, silt retention pond, sediment basins and mechanical water treatment plant. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers would be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system would be undertaken by the contractor prior to the commencement of construction.
- The design of efficient silt removal facilities would be based on the guidelines in Appendix A1 of ProPECC PN 1/94.
- Construction works would be programmed to minimise surface excavation works during the rainy seasons (April to September). If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed soil surfaces would be covered by tarpaulin or other means, as far as possible.
- All drainage facilities and erosion and sediment control structures would be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit would be removed regularly.
- Measures would be taken to minimise the ingress of site drainage into trenches. Water pumped out from trenches would be discharged into storm drains via silt removal facilities.
- All open stockpiles of construction materials (for example, aggregates, sand and fill material) would be covered with tarpaulin or similar fabric during rainstorms. Measures would be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- Manholes (including newly constructed ones) would always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.
- Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention would be paid to the control of silty surface runoff during storm events.
- All vehicles and plants would be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. Adequately designed and sited wheel washing facilities would be provided at every construction site exit where practicable. Wash-water would have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road would be paved with sufficient back fall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.
- Before commencing any demolition works, all sewer and drainage connexions would be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains

- Construction solid waste, debris and rubbish on site would be collected, handled and disposed of properly to avoid water quality impacts.
- Water used in water testing to check leakage of structures and pipes would be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm drains.
- Water used in ground boring and drilling for site investigation or rock/soil anchoring would as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater would be discharged into storm drains via silt removal facilities.

Sewage Effluent from the Construction Workforce

- 6.5.9 Sufficient portable chemical toilets would be provided in the works areas. Sewage collected in the chemical toilets would be removed regularly by a licensed contractor for off-site disposal to sewage treatments plants. Notices would be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment.
- 6.5.10 No sewage discharge on site would be anticipated during the construction phase of the Project.

Accidental Spillage of Chemicals

- 6.5.11 Any contractor generating waste oil or other chemicals as a result of his activities would register as a chemical waste producer and provide a safe designated storage area for chemicals on site. The storage site would be located away from existing water bodies. Chemical waste containers would be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.
- 6.5.12 To prevent spillage of fuels and solvents to water bodies, all fuel tanks and storage areas would be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank.
- 6.5.13 In the event that accidental spillage or leakages of hazardous substances / chemical wastes occur, the response procedures as listed below would be followed. The procedures below are not exhaustive and the contractor would propose other response procedures in the emergency contingency plan based on the particular types and quantities of chemicals or hazardous substances used, handled and stored on-site. Specifically:
- Oil leakage or spillage would be contained and cleaned up immediately. Waste oil would be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.
 - Instruct untrained personnel to keep at a safe distance well away from the spillage area.
 - If the spillage / leakage involves highly toxic, volatile or hazardous waste, initiate emergency evacuation and call the emergency service.
 - Only trained persons equipped with suitable protective clothing and equipment would be allowed to enter and clean up the waste spillage / leakage area.

- Where the spillage/ leakage is contained in the enclosed storage area, the waste can be transferred back into suitable containers by suitable handheld equipment, such as hand operated pumps, scoops or shovels. If the spillage / leakage quantity is small, it can be covered and mixed with suitable absorbing materials such as tissue paper, dry soft sand or vermiculite. The resultant slurry would be treated as chemical waste and transferred to suitable containers for disposal.
- For spillage / leakage in other areas, immediate action is required to contain the spillage / leakage. Suitable liquid absorbing materials such as tissue paper, dry soft sand or vermiculite would be used to cover the spill. The resultant slurry would be treated as chemical waste and transferred to suitable containers for disposal.
- Areas that have been contaminated by chemical waste spillage / leakage would be cleaned. While water is a soluble solvent for aqueous chemical wastes and water soluble organic waste, kerosene or turpentine would be used for organic chemical wastes that are not soluble in water. The waste from the cleanup operation would be treated and disposed of as chemical waste.
- In incidents where the spillage / leakage may result in significant contamination of an area or risk of pollution, the EPD would be informed immediately.

6.6 Review of Operation Phase Impact

Potential Impacts on Water Quality

- 6.6.1 During the operation phase, potential sources of water quality impact associated with the Project would include:
- Station runoff;
 - Runoff from rail track; and
 - Sewage generation

Station Runoff

- 6.6.2 Rainwater runoff from the station would not be contaminated and may contain low levels of suspended solids for the first-rain. Rainwater runoff from the roof of the station would be collected and used for irrigation, and excess runoff would be discharged to the public drainage. No adverse water quality would be anticipated for the station runoff. The treatment of harvested rainwater will consist of pre-treatment, filtration and disinfection system. The whole treatment process shall be in compliance with the requirements in Technical Specifications on Grey Water Reuse and Rainwater Harvesting issued by WSD.

Runoff from Rail Track

- 6.6.3 Discharges of track runoff may be contaminated with suspended solids (including metals from track grindings and corrosion of rolling stock and other equipment) and limited amounts of oil and grease in the storm water runoff from rail tracks would be expected. The existing track runoff is being diverted to oil interceptors before discharge to the public drainage and the same management practice would be applied for the Project for the discharge of runoff from rail track to public drainage. No adverse water quality impact would be anticipated.

Sewage Generation

- 6.6.4 According to the approved EIA for HSK/HT NDA, all initial sewage generated from Advance Works and Stage 1 of HSK/HT NDA would be collected by public sewer and temporarily treated by San Wai Sewage Treatment Works (STW) for proper treatment. Upon commissioning of HSK STW, all sewage arising from HSK/HT NDA would be handled by the new HSK STW.
- 6.6.5 As the testing and commissioning works for HSK Station is scheduled to commence in 2029, the connection to the public sewerage systems of HSK Station may not be available until the sewerage works are commissioned in 2030. It is estimated that 45m³/day of sewage will be generated. Before commissioning of the sewerage works, the sewage generated from the buildings are planned to be collected into a sewage holding tank and transported to Government sewage treatment plants for off-site treatment. The daily sewage volume used in sizing the tank has taken into account the full sewage loading when the projected population of the station is reached. The holding tank is designed to withhold two-day storage which has provided an extra buffer to account for special incidents including public holidays or road traffic issues which prevent timely removal of the stored sewage. The stored sewage will be tanked away on a daily basis.
- 6.6.6 In addition, alarm system would be equipped for the sewage holding tank. If stored sewage is unable to be tanked away in time and the stored volume is approaching the maximum capacity, alert would be sent and measures such as limiting sewage and wastewater generation would be implemented as far as practicable until the storage volume of sewage holding tank is restored.
- 6.6.7 DSD and EPD/SIG has been agreed in principle on the tank away arrangement before the completion of the HSK EPP and the HSK/HT NDA sewerage. In any case, the liaison with DSD and EPD/SIG will be continued on the design of the sewage holding tank to ensure any potential impact to water quality is minimal.
- 6.6.8 Sewage would be generated from passengers and staff and trade effluent from shops at the station. Uncontrolled discharge of sewage would cause unacceptable water quality impacts on the WSRs. All the sewage would be collected and connected to the public sewerage so that there would be no adverse impacts from sewage produced from operation phase. No wastewater discharge to the watercourses or nearby water environment would be anticipated from the operation of the Project.

6.7 Mitigation Measures for Operation Phase Impact

Station Runoff

- 6.7.1 Rainwater runoff from the roof of the station would be collected and conveyed to rainwater harvesting system to reuse. All the drainage system and rainwater harvesting system would be properly maintained.
- 6.7.2 Stormwater surface runoff generated would be collected and discharged to the nearby government drainage system.

Runoff from Rail Track

- 6.7.3 A drainage system would be provided to collect track runoff. The runoff would pass through oil and grit interceptors to remove oil and grease and sediment before discharging to the public stormwater drainage system. The oil and grit interceptors would be cleaned and maintained regularly.

Sewage Generation

- 6.7.4 Sewage effluents from the staff and passengers and trade effluents from shops at the Station would be conveyed to the public sewerage to minimise water quality impacts.
- 6.7.5 Standard oil/grit interceptors/chambers would be provided where necessary to remove the oil, lubricants, grease, silt, and grit for the trade effluents before discharge to public sewers.

6.8 Cumulative Water Quality Impact

- 6.8.1 Concurrent projects with the potential to generate cumulative water quality impacts with the Project are listed in **Section 1**. The water quality impacts associated with the Project have been recommended under the approved EIA of HSK/HT NDA to prevent adverse water quality impacts. It is anticipated that the cumulative impacts arising from HSK/HT NDA in conjunction with the Project would not be significant.
- 6.8.2 With the implementation of the recommended mitigation measures for the construction and operation phases of the Project, no residual water quality impact would be anticipated.

6.9 Conclusion

Construction Phase

- 6.9.1 The potential sources of water quality impact during the construction phase would be mainly from temporary drainage channel diversion, general construction activities, construction site runoff, sewage effluent from the construction workforce, and accidental spillage. Water quality impacts would not be anticipated with the implementation of good site management practices and recommended mitigation measures in the construction phase.

Operational Phase

- 6.9.2 The potential sources of water quality impact during the operation phase would be mainly from station runoff, runoff from the rail track and sewage from the operation of the Project. Stormwater surface runoff generated would be collected and discharged to the nearby government drainage system. All sewage and wastewater generated from the Project would be discharged to the public sewerage and would not be anticipated to cause adverse water quality impact.

7 REVIEW OF WASTE MANAGEMENT

7.1 Review of Approved EIA

7.1.1 The approved EIA for WRL and the approved EIA for HSK/HT NDA were reviewed and their assessment results were considered.

7.1.2 This section identified the potential wastes that may arise from the construction and operation of the Project and evaluated the potential environmental impacts that may result from the waste generation. Mitigation measures and good site practices, including waste handling, storage and disposal, were recommended with reference to relevant waste legislation and management guidelines. Where appropriate, procedures for waste reduction and management were considered, with environmental control measures to avoid or to minimise impacts recommended.

7.2 Assessment Criteria and Guidelines

7.2.1 The criteria and guidelines for assessing waste management implications outlined in Annex 7 and Annex 15 of the EIAO-TM, respectively, were adopted. The following legislation also covers the handling, treatment and disposal of waste in Hong Kong:

- Waste Disposal Ordinance (Cap. 354);
- Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C);
- Land (Miscellaneous Provisions) Ordinance (Cap. 28);
- Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation; and
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N).

7.2.2 The other relevant guidelines include:

- WBTC No. 2/93, Public Dumps;
- WBTC No. 2/93B, Public Filling Facilities;
- WBTC No. 16/96, Wet Soil in Public Dumps;
- WBTC Nos. 4/98 and 4/98A, Use of Public Fill in Reclamation and Earth Filling Projects;
- WBTC No. 12/2000, Fill Management;
- WBTC No. 19/2001, Metallic Site Hoardings and Signboards;
- WBTC No. 12/2002, Specifications Facilitating the Use of Recycled Aggregates;
- ADV-19, Practice Note for Authorized Persons and Registered Structural Engineers on Construction and Demolition Waste;
- DEVB TCW No. 06/2010, Trip Ticket System for Disposal of Construction and Demolition Materials;
- DEVB TCW No. 08/2010, Enhanced Specifications for Site Cleanliness and Tidiness;

- DEVB TCW No. 09/2011, Enhanced Control Measures for Management of Public Fill; and
- ETWB TC(W) No. 19/2005, Environmental Management on Construction Sites;
- Project Administration Handbook (PAH) for Civil Engineering Works, Management of Construction/ Demolition Materials including Rocks;
- A Guide to the Chemical Waste Control Scheme;
- A Guide to the Registration of Chemical Waste Producers; and
- Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

7.3 Assessment Methodology

7.3.1 The waste management hierarchy was applied and is a concept which shows the desirability of various waste management methods and comprises the following preference in order: Avoidance, Minimisation, Recycling/Reuse, Treatment, and Disposal. All opportunities for reducing waste generation were also considered based upon the following factors:

- Avoiding or minimising waste generation through changes in the design;
- Adopting better management practices to promote segregation of waste materials;
- Reuse and recycling; and
- Diverting waste to public dumps or other construction sites.

7.4 Review of Construction Phase Impact

7.4.1 The main activities which may potentially result in the generation of wastes would include:

- Site clearance;
- Minor excavation works for temporary drainage diversion;
- Excavation and piling works; and
- Superstructure construction (e.g., platform and concourse, entrances, etc.).

7.4.2 The construction of the Project would generate the following categories of wastes:

- Construction and Demolition (C&D) materials;
- Chemical waste; and
- General refuse.

C&D Materials

7.4.3 The major waste source of the Project during construction phase was expected to be C&D materials. Construction C&D materials would be generated from site clearance, excavation and piling works. The quantities of the materials generated from each development of the Project during construction phase were estimated and summarised in **Table 7.1**. A C&D Material Management Plan (C&DMMP) is being separately

developed and, as the Project would adopt a precast/prefabrication of modular design construction method, generation of large amounts of on-site inert and non-inert C&D materials would not be anticipated.

- 7.4.4 The Project would include the temporary diversion of an existing drainage channel. The excavated inert C&D materials from the new temporary drainage channel would be temporarily stored on site and well covered, and then used as backfilling for the existing drainage channel. The remaining inert soft C&D materials would be used elsewhere on-site or delivered to the Public Fill Reception Facility for reuse and recycling.
- 7.4.5 Small portion of Artificial Hard Material (AHM) (e.g., broken concrete and tiles) would be reused off-site as far as practicable and the remaining AHM would be delivered to the Public Fill Reception Facility.
- 7.4.6 As the Project would be constructed primarily by precast and assembly method, the generation of large amount of non-inert C&D materials on-site (e.g., timber and steel) would not be anticipated. The non-inert C&D waste would be recycled as much as practicable. The need for disposal of non-inert C&D materials at the landfill sites would be avoided as far as practicable and would only be dealt with as a “last resort”.
- 7.4.7 A summary of estimated amounts of C&D materials to be generated during construction phase is provided in **Table 7.1**.

Table 7.1: Summary of Estimated Amount of C&D Materials to be Generated during Construction Phase

Waste Type	Amount to be Generated (m ³)	On-site Reuse (m ³)	Total Disposed (m ³)
Inert C&D Materials	18,410	15,010	3,400
Non-inert C&D Materials ^[1]	14,316	8	14,308

Note:

[1] “Non-inert C&D Material” involved in the Project includes vegetation, aluminium, steel, acoustic materials and E&M materials. In contrast to public fill, non-inert waste is not suitable for land reclamation and subject to recovery of reusable/ recyclable items, is disposed of at landfills. The non-inert C&D materials generated would be reused and recycled as much as possible before disposal of at designated landfill site to be agreed with EPD/MTR.

Chemical Waste

- 7.4.8 Chemical wastes would be generated from the following construction activities and associated facilities:
 - Scrap batteries or spent acid/ alkali from their maintenance;
 - Used paint, engine oils, hydraulic fluids and waste fuel;
 - Spent mineral oils/ cleansing fluids from mechanical machinery; and
 - Spent solvents/ solutions, some of which may be halogenated, from equipment cleansing activities.
- 7.4.9 Chemical waste would pose serious environmental, health and safety hazards if not stored and disposed of in an appropriate manner as outlined in the Waste Disposal (Chemical Waste) (General) Regulation and the Code of Practice on the Packaging,

Labelling and Storage of Chemical Waste. These hazards may include:

- Toxic effects to workers;
- Adverse effects on water quality from spills; and
- Fire hazards.

7.4.10 It is difficult to quantify the amounts of chemical waste as it would be highly dependent on the future contractor's on-site maintenance practices and the quantities of plant and vehicles utilised. Nevertheless, it is anticipated that the quantity of chemical waste, such as lubricating oil and solvent produced from plant maintenance, would be small and in the order of few hundred litres per month based on general practices.

7.4.11 Mitigation measures for chemical wastes were detailed below. Provided that the handling, storage and disposal of chemical wastes are in accordance with these requirements, adverse environmental impacts would not be anticipated.

General Refuse

7.4.12 The construction workforce would generate refuse comprising of food waste, waste paper, aluminium cans and plastic bottles during the construction period.

7.4.13 The storage of general refuse may give rise to adverse environmental impacts. These would include water quality, odour and visual impact in the form of windblown litter. The construction site may also attract pests and vermin if the storage areas are not well maintained and cleaned regularly. In addition, disposal of waste at sites other than the approved disposal facilities could also lead to similar adverse impacts at those sites.

7.4.14 The exact number of workforce to be employed for the Project is not available at this stage, but it is anticipated to be up to about 400 workers at the peak time based on projects of similar nature and size. Based on the generation rate of 0.65 kg/person/day, approximately 260 kg of general refuse would be generated daily during the construction period.

7.4.15 The general refuse would be stored in enclosed bins to avoid adverse impacts to the surroundings. Recycling bins would be provided to maximise the reuse and recycle volume. A reputable waste collector would be employed to collect the general refuse for later disposal of at landfills.

7.4.16 Provided that the mitigation measures are adopted, the potential environmental impacts caused by the storage, handling, transport and disposal of general refuse would be anticipated to be minimal, and adverse environmental impacts caused by the storage, handling, transport and disposal of general refuse would not be anticipated.

7.5 Mitigation Measures for Construction Phase

Good Site Practices

7.5.1 Adverse waste management implications would not be anticipated, provided that good site practices are strictly implemented. The following good site practices are

recommended throughout the construction activities:

- Nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all waste generated at the site;
- Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;
- Provision of sufficient waste disposal points and regular collection for disposal;
- Appropriate measures to minimise windblown litter and dust during transportation of waste by transporting waste in enclosed containers;
- Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and
- A Waste Management Plan (WMP) (EMP) would be prepared by the contractor in accordance with ETWB TC(W) No.19/2005.

Waste Reduction Measures

7.5.2 Amount of waste generation can be significantly reduced through good management and control. Waste reduction would be best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:

- Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- Plan and stock construction materials carefully to minimise amount of waste;
- Avoid unnecessary generation of waste;
- Sort out demolition debris from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and
- Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.

7.5.3 In addition to the above recommendations, specific reduction measures would be recommended for the specific waste types so as to minimise environmental impacts during handling, transportation and disposal of waste.

Storage, Collection and Transportation of Waste

7.5.4 Storage of waste on site may induce adverse environmental implications if not properly managed. The following recommendation would be implemented to minimise the impacts:

- Non-inert C&D materials (if any) would be handled and stored well to ensure secure containment;
- Stockpiling area would be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and
- Different locations would be designated to stockpile each material to enhance reuse.

7.5.5 The collection and transportation of waste from works area to respective disposal sites may also induce adverse environmental impacts if not properly managed.

- Remove waste in timely manner;
- Employ the trucks with cover or enclosed containers for waste transportation;
- Obtain relevant waste disposal permits from the appropriate authorities; and
- Disposal of waste should be done at licensed waste disposal facilities.

7.5.6 In addition to the above measures, other specific mitigation measures on handling the excavated C&D materials, chemical waste and materials generated from construction phase are recommended as follows.

C&D Materials

7.5.7 Wherever practicable, C&D materials would be segregated from other wastes to avoid contamination and ensure acceptability at Public Fill Reception Facilities (PFRFs) areas or reclamation sites. The following reduction measures would be implemented in handling the C&D materials:

- Carry out on-site sorting;
- Allow and promote the use of recycled aggregates where appropriate; and
- Implement a trip-ticket system in accordance with DEVB TC(W) No. 6/2010 Trip Ticket System for Disposal of Construction and Demolition Materials, if dumping trucks are required, for each works contract to ensure that the disposal of C&D materials is properly documented and verified.

7.5.8 Non-inert C&D materials (e.g., timber and steel) would be recycled as far as practicable. Opportunities for the on-site and off-site reuse of these excavated C&D materials would be critically reviewed (e.g., concrete debris and scrap metal recycling at EcoPark, aggregates as daily cover for landfills and yard waste from tree felling at Y-Park, etc.).

7.5.9 Details of the recommended on-site sorting and reuse of C&D materials are given below:

On-site Sorting of C&D Materials

- Storage areas would be located within the site during construction phase for temporary storage of inert C&D materials.
- All C&D materials arising from the construction would be sorted on-site to recover the inert C&D materials and reusable and recyclable materials prior to disposal off-site as far as practicable. Non-inert portion of C&D materials would also be reused whenever possible and be disposed of at landfills as a last resort.

Reuse of C&D Materials

7.5.10 The following potential measures would be explored to maximize the reuse/ recycle of C&D materials generated from the Project:

- Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (e.g., soil, broken concrete, metal); and
- Protect recyclable material to keep it in usable condition.

Specification of Inert C&D Materials to be Disposed Off-site

- 7.5.11 In case there are surplus inert C&D materials generated in the Project and are required to be disposed of at the PFRFs, the inert C&D materials would meet the following requirements as far as practicable:
- Moisture content of inert C&D materials would be lowered to 25% max when delivered to the PFRFs;
 - Inert C&D materials delivered to the PFRFs would be of a size less than 250mm; and
 - Inert construction waste would not be in liquid form such that it can be contained and delivered by dump truck instead of tanker truck. Inert C&D materials in liquid form would be solidified before delivering to the PFRFs.
- 7.5.12 Nevertheless, the acceptance criteria of inert C&D materials to PFRFs would be subject to the fill management authority of CEDD.

Chemical Waste

- 7.5.13 For those processes which generate chemical waste, it may be possible to find alternatives to eliminate the use of chemicals, to reduce the generation quantities or to select a chemical type of less impact on environment, health and safety as far as possible. Wherever possible, opportunities for the reuse and recycling of materials would be taken.
- 7.5.14 If chemical waste is produced at the construction site, the future contractors would register with EPD as chemical waste producers and follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Chemical waste would be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical waste (e.g., spent lubricant oil) would be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled would be disposed of at either the Chemical Waste Treatment Centre (CWTC), or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.
- 7.5.15 Any unused chemicals or those with remaining functional capacity would be collected for reuse as far as practicable.

General Refuse

- 7.5.16 General refuse would be stored in enclosed bins separately from construction and chemical wastes. Recycling bins would also be placed to encourage recycling. Preferably enclosed and covered areas would be provided for general refuse collection and routine cleaning for these areas would also be implemented to keep areas clean. A reputable waste collector would be employed to remove general refuse on a regular basis. Arrangements would be made with the recycling companies to collect the recycle waste as required. It is expected that such arrangements would minimise potential environmental impacts.
- 7.5.17 The future contractor would implement an education programme for workers relating to avoiding, reducing, reusing and recycling general waste. Participation in a local collection scheme would be considered by the future contractor to facilitate waste reduction.

7.6 Review of Operation Phase Impact

7.6.1 The operation of the Project would generate the following categories of wastes:

- General refuse
- Chemical waste

General Refuse

7.6.1.1 General refuse would arise from the public, station employees and commercial operators within the Station. Waste would include food, paper, wood, plastic, office waste, metal containers, etc. The storage and handling of these wastes may cause adverse environmental impacts if not properly managed.

7.6.1.2 The amount of general refuse that would arise during operation phase of the Project cannot be confirmed at this stage as it would be subject to operational needs and the number of passengers, staff and any commercial operators in the future. However, by making reference to other similar projects, approximately 100 kg of general refuse per day would be generated during operation phase. As such, the total quantity of municipal solid waste to be generated would not be significant.

Chemical Waste

7.6.1.3 Maintenance of the stations and tracks would generate chemical waste including used fluorescent tubes, cleansing materials, discarded electronic equipment, lubricants, paints, used batteries, mineral oil, coolants, and solvents etc. during the operational phase. These wastes may pose adverse environmental, health and safety hazard if not properly managed. Considering the quantity of chemical waste to be generated during the operational phase would be in a range of very small amount to a few hundred litres/kg per month, subject to future operational needs, no adverse environmental impact would be anticipated with proper storage, handling and disposal of this waste.

7.6.2 A summary of estimated amount for each type of waste to be generated during operational phase is shown in **Table 7.2**.

Table 7.2: Summary of Estimated Amount for Each Type of Waste to be Generated during Operational Phase

Waste Type	Amount to be generated	Disposal Outlets
General Refuse	Approximate 100 kg per day	Recycling facilities on site for recyclable resources and landfill disposal for the rest of refuse
Chemical Waste	Approximate few hundred litres or kg per month	To be collected by a licensed chemical waste collector and disposed of at a licensed chemical waste treatment and disposal facility

7.7 Mitigation Measures for Operation Phase

General Refuse

- 7.7.1 Recycling of waste paper, aluminium cans and plastic bottles would be encouraged. It is recommended to place clearly labelled recycling bins at designated locations which could be accessed conveniently. General refuse would be separated from chemical waste by providing separated bins for storage to maximise the recyclable volume as far as practicable.
- 7.7.2 A reputable waste collector would be employed to remove general refuse regularly to minimise odour, pest and litter impacts. Arrangements would be made with the recycling companies to collect the recycle waste as required. It is expected that such arrangements would minimise potential environmental impacts.

Chemical Waste

- 7.7.3 Subject to operational needs, if chemical waste is to be produced, the Project Proponent would register with EPD as chemical waste producers as appropriate in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. Chemical waste would be collected and disposed of at appropriate facility by licensed collectors.
- 7.7.4 The requirements given in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes would be followed, where applicable, in handling of these chemical wastes. The requirements for the collection and disposal of chemical waste as stipulated in the Waste Disposal (Chemical Waste) (General) Regulation would be followed to monitor all movements of chemical wastes which would be collected by a licensed collector to a licensed facility for final treatment and disposal.
- 7.7.5 Good quality containers compatible with the chemical wastes would be used, and incompatible chemicals should be stored separately.
- 7.7.6 Appropriate labels would be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidising, irritant, toxic, harmful, corrosive, etc.
- 7.7.7 Non-recyclable chemical waste (e.g., spent lubricant oil) would be disposed of at appropriate facility by licensed collectors. Recyclable chemical waste (e.g., used fluorescent tubes) would be collected and transported off-site by licensed collector.

7.8 Conclusion

Construction Phase

- 7.8.1 Potential waste management implications from the generation of waste during the construction phase were evaluated. Measures, including the opportunity for on-site sorting, reusing C&D materials etc., were devised in the construction methodology to minimise the surplus materials to be disposed. Recommendations were made for implementation by the future contractor during the construction period to minimise waste

generation and off-site disposal. Adverse impacts would not be anticipated if mitigation measures are strictly followed.

Operation Phase

- 7.8.2 Potential waste management implications from the generation of waste during the operation phase were also evaluated. About 100 kg per day of general refuse and few hundred litre per month of chemical waste would be generated during the operation phase of the Project. Recommendations were made to ensure proper treatment and disposal of these wastes. Adverse impacts would not be anticipated.

8 REVIEW OF LAND CONTAMINATION

8.1 Review of Approved EIA

8.1.1 The approved EIA for WRL and the approved EIA for HSK/HT NDA were reviewed and the assessment results were considered. This section identified and assessed the potential land contamination issues at the Project Site.

8.2 Review of Environmental Legislation

8.2.1 As there are no changes to the existing land contamination related legislation, standards or criteria since the approval of the relevant EIA Reports, all the related legislation, standards or criteria stated in the EIA Reports are applicable and listed as below:

- Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM);
- Practice Guide for Investigation and Remediation of Contaminated Land, August 2011, EPD, HKSAR (Practice Guide);
- Guidance Note for Contaminated Land Assessment and Remediation, August 2007, EPD, HKSAR (Guidance Note); and
- Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management, December 2007, EPD, HKSAR (Guidance Manual).

8.3 Methodology

8.3.1 The following tasks have been undertaken to identify any potential contaminated areas for the land contamination assessment:

- Desktop review of site history; and
- Site surveys to identify the potentially contaminated sites.

8.3.2 Findings of the desktop review and site surveys, as well as the proposed soil and groundwater sampling and testing strategy are presented in the Contamination Assessment Plan (CAP) enclosed in **Appendix 8.1**.

8.3.3 Due to the physical constraints and accessibility issues of the identified potentially contaminated sites, undertaking of the site investigation (SI) works at this stage is not feasible. Therefore, the SI works are recommended to be conducted in the later stage of this Project.

8.3.4 Following the completion of SI works, Contamination Assessment Report(s) (CAR(s)) and, if necessary, Remediation Action Plan(s) (RAP(s)) will be submitted to EPD for approval to identify the presence, nature and extent of contamination as well as the proposed remedial strategy for the identified contaminated soil and/or groundwater. Any contaminated soil and/or groundwater should be treated according to EPD's approved RAP(s) and Remediation Report(s) (RR(s)) will be submitted to EPD for agreement after completion of the remediation works.

8.4 Review of Land Contamination Impact

- 8.4.1 The CAP under the approved EIA for HSK/HT NDA in 2016 inspected the HSK Station footprint and various areas around the HSK Station footprint. These areas are shown in Figures 1.2 – 1.3 of **Appendix 8.1**. The approved EIA for HSK/HT NDA identified that some areas with potential contamination issues may be triggered should there be future land development and would require site re-appraisal.
- 8.4.2 A Land Contamination Review (LCR) was conducted to review the validity and accuracy of the endorsed CAP conducted under the approved EIA for HSK/HT NDA in 2016, as well as the past and present land use of the Project Site. Based on the results of LCR, a CAP has been submitted to EPD on 15 March 2022 and agreed by EPD on 30 March 2022. The agreed CAP is shown in **Appendix 8.1**.
- 8.4.3 The current boundary of the Project Site has been slightly expanded as compared with that of the agreed CAP for general and site office uses during construction phase, located to the south of the HSK Station (**Section 1.4.4**). The Project Site areas not covered by the agreed CAP are shown in **Figure 8.1**. No potential contamination sites have been identified from the approved EIA for HSK/HT NDA in 2016 within the areas not covered by the agreed CAP as shown in **Appendix 8.2**. Also, the site formation for Area 26 will be completed by CEDD before MTRC's use. Any land contamination assessment (if required) will be further conducted by CEDD before the site formation works and hence are not considered part of this assessment.

8.5 Review of Historical Land Use

- 8.5.1 According to the aerial photographs review of the CAP, the Project Site was located on agricultural lands before 1962. Progressive land clearance and development are observed mainly to the east of the Project Site from 1946 to 1963. Progressive site clearance and structure construction were observed within Project Site between 1963 and 1998. Structures were removed in 1999 for the preparation of the then West Rail Line development within Project Site, where the area was paved with concrete in 2001. No changes to the Project Site occurred since then.
- 8.5.2 Aerial photographs review has been conducted for the areas not covered by the agreed CAP as shown in **Appendix 8.3**. Historical land uses of the areas not covered by the agreed CAP tallies with the major land uses identified for other parts of the Project Site as described in **Section 8.4.1**, which were mainly occupied by vegetation and village/squatter houses.
- 8.5.3 Site inspection for the Project Site and the surrounding areas was conducted on 21 October 2021, 18 November 2021, 17 December 2021 and 30 December 2021, to identify possible land contamination within the site. The Project Site is mainly occupied by vegetation, road, a drainage channel, refuse collection point, parking area, open storage area and village-typed houses. Based on the historical aerial photos and land use records and site inspection photographs review, part of the Project Site is identified under potentially contaminated land uses, which include open storage areas. The site inspection of the CAP covered the Project Site and the surrounding areas, which is currently occupied by vegetations. Details of the site inspection can be referred to Appendix C of **Appendix 8.1**. As shown in **Appendix 8.4**, the areas not covered by the agreed CAP

located in the southern part of the Project Site is currently occupied by mainly vegetations and village houses with no sign of potential land contamination observed.

- 8.5.4 Referring to land use review, the HSK Station footprint has been vacant and covered in vegetation since 2014. No signs of contamination were identified from site appraisal for the area of the HSK Station footprint or the areas not covered by the agreed CAP. The findings of land contamination assessment in the agreed CAP are valid and applicable to the entire Project Site, including the areas not covered by the agreed CAP.

8.6 Potential Contaminated Areas

- 8.6.1 Site appraisal has been conducted for the entire Project Site in the CAP. The area of potential contamination, as determined by previous studies and site inspection of surrounding areas, is limited to identified areas of potential contamination in the approved EIA for HSK/HT NDA located in the proposed works area and works site surrounding the HSK Station footprint. No potential contamination was identified on the footprint of HSK Station. Sampling will therefore be limited to the surrounding works site and works area where they overlap areas of identified potential contamination in the approved EIA for HSK/HT NDA (the “Sampling Area of Current CAP” and “CEDD Assessment Area”) (Figures 1.2 – 1.3 of **Appendix 8.1**).

- 8.6.2 A total of 6 sampling locations has been proposed for the works site and works area in accordance to the agreed CAP for the Project Site. The sampling locations are proposed on areas of potential contamination based on their land use identified in previous studies and during Site Inspection. No sampling points are proposed on the HSK Station footprint as no potential contamination was identified based on previous land use and site inspection.

- 8.6.3 Land contamination assessment will be conducted based on the agreed CAP. Upon completion of the site investigation, results will be presented in a Contamination Assessment Report (CAR) for EPD’s agreement. If remediation is required, a Remediation Action Plan (RAP) will be prepared and submitted to EPD for agreement prior to the remediation works. A Remediation Report (RR) will be prepared for submission to EPD upon completion of the remediation.

8.7 Conclusion

- 8.7.1 The potential for land contamination and their impacts to future land use was assessed.
- 8.7.2 No deviation of the environmental performance requirements set out in the approved EIA for HSK/HT NDA were noted. The findings of land contamination assessment in the approved EIA for HSK/HT NDA are still valid.
- 8.7.3 Further works, including SI works as well as submission of the CAR and/or RAP for EPD’s approval will be required. If contaminated soil and/or groundwater are identified, remediation should be carried out according to EPD approved RAP and RR should be submitted to EPD for agreement after completion of the remediation works. The further works would need to follow EPD’s Guidance Manual, Guidance Note and Practice Guide.

9 REVIEW OF ECOLOGY

9.1 Review of Approved EIA

9.1.1 The approved EIA for WRL was reviewed for the ecological resources within the area affected by that Project, including the identified habitats and species of conservation importance, potential impacts from the construction and operation of WRL, and potential mitigation measures to reduce the potential impacts of the construction and operation of WRL.

9.1.2 The Project is a new railway station. Given that the approved EIA for WRL was conducted in 1998, some information and assessment assumptions adopted were not updated. In view of this, reference was made to the approved EIA for HSK/HT NDA in 2016 for the review of ecological impacts in this ERR. As the assessment in the approved EIA for HSK/HT NDA included the works area of the Project, which covered the construction periods and its relevant construction work sites and work areas, it is considered as the most updated and best available information for review.

9.2 Methodology

Project Site Boundary and 500m Study Area

9.2.1 A summary of the key construction activities and construction methodology for the Project is provided in **Section 1** of this ERR. The literature review of the area for ecology consisted of (1) Project Site Boundary (i.e. work sites and work areas of the Project) and (2) 500m Study Area (i.e. 500m from the Project Site Boundary) which were applied for conducting this ecological review.

Literature Review

9.2.2 A literature review was conducted to determine the existing ecological baseline conditions within the 500m Study Area to identify habitat resources and species of potential conservation importance, and to demonstrate no information gap in the baseline conditions of the habitats. The reviewed literature comprised the following:

Reports and studies from Private Sector and Government

- Register of Sites of Special Scientific Interest (SSSIs) (PlanD, 2015);
- Memoirs of Hong Kong Natural History Society;
- Avifauna of Hong Kong (Carey *et al.*, 2001);
- GeoInfo Map from Lands Department;
- Porcupine! – newsletter of Department of Ecology & Biodiversity of The University of Hong Kong;
- Biodiversity – newsletter of Agriculture, Fisheries and Conservation Department (AFCD); and
- Annual Report and other Publications of The Hong Kong Bird Watching Society.

Relevant EIA Studies

- West Rail – Final Assessment Report West Kowloon to Tuen Mun Centre - Environmental Impact Assessment - Vol. 1 (KCRC, 1998);
- Shenzhen Western Corridor (SWC) Environmental Impact Assessment (Highways Department (HyD), 2002);
- Hang Hau Tsuen Channel at Lau Fau Shan Environmental Impact Assessment (CEDD, 2009); and
- Hung Shui Kiu New Development Area (CEDD, 2016).

9.2.3 Subsequent to the approved EIA for WRL, the Project Site was also covered in the approved EIA for HSK/HT NDA. The purpose of this ecological literature review was to provide an update to the ecological baseline information and verify the update of information of the approved EIAs.

9.2.4 As discussed in **Section 1**, the neighbouring areas of HSK/HT NDA would be progressively developed by CEDD. After site formation works, the superstructure, utilities and landscaping works would be commenced to develop the areas to a new town in HSK. The ecological impact of HSK/HT NDA which covered the Project Site Boundary and the 500m Study Area of the Project were already assessed in the approved EIA for HSK/HT NDA with the recommendation of appropriate mitigation measures.

9.2.5 The ecological characteristics of each habitat type, including size, vegetation type, species present, dominant species found, species diversity and abundance, community structure, ecological value and inter-dependence of the habitats and species, and presence of any features of ecological importance were defined and characterised in the approved EIA for HSK/HT NDA. For the description of general distribution status of species in Hong Kong, reference was made to Fellowes et al. (2002) and the Hong Kong Biodiversity Database (AFCD, 2022).

Ecological Reconnaissance Site Visits

9.2.6 Ecological reconnaissance site visits were carried out with reference to the EIAO Guidance Note No. 7/2010 – Ecological Baseline Survey for Ecological Assessment to verify the information gathered from desktop review by targeted area reconnaissance, mapping and ground truthing.

9.2.7 For general distribution status of the species in Hong Kong, reference was made to Fellowes *et al.* (2002) and the Hong Kong Biodiversity Database (AFCD, 2020). The ecological reconnaissance site visit methodology made reference to the EIAO Guidance Notes (No. 7/2010 and No. 10/2010) and covered active seasons of the flora and fauna groups. The criteria and guidelines as stated in Annexes 8 and 16 of the EIAO-TM were referenced for evaluating and assessing the potential ecological impact arising from the construction and operation of the proposed works. All site appraisals were carried out in such ways that would not cause unnecessary stress or damage to the existing habitats and wildlife.

9.2.8 The ecological reconnaissance site visits were conducted in January 2022 (dry season) and April 2022 (wet season) including day and night visits within the 500m Study Area with the schedule as shown in **Table 9.1** below.

Table 9.1: Ecological Renaissance Site Visit Schedule

	Jan 2022	Apr 2022
Habitat and Vegetation	D	D
Mammal	D&N	D&N
Avifauna	D&N	D&N
Herpetofauna	D&N	D&N
Butterfly and Odonate	D	D
Freshwater Invertebrate	D&N	D&N

Note: D=daytime visit; N=night-time visit

9.3 Baseline Ecological Conditions

A. Within the Project Site Boundary

Literature Review of Habitats and Species of Conservation Importance

- 9.3.1 According to the approved EIA for HSK/HT NDA, the Project Site is classified as developed area/wasteland without ecologically sensitive areas, e.g. brownfield, wasteland, developed land, village houses, modified watercourse, etc.
- 9.3.2 Based on Figure 9.3I of the approved EIA for HSK/HT NDA, totally one avifauna species of conservation importance, Little Egret (*Egretta garzetta*), was recorded within the Project Site Boundary. No floral species of conservation importance was reported within the Project Site Boundary.

Review of Historic Aerial Photographs for Habitat Change

- 9.3.3 To identify any ecological information gap of habitat changes between 2016 and 2022, the respective aerial photographs as shown in **Figures 9.1** and **9.2** were reviewed. The habitat in the work sites and work areas within the Project Site Boundary were identified with no significant change between 2016 and 2022. The habitat map was updated based on the review of aerial photographs as shown in **Figure 9.3**.

Ecological Renaissance Site Visit Observations

- 9.3.4 A total of three habitat types, including developed area/wasteland, village/orchard and modified watercourse were recorded within the Project Site Boundary. The habitat map is shown in **Figure 9.3**.
- 9.3.5 The developed area/wasteland within the Project Site Boundary comprised mainly residential dwellings, open storage areas, light industrial factories and transport infrastructure such as roads and railway/light rail. Wasteland was mainly dominated by herbaceous and ruderal vegetation and was mainly recorded in heavily disturbed or previously developed areas within the Project Site Boundary. Dominant species recorded in the developed area/wasteland included the exotic White Popinac (*Leucaena leucocephala*), Mile-a-minute Weed (*Mikania micrantha*) and Morning-glory (*Ipomoea cairica*), as well as the native Elephant's Ear (*Macaranga tanarius* var. *tomentosa*) and

Common *Lophantherum* (*Lophantherum gracile*). No plant species of conservation importance was recorded.

- 9.3.6 Village/orchard habitat refers to areas occupied by village-type residence, which comprised houses with less than three storeys, interspersed with patches of household planting. Fruit trees such as Wampi (*Clausena lansium*), Longan (*Dimocarpus longan*) and Papaya (*Carica papaya*) were commonly recorded around villages and dwellings within the Project Site Boundary. No plant species of conservation importance were recorded.
- 9.3.7 Modified watercourses identified within the Project Site Boundary included Tin Sam Channel. The modified channels were mostly void of vegetation with a few records of the exotic Water Hyacinth (*Eichhornia crassipes*) on the surface along the bank. No freshwater aquatic fauna or species of conservation importance was recorded.
- 9.3.8 Avifauna – A low diversity of avifauna was recorded within the Project Site Boundary. Only ten locally common species were recorded including Eurasian tree sparrow (*Passer montanus*), Masked Laughingthrush (*Garrulax perspicillatus*) and Japanese White-eye (*Zosterops japonicus*) etc. In terms of the relative abundance, Eurasian tree sparrow, Daurian Redstart and Japanese White-eye are the most commonly recorded species within the Project Site Boundary. One species of conservation importance, Chinese Pond Heron (*Ardeola bacchus*), was found in modified watercourse (Tin Sam Channel) near (outside) the Project Site Boundary (details refer to **Section 9.3.24**).
- 9.3.9 Butterfly and Odonate – A low diversity and abundance of butterflies and odonata were recorded within the Project Site Boundary. Two common species of butterfly were recorded in the Project Site Boundary, e.g. Indian Cabbage White (*Pieris canidia*) and Common Grass Yellow (*Eurema hecabe hecabe*). No odonate was recorded in the Project Site Boundary and no species of conservation importance was recorded.
- 9.3.10 Herpetofauna – One species of herpetofauna namely Asian Common Toad (*Duttaphrynus melanostictus*) was recorded within the Project Site Boundary. No species of conservation importance was recorded.
- 9.3.11 Mammal – Japanese Pipistrelle (*Pipistrellus abramus*) is the only species of mammal, which is of conservation importance, recorded in the modified watercourse near (outside) the Project Site Boundary (details refer to **Section 9.3.24**). Japanese Pipistrelle is listed in Wild Animals Protection Ordinance (Cap. 170), yet is very common in Hong Kong.
- 9.3.12 Freshwater Communities – No freshwater fauna was recorded within the Project Site Boundary.
- 9.3.13 Based on the findings in the desktop review of the existing literature information verified by the comparison of historic aerial photographs and reconnaissance site visits, no ecological information gap was considered existing. The habitat evaluation of the Project Site Boundary is presented in **Table 9.2** with reference made to the guidelines of Annex 8 of the EIAO-TM.

Table 9.2: Evaluation of Habitats within Project Site Boundary

Criteria	Developed area/wasteland	Village/Orchard	Modified watercourse
Naturalness	Low	Low	Low
Size	5.88ha	1.04ha	806m
Diversity	Very low	Very low	Very low
Rarity	Very common	Very common	Very common, with one avifauna and one flying mammal species of conservation importance were found at the Project site boundary
Re-creatability	Easy to recreate	Easy to recreate	Easy to recreate
Fragmentation	Low	Low	Low
Ecological Linkage	No significant linkage with any important habitat nor site of conservation importance	No significant linkage with any important habitat nor site of conservation importance	No significant linkage with any important habitat nor site of conservation importance
Potential Value	Low	Low	Low
Nursery/Breeding Ground	None recorded	None recorded	None recorded
Age	Uncertain	Uncertain	Uncertain
Abundance/Richness of wildlife	Very Low	Very Low	Very Low
Ecological Value	Low	Low	Low

B. Within the 500m Study Area

Review of Habitats and Species of Conservation Importance

- 9.3.14 Totally seven avifauna species of conservation importance including Chinese Pond Heron, Grey Heron, Eastern Great Egret, Little Egret, Besra, Greater Coucal and Collared Crow were previously reported within the 500m Study Area according to Figure 9.3I of the approved EIA of HSK/HT NDA.
- 9.3.15 Totally two flying mammal species of conservation importance including Japanese Pipistrelle and Chinese Noctule were previously reported within the 500m Study Area according to Figure 9.3I of the approved EIA of HSK/HT NDA.
- 9.3.16 Totally one freshwater fish species of conservation importance namely Predaceous Chub was previously reported within the 500m Study Area according to Figure 9.3I of the approved EIA of HSK/HT NDA.
- 9.3.17 On the other hand, San Sang San Tsuen Egret was reported in the approved EIA for HSK/HT NDA and was located at north-west of the Project site. However, it is more than 670m away from HSK Station and was found abandoned in 2019 (Anon, 2020). Also, according to the literature of HKBWS, Hung Shui Kiu egret was first published in 2021

which is located at north-east of HSK Station at more than 700m away (Anon, 2021). As such, they are not considered to be affected by the Project. A flight path survey for ardeids was conducted at Hung Shui Kiu Egretty on 30 April 2022 during sunrise and sunset periods. Based on the survey results, the flight paths are illustrated in **Appendix 9.1** and **Appendix 9.2**. As such, they are not considered to be affected by the Project.

Review of Historic Aerial Photographs for Habitat Change

- 9.3.18 To identify any ecological information gap of habitat changes between 2016 and 2022, the respective aerial photographs were reviewed as shown in **Figures 9.1** and **9.2**. The habitat in the 500m Study Area but outside the Project Site Boundary was found with no significant change between 2016 and 2022. A slight reduction of vegetation coverage at the west and south of the Project site boundary was observed between 2016 and 2022. The habitat map was updated based on the review of aerial photographs as shown in **Figure 9.3**.

Ecological Renaissance Site Visit Observations

- 9.3.19 Developed area/wasteland was the dominant habitat within the 500m Study Area. This habitat consisted of residential buildings, light industry, multi-storey village housing, open storage, recreational parks and transport infrastructure. The vegetation recorded was mainly roadside trees and horticultural species in landscaped areas or recreational parks. The dominant species typically included planted tree species, Taiwan Acacia (*Acacia confusa*), Ear-leaved Acacia (*Acacia auriculiformis*) and Flame Tree (*Delonix regia*), and native tree species, Hong Kong Orchid Tree (*Bauhinia x blakeana*) and Elephant's Ear.
- 9.3.20 Village/orchard composed of village housing interspersed with patches of orchard supporting ornamental plants, crops and/or fruit trees. Tin Sam Tsuen, San Sang San Tsuen and Yick Yuen Tsuen are located at the east, northwest and south of the Project Site Boundary respectively. The fruit trees planted within the gardens or orchards included Wampi, Longan and Lychee. Ornamental species including Kwai-fah (*Osmanthus fragrans*), Brazil Bougainvillea (*Bougainvillea spectabilis*) and Chinese Banyan (*Ficus microcarpa*) are also commonly planted in the gardens and the common area of each village. The habitat is exposed to moderate levels of anthropogenic disturbance (e.g. noise, visual disturbance). The structural complexity of the vegetation is simple and no plant species of conservation importance was recorded.
- 9.3.21 Agricultural Land refers to man-made habitat for crop production and is usually associated with village settlement. Rotation cropping was observed within the agricultural areas. Patches of dry agricultural area are present at San Sang San Tsuen. Cabbage (*Brassica oleracea*), Lettuce (*Lactuca sativa*), and Chinese White Cabbage (*Brassica chinensis*), are commonly cultivated while fruit trees such as Papaya and Banana (*Musa x paradisiaca*) are grown along the field bunds. This habitat was subject to a high level of disturbance (e.g. agricultural activities) and no plant species of conservation importance was recorded.
- 9.3.22 Watercourse Tin Sam Channel within the 500m Study Area was made of concrete base and banks of approximately 5.0m in width and with limited vegetation recorded. Plant species including herbs, Guinea Grass (*Panicum maximum*), Greater Duck-weed (*Spirodela polyrhiza*) and *Wedelia trilobata* were found scattered within this area.

- 9.3.23 The 500m Study Area was previously covered in the ecological survey conducted for the approved EIA for HSK/HT NDA. In the current ERR, the fauna within the 500m Study Area consisted mainly of locally common and widespread species e.g., Masked Laughing thrush, Japanese White-eye, Black-collared Starling etc. A low abundance and diversity of common butterfly and odonate species were recorded with the Indian Cabbage White and Wandering Glider being relatively more common. The recorded amphibians included Asian Common Toad and Long Tailed Skink.
- 9.3.24 Totally four fauna species of conservation importance were recorded during the ecological reconnaissance site visits including Chinese Pond Heron (*Ardeola bacchus*), Little Egret (*Egretta garzetta*), Grey Heron (*Ardea cinerea*) and Japanese Pipistrelle (*Pipistrellus abramus*). These are listed in Wild Animals Protection Ordinance (Cap. 170), yet very common in Hong Kong.
- 9.3.25 Based on the findings in the desktop review of the existing literature information verified by the comparison of historic aerial photographs and reconnaissance site visits, no ecological information gap was considered existing. The habitat evaluation of 500m Study Area is presented in **Table 9.3** with reference made to the guidelines of Annex 8 of the EIAO-TM.

Table 9.3: Evaluation of Habitats within 500m Study Area

Criteria	Developed area/ wasteland	Village/ Orchard	Agricultural Land	Modified watercourse
Naturalness	Low	Low	Low	Low
Size	104.01ha	59.53ha	2.51ha	2069m
Diversity	Low-medium	Very low	Low	Very low
Rarity	Very common with one flying mammal species of conservation importance	Very common with one flying mammal and one avifauna species of conservation importance	Very common	Very common with three avifauna species of conservation importance
Re-creatability	Easy to recreate	Easy to recreate	Easy to recreate	Easy to recreate
Fragmentation	Low	Low	Moderate	Low
Ecological Linkage	No significant linkage with any important habitat nor site of conservation importance	No significant linkage with any important habitat nor site of conservation importance	No significant linkage with any important habitat nor site of conservation importance	No significant linkage with any important habitat nor site of conservation importance
Potential Value	Low	Low	Low	Low
Nursery/Breeding Ground	No recorded	No recorded	No recorded	No recorded
Age	Uncertain	Uncertain	Uncertain	Uncertain
Abundance/	Very Low	Very Low	Very Low	Very Low

Criteria	Developed area/wasteland	Village/Orchard	Agricultural Land	Modified watercourse
Richness of wildlife				
Ecological Value	Low	Low	Low	Low

9.4 Review of Ecological Impact and Mitigation Measures

Construction Phase

Direct Loss of Habitats and Vegetation

- 9.4.1 The habitats within the Project Site Boundary are of low ecological value including developed area/wasteland, village/orchard, and modified watercourse. With reference to the evaluation in **Section 9.3**, the affected habitats are all of low ecological value and are readily re-creatable. Besides, they are subject to human and traffic disturbance as they are close to village and vehicle roads.
- 9.4.2 The Project Site Boundary was covered by the approved EIA for HSK/HT NDA. According to the EIA for HSK/HT NDA, no insurmountable residual ecological issue was identified within Project Site Boundary.
- 9.4.3 The vegetation within the Project Site Boundary would be cleared and lost permanently. The affected vegetation is dominated by the invasive exotic species *Leucaena leucocephala* and fast-growing exotic species *Acacia confuse*, the Project site is mostly paved and had a low vegetation coverage. No flora species of conservation importance was recorded nor impacted. The loss of the vegetation is therefore considered to be of low ecological impact. No mitigation measure would be required.

Direct Ecological Impact

- 9.4.4 A very low diversity and low abundance of fauna was recorded within the Project site. According to the Figure 9.3I of the approved EIA of HSK/HT NDA, there was one fauna species of conservation importance recorded within the Project Site Boundary, i.e., Little Egret.
- 9.4.5 Little Egret is protected and listed in Wild Animals Protection Ordinance (Cap. 170). They are very common and widely distributed throughout Hong Kong. This species was recorded in modified watercourse at Project Site Boundary, which is evaluated as low ecological value. As Little Egret is highly mobile and no roost was found within the Project site during the ecological reconnaissance site visit, the potential direct impact to Little Egret is not significant and considered to be **low**. No mitigation measures are required.

Indirect ecological Impact

- 9.4.6 The construction nuisance (e.g. noise generated by construction works) within the Project Site Boundary would be of low ecological impact to fauna. With good site practices in place, the general construction disturbance would be limited. While the low abundance of birds, which are disturbance sensitive, occur in the nearby watercourse, the potential

indirect impact to the nearby habitats would be insignificant.

- 9.4.7 Construction phase water quality impact mainly includes the surface runoff with suspended solid content and potential accidental leakage of oil and grease from mechanical plant equipment. The Project would tentatively commence the major construction works in 2025 for completion by 2028. The main waterbody within the Project Site Boundary is a modified watercourse with low ecological value.
- 9.4.8 As a standard site practice, any surface runoff would be diverted by temporary drain or pumped away and treated by sedimentation tanks before discharge. A discharge license would be applied by the future works contractor. Adequate standby pumps would be provided on-site to prepare for emergency situations such as heavy rain. Exposed earth would be covered by tarpaulin to minimise erosion and generation of runoff during rain. With the implementation of the standard site practice, the potential ecological impact due to water quality deterioration would be insignificant.

Operation Phase

- 9.4.9 During the operation of the Project, human activities and disturbance would be more frequent than the current conditions. As the Project Site Boundary and its surrounding areas were covered by the approved EIA of HSK/HT NDA, all of these areas would be eventually developed and the potential ecological impacts were identified, evaluated and assessed in the approved EIA of HSK/HT NDA. No unacceptable residual ecological impact was identified for the proposed development and around the Project Site Boundary

9.5 Conclusion

- 9.5.1 The ecological impact due to the proposed Project was reviewed. The ecological baseline condition was reviewed based on the literature review and ecological reconnaissance site visit observations conducted for within the Project site boundary and the 500m Study Area. It was found that the habitats covered in the Project Site Boundary are not ecologically important, so it is expected that the ecological impact due to the loss of habitat would be insignificant. No ecological specific mitigation measures were considered necessary, but preventive and precautionary measures were recommended to prevent indirect ecological impact to offsite habitat.
- 9.5.2 Based on the findings in the desktop review of the existing literature information verified by the comparison of historic aerial photographs and reconnaissance site visits, no ecological information gap was considered existing.

9.6 Reference

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10 REVIEW OF LANDSCAPE AND VISUAL

10.1 Review of Planning and Control Framework

Outline of Planning and Control Framework

- 10.1.1 A review of the existing planning studies and documents was undertaken as a part of the baseline study to gain an insight into the planned role of the Project, its surrounding areas, and its landscape context and to help determine if the Project fits into the wider existing and future landscape context.
- 10.1.2 The Project lies within the approved Hung Shui Kiu and Ha Tsuen Outline Zoning Plan No. S/HSK/2, it is currently zoned as “Other Specified Uses” (OU) (Railway Associated Facilities), as shown in **Figure 10.1**. The planning intentions of this zone is primarily for the planned railway associated facilities serving the needs of the general public which is in accordance with the planning goals and objective for the assessment area.
- 10.1.3 Land use zones that may be potentially affected by the Project and the future and current outlook of the area is discussed and summarized in **Table 10.1**.
- 10.1.4 The approved EIA for WRL and the approved EIA for HSK/HT NDA were reviewed and the assessment results were considered. This section identified and assessed the landscape and visual impact at the Project Site.

Table 10.1 Summary of Review of Planning and Development Control Framework

OZP No.	Land use Zone	Approx. Area Affected	Current Design and Planning Intention
Hung Shui Kiu and Ha Tsuen No. S/HSK/2	Other Specified Uses (OU)	1.84ha	The Project is a railway associated facility which would be in line with the current and future planning settings and would not have any conflicts with the statutory town plans of area.

10.2 Baseline of Landscape Resources (LRs)

- 10.2.1 Details of baseline LR which will be potentially affected by the Project, together with their sensitivities are described in **Table 10.2**. Locations of the baseline LR are mapped on **Figure 10.2** and photographs of the LR are provided on **Figures 10.4 to 10.5**. For ease of reference and co-ordination between text, tables and figures, each landscape resource is given an identity number.

LR1 – Hillside Woodland

- 10.2.2 LR1.1 – Yuen Tau Shan (1.57ha) – This LR refers to the hillside woodland of Yuen Tau Shan that forms a distinctive green backdrop of the Hung Shui Kiu. The hillsides comprise dense woodland stands on lower elevation and more open, hillside shrub on higher elevation. Vegetation consists of mature and semi-mature tree canopies of various species forming an interconnected tree canopy. A total of approximately 227 nos. of trees

have been identified within this LR. No tree of particular interest was found and the vegetation consists of predominantly native tree species growing naturally with some understorey vegetation, or plantation style forests. Tree species include *Acacia confusa*, *Dimocarpus longan*, *Eucalyptus spp.*, *Macaranga tanarius var. tomentosa*, *Phyllanthus emblica*, *Schima superba*, etc. The rarity of the LR is **Low** as most of the trees within the LR are common species. The quality and maturity of the LR is **Medium** due to the maturity of tree group within the LR is relative mature. The ability to accommodate change of this LR is **Medium**. LR 1.1 is considered as **Medium** in sensitivity.

LR2 – Plantation

- 10.2.3 LR2.1 – Semi-Natural Vegetation (19.81ha) – This LR refers to medium to large size, woodland and scrubland areas. It consists of continuous, large areas of vegetation including stands of mature and semi-mature trees and open scrubland and grassland areas. A total of approximately 1813 nos. of trees have been identified within this LR. No tree of particular interest was found and the vegetation is generally of good quality in that the trees are mature and semi-mature species. Dominant tree species include *Dimocarpus longan*, *Leucaena leucocephala*, *Macaranga tanarius var. tomentosa*, etc. The rarity of the LR is **Low** as most of the trees within the LR are common species. The quality and maturity of the LR is **Medium** due to the maturity of tree group within the LR is relative mature. The ability to accommodate change of this LR is **Medium**. LR 2.1 is considered as **Medium** in sensitivity.
- 10.2.4 LR2.2 – Roadside Vegetation (0.25ha) – This LR refers to intermittent stands of trees located along Castle Peak Road and Hung Shui Kiu Tin Sam Road. A total of approximately 58 nos. of trees have been identified within this LR. No tree of particular interest was found and the vegetation consists of mature and semi-mature trees of locally common amenity tree species. Tree species include *Crateva trifoliata*, *Melaleuca cajuputi subsp. cumingiana*, *Senna siamea*, etc. The rarity of the LR is **Low** due to its relatively typical village setting and trees within the LR are common species. The quality and maturity of the LR is **Low** as the trees within the LR are relatively young. The ability to accommodate change of this LR is **High**. LR 2.2 is considered as **Low** in sensitivity.

LR3 – Vegetation within Urban Park

- 10.2.5 LR3.1 – Playground (0.61ha) – This LR refers to Tin Ha Road Playground, a medium-sized open space adjacent to industrial mix. It is located at the junction of Castle Peak Road (Hung Shui Kiu) and Tin Ha Road. It consists of a soccer pitch, basketball court and children play area, with various amenity planting, sitting areas, pavilions and open paved area for other activity uses. A total of approximately 36 nos. of trees have been identified within this LR. No tree of particular interest was found and the vegetation consists of semi-mature amenity trees and shrub planting. Tree species include *Aleurites moluccana*, *Callistemon viminalis*, *Delonix regia*, *Eucalyptus torelliana*, etc. The rarity of the LR is **Low** due to its relatively typical village setting and trees within the LR are common species. The quality and maturity of the LR is **Medium** as trees within the LR are dominant with young trees and few big trees. The ability to accommodate change of this LR is **Medium**. LR 3.1 is considered as **Medium** in sensitivity.
- 10.2.6 LR3.2 – Sitting-Out Area (0.16ha) – This LR refers to small sitting-out areas and public leisure areas catering to the local-residents. A total of approximately 27 nos. of trees have been identified within this LR. No tree of particular interest was found within this LR and the vegetation consists of semi-mature trees. Most tree species include *Dimocarpus*

longan, Macaranga tanarius var. tomentosa Clausena lansium, etc. The rarity of the LR is **Low** as trees within the LR are common species. The quality and maturity of the LR is **Low** as the trees within the LR are relatively young. The ability to accommodate change of this LR is **High**. LR 3.2 is considered as **Low** in sensitivity.

LR4 – Vegetation on Rural Villages

- 10.2.7 LR4.1– Rural Village (8.85ha) – This LR refers to rural villages with intermittent greening, located at the north and south of the Project. It is a typical village with low-rise residential settlements and limited infrastructure. This LR often has small orchard areas associated with private gardens, as well as amenity planting among the built structures. A total of approximately 526 nos. of trees have been identified within this LR. No tree of particular interest was found. Tree species include *Aleurites moluccana*, *Dimocarpus longan*, *Mangifera indica*, etc. The rarity of the LR is **Low** due to its relatively typical village setting and trees within the LR are common species. The quality and maturity of the LR is **Medium** as trees within the LR are dominant with young trees with few big trees. The ability to accommodate change of this LR is **Medium**. LR 4.1 is considered as **Medium** in sensitivity.
- 10.2.8 LR4.2 – Tin Sam Tsuen (6.06ha) – This LR refers a large village housing area of Tin Sam Tsuen; it is located south and west of Tin Ha Road along Tin Sam. Vegetation consists of a mixture of self-seeded and cultivated trees within and around the village area. A total of approximately 292 nos. of trees have been identified within this LR. No tree of particular interest was found. Tree species include *Bombax ceiba Delonix regia*, *Dimocarpus longan*, *Macaranga tanarius var. tomentosa*, etc. The rarity of the LR is **Medium** due to its relatively typical village setting and trees within the LR are common species. The quality and maturity of the LR is **Medium** as trees within the LR are dominant with young trees with few big trees. The ability to accommodate change of this LR is **Medium**. LR 4.2 is considered as **Medium** in sensitivity.
- 10.2.9 LR4.3 – Sam Lee UK Tsuen (4.39ha) – This LR refers to large village housing area at the north of Tin Sam Tsuen. No tree of particular interest was found within this LR and the vegetation consists of a mixture of self-seeded and cultivated trees within and around the village area and two vegetation patches located west of Tin Ha Road. A total of approximately 124 nos. of trees have been identified within this LR. No tree of particular interest was found. Tree species include *Bauhinia purpurea*, *Clausena lansium*, *Dimocarpus longan*, *Leucaena leucocephala*, etc. The rarity of the LR is **Medium** due to its relatively typical village setting and trees within the LR are common species. The quality and maturity of the LR is **Medium** as trees within the LR are dominant with young trees with few big trees. The ability to accommodate change of this LR is **Medium**. LR 4.3 is considered as **Medium** in sensitivity.
- 10.2.10 LR4.4 – Low-Rise Development (30.07ha) – This LR refers to large village housing developments, Casa De Oro and Parkview Garden, located south and west of Tin Ha Road along Tin Sam respectively. A total of approximately 428 nos. of trees have been identified within this LR. 3 nos. of tree of particular interest were identified (TPI-018, TPI-27 & TPI-28), species include *Ficus macrocarpa* and a detailed description of the TPI is provided in **Section 10.4**. and the vegetation consists of common ornamental species. Tree species include *Ficus microcarpa*, *Ficus maclellandii 'Alii'* *Terminalia mantaly 'Tricolor'*, etc. The rarity of the LR is **Medium** due to its relatively typical village setting and trees within the LR are common species. The quality and maturity of the LR is **Medium** as trees within the LR are dominant with young trees with few big trees. The

ability to accommodate change of this LR is **Medium**. LR 4.4 is considered as **Medium** in sensitivity.

LR5 – Vegetation within Industrial Land

10.2.11 LR5.1 – Industrial business & Storage Mix (79.24ha) – This LR refers to an area composed of formal and informal industrial structures (warehouses, sheds, temporary buildings, workshops and other associated activities such as factory facilities), open/ un-surfaced ground, access roads/ parking (surfaced and un-surfaced). Vegetation are generally located around the perimeter of the open yard or parking lot. A total of approximately 560 nos. of trees have been identified within this LR. 12 nos. of tree of particular interest were identified (TPI-08, TPI-09, TPI-11, TPI-13, TPI-16, TPI-17, TPI-19, TPI-20, TPI-21, TPI-22, TPI-23 & TPI-24) species include *Celtis sinensis*, *Dimocarpus longan*, *Ficus macrocarpa*, *Ficus elastica*, *Michelia x alba* and *Sterculia monosperma* and detailed description of the TPI is provided in **Section 10.4**. Other tree species include *Bombax ceiba*, *Leucaena leucocephala*, *Artocarpus heterophyllus*, etc. The rarity of the LR is **Medium** as trees within the LR are common species. The quality and maturity of the LR is **Medium** as the LR consists of only a few numbers of young trees. The ability to accommodate change of this LR is **High**. LR 5.1 is considered as **Medium** in sensitivity.

LR6 – Vegetation within Cultural Land

10.2.12 LR6.1 – Church (0.78ha) – This LR refers to religious use site. Amenity vegetation is located at the gathering spaces of the church and adjacent to buildings and internal roads. A total of approximately 50 nos. of trees have been identified within this LR. No tree of particular interest was found and the vegetation consists of common amenity planting in a mixture of native and exotic species. Tree species include *Aleurites moluccana*, *Macaranga tanarius* var. *tomentosa*, *Melaleuca cajuputi* subsp. *cumingiana*, *Roystonea regia* etc. The rarity of the LR is **Medium** as trees within the LR are common species. The quality and maturity of the LR is **Low** as the trees within the LR are in mixed range of age. The ability to accommodate change of this LR is **Medium**. With the above considerations, the sensitivity of LR 6.1 is therefore considered as **Medium** in sensitivity.

LR7 – Vegetation within Agricultural Land

10.2.13 LR7.1 – Actively Cultivated Land (16.79ha) – This LR refers to the continuous agricultural plots of various sizes with growing a variety of crops, numerous stands of trees varying in ages as well as sheds and rural buildings of varying functions. A total of approximately 657 nos. of trees have been identified within this LR. 3 nos. of tree of particular interest were identified (TPI-6, TPI-04 & TPI-05), species include *Eucalyptus* sp. and *Ficus macrocarpa*, and detailed description of the TPI is provided **Section 10.4**. Most of tree species found within this LR includes *Dimocarpus longan*, *Litchi chinensis*, *Musa* sp. etc. The rarity of the LR is **Medium** as trees within the LR are common species. The quality and maturity of the LR is **Medium** as the trees within the LR are in mixed range of age. The ability to accommodate change of this LR is **Medium**. With the above considerations, LR 7.1 is therefore considered as **Medium** in sensitivity.

LR8 – Water Bodies

10.2.14 LR8.1 – Channelized Watercourse (3.15ha) – This LR refers to a concrete channel that runs to south and drain into Tin Shiu Wai Main Drainage Channel. This drainage channel

consists of vertical concrete embankments no major vegetation coverage. A total of approximately 76 nos. of trees have been identified within this LR. No tree of particular interest was found. Tree species include *Melia azedarach*, *Leucaena leucocephala* etc. The rarity, quality, and maturity of the LR is **Low** as only some weeds or self-seed pioneers growing from cracks or climbing on the concrete banks are found in this LR. The LR has **High** ability to accommodate change and therefore, LR8.1 is considered as **Low** in sensitivity.

10.2.15 LR9 – Construction site (5.81ha) – This LR refers to the site office and construction site for planned development. A total of approximately 67 nos. of trees have been identified within this LR. No tree of particular interest was found. Tree species include *Bombax ceiba*, *Celtis sinensis*, *Leucaena leucocephala*, *Psidium guajava*, etc. The rarity of the LR is **Low** as most of the trees within the LR are common species. The quality and maturity of the LR is **Low** as the trees within the LR are dominant with young trees. The LR has **High** ability to accommodate change and therefore, LR9 is considered as **Low** in sensitivity.

LR10 – Transportation & Associated Facilities

10.2.16 LR10.1 – MTR Station, MTR Line, MTRCL Facility (4.43ha) – This LR refers to the existing railway for the TML. The vegetation consists of generally underneath the elevated railway track and buffer planting on the eastern facing Tin Sam. A total of approximately 258 nos. of trees have been identified within this LR. No tree of particular interest was found. Tree species include *Bauhinia x blakeana*, *Celtis sinensis*, *Senna siamea*, etc. The rarity of the LR is **Low** as trees within the LR are common species. The quality and maturity of the LR is **Low** due to presence of considerable amounts of young trees. The LR has **High** ability to accommodate change. Due to its low number of trees, LR 10.1 is considered as **Low** in sensitivity.

10.3 Baseline of Landscape Character Areas (LCAs)

10.3.1 The baseline LCAs which are potentially affected by the Project, together with their sensitivity to change, are described below. The locations of the LCAs are indicated on **Figure 10.3**. Photo-views illustrating the LCAs within the study area are illustrated on **Figure 10.6**. For ease of reference and co-ordination between text, tables and drawings each LCA is given an identity number.

10.3.2 LCA1 – Miscellaneous Rural Fringe Landscape (198.89ha) – This LCA consists of scattered village settlements, open storages plot and agricultural land connected by winding lanes and footpaths. The land uses have fragmented the development pattern of local landscape. Vegetation mainly consists of pockets of woodland scattered within the landscape, and peripheral woodland on hillside. Ornamental species within parks and siting areas are found within this LCA. The rarity of this LCA is **Low** as most of the trees are common species. The quality and maturity of the LCA is **Medium**. The LCA has **Medium** ability to accommodate changes. Through time, changes in the land uses have led to sprawling, resulting fragmentation in land use and the landscape patterns has become more incoherent. LCA1 is considered as **Medium** in sensitivity.

10.3.3 LCA2 – Upland and Hillside Landscape (0.91ha) – This LCA consists of elevated hillside landscape (generally between 40 to 375mPD of Yuen Tau Shan). The hillsides consist of

exposed soils, scrub vegetation with rocky outcrops or boulder and pockets of woodland cover at the low elevations. There are a few human features within this LCA, including footpaths, powerlines and hiking trails. This LCA is of high importance in the district as it forms the green backdrop for the town of Hung Shui Kiu. The rarity of the LCA is **Low** as most of the trees within the LCA common species. The quality and maturity of this LCA is **Medium**. The ability to accommodate change of this LCA is **Medium**. LCA2 is considered as **Medium** in sensitivity.

10.3.4 Summary of sensitivity for all LRs and LCAs within the assessment area are presented in **Table 10.2 and 10.3** respectively.

Table 10.2 Sensitivities of LRs within the Assessment Area

ID No.	LR	Quality (High/ Medium/ Low)	Maturity (High/ Medium/ Low)	Significance of the change in Local & Regional Context	Ability to accommodate to change (High/ Medium/ Low)	Importance & rarity of special landscape elements	Sensitivity
LR1	Hillside Woodland						
LR1.1	Yuen Tau Shan	Medium	Medium	Regional	Medium	Low	Medium
LR2	Plantation						
LR2.1	Sem-Natural Vegetation	Medium	Medium	Local	Medium	Low	Medium
LR2.2	Roadside Vegetation	Low	Low	Local	High	Low	Low
LR3	Vegetation within Urban Park						
LR3.1	Playground	Medium	Medium	Local	Medium	Low	Medium
LR3.2	Sitting-Out Area	Low	Low	Local	High	Low	Low
LR4	Vegetation within Rural Villages						
LR4.1	Rural Village	Medium	Medium	Local	Medium	Low	Medium
LR4.2	Tin Sam Tsuen	Medium	Medium	Local	Medium	Medium	Medium
LR4.3	Sam Lee UK Tsuen	Medium	Medium	Local	Medium	Medium	Medium
LR4.4	Low-Rise Development	Medium	Medium	Local	Medium	Medium	Medium
LR5	Vegetation within Industrial Land						
LR5.1	Industrial Business & Storage Mix	Medium	Medium	Local	High	Medium	Medium
LR6	Vegetation within Cultural Land						
LR6.1	Church	Low	Low	Local	Medium	Medium	Medium
LR7	Vegetation on within Agricultural Land						
LR7.1	Actively Cultivated Land	Medium	Medium	Local	Medium	Medium	Medium
LR8	Water Bodies						
LR8.1	Channelized Watercourse	Low	Low	Local	High	Low	Low
LR9	Construction Site	Low	Low	Local	High	Low	Low
LR10	Transportation & Associated Facilities						
LR10.1	MTR Station, MTR Line, MTRCL Facilities	Low	Low	Local	High	Low	Low

Table 10.3 Sensitivities of LCAs within the Assessment Area

ID No.	LCA	Quality (High/ Medium/ Low)	Maturity (High/ Medium/ Low)	Significance of the change in Local & Regional Context	Ability to accommodate to change (High/ Medium/ Low)	Importance & rarity of special landscape elements	Sensitivity
LCA1	Miscellaneous rural Fringe Landscape	Medium	Medium	Local	Medium	Low	Medium
LCA2	Upland and Hillside Landscape	Medium	Medium	Regional	Medium	Low	Medium

10.4 Broad-brush Tree Survey

Survey for OVTs and TPIs

- 10.4.1 A tree survey was conducted for Old and Valuable Trees (hereafter as OVT) and Tree of Particular Interest (hereafter as TPI) within the assessment area.
- 10.4.2 No registered “Old and Valuable Trees” (OVTs) was recorded under DEVB TC(W) No. 05/2020 – Registration and Preservation of Old and Valuable Trees within the Project Site Boundary and assessment area.
- 10.4.3 Total 18 nos. of the trees were identified as TPI in accordance with the criteria listed in Para 2.6.1 of Guidelines for Tree Risk Assessment and Management Arrangement (9th edition) (the TRAM). All these trees were defined as TPI owing to their trunk diameter exceeding 1m measured at 1.3m above ground level.
- 10.4.4 Most of these TPIs recorded were outside the Project Site Boundary and would not be affected by the proposed works. Only 1 TPI (i.e.TPI-23) was found located in the Project Site Boundary, but it would not be affected by proposed works and thus can be retained in-situ.
- 10.4.5 Species include *Celtis sinensis*, *Dimocarpus longan*, *Eucalyptus sp.*, *Ficus microcarpa*, *Ficus elastica*, *Michelia x alba* and *Sterculia monosperma*. Detailed survey of the TPIs within the assessment area were carried out and their location were indicated on **Figure 10.2**. A Survey Schedule of these TPI were appended in **Appendix 10.1** and the photographic record of these TPI were included in **Appendix 10.2**.

Broad-brush Tree Survey

- 10.4.6 A broad-brush tree survey was carried out within the Works Sites/ Works Areas and approximately 786 nos. trees comprising 35 species were recorded.
- 10.4.7 There are a considerable number of trees located in currently inaccessible government or private lands. Since the access to these lands was not granted/allowed at the time of preparation of this ERR, aerial drone and other desktop tools have been adopted to estimate the quantity.
- 10.4.8 The broad-brush tree survey findings including tree group survey plan, broad-brush tree survey schedule and photographic record are illustrated in **Figure 10.18**, **Appendix 10.3** and **Appendix 10.4** respectively.

Impacts on Existing Trees

- 10.4.9 The proposed works are carefully designed and optimised to minimise impact to the existing trees during construction and operation phase. Approximately 28 nos. of tree are considered feasible to be retained in-situ.
- 10.4.10 However, under the current scheme of development layout, there are approximately 765 nos. of trees that would be affected due to the temporary and permanent above ground structure elements during the construction and operation phases. The quantity of affected

trees in the Landscape Resources is summarized at **Table 10.4**. The actual number of trees to be affected will be presented in the Tree Preservation and Removal Proposal (TPRP) in a later stage.

Table 10.4: Quantity of Trees Affected by the Project

ID No.	Landscape Resources	Approximately Quantity of Trees Affected by the Project
LR 2.1	Semi-Natural Vegetation	7
LR 4.1	Rural Village	254
LR 5.1	Industrial business & Storage Mix	180
LR 8.1	Channelized Watercourse	195
LR 9	Construction site	48
LR 10.1	MTR Station, MTR Line, MTRCL Facility	81
Total approx. quantity of trees affected		765

10.4.11 More than 30% of the trees affected are undesirable weed species *Leucaena leucocephala*, another over 25% of the affected trees are exotic common species, including *Acacia confusa*, *Bauhinia purpurea*, *Bauhinia variegata*, *Bauhinia variegata*, *Bombax ceiba*, *Caryota mitis*, *Cassia siamea*, *Ficus rumphii*, *Melia azedarach* and etc. The remaining affected trees comprise of mostly native plantation species, e.g., *Ficus microcarpa*, *Macaranga tanarius* var. *tomentosa*, *Broussonetia papyrifera*, *Ficus hispida*, *Bauhinia x blakeana*, *Bridelia tomentosa*, *Celtis sinensis*, *Cinnamomum burmannii*, *Ficus variegata*, *Macaranga tanarius* var. *tomentosa*, *Morus alba*, *Sapium sebiferum* and cultivated exotic orchard trees (e.g. *Carica papaya*, *Clausena lansium*, *Dimocarpus longan*, *Litchi chinensis*, *Eriobotrya japonica*, *Mangifera indica*, *Psidium guajava*, etc.).

10.4.12 A subsequent TPRP will be prepared and submitted separately in accordance with the requirements as stipulated in (LAO) PN No. 2/2020.

10.4.13 The affected trees are mainly located at the periphery of the Project Site and under the viaducts. As described in the above **Section 10.4.11**, all the recorded plantations are common species, weed species and amenity landscaping species in Hong Kong and thus not considered as species of conservation importance, as well as no significant linkage with any important habitat.

10.5 Baseline of Visual Impact

Visual Envelope (VE)

10.5.1 The VE on the ground level is largely limited by existing trees, vegetation cover, infrastructures and the dense urban development. Thus, most of the proposed works will be visible to village houses, temporary structures and industry mix-used yards that are directly adjacent to the Project and vehicle travellers on Yick Yuen Road. As a result, the VE is confined to the area that is with relatively close-proximity to the Project. However, with distance, elevated views are available of the Project from surrounding the ridgelines of Yuen Tau Shan, that is running north to Deep Bay and south to Tuen Mun and the ridgelines of Kung Um Shan to the east.

10.5.2 The extent of the VE and the location of the identified VSRs are indicated on **Figure 10.7**.

Visual Character and Resources

10.5.3 The Project is located in a mixed urban-rural area that is densely built with villages houses, low-rise residential developments and industrial land use. The Project is built on the existing elevated structure carrying an operating railway line, part of the existing TML (approximately +20mPD) which is immediately next to villages houses of not more than 3 storeys to the east and intermittent greening to the far west and industrial sheds, temporary structure, storage yards dominate large areas of the west. The visual quality to most public is therefore fair, and the visual quality of the region is generally within the range of medium to good.

10.5.4 The visual outlook is shaped by the combined composition of all the visual elements which come into sight of the viewers. Key visual elements, including those with positive visual qualities i.e. “visual attractors” and those with negative visual qualities i.e. “visual detractors” have been identified and illustrated on **Figure 10.7** and are listed below:

Key Positive Visual Resources/Attractors:

- Ridgelines of Castle Peak (approximately +375mPD) and Kung Um Shan (approximately +297mPD);
- Revitalized Tin Shui Wai Nullah;
- Roadside vegetations, playground and parks;

Key Negative Visual Eyesores/Detractors:

- Primary road distributor (Kong Sham Western Highway);
- West Rail Line; and
- Industrial buildings and temporary structures.

10.5.5 Among the identified key visual resources, ridgelines and roadside vegetation/green slopes are considered as the most sensitive visual resources and have high amenity value to the VSRs.

Visually Sensitive Receivers (VSRs)

10.5.6 The VSRs have been identified and detailed descriptions of the VSRs are provided below and summarised in **Table 10.5** with sensitivities for each. Their locations and representative photos are shown in **Figure 10.7** and **Figures 10.9 to 10.16** respectively.

10.5.7 VSR1 – Residents in Tin Sam Tsuen (Retained Village under HSK/HT NDA) – The VSR represents residents of village houses of not more than 3-storey in Tin Sam Tsuen. It is in close proximity from the northeast of the Project. The existing view is partially blocked by the low-rise village structures, existing trees and vegetations with WRL in the medium height level. In addition, residents can enjoy alternative views of the green backdrop formed by Yuen Tau Shan to the west and Tai Lam Country Park to the east. The sensitivity of viewers at this VSR is considered **High**.

10.5.8 VSR2 – Residents in San Lee Uk Tsuen (Retained Village under HSK/HT NDA) – This VSR represents residents of village houses not more than 3-storey in San Lee Uk Tsuen. It is at a moderate distance from the northeast of the Project, along Tin Sha Road. The existing view is occupied by low-rise villages, mixed commercial/industrial uses buildings and intermittent greening in the foreground. In addition, residents from medium height

level can enjoy alternative views of the green backdrop formed by Yuen Tau Shan to the west and Tai Lam Country Park to the east. The sensitivity of viewers at this VSR is considered **High**.

- 10.5.9 VSR3 – Potential Residents in Residential site (Area 28B) under HSK/HT NDA – The VSR is currently occupied by residents in low density non-recognized village (Tin Sam San Tsuen), comprises of shreds and rural buildings with agricultural plots and existing vegetation. It is immediately adjacent from the east to the Project, in between Tin Sam Tsuen and Yick Yuen Road. The existing views at the ground level view are occupied by existing dense foliage interspersed throughout this area, beyond that, the WRL can be seen partially to the west and existing vegetation to the east. In addition, residents can enjoy alternative views of the green backdrop formed by Yuen Tau Shan to the west and Tai Lam Country Park to the east. The sensitivity of viewers at this VSR is considered **High**.
- 10.5.10 VSR4 – Residents in Yick Yuen Tsuen (North) – The VSR represents residents in Yick Yuen Tsuen, south of Yick Yuen Road. It is a distant view from the southeast of the Project, south of Yick Yuen Road. The existing view is occupied by low-rise villages, mixed commercial/industrial uses buildings and intermittent greening in the foreground. In addition, residents from medium height level can enjoy alternative views of the green backdrop formed by Yuen Tau Shan to the west and Tai Lam Country Park to the east. The sensitivity of viewers at this VSR is considered **High**.
- 10.5.11 VSR5 – Recreational Users Along Castle Peak Trails – The VSR represents users along the trail, at an elevation of approximately 375mPD. It is a distant elevated view from the west of the Project. Users have a full panoramic view of Hung Shui Kiu where the WRL is fully visible against a backdrop of the existing Hung Shui Kiu and Tai Lam Country Park. The sensitivity of viewers at this VSR is considered **High**.
- 10.5.12 VSR6 – Recreational Users in Tin Ha Road Playground / Soccer Pitch – The VSR represents users especially for kids and elderly in the area. It is located at the Yuen Road and Castle corner of Yick Peak Road – Hung Shui Kiu, a distant view from the east of the Project. The existing view is occupied by existing vegetation within the Playground and Low-rise village houses, intermittent greening and temporary structures in Tin Sam Tsuen in the midground. In addition, residents can enjoy alternative views of the green backdrop formed by Yuen Tau Shan to the west and Tai Lam Country Park to the east. The sensitivity of viewers at this VSR is considered **Low**.
- 10.5.13 VSR7 – Potential Recreational Users of Regional Plaza under HSK/HT NDA – The VSR is currently occupied by travellers on Yick Yuen Road. It is in close proximity from the south of the Project. The existing view is occupied by WRL and MTRCL facilities and existing vegetations with no blockage of view. However only a small portion of Yick Yuen Road has a full view of the Project. Viewers are mostly pedestrians or occupants going to industry area of HSK, which has a relatively short duration of stay. The sensitivity of viewers at this VSR is considered **High**.
- 10.5.14 VSR8 – Travellers on Footbridge at Castle Peak Road – Nai Wai Light Rail Station – This VSR represents travellers crossing over Castle Peak Road – Hung Shui Kiu. It is a distant elevated view from south of the Project, but this view is perceived mostly in mobile status, with shorter duration of view. The existing view is occupied by low-rise villages and existing vegetations in the foreground, while the mountain ridgeline of Yuen Tau Sha is in the background. The sensitivity of viewers at this VSR is considered **Low**.

10.5.15 VSR9 - Potential Occupants of Commercial Core (Area 32) under HSK/HT NDA – This VSR is currently occupied by workers in the industry/ storage yards. It is a medium distance view from the west of the Project, in between Kong Sham Western Highway and Tim Sam Channel. The existing view is dominant by material storage and temporary building structures in the foreground, WRL can be seen partially due to blockage from the vegetation at outer edge of the area. In addition, residents can enjoy alternative views of the green backdrop formed by Yuen Tau Shan to the west and Tai Lam Country Park to the east. The sensitivity of viewers at this VSR is considered **High**.

Table 10.5 Sensitivities of Visually Sensitive Receivers

ID No.	HSK/ NT NDA VSR ID	Description	Type of VSR	Approx. Viewing Distance (m)	Population of Viewers (Many/ Intermediate/ Few/ Very Few)	Quality of Existing View (Good/ Fair/ Poor)	Alternative View (Yes/No)	Frequency of View (Very frequent/ Frequent/ Occasional/ Rare)	Degree of Visibility (Full/ Partial/ Glimpsed/ Obstructed)	Duration of View (Long, Medium, Short)	Sensitivity
VSR1		Residents in Tin Sam Tsuen (Retained Village under HSK/HT NDA)	Residents	350	Many	Fair	Yes	Frequent	Partial	Long	High
VSR2		Residents in San Lee Uk Tsuen (Retained Village under HSK/HT NDA)	Residents	710	Many	Fair	Yes	Frequent	Partial	Long	High
VSR3		Potential Residents in Residential site (Area 28B) under HSK/HT NDA	Residents	70	Many	Poor	Yes	Frequent	Partial	Long	High
VSR4		Residents in Yick Yuen Tsuen (North)	Residents	400	Intermediate	Fair	Yes	Frequent	Partial	Long	High
VSR5	REC-1	Recreational Users along Castle Peak Trails	Recreational Users	1,500	Few	Good	Yes	Occasional	Full	Short	High
VSR6	REC-15	Recreational Users in Tin Ha Road Playground / Soccer Pitch	Recreational Users	440	Intermediate	Fair	Yes	Occasional	Obstructed	Short	Low
VSR7		Potential Recreational Users of Regional Plaza under HSK/HT NDA	Recreational Users	50	Many	Poor	Yes	Frequent	Full	Short	High
VSR8		Travellers on Footbridge at Castle Peak Road – Nai Wai Light Station	Travellers	900	Intermediate	Fair	Yes	Occasional	Partial	Short	Low
VSR9		Potential Occupants in Commercial Core (Area32) under HSK/HT NDA	Occupants	200 - 400	Many	Fair	Yes	Occasional	Glimpsed	Short	High

10.6 Potential Sources of Landscape and Visual Impacts

Potential Sources of Impacts

10.6.1 Potential impacts would result from the temporary and permanent above ground structure elements during the construction and operation phase. The potential sources of impacts are listed in **Table 10.6**.

Table 10.6: Sources of Landscape & Visual Impact

Code	Description
Construction Phase	
C1	Removal of vegetation due to site clearance
C2	Site formation works & excavation works
C3	Construction of roads and associated facilities
C4	Construction of underground utilities
C5	Construction traffic
C6	Temporary site office, temporary noise barrier above hoarding, stockpiling, machinery and works area
C7	Potential glare generated from area flood light at night
C8	Dust from construction works
C9	Drainage diversion works
Operation Phase	
O1	Operation of new HSK Station
O2	Residual impacts from loss of trees and vegetation during the construction phase
O3	Increase in ambient light level at night due to new HSK Station

Magnitude and Significance of Landscape Impacts before Mitigation

10.6.2 The magnitude of landscape impacts before implementation of mitigation measures during construction and operational phases have been assessed and are summarized in **Table 10.7** for Landscape Recourse (LR) and **Table 10.8** for Landscape Character Area (LCA).

10.6.3 LR2.1 – Semi-Natural Vegetation – A small portion of this LR within the Project site boundary would be removed or modified as part of the Project. This would involve the felling of 7 nos. of trees with this LR. Given the small scale (0.02%) of area relate to the overall area of this LR within the study area, the magnitude of change for both construction and operation phases is considered to be **Small** and the resulting impact significance during construction and operation phases before mitigation is considered to be **Slight adverse**.

10.6.4 LR4.1 – Rural Village – The entire 1.18ha of this LR within the Project site boundary would be incorporated into the works site. This would only involve the felling of 254 nos. of trees with this LR. However, given the small overall proportion of the resource affected (only 0.07%) of the resource within the study area), the magnitude of change for both construction and operation phases is considered to be **Intermediate** and the resulting impact significance during construction and operation phases before mitigation is considered to be **Moderate adverse**.

- 10.6.5 LR5.1– Industrial business & Storage Mix – Majority of the 1.55ha of this LR with the Project site boundary would be removed or modified as part of the Project, although some areas will be reinstated. This would involve the felling of 180 nos. of trees with this LR and none of the TPIs will be affected. Given the small scale (0.03%) of area relate to the overall area of this LR within the study area, the magnitude of change for both construction and operation phases is considered to be **Small** and the resulting impact significance during construction and operation phases before mitigation is considered to be **Slight adverse**.
- 10.6.6 LR8.1 – Channelized Watercourse – The entire 1.08ha of this LR within the Project site boundary would be removed or modified as part of the Project. This would involve the felling of 195 nos. of trees within this LR. However, given the small overall proportion of the resource affected (only 0.34%) of the resource within the study area), the magnitude of change for both construction and operation phases is considered to be **Small** and the resulting impact significance during construction and operation phases before mitigation is considered to be **Slight adverse**.
- 10.6.7 LR9 – Construction Site – The entire 0.62ha of this LR within the Project site boundary would be removed or modified as part of the Project. This would involve the felling of 48 nos. of trees. However, given the small overall proportion of the resource affected (only 0.11%) of the resource within the study area), the magnitude of change for both construction and operation phases is small and the resulting impact significance during construction and operation phases before mitigation is considered to be **Slight adverse**.
- 10.6.8 LR10.1 – MTR Station, MTR Line, MTRCL Facilities – The entire 1.06ha of this LR within the Project Site boundary would be upgrade and become part the Project. This would involve the felling of 81 nos. of trees. However, given the small overall proportion of the resource affected (only 0.28%) of the resource within the study area), the magnitude of change for both construction and operation phases is considered to be **Small** and the resulting impact significance during construction and operation phases before mitigation is considered to be **Slight adverse**.
- 10.6.9 LCA1 – Miscellaneous rural Fringe Landscape – Only a medium area of this LCA is affected by the Project, as it involves alteration or upgrade railway tack meaning the change is highly compatible with the existing character. No significant changes in topography would be resulted. The small area with upgrading work of the existing TML would be mutually merged to the existing urban topography. Approximately 765 trees will be affected in this LCA (none of them are trees of particular interest) and the magnitude of change for both construction and operation phases are considered to be **Intermediate**. The significance threshold at construction and operation phase is **Moderate adverse**.

Magnitude and Significance of Visual Impacts before Mitigation

- 10.6.10 VSR1 – Residents in Tin Sam Tsuen (Retained Village under HSK NDA) – This VSR to be impacted by the Project. Given its close proximity to the Project, the scale of work is considered Medium, and the Project will obstruct only a small proportion of hillside view. The Project is compatible with the existing surroundings but cause moderate visual degradation of the existing visual resources during construction, due to presence of construction machinery, removal of some existing vegetation and the installation of temporary noise barriers. The Magnitude of change is considered **Intermediate** during construction and operation stages. The significance of impact is **Moderate adverse** during construction and operation phases before mitigation respectively.

- 10.6.11 VSR3 – Potential Residents in Residential site (Area 28B) under HSK/HT NDA – This VSR to be impacted by the Project. Given its immediately location to the Project, the scale of work is considered Large. The Project is compatible with the existing surroundings but cause minimal visual degradation of the existing visual resources during construction, due to presence of construction machinery, removal of some existing vegetation and the installation of temporary noise barriers. The Magnitude of change is considered **Intermediate** during construction and operation stages. The significance of impact is **Moderate adverse** during construction and operation phases before mitigation.
- 10.6.12 VSR5 – Recreational Users along Castle Peak Trails – This VSR is to be partly impacted by the Project. Given its distance far away from the Project, the scale of work is considered Small. As additional lights in the HSK station will be kept to minimal for safety purpose, potential visual, glare and lighting impacts due to the physical installation of lighting equipment are anticipated to be low. The Project is compatible with the existing surroundings but cause minimal visual degradation of the existing visual resources due to presence of construction machinery, removal of some existing vegetation and the installation of temporary noise barriers. The Magnitude of change is considered **Negligible** during construction and operation stages. The significance of impact is **Insubstantial** during construction and operation phases before mitigation.
- 10.6.13 VSR7 – Potential Recreational Users of Regional Plaza under HSK/HT NDA – This VSR is to be impacted by the Project. Given its immediately location to the Project, the scale of work is considered Large. The Project is compatible with the existing surroundings but cause moderate visual degradation during construction, due to presence of construction machinery, removal of some existing vegetation and the installation of temporary noise barriers. The Magnitude of change is considered **Intermediate** during construction and operation stages. The significance of impact is **Moderate adverse** during construction and operation phases before mitigation.
- 10.6.14 VSR9 - Potential Occupants in Commercial Core (Area 32) under HSK/HT NDA – This VSR is to be impacted by the Project. Given its medium distance to the Project, the scale of work is considered Medium. The Project is compatible with the existing surroundings but cause minimal visual degradation of the existing visual resources during construction, due to presence of construction machinery, removal of some existing vegetation and the installation of temporary noise barriers. The Magnitude of change is considered **Intermediate** during construction and operation stages. The significance of impact is **Moderate adverse** during construction and operation phases before mitigation.
- 10.6.15 In addition, there would not be any discernible landscape impact on the remaining VSRs due to full blockage of existing views. Therefore, the magnitude of change and impact significant are **Negligible** and **Insubstantial** respectively on these remaining VSRs.

Recommended Photomontage Viewpoints (VPs)

- 10.6.16 Photomontages have been prepared from these VSRs to illustrate the predicted effectiveness of the proposed landscape and visual impacts unmitigated and mitigated.
- 10.6.17 The Photomontages have been prepared at representative VSRs under the following scenarios:
- Existing baseline conditions;
 - Day 1 of completed works without mitigation measures;

- Day 1 of the completed works with mitigation measures; and
- The completed works with mitigation after 10 years.

10.6.18 The locations of the VSRs are indicated in **Figure 10.7** and the photomontages to illustrate the potential visual impacts of the Project is shown in **Figures 10.9 to 10.17**.

Table 10.7 - Magnitude of Change and Significance of Landscape Resources (Before Mitigation)

ID No.	LR	Sources of Impacts from the Project	Scale of LR Affected	Total Size of LR (ha)	Total Area Affected (ha)	Reversibility of Works	Duration of Impact (Temporary / Permanent)		Compatibility with Surrounding Landscape (High/ Medium/ Low/ Nil)		Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance Without Mitigation Measures ((Substantial/ Moderate/ Slight/ Insubstantial)		
							Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	
LR1	Hillside Woodland														
LR1.1	Yuen Tau Shan	Nil	Nil	1.66	–	Nil	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LR2	Plantation														
LR2.1	Sem-Natural Vegetation	C1-C8, O1-O3	Small	24.19	0.53	Irreversible	Permanent	Permanent	Low	Medium	Small	Small	Slight	Slight	
LR2.2	Roadside Vegetation	Nil	Nil	0.15	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial	
LR3	Vegetation within Urban Park														
LR3.1	Playground	Nil	Nil	0.52	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial	
LR3.2	Sitting-Out Area	Nil	Nil	0.11	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial	
LR4	Vegetation within Rural Villages														
LR4.1	Rural Village	C1-C9, O1-O3	Small	16.66	1.18	Irreversible	Permanent	Permanent	Low	High	Intermediate	Intermediate	Moderate	Moderate	
LR4.2	Tin Sam Tsuen	Nil	Nil	7.79	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial	
LR4.3	Sam Lee UK Tsuen	Nil	Nil	6.06	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial	
LR4.4	Low-Rise Development	Nil	Nil	13.46	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial	
LR5	Vegetation within Industrial Land														
LR5.1	Industrial Business & Storage Mix	C1-C9, O2	Small	51.30	1.55	Irreversible	Permanent	Permanent	High	High	Small	Small	Slight	Slight	
LR6	Vegetation within Cultural Land														
LR6.1	Church	Nil	Nil	0.78	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial	
LR7	Vegetation on within Agricultural Land														
LR7.1	Actively Cultivated Land	Nil	Nil	15.78	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial	
LR8	Water Bodies														
LR8.1	Channelized Watercourse	C1-C9, O2	Small	3.16	1.08	Irreversible	Permanent	Permanent	Medium	High	Small	Small	Slight	Slight	
LR9	Construction Site	C1-C8, O1-O2	Small	5.56	0.62	Irreversible	Permanent	Permanent	Medium	High	Small	Small	Slight	Slight	
LR10	Transportation & Associated Facilities														
LR10.1	MTR Station, MTR Line, MTRCL Facilities	C1-C8, O1-O3	Small	3.72	1.06	Irreversible	Permanent	Permanent	Medium	High	Small	Small	Slight	Slight	

Table 10.8 - Magnitude of Change and Significance of Landscape Character Area (Before Mitigation)

ID No.	LCA	Sources of Impacts from the Project	Scale of LCA Affected	Total Size of LCA (ha)	Total Area Affected (ha)	Reversibility of Works	Duration of Impact (Temporary / Permanent)		Compatibility with Surrounding Landscape (High/ Medium/ Low/ Nil)		Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance Without Mitigation Measures (Substantial/ Moderate/ Slight/ Insubstantial)	
							Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
LCA1	Miscellaneous Rural Fringe Landscape	C1-C7, O1-O3	Medium	166	4.88	Irreversible	Permanent	Permanent	Medium	High	Intermediate	Intermediate	Moderate	Moderate
LCA2	Upland and Hillside Landscape	Nil	Nil	1.15	–	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insignificant	Insignificant

Table 10.9 – Magnitude of Change and Significance on Visually Sensitive Receivers (Before Mitigation)

ID No.	Description	Sensitivity (Low/ Medium/ High)	Sources of Impacts from the Project	Compatibility of the Project with Surrounding Landscape (High/ Medium/ Low/ Negligible)	Scale of Project (Large/ Medium/ Small/ Negligible)	Reversibility (Reversible / Irreversible)	Potential Blockage of View (Large/ Intermediate / Small/ Negligible)	Duration of Impacts (Short / Medium/ Long)		Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Impact Significance without Mitigation (Substantial/ Moderate/ Slight/ Insubstantial)	
								Construction	Operation	Construction	Operation	Construction	Operation
VSR1	Residents in Tin Sam Tsuen (Retained Village under HSK/HT NDA)	High	C1-C9, O1-O3	High	Medium	Irreversible	Intermediate	Long	Long	Intermediate	Intermediate	Moderate	Moderate
VSR2	Residents in San Lee Uk Tsuen (Retained Village under HSK/HT NDA)	High	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
VSR3	Potential Residents in Residential site (Area 28B) under HSK/HT NDA	High	C1-C9, O1-O3	High	Large	Irreversible	Small	Long	Long	Intermediate	Intermediate	Moderate	Moderate
VSR4	Residents in Yick Yuen Tsuen (North)	High	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
VSR5	Recreational Users along Castle Peak Trails	High	C1-C8, O1-O3	High	Small	Irreversible	Nil	Short	Short	Negligible	Negligible	Insubstantial	Insubstantial
VSR6	Recreational Users in Tin Ha Road Playground / Soccer Pitch	Low	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
VSR7	Potential Recreational Users of Regional Plaza under HSK/HT NDA	High	C1-C8, O1-O3	High	Large	Irreversible	Small	Short	Short	Intermediate	Intermediate	Moderate	Moderate
VSR8	Travellers on Footbridge at Castle Peak Road – Nai Wai Light Station	Low	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
VSR9	Potential Occupants in Commercial Core (Area32) under HSK/HT NDA	High	C1-C8, O1-O3	High	Small	Irreversible	Small	Medium	Medium	Intermediate	Intermediate	Moderate	Moderate

10.7 Mitigation Measures

10.7.1 The following recommendations are proposed for the preliminary design in response to the potential landscape and visual impacts. At the planning stage, measures to avoid, reduce and/or compensate for the potential impacts should be considered with priority given to avoidance of impacts.

10.7.2 Proposed mitigation measures during construction and operation phases are summarized in the below **Table 10.10**:

Table 10.10 - Recommended Mitigation Measures

ID No.	Landscape and Visual Mitigation Measure
Construction Phase	
CM1	<u>Preservation of Existing Vegetation</u> – Any existing vegetations, trees and tree of particular interest (TPI) not affected by the Project shall be carefully preserved and protected in accordance with Lands Administration Office (LAO) PN Issue No. 2/2020.
CM2	<u>Control of Night-time Lighting Glare</u> – Any lighting provision of the construction works at night shall be carefully controlled to prevent light overspilling to the nearby VSRs and into the sky. Relevant best practices as suggested in the “Guidelines on Industry Best Practices for External Lighting Installations” promulgated by ENB shall be adopted.
CM3	<u>Good Site Practice</u> – Construction areas’ control, such as reducing the extent of working areas, temporary working areas, storage area and shortening construction period, shall be enforced to minimise potential landscape and visual impact arising from construction activities. The proposed site should reduce topographical / landform changes to reduce disturbance with the natural terrain. Earthworks and engineered slopes should be designed to be visually interesting and compatible with the surrounding landscape, mimic contouring and terrain. Temporary landscape treatment such as hydroseeding temporary stockpiles is recommended. Protection measures for the nearby water bodies, will be conducted in accordance with Environment, Transport and Works Bureau Technical Circular (Works) (ETWB TCW 5/2005).
CM4	<u>Erection of Decorative Screen Hoarding</u> - Site hoardings shall be painted in a colour that is compatible with the surroundings and shall screen the views to the construction works. Hoarding should be taken down at the end of the construction period.
Operation Phase	
OM1	<u>Landscape Treatment within the Project</u> – Planting should be provided on the podium and at-grade where practicable. Vertical greening and screening planting should be considered to soften the built structures. Blue-green infrastructure and sustainable landscape design should be taken into consideration. The choice of planting species selected should take careful consideration to the Greening Master Plan (GMP) of the North District, Street Tree Selection Guide by the Guidelines on Tree Preservation During Development by Greening, Landscape & Tree Management Section (GLTMS), DEVB and the surrounding environment. The number of new trees within the Project will be confirmed in the detail design stage.
OM2	<u>Aesthetically pleasing design</u> – The design of the Project in regard of form, material and finishes shall be incorporated to blend in the existing and future structures to the adjacent landscape and visual context.
OM3	<u>Compensatory Tree Planting</u> – Trees felled due to the Project will be compensated as far as practicable in accordance with Lands Administration Office (LAO) PN Issue No. 2/2020. The compensatory plantings shall be realistic, practicable and sustainable with a holistic consideration to balance the quantity and quality of tree

ID No.	Landscape and Visual Mitigation Measure
	planting and follow the “right tree for the right place” principles. The number of compensatory trees and species types will subject to the approved TPRP.

10.7.3 **Figure 10.8** shows the Landscape Mitigation Plan (LMP) and Elevations with the indicative location of implementation of these mitigation measures in the conceptual LMP.

Compensatory Tree Planting Proposals

10.7.4 Tree felling is considered inevitable for the Project due to site formation works and the construction of the station.

10.7.5 Among the approx. 765 trees to be removed, 245 nos. of them were located within the permanent footprint of HSK Station, where tree compensation strategy will be prepared in accordance with the *Lands Administration Office (LAO) PN Issue No. 2/2020* (updated in August 2022) - *Tree Preservation and Removal Proposals for Building Development in Private Projects*.

10.7.6 The remaining approx. 520 trees were in the Works site /works area of HSK Station but outside future HSK Station footprint. Tree compensation strategy will be also prepared pursuant to *Lands Administration Office (LAO) PN Issue No. 2/2020* (updated in August 2022) - *Tree Preservation and Removal Proposals for Building Development in Private Projects*.

10.7.7 Amongst these approx. 765 trees to be removed, approx. 234 nos. of them are undesirable species *Leucaena leucocephala*. Quantity of these undesirable species *Leucaena leucocephala* to be removed can be exempted from the compensation as stipulated in *(LAO) PN Issue No. 2/2020* (updated in August 2022).

10.7.8 The ultimate quantity to be compensated is subject to the future approved TPRP submission. Size of compensatory trees at their maturity, should be appropriate to the location and function. Sufficient space should be provided for planting of trees taking into account the minimum space required to cater for the establishment, healthy growth and mature size of the trees. Relevant guidelines published by GLTMS of DEVB should be followed, for example:

- Proper Planting Practice - Provide Adequate Growing Space for Future Growth of Canopy; and
- Proper Planting Practice - Provide Sufficient Growing Space Between Trees and Adjacent Buildings / Structures.

On-Site Compensatory

10.7.9 As far as practicable, on-site compensation is considered as priority. While the space within the HSK Station footprint that is available for tree planting is very limited and only a small area at the periphery of the station building could accommodate the planting of minimum 5 nos. of heavy standard trees. The other proposed Work Areas would be developed into Regional Plaza by other parties, which would be handed over from the Project Proponent to the government after the completion of the Project. Under the scheme of HSK/HT NDA development, the landscaped areas within the Regional Plaza (next to Hung Shui Kiu Station) would be fully used for the proposed compensatory trees in HSK/HT NDA development (by other parties) and there would be no remaining area

available to accept any compensatory trees from the Project.

Off-Site Compensatory

- 10.7.10 In accordance with (LAO) PN Issue No. 2/2020 (updated in August 2022), the Project Proponent is actively exploring location(s) for off-site tree compensation for the remaining trees.
- 10.7.11 The process involves extensive desktop study, site visit and liaison with various government departments such as the Civil Engineering and Development Department (CEDD), Leisure and Cultural Services Department (LCSD), Lands Department (LandsD) and Agriculture, Fisheries and Conservation Department (AFCD) etc. to determine the land allocation for tree compensation.
- 10.7.12 One potential site near Yuen Tau Shan in Yuen Long District has been identified and dialogues with relevant departments / stakeholders was initiated to discuss the feasibility to accommodate the compensatory trees, subject to further discussion with government departments on management and maintenance arrangement. The indicative location of the potential compensation site is illustrated in **Figure 10.19**. The Project Proponent commits to conduct the tree compensation in accordance with the future approved TPRP.

10.8 Residual Impact Assessment – After Mitigation

- 10.8.1 During construction phase, control of Night-time Lighting Glare (CM2), good site practice (CM3) and erection of decorative screen hoarding (CM4) would reduce visual disturbance generated through construction and offer physical barrier to public passing by construction site at ground-level, efforts will be made to reduce light and glare pollution at night. Unavoidably, some adverse landscape and visual impact would still be anticipated due to the tree removal. (CM1) would provide sufficient protection measures to retained trees.
- 10.8.2 Approximately 765 nos. of existing trees within the Project Site Boundary will be permanently removed during construction. In case of any unavoidable tree felling during construction, the associated landscape impacts on these LRs could be mitigated by tree compensation in accordance with (LAO) PN Issue No. 2/2020 – Tree Preservation and Removal Proposals for Building Development in Private Projects as far as practical.
- 10.8.3 Due to the limited space within the proposed HSK Station, MTRCL is actively exploring locations for off-site tree compensation.
- 10.8.4 During operational phase, aesthetically pleasing design (OM2) and landscape treatment within the Project (OM1), can enhance the overall visual quality and amenity of the Project. Landscape treatment and compensatory tree planting (OM3) would enhance the greenery of the proposed structure and merge with the surrounding environmental.

Residual Landscape Impact

- 10.8.5 The residual landscape impact on the affected LRs and LCAs after implementation of mitigation measures proposed in **Section 10.8** during construction and operational phases are illustrated in **Table 10.11 and 10.12**.

- 10.8.6 LR2.1 – Semi-Natural Vegetation, LR5.1 – Industrial business & Storage Mix, LR8.1 – Channelized Bodies and LR10.1 MTR Station, MTR Line, MTRCL Facility – The impact significance before mitigation is considered as **Slight adverse** for both construction and operation phases. Loss of vegetation is inevitable during the construction stage for the Project. Thus, with implementation of the recommended mitigation measures during construction, the residual landscape impacts on these LRs will remain as **Slight adverse**. With mitigation measures in place, the residual impact during operation phases will be **Slight adverse** in the operation phase Day 1 and **Insubstantial** in Year 10.
- 10.8.7 LR4.1 – Rural Village – The impact significance before mitigation is considered as **Moderate adverse** for both construction and operation phases. Loss of vegetation is inevitable during the construction stage for the Project. Thus, with implementation of the recommended mitigation measures during construction, the residual landscape impacts on these LRs will be reduced to **Slight adverse**. With mitigation measures in place, the residual impact during operation phases will be **Slight adverse** in both operation phase Day 1 and Year 10.
- 10.8.8 LR9 – Construction Site – The impact significance before mitigation is considered as **Slight adverse** for both construction and operation phases. With the loss of vegetation, is inevitable during the construction stage for the Project. Thus, with implementation of the recommended mitigation measures during construction, the landscape impacts on LR9 will be remained as **Slight adverse**. With mitigation measures in place, the residual impact during operation phases will be **Insubstantial** in the operation phase Day 1 and **Slight beneficial** in Year 10 respectively.
- 10.8.9 LCA1 – Miscellaneous rural Fringe Landscape – The impact significance before mitigation is considered as **Moderate adverse** for both construction and operation phases. With the loss of vegetation, is inevitable during the construction stage for the Project. Thus, with implementation of the recommended mitigation measures during construction, the landscape impacts on LCA1 will be reduced to **Slight adverse**. With mitigation measures in place, the residual impact during operation phases will be **Slight adverse** in the operation phase Day 1 and Year 10.

Residual Visual Impact

- 10.8.10 The residual visual impact on the affected VSRs after implementation of mitigation measures proposed in **Section 10.8** during construction and operational phases are illustrated in **Table 10.13**. Photomontage illustrating the existing baseline conditions, Day 1 of operation phase without mitigation and Day 1 and Year 10 of operation phase with mitigation is shown in **Figure 10.9 to 10.16**.
- 10.8.11 VSR1 – Residents in Tin Sam Tsuen (Retained Village under HSK/HT NDA), VSR3 – Potential Residents in Residential sites (Areas 28B) under HSK/HT NDA, VSR7 – Potential Recreational Users of Regional Plaza under HSK/HT NDA and VSR9 – Potential Occupants in Commercial Core (Area32) under HSK/HT NDA – The impact significance before mitigation is considered as **Moderate adverse** for both construction and operation (Day 1) phases. Although mitigation measure can alleviate part of the visual impact during construction phase, but due to their close distance from the Project, some view blockage induced by proposed works. Thus, with implementation of the recommended mitigation measures during construction, the visual impacts on these VSRs will be reduced to **Slight adverse** for VSR1, VSR3, VSR7 and VSR9.

- 10.8.12 By operation phase day 1, Although mitigation measures can alleviate some visual impacts by the aesthetically pleasing design from the proposed colour and tonal treatment of the façade, integration with the existing railway track, local tree planting, and provision of greening surrounding the HSK Station will seek to improve the outlook considerably. However, due to the close proximity of some of the adjacent VSRs (VSR1, VSR3, VSR7 and VSR9), it will inevitably affect the loss of open sky views and additional station massing to these views. Thus, with implementation of the recommended mitigation, the residual impact during operation phase Day 1, which the project commences in 2030, will remained as **Slight adverse** for VSR1, VSR3, VSR7 and VSR9.
- 10.8.13 By operation phase year 10, it is anticipated that the HSK Station would not cause any substantial visual impact on adjacent VSRs (VSR1, VSR3, VSR7 and VSR9) as the HSK station will be integrated and highly compatible with the HSK/HT NDA, as the HSK Station would be located in an urban context characterised by high-rise buildings in which according to the latest tentative programme of HSK/HT NDA, those areas will commence after 2030 and the whole HSK/HT NDA project is expected to be completed by 2037/38.
- 10.8.14 It is expected the soft landscape treatment (OM1) and on-site compensatory tree planting (OM3) will become mature and in full effect, making the overall landscape more compatible with the surroundings. In addition, it is anticipated that visual bulkiness of the proposed structure will also be eliminated, as the HSK Station would be viewed by high-rise development of HSK/HT NDA. Therefore, the existing level of visual intrusion caused by HSK Station would be mitigated.
- 10.8.15 For VSRs VSR2, VSR4, VSR5, VSR6 and VSR8, the view to the HSK Station is relatively distant and is generally not able or only partially able to view the HSK Station due to the blockage from HSK/HT NDA. These VSRs will have the residual impact of **Insubstantial adverse** for both construction and operation phrases.

10.9 Cumulative Landscape and Visual Impact

- 10.9.1 Cumulative landscape and visual impacts during construction and operational phases from other projects in the vicinity listed in Section 1 were assessed. It is anticipated that the nature of potential cumulative impacts arising from HSK/HT NDA in conjunction with the Project would not be significant.
- 10.9.2 In a number of locations along the HSK Station alignment, current or future works (by project proponents) will occur after the construction of the HSK Station. These include mixed commercial/residential development in Area 28A and 28B, commercial development in Area 32 and Regional Plaza. All of these projects will result in landscape and visual impacts including the degradation of landscape character and visual amenity, and the loss of landscape resources. As this Project is still under planning stage and the construction schedule is yet to be available, the potential cumulative impact caused should be subject to the construction programme and to be assessed by other relevant parties.

10.10 Conclusion

- 10.10.1 The Project will inevitably result in some landscape and visual impacts during construction and operation phases which are identified and addressed in this EIA with the aim of minimising such impacts to within acceptable levels. There are opportunities, at the Project's design, construction and operational phases, for incorporating environmental mitigation measures into the Project. These include providing sensitive treatments of its external appearance and associated planting works. The existing mix urban/rural character would be transformed into a more urbanized landscape setting under Project and in part with HSK/HT NDA.
- 10.10.2 With the implementation of proposed mitigation measures, residual landscape impact on the LRs and LCAs is expected to be moderate to Slight residual impact during construction, slight to insubstantial impact on day 1 of operation. The residual impact on LRs would be further reduced to insubstantial to Slight beneficial in year 10 of operation when the proposed mitigation measures are in full effect.
- 10.10.3 With the implementation of mitigation measures, residual visual impact is expected to be reduced and ranged from Slight adverse to Insubstantial in both the construction phase and by operation phase Year 10. The proposed built forms and sensitive treatment and design of external finish of the built elements, together with landscape treatment around and within the perimeter of the site, greenery features, compensation of mature trees and trees of high amenity value, can enhance the visual quality for HSK station.'
- 10.10.4 Overall, landscape and visual impacts are considered acceptable with mitigation during construction and operation phases.

Table 10.11: Significance Threshold of Residual Landscape Impacts for LR

ID No.	LR	Sensitivity of LR (High / Medium / Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Significance Threshold of Potential Landscape Impact (Before mitigation) (Substantial, Moderate, Slight, Insubstantial)		Proposed Mitigation Measures	Significance Threshold of Potential Landscape Impact (After mitigation) (Substantial, Moderate, Slight, Insubstantial)		
			Construction	Operation	Construction	Operation		Construction	Operation (Day 1)	Operation (Year 10)
LR2.1	Semi-Natural Vegetation	Medium	Small	Small	Slight	Slight	CM1-CM4, OM1-OM3	Slight	Slight	Insubstantial
LR4.1	Rural Village	Medium	Intermediate	Intermediate	Moderate	Moderate	CM1-CM4, OM1-OM3	Slight	Slight	Slight
LR5.1	Industrial business & Storage Mix	Medium	Small	Small	Slight	Slight	CM1-CM4, OM1-OM3	Slight	Slight	Insubstantial
LR8.1	Channelized Watercourse	Low	Small	Small	Slight	Slight	CM1-CM4, OM1-OM3	Slight	Slight	Insubstantial
LR9	Construction Site	Low	Small	Small	Slight	Insubstantial	CM1-CM4	Slight	Insubstantial	Slight Beneficial
LR10.1	MTR Station, MTR Line, MTRCL Facilities	Low	Small	Small	Slight	Slight	CM1-CM4, OM1-OM3	Slight	Slight	Insubstantial

Table 10.12: Significance Threshold of Residual Landscape Impacts for LCA

ID No.	LCA	Sensitivity of LCA (High / Medium / Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Significance Threshold of Potential Landscape Impact (Before mitigation) (Substantial, Moderate, Slight, Insubstantial)		Proposed Mitigation Measures	Significance Threshold of Potential Landscape Impact (After mitigation) (Substantial, Moderate, Slight, Insubstantial)		
			Construction	Operation	Construction	Operation		Construction	Operation (Day 1)	Operation (Year 10)
LCA1	Miscellaneous rural Fringe Landscape	Medium	Intermediate	Intermediate	Moderate	Moderate	CM1-CM4, OM1-OM3	Slight	Slight	Slight

Table 10.13: Significance Thresholds of Visually Sensitive Receivers

ID No.	VSR Description	Sensitivity (High / Medium / Low)	Magnitude of Change (Large/ Intermediate/ Small/ Negligible)		Significance Threshold of Potential Landscape Impact (Before mitigation) (Substantial, Moderate, Slight, Insubstantial)		Proposed Mitigation Measures	Significance Threshold of Potential Landscape Impact (After mitigation) (Substantial, Moderate, Slight, Insubstantial)		
			Construction	Operation	Construction	Operation		Construction	Operation (Day 1)	Operation (Year 10)
VSR1	Residents in Tin Sam Tsuen (Retained Village under HSK/HT NDA)	High	Intermediate	Intermediate	Moderate	Moderate	CM1-CM4, OM1-OM3	Slight	Slight	Slight
VSR2	Residents in San Lee Uk Tsuen (Retained Village under HSK/HT NDA)	High	Negligible	Negligible	Insubstantial	Insubstantial	-	Insubstantial	Insubstantial	Insubstantial
VSR3	Potential Residents in Residential site (Area 28B) under HSK/HT NDA	High	Intermediate	Intermediate	Moderate	Moderate	CM1-CM4,	Slight	Slight	Slight
VSR4	Residents in Yick Yuen Tsuen (North)	High	Negligible	Negligible	Insubstantial	Insubstantial	-	Insubstantial	Insubstantial	Insubstantial
VSR5	Recreational Users along Castle Peak Trails	High	Negligible	Negligible	Insubstantial	Insubstantial	-	Insubstantial	Insubstantial	Insubstantial
VSR6	Recreational Users in Tin Ha Road Playground / Soccer Pitch	Low	Negligible	Negligible	Insubstantial	Insubstantial	-	Insubstantial	Insubstantial	Insubstantial
VSR7	Potential Recreational Users of Regional Plaza under HSK/HT NDA	Medium	Intermediate	Intermediate	Moderate	Moderate	CM1-CM4,	Slight	Slight	Slight
VSR8	Travellers on Footbridge at Castle Peak Road – Nai Wai Light Station	Low	Negligible	Negligible	Insubstantial	Insubstantial	-	Insubstantial	Insubstantial	Insubstantial
VSR9	Potential Occupants in Commercial Core (Area32) under HSK/T NDA	Low	Intermediate	Intermediate	Moderate	Moderate	CM1-CM4, OM1-OM3	Slight	Slight	Slight

11 REVIEW OF CULTURAL HERITAGE

11.1 Review of Approved EIA

- 11.1.1 The approved EIA for HSK/HT NDA has been reviewed in terms of the potential cultural heritage impacts resulting from the Project. The Cultural Heritage Impact Assessment (CHIA) in the approved EIA for HSK/HT NDA included the baseline site evaluation, built heritage survey and data collection on archaeological resources. Mitigation measures were also recommended.
- 11.1.2 This section reviewed the cultural heritage impact on any Site of Archaeological Interest (SAI) and built heritage within a 100m assessment area.

11.2 Baseline Condition

- 11.2.1 The surrounding of the Project Site is mainly rural and consists of village houses, temporary structures and open storage. In 2016, a CHIA including research on built heritages and an Archaeological Field Survey (AFS) were conducted in the approved EIA for HSK/HT NDA.

Built Heritage

- 11.2.2 The approved EIA for HSK/HT NDA reviewed the historic buildings in the surrounding area of the Project site. There was no declared monument, graded historic sites/buildings/structures, sites/buildings/structures in the new list of proposed grading items; and Government historic sites identified by the Antiquities and Monuments Office (AMO) within the 100m assessment area identified.
- 11.2.3 A CHIA of Yick Yuen Tsuen (a village located at the immediate south of the assessment area) has been carried out in the approved EIA for HSK/HT NDA. However, the result indicated that the built heritage in Yick Yuen Tsuen could be commonly found and with a low historical and architectural value. The closest graded heritage would be the Shrine, Tin Sam Tsuen (Grade 3) which is at least 180m from the Project Site Boundary. The location of recorded built heritage near the assessment area is shown in **Figure 11.1**.
- 11.2.4 In addition to the review of the approved EIA for HSK/HT NDA, historical aerial photographs of years 1963, 1973 and the recent 2021 were reviewed and compared to identify any potential heritage that was built in or before 1969 (see **Figure 11.2- Figure 11.5**). Based on these aerial photographs, the Project site was an undeveloped area comprising farmland and a few farmhouses in 1963. In 1973, the number of building structures, mainly farmhouses and village houses, increased in the area. However, according to the recent aerial photograph, the buildings existing within the assessment area in 2021 were temporary structures (e.g. scattered houses and storage) and modern village houses. To conclude, there is no structure built before 1969 that carries heritage value within the assessment area.

Site of Archaeological Interest (SAI)

- 11.2.5 According to the approved EIA for HSK/HT NDA and the list of SAIs by the AMO, no SAI was identified within the assessment area. The nearest SAI identified is the Tsing Tsuen Wai SAI, which is at least 750m from the Project Site Boundary as shown in **Figure 11.1**.

11.3 Review of Cultural Heritage Impact

- 11.3.1 The approved EIA for HSK/HT NDA indicated that the construction of the Project would unlikely cause impact on cultural heritage resources.

Built Heritage

- 11.3.2 No declared monument graded historic sites/buildings/structures, sites/buildings/structures in the new list of proposed grading items; and Government historic sites was identified by the AMO was identified within the assessment area of the Project, and the nearest graded built heritage (Shrine, Tin Sam Tsuen) is located at a considerable distance (more than 180m) from the Project site boundary. As such, no direct or indirect impact would be anticipated, and no mitigation measure would be required.

Site of Archaeological Interest (SAI)

- 11.3.3 As no SAI was identified in the assessment area while the closest recorded SAI is adequately far away from the Project site (more than 750m), no direct or indirect impact would be anticipated and no specific mitigation measure would be required. However, as a precautionary measure, AMO should be informed immediately in case of discovery of antiquities or supposed antiquities in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.

Archaeological Potential Area (APA)

- 11.3.4 No APA identified in the approved EIA for HSK/HT NDA is located within the assessment area of the Project. The nearest identified APA (Hung Uk Tsuen (South)) is at least 1 km from the Project Site, which is adequately distanced. Thus, no direct or indirect archaeological impact would be anticipated, and no mitigation measure would be required.

11.4 Conclusion

- 11.4.1 No declared monument, graded historic sites/buildings/structures, sites/buildings/structures in the new list of proposed grading items; Government historic sites identified by the AMO and site of archaeological interest or archaeological potential area (according to the approved EIA for HSK/HT NDA) was identified within the assessment area of the Project. Due to the large distance between the Project site and the nearest heritage, no direct or indirect cultural heritage impact would be anticipated, and mitigation measure would not be required. As a precautionary measure, AMO should be informed immediately in case of discovery of antiquities or supposed antiquities in the course of works, so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.

12 REVIEW OF HAZARD TO LIFE

12.1 Review of Approved EIA

12.1.1 A review has been conducted on the hazard to life of the approved EIA for WRL as well as the approved EIA for HSK/HT NDA. It was identified that the Project site does not fall within any Consultation Zone (CZ) of Potentially Hazardous Installation (PHI).

12.2 Conclusion

12.2.1 Based on the current review, no PHI was identified relevant to the Project site. No further hazard assessment is deemed necessary.

13 CHANGE OF ENVIRONMENTAL MONITORING AND AUDIT (EM&A) SCOPE

13.1 Review of Approved EIA

- 13.1.1 Based on the potential environmental issues identified in previous chapters of this ERR including the review for air quality, noise, water quality, waste management, contaminated land, ecology, landscape and visual, cultural heritage and hazard to life, the proposed amendment would not result in significant environmental impacts as compared with those recommended in the approved EIA for WRL.
- 13.1.2 According to the latest programme, the land resumption and construction works in the areas within the HSK/HT NDA by others would be in progress concurrently with the Project. Land resumption in those areas surrounding the Project would be implemented and completed before/during the construction of the Project. As such, the existing sensitive receivers in these land resumption areas, except those in Tin Sam Tsuen, ASRs A417 and A418 as defined in **Table 4.4** of Section 4, would not be in use anymore during the major construction works.
- 13.1.3 With the implementation of the recommended mitigation measures, no adverse environmental impact would be anticipated during the construction phase. The environmental monitoring and audit (EM&A) of air quality and noise would still be recommended during the construction phase to ascertain that there would be no adverse dust and noise impacts due to the Project works.

13.2 EM&A Requirement

- 13.2.1 The Contractor and Project Proponent would be required to implement an EM&A programme throughout the Project. In case exceedance was found, the Contractor, Project Proponent (i.e. MTRCL) and Environmental Team (ET) would take immediate action to implement remediation measures following the procedures specified in this chapter. The EM&A programme are summarized in **Table 13.1** and details are as follows.

Table 13.1: EM&A Programme Summary

Discipline	EM&A Programme	
	Construction Phase	Operational Phase
Air Quality	Yes	No
Noise	Yes	- Commissioning test of railway noise and fixed plant noise - 6-month operational railway noise monitoring
Water Quality, Waste, Land Contamination, Ecology, Landscape and Visual, Cultural Heritage, Hazard to Life	No	No

13.2.2 Measurements and activities that would be conducted in accordance with the requirements of the EM&A programme are summarised as follows:

- Baseline monitoring (construction dust and noise);
- Impact monitoring (construction dust and noise);
- Remedial action in accordance with the Event and Action Plan within the timeframe in case the specified criteria were exceeded;
- Logging and keeping records of monitoring results; and
- Preparation and submission of Baseline, Monthly and Final EM&A Reports.

Engineer or Engineer's Representative

13.2.3 The Engineer or Engineer's Representative (ER) would be responsible for overseeing the construction works and for ensuring that the works would be undertaken by the Contractor in accordance with the specification and contractual requirements. The duties and responsibilities of the Engineer with respect to EM&A may include:

- Supervise the Contractor's activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Inform the Contractor when action is required to reduce impacts in accordance with the Event and Action Plan;
- Participate in joint site inspections and audits undertaken by the ET; and
- Adhere to the procedures for carrying out exceedance and complaint investigations.

Contractor

13.2.4 The Contractor would report to the ER. The duties and responsibilities of the Contractor are:

- Implement the VEP and EM&A recommendations and requirements;
- Provide assistance to ET in carrying out monitoring and auditing;
- Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event and Action Plan;
- Implement measures to reduce impact where Action and Limit levels are exceeded; and
- Adhere to the agreed procedures for carrying out exceedance and complaint investigations.

Environmental Team

13.2.5 The leader of the ET would be an independent party from the Contractor and has relevant professional qualifications or sufficient relevant EM&A experience subject to approval of the ER.

13.2.6 The ET would conduct the EM&A programme and ensure the Contractor's compliance with the Project's environmental performance requirements during construction. The ET would be an independent party from the Contractor.

13.2.7 The ET would be led and managed by the ET Leader. The ET Leader would possess at least 7 years of experience in EM&A. The ET would monitor the mitigation measures implemented by the Contractor on a regular basis to ensure the compliance with the intended aims of the measures.

- Set up the environmental monitoring stations as required in this ERR;
- Monitor various environmental parameters as required in this ERR;
- Analyse the EM&A data and review the success of EM&A programme to cost-effectively confirm the adequacy of mitigation measures implemented and to identify any adverse environmental impacts;
- Carry out site inspection to investigate and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and take proactive actions to pre-empt problems;
- Audit and prepare audit reports on the environmental monitoring data and site environmental conditions;
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plan;
- Undertake regular and ad-hoc on-site audits / inspections and report to the Contractor and the ER of any potential non-compliance;
- Follow up and close out non-compliance action;
- Advice to the Contractor on environmental improvement, awareness, enhancement matters, etc. on site;
- Timely submission of the EM&A report to the Project Proponent and the EPD; and
- Adhere to the procedures for carrying out complaint investigation.

Independent Environmental Checker

13.2.8 The Independent Environmental Checker (IEC) would advise the ER on environmental issues related to the Project. The IEC would possess at least 7 years of experience in EM&A. The duties and responsibilities of the IEC are:

- Review the EM&A works performed by the ET (at not less than monthly intervals);
- Audit the monitoring activities and results (at not less than monthly intervals);
- Report the audit results to the ER;
- Review the EM&A reports submitted by the ET;
- Review the proposal on mitigation measures submitted by the Contractor in accordance with the Event and Action Plan;
- Check the mitigation measures submitted by the Contractor in accordance with the Event and Action Plan;
- Check the mitigation measures that have been recommended in the ERR, and ensure they are properly implemented in a timely manner, when necessary;
- Report the findings of site inspections and other environmental performance reviews to ER;

- Verify the investigation results of environmental complaint cases and the effectiveness of corrective measures;
- Verify EM&A report that has been certified by the ET Leader; and
- Provide feedback on the audit results to the ET, the ER or the EP holder according to Event and Action Plan in the ERR.

13.3 Environmental Mitigation Implementation Schedule

13.3.1 A detailed review of the Project has been conducted and presented in this ERR. Mitigation measures during the construction and operation phases have also been identified and recommended. It specifies the extent, locations, time frame and responsibilities for the implementation of the environmental mitigation measures identified.

Air Quality

Construction Phase

13.3.2 Major construction works including foundation works, temporary drainage diversion, etc. would be conducted between 2025 to 2027. The construction of station structure which is not considered dusty works would be carried out from 2026 to 2028. The remaining works would only include fitting out and external building works, testing and commissioning, etc in around 2029 to 2030, where potential dust impacts are considered minor. The major construction activities for the Project would include site mobilisation, site clearance and erection of hoarding, minor excavation works for temporary drainage diversion, resurfacing, foundation of station, assembly and limited casting of structural elements, piling, piers works, station modules installation (up track and down track), and OHL cantilever relocation, etc. 1-hour TSP is recommended to be monitored and audited at the proposed monitoring locations during construction phase.

13.3.3 The sub-sections below present the requirements, methodology, equipment, monitoring locations and criteria for the monitoring and audit of construction dust during the construction phase of the Project.

Monitoring Parameters and Equipment

13.3.4 The 1-hour TSP levels would be measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). Upon approval of the IEC, 1-hour TSP levels can be measured by direct reading method with using handheld dust particle measuring device which is capable of producing comparable results as that by the high-volume sampling method, to indicate short event impacts.

13.3.5 All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any other local atmospheric factors affecting or affected by site conditions, etc., shall be recorded down in detail.

13.3.6 High volume samplers (HVSs) in compliance with the following specifications would be used for carrying out the 1-hour TSP monitoring:

- 0.6 – 1.7 m³ per minute adjustable flow range;
- Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- Capable of providing a minimum exposed area of 406cm²;
- Flow control accuracy: +/-2.5% deviation over 24-hour sampling period;
- Separately equipped with a shelter to protect the filter and sampler;
- Incorporated with an electronic mass flow rate controller or other equivalent devices;
- Separately equipped with a flow recorder for continuous monitoring;
- Provided with a peaked roof inlet;
- Incorporated with a manometer;
- Able to hold and seal the filter paper to the sampler housing at horizontal position;
- Easily changeable filter; and
- Capable of operating continuously for a 24-hour period.

13.3.7 The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment. They would ensure that sufficient number of HVSs with an appropriate calibration kit is available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. The HVSs would be equipped with an electronic mass flow controller and be calibrated against a traceable standard at regular intervals. All the equipment, calibration kit, filter papers, etc., would be clearly labelled.

13.3.8 Initial calibration of HVSs with mass flow controller would be conducted upon installation and thereafter every six months. The transfer standard would be traceable to the internationally recognized primary standard and be calibrated annually. The calibration data would be properly documented for future reference by the IEC.

13.3.9 The flow-rate of the sampler before and after the sampling exercise with the filter in position would be verified to be constant and be recorded in the data sheet as shown in **Appendix 13.1**.

13.3.10 If the ET proposed to use a direct reading method with using handheld dust particle measuring device to measure 1-hour TSP levels, they would submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable result to the HVS. The instrument would also be calibrated regularly following the requirements specified by the equipment manufacturers.

13.3.11 Wind data monitoring equipment would also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location would be proposed by the ET and agreed with the IEC. For installation and would be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points would be observed:

- The wind sensors should be installed 10m above ground so that they are clear of obstructions or turbulence caused by building;

- The wind data would be captured by a data logger, the data would be downloaded for analysis at least once a month;
- The wind data monitoring equipment would be re-calibrated at least once every six months; and
- Wind direction would be divided into 16 sectors of 22.5 degrees each.

13.3.12 If the ET Leader proposes alternative dust monitoring equipment / methodology (e.g., direct reading methods) after the approval of this ERR, agreement from the IEC would be sought. The instrument would also be calibrated regularly following the requirements specified by the equipment manufacturers

Laboratory Measurement / Analysis

13.3.13 A clean laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, would be available for sample analysis, and equipment calibration and maintenance. The laboratory would be Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited or other internationally accredited laboratory.

13.3.14 If a site laboratory is set up or a non-HOKLAS accredited laboratory is hired for carrying out the laboratory analysis, the laboratory equipment would be verified by IEC. Measurement performed by the laboratory would be demonstrated to the satisfaction of the ER and the IEC and EPD.

13.3.15 IEC would conduct regular audit to the measurement performed by the laboratory to ensure the accuracy of measurement results. The ET Leader would provide the ER with one copy of the Title 40 of Code of Federal Regulations, Chapter 1 (Part 50), Appendix B for his reference.

13.3.16 Filter paper of size 8" X 10" would be labelled before sampling. It shall be a clean filter paper with no pinholes and would be conditioned in a humidity-controlled chamber for over 24-hours and be pre-weighed before use for the sampling.

13.3.17 After sampling, the filter paper loaded with dust would be kept in a clean and tightly sealed plastic bag. The filter paper would then be returned to the laboratory for reconditioning in the humidity-controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1 mg. The balance would be regularly calibrated against a traceable standard.

13.3.18 All the collected samples would be kept in a good condition for 6 months before disposal.

Dust Monitoring Station

13.3.19 The proposed dust monitoring station is listed in **Table 13.2** and shown in **Figure 13.1**.

Table 13.2: Proposed dust monitoring station

Monitoring Station ID ^[1]	Description	Use
M01 (A417) ^[2]	Premises to the Northeast of Proposed HSK Station Boundary	Residential

M02 (A209) ^[3]	Ling Liang Church Primary School	Education
M03 (P240) ^[3]	Planned Village Resite	Rural Residential Density Zone 4 (RR4)

Note:

[1] The dust monitoring station and monitoring period is subject to the actual land resumption and status of existing ASR, operation of planned ASR and construction programme of the Project. Representative monitoring station and monitoring period will be selected and reviewed in carrying out baseline and impact monitoring given that the ASR is in still in use or operation during construction phase of the Project.

[2] M01 was not included in both the air quality assessment and EM&A sections of the approved EIA for HSK/HT NDA. Based on desktop review, however, M01 will still exist after the land resumption in 2024 and it was included as “N3” in the construction noise impact assessment in Section 5 of this ERR. In addition, it is the nearest ASR to the project site boundary and to the areas with dusty activities. As a conservative approach, it was also included in the air quality assessment in Section 4 of this ERR and is also selected as a dust monitoring location to monitor the dust impacts during the construction phase.

[3] ASRs P249 and P250 are actually located closer to the construction site than P240 (M03) and A209 (M02), respectively, but they are not selected as the monitoring station location since these ASRs would not have population intake during the construction period of the Project, therefore P240 and A209 are proposed instead.

13.3.20 The status and locations of ASRs may change after issuing this ERR. In such case, the ET would propose updated monitoring locations and seek agreement from IEC and EPD.

13.3.21 When alternative monitoring locations are proposed, the following criteria, as far as practicable, would be followed:

- Monitoring at ASRs close to the major site activities which are likely to have air quality impacts;
- Monitoring as close as possible to the ASRs, as defined in the EIAO-TM;
- Assurance of minimal disturbance to the occupants and working under a safe condition during monitoring; and
- Take into account the prevailing meteorological conditions.

13.3.22 The ET would agree with the ER in consultation with the IEC on the position of the HVS for the installation of the monitoring equipment. When positioning the HVS, the following points would be noted:

- A horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;
- No two samplers would be placed less than 2 m apart;
- The distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- A minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- A minimum of 2 meters separation from any supporting structure, measured horizontally is required;
- No furnace or incinerator flue is nearby;
- Airflow around the sampler is unrestricted;
- The sampler is more than 20 meters from the dripline;

- Any wire fence and gate, to protect the sampler, would not cause any obstruction during monitoring;
- Permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- A secured supply of electricity is needed to operate the samplers.

Baseline Monitoring

13.3.23 TSP baseline monitoring would be carried out for a continuous period of at least two weeks with three sets of 1-hour ambient measurements taken daily at each monitoring station prior to the commissioning of major construction works.

13.3.24 Before commencing baseline monitoring, the ET would inform the IEC of the baseline monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the baseline monitoring results.

13.3.25 During the baseline monitoring, there would not be any dust generation activities in the vicinity of the monitoring stations. General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources would also be recorded throughout the baseline monitoring period. A summary of baseline monitoring is presented in **Table 13.3**.

13.3.26 In case the baseline monitoring cannot be carried out at the designated monitoring locations, the ET Leader would carry out the monitoring at alternative locations that can effectively represent the baseline conditions at the impact monitoring locations. The alternative baseline monitoring locations would be agreed with the IEC prior to commencement of baseline monitoring.

13.3.27 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET Leader would liaise with the IEC to agree on an appropriate set of data to be used as a baseline reference and submit to EPD for approval.

Impact Monitoring

13.3.28 The ET would carry out impact monitoring at all designated monitoring locations for construction dust during construction period. For 1-hour TSP monitoring, the sampling frequency of 3 times in every 6 days would be undertaken when the highest dust impact occurs. The impact monitoring programme is summarized in **Table 13.3**.

Table 13.3: Summary of Construction Dust Monitoring Programme

Monitoring Period	Duration	Parameter	Frequency
Baseline Monitoring	At least 14 consecutive days prior to the commissioning of major construction works	1-hour TSP	3 times per day
Impact Monitoring	Throughout the construction phase	1-hour TSP	3 times in every 6 days

Action / Limit Levels

13.3.29 The baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET would compare the construction dust impact monitoring results with air quality criteria set up for 1-hour TSP. **Table 13.4** shows the air quality criteria, namely Action and Limit levels to be used.

Table 13.4: Action and Limit Levels for Construction Dust Monitoring

Parameters	Action Level	Limit Level
1-hour TSP	For baseline level $\leq 384 \mu\text{g}/\text{m}^3$, Action level = $(\text{baseline level} * 1.3 + \text{Limit level})/2$; For baseline level $> 384 \mu\text{g}/\text{m}^3$, Action level = Limit level	$500 \mu\text{g}/\text{m}^3$

Event and Action Plan

13.3.30 Should non-compliance of the air quality criteria occur, actions in accordance with the Action Plan in **Table 13.5** would be carried out.

Operational Phase

13.3.31 No adverse air quality impact is expected during the operation of the Project, and therefore air quality monitoring would not be required.

Table 13.5: Event / Action Plan for Construction Dust

Event	Action			
	ET	IEC	ER	Contractor
Action Level exceedance for one sample	1. Identify source, investigate the causes of exceedance, and propose remedial measures; 2. If exceedance is confirmed, inform ER, IEC and Contractor; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET, ER and contractor on possible remedial measures; 4. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance; 2. Ensure remedial measures properly implemented.	1. Identify sources and investigate the cause of exceedance; 2. Implement the agreed proposals; 3. Amend working methods agreed with the ER as appropriate.
Action Level exceedance for two or more consecutive samples	1. Identify source and investigate the cause of exceedance; 2. If exceedance is confirmed, inform ER, IEC, and Contractor; 3. Advise the ER, IEC on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency; 6. Discuss with ER, IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with ER, IEC, and contractor to discuss the remedial measures to be taken; and 8. If exceedance stops, cease additional monitoring	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; 4. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance; 2. In consultation with the ET and IEC agree with the Contractor on the remedial measures to be implemented; and 3. Supervise implementation of remedial measures.	1. Identify sources and investigate the cause of exceedance; 2. Submit proposals for remedial to ET, ER and IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit Level exceedance for one sample	1. Identify source, investigate the cause of exceedance and propose remedial measures; 2. If exceedance is confirmed, inform ER, IEC, contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency; 5. Discuss with the ER, IEC and Contractor on the remedial measures and assess effectiveness.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; 4. Advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Ensure remedial measures properly implemented.	1. Identify sources and investigate the cause of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial actions to ET, ER and IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
Limit Level exceedance for two or more consecutive samples	1. Identify source, investigate the cause of exceedance, and propose remedial measures; 2. If exceedance is confirmed, inform ER, IEC, contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with ER, IEC, and contractor to discuss the remedial actions to be taken;	1. Check monitoring data submitted by ET; 2. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 3. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of exceedance; 2. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 3. Ensure remedial measures properly implemented; 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify sources and investigate the cause of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial actions to ET, ER and IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ET, ER and IEC until the exceedance is abated.

	7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.			
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Noise

Construction Phase

13.3.32 Below sub-section presents the requirements, methodology, equipment, monitoring locations, criteria and protocols for the monitoring and audit of noise during the construction phase of the Project.

Noise Monitoring Parameter

13.3.33 The construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (Leq). Leq 30 min shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays.

13.3.34 Supplementary information for data auditing, statistical results such as L10 and L90 shall also be obtained for reference. A sample data record sheet is shown in **Appendix 13.2** for reference.

Monitoring Equipment

13.3.35 As referred to in the TM issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement, the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 db.

13.3.36 Noise measurements should not be made in the presence of fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed should be checked with a portable wind speed meter capable of measuring wind speeds in m/s.

13.3.37 The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment and shall ensure that sufficient noise measuring equipment and associated instrumentation are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation shall be clearly labelled.

Noise Monitoring Locations

13.3.38 The locations of construction airborne noise monitoring stations are summarised in **Table 13.6** and is shown in **Figure 13.1**.

Table 13.6: Proposed noise monitoring station

Monitoring Station ID ^[1]	Description	Use
M01	Premises to the Northeast of Proposed HSK Station Boundary	Residential

Note:

[1] The noise monitoring station and monitoring period is subject to the actual land resumption and status of existing NSR, operation of planned NSR and construction programme of the Project. Representative

monitoring station and monitoring period will be selected and reviewed in carrying out baseline and impact monitoring given that the NSR is still in use or operation during construction phase of the Project.

13.3.39 The status and location of noise sensitive receivers (NSRs) may change after approval of this Manual. In such case, and if changes to the monitoring locations are considered necessary, the ET should propose alternative monitoring stations and seek approval from the ER and agreement from the IEC and EPD on the proposal. If alternative monitoring stations are proposed, these stations should be chosen based on the following criteria:

- Monitoring at the location of NSRs close to the major site activities of the Project that are likely to arise noise impacts
- Monitoring as close as possible to the NSRs as defined in the EIAO-TM
- Assurance of minimal disturbance to the occupants and working under a safe condition during monitoring

13.3.40 The monitoring station shall normally be at a point 1 m from the exterior of the sensitive receiver building facade and be at a position 1.2 m above the ground. If there is problem with access to the normal monitoring position, an alternative position may be chosen, and a correction to the measurements shall be made. For reference, a correction of +3 dB(A) shall be made to the free field measurements.

13.3.41 The ET shall agree with the IEC on the monitoring position and the corrections adopted. Once the positions for the monitoring stations are chosen, the baseline monitoring and the impact monitoring shall be carried out at the same positions.

13.3.42 If changes to the monitoring stations are required upon commencing the baseline monitoring or thereafter, the ET should propose alternative locations based on the above-mentioned criteria and seek approval from the ER and agreement from the IEC and EPD on the proposal.

Baseline Monitoring

13.3.43 The ET should carry out baseline noise monitoring prior to the commencement of the construction of the Project for the Project Proponent's reference. The baseline noise levels should be measured for a continuous period of at least 2 weeks at a minimum logging interval of 30 minutes for daytime (between 0700 and 1900 hours of normal weekdays) and 15 minutes (as three consecutive Leq, (5 minutes) readings) for evening time (between 1900 and 2300 hours on normal weekdays), general holidays including Sundays (between 0700 and 2300 hours) and night-time (between 2300 and 0700 on all days). The Leq, L10 and L90 should be recorded at the specified interval. Before commencing the baseline monitoring, the ET should inform the IEC of the baseline monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the baseline monitoring results.

13.3.44 There shall not be any construction activities in the vicinity of the stations during the baseline monitoring. Any non-project related construction activities in the vicinity of the monitoring stations during the baseline monitoring should be noted and the source and location of such activities should be recorded. In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET shall liaise with IEC to agree on an appropriate set of data to be used as a baseline reference.

Impact Monitoring

13.3.45 Noise monitoring should be carried out at all the designated monitoring stations when there are Project-related construction activities being undertaken within a radius of 300m from the monitoring stations. The monitoring frequency should depend on the scale of the construction activities. An initial guide on the monitoring is to obtain one set of 30-minute measurement at each station between 0700 and 1900 hours on normal weekdays at a frequency of once a week when construction activities within 300m from respective monitoring station are underway.

13.3.46 In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Event and Action Plan in **Table 13.8**, shall be carried out. This additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the project-related construction activities.

Action / Limit Levels

13.3.47 The Action and Limit levels for construction noise are defined in **Table 13.7**.

Table 13.7: Action and Limit Levels for Construction Noise Monitoring

Time Period	Action Level	Limit Level
0700 - 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A) for residential premises
		70 dB(A) for schools and 65 dB(A) during examination period
Note: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.		

Event and Action Plan

13.3.48 Should non-compliance of the noise criteria occur, actions in accordance with the Event and Action Plan in **Table 13.8** shall be carried out.

Table 13.8: Event / Action Plan for Construction Noise

Event	Action			
	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Investigate the complaint and propose remedial measures; 2. Discuss with the ER and Contractor on the remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the Contractor; 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor; and 3. Supervise the implementation of the remedial measures. 	<ol style="list-style-type: none"> 1. Notify the Contractor, ET, IEC and Confirm receipt of notification of complaint in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Ensure the proper implementation of the remedial measures 	<ol style="list-style-type: none"> 1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET, and ER; 3. Submit noise mitigation proposals to the ER, IEC, and ET within three working days of notification for agreement; and 4. Implement noise mitigation proposals.
Limit Level exceedance	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Notify the Contractor, IEC, EPD and ER; 3. Repeat measurement to confirm exceedance; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 7. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET, and Contractor on the potential remedial measures; 4. Supervise the implementation of the remedial measures; and 5. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Ensure the proper implementation of the remedial measures; and 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER, IEC, and ET within three working days of notification for agreement; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Operation Phase

Railway Noise

Commissioning Test

13.3.49 Prior to the operation of the HSK Station, the ET should carry out a noise commissioning test for railway noise at the proposed monitoring location identified in this EM&A Manual to demonstrate compliance of railway noise levels with the noise standards stipulated in the NCO with the implemented railway noise mitigation measure. If the proposed noise monitoring location is not accessible at the time of the testing and commissioning stage, suitable alternative measurement location(s) should be proposed by the ET, and noise measurement at height (targeting for a similar noise screening effect by the proposed acoustic canopies) will need to be considered, for example, at roof top of the HSK Station and appropriate corrections should be applied to the measurement results. The ET should propose noise measurement location(s), measurement equipment and methodology, and seek approval from the ER and agreement from the IEC and EPD on the proposal. The noise commissioning test report should be certified by the ET leader and verified by the IEC as conforming to the information and recommendations contained in the ERR, and be submitted to the EPD for approval .

Railway Noise Monitoring

13.3.50 In addition to commissioning test, railway noise monitoring should be conducted on a monthly basis after the Project is in operation. One set of 30-minute measurement at the designated monitoring station should be conducted during night-time (i.e. 2300 – 0700 hours). Noise measurements of the A-weighted equivalent continuous sound pressure level (Leq) should be made. Leq (30 minutes) should be used as the monitoring parameter. Supplementary information for data auditing, statistical results, such as Lmax, L10 and L90 should also be obtained for reference. It is recommended to carry out the noise monitoring for the initial start-up of up to 6 months. With full compliance of the noise limit and agreement from IEC, monitoring can be terminated before the end of this 6-month period. The tentative noise monitoring location is shown in **Table 13.9** and **Figure 13.2**.

Table 13.9: Tentative noise monitoring location for operational railway noise

Monitoring Location ID	NSR ID in this ERR	Description
OM01 ^[1]	PN4-2	Planned Residential Development in Area 28B

Note:

[1] As noted from Table 3.5 of the approved EIA for HSK/HT NDA, the population intake of the planned residential development in Area 28B (referred as Site 4-25 in the approved EIA) was targeted to be in Year 2031, it may not be practicable for noise commissioning test to be conducted directly at the residential development in Area 28B during the testing and commissioning of the HSK Station in Year 2029 to 2030. In such case, the noise commissioning test should be conducted at suitable alternative location(s) (for example, at roof top of the HSK Station) and appropriate corrections should be applied to the measurement results. The ET should propose noise measurement location(s), measurement equipment and methodology, and seek approval from the ER and agreement from the IEC and EPD on the proposal.

Fixed Noise

Commissioning Test

- 13.3.51 It is anticipated that the Project would provide ventilation fans, smoke extraction fans, chillers etc. at the ventilation building. As discussed in **Section 5**, a preliminary estimation of the maximum allowable SWL of the fixed noise sources was conducted in this ERR. A detail quantitative assessment would be conducted to determine the maximum allowable SWL during detailed design stage. If necessary, the Operator/Project Proponent would implement and refine the specified sound power levels as appropriate to ensure compliances with the noise standards stipulated in the EIAO-TM and NCO for the fixed plant operation.
- 13.3.52 Prior to the operation of HSK Station, noise commissioning tests for planned fixed noise sources would be conducted by independent qualified person(s) possessing at least 7 years of noise control experience and a corporate membership of Hong Kong Institute of Acoustics or equivalent. A Fixed Noise Audit Report (FNAR) showing the design of the fixed noise sources associated with the Project and the results of the commissioning tests would be submitted to the ER, ET, and IEC for agreement and submitted to the EPD for approval before the operation of the HSK station. The purpose of the commissioning test is to demonstrate that the maximum allowable SWL of the planned fixed plant noise sources could be achieved during operational phase, or otherwise approved by the Director of Environmental Protection in compliance with the requirements in the EIAO-TM and NCO having due regard to the characteristics of tonality, impulsiveness and intermittency.

Water Quality

Construction Phase

- 13.3.53 With the implementation of good site practices to control construction site runoff, no adverse environmental impact would be anticipated during the construction phase. Effluent discharge from the works areas to the public drain would be required to comply with the terms and conditions of a discharge licence issued by EPD under the WPCO. Although regular water quality impact monitoring is not required, regular site environmental inspection at least once per week shall be carried out during construction phase to ensure that the recommended best management practices as recommended in this ERR would be properly implemented.

Operation Phase

- 13.3.54 With proper connection to the public drainage and sewerage systems, no adverse impact on the watercourse in proximity to the Project would be anticipated during the operational phase. As such, water quality impact monitoring would not be required.

Waste

Construction Phase

- 13.3.55 Regular audits and site inspections would be carried out during construction phase to ensure that the recommended good site practices and other recommended mitigation measures are properly implemented by the Contractor.

Operation Phase

13.3.56 During operational phase, enough trash bins and recycling bins would be provided for collection of general refuse by users at designated locations. A licensed collector would be employed for the collection of chemical waste. Reputable waste collector would be employed to remove general refuse regularly. In addition, chemical waste which cannot be recycled would be disposed of at Chemical Waste Treatment Centre (CWTC).

Land Contamination

13.3.57 It is anticipated that there would be no adverse impacts on land contamination during construction and operational phases, and thus monitoring and audit would be considered not required.

Ecology

13.3.58 It is anticipated that there would be no adverse impact on ecology during construction and operational phases, hence monitoring and audit are considered not required.

Landscape and Visual

Construction Phase

13.3.59 The landscape and visual mitigation measures proposed would be incorporated in the landscape and engineering design. Mitigation measures to be implemented during construction would be adopted from the start of construction and be in place throughout the construction period. Site inspections would be undertaken at least once per month during the construction period to ensure that the mitigation measures recommended in this ERR are properly implemented.

Operation Phase

13.3.60 With the mitigation measures recommended in the ERR implemented, specific auditing during the operational phase of the Project would not be required.

Cultural Heritage

13.3.61 It is anticipated that there would be no adverse impacts on cultural heritage during construction and operation phases, hence the monitoring and audit are considered not required. However, should any potential antiquity be discovered during the construction stage, AMO would be informed.

Hazard to Life

13.3.62 It is anticipated that there would be no adverse impacts on hazard to life during construction and operational phases, hence monitoring and audit are considered not required.

13.4 Site Inspection

- 13.4.1 Site inspection is one of the most effective tools to enforce the environmental protection requirements at the works area by providing a direct mean to trigger and enforce specified environmental protection and pollution control measures. Site inspection would be undertaken regularly during the construction phase to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented for the activities associated with the Project.
- 13.4.2 The ET Leader would be responsible for formulating the environmental site inspection programme as well as the deficiency and action reporting system, and for carrying out the site inspections. The proposal for rectification, if any, would be prepared and submitted to the ET Leader and IEC by the Contractor.
- 13.4.3 Regular site inspections would be carried out and led by the ER and attended by the Contractor and ET at least once per week during the construction phase. The areas of inspection would not be limited to the environmental situation, pollution control and mitigation measures within the site. It would also review the environmental situations outside the works area, which is likely to be affected, directly or indirectly, by the construction site activities of the Project. The ET would refer to the following information in conducting the inspection. During the inspection, the following information would be referred to:
- The ERR recommendations on environmental protection and pollution control mitigation measures;
 - Ongoing results of the EM&A programme;
 - Works' progress and programme;
 - Individual works methodology proposals (which would include the proposal on associated pollution control measures);
 - Contract specifications on environmental protection;
 - Relevant environmental protection and pollution control legislations; and
 - Previous site inspection results.
- 13.4.4 The Contractor would keep the ER and ET Leader updated with all relevant environmental related information on the construction contract necessary for him to carry out the site inspections. Site inspection results and associated recommendations for improvements to the environmental protection and pollution control efforts would be recorded and followed up by the Contractor in an agreed timeframe. The Contractor would follow the procedures and timeframe as stipulated in the environmental site inspection, and the deficiency and action reporting system formulated by the ET, to report on any remedial measures after the site inspections.
- 13.4.5 The ER, ET and the Contractor would also carry out ad-hoc site inspections if significant environmental problems are identified. Inspections may also be required after receipt of a valid environmental complaint, or as part of the investigation work, as specified in the Event and Action Plan for the EM&A programme.

13.5 Environmental Compliance

- 13.5.1 There are statutory requirements on environmental protection and pollution control with which construction activities must comply.
- 13.5.2 In order that the works follow the contractual requirements, the works method statements (where relevant to environmental measures) submitted by the Contractor to the ER for approval and to the ET Leader to ensure sufficient environmental protection and pollution control measures have been included.
- 13.5.3 The ET Leader would also review the progress and programme of the works to check that relevant environmental laws have not been violated, and that any foreseeable potential for violating laws can be prevented.
- 13.5.4 The Contractor would provide the update of the relevant documents to the ET Leader so that works checking could be carried out effectively. The document would at least include the updated Works Progress Reports, updated Works Programme, method statements, any application letters for licences / permits under the environmental protection legislations, and copies of all valid licences / permits. The site diary would also be available for the inspection by the relevant parties.
- 13.5.5 After reviewing the document, the ET Leader would advise the IEC and Contractor of any non-compliance with legislative requirements on environmental protection and pollution control for them to take follow-up actions as appropriate. If the follow-up actions may still result in violation of environmental protection and pollution control requirements, the ER and ET would provide further advice to the Contractor to take remedial action to resolve the problem.
- 13.5.6 Upon receipt of the advice, the Contractor would undertake immediate action to correct the situation. The ER and ET would follow up to ensure that appropriate action has been taken to satisfy contractual and legal requirements.

13.6 Environmental Complaints

- 13.6.1 The following procedures would be undertaken upon receipt of any environmental complaint:
- The Contractor to log complaint and date of receipt onto the complaint database and inform the ER, ET, and IEC immediately;
 - The Contractor to investigate, with the ER and ET, the complaint to determine its validity, and assess whether the source of the problem is due to construction works of the Project with the support of additional monitoring frequency and stations, if necessary;
 - The Contractor to identify remedial measures in consultation with the IEC, ET, and ER if a complaint is valid and due to the construction works of the Project;
 - The Contractor to implement the remedial measures as required by the ER and to agree with the ET and IEC any additional monitoring frequency and stations, where necessary, for checking the effectiveness of the remedial measures;
 - The ER, ET, and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation;

- The ET to undertake additional monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur;
- If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and additional monitoring identified or already taken, for submission to EPD within the time frame assigned by the EPD; and
- The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and additional monitoring results in the monthly EM&A reports.

13.7 Reporting

Baseline Monitoring Report

13.7.1 The ET would prepare and submit a Baseline Environmental Monitoring Report at least one month before commencement of construction of the Project. Copies of the Baseline Environmental Monitoring Report would be submitted to the IEC, ER and EPD. The ET should liaise with the relevant parties on the exact number of copies require.

13.7.2 The Baseline Monitoring Report would include at least the following:

- Up to half a page executive summary
- Brief project background information
- Drawings showing locations of the baseline monitoring stations
- Monitoring results (in both hard and soft copies) together with the following information:
 - monitoring methodology
 - name of laboratory and types of equipment used and calibration details
 - parameters monitored
 - monitoring locations
 - monitoring date, time, frequency, and duration
 - quality assurance (QA) / quality control (QC) results and detection limits
- Details of influencing factors, including:
 - major activities, if any, being carried out on the site during the period;
 - weather conditions during the period
 - other factors which might affect monitoring results
- Determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data
- Revisions for inclusion in the ERR
- Comments, recommendations, and conclusions

Monthly EM&A Report

- 13.7.3 The results and findings of all EM&A work required in the Manual would be recorded in the monthly EM&A reports prepared by the ET and endorsed by the IEC. The EM&A report would be prepared and submitted to EPD within 10 working days of the end of each reporting month, with the first report within the month after construction commences. Copies of each monthly EM&A report would be submitted to the following parties: the IEC, the ER and EPD. Before submission of the first EM&A report, the ET would liaise with the parties on the required number of copies and format of the monthly reports in both hard copy and electronic medium.
- 13.7.4 The ET would review the number and location of monitoring stations and parameters on as needed basis, to cater for any changes in the surrounding environment and the nature of works in progress.

First Monthly EM&A Report

- 13.7.5 The first monthly EM&A report would include at least the following:
- (a) Executive summary:
 - breaches of Action and Limit levels;
 - compliant log
 - notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
 - (b) Basic project information:
 - project organisation including key personnel contact names and telephone numbers;
 - programme;
 - management structure; and
 - works undertaken during the month.
 - (c) Environmental status:
 - advice on the status of statutory environmental compliance such as the status of compliance with the EP / FEP conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
 - works undertaken during the month with illustrations (such as location of works, etc.); and
 - drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations
 - (d) A summary of EM&A requirements including:
 - all monitoring parameters;
 - environmental quality performance limits (Action and Limit levels);
 - Event-Action Plans;
 - environmental mitigation measures, as recommended in the ERR
 - study final report; and
 - environmental requirements in contract documents.
 - (e) Implementation status:
 - advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the ERR.

- (f) Monitoring results (in both hard and soft copies) together with the following information:
- monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - monitoring parameters;
 - monitoring locations;
 - monitoring date, time, frequency, and duration;
 - weather conditions during the period;
 - any other factors which might affect the monitoring results; and
 - QA / QC results and detection limits.
- (g) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
 - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
 - record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
 - review of the reasons for and the implications of non-compliances, complaints, summons, and prosecutions including review of pollution sources and working procedures; and
 - description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.
- (h) Others
- an account of the future key issues as reviewed from the works programme and work method statements;
 - advice on the solid and liquid waste management status;
 - record of any project changes from the originally proposed as described in the ERR (e.g., construction methods, mitigation proposals, design changes, etc.); and
 - comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the EM&A programme) and conclusions.

Subsequent Monthly EM&A Reports

13.7.6 Subsequent monthly EM&A reports would include at least the following:

- (i) Executive summary:
- breaches of Action and Limit levels;
 - compliant log;
 - notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
- (j) Basic project information:

- project organisation including key personnel contact names and telephone numbers;
 - programme;
 - management structure; and
 - works undertaken during the month; and
 - any updates as needed to the scope of works and construction methodologies.
- (k) Environmental status:
- advice on the status of statutory environmental compliance such as the status of compliance with the EP / FEP conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
 - works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
 - drawings showing the project area, any environmental sensitive receivers, and the locations of the monitoring stations.
- (l) Implementation status:
- advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the ERR.
- (m) Monitoring results (in both hard and soft copies) together with the following information:
- monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - monitoring parameters;
 - monitoring locations;
 - monitoring date, time, frequency, and duration;
 - weather conditions during the period;
 - any other factors which might affect the monitoring results; and
 - QA / QC results and detection limits.
- (n) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
 - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
 - record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
 - review of the reasons for and the implications of non-compliance's, complaints, summons, and prosecutions including review of pollution sources and working procedures; and
 - description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.
- (o) Others:
- an account of the future key issues as reviewed from the works programme
 - and work method statements;
 - advice on the solid and liquid waste management status;
 - record of any project changes from the originally proposed as described in the ERR (e.g., construction methods, mitigation proposals, design changes, etc.); and

- comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the EM&A programme) and conclusions.
- (p) Appendices:
- Action and Limit levels;
 - graphical plots of trends of the monitoring parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
 - major activities being carried out on site during the period;
 - weather conditions during the period; and
 - any other factors that might affect the monitoring results.
 - monitoring schedule for the present and next reporting period;
 - cumulative statistics on complaints, notifications of summons and
 - successful prosecutions; and
 - outstanding issues and deficiencies.

Final EM&A Review Reports

- 13.7.7 The EM&A programme would be terminated upon the completion of the construction activities that have the potential to result in significant environmental impacts and completion of operation monitoring of rail/fixed noise.
- 13.7.8 Prior to the proposed termination, the proposed termination would only be implemented after the proposal has been endorsed by the IEC followed by approval from the Director of Environmental Protection.
- 13.7.9 The final EM&A report would contain at least the following information:
- (a) Executive summary;
 - (b) Drawings showing the project are, any environmental sensitive receivers and the locations of the monitoring and control stations;
 - (c) Basic project information including a synopsis of the project organisation, contacts of key management, and a synopsis of work undertaken during the project or past twelve months;
 - (d) A summary of EM&A requirements including:
 - environmental mitigation measure, as recommended in the ERR;
 - environmental quality performance limits (Action and Limit levels);
 - all monitoring parameters;
 - Event and Action Plans;
 - (e) A summary of the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the ERR, summarised in the updated implementation schedule;
 - (f) Graphical plots and the statistical analysis of the trends of monitoring parameter over the course of the project, including the post-project monitoring for all monitoring stations annotated against:
 - the major activities being carried out on site during the period;
 - weather conditions during the period; and
 - any other factors which might affect the monitoring results;

- (g) A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- (h) A review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures as appropriate;
- (i) A description of the actions taken in the event of non-compliance;
- (j) A summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up actions taken and results;
- (k) A review of the validity of ERR predictions and identification of shortcomings in ERR recommendations;
- (l) Comments (for example, a review of the effectiveness and efficiency of the mitigation measures and of the performance of the environmental management system, that is, of the overall EM&A programme); and
- (m) Recommendations and conclusions (for example, a review of success of the overall EM&A programme to cost-effectively identify deterioration and to initiate prompt effective mitigatory action when necessary).

Data Keeping

13.7.10 No site-based documents (such as monitoring field records, laboratory analysis records, site inspection forms, etc.) are required to be included in the monthly EM&A reports. However, any such document would be well kept by the ET and be ready for inspection upon request. All relevant information would be clearly and systematically recorded in the document. Monitoring data shall also be recorded in electronic format, and the software copy must be available upon request. All documents and data would be kept for at least one year following completion of the construction phase EM&A.

Interim Notifications of Environmental Quality Limit Exceedances

13.7.11 With reference to the Event and Action Plans, when the environmental quality performance limits are exceeded and if they are proven to be valid, the ET would immediately notify the IEC, ER, contractor and EPD, as appropriate. The notification would be followed up with advice to the IEC and EPD on the results of the investigation, proposed actions and success of the actions taken, with any necessary follow-up proposals. A sample template for the interim notification is presented in **Appendix 13.3**.

14 JUSTIFICATION ON NO MATERIAL CHANGE

14.1 Details of the proposed amendments under the VEP application

14.1.1 The details of the proposed amendments under the VEP application are summarised in **Table 14.1**, which evaluates if there are material changes to DP in accordance with Section 6 of the EIAO-TM.

Table 14.1: Elements of Proposed Amendment may be Regarded as Material Changes to DP

Items	Responses
<p>A change to physical alignment layout or design of the project causing an environmental impact likely to affect existing or planned community, ecologically important areas or sites of cultural heritage.</p>	<p>The existing WRL would need to be modified to accommodate the two-level station with at-grade concourse and elevated side-platforms for 8-car train sets. The station will be constructed with the majority of the aboveground superstructure works performed with precast / prefabrication. No extensive excavation would be required. Moreover, the general construction works for the Project would mainly involve the delivery, storage, and assembly of precast modules to form the Station structure. The internal ring road abutting and around the Station will be provided for vehicular access of Emergency Vehicular Access (EVA), refuse collection, delivery and maintenance.</p> <p>Based on the assessment findings of this ERR, the proposed amendments will not cause adverse environmental impact on the existing or planned communities, ecologically important areas or sites of cultural heritage during construction and operation phases.</p>
<p>A physical change resulting in an increase in the extent of reclamation or dredging affecting water flow or quality likely to affect ecologically important areas, or disrupting sites if cultural heritage.</p>	<p>Neither reclamation nor dredging is required.</p>
<p>An increase in pollution emissions or discharges or waste generation likely to violate guidelines or criteria in this technical memorandum without mitigation measures in place.</p>	<p>The modification works of the existing WRL viaduct to form HSK Station will not lead to an increase in pollution emission, discharges or waste generation that will result in violation of guidelines or criteria in the EIAO-TM.</p>

<p>An increase in throughput or scale of the project leading to physical additions or alterations that are likely to violate the guidelines or criteria in this technical memorandum without mitigation measures in place.</p>	<p>There will be no increase in throughput or scale of the Project. Although there are physical modification works of the existing WRL viaduct, the environmental impacts of the proposed amendments have already been thoroughly assessed for different environmental aspects, and it is anticipated that there will be no violation of the guidelines or criteria in the EIAO-TM.</p>
<p>A change requiring works that are likely to affect rare, endangered or protected species, or any important ecological habitats, or sites of cultural heritage.</p>	<p>The proposed amendments will not involve works that will affect rare, endangered or protected species, or any important ecological habitats, or sites of cultural heritage.</p>

14.1.2 Based on **Table 14.1**, the proposed amendment does not constitute material changes to the DP. In addition, with the mitigation measures in place as recommended in the approved EIA for WRL, approved EIA for HSK/HT NDA, and in **Sections 4 to 12** of this ERR, the proposed amendment would not lead to exceedance or violation of environmental performance requirement as set out in the approved EIA for WRL and EIAO-TM. As such, the proposed amendment would not constitute a material change in terms of the environmental performance requirement compared to the approved EIA for WRL and approved EIA for HSK/HT NDA.

15 CONCLUSION

15.1 Impact Summary

15.1.1 This document has discussed the possible environmental changes that may result from changes including the following items:

- Modification of the existing WRL viaduct to a new railway station at Hung Shui Kiu between TIS Station and SIH Station, including foundation and piers works, installation of station modules, relocation of OHL cantilever;
- Construction of concourse, platform areas, back-of-house areas, construction of EVA and associated facilities; and
- Operation of railway station at Hung Shui Kiu.

15.1.2 An environmental review has been conducted for the proposed variation on various environmental aspects, including air quality, noise, water quality, waste management, land contamination, ecology, landscape and visual, cultural heritage, and hazard to life. Evaluation results indicate that there is no adverse environmental impact arising from the proposed amendments with the implementation of good site practices and mitigation measures recommended in this ERR.

15.1.3 As such, there will be no material change to the environmental impact even with the proposed amendments. The Project will remain in compliance with the EIAO-TM requirements, and no deterioration of the surrounding environment is anticipated.

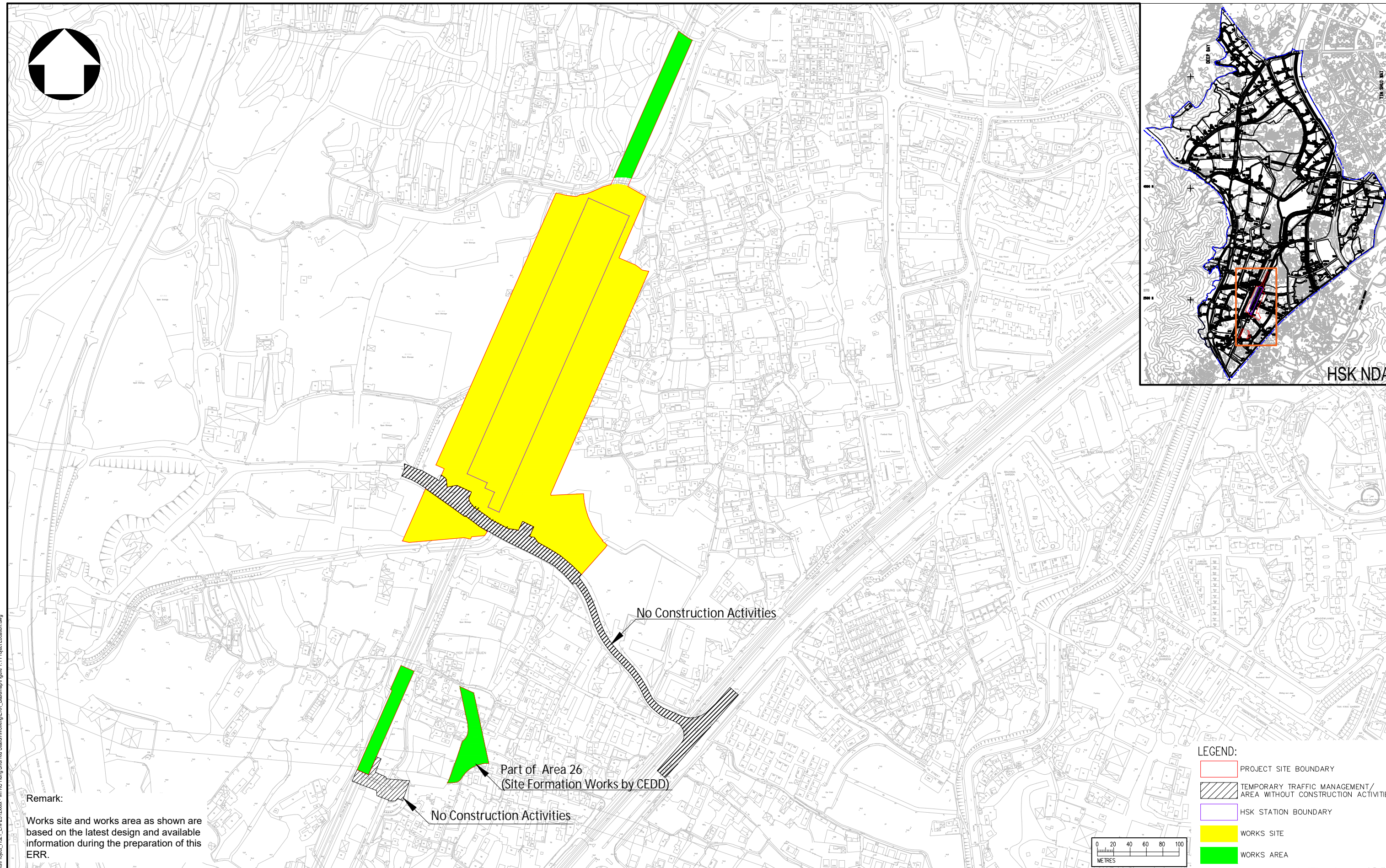
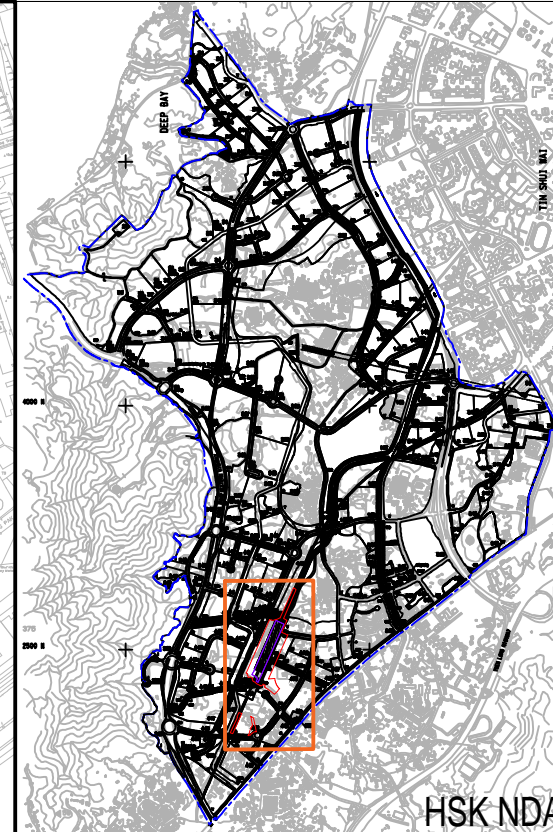
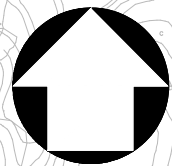
15.2 Proposed Variation to the Conditions in Current Environmental Permit

15.2.1 HSK Station is proposed to be constructed between Tin Shui Wai Station and Siu Hong Station on the existing WRL. The Project location will be supplemented by a new Figure 3A in Part B.

15.2.2 The project description under Western Section in Part B (EP No. FEP-24/004/1998/J) is proposed to be updated to include the new HSK Station. Scale and Scope of Designated Project(s) in Part B will be varied.

15.2.3 The submission of Construction Noise Management Plan (CNMP) of HSK Station will be included as a new condition in Part C.

15.2.4 Noise mitigation measures are proposed as per the ERR to mitigate the potential noise impact on future noise sensitive receivers in close vicinity to the new HSK Station. Railway noise mitigation measure for the Project will be incorporated into a new condition in Part C, a new Table D in Schedule 1 and a new Figure 17.



Remark:
Works site and works area as shown are based on the latest design and available information during the preparation of this ERR.

- LEGEND:
- PROJECT SITE BOUNDARY
 - TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
 - HSK STATION BOUNDARY
 - WORKS SITE
 - WORKS AREA

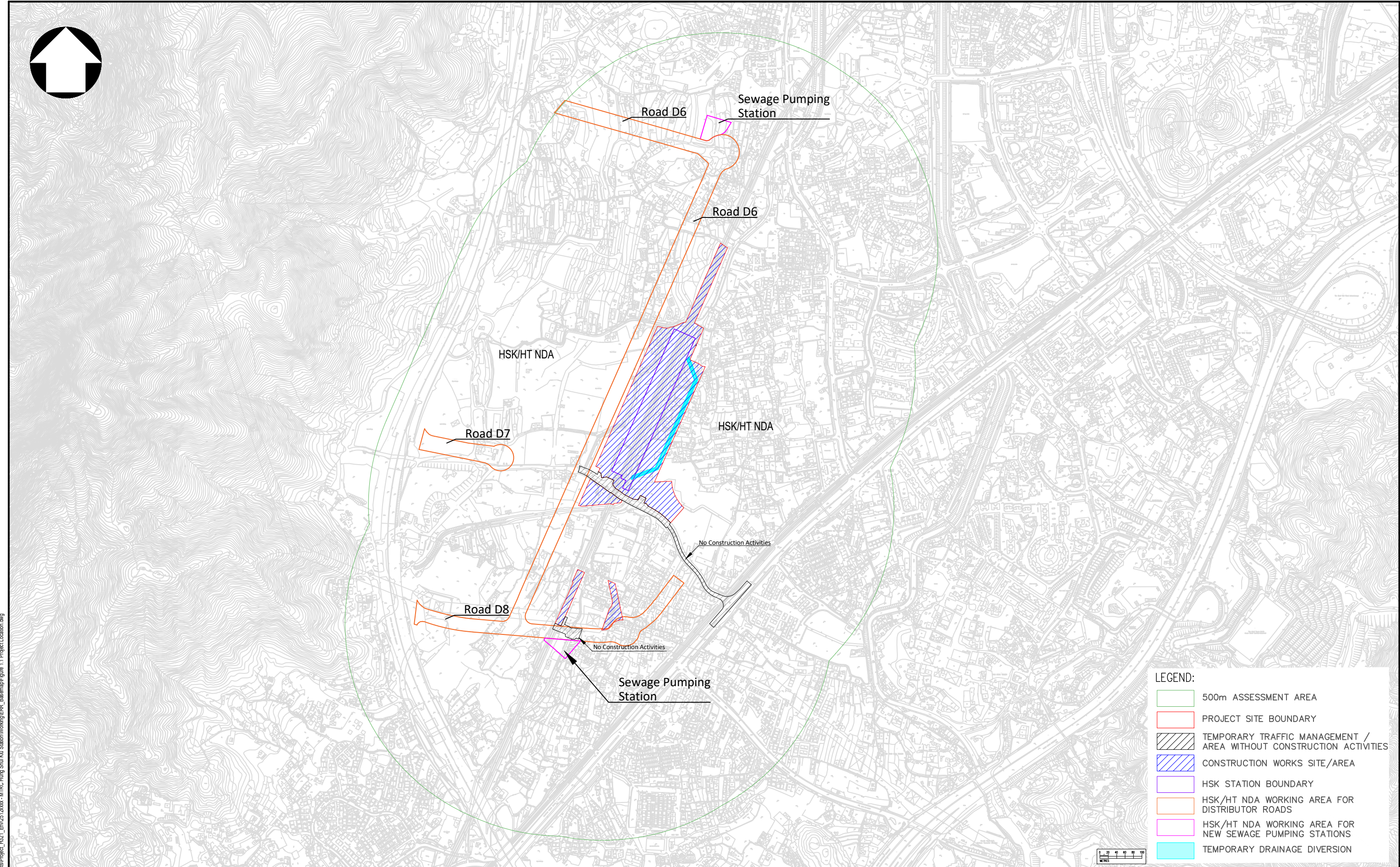
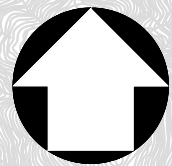
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6	Revision 6	JY	31/08/2022	FL	0	Initial Submission	JY	18/01/2022	FL
					2	Revision 2	JY	16/02/2022	FL
					3	Revision 3	JY	22/04/2022	FL
					4	Revision 4	JY	22/06/2022	FL
					5	Revision 5	JY	18/07/2022	FL

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MTR
HUNG SHUI KIU STATION
 ORIGINATOR **aurecon** **wsp**

TITLE C1801 Design Services for Hung Shui Kiu Station Project Site Boundary	
SCALE NTS	DRAWING NO. Figure 1.1
	REV. 7



LEGEND:

- 500m ASSESSMENT AREA
- PROJECT SITE BOUNDARY
- TEMPORARY TRAFFIC MANAGEMENT / AREA WITHOUT CONSTRUCTION ACTIVITIES
- CONSTRUCTION WORKS SITE/AREA
- HSK STATION BOUNDARY
- HSK/HT NDA WORKING AREA FOR DISTRIBUTOR ROADS
- HSK/HT NDA WORKING AREA FOR NEW SEWAGE PUMPING STATIONS
- TEMPORARY DRAINAGE DIVERSION



MODELNAME: \\hkwr2001\16\SD\17_Proj\Proj\Project_H21_Env\2512\xxx - MTRC Hung Shui Kiu Station\Working\ERR_Base\map\Figure 1.1 Project Location.dwg
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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
4	Revision 4	JY	18/10/2022	FL					
3	Revision 3	JY	31/08/2022	FL					
2	Revision 2	JY	18/07/2022	FL					
1	Revision 1	JY	22/04/2022	FL					
0	Initial Submission	JY	01/04/2022	FL					

DRAWN	JY
DESIGNED	P Kau
CHECKED	F Leong
APPROVED	
DATE	18/10/2022

HUNG SHUI KIU STATION
 ORIGINATOR

TITLE C1801 Design Services for Hung Shui Kiu Station Concurrent Projects in HSK/HT NDA	
SCALE NTS	DRAWING NO. Figure 1.2
	REV. 4

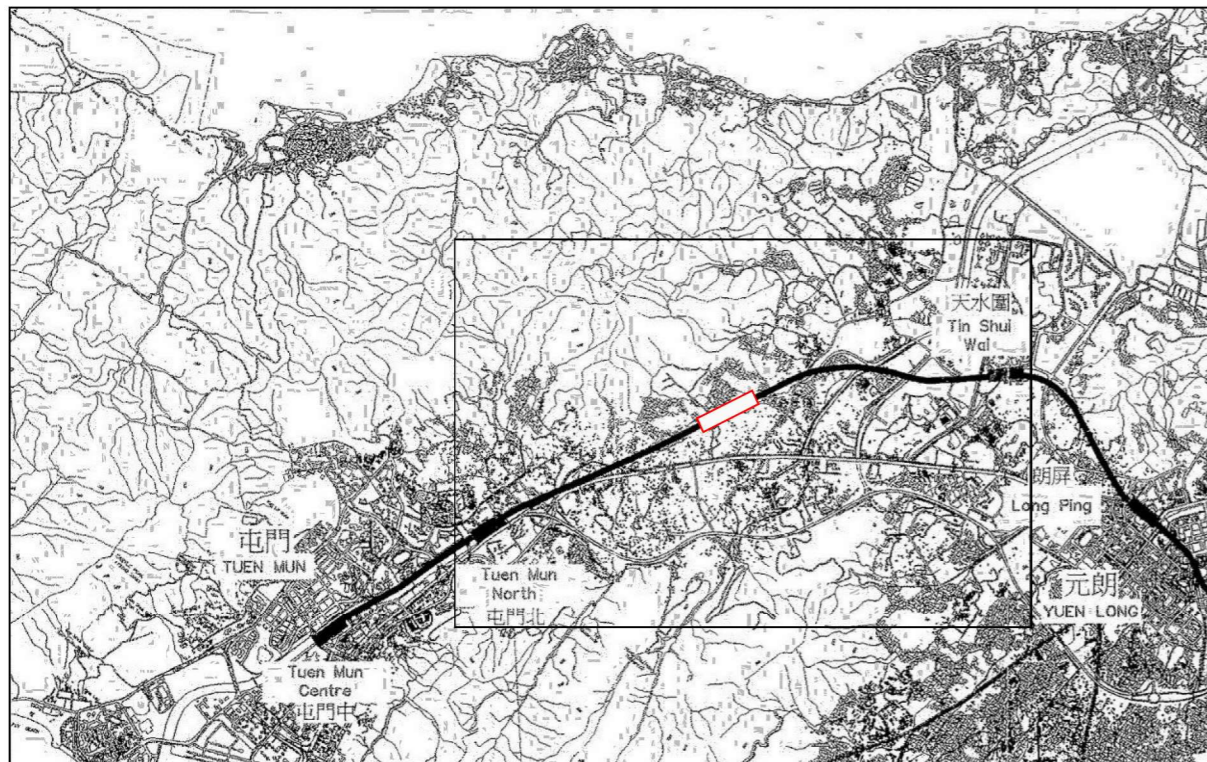
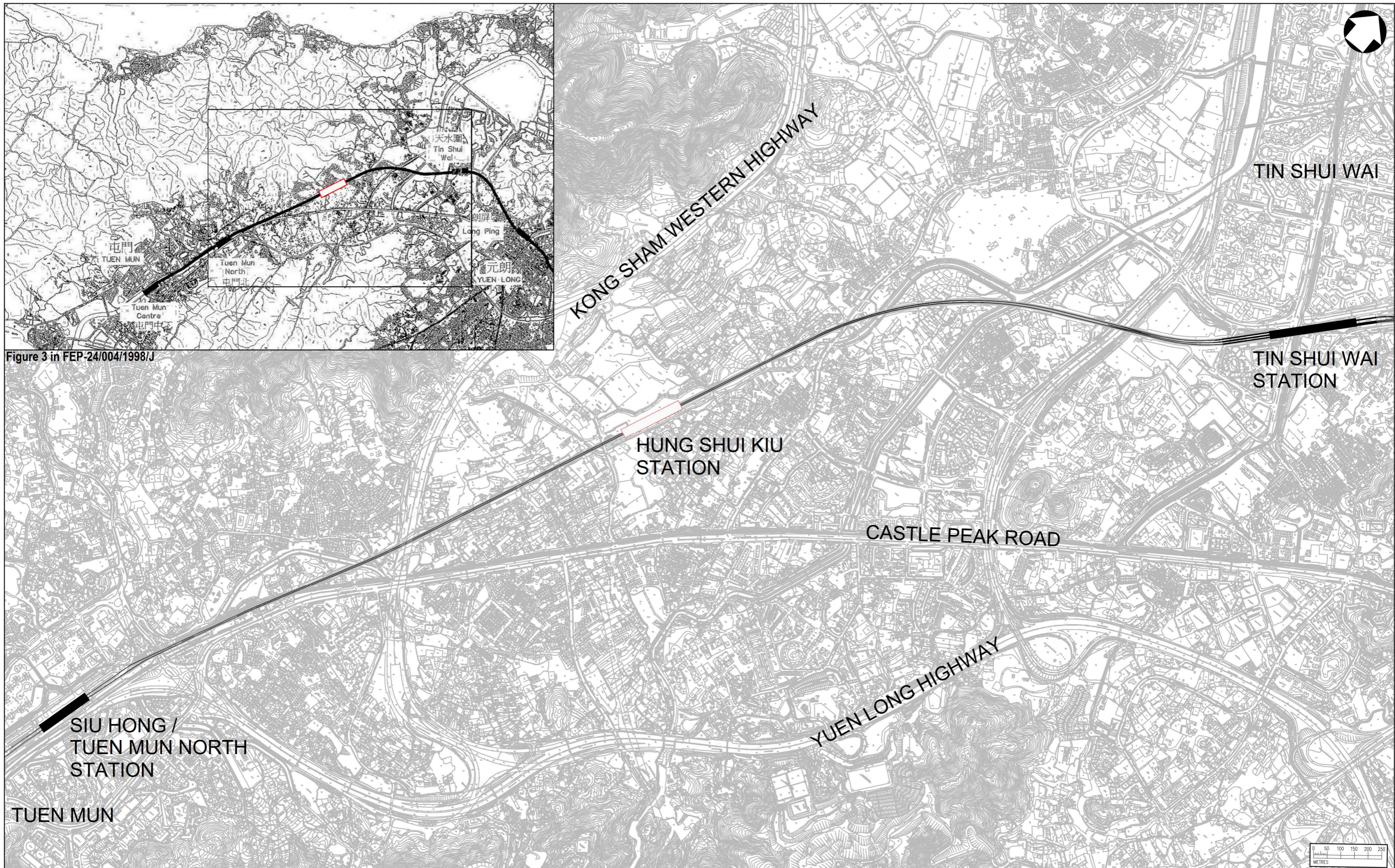


Figure 3 in FEP-24/004/1998/J



REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
0	Initial Submission	JY	01/11/2022	FL					

DRAWN	JY
DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	01/11/2022

HUNG SHUI KIU STATION

 ORIGINATOR

 MODEL REF.

TITLE

C1801 Design Services for Hung Shui Kiu Station

Location of Hung Shui Kiu Station

 SCALE NTS

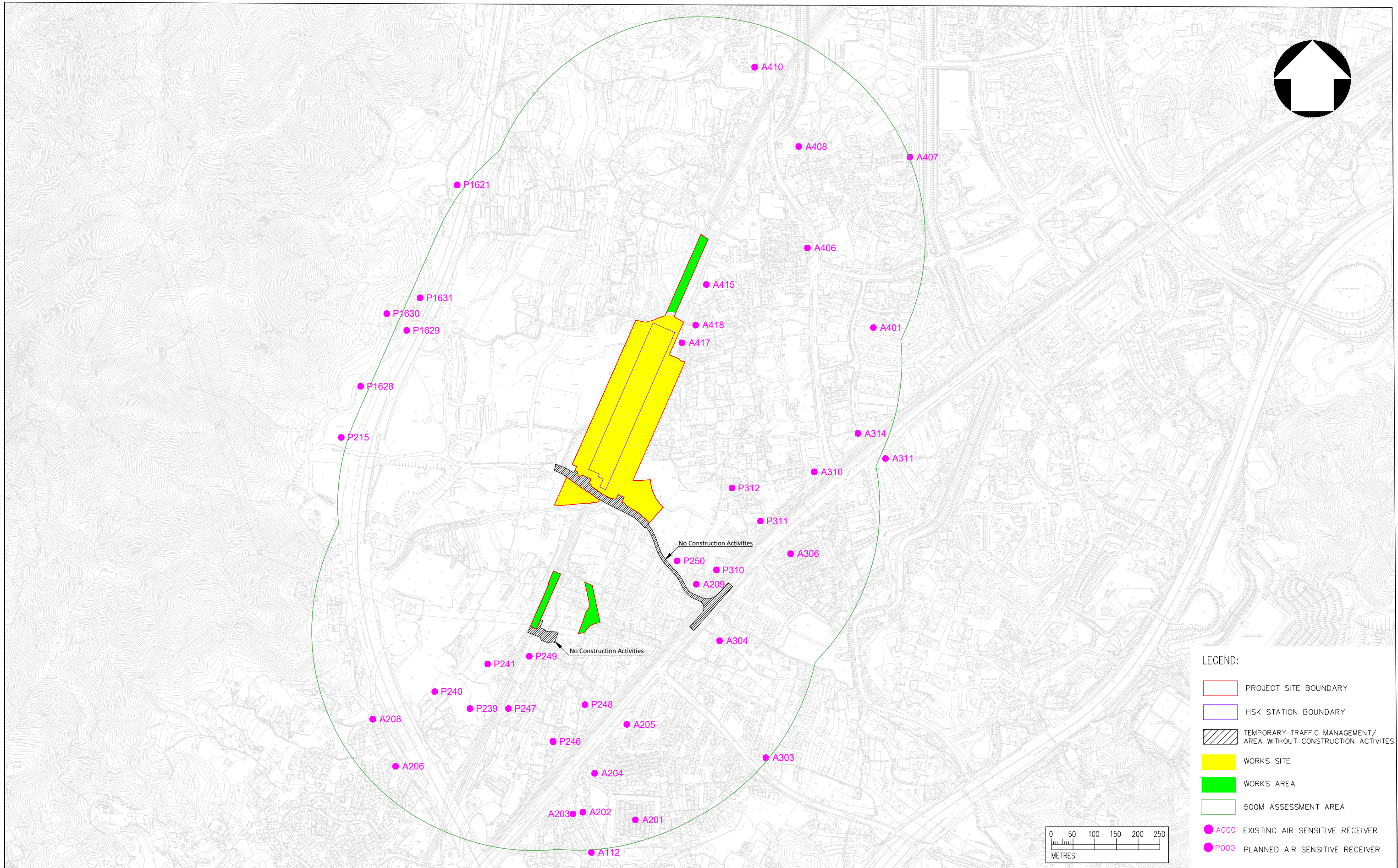
 DRAWING NO. **Figure 2.1**

 REV. **0**

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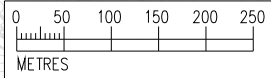
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FILENAME:



LEGEND:

- PROJECT SITE BOUNDARY
- HSK STATION BOUNDARY
- TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
- WORKS SITE
- WORKS AREA
- 500M ASSESSMENT AREA
- A000 EXISTING AIR SENSITIVE RECEIVER
- P000 PLANNED AIR SENSITIVE RECEIVER



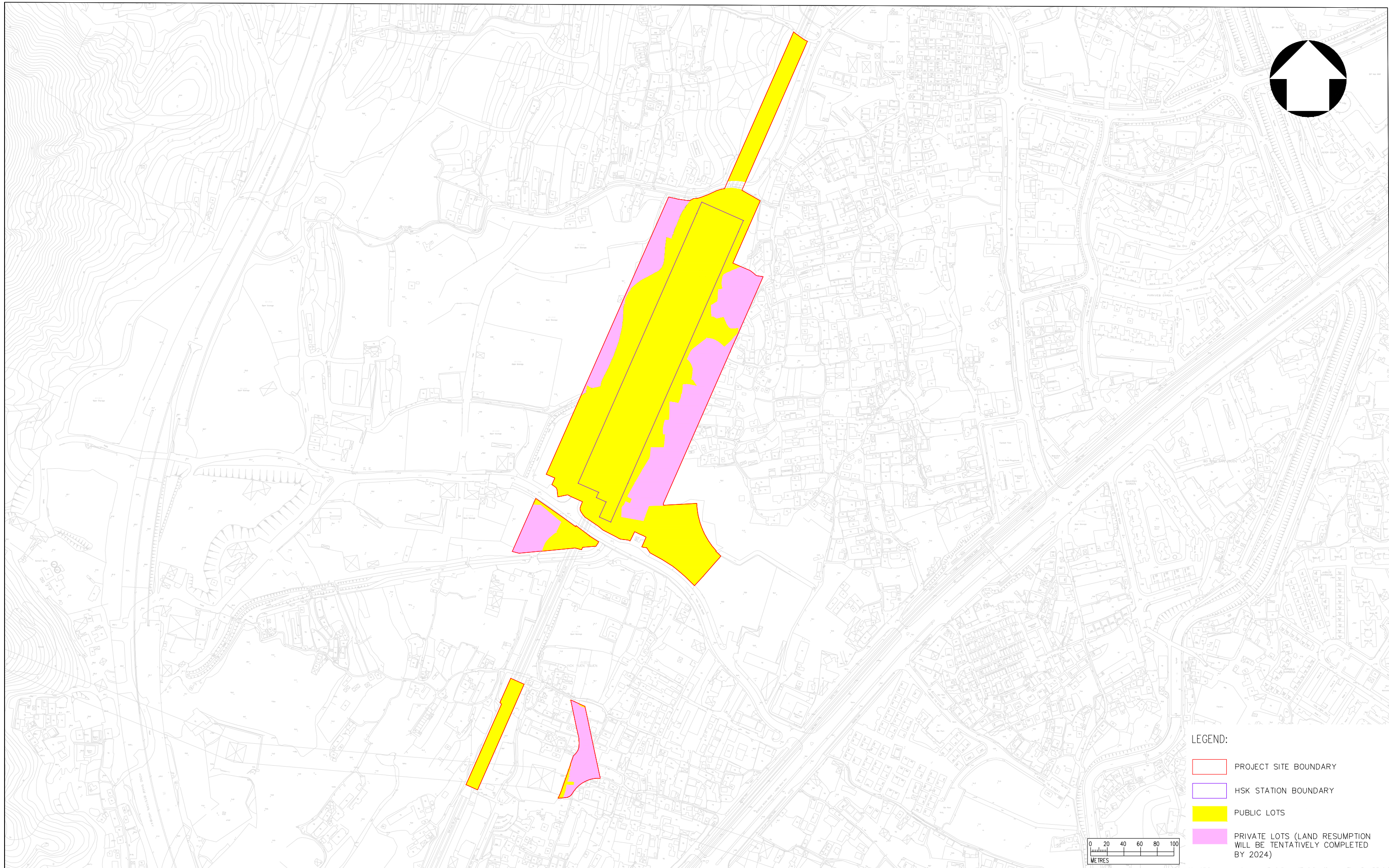
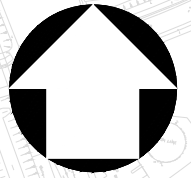
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3	Revision 3		30/03/2022	FL	CHECKED	P Kau		
2	Revision 2		16/02/2022	FL	APPROVED	F Leong		
1	Revision 1		10/02/2022	FL	DATE	18/10/2022		
0	Initial submission		18/01/2022	FL				

MTR
HUNG SHUI KIU STATION
 ORIGINATOR **aurecon wsp**

TITLE
C1801 Design Services for Hung Shui Kiu Station
Air Quality Impact Assessment
Location of Air Sensitive Receivers

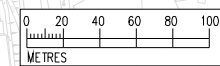
SCALE NTS DRAWING NO. **Figure 4.1** REV. **5**

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LEGEND:

- PROJECT SITE BOUNDARY
- HSK STATION BOUNDARY
- PUBLIC LOTS
- PRIVATE LOTS (LAND RESUMPTION WILL BE TENTATIVELY COMPLETED BY 2024)



MODELNAME:
FILENAME:

REV	DESCRIPTION	BY	DATE	APPROVED	DESCRIPTION	BY	DATE	APPROVED
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2	Revision 2							
1	Revision 1							
0	Initial submission							

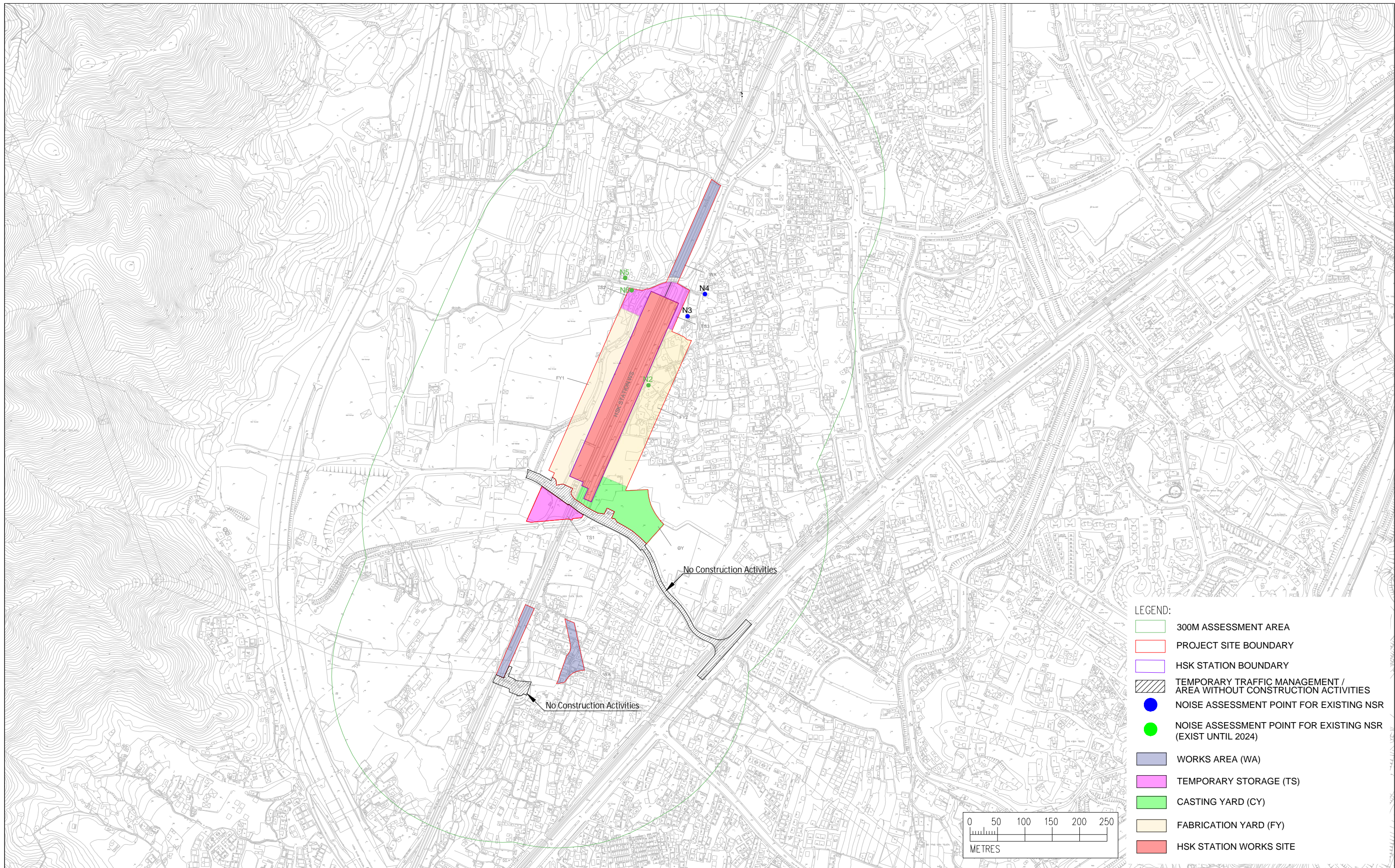
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DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	

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 ORIGINATOR **aurecon wsp**
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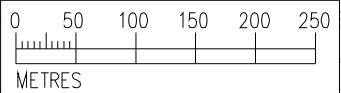
TITLE
C1801 Design Services for Hung Shui Kiu Station
Air Quality Impact Assessment
Ownership of Lots Nearby
 SCALE NTS DRAWING NO. **Figure 4.2** REV.

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- LEGEND:**
- 300M ASSESSMENT AREA
 - PROJECT SITE BOUNDARY
 - HSK STATION BOUNDARY
 - TEMPORARY TRAFFIC MANAGEMENT / AREA WITHOUT CONSTRUCTION ACTIVITIES
 - NOISE ASSESSMENT POINT FOR EXISTING NSR
 - NOISE ASSESSMENT POINT FOR EXISTING NSR (EXIST UNTIL 2024)
 - WORKS AREA (WA)
 - TEMPORARY STORAGE (TS)
 - CASTING YARD (CY)
 - FABRICATION YARD (FY)
 - HSK STATION WORKS SITE



MODELNAME:
FILENAME:

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
3	Revision 3		26/08/22	FL	SC				
2	Revision 2		15/06/22	FL	TL				
1	Revision 1		23/05/22	FL	TL				
0	Initial submission		18/01/22	FL	TL				

DRAWN TL
DESIGNED
CHECKED P Kau
APPROVED F Leong
DATE 26/08/22

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HUNG SHUI KIU STATION

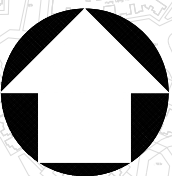
ORIGINATOR aurecon wsp

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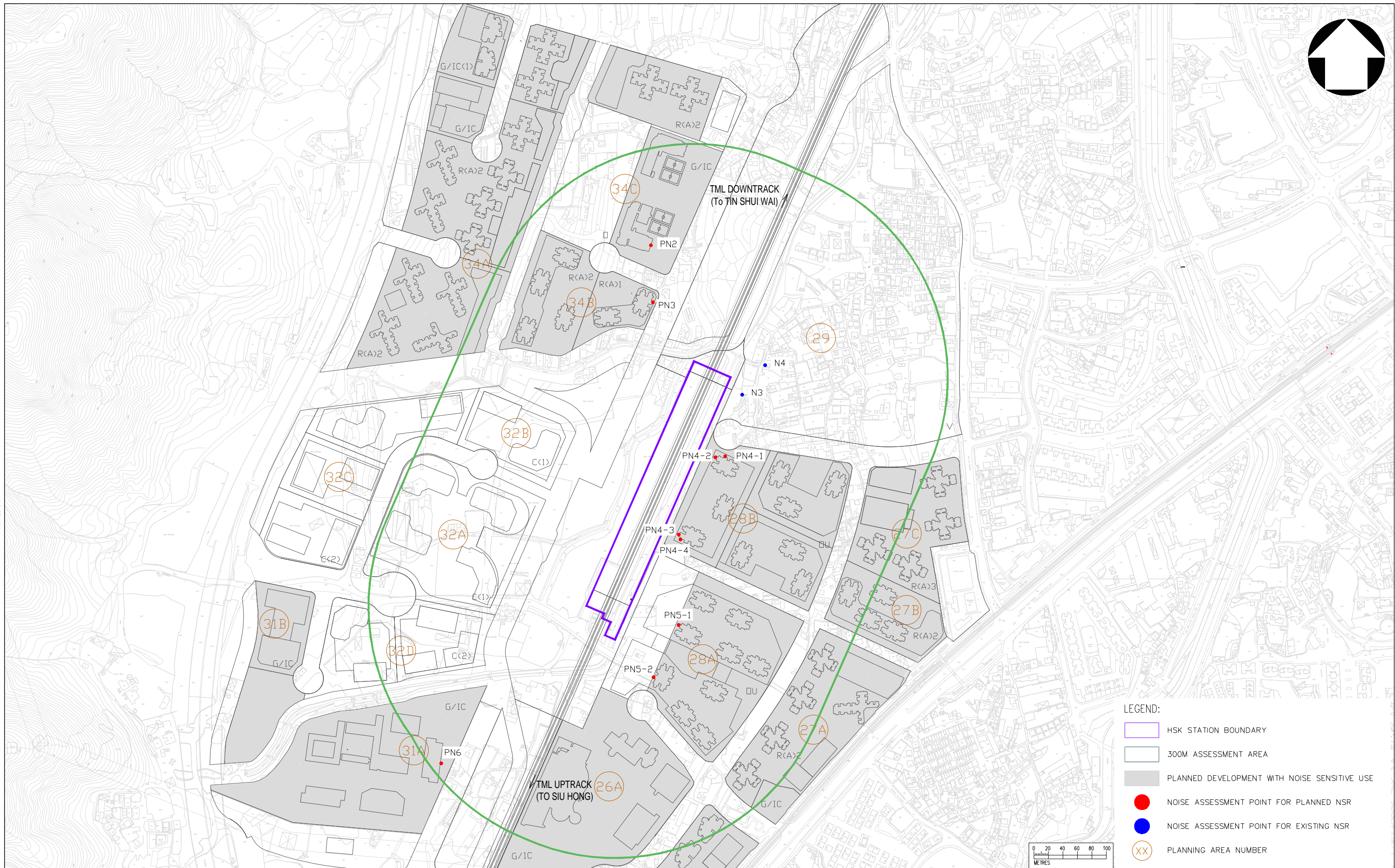
TITLE
C1801 Design Services for Hung Shui Kiu Station
Construction Noise Impact Assessment
Location of Construction Works Area / Works Site and
Representative Noise Sensitive Receivers (NSRs)

SCALE (A3) **DRAWING NO.** Figure 5.1 **REV.** 3



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FILENAME:

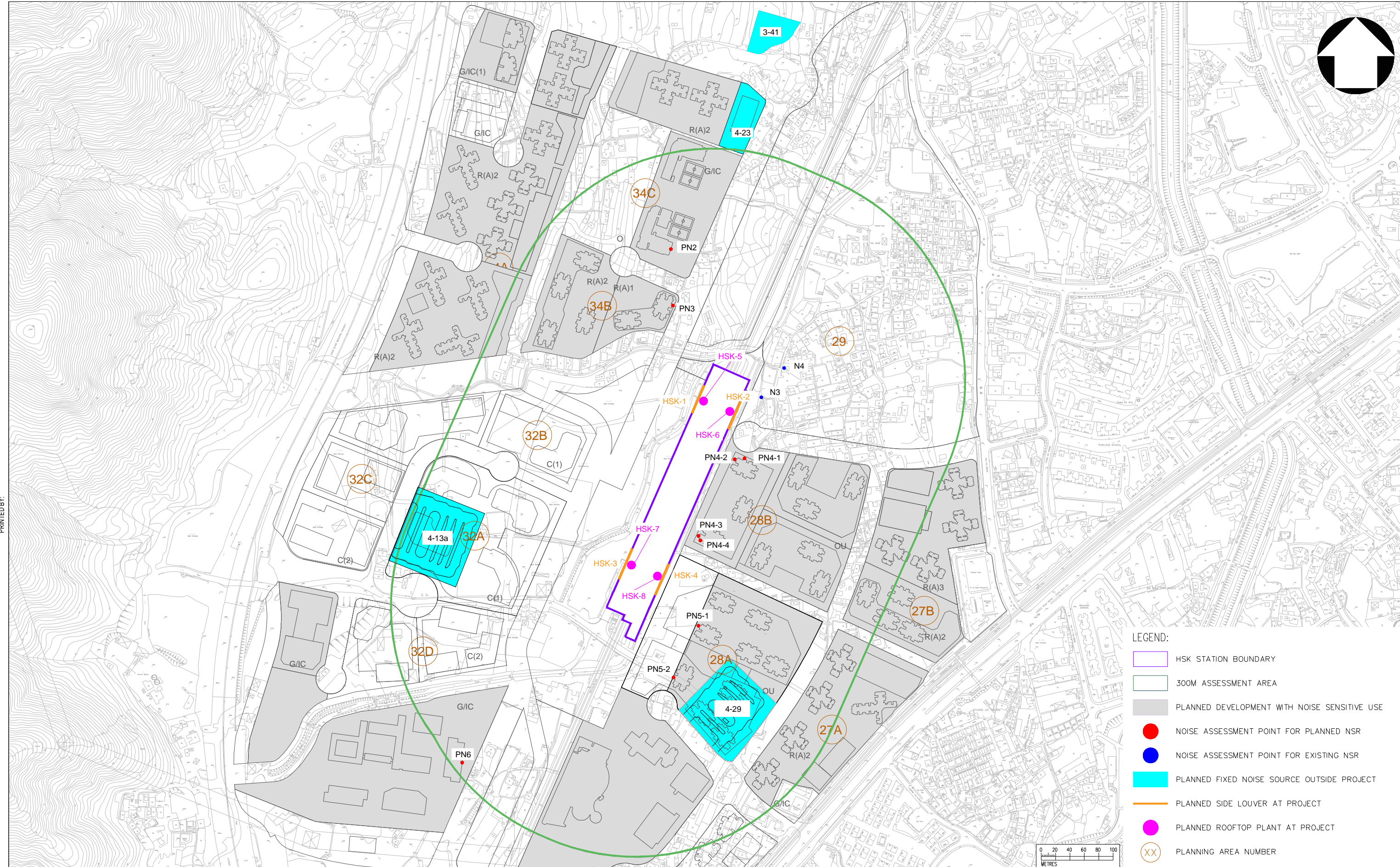


- LEGEND:**
- HSK STATION BOUNDARY
 - 300M ASSESSMENT AREA
 - PLANNED DEVELOPMENT WITH NOISE SENSITIVE USE
 - NOISE ASSESSMENT POINT FOR PLANNED NSR
 - NOISE ASSESSMENT POINT FOR EXISTING NSR
 - XX PLANNING AREA NUMBER

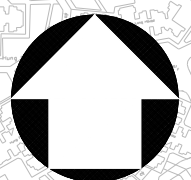
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4	Revision 4	CC	05/09/2022	FL
3	Revision 3	CC	22/06/2022	FL
2	Revision 2	CC	21/04/2022	FL
1	Revision 1	CC	28/03/2022	FL
0	Initial Submission	CC	18/01/2022	FL

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HUNG SHUI KIU STATION
ORIGINATOR aurecon wsp
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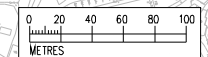
TITLE	
C1801 Design Services for Hung Shui Kiu Station	
Railway Noise Impact Assessment	
Location of Representative Noise Sensitive Receivers for Railway Noise	
SCALE (A3)	DRAWING NO. Figure 5.2
REV. 5	



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- LEGEND:**
- HSK STATION BOUNDARY
 - 300M ASSESSMENT AREA
 - PLANNED DEVELOPMENT WITH NOISE SENSITIVE USE
 - NOISE ASSESSMENT POINT FOR PLANNED NSR
 - NOISE ASSESSMENT POINT FOR EXISTING NSR
 - PLANNED FIXED NOISE SOURCE OUTSIDE PROJECT
 - PLANNED SIDE LOUVER AT PROJECT
 - PLANNED ROOFTOP PLANT AT PROJECT
 - XX PLANNING AREA NUMBER



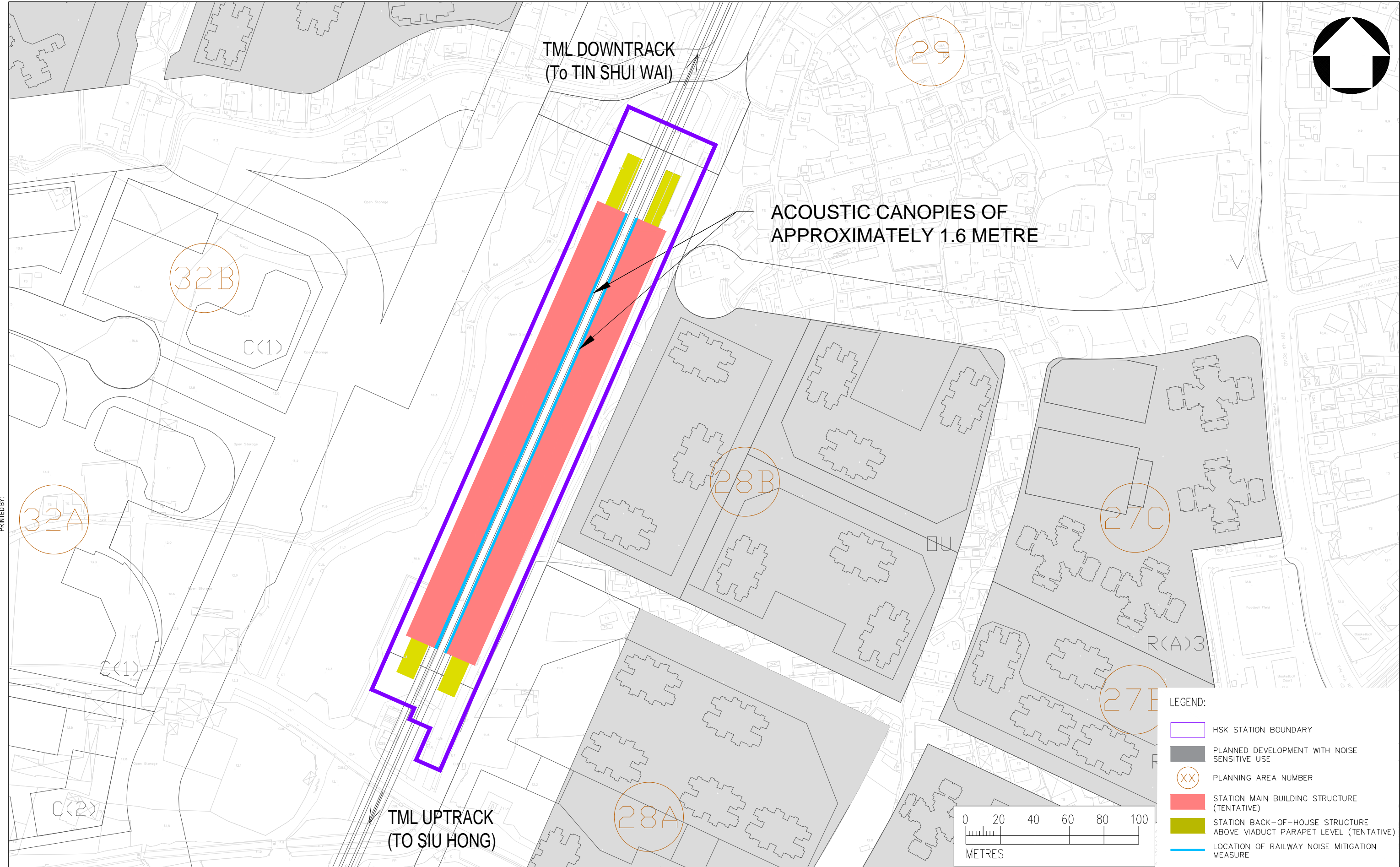
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6	Revision 6	AL	24/08/22	FL	0	Initial submission	AL	18/01/22	FL
					2	Revision 2	AL	21/04/22	FL
					3	Revision 3	AL	05/05/22	FL
					4	Revision 4	AL	17/05/22	FL
					5	Revision 5	AL	16/06/22	FL

MTR
HUNG SHUI KIU STATION
 ORIGINATOR **aurecon wsp**

DESIGNED: AL
 CHECKED: P Kau
 APPROVED: F Leong
 DATE: 05/09/22

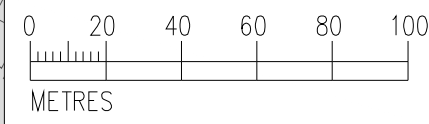
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TITLE	C1801 Design Services for Hung Shui Kiu Station		
	Fixed Noise Impact Assessment		
	Location of Planned Fixed Noise Sources and Representative Noise Sensitive Receivers		
SCALE	(A3)	DRAWING NO.	Figure 5.3
REV.			7



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- LEGEND:**
- HSK STATION BOUNDARY
 - PLANNED DEVELOPMENT WITH NOISE SENSITIVE USE
 - PLANNING AREA NUMBER
 - STATION MAIN BUILDING STRUCTURE (TENTATIVE)
 - STATION BACK-OF-HOUSE STRUCTURE ABOVE VIADUCT PARAPET LEVEL (TENTATIVE)
 - LOCATION OF RAILWAY NOISE MITIGATION MEASURE



REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
3	Revision 3				CC	05/09/22	FL		
2	Revision 2				CC	05/08/22	FL		
1	Revision 1				CC	18/07/22	FL		
0	Initial Submission				CC	17/05/22	FL		

DRAWN	CC
DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	05/09/22

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HUNG SHUI KIU STATION
 ORIGINATOR
aurecon wsp

TITLE		C1801 Design Services for Hung Shui Kiu Station	
		Railway Noise Impact Assessment	
		Location of Railway Noise Mitigation Measure	
SCALE (A3)	DRAWING NO.	Figure 5.4	REV. 3

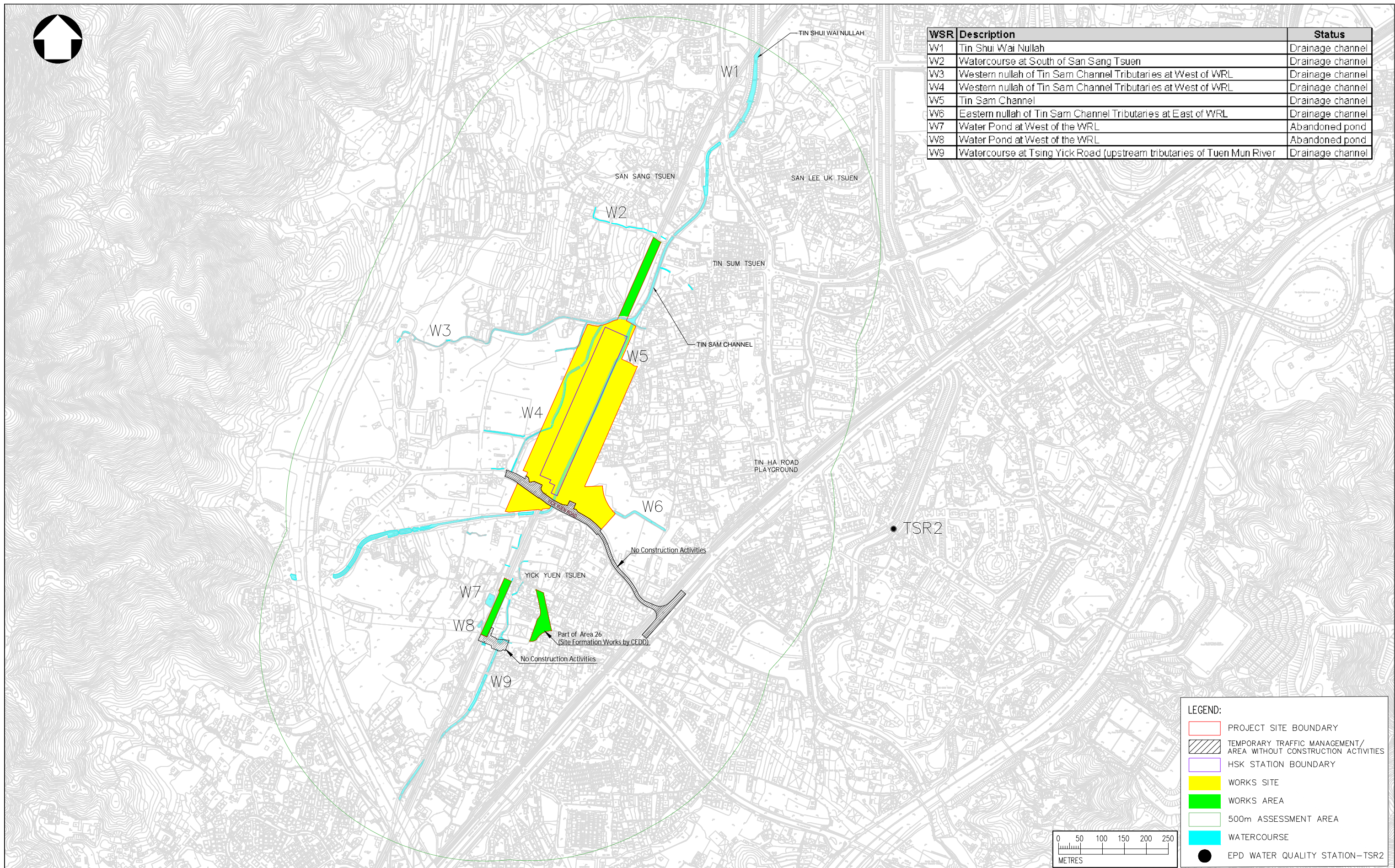
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WSR	Description	Status
W1	Tin Shui Wai Nullah	Drainage channel
W2	Watercourse at South of San Sang Tsuen	Drainage channel
W3	Western nullah of Tin Sam Channel Tributaries at West of WRL	Drainage channel
W4	Western nullah of Tin Sam Channel Tributaries at West of WRL	Drainage channel
W5	Tin Sam Channel	Drainage channel
W6	Eastern nullah of Tin Sam Channel Tributaries at East of WRL	Drainage channel
W7	Water Pond at West of the WRL	Abandoned pond
W8	Water Pond at West of the WRL	Abandoned pond
W9	Watercourse at Tsing Yick Road (upstream tributaries of Tuen Mun River)	Drainage channel

LEGEND:

	PROJECT SITE BOUNDARY
	TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
	HSK STATION BOUNDARY
	WORKS SITE
	WORKS AREA
	500m ASSESSMENT AREA
	WATERCOURSE
	EPD WATER QUALITY STATION-TSR2

REV	DESCRIPTION	BY	DATE	APPROVED
5	Revision 5	AI	26/08/22	FL
4	Revision 4	AI	15/07/22	FL
3	Revision 3	AI	04/05/22	FL
2	Revision 2	AI	20/04/22	FL
1	Revision 1	AI	10/02/22	FL
0	Initial submission	AI	18/01/22	FL

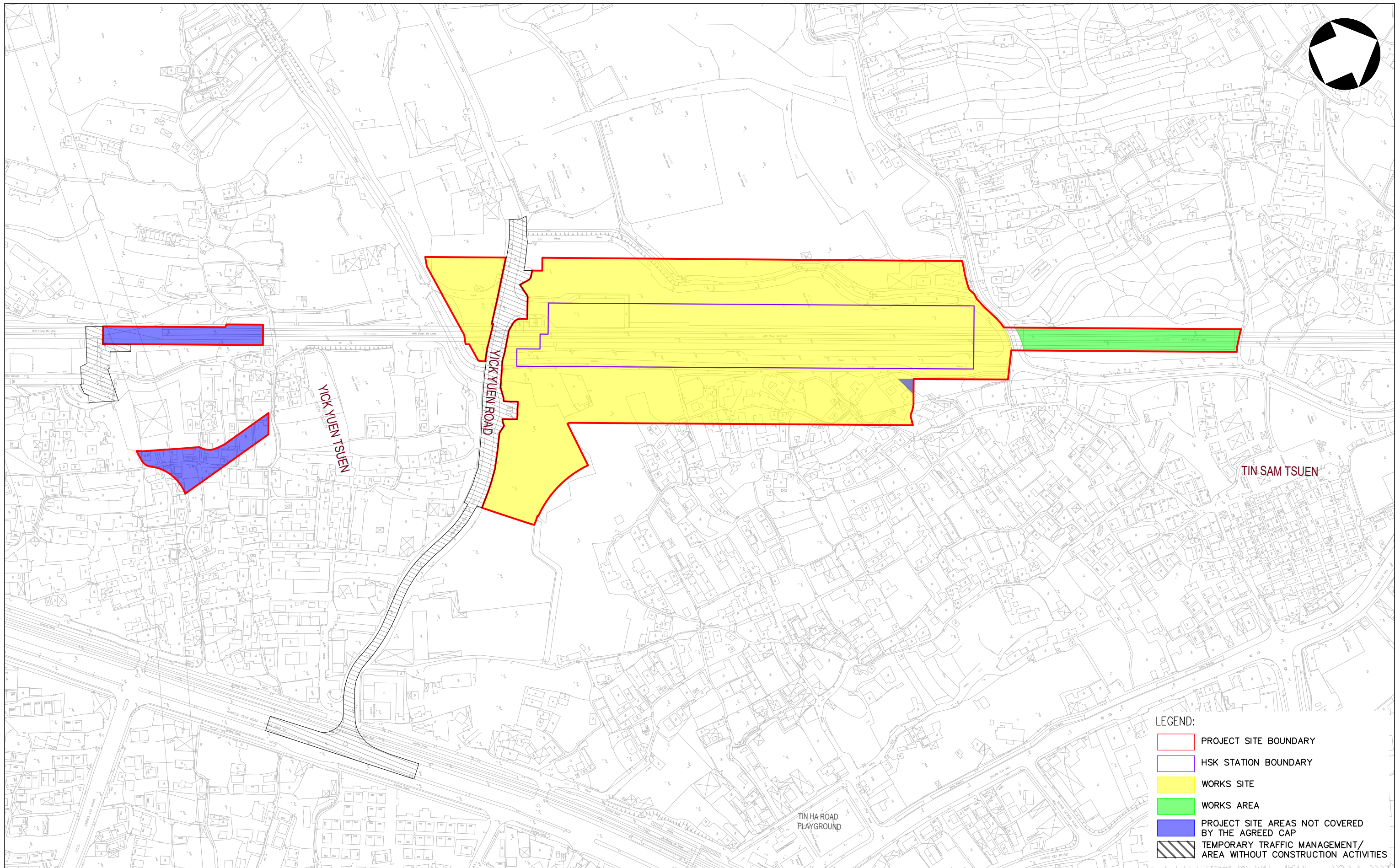
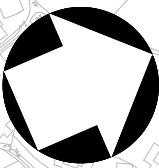
MTR
HUNG SHUI KIU STATION
 ORIGINATOR **aurecon wsp**

DRAWN: AI
 DESIGNED: AI
 CHECKED: P Kau
 APPROVED: F Leong
 DATE: 26/08/2022

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TITLE
C1801 Design Services for Hung Shui Kiu Station
Water Quality Impact Assessment
Location of Water Sensitive Receivers

SCALE (A3) DRAWING NO. **Figure 6.1** REV. **5**



- LEGEND:**
- PROJECT SITE BOUNDARY
 - HSK STATION BOUNDARY
 - WORKS SITE
 - WORKS AREA
 - PROJECT SITE AREAS NOT COVERED BY THE AGREED CAP
 - TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES

MODEL NAME:
FILENAME:

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
2	Revision 2	IY	18/10/2022	FL					
1	Revision 1	IY	13/09/2022	FL					
0	Initial Submission	IY	26/08/2022	FL					

DRAWN	IY
DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	18/10/2022

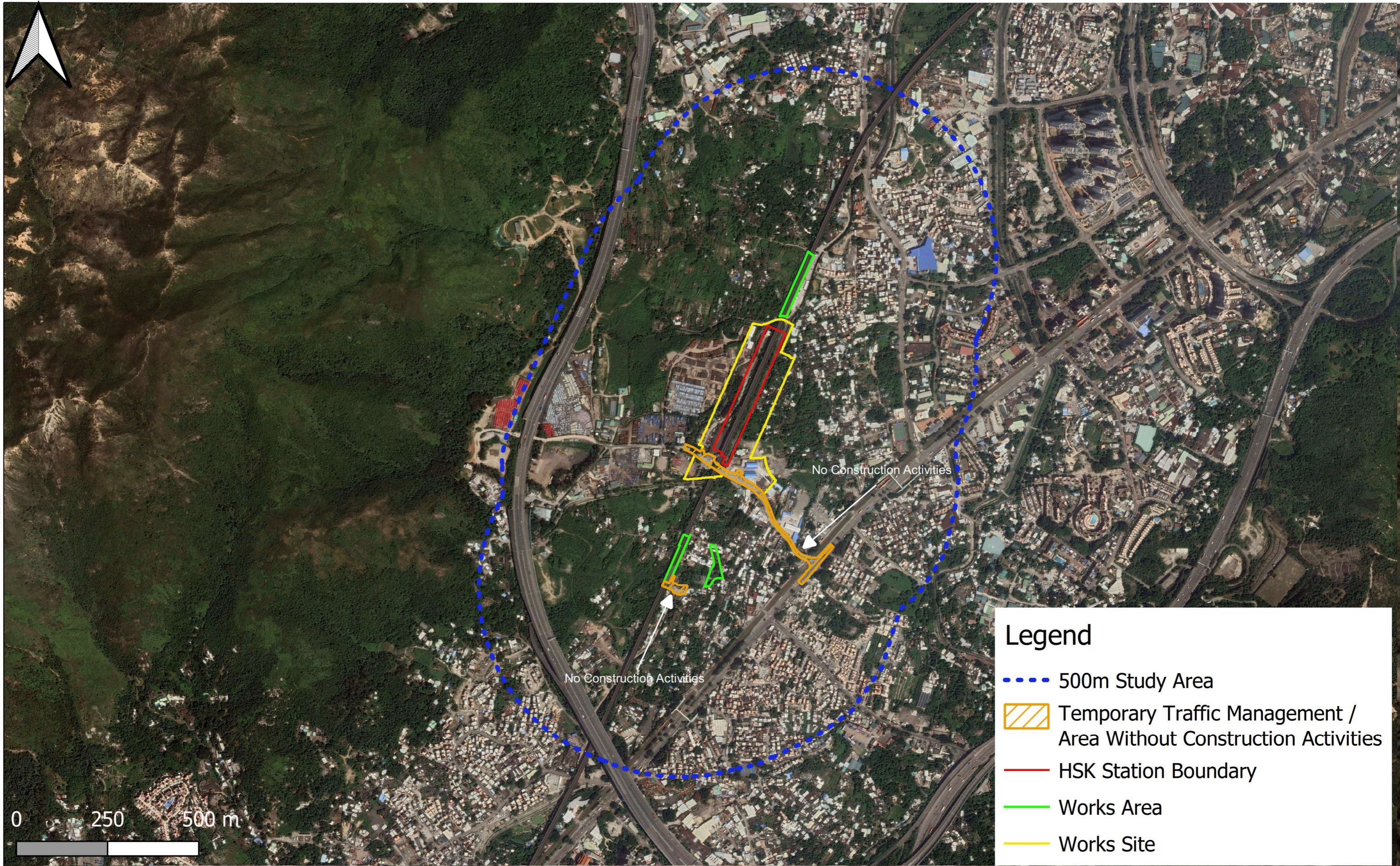
MTR
HUNG SHUI KIU STATION

ORIGINATOR **aurecon wsp**

MODEL REF.

TITLE C1801 Design Services for Hung Shui Kiu Station Project Works Area and Works Site	
SCALE NTS	DRAWING NO. Figure 8.1
	REV. 2

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Legend

- - - 500m Study Area
- Temporary Traffic Management / Area Without Construction Activities
- HSK Station Boundary
- Works Area
- Works Site

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FILENAME:

				DRAWN SC		 HUNG SHUI KIU STATION <small>ORIGINATOR</small> 	<small>TITLE</small> C1801 Design Services for Hung Shui Kiu Station Ecological Impact Assessment Aerial Photo 2016		
				DESIGNED P Kau					
				CHECKED F Leong					
				DATE 18/01/22					
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				MODEL REF.					
REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
	A1 Initial submission		18/01/22	FL					



Legend

- 500m Study Area
- ▨ Temporary Traffic Management / Area Without Construction Activities
- HSK Station Boundary
- Works Area
- ▭ Works Site

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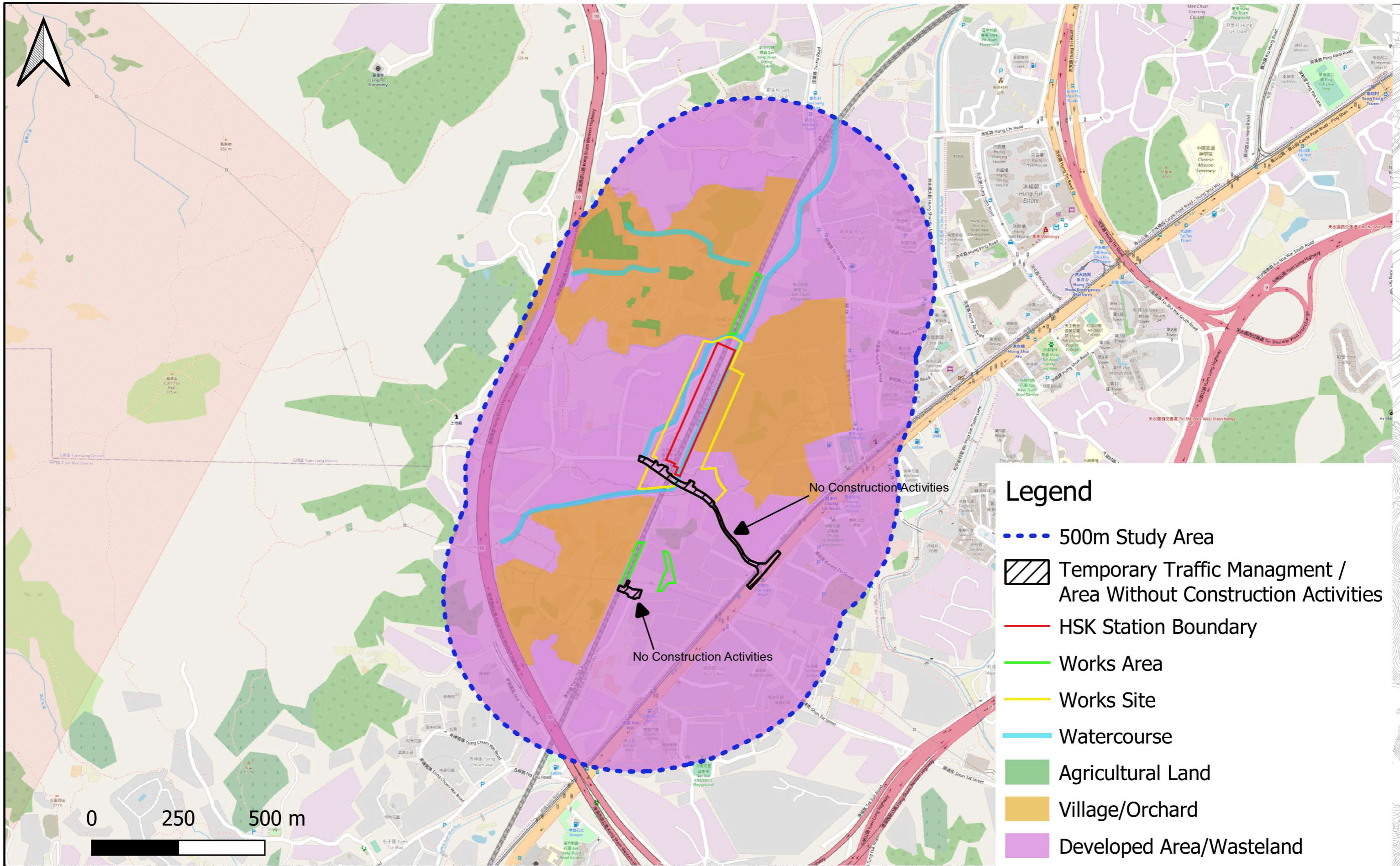
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DRAWN	SC	 HUNG SHUI KIU STATION ORIGINATOR
DESIGNED	P Kau	
CHECKED	F Leong	
APPROVED		
DATE	18/01/22	
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TITLE
C1801 Design Services for Hung Shui Kiu Station
 Ecological Impact Assessment
 Aerial Photo 2022

SCALE (A3) DRAWING NO. Fig. 9.2 REV. A0



Legend

- ⋯ 500m Study Area
- Temporary Traffic Management / Area Without Construction Activities
- HSK Station Boundary
- Works Area
- Works Site
- Watercourse
- Agricultural Land
- Village/Orchard
- Developed Area/Wasteland

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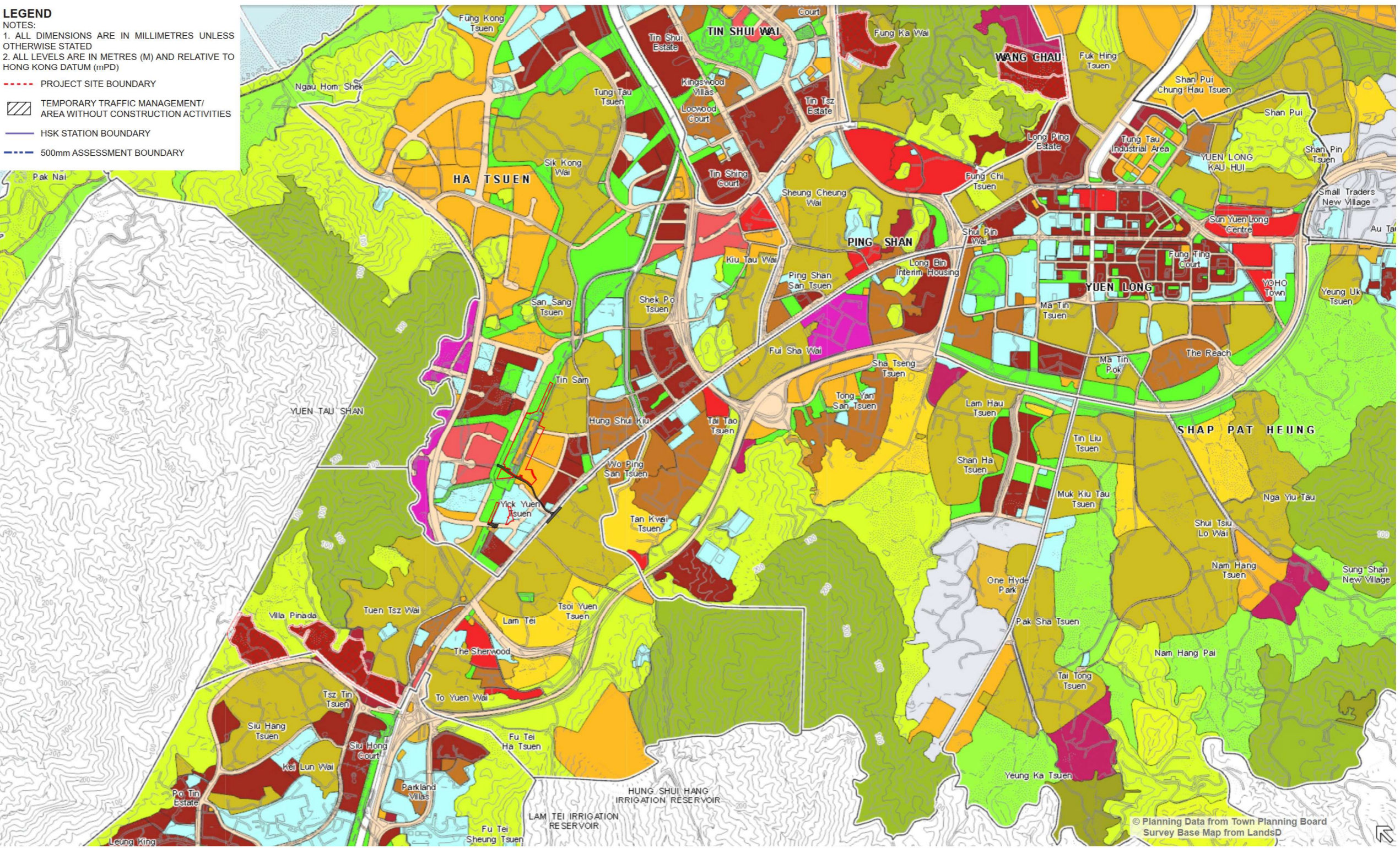
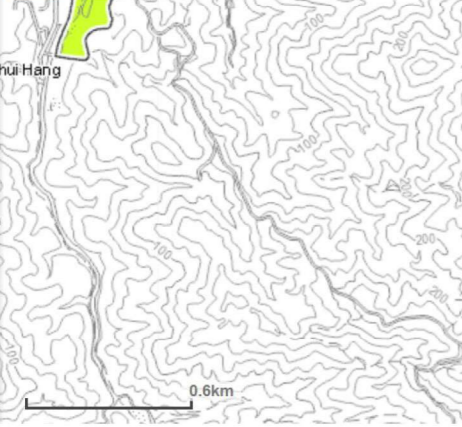
				DRAWN SC		 HUNG SHUI KIU STATION ORIGINATOR 	TITLE C1801 Design Services for Hung Shui Kiu Station Ecological Impact Assessment Habitat Map						
				DESIGNED P Kau									
				CHECKED F Leong									
				DATE 18/01/22									
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				A1 Initial submission		SC 18/01/22 FL							
REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED	MODEL REF.	SCALE (A3)	DRAWING NO. Fig. 9.3	REV. A0

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- Statutory Plan**
- OZP Zoning**
- Amendment Item under S.5/S.7 of the TPO
 - RE Residential (Group E)
 - U Undetermined
 - CP Country Park
 - I Industrial
 - OU Other Specified Uses
 - C Commercial
 - CDA Comprehensive Development Area
 - O Open Space
 - REC Recreation
 - V Village Type Development
 - AGR Agriculture
 - CA Conservation Area
 - G/IC Government, Institution or Community
 - R(C) Residential (Group C)
 - R(D) Residential (Group D)
 - CPA Coastal Protection Area
 - GB Green Belt
 - OS Open Storage
 - R(A) Residential (Group A)
 - R(B) Residential (Group B)

- LEGEND**
- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED
2. ALL LEVELS ARE IN METRES (M) AND RELATIVE TO HONG KONG DATUM (mPD)
- PROJECT SITE BOUNDARY
 - TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
 - HSK STATION BOUNDARY
 - 500mm ASSESSMENT BOUNDARY



© Planning Data from Town Planning Board Survey Base Map from LandsD

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ORIGINATOR

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TITLE		C1801 Design Services for Hung Shui Kiu Station	
		REVIEW OF PLANNING AND DEVELOPMENT CONTROL FRAMEWORK	
SCALE	N.T.S.	DRAWING NO.	Figure 10.1
REV.	A3		

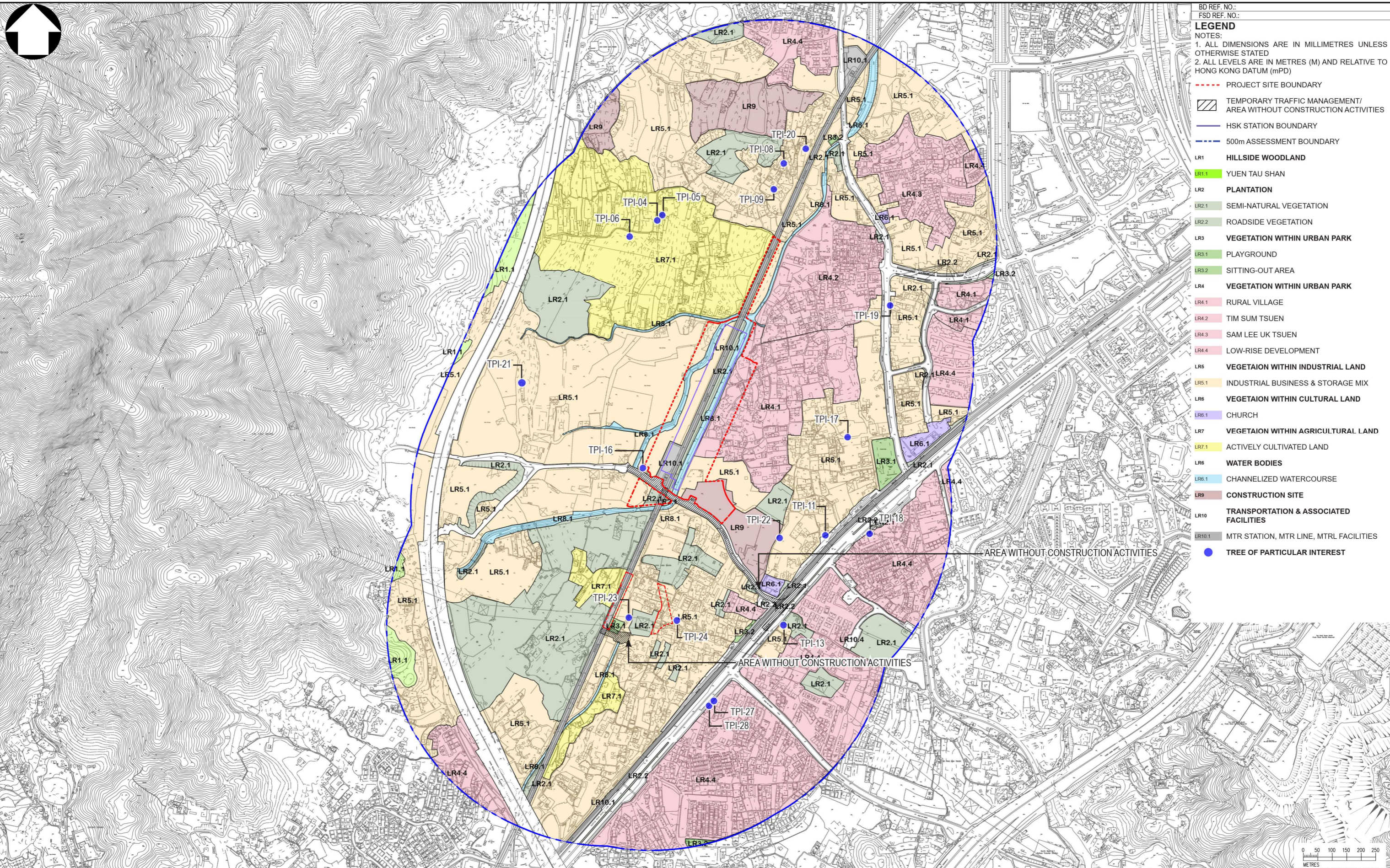
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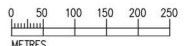
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- LEGEND**
- NOTES:
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- PROJECT SITE BOUNDARY
 - ▨ TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
 - HSK STATION BOUNDARY
 - 500m ASSESSMENT BOUNDARY
 - LR1 HILLSIDE WOODLAND
 - LR1.1 YUEN TAU SHAN
 - LR2 PLANTATION
 - LR2.1 SEMI-NATURAL VEGETATION
 - LR2.2 ROADSIDE VEGETATION
 - LR3 VEGETATION WITHIN URBAN PARK
 - LR3.1 PLAYGROUND
 - LR3.2 SITTING-OUT AREA
 - LR4 VEGETATION WITHIN URBAN PARK
 - LR4.1 RURAL VILLAGE
 - LR4.2 TIM SUM TSUEN
 - LR4.3 SAM LEE UK TSUEN
 - LR4.4 LOW-RISE DEVELOPMENT
 - LR6 VEGETATION WITHIN INDUSTRIAL LAND
 - LR5.1 INDUSTRIAL BUSINESS & STORAGE MIX
 - LR6 VEGETATION WITHIN CULTURAL LAND
 - LR6.1 CHURCH
 - LR7 VEGETATION WITHIN AGRICULTURAL LAND
 - LR7.1 ACTIVELY CULTIVATED LAND
 - LR6 WATER BODIES
 - LR6.1 CHANNELIZED WATERCOURSE
 - LR9 CONSTRUCTION SITE
 - LR10 TRANSPORTATION & ASSOCIATED FACILITIES
 - LR10.1 MTR STATION, MTR LINE, MTRL FACILITIES
 - TREE OF PARTICULAR INTEREST



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ORIGINATOR

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MODEL REF.

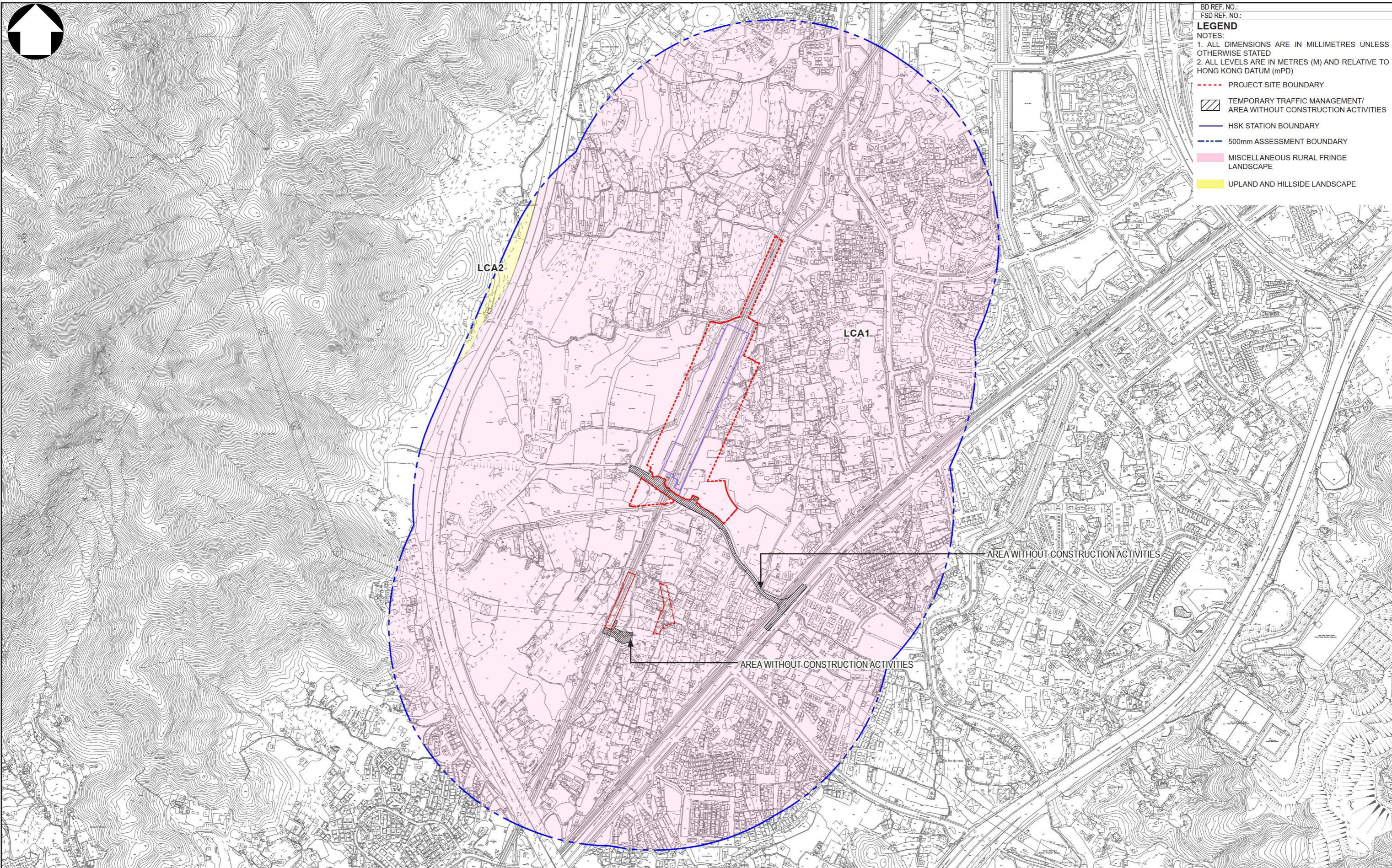
TITLE	C1801 Design Services for Hung Shui Kiu Station LANDSCAPE RESOURCES PLAN
SCALE	1:8000
DRAWING NO.	Figure 10.2
REV.	A3



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- LEGEND**
- NOTES:
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2. ALL LEVELS ARE IN METRES (M) AND RELATIVE TO HONG KONG DATUM (mPD)
- - - - - PROJECT SITE BOUNDARY
 - ▨ TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
 - HSK STATION BOUNDARY
 - - - - - 500mm ASSESSMENT BOUNDARY
 - ▭ MISCELLANEOUS RURAL FRINGE LANDSCAPE
 - ▭ UPLAND AND HILLSIDE LANDSCAPE



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TITLE	C1801 Design Services for Hung Shui Kiu Station LANDSCAPE CHARACTER AREA PLAN
SCALE	1:8000
DRAWING NO.	Figure 10.3
REV.	A3

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LR1 - HILLSIDE WOODLAND

LR1.1 - YUEN TAU SHAN



LR2 - PLANTATION

LR2.1 - SEMI-NATURAL VEGETATION



LR2.2 - ROADSIDE VEGETATION



LR3 - VEGETATION WITHIN URBAN PARK

LR3.1 - PLAYGROUND



LR3.2 - SITTING-OUT AREA



LR4 - VEGETATION WITHIN RURAL VILLAGES

LR4.1 - RURAL VILLAGE



LR4 - VEGETATION WITHIN RURAL VILLAGES

LR4.2 - TIM SUM TSUEN



LR4.3 - SAM LEE UK TSUEN



LR4.4 - LOW-RISE DEVELOPMENT



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TITLE
C1801 Design Services for Hung Shui Kiu Station
PHOTO OF LANDSCAPE RESOURCES
(SHEET 1)
 SCALE N.T.S. DRAWING NO. Figure 10.4 REV. A3

LCA1 - MISCELLANEOUS RURAL FRINGE LANDSCAPE

BD REF. NO.:
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LCA2 - UPLAND AND HILLSIDE LANDSCAPE



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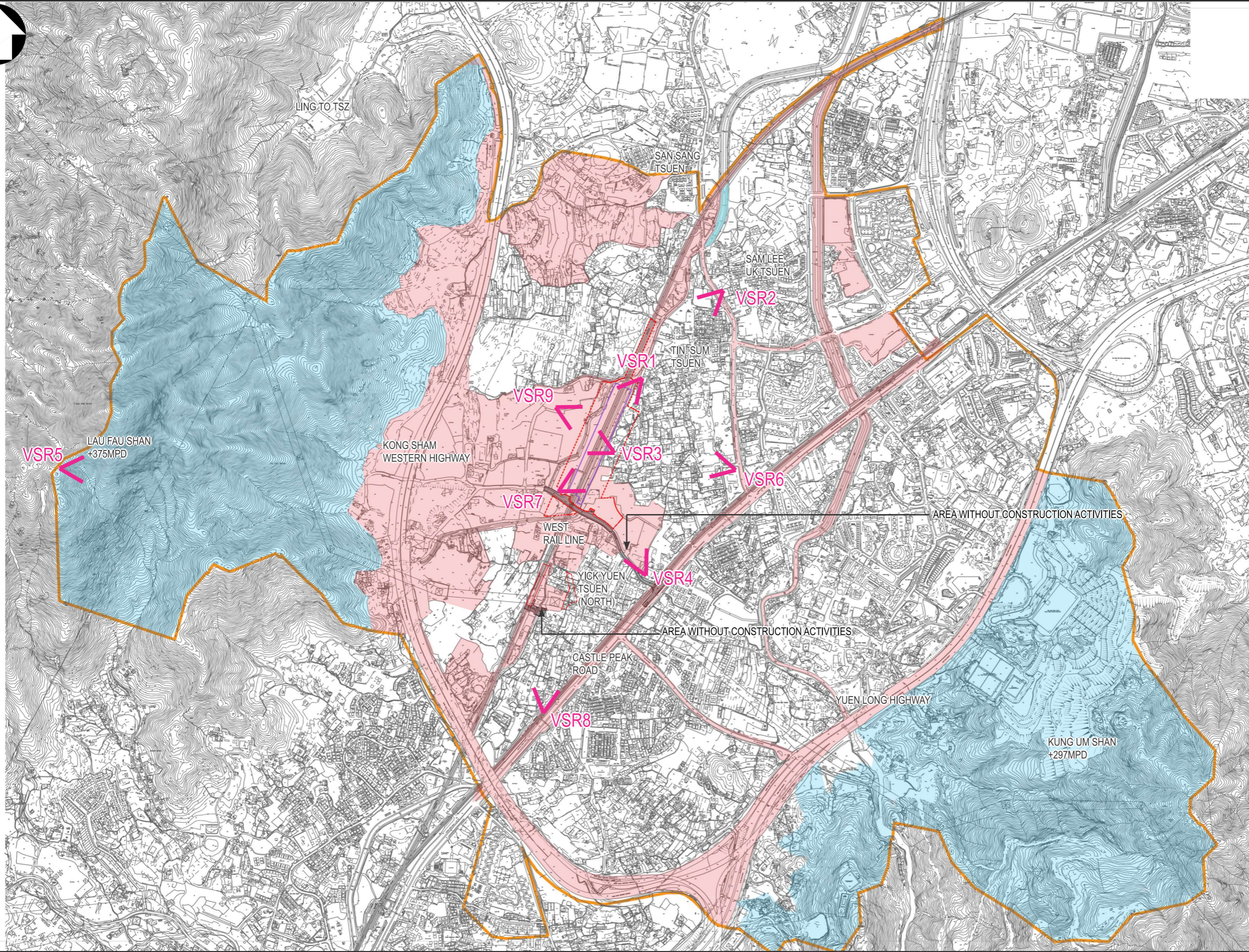
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										HUNG SHUI KIU STATION				
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										MODEL REF.				
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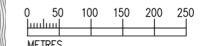
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- LEGEND**
- NOTES:
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- PROJECT SITE BOUNDARY
 - HSK STATION BOUNDARY
 - ▨ TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
 - VISUAL ENVELOPE
 - KEY VISUAL RESOURCES/ ATTRACTORS
 - KEY VISUAL EYESORES/ DETRACTORS
 - ◁ VSR1 RESIDENTS IN TIN SAM TSUEN (RETAINED VILLAGE UNDER HSK/HT NDA)
 - ◁ VSR2 RESIDENTS IN SAN LEE UK TSUEN (RETAINED VILLAGE UNDER HSK/HT NDA)
 - ◁ VSR3 POTENTIAL RESIDENTS IN RESIDENTIAL SITE (AREA 28B) UNDER HSK/HT NDA
 - ◁ VSR4 RESIDENTS IN YICK YUEN TSUEN (NORTH)
 - ◁ VSR5 RECREATIONAL USERS ALONG CASTLE PEAK TRAILS
 - ◁ VSR6 RECREATIONAL USERS IN TIN HA ROAD PLAYGROUND / SOCCER PITCH
 - ◁ VSR7 POTENTIAL RECREATIONAL USERS OF REGIONAL PLAZA UNDER HSK/HT NDA
 - ◁ VSR8 TRAVELLERS ON FOOTBRIDGE AT CASTLE PEAK ROAD - NAI WAI LIGHT RAIL STATION
 - ◁ VSR9 POTENTIAL OCCUPANTS OF COMMERCIAL CORE (AREA 32) UNDER HSK/HT NDA



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TITLE **C1801 Design Services for Hung Shui Kiu Station VISUALLY SENSITIVE RECEIVER PLAN**

SCALE 1:12000

DRAWING NO. Figure 10.7

REV. A3

REMARKS:

1. THE DRAWING DOES NOT INDICATE PRECISE NUMBER AND LOCATIONS OF RETAINED TREES AND COMPENSATORY TREES.
2. THE PRECISE NUMBER OF TREES TO BE RETAINED, TRANSPLANTED, REMOVED AND COMPENSATED SHALL BE DETERMINED AND AGREED SEPARATELY WITH RELEVANT GOVERNMENT DEPARTMENTS DURING SUBSEQUENT THE TREE PRESERVATION AND REMOVAL PROPOSAL (TPRP) SUBMISSION UNDER DEVB TC(W) NO. 4/2020 AND (LAO) PN NO. 2/2020.
3. LANDSCAPING FEATURES AND FORMS OF STRUCTURES SHOWN IN THE DRAWING ARE INDICATIVE ONLY

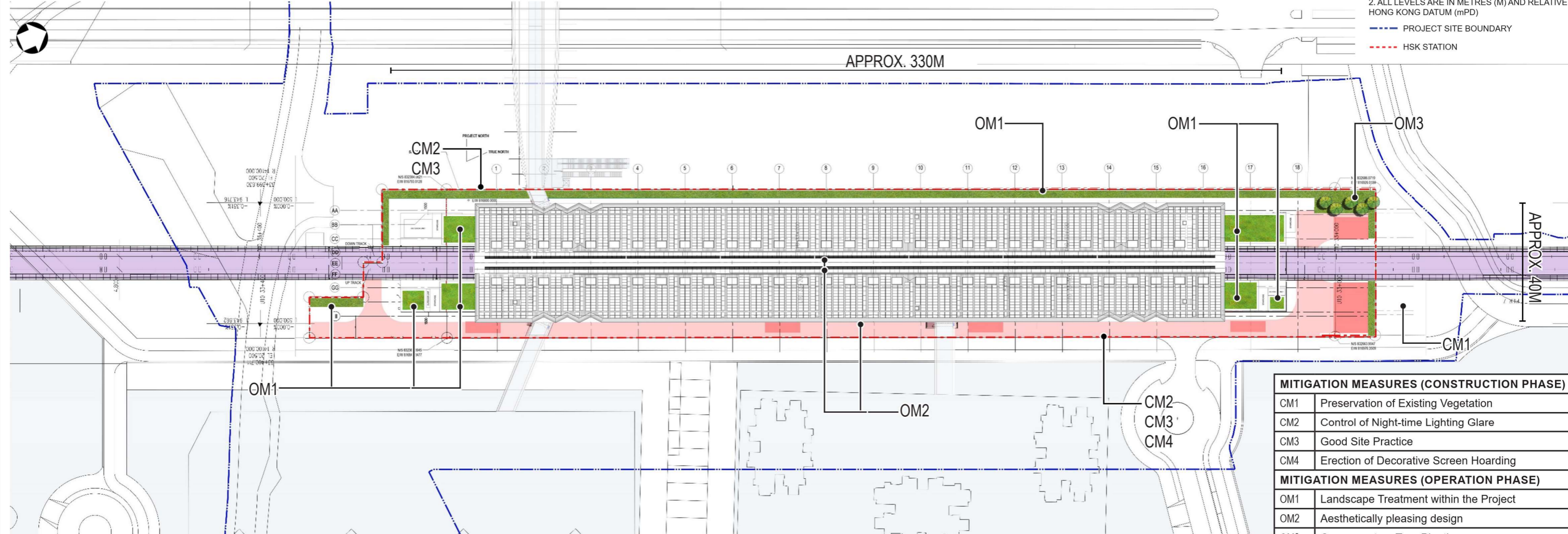
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FSD REF. NO.:

- LEGEND**
NOTES:
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2. ALL LEVELS ARE IN METRES (M) AND RELATIVE TO HONG KONG DATUM (mPD)

- PROJECT SITE BOUNDARY
- HSK STATION

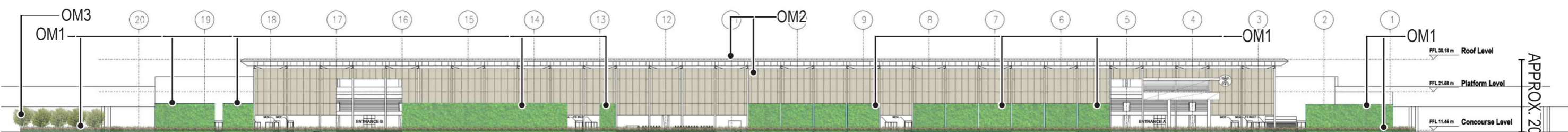
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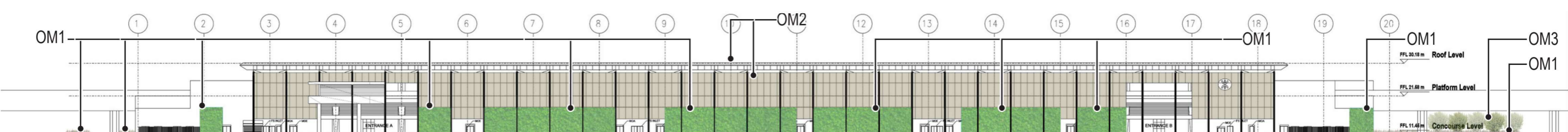


① LANDSCAPE MITIGATION PLAN
SCALE N.T.S.

MITIGATION MEASURES (CONSTRUCTION PHASE)	
CM1	Preservation of Existing Vegetation
CM2	Control of Night-time Lighting Glare
CM3	Good Site Practice
CM4	Erection of Decorative Screen Hoarding
MITIGATION MEASURES (OPERATION PHASE)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting



② WEST ELEVATION
SCALE N.T.S.



③ EAST ELEVATION
SCALE N.T.S.

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TITLE C1801 Design Services for Hung Shui Kiu Station LANDSCAPE MITIGATION PLAN	SCALE N.T.S.	DRAWING NO. Figure 10.8	REV. A3
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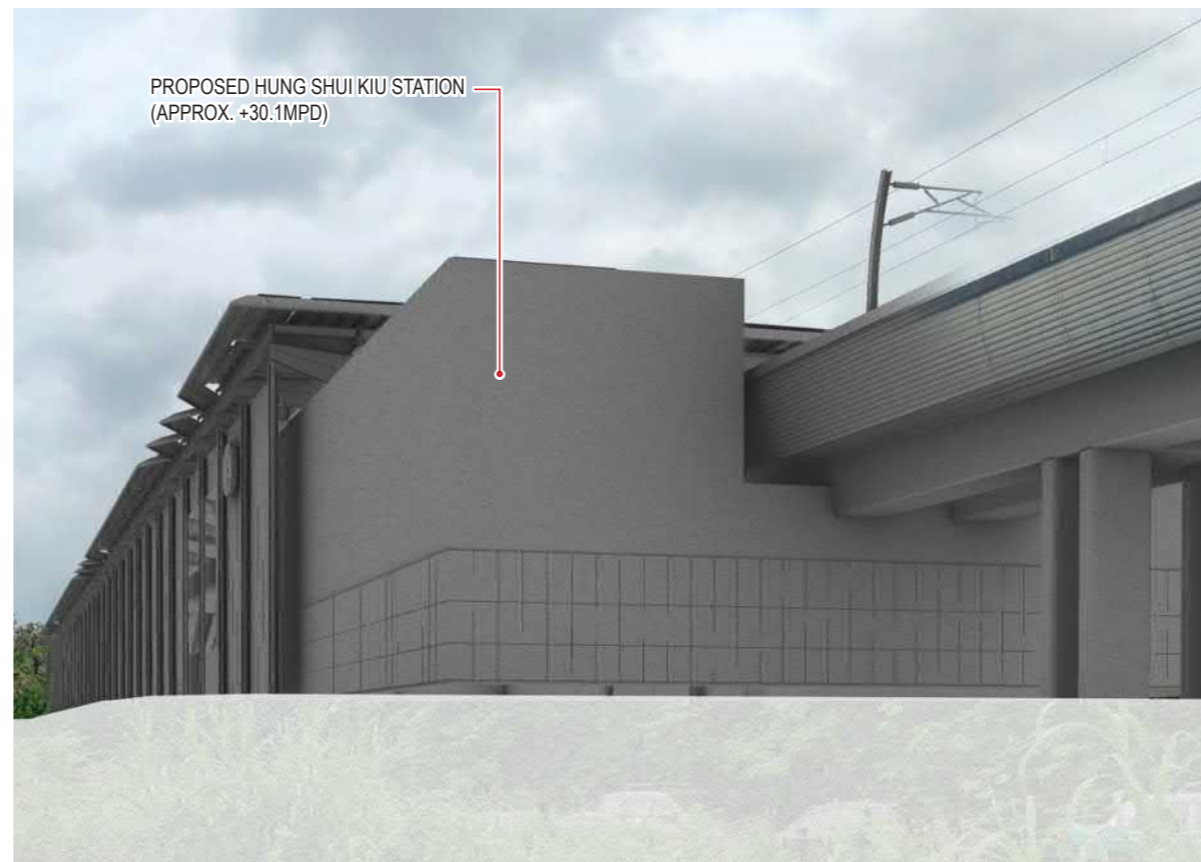
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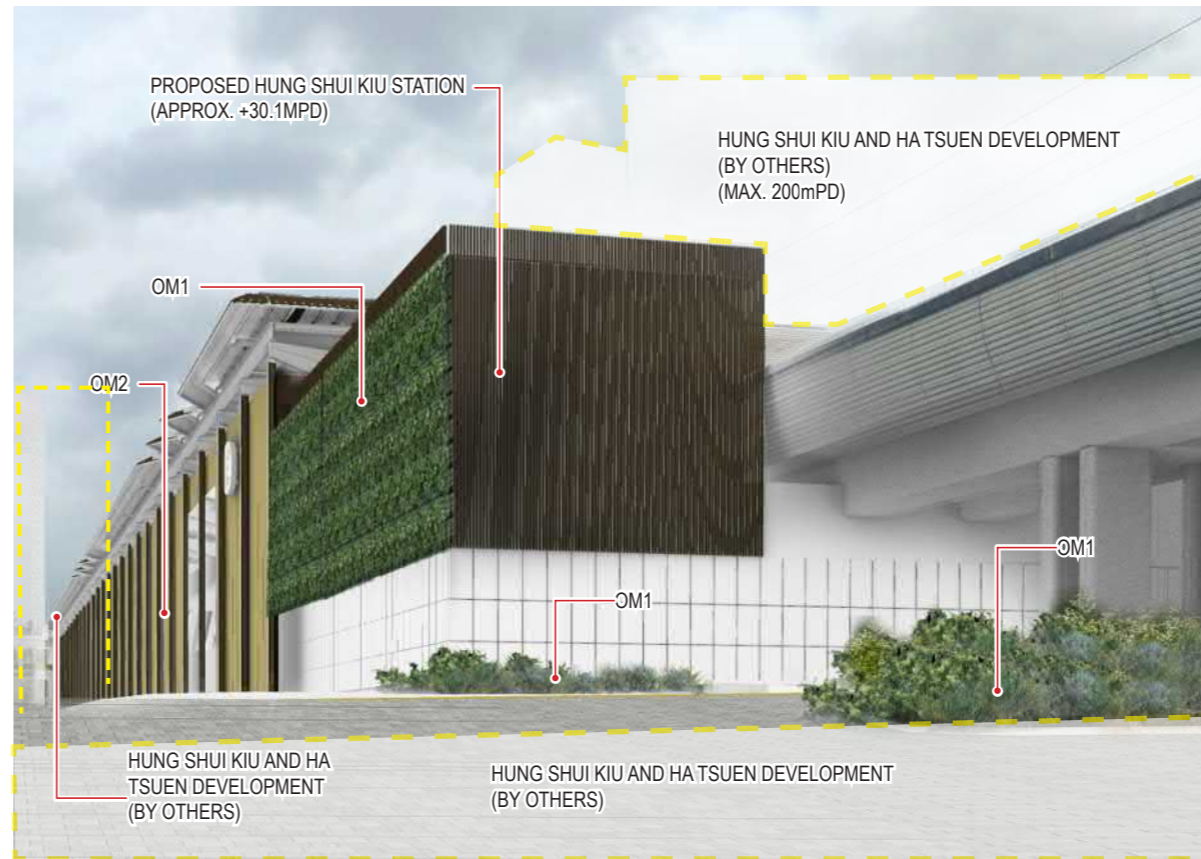
VSR1 - RESIDENTS IN TIN SAM TSUEN - EXISTING SITE CONDITION



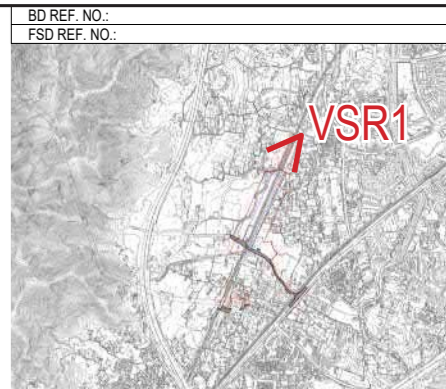
VSR1 - RESIDENTS IN TIN SAM TSUEN - WITHOUT MITIGATION MEASURES



VSR1 - RESIDENTS IN TIN SAM TSUEN - DAY 1 WITH MITIGATION MEASURES



VSR1 - RESIDENTS IN TIN SAM TSUEN - YEAR 10 WITH MITIGATION MEASURES



BD REF. NO.:
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NOTES:
Sample photomontages have been generated to provide a preliminary idea on the scale, massing and extent of the proposed development, as well as the effect of the proposed mitigation measures. These images will be subject to change and are for illustrative purposes only.

The architectural design, finishes or any other related detailed design components are subject to refinement and changes at the detailed design stage.

Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

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TITLE	C1801 Design Services for Hung Shui Kiu Station
	PHOTOMONTAGE - VSR1 - RESIDENTS IN TIN SAM TSUEN (RETAINED VILLAGE UNDER HSK/HT NDA)
SCALE	N.T.S
DRAWING NO.	Figure 10.9
REV.	A3

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VSR2 - POTENTIAL RESIDENTS IN SAN LEE UK TSUEN (RETAINED VILLAGE UNDER HSK/HT NDA) -EXISTING SITE CONDITION



VSR2 - POTENTIAL RESIDENTS IN SAN LEE UK TSUEN (RETAINED VILLAGE UNDER HSK/HT NDA) -WITHOUT MITIGATION MEASURES

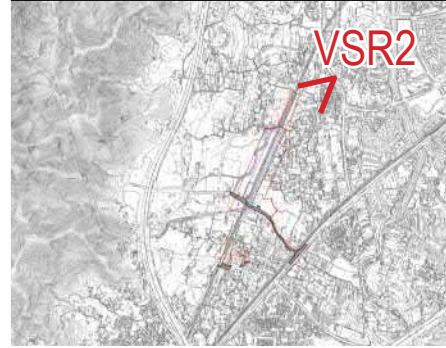


VSR2 - POTENTIAL RESIDENTS IN SAN LEE UK TSUEN (RETAINED VILLAGE UNDER HSK/HT NDA) -DAY 1 WITH MITIGATION MEASURES



VSR2 - POTENTIAL RESIDENTS IN SAN LEE UK TSUEN (RETAINED VILLAGE UNDER HSK/HT NDA) -YEAR 10 WITH MITIGATION MEASURES

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Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

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MODEL REF.

TITLE	C1801 Design Services for Hung Shui Kiu Station PHOTOMONTAGE - VSR2 - POTENTIAL RESIDENTS IN SAN LEE UK TSUEN (RETAINED VILLAGE UNDER HSK/ HT NDA)
SCALE N.T.S	
DRAWING NO.	Figure 10.10
REV.	A3

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VSR3 - POTENTIAL RESIDENTS IN RESIDENTIAL SITES (AREAS 28B) UNDER HSK/HT NDA (+45MPD) - EXISTING SITE CONDITION



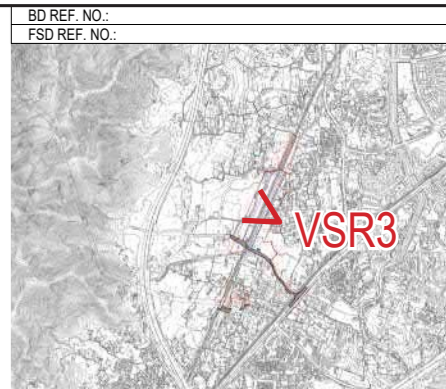
VSR3 - POTENTIAL RESIDENTS IN RESIDENTIAL SITES (AREAS 28B) UNDER HSK/HT NDA (+45MPD) - WITHOUT MITIGATION MEASURES



VSR3 - POTENTIAL RESIDENTS IN RESIDENTIAL SITES (AREAS 28B) UNDER HSK/HT NDA (+45MPD) - DAY 1 WITH MITIGATION MEASURES



VSR3 - POTENTIAL RESIDENTS IN RESIDENTIAL SITES (AREAS 28B) UNDER HSK/HT NDA (+45MPD) - YEAR 10 WITH MITIGATION MEASURES



NOTES:
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Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

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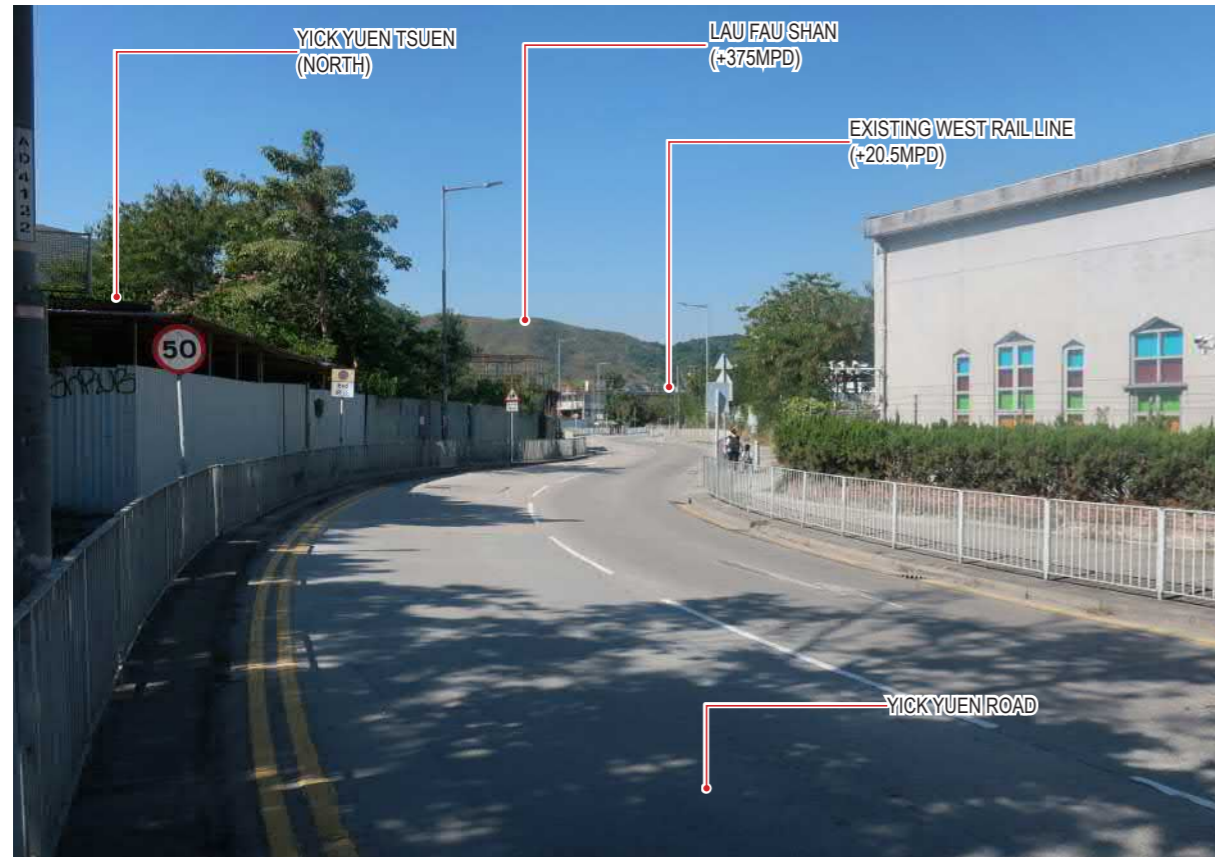
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TITLE	C1801 Design Services for Hung Shui Kiu Station PHOTOMONTAGE - VSR3 - POTENTIAL RESIDENTS IN RESIDENTIAL SITES (AREAS 28B) UNDER HSK/HT NDA	
SCALE	N.T.S	
DRAWING NO.	Figure 10.11	
REV.	A3	

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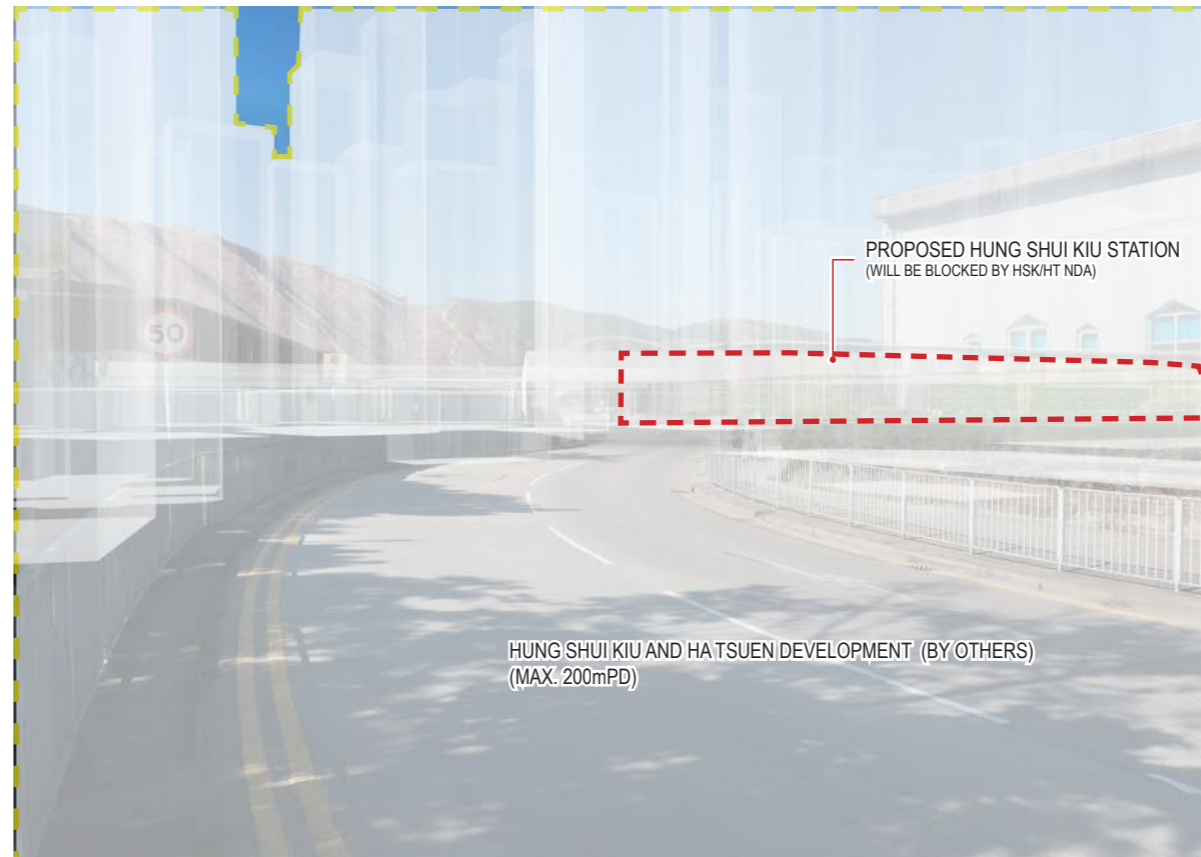
VSR4 - RESIDENTS IN YICK YUEN TSUEN (NORTH) - EXISTING SITE CONDITION



VSR4 - RESIDENTS IN YICK YUEN TSUEN (NORTH) - WITHOUT MITIGATION MEASURES



VSR4 - RESIDENTS IN YICK YUEN TSUEN (NORTH) - DAY 1 WITH MITIGATION MEASURES



VSR4 - RESIDENTS IN YICK YUEN TSUEN (NORTH) - YEAR 10 WITH MITIGATION MEASURES

BD REF. NO.:
FSD REF. NO.:



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Sample photomontages have been generated to provide a preliminary idea on the scale, massing and extent of the proposed development, as well as the effect of the proposed mitigation measures. These images will be subject to change and are for illustrative purposes only.

The architectural design, finishes or any other related detailed design components are subject to refinement and changes at the detailed design stage.

Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	
DESIGNED	
CHECKED	
APPROVED	
DATE	

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HUNG SHUI KIU STATION

ORIGINATOR

aurecon wsp

MODEL REF.

TITLE	C1801 Design Services for Hung Shui Kiu Station PHOTOMONTAGE - VSR4 RESIDENTS IN YICK YUEN TSUEN (NORTH)
SCALE	N.T.S
DRAWING NO.	Figure 10.12
REV.	A3

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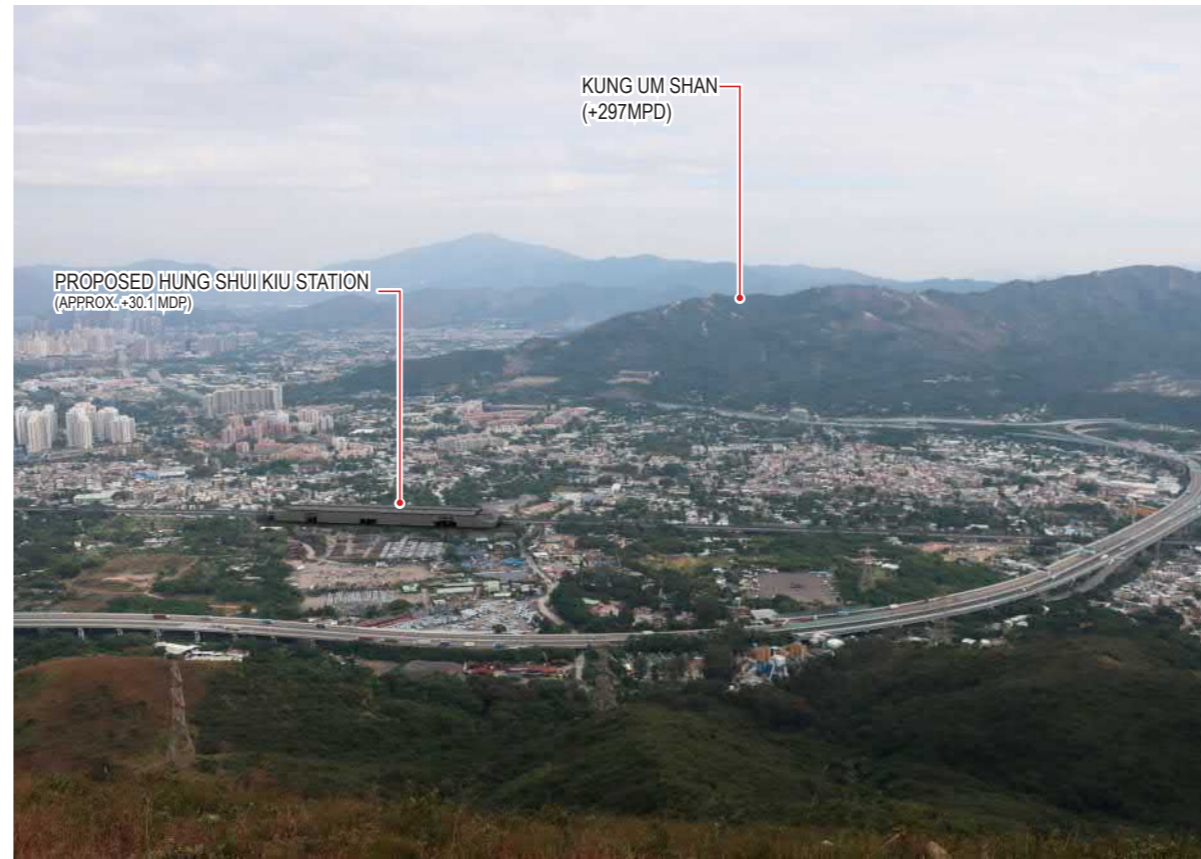
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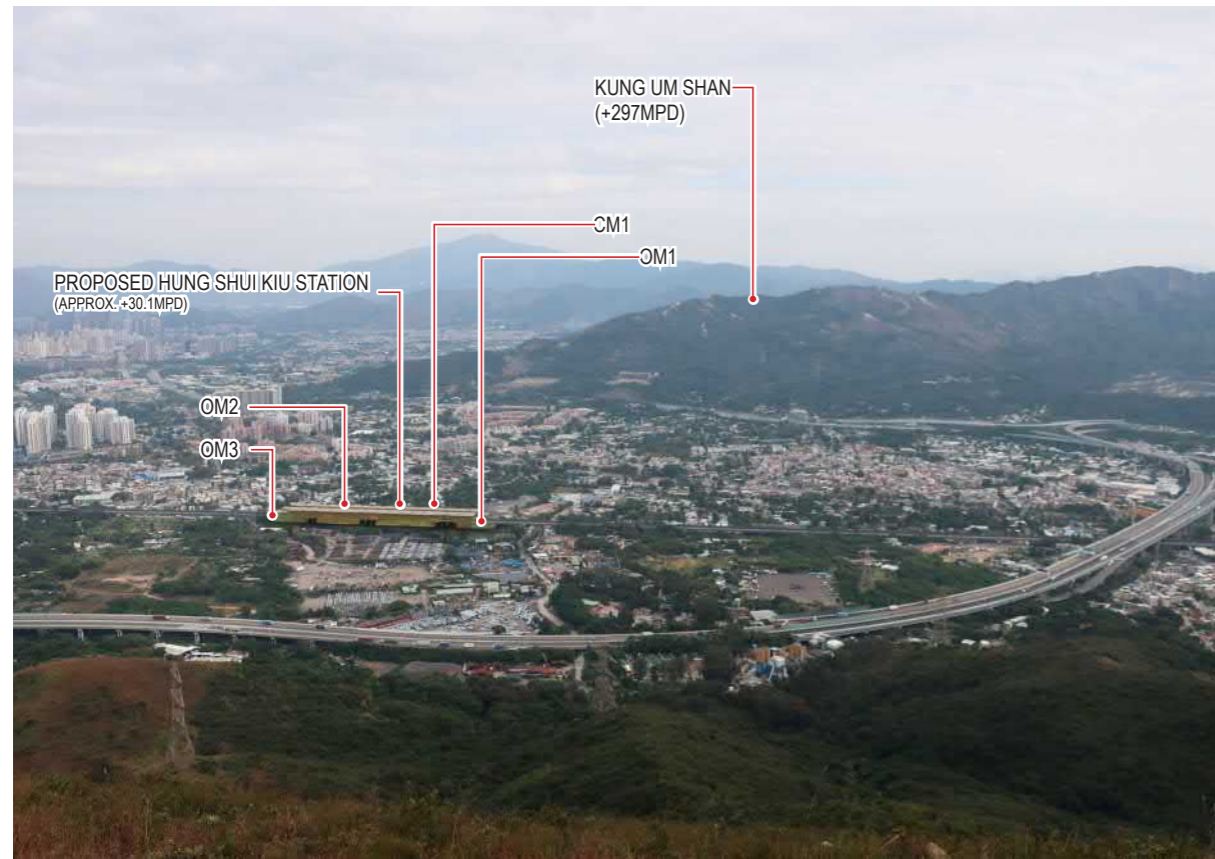
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FILENAME:



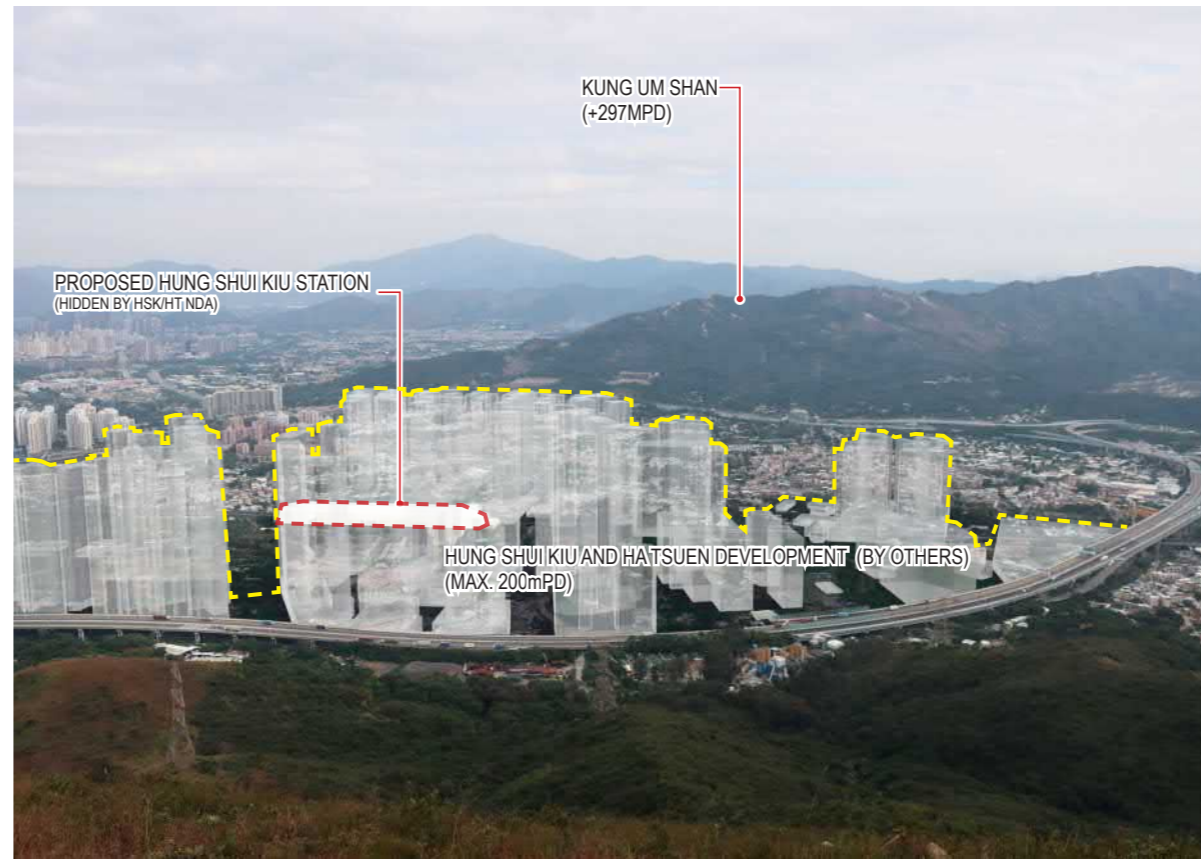
VSR5 - RECREATIONAL USERS ALONG CASTLE PEAK TRAILS - EXISTING SITE CONDITIO



VSR5 - RECREATIONAL USERS ALONG CASTLE PEAK TRAILS - WITHOUT MITIGATION MEASURES



VSR5 - RECREATIONAL USERS ALONG CASTLE PEAK TRAILS - DAY 1 WITH MITIGATION MEASURES



VSR5 - RECREATIONAL USERS ALONG CASTLE PEAK TRAILS - YEAR 10 WITH MITIGATION MEASURE

BD REF. NO.:
FSD REF. NO.:



NOTES:
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The architectural design, finishes or any other related detailed design components are subject to refinement and changes at the detailed design stage.

Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

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APPROVED	
DATE	

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MODEL REF.

TITLE	C1801 Design Services for Hung Shui Kiu Station PHOTOMONTAGE - VSR5 RECREATIONAL USERS ALONG CASTLE PEAK TRAILS
SCALE	N.T.S
DRAWING NO.	Figure 10.13
REV.	A3

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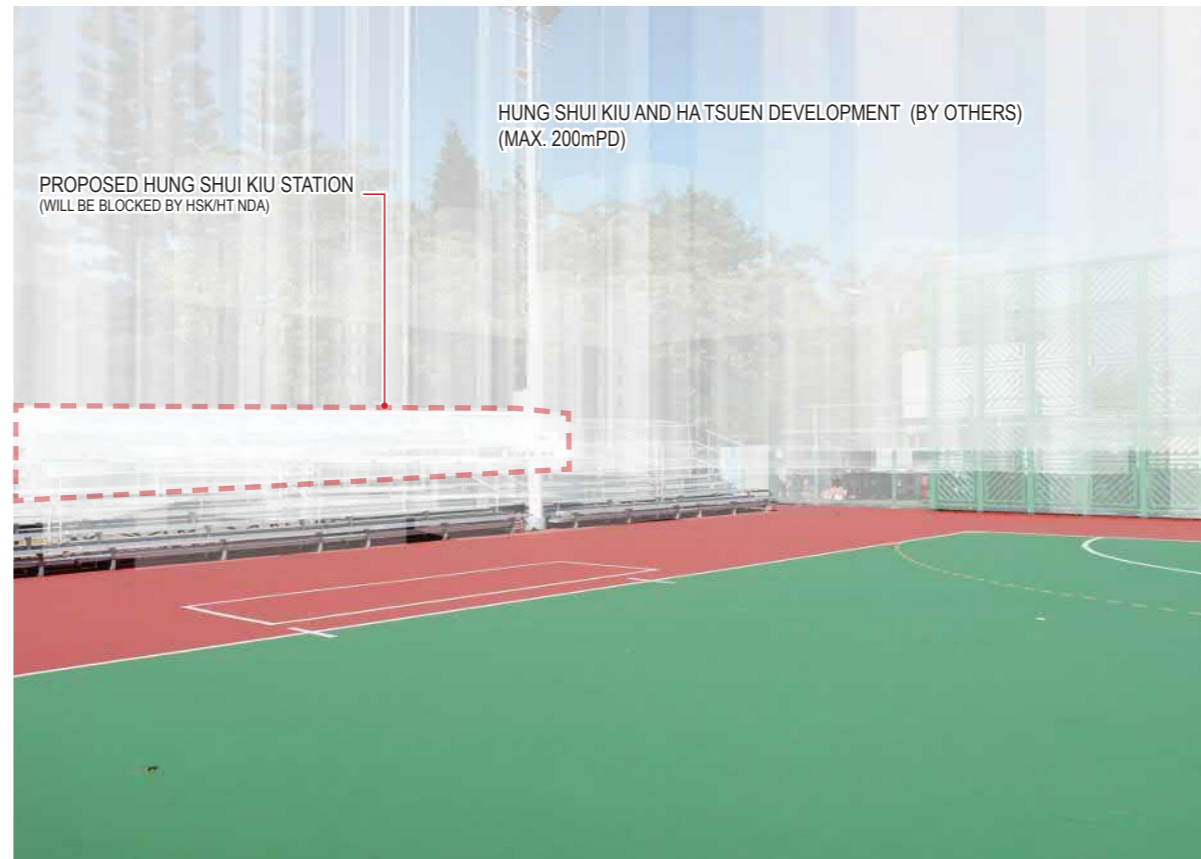
VSR6 - RECREATIONAL USERS IN TIN HA ROAD PLAYGROUND / SOCCER PITCH - EXISTING SITE CONDITION



VSR6 - RECREATIONAL USERS IN TIN HA ROAD PLAYGROUND / SOCCER PITCH - WITHOUT MITIGATION MEASURES



VSR6 - RECREATIONAL USERS IN TIN HA ROAD PLAYGROUND / SOCCER PITCH - DAY 1 WITH MITIGATION MEASURES



VSR6 - RECREATIONAL USERS IN TIN HA ROAD PLAYGROUND / SOCCER PITCH - YEAR 10 WITH MITIGATION MEASURES

BD REF. NO.:
FSD REF. NO.:



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Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	
DESIGNED	
CHECKED	
APPROVED	
DATE	

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 MODEL REF.

TITLE	
C1801 Design Services for Hung Shui Kiu Station PHOTOMONTAGE - VSR6 RECREATIONAL USERS IN TIN HA ROAD PLAYGROUND / SOCCER PITCH	
SCALE N.T.S	DRAWING NO. Figure 10.14
	REV. A3

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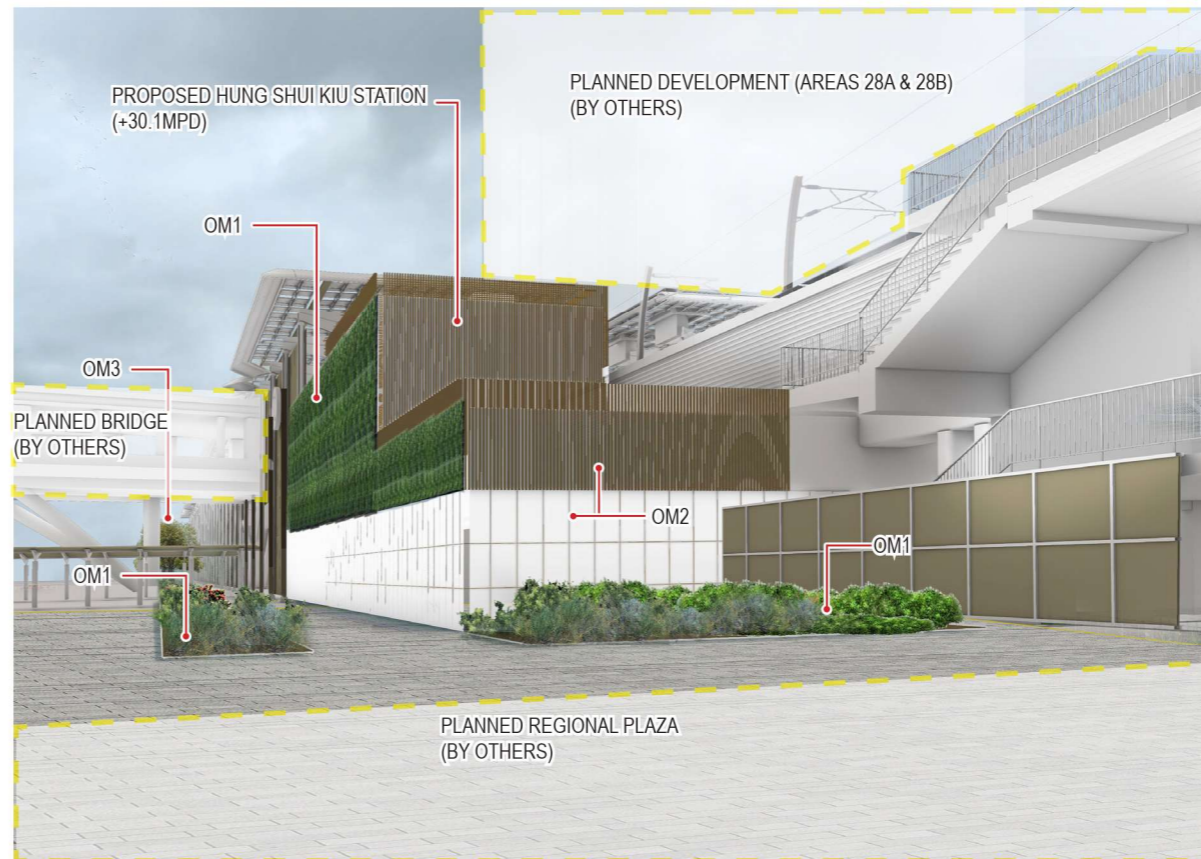
VSR7 - POTENTIAL RECREATIONAL USERS OF REGIONAL PLAZA UNDER HSK/HT NDA - EXISTING SITE CONDITION



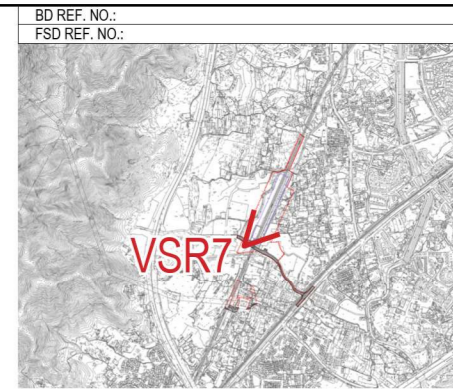
VSR7 - POTENTIAL RECREATIONAL USERS OF REGIONAL PLAZA UNDER HSK/HT NDA - WITHOUT MITIGATION MEASURES



VSR7 - POTENTIAL RECREATIONAL USERS OF REGIONAL PLAZA UNDER HSK/HT NDA - DAY 1 WITH MITIGATION MEASURES



VSR7 - POTENTIAL RECREATIONAL USERS OF REGIONAL PLAZA UNDER HSK/HT NDA - YEAR 10 WITH MITIGATION MEASURES



BD REF. NO.:
FSD REF. NO.:

NOTES:
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Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

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TITLE	C1801 Design Services for Hung Shui Kiu Station PHOTOMONTAGE - VSR7 POTENTIAL RECREATIONAL USERS OF REGIONAL PLAZA UNDER HSK/HT NDA		
SCALE N.T.S.	DRAWING NO.	Figure 10.15	REV. A3

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FILENAME:



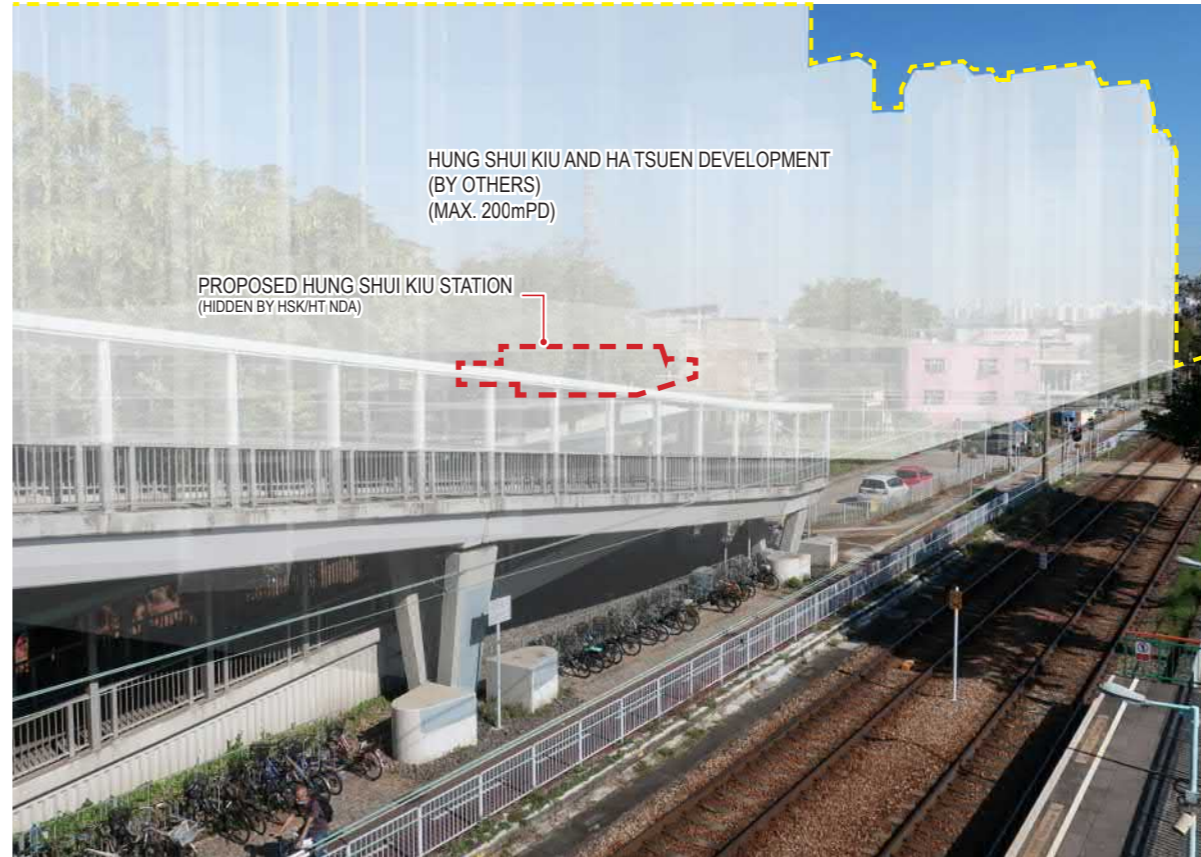
VSR8 - TRAVELLERS ON FOOTBRIDGE AT CASTLE PEAK ROAD – NAI WAI LIGHT RAIL STATION - EXISTING SITE CONDITION



VSR8 - TRAVELLERS ON FOOTBRIDGE AT CASTLE PEAK ROAD – NAI WAI LIGHT RAIL STATION – WITHOUT MITIGATION MEASURES

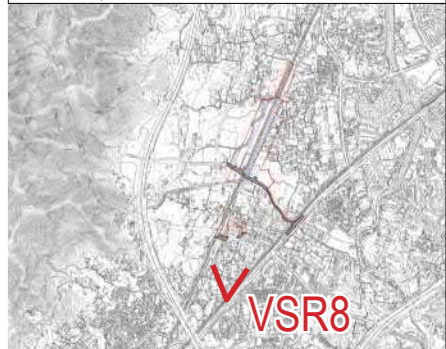


VSR8 - TRAVELLERS ON FOOTBRIDGE AT CASTLE PEAK ROAD – NAI WAI LIGHT RAIL STATION – DAY 1 WITH MITIGATION MEASURES



VSR8 - TRAVELLERS ON FOOTBRIDGE AT CASTLE PEAK ROAD – NAI WAI LIGHT RAIL STATION – YEAR 10 WITH MITIGATION MEASURES

BD REF. NO.:
FSD REF. NO.:



NOTES:
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Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

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TITLE	C1801 Design Services for Hung Shui Kiu Station PHOTOMONTAGE - VSR8 TRAVELLERS ON FOOTBRIDGE AT CASTLE PEAK ROAD – NAI WAI LIGHT RAIL STATION		
SCALE N.T.S.	DRAWING NO.	Figure 10.16	REV. A3

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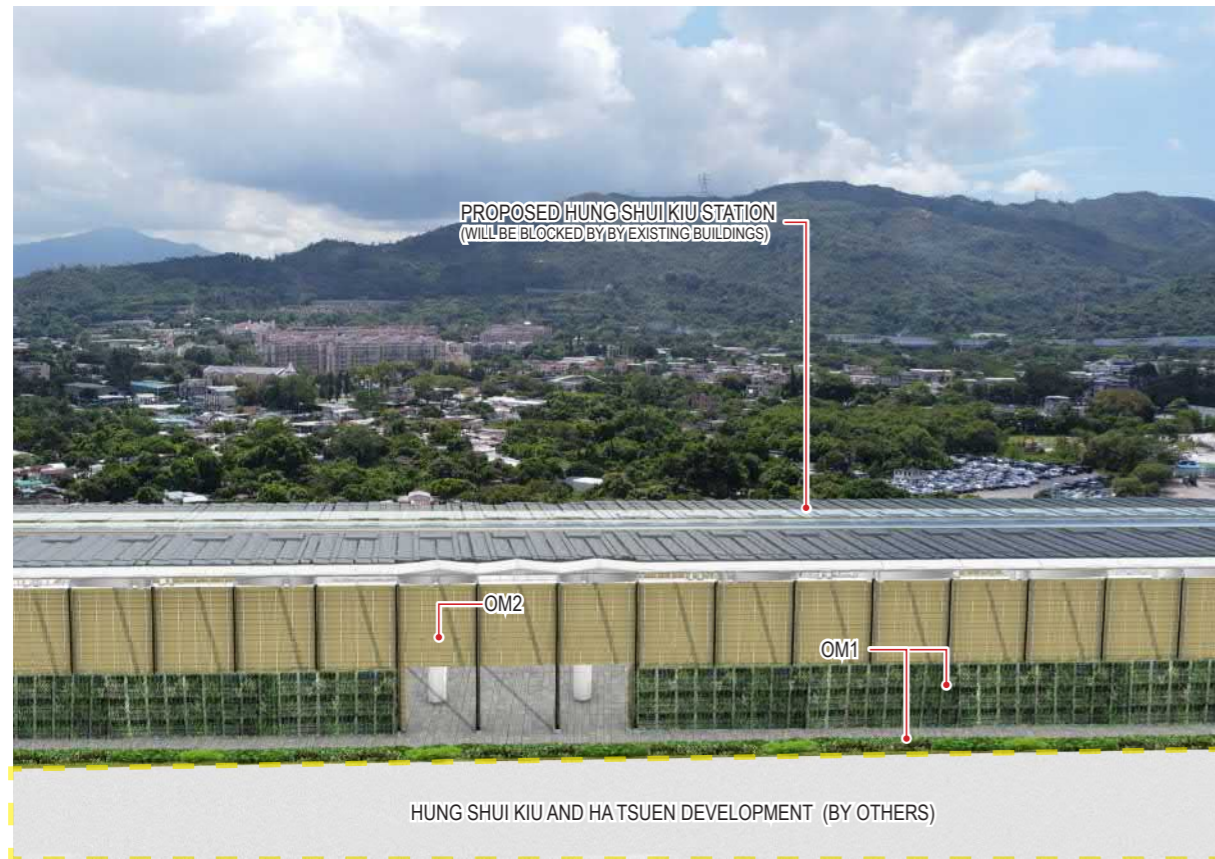
MODELNAME:
FILENAME:



VSR9 - POTENTIAL OCCUPANTS OF COMMERICAL CORE (AREA 32) UNDER HSK/HT NDA (+45MPD) – EXISTING SITE CONDITION



VSR9 - POTENTIAL OCCUPANTS OF COMMERICAL CORE (AREA 32) UNDER HSK/HT NDA (+45MPD) – WITHOUT MITIGATION MEASURES



VSR9 - POTENTIAL OCCUPANTS OF COMMERICAL CORE (AREA 32) UNDER HSK/HT NDA (+45MPD) – DAY 1 WITH MITIGATION MEASURES



VSR9 - POTENTIAL OCCUPANTS OF COMMERICAL CORE (AREA 32) UNDER HSK/HT NDA (+45MPD) – YEAR 10 WITH MITIGATION MEASURES

BD REF. NO.:
FSD REF. NO.:



NOTES:
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Mitigation Measures (Operational Phase)	
OM1	Landscape Treatment within the Project
OM2	Aesthetically pleasing design
OM3	Compensatory Tree Planting

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

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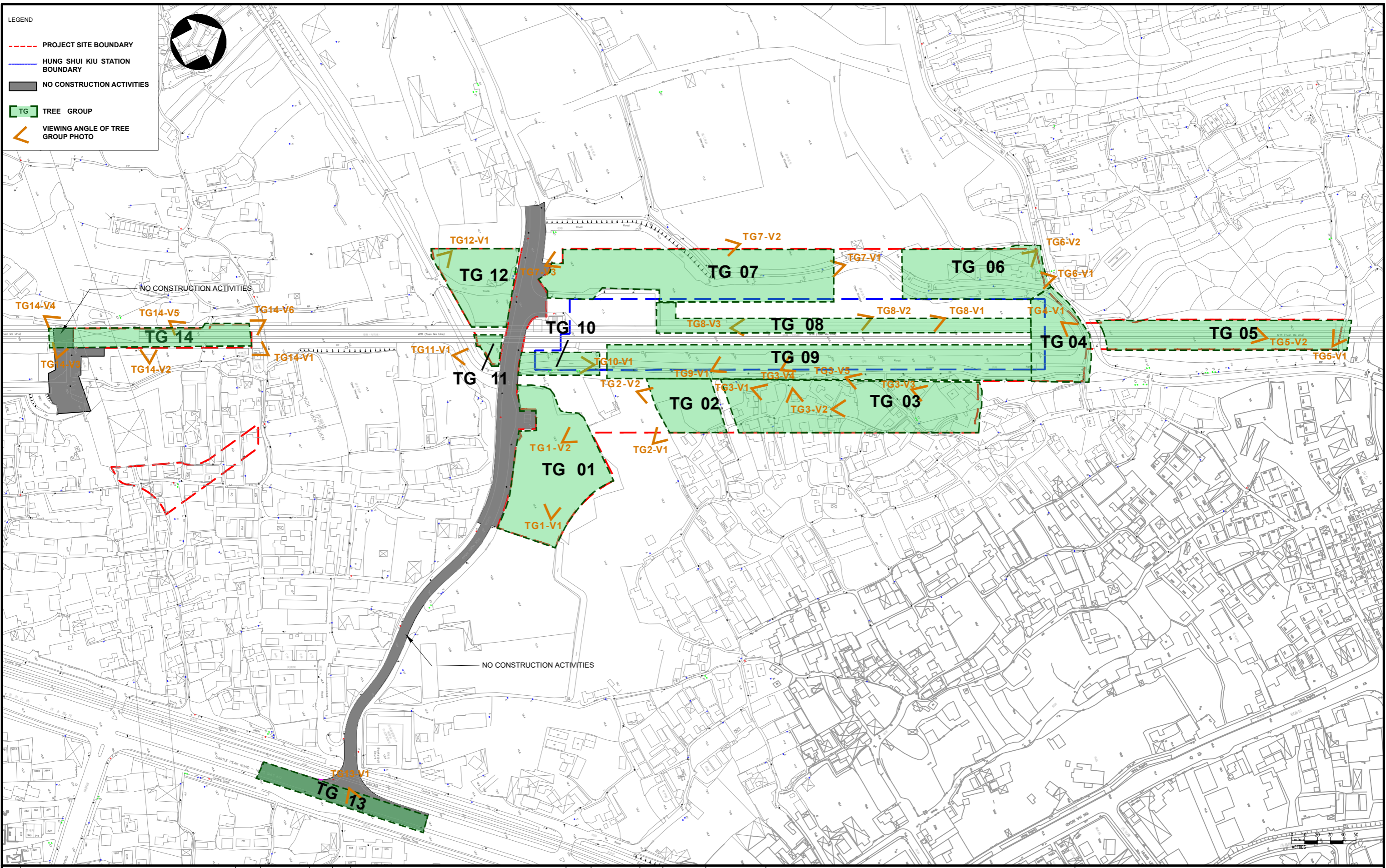
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TITLE	C1801 Design Services for Hung Shui Kiu Station PHOTOMONTAGE - VSR9 POTENTIAL OCCUPANTS OF COMMERICAL CORE (AREA 32) UNDER HSK/HT NDA
SCALE	N.T.S
DRAWING NO.	Figure 10.17
REV.	A3

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LEGEND

- PROJECT SITE BOUNDARY
- HUNG SHUI KIU STATION BOUNDARY
- NO CONSTRUCTION ACTIVITIES
- TREE GROUP
- < VIEWING ANGLE OF TREE GROUP PHOTO



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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	-
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APPROVED	-
DATE	OCT 22

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HUNG SHUI KIU STATION

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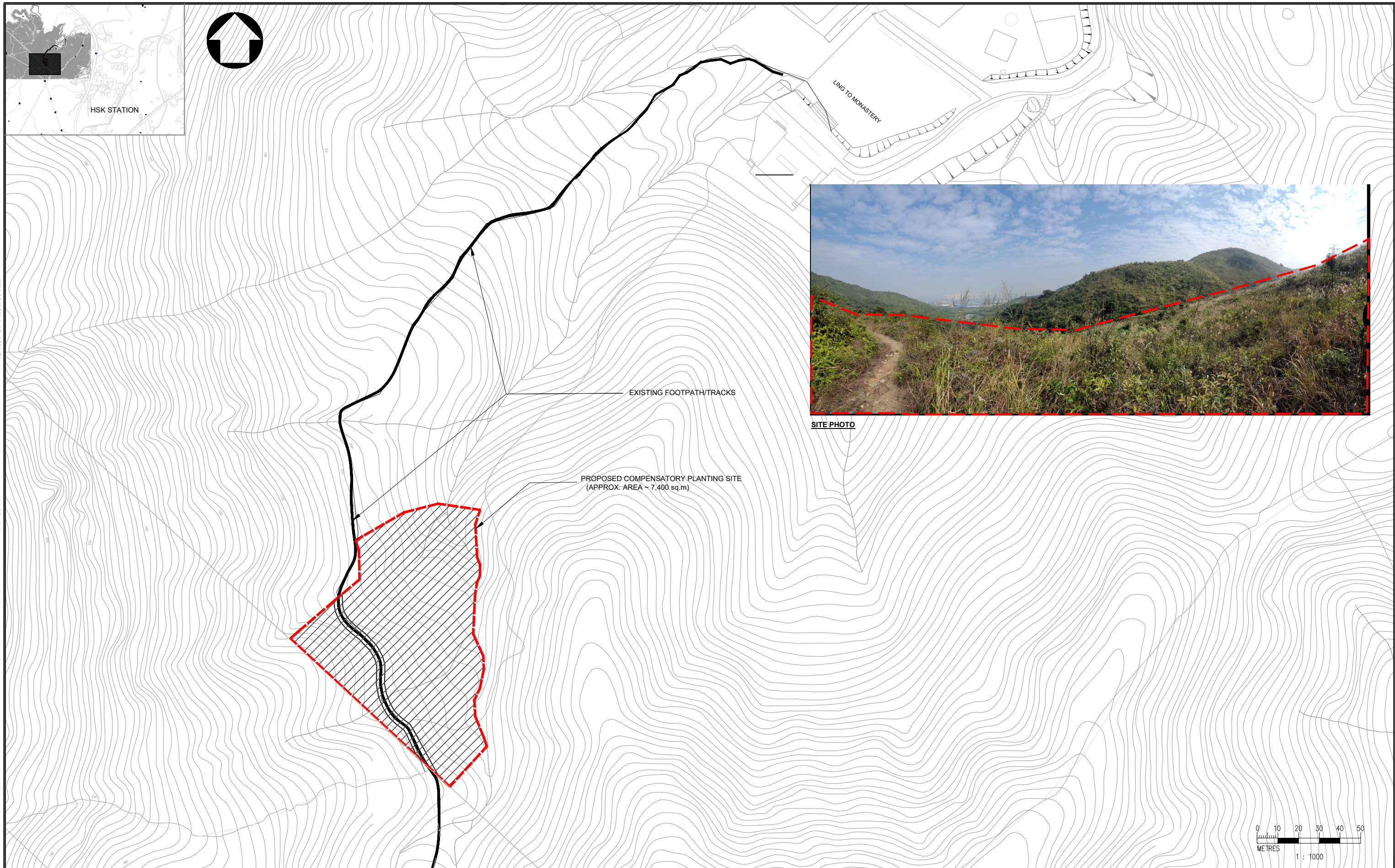
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C1801 DESIGN SERVICES FOR HUNG SHUI KIU STATION	
GENERAL LAYOUT PLAN FOR BROAD BRUSH TREE SURVEY	
SCALE	DRAWING NO. Figure 10.18
REV.	0

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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
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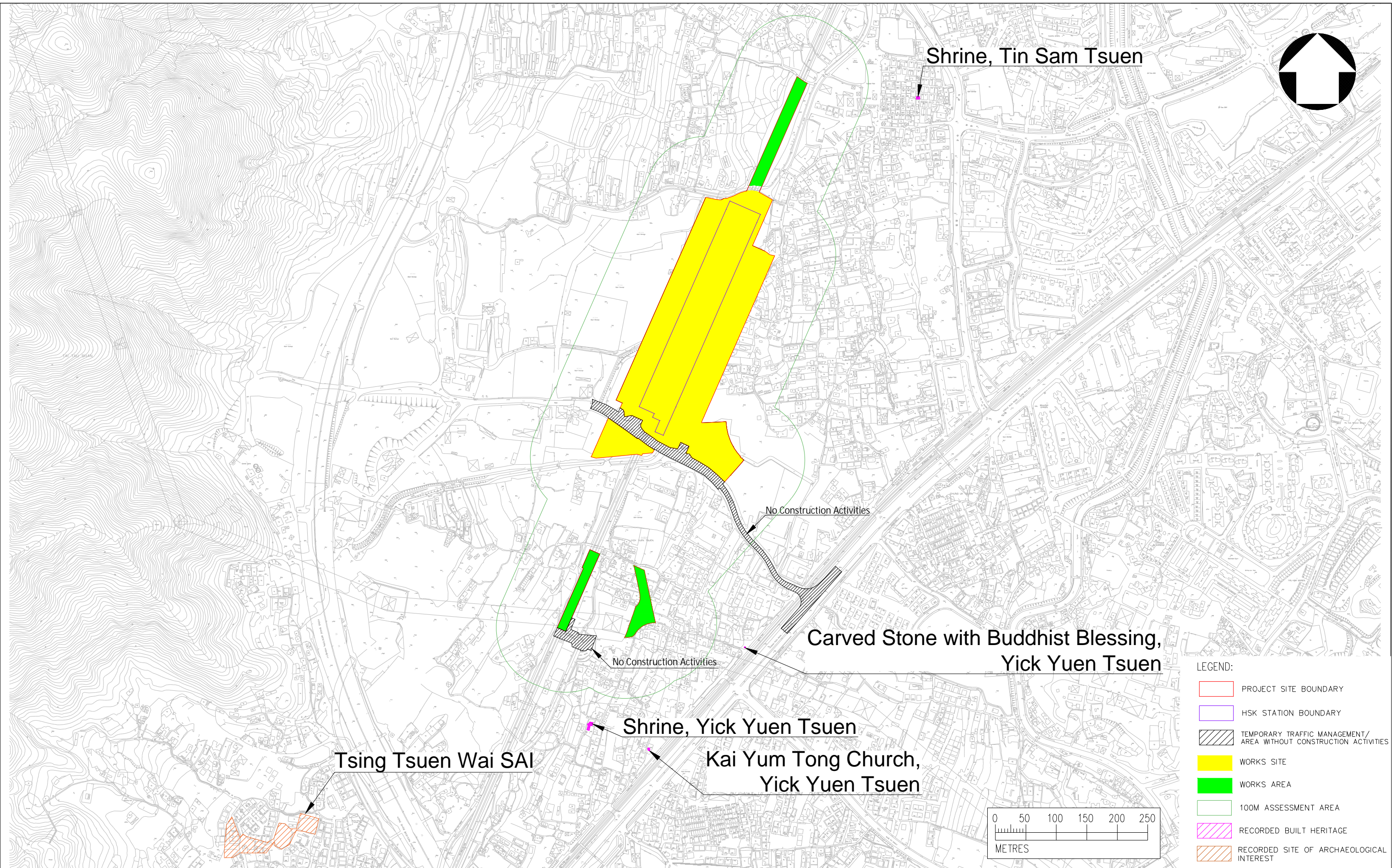
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APPROVED	-
DATE	OCT 22

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 ORIGINATOR **aurecon wsp**
 MODEL REF.

TITLE C1801 DESIGN SERVICES FOR HUNG SHUI KIU STATION PROPOSED COMPENSATORY LOCATION	
SCALE 1:1000(A1)	DRAWING NO. Figure 10.19
REV. 0	

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LEGEND:

	PROJECT SITE BOUNDARY
	HSK STATION BOUNDARY
	TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
	WORKS SITE
	WORKS AREA
	100M ASSESSMENT AREA
	RECORDED BUILT HERITAGE
	RECORDED SITE OF ARCHAEOLOGICAL INTEREST

REV	DESCRIPTION	BY	DATE	APPROVED
4	Revision 4	SC	18/10/2022	FL
3	Revision 3	SC	20/06/2022	FL
2	Revision 2	SC	22/04/2022	FL
1	Revision 1	SC	16/02/2022	FL
0	Initial submission	SC	18/01/2022	FL

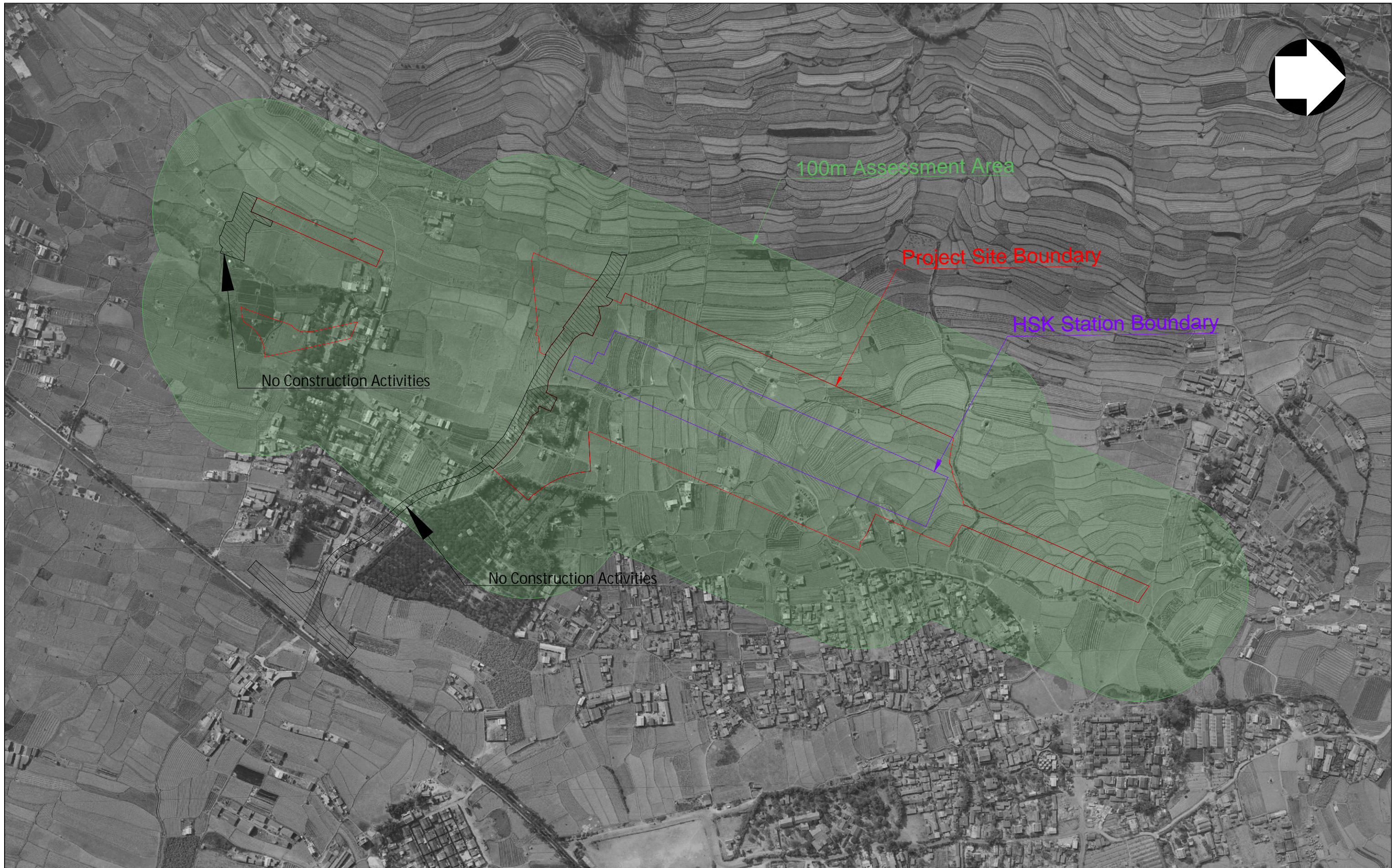
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DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	18/10/2022

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TITLE C1801 Design Services for Hung Shui Kiu Station Cultural Heritage Impact Assessment Location of Recorded Cultural Heritage	
SCALE (A3)	DRAWING NO. Figure 11.1
	REV. 3

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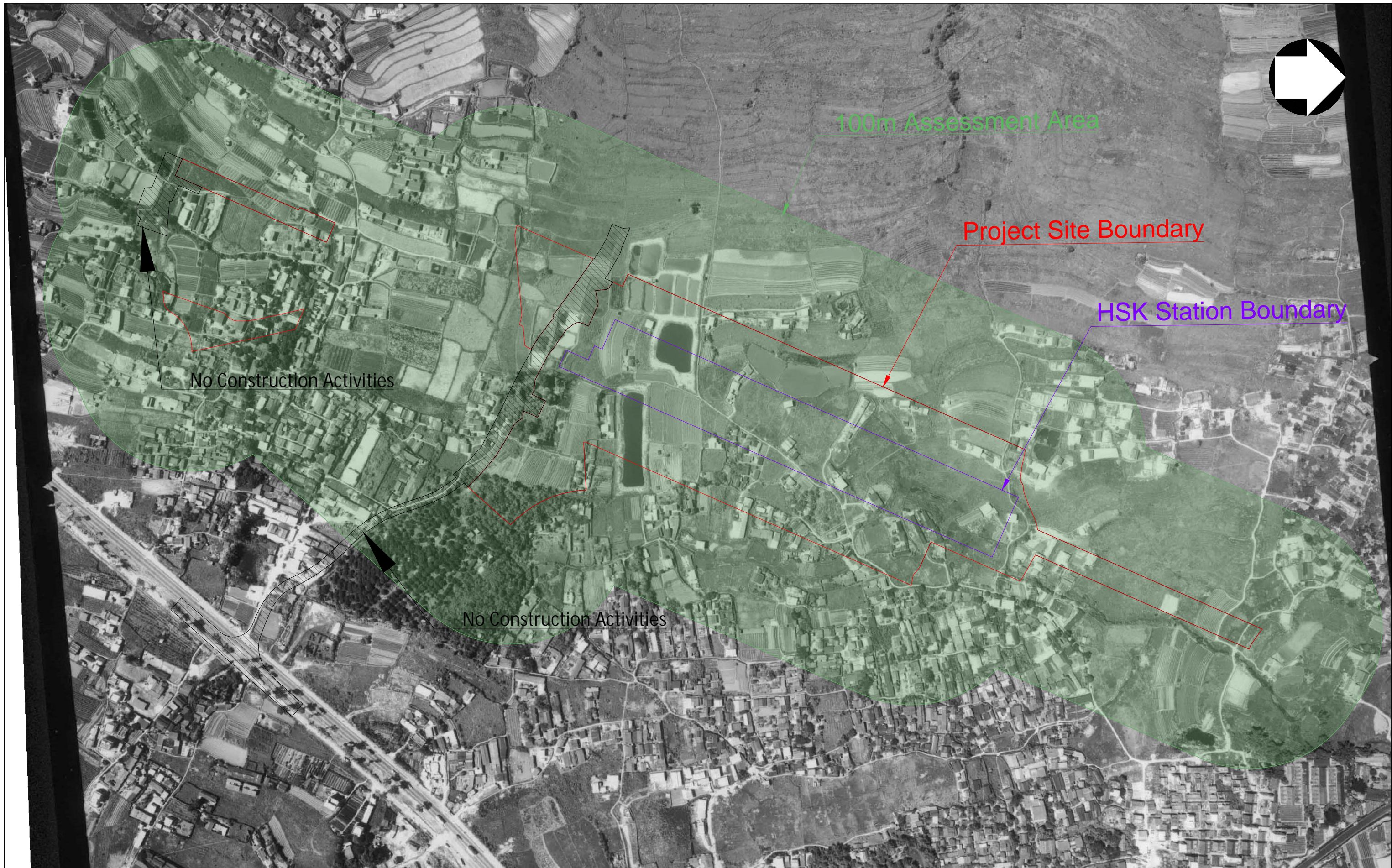
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REV	DESCRIPTION	BY	DATE	APPROVED
4	Revision 4	SC	18/10/2022	FL
3	Revision 3	SC	25/08/2022	FL
2	Revision 2	SC	18/07/2022	FL
1	Revision 1	SC	16/02/2022	FL
0	Initial Submission	SC	18/01/2022	FL

DRAWN	SC
DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	18/10/2022
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TITLE C1801 Design Services for Hung Shui Kiu Station Cultural Heritage Impact Assessment		
Historial Aerial Photo (1963)		
SCALE (A3)	DRAWING NO. Figure 11.2	REV. 4



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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
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					3	Revision 3	SC	25/08/2022	FL
					2	Revision 2	SC	18/07/2022	FL
					1	Revision 1	SC	16/02/2022	FL
					0	Initial Submission	SC	18/01/2022	FL

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CHECKED	P Kau
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DATE	18/10/2022

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TITLE	SCALE (A3)	DRAWING NO.	REV.
C1801 Design Services for Hung Shui Kiu Station Cultural Heritage Impact Assessment Historical Aerial Photo (1973)		Figure 11.3	4

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REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	SC	DATE	FL	APPROVED
4	Revision 4		18/10/2022	SC		FL			
3	Revision 3		25/08/2022	SC		FL			
2	Revision 2		18/07/2022	SC		FL			
1	Revision 1		16/02/2022	SC		FL			
	Initial Submission		18/08/2022	SC		APPROVED			

DRAWN	SC
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CHECKED	P Kau
APPROVED	F Leong
DATE	18/10/2022

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TITLE C1801 Design Services for Hung Shui Kiu Station Cultural Heritage Impact Assessment	
Historial Aerial Photo (2021)a	
SCALE (A3)	DRAWING NO. Figure 11.4
	REV. 4

100m Assessment Area

Project Site Boundary

HSK Station Boundary

No Construction Activities



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REV	DESCRIPTION	BY	DATE	REV	DESCRIPTION	BY	DATE	APPROVED
4	Revision 4	SC	18/10/2022	FL				
3	Revision 3	SC	25/08/2022	FL				
2	Revision 2	SC	18/07/2022	FL				
1	Revision 1	SC	16/02/2022	FL				
0	Initial Submission	SC	18/01/2022	FL				

DRAWN	SC
DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	18/10/2022

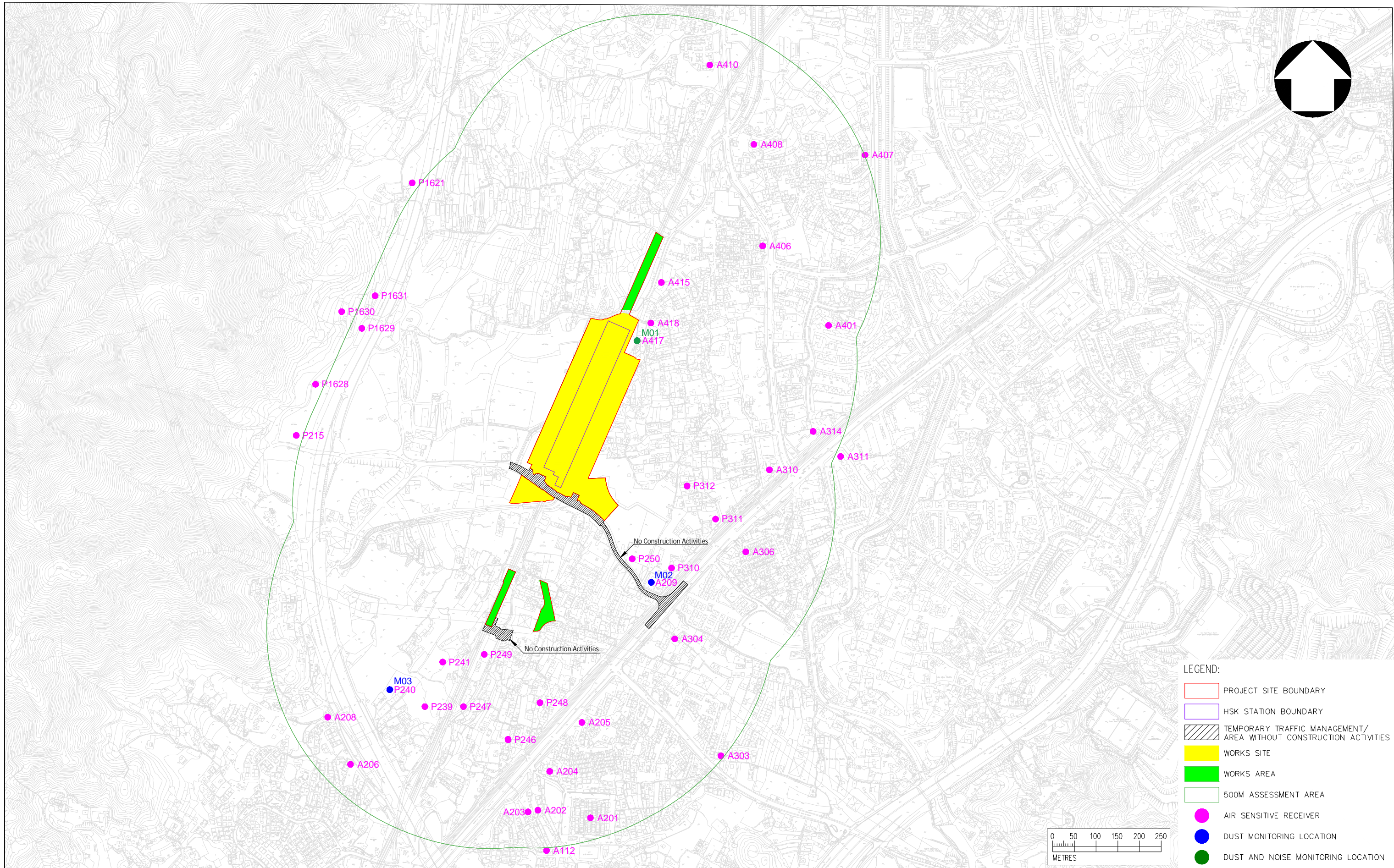
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HUNG SHUI KIU STATION
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 MODEL REF.

TITLE C1801 Design Services for Hung Shui Kiu Station Cultural Heritage Impact Assessment		
Historial Aerial Photo (2021)b		
SCALE (A3)	DRAWING NO. Figure 11.5	REV. 4

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LEGEND:

- PROJECT SITE BOUNDARY
- HSK STATION BOUNDARY
- TEMPORARY TRAFFIC MANAGEMENT/ AREA WITHOUT CONSTRUCTION ACTIVITIES
- WORKS SITE
- WORKS AREA
- 500M ASSESSMENT AREA
- AIR SENSITIVE RECEIVER
- DUST MONITORING LOCATION
- DUST AND NOISE MONITORING LOCATION

REV	DESCRIPTION	BY	DATE	APPROVED	DESCRIPTION	BY	DATE	APPROVED
7	Revision 7	SC	01/11/2022	FL	1	Revision 1	SC	10/02/2022
6	Revision 6	SC	18/10/2022	FL	0	Initial submission	SC	18/01/2022
5	Revision 5						SC	25/08/2022
4	Revision 4						SC	22/04/2022
3	Revision 3						SC	30/03/2022
2	Revision 2						SC	16/02/2022
1	Revision 1						SC	10/02/2022

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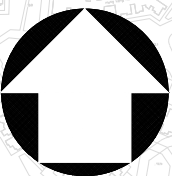
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 CHECKED: P Kau
 APPROVED: F Leong
 DATE: 01/11/2022

MODEL REF.

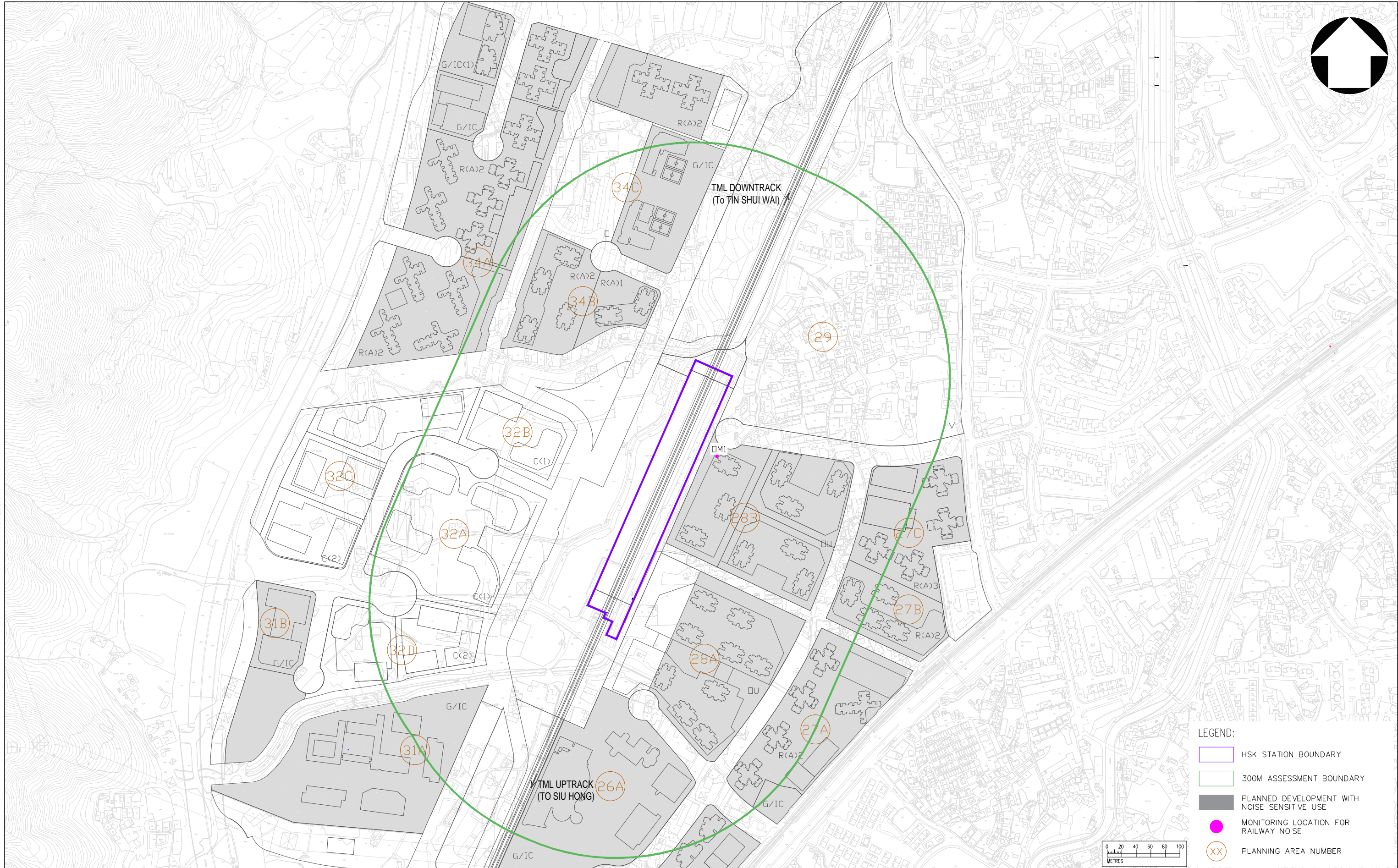
TITLE
**C1801 Design Services for Hung Shui Kiu Station
 Environmental Monitoring and Auditing (EM&A)
 Proposed Construction Dust and Noise
 Monitoring Location**

SCALE NTS DRAWING NO. FIGURE 13.1 REV. 7

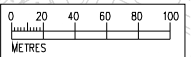
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- LEGEND:**
- HSK STATION BOUNDARY
 - 300M ASSESSMENT BOUNDARY
 - PLANNED DEVELOPMENT WITH NOISE SENSITIVE USE
 - MONITORING LOCATION FOR RAILWAY NOISE
 - XX PLANNING AREA NUMBER



MODELNAME:
FILENAME:

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
3	Revision 3				CC	14/09/2022	FL		
2	Revision 2				CC	05/09/2022	FL		
1	Revision 1				CC	26/08/2022	FL		
0	Initial Submission				CC	07/07/2022	FL		

DRAWN	CC
DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	14/09/22

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MODEL REF.

TITLE	
C1801 Design Services for Hung Shui Kiu Station	
Environmental Monitoring and Auditing (EM&A)	
Tentative Monitoring Location for Monthly Railway Noise Monitoring	
SCALE (A3)	DRAWING NO. Figure 13.2
	REV. 3

Appendix 5.1

Construction Plant Inventory

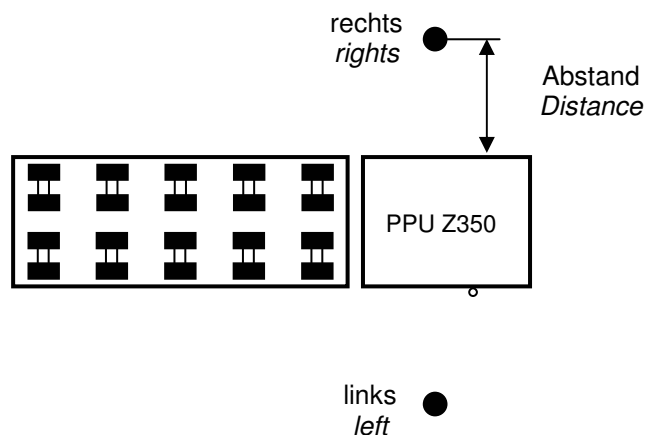
Area	Construction Activity	PME Group [1]	Unmitigated Scenario					Mitigated Scenario (QPME / Quiet Method / Noise Barrier)									
			Equipment	Reference Code [2][3]	No. of item	% on-time in 30 min	PME SWL, dB(A)	Unmitigated Sub-total SWL, dB(A)	Equipment	Reference Code	QPME SWL, dB(A)	Mitigated Sub-total SWL, dB(A)	Barrier, dB(A)	Mitigated Sub-total SWL, dB(A)			
Casting Yard, Fabrication Yard 1/2, Temporary Storage & HSK Station Work Site	A1. Site Mobilization, Site Clearance & GI	Site Mobilization, Site Clearance & GI	Generator, super silenced, 70 dB(A) at 7 m	CNP 103	2	100%	95	98	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	90	-	90			
			Lorry, with crane/grab, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-036	3	50%	105	107	-	-	-	107	-5	102			
			Excavator/ loader, wheeled/ tracked	CNP 081	3	50%	112	114	Excavator, KOMATSU Model:PC78US-8	EPD-12196	95	97	-	97			
			Water pump, submersible (electric)	CNP 283	2	100%	85	88	-	-	-	88	-	88			
			Saw, chain, hand-held	CNP 202	2	50%	114	114	-	-	-	114	-5	109			
			Drill rig, rotary type (diesel)	OCUPME-012	2	70%	110	111	-	-	-	111	-5	106			
Casting Yard, Fabrication Yard 1/2 & Temporary Storage	A2. Resurfacing Work	Resurfacing Work Group A	Group A														
			Excavator/ loader, wheeled/ tracked	CNP 081	1	100%	112	112	Excavator, KOMATSU Model:PC78US-8	EPD-12196	95	95	-	95			
			Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-038	1	50%	105	102	-	-	-	102	-5	97			
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87			
			Water pump (electric)	CNP 281	1	100%	88	88	-	-	-	88	-	88			
			Breaker, hand-held, mass > 10kg and < 20kg	CNP 024	1	50%	108	105	Hand-held Percussive Breaker, HILTI Model: TE1000-AVR	EPD-12751	99	96	-	96			
	Resurfacing Work Group B (Concreting)	Group B															
		Concrete lorry mixer	CNP 044	1	50%	109	106	-	-	-	106	-5	101				
		Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87				
		Roller, vibratory	CNP 186	1	50%	108	105	Roller, vibratory, BOMAG Model: BW 135 AD-5	EPD-11837	106	103	-	103				
		Compactor, vibratory	CNP 050	1	50%	105	102	-	-	-	102	-5	97				
		Bar bender and cutter (electric)	CNP 021	1	50%	90	87	-	-	-	87	-	87				
Casting Yard	A3. Precasting Work	Precasting Work	Lorry, with crane/grab, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-036	1	50%	105	102	-	-	-	102	-5	97			
			Bar bender and cutter (electric)	CNP 021	1	50%	90	87	-	-	-	87	-	87			
			Concrete lorry mixer	CNP 044	1	50%	109	106	-	-	-	106	-5	101			
			Poker, vibratory, hand-held (electric)	OCUPME-019	1	50%	102	99	-	-	-	99	-5	94			
			Bar bender and cutter (electric)	CNP 021	1	50%	90	87	-	-	-	87	-	87			
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87			
			Air compressor, air flow ≤ 10m3/min	CNP 001	1	50%	100	97	Air Compressor, DENYO CO LTD / DENYO, Model: DAS180LB	EPD-10517	94	91	-	91			
			Crane, mobile/ barge mounted (diesel)	CNP 048	1	50%	112	109	Crane, Mobile, SENNEBOGEN Model:653	EPD-10768	101	98	-	98			
			Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-038	1	50%	105	102	-	-	-	102	-5	97			
			Fabrication Yard 2	B1. Temporary Drainage Diversion	Excavation & Lifting	Excavator/ loader, wheeled/ tracked	CNP 081	1	50%	112	109	Excavator, KOMATSU Model:PC78US-8	EPD-12196	95	92	-	92
						Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-038	1	50%	105	102	-	-	-	102	-5	97
						Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87
Water pump, submersible (electric)	CNP 283	1				100%	85	85	-	-	-	85	-	85			
Lorry, with crane/grab, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-036	1				50%	105	102	-	-	-	102	-5	97			
Crane, mobile/ barge mounted (diesel)	CNP 048	1				50%	112	109	Crane, mobile Maeda, Model: CC985S-1	EPD-05797	91	88	-	88			
Piling, vibrating hammer	OCUPME-018	1				50%	115	112	Silent Piling by Press-in Method	-	95	92	-	92			
Poker, vibratory, hand-held (electric)	OCUPME-019	1				50%	102	99	-	-	-	99	-5	94			
Water pump, submersible (electric)	CNP 283	1				100%	85	85	-	-	-	85	-	85			
Concreting	Generator, super silenced, 70 dB(A) at 7 m	CNP 103		1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87				
	Concrete lorry mixer	CNP 044		1	50%	109	106	-	-	-	106	-5	101				
	Bar bender and cutter (electric)	CNP 021		1	50%	90	87	-	-	-	87	-	87				
	Crane, mobile/ barge mounted (diesel)	CNP 048		1	50%	112	109	Crane, mobile Maeda, Model: CC985S-1	EPD-05797	91	88	-	88				
	HSK Station Work Site	C1. Foundation Works (Construction of Piles)		Piling Group A	Group A												
					Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87	
					Water pump, submersible (electric)	CNP 283	1	100%	85	85	-	-	-	85	-	85	
					Air compressor, air flow ≤ 10m3/min	CNP 001	1	70%	100	98	Air Compressor, DENYO CO LTD / DENYO, Model: DAS180LB	EPD-10517	94	92	-	92	
					Piling, large diameter bored, oscillator	CNP 165	1	70%	115	113	-	-	-	113	-5	108	
Group B																	
Piling Group B			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87			
			Water pump, submersible (electric)	CNP 283	1	100%	85	85	-	-	-	85	-	85			
			Air compressor, air flow ≤ 10m3/min	CNP 001	1	70%	100	98	Air Compressor, DENYO CO LTD / DENYO, Model: DAS180LB	EPD-10517	94	92	-	92			
			Piling, large diameter bored, reverse circulation drill	CNP 166	1	70%	100	98	-	-	-	98	-	98			
			Group C														
			Piling Group C	Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87		
Water pump, submersible (electric)	CNP 283	1		100%	85	85	-	-	-	85	-	85					
Crane, mobile/ barge mounted (diesel)	CNP 048	1		70%	112	110	Crane, Mobile, SENNEBOGEN Model:653	EPD-10768	101	99	-5	94					
Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-038	1		70%	105	103	-	-	-	103	-5	98					
Group D																	
Piling Group D (Concreting)	Generator, super silenced, 70 dB(A) at 7 m	CNP 103		1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87				
	Water pump, submersible (electric)	CNP 283	1	100%	85	85	-	-	-	85	-	85					
	Concrete lorry mixer	CNP 044	1	50%	109	106	-	-	-	106	-5	101					
	Concrete pump, stationary/ lorry mounted	CNP 047	1	50%	109	106	-	-	-	106	-5	101					
	Grout pump	OCUPME-022	2	50%	105	105	-	-	-	105	-5	100					
	Grout mixer	OCUPME-021	1	70%	90	88	-	-	-	88	-	88					
HSK Station Work Site	C2. Pile Cap, Ground Slab & Tie Beam	Pile Cap, Ground Slab & Tie Beam Group A	Group A														
			Crane, mobile/ barge mounted (diesel)	CNP 048	1	70%	112	110	Crane, Mobile, SENNEBOGEN Model:653	EPD-10768	101	99	-	99			
			Excavator/ loader, wheeled/ tracked	CNP 081	1	50%	112	109	Excavator, KOMATSU Model:PC78US-8	EPD-12196	95	92	-	92			
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87			
			Water pump, submersible (electric)	CNP 283	1	100%	85	85	-	-	-	85	-	85			
			Group B														
		Pile Cap, Ground Slab & Tie Beam Group B	Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-038	1	50%	105	102	-	-	-	102	-5	97			
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87			
			Water pump, submersible (electric)	CNP 283	1	100%	85	85	-	-	-	85	-	85			
			Group C														
			Pile Cap, Ground Slab & Tie Beam Group C (Concreting)	Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-45LSK	EPD-10735	87	87	-	87		
				Water pump, submersible (electric)	CNP 283	1	100%	85	85	-	-	-	85	-	85		
	Concrete lorry mixer	CNP 044		1	50%	109	106	-	-	-	106	-5	101				
	Poker, vibratory, hand-held (electric)	OCUPME-019		1	50%	102	99	-	-	-	99	-	99				
	Concrete pump, stationary/ lorry mounted	CNP 047		1	50%	109	106	-	-	-	106	-5	101				

Area	Construction Activity	PME Group [1]	Unmitigated Scenario					Mitigated Scenario (QPME / Quiet Method / Noise Barrier)							
			Equipment	Reference Code [2][3]	No. of Item	% on-time in 30 min	PME SWL, dB(A)	Unmitigated Sub-total SWL, dB(A)	Equipment	Reference Code	QPME SWL, dB(A)	Mitigated Sub-total SWL, dB(A)	Barrier, dB(A)	Mitigated Sub-total SWL, dB(A)	
Fabrication Yard 1/2 & HSK Station Work Site	C3. Resurfacing Work	Resurfacing Work Group A	Group A												
			Excavator/ loader, wheeled/ tracked	CNP 081	1	100%	112	112	Excavator, KOMATSU Model:PC78US-8	EPD-12196	95	95		95	
			Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-038	1	50%	105	102	-		-	102	-5	97	
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-4SLSK	EPD-10735	87	87		87	
			Water pump (electric)	CNP 281	1	100%	88	88	-		-	88		88	
			Breaker, hand-held, mass > 10kg and < 20kg	CNP 024	1	50%	108	105	Hand-held Percussive Breaker, HILTI Model: TE1000-AVR	EPD-12751	99	96		96	
		Resurfacing Work Group B (Concreting)	Group B												
			Concrete lorry mixer	CNP 044	1	50%	109	106	-		-	106	-5	101	
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-4SLSK	EPD-10735	87	87		87	
			Roller, vibratory	CNP 186	1	50%	108	105	Roller, vibratory, BOMAG Model: BW135 AD-5	EPD-11837	106	103		103	
			Compactor, vibratory	CNP 050	1	50%	105	102			-	102	-5	97	
			Bar bender and cutter (electric)	CNP 021	1	50%	90	87			-	87		87	
			Water pump (electric)	CNP 281	1	100%	88	88	-		-	88		88	
Fabrication Yard 1/2	C4. Fabrication	Fabrication	Crane, mobile/ barge mounted (diesel)	CNP 048	1	50%	112	109	Crane, Mobile, SENNEBOGEN Model:653	EPD-10768	101	98	-5	93	
			Drill/grinder, hand-held (electric)	CNP 065	2	50%	98	98			-	98		98	
			Air compressor, air flow ≤ 10m ³ /min	CNP 001	2	50%	100	100	Air Compressor, DENYO CO LTD / DENYO, Model: DAS180LB	EPD-10517	94	94		94	
	C5. Station Module	Station Module	Self-Propelled Modular Transporter	Manufacturer Report[4]	2	30%	108-124	106-122	-		-	106-122	-5	101-117	
HSK Station Work Site	C6. Superstructure	Superstructure	Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-4SLSK	EPD-10735	87	87		87	
			Concrete lorry mixer	CNP 044	1	50%	109	106	-		-	106	-5	101	
			Bar bender and cutter (electric)	CNP 021	1	50%	90	87	-		-	87		87	
			Poker, vibratory, hand-held (electric)	OCUPME-019	1	50%	102	99	-		-	99		99	
			Concrete pump, stationary/ lorry mounted	CNP 047	1	50%	109	106	-		-	106	-5	101	
	C7. Concourse BOH & Platform BOH	Concourse BOH & Platform BOH	Water pump, submersible (electric)	CNP 283	1	100%	85	85	-		-	85	-5	80	
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-4SLSK	EPD-10735	87	87		87	
			Crane, mobile/ barge mounted (diesel)	CNP 048	1	50%	112	109	Crane, Mobile, SENNEBOGEN Model:653	EPD-10768	101	98	-5	93	
	C8. E&M Installation	E&M	Lorry, with crane/grab, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-036	1	50%	105	102	-		-	102	-5	97	
			Water pump, submersible (electric)	CNP 283	1	100%	85	85	-		-	85	-5	80	
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-4SLSK	EPD-10735	87	87		87	
			Crane, mobile/ barge mounted (diesel)	CNP 048	1	50%	112	109	Crane, mobile Sunward - Cummins, Model: SWTC10	EPD-10143	100	97		97	
	C9. ABWF Works	ABWF	Lorry, with crane/grab, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-036	1	50%	105	102	-		-	102	-5	97	
			Crane, mobile/ barge mounted (diesel)	CNP 048	1	50%	112	109	Crane, mobile Maeda, Model: CC985S-1	EPD-05797	91	88		88	
Drill/grinder, hand-held (electric)			CNP 065	4	50%	98	101	-		-	101		101		
Fabrication Yard 1/2	D1. External Work	External Work	Excavator/ loader, wheeled/ tracked	CNP 081	1	50%	112	109	Excavator, KOMATSU Model:PC78US-8	EPD-12196	95	92		92	
			Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-038	1	70%	105	103	-		-	103	-5	98	
			Water pump, submersible (electric)	CNP 283	1	100%	85	85	-		-	85		85	
			Concrete lorry mixer	CNP 044	1	30%	109	104	-		-	104	-5	99	
			Poker, vibratory, hand-held (electric)	OCUPME-019	1	30%	102	97	-		-	97		97	
			Concrete pump, stationary/ lorry mounted	CNP 047	1	30%	109	104	-		-	104	-5	99	
			Crane, mobile/ barge mounted (diesel)	CNP 048	1	50%	112	109	Crane, mobile Maeda, Model: CC985S-1	EPD-05797	91	88		88	
			Generator, super silenced, 70 dB(A) at 7 m	CNP 103	1	100%	95	95	Generator, DENYO Model: DCA-4SLSK	EPD-10735	87	87		87	
			Lorry, with crane/grab, 5.5 tonne < gross vehicle weight ≤ 38 tonne	OCUPME-036	1	50%	105	102	-		-	102	-5	97	

Notes:
 [1] Only one PME group will be operating at the same time for each activity.
 [2] Sound Power Level of QPME (<https://www.epd.gov.hk/epd/english/environment/nh/epme/index.html>)
 Quieter Construction Methods (https://www.epd.gov.hk/epd/mis/construction_noise/contents/index.php/en/index.html)
 [3] OCUPME-XXX are make reference to the list of "Sound power levels of other commonly used PME" (https://www.epd.gov.hk/epd/sites/default/files/epd/english/application_for_licenses/guidance/files/OtherSWL.pdf)
 [4] The sound power level of Self-Propelled Modular Transporter (SPMT) is derived from the data provided by Manufacturer. The SWL of the SPMT shall be verified by using a more comprehensive measurement method in the later CNMP stages.

Noise Data of
“Self-Propelled Modular Transporter” provided by manufacturer

Power Pack Unit Z 350



Höhe Meßmikrophon über Fahrbahn 1,2 m ± 0,1 m
Height of measuring microphone over ground 1,2 m ± 0,1 m

Messung im Leerlauf / Measuring idling (960 rpm/min)

Außentemperatur Ambient temp.	- 8,4 C° bis – 5,1 °C					
Messpunkt/ Measuring Point	Abstand / Distance					
	5 m	7,5 m	10 m	20 m	50 m	100 m
Rechts / Right	85,6	84,5	82,6	78,7	74,5	67,7
Links / Links	86	81,4	80,5	76,0	70,9	70,9

Messung im Leerlauf / Measuring idling (1.600 rpm/min)

Außentemperatur Ambient temp.	- 8,4 C° bis – 5,1 °C					
Messpunkt/ Measuring Point	Abstand / Distance					
	5 m	7,5 m	10 m	20 m	50 m	100 m
Rechts / Right	95,7	92,8	90,8	86,9	78,5	74,3
Links / Links	94,2	90,6	87,9	84,5	78,8	73,6

Messung im Leerlauf / *Measuring idling (1.800 rpm/min)*

Außentemperatur Ambient temp.	- 8,4 C° bis – 5,1°C						
Messpunkt/ <i>Measuring Point</i>	Abstand / <i>Distance</i>						
	5 m	7,5 m	10 m	20 m	50 m	100 m	
Rechts / <i>Right</i>	96,7	94,0	91,7	86,1	79,0	76,3	
Links / <i>Links</i>	94,6	90,7	89,6	85,0	81,4	73,1	

Messung im Leerlauf / *Measuring idling (2.000 rpm/min)*

Außentemperatur Ambient temp.	- 8,4 C° bis – 5,1°C						
Messpunkt/ <i>Measuring Point</i>	Abstand / <i>Distance</i>						
	5 m	7,5 m	10 m	20 m	50 m	100 m	
Rechts / <i>Right</i>	101,9	99,8	96,7	91,1	83,4	78,4	
Links / <i>Links</i>	98,4	94,9	93,4	88,5	81,9	75,9	

Messungen gemäß DIN ISO 362 / DIN 45635 bei Abstand 7,5 m
measuring performed according to DIN ISO 362 / DIN 45635 at distance 7,5 m

16.02.2010

Datum / *Date*

Obenland

Unterschrift / *Signature*

Estimation of Sound Power Level of Self-Propelled Modular Transporter

$$SWL = SPL + 20 \times \log D + 8$$

where

SWL: Sound Power Level in dB(A)

SPL: Sound Pressure Level in dB(A)

D: Measuring Distance

Measuring idling (960 rpm/min)

Distance, D (m)	Left	Right
	5	5
SPL, dB(A) (manufacturer data)	86	85.6
SWL, dB (A)	108.0	107.6

Measuring idling (1600 rpm/min)

Distance, D (m)	Left	Right
	5	5
SPL, dB(A) (manufacturer data)	94.2	95.7
SWL, dB (A)	116.2	117.7

Measuring idling (1800 rpm/min)

Distance, D (m)	Left	Right
	5	5
SPL, dB(A) (manufacturer data)	94.6	96.7
SWL, dB (A)	116.6	118.7

Measuring idling (2000 rpm/min)

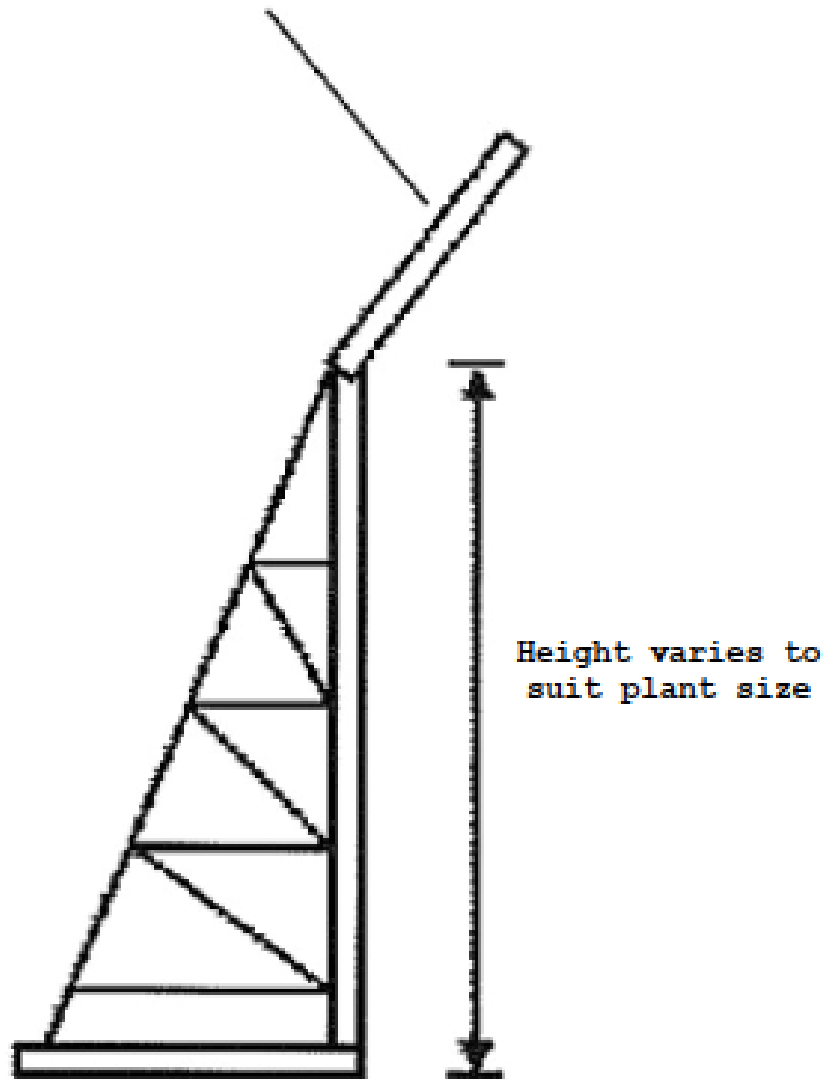
Distance, D (m)	Left	Right
	5	5
SPL, dB(A) (manufacturer data)	98.4	101.9
SWL, dB (A)	120.4	123.9

Appendix 5.2

Noise Barrier for Construction Noise

Schematic Configurations of Moveable Noise Barriers

Minimum surface density of (10kg/m²)



Typical Temporary Noise Barrier
for Mobile Plant (~3-5m tall)

Appendix 5.3

Railway Noise Assessment Methodology

Table 1: Railway Noise Assessment Assumptions and Methodology

Assumption	Details of Assumptions / Methodology
Train Type	Electric Multiple Unit (EMU) train, train length 200m for 8-car train
Train Noise Source Term for 8-car train at 130 km/h at 25 m	<div style="display: flex; justify-content: space-between;"> <div style="width: 70%;"> <ul style="list-style-type: none"> • Rolling Noise Sound Exposure Level (SEL): 81.4 dB(A) ^[1,2] • Air-Conditioning Noise <ul style="list-style-type: none"> ◆ For running train, L_{max} at viaduct: 48.8 dB(A) ^[1,2] L_{max} at station: 54.8 dB(A) ^[1,2] ◆ For each of the 16 air-conditioning units of an 8-car stationary train, Sound Power Level (SWL): 83.5 dB(A) ^[1,2] Based on MTRCL’s internal design standards, the dwell time of each train at station is assumed to be 32 seconds (i.e. time factor of 1.8% in a 30-minute assessment period) • Viaduct Re-radiated Noise $L_{eq,30min}$: 40.6 dB(A) (typical viaduct – plain track) ^[1,2] </div> <div style="width: 25%; text-align: right; vertical-align: top;"> <p>Calculation Methodology^[3]</p> <p>(Line Source) CRN ^[2]</p> <p>(Line Source) CRN ^[2]</p> <p>(Point Source) ISO 9613 ^[2]</p> <p>(Line Source) CRN ^[2]</p> </div> </div>
Track and Rolling Stock Condition Deterioration Correction	+3.0 dB(A) ^[1,2]
Train Speed Correction	<p>+20 log(V/V_{ref}) dB(A), where V_{ref} is the reference train speed 130 km/h and V is the train speed in km/h between Tin Shui Wai Station (TIS) and Siu Hong Station (SIH) according to the following train speed profile provided by MTRCL ^[4,5]:</p>

Assumption	Details of Assumptions / Methodology
Joint/Turnout Correction	See Note [6]
Gap Size Correction	See Note [7]
Train Frequency Correction	+10 log(N) dB(A), where N is the number of trains per 30 minutes per direction $N = 14$ during day and evening time ^[1,2] $N = 10$ during night-time ^[1,2]
Distance Correction	-10 log(d'/d_{ref}) dB(A), where d' is the slant distance (in metre) from track to NSR and d_{ref} is the reference distance 25 m
Air Absorption Correction	+(0.2 - 0.008 d') dB(A), where d' is the slant distance (in metre) from track to NSR (Reference: CRN Chart 4)
Angle of View Correction	+ (10 log($\frac{\pi\theta}{180} - \cos 2\alpha \sin \theta$) - 5) dB(A), where θ is the angle of view, and α is the acute angle between the line drawn parallel to the track through the NSR and the line bisecting θ (Reference: CRN Chart 7)
Reflection Correction	+1.5 ($\frac{\theta'}{\theta}$) dB(A), where θ' is the sum of the angles subtended by all reflecting façades on the opposite side of the railway facing the receiver point, and θ is the total angle subtended by the source line at the reception point, +1.5 dB(A) maximum correction for each reflection (Reference: CRN Clause 31.2)
Barrier Correction	As per CRN Chart 6(a)
Façade Correction	+2.5 dB(A)
Conversion of SEL to $L_{eq,30min}$	-10 log(1800) dB(A)

Note:

- [1] Referring to the “West Rail Operational Train Noise Assessment Report” prepared by MTRCL in July 2015.
- [2] Referring to Appendix 4.15A of the approved Tuen Mun South Extension EIA.
- [3] The ISO 9613 methodology is adopted for the calculation of multiple reflection of noise at station.
- [4] A maximum train speed of 100 km/h is adopted in the current assessment based on the VEP document (Application No. VEP-45/2001) and the current EP conditions in FEP-24/004/1998/J.
- [5] Up track of TML refers to the track for trains travelling in the direction from Wu Kai Sha to Tuen Mun, with an ascending chainage. Down track of TML refers to the track for trains travelling in the direction from Tuen Mun to Wu Kai Sha, with a descending chainage.
- [6] No correction for plain track in the current assessment.
- [7] No correction for plain track with standard gap size 250 mm in the current assessment.

Image 1: Assumed Positions and Propagation Paths of Noise Sources for a Typical Viaduct Section

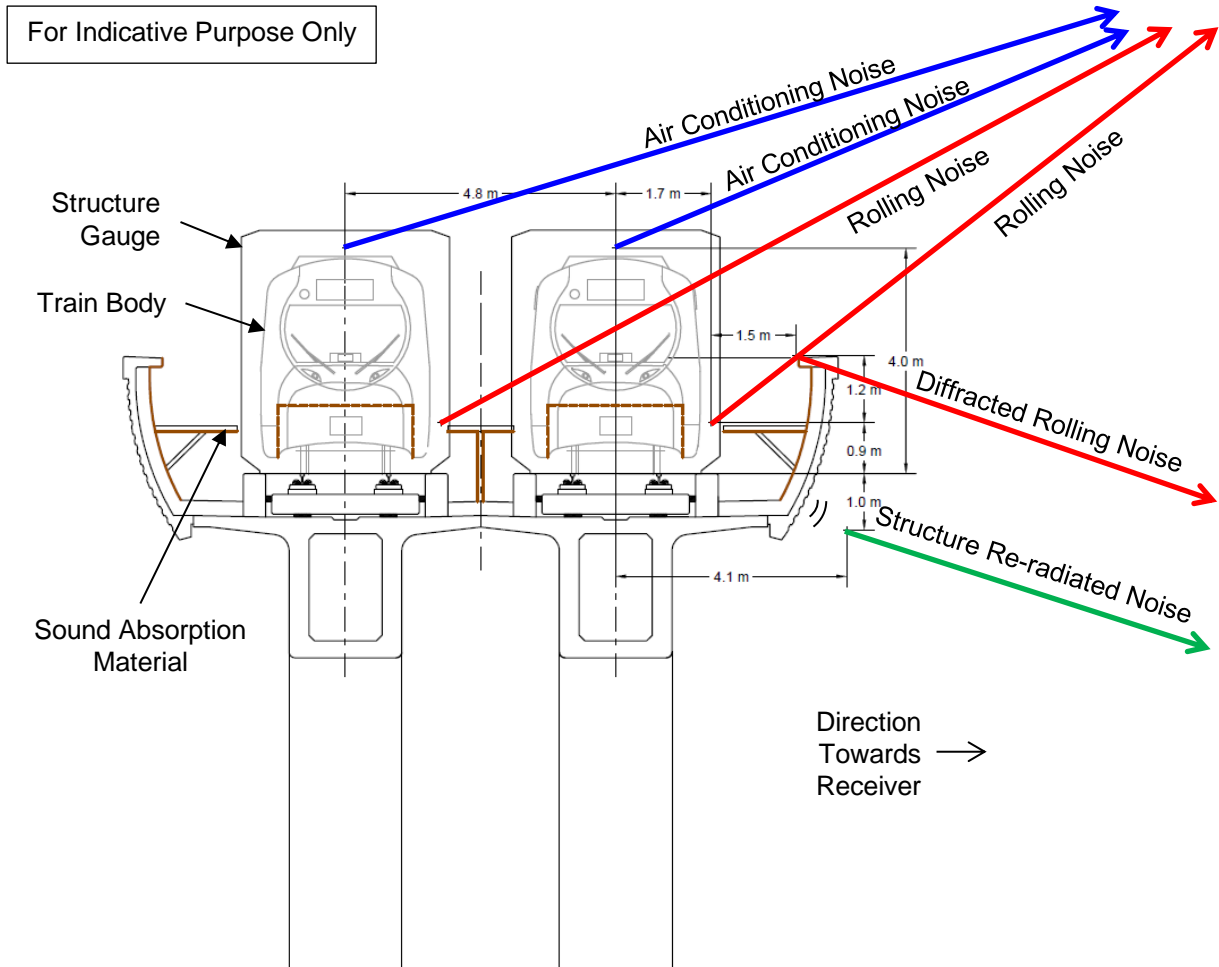


Table 2: Approximate Rail Top Elevation Levels

Chainage	Approximate Rail Top Elevation Level (mPD)	Chainage	Approximate Rail Top Elevation Level (mPD)
-	-	133+100	20.5
-	-	133+200	20.5
-	-	133+300	20.5
-	-	133+400	20.5
-	-	133+500	20.2
132+600	17.2	133+600	19.8
132+700	18.3	133+700	19.5
132+800	19.4	133+800	19.1
132+900	20.3	133+900	18.8
133+000	20.5	134+000	18.4

Image 2: Sketch of Cross Section at Station Main Building Structure

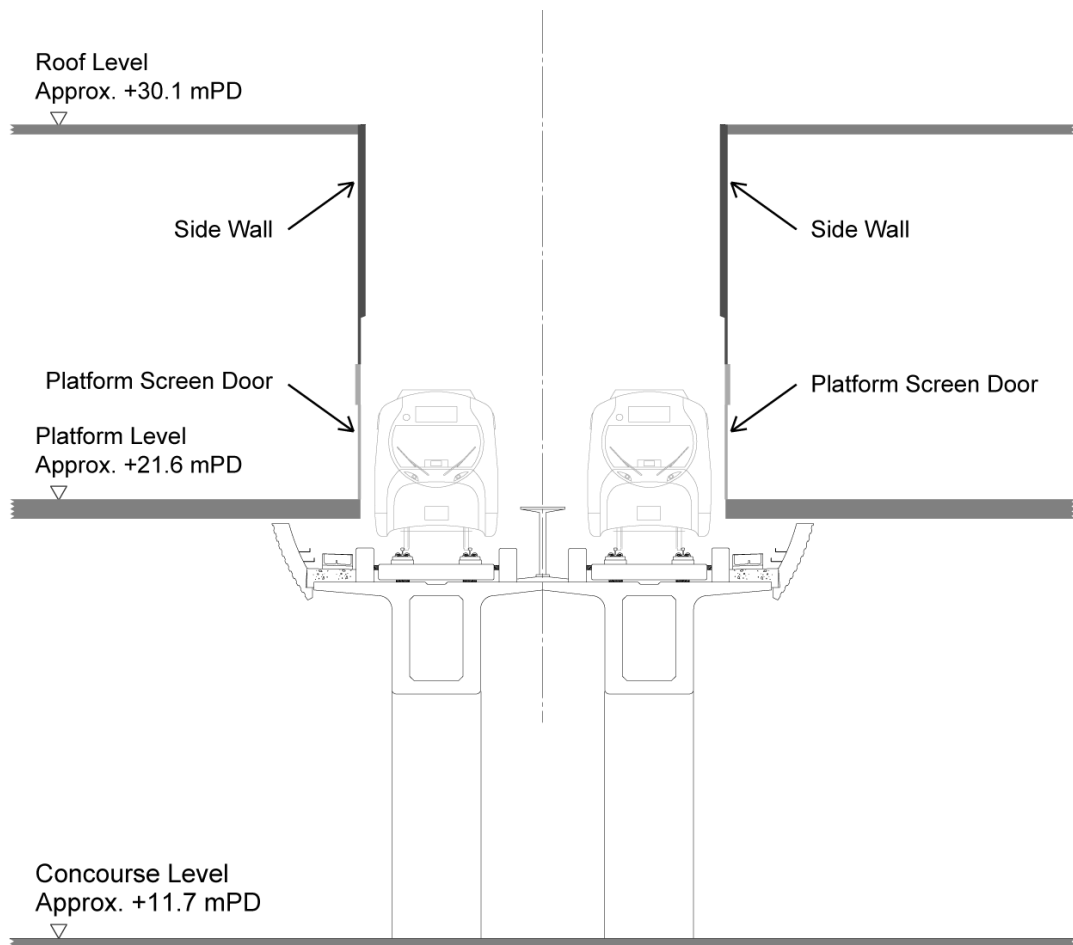


Image 3: Sketch of Cross Section at Station Back-of-House Structure

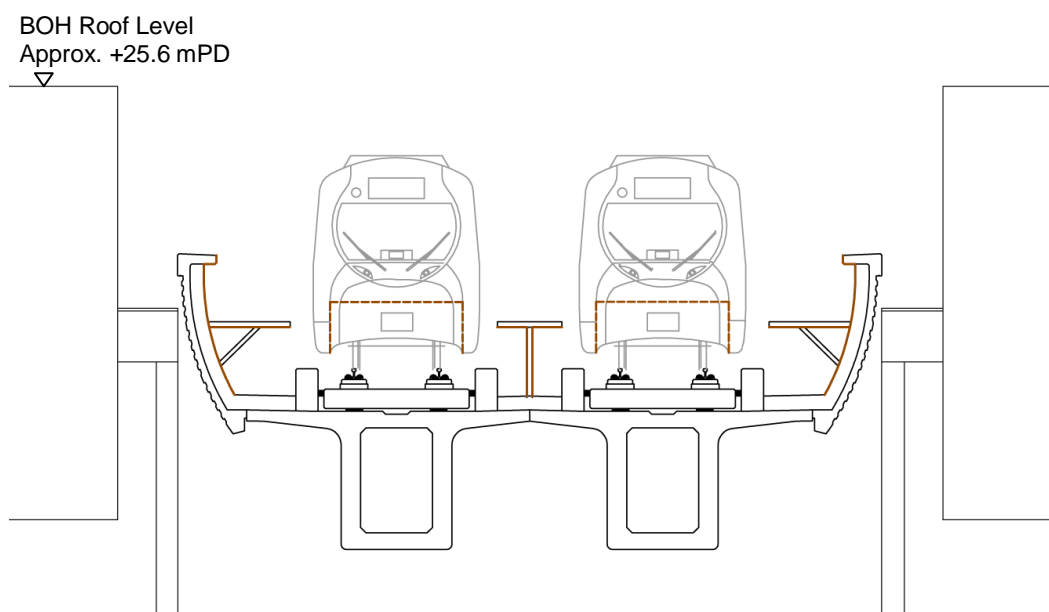
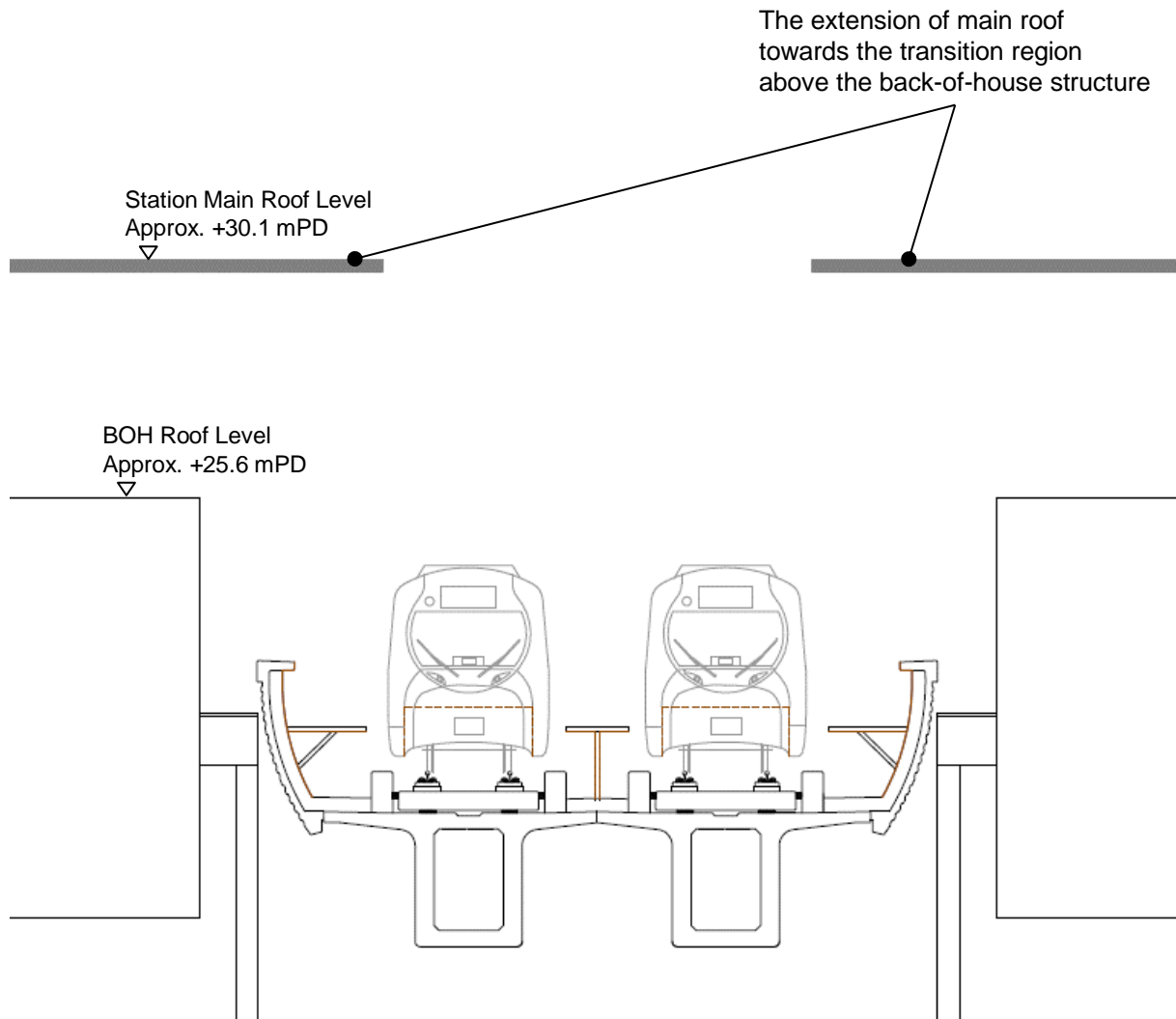
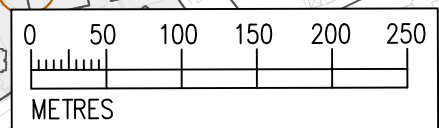
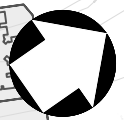
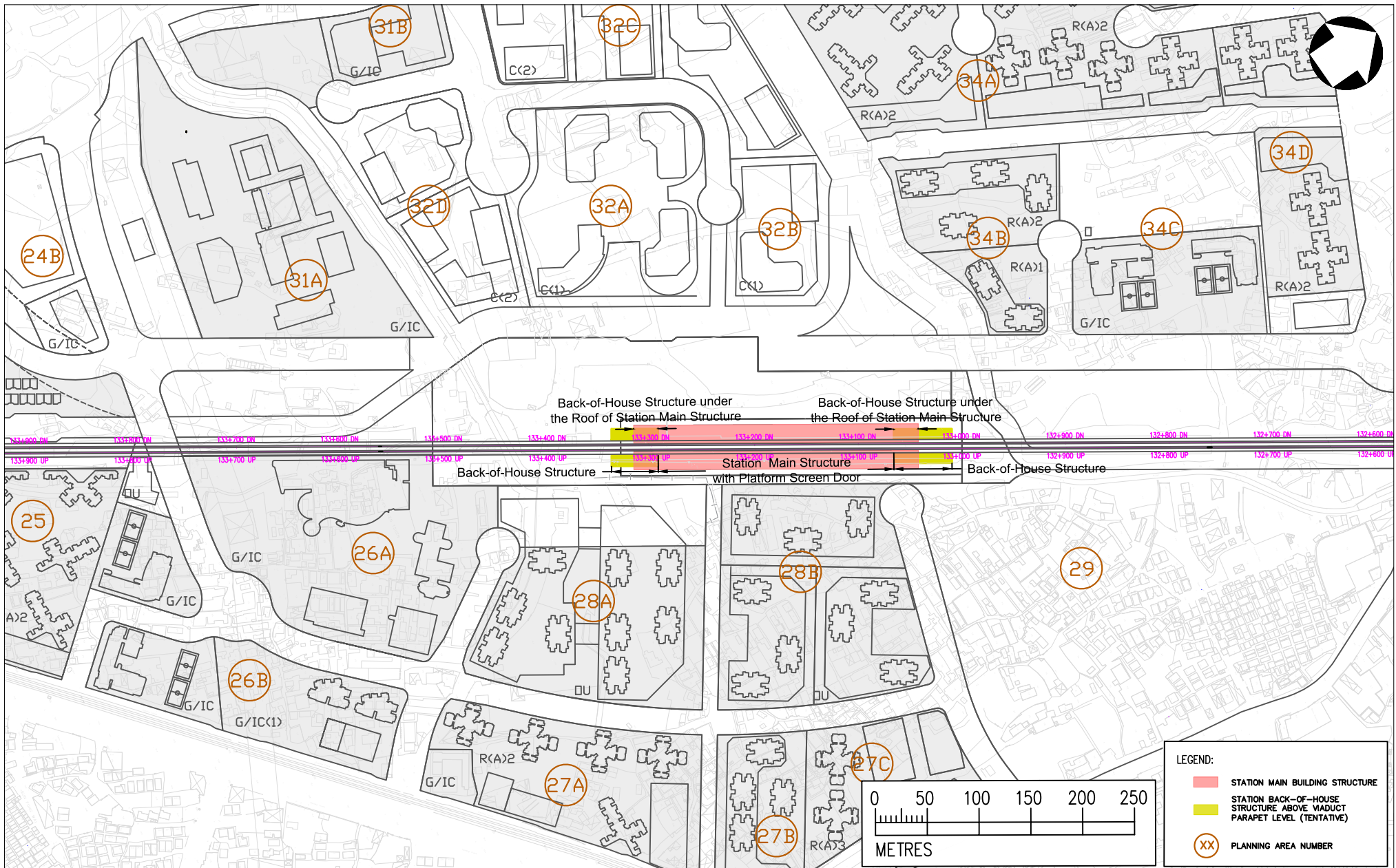


Image 4: Sketch of Cross Section at Transition Region with the Station Back-of-House Structure under the Roof of the Station Main Structure





LEGEND:

- STATION MAIN BUILDING STRUCTURE
- STATION BACK-OF-HOUSE STRUCTURE ABOVE VIADUCT PARAPET LEVEL (TENTATIVE)
- PLANNING AREA NUMBER

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED
2	Revision 2		27/10/2022	FL	CC	27/10/2022	FL		
1	Revision 1		11/02/2022	FL	CC	11/02/2022	FL		
0	Initial Submission		16/01/2022	FL	CC	16/01/2022	FL		

DRAWN	cc
DESIGNED	
CHECKED	P Kau
APPROVED	F Leong
DATE	10/02/2022

MTR

HUNG SHUI KIU STATION

ORIGINATOR **aurecon wsp**

MODEL REF.

TITLE	C1801 Design Services for Hung Shui Kiu Station	
	Railway Noise Impact Assessment	
	Chainage of Tracks and Tentative Station Layout	
SCALE	AS SHOWN	
DRAWING NO.		
REV.		2

MODEL NAME
FILE NAME

Appendix 5.4

Background Noise Measurement

Appendix 5.4 Background Noise Measurement

1. Measurement Equipment

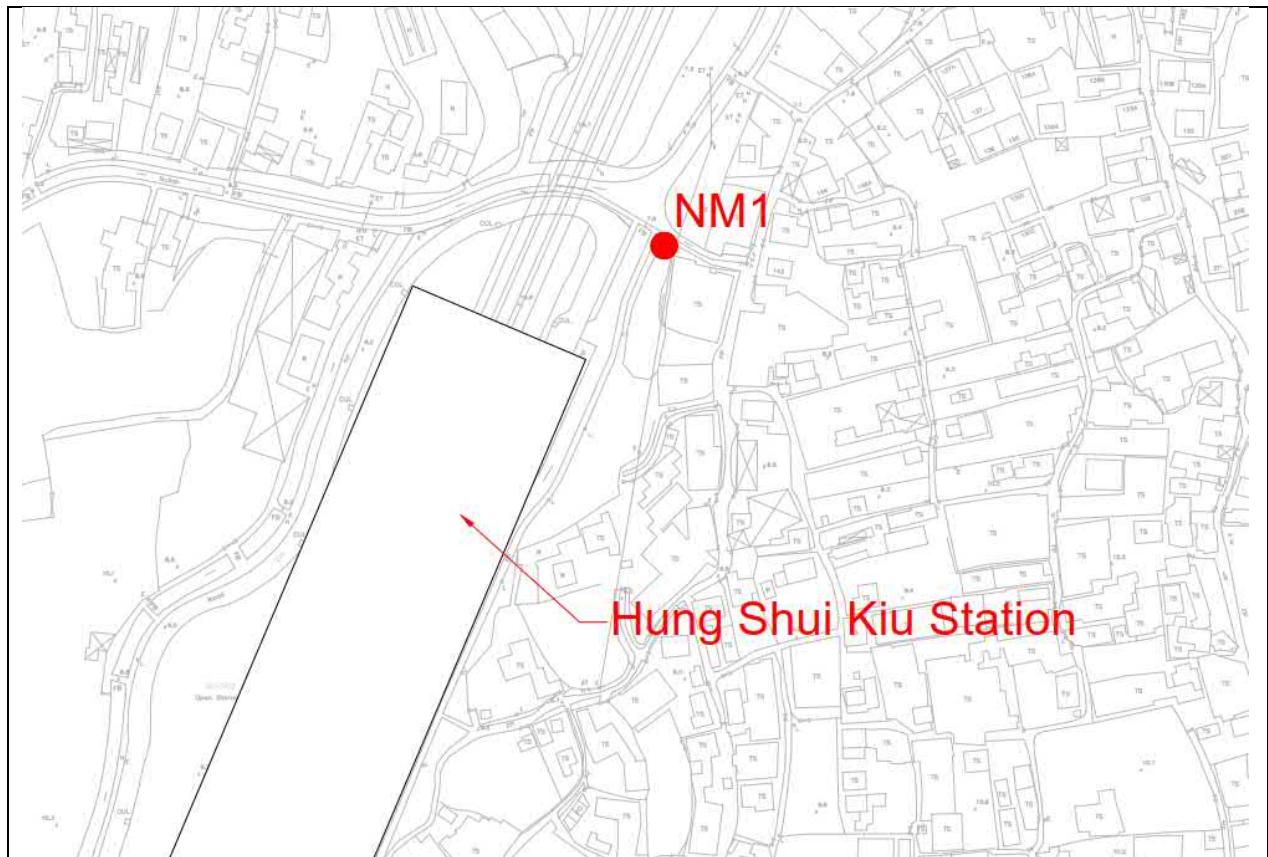
1.1 A sound level meter with fast response mode, Rion NL-52, was used for the measurement. The meter used for background noise measurement complies with the International Electrotechnical Commission Publications 61672 (Type 1). The meter was calibrated with a Rion NC-74 acoustic calibrator which complies with the International Electrotechnical Commission Publications 60942 Class 1 specifications before and after the measurements. The calibrations were checked to within ± 1.0 dB(A). Calibration certificates are supplemented in Annex 1.

The instruments used for the measurement are summarized in Table 1.1 as below.

Table 1.1 Instrument List

Instruments	Model, S/N
Sound Level Meter	Rion Type NL-52, S/N: 01143483
Calibrator	Rion Type NC-74, S/N: 34678506

2. Measurement Locations





Location of Prevailing Background Noise Measurement near Tin Sam Tsuen (NM1)

3. Measurement Conditions and Results

3.1 Measurements conducted in free field condition from 8 April 2022 to 9 April 2022. Noise measurements were made in sunny and calm weather. The noise measurement descriptor is A-weighted equivalent continuous sound pressure level (L_{90}) measured using Type 1 sound level meter. A series of measurements with duration of 1 hour were taken which were steady and representative of prevailing background noise.

Date & Time	Measurement Position	Measurement Location	Lowest Measured Noise Levels, L_{90} (1hour), dB(A) ^[1]	
			Day/Evening	Night
8 April 2022 0:00 – 9 April 2022 23:00	1.5 m above ground	NM1	50	48

Note:

[1] The background noise levels are measured in free-field condition. A +3dB(A) correction is included for comparison with noise criterion.

3.2 The measurement result shows the lowest measured noise level in L_{90} (1 Hour) during the day/evening time and night-time period. Thus, the prevailing background noise level for day/evening time period is 50 dB(A), while that of the night-time period is 48 dB(A).

Annex 1

Calibration Certificates



Calibration Certificate

Certificate No. **201030**

Page 1 of 3 Pages

Customer : Enovative Environmental Service Limited

Address : Room 23, 6/F, Block C, Goldfield Industrial Centre, Shatin, N.T.

Order No. : Q20449

Date of receipt : 8-Feb-22

Item Tested

Description : Sound Level Meter

Manufacturer : Rion

I.D. : N15-RION-006

Model : NL-52

Serial No. : 01143483

Test Conditions

Date of Test : 17-Feb-22

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure: Z01, IEC 61672.

Test Results

All results were within the IEC 61672 type 1 or manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S017	Multi-Function Generator	C211339	SCL-HKSAR
S240	Sound Level Calibrator	106446	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : 
Elva Chong

Approved by : 
Kin Wong

Date: 17-Feb-22

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.
Tel. 2425 8801 Fax: 2425 8646

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Calibration Certificate

Certificate No. 201030

Page 2 of 3 Pages

Results :

Acoustical signal test

1. Self-generated noise: 14.5 dBA (Mfr's Spec \leq 17 dBA)

2. Reference Sound Pressure Level

UUT Setting				Applied Value (dB)	UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Octave Filter		
20 ~ 130	A	F	OFF	94.0	94.0
		S	OFF		94.0
	C	F	OFF		94.0
	Z	F	OFF		94.0
	A	F	OFF	114.0	114.0
			OFF		114.0
		C	OFF		114.0
		Z	OFF		114.0

IEC 61672 Type 1 Spec. : \pm 1.1 dB

Uncertainty : \pm 0.1 dB

Electrical signal tests

3. Electrical signal tests of frequency weightings (A weighting)

Frequency	Attenuation (dB)	IEC 61672 Type 1 Spec.
31.5 Hz	-39.5	- 39.4 dB, \pm 2 dB
63 Hz	-26.1	- 26.2 dB, \pm 1.5 dB
125 Hz	-16.1	- 16.1 dB, \pm 1.5 dB
250 Hz	-8.6	- 8.6 dB, \pm 1 dB
500 Hz	-3.1	- 3.2 dB, \pm 1.4 dB
1 kHz	0.0 (Ref)	0 dB, \pm 1.1 dB
2 kHz	+1.1	+ 1.2 dB, \pm 1.6 dB
4 kHz	+0.7	+ 1.0 dB, \pm 1.6 dB
8 kHz	-1.1	- 1.1 dB, + 2.1 dB ~ -3.1 dB
16 kHz	-8.5	- 6.6 dB, + 3.5 dB ~ - 17.0 dB

Uncertainty : \pm 0.1 dB



Calibration Certificate

Certificate No. 201030

Page 3 of 3 Pages

4. Frequency & Time weightings at 1 kHz

4.1 Frequency Weighting (Fast)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
A	94.0	94.0 (Ref.)	--	± 0.4 dB
C	94.0	94.0	0.0	
Z	94.0	94.0	0.0	

4.2 Time Weighting (A-weighted)

UUT Setting	Applied Value (dB)	UUT Reading (dB)	Difference (dB)	IEC 61672 Type 1 Spec.
Fast	94.0	94.0 (Ref.)	--	± 0.3 dB
Slow	94.0	94.0	0.0	
Time-averaging	94.0	94.0	0.0	

Uncertainty : ± 0.1 dB

- Remarks :
1. UUT : Unit-Under-Test
 2. The uncertainty claimed is for a confidence probability of not less than 95%.
 3. Atmospheric Pressure : 1 012 hPa.
 4. Microphone model: UC-59, S/N : 11558.
 5. Preamplifier model : NH-25 , S/N : 43502.
 6. Firmware Version: 1.8
 7. Power Supply Check: OK
 8. The UUT was adjusted with the supplied sound calibrator at the reference sound pressure level before the calibration.

----- END -----



Calibration Certificate

Certificate No. **201032**

Page 1 of 2 Pages

Customer : Enovative Environmental Service Limited

Address : Room 23, 6/F, Block C, Goldfield Industrial Centre, Shatin, N.T.

Order No. : Q20449

Date of receipt : 8-Feb-22

Item Tested

Description : Sound Level Calibrator

Manufacturer : Rion

I.D. : --

Model : NC-74

Serial No. : 34678506

Test Conditions

Date of Test : 17-Feb-22

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02, IEC 60942.

Test Results

All results were within the IEC 60942 Class 1 specifications.


The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	106615	NIM-PRC & SCL-HKSAR
S240	Sound Level Calibrator	106446	NIM-PRC & SCL-HKSAR
S041	Universal Counter	101743	SCL-HKSAR
S206	Sound Level Meter	106447	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : 
Elva Chong

Approved by : 
Kin Wong

Date: 17-Feb-22



Calibration Certificate

Certificate No. 201032

Page 2 of 2 Pages

Results :

1. Generated Sound Pressure Level

UUT Nominal Value (dB)	Measured Value (dB)	IEC 60942 Class 1 Spec.
94.0	94.1	± 0.4 dB

Uncertainty : ± 0.2 dB

2. Short-term Level Fluctuation : 0.0 dB

IEC 60942 Class 1 Spec. : ± 0.1 dB

Uncertainty : ± 0.01 dB

3. Frequency

UUT Nominal Value (kHz)	Measured Value (kHz)	IEC 60942 Class 1 Spec.
1	1.000	± 1 %

Uncertainty : $\pm 3.6 \times 10^{-6}$

4. Total Distortion : < 0.9 %

IEC 60942 Class 1 Spec. : < 4 %

Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 1 012 hPa.

----- END -----

Appendix 5.5

Predicted Railway Noise Levels

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
N3	G/F	7.7	49	47	49	47
N4	G/F	7.9	49	47	49	47
	1/F	10.2	49	48	49	48
	2/F	12.4	50	48	49	48
PN2	G/F	11.0	44	N/A	44	N/A
	1/F	15.5	45	N/A	45	N/A
	2/F	20.0	45	N/A	45	N/A
	3/F	24.5	46	N/A	46	N/A
	4/F	29.0	47	N/A	46	N/A
	5/F	33.5	47	N/A	47	N/A
	6/F	38.0	48	N/A	48	N/A
	7/F	42.5	49	N/A	49	N/A
	8/F	47.0	50	N/A	49	N/A
PN3	1/F	11.0	46	44	45	44
	2/F	14.4	46	44	46	44
	3/F	17.7	47	45	46	45
	4/F	21.1	47	46	47	45
	5/F	24.5	48	46	47	46
	6/F	27.8	48	47	48	46
	7/F	31.2	49	48	49	47
	8/F	34.6	50	48	49	48
	9/F	38.0	50	49	50	48
	10/F	41.3	51	49	50	49
	11/F	44.7	51	50	51	50
	12/F	48.1	52	51	52	50
	13/F	51.4	53	51	52	51
	14/F	54.8	53	51	53	51
	15/F	58.2	53	52	53	51
	16/F	61.5	53	52	53	52
	17/F	64.9	54	52	53	52
	18/F	68.3	54	52	54	52
	19/F	71.7	54	52	54	52
	20/F	75.0	54	53	54	52
	21/F	78.4	54	53	54	52
	22/F	81.8	54	53	54	52
	23/F	85.1	54	53	54	53
	24/F	88.5	54	53	54	53
	25/F	91.9	54	53	54	53
	26/F	95.2	54	53	54	53
	27/F	98.6	54	53	54	52
	28/F	102.0	54	53	54	52
	29/F	105.3	54	53	54	52
	30/F	108.7	54	53	54	52

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
PN3	31/F	112.1	54	53	54	52
	32/F	115.5	54	53	54	52
	33/F	118.8	54	53	54	52
	34/F	122.2	54	53	54	52
	35/F	125.6	54	53	54	52
	36/F	128.9	54	53	54	52
	37/F	132.3	54	52	54	52
	38/F	135.7	54	52	54	52
	39/F	139.0	54	52	54	52
	40/F	142.4	54	52	53	52
	41/F	145.8	54	52	53	52
	42/F	149.2	54	52	53	52
	43/F	152.5	54	52	53	52
	44/F	155.9	54	52	53	52
	45/F	159.3	54	52	53	52
	46/F	162.6	54	52	53	52
	47/F	166.0	54	52	53	52
	48/F	169.4	54	52	53	52
	49/F	172.7	54	52	53	52
	50/F	176.1	54	52	53	51
PN4-1	1/F	12.0	47	45	46	44
	2/F	15.5	47	46	46	45
	3/F	18.9	46	45	45	44
	4/F	22.4	47	46	46	45
	5/F	25.8	49	47	48	46
	6/F	29.3	49	48	48	47
	7/F	32.8	50	49	49	48
	8/F	36.2	51	49	50	49
	9/F	39.7	52	50	50	49
	10/F	43.1	53	51	51	49
	11/F	46.6	53	51	51	50
	12/F	50.0	53	51	51	49
	13/F	53.5	54	52	50	49
14/F	57.0	53	51	50	48	
15/F	60.4	53	52	50	49	
16/F	63.9	53	52	51	49	
17/F	67.3	54	52	51	49	
18/F	70.8	53	52	51	50	
19/F	74.3	53	52	50	49	
20/F	77.7	53	52	50	49	
21/F	81.2	53	52	50	48	
22/F	84.6	53	52	50	49	
23/F	88.1	53	52	50	49	

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
PN4-1	24/F	91.5	52	51	50	49
	25/F	95.0	52	51	50	49
	26/F	98.5	53	51	50	49
	27/F	101.9	53	51	50	49
	28/F	105.4	53	51	50	49
	29/F	108.8	52	51	50	49
	30/F	112.3	53	51	50	49
	31/F	115.8	53	51	50	49
	32/F	119.2	52	51	50	49
	33/F	122.7	52	50	50	49
	34/F	126.1	52	50	50	49
	35/F	129.6	52	50	50	49
	36/F	133.0	52	50	50	49
	37/F	136.5	52	50	50	49
	38/F	140.0	52	50	50	49
	39/F	143.4	52	50	50	49
	40/F	146.9	52	50	50	49
	41/F	150.3	51	50	50	49
	42/F	153.8	51	50	50	49
	43/F	157.3	51	50	50	49
	44/F	160.7	51	50	50	49
	45/F	164.2	51	50	50	49
	46/F	167.6	51	50	50	49
	47/F	171.1	51	50	50	49
48/F	174.5	51	49	50	49	
49/F	178.0	51	49	50	48	
PN4-2	1/F	12.0	51	50	50	48
	2/F	15.5	50	49	49	47
	3/F	18.9	51	49	49	47
	4/F	22.4	51	49	49	47
	5/F	25.8	52	51	50	49
	6/F	29.3	53	52	51	50
	7/F	32.8	55	53	54	52
	8/F	36.2	56	55	55	53
	9/F	39.7	57	56	55	53
	10/F	43.1	58	56	55	53
	11/F	46.6	58	57	54	53
	12/F	50.0	58	57	53	52
	13/F	53.5	58	57	54	52
	14/F	57.0	59	57	54	52
	15/F	60.4	59	57	54	53
	16/F	63.9	58	57	53	52
	17/F	67.3	59	57	53	52

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
PN4-2	18/F	70.8	59	57	53	51
	19/F	74.3	59	57	53	52
	20/F	77.7	58	57	53	51
	21/F	81.2	57	56	53	52
	22/F	84.6	58	56	53	52
	23/F	88.1	58	56	53	51
	24/F	91.5	58	56	53	52
	25/F	95.0	58	56	53	52
	26/F	98.5	58	56	53	52
	27/F	101.9	57	56	53	52
	28/F	105.4	57	55	54	52
	29/F	108.8	57	55	54	52
	30/F	112.3	57	55	54	52
	31/F	115.8	56	55	54	52
	32/F	119.2	56	55	54	52
	33/F	122.7	56	55	54	52
	34/F	126.1	56	55	54	52
	35/F	129.6	56	55	54	52
	36/F	133.0	56	55	54	52
	37/F	136.5	56	55	54	52
	38/F	140.0	56	54	54	52
	39/F	143.4	56	54	54	52
	40/F	146.9	56	54	54	52
	41/F	150.3	56	54	54	52
	42/F	153.8	56	54	54	52
	43/F	157.3	56	54	54	52
	44/F	160.7	55	54	54	52
	45/F	164.2	55	54	54	52
	46/F	167.6	55	54	54	52
	47/F	171.1	55	54	53	52
	48/F	174.5	55	54	53	52
	49/F	178.0	55	54	53	52
PN4-3	1/F	12.0	48	46	46	44
	2/F	15.5	48	47	46	45
	3/F	18.9	48	46	46	44
	4/F	22.4	48	46	45	44
	5/F	25.8	49	47	46	45
	6/F	29.3	50	49	48	46
	7/F	32.8	53	51	52	50
	8/F	36.2	55	53	53	52
	9/F	39.7	56	55	53	52
	10/F	43.1	56	55	52	50
	11/F	46.6	56	55	51	49

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
PN4-3	12/F	50.0	56	54	50	49
	13/F	53.5	57	55	50	49
	14/F	57.0	57	55	50	48
	15/F	60.4	56	54	50	48
	16/F	63.9	56	55	49	48
	17/F	67.3	56	55	49	47
	18/F	70.8	56	55	49	48
	19/F	74.3	56	54	49	48
	20/F	77.7	55	54	49	48
	21/F	81.2	55	54	49	48
	22/F	84.6	55	54	49	48
	23/F	88.1	55	54	49	48
	24/F	91.5	55	54	50	48
	25/F	95.0	55	54	50	48
	26/F	98.5	54	53	50	49
	27/F	101.9	54	53	51	49
	28/F	105.4	54	53	51	49
	29/F	108.8	54	53	51	49
	30/F	112.3	54	53	51	49
	31/F	115.8	54	53	51	49
	32/F	119.2	54	53	51	50
	33/F	122.7	54	53	51	50
	34/F	126.1	54	53	51	50
	35/F	129.6	54	52	51	50
	36/F	133.0	54	52	51	50
	37/F	136.5	54	52	51	50
	38/F	140.0	54	52	51	50
	39/F	143.4	54	52	51	50
	40/F	146.9	54	52	51	50
	41/F	150.3	54	52	51	50
	42/F	153.8	54	52	51	50
	43/F	157.3	54	52	51	50
	44/F	160.7	53	52	51	50
	45/F	164.2	53	52	51	50
	46/F	167.6	53	52	51	50
	47/F	171.1	53	52	51	50
	48/F	174.5	53	52	51	50
	49/F	178.0	53	52	51	50
PN4-4	1/F	12.0	48	47	47	45
	2/F	15.5	48	47	46	45
	3/F	18.9	48	47	46	44
	4/F	22.4	48	47	46	45
	5/F	25.8	49	48	47	45

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
PN4-4	6/F	29.3	50	49	48	47
	7/F	32.8	52	51	51	49
	8/F	36.2	54	53	53	51
	9/F	39.7	55	53	53	51
	10/F	43.1	56	54	53	51
	11/F	46.6	56	54	52	51
	12/F	50.0	57	55	52	50
	13/F	53.5	57	55	51	50
	14/F	57.0	57	55	51	50
	15/F	60.4	57	56	51	50
	16/F	63.9	56	55	51	49
	17/F	67.3	57	55	51	49
	18/F	70.8	57	55	50	49
	19/F	74.3	57	55	50	49
	20/F	77.7	56	55	50	49
	21/F	81.2	56	54	50	49
	22/F	84.6	56	54	50	49
	23/F	88.1	56	54	50	49
	24/F	91.5	56	54	50	49
	25/F	95.0	56	54	50	49
	26/F	98.5	56	54	51	49
	27/F	101.9	56	54	51	49
	28/F	105.4	55	54	51	49
	29/F	108.8	55	54	51	50
	30/F	112.3	55	54	51	50
	31/F	115.8	55	54	51	50
	32/F	119.2	55	53	51	50
	33/F	122.7	55	53	51	50
	34/F	126.1	55	53	52	50
	35/F	129.6	55	53	52	50
	36/F	133.0	55	53	52	50
	37/F	136.5	55	53	52	50
	38/F	140.0	55	53	52	50
	39/F	143.4	55	53	52	50
	40/F	146.9	54	53	52	51
	41/F	150.3	54	53	52	51
	42/F	153.8	54	53	52	51
	43/F	157.3	54	53	52	51
	44/F	160.7	54	53	52	51
	45/F	164.2	54	53	52	51
	46/F	167.6	54	53	52	51
	47/F	171.1	54	53	52	51
	48/F	174.5	54	52	52	50

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
PN4-4	49/F	178.0	54	52	52	50
PN5-1	1/F	13.0	48	46	47	46
	2/F	16.4	48	47	48	46
	3/F	19.9	49	48	48	47
	4/F	23.3	50	48	49	48
	5/F	26.7	51	49	50	48
	6/F	30.2	51	50	51	49
	7/F	33.6	52	51	51	50
	8/F	37.0	53	51	52	50
	9/F	40.5	53	52	53	51
	10/F	43.9	54	52	53	52
	11/F	47.3	54	53	53	52
	12/F	50.8	55	53	54	52
	13/F	54.2	55	53	54	53
	14/F	57.7	55	54	54	53
	15/F	61.1	56	54	54	53
	16/F	64.5	56	54	54	53
	17/F	68.0	56	54	55	53
	18/F	71.4	56	54	54	53
	19/F	74.8	56	54	54	53
	20/F	78.3	56	55	55	53
	21/F	81.7	56	55	55	53
	22/F	85.1	56	55	55	53
	23/F	88.6	56	55	55	53
	24/F	92.0	56	54	55	53
	25/F	95.4	56	54	55	53
	26/F	98.9	56	55	55	53
	27/F	102.3	56	54	54	53
	28/F	105.7	56	55	54	53
	29/F	109.2	56	54	54	53
	30/F	112.6	56	54	54	53
	31/F	116.0	56	54	54	53
	32/F	119.5	56	54	54	53
	33/F	122.9	55	54	54	53
	34/F	126.3	55	54	54	53
	35/F	129.8	55	54	54	53
	36/F	133.2	55	54	54	53
	37/F	136.7	55	54	54	53
	38/F	140.1	55	54	54	52
	39/F	143.5	55	54	54	52
	40/F	147.0	55	54	54	52
	41/F	150.4	55	54	54	52
	42/F	153.8	55	54	54	52

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
PN5-1	43/F	157.3	55	54	54	52
	44/F	160.7	55	54	54	52
	45/F	164.1	55	54	54	52
	46/F	167.6	55	53	54	52
	47/F	171.0	55	53	54	52
	48/F	174.4	55	53	54	52
	49/F	177.9	55	53	54	52
PN5-2	1/F	13.0	49	47	48	47
	2/F	16.4	49	48	49	47
	3/F	19.9	50	48	50	48
	4/F	23.3	51	49	50	49
	5/F	26.7	51	50	51	50
	6/F	30.2	52	51	52	50
	7/F	33.6	53	51	52	51
	8/F	37.0	53	52	53	52
	9/F	40.5	54	52	54	52
	10/F	43.9	55	53	55	53
	11/F	47.3	55	54	55	54
	12/F	50.8	56	54	56	54
	13/F	54.2	56	55	56	54
	14/F	57.7	56	55	56	55
	15/F	61.1	57	55	56	55
	16/F	64.5	57	55	56	55
	17/F	68.0	57	55	56	55
	18/F	71.4	57	55	57	55
	19/F	74.8	57	55	57	55
	20/F	78.3	57	56	57	55
	21/F	81.7	57	56	57	55
	22/F	85.1	57	56	57	55
	23/F	88.6	57	55	57	55
	24/F	92.0	57	55	57	55
	25/F	95.4	57	55	57	55
	26/F	98.9	57	55	56	55
	27/F	102.3	57	55	56	55
	28/F	105.7	57	55	56	55
	29/F	109.2	57	55	56	55
	30/F	112.6	57	55	56	55
31/F	116.0	57	55	56	55	
32/F	119.5	57	55	56	55	
33/F	122.9	56	55	56	55	
34/F	126.3	56	55	56	55	
35/F	129.8	56	55	56	55	
36/F	133.2	56	55	56	54	

NSR ID	Floor	Floor Level, mPD	Predicted Railway $L_{eq,30min}$ Noise Levels ^[1,2] , dB(A)			
			Unmitigated Scenario		Mitigated Scenario	
			Day & Evening Time	Night-Time	Day & Evening Time	Night-Time
PN5-2	37/F	136.7	56	55	56	54
	38/F	140.1	56	55	56	54
	39/F	143.5	56	55	56	54
	40/F	147.0	56	55	56	54
	41/F	150.4	56	55	56	54
	42/F	153.8	56	54	56	54
	43/F	157.3	56	54	55	54
	44/F	160.7	56	54	55	54
	45/F	164.1	56	54	55	54
	46/F	167.6	56	54	55	54
	47/F	171.0	56	54	55	54
	48/F	174.4	55	54	55	54
	49/F	177.9	55	54	55	53
PN6	G/F	13.0	47	45	46	45
	1/F	16.4	47	46	47	45
	2/F	19.7	48	46	47	46
	3/F	23.1	48	47	48	46
	4/F	26.4	49	47	48	47
	5/F	29.8	49	48	49	47
	6/F	33.1	50	48	50	48
	7/F	36.5	50	49	50	49
	8/F	39.8	51	49	51	49
	9/F	43.2	51	50	51	50
	10/F	46.5	52	50	52	50
	11/F	49.9	52	51	52	51
	12/F	53.2	53	51	53	51
	13/F	56.6	53	52	53	52
	14/F	59.9	54	52	54	52
	15/F	63.3	54	53	54	53
	16/F	66.6	54	53	54	53
	17/F	70.0	55	53	54	53
	18/F	73.3	55	53	55	53
	19/F	76.7	55	53	55	53

Note:

[1] Based on the tentative station and platform conditions, the potential reverberation effect between station structures has been included for conservative assessment.

[2] Figures in **bold** indicate predicted noise exceedances of noise criteria.

Appendix 5.6

Maximum Allowable SWLs of the Planned Fixed Noise Sources

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
Fixed Noise Impact Assessment
Title: Maximum Allowable Sound Power Level for Planned Fixed Noise Sources and Noise Criteria

NSR ID	Land Use	ASR	Day and Evening Time Criteria			Night Time Criteria		
			Planned Fixed Noise Source		Cumulative Noise (Fixed Noise + Railway Noise)	Planned Fixed Noise Source		Cumulative Noise (Fixed Noise + Railway Noise)
			Prevailing Background Noise Level, dB(A)	ANL - 5, dB(A)	ANL, dB(A)	Prevailing Background Noise Level, dB(A)	ANL - 5, dB(A)	ANL, dB(A)
N3	Residential	A	50	55	60	48	45	50
N4	Residential	A	50	55	60	48	45	50
PN2 [2]	Education	B	-	60	65	-	-	55
PN3	Residential	B	-	60	65	-	50	55
PN4-1	Residential	B	-	60	65	-	50	55
PN4-2	Residential	B	-	60	65	-	50	55
PN4-3	Residential	B	-	60	65	-	50	55
PN4-4	Residential	B	-	60	65	-	50	55
PN5-1	Residential	B	-	60	65	-	50	55
PN5-2	Residential	B	-	60	65	-	50	55
PN6	Residential	B	-	60	65	-	50	55

Note:

[1] The bold figure represents the noise criteria to be adopted for the calculation of cumulative impact of planned fixed noise sources

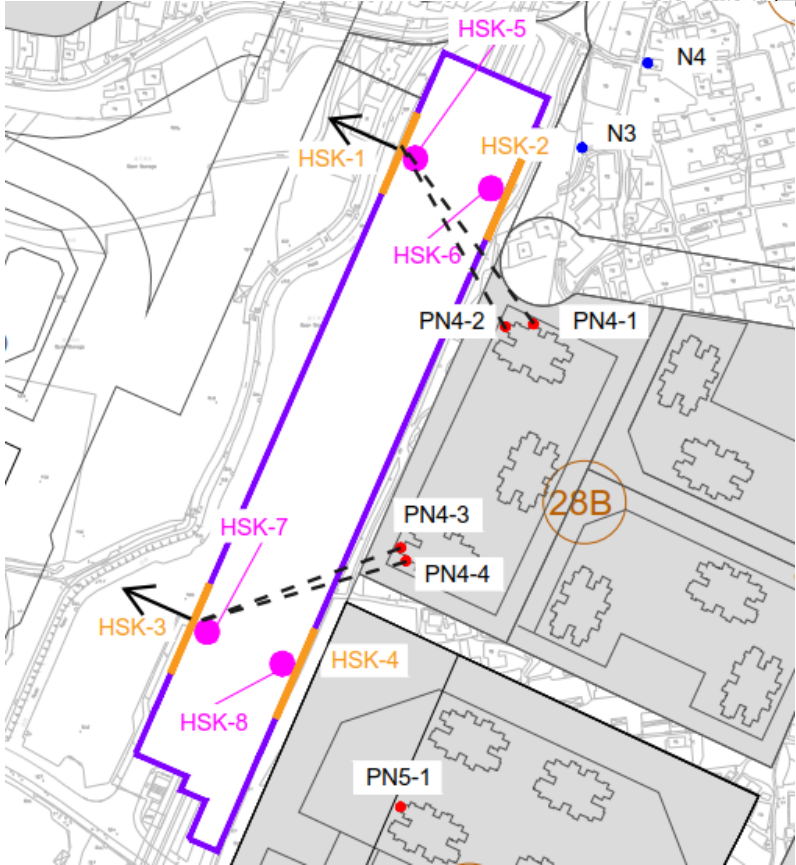
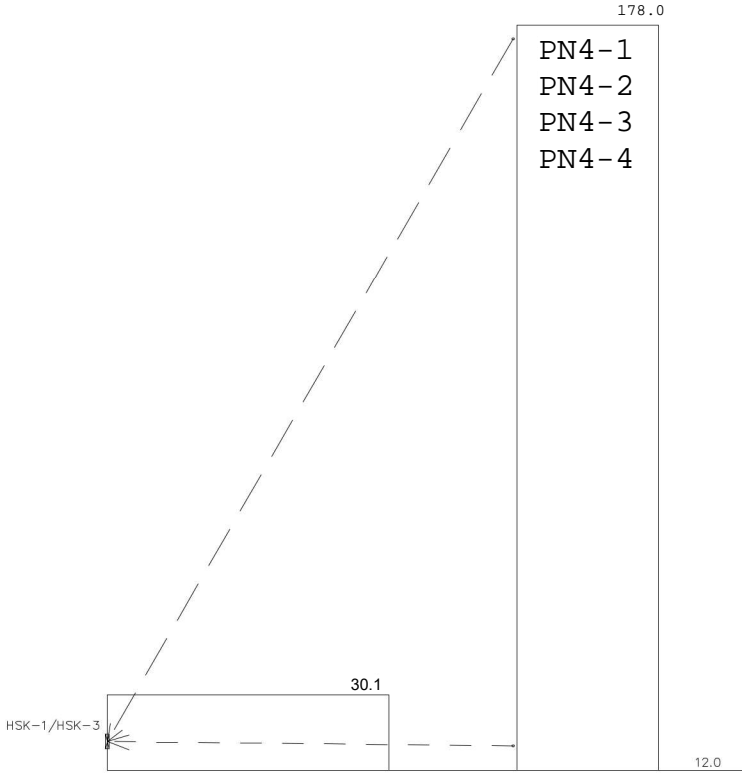
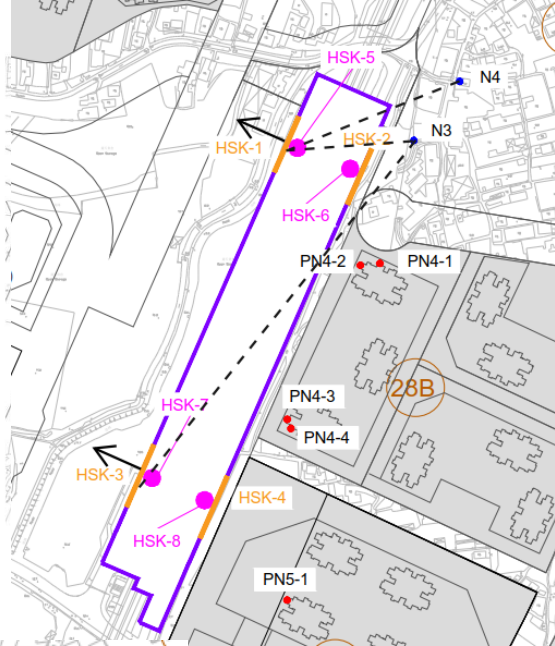
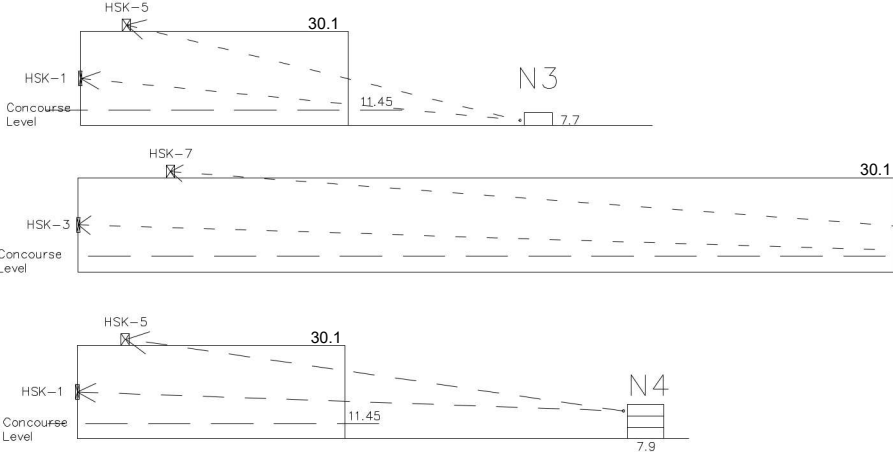
[2] Educational use is not considered to operate during night-time period.

Source Location	Source Description	Maximum Allowable SWL, dB(A)	
		Day & Evening Time	Night-Time
HSK-1	Side Louver	90	86
HSK-2	Side Louver	82	77
HSK-3	Side Louver	95	90
HSK-4	Side Louver	90	85
HSK-5	Rooftop Plant	90	86
HSK-6	Rooftop Plant	83	78
HSK-7	Rooftop Plant	95	86
HSK-8	Rooftop Plant	95	87
3-41	Planned Sewage Pumping Station	95	85
4-13a	Planned PTI	99	89
4-23	Planned Electricity Substation	89	79
4-29	Planned PTI	96	86

Note:

[1] Maximum Allowable SWL is proposed in order to comply with the noise criteria under cumulative impact of planned fixed noise sources.

Section Drawing



Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Fixed Noise Impact at N3 (Day and Evening)

ASR: A

Prevailing Background Noise 50 (At Façade)
 (Day/Evening)

Criterion (ANL-5): 55
 Criterion (ANL): 60

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	Background Noise	ANL	
									Distance	Façade	Tonality [2] [3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
N3	G/F	8.9	HSK-1	16.7	81	Y	81.7	90	-46	3	0	-10	37	50	49	53
			HSK-2	16.7	29	Y	29.8	82	-37	3	0	0	48			
			HSK-3	16.7	274	Y	274.0	95	-57	3	0	-10	31			
			HSK-4	16.7	262	Y	262.5	90	-56	3	0	0	37			
			HSK-5	31.2	80	Y	83.5	90	-46	3	0	-10	37			
			HSK-6	31.2	48	Y	53.3	83	-43	3	0	0	43			
			HSK-7	31.2	295	Y	296.1	95	-57	3	0	-10	31			
			HSK-8	31.2	288	Y	288.4	95	-57	3	0	0	41			
			3-41	20.0	478	N	478.0	0	0	0	0	0	0			
			4-13a	22.0	417	N	417.4	0	0	0	0	0	0			
			4-23	12.0	339	N	339.1	0	0	0	0	0	0			
			4-29	20.0	365	N	365.1	0	0	0	0	0	0			

Note:

[1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.

[2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.

[3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Fixed Noise Impact at N4 (Day and Evening)

ASR: A

Prevailing Background Noise (Day/Evening) 50 (At Façade)

Criterion (ANL-5): 55
 Criterion (ANL): 60

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	Background Noise		
									Distance	Facade	Tonality [2][3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	
																ANL
N4	2/F	13.6	HSK-1	16.7	113	Y	113.2	90	-49	3	0	-10	34	43	49	50
			HSK-2	16.7	75	Y	74.7	82	-45	3	0	0	40			
			HSK-3	16.7	325	N	325.5	0	0	0	0	0	0			
			HSK-4	16.7	313	N	313.5	0	0	0	0	0	0			
			HSK-5	31.2	121	Y	122.2	90	-50	3	0	-10	33			
			HSK-6	31.2	97	Y	98.7	83	-48	3	0	0	38			
			HSK-7	31.2	347	N	347.3	0	0	0	0	0	0			
			HSK-8	31.2	339	N	339.2	0	0	0	0	0	0			
			3-41	20.0	439	N	438.6	0	0	0	0	0	0			
			4-13a	22.0	463	N	462.9	0	0	0	0	0	0			
			4-23	12.0	303	N	302.8	0	0	0	0	0	0			
			4-29	20.0	410	N	410.1	0	0	0	0	0	0			

Note:

[1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.

[2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.

[3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN2 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)		Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
PN2	1/F	16.7	HSK-1	16.7	194	Y	193.5	90	-54	3	0	0	39	48	45	49
			HSK-2	16.7	231	Y	230.8	82	-55	3	0	-10	20			
			HSK-3	16.7	419	N	418.8	0	0	0	0	0	0			
			HSK-4	16.7	437	N	436.7	0	0	0	0	0	0			
			HSK-5	31.2	216	Y	216.5	90	-55	3	0	0	38			
			HSK-6	31.2	240	Y	240.8	83	-56	3	0	0	30			
			HSK-7	31.2	443	N	443.1	0	0	0	0	0	0			
			HSK-8	31.2	455	N	455.3	0	0	0	0	0	0			
			3-41	20.0	295	Y	295.3	95	-57	3	3	0	44			
			4-13a	22.0	449	N	449.5	0	0	0	0	0	0			
			4-23	12.0	166	Y	166.0	89	-52	3	3	0	43			
			4-29	20.0	574	N	574.1	0	0	0	0	0	0			
PN2	8/F	48.2	HSK-1	16.7	194	Y	196.1	90	-54	3	0	0	39	47	49	52
			HSK-2	16.7	231	Y	232.9	82	-55	3	0	-10	20			
			HSK-3	16.7	419	N	420.0	0	0	0	0	0	0			
			HSK-4	16.7	437	N	437.8	0	0	0	0	0	0			
			HSK-5	31.2	216	Y	216.7	90	-55	3	0	0	38			
			HSK-6	31.2	240	Y	241.0	83	-56	3	0	0	30			
			HSK-7	31.2	443	N	443.2	0	0	0	0	0	0			
			HSK-8	31.2	455	N	455.4	0	0	0	0	0	0			
			3-41	20.0	295	Y	296.6	95	-57	3	3	0	44			
			4-13a	22.0	449	N	450.2	0	0	0	0	0	0			
			4-23	12.0	166	Y	169.8	89	-53	3	3	0	42			
			4-29	20.0	574	N	574.8	0	0	0	0	0	0			

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN3 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)		Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
PN3	2/F	15.6	HSK-1	16.7	118	Y	117.8	90	-49	3	0	0	44	47	46	49
			HSK-2	16.7	161	Y	161.3	82	-52	3	0	-10	23			
			HSK-3	16.7	341	N	341.4	0	0	0	0	0	0			
			HSK-4	16.7	358	N	358.2	0	0	0	0	0	0			
			HSK-5	31.2	139	Y	140.2	90	-51	3	0	0	42			
			HSK-6	31.2	167	Y	168.1	83	-53	3	0	0	33			
			HSK-7	31.2	366	N	365.8	0	0	0	0	0	0			
			HSK-8	31.2	377	N	377.1	0	0	0	0	0	0			
			3-41	20.0	369	N	368.9	0	0	0	0	0	0			
			4-13a	22.0	390	N	389.9	0	0	0	0	0	0			
			4-23	12.0	232	Y	232.1	89	-55	3	3	0	40			
			4-29	20.0	496	N	496.1	0	0	0	0	0	0			
PN3	10/F	42.5	HSK-1	16.7	118	Y	120.6	90	-50	3	0	0	43	47	50	52
			HSK-2	16.7	161	Y	163.4	82	-52	3	0	-10	23			
			HSK-3	16.7	341	N	342.4	0	0	0	0	0	0			
			HSK-4	16.7	358	N	359.1	0	0	0	0	0	0			
			HSK-5	31.2	139	Y	139.8	90	-51	3	0	0	42			
			HSK-6	31.2	167	Y	167.7	83	-52	3	0	0	34			
			HSK-7	31.2	366	N	365.7	0	0	0	0	0	0			
			HSK-8	31.2	377	N	377.0	0	0	0	0	0	0			
			3-41	20.0	369	N	369.5	0	0	0	0	0	0			
			4-13a	22.0	390	N	390.3	0	0	0	0	0	0			
			4-23	12.0	232	Y	234.1	89	-55	3	3	0	40			
			4-29	20.0	496	N	496.6	0	0	0	0	0	0			

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN3 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5	Railway Noise, dB(A)	ANL	
									Distance	Façade	Tonality			Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
											[2]	[3]					
PN3	20/F	76.2	HSK-1	16.7	118	Y	132.0	90	-50	3	0	0	43	46	54	54	
			HSK-2	16.7	161	Y	172.0	82	-53	3	0	-10	22				
			HSK-3	16.7	341	N	346.6	0	0	0	0	0	0				
			HSK-4	16.7	358	N	363.1	0	0	0	0	0	0				
			HSK-5	31.2	139	Y	146.4	90	-51	3	0	0	42				
			HSK-6	31.2	167	Y	173.3	83	-53	3	0	0	33				
			HSK-7	31.2	366	N	368.3	0	0	0	0	0	0				
			HSK-8	31.2	377	N	379.5	0	0	0	0	0	0				
			3-41	20.0	369	N	373.1	0	0	0	0	0	0				
			4-13a	22.0	390	N	393.6	0	0	0	0	0	0				
			4-23	12.0	232	Y	240.8	89	-56	3	3	0	39				
4-29	20.0	496	N	499.2	0	0	0	0	0	0							
PN3	23/F	86.3	HSK-1	16.7	118	Y	136.8	90	-51	3	0	0	42	46	54	55	
			HSK-2	16.7	161	Y	175.7	82	-53	3	0	-10	22				
			HSK-3	16.7	341	N	348.4	0	0	0	0	0	0				
			HSK-4	16.7	358	N	364.9	0	0	0	0	0	0				
			HSK-5	31.2	139	Y	149.9	90	-52	3	0	0	41				
			HSK-6	31.2	167	Y	176.2	83	-53	3	0	0	33				
			HSK-7	31.2	366	N	369.6	0	0	0	0	0	0				
			HSK-8	31.2	377	N	380.8	0	0	0	0	0	0				
			3-41	20.0	369	N	374.7	0	0	0	0	0	0				
			4-13a	22.0	390	N	395.1	0	0	0	0	0	0				
			4-23	12.0	232	Y	243.7	89	-56	3	3	0	39				
4-29	20.0	496	N	500.5	0	0	0	0	0	0							

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN4-1 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5 Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	ANL Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
									Distance	Façade	Tonality [2] [3]	Screening [1]				
PN4-1	2/F	16.7	HSK-1	16.7	97	Y	96.9	90	-48	3	0	-10	35	49	46	51
			HSK-2	16.7	48	Y	48.2	82	-42	3	0	0	43			
			HSK-3	16.7	197	Y	197.2	95	-54	3	0	-10	34			
			HSK-4	16.7	178	Y	177.7	90	-53	3	0	-10	30			
			HSK-5	31.2	98	Y	99.0	90	-48	3	0	0	45			
			HSK-6	31.2	68	Y	69.6	83	-45	3	0	0	41			
			HSK-7	31.2	216	Y	216.9	95	-55	3	0	-10	33			
			HSK-8	31.2	204	Y	204.1	95	-54	3	0	-10	34			
			3-41	20.0	563	N	563.0	0	0	0	0	0	0			
			4-13a	22.0	369	N	369.3	0	0	0	0	0	0			
			4-23	12.0	423	N	423.0	0	0	0	0	0	0			
			4-29	20.0	278	Y	278.1	96	-57	3	3	-10	35			
PN4-1	10/F	44.3	HSK-1	16.7	97	Y	100.7	90	-48	3	0	-10	35	49	51	53
			HSK-2	16.7	48	Y	55.5	82	-43	3	0	0	42			
			HSK-3	16.7	197	Y	199.1	95	-54	3	0	-10	34			
			HSK-4	16.7	178	Y	179.9	90	-53	3	0	-10	30			
			HSK-5	31.2	98	Y	98.9	90	-48	3	0	0	45			
			HSK-6	31.2	68	Y	69.4	83	-45	3	0	0	41			
			HSK-7	31.2	216	Y	216.8	95	-55	3	0	-10	33			
			HSK-8	31.2	204	Y	204.0	95	-54	3	0	-10	34			
			3-41	20.0	563	N	563.5	0	0	0	0	0	0			
			4-13a	22.0	369	N	369.9	0	0	0	0	0	0			
			4-23	12.0	423	N	424.2	0	0	0	0	0	0			
			4-29	20.0	278	Y	279.1	96	-57	3	3	-10	35			
PN4-1	18/F	72	HSK-1	16.7	97	Y	111.5	90	-49	3	0	-10	34	48	51	53
			HSK-2	16.7	48	Y	73.4	82	-45	3	0	0	40			
			HSK-3	16.7	197	Y	204.8	95	-54	3	0	-10	34			
			HSK-4	16.7	178	Y	186.2	90	-53	3	0	-10	30			
			HSK-5	31.2	98	Y	106.1	90	-49	3	0	0	44			
			HSK-6	31.2	68	Y	79.4	83	-46	3	0	0	40			
			HSK-7	31.2	216	Y	220.2	95	-55	3	0	-10	33			
			HSK-8	31.2	204	Y	207.7	95	-54	3	0	-10	34			
			3-41	20.0	563	N	565.4	0	0	0	0	0	0			
			4-13a	22.0	369	N	372.6	0	0	0	0	0	0			
			4-23	12.0	423	N	427.2	0	0	0	0	0	0			
			4-29	20.0	278	Y	282.9	96	-57	3	3	-10	35			

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
Fixed Noise Impact Assessment
Title: Predicted Noise Impact at PN4-2 (Day and Evening)

ASR: B
Criterion (ANL-5): 60
Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)	
PN4-2	2/F	16.7	HSK-1	16.7	88	Y	88.3	90	-47	3	0	-10	36	52	49	53
			HSK-2	16.7	45	Y	45.2	82	-41	3	0	0	44			
			HSK-3	16.7	186	Y	186.1	95	-53	3	0	-10	35			
			HSK-4	16.7	169	Y	169.3	90	-53	3	0	0	40			
			HSK-5	31.2	92	Y	93.1	90	-47	3	0	0	46			
			HSK-6	31.2	67	Y	68.2	83	-45	3	0	0	41			
			HSK-7	31.2	206	Y	206.3	95	-54	3	0	0	44			
			HSK-8	31.2	195	Y	195.3	95	-54	3	0	0	44			
			3-41	20.0	565	N	565.0	0	0	0	0	0	0			
			4-13a	22.0	356	N	355.8	0	0	0	0	0	0			
			4-23	12.0	424	N	424.5	0	0	0	0	0	0			
			4-29	20.0	276	Y	276.1	96	-57	3	3	-10	35			
PN4-2	10/F	44.3	HSK-1	16.7	88	Y	92.5	90	-47	3	0	-10	36	51	55	57
			HSK-2	16.7	45	Y	52.9	82	-42	3	0	0	43			
			HSK-3	16.7	186	Y	188.1	95	-53	3	0	-10	35			
			HSK-4	16.7	169	Y	171.5	90	-53	3	0	0	40			
			HSK-5	31.2	92	Y	92.9	90	-47	3	0	0	46			
			HSK-6	31.2	67	Y	67.9	83	-45	3	0	0	41			
			HSK-7	31.2	206	Y	206.2	95	-54	3	0	0	44			
			HSK-8	31.2	195	Y	195.2	95	-54	3	0	0	44			
			3-41	20.0	565	N	565.5	0	0	0	0	0	0			
			4-13a	22.0	356	N	356.5	0	0	0	0	0	0			
			4-23	12.0	424	N	425.7	0	0	0	0	0	0			
			4-29	20.0	276	Y	277.1	96	-57	3	3	-10	35			

Note:
[1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
[2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
[3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN4-3 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)		Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
PN4-3	2/F	16.7	HSK-1	16.7	172.6	Y	172.6	90	-53	3	0	-10	30	57	46	57
			HSK-2	16.7	157	Y	156.7	82	-52	3	0	0	33			
			HSK-3	16.7	90	Y	90.3	95	-47	3	0	-10	41			
			HSK-4	16.7	54	Y	53.6	90	-43	3	0	0	50			
			HSK-5	31.2	188	Y	188.3	90	-53	3	0	0	40			
			HSK-6	31.2	178	Y	178.6	83	-53	3	0	0	33			
			HSK-7	31.2	102	Y	103.0	95	-48	3	0	0	50			
			HSK-8	31.2	80	Y	81.3	95	-46	3	0	0	52			
			3-41	20.0	676	N	675.7	0	0	0	0	0	0			
			4-13a	22.0	299	Y	299.0	99	-58	3	3	0	47			
			4-23	12.0	534	N	534.4	0	0	0	0	0	0			
			4-29	20.0	175	Y	175.0	96	-53	3	3	0	49			
PN4-3	8/F	37.4	HSK-1	16.7	173	Y	173.8	90	-53	3	0	-10	30	57	53	59
			HSK-2	16.7	157	Y	158.1	82	-52	3	0	0	33			
			HSK-3	16.7	90	Y	92.7	95	-47	3	0	-10	41			
			HSK-4	16.7	54	Y	57.5	90	-43	3	0	0	50			
			HSK-5	31.2	188	Y	187.8	90	-53	3	0	0	40			
			HSK-6	31.2	178	Y	178.1	83	-53	3	0	0	33			
			HSK-7	31.2	102	Y	102.1	95	-48	3	0	0	50			
			HSK-8	31.2	80	Y	80.2	95	-46	3	0	0	52			
			3-41	20.0	676	N	675.9	0	0	0	0	0	0			
			4-13a	22.0	299	Y	299.3	99	-58	3	3	0	47			
			4-23	12.0	534	N	535.0	0	0	0	0	0	0			
			4-29	20.0	175	Y	175.8	96	-53	3	3	0	49			

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN4-4 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5 Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	ANL Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
									Distance	Façade	Tonality [2] [3]	Screening [1]				
PN4-4	2/F	16.7	HSK-1	16.7	179	Y	178.9	90	-53	3	0	-10	30	57	46	57
			HSK-2	16.7	162	Y	162.1	82	-52	3	0	-10	23			
			HSK-3	16.7	92	Y	91.9	95	-47	3	0	-10	41			
			HSK-4	16.7	51	Y	51.3	90	-42	3	0	0	51			
			HSK-5	31.2	194	Y	194.4	90	-54	3	0	-10	29			
			HSK-6	31.2	183	Y	184.1	83	-53	3	0	-10	23			
			HSK-7	31.2	102	Y	103.0	95	-48	3	0	0	50			
			HSK-8	31.2	78	Y	79.0	95	-46	3	0	0	52			
			3-41	20.0	682	N	681.6	0	0	0	0	0	0			
			4-13a	22.0	302	N	302.2	0	0	0	0	0	0			
			4-23	12.0	540	N	540.3	0	0	0	0	0	0			
4-29	20.0	168	Y	168.3	96	-53	3	3	0	49						
PN4-4	9/F	40.9	HSK-1	16.7	179	Y	180.6	90	-53	3	0	-10	30	57	53	58
			HSK-2	16.7	162	Y	163.9	82	-52	3	0	-10	23			
			HSK-3	16.7	92	Y	95.0	95	-48	3	0	-10	40			
			HSK-4	16.7	51	Y	56.8	90	-43	3	0	0	50			
			HSK-5	31.2	194	Y	194.1	90	-54	3	0	-10	29			
			HSK-6	31.2	183	Y	183.8	83	-53	3	0	-10	23			
			HSK-7	31.2	102	Y	102.5	95	-48	3	0	0	50			
			HSK-8	31.2	78	Y	78.3	95	-46	3	0	0	52			
			3-41	20.0	682	N	681.9	0	0	0	0	0	0			
			4-13a	22.0	302	N	302.7	0	0	0	0	0	0			
			4-23	12.0	540	N	541.0	0	0	0	0	0	0			
4-29	20.0	168	Y	169.6	96	-53	3	3	0	49						

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN5-1 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5 Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	ANL Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
									Distance	Façade	Tonality [2] [3]	Screening [1]				
PN5-1	2/F	17.6	HSK-1	16.7	297	Y	297.3	90	-57	3	0	-10	26	54	48	55
			HSK-2	16.7	279	Y	278.9	82	-57	3	0	0	28			
			HSK-3	16.7	125	Y	124.9	95	-50	3	0	-10	38			
			HSK-4	16.7	71	Y	71.0	90	-45	3	0	0	48			
			HSK-5	31.2	312	N	312.7	0	0	0	0	0	0			
			HSK-6	31.2	301	N	300.9	0	0	0	0	0	0			
			HSK-7	31.2	126	Y	126.3	95	-50	3	0	0	48			
			HSK-8	31.2	89	Y	90.3	95	-47	3	0	0	51			
			3-41	20.0	800	N	799.7	0	0	0	0	0	0			
			4-13a	22.0	334	N	334.4	0	0	0	0	0	0			
4-23	12.0	658	N	658.5	0	0	0	0	0	0						
PN5-1	10/F	45.1	HSK-1	16.7	297	Y	298.6	90	-58	3	0	-10	25	54	53	57
			HSK-2	16.7	279	Y	280.4	82	-57	3	0	0	28			
			HSK-3	16.7	125	Y	128.1	95	-50	3	0	-10	38			
			HSK-4	16.7	71	Y	76.5	90	-46	3	0	0	47			
			HSK-5	31.2	312	N	312.8	0	0	0	0	0	0			
			HSK-6	31.2	301	N	300.9	0	0	0	0	0	0			
			HSK-7	31.2	126	Y	126.4	95	-50	3	0	0	48			
			HSK-8	31.2	89	Y	90.4	95	-47	3	0	0	51			
			3-41	20.0	800	N	800.1	0	0	0	0	0	0			
			4-13a	22.0	334	N	335.1	0	0	0	0	0	0			
4-23	12.0	658	N	659.3	0	0	0	0	0	0						

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
Fixed Noise Impact Assessment
Title: Predicted Noise Impact at PN5-1 (Day and Evening)

ASR: B
Criterion (ANL-5): 60
Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5 Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	ANL Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
									Distance	Façade	Tonality [2] [3]	Screening [1]				
PN5-1	20/F	79.5	HSK-1	16.7	297	Y	303.8	90	-58	3	0	-10	25	53	55	57
			HSK-2	16.7	279	Y	285.9	82	-57	3	0	0	28			
			HSK-3	16.7	125	Y	139.8	95	-51	3	0	-10	37			
			HSK-4	16.7	71	Y	94.8	90	-48	3	0	0	45			
			HSK-5	31.2	312	N	316.2	0	0	0	0	0	0			
			HSK-6	31.2	301	N	304.5	0	0	0	0	0	0			
			HSK-7	31.2	126	Y	134.6	95	-51	3	0	0	47			
			HSK-8	31.2	89	Y	101.5	95	-48	3	0	0	50			
			3-41	20.0	800	N	801.9	0	0	0	0	0	0			
			4-13a	22.0	334	N	339.3	0	0	0	0	0	0			
4-23	12.0	658	N	661.9	0	0	0	0	0	0						
PN5-1	24/F	93.2	HSK-1	16.7	297	Y	307.0	90	-58	3	0	-10	25	52	55	57
			HSK-2	16.7	279	Y	289.2	82	-57	3	0	0	28			
			HSK-3	16.7	125	Y	146.5	95	-51	3	0	-10	37			
			HSK-4	16.7	71	Y	104.4	90	-48	3	0	0	45			
			HSK-5	31.2	312	N	318.5	0	0	0	0	0	0			
			HSK-6	31.2	301	N	307.0	0	0	0	0	0	0			
			HSK-7	31.2	126	Y	140.1	95	-51	3	0	0	47			
			HSK-8	31.2	89	Y	108.7	95	-49	3	0	0	49			
			3-41	20.0	800	N	803.0	0	0	0	0	0	0			
			4-13a	22.0	334	N	341.8	0	0	0	0	0	0			
4-23	12.0	658	N	663.5	0	0	0	0	0	0						

Note:
[1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
[2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
[3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN5-2 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)		Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
PN5-2	2/F	17.6	HSK-1	16.7	370	N	370.1	0	0	0	0	0	50	49	53	
			HSK-2	16.7	356	N	356.1	0	0	0	0	0				
			HSK-3	16.7	155	Y	154.6	95	-52	3	0	-10				36
			HSK-4	16.7	118	Y	117.7	90	-49	3	0	0				44
			HSK-5	31.2	387	N	386.9	0	0	0	0	0				0
			HSK-6	31.2	378	N	377.9	0	0	0	0	0				0
			HSK-7	31.2	167	Y	167.3	95	-52	3	0	0				46
			HSK-8	31.2	143	Y	143.2	95	-51	3	0	0				47
			3-41	20.0	875	N	875.4	0	0	0	0	0				0
			4-13a	22.0	334	N	333.6	0	0	0	0	0				0
4-23	12.0	734	N	734.0	0	0	0	0	0	0						
PN5-2	10/F	45.1	HSK-1	16.7	370	N	371.2	0	0	0	0	0	50	55	56	
			HSK-2	16.7	356	N	357.3	0	0	0	0	0				
			HSK-3	16.7	155	Y	157.1	95	-52	3	0	-10				36
			HSK-4	16.7	118	Y	121.1	90	-50	3	0	0				43
			HSK-5	31.2	387	N	386.9	0	0	0	0	0				0
			HSK-6	31.2	378	N	377.9	0	0	0	0	0				0
			HSK-7	31.2	167	Y	167.3	95	-52	3	0	0				46
			HSK-8	31.2	143	Y	143.2	95	-51	3	0	0				47
			3-41	20.0	875	N	875.7	0	0	0	0	0				0
			4-13a	22.0	334	N	334.4	0	0	0	0	0				0
4-23	12.0	734	N	734.7	0	0	0	0	0	0						
PN5-2	20/F	79.5	HSK-1	16.7	370	N	375.4	0	0	0	0	0	50	57	58	
			HSK-2	16.7	356	N	361.6	0	0	0	0	0				
			HSK-3	16.7	155	Y	166.8	95	-52	3	0	-10				36
			HSK-4	16.7	118	Y	133.4	90	-51	3	0	0				42
			HSK-5	31.2	387	N	389.6	0	0	0	0	0				0
			HSK-6	31.2	378	N	380.7	0	0	0	0	0				0
			HSK-7	31.2	167	Y	173.6	95	-53	3	0	0				45
			HSK-8	31.2	143	Y	150.5	95	-52	3	0	0				46
			3-41	20.0	875	N	877.4	0	0	0	0	0				0
			4-13a	22.0	334	N	338.5	0	0	0	0	0				0
4-23	12.0	734	N	737.1	0	0	0	0	0	0						

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN6 (Day and Evening)

ASR: B
 Criterion (ANL-5): 60
 Criterion (ANL): 65

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Day and Evening	Correction, dB(A)				Predicted SPL, dB(A) Day/Evening	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)		Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
PN6	1/F	17.6	HSK-1	16.7	583	N	583.5	0	0	0	0	0	49	47	51	
			HSK-2	16.7	596	N	595.8	0	0	0	0	0				
			HSK-3	16.7	383	N	382.7	0	0	0	0	0				
			HSK-4	16.7	402	N	401.9	0	0	0	0	0				
			HSK-5	31.2	605	N	604.8	0	0	0	0	0				
			HSK-6	31.2	614	N	613.7	0	0	0	0	0				
			HSK-7	31.2	362	N	361.8	0	0	0	0	0				
			HSK-8	31.2	375	N	375.7	0	0	0	0	0				
			3-41	20.0	1069	N	1068.7	0	0	0	0	0				
			4-13a	22.0	244	Y	244.4	99	-56	3	3	0				49
			4-23	12.0	932	N	931.9	0	0	0	0	0				0
			4-29	20.0	310	N	310.3	0	0	0	0	0				0
PN6	10/F	47.7	HSK-1	16.7	583	N	584.3	0	0	0	0	0	49	52	54	
			HSK-2	16.7	596	N	596.6	0	0	0	0	0				
			HSK-3	16.7	383	N	384.0	0	0	0	0	0				
			HSK-4	16.7	402	N	403.1	0	0	0	0	0				
			HSK-5	31.2	605	N	604.8	0	0	0	0	0				
			HSK-6	31.2	614	N	613.8	0	0	0	0	0				
			HSK-7	31.2	362	N	361.9	0	0	0	0	0				
			HSK-8	31.2	375	N	375.8	0	0	0	0	0				
			3-41	20.0	1069	N	1069.1	0	0	0	0	0				
			4-13a	22.0	244	Y	245.7	99	-56	3	3	0				49
			4-23	12.0	932	N	932.5	0	0	0	0	0				0
			4-29	20.0	310	N	311.5	0	0	0	0	0				0
PN6	19/F	77.9	HSK-1	16.7	583	N	586.7	0	0	0	0	0	49	55	56	
			HSK-2	16.7	596	N	598.9	0	0	0	0	0				
			HSK-3	16.7	383	N	387.6	0	0	0	0	0				
			HSK-4	16.7	402	N	406.5	0	0	0	0	0				
			HSK-5	31.2	605	N	606.4	0	0	0	0	0				
			HSK-6	31.2	614	N	615.3	0	0	0	0	0				
			HSK-7	31.2	362	N	364.5	0	0	0	0	0				
			HSK-8	31.2	375	N	378.4	0	0	0	0	0				
			3-41	20.0	1069	N	1070.3	0	0	0	0	0				
			4-13a	22.0	244	Y	250.7	99	-56	3	3	0				49
			4-23	12.0	932	N	934.2	0	0	0	0	0				0
			4-29	20.0	310	N	315.6	0	0	0	0	0				0

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Fixed Noise Impact at N3 (Night-Time)

ASR: A

Prevailing Background Noise 48 (At Façade)
 (Day/Evening)

Criterion (ANL-5): 45
 Criterion (ANL): 50

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	Background Noise	ANL	
									Distance	Façade	Tonality [2] [3]	Screening [1]	Night	Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
N3	G/F	8.9	HSK-1	16.7	81	Y	81.7	86	-46	3	0	-10	33	45	47	49
			HSK-2	16.7	29	Y	29.8	77	-37	3	0	0	43			
			HSK-3	16.7	274	Y	274.0	90	-57	3	0	-10	26			
			HSK-4	16.7	262	Y	262.5	85	-56	3	0	0	32			
			HSK-5	31.2	80	Y	83.5	86	-46	3	0	-10	33			
			HSK-6	31.2	48	Y	53.3	78	-43	3	0	0	38			
			HSK-7	31.2	295	Y	296.1	86	-57	3	0	-10	22			
			HSK-8	31.2	288	Y	288.4	87	-57	3	0	0	33			
			3-41	20.0	478	N	478.0	0	0	0	0	0	0			
			4-13a	22.0	417	N	417.4	0	0	0	0	0	0			
			4-23	12.0	339	N	339.1	0	0	0	0	0	0			
			4-29	20.0	365	N	365.1	0	0	0	0	0	0			

Note:

[1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.

[2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.

[3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Fixed Noise Impact at N4 (Night-Time)

ASR: A

Prevailing Background Noise (Day/Evening) 48 (At Façade)

Criterion (ANL-5): 45
 Criterion (ANL): 50

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A) Night	Background Noise Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	ANL Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
									Distance	Facade	Tonality [2][3]	Screening [1]				
N4	2/F	13.6	HSK-1	16.7	113	Y	113.2	86	-49	3	0	-10	30	38	48	48
			HSK-2	16.7	75	Y	74.7	77	-45	3	0	0	35			
			HSK-3	16.7	325	N	325.5	0	0	0	0	0	0			
			HSK-4	16.7	313	N	313.5	0	0	0	0	0	0			
			HSK-5	31.2	121	Y	122.2	86	-50	3	0	-10	29			
			HSK-6	31.2	97	Y	98.7	78	-48	3	0	0	33			
			HSK-7	31.2	347	N	347.3	0	0	0	0	0	0			
			HSK-8	31.2	339	N	339.2	0	0	0	0	0	0			
			3-41	20.0	439	N	438.6	0	0	0	0	0	0			
			4-13a	22.0	463	N	462.9	0	0	0	0	0	0			
			4-23	12.0	303	N	302.8	0	0	0	0	0	0			
4-29	20.0	410	N	410.1	0	0	0	0	0	0						

Note:

[1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.

[2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.

[3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN3 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality					
											[2]	[3]				
PN3	2/F	15.6	HSK-1	16.7	118	Y	117.8	86	-49	3	0	0	40	42	44	46
			HSK-2	16.7	161	Y	161.3	77	-52	3	0	-10	18			
			HSK-3	16.7	341	N	341.4	0	0	0	0	0	0			
			HSK-4	16.7	358	N	358.2	0	0	0	0	0	0			
			HSK-5	31.2	139	Y	140.2	86	-51	3	0	0	38			
			HSK-6	31.2	167	Y	168.1	78	-53	3	0	0	28			
			HSK-7	31.2	366	N	365.8	0	0	0	0	0	0			
			HSK-8	31.2	377	N	377.1	0	0	0	0	0	0			
			3-41	20.0	369	N	368.9	0	0	0	0	0	0			
			4-13a	22.0	390	N	389.9	0	0	0	0	0	0			
			4-23	12.0	232	Y	232.1	79	-55	3	3	0	30			
			4-29	20.0	496	N	496.1	0	0	0	0	0	0			
PN3	10/F	42.5	HSK-1	16.7	118	Y	120.6	86	-50	3	0	0	39	42	49	50
			HSK-2	16.7	161	Y	163.4	77	-52	3	0	-10	18			
			HSK-3	16.7	341	N	342.4	0	0	0	0	0	0			
			HSK-4	16.7	358	N	359.1	0	0	0	0	0	0			
			HSK-5	31.2	139	Y	139.8	86	-51	3	0	0	38			
			HSK-6	31.2	167	Y	167.7	78	-52	3	0	0	29			
			HSK-7	31.2	366	N	365.7	0	0	0	0	0	0			
			HSK-8	31.2	377	N	377.0	0	0	0	0	0	0			
			3-41	20.0	369	N	369.5	0	0	0	0	0	0			
			4-13a	22.0	390	N	390.3	0	0	0	0	0	0			
			4-23	12.0	232	Y	234.1	79	-55	3	3	0	30			
			4-29	20.0	496	N	496.6	0	0	0	0	0	0			

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
Fixed Noise Impact Assessment
Title: Predicted Noise Impact at PN3 (Night-Time)

ASR: B
Criterion (ANL-5): 50
Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality					
											[2]	[3]				
PN3	20/F	76.2	HSK-1	16.7	118	Y	132.0	86	-50	3	0	0	39	42	52	53
			HSK-2	16.7	161	Y	172.0	77	-53	3	0	-10	17			
			HSK-3	16.7	341	N	346.6	0	0	0	0	0	0			
			HSK-4	16.7	358	N	363.1	0	0	0	0	0	0			
			HSK-5	31.2	139	Y	146.4	86	-51	3	0	0	38			
			HSK-6	31.2	167	Y	173.3	78	-53	3	0	0	28			
			HSK-7	31.2	366	N	368.3	0	0	0	0	0	0			
			HSK-8	31.2	377	N	379.5	0	0	0	0	0	0			
			3-41	20.0	369	N	373.1	0	0	0	0	0	0			
			4-13a	22.0	390	N	393.6	0	0	0	0	0	0			
			4-23	12.0	232	Y	240.8	79	-56	3	3	0	29			
			4-29	20.0	496	N	499.2	0	0	0	0	0	0			
PN3	23/F	86.3	HSK-1	16.7	118	Y	136.8	86	-51	3	0	0	38	41	53	53
			HSK-2	16.7	161	Y	175.7	77	-53	3	0	-10	17			
			HSK-3	16.7	341	N	348.4	0	0	0	0	0	0			
			HSK-4	16.7	358	N	364.9	0	0	0	0	0	0			
			HSK-5	31.2	139	Y	149.9	86	-52	3	0	0	37			
			HSK-6	31.2	167	Y	176.2	78	-53	3	0	0	28			
			HSK-7	31.2	366	N	369.6	0	0	0	0	0	0			
			HSK-8	31.2	377	N	380.8	0	0	0	0	0	0			
			3-41	20.0	369	N	374.7	0	0	0	0	0	0			
			4-13a	22.0	390	N	395.1	0	0	0	0	0	0			
			4-23	12.0	232	Y	243.7	79	-56	3	3	0	29			
			4-29	20.0	496	N	500.5	0	0	0	0	0	0			

Note:
[1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
[2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
[3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN4-1 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A) Night	ANL-5 Cumulative Planned Fixed Noise Impact, dB(A)	Railway Noise, dB(A)	ANL Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)	
									Distance	Façade	Tonality						Screening [1]
											[2]	[3]					
PN4-1	2/F	16.7	HSK-1	16.7	97	Y	96.9	86	-48	3	0	-10	31	44	45	47	
			HSK-2	16.7	48	Y	48.2	77	-42	3	0	0	38				
			HSK-3	16.7	197	Y	197.2	90	-54	3	0	-10	29				
			HSK-4	16.7	178	Y	177.7	85	-53	3	0	-10	25				
			HSK-5	31.2	98	Y	99.0	86	-48	3	0	0	41				
			HSK-6	31.2	68	Y	69.6	78	-45	3	0	0	36				
			HSK-7	31.2	216	Y	216.9	86	-55	3	0	-10	24				
			HSK-8	31.2	204	Y	204.1	87	-54	3	0	-10	26				
			3-41	20.0	563	N	563.0	0	0	0	0	0	0				
			4-13a	22.0	369	N	369.3	0	0	0	0	0	0				
			4-23	12.0	423	N	423.0	0	0	0	0	0	0				
			4-29	20.0	278	Y	278.1	86	-57	3	3	-10	25				
PN4-1	10/F	44.3	HSK-1	16.7	97	Y	100.7	86	-48	3	0	-10	31	44	49	51	
			HSK-2	16.7	48	Y	55.5	77	-43	3	0	0	37				
			HSK-3	16.7	197	Y	199.1	90	-54	3	0	-10	29				
			HSK-4	16.7	178	Y	179.9	85	-53	3	0	-10	25				
			HSK-5	31.2	98	Y	98.9	86	-48	3	0	0	41				
			HSK-6	31.2	68	Y	69.4	78	-45	3	0	0	36				
			HSK-7	31.2	216	Y	216.8	86	-55	3	0	-10	24				
			HSK-8	31.2	204	Y	204.0	87	-54	3	0	-10	26				
			3-41	20.0	563	N	563.5	0	0	0	0	0	0				
			4-13a	22.0	369	N	369.9	0	0	0	0	0	0				
			4-23	12.0	423	N	424.2	0	0	0	0	0	0				
			4-29	20.0	278	Y	279.1	86	-57	3	3	-10	25				
PN4-1	18/F	72.0	HSK-1	16.7	97	Y	111.5	86	-49	3	0	-10	30	43	50	51	
			HSK-2	16.7	48	Y	73.4	77	-45	3	0	0	35				
			HSK-3	16.7	197	Y	204.8	90	-54	3	0	-10	29				
			HSK-4	16.7	178	Y	186.2	85	-53	3	0	-10	25				
			HSK-5	31.2	98	Y	106.1	86	-49	3	0	0	40				
			HSK-6	31.2	68	Y	79.4	78	-46	3	0	0	35				
			HSK-7	31.2	216	Y	220.2	86	-55	3	0	-10	24				
			HSK-8	31.2	204	Y	207.7	87	-54	3	0	-10	26				
			3-41	20.0	563	N	565.4	0	0	0	0	0	0				
			4-13a	22.0	369	N	372.6	0	0	0	0	0	0				
			4-23	12.0	423	N	427.2	0	0	0	0	0	0				
			4-29	20.0	278	Y	282.9	86	-57	3	3	-10	25				

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN4-2 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]	Night	Cumulative Planned Fixed Noise Impact, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)	
PN4-2	2/F	16.7	HSK-1	16.7	88	Y	88.3	86	-47	3	0	-10	32	46	47	50
			HSK-2	16.7	45	Y	45.2	77	-41	3	0	0	39			
			HSK-3	16.7	186	Y	186.1	90	-53	3	0	-10	30			
			HSK-4	16.7	169	Y	169.3	85	-53	3	0	0	35			
			HSK-5	31.2	92	Y	93.1	86	-47	3	0	0	42			
			HSK-6	31.2	67	Y	68.2	78	-45	3	0	0	36			
			HSK-7	31.2	206	Y	206.3	86	-54	3	0	0	35			
			HSK-8	31.2	195	Y	195.3	87	-54	3	0	0	36			
			3-41	20.0	565	N	565.0	0	0	0	0	0	0			
			4-13a	22.0	356	N	355.8	0	0	0	0	0	0			
			4-23	12.0	424	N	424.5	0	0	0	0	0	0			
			4-29	20.0	276	Y	276.1	86	-57	3	3	-10	25			
PN4-2	10/F	44.3	HSK-1	16.7	88	Y	92.5	86	-47	3	0	-10	32	46	53	54
			HSK-2	16.7	45	Y	52.9	77	-42	3	0	0	38			
			HSK-3	16.7	186	Y	188.1	90	-53	3	0	-10	30			
			HSK-4	16.7	169	Y	171.5	85	-53	3	0	0	35			
			HSK-5	31.2	92	Y	92.9	86	-47	3	0	0	42			
			HSK-6	31.2	67	Y	67.9	78	-45	3	0	0	36			
			HSK-7	31.2	206	Y	206.2	86	-54	3	0	0	35			
			HSK-8	31.2	195	Y	195.2	87	-54	3	0	0	36			
			3-41	20.0	565	N	565.5	0	0	0	0	0	0			
			4-13a	22.0	356	N	356.5	0	0	0	0	0	0			
			4-23	12.0	424	N	425.7	0	0	0	0	0	0			
			4-29	20.0	276	Y	277.1	86	-57	3	3	-10	25			

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN4-3 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality		Screening [1]	Night	Cumulative Planned Fixed Noise Impact, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
											[2]	[3]				
PN4-3	2/F	16.7	HSK-1	16.7	172.6	Y	172.6	86	-53	3	0	-10	26	50	45	51
			HSK-2	16.7	157	Y	156.7	77	-52	3	0	0	28			
			HSK-3	16.7	90	Y	90.3	90	-47	3	0	-10	36			
			HSK-4	16.7	54	Y	53.6	85	-43	3	0	0	45			
			HSK-5	31.2	188	Y	188.3	86	-53	3	0	0	36			
			HSK-6	31.2	178	Y	178.6	78	-53	3	0	0	28			
			HSK-7	31.2	102	Y	103.0	86	-48	3	0	0	41			
			HSK-8	31.2	80	Y	81.3	87	-46	3	0	0	44			
			3-41	20.0	676	N	675.7	0	0	0	0	0	0			
			4-13a	22.0	299	Y	299.0	89	-58	3	3	0	37			
			4-23	12.0	534	N	534.4	0	0	0	0	0	0			
			4-29	20.0	175	Y	175.0	86	-53	3	3	0	39			
PN4-3	8/F	37.4	HSK-1	16.7	173	Y	173.8	86	-53	3	0	-10	26	50	52	54
			HSK-2	16.7	157	Y	158.1	77	-52	3	0	0	28			
			HSK-3	16.7	90	Y	92.7	90	-47	3	0	-10	36			
			HSK-4	16.7	54	Y	57.5	85	-43	3	0	0	45			
			HSK-5	31.2	188	Y	187.8	86	-53	3	0	0	36			
			HSK-6	31.2	178	Y	178.1	78	-53	3	0	0	28			
			HSK-7	31.2	102	Y	102.1	86	-48	3	0	0	41			
			HSK-8	31.2	80	Y	80.2	87	-46	3	0	0	44			
			3-41	20.0	676	N	675.9	0	0	0	0	0	0			
			4-13a	22.0	299	Y	299.3	89	-58	3	3	0	37			
			4-23	12.0	534	N	535.0	0	0	0	0	0	0			
			4-29	20.0	175	Y	175.8	86	-53	3	3	0	39			

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN4-4 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality		Screening [1]	Night	Cumulative Planned Fixed Noise Impact, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
											[2]	[3]				
PN4-4	2/F	16.7	HSK-1	16.7	179	Y	178.9	86	-53	3	0	-10	26	49	45	51
			HSK-2	16.7	162	Y	162.1	77	-52	3	0	-10	18			
			HSK-3	16.7	92	Y	91.9	90	-47	3	0	-10	36			
			HSK-4	16.7	51	Y	51.3	85	-42	3	0	0	46			
			HSK-5	31.2	194	Y	194.4	86	-54	3	0	-10	25			
			HSK-6	31.2	183	Y	184.1	78	-53	3	0	-10	18			
			HSK-7	31.2	102	Y	103.0	86	-48	3	0	0	41			
			HSK-8	31.2	78	Y	79.0	87	-46	3	0	0	44			
			3-41	20.0	682	N	681.6	0	0	0	0	0	0			
			4-13a	22.0	302	N	302.2	0	0	0	0	0	0			
			4-23	12.0	540	N	540.3	0	0	0	0	0	0			
			4-29	20.0	168	Y	168.3	86	-53	3	3	0	39			
PN4-4	9/F	40.9	HSK-1	16.7	179	Y	180.6	86	-53	3	0	-10	26	49	51	53
			HSK-2	16.7	162	Y	163.9	77	-52	3	0	-10	18			
			HSK-3	16.7	92	Y	95.0	90	-48	3	0	-10	35			
			HSK-4	16.7	51	Y	56.8	85	-43	3	0	0	45			
			HSK-5	31.2	194	Y	194.1	86	-54	3	0	-10	25			
			HSK-6	31.2	183	Y	183.8	78	-53	3	0	-10	18			
			HSK-7	31.2	102	Y	102.5	86	-48	3	0	0	41			
			HSK-8	31.2	78	Y	78.3	87	-46	3	0	0	44			
			3-41	20.0	682	N	681.9	0	0	0	0	0	0			
			4-13a	22.0	302	N	302.7	0	0	0	0	0	0			
			4-23	12.0	540	N	541.0	0	0	0	0	0	0			
			4-29	20.0	168	Y	169.6	86	-53	3	3	0	39			

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN5-1 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]	Night	Cumulative Planned Fixed Noise Impact, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)	
PN5-1	2/F	17.6	HSK-1	16.7	297	Y	297.3	86	-57	3	0	-10	22	47	46	50
			HSK-2	16.7	279	Y	278.9	77	-57	3	0	0	23			
			HSK-3	16.7	125	Y	124.9	90	-50	3	0	-10	33			
			HSK-4	16.7	71	Y	71.0	85	-45	3	0	0	43			
			HSK-5	31.2	312	N	312.7	0	0	0	0	0	0			
			HSK-6	31.2	301	N	300.9	0	0	0	0	0	0			
			HSK-7	31.2	126	Y	126.3	86	-50	3	0	0	39			
			HSK-8	31.2	89	Y	90.3	87	-47	3	0	0	43			
			3-41	20.0	800	N	799.7	0	0	0	0	0	0			
			4-13a	22.0	334	N	334.4	0	0	0	0	0	0			
4-23	12.0	658	N	658.5	0	0	0	0	0	0						
PN5-1	10/F	45.1	HSK-1	16.7	297	Y	298.6	86	-58	3	0	-10	21	47	52	53
			HSK-2	16.7	279	Y	280.4	77	-57	3	0	0	23			
			HSK-3	16.7	125	Y	128.1	90	-50	3	0	-10	33			
			HSK-4	16.7	71	Y	76.5	85	-46	3	0	0	42			
			HSK-5	31.2	312	N	312.8	0	0	0	0	0	0			
			HSK-6	31.2	301	N	300.9	0	0	0	0	0	0			
			HSK-7	31.2	126	Y	126.4	86	-50	3	0	0	39			
			HSK-8	31.2	89	Y	90.4	87	-47	3	0	0	43			
			3-41	20.0	800	N	800.1	0	0	0	0	0	0			
			4-13a	22.0	334	N	335.1	0	0	0	0	0	0			
4-23	12.0	658	N	659.3	0	0	0	0	0	0						

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN5-1 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]	Night	Cumulative Planned Fixed Noise Impact, dB(A)	Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)	
PN5-1	20/F	79.5	HSK-1	16.7	297	Y	303.8	86	-58	3	0	-10	21	45	53	54
			HSK-2	16.7	279	Y	285.9	77	-57	3	0	0	23			
			HSK-3	16.7	125	Y	139.8	90	-51	3	0	-10	32			
			HSK-4	16.7	71	Y	94.8	85	-48	3	0	0	40			
			HSK-5	31.2	312	N	316.2	0	0	0	0	0	0			
			HSK-6	31.2	301	N	304.5	0	0	0	0	0	0			
			HSK-7	31.2	126	Y	134.6	86	-51	3	0	0	38			
			HSK-8	31.2	89	Y	101.5	87	-48	3	0	0	42			
			3-41	20.0	800	N	801.9	0	0	0	0	0	0			
			4-13a	22.0	334	N	339.3	0	0	0	0	0	0			
4-23	12.0	658	N	661.9	0	0	0	0	0	0						
PN5-1	24/F	93.2	HSK-1	16.7	297	Y	307.0	86	-58	3	0	-10	21	45	53	54
			HSK-2	16.7	279	Y	289.2	77	-57	3	0	0	23			
			HSK-3	16.7	125	Y	146.5	90	-51	3	0	-10	32			
			HSK-4	16.7	71	Y	104.4	85	-48	3	0	0	40			
			HSK-5	31.2	312	N	318.5	0	0	0	0	0	0			
			HSK-6	31.2	301	N	307.0	0	0	0	0	0	0			
			HSK-7	31.2	126	Y	140.1	86	-51	3	0	0	38			
			HSK-8	31.2	89	Y	108.7	87	-49	3	0	0	41			
			3-41	20.0	800	N	803.0	0	0	0	0	0	0			
			4-13a	22.0	334	N	341.8	0	0	0	0	0	0			
4-23	12.0	658	N	663.5	0	0	0	0	0	0						

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN5-2 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A)	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]				
													Night			
PN5-2	2/F	17.6	HSK-1	16.7	370	N	370.1	0	0	0	0	0	43	47	49	
			HSK-2	16.7	356	N	356.1	0	0	0	0	0				
			HSK-3	16.7	155	Y	154.6	90	-52	3	0	-10				31
			HSK-4	16.7	118	Y	117.7	85	-49	3	0	0				39
			HSK-5	31.2	387	N	386.9	0	0	0	0	0				0
			HSK-6	31.2	378	N	377.9	0	0	0	0	0				0
			HSK-7	31.2	167	Y	167.3	86	-52	3	0	0				37
			HSK-8	31.2	143	Y	143.2	87	-51	3	0	0				39
			3-41	20.0	875	N	875.4	0	0	0	0	0				0
			4-13a	22.0	334	N	333.6	0	0	0	0	0				0
4-23	12.0	734	N	734.0	0	0	0	0	0	0						
PN5-2	10/F	45.1	HSK-1	16.7	370	N	371.2	0	0	0	0	0	43	53	53	
			HSK-2	16.7	356	N	357.3	0	0	0	0	0				
			HSK-3	16.7	155	Y	157.1	90	-52	3	0	-10				31
			HSK-4	16.7	118	Y	121.1	85	-50	3	0	0				38
			HSK-5	31.2	387	N	386.9	0	0	0	0	0				0
			HSK-6	31.2	378	N	377.9	0	0	0	0	0				0
			HSK-7	31.2	167	Y	167.3	86	-52	3	0	0				37
			HSK-8	31.2	143	Y	143.2	87	-51	3	0	0				39
			3-41	20.0	875	N	875.7	0	0	0	0	0				0
			4-13a	22.0	334	N	334.4	0	0	0	0	0				0
4-23	12.0	734	N	734.7	0	0	0	0	0	0						
PN5-2	20/F	79.5	HSK-1	16.7	370	N	375.4	0	0	0	0	0	43	55	55	
			HSK-2	16.7	356	N	361.6	0	0	0	0	0				
			HSK-3	16.7	155	Y	166.8	90	-52	3	0	-10				31
			HSK-4	16.7	118	Y	133.4	85	-51	3	0	0				37
			HSK-5	31.2	387	N	389.6	0	0	0	0	0				0
			HSK-6	31.2	378	N	380.7	0	0	0	0	0				0
			HSK-7	31.2	167	Y	173.6	86	-53	3	0	0				36
			HSK-8	31.2	143	Y	150.5	87	-52	3	0	0				38
			3-41	20.0	875	N	877.4	0	0	0	0	0				0
			4-13a	22.0	334	N	338.5	0	0	0	0	0				0
4-23	12.0	734	N	737.1	0	0	0	0	0	0						

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Project: Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station
 Fixed Noise Impact Assessment
 Title: Predicted Noise Impact at PN6 (Night-Time)

ASR: B
 Criterion (ANL-5): 50
 Criterion (ANL): 55

NSR	Floor	NAP Level, mPD	Source Location	Source Level, mPD	Horizontal Distance between source and NSR, m	Within 300m ?	Slant Distance, m	Max Allowable SWL, dB(A) Night	Correction, dB(A)				Predicted SPL, dB(A) Night	ANL-5	Railway Noise, dB(A)	ANL
									Distance	Façade	Tonality [2] [3]	Screening [1]		Cumulative Planned Fixed Noise Impact, dB(A)		Cumulative Impact, dB(A) (Planned Fixed Noise + Railway Noise)
PN6	1/F	17.6	HSK-1	16.7	583	N	583.5	0	0	0	0	0	39	45	46	
			HSK-2	16.7	596	N	595.8	0	0	0	0	0				
			HSK-3	16.7	383	N	382.7	0	0	0	0	0				
			HSK-4	16.7	402	N	401.9	0	0	0	0	0				
			HSK-5	31.2	605	N	604.8	0	0	0	0	0				
			HSK-6	31.2	614	N	613.7	0	0	0	0	0				
			HSK-7	31.2	362	N	361.8	0	0	0	0	0				
			HSK-8	31.2	375	N	375.7	0	0	0	0	0				
			3-41	20.0	1069	N	1068.7	0	0	0	0	0				
			4-13a	22.0	244	Y	244.4	89	-56	3	3	0				39
			4-23	12.0	932	N	931.9	0	0	0	0	0				0
			4-29	20.0	310	N	310.3	0	0	0	0	0				0
			PN6	10/F	47.7	HSK-1	16.7	583	N	584.3	0	0				0
HSK-2	16.7	596				N	596.6	0	0	0	0	0				
HSK-3	16.7	383				N	384.0	0	0	0	0	0				
HSK-4	16.7	402				N	403.1	0	0	0	0	0				
HSK-5	31.2	605				N	604.8	0	0	0	0	0				
HSK-6	31.2	614				N	613.8	0	0	0	0	0				
HSK-7	31.2	362				N	361.9	0	0	0	0	0				
HSK-8	31.2	375				N	375.8	0	0	0	0	0				
3-41	20.0	1069				N	1069.1	0	0	0	0	0				
4-13a	22.0	244				Y	245.7	89	-56	3	3	0	39			
4-23	12.0	932				N	932.5	0	0	0	0	0	0			
4-29	20.0	310				N	311.5	0	0	0	0	0	0			
PN6	19/F	77.9				HSK-1	16.7	583	N	586.7	0	0	0	0	0	39
			HSK-2	16.7	596	N	598.9	0	0	0	0	0				
			HSK-3	16.7	383	N	387.6	0	0	0	0	0				
			HSK-4	16.7	402	N	406.5	0	0	0	0	0				
			HSK-5	31.2	605	N	606.4	0	0	0	0	0				
			HSK-6	31.2	614	N	615.3	0	0	0	0	0				
			HSK-7	31.2	362	N	364.5	0	0	0	0	0				
			HSK-8	31.2	375	N	378.4	0	0	0	0	0				
			3-41	20.0	1069	N	1070.3	0	0	0	0	0				
			4-13a	22.0	244	Y	250.7	89	-56	3	3	0	39			
			4-23	12.0	932	N	934.2	0	0	0	0	0	0			
			4-29	20.0	310	N	315.6	0	0	0	0	0	0			

Note:
 [1] -10 dB(A) is adopted for the fixed noise sources that cannot be viewed from the NSR.
 [2] A +3 dB(A) tonal corrections are assumed for all planned fixed noise sources under EIA for the HSK/HT NDA.
 [3] Correction of tonality, intermittency or impulsiveness is not included for planned fixed noise sources at the Proposed HSK Station due to lack of design/supplier information at the current stage.

Appendix 8.1

Contamination Assessment Plan









Hung Shui Kiu Station
Consultancy Agreement No. C1801
**Design Services for
Hung Shui Kiu Station**

Contamination Assessment Plan

9 March 2022

Project Title	Hung Shui Kiu Station Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station		
Report Title	Contamination Assessment Plan		
Report No.		Corres No.	
Copy No.		Issue Date	9 March 2022

Date	Status	Rev No.	Prepared by		Checked by		Approved by	
			Person Name	Signature	Person Name	Signature	Person Name	Signature
15 Feb 22		0	Fredrick LEONG		Bill CHAN		SP CHIN	
9 Mar 22		1	Fredrick LEONG		Bill CHAN		SP CHIN	

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1 INTRODUCTION

1.1 Background

- 1.1.1 Hung Shui Kiu (HSK) Station, is a proposed new railway station to be located between Tin Shui Wai (TIS) Station and Siu Hong (SIH) Station on existing Tuen Ma Line (TML) to serve the future Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA).
- 1.1.2 In September 2014, the Government released the Railway Development Strategy 2014 (RDS-2014), which sets out the blueprint for territory-wide railway development up to 2031. The HSK Station is included as one of the seven recommended railway schemes. In May 2019, the Transport and Housing Bureau invited the MTR Corporation Limited (the Corporation) to submit a Project Proposal of the HSK Station based on the concept of RDS-2014. The Corporation completed a technical study for HSK Station and submitted a project proposal to the Government in May 2020. The Hong Kong SAR Government has invited the Corporation on 18 May 2021 to proceed with the detailed planning and design of the HSK station.
- 1.1.3 The station is envisaged to be a two-level station with at-grade concourse and elevated side-platforms for 8-car train sets. The station entrances are currently anticipated with passenger lifts, escalators and staircases provided to connect the two levels. Station concessions would be provided to enhance services to passengers. Back of house staff accommodation and plant rooms would be provided to cope with railway operations and maintenance requirements.
- 1.1.4 The MTR Corporation Limited (“MTRCL”) commissioned Aurecon Hong Kong Limited - WSP (Asia) Limited – Joint Venture (“AWJV”) as the Consultant for undertaking the Design Services for Hung Shui Kiu Station.

1.2 Tentative Project Site

- 1.2.1 The Tentative Project Site is located along Tuen Ma Line (TML) at Hung Shui Kiu, adjacent to Yick Yuen Road. The entire site (including HSK Station and temporary works area) covers a total area of about 71,400 m²¹. Location of the Tentative Project Site is shown in **Figure 1.1**. HSK Station is a proposed new railway station to be located between Tin Shui Wai Station and Siu Hong Station on the existing TML to serve the future Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA).
- 1.2.2 This Contamination Assessment Plan (“CAP”) has been prepared to set out the requirement for the evaluation of potential land contamination at the Tentative Project Site including the HSK Station and temporary works area, which will draw references to previous studies assessing the potential risk of land contamination. Previous studies to be reviewed in conjunction include:

¹ Subject to grant of access.

- Agreement No. CE 2/2011 (CE) Hung Shui Kiu New Development Area Planning and Engineering Study – Investigation, Environmental Impact Assessment Report (“EIAR”), conducted by AECOM in August 2016; and
 - Civil Engineering and Development Department (CEDD) liaison meetings conducted on 24 September and 29 December 2021.
- 1.2.3 According to the proposed layout plan of the HSK Station, the majority of construction works, and site formation will be above ground with minimal ground excavation works. A temporary site office, storage and assembly area south west of the Tentative Project Site and potential temporary diversion of the existing drainage channel are also proposed, requiring the excavation of limited areas east of the Tentative Project Site are proposed. Both these areas are located within temporary works areas. The locations of temporary works areas are presented in **Figure 1.1**. It is noted that the exact location of the temporary drainage channel is to be confirmed but after construction of the HSK Station, this channel will be backfilled upon completion of a new box culvert by CEDD.
- 1.2.4 The temporary site office, storage and assembly area and temporary drainage channel area are situated on land to be provided by others, with some areas fenced off. Where the areas are located on fenced off or otherwise inaccessible areas, access for Site Investigation (SI) works shall be delayed until granting of access. SI will thus be performed in batches, with works on accessible land to be conducted first.
- 1.2.5 Based on the CAP conducted by AECOM under the EIAR in 2016, various areas were inspected around the Tentative Project Site (refer to the CEDD liaison meeting on 24 September 2021; Appendix 8.1 of EIAR for the CAP; Figure 2.1 and Appendix E4 of the CAP) which are shown in **Figures 1.2** and **1.3**. Some areas were accessible for site inspection while inaccessible areas were limited to drone inspection. Of the accessible areas inspected, none showed any potential contamination issues, whereas inaccessible areas conducted by drone inspection, required further site re-appraisal to confirm any presence of land contamination issues.
- 1.2.6 The EIAR indicated that no land contamination issues were anticipated as no excavation activities would take place on the HSK Station footprint. However, the EIAR identified that some areas with potential contamination issues may be triggered should future excavation be performed and would require site re-appraisal.
- 1.2.7 This CAP therefore aims to present any potential land contamination requiring site investigation at the proposed temporary drainage channel, temporary site office, and storage and assembly areas which coincide with the areas with potential contamination as identified in the EIAR.

1.3 Objectives

- 1.3.1 The objectives of this CAP are to:
- a) Review the past and present land use within the Tentative Project Site boundary and works area, and identify activities that may lead to land contamination;
 - b) Identify areas of potential contamination; and
 - c) Propose the sampling strategy and method for the SI.

1.4 Statutory Legislation and Evaluation Criteria

- 1.4.1 This CAP is prepared in accordance with the following documents published by the Environmental Protection Department (EPD), HKSAR:
- a) Practice Guide for Investigation and Remediation of Contaminated Land, August 2011 (Practice Guide);
 - b) Guidance Note for Contaminated Land Assessment and Remediation, August 2007 (Guidance Note); and
 - c) Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management, December 2007 (Guidance Manual).
- 1.4.2 This CAP sets out the requirement for a baseline contamination evaluation of the Tentative Project Site. A Contamination Assessment Report (CAR) will be prepared following Site Investigation activities. If contamination is confirmed at levels in excess of the appropriate Risk-Based Remediation Goals (RBRGs) values, a Remediation Action Plan (RAP) will be prepared and submitted together with the CAR to EPD. A Remediation Report (RR) shall be prepared for submission to EPD to demonstrate adequate clean-up upon completion of the remediation. An Interim RR (IRR) will be submitted for agreement with EPD to demonstrate the complete excavation of contaminated soil to allow the construction work of the excavated area to commence whilst the excavated soil is being treated in a designated area within the Tentative Project Site boundary.

2 SITE APPRAISAL

2.1 Site Description

- 2.1.1 The Tentative Project Site is located along Tuen Ma Line at Hung Shui Kiu, adjacent to Yick Yuen Road. It tentatively covers a total area of about 71,400 m². The locality of the site is a rural area situated on a flat terrain, surrounded by village-type development and open storages.
- 2.1.2 Sections of the HSK Station footprint lies within a fenced off area beneath Tuen Ma Line Rail. Majority of the site consist of grassy vegetations, partially being a paved area for an emergency access point of MTRCL.
- 2.1.3 Potentially contaminated areas were however identified in areas adjacent to the HSK Station footprint, i.e., areas on the potential temporary drainage channel and temporary works area (Works Area), situated on land to be provided by others, with some areas fenced off.

2.2 Site History

- 2.2.1 From the General Memoirs about Geology of Hong Kong shown on the website of CEDD, the Tentative Project Site is situated on Quaternary Alluvium / Colluvium from the Quaternary period. The information is shown in **Appendix A**.
- 2.2.2 Based on the review of aerial photographs from Hong Kong Map Service 2.0 of Lands Department, the Tentative Project Site was located on agricultural lands before 1962. Progressive land clearance and development are observed mainly to the east of the Tentative Project Site from 1946 to 1963. Progressive site clearance and structure construction were observed within Tentative Project Site between 1963 and 1998. Structures were removed in 1999 for the preparation of the then West Rail Line development within Tentative Project Site, where the area was paved with concrete in 2001. No changes to the Tentative Project Site occurred since then. The key findings are summarised in **Table 2.1**. Historical aerial photographs are shown in **Appendix B**.

Table 2.1 Key Findings of Aerial Photographs

Year	Height (Feet)	Photo Reference Number	Site Description
1945	20,000	681_4-3186	The Tentative Project Site located on agricultural lands.
1963	3,900	1963-8416	No changes to the Tentative Project Site until 1963. Part of a structure and site clearance are observed within the northern portion of the Tentative Project Site. Structures were constructed between 1946 and 1963 mainly to the east of the Tentative Project Site.
1973	2,500	05239	Some agricultural lands were converted into dwellings within the Tentative Project Site between 1964 and 1973.

² Subject to grant of access.

Year	Height (Feet)	Photo Reference Number	Site Description
			Some areas to the southwest of the Tentative Project Site were converted into ponds.
1984	4,000	57460	More structures were constructed within the Tentative Project Site between 1974 and 1984. A drainage channel was completed to the west of and within the southern portion of Tentative Project Site.
1995	3,500	CN13089	More structures were observed within and adjacent to the Tentative Project Site.
1999	3,500	CN24586	Structures within the Tentative Project Site were removed, and site clearance activities are observed within and outside the Tentative Project Site for the construction of the then West Rail Line.
2001	4,000	CW33157	Area around the Tentative Project Site has been concrete paved for the West Rail Line. The drainage channel was modified between 2000 and 2001.
2009	2,000	CW85485	No changes to the Tentative Project Site between 2002 and 2009. The western area adjacent to the Site was covered in vegetation and areas further to the west has been established as open storage between the period.
2014	6,000	CS52463	No changes to the Tentative Project Site from 2009 to 2014. Area immediately west to Tentative Project Site was paved and used for open storage.
2021	6,900	E131683C	The open storage area directly west of the Tentative Project Site has been cleared. Otherwise, no changes to the Tentative Project Site and it resembles to present day.

2.3 Site Geology and Hydrogeology

2.3.1 Ground Investigation (GI) Reports^{3,4,5,6,7} in the vicinity of the Tentative Project Site were reviewed. Ground level of the Tentative Project Site area ranges from +7.89 to +11.86 mPD. The Tentative Project Site area generally consisted of the following strata:

- **Fill – excavated soils** of assorted origin / Fill – disturbed alluvium / Fill – reworked alluvium / Fill – domestic refuse / Fill as the first layer of strata for most boreholes from around +11.86 to +7.54 mPD with a maximum depth of 3.50 m. Fill – construction

³ Contract DD-210 Ch.5 Geotechnical Investigation Data Report Milestone 5 Tuen Mun Section Volume 4.1, by Maunsell Construction Asia Limited.

⁴ Contract DD-210 Ch.5 Geotechnical Investigation Data Report Milestone 5 Tuen Mun Section Volume 4.2, by Maunsell Construction Asia Limited.

⁵ Contract DD-210 Ch.5 Geotechnical Investigation Data Report Milestone 5 Tuen Mun Section Volume 4.7, by Maunsell Construction Asia Limited.

⁶ West Term GI contract New Territories CE2/2011 (CE) Hung Shui Kiu New Development Area Batch 1, by DrilTech Ground Engineering Limited.

⁷ Agreement TS-200 KCRC West Rail Project Western Section (1997), by Gammon Construction Limited.

waste / Fill was encountered as the second layer of the strata for two boreholes from +10.15 to +7.83 mPD with a maximum depth of 1.50 m.

- **Topsoil** is the first layer for two boreholes from +10.1 to +7.14 mPD with a maximum depth of 0.75 m.
- **Platform** is the first layer of strata for two boreholes from +9.50 to +8.63 mPD with a maximum depth of 0.20 m.
- **Alluvium** ranging from +10.4 to -2.11 mPD with a depth of 8.73 to 13.48 m was encountered as the second layer for most boreholes. It is also seen as the first, fourth or last layer in the strata for several boreholes from +9.15 to -3.00 mPD, with a depth from 6.50 to 12.00 m.
- **Pond bottom deposit** is the third layer for only one borehole from +9.65 to +9.15 mPD for a depth of 1.75 m.
- **Tuff breccia / Tuff** is the last layer from +1.40 mPD to termination depth, for a maximum depth of 79.47 m.

2.3.2 According to the GI Reports, groundwater level in the vicinity of the Tentative Project Site ranged from 5.93 m to 10.37 m. Groundwater general flows in a north-westerly direction. The locations of previous GI boreholes and groundwater flow direction are shown in **Figure 2.1**.

2.4 Site Inspection

2.4.1 Site inspection for the Tentative Project Site was conducted on 21 October 2021, 18 November 2021, 17 December 2021 and 30 December 2021, to identify possible land contamination within the site. Site visits were conducted by AWJV's Land Contamination Specialist (i.e., persons with substantial land contamination background person to monitor the entire land contamination sampling process on-site, including sample locations, collection, labelling, storage and documentary). Site inspection checklist, summary of findings and photographic logs are included in **Appendix C**.

2.4.2 The closest road to the Tentative Project Site is Yick Yuen Road where a refuse collection point, parking area, an EAP support room and an open storage area are located to the southeast and southwest of the HSK Station footprint (**Photos 1-4, 6-7, 21-23, 33-35, 56⁸, Appendix C**). Part of the Tentative Project Site lies within the emergency access point of the Tuen Ma Line, namely EAP 25 (**Photo 5, Appendix C**). Based on the condition of the observed ground, no concrete cracks nor oil stains were identified.

2.4.3 Village-typed houses, open storages, motor repairing shops are observed from the path leading into Yick Yuen Tsuen from Yick Yuen Road to the south of HSK Station footprint (**Photos 8-9, 10-20, Appendix C**).

2.4.4 Areas to the west and north of HSK Station footprint consist of open storages, fenced off vacant areas with thick grassy vegetation and a storage area (**Photos 24-32, Appendix**

⁸ It should be noted that Photos 33-35, 56 were taken on land to be provided by others, which was inaccessible to the public. Access was granted for AWJV on 30 December 2021 for Site Inspection.

C). Areas to the south of HSK Station footprint include village-typed houses, a drainage channel and a carpark (**Photos 36-47, Appendix C**).

- 2.4.5 The desktop review of the EIAR indicated areas of potential contamination around the Tentative Project Site, located in the proposed areas of temporary drainage channel and temporary works area. As shown in **Figures 1.2 and 1.3**, Sites 218, 220, 221 and 231 were identified with potential land contamination. No potential land contamination issue was identified in Sites 219, 232, 236 and 237.
- 2.4.6 The area beneath the Tuen Ma Line viaduct is covered with grassy vegetation (**Photos 48-51, Appendix C**). Since only vacant vegetated land was identified within this area, no potential land contamination is anticipated there.

2.5 Other Relevant Information

- 2.5.1 Various HKSAR Government Departments listed below have been approached on the historical land use, chemical storage, and accident records for further identify potential land contamination of the land. Replies from Government Departments are presented in **Appendix D**.

Environmental Protection Department (EPD)

- 2.5.2 Historical Records of Chemical and Dangerous Spillage: A request letter was sent to EPD to identify historical records of chemical and dangerous spillage / leakage. Reply from EPD dated 20 January 2022 stated there are no records of reported accidents of spillage / leakage of chemicals at the Tentative Project Site (**Appendix D**).
- 2.5.3 The registrar for Chemical Waste Producers (CWPs) was reviewed to identify any present or past CWPs on the Tentative Project Site on 3 December 2021. No valid nor invalid CWPs were identified on the Tentative Project Site, however, six CWPs were identified within a 450m radius around the Tentative Project Site. Details and locations of the CWPs are presented in **Appendix E**.

Fire Services Department (FSD)

- 2.5.4 To identify the registration records of Dangerous Goods (DG) and the historical records of dangerous goods spillage / leakage, letter was sent to FSD. A reply was received on 3 December 2021 stating there were no DG Licenses issued in respect of the Tentative Project Site. One incident record of a rubbish fire was reported on Yick Yuen Road on 21 December 2019 (**Appendix D**).

Lands Department (LandsD)

- 2.5.5 To further understand the current and past land uses of the Site detailed with duration and reported land contamination issues, information request letters were sent to LandsD. A reply was received on 31 December 2021 stating that advice should be seek from NDA Section of LandsD (**Appendix D**). Reply from the NDA Section of LandsD has not been received at the time of report issuance.

2.6 Future Land Use

- 2.6.1 The RBRGs were developed for four different post-restoration land uses, namely “Urban Residential”, “Rural Residential”, “Industrial” and “Public Parks”, to reflect typical settings

in Hong Kong where people could be exposed to contaminated soil. Definitions of post-restoration land uses are given in the Guidance Manual.

- 2.6.2 The current plan is that the Tentative Project Site will be used for MTR Station development including HSK Station and temporary works area. According to the HSK/HT NDA, the temporary works area will become part of the Regional Plaza upon completion of the HSK Station, which will be used as a park. As defined in RBRGs, the lower of “Public Parks” / “Industrial” land use scenario is recommended as the land contamination assessment criteria for this type of land use.

3 POTENTIAL SOIL AND LAND CONTAMINATION

3.1 Potential Contaminated Uses

- 3.1.1 The potential contaminated area at the site is determined according to the historical and current uses or activities potentially leading to soil or groundwater contamination.
- 3.1.2 Based on the historical aerial photos and land use records (**Table 2.1** and **Appendix B**) and site inspection photographs review (**Appendix C**), part of the Tentative Project Site is identified under potentially contaminated land uses, which include open storage areas from 2010 to 2014.
- 3.1.3 Referring to historical aerial photographs, the HSK Station footprint has been vacant and covered in vegetation since 2014. Since no signs of contamination were identified from site inspection for the area of the HSK Station footprint, i.e., the area directly under the Tuen Ma Line viaduct, no sampling works are deemed necessary for this area.
- 3.1.4 Referring to the EIAR, potentially contaminated areas were however identified in areas adjacent to the HSK Station footprint, i.e., areas on the proposed temporary drainage channel and temporary works area (Works Area). This is discussed in the following sections.

3.2 Potential Contaminated Areas

- 3.2.1 Part of the temporary Works Area with identified historical land use of open storage falls under the contaminated land types as listed in Table 2.3 of the Practice Guide.
- 3.2.2 As mentioned in **Section 2.4.5** and shown in **Figures 1.2 and 1.3**, Sites 218, 220, 221 and 231 were identified with potential land contamination. No potential land contamination issue was identified in Sites 219, 232, 236 and 237. Based on the site appraisal of the current CAP and of the accessible areas, none showed any potential contamination issues. In accordance with the Practice Guide, the Chemicals of Concerns associated with potential uses and site activities are covered in **Table 3.1** below:

Table 3.1 Chemicals of Concern at the Tentative Project Site

Location / Potential Uses	Potentially Polluting Activities	Chemicals of Concern
Area east of HSK Station footprint / Temporary Drainage Channel and Temporary Works Area (refer to Site 220 & Site 221 in Figure 1.3)	Loading, unloading and storage of goods, fuel storage and transfer, maintenance of equipment and vehicles.	Metals (full list), PCR, VOCs, SVOCs
Area southwest of HSK Station footprint / Temporary Works Area (refer to Site 231 in Figure 1.2)	Loading, unloading and storage of goods, fuel storage and transfer, maintenance of equipment and vehicles.	Metals (full list), PCR, VOCs, SVOCs

Location / Potential Uses	Potentially Polluting Activities	Chemicals of Concern
Area west of HSK Station footprint / Temporary Works Area (refer to Site 218 in Figure 1.2)	Loading, unloading and storage of goods, fuel storage and transfer, maintenance of equipment and vehicles.	Metals (full list), PCRs, VOCs and SVOCs

3.2.3 Where the full lists of VOCs, SVOCs, Metals, PCRs respectively are shown as below in **Table 3.2**.

Table 3.2 List of Chemicals of Concern

VOCs	Acetone, BTEX (Benzene, Toluene, Ethylbenzene and Xylenes (Total)), Bromodichloromethane, 2-Butanone, Chloroform, Methylene Chloride, Methyl tert-Butyl Ether (MTBE), Styrene, Tetrachloroethene and Trichloroethene
SVOCs	Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g, h, i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a, h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene, bis-(2-Ethylhexyl)phthalate, Hexachlorobenzene and Phenol
Metals	Antimony, Arsenic, Barium, Cadmium, Chromium III, Chromium VI, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Tin, Zinc and Mercury
PCRs	Petroleum Carbon Ranges: C6 to C8, C9 to C16 and C17 to C35

4 SAMPLING STRATEGY

4.1 Proposed Sampling Location and Scale

- 4.1.1 Site appraisal has been conducted for the entire Project Site boundary. The area of potential contamination, as determined by previous studies and site inspection of surrounding areas, is limited to areas of proposed temporary drainage channel and proposed works area. No potential contamination was identified on the footprint of the HSK Station. Sampling will therefore be limited to the proposed areas of temporary drainage channel and temporary works area where they overlap areas of identified potential contamination in the EIAR (the “Sampling Area of Current CAP” and “CEDD Assessment Area”) (**Figures 1.2 and 1.3**). “CEDD Assessment Area” will be resumed by CEDD before change of land use (e.g. use as areas of temporary drainage channel and temporary works area for the HSK Station). Upon land resumption of the “CEDD Assessment Area” (**Figure 4.1**) expected by the end of 2024, CEDD will be provided with site access to perform land contamination assessment and site investigation (SI) in accordance with the CAP under EIAR (i.e., this CAP will not cover SI for the “CEDD Assessment Area”).
- 4.1.2 Land contamination assessment and SI for the area of “Sampling Area of Current CAP” is responsible by MTRCL and covered in this CAP. This area covers approximately 155m². The SI areas responsible by MTRCL and CEDD are indicated as “Sampling Area of Current CAP” and “CEDD Assessment Area” respectively, in **Figures 4.1 – 4.2**. Based on the Practice Guide and size of the sampling area, square sampling grid with size of 7.5m that allows 95% confidence in detecting contamination is proposed for the “Sampling Area of Current CAP”. Details of the design of the sampling grid and relevant calculation are shown in **Appendix F**.
- 4.1.3 In total, 6 sampling points for the temporary drainage channel and temporary works areas will be collected. Within the 6 proposed sampling locations, there are currently 3 proposed sampling locations within fenced or inaccessible areas. Therefore, the sampling sequence shall be split into two batches, i.e., Batch 1 consisting of 3 sampling locations (located in accessible government land) and 3 sampling locations in Batch 2 (located within inaccessible government land), as illustrated in **Table 4.1**. Batch 2 shall commence upon site accessibility. The remaining areas with potential land contamination, as indicated by “CEDD Assessment Area” in **Figure 4.1**, will be assessed by CEDD upon or following land resumption.
- 4.1.4 The exact sampling locations shall be determined by the on-site Land Contamination Specialist subject to fine adjustment from specific site conditions e.g., existing foundations or underground utilities.
- 4.1.5 Soil samplings have to be conducted. Collection of 1 sample at depths of 0.5, 1.5 and 3.0 m from soil surface are proposed. The proposed sampling locations are shown in **Figure 4.1** and the close-up plan in **Figure 4.2**, and testing parameters with respect to the target areas are provided in **Table 4.1**. If sign of contamination⁹ is identified at the samples taken at depth of 3.0 m from soil surface during Site Investigation, sampling at further

⁹ Sign of contamination refers to abnormal odour, stained soil, presence of NAPL and/or abnormal PID readings.

depths shall be taken until there is no sign of contamination in the samples. The further sampling depth should be specified by the on-site Land Contamination Specialist. PID measurements will also be conducted during sampling.

- 4.1.6 During soil sample collection, when groundwater is observed in a borehole, 1 sample of groundwater at that underground level shall be collected at that borehole to account for the groundwater flow at the Tentative Project Site. The termination level of groundwater sampling would be at around 6 m from soil surface if no groundwater is encountered. If groundwater is encountered, the termination will be at 2 metres below the water table depth at that location.
- 4.1.7 If the presence of NAPL is observed during SI works, it will be recorded. Field observations such as abnormal odour and stained soil will also be recorded, if present.
- 4.1.8 In-situ field measurements for VOCs will be carried out by means of a PID survey during soil and groundwater sampling. Photos will be taken during SI and will be incorporated in the CAR for reference. Laboratory testing will further confirm the presence of any VOCs. Remedial measures will be provided i.e., whether to clean up the contamination or if a vapour membrane is required within the proposed development.

Table 4.1 Proposed Sampling Location

Sampling Sequence	Potential Uses	Borehole No.	Coordinate ^[1]		Sampling Depth (mbg) ^[2]	Required Sampling ^[3]		Testing Parameter
			Easting	Northing		Soil	Groundwater ^[4]	
Batch 1	Temporary Works Area / Drainage Channel Works Area	BH1E	816863.989	832406.086	0.5, 1.5, 3.0	✓	✓	Metals (full list), PCRs, VOCs, SVOCs
		BH3E	816857.386	832392.515	0.5, 1.5, 3.0	✓	✓	
		BH5E	816850.705	832377.790	0.5, 1.5, 3.0	✓	✓	
Batch 2		BH2E	816862.533	832398.442	0.5, 1.5, 3.0	✓	✓	
		BH4E	816855.616	832384.019	0.5, 1.5, 3.0	✓	✓	
		BH6E	816849.065	832370.000	0.5, 1.5, 3.0	✓	✓	

Note:

[1] Exact locations of sampling would be further adjusted on-site based on the locations of existing trees, site constraints and underground utilities.

[2] If sign of contamination is identified at the samples taken at the lowest proposed depth during Site Investigation, sampling at further depths shall be taken until there is no sign of contamination in the samples or when bedrock is reached.

[3] Laboratory testing is required for all parameters in **Table 4.2**.

[4] Only applicable to the borehole with groundwater encountered during sampling within terminal sampling depth. The termination level of groundwater sampling would be at around 6 m from soil surface if no groundwater is encountered. If groundwater is encountered, the termination will be at 2 metres below the water table depth at that location. The termination depth for groundwater sampling will be determined by on-site Land Contamination Specialist.

4.2 Soil Sampling Methodology

- 4.2.1 The sampling methods proposed are based on techniques developed by EPD's Practice Guide and USEPA which include decontamination procedures, preparation for sample collection, preservation of sample and the chain-of-custody documentation.
- 4.2.2 Boreholes should be undertaken by inspection pit (0.5m x 0.5m) for the first 2 mbgl. Dry rotary drilling shall be used at depths beyond 2 mbgl without any flushing medium to prevent cross-contamination.
- 4.2.3 The samples will be collected at proposed depth mentioned in **Section 4.1.5**. The termination level of soil sampling would be around 3 metres from soil surface. If sign of contamination is identified at the samples taken at the lowest proposed depth during Site Investigation, sampling at further depths shall be taken until there is no sign of contamination in the samples or when bedrock is reached. The appropriate sampling depth and termination depth at sampling locations should be specified by the on-site Land Contamination Specialist. Removal of existing structures is not required but underground utility checks will be conducted prior to sampling.
- 4.2.4 The samples should be put in pre-cleaned glass sample jars and lids washed with laboratory solvent provided by a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.
- 4.2.5 All soil samples should be placed with proper label in the containers provided by a HOKLAS accredited laboratory. Records showing the details of sampling locations and other pertinent data should be made.
- 4.2.6 Borehole logs would be recorded by a Qualified Geologist and reported in the CAR.

4.3 Groundwater Sampling Methodology

- 4.3.1 The proposed groundwater sampling methods are also based on techniques developed by EPD's Practice Guide and USEPA, which include the decontamination procedures, preparation for sample collection, preservation of sample and chain-of-custody documentation.
- 4.3.2 When groundwater is present in boreholes, 1 sample of groundwater at that underground level should be collected at that borehole. Prior to sampling of groundwater, the groundwater level and thickness of free product layer, if present, should be measured. Purging at least 3 times volume of the well to remove fine-grained materials should be performed to collect freshly refilled groundwater samples.
- 4.3.3 To avoid dilution or contamination by water from other sources, a groundwater sampling well should be installed at the sampling boreholes. Silt and debris should be removed from the well by flushing of approximately 5 times volume of the well, followed by equilibration of the permit groundwater condition for a day.
- 4.3.4 To collect sufficient groundwater sample, the dry-up of borehole should be avoided by observing the permeability of the surrounding strata and storage.

- 4.3.5 The sample should be collected with a Teflon bailer and temperature and pH should be measured on Tentative Project Site for each sample. Sample of free product, if present, should also be taken for identification by laboratory.
- 4.3.6 All groundwater samples should be placed with proper labels on the containers provided by a HOKLAS accredited laboratory. Records showing the details of sampling locations and other pertinent data should be made.

4.4 Sample Handling Requirements

- 4.4.1 Prior to sampling, the laboratory responsible for analysis shall be consulted on the particular sample size and preservative procedures for each chemical test.
- 4.4.2 To minimise potential cross-contamination, all equipment, including drilling and sampling, contact with the ground and sample shall be thoroughly decontaminated by steam cleaning, washing with phosphate-free detergent and water rinsing, between each sampling event and sampling hole. An area shall be arranged immediately adjacent to the sampling location with a clean plastic sheet for placing all cleaned and foil wrapped equipment.
- 4.4.3 All liquid and soil wastes and hazardous substances arising from the Site Investigation shall be handled and / or disposed of in compliance with the applicable environmental ordinances, regulations and code of practice. Upon completion of the SI, all debris, waste materials and equipment generated shall be cleared. All boreholes shall be filled in and compacted using uncontaminated materials as soon as practicable upon the completion of field work. The Project Site shall be levelled and reinstated. Proper gears such as disposable latex gloves shall be worn to avoid transfer of contaminants during sampling and decontamination.
- 4.4.4 No headspace shall be allowed in the containers with samples to be analysed for VOCs, PCRs or other volatile chemicals.
- 4.4.5 The containers shall be marked with the sampling location codes and the sampling depths. Samples should be stored at between 0 to 4 °C but never frozen. Samples shall be delivered to laboratory within 24 hours and analysed within 7 days of delivery.

4.5 Assessment Guidelines and Laboratory Analysis

- 4.5.1 According to EPD's Practice Guide for Investigation and Remediation of Contaminated Land, future land uses of the Tentative Project Site shall be determined before selecting the appropriate RBRGs. The current plan is that the Tentative Project Site will be used for MTR Station development including the HSK Station and temporary works area. According to the HSK/HT NDA, the temporary works area will become part of the Regional Plaza upon completion of the HSK Station. As defined in RBRGs, the lower of "Public Parks" / "Industrial" land use scenario is recommended as the land contamination assessment criteria for this type of land use.
- 4.5.2 The collected soil samples shall be screened against the relevant RBRGs for soil and soil saturation limit (C_{sat}) whereas collected groundwater samples shall be screened against the relevant RBRGs for groundwater and solubility limit. The RBRGs of the Chemical of

Concerns for the lower of “Public Parks” / “Industrial” land use scenario as shown in **Table 4.2** shall be adopted.

- 4.5.3 A HOKLAS accredited testing laboratory shall be appointed to conduct chemical analysis for the soil and groundwater samples. All laboratory test methods shall be accredited by the HOKLAS or one of its Mutual Recognition Arrangement Partners.

Table 4.2 RBRGs for Soil and Groundwater for the lower of “Public Parks” / “Industrial” land use scenario

Parameters	RBRGs		Reference Analytical Method	Reporting Limit		Soil Saturation Limit (mg/kg)	Groundwater Solubility Limit (mg/L)
	Soil (mg/kg)	Groundwater (mg/L)		Soil (mg/kg)	Groundwater (µg/L)		
VOCs							
2-Butanone (MEK)	1.00E+04*	1.00E+04*	USEPA Method 8260	5	50	***	***
2-Propanone (Acetone)	1.00E+04*	1.00E+04*		50	500	***	***
Benzene	9.21	54		0.2	5	336	1,750
Bromodichloromethane	2.85	26.2		0.1	5	1,030	6,740
Chloroform	1.54	11.3		0.04	5	1,100	7,920
Ethylbenzene	8,240	1.00E+04*		0.5	5	138	169
Methyl tert-Butyl Ether (MTBE)	70.1	1,810		0.5	5	2,380	***
Methylene chloride	13.9	224		0.5	50	921	***
Styrene	1.00E+04*	1.00E+04*		0.5	5	497	310
Tetrachloroethene	0.777	2.95		0.04	5	97.1	200
Toluene	1.00E+04*	1.00E+04*		0.5	5	235	526
Trichloroethene	5.68	14.2		0.1	5	488	1,100
Xylenes (Total)	1,230	1,570		2	20	150	175
PCRs							
C6 to C8	1.00E+04*	1,150	USEPA Method 8015/8260	5	20	1,000	5.23
C9 to C16	1.00E+04*	9,980		200	500	3,000	2.8
C17 to C35	1.00E+04*	178		500	500	5,000	2.8
SVOCs							
Acenaphthene	1.00E+04*	1.00E+04*	USEPA Method 8270	0.5	2	60.2	4.24
Acenaphthylene	1.00E+04*	1.00E+04*		0.5	2	19.8	3.93
Anthracene	1.00E+04*	1.00E+04*		0.5	2	2.56	0.0434

Parameters	RBRGs		Reference Analytical Method	Reporting Limit		Soil Saturation Limit (mg/kg)	Groundwater Solubility Limit (mg/L)
	Soil (mg/kg)	Groundwater (mg/L)		Soil (mg/kg)	Groundwater (µg/L)		
Benz(a)anthracene	38.3	--	USEPA Method 8270	0.5	--	--	--
Benzo(a)pyrene	3.83	--		0.5	--	--	--
Benzo(b)fluoranthene	17.8	7.53		0.5	1	--	0.0015
Benzo(g,h,i)perylene	5,740	--		0.5	--	--	--
Benzo(k)fluoranthene	383	--		0.5	--	--	--
Bis(2-Ethylhexyl)phthalate	91.8	--	USEPA Method 8270	5	--	--	--
Chrysene	1,140	812		0.5	1	--	0.0016
Dibenzo(a,h)anthracene	3.83	--		0.5	--	--	--
Fluoranthene	7,620	1.00E+04*		0.5	2	--	0.206
Fluorene	7,450	1.00E+04*		0.5	2	54.7	1.98
Hexachlorobenzene	0.582	0.695		0.2	4	--	6.2
Indeno(1,2,3,-cd)pyrene	38.3	--		0.5	--	--	--
Naphthalene	453	862		0.5	2	125	31
Phenanthrene	1.00E+04*	1.00E+04*		0.5	2	28	1
Phenol	1.00E+04*	--		0.5	--	7,260	--
Pyrene	5,720	1.00E+04*	0.5	2	--	0.135	
Metals							
Antimony	97.9	--	USEPA Method 6020A (except Chromium III by calculation, and Chromium VI USEPA3060 APHA 3500 Cr: D)	1	1	--	--
Arsenic	73.5	--		1	10	--	--
Barium	1.00E+04*	--		1	1	--	--
Cadmium	245	--		0.2	0.2	--	--
Chromium III	1.00E+04*	--		1	20	--	--

Parameters	RBRGs		Reference Analytical Method	Reporting Limit		Soil Saturation Limit (mg/kg)	Groundwater Solubility Limit (mg/L)
	Soil (mg/kg)	Groundwater (mg/L)		Soil (mg/kg)	Groundwater (µg/L)		
Chromium VI	735	--	USEPA Method 6020A (except Chromium III by calculation, and Chromium VI USEPA3060 APHA 3500 Cr: D)	1	20	--	--
Cobalt	4,900	--		1	1	--	--
Copper	9,790	--		1	1	--	--
Lead	857	--		1	1	--	--
Manganese	1.00E+04*	--		1	--	--	--
Mercury	38.4	6.79		0.05	0.5	--	--
Molybdenum	1,220	--		1	--	--	--
Nickel	4,900	--		1	--	--	--
Tin	1.00E+04*	--		1	--	--	--
Zinc	1.00E+04*	--		1	10	--	--

Notes: Blank indicates that RBRG could not be calculated because the toxicity or physical/chemical values were unavailable, or the condition of Henry's Law Constant > 1.00 E-05 was not met for the inhalation pathway.

* Indicates a 'ceiling limit' concentration.

*** Indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

4.6 QA/QC Procedures

- 4.6.1 QA/QC is the practice of making sure that collection and analysis techniques provide precise and accurate information. This process is to ensure the levels of contamination measured in the environmental samples reflect the actual environmental levels and are not due to accidental contamination of the sample or sample container.
- 4.6.2 During the sampling activities, all records including sampling locations, observation on soil sample and measurement data should be made by on-site personnel.
- 4.6.3 Chain-of-Custody procedures should be adopted. Quality control samples will be collected in the course of soil sampling. Duplicate soil samples will also be taken as part of the Project QA/QC programme.
- 4.6.4 The QA/QC Programme would include the following:
- 1 duplicate sample per 20 samples for full suite¹⁰ analysis;
 - 1 equipment blank sample per 20 samples for full suite analysis;
 - 1 field blank sample per 20 samples for full suite of analysis; and
 - 1 trip blank per trip for the analysis of volatile parameters.
- 4.6.5 The estimated number of samples to be collected for laboratory testing including QA/QC samples are summarised as below:

Table 4.3 Estimated Number of Samples for Laboratory Testing

Types of samples	Sampling Frequency	Number of Samples
Borehole	0.5m, 1.5m, 3.0m below ground level for soil samples. Depth of groundwater occurrence for groundwater samples.	19 soil samples (including 1 duplicate) 7 groundwater samples (including 1 duplicate)
Equipment Blank	Depends on sampling sequence, 1 sample per 20 samples per equipment.	1 (soil, assuming 1 drilling rig) 1 (groundwater)
Field Blank	Depends on sampling sequence, 1 sample per 20 samples.	1 (soil) 1 (groundwater)
Trip Blank	1 sample per trip for analysis of volatile parameters.	3 (Estimation)
Total		33

¹⁰ Full suite refers to all Chemicals of Concern in Table 4.2.

5 HEALTH AND SAFETY MEASURES

5.1 Introduction

5.1.1 Health and safety aspects during Site Investigation and the subsequent implementation of remediation measures are of prime importance. The specific safety measures to be adopted depend on the nature and extent of contamination, the site conditions and the regulations on the site safety requirements.

5.2 Potential Contamination Pathway to the Environment and Humans

5.2.1 During the course of SI, potential contamination pathways include the following:

- (1) Migration of contaminants to the soil due to leakage of oil;
- (2) Diffusion of volatile or particulates to the ambient indoors and outdoors;
- (3) Human exposure including accidental dermal contact, inhalation and ingestion to contaminated soil during construction and to the surface soil during future occupation; and
- (4) Handling of contaminated soil during excavation and disposal.

5.3 Recommendation on Site Investigation

5.3.1 In view of the potential contamination sources identified from Site Inspection and the risks of exposure to contaminated soil on the surface and subsurface, a Site Investigation is recommended to assess the concentration of toxic elements at the Tentative Project Site and the determination of subsequent treatment, mitigation or removal of the contaminated materials, if any.

5.4 Safety Measures

5.4.1 In general, all personnel who are involved in carrying out Site Investigation and Site Remediation for the Premise are required to observe the following health and safety precautionary measures:

- a) All site personnel shall possess an approved Construction Industry Safety Training Certificate (e.g. Green Card);
- b) Briefing on health and safety requirements shall be provided to the site personnel before they perform the site works;
- c) Safety helmets, safety boots, gloves and protective clothing shall be provided to all personnel working on site;
- d) Eye and ear protectors shall be provided for concrete layer breaking;
- e) No food, drink, alcohol or drugs shall be consumed whilst conducting the site works and no smoking shall be allowed on site;
- f) All site personnel shall maintain a hygienic working environment;
- g) Direct skin contact with the contaminated materials shall be avoided;

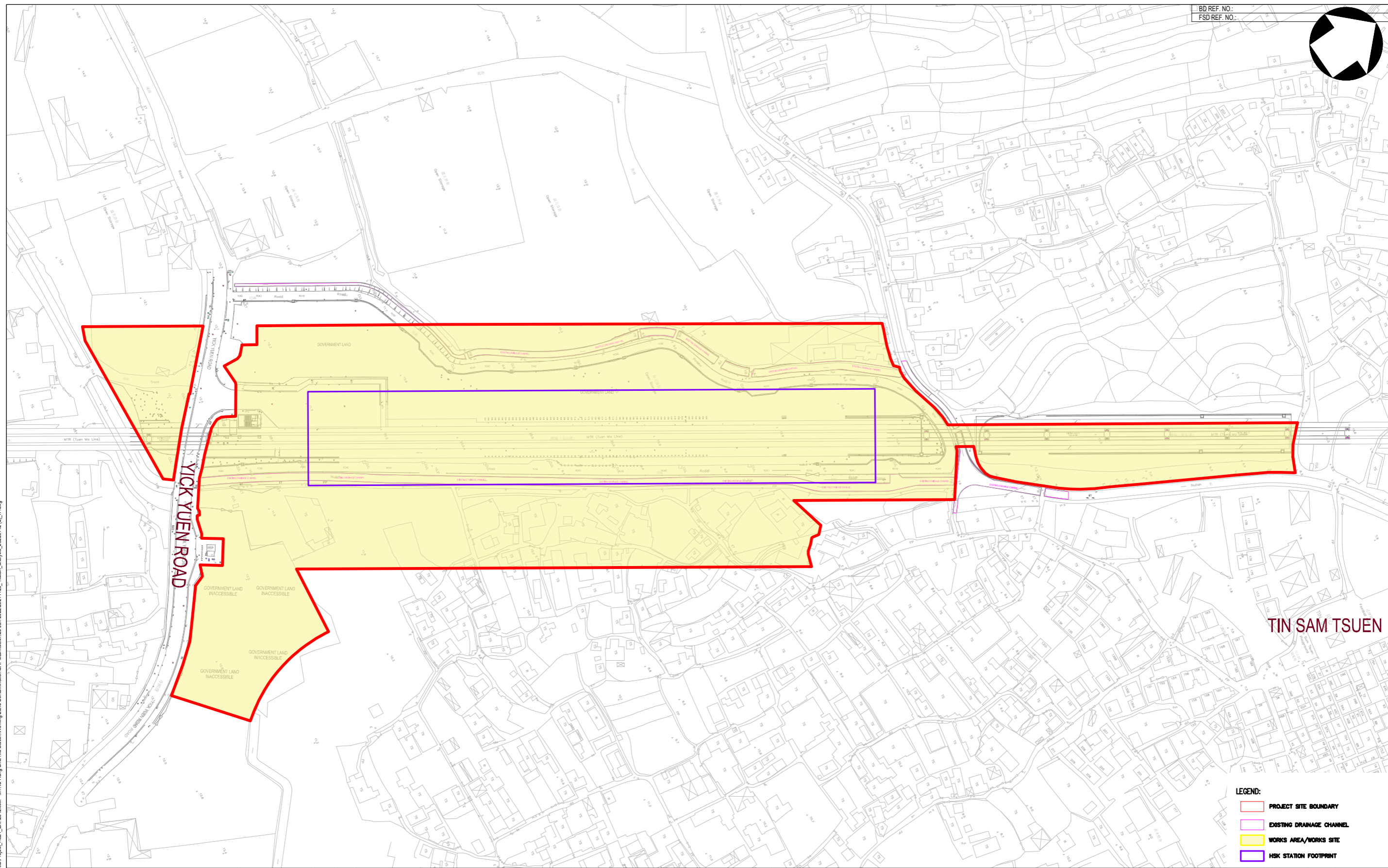
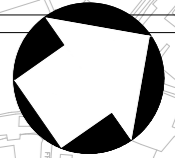
- h) Hand wash basins shall be provided and made accessible to all personnel working on the site;
- i) Sufficient and appropriate first aid materials shall be provided on the site; and
- j) Prior to commencement of site walkover, the project proponent shall identify potential health and safety risks during the site walkover and determine the necessary health and safety control measures.

6 CONCLUSION

- 6.1.1 This CAP proposes a total 6 sampling locations for the proposed temporary drainage channel and temporary works area. The sampling locations are proposed on areas of potential contamination based on their land use identified in previous studies and during Site Inspection. No sampling points are proposed on the HSK Station footprint as no potential contamination was identified based on previous land use and site inspection.
- 6.1.2 Sampling works shall be conducted in 2 Batches, 3 sampling locations shall be conducted in Batch 1 and 3 sampling locations in Batch 2. Batch 2 sampling works shall commence upon site accessibility.
- 6.1.3 Upon availability of the results, land contamination assessment shall be conducted and presented in a Contamination Assessment Report (CAR) for EPD's agreement. The CAR shall present the findings of the Site Investigation and evaluate the potential environmental and human health impact based on the extent of potential contamination identified.
- 6.1.4 If remediation is required, a Remediation Action Plan (RAP) shall be prepared in purpose to set remediation goals and specify remediation monitoring and measurements to monitor remediation progress and to confirm completion of the remediation. The RAP, if needed, shall be submitted to EPD for agreement prior to the remediation works.
- 6.1.5 A Remediation Report (RR) shall be prepared for submission to EPD to demonstrate adequate clean-up upon completion of the remediation. The content of the RR shall include the description of remediation programme carried out and the remediation monitoring results. In general, no construction works or development of areas with contaminated soil should be carried out prior to the confirmation of complete remediation. However, due to the tight programme, an Interim RR (IRR) will be submitted to EPD for agreement when the contaminated soils are completely excavated to allow the construction works to commence whilst the excavated soils are being treated at the designated area within the Tentative Project Site boundary.

Figures

BD REF. NO.:
FSD REF. NO.:



- LEGEND:**
- PROJECT SITE BOUNDARY
 - EXISTING DRAINAGE CHANNEL
 - WORKS AREA/WORKS SITE
 - HSK STATION FOOTPRINT

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HUNG SHUI KIU STATION

ORIGINATOR

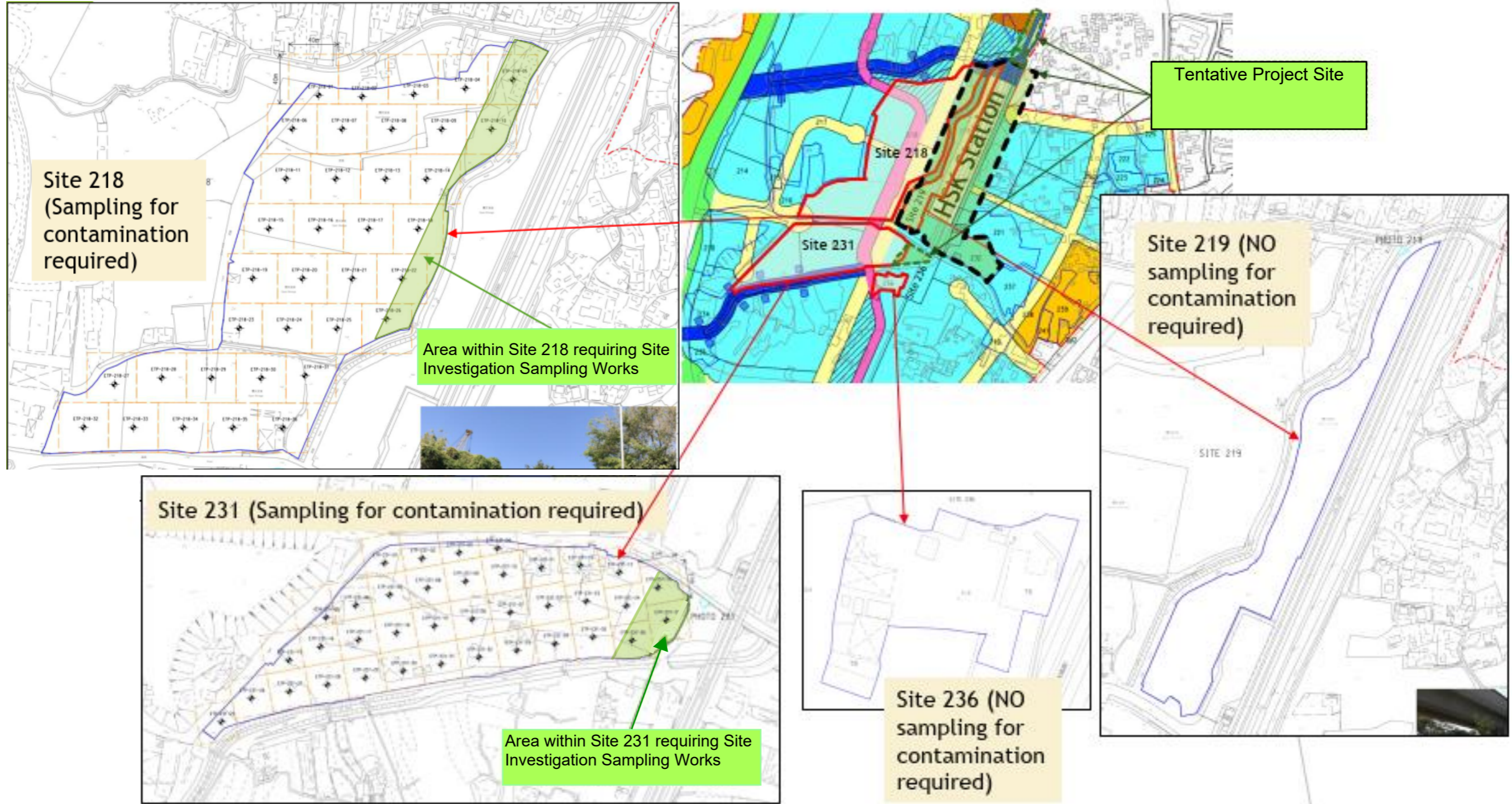
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MODEL REF.

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		LOCATION OF TENTATIVE PROJECT SITE	
SCALE	NTS	DRAWING NO.	FIGURE 1.1
		REV.	2

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

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										DRAWN Author DESIGNED Designer CHECKED Checker APPROVED Approver DATE 05/21/20	 HUNG SHUI KIU STATION ORIGINATOR 	TITLE C1801 Design Services for Hung Shui Kiu Station INACCESSIBLE AND ACCESSIBLE AREAS IN THE WESTERN SIDE SURVEYED IN THE EIAR		
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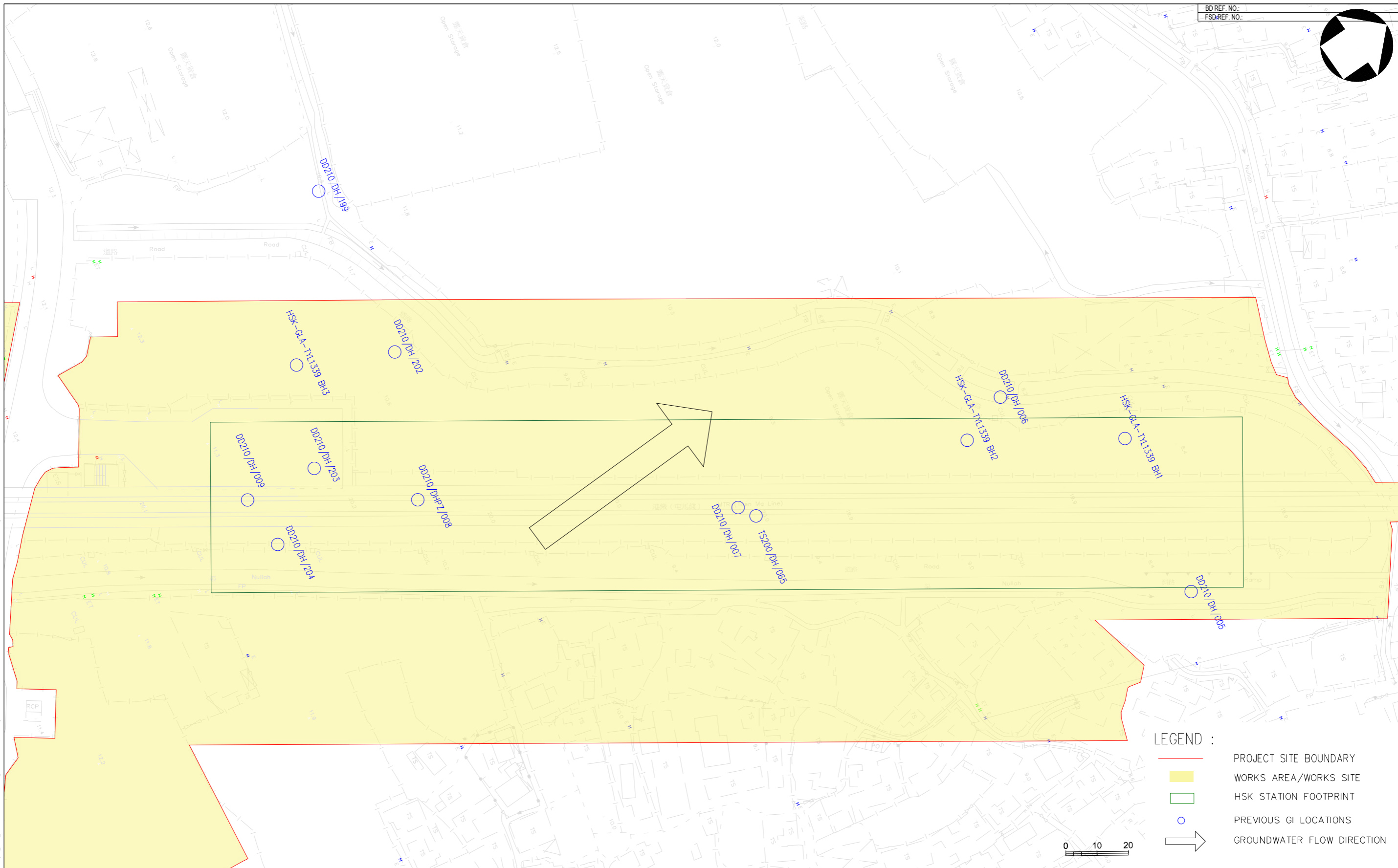
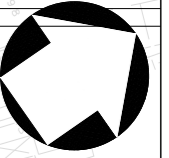


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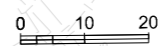
				DRAWN Author		MTR		TITLE C1801 Design Services for Hung Shui Kiu Station	
				DESIGNED Designer		HUNG SHUI KIU STATION			
				CHECKED Checker		ORIGINATOR		INACCESSIBLE AND ACCESSIBLE AREAS IN THE EASTERN SIDE SURVEYED IN THE EIAR	
				APPROVED Approver		aurecon wsp			
				DATE 05/21/20		MODEL REF. (Model File Name.rvt)		SCALE NTS	
				<small>DO NOT SCALE DRAWING. ALL DIMENSIONS SHALL BE VERIFIED ON SITE. MTR CORPORATION LIMITED ASSUMES NO LIABILITY IN RESPECT OF THIS DRAWING / DOCUMENT IS OWNED BY THE MTR CORPORATION LIMITED. NO REPRODUCTION OR TRANSMISSION OF ANY PART OF THIS DRAWING / DOCUMENT IS PERMITTED WITHOUT THE WRITTEN CONSENT OF THE MTR CORPORATION LIMITED.</small>		DRAWING NO. FIGURE 1.3		REV. 0	
REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

MODEL NAME:
FILE NAME:

BD REF. NO.:
FSDREF. NO.:



- LEGEND :**
- PROJECT SITE BOUNDARY
 - WORKS AREA/WORKS SITE
 - HSK STATION FOOTPRINT
 - PREVIOUS GI LOCATIONS
 - ➔ GROUNDWATER FLOW DIRECTION



MODELNAME: \\hkaw2020\ant16\SDET7_Projects\Project_H321_Env\51\2000 - MTRC Hung Shui Kiu Station Working Land Contamination\CA\Submission\2020\2020120.dwg
 FILENAME: \\hkaw2020\ant16\SDET7_Projects\Project_H321_Env\51\2000 - MTRC Hung Shui Kiu Station Working Land Contamination\CA\Submission\2020\2020120.dwg

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

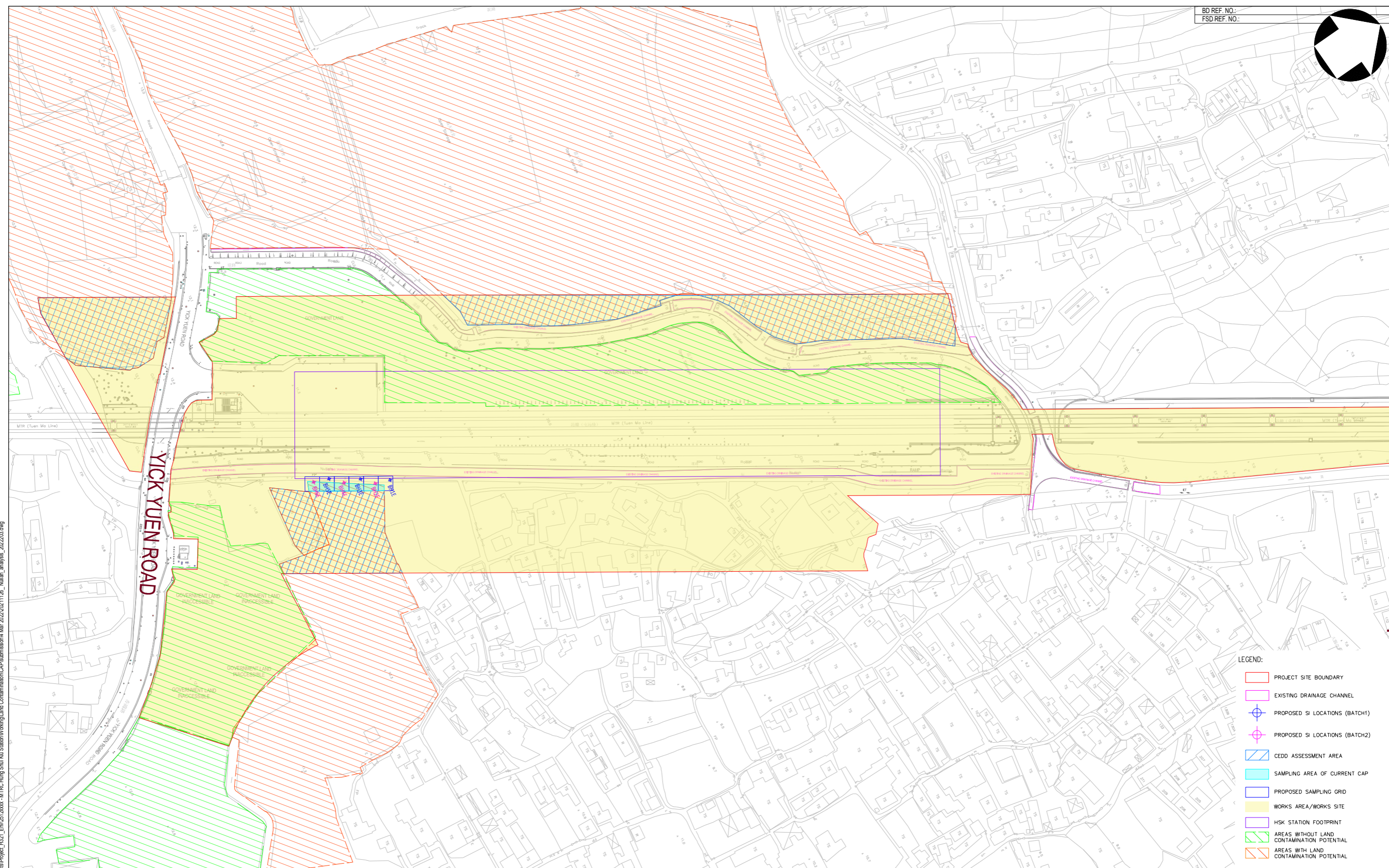
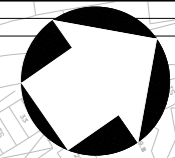
DRAWN	ST
DESIGNED	
CHECKED	AC
APPROVED	AC
DATE	13/01/2022

MTR
HUNG SHUI KIU STATION
 ORIGINATOR

TITLE C1801 Design Services for Hung Shui Kiu Station PREVIOUS GI LOCATIONS AND DIRECTION OF GROUNDWATER FLOW AT HUNG SHUI KIU	
SCALE NTS	DRAWING NO. FIGURE 2.1
	REV. 1

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BD REF. NO.:
FSD REF. NO.:



- LEGEND:**
- PROJECT SITE BOUNDARY
 - EXISTING DRAINAGE CHANNEL
 - + PROPOSED SI LOCATIONS (BATCH1)
 - + PROPOSED SI LOCATIONS (BATCH2)
 - CEDD ASSESSMENT AREA
 - SAMPLING AREA OF CURRENT CAP
 - PROPOSED SAMPLING GRID
 - WORKS AREA/WORKS SITE
 - HSK STATION FOOTPRINT
 - AREAS WITHOUT LAND CONTAMINATION POTENTIAL
 - AREAS WITH LAND CONTAMINATION POTENTIAL

MODEL NAME: \\mwm2020\at\B\DE\T_P\Projects\Project_14321_E\m\21\2000 - MTRC Hung Shui Kiu Station Working Land Contamination CA\Phase\Station Mtr 2022\20211126_Nuliah_analysis_2022203.dwg
 FILE NAME:

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CHECKED	AC
APPROVED	AC
DATE	17/01/2022

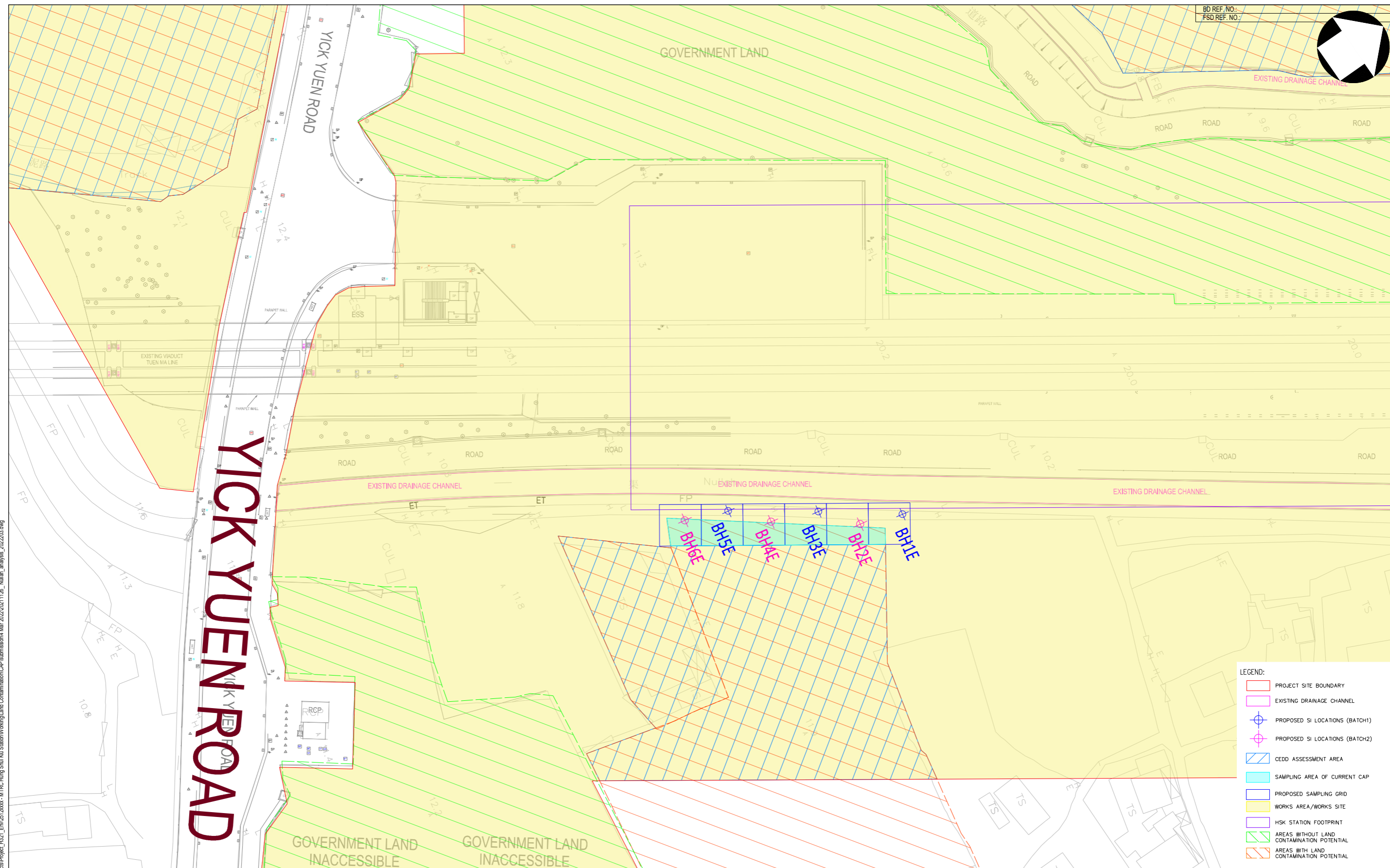
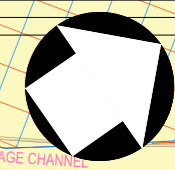
HUNG SHUI KIU STATION

ORIGINATOR

TITLE	
C1801 Design Services for Hung Shui Kiu Station	
PROPOSED BOREHOLE LOCATIONS ON TENTATIVE PROJECT SITE	
SCALE NTS	DRAWING NO. FIGURE 4.1
REV. 2	

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BD REF. NO.:
FSD REF. NO.:



- LEGEND:**
- PROJECT SITE BOUNDARY
 - EXISTING DRAINAGE CHANNEL
 - + PROPOSED SI LOCATIONS (BATCH1)
 - + PROPOSED SI LOCATIONS (BATCH2)
 - CEDD ASSESSMENT AREA
 - SAMPLING AREA OF CURRENT CAP
 - PROPOSED SAMPLING GRID
 - WORKS AREA/WORKS SITE
 - HSK STATION FOOTPRINT
 - AREAS WITHOUT LAND CONTAMINATION POTENTIAL
 - AREAS WITH LAND CONTAMINATION POTENTIAL

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CHECKED	AC
APPROVED	AC
DATE	17/01/2022

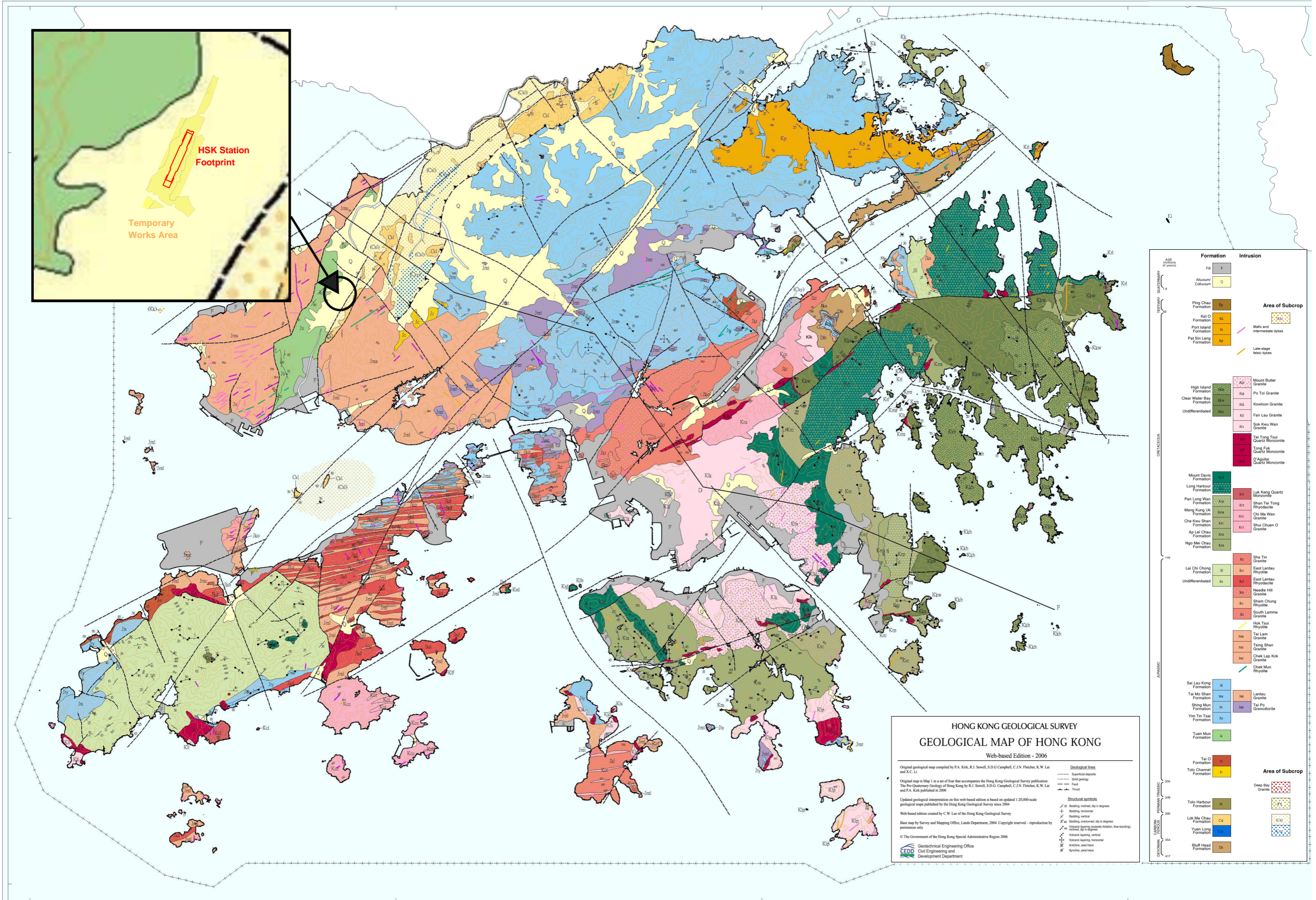
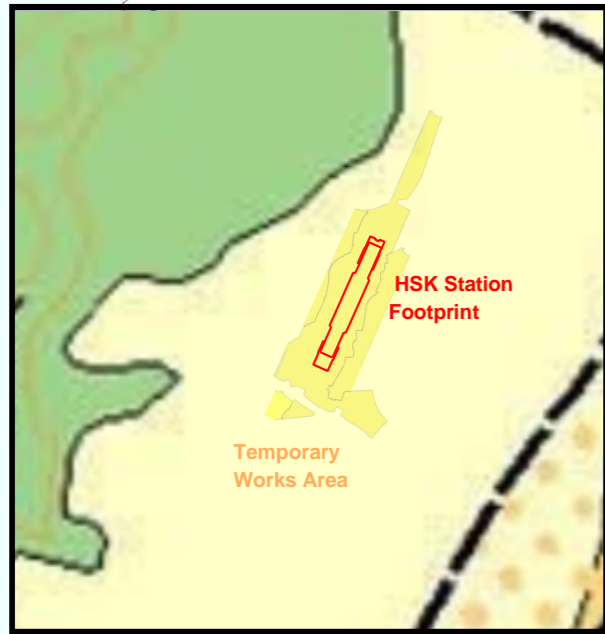
HUNG SHUI KIU STATION
 ORIGINATOR

TITLE C1801 Desian Services for Huna Shui Kiu Station PROPOSED BOREHOLE LOCATIONS ON TENTATIVE PROJECT SITE (CLOSE-UP PLAN)	
SCALE NTS	DRAWING NO. FIGURE 4.2
	REV. 2

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Appendix A

Geology Map of Hong Kong



AGE (millions of years)	Formation	Intrusion
TERTIARY QUATERNARY	Fll	F
	Aluvium/Coluvium	Q
	Ping Chau Formation	Kp
	Kat O Formation	Kk
	Port Island Formation	Ki
CRETACEOUS	Pat Sin Leng Formation	Kr
	High Island Formation	Ki
	Clear Water Bay Formation	Kk
	Undifferentiated	Ki
	Mount Davis Formation	Kd
	Long Harbour Formation	Kl
	Pan Long Wan Formation	Kp
	Mang Kung Uk Formation	Km
	Che Kwo Shan Formation	Kc
	Ap Lei Chau Formation	Ka
Ngo Mei Chau Formation	Kn	
JURASSIC	Lai Chi Chong Formation	Lc
	Undifferentiated	Lc
	Sai Lau Kong Formation	Sl
	Tai Mo Shan Formation	Tm
	Shing Mun Formation	Sm
	Yim Tin Tsai Formation	Yt
	Tuen Mun Formation	Tm
	Tai O Formation	To
	Tofo Channel Formation	Tc
	PERMIAN TRIASSIC	Tolo Harbour Formation
Lok Ma Chau Formation		Lc
Yuen Long Formation		Yl
Bluff Head Formation		Bh
Area of Subcrop		Area of Subcrop

HONG KONG GEOLOGICAL SURVEY
GEOLOGICAL MAP OF HONG KONG
 Web-based Edition - 2006

Original geological map compiled by P.A. Kirk, R.J. Sewell, S.D.G. Campbell, C.J.N. Fletcher, K.W. Lai and X.C. Li

Original map in Map 1 in a set of four that accompany the Hong Kong Geological Survey publication: The Pre-Quaternary Geology of Hong Kong by R.J. Sewell, S.D.G. Campbell, C.J.N. Fletcher, K.W. Lai and P.A. Kirk published in 2009

Updated geological interpretation on this web-based edition is based on updated 1:20,000-scale geological maps published by the Hong Kong Geological Survey since 2004

Web-based edition created by C.W. Lee of the Hong Kong Geological Survey

Base map by Survey and Mapping Office, Lands Department, 2004. Copyright reserved - reproduction by permission only

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Geotechnical Engineering Office
 Civil Engineering and
 Development Department

Appendix B

Historical Aerial Photographs

Aerial Photographs

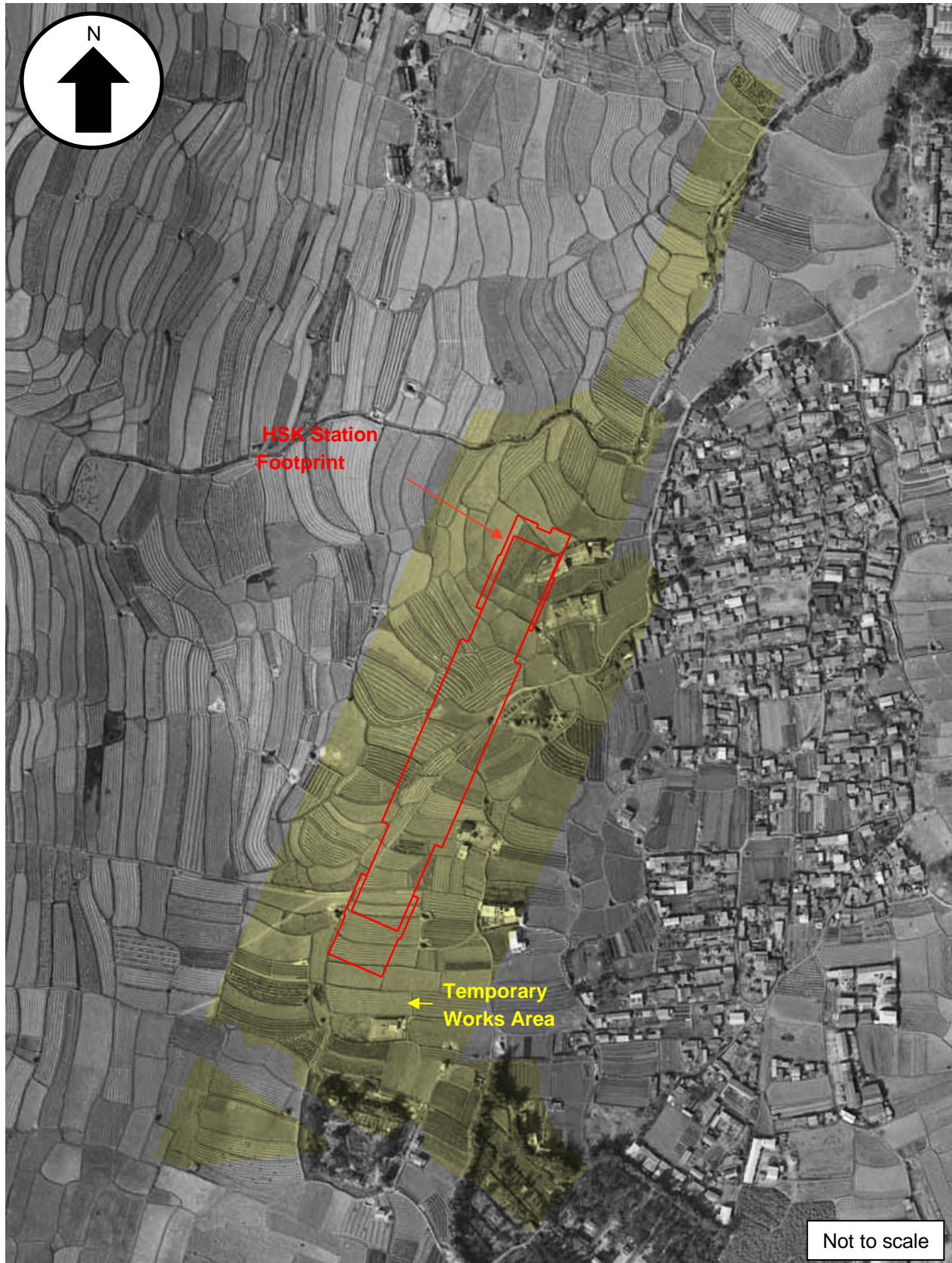
1945 (Photo reference: 681_4-3186) 20,000 ft.



Observation: The Tentative Project Site located on agricultural lands.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

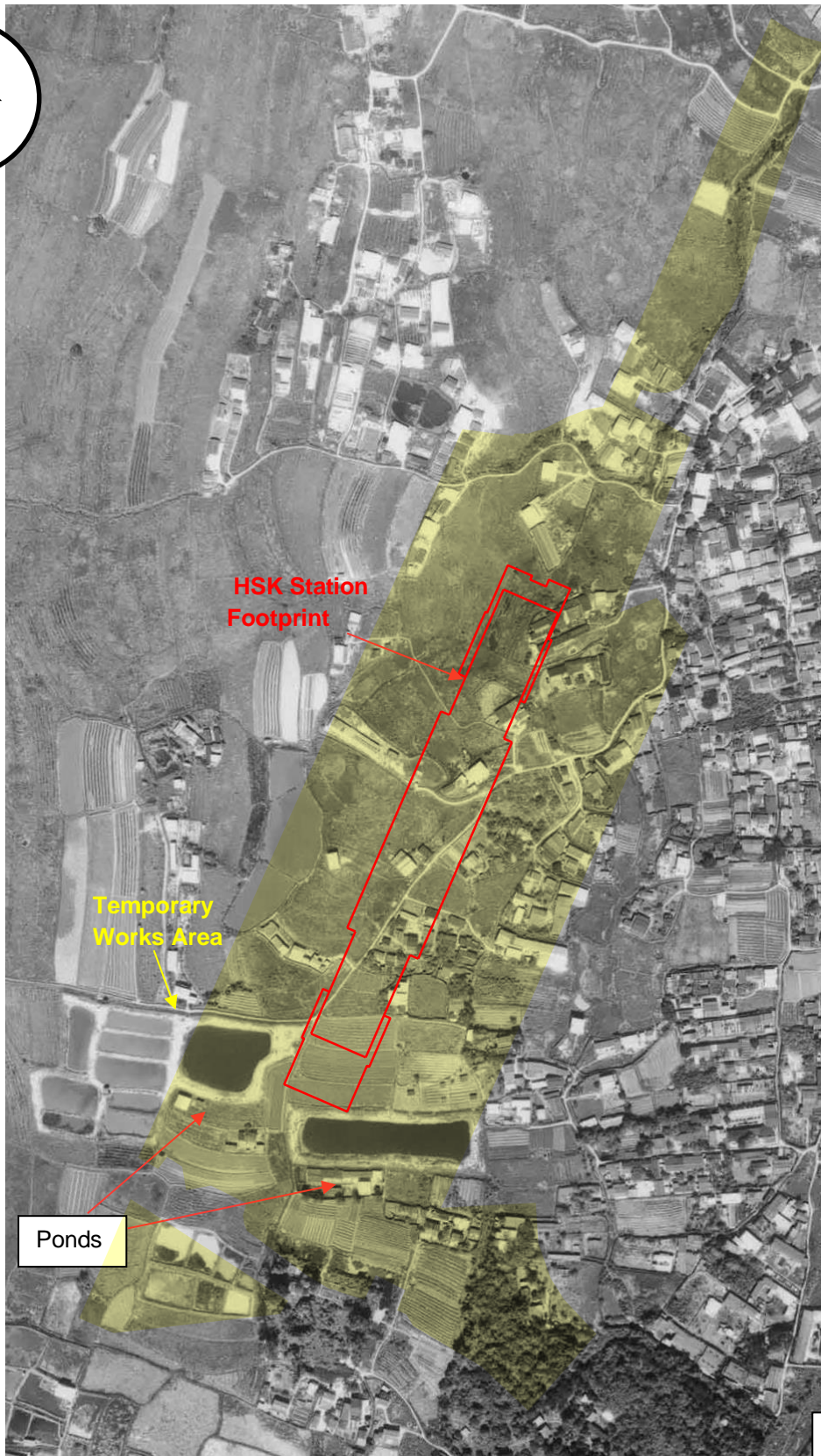
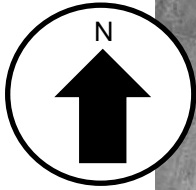
1963 (Photo reference: 1963-8416) 3,900 ft.



Observation: No changes to the Tentative Project Site until 1963. Part of a structure and site clearance are observed within the northern portion of the Tentative Project Site. Structures were constructed between 1946 and 1963 mainly to the east of the Tentative Project Site.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

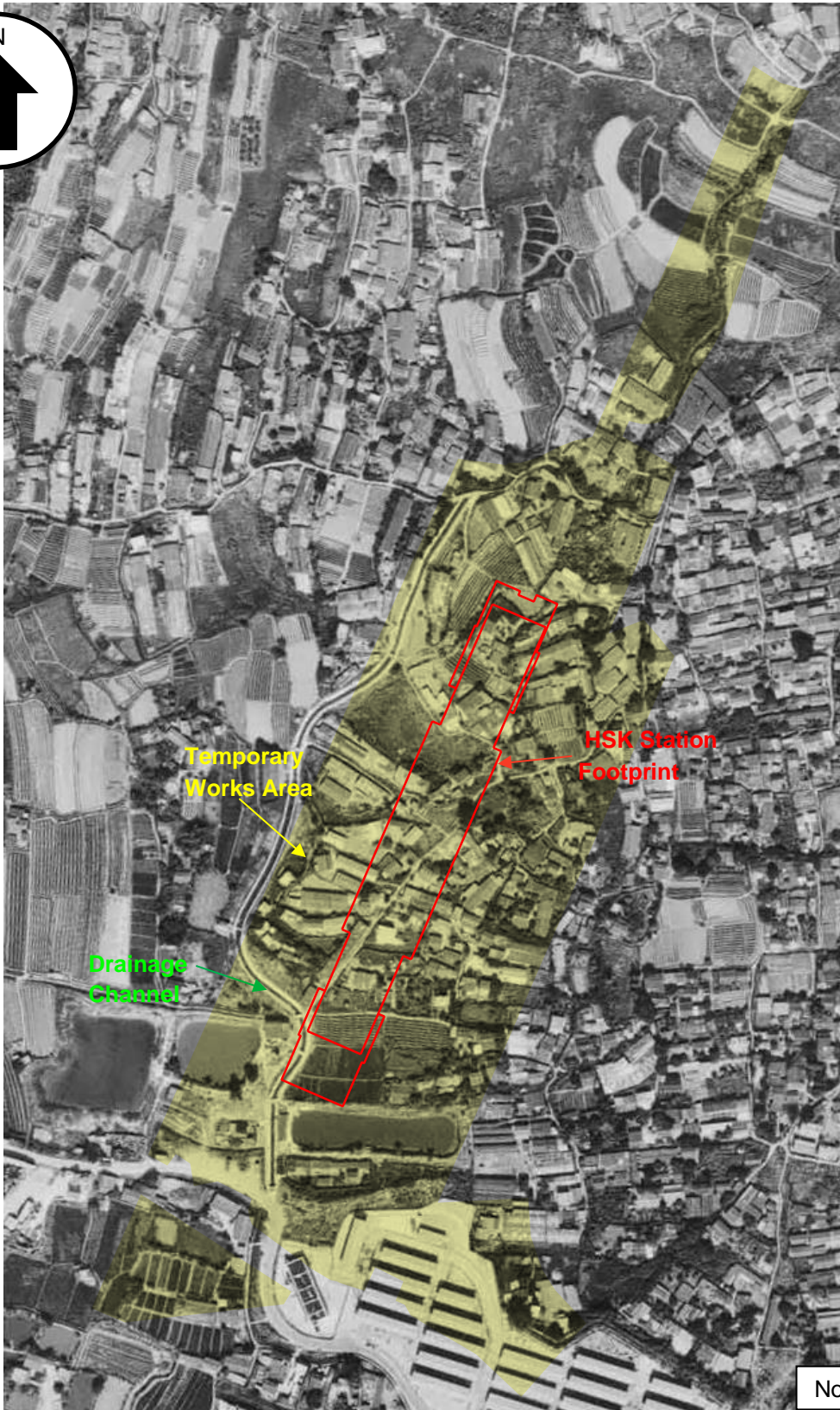
1973 (Photo reference: 05239) 2,500 ft.



Observation: Some agricultural lands were converted into dwellings within the Tentative Project Site between 1964 and 1973. Some areas to the southwest of the Tentative Project Site were converted into ponds.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

1984 (Photo reference: 57460) 4,000 ft.



Observation: More structures were constructed within the Tentative Project Site between 1974 and 1984. A drainage channel was completed to the west of and within the southern portion of Tentative Project Site.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

1995 (Photo reference: CN13089) 3,500 ft.

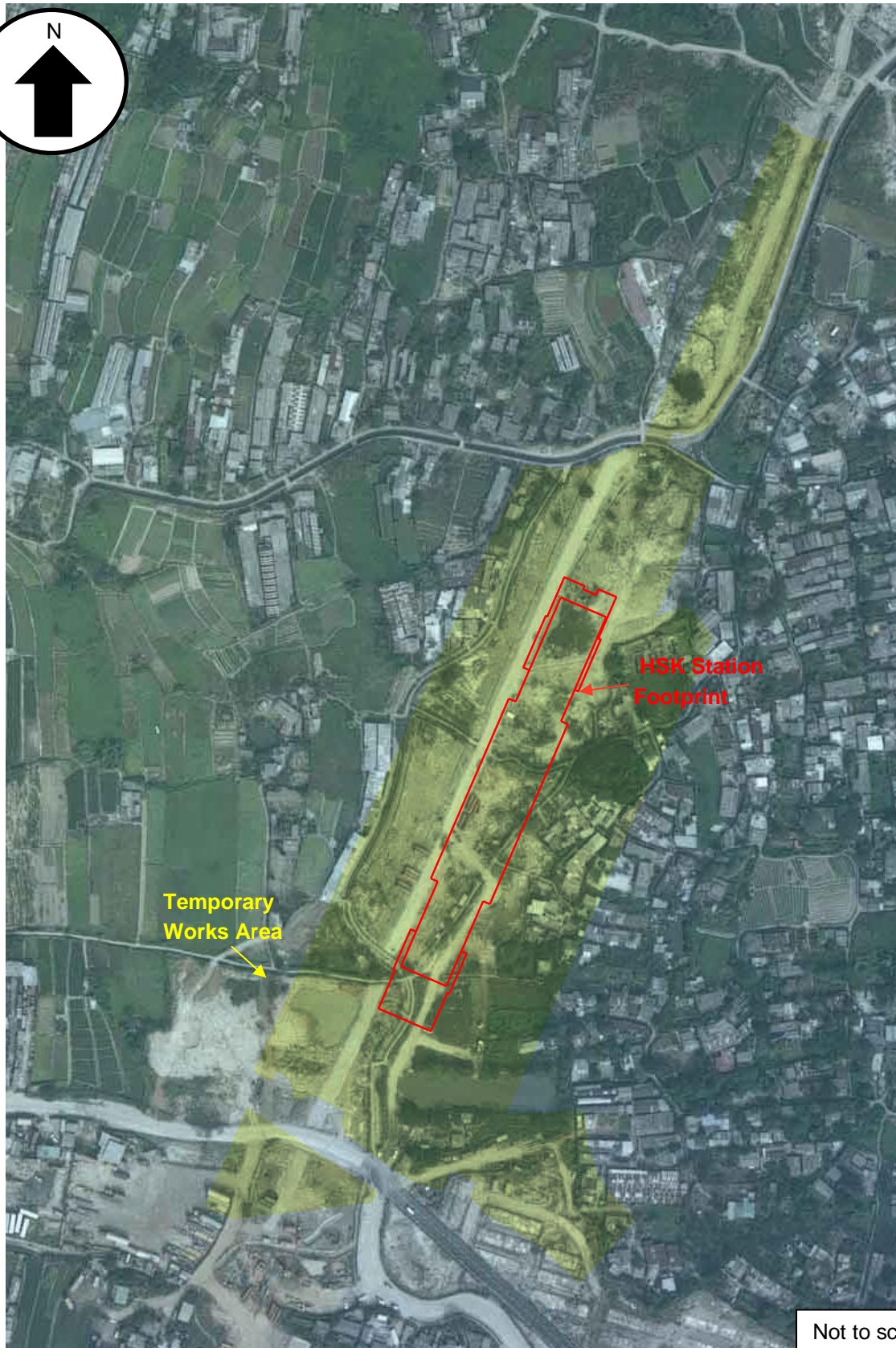


Not to scale

Observation: More structures were observed within and adjacent to the Tentative Project Site.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

1999 (Photo reference: CN24586) 3,500 ft.



Not to scale

Observation: Structures within the Tentative Project Site were removed, and site clearance activities are observed within and outside the Tentative Project Site for the construction of the then West Rail Line.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

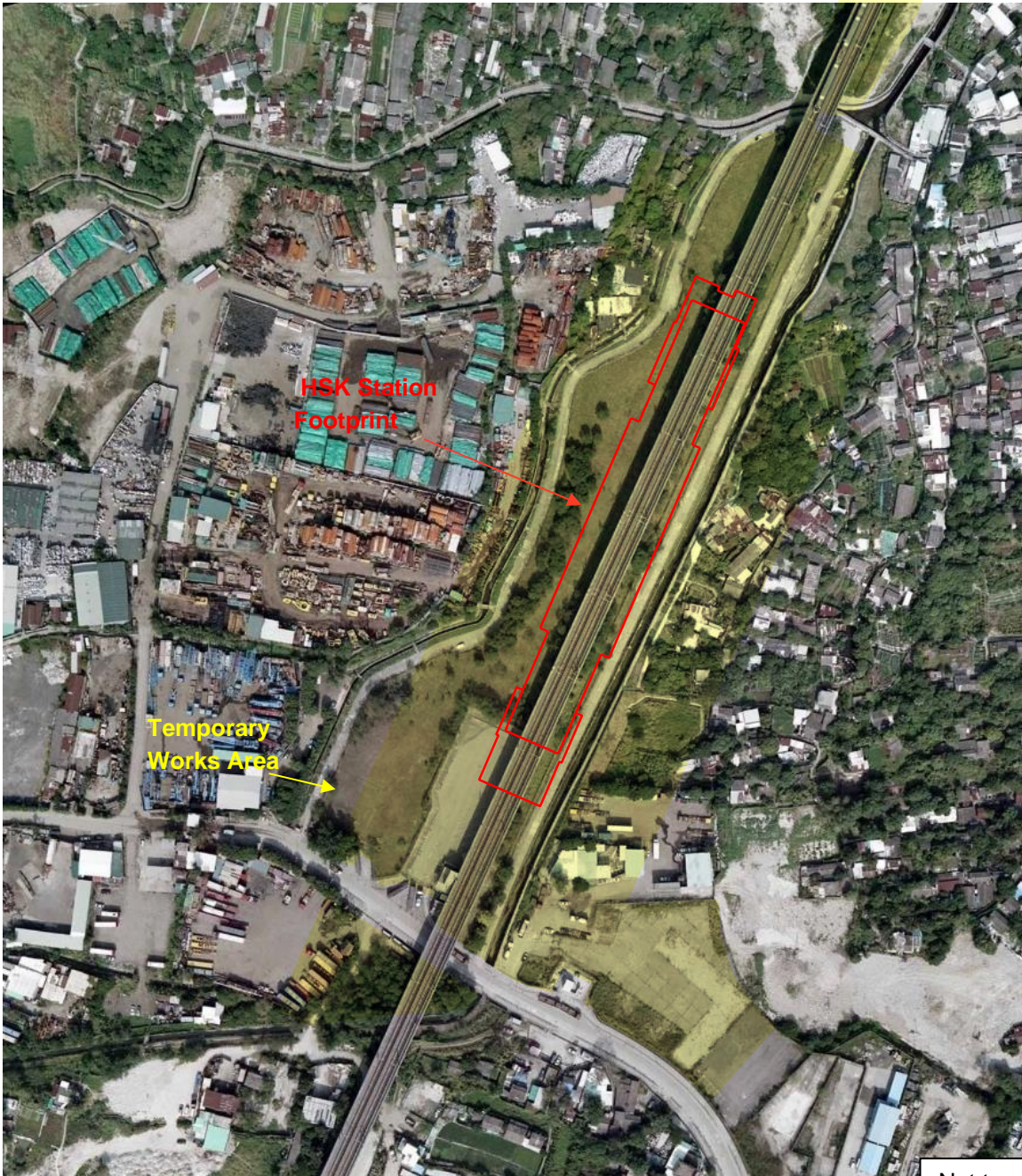
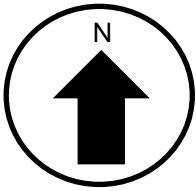
2001 (Photo reference: CW33157) 4,000 ft.



Observation: Area around the Tentative Project Site has been concrete paved for the West Rail Line. The drainage channel was modified between 2000 and 2001.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

2009 (Photo reference: CW85485) 2,000 ft.

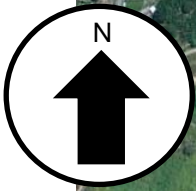


Not to scale

Observation: No changes to the Tentative Project Site between 2002 and 2009. The western area adjacent to the Site was covered in vegetation and areas further to the west has been established as open storage between the period.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

2014 (Photo reference: CS52463) 6,000 ft.

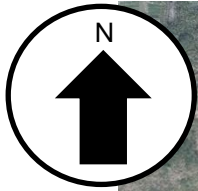


Not to scale

Observation: No changes to the Tentative Project Site from 2009 to 2014. Area immediately west to Tentative Project Site was paved and used for open storage.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

2021 (Photo reference: E131683C) 6,900 ft.



Not to scale

Observation: The open storage area directly west of the Tentative Project Site has been cleared. Otherwise, no changes to the Tentative Project Site and it resembles to present day.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

Appendix C

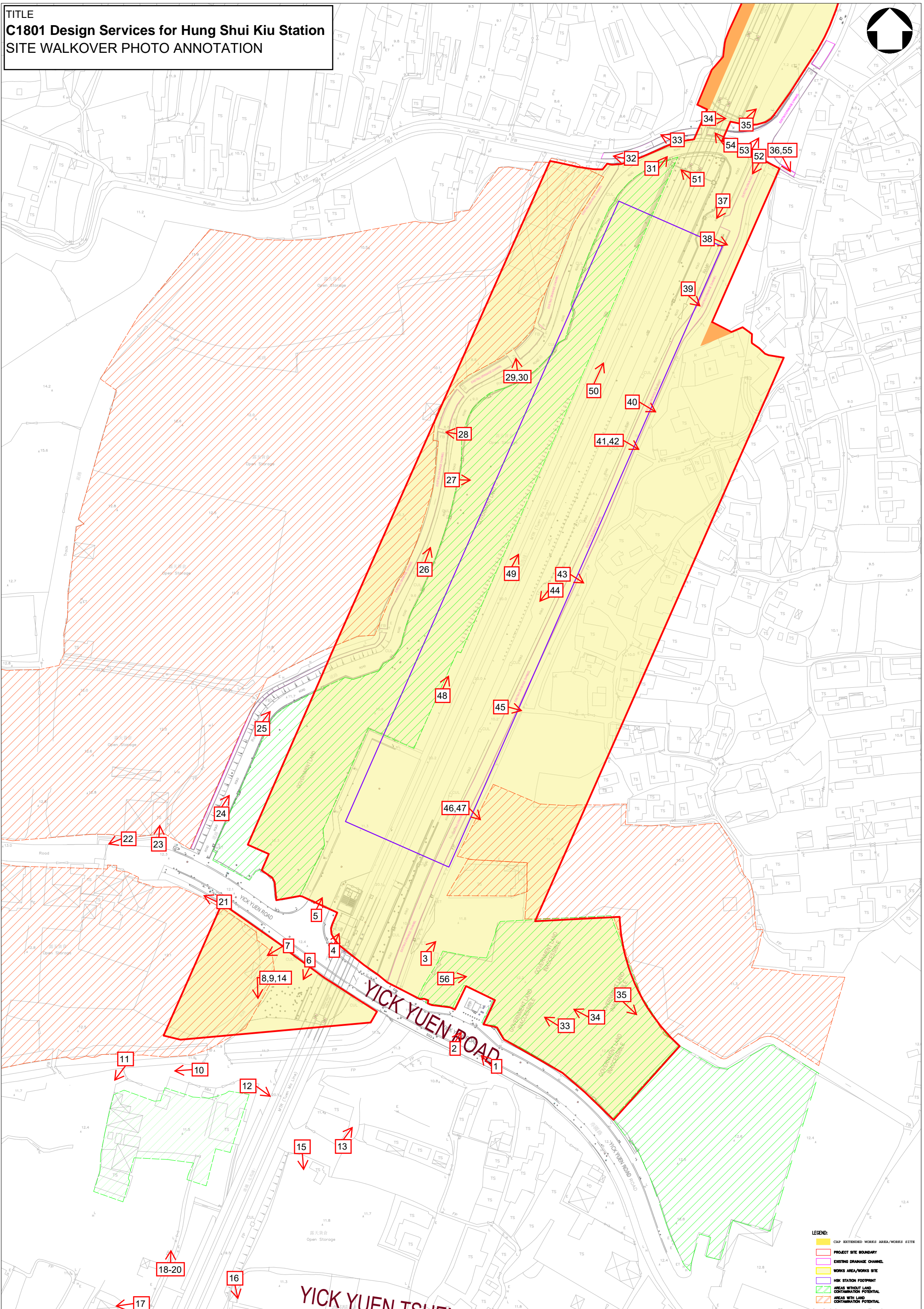
Site Inspection Checklist and Photographs

Site Inspection Checklist**Hung Shui Kiu Station, Tuen Mun**

<i>1 General Site Details</i>	
Date of Site Inspection:	21 October 2021, 18 November 2021, 17 December 2021 and 30 December 2021
Site Client:	MTRCL
Property Address:	Tuen Ma Line by Yick Yuen Road (north of DD124 3416RP & 3419 – 3420RP)
Person conducting the questionnaire:	Steffi To, Assistant Consultant Michelle Cheung, Assistant Consultant
Authorized owner/client representative (if applicable):	MTRCL and Private
<i>2 Site Activities</i>	
Number of employees: Full Time: Part Time: Temporary/Seasonal:	N/A
Maximum no. of people on-site at any time:	N/A
Typical hours of operation:	N/A
Number of shifts:	N/A
Days per week:	N/A
Weeks per year:	N/A
Scheduled plant shut down:	N/A
The main sources of energy at the site:	N/A
<i>3 Site Description</i>	
Total site area:	71,400 m ²
What area of the site is covered by buildings (%):	0
List of current and previous owners:	MTRCL, Private
Is site plan available:	No
Are there any other parties on-site as tenants or sub-tenants?	Unknown
Surrounding land use, facilities or types of industry:	
	North: Undeveloped greenfield
	South: Roads
	East: Open storage and village houses
	West: Undeveloped greenfield and open storage
Topography of the area:	Flat
Size and location of the nearest residential communities:	Unknown population
Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands, or Sites of Scientific Interest?	No
<i>4 Investigation</i>	
What are the main activities/operations at the Site?	Greenfield
How long have the occupants been occupying the site?	N/A
Were the current occupants the first occupant on site?	N/A
Prior to the current occupancy, who occupied the site?	Unknown
What were the main activities/operations during their occupancy?	Greenfield
Have there been any major changes in operations carried out at the site in the last 10 years?	No
Have any polluting activities been carried out in the vicinity of the site in past?	No
Has the site ever been used as a petrol filling station/car service garage?	No

Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	Yes
Do the occupants have any registered hazardous installations as defined under relevant ordinances?	No
Are any chemicals used in the occupants' daily operations? Where do they store these chemicals?	No
Material inventory lists, including quantities and locations available?	N/A
Has the site produced a separate hazardous substance inventory?	N/A
Has there ever been any incidents or accidents involving any of these materials?	No
How are materials received (e.g., rail, truck, etc.) and stored on site (e.g., drums, tanks, carboys, bags, silos, cisterns, vaults, and cylinders)?	N/A
Do the occupants have any underground storage tanks?	No
Are there any disused underground storage tanks?	No
Do the occupants have regular check for any spillage and monitoring of chemicals handled?	N/A
How are the wastes disposed of?	N/A
Have the occupants ever received any notices of violation of environmental regulations or received public complaints?	Unknown
Have any spills occurred on site?	Unknown
Do the occupants have any records of major renovation of the site or re-arrangement of underground utilities, pipe work/underground tanks?	Unknown
Are there any known contaminations on site?	Unknown
Has the site ever been remediated?	No
<i>5 Observations</i>	
Are chemical storage areas provided with secondary containment (i.e., bund walls and floors)?	Inaccessible
What are the conditions of the bund walls and floors?	Inaccessible
Are any surface water drains located near to drum storage and unloading areas?	Inaccessible
Are any solid or liquid waste (other than wastewater) generated at the site?	Inaccessible
Is there a storage site for the wastes?	Inaccessible
Is there an on-site landfill?	No
Was any stressed vegetation noted on site during the site reconnaissance?	No
Were any stained surfaces noted on-site during the site reconnaissance?	Inaccessible
Are there any potential off-site sources of contamination?	No
Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	Inaccessible
Are there any sumps, effluent pits, interceptors or lagoons on site?	No
Any noticeable odours during site walkover?	No
Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	Inaccessible



TITLE
C1801 Design Services for Hung Shui Kiu Station
SITE WALKOVER PHOTO ANNOTATION



Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
1.	21 Oct 2021	 <p>Yick Yuen Road leading toward the tentative Project Site.</p>
2.	21 Oct 2021	 <p>Refuse collection point on Yick Yuen Road adjacent to the tentative Project Site.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun


Project No.
2512234

Photo No.	Date	Photo and Description
3.	21 Oct 2021	 <p>Carpark to the east of the Proposed HSK Station footprint.</p>
4.	21 Oct 2021	 <p>Substation to the south of the Proposed HSK Station footprint.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
5.	21 Oct 2021 & 18 November 2021	 <p>Emergency access point within the West Rail Siu Hong Station to the southwest of the Proposed HSK Station footprint. Ground is in good condition with no concrete cracks or stains.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun


Project No.
2512234

Photo No.	Date	Photo and Description
6.	21 Oct 2021	 <p>Parking area on Yick Yuen Road.</p>
7.	21 Oct 2021	 <p>Open storage area along Yick Yuen Road.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
8.	21 Oct 2021 & 17 December 2021	 <p>A path leading into Yick Yuen Tsuen.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
9.	21 Oct 2021 & 17 December 2021	 <p>A path leading into Yick Yuen Tsuen.</p>
10.	21 Oct 2021	 <p>Path further leads into the village.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
11.	21 Oct 2021	 <p>Motor repairing shop along the path into the village.</p>
12.	21 Oct 2021	 <p>A path to the opposite direction leading into Yick Yuen Tsuen.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
13.	21 Oct 2021	 <p>Motor repairing shop.</p>
14.	17 December 2021	 <p>A path leading into Yick Yuen Tsuen.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
15.	21 Oct 2021	 <p>Open storage area within Yick Yuen Tsuen.</p>
16.	21 Oct 2021	 <p>Path leading further south from the Proposed HSK Station footprint into Yick Yuen Tsuen.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
17.	21 Oct 2021	 <p>A path toward the west leading into the village.</p>
18.	21 Oct 2021	 <p>A path leading to a dead end toward Yick Yuen Road direction.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
19.	21 Oct 2021	 <p>A path leading to a dead end toward Yick Yuen Road direction with general wood materials observed.</p>
20.	21 Oct 2021	 <p>Dead end of the path.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
21.	21 Oct 2021	 <p>Yick Yuen Road toward the west outside the tentative Project Site.</p>
22.	21 Oct 2021	 <p>Yick Yuen Road.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
23.	21 Oct 2021	 <p>Open storage area to the west of the Proposed HSK Station footprint.</p>
24.	21 Oct 2021	 <p>A road leading toward the north outside the tentative Project Site.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
25.	21 Oct 2021	 <p>A road leading toward the north outside the tentative Project Site.</p>
26.	21 Oct 2021	 <p>Road continuing toward the north.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
27.	21 Oct 2021	 <p>Fenced undeveloped field with thick vegetation outside the Proposed HSK Station footprint.</p>
28.	21 Oct 2021	 <p>Path leading into the open storage area over the drainage channel to the west of the Proposed HSK Station footprint.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
29.	21 Oct 2021	 <p>Open storage area.</p>
30.	21 Oct 2021	 <p>Wood pallets stored within the area.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
31.	21 Oct 2021	 <p>Road leading toward Tin Sum Village.</p>
32.	21 Oct 2021	 <p>Road leading into the residency on the west of Tuen Ma Line.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
33.	30 December 2021	 <p>Large areas of concrete paved areas with no signs of oil stains in cracks.</p>
34.	30 December 2021	 <p>Large areas of concrete paved areas in good condition with no signs of oil stains or cracks.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
35.	30 December 2021	 <p>Vegetation growth on the borders of the Government land site.</p>
36.	21 Oct 2021	 <p>Path leading into Tin Sum Village.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
37.	21 Oct 2021	 <p>Road toward the south leading back to Yick Yuen Road.</p>
38.	21 Oct 2021	 <p>Village house observed along the path.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun


Project No.
2512234

Photo No.	Date	Photo and Description
39.	21 Oct 2021	 <p>Entrance into the drainage channel on the east side of Tuen Ma Line.</p>
40.	21 Oct 2021	 <p>Village houses along the road.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
41.	21 Oct 2021	 <p>Village houses along the road.</p>
42.	21 Oct 2021	 <p>A path leading into Tin Sum Village.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun


Project No.
2512234

Photo No.	Date	Photo and Description
43.	21 Oct 2021	 <p>Village area along the road.</p>
44.	21 Oct 2021	 <p>Fenced area within the tentative Project Site.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
45.	21 Oct 2021	 <p>Path leading into the village on the east of Tuen Ma Line.</p>
46.	21 Oct 2021 & 17 December 2021	

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
		 <p>The carpark with the entrance from Yick Yuen Road.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
47.	21 Oct 2021	 <p>The carpark with entrance from Yick Yuen Road.</p>
48.	18 November 2021	 <p>Vegetated land under the Tuen Ma Line viaduct.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
49.	18 November 2021	 <p>Barren land directly under the Tuen Ma Line viaduct.</p>
50.	18 November 2021	 <p>Barren land directly under the Tuen Ma Line viaduct.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
51.	18 November 2021	 <p>Drainage channel under the Tuen Ma Line Viaduct.</p>
52.	18 November 2021	 <p>Existing drainage channel along the eastern side of the Proposed HSK Station footprint.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
53.	18 November 2021	 <p>Existing drainage channel along the eastern side of the Proposed HSK Station footprint. Algae growth is observed.</p>
54.	18 November 2021	 <p>Existing drainage channel along the eastern side of the Proposed HSK Station footprint. Algae growth is observed.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
55.	18 November 2021	 <p>Existing drainage channel along the eastern side of the Proposed HSK Station footprint.</p>
56.	30 December 2021	 <p>Government land southeast of the Proposed HSK Station footprint is concrete paved and occasional trees and shrubs.</p>

Appendix D

Information Request Letter

Our ref. 69001-EN-18795/21

8 November 2021

By POST and EMAIL

Environmental Protection Department
Environmental Compliance Division
Regional Office (North), Yuen Long
10th floor, Shatin Government Offices
No.1 Sheung Wo Che Road, Sha Tin, New Territories

Attn: Dr. LAW Chi Wing
(Sr Env Protection Offr(Regional N)2)

Dear Sir,

Contract 1830 Ground Investigation for Hung Shui Kiu Station
Request for Information – Historical Records of Chemical Spillage / Leakage

We are currently undertaking environmental studies listed above (also shown in the enclosed site location plan) on behalf of MTR Corporation Limited (MTRCL). A copy of MTRCL's memo reference CMD/HSK/C1801/614/007 dated 5 October 2021 is enclosed for your reference.

In order to facilitate our land contamination assessment, we appreciate if the following information of the Project Site could be provided:

- (i) Historical records of chemical and dangerous spillage / leakage.

In view of the tight programme of this project, your prompt response on or before 30 November 2021 would be much appreciated. A Nil Return is also required.

Should you have any queries, please contact our Ms Steffi TO at 2579 8583 or Dr Alex CHEUNG at 3900 2021.

Yours faithfully,
For and on behalf of
WSP (ASIA) LIMITED

Dr Alex W.H. CHEUNG
Associate Director,
Sustainable Development and Environment, China Region



CONFIDENTIAL

AURECON-WSP Joint Venture
Units 1601A & 1604B-16088
16/F TWR B Manulife Financial CTR
223-231 Wai Yip Street,
Kwun Tong, Hong Kong

Our ref : CMD/HSK/C1801/614/007

By Collection

Date : 5 October 2021

Attn: Mr. Stephane Asselin, Chief Executive, Asia, Aurecon Hong Kong Limited; and
Mr. Wing LAW, Managing Director, Transport & Infrastructure, Asia, WSP (Asia) Limited)

Dear Sirs,

**Hung Shui Kiu Station
Consultancy Agreement No. C1801
Design Services for Hung Shui Kiu Station
Letter of Appointment**

I am pleased to inform you that your Proposal dated 7 September 2021 for Consultancy Agreement No. C1801 - Design Services for Hung Shui Kiu Station as subsequently modified, amended and specified by the Letter of Clarification dated 30 September 2021 Ref. CMD/HSK/C1801/614/006 and documents referenced therein, is hereby accepted by the MTR Corporation Limited in the Agreement Sum of

Unless and until a Form of Agreement is executed, your Proposal as defined by the documents referred to in the above-referenced Letter of Clarification together with this Letter of Appointment shall form a binding Agreement between us.

The *starting date* is 8 October 2021.


Please acknowledge receipt of this letter by signing and returning it to this office.

Yours faithfully,



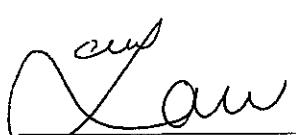
JS Mackenzie
General Manager-Commercial Management
MTR Corporation Limited

RECEIPT ACKNOWLEDGED



Signed by: Stephane Asselin
(being duly authorised)
for and on behalf of
Aurecon Hong Kong Limited
Date: 6 Oct 2021





Signed by: Wing LAW
(being duly authorised)
for and on behalf of
WSP (Asia) Limited
Date: 6 Oct 2021





Our ref. 69001-EN-18794/21

8 November 2021

By POST and EMAIL

Environmental Protection Department
Environmental Compliance Division
Territorial Control Office
Chemical Waste and WEEE (Licensing and Control
Support) Section
25th floor, Southern Centre, 130 Hennessy Road
Wan Chai, Hong Kong

Attn: Mr. MA Pak Kay, Andy
(Env Protection Insp(Territorial Control)52)

Dear Sir,

Contract 1830 Ground Investigation for Hung Shui Kiu Station
Request for Information – Records of Registered Chemical Waste Producers

We are currently undertaking environmental studies listed above (also shown in the enclosed site location plan) on behalf of MTR Corporation Limited (MTRCL). A copy of MTRCL's memo reference CMD/HSK/C1801/614/007 dated 5 October 2021 is enclosed for your reference.

In order to facilitate our land contamination assessment, we appreciate if the following information of the Project Site could be provided:

- (i) Current and past records of registered chemical waste producers.

In view of the tight programme of this project, your prompt response on or before 30 November 2021 would be much appreciated. A Nil Return is also required.

Should you have any questions, please contact our Ms Steffi TO at 2579 8583 or Dr Alex CHEUNG at 3900 2021.

Yours faithfully,
For and on behalf of
WSP (ASIA) LIMITED

Dr Alex W.H. CHEUNG
Associate Director,
Sustainable Development and Environment, China Region

7/F One Kowloon
1 Wang Yuen Street
Kowloon Bay, Hong Kong

香港九龍灣宏遠街1號
一號九龍7字樓

T+ 852 2579-8899
F+ 852 2856-9902
wsp.com

Encl. Appendix 1 – Site Location Plan
MTRCL Memo Reference

ACWH/et

本署檔案
OUR REF : EP910/G1/1/YLW
來函檔案
YOUR REF :
TEL NO : 2158 5825
圖文傳真
FAX NO : 2650 6033
網 址
HOMEPAGE : <http://www.epd.gov.hk/>

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10/F, Sha Tin Government Offices,
No. 1 Sheung Wo Che Road,
Shatin, New Territories,
Hong Kong



環境保護署
環保法規管理科
區域辦事處(北)
香港新界沙田
上禾輦路一號
沙田政府合署十樓

20 January 2021

WSP
7/F One Kowloon
1 Wang Yuen Street
Kowloon Bay, Hong Kong

(Attn.: Dr Alex CHEUNG, Associate Director)

Dear Dr. CHEUNG,

Contract 1830 Ground Investigation for Hung Shui Kiu Station
Request for Information of Chemical Spillage Accident Records

I refer your letter dated 8 November 2021 about the captioned. Our reply is as below:-

- (a) This Regional Office has no record of reported accidents of spillage / leakage of chemicals at the concerned site. You may also need to check with other parties / departments for such information as appropriate.
- (b) For the register of Chemical Waste Producers, a registry is available at our Territory Control Office at Wan Chai. Please contact our Mr. Eric FUNG, Senior Environmental Protection Inspector, at Tel : 2835 1027 for details;

Should you have any enquiry, you may contact my colleague Mr. LO at 2158 5713.

Yours faithfully,



(LAI Ho-leung)

for Director of Environmental Protection



C0944184

Our ref. 69001-EN-18796/21

8 November 2021

By POST and EMAIL

Fire Services Department
Fire Services Headquarters Command
Management Group (MG)
9th Floor, Fire Service HQ Building
1 Hong Chong Road, Tsim Sha Tsui East
Kowloon

Attn: Mr. NG Wing Chit
(Asst Div Offr (Management Group)1)

Dear Sir,

Contract 1830 Ground Investigation for Hung Shui Kiu Station
Request for Information – Registration of Dangerous Goods Records and Historical
Records of Dangerous Goods Spillage / Leakage

We are currently undertaking environmental studies listed above (also shown in the enclosed site location plan) on behalf of MTR Corporation Limited (MTRCL). A copy of MTRCL's memo reference CMD/HSK/C1801/614/007 dated 5 October 2021 is enclosed for your reference.

In order to facilitate our land contamination assessment, we would be grateful if the following information of the Project Site could be provided:

- (i) Current and past registration of dangerous goods records; and
- (ii) Historical records of chemical and dangerous goods spillage / leakage.

In view of the tight programme of this project, your prompt response on or 30 November 2021 would be very much appreciated. A Nil Return is also required.

Should you have any queries, please contact our Ms Steffi TO at 2579 8583 or Dr Alex CHEUNG at 3900 2021.

Yours faithfully,
For and on behalf of
WSP (ASIA) LIMITED

Dr Alex W.H. CHEUNG
Associate Director,
Sustainable Development and Environment, China Region

7/F One Kowloon
1 Wang Yuen Street
Kowloon Bay, Hong Kong

香港九龍灣宏遠街1號
一號九龍7字樓

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F+ 852 2856-9902
wsp.com

Encl. Appendix 1 – Site Location Plan
MTRCL Memo Reference

ACWH/et

消防處
香港九龍尖沙咀東部康莊道 1 號
消防處總部大廈



FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (115) in FSD GR 6-5/4 R Pt. 37
來函檔號 YOUR REF. : 69001-EN-18796/21
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

3 December 2021

WSP
7/F One Kowloon,
1 Wang Yuen Street,
Kowloon Bay,
Hong Kong.
(Attn: Dr. Alex W.H. CHEUNG, Associate Director)

Dear Mr. CHEUNG,

**Contract 1830 Ground Investigation for Hung Shui Kui Station
Request for Information of Dangerous Goods & Incident Records**

I refer to your letter of 8.11.2021 regarding the captioned request and reply below in response to your questions:-

1. No Dangerous Goods Licence was issued in respect of the captioned address.
2. A total of one incident records were found at the subject location. Please refer to **Appendix A** for details.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(NG Wing-chit)

for Director of Fire Services.

Contract 1830 Ground Investigation for Hung Shui Kui Station

Request for Information of Dangerous Goods & Incident Records

No.	Date	Type of Incident	Address
1	21.12.2019	Rubbish Fire	Yick Yuen Road

Our ref. 69001-EN-18797/21

8 November 2021

By POST and EMAIL

Lands Department
Lands Administration Office
District Lands Office, Yuen Long
7th and 9th-11th floors, Yuen Long Government Offices
2 Kiu Lok Square, Yuen Long, New Territories

Attn: Ms. CHAN Ching Han, Peggy
(Dist Lands Offr/YL (District Lands Office, Yuen Long))

Dear Madam,

**Contract 1830 Ground Investigation for Hung Shui Kiu Station
Request for Information – Current and Past Land Uses**

We are currently undertaking environmental studies listed above (also shown in the enclosed site location plan) on behalf of MTR Corporation Limited (MTRCL). A copy of MTRCL's memo reference CMD/HSK/C1801/614/007 dated 5 October 2021 is enclosed for your reference.

In order to facilitate our land contamination assessment, it would be grateful if the following information of the Project Site could be provided:

- (i) Current and past land uses of the Site detailed with duration; and
- (ii) Reported land contamination issues (e.g. chemical and dangerous goods spillage / leakage), if any.

In view of the tight programme of this project, your prompt response on or before 30 November 2021 would be much appreciated. A Nil Return is also required.

Should you have any queries, please contact our Ms Steffi TO at 2579 8583 or Dr Alex CHEUNG at 3900 2021.

Yours faithfully,
For and on behalf of
WSP (ASIA) LIMITED



Dr Alex W.H. CHEUNG
Associate Director,
Sustainable Development and Environment, China Region

7/F One Kowloon
1 Wang Yuen Street
Kowloon Bay, Hong Kong

香港九龍灣宏遠街1號
一號九龍7字樓

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F+ 852 2856-9902
wsp.com

Encl. Appendix 1 – Site Location Plan
MTRCL Memo Reference

ACWH/et

電話 Tel: 2443 3114
 圖文傳真 Fax: 2473 3134
 電郵地址 Email: esylw1@landsd.gov.hk
 本署檔號 Our Ref: (11) in DLOYL 6/YPS/2018T
 來函檔號 Your Ref: 69001-EN-18797/21

來函請註明本署檔號
 Please quote our reference in your reply



地政總署
 元朗地政處
 DISTRICT LANDS OFFICE/
 YUEN LONG
 LANDS DEPARTMENT

我們矢志努力不懈，提供盡善盡美的土地行政服務。
 We strive to achieve excellence in land administration.

新界元朗橋樂坊二號元朗政府合署七樓及九至十一樓
 7/F & 9/F-11/F, YUEN LONG GOVERNMENT OFFICES
 2 KIU LOK SQUARE, YUEN LONG, N.T.

網址 Website: www.landsd.gov.hk

By Fax (2856 9902) & By Post

31 December 2021

WSP (Asia) Limited
 7/F, One Kowloon
 1 Wang Yuen Street, Kowloon Bay
 Hong Kong

(Attn.: Ms. Steffi TO)


Dear Madam,

Contract 1830 Ground Investigation for Hung Shui Kiu Station
Request for Information – Current and Past Land Uses

I refer to your letter of 8 November 2021 for the captioned.

2. Please be advised that Hung Shui Kiu Station falls within the developable area and planned development area of Hung Shui Kiu/Ha Tsuen New Development Area (NDA) which under the purview of our NDA Section. As advised in our memos of 2 June 2020 and 23 July 2020 to Highways Department, please seek advice from our NDA Section regarding the Hung Shui Kiu Station project accordingly.

Yours faithfully,


 (Vincent WONG)
 for District Lands Officer, Yuen Long

c.c. RDO, HyD (Attn: Mr. Kenneth WONG)
 NDA Section, LandsD

(Fax: 2714 5297)
 (Fax: 3547 0756)

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Appendix E

Chemical Waste Producers in Vicinity of Tentative Project Site

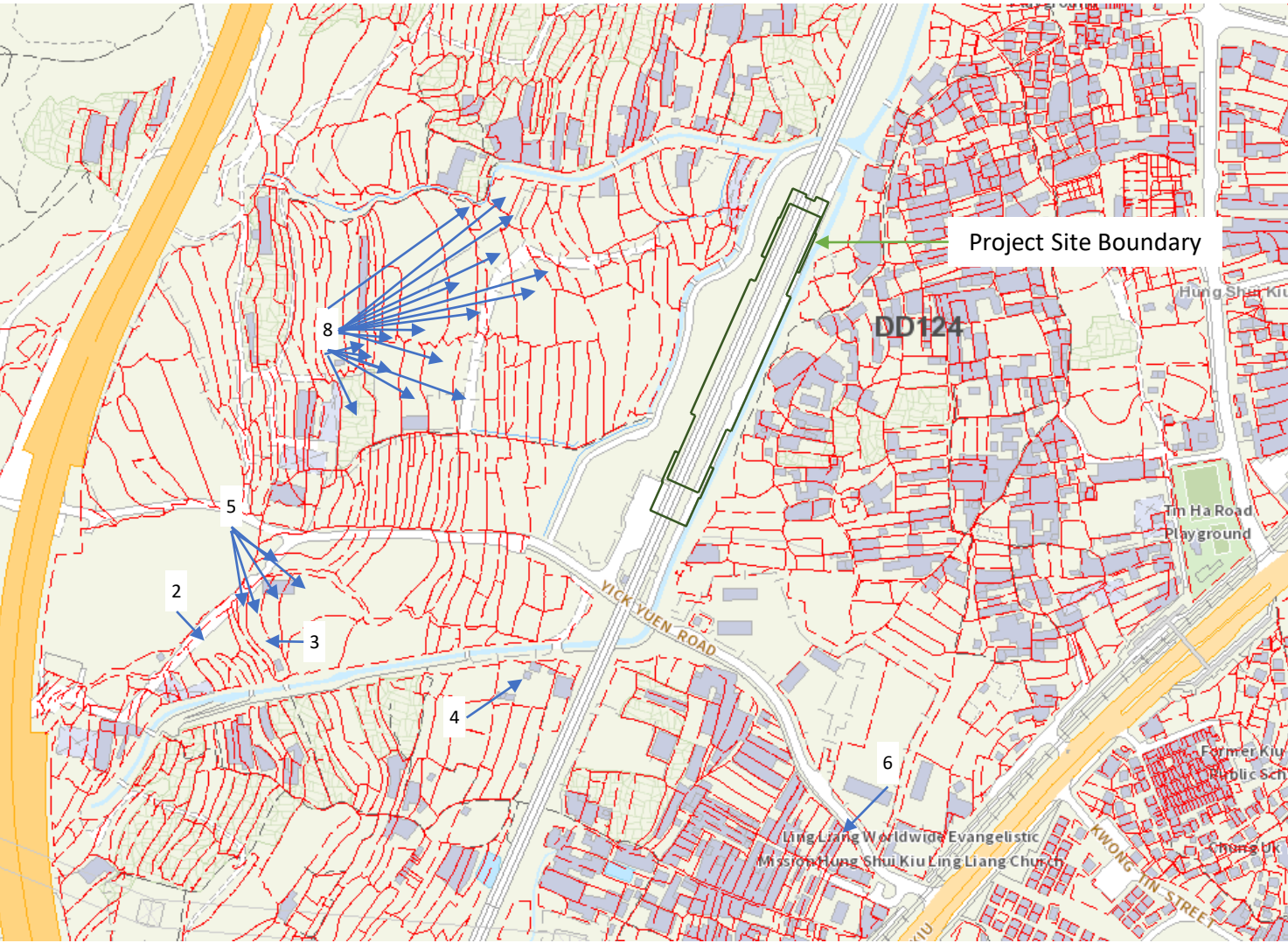
Hung Shui Kiu Proposed MTR Station Chemical Waste Producers (450m buffer)

Valid as of 20210826

Number	Business	Address	Operation
1	Kuly Construction and Engineering Co., Ltd.	DSD site office Yick Yuen Road, Tuen Mun	Civil Engineering
2	Hong Kong Taihezaisheng Resources Co., Ltd.	Hung Shui Kiu Yick Yuen Road, DD130, Lot 1847	Recycling of computer components including printed circuit boards
3	Lin Yuo Recycle Company Ltd.	DD124 Lot 3437 Yick Yuen Road	Recycling
4	Kin Shing Forklifts and Maintenance Co.	58A Yick Yuen Road, Yick Yuen Tsuen	Vehicle Repair Workshop
5	Chi Cardo Investment Limited	DD124 Lot 3401, 3435-3438 Yick Yuen Road, Hung Shui Kiu	Renting, selling, buying platform lifts
6	Windex Industrial Equipment and Engineering Co., Ltd.	5A Yick Yuen Road	Warehouse
7	Railway Construction Corporation Queensland Rail JV	G/F, Yick Yuen Tsuen (CC-1820 Site Office) Yick Yuen Road	Construction Contracting

Invalid as of 20210826

Number	Business	Address	Operation
8	E.Tech Management (HK) Limited	DD124 Lot 3338, 3240-3249, 3251, 3252, 3335-3337, 3339, Yick Yuen Road	Recycling Management



Valid as of 20210826		
Business	Address	Operation
1 Kuly Construction and Engineering Co., Ltd.	DSD site office Yick Yuen Road, Tuen Mun	Civil Engineering
2 Hong Kong Taihezaisheng Resources Co., Ltd.	Hung Shui Kiu Yick Yuen Road, DD130, Lot 1847	Recycling of computer components including printed circuit boards
3 Lin Yuo Recycle Company Ltd.	DD124 Lot 3437 Yick Yuen Road	Recycling
4 Kin Shing Forklifts and Maintenance Co.	58A Yick Yuen Road, Yick Yuen Tsuen	Vehicle Repair Workshop
5 Chi Cardo Investment Limited	DD124 Lot 3401, 3435-3438 Yick Yuen Road, Hung Shui Kiu	Renting, selling, buying platform lifts
6 Windex Industrial Equipment and Engineering Co., Ltd.	5A Yick Yuen Road	Warehouse
7 Chun Wo - Henry vicy-China Railway Construction Corporation	G/F, Yick Yuen Tsuen (CC-1820 Site Office) Yick Yuen Road	Construction Contracting
Invalid as of 20210826		
Business	Address	Operation
8 E.Tech Management (HK) 8 Limited	DD124 Lot 3338, 3240-3249, 3251, 3252, 3335-3337, 3339, Yick Yuen Road	Recycling Management

Note: Chemical Waste Producer No. 1 and 7 does not have specific address

Appendix F

Design of Sampling Grid

Design of Sampling Grid

- 1.1.1 The sampling locations and numbers for site investigation are designed in accordance with the EPD's "Practice Guide for Investigation and Remediation of Contaminated Land" (Practice Guide).
- 1.1.2 According to the Practice Guide, for the calculation of the number of sampling locations required for a suitable level of contamination detection, a formula should be applied that allows 95% confidence in detecting contamination of a certain size, which refers to the same formula stated in "Department of the Environment: Contaminated Land Research Report: Sampling Strategies for Contaminated Land" published by Department for Environment, Food & Rural Affairs (DEFRA) and "Ministry for the Environment. Site Investigation and Analysis of Soils Contaminated Land Management Guidelines No. 5. Wellington".
- 1.1.3 All references illustrate an equation that can be applied to determine the grid sizes for detecting circular hotspots with 95% confidence.

- 1.1.4 The equation used to calculate the grid size is:

$$G = \frac{R}{0.59} \quad (1)$$

where

G = the grid size of the sampling pattern in m

R = radius of the smallest hotspot that the sampling intends to detect in m

0.59 = factor derived from 95% detection probability assuming circular hotspots

- 1.1.5 The number of sampling points can be calculated from the following equation:

$$n = \frac{A}{G^2} \quad (2)$$

where

n = number of sampling points

A = the area to be sampled in m²

G = the grid size of the sampling pattern in m

- 1.1.6 The investigation area is approximately 155m². According to Table 2.1 of the Practice Guide, 6m and 13m sampling grids are recommended for 100m² and 500 m² investigation areas respectively. To design the sampling grid with reasonable coverage of the investigation area, same approach and assumption using in the Practice Guide's grid sampling design are adopted.
- 1.1.7 By substitute the recommended sampling grid size and site area from the Practice Guide into Equation (1), the assumed size of hotspots for detection in the Practice Guide's calculation can be obtained. Based on the 6m grid recommended for 100m² site, the

Design of Sampling Grid

assumed size of hotspots for detection is approximately 3.54m in radius and 40m² in area, which is approximately 40% of the site area. By using the same assumed ratio, the assumed size of hotspots for detection in 155m² site is approximately 62m² in area and 4.44m in radius. The calculated size of sampling grid and minimum number of sampling locations required are summarised in the following table:

Table. Number of Sampling Locations Required

Grid Size (m)	$R = 0.59 G$	$G =$	6	7.5
Range of Radius of Hotspots to be Detected (m)		$R =$	3.54	4.44
Area of Investigation (m²)	$n = \frac{A}{G^2}$	$A =$	100	155
Calculated Number of Sampling Points		$n =$	3	3

Assumption: Method based on detecting a circular hotspot with a 95% confidence with a square pattern

- 1.1.8 Based on the calculation, 7.5m sampling grid is proposed for 155m² investigation area. To cover the entire investigation area with irregular shape, a total of 6 sampling points is proposed.

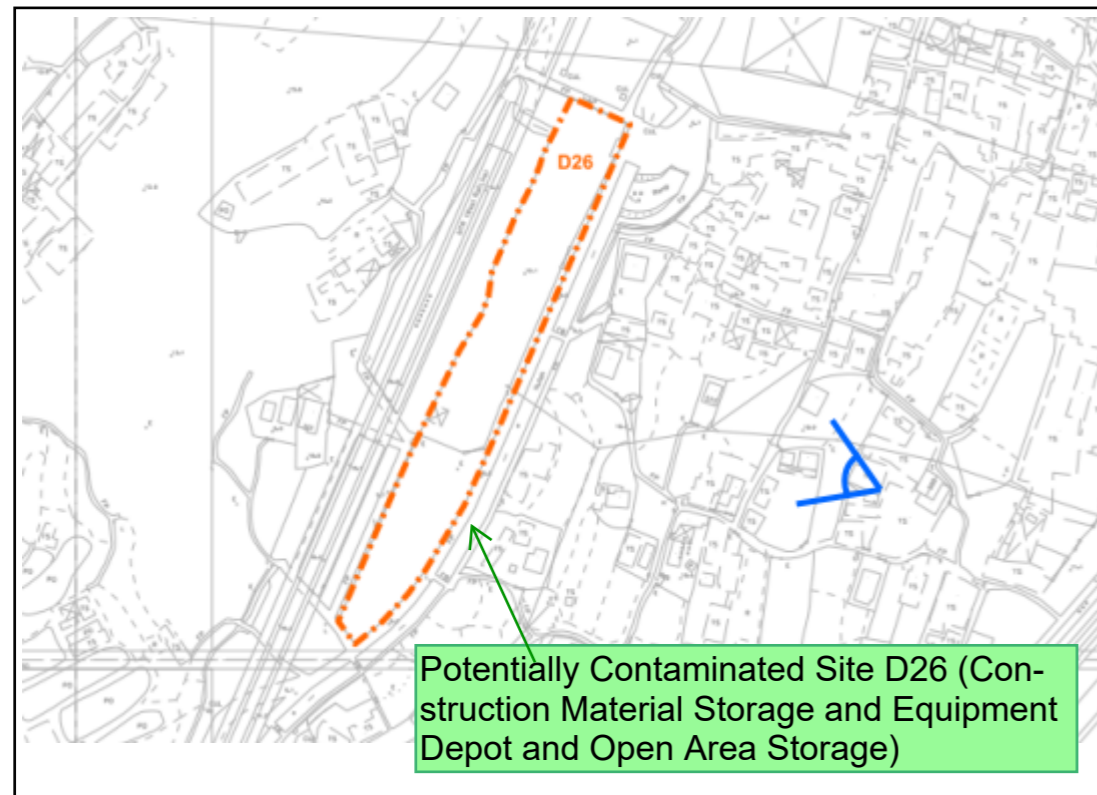
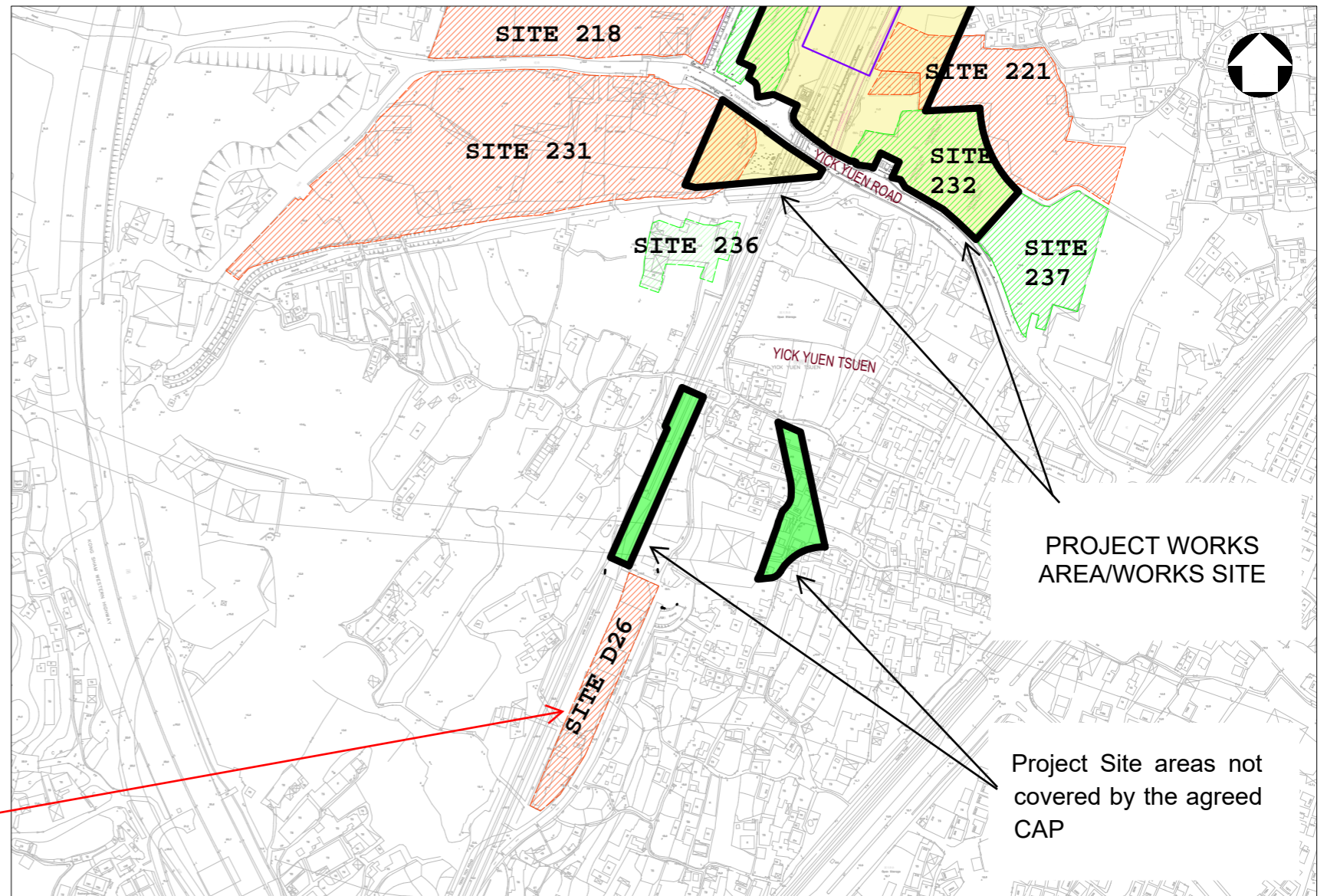


Unit 1608, 16/F, Tower B
Manulife Financial Centre
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Kwun Tong, Kowloon, Hong Kong

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F +852 3664 6999
E HSK_AWJV@aurecongroup.com

Appendix 8.2

Potential Contaminated Sites



Potentially Contaminated Site D26 (Construction Material Storage and Equipment Depot and Open Area Storage)

Source: CEDD liaison meeting, 24 September 2021

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	Author
DESIGNED	Designer
CHECKED	Checker
APPROVED	Approver
DATE	05/21/20

MTR
HUNG SHUI KIU STATION
 ORIGINATOR
aurecon wsp
 MODEL REF: (Model File Name.rvt)

TITLE C1801 Design Services for Hung Shui Kiu Station	
INACCESSIBLE AND ACCESSIBLE AREAS IN THE SOUTHERN SIDE SURVEYED IN THE EIAR	
SCALE NTS	DRAWING NO.
REV.	0

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Appendix 8.3

Aerial Photographs Review

Aerial Photographs for Northern Extended Works Area/Works Site

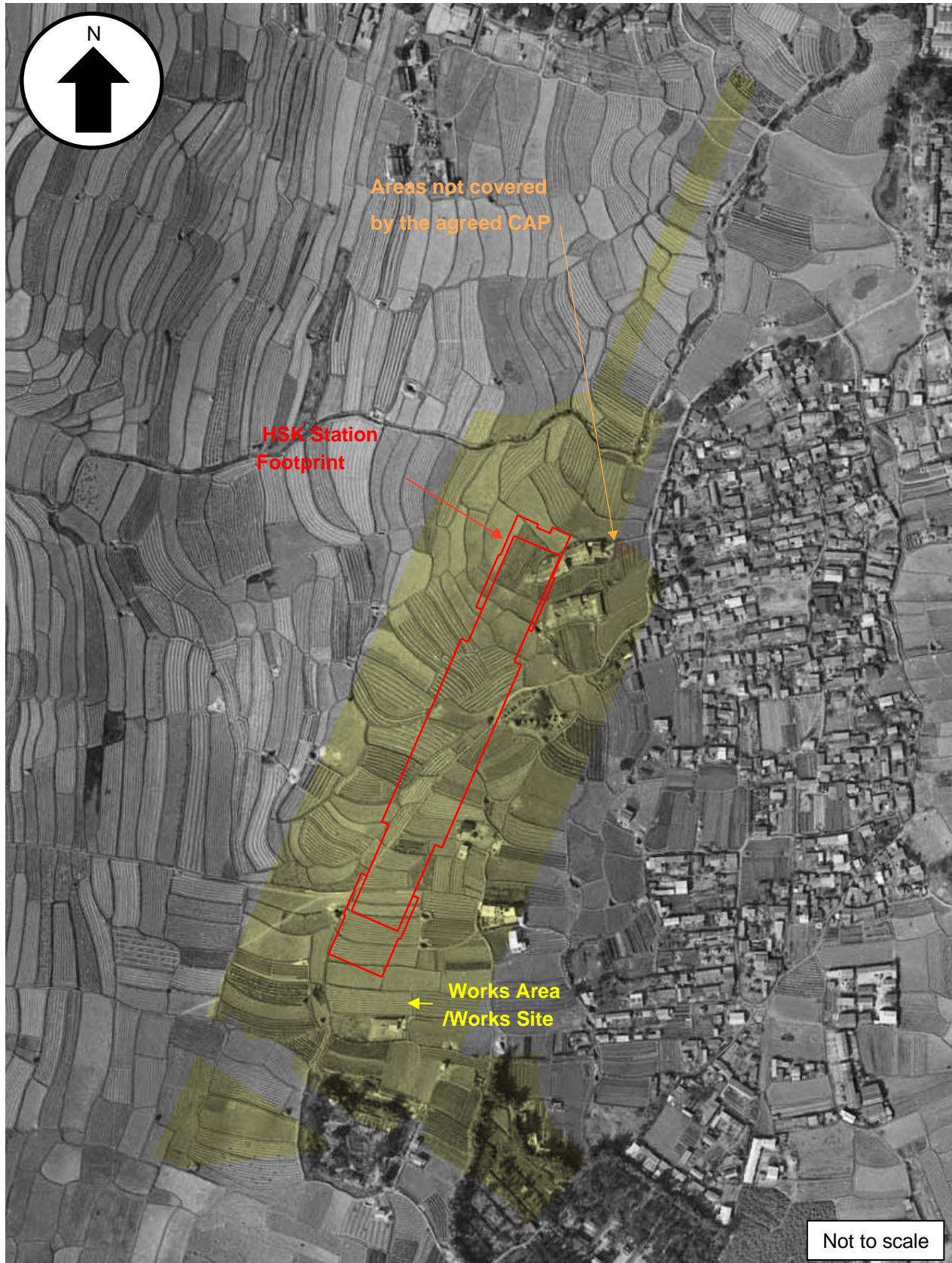
1945 (Photo reference: 681_4-3186) 20,000 ft.



Observation: The Project Site located on agricultural lands.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

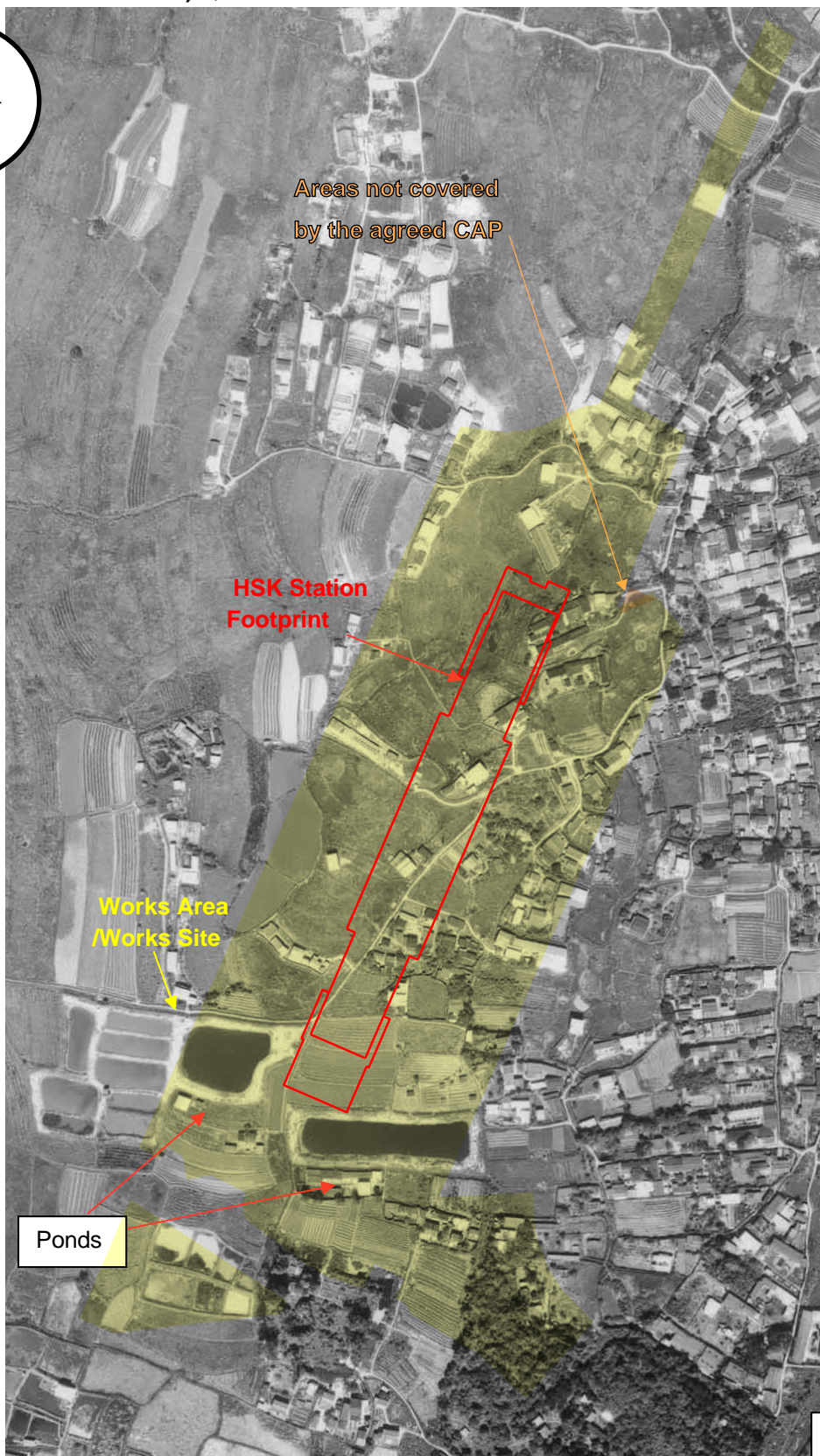
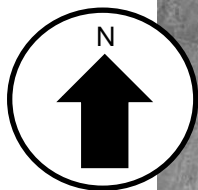
1963 (Photo reference: 1963-8416) 3,900 ft.



Observation: No changes to the Project Site until 1963. Part of a structure and site clearance are observed within the northern portion of the Project Site. Structures were constructed between 1946 and 1963 mainly to the east of the Project Site.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

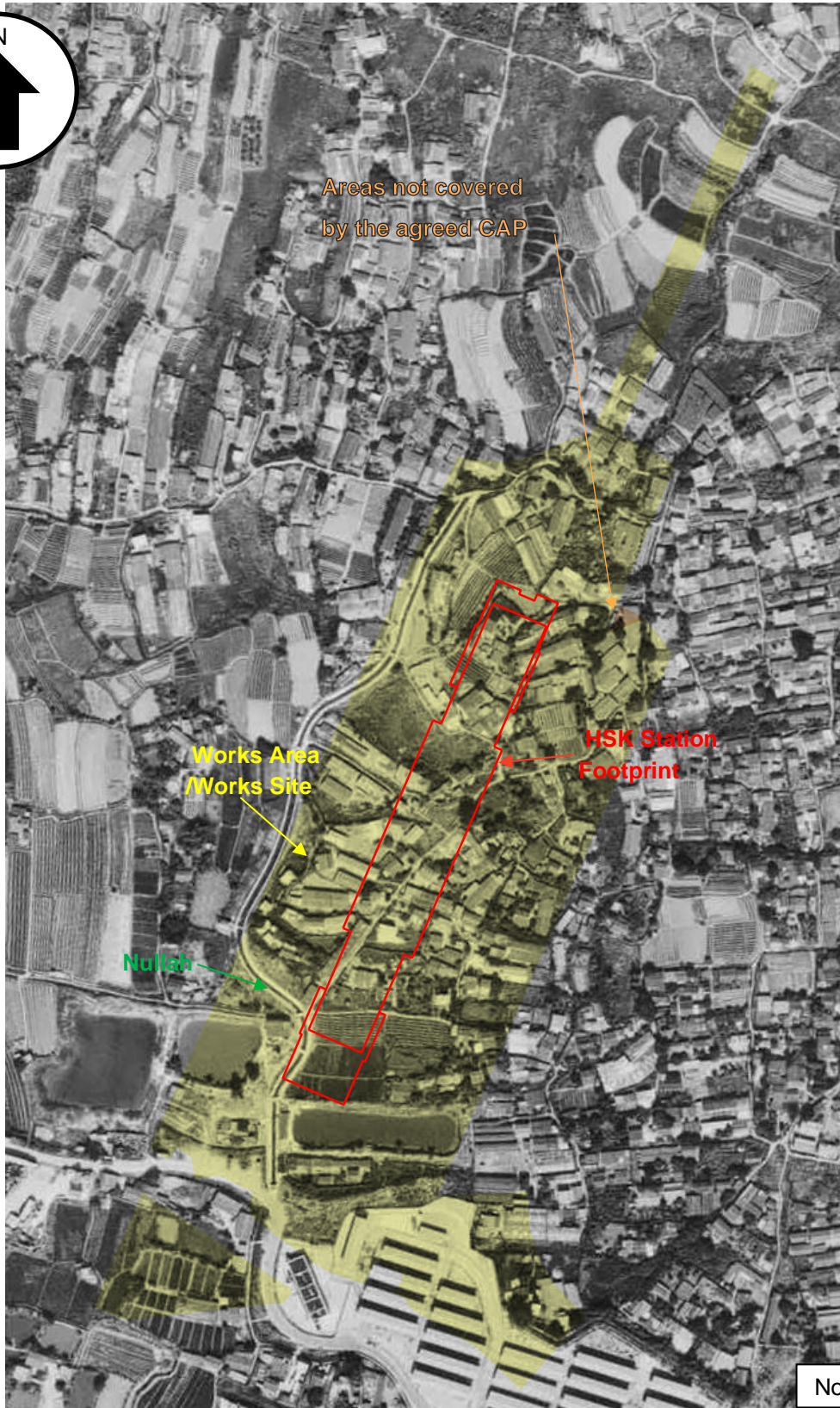
1973 (Photo reference: 05239) 2,500 ft.



Observation: Some agricultural lands were converted into dwellings within the Project Site between 1964 and 1973. Some areas to the southwest of the Project Site were converted into ponds.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

1984 (Photo reference: 57460) 4,000 ft.



Observation: More structures were constructed within the Project Site between 1974 and 1984. A drainage channel was completed to the west of and within the southern portion of Project Site.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

1995 (Photo reference: CN13089) 3,500 ft.



Areas not covered
by the agreed CAP

HSK Station
Footprint

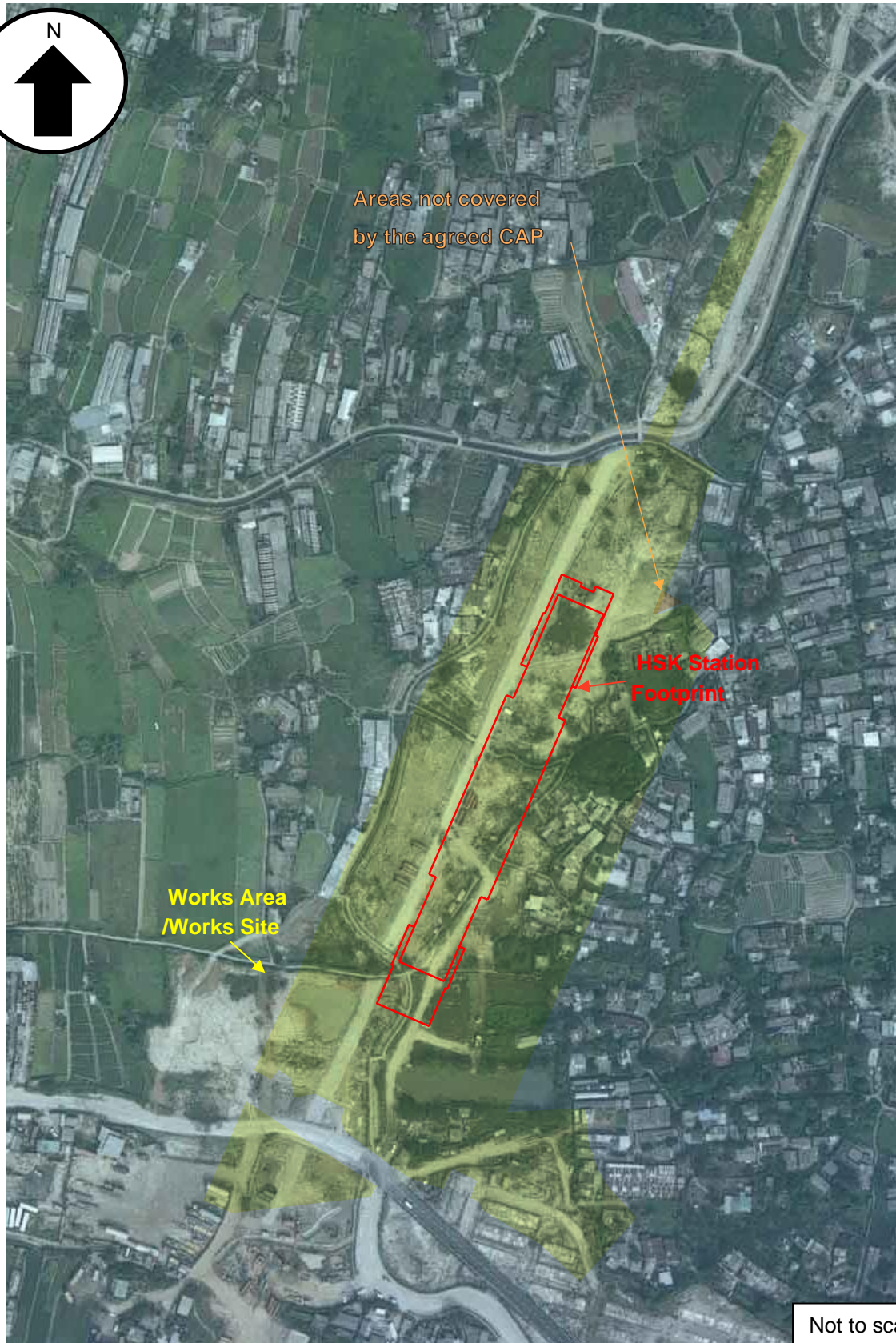
Works Area
/Works Site

Not to scale

Observation: More structures were observed within and adjacent to the Project Site.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

1999 (Photo reference: CN24586) 3,500 ft.



Observation: Structures within the Project Site were removed, and site clearance activities are observed within and outside the Project Site for the construction of the then West Rail Line.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

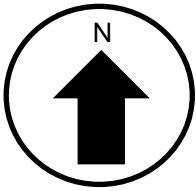
2001 (Photo reference: CW33157) 4,000 ft.



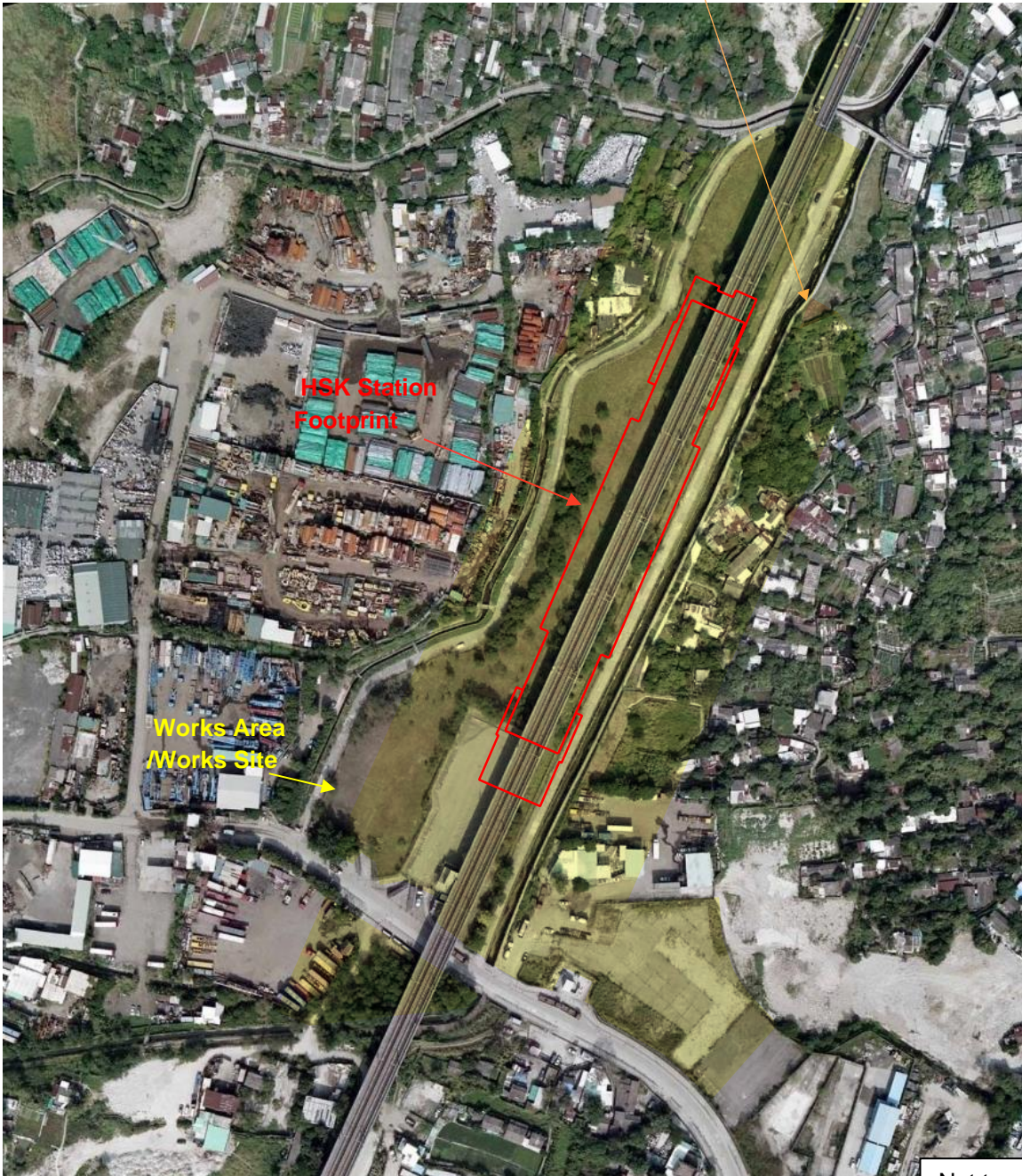
Observation: Area around the Project Site has been concrete paved for the West Rail Line. The drainage channel was modified between 2000 and 2001.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

2009 (Photo reference: CW85485) 2,000 ft.



Areas not covered
by the agreed CAP

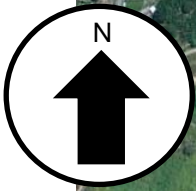


Not to scale

Observation: No changes to the Project Site between 2002 and 2009. The western area adjacent to the Site was covered in vegetation and areas further to the west has been established as open storage between the period.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

2014 (Photo reference: CS52463) 6,000 ft.

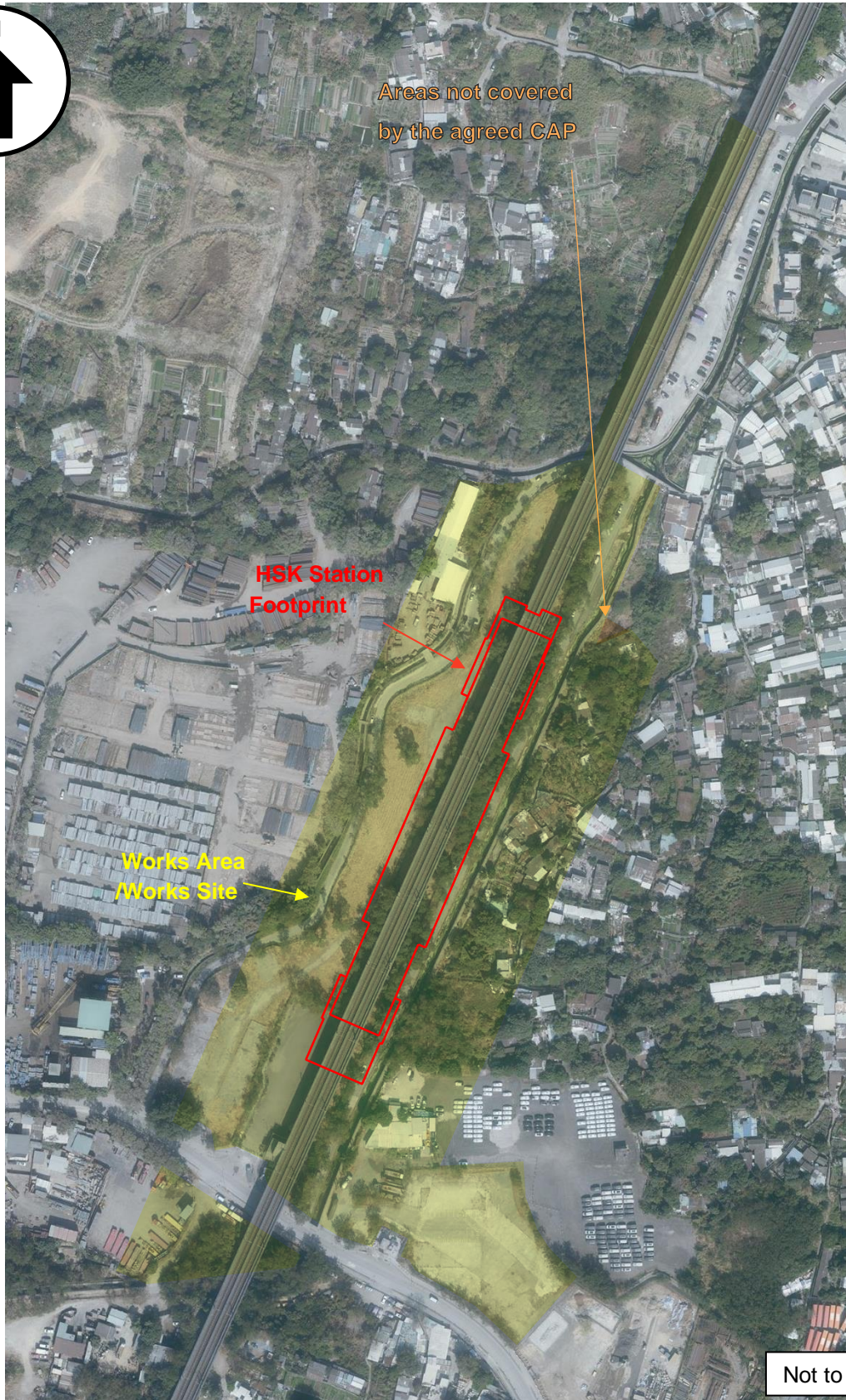
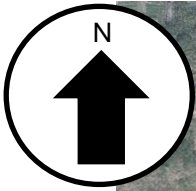


Not to scale

Observation: No changes to the Project Site from 2009 to 2014. Area immediately west to Project Site was paved and used for open storage.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

2021 (Photo reference: E131683C) 6,900 ft.



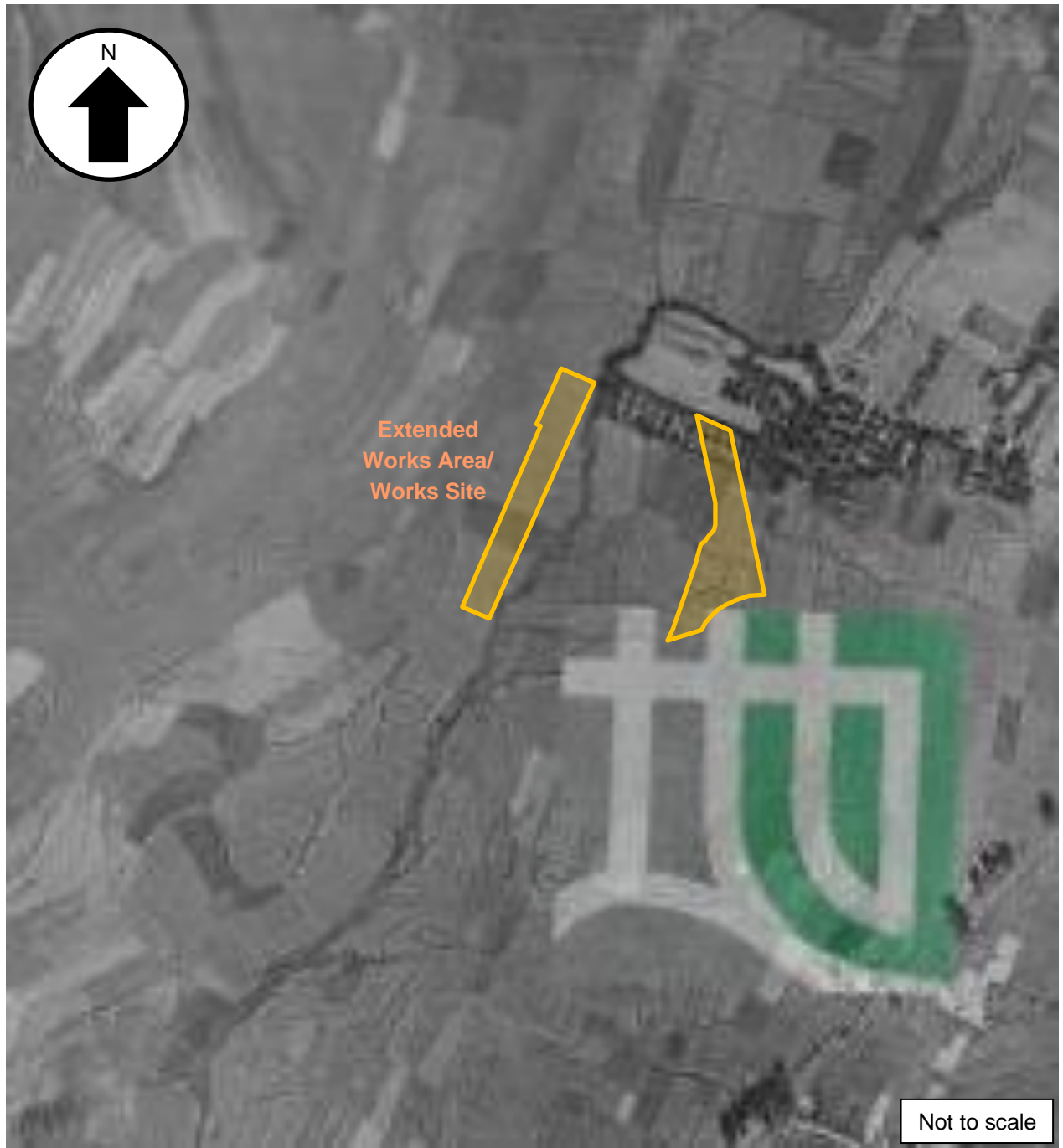
Not to scale

Observation: The open storage area directly west of the Project Site has been cleared. Otherwise, no changes to the Project Site and it resembles to present day.

'Not to scale' refers to the identification of the 'Project Site' on the aerial photo.

Aerial Photographs

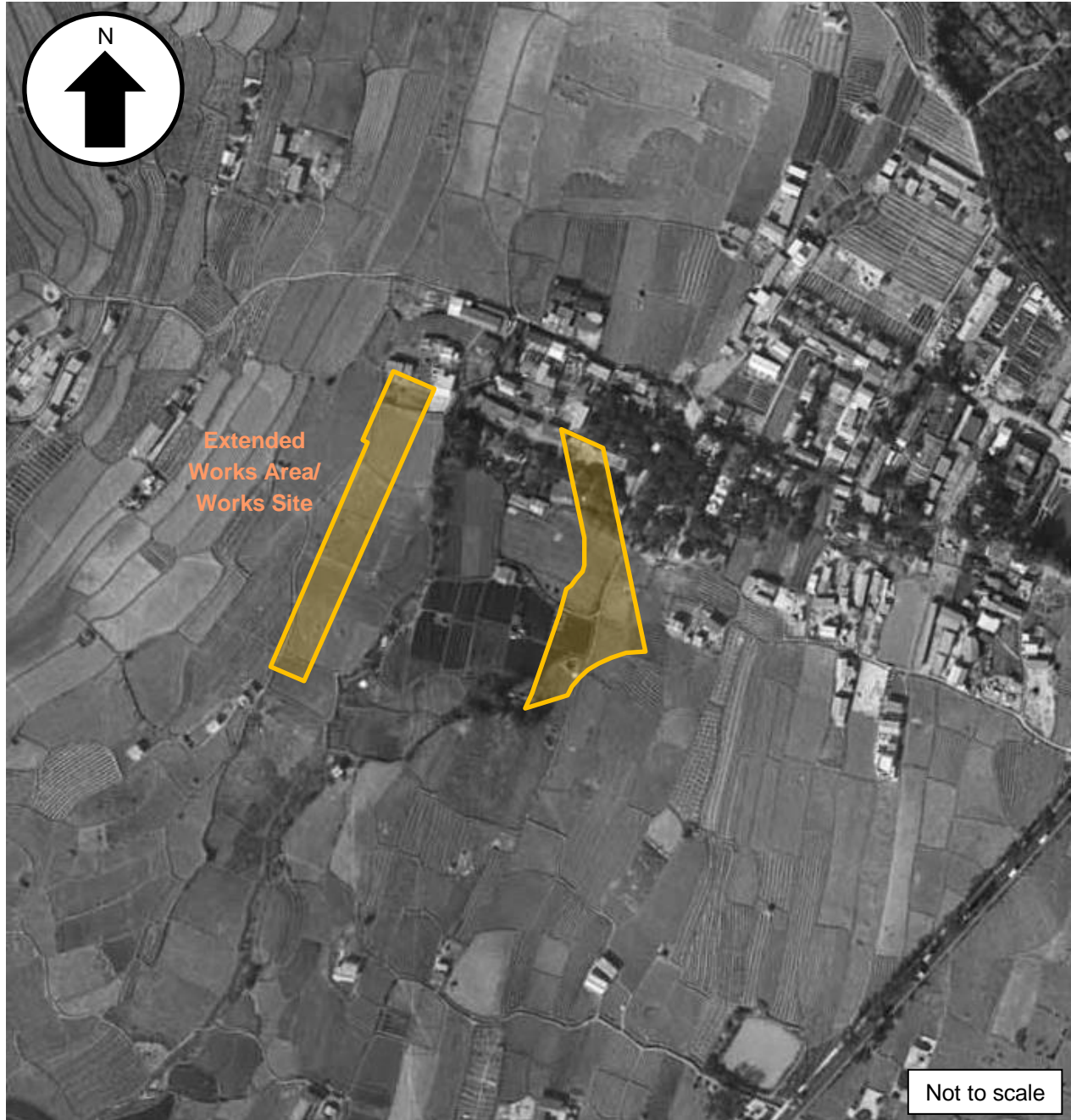
1945 (Photo reference: 681_4-3186) 20,000 ft.



Observation: The extended works area/works site located on agricultural lands.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

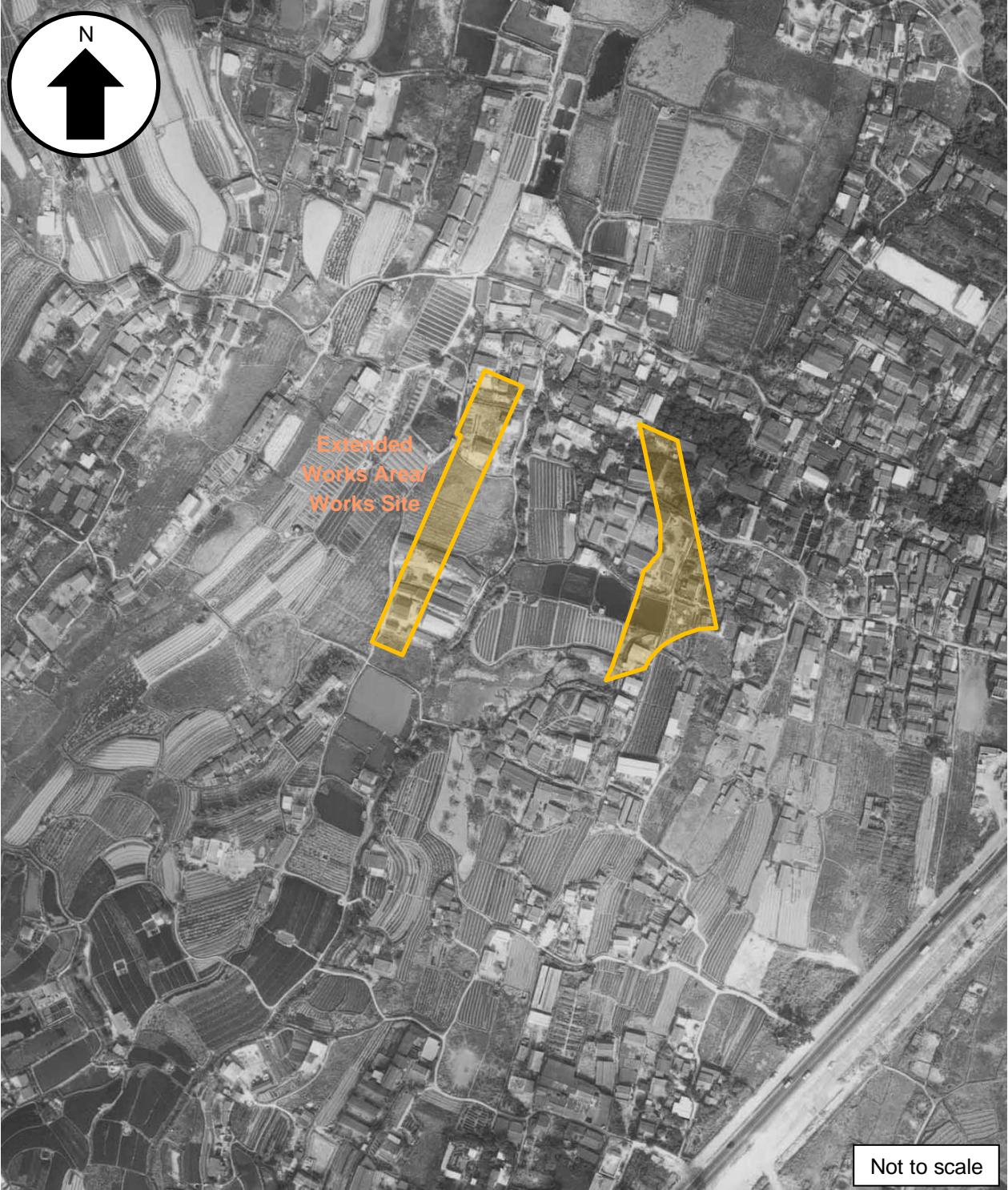
1963 (Photo reference: 1963-8416) 3,900 ft.



Observation: No changes in land use until 1963 when squatters are observed to the north of the extended works area/works site and within the northern portion of the area. Other parts of the site remain to be of agricultural uses.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

1973 (Photo reference: 07552) 2,000 ft.



Observation: More squatters are observed to the northeast and within the extended works area/works site between 1964 and 1973.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

1984 (Photo reference: 57460) 4,000 ft.



Extended
Works Area/
Works Site



Not to scale

Observation: Squatters occupied most of the extended works area/works site and adjacent to the area between 1974 and 1984.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

1995 (Photo reference: CN13089) 3,500 ft.



Extended
Works Area/
Works Site



Not to scale

Observation: No changes to the extended works area/works site between 1985 and 1995.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

1999 (Photo reference: CN24641) 4,000 ft.



Observation: Site clearance is observed for the construction of Tuen Ma Line at the temporary traffic management area. Land use in the other parts of the extended works area/works site remains the same.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

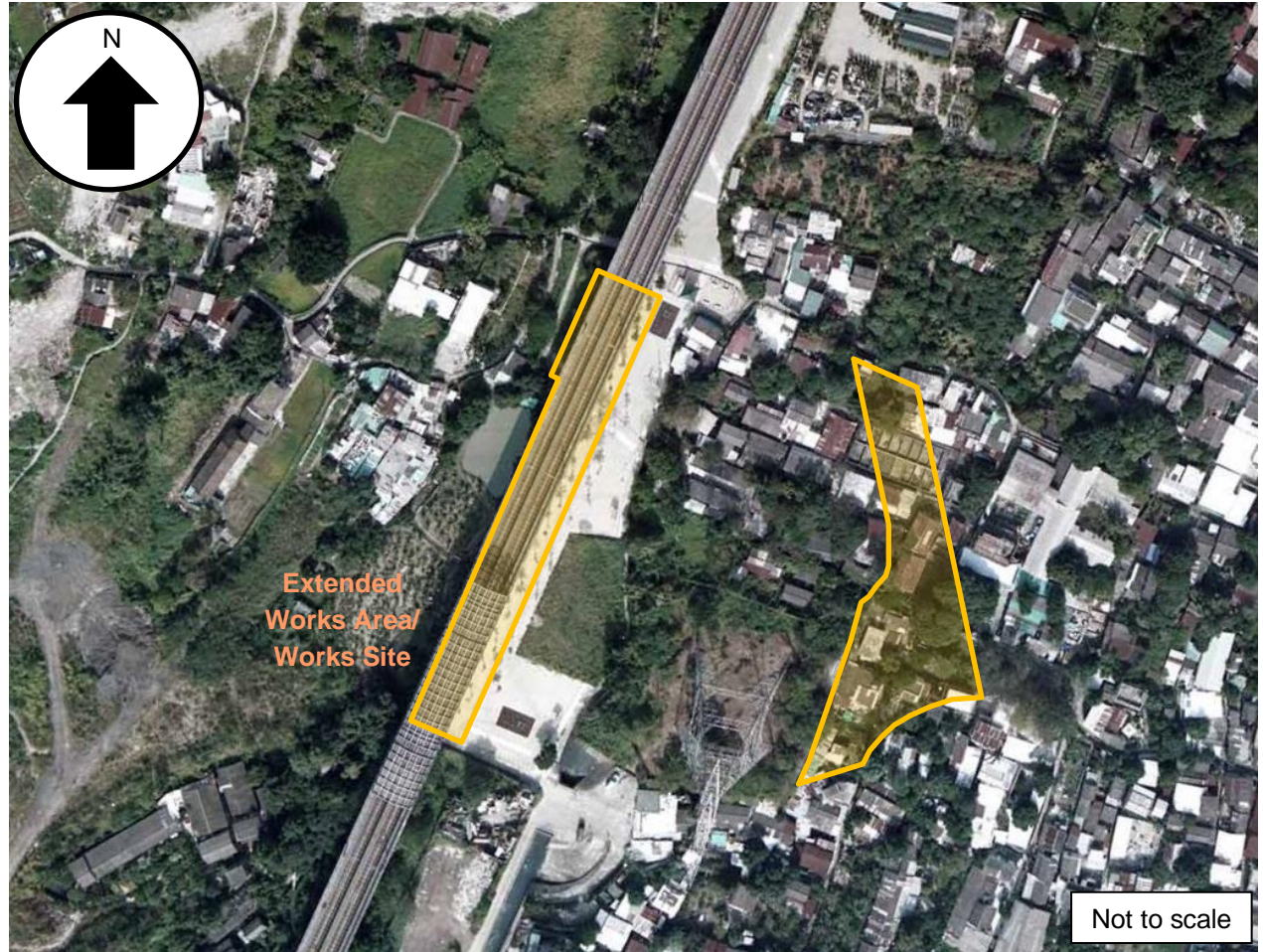
2001 (Photo reference: CW33157) 4,000 ft.



Observation: Tuen Ma Line was established at this section in Hung Shui Kiu. No changes to the extended works area/works site.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

2009 (Photo reference: CW85485) 2,000 ft.



Observation: No changes to the extended works area/works site between 2002 and 2009. Tuen Ma Line was completed and under operation.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

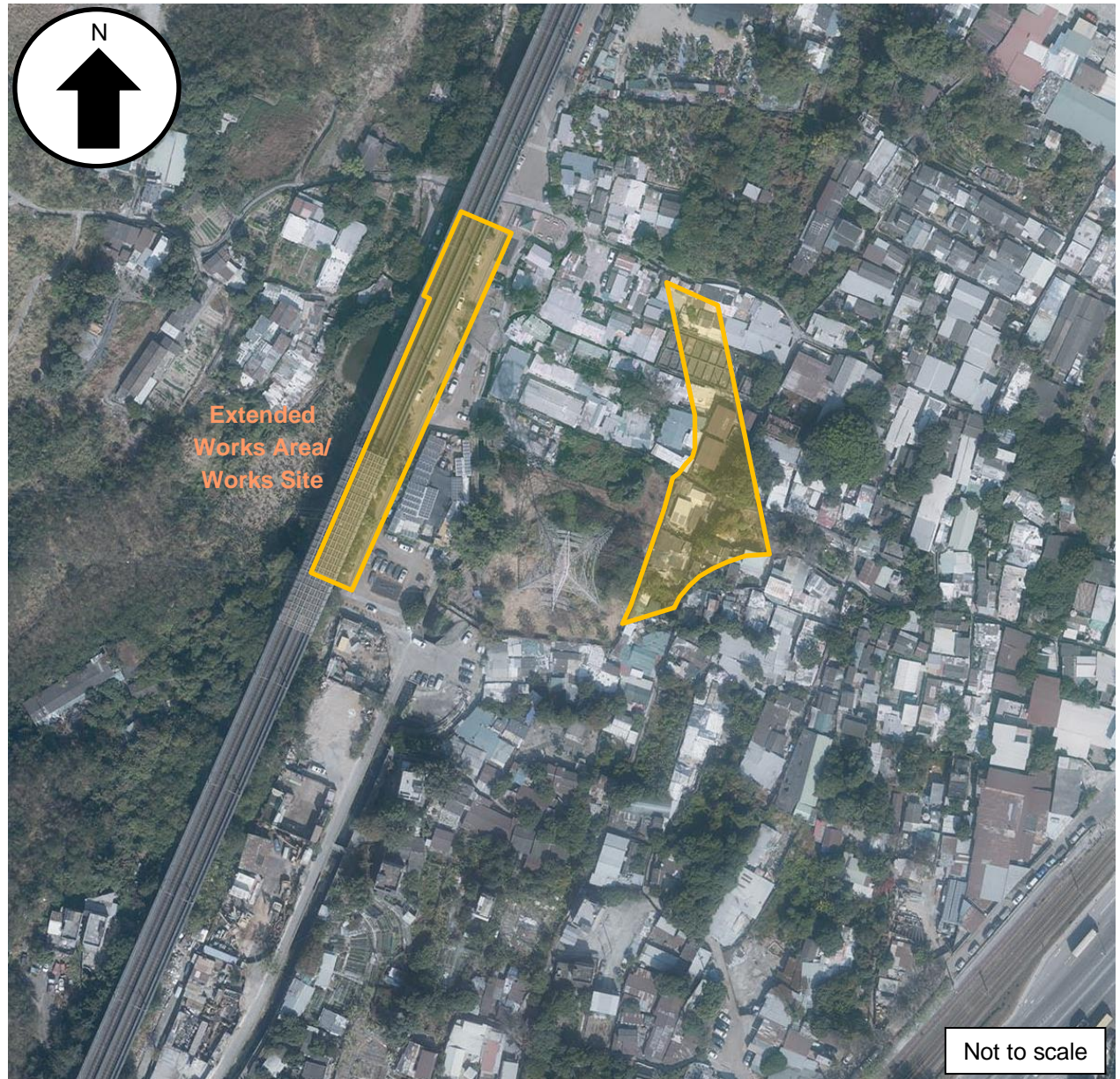
2014 (Photo reference: CS52463) 6,000 ft.



Observation: No changes to the extended works area/works site between 2010 and 2014.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

2021 (Photo reference: E131220C) 6,900 ft.

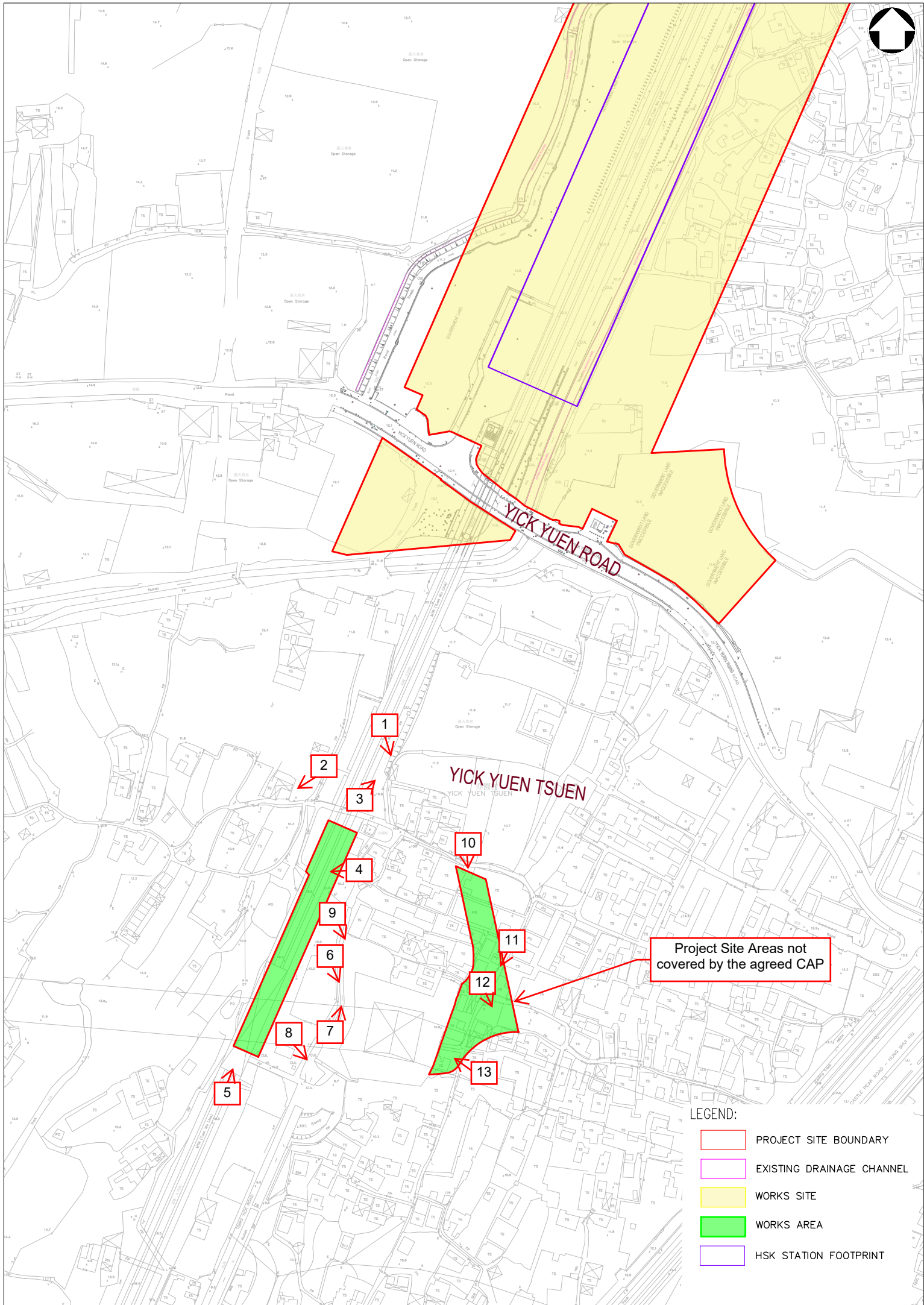


Observation: No changes to the extended works area/works site and it resembles to present day.

'Not to scale' refers to the identification of the 'Tentative Project Site' on the aerial photo.

Appendix 8.4

Site Walkover Photos



Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun



Project No.
2512234

Photo No.	Date	Photo and Description
1.	21 Oct 2021	 <p>Path leading further south from the Proposed HSK Station footprint into Yick Yuen Tsuen.</p>
2.	21 Oct 2021	 <p>A path toward the west leading into the village.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
3.	24 Aug 2022	 <p>Footpath next to Tuen Ma Line viaduct.</p>
4.	24 Aug 2022	 <p>Vegetations under Tuen Ma Line viaduct.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
5.	24 Aug 2022	 <p>Vegetations under Tuen Ma Line viaduct.</p>
6.	24 Aug 2022	 <p>A path toward south next to truck container storage.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
7.	24 Aug 2022	 <p>A path toward north next to vegetations.</p>
8.	24 Aug 2022	 <p>Road next to village.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
9.	24 Aug 2022	 <p>Village house along the road.</p>
10.	24 Aug 2022	 <p>Village house along the road.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
11.	24 Aug 2022	 <p>Village house along the road.</p>
12.	24 Aug 2022	 <p>Vacant areas occpied by vegetations.</p>

Client Name
MTR Corporation Limited

Site Location
Hung Shui Kiu Station, Tuen Mun

Project No.
2512234

Photo No.	Date	Photo and Description
13.	24 Aug 2022	 <p>Vegetations and village houses.</p>

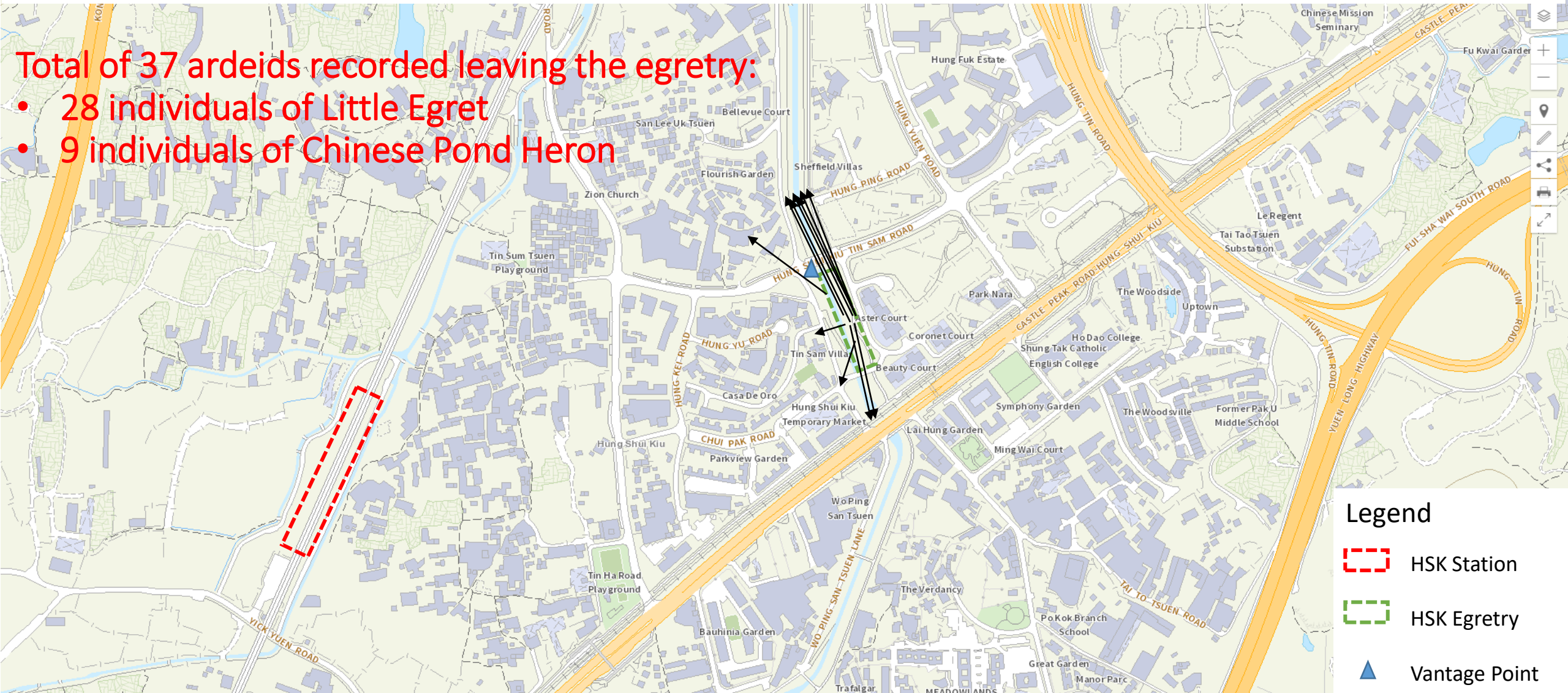
Appendix 9.1

Flight Path Survey during Sunrise

Appendix 9.1 Flight Path Survey during Sunrise

Total of 37 ardeids recorded leaving the egrettry:

- 28 individuals of Little Egret
- 9 individuals of Chinese Pond Heron



The density of arrows reflects only the relative frequency but not the total number of the bird use. The arrows show only the direction of bird flight path but not the landing location of the bird as it was not visible from the vantage point

Legend

- HSK Station
- HSK Egrettry
- Vantage Point

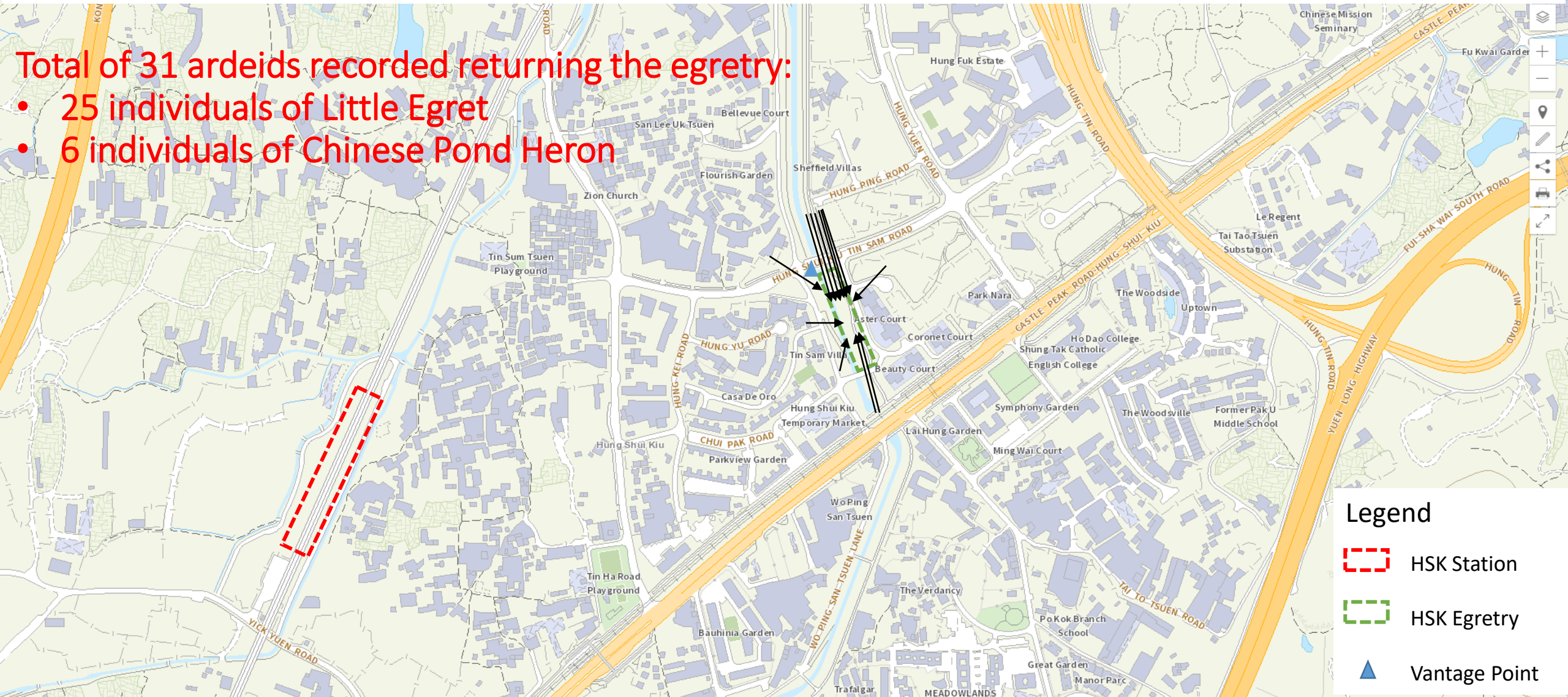
Appendix 9.2

Flight Path Survey during Sunset

Appendix 9.2 Flight Path Survey during Sunset

Total of 31 ardeids recorded returning the egretty:

- 25 individuals of Little Egret
- 6 individuals of Chinese Pond Heron



The density of arrows reflects only the relative frequency but not the total number of the bird use. The arrows show only the direction of bird flight path but not the landing location of the bird as it was not visible from the vantage point

Legend

- HSK Station
- HSK Egretty
- Vantage Point

Appendix 10.1

Tree Survey Schedule of Tree with Particular Interest

Appendix 10.1 - Tree Survey Schedule of Tree with Particular Interest

Tree No.	Species		Estimated Tree Dimension			Amenity Value	Form	Health condition	Structural condition	Suitability for transplanting	Remarks
	Scientific name	Chinese Name	Height (m)	DBH (m)	Crown Spread (m)	(High/Medium/Low)	(Good/Average/Poor)			(High/Medium/Low)	
TPI - 04	<i>Eucalyptus</i> sp.	桉屬	16	1.2	16	Medium	Average	Average	Average	Low	epiphytes
TPI - 05	<i>Eucalyptus</i> sp.	桉屬	16	1	10	Medium	Average	Average	Average	Low	dead branch
TPI - 06	<i>Ficus microcarpa</i>	細葉榕	12	2.5	22	High	Average to Good	Average to Good	Average	Low	robust aerial roots
TPI - 08	<i>Dimocarpus longan</i>	龍眼	10	1	12	Medium	Average	Average	Poor	Low	co-dominant trunks with included bark
TPI - 09	<i>Sterculia monosperma</i>	蘋婆	12	1	13	Medium	Poor to Average	Average	Average	Low	imbalanced crown
TPI - 11	<i>Ficus microcarpa</i>	細葉榕	10	1.5	14	Medium	Poor to Average	Average	Average	Low	trimmed branches
TPI - 13	<i>Ficus microcarpa</i>	細葉榕	12	1	16	Medium	Poor to Average	Average	Average	Low	several trimmed branches with wounds
TPI - 16	<i>Ficus elastica</i>	印度橡樹	15	3.5	29	Medium	Poor to Average	Average	Average	Low	robust aerial roots, imbalanced crown, various pruning wound
TPI - 17	<i>Ficus elastica</i>	印度橡樹	10	2	12	Low	Poor	Poor to Average	Average	Low	various pruning wound, various branch wounds, imbalance crown, slightly yellowish foliage
TPI - 18	<i>Ficus microcarpa</i>	細葉榕	16	1	12	Medium	Average	Average	Average	Low	
TPI - 19	<i>Ficus microcarpa</i>	細葉榕	10	1	12	Medium	Poor to Average	Average	Average	Low	slightly imbalanced crown
TPI - 20	<i>Michelia x alba</i>	白蘭	14	1	10	Medium	Poor to Average	Average	Average	Low	imbalanced crown
TPI - 21	<i>Ficus microcarpa</i>	細葉榕	10	1	13	Medium	Average	Average	Average	Low	
TPI - 22	<i>Ficus microcarpa</i>	細葉榕	12	1	13	Medium	Average	Average	Average	Low	various aerial roots
TPI - 23	<i>Ficus microcarpa</i>	細葉榕	11	1.5	16	Medium	Average	Poor to Average	Average	Low	sparse foliage density caused by the attack of <i>Phauda flammans</i>
TPI - 24	<i>Celtis sinensis</i>	朴樹	12	1	16	Medium	Poor to Average	Average	Average	Low	imbalanced crown, trimmed scaffold
TPI - 27	<i>Ficus microcarpa</i>	細葉榕	11	1.2	12	Medium	Poor to Average	Average	Average	Low	imbalanced crown
TPI - 28	<i>Ficus microcarpa</i>	細葉榕	11	1	12	Medium	Average	Average	Average	Low	

Appendix 10.2

Photographic Record of Tree of Particular Interest



TPI - 04



TPI - 05



TPI - 06



TPI - 08



TPI - 09



TPI - 11



TPI - 13



TPI - 16



TPI - 17



TPI - 18



TPI - 19



TPI - 20



TPI - 21



TPI - 22



TPI - 23



TPI - 24



TPI - 27



TPI - 28

Appendix 10.3

Broad-brush Tree Survey Schedule

Appendix 10.3 - Tree Group Survey Schedule

Tree Group No.	Additional Remarks	Total Number of Trees in Individual Tree Group	Spices	Chinese Common Name	Estimated tree size (range)			Approximate quantity in the group	Form (Good/Average/Poor)	Health (Good/Average/Poor)	Structural condition (Good/Average/Poor)	Amenity value (High/Medium/Low)	Conservation status	Recommendation (Retain/Transplant/Remove)
					Range of Height (m)	Range of DBH (mm)	Range of Crown Spread (m)							
TG 01		56	<i>Bombax ceiba</i>	木棉	3-9	95-370	2.5-7	4	Poor to Average	Poor to Average	Average	Low	Nil	Re
			<i>Celtis sinensis</i>	朴	4-7	100-210	2.5-4	3	Poor	Average	Average	Low	Nil	Re
			<i>Ficus rumphii</i>	假菩提樹	5.5	175	4	1	Average	Average	Poor	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	3-6	95-300	2-5	42	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	4	105-115	2.5-3.5	2	Poor	Average	Poor to Average	Low	Nil	Re
			<i>Morus alba</i>	桑	4.5-5	95-120	3	2	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Psidium guajava</i>	番石榴	3.5	125	4	1	Poor	Average	Average	Low	Nil	Re
			<i>Sapium sebiferum</i>	烏柏	6	120	3	1	Poor	Average	Average	Low	Nil	Re
TG 02	Inaccessible Area (Survey in aid of drone)	47	<i>Dimocarpus longan</i>	龍眼	4.5-8	460	3.5-7	15	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Eriobotrya japonica</i>	枇杷	3-9	100-370	2.5-7	3	Poor	Average	Average	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	4-7	100-210	2.5-4	4	Poor	Average	Average	Low	Nil	Re
			<i>Ligustrum sinense</i>	山指甲	5.5	175	4	2	Average	Average	Poor	Low	Nil	Re
			<i>Litchi chinensis</i>	荔枝	4-9	100-400	3-7	10	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	4-7	100-210	3-7	10	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Melia azedarach</i>	苦楝	8-11	100-210	2.5-4	3	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
TG 03	Inaccessible Area (Survey in aid of drone)	126	<i>Khaya senegalensis</i>	非洲楝	9-13	250-450	8-10	2	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Carica papaya</i>	番木瓜	3-6	100-240	1-3	20	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Celtis sinensis</i>	朴	3-7	100-210	2.5-4	3	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Bridelia tomentosa</i>	土蜜樹	4-9	95-260	3-7	8	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	7-8	150-185	3.5-4	5	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Ficus hispida</i>	對葉榕	4-7	100-210	2.5-4	30	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	8-11	270-420	5-9	10	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Mangifera indica</i>	芒果	6-10	150-185	6-12	14	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Dimocarpus longan</i>	龍眼	4-9	100-400	3-7	10	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Clausena lansium</i>	黃皮	8-11	270-420	5-9	12	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Ficus elastica</i>	印度榕	8-11	600	8-12	2	Poor	Average	Average	Low	Nil	Re
<i>Litchi chinensis</i>	荔枝	4-9	100-400	3-7	10	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re			
TG 04		22	<i>Acacia confusa</i>	台灣相思	11	348	7	1	Poor	Average	Poor	Low	Nil	R
			<i>Bauhinia x blakeana</i>	洋紫荊	8-11	270-420	5-9	2	Poor to Average	Average	Average	Low	Nil	R
			<i>Bauhinia purpurea</i>	紅花羊蹄甲	4-9	95-260	3-7	5	Poor	Average	Poor to Average	Low	Nil	R
			<i>Bauhinia variegata</i>	宮粉羊蹄甲	4-9	95-260	3-7	11	Poor to Average	Poor to Average	Poor to Average	Low	Nil	R
			<i>Bombax ceiba</i>	木棉	14	490	9	1	Poor	Average	Average	Low	Nil	R
			<i>Leucaena leucocephala</i>	銀合歡	10	200	6	1	Poor	Average	Average	Low	Nil	R
			<i>Melia azedarach</i>	苦楝	13	273	7	1	Poor	Average	Average	Low	Nil	R
TG 05		13	<i>Bauhinia variegata</i>	宮粉羊蹄甲	5.5	143	4.5	1	Poor	Average	Average	Low	Nil	R
			<i>Bridelia tomentosa</i>	土蜜樹	4-6	100-150	3.5-4	3	Poor to Average	Poor to Average	Poor to Average	Low	Nil	R
			<i>Caryota mitis</i>	短穗魚尾葵	5	122	3	1	Average	Poor	Average	Low	Nil	Re
			<i>Celtis sinensis</i>	朴	4.5	109	4	1	Average	Average	Average	Low	Nil	R
			<i>Cerbera manghas</i>	海芒果	5	144	4	1	Poor	Poor	Average	Low	Nil	R
			<i>Leucaena leucocephala</i>	銀合歡	7-8	150-185	3.5-4	2	Poor	Average	Average	Low	Nil	R
			<i>Ligustrum sinense</i>	山指甲	4.5	113	4	1	Average	Average	Poor	Low	Nil	R
			<i>Macaranga tanarius var. tomentosa</i>	血桐	5	137	4.5	1	Poor	Average	Average	Low	Nil	R
			<i>Morus alba</i>	桑	5-6.5	170-180	5	2	Poor	Average	Average	Low	Nil	R
TG 06	Partial Area Fenced Off (Survey in aid of drone)	97	<i>Bauhinia variegata</i>	宮粉羊蹄甲	4-7.5	95-250	2.6-5	9	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Bridelia tomentosa</i>	土蜜樹	4-4.5	95-120	3-3.5	2	Poor	Average	Poor	Low	Nil	Re
			<i>Bauhinia purpurea</i>	紅花羊蹄甲	6.5	354	6	1	Poor	Average	Poor	Low	Nil	Re
			Dead tree	死樹	5-6	95-160	1	3	Poor	Poor	Poor	Low	Nil	Re
			<i>Bombax ceiba</i>	木棉	7	193	4	4	Poor	Average	Average	Low	Nil	Re
			<i>Ficus variegata</i>	青果榕	5	144	3.5	1	Poor	Average	Average	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	6.5-10	95-290	4.5-6	5	Poor to Average	Average	Average	Low	Nil	Re
			<i>Ficus microcarpa</i>	榕樹	5-12	150-500	6-12	20	Poor to Average	Average	Average	Low	Nil	Re
			<i>Clausena lansium</i>	黃皮	4-9	100-400	3-7	20	Poor to Average	Average	Average	Low	Nil	Re
			<i>Bauhinia acuminata</i>	矮白花羊蹄甲	5-12	150-500	6-12	10	Poor	Average	Average	Low	Nil	Re
			<i>Carica papaya</i>	番木瓜	8-11	270-420	5-9	20	Poor to Average	Average	Average	Low	Nil	Re
<i>Melia azedarach</i>	苦楝	9-10	240-380	4-7	2	Poor	Average	Poor	Low	Nil	Re			
TG 07	Partial Area Fenced Off (Survey in aid of drone)	75	<i>Leucaena leucocephala</i>	銀合歡	5-12	95-370	2-7.5	27	Poor	Average	Poor	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	4	95	3.5	1	Poor	Average	Average	Low	Nil	Re
			<i>Melia azedarach</i>	苦楝	8.5	615	8	3	Poor	Average	Average	Low	Nil	Re
			<i>Acacia confusa</i>	台灣相思	5-14.5	120-340	3-10	13	Poor	Average	Average	Low	Nil	Re
			<i>Mangifera indica</i>	芒果	8.5	615	8	1	Poor	Average	Poor	Low	Nil	Re
			<i>Ficus microcarpa</i>	榕樹	5-12	150-500	6-12	30	Poor to Average	Average	Poor	Low	Nil	Re
TG 08		61	<i>Bauhinia x blakeana</i>	洋紫荊	6-8	190-265	4-5	5	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Bauhinia purpurea</i>	紅花羊蹄甲	4-7	100-250	3-5	10	Poor to Average	Average	Average	Low	Nil	Re
			<i>Bauhinia variegata</i>	宮粉羊蹄甲	5-6	135-265	4-6	4	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Caryota mitis</i>	短穗魚尾葵	4-6	100-280	1-4	10	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Cassia siamea</i>	鐵刀木	5-12	120-340	3-8	13	Poor to Average	Average	Average	Low	Nil	Re
			<i>Celtis sinensis</i>	朴樹	6	170	3	1	Poor	Average	Average	Low	Nil	Re
			<i>Cinnamomum burmannii</i>	陰香	4	127	3	1	Poor	Average	Poor	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	5-10	95-400	3-6	17	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Acacia confusa</i>	台灣相思	9-12	150-440	6-12	5	Poor	Average	Poor to Average	Low	Nil	Re
			<i>Bauhinia x blakeana</i>	洋紫荊	6-10	210-390	5-8	9	Poor	Average	Poor to Average	Low	Nil	Re

Appendix 10.3 - Tree Group Survey Schedule

Tree Group No.	Additional Remarks	Total Number of Trees in Individual Tree Group	Spices	Chinese Common Name	Estimated tree size (range)			Approximate quantity in the group	Form (Good/Average/Poor)	Health (Good/Average/Poor)	Structural condition (Good/Average/Poor)	Amenity value (High/Medium/Low)	Conservation status	Recommendation (Retain/Transplant/Remove)
					Range of Height (m)	Range of DBH (mm)	Range of Crown Spread (m)							
TG 09		148	<i>Bauhinia purpurea</i>	紅花羊蹄甲	5-10	95-170	3-7	4	Poor	Average	Poor to Average	Low	Nil	Re
			<i>Bauhinia variegata</i>	宮粉羊蹄甲	4-10	95-280	3.5-5	11	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Bombax ceiba</i>	木棉	7-11	190-270	3.5-6	3	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Caryota mitis</i>	短穗魚尾葵	4-6	120-230	3-4	9	Average	Average	Average	Low	Nil	Re
			<i>Cassia siamea</i>	鐵刀木	9-12	230-360	5-8	9	Poor	Average	Poor to Average	Low	Nil	Re
			<i>Cinnamomum burmannii</i>	陰香	5-7	140-270	5-7	2	Poor	Average	Poor	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	2-14	95-440	1-9	94	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	3-8	160-260	5-7	2	Poor	Average	Poor to Average	Low	Nil	Re
TG 10		21	<i>Bombax ceiba</i>	木棉	12	350-460	6	2	Poor to Average	Average	Average	Low	Nil	Re
			<i>Ficus variegata</i>	青果榕	7	222	5	1	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	3-12	120-380	1-6	11	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	4-8	110-150	4-5	4	Poor	Average	Poor to Average	Low	Nil	Re
			<i>Morus alba</i>	桑	4	240	4	1	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Sapium sebiferum</i>	烏柏	5-7	210-230	3-6	2	Poor	Average	Poor to Average	Low	Nil	Re
TG 11	Inaccessible Area (Survey in aid of drone)	25	<i>Caryota mitis</i>	短穗魚尾葵	4-6	120-230	3-4	5	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Broussonetia papyrifera</i>	構	9-12.5	95-205	3.5-5.5	10	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	4	110	3	5	Poor to Average	Average	Poor to Average	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	5-10	95-400	3-6	5	Poor to Average	Average	Poor to Average	Low	Nil	Re
TG 12	Partial Area Fenced Off (Survey in aid of drone)	49	<i>Caryota mitis</i>	短穗魚尾葵	4-7	100-190	2.5-4	7	Poor to Average	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Bauhinia purpurea</i>	紅花羊蹄甲	4-9	120-280	4-6.5	5	Poor	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Broussonetia papyrifera</i>	構	9-12.5	95-205	3.5-5.5	22	Poor	Average	Average	Low	Nil	Re
			<i>Celtis sinensis</i>	朴樹	3	107	2.5	1	Poor	Poor	Average	Low	Nil	Re
			Dead tree	死樹	6	120	4.5	1	Poor	Average	Average	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	4-11.5	100-190	3-6.5	12	Poor	Poor to Average	Poor to Average	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	4	110	3	1	Poor	Poor	Average	Low	Nil	Re
TG13		1	<i>Melaleuca cajuputi subsp. cumingiana</i>	白千層	10	330	7	1	Average	Average	Average	Low	Nil	R
TG14		45	<i>Caryota mitis</i>	短穗魚尾葵	3.5-5	100-220	2-4	8	Poor to Average	Average	Average	Low	Nil	Re
			<i>Lagerstroemia speciosa</i>	大花紫薇	3.5	120	3.5	1	Average	Average	Average	Low	Nil	Re
			<i>Bauhinia x blakeana</i>	洋紫荊	9	280	5	1	Average	Average	Average	Low	Nil	Re
			<i>Leucaena leucocephala</i>	銀合歡	5-15	95-260	3-8	18	Average	Average	Average	Low	Nil	Re
			<i>Saraca dives</i>	中國無憂花	4.5-9	100-280	4-7	5	Average	Average	Average	Low	Nil	Re
			<i>Bauhinia variegata</i>	宮粉羊蹄甲	3-8	95-150	3.5-5	3	Average	Average	Average	Low	Nil	Re
			<i>Macaranga tanarius var. tomentosa</i>	血桐	4.5	95	4	5	Poor	Average	Poor to Average	Low	Nil	Re
			<i>Broussonetia papyrifera</i>	構	7	120	3	1	Poor	Average	Average	Low	Nil	Re
			<i>Celtis sinensis</i>	朴樹	3.5	95	3	1	Poor	Average	Average	Low	Nil	Re
			<i>Cassia siamea</i>	鐵刀木	4.5	165-450	4	2	Poor	Average	Poor to Average	Low	Nil	Re

Total 786

Appendix 10.4

Photographic Record of

Broad-brush Tree Survey



TG 01-V1



TG 01-V2



TG 02-V1



TG 02-V2



TG 03-V1



TG 03-V2



TG 03-V3

TG 03-V4

TG 03-V5



TG 04-V1



TG 05-V1



TG 05-V2



TG 06-V1



TG 06-V2



TG 07-V1



TG 07-V2



TG 07-V3



TG 08-V1



TG 08-V2



TG 08-V3



TG 09-V1



TG 09-V2



TG 10-V1



TG 11-V1



TG 12-V1



TG 13-V1



TG 14 -V1



TG 14 -V2



TG 14 -V3



TG 14 -V4



TG 14 -V5



TG 14 -V6

Appendix 13.1

Sample Data Sheet for TSP Monitoring

Sample Data Record Sheet for TSP Monitoring

	Name & Designation	Signature	Date
Field Operator			
Laboratory Staff			
Checked by			

Monitoring Location		
Details of Location		
Sampler Identification		
Data & Time of Sampling		
Elapsed-time	Start (min)	
Meter Reading	Stop (min)	
Total Sampling Time (min)		
Weather Conditions		
Site Conditions		
Initial Flow Rate, Q_{si}	P_i (mmHg)	
	T_i (°C)	
	H_i (in)	
	Q_{si} (Std. m ³)	
Final Flow Rate, Q_{sf}	P_f (mmHg)	
	T_f (°C)	
	H_f (in)	
	Q_{sf} (Std. m ³)	
Average Flow Rate (Std. m ³)		
Total Volume (Std. m ³)		
Filter Identification No.		
Initial Wt. of Filter (g)		
Final Wt. of Filter (g)		
Measured TSP Level (g/m ³)		
Remarks		

Appendix 13.2

Sample Data Sheet for

Construction Noise Monitoring

Sample Data Record Sheet for Construction Noise Monitoring

	Name & Designation	Signature	Date
Recorded by			
Checked by			

Monitoring Location		
Details of Location		
Data & Time of Sampling		
Major Noise Source(s)		
Other Noise Source(s)		
Measurement Period		
Sound Level Meter (Model, S/N)		
Calibrator (Model, S/N)		
Measurement Results	L ₉₀ (dB(A))	
	L ₁₀ (dB(A))	
	L _{eq} (dB(A))	
Remarks		

Appendix 13.3

Sample for Interim Notifications of Environmental Quality Limits Exceedances

Sample for Interim Notifications of Environmental Quality Limits Exceedances

Project	
Date	
Time	
Monitoring Location	
Parameter	
Action and/or Limit Levels	
Measured Level	
Possible reason for Action or Limit Level Non-compliance	
Actions Taken / to be taken	
Remarks	

Prepared by: _____

Designation: _____

Signature: _____

Date: _____



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